About the authors



Y. Mahesh, Senior Preservation Assistant, Botanical Survey of India, Eastern Regional Centre Shillong has been working on floristics and ex-situ conservation for the last seven years. He was a Senior Research Fellow at Botanical Survey of India, initially at Central National Herbarium, Howrah, later at Deccan Regional Centre of BSI, Hyderabad. He has completed his Ph.D. in Botany from Osmania University, Hyderabad, Telangana. He has described one new grass taxa and published more than twenty research papers in national and international journals. He is also authored a book and three book chapters. Currently he is working on Trees and Parasitic angiosperms of Meghalaya, India. He is life member of Indian Association for Angiosperm Taxonomy.



L. Rasingam, Scientist -E & Head of Office, Botanical Survey of India, Deccan Regional Centre, Hyderabad, is a field botanist specializing in floristic studies, ecological assessments, Non Detrimental Findings (NDF), and ethnobotanical studies. He has extensively worked on the flora of remote islands of Andaman & Nicobar Islands, Southern Western Ghats, Deccan Plateau, and Eastern Ghats. He has completed floristic studies on Nagarjunasagar Srisailam Tiger Reserve, Flora of Manjeera Wildlife Sanctuary, and the MoEF & CC funded Study on Non Detrimental Findings (NDF) on Red Sanders (Pterocarpus santalinus L.f.) in India. He has co-authored 05 books and 120 research articles in national and international peer-reviewed journals. He is a member of the Indian Association of Angiosperm Taxonomy and an Editorial Board Member for the Journal of Economic and Taxonomic Botany. Presently, he is working on the flora of Pakhal Wildlife Sanctuary, Telangana, and two Andhra Pradesh State Biodiversity Board funded projects.



ISBN 8197064776

भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA

Botanical Survey of India
CGO Complex, 3rd MSO Building,
Block-F (5th and 6th Floor), DF Block,
Sector I, Salt Lake City, Kolkata - 700 064

सत्यमेव जयते

Flora of
Papikonda National Park
Andhra Pradesh

भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA

Botanical Survey of India

2024

LiFE
Lifestyle for Environment

About the book

The book Flora of Papikonda National Park, Andhra Pradesh, is an outcome of five years of extensive studies on the flora of the area. It provides a floristic account of angiosperm species in Papikonda National Park, an area known for its unique vegetation and floral diversity. A total of 970 taxa (including 2 subspecies and 8 varieties) belonging to 576 genera and 119 families are enumerated in this account. One new variety, seven new records for the state, one new record for southern India, and one for the Eastern Ghats have been reported from the study area. The book provides a detailed analysis, a key to the families, updated nomenclature for each taxon, a brief description, phenology, habitat, occurrence, voucher numbers with specific locality, and more than 450 colored photographs. The book also provides data on important species that will further aid in sustainable utilization and conservation strategies.

FLORA OF PAPIKONDA NATIONAL PARK, ANDHRA PRADESH

Y. Mahesh

L. Rasingam

भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA

BOTANICAL SURVEY OF INDIA

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

2024

Flora of Papikonda National Park, Andhra Pradesh

Authors
Y. Mahesh
L. Rasingam

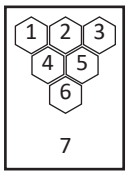
© Botanical Survey of India
Date of Publication: June, 2024

Published by
Director
Botanical Survey of India
CGO Complex, 3rd MSO Building
Block - F, 5th & 6th Floor
DF-Block, Sector - I, Salt Lake City
Kolkata - 700 064

Disclaimer
This e-book is a part of the mission to complete quick publication of manuscripts and the research results addressing a portion of the larger prospective on the subject for the projects carried out at Botanical Survey of India. This is for the immediate dissemination of research findings in the public domain for use of the stakeholders and general public. The book has not gone through any editorial process and the entire content, expressed opinions, design, layout etc. solely belong to the authors.

All rights reserved
No part of this publication may be reproduced, stored in a retrival system, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior permission of the copyright owner. Applications for such permission, with a statement of the purpose and extent of reproduction, should be addressed to the Director, Botanical Survey of India, CGO Complex, 3rd MSO Building, Block - F, 5th & 6th Floor, DF - Block, Sector - I, Salt Lake City, Kolkata - 700 064.

Cover photo (front) : A view of Godavari river flowing through Papikonda National Park.



(back) : 1. *Callicarpa arborea* Roxb.; 2. Careya arborea Roxb.;
3. *Miliusa tomentosa* (Roxb.) Finet & Gagnep.; 4. *Soymida febrifuga* (Roxb.) A.Juss.;
5. *Habenaria plantaginea* Lindl.; 6. *Strobilanthes heyneanus* Nees;
7. A view of hillocks and grassland at Papikonda National Park.

Citation: MAHESH, Y. AND L. RASINGAM 2024. Flora of Papikonda National Park, Andhra Pradesh. Botanical Survey of India, Kolkata. 419 pp.

ISBN: 978-81-970647-7-7

e-Publication

डॉ. ए.ए. माओ
निदेशक

Dr. A.A. Mao
Director

भारतीय वनस्पति सर्वेक्षण

Botanical Survey of India



FOREWORD

Protected areas are important components for achieving the objectives stated in articles 6 and 8 of the Convention on Biological Diversity (CBD). They serve as key ecosystems for conserving the biodiversity. In India, there are 998 protected areas covering 173,629.52 square kilometers of land under protection.

Floristic studies in these protected areas are vital for the functional aspects of the ecosystem and the status of various species. These studies also contribute to the safeguarding of habitats, restoration of degraded habitats, and species rehabilitation. Research conducted in protected areas will help us devise better policies for the conservation and sustainable utilization of available resources to meet human social and economic needs. The National Wildlife Action Plan (1993) recognized the need for establishing a network of protected areas in different phytogeographic regions of the country.

According to the Andhra Pradesh Reorganization Act of 2014, the state is represented by 19 protected areas, which include 1 Biosphere Reserve, 13 Wildlife Sanctuaries, 3 National Parks, 1 Tiger Reserve, and 1 Elephant Reserve. These areas cover a total geographical area of 8139.89 sq. km., which is 22.05% of the state's total notified forest area. As a part of the Annual Research Programme of Botanical Survey of India, the floristic diversity of Papikonda National Park (PNP) has been completed during 2017 - 2021 and the results are presented in the e-book 'Flora of Papikonda National Park, Andhra Pradesh'. This national park covers an area of 1,012.86 square kilometers and contains some of the finest representative forests of the Eastern Ghats. It is located on the left and right banks of the Godavari River and cuts through the Papikonda hill range of the Eastern Ghats, with elevations ranging from 150 to 1,350 meters above sea level. The area represent high species diversity with 970 plant taxa belonging to 576 genera and 119 families. The Flora is presented here with artificial keys for identification of these species alongwith photographs as value addition.

I congratulate the authors for making this valuable scientific information available in its present form. I believe, this book would serve as one of the important reference material for the flora of Eastern Ghats in general and Andhra Pradesh in particular.

(**A.A. MAO**)

PREFACE

Protected areas are the cornerstone of biodiversity conservation in India. There are 990 protected areas in India, which include 565 wildlife Sanctuaries, 106 National Parks, 100 Conservation Reserves and 219 Community Reserves. They constitute approximately 5.27% of the total geographical area of the country (National Wildlife Database Cell, up to May 31, 2022). In Andhra Pradesh, there are 19 protected areas including 1 Biosphere Reserve, 13 Wildlife Sanctuaries, 3 National Parks, 1 Tiger Reserve and 1 Elephant Reserve. Documentation of floristic diversity in protected areas is of paramount importance, as these are the ecosensitive zones with fragile habitats. The floristic studies will help in monitoring, management and sustenance of these ecosystems.

The e-book 'Flora of Papikonda National Park, Andhra Pradesh' includes the results of floristic studies carried out in this national park during 2017 to 2021 as a part of the Flora of India project under the Annual Research Programme of Botanical Survey of India. The work was carried out at the Deccan Regional Centre of BSI at Hyderabad with all the voucher specimens deposited at BSID. Although Papikonda National Park is one of the important wildlife habitats, it remained floristically less explored, and there is no past comprehensive floristic account apart from some sporadic collections refered in the Flora of Visakhapatnum District and Flora of Andhra Pradesh. Any conservation action begins with effective documentation of biodiversity, and hence this work was carried out with the objective to explore and document the floristic diversity of Papikonda National Park. The study has resulted in the documentation of overall floristic diversity, endemic species diversity, grass species, and invasive species diversity. The present work has resulted in documentation of 970 plant taxa belonging to 576 genera and 119 families from the Papikonda National Park. The families are arranged according to the recent Angiosperm Phylogeny group classification (APG IV, 2016). Dichotomous bracketed Keys are provided for families, genera, species and infraspecific taxa. The genera under each family and species under each genus are arranged alphabetically. Each species is provided with the correct name followed by basionym and its relevant synonyms, if any. Nomenclatural citations are followed by description in details including many general features, which are observed in the field, followed by the season of flowering and fruiting, distribution, specimens examined and notes on taxonomy and nomenclature, if any. Maximum photographs are provided which add value for identification.

We are sure that this book will be helpful to the conservation authorities for future management and restoration of some of the degraded habitats with suitable plant species. Besides, this book will be helpful to botany students, researchers, biodiversity management committees, and plant enthusiasts to know about the diversity of the local flora of this region.

Y. Mahesh
L. Rasingam

ACKNOWLEDGEMENTS

The authors are grateful to Dr. A.A. Mao, Director, Botanical Survey of India, Kolkata for giving this opportunity and express their deep gratitude to Dr. Paramjit Singh, Former Director, Botanical Survey of India, Kolkata for the encouragement. Dr. P.V. Prasanna, Scientist-G (Retd.), and other staffs of Botanical Survey of India, Deccan Regional Centre, Hyderabad are thankfully acknowledged for their valuable inputs, corrections and various support during the study period. Dr. S.S. Dash, Scientist 'F', In-charge, Technical Section, Dr. Dinesh Kumar Agrawala, Scientist 'E', In-charge, Publication Section and the staffs of Technical and Publication section deserve special thanks for their valuable support in processing, designing and editing the book. Dr. N. Odyuo, Scientist-E & HoO and all scientific and technical staffs of Botanical Survey of India, Eastern Regional Centre, Shillong are gratefully acknowledged for their continuous support.

The authors are also thankful to Dr. M. Venkat Ramana, Assistant Professor, Dept. of Botany, UCSS, Hyderabad, Dr. K. Chandramohan, F.R.O, Forest Survey of India, Central Zone, Nagpur, Dr. K. Prasad, Assistant Professor, Sri Venkateshwara College, Delhi University, and Dr. M. Chennakesavulu Naik, Coordinator, Andhra Pradesh State Biodiversity Board, Guntur for their valuable inputs and support. The PCCF and all the forest officials of the Andhra Pradesh state forest department deserve special thanks for granting permission, logistic support and help during field trips. Family members who gave their unstinted support during the study are also thankfully acknowledged.

Y Mahesh
L. Rasingam

CONTENTS

Introduction	1
Material and Methods	8
Plan of Presentation	9
Result and Discussion	10
References	14
Systematic treatment	16
Index to the Scientific names	398

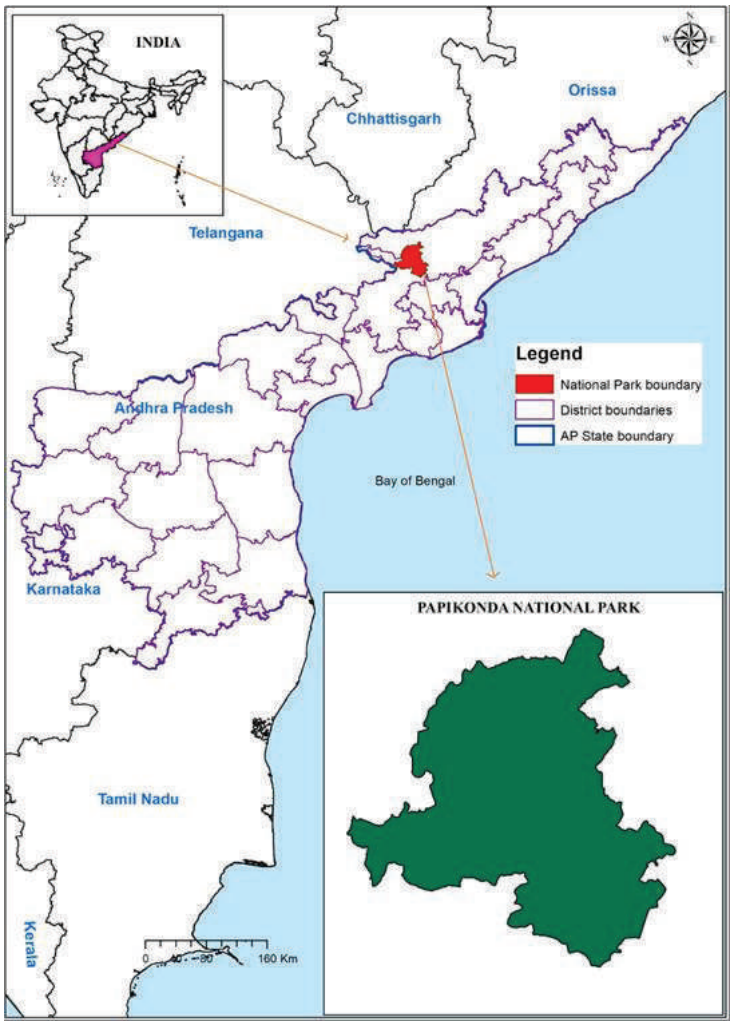
1. INTRODUCTION

Floristic studies in the protected areas are vital for better understanding of ecosystems, their functions, ecology and status of various species, safeguarding of habitats, restoration of degraded habitats, and species rehabilitation. The research in protected areas will help us to devise better policies for conservation and sustainable utilization of available resources for human social and economic needs. The National Wildlife Action Plan (1993) recognized the need for establishing a network of protected areas in different phytogeographic regions of the country.

At present, India has a total of 990 protected areas, which include 565 Wildlife Sanctuaries, 106 National Parks, 100 Conservation Reserves and 219 Community Reserves. They constitute approximately 5.27% of the total geographical area of the country (National Wildlife Database Cell, up to May 31, 2022). The floristic survey and documentation of protected areas was given more importance in the 12th plan of the Botanical Survey of India since they are expected to harbour significant flora.

As per the Andhra Pradesh Reorganization Act' 2014, the state is represented by 19 protected areas, which includes 1 Biosphere Reserve, 13 Wildlife Sanctuaries, 3 National Parks, 1 Tiger Reserve and 1 Elephant Reserve covering together 22.05% of the total notified forest area of the state.

The present study is aimed to document the floral wealth of Papikonda National Park (PNP), which is located in East Godavari and West Godavari districts of Andhra Pradesh. The vegetation found in the state is largely dry deciduous type with a mixture of species belonging to the genera, *Tectona*, *Terminalia*, *Dalbergia*, *Pterocarpus*, and *Anogeissus* predominantly. The hills are part of the Eastern Ghats and home to many endemic species of plants, birds and lesser forms of animals. The varied habitats harbour a diversity of fauna, which includes Tiger, Leopard, Fox, Wild Dog, Hyena, Sloth Bear, Gaur, Black Buck, Chinkara, Chowsingha, Nilgai, Cheetal, Sambar and a number of birds and reptiles.



Map 1: Map of the Papikonda National Park.

1.1. About study area

The Papikonda National Park (PNP) is spread in an area of 1,012.86 km² lying between 16°57′0″–16°55′0″N and 82°15′0″–81°20′0″E and has finest representative forests of the Eastern Ghats. It lies on the left and right banks of the river Godavari and cuts through the Papikonda hill range of Eastern Ghats with an elevation ranging from 150-1,350 m asl. Varied and multifarious streams emanating from PNP make the Papikonda forest vegetation luxuriant. All these constitute to make the area into a typical ecological and geomorphological zone. The sight of mighty Godavari meandering through densely forested hills with deep gorges & valleys is to be seen to relish the nature's beauty. Initially, the PNP was notified as the Wildlife Sanctuary in 1978, and later designated as National Park in 2008.

1.2. Topography

Papikonda National Park is located in the East and West Godavari districts of Andhra Pradesh and some part in Khammam district of Telangana (now in Andhra Pradesh after 9 mandals from Khammam were merged with Andhra Pradesh). It lies on either side of the perennial river Godavari in Eastern

Ghats encompassing the famous Papi hill range starting from Koida and Kotarigommu villages of West & East Godavari districts of the river at a width of about one km and flows in a length of 42.5 km amidst the hill ranges and terminates at Singanapally and Devipatnam villages within the limits of West & East Godavari districts respectively. The National Park is mostly hilly and there are few plain lands. Average height of the National Park is 600 m. Between the ranges there are glens and gorges through which flow the hill streams.

The papikonda national park consist of an area of 1,012.86 km^2, divided into three forest divisions (Eluru, Kakinada, Rajahmundry), six forest ranges and thirty-three forest beats. The forest beats under forest ranges are given here: **Rampachodavaram** (Valamuru, Pindikura Valasa) **Gokavaram:** (Kondamodalu, Teliperu, Katchuluru, Pedanunthala, Manturu, Devipatnam); **Polavaram:** (Sirivaka, Shivagiri, Chilukaluru, Tekuru, Thutigunta, Kondrukota, Udtapally, Netteppakota, Kothuru); **Kukunoor:** (Pentapally, Tekupalli, Koida, Kakeshnur, Chigurumamidi, Kavadiguntla East, Kavadiguntla North.) **V.R. Puram: (**Pocharam, Thummileru, Geediguppa, Darapally, Maredupudi, Gonduru, Buruguwada) **Chinturu**: (Eruwada, Gulletiwada).

1.2.1. Geology

The tract is endowed with the varied types of rocks and mineral deposits. The important geological formations occurring in the tract are Khondalites of Archaean age. This geological formation consists of Granite, Graphite, Gnesses, and associated rocks, ferruginous quartzite, banded magnetite and quartz. Gneiss and schist form the underlying rock in all the hill forests, sand stone formations are well developed in the plain forests in West Godavari district. Most of the rocks are metamorphic with granite intrusions which have undergone long and severe weathering resulting in sandy-to-sandy loam soils. Geological formations occurring in this catchment are varied in nature and belong to Achaean to recent period. Recent alluvial deposits, coastal sand and lateritic soils are also present (R.S. Rao & al., 1989).

1.2.2. Soil types

a. Loamy soils: These soils are found due to disintegration of parent rock like sand stones, gneisses. They are fine in texture, red in colour and fertile with high content of humus. These soils are found in Akuru, Kondamodalu, Manturu and Papikonda reserve forests.

b. Lateritic soils: These types of soils are extensively seen in all the areas of two districts. They are formed due to disintegration of Archean rocks. The soils in East Godavari district are fairly deep even on hill slopes and are well developed, where the parent rock is Schist's and are well developed, where the parent rock is schist's and Khondalites, the clay content of the soil is more, forming dark brown clay loams. The soils formed out of granites, gneisses and sand stones are red loamy with less clay content and more gravel. In the interior high forests, these soils are deep and fertile with high content of organic matter in the top layer imparting dark brown colour to the soil. These highly productive well drained soils are ideally suited for raising teak plantations. In areas subjected to large scale deforestation in the past, mostly under shifting cultivation, the soils are shallow and boulder with high gravel content. They are common in the tracts of west Godavari district.

c. Alluvial soils: These soils are formed by the rich slit deposits by river Godavari and formed into vast delta mostly suited for Agriculture present in Polavaram range, V.R. Puram range, Kukunur range.

d. Black cotton soils: These soils are rare and found mixed with calcareous nodules in patches in West Godavari district.

1.2.3. Terrain

Terrain is mostly hilly with steep slopes of 30% to 50%. The hill ranges which run from west to east are part of Eastern Ghats and their extensions bear valuable forests. The elevation of these hills varies from 500 m to 1200 m above M.S.L. In certain parts of Kukunur range of Eluru division the elevation varies from 12 m to 600 m above Mean Sea level. These hills bear the most valuable high forests of the catchment forming rampa Agency tract with poor accessibility. The highest peaks of Papikonda hill are present near Ravigudem and Geddapalli areas. The plateaus are large with grassy patches which support herds of Gaur. Large plains are called lankas. They are Neelalamma, Mutchukonda lankas in Papikonda R.F. The terrain is much undulating due to many peaks with saddles, valleys and plains between them.

The Rekhapalli Hill R.F. in East Godavari district drains southerly by peddavagu which ultimately drains into the river Godavari. The Akuru R.F. of East Godavari drains into Pamuleru river. The drainage in the part of National Park in West Godavari district is mainly by Jalatar Kalva, Yerrakalva and Kovvada kalva which flow in southern direction. A few streams in Perantapalle R.L. drain into Godavari in Northern direction. The banks of River Godavari and banks of Kovvada and yerrakalva are much affected by erosion.

1.2.4. Climate

The distribution of wildlife in Papikonda is largely governed by the climatic factors. The climatic conditions in Papikonda National Park and its surroundings can be described as typical coastal climate, which is hot and humid. It is pleasant during night time and little warmer during the day time. Due to its proximity to sea, humidity is high. Light winter extends from November to February and hot summer from March to June whereas rainy season lasts from July to October. Climate is broadly divided into four season's *viz*., winter from January to February followed by pre monsoon extending from March to May; south-west monsoon extends to June to September and post monsoon from October to December. From November to April, a continental high-pressure system brings North-East winds which are characteristic of winter season and from June to September rain bearing south-west monsoon prevails along with cyclonic storm which bring heavy rainfall associated with major physical changes. Period from September to December produces severe cyclones.

1.2.5. Rainfall

The rainfall is mainly from South-West monsoon from July to October and occasionally from North-East monsoon occurring during October and November. During the period 1999-2000 and 2009-2010, the mean average rainfall is 974.55mm which ranges between 575 mm and 1375 mm/yr in East Godavari part of Papikonda National Park. Most of the rainfall is received due to frequent cyclones. Pre-monsoon showers occur in May or early June and winter rains are rare. The annual average rainfall pattern varies differently within the National Park area being vast area. The average rainfall is 1362 mm in Chinturu division (erstwhile Paloncha) division and it is 1076 mm in Eluru and 1280 mm in Kakinada division.

1.2.6. Temperature

Temperature in the national park ranges from 10°C to 48°C and it varies from each and every division. In Chinturu division the temperature remains from 17°C to 37°C and in the Eluru division it ranges from 12°C to 48°C. Due to the high temperature during the summer, the forests in the Eluru division are more prone to forest fires. In West Godavari, the temperature varies from 17°C to 45°C where as in Kakinada division it varies from 10°C to 48°C.

1.2.7. Humidity

The Papikonda National Park area is very humid and hot climate due to its close proximity to the coastline. The humidity ranges from 75-80% throughout the year except in April and May when the percentage of humidity reach 70% or less.

1.2.8. Water Sources

PNP is connected by a network of Rivers, Vagus, Rivulets, Tributaries, such as River Godavari, Pamuleru, Peddavagu, Jalthar kalva, Kovvada kalva, Yerra kalva, Seethapally vagu, Katchuluru Vagu, Ijjaluru vagu, Chigurumamidi vagu etc. which are the main water resources. In addition to the above, there are number of minor Vagus which serves the water needs of Park dwellers.

1.3. People

There are various ethnic groups inhabiting in around the National Park. The tribal communities inhabiting around the park are Gonds, Koyas, Koya doras, Kondas, Raj Gonds, Pradhan, Toti, Dadve, Gowari and Kolam and all are endogamous of which Gonds are the predominant tribal community. The tribal communities possess indigenous knowledge related to the uses of plant resources as they depend on the forest resource for their living. This knowledge was even passed through generation to generation and played an important role in the conservation and sustainable use of biodiversity. Though the area is inhibited by many tribes Koyas and Konda Reddi are the dominant tribal communities in the National Park.

1.3.1. Koyas

The Koyas are believed to be a section of the great Gond tribe of the central provinces. They have language of their own but speak crude Telugu. Basically, they are agriculturists and during summer season, they extract timber, fuel and bamboo in departmental coupes, collect minor forest produce and form labour force in the plantation works of the department. Summer is their festive season as they indulge in drinking of sap extracted from sago palm the *Caryota urens* (Fish tail Palm). They eat, drink and make merriment through communal dances. During this period, they look lively and cheerful and avoid any hard work and labour. Their staple food is sap extracted from palms and they found intoxicated from dawn to dusk. The relationship of these people with forests is inseparable. They are entirely dependent on forests either for their food or earnings.

1.3.2. Konda Reddis:

Konda Reddis inhabit on the banks situated on either side of Godavari River in the hilly and forest tracts of East and West Godavari districts of Andhra Pradesh. Their mother tongue is Telugu. They are recognized as primitive tribal group. Konda Reddy tribe is divided into exogamous sections for regulating matrimonial relations. They are primarily shifting cultivators and largely depend on flora and fauna of forest for their livelihood. They eat variety of tubers, roots, leaves, wild fruits etc., They collect and sell non-timber forest produce like *Tamarindus indica* (Tamarind), *Phanera vahlii* (Adda leaves), *Diospyros melanoxylon* (Thuniki leaves), *Thysanolaena latifolia* (Broom sticks) etc. to supplement their meagre income. They cultivate largely Jowar which is their staple food. They also grow ragi, red gram, bajra, beans, paddy and pulses. They worship Muthyalamma, Bhumi Devi, Konda Devi, Gangamma Devi etc., and celebrate festivals like Mamidi kotha, Bhudevi pandaga and Vanadhevudu pandaga.

These people have their own institution of social control called Kula Panchayat. Each village has a traditional headman called Pedda kapu. The offences like adultery, incest and cases of divorce and inter dining with persons of other community are dealt by the village panchayat.

1.4. Earlier Botanical Studies

Floristically, the PNP is under explored and there is no past detailed and dedicated floristic account. In a few regional herbaria, specimens from PNP are either scanty or no representative collections. The rich floral and faunal resources of the National Park have not received any attention especially on floristic studies after publication of The Flora of East Godavari District (Rao & al. 1999). Rao (1958-1964) explored to an extent of 300 sq miles area of Eastern Ghats covering Addatigala, Etrakonda, Gudem, Rampachodavaram, Maredumilli, Sambarkonda, *etc*. Raju (1966a, c) studied the vegetation and flora of Polavaram agency tracts and reported 410 species (Raju, 1966, 1968) and also did plants of Papi hills, Andhra Pradesh (Raju, 1966) and reported 170 species belongs to 135 genera under 50 families. Later, in 1968, he surveyed Bedadamuru, Jilugumilli, Jangareddy gudem and Ravigudem (environs of Bhardhrachalam) areas. Seshavatharam (1974) reported 43 aquatic weeds from the Paddy fields and irrigation canals of west Godavari district. Pullaiah and Pullaiah & al. (1998) published flora of Andhra Pradesh in 3 volumes.

Although the area has tremendous potential from floristic point of view, it was ignored due to inaccessibility to certain areas in PNP. Hence, Floristic studies on Papikonda National Park was undertaken as part of Flora of India Project of Botanical Survey of India with an aim to create a data base of plant diversity of protected areas on rare, endemic and threatened plant species, economically and medicinally important, knowing the present status of the floral resources for the better management and conservation of the National Park. The local floras will help to build the national flora “Flora of India”.

1.5. Forest and vegetation types in the national park (PNP)

With varied habitats and climatic conditions, the park exhibits various types of forest types. As per the Champion & Seth (1968), the vegetation of the National Park is broadly classified as

1. Moist mixed deciduous forests (Southern moist mixed deciduous forests, 3B/C2)
2. Dry mixed deciduous forests (Southern dry mixed deciduous forests, 5A/C3)
3. Thorny scrub forests (Southern Thorny Scrub forests, 6A/DS1)
4. Hill-top flora (Dry Savannah forests, 5A/DS2)
5. Riverine Forest

1.5.1. Moist mixed deciduous forest:

This type of forest occurs in localised patches along moist valleys and along the interior parts of perennial streams and sometimes at a fairly high altitude (± 500-1000 m) where the soil is very moist with high humus content and with rainfall more than 120 cm. In such forests, the dominant species are mostly deciduous which however, get intimately mixed up with relatively small number of evergreen species, occupying the middle and lower canopies. Sometimes relatively pure communities of evergreen species grow closely mixed up with deciduous species, giving an appearance of rather Semi-evergreen type of vegetation. This kind of vegetation is common in Valamuru, Bodhaluru, PK Valasa, Ijjaluru of Maredumilli zone under Rampachodavaram range.

Such type of forests are covered by tall deciduous species such as *Xylia xylocarpa, Adina cordifolia, Anogeissus latifolia, Pterocarpus marsupium, Lagerstroemia parviflora, Madhuca longifolia, Soymida febrifuga, Diospyros melanoxylon* etc. mixed with smaller trees of evergreen species and the ground cover with profuse growth of ferns and other



Moist mixed deciduous forest, Rampachodavaram Range



Moist mixed deciduous forest, Gokavaram Range



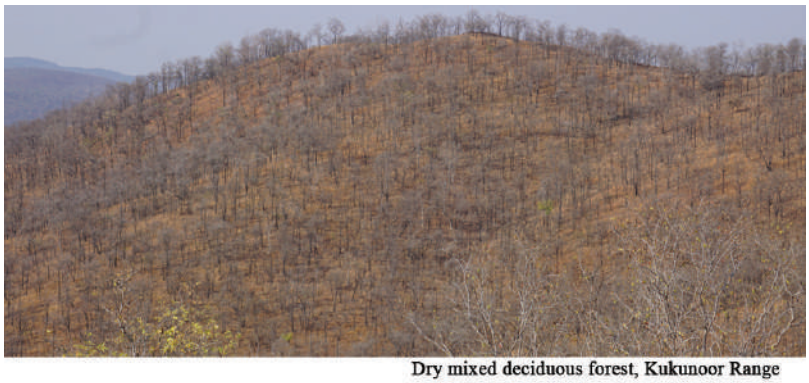
Moist mixed deciduous forest, Chinturu Range

Plate 1. Moist mixed deciduous forest.

plants, particularly along the interior ravines and shady corners near streams. Such evergreen species are *Diospyros sylvatica, Syzigium cumini, Mangifera indica, Schleichera oleosa*, etc. which grow luxuriantly reaching to more than 15-20 m height mixed with smaller trees and shrubs like *Uvaria hamiltonii, Polyalthia suberosa, P. cerasoides, Bauhinia racemosa, Memycylon umbellatum, Mallotus philippensis, Kydia calycina, Macaranga peltata, Ardisia solanacea* etc.. Mixed with shrubby undergrowth is dense layer of herbs and undershrubs, some of them are *Barleria strigosa, Eranthemum purpurascens, Byttneria herbacea, Hemigraphis latebrosa* etc. Amongst various woody and herbaceous climbers the following are common: *Gnetum ula, Entada rheedii, Phanera vahlii, Butea superba, Argyreia nervosa, Celastrus paniculatus, Ampelocissus tomentosa, Ichnocarpus frutescens, Olax scandens, Smilax zeylanica, Stemona tuberosa, Clematis zeylanica* etc.. The common ferns observed along stream banks are *Cyathea gigantea, Nephrolepis cordifolia, Angiopteris evecta, Pronephrium nudatum* besides an epiphytic fern *Pyrrosia adnascens*. Herbs like *Elatostemma cuneatum, Argostemma verticillatum* are common on rocky boulders near streams presenting a matty growth and many Zingiberaceae members dominate the ground flora. The Common epiphytic orchids in such forest area are *Cymbidium aloefolium, Oberonia wightiana, Vanda tessellata, V. testacea, Aerides ringens, Acampe praemorsa* etc. and terrestrial orchids like *Geodorum densiflorum, Habenaria barbata, H. commelinifolia, H. plantaginea* etc. Do occur. grasses are few in the moist deciduous forest due to thick canopy, and dense shade, such conditions restrict good bamboo growth. The grass species are *Panicum brevifolium, Centotheca lappacea*, *Erogrostis* spp. mixed with an undergrowth of *Oplismenus compositus* and *O. burmanii* forming important component of the ground flora.

1.5.2. Dry Mixed deciduous forest:

This is the main type of vegetation, covering about 60-70% of the forests in the National Park. This is a climax type with closed upper canopy though uneven in the density, and it is formed of tall deciduous species reaching about 20 m. With the rainfall of about 100-120 cm along the undulating area with altitude ranging from 150-1000 m, the range of species are comparatively less than those of the moist deciduous pockets, though in some areas selected species are predominant, forming more or less pure associations which are normally due to soil variation or topography, through sometimes human interference may also be responsible. Thus, the dry deciduous forests provide predominant vegetation in tropical India and the upper area under study represents a good example of such deciduous forests. The lower canopy with smaller trees, shrubs and climbers is also to some extent entirely deciduous, though in some moist and shadier areas, a few semi-evergreen species get mixed up though quite inconspicuous. With such setup enough light gets into the forests to permit reasonably good growth of grasses. Bamboos grow to some extent in



Dry mixed deciduous forest, Kukunoor Range



Dry mixed deciduous forest, Gokavaram Range



Dry mixed deciduous forest, V.R.Puram Range

Plate 2: Dry mixed deciduous forest.

this forest type but not luxuriantly. However, by human interference by way of removing timber trees of deciduous species, leaving bamboo clumps alone for some more growth.

Dry mixed deciduous forests comprise a variety of trees, shrubs, climbers, herbs, epiphytes and parasites. *Xylia, Terminalia, Anogeissus, Adina, Dendrocalamus* association predominates in various forest regions of the National Park. The top canopy usually composed of *Xylia xylocarpa, Terminalia alata, Anogeissus latifolia, Adina cordifolia, Pterocarpus marsupium* while *Cleistanthus collinus, Holarrhena pubescens, Leea indica, Tarenna asiatica, Pavetta indica, Helicteres isora* are some of the dominant species in the second storey. Besides the above representative deciduous species of some other components which constitute first and second storeys in various combinations are *Pterocarpus marsupium, Garuga pinnata, Schleichera oleosa, Madhuca longifolia, Sterculia urens, Dillenia pentagyna, Diospyros melanoxylon* while second storey occupied by *Bridelia retusa, Derris indica, Kydia calycina, Schrebera swietenioides, Macaranga peltata, Strychnos nux-vomica, Canthium dicoccum, Terminalia bellirica, Gmelina arborea* and these are usually associated with *Cleistanthus collinus, Trema orientalis, Cipadessa baccifera, Chloroxylon swietenia* and *Ziziphus xylopyrus.* The various climbers commonly observed along the dry deciduous forest are *Ichnocarpus frutescens, Erycibe paniculata, Argyreia nervosa, Opilia amentacea, Olax scandens, Derris scandens, Ampelocissus tomentosa, Tinospora cordifolia, Cayratia pedata, Cissampelos pareira* etc. Ground flora mainly comprises various undershrubs, herbs, and most of them being seasonal, usually wither away by the end of monsoon or a little later. Some of the common herbs are *Urena lobata, Byttneria herbacea, Plumbago zeylanica, Globba* spp., *Corchorus olitorius, Justicia betonica, Boerhaavia diffusa, Hibiscus micranthus, Cleome viscosa, Sida rhombifolia, S. cordifolia, S. acuta, Andrographis paniculata, Hemidesmus indicus, Aerva lanata, Evolvulus alsinoides, Commelina benghalensis, Cyanotis cristata, Elytraria acaulis, Elephantophus scaber, Hemigraphis latebrosa, Vernonia cinerea* and some species of *Crotalaria, Cassia* and *Indigofera*.

The common epiphytic orchids are *Vanda tessellata, V. testacea, Acampe praemorsa, Cymbidium aloeifolium* etc. and terrestrial orchids are represented by species belonging to the genera, *Habenaria, Peristylus* and *Geodorum.* Some of the grasses growing as undergrowth are *Heteropogon contortus, Alloteropsis cimicina, Apluda mutica, Paspalidium flavidum, Imperata cylindrica, Panicum brevifolium, Themeda triandra, Thysanolaena maxima, Cymbopogon nardus, Dactyloctenium aegyptium, Eragrostiella uniloides* etc.

1.5.3. Thorny scrub forests:

Thorny-scrub type of vegetation is represented by degraded forests which are fairly common in the flat or undulating plateau areas or low hills on the outskirts of the dry deciduous forests and sometimes along the areas

surrounding the villages within the forest area. In such open low forests, thorny and usually hard-wooded species predominate with tree height of 5-10 m, producing short boles and low branching canopy which rarely meet. Such forest areas which are not of climax type in a pre-dominantly dry deciduous forest zones of National Park, are formed due to denudation of the original deciduous forests and with the subsequent maltreatment of the area by constant biotic interference when formation of impenetrable thorny thickets hardly 4-6 m high predominate. This type of thorny-scrub forests are found along the low hills of Chilugaluru, Tekuru of Polavaram range, Chigurumamidi, Tekupally, Koida, Kavadiguntla East, Pentapally, Kakeshnur of Kukunur range, Gulletiwada of Chinturu range.



Dry mixed deciduous forest along River Godavari, V.R. Puram Range



Thorny scrub forest, Kukunoor Range

Plate 3: Thorny scrub forests & Dry Mixed deciduous forest.

The common trees in those areas are *Senegalia chundra, Diospyros melanoxylon, Canthium dicoccum, Strychnos nux-vomica, Cassia fistula, Ziziphus mauritiana*, *Z. xylopyrus, Wrightia tinctoria, Ixora arborea* etc. The common shrubs are *Bridelia montana, Benkara malabarica* etc. The common climbers are *Abrus precatorius, Gymnema sylvestre, Aristolochia indica, Cissamplelos pareira, Cocculus hirsutus* etc. Herbs are *Boerhaavia diffusa, Hibiscus micranthus, Pavonia zeylanica, Vernonia cinerea, Andrographis paniculata, Polycarpea corymbosa, Trichodesma indicum, Leucas aspera, Oldenlandia umbellata, Evolvulus alsinoides* and species of *Crotalaria, Indigofera, Cassia* are frequent.

In low lands, there are hardly any trees and some of those are cultivated. The common tree in these areas is *Borassus flabellifer*, usually covered by epiphytic figs or climbers. The common trees and shrubs in this area are *Ficus gibbosa, Strychnos nux-vomica, Vachellia nilotica, Alangium salviifolium, Calycopteris floribunda, Pergularia daemia, Ziziphus oenoplia* etc. Some of the common herbs of these areas are *Acanthospermum hispidum, Achyranthes aspera, Argemone mexicana, Boerhaavia diffusa, Cleome gynandra, Ocimum americanum, Vernonia cinerea* etc.

1.5.4. Hill Top flora (Dry Savannah Forests):

They are the open grasslands on the hill tops above 800 m elevation found in Papikonda, Kondamodalu, Perantalapalli, Valamuru, Ijjaluru, Eruwada and Rehkapalli hill forest areas. The forests are interspersed with the open grass lands on the hill tops with *Phoenix loureiroi* and scattered stunted tree growth of *Terminalia chebula*, *Gardenia latifolia, Phyllanthus emblica, Diospyros melanoxylon, Buchanania lanzan* etc. Some of the common grasses are *Iseilema laxum, Ischaemum indicum, Eragrostis unioloides, Echinochloa colonum, Cymbopogon nardus, Apluda mutica, Heteropogon contortus, Aristida setacea* etc. Common shrubs along the three hill-tops of the National Park are frequently represented by *Scutellaria violacea, Rothia serrata, Desmodium triangulare, D. heterocarpon* and frequent shrubs near slow streams are *Melastoma malabathricum, Flemingia lineata* etc. The



Savannah forest, Rampachodavaram Range



Savannah forest, Chinturu Range



Savannah forest, Polavaram Range

Plate 4: Hill Top flora (Dry Savannah Forests)

common herbaceous species are generally mixed with the members of Poaceae. Some of them are *Exacum tetragonum, Osbeckia chinensis, Blainvillea acmella, Cyanotis arachnoidea, Lepidagathis cristata, Zornia gibbosa, Osbeckia muralis, Oxalis corniculata, Parasopubia delphinifolia, Drosera indica* on sandy patches in the crevices of huge boulders. The common climbers are *Thunbergia fragrans*, *Argyreia daltonii,* and *Stemona tuberosa*. The common grasses on hill tops are *Thysanolaena maxima, Themeda triandra, Heteropogon contortus, Arundinella pumilla, Capillipedium huegelii, Chrysopogon fulvus, Cymbopogon martini* etc.

The open grasslands with sparse, stunted tree and shrub growth exclusively on the hill tops above ± 800 m altitude along Eastern ghats are treated here as an interesting vegetation type due to its specific and unusual character as explained below. Though it forms a part of the dry deciduous forest, the climatic climax type of vegetation of Eastern Ghats. It is very evident that the typical formation of the deciduous forest is lost usually beyond 900 m and standout clearly as an open bald hill top with trees growing distantly or in small groups and extremely stunted along with grasses mixed with the characteristic bushy *Phoenix* and stout woody root stocks. The trees and shrubs also look unhealthy with very short stems usually crooked and hollow. This is a distinct feature seen very commonly all along the hilltops from river Godavari banks in major parts of National Park.

1.5.5. Riverine Forest:

These forests chiefly occur along streams, nalas and along Godavari River banks. Major elements are *Dimorphocalyx glabellus*, *Ficus nervosa*, *Gnetum ula*, *Homonoia retusa*, *Homonoia riparia*, *Melastoma malabathricum, Rotula aquatica, Terminalia arjuna* etc. *Musa ornata, Ensete glaucum* are also common along the stream banks of above 700 m altitude.

2. MATERIAL AND METHODS

The present floristic account is mainly based on field studies and collections of plant specimens which have been made over a period of 4 years (2018-2021). Before commencing the field work, the data in connection with the general geography, physiography and people of the area have been collected from authentic records *viz*., Flora of West Godavari district (Rao *& al.*, 1987), Flora of East Godavari district (Rao *& al.*, 1999) Flora of Polavaram and legendary Papihills (Raju, 1966a, c), Flora of Eastern Ghats (Muralidhara Rao & Pullaiah, 2002). Similarly, plants collected by earlier workers from the East and West Godavari districts of Andhra Pradesh and some areas



Riverine forest, Polavaram Range



Riverine forest, Kukunoor Range

Plate 5: Riverine Forest.

of Khammam district of Telangana deposited at Deccan Regional Centre (BSID) and Madras Herbarium (MH), Botanical Survey of India were consulted and studied.

Periodic field surveys were undertaken to the study area and close attention was paid to collect all the necessary and pertinent data of the plant specimens which may be lost or may not be apparent after drying such as colour of flowers and fruits, texture of foliage etc. Other features such as habit, habitat, height of the plant, flowers and fruits features, associated plants, general distribution and frequency were recorded in a field book. Ethno medicinal data, economic uses and vernacular names of plant species have been recorded from local ayurvedic vaidyas, the tribals and the common folk. The collection, processing and preparing of herbarium specimens is done following as per the established procedure (Jain & Rao, 1977). All the species have been photographed in all aspects for further study. The collected plant specimens were provisionally identified using Keys available in regional/state floras *viz*. *Flora of Presidency of Madras* (Gamble, 1915-1936), *Flora of India series*, *Flora of Andhra Pradesh* (Pullaiah, 2018), *Flora of East Godavari district* (Rao & al., 1999), *Flora of West Godavari district* (Rao & al.,1987), besides relevant revisionary works, monographs and research articles were also referred for further confirmation. Later, the identifications were confirmed by comparison with authentic specimens housed at BSID, MH and CAL. The up-to-date nomenclatures for all taxa were provided by referring to authentic databases and literature. Detailed descriptions were made based on fresh and herbarium specimens as well as photographs. Families were arranged according to Angiosperm Phylogenetic Group IV Classification (APG IV, 2016).

3. PLAN OF PRESENTATION

The families are arranged according to the recent Angiosperm Phylogeny group classification (APG IV, 2016). Dichotomous bracketed Keys are provided for families, genera, species and infraspecific taxa. The genera under family and species under genus are arranged alphabetically. Under each genus distribution and number of species is given in the order of the world, India and the present study area. Each species is provided with the correct name followed by basionym and its relevant synonyms, if any. Abbreviations of authors names are after Brummit & Powell (1992) and abbreviations of books and journals Taxonomic literature ed.2 (Stafleu & Cowan, 1976-88) has followed. Nomenclatural citations are followed by description in details including many general features, which are observed in the field, followed by the season of flowering and fruiting, distribution, specimens examined and notes on taxonomy and nomenclature, if any, are also included. Some of the species which have not been collected during the present study but included based on the earlier collections.

4. RESULT AND DISCUSSION

A total of 1153 field numbers comprising 4,612 specimens were collected during the study period and all the specimens were identified into 970 taxa under 576 genera, 119 families. Among the Eudicots, Rosids dominated with 359 species followed by Asterids with 266 species. Within the rosids group, Fabids dominated with 229 species, followed by Malvids and Vitales with 119, 11 species respectively. Within the Asterids, Lamids dominated with 230 species, followed by Campanulids with 36 species. Among the Monocots, Commelinids is the more dominant with 198 species, followed by other monocots with 49 species.

Table: 1. Comparative statistical analysis of the Flora of Andhra Pradesh, Flora of East Godavari District and Flora of Papikonda National Park (PNP).

Sl. No.	Flora	Plant group	Families	Genera	species	subsp.	Variety & Forma	Total Taxa
1.	**Andhra Pradesh**	Monocots	34	252	712	**102**		**2982**
		Dicots	143	870	2168			
Total			**177**	**1122**	**2880**			
2.	**East Godavari**	Monocots	22	128	225			**1022**
		Dicots	113	435	797			
Total			**135**	**563**	**1022**			
3.	**Papikonda National Park**	Monocots	21	120	251		02	**970**
		Dicots	98	456	709	02	06	
Total			**119**	**576**	**960**	**02**	**08**	

Table 2: Comparison in ten dominant families among Flora of British India, flora of India, flora of Andhra Pradesh, flora of East Godavari District & flora of Papikonda National Park.

Sl. No.	Flora of British India (1872-1897)	Flora of India	Flora of Andhra Pradesh (2018)	Flora of East Godavari District (1999)	Flora of Papikonda National Park Present study (2018-2022)
1	Orchidaceae	Poaceae	Fabaceae	Fabaceae	Fabaceae
2	Leguminosae	Leguminosae	Poaceae	Poaceae	Poaceae
3	Poaceae	Orchidaceae	Euphorbiaceae	Euphorbiaceae	Cyperaceae
4	Rubiaceae	Rubiaceae	Cyperaceae	Acanthaceae	Malvaceae
5	Euphorbiaceae	Cyperaceae	Asteraceae	Rubiaceae	Rubiaceae
6	Acanthaceae	Rosaceae	Acanthaceae	Asteraceae	Acanthaceae
7	Compositae	Acanthaceae	Orchidaceae	Cyperaceae	Lamiaceae
8	Cyperaceae	Euphorbiaceae	Rubiaceae	Orchiodaceae	Asteraceae
9	Lamiaceae	Lamiaceae	Lamiaceae	Convolvulaceae	Euphorbiaceae
10	Urticaceae	Scrophulariaceae	Asclepiadaceae	Lamiaceae	Apocynaceae

Table 3: Comparison of ten dominant families in flora of Andhra Pradesh, flora of East Godavari District and flora of Papikonda National Park with species (including infraspecific) wise:

Sl. No	Flora of Andhra Pradesh		Flora of East Godavari District		Flora of Papikonda National Park	
	Name of the family	No. of species (inclusive infraspecific)	Name of family	No. of species (inclusive infraspecific)	Name of the family	No. of species (inclusive infraspecific)
1	Fabaceae	332	Fabaceae	103	Fabaceae	121
2	Poaceae	311	Poaceae	80	Poaceae	119
3	Euphorbiaceae	143	Euphorbiaceae	49	Cyperaceae	48
4	Cyperaceae	124	Acanthaceae	40	Malvaceae	44
5	Asteraceae	115	Rubiaceae	40	Rubiaceae	42
6	Acanthaceae	105	Asteraceae	39	Acanthaceae	34
7	Orchidaceae	93	Cyperaceae	35	Lamiaceae	33
8	Rubiaceae	91	Orchiodaceae	28	Asteraceae	32
9	Lamiaceae	74	Convolvulaceae	25	Euphorbiaceae	25
10	Asclepiadaceae	64	Lamiaceae	23	Apocynaceae	23

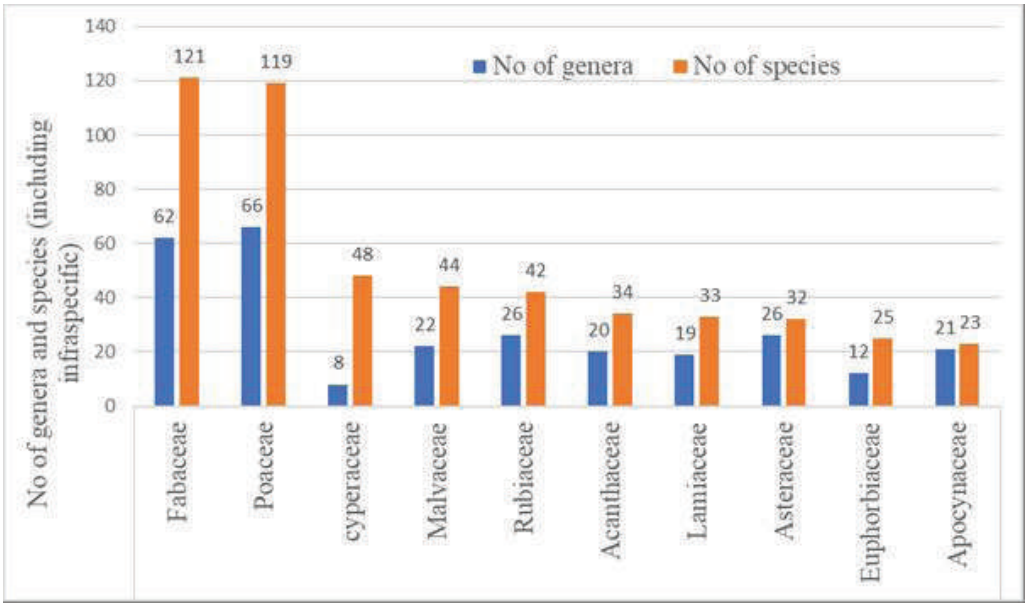


Fig. 1: Family wise genera and species (including infraspecific) distribution in National Park

Among the 119 families reported from the study area, the family Fabaceae *S.l.* is the predominant family with 121 species under 62 genera followed by grass family Poaceae with 119 species under 66 genera. The other dominant families are Cyperaceae with 48 species under 8 genera, Malvaceae (*sensu-lato*) with 44 species under 22 genera, Rubiaceae with 42 species under 26 genera, Acanthaceae with 34 species under 20 genera, Lamiaceae with 33 species under 19 genera, Asteraceae with 32 species with 26 genera and Euphorbiaceae (*sensu-stricto*) with 25 species under 12 genera.

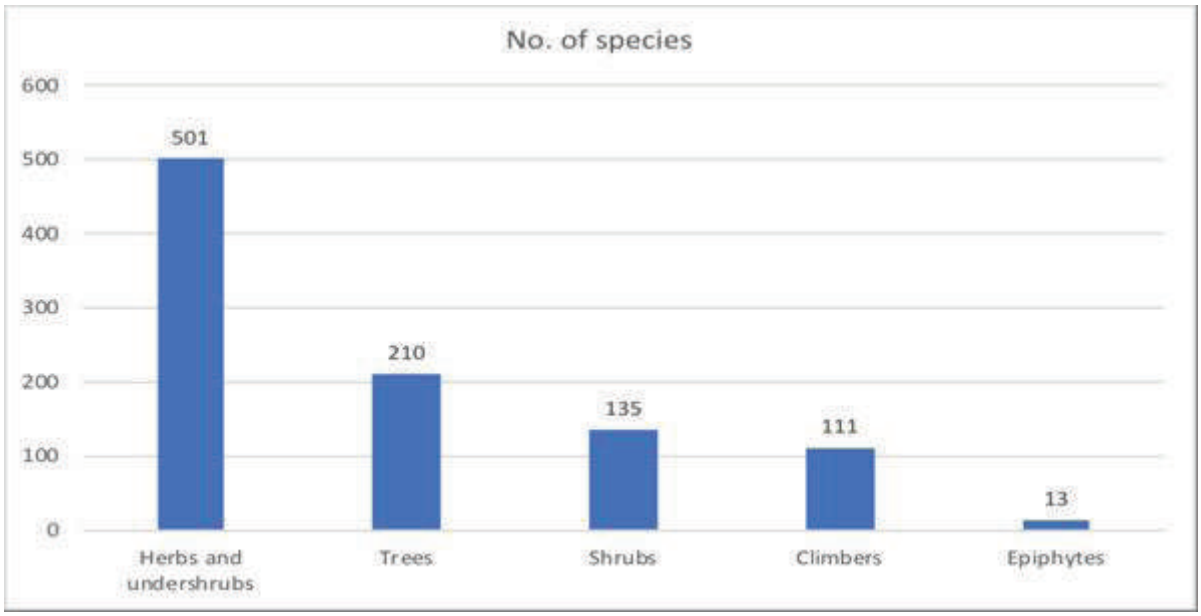


Fig. 2: Habit-wise species distribution in National Park

Habit wise the National Park is rich in having herbs and undershrubs with 501 species followed by trees with 210 species. The shrubs, climbers and epiphytes ranked next with 135, 111 and 13 species respectively.

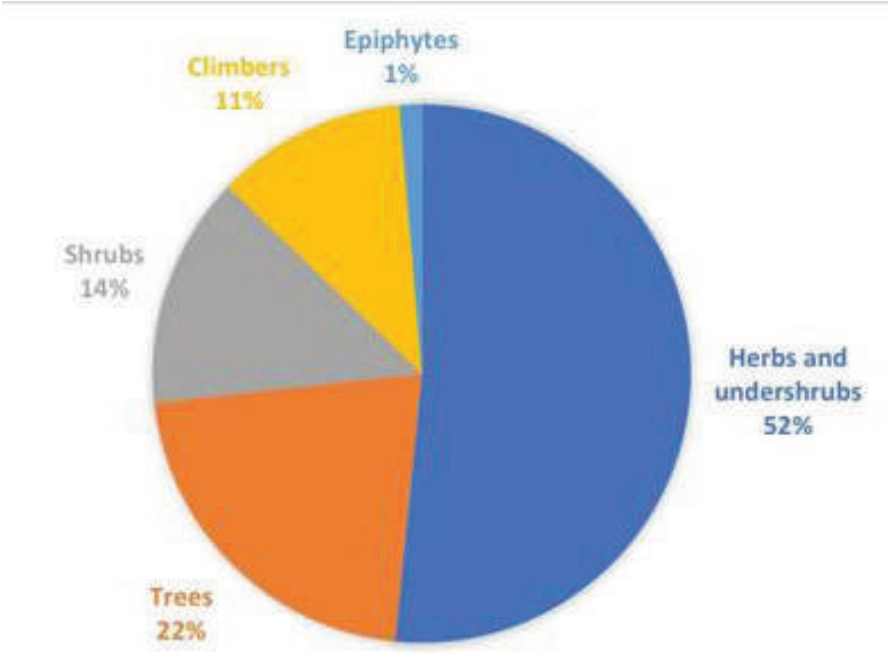


Fig. 3: Habit-wise species distribution ratio

Herbs and undershrubs are dominant groups based on the habit wise distribution with 52% followed by trees with 22%. Shrubs, climbers and epiphytes ranked next with 14%, 11% and 1% respectively.

4.1. Report of endemic species from the Papikonda National Park:

The National Park is home for several species endemics to peninsular India and India. *Argyreia daltonii*, *Barleria montana*, *Bridelia retusa*, *Crotalaria epunctata*, *Cyperus clarkei*, *Dyschoriste vagans*, *Habenaria roxburghii*, *Huberantha cerasoides*, *Indigofera mysorensis*, *Pavetta madrassica*, *Radermachera xylocarpa*, *Strobilanthes pavala*, *Tephrosia strigosa*, and *Wendlandia gamblei*. are endemic to peninsular India and *Chrysopogon hackelii*, *Tripogon capillatus, Dimeria connivens*, *Ischaemum polystachyum* are endemic to India also reported from the study area.



Wetland, Polavaram Range



Wetland, Kukunoor Range



Wetland, V.R. Puram Range

Plate 6: Wetlands, Papikonda National Park.

4.2. Report of some noteworthy medicinal plants from the Papikonda National Park:

During the course of study, many of the medicinally important species are collected from the study area. The species has been used in the traditional and local medicines. Some of the noteworthy species are *Asparagus racemosus*, *Andrographis paniculata*, *Caralluma attenuata*, *Cheilocostus speciosus*, *Cymbopogon martini*, *Centella asiatica*, *Curcuma pseudomontana*, *Cochlospermum religiosum*, *Commiphora caudata*, *Chloroxylon swietenia*, *Curculigo orchioides*, *Dioscorea bulbifera*, *Gloriosa superba*, *Hemidesmus indicus*, *Holarrhena pubescens*, *Phyllanthus emblica*, *Rauvolfia serpentina*, *Plumbago indica*, *Plumbago zeylanica*, *Tinospora sinensis*, *Strychnos potatorum*, *Strychnos nux-vomica*, *Sterculia urens*, *Soymida febrifuga*, *Terminalia chebula*, *Terminalia bellirica*, *Mallotus philippensis* etc.



Papikondalu, Polavaram Range



View of River Godavari, V.R. Puram Range



Polavaram Irrigation Project on River Godavari, Polavaram Range

Plate 7: River Godavari & Polavaram irrigation project, Papikonda National Park.

4.3. Monotypic genera reported from the Papikonda National Park:

There are 11 monotypic genera reported from the national park *viz*., *Caesulia axillaris*, *Chloroxylon swietenia*, *Colebrookea oppositifolia*, *Getonia floribunda*, *Hemidesmus indicus*, *Lawsonia inermis*, *Limonia acidissima*, *Naringi crenulata*, *Neodistemon indicus*, *Pentapetes phoenicea* and *Pongamia pinnata.*

4.4. New findings

During the course of study, a new variety *Dichanthium caricosum* (L.) A. Camus var. *bilobum* Y. Mahesh, L. Rasingam & J. Swamy (Poaceae) was described from the grasslands of Kondamodalu Beat, Gokavaram Range (Mahesh & al., 2021). Apart from the new variety, *Salomonia cantoniensis* Lour. (Polygalaceae), *Stemodia verticillata* (Mill.) Hassl. (Plantaginaceae) were collected and reported as new additions to the flora of South India and Eastern Ghats respectively (Mahesh & al., 2021, 2022). Five species *viz*. *Neanotis tubulosa* (G. Don) Mabb. (Rubiaceae), *Adenosma indiana* (Lour.) Merr. (Plantaginaceae), *Ipomoea laxiflora* H.J. Chowdhery & Debta (Convolvulaceae), *Nicotiana plumbaginifolia* Viv. Elench. (Solanaceae) and *Habenaria reniformis* (D. Don) Hook.f. (Orchidaceae) were reported as additions to the flora of Andhra Pradesh (Mahesh & al., 2020, 2022).

5. REFERENCES

BRUMMITT, N. A., S. P. BACHMAN, J. GRIFFITHS-LEE, LUTZ, J.F. MOAT, A. FARJON, & al. (2015). Green Plants in the Red: A baseline Global Assessment for the IUCN Sampled Red List Index for Plants. *PLoS ONE* 10 (8): e0135152.

CHAMPION, H.G. AND S.K. SETH. (1968). *A Revised Survey of the Forest Types of India*,New Delhi, India: Government of India Publications.

GAMBLE, J. S. (1884). A short account of the forests of the Northern Forest Circle. Madras Presidency. *Indian Forester* 10: 543-553.

GAMBLE, J. S. AND C. E. C. FISCHER. (1915– 36). *Flora of the Presidency of Madras*. Vol. 1-3, Adlard and Son Ltd., London.

HOOKER, J.D. (1872 – 1897). *Flora of British India*. Vol. I-VII, Reeve & Co. Ltd., London.

HAINES, H.H. (1925). *The botany of Bihar and Orissa*. Vol. 1- 6. Adlard and Son Ltd.,London.

IPNI. (2022). International Plant Names Index. Published on the Internet http://www.ipni.org, The Royal Botanic Gardens, Kew, Harvard University Herbaria & Libraries and Australian National Botanic Gardens.

IUCN Standards and Petitions Committee. (2019). Guidelines for using the IUCN Red List Categories and Criteria. Version 14. IUCN, Gland and Cambridge. https://www.iucnredlist.org/resources/redlistguidelines.pdf

JAIN, S.K. & R.R. RAO, (1977). *A Handbook of Field and Herbarium Methods*, Today & Tomorrow's Printers and Publishers, New Delhi.

MAHESH, Y., L. RASINGAM AND M. V. RAMANA. (2020). *Habenaria reniformis* (D. Don) Hook. f. (Orchidaceae) - A New Distributional Record for Andhra Pradesh. *Nelumbo* 62 (1): 57-59.

MAHESH, Y., L. RASINGAM AND J. SWAMY. (2020). A new variety of *Dichanthium caricosum* (L.) A. Camus (Poaceae) from Papikonda National Park, Andhra Pradesh, India. *Indian Journal of Forestry*, 43(2): 134-136.

MAHESH, Y., L. RASINGAM AND M. V. RAMANA. (2021). *Salomonia cantoniensis* Lour. (Polygalaceae) - A new distributional record for flora of southern India. *Nelumbo* 63 (2): 63-65.

MAHESH, Y., L. RASINGAM AND M. V. RAMANA. (2021). Note on the distribution of *Stemodia verticillata* (Plantaginaceae) in Eastern Ghats, India. *Indian Journal of Forestry* 44 (2), 77-79.

MAHESH, Y., L. RASINGAM & M. V. RAMANA. (2022). *Neanotis tubulosa* (G. Don) Mabb. (Rubiaceae)- A New Distributional Record for Andhra Pradesh, India. *Indian Forester* 148(11): 1160-1161.

MAHESH, Y., L. RASINGAM AND M. V. RAMANA. (2022). Three New Distributional Records to the Flora of Andhra Pradesh, India. *Indian Forester* 148 (12): 1274-1275.

MICHAEL F FAY, WALTER S JUDD, DOUGLAS E SOLTES & PAMELA S SOLTES. (2016). An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV. *Botanical Journal of the Linnean Society* 181: 1–20.

MURALIDHARA RAO, D. & T. PULLAIAH, (2002). *Flora of Eastern Ghats*.Vol.1. Regency Publication, New Delhi.

POWO. (2021). Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; http://www.plantsoftheworldonline.org/ Retrieved 09 June 2021.

PULLAIAH, T. & S. SANDHYA RANI. (1999). *Trees of Andhra Pradesh*. Regency Publications, New Delhi.

PULLAIAH, T. & D. MURALIDHARA RAO, (2001). *Flora of Eastern Ghats*. Vol. 2. Regency Publication, New Delhi.

PULLAIAH, T. & al. (1997-2008). *Flora of Andhra Pradesh (India)*. Vols. 1-5. ScientificPublishers, Jodhpur, India.

PULLAIAH, T., K. SRI RAMA MURTHY AND S. KARUPPUSAMY. (2011). *Flora of Eastern Ghats: Hill Ranges of South Easter India.* Vol. 3. Regency publciations, New Delhi.

RAJU, D. C. S. (1996). Excursion of Simhachalam Hill. Sibpur.

RAJU, D. C. S. (1966a). Plants of Papi hills in Andhra Pradesh. *Indian Forester* Vol.92: 482- 492.

RAO, R. S. (1958). Observations on the Vegetation of the Rampa and Gudem Agency tracts of the Eastren Ghats. *The Journal of Bombay Natural History Society* 55(3): 429-449. 1958.

RAO, R. S., P. VENKANNA AND T. APPI REDDY. (1986). *Flora of West Godavari District, Andhra Pradesh, India.* Published by Indian Botanical Society, Meerut.

RAO, R. S., S. SUDHAKAR AND P. VENKANNA. (1999). *Flora of East Godavari district. Andhra Pradesh.* The Indian National Trust of Art and Cultural Heritage. New Delhi.

SESHAVATHARAM, V. (1974). Aquatic weed flora of the paddy fields and irrigation canals of the delta area of the West Godavari, Andhra Pradesh. *Science and Culture* 40: 70-75.

STAFLEU, F. A. & R. S. COWAN, (1976-88). *Taxonomic Literature*. Second Edition. Utrecht.

6. SYSTEMATIC TREATMENT

Key to the Families

1a.	Stem with vascular bundles in one or more rings; leaves usually reticulately veined; flowers generally 4-5-merous; cotyledons 2	2
1b.	Stem with vascular bundles scattered; leaves usually parallel-veined; flowers generally 3-merous; cotyledon 1	**100**
2a.	Fruit a legume or lomentum	**38. Fabaceae**
2b.	Fruits otherwise	3
3a.	Carnivorous plants	4
3b.	Autophytic or parasitic plants	5
4a.	Bladders absent; petals free	**82. Droseraceae**
4b.	Bladders present; petals fused	**112. Lentibulariaceae**
5a.	Anthers syngenesious; fruit a cypsela	**118. Asteraceae**
5b.	Anthers not syngenesious; fruits other than cypsela	6
6a.	Ovary inferior	7
6b.	Ovary superior	19
7a.	Stem or root parasites	**79. Santalaceae**
7b.	Autophytic plants	8
8a.	Fruit a cremocarp	**119. Apiaceae**
8b.	Fruits otherwise	9
9a.	Flowers unisexual	10
9b.	Flowers bisexual	11
10a.	Climbers; Anthers synandrous	**46. Cucurbitaceae**
10b.	Herbs or shrubs; anthers free	**26. Begoniaceae**
11a.	Stamens epipetalous	12
11b.	Stamens not epipetalous	13
12a.	Leaves stipulate	**95. Rubiaceae**
12b.	Leaves estipulate	**116. Campanulaceae**
13a.	Filaments and anthers fused to form gynostemium	**3. Aristolochiaceae**
13b.	Filaments and anthers free	14
14a.	Plants armed; stems fleshy	**88. Cactaceae**
14b.	Plants unarmed; stems not succulent	15
15a.	Leaves gland-dotted	**62. Myrtaceae**
15b.	Leaves not gland-dotted	16
16a.	Anthers geniculate	**63. Melastomataceae**
16b.	Anthers not geniculate	17
17a.	Stamens <10	**61. Onagraceae**
17b.	Stamens >12	18
18a.	Leaves oblanceolate	**91. Lecythidaceae**
18b.	Leaves elliptic or oblong-lanceolate	**89. Cornaceae**
19a.	Flowers dichlamydeous	20
19b.	Flowers achlamydeous or monochlamydeous	86
20a.	Petals free	21
20b.	Petals united to form a tube	61
21a.	Thalamus prominent	22
21b.	Thalamus absent	38
22a.	Flowers unisexual	**29. Menispermaceae**
22b.	Flowers bisexual	23
23a.	Plants rhizomatous	24
23b.	Plants not rhizomatous	25
24a.	Leaves peltate	**31. Nelumbonaceae**
24b.	Leaves not peltate	**1. Nymphaeaceae**
25a.	Carpels free	26
25b.	Carpels united	29
26a.	Stipule or stipular scar present	**4. Magnoliaceae**
26b.	Stipule or stipular scar absent	27
27a.	Leaves compound	**30. Ranunculaceae**
27b.	Leaves simple	28
28a.	Flowers trimerous	**5. Annonaceae**
28b.	Flowers pentamerous	**34. Dilleniaceae**
29a.	Placentation parietal	30
29b.	Placentation otherwise	35
30a.	Leaves spiny	**28. Papaveraceae**
30b.	Leaves not spiny	31
31a.	Plant a herb	32

31b.	Plants other than herbs	34
32a.	Anthers connectives appendaged	**53. Violaceae**
32b.	Anthers connectives not appendaged	33
33a.	Sepals equal; seeds with cleft	**75. Cleomaceae**
33b.	Sepals unequal; seeds without cleft	**76. Brassicaceae**
34a.	Gynophore absent	**71. Bixaceae**
34b.	Gynophore present	**74. Capparaceae**
35a.	Anthers monthecous	**70. Malvaceae**
35b.	Anthers dithecous	36
36a.	Corolla zygomorphic	**39. Polygalaceae**
36b.	Corolla actinomorphic	37
37a.	Sepals 2	**87. Talinaceae**
37b.	Sepals 5	**83. Caryophyllaceae**
38a.	Flowers unisexual	**56. Euphorbiaceae p.p.**
38b.	Flowers bisexual	39
39a.	Disc present below the ovary	40
39b.	Disc not present below the ovary	56
40a.	Leaves and floral parts gland-dotted	**67. Rutaceae**
40b.	Leaves and floral parts not gland-dotted	41
41a.	Androecium obdiplostemonous or diplostemonous	42
41b.	Androecium haplostemonous	52
42a.	Petals with a ligule or scale at base	43
42b.	Petals without a ligule or scale at base	44
43a.	Leaves simple	**50. Erythroxylaceae**
43b.	Leaves compound or ternate	**66. Sapindaceae**
44a.	Stamens obdiplostemonous	45
44b.	Stamens diplostemonous	49
45a.	Climbers	46
45b.	Herbs or trees	47
46a.	Peduncles hooked at base	**57. Linaceae**
46b.	Peduncles not hooked at base	**52. Malphigiaceae**
47a.	Plants prostrate; fruits spiny	**37. Zygophyllaceae**
47b.	Plants erect; fruits not spiny	48
48a.	Corolla spurred	**90. Balsaminaceae**
48b.	Corolla not spurred	**49. Oxalidaceae**
49a.	Leaves simple	**51. Ochnaceae**
49b.	Leaves compound	50
50a.	Staminal tube present	**69. Meliaceae**
50b.	Staminal tube absent	51
51a.	Fruit a samara	**68. Simaroubaceae**
51b.	Fruit a drupe	**64. Burseraceae**
52a.	Climber or scandent shrubs	53
52b.	Plant a tree	**65. Anacardiaceae**
53a.	Ovary 1-celled	**78. Opiliaceae**
53b.	Ovary 3-4 celled	54
54a.	Stamens antipetalous	**41. Rhamnaceae**
54b.	Stamens alternipetalous	55
55a.	Leaves entire	**77. Olacaceae**
55b.	Leaves crenate or serrate	**48. Celastraceae**
56a.	Placentation parietal	57
56b.	Placentation otherwise	58
57a.	Bracts pinnatisect; coronary scales present	**54. Passifloraceae**
57b.	Bracts entire; coronary scales absent	**72. Moringaceae**
58a.	Plants tendrillar; fruit a berry	**36. Vitaceae**
58b.	Plants non-tendrillar; fruits otherwise	59
59a.	Styles as many as carpels	**40. Rosaceae**
59b.	Styles not as above	60
60a.	Fruit a drupe or samara	**59. Combretaceae**
60b.	Fruit a capsule	**60. Lythraceae**
61a.	Stamens epipetalous	62
61b.	Stamens free	**35. Crassulaceae**
62a.	Flowers actinomorphic	63
62b.	Flowers zygomorphic	77
63a.	Leaves alternate	64
63b.	Leaves opposite	74

64a.	Aquatic or marshy plants	65
64b.	Terrestrial plants	67
65a.	Corolla blue	**103. Hydroleaceae**
65b.	Corolla white	66
66a.	Leaves peltate	**117. Menyanthaceae**
66b.	Leaves not peltate	**102. Sphenocleaceae**
67a.	Branchlets usually scabrous with strigose or sericeous hairs	**99. Boraginaceae**
67b.	Branchlets not as above	68
68a.	Milky latex absent	69
68b.	Milky latex present	73
69a.	Style terminally 5-branched	**80. Plumbaginaceae**
69b.	Style not as above	70
70a.	Stamens 2	**104. Oleaceae**
70b.	Stamens 4 or 5	71
71a.	Leaves punctate	**94. Primulaceae**
71b.	Leaves not punctate	72
72a.	Flowers unisexual	**93. Ebenaceae**
72b.	Flowers bisexual	**101. Solanaceae**
73a.	Climbers or herbs; fruit a capsule	**100. Convolvulaceae**
73b.	Trees; fruit a berry	**92. Sapotaceae**
74a.	Ovary apocarpous	**98. Apocynaceae**
74b.	Ovary syncarpous	75
75a.	Ovary 1-celled	**73. Salvadoraceae**
75b.	Ovary 2-celled	76
76a.	Plants arborescent	**97. Loganiaceae**
76b.	Plants herbaceous	**96. Gentianaceae**
77a.	Root parasites	**115. Orobanchaceae**
77b.	Plants otherwise	78
78a.	Plants scapigerous	**105. Gesneriaceae**
78b.	Plants not scapigerous	79
79a.	Calyx bilabiate; style gynobasic	**114. Lamiaceae**
79b.	Calyx not bilabiate; style terminal	80
80a.	Fruit a capsule	81
80b.	Fruit a drupe or pyrene	**113. Verbenaceae**
81a.	Leaves compound	**111. Bignoniaceae**
81b.	Leaves simple	82
82a.	Seeds supported by retinacula	**110. Acanthaceae**
82b.	Seeds not supported by retinacula	83
83a.	Fruit tip spiny and curved	**108. Martyniaceae**
83b.	Fruit tip neither spiny nor curved	84
84a.	Pedicel with glands	**109. Pedaliaceae**
84b.	Pedicels without glands	85
85a.	Filaments appendiculate	**107. Linderniaceae**
85b.	Filaments not appendiculate	**106. Plantaginaceae**
86a.	Anther dehiscence valvular	**6. Lauraceae**
86b.	Anther dehiscence otherwise	87
87a.	Stipules ochreate	**81. Polygonaceae**
87b.	Stipules none or other than ochreate	88
88a.	Fruits an anthocarp	**85. Nyctaginaceae**
88b.	Fruits otherwise	89
89a.	Prophylls present	**2. Piperaceae**
89b.	Prophylls absent	90
90a.	Perianth scarious	91
90b.	Perianth not scarious	92
91a.	Leaves stipulte	**86. Molluginaceae**
91b.	Leaves exstipulate	**84. Amaranthaceae**
92a.	Stems furrowed or winged	**43. Cannabaceae**
92b.	Stems neither furrowed nor winged	93
93a.	Ovary usually 3-locular	94
93b.	Ovary 1-2 locular	96
94a.	Cells of ovary 1-ovuled	**56. Euphorbiaceae p.p.**
94b.	Cells of ovary 2-ovuled	95
95a.	Leaves stipulate	**58. Phyllanthaceae**
95b.	Leaves estipulate	**33. Buxaceae**
96a.	Inflorescence a syconium	**44. Moraceae**

96b. Inflorescence other than a syconium 97
97a. Style apically clavate **32. Proteaceae**
97b. Style not as above 98
98a. Flowers with a cupular disc or nectarifeous glands **55. Salicaceae**
98b. Flowers neither with a cupular disc nor a nectarifeous glands 99
99a. Stamens inflexed in bud; ovules erect **45. Urticaceae**
99b. Stamens erect in bud; ovules pendulous **42. Ulmaceae**
100a. Petioles sheathing, imbricated, forming tall pseudostem; flowers in spadix with several spathes **23. Musaceae**
100b. Plants not as above 101
101a. Trees, shrubs or scramblers with plicate fan-shaped or pinnatisect leaves; flowers almost sessile, 3-merous, in fleshy spikes or panicles with spathaceous bracts **19. Arecaceae**
101b. Plants not as above 102
102a. Inflorescence a spadix of inconspicuous florets subtended by usually large and showy spathe; fruit a berry **7. Araceae**
102b. Plants without above combination of characters 103
103a. Ovary superior 104
103b. Ovary inferior or half-inferior 113
104a. Inflorescence capitate, subtended by an involucre of bracts; flowers unisexual, usually monoecious; perianth-lobes in 2 series of 2-3 each, the inner sometimes absent **25. Eriocaulaceae**
104b. Inflorescence and flowers without above combination of characters 105
105a. Flowers imbricated in distichous or cylindrical spikelets (sometimes 1-flowered), each flower subtended by 1-2 glumaceous bracts and more or less hidden within it 106
105b. Flowers arranged in heads, spikes, cymes, fascicles or panicles, not in spikelets, sometimes solitary, axillary but not subtended by glumaceous bracts 107
106a. Stem usually terete with hollow internodes; leaf-sheath usually open; flower enclosed by 2 glumes, lemma and palea (sometimes one or both absent); anthers mostly dorsifixed and versatile **27. Poaceae**
106b. Stem usually 3-angled and solid; leaf-sheath usually closed; flower subtended by a single glume; anthers basifixed **26. Cyperaceae**
107a. Flowers arranged in spikes **10. Aponogetonaceae**
107b. Flowers not arranged in spikes 108
108a. Carpels many, free or connate at base only **8. Alismataceae**
108b. Carpel solitary or united 109
109a. Perianth 2-seriate with the outer whorl sepaloid and inner whorl petaloid **20. Commelinaceae**
109b. Perianth 1 -seriate or if 2-seriate then the inner and outer whorls similar, often petaloid 110
110a. Aquatic herbs; inflorescence subtended by a spathe-like leaf-sheath **21. Pontederiaceae**
110b. Terrestrial herbs, shrubs or climbers; inflorescence not subtended by a spathe-like leaf-sheath 111
111a. Plants herbaceous; leaves succulent or membranous 112
111b. Plants woody; leaves coriaceous **14. Smilacaceae**
112a. Stigmas short; nectaries present **13. Colchicaceae**
112b. Stigmas slender; nectarines absent **18. Asparagaceae**
113a. Flowers prominently zygomorphic 114
113b. Flowers actinomorphic or sometimes slightly zygomorphic 116
114a. Stamens and style fused to form a column; seeds minute, microscopic **15. Orchidaceae**
114b. Stamens and style not fused; seeds large 115
115a. Leaves distichously arranged; anther-cell without apical appendage **24. Zingiberaceae**
115b. Leaves spirally arranged; anther-cell with apical appendage **22. Costaceae**
116a. Plants aquatic, usually submerged; flowers subtended by a pair of more or less connate spathes **9. Hydrocharitaceae**
116b. Plants usually terrestrial, never submerged; flowers not as above 117
117a. Climbers or twiners 118
117b. Plants other than a climber or twiner 119
118a. Flowers unisexual **11. Dioscoreaceae**
118b. Flowers bisexual **12. Stemonaceae**
119a. Rootstock bulbous; flowers in umbels **17. Amaryllidaceae**
119b. Rootstock tuberous; flowers in spikes or racemes **16. Hypoxidaceae**

1. NYMPHAEACEAE

India: 2 genera, 10 spp., 2 var.; Andhra Pradesh: 1 genus, 3 spp.; PNP:1 genus, 2 spp.

1. NYMPHAEA L.

India: 9 spp. & 2 var.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a. Leaves glabrous; anthers appendaged; stigmatic rays unappendaged **1. N. nouchali**
1b. Leaves brown hairy beneath; anthers unappendaged; stigmatic rays with clavate appendage **2. N. pubescens**

1. Nymphaea nouchali Burm.f., Fl. Ind. 120.1768; R.S. Rao & al., Fl. E. Godavari Dist. 199. 1999; Pull. & al., Fl. Andhra Pradesh 1: 97. 2018. *Nymphaea stellata* Willd. Sp. Pl. 2: 1153. 1799; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 114. 1872; Dunn in Gamble, Fl. Madras 1: 33. 1915. **(Plate 8A)** *'Kaluva'*

A perennial rhizomatous, aquatic herb, up to 1 m high; rhizome fixed, cylindrical. Leaves floating, cordate, orbicular, 25 cm across, entire or bluntly toothed at margins, greenish above, pale purple beneath, glabrous. Flower solitary, 10 cm across. Sepals ovate, green with purple streaks outside, acute, inconspicuously nerved. Petals 8–14, oblong, mauve coloured, acute. Stamens 20–40, yellow; staminal connective exceeding anthers; anthers with creamy appendages. Ovary 8–16 loculed, urceolate; stigmatic rays unappendaged. Berry globose, green, spongy. Seeds many, minute, enclosed in pulp.

Fl. & Fr.: Almost throughout the year.

Habitat: Common in open tanks, ditches in the deciduous forest.

Specimens examined: Chigurumamidi, *Y. Mahesh* 011379 (BSID).

Field notes: Flowers open in early morning and close early afternoon.

2. Nymphaea pubescens Willd., Sp. Pl. 2: 1154. 1799; Dunn in Gamble, Fl. Madras 1: 34. 1915; Pull. & al., Fl. Andhra Pradesh 1: 99. 2018. *Nymphaea lotus* sensu Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 114. 1872, uterque p.p., non L., 1753. *Nymphaea lotus* var. *pubescens* (Willd.) Hook.f. & Thomson in Hook. f., Fl. Brit. India 1: 114. 1872. **(Plate 8B)** *'Kaluva'*

Large perennial, aquatic herbs, up to 1.5 m high; rhizomes fixed. Leaves floating, deeply cordate at base, 30 cm across, sharply dentate at margins, greenish above, brown and hairy beneath. Flowers solitary. Sepals ovate-oblong, 7-nerved, acute at apex. Petals pink or white, connective hooded over anthers, slightly exceeding them. Stamens yellow, free from petals; anthers yellow, unappendaged; stigmatic rays with clavate appendages. Berry globose. Seeds numerous.

Fl. & Fr.: Throughout the year.

Habitat: Frequent in open tanks, lakes, ponds in deciduous forest.

Specimens examined: Arvapally lake, *Y. Mahesh* 011390 (BSID).

Field notes: Flowers open in night to early morning and close in the late morning.

2. PIPERACEAE

India: 3 genera, 73 taxa; Andhra Pradesh: 2 genera, 8 spp.; PNP:1 genus, 3 spp.

1. PIPER L.

India: 57 spp. & 1 var.; Andhra Pradesh: 5 spp.; PNP: 3 spp.

Key to the species

1a.	Prostrate or ascending herbs	**2. P. longum**
1b.	Twining or woody climbers or shrubs	2
2a.	Female spikes glabrous, stamens more than 2	**3. P. nigrum**
2b.	Female spikes pubescent, stamens 2	**1. P. betle**

1. Piper betle L., Sp. Pl. 1: 28.1753; Pull. & al., Fl. Andhra Pradesh 4: 1599. 2018. *Chavica betle* Miq., Syst. Piperac. 228. 1843. **(Plate 8C)** *'Tamalapaku'*

Perennial, stout climber; branches with adventious roots at swollen nodes. Leaves ovate, up to 18 cm across, cordate at base, acute or acuminate at apex, margins entire, 5-nerved from base, glabrous on both surfaces. Bracts suborbicular, peltate. Spikes cylindrical, up to 6 cm long, pendulous. Flowers minute. Stamens 2. Female spikes pubescent; stigmas 5.

Fl. & Fr.: Nov.–Mar.

Habitat: Cultivated.

Specimens examined: PK Valasa, *Y. Mahesh* 012110 (BSID).

Uses: Leaves edible.

2. Piper longum L., Sp. Pl. 1: 29. 1753; Hook. f., Fl. Brit. India 5: 83. 1886; Gamble, Fl. Madras 2: 1205. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1598. 2018. *Piper latifolium* Hunter, Asiat. Res. 9: 392. 1809. **(Plate 8D)** *'Pippallu'*

Prostrate or ascending herb; vegetative branches prostrate, rooting at nodes. Leaves of sterile shoots ovate-lanceolate, up to 12 cm long, deeply cordate at base, acute or acuminate at apex, margins entire, glabrous on both surfaces; leaves on fertile shoot sessile or shortly petioled, ovate-oblong, unequally cordate at base, acute at apex, 6 ribbed. Flowers minute, pinkish white; bracts peltate, orbicular. Male spikes *c.*5 cm long; stamens 2. Female spikes up to 3.8 cm long; stigmas 3 or 4. Berries forming a fleshy spadix.

Fl. & Fr.: Jul.–Oct.

Habitat: Cultivated for its medicinal importance.

Specimens examined: PK Valasa, *Y. Mahesh* 010409 (BSID).

Uses: Root & stem used for stomach pain by local aadivasi people.

3. Piper nigrum L., Sp. Pl. 1: 28. 1753; Hook. f., Fl. Brit. India 5: 90. 1886; Gamble, Fl. Madras 2: 1206. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 603. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1598. 2018. **(Plate 8E)** *'Miriyalu'*

A slender herbaceous, woody climber; climbing with adventious roots present at nodes; stem grooved. Leaves ovate-elliptic or often orbicular, *c.*13 cm long, cordate at base, acuminate at apex, margins entire, chartaceous, glabrous above, gland dotted beneath, 5- nerved; petiole 3.5 cm long; bracts oblong. Flowers green in interrupted spikes, bisexual. Male spikes slender; stamens more than 2. Female spikes cylindric, glabrous; stigmas 3. Berries globose, red.

Fl. & Fr.: Jul. – Oct.

Habitat: Cultivated.

Specimens examined: PK Valasa, *Y. Mahesh* 010523 (BSID).

Field notes: Often twining over the small bushes.

3. ARISTOLOCHIACEAE

India: 3 genera, 29 spp.; Andhra Pradesh: 1 genus, 4 spp.; PNP:1 genus, 1 sp.

1. ARISTOLOCHIA L.

India: 15 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Aristolochia indica L., Sp. Pl. 2: 960. 1753; Hook. f., Fl. Brit. India 5: 75. 1886; Gamble, Fl. Madras 2: 1202. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 600. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1593. 2018. **(Plate 8F)**

A herbaceous twiner. Leaves oblong-ovate or obovate, *c.* 8 cm long, 3–5 nerved, acute at base, acuminate at apex, margins entire, glabrous on both surfaces; bracts small, lanceolate. Flowers 3.2 cm long, in short raceme, tube shortly funnel shaped with oblique mouth, trumpet shaped, purple streaked. Capsule broadly oblong, dehiscence at base.

Fl. & Fr.: Aug.– Oct.

Habitat: Frequently found along roadside in the forest.

Specimens examined: Bhupathipalem project, *Y. Mahesh* 011433 (BSID).

4. MAGNOLIACEAE

India: 1 genus, 28 spp., 1 var.; Andhra Pradesh: 1 genus, 1 spp.; PNP:1 genus, 1 spp.

1. MAGNOLIA Plum. ex L.

India: 28 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Magnolia champaca (L.) Baill. ex Pierre, Fl. Forest. Cochinch. 1: t. 3. 1880; Pull. & al., Fl. Andhra Pradesh 1: 71. 2018. *Michelia champaca* L., Sp. Pl. 1: 536. 1753; Hook. f., Fl. Brit. India 1: 42. 1886; Gamble, Fl. Madras 1: 9. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 190. 1999. **(Plate 9A)** *'Sampenga chettu'*

Medium sized evergreen tree, up to 8 m high. Leaves lanceolate or lanceolate-oblong, *c.*15 cm long, acute at base, long acuminate at apex, margins entire; petiole 3 cm long. Flower buds enclosed in convolute stipules; bracts 2, covering the young buds, hairy. Flowers axillary, 6 cm across, sweet fragrant. Sepals oblong, acute at apex. Petals linear-lanceolate, white when early blooming, turning to orange. Stamens numerous, many seriate, staminal connective apiculate. Gynophore stalked. Follicles warty, dehiscing by 2 valves. Seeds oblong, pendulous from the carpels by long cord.

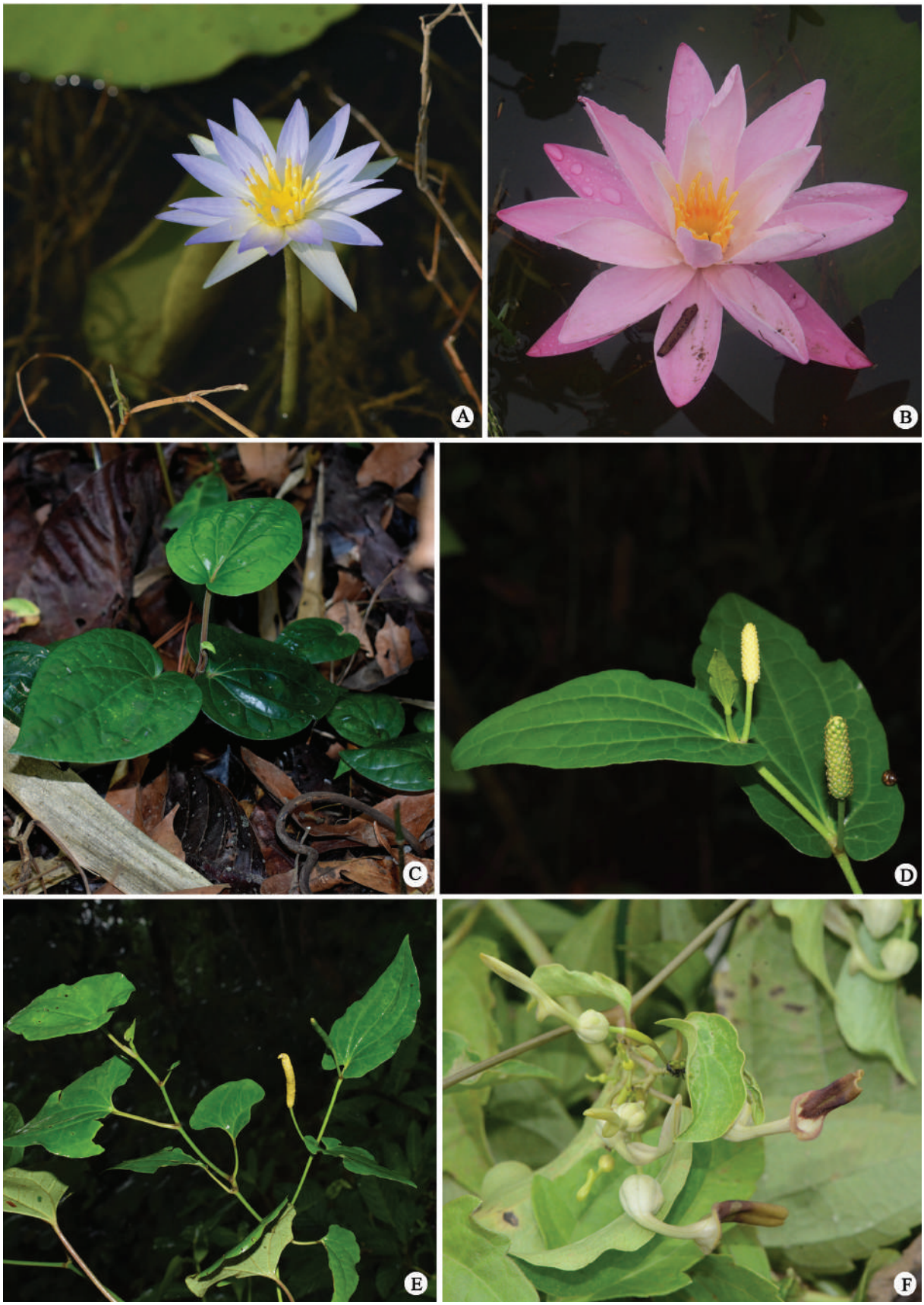


Plate 8: A. *Nymphaea nouchali* Burm.f.; **B.** *Nymphaea pubescens* Willd.; **C.** *Piper betle* L.; **D.** *Piper longum* L.; **E.** *Piper nigrum* L.; **F.** *Aristolochia indica* L.

Fl. & Fr.: May–Sep.

Habitat: Occasional in near tribal villages in moist deciduous forests.

Specimens examined: PK Valasa, *Y. Mahesh* 010467 (BSID).

Field notes: Flowers white when early blooming, turning to orange.

5. ANNONACEAE

India: 24 genera, 148 spp., 12 var.; Andhra Pradesh: 8 genera, 18 spp.; PNP: 5 genera, 6 spp.

Key to the genera

1a.	Scandent shrubs or climbers	**5. Uvaria**
1b.	Trees or shrubs	2
2a.	Fruits syncarpic	**1. Annona**
2b.	Fruits not syncarpic	3
3a.	Ripe carpels 1-seeded	4
3b.	Ripe carpels 2-seeded	**3. Miliusa**
4a.	Leaves attenuate to obtuse at the base	**2. Huberantha**
4b.	Leaves more or less cordate at the base	**4. Polyalthia**

1. ANNONA L.

India: 4 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Sepals broadly ovate; carpels not separating on maturity	**1. A. reticulata**
1b.	Sepals narrowly triangular; carpels separating on maturity	**2. A. squamosa**

1. Annona reticulata L., Sp. Pl. 1: 537. 1753; Hook. f., Fl. Brit. India 1: 78. 1872; Gamble, Fl. Madras 1: 20. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 193. 1999; Pull. & al., Fl. Andhra Pradesh1:76. 2018. **(Plate 9B)** *'Ramaphalam'*

Small trees, up to 8 m high; bark with lines. Leaves oblong-lanceolate, 12 cm long, acute at base, sub-acuminate at apex, margins entire, glabrous on both surfaces; petiole short, 1 cm long. Inflorescence few flowered. Flowers 2–4 on lateral pedicels; pedicels elongate, turgid, woody in fruit. Sepals 3, lobes broadly ovate, obtuse at apex, tomentose. Petals 3, in two rows, valvate in bud, pale green, outer tomentose, inner glabrous, minute. Fruit syncorpus, sub globose, smooth. Seeds black.

Fl.: & Fr.: Mar.–Jun.

Habitat: Occasional in the surroundings of tribal villages.

Specimen examined: PK Valasa, *Y. Mahesh* 010033 (BSID).

2. Annona squamosa L., Sp. Pl. 1: 537. 1753; Hook. f., Fl. Brit. India 1: 78. 1872; Gamble, Fl. Madras 1: 20. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 191. 1999; Pull. & al., Fl. Andhra Pradesh 1: 77. 2018. *Annona asiatica* L., Sp. Pl. 1: 537. 1753. **(Plate 9C)** *'Seethaphalamu'*

Small tree, up to 8 m high; bark brown with vertical lines. Leaves oblong-lanceolate or elliptic-lanceolate, 12 cm long, pellucid dotted, acute at base, acuminate at apex, margins entire, glabrous on both surfaces. Inflorescence short, few flowered, leaf opposed; flowers yellowish green; pedicel 1.2 cm long, glabrous. Sepals 3, basally connate; lobes narrowly triangular, 2.2 mm. Petals 3, oblong, triquetrous. Fruit tuberculed due to fusion of ovaries, yellowish green, broadly ovate-sub globose. Seeds black, smooth, shining.

Fl.: & Fr.: Jul.–Nov.

Habitat: Common along road sides and forest edges.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. HUBERANTHA Chaowasku

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Huberantha cerasoides (Roxb.) Chaowasku, Kew Bull. 70: 23. 2015. *Uvaria cerasoides* Roxb., Pl. Coromandel 1: 30, t. 33. 1795. *Polyalthia cerasoides* (Roxb.) Hook. f. & Thomson, Fl. Brit. India 1: 63. 1872; Gamble, Fl. Madras 1: 17. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 191. 1999; Pull. & al., Fl. Andhra Pradesh 1: 84. 2018. **(Plate 9D)** *'Guttichettu'*

Small tree, up to 8 m high; bark light grey; young branchlets pubescent. Leaves oblong-lanceolate, 14 cm long,

obtuse at base, acute or acuminate at apex, margins entire, glabrous above, pubescent beneath; petiole short; bracts 2, basal, leafy, ovate. Flowers axillary, solitary. Sepals 3, free, ovate or ovate-lanceolate, pubescent. Petals 6, ovate-lanceolate, greenish, incurved, puberulous outside. Stamens numerous, cuneate; anthers extrose, flat at apex. Carpels many, curved with stiff hairs; ovules 2; stigma clavate, slightly curved. Fruitlets globose, red when ripe, stalked, 1-seeded. Seed globose, light brown.

Fl.: & Fr.: Feb.–Oct.

Habitat: Common along slopes of deciduous forest.

Specimens examined: Koida, PK Valasa, Kondamodalu, *Y. Mahesh* 010182, 011541, 011727 (BSID).

Field notes: Young branches pubescent.

3. MILIUSA Lesch. ex A. DC.

India: 28 spp. & 2 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Miliusa tomentosa (Roxb.) Finet & Gagnep., Bull. Soc. Bot. France 53: 153. 1906; R.S. Rao & al., Fl. E. Godavari Dist. 192. 1999; Pull. & al., Fl. Andhra Pradesh 1: 81. 2018. *Uvaria tomentosa* Roxb., Pl. Coromandel 1: t. 35. 1795. *Saccopetalum tomentosum* (Roxb.) Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 88. 1872; Gamble, Fl. Madras 1: 22. 1915. **(Plate 9E)** *'Pedda chilukaduduga'*

Medium size tree, up to 10 m high; bark brown; young branches tomentose. Leaves ovate-lanceolate, 8 cm long, rounded at base, acute at apex, margins entire, pubescent when young; petioles short. Flowers axillary, solitary or in fascicles. Sepals 3, lanceolate, greenish, hairy. Petals 3+3; outer petals sepaloid, lanceolate; inner ones ovate–oblong. Stamens numerous. Carpels 5–15, on long stalk, sub-globose, tomentose. Ovules many; stigma capitate. Fruits fleshy, sub globose. Seeds 2, greyish brown.

Fl.: & Fr.: Mar.–Jun.

Habitat: Occasionally found in watercourse areas of dry deciduous forest.

Specimen examined: Koyalagudem, *Y. Mahesh* 011753 (BSID).

Field notes: Flowers pendulous with long pedicels.

4. POLYALTHIA Blume

India: 18 spp. & 2 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Polyalthia suberosa (Roxb.) Thwaites, Enum. Pl. Zeyl. 398. 1864; Hook.f. & Thomson in Hook. f. Fl. Brit. India 1: 65. 1872; Gamble, Fl. Madras 1: 16. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 192. 1999; Pull. & al., Fl. Andhra Pradesh 1: 86. 2018. *Uvaria suberosa* Roxb., Pl.Coromandel 1: t. 34. 1795. **(Plate 9F)** *'Chilukadudu'*

Shrub or small tree, up to 4 m high; bark corky, white spotted; young branches pubescent, old ones glabrous. Leaves oblong–elliptic, 11 cm long, slightly subequal at base, obtuse or rounded at apex, margins entire, glabrous above, puberulous beneath; petiole 2.5 mm long, pubescent. Flowers in extra-axillary, solitary, simple umbels, greenish yellow; pedicels slender, pubescent, 3 cm long. Carpels many, up to 5 mm long. Ovary pubescent; ovules solitary, basal; stigma sessile, minute. Fruit aggregate; fruitlets purple or red, silky pubescent when young, 1-seeded.

Fl.: & Fr.: Apr.–Oct.

Habitat: Common in the slope and open areas of deciduous forest.

Specimens examined: Tekuru forest, *Y. Mahesh* 011534, 011640 (BSID).

Field notes: Stem has persistent white spots.

5. UVARIA L.

India: 13 spp. & 2 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Uvaria hamiltonii Hook.f. & Thomson, Fl. Ind. 1: 96.1855; Hook. f., Fl. Brit. India 1: 48. 1872; Gamble, Fl. Madras 1: 12. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 193. 1999; D. Mitra in B. D. Sharma & al., Fl. India 1: 290.1993; Pull. & al., Fl. Andhra Pradesh 1: 86. 2018. *'Uvva'*

Woody climbing shrub; stems rusty tomentose. Leaves elliptic–oblong or obovate, 13–18 cm long, prominently nerved, cordate at base, acute or acuminate at apex, margins entire, pubescent above, stellate tomentose beneath. Flowers extra axillary, solitary or 2–4 together, leaf opposed, 5–6 cm diam., scarlet. Sepals 3, ovate,

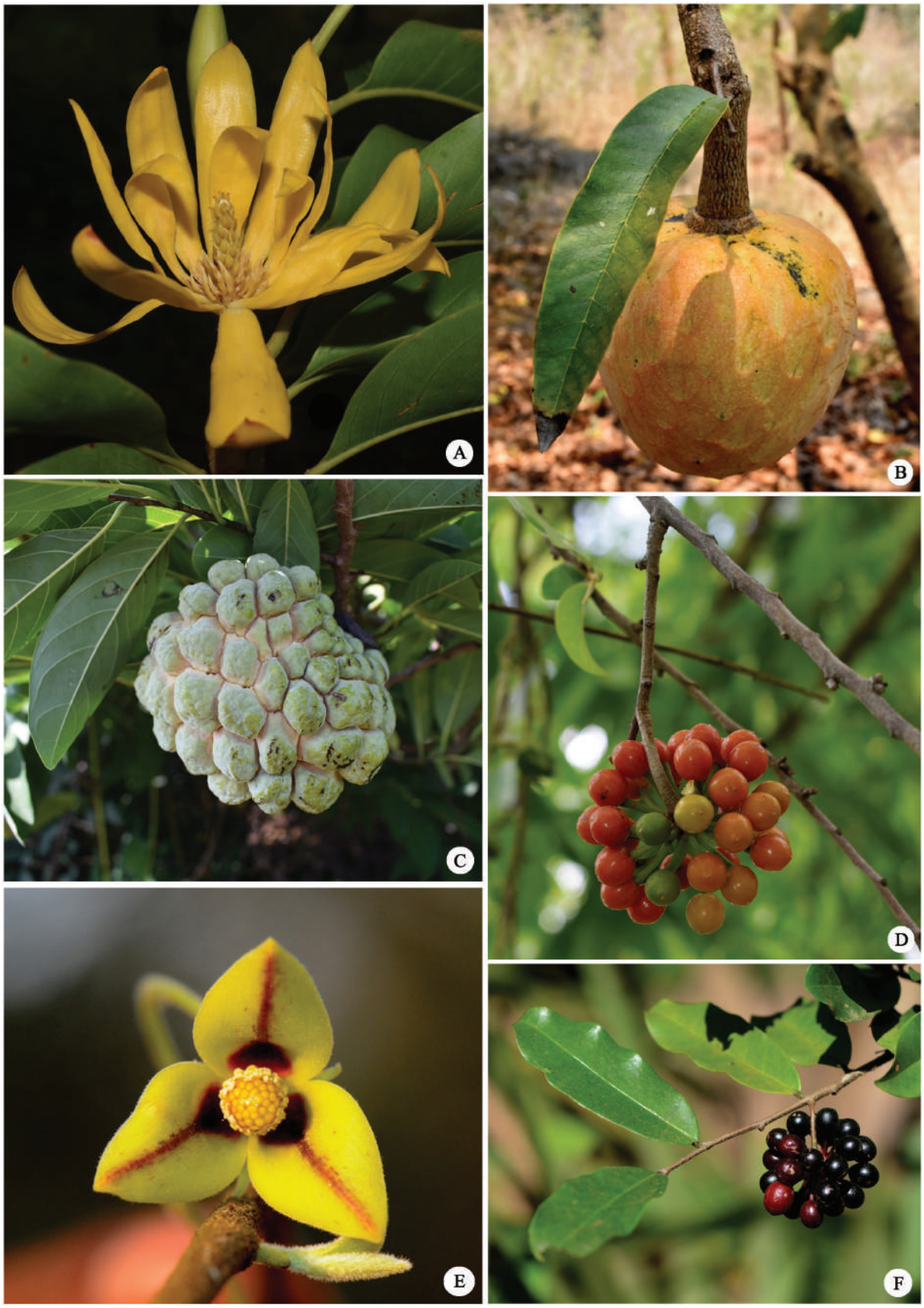


Plate 9: A. *Magnolia champaca* (L.) Baill. ex Pierre; **B.** *Annona reticulata* L.; **C.** *Annona squamosa* L.; **D.** *Huberantha cerasoides* (Roxb.) Chaowasku; **E.** *Miliusa tomentosa* (Roxb.) Finet & Gagnep.; **F.** *Polyalthia suberosa* (Roxb.) Thwaites

connate at base, reflexed, tomentose outside. Petals 6, obovate, 2.5 cm long, incurved at tip, brown tomentose on both surfaces. Stamens numerous. Carpels numerous, pubescent. Stigma sessile, glabrous. Ripe carpels broadly ovoid, tomentose, red. Seeds flat, shining.

Fl.: & Fr.: Apr.–Aug.

Habitat: Occasional on open hillslopes in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. LAURACEAE

India: 20 genera, 222 taxa; Andhra Pradesh: 9 genera, 15 spp.; PNP: 4 genera, 5 spp.

Key to the genera

1a.	Twining leafless herbs	**2. Cassytha**
1b.	Shrubs or trees	2
2a.	Inflorescence dense, clustered; anthers introse	**3. Litsea**
2b.	Inflorescence lax, cymose or panicle; inner most perfect stamens with anthers introse	3
3a.	Anthers 2-celled; perianth deciduous	**1. Beilschmiedia**
3b.	Anthers 4-celled; perianth persistent, enlarged, lobes reflexed	**4. Machilus**

1. BEILSCHMIEDIA Nees

India: 13 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Beilschmiedia roxburghiana Nees in Wall. Pl. Asiat. Rar. 2: 61. 1831; Hook. f., Fl. Brit. India 5: 121. 1886; Gamble, Fl. Madras 2: 1221. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 604. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1600. 2018. **(Plate 10A)**

Medium sized tree, up to 10 m high; branches brown. Leaves oblong–elliptic or lanceolate, 14 cm long, oblique at base, bluntly acuminate at apex, margins entire, shining above; reticulations raised on the upper surface. Flowers axillary, on long racemes, pedunculate, pubescent. Tepals linear–oblanceolate. Stamens in 3-series; anthers 2-celled. Ovary oblong, smooth. Berries oblong, *c.*3.5 cm long.

Fl.: & Fr.: Mar.–May.

Habitat: Rare along stream banks in semievergreen forest.

Specimen examined: Ijjaluru ghat road, *Y. Mahesh* 012103 (BSID).

2. CASSYTHA L.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cassytha filiformis L., Sp. Pl. 1: 35. 1753; Hook. f., Fl. Brit. India 5: 188. 1886; Gamble, Fl. Madras 2: 1241. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 604. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1601. 2018. **(Plate 10B)** *'Seethammavari jadalu, Pacchateega'*

Wiry, twining semi-parasitic, leafless herb, growing extensively attaching its stem to host plants; stem dark green, filiform, puberulous. Flowers white in lateral divaricate spikes; bracts small, suborbicular, ciliolate at margins. Perianth connate, tube short; lobes 6, in two rows; outer suborbicular, small; inner oblong, large, valvate. Stamens 9, in 3-whorls; staminodes 3, fleshy. Ovary ovoid, glabrous, tapering to minute capillate stigma. Drupe globose, enclosed in perianth.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common along the roadsides and hedges near villages.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011674 (BSID).

3. LITSEA Lam.

India: 44 spp. & 12 infraspecific; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Perianth incomplete, pedicels short; fruits globose	**1. L. glutinosa**
1b.	Perianth lobes usually 5, complete, pedicels long; fruits ovoid	**2. L. monopetala**

1. Litsea glutinosa (Lour.) C.B. Rob., Philipp. J. Sci., 6: 321. 1911; R.S. Rao. & al., Fl. E. Godavari Dist. 606. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1604. 2018. *Sebifera glutinosa* Lour., Fl. Cochinch. 2: 638. 1790. *Litsea chinensis* Lam., Encycl. 3. 574. 1792; Hook. f., Fl. Brit. India 5: 157. 1886; Gamble, Fl. Madras 2: 1235. 1925. *'Medanaranakili'*

Medium sized tree, up to 15 m high; bark greyish, smooth; branches spreading. Leaves ovate or elliptic–lanceolate, 20 cm long, narrowed at base, obtuse or acute at apex, margins entire, secondary nerves 9–12, distinct, glabrous above, grey pubescent beneath. Flowers in few flowered umbels, greenish in bud, light yellow later; pedicels short, arise from the axil of cauducous bracts; bracts concave, orbicular. Perianth incomplete; tube small, disc like, continued in fruit. Stamens up to 20, yellow, with long villous filaments. Fruit globose, purple when ripe.

Fl.: & Fr.: Apr.–Sep.

Habitat: Common along ghat areas, hill slopes in the semi-evergreen forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Litsea monopetala (Roxb.) Pers., Syn. 2: 4. 1806; R.S. Rao & al., Fl. E. Godavari Dist. 606. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1605. 2018. *Tetranthera monopetala* Roxb., Pl. Coromandel 2: 26. 1800. *Litsea polyantha* Juss., Ann. Mus. Hist. Nat. 6: 211. 1805; Hook. f., Fl. Brit. India 5: 162. 1886; Gamble, Fl. Madras 2: 1237. 1925.*'Chirumamidi.*

Large tree, up to 16 m high; bark greyish, smooth; young branches and leaves tomentose. Leaves elliptic-oblong or obovate, 15 cm long, rounded at base, narrowed at apex, margins entire, chartaceous, more or less pubescent above, fulvous pubescent beneath; secondary nerves 10. Flowers 5–8, in capitate, subsessile umbels, greenish white or greenish yellow, tomentose when young, long pedicelled; bracts 4, surrounding the flower. Perianth lobes 5, oblong. Stamens numerous with hairy filaments. Fruit ovoid or ellipsoid, seated on saucer shaped perianth.

Fl.: & Fr.: Mar.–May.

Habitat: Occasional along stream banks, hill slopes in the forest.

Specimens examined: Maredumilli, Ijjaluru, *Y. Mahesh* 011526, 011799 (BSID).

Field notes: Flowers aggregated in clusters, creamy white.

4. MACHILUS Nees

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP; 1 sp.

1. Machilus glaucescens (Nees) Wight, Icon. Pl. Ind. Orient. 5: 12, t. 1825. 1852. *Machilus macrantha* Nees in Wall., Pl. Asiat. Rar. 2: 70. 1831 & 3: 31. 1831; Hook. f., Fl. Brit. India 5: 140. 1886; Gamble, Fl. Madras 2: 1227. 1925. *Persea macrantha* (Nees) Kosterm., Reinwardtia 6: 193. 1962; R.S. Rao & al., Fl. E. Godavari Dist. 607. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1608. 2018.

Large evergreen tree, up to 20 m high. Leaves elliptic-lanceolate or oblong, 17 cm long, rounded at base, acute or sub acuminate at apex, margins entire, glaucous beneath, prominently nerved; nerves up to 7 pairs; petiole 4 cm long. Flowers in panicles at the end of branches, minute, greenish yellow; peduncle branched, up to 25 cm long. Perianth persistent; lobes reflexed. Anthers 4-celled. Fruit globose, about 1.2 cm across, black when ripe.

Fl.: & Fr.: Mar.–Oct.

Habitat: Occasional in hill slopes, ghats areas in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

7. ARACEAE

India: 25 genera, 200 taxa; Andhra Pradesh: 11 genera, 20 spp., 1 var.; PNP: 6 genera, 6 spp.

Key to the genera

1a.	Leaves radially, pedately compound or 3-partite	2
1b.	Leaves simple, deeply lobed	3
2a.	Flowers monoecious	**2. Amorphophallus**
2b.	Flowers dioecious	**3. Arisaema**
3a.	Epiphytic or lithophytic in nature	**6. Remusatia**
3b.	Terrestrial in nature	4
4a.	Climbing shrubs	**5. Raphidophora**
4b.	Tuberous plants	5
5a.	Ovules many, parietal	**1. Alocasia**
5b.	Ovules few, basal	**4. Colocasia**

1. ALOCASIA (Schott) G.Don

India: 10 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Alocasia decipiens Schott, Bonplandia 7: 28. 1859; Hook. f., Fl. Brit. India 6: 526. 1893; R.S. Rao & al., Fl. E. Godavari Dist. 719. 1999; Pull., Fl. Andhra Pradesh 5: 1963. 2018. *Arum fornicatum* Wight, Icon. Pl. Ind. Orient. 3: t. 789. 1844, non Roxb. 1832. nec Wight, t. 792. 1844. **(Plate 10C)**

Stout rhizomatous herb, up to 1 m high. Leaves ovate-oblong, 30 cm long, sagittate at base, acute at apex, margins entire, glabrous on both surfaces; nerves 6–7 pairs; petiole up to 50 cm long. Peduncle up to 40 cm long. Spathe 7.5 cm long, shorter than cymbiform limb. Male and female flowers separated by neuter flowers. Stamens 5. Style short; stigma capitate, entire. Fruiting spathe pyriform. Berry red.

Fl.: & Fr.: Aug.–Oct.

Habitat: Common along deep moist valleys in the forest, open marshy waste lands.

Specimen examined: Valamuru, *Y. Mahesh* 010952 (BSID)

2. AMORPHOPHALLUS Blume ex Decne.

India: 23 spp. & 4 var.; Andhra Pradesh: 4 spp. & 1 var.; PNP: 1 sp.

1. Amorphophallus paeoniifolius (Dennst.) Nicolson, Taxon 26: 338. 1977; R.S. Rao & al., Fl. E. Godavari Dist. 720. 1999; Pull., Fl. Andhra Pradesh 5: 1966. 2018. *Dracontium paeoniifolium* Dennst., Schlussel Hortus Malab. 13: 38. 1818. **(Plate 10 D&E)** *'Adavikonda, Manchi kanda'*

A stout tuberous herb; tuber large, up to 20 cm diam., hemispherical, warted. Leaves 3- partite, 40–80 cm wide, not bulbiferous, lateral segments spreading, bifurcate, pinnatifid, apex acuminate; petiole 50–90 cm long, warted or smooth, dark green with paler blotches. Peduncles shorter than the spathe, stout, elongating in fruit. Spathe pink or light reddish, 18 × 14 cm, campanulate, suddenly widening into an irregular spreading, margins undulate, recurved. Spadix stout. Male and female flower regions almost equal in length, contiguous. Styles purple. Berry 2-3 seeded, red.

Fl.: & Fr.: May.–Aug.

Habitat: Common in moist interior forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010456 (BSID).

3. ARISAEMA Mart.

India: 47 spp., 2 subsp. & 6 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Arisaema tortuosum (Wall.) Schott, Melet. Bot. 1: 17. 1832; Hook. f., Fl. Brit. India 6: 502. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1584. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 722. 1999; Pull. & al., Fl. Andhra Pradesh 5: 1967. 2018. *Arum tortuosum* Wall., Pl. Asiat. Rar. 2: 10, t. 114. 1830. **(Plate 10F)**

Tuberous herb, up to 1 m high; tubers globose; stem marbled. Leaves 2, pedatisect; leaflets 5, rarely 3–4, lanceolate-oblanceolate or ovate, cuneate at base, acuminate at apex, margin entire, pale green; secondary nerves numerous, oblique with short petiolule. Peduncle embraced by the leaf sheath, about 30 cm long in fruits. Spathe 14 cm long, cymbiform above the open tube, acuminate, pale green. Spadix with smooth purple appendage, decurved and then upcurved, slender, smooth. Stamens occupy upper two-third of the inflorescence. Fruiting head short. Berry ovoid, red. Seeds 3–5, sub globose, greyish.

Fl.: & Fr.: Jul.–Sep.

Habitat: Occasional as undergrowth in moist semi evergreen forests.

Specimen examined: PK Valasa, *Y. Mahesh* 010983 (BSID).

4. COLOCASIA Schott

India: 8 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Colocasia esculenta (L.) Schott, Melet. Bot. 18. 1832; R.S. Rao & al., Fl. E. Godavari Dist. 723. 1999; Pull., Fl. Andhra Pradesh 5: 1968. 2018. *Arum esculentum* L., Sp. Pl. 2: 965. 1753. *Colocasia antiquorum* Schott, Melet. Bot. 1: 18. 1832; Hook. f., Fl. Brit. India 6: 523. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1580. 1931. **(Plate 11A)** *'Chama gadda'*

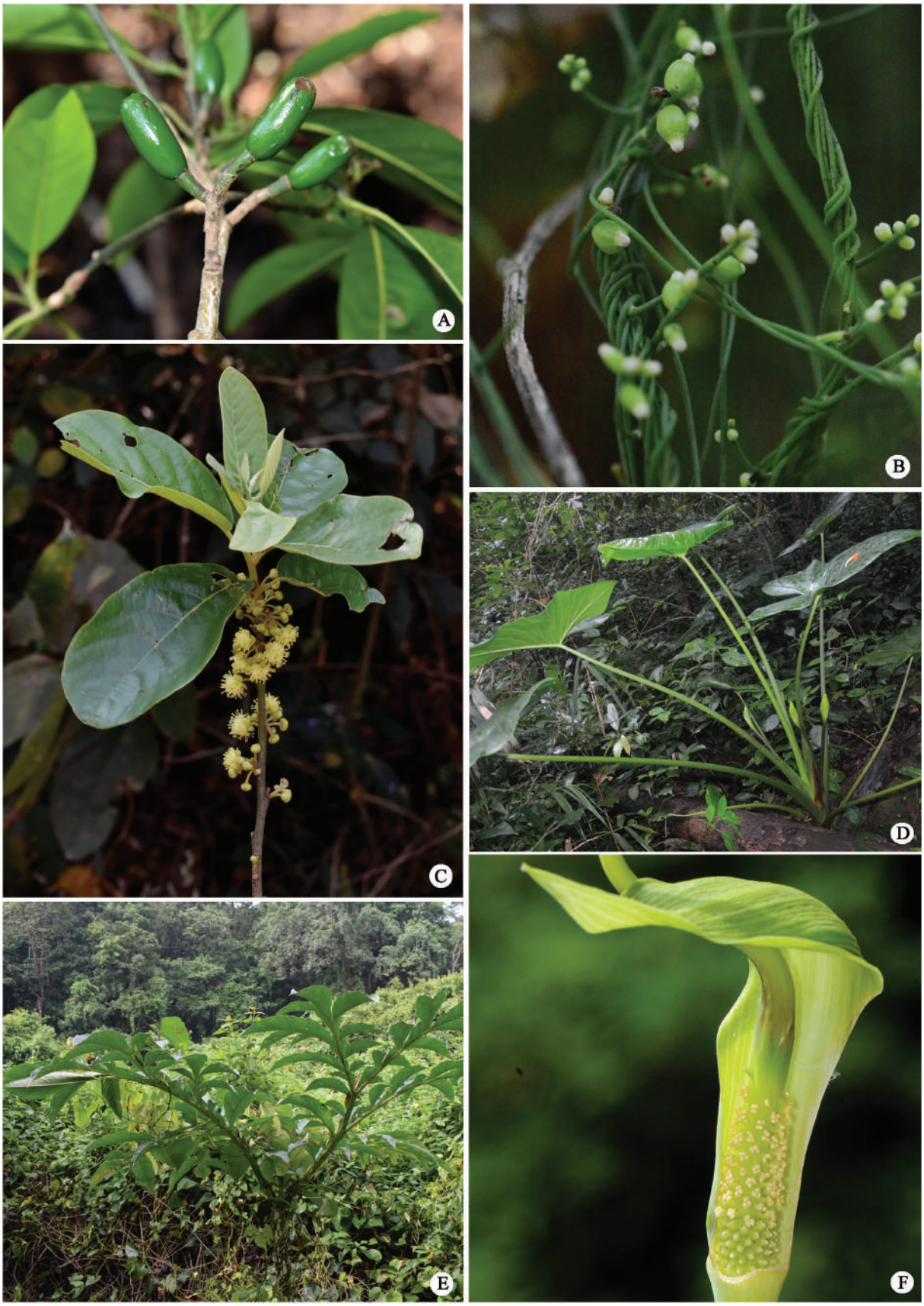


Plate 10: A. *Beilschmiedia roxburghiana* Nees; **B.** *Cassytha filiformis* L.; **C.** *Alocasia decipiens* Schott; **D. & E.** *Amorphophallus paeoniifolius* (Dennst.) Nicolson; **F.** *Arisaema tortuosum* (Wall.) Schott

Erect, tuberous herb. Leaves peltate-ovate or sub triangular, up to 30 cm long, cordate at base, rounded-apiculate at apex, margins slightly undulate. Peduncles shorter than petioles. Spathe about 25 cm long, peduncled, pale yellow, curved slightly backwards in flower. Spadix shorter than spathe, about 12 cm long. Male and female flowers with interposed flat neuters. Stamens 3–6, connate. Berries oblong. Seeds oblong, numerous.

Fl.: & Fr.: Sep.–Nov.

Habitat: Common in shady moist areas.

Specimens examined: GM Valasa, Amruthadara, Maredumilli, *Y. Mahesh* 010485, 010954, 011512 (BSID).

5. REMUSATIA Schott

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Remusatia vivipara (Roxb.) Schott in Schott & Endl., Melet. Bot. 1: 18. 1832; Hook. f., Fl. Brit. India 6: 521. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1583. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 725. 1999; Pull., Fl. Andhra Pradesh 5: 1970. 2018. *Arum viviparum* Roxb., Fl. Ind. 3: 496. 1832. **(Plate 11B)**

Tuberous herb, up to 40 cm long; stems bearing scaly leaves in axils of which are bulbils, covered with hooked cataphylls. Leaves usually solitary, peltate, broadly ovate, 22 cm long, cordate at base, acute-acuminate at apex, margins undulate, sinus not extending half-way to the petiole, basal lobes rounded. Flowers monoecious. Spathe coriaceous, ovate, 16 cm long, fleshy, thick in fruiting, light green, short. Peduncle *c.* 10 cm long, enclosed in cataphylls. Male and female flowers separated by neuters. Berries small, obovoid, rarely produced. Seeds ovoid.

Fl.: & Fr.: Feb.–May.

Habitat: Rare in rocky crevices of hill slopes in the moist deciduous forest.

Specimen examined: Thummulakonda, *Y. Mahesh* 010476 (BSID).

Field note: Bulbils have hooked cataphylls, looks like spines.

6. RHAPHIDOPHORA Hassk.

India: 11 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Rhaphidophora decursiva (Roxb.) Schott, Bonplandia 5: 45. 1857; Hook. f., Fl. Brit. India 6: 547. 1893; R.S. Rao & al., Fl. E. Godavari Dist. 725. 1999; Pull., Fl. Andhra Pradesh 5: 1971. 2018. *Pothos decursivus* Roxb., Fl. Ind. 1: 436. 1820. *Rhaphidophora eximia* Schott, Hook. f., Fl. Brit. India 6: 547. 1893. **(Plate 11C)**

Climbing shrub; climbing with the help of roots; stem sout, *c.* 3 cm thick, cylindric. Leaves coriaceous, resemble the fronds of a fern, oblong-obovate or suborbicular, 40 cm long, shining, deeply lobed, segments unequal, truncate or acuminate at apex; petiole stout, grooved. Peduncle stout, 10 cm long. Spathes cymbiform, yellow, beaked, deciduous. Spadix thick, cylindrical. Ovaries hexagonal.

Fl.: & Fr.: Aug.–Oct.

Habitat: Occasional climber on the trees in deep moist valleys in the forest.

Specimen examined: Valamuru, *Y. Mahesh* 010949 (BSID).

Field note: Leaves looks like fern leaves.

8. ALISMATACEAE

India: 7 genera, 17 spp., 3 subspp.; Andhra Pradesh: 2 genera, 2 spp.; PNP: 1 genus, 1 sp.

1. LIMNOPHYTON Miq.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Limnophyton obtusifolium (L.) Miq., Fl. Ned. Ind. 3: 242. 1855; Hook. f., Fl. Brit. India 6: 560. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1595. 1931. R.S. Rao & al., Fl. E. Godavari Dist. 728. 1999; Pull., Fl. Andhra Pradesh 5: 1975. 2018. *Sagittaria obtusifolia* L., Sp. Pl. 2: 993. 1753. **(Plate 11D)**

Aquatic scapigerous herb; stem succulent, spongy. Leaves erect, sagittate-triangular, up to 20 cm long, cordate at base, rounded at apex, margins entire, glandular with stellate hairy on both surfaces, 8–20 nerved. Inflorescence many flowered; peduncle branched; bracts 3, elliptic-lanceolate. Flowers bisexual, in whorls on stout peduncles. Sepals 3, elliptic, small. Petals 3, obovate, larger than sepals. Stamens 6. Pistils 14–many on small receptacle. Achenes reticulately ribbed, swollen with 2 lateral gas filled chambers.

Fl.: & Fr.: Jan.–Apr.

Habitat: Common in stagnant water bodies, ponds in the open forests area.

Specimen examined: Shivagiri, *Y. Mahesh* 010083 (BSID).

Field note: Sagittate leaves looks like triangle arrow in water bodies.

9. HYDROCHARITACEAE

India: 10 genera, 23 taxa; Andhra Pradesh: 6 genera, 9 spp., 2 var.; PNP: 2 genera, 2 spp.

Key to the genera

1a.	Leaves linear, whorled, spathes sessile	**1. Hydrilla**
1b.	Leaves broadly ovate to oblong, spathes peduncled	**2. Ottelia**

1. HYDRILLA Rich.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Hydrilla verticillata (L.f.) Royle, Ill. Bot. Himal. t. 376. 1839. Hook. f., Fl. Brit. India 5: 659. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1396. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 656. 1999; Pull., Fl. Andhra Pradesh 5: 1836. 2018. *Serpicula verticillata* L.f., Suppl. Pl. 416. 1782.

A fresh water herb; stem slender, often rooting at nodes. Leaves linear-oblong, 1.3 cm long, whorled, 3–4 or sometimes more at each node, membranous, rounded at base, acute or apiculate at apex, margins scarcely serrate, glabrous on both surfaces. Flowers unisexual. Spathes sessile. Male flowers small; pedicel short. Sepals 3, ovate. Petals 3. Female flowers sessile, solitary, in two toothed spathes; neck long above the ovary; style trifid. Fruit carried on long stalk due to lengthening of the calyx tube.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common in ponds, lakes and stagnant waters.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c*).

2. OTTELIA Pers.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Ottelia alismoides (L.) Pers., Syn. Pl. 1: 400. 1805. Hook. f., Fl. Brit. India 5: 662. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1398. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 657. 1999; Pull., Fl. Andhra Pradesh 5: 1838. 2018. *Stratiotes alismoides* L., Sp. Pl. 1: 535. 1753.

An aquatic, submerged, flaccid herb, varying in height with depth of the water, attached to the soil with fibrous roots; stem reduced. Leaves of two kinds; radical leaves crowded, submerged, variable, narrow-oblong with tapering base, shortly petioled; floating leaves ovate-reniform, 10 cm long, cordate at base, obtuse-rounded at apex, margins undulate. Flowers axillary, solitary, white with yellow throat. Spathe peduncled, with 5 crisped, undulate wings. Sepals 3, oblong. Petals 3, obovate or orbicular, with fleshy basal appendages. Stamens 6. Ovary oblong, beaked; styles 2-fid; stigma fimbriate. Fruit oblong, 6 valved, enclosed in the winged spathe. Seeds numerous.

Fl.: & Fr.: Jun.–Oct.

Habitat: Frequent along the margins of ponds, in rice fields and ditches.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011396 (BSID).

Field note: This species grows along the edges of shallow waterbodies and ponds and in rice fields of Godavari delta area.

10. APONOGETONACEAE

India: 1 genus, 9 spp.; Andhra Pradesh: 1 genus, 2 spp.; PNP:1 genus, 2 spp.

1. APONOGETON L.f.

India: 9 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves only floating, linear-oblong or lanceolate, shallowly cordate at base, spikes with dense flowered	**1. A. natans**
1b.	Leaves two kinds; submerged and floating, oblong or oblong-linear, narrowed at base, spikes lax flowered	**2. A. crispus**

1. Aponogeton crispus Thunb., Nov. Gen. Pl. 4: 73. 1784; Hook. f., Fl. Brit. India 6: 564. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1598. 1931; Pull., Fl. Andhra Pradesh 5: 1977. 2018. *Aponogeton echinatus* Roxb., Fl. Ind. 2: 210. 1832; Hook. f., Fl. Brit. India 6: 564. 1893; R.S. Rao & al., Fl. E. Godavari Dist. 729. 1999. **(Plate 11E)** *'Nammapuvvu'.*

Aquatic herb with tuberous roots; tuber oblong-ovoid, 4 × 3 cm. Leaves of two kind; submerged leaves oblong-elliptic, 15 cm long; floating leaves oblong-linear, 20 cm long, subcordate at base, rounded or subacute at apex, margins undulate, glabrous; petiole narrow, large, about 30–40 cm long. Flowering scape long, usually lax flowered. Flowers on long spikes, dense at base, apically lax. Tepals 2, light pink or white, obovate, as long as broad, persistent. Stamens 6. Ovaries 3, globose; style short. Follicles 3, beaked. Seeds 1-2, oblong, smooth.

Fl.: & Fr.: Jul.–Sep.

Habitat: Common in ponds, canals, stagnant water bodies and roadside ponds.

Specimen examined: Thutigunta, *Y. Mahesh* 011646 (BSID).

Field note: Free floating herb with long oblong leaves.

2. Aponogeton natans (L.) Engl. & Krause, Pflanzenr. 24: 11. 1906; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1598. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 730. 1999; Pull., Fl. Andhra Pradesh 5: 1977. 2018. *Saururus natans* L., Mant. Pl. 2: 227. 1771. *Aponogeton monostachyon* L.f., Suppl. Pl. 214. 1781; Hook. f., Fl. Brit. India 6: 564. 1893. *'Nava dumpa'*

Submerged or floating aquatic herb; rhizomes stoloniferous, about 3.5 cm across; roots fibrous. Leaves radical, oblong or linear-lanceolate, 8 cm long, mostly floating, rounded or cordate at base, obtuse or subacute at apex, margins entire, glabrous on both surfaces; petiole up to 35 cm long. Spikes usually dense flowered, about 10 cm long; peduncle 20 cm long, overtopping leaves. Flowers light pink with bluish purple anthers. Teplas 2, obovate, 2 × 4 mm, nearly twice as long as broad. Stamens 6; anthers bluish purple. Ovaries 3, oblong. Follicles 3, sub globose. Seeds 6, more than 5 ribbed, striate.

Fl.: & Fr.: Aug.–Oct.

Habitat: Frequently in stagnant water bodies and roadside ponds.

Specimens examined: Murdhvada, Chigurumamidi, *Y. Mahesh* 010518, 011381 (BSID).

11. DIOSCOREACEAE

India: 2 genera, 61 taxa; Andhra Pradesh: 2 genera, 10 spp; PNP: 2 genera, 7 spp.

Key to the genera

1a.	Leaves radical; fruit baccate or 3-valved berry, to 6 ribbed	**2. Tacca**
1b.	Leaves not radical; fruit 3-valved capsule, not ribbed	**1. Dioscorea**

1. DIOSCOREA Plum. ex L.

India: 37 spp. & 23 var.; Andhra Pradesh: 10 spp.; PNP: 6 spp.

Key to the species

1a.	Stem twining to the left	2
1b.	Stem twining to the right	3
2a.	Leaves simple, alternate	***1.* D. bulbifera**
2b.	Leaves compound, 3-5 foliolate	4
3a.	Stems densely pubescent	**5. D. pubera**
3b.	Stems glabrous	5
4a.	Leaflets and capsules glabrous	**4. D. pentaphylla**
4b.	Leaflets densely tomentose beneath; capsule downy	**6. D. tomentosa**
5a.	Leaves all alternate, axis of male spikes not zig-zag	**3. D. oppositifolia**
5b.	Leaves opposite and alternate, axis of male spikes zig-zag	**2. D. hamiltonii**

1. Dioscorea bulbifera L., Sp. Pl. 2: 1033. 1753. Hook. f., Fl. Brit. India 6: 296. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1511. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 689. 1999; Pull., Fl. Andhra Pradesh 5: 1915. 2018. **(Plate 11F)** *'Adavidumpa'*

Climbing herb, with solitary globose-sub globose bulbil or tuber in leaf axils; stem twining to the left, smooth. Leaves simple, alternate, suborbicular-broadly ovate, 12 cm long, 11-ribbed, deeply cordate at base, caudate or acuminate at apex, margin entire, glabrous on both surfaces. Male flowers many in long slender axillary paniculate spikes, light green. Perianth lobes linear. Stamens 6, small. Female spikes 1–3 together, several fascicled at each axil, slender, drooping. Staminodes 6. Capsule quadrately oblong, wings rounded, glabrous.

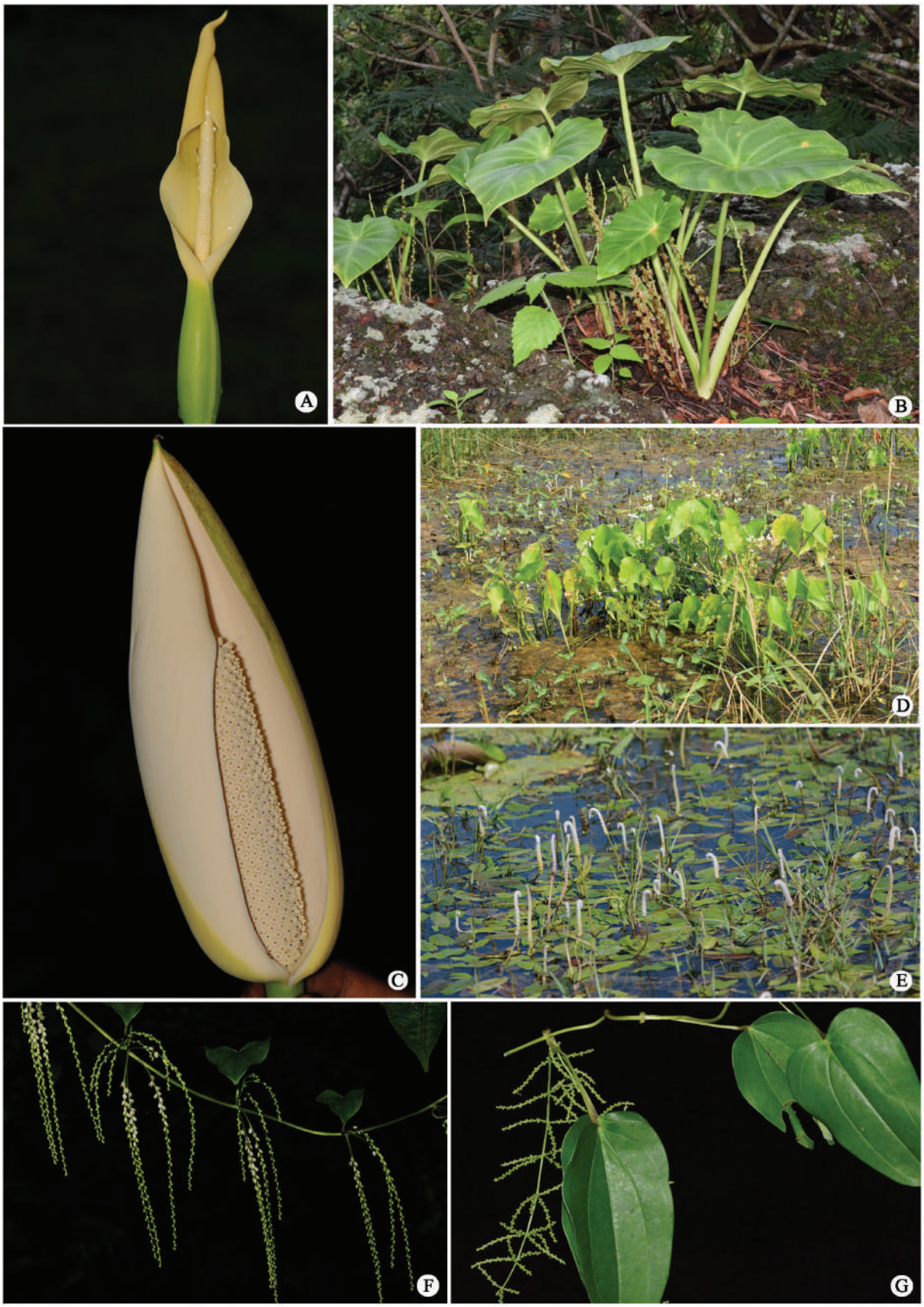


Plate 11: A. *Colocasia esculenta* (L.) Schott; **B.** *Remusatia vivipara* (Roxb.) Schott; **C.** *Rhaphidophora decursiva* (Roxb.) Schott; **D.** *Limnophyton obtusifolium* (L.) Miq.; **E.** *Aponogeton crispus* Thunb.; **F.** *Dioscorea bulbifera* L.; **G.** *Dioscorea oppositifolia* L.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in forest pathways, hilly areas, climbing on bushes.

Specimen examined: Kondamodalu, *Y. Mahesh* 011418 (BSID).

Field note: Tubers single or in clusters, globose or irregular, dark brown outside, covered with roots.

Uses: Tubers edible.

2. Dioscorea hamiltonii Hook. f., Fl. Brit. India 6: 295. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1512. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 690. 1999; Pull., Fl. Andhra Pradesh 5: 1916. 2018.

Twisted, climbing shrub; tubers long stalked; stem winged, glabrous. Leaves opposite, ovate-lanceolate or sagittate, 10 cm long, cordate at base, acuminate at apex, margin entire, glabrous on both surfaces; petiole curved, base swollen, 5 cm long. Inflorescence in axillary spikes. Male flower rachis slender, usually zig-zag. Female flowers in axillary slender spikes, *c.* 15 cm long. Capsule reniform, winged, *c.* 3 cm long.

Fl.: & Fr.: Sep.–Nov.

Habitat: Occasional on small trees and shrubs along deep forest pathways.

Specimen examined: Eruwada, *Y. Mahesh* 010632 (BSID).

Field note: Tubers cylindrical, with long stalk.

3. Dioscorea oppositifolia L., Sp. Pl. 2: 1033. 1753; Hook. f., Fl. Brit. India 6: 292. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1512. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 690. 1999; Pull., Fl. Andhra Pradesh 5: 1917. 2018. *Dioscorea lanceolata* Heyne ex Hook.f., Fl. Brit. India 6: 292. 1892. **(Plate 11G)** *'Tellagadda'*

Tuberous, climbing undershrub; stem twisted towards right, purple when young, swollen at nodes, glabrous. Leaves opposite, broadly elliptic-ovate, 9 cm long, cuneate–rounded at base, acuminate at apex, margins cartilaginous, 3–5 ribbed. Inflorescence in axillary, clustered spikes. Flowers unisexual, brownish pubescent. Male spikes short in false whorls on the axillary rachis. Stamens 6. Female racemes solitary, distant, from leaf axils; pistil pubescent. Capsule suborbicular, laterally flattened, 3-angled, stipitate, pendulous.

Fl.: & Fr.: Aug.–Oct.

Habitat: Common along roads and hedges.

Specimens examined: P K Valasa, Ijjaluru, Enukuru, *Y. Mahesh* 010462, 010568, 010974 (BSID).

4. Dioscorea pentaphylla L., Sp. Pl. 2: 1032. 1753; Hook. f., Fl. Brit. India 6: 289. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1511. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 691. 1999; Pull., Fl. Andhra Pradesh 5: 1917. 2018. *Dioscorea jacquemontii* Hook. f., Fl. Brit. India 6: 290. 1892. **(Plate 12A)** *'Dukapedalamu'*

Gregarious prickly tuberous twiner; stem twisted to right. Leaves alternate, penta-foliate; leaflets digitate, obovate-elliptic, 8 cm long, oblique at base, acuminate at apex, margins entire, glabrous above, rusty pubescent beneath. Inflorescence in axillary spikes. Flowers unisexual, dioecious, bracteate. Perianth 6 lobed; lobes connate in males, free in female, pubescent. Stamens 3, alternating with 3 staminodes. Ovary trigonous, pubescent. Style 3, short; stigma bifid. Capsule oblong, longer than broad, compressed, 3-angled, glabrous.

Fl.: & Fr.: Sep.–Nov.

Habitat: Common in hilly slopes, along forest pathways.

Specimen examined: Koduru, *Y. Mahesh* 011538 (BSID).

Field note: Leaves pentafoliate.

5. Dioscorea pubera Blume, Enum. Pl. Jav. 1: 21. 1827; Pull., Fl. Andhra Pradesh 5: 1918. 2018. *Dioscorea anguina* Roxb., Fl. Ind. 3: 803. 1832; Hook. f., Fl. Brit. India 6: 293. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1513. 1928.

Large tuberous climber; tubers large, cylindric; stem woody, twisted to right, densely pubescent. Leaves opposite, alternate, broadly ovate, *c.*13 cm long, cordate at base, acuminate at apex, margins entire, glabrous above, pubescent on the nerves beneath. Inflorescence axillary spikes. Flowers unisexual. Bracts ovate, deflexed. Outer perianth lobes 6, oblong; inner ones ovate. Stamens 6, adnate to the inner perianth lobes. Ovary densely hairy. Capsule subcordate, smooth.

Fl.: & Fr.: Aug.–Oct.

Habitat: Occasional in the hilly areas of moist deciduous forest.

Specimen examined: Ijjaluru, *Y. Mahesh* 010963 (BSID).

Field note: Stem woody, densely pubescent.

6. Dioscorea tomentosa J. Koenig ex Spreng., Pl. Min. Cogn. Pug. 2: 92. 1815; Hook. f., Fl. Brit. India 6: 289. 1892; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1511. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 691. 1999; Pull., Fl. Andhra Pradesh 5: 1918. 2018. **(Plate 12B)** *'Teegadumpa'*

White tomentose, tuberous, climbing herb; stem prickly, twisted to the left; branches pubescent. Leaves trifoliate; leaflets ovate-elliptic,12 cm long, oblique at base, acute or rounded at apex, margin entire, pubescent above, densely white tomentose beneath. Inflorescence axillary panicle, tomentose. Flowers unisexual, dioecious. Perianth segments 6; connate in males, free in females. Stamens 3; staminodes 3. Ovary oblong, triquetrous, trilocular; style 3; stigma bifid. Capsule oblong-ovate, flattened, 3-angled, downy.

Fl.: & Fr.: May–Oct.

Habitat: Common in lower hilly areas, along forest foot hills.

Specimen examined: Eruwada, *Y. Mahesh* 011561 (BSID).

Field note: Entire plant with white tomentose hairs.

2. TACCA J.R. Forst. & G. Forst.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Tacca leontopetaloides (L.) Kuntze, Revis. Gen. Pl. 2: 704. 1891. R.S. Rao & al., Fl. E. Godavari Dist. 687. 1999; Pull., Fl. Andhra Pradesh 5: 1914. 2018. *Leontice leontopetaloides* L., Sp. Pl. 313. 1753. *Tacca pinnatifida* J.R. Forst. & G. Forst., Char. Gen. Pl. 70, f. 35. 1776; Hook. f., Fl. Brit. India 6: 287.1892; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1506. 1928. **(Plate 12C)**

An erect, perennial, tuberous herb, up to 100 cm high; tuber globose. Leaves radical, tripartite with pinnatifid segments, spreading, up to 50 cm in diam., shortly acuminate at apex, margins undulate, glabrous on both surfaces. Scape striate, arise from the base, longer than petioles, glabrous, many flowered. Flowers greenish, tinged with purple, drooping. Involucral bracts 5, lanceolate, subequal, striped with purple, acuminate, recurved. Bracteoles numerous, filiform, ribbed with persistent perianth. Perianth 6-lobed; lobes connate, fleshy, biseriate with purple margins; tube sub globose. Stamens 6, adnate to perianth tube. Style short; stigmas 3, bifid. Berry sub-globose, 6-ribbed.

Fl.: & Fr.: Jun.–Oct.

Habitat: Common in damp, humid valleys of semievergreen forests.

Specimen examined: PK Valasa, *Y. Mahesh* 012136 (BSID).

Field note: This species looks like *Amorphophallus* sp. in vegetative condition.

12. STEMONACEAE

India: 2 genera, 4 taxa; Andhra Pradesh: 1 genus, 1 sp.; PNP:1 genus, 1 sp.

1. STEMONA Lour.

India: 2 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Stemona tuberosa Lour., Fl. Cochinch. 2: 404. 1790; Hook. f., Fl. Brit. India 6: 298. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1514. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 700. 1999; Pull., Fl. Andhra Pradesh 5: 1920. 2018. **(Plate 12D)** *'Kaniputeega'*

A twining herb; stems green when young, ashy white later, glabrous. Leaves opposite, ovate, up to 9 cm long, membranous, cordate at base, caudate at apex, margins entire, 9 ribbed, glabrous on both surfaces; petioles 5 cm long. Flowers in racemes, 1–3 flowered. Perianth segments ovate-lanceolate, greenish with purple nerves. Stamens large; filaments dark red, stout, grooved. Ovary free, compressed; stigma small. Capsule ovoid, up to 8 seeded.

Fl.: & Fr.: Feb.–Apr.

Habitat: Occasional in the shady areas of semievergreen forest.

Specimens examined: Ijjaluru ghat road, *Y. Mahesh* 010901, 11793 (BSID).

Field note: Leaves looks like betel leaves.

13. COLCHICACEAE

India: 3 genera, 9 spp.; Andhra Pradesh: 2 genera, 3 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a. Climbing herbs, leaves ending with a tendril, flowers large, showy **1. Gloriosa**
1b. Erect perennial herbs, leaves not ending with tendril, flowers small, not showy **2. Iphigenia**

1. GLORIOSA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Gloriosa superba L., Sp. Pl. 1: 305. 1753; Hook. f., Fl. Brit. India 6: 358. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1519. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 695. 1999; Pull., Fl. Andhra Pradesh 5: 1931. 2018. **(Plate 12E)** *'Agnishika, Adavinabi'*

Medium sized perennial twiner, with tuberous root stock; tubers cylindric, white, variously shaped, mostly V or L- shaped; stem herbaceous, about 2 m long, twisted, glabrous. Leaves ovate-lanceolate, up to 12 cm long, sessile, auricled or rounded at base, apex modified into coiled tendril, margin entire, glabrous on both surfaces. Flowers axillary, solitary, deep orange-red; pedicel long with deflexed tip. Perianth segments 6, petaloid, lanceolate, crisped, reflexed. Stamens 6; filaments spreading; anthers versatile. Ovary elongate, trilocular; style filiform. Capsule oblong, septicidal.

Fl.: & Fr.: Aug.–Nov.

Habitat: Fairly common in the upper ghats, plains and fences.

Specimen examined: Kondamodalu, *Y. Mahesh* 011412 (BSID).

Field note: Flowers looks like fire from distance.

2. IPHIGENIA Kunth

India: 6 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Iphigenia indica (L.) A. Gray ex Kunth, Enum. Pl. 4: 213. 1843; Hook. f., Fl. Brit. India 6: 357. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1528. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 696. 1999; Pull., Fl. Andhra Pradesh 5: 1932. 2018. *Melanthium indicum* L., Mant. Pl. 2: 226. 1771. **(Plate 12F)**

Erect, grass like perennial herb; corm small, sub globose, 2.2 cm high; stem 30 cm high, slender. Leaf sheath 3.5 cm long, tubular. Leaves cauline, linear-lanceolate, sessie, 10 cm long, gradually smaller above, filiform, acuminate at apex, margins entire, glabrous on both surfaces. Flowers in terminal racemes, on long pedicels. Bracts subulate, lower leafy. Perianth segments 6, linear-subulate, dark or dark purple. Stamens oblong; filaments rarely papillose. Ovules numerous in each cell. Capsule oblong-ellipsoid, 1.2 cm long, loculicidal. Seeds orbicular, black.

Fl.: & Fr.: Jul.–Oct.

Habitat: Fairly common along the grasslands.

Specimen examined: Inupakonda, PK Valasa, *Y. Mahesh* 010465(BSID).

Field note: Leaves looks like grass, flowers dark purple.

14. SMILACACEAE

India: 2 genera, 40 taxa; Andhra Pradesh: 1 genus, 3 spp.; PNP:1 genus, 1 sp.

1. SMILAX L.

India: 33 spp., 3 subsp. & 2 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Smilax zeylanica L., Sp. Pl. 2: 1029. 1753; Hook. f., Fl. Brit. India 6: 309. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1518. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 698. 1999; Pull., Fl. Andhra Pradesh 5: 1935. 2018. *Smilax macrophylla* Roxb., Fl. Ind. 3. 793. 1832; Hook. f., Fl. Brit. India 6: 310. 1892. **(Plate 13A)** *'Adavikonda teega'*

Gregarious climber; up to 15 m high; stem 4-angled, sparsely prickled. Leaves variable, ovate-lanceolate or elliptic-oblong, orbicular, up to 20 cm long, 3–9 ribbed, deccurrent on petiole, rounded or subcordate at base,



Plate 12: A. *Dioscorea pentaphylla* L.; **B.** *Dioscorea tomentosa* J. Koenig ex Spreng.; **C.** *Tacca leontopetaloides* (L.) Kuntze; **D.** *Stemona tuberosa* Lour.; **E.** *Gloriosa superba* L.; **F.** *Iphigenia indica* (L.) A. Gray ex Kunth

acuminate at apex, margins entire; petiole 3 cm long, curved at base and jointed. Flowers white in pedunculate umbels. Fruit globose. Seeds 1 or 2.

Fl.: & Fr.: Apr.–Sep.

Habitat: Fairly common on hill slopes and forest outskirts.

Specimen examined: PK Valasa, *Y. Mahesh* 010988 (BSID).

15. ORCHIDACEAE

India: 155 genera, 1268 taxa; Andhra Pradesh: 44 genera, 93 spp.; PNP: 13 genera, 21 spp.

Key to the genera

1a.	Plants terrestrial	2
1b.	Plants epiphytic	7
2a.	Root climbers; stem branching; leaves scaly	13. **Vanilla**
2b.	Non climbers; leaves large, green	3
3a.	Leaves absent while flowereing, solitary, orbicular with large petiole	7. **Nervillia**
3b.	Leaves present while flowering, more than one, subsessile, not orbicular	4
4a.	Flowers resupinate	5
4b.	Flowers non resupinate	4. **Geodorum**
5a.	Plants and flowers small or medium sized; lip not pectinately lobed	6
5b.	Plants up to 150 cm tall, robust; flowers large; lateral lobes of lip pectinately lobed	9. **Pecteilis**
6a.	Spur long, cylindric or clavate; stigmatic processes free	5. **Habenaria**
6b.	Spur scrotiform; stigmatic processes fused with claw of lip	10. **Peristylus**
7a.	Plants without pseudobulbs	8
7b.	Plants with distinct pseudobulbs	6. **Liparis**
8a.	Plants with sympodial growth	9
8b.	Plants with monopodial growth	10
9a.	Plants short; leaves fleshy, flattened laterally, ensiform; inflorescence terminal, spike	8. **Oberonia**
9b.	Plants large; leaves flat, oblong-linear; inflorescence lax flowered racemes	3. **Cymbidium**
10a.	Pollinia 2	11
10b.	Pollinia 4	12
11a.	Lip immobile	12. **Vanda**
11b.	Lip mobile	2. **Aerides**
12a.	Spur with a callus on the back-wall within	11. **Pomotocalpa**
12b.	Spur without callus on the back wall within	1. **Acampe**

1. Acampe Lindl.

India: 5 spp. & 1 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Acampe praemorsa (Roxb.) Blatt. & Mc Cann, J. Bombay Nat. Hist. Soc. 35: 495. 1932; R.S. Rao & al., Fl. E. Godavari Dist. 659. 1999; Pull., Fl. Andhra Pradesh 5: 1844. 2018. *Epidendrum praemorsum* Roxb., Pl. Coromandel 1: 34. t. 43. 1795. *Saccolabium praemorsum* Hook. f., Fl. Brit. India 6: 62. 1890. *Saccolabium wightianum* Hook. f., Fl. Brit. India 6: 62. 1890. *Acampe wightiana* Lindl., Fol. Orchid. 4: 2. 1853; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1447. 1928. **(Plate 13B & C)**

An epiphytic, stout herb, up to 50 cm high; stem woody. Leaves lorate, 16 cm long, narrow, coriaceous, channelled, shortly bilobed at apex. Scape stout; internodes short with annular sheaths; bracts semi-circular. Flowers in spiciform racemes or supra-axillary panicles, papillose, yellow with red bars; floral bracts triangular, spotted with pink. Sepals and petals thick, barred with red inside, spotted outside. Dorsal sepal oblong, obtuse; lateral sepals oblong. Lip saccate, fleshy; lateral lobes small, blunt; midlip thick, ovate, white barred with pink. Column short. Capsule oblong, fusiform, longitudinally ribbed.

Fl.: & Fr.: Apr.–Aug.

Habitat: Common on large trees, dead trees in semi evergreen forest.

Specimens examined: Bhojeripakala, Ettukkam & Muzumamidi Valasa, *M. Mohanan* 101325, 105139 & 101221 (BSID).

2. AERIDES Lour.

India: 9 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Aerides ringens (Lindl.) C.E.C. Fisch., Bull. Misc. Inform. 1928. 284. 1928 & in Gamble, Fl. Madras 3: 1442. 1928; R.S. Rao & al., Fl. W. Godavari Dist. 382. 1986. Pull., Fl. Andhra Pradesh 5: 1846. 2018. *Saccolabium ringens* Lindl., Gen. Sp. Orchid. Pl. 221. 1833. *Aerides radicosa* A. Rich., Ann. Sci. Nat., Bot. ser. 2. 15: 65. 1841; Hook. f., Fl. Brit. India 6: 46. 1890.

An epiphytic robust herb, up to 20 cm high; roots branched; stem erect, short, stout. Leaves linear-oblong, 18 cm long, unequally bilobed, closely imbricate at base, obtuse at apex, margins entire, coriaceous, green with purple spots. Inflorescence axillary, lax racemes, many flowered; floral bracts, triangular, acute; pedicel with ovary, whitish rose. Flowers white. Dorsal sepal ovate- oblong, obtuse, 5 nerved; lateral sepals broadly ovate, obtuse, 3 nerved. Petals narrow, obovate, rounded, 3-nerved. Lip sessile, 3-lobed, mobile; lateral rounded; middle flat, ovate; spur laterally compressed, incurved, cylindric. Disc with two basal calli; column whitish rose, oblong. Stigma orbicular. Pollinia 2, sub globose. Capsule 2.5 cm long, fusiform.

Fl.: & Fr.: Apr.–Jun.

Habitat: Rare in moist areas of semi evergreen forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. CYMBIDIUM Sw.

India: 26 spp., 3 subsp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cymbidium aloifolium (L.) Sw., Nova Acta. Sc. Upsal. 6: 73. 1799. Hook. f., Fl. Brit. India 6: 10. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1436. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 660. 1999; Pull., Fl. Andhra Pradesh 5: 1850. 2018. *Epidendrum aloifolium* L., Sp. Pl. 2: 953. 1753. **(Plate 13D)**

Tufted epiphytic herb; roots with needle like rootlets; stem clothed with membranous sheaths, embrasing the leaf bases; pseudobulbs woody, ovoid, covered with leaf sheaths. Leaves linear-oblong, lorate, up to 40 cm long, curved, keeled, coriaceous, glabrous on both surfaces. Inflorescence in racemes, shorter than leaves; floral bracts ovate, 3-nerved, acute, reddish brown. Flowers fleshy, cream coloured with reddish purple. Sepals oblong-lanceolate, 7-nerved, acute. Petals ovate-elliptic, 3-nerved, acute. Lip sessile, 3-lobed; lateral lobes longer than column, narrowly oblong, acute; midlobe decurved, oblong, rounded. Disc with 2 yellow keels. Column yellow, oblong, winged with foot. Stigma subtriangular. Pollinia 2, ovoid. Capsule 5 cm long, pyriform.

Fl.: & Fr.: Apr.–Jul.

Habitat: Frequent epiphytic herb on huge tree trunks, branches.

Specimen examined: PK Valasa, *Y. Mahesh* 010404 (BSID).

4. GEODORUM Andrews

India: 5 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Geodorum densiflorum (Lam.) Schltr., in Feddes Repert. 4: 259. 1919; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1437. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 661. 1999; Pull., Fl. Andhra Pradesh 5: 1858. 2018. *Limodorum densiflorum* Lam., Encycl. 3: 516. 1792. *Geodorum purpureum* R.Br. in Aiton, Hort. Kew., ed. 2, 5: 207. 1813; Hook. f., Fl. Brit. India 6: 16. 1890. **(Plate 13E)**

A terrestrial herb with underground tubers; up to 45 cm high; stem stout, sheathed. Leaves 2–4, plicate, lanceolate-elliptic, up to 25 cm long, narrow at base, acuminate at apex, margins wavy. Inflorescence longer than leaves, apex hooked. Raceme many flowered. Flowers dense, non-resupinate, whitish with purple lines. Dorsal sepals elliptic-oblong, acute; lateral sepals lanceolate-oblong, acute. Petals elliptic, 5-nerved, acute. Lip sessile, 5-nerved, veins purple, 3-lobed; laterals rounded; midlobe sub quadrate, bilobed at apex. Disc with 3 granulated ridges, throat yellow. Column whitish rose, oblong. Stigma rounded. Pollinia 2, ellipsoid. Capsule 3 cm long, fusiform.

Fl.: & Fr.: Apr.–Jul.

Habitat: Frequent along hill slopes.

Specimen examined: Valamuru, *Y. Mahesh* 010532 (BSID).

Field note: Peduncle of flowers pendulous.

5. HABENARIA Willd.

India: 64 spp.& 1 var.; Andhra Pradesh: 13 spp.; PNP: 7 spp.

Key to the species

1a.	Petals entire	3
1b.	Petals bipartite	2
2a.	Petals bearded; tubers oblong	**1. H. barbata**
2b.	Petals otherwise; tubers ovoid	**3. H. digitata**

3a.	Lip 3-lobed	4
3b.	Lip not lobed	**6. H. reniformis**
4a.	Side lobes of lip filiform or linear	6
4b.	Side lobes of lip broad	5
5a.	Leaves more than 2, not adpressed to the ground	**5. H. plantaginea**
5b.	Leaves 2 (rarely 4) adpressed to the ground	**7. H. roxburghii**
6a.	Ovary long beaked; segments of lip filiform	**2. H. commelinifolia**
6b.	Ovary scarcely beaked; segments of lip not filiform	**4. H. furcifera**

1. Habenaria barbata Wight ex Hook. f., Fl. Brit. India 6: 133. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1468. 1928; Pull., Fl. Andhra Pradesh 5: 1862. 2018. **(Plate 13F)**

An erect terrestrial herb, up to 30 cm high; tubers 1–2, oblong, 2.8 cm long; stem stout, terete. Leaves 3–5, cauline, sessile, narrow-lanceolate, 9 cm long, acuminate at apex, margins entire. Inflorescence in lax racemes, many flowered, about 18 cm long; floral bracts green, ovate-lanceolate, acuminate. Flowers greenish-yellow, 2 cm across. Dorsal sepal broadly ovate, acuminate; lateral sepals deflexed, oblong-lanceolate, acuminate. Petals bipartite, margins hairy; upper lobe cohering with dorsal sepal, lanceolate, 2-veined; lower lobe shorter than upper, linear, 1-veined. Lip sessile, pilose, 3-lobed above the middle; lateral linear; midlobe lanceolate, obtuse. Spur as long as or shorter than the ovary, cylindrical. Stigmatic lobes 2, oblong, incurved. Pollinia 2, ovoid. Capsule 2.5 cm long, fusiform.

Fl.: & Fr.: Apr.–Jul.

Habitat: Occasional on hill tops, higher altitudes in the semi evergreen forest.

Specimen examined: Valisugreevula konda, Valamuru, *Y. Mahesh* 010497 (BSID).

Field note: Lower lip of the flower deeply 3-lobed.

2. Habenaria commelinifolia Wall. ex Lindl., Gen. Sp. Orchid. Pl. 325. 1835; Hook. f., Fl. Brit. India 6: 143. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1470. 1928; Pull., Fl. Andhra Pradesh 5: 1862. 2018. **(Plate 13G)**

Terrestrial robust herb; up to 80 cm long; tubers 1 or 2, oblong, 4 cm long; stem terete. Leaves cauline, sessile, oblong-lanceolate, 12 cm long, acuminate at apex, margins entire. Inflorescence in spikes, up to 25 cm long; floral bracts lanceolate, longer than ovary, acuminate, 3-nerved. Flowers greenish-white, fragrant. Sepals subequal, beaked at apex, veined; dorsal orbicular; lateral reflexed, hatchet shaped. Petals oblong, subacute. Lip 3-lobed, linear at base, side lobes filiform, midlobe small, deflexed, linear. Spur incurved, greenish white, longer than ovary. Ovary pale green, 3 cm long. Stigmatic lobes 2, cylindrical. Pollinia 2, ovoid. Capsule 4.5 cm long, fusiform.

Fl.: & Fr.: Apr.–Jul.

Habitat: Rare in grasslands.

Specimen examined: Eruwada, *Y. Mahesh* 011544 (BSID).

3. Habenaria digitata Lindl., Gen. Sp. Orchid. Pl. 307. 1835; Hook. f., Fl. Brit. India 6: 134. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1469. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 662. 1999; Pull., Fl. Andhra Pradesh 5: 1863. 2018.

An erect terrestrial herb, about 55 cm high; tubers ovoid, 2.5 cm long; stem stout, terete. Leaves cauline, sheatining at base, obovate-oblong or elliptic, 10 cm long, membranous. Inflorescence 14 cm long. Spikes lax flowered; floral bracts longer than the ovary, pale green, ovate, 3-veined, acuminate at apex. Flowers green. Dorsal sepals broadly ovate; lateral sepals ovate-oblong, drooping. Petals bipartite near base, lobes unequal. Lip fleshy, sessile, 3-lobed; laterals upcurved, linear, acute; midlobe as long as lateral lobes, linear, reflexed. Spur shorter or as long as ovary, green. Stigmatic lobes 2, narrowly oblong. Pollinia 2, obovoid. Capsule ellipsoid, 2.2 cm long.

Fl.: & Fr.: Jul.–Oct.

Habitat: Rare in shady areas of moist deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

4. Habenaria furcifera Lindl., Gen. Sp. Orchid. Pl. 319. 1835; Hook.f. Fl. Brit. India 6: 149. 1890; R.S. Rao & al., Fl. E. Godavari Dist. 662. 1999; Pull., Fl. Andhra Pradesh 5: 1863. 2018. *Habenaria ovalifolia* Wight, Icon. Pl. Ind. Orient. 5: 13, t. 1708. 1851; Hook. f., Fl. Brit. India 6: 149. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1471. 1928. **(Plate 13H)**



Plate 13: A. *Smilax zeylanica* L.; **B. & C.** *Acampe praemorsa* (Roxb.) Blatt. & Mc Cann; **D.** *Cymbidium aloifolium* (L.) Sw.; **E.** *Geodorum densiflorum* (Lam.) Schltr.; **F.** *Habenaria barbata* Wight ex Hook. f.; **G.** *Habenaria commelinifolia* (Roxb.) Wall. ex Lindl.; **H.** *Habenaria furcifera* Lindl.

An erect terrestrial herb, about 30 cm high; tubers ovoid, 3 × 2 cm. Leaves variable in shape, sub sessile, elliptic-ovate or oblanceolate, 7.5 cm long, acuminate at apex. Inflorescence in cylindrical, many flowered spike, 15 cm long; floral bracts shorter than ovary, ovate, 1-veined, acuminate. Flowers green. Dorsal sepals concave, ovate, 3-veined, obtuse; lateral sepals reflexed, ovate-lanceolate, 1-veined, acute. Petals falcate, oblong-lanceolate, 1-veined. Lip sessile, 3-lobed near the base; midlobe shorter than the lateral lobes, linear. Spur short, green, laterally compressed. Stigmatic lobes 2, elliptic. Pollinia 2, obovoid. Capsule 1.1 cm long, fusiform.

Fl.: & Fr.: Aug.–Nov.

Habitat: Rare in open shady areas along the forest pathways.

Specimen examined: Valamuru, *Y. Mahesh* 010531 (BSID).

5. Habenaria plantaginea Lindl., Gen. Sp. Orchid. Pl. 323. 1835; Hook. f., Fl. Brit. India 6: 141. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1470. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 663. 1999; Pull., Fl. Andhra Pradesh 5: 1865. 2018. **(Plate 14A)**

A terrestrial herb, about 40 cm high; tubers 1–2, ellipsoid, 4 × 1.8 cm. Leaves 2–6, oblong-elliptic, 8 cm long, acute at apex, margins entire. Inflorescence many flowered spike, 35 cm long; floral bracts shorter than the ovary, lanceolate, acuminate. Flowers white, 1.4 cm across. Dorsal sepal broadly ovate, 4-veined, obtuse; lateral sepals spreading, oblong. Petals linear-oblong. Lip clawed, rhomboid 1.4 cm long, 3-lobed; lateral longer than the midlobe, ovate; midlobe linear-oblong. Spur larger than the ovary, 3 cm long, acute. Stigmatic lobes 2, elliptic. Pollinia 2, sub globose. Capsule 1.4 cm long.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in open moist areas of decidous forest.

Specimen examined: Gulletiwada forest area, *Y. Mahesh* 010581 (BSID).

6. Habenaria reniformis (D. Don) Hook. f., Fl. Brit. India 6: 152. 1890; Misra, Orch. Orissa 201. 2004; Singh & al., Orch. India 328. 2019; K. Prasad & al., Orch. E. Ghats (India) 168. 2019; Mahesh & al., Nelumbo 62 (1): 59. 2020. *Listera reniformis* D. Don, Prodr. Fl. Nepal. 28. 1825. **(Plate 14B)**

Tuberous herb up to 30 cm high; tubers globose or oblong, *c.* 1 cm in diam., fleshy. Leaves 1 or 2, adpressed on the ground, sessile, reniform, ovate-cordate or broadly ovate-orbicular, 1.6–3 × 1.2–2.6 cm, fleshy, cordate or amplexicaul at base, obtuse at apex. Inflorescence up to 13 cm long, with 3–4 bract like leaves at base, glabrous. Flowers 3–7, greenish-white, very lax, up to 2.1 cm long, including the ovary; floral bracts small, light green, lanceolate, acuminate at apex, *c.* 1 cm long, shorter than pedicel cum ovary. Pedicel cum ovary twisted, cylindric-fusiform, 1.6–1.9 cm long, glabrous. Dorsal sepal erect, concave, narrowly ovate-oblong, *c.* 6.4 × 3 mm, 3-veined, obtuse at apex; lateral sepals spreading or reflexed, obliquely ovate-lanceolate, 6.2 × 2 mm, 3-veined, acute at apex. Petals entire, narrowly lanceolate, straight or falcate, 6 × 1.8 mm, 1-veined, apex sub-obtuse. Lip linear, as long as sepals, not lobed, twisted, acuminate at apex. Spur absent. Pollinia 2, obovoid, caudicles of pollinia short. Stigma sub-cylindric or clavate, *c.* 1.5 mm.

Fl.: & Fr.: Jul.–Dec.

Habitat: Rare in open and exposed grasslands on hill tops of moist deciduous forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010458 (BSID).

Field notes: Leaves 1 or 2, sessile, adpressed on the ground.

7. Habenaria roxburghii Nicolson in Saldanha & Nicolson, Fl. Hassan Dist. 834. 1976; R.S. Rao & al., Fl. E. Godavari Dist. 663. 1999; Pull., Fl. Andhra Pradesh 5: 1867. 2018. *Habenaria platyphylla*. Spreng. in L., Syst. Veg. (ed. 16) 3: 690. 1826; Hook. f., Fl. Brit. India 6: 140. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1470. 1928.

Terrestrial herb, up to 45 cm high; tubers 2, ovoid, 3.5 × 1.8 cm; stem cylindric, stout. Leaves 5, lying flat on ground, ovate-orbicular, 6 × 5 cm, fleshy, sessile, acute at apex. Inflorescence many flowered, cylindrical spike, 40 cm long; floral bracts shorter than ovary, green. Flowers white, 1.2 cm across. Dorsal sepal ovate-oblong, 3-nerved; lateral sepals deflexed, ovate. Petals linear-oblong. Lip fleshy, sessile, 3-lobed near middle; laterals oblong, acute. Spur longer than ovary, light white, funnel shaped. Stigmatic lobes 2, cylindrical. Pollinia 2, oblong. Capsule oblong, 3 cm long.

Fl.: & Fr.: Jul.–Oct.

Habitat: Frequent in open and exposed grasslands.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. LIPARIS Rich.

India: 49 spp. & 1 var.; Andhra Pradesh: 5 spp.; PNP: 1 sp.

1. Liparis nervosa (Thunb.) Lindl., Gen. Sp. Orchid. Pl. 26. 1830; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1410. 1928; Pull., Fl. Andhra Pradesh 5: 1869. 2018. *Ophrys nervosa* Thunb., Syst. Veg., ed. 14. 814. 1784. *Liparis bituberculata* Lindl. in Bot. Reg. Sub. t. 882. 1825; Hook. f., Fl. Brit. India 5: 696. 1890. **(Plate 14C)**

Terrestrial herb, about 35 cm high; pseudobulbs 1.5 cm long, green, curved by leaf sheath; stem stout. Leaves 2–5, elliptic-lanceolate, 10 × 3.5 cm, narrow at base, acuminate at apex, margins undulate. Inflorescence many flowered racemes, *c.* 30 cm long, angular; floral bracts green, shorter than ovary, triangular, 1-veined, acute; pedicel light green. Dorsal sepal linear-oblong, obtuse, 4-veined; lateral sepals twisted, ovate. Petals spreading, linear deflexed at margins, 1-veined. Lip cuneately obovate, recurved; base rectangular callus with 2 tubercules on top. Column yellowish cream, winged. Pollinia 4, oblong-ovate. Capsule 2 cm long, ellipsoid.

Fl.: & Fr.: Jun.–Sep.

Habitat: Rare along streams and shady places.

Specimen examined: Valamuru, *Y. Mahesh* 010529 (BSID).

7. NERVILIA Comm. ex Gaudich.

India: 15 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1 a.	Scape many flowered; leaf blade with long petioles	**1. N. concolor**
1 b.	Scape 2-flowered; leaf lying on ground, sessile	**2. N. plicata**

1. Nervilia concolor (Blume) Schltr., Bot. Jahrb. Syst. 45: 404. 1911; Pull., Fl. Andhra Pradesh 5: 1872. 2018. *Cordyla concolor* Blume, Bijdr. Fl. Ned. Ind. 8: 416. 1825. *Nervilia aragoana* Comm ex Gaudich in Freyc., Voy. Bot. 422. t. 35. 1829; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1459. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 665. 1999. **(Plate 14D)**

Terrestrial herb with single leaf; tuber 1.5 cm across, globose, white. Leaf appearing after flowering, petiolate, orbicular-broadly ovate, 15 cm in diam., cuspidate, cordate at base, shortly acuminate at apex, margins wavy; petiole long, up to 25 cm long, delicate. Scape erect, terminal with drooping flowers. Flowers many, 3 cm long, light green. Sepals unequal, lanceolate or oblanceolate, acute, green. Petals narrow, shorter than sepals, obtuse. Lip 3-lobed, white with purple veins, yellow tinge at base, midlobe ovate; lateral lobes obtuse, crisped hairy; column elongate, broadening upwards.

Fl.: & Fr.: Apr.–Jul.

Habitat: Rare under moist shady localities in the forest.

Specimen examined: Valamuru, *Y. Mahesh* 010959 (BSID).

Field notes: Leaves with long petiole, orbicular.

2. Nervilia plicata (Andrews) Schltr. in Engl., Bot. Jahrb. Syst. 45: 403. 1911; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1458. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 665. 1999; Pull., Fl. Andhra Pradesh 5: 1873. 2018. *Arethusa plicata Andrews*, Bot. Repos. 5: t. 321. 1803. **(Plate 14E)**

Terrestrial hysteranthous herb; tuber globose, 2 cm across. Leaves sessile, lying on the ground, appears after the flowering, plicate, orbicular-broadly ovate, 12 cm long, cordate or rounded at base, shortly acute at apex, margin slightly wavy, dark green or brownish, green with impressed white hairs along veins of upper surface, few hairs on lower surface. Scape *c.* 14 cm long, sheathed, 1–2-flowered. Flowers brownish purple; bracts ovate, acute. Sepals and petals brownish green, with brown veins, spreading, lanceolate, acuminate, glabrous. Capsule drooping, ellipsoid, winged along ribs.

Fl.: & Fr.: Apr.–Jul.

Habitat: Occasional under moist shady areas in the semi evergreen forest.

Specimens examined: Ijjaluru, Valamuru, *Y. Mahesh* 010528, 010911 (BSID).

8. OBERONIA Lindl.

India: 53 spp.; Andhra Pradesh: 5 spp.; PNP: 1 sp.

1. Oberonia wightiana Lindl., Edwards's Bot. Reg. 25: 14. 1839; Hook. f., Fl. Brit. India 5: 683. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1407. 1928; Pull., Fl. Andhra Pradesh 5: 1876. 2018. **(Plate 14F)**

Epiphytic, acaulescent herb. Leaves falcate, oblong-ensiform, 12 cm long. Inflorescence many flowered spike, longer than the leaves, terete, up to 20 cm long; floral bracts ovate, longer than the ovary, acuminate at apex. Flowers pale yellowish-green, with short pedicel; pedicels with ovary, 2 mm long, green. Sepals reflexed, ovate or oblong. Petals linear, obtuse. Lip spreading, 3-lobed; laterals wing like, orbicular, folded upwards; midlobe 2 lobuled, oblong, irregularly toothed. Column light yellow, sub globose. Sigma crescent shaped. Pollinia 4. Capsule oblong, 2 mm long.

Fl.: & Fr.: Jun.–Oct.

Habitat: Occasionally found on large tree trunks and branches.

Specimen examined: Valamuru, *Y. Mahesh* 011525 (BSID).

Field notes: Inflorescence pendulous.

9. PECTEILIS Raf.

India: 5 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pecteilis gigantea (Sm.) Raf., Fl. Tellur. 2: 38. 1837; Pull., Fl. Andhra Pradesh 5: 1877. 2018. *Orchis gigantea* Sm., Exot. Bot. 2: 79. t. 100. 1805. *Habenaria susannae* (L.) R.Br. ex Spreng., Syst. Veg., ed. 3: 692. 1826; auct. non. Lindl. 1835; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1475. 1928. *Pecteilis susannae* (L.) Raf., Fl. Tellur. 2: 38. 1837; R.S. Rao & al., Fl. E. Godavari Dist. 667. 1999. **(Plate 14G)**

Terrestrial, tuberous herb, up to 1.5 m high; tubers oblong, fleshy; stem stout, leafy throughout. Leaf sheaths covering about half of the internodes; leaves ovate-oblong or elliptic-lanceolate, 16 cm long, rounded at base, acute at apex, margins entire, glabrous on both surfaces, shining above; upper smaller upwards forming leafy bracts. Flowers 3-6, in racemes, fragrant, showy, white, 5 cm across. Sepals obliquely oblong, dorsal short, rhomboid. Petals linear, acute; labellum 3-lobed; sidelobes deeply dissected and pectinate, midlobe spathulate; spur up to 10 cm long, curved. Ovary resupinate. Capsule ellipsoid, 4.5 cm long.

Fl. & Fr.: Sep.-Oct.

Habitat: Rare in forest undergrowth, moist shady localities.

Specimen examined: Eruwada-Tulasipaka way, *Y. Mahesh* 012156 (BSID)

Field notes: Flowers showy, fragrant.

10. PERISTYLUS Blume

India: 34 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Peristylus plantagineus Lindl., Gen. Sp. Orchid. 300. 1835; C.E.C. Fisch. in Gamble, Fl; Madras 3: 1475. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 667. 1999; Pull., Fl. Andhra Pradesh 5: 1879. 2018. *Habenaria wightii* Trimen, Syst. Cat. Fl. Pl. Ceylon 91. 1885; Hook. f., Fl. Brit. India 6: 162. 1890. **(Plate 15A)**

Terrestrial herb, up to 50 cm high; tubers 2, ellipsoid, 4 × 2 cm; stem sheathed, robust. Leaves oblong-lanceolate, 10 cm long, sessile, acute at apex. Inflorescence 20 cm long. Spikes many flowered; floral bracts larger, greenish brown, lanceolate, acuminate. Pedicel with ovary, 5 mm long. Flowers 2 mm across, brownish green. Sepals rounded with mucro; dorsal ovate; laterals oblong, longer. Petals suborbicular, 2.5 mm long, 2 veined. Lip as long as sepal, sessile, broadly ovate, obscurely 3-lobed, 3-veined; midlobe prominent, triangular. Spur small, 0.13 cm long, scrotiform. Stigmatic lobes 2, oblong. Pollinia pyriform. Capsule 7.5 mm long, ellipsoid.

Fl.: & Fr.: Aug.–Oct.

Habitat: Occasional in moist shady localities and along the forest roads.

Specimen examined: Ijjaluru area, *Y. Mahesh* 010527 (BSID).

11. POMATOCALPA Breda

India: 6 spp. & 1 subsp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pomatocalpa spicatum Breda, Gen. Sp. Orchid. Asclep. t. 15. 1827; Pull., Fl. Andhra Pradesh 5: 1881. 2018. *Cleisostoma wendlandorum* Rchb.f. in Otto & Dietr. Allg. Gard. 24: 219. 1856; Hook. f., Fl. Brit. India 6: 74. 1890. *Cleisostoma mannii* Rchb.f., Flora 55: 274. 1872; Hook. f., Fl. Brit. India 6: 74. 1890; C.E.C. Fisch. in Gamble, Fl.

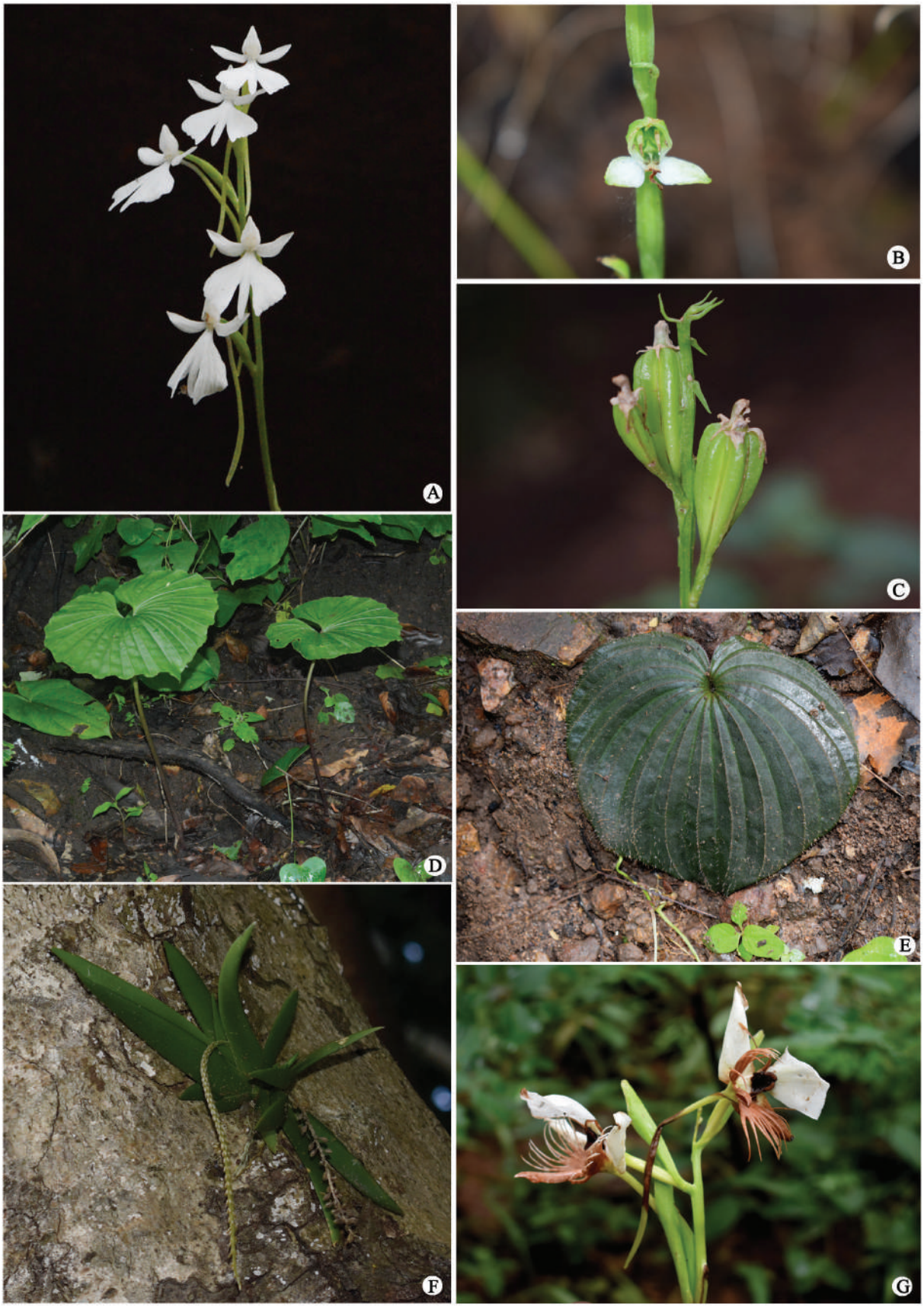


Plate 14: A. *Habenaria plantaginea* Lindl.; **B.** *Habenaria reniformis* (D.Don) Hook.f.; **C.** *Liparis nervosa* (Thunb.) Lindl.; **D.** *Nervilia concolor* (Blume) Schltr.; **E.** *Nervilia plicata* (Andrews) Schltr.; **F.** *Oberonia wightiana* Lindl.; **G.** *Pecteilis gigantea* (Sm.) Raf.

Madras 3: 1448. 1928. *Pomatocalpa mannii* J.J.Sm., Nat. Tijdschr. Ned. Ind. 72: 105.1912; R.S. Rao & al., Fl. E. Godavari Dist. 668. 1999.

Epiphytic herb; stem stout; roots fascicled. Leaves linear, distichous, unequally 2-lobed, 20 cm long, blunt. Racemes branched, many flowered. Flowers yellow with red streaks. Sepals and petals obovate. Lip lobes obscure, rounded; midlobe orbicular, fleshy. Spur saccate. Capsule oblong.

Fl.: & Fr.: Feb.–Aug.

Habitat: Occasional in shady localities of semi evergreen and moist deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c*).

12. VANDA R.Br.

India: 15 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Sepals and petals brown tessellated; Capsule with pedicels to 10 cm long	**1. V. tessellata**
1b.	Sepals and petals not tessellated; Capsule with pedicels to 6 cm long	**2. V. testacea**

1. Vanda tessellata (Roxb.) Hook. ex G. Don in Loud, Hort. Brit. 372. 1830; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1445. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 670. 1999; Pull., Fl. Andhra Pradesh 5: 1885. 2018. *Epidendrum tessellatem* Roxb., Pl. Coromandel 1: 34. 1795. **(Plate 15B)**

An epiphytic herb, up to 50 cm high; stem erect, woody. Leaves sessile, fleshy, linear-oblong, 20 cm long, channelled, unequally lobed at apex, conduplicate. Inflorescence few flowered racemes, axillary, erect, up to 25 cm long. Flowers laxy, grey, buff or red with brown tessellated, margins white. Sepals and petals clawed, twisted, obovate, 5–7 veined, obtuse, brown tessellated; dorsal and laterals 2.5 cm. Petals 2.5 cm long. Lip sessile, fleshy, 3-lobed. Spur laterally compressed. Column cylindrical, white. Stigma orbicular. Pollinia 2. Capsule oblong, pedicelled; pedicel to 10 cm long.

Fl.: & Fr.: May–Aug.

Habitat: Common epiphyte on huge tree trunks, especially on *Tamarindus indica*.

Specimen examined: Geediguppa, *Y. Mahesh* 011577 (BSID).

Field notes: Sepals and petals clawed, twisted.

2. Vanda testacea (Lindl.) Rchb.f., Gard. Chron. (n.s) 8: 166. 1877; R.S. Rao & al., Fl. E. Godavari Dist. 670. 1999; Pull., Fl. Andhra Pradesh 5: 1886. 2018. *Aerides testacea* Lindl., Gen. Sp. Orchid. Pl. 238. 1833 (*testaceum*). *Vanda parviflora* Lindl., Edwards Bot. Reg. 30: Misc. 57. 1844; Hook. f., Fl. Brit. India 6: 50. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1444. 1928. **(Plate 15C)**

An epiphytic herb, on tree trunks; stem erect, stout. Leaves sessile, fleshy, distichous, oblong, 15 cm long, shortly lobed or rounded at apex, margins entire. Inflorescence many flowered racemes, axillary, 20 cm long; pedicel with ovary, yellowish green. Flowers yellow. Dorsal sepal spathulate, rounded; laterals obovate, twisted. Petals obovate-spathulate, twisted. Lip sessile, 3-lobed; spur compressed laterally, short. Column yellow with purple dotted. Pollinia 2, suborbicular. Capsule elliptic, 3.5 cm long, pedicelled; pedicel to 6 cm long.

Fl.: & Fr.: Mar.–Jul.

Habitat: Rare on huge tree trunks.

Specimen examined: Kintukuru*, Y. Mahesh* 011742 (BSID).

13. VANILLA Plum. ex Mill.

India: 7 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Vanilla walkerae Wight, Icon. Pl. Ind. Orient. 3 (2): t. 932.1845; Hook. f., Fl. Brit. India 6: 90. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1451. 1928; Pull., Fl. Andhra Pradesh 5: 1887. 2018. *Vanilla wightiana* Lindl. in Wight Cat. 2091. 1833; Hook. f., Fl. Brit. India 6: 90. 1890; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1451. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 671. 1999. *'Naganalleru, Vine mokka'*

Scandent terrestrial, climbing herb, up to 5 m high; stem fleshy, branched, greenish with pink dots. Leaves deciduous, sessile, ovate-lanceolate, acuminate at apex. Inflorescence few flowered racemes, axillary; pedicel with ovary green, 5 cm long. Flowers fleshy, 6 cm across, white, sweet scented. Sepals oblong-lanceolate, acute at apex; dorsal one 5 cm long; laterals 5.2 cm long. Petals spathulate-oblanceolate, 5 × 2 cm. Lip clawed, trumpet

shaped, 3-lobed. Column white, obovate. Stigma obovate; rostellum curved downwards. Pollinia 2, ovate. Capsule cylindrical, 12 cm long, dark green.

Fl.: & Fr.: Mar.–Apr.

Habitat: Rare along stream banks in deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (1999).

16. HYPOXIDACEAE

India: 3 genera, 17 taxa; Andhra Pradesh: 3 genera, 4 spp.; PNP: 1 genus, 2 spp.

1. CURCULIGO Gaertn.

India: 5 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a. Leaves subsessile, linear-lanceolate; ovary produced upwards into a filamentous rostrum **1. C. orchioides**
1b. Leaves petiolate, elliptic-lanceolate; ovary not as above **2. C. trichocarpa**

1. Curculigo orchioides Gaertn., Fruct. 1: 63, t. 16. 1788; Hook. f., Fl. Brit. India 6: 279. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1502. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 684. 1999; Pull., Fl. Andhra Pradesh 5: 1911. 2018. **(Plate 15D)** *'Neelataati'*

Stemless, tuberous herb, 45 cm long; tubers elongate with thick and stout root stock. Leaves sheathing, linear-lanceolate, up to 15 cm long, subsessile or shortly petioled, membranous, acute at apex, margins entire, glabrous or sparsely hairy. Inflorescence a raceme. Scape short, hidden within leaf sheath. Flowers 1-3, distichous, yellow, glabrous, imbricating. Perianth segments 6, elliptic-oblong, more or less hairy. Stamens 6. Style short; stigma 3, oblong. Berry oblong, subulate, indehiscent, beaked.

Fl.: & Fr.: Mar.–Apr.

Habitat: Common on rocky crevices, along moist, damp soils of forest pathways.

Specimen examined: PK Valasa, *Y. Mahesh* 010431 (BSID).

Field notes: Appears after rain, flowers bright yellow, bloom during early monsoon.

2. Curculigo trichocarpa (Wight) Bennet & Raizada, Indian J. Forest. 4: 68. 1981. *Hypoxis trichocarpa* Wight, Icon. Pl. Ind. Orient. t. 2045. 1853. *Molineria trichocarpa* (Wight) N.P. Balakr., J. Bombay Nat. Hist. Soc. 63: 330. 1967; Pull., Fl. Andhra Pradesh 5: 1913. 2018. **(Plate 15E)**

A perennial, tuberous herb, up to 40 cm high; tubers cylindric; root stock stout. Leaves elliptic-lanceolate, 20 cm long, tapering at base, acuminate at apex, margins entire, petiolate, coriaceous, glabrous on both surfaces. Inflorescence racemose. Scape short, hidden within leaf sheath. Flowers solitary or 3–7, bisexual, yellow; bracts linear, densely hairy. Perianth segments 6, elliptic. Stamens 6; anthers hastate. Style columnar. Berry ellipsoid.

Fl.: & Fr.: Jun.–Aug.

Habitat: Occasional in moist, highly humous rich soils in the deciduous forest.

Specimen examined: P.K. Valasa, *Y. Mahesh* 011523 (BSID).

Field notes: Appears after rain in damp soils, flowers yellow.

17. AMARYLLIDACEAE

India: 19 genera, 36 taxa; Andhra Pradesh: 2 genera, 5 spp.; PNP: 1 genus, 2 spp.

1. CRINUM L.

India: 16 spp.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a. Umbels 12- flowered **2. C. viviparum**
1b. Umbels 20- flowered **1. C. asiaticum**

1. Crinum asiaticum L., Sp. Pl. 292. 1753; Hook. f., Brit. India 6: 280. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1504. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 686. 1999; Pull., Fl. Andhra Pradesh 5: 1904. 2018.

Stout herb, 1.5 m high; root stock white, bulbous, about 10 cm across; stem clothed with old leaf sheaths.

Leaves flat, linear-lanceolate, 120 × 10 cm, narrow at base, acuminate at apex, margins entire, glabrous. Scape up to 1 m long; flowers in umbels, white, 20 flowered. Perianth tube white, 10–15 cm long, salver shaped; lobes, oblong, 9 cm long, glabrous. Stamens reddish; filaments slender, 3.5 cm long. Ovary 3-celled. Style filiform; stigma minute. Fruit globose, 3 cm long. Seed solitary.

Fl.: & Fr.: Jul.–Sep.

Habitat: Occasional in plains, along river beds and stream banks.

Specimen examined: P. K. Valasa, *Y. Mahesh* 011440 (BSID).

Field notes: Scape up to 1 m long, flowers white.

2. Crinum viviparum (Lam.) R. Ansari & V.J. Nair in J. Econ. Taxon. Bot. 11: 205. 1987; Pull., Fl. Andhra Pradesh 5: 1905. 2018. *Amaryllis vivipara* Lam., Encycl. 1: 123. 1783. *Crinum defixum* Ker Gawl., J. Sci. Arts (London) 3: 105. 1817; Hook. f., Fl. Brit. India 6: 281. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1504. 1928. **(Plate 15F)**

Stout herb with bulbous rootstock; bulb cylindric, 12×7 cm, narrowed into a neck. Leaves 6 to a bulb, linear, 95 × 5.5 cm, deeply channelled, obtuse at apex. Scape cylindric, 70 cm long; flowers in umbels, white, 12-flowered, fragrant; pedicels short. Perianth tube salver shaped; lobes oblong, 8 cm long, white, cuspidate at apex. Stamens 6, reddish. Ovary 3-celled, oblong. Style delicate. Capsule sub globose, 3.5 cm in diam. Seeds rugose.

Fl.: & Fr.: Aug.–Nov.

Habitat: Occasional along stream banks, waterlogged areas.

Specimen examined: Devipatnam, *Y. Mahesh* 012128 (BSID).

Field notes: Flowers large, white.

18. ASPARAGACEAE

India: 16 genera, 99 spp., 1 subsp., 8 var.; Andhra Pradesh: 9 genera, 21 spp.; PNP: 4 genera, 5 spp.

Key to the genera

1a.	Leaves minute, often spinescent scales, bearing needle like cladodes	**1. Asparagus**
1b.	Leaves well developed, not as above	2
2a.	Undershrubs	**3. Dracaena**
2b.	Herbs or undershrubs	3
3b.	Flowers closely set, appears with leaves, white	**2. Chlorophytum**
3a.	Flowers distant, appearing before leaves, not white	**4. Drimia**

1. ASPARAGUS Tourn. ex L.

India: 19 spp. & 5 var.; Andhra Pradesh: 3 spp. & 1 var.; PNP: 1 sp.

1. Asparagus racemosus Willd., Sp. Pl. 2: 152.1799; Hook. f., Fl. Brit. India 6: 316. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1517. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 692. 1999; Pull., Fl. Andhra Pradesh 5: 1923. 2018. **(Plate 15G)**

Scandent, much branched, spinous undershrub, up to 2 m high; branches angular, glabrous; cladodes slender, spinescent. Leaves linear with a spinous spur, 3.5 mm long. Inflorescence in axillary racemes; pedicel filiform, jointed above the middle. Flowers white, fragrant. Perianth 6, petaloid, connate; lobes linear-oblong, obtuse. Stamens 6, adnate to the base of the perianth lobes; anthers sub globose. Ovary trilocular; style short; stigmas 3. Fruit berry, globose, red when ripe.

Fl.: & Fr.: Jul.–Sep.

Habitat: Common in dry deciduous forests.

Specimen examined: P.K. Valamuru, *Y. Mahesh* 012121 (BSID).

2. CHLOROPHYTUM Ker Gawl.

India: 15 spp.; Andhra Pradesh: 5 spp.; PNP: 2 spp.

Key to the species

1a.	Scape longer than leaves; racemes continuous; bracts overtopping the buds; tepals oblong-lanceolate, acute at apex	**1. C. arundinaceum**
1b.	Scape as long as leaves; racemes interrupted; bracts shorter than buds; tepals elliptic, rounded at apex	**2. C. tuberosum**

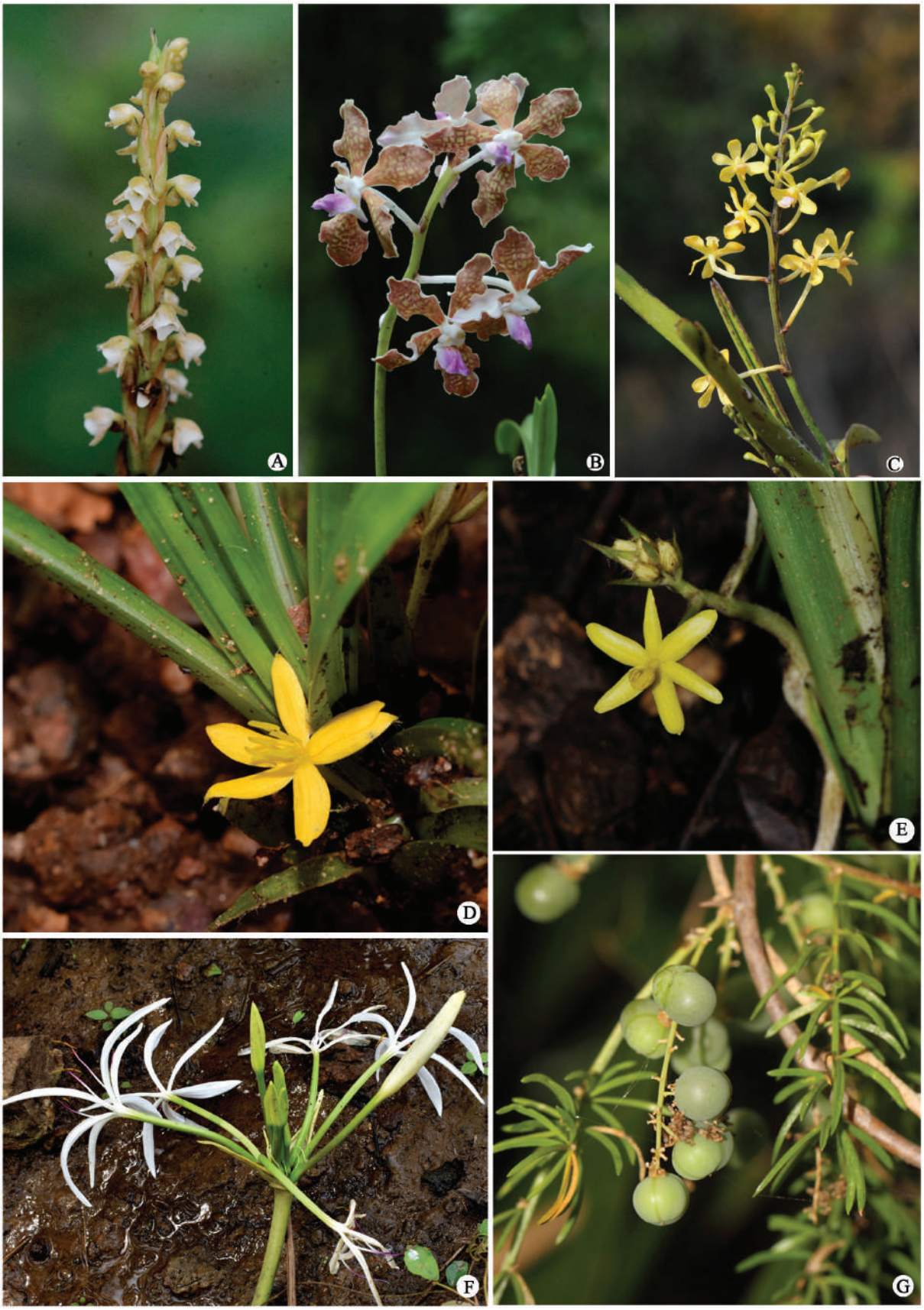


Plate 15: A. *Peristylus plantagineus* (Lindl.) Lindl.; **B.** *Vanda tessellata* (Roxb.) Hook. ex G.Don; **C.** *Vanda testacea* (Lindl.) Rchb.f.; **D.** *Curculigo orchioides* Gaertn.; **E.** *Curculigo trichocarpa* (Wight) Bennet & Raizada; **F.** *Crinum viviparum* (Lam.) R. Ansari & V.J. Nair; **G.** *Asparagus racemosus* Willd.

1. Chlorophytum arundinaceum Baker, J. Linn. Soc., Bot. 15: 323. 1876; Hook. f., Fl. Brit. India 6: 333. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1526. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 693. 1999; Pull., Fl. Andhra Pradesh 5: 1924. 2018. **(Plate 16A)**

Perennial erect, tuberous herb, up to 40 cm high. Leaves radical, linear-lanceolate or oblanceolate, 10 cm long, sheathing in to petiole, acute at apex, margins scarious, glabrous. Inflorescence terminal racemose spike, 30 cm long. Flowers white; pedicel jointed below the middle. Perianth lobes 6, oblong-lanceolate, acute at apex, 7 nerved. Stamens 6; filaments shorter than anthers; anthers linear. Ovary trilocular; ovules 4 or numerous in each locule, axile. Style filiform, stigma simple. Fruit capsule, depressed globose. Seeds sub-orbicular, black.

Fl.: & Fr.: Jul.–Sep.

Habitat: Common as undergrowth along the forest pathways.

Specimen examined: PK Valamuru, *Y. Mahesh* 010454 (BSID).

2. Chlorophytum tuberosum Baker, J. Linn. Soc., Bot. 15: 332. 1876; Hook. f., Fl. Brit. India 6: 334. 1892; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1526. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 693. 1999; Pull., Fl. Andhra Pradesh 5: 1925. 2018.

Perennial, tuberous herb, up to 50 cm high. Leaves clustered at base, linear-lanceolate, 20–30 cm long, sheathing, ensiform, acute at apex, margins scarious, glabrous. Inflorescence in terminal racemes, as long as leaves. Flowers white; bracts shorter than buds; pedicels jointed below the middle. Perianth 6, petaloid, elliptic, 9 nerved, rounded at base. Stamens 6, hypogynous; anthers linear, yellow. Ovary trilocular, with numerous ovules in each locule. Style filiform. Fruit loculicidal capsule, obovoid, 3-winged. Seeds black.

Fl.: & Fr.: May–July.

Habitat: Occasional in shady moist localities.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. DRACAENA Vand. ex L.

India: 16 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Dracaena roxburghiana (Schult.f.) Byng & Christenh., Global Fl. 4: 66. 2018. *Sansevieria roxburghiana* Schult.f., Syst. 7: 357. 1829; Hook. f., Fl. Brit. India 6: 271. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1520. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 696. 1999; Pull., Fl. Andhra Pradesh 5: 1910. 2018. *Sansevieria zeylanica* Roxb., Pl. Coromandel. t. 184. 1805, non L. Willd., 1799. *'Chamakadanara, Nelakithala, Errajada'*

An erect, rhizomatous herb; rhizomes creeping; stem stout. Leaves 6-8, clustered near base, linear-oblong, 55 cm long, cartilaginous, fleshy, blotched with bands of dark green on upper surface, convex on lower surface, with rigid and spine like apex, glabrous on both surfaces. Inflorescence terminal, paniculate, stout racemes. Flowers in clusters, greenish-yellow. Perianth lobes 6, narrow, revolute, connate, obtuse. Stamens 6, exserted. Style filiform. Berry ovoid, orange when ripe.

Fl. & Fr.: Jul.–Sep.

Habitat: Common in rocky crevices, along water streams.

Specimen examined: Kurlagattu, *Y. Mahesh* 011474 (BSID)

Field notes: Leaves blotched with dark bands.

4. DRIMIA Jacq. ex Willd.

India: 6 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Drimia indica (Roxb.) Jessop, J. S. African Bot. 43: 272. 1977; Pull., Fl. Andhra Pradesh 5: 1929. 2018. *Scilla indica* Roxb., Fl. Ind. 2: 147. 1832; Hook. f., Fl. Brit. India 6: 348. 1892. *Urginea coromandeliana* (Roxb.) Hook. f., Fl. Brit. India 6: 347. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1527. 1928. *Urginea wightiana* Hook. f., Fl. Brit. India 6: 347. 1892.

Scapigerous herb; bulb globose, 3 cm thick. Leaves appear after flowers, linear-lorate, up to 20 cm long, narrowed at apex, obtuse, pale green. Scape erect, up to 50 cm long, stout, brittle, very lax flowered; bracts subtending the pedicels of buds, ovate, auricled. Flowers brownish white, opening in the night; pedicels slender, 3.5 cm long. Perianth segments linear-oblong, recurved, brown streak outside, white within, pubescent at tip. Capsule ellipsoid, coriaceous, ribbed. Seeds irregularly orbicular, winged, black.

Fl.: & Fr.: Mar.–May.

Habitat: Occasional on hilly slopes in the dry deciduous forest.

Specimen examined: Chigurumamidi, *Y. Mahesh* 012109 (BSID).

Field note: Leafless when flowering, tubers look like onion.

19. ARECACEAE

India: 20 genera, 110 taxa; Andhra Pradesh: 4 genera, 8 spp., 1 var.; PNP: 4 genera, 6 spp.

Key to the genera

1a.	Climbing shrubs with hooked spines on the stem	**2. Calamus**
1b.	Erect shrubs or trees; stems without spines	2
2a.	Leaves simple, palmately divided	**1. Borassus**
2b.	Leaves compound, pinnately divided	3
3a.	Leaves bipinnate	**3. Caryota**
3b.	Leaves unipinnate	**4. Phoenix**

1. BORASSUS L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Borassus flabellifer L., Sp. Pl. 2: 1187. 1753; Becc. & Hook. f. in Hook. f., Fl. Brit. India 6: 482. 1893; C.E.C. Fischer in Gamble, Fl. Madras 3: 1562. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 714. 1999; Pull., Fl. Andhra Pradesh 5: 1956. 2018. *'Taati chettu'*

Tall tree, up to 30 m high; stem greyish black, covered with bases of petioles when young, swollen at the bottom, gradually tapering above. Leaves 90 cm in diam., approximately circular, margins split in 60–75 linear-lanceolate, acuminate, segments with spinulose margins, folded along midrib; petiole 35 cm long, stout, semi terete, horny, spinescent serratures along margins. Male spadix branched, clustered. Female spadix simple. Drupe sub globose, 1–3 pyrenes, seated on enlarged perianth.

Fl.: & Fr.: Mar.–July.

Habitat: Very common in plains and village surroundings.

Specimen examined: Sirivaka, *Y. Mahesh* 011430 (BSID).

Uses: Leaves and woods used for hut construction; pulp of the tender fruit is edible; toddy extracted from the inflorescence.

2. CALAMUS L.

India: 47 spp. & 3 var.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Leaflets fascicled near base	**2. C. viminalis**
1b.	Leaflets not fascicled, more or less regularly equidistant	**1. C. rotang**

1. Calamus rotang L., Sp. Pl. 325. 1753; Becc. in Hook. f., Fl. Brit. India 6: 447. 1892; C.E.C. Fisch in Gamble, Fl. Madras 3: 1568. 1931; R.S Rao & al., Fl. W. Godavari Dist. 409. 1986; Pull., Fl. Andhra Pradesh 5: 1957. 2018.

A slender armed shrub; stems tufted, ringed at nodes, clustered. Leaves pinnatisect, up to 80 × 1.5 cm, cuneate at base, acuminate at apex, margins ciliate, spines below; petiole short with recurved spines. Leaf sheath glabrous. Spadices axillary, branched, apical flagellum with spines. Spathes tubular, armed. Male flowers in 3 series. Calyx copular, 3- lobed. Petals 3, yellow. Stamens 6, connate at base. Female: ovary 3-celled; ovules 3. Style terminal. Fruit sub globose, 1.3 cm in diam., ovoid. Seed solitary.

Fl.: & Fr.: Sep.–Jan.

Habitat: Frequent along streams banks, moist shady areas, forest pathways.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*)

2. Calamus viminalis Willd., Sp. Pl. 2: 203. 1799. *Calamus viminalis* var. *fasciculatus* (Roxb.) Becc. in Hook. f., Fl. Brit. India 6: 444. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1567. 1931. subvar. *pinangianus* Becc., Ann. Roy. Bot. Gard. Calcutta 15: 209. 1856; R.S. Rao & al., Fl. E. Godavari Dist. 712. 1999; Pull., Fl. Andhra Pradesh 5: 1957. 2018. **(Plate 16B)**

A stout moderate sized shrub; stem armed, climbing in suitable conditions; young parts covered with powdery

tomentum. Leaves up to 1.2 m long; leaflets linear-lanceolate, distinctly grouped in fascicles of 2–4 on each side; sheath and rachis white floccose, armed with yellowish spine; petiole short with scattered spines. Rachis nearly terete, with deflexed spines. Inflorescence flagellate; rachilla 20 cm long in male and 26 cm long in female. Fruit globose, up to 9 mm in diam., beaked; scales light green, channelled down the middle.

Fl.: & Fr.: Oct.–Feb.

Habitat: Common along stream banks, forest pathways.

Specimen examined: Valamuru, *Y. Mahesh* 011776 (BSID).

Field notes: Stem armed with sharp spines.

3. CARYOTA L.

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Caryota urens L., Sp. Pl. 2: 1189. 1753; Becc. in Hook. f., Fl. Brit. India 6: 422. 1892; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1560. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 712. 1999; Pull., Fl. Andhra Pradesh 5: 1958. 2018. **(Plate 16C)** *'Jeeluga chettu'*

Medium sized tree, up to 25 m tall; stem with scars of fallen leaves, cylindric, smooth, shining. Leaves 2-pinnate, *c.*4 m long; pinnae 8–10 pairs, curved, drooping. Leaflets triangular, broadly cuneate at base, serrate at apex, margins serrate. Spadix *c.* 3 m long. Spathe *c.* 5 m long. Flowers truncate in pendant branched peduncle. Fruits globose, 1.2 cm across, reddish. Seed 1.

Fl.: & Fr.: Feb.–Aug.

Habitat: Frequent in hilly slopes and deep valleys.

Specimen examined: PK Valasa, *Y. Mahesh* 010165 (BSID)

Uses: Toddy extracted from the inflorescence.

4. PHOENIX L.

India: 7 spp. & 1 var.; Andhra Pradesh: 3 spp. & 1 var.; PNP: 2 spp.

Key to the species

1a. Stem up to 3 m tall	**1. P. loureiroi**
1b. Stem 7 m or more tall	**2. P. sylvestris**

1. Phoenix loureiroi Kunth., Enum. Pl. 3: 257. 1841; R.S. Rao & al., Fl. E. Godavari Dist. 713. 1999; Pull., Fl. Andhra Pradesh 5: 1958. 2018. *'Chinna etha chettu'*

Stunted gregarious tree; stem stout, short, up to 3 m tall, covered with persistent leaf sheaths. Leaves 1.6 m long; leaflets 14–30 cm, glabrous on both sides, basal ones turning into spinous, lateral ones linear, pliable, narrowed at base, acuminate at apex, spinous, margins entire. Flowers creamy, 9 mm long, in spadix *c.* 30 cm long, covered with leathery spathes, up to 26 cm long. Male flowers 3-toothed. Calyx cupular. Petals 3, *c.* 5 mm long. Ovary with 3 carpels. Drupe 1–1.4 cm long, oblong, orange first, black when ripe. Seeds vertically grooved.

Fl.: & Fr.: Mar.–May.

Habitat: Common along forest pathways, grasslands on the top of the hills and hill slopes.

Specimens examined: Kakeshnur, Kurlagattu, *Y. Mahesh* 010195, 011764 (BSID).

Field notes: Fruits orange first, reddish or black when ripe.

2. Phoenix sylvestris (L.) Roxb., Fl. Ind. 3: 787. 1832; Becc. in Hook. f., Fl. Brit. India 6: 425. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1559. 1931; Pull., Fl. Andhra Pradesh 5: 1958. 2018. *Elate sylvestris* L., Sp. Pl. 2: 1189. 1753. *'Ethachettu'*

Medium sized, graceful palm, 7 or more m high; stem slender, cylindrical, 45 cm across, clothed with persistent petiole bases. Leaves 3–4 m long; leaflets fascicled, 2–4 farious, 15–30 cm long, spiny at apex, few at the base forming channelled triangular spines. Spadix up to 1 m long. Spathes coriaceous, as long as spadix, almost woody. Male flowers white, oblique. Calyx cup shaped, with 3 short teeth. Petals longer than calyx, concave. Stamens 6; anthers linear; filaments very short. Female flowers roundish. Calyx obsoletely 3-toothed. Petals 3, broad. Fruit oblong-ellipsoid, orange yellow. Seeds grooved.

Fl.: & Fr.: Mar.–Jun.

Habitat: Common along the stream banks, ponds and rice fields.

Specimen examined: Burugandi, *Y. Mahesh* 010047 (BSID).

Field notes: Trunk clothed with persistent bases of petiole, smooth with age.

20. COMMELINACEAE

India: 12 genera, 96 taxa; Andhra Pradesh: 8 genera, 27 spp.; PNP: 3 genera, 11 spp.

Key to the genera

1a.	Fertile stamens 3; staminodes present	**2**
1b.	Fertile stamens 6; staminodes absent	**2. Cyanotis**
2a.	Inflorescence axillary in 1–2 cymes arising from spathaceous bracts	**1. Commelina**
2b.	Inflorescence terminal in paniculate cymes, not arising from spathaceous bracts	**3. Murdannia**

1. COMMELINA Plum. ex L.

India: 29 spp. & 1 subsp.; Andhra Pradesh: 12 spp.; PNP: 3 spp.

Key to the species

1a.	Spathe complicate, margins connate only at base or free	**2. C. clavata**
1b.	Spathe funnel shaped, margins connate upto the top	2
2a.	Annuals; stems creeping and rooting at lowers nodes; cleistogamous flowers present; capsule pyriform	**1. C. benghalensis**
2b.	Perennials; stems tufted, trailing and not rooting at lowers nodes; cleistogamous flowers absent; capsule obovoid or trigonous	**3. C. paludosa**

1. Commelina benghalensis L., Sp. Pl. 41. 1753; Hook. f., Fl. Brit. India 6: 370. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1539. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 704. 1999; Pull., Fl. Andhra Pradesh 5: 1940. 2018.

Annual diffuse herb; root stock with cleistogamous flowers; stem slender, dichotomously branched from the base, 35 cm long; rooting at lower nodes, hispid. Leaves ovate, up to 5 cm long, narrowed at base, obtuse at apex, margins ciliolate, velvety pubescent on both surfaces. Leaf sheaths pubescent with rufous hairs near mouth. Inflorescence terminal, spathiform cymes, 2–3 flowered. Spathes cymbiform, pubescent. Flowers bluish-violet. Sepals 3, membranous, two inners connate at base. Petals 3, two large, clawed; third one orbicular. Stamens 6; fertile 3; sterile 3. Ovary trilocular. Style slender; stigma capitate. Capsule loculicidal, pyriform, membranous, 5-seeded.

Fl.: &Fr.: Jul.–Nov.

Habitat: Common in open moist banks, shady localities and rice fields.

Specimen examined: Madduluru, PK Valasa, *Y. Mahesh* 010411 (BSID).

Field notes: Flowers blooms at early morning, closes at early afternoon.

2. Commelina clavata C.B. Clarke, Commelyn. Cyrtandr. Bengal. t. 5. 1874; Hook. f., Fl. Brit. India 6: 371. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1539. 1931; Pull., Fl. Andhra Pradesh 5: 1941. 2018. **(Plate 16D)**

Annual herb, up to 80 cm long; stem branched; branches rooting at nodes. Leaves ovate-elliptic or lanceolate, up to 4.5 cm long, narrowed at base, apex acuminate, margins entire, glabrous on both surfaces; sheaths 3 cm long, hirsute. Spathes ovate-lanceolate, 2.6 cm long, cordate at base, attenuate at apex, margins connate at base. Sepals small with brown spots. Petals lilac. Capsules 2, oblong, truncately rounded at the ends, constructed in the middle. Seeds 4, black.

Fl.: & Fr.: Jul.–Nov.

Habitat: Occasionally found along the banks of ponds and rice fields.

Specimen examined: Gulletiwada, *Y. Mahesh* 010605 (BSID).

3. Commelina paludosa Blume, Enum. Pl. Jav. 1: 2. 1827; R.S. Rao & al., Fl. E. Godavari Dist. 706. 1999; Pull., Fl. Andhra Pradesh 5: 1943. 2018. *Commelina obliqua* Buch.-Ham ex D.Don, Prodr. Fl. Nep. 45. 1825; Hook. f., Fl. Brit. India 6: 372. 1892; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1539. 1931. **(Plate 16E)**

A stout erect or decumbent perennial herb, up to 90 cm long; stem stout, branched with fibrous roots, glabrous. Leaves elliptic-lanceolate, 8–18 cm long, narrowed at base, acute at apex, margins entire, glabrous above, puberulous beneath, sessile or shortly petioled; sheaths bearded, up to 3 cm long. Spathes sessile, solitary or crowded heads, funnel shaped, glabrous. Flowers blue in a raceme. Large petals clawed, orbicular. Stamens yellow. Ovary 3- celled. Capsule obovoid or trigonous, 3-celled. Seeds 3, oblong-ellipsoid, smooth.

Fl.: & Fr.: Jul.–Nov.

Habitat: Common in the marshy localities, cultivated fields in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. CYANOTIS D. Don

India: 13 spp.; Andhra Pradesh: 8 spp.; PNP: 4 spp.

Key to the species

1a.	Cymes enclosed in leaf sheath	**2. C. axillaris**
1b.	Cymes not enclosed in leaf sheath	2
2a.	Plants not cobwebby or cottony throughout	**3. C. cristata**
2b.	Plants cobwebby or cottony throughout	3
3a.	Robust herbs, leaves oblong, bracts shorter than cymes	**1. C. arachnoidea**
3b.	Decumbent herbs, leaves linear-ovate, bracts longer than cymes	**4. C. fasciculata**

1. Cyanotis arachnoidea C.B. Clarke in DC., Monogr. Phan. 3: 250. 1881; Hook. f., Fl. Brit. India 6: 386. 1892; C.E.C. Fisch. in Gamble, 3: 1550. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 708. 1999; Pull., Fl. Andhra Pradesh 5: 1946. 2018. **(Plate 16F)**

A robust, bushy, prostrate herb with white cobwebby woolly all over. Leaves linear-lanceolate, 8–12 cm long, obtuse at base, acute or rounded at apex, margins entire; sheaths short. Cymes axillary or terminal; bracts lanceolate, shorter than cymes; bracteoles up to 8 pairs, falcate. Flowers blue, often large. Sepals 3, green, lanceolate, bearded. Petals 3, violet. Stamens 6; filaments bearded; anther lobes yellow. Ovary 3-celled. Style hairy. Capsule pilose. Seeds terete, pitted.

Fl.: & Fr.: Jul.–Oct.

Habitat: Frequently found in rocky crevices on hilltops.

Specimen examined: Valisugreevula konda, Valamuru, *Y. Mahesh* 011500 (BSID).

Field notes: This species found only on hill tops and whole plant is covered with white cobwebby woolly hairs.

2. Cyanotis axillaris (L.) D. Don ex Sweet, Hort. Brit. 430.1826; Hook. f., Fl. Brit. India 6: 388. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1550. 1931; Pull., Fl. Andhra Pradesh 5: 1946. 2018. *Commelina axillaris* L., Sp. Pl. 1: 42. 1753. **(Plate 16G)**

An annual, glabrous herb; stem stout, erect or prostrate, up to 50 cm long, rooting at nodes. Leaves linear-lanceolate, up to 8 cm long, succulent, rounded at base, acuminate at apex, margins entire, glabrous on both surfaces; sheaths 5 mm long, scarious, ciliate at mouth. Flowers clustered in the axils of leaf sheaths, bracteolate, purple or blue; bracteoles linear. Sepals connate; lobes minute, lanceolate. Petals ovate. Stamens 6; filaments blue, bearded; anthers oblong. Ovary 3-celled. Stigma 3-fid. Capsule oblong, beaked, glabrous. Seeds angled, pitted.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common along stream banks, moist localities, cultivated fields.

Specimen examined: Bapanammapolam, *Y. Mahesh* 010052 (BSID).

Field notes: Entire plant glabrous.

3. Cyanotis cristata (L.) D. Don, Prodr. Fl. Nepal. 46. 1825; Hook. f., Fl. Brit. India 6: 385. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1549. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 708. 1999; Pull., Fl. Andhra Pradesh 5: 1947. 2018. *Commelina cristata* L., Sp. Pl. 1: 42. 1753.

An erect or decumbent herb, up to 30 cm high; stems slender, branching at nodes, creeping, glabrous; nodes distant, rooting at lower ones. Leaves ovate-oblong, 2–2.5 cm long, rounded or cordate at base, obtuse at apex, margins ciliate, sparsely pubescent; sheaths loose, hairy. Inflorescence recurved, scorpioid cymes in the axils of spathes; bracts ovate; bracteoles up to 7 pairs, ovate. Flowers violet. Sepals 3, light white. Petals 3, connate up to middle. Stamens 6; filaments violet, bearded with blue hairs; anther lobes yellow. Ovary hairy at tip, globose. Style glabrous; stigma capitate. Capsule nearly glabrous.

Fl.: &Fr.: Jul.–Oct.

Habitat: Common in cultivated fields and open moist areas and near ponds.

Specimen examined: PK Valasa, Valamuru, *Y. Mahesh* 010906 (BSID).



Plate 16: A. *Chlorophytum arundinaceum* Baker; **B.** *Calamus viminalis* Willd.; **C.** *Caryota urens* L.; **D.** *Commelina clavata* C.B. Clarke; **E.** *Commelina paludosa* Blume; **F.** *Cyanotis arachnoidea* C.B. Clarke; **G.** *Cyanotis axillaris* (L.) D. Don ex Sweet

4. Cyanotis fasciculata (B. Heyne ex Roth) Schult. & Schult.f., Syst. Veg., 7: 1152. 1830; Hook. f., Fl. Brit. India 6: 387. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1550. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 709. 1999; Pull., Fl. Andhra Pradesh 5: 1948. 2018. *Tradescantia fasciculata* B. Heyne ex Roth, Nov. Pl. Sp. 189. 1821.

A slender, decumbent herb, up to 30 cm long; branches ascending, spreading, cottony. Leaves narrowly ovate or linear, 2.5 cm long, cordate at base, subacute at apex, margins entire, silvery silky. Inflorescence in axillary and terminal, floccose, scorpioid cymes. Flowers pinkish-violet; basal bracts lanceolate, falcately recurved, longer than cymes. Sepals 3, elliptic, cottony. Petals 3, connate; lobes ovate, subacute. Stamens 6; filaments spirally twisted, with blue and white moniliform hairs near apex; anthers yellow. Style slender. Capsule oblong, glabrous.

Fl.: & Fr.: Jul.–Oct.

Habitat: Rare in open moist areas and moist rocky crevices.

Specimen examined: Valamuru, *Y. Mahesh* 010906 (BSID).

3. MURDANNIA Royle

India: 27 spp., 2 subsp. & 1 var.; Andhra Pradesh: 6 spp.; PNP: 4 spp.

Key to the species

1a.	Leaves linear-lanceolate, 8 times longer than broad, spathes not prominently winged	**3. M. nudiflora**
1b.	Leaves ovate-lanceolate, 3 times longer than broad, spathes prominently winged	2
2a.	Roots tuberous	**2. M. japonica**
2b.	Roots fibrous	3
3a.	Stems erect, bracts ovate, orbicular, seeds dark brown	**1. M. dimorpha**
3b.	Stems decumbent, bracts amplexicaul, seeds straw coloured	**4. M. spirata**

1. Murdannia dimorpha (Dalzell) G. Bruckn. in Engl. & Prantl, Pflanzenfam., ed. 2. 15a: 173. 1930; R.S. Rao & al., Fl. E. Godavari Dist. 710. 1999; Pull., Fl. Andhra Pradesh 5: 1952. 2018. *Aneilema dimorphum* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 3: 138. 1851; Hook. f., Fl. Brit. India 6: 377. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1545. 1931.

An erect herb, up to 35 cm long, whole plant glabrous; stem branching from base. Leaves ovate-lanceolate or linear, 5–7 cm long, rounded at base, acute at apex, margins entire; sheaths ciliate at mouth. Flowers small, in terminal, dichotomously branched panicles; bracts ovate-orbicular. Sepals 3, ovate, obtuse, reflexed. Petals 3, obovate, blue. Stamens and staminodes 3 each; filaments of fertile stamens bearded. Ovary 3-celled. Capsule oblong, 0.4 cm long, trigonous. Seeds 3-5, uniseriate, pitted, dark brown.

Fl.: & Fr.: Sep.–Nov.

Habitat: Common in moist shady localities, forest pathways and agricultural fields.

Specimen examined: Ijjaluru, *Y. Mahesh* 010968 (BSID).

2. Murdannia japonica (Thunb.) Faden, Taxon 26: 142. 1977; R.S. Rao & al., Fl. W. Godavari Dist. 407. 1986. *Commelina japonica* Thunb., Trans. Linn. Soc. London 2: 332 1794. *Aneilema lineolatum* (Blume) Kunth, Enum. Pl. 4: 69. 1843; Hook. f., Fl. Brit. India 6: 376; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1544. 1931. **(Plate 17A)**

An erect, stout large herb, up to 1 m high; stem erect, branching, leafy; root tubers slender. Leaves amplexicaul, ovate-elliptic or lanceolate, 15 cm long, rounded at base, acuminate at apex, margins scarious; leaf sheath long. Panicles in axillary and terminal, dichotomously branched, stout, glabrous. Flowers light blue. Sepals light brown. Petals 3, white. Stamens and staminodes 3 each; filaments bearded. Capsule ellipsoid, trigonous. Seeds 3-4 in each cell, glandular, reticulate.

Fl.: &Fr.: Jul.–Oct.

Habitat: Occasionally found in moist shady localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010993 (BSID).

3. Murdannia nudiflora (L.) Brenan, Kew Bull. 7: 189. 1952; R.S. Rao & al., Fl. E. Godavari Dist. 710. 1999; Pull., Fl. Andhra Pradesh 5: 1952. 2018. *Commelina nudiflora* L., Mant. 177. 1771. (non Sp. Pl. 1: 41. 1753). *Aneilema nudiflorum* (L.) R.Br., Prodr. 271. 1810; Hook. f., Fl. Brit. India 6: 378. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1545. 1931. **(Plate 17B)**

An erect or decumbent, slender herb, up to 35 cm high; branches spreading, rooting at nodes. Leaves sessile, sheathing, linear-lanceolate, 6 cm long, obtuse at base, acute at apex, margins entire, glabrous on both surfaces; sheaths ciliate on margins. Inflorescence terminal scorpioid cymes. Flowers bluish; bracts cymbiform, caducous;

spathes not winged. Sepals 3, oblong, trinerved. Petals 3, suborbicular. Fertile stamens 2; filaments hairy; anthers yellow. Ovary trilocular. Style slender; stigma simple. Fruit loculicidal capsule, globose, mucronate. Seeds 2 in each cell, brown, tuberculate.

Fl.: &Fr.: Aug.–Oct.

Habitat: Common in sandy areas and cultivated fields.

Specimens examined: Mulugubokka, Murduvada, Kintukuru, *Y. Mahesh* 010429, 010512, 011459 (BSID).

Field notes: Flowers bluish, open in early morning and closes at early afternoon.

4. Murdannia spirata (L.) G. Brueckn. in Engl. & Prantl., Nat. Pflanzenfam., (ed. 2) 15a: 173. 1930; R.S. Rao & al., Fl. E. Godavari Dist. 711. 1999; Pull., Fl. Andhra Pradesh 5: 1953. 2018. *Commelina spirata* L., Mant. Pl. Altera 176. 1771. *Aneilema spiratum* (L.) R.Br., Prodr. 271. 1810; Hook. f., Fl. Brit. India 6: 377. 1892; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1545. 1931. **(Plate 17C)**

Annual decumbent or diffuse herb, up to 30 cm long; stems rooting at nodes. Leaves sessile, amplexicaul, ovate-oblong or elliptic-lanceolate, 1.6–4 cm long, rounded at base, acute at apex, margins undulate, glabrous on both surfaces. Flowers bluish in dichotomously branched panicles; bracts amplexicaul. Sepals 3, oblong. Petals 3, ovate-sub-orbicular, obtuse. Stamens and staminodes 3 in each; filaments bearded. Ovary 3-celled. Capsule ovoid-oblong. Seeds 3–7, minute, straw coloured.

Fl.: & Fr.: Sep.–Mar.

Habitat: Occasionally found in moist shady localities and cultivated fields.

Specimen examined: Bapanammapolam, *Y. Mahesh* 010067 (BSID).

Field notes: Flowers bluish, open in early morning, closes early afternoon.

21. PONTEDERIACEAE

India: 1 genus, 8 spp.; Andhra Pradesh: 1 genua, 3 spp.; PNP: 1 genus, 2 spp.

1. PONTEDERIA L.

India: 7 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a. Leaves ovate or ovate to oblong, obtuse at apex	**2. P. vaginalis**
1b. Leaves rosette, broadly ovate-orbicular, emarginate or obtuse at apex	**1. P. crassipes**

1. Pontederia crassipes Mart., Nov. Gen. Sp. Pl.1: 9. t. 4. 1823. *Eichhornia crassipes* (Mart.) Solms, Monogr. Phan. 4: 527. 1883; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1530. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 699. 1999; Pull., Fl. Andhra Pradesh 5: 1935. 2018.

A free floating or rooted herb, frequently rooting in mud; stem short, leafy, with bunch of filiform fibrous roots. Leaves in a rosette, broadly ovate-orbicular, 5–8 cm long, broader than larger, emarginate or obtuse at apex, margins entire; petiole swollen, up to 10 cm long, helps in buoyancy. Scape simple, erect, 16 cm long, conspicuous sheath near middle, about 10 flowered. Flowers bluish-violet. Perianth funnel shaped, tube 2-lipped, upper one lilac, blue, yellow blotch in middle, lower one small. Stamens 6; anthers sub-equal. Capsule oblong. Seeds many ribbed.

Fl.: & Fr.: Sep.–Mar.

Habitat: Frequent in ditches, ponds near villages.

Specimen examined: Nallakunta cheruvu, *Y. Mahesh* 011595 (BSID).

Field notes: Stout exotic herb, often roots fixed into mud or free floating.

2. Pontederia vaginalis Burm.f., Fl. Ind. 80. 1768. *Monochoria vaginalis* (Burm.f.) C. Presl., Reliq. Haenk 1: 128. 1827; Hook. f., Fl. Brit. India 6: 363. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1529. 1928; Pull., Fl. Andhra Pradesh 5: 1936. 2018. **(Plate 17D)**

An erect, aquatic herb, up to 50 cm high. Leaves ovate-lanceolate or ovate-oblong, 5–10 cm long, cordate at base, acuminate or obtuse at apex, margins entire; petiole up to 20 cm long. Flowers light bluish. Perianth campanulate, deeply lobed; lobes oblong. Stamens 6. Ovary globose, 3-celled. Capsule oblong. Seeds small with thin longitudinal ribs, brown.

Fl.: & Fr.: Aug.–Nov.

Habitat: Frequently found in ditches, ponds and rice fields.

Specimen examined: Nallakunta cheruvu, *Y. Mahesh* 011593 (BSID).

22. COSTACEAE

India: 1 genus & 4 spp.; Andhra Pradesh: 1 genus & 1 sp.; PNP: 1 genus & 1 sp.

1. HELLENIA Retz.

India: 4 spp; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Hellenia speciosa (J. Koenig) S.R. Dutta, Pleione 7: 228. 2013. *Banksea speciosa* J.Koenig, Observ. Bot.3: 75. 1783. *Costus speciosus* (J. Koenig) Sm., Trans. Linn. Soc. London 1: 249. 1791; Baker in Hook. f. Fl. Brit. India 6: 249. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1490. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 681. 1999. *Cheilocostus speciosus* (J. Koenig) C. D. Specht in Taxon 55: 159. 2006; Pull., Fl. Andhra Pradesh 5: 1890. 2018. *Costus specious* var. *nepalensis* (Rosc.) Baker in Hook. f., Fl. Brit. India 6: 249. 1892. **(Plate 17E)**

Erect undershrub, up to 2 m high. Stem sub woody at base, spirally twisted. Leaves subsessile, looks like spirally arranged, elliptic, oblong-lanceolate, oblancelate-oblong, 25 cm long, rounded at base, acuminate at apex, margins entire, slightly undulate, glabrous above, pale and silky pubescent beneath; sheath tubular. Flowers in dense terminal spikes, very large, white; bracts oblong-ovate, reddish, obtusely apiculate, glabrous; bracteoles solitary below the calyx. Calyx short, funnel shaped; teeth 3, ovate, triangular. Corolla tube short, lobes large, elliptic-oblong, subequal. Labellum suborbicular, white with yellow in centre, with incurved margins. Staminodes oblong, petaloid. Ovary globose. Capsule globose. Seeds black with white aril.

Fl. & Fr.: Jul.–Sep.

Habitat: Common in shady places, along streams banks, moist localities.

Specimens examined: Valamuru, PK Valasa, *Y. Mahesh* (BSID).

23. MUSACEAE

India: 2 genera, 33 taxa; Andhra Pradesh: 2 genera, 4 spp.; PNP: 2 genera, 3 spp.

Key to the genera

1a.	Pseudo-stem swollen at the base, without offsets	**1. Ensete**
1b.	Pseudo-stem cylindric with offsets	**2. Musa**

1. ENSETE Bruce ex Horan.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Ensete glaucum (Roxb.) Cheesman, Kew Bull. 2: 101. 1948; Pull., Fl. Andhra Pradesh 5: 1901. 2018. *Musa glauca* Roxb., Pl. Coromandel 3: 96. 1820; Baker in Hook. f., Fl. Brit. India 6: 262. 1892. *Musa nepalensis* Wall. in Roxb., Fl. Ind. 2: 492. 1824; Baker in Hook. f., Fl. Brit. India 6: 261. 1892. **(Plate 17F)**

An unbranched, medium sized tree, up to 6 m high; pseudo-stem swollen at base. Leaves oblong, 1.5–2 × 3–4 mm, oblique at base, obtuse at apex, margins entire, glaucous beneath; petiole up to 40 cm long, shallow, broad channelled. Inflorescence pendulous; bracts ovate, persistent. Basal flowers fertile, hermaphrodite, transforming into staminate flowers. Flowers translucent; outer perianth striped; inner membranous. Fruit bunch compact. Fruits geotropic, oblong with scanty pulp, hard. Seeds smooth, black.

Fl.: & Fr.: Aug.–Nov.

Habitat: Rare along stream banks, moist localities in the forest.

Specimen examined: Maredumilli, *L. Rasingam & Y. Mahesh* 010951 (BSID).

Field notes: Pseudo-stem swollen at base; fruits hard.

2. MUSA L.

India: 25 spp., 1 subsp. & 5 var.; Andhra Pradesh: 3 sp.; PNP: 2 spp.

Key to the species

1a. Inflorescence erect, pink	**1. M. ornata**
1b. Inflorescence drooping, green	**2. M. x paradisiaca**

1. Musa ornata Roxb., Fl. Ind. (ed. 1.) 2: 488. 1824; Pull., Fl. Andhra Pradesh 5: 1902. 2018. *Musa rosea* sensu Baker in Hook. f., Fl. Brit. India 6: 263. 1892; C.E.C. Fisch.in Gamble, Fl. Madras 3: 1497.1928; R.S. Rao & al., Fl. E. Godavari Dist. 683. 1999. **(Plate 17G)** *'Adaviarati'*

An erect, slender, shrub or small tree, up to 3 m high; stem cylindric, stoloniferous, covered with convolute leaf sheaths. Leaves oblong, 1–2.5 × 2–3 mm, oblique at base, obtuse at apex, margins entire, glabrous on both surfaces. Flowers in erect bracteolate spikes, pinkish, monoecious, up to 20 cm long. Flowers of the basal bracts pistillate; bracts ovate, reddish. Pistillate flowers 8 cm long. Calyx yellowish white. Petals as long calyx. Stamens 5. Fruits linear-oblong, slightly incurved, obscurely 4–5 angled. Seeds numerous, blackish, embedded in white pulp.

Fl.: & Fr.: Apr.–Aug.

Habitat: Rare along stream banks, moist shady localities in dense forest.

Specimen examined: PK Valasa area, *Y. Mahesh* 010471 (BSID).

Field notes: Inflorescense straight, petals pinkish.

2. Musa x paradisiaca L., pl. 2: 1043. 1753. *'Arati'*

A stout shrub, up to 5 m high; pseudo stem cylindric, with offsets. Leaves large, oblong, truncate at base, obtuse at apex, margins entire, glabrous on both surfaces. Flowers in terminal, drooping spikes, unisexual, two rows under each bract, those of lower bracts pistillate and of upper ones staminate. Fruit cylindric, obscurely trigonous, greenish-yellow when ripe, sweet. Seeds irregularly globose, black.

Fl.: & Fr.: Apr.–Aug.

Habitat: Cultivated for its edible fruits.

Specimens examined: Balusugudem, Ijjaluru, *Y. Mahesh* 010962, 011729 (BSID).

Distribution: Cultivated near home gardens for fruits.

24. ZINGIBERACEAE

India: 21 genera, 232 taxa; Andhra Pradesh: 5 genera, 19 spp., 2 var.; PNP: 4 genera, 6 spp.

Key to the genera

1a.	Inflorescence terminal on a leafy shoot	**2**
1b.	Inflorescence on a leafless scape	**3**
2a.	Anthers winged; ovary 1 celled	**2. Globba**
2b.	Anthers not winged; ovary 3 celled	**3. Hedychium**
3a.	Herbs devoid of stem; lateral staminodes well developed, broad; inflorescence not radical	**1. Curcuma**
3b.	Herbs with elongated leafy stem; lateral staminodes small; inflorescence radical	**4. Zingiber**

1. CURCUMA L.

India: 40 spp.; Andhra Pradesh: 7 spp.; PNP: 1 sp.

1. Curcuma pseudomontana J. Graham, Cat. Pl. Bomb. 210. 1839; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1483. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 677. 1999; Pull., Fl. Andhra Pradesh 5: 1894. 2018. *Curcuma montana* sensu Baker in Hook. f., Fl. Brit. India 6: 214. 1890. *p.p.*non Roscoe 1807. **(Plate 17H)**

An erect, aromatic, tuberous herb, up to 1 m high; tubers sub-globose, white. Leaves large, oblong-lanceolate, 35–50 cm long, tapering to the base, acuminate at apex, margins entire; petiole up to 50 cm long. Flowering spikes central or lateral; bracts obovate-lanceolate, acute at apex, with pink tinge; bracts of coma oblong, lowest with purple edges, upper one's mauve purple. Flowers yellow with purple coloured centre. Stamen 1; filaments short; anthers with contiguous, spurred at the base; staminodes oblong. Lip orbicular-suborbicular with deflexed tip. Ovary 3-celled with many ovules. Style filiform; stigma 2-lipped. Fruit globose, 3-valved capsule. Seeds oblong.

Fl.: & Fr.: Jun.–Sep.

Habitat: Common in forest undergrowth, along stream banks and cultivated fields.

Specimens examined: PK Valasa, *Y. Mahesh* 010446, 010451 (BSID).

2. GLOBBA L.

India: 19 spp. & 1 var.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Bracts persistant; anthers with bifid wings	**1. G. marantina**
1b.	Bracts deciduous; anthers without bifid wings	**2. G. sessiliflora**

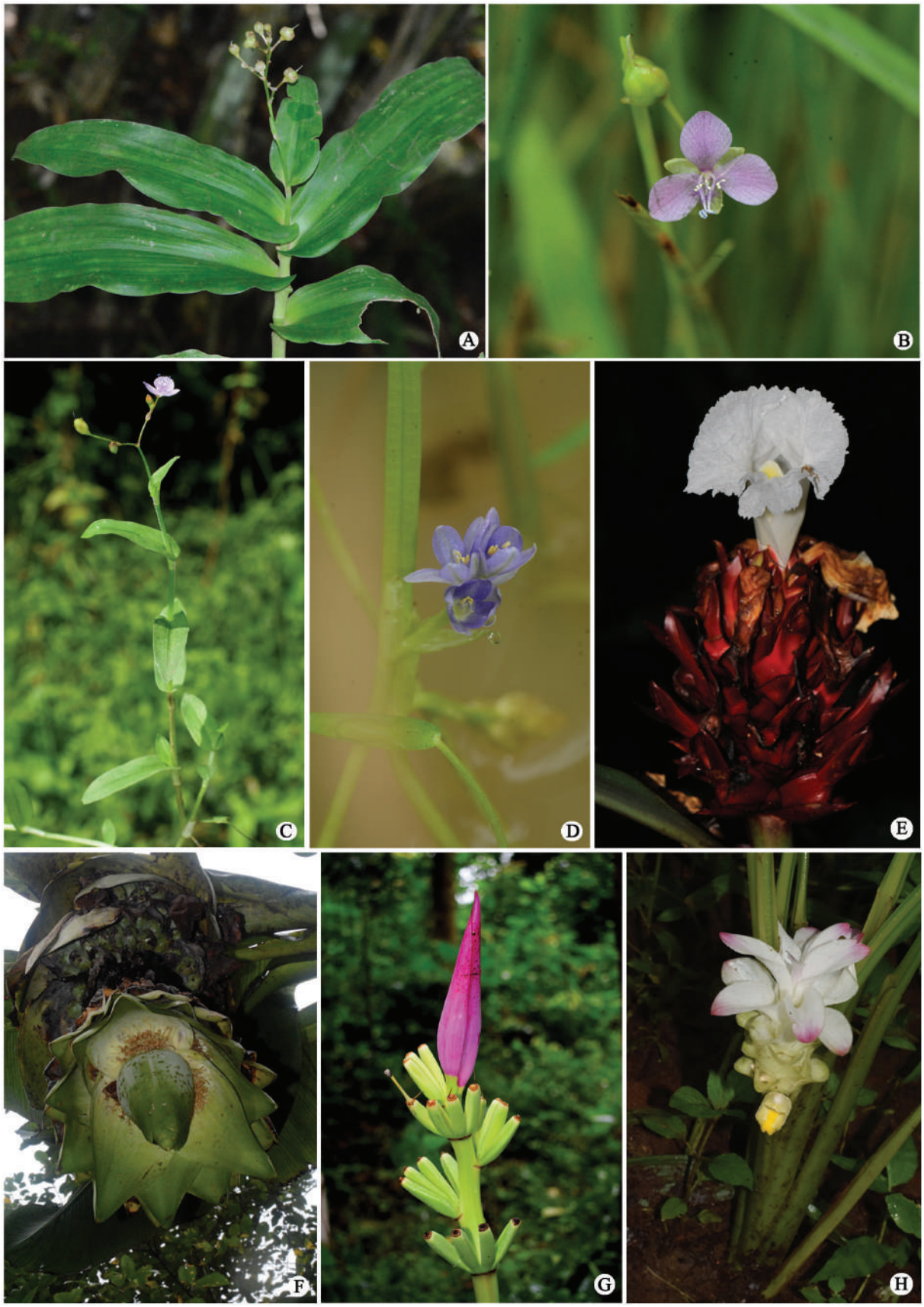


Plate 17: A. *Murdannia japonica* (Thunb.) Faden; **B.** *Murdannia nudiflora* (L.) Brenan; **C.** *Murdannia spirata* (L.) G.Bruckn.; **D.** *Pontederia vaginalis* Burm.f.; **E.** *Hellenia speciosa* S.R. Dutta; **F.** *Ensete glaucum* (Roxb.) Cheesman; **G.** *Musa ornata* Roxb. **H.** *Curcuma pseudomontana* J. Graham

1. Globba marantina L., Mant. Pl. 170. 1771; Baker in Hook. f., Fl. Brit. India 6: 206. 1890; Pull., Fl. Andhra Pradesh 5: 1895. 2018. *Globba bulbifera* Roxb., Asiat. Res. 11: 358. 1810; Hook. f., Fl. Brit. India 6: 206. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1481. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 679. 1999. **(Plate 18A)**

A slender herb, up to 60 cm high; rhizomes creeping; stem erect. Leaves oblong-lanceolate, 12–18 cm long, cuneate at base, acuminate or caudate at apex, margins entire; petiole short. Spikes terminal, up to 10 cm long. Flowers in axiles of large persistent bracts, orange yellow; peduncles 7 cm long, exerted from leaf sheath. Calyx funnel shaped, 3-lobed, hairy. Corolla yellow, slender, larger than the calyx; lobes ovate, reflexed. Labellum small, 2-fid, narrow at base. Stamens with long filaments; anthers oblong with bifid wings. Ovary globose, single celled. Style filiform; stigma turbinate. Capsule ovoid. Seeds ovoid.

Fl.: & Fr.: Jul.–Sep.

Habitat: Frequent in marshy areas, along streams in dense semi-evergreen forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011408 (BSID).

Field notes: Flowers yellow, anthers with bifid wings, style hook shaped.

2. Globba sessiliflora Sims, Bot. Mag. 35: t. 1428. 1811; Pull., Fl. Andhra Pradesh 5: 1896. 2018. *Globba ophioglossa* Wight, Icon. Pl. Ind. Orient. 6: 16., t. 2002. 1853; Baker in Hook. f., Fl. Brit. India 6: 202. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1480. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 679. 1999. **(Plate 18B)**

An erect herb, up to 40 cm high; rhizomes creeping. Leaves linear-elliptic or lanceolate, 12–16 cm, acuminate or caudate at base, acuminate at apex, margins entire, pubescent beneath. Inflorescence in racemose narrow panicles. Flowers orange yellow, 2 cm across; bracts minute, deciduous. Calyx pale green, funnel shaped, ovate. Corolla orange yellow, tube longer than calyx; lobes ovate, shorter than the staminodes. Lip deeply 2-fid, twice the length of the corolla. Stamens with 2-appendaged filament; anthers oblong, simple. Ovary globose. Style filiform; stigma turbinate. Capsule globose. Seeds ovoid, tomentose.

Fl.: & Fr.: Jul.–Oct.

Habitat: Frequent herb as an undergrowth in shady localities, under large trees.

Specimen examined: PK Valasa, *Y. Mahesh* 010403 (BSID).

3. HEDYCHIUM J. Koenig

India: 40 spp. & 2 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Hedychium flavescens Carey ex Roscoe, Monandr. Pl. Scitam. t. 50. 1825; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1485. 1928; Pull., Fl. Andhra Pradesh 5: 1897. 2018. *Hedychium coronarium* var. *flavescens* (Carey ex Roscoe) Baker, Fl. Brit. India 6: 226. 1892. **(Plate 18C)**

Large, robust herb, up to 2 m high. Leaves elliptic–lanceolate, 20–35 cm long, caudate at base, acuminate at apex, margins entire, slightly pubescent along midrib. Spikes dense flowered; bracts imbricate, 3–4 flowered, oblong, more or less villous at apex. Calyx slightly longer than the bract, apex puberulous. Corolla *c.* 8 cm long. Lip subcordate, narrowed at the base. Staminodes narrowly oblanceolate. Stamens longer than the lip. Ovary 3-celled, globose. Capsule oblong, glabrous. Seeds many, small.

Fl.: & Fr.: Jul.–Sep.

Habitat: Rare along streams in dense semi-evergreen forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010401 (BSID).

4. ZINGIBER Mill.

India: 33 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Spikes sessile, short, produce directly from root stock; bracts red	**2. Z. roseum**
1b.	Spikes on terminating long peduncles; bracts bright red	**1. Z. purpureum**

1. Zingiber purpureum Roscoe, Trans. Linn. Soc. London 8: 348. 1807; R.S. Rao & al., Fl. East Godavari Dist. 680. 1999; Pull., Fl. Andhra Pradesh 5: 1898. 2018. *Zingiber cassumunar* Roxb., Asiat. Res. 11: 347. 1810; Baker in Hook. f., Fl. Brit. India 6: 248. 1892; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1490. 1928.

A large aromatic herb; stem slender, leafy, up to 1.5 m high. Leaves distichous, oblong-lanceolate, 15–30 × 6–9

cm, numerous, narrowed at base, acuminate at apex, margins entire, glabrous above, pubescent below. Spikes on long peduncles. Flowering heads conical, up to 10 cm long; bracts ovate, closely imbricate, bright red. Flowers 4 cm long, whitish, stamens yellow. Capsule sub-globose, 2 cm. Seeds numerous, purple.

Fl.: & Fr.: Aug.–Sep.

Habitat: Occasionally found along stream banks and moist damp localities.

Specimen examined: Included on the authority of R. S. Rao & al. (*l.c.*).

2. Zingiber roseum (Roxb.) Roscoe, Trans. Linn. Soc. London 8: 348. 1807; Baker in Hook. f., Fl. Brit. India 6: 244. 1892; C.E.C. Fisch.in Gamble 3: 1489. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 681. 1999; Pull., Fl. Andhra Pradesh 5: 1899. 2018. *Amomum roseum* Roxb., Pl. Coromandel 2: t. 126. 1800. (**Plate 18D & E)**

Tall herb, up to 1.5 m high. Leaves oblong-lanceolate, 15–35 × 5–10 cm, acuminate at apex, margins entire, pubescent, sessile. Inflorescence in racemose sessile spikes arising directly from root. Flowers 4.5 cm long, bracts bright red. Calyx cylindric, 3-lobed; lobes small. Corolla red. Lip 3-lobed, midlobe oblong, recurved at margin; lateral lobe short. Stamens yellow. Ovules 3-celled with numerous ovules. Style filiform, stigma short. Capsule sub-globose. Seeds small, numerous.

Fl.: & Fr.: Aug.–Sep.

Habitat: Frequent herb in moist area and deep valleys.

Specimens examined: Swamykonda, Gulletiwada, *Y. Mahesh* 010445, 010561 (BSID).

Field notes: The species can be easily recognised based on the red capsule with white seeds.

25. ERIOCAULACEAE

India: 1 genus, 118 taxa; Andhra Pradesh: 1 genus, 8 spp.; PNP: 1 genus, 2 spp.

1. ERIOCAULON L.

India: 109 spp. & 9 var; Andhra Pradesh: 8 spp.; PNP: 2 spp.

Key to the species

1a.	Floral bracts glabrous; anthers black; seeds pale yellow	**2. E. truncatum**
1b.	Floral bracts bearded; anthers dark green; seeds black	**1. E. quinquangulare**

1. Eriocaulon quinquangulare L., Sp. Pl. 1: 87. 1753; Hook. f., Fl. Brit. India 6: 582. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1620. 1931; R.S. Rao & al. Fl. E. Godavari Dist. 733. 1999; Pull., Fl. Andhra Pradesh 5: 1984. 2018. **(Plate 18F)**

An annual herb, up to 20 cm high. Leaves basal, linear-subulate, 6.5–0.3 cm, narrowed from the base, many nerved. Peduncles many, up to 15 cm long. Flowering heads globose, 4 mm across, greyish-white. Involucral bracts oblong, glabrous. Floral bracts obovate, acuminate, recurved, bearded. Male flowers: calyx spathaceous, hairy at apex; corolla lobes hairy at apex; anthers dark green. Female flowers: sepals 3, hairy; petals oblanceolate, ciliate, gland at apex. Seeds black.

Fl.: & Fr.: Apr.–Jul.

Habitat: Frequent herb along moist localities and edges of stagnant water bodies.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011344 (BSID).

2. Eriocaulon truncatum Buch.-Ham. in Wall., Pl. Asiat. Rar. 3. 29. 1832; Hook. f., Fl. Brit. India 6: 578. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1619. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 733. 1999; Pull., Fl. Andhra Pradesh 5: 1986. 2018.

Annual herb, up to 15 cm high. Leaves tapering from base to apex, subulate, 3–3.5 × 0.2 cm. Peduncles few, 5 cm long. Heads 3 mm across; receptacles villous. Involucral bracts elliptic, glabrous. Floral bracts obovate, imbricate, glabrous, hairy only at apex. Male flowers: sepals 2, connate at base; corolla lobes small. Female flower: sepals 2, pubescent at apex; petals filiform, hairy. Seeds pale yellow.

Fl.: & Fr.: May–Aug.

Habitat: Frequently found in moist areas and cultivated fields.

Specimen examined: Eruwada, *Y. Mahesh* 010652 (BSID).

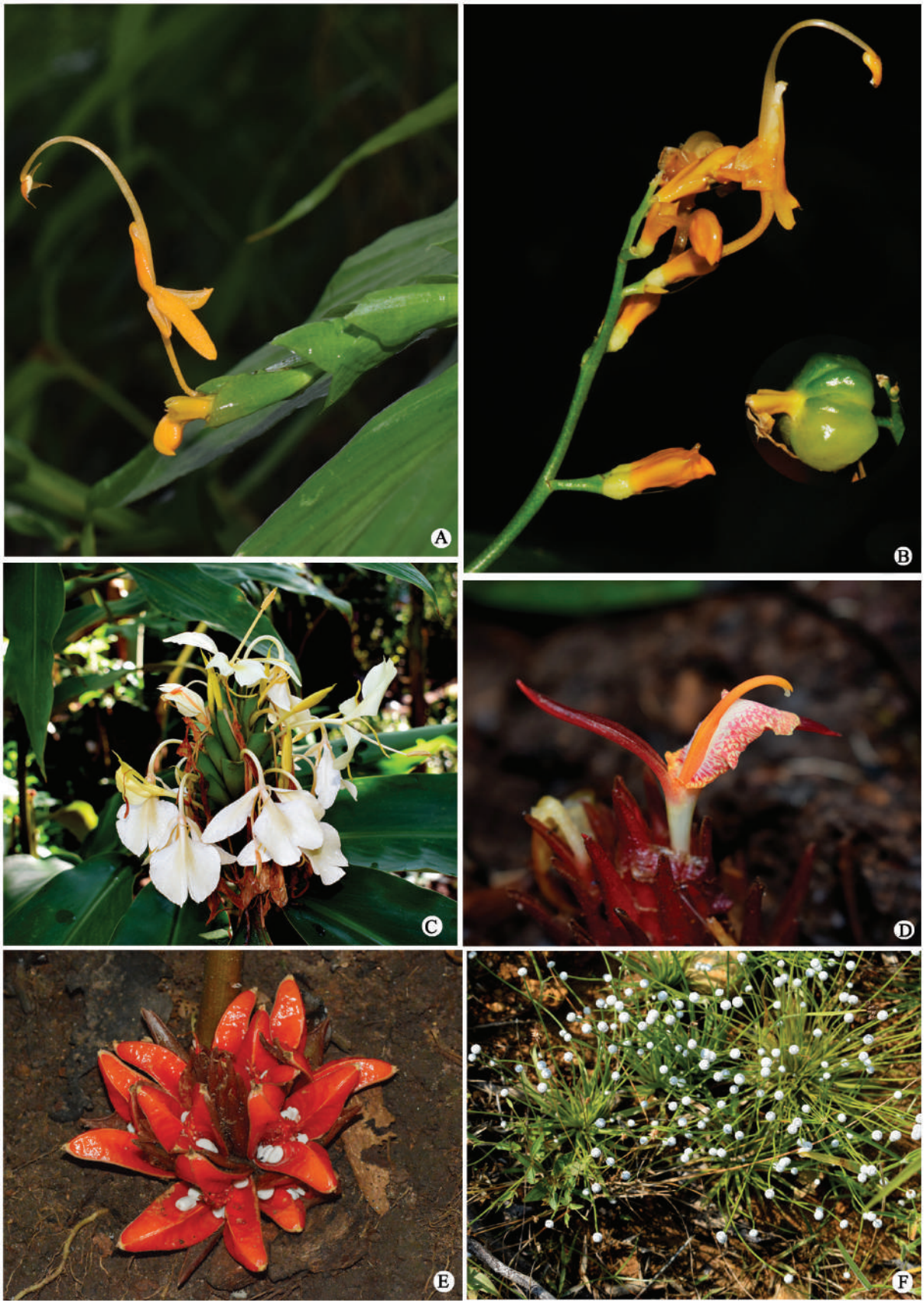


Plate 18: A. *Globba marantina* L.; **B.** *Globba sessiliflora* Sims; **C.** *Hedychium flavescens* Carey ex Roscoe; **D** & **E.** *Zingiber roseum* (Roxb.) Roscoe; **F.** *Eriocaulon quinquangulare* L.

26. CYPERACEAE

India: 32 genera, 553 spp., 24 subspp., 33 var.; Andhra Pradesh: 19 genera, 124 spp., 7 subspp., 5 var.; PNP: 8 genera, 48 spp.

Key to the genera

1a.	Nuts enclosed in a utricle	**2. Carex**
1b.	Nuts not enclosed in a utricle	2
2a.	Flowers unisexual	**8. Scleria**
2b.	Flowers bisexual	3
3a.	Perianth present (sometimes absent in *Lipocarpha squarrosa*)	4
3b.	Perianth absent	6
4a.	Perianth of scales and bristles	**6. Fuirena**
4b.	Perianth of bristles only	5
5a.	Inflorescence reduced to single spikelet	**4. Eleocharis**
5b.	Inflorescence of paniculate or anthelate	**7. Schoenoplectiella**
6a.	Style base persistent on the nut	**1. Bulbostylis**
6b.	Style base not persistent on the nut	7
7a.	Style articulate with the nuts, 3-fid	**5. Fimbristylis**
7b.	Style continuous with the nuts, 2-3 fid	**3. Cyperus**

1. BULBOSTYLIS Kunth

India: 6 spp. & 2 var.; Andhra Pradesh: 4 spp. & 1 subsp.; PNP: 1 sp.

1. Bulbostylis barbata (Rottb.) Kunth ex C.B. Clarke, Fl. Brit. India 6: 651. 1893; R.S. Rao & al., Fl. E. Godavari Dist. 734. 1999; Pull., Fl. Andhra Pradesh 5: 1989. 2018. *Scirpus barbatus* Rottb., Pl. Rar. 27. 1772. *Stenophyllus barbatus* (Rottb.) T. Cooke, Fl. Bombay 2. 887. 1908; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1662. 1931. **(Plate 19A)**

An erect, tufted herb, up to 20 cm high; stems slender. Leaves filiform, *c.* 10 cm long, glabrous except at the mouth of the sheath. Inflorescence hemispherical, 1 cm across; bracts short, filiform. Spikelets in dense oblong or globose heads, 5 × 1.2 cm, acute. Glumes ovate, red-brown, mucronate with stout curved keel. Nut obovoid, triquetrous, finely reticulate.

Fl.: & Fr.: Jul.–Aug.

Habitat: Frequently found in sandy soils and open waste lands.

Specimen examined: PK Valasa, *Y. Mahesh* 012139 (BSID).

2. CAREX L.

India: 192 spp., 9 subsp. & 7 var.; Andhra Pradesh: 6 spp.; PNP: 2 spp.

Key to the species

1a. Annual herbs; inflorescence spicate; nut 1 mm long	**2. C. speciosa**
1b. Perennial herbs; inflorescence panicled; nut 2 mm long	**1. C. cruciata**

1. Carex cruciata Wahlenb., Vet. Acad. Handl. Stockh. 24: 149. 1803; Pull., Fl. Andhra Pradesh 5: 1992. 2018. *Carex condensata* Nees in Wight, Contr. Bot. India 123. 1834; C.B. Clarke in Hook. f., Fl. Brit. India 6: 716. 1894.

Perennial herb, up to 80 cm high; stem trigonous. Leaves basal, flat, cauline, up to 60 cm long, acuminate at apex. Inflorescence peduncled, in dense panicles, branched with many spikelets. Involucral bracts up to 38 cm long. Spikelets oblong-linear, cylindric, 1 cm long, upper ones male section shorter than lower female section. Male glumes ovate, aristate, reddish brown. Female glumes ovate, 2.6 mm long. Utricle ellipsoid, trigonous, 4.1 mm long, spongy, dark greenish with purple dotted, abruptly beaked; beak bifid. Nuts ellipsoid, triquetrous, 2 mm long, yellow, with small beak.

Fl.: & Fr.: Oct.–Nov.

Habitat: Occasional in moist shady localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010978 (BSID).

2. Carex speciosa Kunth, Enum. Pl. 2: 504. 1837; C.B. Clarke in Hook. f., Fl. Brit. India 6: 729. 1894; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1686. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 735. 1999; Pull., Fl. Andhra Pradesh 5: 1993. 2018.

Annual, woody, rhizomatous herb, up to 60 cm high; culms slender, winged, surrounded by basal leaves. Leaves basal, longer than stem, 3–4 mm wide, acuminate at apex, margins revolute. Involucral bracts exceeding.

Inflorescence of 1–4 spikelets. Male spikelets at apex, female at base. Male glumes ovate, 1.3 mm long. Stamens 3; filaments connate at base. Female glumes broadly ovate. Ovary triquetrous. Style deltoid at base, enclosed in utricle. Utricle ellipsoid-ovoid, 3.5 mm long, winged at margins. Nuts ellipsoid, 1 mm long, trigonous.

Fl.: & Fr.: Aug.–Oct.

Habitat: Occasional along moist localities and stream banks.

Specimen examined: Valamuru, *Y. Mahesh* 010473 (BSID).

3. CYPERUS L.

India: 82 spp., 4 subsp. & 6 var.; Andhra Pradesh: 43 spp., 2 subsp. & 1 var.; PNP: 26 spp.

Key to the species

1a.	Glumes spirally arranged	2
1b.	Glumes at least lower one distichous	4
2a.	Glumes obovate-rhomboid, tightly imbricating, aristate	**16. C. neochinensis**
2b.	Glumes spathulate, concave, with a short, incurved triangular tip	3
3a.	Perennials	**4. C. ceylanicus**
3b.	Annuals	**1. C. albescens**
4a.	Rachilla not articulated	5
4b.	Rachilla articulated	7
5a.	Glumes with often a white hyaline elliptic depression or furrow on either sides	**24. C. sanguilentus**
5b.	Glumes with neither depression or furrow	6
6a.	Rachilla wingless	**11. C. flavidus**
6b.	Rachilla narrowly to distinctly winged	**21. C. polystachyos**
7a.	Spikelets 1-3 flowered, arranged in capitate head like glomerule on very condensed rachis	8
7b.	Spikelets few to many, arranged in elongated rachis	9
8a.	Keel of glumes distinctly winged	**15. C. mindorensis**
8b.	Keel of glumes wingless	**3. C.brevifolius**
9a.	Spikelets deciduous as whole together with glumes and nuts from the 2 lowest persistent glumes	10
9b.	Glumes and nuts only early deciduous; rachilla of the spikelet persistent	15
10a.	Spikelets 3-8 in each head	11
10b.	Spikelets many in each head	12
11a.	Nerves on glumes distinct, fair	**5. C. clarkei**
11b.	Nerves on glumes indistinct	**19. C. panicus**
12a.	Spikelets terete or subturgid; glumes muticous	**6. C.compactus**
12b.	Spikelets compressed; glumes with acute keel on the back	13
13a.	Involucral bracts shorter than inflorescence	**7. C. corymbosus**
13b.	Involucral bracts longer than inflorescence	14
14a.	Spikelets squarrose	**25. C. sqarrosus**
14b.	Spikelets not squarrose	**23. C. pseudokyllingioides**
15a.	Stigmas 2; nuts lenticular	16
15b.	Stigmas 3; nuts trigonous	17
16a.	Plants leafless	**14. C. laevigatus**
16b.	Plants leafy	**2. C. alopecuroides**
17a.	Clusters of spikelets single; rays absent	18
17b.	Clusters of spikelets 2-many; rays present	19
18a.	Glume 3-4 mm long with straight awn	**17. C. niveus**
18b.	Glumes 1-2 mm long with recurved awn	**8. C. cuspidatus**
19a.	Glumes muticous or mucronate with very short subulate awn	20
19b.	Glumes mucronate with straight or recurved awn	22
20a.	Rays more than 20 cm long	**9. C. diffusus**
20b.	Rays less than 20 cm long	21
21a.	Nuts exposed between the glumes	**26. C. tenuispica**
21b.	Nuts not exposed between the glumes	**12. C. haspan**
22a.	Rachilla distinctly winged	23
22b.	Rachilla wingless	24
23a.	Plants leafless or leaves reduced bladeless sheaths	**18. C. pangorei**
23b.	Plants leafy	**10. C. distans**
24a.	Spikes oblong, longer than broad	**13. C. iria**
24b.	Spikes broadly ovate, as long as broad	25
25a.	Inflorescence simple	**22. C. procerus**
25b.	Inflorescence compound	**20. C. pilosus**

1. Cyperus albescens (Steud.) Larridon & Govaerts, Kew Bull. 71: 1. 2016. *Kyllinga albescens* Steud., Syn. Pl. Glumac. 2: 68. 1854. *Kyllinga albescens* Steud., Syn. Pl. Glumac. 2(7): 68. 1854. *Lipocarpha argentea* (Vahl) R.Br. ex Nees, Linnaea 9: 287. 1835; C.B. Clarke in Hook. f., Fl. Brit. India 6: 667. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1670. 1931. *Lipocarpha chinensis* (Osbeck) J. Kern, Blumea, Suppl. 4: 167. 1958; R.S. Rao & al., Fl. E. Godavari Dist. 746. 1999; Pull., Fl. Andhra Pradesh 5: 2054. 2018. *Scirpus chinensis* Osbeck, Dagb. Osting. Rosa 220. 1757.

A rhizomatous, obtusely trigonous herb, up to 45 cm high; roots fibrous, reddish brown. Leaves linear, up to 20 cm long, acute at apex, rigid. Inflorescence of 5–7 spikes. Involucral bracts 3, unequal, up to 15 cm long. Spikelets ovoid. Bracteoles numerous. Glumes spathulate-oblong, subtruncate at apex, reddish. Scales 5-nerved. Nuts oblong, trigonous, brown.

Fl.: & Fr.: Mar.–Sep.

Habitat: Common in the moist swampy localities and paddy fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Cyperus alopecuroides Rottb., Descr. Pl. Rar. 20. 1772; R.S. Rao & al., Fl. W. Godavari Dist. 419. 1986. Pull., Fl. Andhra Pradesh 5: 1998. 2018. *Juncellus alopecuroides* (Rottb.) C.B. Clarke in Hook. f., Fl. Brit. India 6: 595. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1629. 1931.

An erect, stout, rhizomatous herb, up to 1 m high; culms trigonous with dark brown sheaths. Leaves numerous, flat, as long as stem, leathery, acute at apex. Involucral bracts leaf like, up to 50 cm long, overlapping. Inflorescence compound umbel; primary rays 7, up to 12 cm; secondary rays 6 with digitately clustered spikes. Spikes cylindric. Spikelets crowded, ovate, up to 25 flowered. Glumes ovate, apiculate with rounded keel. Styles 2. Nuts obovoid, light brown, apiculate.

Fl. & Fr.: Sep.–Jan.

Habitat: Common in marshy areas near ponds, lake surrounding.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Cyperus brevifolius (Rottb.) Endl. ex Hassk., Cat. Hort. Bot. Bogor. 24. 1844. *Kyllinga brevifolia* Rottb., Descr. Icon. Rar. Pl. 13, t. 4. 1773; C.B. Clarke in Hook. f., Fl. Brit. India 6: 588. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1624. 1931; Pull., Fl. Andhra Pradesh 5: 2051. 2018. **(Plate 19B)**

Perennial, rhizomatous herb, up to 22 cm high; rhizome horizontal, creeping, with brown scaly; culms slender, many along with rhizome, slender. Leaf blades linear, 2 mm broad, sub-basal, acuminate at apex, margins scabrid; lower ones reduced to sheaths, brownish. Inflorescence with terminal sessile, globose heads with 1–3 spikes. Involucral bracts 3, foliaceous, erect, unequal in length, 6 cm long. Spikes solitary, globose, 5 mm long with many spikelets. Spikelets ellipsoid, laterally compressed. Glumes 4, ovate- elliptic, 3–5 nerved. Stamens 2; anthers muticus. Style 2-fid, glabrous. Nuts obovate, brownish, obtuse.

Fl.: & Fr.: Nov.–Jan.

Habitat: Frequent in the marshy areas, sandy soils.

Specimens examined: Bapanammapolam, Maredupudi, *Y. Mahesh* 010058, 010112 (BSID).

4. Cyperus ceylanicus T. Koyama, Bot. Mag.73: 438. 1960. *Lipocarpha gracilis* (Rich. ex Pers.) Nees, Linnaea 9: 287. 1834; Pull., Fl. Andhra Pradesh 5: 2054. 2018. *Hypolytrum gracile* Rich. ex Pers., Syn. Pl. 1: 70. 1805. *Lipocarpha triceps* Nees in Wight, Contrib. Bot. India 92. 1834; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1670. 1931.

An erect, caespitose herb, up to 25 cm high; culms trigonous. Leaves clustered at base, linear, up to 13 cm long, acute at apex, glabrous, shorter than culms; sheaths brownish. Inflorescence terminal, capitate of few spikelets, subtended by 2–3 bracts, horizontally spreading, base dilated. Spikelets in clusters, ovoid, greyish white, many flowered; glumes concave, with a short, incurved triangular tip with a conspicuous midrib, 5-nerved. Perianth scales 2, clasping the nut, purple streaked. Nuts narrowly oblong-ellipsoid, trigonous.

Fl. & Fr.: Sep.–Jan.

Habitat: Common near water bodies and moist localities.

Specimens examined: Teliperu, Eruwada, *Y. Mahesh* 011477, 011549 (BSID).

5. Cyperus clarkei T. Cooke, Fl. Bombay 2: 873. 1908; Pull., Fl. Andhra Pradesh 5: 2003. 2018. *Mariscus*

bulbosus C.B. Clarke in Hook. f., Fl. Brit. India 6: 620. 1893. non Steud. 1854; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1644. 1931. **(Plate 19C)**

Perennial, rhizomatous herb, up to 50 cm high; rhizome sub-globose with straminaceous scales; culms solitary, trigonous, 2 mm wide, clothed with brown, membranous sheaths. Leaves 5–6 to a culm, shorter than the culms, up to 15 cm long, flaccid, margins slightly undulate; sheaths 4.5 cm long, whitish forming swollen base of stems. Inflorescence simple. Involucral bracts 3–4, foliaceous, spreading, up to 20 cm long. Spikelets oblong-terete, 2–3 × 1.5 mm, 1-fid, nerved. Glumes unequal, elliptic-oblong, 2.5 mm long, keeled, inflated with enrolled margins, rounded on back. Stamens 3; anthers linear, with appendicular tip. Style shorter than nuts, glabrous. Nuts ellipsoid, trigonous, toothed, with brown apiculate.

Fl.: & Fr.: Nov.–Jan.

Habitat: Frequent in the moist localities and along rice fields.

Specimen examined: PK Valasa, *Y. Mahesh* 010437 (BSID).

6. Cyperus compactus Retz., Observ. Bot. 5: 10. 1788; Pull., Fl. Andhra Pradesh 5: 2003. 2018. *Mariscus microcephalus* J. Presl & C. Presl, Reliq. Haenk. 1: 182. 1830; C.B. Clarke in Hook. f., Fl. Brit. India 6: 624. 1893. *Mariscus compactus* (Retz.) Bold., Zakfl. Java 77. 1916; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1645. 1931. **(Plate 19D)**

Perennial herb, with short corn like rhizome; culms erect, up to 60 cm long, obtusely trigonous-subterete, with septate nodulose. Leaves 3, slightly longer than stem; blades linear, elongate, glaucous green with septate nodulose; sheaths cylindrical, purple brown. Inflorescence compound, dense, 8–25 cm long. Involucral bracts 4–8, patent to divergent, lower ones much surpassing the inflorescence, the longest up to 80 cm long. Spikes globose, 10–20 mm across, with numerous spikelets. Spikelets falling as whole, linear-lanceolate, subterete, 12 × 1.5 mm, reddish brown. Glumes erect, linear-lanceolate, sub obtuse at apex, 5 × 1.4 mm, pale brown, 5-nerved. Stamens 3; anthers 1 mm long. Style linear, 0.5 mm long. Nut linear-oblong, trigonous, brownish yellow.

Fl.: & Fr.: Nov.–Jan.

Habitat: Frequent along marshy areas and hedges of cultivated fields.

Specimens examined: Mulugubokka, Gulletiwada, Kintukuru, *Y. Mahesh* 010027, 010612, 011455 (BSID).

7. Cyperus corymbosus Rottb., Descr. Icon. Rar. Pl. 42. t. 4. 1773; C.B. Clarke in Hook. f., Fl. Brit. India 6: 612. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1641. 1931; Pull., Fl. Andhra Pradesh 5: 2005. 2018.

Robust, perennial herb, up to 1.2 m high; rhizome stout, woody, creeping, brown scaly; culms in a series along rhizome, terete, subtrigonous above. Leaves reduced to sheaths. Inflorescence compound, 4–12 × 2.5 cm. Involucral bracts 3, lowest shorter, overtopping the inflorescence; upper ones longer, up to 12 cm long. Spikes ovoid, with 4-10 spikelets. Spikelets subterete, linear, 2 mm long, rusty brown. Rachilla winged. Glumes oblong, 2.5 × 1.5 mm, 3-nerved. Stamens 3; anthers linear. Nuts trigonous, elliptic-oblong, greyish-brown at maturity.

Fl.: & Fr.: Nov.–Dec.

Habitat: Frequent herb along moist localities and cultivated fields.

Specimen examined: Gulletiwada, *Y. Mahesh* 010553 (BSID).

8. Cyperus cuspidatus Kunth, Nov. Gen. Pl. 1: 204. 1815; C.B. Clarke in Hook. f., Fl. Brit. India 6: 598. 1893; Pull., Fl. Andhra Pradesh 5: 2006. 2018. *Cyperus uncinatus* sensu C.E.C. Fisch. in Gamble, Fl. Madras 3: 1639. 1931 non Poir. 1806.

Annual, erect herb; culms tufted, trigonous, 15 cm high. Leaves setaceous, as long as culms; sheaths purple. Inflorescence simple, reduced to single head, few or many filiform spreading unequal rays. Involucral bracts 4, patent. Spikelets linear, digitately arranged, up to 20 in each cluster. Rachilla persistent. Glumes oblong, 1.5 × 1 mm, emarginate at apex, mucronate; keel acute, 3-nerved. Stamens 3; anthers small. Style 3-fid. Nuts trigonous, oblong-obovoid, shortly apiculate.

Fl.: & Fr.: Nov.–Dec.

Habitat: Common herb along wet localities and streams banks.

Specimen examined: Eruwada, *Y. Mahesh* 011547 (BSID).

9. Cyperus diffusus Vahl, Enum. Pl. 2: 321. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 6: 603. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1639. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 737. 1999; Pull., Fl. Andhra Pradesh 5: 2007. 2018.

Perennial herb with short corm like rhizome; rhizome with brown scales; culms up to 80 cm high, rigid, trigonous. Leaves 3-costate, margins scabrous, sheaths light green turning brown. Involucral bracts 12, longer than corymb, the longest up to 30 cm long. Spikelets sessile, digitate in groups of 3–5 at apices of secondary rays, linear, 7 mm long, 10–12 flowered. Nut elliptic, 1.8 mm long, brown.

Fl.: & Fr.: Dec.–Feb.

Habitat: Frequent herb along wet areas, moist localities, cultivated fields.

Specimen examined: Eruwada, *Y. Mahesh* 010621 (BSID).

10. Cyperus distans L.f., Suppl. Pl. 103. 1782; C. B. Clarke in Hook. f., Fl. Brit. India 6: 607. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1640. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 738. 1999; Pull., Fl. Andhra Pradesh 5: 2008. 2018. **(Plate 19E)**

An erect, perennial herb with short rhizome; culms triquetrous, up to 80 cm high. Leaves as long as stem, 0.5 cm wide; sheaths up to 13 cm long, purplish at base. Inflorescence decompound, more than 20 cm long. Involucral bracts 4–6, spreading. Spikes broadly ovoid, bearing *c.* 22 spikelets; rachis smooth. Spikelets spreading, narrowly linear, 1.5 × 0.1 cm. Glumes ovate-elliptic, distantly arranged; keel greenish, 3-5 nerved. Stamens 3, anther oblong. Style 3-fid. Nuts oblong, trigonous, dark brown when mature.

Fl.: & Fr.: Sep.–Dec.

Habitat: Frequent along wet areas and streams of moist deciduous forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010434 (BSID).

11. Cyperus flavidus Retz., Observ. Bot. 5: 13. 1788; R.S. Rao & al., Fl. E. Godavari Dist. 739. 1999. *Pycreus flavidus* (Retz.) T. Koyama, J. Jap. Bot. 51: 313. 1976; Pull., Fl. Andhra Pradesh 5: 2057. 2018. **(Plate 19F)**

Densely tufted, annual herb, up to 35 cm high; rhizomes short; culms spreading from the base. Leaves few, shorter than the culm, sheaths glabrous, purple below; blades linear, plicate. Inflorescence simple, contracted, sometimes reduced to single terminal head. Involucral bracts 3–4, overtopping the inflorescence. Spikes in globose heads with cluster of 20 or more spikelets on primary and secondary rays. Spikelets linear, spreading, 0.8–3 × 0.2 cm, compressed. Rachilla wingless. Glumes ovate, imbricate. Stamens 2; anthers elliptic-oblong, muticous. Style 2-fid, glabrous. Nuts obovoid, biconvex, brown.

Fl.: & Fr.: Oct.–Jan.

Habitat: Frequently found along cultivated fields.

Specimen examined: PK Valasa, *Y. Mahesh* 010515 (BSID).

12. Cyperus haspan L., Sp. Pl. 1: 45. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 6: 600. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1640. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 740. 1999; Pull., Fl. Andhra Pradesh 5: 2012. 2018.

Perennial, rhizomatous herb; roots red; culms slender, up to 45 cm, acutely triquetrous, smooth. Leaves basal, 2 to a culm; blades linear, reduced to lanceolate appendage of sheaths, up to 20 cm long, plicate, reddish-brown. Inflorescence compound, dense, about 16 cm long and wide. Involucral bracts 2, shorter or nearly equal to inflorescence. Spikelets linear-oblong, digitately disposed at apices of rays, up to 1 cm long, flattened; rachilla wingless, hidden by glumes. Glumes oblong-elliptic, 1. 5 × 0.5 mm, pale brown, muticous; keel green, 3-nerved. Stamens 3; anthers 0.5 mm long. Style 3-fid, longer than nut. Nuts obovate, trigonous, smooth.

Fl.: & Fr.: Oct.–Dec.

Habitat: Frequently found along stream banks, edges of ponds.

Specimen examined: Eruwada, *Y. Mahesh* 010649 (BSID).

13. Cyperus iria L., Sp. Pl. 1: 45. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 6: 606. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1640. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 740. 1999; Pull., Fl. Andhra Pradesh 5: 2013. 2018. **(Plate 20A)**

An erect, annual herb, culms up to 40 cm long, trigonous, rigid. Leaves often basal, 0.5 cm wide, flat, up to 30 cm long, flaccid, acuminate, shorter than culms. Sheaths purplish, glabrous. Inflorescence compound, *c.* 13 cm long, often loose. Involucral bracts 3–5, longer one to 20 cm long. Spikes oblong, cylindrical, longer than broad with numerous spikelets. Spikelets linear-oblong, 6–1 × 1–1.5 mm, often appressed to the rachis, greenish yellow; rachilla wingless. Glumes suborbicular-broadly ovate, erect; keel 3-nerved, with strong lateral nerve, muticous. Stamens 3. Style 3- fid, obscure. Nuts trigonous, smooth.



Plate 19: A. *Bulbostylis barbata* (Rottb.) C.B. Clarke; **B.** *Cyperus brevifolius* (Rottb.) Hassk.; **C.** *Cyperus clarkei* T. Cooke; **D.** *Cyperus compactus* Retz.; **E.** *Cyperus distans* L.f.; **F.** *Cyperus flavidus* Retz.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common along wet areas and agricultural fields.

Specimen examined: Kondamodalu, *Y. Mahesh* 011456 (BSID).

14. Cyperus laevigatus L., Mant. Pl. Alt. 179. 1771; Pull., Fl. Andhra Pradesh 5: 2014. 2018. *Juncellus laevigatus* (L.) C.B. Clarke in Hook. f., Fl. Brit. India 6: 596. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1629. 1931.

Perennial, rhizomatous herb, up to 30 cm high; rhizome long, creeping horizontally; culms arranged in rows along rhizome, terete, 0.1 cm thick, fleshy, smooth. Leaves reduced. Inflorescence with subsessile, clusters of 2–12 spikelets, below the apex. Involucral bracts 2–3, longest one terete, erect, stem like. Spikelets about 30, oblong-elliptic, 6–8 × 1–2 mm, straminaceous; rachilla wingless. Glumes broadly ovate, 2 × 1.8 mm, boat shaped, muticous, keeled; keel multinerved. Stamens 3; anthers linear with red appendages at tips. Style 2 fid, longer than nuts. Nuts biconvex, ellipsoid, 1.5 × 0.6 mm, smooth.

Fl.: & Fr.: Nov.–Jan.

Habitat: Common along wet areas and agricultural fields.

Specimen examined: Kondamodalu, *Y. Mahesh* 010057 (BSID).

15. Cyperus mindorensis (Steud.) Huygh, Phytotaxa 166: 39. 2014. *Kyllinga mindorensis* Steud., Syn. Pl. Glumac. 2: 67.1854. *Kyllinga nemoralis* (J.R. Forst. & G. Forst.) Dandy, Fl. W. Trop. Afr. 2: 487. 1936; R.S. Rao & al., Fl. E. Godavari Dist. 746. 1999; Pull., Fl. Andhra Pradesh 5: 2052. 2018. *Thryocephalon nemorale* J.R. Forst. & G. Forst., Char. Gen. Pl.130. 1776. *Kyllinga monocephala* Rottb., Descr. Ic. Rar. Nov. Pl.13, t. 4, f. 4, 1773; C.B. Clarke in Hook. f., Fl. Brit. India 6: 588. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1624. 1931. **(Plate 20B)**

A perennial, tufted herb, up to 25 cm high; rhizomes flexuous, slender, creeping; culms leafy, triquetrous. Leaves longer than culm with brown sheaths. Inflorescence oblong, solid head, bearing numerous, white spikelets. Involucral bracts 4, lower one to 18 cm long, spreading. Spikelets ovate, 2-flowered. Glumes with broad opaque, ciliate winged. Nuts obovate, brown.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common in waste places, rodasides and agricultural fields.

Specimen examined: PK Valasa, *Y. Mahesh* 010449 (BSID).

16. Cyperus neochinensis (Tang & F.T. Wang) Bauters, Phytotaxa 166: 21. 2014. *Scirpus neochinensis* Tang & F.T. Wang, Fl. Reipubl. Popularis Sin. 28: 223. 1961. *Lipocarpha squarrosa* (L.) Goetgh., Wageningen Agr. Univ. Pap. 89: 71. 1989; Pull., Fl. Andhra Pradesh 5: 2055. 2018. *Scirpus squarrosus* L., Mant. Pl. Altera 2: 181. 1771; C.B. Clarke in Hook. f., Fl. Brit. India 6: 663. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1666. 1931.

A slender, glabrous herb, up to 30 cm high; rhizomes short; culms tufted, filiform. Leaves several, clustered at base, linear, with brownish sheaths. Inflorescence terminal, pseudo lateral head with 1–4 spikes, subtended by 2–3 foliaceous involucral bracts. Spikelets ovate-oblong, deeply red, squarrose, many flowered. Glumes rhomboid, tightly imbricating, 5-nerved, aristate, brown. Stamens 2; stigma 3. Nuts narrowly obovoid, trigonous, brownish.

Fl. & Fr.: Aug.– Dec.

Habitat: Common in moist localities and along roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

17. Cyperus niveus Retz., Observ. Bot. 5: 12.1788; C.B. Clarke in Hook. f., Fl. Brit. India 6: 601. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1640. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 741. 1999; Pull., Fl. Andhra Pradesh 5: 2016. 2018. **(Plate 20C)**

Perennial herb, up to 40 cm high; rhizomes woody, short, thick; culms with swollen base, close, triangular, smooth. Leaves shorter than culms, *c.* 28 cm long, linear, acuminate. Inflorescence contracted in to a single head, 5–20 spikelets. Involucral bracts 3, spreading; lower ones up to 7 cm long. Spikelets to 15 in one head, stellately spreading, oblong-lanceolate, 13 × 4 mm, whitish; rachilla wingless. Glumes closely arranged, ovate- lanceolate, 4 × 3 mm, shortly sinuate, acutely keeled at apex, mucronate. Stamens 3; anthers linear, 1.1 mm long. Style 3-fid. Nuts triquetrous, obovoid, black.

Fl.: & Fr.: Jul.–Nov.

Habitat: Occasionally found along sandy areas and lake surroundings.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011382 (BSID).

18. Cyperus pangorei Rottb., Descr. Icon. Rar. Pl. 31. 7, f. 3. 1773; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1641. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 741. 1999; Pull., Fl. Andhra Pradesh 5: 2017. 2018. *Cyperus tegetum* Roxb., Fl. Ind. 1: 211. 1820; C.B. Clarke in Hook. f., Fl. Brit. India 6: 613. 1893. *Cyperus corymbosus* var. *pangorei* (Rottb.) C.B. Clarke, J. Linn. Soc. Bot. 21: 292. 1884 & in Hook. f., Fl. Brit. India 6: 613. 1893. **(Plate 20D)**

Robust perennial herb, up to 1 m high; rhizomes short, aromatic; culms subterete-trigonus, with one concave face. Leaves flat, 20 × 1 cm; acuminate, nerves prominent. Sheaths long, lax, purple. Inflorescence compound, large, up to 20 cm long and broad. Involucral bracts 3, unequal, spreading, longest up to 25 cm long. Spikes ovoid, with short rachilla, 5–10 spikelets. Spikelets linear, slender, 2 cm long, acute, brownish; rachilla winged. Glumes elliptic-oblong, 2.5 × 1.5 mm, 7-nerved; keel 3-nerved. Stamens 3; anthers linear, with hyaline appendage at tips. Style 3-fid, small. Nuts ellipsoid, shortly denticulate at base, muticous.

Fl.: & Fr.: Dec.–Apr.

Habitat: Frequently found along stream banks, moist localities and cultivated fields.

Specimen examined: Kurlagattu, *Y. Mahesh* 011765 (BSID).

Field notes: Large herb; rhizomes aromatic.

19. Cyperus paniceus (Rottb.) Boeckeler, Linnaea 36: 381. 1870; Pull., Fl. Andhra Pradesh 5: 2018. 2018. *Kyllinga panacea* Rottb., Descr. Icon. Rar. Pl. 15, t. 4, f. 1. 1773. *Mariscus paniceus* (Rottb.) Vahl, Enum. Pl. 2: 373. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 6: 620. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1644. 1931. **(Plate 20E)**

Perennial, rhizomatous herb, up to 30 cm high; rhizomes short, decumbent, clothed with dark brown fibres; stolons slender, trigonous, covered with brown scales. Leaves shorter than culms, 4 to a culm, flat, plicate; sheaths 4 cm long, reddish brown. Inflorescence simple; bracts 3–5, longer one 10 cm long or more. Spikes sessile, cylindrical, 1 × 0.5 cm, bearing many spikelets. Spikelets lanceolate, 3 mm long, spreading. Glumes 4, lower 2 ovate, third one ovate-lanceolate, bearing nut, fourth one reduced. Stamens 3; anthers linear, 1 mm long. Style short, 3-fid. Nuts trigonous, oblong.

Fl.: & Fr.: Aug.–Oct.

Habitat: Occasional along wet areas and water courses.

Specimen examined: Valamuru, *Y. Mahesh* 010923 (BSID).

20. Cyperus pilosus Vahl, Enum. Pl. 2: 354. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 6: 609. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1641. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 742. 1999; Pull., Fl. Andhra Pradesh 5: 2018. 2018.

Perennial, rhizomatous herb; culms up to 80 cm high, triquetrous, smooth. Leaves shorter than stem, 30 × 0.7 cm, plicate; sheaths pale greenish to purplish-brown. Inflorescence varying in size, compound, loose. Involucral bracts 2–5, spreading, 3 much longer than inflorescence, up to 40 cm long. Spikes ovoid, up to 20 spikelets; rachis densely hirsute. Spikelets spreading, linear-lanceolate or elliptic, straw coloured with brown tinges; rachilla erect. Glumes ovate, acute, pale straw coloured, 5–7 nerved, keel on back. Stamens 3; anthers 0.7 mm long. Style 3-fid. Nuts obovate, trigonous, dark brown.

Fl.: & Fr.: Sep.–Nov.

Habitat: Commonly found near water courses and along roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

21. Cyperus polystachyos Rottb., Descr. Pl. Rar. 21. 1772. *Pycreus polystachyos* **(**Rottb.) P. Beauv., Fl. De Oware & Benin 2: 48, t. 86, f. 2. 1807; C.B. Clarke in Hook. f., Fl. Brit. India 6: 592. 1893; R.S. Rao & al., Fl. E. Godavari Dist. 748. 1999; Pull., Fl. Andhra Pradesh 5: 2058. 2018. *Pycreus odoratus* Urban., Symb. Antill. 2: 164. 1900; C.E.C. Fisch. in Fl. Madras 3: 1627. 1931. **(Plate 20F)**

Perennial, rhizomatous herb, up to 40 cm high; rhizomes covered with purple scales; culms tufted, triquetrous. Leaves shorter than culms, flat, linear, acuminate; sheaths reddish brown. Inflorescence simple, sub globose, with cluster of spikelets. Spikelets spicately arranged, narrowed to acute at apex, flat, reddish brown; rachilla flexuous, shortly winged. Glumes ovate, 2.5 × 1 mm, mucronulate at apex, reddish brown, 3-nerved on keel. Stamens 2, anthers small. Style 2-fid. Nuts oblong, 0.15 mm long, truncate at apex, dark brown.

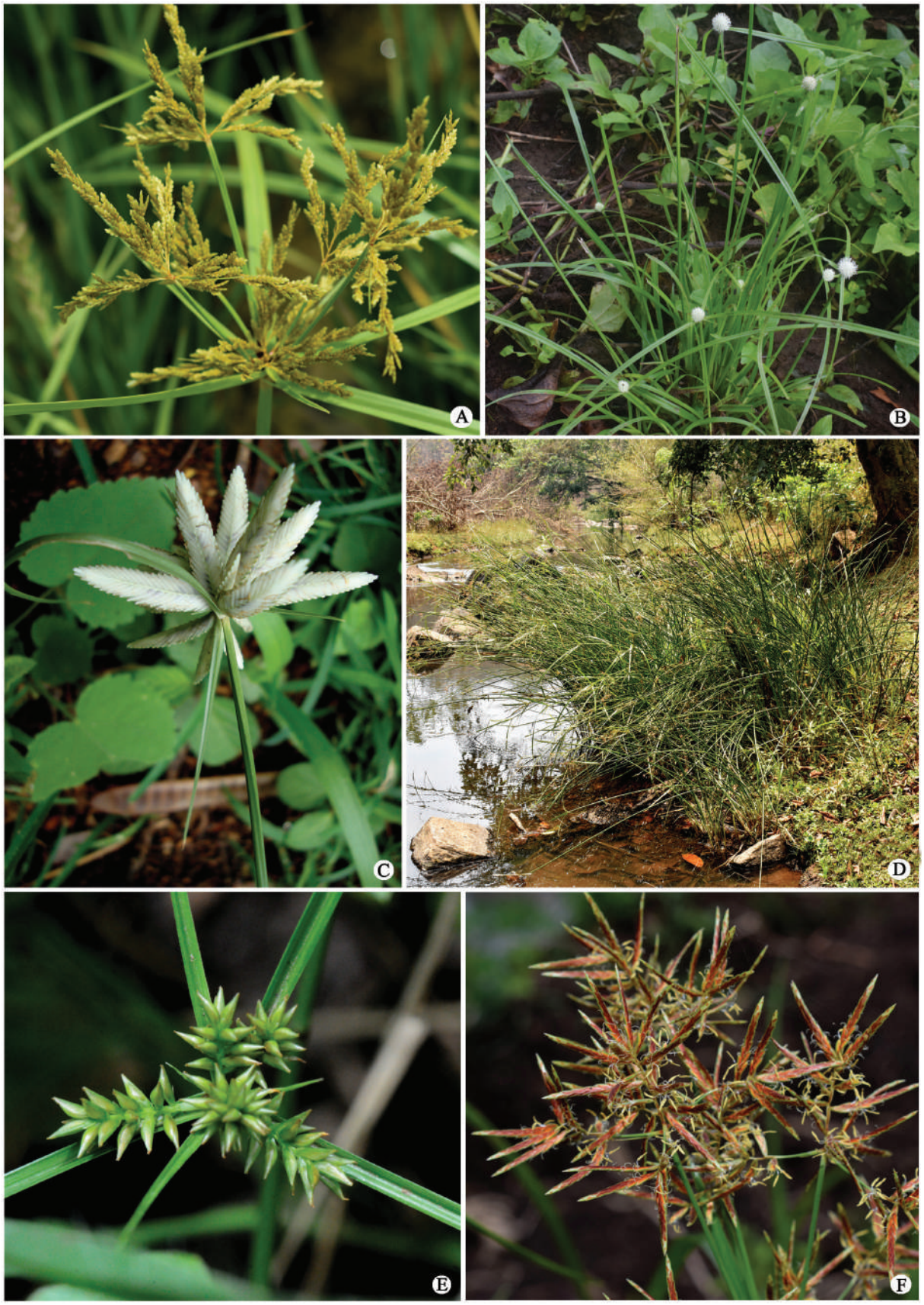


Plate 20: A. *Cyperus iria* L.; **B.** *Cyperus mindorensis* (Steud.) Huygh; **C.** *Cyperus niveus* Retz.; **D.** *Cyperus pangorei* Rottb.; **E.** *Cyperus paniceus* (Rottb.) Boeckeler; **F.** *Cyperus polystachyos* Rottb.

Fl.: & Fr.: Sep.–Nov.

Habitat: Frequently found in moist localities and sandy soils in the forest.

Specimen examined: Bhupathipalem, *Y. Mahesh* 011442 (BSID).

22. Cyperus procerus Rottb., Descr. Icon. Rar. Pl. 29, t. 5. 1773; C.B. Clarke in Hook. f., Fl. Brit. India 6: 610. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1641. 1931; Pull., Fl. Andhra Pradesh 5: 2020. 2018.

Perennial, rhizomatous herb, up to 80 cm high; stolons slender, wiry, covered with scales; culms triquetrous, arising from base. Leaves spongy, shorter than culms, glabrous beneath; sheaths glabrous. Inflorescence simple, 6 cm long and broad. Involucral bracts 4, foliaceous, spreading, lowest one overtopping the inflorescence. Spikes ovoid, about 10 spikelets; rachis smooth, angular. Spikelets linear, sub compressed, yellowish brown, acute. Glumes ovate, 3 × 2 mm, 7-nerved, slightly keeled. Stamens 3; anthers linear, 2 mm long. Style 3-fid. Nuts obovoid, triquetras, 1 mm across.

Fl.: & Fr.: Apr.–Sep.

Habitat: Occasionally found in marshy areas and near lakes.

Specimen examined: PK Valasa, Kondamodalu, *Y. Mahesh* 010516, 011738 (BSID).

23. Cyperus pseudokyllingioides Kuk., in Engler, Pflanzenr. IV. (Ht. 101) 14. 1935. *Courtoisia cyperoides* (Roxb.) Nees, Linnaea 9: 286. 1834; C.B. Clarke in Hook. f., Fl. Brit. India 6: 625. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1645. 1931. *Cyperus cyperoides* (Roxb.) Sojak, Cass. Nar. Mus. Odd. Prir. 148: 193. 1979. Publ. 1980; Pull., Fl. Andhra Pradesh 5: 1994. 2018. **(Plate 21A)**

Robust, annual herb, up to 50 cm high; culms slender, trigonous, rigid, strongly ribbed. Leaves shorter than culms, 4 mm wide, single nerved. Inflorescence compound, consists of head like spikes on rays. Involucral bracts 5, the longest one 25 cm long, compressed. Rachis obscure. Glumes plicate, semilunar, 4 × 1.1 mm, strongly keeled; keel spongy, 0.3 mm wide. Stamens 3; anthers 0.4 mm long, linear. Style 3-fid, obscure. Nuts trigonous, ellipsoid, tapering at both ends, reddish brown.

Fl.: & Fr.: Oct.–Dec.

Habitat: Frequent in agriculture fields of open forests and marshy areas.

Specimen examined: Gulletiwada, *Y. Mahesh* 010606 (BSID).

24. Cyperus sanguinolentus Vahl, Enum. Pl. 2: 351. 1805; R.S. Rao & al., Fl. E. Godavari Dist. 742. 1999. *Pycreus sanguinolentus* (Vahl) Nees ex C.B. Clarke in Hook. f., Fl. Brit. India 6: 590. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1627. 1931; Pull., Fl. Andhra Pradesh 5: 2060. 2018.

Annual herb, up to 35 cm high; culms tufted, obtuse-angular, rooting at 1–3 nodes above the base, clothed above the base. Leaves shorter than culms; blades linear, 0.3 cm wide, flat, plicate, acute-acuminate; sheaths reddish brown, glabrous. Inflorescence simple, contracted to 2–3, dense, sessile, single terminal head. Involucral bracts 3–5, foliaceous, longest one *c.*10 cm long, deflexed. Spikelets linear or narrowly ovate, 1.2 cm long, compressed, stellately spreading, blood red, acute; rachilla wingless. Glumes narrowly ovate, 2.5 mm, as long as broad, boat shaped; keel 3–5 nerved, with a dark brown lateral nerve. Stamen 2; anthers appendiculate at tips. Style 2-fid. Nuts biconvex, suborbicular, 1 mm across, apiculate.

Fl.: & Fr.: Sep.–Dec.

Habitat: Frequently found in rice fields and marshy localities near water courses.

Specimen examined: Kondamodalu, *Y. Mahesh* 011721 (BSID).

25. Cyperus squarrosus L., Cent. Pl. 2: 6. 1756; R.S. Rao & al., Fl. E. Godavari Dist. 743. 1999; Pull., Fl. Andhra Pradesh 5: 2022. 2018. *Mariscus squarrosus* (L.) C.B. Clarke in Hook. f., Fl. Brit. India 6: 623. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1645. 1931.

Densely tufted, annual herb, up to 15 cm high; culms small, filiform, triquetrous, aromatic. Leaves 3 to a culm, filiform, shorter than culm; blades herbaceous. Involucral brats 3, filiform. Inflorescence simple, reduced to pseudo lateral clusters, *c.* 7 mm diam. Spikes cylindric, oblong, 1.3 cm long. Spikelets linear-oblong, 4–3.5 × 1.2–1.6 mm, compressed, *c.* 10 flowered, brown ringed; rachilla not winged, persistent. Glumes ovate, 2 × 0.5 mm, keel 3-nerved. Stamen 1; anthers small, muticous. Style 3-fid, smaller than nuts. Nuts obovoid, trigonous, 1 mm long, obscurely dotted.

Fl.: & Fr.: Sep.–Nov.

Habitat: Frequently found in rice fields, wet rocky areas and near water courses.

Specimen examined: Eruwada, *Y. Mahesh* 011548 (BSID).

26. Cyperus tenuispica Steud., Syn. Pl. Glumac. 2: 11. 1854; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1640. 1931; Pull., Fl. Andhra Pradesh 5: 2023. 2018. *Cyperus flavidus* Retz: sensu C.B. Clarke in Hook. f., Fl. Brit. India 6: 600. 1893.

Densely tufted, annual herb, up to 20 cm high; culms slender, triquetrous, ribbed. Leaves linear, flat, almost as long as culms, acute. Inflorescence compound, 10 cm across. Involucral bracts 3–5, spreading, the lowest one equaling the culm. Spike ovate, with finger like sessile spikelets. Spikelets linear-oblong, 4–6 × 0.6–1.2 mm, compressed, stellatly spreading, greenish, tinged with red, acute; rachilla fluxosus, slender, visible. Glumes ovate, 0.8 × 0.5 mm, keeled, with 2 distant nerved. Stamen 1; anther elliptic, muticous. Style 3-fid. Nut trigonous, 0.3 mm long.

Fl.: & Fr.: Sep.–Nov.

Habitat: Common in marshy areas and rice fields.

Specimen examined: Maredupudi, *Y. Mahesh* 010120 (BSID).

4. ELEOCHARIS R.Br.

India: 28 spp., 1 subsp. & 1 var.; Andhra Pradesh: 7 spp.; PNP: 1 sp.

1. Eleocharis acutangula (Roxb.) Schult. in Roem. & Schult., Mant. 2: 91. 1824; Pull., Fl. Andhra Pradesh 5: 2025. 2018. *Scirpus acutangulus* Rox., Fl. Ind. 1: 216. 1820. *Eleocharis fistulosa* (Poir.) Schult. in Roem. & Mant. 2: 89. 1824; C.B. Clarke in Hook. f., Fl. Brit. India 6: 626. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1648. 1931. *Scirpus fistulosus* Poir., Encycl. 6: 749. 1805.

Perennial, rhizomatous herb, up to 60 cm high; culms triquetrous, slightly green. Leaf sheaths membranous, *c.*15 cm long, purplish towards base, oblique at mouth. Spikelets cylindrical, acute at apex, *c.* 3 cm long with many flowers. Glumes loosely imbricate, ovate-oblong, slightly acute at apex. Hypogynous bristles 6, linear, 2.2 mm long, retrorsely scabrid. Stamens 3; anthers linear-oblong, brown. Style 3-fid, with conical base. Nuts obovoid, compressed, yellowish brown, with persistent style base.

Fl.: & Fr.: Sep.–Dec.

Habitat: Rare near ponds and stagnant water courses.

Specimen examined: Nallakunta, *Y. Mahesh* 011591 (BSID).

5. FIMBRISTYLIS Vahl

India: 117 spp., 5 subsp. & 6 var.; Andhra Pradesh: 21 spp.; PNP: 10 spp.

Key to the species

1a.	Stigmas 3	2
1b.	Stigmas 2	6
2a.	Inflorescence of single spikelet	**6. F. ovata**
2b.	Inflorescence of few to many spikelets	3
3a.	Spikelets sessile, all clustered or partly clustered	**4. F. falcata**
3b.	Spikelets all solitary, not clustered	4
4a.	Cauline leaves well developed	**10. F. tenera**
4b.	Cauline leaves reduced to bladeless sheath	5
5a.	Rachilla wingless; glumes muticous	**5. F. littoralis**
5b.	Rachilla more or less winged; glumes mucronate	**8. F. quinguangularis**
6a.	Inflorescence of single terminal spikelet	7
6b.	Inflorescence of few to several spikelets	8
7a.	Glumes with distinct 4-7 nerves	**9. F. schoenoides**
7b.	Glumes nerveless	**7. F. polytrichoides**
8a.	Leaves eligulate	**1. F. aestivalvis**
8b.	Leaves ligulate	9
9a.	Nuts smoothly trabeculate; stamen 1	**2. F. bisumbellata**
9b.	Nuts coarsely trabeculate; stamens 1-2	**3. F. dichotoma**

1. Fimbristylis aestivalis (Retz.) Vahl, Enum. Pl. 2: 288.1805; C.B. Clarke in Hook. f., Fl. Brit. India 6: 637. 1893; Pull., Fl. Andhra Pradesh 5: 2030. 2018. *Scirpus aestivalis* Retz., Observ. Bot. 4: 12. 1786.

Annual, tiny herb with fibrous roots, up to 20 cm high; culms tufted, trigonous, slender, smooth. Leaves 4 to a culm, setaceous, filiform, shorter than culm, flat, pubescent, eligulate. Inflorescence decompound with

many spikelets. Involucral bracts few, ciliate at base. Spikelets solitary, oblong-lanceolate, acute, many flowered. Glumes ovate, acute, mucronate. Stamen 1; anthers oblong. Style filiform, ciliate at top. Nuts biconvex, obovate-elliptic, brown.

Fl.: & Fr.: Sep.–Dec.

Habitat: Occasionally in muddy areas and moist localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010470 (BSID).

2. Fimbristylis bisumbellata (Forssk.) Bubani, Gazz. Tosc. Sci. Med.-Fis. 8(5): 30. 1850; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1658; R.S. Rao & al., Fl. E. Godavari Dist. 743. 1999; Pull., Fl. Andhra Pradesh 5: 2031. 2018. *Scirpus bisumbellatus* Forssk., Fl. Aegypt. -Arab.1:15. 1775. *Fimbristylis dichotoma* C.B. Clarke in Hook. f., Brit. India 6: 636. 1893. (**Plate 21B)**

Densely tufted, annual herb, up to 30 cm high; culms slightly angular. Leaves linear, flat, 15 cm long, shorter than the culms, pubescent beneath, ligulate; sheaths pubescent, membranous. Inflorescence compound, contracted. Involucral bracts 4, foliaceous; rays 3–4, up to 3 cm long with many spikelets. Spikelets solitary, oblong-ovoid, 4–8.5 × 1–16 mm; rachis winged. Glumes ovate-elliptic, 1.2 × 1 mm, membranous, 3-nerved keel. Stamen 1; anthers oblong, muticous. Style bifid, slender, dilated at base. Nuts biconvex, obovoid, shortly stipitate.

Fl.: & Fr.: Nov.–Mar.

Habitat: Frequent in sandy soils, rice fields and marshy localities.

Specimen examined: Kakeshnur, *Y. Mahesh* 011315 (BSID).

3. Fimbristylis dichotoma (L.) Vahl, Enum. Pl. 2: 287. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 6: 635. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1658. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 744. 1999; Pull., Fl. Andhra Pradesh 5: 2035. 2018. *Scirpus dichotomus* L., Sp. Pl. 1: 50. 1753.

Annual tufted herb, up to 45 cm high; culms trigonous, compressed below, glabrous. Leaves up to 8, equal to the culms; blades erect, linear, 40 cm long, glaucous beneath, many veined, ligulate; sheaths glabrous, arborescent. Inflorescence simple to compound, contracted in capitate heads. Involucral bracts 4, filiform, shorter than inflorescence, lower one erect with many spikelets. Spikelets solitary, ovoid, 5 × 2.5 mm long, peduncled, subacute; rachis winged. Glumes oblong, 3.4 × 2.1 mm; keel with 4 nerves, brown, lineolate, apiculate. Stamens 2; anthers linear, apiculate. Style 2-fid, linear. Nuts obovoid, biconvex, 1 mm across, stipitate, muticous.

Fl.: & Fr.: Nov.–Mar.

Habitat: Frequent in water courses and marshy localities near lakes.

Specimen examined: PK Valasa, *Y. Mahesh* 010441 (BSID).

4. Fimbristylis falcata (Vahl) Kunth, Enum. Pl. 2: 239. 1837; Pull., Fl. Andhra Pradesh 5: 2037. 2018. *Scirpus falcatus* Vahl, Enum. Pl. 2: 275. 1805. *Fimbristylis junciformis* (Nees) Kunth, Enum. Pl. 2: 239. 1837; C.B. Clarke in Hook. f., Fl. Brit. India 6: 647. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1660. 1931.

Perennial, rhizomatous herb, up to 40 cm high; culms solitary, angular, rigid. Leaves shorter than culms, falcate, 25 cm long, spreading, coriaceous, rounded at base, triangular acute at tip, margins incurved; sheaths short. Inflorescence compound, with many spikelets, 4 × 2.5 cm. Involucral bracts 4, shorter than inflorescence, acuminate at apex. Spikelets in clusters, ovoid, angled, acute, 5 × 1.5 mm, many flowered; rachilla winged. Glumes spiral, ovate, 2.5 mm across, apiculate, keeled; keel with hyaline apex. Stamens 3; anthers linear-oblong, produced white bristles at tip. Style 3-fid, triquetrous, thickened at base, glabrous. Nuts obovoid, trigonous, smooth.

Fl.: & Fr.: Aug.–Nov.

Habitat: Frequent in water courses and open wet grassy areas.

Specimen examined: Kondamodalu, *Y. Mahesh* 011490 (BSID).

5. Fimbristylis littoralis Gaudich., Voy. Uranie, Bot. 413. 1829; Pull., Fl. Andhra Pradesh 5: 2039. 2018. *Fimbristylis miliacea* (L.) Vahl, Enum. Pl. 2: 287. 1805; C. B. Clarke in Hook. f., Fl. Brit. India 6: 644. 1893; R.S. Rao & al., Fl. E. Godavari Dist. 745. 1999.

Annual tufted herb, up to 50 cm high; culms erect, tetra angled with sharp edges below the inflorescence. Leaves reduced to sheaths, 5–8 cm long, clasping the stem. Inflorescence compound with few to many spikelets. Involucral bracts 3–4, rigid. Spikelets ovoid, 3 × 2.4 mm, many flowered, brown. Glumes ovate, 1.6 × 0.6 mm, boat

shaped, obtuse at apex, membranous, reddish brown, keeled; keel single nerved. Stamen 1; anthers linear. Style 3-fid, flat. Nut obovoid, trigonous, 0.9 × 0.5 mm, creamy yellow.

Fl.: & Fr.: Apr.–Oct.

Habitat: Occasionally found in moist localities and water courses.

Specimen examined: Maredupudi, *Y. Mahesh* 010121 (BSID).

Field note: Culms 4-angled, leaves reduced to sheaths.

6. Fimbristylis ovata (Burm.f.) J. Kern, Blumea 15: 126. 1967. & in Steenis, Fl. Males. 1. 7: 595. 1974; R.S. Rao & al., Fl. E. Godavari Dist. 745. 1999; Pull., Fl. Andhra Pradesh 5: 2040. 2018. *Carex ovata* Burm.f., Fl. Ind. 194. 1768. *Fimbristylis monostachyos* (L.) Hassk., Pl. Jav. Rar. 61. 1848, (*monostachya*); C.B. Clarke in Hook. f., Fl. Brit. India 6: 649. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1660. 1931.

An erect, perennial herb, up to 30 cm high; culms filiform, angular, rigid, scabrid below the inflorescence. Leaves crowded on swollen base of the culm, linear, 18 cm long, scabrid, shorter than culms, subacute; sheaths straminaceous, glabrous. Inflorescence single, terminal spikelet, with 2 additional peduncled spikelets. Involucral bracts 2, 1 cm long. Spikelets ellipsoid–oblong, erect, straminaceous; rachilla winged. Glumes broadly ovate, 6 × 5 mm, carinate, with 5-nerved, smooth, keeled. Stamens 3, anthers linear. Style 3-fid, flat, pubescent, dilated at base. Nuts obovoid, trigonous, straminaceous.

Fl.: & Fr.: Apr.–Oct.

Habitat: Occasionally found along water courses in open forest.

Specimen examined: PK Valasa, *Y. Mahesh* 012149 (BSID).

7. Fimbristylis polytrichoides (Retz.) R. Br., Prodr. Fl. 226. 1810; C.B. Clarke in Hook. f., Fl. Brit. India 6: 632. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1658. 1931; Pull., Fl. Andhra Pradesh 5: 2041. 2018. *Scirpus polytrichoides* Retz., Observ. Bot. 4: 11. 1786.

Perennial, densely tufted herb, up to 30 cm high; culms subcompressed, trigonous, clothed with sheaths at base. Leaves ligulate, reduced to sheaths; sheaths straminaceous, smooth. Inflorescence of a single terminal spikelet. Involucral bracts 2, many nerved on keel, smooth. Spikelets ellipsoid, 4–8 × 3–35 mm, subacute, many flowered; rachis winged. Glumes spiral, lanceolate, 3 × 1.3 mm, sub-flat, broadly hyaline margins. Stamen 1; anther linear. Style 2-fid. Nuts biconvex, oblong-obovoid, sub-truncate, greyish- purple.

Fl.: & Fr.: Sep.–Nov.

Habitat: Rare in sandy shores of open forest.

Specimen examined: Kondamodalu, *Y. Mahesh* 011485 (BSID).

Field notes: Leaves reduced to sheaths and ligulate.

8. Fimbristylis quinquangularis (Vahl) Kunth, Enum. Pl. 2: 229. 1837; C.B. Clarke in Hook. f., Fl. Brit. India 6: 644. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1659. 1931; Pull., Fl. Andhra Pradesh 5: 2042. 2018. *Scirpus quinquangularis* Vahl, Enum. Pl. 2: 279. 1805. *Fimbristylis miliacea* (L.) Vahl, Enum. Pl. 2: 287 1805; C.B. Clarke in Hook. f., Fl. Brit. India 6: 644. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1660. 1931.

Annual, rhizomatous, tufted herb, up to 60 cm high; culms arising from axils of leaf blades, pentagonous, clothed at base with sheaths, smooth. Leaves cauline, blades dorsiventrally flat, shorter than culms, 35 cm long, 5-nerved above, smooth, except on upper margins. Sheaths 6 cm long, pale green. Inflorescence compound, 8 cm long, rays 6–7, patent, scabrous. Secondary corymbs with many spikelets. Involucral bracts 5, shorter than rays. Spikelets solitary, ovoid, rusty brown, with many flowered; rachilla winged. Glumes spiral, broadly ovate, obtuse, apiculate at apex, keeled. Stamen 1; anther oblong. Stigmas 3, minutely ciliate. Nuts obovoid, trigonous.

Fl.: & Fr.: Sep.–Nov.

Habitat: Frequent in wet areas and water courses of open forests.

Specimen examined: Teliperu, *Y. Mahesh* 011478 (BSID).

9. Fimbristylis schoenoides (Retz.) Vahl, Enum. Pl. 2: 286. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 6: 634. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1658. 1931; Pull., Fl. Andhra Pradesh 5: 2043. 2018. *Scirpus schoenoides* Retz., Observ. Bot.5: 14. 1788.

Annual, glaucous herb, up to 60 cm high; culms filiform, obtusely angled, ribbed. Leaves few, ligulate, filiform,

shorter than the culms; sheaths pinkish-brown. Inflorescence a solitary, terminal spikelet. Involucral bracts 3, filiform, glume like. Spikelets 3, ovoid, 5.5 × 4 mm, many flowered; rachilla winged. Glumes spiral, 2 mm across, broadly ovate, apiculate at apex, straw coloured with red tinged, keeled. Stamens 2, flattened; anthers oblong, mucronate. Style flattened, ciliate in upper part; stigma 2-fid. Nut biconvex, obovate, stipitate.

Fl.: & Fr.: Aug.–Nov.

Habitat: Occasioanally found in grasslands, rice fields and water course areas.

Specimen examined: PK Valasa, *Y. Mahesh* 010519 (BSID).

10. Fimbristylis tenera Roem. & Schult., Mant. 2: 57. 1825; C.B. Clarke in Hook. f., Fl. Brit. India 6: 642. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1660. 1931; Pull., Fl. Andhra Pradesh 5: 2044. 2018. (**Plate 21C)**

Annual, tufted herb, up to 40 cm high; culms slender, filiform, striate. Leaves many, erect, half the length of the culm, glaucous green, up to 20 cm long. Inflorescence sub- compound with many spikelets. Involucral bracts 3, shorter than inflorescence. Spikelets solitary, ovate, 8 × 2 mm, acute at apex, many flowered; rachilla winged. Glumes spiral, ovate, mucronate at apex, keeled. Stamen 1; anthers linear, acute. Stigmas 3. Nuts obovoid, trigonous.

Fl.: & Fr.: Aug.–Nov.

Habitat: Rare in rice fields and water course areas.

Specimen examined: Tekupally, *Y. Mahesh* 011700 (BSID).

6. FUIRENA Rottb.

India: 8 spp. & 1 var.; Andhra Pradesh: 5 spp.; PNP: 2 spp.

Key to the species

1a.	Glumes thick, spongy within, 5-7 nerved	**2. F. uncinata**
1b.	Glumes thin, membranous, slender, 3-nerved	**1. F. ciliaris**

1. Fuirena ciliaris (L.) Roxb., Fl. Ind. 1: 184. 1820; Pull., Fl. Andhra Pradesh 5: 2047. 2018. *Scirpus ciliaris* L., Mant. Pl. 182. 1771. *Fuirena glomerata* Lam., Tabl. Encycl. 1: 150. 1791; C. B. Clarke in Hook. f., Fl. Brit. India 6: 666. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1669. 1931. (**Plate 21D)**

Annual, erect herb, up to 60 cm high; culms obtuse, angular. Leaves linear-lanceolate, 8–18 × 0.4–0.6 cm, 5-nerved, acute, margins ciliate, densely hispid on both surfaces. Inflorescence terminal, contracted, 2–4 clusters, often 1–2 lateral clusters, excerted from lower axils of bractiform leaves. Involucral bracts 3, hispid. Spikelets ellipsoid, 3–8 × 3.5 mm, terete, greenish-brown, tinged with brown; rachis pilose. Glumes oblong, 2 × 1 mm, keel 3-nerved. Stamens 3; anthers elliptic. Style 3-fid, as long as stigma. Nuts triquetrous, obovoid, 0. 5 mm long, smooth, slightly beaked.

Fl.: & Fr.: Sep.–Nov.

Habitat: Common in grasslands and rice fields.

Specimen examined: PK Valasa, *Y. Mahesh* 010537 (BSID).

2. Fuirena uncinata (Willd.) Kunth, Enum. Pl. 2: 184. 1837; C.B. Clarke in Hook. f., Fl. Brit. India 6: 666. 1983; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1669. 1931; Pull., Fl. Andhra Pradesh 5: 2050. 2018. *Scirpus uncinatus* Willd., Sp. Pl. 4. 1: 300. 1797.

Annual, tufted herb, up to 45 cm high; culms sub-pentagonal, ribbed. Leaves basal and cauline, 0.3–16 × 0.04–0.06 cm, soft, pilose on both sides with spreading tubercle-based hairs; sheaths 3.5 cm long, hairy, ligule membranous. Inflorescence 3-glomerules of spikelets. Spikelets sessile, ellipsoid, 4–6 × 2–3.5 mm. Glumes spiral, obovate-elliptic, 2.2 × 1.5 mm, boat shaped, with 1-nerved keel, obtuse, glaucous green, pilose. Hypogynous bristles 3, retrorsely scabrid. Stamens 3; anthers 0.4 mm long. Style linear, stigmas 3. Nuts triquetrous, acute at both ends.

Fl.: & Fr.: Oct.–Jan.

Habitat: Rare along the rice fields and road sides.

Specimen examined: Kondamodalu, *Y. Mahesh* 010066 (BSID).

7. SCHOENOPLECTIELLA Lye

India: 11 spp.; Andhra Pradesh: 6 spp.; PNP: 3 spp.

Key to the species

1a.	Hypogynous scales or bristles present	**2. S. mucronata**
1b.	Hypogynous scales or bristles absent	2
2a.	Nuts smooth, not undulate	**1. S. articulata**
2b.	Nuts undulated from transversely wavy lines on each face	**3. S. senegalensis**

1. Schoenoplectiella articulata (L.) Lye, Lidia 6: 20. 2003; Pull., Fl. Andhra Pradesh 5: 2064. 2018. *Scirpus articulatus* L., Sp. Pl. 1: 47. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 6: 656. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1666. 1931. *Schoenoplectus articulatus* (L.) Palla, Bot. Jahrb. Syst. 10: 299. 1888; R.S. Rao & al., Fl. E. Godavari Dist. 749. 1999. (**Plate 21E)**

Densely tufted, perennial herb, up to 35 cm high; culms many, terete, spongy, septate. Leaf sheaths sub-distichous, membranous, striate, oblique at mouth; blades reduced to sheaths. Inflorescence simple, pseudo-lateral, sessile, of capitate heads, below the middle with *c.* 20 spikelets. Involucral bracts solitary, stem like, longer than culms. Spikelets ellipsoid, 4–8 × 3.2–3.5 mm, sessile, tinged with brown, obtuse. Glumes broadly ovate, 4 × 3.5 mm, boat shaped; keel 1-mid nerved. Stamens 3; anthers elliptic-oblong, muticous. Style 3-fid. Nuts obovoid, trigonous, yellowish-brown, apiculate.

Fl.: & Fr.: Oct.–Dec.

Habitat: Rare in stagnant water bodies and moist localities.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Schoenoplectiella mucronata (L.) J. Jung & H.K. Choi, J. Pl. Biol. 53: 230. 2010. *Scirpus mucronatus* L., Sp. Pl. 1: 50. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 6: 657. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1666. 1931. *Schoenoplectus mucronatus* (L.) Palla, Bot. Jahrb. Syst. 10: 299. 1888; Pull., Fl. Andhra Pradesh 5: 2068. 2018.

Perennial, short rhizomatous herb, up to 60 cm high; culms 3-angled, concave, green. Leaves reduced to sheaths, lower one brown; upper one 3-angled, cylindrical, straminaceous brown, mucronate at apex. Inflorescence pseudo-lateral heads with about 12 spiklets. Involucral bracts 1, trigonous, erect. Spikelets straminaceous brown, oblong, 6–10 × 2.5–5.5 mm, with many flowered. Glumes ovate-orbicular, ciliate at apex, brown, numerous nerved on both sides. Hypogynous bristles 6, shorter than nuts, reddish brown. Stamens 3, anthers with cuspidate tip. Style 3-fid. Nuts obovate, trigonous, mucronate at apex, brown.

Fl.: & Fr.: Oct.–Jan.

Habitat: Rare in stagnant water bodies and edges of ponds.

Specimen examined: Kondamodalu, *Y. Mahesh* 010065 (BSID).

3. Schoenoplectiella senegalensis (Steud.) Lye, Lidia 6: 27. 2003; Pull., Fl. Andhra Pradesh 5: 2066. 2018. *Isolepis senegalensis* Steud., Syn. Pl. Glumac. 2(8-9): 96. 1855. *Schoenoplectus senegalensis* (Hochst. ex Steud.) Palla, Bot. Jahrb. Syst. 10: 299. 1888. *Scirpus jacobi* C.E.C. Fisch., Kew Bull. Misc. 1931: 103. 1931 & in Gamble, Fl. Madras 3: 1666. 1931.

An erect, perennial herb, up to 35 cm high; culms tufted, slender, subterete, transversely septate, sheathed. Leaves reduced to sheaths, contracted, obliquely truncate. Inflorescence pseudo-lateral, dense, with many spikelets. Involucral bracts up to 22 cm long, culm like. Spikelets sessile, ovoid or subglobose, 7 mm long, up to 15 in cluster, fulvous. Glumes suborbicular, 3 mm long, obtuse. Stigmas 3. Nuts obtusely trigonous, obovoid, apiculate, black.

Fl.: & Fr.: Nov.–Jan.

Habitat: Rare in sandy localities in the forest.

Specimen examined: Gulletiwada, *Y. Mahesh* 010600 (BSID).

8. SCLERIA P.J. Bergius

India: 27 spp. & 1 var.; Andhra Pradesh: 5 spp. & 1 subsp.; PNP: 3 spp.

Key to the species

1a.	Disc well developed	**3. S. terrestris**
1b.	Disc obsolete or reduced; nuts with depression at the base	2
2a.	Leaves evenly distributed throughout the stem	**1. S. corymbosa**
2b.	Leaves aggregate in middle of the stem	**2. S. lithosperma**

1. Scleria corymbosa Roxb., Fl. Ind. 2, 3: 574. 1832; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1677. 1931; R.S. Rao

& al., Fl. E. Godavari Dist. 749. 1999; Pull., Fl. Andhra Pradesh 5: 2069. 2018. *Scleria ridleyi* C.B. Clarke in Fl. Brit. India 6: 686. 1894.

Perennial herb, up to 1.3 m high; rhizome woody; culms solitary, robust, trigonous. Leaves evenly distributed on culm, blades linear, up to 50 cm long, glabrous, light green; sheaths trigonous, smooth. Inflorescence long, cylindrical, panicles, up to 70 cm long. Spikelets bisexual. Male spikelets sessile, lanceolate, 4.5 mm long. Glumes ovate, 4 mm long. Stamens 3; anthers 1.8 mm long. Bisexual spikelets subsessile, ovoid with one male sessile spikelet in uppermost axil. Glumes broadly ovate, 4 mm long, brown. Nuts ovoid, acute at apex, obtusely trigonous, glabrous.

Fl.: & Fr.: Sep.–Nov.

Habitat: Rare in moist localities as forest undergrowth.

Specimen examined: Valamuru, *Y. Mahesh* 010525 (BSID).

2. Scleria lithosperma (L.) Sw., Prodr. Fl. Ind. Occid. 18. 1788; C.B. Clarke in Hook. f., Fl. Brit. India 6: 685. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1677. 1931; Pull., Fl. Andhra Pradesh 5: 2070. 2018. *Scirpus lithospermus* L., Sp. Pl. 1: 51. 1753.

Perennial herb, up to 70 cm high; culms slender, smooth, trigonous. Leaves linear, 30 cm long, dense at the middle of the culm, rigid, narrow at apex, margins scabrid; sheaths pubescent on the faces. Inflorescence in terminal loose panicle, 3–4 or with few spikelets; terminal one *c.* 20 cm long. Spikelets bisexual, solitary, with one female flower and several male flowers. Glumes of nut bearing spikelets ovate-lanceolate, mucronate at apex. Stamen 1; anther linear. Style 3-fid, short. Nuts obovoid, trigonous, 2.6 × 1.9 cm, obtuse, smooth, white.

Fl.: & Fr.: Sep.–Nov.

Habitat: Frequently found in moist localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010464 (BSID).

Field notes: Leaves dense at the middle of the culms.

3. Scleria terrestris (L.) Fassett, Rhodora 26: 159. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 750. 1999; Pull., Fl. Andhra Pradesh 5: 2071. 2018. *Zizania terrestris* L., Sp. Pl. 2: 991. 1753. *Scleria chinensis* Kunth. var. *biauriculata* C.B. Clarke in Hook. f., Fl. Brit. India 6: 690. 1893. *Scleria cochinchinensis* (Lour.) Druce, Bot. Soc. Exch. Club Brit. Isles Rep. 4: 646. 1917; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1678. 1931. (**Plate 21F)**

Perennial herb; rhizomes short; culms slender, robust, trigonous, scabrid on sharp angles. Leaves with long sheaths; sheaths *c.* 25 cm long; blades scabrid on margins. Inflorescence a linear cluster of panicle, terminal or axillary. Involucral bracts setaceous, shorter than inflorescence, each subtending a fascicle of spikelets; terminal panicles solitary, 12 cm long; lateral ones as long as terminal ones. Female spikelets sessile. Male ones 3.5 mm long with pilose peduncles. Female glumes: lower one short, upper ones long, broadly ovate-lanceolate, keeled, glabrous. Stamens 3; anthers appendiculate at tips. Disk lobed. Nuts ovoid, obscurely warted.

Fl.: & Fr.: Sep.–Nov.

Habitat: Frequently found in marshy localities.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

27. POACEAE

India: 278 genera, 1760 taxa; Andhra Pradesh: 111 genera, 311 spp., 2 subspp., 2 var.; PNP: 66 genera, 119 spp., 2 var.

Key to the genera

1a.	Spikelets 1-many flowered, breaking up at maturity above the more or less persistent glumes or if falling entire then 2-flowered with the lower floret male or barren and the upper hermaphrodite	2
1b.	Spikelets 2-flowered, falling entire at maturity, with upper floret hermaphrodite and lower male or reduced to barren	23
2a.	Arborescent grasses, perennials	3
2b.	Medium sized grasses, annuals or perennials	4
3a.	Pericarp thin, adnate to the seed	**8. Bambusa**
3b.	Pericarp crustaceous, not adnate to the seed	**21. Dendrocalamus**
4a.	Spikelets mostly pedicelled in open or contracted spike like panicles	5
4b.	Spikelets sessile or shortly pedicelled along one side of rachis in racemes	21
5a.	Spikelets with two or more fertile florets	6
5b.	Spikelets with only one fertile floret sometimes lower floret reduced	13
6a.	Lemmas 1-3 nerved	7
6b.	Lemmas usually 5-many nerved	**13. Centotheca**

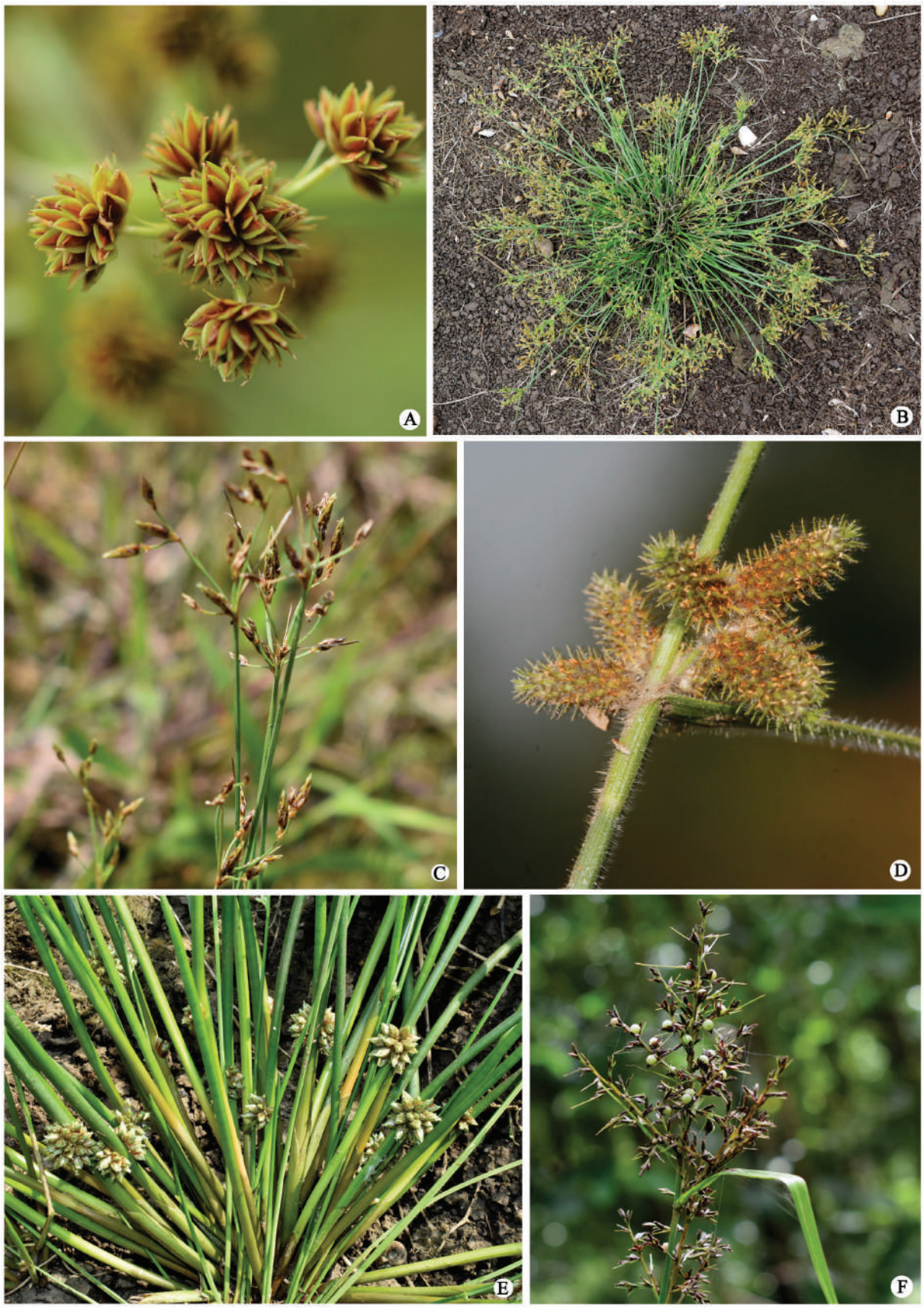


Plate 21: A. *Cyperus pseudokyllingioides* Kuk.; **B.** *Fimbristylis bisumbellata* (Forssk.) Bubani; **C.** *Fimbristylis tenera* Schult.; **D.** *Fuirena ciliaris* (L.) Roxb.; **E.** *Schoenoplectiella articulata* (L.) Lye; **F.** *Scleria terrestris* (L.) Fassett

7a.	Lemma usually entire, obtuse, acute or acuminate	8
7b.	Lemma usually emarginated or 2-4 lobed	11
8a.	Spikelets arranged in open contracted spike like panicles or single secund spike	9
8b.	Spikelets arranged in digitately or racemosely spikes	10
9a.	Inflorescence of panicle	**31. Eragrostis**
9b.	Inflorescence of single spike	**30. Eragrostiella**
10a.	Inflorescence axis ends with sharp point	**20. Dactyloctenium**
10b.	Inflorescence axis ends with spikelet	**28. Eleusine**
11a.	Spikelets arranged in spikes like racemes	12
11b.	Spikelets arranged in single secund spikes	**65. Tripogon**
12a.	Spikelets linear to oblong	**26. Diplachne**
12b.	Spikelets oblong to elliptic	**42. Leptochloa**
13a.	Glumes minute	14
13b.	Glumes well developed	15
14a.	Fertile lemma supported by two empty scales	**46. Oryza**
14b.	Fertile lemma solitary	**41. Leersia**
15a.	Spikelets with two florets, lower one barren or male, upper one fertile	16
15b.	Spikelets with only one fertile floret	18
16a.	Upper glume half the length of spikelet	**64. Thysanolaena**
16b.	Upper glume as long as spikelet	17
17a.	Glumes similar	**38. Isachne**
17b.	Glumes dissimilar	**7. Arundinella**
18a.	Spikelets bearded at the base	**34. Garnotia**
18b.	Spikelets not bearded at the base	19
19a.	Spikelets falling entire at maturity	**49. Perotis**
19b.	Spikelets not falling entire at maturity	20
20a.	Lemma awned; awn 3-fid	**5. Aristida**
20b.	Lemma unawned	**62. Sporobolus**
21a.	Spikelets with 1 or more imperfect florets above fertile floret	**14. Chloris**
21b.	Spikelets without imperfect florets	22
22a.	Inflorescence digitately arranged	**18. Cynodon**
22b.	Inflorescence solitary	**29. Enteropogon**
23a.	Spikelets unisexual	59
23b.	Spikelets bisexual	24
24a.	Spikelets dissimilar, usually paired or triads; upper lemma usually awned	25
24b.	Spikelets similar, usually solitary or paired; upper lemma unawned	46
25a.	Spikelets solitary, subsessile or pedicelled	**25. Dimeria**
25b.	Spikelets paired, one sessile or one pedicelled	26
26a.	Sessile or pedicelled spikelets hermaphrodite	27
26b.	Sessile spikelet hermaphrodite, pedicelled spikelets male or barren	32
27a.	Spikelets arranged in panicles	28
27b.	Spikelets arranged in racemes	29
28a.	Panicles narrow	**37. Imperata**
28b.	Panicles effuse	**57. Saccharum**
29a.	Pedicelled spikelets much reduced	**4. Apocopis**
29b.	Pedicelled spikelets well developed	30
30a.	Upper glume unawned; if awned less than 3 mm long	31
30b.	Upper glume awned	60
31a.	Lower glume of fertile spikelet with tuft of hairs	**43. Lophopogon**
31b.	Lower glume of fertile spikelet without tuft of hairs	61
32a.	Joints of rachis and pedicels of pedicelled spikelets swollen	33
32b.	Joints of rachis and pedicels of pedicelled spikelets narrow, thickened upwards	35
33a.	Upper lemma of sessile spikelet awned	34
33b.	Upper lemma of sessile spikelet awnless	62
34a.	Racemes 1-noded	**3. Apluda**
34b.	Racemes many noded	63
35a.	Racemes solitary at the end of branches, not inserted in spathe	36
35b.	Racemes in pairs or digitate, inserted in spathe	37
36a.	Spikelets dorsally compressed	**61. Sorghum**
36b.	Spikelets laterally compressed	**15. Chrysopogon**
37a.	Upper lemma of sessile spikelet with basal awn	**6. Arthraxon**
37b.	Upper lemma of sessile spikelet awned from tip or from cleft	38
38a.	Callus sharp and long	39
38b.	Callus obtuse	42

39a.	Racemes with 1-4 sessile spikelets	40
39b.	Racemes with many sessile spikelets	**36. Heteropogon**
40a.	Racemes without involvucral spikelets	**53. Pseudanthistiria**
40b.	Racemes surrounded by four involucral spikelets	41
41a.	Involucral spikelets sessile, persistent	**63. Themeda**
41b.	Involucral spikelets pedicellate, deciduous	**40. Iseilema**
42a.	Upper lemma of the sessile spikelets not cleft	64
42b.	Upper lemma of the sessile spikelets 2-cleft	43
43a.	Racemes 2 or more	44
43b.	Racemes solitary	45
44a.	Plants aromatic	**17. Cymbopogon**
44b.	Plant non-aromatic	**2. Andropogon**
45a.	Pedicelled spikelets smaller than sessile	**59. Schizachyrium**
45b.	Pedicelled spikelets larger than sessile	**23. Diectomis**
46a.	Spikelets not subtended by bristles, if present bristles persistent at maturity; spikelets falling singly	47
46b.	Spikelets subtended by bristles, falling entire with bristles	58
47a.	Spikelets arranged in more or less panicles or contracted spikes	48
47b.	Spikelets arranged in one sided racemes	51
48a.	Spikelets subtended by bristles	**60. Setaria**
48b.	Spikelets not subtended by bristles	49
49a.	Spikelets arranged in open panicles	50
49b.	Spikelets arranged in cylindrical spikes	**58. Sacciolepis**
50a.	Spikelets gibbous near base	**19. Cyrtococcum**
50b.	Spikelets not gibbous near base	**47. Panicum**
51a.	Lemma of upper floret thin, with hyaline margins	52
51b.	Lemma of upper floret more or less crustaceous	53
52a.	Spikelets awned	**1. Alloteropsis**
52b.	Spikelets awnless	**24. Digitaria**
53a.	Lower glume reduced to annular callus at the base	**32. Eriochloa**
53b.	Lower glume well developed	54
54a.	Back of upper lemma facing towards rachis	55
54b.	Back of upper lemma turned away from rachis	**44. Moorochloa**
55a.	Lower glume much reduced or absent	**48. Paspalum**
55b.	Lower glume present	56
56a.	Glumes awned	57
56b.	Glumes unawned	**66. Urochloa**
57a.	Culms erect; inflorescence dense	**27. Echinochloa**
57b.	Culms creeping; inflorescence loose	65
58a.	Bristles solitary	**55. Pseudoraphis**
58b.	Bristles numerous	**12. Cenchrus**
59a.	Fruit case close, formed by leaf sheath	**16. Coix**
59a.	Fruit case longitudinally open, not formed by leaf sheath	**51. Polytoca**
60a.	Racemes solitary	**50. Pogonatherum**
60b.	Racemes 2-3	**54. Pseudopogonatherum**
61a.	Spikelets in pairs	**33. Eulalia**
61b.	Spikelets in triads	**52. Polytrias**
62a.	Joints and pedicels jointed	**56. Rottleboellia**
62b.	Joints and pedicels not jointed	**35. Hackelochloa**
63a.	Joints and pedicel with a translucent longitudinal furrow	**9. Bothriochloa**
63b.	Joints and pedicel without a translucent longitudinal furrow	**39. Ischaemum**
64a.	Spikelets arranged in false racemes, terminating the branches and branchlets of a true panicle	**11. Capillipedium**
64b.	Spikelets arranged in false racemes either solitary or terminal along axis	**22. Dichanthium**
65a.	Leaf blades ovate to lanceolate	**45. Oplismenus**
65b.	Leaf blades linear to lanceolate	**10. Brachiaria**

1. ALLOTEROPSIS J. Presl

India: 2 spp. & 2 var.; Andhra Pradesh: 2 spp. PNP: 1 sp.

1. Alloteropsis cimicina (L.) Stapf, Fl. Trop. Afr.9: 487. 1919; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1766. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 276. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 754. 1999; Pull., Fl. Andhra Pradesh 5: 2083. 2018. *Milium cimicinum* L., Mant. Pl. Altera 184. 1771. *Axonopus cimicinus* (L.) P. Beauv., Ess. Agrost. 12. 1812; Hook. f., Fl. Brit. India 7: 64. 1896. (**Plate 22A)**

Culms tufted, up to 80 cm high; nodes hairy. Leaf sheaths tuberculate based hairy; ligule ciliate; leaf blades ovate- narrowly lanceolate 2.5–9 × 0.4–2 cm, amplexicaul, ciliate along margins. Racemes digitate, whorled, up

to 16 cm long. Spikelets elliptic, 3 mm long, dorsally compressed. Lower glumes ovate, 3–5 nerved. Upper glumes acuminate, 2-keeled. Lower florets male. Upper florets bisexual. Lower lemmas minute, ovate, 5-nerved. Paleas 1.2–2 mm long. Upper lemmas elliptic; arista 4 mm long, margins ciliate. Caryopsis elliptic.

Fl. & Fr.: Throughout year.

Habitat: Common in open hilly areas and as a weed in cultivated fields.

Specimens examined: Valamuru, Gulletiwada, Seemagandi, *Y. Mahesh* 010510, 010591, 011422 (BSID).

Field notes: Densely hairy nodes.

2. ANDROPOGON L.

India: 8 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP:1 sp.

1. Andropogon pumilus Roxb., Hort. Bengal. 7; Fl. Ind. 1. 277. 1820; Hook. f., Fl. Brit. India 7: 170. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1753. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 93. 1960; Pull., Fl. Andhra Pradesh 5: 2086. 2018. (**Plate 22B)**

Annuals. Culms erect, up to 50 cm high, tufted; nodes glabrous. Leaf sheaths 2 cm long, keeled, glabrous; ligules membranous; blades linear, 8 × 0.5 cm, cordate at base, acuminate at apex. Racemes 2, 2 cm long, digitate, subtended by narrow spathe. Spikelets binate, one sessile another pedicelled. Sessile spikelets 4 mm long, oblong. Lower glumes 4 mm long, lanceolate, 2-keeled, bifid at apex. Upper glumes 4.2 mm long, lanceolate, 1-keeled, aristate. Lower lemmas 2.5 mm long, linear, hyaline. Upper lemmas 2.4 mm long, linear, awn 18 mm long. Pedicelled spikelets 3 mm long, ovate. Pedicels with ciliate margins. Lower glume ovate, 1-nerved. Upper glume lanceolate, lemma hyaline.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in dry localities, along stream banks.

Specimens examined: Eruwada, *Y. Mahesh* 010683 (BSID).

Field notes: Tufted grass, nodes glabrous; racemes twin.

3. APLUDA L.

India: 2 spp.; Andhra Pradesh: 1spp.: PNP: 1 sp.

1. Apluda mutica L., Sp. Pl. 1: 82. 1753; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1750. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 93. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 755. 1999; Pull., Fl. Andhra Pradesh 5: 2087. 2018. *Apluda varia* Hack. subsp. *aristata* (L.) Hack., Monogr. Phan. 6: 196. 1889; Hook. f., Fl. Brit. India 7: 150. 1896. *Apluda aristata* L., Amoen. Acad. 4. 303. 1759; C.E.C. Fisch. *op.cit.,* 1750. (**Plate 22C)**

Perennial, tufted grass. Culms erect, 2.5 m high, leafy; nodes glabrous. Leaf sheaths 3 cm long; ligule membranous; blades linear-lanceolate, 8–30 × 0.5–1 cm, narrowed at base, petiole sparsely hirsute on nerves. Panicle 5–30 cm long, terminal, racemes simple, solitary, enclosed in boat shaped spathe. Spikelets in triads, one sessile, two pedicelled. Sessile spikelets 6 mm long, awned, bisexual. Lower glume 6 mm long, linear, 10-nerved, 2-keeled. Upper glume 6 mm long, 12-nerved. Lower florets male. Upper bisexual. Lemma and palea hyaline. Caryopsis oblong. Pedicelled spikelets 5 mm long, ciliate along margins in upper half. Pedicels 1.5 mm long. Lower and upper glumes 5 mm long, 10-nerved. Florets similar to sessile spikelets.

Fl. & Fr.: Oct.–Jan.

Habitat: Common along the hill slopes, cultivate fields.

Specimens examined: Netteppakota, Gulletiwada, *Y. Mahesh* 010572, 011667 (BSID).

Field notes: Tufted grass, nodes glabrous, racemes enclosed in boat shaped spathe.

4. APOCOPIS Nees

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Apocopis vaginatus Hack., Oesterr. Bot. Z. 41: 8. 1891; Bor, Grass. Burma, Ceylon, India & Pakistan 93. 1960. *Apocopis wightii* Nees ex Thw. var. *vaginata* (Hack) Hook. f., Fl. Brit. India 7: 143. 1896; Pull., Fl. Andhra Pradesh 5: 2088. 2018.

Annual tufted grass. Culms decumbent; up to 20 cm high; nodes glabrous. Leaf sheaths hairy near the mouth, ligule membranous, ciliate; blades 2–5× 0.2–0.4 cm, lanceolate, narrow at base, acute at apex. Racemes 1.5

cm long, paired, enclosed in sheaths. Spikelets 5 mm long, sessile, awned. Lower glume 4.5 mm long, cuneate, 5-nerved. Upper glume similar to lower, 2-keeled. Lower lemma 3 mm long, lanceolate, hyaline. Upper lemma 4 mm long, truncate, awn 2 cm long. Caryopsis oblong.

Fl. & Fr.: Oct.–Dec.

Habitat: Rare in hill slopes, grasslands in the forest.

Specimens examined: PK Valasa, *Y. Mahesh* 012130 (BSID).

Field notes: Nodes glabrous, leaf sheaths ciliate near mouth.

5. ARISTIDA L.

India: 10 spp.; Andhra Pradesh: 7 spp.; PNP: 2 spp.

Key to the species

1a.	Panicle effuse	**1. A. hystrix**
1b.	Panicle contracted	**2. A. setacea**

1. Aristida hystrix L.f., Suppl. Pl. 113. 1782; Hook. f., Fl. Brit. India 7: 225. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1809. 1896; Bor, Grass. Burma, Ceylon, India & Pakistan 410. 1960; Pull., Fl. Andhra Pradesh 5: 2090. 2018. *'Dolluba Gaddi'*

Perennial tufted grass. Culms up to 60 cm high, with creeping root stock; nodes glabrous. Leaf sheaths glabrous; ligule hairy; blades distichous, linear, 10 × 0.2 cm, cordate at base, acuminate at apex. Panicle effuse, 12 cm long, as broad as length. Spikelets 9–12 mm long, lanceolate, straw coloured. Glumes linear, aristate. Lemma 3-nerved, awn trifid. Palea hyaline. Stamens 3. Stigmas plumose. Caryopsis linear.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in lower hill slopes, dried habitats.

Specimens examined: Geediguppa, *Y. Mahesh* 010157 (BSID).

Field notes: Culms with creeping root stock, glabrous at nodes; spikelets straw coloured.

2. Aristida setacea Retz., Observ. Bot. 4. 22. 1786; Hook. f., Fl. Brit. India 7: 225. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1809. 1834; Bor, Grass. Burma, Ceylon, India & Pakistan 412. 1960; Pull., Fl. Andhra Pradesh 5: 2091. 2018. *'Cheepuru gaddi'*

Perennial tufted grass. Culms erect, up to 1.5 m high, basal portion woody; nodes glabrous. Leaf sheaths 10 cm long, glabrous; ligule a fringe of short hairs; blade linear, convolute, 10–25 × 0.2–0.3 cm, cordate at base, acuminate at apex. Panicle 30 cm long, contracted. Spikelets linear, 14 mm long, 1-flowered, pedicelled. Lower glume linear, 12 mm long, convolute, awned. Upper glume 14 mm, 2-toothed. Lemma linear with 3-inarticulate awns. Caryopsis linear, prickly.

Fl. & Fr.: Sep.–Feb.

Habitat: Common in open plain areas, along forest pathways.

Specimens examined: Tekupally, *Y. Mahesh* 011695 (BSID).

Field notes: Culms woody at base: Prickly caryopsis.

6. ARTHRAXON P. Beauv.

India: 9 spp. & 6 var.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Lower glume of the sessile spikelet inflexed	**1. A. lanceolatus**
1b.	Lower glume of the sessile spikelet flat	**2. A. lancifolius**

1. Arthraxon lanceolatus (Roxb.) Hochst., Flora 39: 188. 1856. var. *echinatus* Pull., Fl. Andhra Pradesh 5: 2093. 2018. *Arthraxon echinatus* (Nees) Hochst., Flora 39: 188. 1856; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1728. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 99. 1960. *Arthraxon spathaceus* Hook. f., Fl. Brit. India 7: 145. 1896.

Perennial tufted grass. Culms to 70 cm high; nodes pubescent. Leaf sheath with deciduous hairs; ligule hairy; blade ovate-lanceolate, 1.5–5.5 × 0.3–1.2 cm, margins with bulbous based hairy, puberulous on both surfaces. Racemes 5 cm long. Spikelets binate; sessile spikelets linear-lanceolate, 5 mm long. Lower glume 5 mm long, margins inflexed. Upper glume 5.5 mm long, obscurely nerved. Lower lemma linear, awn 7 mm long. Caryopsis terete. Pedicelled spikelet linear, 5 mm long. Glumes subequal. Lower lemma hyaline. Upper lemma muticous.

Fl. & Fr.: Sep.–Dec.

Habitat: Common grass as undergrowth, rocky crevices.

Specimens examined: Eruwada, 010622 *Y. Mahesh* (BSID).

Field notes: Culms pubescent at nodes, leaf margins with bulbous based hairs.

2. Arthraxon lancifolius (Trin.) Hochst., Flora 39: 188. 1856; Bor, Grass. Burma, Ceylon, India & Pakistan 100. 1960; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1729. 1934; R.S. Rao & al., Fl. E. Godavari Dist. 756. 1999; Pull., Fl. Andhra Pradesh 5: 2095. 2018. *Andropogon lancifolius* Trin., Mem. Acad. Imp. Sci. St. Petersbourg, Ser. 6, Sci. Math. 2: 271. 1833. *Arthraxon microphyllus* (Trin.) Hochst., Flora 39: 188. 1856; Hook. f., Fl. Brit. India 7: 147. 1896. *Andropogon microphyllus* Trin., Mem. Acad. Imp. Sci. St. Petersbourg, Ser. 6, Sci. Math. 2: 275. 1833.

Annual. Culms tufted, decumbent at base, up to 50 cm high; nodes softly villous. Leaf sheaths glabrous, keeled; ligule membranous; blades ovate-lanceolate, 2–3 × 0.3–0.6 cm, amplexicaul at base, apex acute. Racemes 3 cm long; joints densely hairy. Sessile spikelets linear, 4 mm long. Lower glume rounded on back, shortly aristate. Upper glume lanceolate, keeled, aristate. Lower lemma hyaline. Upper lemma lanceolate, notched at apex, awn 6 mm long. Caryopsis terete. Pedicellate spikelets 3 mm long, neuter. Glumes faintly nerved.

Fl. & Fr.: Sep–Dec.

Habitat: Common in damp habitats, rock crevices.

Specimens examined: Eruwada, Valamuru, *Y. Mahesh* 010637, 010677, 010908 (BSID).

Field notes: Tufted grass, nodes softly villous, leaf blades ovate-lanceolate.

7. ARUNDINELLA Raddi

India: 25 spp. & 4 var.; Andhra Pradesh: 8 spp. & 2 var.: PNP: 3 spp.

Key to the species

1a.	Upper lemma 2 awned	**3. A. setacea**
1b.	Upper lemma single awned	2
2a.	Spikelets up to 2mm long	**2. A. pumila**
2b.	Spikelets more than 2mm long	**1. A. ciliata**

1. Arundinella ciliata (Roxb.) Nees ex Miq., in Verh. Nederl. Inst. 3. Pt. 4. 30. 1851; Bor, Grass. Burma, Ceylon, India & Pakistan 421. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 757. 1999; Pull., Fl. Andhra Pradesh 5: 2096. 2018. *Holcus ciliates* Roxb., Fl. Ind. 1. 321. 1820. *Arundinella agrostoides* Hook. f., Fl. Brit. India 7: 71. 1896. *Arundinella holcoides* auct. non (Kunth)Trin.: C.E.C. Fisch. in Gamble, Fl. Madras 3: 1801. 1934.

Annual. Culms tufted, up to 45 cm high, hispid; nodes hairy. Leaf sheaths villous; ligule a rim of hairs; blades linear, 5–10 × 0.5–1 cm, narrow at base, acute at apex, hispid. Panicle up to 20 cm long, contracted. Spikelets lanceolate, pedicelled, 3 mm long. Lower glume ovate, 5-nerved, densely hairy towards base. Upper glume ovate, 5-nerved, cuspidate acuminate, hairy towards base. Lower florets male; upper bisexual. Lower lemma ovate-lanceolate, coriaceous. Palea lanceolate, hyaline. Upper lemma sub coriaceous, awn 6 mm long. Caryopsis elliptic.

Fl. & Fr.: Sep.–Dec.

Habitat: Common along hilly slopes, grasslands.

Specimens examined: Eruwada, *Y. Mahesh* 011555 (BSID).

2. Arundinella pumila (Hochst. ex A. Rich.) Steud., Syn. Pl. Glum. 1: 114. 1854; Bor, Grass. Burma, Ceylon, India & Pakistan 423. 1960; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1801. 1934; R.S. Rao & al., Fl. E. Godavari Dist. 757. 1999; Pull., Fl. Andhra Pradesh 5: 2097. 2018. *Acratherum pumilum* Hochst. ex A. Rich., Tent. Fl. Abyss. 2: 414.t. 100.1850. *Arundinella tenella* Nees & Wight ex Steud., *l.c*., 115; Hook. f., Fl. Brit. India 7: 71.1896.

Annual, slender grass. Culms erect, up to 45 cm high, sparsely tuberculate pilose; nodes glabrous. Leaf sheaths ciliate along margins; ligule truncate, with fringe of hairs; blades ovate-lanceolate 4–12 × 0.5–1.2 cm, glabrous, narrowed at base, acuminate at apex. Panicles effuse, 20 cm long, pyramidal, branched. Spikelets ovate, lanceolate, 1.5–2 mm long, pedicelled. Lower glume 3-nerved, membranous. Upper glume 5-nerved, hairy. Lower florets male; upper florets bisexual. Lower lemma lanceolate, 3-nerved. Palea hyaline. Upper lemma coriaceous, awn up to 3 mm long. Caryopsis ellipsoid.

Fl. & Fr.: Aug.–Nov.

Habitat: Common along roadsides, hill slopes in the forest.

Specimens examined: Eruwada, *Y. Mahesh* 10651 (BSID).

3. Arundinella setosa Trin., Gram. Panic. 65. 1826; Hook. f., Fl. Brit. India 7: 70. 1896; Bor, Grass. Burma, Ceylon, India & Pakistan 424. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 758. 1999; Pull., Fl. Andhra Pradesh 5: 2098. 2018. **(Plate 22D)** *'Pathioopagaddi'*

Perennial, stoloniferous grass. Culms up to 80 cm high; nodes glabrous. Leaf sheath glabrous; ligule fimbriate; blades lanceolate, 5–10 × 0.4–0.6 cm, sparsely hispid, narrow at base, acuminate at apex. Panicle 18 cm long, effuse, terminal. Spikelets 4 mm long, lanceolate, pedicelled, 2-flowered. Lower glume ovate, 4 mm long, 3-nerved. Upper glume 5 mm long, 5- nerved. Lower florets male; upper bisexual. Lower lemma elliptic, 5- nerved. Palea hyaline. Upper lemma ovate-lanceolate, awn 10 mm long, with setae. Caryopsis oblong.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasionally found on hill slopes, open hilly areas

Specimens examined: Beemudulanka, Eruwada, Valamuru, *Y. Mahesh* 010580, 010678, 010679, 010929 (BSID).

8. BAMBUSA Schreb.

India: 15 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Bambusa bambos (L.) Voss, Vilm. Blumengartn., ed. 3. 1: 1189. 1895; Pull., Fl. Andhra Pradesh 5: 2102. 1999. *Arundo bambos* L., Sp. Pl. 1: 81. 1753. *Bambusa arundinacea* (Retz.) Willd., Sp. Pl., ed. 4. 2: 245. 1799; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1859. 1934; Hook. f., Fl. Brit. India 7: 395. 1896; R.S. Rao & al., Fl. E. Godavari Dist. 758. 1999. *'Vedhuru'*

Large thorny, tufted shrub. Culms erect, 20 m high, internodes hollow; nodes prominent, the lower producing horizontal, armed with 2 stout recurved spines; leaf sheaths 3 cm long, glabrous; ligule narrow, fringed with pale hairs; blades 12–18 × 1–1.5 cm, lanceolate, rounded at base, apex acuminate, margins ciliate-scabrous. Panicle compound, recemosely arranged spikes. Spikes in loose clusters, acute, glabrous. Glumes ovate-lanceolate, acute, numerous nerved. Lemmas 3–7, upper most 3-nerved, obtuse. Palea truncate. Stamens 3, caryopsis elliptic.

Fl. & Fr.: Jul.–Sep.

Habitat: Common along stream banks, plain areas in the forest.

Specimens examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field note: Culms thorny from thick stoloniferous rhizome, internodes hollow.

9. BOTHRIOCHLOA Kuntze

India: 13 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Aromatic grass; inflorescence paniculate, central axis larger than the lowest raceme	**1. B. bladhii**
1b.	Non aromatic grass; inflorescence digitate, central axis shorter than the lowest raceme	**2. B. pertusa**

1. Bothriochloa bladhii (Retz.) S.T. Blake, Proc. Roy. Soc. Queensland 80: 62. 1969. Pull., Fl. Andhra Pradesh 5: 2103. 2018. *Andropogon bladhii* Retz., Observ. Bot. 2: 27. 1781. *Andropogon intermedius* R. Br., Prodr. Fl. Nov. Holland. 202. 1810; Hook. f., Fl. Brit. India 7: 175. 1896. *Amphilophis glabra* (Roxb.) Stapf, Fl. Trop. Afr. 9: 172. 1917; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1732. 1934. *Bothriochloa glabra* (Roxb.) A. Camus, Ann. Soc. Linn. Lyon ser. 2, 76: 164.1931; Bor, Grass. Burma, Ceylon, India & Pakistan 107. 1960. (**Plate 22E)**

Perennial, aromatic grass. Culms, tufted, up to 150 cm high; nodes bearded. Leaf sheath glabrous; ligule truncate, membranous; blades linear, 15–40 × 0.5–0.8 cm, sparsely hairy, truncate at base, apex acuminate. Inflorescence paniculate racemes; panicles pyramidal, up to to 30 cm long, whorled. Sessile spikelets oblong, 5 mm long. Lower glume ovate-lanceolate, 4.5 mm long, hairy in the lower half, pitted. Upper glume linear-lanceolate, 4.4 mm long, 5-nerved. Lower lemma lanceolate, 3.5 mm long. Upper lemma 2 mm long, stipitate, awn 12 mm long. Caryopsis oblong. Pedicelled spikelets elliptic, 4 mm long. Glumes elliptic, 4 mm long, hairy along margins; lower and upper florets neuter.

Fl. & Fr.: Aug.–Nov.

Habitat: Occasional in river beds, deciduous forest

Specimens examined: Eruwada, *Y. Mahesh* 10631 (BSID).

2. Bothriochloa pertusa (L.) A. Camus, Ann. Soc. Linn. Lyon. 1930, n.s. 2, 76: 164.1931; Bor, Grass. Burma, Ceylon, India & Pakistan 109. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 758. 1999; Pull., Fl. Andhra Pradesh 5: 2104. 2018. *Holcus pertusus* L., Mant. Pl. Altera 301. 1771. *Andropogon pertusus* (L.) Willd., Sp. Pl. 4: 922. 1806; Hook. f., Fl. Brit. India 7: 173. 1896. *Amphilophis pertusa* (L.) Nash ex Stapf, Agric. News W. Ind.15. 179. 1916; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1731. 1934.

Stoloniferous, non-aromatic grass. Culms tufted, geniculate, up to 50 cm high; nodes bearded. Leaf sheath compressed; ligule membranous, ciliate; blades 5–15 × 0.2–0.4 cm, linear, shortly hairy above, with scaberulous margins, acuminate. Inflorescence digitate. Racemes 8, up to 6.5 cm long, clustered; rachis slender; joints and pedicels with silky ciliate hairs. Sessile spikeletes lanceolate, 4 mm long, with bearded callus. Lower glume elliptic-oblong, truncate, 2-many nerved, margins ciliate. Upper glume lanceolate, 3–5 nerved, membranous. Lower florets neuter, upper bisexual. Lower lemma linear. Upper lemma stipitate, awn 20 mm long, epalete. Caryopsis oblong. Pedicelled spikelets 4 mm long, linear. Pedicels hairy. Lower glume with 5–12 nerved, margins ciliate. Upper glume lanceolate, 5-nerved. Lower and upper lemmas hyaline.

Fl. & Fr.: Aug.–Jan.

Habitat: Common in hills, grasslands, along forest pathways.

Specimens examined: PK Valasa, *Y. Mahesh* 012147 (BSID).

Field notes: Leaf blades sparsely hairy, joints of rachis silky hairy.

10. BRACHIARIA (Trin.) Griseb.

India: 20 spp. & 7 var.; Andhra Pradesh: 11 spp.; PNP: 1 sp.

1. Brachiaria remota (Retz.) Haines, Bot. Bih. Orissa Pt. 5: 1005. 1924; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1770. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 285. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 760. 1999; Pull., Fl. Andhra Pradesh 5: 2111. 2018. *Panicum remotum* Retz., Observ. Bot. 4: 17. 1786; Hook. f., Fl. Brit. India 7: 38. 1896. **(Plate 22F)**

Annuals. Culms up to 45 cm high, decumbent at base. Leaf sheath glabrous, margins ciliate towards upwards; ligule short, lacerate; blades linear-oblong, 5–15 × 0.5–1 cm, amplexicaul at base, acuminate at apex, sparsely hairy. Racemes up to 7 cm long; rachis capillary, triquetras. Spikelets ovoid-oblong, 2 mm long, paired, shortly pedicelled. Lower glume 1 mm long, membranous. Upper glume 1.5 mm long, membranous. Lower florets neuter; upper bisexual. Lower lemma membranous, 5-nerved. Upper lemma elliptic, rugose. Palea elliptic, minutely rugose. Caryopsis oblong.

Fl. & Fr.: Jul.–Nov.

Habitat: Common weed in cultivated fields and in moist habitats of the forest.

Specimens examined: PK Valasa, *Y. Mahesh* 010543 (BSID).

Field notes: Culms decumbent at base, leaf blades amplexicaul.

11. CAPILLIPEDIUM Stapf

India: 8 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Nodes densely bearded; panicles contracted	**2. C. huegelii**
1b.	Nodes glabrous or shortly hairy; panicles often open	**1. C. assimile**

1. Capillipedium assimile (Steud.) A. Camus in Lecomte, 7: 314. 1922; Bor, Grass. Burma, Ceylon, India & Pakistan 110. 1960; Pull., Fl. Andhra Pradesh 5: 2113. 2018. *Andropogon assimilis* Steud. in Zoll. Syst. Verz. 58. 1854; Hook. f., Fl. Brit. India 7: 18. 1896. *Capillipedium glaucopsis* (Steud.) Stapf in Hook., Icon. Pl. 31: t. 3085. 1922; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1730. 1934. *Andropogon glaucopsis* Steud., Syn. Pl. Glum. 1: 397. 1854. **(Plate 22G)**

Annual herb. Culms up to 80 cm high; nodes glabrous or shortly hairy. Leaf sheaths glabrous, hairy near mouth; ligule membranous, ciliate; blades 8–20 × 0.3–0.5 cm, linear-lanceolate, acuminate. Panicles often open, effuse, capillary, joints with a translucent groove, ciliate. Sessile spikelets oblong, 3.2 mm long. Lower glume ovoid-oblong, 7-nerved. Upper glumes lanceolate. Lower florets neuter, upper bisexual. Lower lemma linear, hyaline. Upper lemma reduced to base of awn. Pedicelled spikelets elliptic, 4 mm long; pedicels ciliate. Lower glume lanceolate, 10-nerved, keels ciliate in upper half. Lower lemma oblong, ciliate at apex. Upper absent.

Fl. & Fr.: Aug.–Nov.

Habitat: Common in rocky crevices, hilly areas in the forest.

Specimens examined: Eruwada, *Y. Mahesh* 010662 (BSID).

Field notes: Leaf sheaths hairy at mouth; blades linear-lanceolate, panicle effuse.

2. Capillipedium huegelii (Hack.) A. Camus, Rev. Bot. Appl. Agric. Colon. 1: 306. 1921; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1730. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 111. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 761. 1999; Pull., Fl. Andhra Pradesh 5: 2116. 2018. *Andropogon huegelii* Hack. in DC., Monogr. Phan. 6: 492. 1889; Hook. f., Fl. Brit. India 7: 180. 1896.

Perennials. Culms up to 1 m high; branches red at base; nodes densely bearded. Leaf sheaths 12 cm long, ciliate near mouth; ligule membranous; blades linear, 10–20 × 0.5–1 cm, narrow at base, acuminate at apex. Panicles contracted, *c.* 8 cm long. Spikelets binate, 5 mm long. Sessile spikelets ovate, bisexual. Lower glume ovate, hairy below the middle, 11-nerved, chartaceous. Upper glume boat shaped. Lower lemma hyaline. Upper lemma awned. Stamens 3. Stigmas plumose. Caryopsis ovate, compressed. Pedicelled spikelets male, similar to sessile, unawned.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasionally found on hill slopes in the forest.

Specimens examined: Nettappakota, *Y. Mahesh* 011664 (BSID).

Field notes: Branches red at base, racemes alternate.

12. CENCHRUS L.

India: 22 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Spikelets pedicellate	**1. C. pedicellatus**
1b.	Spikelets sessile	**2. C. Polystachios**

1. Cenchrus pedicellatus (Trin.) Morrone, Ann. Bot. (Oxford)106: 128. 2010. *Pennisetum pedicellatum* Trin., Mem. Acad. Imp. Sci. Saint-Petersbourg, Ser. 6, Sci. Math., 3: 184. 1834; Hook. f., Fl. Brit. India 1: 86. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1792. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 346. 1960; Pull., Fl. Andhra Pradesh 5: 2249. 2018.

Perennials. Culms up to 1.1 m high; nodes glabrous. Leaf sheaths hairy; ligule membranous; blades linear-lanceolate, 25 cm long, acute at apex. Panicle 15 cm long, spiciform, interrupted. Spikelets lanceolate, enclosed in involucre, bristles plumose, one spikelet in the involucre pedicelled. Lower, upper glumes lanceolate, hyaline, villous. Lower lemma lanceolate, trilobed, hyaline, ciliate on lobes. Palea hyaline. Upper lemma elliptic-lanceolate, 3-5 nerved, lanceolate.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasionally found along roadsides in forest, waste grassy slopes.

Specimens examined: Eruwada, Kammamkonda, *Y. Mahesh* 010626, 010682 (BSID).

2. Cenchrus polystachios (L.) Morrone, Ann. Bot. (Oxford)106: 129. 2010. *Panicum polystachion* L., Syst. Nat., ed. 10. 2: 870. 1759. *Pennisetum setosum* (Sw.) Rich., Pers., Syn. Pl. 1: 72. 1805; Hook. f., Fl. Brit. India 7: 87. 1896; Bor, Grass. Burma, Ceylon, India & Pakistan 340. 1960; Pull., Fl. Andhra Pradesh 5: 2251. 2018.

Perennials. Culms tufted, 90 cm high, branched from nodes. Leaf sheaths glabrous; ligule with fringed hairs; blades linear, 22 cm long, acuminate at apex. Panicle purplish brown. Involucral bristles unequal, silky hairy. Spikelets solitary. Lower glume absent. Upper glume ovate, hyaline. Lower lemma oblong, bidentate, obtuse. Palea hyaline. Upper lemma ovate, truncate, coriaceous.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasionally found in plains, waste grasslands.

Specimens examined: Kammukonda, Eruwada, *Y. Mahesh* 010684 (BSID).

Field notes: Culms branching from nodes, panicle purplish.

13. CENTOTHECA Desv.

India: 2 spp. & 1 var.; Andhra Pradesh: 1 spp.; PNP: 1 sp.

1. Centotheca lappacea (L.) Desv., Nouv. Bull. Soc. Philom. 2: 189. 1810; Hook. f., Fl. Brit. India 332. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1848. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 457. 1960; Pull., Fl. Andhra Pradesh 5: 2118. 2018. *Cenchrus lappaceus* L., Sp. Pl., ed. 2. 2: 1488. 1763. *Centotheca latifolia* (Osb.) Trin., Fund. Agrost.141. 1820; R.S. Rao & al., Fl. E. Godavari Dist. 762. 1999.

Perennials. Culms up to 1 m high; nodes glabrous. Leaf sheath hairy; ligule membranous, truncate; blades ovate-lanceolate, 8–20 × 0.8–2 cm, narrow at base, acute at apex. Panicles 15 cm long. Spikelets lanceolate, 8 mm. Lower glume ovate-lanceolate, 3-nerved, acute. Upper glume oblong-ovate, 3–5 nerved, chartaceous. Lemma oblong, 5-nerved, glabrous. Palea narrowly elliptic, chartaceous, acute. Caryopsis oblong.

Fl. & Fr.: Oct.–Jan.

Habitat: Occasional in shady places and hill tops in the forest.

Specimens examined: Eruwada, Kondamodalu, *Y. Mahesh* 011487, 010619 (BSID).

Field notes: Leaves ovate-lanceolate, undulate, panicles loose.

14. CHLORIS Sw.

India: 11 spp.; Andhra Pradesh: 8 spp.: PNP: 1 sp.

1. Chloris barbata Sw., Fl. Ind. Occid. 1: 200. 1797; Hook. f., Fl. Brit. India 7: 292. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1838. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 465. 1960; Pull., Fl. Andhra Pradesh 5: 2118. 2018. *Chloris inflata* Link, Enum. Hort. Berol. Alt. 1: 105. 1821; R.S. Rao & al., Fl. E. Godavari Dist. 762. 1999. (**Plate 22H)**

Annual. Culms tufted, up to 70 cm high, creeping at base; nodes glabrous. Leaf sheath keeled; ligule membranous, truncate; blades lanceolate, 5–25 × 0.2–0.5 cm, rounded at base, acuminate at apex, glabrous. Spikes 3–20, digitate. Spikelets obovate, 3 mm long, 2- flowered. Lower glume lanceolate, 1-nerved, scabrid on keels. Upper glume lanceolate, hyaline, scabrid on keels. Fertile lemma elliptic, 3-nerved, awned; awns 5 mm long, ciliate on margins. Palea oblong-elliptic, 2-nerved, hyaline. Sterile lemma obovate, 3-nerved, awn 6 mm long. Caryopsis trigonous.

Fl. & Fr.: Aug.–Dec.

Habitat: Common in plains, roadsides, cultivated fields.

Specimens examined: Tekupally, *Y. Mahesh* 011694 (BSID).

Field notes: Culms tufted, creeping, spikes up to 20.

15. CHRYSOPOGON Trin.

India: 20 spp. & 1 var.; Andhra Pradesh: 11 spp.; PNP: 5 spp.

Key to the species

1a. Racemes composed of several to many spikelet pairs; lower glume tuberculate	**5. C. zizanioides**
1b. Racemes reduced to triads; lower glume smooth	2
2a. Pedicels half-length of sessile spikelets or longer	**1. C. aciculatus**
2b. Pedicels shorter than half of sessile spikelets	3
3a. Leaves arranged distichously	**4. C. polyphyllus**
3b. Leaves not distichous	4
4a. Lower glume of pedicelled spikelet with awn	**2. C. fulvus**
4b. Lower glume of pedicelled spikelet without awn	**3. C. hackelii**

1. Chrysopogon aciculatus (Retz.) Trin., Fund. Agrost. 188. 1820; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1738. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 115. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 763. 1999; Pull., Fl. Andhra Pradesh 5: 2127. 2018. *Andropogon aciculatus* Retz., Observ. Bot. 5. 22. 1789; Hook. f., Fl. Brit. India 7: 188. 1896. (**Plate 23A)**

Perennials. Culms up to 80 cm high, geniculately ascending below; nodes glabrous. Leaf sheaths hairy near mouth; ligule a minute fimbriate rim; blades oblong, 2–8 × 0.4–0.5 cm, tufted, rounded at base, acute at apex, margins spinulose. Panicles narrowly oblong, *c.* 10 cm long, contracted. Pedicels half the length of the sessile spikelets, glabrous. Sessile spikelets lanceolate, 3 mm long. Lower glume lanceolate, faintly 3-nerved. Upper glume lanceolate, 2-nerved, keels ciliate. Lower lemma linear, neuter, keeled, 2-nerved. Upper lemma narrow, 1-3 nerved, arista 5 mm long. Palea hyaline. Caryopsis laterally compressed. Pedicelled spikelets lanceolate, 5 mm, pedicels glabrous. Lower glume 5-nerved, lanceolate. Upper glume 3-nerved, ciliate on margins. Lower lemma lanceolate, hyaline. Upper lemma ovate-lanceolate, palea hyaline.

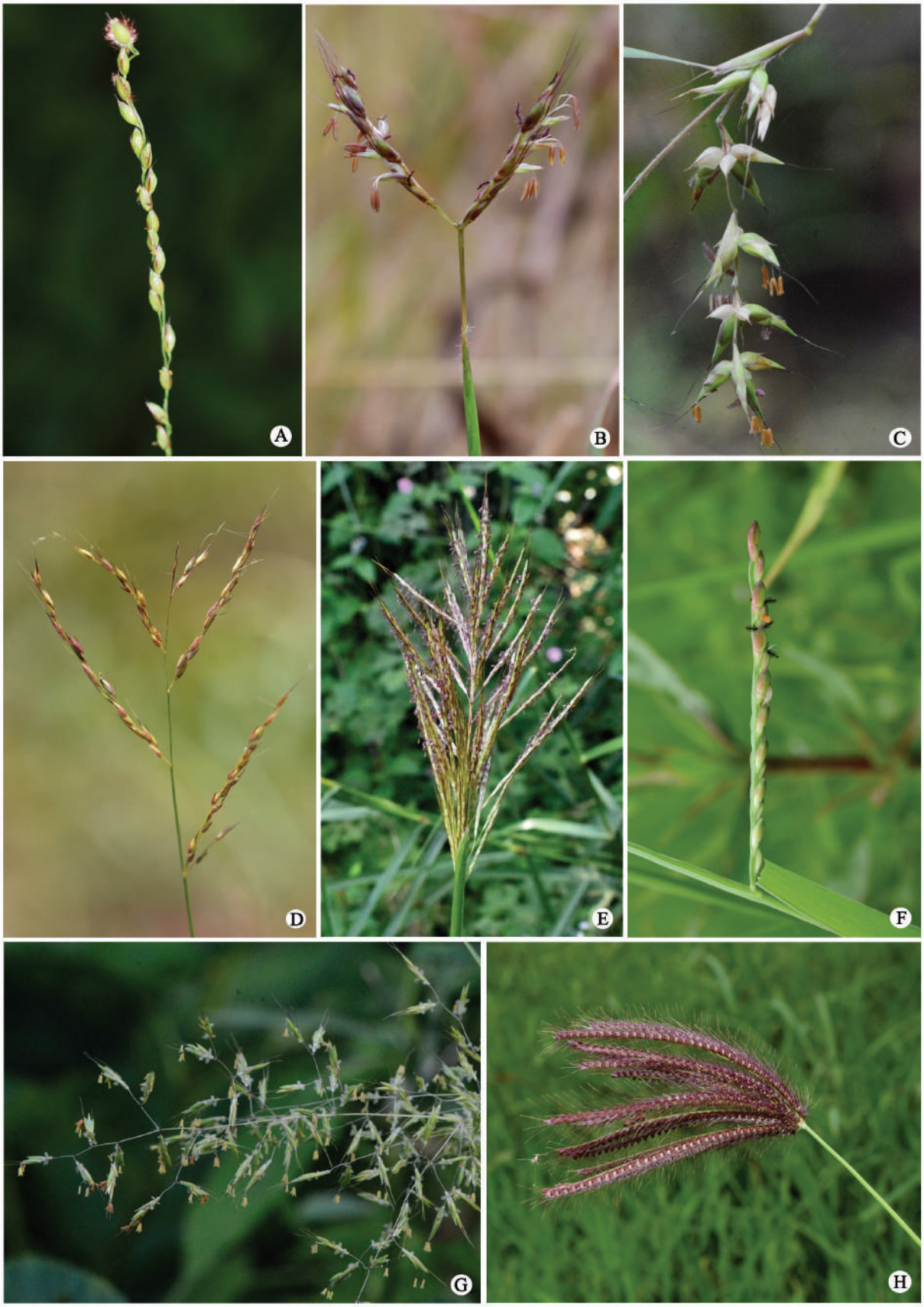


Plate 22: A. *Alloteropsis cimicina* (L.) Stapf; **B.** *Alloteropsis cimicina* (L.) Stapf; **C.** *Apluda mutica* L.; **D.** *Arundinella setosa* Trin.; **E.** *Bothriochloa bladhii* S.T.Blake; **F.** *Brachiaria remota* (Retz.) Haines; **G.** *Capillipedium assimile* (Steud.) A.Camus; **H.** *Chloris barbata* Sw.

Fl. & Fr.: Jul.–Nov.

Habitat: Occasional along water courses, near river banks.

Specimens examined: Murdavada, *Y. Mahesh* 010513 (BSID).

Field notes: Culms ascending at base; panicles contracted.

2. Chrysopogon fulvus (Spreng.) Chiov., Fl. Somala 1: 327. 1929; Bor, Grass. Burma, Ceylon, India & Pakistan 166. 1960; Pull., Fl. Andhra Pradesh 5: 2130. 2018. *Pollinia fulva* Spreng., Pl. Min. Cogn. Pug. 2: 10. 1815. *Chrysopogon montanus* Trin. ex Spreng., Entadeck. Pflanzenk. 2: 93. 1821; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1739. 1934. *Andropogon monticola* Roem. & Schult. var. *robustus* Hook. f., Fl. Brit. India 7: 193. 1896.

Perennial herbs. Culms up to 80 cm high, tufted; nodes glabrous. Leaf sheaths compressed, glabrous; ligule fimbriate; blades linear, 8–20 × 0.3–0.6 cm, margins scaberulous. Panicles 12 cm long, branches whorled, golden yellow. Pedicels shorter than the half the length of sessile spikelets. Sessile spikelets oblong, 5 mm long, callus bearded with golden brown hairs. Lower glume 4-nerved, rufous hairy above. Upper glume 3-nerved, ciliate above, awn 6 mm long. Lower lemma linear, neuter, hyaline. Upper lemma hyaline, 3-nerved, awn 16 mm long, geniculate. Palea linear. Pedicelled narrowly lanceolate, spikelet 5 mm long. Pedicels rufous hairy. Lower glume 6-nerved, hairy above. Upper glume 3-nerved, ciliate along margins. Lower lemma linear, hyaline. Upper lemma hyaline, faintly 1-nerved.

Fl. & Fr.: Sep–Dec.

Habitat: Common on rocky habitats, sandy slope areas in the forest.

Specimens examined: Kondamodalu, Enukuru, *Y. Mahesh* 011486, 010566 (BSID).

Field notes: Panicles whorled, pedicels rufous hairy.

3. Chrysopogon hackelii (Hook. f.) C.E.C. Fisch. in Gamble, Fl. Madras 3: 1739. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 117. 1960; Pull., Fl. Andhra Pradesh 5: 2130. 2018. *Andropogon hackelii* Hook. f., Fl. Brit. India 7: 194. 1896.

Perennials. Culms erect, up to 150 cm high; nodes sparsely hairy. Leaf sheaths scabrid, keeled; ligule a rim of hairs; blades linear, 10–30 × 0.5–1 cm, acuminate at apex, glabrous. Panicles lax branched, 15 cm long. Sessile spikelets oblong, 6 mm long. Lower glume linear, faintly 5-nerved. Upper glume oblong, 6-nerved. Lower lemma faintly 3-nerved, ciliate along margins. Upper lemma with awned, awn up to 20 mm long, geniculate. Pedicelled spikelets lanceolate 5 mm long. Lower glume 7-nerved. Upper glume lanceolate, 3-nerved. Lower lemma 2-nerved, ciliate along margins. Upper lemma oblong, hyaline. Stamens 3.

Fl. & Fr.: Sep.–Nov.

Habitat: Occasionally found on hills, grasslands in the forest.

Specimens examined: Gulletiwada, Kambamkonda, *Y. Mahesh* 010578, 010673 (BSID).

Field notes: Culms erect, nodes sparsely hairy, panicles branched.

4. Chrysopogon polyphyllus (Hack. ex Hook. f.) Blatt. & Mc Cann, J. Bombay Nat. Hist. Soc. 32: 416. 1928; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1739. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 118. 1960; Pull., Fl. Andhra Pradesh 5: 2132. 2018. *Andropogon polyphyllus* Hack. ex Hook. f., Fl. Brit. India 7: 194. 1896. (**Plate 23B)**

Perennials. Culms tufted, up to 80 cm high. Leaf sheath terete; ligule membranous; blades flat, 12–20 × 0.2–0.5 cm, cordate at base, acuminate at apex, glabrous. Panicles many flowered, up to 14 cm long. Sessile spikelets 4 mm long, pale purplish. Lower glume obtuse, keeled; keel ciliate at tip. Upper glume keeled, awned. Lower lemma linear, hyaline. Upper awned. Pedicelled spikelet lanceolate, glabrous; pedicel hairy at apex.

Fl. & Fr.: Oct.–Dec.

Habitat: Occasional in the hill slopes in the forest.

Specimens examined: Kakeshnur, *Y. Mahesh* 011324 (BSID).

Field notes: Spikelets pale purplish.

5. Chrysopogon zizanioides (L.) Roberty, Bull. Inst. Franç. Afrique Noire, A. 22: 106. 1960. *Phalaris zizanioides* L., Mant. Pl. Altera 2: 183. 1771. *Vetiveria zizanioides* Nash in Small, Fl. S.E. U.S. 67: 1326. 1903; C.E.C. Fisch. in

Gamble, Fl. Madras 3: 1733. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 258. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 790. 1999; Pull., Fl. Andhra Pradesh 5: 2303. 2018. *'Vattiveru'*

Perennials. Culms tufted, up to 180 cm high; nodes glabrous. Leaf sheaths keeled, glabrous; ligule membranous; blades lanceolate, up to 70 cm long, sparsely hairy. Panicles spreading. Sessile spikelets lanceolate, bearded at callus. Lower glume lanceolate, 5-nerved, muricate. Upper glume lanceolate, 3-nerved, spinulose on keels. Lower lemma elliptic, ciliate along margins. Upper lemma notched at apex. Paleas 3-nerved. Pedicelled spikelets lanceolate, with turbinate pedicels. Lower glume spinulose. Upper glume spinulose on keels. Lower lemma 3-nerved, ciliate at margins.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional along stream banks, cultivated field hedges.

Specimens examined: Nallagunta, Tekupally, *Y. Mahesh* 011589, 011683 (BSID).

Field notes: Tall tufted grass; nodes glabrous.

16. COIX L.

India: 4 spp.& 2 var.; Andhra Pradesh: 3 spp.; 1 sp.

1. Coix lacryma-jobi L., Sp. Pl. 2: 972. 1753; Hook. f., Fl. Brit. India 7: 100. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1705. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 264.1960; Pull., Fl. Andhra Pradesh 5: 2136. 2018. (**Plate 23C)**

Tall perennial, monoecious grass. Culms up to 150 cm high, rooting at lower nodes; nodes glabrous. Leaf sheaths glabrous; ligule membranous; blades lanceolate, 10–40 cm long, midrib stout. Racemes 8 cm long, flexuous from long peduncle. Male spikelets elliptic, 10 mm long. Lower glumes lanceolate. Upper glume elliptic-lanceolate, 7-nerved. Lower lemma oblong, hyaline. Palea elliptic-lanceolate, 2-nerved. Upper lemma lanceolate, hyaline. Female spikelets ovoid, 10 mm long, shining. Lower and upper glumes chartaceous. Lower lemma empty, oblong. Upper lemma ovate-oblong. Caryopsis ovoid.

Fl. &Fr.: Oct.–Mar.

Habitat: Occasional in marshy habitats, rice fields.

Specimens examined: GM Valasa, Arvapally, *Y. Mahesh* 010038, 011678 (BSID).

Field notes: Tall woody grass, culms rooting at lower nodes, racemes pendulous.

17. CYMBOPOGON Spreng.

India: 22 spp., 1 subsp. & 2 var.; Andhra Pradesh: 9 spp. & 1 var.: PNP: 5 spp. & 1 var.

Key to the species

1a.	Joints and pedicels with long hairs, concealed sessile spikelets	**4. C. jwarancusa**
1b.	Pedicels and joints with short hairs, not concealed sessile spikelets	2
2a.	Lower glume of sessile spikelet with a deep slot like depression	**3. C. gidarba**
2b.	Lower glume of sessile spikelet without slot like depression	3
3a.	Lower glume of sessile spikelet with slit like groove in lower half	4
3b.	Lower glume of sessile spikelet flat in lower half	5
4a.	Leaf blade cordate at the base	**5. C. martini**
4b.	Leaf base rounded at the base	**1. C. caesius**
5a.	Racemes 14 cm long	**6. C. nardus** *var.* **confertiflorus**
5b.	Panicles 40 cm long	**2. C. coloratus**

1. Cymbopogon caesius (Nees ex Steud. ex Hook. & Arn.) Stapf, Bull. Misc. Inform. Kew 1906: 341. 1906; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1757. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 125. 1960; Pull., Fl. Andhra Pradesh 5: 2137. 2018. *Andropogon caesius* Nees ex Steud. ex Hook. & Arn., Bot. Beechey Voy. 244. 1838. *Andropogon schoenanthus* L. var. *gracillimus* Hook. f., Fl. Brit. India 1: 205. 1896.

Perennials. Culms erect, up to 2 m high, wiry; nodes glabrous. Leaf shesths glabrous; ligule membranous; blades linear-lanceolate, 10–25 cm, glabrous. Panicles up to 25 cm long. Racemes 12 cm long; pedicels swollen at lower racemes. Sessile spikelets linear, 3.5 mm, callus hairy. Lower glumes notched at apex, 5-nerved. Upper glumes elliptic-lanceolate, margins ciliate, lower florest neuter. Upper bisexual. Lower lemma oblong, hyaline. Upper lemma with 15 mm awn. Caryopsis oblong. Pedicelled spikelets 4 mm long. Lemma hyaline, 3-nerved.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in grasslands, hilly areas.

Specimens examined: PK Valasa, *Y. Mahesh* 012116 (BSID).

Field notes: Culms wiry, glabrous, leaf sheaths glabrous.

2. Cymbopogon coloratus (Hook.f.) Stapf, Bull. Misc. Inform. Kew 1906: 321. 1906; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1756. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 126.1960; Pull., Fl. Andhra Pradesh 5: 2138. 2018. *Andropogon nardus* var. *coloratus* Hook. f., Fl. Brit. India 7: 206. 1896. *'Boda Gaddi'.*

Perennial, tufted grass. Culms up to 180 cm high; nodes bearded. Leaf sheaths sparsely tomentose; ligule membranous; blades linear, 15–40 cm. Panicles 40 cm long, decompounds. Racemes pilose at base, swollen. Sessile spikelets oblong, 5 mm long. Lower glume lanceolate. Upper glume boat shaped, scabrid on keels. Lower lemma membranous. Upper bifid, awned; awn up to 10 mm long. Pedicelled spikelets lanceolate, 5 mm long.

Fl. & Fr.: Aug.–Jan.

Habitat: Common in hilly plains, grasslands in the forest.

Specimens examined: Pochavaram, *Y. Mahesh* 010142 (BSID).

Field notes: Tufted grass, bearded at nodes, racemes hairy.

3. Cymbopogon gidarba (Buch. -Ham. ex Steud.) A. Camus, Bull. Mus. Natl. Hist. Nat. 26: 562. 1920; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1757. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 128. 1960; Pull., Fl. Andhra Pradesh 5: 2139. 2018. *Andropogon gidarba* Buch. -Ham. ex Steud., Syn. Pl. Glumac. 1: 387. 1854; Hook. f., Fl. Brit. India 7: 208. 1896. (**Plate 23D)**

An aromatic, perennial grass. Culms tufted, up to 80 cm high. Leaf sheaths glabrous; ligule truncate, short; blades linear, 5–35 cm long, ciliate towards base. Panicles narrow, up to 20 cm long, joints clavate. Racemes swollen at base. Sessile spikelets lanceolate, 4 mm long. Lower glumes linear, concave on back with bump at base, 2-toothed at apex. Upper glume1-nerved, cymbiform. Lower lemma lanceolate. Upper lemma lanceolate, bifid, awned; awn up to 14 mm long. Pedicelled spikelets lanceolate, 5 mm long. Lower and upper glumes broadly lanceolate.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in hilly slopes, grasslands in the forest.

Specimens examined: Eruwada, Kambamkonda, *Y. Mahesh* 010642 & 010672 (BSID).

Field notes: Aromatic woody grass, racemes swollen at base.

4. Cymbopogon jwarancusa (Jones) Schult., Mant. 2: 458. 1824; Bor, Grass. Burma, Ceylon, India & Pakistan 128. 1960; Pull., Fl. Andhra Pradesh 5: 2140. 2018. *Andropogon jwarancusa* Jones, Asiat. Res. 4: 109. 1795; Hook. f., Fl. Brit. India 7: 203. 1896.

Perennial tufted grass. Culms up to 80 cm high, creeping at base; nodes swollen. Leaf sheath glabrous; ligule membranous, ciliate; blades linear, 12–30 cm. Panicles up to 40 cm, variable, plumose; joints and pedicels villous. Sessile spikelets lanceolate, 4.4 mm long. Lower glume concave on back, serrate on margins. Upper glumes oblong-lanceolate, margins inflexed. Lower lemma lanceolate, ciliate above. Upper lemma with 6 mm long awn. Pedicelled spikelets lanceolate, 5 mm long. Glumes hyaline.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in open forest, grassy slopes.

Specimens examined: Gulletiwada, *Y. Mahesh* 010574 (BSID).

Field notes: Tufted grass; culms nodes swollen.

5. Cymbopogon martini (Roxb.) S. Watson in E.F.T. Atr., Gaz. N.W. Prov. Ind. 10: 392. 1882; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1756. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 129.1960; R.S. Rao & al., Fl. E. Godavari Dist. 765. 1999; Pull., Fl. Andhra Pradesh 5: 2140. 2018. *Andropogon martini* Roxb., Fl. Ind. 1: 280. 1820. *Andropogon schoenanthus* var. *martini* (Roxb.) Hook. f., Fl. Brit. India 7: 204. 1896. (**Plate 23E)**

Perennial, sweet scented grass. Culms erect, up to 2 m high, straw coloured; nodes glabrous; leaf sheaths glabrous; ligule membranous; blades lanceolate, 25–40 cm long, amplexicaul at base, margins scabrid. Panicles

up to 35 cm long, narrow; joints hairy. Lower racemes pedicels swollen at base. Sessile spikelets oblong, 4 mm long. Lower glumes oblong, deeply grooved at base, narrowly winged, 2-keeled. Upper glume elliptic, aristate, winged. Lower lemma oblong. Upper lemma hyaline, notched at apex, awned; awn 15 mm long. Pedicelled spikelet lanceolate, 4.2 mm long; pedicels villous. Lower glume lanceolate, 9-nerved. Upper glume 2-nerved. Lemmas oblong, hyaline.

Fl. & Fr.: Aug.–Dec.

Habitat: Common along hilly slopes, grasslands in the forest.

Specimens examined: Sunnam bokka, *Y. Mahesh* 010508 (BSID).

Field notes: Sweet scented grass; culms straw coloured.

6. Cymbopogon nardus (L.) Rendle var. **confertiflorus** (Steud.) Stapf ex Bor., J. Bombay Nat. Hist. Soc. 51: 905. 1953 & Grass India 130. 1960; Pull., Fl. Andhra Pradesh 5: 2140. 2018. *Andropogon confertiflorus* Steud., Syn. Pl. Glumac. 1: 385. 1854. *Andropogon nardus L.* subsp. *nilagiricus* Hack. in A. DC. Monog. Phan 6: 604. 1889; Hook. f., Fl. Brit. India 7: 206. 1896. *Cymbopogon confertiflorus* (Steud.) Stapf, Bull. Misc. Inform. Kew 1906: 318. 1906; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1756. 1934. *Andropogon nardus* (L.) Rendle in Cat. Welw. Afr. Pl. 2: 155. 1899; R.S. Rao & al., Fl. E. Godavari Dist. 765. 1999.

Perennial, tufted grass. Culms up to 150 cm high; nodes glabrous. Leaf sheaths glabrous, auricled often; ligule chartaceous; blades lanceolate, 25–60 cm long, rough on lower surface. Panicles pyramidal, up to 80 cm long. Racemes up to 14 cm long; pedicels and internodes hairy along margins; spathes imbricate. Sessile spikelets oblong, 4.2 mm long. Lower glumes ovate-lanceolate, concave on back. Lemmas bidentate. Pedicelled spikelets oblong-elliptic, unawned. Lower glume lanceolate, 11-nerved. Upper glume oblong-lanceolate, 3-nerved. Lemmas oblong, hyaline.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in forest hills, cultivated for aromatic oil.

Specimens examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: Leaves aromatic.

18. CYNODON Rich

India: 5 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Cynodon radiatus Roth ex Roem. & Schult. Syst. Veg., 2: 411. 1817; Pull., Fl. Andhra Pradesh 5: 2144. 2018. *Cynodon arcuatus* J. Presl, Reliq. Haenk. 1: 290. 1830; Bor, Grass. Burma, Ceylon, India & Pakistan 489. 1960. *Cynodon dactylon* (L.) Pers. var. *intermedius* (Rang. & Tadul.) C.E.C. Fisch. in Gamble, Fl. Madras 3: 1835. 1934. *Cynodon intermedius* Rang. & Tadul., J. Bombay Nat. Hist. Soc. 26: 309. 1918.

Perennials. Culms up to 40 cm high, stoloniferous, straggling, rooting at nodes; nodes swollen, glabrous. Leaf sheaths sparsely bearded at mouth; ligule membranous; blade 3–14 cm, linear-lanceolate, scabrid along margins and above. Spikes digitate, up to 9 cm long, rachis tumid. Spikelets subsessile, elliptic-lanceolate. Lower glume lanceolate, 1-nerved. Upper glume lanceolate, boat shaped, chartaceous, 1-nerved. Lemma ovate-lanceolate, hyaline, scabrid. Palea lanceolate. Caryopsis oblong.

Fl. & Fr.: Sep.–Nov.

Habitat: Occasional in plains and ghat areas in the forest.

Specimens examined: PK Valasa, *Y. Mahesh* 010990 (BSID).

Field notes: Culms stoloniferous, rooting at nodes.

19. CYRTOCOCCUM Stapf

India: 7 spp.; Andhra Pradesh: 5 spp.; PNP: 4 spp.

Key to the species

1a.	Pedicels longer than spikelets	2
1b.	Pedicels shorter than spikelets	3
2a.	Panicles lax; spikelets up to 1.5 mm long	**1. C. accrescens**
2b.	Panicles contracted; spikelets up to 3 mm long	**2. C. longipes**
3a.	Spikelets hispid; panicle branches glabrous on axils	**4. C. trigonum**
3b.	Spikelets glabrous; panicle branches pilose on axils	**3. C. oxyphyllum**

1. Cyrtococcum accrescens (Trin.) Stapf in Hooker's Icon. Pl. 31: sub t. 3096. 1922. Bor, Grass. Burma, Ceylon, India & Pakistan 291. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 766. 1999; Pull., Fl. Andhra Pradesh 5: 2144. 2018.

Perennial. Culms weak; nodes glabrous. Leaf sheaths tubercule based hairy; ligule membranous; blades linear, flat, sparsely hairy. Panicles lax or effuse, 15–20 cm long. Spikelets obovate or gibbous, up to 1.5 mm long, distant; pedicels longer than spikelets, swollen, cup shaped at apex. Lower glume obovate, 3-nerved, membranous. Upper glume 5-nerved, gibbous. Lower lemma membranous. Palea minute. Caryopsis minute, obovoid. Upper lemma coriaceous.

Fl. & Fr.: Sep.–Nov.

Habitat: Occasional in moist shady areas, along stream banks.

Specimens examined: Gunapalatenrai, *Y. Mahesh* 010440 (BSID).

Field notes: Culms weak, leaves with tubercule based hairy.

2. Cyrtococcum longipes (Wight & Arn. ex Hook. f.) A. Camus, Bull. Mus. Hist. Nat. (Paris) 27: 118. 1921; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1786. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 291. 1960; Pull., Fl. Andhra Pradesh 5: 2144. 2018. *Panicum longipes* Wight & Arn. ex Hook. f., Fl. Brit. India 7: 58. 1896.

Perennials. Culms up to 50 cm high, decumbent, weak; nodes glabrous. Leaf sheaths tubercule based hairy; ligule membranous; blades linear, flat, 18 cm long. Panicles contracted, up to 15 cm long, fasigately branched; pedicels longer than spikelets. Spikelets ovate, pale brown, up to 3 mm long. Lower glume ovate, chartaceous, acute. Upper glume boat shaped, chartaceous. Lower florets neuter. Upper bisexual. Lower lemma ovate, obtuse, ciliate at apex. Upper lemma crustaceous. Palea 2-keeled. Caryopsis ovoid.

Fl. & Fr.: Aug.–Nov.

Habitat: Occasional in moist habitats, river banks in the forest.

Specimens examined: Maredupudi, PK Valasa, *Y. Mahesh* 010117, 010998 (BSID).

Field notes: Leaves tuberculed based hairs, panicles branched.

3. Cyrtococcum oxyphyllum (Hochst. ex Steud.) Stapf in Hooker's Icon. Pl. 31: sub t. 3096. 1922; C.E.C. Fisch. in Gamble, Fl Madras 3: 1786. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 291. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 767. 1999; Pull., Fl. Andhra Pradesh 5: 2146. 2018. *Panicum oxyphyllum* Hochst. ex Steud., Syn. Pl. Glumac. 1: 65. 1854. *Panicum pilipes* Nees & Arn. ex Buse, Pl. Jungh. 3: 376. 1854; Hook. f., Fl. Brit. India 7: 57. 1896. (**Plate 23F)**

Perennial, stoloniferous herbs. Culms creeping, up to 60 cm high; nodes glabrous. Leaf sheaths ciliate on one margin; ligule membranous; blades lanceolate, 4–12 cm long. Panicles contracted, 8 cm long, pilose on axils. Spikelets ovate, glabrous; pedicels shorter. Lower glume elliptic, chartaceous. Upper glume boat shaped, scaberulous on back. Lower florets neuter, upper bisexual. Lower lemma broadly ovate, ciliate at apex. Upper lemma crustaceous, boat shaped. Palea crustaceous, 2-keeled. Caryopsis globose.

Fl. & Fr.: Jul.–Nov.

Habitat: Occasional in shady places, wet areas in the forest.

Specimens examined: PK Valasa, Valamuru, *Y. Mahesh* 010015, 010423, 010902 (BSID).

Field notes: Stoloniferous grass, panicles contracted.

4. Cyrtococcum trigonum (Retz.) A. Camus, Bull. Mus. Natl. Hist. Nat. 27: 118. 1921; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1785. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 292.1960; Pull., Fl. Andhra Pradesh 5: 2147. 2018. *Panicum trigonum* Retz., Observ. Bot. 3: 9. 1783; Hook. f., Fl. Brit. India 7: 56. 1896.

Annual herb. Culms creeping, up to 45 cm long, rooting at nodes; nodes hairy; Leaf sheaths ciliate along margin; ligule membranous; blades lanceolate, 2–4 cm long, glabrous. Panicles 3–4 cm long, branched; branches glabrous on axils, appressed to rachis. Spikelets ovate, 1.5 mm long, hispid. Lower glume elliptic-ovate. Upper glume boat shaped, chartaceous, softly hairy. Lower florets neuter, upper bisexual. Lower lemma broadly ovate. Upper lemma lanceolate, crustaceous. Palea 2-keeled. Caryopsis sub globose.

Fl. & Fr.: Aug–Nov.

Habitat: Common in dense shady moist places.

Specimens examined: PK Valasa, *Y. Mahesh* 010995 (BSID).

Field notes: Culms rooting at nodes.

20. DACTYLOCTENIUM Willd.

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Dactyloctenium aegyptium (L.) Willd., Enum. Pl. 1029. 1809; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1840. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 489. 1960; R.S. Rao & al. Fl. E. Godavari Dist. 767. 1999; Pull., Fl. Andhra Pradesh 5: 2147. 2018. *Cynosurus aegyptius* L., Sp. Pl. 1: 72. 1753. *Eleusine aegyptia* (L.) Desf., Fl. Atlant. 1: 85. 1798; Hook. f., Fl. Brit. India 7: 295. 1896. (**Plate 23G)**

Annual herb. Culms up to 60 cm long, ascending, rooting at lower nodes; nodes glabrous. Leaf sheaths glabrous, keeled; ligule membranous; blades oblong-lanceolate, 5-20 cm long, ciliate at margins, glabrous. Spikes digitate 4–6, up to 5 cm long. Spikelets oblong, 3 mm long, 3–5-flowered. Lower glume boat shaped, acute. Upper glume obovate, aristate, scabrid along keels. Lemmas ovate, cuspidate. Palea lanceolate, acuminate, chartaceous. Caryopsis obovate, transversely rugose.

Fl. & Fr.: Throughout the year.

Habitat: Common in sandy soils, forest plains, rice fields, along road sides.

Specimens examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: Leaf blades oblong-lanceolate, spikes digitate.

21. DENDROCALAMUS Nees

India: 11 spp.; Andhra Pradesh: 1 spp.; PNP: 1 sp.

1. Dendrocalamus strictus (Roxb.) Nees, Linnaea 9: 476. 1835; Hook. f., Fl. Brit. India 7: 404. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1858. 1934; R.S. Rao & al., Fl. E. Godavari Dist. 767. 1999; Pull., Fl., Andhra Pradesh 5: 2150. 2018. *Bambusa stricta* Roxb., Pl. Coromandel. t. 80. 1798. (**Plate 23H)**

Perennials. Culms erect, woody, up to 14 m high, tufted, unarmed; culm sheaths brown, glabrous, triangular, 5–12 × 7–14 cm; nodes swollen, lower one rooting. Leaf sheaths up to 15 cm long, glabrous; auricle short, hairy; ligule serrate, narrow; blades linear-lanceolate, up to 20 cm long, stiff. Panicles compound. Spikes in globose heads. Spikelets spiny, bisexual. Glumes ovate, many nerved. Lemma obovate, emarginate. Stigma plumose. Caryopsis sub globose.

Fl. &Fr.: Aug.–Oct.

Habitat: Common along slopes, plain areas in the deep forest, along stream banks.

Specimens examined: Buruguwada, *Y. Mahesh* 010101 (BSID).

Field notes: Woody perennial, culms swollen at nodes.

22. DICHANTHIUM P.Willemet

India: 10 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp. & 1 var.

Key to the species

1a.	Nodes with short hairs, ligule a short ciliate membrane; upper lemma bilobed	**2. D. caricosum** var. **bilobum**
1b.	Nodes with long hairs, ligule a long hairs; upper lemma not bilobed	**1. D. annulatum**

1. Dichanthium annulatum (Forssk.) Stapf, Fl. Trop. Afr. 9: 178. 1917; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1741. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 133. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 768. 1999; Pull., Fl. Andhra Pradesh 5: 2151. 2018. *Andropogon annulatus* Forssk., Fl. Aegypt.-Arab. 173. 1775; Hook. f., Fl. Brit. India 7: 196. 1896.

Perennials. Culms geniculate up to 80 cm high; nodes sparsely hairy. Leaf sheaths hairy at apex; ligule membranous; blades linear, 20 cm, glabrous. Racemes up to 8, digitately fascicled. Sessile spikelets elliptic-oblong, 3.5 mm long, subulate. Lower glume 8-nerved, tubercule based hairy. Upper glume lanceolate, 3-nerved. Lower florets neuter; upper florets bisexual. Lower lemma linear, hyaline. Upper lemma stipitiform, awned; awn up to 2.2 cm long. Stamens 3. Caryopsis oblong. Pedicelled spikelets oblong, 4 mm long; pedicels hairy. Lower glume elliptic, 9-nerved. Upper glume softly hairy. Lemmas ciliate.

Fl. & Fr.: Throughout the year.

Habitat: Common in open waste lands, plains, cultivated fields.

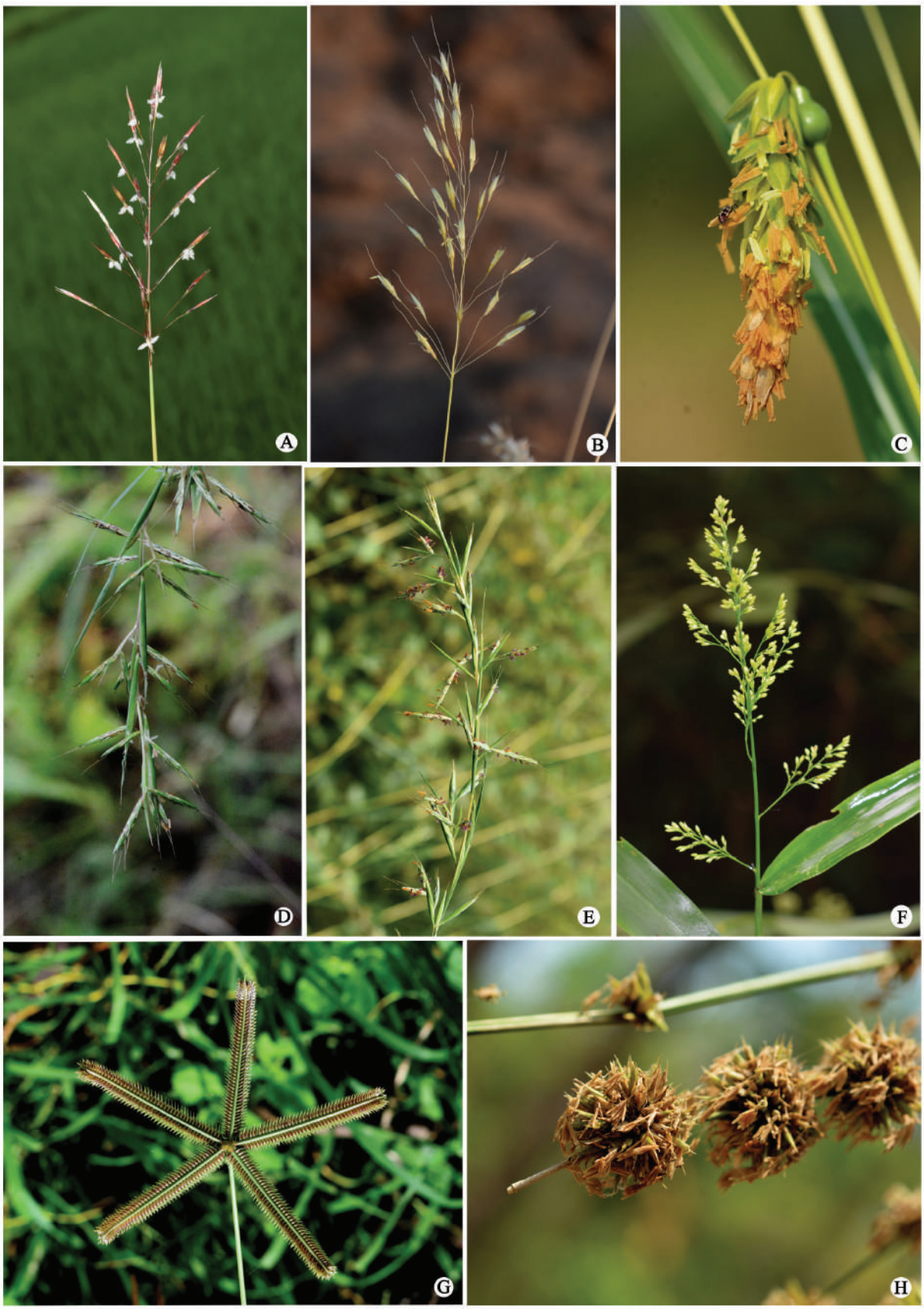


Plate 23: A. *Chrysopogon aciculatus* (Retz.) Trin.; **B.** *Chrysopogon polyphyllus* Blatt. & McCann; **C.** *Coix lacryma-jobi* L.; **D.** *Cymbopogon gidarba* A. Camus; **E.** *Cymbopogon martini* W. Watson; **F.** *Cyrtococcum oxyphyllum* Stapf; **G.** *Dactyloctenium aegyptium* (L.) Willd.; **F.** *Dendrocalamus strictus* (Roxb.) Nees

Specimens examined: Valamuru, Kondrukota, *Y. Mahesh* 010934, 011647 (BSID).

Field notes: Culms geniculate, racemes 8.

2. Dichanthium caricosum (L.) A. Camus var. **bilobum** Mahesh & al., Indian J. Forest. 43 (2): 134. 2020. **(Plate 24)**

Decumbent perennials. Culms geniculate, *c.* 35 cm high, lower nodes rooting. Leaf sheath keeled towards apex, compressed glabrous; ligule acute, membranous with minutely fimbriate apex; blade flat, linear–lanceolate, 5–8 × 0.2–0.3 cm, rounded to truncate at base, cartilaginous, scabrous along margins, acuminate at apex, sparsely tuberculate hairy on surface. Racemes solitary, exserted from spathes. Spikelets paired, closely imbricate, one sessile, awned, other pedicelled, unawned. Lower 2 or 3 spikelets homogamous, sterile or empty; pedicels less than half of sessile spikelet, entire spikelet disarticulating from tip of joint and pedicel. Sterile homogamous spikeletsobovate-elliptic, obtuse at apex, truncate at base, purplish-yellow, hairy up to above middle. Sessile spikelets obovate, obtuse, purplish -yellow, sparsely hairy at base, densely so near apex, awned; callus short bearded. Lower glume obovate, 3.7–4.0 mm long, obtuse, coriaceous, light yellowish, 9-11 nerved, prominently 2-keeled. Upper glume narrowly elliptic to lanceolate, 3.5–3.7 mm long, obtuse, membranous, 1-nerved, 2- keeled. Florets 2, lower sterile, upper bisexual, both epaleate. Lower lemma lanceolate, 3.4–3.6 mm long, apex muticous, membranous, hyaline, nerveless, margins inflexed, finely ciliate in middle. Palea absent. Upper lemma reduced to hyaline base of awn, *c.* 2.2 mm long, straight; awn geniculate, 1.6–1.8 cm long, column twisted, rufous, bristles finely barbellate. Stamens 3; anthers *c.* 1.0–1.2 mm long, greenish-yellow; filaments hyaline. Ovary 0.6 mm long, light brown; styles *c.* 1 mm long; stigmas 2, unequal, 1.6-1.8 mm long. Caryopsis lanceolate-oblong, *c.* 0.7 mm long, brown.

Fl. & Fr.: Sep.–Mar.

Distribution: This variety is currently known from type locality only. It was found in moist places adjacent to paddy field at an elevation of 439 m, in association with *Ammannia* sp., *Cyperus* spp., *Kyllinga* sp. and other grasses.

Specimens examined: Bapanamma polam, Kondamodalu, *Y. Mahesh* 010059 (BSID).

Field notes: Culms geniculate, white bearded at nodes.

23. DIECTOMIS Kunth

India: 1 spp.; Andhra Pradesh: 1 spp.; PNP: 1 sp.

1. Diectomis fastigiata (Swartz) Kunth, Nov. Gen. Sp. 1: 193. 1816; Bor, Grass. Burma, Ceylon, India & Pakistan 135. 1960. *Andropogon fastigiatus* Sw., Prodr. 26. 1788; Hook. f., Fl. Brit. India 7: 167. 1896; Pull., Fl. Andhra Pradesh 5: 2084. 2018.

Perennials. Culms 60 cm high, fastigately branched upward. Leaf sheaths terete; ligule acute; blades linear, up to 25 cm long, scabrid. Racemes enclosed by spathe, white villous hairs at joints. Sessile spikelets oblong; callus hairy. Lower glume lanceolate, keeled, ciliate at apex. Upper glume cymbiform, trinerved, awned. Lower lemma linear, 2-keeled. Upper lemma awned. Palea hyaline. Stamens 3. Pedicelled spikelets neuter. Lower glume ovate, awned. Upper glume membranous.

Fl. & Fr.: Sep–Jan.

Habitat: Occasional in hilly areas in the forest.

Specimens examined: Paraparala Konda, *Y. Mahesh* 011573 (BSID).

Field notes: Culms branched upwards, leaf blades scabrid.

24. DIGITARIA Haller

India: 29 spp., 1 subsp.& 2 var.; Andhra Pradesh: 11 spp.; PNP: 6 spp.

Key to the species

1a.	Inflorescence of digitate or whorled racemes; spikelets binate or ternate	2
1b.	Inflorescence of effuse panicles; spikelets solitary	**6. D. tomentosa**
2a.	Hairs on spikelets verrucose	**3. D. longiflora**
2b.	Hairs on spikelets simple or clavate	3
3a.	Spikelets with clavate hairs	**1. D. abludens**
3b.	Spikelets with other than clavate hairs	4
4a.	Spikelets binate	5
4b.	Spikelets ternate	**5. D. ternata**
5a.	Lower glume absent	**4. D. setigera**
5b.	Lower glume present and reduced to a triangular scale	**2. D. ciliaris**

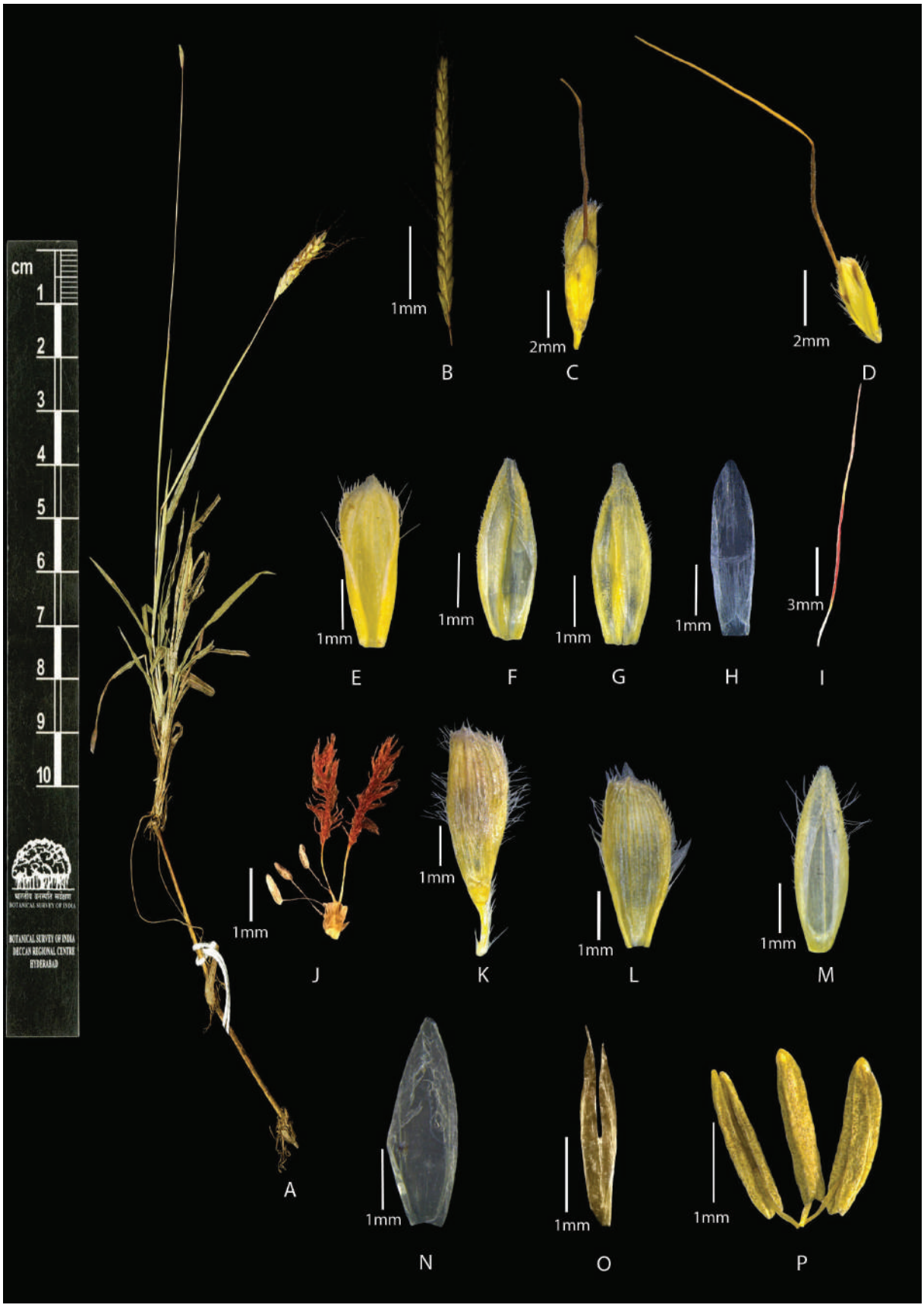


Plate 24: *Dichanthium caricosum* var. *bilobum* Y. Mahesh, Rasingam & J. Swamy var. nov.: **A.** Habit; **B.** Raceme; **C.** Pair of spikelets; **D.** Sessile spikelet; **E.** Lower glume; **F-G.** Upper glume; **H.** Lower lemma; **I.** Upper lemma; **J.** Pistil & stamens; **K.** Pedicelled spikelet; **L.** Lower glume; **M.** Upper glume; **N.** Lower lemma; **O.** Upper lemma; **P.** Stamens.

1. Digitaria abludens (Roem. & Schult.) Veldkamp, Blumea 21: 53. 1973; Pull. Fl. Andhra Pradesh 5: 2155. 2018. *Panicum abludens* Roem. & Schult., Syst. Veg., ed. 15, 2: 457. 1817. *Digitaria granularis* (Trin.) Henrard, Monogr. Digitaria 302. 1950; Bor, Grass. Burma, Ceylon, India & Pakistan 301. 1960. *Paspalum pedicellare* Trin. ex Hook. f., Fl. Brit. India 7: 19. 1896. *Digitaria pedicellaris* (Hook.f.) Prain, Bengal Pl. 1182. 1903; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1765. 1934.

Annuals. Culms tufted, up to 60 cm high, slender; nodes glabrous. Leaf sheaths keeled, glabrous; ligule membranous; blades linear-lanceolate, 12 cm long, glabrous. Racemes 3–5, rachis triquetras, scabrid; pedicels filiform. Spikelets elliptic-oblong, 1.5 mm long, clavate hairy. Lower glume absent. Upper glume 3-nerved, hairy. Lower florets neuter. Upper bisexual. Lower lemma elliptic, 3-nerved. Upper lemma ovate, apiculate. Palea 2-keeled, crustaceous. Caryopsis ellipsoid, enclosed in lemma and palea.

Fl. & Fr.: Aug.–Nov.

Habitat: Common along water courses, rocky habitats.

Specimens examined: Tekupally, *Y. Mahesh* 011693 (BSID).

Field notes: Culms slender, rachis of the scabrid.

2. Digitaria ciliaris (Retz.) Koeler, Descr. Gram. 27. 1802; R.S. Rao & al., Fl. E. Godavari Dist. 769. 1999; Pull., Fl. Andhra Pradesh 5: 2156. 2018. *Panicum ciliare* Retz., Observ. Bot. 4: 16. 1786. *Digitaria marginata* var. *fimbriata* (Link) Stapf in Prain, Fl. Trop. Afr. 9: 440. 1919; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1764. 1934. *Digitaria adscendens* (Kunth) Henrard, Blumea 1: 92. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 298. 1960. *Digitaria ciliaris* subsp. *chrysoblephara* (Fig. & De Not.) Henrard, Monogr. Gen. Digitaris 998. 1950; Bor, Grass. Burma, Ceylon, India & Pakistan 299. 1960. *Paspalum sanguinale* var. *ciliare* (Retz.) Hook. f., Fl. Brit. India 7: 15. 1896.

Annuals. Culms up to 85 cm high, tufted, rooting at lower nodes; nodes glabrous; leaf sheaths strigose; ligules carious; blades linear-lanceolate, 15 cm long, glabrous. Racemes 2-9, digitate, rachis winged; pedicels scabrid, triquetras. Spikelets 2.5 mm long, oblong, hairy, appressed to the rachis. Lower glume reduced to triangular scale. Upper glume lanceolate, 5-nerved, pubescent. Lower lemma oblong-lanceolate, pubescent. Upper lemma oblong, coriaceous. Palea 2-keeled. Caryopsis oblong.

Fl. & Fr.: Throughout the year

Habitat: Common weed in cultivated fields, plains in the forest.

Specimens examined: Bulavegisa, *Y. Mahesh* 010546 (BSID).

Field notes: Culms tufted, rooting at lower nodes.

3. Digitaria longiflora (Retz.) Pers., Syn. Pl. 1: 85. 1805; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1765. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 302. 1960; Pull., Fl. Andhra Pradesh 5: 2157. 2018. *Paspalum longiflorum* Retz., Observ. Bot. 4: 15. 1786; Hook. f., Fl. Brit. India 7: 17. 1896. (**Plate 25A)**

Perennials. Culms tufted, ascending, up to 55 cm high, rooting at nodes; nodes glabrous, leaf sheaths glabrous; ligule membranous; blades ovate-lanceolate, 10 cm long, sparsely hairy. Racemes digitate; rachis winged. Spikelets elliptic, hairy; hairs verrucose. Lower glume absent. Upper glume ovate, 3-nerved, pubescent. Lower lemma similar to upper glume. Upper lemma ovate, coriaceous. Palea 2-nerved. Caryopsis ovoid.

Fl. & Fr.: Aug.–Nov.

Habitat: Commonly found as weed in cultivated fields, plains.

Specimens examined: PK Valasa, Valamuru, *Y. Mahesh* 010415, 010493 (BSID).

Field notes: Culms tufted, rooting at nodes, leaves ovate-lanceolate.

4. Digitaria setigera Roth ex Roem. & Schult., Syst. Veg., ed. 15, 2: 474. 1817; Bor, Grass. Burma, Ceylon, India & Pakistan 305. 1960; Pull., Fl. Andhra Pradesh 5: 2159. 2018. *Paspalum sanguinale* var. *extensum* Hook. f., Fl. Brit. India 7: 15. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1772. 1934.

Annuals. Culms stoloniferous, up to 70 cm high, rooting at lower nodes; nodes glabrous. Leaf sheath hairy; ligule membranous; blades linear-lanceolate, 10 cm, cordate at base, acuminate apex, glabrous. Racemes 3–8, digitate; rachis winged; pedicels triquertrous, scabrid. Spikelets oblong-elliptic, 2.5 mm long. Lower glume absent. Upper glume triangular, 3-nerved. Lower lemma lanceolate, pubescent. Upper lemma elliptic, crustaceous. Palea 2-keeled. Caryopsis ellipsoid.

Fl. & Fr.: Aug.–Nov.

Habitat: Occasional on hilly slopes in the forest.

Specimens examined: PK Valasa, *Y. Mahesh* 010418 (BSID).

Field notes: Culms stoloniferous, rooting at lower nodes.

5. Digitaria ternata (A. Rich.) Stapf in Dyer, Fl. Cap. 7: 376. 1898; Bor, Grass. Burma, Ceylon, India & Pakistan 305. 1960; Pull., Fl. Andhra Pradesh 5: 2160. 2018. *Cynodon ternatus* A. Rich., Tent. Fl. Abyss. 2: 405. 1850. *Paspalum ternatum* (A. Rich.) Hook. f., Fl. Brit. India 7: 17. 1896.

Annuals. Culms erect, 90 cm high; nodes glabrous. Leaf sheaths glabrous, hairy at mouth; ligule membranous; blades linear- up to 15 cm, oblong, glabrous, margins ciliate. Racemes 2–4, glabrous; rachis serrate. Spikekets ternate, ovate, *c.* 2.5 mm long, pubescent. Lower glume absent. Upper glume lanceolate, pubescent. Lower lemma elliptic-oblong, 5-nerved, hairy. Upper lemma lanceolate, cartilaginous. Caryopsis elliptic.

Fl. & Fr.: Aug.–Dec.

Habitat: Common in plains, hills, moist areas in the forest.

Specimens examined: Eruwada, *Y. Mahesh* 010638 (BSID).

Field notes: Nodes glabrous, spikelets pubescent.

6. Digitaria tomentosa (J. Koenig ex Rottler) Henrard, Blumea 1: 100. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 306. 1960; Pull., Fl. Andhra Pradesh 5: 2160. 2018. *Milium tomentosum* J. Koenig ex Rottler, Neue Schriften Ges. Naturf. Freunde Berlin 4: 220. 1803. *Panicum subegluma* Trin., Mem. Acad. Imp. Sci. St. Petersbourg, Ser. 6, Sci. Math. 3: 292. 1834; Hook. f., Fl. Brit. India 7: 51.1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1783. 1934.

Annuals. Culms tufted, up to 75 cm high, geniculate; nodes hairy. Leaf sheaths hairy along margins; ligule membranous; blades ovate-oblong, up to 12 cm long, softly hairy. Panicles effuse, up to 20 cm long, spreading, hairy on axils of branches. Spikelets solitary, lanceolate, 1.5–2 mm long, distantly arranged, pubescent. Glumes absent. Lower lemma 7-nerved, pilose. Upper lemma elliptic, 5-nerved, glabrous. Caryopsis oblong.

Fl. & Fr.: Aug.–Nov.

Habitat: Common on hills, slopes in the forest.

Specimens examined: Teliperu, *Y. Mahesh* 011479 (BSID).

Field notes: Culms tufted, geniculate, panicle effuse.

25. DIMERIA R.Br.

India: 47 spp., 3 subsp. & 4 var.; Andhra Pradesh: 7 spp.; PNP: 3 spp.

Key to the species

1a.	Uppwer glume winged	2
1b.	Upper glume not winged	**3. D. ornithopoda**
2a.	Racemes rarely divergent; upper glume narrowly winged all along the keel	**2. D. connivens**
2b.	Racemes usually divergent; upper glume broadly winged all along the keel	**1. D. bialata**

1. Dimeria bialata C.E.C. Fisch., Bull. Misc. Inform. Kew 1933: 351. 1933; Bor, Grass. Burma, Ceylon, India & Pakistan 140. 1960; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1713. 1928; Pull., Fl. Andhra Pradesh 5: 2162. 2018.

Annuals. Culms slender, up to 35 cm high; nodes hairy. Leaf sheaths glabrous below, bulbous based hairy above; ligule membranous; blades lanceolate, up to 6 cm long, tubercule based hairy along margins. Racemes 2, usually divergent, up to 4 cm long; rachis scabrous winged. Spikelets elliptic-oblong, 3.5 mm long, compressed. Lower glume lanceolate, keeled; keels ciliate. Upper glume elliptic, keeled; keel broadly winged. Lower lemma lanceolate, 1-nerved. Upper lemma elliptic, hyaline, awned; awn up to 14 mm long. Caryopsis cylindrical.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in open forests, rocky crevices in the forest.

Specimens examined: Tekupally, *Y. Mahesh* 011697 (BSID).

Field notes: Culms hairy at nodes, spikelets compressed.

2. Dimeria connivens Hack. in DC., Monogr. Phan. 6: 689. 1889; Hook. f., Fl. Brit. India 7: 104. 1896; Bor, Grass. Burma, Ceylon, India & Pakistan 140. 1960; Pull., Fl. Andhra Pradesh 5: 2163. 2018.

Annuals. Culms erect, terete, up to 3.5 cm long, smooth; nodes sparsely bearded. Leaf sheaths keeled; ligule membranous; blades linear-lanceolate, 2–4.5 cm long, acumiate at apex, tuberculate hairs. Racemes 2, rarely divergent, erect, ciliate along margins; rachis flat, narrowely winged. Spikelets alternate, oblong; callus beareded; pedicels short. Lower glume chartaceous, keeled. Upper glume lanceolate, winged all along the keel. Lower lemma oblong, hyaline. Upper lemma elliptic, fainely nerved, awned; awn 6 mm long. Caryopsis linear, curved.

Fl. & Fr.: Sep.–Nov.

Habitat: Occasional in grasslands, hilly areas in the forest.

Specimens examined: Eruwada, Gundragattu, *Y. Mahesh* 010653, 011499 (BSID).

Field notes: Culms hairy, spikelets alternate.

3. Dimeria ornithopoda Trin., Fund. Agrost. 167. t. 14. 1820; Hook. f., Fl. Brit. India 7: 104. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1713. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 142. 1960. var. *ornithopoda* Pull., Fl. Andhra Pradesh 5: 2164. 2018.

Annuals. Culms tufted, slender, up to 45 cm high. Leaf sheaths glabrous; ligule lacerate; blades lanceolate, up to 5 cm long, densely pubescent. Racemes 2, up to 5 cm long, digitate; rachis angular. Spikelets linear-oblong, up to 2 mm long; callus hairy. Lower glume linear, pubescent. Upper glume linear, not winged, hyaline along margins, hairy. Lower lemma absent. Upper lemma hyaline, awned; awn capillary, up to 8 mm long. Caryopsis ellipsoid.

Fl. & Fr.: Aug.–Dec.

Habitat: Rare on hill tops, moist rocky crevices.

Specimens examined: Kambam konda, *Y. Mahesh* 010675 (BSID).

Field notes: Tufted grass, racemes digitate.

26. DIPLACHNE P. Beauv.

India: 1 spp.; Andhra Pradesh: 1 spp.; PNP: 1 sp.

1. Diplachne malabarica (L.) Merr., Bull. Torrey Bot. Club 60: 635. 1933. *Poa malabarica* L., Sp. Pl. 1: 69. 1753. *Leptochloa fusca* (L.) Kunth, Revis. Gramin. 1: 91. 1829; Pull., Fl. Andhra Pradesh 5: 2217. 2018. *Diplachne fusca* P. Beauv., Ess. Agrost. 80 &163. 1812; Hook. f., Fl. Brit. India 7: 329. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1829. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 492. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 768. 1999.

Perennials. Culms erect, tufted, up to 70 cm high. Leaf sheath keeled; ligule membranous; blades linear-lanceolate, up to 20 cm long. Panicles up to 18 cm long. Spikelets linear-oblong, up to 6 mm, 6 flowered. Lower glumes lanceolate, single nerved, chartaceous. Upper glume oblong, mucronate. Lemmas elliptic, trilobed, muticous, 3-nerved, hairy in lower half. Palea elliptic-oblong, hyaline, ciliate along margins.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in marshy localities, cultivated fields.

Specimens examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: Spikelets linear-oblong.

27. ECHINOCHLOA P.Beauv.

India: 8 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Racemes appressed to the rachis; spikelets loosely placed, unawned	**1. E. colona**
1b.	Racemes not appressed to the rachis; spikelets closely placed, awned	**2. E. crus-galli**

1. Echinochloa colona (L.) Link, Hort. Berol. 2: 209. 1833; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1776. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 308. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 770. 1999; Pull., Fl. Andhra Pradesh 5: 2166. 2018. *Panicum colonum* L., Syst. Nat., ed. 10. 2: 870. 1759; Hook. f., Fl. Brit. India 7: 32. 1896. (**Plate 25B)**

Annuals. Culms tufted, decumbent, up to 80 cm high, branching from lower nodes; nodes glabrous. Leaf sheath glabrous; ligule absent; blades lanceolate, 8–22 cm long, cordate at base, acuminate at apex. Panicles up to 18 cm long. Racemes appressed to the rachis. Spikelets biseriate, loosely placed, elliptic, unawned, 3 mm long,

hispid. Lower glume broadly ovate-orbicular, hairy. Upper glume broadly ovate, 8-nerved. Lower lemma broadly ovate, cuspidate. Upper lemma ovate, crustaceous, obtuse. Palea ovate, 2-keeled. Caryopsis ellipsoid.

Fl. & Fr.: Throughout the year.

Habitat: Common in cultivated fields, plains.

Specimens examined: Bulavegisa, *Y. Mahesh* 010540 (BSID).

Field notes: Culms decumbent, branching from lower nodes.

2. Echinochloa crus-galli (L.) P. Beauv., Ess. Agrostogr. 53, t. 11, f. 2. 1812; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1777. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 310. 1960; Pull., Fl. Andhra Pradesh 5: 2166. 2018. *Panicum crus-galli* L., Sp. Pl. 1: 56. 1753; Hook. f., Fl. Brit. India 7: 30. 1896. (**Plate 25C)**

Annuals. Culms erect, tufted, up to 80 cm high, rooting at lower nodes; nodes glabrous. Leaf sheaths glabrous; ligule absent; blades linear, 6–25 cm long, rounded at base, acuminate at apex, glabrous. Panicles pyramidal, up to 15 cm long. Racemes not appressed to the rachis, spreading. Spikelets ovate, up to 3.5 mm long, shortly awned. Lower glume ovate, 5-nerved, ciliate at margin. Upper glume broadly ovate, concave, 5-nerved, hairy on nerves, cuspidate. Lower lemma oblong-ovate, scabrid, cuspidate, awned; awn up to 12 mm long. Upper lemma elliptic, coriaceous, cuspidate. Paleas hyaline 2-keeled. Caryopsis ellipsoid.

Fl. &Fr.: Throughout the year.

Habitat: Common in paddy fields, waste lands, marshy localities in the forest.

Specimens examined: Kintukuru, *Y. Mahesh* 011454 (BSID).

Field notes: Culms rooting at lower nodes.

28. ELEUSINE Gaertn.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Eleusine indica (L.) Gaertn., Fruct. Sem. Pl. 1: 8. 1789; Hook. f., Fl. Brit. India 7: 293. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1839. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 493. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 770. 1999; Pull., Fl. Andhra Pradesh 5: 2170. 2018. *Cynosurus indicus* L., Sp. Pl. 1: 72. 1753. (**Plate 25D)**

Annuals. Culms erect, tufted, up to 85 cm high; nodes glabrous. Leaf sheaths keeled, glabrous; ligule membranous; blades linear, 5–40 cm long, cordate at base, tip blunt. Spikes digitate, up to 10 in number. Spikelets ovate, 4 mm long, 5-flowered. Lower glume oblong, 3-nerved, scabrid along keels. Upper glume oblong, 3-5-nerved, chartaceous. Lemmas ovate-oblong, 3-nerved. Paleas hyaline, keeled. Caryopsis oblong, trigonous.

Fl. & Fr.: Throughout the year.

Habitat: Common near water courses, open areas, roadsides.

Specimens examined: PK Valasa, Ijjaluru, *Y. Mahesh* 010420, 010972 (BSID).

Field notes: Leaf sheaths keeled; spikes digitate.

29. ENTEROPOGON Nees

India: 4 spp.; Andhra Pradesh: 1 spp.: PNP: 1 sp.

1. Enteropogon dolichostachyus (Lag.) Keng, Clav. Gen. Sp. Gram. Prim. Sin. 197. 1957; R.S. Rao & al., Fl. E. Godavari Dist. 763. 1999. *Chloris dolichostachya* Lag., Gen. Sp. Pl.5. 1816; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1838. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 466. 1960; Pull., Fl. Andhra Pradesh 5: 2123. 2018. *Chloris incompleta* Roth, Nov. Pl. Sp. 60. 1821; Hook. f., Fl. Brit. India 7: 290.1896.

Perennials. Culms creeping, up to 140 cm high; nodes glabrous. Leaf sheath glabrous; ligule membranous; blades linear, up to 20 cm long, acuminate at apex. Spikes 5, digitate. Spikelets lanceolate, 2-flowered. Lower glume lanceolate, 1-nerved. Upper glume lanceolate, 1-nerved. Fertile lemma lanceolate, awned; awns 14 cm long. Palea hyaline. Sterile lemmas reduced to scales. Caryopsis oblong.

Fl. & Fr.: Sep–Dec.

Habitat: Common along moist hilly areas, under shady areas.

Specimens examined: Eruwada, Bapanagandi, *Y. Mahesh* 010616, 011681 (BSID).

Field notes: Culms creeping, glabrous.

30. ERAGROSTIELLA Bor

India: 4 spp. & 1 var.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves from the basal sheaths shorter, never reaching the base of the inflorescence	**1. E. bifaria**
1b.	Leaves from the basal sheaths reaching to the base of the inflorescence	**2. E. nardoides**

1. Eragrostiella bifaria (Vahl) Bor, Indian Forester 66: 270. 1940; R.S. Rao & al., Fl. E. Godavari Dist. 770. 1999; Pull., Fl. Andhra Pradesh 5: 2173. 2018. *Poa bifaria* Vahl, Symb. Bot. 2: 19. 1791. *Eragrostis bifaria* (Vahl) Wight ex Steud., Nom. Bot. ed. 2. 1: 562. 1840; Stapf in Hook. f., Fl. Brit. India 7: 325. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1828. 1934. (**Plate 25E)**

Perennials. Culms erect, up to 60 cm, basal portion covered with older sheaths; nodes glabrous. Leaf sheaths glabrous; ligule ciliate; blades filiform, rolled, up to 10 cm long, hairy above. Spikes up to 20 cm long. Spikelets compressed, ovate-lanceolate, 5–25-flowered, grey. Glumes ovoid, 1-nerved, hairy on keels. Lemmas ovate, falcate, puberulous along margins. Paleas elliptic, hyaline, winged a keel, ciliate. Caryopsis broadly ovate.

Fl. & Fr.: Sep–Dec.

Habitat: Common in plains, grasslands, forest uotskirts.

Specimens examined: Katchuluru, *Y. Mahesh* 011502 (BSID).

Field notes: Culms covered with older leaves; spikelets compressed.

2. Eragrostiella nardoides (Trin.) Bor, Indian Forester 66: 270. 1940; Pull., Fl. Andhra Pradesh 5: 2175. 2018. *Eragrostis nardoides* Trin., Mem. Acad. Imp. Sci. St. Petersbourg, 1: 415. 1831; Stapf in Hook. f., Fl. Brit. India 7: 326. 1896.

An erect perennial herb. Culms erect, tufted, up to 50 cm high; nodes glabrous. Leaf sheaths glabrous; blades filiform, convolute, with delicate long hairs. Spikes slender. Glumes subequal, keeled. Lemmas turgid. Paleas hyaline. Caryopsis ellipsoid with oblique base.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in moist habitats, near water courses.

Specimens examined: Pochavaram, *Y. Mahesh* 011569 (BSID).

Field notes: Perennial grass, culms tufted.

31. ERAGROSTIS Wolf

India: 44 spp. & 5 var.; Andhra Pradesh: 22 spp.; PNP: 11 spp.

Key to the species

1a.	Rachis tough; lemmas breaking up from below to upwards	2
1b.	Rachis fragile; lemmas breaking from apex to downwards	7
2a.	Plants glandular	3
2b.	Plants eglandular	5
3a.	Perennials	**6. E. maderaspatana**
3b.	Annuals	4
4a.	Culm nodes devoid of glandular band; paleas persistant	**2. E. cilianensis**
4b.	Culm nodes with a glandular band below; paleas deciduous	**8. E. pilosa**
5a.	Spikelets narrowely linear-oblong or lanceolate	6
5b.	Spikelets broadly ovate	**11. E. unioloides**
6a.	Lemmas up to 1.5 mm long	**7. E. nutans**
6b.	Lemmas > 1.5 mm long	**1. E. atrovirens**
7a.	Keels of the palea ciliate	8
7b.	Keels of the palea not ciliate	**5. E. japonica**
8a.	Panicles spiciform or compact and dense	9
8b.	Panicles effuse	**10. E. tenella**
9a.	Annuals; lemma ciliate on the keels	**3. E. ciliaris**
9b.	Perennials not ciliate on the keels	10
10a.	Panicle more or less dense; lemma acute at apex	**4. E. coarctata**
10b.	Panicle very dense; lemma rounded at apex	**9. E. riparia**

1. Eragrostis atrovirens (Desf.) Trin. ex Steud., Nom. Bot. ed. 2. 1: 562. 1840; Bor, Grass. Burma, Ceylon, India

& Pakistan 503. 1960; Pull., Fl. Andhra Pradesh 5: 2177. 2018. *Poa atrovirens* Desf., Fl. Atlant. 1: 73. t. 14. 1798. (**Plate 25F)**

Perennials. Culms erect, tufted, up to 90 cm high; nodes glabrous. Leaf sheaths keeled, glabrous; ligule membranous; blades linear-lanceolate, 5–30 cm long, convolute. Panicles up to 20 cm long, contracted. Spikelets short pedicelled, linear, 6–30 flowered. Lower glume lanceolate, chartaceous, 1-nerved. Upper glume lanceolate, 1-nerved. Lemmas broadly ovate, 3-nerved. Paleas lanceolate, 2-keeled, hyaline. Caryopsis ellipsoid, brown.

Fl. & Fr.: Aug.–Dec.

Habitat: Common in stram banks, swampy habitats.

Specimens examined: Eruwada, *Y. Mahesh* 010648 (BSID).

Field notes: Panicles contracted, spikelets pedicelled.

2. Eragrostis cilianensis (All.) Vignolo ex Janch., Mitt. Naturwiss. Vereins Univ. Wien 5: 110. 1907; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1827. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 503. 1960; Pull., Fl. Andhra Pradesh 5: 2178. 2018. *Poa cilianensis* All., Fl. Pedem. 2: 246, t. 91, f. 2. 1785. *Eragrostis major* Host, Gram. Austr. 4: 14 & 24. 1809; Stapf in Hook. f., Fl. Brit. India 7: 320. 1896.

Annuals. Culms erect, tufted, up to 60 cm high; nodes glabrous. Leaf sheaths hairy near mouth; ligule a rim of hairs; blades linear-lanceolate, 5–15 cm long, flat, cordate at base, margins glandular. Panicles contracted, up to 18 cm long. Spikelets ovate-oblong, up to 30 flowered, grey, tinged with purple colour. Lower glume lanceolate, 1-nerved. Upper glume ovate-lanceolate, 3-nerved, chartaceous, scabrid on keels. Lemmas glandular on keels. Paleas 2-keeled, ciliate along keels. Caryopsis orbicular.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in the forest slopes, cultivated fields.

Specimens examined: Koida, *Y. Mahesh* 010189 (BSID).

Field notes: Ligule hairy, leaf blade margins glandular.

3. Eragrostis ciliaris (L.) R. Br. in TucKey, Narr. Exp. Congo, App. 478. 1818; Stapf in Hook. f., Fl. Brit. India 7: 314. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1825. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 506. 1960. var. *ciliaris* Pull., Fl. Andhra Pradesh 5: 2178. 2018. *Poa ciliaris* L., Syst. Nat., ed. 10. 2: 875.1759.

Annual herb. Culms erect, tufted, up to 50 cm high; nodes glabrous. Leaf sheaths ciliate near mouth; ligule with silky hairy; blades linear-lanceolate, up to 8 cm long, glabrous. Panicles spiciform, compact, up to 60 cm long. Spikelets ovate, 4.5 mm long, up to 10 flowered, closely arranged. Glumes subequal, ovate-lanceolate, 1-nerved. Lemmas broadly ovate, hairy on keels. Palea obovate, 2-keeled, hairy on keels. Caryopsis ellipsoid.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in moist habitats, sandy river beds in the forest.

Specimens examined: Maredupudi, *Y. Mahesh* 010116 (BSID).

Field notes: Spikelets closely arranged.

4. Eragrostis coarctata Stapf in Hook. f., Fl. Brit. India 7: 313. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1825. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 507. 1960; Pull., Fl. Andhra Pradesh 5: 2181. 2018.

Perennial grass. Culms tufted, up to 90 cm high, wiry, geniculately ascending; nodes glabrous. Leaf sheaths glabrous; ligule hairy; blades linear-lanceolate, up to 10 cm long. Panicles compact, up to 10 cm long, spiciform, branches hispid. Rachis bearded at nodes. Spikelets oblong, up to 3.5 mm long, 10 flowered, grey in colour. Glumes subequal, ovate-lanceolate, chartaceous, 1-nerved. Lemmas ovate, membranous, 3-nerved, ciliate on margins. Palea oblong, keeled. Caryopsis ovoid.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional along marshy habitats along stream banks.

Specimens examined: Eruwada, *Y. Mahesh* 010620 (BSID).

Field notes: Culms wiry, ascending.

5. Eragrostis japonica (Thunb.) Trin., Mem. Acad. Imp. Sci. St. Petersbourg, Ser. 6, Sci. Math. 1: 405. 1831; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1826. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 509. 1960; R.S.

Rao & al., Fl. E. Godavari Dist. 771. 1999; Pull., Fl. Andhra Pradesh 5: 2182. 2018. *Poa japonica* Thunb., Fl. Jap. 51. 1784. *Eragrostis interrupta* Stapf in Hook. f., Fl. Brit. India 7: 316. 1896. Incl. vars., non (R. Br.) P. Beauv., 1812. *Eragrostis diarrhena* (Schult.) Steud., Syn. Pl. Glumac. 1: 266.1854; C.E.C. Fisch. in Gamble, Fl. Madras 1826. 1934.

Perennials. Culms erect, tufted up to 100 cm high, geniculately ascending; nodes glabrous. Leaf sheaths glabrous, keeled; ligule fimbriate; blades linear-lanceolate, up to 20 cm, involute, glabrous. Panicles contracted, spiciform, branches whorled. Spikelets oblong-lanceolate, up to 6 mm long, 8-flowered. Lower glume ovate, 1-nerved. Upper glume ovate, hyaline, 1-nerved. Lemmas obovate, chartaceous. Palea keeled; keels scabrid. Caryopsis obovoid, shining.

Fl. & Fr.: Oct.–Jan.

Habitat: Common weed in cultivated fields, along stream beds, moist localities.

Specimens examined: Tekupally, *Y. Mahesh* 011698 (BSID).

Field notes: Tall grass, culms tufted, panicle spiciform.

6. Eragrostis maderaspatana Bor, Grass. Burma, Ceylon, India & Pakistan 509. 1960; Pull., Fl. Andhra Pradesh 5: 2183. 2018. *Eragrostis willdenowiana* Nees ex Steud. ex Stapf in Hook. f., Fl. Brit. India 7: 322. 1896., non Nees ex Hook. & Arn., 1838; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1827. 1934.

Perennials. Culms erect or geniculately ascending, tufted, up to 45 cm high; nodes with glandular ring. Leaf sheaths glabrous, ciliate at outer margin; ligule, fimbriate; blades linear, 1.5 cm long, margins glandular, glabrous. Panicles oblong, up to 7 cm long, branches spreading. Spikelets linear, dark green, up to 20-flowered. Glumes ovate, 1-nerved, chartaceous. Lemmas broadly elliptic. Paleas oblong, scabrid on keels. Caryopsis oblong, dorsally grooved, truncate at both ends.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in open areas, marshy places.

Specimens examined: Tekupally, *Y. Mahesh* 011696 (BSID).

Field notes: Nodes with glandular ring of hairs.

7. Eragrostis nutans (Retz.) Nees ex Steud. ex Steud., Nomencl. Bot., ed. 2. 1: 563. 1840; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1826. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 511. 1960; Pull., Fl. Andhra Pradesh 5: 2185. 2018. *Poa nutans* Retz., Observ. Bot. 4: 19. 1786. *Eragrostis elegantula* Nees ex Steud., Syn. Pl. Glumac. 1: 266. 1854; Hook. f., Fl. Brit. India 7: 318. 1896.

Perennials. Culms erect, tufted, up to 60 cm high; nodes glabrous. Leaf sheaths hairy near mouth; ligule hairy; blades linear-lanceolate, up to 12 cm long. Panicles contracted, oblong, up to 8 cm long, spiciform. Spikelets oblong-lanceolate, 4 mm long, up to 14 flowered. Lower glume oblong, 1-nerved. Upper glume oblong, chartaceous, 1-nerved. Lemmas ovate, 3-nerved. Paleas oblong, 2-nerved, 2-keeled, scabrid on keels. Caryopsis ellipsoid.

Fl. & Fr.: Jul.–Dec.

Habitat: Common in cultivated fields, moist localities.

Specimens examined: Tekupally, Kukunur range, *Y. Mahesh* 011688 (BSID).

Field notes: Perennial grass, spikelets oblong.

8. Eragrostis pilosa (L.) P. Beauv., Ess. Agrostogr. 71: 162, 175. 1812; Stapf in Hook. f., Fl. Brit. India 7: 323. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1827. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 512. 1960; Pull., Fl. Andhra Pradesh 5: 2185. 2018. *Poa pilosa* L., Sp. Pl. 1: 68. 1753.

Annuals. Culms geniculately ascending, up to 90 cm high; nodes glabrous. Leaf sheath glabrous, keeled; ligules fimbriate; blades linear-lanceolate, up to 15 cm long. Panicles lax, filiform. Spikelets ovate-lanceolate, up to 10 flowered, grey. Lower glumes ovate, chartaceous. Upper glume lanceolate, hyaline, 1-nerved. Lemmas lanceolate, chartaceous, 3-nerved. Palea ovate-lanceolate, keeled; keels scabrid. Caryopsis ovoid, brown.

Fl. & Fr.: Aug.–Jan.

Habitat: Occasional in plains, as weed in cultivated fields, marshy areas.

Specimens examined: Buruguwada, *Y. Mahesh* 011598 (BSID).

9. Eragrostis riparia (Willd.) Nees, Agrost. Bras. 512. 1829; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1825. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 513. 1960; Pull., Fl. Andhra Pradesh 5: 2186. 2018. *Poa riparia* Willd. in Ges., Natur. Freunde Berlin, Neue Schrift. 4: 185. 1803. *Eragrostis tenella* P. Beauv. var. *riparia* Stapf in Hook. f., Fl. Brit. India 7: 315. 1896.

Perennials. Culms wiry, tufted, ascending, up to 50 cm high; nodes glabrous. Leaf sheaths keeled, glabrous; ligule hairy; blades narrowly linear-lanceolate, up to 6 cm long. Panicles contracted, 7 cm long, cylindric. Spikelets ovate-oblong, 7-flowered. Glumes subequal, linear, chartaceous, 1-nerved. Lemmas oblong, chartaceous, 3-nerved. Paleas lanceolate, 2-keeled, ciliate on keels. Caryopsis ovoid, brown.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in sandy soils, marshy areas.

Specimens examined: Gulletiwada, *Y. Mahesh* 010603 (BSID).

10. Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult., Syst. Veg. 2: 576. 1817; Bor, Grass. Burma, Ceylon, India & Pakistan 513. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 772. 1999; Pull., Fl. Andhra Pradesh 5: 2186. 2018. *Poa tenella* L., Sp. Pl. 1: 69. 1753. *Eragrostis plumosa* (Retz.) Link, Hort. Berol. 1: 192. 1827; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1826. 1934. *Eragrostis tenella* (L.) P. Beauv. ex Roem. & Schult. var. *plumosa* (Retz.) Stapf in Hook. f., Fl. Brit. India 7: 315. 1896.

Annuals. Culms tufted, slender, up to 70 cm high; nodes glabrous. Leaf sheaths ciliate near mouth; ligule membranous; blades linear, glabrous. Panicles lax, 15 cm long. Spikelets ovate, 8-flowered. Glumes ovate-lanceolate, 1-nerved. Lemmas oblong, chartaceous, 3-nerved. Paleas elliptic-lanceolate, 2-keeled, ciliate on keels. Caryopsis elliptic.

Fl. & Fr.: Jul–Nov.

Habitat: Common in waste places, hill slopes.

Specimens examined: Netteppakota, *Y. Mahesh* 011661 (BSID).

11. Eragrostis unioloides (Retz.) Nees ex Steud., Syn. Pl. Glumac. 1: 264. 1854; C.E.C. Fisch. in Gamble, Fl. Madras 31826. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 515. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 772. 1999; Pull., Fl. Andhra Pradesh 5: 2187. 2018. *Poa unioloides* Retz., Observ. Bot. 5: 19. 1789. *Eragrostis amabilis* auct. non Wight & Arn. ex Nees, 1838; Stapf in Hook. f., Fl. Brit. India 7: 317. 1896. (**Plate 25G)**

Perennials. Culms erect, up to 80 cm high; nodes glabrous. Leaf sheaths compressed, glabrous; ligule a rim of hairs; blades linear-lanceolate, up to 15 cm long, convolute. Panicles lax, purplish, up to 20 cm long. Spikelets ovate, many flowered. Lower glumes oblong-lanceolate, 1-nerved. Upper glumes ovate-lanceolate, chartaceous, 1-nerved. Lemmas ovate-elliptic, 2-nerved. Paleas oblong, scabrid on keels. Caryopsis ellipsoid.

Fl. & Fr.: Aug.–Dec.

Habitat: Common grass in marshy habitats, rice fields, waste lands.

Specimens examined: Bapannapolam, GM Valasa, Gulletiwada, Valamuru, *Y. Mahesh* 010064, 010488, 010555, 010922 (BSID).

Field notes: Leaf sheaths compressed, panicles purple coloured.

32. ERIOCHLOA Kunth

India: 2 spp.; Andhra Pradesh: 1 spp.; PNP: 1 sp.

1. Eriochloa procera (Retz.) C.E. Hubb., Bull. Misc. Inform. Kew 1930: 256. 1930; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1767. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 312. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 773. 1999; Pull., Fl. Andhra Pradesh 5: 2189. 2018. *Agrostis procera* Retz., Observ. Bot. 4: 19. 1786. *Eriochloa polystachya* sensu Hook. f., Fl. Brit. India 7: 20. 1896, non Kunth, 1816. (**Plate 25H)**

Perennials. Culms erect, tufted, up to 70 cm high, creeping at base; nodes glabrous. Leaf sheaths loose, glabrous; ligule hairy; blades linear-lanceolate, up to 20 cm long, glabrous. Panicles lax, up to 15 cm long; rachis triquetrous. Spikelets elliptic-lanceolate, silky hairy. Lower glume obscure. Upper glume ovate-lanceolate, 5-nerved, hairy. Lower lemma lanceolate, soft villous. Upper lemma elliptic, mucronate. Palea oblong, crustaceous, 2-keeled. Caryopsis ellipsoid-oblong.

Fl. & Fr.: Sep.–Feb.

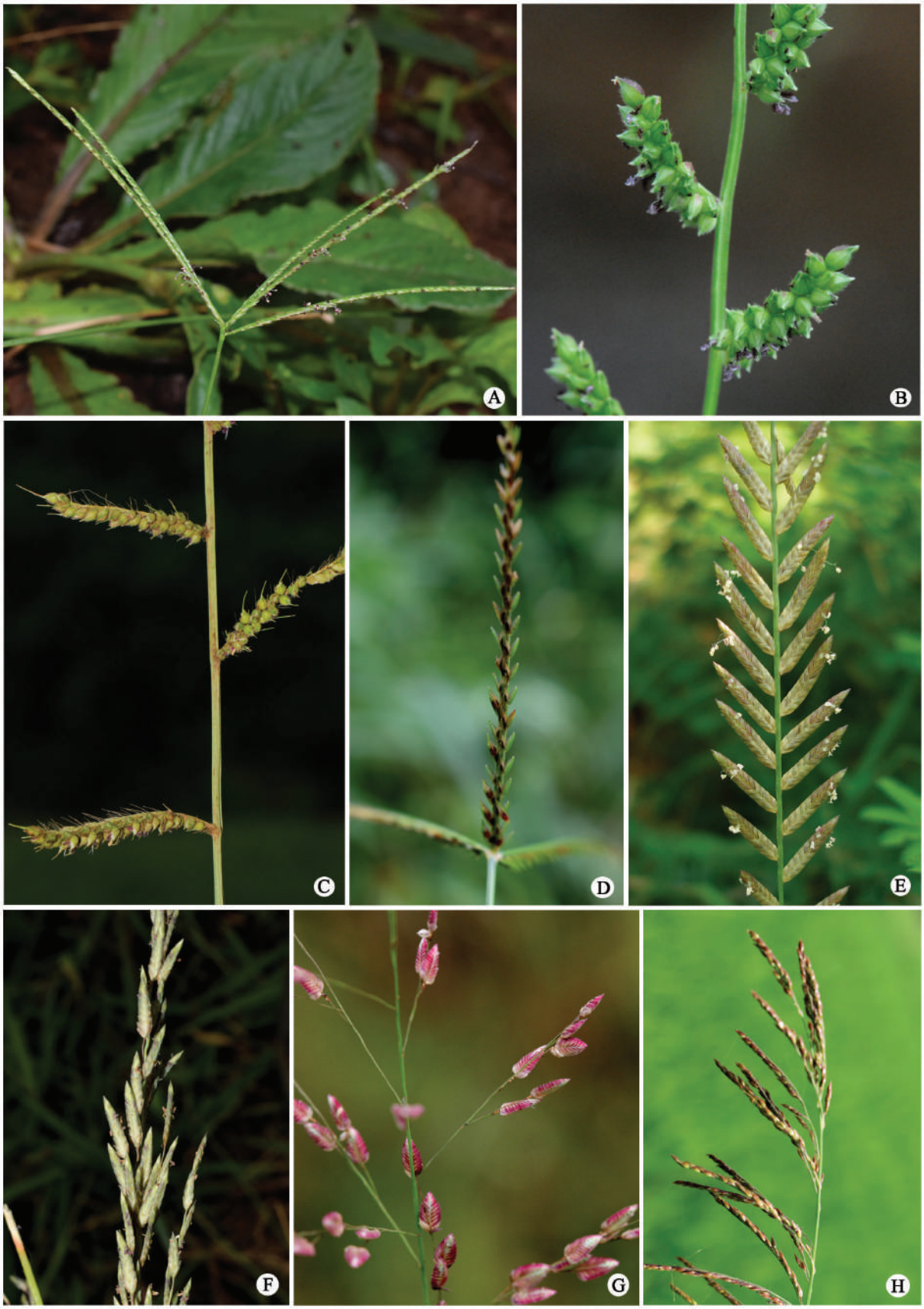


Plate 25: A. *Digitaria longiflora* (Retz.) Pers.; **B.** *Echinochloa colona* (L.) Link; **C.** *Echinochloa crus-galli* (L.) P. Beauv.; **D.** *Eleusine indica* (L.) Gaertn.; **E.** *Eragrostiella bifaria* (Vahl) Bor; **F.** *Eragrostis atrovirens* Trin. ex Steud.; **G.** *Eragrostis unioloides* Nees ex Steud.; **H.** *Eriochloa procera* C.E. Hubb.

Habitat: Common in marshy places, along streams, rice fields.

Specimens examined: Tekupally, *Y. Mahesh* 011689 (BSID).

Field notes: Spikelets with swollen callus at base; silky hairy.

33. EULALIA Kunth

India: 17 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP:1 sp.

1. Eulalia phaeothrix (Hack.) Kuntze, Revis. Gen. Pl. 2: 775. 1891; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1715. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 156. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 773. 1999; Pull., Fl. Andhra Pradesh 5: 2191. 2018. *Pollinia phaeothrix* Hack., in DC. Monogr. Phan. 6: 168. 1889; Hook. f., Fl. Brit. India 7: 112. 1896.

Perennials. Culms tufted, up to 140 cm high; basal sheaths brown woolly at base; nodes sparsely hairy. Leaf sheaths hairy; ligule ciliate, membranous; blades linear-lanceolate, 25 cm long, hairy above. Racemes digitate, 10 cm long, joints hairy. Sessile spikelets elliptic, 4 mm long, with brown hairy. Lower glume lanceolate, hairy at base. Upper glume lanceolate, keeled, ciliate along margins. Lower lemma lanceolate, hyaline. Upper lemma oblong, notched at apex. Pedicelled spikelets oblong-lanceolate, densely hairy; pedicels hairy, turbinate. Lower glume elliptic hairy. Upper glume lanceolate. Lower lemma lanceolate, hyaline. Upper lemma linear, bifid at apex, awned; awn up to 14 cm long. Paleas obovate, fimbriate near apex. Caryopsis oblong.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in grossy slopes, hills areas in the forest.

Specimens examined: Valamuru, *Y. Mahesh* 012151 (BSID).

Field notes: Racemes digitate, hairy at joints.

34. GARNOTIA Brongn.

India: 12 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Perennial grass; nodes glabrous; spikelets up to 6 mm long	**1. G. elata**
1b.	Annual grass; nodes bearded; spikelets up to 3 mm long	**2. G. tenella**

1. Garnotia elata (Arn. ex Miq.,) Janowski, Repert. Spec. Nov. Regni Veg. 17: 86. 1921; Bor, Grass. Burma, Ceylon, India & Pakistan 567. 1960; Pull., Fl. Andhra Pradesh 5: 2193. 2018. *Berghausia elata* Arn. ex Miq., Anal. Bot. Ind. 2: 32. 1851. *Garnotia scoparia* Stapf ex Hook. f., Fl. Brit. India 7: 242. 1896, non Thwaites, 1864; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1812. 1934. *Garnotia tenuiglumis* Stapf ex Hook. f., Fl. Brit. India 7: 242. 1896.

Perennial grass. Culms erect, tufted, up to 120 cm high; nodes glabrous. Leaf sheaths glabrous; ligule membranous; blades linear-lanceolate, 15–40 cm long, glabrous. Panicles contracted, up to 60 cm long; branches filiform. Spikelets lanceolate, up to 6 mm long, hairy at base, awned. Lower glume lanceolate, acuminate. Upper glume oblong-lanceolate, aristate. Lemmas bidentate at apex. Palea hyaline. Caryopsis linear.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in hilly areas, rocky crevices in the forest.

Specimens examined: Valisugreevulakonda, Valamuru, *Y. Mahesh* 010494, 010925 (BSID).

Note: Endemic to India

2. Garnotia tenella (Arn. ex Miq.) Janowski, Repert. Spec. Nov. Regni Veg. 17: 86. 1921; Pull., Fl. Andhra Pradesh 5: 2194. 2018. *Berghausia tenella* Arn. ex Miq., Anal. Bot. Ind. 2: 34. 1851. *Garnotia stricta* sensu Hook. f., Fl. Brit. India 7: 243 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1812. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 569. 1960.

Annuals. Culms erect, up to 90 cm high, geniculately ascending; nodes bearded. Leaf sheaths keeled, glabrous; ligule fimbriate; blades lanceolate, 15 cm long, hairy. Panicles lax, appressed to the rachis, scabrulous. Spikelets lanceolate, up to 3 mm long, hairy at base. Glumes ovate-lanceolate, hairy. Lemmas lanceolate, bidentate at apex, awned; awn 15 mm long. Palea lanceolate, hyaline. Caryopsis linear.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in hilly areas, roadsides in the forest

Specimens examined: Kambam Konda, *Y. Mahesh* 011557 (BSID).

Field notes: Culms hairy at nodes.

35. HACKELOCHLOA Kuntze

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Hackelochloa granularis (L.) Kuntze, Revis. Gen. Pl. 2: 776. 1891; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1758. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 159. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 774. 1999; Pull., Fl. Andhra Pradesh 5: 2195. 2018. *Cenchrus granularis* L., Mant. 2, App. 575. 1771. *Manisuris granularis* (L.) L.f. Nov. Gram. Gen. 40. 1779; Hook. f., Fl. Brit. India 7: 159. 1896.

Annuals. Culms tufted, up to 40 cm high; nodes bearded. Leaf sheaths hispid, keeled; ligule membranous; blades linear-lanceolate, 10 cm long, ciliate along margins. Racemes 3 cm long, spiciform; rachis fragile. Sessile spikelets globose. Lower glume hemispherical, tuberculed, 7-nerved. Upper glume ovate, narrowly crested at apex, faintly 3-nerved. Lower lemma broadly ovate, hyaline, obtuse. Upper lemma ovate, hyaline. Palea hyaline. Pedicelled spikelets ovate-lanceolate; pedicels fused with rachis. Lower glume broadly ovate, keeled, ciliate, winged on one side. Upper glume boat shaped; keels winged.

Fl. & Fr.: Aug.–Dec.

Habitat: Common weed in cultivated fields, on hilly grasslands.

Specimens examined: PK Valasa, Eruwada, Netteppakota, *Y. Mahesh* 010460, 010630, 011662 (BSID).

Field notes: Nodes bearded, leaf blades ciliate along margins.

36. HETEROPOGON Pers.

India: 6 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult., Syst. Veg., ed. 15, 2: 836. 1817; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1743. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 163. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 774. 1999; Pull., Fl. Andhra Pradesh 5: 2196. 2018. *Andropogon contortus* L., Sp. Pl. 2: 1045. 1753; Hook. f., Fl. Brit. India 7: 199. 1896. *'Eddi gaddi', 'Kaserigaddi'*

Perennials. Culms erect, tufted, up to 80 cm high; nodes glabrous. Leaf sheaths keeled, glabrous; ligule membranous, fimbriate; blades linear-lanceolate, 25 cm long, tubercled based hairs at base, scabrid. Racemes 6 cm long, spiciform. Spikelets closely arranged. Lower spikelets male, unawned. Upper spikelets sessile, linear-lanceolate, awned, callus covered with reddish brown hairs. Lower glumes linear, hairy above, truncate. Upper glumes linear, 3-nerved. Lower lemmas oblong, hyaline. Upper lemmas reduced to awn, up to 10 cm long, twisted, hirsute. Caryopsis linear. Pedicelled spikelets elliptic-lanceolate, 8 mm long. Lower glumes lanceolate, hispid above. Upper glume lanceolate, 5-nerved, ciliate. Lower lemma oblong. Upper lemma oblong, ciliate along margins.

Fl. & Fr.: Throughout the year.

Habitat: Common along road sides, plains, waste lands, cultivated fields.

Specimens examined: Eruwada, *Y. Mahesh* 010624 (BSID).

Field notes: Spikelets awned, callus covered with brown hairs.

37. IMPERATA Cirillo

India: 1 spp. & 1 var.; Andhra Pradesh: 1 spp.; PNP: 1 sp.

1. Imperata cylindrica (L.) Raeusch., Nomencl. Bot. ed. 3: 10. 1797; R.S. Rao & al., Fl. E. Godavari Dist. 775. 1999; Pull., Fl. Andhra Pradesh 5: 2200. 2018. *Lagurus cylindricus* L., Syst. Nat., ed. 10. 878. 1759. *Imperata arundinacea* Cirillo, Pl. Rar. Neapol. 2: 26. t. 11. 1792; Hook. f., Fl. Brit. India 7: 160. 1896. *Imperata cylindrica* var. *koenigii* (Retz.) T.A. Durands Sching, Consp. Fl. Afric. 5: 694; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1707. 1934. *Imperata cylindrica* (L.) Raeusch. var. *major* (Nees) C.E. Hubb., Grass. Mauritius 96. 1940; Bor, Grass. Burma, Ceylon, India & Pakistan 163. 1960. **(Plate 26A)** *'Darbagaddi'*

Perennial rhizomatous herbs. Culms tufted, up to 80 cm high; nodes hairy. Leaf sheaths overlapping, hairy at mouth; ligule membranous; blades mostly basal, lanceolate, up to 20 cm long, glabrous. Panicles cylindric, spiciform, *c.*10 cm long, white silky villous. Spikelets linear-lanceolate, 3.5 mm long; pedicels encircled by silky hairs. Lower glume lanceolate, hyaline, hairy in lower half. Upper glume lanceolate, hyaline, hairy below, apex

fringed. Lower lemmas lanceolate, hyaline, 3-lobed. Upper lemma elliptic-lanceolate, 3-lobed, hairy along margins. Palea elliptic, hyaline. Caryopsis oblong.

Fl. & Fr.: Throughout the year.

Habitat: Common in waste lands, hedges of field bunds, river banks.

Specimens examined: PK Valasa, *Y. Mahesh* 010450 (BSID).

Field notes: Rhizomatous herb, leaves overlapping; panicles white silky villous.

38. ISACHNE R. Br.

India: 34 spp. & 3 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Isachne globosa (Thunb.) Kuntze, Revis. Gen. Pl. 2: 778. 1891; Bor, Grass. Burma, Ceylon, India & Pakistan 580. 1960; Pull., Fl. Andhra Pradesh 5: 2202. 2018. *Milium globosum* Thunb., Fl. Jap. 49. 1794. *Isachne australis* R. Br., Prodr. Fl. Nov. Holland. 196. 1810; Hook. f., Fl. Brit. India 7: 24. 1896. *Isachne dispar* non Trin., 1828; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1797. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 580. *p.p.*1960; Hook. f., Fl. Brit. India 7: 26. 1896. *p.p.* **(Plate 26B)**

Perennials. Culms slender, ascending from root stock, up to 30 cm high; nodes sparsely hairy. Leaf sheath densely ciliate; ligule al line of white hairs; blades lanceolate, up to 8 cm long, scabrid on both surfaces. Panicles compact, up to 10 cm long. Spikelets globose, 2 mm long. Glumes similar, ovate, sparsely setosely hirsute above. Lower lemma elliptic 5-nerved. Palea elliptic, 2-keeled. Upper lemma ovate-elliptic, faintly 5-nerved, softly hairy on back. Caryopsis ellipsoid.

Fl. &Fr.: Throughout the year.

Habitat: Common in paddy fields, marshy areas, margins of ponds.

Specimens examined: PK Valasa, *Y. Mahesh* 010517 (BSID).

Field notes: Perennial grass, spikelets globose.

39. ISCHAEMUM L.

India: 56 spp., 6 var. & 2 subvar.; Andhra Pradesh: 6 spp.; PNP: 2 spp.

Key to the species

1a. Annual tufted grass; lower glume of the spikelets rugose with transverse ridges	**2. I. rugosum**
1b. Perennial, rhizomatous grass; lower glume of the spikelets not rugose with transverse ridges	**I. polystachyum**

1. Ischaemum polystachyum J. Presl, Reliq. Haenk. 1: 328. 1830. *Ischaemum pilosum* (Klein ex Willd.) Wight, Madras J. Lit. Sci. 3: 138. 1835; Hook. f., Fl. Brit. India 7: 130. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1723. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 183. 1960; Pull., Fl. Andhra Pradesh 5: 2208. 2018. *Andropogon pilosus* J.G. Klein ex Willd., Sp. Pl. 4: 920. 1806. *'Kundaranattu'*

Robust, perennial, rhizomatous grass. Culms up to 90 cm high; nodes glabrous. Leaf sheaths keeled, ciliate on one side; ligule fimbriate; blades linear-lanceolate, 12 cm long, hairy. Racemes corymbose. Sessile spikelets lanceolate, villous. Lower glume lanceolate, hairy, notched at apex, not rugose. Upper glume boat shaped, acuminate, keeled. Lower lemma elliptic-lanceolate, trinerved, ciliolate along margins. Paleas 2-keeled, hyaline. Upper lemma notched at apex, awned; awn 8 mm long. Pedicelled spikelets lanceolate. Glumes lanceolate or boat shaped, keeled.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in the hilly areas of forest.

Specimens examined: Eruwada, *Y. Mahesh* 010669 (BSID).

Field notes: Robust grass, racemes corymbose.

2. Ischaemum rugosum Salisb., Icon. Stirp. Rar. 1, t. 1. 1791; Hook. f., Fl. Brit. India 7: 127. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1722. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 184. 1960; Pull., Fl. Andhra Pradesh 5: 2209. 2018. **(Plate 26C)**

Annuals. Culms tufted, geniculately ascending, up to 60 cm high; nodes glabrous. Leaf sheaths loose, auricled, glabrous; ligule membranous; blades linear-lanceolate, 12 cm long, glabrous, margins scabrid. Racemes 2, digitate,

up to 10 cm long; joints, pedicels ciliate. Sessile spikelets oblong, 5 mm, callus appressed hairy. Lower glume elliptic-oblong, cartilaginous from base, 2-keeled, winged, rugose with transverse ridges. Upper glume oblong-lanceolate, keeled, keels ciliate. Lower lemma oblong, hyaline. Palea oblong-lanceolate, hyaline. Upper lemma cleft in to 2-lobes, awned; awn up to 14 mm long. Palea lanceolate, hyaline, 2-keeled. Caryopsis oblong. Pedicelled spikelets oblong, 5 mm long, unawned; pedicels ciliate on one side. Lower glume oblong, with transverse ridges, ciliate winged on margin. Upper glume boat shaped.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in cultivated fields, marshy localities.

Specimens examined: Eruwada, Koida, *Y. Mahesh* 010615, 011362 (BSID).

Field notes: Culms ascending, leaf blades scabrid on margins.

40. ISEILEMA Andersson

India: 8 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Iseilema prostratum (L.) Andersson, Nova Act. Reg. Soc. Sci. Upsal. ser. 3, 2: 251. 1856; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1747. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 188. 1960; Pull., Fl. Andhra Pradesh 5: 2213. 2018. *Andropogon prostratus* L., Mant. Pl. Altera 2: 304. 1771. *Iseilema wightii* Andersson, Nov. Act. Reg. Soc. Sci. Upsal. Ser. 3, 2:251. 1856; Hook. f., Fl. Brit. India 7: 218. 1896.

Perennials. Culms tufted, procumbent, up to 65 cm high, rooting at lower nodes; nodes bearded. Leaf sheaths hairy near mouth; ligule membranous, ciliate; blades linear, flat, 20 cm long, glabrous. Panicles up to 20 cm long; racemes on slender peduncle, spreading. Involucral spikelets oblong, 4 mm long, male. Pedicels short. Lower glume lanceolate, 5-nerved, tuberculate on margins. Upper glume lanceolate, 3-nerved. Lemmas lanceolate, 1-nerved. Sessile spikelets bisexual, lanceolate. Lower glume lanceolate, bifid at apex. Upper glume lanceolate. Lower lemma linear-lanceolate, hyaline. Upper lemma bidentate, reduced to a base of awned; awn 15 mm long. Caryopsis oblong. Pedicelled spikelets lanceolate, 3 mm long, similar to involucral spikelets.

Fl. & Fr.: Oct.–Feb.

Habitat: Common in plains, moist habitats.

Specimens examined: Kakeshnur, Shivagiri, *Y. Mahesh* 010081, 011322, 011613 (BSID).

Field notes: Culms procumbent, rooting at lower nodes, spikelets of 3 types.

41. LEERSIA Sw.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Leersia hexandra Sw., Prodr. 21. 1788; Hook. f., Fl. Brit. India 7: 94. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1845. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 599. 1960; Pull., Fl. Andhra Pradesh 5: 2214. 2018. (**Plate 26D)**

Perennial, aquatic grass. Culms up to 120 cm high; nodes bearded. Leaf sheaths glabrous; ligule membranous; blades stiff, linear-lanceolate, 20 cm long, scabrid on both sides. Panicles effuse, oblong, up to 10 cm long; pedicels apically copular. Spikelets ovate-oblong, 4 mm long, solitary, laterally compressed. Glumes absent. Lemmas boat shaped, coriaceous, 3-nerved, ciliate on keels, scabrid. Palea linear-lanceolate, keeled; keels ciliate, coriaceous. Caryopsis oblong.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in ponds, marshy localities, stagnant water courses.

Specimens examined: Bapanamma polam, PK Valasa, *Y. Mahesh* 010062, 010522 (BSID).

Field notes: Leaf blades scabrid, spikelets ovate, ciliate.

42. LEPTOCHLOA P. Beauv.

India: 5 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Leptochloa chinensis (L.) Nees, Syll. Ratisb.1:4. 1824; Hook. f., Fl. Brit. India 7: 299. 1986; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1820. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 516. 1960; Pull., Fl. Andhra Pradesh 5: 2215. 2018. *Poa chinensis* L., Sp. Pl. 1: 69. 1753.

Annual herb. Culms erect, tufted, up to 80 cm high; nodes glabrous. Leaf sheaths compressed, glabrous; ligule

membranous; blades linear, 15 cm long, scaberulous. Panicles oblong, up to 30 cm long, open. Spikelets oblong, 5 mm long, 3-6-flowered. Lower glume lanceolate, chartaceous, 1-nerved. Upper glume ovate-lanceolate, 1-nerved. Lemmas lanceolate, 3-nerved. Palea lanceolate, 2-keeled, ciliate on keels. Caryopsis oblong.

Fl. & Fr.: Aug.–Dec.

Habitat: Commonas weed in cultivated fields, near marshy localities, water sources.

Specimens examined: Gulletiwada, *Y. Mahesh* 010610 (BSID).

Field notes: Leaf blades scaberulous, panicles oblong.

43. LOPHOPOGON Hack.

India: 3 spp.; Andhra Pradesh: 1 spp.; PNP: 1 sp.

1. Lophopogon tridentatus (Roxb.) Hack. in Engl. & Prantl, Nat. Pflanzenfam. 2: 26. 1887; Hook. f., Fl. Brit. India 7: 149. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1724. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 190. 1960; Pull., Fl. Andhra Pradesh 5: 2219. 2018. *Andropogon tridentatus* Roxb., Fl. Ind. 1: 261. 1820. **(Plate 26E)**

Perennial grass. Culms tufted, decumbent, up to 30 cm high; nodes glabrous. Leaf sheaths glabrous; ligule ciliate; blades linear, 8 cm long, convolute. Racemes compressed, pilose, enclosed in upper sheath. Spikelets obovate, 5 mm long; callus bearded at apex. Lower glume oblong, tridentate at apex with brownish tuft hairs. Upper glume lanceolate, bidentate, hairy at apex. Lower lemma linear-lanceolate, hyaline. Upper lemma lanceolate, hyaline, bifid at apex, unawned in lower spikelets, awned in upper spikelets; awn up to 18 mm long. Caryopsis linear.

Fl. & Fr.: Jul.–Nov.

Habitat: Common on hill slopes, arid localities in the forest.

Specimens examined: Gulletiwada, *Y. Mahesh* 010583 (BSID).

Field notes: Spikelets with tuft of brownish hairs.

44. MOOROCHLOA Veldkamp

India: 6 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Moorochloa eruciformis (Sm.) Veldkamp, Reinwardtia 12: 139. 2004. *Panicum eruciformis* Sm., Fl. Graec. Prodr. 1: 40. 1806. *Brachiaria eruciformis* (Sm.) Griseb. in Ledeb., Fl. Ross. 4: 469.1853; Bor, Grass. Burma, Ceylon, India & Pakistan 283. 1960; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1769. 1934; Pull., Fl. Andhra Pradesh 5: 2108. 2018. *Panicum isachne* Roth ex Roem. & Schult., Syst. Veg. 2. 458. 1817; Hook. f., Fl. Brit. India 7: 28. 1896. (**Plate 26F)**

Annual tufted grass. Culms ascending, up to 70 cm high; nodes hairy. Leaf sheaths with bulbous based hairy; ligule a rim of hairy; blades lanceolate, up to 5 cm long, glabrous. Spikelets elliptic, pubescent. Lower glume reduced to a scale. Upper glume 5-nerved, hairy. Lower lemma hairy, 3-nerved. Upper lemma flat, 2-nerved. Palea involute. Caryopsis oblong.

Fl. & Fr.: Jul.–Nov.

Habitat: Common in marshy localities, plain ares, along grasslands.

Specimens examined: PK Valasa, *Y. Mahesh* 010419 (BSID).

Field notes: Leaf sheaths with bulbous based hairs.

45. OPLISMENUS P.Beauv.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Annuals; awns slender	**1. O. burmannii**
1a.	Perennials; awns stiff	**2. O. compositus**

1. Oplismenus burmanni (Retz.) P. Beauv., Ess. Agrost. 54, 168. 1812; Hook. f., Fl. Brit. India 7: 68. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1778. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 317. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 777. 1999; Pull., Fl. Andhra Pradesh 5: 2226. 2018. *Panicum burmanni* Retz., Observ. Bot. 3: 10. 1783. **(Plate 26G)**

Annuals. Culms slender, trailing, up to 50 cm high, rooting at nodes, diffusely branching at base; nodes

glabrous. Leaf sheaths hairy; ligule a rim of hairs; blades ovate-lanceolate, 5 cm, amplexicaul at base, sparsely hairy. Racemes bristly; rachis, slender, up to 6 cm long, trigonous. Spikelets elliptic-lanceolate, solitary. Lower glume ovate, hairy. Upper glume ovate-lanceolate, hairy, awned; awn slender, up to 8 mm long, scabrid. Lower lemma lanceolate, aristate. Upper lemma ovate, 5-nerved. Palea linear, 2-nerved. Caryopsis linear.

Fl. & Fr.: Aug.–Dec.

Habitat: Very common in moist habitats, shades of large trees, cultivated fields.

Specimens examined: Maredupudi, *Y. Mahesh* 010113 (BSID).

Field notes: Culms rooting at nodes, racemes bristly.

2. Oplismenus compositus (L.) P. Beauv., Ess. Agrostogr. 54.1812; Hook. f., Fl. Brit. India 7: 66. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1778. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 317. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 777. 1999; Pull., Fl. Andhra Pradesh 5: 2226. 2018. *Panicum compositum* L., Sp. Pl. 57. 1753. *'Kodijuttugaddi'*

Perennial grass. Culms creeping, rooting at lower nodes, up to 80 cm long; nodes glabrous. Leaf sheaths hairy; ligule ciliate; blades ovate-lanceolate, 7 cm long, amplexicaul at base, hairy. Racemes 8 cm long; rachis triquetrous. Spikelets elliptic-lanceolate, 3 mm long, awned. Lower glume ovate, scaberulous above, with 5 mm awn; awn stiff. Upper glume ovate-lanceolate, arista 1.4 mm long. Lower lemma ovate, 5-nerved, membranous. Upper lemma ovate, 5-nerved. Palea lanceolate, 2-nerved. Caryopsis linear.

Fl. & Fr.: Throughout the year.

Habitat: Common in marshy areas, damp places in the forest.

Specimens examined: PK Valasa, Shivagiri, Eruwada, Netteppakota, *Y. Mahesh* 010011, 010078, 010666, 011668 (BSID).

Field notes: Culms creeping, rooting at lower nodes, leafsheaths hairy.

46. ORYZA L.

India: 11 spp., 1 subsp.& 1 var.; Andhra Pradesh: 1 spp., 2 subspp. & 1 var.; PNP: 2 spp.

Key to the species

1a.	Panicles lax; branches 12-30 cm long; surface of the lemma and palea not rugose	**2. O. officinalis**
1b.	Panicles spiciform; branches up to 10 cm long; surface of the lemma and palea granulate	**1. O. meyeriana**

1. Oryza meyeriana (Zoll. & Moritzi) Baill., Hist. Pl. 12: 166. 1893; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1845. 1934. *Padia meyeriana* Zoll. & Moritzi in A.Moritzi, Syst. Verz. Java: 103. 1846. *Oryza granulata* Nees & Arn ex Watt., Dict. Econ. Prod. Ind. 5: 500. 1891; Hook. f., Fl. Brit. India 7: 96. 1896; Bor, Grass. Burma, Ceylon, India & Pakistan 604. 1960. **(Plate 26H)** *'Adavi vari'*

Perennials. Culms tufted, up to 1 m high; nodes glabrous. Leaf sheaths keeled, glabrous; ligule membranous, hairy; blades linear-lanceolate, 18 cm long, glabrous. Panicles spiciform, slender, 10 cm long; branches up to 10 cm long. Spikelets oblong, 5 mm long, obtuse, unawned. Lower glume absent. Upper glume linear. Lemmas boat shaped, 4.5 mm long, irregularly granulate. Palea elliptic, granulate. Caryopsis ellipsoid.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in marshy areas, plains, stream banks in the forest.

Specimens examined: Madduluru, Ijjaluru, *Y. Mahesh* 010412, 010961 (BSID).

Field notes: Culms tufted, spikelets oblong.

2. Oryza officinalis Wall. ex Watt, Dict. Econ. Pod. India 5: 501. 1891; subsp. *malampuzhaensis* (Krish. & Chandr.) Tateoka, Bot. Mag. Tokyo 75: 422. 1962; Pull., Fl. Andhra Pradesh 5: 2230. 2018. *Oryza malampuzhaensis* Krish. & Chandr., Madras Agric. J.45: 471. 1958; Bor, Grass. Burma, Ceylon, India & Pakistan 606. 1960.

Perennial, stoloniferous grass. Culms branching at base, up to 60 cm high; nodes glabrous. Leaf sheaths keeled, glabrous; ligule fringe of hairs at apex; blades lanceolate, 30 cm long, midrib prominent. Panicles lax; branches 12–30 cm long. Spikelets oblong, awned. Glumes triangular, scaberulous. Lemma boat shaped, smooth. Palea lanceolate, hairy at outer surface. Caryopsis oblong.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in shady areas in the forest.

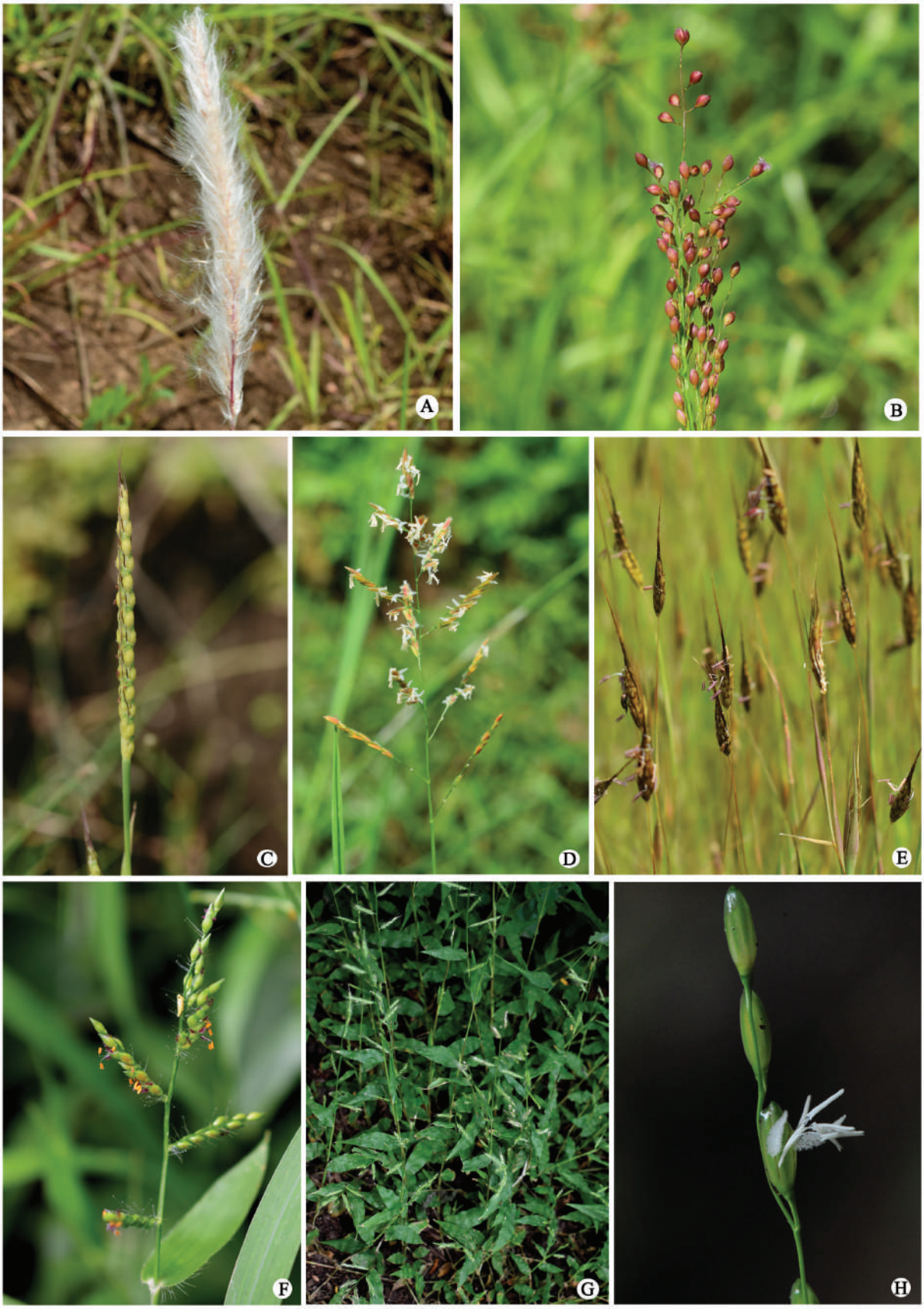


Plate 26: A. *Imperata cylindrica* (L.) P. Beauv.; **B.** *Isachne globosa* (Thunb.) Kuntze; **C.** *Ischaemum rugosum* Salisb.; **D.** *Leersia hexandra* Sw.; **E.** *Lophopogon tridentatus* (Roxb.) Hack.; **F.** *Moorochloa eruciformis* Veldkamp; **G.** *Oplismenus burmanni* P. Beauv.; **H.** *Oryza meyeriana* Baill.

Specimens examined: Tekupally, *Y. Mahesh* 011691 (BSID).

Field notes: Stoloniferous grass, culms branching at nodes.

47. PANICUM L.

India: 36 spp. & 1 var.; Andhra Pradesh: 12 spp.; PNP: 5 spp.

Key to the species

1a.	Leaf blades linear- lanceolate	2
1b.	Leaf blades ovate- lanceolate or ovate	**1. P. brevifolium**
2b.	Lower glume more than half as long as the spikelet	3
2a.	Lower glume less than half as long as the spikelet	4
3a.	Annuals; blades truncate or rounded at base; caryopsis ovoid	**2. P. curviflorum**
3b.	Perennial grass; blades amplexicaul at base; caryopsis ellipsoid	**4. P. notatum**
4a.	Culms not spongy; lower glumes prominently nerved	**3. P. humile**
4b.	Culms spongy; lower glumes nerveless	**5. P. paludosum**

1. Panicum brevifolium L., Sp. Pl. 1: 59. 1753; C.E.C. Fisch. in gamble, Fl. Madras 3: 1783. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 324. 1960; R.S. Rao & al., Fl. E. Godavari DIST. 778. 1999; Pull., Fl. Andhra Pradesh 5: 2232. 2018. *Panicum ovalifolium* Poir., Encyc. Suppl. 4: 279. 1816; Hook. f., Fl. Brit. India 7: 44. 1896. (**Plate 27A)**

Annuals. Culms tufted, up to 80 cm high, stoloniferous, rooting at base. Leaf sheaths ciliate on one margin; ligule hairy; blades ovate or ovate-lanceolate, *c.* 6 cm long, amplexicaul at base, sparsely ciliate on both sides. Panicles effuse, pyramidal, 12 cm long. Spikelets gibbous, hairy. Glumes ovate, 5-nerved, sparsely hairy. Lower lemma ovate, puberulous. Palea ovate, scabrid on keels. Upper lemma coriaceous, shining. Caryopsis ovate.

Fl. & Fr.: Sep.–Jan.

Habitat: Common in marshy areas, water courses in the plains.

Specimens examined: Eruwada, *Y. Mahesh* 010617 (BSID).

Field notes: Culms rooting at base, leaf sheaths ciliate.

2. Panicum curviflorum Hornem., Hort. Bot. Hafn. Suppl. 116.1819. *Panicum trypheron* Schult., Mant. 2: 244. 1824; Hook. f., Fl. Brit. India 7: 47. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1783. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 331. 1960; Pull., Fl. Andhra Pradesh 5: 2239. 2018.

Annuals. Culms geniculate at base, up to 80 cm high. Leaf sheaths ciliate on margins; ligule fimbriate; blades lanceolate, 20 cm long, truncate or rounded at base, acuminate at apex, hairy on both sides. Panicles 20 cm long, effuse. Spikelets ovoid, 3 mm long, distantly arranged; pedicels scabrid. Lower glume ovate, 5-nerved. Upper glume ovate. Lower lemma ovate-oblong, membranous; paleas oblong, hyaline, 2-keeled. Upper lemma elliptic, coriaceous, faintly nerved. Paleas elliptic, margins involute. Caryopsis ovoid.

Fl. & Fr.: Aug.–Dec.

Habitat: Common in grasslands, cultivated fields, roadsides.

Specimens examined: Eruwada, *Y. Mahesh* 011550 (BSID).

Field notes: Leaf blades hairy on both surfaces.

3. Panicum humile Nees ex Steud., Syn. Pl. Glumac. 1: 84. 1854 non Thunb. ex Trin., 1826; Hook. f., Fl. Brit. India 7: 48. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1782. 1934. *Panicum walense* Mez., Bot. Jahrb. 34.146. 1904; Pull., Fl. Andhra Pradesh 5: 2240. 2018. *Panicum austroasiaticum* Ohwi, Acta Phytotax. Geobot. 11: 45. 1942; Bor, Grass. Burma, Ceylon, India & Pakistan 324. 1960. **(Plate 27B)**

Annual, slender grass. Culms erect, 55 cm high. Leaf sheaths ciliate, along margins; ligule fimbriate; blades lanceolate, 8 cm. Panicles with capillary branches. Spikelets elliptic. Lower glume ovate, prominently trinerved. Upper glume lanceolate. Lower lemmas trinerved. Palea 2-keeled, hyaline. Upper lemma shining, trinerved.

Fl. & Fr.: Aug.–Jan.

Habitat: Occasional along moist localities in the forest.

Specimens examined: Gulletiwada, *Y. Mahesh* 010592 (BSID).

Field notes: Ligule fimbriate.

4. Panicum notatum Retz., Observ. Bot. 4: 18. 1786; Bor, Grass. Burma, Ceylon, India & Pakistan 701. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 778. 1999; Pull., Fl. Andhra Pradesh 5: 2235. 2018. *Panicum montanum* Roxb., Fl. Ind. 1: 313. 1820; Hook. f., Fl. Brit. India 7: 53. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1783. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 329. 1960.

Perennials. Culms slender, with woody stock up to 100 cm high; nodes glabrous. Leaf sheaths ciliate along margins; ligule a row of soft hairs; blades linear-lanceolate, 15 cm long, amplexicaul at base, with tubercle-based hairs. Panicles lax, profusely branched, up to 30 cm long; rachis scabrid. Spikelets ellipsoid, 3 mm long, hairy. Lower glume ovate, 3-nerved, hairy on margins. Upper glume broadly ovate, 5-nerved, sparsely hairy on margins. Lower lemma ovate, epaleate. Upper lemma elliptic, coriaceous. Paleas elliptic, margins inflexed. Caryopsis ellipsoid.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in hill slopes, under the shade of trees, marshy areas.

Specimens examined: Valamuru, *Y. Mahesh* 010904 (BSID).

Field notes: Culms with woody stock, leaf blades with tuberculed based hairs.

5. Panicum paludosum Roxb., Fl. Ind. 1: 310. 1820; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1783. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 329. 1960; Pull., Fl. Andhra Pradesh 5: 2237. 2018. *Panicum proliferum* sensu Hook. f., Fl. Brit. India 7: 50. 1896, non Lam., 1797. **(Plate 27C)**

Perennial, aquatic grass. Culms erect, spongy, up to 80 cm high, sometimes floating; nodes glabrous. Leaf sheaths loose, inflated; ligule a rim of hairs; blades lanceolate, 15 cm long, rounded at base, scabrid on margins. Panicles spreading, whorled, up to 22 cm long; rachis scabrid. Spikelets ovate-lanceolate, 3.5 mm long. Lower glume orbicular, less than half the length of spikelet, nerveless. Upper glume ovate-elliptic, prominently nerved. Lower lemma ovate, 9-nerved. Upper lemma coriaceous. Paleas shining, margins inflexed. Caryopsis ellipsoid.

Fl. & Fr.: Sep.–Feb.

Habitat: Occasional in ponds, marshy areas in the forest.

Specimens examined: Bulavegisa, *Y. Mahesh* 010550 (BSID).

Field notes: Culms spongy, leaf blades scabrid. Panicle whorled.

48. PASPALUM L.

India: 12 spp. & 4 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Paspalum scrobiculatum L., Mant. Pl. 29. 1767; Hook. f., Fl. Brit. India 7: 10. 1890; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1772. 1934; R.S. Rao & al., Fl. E. Godavari Dist. 779. 1999; Pull., Fl. Andhra Pradesh 5: 2246. 2018. *Paspalum commersonii* Lam., Tabl. Encycl. 1: 175, t.43, f. 1. 1791; Bor, Grass. Burma, Ceylon, India & Pakistan 335. 1960; *Paspalum orbiculare* G. Forst., Fl. Ins. Austr. Prodr.7. 1786; C.E.C. Fisch., Fl. Madras 3: 1772. 1934. **(Plate 27D)** *'Arikelu'*

Perennials. Culms tufted, up to 75 cm high; nodes glabrous. Leaf sheaths compressed, glabrous; ligule fimbriate; blades linear-lanceolate, 30 cm long, midrib prominent. Racemes 2, up to 10 cm long, axis flattened. Spikelets ovate, 2.5 mm long. Lower glume absent. Upper glume ovate-orbicular, 5-nerved. Lower lemmas orbicular, 3-nerved. Upper lemma orbicular, crustaceous. Paleas ovate, crustaceous. Caryopsis planoconvex.

Fl. & Fr.: Throughout the year.

Habitat: Common in marsh localities, cultivated fields.

Specimens examined: Tekupally, Valamuru, *Y. Mahesh* 010177, 010973 (BSID).

Field notes: Leaf blades with prominent midrib, axis of the raceme flattened.

49. PEROTIS Aiton

India: 2 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Perotis indica (L.) Kuntze, Rev. Gen. Pl. 2. 1891; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1814. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 611. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 780. 1999; Pull., Fl. Andhra Pradesh 5: 2252. 2018. *Anthoxanthum indicum* L., Sp. Pl. 1: 1753. *Perotis latifolia* Ait., Hort. Kew. Bull.1: 85. 1789; Hook. f., Fl. Brit. India 7: 98. 1896. **(Plate 27E)**

Annuals. Culms tufted, up to 50 cm high, geniculately ascending; nodes glabrous. Leaf sheaths glabrous;

ligule membranous; blades ovate-lanceolate, 2–5 cm, scabrid on margins. Racemes up to 12 cm, terminal, purple coloured; spikelets 3 mm long, linear- lanceolate; glumes subequal, linear-lanceolate, 1-nerved, awn up to 13 mm long, capillary; lemma linear, hyaline. Paleas linear, 2-nerved. Caryopsis linear.

Fl. & Fr.: Aug.–Jan.

Habitat: Common in sandy soils, cultivated field bunds.

Specimens examined: Geediguppa, *Y. Mahesh* 011582 (BSID).

Field notes: Racemes purple coloured.

50. POGONATHERUM P. Beauv.

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Pogonatherum crinitum (Thunb.) Kunth, Enum. Pl. 1: 478. 1833; Hook. f., Fl. Brit. India 7: 141. 1896; Bor, Grass. Burma, Ceylon, India & Pakistan 200. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 781. 1999; Pull., Fl. Andhra Pradesh 5: 2255. 2018. *Andropogon crinitus* Thunb., Fl. Jap. 40, t. 7. 1784. *Pogonatherum paniceum* sensu C.E.C. Fisch. in Gamble, Fl. Madras 3: 1714. 1934; non (Lam.) Hack., 1706.

Perennials. Culms densely tufted, up to 25 cm high; nodes sparsely hairy. Leaf sheaths scaberulous; ligule hairy; blades linear-lanceolate, 6 cm long, minutely scabrid. Racemes solitary, slender, 2.5 cm long; joints ciliate on margins. Spikelets binate. Sessile spikelets lanceolate, 2 mm long. Lower glume oblong, truncate, hairy at apex, setose. Upper glume ovate-lanceolate, keeled, 2-fid, lobes ciliate, awned; awn 15 mm long. Lower lemma linear, epaleate. Upper lemma ovate-oblong, 2-fid, awned; awns up 25 mm long. Palea oblong, hyaline. Pedicelled spikelets similar to sessile.

Fl. & Fr.: Aug.–Feb.

Habitat: Common in moist localities, water courses.

Specimens examined: Valamuru, *Y. Mahesh* 012102 (BSID).

Field notes: Culms tufted; racemes single.

51. POLYTOCA R.Br.

India: 3 spp.; Andhra Pradesh: 1 spp.; PNP: 1 sp.

1. Polytoca gigantea (J. Koenig) Mabb., Mabberley's Pl. Book 1102. 2017. *Chionachne gigantea* (J. Koenig) Veldkamp, Blumea 47: 559. 2002; Pull., Fl. Andhra Pradesh 5: 2119. 2018. *Coix gigantea* J. Koenig, Naturforscher (Halle) 23: 211. 1788. *Chionachne koenigii* (Spreng.) Thw., Enum. Pl. Zeyl. 357. 1864; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1706. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 263. 1960. *Coix koenigii* Spreng., Syst. Veg., 1: 239. 1824. *Polytoca barbata* (Roxb.) Stapf ex Hook. f., Fl. Brit. India 7: 102. 1896.

A perennial grass. Culms tufted, 1.5 m high; nodes hairy. Leaf sheaths glabrous; ligule membranous; blades lanceolate, glabrous, rounded at bvase, acuminate at apex. Racemes terminal, umbellate. Male spikelets at top, 2-flowered, one sessile, one pedicelled, oblong. Glumes ovate, 6–8 nerved. Stamens 3. Female spikelets at base, oblong. Glumes dissimilar; lemmas hyaline. Caryopsis compressed.

Fl. & Fr.: Aug.–Jan.

Habitat: Common on hilly areas, moist localities in the forest.

Specimens examined: Rekupally, *Y. Mahesh* 011682 (BSID).

Field notes: Nodes hairy, racemes umbellate.

52. POLYTRIAS Hack.

India: 1 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Polytrias indica (Houtt.) Veldkamp, Blumea 36: 180. 1991. *Phleum indicum* Houtt., Nat. Hist. 2: 198, t. 90. 1782. *Ischaemum indicum* (Houtt.) Merr., J. Arnold Arbor. 19: 320. 1938; Bor, Grass. Burma, Ceylon, India & Pakistan 180. 1960; Pull., Fl. Andhra Pradesh 5: 2206. 2018. *Ischaemum aristatum* auct. non L., C.E.C. Fisch. in Gamble, Fl. Madras 3: 1721. 1934. *Ischaemum ciliare* Retz., Obs. Bot. 6. 36. 1791; Hook. f., Fl. Brit. India 7: 133. 1896.

Annuals. Culms ascending, 45 cm high; nodes sparsely bearded. Leaf sheaths glabrous to hirsute; ligule ciliate; blade linear, 8 cm long, sparsely hairy. Sessile spikelets oblong, bearded at callus. Lower glume ovate, with broad

inflexed sides below, broadly winged in the upper half. Upper glumes boat shaped, 5-nerved, aristate, keeled, acuminate. Lower lemma lanceolate, hyaline, acute, 3 nerved. Upper lemma notched; Pedicelled spikelets obovate, awned, similar as above.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in marshy localities in the forest.

Specimens examined: Kondamodalu, Gulletiwada, *Y. Mahesh* 010060, 010594 (BSID).

Field notes: Culms ascending, blades linear.

53. PSEUDANTHISTIRIA (Hack.) Hook.f.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pseudanthistiria umbellata (Hack.) Hook. f., Fl. Brit. India 7: 220. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1749. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 204. 1960; Pull., Fl. Andhra Pradesh 5: 2258. 2018. *Andropogon umbellatus* Hack., in A. DC., Monogr. Phan. 6: 401. 1889. **(Plate 27F)**

Annuals. Culms tufted, slender, creeping, up to 70 cm high, rooting at nodes; nodes glabrous. Leaf sheaths ciliate; ligule membranous; blades 6 cm long, linear-lanceolate. Panicles lax, 20 cm long. Sessile spikelets linear-oblong. Lower glume oblong, coriaceous. Upper glume elliptic, chartaceous. Lower lemma small. Upper lemma stipitate, awned; awn 20 mm long. Caryopsis minute. Pedicelled spikelets lanceolate, glumes lanceolate. Lemmas unawned.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional as weed in cultivated fields, shady areas.

Specimens examined: Eruwada, Kambam konda, *Y. Mahesh* 010635, 010681 (BSID).

Field notes: Culms creeping, rooting at nodes.

54. PSEUDOPOGONATHERUM A. Camus

India: 1 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pseudopogonatherum trispicatum (Schult.) Ohwi, Bull. Tokyo Sci. Mus. 18: 3. 1947. *Andropogon trispicatus* Schult., Mant. 2: 452. 1824. *Eulalia trispicata* (Schult.) Henrard, Blumea 3: 453. 1940; Bor, Grass. Burma, Ceylon, India & Pakistan 157. 1960; Pull., Fl. Andhra Pradesh 5: 2192. 2018. *Eulalia tristachya* (Roxb.) Kuntze, Revis. Gen. Pl. 1891; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1715. 1934. *Pollinia argentea* Trin., Bull. Sci. Acad. Petersb. 1: 71. 1836; Hook. f., Fl. Brit. India 7: 111. 1896.

Perennials. Culms erect, up to 80 cm high. Leaf sheaths galbrous, Ligule a ciliate membranous; blades glabrous, 20 cm long. Racemes compound, 2–10, digitate; rachis hairy on margins. Spikelets in pairs, elliptic; pedicels angled, hairy. Lower glume oblong, coriaceous, dark brown, 2-keeled. Upper glume oblong, pilose, muticous. Lemma hyaline, ciliate on margins, apex lobed, 2-fid, awned. Upper lemma awn from a sinus, geniculate. Palea absent or minute.

Fl. & Fr.: Oct.–Jan.

Habitat: Occasional on hills, grasslands, slopes in the forest.

Specimens examined: Enukuru, Gulletiwada, *Y. Mahesh* 010567, 010569 (BSID).

Field notes: Racemes digitate, spikelets in pairs.

55. PSEUDORAPHIS Griff. ex Pilg.

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pseudoraphis spinescens (R.Br.) Vickery, Proc. Roy. Soc. Queens. 62: 69. 1952; Bor, Grass. Burma, Ceylon, India & Pakistan 353. 1960; Pull., Fl. Andhra Pradesh 5: 2259. 2018; Pull., Fl. Andhra Pradesh 5: 2259. 2018. *Panicum spinescens* R.Br., Prodr. Fl. Nov. Holland. 193. 1810. *Chamaeraphis spinescens* (R.Br.) Poir., in Lam. & Poir., Encycl. Suppl. 2: 189. 1811; Hook. f., Fl. Brit. India 7: 62. 1896. *Pseudoraphis aspera* (Koen.) Pilg., Notizbl. Bot. Gart. Berlin. Dahlem 10: 210. 1928; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1790. 1934.

Annual, aquatic grass. Culms trailing, up to 50 cm long, much branched; nodes wooly. Leaf sheaths loose, glabrous, keeled; ligule a rim of hairs; blades linear-lanceolate, 10 cm, convolute, tubercule based hairy above, scabrid along margins. Panicles up to 12 cm long, effuse; branches filiform, triquetrous. Spikelets elliptic-

lanceolate, 5 mm long, 2-fllowered. Lower glume ovate, truncate, hyaline. Upper glume ovate-lanceolate, membranous, acuminate, aristate, scabrid along margins. Lower lemma oblong, acuminate. Palea linear-oblong, hyaline. Caryopsis oblong.

Fl. & Fr.: Aug.–Jan.

Habitat: Occasional in ponds, marshy localities in the forest.

Specimens examined: Nallgunta cheruvu, *Y. Mahesh* 011592 (BSID).

Field notes: Culms trailing, branched, woolly at nodes.

56. ROTTBOELLIA L.f.

India: 1 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Rottboellia cochinchinensis (Lour.) Clayton, Kew Bull. 35: 817. 1981; Pull., Fl. Andhra Pradesh 5: 2262. 2018. *Stegosia cochinchinensis* Lour., Fl. Cochinch. 1: 51.1790. *Rottboellia exaltata* L.f., Suppl. Pl. 114.1781. non (L.) L.f. 1779; Hook. f., Fl. Brit. India 7: 156. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1759. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 206. 1960.

Perennials. Culms supported stilt roots, up to 220 cm high, branching from base; nodes glabrous. Leaf sheaths hirsute; ligule membranous, ciliate; blades linear-lanceolate, 40 cm long, flat, scabrid, acuminate, midrib prominent. Racemes cylindrical, up to 10 cm long; rachis fragile. Sessile spikelets ovate, 6 mm long, sunk in the cavities of joints. Lower glume broadly ovate, coriaceous, 11-nerved. Upper glume boat shaped, 10-nerved. Lower lemma ovate-lanceolate, coriaceous, hyaline. Upper lemma broadly ovate, hyaline. Palea hyaline. Caryopsis ellipsoid, compressed. Pedicelled spikelets ovate-lanceolate, 5 mm long. Lower glume elliptic-ovate, chartaceous. Upper glume broadly ovate. Lemma elliptic-ovate, hyaline. Palea hyaline, empty.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in water logged areas, paddy fields.

Specimens examined: Tekupalli, *Y. Mahesh* 011692 (BSID).

Field notes: Culms with stilt roots, branching from base, racemes cylindrical.

57. SACCHARUM L.

India: 15 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Saccharum spontaneum L., Mant. Pl. Alt. 2: 183. 1771; Hook. f., Fl. Brit. India 7: 118. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1709. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 214. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 782. 1999; Pull., Fl. Andhra Pradesh 5: 2264. **(Plate 27G)**

Perennials. Culms erect, tufted, up to 4.5 m high, rhizomatous; nodes glabrous. Leaf sheaths silky hairy near mouth; ligule membranous, blades linear-lanceolate, flat, 20-140 cm, scabrid along margins. Panicles up to 65 cm long, contracted, densely silky villous; peduncles appressed silky villous below, rachis capillary; spikelets binate, 4 mm long, similar, lanceolate; lower glume lanceolate, coriaceous, 2-nerved; upper glume lanceolate, 1-nerved, chartaceous, ciliate along margins; lower lemma ovate-elliptic, hyaline, hairy on margins; upper lemma linear-lanceolate, hyaline; palea ciliate. Caryopsis oblong. Pedicelled spikelets lanceolate, similar to sessile spikelets.

Fl. & Fr.: Oct.–Feb.

Habitat: Common along river banks, streams.

Specimens examined: Tatilanka, Gaddimadugu, *Y. Mahesh* 010660, 010511 (BSID).

58. SACCIOLEPIS Nash

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a. Culms robust, spongy, creeping at base; panicles interrupted; lower glume less than half the length of spikelets **2. S. interrupta**

1b. Culms slender not spongy; panicles uninterrupted; lower glume half as long as the spikelets. **1. S. indica**

1. Sacciolepis indica (L.) Chase, Proc. Biol. Soc. Wash. 21: 8. 1908; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1787. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 357. 1960; Pull., Fl. Andhra Pradesh 5: 2265. 2018. *Aira indica* L., Sp. Pl. 1: 63; 2: 1753. *Panicum indicum* L., Mant. Pl. 2: 184. 1771, non. Mill., 1768; Hook. f., Fl. Brit. India 7: 41. 1896. *Panicum indicum* L. var. *angustum* (Trin.) Hook. f., Fl. Brit. India 7: 41. 1896.

Annuals. Culms slender, erect, up to 70 cm high; nodes glabrous. Leaf sheaths glabrous; ligule absent; blades linear-lanceolate, 15 cm, base truncate. Panicles cylindric, spiciform, up to 10 cm long. Spikelets elliptic-ovate, *c.* 3 mm long. Lower glume ovate, half as long as the spikelets, chartaceous. Upper glume ovate, keeled. Lower lemma ovate, keeled, hairy at apex. Upper lemma ovate-lanceolate, coriaceous, hyaline, involute. Palea linear, coriaceous. Caryopsis linear.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in water logged areas, marshy habitats.

Specimens examined: Kondamodalu, Valisugrevla, *Y. Mahesh* 010061, 010499 (BSID).

2. Sacciolepis interrupta (Willd.) Stapf, Fl. Trop. Afr. 9: 757. 1920; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1787. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 358. 1960; Pull., Andhra Pradesh 5: 2266. 2018. *Panicum interruptum* Willd., Sp. Pl., ed. 4. 1: 341. 1798.; Hook. f., Fl. Brit. India 7: 40. 1896.

Aquatic perennials. Culms robust, spongy, creeping at base, floating, up to 120 cm high; nodes glabrous. Leaf sheaths glabrous; ligule membranous, truncate; leaf blades linear-lanceolate, flat, 25 cm long, glabrous, margins scaberulous. Panicles interrupted, cylindric, spiciform, up to 25 cm long. Spikelets ovate-lanceolate, 4 mm long. Lower glume broadly ovate, less than half the length of spikelets, 5-nerved. Upper glume ovate-lanceolate, membranous. Lower lemma ovate, scabrid on outer surface. Palea oblong; upper lemma ovate-oblong, coriaceous, convex. Caryopsis ovoid.

Fl. & Fr.: Throughout the year.

Habitat: Occasional in water logged areas, marshy habitats.

Specimens examined: Gulletiwada, *Y. Mahesh* 010607 (BSID).

59. SCHIZACHYRIUM Nees

India: 6 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Schizachyrium brevifolium (Sw.) Nees ex Buse in Miq., Pl. Jungh. 3: 359. 1854; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1752. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 215. 1960; Pull., Andhra Pradesh 5: 2268. 2018. *Andropogon brevifolius* Sw., Prodr. 26. 1788; Hook. f., Fl. Brit. India 7: 165. 1896.

Annuals. Culms erect, up to 50 cm high; nodes glabrous. Leaf sheaths compressed, keeled; ligule membranous, fimbriate; blades oblong-lanceolate, 5 cm long, obtuse at apex. Racemes concealed a narrow spathe; joints clavate. Spikelets binate. Sessile spikelets linear-lanceolate, callus bearded. Lower glume lanceolate, chartaceous, bifid at apex. Upper glume linear-lanceolate, 1-nerved. Lower lemma epaleate, hyaline. Upper lemma deeply 2-lobed, awned; awn 10 mm long. Palea short, hyaline. Caryopsis linear. Pedicelled spikelets reduced to arista.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in grasslands, hill slopes in the forest.

Specimens examined: Pochavaram, *Y. Mahesh* 011574 (BSID).

Field notes: Pedicelled spikelets reduced to arista.

60. SETARIA P. Beauv.

India: 19 spp. & 1 var.; Andhra Pradesh: 6 spp.; PNP: 4 spp.

Key to the species

1a.	Spikelets not subtended by bristles	**1. S. flavida**
1b.	Spikelets subtended by bristles	2
2a.	Bristles retrorsely barbellate	**4. S. verticillata**
2b.	Bristles antrorsely barbellate	3
3a.	Culms robust; Leaf blade more or less plicate	**2. S. palmifolia**
3b.	Culms slender; Leaf blades flat	**3. S. pumila**

1. Setaria flavida (Retz.) Veldkamp, Blumea 39: 376. 1994. *Panicum flavidum* Retz., Observ. Bot. 4: 15. 1786; Hook. f., Fl. Brit. India 7: 28. 1896. *Paspalidium flavidum* (Retz.) A. Camus in Lecomte., Fl. Indo-china 7: 419. 1922; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1744. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 333. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 779. 1999; Pull., Andhra Pradesh 5: 2241. 2018. **(Plate 27H)**

Annual, slender grass. Calms ascending, 80 cm high; nodes glabrous. Leaf sheaths keeled; ligule hairy; blades linear, 15 cm long. Spikes shorter. Spikelets biseriate, ovoid, gibbous. Lower glume ovate, trinerved. Upper glume

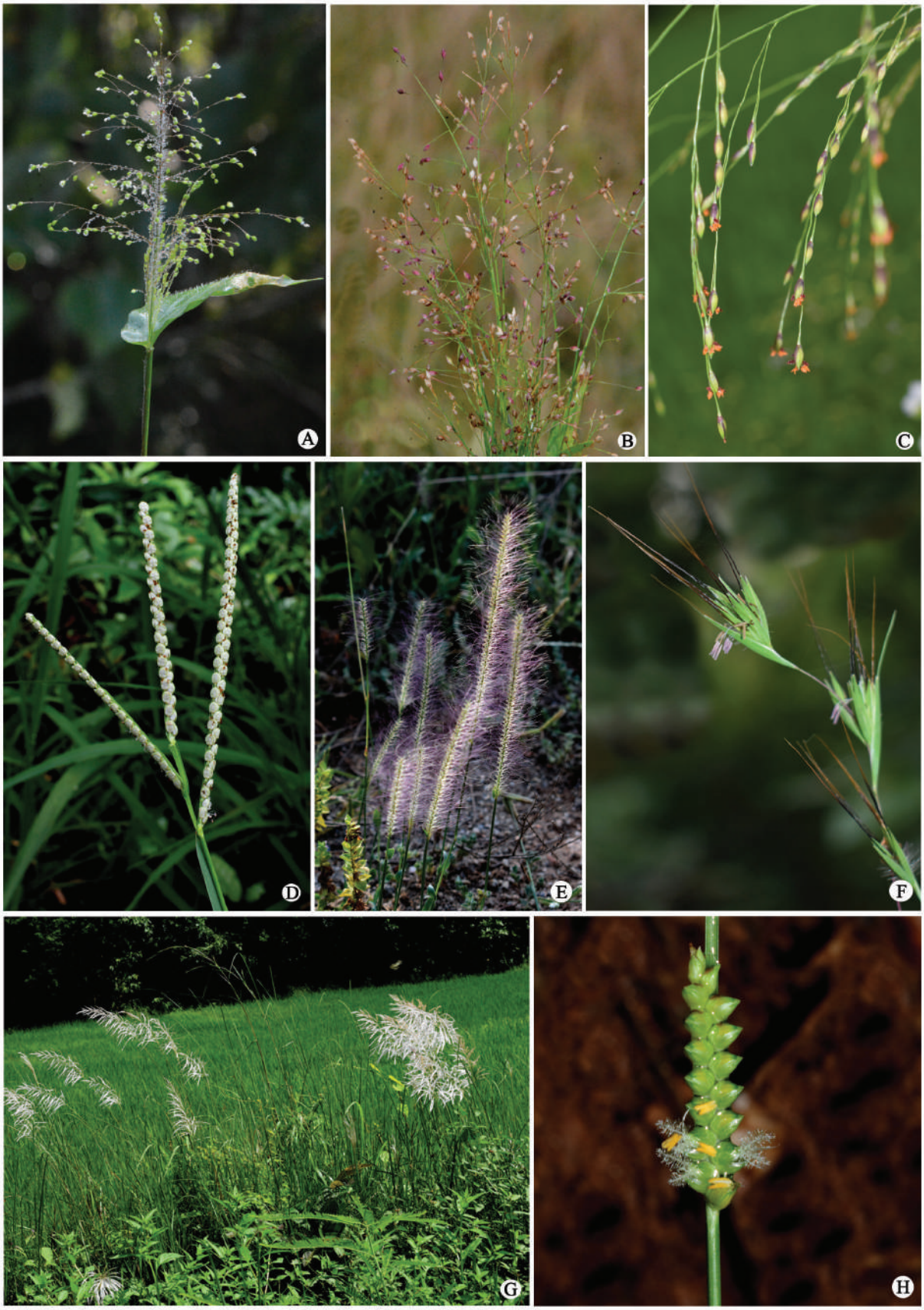


Plate 27: A. *Panicum brevifolium* L.; **B.** *Panicum humile* Nees ex Steud.; **C.** *Panicum paludosum* Roxb.; **D.** *Paspalum scrobiculatum* L.; **E.** *Perotis indica* (L.) Kuntze; **F.** *Pseudanthistiria umbellata* Hook.f.; **G.** *Saccharum spontaneum* L.; **H.** *Setaria flavida* (Retz.) Veldkamp

more than 5-nerved. Lower lemma chartaceous. Palea hyaline. Upper lemma convex, crustaceous.

Fl. & Fr.: Jul.–Dec.

Habitat: Common in paddy field hedges, marshy habitats of cultivated fields.

Specimens examined: Ontikomulachettu, Netteppakota, *Y. Mahesh* 010414, 011666 (BSID).

2. Setaria palmifolia (J.Koenig) Stapf in J. Linn. Soc., Bot. 42: 186. 1914; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1789. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 363. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 783. 1999; Pull., Andhra Pradesh 5: 2272. 2018. *Panicum palmifolium* J.Koenig, Naturforscher (Halle) 23: 208. 1788. *Panicum plicatum* Willd., Enum. Hort. Berol. Pl. 1033. 1809; Hook. f., Fl. Brit. India 7: 55. 1896. **(Plate 28A)**

Perennials. Culms tufted, ascending at base, up to 160 cm high; nodes glabrous. Leaf sheaths glabrous; ligule a rim of hairs; blades elliptic-lanceolate, 30 cm long, sparsely hairy along margins. Panicles up to 12 cm long. Involucral bristles many, antrorsely barbed. Spikelets elliptic-lanceolate, 3 mm long. Lower glume ovate, hyaline, obtuse, 3-nerved. Upper glume ovate, 5-nerved, membranous. Lower lemma ovate-elliptic, hyaline, epaleate. Upper lemma ovate, crustaceous, transversely rugose, palea ovate, crustaceous. Caryopsis ellipsoid.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional on hilly areas in the forest.

Specimens examined: PK Valasa, *Y. Mahesh* 012144 (BSID).

Field notes: Involucral bristles many, antrosely barbed.

3. Setaria pumila (Poir.) Roem. & Schult., Syst. Veg., 2: 891. 1817; R.S. Rao & al., Fl. E. Godavari Dist. 784. 1999; Pull., Andhra Pradesh 5: 2274. 2018. *Panicum pumilum* Poir., Encyc. Suppl. 4: 273. 1816. *Setaria pallide-fusca* (Schumach.) Stapf & C.E. Hubb., Kew Bull. 259. 1930; C.E.C. Fisch. in Gamble, Fl. Brit. India 7: 1789. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 363. 1960. **(Plate 28B)**

Annuals. Culms tufted, creeping or erect, up to 80 cm high; nodes glabrous. Leaf sheaths glabrous; ligule membranous; blades linear-lanceolate, flat, 15 cm long, sparsely hairy on surface, margins scabrid. Panicles spiciform, cylindric, 7 cm long, many flowered. Involucral bristles numerous, antrorsely bearded. Spikelets ovate-elliptic, 1.8 mm, gibbose. Lower glume broadly ovate, hyaline. Upper glume ovate, hyaline, 5-nerved. Lower lemma ovate-elliptic, hyaline. Palea elliptic, hyaline. Upper lemma elliptic, crustaceous, rugose. Caryopsis ellipsoid.

Fl. & Fr.: Aug.–Jan.

Habitat: Common along roadsides, as weed in cultivated fields, plain areas.

Specimens examined: Gunapalateenrai, Valamuru, *Y. Mahesh* 010436, 010509 (BSID).

Field notes: Culms creeping, leaf blades sparsely hairy.

4. Setaria verticillata (L.) P. Beauv., Ess. Agrost. 51.178. 1812; Hook. f., Fl. Brit. India 7: 80. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1789. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 365. 1960; Pull., Fl. Andhra Pradesh 5: 2274. 2018. *Panicum verticillatum* L., Sp. Pl., ed. 2. 1: 82. 1762. **(Plate 28C)**

Annuuals. Culms erect, tufted, up to 70 cm high; nodes glabrous. Leaf sheaths glabrous; ligule a fringe of hairs; blades linear-lanceolate, 15 cm long, scabrid on both surfaces. Panicles spiciform, pyramidal, up to 12 cm long. Involucral bristles retrorsely bearded; spikelets ovate, 2.5 mm long, Lower glume broadly ovate, hyaline. Upper glume ovate, membranous. Lower lemma ovate, dorsally compressed, epaleate. Upper lemma elliptic, rugose, coriaceous. Palea elliptic, coriaceous. Caryopsis ellipsoid.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in water logged areas, shady localities, marshy habitats.

Specimens examined: PK Valasa, *Y. Mahesh* 010448 (BSID).

Field notes: Tufted grass, panicles pyramidal.

61. SORGHUM Moench

India: 20 spp. & 45 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Sorghum halepense (L.) Pers., Syn. Pl. 1: 101. 1805; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1735. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 222. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 784. 1999; Pull., Fl. Andhra Pradesh 5: 2274. 2018. *Holcus halepensis* L., Sp. Pl. 2: 1047. 1753. *Andropogon halepensis* (L.) Brot., Fl. Lusit. 1:

89. 1804; Hook. f., Fl. Brit. India 7: 182. 1896. *Sorghum miliaceum* (Roxb.) Sw., J. Linn. Soc., Bot. 55: 207. 1955 incl. var. *parvispiculum* Sw. loc. Cit. 209; Bor, Grass. Burma, Ceylon, India & Pakistan 223. 1960. **(Plate 28D)**

Rhizomatous perennials. Culms stout, up to 180 cm high; nodes glabrous. Leaf sheath striate; ligule ciliate, membranous; blades liner-lanceolate, 50 cm long, scaberulous along margins. Panicles effuse, up to 30 cm long, decompound, branches scaberulous. Spikelets binate. Sessile spikelets ovate-lanceolate, 5 mm long; callus bearded. Lower glume ovate, toothed at apex, silky hairy on outside. Upper glume ovate-lanceolate, crustaceous, sparsely hairy. Lower lemma triangular-ovate, ciliate along margins. Upper lemma ovate, notched at apex, ciliate along margins, awned; awn 15 mm long. Caryopsis ovoid. Pedicelled spikelets similar to sessile spikelets, narrowly lanceolate, unawned.

Fl. & Fr.: Oct.–Dec.

Habitat: Occasional near water logged areas, as a weed in cultivated fields.

Specimens examined: Shivagiri, *Y. Mahesh* 010085 (BSID).

Field notes: Rhizomatous grass, panicles effuse.

62. SPOROBOLUS R.Br.

India: 20 spp. & 1 var.; Andhra Pradesh: 11 spp.; PNP: 3 spp.

Key to the species

1a.	Upper glume conspicuously shorter than the lemma; panicles effuse or otherwise	2
1b.	Upper glume as long as or longer than the lemma; panicle contracted	**2. S. piliferus**
2a.	Spikelets crowded; lower glumes truncate; stamens 2	**1. S. diandrus**
2b.	Spikelets scattered; lower glumes obtuse; stamens 3	**3. S. wallichii**

1. Sporobolus diandrus (Retz.) P. Beauv., Ess. Agrost. 26: 147. 178. 1812. Hook. f., Fl. Brit. India 7: 247. 1896; C.E.C. Fisch. in Gamble, Fl. Mdras 3: 1817. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 629. 1960. *Agrostis diandra* Retz., Obs. Bot. 5: 19. 1789. *Sporobolus indicus* (L.) R.Br., Prodr. Fl. Nov. Holl. 170. 1810. var. *diander* (Retz.) Jovet & Guedes, Taxon 22: 163. 1973.

Annuals. Culms tufted, erect, up to 80 cm high; nodes glabrous. Leaf sheaths glabrous; ligule membranous; blades linear-lanceolate, 10 cm long, glabrous. Panicle lax, up to 20 cm long, filiform. Spikelets crowded, lanceolate. Lower glume lanceolate, truncate at apex, chartaceous. Upper glume ovate, chartaceous, single nerved. Lemma hyaline. Palea oblong, 2-nerved. Stamens 2. Caryopsis obovoid.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in shady areas, marshy habitats in the forest.

Specimens examined: Ijjaluru, *Y. Mahesh* 010970 (BSID).

Field notes: Annual herb, panicles lax, filiform.

2. Sporobolus piliferus (Trin.) Kunth, Enum. Pl.1: 211. 1833; Hook. f., Fl. Brit. India 7: 251. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1817. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 629. 1960; Pull., Fl. Andhra Pradesh 5: 2283. 2018. *Vilfa pilifera* Trin., Dess. Bot. 157. 1824.

Annuals. Culms erect, tufted, up to 25 cm high; nodes glabrous. Leaf sheaths hairy near mouth; ligule a ring of hairs; blades linear, 10 cm long, involute, serrulate along margins. Panicles spiciform, contracted, 8 cm long, many flowered. Spikelets lanceolate, 2 mm long. Lower glume ovate-lanceolate, chartaceous. Upper glume as long as or longer than lemma, ovate-lanceolate, single nerved. Lemmas oblong, up to 2 mm long. Palea oblong-lanceolate, hyaline. Caryopsis ellipsoid, compressed.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional on hill slopes, marshy areas in the forest.

Specimens examined: Valamuru, *Y. Mahesh* 010931 (BSID).

Field notes: Ligule a ring of hairs, blades serrulate along margins.

3. Sporobolus wallichii Munro ex Trimen, J. Bot. 27: 171. 1889; Hook. f., Fl. Brit. India 7: 248. 1896; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1817. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 634. 1960; Pull., Fl. Andhra Pradesh 5: 2286. 2018.

Perennials. Culms erect, tufted, up to 90 cm high; nodes glabrous. Leaf sheaths glabrous; ligule fimbriate;

blades linear, 20 cm, convolute, glabrous. Panicles effuse, up to 15 cm long, branches slender. Spikelets scattered, oblong-lanceolate, 2 mm long. Lower glume ovate, obtuse at apex, chartaceous. Upper glume elliptic, hyaline. Lemma ovate-elliptic, chartaceous. Palea oblong, hyaline. Stamens 3. Caryopsis oblong, rugose.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in moist habitats, waste open places.

Specimens examined: PK Valasa, *Y. Mahesh* 010421 (BSID).

Field notes: Perennial grass, panicles effuse.

63. THEMEDA Forssk.

India: 19 spp. & 3 var.; Andhra Pradesh: 8 spp.; PNP: 3 spp.

Key to the species

1a. Involucral spikelets > 6 mm long; awns up to 55 mm long	**3. T. triandra**
1b. Involucral spikelets < 5.5 mm long; awns shorter	2
2a. Panicles contracted	**2. T. quadrivalvis**
2b. Panicles effuse	**1. T. laxa**

1. Themeda laxa (Andersson) A. Camus, Bull. Mus. Hist. Nat. (Paris) 26: 423. 1920; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1746. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 251. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 786. 1999; Pull., Fl. Andhra Pradesh 5: 2290. 2018. *Anthistiria laxa* Andersson, Nov. Act. Sci. Upsal. Ser. 3, 2. 243. 1856; Hook. f., Fl. Brit. India 7: 213. 1896.

Perennials. Culms erect, tufted, up to 40 cm high. Leaf sheath compressed; ligule absent; blades linear-lanceolate, 18 cm long, filiform. Panicles effuse, with few racemes, 7 cm long. Spathes glabrous, 2 cm long. Involucral spikelets 4, male, all same level, 5 mm long. Lower glume 9-nerved, tubercule based hairy. Upper glume lanceolate. Lemmas hyaline. Sessile spikelets 4.5 mm long. Lower glume 9-nerved. Upper glume lanceolate. Lower lemma linear. Upper lemma reduced to awn; awn 4 mm long. Pedicelled spikelets similar to involucral spikelets. Caryopsis oblong.

Fl. & Fr.: Aug–Nov.

Habitat: Occasional on hill slopes, grasslands in the forest.

Specimens examined: Eruwada, *Y. Mahesh* 010659 (BSID).

Field notes: Leafsheaths compressed, involucral spikelets tubercled based hairy.

2. Themeda quadrivalvis (L.) Kuntze, Revis. Gen. Pl. 2: 794. 1891; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1746. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 252. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 786. 1999; Pull., Fl. Andhra Pradesh 5: 2291. 2018. *Andropogon quadrivalvis* L. in Murr., Syst. Veg., ed. 13. 758. 1774. *Anthistiria ciliata* L.f., Suppl. Pl. 113.1782; Hook. f., Fl. Brit. India 7: 213. 1896.

Perennials. Culms geniculately ascending, up to 120 cm high, rooting from lower nodes; nodes glabrous. Leaf sheathes compressed, glabrous; ligules membranous; blades linear, 20 cm long, scabrid along margins, sparsely hairy. Panicles contracted; fascicled racemes terminate the upper branches. Spathes subulate, tuberculate base hairs along margins. Involucral spikelets linear-lanceolate, 5 mm long, whorled. Lower glume lanceplate, bristly. Upper glume oblong-lanceolate, 5 mm long. Lemmas oblong-lanceolate, hyaline, epaleate. Sessile spikelets bisexual, lanceolate, 4 mm long. Upper glume lanceolate, 3-nerved. Lower lemma lanceolate, epaleate. Upper lemma reduced to awn; awn up to 35 mm long. Caryopsis linear, grooved. Pedicelled spikletes lanceolate, 7 mm long, similar to involucral spikelets.

Fl. & Fr.: Sep.–Dec.

Habitat: Common on hill slopes, grossy patches in the forest.

Specimens examined: Gulletiwada, Kambam Konda, *Y. Mahesh* 010575, 010680 (BSID).

Field notes: Culms rooting from lower nodes.

3. Themeda triandra Forssk., Fl. Aegypt. -Arab. 123 &178. 1775; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1746. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 254. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 787. 1999; Pull., Fl. Andhra Pradesh 5: 2292. 2018. *Anthistiria imberbis* Retz., Observ. Bot.3: 11. 1783; Hook. f., Fl. Brit. India 7: 211. 1896. **(Plate 28E)**

Perennials. Culms tufted, robust, up to 220 cm high; nodes glabrous. Leafe sheaths glabrous, compressed;

ligule ciliate; blades linear-lanceolate, 30 cm long, scabrid. Panicles effuse, up to 50 cm long. Racemes clustered, drooping, flabelliform. Spathes 4 cm long, tubercule-based hairs. Involucral spikelets oblong-lanceolate, 8 mm long, tubercle based hairy at apex, whorled. Lower glume oblong, hairy. Upper glume ciliate at apex, margins incurved. Lemmas linear. Sessile spikelets linear, densely villous with yellow hairs. Lower glume oblong, scabrid outside. Upper glume oblong, obtuse, keeled. Lower lemma lanceolate, hyaline. Upper lemma stipitate, awned; awn up to 55 mm long, stout. Caryopsis linear, grooved. Pedicelled spikelets linear-lanceolate. Glumes similar to involucral spikelets.

Fl. & Fr.: Aug.–Dec.

Habitat: Common in grassy patches of hilly slopes, near stream banks.

Specimens examined: PK Valasa, Ijjaluru, *Y. Mahesh* 010013, 010971 (BSID).

Field notes: Culms robust, leaf blades scabrid.

64. THYSANOLAENA Nees

India: 1 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Thysanolaena latifolia (Roxb. ex Hornem.) Honda, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 3: 312. 1930. *Melica latifolia* Roxb. ex Hornem., Suppl. Hort. Bot. Hafn.117. 1819. *Thysanolaena maxima* (Roxb.) Kuntze, Revis. Gen. Pl. 2: 794. 1891; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1797. 1934; Bor, Grass. Burma, Ceylon, India & Pakistan 650. 1960; R.S. Rao & al., Fl. E. Godavari Dist. 787. 1999; Pull., Fl. Andhra Pradesh 5: 2294. 2018. *Agrostis maxima* Roxb., Fl. Ind. 1. 319. 1820. *Thysanolaena agrostis* Nees, Edinb. New Philos. J. 18: 180. 1835; Hook. f., Fl. Brit. India 7: 61. 1896. **(Plate 28F)***'Kondacheepuru'*

Perennial, tufted grass. Culms woody, up to 2.5 m high, shining; nodes glabrous. Leaf sheaths ciliate near mouth; ligule ciliate; blades lanceolate, 45 cm long, glabrous on both sides, cordate at base, acuminate at apex, margins scabrous. Panicles large, effuse, up to 65 cm long; spikelets ovate-lanceolate, 3-flowered. Glumes ovate-lanceolate, uninerved, hyaline. Lower lemma membranous, empty. Upper lemma lanceolate, hairy. Stamens 2.

Fl. & Fr.: Mar.–Oct.

Habitat: Videly cultivated in hilly slopes, forest hedges.

Specimens examined: Ijjaluru, *Y. Mahesh* 010958 (BSID).

Field notes: Woody rhizomatous grass, panicles effuse, large.

65. TRIPOGON Roem. & Schult.

India: 29 spp.; Andhra Pradesh: 5 spp.; PNP: 1 sp.

1. Tripogon capillatus Jaub. & Spach, Ill. Pl. Orient. 4: 47, t. 332. 1851; Kumar & Rao, Indian Journal of Forestry, 43(3): 246-251. 2021. **(Plate 28G)**

Annual herb. Culms geniculately ascending, up to 30 cm high; nodes glabrous. Leaf sheaths glabrous; ligule membranous; blades linear, 20 cm long, involute. Spikes up to 25 cm long, 4-flowered. Glumes lanceolate, cuspidate, chartaceous. Lemmas ovate-lanceolate, bifid at apex, awned; awn up to 20 mm long. Palea lanceolate, hyaline, 2-nerved.

Fl. & Fr.: Aug.–Dec.

Habitat: Rare in moist rocky crevices, on large dead tree trunks in the forest.

Specimens examined: Kambam konda, *Y. Mahesh* 011558 (BSID).

Field notes: Annual herb, culms wiry, filiform, spikelets linear-lanceolate, small.

66. UROCHLOA P. Beauv.

India: 9 spp. & 1 var.; Andhra Pradesh: 2 spp. & 2 var.; PNP: 1 sp.

1. Urochloa reptans (L.) Stapf, Fl. Trop. Afr. 9: 601. 1920; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1775. 1934. *Panicum reptans* L., Syst. Nat., ed. 10. 2: 870. 1759. *Brachiaria reptans* (L.) C.A. Gardner & C.E. Hubb. in Hooker's Icon. Pl. 34: sub t. 3363. 1938; Bor, Grass. Burma, Ceylon, India & Pakistan 285. 1960; Pull., Fl. Andhra Pradesh 5: 2111. 2018. *Panicum prostratum* Lam., Tabl. Encycl. 1: 171. 1791; Hook. f., Fl. Brit. India 7: 33. 1896.

Annual, tufted grass. Culms rooting at nodes, 45 cm long; nodes glabrous. Leaf shaths ciliate along margins; ligule hairy; blades lanceolate, 2 cm, scabrid along margins. Spikelets elliptic-lanceolate, with hairs. Lower glumes

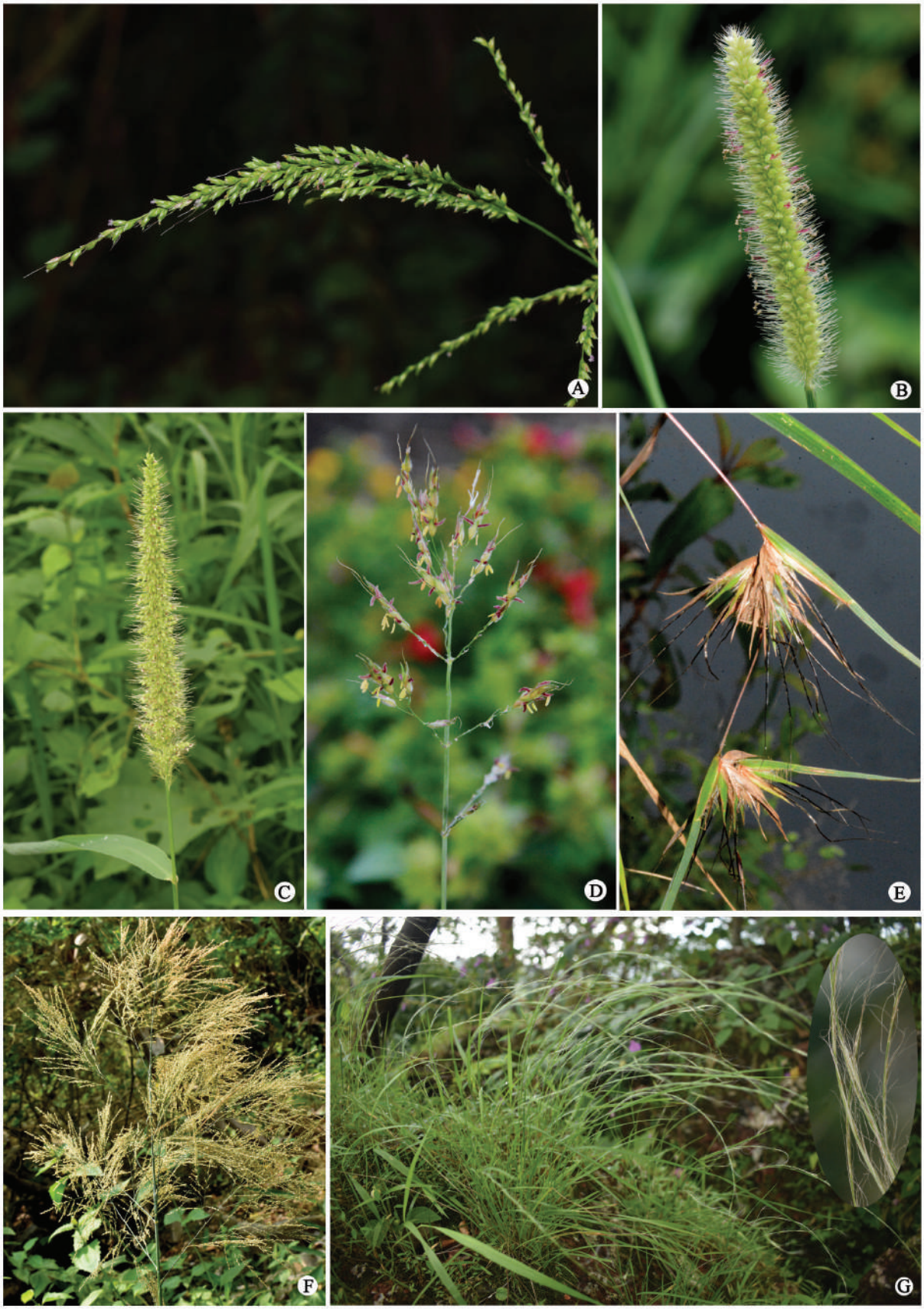


Plate 28: A. *Setaria palmifolia* (J.Koenig) Stapf; **B.** *Setaria pumila* (Poir.) Roem. & Schult.; **C.** *Setaria verticillata* (L.) P.Beauv.; **D.** *Sorghum halepense* (L.) Pers.; **E.** *Themeda triandra* Forssk.; **F.** *Thysanolaena latifolia* Honda; **G.** *Tripogon capillatus* Jaub. & Spach

trinerved, truncate at apex. Upper glume 5-nerved. Lower lemma lanceolate. Paleas hyaline, keeled. Upper lemma elliptic, rugulose. Palea keeled.

Fl. & Fr.: Jun.–Dec.

Habitat: Common in moist localities, under shady places, near water bunds.

Specimens examined: Gorrelabanda, *Y. Mahesh* 010164 (BSID).

Field notes: Culms rooting at nodes, leaf blades scabrid along margins.

28. PAPAVERACEAE

India: 5 genera, 31 spp., 1 forma; Andhra Pradesh: 1 genus, 1 sp.; PNP: 1 genus, 1 sp.

1. ARGEMONE L.

India: 3 spp. & 1 forma; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Argemone mexicana L., Sp. Pl. 1: 508. 1753; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 117. 1872; Gamble, Fl. Madras 1: 35. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 200. 1999; Pull. & al., Fl. Andhra Pradesh 1: 101. 2018. *'Yerrikusuma'*

Annual prickly herb, up to 1 m high; stems, branches greyish white. Leaves sessile, amplexicaul, prickly, 6–9 cm long, pinnatifid, with dentate lobes, glabrous; midrib, nerves prickly on the lower surface, spinose at apex, margins prickly. Flowers solitary, terminal on short axillary branches; bracts foliaceous, *c.* 3 cm long. Sepals 3, caducous, prickly, 2 cm long, apex hooded, horny. Petals 6, yellow, cuneate, with dark yellow nerves, *c.* 2 cm long. Stamens many; anthers yellow, basifixed. Style short; stigma lobed. Capsule elliptic-oblong, prickly *c.* 2 cm long. Seeds black, scrobiculate.

Fl.: & Fr.: Throughout the year.

Habitat: Common along river bank and open agricultural waste lands.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

29. MENISPERMACEAE

India: 20 genera, 45 spp., 4 var.; Andhra Pradesh: 11 genera, 12 spp., 1 var.; PNP: 4 genera, 5 spp.

Key to the genera

1a.	Leaves peltate; stamens connate	**1. Cissampelos**
1b.	Leaves not peltate; stamens free	2
2a.	Leaves deeply cordate at base	**4. Tinospora**
2b.	Leaves subcordate, acute, obtuse at base	3
3a.	Leaves glabrous; flowers 2-3 mm long; anthers oblong, drupe red	**3. Tiliacora**
3b.	Leaves pubescent; flowers 1-1.5 mm long; anthers globose; drupe purplish black	**2. Cocculus**

1. CISSAMPELOS L.

India: 1 sp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cissampelos pareira L., Sp. Pl. 2: 1031. 1753; Hook. f. & Thompson in Hook. f., Fl. Brit. India 1: 103. 1872; Gamble, Fl. Madras 1: 30. 1915; R.S. Rao & al., Fl. E. Godavari Dist.195. 1999. *'Gundukura'*

A deciduous climber; stems, branches tomentose. Leaves peltate, reniform, cordate, 5.5–7 cm long, cordate at base, mucronate at apex, margins entire, 5-nerved, glabrous above, hairy below. Flowers greenish-yellow. Male flowers in axillary pendulous cymes, pale green; bracts orbicular. Sepals 4, pilose. Petals 4, connate. Stamens 4 in a peltate synandrium; anthers minute. Female flowers in pendulous racemes, in axils of leaf like bracts, yellowish; bracts orbicular, persistent. Sepal 1, obovate. Petal 1, obovate. Stigma trifid. Fruit ovoid, scarlet, hairy.

Fl.: & Fr.: Apr.–Nov.

Habitat: Common twiner on shrubs in deciduous and open scrub forests.

Specimen examined: Thurupupalem, *Y. Mahesh* 010406 (BSID).

2. COCCULUS DC.

India: 5 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cocculus hirsutus (L.) W. Theob., Burmah ed. 3. 2: 657. 1883; R.S. Rao & al., Fl. E. Godavari Dist. 196. 1999;

Pull. & al., Fl. Andhra Pradesh 1: 88. 2018. *Cocculus hirsutus* (L.) Diels in Engl. Pflanzenr. 46: 236. 1910; Gamble, Fl. Madras 1: 29. 1915. *Menispermum hirsutum* L., Sp. Pl. 1: 341. 1753. *Cocculus villosus* (Lam.) DC., Syst.1: 525. 1817; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 101. 1872. *'Dusarateega'*

Perennial, woody climber, straggling over bushes; branches striate, hirsute. Leaves ovate-oblong, *c.* 4 cm long, cordate at base, obtuse at apex, margins entire, softly pubescent above, velvety tomentose below. Flowers unisexual, greenish yellow. Male in short panicles, pubescent. Sepals 3+3, dorsally pubescent, outer broader, trinerved; inner narrow, single nerved. Petals 3+3, auricled at base. Stamens 6; anther lobes 4, sub-globose. Female flowers in axillary fascicles. Perianth same as in male flower. Style small, slender; stigma simple. Drupe *c.* 4 mm across, purplish-black.

Fl.: & Fr.: Nov.–Apr.

Habitat: Common climbing shrub on pathways and open scrub forests.

Specimen examined: Tekuru, Tekupally, *Y. Mahesh* 011632, 011685 (BSID).

3. TILIACORA Colebr.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Tiliacora acuminata (Lam.) Miers, Ann. Mag. Nat. Hist. ser. 2, 7: 39. 1851; Gamble, Fl. Madras 1: 28. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 197. 1999; Pull. & al., Fl. Andhra Pradesh 1: 95. 2018. *Menispermum acuminatum* Lam., Encycl. 4: 101. 1797. *Tiliacora racemosa* Colebr., Trans. Linn. Soc. London 13: 67. 1821; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 99. 1872. **(Plate 29A)** *'Kappa teega'*

A large, evergreen, climbing shrubs, up to 6 m high; branches striate. Leaves ovate- lanceolate, up to 11 cm long, rounded at base, acuminate at apex, margins entire, shiny above, pale beneath, glabrous on both surfaces; petiole 2 cm long. Flowers in lax axillary panicles, deciduous, greenish-yellow. Male flowers 2–6 at terminal. Sepals 6. Petals 6, obovate. Stamens 6. Female flowers solitary. Sepals and petals as in male. Drupes scarlet red, oblong.

Fl.: & Fr.: Aug.–Nov.

Habitat: Common climber over small trees, forest hedges and open scrub forests.

Specimen examined: Pedanunthalu, *Y. Mahesh* 011508 (BSID).

4. TINOSPORA Miers

India: 6 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves glabrous on both surfaces; flowers greenish yellow	**1. T. cordifolia**
1b.	Leaves densely villous-hairy below, pubescent above; flowers green	**2. T. sinensis**

1. Tinospora cordifolia (Willd.) Miers ex Hook. f. & Thomson, Fl. Ind. 1: 184. 1855 & Hook. f., in Fl. Brit. India 1: 97. 1872; Gamble, Fl. Madras 1: 26. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 198. 1999; Pull. & al., Fl. Andhra Pradesh 1: 96. 2018. *Menispermum cordifolium* Willd., Sp. Pl., ed. 4: 826. 1806. *'Tippateega'*

Deciduous, woody climber, up to 12 m high; bark corky, flaking off with age; branches glabrous. Leaves cordate, 6–12 cm long, chartaceous, 6-nerved, sinuate at base, acuminate at apex, margins entire, glabrous on both surfaces; petiole pulvinate, *c.* 5 cm long. Flowers axillary, solitary, in pseudo-racemes, greenish-yellow. Male flowers light yellow. Outer sepals 3, ovate; inner 3 elliptic, concave. Petals 6, rhombic. Stamens 6. Female flowers solitary. Petals spathulate. Staminodes 6. Carpels 3, ellipsoid. Stigma capitate. Drupe globose, red when ripe. Seeds grooved ventrally.

Fl.: & Fr.: Jan.–May.

Habitat: Common climber over small trees, forest outskirts and roadsides.

Specimen examined: PK Valasa, *Y. Mahesh* 012146 (BSID).

Field notes: Bark corky, flaking off with age, leaves cordate.

2. Tinospora sinensis (Lour.) Merr., Sunyatsenia 1: 193. 1934; Pull. & al., Fl. Andhra Pradesh 1: 97. 2018. *Campylus sinensis* Lour., Fl. Cochinch. 1: 113. 1790. *Tinospora malabarica* (Lam.) Miers, Ann. Mag. Nat. Hist. ser. 2. 7: 38. 1851; Hook. f. & Thomson, Fl. Brit. India 1: 96. 1872.

Large climber, *c.* 13 m long; stem and branches woody, warty, tuberculed. Leaves broadly ovate, suborbicular,

c. 14 cm long, cordate at base, acuminate at apex, margins entire, 5-nerved from base, pubescent above, densely villous-hairy below; petiole *c.* 10 cm long. Inflorescence axillary, 3-flowered fascicles. Male flowers greenish-yellow. Sepals 6, ovate. Petals 3. Stamens 6, free; anthers subextrose. Female flowers: Sepals and petals as in male flowers. Staminodes 6. Carpels 3, ellipsoid. Style short; stigma lobed. Drupes sub-globose, *c.* 1.2 cm across, orange when ripe. Seeds curved.

Fl.: & Fr.: Jan.–May.

Habitat: Occasional over small trees and along roadsides.

Specimen examined: Kuduru, *Y. Mahesh* 011539 (BSID).

30. RANUNCULACEAE

India: 31 genera, 249 spp., 3 subspp., 41 varieties; Andhra Pradesh: 3 genera, 6 spp.; PNP: 1 genus, 1 sp.

1. CLEMATIS L.

India: 42 spp., 1 subsp. & 6 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Clematis zeylanica (L.) Poir., Encycl. Suppl. 2. 296. 1811. *Naravelia zeylanica* (L.) DC., Syst. 1: 167. 1817; Hook.f. & Thomson in Hook. f., Fl. Brit. India 1: 6. 1872; Gamble, Fl. Madras 1: 3. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 188. 1999; Pull. & al., Fl. Andhra Pradesh 1: 67. 2018. *Atragene zeylanica* L., Sp. Pl. 542. 1753. **(Plate 29B)** *'Pullabasala'*

Large climbing shrub, up to 10 m high; young branches pubescent. Leaves trifoliate; basal leaflets broadly ovate, 10 cm long, cordate at base, acuminate at apex, margins toothed, 5-nerved, pubescent; terminal leaflet transformed in to hooked tendrils. Flowers in axillary or terminal panicles. Sepals 5, elliptic, pubescent below. Petals 5–12, spathulate-linear, yellowish-green. Stamens *c.* 28. Fruit of achenes with twisted feathery styles.

Fl.: & Fr.: Nov.–Apr.

Habitat: Occasional over medium trees, along stream banks in deep forest.

Specimen examined: PK Valasa, Sirivaka, *Y. Mahesh* 010025, 011610 (BSID).

Field notes: Terminal leaflets modified into hooked tendril.

31. NELUMBONACEAE

India: 1 genus, 1 sp.; Andhra Pradesh: 1 genus, 1 sp.; PNP: 1 genus, 1 sp..

1. NELUMBO Adans.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Nelumbo nucifera Gaertn., Fruct. 1: 73, t. 19., f. 2. 1788; R.S. Rao & al., Fl. E. Godavari Dist. 198. 1999; Pull. & al., Fl. Andhra Pradesh 5: 101. 2018. *Nelumbium speciosum* Willd., Sp. Pl. 2: 1258. 1799; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 116. 1872; Gamble, Fl. Madras 1: 34. 1915. *'Kamalamu', 'Thamarapuvu'*

A perennial, aquatic, rhizomatous herb; rhizomes creeping. Leaves large, peltate, conical, up to 30 cm across, radiately nerved, margin entire, waxy, glaucous on both surfaces, glabrous; petiole attached at centre of the leaf, up to 1.5 m high. Flowers large, showy, pedunculate; peduncles up to 1.6 m long. Sepals elliptic, pinkish-green. Petals many, elliptic-obovate, white or rose. Stamens *c.*180. Receptacle 8 cm across, yellow-dark brown when ripen. Carpels embedded in the torus, cylindric. Seeds oblong, black.

Fl.: & Fr.: Throughout the year.

Habitat: Commonly grows in the mud at the bottom of the ponds, tanks and lagoons.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

32. PROTEACEAE

India: 6 genera, 6 spp.; Andhra Pradesh: 1 genus, 1 spp.; PNP: 1 genus, 1 sp.

1. GREVILLEA R.Br. ex Knight

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Grevillea robusta A. Cunn. ex R.Br., Suppl. Prodr. Fl. Nov. Holl. 1: 24. 1830; Gamble, Fl. Madras 2: 1243.

1925; R.S. Rao & al., Fl. E. Godavari Dist. 608. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1610. 2018. *'Parana'*

Evergreen fast growing tree, up to 30 m high; branching at top. Leaves fern like, bipinnatifid, lanceolate, 15–30 cm long, recurved at margins, dark green above, silvery white beneath. Flowers in unilateral racemes, bottle brush like, golden-orange, up to 15 cm long. Sepals hooded, fused except one side. Stamens sessile. Disc annual. Style 2 cm long; stigma conical. Capsule broad, oblique, *c.* 2.2 cm long. Seeds 2, black, winged.

Fl.: & Fr.: Apr.–Aug.

Habitat: Occasionally planted near tribal villages.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

33. BUXACEAE

India: 3 genera, 12 taxa; Andhra Pradesh: 1 genus, 1 sp.; PNP: 1 genus, 1 sp.

1. SARCOCOCCA Lindl.

India: 4 spp. & 2 forma; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Sarcococca coriacea (Hook.) Sweet, Hort. Brit., ed.1, 491. 1826; Pull. & al., Fl. Andhra Pradesh 4: 1624. 2018. *Pachysandra coriacea* Hook., Exot. Fl. 2: t. 148. 1825. *Sarcococca trinervia* Wight, Icon. Pl. Ind. Orient. 5: 22, t. 1877. 1852; Gamble, Fl. Madras 2: 1265. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 613. 1999.

Evergreen shrubs, up to 3 m high, entirely glabrous; branches terete, glabrous. Leaves elliptic, oblong-elliptic or lanceolate, 8–10 × 2–3 cm, acute at base, long acuminate or caudate at apex, margins entire, lateral nerves 6–10 pairs, coriaceous, glabrous; petiole *c.* 1.5 cm long. Flowers monoecious, in short axillary racemes; bracts ovate, or deltoid; bracteoles absent. Male flowers subsessile, 1–2.5 cm long; perianth lobes 4, oblong. Stamens 4. Female flowers below the male, 1–2 cm long, often paired. perianth lobes 6, deltoid. Style 2, up to 3 mm long, recurved above. Fruit ovoid, obliquely ellipsoid, indehiscent, tipped with remnant style.

Fl.: & Fr.: Mar.–Oct.

Habitat: Rare along stream banks of interior forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

34. DILLENIACEAE

India: 3 genera, 8 spp., 1 subsp.; Andhra Pradesh: 1 genus, 4 spp.; PNP: 1 genus, 2 spp.

1. DILLENIA L.

India: 9 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Plants leafy when flowering; flowers large, solitary, white	**1. D. indica**
1b.	Plants leafless when flowering; flowers small, fascicled, yellow	**2. D. pentagyna**

1. Dillenia indica L., Sp. Pl. 1: 535. 1753; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 36. 1872; Gamble, Fl. Madras 1: 7. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 189. 1999; Pull. & al., Fl. Andhra Pradesh 1: 69. 2018. **(Plate 29C)** *'Ravadichettu'*

An evergreen, medium sized tree, up to 15 m high; bark smooth, peeling off in small thin scales; branches spreading. Leaves oblong, 15–30 cm long, attenuate at base, acute at apex, margins serrate, secondary nerves 20–30 pairs, conspicuous; petiole pubescent, *c.* 4 cm long, narrowly winged. Flowers large, up to 10 cm across, solitary, rise at the ends of twigs, fragrant, white. Sepals 5, obovate or rounded, 3 × 2 cm, thick, yellowish-green. Petals obovate, 6 × 4.5 cm. Stamens numerous, yellow; filaments 8 mm long, white; anthers linear. Style flat. Fruit fleshy, enclosed in accrescent sepals, *c.* 12 cm in diameter. Seeds reniform, embedded in glutinous edible pulp.

Fl.: & Fr.: May–July.

Habitat: Occasionally in moist hilly areas and along forest pathways.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Dillenia pentagyna Roxb., Pl. Coromandel 1: 21, t. 20. 1795; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 33. 1872; Gamble, Fl. Madras 1: 8. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 189. 19*99;* Pull. & al., Fl. Andhra Pradesh 1: 70. 2018. **(Plate 29D)** *'Evadichettu'*

Tall deciduous tree, up to 40 m high; trunk cylindrical; bark pale brown with depressions; young branches silky white. Leaves large, obovate-oblong or oblanceolate, 60 cm long, cuneate or narrow at base, obtuse at apex, margins crenate, lateral nerves 45 pairs, forking towards margins; petiole *c.* 4 cm long. Flowers small, 5–10 in fascicles on leafless branches, *c.* 2.5 cm across, yellow. Sepals 5, ovate, obtuse at apex, glabrous, margins ciliate. Petals 5, obovate, 1.5 cm long, rounded at apex. Stamens 2-series; outer series with 80 stamens, erect; inner series to 10 stamens, reflexed apex in bud. Styles 5. Fruit rounded, *c.* 1.5 cm across, drooping, fleshy, enclosed by sepals. Seeds ovoid, glabrous.

Fl.: & Fr.: Feb.–May.

Habitat: Common in plains and hilly areas of deciduous forest.

Specimen examined: Kavadiguntla, Peddanunthala, *Y. Mahesh* 011368, 011712 (BSID).

35. CRASSULACEAE

India: 9 genera, 61 taxa; Andhra Pradesh: 2 genera, 5 spp.; PNP: 1 genus, 1 spp.

1. KALANCHOE Adans.

India: 9 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Kalanchoe pinnata (Lam.) Pers., Syn. Pl. 1: 446. 1805; R.S. Rao & al., Fl. E. Godavari Dist. 353. 1999. *Cotyledon pinnata* Lam., Encycl. 2: 141. 1786. *Bryophyllum calycinum* Salisb., Parad. Lond. t. 3. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 2: 413. 1878. *Bryophyllum pinnatum* (Lam.) Oken, Allg. Naturgesch. 3: 1966. 1841; Gamble, Fl. Madras 1: 451. 1919; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 706. 2018. *'Gallarapaku, Ranapala'*

A semi-succulent, glabrous herb, up to 1 m high; stem swollen at nodes. Leaves simple, crowded in young shoots, distant in adults, 5-foliolate; leaflets ovate-elliptic or oblong, *c.* 15 cm long, oblique at base, obtuse or subacute at apex, margins crenate; petiolule 3 cm long. Flowers many in paniculate cymes, greenish; peduncle *c.* 8 cm long; bracts foliar; bracteoles linear. Calyx 4 lobed; lobes triangular, 3 × 1.4 cm. Corolla 4-lobed, 4.5 cm long; lobes ovate, reddish. Stamens 8, inserted basally on corolla; filaments 3 cm long. Style 2.5 cm. Fruit a follicle, 1.4 cm long. Seeds numerous.

Fl.: & Fr.: May–Jul.

Habitat: Occasionally in cultivation areas and near tribal villages.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

36. VITACEAE

India: 9 genera, 67 taxa; Andhra Pradesh: 6 genera, 23 spp.; PNP: 6 genera, 11 spp.

Key to the genera

1a.	Large or small shrubs	**6. Leea**
1b.	Large or small climbing shrubs or climbers, twinners	2
2a.	Petals cohering at apex; leaves always simple	**2. Causonis**
2b.	Petals free; leaves simple or compound	3
3a.	Flowers 5-merous	**1. Ampelocissus**
3b.	Flowers 4-merous	4
4a.	Flower buds globose or oblong; nectariferous disc entire	5
4b.	Flower buds flask shaped; nectariferous disc of 4-free glands	**4. Cyphostemma**
5a.	Leaves 3-foliolate; berries 2-4-seeded	**5. Cyratia**
5b.	Leaves simple; berries 1-seeded	**3. Cissus**

1. AMPELOCISSUS Planch.

India: 10 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Whole plant covered with brown woolly tomentum; leaves deeply lobed; disc not furrowed	**2. A. tomentosa**
1b.	Only adaxial side of the leaf tomentose when young, becoming glabrescent on old; leaves angled; disc 5 furrowed	**1. A. latifolia**

1. Ampelocissus latifolia (Roxb.) Planch.,Vigne Amer. Vitic. Eur. 8: 374. 1884; Gamble, Fl. Madras 1: 230. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 268. 1999; Pull. & al., Fl. Andhra Pradesh 1: 366. 2018. *Vitis latifolia* Roxb., Fl. Ind. 2: 474. 1824; Lawson in Hook. f., Fl. Brit. India 1: 652. 1875.

Large, herbaceous climber, up to 10 m high; stem weak; branches terete, hollow, striate, with forked tendrils on peduncle; young shoots and inflorescence pubescent. Leaves cordate-orbicular, 6–16 × 7–15 cm, 3–5 lobed; lobes teethed, acute, acuminate at apex, margins dentate-serrulate, 5-nerved from base, pubescent beneath when young, glabrous on old; petiole up to 8 cm long. Inflorescence in compact thyrsoid cymes, puberulous; stalk 7 cm long, ending with bifurcate tendril. Flowers numerous. Sepals campanulate, saucer-shaped, glabrous. Petals 5, oblong, deep reddish, glabrous. Stamens minute; half of the ovary enclosed by disc, glabrous. Disc 5-grooved; stigma subsessile. Berries globose, black. Seeds 2, ellipsoid.

Fl.: & Fr.: May–Jul.

Habitat: Occasionally in hilly slopes, along stream banks and forest pathways.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Ampelocissus tomentosa (Roth) Planch., Vigne Amer. Vitic. Eur. 8: 375. 1884; Gamble, Fl. Madras 1: 230. 1918; R.S. Rao & al., Fl. E. Godavari Dist.268. 1999; Pull. & al., Fl. Andhra Pradesh 1: 367. 2018. *Vitis tomentosa* Roth in Roem & Schult., Syst. Veg. 5: 318. 1819; Lawson in Hook. f., Fl. Brit. India 1: 650. 1875. **(Plate 29E)**

Scandent, climbing shrub, up to 5 m high; stem, branches brown woolly tomentose, striate, brownish-red; tendrils woody, coiled, forked. Leaves broadly ovate, 15 × 14 cm, palmately 3–5 lobed; lobes cordate at base, acuminate at apex, margins crenate, woolly tomentose; petiole tomentose, up to 7 cm long. Inflorescence in thyrsoid cymes. Flowers peduncled, densely woolly; peduncles up to 6 cm long. Sepals 5, connate; lobes small, cupular, woolly. Petals 5, oblong-ovate, reddish, glabrous. Stamens 5, minute. Disc annular. Ovary conical, furrowed; stigma sessile. Berries globose, black when ripe. Seeds 4, ovate, rugose.

Fl.: & Fr.: May–Jul.

Habitat: Occasionally found along hilly slopes and forest pathways in the deep forest.

Specimen examined: Tiger camp, Kurlagattu, *Y. Mahesh* 010946, 011468 (BSID).

Uses: Fruits edible.

2. CAUSONIS Raf.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Causonis trifolia (L.) Mabb. & J. Wen, Mabberley's Pl.-Book 1101. 2017. *Vitis trifolia* L., *Sp. Pl. 1: 203. 1753. Cayratia trifolia* (L.) Domin, Biblioth. Bot. 89: 370. 1927; R.S. Rao & al., Fl. E. Godavari Dist. 270. 1999; Pull. & al., Fl. Andhra Pradesh 1: 368. 2018. *Cayratia carnosa* (Lam.) Gagnep., Notul. Syst. 1: 347. 1911; Gamble, Fl. Madras 1: 237. 1918. *Vitis carnosa* (Lam.) Wall. ex Lawson in Hook. f., Fl. Brit. India 1: 654. 1875.

Climbing shrubs; branches, tendrillar, pubescent; tendrils slender, opposite to leaves, branched. Leaves trifoliate, petiolate; leaflets ovate or oblong, 10 × 5 cm, cuneate at base, acute at apex, margins crenate-serrate, pubescent on both surfaces; petioles 6 cm long, pubescent; stipules small, ovate. Flowers in divaricate cymes, greenish-white; bracts ovate, ciliate; pedicels pubescent. Sepals 4, small, connate, pubescent. Petals 4, oblong, pubescent, cucullate. Stamens 4; filaments short; anthers minute. Ovary globose; ovules 2 in each cell; stigma sessile. Fruit berry, obovoid, spherical, fleshy, dark purple. Seeds 4.

Fl.: & Fr.: May–Jul.

Habitat: Occasionally found in the outskirts of villages and forest pathways.

Specimen examined: Bhupathipalem, *Y. Mahesh* 011438 (BSID).

Uses: Fruits edible.

3. CAYRATIA Juss.

India: 6 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Cayratia pedata (Lam.) Juss. ex Gagnep., Notul. Syst. (Paris) 1: 346. 1911; Gamble, Fl. Madras 1: 236. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 269. 1999; Pull. & al., Fl. Andhra Pradesh 1: 367. 2018. *Cissus pedata* Lam., Encycl. 1: 31. 1783. *Vitis pedata* (Lam.) Wall. ex Wight & Arn., Prodr. Fl. Ind. Orinet. 128. 1834; Lawson in Hook. f., Fl. Brit. India 1: 661. 1875. **(Plate 29F)**

Climbing shrubs; branches striate, puberulous. Leaves pedately 5-7 foliate; leaflets oblong-lanceolate, up to 10 cm long, cuneate at base, acute at apex, margins serrate, membranous, pubescent. Flowers in axillary, branched cymes, pale green. Sepals connate, cupular, pubescent; lobes ovate, minute. Petals incurved at apex.

Stamens 2.1 mm long. Disc cupular, 4-lobed. Ovary 1.4 mm long. Style subulate; stigma subcapiatate. Berry sub-globose, white. Seeds 2, deeply pitted.

Fl.: & Fr.: May–Jul.

Habitat: Common climber along forest pathways and near villages.

Specimen examined: PK Valasa, *Y. Mahesh* 011532 (BSID).

4. CISSUS L.

India: 17 spp. & 1 subsp.; Andhra Pradesh: 8 spp.; PNP: 3 spp.

Key to the species

1a. Stem and branches quadrangular	**1. C. quadrangularis**
1b. Stem and branches terete or obscurely angled	2
2a. Weak climbers; leaves simple; tendril branched, persistent	**2. C. repens**
2b. Stout, climbing shrubs; leaves 3–5 lobed; tendril simple, deciduous	**3. C. vitiginea**

1. Cissus quadrangularis L., Syst. Nat., ed. 12. 2: 124. 1767; Gamble, Fl. Madras 1: 234. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 270. 1999; Pull. & al., Fl. Andhra Pradesh 1: 370. 2018. *Vitis quadrangularis* (L.) Wall. ex Wight, Cat. Ind. Pl. 26. 1833; Lawson in Hook. f., Fl. Brit. India 1: 645. 1875. *'Nalleru'*

A fleshy, tendrillar climber; stems jointed, quadrangular, constricted at nodes, slightly winged. Leaves ovate, 3.5 × 2.5 cm, rounded at base, obtuse or rounded at apex, margins serrate; petiole short; tendrils leaf opposed, coiled. Flowers in short umbellate cymes. Calyx cupular, shortly lobed, glabrous. Petals ovate-oblong, acute, pale reddish. Stamens 1.4 mm long. Style short. Berry globose, red when ripe. Seeds solitary, obovate, smooth.

Fl.: & Fr.: May–Jul.

Habitat: Common in thorny scrub forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010538 (BSID).

2. Cissus repens Lam., Encycl. 1: 31. 1783; Gamble, Fl. Madras 1: 233. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 271. 1999; Pull. & al., Fl. Andhra Pradesh 1: 371. 2018. *Vitis repens* (Lam.) Wight & Arn., Prodr. Fl. Ind. Orient. 1: 125. 1834; Lawson in Hook. f., Fl. Brit. India 1: 646. 1875. *'Nalaboddu'*

Weak, glabrous, succulent climber; stem glaucous white; tendrils weak, leaf opposed, forked. Leaves simple, ovate-cordate, 13 cm long, cordate at base, acuminate at apex, margins membranous; tendrils branched. Flowers in irregular umbellate cymes. Calyx cupular, subtruncate, glabrous. Petals oblong, hooded, red, glabrous. Stamens 1 mm long. Style stout; stigma minute. Berry succulent, globose, 7 mm across, reddish black, 1-seeded. Seeds with encircling raphe.

Fl.: & Fr.: Aug.–Oct.

Habitat: Occasional along streams banks in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Cissus vitiginea L., Sp. Pl. 1: 117. 1753; Gamble, Fl. Madras 1: 234. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 271. 1999; Pull. & al., Fl. Andhra Pradesh 1: 371. 2018. *Vitis linnaei* Wight & Arn., Prodr. Fl. Ind. Orient. 126. 1834; Lawson in Hook. f., Fl. Brit. India 1: 649. 1875. *'Adavidraksha, Gummaditeega'*

Scandent, climbing shrub; tendrils simple, woody; branches fulvus-pubescent. Leaves cordate, shallowly palmately 3–5 lobed, 9 cm long, subcordate at base, acuminate at apex, margins coarsely dentate, pubescent on both sides; tendrils leaf opposed, simple, coiled, deciduous; petiole pubescent; stipules ovate, pubescent. Flowers in umbellate cymes. Sepals 4, connate, truncate, 1 mm long. Petals 4, oblong, with hooded apex, 2 mm long, light yellowish. Stamens 4; filaments glabrous; anthers oblong. Style short; stigma minutely lobed. Fruit a berry, ovoid, dark violet, apiculate. Seeds tessellate.

Fl.: & Fr.: May–Jul.

Habitat: Common climber on hills and open forest.

Specimen examined: Pochavaram, *Y. Mahesh* 011570 (BSID).

5. CYPHOSTEMMA (Planch.) Alston

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Cyphostemma auriculatum (Roxb.) P. Singh & B.V. Shetty in Taxon 35: 596. 1986; Pull. & al., Fl. Andhra

Pradesh 1: 373. 2018. *Cissus auriculata* Roxb., Fl. Ind. 1: 411. 1820. *Cayratia auriculata* (Roxb.) Gamble, Fl. Madras 1: 237. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 269. 1999. *Vitis auriculata* (Roxb.) Wall. ex Lawson in Hook. f., Fl. Brit. India 1: 658. 1875. *'Kurapalleru, Pulusa'*

A large climbing shrub; stems cylindric, hollow; young branches softly pubescent. Leaves 5-foliolate; leaflets obovate, up to 15 cm long, cuneate at base, acuminate at apex, margins serrate, pubescent; stipules ear shaped; tendrils 2–3 cleft, pubescent. Flowers in dichasial cymes on long succulent peduncles. Calyx cupular, truncate. Petals oblong, hooded, greenish cream. Stamens 1.8 mm long. Ovary pyramidal, hairy. Berry globose, 1 cm across, 1-seeded. Seeds ovoid or sub-globose.

Fl.: & Fr.: Jun.–Sep.

Habitat: Occasional on hilly slopes, along forest pathways on higher elevations.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. LEEA D. Royen

India: 11 spp.; Andhra Pradesh: 3 spp.; PNP: 3 sp.

Key to the species

1a.	Leaflets serrulate; lobes of staminal tube truncate	**3. L. macrophylla**
1b.	Leaflets dentate or serrate; lobes of staminal tube bifid or notched	2
2a.	Large shrubs; leaflets glabrous above; lateral nerves up to 11 pairs, not prominent	**2. L. indica**
2b.	Small shrubs; leaflets asperous above; lateral nerves up to 20 pairs, prominent	**1. L. asiatica**

1. Leea asiatica (L.) Ridsdale, Bot. Hist. Hort. Malab. 189. 1980; Pull. & al., Fl. Andhra Pradesh 1: 378. 2018. *Phytolacca asiatica* L., Sp. Pl. 1: 441. 1753. *Leea crispa* L., Mant. Pl. 1: 124. 1767; Lawson in Hook. f., Fl. Brit. India 1: 665. 1875; Gamble, Fl. Madras 1: 240. 1918; R.S. Rao & al., Fl. E. Godavari Dist 272. 1999.

Small shrubs, up to 2 m high; branches grooved, glabrous. Leaves imparipinnate, up to 25 cm; leaflets 2–3 pairs, ovate-elliptic, 14 cm long, rhomboid, cordate at base, acuminate at apex, margins serrate; secondary nerves up to 20 pairs. Flowers in terminal and axillary cymes, pale green, 2.5–3.5 mm long. Sepals 5, connate. Corolla tube along with bifid staminal lobes. Berries globular, 6-lobed, 7 mm long, purple black when ripe. Seeds wedge shaped.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common shrub along shady moist localities and stream banks.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Leea indica (Burm.f.) Merr., Philipp. J. Sci. 14: 245. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 273. 1999; Pull. & al., Fl. Andhra Pradesh 1: 379. 2018. *Staphylea indica* Burm.f., Fl. Ind. 75. t. 24. f. 2. 1768. *Leea sambucina* (L.) Willd., Sp. Pl. 1: 1177. 1798; Lawson in Hook. f., Fl. Brit. India 1: 666. 1875; Gamble, Fl. Madras 1: 240. 1918. *Aquilicia sambucina* L., Mant. Pl. 2: 211. 1771. *'Ankadora'*

Large shrubs or small tree, up to 5 m high; young branches hairy. Leaves 2–3 pinnate; leaflets imparipinnate, 2–3 pairs, oblong-elliptic or lanceolate, up to 12 cm, chartaceous, with prominent mid nerve below, obtuse at base, acuminate at apex, serrate at margins, glabrous above; secondary nerves up to 11 pairs, not prominant. Flowers in leaf opposed corymbose cymes, greenish white. Sepals 5, connate at base, lobed up to the middle. Petals 5, connate, lobes small. Stamens 5. Ovary globose. Berry globose, purple; pyrenes 5. Seeds 3-6.

Fl.: & Fr.: Jun.–Nov.

Habitat: Frequent in plains, hilly slopes, shady places in the forest.

Specimen examined: PK Valasa, Tiger camp, 010405, 010524 *Y. Mahesh* (BSID).

3. Leea macrophylla Roxb. ex Hornem. & Roxb., Fl. Ind., 2: 465. 1824; Lawson in Hook. f., Fl. Brit. India 1: 664. 1875; Gamble, Fl. Madras 1: 239. 1918; Pull. & al., Fl. Andhra Pradesh 1: 380. 2018. *Leea venkobarowii* Gamble, Kew Bull. 1977. 26. 1917 & Fl. Madras 1: 240. 1918. *'Booradipokai'*

A small, perennial shrubs; 1.5 m high; young branches puberulous. Leaves 3-5 foliolate, up to 30 cm; leaflets elliptic-ovate, 8–22 cm long, unequally rounded at base, acute at apex, margins coarsely serrate; lateral nerves up to 10 pairs. Flowers in leaf opposed corymbose cymes, white; rachis puberulous. Sepals 5, connate; lobes deltoid, hairy. Petals 5, connate at base, adnate to the stamina tube, pubescent. Stamens 5. Style short. Berry 6-lobed, depressed, 8 mm long, apiculate. Seeds black, rugose.

Fl.: & Fr.: Jun.–Nov.

Habitat: Occasional in the shady areas and along stream banks.

Specimen examined: Ijjaluru, *Y. Mahesh* 010530 (BSID).

37. ZYGOPHYLLACEAE

India: 8 genera, 15 spp., 5 varieties; Andhra Pradesh: 2 genera, 4 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a.	Trees	**1. Balanites**
1b.	Herbs	**2. Tribulus**

1. BALANITES Delile

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Balanites roxburghii Planch., Ann. Sci. Nat., Bot. ser. 4, 2: 258. 1854; Bennett in Hook. f., Fl. Brit. India 1: 522. 1875; Gamble, Fl. Madras 1: 164. 1915; Pull. & al., Fl. Andhra Pradesh 1: 307. 2018. *Balanites aegyptiaca* sensu Basak in Fasc. Pl. India 4: 20. 1980, non *Ximenia aegyptica* L., 1753; R.S. Rao & al., Fl. E. Godavari Dist. 252. 1999. *'Gara chettu'*

Small spiny tree, up to 5 m high; spines 1 cm long; bark rugged, greenish white; young branches glabrous. Leaves 2-foliate, arise from thorny twigs; leaflets elliptic-obovate, 4.5 × 2.2 cm, obtuse at apex, margins entire, ashy green, glabrous above, pubescent below. Flowers in fascicles of cymes, 8 mm across. Sepals 5, ovate, pubescent, silky within. Petals 5, oblong-obovate, silky within, greenish white. Stamens 10. Ovary silky hairy. Drupe oblong, *c.* 5 cm long, woody, 5-grooved. Seed solitary.

Fl.: & Fr.: Aug.–Nov.

Habitat: Occasional in the outskirts, black delta soils and along river beds.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Uses: Pulp of the fruit edible; juice from bark used as fish poison.

2. TRIBULUS L.

India: 5 spp. & 3 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Tribulus terrestris L., Sp. Pl. 1: 387. 1753; Edgew. & Hook. f., Fl. Brit. India 1: 423. 1874; Gamble, Fl. Madras 1: 130. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 243. 1999; Pull. & al., Fl. Andhra Pradesh 1: 274. 2018. *'Palleru'*

Procumbent, villous herb; branches ascending; young parts silky villous. Leaves paripinnate; leaflets 4–8 pairs, oblong, 2 × 1 cm, pubescent above, appressed hairy below, oblique at base, mucronate at apex, margins entire. Flowers pseudo axillary, or leaf opposed, solitary. Sepals 5, ovate-lanceolate, villous. Petals 5, obovate, spreading, bright yellow. Stamens 10. Ovary 5-loculed. Style minute; stigma 5-rayed. Fruits globose, 9 mm long, cocci-5, woody, each coccus with two hard divaricate, long spines.

Fl.: & Fr.: Throughout the year.

Habitat: Common weed in cultivated fields, open places and roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

38. FABACEAE

India: 174 genera, 1368 taxa; Andhra Pradesh: 81 genera, 315 spp., 2 subspp., 15 var.; PNP: 62 genera, 121 spp.

Key to the genera

1a.	Flowers zygomorphic	2
1b.	Flowers actinomorphic	51
2a.	Corolla ascendingly imbricate; stamens free	41
2b.	Corolla descendingly imbricate; stamens united	3
3a.	Trees	36
3b.	Other than trees	4
4a.	Climbing or twinning herbs or shrubs	26
4b.	Erect or prostrate or diffuse herbs, undershrubs or shrubs	5
5a.	Leaves simple or 3-many foliate	6
5b.	Leaves 2-foliate	**62. Zornia**

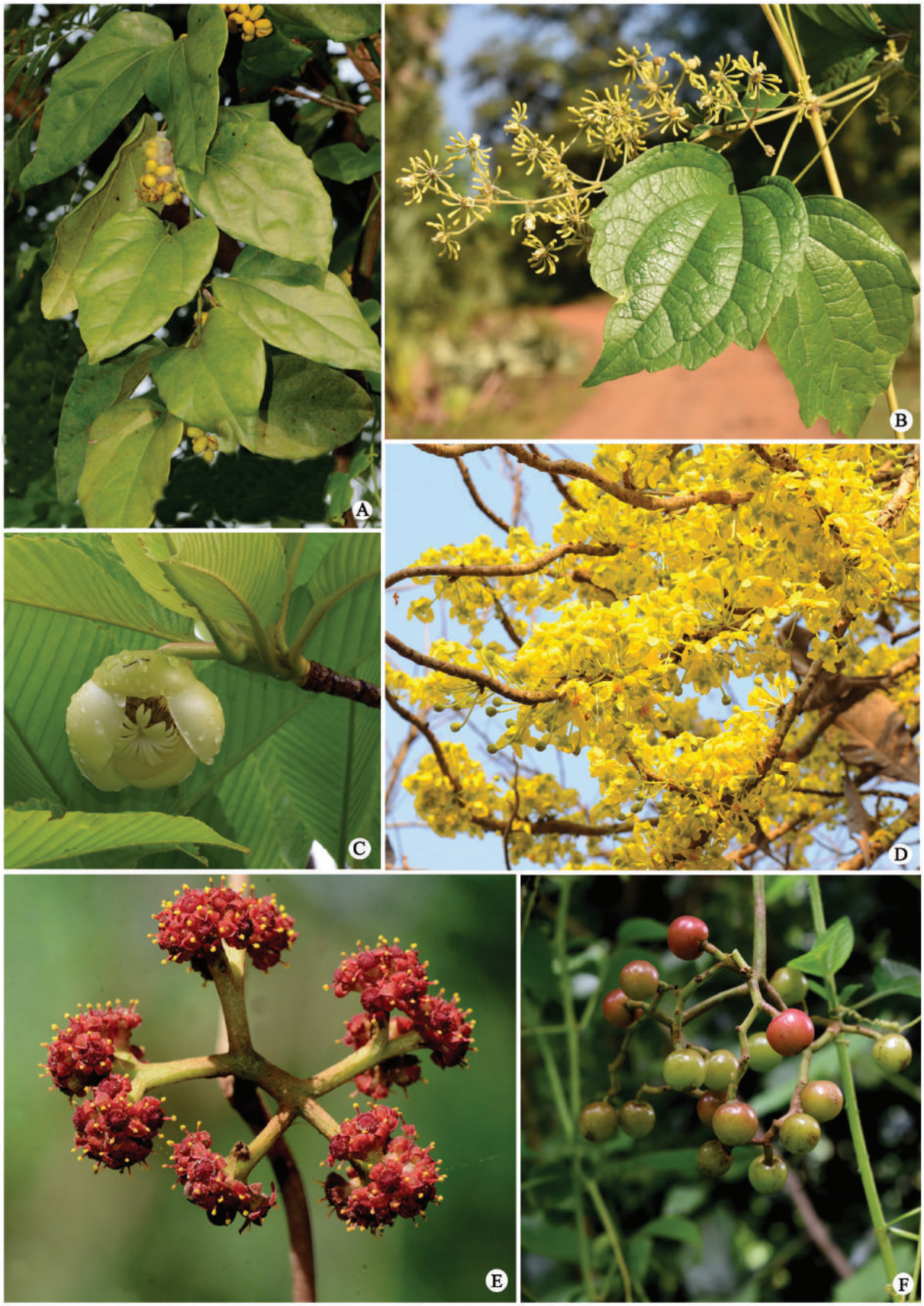


Plate 29: A. *Tiliacora acuminata* (Lam.) Miers; **B.** *Clematis zeylanica* (L.) Poir.; **C.** *Dillenia indica* L.; **D.** *Dillenia pentagyna* Roxb.; **E.** *Ampelocissus tomentosa* (Roth) Planch.; **F.** *Cayratia pedata* (Lam.) Gagnep.

6a.	Anthers uniform	7
6b.	Anthers dimorphic	**15. Crotalaria**
7a.	Pulvinus reduced; pod 1-seeded	**16. Cullen**
7b.	Plants not as above	8
8a.	Pods transversely jointed	17
8b.	Pods not transversely jointed	9
9a.	Anthers apiculate; biramous hairs present	**30. Indigofera**
9b.	Anthers not apiculate; biramous not hairs absent	10
10a.	Style straight, away from standard petal	**48. Rothia**
10b.	Style curved, towards standard petal	11
11a.	Leaflets and calyx with yellow glands	12
11b.	Leaflets and calyx without above characters	14
12a.	Ovules 1-2	13
12b.	Ovules 4-many	**9. Cajanus**
13a.	Pods flat	**47. Rhynchosia**
13b.	Pods turgid	**25. Flemingia**
14a.	Leaves simple or five-many foliolate	**56. Tephrosia**
14b.	Leaves trifoliolate	15
15a.	Leaflets with serrate or denticulate margin	**31. Melilotus**
15b.	Leaflets with entire margins	16
16a.	Style hairy	**60. Vigna**
16b.	Style glabrous	**43. Pseudarthria**
17a.	Calyx glumaceous, striate	**3. Alysicarpus**
17b.	Calyx not as above	18
18a.	Pods folded within persistent calyx	**58. Uraria**
18b.	Pods not as above	19
19a.	Stamens monadelphous, dimorphic	**54. Stylosanthes**
19b.	Stamens diadelphous, 5+5 or 9+1 (if monadelphous anthers uniform)	20
20a.	Stamens 5+5	25
20b.	Stamens monadelphous or 9+1; anthers uniform	21
21a.	Shrubs with woody branches; flowers in dense short-peduncled or sessile axillary umbels	**18. Dendrolobium**
21b.	Erect or trailing herbs or undershrubs; Flowers in long racemes or panicles	22
22a.	Trailing undershrubs; leaves small, 3-foliolate; exstipelate	**4. Aphyllodium**
22b.	Erect herb or undershrub; Leaves 1-3-foliolate	23
23a.	Pods 3-5 times as long as broad	**53. Sohmaea**
23b.	Pods as long as or twice as long as broad	24
24a.	Inflorescences pseudoracemes or often panicles, to 30 cm long, flowers less than 5 mm long; loments usually 6–8-jointed	**40. Pleurolobus**
24b.	Inflorescences in racemes; under 2.5 cm long; loments 2-jointed	**28. Grona**
25a.	Leaflets 3-10 pairs	**52. Smithia**
25b.	Leaflets more than 15 pairs	**2. Aeschynomene**
26a.	Leaves 3-foliolate	27
26b.	Leaves 5-many foliolate	60
27a.	Stamens monadelphous	28
27b.	Stamens diadelphous	30
28a.	Inflorescence rachis swollen at nodes	29
28b.	Calyx not as above	**57. Teramnus**
29a.	Calyx campanulate, teeth subequal	**46. Pueraria**
29b.	Calyx not as above	**10. Canavalia**
30a.	Anthers uniform	31
30b.	Anthers dimorphic	**34. Mucuna**
31a.	Leaves gland dotted below	32
31b.	Leaves not gland dotted below	33
32a.	Pods fully concealed in calyx	**36. Paracalyx**
32b.	Pods not concealed in calyx	**22. Dunbaria**
33a.	Style bearded below the stigma	**21. Dolichos**
33b.	Style not as above	34
34a.	Inflorescence rachis nodes swollen	**26. Galactia**
34b.	Inflorescence rachis not swollen	35
35a.	Pod turgid, glabrous	**12. Centrosma**
35b.	Pod not turgid, hairy	**51. Shuteria**
36a.	Pods orbicular, winged	**44. Pterocarpus**
36b.	Pods not orbicular, not winged	37
37a.	Leaves 5-many foliolate	38
37b.	Leaves 3-foliolate	40

38a.	Leaflets alternate	**17. Dalbergia**
38b.	Leaflets opposite	39
39a.	Pods woody obliquely oblong; seeds less than 2	**41. Pongamia**
39b.	Pods not woody, linearly oblong; seeds more than 2	**27. Gliricida**
40a.	Stems prickled; keel petals shorter than the standard	**24. Erythrina**
40b.	Stems not prickled; keel petal longer than the standard	**8. Butea**
41a.	Leaves unipinnate	45
41b.	Leaves bipinnate	42
42a.	Stragglers or lianas; pods samaroid	**45. Pterolobium**
42b.	Shrubs or small trees; pods not samaroid	43
43a.	Fruits with a wing, although this sometimes very narrow	**7. Biancaea**
43b.	Fruits without a wing	44
44a.	Fruit oblong to oblong-elliptic	**33. Moullava**
44b.	Fruit broadly elliptic to circular	**29. Guilandina**
45a.	Leaflets usually 2 or 1 foliolate, palmately nerved	46
45b.	Leaflets 4-many, reticulately nerved	48
46a.	Trees or shrubs (rarely semiscandent), sometimes with intrastipular spines, rarely with thorns, never with tendrils	47
46b.	Lianas, or vines (rarely shrubs) with tendrils (rarely without), never with intrastipular spines or thorns	**37. Phanera**
47a.	Calyx spathaceous or dividing to the hypanthium into 2–5 lobes	**6. Bauhinia**
47b.	Calyx only lobed in the upper part	**38. Piliostigma**
48a.	Petals 3; pods with pulpy mesocarp	**56. Tamarindus**
48b.	Petals 5; pods without pulpy mesocarp	49
49a.	Pods various, dehiscent or indehiscent; extrafloral glands present or absent	50
49b.	Pods indehiscent; extrafloral glands absent	**11. Cassia**
50a.	Bracteoles present; pods elastically dehiscent	**13. Chamaecrista**
50b.	Bracteoles absent; pods indehiscent, if dehiscent through one suture then pods follicular	**50. Senna**
51a.	Flowers tetramerous; stamens 4-8	**32. Mimosa**
51b.	Flowers pentamerous; stamens 10 or more	52
52a.	Stamens definite	56
52b.	Stamens indefinite	53
53a.	Unarmed trees or shrubs; flowers in globose heads	**3. Albizia**
53b.	Armed trees, shrubs; flowers in spikes or forming paniculate heads	54
54a.	Pinnae more than 1-paired; pods flat, turgid or torulose	55
54b.	Pinnae 1-paired; pods folcate, often spirally twisted	**39. Pithecellobium**
55a.	Stipules spinescent; Inflorescence capitates	**59. Vachellia**
55b.	Stipules non-spinescent; Inflorescence spicate	**49. Senegalia**
56a.	Flowers in globose heads	59
56b.	Flowers in elongate spikes	57
57a.	Large climber; pods large, woody	**23. Entada**
57b.	Erect trees or shrubs; pods small, not woody	58
58a.	Spikes dimorphic, bicoloured; upper flowers bisexual, lower sterile	**20. Dichrostachys**
58b.	Spikes uniform, concolourous, usually all bisexual	**42. Prosopis**
59a.	Herbs	**35. Neptunia**
59b.	Trees	**61. Xylia**
60a.	Leaves even pinnate	**1. Abrus**
60b.	Leaves odd pinnate	61
61a.	Flowers solitary	**14. Clitoria**
61b.	Flowers not as above	**19. Derris**

1. ABRUS Adans.

India: 3 spp. & 1 subsp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Abrus precatorius L., Syst. Nat., ed. 12. 2: 472. 1767; Baker in Hook. f., Fl. Brit. India 2: 175. 1876; Gamble, Fl. Madras 1: 349.1918; R.S. Rao & al., Fl. E. Godavari Dist. 283. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 404. 2018. *Glycine abrus* L., Sp. Pl. 2: 753. 1753. **(Plate 30A)** *'Gurivindha'*

Branching, wiry twiner, up to 5 m high; stems terete, sparsely pubescent. Leaves paripinnate; stipules subulate; leaflets 10 pairs, obovate-oblong, 2.3 × 0.7 cm, sparsely puberulous on both sides, deciduous, rounded at base, apiculate at apex, margins entire. Flowers in axillary, pedunculate fascicled racemes, clustered at ends of the peduncles. Calyx campanulate, tube 1.8 mm long; lobes truncate, obscure. Corolla pink; petals: standard broadly ovate, 1.2 cm long; wings oblong, 7 mm long; keels curved, 8 mm long. Pods linear-oblong, 4 cm long, septate, beaked at apex, dehiscent. Seeds oval, scarlet with black eye.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common along outskirts of thorny scrub forest.

Specimen examined: Pocharam, Kurla gattu, *Y. Mahesh* 010147, 011472 (BSID).

Uses: Leaves and roots used in local medicine.

2. AESCHYNOMENE L.

India: 4 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Aeschynomene aspera L., Sp. Pl. 2: 713. 1753; Baker in Hook. f., Fl. Brit. India 2: 152. 1876; Gamble, Fl. Madras 1: 331. 1918; Pull. & K. Sri. Rama Murthy, Fl. Andhra Pradesh 2: 406. 2018.

An erect undershrub, up to 1 m high; branches glabrous. Leaves imparipinnate, up to 10 cm long; stipules lanceolate; leaflets *c.* 30 pairs, oblong, up to 1 cm long, glabrous, oblique at base, obtuse-mucronate at apex, margins entire. Inflorescence in racemes, up to 4 cm long. Flowers large; bracts ovate. Calyx tube 5 mm long, hispid, upper lobes rounded, lower ovate. Corolla yellow; standard obovate, 1.3 × 1.6 cm, hairy on back; wings 8 mm long, hairy; keels 1.6 cm long. Pod up to 7 joints, straight, 3.8 cm long, glabrous. Seeds 5.

Fl.: & Fr.: Throughout the year.

Habitat: Common along water courses, ponds and outskirts of cultivated fields.

Specimen examined: Bulavegisa, *Y. Mahesh* 010551 (BSID).

3. ALBIZIA Durazz.

India: 17 spp. & 3 var.; Andhra Pradesh: 7 spp.; PNP: 3 spp.

Key to the species

1a. Leaflets usually under 1.2 cm long	**1. A. amara**
1b. Leaflets usually more than 1.2 cm long	2
2a. Leaflets 6-24 pairs; flowers sessile	**3. A. odoratissima**
2b. Leaflets 5-8 pairs; flowers pedicelled	**2. A. lebbeck**

1. Albizia amara (Roxb.) Boivin, Encycl. 2: 34. 1834; Baker in Hook. f., Fl. Brit. India 2: 301. 1878; Gamble, Fl. Madras 1: 432. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 344. 1999; Pull. & Sri Rama Murthy 2: 674. 2018. *Mimosa amara* Roxb., Pl. Coromandel 2: 13, t. 122. 1799. *'Nallaregi'*

Trees, up to 10 m high; bark brown with blackish vertical lines; young branches yellowish-grey, pubescent. Leaves alternate, bipinnate, 10 cm long; leaflets up to 20 pairs, linear-oblong, 1 cm long, entire, sub-acute at apex, glabrous above, pubescent below; petiole 2.5 cm long, pubescent, with a small gland above the middle. Inflorescence axillary globose heads. Flowers shortly pedicelled, yellowish, fragrant. bracts obovate, hirsute; pedicels short, pubescent. Sepals 5, connate, pubescent; lobes small. Petals 5, connate, pubescent; lobes lanceolate. Stamens numerous; filaments much excreted, monadelphous; anthers minute. Pods thin, straight, *c.* 15 cm long, abruptly acuminate. Seeds suborbicular, yellowish-brown.

Fl.: & Fr.: Feb.–Jul.

Habitat: Common tree in dry deciduous forest and around tribal villages.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011373 (BSID).

2. Albizia lebbeck (L.) Benth. in Hook., J. Bot. 3: 87. 1844, p.p. (as *lebbek*); Baker in Hook. f., Fl. Brit. India 2: 298. 1878; Gamble, Fl. Madras 1: 432. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 345. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 677. 2018. *Mimosa lebbeck* L., Sp. Pl. 1: 516. 1753. *'Dirisana'*

Large deciduous tree, up to 10 m high; bark yellowish-brown, rugged; young branches puberulous. Leaves bipinnate; pinnae with glands just below the leaflets, up to 8 cm long; leaflets 4-8 pairs, elliptic-oblong, 3.5 cm long, oblique at base, rounded at apex, margins entire, glabrous above, puberulous below; petiole swollen, puberulous with a gland at base, up to 6 cm long. Inflorescence in axillary, globose heads. Flowers pedicelled, greenish-yellow. Sepals 5, connate, pubescent; lobes obscure. Petals 5, connate, pubescent, tube funnel shaped; lobes lanceolate. Stamens numerous, monadelphous. Pods linear, *c.* 15 cm long, straw coloured, thin, 8-seeded, compressed, strongly nerved. Seeds flat, orbicular.

Fl.: & Fr.: Apr.–Sep.

Habitat: Common along road sides and near village premises.

Specimen examined: Tekupally, *Y. Mahesh* 011336 (BSID).

3. Albizia odoratissima (L.f.) Benth., London J. Bot. 3: 88. 1844; Baker in Hook. f., Fl. Brit. India 2: 299. 1878; Gamble, Fl. Madras 1: 431. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 346. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 678. 2018. *Mimosa odoratissima* L.f., Suppl. Pl. 437. 1782. **(Plate 30B)** *'Chinduga'*

Large tree, up to 15 m high; bark dark greyish-white with horizontal lenticels. Leaves bipinnate; rachis with gland between upper pairs of pinnae, leaflets 6–24 pairs, elliptic-oblong, 2.5 cm long, glabrous above, puberulous beneath, oblique at base, obtuse or minutely apiculate at apex, margins entire; petiole glandular at base; gland around the middle, conspicuous. Inflorescence axillary and terminal panicle of heads. Flowers sessile, white, fragrant; bracts ovate, minute, pubescent. Sepals 5, connate, pubescent; tube short; lobes small. Petals 5, connate, pubescent; tube 3 mm long; lobes ovate-lanceolate, 2 mm long. Stamens numerous, much excreted; filaments monadelphous; staminal tube short; anthers minute. Pods 18 cm long, brown, apiculate, sparsely puberulous, reticulately veined, 8-seeded. Seeds orbicular, flat.

Fl.: & Fr.: Mar.–Aug.

Habitat: Common along roadsides, near tribal villages and agricultural fields.

Specimen examined: Darapally, *Y. Mahesh* 011583 (BSID).

4. ALYSICARPUS Desv.

India: 22 spp. & 14 var.; Andhra Pradesh: 13 spp.; PNP: 4 spp.

Key to the species

1a.	Joints of pods rugose or plicate	**1. A. heyneanus**
1b.	Joints of pods smooth or ornamented	2
2a.	Pods without constrictions between two articles	**3. A. ovalifolius**
2b.	Pods with distinct constrictions between articles	3
3a.	Articles glabrous or with minute hairs	**4. A. vaginalis**
3b.	Articles with distinctly hooked hairy	**2. A. monilifer**

1. Alysicarpus heyneanus Wight & Arn., Prodr. Fl. Ind. Orient. 1: 234. 1834; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 413. 2018. *Alysicarpus rugosus* (Willd.) DC. var. *heyneanus* (Wight & Arn.) Baker in Hook. f., Fl. Brit. India 2: 159. 1876; Gamble, Fl. Madras 1: 339. 1918.

Diffuse herb, up to 60 cm high; stems hairy. Leaves 1-foliolate; lower leaves elliptic-oblong, 3–4 cm long, obtuse at base, apiculate or obtuse at apex, margins entire, puberulous; petiole short, up to 0.6 mm long. Flowers in long racemes; racemes up to 16 cm long; pedicels short. Calyx tube up to 2 mm long; lobes short, up to 7 mm long, ciliate; Corolla dark purple-pink; standard 5 mm long; wing petals 4 mm long; keel petals 4 mm long. Pods moniliform, joints up to 5, slightly exserted, rugose, downy. Seeds rugose.

Fl.: & Fr.: Sep.–Dec.

Habitat: Occasional in open grasslands and cultivated fields.

Specimen examined: Arvapally, *Y. Mahesh* 011676 (BSID).

2. Alysicarpus monilifer (L.) DC., Prodr. 2: 353. 1825; Baker in Hook. f., Fl. Brit. India 2: 157. 1876; Gamble, Fl. Madras 1: 338. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 284. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 414. 2018. *Hedysarum moniliferum* L., Mant. Pl. 102. 1767. '*Amera chettu'*

Prostrate, much branched herb; up to 50 cm high; branches with spreading pilose hairs. Leaves simple, variable in shape, elliptic-oblong, up to 3.5 cm long, papery stipule sheathing, subcordate at base, obtuse at apex, margins entire, pubescent; petiole 1.4 cm long. Flowers pinkish white in axillary racemes; racemes 5-10 flowered; pedicels very short. Calyx pilose, up to 4.5 mm long. Corolla violet; standard 5 mm long; wings 4.5 mm long; keel petals 5.5 mm long. Pods moniliform, 3-6 jointed, *c.* 2 cm long, hooked hairy, apiculate at apex. Seeds ovoid.

Fl.: & Fr.: Throughout the year.

Habitat: Common along roadsides, open places and cultivated fields.

Specimen examined: Included on the authority of R.S. Rao & al.(*l.c.*).

3. Alysicarpus ovalifolius (Schumach.) J. Leonard, Bull. Jard. Bot. Etat Brux. 24: 88. 1954; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 416. 2018. *Hedysarum ovalifolium* Schumach., Beskr. Guin. Pl. 359. 1827.

Prostrate herb, up to 60 cm high; branches glabrous, rooting at nodes. Leaves oblong-elliptic, 2-5 cm long, obtuse at base, acute or mucronate at apex, margins entire, puberulous on the nerves below; petiole up to 1 cm long. Flowers in leaf-opposed or terminal lax racemes; pedicel minute; bracts lanceolate, 0.5 mm long. Calyx tube

up to 1 cm long, puberulous. Corolla sparsely puberulous; standard 5 mm long, pinkish; wings purple; keels pink in colour. Stamens diadelphous; filaments densely pubescent. Pods jointed, flattened, 1.8 cm long, hairy. Seeds ellipsoid, brown.

Fl.: & Fr.: Sep.–Jan.

Habitat: Occasional in open places and edges of the forest.

Specimen examined: Bapannapolam, *Y. Mahesh* 010056 (BSID).

4. Alysicarpus vaginalis (L.) DC., Prodr. 2: 353. 1825; Baker in Hook. f., Fl. Brit. India 2: 158.1976; Gamble, Fl. Madras 1: 138. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 285. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 419. 2018. *Hedysarum vaginale* L., Sp. Pl. 2: 746. 1753. *'Barammata mokka'*

Diffuse, much branched herb, up to 50 cm high; branches glabrescent. Leaves unifoliolate, variable in shape, linear-oblong or lanceolate, 2 × 1.4 cm, cordate at base, retuse at apex, margins entire, glabrous above, puberulous beneath; petiole up to 5 mm long. Flowers pinkish, in close terminal racemes; pedicels minute. Calyx tube 5 mm long, glabrous, lobes longer than the first joint of pod. Corolla pinkish; standard 6 mm long; wings, keels 4.5–5 mm long. Pods cylindric, linear, 3-6 jointed, tetragonous, glabrous or minutely hairy. Seeds almost orbicular.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common along roadsides, stream hedges and edges of the forest.

Specimen examined: Gulletiwada, *Y. Mahesh* 010590 (BSID).

5. APHYLLODIUM (DC.) Gagnep.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Aphyllodium biarticulatum Gagnep., Notul. Syst. (Paris) 3: 254. 1916. *Hedysarum biarticulatum* L., Sp. Pl. 2: 747. 1753. *Dicerma biarticulatum* (L.) DC., Prodr. 2: 339. 1825; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 500. 2018. *Desmodium biarticulatum* (L.) F. V. Muell., Fragm. Phyt. Austr. 2: 121. 1861; Baker in Hook. f., Fl. Brit. India 2. 163. 1876; Gamble, Fl. Madras 1: 344. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 303. 1999.

A procumbent undershrub, up to 70 cm high; stems and branches densely caespitose, glabrous. Leaves digitately trifoliate; leaflets oblong-oblanceolate, *c.* 1.3 cm long, cuneate at base, obtuse at apex, margins entire, glabrous above, silky beneath; petiole short, 5 mm long. Flowers in terminal 8–14 cm long racemes, 3–4 flowered; pedicels short; bracts subulate. Sepals connate, scarious; lobes acute. Petals connate, reddish; standard obovate; wing petals short; keel petals 4 mm long. Stamens 10, diadelphous; filaments very short. Pods oblong, 2-jointed, *c.* 1.2 cm long, densely hairy.

Fl.: & Fr.: Jun.–Dec.

Habitat: Rare along streams and sandy localities in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. BAUHINIA Plum. ex L.

India: 14 spp., 1 subsp. & 1 var.; Andhra Pradesh: 6 spp.; PNP: 3 spp.

Key to the species

1b.	Stamens 1–5	**1. B. acuminata**
1b.	Stamens 10	2
2a.	Flowers large, purple; fertile stamens 3	**2. B. purpurea**
2b.	Flowers small, white; fertile stamens 10	**3. B. racemosa**

1. Bauhinia acuminata L., Sp. Pl. 1: 376. 1753; Baker in Hook. f., Fl. Brit. India 2: 276.1878; Gamble, Fl. Madras 1: 408. 1919; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 609. 2018. *'Kanchana'*

Medium sized shrub, up to 3 m high; branches brown. Leaves deeply lobed, 5–6.5 cm long, subcordate at base, lobes acute at apex, glabrous; nerves 8–10; petiole *c.* 3.5 cm long. Inflorescence in short racemes, up to 6 cm long. Sepals 5, 3.5 cm long, large, acuminate. Petals 5, obovate, whitish, narrow at base, 6.5 cm long. Stamens 5; filaments large. Pods beaked, *c.* 13 cm long, ridged both sides of upper suture, 5-seeded.

Fl.: & Fr.: Jul.–Jan.

Habitat: Cultivated near villages and roadsides.

Specimen examined: Rekapally, *Y. Mahesh* 011567 (BSID).

2. Bauhinia purpurea L., Sp. Pl. 1: 375. 1753; Baker in Hook. f., Fl. Brit. India 2: 284.1878; Gamble, Fl. Madras 1: 407. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 332. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 609. 2018. *Phanera purpurea* (L.) Benth., Pl. Jungh. 2: 262. 1852. *'Kanchana'*

Moderate sized evergreen tree, up to 8 m high; bark brown; branches warty. Leaves deeply lobed, suborbicular, as long as broad, 10 × 11 cm, subcordate at base, bilobed at apex; lobes connate up to half way down into two obtuse apices, margins entire, up to 12 nerved, glabrous above, pubescent below; petiole up to 3.3 cm long. Inflorescence axillary or terminal corymbose racemes. Flowers large, purple or pink; pedicels up to 2.6 cm long; bracts ovate. Sepals spathaceous, 2.4 cm long. Petals 5, obovate, narrow at base, all similar. Fertile stamens 3, remaining sterile; filaments short. Pods *c.* 22 cm long, flat, compressed, narrow at both ends. Seeds globose, up to 15, smooth.

Fl.: & Fr.: Sep.–Jan.

Habitat: Common along forest edges, roadsides and also along water course areas.

Specimen examined: Eruwada, *Y. Mahesh* 011560 (BSID).

3. Bauhinia racemosa Lam., Encycl. 1: 390. 1785; Baker in Hook. f., Fl. Brit. India 2: 276. 1878; Gamble, Fl. Madras 1: 407. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 332. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 612. 2018. *Bauhinia parviflora* Vahl, Symb. Bot. 3: 55. 1794. *'Are chettu'*

Small deciduous tree, up to 10 m high; bark dark brown; branches sparsely pubescent. Leaves broader than long, broadly ovate-orbicular, 2–3.5 cm long, thin, coriaceous, subcordate at base, apex cleft into two obtuse lobes, margins entire; main nerves 7, glabrous on both surfaces. Inflorescence in axillary or leaf opposed racemes. Flowers creamy-white; pedicels short; bracteoles small, subulate. Sepals 5, connate; lobes cleft at apex. Petals 5, narrowly oblanceolate, hairy in the middle. Stamens 10; filaments short. Pods oblong, twisted, *c.* 25 cm long, indehiscent, rounded with small apiculate at apex, glabrous. Seeds up to 20, ovoid, brown.

Fl.: & Fr.: Mar.–Oct.

Habitat: Common along forest paths and roadsides.

Specimen examined: Maredupudi, *Y. Mahesh* 010126 (BSID).

7. BIANCAEA Tod.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Biancaea decapetala (Roth) O. Deg., Fl. Hawaiiensis K 7. 1936. *Reichardia decapetala* Roth, Nov. Pl. Sp. 212. 1821. *Caesalpinia decapetala* (Roth) Alston in Trimen, Handb. Fl. Ceylon Suppl. 6: 89. 1931; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 619. 2018. *Caesalpinia sepiaria* Roxb., Fl. Ind. 2: 360. 1832; Baker in Hook. f., Fl. Brit. India 2: 256. 1876; Gamble, Fl. Madras 1: 394. 1919. **(Plate 30C)**

Large thorny stragglers, up to 6 m high; stems, branchlets 5-angled, with recurved prickles. Leaves abruptly 2-pinnate; pinnae up to 10 pairs, leaflets 6–12 pairs, broadly oblong-obovate, 1.6 cm long, cuneate or subacute at base, round or obtuse at apex, margins entire, puberulous on both surfaces; petiole up to 3 cm long; stipules semi sagittate, caducous. Flowers in long, simple terminal or supra-axillary racemes; pedicels jointed, up to 3.2 cm long; bracts lanceolate, short. Calyx tube campanulate, lobes 5, oblong, Petals 5, bright yellow. Stamens 10; filaments short, pubescent at base. Pods oblong, 8 cm long, compressed, turgidly dehiscent. Seeds 5–8, sub-globose.

Fl. & Fr.: Oct.–Jan.

Habitat: Occasional in open scrub forests, along forest pathways and roadsides.

Specimen examined: Geediguppa, *Y. Mahesh* 011575 (BSID).

8. BUTEA Roxb. ex Willd.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Trees; base of the pod rounded	**1. B. monosperma**
1b.	Large woody climbers; base of the pod narrowed	**2. B. superba**

1. Butea monosperma (Lam.) Taub., Nat. Pflanzenfam. 3: 366. 1894; R.S. Rao & al., Fl. E. Godavari Dist. 288. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 421. 2018. *Erythrina monosperma* Lam., Encycl. 1: 391. 1785. *Butea frondosa* Roxb., Asiat. Res. 3: 469. 1792; Baker in Hook. f., Fl. Brit. India 2: 194. 1876; Gamble, Fl. Madras 1: 357. 1918. *'Modhuga chettu'*

Moderate sized, deciduous trees, up to 12 m high, bark greyish; branchlets tomentose. Leaves trifoliate; leaflets coriaceous, terminal leaflets rhomboid, as long as broad, up to 15 cm long, laterals leaflets shorter than terminal ones, cuneate at base, obtuse at apex, margins entire, glabrous above, pubescent beneath. Flowers in racemes, yellowish orange or scarlet coloured, clustered at the nodes of rachis, appear before the leaves; pedicels twice as long as calyx, brown-velvety. Sepals velvety, upper lobes connate, lower one deltoid. Corolla clothed with silky hairs; standard lanceolate, 3.8 cm long; wings falcate, 4 cm long; keels 4.1 cm long. Stamens 10; sheath curved. Pods flat, oblong, *c.* 14 cm long, rounded at base, indehiscent, thick velvety brown, pubescent. Seeds 1-3, obovate.

Fl.: & Fr.: Feb.-May.

Habitat: Common in open places and dry deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: It is called flame of the forest due to it flowers in absence in leaves and presents beautiful sight.

2. Butea superba Roxb. ex Willd., Sp. Pl.3: 917. 1802; Baker in Hook. f., Fl. Brit. India 2: 194. 1876; Gamble, Fl. Madras 1: 357. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 289. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 422. 2018. **(Plate 30D)** *'Teega modhuga'*

Gigantic, woody climber *c.* 20 m long; bark brownish, smooth; young branches tomentose. Leaves trifoliate; leaflets large, coriaceous, terminal leaflets rhomboid, obovate, 30 cm in diam.; laterals leaflets shorter than terminal ones, with fine nerves beneath, sparsely rugose above, hairy on nerves below, cuneate at base, apex obtuse, margins entire. Flowers in racemes, yellowish-red or flame coloured, 6 cm long. Sepals velvety, upper lobes connate, lower one deltoid. Corolla clothed with silky hairs; standard lanceolate, 4 cm long; wings falcate, 3.8 cm long; keels curved. Stamens 10; sheaths slightly curved. Pods flat, *c.* 15 cm long, with persistent calyx, narrowed at base, rusty tomentose. Seeds 2, obovate.

Fl.: & Fr.: Mar.–May.

Habitat: Common climber on huge trees in deciduous forest.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011309 (BSID).

9. CAJANUS Adans.

India: 15 spp. & 1 var.; Andhra Pradesh: 5 spp.; PNP: 2 spp.

Key to the species

1a.	Calyx teeth as long as or slightly longer than tube	**2. C. scarabaeoides**
1b.	Calyx teeth shorter than tube	**1. C. albicans**

1. Cajanus albicans (Wight & Arn.) Maesen, Agric. Univ. Wageningen Pap. 85: 55. 1986; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 423. 2018. *Cantharospermum albicans* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 256. 1834. *Atylosia albicans* (Wight & Arn.) Benth. in Miq., Pl. Jungh. 2: 243. 1852; Baker in Hook. f., Fl. Brit. India 2: 215. 1876; Gamble, Fl. Madras 1: 369. 1918. R.S. Rao & al., Fl. E. Godavari Dist. 285. 1999.

Climbing shrubs, up to 4 m long; branches white hairy. Leaves trifoliate; leaflets obovate, 2–3 cm long, obliquely cuneate at base, rounded or obtuse at apex, margin entire pubescent above, appressed tomentose beneath, secondary nerves 4–6 pairs; petiole up to 2.8 cm long, hairy. Flowers in racemes; bracts and bracteoles 3.5 mm long. Calyx tube pubescent, teeth shorter than tube. Corolla golden yellow, standard emarginate at apex, 2.2 cm long; wing, keel petals 1.4 cm long. Stamens 10, diadelphous; filaments short. Pods *c.* 3.2 cm long, grey in colour, up to 7 seeded. Seeds oblong.

Fl.: & Fr.: Sep.–Feb.

Habitat: Occasional along forest paths, undergrowth of the dry deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Cajanus scarabaeoides (L.) Thouars, Dict.Sci. Nat. 6: 617. 1817. (as *Cajan scarabaeoide*); Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 427. 2018. *Dolichos scarabaeoides* L., Sp. Pl. 2: 726. 1753. *Atylosia scarabaeoides* Benth., Pl. Jungh. 2: 242. 1852; Baker in Hook. f., Fl. Brit. India 2: 215. 1876; Gamble, Fl. Madras 1: 369. 1918.

Procumbent, perennial climber or trailer, up to 1.5 m long; roots woody; stem, branches with densely reddish pubescence. Leaves trifoliate; lateral leaflets oblique, ovate-oblong, or elliptic, 1–4.5 cm long, slightly rugose, trinerved, truncate at base, subacute at apex, margins entire, velvety and gland dotted on both surfaces; petiole 1.5 mm long. Flowers in axially racemes, 2–6 flowered; pedicel 5 mm long. Calyx tubes 5-toothed; teeth linear,

as long as or slightly longer than tube, upper two connate with bifid tip, lower ones long, densely velvety. Petals 5, yellow; standard shortly clawed, auricled at base, obovate; wing, keel petals 8.5 mm long. Stamens 10, diadelphous. Pod linear, densely velvety, glandular. Seeds 4–6, oblong, furrowed between the seeds.

Fl.: & Fr.: Jul.–Mar.

Habitat: Common along forest pathways and on small bushes in scrub forests.

Specimen examined: Geediguppa, *Y. Mahesh* 010158 (BSID).

10. CANAVALIA DC.

India: 8 spp.; Andhra Pradesh: 5 spp.; PNP: 2 spp.

Key to the species

1a.	Leaflets narrowly ovate; seeds red or dull red	**2. C. gladiata**
1b.	Leaflets broadly ovate-oblong; seeds brown	**1. C. africana**

1. Canavalia africana Dunn ex Hutch., Bull. Misc. Inform. Kew 1922: 135. 1922; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 429. 2018. *Canavalia virosa* (Roxb.) Wight & Arn., Cat. Ind. Pl. 44. 1834; Gamble, Fl. Madras 1: 359. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 290. 1999. *Dolichos virosus* Roxb., Hort. Bengal. 55.1814. *Canavalia ensiformis* DC. var. *virosa* (Roxb.) Baker in Hook. f., Fl. Brit. India 2: 196. 1876. *'Adavi chamma'*

Extensive perennial, twiner, up to 6 m long; young parts reddish, pubescent. Leaves trifoliate, 8–16 cm long; leaflets ovate-elliptic or oblong, 5–12 cm long, rounded at base, acuminate, apiculate at apex, margins entire, glabrous above, sparsely pubescent beneath; petiole up to 9 cm long. Inflorescence in axillary, long racemes; peduncle with swollen nodes, pubescent. Flowers purple-violet, solitary or binate; pedicels 4.5 mm long. Sepals 5, connate, bilobed; lobes glabrous; upper lip notched. Petals 5; standard suborbicular, notched, clawed; wings 2.6 mm long; keels 3 mm long. Stamens 10, Monadelphous; filaments up to 6 mm long. Pod jointed, *c.* 14 cm long, 10-seeded. Seeds ovoid, dark brown.

Fl.: & Fr.: Sep.–Jan.

Habitat: Occasional on bushes along stream banks and scrub jungles.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Canavalia gladiata (Jacq.) DC., Prodr.2: 404. 1825; R.S. Rao & al., Fl. E. Godavari Dist. 289. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 430. 2018. *Dolichos gladiatus* Jacq., Icon. Pl. Rar. 3: t. 560. 1788 & Coll. Bot. 2. 276. 1789. *Canavalia ensiformis* sensu Baker in Hook. f., Brit. India 2: 195. 1876, non (L.) DC., 1825. *'Chemmakaya'*

A stout, woody climber; up to 2.5 m long; branches glabrous. Leaves trifoliate; leaflets ovate-obovate, 5–13 cm long, cuneate at base, acute at apex, glabrous, margins entire; petiole up to 7 cm long. Flowers in axillary racemes, pinkish-white or lilac. Sepals campanulate; tube with two lobes; lobes rounded, emarginate. Petals campanulate; standard c. 2.6 cm long; wing lobes oblong-spathulate, 3 cm long, obtuse; keels falcate, oblong, 2.7 cm long. Stamens 10, monadelphous; filaments 1 cm long. Pods linear, *c.* 15 cm long, flattened, beaked. Seeds ellipsoid, red.

Fl.: & Fr.: Sep.–Feb.

Habitat: Planted for vegetables, occasionally found as an escape along roadsides and forest edges.

Specimen examined: Shivagiri, Kakeshnur, *Y. Mahesh* 010080, 011333 (BSID).

Uses: Fruits used as vegetable.

11. CASSIA L.

India: ; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cassia fistula L., Sp. Pl. 1: 377. 1753; Baker in Hook. f., Fl. Brit. India 2: 261. 1878; Gamble, Fl. Madras 1: 400. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 336. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 622. 2018. **(Plate 30E)** *'Relachettu'*

Medium sized, deciciduous tree; bark smooth, whitish. Leaves large, paripinnate, alternate, 25–40 cm long; leaflets 4–8 pairs, elliptic-ovate or lanceolate-oblong, 7–15 cm long, coriaceous, subacute or cuneate at base, acute to acuminate at apex, margins entire, glabrous, with close strong secondary nerves, silvery pubescent when young; petiole 2.5 cm long. Flowers bright yellow, in long pendulous, terminal branched racemes, pedicellate. Calyx tube short, lobes 5, imbricate, reflexed, ovate, 1 cm long, obtuse at apex. Petals 5, imbricate, subequal,

obovate, 1.5 cm long. Stamens 10, equal. Pods short stipitate, long cylindric, *c.* 50 cm long, drooping, terete, brown or black when mature, indehiscent. Seeds *c.* 40, orbicular, flattened.

Fl. & Fr.: May–Dec.

Habitat: Common along road sides in dry deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

12. CENTROSEMA (DC.) Benth.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Centrosema pubescens Benth., Comm. Legum. Gen. 55. 1837; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 433. 2018. *Bradburya pubescens* (Benth.) Kuntze, Revis. Gen. Pl. 1: 164. 1891.

Climbing herbs; branches slender, hairy. Leaves trifoliate; leaflets ovate-oblong, 4–8 cm long, rounded at base, acuminate at apex, margins entire, pubescent on both surfaces, lateral nerves 4–6 pairs; petiole up to 8 cm long. Flowers in axillary racemes, 4-6 together; bracts ovate, large. Calyx campanulate, lobes 5, subequal, upper two connate, small. Corolla papilionaceous, shortly pubescent outside; vexillum orbicular, 3.8 cm across, pinkish-violet, minutely hairy; wings 2.9 cm long, clawed; keel petals curved. Stamens diadelphous. Pods oblong, *c.* 10 cm long, compressed, beaked at apex, 14-20 seeded.

Fl.: & Fr.: Nov.–Jan.

Habitat: Occasional along stream banks in the forest.

Specimen examined: Bapanammapolam, *Y. Mahesh* 011741 (BSID).

13. CHAMAECRISTA Moench

India: 11 spp. & 1 var.; Andhra Pradesh: 8 spp.; PNP: 2 spp.

Key to the species

1a.	Leaflets 2 pairs; gland flattened and ligulate; petals imbricate	**1. C. absus**
1b.	Leaflets up to 80 pairs; gland cup-shaped; petals irregular	**2. C. mimosoides**

1. Chamaecrista absus (L.) H.S. Irwin & Barneby, Mem. New York Bot. Gard. 35: 664. 1982; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 624. 2018. *Cassia absus* L., Sp. Pl. 1: 376. 1753; Baker in Hook. f., Fl. Brit. India 2: 265. 1878; Gamble, Fl. Madras 1: 403. 1919. *'Chanupala vitulu'*

Erect annual herb, up to 70 cm high; stem and leaves clothed with grey viscous hairs. Leaves pinnately compound; leaflets 2-pairs, elliptic-oblong or ovate, 2–4.5 cm long, cuneate at base, mucronate at apex, margins entire, glabrous on upper surface, pubescent on lower surface; petiolule very short. Flowers in leaf opposed or terminal racemes, yellow; pedicels up to 1 cm long; bracts ovate, minute. Petals 5, subequal, obovate. Stamens 5; filaments short; anthers minute. Pods flat, *c.* 4 cm long, oblique, with glandular hairs. Seeds ovoid, black.

Fl.: & Fr.: Sep.–Feb.

Habitat: Common in marshy areas, waste places and grasslands in the forest.

Specimen examined: GM Valasa, *Y. Mahesh* 010486 (BSID).

2. Chamaecrista mimosoides (L.) Greene, Pittonia 4: 27. 1899; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 626. 2018. *Cassia mimosoides* L., Sp. Pl. 1: 379. 1753; Baker in Hook. f., Fl. Brit. India 2: 266. 1878; Gamble, Fl. Madras 1: 403. 1919.

An erect herb, up to 60 cm high; stem and branches with appressed hairy. Leaves paripinnate; leaflets about 80 pairs or more, oblong-elliptic, 2–5.5 mm long, chartaceous, obtuse at base, obtuse, apiculate at apex, margins entire, glabrous; petiole short with a gland below the basal pair of the leaflets; stipules auriculate, lanceolate, 1.6 mm long. Flowers solitary or 2–3, in axillary fascicles, yellow; pedicels slender, hairy; bracts stipular. Sepals connate, lobes 5, unequal, lanceolate, 5 mm long, acute at apex, hairy. Petals 5, subequal, obovate, 5.2 mm long, clawed. Stamens 10; filaments short. Pods flat, strap shaped, *c.* 4.5 cm long, tomentose, dehiscent, apiculate with oblique depressions between seeds. Seeds ellipsoid, brown.

Fl.: & Fr.: Sep.–Mar.

Habitat: Common in marshy areas, wastelands and forest edges.

Specimen examined: Eruwada, Valamuru, *Y. Mahesh* 010627, 010917 (BSID).

14. CLITORIA L.

India: 6 spp. & 3 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Clitoria ternatea L., Sp. Pl. 2: 753. 1753; Baker in Hook. f., Fl. Brit. India 2: 208. 1876; Gamble, Fl. Madras 1: 365. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 290. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 433. 2018. *'Shankapuvvu'*

Twining herb; up to 5 m long; branchlets strigose tomentose. Leaves imparipinnate, 5–7 foliolate; stipules linear, small; leaflets 3-pairs, broadly elliptic-oblong, or ovate, 3 cm long, cuneate at base, obtuse, mucronate at apex, margins entire, adpressed shortly villous or glabrous on both surfaces; lateral veins 4 or 5 pairs. Flowers large, solitary, axillary, showy; bracteoles suborbicular, small, green, membranous with reticulate veins. Calyx membranous, short. Corolla excreted, sky blue, pink or white, emarginate; standard broadly obovate, emarginate, 3 cm long, orange or white in middle; wings oblong-obovate or falcate, 2.9 cm long; keel petals elliptic, 2.2 cm long. Stamens diadelphous. Pods linear-oblong, *c.* 8 cm long, flat, shortly beaked. Seeds reniform, brown.

Fl.: & Fr.: Throughout the year.

Habitat: Common in cultivated field and forest edges.

Specimen examined: Shivagiri, *Y. Mahesh* 011628 (BSID).

Field notes: Cultivated in home gardens for its showy flowers.

15. CROTALARIA L.

India: 102 spp., 4 subsp. & 21 var.; Andhra Pradesh: 45 spp.; PNP: 10 spp.

Key to the species

1a.	Leaves simple	2
1b.	Leaves compound	9
2a.	Leaves numerous, closely set; flowers solitary; pods flattened	**4. C. herbecarpa**
2b.	Plants without above combination of charecters	3
3a.	Racemes few, often 1-flowered, mostly trailing herbs	4
3b.	Racemes many-flowered; erect herbs, undershrubs or shrubs	5
4a.	Stipules present	**5. C. humifusa**
4b.	Stipules absent	**9. C. prostrata**
5a.	Pods hairy; flowers in panicles or racemes	**10. C. verrucosa**
5b.	Pods glabrous; flowers always in racemes	6
6a.	Pods included or slightly exserted from calyx	7
6b.	Pods conspicuously exserted from calyx	8
7a.	Stipules present; calyx fulvous pubescent	**2. C. calycina**
7b.	Stipules absent; calyx silky	**6. C. linifolia**
8a.	Leaves thick, pellucid-dotted; flowers 8 mm long	**1. C. albida**
8b.	Leaves membranous, not pellucid-dotted; flowers 7-12 mm long	**3. C. epunctata**
9a.	Pods 2-seeded, hairy or velvety	**7. C. medicaginea**
9b.	Pods 8-28-seeded, glabrous	**8. C. pallida**

1. Crotalaria albida B. Heyne ex Roth, Nov. Pl. Sp. 333. 1821; Baker in Hook. f., Fl. Brit. India 2: 71. 1876; Gamble, Fl. Madras 1: 295. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 292. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 439. 2018.

Annual herb, 30–50 cm high, clothed with appressed silky pubescence. Leaves simple, subsessile, oblanceolate, 2 cm long, cuneate at base, margin entire, obtuse or retuse at apex, glabrous, pellucid-punctuate above, silky hairy beneath; petiole 1.4 mm long. Racemes terminal, 4–18 cm long, 6–10-flowered; bracts minute, linear. Calyx 1.2 cm long, three teeth linear, acuminate at apex, upper two broader, sub obtuse. Corolla yellow, equalling the calyx, pubescent without; wings oblong 7 × 3 mm; keels ovate or oblong, 7.5 × 3.6 mm, beak twisted. Stamens monadelphous; staminal sheath 3 mm long; filaments 4 mm long. Pods oblong, glabrous 1.5 cm, prominently nerved, 2-5 seeded.

Fl.: & Fr.: Aug.–Oct.

Habitat: Common in wastelands and the floors of dry deciduous forests.

Specimen examined: PK Valasa, Kakeshnur, 010012, 010696, *Y. Mahesh* (BSID).

2. Crotalaria calycina Schrank, Pl. Rar. Hort. Monac. t. 12. 1817; Baker in Hook. f., Fl. Brit. India 2: 72. 1876; Gamble, Fl. Madras 1: 295. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 292. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 443. 2018.

Erect herbs, up to 70 cm high; branches fulvous appressed hairy. Leaves elliptic-oblanceolate, 4–8 cm long, cuneate at base, obtuse or rounded at apex, margins entire, glabrous above, hairy beneath; petiole 3 mm long. Inflorescence in terminal or lateral long racemes; racemes 3-10-flowered, up to 14 cm long. pedicels 1 cm long. Calyx with fulvous hairy, lobes 5, lanceolate. Corolla excreted, yellow, silky pubescent; standard obovate, 2.3 cm long, clawed, midnerve sericeous below; wings, keels obovate, 1.5 cm long. Stamens 10, monadelphous; filaments short, up to 7 mm long. Pods oblong, *c.* 2.7 cm long, blackish-brown. Seeds up to 20, compressed, bean shaped.

Fl.: & Fr.: Sep.–Dec.

Habitat: Occasional in open grasslands and open places in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Crotalaria epunctata Dalzell, Hooker's J. Bot. Kew Gard. Misc. 3: 210. 1851; Gamble, Fl. Madras 1: 295. 1918; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 445. 2018. *Crotalaria albida* B. Heyne ex Roth var. *epunctata* (Dalzell) Baker in Hook. f., Fl. Brit. India 2: 71. 1876. **(Plate 30F)**

Branched herb, up to 60 cm high; branchlets appressed pubescent. Leaves linear-oblanceolate, up to 3 cm long, narrowly obtuse at base, mucronate apex, margins entire, pubescent on both surfaces; petiole very short, 1 mm long. Inflorescence in lax racemes, 2-7 flowered. Flowers short. Calyx pubescent, tube very short, lobes 5, elongate, up to 6 mm long. Corolla longer than calyx, standard 1.2 cm long, wings and keels 9 mm long. Stamens 10, monadelphous; filaments up to 3.5 mm long. Ovary glabrous; style linear. Pods oblong, *c.* 1.1 cm long, glabrous, 5-10 seeded.

Fl.: & Fr.: Oct.–Feb.

Habitat: Common in grasslands, waste places, cultivated fields.

Specimen examined: Gulletiwada, Enukuru, *Y. Mahesh* 010554, 010570 (BSID).

4. Crotalaria hebecarpa (DC.) Rudd, Phytologia 54: 28. 1983; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 447. 2018. *Goniogyna hebecarpa* DC., Ann. Sci. Nat. Paris 4: 92. 1825. *Heylandia latebrosa* sensu Baker in Hook. f., Fl. Brit. India 2: 65. 1876, non (L.) DC. 1825; Gamble, Fl. Madras 1: 280. 1918. **(Plate 30G)**

Prostrate herb, up to 40 cm high; branches dichotomous, with silky hairy. Leaves ovate-cordate, 1.5–2 cm long, chartaceous, truncate at base, obtuse, apiculate at apex, margins entire, ciliate, pubescent on both surfaces. Flowers axillary, solitary; pedicels short, 2.5 mm long. Calyx tube short, pubescent, upper two lobes connate. Corolla yellow with red veins, exserted, petals clawed; standard orbicular or oblong, 6 mm long; wings oblong or obovate, 5 mm long, keels connate, 4.5 mm long. Stamens 10, monadelphous, sheath short. Pods oblong, *c.* 1.5 cm long, flat with persistent style. Seeds reniform.

Fl.: & Fr.: Sep.–Feb.

Habitat: Common in wastelands, open grasslands and along pathways.

Specimen examined: Seemagandi, *Y. Mahesh* 011424 (BSID).

5. Crotalaria humifusa Graham ex Benth., London J. Bot. 2: 476. 1843; Baker in Hook. f., Fl. Brit. India 2: 97. 1876; Gamble, Fl. Madras 1: 292. 1918; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 450. 2018.

Climbing herb, up to 40 cm long; branches densely clothed with yellow-brown hairs. Leaves with short petiole or nearly sessile, ovate-suborbicular, 3–3.2 cm long, membranous, rounded or cuneate at base, acute at apex, margins entire, glaucous beneath; stipules short, subulate. Inflorescence terminal, in racemes, 5-flowered, appressed silky; peduncle filiform. Flowers yellow; bracts subulate, 2 mm long; pedicels short, 3 mm long. Calyx connate, tube 5 mm long, densely silky, lobes ovate, short, 8 mm long. Corolla glabrous, equal to the calyx, lobes oblong-obovate. Pods oblong, *c.* 7 mm long, glabrous. Seeds 8.

Fl.: & Fr.: Oct.–Dec.

Habitat: Occasional in grasslands and edges of forest.

Specimen examined: PK Valasa, *Y. Mahesh* 012118 (BSID).

6. Crotalaria linifolia L.f., Suppl. Pl. 322. 1782; R.S. Rao & al., Fl. E. Godavari Dist. 294. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 452. 2018. *Crotalaria tecta* sensu Baker in Hook. f., Fl. Brit. India 2: 72. 1876. auct. non B.Heyne ex Roth 1821. **(Plate 31A)**

Erect branched herb, up to 60 cm high; branches with appressed silky hairs. Leaves oblanceolate, 2.5–4 cm long, cuneate at base, obtuse, apiculate at apex, sparsely pubescent above, densely beneath; petiole short,

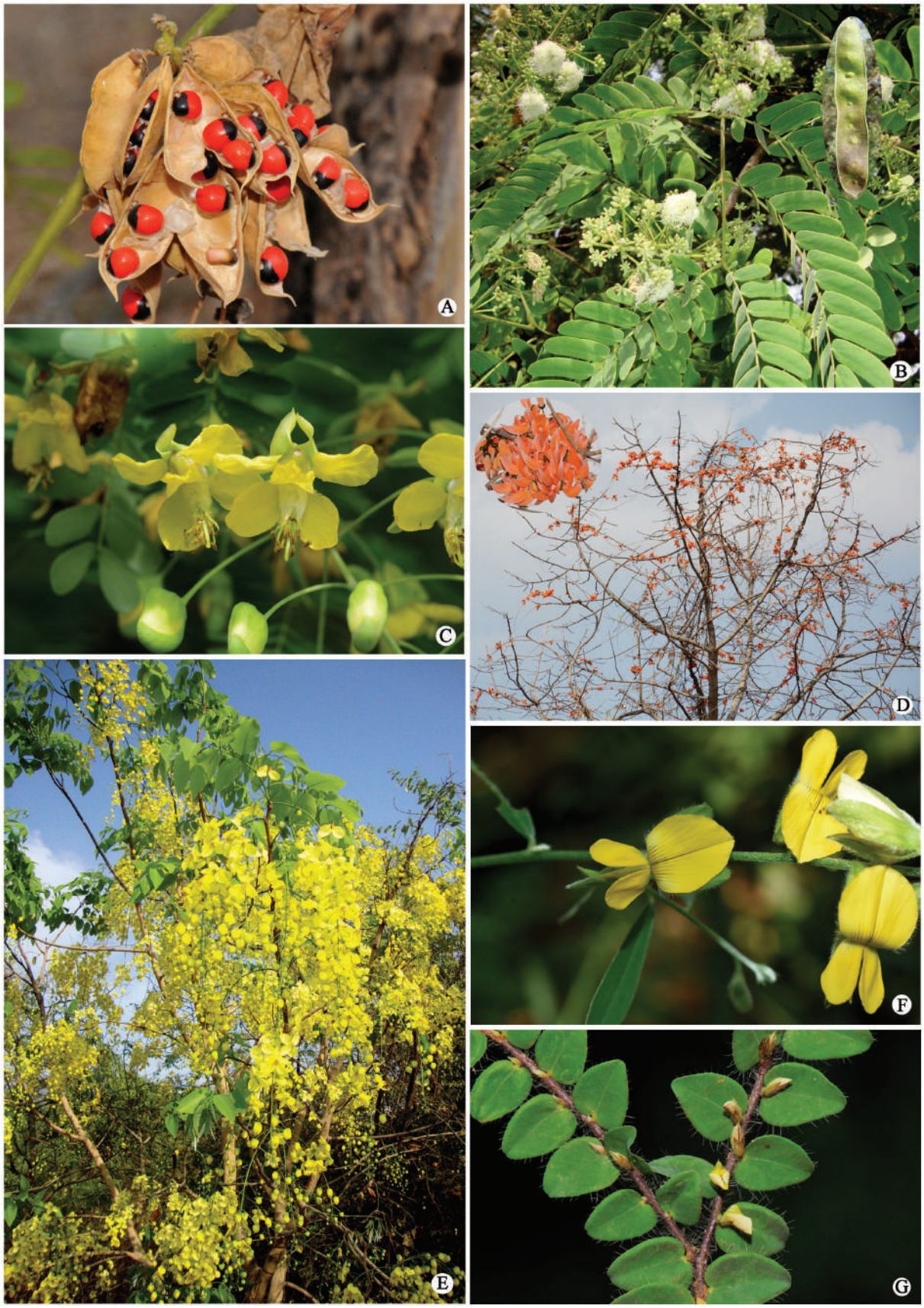


Plate 30: A. *Abrus precatorius* L.; **B.** *Albizia odoratissima* (L.f.) Benth.; **C.** *Biancaea decapetala* (Roth) O. Deg.; **D.** *Butea superba* Roxb. ex Willd.; **E.** *Cassia fistula* L.; **F.** *Crotalaria epunctata* Dalzell; **G.** *Crotalaria hebecarpa* (DC.) Rudd

appressed hairy. Inflorescence in terminal racemes, appressed hairy. Flowers yellow, silky appressed hairy. Calyx 5-lobed, lobes linear-ovate, densely silky. Corolla slightly exserted, glabrous; lobes 5; standard oblong, 6 mm long, auricled at base, emarginate. Stamens 10, monadelphous. Pods oblong, *c.* 1.4 cm long, black. Seeds 7.

Fl.: & Fr.: Sep.–Dec.

Habitat: Occasional in hilly areas and waste places in the forest.

Specimen examined: Gulletiwada, Kintukuru, *Y. Mahesh* 010593, 011750 (BSID).

7. Crotalaria medicaginea Lam., Encycl. 2: 201. 1786; Baker in Hook. f., Fl. Brit. India 2: 81. 1876; Gamble, Fl. Madras 2: 299. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 294. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 455. 2018.

A diffuse herb, up to 70 cm long; branches sparsely hairy. Leaves trifoliate; leaflets linear-oblong or oblanceolate, 1–1.5 cm long, terminal longer than laterals, cuneate at base, emarginate at apex, margins entire, glabrous above, hairy beneath. Inflorescence in axillary or terminal racemes, 2-3 flowered. Flowers yellow; standard oblong, obtuse. Stamens 10. Pods sub-globose, pubescent, beaked. Seeds 2, brown.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common along hilly slopes and open forest.

Specimen examined: Included on the authority of R.S Rao & al. (*l.c.*).

8. Crotalaria pallida Aiton, Hort. Kew. 3: 20. 1789; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 460. 2018. *Crotalaria striata* DC., Prodr. 2:131. 1825; Baker in Hook. f., Fl. Brit. India 2: 84. 1876; Gamble, Fl. Madras 1: 302. 1918. **(Plate 31B)**

Undershrub, up to 1.5 m high; branchlets pubescent. Leaves trifoliate; leaflets obovate or elliptic, 2.5–5 cm long, chartaceous, cuneate at base, mucronate at apex, margins entire, glaucous beneath; petiole up to 5 cm long. Inflorescence lateral or terminal elongated racemes. Flowers many, yellow; pedicel 5 mm long. Calyx pubescent, lobes 5, short, lanceolate. Corolla exserted, glabrous; standard oblong or elliptic, 1.4 cm long; wings 1.2 cm long; keels 1.3 cm long, beaked. Stamens 10, monadelphous. Pods oblong, *c.* 1.8 cm long, exceeding calyx. Seeds more than 10.

Fl.: & Fr.: Sep.-Feb.

Habitat: Common in forest edges and of dry deciduous forest.

Specimen examined: Shivagirri, *Y. Mahesh* 011612 (BSID).

9. Crotalaria prostrata Rottler in Willd., Enum. Pl. Hort. Berol.2: 747. 1809; Baker in Hook. f., Fl. Brit. India 2: 67. 1876; Gamble, Fl. Madras 1: 292. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 294. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 464. 2018.

A prostrate herb, up to 45 cm long; branches silky hairs. Leaves ovate-oblong, 2.5 cm long, chartaceous, obliquely cordate at base, subacute at apex, margins ciliate, appressed pubescent; petiole short. Inflorescence axillary racemes. Flowers few, yellow; bracts short, subulate, persistent. Calyx lobes short, linear, acuminate, pubescent. Corolla exserted, standard oblong, 5.5 mm long, apex emarginate; wings, keels oblong, 4.5 mm long. Stamens 10, monodelphous. Pods pale green, oblong, 3 mm long, glabrous. Seeds up to 20.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in moist places and cultivated fields.

Specimen examined: Gulletiwada, *Y. Mahesh* 010599 (BSID).

10. Crotalaria verrucosa L., Sp. Pl. 2: 715.1753; Baker in Hook. f., Fl. Brit. India 2: 77. 1876; Gamble, Fl. Madras 1: 297. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 296. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 475. 2018. *'Gilligichha'*

Much branched, erect herbs, up to 1 m high; branchlets 4-anguled, pubescent. Leaves ovate-broadly rhomboidal, 5-9 cm long, acute at base, acute or obtuse at apex, margins entire, pubescent above, nearly glabrous beneath. Inflorescence axillary or terminal racemes. Flowers bluish white, with dark purple veins; bracts subulate, short. Calyx hairy, lobes lanceolate, 7 mm long. Corolla lobed, standard broadly ovate, 1.2 cm long, wing oblong-obovate, keel petals beaked, *c.* 1 cm long. Stamens 10, monodelphous; filaments up to 6 mm long. Pods cylindric, *c.* 3.8 cm long, minutely pubescent, exceeding calyx. Seeds more than 15.

Fl.: & Fr.: Aug.-Dec.

Habitat: Occasional in waste places.

Specimen examined: PK Valasa, *Y. Mahesh* 012120 (BSID).

16. CULLEN Medik.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cullen corylifolium (L.) Medik., Vorles. Churpfalz. Phys.-Ocon. Ges. 2: 381. 1787; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 477. 2018. *Psoralea corylifolia* L., Sp. Pl. 2: 764.1753; Baker in Hook. f., Fl. Brit. India 2: 103. 1876; Gamble, Fl. Madras 1: 314. 1918. *'Bapunga'*

Erect under shrub, up to 1.2 cm high; branches glandular pubescent, warty. Leaves elliptic-ovate, 6–8 cm long, hairy, obtuse at base, apex acute, margin entire, secondary nerves 3–5 pairs; petiole up to 1.5 cm long. Flowers in axillary clustered racemes, purple coloured. Calyx campanulate, lobes lanceolate, 3 mm long. Corolla exserted, petals clawed, standard oblong-obovate, 7 mm long, wings oblong, 6 mm long, keels connate, 5 mm long. Stamens 10, diadelphous. Pods oblong. Seeds reniform.

Fl.: & Fr.: Nov.–Jan.

Habitat: Occasional along roadsides and open lands.

Specimen examined: Koida, *Y. Mahesh* 011364 (BSID).

17. DALBERGIA L.f.

India: 33 spp., 1 subsp. & 8 var.; Andhra Pradesh: 7 spp.; PNP: 4 spp.

Key to the species

1a.	Scandent or woody climbing shrubs	2
1b.	Erect trees or shrubs	3
2a.	Scandent shrubs	**1. D. horrida**
2b.	Woody climbers	**4. D. volubilis**
3a.	Standard petal reflexed; wing and keel petals spurred; style elongate	**2. D. latifolia**
3b.	Standard petal erect, flat; wing and keel petals not spurred; style short	**3. D. sissoo**

1. Dalbergia horrida (Dennst.) Mabb., Taxon 26: 538. 1977 excl syn. *Dalbergia spinosa* Roxb.; R.S. Rao & al., Fl. E. Godavari Dist. 297. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 5: 478. 2018. *Amerimnon horridum* Dennst., Schlüssel Hortus Malab. 34. 1818. *Dalbergia sympathetica* Nimmo, in J. Grah. Cat. Bomb. Pl. 55. 1839; Hook. f., Fl. Brit. India 2: 234. 1876.

Medium sized shrub, up to 3 m high; bark brown with white patches; branches ending with spines. Leaves imparipinnate; leaflets up to 15, oblong, coriaceous, rounded at base, obtuse-rounded at apex, margins entire, pubescent on both surfaces. Flowers in axillary racemes, white or light pinkish. Sepals 5, connate, fleshy, brown coloured. Petals 5, standard large, as long as broad, 2.8 mm long; wings and keels 2.5 mm long. Stamens 10, diadelphous; filaments short. Pods reniform, 2.7 cm long, flat, 1-seeded.

Fl.: & Fr.: May–Sep.

Habitat: Occasional on pond embankment and forest edges.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Dalbergia latifolia Roxb., Pl. Coromandel 2: 7, t. 113. 1799; Baker in Hook. f., Fl. Brit. India 2: 231. 1876; Gamble, Fl. Madras 1: 383. 1918; R.S. Rao & al., Fl, E. Godavari Dist. 298. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 481. 2018. *'Jittegi chettu'*

Tall tree, up to 20 m high; bark brownish black; branches terete, striate, glabrous. Leaves imparipinnate, up to 20 cm long, 5-foliolate; leaflets 5, ovate-suborbicular, 7 × 6 cm, subacute at base, apex emarginated, margins entire, coriaceous glabrous; lateral nerves up to 7-pairs, reticulations prominent; petioles thick, 1 cm long. Flowers in lax, divaricate, axillary branched panicles, white with pale yellow tinge. Calyx 4 mm long, glabrous, lobes linear-oblong, obtuse, sparsely ciliate along margins. Petals 5 mm long, clawed at base; standard reflexed, 7.5 mm long, wings and keels 8 mm long, spurred. Stamens 10, monodelphous; filaments connate. Pods strap shaped, *c.* 3.8 cm long, compressed, glabrous. Seeds 1–3.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common in hilly areas of deciduous forest.

Specimen examined: Kintukuru, *Y. Mahesh* 011463 (BSID).

Field notes: Population of this tree is less due to its strong, durable timber, which is often logged and used in making furniture.

3. Dalbergia sissoo Roxb., Fl. Ind. Ed. 1832, 3: 223. 1832; Baker in Hook. f., Fl. Brit. India 2: 237. 1876; Gamble, Fl. Madras 1: 383. 1918; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 483. 2018. *'Sissu'*

Medium sized, semi-evergreen tree, up to 15 m high; bark greyish-brown, exfoliating in narrow longitudinal stripes. Leaves imparipinnate; leaflets 5-7, ovate-suborbicular, narrow at base, shortly acuminate at apex, margins entire, glabrous on both surfaces. Flowers in axillary scorpioid racemes, creamy yellow. Sepals 5, connate, pubescent, lobes minute. Petals 5, standard flat, erect, shortly clawed, suborbicular or obovate, 7 mm long; wings, keels up to 6.5 mm long. Stamens 10, monodelphous; filaments minute. Pods strap shaped, *c.* 6.5 cm long, compressed, narrowed at both ends, shortly mucronate, glabrous. Seeds 1–4, reniform, brown.

Fl.: & Fr.: Mar.–Sep.

Habitat: Occasional along stream banks, planted as avenue tree along road sides.

Specimen examined: PK Valasa, *Y. Mahesh* 012137 (BSID).

4. Dalbergia volubilis Roxb., Pl. Coromandel 2: 48, t. 191. 1805; Baker in Hook. F., Fl. Brit. India 2: 235. 1876; Gamble, Fl. Madras 1: 384. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 300. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 484. 2018. **(Plate 31C)**

Small woody, bushy tree, up to 10 m high; bark brown; branches straggling, spiny, thickened, twisted into spiral loops. Leaves imparipinnate; leaflets 9-13, oblong-obovate, 2–4 cm long, coriaceous, emarginate at base, obtuse at apex, margins entire, glabrous. Flowers in axillary and terminal panicles, dull-white, fragrant. Sepals 5, connate, lobes short. Petals campanulate, lobes 5, standard suborbicular, 7 mm long, wings 7.2 mm long, keels short, 6 mm long. Stamens 10, isodiadelphous; filaments short. Pods oblong, *c.* 7 cm long, narrowed at both ends, glabrous. Seeds 1–2, ellipsoid, brown.

Fl.: & Fr.: Feb.–May.

Habitat: Occasional in interior hilly areas.

Specimen examined: Arvapally, *Y. Mahesh* 011389 (BSID).

18. DENDROLOBIUM (Wight & Arn.) Benth.

India: 2 spp., 1 subsp. & 1 var.; Andhra Pradesh: 1 sp.

1. Dendrolobium triangulare (Retz.) Schindl., Repert. Spec. Nov. Regni Veg. 20: 279. 1924. *Hedysarum triangulare* Retz., Observ. Bot. 3: 40. 1783. *Desmodium triangulare* (Retz.) Merr., J. Arnold Arbor. 23: 170. 1942; R.S. Rao & al., Fl. E. Godavari Dist. 307. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 495. 2018. *Desmodium cephalotes* Wall. ex Wight & Arn., Prodr. Fl. Ind. Orient. 1: 224. 1834; Gamble, Fl. Madras 1: 344. 1918. **(Plate 31D)**

An erect, stout undershrub, up to 1.8 m high; stem, branches slightly angled; young parts pubescent. Leaves trifoliate; leaflets elliptic-oblong or lanceolate, terminal one large, 7–10 cm long, lateral leaflets shorter than terminal, cuneate at base, acuminate at apex, margins entire, silky pubescent on both surfaces; petiole up to 2.3 cm long. Flowers in many flowered umbels, more than 20, creamy white, shortly pedicelled; pedicel 6 mm long; bracts linear. Calyx campanulate, tube 4 mm long, lobes linear, acute, pubescent. Corolla campanulate, glabrous. Pod oblong, 2.2 cm long, curved, indented on both sides, pubescent.

Fl.: & Fr.: Sep.–Feb.

Habitat: Common along the forest pathways.

Specimen examined: GM Valasa, *Y. Mahesh* 010979 (BSID).

19. DERRIS Lour.

India: 25 spp., 7 var. & 1 forma; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Derris scandens (Roxb.) Benth., J. Proc. Linn. Soc., Bot. 4: 103. 1860; Baker in Hook. f., Fl. Brit. India 2: 240. 1876; Gamble, Fl. Madras 1: 387. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 301. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 486. 2018. *Dalbergia scandens* Roxb., Pl. Coromandel 2: 49. t. 192. 1805.

A large climbing shrub, up to 8 m long; branches closely curverd with reddish round lenticels; young parts rusty tomentose. Leaves odd pinnate; leaflets 6–12 pairs, oblong-elliptic, up to 4 cm long, cuneate at base, obtuse

or retuse at apex, margins entire, glabrous above, puberulous beneath; petiole up to 2.3 cm long. Flowers in clusters on the long axillary or terminal panicles, pale pink, fragrant; pedicles small; bracts small, caducous. Calyx campanulate; lobes short. Corolla whitish-cream, exserted, standard obovate, 7 mm long; wings oblong, oblique, 6 mm long; keels incurved, 6.5 mm long. Stamens 10, monodelphous; filaments very short. Pods narrow, *c.* 5 cm long, winged along upper suture. Seeds reniform.

Fl.: & Fr.: Apr.–Oct.

Habitat: Common climber in forest edges and degraded places.

Specimen examined: Pedanunthalu, *Y. Mahesh* 011510 (BSID).

20. DICHROSTACHYS (A.DC.) Wight & Arn.

India: 1 sp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Dichrostachys cinerea (L.) Wight & Arn., Prodr. Fl. Ind. Orient. 1: 271. 1834; Baker in Hook. f., Fl. Brit. India 2: 288. 1878; Gamble, Fl. Madras 1: 419. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 346. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 682. 2018. *Mimosa cinerea* L., Sp. Pl. 1: 520. 1753. *'Veluthuruchettu'*

Small armed, deciduous tree, up to 5 m high; branches spreading, densely pubescent, ending with spine; spines right angles to the stem, up to 4 cm long. Leaves bipinnate, 4–6 cm long, gland between pinnae, pinnae 6–10 pairs; leaflets 12–20 pairs, linear-oblong, sessile, truncate at base, subacute at apex, margins entire, pubescent. Flowers dimorphic, in axillary, cylindric drooping, dense spikes, polygamous, upper half of the spike with fertile yellow flowers, lower half with barren sterile pink flowers. Sepals 5, connate; lobes small, ciliate. Petals 5, connate; lobes small, triangular. Stamens 10; filaments apically dilated. Pods narrow, stalked, spiralled, up to 10 cm long, yellow brown at maturity. Seeds 4-6, ovoid, black.

Fl.: & Fr.: Oct.–Dec.

Habitat: Frequent in thorn scrub and open forests.

Specimen examined: Koida, *Y. Mahesh* 010186 (BSID).

21. DOLICHOS L.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Dolichos trilobus L., Sp. Pl. 2: 726. 1753. *Dolichos falcatus* Klein ex Willd., Sp. Pl. 3. 1047. 1802; Baker in Hook. f., Fl. Brit. India 2: 211. 1876; Gamble, Fl. Madras 1: 366. 1918; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 501. 2018.

A slender twiner, up to 2.5 m high; branchlets glabrous. Leaves trifoliate; leaflets ovate, terminal one 3-lobed, rhomboid, 3.5–6 cm long, laterals ovate- elliptic, up to 5 cm long, chartaceous, truncate at base, acute at apex, margins entire, sparsely pubescent; stipules lanceolate, reflexed, 5 mm long; petiole up to 6 cm long. Flowers in axillary racemes, pinkish-violet; pedicels up to 9 mm long. Calyx tube up to 5 mm long, campanulate, lobes ovate. Corolla exserted, standard orbicular, auricled at base, 1.5 long; wings 1.6 cm long; keels 1.2 cm long, incurved, obtuse. Stamens 10, diadelphous. Pods linear, *c.* 5 cm long, horned at apex, glabrous. Seeds up to 7.

Fl.: & Fr.: Sep.–Feb.

Habitat: Common in forest foot hills, edges and open wastelands.

Specimen examined: Kondamodalu, Udtapally, *Y. Mahesh* 011417, 011670 (BSID).

22. DUNBARIA Wight & Arn.

India: 7 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Dunbaria ferruginea Wight & Arn., Prodr. Fl. Ind. Orient. 1: 258. 1834; Baker in Hook. f., Fl. Brit. India 2: 217. 1876; Gamble, Fl. Madras 1: 370. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 310. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 502. 2018.

Stout climber, up to 7 m long; branches appressed tomentose. Leaves trifoliate, terminal leaflets rhomboid, 11–16 cm long, laterals ovate, unequal in size, 4–6 cm long, coriaceous, cuneate at base, apex acuminate, margins entire, pubescent on both surfaces; petiole up to 7 cm long. Flowers in axillary racemes, up to 20, yellow; pedicels 1.8 cm long; Bracts broadly ovate, 3 mm long, membranous. Calyx campanulate, tube tomentose, lobes lanceolate. Corolla exserted, petals clawed, standard orbicular, up to 3.2 cm long, wings obliquely obovate, up to 2.6 cm long, keels 2.4 cm long. Stamens 10, diadelphous. Pods oblong, *c.* 3.8 cm long, compressed. Seeds 5, suborbicular.

Fl.: & Fr.: Feb.–Apr.

Habitat: Common along forest pathways in scrub jungles.

Specimen examined: PK Valasa, *Y. Mahesh* 010022 (BSID).

23. ENTADA Adans.

India: 3 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Entada rheedei Spreng., Syst. Veg. 2: 325. 1825; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 684. 2018. *Mimosa entada* L., Sp. Pl. 1: 518. 1753. *Entada pursaetha* DC., Prodr. 2: 425. 1825; R.S. Rao & al., Fl. E. Godavari Dist. 347. 1999. *Entada scandens* auct. non. Benth., J. Bot. 4: 332. 1841; Baker in Hook. f., Fl. Brit. India 2: 86. 1878; Gamble, Fl. Madras 1: 417. 1919. **(Plate 31E)** *'Jillateega'*

Large woody climber, up to 30 m long; branches terete, glabrous. Leaves paripinnate, pinnae 2; leaflets 4–5 pairs, ovate-oblong, 5–7 cm long, coriaceous, subacute or cuneate at base, obtuse or retuse at apex, margins entire, glaucous, glabrous on both surfaces, main rachis ending with bifid hooked tendril; petiole up to 3.5 cm long. Flowers in lax, 25 cm long spikes, polygamous, pale yellowish-white; bracts linear. Calyx 5-lobed, campanulate, lobes minute. Corolla twice as long as calyx, campanulate, lobes 5, oblanceolate. Stamens 10, free; filaments dilated apically. Pods elongate, woody, 80 × 10 cm, sutures thick, with deep depressions between. Seeds up to 15, orbicular, smooth, shining, brown.

Fl.: & Fr.: Feb.–Jul.

Habitat: Common along stream banks on large trees in deep forest.

Specimen examined: Badigunta vaagu, *Y. Mahesh* 011476 (BSID).

24. ERYTHRINA L.

India: 7 spp.; Andhra Pradesh: 5 spp.; PNP: 2 spp.

Key to the species

1a.	Leaflets subcoriaceous, tomentose below, margins entire or sinuate lobed	**1. E. suberosa**
1b.	Leaflets membranous, glabrous below, margins entire	**2. E. subumbrans**

1. Erythrina suberosa Roxb., Fl. Ind.3: 53. 253. 1832; Baker in Hook. f., Fl. Brit. India 2: 189. 1876; Gamble, Fl. Madras 1: 354. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 310. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 507. 2018. **(Plate 31F)** 'Mullamodhuga'

Armed tree, up to 12 m high; branches armed with stout, pointed, prickles, tomentose; prickles yellowish-white, persistant. Leaves pinnately trifoliate; leaflets terminal, rhomboid-ovate, 10–15 cm long, lateral obliquely ovate, 8–13 cm long, subcoriaceous, deltoid at base, subacute at apex, margin entire, sinuate lobed, glabrous above, densely tomentose below. Flowers in terminal 2-3 fascicles of dense racemes, at the ends of branchlet tips, crimson red or scarlet-orange, 6 cm long, Calyx campanulate, lobes 5, splitting into two lobes. Corolla exserted, lobes 5, standard oblong-ovate. 3.2 cm long, wings 1.6 cm long. Stamens 10, monodelphous. Pods torulose, *c.* 12 cm long, pubescent. Seeds 2–5, reniform, black.

Fl.: & Fr.: Apr.–Jul.

Habitat: Common in dry deciduous forests.

Specimen examined: Badagunta, *Y. Mahesh* 011759 (BSID).

Field notes: Very conspicuous due to its corky fissured bark; dried fruits found on the tree throughout the year.

2. Erythrina subumbrans (Hassk.) Merr., Philipp. J. Sci., 5: 113. 1910; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 507. 2018. *Hypaphorus subumbrans* Hassk., Hort. Bogor. Desc. 198. 1858. **(Plate 31G)**

Large deciduous tree, up to 20 m tall; bark greyish-green, smooth; branches stout with sharp spines. Leaves trifoliate with 3-primary basal veins; leaflets ovate, 10–14 cm long, membranous, rounded at base, acuminate at apex, margins entire, glabrous below; petiole up to 10 cm long. Inflorescence in terminal racemes. Flowers scarlet, clustered at ends of branches. Calyx campanulate, lobes blipped. Corolla campanulate, tube red, lobes 5, standard 3 cm long. Stamens 10, diadelphous; filaments unequal. Pods empty at base, flat, turgid, *c.* 8 cm long, 4 seeded. Seeds dark purple.

Fl.: & Fr.: Dec.–Mar.

Habitat: Introduced in to the tribal villages, occasionally escaped in to the wild.

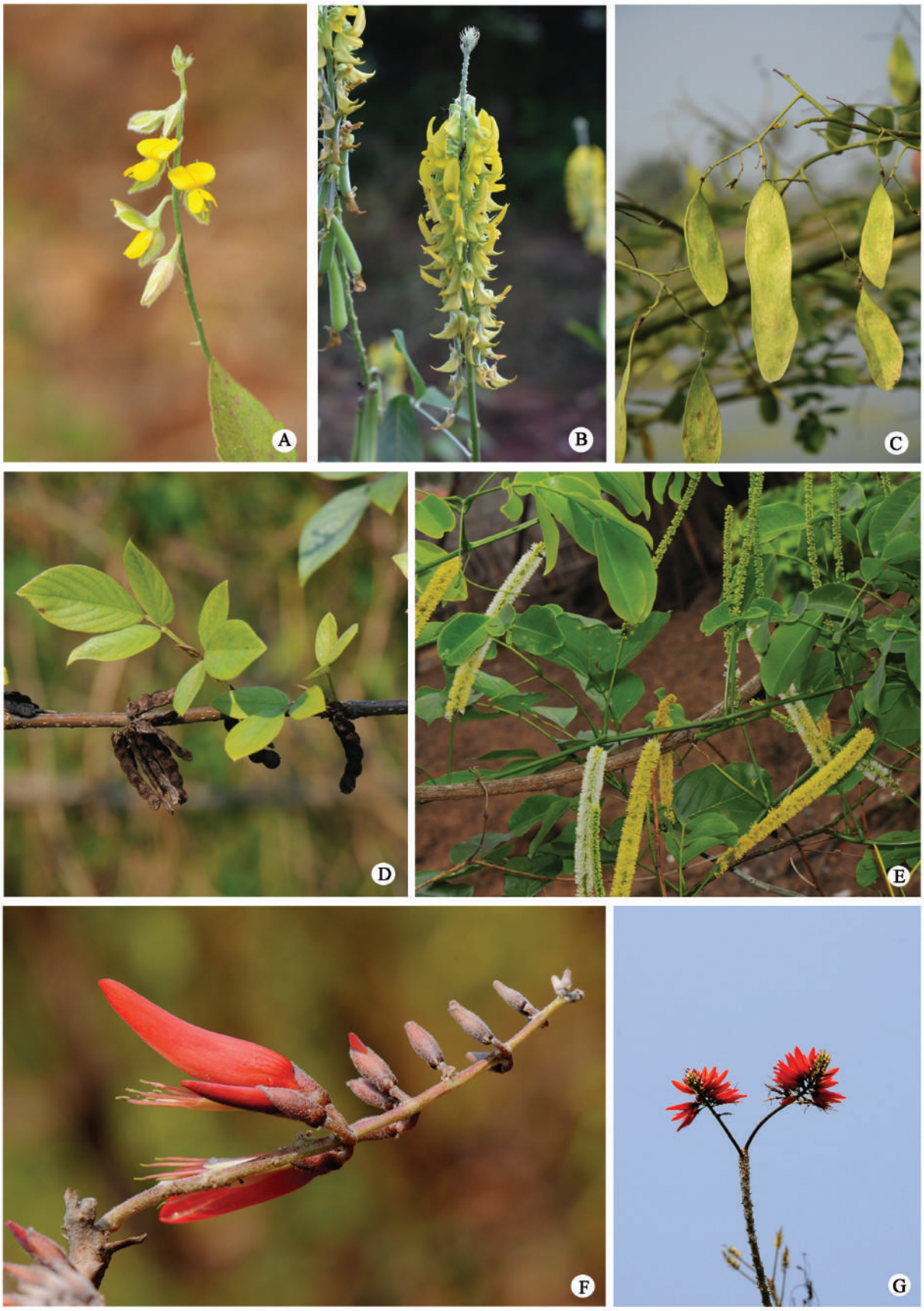


Plate 31: A. *Crotalaria linifolia* L.f.; **B.** *Crotalaria pallida* Aiton; **C.** *Dalbergia volubilis* Roxb.; **D.** *Dendrolobium triangulare* (Retz.) Schindl.; **E.** *Entada rheedei* Spreng.; **F.** *Erythrina suberosa* Roxb.; **G.** *Erythrina subumbrans* (Hassk.) Merr.

Specimen examined: PK Valasa, *Y. Mahesh* 011775 (BSID).

25. FLEMINGIA Roxb. ex W.T.Aiton

India: 20 spp. & 4 var.; Andhra Pradesh: 8 spp.; PNP: 3 spp.

Key to the species

1a.	Leaves 3-foliolate; flowers not hidden within foliaceous bracts	2
1b.	Leaves 1-foliolate; flowers hidden within foliaceous bracts	**3. F. strobilifera**
2a.	Flowers in lax panicled racemes	**1. F. lineata**
2b.	Flowers in dense subspicate racemes	**3. F. stricta**

1. Flemingia lineata (L.) W. T. Aiton, Hort. Kew., ed. 2, 4: 350. 1812; Baker in Hook. f., Fl. Brit. India 2: 228. 1876; R.S. Rao & al., Fl. E. Godavari Dist. 311. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 510. 2018. *Hedysarum lineatum* L., Sp. Pl. 2: 1054. 1753.

Small erect shrub, up to 1.2 m high; young branches slightly angular, pubescent. Leaves trifoliate; leaflets oblanceolate-obovate, 3-ribbed, 4–8 cm long, lateral leaflets smaller than the terminal, oblique, cuneate at base, rounded at apex, margins entire, glabrous above, silky pubescent beneath; petiole up to 3 cm long, quadrangular, pubescent. Flowers in axillary lax panicled racemes; bracts linear, caducous. Calyx campanulate, 3.8 mm long, lobes subequal, linear-lanceolate. Corolla purplish with dark pink lines. Pods oblong, up to 3.5 cm long, apiculate, glandular pubescent. Seeds 2, orbicular, black.

Fl.: & Fr.: Feb.–May.

Habitat: Rare along stream banks.

Specimen examined: Tekupally, *Y. Mahesh* 010179 (BSID).

2. Flemingia stricta Roxb., Pl. Coromandel 3: 44, t. 248. 1815; Baker in Hook. f., Fl. Brit. India 2: 228. 1876; R. S. Rao & al., Fl. E. Godavari Dist. 313. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 512. 2018. *Flemingia stricta* Roxb. var. *pteropus* Baker in Hook. f., Fl. Brit. India 2: 228. 1876. *'Nemalipadam'*

Bushy shrub, up to 1.2 m high; branches woody, triquertrous, covered with sparsely appressed hairs. Leaves trifoliate; leaflets oblong-lanceolate, 12–25 cm long, narrowed at both ends, glabrous above, small obscure hairy beneath; secondary nerves up to 20, prominent; stipules up to 8 cm long, lanceolate; petiole triquertrous, up to 12 cm long, winged. Flowers in axillary dense, subcapitate racemes, conspicuous due to densely covered lanceolate bracts; basal bracts up to 3 cm long, embraced by large stipules. Calyx silky, *c.* 1.5 cm long, lobes linear. Corolla purplish, standard obovate; wings, keels smaller than standard. Pods oblong, *c.* 1.4 cm long, glabrescent. Seeds deltoid, black.

Fl.: & Fr.: Aug.–Feb.

Habitat: Common in shady areas and along valleys in deep forest.

Specimen examined: Thummalakonda, *Y. Mahesh* 010028 (BSID).

Field notes: Leaves prominently nerved, flowers covered with lanceolate long bracts.

3. Flemingia strobilifera (L.) W.T. Aiton, Hort. Kew. ed. 2, 4: 350. 1812; Baker in Hook. f., Fl. Brit. India 2: 227. 1876; Gamble, Fl. Madras 1: 377. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 313. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 512. 2018. *Hedysarum strobiliferum* L., Sp. Pl. 2: 746. 1753.

An erect undershrub, up to 1 m high; branches brown pubescent. Leaves 1-foliate, ovate-oblong, 8–15 cm long, sub-coriaceous, cordate at base, acuminate at apex, margins entire, glabrous except on nerves above, sparsely silky pubescent below; secondary nerves up to 10, distinct beneath, 3-ribbed; stipules scarious, lanceolate, up to 1 cm long, caducous. Flowers in axillary or terminal, 8–16 cm long racemes, hidden within foliaceous bracts; rachis slender, zig-zag, pubescent; bracts persistent, broader than long, cordate at base. Calyx tube up to 1.6 cm long, lobes minute, setaceous. Corolla white, exserted, standard obovate, 0.6 cm long; wings oblong, 5 mm long, keels incurved, 6.5 mm long. Stamens 10, diadelphous Pods oblong, *c.* 1.1 cm long, covered by bracts. Seeds 2.

Fl.: & Fr.: Oct.–May.

Habitat: Frequently found along stream banks and hilly slopes.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

26. GALACTIA P. Browne

India: 4 spp. & 2 var.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaflets subcoriaceous; pods 3.5 cm long, glabrous	**1. G. longifolia**
1b.	Leaflets silky grey below; pods 5 cm long, thinly grey silky	**2. Galactia striata** var. **villosa**

1. Galactia longifolia Benth., Ann. Wien. Mus. Nat. 2: 127. 1838; Gamble, Fl. Madras 1: 356. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 314. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 515. 2018. *Galactia tenuiflora* (Klein ex Willd.) Wight & Arn. var. *lucida* Baker in Hook. f., Fl. Brit. India 2: 192. 1876.

A slender climber, up to 2 m long; branches glabrous. Leaves trifoliate; leaflets linear-oblong, 3–8.5 cm long, obtuse at base, acute or acuminate apex, margins entire, sub-coriaceous, glabrous above, appressed pubescent beneath; petiole short, 1–2 cm long. Flowers axillary or leaf-opposed racemes, clustered or solitary; pedicels up to 5 mm long. Calyx lobes rather broad, acute, glabrous. Corolla purple, standard obovate. Pods linear, *c.* 3.5 cm long, glabrous. Seeds 4–6, compressed.

Fl.: & Fr.: Feb.–Oct.

Habitat: Rare along hilly slopes near moist shady localities.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Galactia striata (Jacq.) Urb. var. **villosa** (Wight & Arn.) Verdc., Fl. Zambes. 3(5): 42. 2001. *Galactia tenuiflora* Willd. ex Wight & Arn., Prodr. Fl. Ind. Orient. 1: 207. 1834; R.S. Rao & al., Fl. E. Godavari Dist. 314. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 515. 2018.

A slender climber, 5 m high; young branches pubescent. Leaves imparipinnate, 3-foliate; elliptic-lanceolate, 4-8 cm long, coriaceous, obtuse at base, acuminate, mucronate at apex, margins entire, glabrous above, silky-grey below; petiole 3 cm long. Flowers in axillary elongated racemes, up to 10 cm long, few, pinkish-white; pedicels filiform, short. Calyx campanulate, red; lobes linear. Corolla bilabiate, standard 1 cm long, wings, keels 1.1 cm long. Pods flat, *c.* 5 cm long, grey silky. Seeds 6.

Fl.: & Fr.: Feb.–Apr.

Habitat: Occasional on the grasslands and forest edges.

Specimen examined: Valamuru, *Y. Mahesh* 010933 (BSID).

27. GLIRICIDIA Kunth

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Gliricidia sepium (Jacq.) Kunth ex Walp., Repert. Bot. Syst. 1: 679. 1842; R.S. Rao & al., Fl. E. Godavari Dist. 331. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 518. 2018. *Robinia sepium* Jacq., Enum. Syst. Pl. 28. 1760. *Gliricidia maculata* (Kunth) Steud., Nom. Bot. 2: 688. 1840. *'Eruvaka chettu'*

Small deciduous tree, up to 10 m high; bark smooth, greyish, peeling in small vertical flakes; branches hairy. Leaves imparipinnate; leaflets 7 pairs, elliptic-ovate or oblong-lanceolate, 4–5 cm long, obtuse at base, acute at apex, margins entire, grey pubescent when young, glabrous with age. Flowers in dense axillary racemes, 20-40 at each raceme; pedicel up to 6 mm long. Calyx campanulate, green, glabrous. Corolla pinkish, standard petal large, orbicular with yellow throat, curved at margins; wings, keel petals oblong, curved. Pods thick, oblong, 16 cm long, narrowed at base, flat, glabrous, many seeded. Seeds compressed.

Fl.: & Fr.: Feb.–May.

Habitat: Frequent along agricultural fields and around tribal villages.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: Flowers pinkish.

Uses: It is cultivated for its fast-growing habitat as avenue tree.

28. GRONA Lour.

India: 12 spp. & 2 var.; Andhra Pradesh: 3 spp.; PNP: 3 spp.

Key to the species

1a.	Herbs; leaves 1-foliolate, up to 3 cm long	**1. G. brachystachya**
1b.	Herbs or undershrubs; leaves 3-foliolate, more than 3 cm long	2
2a.	Trailing herbs or shrubs	**3. G. triflora**
2b.	Erect herbs or scandent undershrubs	**2. G. heterocarpon**

1. Grona brachystachya (Graham ex Benth.) H. Ohashi & K. Ohashi, J. Jap. Bot. 93: 110. 2018. *Desmodium brachystachyum* Graham ex Benth., Pl. Jungh. 2: 223. 1852; Baker in Hook. f., Fl. Brit. India 2: 171. 1876; Gamble, Fl. Madras 1: 347. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 303. 1999. *Desmodium benthamii* N.P. Balakr., J. Bombay Nat. Hist. Soc. 63: 328. 1967; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 489. 2018.

A slender undershrub, up to 50 cm high; stems slender, caespitose; young branches angular, appressed hairy. Leaves unifoliolate, elliptic, 3–5 cm long, reflexed on petiole, cordate at base, obtuse, emarginated at apex, margins entire, glabrous above, sparsely hairy below; petiole up to 4.5 cm long. Flowers in axillary or terminal racemes; pedicels short, 5 mm long. Bracts ovate. Calyx connate, white hairy; lobes lanceolate. Corolla twice as long as calyx, deep purple, bilabiate. Pod 1-3 jointed, dehiscent when dry, hairy.

Fl.: & Fr.: Aug.–Dec.

Habitat: Occasional in open grasslands, along forest slopes, near streans.

Specimen examined: Kondamodalu, *Y. Mahesh* 011492 BSID

Field notes: Flowers deep purple.

2. Grona heterocarpon (L.) H. Ohashi & K. Ohashi, J. Jap. Bot. 93: 112. 2018. *Hedysarum heterocarpon* L., Sp. Pl. 2: 747. 1753. *Desmodium heterocarpon* (L.) DC., Prodr. 2: 337. 1825; R.S. Rao & al., Fl. E. Godavari Dist. 305.1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 491. 2018. *Desmodium polycarpum* (Poir.) DC., Prodr. 2: 334.1825 *p.p.* Baker in Hook. f., Fl. Brit. India 2: 171.1876. incl. *var. trichocaulon;* Gamble, Fl. Madras 1: 346. 1918. *Hedysarum polycarpon* Poir., Encycl. 6: 413. 1805.

An erect or trailing undershrub, up to 1 m high; branches terete, striate, pubescent when young. Leaves 3-foliolate, up to 18 cm long; stipules subulate, caudate, scarious; leaflets obovate or elliptic, terminal one larger than lateral, 4–8 cm long, lateral almost orbicular, rounded at base, mucronate at apex, margins entire, glabrous above, softly pilose beneath; secondary nerves up to 10, with prominent reticulations. Flowers in terminal, dense clustered, 15 cm long racemes, pinkish-violet. Bracts closely imbricating, lanceolate. Calyx up to 2 mm long, glabrous, lobes minute, acuminate, scarious. Corolla campanulate, standard obovate or orbicular, wings and keels 5 mm long. Stamens 10, diadelphous; filaments connate, glabrous. Ovary puberulous; style minute. Pod linear-oblong, 5-jointed, hooked hairy along suture. Seeds flattened, reniform.

Fl.: & Fr.: Sep.–Mar.

Habitat: Common in pathways, along rocky moist places.

Specimen examined: Eruwada, *Y. Mahesh* 010618 (BSID).

Field notes: Young branches pubescent; flowers pinkish-violet.

3. Grona triflora (L.) H. Ohashi & K. Ohashi, J. Jap. Bot. 93: 117. 2018. *Hedysarum triflorum* L., Sp. Pl. 2: 749. 1753. *Desmodium triflorum* (L.) DC., Prodr. 2: 334. 1825; Baker in Hook. f., Fl. Brit. India 2: 173. 1876; Gamble, Fl. Madras 1: 347. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 308. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 497. 2018.

A trailing, spreading, hairy herb, 60 cm long; rooting at nodes; branches faintly angled, sparsely hirsute. Leaves trifoliate; leaflets obovate, c. 0.8 cm long, cuneate at base, obtuse or emarginated at apex, margins entire, glabrous above, sparsely pubescent below; petiole up to 1.2 cm long. Flowers in axillary fascicles, 8 mm across, purplish. Bracts ovate, ciliate; pedicels hairy. Calyx campanulate, lobes 5, short, hairy. Corolla up to 3 mm long, glabrous, standard clawed, obovate, 5 mm long, wings and keels short, 4 mm long. Stamens 10, diadelphous; filaments connate up to top. Ovary linear; style pubescent at base, inflexed. Pod 3-5 jointed, 8 mm long, compressed, indehiscent, puberulous with hooked hairs.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common weed in moist waste localities, in cultivated fields.

Specimen examined: Gulletiwada, Valamuru, *Y. Mahesh* 010588, 010932 (BSID).

Field notes: Spreading herb; flowers purple coloured.

Uses: Used as a manure; it is cultivated for its fast-growing habit.

29. GUILANDINA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Guilandina bonduc L., Sp. Pl. 1: 381. 1753. *Caesalpinia bonduc* (L.) Roxb., Fl. Ind. 2: 362. 1832; R.S. Rao & al., Fl. E. Godavari Dist. 334. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 617. 2018. **(Plate 32A)** *'Gachakaya'*

A large straggling shrub, up to 7 m high; branches downy, armed with prickles. Leaves bipinnate; leaflets 6-8 pairs, oblong-elliptic, 2.5–4 cm long, with foliaceous stipules, truncate at base, apex obtuse, margin entire, glabrous above, hairy beneath; petiole 1 mm long. Flowers axillary or terminal spicate racemes, yellowish; peduncle prickled; pedicels up to 1.6 cm long; bracts lanceolate, deciduous. Calyx campanulate, gibbous at base, lobes 5, oblong, unequal, hairy. Petals 5, oblanceolate, upper one smaller than laterals, obtuse. Stamens 10, alternate; filaments attenuate. Pods oblong-elliptic up to 8 cm long, inflated, armed with prickles. Seeds 2, smooth.

Fl.: & Fr.: Aug.–Oct.

Habitat: Occasional on the edges of the forest, around the villages and roadsides.

Specimen examined: Near Bhupathipalem project, *Y. Mahesh* 011439 (BSID).

Uses: Leaves are used in dispersing swelling of the hydrocyl, seeds used in febrifuge.

30. INDIGOFERA L.

India: 63 spp. & 11 var.; Andhra Pradesh: 22 spp.; PNP: 9 spp.

Key to the species

1a.	Leaves simple	**4. I. linifolia**
1b.	Leaves compound	2
2a.	Leaves 3-foliolate	3
2b.	Leaves more than 3-foliolate	6
3a.	Leaflets linear; flowers solitary	**1. I. aspalathoides**
3b.	Leaflets not linear; flowers in racemes	4
4a.	Leaflets gland dotted or punctate beneath	5
4b.	Leaflets not gland dotted beneath	**9. I. trita**
5a.	Prostrate herbs; pods 8 seeded	**7. I. prostrata**
5b.	Erect undershrubs or shrubs; pods about 5-seeded	**8. I. trifoliata**
6a.	Inflorescence of panicles; bracts foliaceous, 1-3-lobed	**6. I. mysorensis**
6b.	Inflorescence of racemess; bracts not as above	7
7a.	Pods 2-4 seeded	**5. I. linnaei**
7b.	Pods more than 5- seeded	8
8a.	Calyx hirsute; pod tetragonous, densely pubescence	**2. I. astragalina**
8b.	Calyx not hirsute; pod cylindric, glabrous or nearly so	**3. I. cassioides**

1. Indigofera aspalathoides Vahl ex DC., Prodr. 2: 231. 1825; Baker in Hook. f., Fl. Brit. India 2: 94. 1896; Gamble, Fl. Madras 1: 309. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 315. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 520. 2018. *'Nelavempalli'*

An erect, much branched undershrub, up to 80 cm high; young branches silvery pubescent. Leaves 5-foliate, digitate; leaflets linear-oblanceolate, up to 6 cm long, cuneate at base, obtuse, apiculate at apex, margins entire, appressed hairy below. Flowers solitary, axillary, reddish or brick-red; pedicel up to 4 mm long. Calyx short, 6 mm long, lobes linear, minute. Corolla exserted, standard orbicular, 5 mm long, minutely hairy; wings and keels 4 mm long. Stamens 10, diadelphous; filaments short, up to 6 mm long. Pods cylindrical, straight, 1.4 cm long, glabrous. Seeds smooth.

Fl.: & Fr.: Jun.–Nov.

Habitat: Rare in sandy soils in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Indigofera astragalina DC., Prodr. 2: 228. 1825; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 520. 2018. *Indigofera hirsuta sensu* Baker in Hook. f., Fl. Brit. India 2: 98. 1876 *p.p.* non L. 1753; Gamble, Fl. Madras 1: 312. 1918. **(Plate 32B)**

Herbs or small shrubs, up to 100 cm high; branches tetrangled, purplish, striate with brown hairs. Leaves imparipinnate, up to 14 cm long; leaflets 11, opposite, elliptic-oblong, 3–4.5 cm long, acute at base, apiculate at apex, hairy on both sides; stipules filiform; petiole up to 3 cm long. Flowers in axillary dense racemes, pink, up to 15 cm long. Calyx 5 mm long, hirsute, brown pubescent. Corolla longer than calyx; wing, keels petals pubescent along margins. Stamens 10; filaments connate. Pods tetragonous, cylindric, *c.* 1.8 cm long, apex pointed. Seeds 5, hexagonal, brown.

Fl.: & Fr.: Aug.–Nov.

Habitat: Common in dry rice fields and open moist areas.

Specimen examined: Bhulavegisa, *Y. Mahesh* 010539 (BSID).

3. Indigofera cassioides Rottler ex DC., Prodr. 2: 225. 1825; R.S. Rao & al., Fl. E. Godavari Dist. 316. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 521. 2018. *Indigofera pulchella* auct. non Roxb. 1832; Baker in Hook. f., Fl. Brit. India 2: 101. 1876; Gamble, Fl. Madras 1: 313. 1918. **(Plate 32C)** *'Siralli', 'Vuyya'*

Shrubs, up to 2 m high; branches appressed with white pubescent. Leaves imparipinnate; leaflets up to 15, subopposite, elliptic-oblong, sparsely appressed pubescent, emarginate, apiculate at apex, margins entire; petiole short, appressed hairy; stipules small, pubescent, caducous. Flowers in axillary, appressed pubescent racemes, crimson red; bracts cymbiform, cuspidate. Calyx *c.* 2 mm long, 5-lobed, lobes triangular, ciliate. Corolla 5-lobed, glabrous, standard ovate, 1.1 cm long, clawed, wings oblong, 1 cm long, keels with spur. Stamens 10; filaments short. Pods cylindric, *c.* 3.8 cm long; sharply pointed. Seeds about 8, black.

Fl.: & Fr.: Nov.–Mar.

Habitat: Common in forest undergrowth and along pathways in deciduous forest.

Specimen examined: Madhaluru, *Y. Mahesh* 010032 (BSID).

4. Indigofera linifolia (L.f.) Retz., Observ. Bot. 4: 29. 1786; Baker in Hook. f., Fl. Brit. India 2: 92. 1876; Gamble, Fl. Madras 1: 309. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 317. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 528. 2018. *Hedysarum linifolium* L.f., Suppl. Pl. 331. 1782.

Prostrate herb, up to 50 cm long; branches faintly quadrangular, adpressed silvery pubescent. Leaves linear-elliptic, 2–3 cm long, ovate or obovate, cuneate at base, acute at apex, margins entire, adpressed silvery pubescent on both surfaces. Flowers in axillary racemes, 5-12, bright red. Calyx clothed with silvery white hairy, lobes linear, 1.2 mm long, adpressed pubescent. Corolla reddish, lobed, standard ovate, wings oblong, 3 mm long, smooth, keels 0.4 cm long, with short spur. Stamens 10, diadelphous. Pods globose, *c.* 2 mm long, hard, with silky adpressed grey pubescent. Seed 1, globose, muriculate.

Fl.: & Fr.: Sep.–Dec.

Habitat: Occasional along rocky crevices, open waste places and cultivated fields.

Specimen examined: Doramamidi, *Y. Mahesh* 010601 (BSID).

5. Indigofera linnaei Ali, Bot. Not. 111: 549. 1958; R.S. Rao & al., Fl. E. Godavari Dist. 317. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 529. 2018. *Indigofera enneaphylla* L., Mant. Pl. Altera 2. 272. 1771 nom. illeg; Baker in Hook. f., Fl. Brit. India 2: 94. 1876; Gamble, Fl. Madras 1: 309.1918.

Procumbent herb, up to 40 cm long; branches spreading, pubescent. Leaves imparipinnate; leaflets 7-9, alternate, obovate, 5 mm long, pubescent, cuneate at base, apiculate at apex, margins entire, pubescent. Flowers in axillary, densely condensed pubescent spikes, orange red; bracts ovate, ciliate, acuminate. Calyx 2 mm long, pubescent, lobes setaceous, long acuminate, ciliate. Corolla exserted, glabrous, petals 5, standard abruptly clawed, obovate, 4 mm long, wings 5 mm long, keels 5.2 mm long with short spur. Stamens 10, diadelphous; filaments glabrous. Pods slightly compressed, oblong, cylindric, hairy. Seeds 2, globose, brownish.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in open waste lands, sandy soils and cultivated fields.

Specimen examined: Seemagandi, *Y. Mahesh* 011425 (BSID).

6. Indigofera mysorensis Rottler ex DC., Prodr. 2: 222. 1825; Baker in Hook. f., Fl. Brit. India 2: 102. 1876; Gamble, Fl. Madras 1: 313. 1918; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 529. 2018. **(Plate 32D)**

Erect robust herb or undershrub, up to 1 m high; branches terete, dark brown, rather woody, younger viscid pubescent. Leaves imparipinnate, *c.* 3.5 cm long; leaflets 9-11, elliptic-oblong, 1 cm long, acute or obtuse at base, obtuse, apiculate at apex, glandular pubescent on both sides, margin entire; stipules filiform, short. Flowers in axillary, bracteate racemes, red. Calyx 5-lobed, 4 mm long, lobes lanceolate, acuminate. Corolla exserted, sparsely hairy, petals clawed, standard oblong, 7.2 mm long, wings 6 mm long, keels 6.5 mm long. Stamens 10, diadelphous; filaments glabrous. Pods cylindric, oblong, *c.* 1.1 cm long, sparsely pilose. Seeds 2, cuboid.

Fl.: & Fr.: Aug.–Dec.

Habitat: Occasional on the grasslands of dry deciduous forest.

Specimen examined: Kambamkonda, Kondamodalu, *Y. Mahesh* 010676, 011752 (BSID).

7. Indigofera prostrata Willd., Sp. Pl., ed. 4, 3: 1226. 1802; Gamble, Fl. Madras 1: 310. 1876; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 532. 2018. *Indigofera trifoliata* sensu Baker in Hook. f., Fl. Brit. India 2: 96. 1876 p.p. non L. 1753.

Prostrate herb, up to 55 cm long; branches adpressed pubescent. Leaves trifoliate; leaflets obovate-oblong, 1–2.2 cm long, cuneate at base, obtuse at apex, margins entire; pubescent on both sides; petiole up to 1.1 cm long. Flowers in axillary racemes, pink, 7-flowered. Calyx tube 6 mm long, hairy, lobes short, setaceous. Corolla exserted, pinkish, standard, oblong-elliptic, 5 mm long; wings oblong, 4 mm long; keels short, 4 mm long. Stamens 10, diadelphous; filaments short. Pods filiform, slender, 1.5 cm long, tortulose. Seeds oblong.

Fl.: & Fr.: Jul.–Dec.

Habitat: Occasional in grasslands.

Specimen examined: Valamuru, *Y. Mahesh* 010921 (BSID).

8. Indigofera trifoliata L., Cent. Pl. 2: 29. 1756; Baker in Hook. f., Fl. Brit. India 2: 96. 1876 p.p. Gamble, Fl. Madras 1: 310. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 318. 1999; Ali, Bot. Not. 111: 552. 1958; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 534. 2018. *Indigofera barberi* Gamble, Bull. Misc. Inform. Kew 1918: 222. 1918. & Fl. Madras 1: 310. 1918. *'Baragadam'*

Erect, branched, adpressed pubescent herb, up to 55 cm high. Leaves digitately trifoliate; leaflets obovate-oblanceolate, 1.5–2.5 cm long, cuneate at base, apiculate at apex, margins entire, adpressed ciliate, sparsely hairy above, punctate, brownish gland dotted and densely hairy beneath; petiole 1.3 cm long. Flowers in axillary condensed racemes, appressed pubescent. Calyx 5-lobed, lobes subulate, pubescent. Corolla orange-red, standard oblong-obovate, 6 mm long, appressed hairy. Stamens 10, diadelphous; filaments short. Pods deflexed, tetragonous with 4- narrow wings, *c*. 1.1 cm long, appressed pubescent, apiculate. Seeds oblong.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common along open rocky areas in hill slopes and forest edges.

Specimen examined: Eruwada, *Y. Mahesh* 011545 (BSID).

9. Indigofera trita L.f., Suppl. Pl. 335. 1781; Baker in Hook. f., Fl. Brit. India 2: 96. 1876; R.S. Rao & al., Fl. E. Godavari Dist. 318. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 535. 2018. **(Plate 32E)** *'Nakkanaru'*

Much branched herb or undershrub, up to 90 cm high; branches woody, reddish, terete-faintly angled, pubescent. Leaves trifoliate, up to 7 cm long; leaflets obovate-oblong, 2.3–4 cm long, acute at base, obtuse, emarginate, mucronate at apex, margins entire, silvery pubescent; petiolule very short. Flowers in axillary, 4 cm long racemes, up to 10 flowered. Calyx 3.5 mm long, pubescent, lobes subulate or ovate-acuminate. Corolla equals to the calyx, red, petals clawed, standard orbicular, pubescent without. Stamens 10, diadelphous; filaments glabrous. Pods tetragonous, *c.* 2.8 cm long, beaked, grey pubescent. Seeds up to 10, quadrangular, black.

Fl.: & Fr.: Oct–Dec.

Habitat: Common in open hilly areas, along forest paths and waste lands.

Specimen examined: Arvapally, *Y. Mahesh* 011677 (BSID).

31. MELILOTUS Mill.

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Melilotus albus Medik., Vorles. Churpfalz. Phys.-Ocon. Ges. 2: 382. 1787; Baker in Hook. f., Fl. Brit. India 2: 89. 1876; Gamble, Fl. Madras 1: 303. 1918; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 541. 2018.

Erect biennial herb, up to 70 cm high; branches terete or faintly angular, white pubescent. Leaves compound, trifoliate; leaflets oblong-obovate or oblanceolate, 1.2–2.1 cm long, cuneate at base, obtuse, mucronate at apex, margins serrate half way from apex to base, glabrous above, appressed pubescent below; petiole up to 5 mm long. Flowers arranged in leaf axils and end of branches, many flowered racemes. Calyx campanulate, green, lobes 5, ovate, acuminate. Corolla white, standard obovate, emarginate, light yellow patch at centre of throat. Pods ovoid, up to 5 mm long, obscurely reticulate, black when ripe. Seeds 2.

Fl.: &Fr.: Dec.–Mar.

Habitat: Rare along Godavari river banks and sandy delta soils.

Specimen examined: Devipatnam, *Y. Mahesh* 011701 (BSID).

32. MIMOSA L.

India: 8 spp. & 3 var.; Andhra Pradesh: 6 spp.; PNP: 2 spp.

Key to the species

1a.	Pinnae of the leaves 1–2 pairs; pods under 2.5 cm long	**1. M. pudica**
1b.	Pinnae of the leaves more than 2-pairs; pods more than 2.5 cm long	**2. M. rubicaulis**

1. Mimosa pudica L., Sp. Pl. 1: 518. 1753; Baker in Hook. f., Fl. Brit. India 2: 291. 1878; Gamble, Fl. Madras 1: 421. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 348. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 690. 2018. *'Nidrakanthi mokka'*

Prickly undershrub, up to 80 cm long; prickles short, erect, up to 5 mm long, recurved. Leaves pinnate, sensitive, 6–13 cm long; pinnae usually 1–2-pairs, rarely more than 2 pairs; leaflets *c.* 20 pairs, linear-oblong, 6 mm long, overlapping, truncate at base, acute, mucronate at apex, margins ciliate; petiole 3–4.5 cm long; stipules linear-lanceolate. Flowers axillary in globose heads, 2 or 3 in a cluster, pink; peduncle 2.5 cm long; bracteoles 2-3, linear, short. Calyx 4-lobed, connate. Corolla triangular, 4-toothed, connate at base. Stamens 4, exserted. Pods clustered, flat, *c.* 1.5 cm long, jointed with spreading yellowish bristles. Seeds 3-5, ovoid.

Fl.: & Fr.: Jun.–Oct.

Habitat: Common along stream banks and moist shady places.

Specimen examined: Bhulavegisa, *Y. Mahesh* 010548 (BSID).

2. Mimosa rubicaulis Lam., Encycl. 1: 20. 1783; Baker in Hook. f., Fl. Brit. India 2: 291. 1878; Gamble, Fl. Madras 1: 421. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 349. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 691. 2018. **(Plate 32F)** *'Kandrateega'*

Armed straggling shrub, up to 7 m high; branches armed with hooked prickles. Leaves bipinnate, up to 13 cm long; pinnae 5 or more pairs; leaflets 8–11 pairs, linear-oblong, overlapping, truncate at base, obtuse, mucronate at apex, margins entire, glabrous above, pubescent beneath; petiole prickled, up to 3.1 cm long. Flower in axillary clusters of globose heads, crowded at the ends of branchlets, pinkish, becoming white; peduncle 2–3 cm long; bracteoles linear. Calyx lobes 4, teeth minute, ciliate. Corolla connate at base; lobes ovate, short, 2.5 mm long. Stamens 8; filaments exserted, up to 7 mm long. Pods stipitate, 5-10 cm long, curved, glabrous. Seeds 4–8, ovoid, dark brown.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common prickly shrub along forest paths and thorny scrub forests.

Specimen examined: PK Valasa, Eruwada, *Y. Mahesh* 010417, 010645 (BSID).

33. MOULLAVA Adans.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Moullava digyna (Rottler) Gagnon & G.P. Lewis, Phyto Keys 71: 67. 2016. *Caesalpinia digyna* Rottler, Ges. Naturf. Freunde Berlin Neue Schriften 4: 200. 1803; Baker in Hook. f., Fl. Brit. India 2: 256. 1878; Gamble, Fl. Madras 1: 394. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 335. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 620. 2018.*'Nune gacchhakaya'*

Small prickly, climbing shrub, up to 1 m high; prickles scattered, up to 1 cm long, recurved. Leaves bipinnate; leaflets 6–10 pairs, oblong, shortly petioled, *c.* 1.1 cm long, obtuse, mucronate or emarginate at apex, margins entire, glabrous above, obscurely pubescent beneath. Flowers in supra-axillary racemes. Calyx tube oblique, lobes 5, lanceolate, smooth. Corolla yellow with red streaks on standard; lobes 5, orbicular, reflexed. Stamens 10; filaments exserted. Pods oblong, *c.* 3 mm long, covered with gelatinous, stiff, glandular hairs, prickly, torulose, septate. Seeds 3–4, ovate, dark brown.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common along forest paths and near villages.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

34. MUCUNA Adans.

India: 13 spp. & 2 var.; Andhra Pradesh: 5 spp.; PNP: 3 spp.

Key to the species

1a.	Pods 1-seeded	**2. M. monosperma**
1b.	Pods 2 or more seeded	2
2a.	Plants annuals; pods 6-seeded	**3. M. pruriens**
2b.	Plants perennials; pods 2-seeded	**1. M. atropurpurea**

1. Mucuna atropurpurea (Roxb.) DC. ex Wight & Arn., Prodr. Fl. Ind. Orient. 1: 254. 1834; Baker in Hook. f., Fl. Brit. India 2: 186. 1876; Gamble, Fl. Madras 1: 355. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 319. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 543. 2018. *Carpopogon atropurpureus* Roxb., Fl. Ind. 3: 287. 1832. *'Gede dhulagaondi'*

A woody perennial climber, up to 5 m long; branches glabrous. Leaves trifoliate; leaflets ovate-elliptic or oblong, rounded at base, acuminate at apex, margins entire, glabrous above, sparsely hairy below; petiole up to 7 cm long. Flowers in pendulous short racemes, dark purple, 8–12-flowered; pedicels *c.* 1.2 cm long; bracts small, ovate. Calyx tube deeply bilabiate, lobes 4–6 mm long, triangular, orange. Corolla dark purple, lobes glabrous. Stamens 10, diadelphous; filaments short. Pods 8–10 cm long, winged on both sutures, covered with orange bristles. Seeds 2, subreniform.

Fl.: &Fr.: Dec.–Mar.

Habitat: Occasional along hilly slopes and edges of stream banks.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Mucuna monosperma DC. ex Wight in Hook, Bot. Misc. 2: 346, suppl. t. 12. 1831; Baker in Hook. f., Fl. Brit. India 2: 186. 1876; Gamble, Fl. Madras 1: 355. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 320. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 544. 2018. *'Enugu dulagondi, Pedda dulagondi'*

A large woody climber, up to 8 m long; branches clothed with rusty brown tomentose. Leaves trifoliate, 22 cm long; leaflets ovate-elliptic, 4–6 cm long, coriaceous, rounded at base, acuminate at apex, margins entire, glabrous above, sparsely hairy below. Flowers in axillary corymbose racemes, 4–10, shortly pedicelled; bracts triangular, 5 mm long, deciduous. Calyx tube clothed with bristles; lobes various in shapes. Corolla purple, up to 4.5 cm long. Stamens 10, diadelphous. Pods orbicular, 5–9 cm long, clothed with brown irritable bristles, winged on sutures. Seed 1, dark brown.

Fl.: & Fr.: Oct.–Feb.

Habitat: Occasional along edges of the forest and hill slopes.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Mucuna pruriens (L.) DC., Prodr. 2: 405. 1825; Baker in Hook. f., Fl. Brit. India 2: 189. 1876**;** R.S. Rao & al., Fl. E. Godavari Dist. 320. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 546. 2018. *Dolichos pruriens* L. in Stickman, Diss. Herb. Amb. 23. 1754. *Mucuna prurita* Wight, Bot. Misc. 2: 348. 1831; Gamble, Fl. Madras 1: 355. 1918. **(Plate 32G)** *'Dhulagondi'*

Annual, silky pubescent twiner, up to 8 m long; branches striate, downy pubescent. Leaves trifoliate; leaflets rhomboid-ovate, 10 cm, membranous, laterals slightly langer than terminal, obliquely truncate at base, mucronate at apex, margins entire, pubescent above, with appressed silvery white hairs below; petiole up to 18 cm long. Flowers in axillary elongate, silky pubescent racemes, peduncled; bracts lanceolate. Calyx campanulate, lobes linear-lanceolate, silky white hairy without. Corolla purple, lobes unequal, standard ovate, folded, auricled. Stamens 10, diadelphous. Pods S- shaped, *c.* 8 cm long, densely clothed with stiff irritable silky bristles. Seeds 6, orbicular or ovoid, blackish.

Fl.: & Fr.: Dec.–Feb.

Habitat: Commonly climbing on bushes in forest edges.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

35. NEPTUNIA Lour.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Neptunia prostrata (Lam.) Baill., Bull. Mens. Soc. Linn. Paris 1: 356. 1883. *Mimosa prostrata* Lam., Encycl. 1: 10. 1783. *Neptunia oleracea* Lour., Fl. Cochinch. 2: 654. 1790; Baker in Hook. f., Fl. Brit. India 1: 285. 1878;

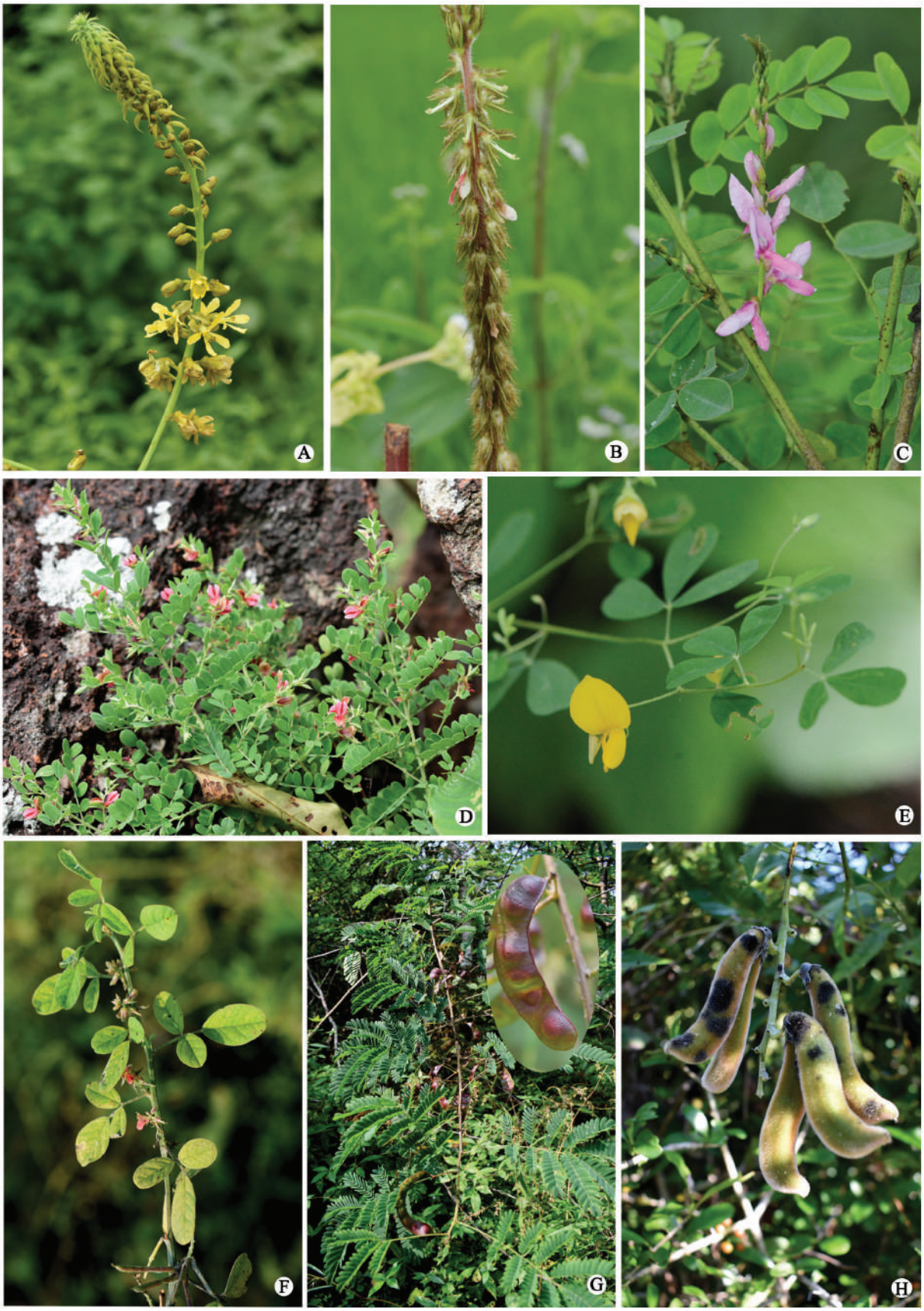


Plate 32: A. *Guilandina bonduc* L.; **B.** *Indigofera astragalina* DC.; **C.** *Indigofera cassioides* Rottler ex DC.; **D.** *Indigofera mysorensis* Rottler ex DC.; **E.** *Indigofera trita* L.f.; **F.** *Mimosa rubicaulis* Lam.; **G.** *Mucuna pruriens* (L.) DC.

Gamble, Fl. Madras 1: 416. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 349. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 692. 2018. **(Plate 33A)** *'Niruthalavapu, Nidrayam'*

Annual, free-floating herb, up to 3 m long; stems terete, glabrous, nodes numerous with feathery rootlets, white spongy, floats on internodes. Leaves 2-pinnate; pinnae 2–3 pairs; leaflets 7–15 pairs, narrowly oblong, 6 mm long, glabrous, truncate at base, obtuse at apex, margins entire; petiole 1.5 cm long. Flowers in axillary oblong heads, minute, lower replaced with yellow staminodes, peduncled. Calyx campanulate, 5-lobed; lobes membranous, acute. Corolla 5-lobed; lobes connate, acute, glabrous. Stamens 10, exserted. Pods stipitate, *c.* 2.4 cm long, stalked, oblong, reddish-brown, dehiscing by the upper suture. Seeds 4–8, ovoid, brown.

Fl.: & Fr.: Nov.–Mar.

Habitat: Occasional in stagnant ponds, water tanks and lakes in the plains.

Specimen examined: Arvapally, *Y. Mahesh* 011380 (BSID).

Field notes: Free floating herb; internodes with white spongy roots.

36. PARACALYX Ali

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Paracalyx scariosus (Roxb.) Ali, Univ. Stud. (Karachi) 5: 95. 1968; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 551. 2018. *Cylista scariosa* Roxb., Pl. Coromandel 1: 64, t. 92. 1798; Baker in Hook. f., Fl. Brit. India 2: 265. 1876; Gamble, Fl. Madras 1: 371. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 296. 1999. **(Plate 33B)**

Small climbing shrub, to 5 m long; branches striate, pubescent. Leaves trifoliate, up to 10 cm long; leaflets rhomboid-ovate or lanceolate, 4–6 cm long, coriaceous, obtuse at base, acuminate at apex, margins entire, sparsely pubescent, glandular beneath petiole 2–3 cm long. Flowers in axillary 12 cm long racemes. Calyx campanulate, tube accrescent, pubescent; lobes scariose, lower one large, membranous, reticulately veined. Corolla enclosed within calyx, petals clawed, standard at base. Stamens 10, diadelphous. Pods ellipsoid, 9 mm long, enclosed by accrescent calyx, pubescent. Seed 1, reniform.

Fl.: & Fr.: Nov.–Mar.

Habitat: Occasional in open forests, along pathways and hedges of cultivated fields.

Specimen examined: Aakuru, *Y. Mahesh* 011755 (BSID).

Field notes: Conspicuous climber due to its strongly nerved accresscent calyx.

37. PHANERA Lour.

India: 10 spp., 2 subsp. & 3 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Phanera vahlii (Wight & Arn.) Benth. in Miq., Pl. Jungh. 2: 263. 1852. *Bauhinia vahlii* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 297. 1834; Baker in Hook. f., Fl. Brit. India 2: 279. 1878; Gamble, Fl. Madras 1: 408. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 333. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 615. 2018. **(Plate 33C)** *'Addaku'*

Large lianas, up to 30 m long; stem woody, younger parts rusty tomentose. Leaves as long as broad, suborbicular, 25 × 25 cm; cordate at base, apex cleft in to two lobes, margins entire, glabrous above, pubescent below, nerves 8–13, arise from base; petioles up to 16 cm long, pubescent; stipules broad, rusty tomentose. Flowers in terminal corymbose racemes, white, hairy; corymbs *c.* 15 cm across, bracteate; pedicels 4 cm long, tomentose. Calyx tube 5 mm long, tomentose, limb splitting in to two broadly ovate lobes. Petals 5, white, subequal, obovate, rounded, villous in middle without. Fertile stamens 3; filaments glabrous; staminodes 2. Pods 25 cm long, woody, flattened, rusty-downy. Seeds 6, oblong-ellipsoid, dark brown.

Fl.: & Fr.: Feb.–May.

Habitat: Common along pathways and edges of forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011404 (BSID).

38. PILIOSTIGMA Hochst.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Piliostigma malabaricum (Roxb.) Benth. in Miq., Pl. Jungh. 261. 1852. *Bauhinia malabarica* Roxb. Fl. Ind. 2: 321. 1832; Baker in Hook. f., Fl. Brit. India 2: 217. 1878; Gamble, Fl. Madras 1: 407. 1919; R.S. Rao &

al., Fl. E. Godavari Dist. 332. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 610. 2018. **(Plate 33D)** *'Pullachintha'*

Medium sized tree, up to 15 m high; stem rather rough, glaucous when young, glabrous. Leaves oblong, broader than long, 8-16 cm long, with 9 main nerves, cordate at base, apex cleft into two lobes, margins entire, glabrous above, shortly pubescent below; petiole 2.5 cm long, grooved, thickened at the both ends. Flowers in dense, axillary, subsessile racemes; pedicels slender, brown puberulous. Calyx 8 mm long, brown pubescent, lobes 5, short, linear, subulate. Petals obovate-spathulate, exserted, 1.5 cm long, pale yellow. Stamens 10, all fertile. Pods straight, *c.* 20 cm long, flattened, beaked, rugulose, shortly pubescent. Seeds globose-ovoid, dark brown.

Fl.: & Fr.: Oct.–Feb.

Habitat: Occasional in hilly slopes in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011402 (BSID).

39. PITHECELLOBIUM Mart.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pithecellobium dulce (Roxb.) Benth., London J. Bot. 3: 199. 1844; Baker in Hook. f., Fl. Brit. India 2: 302. 1878; Gamble, Fl. Madras 1: 434. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 349. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 694. 2018. *Mimosa dulcis* Roxb., Pl. Coromandel 1(4): 67, t. 99. 1798. *'Seemachintha'*

Moderate sized trees, up to 20 m high; branches erect, armed with stipular thorns. Leaves bipinnate; pinnae 2 pairs; leaflets paired, oblong-oblanceolate, 2 cm long, obtuse at base, obtuse, apiculate at apex, margins entire, glabrous; petiole with concave gland. Flowers in terminal and axillary panicled globose heads; heads white. Calyx campanulate, tube 5-lobed, hairy. Corolla 5-toothed, connate above the middle, tomentose. Stamens numerous, monodelphous. Pods strap shaped, circinate, 12 cm long, dehiscent, sub-moniliform, become reddish when ripe. Seeds sub globose, flat, black, embedded in pulp, funicles expanded into a fleshy aril.

Fl.: & Fr.: Jan.–Jun.

Habitat: Common in the Godavari River banks and near villages.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

40. PLEUROLOBUS J.St.-Hil.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pleurolobus gangeticus (L.) J.St.-Hil. ex H. Ohashi & K. Ohashi, J. Jap. Bot. 93: 184. 2018. *Hedysarum gangeticum* L., Sp. Pl. 2: 746. 1753. *Desmodium gangeticum* (L.) DC., Prodr. 2: 327. 1825; Baker in Hook. f., Fl. Brit. India 2: 168. 1876; Gamble, Fl. Madras 1: 345. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 349. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 491. 2018.

A sarmentose herb, 1 m high; branchlets angled, grooved, clothed with appressed white hairy. Leaves unifoliate, ovate, 6–14 cm long, ciliate, truncate at base, acuminate at apex, margins entire, glabrous, above, sparsely pubescent beneath; petiole up to 2.5 cm long, appressed hairy. Inflorescence terminal racemes; peduncle 10 cm long, pubescent. Flowers in fascicles, bluish-pink, bracteate; bracts narrow, pubescent, ciliate. Calyx tube short, 3 mm long, pubescent; lobes 5, short, upper two lobes connate, triangular. Petals 5; standard obovate, pilose near apex without. Stamens 10, diadelphous; filaments connate up to the top. Pods indehiscent, joints longer than broad, clothed with minute hooked hairs. Seeds reniform, flattened.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in forest pathways and undergrowth in the forest.

Specimen examined: Buruguvada, *Y. Mahesh* 010102 (BSID).

41. PONGAMIA Adans.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pongamia pinnata (L.) Pierre, Fl. Forest. Cochinch. sub t. 385. 1899; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 553. 2018. *Cytisus pinnatus* L., Sp. Pl. 2: 741. 1753. *Pongamia glabra* Vent., Jard. Mal. 1: 28. t. 28. 203. 1803; Baker in Hook. f., Fl. Brit. India 2: 240.1876; Gamble, Fl. Madras 1: 385. 1918. *'Kanuga'*

Evergreen tree, up to 15 m high; bark dark-grey, smooth; branches glabrous. Leaves imparipinnate, rachis

8–13 cm long, pulvinate; leaflets 5–7, opposite, ovate-lanceolate, 10 cm long, cuneate at base, acuminate at apex, margins entire, glabrous but sparsely pubescent on veins; petiolule short, dark brown. Flowers in lax pseudo-racemes, purplish-white; peduncle sparsely pubescent; bracts ovate, hairy. Calyx tube campanulate, glabrous; lobes 5, small, bract like. Corolla lobes 5; standard sub-orbicular, 1.3 cm long, shortly clawed, emarginate. Stamens 10, monodelphous; filaments glabrous. Pods obliquely oblong, 5 cm long, beaked, compressed, indehiscent, yellowish-grey when ripe. Seeds 1 or 2, reniform, reddish brown.

Fl.: & Fr.: Feb.–Oct.

Habitat: Common near villages and stream banks.

Specimen examined: Darapally, *Y. Mahesh* 010135 (BSID).

42. PROSOPIS L.

India: 3 spp.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Leaflets 8–12 pairs; pods cylindric	**1. P. cineraria**
1b.	Leaflets 14 –20 pairs; pods compressed	**2. P. juliflora**

1. Prosopis cineraria (L.) Druce, Bot. Exch. Club. Soc. Brit. Isles. 3: 422. 1914; R.S. Rao & al., Fl. E. Godavari Dist. 352. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 695. 2018. *Mimosa cineraria* L., Syst. Nat., ed. 10. 2: 1311. 1759. *Prosopis spicigera* L., Mant. Pl. 68. 1767; Baker in Hook. f., Fl. Brit. India 2: 288. 1878; Gamble, Fl. Madras 1: 421. 1919. **(Plate 33E)** *'Jammi chettu'*

Medium sized evergreen tree, up to 8 m high; branches slender, drooping, with scattered conical spines. Leaves bipinnate; pinnae 2 pair; leaflets 8–12 pairs, oblong, 0.8 cm long, oblique at base, rounded, mucronate at apex, margins entire glabrous or sparsely appressed hairy. Flowers in slender, 2-few in clusters on 8–10 cm long dense axillary spikes, creamy-yellow. Calyx 5-lobed, membranous. Corolla campanulate, lobes 5, glabrous. Stamens free. Pods pendent, cylindrical, moniliform, 16 cm long, coriaceous with dry pulp, glabrous. Seeds 10, oblong.

Fl.: & Fr.: Sep.–May.

Habitat: Occasional near villages and open waste lands in the forest.

Specimen examined: Devipatnam, *Y. Mahesh* 011710 (BSID).

Field notes: This plant is worshiped by hindhus during Dussura festival.

2. Prosopis juliflora (Sw.) DC., Prodr. 2: 447. 1825; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 698. 2018. *Mimosa juliflora* Sw., Prodr. 85. 1788. *Prosopis chilensis* (Molina) Stuntz, Bull. Bur. Pl. Industr. U.S.D.A. 31: 85. 1914; Pullaiah & Chennaiah, Fl. Andhra Pradesh 1: 362. 1997; R.S. Rao & al., Fl. E. Godavari Dist. 351. 1999. *'Srkaruthumma'*

Thorny deciduous tree, up to 12 m high; branches spreading, glabrous; spines axillary, stout, on young branches. Leaves bipinnate; rachis grooved with a single gland; leaflets 15–20 pairs, linear-oblong, 1.2 cm long, obtuse at base, obtuse, apiculate at apex, margins entire, glabrous. Flowers in axillary, pendulous spikes, pale yellow. Calyx 5-lobed, connate, lobes triangular. Corolla 5-toothed. Stamens 10. Pods sickle shaped, straight or curved, *c.* 14 cm long, pendulous, indehiscent. Seeds 16, compressed, ovoid, brownish, surrounded with aril.

Fl.: & Fr.: Sep.–Mar.

Habitat: Common along Godavari River banks, near villages and wastelands.

Specimen examined: Maredumilli, *Y. Mahesh* 012107 (BSID).

Field notes: wood used as fire wood by village people.

43. PSEUDARTHRIA Wight & Arn.

India: 1 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pseudarthria viscida (L.) Wight & Arn., Prodr. Fl. Ind. Orient. 1: 209. 1834; Baker in Hook. f., Fl. Brit. India 2: 154.1876; Gamble, Fl. Madras 1: 334. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 322. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 554. 2018. *Hedysarum viscidum* L., Sp. Pl. 2: 747. 1753. **(Plate 33F)** *'Nayakuponna', 'Muyaku'*

Small viscid, undershrub, up to 80 cm high; branches terete, pubescent. Leaves trifoliate; leaflets ovate-rhomboid, coriaceous, terminal larger than laterals, 4–6 cm long; laterals obliquely ovate, dense grey pubescent

beneath, cuneate at base, acuminate at apex, margins entire. Flowers numerous on axillary or terminal racemes, pinkish. Calyx campanulate; lobes small. Corolla exserted, petals clawed. Stamens 10, diadelphous; filaments glabrous. Pods oblong, compressed, *c.* 1.4 cm long, covered with hooked viscous hairs. Seeds 5.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common along forest paths and grasslands.

Specimen examined: PK Valasa, Kintukuru, *Y. Mahesh* 010416, 011409 (BSID).

Field notes: Pods have hooked viscous hairs.

44. PTEROCARPUS Jacq.

India: 3 spp., 1 subsp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Pterocarpus marsupium Roxb., Pl. Coromandel 2: t. 116. 1799; Baker in Hook. f., Fl. Brit. India 2: 239. 1876; Gamble, Fl. Madras 1: 385. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 322. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 556. 2018. **(Plate 33G)** *'Yegisa chettu'*

Tall deciduous tree, up to 16 m high; bark thick, greyish-black, with deeply vertical irregular flakes. Leaves imparipinnate; leaflets 5-7, alternate, oblong-elliptic, 5–12 cm long, coriaceous, acute at base, obtuse, emarginate at apex, margins entire; hairy beneath. Flowers in terminal, 10–14 cm long panicles, golden yellow. Calyx dark brown, pubescent. Corolla papilionaceous, lobed, standard small. Stamens 10, monodelphous; filaments short. Pod a samara, *c.* 3 cm across, orbicular, winged. Seed solitary, brownish.

Fl.: & Fr.: Mar.–Jun.

Habitat: Occasional in the hilly regions of moist places of Eruwada forest area.

Specimen examined: Eruwada, *Y. Mahesh* 010689 (BSID).

Uses: Wood is used in furniture, bark used as an astringent; flowers used in fever; leaf paste used for skin diseases.

45. PTEROLOBIUM R.Br. ex Wight &Arn.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pterolobium hexapetalum (Roth) Santapau & Wagh, Bull. Bot. Surv. India 5: 108. 1963; R.S. Rao & al., Fl. E. Godavari Dist. 339. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 636. 2018. *Reichardia hexapetala* Roth, Nov. Pl. Sp. 210. 1821. *Pterolobium indicum* A. Rich., Tent. Fl. Abyss. 1: 247. 1847; Baker in Hook. f., Fl. Brit. India 2: 259. 1878; Gamble, Fl. Madras 1: 395. 1919. **(Plate 34A)**

Straggling shrub, up to 3 m high; stem and branches with recurved, hooked prickles. Leaves bipinnate, 10 cm long; petiole up to 8 cm long; leaflets 5–8 pairs, oblong or obovate, 1 cm long, with tuft hairs near the base of lamina, oblique at base, rounded with minutely mucronate at apex, margins entire. Flowers in axillary and terminal racemose panicles, white, tinged with light rose, bracteate; pedicels 6 mm long. Sepals 5, oblong, subequal, lowest large, glabrous. Petals 5, obovate, 5 mm long, subequal. Stamens 10, free; filaments pubescent. Pods reticulate, winged along one side, shortly pubescent. Seed 1, flattened.

Fl.: & Fr.: Feb.–May.

Habitat: Common along stream banks in the hilly areas and edges of forest.

Specimen examined: Kondrukota, *Y. Mahesh* 011648 (BSID).

46. PUERARIA DC.

India: 9 spp. & 3 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pueraria tuberosa (Roxb. ex Willd.) DC, Ann. Sci. Nat 4: 97. 1825; Baker in Hook. f., Fl. Brit. India 2: 197. 1876; Gamble, Fl. Madras 1: 360. 1918; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 559. 2018. *Hedysarum tuberosum* Roxb. Ex Willd., Sp. Pl. 3: 1197. 1803. **(Plate 34B)** *'Dari gummadi'*

Large woody, climber, to 5 m long; branches dark brown when young, velvety spreading. Leaves pinnately trifoliate, 20 cm long; petiole up to 10 cm long; leaflets ovate, 12 cm long, truncate at base, caudate-acuminate at apex, margins entire, pubescent. Flowers in axillary, lax, dense, pendulous racemes, silky pubescent, bracteate. Sepals connate, bluish pink; lobes ovate, 5 mm long, ciliate. Petals 5, white with pale pink tinge, clawed, standard spurred, orbicular. Stamens 10, monodelphous. Pods flat, 7.5 cm long, compressed, pubescent, constricted between seeds. Seeds oblong.

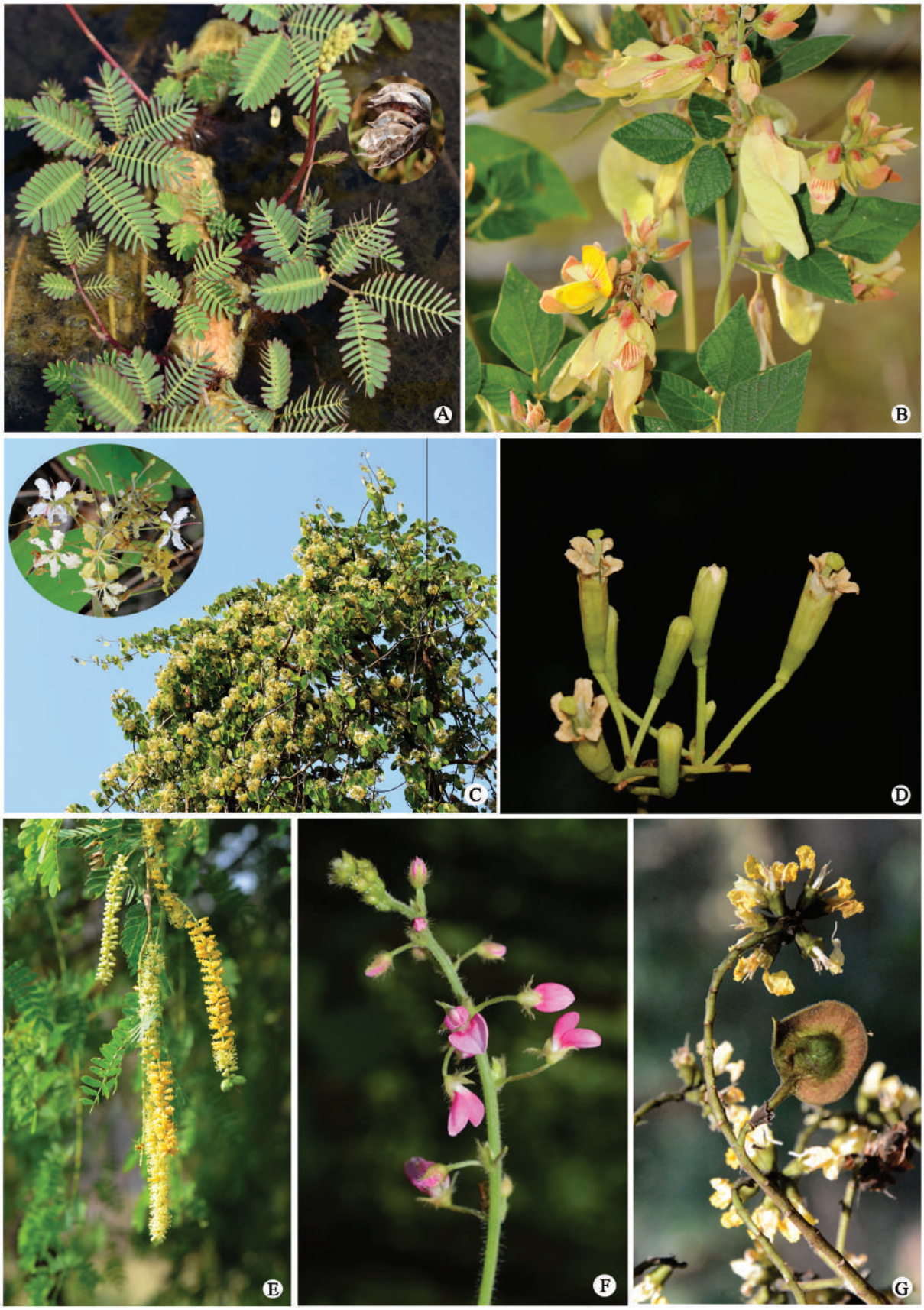


Plate 33: A. *Neptunia prostrata* (Lam.) Baill.; **B.** *Paracalyx scariosus* (Roxb.) Ali; **C.** *Phanera vahlii* (Wight & Arn.) Benth.; **D.** *Piliostigma malabaricum* (Roxb.) Benth.; **E.** *Prosopis cineraria* (L.) Druce; **F.** *Pseudarthria viscida* (L.) Wight & Arn.; **G.** *Pterocarpus marsupium* Roxb.

Fl.: & Fr.: Feb.–Apr.

Habitat: Common climber on shrubs along the forest pathways.

Specimen examined: Peddanunthalu, *Y. Mahesh* 011711 (BSID).

47. RHYNCHOSIA Lour.

India: 28 spp., 1 subsp. & 1 var.; Andhra Pradesh: 15 spp.; PNP: 2 spp.

Key to the species

1a.	Trailing herbs; branchlets angular	**1. R. minima**
1b.	Erect herbs or undershrubs; branchlets terete	**2. R. suaveolens**

1. Rhynchosia minima (L.) DC., Prodr. 2: 385. 1825; Baker in Hook. f., Fl. Brit. India 2: 223. 1876; Gamble, Fl. Madras 1: 375. 1918; R.S. Rao & al., Fl. W. Godavari Dist. 163. 1986. Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 570. 2018. *Dolichos minimus* L., Sp. Pl. 726. 1753. *'Gaddichikkudu, 'Nela alamu'*

A slender, trailing herbs, up to 90 cm long; branches many, angular, puberulous. Leaves trifoliate, up to 12 cm long, stipulate; petiole *c.* 5 cm long; leaflets ovate-rhomboid, 2–4 cm long, coriaceous, cuneate at base, rounded, apiculate at apex, margins entire, glabrous above, glandular, slightly hairy beneath. Flowers in axillary effuse, elongated racemes, yellow. Calyx 5 mm long, pubescent; lobes lanceolate, acuminate. Corolla larger than calyx, standard oblong, glabrous. Stamens 10, diadelphous; filaments glabrous. Pods flattened, 1.6 cm long, slightly recurved, puberulous. Seeds 2, orbicular.

Fl.: & Fr.: Oct.–Jan.

Habitat: Common in wastelands and edges of moist areas.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Rhynchosia suaveolens (L.f.) DC., Prodr. 2: 387. 1825; Baker in Hook. f., Fl. Brit. India 2: 221. 1876; Gamble, Fl. Madras 1: 374. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 323. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 575. 2018. *Glycine suaveolens* L.f., Suppl. Pl. 326. 1781. *'Adavikandi'*

Erect herbs or undershrubs, up to 1 m long; branches terete, pubescent, viscous. Leaves trifoliate, 10 cm long; petiole up to 5 cm long, terminal leaflet oblong-ovate, laterals ovate-rhomboid, 8 cm long, coriaceous, obtuse at base, acuminate apex, margins entire, hairy; petiolule short, 2 mm long. Flowers in axillary, solitary or in pairs on long, slender rachis. Calyx tube up to 3 mm long, glandular pubescent; lobes lanceolate, 7 mm long. Corolla yellow, exserted, standard orbicular, wings, keels subequal, 1 cm long. Stamens 10, diadelphous; filaments glabrous. Pods oblong, *c.* 1.3 cm long, compressed, constricted between seeds. Seeds 2, brown.

Fl.: & Fr.: Nov.–Feb.

Habitat: Occasional in hilly areas and forest edges.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

48. ROTHIA Pers.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Rothia indica (L.) Druce, Bot. Exch. Club Brit. Isles Rep. 3: 423. 1914; R.S. Rao & al., Fl. E. Godavari Dist. 324. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 578. 2018. *Trigonella indica* L., Sp. Pl. 2: 778. 1753. *Rothia trifoliata* (Roth) Pers. Syn. 2: 302. 1807; Baker in Hook. f., Fl. Brit. India 2: 63. 1876; Gamble, Fl. Madras 1: 279. 1918. *'Vacchakura'*

Annual herb, up to 40 cm long; branches pubescent. Leaves digitately trifoliate; leaflets obovate, 2.2 cm long, attenuate at base, acute at apex, margins ciliate, pubescent benneath. Flowers solitary or in short racemes; bracts linear-lanceolate. Calyx tube 5 mm long, lobes subequal, turbinate. Corolla yellow, exserted, clawed, standard oblong, 1 cm long, wings 9 mm long, narrow, keels 6.5 mm long. Stamens monodelphous; filaments very short. Pods linear, pubescent, with persistent style. Seeds 15, reniform.

Fl.: & Fr.: Jul.–Nov.

Habitat: Occasional along stream banks and common weed in cultivated fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

49. SENEGALIA Raf.

India: 19 spp., 3 subsp. & 3 var.; Andhra Pradesh: 5 spp.; PNP: 5 spp.

Key to the species

1a.	Erect shrubs or trees	2
1b.	Climbing shrubs	3
2a.	Calyx and petals glabrous or pubescent without	**3. S. ferruginea**
2b.	Calyx and petals pubescence	**2. S. chundra**
3a.	Leaflets 35-60 pairs	**4. S. pennata**
3b.	Leaflets less than 35 pairs	4
4a.	Leaflets 10-15 pairs, not overlapping; branches glabrous	**1. S. caesia**
4b.	Leaflets 20-30 pairs, overlapping; branches hairy	**5. S. torta**

1. Senegalia caesia (L.) Maslin, Seigler & Ebinger in Blumea 58: 40. 2013. *Mimosa caesia* L., Sp. Pl. 1: 522. 1753. *Acacia caesia* (L.) Willd., Sp. Pl., ed. 4: 1090. 1806; Gamble, Fl. Madras 1: 428. 1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 661. 2018. **(Plate 34C)**

Large, climbing shrubs, up to 4 m long; branches angled, prickly, pubescent when young. Leaves bipinnate, 8–15 cm long; pinnae up to 6 pairs; petioles 5 cm long; leaflets 6–15 pairs, oblong, 1.2 cm long, obliquely rounded at base, obtuse, mucronate at apex, margins entire, glabrous. Flowers in axillary globose heads; heads 2.5 mm across, pale yellow, bracteate. Calyx 5-partite, pubescent; lobes ovate, triangular. Corolla 5-lobed, 2 mm long, connate; lobes pubescent, triangular. Stamens numerous; filaments short. Pods oblong, *c.* 14 cm long, compressed, glabrous. Seeds 5–10, flat.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common along roadsides and forest pathways in scrub forest.

Specimen examined: Peddagidhada, *Y. Mahesh* 011432 (BSID).

2. Senegalia chundra (Roxb. ex Rottler) Maslin in Nuytsia 22: 466. 2012. *Mimosa chundra* Roxb. & Rottler, Neue Schriften Ges. Naturf. Freunde Berlin 4: 207. 1803. *Acacia catechu* (L.f.) Willd., Sp. Pl. 4: 1079, 1806; Baker in Hook. f., Fl. Brit. India 2: 295. 1878; Gamble, Fl. Madras 1: 427.1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 662. 2018. *Acacia chundra* (Roxb. ex Rottl.) Willd., Sp. Pl. 4: 1078. 1806; Baker in Hook. f., Fl. Brit. India 2: 2951878; Gamble, Fl. Madras 1: 428. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 341.1999.

Moderate, deciduous, armed tree, up to 10 m high; bark rusty-brown, peeling off in thin flakes; branches spinous, scandent, with recurved prickles; prickles 0.8 cm long, hooked. Leaves bipinnate; pinnae opposite, 10–12 pairs; glands near petiolar base; leaflets 30 or more pairs, oblong, 0.5 cm long, overlapping, glabrous, obtuse at base, rounded at apex, margins entire. Flowers in axillary peduncled spikes, 3 mm across, creamy white. Calyx connate, 5-lobed; lobes triangular. Corolla 5-lobed, larger than sepals. Stamens numerous. Pods thin, oblong, up to 12 cm long, flat, acute at both ends, brown, glabrous. Seeds 2–5, orbicular.

Fl.: &Fr.: Aug.–Nov.

Habitat: Common along streams and open forest areas.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Uses: Wood used to make agricultural impliments.

3. Senegalia ferruginea (DC.) Pedley in Bot. J. Linn. Soc. 92: 250. 1986. *Acacia ferruginea* DC., Prodr. 2: 458. 1825; Baker in Hook. f., Fl. Brit. India 2: 295. 1878; Gamble, Fl. Madras 1: 425. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 342. 1999; Pull. & Sir Rama Murthy, Fl. Andhra Pradesh 2: 665. 2018. **(Plate 34D)** *'Velisandra'*

Small, deciduous tree, up to 8 m high; branches glabrous, armed with prickles. Leaves 5 pairs of pinnae; gland in between terminal two pinnae pairs; leaflets 20-pairs, oblong, 1 cm, oblique at base, subacute at apex, margins entire, glabrous. Flowers in axillary spikes, up to 8 cm long, creamy-white or pale yellow. Calyx lobes 5, puberulous. Corolla 5-lobed, longer than calyx. Stamens numerous. Pods flat, 8–15 cm long, lanceolate, thin, dark brown, glabrous, apiculate at apex. Seeds 3-5.

Fl.: & Fr.: Feb.–May.

Habitat: Occasional in scrub forest.

Specimen examined: Manturu, Arvapally, *Y. Mahesh* 011393, 011708 (BSID).

4. Senegalia pennata (L.) Maslin in Nuytsia 22: 466. 2012. *Mimosa pennata* L., Sp. Pl. 1: 522. 1753. *Acacia pennata* (L.) Willd., Sp. Pl. 4: 1090. 1806; Baker in Hook. f., Fl. Brit. India 2: 297. 1878 *p.p.*; Gamble, Fl. Madras 1: 429. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 344. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 669. 2018. *'Mullugorinta'*

Large scandent shrubs, up to 5 m high; branchlets with stout, hooded prickles. Leaves bipinnate; pinnae up to 10 pairs; leaflets 20–40 pairs, subsessile, linear-oblong, overlapping, oblique at base, obtuse at apex, margins slightly ciliate, glabrous on both surfaces; petiole 5 cm long, grooved, pubescent. Flowers in axillary or terminal panicled heads, light yellow; bracts obovate, keeled, ciliate on margins. Calyx 5 lobed, connate; lobes triangular. Corolla 5-toothed. Stamens numerous; filaments slender, 5 mm long. Pods straight, up to 20 cm long, flat, strap shaped. Seeds oblong, dark brown.

Fl.: & Fr.: Aug.–Nov.

Habitat: Common along pathways and roadsides in deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

5. Senegalia torta (Roxb.) Maslin, Seigler & Ebinger in Blumea 58: 42. 2013. *Mimosa torta* Roxb., Fl. Ind. 2: 566. 1832. *Acacia torta* (Roxb.) Craib, Bull. Misc. Inform. Kew 1915: 410. 1915; Gamble, Fl. Madras 1: 428. 1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 673. 2018. *'Korinta'*

Small prickly tree, to 6 m high; young branches pubescent. Leaves bipinnate; pinnae 10 pairs; leaflets 30-pairs, oblong, 6 mm long, truncate at base, apiculate at apex, margins entire, ciliate, pubescent; petiole grooved, 4.5 cm long, pubescent, with conical gland near base. Flowers in terminal, paniculate, globose heads; peduncles single or fascicles of 2-4; bracts linear or oblong, acute. Calyx campanulate, lobes ovate, subacute. Corolla white; lobes lanceolate, acute. Pods thin, *c.* 12 cm long, brown velvety when young, glabrous with age, 10 seeded.

Fl.: & Fr.: Oct.–Mar.

Habitat: Occasional in deciduous forest.

Specimen examined: Bapanamma polam, *Y. Mahesh* 011740 (BSID).

50. SENNA Mill.

India: 23 spp. & 3 var.; Andhra Pradesh: 19 spp.; PNP: 5 spp.

Key to the species

1a.	Herbs or undershrubs	2
1b.	Shrubs or trees	4
2a.	Leaflets 3-pairs	**5. S. tora**
2b.	Leaflets more than 3- pairs	3
3a.	Stipules ovate, acuminate; branchlets angular-striate	**4. S. occidentalis**
3b.	Stipules linear; branchlets quadrangular or ribbed	**3. S. hirsuta**
4a.	Stipules broadly ovate-cordate or reniform, persistent; pods flat	**2. S. auriculata**
4b.	Stipules linear, caducous; pods terete or sub compressed	**1. S. alata**

1. Senna alata (L.) Roxb., Fl. Ind. 2: 349. 1832; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 639. 2018. *Cassia alata* L., Sp. Pl. 1: 378. 1753; Baker in Hook. f., Fl. Brit. India 2: 264. 1878; Gamble, Fl. Madras 1: 404. 1919.

Large shrub, up to 4 m high; branches glabrous. Leaves pinnately compound, up to 80 cm long; leaflets 5-12 pairs, oblong or oblong-obovate, 5–10 cm long, coriaceous, rounded at base, obtuse, apiculate at apex, margins entire, glabrous; rachis narrowly winged; petiole 2 cm long; stipules lunate, up to 1 cm long, auriculate, persistent. Flowers in terminal long vertical dense racemes, yellow, looks like yellow candle; peduncle up to 10 cm long. Calyx campanulate, lobes 5, oblong, obtuse. Corolla distinctly veined; petals 5, ovate, 2.5 cm long. Stamens 10; filaments subequal. Pods oblong, dry dehiscent, *c.* 16 cm long, winged, dark purple-black when ripe. Seeds numerous.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common around villages and also cultivated for its showy flowers.

Specimen examined: Eruwada, *Y. Mahesh* 010623 (BSID).

Field notes: Flowers looks like yellow candle.

2. Senna auriculata (L.) Roxb., Fl. Ind. 2: 349. 1832; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 641. 2018. *Cassia auriculata* L., Sp. Pl. 379. 1753; Baker in Hook. f., Fl. Brit. India 2: 263. 1878; Gamble, Fl. Madras 1: 402. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 336. 1999. *'Tangedu'*

Medium sized shrubs, to 2.5 m high; branches many, terete, ascending, pubescent. Leaves paripinnate, 8-10 cm long, with an erect gland between each pair of leaflets; leaflets 8–12 pairs, oblong-obovate, 2.2–3 cm long, truncate at base, apex obtuse, mucronate, margins entire, puberulous beneath, sparsely above; stipules

foliaceous, reniform, cordate at base with one end produced in to a tail; petioles 7.5 cm long. Flowers in axillary and terminal corymbose racemes, yellow; bracts ovate, pubescent. Sepals 5, 1.5 cm long, concave, obtuse. Petals 5, unequal, 2.5 cm long, clawed, ovate-orbicular, prominently nerved. Stamens 10; upper ones reduced to staminodes; anthers covered at tips. Pods thin, *c.* 10 cm long, mucronate, depressed between the seeds. Seeds 12, flattened, deep brown.

Fl.: & Fr.: Throughout the year.

Habitat: Common in the wastelands, thorny scrub forests and open disturbed forests.

Specimen examined: Thutigunta, *Y. Mahesh* 011644 (BSID).

3. Senna hirsuta (L.) H.S. Irwin & Barneby in Phytologia 44: 499. 1979 & Mem. New York Bot. Gard. 35: 425, 434. 1982; Pull. & Sri Rama Murthy, Fl Andhra Pradesh 2: 642. 2018. *Cassia hirsuta* L., Sp. Pl. 1: 378. 1753; Baker in Hook. f., Fl. Brit. India 2: 263. 1878; Gamble, Fl. Madras 1: 401. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 337. 1999. **(Plate 34E)**

Large hirsute shrub, up to 1 m high; branches grooved, softly tomentose. Leaves compound, 13-18 cm long, with a gland at base of the petiole; petiole up to 2.8 cm long; leaflets 3–6-pairs, ovate-elliptic or lanceolate, 4–6 cm long, cuneate at base, acuminate at apex, margins entire, appressed hirsute; petiolule 5 mm long. Flowers in leaf axils, in pairs, corymbose panicles, yellow; pedicels up to 2.1 cm long; bracts linear, 1.6 cm long. Sepals 5, connate, lobes ovate, 9 mm long, obtuse. Petals 5, obovate, 1 cm long. Stamens 10, lowers 2 large, beaked apically, upper 3 staminodes. Pods ribbed, *c.* 13 cm long, hirsute, flattened. Seeds numerous.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common in the open waste lands and edges of forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011537 (BSID).

4. Senna occidentalis (L.) Link, Handbuch 2: 140. 1831; Pull. & Sri Rama Murthy, Fl Andhra Pradesh 2: 649. 2018. *Cassia occidentalis* L., Sp. Pl. 1: 377. 1753; Baker in Hook. f., Fl. Brit. India 2: 262. 1878; Gamble, Fl. Madras 1: 401. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 337. 1999. *'Kaschinta'*

Much branched undershrub, 1.5 m high; branches furrowed, sparsely pubescent. Leaves paripinnate, 8–15 cm long; petioles glandular above, 8 cm long; leaflets 3-5-pairs, ovate-lanceolate, 4 cm long, unequally rounded at base, acuminate at apex, margins ciliolate. glabrous above, sparsely pubescent below; stipules ovate. Flowers in axillary and terminal, corymbose, few flowered racemes, yellow; bracts ovate, acuminate. Sepals 5, connate, lobes green, oblong, turning yellow, hooded, glabrous. Petals 5, 1.5 cm long, shortly clawed, obovate. Stamens 10, 7-fertile. Pods *c.* 12 cm long, slightly, curved, sparsely pubescent, torulose. Seeds 20, pale brown, reniform.

Fl.: & Fr.: Dec.–Mar.

Habitat: Common along roadsides and near tribal villages.

Specimen examined: Bapanammapolam, *Y. Mahesh* 011739 (BSID).

5. Senna tora (L.) Roxb., Fl. Ind. 2: 340. 1832; Pull. & Sri Rama Murthy, Fl Andhra Pradesh 2: 655. 2018. *Cassia tora* L., Sp. Pl. 1: 376. 1753; Baker in Hook. f., Fl. Brit. India 2: 263. 1878 *p.p.*; Gamble, Fl. Madras 1: 401. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 338. 1999. *'Tantepu', 'Tangarisa'*

Small herb, up to 50 cm high; young branches crisped hairy. Leaves bipinnate, 8 cm long; petioles up to 6.5 cm long; leaflets 3 pairs, oblong-obovate, 2.8 cm long, coriaceous, unequally cuneate at base, obtuse at apex, margins entire, glabrous above, glaucous and pubescent below; stipules linear. Flowers in terminal globose heads, 1 cm across. Calyx campanulate, 5 mm long; lobes ovate, subacute, pubescent. Petals yellow, oblong-lanceolate, obtuse. Stamens 10, 7-fertile. Pods thin, quadrangular, *c.* 8 cm long, brown velvety when young. Seeds 10.

Fl.: & Fr.: Aug.–Dec.

Habitat: A weed along roadside and waste places.

Specimen examined: PK Valasa, *Y. Mahesh* 010480 (BSID).

51. SHUTERIA Wight & Arn.

India: 1 sp. & 2 forma.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Shuteria involucrata (Wall.) Wight & Arn., Prodr. Fl. Ind. Orient. 1: 207. 1834; ; R.S. Rao & al., Fl. W. Godavari Dist. 165. 1986. *Glycine involucrata* Wall., Pl. Asiat. Rar. 3: 22. 1832. *Shuteria glabrata* Wight & Arn., Prodr. Fl. Ind.

Orient. 1: 207. 1834; Baker in Hook. f., Fl. Brit. India 2: 181. 1876; Gamble, Fl. Madras 1: 350. 1918.

Twining herb, up to 1 m long; branches fulvous, spreading, strigose hairy. Leaves trifoliate; petiole terete, up to 6.5 cm long; terminal one ovate-rhomboid, 7 cm long, laterals ovate, 3–5 cm long, cuneate at base, obtuse, mucronate at apex, margins ciliate, sparsely puberulous. Flowers in axillary dense racemes, purplish, solitary or in pairs; bracts 5 mm long, lanceolate. Calyx gibbous; lobes ovate. Petals clawed, standard broadly ovate-orbicular, 9 mm long, wings obliquely oblong; keels up to 1.1 cm long. Stamens 10, diadelphous. Pods linear, flat, *c.* 2.8 cm long, curved, adpressed pubescent, volves twisted when open. Seeds 6, ellipsoid, brownish-black.

Fl.: & Fr.: Dec.–Mar.

Habitat: Occasional along pathways and stream banks.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

52. SMITHIA Aiton

India: 18 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Smithia conferta Sm. in Rees, Cyclop. 33: 2. 1816; Gamble, Fl. Madras 1: 329. 1918; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 582. 2018. *Smithia geminiflora* Roth, Nov. Pl. Sp. 352. 1821; Baker in Hook. f., Fl. Brit. India 2: 149. 1876 incl. var. *conferta.*

Annual diffuse herbs, up to 90 cm high; branches terete. Leaves imparipinnate; leaflets 4–7 pairs, oblong, up to 1 cm long, obliquely truncate at base, rounded at apex, margins entire, midrib ending in a seta, bristly on the margins, below midrib; stipules persistent, scarious. Flowers solitary or 2 in axils of upper leaves; bracteoles up to 6 mm long, ovate. Calyx lobes acute with many parallel veins, bristles along midrib. Corolla yellow, exserted, standard broadly oblong; wings and keels oblong. Stamens 10, isodiadelphous. Pods moniliform, 4–6 jointed, *c.* 7 mm long, turgid.

Fl.: & Fr.: Sep.–Dec.

Habitat: Occasional in grasslands of the hilly forest area.

Specimen examined: Valamuru, *Y. Mahesh* 010916 (BSID).

53. SOHMAEA H. Ohashi & K. Ohashi

India: 5 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves unifoliolate	**2. S. zonata**
1b.	Leaves trifoliolate	**1. S. laxiflora**

1. Sohmaea laxiflora (DC.) H. Ohashi & K. Ohashi, J. Jap. Bot. 93: 162. 2018. *Desmodium laxiflorum* DC., Ann. Sci. Nat. 4: 100. 1825 & Prodr. 2: 335. 1825; Baker in Hook. f., Fl. Brit. India 2: 164. 1876; Gamble, Fl. Madras 1: 344. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 305. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 493. 2018. **(Plate 34F)**

Scandent undershrub, up to 80 cm high; stems quadrangular, appressed hairy. Leaves trifoliate; petiole short; leaflets ovate-elliptic or deltoid, 10 cm long, membranous, with adpressed whitish hairs, acute at base, subacute-obtuse at apex, margins entire. Flowers in terminal racemes, bluish-white. Calyx campanulate, lobes strigose. Corolla lobed, standard obovate. Stamens 10, diadelphous. Pods oblong, 3 cm long, with minute hairs, jointed. Seeds small.

Fl.: & Fr.: Jul.–Nov.

Habitat: Frequent along forest paths on hilly areas.

Specimen examined: Ijjaluru, Kintukuru, *Y. Mahesh* 010526, 011410 (BSID).

2. Sohmaea zonata (Miq.) H. Ohashi & K. Ohashi, J. Jap. Bot. 93: 163. 2018. *Desmodium zonatum* Miq., Fl. Ned. Ind. 1: 250. 1885; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 499. 2018. *Desmodium ormocarpoides* sensu Baker in Hook. f., Fl. Brit. India 2: 164. 1876, non DC., 1825; Gamble, Fl. Madras 1: 345. 1918.

An erect undershrub, up to 60 cm high; branches with hooked hairs. Leaves 1-foliate, elliptic-ovate, 4–9 cm long, chartaceous, rounded at base, acute at apex, margins entire, hooked hairy; petiole short, 2.5 cm long. Flowers in terminal racemes, pale pink. Calyx campanulate, lobes 4, unequal, with minute hooked hairs. Corolla papilionaceous, standard orbicular, clawed, emarginate at apex. Stamens diadelphous; filaments short. Pods linear, 9 cm long, with hooked hairy, jointed. Seeds oblong.

Fl.: & Fr.: Sep.–Nov.

Habitat: Occasional along forest paths and grasslands.

Specimen examined: Eruwada, *Y. Mahesh* 010634 (BSID).

54. STYLOSANTHES Sw.

India: 8 spp.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Branchlets silky villous	**1. S. fruticosa**
1b.	Branchlets glabrous or sparsely pubescent	**2. S. hamata**

1. Stylosanthes fruticosa (Retz.) Alston in Trimen, Handb. Fl. Ceylon 6: Suppl.: 77. 1931; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 583. 2018. *Arachis fruticosa* Retz., Observ. Bot. 5: 26. 1788. *Stylosanthes mucronata* Willd., Sp. Pl., ed. 4, 3: 1166. 1802, nom. illeg.; Baker in Hook. f., Fl. Brit. India 2: 148. 1876; Gamble, Fl. Madras 1: 326. 1918.

Rigid undershrubs, up to 60 cm high; stems terete, striate, silky villous. Leaves 3-foliate, 1.6 cm long; leaflets elliptic-oblong, 1.5 cm long, coriaceous, acute at base, mucronate at apex, margins entire, sparsely pilose beneath, prominently nerved, impressed above; stipules large, vaginate. Flowers in axillary, dense racemes, yellow with maroon markings near throat, bracteate. Calyx tube slender, lobes connate, linear, 2 mm long. Petals inserted at throat of calyx tube, 7.5 mm long, ovate, minutely clawed. Stamens 10, monodelphous. Pods oblong, jointed, 4 mm long, reticulate, pubescent. Seeds 2, compressed.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common in open waste lands and cultivated fields.

Specimen examined: PK Valasa, *Y. Mahesh* 012111 (BSID).

2. Stylosanthes hamata (L.) Taub., Verh. Bot. Vereins Prov. Brandenburg 32: 22. 1890; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 585. 2018. *Hedysarum hamatum* L., Syst. Nat., ed. 10, 2: 1170. 1759.

Diffuse herbs, up to 45 cm long; branches prostrate or ascending, glabrous or sparsely pubescent. Leaves trifoliate; leaflets ovate-elliptic, 1.2 cm long, cuneate at base, acute, mucronate at apex, margins setose, glabrous; stipules 1 cm long, sheathing, membranous. Flowers in clusters, yellow; bracts setose, 1.1 cm long, spreading; bracteoles very short. Calyx tube oblong, lobes minute. Corolla yellow, standard lobe suborbicular, 3.8 mm long. Stamens 10. Pods quadrangular, *c.* 3.2 mm long, hairy. Seeds ellipsoid, brown.

Fl.: & Fr.: Sep.–Jan.

Habitat: Common along cultivated fields and forest edges.

Specimen examined: Arvapally, *Y. Mahesh* 011400 (BSID).

Field notes: Introduced as fodder plant and naturalized.

55. TAMARINDUS L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Tamarindus indica L., Sp. Pl. 1: 34. 1753; Baker in Hook. f., Fl. Brit. India 2: 273. 1878; Gamble, Fl. Madras 1: 409. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 339. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 656. 2018. *'Chintha chettu'*

Large tree, up to 20 m high. Leaves alternate, paripinnate; leaflets 15 pairs, oblong, 1.2 cm long, oblique at base, obtuse at apex, margins entire, glabrous. Flowers in terminal branched racemes, yellow with orange lines. Sepals 4, subequal, oblong, 8 mm long, subacute. Petals 3, hairy in the middle at base within, irregularly indulate and crisped, 7 mm long, upper hooded; lateral ones obovate-oblong. Fertile stamens 3; staminodes 2-3, bristle like. Pod subcompressed, slightly curved, 10 cm long, brown, glabrous. Seeds suborbicular or orbicular, dark brown.

Fl.: & Fr.: Apr.–Jan.

Habitat: Planted near villages.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

56. TEPHROSIA Pers.

India: 29 spp., 1 subsp. & 2 var.; Andhra Pradesh: 10 spp.; PNP: 4 spp.

Key to the species

1a.	Leaves compound	**2**
1b.	Leaves simple	**3. T. strigosa**
2a.	Pods villous	**4. T. villosa**
2b.	Pods glabrescent or pilose	**3**
3a.	Inflorescence axillary; style bearded	**1. T. maxima**
3b.	Inflorescence terminal or leaf opposed; style glabrous	**2. T. purpurea**

1. Tephrosia maxima (L.) Pers., Syn. Pl. 2: 329. 1807; Gamble, Fl. Madras 1: 329. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 325. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 589. 2018. *Cracca maxima* L., Sp. Pl. 2: 752. 1753. *Tephrosia purpurea* (L.) Pers. var. *maxima* (L.) Baker in Hook. f., Fl. Brit. India 2: 113. 1876.

An ascending herb, up to 40 cm high; branches spreading, sparsely appressed pubescent. Leaves imparipinnate; leaflets 5-9 pairs, obovate-oblanceolate, 1.4 cm long, coriaceous, cuneate at base, truncate or obtuse, emarginated at apex, margin entire, sparsely puberulous or glabrous; petiole up to 4 mm long; stipules lanceolate. Flowers in axillary racemes, pale purple or pink. Calyx pubescent, lobes hairy. Corolla lobed, standard obovate. Stamens 10, diadelphous. Ovary pubescent; style bearded. Pods straight, *c.* 5 cm long, hairy. Seeds orbicular.

Fl.: & Fr.: Aug.–Nov.

Habitat: Occasional in forest foot hills and near villages.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Tephrosia purpurea (L.) Pers., Syn. Pl. 2: 329. 1807; Baker in Hook. f., Fl. Brit. India 2: 112. 1876. *p.p.*; Gamble, Fl. Madras 1: 320. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 326. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 590. 2018. *Cracca purpurea* L., Sp. Pl. 2: 753. 1753. *Tephrosia hamiltonii* J.R. Drumm. in Gamble, Fl. Madras 320. 1918. *'Vempalli'*

Erect, branched herb, to 80 cm high. Leaves imparipinnate; leaflets 9-pairs, obovate-oblanceolate, 2.1 cm, glabrous above, cuneate at base, acute or mucronate at apex, margins entire, appressed pubescent beneath. Flowers in terminal or leaf opposed racemes, purple or pinkish-blue, trinate in the axils of lower bracts. Sepals 5, connate, silky pubescent; lobes subulate. Petals 5; standard clawed, suborbicular, sericeous. Stamens 10, diadelphous. Style short, glabrous. Pods downy, straight, *c.* 3.8 cm long, flattened, mucronate, glabrous. Seeds with strophiole in the middle.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common around the villages, roadside and wasteplaces.

Specimen examined: GM Valasa, Doramamidi, *Y. Mahesh* 010487, 010609 (BSID).

3. Tephrosia strigosa (Dalzell) Santapau & Maheshw., J. Bombay Nat. Hist. Soc. 54: 805. 1957; R.S. Rao & al., Fl. E. Godavari Dist. 326. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 590. 2018. *Macronyx strigosus* Dalzell, Hooker's J. Bot. Kew Gard. Misc. 2: 35. 1850; *Tephrosia tenuis* Wall. ex Dalzell & A. Gibson, Bombay Fl. 61. 1861; Baker in Hook. f., Fl. Brit. India 2: 111. 1876; Gamble, Fl. Madras 1: 318. 1918.

Slender or caespitose, spreading herb, up to 30 cm high; branches appressed pubescent. Leaves simple, linear-oblong or lanceolate, 5 cm long, narrow at both sides, tip apiculate, margins entire, pubescent on both surfaces; stipules 2 mm long, deltoid or trigonous. Flowers in axils of leaves, often two together, pinkish. Calyx lobes short. Corolla lobed, standard ovate, 5 mm long. Stamens 10, diadelphous; filaments short. Pods linear, *c.* 2 cm long, with deflexed style. Seeds oblong.

Fl.: & Fr.: Nov–Jan.

Habitat: Occasional along Godavari River bank.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

4. Tephrosia villosa (L.) Pers., Syn. Pl. 2: 329. 1807; Baker in Hook. f., Fl. Brit. India 1: 113. 1876; R.S. Rao & al., Fl. E. Godavari Dist. 327. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 592. 2018. *Cracca villosa* L., Sp. Pl. 2: 752. 1753. *Tephrosia hirta* (Buch. -Ham.) Benth., Trans. Linn. Soc. London 13(2): 546. 1822; Gamble, Fl. Madras 1: 319. 1918. *'Nuguvempalli'*

Erect, silky villous herbs, up to 80 cm high; branches faintly angled. Leaves imparipinnate, 5–6 cm long, 8– 13 foliolate; leaflets oblong, narrowly oblanceolate, 2.5 cm long, cuneate at base, emarginate apex, margin entire, glabrous above, puberulous below. Flowers in axillary racemes, pale purple, 1 cm long; racemes 6-10 cm long, bracteate; pedicels articulate. Calyx pubescent, 6 mm long, lobes lanceolate, ciliate. Corolla 1.2 cm long, lobed,

standard orbicular. Stamens 10, diadelphous; filaments short, glabrous. Pods linear, *c.* 2.8 cm long, flattened, curved upward, villous hairy. Seeds 6, ovoid, strophiolate.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in open waste lands near villages and along roadsides.

Specimen examined: Kondrukota, *Y. Mahesh* 011649 (BSID).

57. TERAMNUS P. Browne

India: 4 spp. & 1 subsp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Teramnus labialis (L.f.) Spreng., Syst. Veg., 3: 235. 1826; Baker in Hook. f., Fl. Brit. India 2: 184. 1876; Gamble, Fl. Madras 1: 352. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 328. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 594. 2018. *Glycine labialis* L.f., Suppl. Pl. 325. 1782. *'Mashaparni'*

A small twining herb; branches appressed tomentose. Leaves trifoliate; petiole *c.* 3 cm long; terminal leaflets obovate-ovate, 4 cm long, laterals inequilateral, cuneate at base, apex acute, margins entire, pubescent below. Flowers in axillary racemes, pinkish or purple, bracteate; pedicels up to 5 mm long. Calyx campanulate; lobes small. Corolla exserted; petals clawed, standard obovate, 5 mm long; wings, keels oblong, 4 mm long. Stamens 10, monodelphous. Pods linear, *c.* 4.5 cm long, glabrous, hooked at apex. Seeds 5, dark brown.

Fl.: & Fr.: Aug.–Nov.

Habitat: Occasional in hill tops, pathways and plains in the forest.

Specimen examined: Tekuru, *Y. Mahesh* 011633 (BSID).

Field notes: Pods used in nervous disorder.

58. URARIA Desv.

India: 12 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Uraria lagopodioides (L.) DC., Prodr. 2: 324. 1825; Baker in Hook. f., Fl. Brit. India 2: 156. 1876; Gamble, Fl. Madras 1: 336. 1918; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 597. 2018. *Hedysarum lagopodioides* L., Sp. Pl. 2: 1198. 1753.

Spreading, prostrate herbs, to 50 cm high; branches pubescent. Leaves 1-foliate or 3-foliate; petiole 2 cm long; terminal leaflets orbicular or elliptic-ovate, cordate, 5 cm long, cordate at base, rounded or mucronate at apex, margins entire, glabrous above, grey pubescent below. Flowers in terminal, cylindrical, hairy racemes, densely flowered, pink or pale purple; pedicels *c.* 4 mm long, sparsely hairy. Calyx lobes 5, longer than tube, white hairy. Corolla as long as calyx, standard obovate. Pods jointed, smooth, enclosed by calyx, black-brown.

Fl.: & Fr.: Aug.–Oct.

Habitat: Occasional along forest pathways.

Specimen examined: Kintukuru, *Y. Mahesh* 011458 (BSID).

59. VACHELLIA Wight & Arn.

India: 14 spp. & 6 subsp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Heads axillary, solitary or fascicled	**2. V. nilotica**
1b.	Heads in terminal panicles	**1. V. leucophloea**

1. Vachellia leucophloea (Roxb.) Maslin, Seigler & Ebinger, Blumea 58: 42. 2013. *Mimosa leucophloea* Roxb., Pl. Coromandel 2: 27, t. 150. 1800. *Acacia leucophloea* (Roxb.) Willd., Sp. Pl., ed. 4: 1083.1806; Baker in Hook. f., Fl. Brit. India 2: 294. 1878; Gamble, Fl. Madras 1: 427. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 343. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 667. 2018. *'Tellathumma'*

Medium sized deciduous tree, to 10 m high; bark creamy-white, smooth when young, exfoliating in irregular scales. Leaves bipinnate, 6 cm long, pinnae 6–14 pairs; stipular spines straight; petiole gland just below the 1st pair of the pinnae; leaflets opposite, 15–25 pairs, linear-elliptic, 0.6–1.1 cm long, chartaceous, oblique at base, rounded or subacute at apex, ciliate along the margin, glabrous above, pubescent below. Flowers in terminal, panicled globose heads, creamy white, 1 cm across; peduncle short; bracts ovate, small; bracteoles in the middle of peduncle. Calyx 5-lobed, teeth short, pubescent, apex ciliate. Corolla longer than calyx. Pods oblong, up to 15 cm long, thick, slightly turgid, brown-tomentose, depressed between the seeds on the outside. Seeds up to 14, ovoid.

Fl.: & Fr.: Oct.–Feb.

Habitat: Common in dry deciduous forests and open waste lands.

Specimen examined: Koida, *Y. Mahesh* 010183 (BSID).

Field notes: Timber is used in agricultural implements, carts and cart wheels *etc*.

2. Vachellia nilotica (L.) P.J.H. Hurter & Mabb., Mabberley's Pl.-Book: 1021. 2008. *Mimosa nilotica* L., Sp. Pl. 1: 521. 1753. *Acacia arabica* auct. non (Lam.) Willd., Sp. Pl. 4: 1085. 1806; Hook. f., Fl. Brit. India 2: 293. 1878; Gamble, Fl. Madras 1: 425. 1919. *Acacia nilotica* (L.) Willd. ex Delile, Fl. Aegyp. Illustr. 2: 79. 1813; R.S. Rao & al., Fl. E. Godavari Dist. 343. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 668. 2018. *'Nallathumma'*

Medium sized tree, 10 m high; bark deeply grooved with longitudinal fissures; young parts armed with spines, greyish-brown, pubescent; pair of spines from single base, 4–6 cm long, whitish. Leaves bipinnate; rachis with 1-2 petiolar glands, pinnae 5–10 pairs; leaflets 8–30 pairs, linear-oblong, 4 mm long, obtuse, glabrous on both surfaces. Flowers in axillary globose heads, at the ends of branches, golden yellow; bracts linear, yellow. Sepals 5, connate, lobes triangular. Petals 5, connate, lobes triangular. Stamens numerous. Fruit lomentum, straight, compressed, moniliform, *c.* 15–20 cm long, grey downy, aromatic. Seeds orbicular.

Fl.: & Fr.: Aug.–Nov.

Habitat: Common tree in cultivated fields, waste lands and along the edges of forest.

Specimen examined: Shivagiri, Thutugunta, *Y. Mahesh* 011629, 011643 (BSID).

60. VIGNA Savi

India: 28 spp., 1 subsp. & 5 var.; Andhra Pradesh: 9 spp.; PNP: 4 spp.

Key to the species

1a.	Podas glabrous	2
1b.	Pods hirsute or villous	3
2a.	Stipules lanceolate; leaflets deeply 3-5 lobed; peduncle up to 8 cm long	**1. V. aconitifolia**
2b.	Stipules ovate-oblong; leaflets shallowly lobed; peduncle more than 10 cm long	**4. V. trilobata**
3a.	Pods erect or suberect	**2. V. mungo**
3b.	Podes spreading or deflexed	**3. V. radiata**

1. Vigna aconitifolia (Jacq.) Marechal, Bull. Jard. Bot. Natl. Belg. 39: 160. 1969; R.S. Rao & al., Fl. E. Godavari Dist. 329. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 600. 2018. *Phaseolus aconitifolius* Jacq., Observ. Bot. 3: 2. t. 52. 1768; Baker in Hook. f., Fl. Brit. India 2: 202. 1876; Gamble, Fl. Madras 1: 363. 1918.

Trailing herbs; branches up to 1.2 m length, terete, retrorsely sparsely pubescent, sometimes glabrous. Leaves trifoliate, 6–8 cm long; leaflets elliptic-lanceolate, deeply 3–5-lobed, 4 cm long, obtuse at base, acute at apex, margins entire, sparsely appressed pubescent; stipules peltate, subulate; petiole up to 6.5 cm long. Flowers in axillary racemes, bracteate, yellow; peduncles *c.* 8 cm long. Calyx campanulate, pubescent, lobes acuminate. Petals yellow. Stamens diadelphous; filaments glabrous. Pods cylindric, *c.* 4 cm long, glabrous. Seeds 4–6, brown, smooth.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in shady moist places, cultivated for fodder.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Vigna mungo (L.) Hepper, Kew Bull. 11: 128. 1956; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 600. 2018. *Phaseolus mungo* L., Mant. Pl. 1: 101. 1767; Baker in Hook. f., Fl. Brit. India 2: 203.1878; Gamble, Fl. Madras 1: 363. 1918. *'Minumulu'*

Erect herb, with golden brown hairs, up to 50 cm high. Leaves trifoliate; leaflets, oblong-lanceolate, 6 cm, strigose, obtuse at base, apex acute, margin entire. Flowers in axillary racemes, yellow; calyx lobes linear. Pods beaked, hairy. Seeds 6, black.

Fl.: & Fr.: Aug.–Nov.

Habitat: Cultivated along Godavari river banks areas.

Specimen examined: Gulletiwada, *Y. Mahesh* 010587 (BSID).

3. Vigna radiata (L.) R. Wilczek, Fl. Congo Belge 6: 386. 1954. var. radiata Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 602. 2018. *Phaseolus radiatus* L., Sp. Pl. 2: 725. 1753; Gamble, Fl. Madras 1: 363. 1918. *Phaseolus mungo* L. var. *radiates* (L.) Baker in Hook.f, Fl. Brit. India 2: 203. 1876. *'Pesallu'*

Erect hrb, up to 50 cm high; branches pubescent. Leaves trifoliate; leaflets oblong-lanceolate, 8 cm, glabrous above, hispid beneath, oblique at base, apex acuminate, margin entire. Flowers in subumbellate clusters, yellow; calyx glabrous; corolla exserted; stamens 10, diadelphous. Ovary pubescent; style incurved. Pods straight, pubescent. Seeds 10, green.

Fl.: & Fr.: Jun.–Dec.

Habitat: Cultivated along Godavari River banks areas.

Specimen examined: Gulletiwada, Kondamodalu, *Y. Mahesh* 010560, 011757 (BSID).

4. Vigna trilobata (L.) Verdc., Taxon 17: 172. 1968 & Kew Bull. 24: 560. 1970; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 604. 2018. *Dolichos trilobatus* L., Mant. Pl. 1: 101. 1767; Baker in Hook. f., Fl. Brit. India 2: 262. 1876. *Phaseolus trilobatus* (L.) Schreb., Nova. Act. Acad. Caes. Leopr. Carol. Germ. Nat. Curios 4: 132. 1770; R.S. Rao & al., Fl. W. Godavari Dist. 162. 1986 Gamble, Fl. Madras 1: 363. 1918. *'Pillipesara'*

Twining herb, up to 80 cm, branches ribbed, pubescent. Leaves trifoliate; leaflets 3-lobed, midlobe obovate-spathulate, lateral oblique, obtuse at base, acute at apex, margins entire, glabrous; stipules ovate-oblong. Flowers in capitates racemes, yellow, pedunculate; peduncle more than 10 cm long. Calyx tube deeply lobed. Corolla lobed, standard orbicular; stamens 10, diadelphous. Pods sub-cylindrical, *c.* 3.5 cm long, sparsely hairy. Seeds 10, dark brown.

Fl.: & Fr.: Jul.–Jan.

Habitat: Common in wastelands and the banks of Godavari River.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

61. XYLIA Benth.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Xylia xylocarpa (Roxb.) Taub., Bot. Centralbl. 47: 395. 1891; Gamble, Fl. Madras 1: 417. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 350. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 698. 2018. *Mimosa xylocarpa* Roxb., Pl. Coron. 1: t. 100. 1798. *Xylia dolabriformis* Benth., J. Bot. 4: 417. 1842; Baker in Hook. f., Fl. Brit. India 2: 286. 1878. **(Plate 34H)** *'Konda tangedu', 'Chennangichettu'*

Tall deciduous tree, up to 20 m high; bark reddish-grey, brittle, rough, irregularly flacking off; young parts tomentose. Leaves bipinnate, large; pinnae 2; petioles c. 6 cm long, with orbicular gland at tip; leaflets 2–4-pairs, opposite, oblong, 12 cm long, terminal leaflets larger than lower ones, sub coriaceous, acute at base, acuminate at apex, margins entire, glabrous. Flowers in axillary, clustered globose heads, yellowish-white. Calyx tubular, teeth 5, valvate. Corolla 5 mm long, lobes 5, lanceolate, valvate. Stamens 10, exserted, free. Pods oblong, *c.* 15 cm long, woody, broadly falcate, rusty tomentose. Seeds 8, oblong-ellipsoid, brown, shiny.

Fl.: &Fr.: Mar.–May.

Habitat: Common in dry deciduous forest.

Specimen examined: Maredupudi, *Y. Mahesh* 010108 (BSID).

Uses: Wood is used household constructions.

62. ZORNIA J.F. Gmel.

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Zornia gibbosa Span., Linnaea 15: 192. 1841; R.S. Rao & al., Fl. E. Godavari Dist. 329. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 607. 2018. *Zornia diphylla* auct non (L.) Pers. 1807; Baker in Hook. f., Fl. Brit. India 2: 147. 1876 *p.p.*; Gamble, Fl. Madras 1: 325. 1918.

Procumbent or diffuse herbs, up to 20 cm long; branches terete, ascending, puberulous. Leaves 2-foliate, 3.2 cm long; petiole 1.6 cm long; leaflets 2.8 cm long, ovate-lanceolate, obtuse at base, acute at apex, margins entire, glabrous above, punctate with glands below, sparsely hairy on midrib beneath; stipules peltate, glandular. Flowers in axillary and terminal spicate racemes, pale yellow; bracts foliar, enclosing flowers, ovate-peltate,

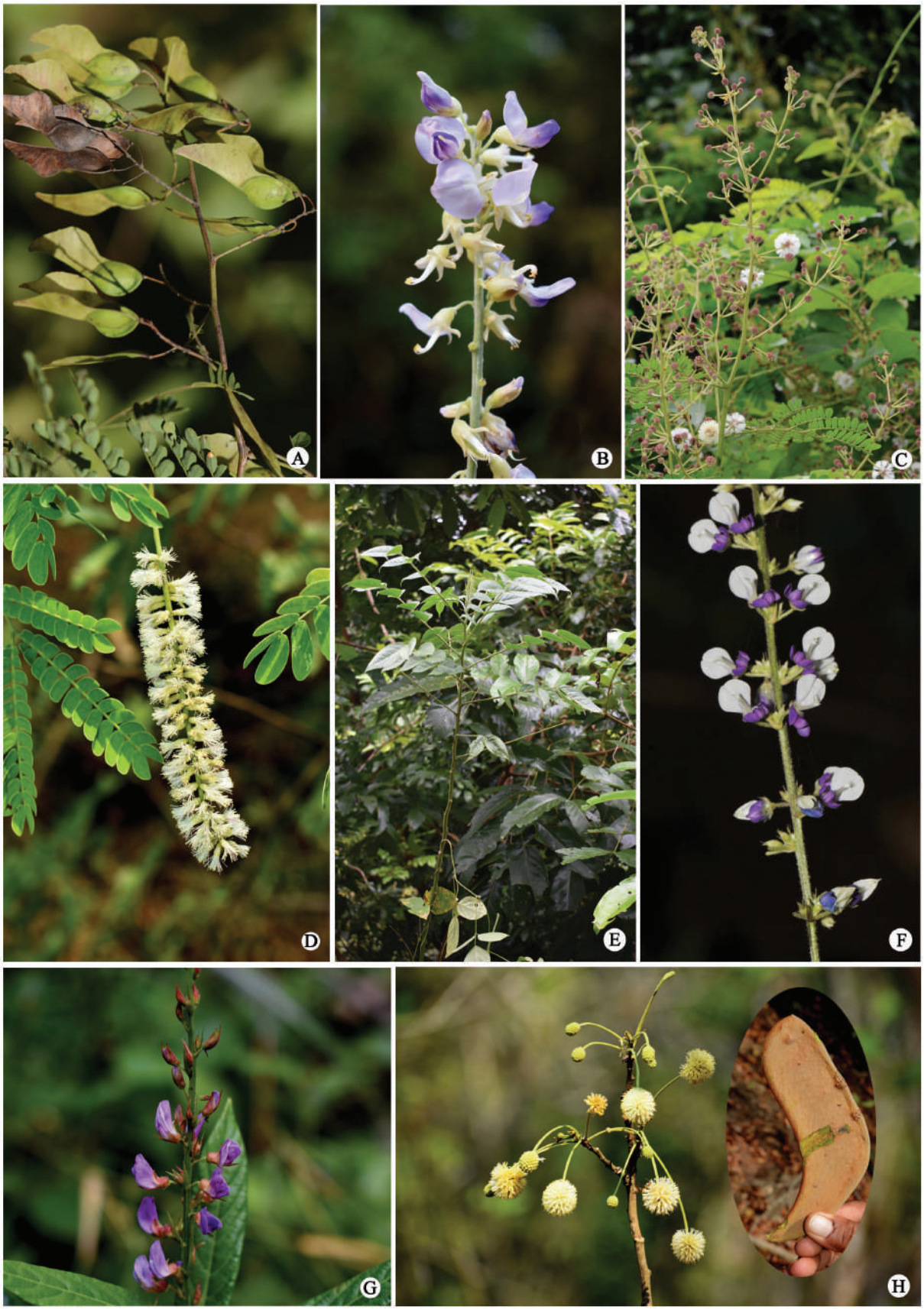


Plate 34: A. *Pterolobium hexapetalum* Santapau & Wagh; **B.** *Pueraria tuberosa* (Roxb. ex Willd.) DC.; **C.** *Senegalia caesia* Maslin, Seigler & Ebinger; **D.** *Senegalia ferruginea* (DC.) Pedley; **E.** *Senna hirsuta* (L.) H.S. Irwin & Barneby; **F.** *Sohmaea laxiflora* H. Ohashi & K.Ohashi; **G.** *Tadehagi triquetrum* (L.) H.Ohashi; **H.** *Xylia xylocarpa* (Roxb.) W.Theob.

prominently nerved. Calyx connate, 2 mm long, membranous, lobes 5, ciliate. Corolla 5-lobed, standard clawed, orbicular, glabrous. Stamens 10, monadelphous; filaments connate up to middle. Pods jointed, compressed, 1.1 cm long, spinous. Seeds reniform, smooth.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in open waste lands, cultivated fields and, grasslands in the forest.

Specimen examined: Gulletiwada, *Y. Mahesh* 10597 (BSID).

39. POLYGALACEAE

India: 4 genera, 32 spp., 9 var.; Andhra Pradesh: 2 genera, 14 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a.	Stem 3-winged, glabrous; leaves ovate; flowers purplish-pink	**2. Salomonia**
1b.	Stem terete, pubescent; leaves elliptic-oblong; flowers yellow	**1. Polygala**

1. POLYGALA Tourn. ex L.

India: 28 spp. & 7 var.; Andhra Pradesh: 14 spp.; PNP: 1 sp.

1. Polygala arvensis Willd., Sp. Pl., ed. 4. 3: 876. 1802; R.S. Rao & al., Fl. E. Godavari Dist. 206. 1999; Pull. & al., Fl. Andhra Pradesh 1: 146. 2018. *Polygala chinensis* auct. non. L. 1753; A.W.Benn. in Hook. f., Fl. Brit. India 1: 204. 1872 *p.p.*; Gamble, Fl. Madras 1: 58. 1915.

Prostrate or ascending, branched herbs, up to 20 cm long; branches faintly angled, pubescent. Leaves elliptic-obovate, or oblong, 2–4 cm long, narrow at base, emarginate apex, margins entire, incurved, softly pilose on both surfaces. Flowers in axillary or extra-axillary racemes, 5 mm long, yellow, few, bracteate. Sepals 5, unequal, inner two 5.5 mm long, outer 3 smaller, ovate, ciliolate along margins. Petals 3, adnate at base, midlobe keeled, laterals suborbicular. Stamens 8; filaments connate in bundles. Capsule globose, flattened, 4 cm long, ciliate along margins. Seeds 2, black, hairy.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common weed in cultivated fields, along roadsides and waste lands.

Specimen examined: PK Valasa, *Y. Mahesh* 010432 (BSID).

2. SALOMONIA Lour.

India: 2 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Salomonia cantoniensis Lour., Fl. Cochinch. 1: 14. 1790; A.W. Benn. in Hook. f., Fl. Brit. India 1: 206. 1872; R.N. Banerjee in B.D. Sharma & al., Fl. India 2: 489. 1993; Mahesh & al., Nelumbo, 63 (2): 63. 2021. *Salomonia edentula* DC., Prodr. 1: 334. 1824; A.W. Benn. in Hook. f., Fl. Brit. India 1: 207. 1872. *Salomonia cantoniensis* var. *edentula* (DC.) Gagnep., Bull. Soc. Bot. France 56: 16 1909; R.N. Banerjee in B.D. Sharma & al., Fl. India 2: 490. 1993. **(Plate 35)**

Annual, erect herb, up to 22 cm high; stems 3-winged, much branched, dichotomously branched at top, glabrous. Leaves simple, ovate, 0.4-1.5 × 0.3-1.1 cm, truncate at base, apiculate or cuspidate-mucronate at apex, margins slightly undulate or entire, membranous, shiny above, glabrous, 3-nerved from base; petioles up to 1.5 mm long, winged. Inflorescence 2-6 cm long, terminal or rarely in upper axillary spikes; rachis winged. Flowers small, *c*. 2.2 mm long, purplish-pink; bracts linear to lanceolate, 0.8 mm long. Sepals 5, linear–lanceolate or subulate, persistent, subequal, 0.3 - 0.5 mm, transparent. Petals 3, purplish-pink, subequal, connate at base, tube *c*. 1 mm long, keel petal *c*. 1 mm long, lateral petals 0.8 mm long, light purplish. Stamens 4, united into an open sheath; filaments *c*. 0.9 mm long, connate; anthers united, opening by apical pores. Capsules sessile, reniform, 0.7 × 1.3 mm, margins with minute hairs; surface covered with small teeth. Seeds 2, ovoid–obovate, *c*. 0.7 × 0.5 mm long, light orange.

Fl. &*Fr.*: Oct.–Nov.

Habitat: Rare in the marshy areas and grasslands of the hilly areas.

Specimens examined: Eruwada Beat, *Y. Mahesh* 011554 (BSID).

Notes: *Salomonia cantoniensis* differs from the *S. ciliata* by its winged stem, ovate-cordate, petiolate leaves, whereas the latter species have terete or angular stem, elliptic-lanceolate, sessile leaves.



Plate 35: *Salomonia cantoniensis* Lour. **A.** Habitat; **B.** Habit; **C-D.** Inflorescence; **E.** Stamen; **F.** Gynoecium; **G.** Fruits; **H.** Seeds

40. ROSACEAE

India: 37 genera, 515 taxa; Andhra Pradesh: 3 genera, 5 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a.	Plants armed with prickles; leaves trifoliate, margin biserrate; carpels numerous	**2. Rubus**
1b.	Plants unarmed; leaves simple, margin entire; carpels solitary	**1. Prunus**

1. PRUNUS L.

India: 29 spp., 1 subsp. & 6 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Prunus ceylanica (Wight) Miq., Fl. Ned. Ind. 1: 366. 1855; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 700. 2018. *Polydontia ceylanica* Wight, Ill. Ind. Bot. 1: 203. 1840. "*Polyodontia*", *Polydontia wightianum* Blume ex C. Muell. in Walp. Ann. 4: 642. 1858; Hook. f., Fl. Brit. India 2: 319. 1878; Gamble, Fl. Madras 1: 439. 1919.

Evergreen tree, up to 20 m high; bark dark brown or brownish-black, rough, vertically fissured, cracked with thin flacks. Leaves simple, ovate-lanceolate or oblong, 8-20 cm long, subacute or obliquely rounded at base, caudate at apex, margins entire, glabrous; lateral nerves 8 pairs. Flowers in axillary racemes, 5 mm across, creamy-white, bracteate. Calyx tube urceolate or bell shaped; lobes 5, ovate, blunt at apex, hairy. Petals 5, ovate-oblong, pubescent. Stamens up to 30; filaments slender, incurved. Drupe 2-lobed, *c.* 2.2 cm across, glabrous. Seeds 2, spherical.

Fl.: & Fr.: Jun.–Dec.

Habitat: Common along streams in the deep forest.

Specimen examined: Maredumilli, *Y. Mahesh* 011527 (BSID).

2. RUBUS L.

India: 73 spp. & 6 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Rubus ellipticus Sm., Cycl. London ed. 30: 16. 1815; Hook. f., Fl. Brit. India 2: 336. 1878; Gamble, Fl. Madras1: 441. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 352. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 702. 2018. **(Plate 36A)**

Straggling evergreen shrub, up to 3.5 m long; branches covered with stiff red or brownish bristles and prickles; prickles recurved. Leaves trifoliate; leaflets elliptic or suborbicular, 5–8 cm long, chartaceous, rounded at base, short acute or obtuse at apex, margins biserrate or serrulate, glabrous above, grey tomentose, small prickles on midrib below; secondary nerves 8 pairs. Flowers many, in panicles, white, pedicellate; pedicels *c.* 1.1 cm long. Sepals 5, connate at base, ovate, 5.5 mm long, pubescent. Petals 5, obovate, 7 mm long, densely villous. Stamens 20; filaments short. Berry aggregate, globose, *c.* 2 cm across, orange-red.

Fl.: & Fr.: Mar.–Jun.

Habitat: Common along streams and hilly areas in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

41. RHAMNACEAE

India: 12 genera, 73 taxa; Andhra Pradesh: 7 genera, 16 spp., 2 var.; PNP: 4 genera, 8 spp.

Key to the genera

1a.	Fruit superior, partly enclosed by calyx tube; tendrils absent	2
1b.	Fruit inferior, crowned by persistent calyx; tendrils present	**1. Gouania**
2a.	Armed (except glabrata) trees or climbing shrubs; fruits a drupe, 1-4 seeded	3
2b.	Unarmed climbing shrubs, fruit 1-seeded samara	**3. Ventilago**
3a.	Fruit a dry or fleshy drupe with 1-4 celled stone	**4. Ziziphus**
3b.	Fruit a baccate; pyrenes 2-4	**2. Scutia**

1. GOUANIA Jacq.

India: 4 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Gouania leptostachya DC., Prodr. 2: 40. 1825; Lawson in Hook. f., Fl. Brit. India 1: 643. 1875; Gamble, Fl. Madras 1: 225. 1918; Pull. & al., Fl. Andhra Pradesh 1: 351. 2018. **(Plate 36B)** *'Penkiteega'*

Large scandent, climbing shrub. Leaves ovate, 6–9 cm long, rounded or slightly cordate at base, acuminate at apex, margins serrate; petioles 2.8 cm long; stipules subulate. Flowers in 20 cm long spikes, creamy white, hairy.

Sepals 5, deltoid, glabrous. Petals hooded. Stamens short; filaments alternating with appendages of glabrous disc; style 3-cleft up the middle. Fruit inferior capsule, *c.* 1.4 cm in diam., crowned with persistent calyx, glabrous,

Fl.: & Fr.: Nov.–Mar.

Habitat: Common in forest hedges and pathways.

Specimen examined: PK Valasa, *Y. Mahesh* 011403 (BSID).

2. SCUTIA (Comm. ex DC.) Brongn.

India: 1 spp.; Andhra Pradesh: 1 sp. & 1 var.; PNP: 1 sp.

1. Scutia myrtina (Burm.f.) Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 44: 168. 1876; Gamble, Fl. Madras 1: 223. 1918; R.S. Rao & al., Fl. W. Godavari Dist. 122. 1986. Pull. & al., Fl. Andhra Pradesh 1: 354. 2018. *Rhamnus myrtina* Burm.f., Fl. Ind. 60. 1768. *Scutia indica* Brongn., Mem. Fam. Rham. 56: 1826; Lawson in Hook. f., Fl. Brit. India 1: 640. 1875. *'Gariki'*

A large straggling thorny shrub; branches armed with recurved spines. Leaves broadly obovate-orbicular, 3.1 cm long, coriaceous, shining, cuneate at base, obtuse at apex, margins entire. Flowers small in clustered pedunculate umbels or axillary fascicles, cream coloured. Calyx short, lobes keeled below. Petals 5, clawed, 2-lobed. Stamens inserted on calyx tube. Ovary glabrous; style shortly 2-lobed. Fruit a baccate drupe, sub-globose, *c.* 8 mm across, fleshy, dark blue, 2–4 pyrenes. Seeds compressed.

Fl.: & Fr.: Nov.–Apr.

Habitat: Very common in the dry deciduous forest.

Specimen examined: Included on authority of R.S. Rao & al. (*l.c.*).

3. VENTILAGO Gaertn.

India: 4 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Ventilago denticulata Willd., Ges. Naturf. Freunde Berlin Neue Schriften. 3: 417. 1801; R.S. Rao & al., Fl. E. Godavari Dist. 264. 1999; Bhandari & Bhansali in N.P. Singh *& al.*, Fl. India 5: 217.2000; Pull. & al., Fl. Andhra Pradesh 1: 356. 2018. *Ventilago calyculata* Tul., Ann. Sci. Nat., Bot. ser. 4, 8: 124. 1857; Lawson in Hook. f., Fl. Brit. India 1: 631. 1875; Gamble, Fl. Madras 1: 218. 1918.*'Suragudu'*

Woody climbing shrubs; branches with tendrils, faintly angled, striate, fulvous pubescent when young. Leaves alternate, ovate-elliptic, 8–15 cm long, unequally rounded at base, acuminate at apex, margins crenate; petioles up to 1.1 cm long. Flowers minute, 0.4 cm long, in terminal, rarely axillary dense 10 cm long panicles, pale yellowish with unpleasant odour. Calyx short, lobes ovate or deltoid, cucullate at tips. Petals minute, ovate, obcordate, or spathulate, clawed at base. Stamens 5, adnate to petals. Fruit samaroid, *c.* 4.5 cm across, enclosed by adherent calyx tube, pubescent, flower style enlarged into a linear-oblong wing. Seed 1.

Fl.: & Fr.: Oct.–Mar.

Habitat: Common along hill slopes and edges of dry deciduous forest.

Specimen examined: Tekupally, *Y. Mahesh* 011338 (BSID).

Uses: Root bark yields dye.

4. ZIZIPHUS Mill.

India: 16 spp., 1 subsp. & 8 var.; Andhra Pradesh: 7 spp.; PNP: 5 spp.

Key to the species

1a.	Armed plants	2
1b.	Unarmed plants	**1. Z. glabrata**
2a.	Petals present	3
2b.	Petals absent	**4. Z. rugosa**
3a.	Flowers in fascicles or shortly peduncled cymes; styles 2	4
3b.	Flowers in pedunculate cymes; styles 3	**5. Z. xylopyrus**
4a.	Leaves rounded at base, tomentose; prickles in pairs; drupe more than 1.5 cm in diam	**2. Z. mauritiana**
4b.	Leaves oblique at base, with silky hairs below; prickles solitary; drupe less than 1.5 cm in diam	**3. Z. oenopolia**

1. Ziziphus glabrata B. Heyne ex Roth, Nov. Pl. Sp. 159. 1821; Lawson in Hook. f., Fl. Brit. India 1: 633. 1875; Pull. & al., Fl Andhra Pradesh 1: 358. 2018. *Ziziphus trinervia* Roxb., Fl. Ind., 1: 606. 1832; Gamble, Fl. Madras 1: 220. 1918.

Medium sized, unarmed trees, up to 10 m high; bark dark brown; branches terete, glabrous, rusty tomentose when young. Leaves broadly ovate–oblong or orbicular, 4–7 cm long, 3-nerved, subcordate, or cuneate, asymmetrical at base, obtuse apex, margins entire, pubescent, glaucous below, shiny above. Flowers small, 2.5 mm across, in axillary, peduncled cymes, greenish-yellow. Calyx lobes keeled up to the middle. Petals obtuse triangular. Stamens short. Ovary glabrous; style 2-cleft. Drupe globose, *c.* 8 mm across, 1-2 celled, rugose, orange-yellow when ripe. Stones bony. Seeds 2, brown.

Fl.: & Fr.: Mar.–Oct.

Habitat: Common in deciduous forest.

Specimen examined: Valamuru, *Y. Mahesh* 012154 (BSID).

2. Ziziphus mauritiana Lam., Encycl. 3: 319. 1789; R.S. Rao & al., Fl. E. Godavari Dist. 265. 1999. *Ziziphus jujuba* (L.) Gaertn., Fruct. 1: 203. 1788; Lawson in Hook. f., Fl. Brit. India 1: 632. 1875; Gamble, Fl. Madras 1: 219. 1918 *jujube*; Pull. *& al.*, Fl. Andhra Pradesh 1: 360. 2018. *Rhamnus jujuba* L., Sp. Pl. 184. 1753. *'Regu', 'Gangaregu'*

Much branched, small trees, up to 8 m high; bark dark brown or grey with deep vertical cracks; branches drooping, zigzag, grey tomentose; prickles in pairs. Leaves simple, ovate-broadly elliptic, 3–6 cm long, rounded at base, obtuse, mucronate at apex, margins serrate, 3-nerved from base, glabrous above, tomentose beneath; stipular spines one straight, one curved. Flowers very short, greenish-white, in axillary fascicles; disk grooved; styles 2. Drupe more than *c.* 1.5 cm in diam., brownish, ovate, single seeded, reddish brown with sticky pulp. Stones bony.

Fl.: & Fr.: Dec.–Mar.

Habitat: Common near villages and wastelands.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Ziziphus oenopolia (L.) Mill., Gard. Dict. Ed. 8. N. 3. 1768; Lawson in Hook. f., Fl. Brit. India 1: 634. 1875; Gamble, Fl. Madras 1: 220. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 266. 1999; Bhandari & Bhansali in N.P. Singh & al., Fl. India. 5: 236. 2000; Pull. & al., Fl. Andhra Pradesh 1: 362. 2018; *Rhamnus oenoplia* L. Sp. Pl. 194. 1753. **(Plate 36C)** *'Parikichettu'.*

Large straggling shrubs, up to 6 m high, branches brown pubescent; prickles in two pairs, one recurved, one straight, brown. Leaves ovate-lanceolate, 4–6.5 cm long, 3- nerved from base, oblique at base, acuminate at apex, margins entire, slightly pubescent above, silky pubescent below; petiole up to 7 mm long. Flowers in axillary peduncled cymes, 3.2 mm across, pale green, bracteate. Calyx lobes ovate, brownish, glabrous within. Petals obovate. Stamens 9 mm long. Ovary sunk in disk, glabrous; style 2-cleft. Drupes less than *c.* 1.5 cm in diam., globose, black, edible. Seeds solitary, rounded.

Fl.: & Fr.: Oct.–Jan.

Habitat: Common in thorny scrub forest, along waste lands and cultivated fields.

Specimen examined: Buruguwada, Eruwada, GM Valasa, *Y. Mahesh* 010096, 010646, 010985 (BSID).

4. Ziziphus rugosa Lam. in J. Lam & Poir., Encycl. 3: 319. 1789; Lawson in Hook. f., Fl. Brit. India 1: 636. 1875; Gamble, Fl. Madras 1: 221. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 266. 1999; Bhandari & Bhansali in N.P. Singh & al., Fl. India. 5: 240. 2000; Pull. & al., Fl. Andhra Pradesh 1: 362. 2018. **(Plate 36D)** *'Gottiteega', Sareduchettu'*

Straggling shrubs, up to 6 m high, branches brown pubescent when young, prickly; prickles with broad base, recurved. Leaves elliptic-ovate, 6–14 cm long, coriaceous, unequally cordate at base, mucronate at apex, margins serrulate, 3-nerved from base, glabrous above, rufous on nerves beneath; petioles up to 1.2 cm long. Flowers in large, pubescent cymose panicles, 6 mm across, pale yellow, pubescent, bracteate. Calyx *c.* 4 mm long; lobes 5, ovate, densely brown pubescent, cucullate at tips. Petals absent. Stamens 5, short. Disc 5-lobed, glabrous. Ovary pubescent; styles 2. Drupes globose, *c.* 1.8 cm across. Seeds black.

Fl.: & Fr.: Mar.–May.

Habitat: Common in dry deciduous forests.

Specimen examined: Maredupudi, *Y. Mahesh* 010111 (BSID).

5. Ziziphus xylopyrus (Retz.) Willd., Sp. Pl., ed. 4, 1: 1104. 1798; Lawson in Hook. f., Fl. Brit. India 1: 634. 1875; Gamble, Fl. Madras 1: 220. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 266. 1999; Pull. & al., Fl. Andhra Pradesh 1: 363. 2018. *Rhamnus xylopyrus* Retz., Observ. Bot. 2: 11. 1781. *'Gottichettu'*

Thorny deciduous trees, up to 5 m high; branches thorny, young shoots rusty tomentose, sometimes unarmed. Leaves elliptic-oblong, or ovate-suborbicular, 3.5-6 cm long, palmately 3-veined from base, obliquely cordate at base, rounded or abruptly acuminate at apex, margins crenate or sharply serrate, pubescent above, white woolly tomentose beneath when young; petiole 8 mm long; stipular spines one straight, one curved. Flowers in axillary, divaricate, pedunculate cymes, pale yellow. Sepals 5, basally connate, lobes ovate, pubescent. Petals 5, minute, obovate-spathulate, clawed. Stamens 5, near brownish disk. Ovary globose, triangular; styles 3, small. Drupe woody, globose or ovoid, *c.* 1.6 cm across, grey tomentose when young. Seeds 3.

Fl.: & Fr.: May–Nov.

Habitat: Common in thorny dry deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

42. ULMACEAE

India: 2 genera, 10 taxa; Andhra Pradesh: 1 genus, 1 sp.; PNP: 1 genus, 1 sp.

1. HOLOPTELEA Planch.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Holoptelea integrifolia (Roxb.) Planch., Ann. Sci. Nat. Bot. (ser. 3) 10: 259. 1848; Hook. f., Fl. Brit. India 5: 481. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1348. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 641. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1794. 2018. *Ulmus integrifolia* Roxb., Pl. Coromandel 1: 56. 1796. **(Plate 36E)** *'Nemalinara',*

Large deciduous trees, up to 25 m high; branches terete, glabrous, lenticellate, drooping. Leaves distichous, elliptic-ovate, 8–13 cm long, chartaceous, round at base, acuminate at apex, margins entire, glabrous above, puberulous beneath; petiole up to 1 cm long; stipules scarious, puberulous. Flowers polygamous, in short clusters of fascicles on scars of fallen leaves, purple. Perianth elliptic, 4-8 partite, concave, pubescent on both sides. Stamens 6, exserted. Fruit samara, orbicular, *c.* 2.3 cm across, flattened with reticulate with papery winged. Seed 1, flat.

Fl.: & Fr.: Feb.–May.

Habitat: Common in deciduous forests, agricultural lands and wastelands.

Specimen examined: Darapally, *Y. Mahesh* 010130 (BSID).

43. CANNABACEAE

India: 6 genera, 15 taxa; Andhra Pradesh: 3 genus, 5 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a.	Plants dioecious; leaves chartaceous, serrate	**2. Trema**
1b.	Plants with polygamous flowers; leaves coriaceous, entire	**1. Celtis**

1. CELTIS L.

India: 4 spp., 1 subsp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Celtis timorensis Span., Linnaea 15: 343. 1841; R.S. Rao & al., Fl. E. Godavari Dist. 641. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1794. 2018. *Celtis cinnamomea* Lindl. ex Planch., Ann. Sci. Nat., Bot. (ser. 3) 10: 303. 1848; Hook. f., Fl. Brit. India 5: 482. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1349. 1925. *'Kodamma'*

Small evergreen trees, up to 8 m high; young branches reddish brown, lenticellate, pubescent. Leaves ovate-oblong or elliptic, 6–12 cm long, membranous, obtuse or rounded at base, acute or acuminate at apex, margins entire, glabrous; petiole up to 1.2 cm long. Flowers polygamous, in axillary short dichotomous racemes, minute, greenish-white. Tepals 5, ovate, concave, ciliate. Stamens 4. Ovary ovoid; styles 2-fid, hairy. Drupe globose, *c.* 1.2 cm across, pisiform. Seeds flattened.

Fl.: & Fr.: Mar.–May.

Habitat: Occasional in moist deciduous forest and along stream banks.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. TREMA Lour.

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Trema orientale (L.) Blume, Mus. Bot. 2: 62. 1856; Hook. f., Fl. Brit. India 5: 484. 1888; C.E.C. Fisch. in



Plate 36: A. *Rubus ellipticus* Sm.; **B.** *Gouania leptostachya* DC.; **C.** *Ziziphus oenopolia* (L.) Mill.; **D.** *Ziziphus rugosa* Lam.; **E.** *Holoptelea integrifolia* (Roxb.) Planch.; **F.** *Trema orientale* (L.) Blume

Gamble, Fl. Madras 3: 1350 .1925; R.S. Rao & al., Fl. E. Godavari Dist. 642. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1795. 2018. *Celtis orientalis* L., Sp. Pl. 2: 1044. 1753. **(Plate 36F)** *'Bogguchettu', 'Moralichettu'*

Medium sized, trees, up to 10 m high; branches terete, spreading, pubescent. Leaves obliquely ovate-lanceolate, 6–14 cm long, oblique or unequally cordate at base, acuminate or caudate at apex, margins serrate, scabrous above, silvery tomentose beneath; main nerves prominent below; petiole pubescent, 7 mm long. Flowers dioecious, small in axillary pedunculate cymes, greenish-white, appears like new flush of leaves; male flowers in much branched cymes more compact than female, bracteate. Sepals small, densely white pubescent along margins. Stamens 4, exserted. Drupes ovoid, *c.* 2 cm across, rugose, black at maturity.

Fl.: & Fr.: Throughout the year.

Habitat: Common along streams and edges of disturbed forests.

Specimen examined: Tiger camp, *Y. Mahesh* 011786 (BSID).

Uses: Bark yields fibre, wood used as firewood.

44. MORACEAE

India: 9 genera, 140 taxa; Andhra Pradesh: 7 genera, 36 spp.; PNP: 4 genera, 20 spp.

Key to the genera

1a.	Flowers enclosed in receptacles forming synchonia	**2. Ficus**
1b.	Flowers exposed on receptacles, not forming synchonia	2
2a.	Fruit a syncarp, fleshy, globose or oblong; stamens monandrus	**1. Artocarpus**
2b.	Fruit of Drupe, globose; stamens 4	**3**
3a.	Leaf margin serrate	**4. Streblus**
3b.	Leaf margin entire	**3. Maclura**

1. ARTOCARPUS J.R. Forst. & G. Forst.

India: 9 spp. & 1 subsp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves and stipules glabrous; stipules spathaceous; fruit tuberculate, 35-85 cm long	**1. A. heterophyllus**
1b.	Leaves below and stipules pubescent; stipules not spathaceous; fruit smooth, 4-8 cm long	**2. A. lacucha**

1. Artocarpus heterophyllus Lam., Encycl. 3: 209. 1789; R.S. Rao & al., Fl. E. Godavari Dist. 649. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1798. 2018. *Artocarpus integrifolius* auct. non L.f. 412. 1782; Hook. f., Fl. Brit. India 5: 541. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1369. 1928. *'Panasa'*

Large evergreen trees, up to 15 m high; branchlets glabrous. Leaves ovate-oblong or obovate, 8–15 cm long, coriaceous, rounded at base, obtuse apex, margins entire, glabrous, lateral nerves 6–7 pairs; stipules amplexicaul, glabrous; petiole 3 cm long. Flowers small, unisexual, crowded on globose, cylindrical axillary and cauliflorus receptacles, greenish-yellow, enclosed by spathe like bracts. Perianth 2-lobed. Stamen 1. Ovary unilocular, pendulous. Fruit large, oblong, 30–85 cm long, with hexagonal tubercles, thick spines through on a stout, drooping peduncle, greenish yellow when mature. Seeds 2-3.5 cm long, reniform, shiny or oily.

Fl.: & Fr.: Feb.–Oct.

Habitat: Planted near villages and forest for fruits.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Artocarpus lacucha Roxb. ex Buch.-Ham., Mem. Wern. Nat. Hist. Soc. 5(2): 333. 1826.; Hook. f., Fl. Brit. India 5: 543. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1369. 1928; Pull. & al., Fl. Andhra Pradesh 4: 1799. 2018. **(Plate 37A)** *'Nakkarenu','Kammaregu'*

Large deciduous trees, up to 20 m high; branches tomentose with milky juice when young. Leaves oblong-elliptic or ovate, 12–25 cm long, coriaceous, rounded at base, cuspidate at apex, margins serrate, shining, glabrous above, densely grey pubescent below; petiole 2 cm long; stipules pubescent. Flowers monoecious, axillary, globose. Male receptacles sessile, yellowish-orange, ovoid, spongy, deciduous. Sepals 3, pubescent. Stamen 1. Female receptacles irregularly sub-globose, pedunculate, smooth. Fruit irregularly globose, 4–8 cm in diam., smooth, yellow at maturity.

Fl.: & Fr.: Dec.–Oct.

Habitat: Occasional in hilly areas and along stram banks in the forest.

Specimen examined: Valamuru view point, *Y. Mahesh* 011789 (BSID).

2. FICUS Tourn. ex L.

India: 96 spp. & infraspecific; Andhra Pradesh: 26 spp.; PNP: 15 spp.

Key to the species

1a.	leaves opposite or subopposite	**6. F. hispida**
1b.	Leaves alternate	2
2a.	Bushy climbing shrubs	**14. F. tinctoria** subsp. **gibbosa**
2b.	Tress and straggling shrubs	3
3a.	Figs cauliflorous, arise on old stems or branches or leafless hanging stolons	4
3b.	Figs axillary or below the leaves or in clusters on tuberculate burs	5
4a.	Leaf base semicordate, with subrotund lobe which covers petiole	**13. F. semicordata**
4b.	Leaf base not semicordate, without any subrotund lobe	**10. F. racemosa**
5a.	Figs distinctly pedunculate	13
5b.	Figs sessile or subsessile	6
6a.	Apex of leaves caudate with 4-8 cm long linear tail	**11. F. religiosa**
6b.	Apex of leaves obtuse, rounded or acute to 3 cm long, acuminate	7
7a.	Aerial prop roots numerous, becoming piller like accessory trunks	8
7b.	Aerial prop roots less or absent	9
8a.	Figs up to 2.5 cm in diam.; basal and lateral nerves of leaves conspicuous; lateral nerves reticulate, 3-8 pairs	**2. F. benghalensis**
8b.	Figs up to 1 cm in diam.; basal and lateral nerves of leaves inconspicuous; lateral nerves parallel, numerous	**7. F. microcarpa**
9a.	Figs, branchlets and lower surface of the leaves densely tomentose at maturity	**8. F. mollis**
9b.	Figs, branchlets and lower surface of the leaves not tomentose at maturity	10
10a.	Basal and lateral nerves of leaves inconspicuous; nerves many, parallel; figs often wrinkled when dry	**3. F. benjamina**
10b.	Basal and lateral nerves of leaves conspicuous; nerves less, not parallel; figs not wrinkled when dry	11
11a.	Figs 1.5–3 cm in diam., basal bracts concealed, hidden with base of figs	**12. F. rumphii**
11b.	Figs 0.4–1.5 cm in diam., basal bracts not concealed and hidden	12
12a.	Figs obovoid or obconical; stipules 1.2-2.5 cm long; surfaces of achenes verrucose	**1. F. amplissima**
12b.	Figs globose or subglobose; stipules 0.5-1 cm long; surfaces of achenes not verrucose	**5. F. geniculata**
13a.	Leaves scabrous, hispid on both sides; lateral and peduncular bracts present	**4. F. exasperata**
13b.	Leaves glabrous or puberulous on both sides; lateral and peduncular bracts absent	14
14a.	Lateral nerves prominently raised and bullet in appearance; basal bracts deciduous or absent	**9. F. nervosa**
14b.	Lateral nerves not bullet in appearance below the leaves; basal bracts persistent	**15. F. virens**

1. Ficus amplissima Sm., Rees Cyclop 14: Ficus no. 68. 1810; Pull. & al., Fl. Andhra Pradesh 4: 1801. 2018. *Ficus tsiela* Roxb. ex Buch.-Ham., Trans. Linn. Soc. London 15: 149. 1827; King in Hook. f., Fl. Brit. India 5: 515. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1362. 1928. **(Plate 37B)** *'Peddajuvvi'*

Large trees, up to 22 m high; aerial roots few or absent; branches spreading, glabrous. Leaves elliptic-broadly ovate or oblong, 5–18 cm long, coriaceous, rounded or cuneate at base, abruptly acuminate at apex, margins entire, glaucous, glabrous on both surfaces; petiole up to 4–8 cm long, glandular at apex; stipules 1.2–2.5 cm long. Figs monoecious, 1 cm in diam., sessile in axillary pairs on leafless branchlets, obovoid-obconical or pyriform, glabrous, purple when ripe; basal bracts 4, small, scarious; orifice circular, closed by 3 flat apical scales. Achenes verrucose.

Fl.: & Fr.: Jan.–Apr.

Habitat: Common along plains and near stream banks in the deciduous forest.

Specimen examined: Katukur, *Y. Mahesh* 010200 (BSID).

2. Ficus benghalensis L., Sp. Pl. 2: 1059. 1753; King in Hook. f., Fl. Brit. India 5: 499. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1361. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 644. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1804. 2018. *Ficus indica* L., Sp. Pl. 1060. 1753, nonsensu King 1887. *'Marrichettu'*

Large evergreen trees, up to 35 m high; aerial roots numerous, forming accessary trunks; branches spreading, softly puberulous when young. Leaves spirally arranged, or clustered at ends of branches, thick, ovate-elliptic, 7–28 cm long, coriaceous, rounded or subcordate at base, obtuse at apex, margins entire, glabrous above, puberulous below, glandular near petiole; lateral nerves 3–8 from base, reticulate, conspicuous; stipules ovate, acuminate; petiole up to 4 cm long, puberulous. Figs monoecious, axillary, sessile, globose or sub-globose, *c.* 2.5 cm in diam., binate, silky puberulous, tuberculate on surface, with 3 orbicular persistent bracts, red or orange red when ripe.

Fl.: & Fr.: Almost throughout the year.

Habitat: Common in the wild, quite frequent near villages and roadsides.

Specimen examined: Tekupally, *Y. Mahesh* 011699 (BSID).

3. Ficus benjamina L., Mant. Pl. 129. 1767; King, Ann. Roy. Bot. Gard. (Calcutta) 1: t. 52A. 1887 & in Hook. f., Fl. Brit. India 5: 508. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1367. 1928; Pull. & al., Fl. Andhra Pradesh 4: 1806. 2018. *'Kondajuvvi'*

Huge evergreen trees, up to 30 m high; areal roots few; branches drooping, glabrous. Leaves broadly elliptic-oblong or ovate, 7–12 cm long, coriaceous, rounded or obtuse at base, acute-acuminate at apex, margins entire, dark green, shining above, light green below, glabrous, basal and lateral nerves inconspicuous; stipules lanceolate, membranous, caducous; petioles 2.2 cm long. Figs monoecious, subsessile, obovoid or globose, pyriform, *c.* 1.8 cm in diam., solitary or in axillary pairs on leafy branchlets, glabrous, attenuate at base, orange red when ripen, wrinkled when dry.

Fl.: & Fr.: Feb.–Jun.

Habitat: Occasional along moist areas, stream banks and also planted along roadside as avenue tree.

Specimen examined: Maredumilli, *Y. Mahesh* 011778 (BSID).

4. Ficus exasperata Vahl, Enum. Pl. 2: 197. 1805; Pull. & al., Fl. Andhra Pradesh 4: 1808. 2018. *Ficus asperrima* Roxb. Fl. Ind. 3: 554. 1832; King in Hook. f., Fl. Brit. India 5: 522. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1366. 1928. *'Karaka boddu'*

Medium sized deciduous trees, up to 14 m high; aerial roots absent; branches scabrous when young. Leaves elliptic-oblong or ovate-obovate, 7–20 cm long, coriaceous, cuneate or rounded at base, shortly acuminate or blunt at apex, margins sinuate or dentate, scabrous, hispid with stiff white hairs on both surfaces, 3-nerved from base; petiole 4 cm long, scabrid. Figs pedunculate, axillary, solitary or in pairs in leaf axils, globose, 1.8 cm in diam., scabrous, deciduous, yellow with purple spots when ripe; basal bracts absent.

Fl.: & Fr.: Throughout the year.

Habitat: Occasional in plains and along stream banks in dry deciduous forests.

Specimen examined: Maredumilli, Valamuru, *Y. Mahesh* 011522, 011784 (BSID).

5. Ficus geniculata Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 105. 1873 & For. Fl. Brit. Burma 2: 447. 1877; King in Hook. f., Fl. Brit. India 5: 516. 1888; Pull. & al., Fl. Andhra Pradesh 4: 1809. 2018. **(Plate 37C)**

Very large deciduous trees, up to 30 m high; epiphytic in early stage, arial roots absent; branchlets glabrous, with scars of fallen leaves, lenticellate; young branchlets pubescent. Leaves ovate-lanceolate or oblong, 8–20 cm long, coriaceous, rounded or broadly cuneate at base, abruptly acuminate at apex, margin undulate or entire, glabrous on both surfaces; petiole up to 8.5 cm long; stipules up to 1 cm long. Figs in clustered on woody burs on old twigs and in axils of leaf scars on branchlets, monoecious, sessile, depressed globose or subglobose, 0.7 cm in diam., yellowish-red with white dots when ripe, glabrous.

Fl.: & Fr.: Mar.–Nov.

Habitat: Occasional along plains and near stream banks in the deciduous forest.

Specimen examined: Pocharam, Maredumilli, *Y. Mahesh* 010144, 011543 (BSID).

6. Ficus hispida L.f., Suppl. Pl. 442. 1782; King in Hook. f., Fl. Brit. India 5: 522. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1367. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 645. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1811. 2018. *'Kakimedi' 'Bomma medi'*

Medium sized evergreen trees, up to 8 m high; aerial roots absent; branchlets terete, hispid, hallow. Leaves opposite or subopposite, elliptic-ovate or oblong; 10–35 cm long, thickly coriaceous, obtuse or rounded at base, acute or abruptly acuminate at apex, margins crenate-serrulate, white pubescent above, brown hispid below, nerves prominent below; petiole up to 4–6 cm long, hispid; stipules terminal or axillary, ovate-lanceolate, pubescent above, glabrous beneath. Figs numerous on trunk, hispid, obovate or depressed globose, *c.* 2.8 cm in diam., axillary, in pairs or solitary or clusters of 3–5 on cauliflorous, long drooping racemes, pedunculate, greenish-white, yellowish when ripe, hispid; bracts small, glabrous.

Fl.: & Fr.: Throughout the year.

Habitat: Common along Godavari River bank and open places in the forest.

Specimen examined: Buruguwada, Darapally, *Y. Mahesh* 010099, 010131 (BSID).

7. Ficus microcarpa L.f., Suppl. Pl. 442. 1782; R.S. Rao & al., Fl. E. Godavari Dist. 646. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1813. 2018. *Ficus retusa* auct. non L.; King, Ann. Roy. Bot. Gardn. Cal. 1: 50. 1887 & in Hook. f. Fl. Brit. India 5: 511. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1362. 1928. *'Yerrajuvva, Konda juvvi, Billa juvvi'*

Moderate sized evergreen trees, up to 20 m high; areal roots numerous; branches finely pubescent when young. Leaves alternate, obovate-oblong or elliptic or suborbicular, 4–9 cm long, rounded-cuneate or obtuse at base, obtuse or bluntly acuminate or retuse at apex, margins entire, undulate, coriaceous, dark green, shining above, pale green below, glabrous on both surfaces; basal, lateral nerves inconspicuous, lateral nerves numerous, parallel; petiole short, up to 2.2 cm long; stipules ovate-lanceolate, acuminate, pubescent. Figs monoecious, axillary, sessile, binate, depressed globose or pyriform, *c.* 1 cm in diam., pale green-dark green or purple when mature, verrucose on surface, subtended by 3 ovate bracts.

Fl.: & Fr.: Feb.–Jul.

Habitat: Common along streams and foot hills in the forest.

Specimen examined: Kintukuru, *Y. Mahesh* 011461 (BSID).

8. Ficus mollis Vahl, Symb. Bot. 1: 82. 1790; Pull. & al., Fl. Andhra Pradesh 4: 1813. 2018. *Ficus tomentosa* Roxb. ex Willd., Sp. Pl. 4: 1136. 1806; King in Hook. f. Fl. Brit. India 5: 501. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1361. 1928. **(Plate 37D)** *'Juvvi', 'Kalajuvvi'*

Moderate sized, deciduous trees, up to 15 m high; areal roots numerous; branches densely yellowish or rusty brown tomentose when young. Leaves alternate, ovate-oblong or elliptic, 7–14 cm long, crowded at ends of branches, coriaceous, cordate or rounded at base, obtuse or bluntly mucronate at apex, margins entire, undulate, dark green, glabrous above, softly rusty grey tomentose below, 3-6 ribbed from base; petiole 2–4.5 cm long. Figs monoecious, axillary in pairs or clusters at ends of branches, globose or sub-globose, *c.* 9 mm across, creamy white or grey when mature, tinged with brown, tomentose, covered by basal bracts.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common along pathways, edges in the forest.

Specimen examined: Shivagiri, *Y. Mahesh* 011626 (BSID).

9. Ficus nervosa B. Heyne ex Roth in Nov. Pl. Sp. 388. 1821. King in Hook. f. Fl. Brit. India 5: 512. 1888 *p.p.*; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1364. 1928; Pull. & al., Fl. Andhra Pradesh 4: 1815. 2018. **(Plate 37E)** *'Vonjarchettu'*

Large evergreen trees, up to 35 m high; aerial roots absent; young branches appressed pubescent with white latex. Leaves alternate, elliptic or oblong-lanceolate, 9–18 cm long, narrowly cuneate or rounded at base, abruptly acuminate or shortly caudate at apex, margins revolute, entire or undulate, dark green above, pale below, shining, glabrous on both surfaces, 3-nerved from base; lateral nerves prominently raise and bullet in appearance; petiole up to 3 cm long. Figs monoecious, in axillary pairs or solitary, pedunculate, depressed globose, sub-globose or pyriform, *c.* 1.4 cm in diam., greenish-yellowish to orange red when ripe, smooth or slightly verrucose.

Fl.: & Fr.: Mar.–Nov.

Habitat: Occasional in hilly areas and along ghat roads in the forest.

Specimen examined: Maredumilli, Eruwada, *Y. Mahesh* 011535, 011563 (BSID).

10. Ficus racemosa L., Sp. Pl. 2: 1060. 1753; Pull. & al., Fl. Andhra Pradesh 4: 1817. 2018. *Ficus glomerata* Roxb., Pl. Coromandel 2: 13, t. 123. 1799; King in Hook. f., Fl. Brit. India 5: 535. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1364. 1928. *'Medi chettu''Paida'*

Tall deciduous trees, up to 28 m high, epiphytic when young; aerial roots absent; branches reddish-brown when young. Leaves alternate, elliptic-ovate or oblong-lanceolate, symmetric, 8–18 cm long, chartaceous, rounded-acute or obtuse at base, acute at apex, margins entire, dark green, shining above, pale dotted below, glabrous on both surfaces, 3-nerved from base, prominent below; petiole 2–4.5 cm long, glabrous. Figs monoecious, pedunculate, cauliflorous on trunk, on branches, in clusters on long racemes, sub-globose or sub-pyriform *c.* 3.5 cm in diam., pilose, red or orange when ripe.

Fl.: & Fr.: Almost throughout the year.

Habitat: Common along stream and river banks.

Specimen examined: Maredupudi, *Y. Mahesh* 010127, 010110 (BSID).

11. Ficus religiosa L., Sp. Pl. 2: 1059. 1753; King in Hook. f., Fl. Brit. India 5: 513. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1363. 1928; Rao & al., Fl. E. Godavari Dist. 647. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1818. 2018. *'Ravichettu'*

Large deciduous trees, up to 30 m high; trunk deeply furrowed, fluted, epiphytic when young; aerial roots absent; young parts puberulous. Leaves alternate, broadly ovate-suborbicular or cordate, 6–25 cm long, coriaceous, truncate or subcordate at base, caudate at apex with *c.* 6 cm long tail, margins entire or undulate, dark green, glaucous above, pale, minutely dotted below, glabrous on both surfaces, 5-nerves from base; petiole 4–8 cm long; stipules ovate, hairy. Figs monoecious, sessile, axillary, clustered or paired at ends of branchlets, depressed globose or sub-globose, *c.*1.3 cm across, smooth, green when young, dark purple when ripe; basal bracts 3, persistent.

Fl.: & Fr.: Mar.–Oct.

Habitat: Very common near villages and planted in temples premises.

Specimen examined: PK Valasa, *Y. Mahesh* 012132 (BSID).

Uses: It is a sacred, religious tree of Hindus.

12. Ficus rumphii Blume, Bijdr. Fl. Ned. Ind. 9: 437. 1825; King in Hook. f., Fl. Brit. India 5: 512. 1888; Pull. & al., Fl. Andhra Pradesh 4: 1819. 2018. *'Bodhi chettu'*

Large evergreen trees, up to 20 m high; aerial roots absent; branches glabrous. Leaves alternate, broadly ovate-elliptic, 6–16 cm long, sub-coriaceous, truncate or subcordate at base, acuminate or tapering at apex, margins undulate or entire, dark green, glaucous above, red when young, pale below, glabrous on both surfaces; lateral nerves 8-pairs from base; petiole 3–8 cm long; stipules ovate-lanceolate, glabrous. Figs monoecious, sessile, in axillary pairs or below the leaves on old leaf scars, globose or obovoid, *c.* 1.5–3 cm in diam., pale green with white dots when young, purple-black or yellow when ripe; basal bracts 3, rounded, concealed, hidden with base of figs.

Fl.: & Fr.: Throughout the year.

Habitat: Occasional in plains and along stream and river banks.

Specimen examined: Maredumilli, *Y. Mahesh* 011515 (BSID).

13. Ficus semicordata Buch.-Ham. ex J. E. Sm., Rees. Cyclop. 14: Ficus no. 71. 1810; Pull. & al., Fl. Andhra Pradesh 4: 1820. 2018. *Ficus cunia* Buch.-Ham. ex Roxb., Fl. Ind. 3: 561. 1832; King in Hook. f., Fl. Brit. India 5: 523. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1366. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 645. 1999. **(Plate 37F)** *'Bomma marri'*

Medium sized evergreen trees, up to 10 m high; areal roots absent; young branchlets pubescent. Leaves variable in shape, asymmetric, elliptic- oblong or lanceolate, 8–30 cm long, semi-sagittate one side, other cuneate, semicordate or semi-sagittate at base, forming subrotund lobes often covering petiole, acuminate or acute at apex, margins coarsely serrate, denticulate, subentire, subcoriaceous, scabrid, dark green above, densely pubescent, often scaberulous, pale below; secondary nerves 8–13 pairs, prominent below; petiole *c.* 1.8 cm long. Figs dioecious, pedunculate, subglobose or globose, pear shaped, *c.* 2 cm in diam., turbinate, binate, or in clusters on large leafless branches, dull reddish-brown when mature.

Fl.: & Fr.: Throughout the year

Habitat: Common along stream banks, moist areas and damp slopes in the forest.

Specimen examined: Kintukuru, *Y. Mahesh* 011464 (BSID).

14. Ficus tinctoria G. Forst. subsp. **gibbosa** (Blume) Corner in Gard. Bull. Singapore 17: 476. 1960; Pull. & al., Fl. Andhra Pradesh 4: 1822. 2018. *Ficus gibbosa* Blume, Bijdr. Fl. Ned. Ind. 9: 466. 1825; King, Ann. Roy. Bot. Gard. (Calcutta) 1: 4. t. 2. 1887 & in Hook. f., Fl. Brit. India 5: 497. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1365. 1928. *'Konda juvvi'*

Bushy, climbing shrubs, up to 7 m high; semi-epiphytic, enclosing the trunks of a tree with network of branches; areal roots absent; branches scaberulous. Leaves distichous, asymmetric, variable, rhomboid, gibbose, elliptic-ovate or oblanceolate, 4–15 cm long, coriaceous, obliquely rounded, truncate or cuneate at base, acute or obtuse

at apex, margins entire, often revolute, slightly lobed, hispid above, scabrid, tuberculate beneath; leaf-halves unequal, one half gibbose; petiole 1.4 cm long; stipules lanceolate, scaberulous. Figs dioecious, pedunculate; receptacles axillary, binate or solitary, in umbellate fascicles, *c.* 1.2 cm in diam., below the leaves, globose or subglobose, pyriform, yellowish-red when ripe.

Fl.: & Fr.: Feb.–May.

Habitat: Common in plains and open scrub forests.

Specimen examined: PK Valasa, *Y. Mahesh* 012112 (BSID).

15. Ficus virens Aiton, Hort. Kew. 3: 451. 1789; R.S. Rao & al., Fl. E. Godavari Dist. 648. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1826. 2018. *Ficus infectoria* Roxb., Fl. Ind. 3: 551. 1832. non Willd. 1806; King in Hook. f., Fl. Brit. India 5; 515. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1362. 1928. **(Plate 37G)** *'Bandajuvvi'*

Large, fast growing, deciduous trees, up to 18 m high; aerial roots few or absent; branches sparsely pubescent or glabrous. Leaves alternate, variable, ovate-oblong or elliptic-lanceolate, 6–13 cm long, subcoriaceous, rounded to cuneate or cordate at base, abruptly acuminate at apex, margins entire, undulate, dark green above, pale below, glabrous on both surfaces, 3-nerved from base, secondary nerves 10 pairs; petiole 3–9 cm long; stipules lanceolate, puberulous. Figs monoecious, pedunculate, in axillary pairs or solitary, *c.* 1–2 cm across, below the leaves, on spurs of old leaves, globose or subglobose, greenish-white with red dots, turning in to creamy white, glabrous, shining on surface.

Fl.: & Fr.: Sep.–Apr.

Habitat: Occasional in hilly areas and along stream banks.

Specimen examined: Jalatharingini, *Y. Mahesh* 012104 (BSID).

3. MACLURA Nutt.

India: 5 spp.; Andhra Pradesh: 1 sp.; PNP; 1 sp.

1. Maclura spinosa (Willd.) C.C. Berg, Proc. Kon. Ned. Akad. Wetensch. C 89(3): 245. 1986. *Plecospermum spinosum* (Roxb. ex Willd.) Trecul, Ann. Sci. Nat., Bot. (ser. 3) 8: 124. 1847; Hook. f., Fl. Brit India 5: 491. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1353. 1928; Pull. & al., Fl. Andhra Pradesh 4: 1829. 2018. *Trophis spinosa* Roxb. ex Willd., Sp. Pl. 4: 734. 1806. **(Plate 37H)** *'Kokintha chettu'*

A large, thorny straggling shrub, up to 3 m high; branches terete, drooping, pubescent when young; spines at leaf axils, stout, straight, slightly recurved, brown. Leaves alternate, obovate or lanceolate, 3–6 cm long, narrowed or acute at base, obtuse, shortly acute at apex, margins entire, dark green, glaucous above, glabrous on both surfaces; petiole up to 1.1 cm long. Flowers in axillary, aggregated groups of capitate clusters, greenish white.

Fl.: & Fr.: Mar.–Jul.

Habitat: Rare along pathways and edges of the forest.

Specimen examined: Peddaguduru, *Y. Mahesh* 011733 (BSID).

4. STREBLUS Lour.

India: 6 spp.; Andhra Pradesh: 2 spp.; PNP; 2 spp.

Key to the species

1a.	Branchlets not spiny; leaves rough, irregularly dentate along margins	**1. S. asper**
1b.	Branchlets spiny; leaves smooth, distantly serrate towards upper half	**2. S. taxoides**

1. Streblus asper Lour., Fl. Cochinch. 2: 615. 1790; Hook. f., Fl. Brit. India 5: 489. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1353. 1928; Pull. & al., Fl. Andhra Pradesh 4: 1830. 2018. **(Plate 37I)** *'Barranki', 'Pakki', 'Stianike'*

Small bushy tree, up to 6 m high; latex white watery, bark smooth, light grey, irregularly ribbed. Leaves elliptic-lanceolate or oblong-obovate, 5–10 cm long, coriaceous, cuneate at base, acute or blunt at apex, tapering into a point, irregularly serrate along margins; lateral nerves 4–6 pairs; petiole 4 mm long. Flowers dioecious. Male flowers pedicellate, axillary, in globose heads, greenish-yellow or creamy white. Female flowers in pairs or solitary on axillary, fascicled peduncles. Sepals large at maturity. Fruit ovoid-globose, *c.* 5.5 mm across, yellow, enclosed by sepals. Seed-1, rounded.

Fl.: & Fr.: Jan.–Apr.

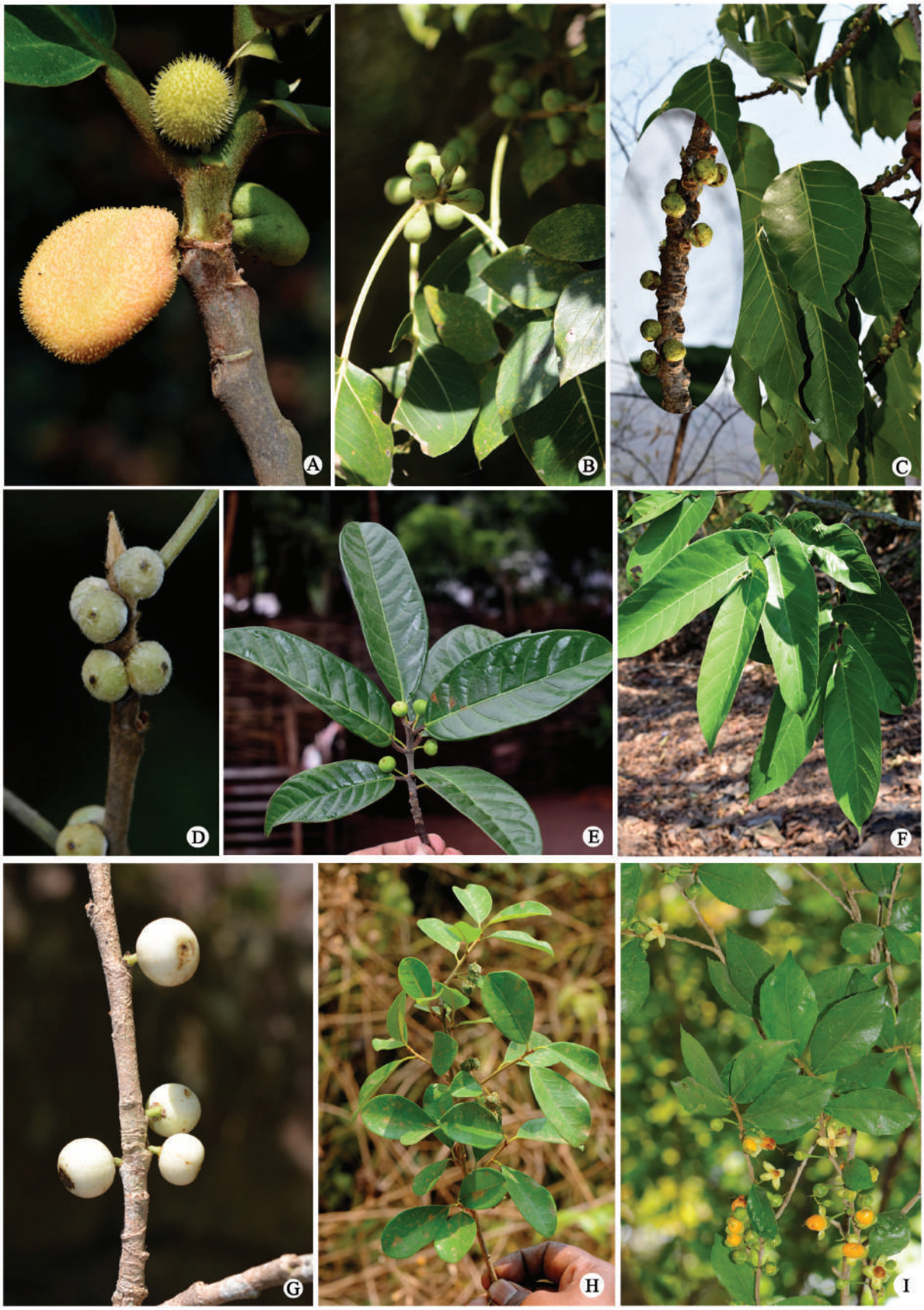


Plate 37: A. *Artocarpus lacucha* Buch.-Ham.; **B.** *Ficus amplissima* Sm.; **C.** *Ficus geniculata* Kurz; **D.** *Ficus mollis* Vahl; **E.** *Ficus nervosa* B. Heyne ex Roth; **F.** *Ficus semicordata* Buch.-Ham.ex Sm.; **G.** *Ficus virens* Aiton; **H.** *Maclura spinosa* (Willd.) C.C. Berg; **I.** *Streblus asper* Lour.

Habitat: Common in in deciduous forests.

Specimen examined: Pocharam, Kakeshnur, Kondamodalu, *Y. Mahesh* 010148, 011319, 011736 (BSID).

2. Streblus taxoides (B.Heyne ex Roth) Kurz., Forest Fl. Burma 2: 465. 1877; Pull. & al., Fl. Andhra Pradesh 4: 1830. 2018. *Trophis taxoides* B. Heyne ex Roth, Nov. Pl. Sp. 368. 1821. *Phyllochlamys spinosa* Bureau, Prodr. 17: 218. 1873; Hook. f., Fl. Brit. India 5: 488. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1352. 1928. *'Sukali, Barivenka'*

Small tree or shrub, up to 4 m high; branches glabrous, curved, ending with a spine; spines straight, strong. Leaves oblanceolate or elliptic-oblong, 2.5–7 cm long, obtuse-cuneate or acuminate at base, acuminate or blunt at apex, margins entire, distantly serrate towards upper half, glabrous on both surfaces; secondary nerves up to 10; petiole 3 mm long. Male flowers in axillary, aggregated, capitate clusters on short racemes, subsessile, brownish. Calyx lobes 4, lanceolate, hairy along margins; filaments exserted. Female flowers two together or solitary. Calyx same as male, enlarged in fruit. Drupe ovoid, *c.* 5 mm across, enclosed by foliaceous calyx.

Fl.: & Fr.: Mar.–Jul.

Habitat: Occasional along stream banks and forest paths.

Specimen examined: Maredumilli, *Y. Mahesh* 011517 (BSID).

45. URTICACEAE

India: 25 genera, 160 taxa; Andhra Pradesh: 11 genera, 18 spp.; PNP: 6 genera, 7 spp.

Key to the genera

1a.	Plants without stinging hairs	2
1b.	Plants with stinging hairs	**4. Laportea**
2b.	Herbs or undershrubs	3
2a.	Shrubs or trees	5
3a.	Flowers aggregate on a fleshy receptacle; stigma pencillate	**3. Elatostemma**
3b.	Flowers not aggregate on a fleshy receptacle	4
4a.	Flowers 4–5 merous; male flowers with 4 or 5 stamens	**6. Pouzolzia**
4b.	Flowers 2–3 merous; male flowers with 2 stamens	**5. Neodistemon**
5a.	Fruiting perianth fleshy; stigma pencillate, deciduous	**2. Debregeasia**
5b.	Fruiting perianth dry; stigma filiform, persistant	**1. Boehmeria**

1. BOEHMERIA Jacq.

India: 16 spp. & 5 var.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a. Leaves opposite; flowers in numerous clustered on axillary spikes	**2. B. virgata**
1b. Leaves alternate; flowers in single axillary clusters	**1. B. glomerulifera**

1. Boehmeria glomerulifera Miq., Syst. Verz. 101. 1854; Pull. & al., Fl. Andhra Pradesh 4: 1779. 2018. *Boehmeria malabarica* Wedd., Arch. Mus. Hist. Nat. 8: 350. 1856; Hook. f., Fl. Brit. India 5: 557. 1888; C.E.C. Fisch., Fl. Madras 3: 1987. 1928.

Erect undershrub, up to 1.5 m high; stems and branches terete, lenticellate, pubescent. Leaves alternate, ovate, 6–12 cm long, membranous, rounded or cordate at base, acute or acuminate at apex, margins serrate, scabrid with bulbous based hairs above, pubescent below, trinerved from base; petioles up to 4.5 cm long, pubescent. Flowers in sessile clusters, brownish-green. Male flowers: Perianth tubular, silky hairy without, 4-toothed. Female flowers: Ovary small, ovoid, surrounded by perianth.

Fl.: & Fr.: Aug.–Oct.

Habitat: Rare in shady places, moist localities and along pathways in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 012124 (BSID).

2. Boehmeria virgata (G.Forst.) Guill. var. **macrophylla** (Hornem.) Friis & Wilmot-Dear, Blumea 58: 159 2013. *Boehmeria macrophylla* Hornem., Hort. Bot. Hafn. 2: 890. 1815; Pull. & al., Fl. Andhra Pradesh 4: 1780. 2018. *Boehmeria platyphylla* D. Don, Prodr. Fl. Nepal. 60.1825; Hook. f., Fl. Brit. India 5: 578. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1387. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 650. 1999. **(Plate 38A)**

Moderate sized shrubs, up to 2 m high; branches terete, strigose. Leaves opposite, broadly ovate, 10–20 cm long, obliquely cordate or rounded at base, caudate or acuminate at apex, margins serrate, teeth large, sparsely hairy above, strigose below; petiole up to 10 cm long. Flowers in axillary, clustered spikes, greenish yellow, bracteate; bracts lanceolate, strigose without. Male flowers: perianth lobes 4, ovate, up to 1.6 mm long; stamens

4. Female flowers: on solitary spike. Perianth tubular, 4-toothed at top, up to *c.* 1.3 mm long; style short; stigma filiform, penicillate. Achenes ovoid, 1.2 mm long, glaucous.

Fl.: & Fr.: Oct.–Apr.

Habitat: Common in shady places and moist hilly areas.

Specimen examined: Valamuru, Maredumilli, *Y. Mahesh* 010504, 011519, (BSID).

2. DEBREGEASIA Gaudich.

India: 5 spp., 1 subsp. & 1 forma; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Debregeasia longifolia (Burm. f.) Wedd. in DC., Prodr. 16: 235. 1869; R.S. Rao & al., Fl. E. Godavari Dist. 650. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1781. 2018. *Urtica longifolia* Burm. f., Fl. Ind. 197. 1768. *Debregeasia velutina* Gaudich., Voy. Bonite, Bot. 3: t. 90. 1844; Hook. f., Fl. Brit. India 5: 590. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1389. 1928.*'Kerangi'*

Shrubs or small trees, up to 5 m high; branches slender, rough, with warty excrescences and scars of fallen leaves, reddish or purplish-brown. Leaves alternate, oblong-lanceolate or obovate, 8–15 cm long, rounded or acute at base, acuminate at apex, margins serrulate, pubescent above, ashy tomentose beneath; secondary nerves 4-8 pairs; petiole up to 3 cm long. Flowers in axillary, short, dichotomously branched, paniculate clusters. Male flowers small, 5.5 mm across, pedunculate; bracts triangular. Tepals 4, ovate, 2 mm long, connate at base. Stamens 4; filaments up to 4.5 mm long. Female flowers minute, 1 mm across, subsessile. Perianth tube fleshy, with 4-minute toothed mouth, *c.* 1 mm long. Ovary obovoid; stigma penicillate. Fruit yellow when ripe, edible.

Fl.: & Fr.: Dec.–Apr.

Habitat: Occasional near stream banks and moist localities in deciduous forests.

Specimen examined: Kakeshnur, *Y. Mahesh* 011334 (BSID).

3. ELATOSTEMA J.R. Forst. & G. Forst.

India: 40 spp. & 9 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Elatostema cuneatum Wight, Icon. Pl. Ind. Orient.6: 35, t. 2094. f. 3. 1853; Hook. f., Fl. Brit. India 5: 568. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1377. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 651. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1783. 2018. **(Plate 38B)**

A small, pubescent herbs, up to 10 cm high; stems rooting near base, branched, crispately pubescent. Leaves alternate, ovate-lanceolate, or obliquely rhomboid to obovate, 1.5–3.2 cm long, falcate, many cystoliths above, cuneate at base, subacute-obtuse or rounded at apex, margins dentate-crenate; petiole very short. Flowers sessile, white, in axillary heads, on aggregate, fleshy receptacle. Achenes ellipsoid, yellow.

Fl.: & Fr.: Aug.–Nov.

Habitat: Occasionally growing on moist rocky crevices in association with Gesneriaceae members.

Specimen examined: Ijjaluru, *Y. Mahesh* 010960 (BSID).

4. LAPORTEA Gaudich.

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Laportea interrupta (L.) Chew in Gard. Bull. Singapore 21: 200. 1965. *Urtica interrupta* L., Sp. Pl. 2: 985. 1753. *Fleurya interrupta* (L.) Gaudich., Voy. Uranie, Bot. 497. 1830; Hook. f., Fl. Brit. India 5: 548. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1372. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 652. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1783. 2018. **(Plate 38C)**

An annual, erect herb, up to 55 cm high; stems and branches furrowed, covered with stinging hairs. Leaves ovate-elliptic or cordate, 3–7.5 cm long, trinerved from base, membranous, rounded or abruptly cuneate at base, acuminate at apex, margins serrate or dentate, lateral nerves 5-pairs, short stinging hairs on both surfaces, cystoliths arranged along veins above, botuliform; petiole 5 cm long. Flowers in long interrupted axillary racemes, small, whish-green, sparsely covered with minute stinging hairs. Male flowers pedicellate. Perianth lobes 4, obovate, connate. Stamens 4. Female flowers short pedicellate. Perianth lobes 4, free, ovate, 1.5 mm long. Ovary triangular; stigma reflexed. Fruit achene, minute, heart shaped or triangular, *c.* 1.6 mm long, compressed, straw coloured.

Fl.: & Fr.: Sep.–Dec.

Habitat: Frequently found along moist shady places.

Specimen examined: GM Valasa, *Y. Mahesh* 010482 (BSID).

Field notes: Whole plant covered with stinging hairs which causes itching when we contact the plant.

5. NEODISTEMON Babu & A.N. Henry

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Neodistemon indicus (Wedd.) Babu & Henry in Taxon 19: 651. 1970; R.S. Rao & al., Fl. E. Godavari Dist. 651. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1786. 2018. *Distemon indicum* Wedd. in Arch. Mus. Hist. Nat. 9: 551. 1856 & in Arch. Mus. Hist. Nat. Paris 9: 551. t. 20A. 1857; Hook. f., Fl. Brit. India 5: 588. 1888. **(Plate 38D)**

A slender, erect herbs, up to 30 cm long; stems terete, zig-zag. Leaves ovate, 7.5 cm long, cuneate at base, acute-acuminate at apex, margins coarsely dentate or serrate; petiole slender, short. Flowers in erect spikes of leaf axils, unisexual, 2-3 merous. Male and female flowers in same axils. Stamens 2. Achenes short, beaked.

Fl.: & Fr.: Jul.–Oct.

Habitat: Shady moist localities and in huge rocky boulder crevices along streams.

Specimen examined: Kondamodalu, *Y. Mahesh* 011484 (BSID).

6. POUZOLZIA Gaudich.

India: 5 spp. & 1 var.; Andhra Pradesh: 4 sp.; PNP: 1 sp.

1. Pouzolzia zeylanica (L.) Benn., Pl. Jav. Rar. 1: 67. 1838; R.S. Rao & al., Fl. E. Godavari Dist. 654. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1791. 2018. *Parietaria zeylanica* L., Sp. Pl. 2: 1052. 1753. *Pouzolzia indica* Gaud., Voy. Bot. 503. 1826; Hook. f., Fl. Brit. India 5: 581. 1888; C.E.C. Fisch. in Gamble, Fl. Madras 3: 1382. 1928. **(Plate 38E)**

An erect, branched herbs, up to 80 cm high; stems weak, obscurely 4-angled, grooved, hirsute. Leaves very variable, ovate-lanceolate, 3–5 cm long, mostly on the upper part of the stem, gradually reducing in size, trinerved from base, rounded at base, acute or acuminate at apex, margins entire, ciliolate, glabrous above, pilose below; petiole up to 5 mm long. Flowers in axillary clusters, monoecious, 4–5 merous, whitish-green; bracts ovate-caudate, scarious, ciliate along margins. Perianth in males 5 lobed, free, linear-oblong, 1.5 mm long, concave; in females tubular, pubescent, lobes 4, 1.2 mm long. Stamens 5. Ovary short; style filiform. Achenes broadly ovoid, *c.* 1.4 mm long, shining, enclosed in persistent perianth.

Fl.: & Fr.: Feb.–Aug.

Habitat: Common weed in cultivated fields, moist shady localities and forest edges.

Specimen examined: Teliperu, *Y. Mahesh* 011473 (BSID).

46. CUCURBITACEAE

India: 32 genera, 109 taxa; Andhra Pradesh: 16 genera, 41 spp.; PNP: 8 genera, 11 spp.

Key to the genera

1a.	Anther-loculi erect or slightly flexuose.	**7. Solena**
1b.	Anther-loculi flexuose, sigmoid.	2
2a.	Corolla divided less than half way down.	**3. Coccinia**
2b.	Corolla 5-partite to the base or 5-petalous	3
3a.	Plants fimbriate	**8. Trichosanthes**
3b.	Plants not fimbriate	4
4a.	Stamens inserted at the mouth of calyx tube	**1. Benincasa**
4b.	Stamens inserted below the mouth of calyx tube	5
5a.	Corolla pale yellow or green	6
5b.	Corolla white.	**5. Lagenaria**
6a.	Calyx with 2-3 scales at base	**6. Memordica**
6b.	Calyx not as above	7
7a.	Connective produced beyond anther loculi	**4. Cucumis**
7b.	Connective not produced beyond anther loculi	**2. Citrullus**

1. BENINCASA Savi

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Benincasa hispida (Thunb.) Cogn. in DC., Monog. Phan. 3: 513. 1881; R.S. Rao & al., E. Godavari Dist. 380.

1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 776. 2018. *Cucurbita hispida* Thunb., Nov. Acta Regiac Soc. Sci. Upsal. 4: 38. 1783. *Benincasa cerifera* Savi, Bibl. Ital. 9. 158. 1818; C.B. Clarke in Hook. f., Fl. Brit. India 2: 616. 1879. *'Budidha gummadi'*

Large climbers, stem much branched; branches softly hairy; tendrils slender, bifid, filiform. Leaves reniform, 12–22 cm long, cordate at base, with small angular lobes, lobes 5–7, margins dentate or sinuate, scabrous above, hispid beneath. Flowers solitary, yellow. Male flowers 6–14 cm long. Calyx campanulate, lobes 5, connate, ovate-lanceolate, 1.1 cm long. Corolla 5-partite, lobes obovate. Stamens 3; filaments linear, slender. Female flowers 3.5 cm long, with hairy ovary; stigmas 3, fluxose. Fruits oblong, covered with waxy bloom.

Fl.: & Fr.: Jun.–Nov.

Habitat: Cultivated near villages and backyards of residences for its fruits.

Specimen examined: Kintukuru, *Y. Mahesh* 011411 (BSID).

2. CITRULLUS Schrad. ex Eckl. & Zeyh.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Citrullus colocynthis (L.) Schrad., Linnaea 12: 414. 1838; C.B. Clarke in Hook. f., Fl. Brit. India 2: 620. 1879; Gamble, Fl. Madras 1: 536. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 375. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 778. 2018. *Cucumis colocynthis* L., Sp. Pl. 2: 1011. 1753. *'Erripuchha'*

Trailing scabrid herb; branches hirsute; tendrils simple or 2-fid. Leaves alternate, ovate, pinnatifid, triangular or ovate, 8–20 cm long, deeply 5–7 lobed, rigid, lobes hirsute, cordate at base, obtuse, margins crisped, dark green, rough above, pale, bristly beneath. Flowers monoecious, axillary, solitary, pale yellow. Male flowers 1.4 cm long. Calyx tube hairy; lobes lanceolate, acute. Petals spreading, ending with point. Stamens short; filaments inflated. Female flowers with pubescent ovary. Fruit globose, *c.* 6 cm long, striped greenish-white when young, yellow when ripe. Seeds oblong, yellowish-brown.

Fl.: & Fr.: Aug.–Nov.

Habitat: Common along Godavari River beds and sandy soils.

Specimen examined: Manturu, *Y. Mahesh* 011707 (BSID).

3. COCCINIA Wight & Arn.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Coccinia grandis (L.) Voigt, Hort. Suburb. Calc. 59. 1845; R.S. Rao & al., Fl. E. Godavari Dist. 376. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 780. 2018. *Bryonia grandis* L., Mant. Pl. 126. 1767. *Cephalandra indica* Naudin, Ann. Sci. Nat., Bot. ser. 5, 5: 16. 1866; C. B. Clarke in Hook. f., Fl. Brit. India 2: 621. 1879. *'Kaki donda'*

A perennial, climbing herb; tendrils simple, slender; branches rigid. Leaves alternate, simple, palmately 3–5 lobed, 5–10 cm long, chartaceous, cordate at base, obtuse at apex, margins denticulate, punctuate above, often with glands on the lower surface near midrib; petiole 5 cm long. Flowers dioecious, white. Male flowers fascicled, solitary, 1.5 cm across. Corolla campanulate, lobes 1.5 cm long. Female solitary, up to 3 cm across. Fruit berry, cylindrical, ovoid-oblong, *c.* 3.5 cm long, rounded at both ends, green with white stripes, deep red when ripe. Seeds ovoid, flat.

Fl.: & Fr.: Throughout the year.

Habitat: Common over hedges in scrub jungles and roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

4. CUCUMIS L.

India: 12 spp.; Andhra Pradesh: 7 spp.; PNP: 3 sp.

Key to the species

1a.	Connectives apically uncrested	**1. C. madraspatanus**
1b.	Connectives apically crested	2
2a.	Ovary hispidulous; young fruits tuberculate	**3. C. sativus**
2b.	Ovary softly hairy; young fruits not tuberculate	**2. C. melo**

1. Cucumis maderaspatanus L., Sp. Pl. 2: 1012. 1753; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 784. 2018. *Melothria maderaspatana* (L.) Cogn. in DC., Mon. Phan. 3: 623. 1881; Gamble, Fl. Madras 1: 539. 1919. *Mukia*

scabrella (L.f.) Arn., in Hook. J. Bot. 3: 276. 1841; C.B. Clarke in Hook. f., Fl. Brit. India 2: 623. 1879. **(Plate 38F)**

Annual climbing or prostrate herbs; branches terete, scabrid hairy. Leaves alternate, ovate or deltoid, angular, 3.5–5.5 cm long, lobed, cordate at base, acuminate, mucronate at apex, margins denticulate, scabrid above, hairy beneath; petiole 3.5 cm long. Flowers monoecious, pale yellow. Male flowers pedicellate, 5.5 mm across. Calyx tube minute, 3 mm long, hairy; lobes short, linear. Petals ovate, 3 mm long. Stamens 3; filaments minute. Female flowers sessile, solitary or in clusters. Ovary villous; style short. Fruits spherical, *c.* 1 cm broad, glabrous. Seeds oblong, greyish-black.

Fl.: & Fr.: Aug.–Nov.

Habitat: Common along open moist localities, stream hedges and cultivated fields.

Specimen examined: Tekuru, Eruwada, *Y. Mahesh* 010667, 011635 (BSID).

2. Cucumis melo L., Sp. Pl. 2: 1011. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 620. 1879; Gamble, Fl. Madras 1: 535. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 381. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 786. 2018. *'Teepipuccha'*

Annual, procumbent climber. Leaves suborbicular, 8 cm long, 5-lobed, scabrous on both surfaces, cordate at base, apex obtuse, margins denticulate. Male flowers pendulous; calyx tube campanulate, lobes subulate; corolla lobes ovate, acute. Female flowers solitary; corolla yellow; ovary hairy. Fruits berry, ellipsoid, spherical, smooth, yellow with age.

Fl.: & Fr.: Jan.–May.

Habitat: Cultivated on sandy beds for its edible fruits.

Specimen examined: Gulletiwada, *Y. Mahesh* 010596 (BSID).

3. Cucumis sativus L., Sp. Pl. 2: 1012. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 630. 1879; Gamble, Fl. Madras 1: 535. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 381. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 787. 2018. *'Dosakaya'*

Scabrous climbing herb. Leaves broadly cordate-ovate, 5-lobed, 15 cm, 5-7 nerved, softly hairy. Male flowers fasciculate; calyx tube campanulate, hairy, lobes subulate; corolla lobes acute. Female flowers solitary. Ovary muricate, hairy. Fruits oblong, pericarp green, yellow when ripen, glabrous.

Fl.: & Fr.: Throughout the year.

Habitat: Cultivated for its edible fruits.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

5. LAGENARIA Ser.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Lagenaria siceraria (Molina) Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 3: 435. 1930; R.S. Rao & al., Fl. E. Godavari Dist. 382. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 794. 2018. *Cucurbita siceraria* Molina, Sag. Stor. Nat. Chili 133. 1782. *Lagenaria vulgaris* Ser., Mem. Soc. Phys. Geneve 3: 25. 1825; C.B. Clarke in Hook. f., Fl. Brit. India 3: 613. 1879. *'Sorakaya'*

Annual climbing herb, softly pubescent. Leaves suborbicular, cordate, shortly trilobed, 5-nerved, apex acute; tendril bifid. Flowers solitary, white. Male flowers with long peduncule; calyx campanulate; sepals 5; petals 5, oblong, free; stamens 3. Female flowers with cup shaped calyx; staminodes 3; ovary cylindric. Fruit indehiscent, fleshy, oblong, greenish yellow; seeds numerous.

Fl.: & Fr.: Jul.–Jan.

Habitat: Cultivated near houses and backyards for its fruits.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. MOMORDICA L.

India: 8 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Momordica charantia L., Sp. Pl. 2: 1009. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 616. 1879; Gamble, Fl. Madras 1: 532. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 382. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 798. 2018. *'Kakarakaya'*

Annual climber; branches many, grooved, pubescent; tendrils simple. Leaves 7-lobed, orbicular, 6 cm long, palmately 3-7 lobed, cordate at base, apex obtuse, margins denticulate. Flowers yellow, monoecious; bracts reniform. Male flowers yellow, corolla campanulate. Stamens 3. Female flowers solitary. Ovary oblong. Fruits beaked, ribbed, orange at maturity, covered with tubercles. Seeds covered by pulp.

Fl.: & Fr.: Throughout the year.

Habitat: Cultivated for its fruits as vegetables.

Specimen examined: Koida, Kintukuru, *Y. Mahesh* 011359, 011416 (BSID).

7. SOLENA Lour.

India: 3 spp. & 1 subsp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Solena amplexicaulis (Lam.) Gandhi, Fl. Hassan Dist. 179. 1976; R.S. Rao & al., Fl. E. Godavari Dist. 379. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 799. 2018. *Bryonia amplexicaulis* Lam., Encycl. 1: 496. 1785. **(Plate 38G)** *'Adavidonda'*

A slender, climbing herb; branches grooved, glabrous. Leaves alternate, polymorphic, ovate-deltoid or orbicular, 5–9 cm long, 3–5-lobed, hastate, often clasping, cordate, amplexicaul at base, obtuse at apex, margins entire or remotely denticulate. Flowers axillary, small, yellowish-white. Staminate flowers in short corymbs, 6 mm across. Calyx tube short, 4 mm long, glabrous; lobes triangular. Corolla campanulate, lobes 5, oblong, 3 mm long, white. Stamens 3; filaments distant, glabrous. Pistillate flowers solitary. Corolla yellow or creamy white. Ovary short, rostrate at apex. Fruit a pepo, ellipsoid, sub-globose, smooth or distinctly ribbed, red with yellow spots. Seeds few, white, sub-globose, compressed.

Fl.: & Fr.: Sep.–Jan.

Habitat: Occasional in grasslands on hill tops and open waste lands.

Specimen examined: Valamuru, *Y. Mahesh* 010501 (BSID).

8. TRICHOSANTHES L.

India: 23 spp.; Andhra Pradesh: 10 spp.; PNP: 2 sp.

Key to the species

1a.	Male racemes with large bracts	2. **T. tricuspidata**
1b.	Male racemes with minute bracts	1. **T. Cucumerina**

1. Trichosanthes cucumerina L., Sp. Pl. 2: 1008. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 609. 1879; Gamble, Fl. Madras 1: 529. 1919; R.S. Rao *& al.*, Fl. E. Godavari Dist. 379. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 803. 2018. *Trichosanthes anguina* L. Sp. Pl. 1008. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 610. 1919. *'Potlakaya'*

A climbing herb; branches sulcate, pubescent with branched tendrils. Leaves reniform, orbicular, 8 cm long, membranous, glandular pubescent below, cordate at base, apex acute, margins denticulate. Male Flowers in racemes. Female flower solitary. Fruits long, glabrous, striped.

Fl.: & Fr.: Jun.–Aug.

Habitat: Cultivated for its long fruits which is used as vegetables.

Specimen examined: Kondamodalu, *Y. Mahesh* 011449 (BSID).

2. Trichosanthes tricuspidata Lour., Fl. Cochinch. 2: 589. 1790; R.S. Rao & al., Fl. E. Godavari Dist. 380. 1999; Runner & Pandey in PhytoKeys 20: 97. 2013; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 804. 2018. *Trichosanthes palmata* Roxb., Fl. Ind. 3: 704. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 2: 606; Gamble, Fl. Madras 1: 529. 1919. **(Plate 38H)**

Robust, woody climbers; tendrils 3-cleft. Leaves alternate, polymorphic, 3–7 lobed; lobes oblong-elliptic, 6–15 cm long, coriaceous, cordate at base, acute-acuminate, apiculate at apex, margins entire, scabrid, glands above, smooth below; petiole up to 4 cm long. Flowers axillary, white. Male flowers in axillary racemes, up to 10 flowered, pedunculate; pedicels up to 5 mm long. Calyx tube 2.8 cm long, glabrous; lobes lanceolate, 1.4 cm long. Petals ovate, lacinate, 2.1 cm long, fimbriate on margins. Stamens 3; filaments short, long cells of anthers winding upwards and downwards on the back of connective. Female flowers axillary, solitary. Calyx tube 1.5 cm long. Corolla tube 4 cm long, limbs involute, fimbriate. Fruit globose, *c.* 6 cm long, red when ripe, with 10 orange streaks. Seeds many, ellipsoid.

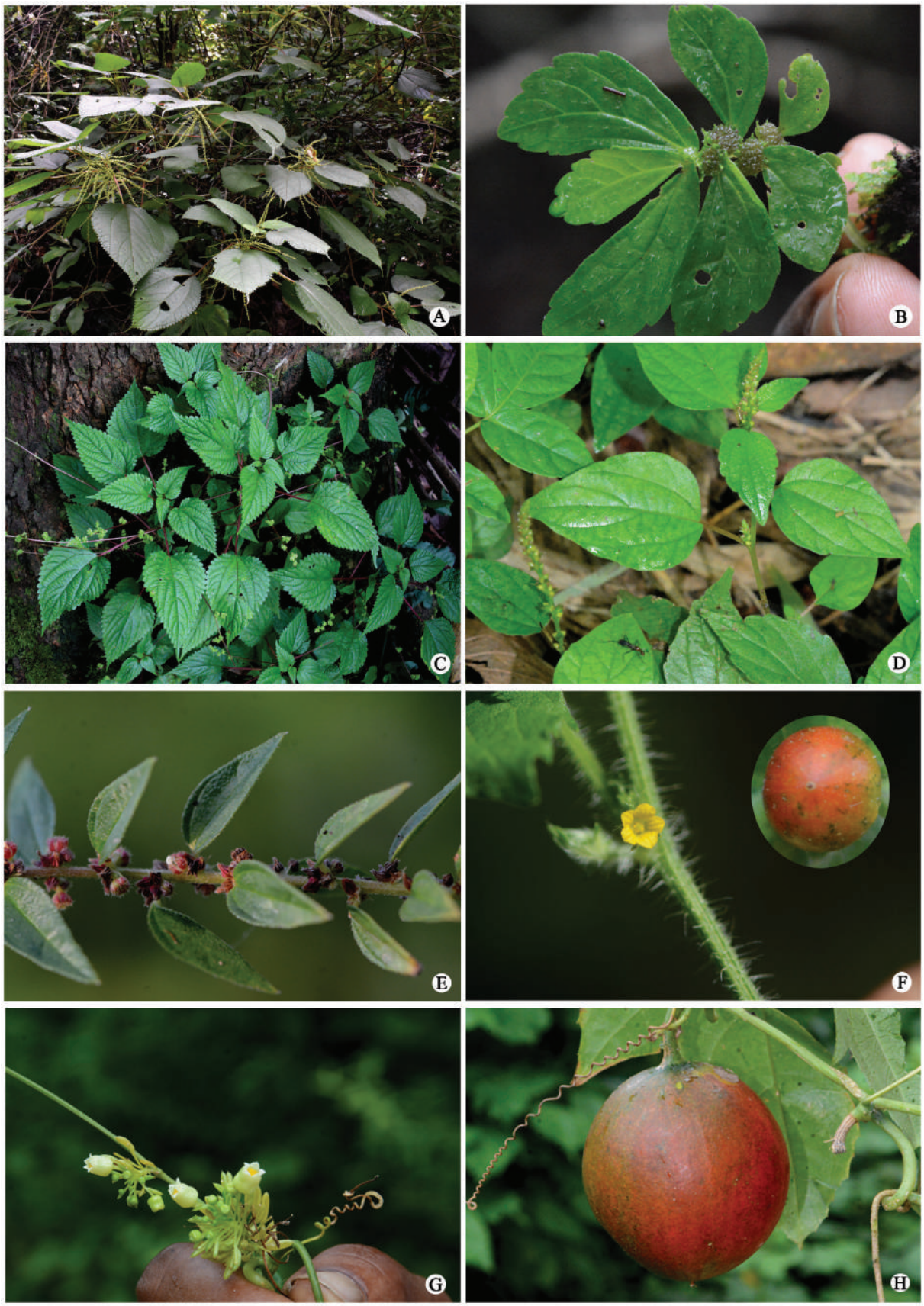


Plate 38: A. *Boehmeria virgata* var. *macrophylla* Friis & Wilmot-Dear; **B.** *Elatostema cuneatum* Wight; **C.** *Laportea interrupta* (L.) Chew; **D.** *Neodistemon indicus* Babu & A.N. Henry; **E.** *Pouzolzia zeylanica* (L.) Benn.; **F.** *Cucumis maderaspatanus* L.; **G.** *Solena amplexicaulis* (Lam.) Gandhi; **H.** *Trichosanthes tricuspidata* Lour.

Fl.: & Fr.: Jul.–Dec.

Habitat: Occasional along roadside in open forest and hilly areas.

Specimen examined: Kintukuru, *Y. Mahesh* 011431 (BSID).

47. BEGONIACEAE

India: 1 genus, 74 taxa; Andhra Pradesh: 1 genus, 2 spp.; PNP: 1 genus, 1 sp.

1. BEGONIA L.

India: 72 spp. & 2 infraspecific; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Begonia picta Sm., Exot. Bot. 2: 81, t. 101. 1806; C. B. Clarke in Hook. f., Fl. Brit. India 2: 638; 1979; Gamble, Fl. Madras 1: 545. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 384. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 808. 2018. **(Plate 39A)**

A slender, delicate herb, up to 45 cm high, hairy; stem succulent, hairy. Leaves broadly ovate, 5–12 cm long, first leaf radical, often slightly lobed, subequally cordate at base, acuminate at apex, margins dentate, whole leaf thickly hairy, upper surface rough due to tubercle-based hairs, sparsely hairy on nerves below; petiole up to 5 cm long. Flowers on long peduncle, light pinkish or rose, divide above in to dichotomous cymes. Male and female flowers on separate showy inflorescence. Male flowers 2 cm long, pink; tepals 4; stamens numerous, monodelphous, yellow. Female flowers: petals 5, 2.1 cm long; ovary trilocular. Capsule 2.5 cm long, 3-winged, one wing obsolete.

Fl.: & Fr.: Aug.–Dec.

Habitat: Common on rocky cervices of the hills and higher elevations in the forest.

Specimen examined: Thummalakonda, Valamuru, *Y. Mahesh* 010475, 010910 (BSID).

48. CELASTRACEAE

India: 13 genera, 90 taxa; Andhra Pradesh: 9 genera, 14 spp.; PNP: 5 genera, 5 spp.

Key to the genera

1a.	Leaves alternate	2
1b.	Leaves opposite or sub opposite	3
2a.	Erect armed shrubs with spines	**4. Gymnosporia**
2b.	Scandent unarmed shrubs	**1. Celastrus**
3a.	Fruit indehiscent; ovary 1-3 celled	4
3b.	Fruit dehiscent; ovary 4 -5 celled	**3. Euonymus**
4a.	Leaves entire; disc flat; seeds arillate	**5. Pleurostylia**
4b.	Leaves crenate-serrate; disc cupular; seeds exarillate	**2. Elaeodendron**

1. CELASTRUS L.

India: 7 spp. & 1 subsp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Celastrus paniculatus Willd., Sp. Pl., ed. 4, 1: 1125. 1798; Lawson in Hook. f., Fl. Brit. India 1: 617. 1875; Gamble. Fl. Madras 1: 208. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 262. 1999; Pull. & al., Fl. Andhra Pradesh 1: 342. 2018. **(Plate 39B)**

A woody, scandent, climbing shrub; young branchlets pubescent. Leaves alternate, elliptic-oblong or obovate-suborbicular, 4–6 cm long, attenuate at base, shortly acuminate at apex, margins entire at base, serrate at apex, glabrous; petiole up to 1.1 cm long, glabrous. Flowers in terminal paniculate cymes, polygamous, 4 mm across, pedunculate, greenish yellow; bracts small, lanceolate. Male flowers: Sepals 5, connate at base, pubescent, lobes rounded, 2 mm long. Petals 5, oblong-obovate. 3 mm long. Stamens 5; filaments glabrous. Female flowers: Sepals and petals same as male flowers. Ovary sessile, columnar, 3-lobed, seated on globose disk; style columnar. Capsule globose, *c.* 1 cm across, yellowish orange at maturity, 3-valved, apiculate. Seeds 2, ellipsoid, brown, enclosed in aril.

Fl.: & Fr.: Apr.–Dec.

Habitat: Common in dry deciduous forests of the National Park.

Specimen examined: Koida, PK Valasa, Kondamodalu, *Y. Mahesh* 010188, 010989, 011481 (BSID).

2. ELAEODENDRON Jacq.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Elaeodendron glaucum (Rottb.) Pers., Syn. Pl. 1: 241. 1805. *Mangifera glauca* Rottb. in Nye Saml. Vid. Selsk. Skr. 2: 534. t. 4.f. 1. 1783. *Cassine glauca* (Rottb.) Kuntze, Revis. Gen. Pl. 1: 114. 1891; R.S. Rao & al., Fl. E. Godavari Dist. 261. 1999. *Cassine paniculata* (Wight & Arn.) Lobr. Callen, Adansonia Ser. 2: 15. 220. 1975; Pull. & al., Fl. Andhra Pradesh 1: 341. 2018. *Elaeodendron paniculatum* Wight & Arn., Prodr. Fl. Ind. Orient. 157. 1834. **(Plate 39C)** *'Nirichi', 'Butankish'*

Medium sized trees, up to 8 m high; branches spreading, reddish, glabrous. Leaves opposite, ovate-oblong or elliptic, 6–9 cm long, coriaceous, obtuse at base, acute-shortly acuminate at apex, margins crenate-serrate, glabrous; petiole 1 cm long. Flowers in axillary, dichotomously branched, corymbose cymes, 0.4 cm long, pedunculate, greenish-yellow. Sepals 5, connate at base, lobes unequal, orbicular, 0.2 cm long. Petals 5, obovate, spathulate, 0.5 cm long, membranous at margins. Stamens 5, arising from lobes of fleshy cupular disk; filaments short. Ovary pyramidal, trigonous, seated on disc. Drupe obovoid, 1.2 cm long, apiculate. Seed -1, exarillate.

Fl.: & Fr.: May–Nov.

Habitat: Occasional on hill slopes in the forest.

Specimen examined: Kondamodalu, *Y. Mahesh* 011465 (BSID).

Field notes: Ripen fruits are edible.

3. EUONYMUS L.

India: 30 spp., 1 subsp. & 4 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Euonymus glaber Roxb., Hort. Bengal. 86. 1814 nom. nud. & Fl. Ind. 1: 628. 1820; Lawson in Hook. f., Fl. Brit. India 1: 609. 1875; R.S. Rao & al., Fl. E. Godavari Dist. 262. 1999; Pull. & al., Fl. Andhra Pradesh 1: 342. 2018. *'Nallakakidi*

Medium sized trees, up to 8 m high. Leaves opposite, elliptic-oblong, 3.5–6 cm long, chartaceous, cuneate at base, acute at apex, margins serrate, glabrous on both surfaces; petiole 1.1 cm long. Flowers in dichotomously branched, peduncled cymes, shortly pedunculate, greenish yellow. Sepals 5, connate at base; lobes very short, unequal, orbicular. Petals 5, ovate-obovate. Stamens 5; filaments short. Ovary trigonous; stigma entire. Fruit a loculicidal capsule, obovoid, 5-celled, apiculate, dehiscent, 4-angled, grooved. Seeds yellowish-orange.

Fl.: & Fr.: Apr.–Jul.

Habitat: Occasional along ghats in the forest and hilly areas.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

4. GYMNOSPORIA (Wight & Arn.) Hook. f.

India: 16 spp. & 2 var.; Andhra Pradesh: 5 spp.; PNP: 1 sp.

1. Gymnosporia emarginata (Willd.) Thwaites, Enum. Pl. Zeyl. 409. 1864; Lawson in Hook. f., Fl. Brit. India 1: 621. 1875; Gamble, Fl. Madras 1: 210. 1918. *Celastrus emarginatus* Willd., Sp. Pl., ed. 4. 1: 1128. 1798. *Maytenus emarginata* (Willd.) Ding Hou in Steenis, Fl. Males. Ser. 1. (6): 241. 1962; Pull. & al., Fl. Andhra Pradesh 1: 345. 2018. *'Danti', 'Goddalichippa'*

Large shrubs or small trees, up to 5 m high; branches greyish-brown or light pink, crooked, shallowly, longitudinally fluted, unarmed. Leaves alternate or subopposite, obovate-spathulate, 3–7 cm long, coriaceous, attenuate at base, rounded or emarginate at apex, margins crenulate, glabrous; petiole 5 mm long. Flowers in axillary, dichotomously branched fascicles or cymes, 4 mm across, white, pedicellate. Sepals 5, connate at base; lobes rounded, 0.7 mm long. Petals oblong or ovate, 3 mm long, entire. Stamens 5; filaments dilated at base. Ovary globose, faintly trilobed. Capsule subglobose, *c.* 1.2 cm long, 3-valved, purple. Seeds arillate.

Fl.: & Fr.: Oct.–Feb.

Habitat: Frequent in open places of dry thorny forests.

Specimen examined: Geediguppa, *Y. Mahesh* 010152 (BSID).

5. PLEUROSTYLIA Wight & Arn.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pleurostylia opposita (Wall. ex Carey) Alston in Trimen, Handb. Fl. Ceylon 6: 48. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 263. 1999; Pull. & al., Fl. Andhra Pradesh 1: 347. 2018. *Celastrus oppositus* Wall. in Roxb., Fl. Ind. 2: 398. 1824. *Pleurostylia wightii* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 157. 1834; Lawson in Hook. f., Fl. Brit. India 1: 617. 1875; Gamble, Fl. Madras 1: 211. 1918. **(Plate 39D)** *'Kunticinta'*

Shrubs or small trees, up to 10 m high; branchlets obscurely 4-angled or subterete. Leaves opposite, ovate-obovate or oblong, 3–6 cm long, coriaceous, attenuate or cuneate at base, obtuse or acute at apex, margins entire, glabrous; petiole 3 mm long. Flowers few, in axillary cymes, shortly pedicelled, green. Calyx campanulate; lobes short, rounded or subreniform, 1 mm long. Petals elliptic-ovate, 2.5 mm long, obtuse or shortly acute. Stamens short; filaments subulate, fleshy, attached to the flat disc. Ovary flask shaped, adnate to the disk. Drupe ellipsoid, *c.* 7 mm long, white, indehiscent. Seed 1, arillate.

Fl.: & Fr.: Mar.–Oct.

Habitat: Occasional in hilly areas in the forest.

Specimen examined: Pochavaram, *Y. Mahesh* 011571 (BSID).

49. OXALIDACEAE

India: 2 genera, 23 taxa; Andhra Pradesh: 2 genera, 6 spp., 1var.; PNP: 2 genera, 4 spp.

Key to the genera

1a.	Erect herb; leaves pinnate, leaflets 6-15 pairs; fruit ellipsoid, not exceeding the persistent calyx	**1. Biophytum**
1b.	Diffuse herb; leaves digitate, 3-foliate, obcordate; fruit cylindric, far exceeding persistent calyx	**2. Oxalis**

1. BIOPHYTUM DC.

India: 12 spp. & 1 var.; Andhra Pradesh: 4 spp.; PNP: 3 spp.

Key to the species

1a.	Leaflets conspicuously nerved beneath	**1. B. nervifolium**
1b.	Leaflets not conspicuously nerved beneath	2
2a.	Condensed stout, erect herb; sepals as long as petals and longer than capsules	**3. B. sensitivum**
2b.	Long erect herb; sepals about half as long as petals and as or shorter than capsules	**2. B. reinwardtii**

1. Biophytum nervifolium Thwaites, Enum. Pl. Zeyl. 64. 1858; Pull. & al., Fl. Andhra Pradesh 1: 275. 2018. *Biophytum sensitivum* DC. var. *nervifolium* (Thwaites) Edgew. & Hook. f. in Hook. f., Fl. Brit. India 1: 437. 1874. *'Attapatthi', 'Jalapushpi'*

Small unbranched, annual herbs, up to 20 cm high; stem terete. Leaves radical, 4-11 cm long, paripinnate; leaflets 10-pairs, oblong-obovate, 0.9–1.3 cm long, largest pair at the end, truncate at base, apiculate at apex, margins entire, conspicuously nerved beneath, glabrous. Flowers in terminal, umbellate clusters, crowded at ends of the peduncle, shortly pedicelled, yellow, tinged with red. Sepals 5, linear-lanceolate. Petals 5, oblanceolate, attenuate near base, obtuse, entire, with a red midnerve. Ovary 3 mm long; style hairy. Capsule ellipsoid or oblong, *c.* 5 mm long, apiculate, glabrous. Seeds brown.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common along moist shady localities and as a weed in cultivated fields.

Specimen examined: PK Valasa, *Y. Mahesh* 012138 (BSID).

2. Biophytum reinwardtii (Zucc.) Klotzsch, Naturw. Reise Mossamb. Bot. 1: 85. 1861; Edgew. & Hook. f. in Hook. f., Fl. Brit. India 1: 437. 1874; Gamble, Fl. Madras 1: 133. 1915; Pull. & al., Fl. Andhra Pradesh 1: 276. 2018. *Oxalis reinwardtii* Zucc., Abh. Math. Phys. Cl. Koenifgl. Bayer. Akad. Wiss. 1: 274. 1831. *Biophytum candolleanum* Wight, Ill. 1: 161, t. 62. 1840; R.S. Rao & al., Fl. E. Godavari Dist. 244. 1999. **(Plate 39E)**

Unbranched, erect, long herbs, up to 16 cm high; stems reddish with deflexed strigose hairy. Leaves thin, paripinnate, up to 8 cm long; leaflets up to 7-pairs, crowded at top of stem, 6–8 mm long, gradually smaller from apex to base, ovate or obovate-oblong, oblique at base, obtuse, apiculate at apex, margins sparsely ciliate, lateral nerves parallel, inconspicuous, glabrous. Flowers in terminal umbels, 2 cm across, yellow with red streak near base of each lobe, pedunculate. Sepals 5, half as long as petals, ovate-lanceolate, 3 mm long, acuminate, pubescent, parallel veined. Petals 5, connate, lobes short. Stamens 10; filaments dilated, sparsely hairy. Ovary ovoid, hairy at the top; style 5, short. Capsule ovoid, *c.* 4 mm long. Seeds ovoid, grooved.

Fl.: & Fr.: Aug.–Dec.

Habitat: Occasional in shade and moist localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010447 (BSID).

3. Biophytum sensitivum (L.) DC., Prodr. 1: 690. 1824; Edgew. & Hook. f. in Hook. f., Fl. Brit. India 1: 436. 1874. *p.p.*; Gamble, Fl. Madras 1: 133. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 244. 1999; Pull. & al., Fl. Andhra Pradesh 1: 276. 2018. *Oxalis sensitiva* L., Sp. Pl. 1: 434. 1753. **(Plate 39F)**

Condensed, erect herbs, up to 10 cm high; stems reddish-pink, appressed retrose hairy. Leaves crowded at top of stem, paripinnate, 4–8 cm long, sensitive to touch; leaflets up to 12 pairs, 1.1 cm long, increasing in size towards ends of rachis, oblong-obovate, obtuse or truncate at base, apiculate at apex, margins entire, lateral nerves reticulate, glabrous; petiole terete. Flowers in terminal umbels, 7 mm across, shortly pedicelled, deep yellow, tinged with red. Sepals 5, ovate-lanceolate, 6 mm long, acuminate, sparsely hairy. Petals 5, oblong, 9 mm long, clawed at base. Stamens 10; filaments short. Capsule ovoid, 5 mm long, 5-locular. Seeds numerous, spirally grooved.

Fl.: & Fr.: Jul.–Dec.

Habitat: Occasional in moist places, along roadsides and black cotton soils in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. OXALIS L.

India: 10 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Oxalis corniculata L., Sp. Pl. 1: 435. 1753; Edgew. & Hook. f. in Hook. f., Fl. Brit. India 1: 436. 1874; Gamble, Fl. Madras 1: 132. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 245. 1999; Pull. & al., Fl. Andhra Pradesh 1: 279. 2018. *'Pulichinta'*

Procumbent, diffuse, stoloniferous herbs, up to 50 cm long; branches reddish, grooved, ascending, rooting at nodes, strigose hairy. Leaves digitately trifoliate; leaflets obovate-obcordate, 1.5 cm long, chartaceous, cuneate at base, emarginate at apex, margins entire, ciliate, glabrous above, sparsely appressed hairy below; petiole 5 cm long, hispid. Flowers in axillary pseudo-umbels, 5 mm across, yellow. Sepals 5, oblong, 4 mm long, obtuse. Petals 5, oblong, 4.5 mm long, obcuneate, emarginate. Stamens 10; filaments dilated. Ovary 5-locular. Capsule linear-oblong, *c.* 1.5 cm long, beaked, glabrous.

Fl.: & Fr.: Throughout the year.

Habitat: Common in moist localities and as a weed in cultivated fields.

Specimen examined: Maddaluru, *Y. Mahesh* 011777 (BSID).

50. ERYTHROXYLACEAE

India: 1 genus, 6 spp.; Andhra Pradesh: 1 genus, 1 spp.; PNP: 1 genus, 1 spp.

1. ERYTHROXYLUM P. Browne

India: 6 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Erythroxylum monogynum Roxb., Pl. Coromandel 1: 61, t. 88. 1798; Hook. f., Fl. Brit. India 1: 414. 1874; Gamble, Fl. Madras 1: 127. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 241. 1999; Pull. & al., Fl. Andhra Pradesh 1: 269. 2018. **(Plate 39G)**

Medium sized shrubs or small trees, up to 4 m high; branches glabrous. Leaves alternate, obovate, sometimes emarginate, 3–6 cm long, coriaceous, cuneate or attenuate at base, obtuse at apex, margins entire, deflexed, glabrous; petioles 5 mm long, glabrous; stipules interpetiolar, shortly acuminate. Flowers axillary, solitary, 2 mm across, greenish white. Sepals 5, connate at base; lobes ovate-triangular, 1 mm long. Petals 5, oblong-obovate. 2 mm long. Stamens 10; filaments monodelphous. Ovary oblong, glabrous; styles 3. Drupe oblong-ellipsoid, *c.* 1.2 cm long, scarlet red. Seed 1.

Fl.: & Fr.: Aug.–Nov.

Habitat: Common in open dry deciduous forests.

Specimen examined: Buruguwada, *Y. Mahesh* 011600 (BSID).

Field notes: Fruit red, edible.

51. OCHNACEAE

India: 3 genera, 7 spp.; Andhra Pradesh: 1 genus, 3 spp.; PNP: 1 genus, 2 spp.

1. OCHNA L.

India: 5 spp.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves waxy, glaucous, rounded at apex	**1. O. gamblei**
1b.	Leaves not waxy or glaucous, obtuse at apex	**2. O. obtusata**

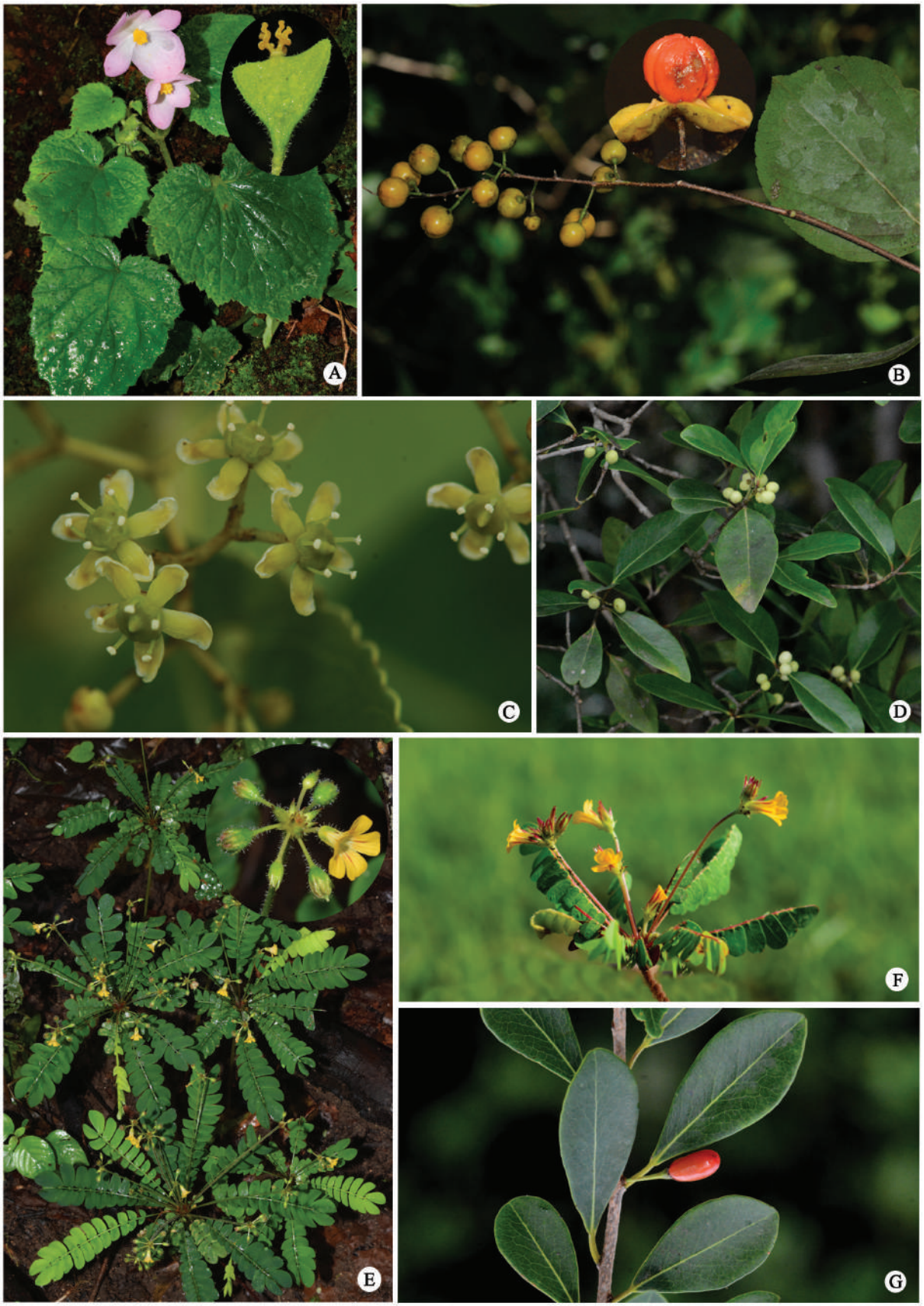


Plate 39: A. *Begonia picta* Sm.; **B.** *Celastrus paniculatus* Willd.; **C.** *Elaeodendron glaucum* (Rottb.) Pers.; **D.** *Pleurostylia opposita* (Wall.) Alston; **E.** *Biophytum reinwardtii* (Zucc.) Klotzsch; **F.** *Biophytum sensitivum* (L.) DC.; **G.** *Erythroxylum monogynum* Roxb.

1. Ochna gamblei King ex Brands, Indian Trees 128. 1906; Gamble, Fl. Madras 1: 166. 1915; Pull. & al., Fl. Andhra Pradesh 1: 309. 2018. *Ochna beddomei* Gamble, Bull. Misc. Inform. 1916: 34. 1916. *Ochna obtusata* DC. var. *gamblei* (King ex Brandis) Kanis in Blumea 16: 34. 1968. **(Plate 40A)**

Small trees, up to 5 m high; bark thick, brown. Leaves fascicled at top of the branchlets, obovate-oblong or elliptic, 8–14 cm long, coriaceous, waxy, glaucous, obtuse or rounded at base, rounded at apex, margins serrate, glabrous. Flowers in compound clustered, cymes, long pedicellate. Sepals 5, ovate, 1.6 cm long, green. Petals 8, obovate, 2 cm long, obtuse, yellow. Stamens *c.* 20. Ovary 5-10 lobed. Fruits about 5, ovoid.

Fl.: & Fr.: Apr.–Oct.

Habitat: Occasional along small hilly areas and plains in dry deciduous forests.

Specimen examined: Kakeshnur, Lankapakalu, *Y. Mahesh* 010691, 011722 (BSID).

2. Ochna obtusata DC., Ann. Mus. Natl. Hist. Nat. 17. 411. 1811; Pull. & al., Fl. Andhra Pradesh 1: 309. 2018. *Ochna squarrosa* sensu A. W. Benn. in Hook. f., Fl. Brit. India 1: 523. 1875. non L. 1753; Gamble, Fl. Madras 1: 165. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 253. 1999. **(Plate 40B)** *'Sonarichettu'*

Small trees, up to 8 m high; young branches glabrous. Leaves clustered, alternate, subsessile, elliptic-lanceolate or obovate-oblong, 8–15 cm long, obtuse or attenuate at base, obtuse, emarginate at apex, margins faintly crenate-serrulate, glabrous. Flowers in short lateral corymbose panicles or cymes of fallen leaf axils, 2 cm across, bracteate, glabrous; bracts small, lanceolate. Sepals 5, elliptic-oblong, 1.6 cm long, reddish, closely parallel veined. Petals 5, obovate, 1.9 cm long, yellow. Stamens numerous; filaments short. Ovary deeply lobed, glabrous. Drupes aggregate, ovoid, *c.* 1.2 cm long, black. Seed 1.

Fl.: & Fr.: Apr.–Jul.

Habitat: Occasional in dry deciduous forest.

Specimen examined: Tekupally, *Y. Mahesh* 010171 (BSID).

52. MALPIGHIACEAE

India: 3 genera, 22 spp., 4 var.; Andhra Pradesh: 2 genera, 3 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a. Flowers regular in panicles; calycine gland absent; samara surrounded by 6 orbicular wings **1. Aspidopterys**

1b. Flowers irregular in long racemes; calycine gland single, adnate to the long pedicel; samara terminated by 3 lanceolate wings **2. Hiptage**

1. ASPIDOPTERYS A. Juss. ex Endl.

India: 14 spp. & 2 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Aspidopterys indica (Willd.) W. Theob. in Mason Burmah ed. 3. 2: 599. 1883; R.S. Rao & al., Fl. E. Godavari Dist. 242. 1999; Pull. & al., Fl. Andhra Pradesh 1: 270. 2018. *Triopteris indica* Willd., Sp. Pl., ed. 4, 2; 744. 1799. *Aspidopterys roxburgiana* A. Juss., Ann. Sci. Nat. Bot. Ser. 2. 13: 267. 1840; Hook. f., Fl. Brit. India 1: 420. 1874; Gamble, Fl. Madras 1: 129. 1915. **(Plate 40C)** *'Bandikota'*

Slender, woody climber; branches brown, tomentose when young. Leaves alternate, broadly ovate, elliptic, 6–10 cm long, rounded or cordate at base, acuminate at apex, margins entire, glabrous above, pubescent below; petioles 1.5 cm long, pubescent. Flowers in terminal, showy, regular, tomentose panicles, 3 mm long, greenish-white; bracts lanceolate, pubescent; pedicels jointed above the middle, pubescent. Calyx 5-partite, pubescent, glandular; lobes ovate, 1 mm long, tomentose. Petals 5, oblong-elliptic or ovate, 4 mm long, concave, shortly subacute. Stamens 10; filaments connate. Ovate trilobed, densely pubescent. Fruits samara, ovate-oblong, surrounds a shield of 6 orbicular, membranous wings, 3.6 cm across.

Fl.: & Fr.: Jun.–Nov.

Habitat: Occasional climber in hilly slopes and stream edges.

Specimen examined: PK Valasa, *Y. Mahesh* 011401 (BSID).

2. HIPTAGE Gaertn.

India: 7 spp. & 2 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Hiptage benghalensis (L.) Kurz, J. Asiat. Soc. Bengal Part 2, Nat. Hist. 43: 136. 1874; Srivastava in Hajra & al., Fl. India 4: 14. 1997; R.S. Rao & al., Fl. E. Godavari Dist. 243. 1999; Pull. & al., Fl. Andhra Pradesh 1: 272. 2018.

Banisteria benghalensis L., Sp. Pl. 1: 427. 1753. *Hiptage madablota* Gaertn., Fruct. 2: 169. 1791; Hook. f., Fl. Brit. India 1: 418. 1874; Gamble, Fl. Madras 1: 218. 1915. **(Plate 40D)**

Huge, woody climbers; branches terete, brown, lenticellate, silky woolly when young. Leaves alternate, elliptic-oblong or lanceolate, 5–12 cm long, coriaceous, acute at base, obtuse at apex, margins entire, shining when young, glabrous; petiole up to 1 cm long. Flowers irregular, in axillary and terminal, tomentose, long racemes, showy, 2 cm across, white, bracteate, pedicellate. Calycine gland single, adnate to the long pedicel. Sepals 5, imbricate, ovate-elliptic or orbicular, 6 mm long, with calycine prominent gland, obtuse. Petals 5, fimbriate along margins, clawed at base, suborbicular, twice as long as sepals, prominently declinate. Stamens 10. Ovary pubescent. Samara with 3 unequal, oblong or lanceolate wings, medium wing *c.* 4 cm long; laterals *c.* 3 cm long.

Fl.: & Fr.: Feb.–Apr.

Habitat: Common climber in hilly areas and along pathways in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011770 (BSID).

Field notes: Worth to introduce in the gardens due to its showy white, fragrant flowers.

53. VIOLACEAE

India: 3 genera, 42 spp., 2 subspp., 5 var.; Andhra Pradesh: 2 genera, 6 spp; PNP: 1 genus, 1 sp.

1. HYBANTHUS Jacq.

India: 4 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Hybanthus enneaspermus (L.) F. Muell., Fragm. Phyt. Austr. 10: 81. 1876; R.S. Rao & al., Fl. E. Godavari Dist. 205. 1999; Pull. & al., Fl. Andhra Pradesh 1: 129. 2018. *Viola enneasperma* L., Sp. Pl.: 937. 1753. *Viola suffruticosa* L., Sp. Pl. 937. 1753. *Ionidium suffruticosum* (L.) Ging. in DC., Prodr. 1: 311. 1824; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 185. 1872; Gamble, Fl. Madras 1: 49. 1915. *'Rathnapurusha'*

Erect branched, suffruticose herb, up to 30 cm high; stem and branches grooved, pubescent. Leaves alternate, subsessile, elliptic-lanceolate or linear, 3–5 cm long, attenuate at base, acute, apiculate at apex, margins serrate, glabrescent or sparsely pubescent with short hairs; stipules subulate, gland tipped, 1.5 mm long. Flowers axillary, solitary, deep purple, bracteate; bracteoles 2, above the middle, short, pubescent. Sepals 5, ovate-lanceolate, 4 mm long, keeled on back, shortly acuminate. Petals 5, unequal, the two upper oblong, acuminate, 3-nerved, 3.5 mm long, laterals larger, falcate, acuminate, 5 mm long; the lowest largest, clawed, obovate, 8 mm long. Stamens 5; filaments short. Ovary unilocular, glabrous. Capsule subglobose, 6 mm across, yellow, tipped with persistent style, few seeded. Seeds ovoid, striate.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common in open hilly areas, grasslands and as weed in cultivated places.

Specimen examined: Pocharam, PK Valasa, Gulletiwada, *Y. Mahesh* 010140, 010461, 010573 (BSID).

54. PASSIFLORACEAE

India: 2 genera, 17 spp.; Andhra Pradesh: 2 genera, 3 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a.	Tendrils only on leaf axils; flowers hermaphrodite; corona of petal conspicuous; fruit berry	**2. Passiflora**
1b.	Tendrils only on inflorescence; flowers unisexual; corona inconspicuous; fruit capsule	**1. Adenia**

1. ADENIA Forssk.

India: 6 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Adenia wightiana (Wall. ex Wight & Arn.) Engl., Bot. Jahrb. Syst. 14: 376. 1891; Gamble, Fl. Madras 1: 525. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 373. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 774. 2018. *Modecca wightiana* Wall. ex Wight & Arn., Prodr. Fl. Ind. Orient. 1: 353. 1834; Masters in Hook. f., Fl. Brit. India 2: 601. 1879.

A tuberous-rooted climber. Leaves simple or trilobed, ovate or lanceolate, 5–8 cm long, cordate or hastate at base, acute at apex, margins entire, glabrous. Flowers unisexual, in axillary cymes, minute, peduncles filiform. Calyx tube campanulate; lobes 5, small. Petals 5, inserted in base of calyx tube. Corona fringe of short hairs, inconspicuous. Stamens 5, connate at base. Ovary subsessile. Capsule oblong-ovoid, *c.* 3.5 cm long, orange or deep red. Seeds heart shaped, black.

Fl.: & Fr.: Sep.–Jan.

Habitat: Common climber in hilly areas in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. PASSIFLORA L.

India: 17 spp. & 2 subsp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Passiflora foetida L., Sp. Pl. 959. 1753; Masters in Hook. f., Fl. Brit. India 2: 599. 1879; Gamble, Fl. Madras 1: 524. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 373. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 774. 2018. *'Gujjuteega', 'Jellajumiki'*

A weak, viscid, glandular climbing herb; branches obscurely angled, pubescent, with axillary simple, coiled tendrils. Leaves alternate, ovate, cordate, palmately 3-lobed to halfway, 5–8 cm long, chartaceous, cordate at base, acute at apex, margins entire, ciliate, glandular pubescent; stipules subreniform, up to 8 mm long, deeply cleft into glandular processes. Flowers axillary, solitary, hermaphrodite, 2–3.5 cm across, white; involucral bracts ovate, deeply pinnatisect, filiform. Calyx tube short; lobes 5, ovate-lanceolate, 2 cm long, greenish. Petals shorter or equalling sepals, purplish-white; coronal filaments conspicuous, sterile in circular series, purplish or violet, hairy. Stamens attached to gynophore. Ovary globose; style columnar, stigmas 5. Berry ovoid or sub-globose, fleshy, *c.* 3.2 cm in diam., glabrous, characteristic with persistent involucre, greenish with densely pubescent. Seeds numerous.

Fl.: & Fr.: Sep.–Feb.

Habitat: Common along roadsides on bushes near villages.

Specimen examined: PK Valasa, *Y. Mahesh* 010407 (BSID).

55. SALICACEAE

(Including Flacourtiaceae)

India: 12 genera, 94 taxa; Andhra Pradesh: 5 genera, 9 spp.; PNP: 3 genera, 4 spp.

Key to the genera

1a.	Trees, *c.* 12 m high; petals present	**3. Homalium**
1b.	Shrubs or small trees, *c.* 6 m high; petals absent	2
2a.	Flowers unisexual; stamens 15 or more	2. **Flacourtia**
2b.	Flowers bisexual; stamens 5–10	**1. Casearia**

1. CASEARIA Jacq.

India: 12 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves tomentose beneath; stipules minute, unequally rounded at base	**2. C. tomentosa**
1b.	Leaves glabrous beneath; stipules conspicuous, rounded at base	**1. C. graveolens**

1. Casearia graveolens Dalzell, Hooker's J. Bot. Kew. Gard. Misc. 4: 107. 1852; C.B. Clarke in Fl. Brit. India 2: 593. 1879; Gamble, Fl. Madras 1: 520. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 210. 1999; Pull. & al., Fl. Andhra Pradesh 1: 135. 2018.

Small trees, up to 5 m high. Leaves alternate, distichous, elliptic, 6–12 cm long, coriaceous, rounded at base, obtuse or shortly acuminate at apex, margins crenate-serrate, glabrous below; lateral nerves 6–9 pairs, prominent below; petiole up to 1.5 cm long; stipules conspicuous, unequally rounded at base. Flowers bisexual, in axillary fascicles, numerous, greenish, pedicellate; bracts deltoid-ovate, rounded, 1.5 mm long. Sepals 5, connate at base, pubescent; lobes oblong, concave, obtuse, 3 mm long. Petals absent. Stamens 8, alternating with staminodes, connate at base; filaments with few hairs at base. Staminodes 8, subulate. Ovary ovoid, unilocular, glabrous; style short. Capsule, ellipsoid, 3-valved, *c.* 1.8 cm across, yellow. Seeds arillate, aril red.

Fl. & Fr.: Mar.–May.

Habitat: Common in dry deciduous forest.

Specimen examined: Geediguppa, *Y. Mahesh* 010160 (BSID).

2. Casearia tomentosa Roxb., Fl. Ind. 2: 421. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 2: 593. 1879; Gamble, Fl. Mdras 1: 521.1919; Pull. & al., Fl. Andhra Pradesh 1: 137. 2018. *Casearia elliptica* Willd., Sp. Pl. 2: 628. 1799; R.S. Rao & al., Fl. E. Godavari Dist. 210. 1999. **(Plate 40E)** *'Vasachettu', 'Chilakaduddi'*

Small trees, up to 6 m high; young parts tomentose. Leaves alternate, rarely subopposite, distichous, oblong-elliptic or ovate-lanceolate, 6–12 cm long, rounded at base, acute at apex, margins serrulate, sparsely pubescent above, densely tomentose beneath; lateral nerves 8-10 pairs; petiole short, 9 mm long; stipules minute, unequally rounded at base. Flowers bisexual, many in dense axillary clusters, greenish; bracts short, deltoid-ovate, hairy. Calyx campanulate, 5-lobed; lobes broadly elliptic, 3 mm long, pubescent, persistent. Petals absent. Stamens 8, alternating with staminodes, connate at base; filaments pubescent; staminodes 8. Ovary ovoid; style short. Capsule succulent, 3 valved, globose, 6 ribbed, greenish-yellow. Seeds many, yellowish-brown with scarlet aril.

Fl.: & *Fr.:* Feb.–Jun.

Habitat: Common in dry deciduous forest.

Specimen examined: Buruguwada, Koida, Tekupally, *Y. Mahesh* 010088, 010185, 011340 (BSID).

2. FLACOURTIA Comm. ex L. Her

India: 6 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Flacourtia indica (Burm.f.) Merr., Interpr. Herb. Amboin. 377. 1917; R.S. Rao & al., Fl. E. Godavari Dist. 211. 1999; Pull. & al., Fl. Andhra Pradesh 1: 138. 2018. *Gmelina indica* Burm.f., Fl. Ind. 132, t. 39, f. 5. 1768. *Flacourtia ramontchi* L Her., Stirp. Nov. 3: 59, t. 30 & 30 B. 1786; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 194. 1872; Gamble, Fl. Madras 1: 54. 1915.

Scandent, thorny shrubs, up to 5 m high; young branches puberulous. Leaves alternate, ovate-obovate, 4–8 cm long, chartaceous, rounded at base, subacute or emarginate at apex, margins serrate, glabrescent on both surfaces; lateral nerves prominent below; petiole up to 1.2 cm long, pubescent. Flowers unisexual, clustered on axillary racemes, 5 mm across, pedicellate, white or pale yellow. Sepals 5, ovate-elliptic, small, 1 mm long, ciliate. Petals absent. Stamens 15-many, exserted; filaments short, white. Ovary unilocular, with numerous ovules; styles 5, connate at base. Berry fleshy, globose, *c.* 1 cm, red when ripe. Seeds 8.

Fl. & Fr.: Feb.–Apr.

Habitat: Common in scrub jungles of dry deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. HOMALIUM Jacq.

India: 6 spp. & 1 subsp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Homalium napaulense (DC.) Benth., J. Proc. Linn. Soc., Bot. 4: 34. 1859; C.B. Clarke in Hook. f., Fl. Brit. India 2: 96. 1789; Gamble, Fl. Madras 1: 552. 1916; R.S. Rao & al., Fl. E. Godavari Dist. 211. 1999; Pull. & al., Fl. Andhra Pradesh 1: 141. 2018. *Blakwellia napaulensis* DC., Prodr. 2: 54. 1825. **(Plate 40F)**

Medium sized tree, up to 12 m high; bark creamy white; young branches pubescent. Leaves ovate or elliptic, 6–11 cm long, subacute or obtuse at base, acuminate at apex, margins crenate or serrate, glabrous above, puberulous beneath; lateral nerves prominent; petiole up to 2.2 cm long, pubescent. Flowers in axillary panicles, small, white, densely hairy. Sepals 6, linear. Petals 6, spathulate, slightly longer than sepals. Stamens 6, opposite to petals. Ovary pilose; styles 4. Capsule ovoid.

Fl.: & Fr.: Mar.–Aug.

Habitat: Rare in hilly slopes of moist deciduous forest.

Specimen examined: Ijjaluru, *Y. Mahesh* 011798 (BSID).

56. EUPHORBIACEAE

India: 70 genera, 468 taxa; Andhra Pradesh: 44 genera, 142 spp., 6 var.; PNP: 12 genera, 25 spp.

Key to the genera

1b.	Flowers in cyathia	3. **Euphorbia**
1b.	Flowers not in cyathia	2
2a.	Outer tepals imbricate in male flowers	8
2b.	Outer tepals valvate in male flowers	3
3a.	Inner tepals present in male flowers	**2. Chrozophora**
3b.	Inner tepals absent in male flowers	4
4a.	Climbers	**5**
4b.	Trees, shrubs or herbs	6
5a.	Fruiting perianth with stinging hairs	**11. Tragia**

5b.	Fruiting calyx without stinging hairs	**10. Plukenetia**
6a.	Filaments branched; staminal bundle indefinite	**5. Homonoia**
6b.	Filaments simple; staminal bundle not as above	7
7a.	Anthers 2-celled	**8. Mallotus**
7b.	Anthers 4-celled	**7. Macaranga**
8a.	Male flowers with inner tepals	9
8b.	Male flowers without inner tepals	11
9a.	Inner tepals connate	**4. Givotia**
9b.	Inner tepals free	10
10a.	Flowers paniculate; panicles branching dichasially	**6. Jatropha**
10b.	Flowers in spicate or racemose, not paniculate	**12. Tritaxis**
11a.	Leaves linear-lanceolate, not glandular	**9. Microstachys**
11b.	Leaves elliptic-ovate, glandular near base	**1. Baliospermum**

1. BALIOSPERMUM Blume

India: 2 spp. & 6 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Baliospermum solanifolium (Burm.) Suresh in Nicolson & al., Interpr. Rheede's Hort. Malab.: 106. 1988; Pull. & al., Fl. Andhra Pradesh 4: 1642. 2018. *Croton solanifolius* Burm., Fl. Malab. 6: 1769. *Baliospermum axillare* Blume, Bijdr. Fl. Ned. Ind. 12: 604. 1826; Hook. f., Fl. Brit. India 5: 461. 1887. *Baliospermum montanum* (Willd.) Mull. Arg. in DC., Prodr. 15: 1125. 1866; Gamble, Fl. Madras 2: 1342. 1925.

An erect, branched, undershrubs, up to 1 m high; branches terete, glabrous, sparsely pubescent when young. Leaves alternate, ovate-elliptic or obovate, 8–18 cm long, rounded, 2-glandular at base, acute or abruptly acuminate at apex, margins distantly dentate, glabrous above, sparsely hairy below; lateral nerves 5 from base, prominent; petiole up to 14 cm long, hirtellous. Flowers monoecious, in axillary and terminal racemes, 6 mm across, greenish, bracteate, shortly pedicellate. Male flowers clustered, 3 mm across. Perianth lobes 5, semicircular, connate at base. Stamens numerous. Female flowers solitary, 6 mm across. Perianth lobes 6, connate. Ovary pubescent; styles 2. Capsule obovate, 3-valved, 8 mm long, 6 mm wide.

Fl.: & Fr.: Oct.–Jan.

Habitat: Occasionally found in forest undergrowth and along river banks.

Specimen examined: PK Valasa, Maredumilli, *Y. Mahesh* 010043, 011521 (BSID).

2. CHROZOPHORA A. Juss.

India: 4 spp.; Andhra Pradesh: 2 spp. & 1 var.; PNP: 1 sp.

1. Chrozophora rottleri (Geiseler) Spreng., Syst. Veg. 3: 850. 1826; Gamble, Fl. Madras 2: 1317. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 621. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1656. 2018. *Croton rottleri* Geisel., Croton. Monogr. 54. 1807. *'Errameriyam'*

Erect bushy shrubs, up to 1 m high, branchlets fulvous-tomentose. Leaves alternate, broadly ovate-orbicular, 3.5–7 cm long, cordate at base, obtuse at apex, margin sinuate, undulate, 2-glands on lower surface near base of midrib, stellate hairy on both surfaces. Flowers monoecious, in terminal racemes, tomentose. Male flowers sessile, clustered or crowded in the upper axils. Tepals in 2 whorls, 5+5; outer connate at base, ovate-lanceolate; inner 2.5-5 cm long, free, lanceolate, obtuse. Stamens 15, biseriate. Female flowers at base, pedicellate, 6 mm across. Tepals in two whorls 5 + 5; outer connate at base, linear-lanceolate, 3-angled; inner globose. Styles 3, each 2-fid. Capsule 3-lobed, 7 mm across, tomentose. Seeds globose, ash coloured.

Fl.: & Fr.: Throughout the year.

Habitat: Common in cultivated fields as a weed.

Specimen examined: Tekupally, *Y. Mahesh* 010180 (BSID).

3. EUPHORBIA L.

India: 87 spp., 2 subsp. & 4 var.; Andhra Pradesh: 36 spp. & 2 var.; PNP: 9 spp.

Key to the species

1a.	Shrubs or small trees; stems and branches fleshy	2
1b.	Herbs; stems and branches not fleshy	3
2a.	Branchlets cylindrical	**6. E. nivulia**
2b.	Branchlets angled or winged	**1. E. cattimandoo**
3a.	Appendages small or conspicuous	4

3b.	Apendages inconspicuous or 0	6
4a.	Cyathia 1-3, within the distichously imbricate leaves	**3. E. elegans**
4b.	Floral leaves not distichous	5
5a.	Erect or ascending herbs	**5. E. hirta**
5b.	Prostrate herbs	**8. E. rosea**
6a.	Erect herbs	**2. E. dracunculoides**
6b.	Prostrate herbs	7
7a.	Leaves with serrulate margins; involucre campanulate	**9. E. thymifolia**
7b.	Leaves with entire margin; involucre tubular	8
8a.	Capsule obtusely keeled	**4. E. heyneana**
8b.	Capsule prominently keeled	**7. E. prostrata**

1. Euphorbia cattimandoo Elliot ex Wight, Icon. Pl. Ind. Orient. 6: t. 1993. 1853; Gamble, Fl. Madras 2: 1277. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1678. 2018. *Euphorbia trigona* Hook. f., Fl. Brit. India 5: 256. 1887 *p.p.* **(Plate 40G)**

An erect, succulent shrub, up to 3.5 m high; branches spinous, 5-winged; spines sharp, stipular, divaricate, persistent. Leaves oblanceolate, 2.5–5 cm long, acute at base, mucronate at apex, margins entire. Cyathia solitary, in diads or triads, yellow; involucres copular, short; bracts opposite, below the involucres, oblong, fimbriate at apex. Male florets in small fascicles. Female florets: gynophores *c.* 1 cm long. Ovary subglobose, glabrous; style 3, connate at base. Capsule *c.* 8 m across, subglobose.

Fl.: & Fr.: Feb.–Apr.

Habitat: Occasional in dry localities.

Specimen examined: Kondamodalu, *Y. Mahesh* 011767 (BSID).

Field notes: Thorny shrub, latex white when we break the branches.

2. Euphorbia dracunculoides Lam., Encycl. 2: 428. 1788; Hook. f., Fl. India 5: 262. 1887; Gamble, Fl. Madras 2: 1278. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1686. 2018. *'Tillakada'*

An erect, much branched herb, up to 45 cm high; branches dichotomous from root stock. Leaves alternate-opposite, 2–3 at nodes, linear-lanceolate, 2.5–4.5 cm long, acute at base, obtuse or subacute at apex, margins entire. Cyathia solitary, terminal, yellowish-green; gland of involucre without petaloid limb; lobes short, ciliate. Male floretes 8; bracteoles lacinate, ciliate. Female florets erect. Ovary short; style 3, each bifid. Cocci ovoid-subglobose, 5 mm across, reticulate venose with a median dorsal wing, scarcely keeled. Seeds ellipsoid, strophilate.

Fl.: & Fr.: Dec.–Apr.

Habitat: Common in cultivated fields, bunds of river banks and wastelands.

Specimen examined: Kakeshnur, *Y. Mahesh* 010197 (BSID).

3. Euphorbia elegans Spreng., Syst. Veg., 3: 794. 1826; Hook. f., Fl. Brit. India 5: 246. 1887; Gamble, Fl. Madras 2: 1274. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1687. 2018. **(Plate 40H)**

Dichotomously branched, decumbent herb, up to 45 cm high; branches terete, striate, hirsute. Leaves with distant nodes, opposite, oblong, 3.5 cm long, unequally subcordate or rounded at base, subacute at apex, margins serrulate, excurved, glabrous above, sparsely villous beneath; petiole short. Floral leaves imbricating at the ends of branches, forming short spikes. Cyathia 1–3, axillary, 5 mm across, within the distichously imbricate leaves; involucres campanulate, 3 mm long, villous; limbs of glands unequal, obovate-cuneate, 4 mm long, rose red, sinuate at apex. Ovary stalked, trilobed; styles 3, bifid. Capsule ovoid-globose, 4 mm in diam., sparsely villous. Seeds angled, grooved.

Fl.: & Fr.: Sep.–Feb.

Habitat: Occasional in rocky bunds and open fields.

Specimen examined: Pochavaram, *Y. Mahesh* 011568 (BSID).

4. Euphorbia heyneana Spreng., Syst. Veg., (ed. 16) 3: 791. 1826, (as 'heyniana'); R.S. Rao & al., Fl. E. Godavari Dist. 624. 1999; Binojk. & N. P. Balakr., Genus *Euphorbia* in India 115. 2010 & in N.P. Balakr. & al., Fl. India 23: 286. 2012; Pull. & al., Fl. Andhra Pradesh 4: 1690. 2018. *Euphorbia microphylla* Heyne ex Roth, Nov. Pl. Sp. 229. 1821, *auct. non* Lam. 1788; Hook. f., Fl. Brit. India 5: 252. 1887; Gamble, Fl. Madras 2: 1276. 1925.

A prostrate herb, up to 20 cm long; branches dichotomously branched, terete, grooved, spreading on ground, glabrous. Leaves ovate-oblong or elliptic, 3.5–5 cm long, reddish coloured, obliquely cordate or truncate at base,



Plate 40: A. *Ochna gamblei* King ex Brandis; **B.** *Ochna obtusata* DC.; **C.** *Aspidopterys indica* (Willd.) W.Theob.; **D.** *Hiptage benghalensis* (L.) Kurz; **E.** *Casearia tomentosa* Roxb.; **F.** *Homalium napaulense* (DC.) Benth.; **G.** *Euphorbia cattimandoo* Elliot ex Wight; **H.** *Euphorbia elegans* Spreng.

retuse at apex, margins shortly serrate or entire; petioles very short. Cyathia axillary, solitary, 1.5 mm across, pale pink; involucres campanulate, lobes triangular, pinkish; glands 4, sessile. Male florets ebracteolate. Female florets pendulous. Ovary short. Capsule 2 mm long, glabrous. Seeds 4-angled, smooth.

Fl.: & Fr.: Throughout the year.

Habitat: Common weed in wastelands, along roadsides and cultivated fields.

Specimen examined: GM Valasa, *Y. Mahesh* 010981 (BSID).

5. Euphorbia hirta L., Sp. Pl. 1: 454. 1753; Gamble, Fl. Madras 2: 1275. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 625. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1691. 2018. *Euphorbia pilulifera* sensu Hook. f., Fl. Brit. India 5:250. 1887, non L. 1753. **(Plate 41A)** *'Reddivarinunubalu'*

Prostrate, or ascending herb, up to 40 cm long; branches quadrangular, striate, glandular pubescent. Leaves opposite, oblong-elliptic or lanceolate, 1.5–3.5 cm long, chartaceous, obliquely obtuse at base, subacute at apex, margins serrulate; petiole 2 mm long, pubescent; stipules interpetiolar, linear. Male flowers 4-6. Female flower 1, in each cyathium. Cyathia crowded in axillary, subsessile, globose cymes, 7 mm across, greenish; involucres very short, glabrous; glands minute, sessile; limb absent. Perianth short; ovary stalked, 3-lobed, appressed hairy; styles 3, short. Capsule globose-ovoid, sparsely appressed-hairy, 1.5 mm across, trilobed. Seeds brown, obtusely quadrangular.

Fl.: & Fr.: Throughout the year.

Habitat: Common weed in open waste places and cultivated fields.

Specimen examined: PK Valasa, *Y. Mahesh* 010542 (BSID).

6. Euphorbia nivulia Buch.-Ham., Trans. Linn. Soc. London 14: 286. 1824; Hook. f., Fl. Brit. India 5: 255. 1887; Gamble, Fl. Madras 2: 1277. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1699. 2018. **(Plate 41B)** *'Bonthajemudu'*

Small armed tree, up to 5 m high; branches terete, rounded, green, with a pair of spines. Leaves deciduous, sessile, present only near the ends of the branches, alternate, oblong-obovate, 10–15 cm long, narrowed at base, rounded at apex, apiculate, margin entire, glabrous. Cyathia trinate; terminal male, lateral ones bisexual. Involucres small, lobes erect, fimbriate; glands transversely oblong; bracteoles many, fimbriate. Stamens numerous, in five bundles. Ovary 3-lobed; styles 3, bifid. Capsule trigonous, *c.* 1 cm in diam.

Fl.: & Fr.: Apr.–May.

Habitat: Common in rocky areas in scrub jungles.

Specimen examined: Eruwada, Kurlagattu, *Y. Mahesh* 010643, 011762 (BSID).

7. Euphorbia prostrata Aiton, Hort. Kew. 2: 139. 1789; Hook. f., Fl. Brit. India 5: 266. 1887; Gamble, Fl. Madras 2: 1276. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1701. 2018. *'Palalamu'*

Prostrate, spreading herb, up to 25 cm long; branchlets hispid. Leaves opposite, distichous, elliptic-obovate, 4–9 cm long, prominently 3-nerved, obliquely truncate at base, obtuse at apex, margins crenulate. Cyathia axillary, solitary, 3-together; involucres tubular; glands 4; appendage inconspicuous. Male florets ebractiolate; female florets laterally pendululous; ovary subglobose; style 3, divided from base. Capsule beaked with stiff hairs at angles.

Fl.: & Fr.: Jun.–Jan.

Habitat: Common in agricultural fields as a weed and wastelands.

Specimen examined: Kothuru, *Y. Mahesh* 011656 (BSID).

8. Euphorbia rosea Retz., Observ. Bot 4: 26. 1786; Hook. f., Fl. Brit. India 5: 251. 1887; Gamble, Fl. Madras 2: 1275. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 625. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1703. 2018.

Small slender, prostrate herb, up to 40 cm long, branches prostrate or ascending. Leaves opposite, oblong-elliptic or oblanceolate, spathulate, 1.2 cm long, coriaceous, obliquely cuneate at base, obtuse-retuse at apex, margins serrulate, 1-nerved. Cyathia up to 10, axillary and sub-terminal aggregated in lax clusters, rosy, rarely solitary in upper axils, upper ones larger than lower; involucres sub-campanulate, 3 mm long, puberulous; lobes triangular, ciliate; glands 4, oblong. Male florets 5; bracteoles lacinate. Female floret pendulous. Ovary short; style 3, bifid. Cocci obtusely keeled, pubescent. 1.7 cm in diam. Seeds 4-angular, furrowed.

Fl.: & Fr.: Oct.–Apr.

Habitat: Common in sandy areas, along river banks and moist localities.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

9. Euphorbia thymifolia L., Sp. Pl. 1: 454. 1753; Hook. f., Fl. Brit. India 5: 252. 1887; Gamble, Fl. Madras 2: 1276. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1707. 2018. **(Plate 41C)** *'Erra chittipayalaku'*

Procumbent, branched herb, up to 30 cm; branches sparsely pubescent. Leaves opposite, elliptic-oblong, 4–6 cm long, oblique and subcordate at base, subacute at apex, margins crenate-serrate, glabrous above, sparsely pubescent below; petiole short, 1 mm long; stipules fimbriate. Cyathia in axillary cymes, clusters of 1–3 together, light rose; stalk short, pubescent; involucres small; glands minute; limbs absent. Staminal filaments short. Ovary stalked, trilobed, pubescent; styles 3. Capsule ovoid-globose, rounded, 3-lobed, 1.5 mm long, obtusely keeled, densely appressed hairy. Seeds obtusely quadrangular, pale brown.

Fl.: & Fr.: Jul.–Nov.

Habitat: Common weed in water courses, rocky areas and roadsides.

Specimen examined: Koida, *Y. Mahesh* 011353 (BSID).

4. GIVOTIA Griff.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Givotia moluccana (L.) Sreem., Taxon 24: 696. 1975. *Croton moluccanus* L., Sp. Pl. 2: 1005. 1753. *Givotia rottleriformis* Griff., Calcutta J. Nat. Hist. 4: 388. 1844; Hook. f., Fl. Brit. India 5: 395. 1888; Gamble, Fl. Madras 2: 1342. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1716. 2018. *'Polikichettu', 'Tellapoliki'*

Medium sized trees, up to 10 m high; branches with stellate white-tomentose hairy. Leaves alternate, broadly ovate or orbicular, 12–25 cm long, chartaceous, deep sinuately cordate at base, acuminate at apex, margins irregularly dentate, glabrescent above, stellately white-tomentose or whitish-brown beneath, 5-nerved from base; petioles up to 20 cm long, densely tomentose. Flowers dioecious, in axillary, stellately white-tomentose panicles, 6 mm across, bracteate, pale yellow; peduncles up to 14 cm long. Sepals 5, 4 mm long, densely tomentose without. Petals 5, basally connate, longer than sepals, lobes rounded; disc glands 5, orbicular in male, cupular in female. Stamens more than 15; filaments connate at base. Ovary stellately pubescent; styles 3, short, bifid. Drupes ovoid or sub-globose, 2 cm in diam., 1-seeded. Seed ellipsoid.

Fl.: & Fr.: Jul.–Sep.

Habitat: Occasional in drydeciduous forest.

Specimen examined: Kondamodalu, *Y. Mahesh* 011760 (BSID).

5. HOMONOIA Lour.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves obovate, cuneate, not densely lepidote-scaly below; flowering spikes stout, up to 2 cm long	**1. H. retusa**
1b.	Leaves linear-lanceolate, densely lepidote-scaly below; flowering spikes slender, up to 10 cm long	**2. H. riparia**

1. Homonoia retusa (Graham ex Wight) Mull. Arg., Linnaea 34: 200. 1865; Hook. f., Fl. Brit. India 5: 456. 1887; Gamble, Fl. Madras 2: 1333. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 627. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1724. 2018. *Adelia retusa* J. Graham ex Wight, Icon. Pl. Ind Orient. 5: t. 1869. 1852. **(Plate 41D)**

Medium sized, rigid shrub, up to 2 m high; branches stout, woody. Leaves ovate-obovate or oblanceolate, 1.8–3.5 cm long, coriaceous, cuneate at base, obtuse or retuse at apex, margins serrate, glandular below; petiole 3 mm long. Flowers sessile, in short, stout spikes; spikes up to 2 cm long; bracts ovate, acute at apex, hairy. Male flowers up to 3.5 mm across. Tepals broadly elliptic, concave. Stamens numerous. Female flowers shorter than male, 2 mm across. Tepals 6, lanceolate or linear. Ovary globose; styles 3, simple. Capsule globose, 3.5 mm across, hairy. Seeds rounded, angular.

Fl.: & Fr.: Mar.–Sep.

Habitat: Occasional along stream bank and, river beds in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Homonoia riparia Lour., Fl. Cochinch. 2: 637. 1790; Hook. f., Fl. Brit. India 5: 455. 1887; Gamble, Fl. Madras 2: 1333. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 628. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1724. 2018.

Shrub, up to 3 m high; branchlets pubescent. Leaves linear-lanceolate 7–16 cm long, acute at base, acuminate at apex, margins entire, rarely serrulate, glabrous above, densely lepidote-scaly, glandular below, pubescent on veins beneath; petiole 1.2 cm long, pubescent. Flowers sessile, 3 mm across in axillary and terminal, slender spikes, pedunculate, bracteate, pale pink; spikes 5–10 cm long. Male flowers short; tepals 3, free, elliptic, concave, acute, puberulous without. Stamens many. Female flowers short; tepals 5, free, ovate. Ovary globose, puberulous; styles 3, simple, papillose. Capsule globose, 2.5 mm across, hairy. Seeds rounded, slightly angular, smooth yellow.

Fl. & Fr.: Nov.–Jan.

Habitat: Common along the rocky boulders in the stream banks and river beds.

Specimen examined: Tekuru, *Y Mahesh,* 010129 (BSID).

6. JATROPHA L.

India: 7 spp. & 2 var.; Andhra Pradesh: 4 spp. & 1 var.; PNP: 1 sp.

1. Jatropha gossypifolia L., Sp. Pl. 1006. 1753 (as 'gossipifolia'); Hook.f. Fl. Brit. India 5: 383. 1887. N.P. Balakr. & al., Fl. India 23: 252. 2012; Pull. & al., Fl. Andhra Pradesh 4: 1730. 2018. **(Plate 41E)** *'Seemanepalam'*

A bushy shrub, up to 1.5 m high; branches glandular, glabrous. Leaves alternate, deeply 3–5 lobed below the middle, 7–10 cm long; lobes obovate, cordate at base, acute or shortly acuminate at apex, margins entire with stipitate glands, glabrous or puberulous above; petiole up to 12 cm long, with many fascicled and branched stipitate gland tipped hairs. Flowers in axillary, paniculate cymes, monoecious, 5 mm long, pedunculate, crimson red, bracteates; bracts obovate, stipitately glandular along margins. Calyx lobes ovate, 4 mm long, stipitately glandular along margins. Corolla lobes oblong, 5 mm long. Ovary hirsute; styles 3, bifid. Capsule 1 cm across, faintly rugose. Seeds oblong, aril furrowed.

Fl.: & Fr.: Mar.–Sep.

Habitat: Common in along roadside and waste lands.

Specimen examined: Koida, *Y. Mahesh* 011349 (BSID).

7. MACARANGA Thouars

India: 9 spp. & 2 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Macaranga peltata (Roxb.) Mull. Arg. in DC., Prodr. 15: 1010. 1866; Gamble, Fl. Madras 2: 1326. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 629. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1733. 2018. *Osyris peltata* Roxb., Fl. Ind. ed. 2, 3: 755. 1832. *Macaranga roxburghii* Wight, Icon. Pl. Ind. Orient. 5: 23. 1852; Hook. f., Fl. Brit. India 5: 448. 1887. **(Plate 41F)** *'Kondajaphera'*

Small to medium sized evergreen trees, up to 10 m high; branches glaucous. Leaves large, peltate, orbicular, 12–26 cm long, usually at the ends of branchlets, acuminate at apex, margins entire, rusty, glandular above, hairy on nerves below; lateral nerves up to 10; petiole thick, about 17 cm long; stipules conspicuous, ovate-acuminate, caducous. Flowers in axillary panicles, usually from axils of fallen leaves, tomentose, greenish-yellow. Male flowers 9 mm long, bracteates; bracts orbicular, tomentose. Stamens 5. Female flowers in simple racemes; tepals minute, rounded. Ovary covered with glands; stigma sessile. Capsule globose, 5 mm in diam., with slender pedicel, densely covered with waxy, resinous, yellowish glands. Seed 1, globose.

Fl.: & Fr.: Mar.–Jun.

Habitat: Common in moist deciduous forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010444 (BSID).

Field notes: Gum obtained from this plant.

8. MALLOTUS Lour.

India: 18 spp. & 4 var.; Andhra Pradesh: 4 spp.; PNP: 4 spp.

Key to the species

1a.	Style plumose; fruit a capsule	2
1b.	Style linear; fruit indehiscent drupe	**1. M. nudiflorus**
2a.	Leaves alternate, red glandular beneath; capsule red glandular	3
2b.	Leaves opposite and alternate, yellow glandular beneath; capsule stellate pubescent	**4. M. rhamnifolius**
3a.	Leaves narrowly oblong-ovoid; stamens 20-30; styles 3; fruits 3-4-loculed	**2. M. phillippensis**
3b.	Leaves broadly ovate-deltoid; stamens more than 40; fruit 2-loculed	**3. M. repandus**

1. Mallotus nudiflorus (L.) Kulju & Welzen in Blumea 52: 124. 2007. *Trewia nudiflora* L., Sp. Pl. 2: 1193. 1753; Hook. f., Fl. Brit. India 5: 423. 1888; Gamble, Fl. Madras 2: 1319. 1925. Pull. & al., Fl. Andhra Pradesh 4: 1777. 2018. *Trewia polycarpa* Benth., Gen. Pl. 3: 318. 1880; Hook. f., Fl. Brit. India 5: 424. 1888. **(Plate 41G)** *'Erraponuku', 'Botuku'*

Medium sized trees, up to 8 m high; young branches pubescent. Leaves broadly ovate to deltoid, 10–15 cm long, cordate or truncate at base, acuminate at apex, margins entire, glabrous above, velutinous beneath, 3-ribbed; petiole up to 10 cm long. Male flowers in 2–3 or many flowered clusters on axillary or terminal pendulous racemes, pedicellate; bracts ovate-lanceolate. Stamens 22; filaments free. Female flowers axillary, solitary on stout racemes. Sepals 5, ovate, woolly tomentose. Ovary 5-loculed; styles 3–5, connate at base. Fruits oblong, woody, 2–5 loculed, subglobose, fleshy, pubescent. Seeds 5, ovoid, dark brown.

Fl. & Fr.: Mar.–Aug.

Habitat: Occasional along stream banks in the forest.

Specimen examined: Katchuluru, *Y. Mahesh* 011503 (BSID).

2. Mallotus philippensis (Lam.) Mull.Arg. Linnaea 34: 1196. 1865; Hook. f., Fl. Brit. India 5: 442. 1887; Gamble, Fl. Madras 2: 1332. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 630. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1734. 2018. *Croton philippensis* Lam., Encycl. 2: 206. 1786. **(Plate 41H)** *'Kunkuma', 'Senduri'*

Medium sized trees, up to 8 m high.. Leaves alternate, oblong-ovoid, 10–20 cm long, rounded at base having two sessile glands above, shortly acuminate at apex, margins entire, trinerved from base, glabrous above, pubescent and red gland dotted beneath; petiole up to 7 cm long. Flowers dioecious, in terminal and uppermost leaf-axile, tomentose racemes, 2 mm long, pale yellow. Male flowers with 6 cm long peduncle, shorter in female: perianth 4, basally connate, lobes lanceolate, 2 mm long. Stamens numerous; filaments free. Female perianth 3, connate at base, 1.5 mm long. Ovary 3-lobed; style 3, basally connate. Capsule 3-valved, trilobed, bright red.

Fl.: & Fr.: Nov.–Mar.

Habitat: Occasional in dry deciduous forests.

Specimen examined: GM Valasa, *Y. Mahesh* 010046 (BSID).

Field notes: From bark and fruits red dye is extracted.

3. Mallotus repandus (Rottler) Mull. Arg., Linnaea 34: 197. 1865; Hook. f., Fl. Brit. India 5: 442. 1887; Gamble, Fl. Madras 2: 1321. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1736. 2018. *Croton repandus* Rottler, Neue Schriften Ges. Naturf. Freunde Berlin 4: 206. 1803. **(Plate 42A)** *'Kandaveltu'*

Large straggling, thorny shrub, up to 5 m high; branches tomentose. Leaves broadly ovate-deltoid, 4–11 cm long, truncate or retuse at base, acute apex, margins entire or slightly toothed, glabrous above, stellately pubescent and small glands below; lateral nerves 3; petiole up to 5 cm long; stipules small, tomentose. Inflorescence densely hairy. Male flowers in terminal panicled racemes, pubescent; teplas 3–5, broadly ovate-lanceolate, 3 mm long, tomentose, glandular. Female flowers in simple racemes, light yellow; tepals linear, caducous. Ovary hairy. Capsule globose, 1.3 cm across, glandular, 2-valved, fulvous tomentose. Seeds black.

Fl.: & Fr.: Dec.–Apr.

Habitat: Occasional in scrub jungles and forest edges.

Specimen examined: Devipatnam, *Y. Mahesh* 011704 (BSID).

4. Mallotus rhamnifolius Mull. Arg., Linnaea 34. 196. 1865; Hook. f., Fl. Brit. India 5: 440. 1887; Gamble, Fl. Madras 2: 1322. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1737. 2018. *'Konda kunkuma'*

Small trees, up to 6 m high; branches fulvous tomentose. Leaves alternate, opposite, oblong-lanceolate, 6–10 cm long, rounded at base, acuminate, shortly mucronate at apex, margins entire, glabrous above, pubescent below; 3-ribbed with 4–6 lateral nerves; petiole up to 4 cm long. Flowers in axillary, erect, brown tomentose spikes. Male flowers in clusters, with 1.6 mm long pedicels; bracts lanceolate. Sepals 3, ovate, 2.5 mm long. Stamens numerous. Female flowers solitary. Calyx 6-lobed, spathulate; lobes lanceolate. Ovary 3-loculed; styles 3. Capsule globose, 3-valved, stellately pubescent. Seeds broadly ovoid, red.

Fl.: & Fr.: Jan.–Mar.

Habitat: Occasional in moist hilly areas and along stream banks.

Specimen examined: Valamuru, Chilukaluru, *Y. Mahesh* 010918, 011619 (BSID).



Plate 41: A. *Euphorbia hirta* L.; **B.** *Euphorbia nivulia* Buch.-Ham.; **C.** *Euphorbia thymifolia* L.; **D.** *Homonoia retusa* Mull. Arg.; **E.** *Jatropha gossypiifolia* L.; **F.** *Macaranga peltata* (Roxb.) Mull.Arg.; **G.** *Mallotus nudiflorus* (L.) Kulju & Welzen; **H.** *Mallotus philippensis* (Lam.) Mull. Arg.

9. MICROSTACHYS A. Juss.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Microstachys chamaelea (L.) Mull. Arg., Linnaea 32: 95. 1863; Pull. & al., Fl. Andhra Pradesh 4: 1742. 2018. *Tragia chamaelea* L., Sp. Pl. 2: 981. 1753. *Sebastiania chamaelea* (L.) Mull. Arg. in DC., Prodr. 15: 1175. 1866; Hook. f., Fl. Brit. India 5: 475. 1888; Gamble, Fl. Madras 2: 1344. 1925. **(Plate 42B)**

Erect or diffuse, annual herbs, up to 55 cm high; branches decumbent, terete, grooved, glabrous. Leaves alternate, linear-lanceolate or oblong, 3–5.5 cm long, cuneate or obtuse at base, obtuse, apiculate at apex, shortly dentate, hirtellous along excurved margins, glabrescent on both surfaces; petiole short, up to 1.2 mm long. Flowers in axillary or leaf opposed spikes, greenish-yellow. Male flowers numerous, minute; tepals 5, unequal, ovate, ciliate along margins. Stamens 3; filaments free. Female flowers larger, solitary; tepals 3, ovate, obovate, ciliate along margins. Ovary short, echinate, glabrous; styles 3. Capsule sub-globose, angular, 5 mm long; cocci 3, each with 2-vertical rows of spinules. Seeds ellipsoid.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common weed in waste places.

Specimen examined: Eruwada, *Y. Mahesh* 010654 (BSID).

10. PLUKENETIA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Plukenetia corniculata Sm., Nov. Act. Regiae Soc. Sci. Upsal. 6: 4. 1799; Hook. f., Fl. Brit. India 5: 464. 1887; Pull. & al., Fl. Andhra Pradesh 4: 1764. 2018. *'Kodigandham'*

Twining shrubs; branches obscurely ribbed. Leaves alternate, ovate-oblong, membranous, puberulous, cordate, 2-glands at base, caudate at apex, margins dentate, puberulous on both surfaces; petiole up to 5 cm long. Flowers in axillary or leaf opposed racemes; bracts 3-fid, lanceolate. Male flowers numerous, pedicellate, crowded at tip; sepals 5, ovate. Stamens 25, on cussion like receptacle. Female flowers few at base; sepals 4, lanceolate; ovary hirsute. Capsule 4-winged.

Fl.: & Fr.: Jun.–Aug.

Habitat: Occasional in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010424 (BSID).

11. TRAGIA Plum. ex L.

India: 7 spp. & 2 var.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves simple; styles circinate-revolute	**1. T. involucrata**
1b.	Leaves palmately 3-lobed; styles entire	**2. T. plukenetii**

1. Tragia involucrata L., Sp. Pl. 2: 980. 1753; Hook. f., Fl. Brit. India 5: 465. 1888; Gamble, Fl. Madras 2: 1332. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 638. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1773. 2018. **(Plate 42C)** *'Dulagondi'*

A twining, hispid herb, with stinging hairs all over, up to 1.1 m high; branches robust, striate. Leaves simple, ovate-oblong or elliptic-lanceolate, 5–9 cm long, rounded-truncate or obtuse at base, acuminate or caudate acuminate at apex, margins serrate, sparsely hispid on both surfaces; petiole up to 2 cm long. Flowers in terminal or axillary, 2.5 cm long racemes, pale green, bracteate. Male flowers many in upper part, 3 mm across; tepals 4, connate at base, orbicular. Stamens 4. Female flowers few near base, 5 mm across, with accrescent calyx; tepals 6, free, pinnatifid, lanceolate. Ovary globose, hairy; styles 3, connate, circinate-recurved. Capsule 3-lobed, 6 × 8 cm, hispid. Seeds globose.

Fl.: & Fr.: Jul.–Nov.

Habitat: Common climber along forest edges and pathways.

Specimen examined: PK Valasa, Valamuru, *Y. Mahesh* 010453, 010909 (BSID).

2. Tragia plukenetii Radcl.-Sm.in Kew Bull. 37: 688. 1983; Pull. & al., Fl. Andhra Pradesh 4: 1775. 2018. *Tragia cannabina* L.f., Suppl. Pl. 415. 1781; Gamble, Fl. Madras 2: 1333. 1925. *Tragia involucrata* L. var. *cannabina* (L.f.) Mull. Arg. in DC., Prodr. 15: 944. 1866; Hook. f., Fl. Brit. India 5: 465. 1888. *'Pedda duradagondi'*

Hispid undershrubs, up to 1.2 m high; branches profuse, striate, densely clothed with stinging bristles. Leaves alternate, palmately 3-lobed, lanceolate, 3–6 cm long, middle one longer than laterals, truncate or rounded at base, acute at apex, margins crenate-dentate, usually hispid on nerves; petiole short. Flowers monoecious, in axillary or leaf opposed racemes, greenish-yellow, bracteate. Male flowers small, in upper part; tepals 3, connate at base, broadly ovate. Female flowers few, situated below the male flowers, 8 mm long; tepals 6, ovate, hispid. Ovary sub-globose; styles 3, entire. Capsule 3-lobed, *c.* 1 cm in diam., covered by accrescent calyx, coarsely hirsute. Seeds globose.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common climber along forest hedges and hill slopes.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

12. TRITAXIS Baill.

India: 4 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Tritaxis glabella (Thwaites) R.Y. Yu & Welzen, Taxon 68: 932. 2019. *Dimorphocalyx glabellus* Thwaites, Enum. Pl. Zeyl. 278. 1861; Hook. f., Fl. Brit. India 5: 403. 1887; Gamble, Fl. Madras 2: 1337. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1668. 2018. *'Duradagonda'*

Small trees, up to 4 m high; young branches with brown shining scales. Leaves ovate-elliptic, 8–12 cm long, obtuse at base, acuminate at apex, margins serrate, glabrous. Flowers monoecious. Male flowers in axillary, umbellate, branched cymes; calyx urceolate, toothed, glabrous; corolla campanulate, lobes oblong. Stamens more than 10. Female flowers in axillary and terminal umbellate racemes; sepals 5, obovate; petals oblong. Capsule globose, grooved, seated on calyx, hairy.

Fl.: & Fr.: Mar.–May.

Habitat: Occasional in moist deciduous forests.

Specimen examined: Valamuru, *Y. Mahesh* 011796 (BSID).

57. LINACEAE

India: 5 genera, 11 spp., 9 var.; Andhra Pradesh: 3 genera, 4 sp.; PNP: 1 genus, 1 sp.

1. HUGONIA L.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Hugonia mystax L., Sp. Pl. 2: 675. 1753; Hook. f., Fl. Brit. India 1: 413. 1874; Gamble, Fl. Madras 1: 90. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 242. 1999; Pull. & al., Fl. Andhra Pradesh 1: 266. 2018. *'Pisangi', 'Kakibeera'*

A rambling or climbing shrubs; young branches tomentose. Leaves crowded at the ends of branchlets, elliptic-obovate, 5–7 cm long, tapering at base, subacute at apex, margins entire, glabrous above, pubescent on nerves beneath; petiole 3.8 cm long. Flowers in upper axils or terminal cymes, shortly pedicellate, about 2.2 cm across, yellow, bracteates; bracts subulate. Sepals 5, imbricate, lanceolate or ovate, pubescent. Petals 5, subequal, twisted, alternate with sepals. Stamens 10. Ovary glabrous; styles short. Drupe globose, 1.2 cm across, red, with compressed seeds.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common along thorny scrub forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

58. PHYLLANTHACEAE

India: Included in Euphorbiaceae; Andhra Pradesh: included in Euphorbiaceae; PNP: 7 genera, 18 spp., 1 var.

Key to the genera

1a.	Inner tepals (petals) present, small	2
1b.	Inner tepals (petals) absent	3
2a.	Ovary 3-celled; fruit a capsule	**3. Bridelia**
2b.	Ovary 2-celled; fruit a drupe	**4. Cleistanthus**
3a.	Disc absent, if present, completely adnate to the calyx	**6. Glochidion**
3b.	Disc conspicuous	4
4a.	Flowers in clusters	5
4b.	Flowers in spikes or racemes	**1. Antidesma**
5a.	Stamens 3, rarely 5; filaments connate or sometimes not	6
5b.	Stamens 5; filaments not as above	**4. Flueggea**

6a.	Tepals spreading, ovary globose	**7. Phyllanthus**
6b.	Tepals turbinate, not as above; ovarytruncate	**2. Breynia**

1. ANTIDESMA L.

India: 15 spp. & 1 var.; Andhra Pradesh: 5 spp.; PNP: 3 spp.

Key to the species

1a.	Leaves obtuse at apex; ovary pubescent	**3. A. ghaesembilla**
1b.	Leaves acute or acuminate at apex; ovary glabrous	2
2a.	Male flowers pedicelled; stamens 2; pistillode 0	**1. A. acidum**
2b.	Male flowers sessile; stamens 3 or 5; pistillode truncate	**2. A. bunius**

1. Antidesma acidum Retz., Observ. Bot. 5: 30. 1788; R.S. Rao & al., Fl. E. Godavari Dist. 617. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1637. 2018. *Antidesma diandrum* (Roxb.) Spreng., Syst. Veg., ed. 1: 826. 1824; Hook. f., Fl. Brit. India 5: 361. 1887; Gamble, Fl. Madras 2: 1298. 1925. **(Plate 42D)** *'Gummadi palleru'*

Small, spreading trees, up to 5 m high; branches glabrous. Leaves elliptic-lanceolate or obovate, obtuse, cuneate at base, acute or acuminate at apex, margins entire, glabrous above, sparsely pubescent below; petiole short, 4 mm long. Flowers slender, glabrous or pubescent, terminal spikes, greenish yellow, bracteates; bracts ovate. Male flowers short, 0.35 cm across, pedicelled; tepals cupular, lobes 4, obtuse. Stamens 2. Female flowers short, 0.15 cm across; tepals cupular, lobes 4, short. Ovary obovoid, glabrous; style 2. Drupe elliptic-oblong, 3 mm across, purple red, prominently ribbed.

Fl.: & Fr.: Mar.–Oct.

Habitat: Common in hilly areas, exposed slopes and along near streams.

Specimen examined: Teliperu, *Y Mahesh* 011475 (BSID).

2. Antidesma bunius (L.) Spreng., Syst. Veg. 1: 826. 1824; Hook. f., Fl. Brit. India 5: 358. 1887; Gamble, Fl. Madras 2: 1298. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 617. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1639. 2018. *'Anepu'*

Small trees, up to 5 m high; branches pubescent. Leaves elliptic-oblong or lanceolate, 14 cm long, acuminate at apex, margins entire, glabrous, shining above, sparsely fulvous hairy below; petiole very short, 1 mm long. Flowers in axillary, about 6 cm long spikes, pubescent. Male flowers compound, sessile; tepals cupular, lobes 4, short; stamens 3. Female flowers simple, shortly pedicellate, 2–3 together; tepals tubular, truncate. Ovary smooth; style 2. Drupe globose or elliptic, black when ripe.

Fl.: & Fr.: Mar.–Jun.

Habitat: Occasional on hills and ghat areas in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Antidesma ghaesembilla Gaertn., Fruct. Sem. Pl. 1: 189, t. 39. f. 5. 1788; Hook. f., Fl. Brit. India 5: 357. 1887; Gamble, Fl. Madras 2: 1298. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 617. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1639. 2018. *'Polarichettu'*

Medium sized trees, up to 10 m high; branches fulvous brown tomentose. Leaves elliptic-oblong or orbicular, 5–10 cm long, rounded at base, obtuse or abruptly acute at apex, margins entire, sparsely puberulous above, more below; petiole *c.* 1 cm long. Flowers in axillary panicled, racemes, 1.5 mm long, pale green, densely tomentose. Male flowers minute; tepals 5, pubescent. Stamens 4–7; filaments glabrous. Female flowers same as male flowers. Ovary pubescent; styles 2, short. Drupe ovoid, 3 mm across, prominently rugose when dry, red. Seeds covered with albumen.

Fl.: & Fr.: May–Aug.

Habitat: Occasional along forest paths and near streams in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. BREYNIA J.R. Forst. & G. Forst.

India: 14 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 3 spp.

Key to the species

1a.	Shrubs, up to 3 m high	2
1b.	Undershrubs, up to 1 m high	**2. B. rigida**

2a. Leaf apex apiculate; stipules lanceolate; style 3, each 2-fid, recurved **1. B. quadrangularis**
2b. Leaf apex obtuse-subacute; style minute, not as above **3. B. vitis-idaea**

1. Breynia quadrangularis (J.G. Klein ex Willd.) Chakrab. & N.P. Balakr., Bangladesh J. Plant Taxon. 19: 121. 2012. *Phyllanthus quadrangularis* J.G. Klein ex Willd., Sp. Pl., ed. 4, 4: 585. 1805. *Sauropus quadrangularis* (J.G. Klein ex Willd.) Mull. Arg., Linnaea 32: 73. 1863; Hook. f., Fl. Brit. India 5: 335. 1887; Gamble, Fl. Madras 2: 1303; 1925. Pull. & al., Fl. Andhra Pradesh 4: 1769. 2018.

Small shrubs, up to 1.5 m high; branches quadrangular. Leaves oblong-elliptic, 1.5 cm long, glabrous, obtuse at base, apiculate at apex, margins entire, glabrous; petiole 2 mm long; stipules small, lanceolate. Flowers in axillary cymes. Male flowers short, 2-3, up to 3 mm across; tepals 6, triangular, connate at base. Stamens 3. Female flowers solitary, 4 mm across; tepals 6, obovate, rounded.Ovary globose; styles 3, 2-fid each. Drupe globose, *c.* 6 mm across.

Fl.: & Fr.: Sep.–Dec.

Habitat: Occasional along forest outskirts, foothills.

Specimen examined: PK Valasa, *Y Mahesh*010435 (BSID).

2. Breynia rigida (Thwaites) Chakrab. & N.P. Balakr., Bangladesh J. Pl. Taxon. 19: 121. 2012. *Sauropus rigidus* Thwaites, Enum. Pl. Zeyl. 284. 1861. *Sauropus compressus* Mull. Arg. var. *puberulus* (Kurz) Chakrab. & M. Gangop., J. Econ. Taxon. Bot. 20: 528. 1996; Pull. & al., Fl. Andhra Pradesh4: 1768 .2018. *'Yellari'*

An erect undershrub, 1.5 m high; young branches quadrangular, tomentose. Leaves oblong-elliptic, 1.2–3 cm long, rounded at base, retuse at apex, margins entire, glabrous ; petiole short. Flowers in axillary cymes, pedicellate, bracteate. Male flowers small, 2 mm across, tepals 6, connate at base, obovate, emarginate. Stamens 3, connate at base. Female flowers short, 4 mm across; tepals 6, orbicular, pubescent. Ovary globose; styles 3, bifid, recurved. Drupe sub-baccate, rounded at top.

Fl.: & Fr.: Sep.–Dec.

Habitat: Occasional in hilly areas and along slopes.

Specimen examined: PK Valasa, *Y. Mahesh* 010443(BSID).

3. Breynia vitis-idaea (Burm.f.) C.E.C. Fisch., Bull. Misc. Inform. Kew 1932: 65. 1932; R.S. Rao & al., Fl. E. Godavari Dist. 618. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1644. 2018. *Rhamnus vitis-idaea* Burm.f., Fl. Ind. 61. 1768 *p.p.*. *Breynia rhamnoides* (Willd.) Mull. Arg. in DC. Prodr. 15: 440. 1866, nom. illeg.; Hook. f., Fl. Brit. India 5: 330. 1887; Gamble, Fl. Madras 2: 1304. 1925.*'Yerrabali', 'Yerra purugudu'*

A much-branched shrub, up to 3 m high; branches mostly horizontal. Leaves subsessile, elliptic-ovate, 3 cm long, membranous, cuneate or rounded at base, obtuse at apex, margins entire, glabrous; petiole 4 mm long; stipules subulate, persistent. Flowers unisexual, in axillary fascicles, minute, reddish white. Male flowers minute, 2 mm across, in axillary clusters; tepals 6, turbinate, entire. Stamens 3; filaments connate. Female flowers solitary, 3 mm across; tepals 6, campanulate, lobes 6, obtuse. Ovary truncate; style small. Capsule depressed-globose, smooth, red when ripe. Seeds trigonous.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common shrub along forest edges and stream banks.

Specimen examined: Sirivaka, Katchuluru, *Y Mahesh*011603, 011717(BSID).

3. BRIDELIA Willd.

India: 11 spp. & 2 var.; Andhra Pradesh: 5 spp.; PNP: 1 sp.

1. Bridelia retusa (L.) A. Juss., Euphorb. Gen. 109. t. 7, t. 22. 1824; Rao & al., Fl. E. Godavari Dist. 620. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1648. 2018. *Clutia retusa* L., Sp. Pl. 1: 1042. 1753. *Bridelia retusa* (L.) Spreng., Syst. Veg. 3: 48. 1826; Hook. f., Fl. Brit. India 5: 268. 1887. **(Plate 42E)** *'Koramanu', 'Pittakaraka'*

Moderate sized tree, up to 10 m high; young branches with conical spines. Leaves ovate-elliptic, 6–15 cm long, chartaceous, obtuse, rounded at base, obtuse or acute at apex, margins entire, glabrous above, glaucous beneath; secondary nerves 10–20, prominent; petiole short. Flowers in dense terminal spikes or axillary clusters, greenish yellow. Male flowers short, pedicellate. Sepals triangular. Petals suborbicular, lobed.Stamens 5. Female flowers pedicellate, minute. Sepals same as in male. Petals oblong, disc cupular; styles 2, bifid. Drupe fleshy and hardened after drying, black. Pyrenes 2, grooved.

Fl.: & Fr.: May–Oct.

Habitat: Common along stream banks.

Specimen examined: GM Valasa, *Y. Mahesh* 010984 (BSID).

Field notes: Conspicuous by its reddish leaves; bark used in tannins preparation.

4. CLEISTANTHUS Hook. f. ex Planch.

India: 8 spp.& 1 var.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a. Leaves ovate-lanceolate, apex acuminate; capsule not woody, deeply 3-lobed; seeds cordate, not shining **2. C. patulus**
1b. Leaves elliptic-obovate or orbicular, apex retuse; capsule hard woody; seeds globose, shining **1. C. collinus**

1. Cleistanthus collinus (Roxb.) Benth. & Hook.f., Fl. Brit. India 5: 274. 1887; Gamble, Fl. Madras 2: 1282. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 621. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1659. 2018. *Clutia collina* Roxb., Pl. Coromandel 2: 37, t. 169. 1802. **(Plate 42F)** *'Kodisa'*

Small trees, up to 7 m high; branchlets terete, glabrous. Leaves oblong-obovate or orbicular, 5–8 cm long, coriaceous, obtuse or rounded at base, acute or retuse at apex, margins entire, glabrous; lateral nerves prominent; petiole 5 mm long, pubescent. Flowers small, 5 mm long, in axillary, clusters or spikes, light greenish yellow. Male flowers in few flowered clusters; female flowers solitary. sepals 4 mm long, spreading, twisted, ovate or triangular-lanceolate, pilose outside. Petals minute, 3 mm long, fleshy, cucullate at tip. Ovary sub-globose, hairy; styles 3, deeply bifid. Capsule woody, trigonous, 2.5 mm across, 3-locular, dark brown, shining. Seeds globose, black.

Fl.: & *Fr.:* Feb.–Jun.

Habitat: Very common in disturbed dry deciduous forest.

Specimen examined: Buruguwada, Shivagiri, *Y Mahesh,* 010091, 010074 (BSID).

Uses: Wood is strong, valuble for house posts and fences; bark is used for wounds of cows, goats and outer crust of the fruit is poisonous and used to kill fish.

2. Cleistanthus patulus (Roxb.) Mull.Arg. in DC. Prodr. 15: 505. 1866; Hook. f., Fl. Brit. India 5: 279. 1887; Gamble, Fl. Madras 2: 1282. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 622. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1660. 2018. *Clutia patula* Roxb., Pl. Coromandel 2: 37, t. 170. 1802. **(Plate 42G)** *'Tellakodisa', 'Jegura'*

Medium sized tree, up to 10 m high; bark smooth, grey; branches terete, horizontal, glabrous. Leaves elliptic-lanceolate, 5–10 cm long, coriaceous, acute-obtuse or rounded at base, acuminate at apex, margins entire, glabrous. Flowers in clustered axillary spikes, 5 mm long. Male flowers: calyx 5-lobed, lobes ovate-deltoid, 4 mm long. Petals 5, obovate, alternate to the calyx, 3 mm long. Stamens 5. Female flowers sessile. Calyx tube cupular, lobes triangular, ovate. Petals suborbicular. Ovary globose; style bifid. Capsule *c.* 6 mm across, 3-lobed, shining.

Fl.: & Fr.: Feb.–Apr.

Habitat: Occasional in shadyrocky areas and along stream banks.

Specimen examined: Valamuru, *Y. Mahesh* 011795 (BSID).

Field notes: Leaves red in colour when young.

5. FLUEGGEA Willd.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Flueggea virosa (Roxb. ex Willd.) Voigt, Hort. Suburb. Calcutt. 152. 1845; Gamble, Fl. Madras 3: 1296. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1714. 2018. *Phyllanthus virosus* Roxb. ex Willd., Sp. Pl., ed. 4, 4(1): 578 1805. *Securinega virosa* (Roxb. ex Willd.) Baill., Adansonia 6: 334. 1866; R.S. Rao & al., Fl. E. Godavari Dist. 637. 1999. *Allichettu'*

Much branched shrub or small tree, up to 3 m high; branches effuse, grooved, sparsely pubescent or glabrous. Leaves variable in size, obovate-elliptic or orbicular, 4–8 cm long, cuneate or obtuse at base, obtuse or emarginate at apex, margins entire, glabrous; petiole 6 mm long. Flowers in axillary clusters, 1 mm long, pale yellow. Male flowers filiform, shorter than female. Sepals 5, ovate, concave. Stamens 5, free, exserted. Female flowers short. Sepals 5, ovate. Ovary sub-globose; styles 3, bifid. Capsule sub-globose, 3 mm across, white, smooth. Seeds wedge shaped, red.

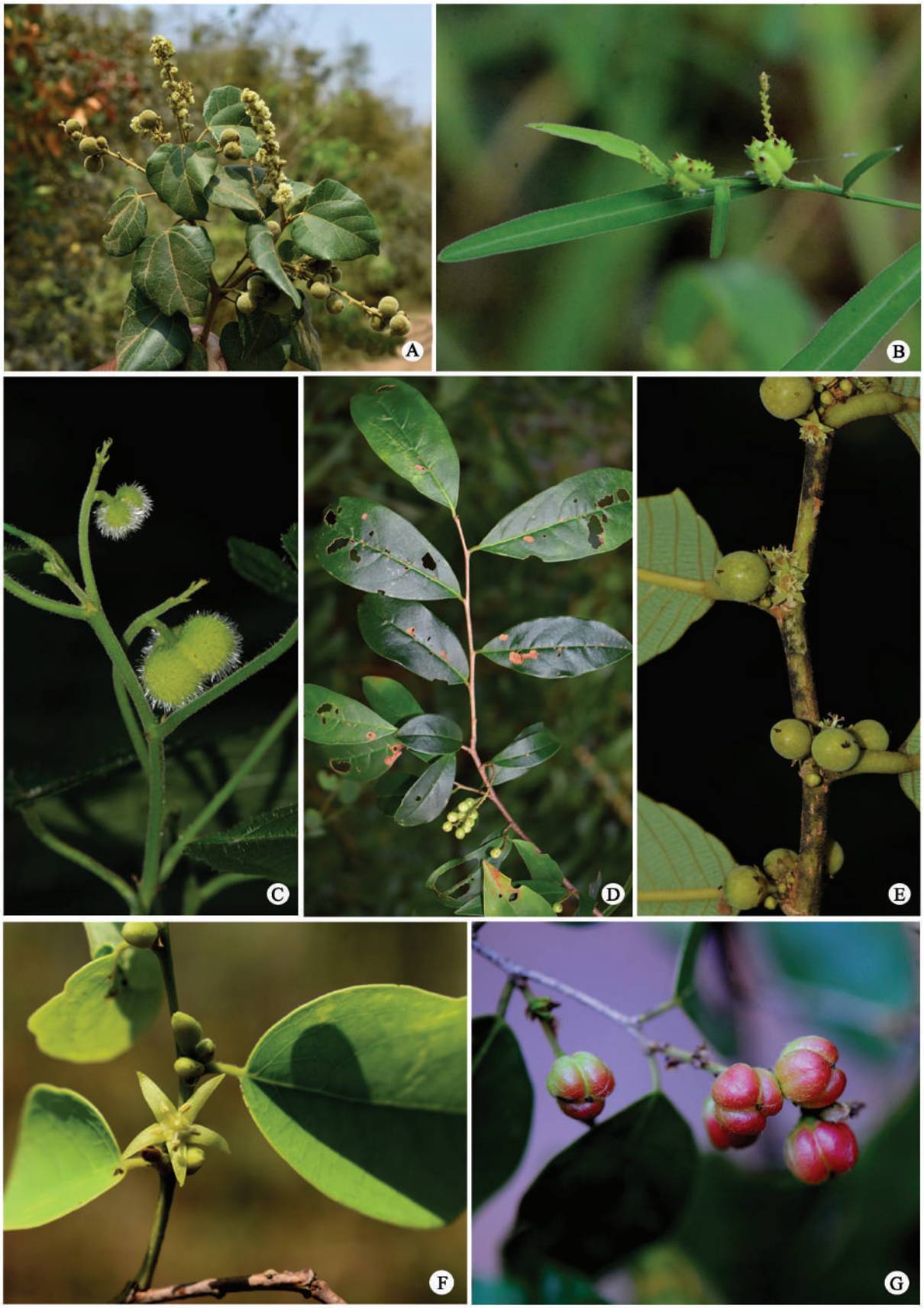


Plate 42: A. *Mallotus repandus* Mull. Arg.; **B.** *Microstachys chamaelea* (L.) Mull. Arg.; **C.** *Tragia involucrata* L.; **D.** *Antidesma acidum* Retz.; **E.** *Bridelia retusa* (L.) A. Juss.; **F.** *Cleistanthus collinus* (Roxb.) Benth. ex Hook.f.; **G.** *Cleistanthus patulus* (Roxb.) Mull. Arg.

Fl.: & Fr.: Jul.–Nov.

Habitat: Occasional in thorny scrub forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. GLOCHIDION J.R. Forst. & G. Forst.

India: 23 spp. & 10 var.; Andhra Pradesh: 5 spp. & 1 var.; PNP: 2 spp.

Key to the species

1a.	Anthers 3	**1. G. heyneanum**
1b.	Anthers 4 or more	**2. G. zeylanicum**

1. Glochidion heyneanum (Wight & Arn.) Wight ex Bedd., For. Man. Bot. 195. 1873; Hook. f., Fl. Brit. India 5: 323. 1887; Pull. & al., Fl. Andhra Pradesh 4: 1719. 2018. *Gynoon heyneanum* Wight & Arn., Edinb. New Phil. J. 14: 300. 1833. *Glochidion velutinum* Wight, Icon. Pl. Ind. Orient. 5: t. 1907, f. 2. 1852; Hook. f., Fl. Brit. India 5: 322. 1887; Gamble, Fl. Madras 2: 1307. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 627. 1999. **(Plate 43A)**

Small evergreen tree, up to 7 m high; branches zig-zag, velutinous. Leaves elliptic-oblong or ovate, 4–10 cm long, coriaceous, obliquely obtuse or attenuate at base, acute, mucronate at apex, margins entire, pubescent on both surfaces; petiole short. Flowers in axillary clusters, 3 mm long, greenish, pedicellate. Male flowers shortly pedicellate, yellow; tepals 6, subequal, ovate, 1.5 mm long. Stamens 3, connate. Female flowers distinctly pedicellate, greenish; tepals 6, lanceolate, hairy. Ovary globose, hirsute; style connate. Capsule depressed globose, 8 mm across, furrowed, pubescent. Seeds flattened, orange.

Fl.: & Fr.: Mar.–Aug.

Habitat: Occasional along stream banks in moist deciduous forests.

Specimen examined: Ijjaluru, *Y Mahesh*010977 (BSID).

2. Glochidion zeylanicum (Gaertn.) A.Juss., Euphorb. Gen. 107. 1824; Hook. f., Fl. Brit. India 5: 310. 1887; Gamble, Fl. Madras 2: 1306. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1723. *Bradleia zeylanica* Gaertn., Fruct. Sem. Pl. 2: 128, t. 109. 1790.

Key to the varieties

1a.	All parts (except ovary) glabrous	var. **zeylanicum**
1b.	All parts pubescent	var. **tomentosum**

2.1. var. **tomentosum** (Dalzell) Trimen, Syst. Cat. Fl. Pl. Ceylon 79. 1885; Pull. & al., Fl. Andhra Pradesh 4: 1722. 2018. *G. tomentosum* Dalzell, Hooker's J. Bot. Kew. Gard. Misc. 2: 38. 1850; Hook. f., Fl. Brit. India 5: 309. 1887; Gamble, Fl. Madras 2: 1307. 1925. **(Plate 43B)**

Medium or small trees, up to 10 m high; branchlets terete, tomentose. Leaves alternate, elliptic-oblong, 10-15 cm long, obliquely rounded or subcordate at base, acute to acuminate at apex, margins entire, pubescent above, grey tomentose below; petiole up to 0.3 cm long, grey pubescent. Flowers small, in axillary fascicles, dull yellow, pedicellate. Male flowers; sepals 6 in two rows, hairy without, glabrous within. Capsule depressed globose, *c.* 0.9 cm across, conical, 12-lobed, beaked, pubescent.

Fl.: & Fr.: Mar.–Jul.

Habitat: Occasional in moist deciduous forests.

Specimen examined: PK Valasa, *Y. Mahesh* 011774 (BSID).

2.2. var. **zeylanicum** **(Plate 43C)** *'Pageri'*

Small evergreen trees, up to 9 m high; bark brown, smooth; branches zig-zag, glabrous. Leaves ovate-lanceolate or oblong, 8–20 cm long, rather coriaceous, unequally truncate or rounded at base, acute at apex, margins entire, glaucous above, copper coloured below, glabrous; petiole short, 0.5 cm long; stipules acuminate, recurved. Flowers small, 3 mm long, in axillary clusters, yellowish green, bracteate. Male flowers pedicellate; sepals 5 or 6, ovate. Stamens 5-7. Female flowers sessile; sepals 3, triangular, deltoid or ovate. Ovary sub-globose; style free, clavate. Capsule globose, 8 mm across, longitudinally grooved, glabrous, yellowish-orange when mature. Seeds wedge shaped.

Fl.: & Fr.: Feb.–Jul.

Habitat: Occasional in moist deciduous forests and stream banks.

Specimen examined: Eruwada, *Y. Mahesh* 011564, (BSID).

7. PHYLLANTHUS L.

India: 52 spp. & 1 var.; Andhra Pradesh: 20 spp. & 1 var.; PNP: 7 spp.

Key to the species

1a.	Fruits berries	2
1b.	Fruits capsules	3
2a.	Trees; berries large, with stony endocarp	**2. P. emblica**
2b.	Shrubs; berries small, without stony endocarp	**4. P. reticulatus**
3a.	Capsule rugose or verrucose	4
3b.	Capsule smooth rarely glandular	5
4a.	Leaves distichous; seeds grooved, not muricate	**6. P. urinaria**
4b.	Leaves not prominently distichous; seeds muricate	**7. P. virgatus**
5a.	Leaves ovate; flowers white	**5. P. rheedii**
5b.	Leaves obovate; flowers greenish	**6**
6a.	Leaves distichous; tepals 5; disc glands 5	**1. P. amarus**
6b.	Leaves not distichous; tepals 6; disc glands 6	**3. P. fraternatus**

1. Phyllanthus amarus Schumach. & Thonn., Beskr. Guin. Pl. 421. 1827; R.S. Rao & al., Fl. E. Godavari Dist. 631. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1746. 2018. *Phyllanthus niruri* auct. non. L., Sp. Pl. 2: 981. 1753. Hook. f., Fl. Brit. India 5: 298. 1887 *p.p.*; Gamble, Fl. Madras 2: 1290. 1925. *'Nelausiri'*

A small, erect or procumbent herb, up to 30 cm high; branches glabrous. Leaves disposed alternately in branchlets, distichous, subsessile, elliptic-oblong or ovate, 4–9 mm long, rounded at base, obtuse, apiculate at apex, margins entire, glabrous. Flowers minute, 5 mm long, in axillary or lateral pairs, greenish, shortly pedicellate. Male flowers up to 3 in upper axils; tepals 5, ovate, greenish with white margins. Stamens 3; filaments columnar. Female flowers numerous, at lowers axils; tepals 5, ovate. Ovary 6-lobed; styles 3, bifid. Capsule globose, 1.5 mm across. Seeds wedge shaped.

Fl.: & Fr.: Throughout the year.

Habitat: Common weed in agricultural fields and open waste lands.

Specimen examined: Ijjaluru, *Y. Mahesh* 012129 (BSID).

Uses: This plant used in jaundice treatment.

2. Phyllanthus emblica L., Sp. Pl. 2: 982. 1753; Hook. f., Fl. Brit. India 5: 289. 1887; R.S. Rao & al., Fl. E. Godavari Dist. 632. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1749. 2018. *Emblica officinalis* Gaertn., Fruct. Sem. Pl. 2: 122, t. 108. f. 2. 1790; Gamble, Fl. Madras 2: 1295. 1925. **(Plate 43D)** *'Peddausiri'*

Medium sized deciduous tree, up to 12 m high; bark greyish-brown, flacking off with irregular flakes; branchlets slender, drooping, glabrous. Leaves simple, alternate, linear-oblong, 1.5 cm, obtuse or subcordate at base, obtuse, mucronate at apex, margins entire, glabrous. Flowers small, unisexual, in axillary fascicles, 3-merous, below the leaves, greenish yellow, shortly pedicellate. Male flowers numerous, short; sepals 6, obovate. Stamens 3, connate. Female flowers few, subsessile; sepals 6, obovate. Ovary ovoid; styles 3, bifid. Berry fleshy, globose, 3-celled, 2.5 cm across, pale green, with 6 vertical lines, endocarp stony. Seeds 6, trigonous.

Fl.: & Fr.: Mar.–Oct.

Habitat: Common tree in deciduous forests.

Specimen examined: Buruguwada, Shivagiri, PK Valasa, *Y Mahesh*010087, 011615, 011773(BSID).

Uses: Fruits used in "Triphala" medicine in ayurveda, and used in pickles.

3. Phyllanthus fraternus G.L. Webster, Contr. Gray Herb. 176: 53. 1955; Rao & al., Fl. E. Godavari Dist. 633. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1750. 2018. *Phyllanthus niruri* sensu Hook.f., Fl. Brit. India 5: 298. 1887 *p.p. non* L., 1753. *'Nelausisri'*

Procumbent or erect, glabrous herbs, up to 50 cm high; branches ascending. Leaves simple, alternate, distichous, oblong-obovate, 4–8 mm long, rounded at base, subacute at apex, margins entire, glabrous; petiole very short; stipules lanceolate, acute. Flowers monoecious, axillary, greenish. Male flowers 1-3; perianth lobes 5, small, rounded. Stamens 3. Female flowers solitary, large; perianth lobes oblong, scarious along margins. Ovary globose, trilocular; styles 3, minute. Capsule depressed globose, 1.5 mm across, smooth. Seeds trigonous, yellowish brown.

Fl.: & Fr.: Aug.–Nov.

Habitat: Common weed in cultivated fields.

Specimen examined: PK Valasa, *Y. Mahesh* 012143 (BSID).

4. Phyllanthus reticulatus Poir. in Lam., Encycl. 5: 298. 1804; Hook. f., Fl. Brit. India 5: 288. 1887; Rao & al., Fl. E. Godavari Dist. 635. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1756. 2018. *Kirganelia reticulata* (Poir.) Bail., Etud. Gen. Euphorb. 613. 1858; Gamble, Fl. Madras 2: 1294. 1925. *'Nallapulugadda'*

An erect, scandent shrub, up to 4 m high; branches striate, pubescent. Leaves simple, elliptic-oblong or obovate, about 2 cm long, rounded or obtuse at base, obtuse at apex, margins entire, sparsely puberulous on prominent reticulations above, glabrous below; petiole very short; stipules small, ovate. Flowers monoecious, small, 1 mm across, 2–3, axillary, greenish. Male flowers many in fascicles, upper axils; tepals 6, obovate, obtuse. Stamens 5, free. Female flowers solitary; tepals 6, obovate, unequal. Ovary globose; styles 3, bifid. Berry globose, 4 mm across, endocarp not stony, black when ripe. Seeds 8, trigonous.

Fl.: & Fr.: Mar.–Jul.

Habitat: Frequent along forest paths and scrub forests.

Specimen examined: Chigurumamidi, *Y Mahesh* 011392 (BSID).

Field notes: Fruits edible, leaf juice used for bleeding gums.

5. Phyllanthus rheedei Wight, Icon. Pl. Ind. Orient. t. 1895. f.1. 1852; Hook. f., Fl. Brit. India 5: 293. 1887; Gamble, Fl. Madras 2: 1289. 1925; Rao & al., Fl. E. Godavari Dist. 635. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1757. 2018. **(Plate 43E)**

An erect, woody herb, up to 55 cm high; branches terete. Leaves ovate or elliptic-oblong, 1.8–2.2 cm long, obtuse or rounded at base, obtuse, apiculate at apex, margins entire, glaucous below; petiole short. Flowers white, axillary. Male flowers few, small, in upper axils, fascicled; tepals 6, oblong, green with white margins. Stamens 3. Female flowers numerous, large; tepals 6, obovate. Ovary globose, glabrous; styles 3, bifid. Capsule globose, 0.5 cm across, smooth. Seeds wedge shaped, minute.

Fl.: & Fr.: Jul.–Nov.

Habitat: Common in moist shady areas in high altitudes.

Specimen examined: Valamuru, *Y. Mahesh* 010905 (BSID).

6. Phyllanthus urinaria L., Sp. Pl. 2: 982. 1753; Hook. f., Fl. Brit. India 5: 293. 1887; Gamble, Fl. Madras 2: 1289. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 635. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1763. 2018. *'Ucchausiri'*

An erect, suffruticose herb, up to 30 cm high; branches obscurely angled, grooved; branchlets faintly winged. Leaves distichous, subsessile, broadly ovate or obovate, up to 1 cm long, rounded at base, apiculate at apex, margins entire, glabrous. Flowers axillary, solitary, minute, 2 mm long, greenish. Male flowers small. Female flowers large. Perianth lobes minute, linear-oblong, connate at base. Ovary glabrous; styles 3, bifid. Capsule rounded, 2 mm across, echinate, greenish. Seeds wedge shaped, transversely grooved.

Fl.: & Fr.: Oct.–Apr.

Habitat: Common along moist shady areas in the forest.

Specimen examined: PK Valasa, Ijjaluru, *Y. Mahesh* 010413, 010975 (BSID).

7. Phyllanthus virgatus G.Forst., Pred. 65. 1786. *Phyllanthus simplex* Retz., Observ. Bot. 5: 29. 1788; Hook. f., Fl. Brit. India 5: 295. 1887; Gamble, Fl. Madras 2: 1289. 1925. R.S. Rao & al., Fl. E. Godavari Dist. 636. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1760. 2018. *'Uchichi usirika'*

An erect, branched herb, up to 60 cm high; branches striate, faintly winged, glabrous. Leaves simple, alternate, subsessile, ovate-elliptic or oblong, up to 1.7 cm long, subcordate at base, obtuse, apiculate at apex, margins entire, excurved, glabrous-scaberulous above; petiole very short; stipules ovate, reddish-brown. Flowers axillary, 2 mm long, greenish. Male flowers 1-2, perianth 6, oblong, subacute. Stamens 3, distinct. Female flowers solitary. Ovary globose, with minute projections, trilocular; styles 3, bifid. Capsule globose, 3 mm across, rough with minute projections. Seeds trigonous, muricate, brown.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common weed in cultivated fields, roadsides and wastelands.

Specimen examined: Kondamodalu, Valamuru, Gulletiwada, *Y. Mahesh* 010053, 010492, 010602, 010935 (BSID).

59. COMBRETACEAE

India: 5 genera, 48 taxa; Andhra Pradesh: 5 genera, 17 species; PNP: 3 genera, 9 species.

Key to the genera

1a.	Trees or shrubs; petals absent	**3. Terminalia**
1b.	Climbing shrubs; petals present or absent	2
2a.	Petals present; calyx limb deciduous; fruit 4–5-winged, calyx persistent	**1. Combretum**
2b.	Petals absent; calyx limb persistent; fruit 5-ribbed, surrounded by calyx	**2. Getonia**

1. COMBRETUM Loefl.

India: 14 spp.& 7 var.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Bracts greenish; flowers tetramerous; fruit with 4 papery globose wings	**1. C. albidum**
1b.	Bracts white; flowers pentamerous; fruit with 5 papery oblong wings	**2. C. album**

1. Combretum albidum G.Don, Trans. Linn. Soc. London 15: 429. 1827; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 722. 2018. *Combretum ovalifolium* Roxb., Fl. Ind. 2: 226. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 2: 458. 1878; Gamble, Fl. Madras 1: 469. 1919. **(Plate 43F)** *'Yadateega', 'Yadateega'*

A climbing, shrub, up to 4 m high; branchlets terete, greyish. Leaves opposite-decussate, elliptic-lanceolate or ovate, 4–10 cm long, coriaceous, narrowed at base, obtuse-acute or emarginate at apex, margins entire, glabrous; lateral nerves up to 10 pairs; petiole *c*. 1.6 cm long. Flowers sessile, in axillary or terminal panicled spikes, 4 mm long, tetramerous, pale yellowish; bracts greenish. Sepals 4, connate, glabrous outside; lobes ovate, 1 mm long, reflexed, prominently nerved. Petals 4, oblong or spathulate, 1.5 mm long, obtuse. Stamens 8, biseriate. Ovary unicellular; style subulate. Fruit samaroid, with 4 wings, pale golden brown.

Fl.: & Fr.: Feb.–May.

Habitat: Common along roadsides in the forest and edges of scrub forests.

Specimen examined: Darapally, Kakeshnur, *Y. Mahesh* 010133, 011312 (BSID).

2. Combretum album Pers., Syn. Pl. 1: 411. 1805; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 724. 2018. *Combretum roxburghii* Spreng., Syst. 2: 331. 1825. *Combretum decandrum* Roxb., Pl. Coromandel 1: 49. 59. 1795; C.B. Clarke in Hook. f., Fl. Brit. India 2: 452. 1878; Gamble, Fl. Madras 1: 468. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 358. 1999. **(Plate 43G)** *'Bonthateega'*

A large climbing shrub, up to 3 m high; branches pendulous, covered with silky pubescence when young. Leaves opposite, oblong-elliptic, 5–10 cm long, cuneate at base, acuminate at apex, margins entire, glabrous; lateral nerves 6 pairs; petiole short, 7 mm long. Flowers in panicled spikes, white; bracts foliaceous, greenish white. Sepals connate; lobes 5, 1.2 mm long, villous. Petals 5, ovate-oblong, 1.3 mm long, white. Stamens short. Ovary small; style 3 mm long. Fruit oblong, 5-winged, 2.5 cm long, glabrous, reddish brown.

Fl.: & Fr.: Feb.–May.

Habitat: Common in open deciduous forests.

Specimen examined: Kakeshnur, *Y. Mahesh* 011313 (BSID).

2. GETONIA Roxb.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Getonia floribunda Roxb., Pl. Coromandel 1: 61. t. 87. 1798. *Calycopteris floribunda* (Roxb.) Lam. ex Poir., Encycl. Suppl. 2: 41. 1811; C.B. Clarke in Hook. f., Fl. Brit. India 2: 449. 1878; Gamble, Fl. Madras 1: 467. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 358. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 721. 2018*. 'Bonthateega'*

Scandent shrubs, up to 12 m high; branches drooping, rusty fulvous pubescent. Leaves opposite, ovate-lanceolate, 6–15 cm long, obtuse or rounded at base, shortly acuminate at apex, margins ciliate, softly pilose above, rusty tomentose, gland dotted below; petiole up to 1 cm long. Flowers 2 cm long, in terminal, fulvous pubescent panicles, greenish white or pale yellow, bracteate; bracts foliaceous, broadly ovate; bracteoles elliptic-lanceolate. Sepals 5, connate; lobes scarious, elliptic-lanceolate, 1.5 cm long, ciliate, prominently 3-nerved; hypanthium elongate-turbinate. Petals absent. Stamens 10, biseriate. Ovary densely villous, unilocular; style villous, with curved apex. Fruit 5-ribbed, tomentose, enclosed by accrescent calyx. Seed 1.

Fl.: & Fr.: Apr.–Jun.

Habitat: Common along stream banks and roadsides.

Specimen examined: Buruguwada, Pocharam, *Y. Mahesh* 010103, 010137 (BSID).

3. TERMINALIA L.

India: 17 spp.; Andhra Pradesh: 10 spp.; PNP: 6 spp.

Key to the species

1a.	Flowers an elongate spikes or racemes	3
1b.	Flowers in globose heads	2
2a.	Leaves elliptic or suborbicular, obtuse –rounded at apex; flower heads in cymes; fruit wings entire	**1. T. anogeissiana**
2b.	Leaves elliptic-lanceolate, acute at apex; flower heads solitary on bracteates peduncles; fruit wings dentate	**6. T. phillyreifolia**
3a.	Fruit 5 equal winged	4
3b.	Fruit not winged, fleshy, faintly rigid	5
4a.	Bark light coloured, smooth, peels off; fruiting wings hard, notched at top	**2. T. arjuna**
4b.	Bark like crocodile scales, hard, deeply cracked; fruit wings papery, rounded at top	**5. T. elliptica**
5a.	Leaves crowded at ends of branchlets, eglandular; fruit faintly pubescent, not shiny	**3. T. bellirica**
5b.	Leaves not crowded at ends of branchlets, glandular at base of lamina; fruit glabrous, shining	**4. T. chebula**

1. Terminalia anogeissiana Gere & Boatwr. in Bot. J. Linn. Soc. 184: 319. 2017. *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. & Perr., Fl. Seneg. Tent. 1: 280. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 2: 450. 1878; Gamble, Fl. Madras 1: 466. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 357. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 720. 2018. *Conocarpus latifolius* Roxb. ex DC., Prodr. 3: 17. 1828. *'Tirumanu'*

Large deciduous tree, up to 15 m high; young branches silky pubescent. Leaves subopposite or alternate, elliptic-oblong or ovate, 4–10 cm long, obtuse at base, shortly acuminate, obtuse or shortly emarginate at apex, margins entire, glabrescent above, sparsely pubescent below, nerves prominent; petiole *c.* 1 cm long. Flower heads globose, 1.2 cm across, in axillary, branched cymes, pubescent, pale yellow, bracteate, shortly pedicellate. Sepals 5, connate, 2 mm long, 2-winged at base, urceolate at apex; lobes small, hypanthium short. Petals absent. Stamens 10, biseriate. Ovary unilocular; style glabrous. Drupe clustered in to a globose head, 05 mm in diam., 2-winged, 1-seeded, pubescent, yellowish brown.

Fl.: & Fr.: Apr.–Sep.

Habitat: Common in plains, along pathways in the forest.

Specimen examined: Kondamodalu, Chilukaluru, *Y. Mahesh* 010070,011620 (BSID).

2. Terminalia arjuna (Roxb. ex DC.) Wight & Arn., Prodr. Fl. Ind. Orient. 1: 314. 477. 1834; C.B. Clarke in Hook. f., Fl. Brit. India 2: 447. 1878; Gamble, Fl. Madras 1: 465. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 360. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 726. 2018. *Pentaptera arjuna* Roxb. ex DC., Prodr. 3: 15. 1828. **(Plate 43H)** *'Tellamaddi'*

Large, deciduous tree, up to 15 m high; bark pale-pinkish to light grey, peeling off in papery flakes, smooth, exudes reddish-brown resin; young branches puberulous. Leaves subopposite, elliptic-oblong, obovate, 7–14 cm long, coriaceous, unequally rounded, glands at base, obtuse or emarginate at apex, margins crenate-serrate, glabrous; nerves 12–16 pairs; petiole *c.* 1.6 cm long. Flowers sessile, 5 mm long, in axillary spikes or terminal panicles of spikes, pale green or creamy white. Sepals 5, connate, 2 mm long, lobes ovate, villous within. Petals absent. Stamens 10, biseriate. Ovary broadly ellipsoid, pubescent, unilocular; style glabrous. Drupe, ovoid, 4.5 cm long, prominently 5-winged, reddish brown, striated with curved nerves, notched at apex.

Fl.: & Fr.: Apr.–Sep.

Habitat: Common along stream banks and water courses in the forest.

Specimen examined: Arvapally, Buruguwada, *Y. Mahesh* 011375, 011597 (BSID).

3. Terminalia bellirica (Gaertn.) Roxb., Pl. Coromandel 2: 54, t. 198. 1805; C.B. Clarke in Hook. f., Fl. Brit. India 2: 445. 1878; Gamble, Fl. Madras 1: 463. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 361. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 727. 2018. *Myrobalanus bellirica* Gaertn., Fruct. 2: 90, t. 97. 1790. **(Plate 44A)** *'Tanikaya', 'Tadigottuchettu'*

Large, deciduous tree, up to 25 m high; bark grey, longitudinally rigid, irregularly breaking; branches rusty brown-tomentose when young. Leaves clustered near the ends of branches, elliptic-obovate, 10–28 cm long,

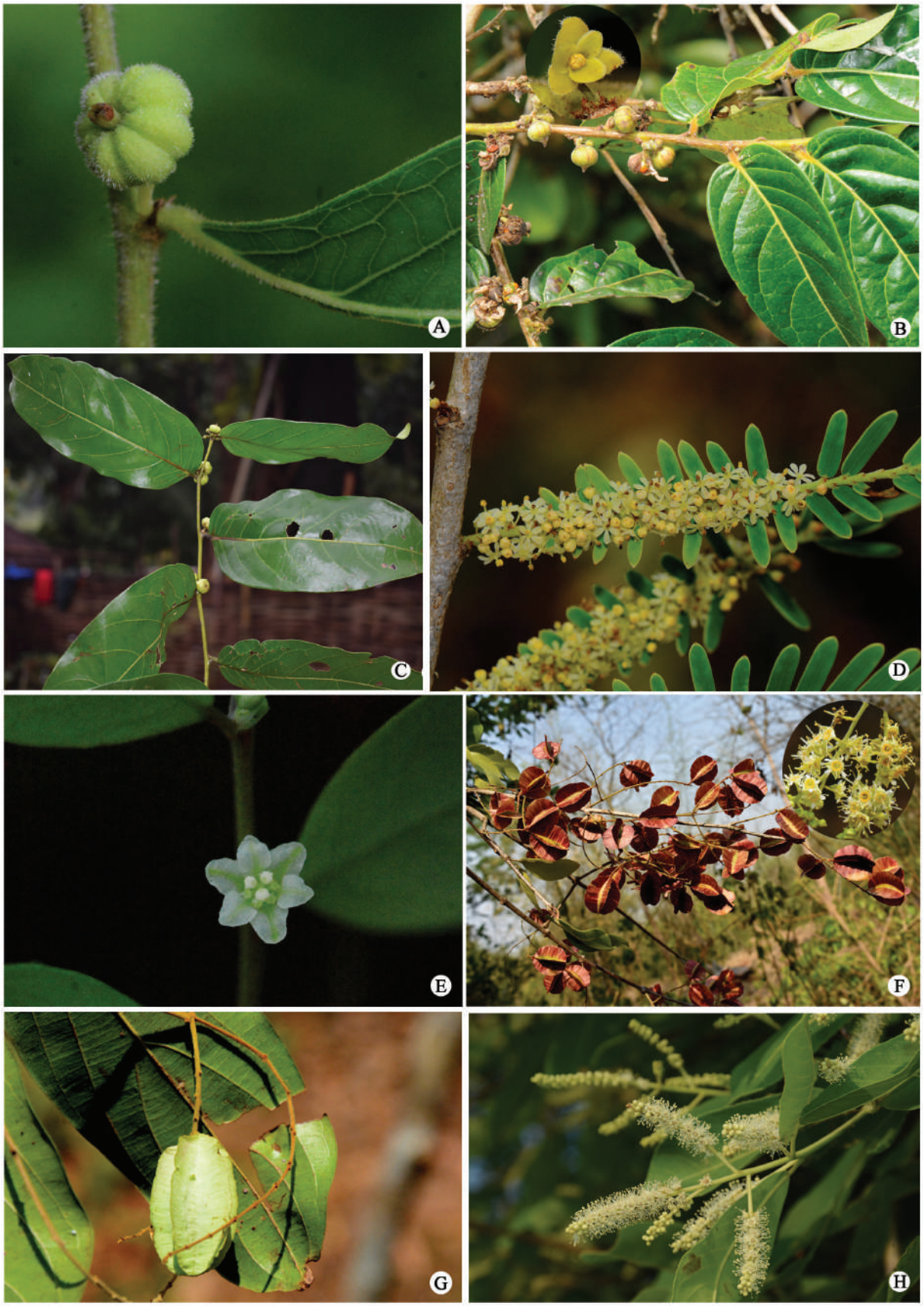


Plate 43: A. *Glochidion heyneanum* (Wight & Arn.) Wight; **B.** *Glochidion zeylanicum* var. *tomentosum* Trimen; **C.** *Glochidion zeylanicum* var. *zeylanicum*; **D.** *Phyllanthus emblica* L.; **E.** *Phyllanthus rheedei* Wight; **F.** *Combretum albidum* G. Don; **G.** *Combretum album* Pers. ex M.G. Gangop. & Chakrab.; **H.** *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.

coriaceous, obliquely rounded or acute at base, acute, rounded at apex, margins entire, glossy above, pale below, sparsely pubescent or glabrous on both surfaces, nerves prominent; petiole *c.* 6 cm long. Flowers at the apex of branchlets, 5 mm across, in axillary, up to 10 cm long spikes, brownish-yellow, pubescent. Male flowers upper; lower bisexual. Sepals 5, connate, 4 mm long, pubescent villous within; lobes triangular. Petals absent. Stamens 10, biseriate. Ovary ellipsoid, pubescent; style villous at base. Drupe ellipsoid or sub-globose, 2.5 cm across, woody, minutely brown tomentose.

Fl.: &Fr.: Mar.–Jul.

Habitat: Occasional in dry deciduous forest.

Specimen examined: Geediguppa, Chigurumamidi, *Y. Mahesh* 010156, 011303, 011372 (BSID).

Field notes: Fruits used in Triphala medicine in ayurveda.

4. Terminalia chebula Retz., Observ. Bot. 5: 31. 1788. Incl. forma. *tomentosa*; C.B. Clarke in Hook. f., Fl. Brit. India 2: 446. 1878 *p.p.*; Gamble, Fl. Madras 1: 464. 1919. R.S. Rao & al., Fl. E. Godavari Dist. 362. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 729. 2018. *Myrobalanus chebula* (Retz.) Gaertn., Fruct. 2: 91, t. 97. 1791. **(Plate 44B)** *'Karakkaya'*

Moderate sized tree, up to 18 m high; bark blackish-grey, irregularly cracking with deep vertical furrows; branches rusty tomentose when young. Leaves sub-opposite, elliptic-oblong or ovate, 6–15 cm long, coriaceous, unequally acute, rounded at base, obtuse, apiculate at apex, margins entire, sparsely pubescent, nerves prominent below; petiole 2 cm long, with two glands at base. Flowers *c.* 3 mm across, creamy white, in 8 cm long, axillary or terminal panicled spikes. Sepals 5, connate, 2 mm long; lobes ovate, villous within. Petals absent. Stamens 10, biseriate. Ovary ellipsoid, pubescent; style glabrous. Drupe, ellipsoid or obovoid, *c.* 3 cm long, pendulous, glabrous, yellowish-green, 5-ribbed when dry.

Fl.: & Fr.: Apr.–Oct.

Habitat: Occasional in hill slopes in the forest.

Specimen examined: Allivagu, Chigurumamidi, *Y. Mahesh* 011302, 011305 (BSID).

5. Terminalia elliptica Willd., Sp. Pl., 4: 969. 1806. *Terminalia alata* B.Heyne ex Roth, Nov. Pl. Sp. 379. 1821; R.S. Rao & al., Fl. E. Godavari Dist 360. 1999. *Terminalia tomentosa* (Roxb. ex DC.) Wight & Arn., Prodr. Fl. Ind. Orient. 1: 314. 1834; C.B. Clarke in Hook. f., Fl. Brit. India 2: 447. 1878; Gamble, Fl. Madras 1: 465. 1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 734. 2018. *Pentaptera tomentosa* Roxb. ex DC., Prodr. 3: 14. 1828. *'Nallamaddi', 'Inamaddi'*

Medium sized, deciduous tree, up to 20 m high; bark blackish-grey, rough, with deep vertical fissures, horizontally cracked; young parts clothed with yellowish or brown tomentose. Leaves elliptic-oblong or lanceolate, 8–16 cm long, coriaceous, rounded or obtuse at base, acute at apex, margins entire or crenulate, glabrous above, tomentose beneath; lateral nerves 10-16 pairs, prominent beneath; petiole *c.* 3.5 cm long, with two large glands near base. Flowers 4 mm long, in axillary or terminal paniculate spikes, light yellow-brown. Sepals 5, pubescent, 3-angled. Petals absent. Stamens 10. Ovary terete, 1-celled; style short. Drupe ellipsoid, 5 cm long, often apiculate, with 5 equal papery wings.

Fl.: & Fr.: Oct.–Dec.

Habitat: Common in dry deciduous forest.

Specimen examined: Kakeshnur, *Y. Mahesh* 010194 (BSID).

Field notes: Bark looks like crocodile skin; wings on fruit with thin horizontal striations.

6. Terminalia phillyreifolia (Van Heurck & Mull. Arg.) Gere & Boatwr, Bot. J. Linn. Soc. 184: 321. 2017. *Anogeissus phillyreifolia* Van Heurck & Mull. Arg., Obs. Bot. 209. 1871. *Anogeissus acuminata* (Roxb. ex DC.) Guill. & Perr., Fl. Seneg. Tent. 1: 280. 1832; C.B. Clarke in Hook.f. Fl. Brit. India 2: 330. 1957; Gamble, Fl. Madras 1: 466. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 357. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 718. 2018. *Conocarpus acuminatus* Roxb. ex DC., Prodr. 3: 17. 1828. **(Plate 44C)** *'Pasachettu', 'Pedda manu'*

Large deciduous tree, to 20 m high; branches drooping, blackish grey, glabrous. Leaves sub-opposite, elliptic-lanceolate, 3.5–6 cm long, narrowed at base, acute or obtuse at apex, margins entire, coriaceous, glabrous; petiole short, 6 mm long. Flowers in axillary, globose heads, on bracteate peduncles, greenish yellow. Calyx tube with ovary 4 mm long, expanded portion shortly campanulate, glabrous, teeth 5. Stamens 10; style short. Fruit broader than long, 2-dentate, winged. Seed 1, ovoid, crowned with stiff beak, reddish-brown.

Fl.: & Fr.: Mar.–Jun.

Habitat: Occasional along the Godavari River banks.

Specimen examined: Tekupally, *Y. Mahesh* 010178 (BSID).

60. LYTHRACEAE

India: 9 genera, 63 spp.; Andhra Pradesh: 6 genera, 15 spp.; PNP: 5 genera, 7 spp.

Key to the genera

1a.	Trees or shrubs; flowers in panicles	2
1b.	Herbs; flowers solitary or in cymes or racemes	3
2a.	Leaves with black gland dotted beneath; flowers zygomorphic; calyx tube scarlet red, bent	**5. Woodfordia**
2b.	Leaves not black gland dotted beneath; flowers actinomorphic; calyx tube not coloured, straight	4
3a.	Flowers solitary in leaf axils; fruit dehiscent, opening by valves	**4. Rotala**
3b.	Flowers in axillary cymes; fruits indehiscent, opening irregularly	**1. Ammania**
4a.	Flowers hexamerous; stamens many; capsule regularly dehiscent; seeds winged	**2. Lagerstroemia**
4b.	Flowers tetramerous; stamens 8; capsule irregularly dehiscent; seeds wingless	**3. Lawsonia**

1. AMMANNIA L.

India: 8 spp.& 1 forma; Andhra Pradesh: 4 spp.; PNP; 3 spp.

Key to the species

1a.	Leaves attenuate or auriculate-subcordate at base; petals present	2
1b.	Leaves tapering at base; petals absent	**1. A. baccifera**
2a.	Leaves attenuate at base, oblique	**3. A. prostrata**
2b.	Leaves auriculate-subcordate at base	**2. A. multiflora**

1. Ammannia baccifera L., Sp. Pl. 1: 120. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 569. 1879; Gamble, Fl. Madras 1: 510. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 368. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 756. 2018.

An erect, annual herb to 30 cm high; stem tetragonous, glabrous. Leaves opposite, sessile, linear-elliptic or oblong, 2.5–4 cm long, narrowed or cordate at base, acute at apex, margins entire, glabrous. Flowers small, 8 mm long, in dense axillary clusters, aften forming whorls, green with reddish tinge, bracteate. Calyx campanulate, tube short; lobes 4, broadly ovate-triangular, short. Petals absent. Stamens 4. Ovary globose, with many ovules; style short. Capsule circumcises, globose, , red, irregularly breaking, apiculate. Seeds numerous, scooped on one side.

Fl.: & Fr.: Sep.–Mar.

Habitat: Common on cultivated fields and marshy habitats.

Specimen examined: Kondamodalu, *Y. Mahesh* 010049, 010050 (BSID).

2. Ammannia multiflora Roxb., Fl. Ind. 1: 426. 1820; C.B. Clarke in Hook. f., Fl. Brit. India 2: 570. 1879; Gamble, Fl. Madras 1: 509. 1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 756. 2018. **(Plate 44D)**

An erect, much branched herb, up to 60 cm high; stem tetragonous, glabrous, winged. Leaves sessile, opposite, linear-lanceolate, 2 cm long, chartaceous, auriculate or subcordate at base, obtuse at apex, margins entire, glabrous. Flowers tetramerous, in axillary cymose clusters, rose coloured, shortly pedicelled. Calyx campanulate, tube 2 mm long, ribbed at anthesis. Petals 4, pinkish, shorter than sepals. Stamens 4. Capsule globose, 2 mm in diam., exceeding calyx tube. Seeds many, trigonous, red.

Fl.: & Fr.: Nov.–Mar.

Habitat: Common in marshy areas, along stream banks and in sandy wet soils.

Specimen examined: Geediguppa, *Y. Mahesh* 011584 (BSID).

3. Ammannia prostrata Buch.-Ham. ex Dillwyn, Rev. Hortus Malab. 40. 1839.. *Nesaea lanceolata* (B. Heyne ex C.B. Clarke) Koehne in Engler Bot. Jahrb. Syst. 3: 325. 1882; Gamble, Fl. Madras 1: 510. 1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 762. 2018. *Ammannia lanceolata* B. Heyne ex C.B. Clarke, Fl. Brit. India 2: 570. 1879.

An erect herb, 35 cm high. Leaves opposite, decussate, elliptic-oblong, 2.5 cm long, oblique, attenuate at base, obtuse at apex, margins entire, glabrous. Flowers in axillary, dichasial cymes, pinkish; bracts lanceolate, longer than sepals. Calyx connate, tube bell shaped; lobes 4 or 5, lanceolate, 3 mm long. Petals 4 or 5, obovate, shorter than sepals. Stamens 4. Capsule globose, 2 mm in diam,. Seeds numerous, reddish brown.

Fl.: & Fr.: Sep.–Feb.

Habitat: Occasional in moist localities and near water courses.

Specimen examined: Thtigunta, *Y. Mahesh* 011645 (BSID).

2. LAGERSTROEMIA L.

India: 10 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Lagerstroemia parviflora Roxb., Pl. Coromandel 1: 48, t. 66. 1796; C.B. Clarke in Hook. f., Fl. Brit. India 2: 575. 1879; Gamble, Fl. Madras 1: 513. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 369. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 758. 2018. **(Plate 44E)** *'Chennangichettu'*

Medium sized, deciduous tree, up to 20 m high; branchlets slender, drooping, puberulous when young. Leaves subsessile, subopposite, elliptic-oblong or lanceolate, 3–7 cm long, coriaceous, rounded or acute at base, obtuse-retuse, apiculate at apex, margins entire, glabrous above, glaucous, minutely pubescent below. Flowers few, 5-merous, 6 mm long, white, in axillary and terminal panicles, bracteate. Calyx campanulate, 5 mm long, accrescent in fruit; lobes triangular, ovate. Petals 6, obovate, 5 mm long, shortly clawed, crisped along margins. Stamens numerous, exserted. Ovary globose; style curved. Capsule woody, ellipsoid, *c.* 1.5 cm long, 6-valved. Seeds numerous, apically winged.

Fl.: & Fr.: May–Nov.

Habitat: Common in plains and dry deciduous forest.

Specimen examined: Geediguppa, Kondamodalu, *Y. Mahesh* 010159, 011493 (BSID).

3. LAWSONIA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Lawsonia inermis L., Sp. Pl. 1: 349. 1753; Gamble, Fl. Madras 1: 514. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 370. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 759. 2018. *'Gorintaku'*

Bushy, deciduous shrub; up to 5 m high; branchlets with spine tip. Leaves opposite, elliptic-lanceolate or ovate, 1.2–3 cm long, attenuate at base, acute at apex, margins entire. Flowers in terminal panicles, creamy white, shortly pedicellate. Calyx campanulate, tube cupular; lobes 4, spreading. Petals 4, obovate-orbicular. Stamens 8. Ovary 4 celled; style 5 mm. Capsule globose, 6 mm across, smooth. Seeds minute, brown, smooth.

Fl.: & F.: Feb.–Jun.

Habitat: Planted in home gardens near tribal villages.

Specimen examined: Kakeshnur, *Y. Mahesh* 010698 (BSID).

4. ROTALA L.

India: 35 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Rotala fimbriata Wight, Icon. Pl. Ind. Orient. t. 217. 1839; Gamble, Fl. Madras 1: 508. 1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 763. 2018. *Ammania pentandra* Roxb. var. *fimbriata* (Wight) C.B. Clarke in Hook. f., Fl. Brit. India 2: 569. 1879.

Erect herbs; up to 55 cm high, creeping below; stems weakly tetrangled, glabrous. Leaves decussate, lanceolate, 1.6 cm, lower ones cuneate or auriculate at base, upper ones cordate at base, subacute or obtuse at apex, margins entire. Flowers sessile, solitary, axillary, yellow. Floral bracts like upper leaves, auriculate at base; bracteoles subulate, triangular, acute at apex. Calyx tube campanulate, 2 mm long; lobes 5, dentate, very short. Petals 5, linear-lanceolate, 3 mm long. Stamens 5, inserted in calyx tube. Capsule 3-valved, 5 mm, exceeding calyx tube. Seeds more than 10, granular.

Fl.: & Fr.: Feb.–Apr.

Habitat: Occasional near ponds and lakes in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 012150 (BSID).

5. WOODFORDIA Salisb.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.



Plate 44: A. *Terminalia bellirica* (Gaertn.) Roxb.; **B.** *Terminalia chebula* Retz.; **C.** *Terminalia phillyreifolia* Gere & Boatwr.; **D.** *Ammannia multiflora* Roxb.; **E.** *Lagerstroemia parviflora* Roxb.; **F.** *Woodfordia fruticosa* (L.) Kurz

1. Woodfordia fruticosa (L.) Kurz., J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 40: 56. 1871; Gamble, Fl. Madras 1: 511. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 369. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 765. 2018. *Lythrum fruticosum* L., Syst. Nat., ed. 10. 2: 1045. 1759. *Woodfordia floribunda* Salisb., Parad. Lond. t. 42. 1806; C.B. Clarke in Hook. f., Fl. Brit. India 2: 572. 1879. **(Plate 44F)** *'Jeelugachettu'*

Large straggling shrub or small tree, up to 6 m high; stems spreading, white pubescent. Leaves sessile, opposite, sometimes in whorls of 3, subsessile, ovate-lanceolate, 5–9 cm long, cordate or rounded at base, acute or acuminate at apex, margins entire; lateral nerves up to 10 pairs, softly velvety above, punctuate below, black glandular on both sides. Flowers numerous in 3–12- flowered axillary cymes, tubular, 8 mm long, usually in axils of former leaves, orange-red. Calyx 1.5 cm long, with glandular dots, campanulate at base, mouth oblique; teeth 6, triangular, acute. Petals slightly longer than calyx teeth, linear, hairy, produced at the apex of the calyx. Stamens 12, exserted. Ovary 2-celled. Capsules oblong, 9 mm long, irregularly dehiscent. Seeds minute, pale brown.

Fl.: & Fr.: Nov.–Apr.

Habitat: Occasional in open exposed hilly areas in the forest.

Specimen examined: Pocharam, Kakeshnur, *Y. Mahesh* 010141, 011323 (BSID).

61. ONAGRACEAE

India: 4 genera, 55 taxa; Andhra Pradesh: 2 genera, 7 spp.; PNP: 1 genus, 5 spp.

1. LUDWIGIA L.

India: 8 spp.& 1 subsp.; Andhra Pradesh: 6 spp.; PNP: 5 spp.

Key to the species

1a.	Plants marshy; capsule tetramerous, thin walled	2
1b.	Plants aquatic; flowers pentamerous; capsule thick walled	**1. L. adscendens**
2a.	Stamens 8	3
2b.	Stamens 4	**4. L. perennis**
3a.	Flowers more than 2 cm; seeds not embedded in endocarp	4
3b.	Flowers 1 cm or less; seeds embedded in endocarp at base	**2. L. hyssopifolia**
4a.	Capsule 4-angled, 4-ribbed; bracteoles deciduous near calyx base	**5. L. peruviana**
4b.	Capsule terete, 8-ribbed; bracteoles persistent near base	**3. L. octovalvis**

1. Ludwigia adscendens (L.) H. Hara in J. Jap. Bot. 28: 291. 1953; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 767. 2018. *Jussiaea adscendens* L., Mant. Pl. 1: 69. 1767.

An aquatic, creeping herb, with white spongy floats; branches ribbed, glabrous. Leaves alternate, elliptic-oblong or lanceolate, 2–3 cm long, attenuate at base, obtuse at apex, margins entire, glossy above, glabrous; petiole up to 1.8 cm long. Flowers axillary, solitary, pentamerous, yellow, pedicellate. Calyx campanulate; lobes 5, deltoid, acuminate. Petals 5, obovate, cuneate at base, rounded or emarginate at apex. Stamens 10. Ovary 5-celled; style hairy. Capsule cylindric, 3 cm long, thick walled, ribbed, glabrous. Seeds embedded in endocarp, smooth.

Fl.: & Fr.: Jul.–Jan.

Habitat: Common in large ponds and lakes.

Specimen examined: Geediguppa, *Y Mahesh* 011578 (BSID).

2. Ludwigia hyssopifolia (G. Don) Exell, Garcia De Orta 5: 471. 1957; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 765. 2018. *Jussiaea hyssopifolia* G. Don, Gen. Syst. 2: 693. 1832.

Erect, branched herbs, up to 80 cm high; branchlets ribbed, glabrous. Leaves ovate-lanceolate or oblong, 2–5 cm long, acute to attenuate at base, acuminate at apex, margins entire, puberulous above, glabrous below; lateral nerves 10 pairs; petiole short, *c.* 9 mm long. Flowers solitary, yellow, pedicellate. Calyx tube up to 1.1 cm long; lobes 4, lanceolate, acuminate at apex. Petals 4, obovate-broadly ovate, 4 mm long, cuneate at base, apex rounded. Stamens 8. Ovary 4 celled, dilated at apex; style 2 mm long. Capsule subterete, *c.* 2.2 cm long, 8 ribbed, puberulous. Seeds brown, multiseriate, embedded in endocarp.

Fl.: & Fr.: Nov.–Jan.

Habitat: Common in marshy areas and ponds.

Specimen examined: Maredupudi, *Y. Mahesh* 010122 (BSID).

3. Ludwigia octovalvis (Jacq.) P.H. Raven, Kew Bull. 15: 476. 1962. subsp. **sessiliflora** (Mich) P.H. Raven, Kew Bull. 15. 476. 1962; R.S. Rao & al., Fl. E. Godavari Dist. 371. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 769. 2018. *Oenothera octovalvis* Jacq., Enum. Syst. Pl. 19. 1760. *Jussiaea octonervia* forma *sessiliflora* Mich. in Masters, Fl. Bras. 13 (2): 171. 1875. *Jussiaea suffruticosa* L. Sp. Pl. 388. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 587. 1879; Gamble, Fl. Madras 1: 516. 1919.

Marshy, suffruticose, robust herbs, up to 1 m high; branches purplish brown, quadri-ribbed, pubescent. Leaves alternate, elliptic-lanceolate or spathulate, 3.5–7 cm long, cuneate or attenuate at base, acute at apex, margins entire, ciliate, sparingly pubescent on both surfaces; petiole very short. Flowers axillary, solitary, 1.8 cm across, tetramerous, yellow, shortly pedicellate; bracteoles 2, minute, persistent. Calyx campanulate, 8 mm long; lobes ovate, pubescent. Petals 4, ovate-obovate, 1.1 cm long. Stamens 8, dimorphous. Ovary narrow, quadrangular, pubescent; style short, stout. Capsule terete, linear, 5 cm long, obtusely 8-ribbed, pubescent. Seeds numerous, minute.

Fl.: & Fr.: Feb.–May.

Habitat: Common along water courses and stream banks.

Specimen examined: Eruwada, *Y. Mahesh* 010650 (BSID).

4. Ludwigia perennis L., Sp. Pl. 119. 1753; R.S. Rao & al., Fl. E. Godavari Dist. 372. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 770. 2018. *Ludwigia parviflora* Roxb., Fl. Ind. 1: 440. 1820; C.B. Clarke in Hook. f., Fl. Brit. India 2: 888. 1879; Gamble, Fl. Madras 2: 517. 1919.

Semi aquatic, erect or decumbent herbs, up to 65 cm high; branches puberulous when young, glabrous later. Leaves alternate, linear-lanceolate or elliptic, 3–5 cm long, chartaceous, cuneate or attenuate at base, acute at apex, margins minutely scaberulous, glabrous; petiole 1.6 cm long. Flowers axillary, solitary, tetramerous, 6.5 mm across, yellow, shortly pedicellate. Calyx tube short; lobes 4, linear-ovate, 3 mm long. Petals 4, suborbicular, spathulate, 4 mm long. Stamens 4. Ovary narrow, quadrangular, inflated, glabrous; style short. Capsule bluntly 4-angled, *c.* 1 cm long, glabrous. Seeds numerous, many rows in each locule, ellipsoid.

Fl.: & Fr.: Nov.–Apr.

Habitat: Common near streams and ponds.

Specimen examined: Geediguppa, *Y Mahesh*011585 (BSID).

5. Ludwigia peruviana (L.) H. Hara in J. Jap. Bot. 28: 293. 1953; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 771. 2018. *Jussiaea peruviana* L., Sp. Pl. 388. 1753. *Jussiaea speciosa* Ridely in J. Bot. 59. 259. 1921; Gamble, Fl. Madras 3: 1875 (1278). 1936.

Semiaquatic shrubs, up to 1.5 m high; branches pubescent. Leaves alternate, elliptic-oblong or lanceolate, 5–12 cm long, attenuate at base, acute at apex, margins entire, pubescent; petiole *c.* 1.3 cm long. Flowers axillary, solitary, pedicellate, 1.8 cm long, yellow, bracteate; bracteoles deciduous. Sepals 4, connate; lobes lanceolate, 1.2 cm long, acuminate at apex. Petals 4, suborbicular, up to 1.5 cm long, cuneate at base, rounded at apex. Stamens 8. Ovary 4-locular; style short; stigma elongate. Capsule oblong, *c.* 2.2 cm long, 4-angled, 4-ribbed. Seeds many seriate, ellipsoid.

Fl.: & Fr.: Feb.–Apr.

Habitat: Occasional along marshy areas and water courses in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011000 (BSID).

62. MYRTACEAE

India: 8 genera, 125 taxa; Andhra Pradesh: 5 genera, 12 spp.; PNP: 1 genus, 2 spp.

1. SYZYGIUM Gaertn.

India: 93 spp. & 4 var.; Andhra Pradesh: 7 spp.; PNP: 2 spp.

Key to the species

1a. Large trees; leaves elliptic-lanceolate or oblong; berries oblong or globose, not crowned with calyx limb **1. S. cumini**
1b. Small trees or shrubs; leaves narrow, oblong; berries obovoid, crowned with calyx limb **2. S. salicifolium**

1. Syzygium cumini (L.) Skeels in U.S. Dept. Agric. Bur. Pl. Industr. Bull. 248: 25. 1912; R.S. Rao & al., Fl. E. Godavari Dist. 363. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 738. 2018. *Myrtus cumini* L., Sp. Pl. 1: 471. 1753. *Eugenia jambolana* Lam., Encycl. 3: 198. 1789; Duthie in Hook. f., Fl. Brit. India 2: 499. 1879. *Syzygium jambolanum* (Lam.) DC., Prodr. 3: 259. 1828; Gamble, Fl. Madras 1: 481. 1919. *'Nereduchettu'*

Large, evergreen trees, up to 20 m high; branchlets pendulous, glabrous. Leaves opposite, decussate, elliptic-oblong or ovate-lanceolate, 5–14 cm long, coriaceous, acute, narrowed at base, acuminate at apex, margins entire, glabrous, gland dotted below; petiole up to 1.5 cm long. Flowers in panicles of corymbose cymes, usually in the axils of fallen leaves, creamy white or greenish-white, fragrant, pedicellate. Calyx campanulate, tube turbinate, 3 mm long; lobes 4, thick. Petals 4, rounded, caducous. Stamens numerous, free, light pinkish. Ovary bilocular; style filiform. Berries sub-globose, 1.5 cm in diam., purplish-red, black when ripe, glabrous,1-seeded.

Fl.: & Fr.: Apr.–Sep.

Habitat: Common along streamlets, near villages and deciduous forests.

Specimen examined: Buruguwada, *Y. Mahesh* 010095 (BSID).

Field notes: Fruits edible.

2. Syzygium salicifolium J.Graham, Cat. Pl. Bomb. 73. 1839; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 740. 2018. *Syzygium heyneanum* (Duthie) Wall. ex Gamble, Fl. Madras 1: 482. 1919. *Eugenia heyneana* Duthie in Hook. f., Fl. Brit. India 2: 500. 1879. *'Chinnaneredu'*

Small trees, up to 5 m high; branchlets greenish-white, glabrous. Leaves opposite, oblong-lanceolate or elliptic, 6–10 cm long, narrowed at base, acuminate at apex, margins entire, glabrous; petiole 1 cm long. Flowers from the scares of fallen leaves, sessile, white. Calyx tube 2.5 mm long; lobes obtuse. Petals rounded. Ovary oblong; style short. Fruits a berry, oblong-ellipsoid, *c.* 2.3 cm long, glabrous, crowned with the cup like calyx limb.

Fl.: & Fr.: Feb.–May.

Habitat: Occasionally found along river banks and stream in the forest.

Specimen examined: Kakeshnur, *Y. Mahesh* 011321 (BSID).

63. MELASTOMATACEAE

India: 13 genera, 109 taxa; Andhra Pradesh: 4 genera, 17 spp., 1 var.; PNP: 3 genera, 5 spp.

Key to the genera

1a.	Leaves rough, 3 or more ribbed; ovary 4 or 5 celled; seeds numerous	2
1b.	Leaves glabrous, not ribbed; ovary 1-celled; seed 1	**2. Memecylon**
2a.	Stamens equal; fruit opening by pores	**3. Osbeckia**
2b.	Stamens very unequal; fruit opening irregularly	**1. Melastoma**

1. MELASTOMA L.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP:1 sp.

1. Melastoma malabathricum L., Sp. Pl. 1: 390. 1753, "*malabathrica*"; C.B. Clarke in Hook. f., Fl. Brit. India 2: 523. 1879; Gamble, Fl. Madras 1: 450. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 366. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 744. 2018. *'Pathudu'*

Medium sized shrub, up to 3 m high; branchlets obtusely 4-angled, clothed with scales. Leaves opposite, elliptic-lanceolate, 4–11 cm long, rounded at base, acute at apex, margins entire, 3-5-nerved, nerves prominent below, strigose, appressed hairy above, tomentose beneath; petiole up to 1 cm long. Flowers in terminal corymbose, panicles, 1-5 flowered, bright purple. Calyx tube covered with white pubescent; lobes 5, ovate. Petals 5, obovate, adnate to the calyx tube, ciliate. Stamens 10, very unequal, adnate to calyx tube. Ovary with appressed silvery hairs; style subulate. Fruit berry like capsule, broadly ovoid, 1.1 cm long, opening irregularly.

Fl.: & Fr.: Sep.–Feb.

Habitat: Common along stream banks and moist localities in the forest.

Specimen examined: Ijjaluru, *Y. Mahesh* 010535 (BSID).

2. MEMECYLON L.

India: 55 spp. & 7 var.; Andhra Pradesh: 10 spp.; PNP: 1 sp.

1. Memecylon edule Roxb., Pl. Coromandel 1: 59, t. 82. 1798; C.B. Clarke in Hook. f., Fl. Brit. India 2: 563. 1879. *p.p.*; Gamble, Fl. Madras 1: 504. 1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 745. 2018. **(Plate 45A)**

Small evergreen tree, up to 5 m high; branches glabrous, 4-angular. Leaves opposite, ovate-elliptic, 4–8 cm long, coriaceous, rounded or obtuse at base, bluntly acuminate or retuse at apex, margins entire, glabrous;

petiole 4 mm long. Flowers small, 4-merous, numerous in diffuse umbellate cymes in axils or on the internodal region of stem, blue, pedunculate. Calyx campanulate, tube short; lobes 4, suborbicular. Petals 4, broadly ovate. Stamens 8. Ovary small; style 5 mm long. Berry globose, 7 mm across, dark purplish, black when ripe. Seed 1.

Fl.: & Fr.: Apr.–Jul.

Habitat: Frequent along stream banks in plains of dry evergreen forest.

Specimen examined: Kakeshnur, *Y. Mahesh* 010699 (BSID).

Uses: Fruits edible.

3. OSBECKIA L.

India: 28 spp. & 4 var.; Andhra Pradesh: 4 spp.; PNP: 3 spp.

Key to the species

1a.	Anthers beaked	2
1b.	Anthers truncate, not beaked	**2. O. muralis**
2a.	Petals 0.3 cm broad; calyx tube bristly; appendages less than 5 mm, stipitate	**3. O. zeylanica**
2b.	Petals 1 cm broad; calyx tube glabrous; appendages up to 8 mm, not stipitate	**1. O. chinensis**

1. Osbeckia chinensis L., Sp. Pl. 1: 345. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 515. 1879; Gamble, Fl. Madras 1: 493. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 366. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 749. 2018. **(Plate 45B)**

Annual erect herb, up to 60 cm high; stem appressed hirsute. Leaves lanceolate or ovate-elliptic, 3–4 cm long, chartaceous, rounded at base, acute at apex, margins entire, 3-nerved from base, appressed hirsute; petiole 2 mm long. Flowers terminal, solitary or cluster of 3–6-flowers, tetramerous, bracteolate; hypanthium campanulate, with a few emergences, hairs simple; intra-sepalar emergences flat, margins ciliate, caducous; other emergences appressed. Sepals 4, triangular, margins ciliate. Petals 4, obovate,1 cm broad, pink, ciliate at apex. Stamens 8. Ovary globose; style 1.5 cm long. Capsules campanulate, 5 mm across. Seeds many, small.

Fl.: & Fr.: Oct.–Dec.

Habitat: Occasional in marshy areas and grasslands on the top of the hills.

Specimen examined: PK Valasa, Valamuru, *Y. Mahesh* 010459, 010928 (BSID).

2. Osbeckia muralis Naudin, Ann. Sci. Nat., Bot. Ser. 3, 14: 56. 1850; R.S. Rao & al., Fl. E. Godavari Dist. 367. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 749. 2018. *Osbeckia truncata* D. Don ex Wight & Arn., Prodr. Fl. Ind. Orient. 1: 322. 1834. *p.p.*; nom. illeg; C.B. Clarke in Hook. f., Fl. Brit. India 2: 514. 1879; Gamble, Fl. Madras 1: 494. 1919. **(Plate 45C)**

Annual, erect herb, up to 30 cm high; stem quadrangular, sparsely covered with hairs. Leaves elliptic-ovate, 1.3–2.5 cm long, shortly attenuate at base, acute-obtuse at apex, margins entire, ciliate, thinly clothed patent hairs, 3- nerved from base; petiole 2 mm long. Flowers axillary, terminal panicle of 2-3 or solitary, subtended by 1 or 2 pairs of leaves, tetramerous; hypanthium campanulate, sparsely covered with patent emergences and long hairs; inter-sepalar emergences stalked, head stellate with few long persistent hairs; other emergences similar, smaller in size towards base. Calyx tube short; lobes 4, ovate- triangular, ciliate, apex with 3-4 patent hairs. Petals 4, broadly ovate, pink, 1-3 hairs at apex. Stamens 8, isomorphic. Ovary bristly; style glabrous. Capsule ovoid.

Fl.: & Fr.: Sep.–Nov.

Habitat: Occasional in grasslands on the top of the hills.

Specimen examined: Valamuru, Gulletiwada, *Y. Mahesh* 010495, 010576 (BSID).

3. Osbeckia zeylanica L.f., Suppl. Pl. 215. 1781; C.B. Clarke in Hook. f., Fl. Brit. India 2: 516. 1879; Gamble, Fl. Madras 1: 494. 1919; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 752. 2018.

Small erect herb, up to 20 cm high; stem quadrangular, striate, appressed bristly. Leaves elliptic-oblong, trinerved, rounded at base, acute at apex, margins serrulate, ciliate, sparsely appressed hairy, 3-nerved from base; petiole 2 mm long. Flowers terminal, capitate or solitary, few, 8 mm across, pinkish-purple, shortly pedicelled. Calyx 3 mm long, with stellate hairs; lobes 4, ovate, acuminate, ciliate, tip with stellate bristles. Petals 4, obovate, 7 mm broad, tipped with stellate bristle. Stamens 8. Ovary globose; style curved at apex. Capsule ovoid, 8 mm long. Seeds numerous, minute.

Fl.: & Fr.: Nov.–Jan.

Habitat: Common in grasslands of higher elevations.

Specimen examined: Gulletiwada, *Y. Mahesh* 010614 (BSID).

64. BURSERACEAE

India: 6 genera, 20 taxa; Andhra Pradesh: 4 genera, 7 spp.; PNP: 3 genera, 3 spp.

Key to the genera

1a.	Disc cup shaped; flowers in racemose panicles	2
1b.	Disc annular, lobed; flowers aggregated in racemose panicles	**3. Protium**
2a.	Leaves with 11-15 leaflets; disc adnate to the calyx; fruit fleshy drupe, oblong, yellowish when ripe; pyrenes 1-5, free	**2. Garuga**
2b.	Leaves with 3-7 leaflets; disc free; fruit hard drupe, globose, green tinged when ripe; pyrenes 1	**1. Commiphora**

1. COMMIPHORA Jacq.

India: 5 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Commiphora caudata (Arn.) Engl. in A. DC. & C. DC., Monogr. Phan. 4: 27. 1883; Gamble, Fl. Madras 1: 171. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 255. 1999; Pull. & al., Fl. Andhra Pradesh 1: 314. 2018. *Protium caudatum* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 176. 1834; A.W. Benn. in Hook. f., Fl. Brit. India 1: 530. 1875. *'Kondamaddi'*

Small, deciduous trees, up to 7 m high; bark papery, smooth, partly flakes off with age, green. Leaves odorous, alternate, crowded at the ends of the branches, imparipinnate, 3-5 foliolate; leaflets ovate-elliptic or sub-orbicular, about 7 cm long, obtuse at base, acuminate, caudate at apex, margins entire, chartaceous, glabrous; petiole 4–7 cm long, glabrous. Flowers small in axillary dichasial cymes, tetramerous, 7 mm across, yellowish, bracteate. Sepals 4, connate; lobes ovate-triangular, 1.5 mm long. Petals 4, linear-oblong, 6 mm long. Stamens 8. Ovary ovoid; style short. Drupe hard, globose, 1.5 cm across, green tinged when ripe; pyrene 1. Seed solitary, black.

Fl.: & Fr.: Apr.–Jul.

Habitat: Common in hilly areas of dry deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. GARUGA Roxb.

India: 2 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Garuga pinnata Roxb., Pl. Corom. 3: 5, t. 208; 1811; A.W. Benn. in Hook. f., Fl. Brit. India 1: 528. 1875; Gamble, Fl. Madras 1; 169. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 255. 1999; Pull. & al., Fl. Andhra Pradesh 1: 315. 2018. **(Plate 45D)** *'Garugachettu'*

Large, deciduous, fragrant tree, up to 20 m high; bark greyish-brown with irregularly, vertical fissures, exfoliating in large flakes; young parts tomentose. Leaves crowed near ends of branches, alternate, 35 cm long, imparipinnate; leaflets 9-17, subopposite, lanceolate, 4–10 cm, oblique at base, chartaceous, acuminate at apex, margins crenate-serrate, glabrous or pubescent on both surfaces; petiole 4 cm long, pubescent. Flowers small in axillary panicles, tomentose, polygamous, yellow. Sepals 5, short, connate, tomentose. Petals 5, linear-oblong, thick, tomentose, inserted on calyx tube. Stamens 10; filaments hairy. Ovary ovoid, 5-locular; style short, hairy. Drupe fleshy, oblong, 1.5 cm across, greenish-yellow, blackish when ripe; pyrenes 3, bony, rugose, free. Seeds solitary.

Fl.: & Fr.: Mar.–May.

Habitat: Occasional in deciduous forest.

Specimen examined: Aakuru, *Y. Mahesh* 011758 (BSID).

3. PROTIUM Burm.f.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP; 1 sp.

1. Protium serratum (Wall. ex Colebr.) Engl. in A. DC. & C. DC., Monogr. Phan. 4: 88. 1883; Gamble, Fl. Madras 1: 171. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 256. 1999; Pull. & al., Fl. Andhra Pradesh 1: 316. 2018. *Bursera serrata* Wall. ex Coleb., Trans. Linn. Soc. London 15: 361, t. 4. 1827; A.W. Benn. in Hook. f., Fl. Brit. India 1: 530. 1875. **(Plate 45E)** *'Erragara'.*

Moderate sized, evergreen tree, 15 m high; bark papery, grey; young branches effuse, densely puberulous. Leaves imparipinnate, 30 cm long; leaflets 5–9, elliptic-ovate or oblong, 6–9 cm long, rounded, acute at base,

acuminate at apex, margins serrate, papery, glabrous above, pubescent below. Flowers small, aggregated in axillary lax racemose panicles, greenish-yellow. Calyx saucer shaped; lobes rounded. Petals 4–6, lanceolate-oblong, valvate. Stamens 10. Disc annular, lobed. Ovary ovoid. Drupe ovoid, 1-3 lobed, 1.6 cm in diam., with obliquely arranged persistent style, pulp ariliform, reddish when ripen, pyrenes 5, hard.

Fl.: & Fr.: May–Aug.

Habitat: Common in hilly areas and roadsides in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010991 (BSID).

65. ANACARDIACEAE

India: 23 genera, 69 spp., 4 var.; Andhra Pradesh: 8 genera, 12 spp.; PNP: 6 genera, 7 spp.

Key to the genera

1a.	Leaves simple	2
1b.	Leaves compound	3
2a.	Stamens as many as petals	4
2b.	Stamens usually twice the number of petals	5
3a.	Shrubs or small trees; leaflets 3; fertile stamens 5	**5. Searsia**
3b.	Moderate to large sized trees; leaflets more than 3; fertile stamens 8-10	**3. Lannea**
4a.	All stamens fertile	**6. Semecarpus**
4b.	Only one stamen fertile	**4. Mangifera**
5a.	Drupe on fleshy hypocarp	**1. Anacardium**
5b.	Drupe on persistent, not enlarged calyx	**2. Buchanania**

1. ANACARDIUM L.

India:1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Anacardium occidentale L., Sp. Pl. 1: 383. 1753; Hook. f., Fl. Brit. India 2: 20. 1876; Gamble, Fl. Madras 1: 260. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 280. 1999; Pull. & al., Fl. Andhra Pradesh 1: 388. 2018. *'Jeedimamidi'*

Small spreading trees, up to 7 m high; branches irregularly spreading, glabrous. Leaves alternate, obovate, 7–15 cm long, coriaceous, cuneate at base, obtuse, retuse at apex, margins entire, glabrous above, plated beneath; secondary nerves about 10 pairs; petiole *c.* 2 cm long. Flowers in axillary or terminal panicles, 8 mm across, reddish or pinkish-white, polygamous, shortly pedicelled. Calyx 5-lobed; lobes ovate, small. Petals 5, lanceolate. Stigmas up to 10. Ovary ovoid; style eccentric. Drupe a reniform nut, *c.* 5 cm across, resinous, seated on large pyriform fleshy body. Seeds reniform.

Fl.: & Fr.: Jan.–May.

Habitat: Planted in most of the forest areas near the tribal gudems.

Specimen examined: Maredupudi, *Y. Mahesh* 010124 (BSID).

Field notes: Nuts and Kernals are edible.

2. BUCHANANIA Spreng.

India: 8 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves broadly ovate, pubescent beneath, apex rounded; panicles copiously branched	**2. B. cochinchinensis**
1b.	Leaves oblong-elliptic, glabrous, apex emarginate; panicles sparsely branched	**1. B. axillaris**

1. Buchanania axillaris (Desr.) T.P. Ramamoorthy in C.J. Saldanha & Nicolson, Fl. Hassan Dist. 374. 1976; R.S. Rao & al., Fl. E. Godavari Dist. 278. 1999; Pull. & al., Fl. Andhra Pradesh 1: 389. 2018. *Mangifera axillaris* Desr. in Lam., Encycl. 3: 697. 1792. *Buchanania angustifolia* Roxb., Pl. Coromandel 3: 58. 1820; Hook. f., Fl. Brit. India 2: 23. 1876; Gamble, Fl. Madras 1: 259. 1918. **(Plate 45F)** *'Saarapappu'*

Medium sized, deciduous tree, up to 12 m high; branchlets glabrous. Leaves alternate, elliptic-oblong or lanceolate, 8–15 cm long, coriaceous, acute at base, obtuse or emarginate at apex, margins entire, wavy, glabrous; lateral nerves up to 13 pairs; petiole up to 1.5 cm long. Flowers axillary and terminal panicles, 4 mm across, glabrous, creamy white, shortly pedicelled. Calyx small, 1.3 mm long, 5-lobed; lobes basally suborbicular, faintly serrulate. Petals 5, ovate-oblong, 2 mm long, slightly reflexed. Stamens 10; filaments short. Ovary unicellular, pilose; style short. Drupes obliquely globose, compressed, 1 cm across, bony. Seeds 1, rounded.

Fl.: &Fr.: Mar.–Sep.

Habitat: Occasional in dry deciduous forests.

Specimen examined: Buruguwada, Kakeshnur*, Y Maheah,* 010086, 010690 (BSID).

Field notes: Kernals edible.

2. Buchanania cochinchinensis (Lour.) M.R. Almeida, Fl. Maharashtra 1: 287. 1996. *Toluifera cochinchinensis* Lour., Fl. Cochinch. 1: 262. 1790. *Buchanania lanzan* Spreng. in Schrad. J. Bot. 2: 234. 1800; Gamble, Fl. Madras 1: 258. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 278. 1999; Pull. & al., Fl. Andhra Pradesh 1: 391. 2018. *Buchanania latifolia* Roxb., Fl. Ind. 2: 385. 1832; Hook. f., Fl. Brit. India 2: 23. 1876. *'Morlichettu'*

Medium sized, semi-evergreen tree, up to 10 m high; young parts pubescent. Leaves alternate, broadly oblong, 12–22 cm long, thinly coriaceous, rounded or acute at base, obtuse or shallowly-emarginate at apex, margins entire, glabrous above, densely pubescent below; petiole *c.* 1 cm long, pubescent. Flowers small, sessile, in axillary and terminal panicles, fulvous pubescent, greenish white. Calyx lobes 5, 2 mm long, ovate, pubescent. Petals 5, ovate-oblong, 3 mm long, glabrous. Stamens 10; filaments flattened, short. Ovary conical, hairy; style subulate. Drupe oblique, 1.5 cm across, stone black. Seeds gibbous.

Fl.: & Fr.: Mar.–Jul.

Habitat: Scattered along hill slopes in dry deciduous forest.

Specimen examined: Shivagiri, *Y. Mahesh* 010077 (BSID).

3. LANNEA A. Rich.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Lannea coromandelica (Houtt.) Merr., J. Arnold Arbor. 19: 353. 1938; Pull. & al., Fl. Andhra Pradesh 1: 391. 2018. *Dialium coromandelinum* Houtt., Nat. Hist. Ser.2: 39, f. 5, f. 2. 1774. *Odina wodier* Roxb., Fl. Ind. 2: 293. 1837; Hook. f., Fl. Brit. India 2: 29. 1876; Gamble, Fl. Madras 1: 263. 1918. *'Gumpena'*

Large deciduous tree, up to 15 m high; young parts stellately puberulous. Leaves crowded near the ends of branches, imparipinnate; leaflets 7-11, opposite, obliquely ovate-lanceolate, 5–10 cm long, chartaceous, obliquely rounded at base, acuminate at apex, margins entire, glabrous; petiolule *c.* 6 mm long. Flowers in terminal fascicled panicles, sessile, 3 mm across, unisexual or polygamous, purplish. Calyx tube small; lobes 4, ovate-oblong, obtuse, ciliate along margins. Petals 4, ovate-oblong, 3 mm long, spreading. Stamens 8; filaments glabrous. Female flowers simple. Ovary oblong, unicellular; styles 4, stout. Drupe ovoid, reniform, 1.2 cm long, compressed, red when ripe, stone hard. Seed 1.

Fl.: & Fr.: Feb.–Jul.

Habitat: Common along plains and hill slopes in dry deciduous forest.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011310 (BSID).

4. MANGIFERA L.

India: 6 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Mangifera indica L., Sp. Pl. 1: 200. 1753; Hook. f., Fl. Brit. India 2: 13. 1875; Gamble, Fl. Madras 1: 259. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 279. 1999; Pull. & al., Fl. Andhra Pradesh 1: 391. 2018. *'Mamidichettu'*

Large, evergreen tree, up to 20 m high; branchlets rather stout, pale green, glabrous. Leaves crowded at ends of branchlets, alternate, oblong-lanceolate, 10–30 cm long, reddish when young, coriaceous, cuneate at base, acuminate at apex, margins entire, somewhat wavy, shining, dark green above, lighter below,glabrous; lateral veins yellow or white; petioles c. 2 cm long. Flowers small, 5 mm across, in terminal tomentose panicles, polygamous, creamy-yellow. Calyx lobes 5, small, 1.2 mm long, linear-ovate, pubescent. Petals 5, adnate to the disk, oblong, 3 mm long, with 5 orange lines ventrally, reflexed. Stamen1; staminodes 3. Ovary globose, unilocular; style oblique. Drupe globose, obliquely gibbose on one side, *c.* 10 cm long, fleshy, fibrous. Seed 1, oblong.

Fl.: & Fr.: Mar.–Jul.

Habitat: Common along streams in deciduous forest.

Specimen examined: Thutigunta, *Y. Mahesh* 011642 (BSID).

5. SEARSIA F.A. Barkley

India: 4 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Searsia paniculata (Wall. ex G.Don) Moffett, Bothalia 37: 171. 2007. *Rhus paniculata* Wall. ex G.Don, Gen. Hist. 2: 73. 1832; Hook. f., Fl. Brit. India 2: 10. 1876; Gamble, Fl. Madras 1: 264. 1918; Pull. & al., Fl. Andhra Pradesh 1: 394. 2018.

Small tree, up to 5 m high; branches glabrous. Leaves 3-foliate; leaflets sessile, contracted at base, elliptic-oblong or oblanceolate, 5–10 cm long, coriaceous, obtuse at base, subacuteat apex, margins entire, slightly wavy, lateral nerves many, parallel, glabrous on both surfaces. Flowers small, in axillary or terminal elongate panicles. Calyx lobes small, orbicular. Petals oblong. Stamens 5. Drupe suborbicular, 5 mm in diam., depressed.

Fl.: & Fr.: May–Aug.

Habitat: Occasional in dry deciduous forest.

Specimen examined: Eruwada, *Y. Mahesh* 011556 (BSID).

6. SEMECARPUS L.f.

India: 7 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Semecarpus anacardium L.f., Suppl. Pl. 182. 1781; Hook. f., Fl. Brit. India 2: 30. 1876; Gamble, Fl. Madras 1: 266. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 279. 1999; Pull. & al., Fl. Andhra Pradesh 1: 395. 2018. **(Plate 45G)** *'Nalla jeedi'*

Medium sized, deciduous tree, up to 15 m high; young parts pubescent. Leaves alternate, obovate-oblong or elliptic, 10–30 cm long, coriaceous, rounded-obtuse or slightly cordate at base, obtuse or emarginate at apex, margins entire, glabrous above, downy pubescent beneath; lateral nerves about 20 pairs; petiole *c.* 2 cm long. Flowers polygamous, 5 mm across, in terminal branched panicles, greenish-white, shortly pedicellate. Calyx lobes 5, small, pubescent. Petals 5, ovate, 2 mm long, glabrous. Stamens 5; filaments linear. Ovary sub-globose, densely pilose; styles 3. Drupe obliquely ovoid or sub-globose, *c.* 2.5 cm long, seated on orange fleshy receptacle, black when ripe. Seed 1, pendulous.

Fl.: & Fr.: Feb.–Jun.

Habitat: Occasional in drydeciduous forest.

Specimen examined: Seemagandi, *Y. Mahesh* 011428 (BSID).

Field notes: Hypocarp of the fruit is eaten when ripe, kernel is like almond like taste and edible, fruit juice with lime water yields making dyes for cloths.

66. SAPINDACEAE

India: 17 genera, 44 taxa; Andhra Pradesh: 6 genera, 9 spp.; PNP: 5 genera, 5 spp.

Key to the genera

1a.	Stamens inserted outside the disc; petals absent; fruit a capsule, hard winged	**2. Dodonaea**
1b.	Stamens inserted inside the disc; petals present or absent; fruit with membranous winged	2
2a.	Flowers regular; disc annular	3
2b.	Flowers irregular; disc unilateral	4
3a.	Petals absent; ovary entire; fruit tipped with persistent style	**5. Schleichera**
3b.	Petals present; ovary angled or lobed; style deciduous	**4. Sapindus**
4a.	Herbaceous climbers; tendrils present; fruit a membranous inflated capsule	**1. Cardiospermum**
4 b.	Erect shrubs or trees; tendrils absent; fruits not inflated, indehiscent	**3. Lepisanthes**

1. CARDIOSPERMUM L.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Cardiospermum halicacabum L., Sp. Pl. 1: 366. 1753; Hiern in Hook. f., Fl. Brit. India 1: 670. 1878; Gamble, Fl. Madras 1: 244. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 275. 1999; Pull. & al., Fl. Andhra Pradesh 1: 382. 2018. *'Buddakakara'*

Climbing herb; branches deeply striate, faintly pubescent. Leaves alternate, bipinnate, about 10 cm long; petiole 5 cm long; leaflets deeply cut into segments, ovate-lanceolate, 3 cm long, attenuate at base, acute at apex, margins entire, coarsely crenate-serrate, dentate, sparsely pubescent above, glabrous below, pubescent on nerves on both sides; petiolule striate, 2 cm long. Flowers in axillary umbellate cymes, 3 mm across, white,

pubescent, polygamous, pedicelled; floral pair of tendrils circinate. Sepals 4, outer two smaller, obovate, inner large, membranous, 1.5 mm long. Petals 4, obovate, spathulate, rounded, 3 mm long, clawed at base, glabrous. Stamens 8; filaments hairy. Ovary obovoid, trilobed; style short. Capsule inflated, 1.6 cm long, 3-winged; wings membranous bladder, depressed at top, puberulous.

Fl.: & Fr.: Jul.–Dec.

Habitat: Common twiner in open forests, outskirts and on hedges of cultivated fields.

Specimen examined: Daragandi, *Y. Mahesh* 011420 (BSID).

2. DODONAEA Mill.

India: 1 sp.& 1 subsp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Dodonaea viscosa Jacq., Enum. Syst. Pl. 19. 1760; Hiern in Hook. f., Fl. Brit. India 1: 697; Gamble, Fl. Madras 1: 253. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 276. 1999. *Dodonaea angustifolia* L.f., Suppl. Pl. 218. 1782; Pull. & al., Fl. Andhra Pradesh 1: 383. 2018.

A gregarious, evergreen shrub, up to 2 m high; branches faintly angled, gland dotted in young. Leaves oblong-lanceolate or elliptic-oblanceolate, 4–8 cm long, coriaceous, cuneate at base, acute at apex, margins entire, shining, viscid, gland dotted, sticky. Flowers small, in axillary or terminal branched cymes, 4 mm across, polygamous, yellowish-green, pedicellate. Sepals 5, elliptic-oblong, 3 mm long, ciliate along margins. Petals absent. Stamens 8; filaments short. Ovary trilocular; style elongate. Capsule 2.5 cm long, 2–4 valved, compressed, membranous, purplish-green, valves winged, viscid. Seeds small, globose, flattened, black.

Fl.: & Fr.: Sep.–Dec.

Habitat: Common in open disturbed areas.

Specimen examined: Gulletiwada, *Y. Mahesh* 010558 (BSID).

3. LEPISANTHES Blume

India: 6 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Lepisanthes rubiginosa (Roxb.) Leenh., Blumea 17. 82. 1969; Pull. & al., Fl. Andhra Pradesh 1: 383. 2018. *Sapindus rubiginosus* Roxb., Pl. Coromandel 1: 44, t. 62. 1796. *Erioglossum edule* Blume, Bijdr. Fl. Ned. Ind. 5: 229. 1825; Hiern in Hook. f., Fl. Brit. India 1: 672. 1875. *'Ishi rashi', 'Tavati'*

Large shrub or small evergreen tree; up to 4 m high; young branches, leaves, inflorescence clothed with rusty, golden tomentose. Leaves imparipinnate, up to 40 cm long; petiole 3 cm long; leaflets 11 pairs, opposite, elliptic-ovate or oblong, 8–16 cm long, obliquely cuneate at base, acuminate at apex, margins entire, densely tomentose below; petiolule short. Flowers small, 5-merous, in elongated terminal rusty panicles, greenish-white. Sepals 5, hairy. Petals 5, oblong, furnished with hooded scales on inner side, glabrous. Ovary trimerous; style short. Fruit trilobed, oblong, *c.* 1.8 cm long, hairy, black when ripe. Seed 1.

Fl.: & Fr.: Feb.–May.

Habitat: Occasional in forest pathways.

Specimen examined: Valamuru, *Y. Mahesh* 011783 (BSID).

4. SAPINDUS Tourn. ex L.

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Sapindus emarginatus Vahl, Symb. Bot. 3: 54. 1794; Gamble, Fl. Madras 1: 250. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 277. 1999. *Sapindus trifoliatus* sensu Hiern in Hook. f., Fl. Brit. India 1: 682. 1875, p.p. non L. 1753; Pull. & al., Fl. Andhra Pradesh 1: 385. 2018. *'Kunkudu'*

Medium sized, deciduous tree, up to 10 m high; branches striate, tomentose when young. Leaves paripinnate, up to 50 cm long; leaflets subopposite, 2–4-pairs, ovate-elliptic or oblong, 4–10 cm long, coriaceous, rounded or attenuate at base, obtuse or emarginate at apex, margins entire, wavy, glabrous above, softly pubescent below. Flowers small, 5 mm across, in long, rusty tomentose, terminal, dense panicles, polygamous, brownish-yellow. Sepals 5, oblong, 4 mm long, cucullate, shortly pubescent. Petals 5, spathulate, 3 mm long, with 1-2 tufts of white hairs on inner surfaces of claw. Stamens 8; filaments pilose. Ovary densely hairy, trilocular; style terminal, simple. Drupe ovoid, *c.* 2.5 cm across, indehiscent, 3-lobed, united up to the half, brown, wrinkled at maturity, glabrous. Seeds hard, black.

Fl.: & Fr.: Oct.–Jan.

Habitat: Common near villages and in dry deciduous forests.

Specimen examined: Tekupally, *Y Mahesh* 011342 (BSID).

Field notes: Fruits used as shampoo for hair cleaning; seeds used as medicine for scorpion bite.

5. SCHLEICHERA Willd.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Schleichera oleosa (Lour.) Merr., Interpr. Herb. Amboin. 337. 1917; R.S. Rao & al., Fl. E. Godavari Dist. 277. 1999.Pull. & al., Fl. Andhra Pradesh 1: 385. 2018. *Pistacia oleosa* Lour., Fl. Cochinch. 2: 615. 1790. *Schleichera trijuga* Willd., Sp. Pl. 4: 1096. 1806; Hiern in Hook. f., Fl. Brit. India 1: 681. 1875; Gamble, Fl. Madras 1: 248. 1918. **(Plate 45H)** *'Busichettu'.*

A large, deciduous tree, up to 15 m high; branches greyish, striate, faintly angled, brown tomentose when young. Leaves paripinnate, up to 30 cm long; petiole *c.* 8 cm long; leaflets 3-pairs, elliptic-oblong or obovate, 5–10 cm long, larger towards apex, coriaceous, unequally rounded or cuneate at base, obtuse or shortly acuminate at apex, margins entire, glabrous. Flowers small, 5 mm across, polygamous, in axillary, much branched panicles, yellow, bracteate. Calyx 4 mm across, cupular; lobes 6, short, ovate, triangular, ciliate. Petals absent. Stamens 8; filaments ciliate. Ovary globose, villous, trilocular; style short, rigid. Drupe ovoid, *c.* 1.5 cm across, indehiscent, 1–2 seeded, with blunt spines, reddish yellow when ripe. Seeds pulpy arillate.

Fl.: & Fr.: Mar.–Jul.

Habitat: Occasional in hilly areas of deciduous forest.

Specimen examined: Kintukuru, *Y. Mahesh* 011745 (BSID).

Field notes: Oil obtained from seeds used for hairs and wood is economically important.

67. RUTACEAE

India: 25 genera, 93 taxa; Andhra Pradesh: 16 genera, 30 spp., 2 var.; PNP: 11 genera, 13 spp.

Key to the genera

1a.	Plants armed	2
1b.	Plants unarmed	8
2a.	Leaves unifoliolate	3
2b.	Leaves 3 or more foliolate	4
3a.	Petioles winged; stamens many, cultivated	**4. Citrus**
3b.	Petioles not winged; stamens 8 or 10, wild	**2. Atalantia**
4a.	Erect shrubs or trees	5
4b.	Much branched trees or stragglers	**11. Zanthoxylum**
5a.	Petiole not winged	**1. Aegle**
5b.	Petiole winged; berries with not woody rind	6
6a.	Disc columnar; stamens 8-10; seeds 3 or 4	7
6b.	Disc annular; stamens 10-12; seeds numerous	**7. Limonia**
7a.	Petioles faintly winged; leaves 3-5 foliolate	**9. Naringi**
7b.	Petioles prominently winged; leaves 3-foliolate	**10. Pleiospermum**
8a.	Leaves 1 or 3 foliolate	**6. Glycosmis**
8b.	Leaves pinnately compound	9
9a.	Medium to large trees	**3. Chloroxylon**
9b.	Shrubs or small trees	10
10a.	Stamens inserted around the disc	**5. Clausena**
10b.	Stamens inserted outside the disc	**8. Murraya**

1. AEGLE Correa

India: 1 sp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Aegle marmelos (L.) Correa, Trans. Linn. Soc. London 5: 223. 1800; Hook. f., Fl. Brit. India 1: 516. 1875; Gamble, Fl. Madras 1: 161. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 247. 1999; Pull. & al., Fl. Andhra Pradesh 1: 285. 2018. *Crateva marmelos* L., Sp. Pl. 1: 444. 1753. *'Mareduchettu'*

Medium sized, thorny tree, up to 10 m high; spines straight, axillary, 2 cm long, reddish brown; bark brown, slightly rugged; young branches stellately pubescent. Leaves alternate, trifoliate; leaflets ovate-elliptic or lanceolate, 4–6.5 cm long, cuneate at base, obtuse at apex, margins faintly crenate-serrate, glabrous, terminal

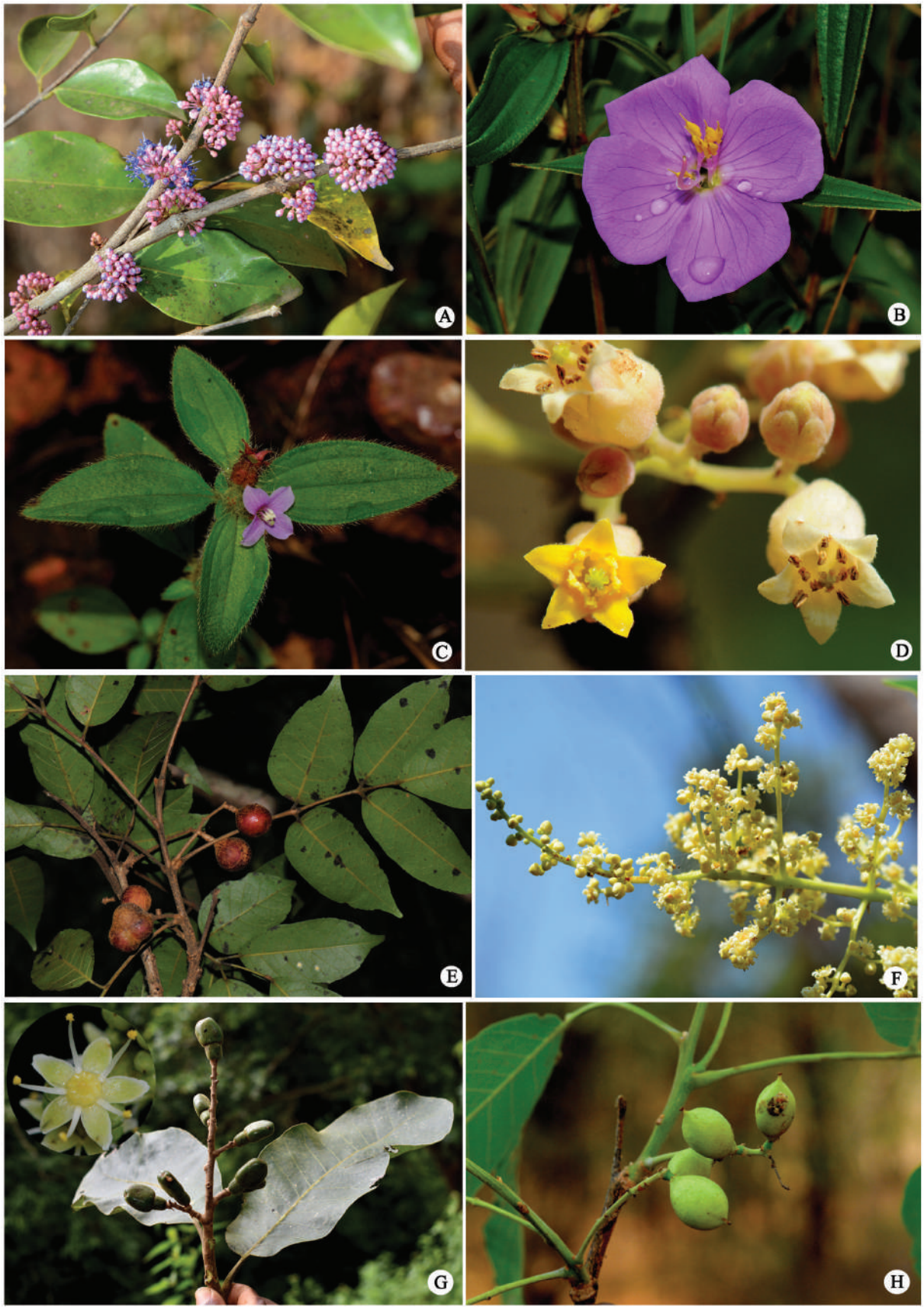


Plate 45: A. *Memecylon umbellatum* Burm.f.; **B.** *Osbeckia chinensis* L.; **C.** *Osbeckia muralis* Naudin; **D.** *Garuga pinnata* Roxb.; **E.** *Protium serratum* (Wall. ex Colebr.) Engl.; **F.** *Buchanania axillaris* (Desr.) Ramamoorthy; **G.** *Semecarpus anacardium* L.f.; **H.** *Schleichera oleosa* (Lour.) Oken

one largest; petiole up to 7 cm long. Flowers in axillary panicles, greenish-white, fragrant, 6 mm across; Calyx 3 mm long, lobes 5, obscure, cupular, wavy, pubescent. Petals 5, ovate-oblong, 1 cm long, coriaceous. Stamens numerous; filaments subulate, glabrous. Ovary ovoid, faintly ribbed; style short, stout. Berries ovoid or globose, *c.* 5 cm across, with rough woody rind. Seeds numerous, flat, embedded in pulp.

Fl. & Fr.: Apr.–Sep.

Habitat: Common in open lands, forest outskirts in deciduous forests, also in temples.

Specimen examined: Maredupudi, *Y. Mahesh* 010109 (BSID).

Field notes: Fruits pulp orange, sweet in taste.

2. ATALANTIA Correa

India: 6 spp. & 2 var.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaflets emarginated at apex; flowers in elongate racemes	**2. A. racemosa**
1b.	Leaflets retuse at apex; flowers in umbels or corymbs	**1. A. monophylla**

1. Atalantia monophylla (L.) DC., Prodr. 1: 535. 1824; Hook. f., Fl. Brit. India 1: 511. 1875; Gamble, Fl. Madras 1: 159. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 247. 1999; Pull. & al., Fl. Andhra Pradesh 1: 286. 2018. *Limonia monophyla* L., Mant. Pl. 237. 1771. *'Adavi nimma'*

A much branched, spinous tree, up to 8 m high; spines axillary, sharp, 1 cm long; stem angled; young branches pubescent. Leaves alternate, unifoliate, ovate-oblong, 4–6 cm long, coriaceous, acute, cuneate at base, acuminate or retuse at apex, margins entire, glabrous; shortly petiolate. Flowers in axillary, umbels or condensed corymbose panicles, 5 mm long, white, bracteate. Calyx irregularly splits to base, 3 mm long, puberulous without along margins. Petals 5, oblong-obovate, 5 mm long, cuneate at base, clawed, adnate to the staminal tube at base. Stamens 8; filaments connate up to the top. Ovary oblong, tetralocular; style short. Hesperidium globose, *c.* 1.5 cm across. Seeds 1–4, oblong.

Fl. & Fr.: Oct.–Feb.

Habitat: Found in degraded localities in deciduous & thorny scrub forests.

Specimen examined: Maredumilli, *Y. Mahesh* 011528 (BSID).

2. Atalantia racemosa Wight & Arn., Prodr. Fl. Ind. Orient. 1: 91. 1834; Hook. f., Fl. Brit. India 1: 512. 1875; Gamble, Fl. Madras 1: 159. 1915; Pull. & al., Fl. Andhra Pradesh 1: 288. 2018. **(Plate 46A)**

Moderate sized, spinous tree, 12 m high; spines axillary, straight; bark brown, smooth or longitudinally striate, lenticellate. young parts pubescent; Leaves unifoliate, ovate-oblong or lanceolate, 3–6 cm long, coriaceous, cuneate at base, emarginate at apex, margins crenulate or entire, glabrous on both surfaces; petiole up to 1 cm long. Flowers in axillary elongated, pedunculate racemes, creamy white. Sepals 3–5, triangular, ciliate along margins. Petals 4, elliptic-oblong. Stamens 8. Ovary ovoid. Berry globose, *c.* 1 cm long, orange when ripe. Seeds 2.

Fl. & Fr.: Oct.–May.

Habitat: Rare scrub forests, outskirts in dry deciduous forest.

Specimen examined: Katchuluru, *Y. Mahesh* 011716 (BSID).

3. CHLOROXYLON DC.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Chloroxylon swietenia DC., Prodr. 1: 625. 1824; Hiern in Hook. f., Fl. Brit. India 1: 569. 1875; Gamble, Fl. Madras 1: 152. 1975; R.S. Rao & al., Fl. E. Godavari Dist. 247. 1999; Pull. & al., Fl. Andhra Pradesh 1: 334. 2018. **(Plate 46B)** *'Billudu'*

Medium sized tree, up to 15 m high; bark grey or yellowish with white vertical lines; young branches pubescent. Leaves alternate, imparipinnate, up to 25 cm long, crowded at ends of branches; leaflets up to 20 pairs, subopposite, oblong, 2.5 cm long, coriaceous, unequally oblique at base, obtuse at apex, margins entire, glabrous, gland dotted below. Flowers in axillary or terminal cymose panicles, 7 mm across, creamy white, bracteate. Calyx 3 mm long, 5-lobed, lobes triangular, pubescent. Petals 5, imbricate, ovate, spathulate, 6 mm long, clawed at base. Stamens 10. Ovary trilobed, tomentose; style short, glabrous. Capsule loculicidal, 3-volved, oblong, *c.* 3 cm long, glabrous, dark brown. Seeds numerous, compressed, angled near base, shortly winged.

Fl.& Fr.: Mar.–Sep.

Habitat: Common in hillslopes, open scrub areas in dry deciduous forests.

Specimen examined: Jeediguppa, *Y. Mahesh* 010161 (BSID).

4. CITRUS L.

India: 6 spp. & 2 var.; Andhra Pradesh: 7 spp.; PNP: 1 sp.

1. Citrus aurantiifolia (Christm.) Swingle, J. Wash. Acad. Sci. 3: 465. 1913; Pull. & al., Fl. Andhra Pradesh 1: 289. 2018. *Limonia aurantiifolia* Christm. in Linn. Pflanzen syst. 1: 618. 1777. *Citrus medica* L. var. *acida* (Roxb.) Hook. f., Fl. Brit. India 1: 515. 1875; Gamble, Fl. Madras 1: 162. 1915. *'Nimma'*

Large shrub, 3 m high; branches with sharp spines. Leaves unifoliate, ocate-lanceolate, coriaceous, glabrous, rounded at base, apex obtuse, margin entire. Flowers in axillary cymes, white; calyx 4-lobed, deltoid, glandular; petals 4, oblong; stamens 25; ovary globose; style cylindric. Fruit oblong, glandular.

Fl. & Fr.: Throughout the year.

Habitat: Planted near villages.

Specimen examined: Kintukuru, *Y. Mahesh* 011725 (BSID).

5. CLAUSENA Burm.f.

India: 7 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Clausena heptaphylla (Roxb.) Wight & Arn; Gamble, Fl. Madras 1: 155. 1915. *Amyris heptaphylla* Roxb. ex DC., Prodr. 2: 82. 1825. *Clausena austroindica* B.C. Stone & K. Narayanan, Nordic J. Bot. 14: 491. 1994; Pull. & al., Fl Andhra Pradesh 1: 292. 2018. **(Plate 46C)**

Branching shrub, fragrant, 5 m high. Leaves 5-9 foliaolate, leaflets ovate-lanceolate, 8 cm, membranous, glabrous, yellowish glands below, oblique at base, apex acuminate, margins crenulate. Flowers axillary panicles, yellowish-white; calyx 5-lobed, glabrous, gland at tip; petals 5, oblong; stamens 10; ovary 4-grooved; style short. Berry oblong, glandular.

Fl. & Fr.: Apr.–Aug.

Habitat: Occasional on hilly areas in the forest.

Specimen examined: Valamuru, *Y. Mahesh* 011797 (BSID).

6. GLYCOSMIS Correa

India: 8 spp. & 7 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Glycosmis mauritiana (Lam.) Tanaka, Bull. Soc. Bot. France 75: 708. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 248. 1999; Pull. & al., Fl. Andhra Pradesh 1: 293. 2018. *Limonia mauritiana* Lam., Encycl. 3: 517. 1792. *'Golugu'*

Medium sized, unarmed shrubs, up to 8 m high; young branches covered with rusty tomentose. Leaves 3–5 foliolate, about 15 cm long; leaflets oblong-ovate, 3–8 cm long, cuneate at base, obtuse or rounded or shortly acute at apex, margins entire, glabrous on both surfaces; petiolule short, 5 mm long. Flowers in axillary panicled racemes, greenish white, fragrant. Sepals 5, suborbicular or deltate, ciliate along margins. Petals elliptic-oblong or obovate, glandular. Stamens 8; subulate. Ovary cylindric-ovoid. Berry globose, *c.* 1 cm across, pinkish-white, apiculate. Seed 1.

Fl. & Fr.: Feb.–May.

Habitat: Common in in forest outskirts, destroyed open forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

7. LIMONIA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Limonia acidissima L., Sp. Pl. 1: 554. 1762; R.S. Rao & al., Fl. E. Godavari Dist. 249. 1999; Pull. & al., Fl. Andhra Pradesh 1: 295. 2018. *Feronia elephantum* Correa, Trans. Linn. Soc. London 5: 224. 1800; Hook. f., Fl. Brit. India 1: 516. 1875; Gamble, Fl. Madras 1: 160. 1915.

Deciduous, spinous tree, 10 m high; bark brownish-black with vertical and horizontal cracks; branches short, zig-zag, pinkish, appressed pubescent when young. Leaves imparipinnate, up to 8 cm long; leaflets 3–7, opposite,

obovate-elliptic or ovate, 2–2.5 cm long, coriaceous, cuneate at base, obtuse or emarginate at apex, margins entire, glabrous; petiole up to 3 cm long, faintly winged. Flowers polygamous, in axillary and terminal panicles, 25 cm long, white with pinkish tinge. Calyx campanulate 5 lobed; lobes triangular, deltoid, 1 mm long, hairy along margins. Petals 5, elliptic-oblong, 3 cm long, glandular. Stamens 10–12; filaments hairy at base. Ovary globose, tetralocular; style thick, short. Berry globose, *c.* 4 cm across, with woody pericarp, 1-celled. Seeds numerous, flattened, embedded in edible pulp.

Fl. & Fr.: Aug.–Nov.

Habitat: Common near villages, open lands in dry deciduous forests.

Specimen examined: Tekupally, Kakeshnur, *Y. Mahesh* 010168, 011318 (BSID).

8. MURRAYA J. Koenig ex L.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaflets 5-7, entire; flowers solitary or in short axillry cymes; berry red	**2. M. paniculata**
1b.	Leaflets 10-18, crenate - dentate; flowers terminal, in corymbose cymes; berry black	**1. M. koenigii**

1. Murraya koenigii (L.) Spreng., Syst. Veg. 2: 315. 1825; Hook. f., Fl. Brit. India 1: 503. 1875; Gamble, Fl. Madras 1: 156. 1915; Rao & al., Fl. E. Godavari Dist. 250. 1999; Pull. & al., Fl. Andhra Pradesh 1: 297. 2018. *Bergera koenigii* L., Mant. Pl. Altera 565. 1771. *'Karivepaku'*

Shrubs or small tree, up to 5 m high, aromatic; branches terete, pubescent when young. Leaves alternate, imparipinnate, 15 cm long, aromatic; leaflets up to 25, subopposite, ovate-elliptic or lanceolate, 3.5 cm long, oblique at base, abruptly acuminate at apex, margins crenately serrulate, pellucid-dotted, sparsely hirsute, shortly petioled. Flowers in terminal corymbose cymes, 7 mm long, white, pedunculate. Calyx 0.4 cm long, 5-lobed; lobes ovate-triangular, hairy without. Petals 5, oblong, 5 mm long, gland dotted. Stamens 10. Ovary globose, bilocular; style short. Berry ovoid or sub-globose, *c.* 1.2 cm long, glandular dotted, dark purple when ripe. Seeds 1 or 2.

Fl. & Fr.: Apr.–Jul.

Habitat: Common in moist deciduous forests.

Specimen examined: Valamuru, *Y. Mahesh* 010948 (BSID).

2. Murraya paniculata (L.) Jack, Malayan Misc. 1: 31. 1820; R.S. Rao & al., Fl. E. Godavari Dist. 251. 1999; Pull. & al., Fl. Andhra Pradesh 1: 297. 2018. *Chalcas paniculata* L., Mant. Pl. 1: 68. 1767. *Murraya exotica* L., Mant. Pl. Alt. 563. 1771. as "*Murraea*"; Hook. f., Fl. Brit. India 1: 502. 1875; Gamble, Fl. Madras 1: 156. 1915. **(Plate 46D)** *'Naga golgu'*

Evergreen shrubs or small trees, up to 8 m high; bark pale white, lenticellate; branches glabrous. Leaves imparipinnate, up to 18 cm long; leaflets 3–7, elliptic-ovate, oblique at base, acuminate at apex, margins entire or obscurely crenate, shining above, dark green; petiole up to 1 cm long. Flowers in axillary or terminal, 1–3 flowered cymes or solitary, milky white, pedunculate. Calyx lobes 5, deltate, glabrous. Petals 5, elliptic-oblong, obtuse, glabrous. Stamens 10; filaments linear. Ovary ovoid; style cylindric. Berry globose, *c.* 1.5 cm long, narrow at both ends, red.

Fl. & Fr.: Mar.–Oct.

Habitat: Common in hilly forest areas, along stream banks, slopes.

Specimen examined: Valamuru, *Y. Mahesh* 010940 (BSID).

9. NARINGI Adans.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Naringi crenulata (Roxb.) Nicolson, Fl. Hassan Dist. 387. 1976; Rao & al., Fl. E. Godavari Dist. 251. 1999; Pull. & al., Fl. Andhra Pradesh 1: 299. 2018. *Limonia crenulata* Roxb., Pl. Coromandel 1: 60, t. 86. 1798; Gamble, Fl. Madras 1: 157. 1915. *Limonia acidissima* auct. non. L. 1762; Hook. f., Fl. Brit. India 1: 507. 1875. **(Plate 46E)** *'Torravelaga'*

Small spinous trees, up to 6 m high; bark greyish-white, with deep vertical furrows; young branches pubescent; spines straight, sharp, up to 1.5 cm long. Leaves alternate, imparipinnate, 3–5-foliolate; leaflets opposite, elliptic-ovate or oblong, 1.5–2.5 cm long, obtuse at base, minutely retuse, at apex, margins crenulated, conspicuously oil dotted, glabrous, faintly hairy on midrib above; rachis broadly winged; petiole 1 cm long, faintly winged.

Flowers in axillary umbelliferous racemes, 6–8 flowered, 7 mm in diam., pale green, pedicellate. Calyx 3 mm long, 5-lobed, lobes glandular. Petals 4, elliptic, 6 mm long, prominently glandular. Stamens 8; filaments dilated. Ovary subovoid, papillose. Berry globose, *c.* 8 mm in diam., black. Seeds few, flattened, shining.

Fl. & Fr.: Aug.–Nov.

Habitat: Common in forest foot hills, plains, roadsides in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010999 (BSID).

10. PLEIOSPERMIUM Swingle

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pleiospermium alatum (Wight & Arn.) Swingle, J. Wash. Acad. Sci. 6: 428. 1916; Pull. & al., Fl. Andhra Pradesh 1: 301. 2018. *Limonia alata* Wight & Arn., Prodr. Fl. Ind. Orient. 92. 1834; Hook. f., Fl. Brit. India 1: 908. 1874; Gamble, Fl. Madras 1: 157. 1915. **(Plate 46F)** *'Adavi Dabbanimma'*

Small spinous trees, up to 5 m high; bark greyish; thorns sharp, *c.* 2 cm long; young branches faintly angled, puberulous. Leaves 3-foliate, 7 cm long; petiole up to 4 cm long; leaflets obovate, 3.5 cm, glabrous, cuneate at base, obtuse at apex, margins entire; petiolule very short. Flowers 5 mm across, in terminal racemes, white, bracteate. Sepals 4, ovate, 2 mm long, pubescent. Petals 4, oblong-ovate, 5 mm long, gland dotted. Stamens 10; filaments dilated at base. Ovary obovoid; style very short. Hesperidium globose, 1.6 cm across. Seeds few, flattened.

Fl. & Fr.: Mar.–Sep.

Habitat: Occasional along stream banks in deciduous forests.

Specimen examined: Kondamodalu, *Y. Mahesh* 011731 (BSID).

11. ZANTHOXYLUM L.

India: 14 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Zanthoxylum asiaticum (L.) Appelhans, Groppo & J. Wen, Molec. Phylogen. Evol. 126: 43. 2018. *Toddalia asiatica* (L.) Lam., Tabl. Encycl. 2: 116. 1797; Gamble, Fl. Madras 1: 150. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 251. 1999; Pull. & al., Fl. Andhra Pradesh 1: 302. 2018. *Paullinia asiatica* L., Sp. Pl. 1: 365. 1753. *Toddalia aculeata* (Smith) Pers., Syn. Pl. 1: 249. 1805, *nom. superfl.*; Hook. f., Fl. Brit. India 1: 479. 1875. *Scopolia aculeata* Smith, Pl. Ic. Hact. ed. 1, 2: t. 34. 1790. *nom. superfl.* **(Plate 46G)** *'Konda kasinda'*

A large, scandent, prickly, climbing shrub, 5 m high; prickles bent downward; young branches pubescent. Leaves alternate, trifoliate; leaflets sessile, obovate-lanceolate, 3-4 cm long, cuneate at base, retuse at apex, margins crenate, glabrous above, prickly on lower midrib. Flowers in axillary panicles, polygamous, white. Sepals 5, connate at base, lobes triangular. Petals 5, oblong, 3 mm long, apex hooded and gland tipped. Stamens 5; filaments short. Ovary globose, 3–7-loculed. Berry globose, 3–5-grooved, pisiform, reddish when ripe.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in thorny scrub and degraded forests.

Specimen examined: Tekuru, *Y. Mahesh* 011638 (BSID).

68. SIMAROUBACEAE

India: 5 genera, 11 spp., 1 subsp.; Andhra Pradesh: 2 genera, 3 spp.; PNP: 1 genus, 1 sp.

1. AILANTHUS Desf.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Ailanthus excelsa Roxb., Pl. Coromandel 1: t. 23. 1795; Bennett in Hook. f., Fl. Brit. India 1: 518. 1875; Gamble, Fl. Madras 1: 163. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 252. 1999; Pull. & al., Fl. Andhra Pradesh 1: 306. 2018. **(Plate 47A)** *'Peddamanu'*

A large, deciduous tree, up to 25 m high; bark rough, white; branches pale, with persistent leaf scars. Leaves imparipinnate, up to 60 cm long; leaflets 8-13 pairs, oblique, alternate or subopposite, oblong-lanceolate, 8 cm long, very unequal at base, acuminate at apex, margins coarsely toothed, tomentose when young, glabrous with age; petiolule 1.8 cm long. Flowers 6 mm long, in large, much branched, lax panicles, polygamous, yellow. Sepals 5, lobes very short, triangular. Petals 5, ovate-lanceolate, 5 mm long, reflexed, glabrous. Stamens 10.

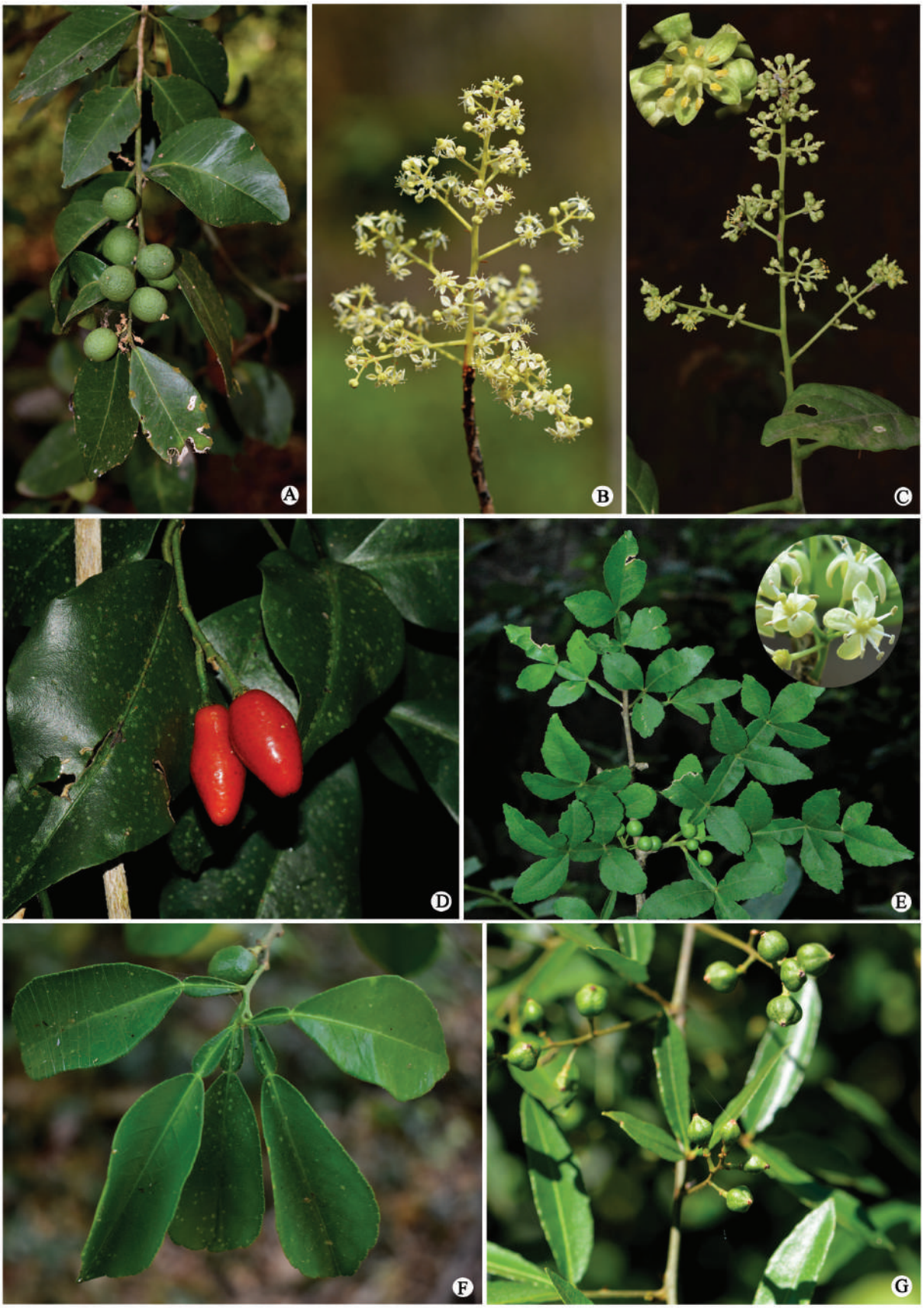


Plate 46: A. *Atalantia racemosa* Wight ex Hook.; **B.** *Chloroxylon swietenia* DC.; **C.** *Clausena heptaphylla* Wight & Arn.; **D.** *Murraya paniculata* (L.) Jack; **E.** *Naringi crenulata* (Roxb.) Nicolson; **F.** *Pleiospermium alatum* Swingle; **G.** *Zanthoxylum asiaticum* Appelhans, Groppo & J. Wen

Ovary 5-partite, hairy; styles 5, connate. Samara oblong-lanceolate, 6 cm long, yellowish, twisted near base, flat, narrowed at both ends. Seed-1, orbicular, brownish.

Fl. & Fr.: Feb.–Apr.

Habitat: Common near villages, along pathways, open lands.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

69. MELIACEAE

India: 19 genera, 90 taxa; Andhra Pradesh: 13 genera, 17 spp., 1 var.; PNP: 6 genera, 6 spp.

Key to the genera

1a.	Seeds winged; ovules many in each cell	**6. Soymida**
1b.	Seeds not winged; ovules 1-2 in each cell	2
2a.	Staminal tube appendaged	3
2b.	Staminal not tube not appendaged	**1. Aglaia**
3a.	Fruit a dehiscent capsule	**4. Heynea**
3b.	Fruit indehiscent berry or drupe	4
4a.	Shrubs or small trees; petiole without glands	**3. Cipadessa**
4b.	Trees; petiole with a pair of sunken glands at base	5
5a.	Leaves 2 or 3 pinnate; stigma 4-10 lobed; seed albuminous; cotyledons thin	**5. Melia**
5b.	Leaves unipinnate; stigma 3-lobed; seeds exalbuminous; cotyledons fleshy	**2. Azadirachta**

1. AGLAIA Lour.

India: 16 spp. & 3 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Aglaia elaeagnoidea (A. Juss.) Benth., Fl. Austral. 1: 383. 1863; Pull. & al., Fl. Andhra Pradesh 1: 318. 2018. *Nemedra elaeagnoidea* A. Juss., Mem. Mus. Hist. Nat. 19: 259. t. 14. 1830. *Aglaia roxburghiana* (Wight & Arn.) Miq., var. *beddomei* Gamble, Fl. Madras 1: 180. 1915. **(Plate 47B)** *'Yerraeduga chettu'*

Moderate sized trees, up to 10 m high; bark brick-reddish grey with black patches; young parts rusty, stellate tomentose. Leaves imparipinnate, 14 cm long; leaflets 5–7, elliptic-oblong, 8 cm long, cuneate at base, acute at apex, margins entire, glabrous. Flowers small, in axillary panicles, polygamodioceous, yellow. Sepals 5, basally connate, lobes small. Petals 5, ovate, 2 mm long, concave, glabrous. Stamens 5, staminal tube urceolate; pistillode present in male flowers. Ovary ovoid, depressed; style short. Berry globose, ferruginous, subglobose 1-seeded.

Fl. & Fr.: Dec.–Mar.

Habitat: Occasional in deep forest, along streams in the forest.

Specimen examined: Ijjaluru, *Y. Mahesh* 010956 (BSID).

2. AZADIRACHTA A. Juss.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Azadirachta indica A. Juss., Mem. Mus. Hist. Nat. 19: 221. 1830; Gamble, Fl. Madras 1: 177. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 256. 1999; Pull. & al., Fl. Andhra Pradesh 1: 320. 2018. *Melia azadirachta* L., Sp. Pl. 1: 385. 1753; Hiern in Hook. f., Fl. Brit. India 1: 544. 1875. *'Vepa'*

A large, much branched, deciduous tree, up to 15 m high; bark dark brown with deep vertical fissures; branchlets glabrous. Leaves alternate, crowded at top of branchlets, imparipinnate, 22 cm long; leaflets 9–19, obliquely lanceolate-elliptic, 3–5 cm long, oblique at base, acuminate at apex, margins serrate, glabrous on both surfaces; petiolule very short. Flowers small, 8 mm long, lilac or creamy white, in axillary, lax, long pedunculate, drooping panicles, sweet scented. Calyx 4 mm long, 5-lobed; lobes ovate, irregularly crenate, puberulous. Petals 5, oblong-obovate, 7 mm long, ciliate, puberulous without. Stamens 10, staminal tube oblong. Ovary ovoid, 3-loculed, glabrous; style stout, exserted. Drupe ovoid-oblong or ellipsoid, 1.4–2 cm long, with milky juice when young, fleshy, sticky yellowish pulp when ripe, 1-seeded. Seed ellipsoid.

Fl. & Fr.: Feb.–May.

Habitat: Very common near villages, road sides, agricultural fields, deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*)

Uses: Entire plant is medicinally important, seed oil used in soap industry; young sticks used as tooth brush.

3. CIPADESSA Blume

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cipadessa baccifera (Roth.) Miq., Ann. Mus. Bot. Lugduno-Batavi 4: 6. 1868; Gamble, Fl. Madras 1: 176. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 257. 1999; Pull. & al., Fl. Andhra Pradesh 1: 323. 2018. *Melia baccifera* Roth, Nov. Pl. Sp. 215. 1821. *Cipadessa fruticosa* Blume, Bijdr. Fl. Ned. Ind. 4: 162. 1825; Hiern in Hook. f., Fl. Brit. India 1: 545. 1875. **(Plate 47C)** *'Chandu bera'*

Large, bushy shrubs or small evergreen trees, up to 4 m high; bark rough; young branchlets warty, greyish brown, yellow tomentose. Leaves alternate, 25 cm long, imparipinnate; leaflets up to 9, opposite, oblong-lanceolate or ovate, 3–6 cm long, cuneate at base, acuminate at apex, margins coarsely serrate, glabrous above, appressed pubescent below; petiolule minute. Flowers small, 5 mm long, in axillary, corymbose panicles, greenish white. Calyx small, 2.5 mm long; lobes 5, pubescent outside. Petals 5, oblong, 5 mm long, obtuse, pubescent. Stamens short; staminal tube 10 lobed; anthers inserted between forks of filaments. Ovary glabrous. Drupe globose, 5- celled, 7 mm across, fleshy, purple to black when mature. Seeds up to 10, angled.

Fl. & Fr.: Mar.–Aug.

Habitat: Common on top of the rocky hills, along foot hills, rare in plains.

Specimen examined: PK Valasa, Kintukuru, *Y. Mahesh* 010472, 011726 (BSID).

Field notes: Lower pairs of leaflets are smaller than upper ones.

4. HEYNEA Roxb.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Heynea trijuga Roxb. ex Sims, Bot. Mag. 41: t. 1738. 1815, non *Trichilia trijuga* Vell., 1825; Hiern in Hook. f., Fl. Brit. India 1: 565. 1875; Gamble, Fl. Madras 1: 183. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 257. 1999. *Trichilia connaroides* (Wight & Arn.) Bentv., Acta Bot. Neerl. 11: 13. 1962. *Zanthoxylum connaroides* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 148. 1834 as "Zanthoxylon"; Pull. & al., Fl. Andhra Pradesh 1: 330. 2018. **(Plate 47D)** *'Garugudu chettu'*

Moderate sized, evergreen tree, up to 10 m high; bark grey; young branches yellow pubescent. Leaves alternate, imparipinnate, up to 30 cm long; leaflets 5–9, ovate-lanceolate, 6–16 cm long, membranous, obliquely rounded at base, acuminate at apex, margins entire, glabrous on both sides; petiolule up to 1 cm long. Flowers in lax, 35 cm long peduncled axillary or terminal, corymbose panicles, 8 mm long, shortly pedicelled, white. Calyx small, 3 mm long; lobes 4, obtusely triangular. Petals 4, elliptic-oblong, 7 mm long. Stamens 10; filaments connate; anthers inserted between filaments lobes. Ovary spherical, glabrous; style short. Capsule ellipsoid, 2-volved, *c.* 1.5 cm across, coriaceous, 1-seeded. Seed black.

Fl. & Fr.: Mar.–Jul.

Habitat: Occasional in deep moist forest valleys, along stream banks

Specimen examined: Maredumilli, Valamuru, *Y. Mahesh* 011516, 011792 (BSID).

5. MELIA L.

India: 2 sp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Melia dubia Cav., Diss. 7: 364. 1789; Hiern in Hook. f., Fl. Brit. India 1: 545. 1875; Pull. & al., Fl. Andhra Pradesh 1: 326. 2018. *Melia composita* Willd., Sp. Pl. 2: 559. 1799; Gamble, Fl. Madras 1: 176. 1915. **(Plate 47E)** *'Munnuthi Karaka'*

A large, deciduous tree, up to 25 m high; bark rough, dark brown, vertically fissured; young branchlets pinkish-tomentose. Leaves alternate, bipinnate or tripinnate, 40 cm long; leaflets 10 pairs, ovate-lanceolate, 3–5 cm long, obtuse at base, acuminate at apex, margins crenate-serrate, glabrous on both sides; petiolule short. Flowers small, 6 mm long, in axillary branched panicles, greenish-white, bracteate. Calyx 2 mm long; lobes 5, ovate, stellate hairy without. Petals 5, spathulate, 5 mm long, concave, pubescent. Staminal tube gibbous, cylindric. Ovary glabrous; style cylindric. Drupe ellipsoid, *c.* 2 cm long, shiny, yellowish when ripe, endocarp woody. Seeds 3, smooth.

Fl. & Fr.: Feb.–Jul.

Habitat: Occasional in forest, fast growing species in plains

Specimen examined: Valamuru, *Y. Mahesh* 011782 (BSID).

6. SOYMIDA A.Juss.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Soymida febrifuga (Roxb.) A. Juss., Mem. Mus. Hist. Nat. 19: 251. 1830; Hiern in Hook. f., Fl. Brit. India 1: 567. 1875; Gamble, Fl. Madras 1: 185. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 258. 1999; Pull. & al., Fl. Andhra Pradesh 1: 328. 2018. *Swietenia febrifuga* Roxb., Pl. Coromandel 1: 18. t. 17. 1795. **(Plate 47F)** *'Somichettu'*

A tall, deciduous tree, up to 15 m high; bark blackish-grey with small patches, vertical fissures; branches lenticellate, glabrous. Leaves crowded at ends of branches, alternate, paripinnate, up to 25 cm long; leaflets 3–6 pairs, elliptic-oblong or lanceolate, 4–8 cm long, coriaceous, obliquely obtuse at base, obtuse at apex, margins entire, glabrous, white dotted below; petiolule short. Flowers small, 8 mm long, in axillary and terminal, branched panicles, greenish white. Calyx short, 4 mm long, cupular, rotund, margins membranous. Petals 5, thick, obovate, 8 mm long, clawed, rounded. Stamens 10, tube faintly urceolate. Ovary 5-lobed, glabrous; style short; stigmas discoid, 5-lobed. Capsule ovoid, *c.* 7.5 cm long, 5-volved, woody. Seeds many, compressed, winged at both ends.

Fl. & Fr.: Feb.–Jun.

Habitat: Occasional in forest outskirts, roadsides in dry deciduous forest.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011394 (BSID).

Field notes: Wood is valuable for domestic purpose, seeds edible.

70. MALVACEAE

India: 63 genera, 265 taxa; Andhra Pradesh: 36 genera, 109 spp., 5 subspp., 3 var.; PNP: 22 genera, 44 spp.

(Including Tiliaceae, Sterculiaceae and Bombacaceae)

Key to the genera

1a.	Anthers monothecous	2
1b.	Anthers dithecous	10
2a.	Flowers unisexual	**11. Kydia**
2b.	Flowers bisexual	3
3a.	Epicalyx absent	4
3b.	Epicalyx present but persistent or caducous	5
4a.	Cells of ovary 1-ovuled	**17. Sida**
4b.	Cells of ovary 2 to many ovuled	**1. Abutilon**
5a.	Plant a tree	**19. Thespesia**
5b.	Plants otherwise	6
6a.	Epicalyx lobes or segments 3	**12. Malvastrum**
6b.	Epicalyx lobes or segments > 3	7
7a.	lower surface of the petal densely ferruginous hairy	**2. Azanza**
7b.	lower surface of the petal not as above	8
8a.	Stylar branches 5	**10. Hibiscus**
8b.	Stylar branches 10	9
9a.	Staminal column antheriferous only towards tip	**21. Urena**
9b.	Staminal column antheriferous throughout	**14. Pavonia**
10a.	Petals absent	11
10b.	Petals present	12
11a.	Cells of ovary 2-ovuled	**7. Firmiana**
11b.	Cells of ovary many-ovuled	**18. Sterculia**
12a.	Petals with scaly or thickened glands on base	13
12b.	Petals not with scaly or thickened glands on base	14
13a.	Fruit a drupe	**8. Grewia**
13b.	Fruit a capsule	**20. Triumfetta**
14a.	Trees15	
14b.	Herbs or shrubs or under-shrubs	17
15a.	Leaves compound	**4. Ceiba**
15b.	Leaves simple	16
16a.	Staminodes absent	**6. Eriolaena**
16b.	Staminodes present	**16. Pterospermum**
17a.	Petals appendaged	**3. Byttneria**
17b.	Petals not appendaged	18
18a.	Staminodes absent	19

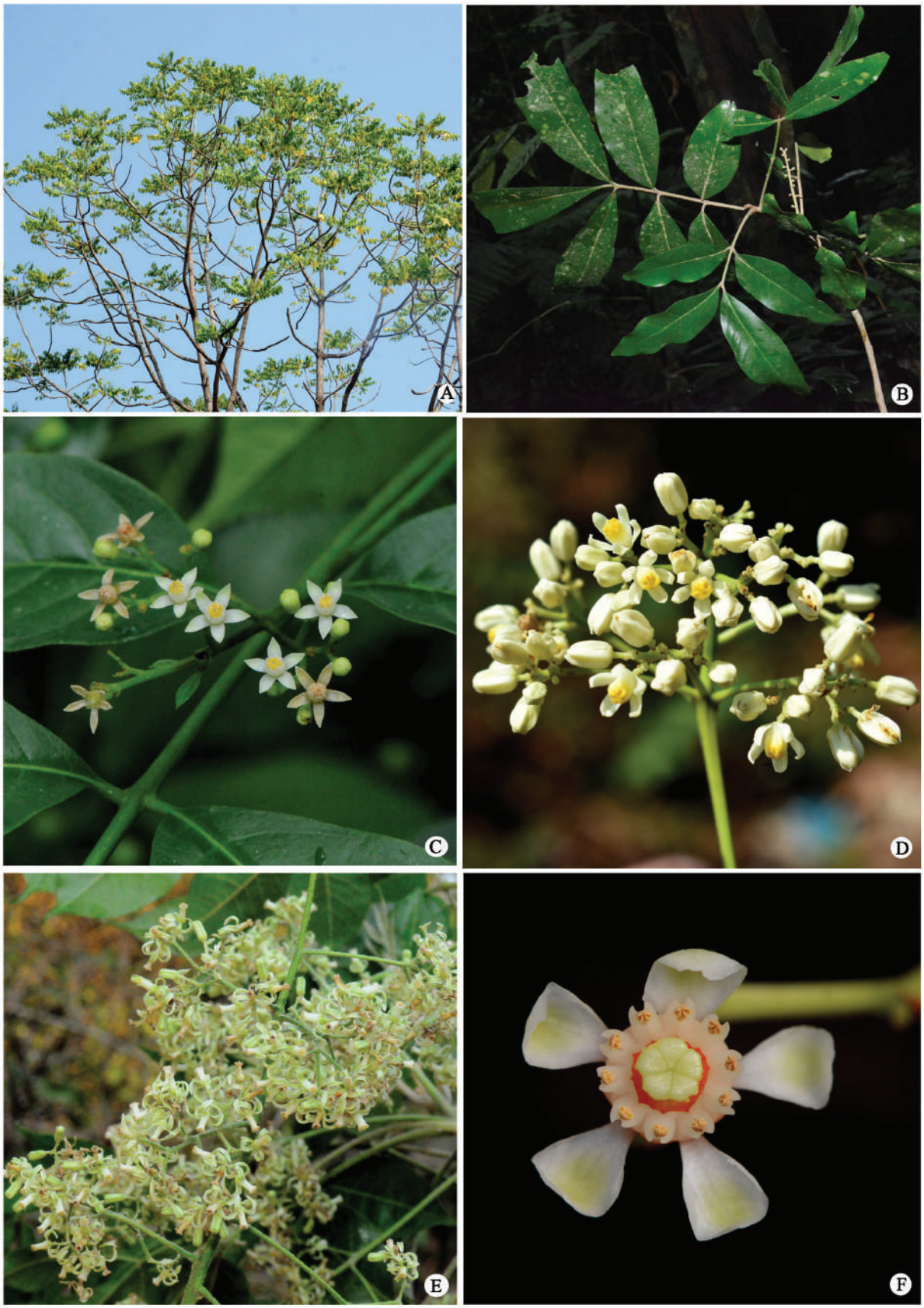


Plate 47: A. *Ailanthus excelsa* Roxb.; **B.** *Aglaia elaeagnoidea* (A.Juss.) Benth.; **C.** *Cipadessa baccifera* (Roth) Miq.; **D.** *Heynea trijuga* Roxb. ex Sims; **E.** *Melia dubia* Cav.; **F.** *Soymida febrifuga* (Roxb.) A. Juss.

18b.	Staminodes present	21
19a.	Cells of ovary many ovuled	**5. Corchorus**
19b.	Cells of ovary 1 or 2 ovuled	20
20a.	Flowers pink; capsules 5-valved	**13. Melochia**
20b.	Flowers yellow; capsules 2-valved	**22. Waltheria**
21a.	Erect herbs; fruits capsular, not twisted	**15. Pentapetes**
21b.	Shrubs; fruits follicular, twisted	**9. Helicteres**

1. ABUTILON Mill.

India: 12 spp., 2 subsp. & 6 var.; Andhra Pradesh: 5 spp. & 2 subsp.; PNP: 3 spp.

Key to the species

1a.	Staminal tube tube long, hairy near base; carpels 10-20	2
1b.	Staminal tube short, hairy at apex; carpels 5	**3. A. persicum**
2a.	Stem with close tomentose; corolla without purple centre; cocci shortly awned	**2. A. indicum**
2b.	Stem with long spreading hairs; corolla with purple centre; cocci mucronate	**1. A. hirtum**

1. Abutilon hirtum (Lam.) Sweet, Hort. Brit. Ed. 1: 53. 1826; Gamble, Fl. Madras 1: 91. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 214. 1999; Pull. & al., Fl. Andhra Pradesh 1: 180. 2018. *Sida hirta* Lam., Encycl. 1: 7. 1783. *Abutilon graveolens* (Roxb. ex Homem.) Wight & Arn. var. *hirtum* (Lam.) Masters in Hook. f., Fl. Brit. India 1: 327. 1874. *'Nela benda'*

An erect, undershrub, up to 1.5 m high; whole plant covered with glandular pubescent; stem with long spreading hairy. Leaves alternate, deeply cordate, ovate, 6.5–8 cm long, acuminate at apex, margins crenate; petiole up to 5 cm long. Flowers 1.5–2.5 cm in diam., axillary, solitary, bright yellow with purple tinge centre. Calyx 5 lobed; lobes ovate-triangular, velvety. Corolla lobes 5, broadly ovate-obovate, 1.5 cm long. Stamens numerous. Ovary broader, hairy; style dividing into 14-branches. Fruit a schizocarp, *c.* 1 cm across, carpels rounded, mucronate, stellate pubescent. Seeds roughly reniform, stellately hairy.

Fl. & Fr.: Sep.–Jan.

Habitat: Common herb along forest hedges, stream banks, roadsides, waste places.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Abutilon indicum (L.) Sweet, Hort. Brit. 1: 54. 1826; Masters in Hook. f., Fl. Brit. India 1: 326. 1874; Gamble, Fl. Madras 1: 91. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 214. 1999; Pull. & al., Fl. Andhra Pradesh 1: 182. 2018. *Sida indica* L., Cent. Pl. 2: 26. 1756. *Abutilon indicum* var. *populifolium* (Lam.) Wight & Arn. ex Masters in Hook. f., Fl. Brit. India 1: 326. 1874. *'Tuthurubenda'*

A suffrutescent, much branched undershrub, up to 1.5 m high; whole plant faintly, soft stellately hairy; stems terete, with close tomentum. Leaves alternate, broadly ovate, cordate, 6–8 cm long, cordate at base, shortly acuminate at apex, margins crenate or toothed; stipules linear, falcate; petiole up to 12 cm long. Flowers axillary, solitary, 1.5 cm across, yellow, with long accrescent pedicels. Calyx 7 mm long, villous; lobes ovate, triangular, apiculate. Corolla 5-lobed; lobes obovate, hairy along margins at base. Stamens numerous, columnar around ovary; staminal tube hairy at base. Ovary broader, pubescent; style dividing into 20 branches. Fruit schizocarp, hairy, with 15–20 mericarps, *c.* 1.5 cm across, black at maturity, shortly awned. Seeds reniform, brown, minutely pitted, tuberculated with white hairs.

Fl. & Fr.: Mar.–Aug.

Habitat: Common in open waste places, along roadsides.

Specimen examined: Kondamodalu, *Y. Mahesh* 011448 (BSID).

3. Abutilon persicum (Burm.f.) Merr., Philipp. J. Sci. 19: 364. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 214. 1999; Pull. & al., Fl. Andhra Pradesh 1: 185. 2018. *Sida persica* Burm.f., Fl. Ind. 148, t. f. 1. 1768. *Abutilon polyandrum* (Roxb.) Wight & Arn. ex wight, Cat. Indian Pl. 12. 1833; Masters in Hook. f., Fl. Brit. India 1: 325. 1874; Gamble, Fl. Madras 1: 91. 1915. **(Plate 48A)**

An erect, robust undershrub, up to 2.5 m high; stem and branches pubescent with stellate hairs. Leaves alternate, ovate-cordate, 4–18 cm long, rounded to cordate at base, acute-long acuminate at apex, margins crenate-dentate, stellately hairy above, velutinous below; petiole up to 10 cm long. Flowers terminal racemes or panicles, bright yellow. Calyx cup shaped, divided up to middle; lobes ovate-lanceolate. Petals obovate; staminal column conical, short, stellately hairy at upper part. Fruit a schizocarp, *c.* 2 cm across, campanulate. Mericarps 5 each, Seeds 4-6 per mericarp, reniform, blackish-brown.

Fl. & Fr.: Nov.–Mar.

Habitat: Occasional along streams banks inside the deep forest.

Specimen examined: Kondamodalu, *Y. Mahesh* 010044 (BSID).

2. AZANZA Alef.

India: 4 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Azanza lampas Alef., Bot. Zeitung 19: 297. 1861. *Thespesia lampas* (Cav.) Dalzell & Gibson, Bombay Fl. 19. 1861; Masters in Hook. f., Fl. Brit. India 1: 345. 1874; R.S. Rao & al., Fl. E. Godavari Dist. 222. 1999; Pull. & al., Fl. Andhra Pradesh 1: 210. 2018; var. *lampas*; Paul in B.D. Sharma & Sanjappa, Fl. India 3: 350. 1993. *Hibiscus lampas* Cav., Diss. 3: 154. t. 56, f. 2. 1787; Gamble, Fl. Madras 1: 98. 1915. *'Adavi prathi', 'Kondapathi'*

An erect, stout shrubs, 2 m high; branches with stellate pubescent. Leaves alternate, trilobed, ovate-cordate, 8–20 cm long, cordate at base, acute at apex, margins entire, sparsely stellately pubescent above, densely below, glandular on midrib at base; petiole up to 10 cm long, pubescent. Flowers axillary or terminal, solitary, yellow with crimson in centre, shortly pedicelled. Epicalyx lobes 5, linear, small. Calyx 1.2 cm long, 5-lobed, copular; lobes subulate, minute. Corolla 5-lobed, 5 cm across; lobes obovate, adnate to the staminal column at base, brown stellate tomentose without. Stamens numerous. Ovary clavate; carpels 5. Capsule loculicidal, ovoid, *c.* 2.5 cm long, 3-5-volved, faintly stellate-puberulous. Seeds many, black.

Fl. & Fr.: Nov.–Feb.

Habitat: Common as undergrowth in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 012142 (BSID).

3. BYTTNERIA Loefl.

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Byttneria herbacea Roxb., Pl. Coromandel 1: 28, t. 29. 1795; Masters in Hook. f., Fl. Brit. India 1: 376. 1874; Gamble, Fl. Madras 1: 112. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 227. 1999; Pull. & al., Fl. Andhra Pradesh 1: 218. 2018. **(Plate 48B)**

Prostrate herb, up to 1 m high; branches ascending, faintly angled, minutely stellate-pubescent. Leaves alternate, ovate-lanceolate, 3–4 cm long, chartaceous, rounded or subcordate at base, acute-acuminate at apex, margins serrate, ciliate, pubescent above, glabrous below, glandular beneath on midrib; petiole 1.5 cm long. Flowers in axillary, umbellate, 2–3-flowered clusters, 6 mm long, purplish, bracteate. Sepals 5, connate at base, lobes narrowly ovate-lanceolate, recurved, prominently 3-nerved. Petals 5, free, connate at base, 5 mm long, clawed, limb subulate, pubescent, with bifid appendage. Stamens 5. Ovary globose, 5-celled; style short. Capsule globose, *c.* 1 cm across, septicidal glochidate. Seeds ovoid, black

Fl. & Fr.: Throughout the year.

Habitat: Common in forest pathways, shady localities in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010442 (BSID).

4. CEIBA Mill.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Ceiba pentandra (L.) Gaertn., Fruct. Sem. Pl. 2: 244. 1791; R.S. Rao & al., Fl. E. Godavari Dist. 226. 1999; Pull. & al., Fl. Andhra Pradesh 1: 215. 2018. *Bombax pentandrum* L., Sp. Pl. 1: 511. 1753. *Eriodendron pentandrum* (L.) Kurz, J. Asiat. Soc. Bengal 43: 113. 1874; Gamble, Fl. Madras 1: 100. 1915. *'Tella buruga'*

A tall, deciduous tree, up to 18 m high; stem cylindrical, green, prickly when young; branches verticillate, spreading horizontally. Leaves digitately compound, 6–9-foliate; leaflets oblong-lanceolate, 9 cm long, cuneate at base, acuminate at apex, margin entire, glaucous below, glabrous on both sides; petiole long. Flowers axillary or subterminal, tufted, appears before the leaves or along with young leaves, white. Sepals 5, connate; lobes glabrous. Petals 5, connate at base, oblanceolate, imbricate. Staminal tube divided. Ovary ovoid; style short. Capsule cylindric, oblong, with coriaceous pericarp. Seeds pyriform, embedded in silky woolly.

Fl. & Fr.: Jan.–May.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: The plant resembles *Bombax ceiba* in vegetative characters, but distinguished by its yellowish or white flowers.

5. CORCHORUS L.

India: 10 spp.; Andhra Pradesh: 8 spp.; PNP: 3 spp

Key to the species

1a.	Capsule 6-angled, ending in 3-radiating points	**1. C. aestuans**
1b.	Capsule cylindrical, ending in single beak	2
2a.	Capsule not ribbed, less than 3 cm long	**2. C. fascicularis**
2b.	Capsule 10 ribbed, 4–7 cm long	**3. C. olitorius**

1. Corchorus aestuans L., Syst. Nat., ed. 10. 2: 1079. 1759; R.S. Rao & al., Fl. E. Godavari Dist. 231. 1999; Pull. & al., Fl. Andhra Pradesh 1: 239. 2018. *Corchorus acutangulus* auct. non. Forssk. 1755; Masters in Hook. f., Fl. Brit. India 1: 398. 1874; Gamble, Fl. Madras 1: 121. 1915. *'Kalasa'*

An erect, much branched herb, up to 80 cm high; stem and branches tomentose. Leaves alternate, ovate, elliptic, 2.5–4.5 cm long, rounded or obtuse at base, acute at apex, margins crenate-serrate, 3 or 4-nerved from base, sparsely hairy or glabrous on both surfaces; petiole up to 2.5 cm long. Stipules linear, caudate. Flowers in capitate, axillary, 2-3 flowered clusters or leaf opposed cymes, 5 mm long, yellow, shortly pedicellate. Sepals linear-oblong, boat like, 3 mm long, apiculate. Petals obovate, clawed at base, sparsely puberulous along margins. Stamens 25. Ovary cylindric, elongate, hairy; style trifid. Capsule elongate, *c.* 3 cm long, 6-angled, septate, 3-winged. Seeds numerous, angled, brown.

Fl. & Fr.: Oct.–Dec.

Habitat: Common in cultivated fields, stream hedges, waste open places.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Corchorus fascicularis Lam., Encycl. 2: 104. 1786; Masters in Hook. f., Fl. Brit. India 1: 398. 1874; Gamble, Fl. Madras 1: 122. 1915; Pull. & al., Fl. Andhra Pradesh 1: 240. 2018.

An erect, annual herb, up to 40 cm high; branches terete, glabrous. Leaves alternate, oblong-lanceolate or elliptic, 3–4 cm long, rounded-obtuse at base, acute at apex, margins crenate-serrate, glabrous on both surfaces, 3-nerved from base; petiole 2 cm long. Stipules linear, caudate. Flowers in axillary or leaf-opposed, 4–5 flowered cymes, 5 mm long, yellow. Sepals linear, 3 mm long, apiculate. Petals elliptic-obovate, 4 mm long. Stamens 10; filaments dilated. Ovary oblong-ovoid, hairy. Capsules in clusters of 3–6, cylindric, 1.5 cm long, 3-volved, angled, densely hairy. Seeds many.

Fl. & Fr.: Sep.–Jan.

Habitat: Common in cultivated fields, marshy localities, canals.

Specimen examined: PK Valasa, *Y. Mahesh* 012113 (BSID).

3. Corchorus olitorius L., Sp. Pl. 1: 529. 1753; Masters in Hook. f., Fl. Brit. India 1: 397. 1874; Gamble, Fl. Madras 1: 122. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 232. 1999; Pull. & al., Fl. Andhra Pradesh 1: 241. 2018. **(Plate 48C)** *'Parintakura'*

Procumbent or suffruticose, much branched herb, up to 60 cm high; branches terete, glabrous. Leaves alternate, elliptic-lanceolate or ovate 6 cm long, obtuse or rounded at base with two filiform appendages, acuminate at apex, margins serrate, glabrous on both surfaces; petiole 3 cm long, hairy on grooves. Stipules reddish, acuminate. Flowers in extra-axillary or leaf opposed clusters, in simple 1–2-flowered cymes, 5 mm long, yellow. Sepals 5, oblong, acuminate, 3 mm long, apiculate, hairy on margins below. Petals 5, oblong-spathulate or obovate, 4 mm long, clawed at base. Stamens numerous. Ovary oblong, lobed; style short. Capsule linear, cylindric, 4.5 cm long, 10-ribbed, 5-volved, glabrous. Seeds many, angled, brown.

Fl. & Fr.: Aug.–Jan.

Habitat: Common in damp places, cultivated fields, moist waste localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010430 (BSID).

6. ERIOLAENA DC.

India: 7 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Eriolaena candollei var. **hookeriana** (Wight & Arn.) K.C. Mohan, Ann. Plant Sci. 9:1. 3684. 2020. *Eriolaena hookeriana* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 70. 1834; Masters in Hook. f., Fl. Brit. India 1: 370. 1874; Dunn in Gamble, Fl. Madras 1: 110. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 227. 1999; Pull. & al., Fl. Andhra Pradesh 1:

219. 2018. var. *hookeriana*; Malick in B.D. Sharma & Sanjappa, Fl. India 3: 415. 1993. *'Narabotaka'*

Small, deciduous trees, up to 8 m high; Bark grey; young branches tomentose. Leaves broadly ovate-cordate, 15 cm in diam., chartaceous, cordate at base, acuminate apex, margins irregularly dentate, crenate glabrous above, stellate pubescent below, with 5–8 basal prominent nerves; petiole 6 cm long. Flowers in axillary cymes, few flowered, 3.5 cm across, yellow, pedicellate. Sepals 5, lanceolate, green. Petals 5, obovate, tomentose clawed. Stamens numerous; staminal column 2 cm long. Ovary short. Capsule ovoid, *c.* 3.2 cm long, woody, loculicidal, 10- volved, tubercled. Seeds papery, winged above.

Fl. & Fr.: Mar.–Aug.

Habitat: Occasional in deciduous forest.

Specimen examined: Maredumilli, *Y. Mahesh* 011542 (BSID).

7. FIRMIANA Marsili

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Firmiana colorata (Roxb.) R.Br. in Benn. & R. Br., Pl. Jav. Rar. 235. 1844; Gamble, Fl. Madras 1: 107. 1915; Pull. & al., Fl. Andhra Pradesh 1: 220. 2018. *Sterculia colorata* Roxb., Pl. Coromandel 1: 26, t. 25. 1795; Masters in Hook. f., Fl. Brit. India 1: 359. 1874. **(Plate 48D)** *'Karaka, Karuboppaja'*

Moderate sized, deciduous tree, up to 10 m high; bark grey, rough; branches gnarled towards ends with raised pads of deciduous leaves; young parts covered with stellate tomentose. Leaves alternate, crowded at ends of the branches, deeply cordate, 3–5-lobed, 8–18 cm long, thinly leathery, cordate at base, acuminate at apex, margins entire or faintly serrulate, 7-nerved from base, slightly pubescent above, tomentose below; petiole up to 8 cm long. Flowers unisexual in axillary and terminal panicles, orange red, stellate tomentose, 2.6 cm long. Calyx tubular, 2 cm long, inundibuliform, softly pubescent; lobes very short, triangular. Petals absent. Stamens 15. Ovary pentalocular; style short. Fruit aggregate of 5-membranous follicles; follicles stipitate, oblong-lanceolate, 3 cm long, purple or red when mature. Seeds 2, attached to margins of follicles.

Fl. & Fr.: Mar.–Jul.

Habitat: Occasional in deep forest stream banks, rocky areas of deciduous forest.

Specimen examined: Kondamodalu, *Y. Mahesh* 011761 (BSID).

Field notes: Flowers orange red in colour, looks like red fire.

8. GREWIA L.

India: 34 spp.; Andhra Pradesh: 18 spp.; PNP: 6 spp.

Key to the species

1a.	Leaves ovate-orbicular, 5 or more ribbed from base	5
1b.	Leaves ovate-lanceolate, 3-ribbed from base	2
2a.	Plants stragglers	**1. G. abutilifolia**
2b.	Plants shrubs or small trees	3
3a.	Flowers polygamous	**3. G. hirsuta**
3b.	Flowers bisexual	4
4a.	Leaves glabrous below	**4. G. oppositifolia**
4b.	Leaves tomentose below	**2. G. damine**
5a.	Leaf margins serrate; fruit not lobed	**5. G. rothii**
5b.	Leaf margins crenate-serrate; fruit 2-lobed	**6. G. tilifolia**

1. Grewia abutilifolia Vent. ex Juss., Ann. Mus. Natl. Hist. Nat. 4: 92. 1804; Masters in Hook. f., Fl. Brit. India 1: 390. 1874; R.S. Rao & al., Fl. E. Godavari Dist. 235. 1999; Pull. & al., Fl. Andhra Pradesh 1: 245. 2018. *G. aspera* Roxb., Fl. Ind. 2: 591. 1832; Gamble, Fl. Madras 1: 119. 1915. *'Guvvadada, Peddatadaki, Potucamanchi'*

Straggling shrubs, up to 5 m high; bark brown, rough; young branches densely pubescent. Leaves broadly ovate or rhomboid or ovate, obscurely 3-4 lobed, 6–12 cm long, rounded or subcordate at base, acute at apex, margins bidentate, irregularly serrate, 5-nerved from base, scabrous, stellate pubescent above, densely velvety below. Flowers in axillary umbellate cymes, 5-merous, small, 1.5 cm across, white turning into yellow. Sepals 5, lanceolate, woolly outside. Petals 5, oblong, clawed with a gland, shorter than sepals. Stamens numerous. Ovary sub-globose. Drupe in cluster of 2–4, sub-globose, *c.* 1 cm across, obscurely 4-lobed, pubescent, yellow-black when ripe.

Fl. & Fr.: Apr.–Sep.

Habitat: Common in hilly slopes, plains in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: Drupe rind firmly adhers to fibrous mesocarp.

2. Grewia damine Gaertn., Fruct. Sem. Pl. 2. 113. t. 106. f. 9. 1790; Gamble, Fl. Madras 1: 118. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 235. 1999; Pull. & al., Fl. Andhra Pradesh 1: 247. 2018. *Grewia salviifolia* Heyne ex Roth, Nov. Pl. Sp. 239. 1821; Masters in Hook. f., Fl. Brit. India 1: 386. 1874 *p.p.* **(Plate 48E)** *'Cheepuru chettu'*

Scandent shrubs or small trees, up to 3 m high; bark dark, peeling off; branchlets white or grey pubescent when young. Leaves alternate, elliptic-ovate or lanceolate 4 cm long, obliquely rounded at base, acute at apex, margins serrulate, stellate puberulous above, white tomentose beneath, 3-nerved from base; petiole 6 mm long. Flowers in axillary 3-flowered, cymose clusters, 1 cm across, yellow, shortly pedicellate, bracteate. Sepals 5, lenior-lanceolate, 5 mm long, pubescent on abaxial. Petals 5, elliptic-oblong or obovate, 4 mm long, clawed at base, silky hairy. Stamens numerous. Ovary subglobose, hirsute. Drupe globose, *c.* 1 cm across, 2-lobed, rugose, dark brown, stellate pubescent. Seeds 4.

Fl. & Fr.: Jul.–Oct.

Habitat: Common in deciduous forest hedges, forest pathways.

Specimen examined: Tekupally, Y. Mahesh 010167 (BSID).

3. Grewia hirsuta Vahl, Symb. Bot. 1: 84. 1790; Masters in Hook. f., Fl. Brit. India 1: 391. 1874; Gamble, Fl. Madras 1: 119. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 236. 1999; Pull. & al., Fl. Andhra Pradesh 1: 250. 2018. *'Bonthuchettu',' Narvi'*

Medium sized shrub, up to 2 m high; young branches brown pubescent. Leaves alternate, ovate-lanceolate, 3.5–7 cm long, obliquely rounded at base, acute at apex, margins serrate, sparsely stellate pubescent above, densely pubescent below, 3-nerved from base; petiole 5 mm long. Flowers in axillary 3-flowered, umbellate cymes, polygamous, 8 mm across, white, bracteate. Sepals 5, elliptic-lanceolate, 6 mm long, hairy without. Petals 5, ovate-oblong, 8 mm long, with a gland, ciliate at tip. Stamens numerous. Ovary villous; style short, glabrous. Drupe fleshy, globose, 4-lobed, 1 cm across, sparsely hairy.

Fl. & Fr.: Jun.–Nov.

Habitat: Common in open hill forests, forest pathways.

Specimen examined: Valamuru, Seemagandi, Kondamodalu, *Y. Mahesh* 010479, 011423, 011445 (BSID).

Field notes: This species is very variable.

4. Grewia oppositifolia Buch.-Ham. ex DC., Prodr. 1: 509. 1824. *Grewia rhamnifolia* B. Heyne ex Roth, Nov. Sp. Pl. 244. 1824; Gamble, Fl. Madras 1: 117. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 238. 1999; Pull. & al., Fl. Andhra Pradesh 1: 253. 2018. *Grewia orientalis* auct. non L. 1753; Masters in Hook. f., Fl. Brit. India 1: 384. 1874. p.p. **(Plate 48F)**

Medium sized shrubs, up to 3 m high; branches terete, glabrous, sparsely pubescent when young. Leaves alternate, ovate-elliptic, 5–10 cm long, rounded or obtuse at base, acuminate at apex, margins crenate-serrulate, coriaceous trinerved from base, glabrous on both surfaces; petiole up to 8 mm long. Flowers in axillary, 2-3 flowered cymes, 2.5 cm across, yellow, bracteate; peduncle longer than petiole; flower buds ovoid, strongly ribbed, tomentose, hirsute; torus grooved, woolly. Sepals 5, elliptic-lanceolate, 2 cm long, inrolled, stellate tomentose without. Petals 5, lanceolate, 9 mm long, inrolled. Stamens numerous. Ovary faintly lobed, yellowish-hirsute; stigma 4-lobed. Drupe globose, 2 cm long, depressed, faintly 2-4-lobed, pubescent. Seeds globose.

Fl. & Fr.: Jun.–Nov.

Habitat: Common in open scrub forests, along forest pathways.

Specimen examined: Maredumilli, Tekuru, *Y. Mahesh* 011511, 011630 (BSID).

5. Grewia rothii DC., Prodr. 1: 509. 1824; Gamble, Fl. Madras 1: 117. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 238. 1999; Pull. & al., Fl. Andhra Pradesh 1: 253. 2018. *Grewia excelsa* auct. non Vahl 1790; Masters in Hook. f., Fl. Brit. India 1: 385. 1874 *p.p. 'Cipuru', 'Jana chettu', 'Muvanchi'*

Large, evergreen shrub or small tree, up to 5 m high; bark grey, rough; young branches pubescent. Leaves alternate, distichous, elliptic-ovate or lanceolate, 6-12 cm long, oblique at base, acute or acuminate at apex, margins finely serrate, glabrous above, glaucous, grey pubescent below, 3-ribbed from base; petiole 5 mm long.

Flowers in axillary, 1–3-flowered cymes, 5 mm across, yellowish, bracteate, pedunculate; peduncles longer than petioles; young buds subglobose, tomentose. Sepals 5, elliptic-lanceolate or obovate, 3 mm long, white tomentose without, white pubescent within. Petals 5, ovate-lanceolate, 4 mm long, hairy. Stamens numerous. Ovary globose, pubescent; stigma 3-lobed. Drupe globose, *c.* 5 mm across, obscurely or not lobed, reddish-brown, white tomentose.

Fl. & Fr.: Jul.–Nov.

Habitat: Common in open hilly slopes, forest pathways, outskirts.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. Grewia tiliifolia Vahl, Symb. Bot. 1: 35. 1790; Masters in Hook. f., Fl. Brit. India 1: 386. 1874; Gamble, Fl. Madras 1: 118. 1915; Rao & al., Fl. E. Godavari Dist. 240. 1999; Pull. & al., Fl. Andhra Pradesh 1: 257. 2018. **(Plate 48G)** *'Tada chettu'*

Small tree, up to 10 m high; bark greyish-brown, rough with vertical striations; young parts sparsely, minutely stellate pubescent. Leaves alternate, broadly ovate or suborbicular, 6–12 cm long, obliquely cordate at base, acute or acuminate at apex, margins crenate-serrate, palmately 5-nerved from base, coriaceous, glabrous on both surfaces; petiole 1.6 cm long. Stipules auricled on one side. Flowers in axillary, 2–3- flowered, umbellate cymes, 1 cm across, yellow, peduncled, bracteate; peduncle shorter than petiole. Sepals 5, elliptic or lanceolate, 6 mm long, incurved at tips, glabrous within, pubescent outside. Petals 5, elliptic-oblong, spathulate, 8 mm long, apically notched, hairy, glandular within. Stamens numerous. Ovary globose, hairy; style glabrous. Drupe globose, 1 cm across, shallowly 2-lobed, glabrescent or sparsely hirsute, dark maroon when ripe.

Fl. & Fr.: Feb.–Jun.

Habitat: Occasional in deciduous forests.

Specimen examined: Kakeshnur, Kondamodalu, *Y. Mahesh* 010193, 011754 (BSID).

9. HELICTERES Pluk. ex L.

India: 5 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Helicteres isora L., Sp. Pl. 2: 963. 1753; Masters in Hook. f., Fl. Brit. India 1: 365. 1874; Gamble, Fl. Madras 1: 107. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 227. 1999; Pull. & al., Fl. Andhra Pradesh 1: 222. 2018. *'Gubbatada', 'Nulitada'*

Large shrubs or small deciduous trees, up to 5 m high; bark whitish grey, smooth; young branches tomentose. Leaves alternate, ovate-suborbicular, 5–12 cm long, obliquely cordate or rounded at base, acute or obtuse at apex, margins crenate-serrate, thin, coriaceous, scabrous above, tomentose below, palmately 3–5 nerved from base; petiole 1.5 cm long. Flowers in axillary, 5-8-flowered fascicles, up to 3 cm long, reddish or crimson. Calyx 1.5 cm long, brown tomentose without, gibbous, 2-lipped; lobes triangular. Petals 5, reflexed, clawed at base, unequal. Stamens 10; staminal column fused with gynophore. Ovary conical, pubescent; style deflexed, glabrous. Fruit aggregate of 5-folicles, *c.* 5 cm long, spirally twisted. Seeds black, angled.

Fl. & Fr.: Sep.–Mar.

Habitat: Common in scecondary forests, plain forests, pathways inside the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010006 (BSID).

Field notes: Quickly growing shrub, occupying wide area; fruits used for stomach pains.

10. HIBISCUS L.

India: 23 spp., 1 subsp. & 3 var.; Andhra Pradesh: 13 spp. & 1 var.; PNP: 5 spp.

Key to the species

1a.	Epicalyx long, present	2
1b.	Epicalyx short, caducous	**2. H. lobatus**
2a.	Leaves entire	**3. H. micranthus**
2b.	Leaves lobed or partite	3
3a.	Plants unarmed with prickles	**4. H. vitifolius**
3b.	Plants armed with prickles on stem and calyx	4
4a.	Stipules foliaceous, semi-sagittate, auricled at base	**5. H. surattensis**
4b.	Stipules linear-lanceolate	**1. H. aculeatus**

1. Hibiscus aculeatus Roxb., Fl. Ind. 3: 206. 1832; Pull. & al., Fl. Andhra Pradesh 1: 192. 2018. *Hibiscus furcatus*

Roxb. ex DC., Prodr. 1: 449. 1824, non Willd. 1809; Masters in Hook. f., Fl. Brit. India 1: 335. 1874; Gamble, Fl. Madras 1: 97. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 215. 1999.

An erect or trailing undershrub, up to 1.5 m high; stems with recurved prickles. Leaves alternate, 3–5-lobes, 4–7 cm long, as much as broad, cordate at base, acute at apex, scabrous on both surfaces; stipules linear-lanceolate; petiole up to 8 cm long. Flowers axillary, solitary, pedicellate, bright yellow with purple throat. Epicalyx forked at apex, with ovate lobe; lobes projecting upwards. Calyx deeply-5 partied, lobes lanceolate, persistent. Corolla lobes obovate, obtuse. Capsule beaked, covered with deciduous hairs, enclosed in accrescent calyx. Seeds small.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in the deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Hibiscus lobatus (Murray) Kuntze, Rev. Gen. Pl. 3: 19. 1898; Pull. & al., Fl. Andhra Pradesh 1: 193. 2018. *Solandra lobata* Murr. In Commentat. Soc. Regiae Sci. Gott. 6: 20. t. 1. 1785. *Hibiscus solandra* L'Herit., Strip. Nov. 1: 103. t. 549. 1789; Masters in Hook. f., Fl. Brit. India 1: 336. 1874; Gamble, Fl. Madras 1: 98. 1915. *'Atakanara'*

Erect, annual herbs, up to 40 cm high, woody at base; branches sparsely pubescent. Leaves alternate, ovate-orbicular, 6–12 cm long, palmately 3-lobed, rounded or cordate at base, bluntly acuminate at apex, margins crenate-dentate sparsely pubescent, 5–7-nerved from base; petiole 10 cm long. Flowers in axillary or terminal racemes, about 1.6 cm long, white, pedicellate. Epicalyx short, caducous. Calyx campanulate, 1.5 cm long, 5-lobed, pubescent; lobes linear-lanceolate or ovate, ciliate, obtuse. Corolla lobes obovate, 1.6 cm long, adnate to the base of staminal tube. Stamens numerous. Ovary ovoid, pubescent, 5-locular; style slender. Capsule oblong, *c.* 1.2 cm across, beaked, crispately hairy. Seeds black.

Fl. & Fr.: Aug.–Nov.

Habitat: Common as undergrowth in the forest outskirts, forest pathways.

Specimen examined: Eruwada, Tekupally, *Y. Mahesh* 010633, 011679 (BSID).

3. Hibiscus micranthus L.f., Suppl. Pl. 308. 1782; Masters in Hook. f., Fl. Brit. India 1: 335. 1874; Gamble, Fl. Madras 1: 97. 1915; R.S. Rao & al., Fl. W. Godavari Dist. 89. 1986. Pull. & al., Fl. Andhra Pradesh 1: 194. 2018. *'Nithyamalli'*

An erect, suffrutescent herb, up to 1.2 m high; branches slender, scabrid, with densely stellate hairy when young. Leaves alternate, entire, ovate-suborbicular, 2–4 cm long, aften shallowly 3-lobed, acute or rounded at base, acute at apex, margins irregularly dentate or serrulate, sparsely scabrid with bristles on both surfaces, 5-nerved from base; petiole very short. Flowers in axillary, solitary or in pairs, about 1 cm across, white, pedicellate. Epicalyx segments 8, linear or filiform, hirsute. Calyx divided up to the middle, 0.8 cm long, stellate outside, lobes 5, acute. Corolla lobes ovate, 1 cm across, reflexed, pubescent. Capsule spherical, dehisces in 5-volves. Seeds reniform, covered with silky hairs.

Fl. & Fr.: Aug.–Dec.

Habitat: A common weed along roadsides and open places.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: Flowers open only in direct sunlight.

4. Hibiscus surattensis L., Sp. Pl. 2: 696. 1753; Masters in Hook. f., Fl. Brit. India 1: 334. 1874; Gamble, Fl. Madras 1: 97. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 217. 1999; Pull. & al., Fl. Andhra Pradesh 1: 197. 2018. *'Mulla gogu'*

An erect, prickly undershrub, up to 3 m high; branches sparsely covered with hairs. Leaves palmately 3-5 lobed; lobes linear-lanceolate, 3–7 cm long, cordate at base, acute at apex, margins serrate, 3–5 nerved from base, glabrous above, prickly below; stipules foliaceous, semi-sagittate, auricled at base; petiole 5 cm long. Flowers in axillary and terminal, solitary, yellow with purple centre. Epicalyx segments 10, spathulate, filiform, hairy. Calyx deeply 5-lobed; lobes ovate, acuminate, hairy with recurved prickles, persistent. Corolla lobes obovate, 4 cm long, rounded at top, stellate hairy. Staminal column glandular hairy. Ovary conical; style short, hairy. Capsule ovoid, with yellow bristle hairs, beaked. Seeds reniform, black.

Fl. & Fr.: Aug.–Nov.

Habitat: Occasional along streams, hilly areas, forest pathways.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

5. Hibiscus vitifolius L., Sp. Pl. 2: 696. 1753; Masters in Hook. f., Fl. Brit. India 1: 338. 1874; Gamble, Fl. Madras 1: 98. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 217. 1999. *Fioria vitifolia* (L.) Mattei, Boll. Orto Bot. Palermo n.s. 2: 71. 1917; Pull. & al., Fl. Andhra Pradesh 1: 188. 2018. *'Karupatti'*

An erect, unarmed, undershrubs, up to 1.2 m high; branches tomentose, slightly viscid, with few stellate hairs. Leaves alternate, broadly ovate, 5–10 cm long, deeply 3–5-lobed, with large gland on the midrib below, cordate at base, acute-acuminate at apex, margins crenate-serrate or dentate, hairy, 5–8-nerved from base; petiole c. 12 cm long. Flowers in axillary, solitary, drooping, crowded at ends of branches, up to 6 cm across, yellow with maroon centre, pedicellate. Epicalyx lobes 9, linear. Calyx lobes 5, ovate, 1.6 cm long, acute, pubescent. Corolla lobes obovate, 5 cm across. Capsule broader than long, *c.* 1.5 cm long, 5-winged, beaked, enclosed by calyx. Seeds 5 in each locule, tuberculate, glabrous.

Fl. & Fr.: Apr.–Oct.

Habitat: Common in outskirts, as a weed in open wastelands, roadsides.

Specimen examined: Kintukuru, *Y. Mahesh* 011407 (BSID).

Field notes: This species is attractive with its large, showy yellow flowers, worth to introduce in gardens.

11. KYDIA Roxb.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Kydia calycina Roxb., Pl. Coromandel. 3: 11, t. 215. 1819**;** Masters in Hook. f., Fl. Brit. India 1: 348. 1874; Gamble, Fl. Madras 1: 93. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 218. 1999; Pull. & al., Fl. Andhra Pradesh 1: 199. 2018. **(Plate 48H)** *'Potrichettu'*

Moderate sized, deciduous tree, up to 15 m high; bark greyish-brown, thick, with vertical fissures; branchlets stellately pubescent. Leaves alternate, broadly ovate-suborbicular or cordate with angular lobes, 8–15 cm long, coriaceous, cordate at base, acute or obtuse at apex, margins crenate-dentate, stellate pubescent above, velvety or hoary tomentose below, palmately 5-nerved from base; petiole up to 5 cm long. Flowers in axillary or terminal panicles, polygamous, 1.4—2 cm long, white. Calyx lobes 5, ovate, incurved over the fruit. Corolla lobes 5, imbricate, spathulate, 1.5 cm long, emarginate, clawed, fimbriate along margins. Stamens numerous; staminal column glandular, hairy. Ovary trilocular; style 5 mm. Capsule globose, *c.* 6 mm in diam., 3-celled, stellate tomentose, enclosed in accrescent calyx. Seeds reniform, brown.

Fl. & Fr.: Dec.–Mar.

Habitat: Occasional in deciduous forest.

Specimen examined: Maredumilli, Sirivaka, *Y. Mahesh* 011533, 011604 (BSID).

12. MALVASTRUM A.Gray

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Malvastrum coromandelianum (L.) Garcke, Bonplandia 5: 295. 1857; Gamble, Fl. Madras 1: 54. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 218. 1999; Pull. & al., Fl. Andhra Pradesh 1: 200. 2018. *Malva coromandeliana* L., Sp. Pl. 2: 687. 1753.

Much branched undershrub, up to 90 cm high; branches with adpressed hairs. Leaves alternate, ovate-lanceolate, 3–5 cm long, obtuse at base, acute at apex, margins serrate or dentate, hairy, 5-nerved from base, petiole short, up to 6 mm long. Flowers in axillary or terminal, solitary or in clusters, 1 cm across, pale yellow. Epicalyx lobes linear-lanceolate, hairy, persistent in fruit. Calyx lobes deltoid, hairy. Corolla lobes obliquely obovate. Staminal column conical. Ovary up to 15 locular. Schizocarp globose; mericarps reniform, curved, dorsal bristles 3-awned. Seeds reniform, black.

Fl. & Fr.: Throughout the year.

Habitat: Common in open wastelands, as weed in cultivated fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

13. MELOCHIA L.

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Melochia corchorifolia L., Sp. Pl. 2: 675. 1753; Masters in Hook. f., Fl. Brit. India 1: 374. 1874; Gamble, Fl. Madras 1: 110. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 228. 1999; Pull. & al., Fl. Andhra Pradesh 1: 229. 2018. *'Sitnakura'*

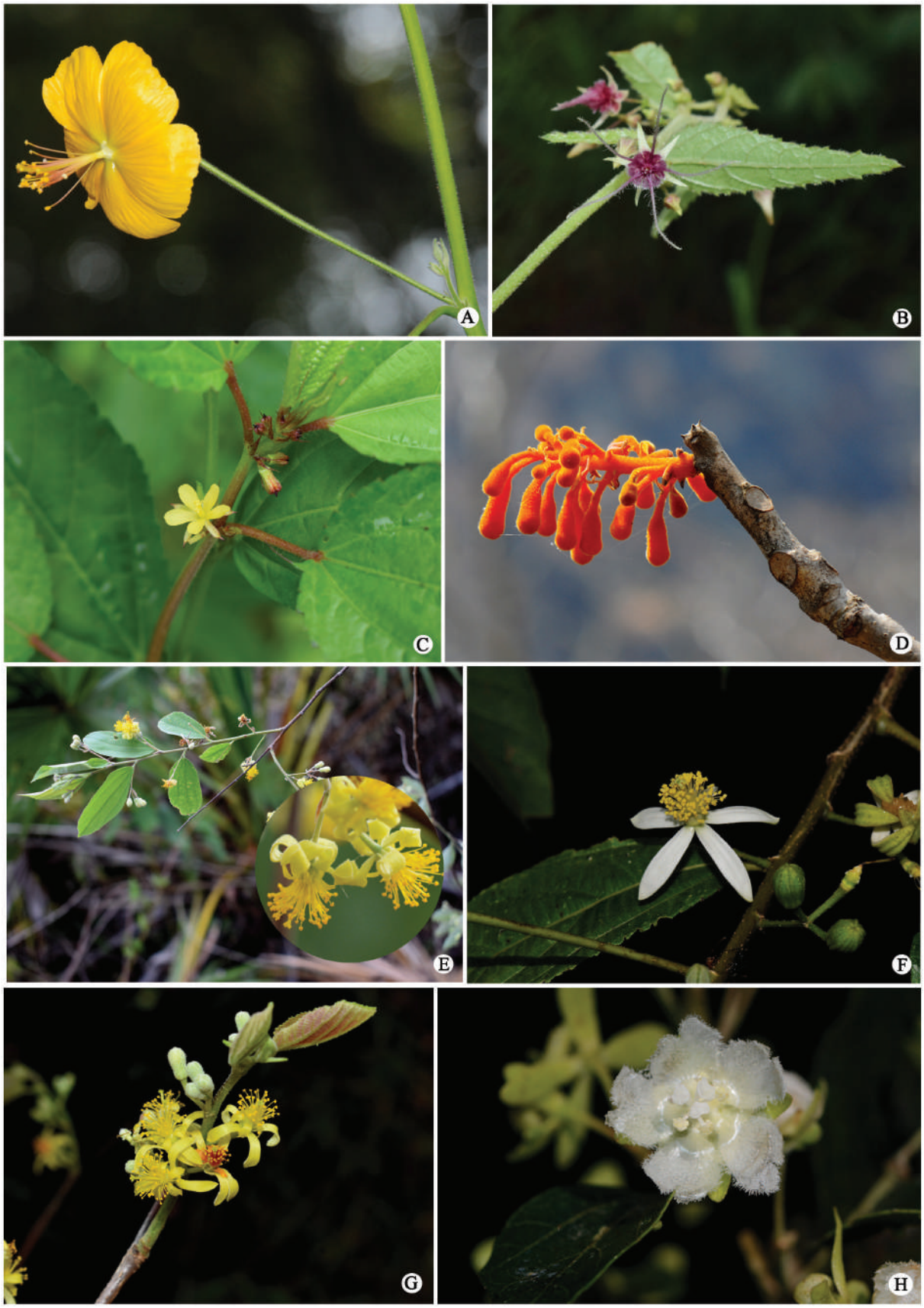


Plate 48: A. *Abutilon persicum* (Burm.f.) Merr.; **B.** *Byttneria herbacea* Roxb.; **C.** *Corchorus olitorius* L.; **D.** *Firmiana colorata* (Roxb.) R.Br.; **E.** *Grewia damine* Gaertn.; **F.** *Grewia oppositifolia* Roxb. ex DC.; **G.** *Grewia tiliifolia* Vahl; **H.** *Kydia calycina* Roxb.

A stout, prostrate, much branched, undershrub; up to 80 cm high; branches stellately pubescent. Leaves alternate, variable, ovate-lanceolate or oblong, 3–5 cm long, faintly lobed truncate or subcordate at base, acute at apex, margins serrate, glabrous on both surfaces, 5-nerved from base; petiole up to 1 cm long. Flowers in axillary or terminal clusters of sessile racemes, 5 mm long, pinkish-white, bracteate. Calyx lobes 3, lanceolate, 3 mm long, ciliate along margins. Corolla lobes obovate, clawed at base. Stamens 5; filaments connate. Ovary pubescent. Capsule ovoid-subglobose, 5 mm across, brown. Seeds black.

Fl. & Fr.: Aug.–Nov.

Habitat: Common weed in cultivated fields, edges of ponds, watercourses, ditches.

Specimen examined: PK Valasa, *Y. Mahesh* 010547 (BSID).

14. PAVONIA Ruiz

India: 6 spp. & 2 var.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves shallowly lobed, viscid and hairy; carpels rounded, pubescent	**1. P. odorata**
1b.	Leaves deeply lobed, hairy; carpels 3-angled, glabrous	**2. P. zeylanica**

1. Pavonia odorata Willd., Sp. Pl., 3: 837. 1800; Masters in Hook. f., Fl. Brit. India 1: 331. 1874; Gamble, Fl. Madras 1: 93. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 219. 1999; Pull. & al., Fl. Andhra Pradesh 1: 201. 2018.

An erect, viscid pubescent herb, up to 80 cm high; stem, petioles and pedicels covered with glandular hairs. Leaves alternate, ovate-orbicular, shallowly lobed, 2.5–4.5 cm long, cordate at base, acute at apex, margins dentate, viscid, stellately hairy above, sparsely below, 3–7-nerved from base; petiole up to 8 cm long. Flowers at ends of branches, solitary or paired, 2 cm across, light pinkish-white, long pedicelled. Epicalyx segments 12, linear, free, persistent, hairy. Calyx lobes 5, ovate-lanceolate, 5 mm long. Corolla lobes obovate, 1.7 cm long. Stigma capitate. Schizocarp rounded, spreading in to 5 mericarps, pubescent; mericarps slightly winged, 5 mm long. Seeds reniform, brown, minutely papillose.

Fl. & Fr.: Throughout the year.

Habitat: Common weed in wastelands, cultivated field hedges

Specimen examined: Kakeshnur, *Y. Mahesh* 10693 (BSID).

2. Pavonia zeylonica (L.) Cav., Diss. Tertia Diss. Bot. 3: 134, t. 48. f. 2. 1787; Masters in Hook. f., Fl. Brit. India. 1: 330. 1874; Gamble, Fl. Madras 1: 93. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 219. 1999; Pull. & al., Fl. Andhra Pradesh 1: 202. 2018. *Hibiscus zeylonicus* L., Sp. Pl. 2: 697. 1753. *'Karubenda'*

Erect, woody, viscid herb, up to 1 m high; branches pubescent. Leaves alternate, orbicular-ovate, roundish, 2.5–4 cm long, deeply 3–5 lobed, lobes distantly dentate, cordate at base, acuminate at apex, margins dentate, sparsely stellately pubescent above, densely below; petiole up to 3.5 cm long. Flowers axillary, solitary, light rose. Epicalyx segments up to 10, linear, 8 mm long. Calyx lobes 5, ovate-lanceolate, 4 mm long, pubescent. Corolla lobes 5, obovate, 8 mm long, obtuse, adnate to staminal column. Stamens numerous, monodelphous. Ovary pubescent; style slender. Schizocarps globose, 3-angled, *c.* 5 mm across, mericarps narrowly winged, glabrous. Seeds brown.

Fl. & Fr.: Apr.–Dec.

Habitat: Common weed in cultivated field hedges, open places.

Specimen examined: Eruwada, Teliperu, *Y. Mahesh* 010647, 011471 (BSID).

15. PENTAPETES L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pentapetes phoenicea L., Sp. Pl. 2: 698. 1753; Masters in Hook. f., Fl. Brit. India 1: 371. 1874; Gamble, Fl. Madras 1: 113. 1915; Pull. & al., Fl. Andhra Pradesh 1: 229. 2018.

An erect, undershrub, up to 1.3 m high; branches sparsely hairy. Leaves hastate, lanceolate, 7–10 cm long, rounded or obtuse at base, tapering gradually at apex, margins crenate-serrate, glabrous on both surfaces; petiole up to 2.5 cm long. Flowers axillary, 2-flowered, red, pedunculate. Sepals connate at base, lobes lanceolate. Petals obovate. Staminal cup bearing 5-groups of 3-stamens, alternating with staminodes. Ovary pentalocular, pubescent. Capsule subglobose, *c.* 1.5 cm in diam., beaked, hairy with persistent calyx.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in open marshy, water courses, growing as ornamental.

Specimen examined: Chigurumamidi, *Y. Mahesh* 10938 (BSID).

Field notes: Flowers open at afternoon and closes at evening.

16. PTEROSPERMUM Schreb.

India: 11 spp.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves ovate-elliptic; capsule oblong, covered with brown tubercles	**1. P. acerifolious**
1b.	Leaves oblong-obovate; capsule pyriform, brown tomentose	**2. P. xylocarpum**

1. Pterospermum acerifolium (L.) Willd., Sp. Pl. 3: 729. 1800; Masters in Hook. f., Fl. Brit. India 1: 368. 1874; Pull. & al., Fl. Andhra Pradesh 1: 231. 2018. *Pentapetes acerifolia* L., Sp. Pl. 3: 698. 1753. *'Kanaka champa'*

Small trees, up to 10 m high; branches clothed with rusty pubescent. Leaves alternate, broadly ovate-elliptic, 15–25 cm long, coriaceous, cordate or peltate at base, acute at apex, margins entire, lobed or toothed, glabrous above, white tomentose below; petiole up to 8 cm long. Flowers in axillary, 2–3 flowered cymes, white, fragrant. Sepals 5, linear, connate, rusty tomentose. Petals 5, linear, 8 cm long, revolute. Staminodes club shaped; style 5 cm long. Capsule loculicidal, oblong, woody, 12 cm long, 5-angled, covered with brown tubercles. Seeds 2, ovoid, winged.

Fl. & Fr.: Mar.–Oct.

Habitat: Occasional in open forest edges, along pathways.

Specimen examined: Ijjaluru, *Y. Mahesh* 010955 (BSID).

2. Pterospermum xylocarpum (Gaertn.) Oken, Allg. Naturgesch. 3: 1198. 1841; R.S. Rao & al., Fl. E. Godavari Dist. 228. 1999; Pull. & al., Fl. Andhra Pradesh 1: 233. 2018. *Velago xylocarpa* Gaertn., Fruct. Sem. Pl. 2: 245, t. 133. F. 2. 1791. *Pterospermum heyneanum* wall. Ex Wight & Arn., Prodr. Fl. Ind. Orient. 69. 1834; Masters in Hook. f., Fl. Brit. India 1: 369. 1874; Gamble, Fl. Madras 1: 106. 1915. *'Tada, Volikaya chettu'*

Moderate sized, evergreen trees, up to 12 m high; bark dark brown; young branches rusty tomentose. Leaves alternate, variable, oblong-obovate or ovate-subcordate, 8–18 cm long, lobed when young, obliquely cordate or truncate at base, shortly acuminate at apex, margins dentate, toothed, glabrous above, grey pubescent beneath; petiole short. 5 mm long. Flowers in axillary, 2–3-flowered cymes, 5 cm across, white, fragrant, bracteate. Sepals 5, 3.5 cm long, rusty tomentose. Petals 5, obovate. Stamens 15. Ovary densely tomentose. Capsule loculicidal, woody, pyriform, 7 cm long, acutely 5-angled, rusty brown tomentose. Seeds up to 8 per locule, orbicular, winged.

Fl. & Fr.: Apr.–Dec.

Habitat: Common along forest pathways in deciduous forests.

Specimen examined: Kintukuru, Pocharam, Geediguppa, *Y. Mahesh* 10071 010145, 010151 (BSID).

17. SIDA L.

India: 17 spp., 2 subsp. & 2 var.; Andhra Pradesh: 10 spp.; PNP: 4 spp.

Key to the species

1a.	Petioles up to 4 cm long; mericarps exceeding calyx	**3. S. cordifolia**
1b.	Petioles about 0.5 cm long; mericarps as long as or shorter than calyx	2
2a.	Pedicels twice as long as petioles; leaves cordate at base, hairy	**2. S. cordata**
2b.	Pedicels as long as or slightly longer than petiole; leaves acute at base, glabrous or pubescent	3
3a.	Leaves much longer than broad, glabrous; flowers solitary	**1. S. acuta**
3b.	Leaves broad, rhomboid, pubescent; flowers mostly in clusters	**4. S. rhombifolia**

1. Sida acuta Burm.f., Fl. Ind. 147. 1768; Gamble, Fl. Madras 1: 90. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 220. 1999; Pull. & al., Fl. Andhra Pradesh 1: 203. 2018. *Sida carpinifolia* sensu Masters in Hook. f., Fl. Brit. India 1: 323. 1874, non. L.f., 1781. *'Visaboddi'*

An erect, branched herb, up to 60 cm high; branches with minute hairs. Leaves alternate, much longer than broad, elliptic-lanceolate or ovate, 4–6 cm long, acute or obtuse at base, acute or acuminate at apex, margins serrate or dentate, glabrous above, sparsely hairy on midrib below, 3–5-nerved from base; petiole up to 6 mm long. Stipules linear-lanceolate, 3-nerved. Flowers axillary, solitary, 5 mm long, yellow, pedicellate. Calyx lobes 5, triangular, ovate, acute, 7 mm long. Corolla 5, obovate, 5 mm long, adnate to the staminal column at base. Stamens numerous. Ovary lobed, hairy; style short. Fruit schizocarp awned with 5 mericarps, mericarps 5 mm long, reticulate. Seeds trigonous, depressed.

Fl. & Fr.: Throughout the year.

Habitat: Common weed along roadsides, waste places, outskirts.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Sida cordata (Burm.f.) Borss.Waalk. Blumea 14: 182. 1966; R.S. Rao & al., Fl. E. Godavari Dist. 220. 1999; Pull. & al., Fl. Andhra Pradesh 1: 206. 2018. *Melochia cordata* Burm.f., Fl. Ind. 143. 1768. *Sida veronicifolia* Lam., Encycl. 1: 5. 1783; Gamble, Fl. Madras 1: 89. 1915. *Sida humillis* Cav., Diss. 5. 277. 1788; Masters in Hook. f., Fl. Brit. India 1: 322. 1874. **(Plate 49A)** *'Gayapuaaku'*

An erect, much branched herb, up to 70 cm high; branches sparsely ciliate or stellately pubescent, with long scattered hairs. Leaves alternate, ovate-cordate, 4.5 cm long, cordate at base, acuminate at apex, margins crenate-dentate, pubescent above, stellately pubescent below, up to 8 nerved from base; petiole up to 1.8 cm long. Stipules linear, small. Flowers axillary, solitary or clustered in sub panicles, 6 mm long, light yellow, pedicellate; pedicels twice as long as petiole. Calyx 4 mm long, lobes ovate-triangular, ciliate. Corolla lobes 5, obovate, 5 mm long, adnate to the column. Stamens numerous. Ovary 5-lobed; style short. Fruit schizocarp, globose; mericarps 5, 4 mm long, awned. Seeds rounded or angled on one side.

Fl. & Fr.: Aug.–Dec.

Habitat: Common weed in open waste places, roadsides in the forest.

Specimen examined: Gulletiwada, *Y. Mahesh* 010598 (BSID).

3. Sida cordifolia L., Sp. Pl. 2: 684. 1753; Masters in Hook.f., Fl. Brit. India 1: 324. 1874; Gamble, Fl. Madras 1: 89. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 220. 1999; Pull. & al., Fl. Andhra Pradesh 1: 206. 2018. **(Plate 49B)** *'Cheribenda'*

An erect, much branched herb, up to 90 cm high; branches brown tomentose, long ciliate. Leaves alternate, broadly ovate-orbicular, 2–6 cm long, cordate or rounded at base, acute at apex, margins crenate-serrate, sparsely pubescent above, densely velvety tomentose beneath, 7-nerved from base; stipules linear, setaceous; petiole up to 4 cm long. Flowers axillary, solitary or in clusters, 1 cm across, pale yellow, pedicellate. Calyx lobes 5, triangular, 8 mm long, acute, densely pubescent without. Corolla lobes 5, obovate, adnate to the staminal column, hairy along margins. Stamens numerous. Ovary short, pubescent; style 5 mm long. Schizocarp globose, 7 mm across, exceeds the calyx; mericarps reticulate, prominently 2-aristate, retrorsely scabrid hairy. Seeds depressed, blackish-brown, smooth.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weed in open waste lands, along roadsides.

Specimen examined: Seemagandi, Kondamodalu, *Y. Mahesh* 011421, 011451 (BSID).

4. Sida rhombifolia L., Sp. Pl. 2: 684. 1753; Masters in Hook.f., Fl. Brit. India 1: 323. 1874; Gamble, Fl. Madras 1: 90. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 221. 1999; Pull. & al., Fl. Andhra Pradesh 1: 208. 2018. *Sida rhomboidea* Roxb. ex Fleming, Asiat. Res. 6: 178. 1810; Gamble, Fl. Madras 1: 90. 1915. **(Plate 49C)** *'Gubbatada'*

An erect, suffruticose, woody herb, up to 60 cm high; branches spreading, minutely stellate pubescent. Leaves alternate, variable, broad, rhomboid-ovate or obovate 2.5–5 cm long, obcuneate at base, acute at apex, margins serrate, dentate, sparsely pubescent above, densely tomentose, glaucus below; petiole up to 1 cm long. Stipules linear, 8 mm long. Flowers axillary, in clusters of rarely solitary, 8 mm across, yellow, crowded towards end, pedicellate. Calyx appressed hairy, 7 mm long, lobes 5, ovate-triangular, acuminate. Corolla lobes 5, obovate, 1 cm long, twisted, adnate to the staminal column. Stamens numerous. Ovary lobed; style short. Schizocarp globose, 5 mm across, rugulose; mericarps 8, 2-awned. Seeds smooth, black.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weed in waste places, moist localities.

Specimen examined: Valamuru, *Y. Mahesh* 010505 (BSID).

18. STERCULIA L.

India: 16 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Bark not papery; calyx pink, glabrous within; follicles rusty villous	**2. S. villosa**
1b.	Bark papery, smooth; calyx olive green, pubescent within; follicles with stinging hairs	**1. S. urens**

1. Sterculia urens Roxb., Pl. Coromandel 1: 25, t. 24. 1795; Masters in Hook. f., Fl. Brit. India 1: 355. 1874; Gamble, Fl. Madras 1: 106. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 229. 1999. *Kavalama urens* (Roxb.) Raf., Sylv. Tellur. 72. 1838; Pull. & al., Fl. Andhra Pradesh 1: 225. 2018. **(Plate 49D)** *'Kovela chettu'*

Medium sized tree, up to 15 m high; bark papery, reddish, smooth, peeling off in flakes; trunk yellowish after peeling; young parts tomentose. Leaves alternate, crowded at the ends of branchlets, orbicular, 40 cm across, palmately 3–5 lobed, cordate at base, acuminate at apex, margins entire, sparsely stellately pubescent above, densely grey-tomentose beneath, 6-nerved from base; petiole up to 35 cm long. Flowers small, in terminal panicles, pale green within with bright red centre, yellow, glandular pubescent, scented. Calyx campanulate, 6 mm long, 5-lobed at top, olive green, glandular pubescent within. Petals absent. Stamens 10; carpels 5. Ovaries densely hairy; style short. Fruit aggregate of 4–6-follicles, *c.* 4.5 cm long, ovoid-oblong, covered with rusty brown tomentose, stinging hairs, red when ripe. Seeds oblong, blackish.

Fl. & Fr.: Jan.–May.

Habitat: Common in deciduous forest and rocky hill slopes.

Specimen examined: Kintukuru, *Y. Mahesh* 010069 (BSID).

Field notes: This species is distinguished by its pale pinkish, thin papery, shining smooth bark and its very conspicuous in deciduous forest, especially in summer when all the other trees without leaves.

2. Sterculia villosa Roxb. ex Sm. in Rees, Cycl. 34: no. 16. 1816; Masters in Hook. f., Fl. Brit. India 1: 355. 1874; Gamble, Fl. Madras 1: 106. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 230. 1999; Pull. & al., Fl. Andhra Pradesh 1: 234. 2018. **(Plate 49E)** *'Chamanthichettu'*

Moderate sized, deciduous tree, up to 18 m high; bark pale brown, smooth with small corky warts; branches lax with scars. Leaves alternate, crowded at the end of branchlets, suborbicular, 15–40 cm long, palmately 5–7 lobed, lobes ovate-oblong, coriaceous, cordate at base, acuminate at apex, margins entire, glabrous or sparsely stellate hairy above, villous below, 5-7 ribbed from base; petiole up to 35 cm long. Flowers small, in drooping panicles, unisexual, bright orange, bunches at the ends of branchlets after leaf falling. Calyx campanulate, lobed below the middle, pale pink, glabrous within, hairy outside. Petals absent. Stamens 10. Ovaries 5, globose; style recurved. Fruit an aggregate of 2-5 follicles; follicles oblong, *c.* 5 cm long, reddish brown, rusty villous. Seeds smooth, black.

Fl. & Fr.: Mar.–Jul.

Habitat: Occasional in open rocky hills of dry deciduous forests.

Specimen examined: PK Valasa, *Y. Mahesh* 010040 (BSID).

Uses: Fibre is obtained from this species used for making ropes.

19. THESPESIA Sol. ex Correa

India: 4 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Thespesia populnea (L.) Sol. ex Correa, Ann. Mus. Paris 9: 290. t. 8. 1807; Masters in Hook. f., Fl. Brit. India 1: 345. 1874. *p.p.*; Gamble, Fl. Madras 1: 101. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 223. 1999; Pull. & al., Fl. Andhra Pradesh 1: 210. 2018. *Hibiscus populnea* L., Sp. Pl. 694. 1753. *'Ganga ravichettu'*

Medium sized, evergreen tree, up to 10 m high; bark dark brown, deeply cracked; branches clothed with brown-silvery peltate scales. Leaves opposite, ovate-orbicular, 8–20 cm long, coriaceous, cordate at base, acute-acuminate at apex, margins entire, glabrous above, stellate tomentose below, 5–7-nerved from base; petiole up to 8 cm long. Flowers large, axillary, solitary or few flowered cymes, light yellow with dark purple centre, purplish pink when withering. Calyx copular, accrescent in fruit, coriaceous. Corolla campanulate, lobes 5, obovate, twisted. Staminal tube included. Ovary globose. Capsule globose, 2.5 cm across, faintly 5-angled, mucronate, black when ripe. Seeds numerous, obovoid.

Fl. & Fr.: Throughout the year.

Habitat: Occasionally cultivated along roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

20. TRIUMFETTA Plum. ex L.

India: 9 spp.; Andhra Pradesh: 5 spp.; PNP: 4 spp.

Key to the species

1a.	Leaves lobed	2
1b.	Leaves not lobed	3
2a.	Bristles on capsule glabrous throughout	**3. T. rhomboidea**
2b.	Bristles on capsule hispid below	**2. T. pentandra**
3a.	Leaves ovate, young branches densely hispid woolly	**1. T. bogotensis**
3b.	Leaves suborbicular or rhomboid; young branches stellate tomentose	**4. T. rotundifolia**

1. Triumfetta bogotensis DC., Prodr. 1: 506. 1824; Pull. & al., Fl. Andhra Pradesh 1: 258. 2018. *Triumfetta pilosa* Roth, Nov. Pl. Sp. 223. 1821; Masters in Hook. f., Fl. Brit. India 1: 394. 1874; Gamble, Fl. Madras 1:120. 1915. *'Tigabenda'*

Undershrubs, up to 1.5 m high; young branches densely hispid woolly. Lower leaves trilobed, upper ones ovate, 6–10 cm long, coriaceous, subcordate at base, acuminate apex, margins toothed. stellate tomentose above, woolly below, 3–5-nerved from base; petiole up to 4 cm long. Flowers in umbellate cymes or leaf opposed, yellow, pedunculate. Sepals 5, lorate. Petals 5, oblanceolate. Stamens 10. Ovary globose, tetra-loculed; style subulate. Capsule globose, 9 mm across, 4-celled, covered with hooked spines. Seeds up to 8, ovoid, black.

Fl. & Fr.: Throughout the year.

Habitat: Common in moist shady areas, along pathways.

Specimen examined: Valamuru, *Y. Mahesh* 010913 (BSID).

2. Triumfetta pentandra A. Rich in Guillemin & al., Fl. Seneg. Tent. 93. t. 19. 1831; Gamble, Fl. Madras 1: 120. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 232. 1999; Pull & al., Fl. Andhra Pradesh 1: 260. 2018. *Triumfetta neglecta* Wight & Arn., Prodr. Fl. Ind. Orient. 75. 1834; Masters in Hook. f., Fl. Brit. India 1: 396. 1874.

Annual, erect herbs, up to 1.5 m high; branches glabrescent. Leaves alternate, variable in shape, lower leaves trilobed, upper ones elliptic, 3–6 cm long, cuneate at base, acuminate at apex, margins serrate, strigose above, stellate tomentose beneath; petioles up to 5 cm long. Flowers in extra axillary, clusters, bright yellow. Sepals 5, lorate, stellate pubescent. Petals 5, spathulate, glabrous. Stamens 5. Ovary ovoid, hairy. Capsule ovoid, 6 mm across, glochidiate, bristles hispid below. Seeds 2, broadly ovate.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional along roadsides, open waste places.

Specimen examined: Ijjaluru, *Y. Mahesh* 012127 (BSID).

3. Triumfetta rhomboidea Jacq., Enum. Syst. Pl. 22. 1760; Masters in Hook. f., Fl. Brit. India 1: 395. 1874; Gamble, Fl. Madras 1: 120. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 233. 1999; Pull & al., Fl. Andhra Pradesh 1: 260. 2018. *'Chirusithrica'*

Suffruticose, undershrubs, up to 85 cm high; branches stellate pubescent when young. Leaves variable, lower ones trilobed, orbicular, 5–8 cm long, upper ones entire, elliptic-ovate, acute or cuneate at base, acute at apex, margins irregularly serrate, sparsely stellate pubescent; petiole up to 5 cm long. Flowers in axillary and terminal cymose clusters, 1 cm across, yellow. Sepals 5, oblong, 4 mm long, speculate hooded, ciliate. Petals 5, obovate-oblong, ciliate at base. Stamens 10. Ovary conical, 5-loculed; style glabrous. Capsule globose, 7 mm across, bristly; bristles glabrous, hooked. Seeds brown.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weed in cultivated fields, open waste places, forest outskirts.

Specimen examined: Valamuru, *Y. Mahesh* 010506 (BSID).

4. Triumfetta rotundifolia Lam., Encycl. 3: 421. 1792; Masters in Hook. f., Fl. Brit. India 1: 395. 1874; Gamble, Fl. Madras 1: 120. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 234. 1999; Pull & al., Fl. Andhra Pradesh 1: 261. 2018. *'Bankitutthiri'*

A stout undershrub, up to 1 m high; young branches stellate tomentose. Leaves alternate, suborbicular-rhomboid, scarcely 3–5-lobed, 3 cm long, cuneate at base, obtuse apex, margins irregularly crenate-serrate, scabrid above, woolly below; petiole 2.5 cm long. Flowers in axillary or leaf opposed cymes, 6 mm long, yellow. Sepals 5, obovate, connate at base, lorate. Petals 5, spathulate. Stamens 10. Ovary spherical, 4-locular; stigma

4-fid. Capsule globose, stellate tomentose, with bristles.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weed along roadsides, waste places, as undergrowth in forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

21. URENA Dill. ex L.

India: 2 spp., 1 subsp. & 3 var.; Andhra Pradesh: 1 sp. & 1 subsp.; PNP: 1 sp.

1. Urena lobata L., Sp. Pl. 692. 1753; Masters in Hook. f., Fl. Brit. India 1: 327. 1874; Gamble, Fl. Madras 1: 92. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 224. 1999. subsp. **lobata** var. **lobata** Paul in B.D. Sharma & Sanjappa, Fl. India 3: 380. 1993; Pull. & al., Fl. Andhra Pradesh 1: 212. 2018. *'Nalla benda'*

An erect, branched herbs, up to 1.5 m high; branches minutely pubescent. Leaves alternate, cordate, shallowly 3–5 lobed, 8 cm long, with roundish sinuses, cordate at base, acute at apex, margins serrate, stellately pubescent, with a gland at the midrib on the lower side, 3–7 nerved from base; petiole up to 8 cm long. Flowers in axillary, fascicles of few flowers, rose coloured. Epicalyx segments 5, linear-lanceolate. Calyx lobes 5, ovate-elliptic, pubescent. Corolla lobes 5, obovate, 1.2 cm long, adnate to the staminal column. Stamens numerous. Ovary 5-lobed; style short. Schizocarp 5-lobed, glochidiate, hairy. Seeds striate, brown, hairy.

Fl. & Fr.: Jul.–Dec.

Habitat: Common weed in waste places, along roadsides

Specimen examined: GM Valasa, *Y. Mahesh* 010036 (BSID).

22. WALTHERIA L.

India: 1 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Waltheria indica L., Sp. Pl. 673. 1753; Masters in Hook. f., Fl. Brit. India 1: 374. 1874; Gamble, Fl. Madras 1: 106. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 230. 1999; Pull & al., Fl. Andhra Pradesh 1: 237. 2018.

An erect, branched herb, up to 1 m high; branchlets terete, stellate tomentose. Leaves alternate, ovate-elliptic, 5 cm long, subcordate or rounded at base, obtuse at apex, margins crenate-serrate, velvety tomentose on both surfaces; petiole up to 2.6 cm long. Stipules subulate, hairy. Flowers small, in capitate, axillary clusters, 1 cm across, yellow; involucral bracts narrowly lanceolate, ciliate. Calyx 5 mm long, lobes 5, triangular-subulate, ciliate, 3-nerved. Petals 5, obovate-spathulate, wrinkled on margins, clawed at base. Stamens 5, connate, opposite to petals. Ovary unilocular, hairy; style fimbriate at apex. Capsule obconical, 5 mm across, membranous, glabrous, enclosed in calyx. Seed 1, reinform, black.

Fl. Fr.: Aug.–Jan.

Habitat: Common weed in cultivated fields, open waste localities.

Specimen examined: Kakeshnur, *Y. Mahesh* 010694 (BSID).

71. BIXACEAE

India: 2 genera, 2 spp.; Andhra Pradesh: 2 genera, 2 spp.; PNP: 2 genera; 2 spp.

Key to the genera

1a. Leaves palmatipartite; flowers yellow; ovary and capsule glabrous; seeds wrapped in long white woolly **2. Cochlospermum**
1b. Leaves entire; petals pink; ovary and capsules covered densely by thick bristles; seeds with thick red testa **1. Bixa**

1. BIXA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Bixa orellana L., Sp. Pl. 512. 1753; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 190. 1872; Gamble, Fl. Madras 1: 51. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 206. 1999; Pull. & al., Fl. Andhra Pradesh 1: 133. 2018. *'Jabra'*

Small, evergreen tree, up to 6 m high; young branches dark scaly. Leaves alternate, ovate-cordate, 6–12 cm long, cordate at base, acuminate at apex, margins entire, glabrous on both surfaces; petiole up to 8 cm long. Flowers in terminal panicles, pale pinkish or white, many flowered, fragrant. Sepals broadly ovate, concave. Petals 5 or 7, unequal, obovate, rounded at top. Stamens numerous. Ovary covered with red bristles; style turgid above. Capsule ovoid-subglobose, 3–4 cm long, 2-volved, with soft hairs. Seeds trigonous, red.

Fl. & Fr.: Jul.–Dec.

Habitat: Planted near agency villages inside the forest, occasionally escaped to wild.

Specimen examined: PK Valasa, GM Valasa, *Y. Mahesh* 010007, 010468 (BSID).

Uses: Seeds yield red dye.

2. COCHLOSPERMUM Kunth

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cochlospermum religiosum (L.) Alston in Trimen Handb. Fl. Ceylon 6 (Suppl.) 14. 1931; R.S. Rao & al., Fl. E. Godavari Dist. 205. 1999; Pull. & al., Fl. Andhra Pradesh 1: 134. 2018. *Bombax religiosum* L., Sp. Pl. 512. 1753. *Cochlospermum gossypium* DC., Prodr. 1: 527. 1824; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 190. 1872; Gamble, Fl. Madras 1: 50. 1915. **(Plate 49F)** *'Adavi buruga', 'Kondagogu'*

Small, deciduous trees, up to 15 m high; bark grey, cracked; young branches pubescent. Leaves alternate, clustered at end of branchlets, palmately 3–5 lobed, 6–20 cm long, lobes ovate, cordate at base, acute-acuminate at apex, margins entire, wavy, glabrous above, densely tomentose beneath, 8-nerved from base; petioles up to 15 cm long. Flowers large, 10 cm across, in terminal panicles, showy, bright yellow, pedicellate. Sepals 5, oblong-orbicular, 2.8 cm long, unequal, concave, silky pubescent. Petals 5, oblong-obovate or orbicular, 5 cm long, obtuse, emarginate. Stamens numerous, connate at base. Ovary globose; style simple. Capsule pear shaped or obovoid, 10 cm long, drooping, brown. Seeds small, black with white silky woolly.

Fl. & Fr.: Feb.–Jun.

Habitat: Common in dry deciduous forests, rocky hilly areas

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: Flowers appearing after leaf fall.

Uses: Gum obtained from this plant uses in substitute of *Sterculia urens*.

72. MORINGACEAE

India: 1 genus, 2 spp.; Andhra Pradesh: 1 genus, 2 spp.; PNP: 1 genus; 1 sp.

1. MORINGA Adans.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Moringa concanensis Nimmo ex Dalzell & A. Gibson, Bombay Fl. 311. 1861; Hook. f., Fl. Brit. India 2: 45. 1876; Gamble, Fl. Madras 1: 270. 1918; R.S. Rao & al., Fl. E. Godavari Dist. 281. 1999; Pull. & al., Fl. Andhra Pradesh 1: 396. 2018. *Adavimunaga'*

Small, deciduous tree, up to 8 m high; bark with vertical furrows; young branches pubescent. Leaves bipinnate, up to 35 cm long, primary rachis articulated with a gland; petiole up to 10 cm long; leaflets elliptic-oblong or orbicular, 2.5 cm long, rounded at base, obtuse or retuse, with a small mucro at apex, margins entire, sparsely pubescent above, glabrous below; petiolule short. Flowers in axillary panicles, pubescent, 2.5 cm across, pale yellow with purple colouration, pedicellate. Sepals 5, 1.2 cm long, connate at base; lobes linear-oblong, reflexed. Petals 5, unequal, oblong-spathulate, 1.5 cm long, glabrous. Stamens 10, fertile 5, sterile 5. Ovary stipitate, oblong, pubescent; style pubescent. Capsule elongate, *c.* 30 cm long, drooping, obtusely 3-angled, torulose. Seeds globose, 3-winged, black.

Fl. & Fr.: Feb.–May.

Habitat: Occasional in plain areas, outskirts in the forest.

Specimen examined: Shivagiri, *Y. Mahesh* 010076 (BSID).

Field notes: Fruits bitter in taste, reddish green when young.

73. SALVADORACEAE

India: 2 genera, 7 spp.; Andhra Pradesh: 2 genera, 2 spp.; PNP: 1 genus; 1 sp.

1. AZIMA Lam.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Azima tetracantha Lam., Encycl. 1: 343. 1783; Hook. f., Fl. Brit. India 3: 620. 1882; Gamble, Fl. Madras 2: 800. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 456. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1059. 2018. *'Tellauppi', 'Uppikada'*

Scrambling, armed shrub, up to 4 m high; spines 4 at each node, up to 2.5 cm long, sharp, grooved; branchlets tetragonous, pubescent when young. Leaves opposite, ovate-elliptic, 2–3 cm long, coriaceous, obtuse or rounded at base, acute with mucro at apex, margin entire, shining above, glabrous on both sides; petiole very short, up to 3 mm long. Flowers unisexual, in axillary fascicles, 4 mm across, white. Calyx bell shaped, 4-toothed, bilobed, unequal, imbricate, hairy. Corolla lobes 4, oblong, 3 mm long, free. Stamens 4, free. Ovary bilocular. Berry globose, *c.* 5 mm in diam., glabrous, white, when ripe. Seeds 1 or 2.

Fl. & Fr.: Oct.–May.

Habitat: Common in outskirts, scrub jungles, foothills.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

74. CAPPARACEAE

India: 7 genera, 43 spp., 6 subspp., 1 var.; Andhra Pradesh: 4 genera, 17 taxa; PNP: 4 genera; 6 spp.

Key to the genera

1a.	Calyx lobes devided to base	2
1b.	Calyx lobes fused below	**4. Maerua**
2a.	Stamens more than 20, inserted in base of gynophore	3
2b.	Stamens up to 6, inserted on the middle of the gynophore	**1. Cadaba**
3a.	Leaves trifoliolate; fruit globose, tough	**3. Crateva**
3b.	Leaves simple; fruit globose, smooth	**2. Capparis**

1. CADABA Forssk.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Cadaba fruticosa Druce, Bot. Exch. Club Brit. Isles Rep. 3: 415. 1914; Pull. & al., Fl. Andhra Pradesh 1: 109. 2018. *Cleome fruticosa* L., Sp. Pl. 2: 671. 1753. *Cadaba indica* Lam., Encycl. 1: 554. 1785; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 172. 1872; Gamble, Fl. Madras 1: 43. 1915. **(Plate 49G)** *'Utharasi chettu'*

A rambling, glandular-pubescent shrub, up to 3 m high; branches spreading. Leaves alternate, ovate-elliptic or oblong, 2.5–4.5 cm long, cuneate at base, obtuse, mucronate at apex, margins entire, glabrous on both sides; petiole up to 7 mm long. Flowers few in terminal racemes, 1.5 cm long, greenish yellow, bracteate. Sepals 4, outer ovate, boat shaped, inner ones lanceolate, greenish. Petals 4, spathulate, narrowly clawed, spur trumpet shaped. Stamens 4. Ovary short. Berry cylindrical, irregularly torulose, 2-volved, moniliform, hirsute, red when ripe. Seeds striate, clothed with aril.

Fl. & Fr.: Apr.–Oct.

Habitat: Occasionally in waste lands, near villages.

Specimen examined: Kondamodalu, *Y. Mahesh* 011734 (BSID).

2. CAPPARIS Tourn. ex L.

India: 31 spp., 5 subsp. & 1 var.; Andhra Pradesh: 11 spp.; PNP:2 spp.

Key to the species

1a.	Flowers terminal or axillary; berry small, less than or up to 8 mm across	**1. C. sepiaria**
1b.	Flowers other than axillary; berry more than 1cm across	**2. C. zeylanica**

1. Capparis sepiaria L., Syst. Nat., (ed. 10) 2: 1071. 1759; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 177. 1872; R.S. Rao & al., Fl. W. Godavari Dist. 77. 1986. Pull. & al., Fl. Andhra Pradesh 1: 115. 2018. *'Nall uppi'*

An erect or climbing shrubs, up to 5 m high, stems zig-zag, thorny; thorns 2, curved downwards; branches puberulous. Leaves variable, obovate-oblong or elliptic-lanceolate, 2.5–4.5 cm long, coriaceous, cuneate at base, acute or emarginate, notched at apex, margins entire, recurved, sparsely pilose above, softly pilose below; petiole short, up to 6 mm long. Flowers in terminal or axillary umbels, 5 mm across, white, pedicellate. Sepals 4, outer larger, ovate, 4 mm long, inner smaller, 2.8 mm long. Petals 4, obovate-spathulate, 5 mm long, hairy at base. Stamens numerous. Gynophore 1.2 cm long. Ovary ovoid. Berry globose, *c.* 8 mm across, black when ripe. Seeds many, embedded in a sticky pulp.

Fl. & Fr.: Feb.–May.

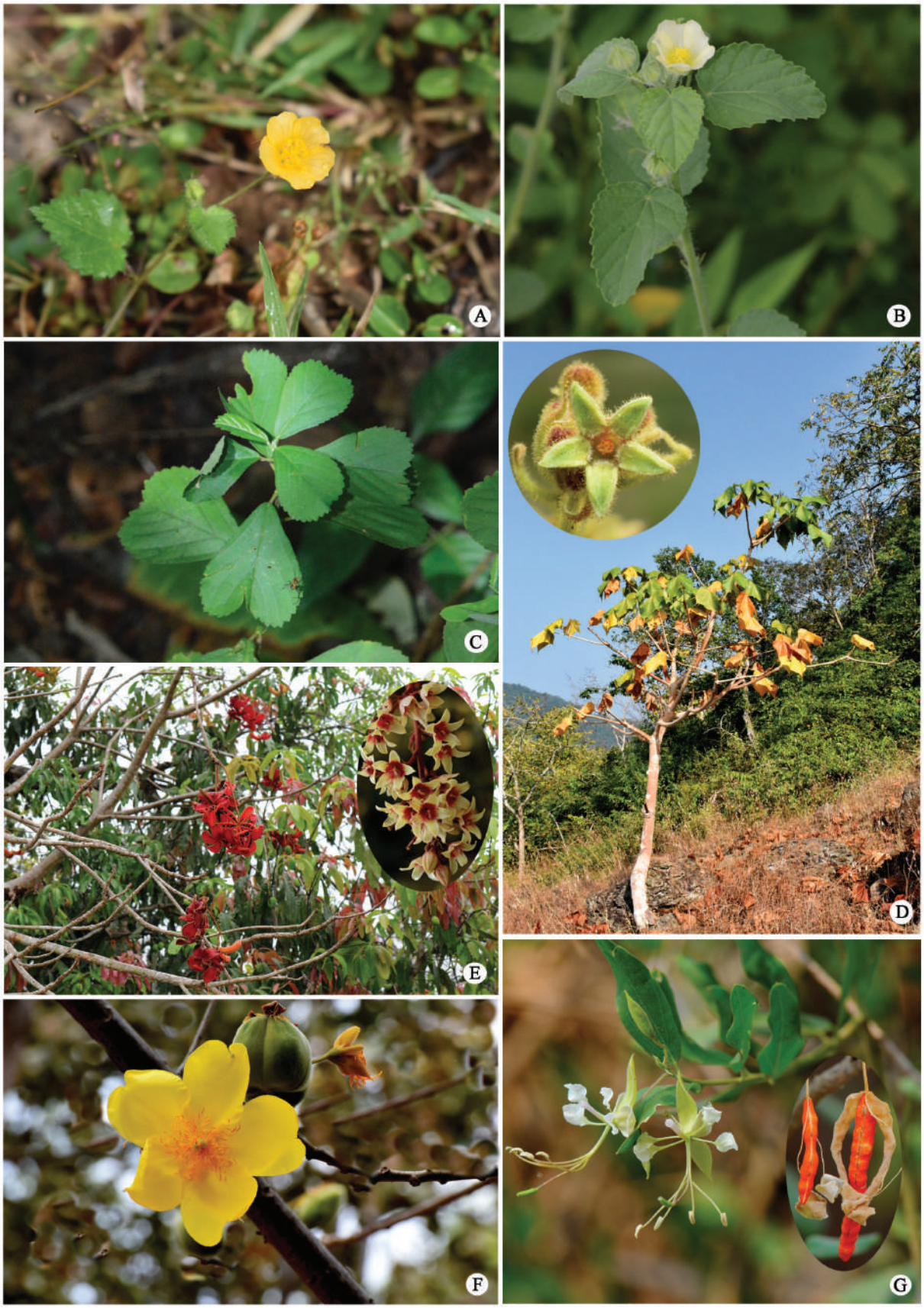


Plate 49: A. *Sida cordata* (Burm.f.) Borss.Waalk.; **B.** *Sida cordifolia* L.; **C.** *Sida rhombifolia* L.; **D.** *Sterculia urens* Roxb.; **E.** *Sterculia villosa* Roxb. ex Sm.; **F.** *Cochlospermum religiosum* (L.) Alston; **G.** *Cadaba fruticosa* (L.) Druce

Habitat: Common in scrub forests, along pathways, forest hedges.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Capparis zeylanica L., Sp. Pl., ed. 2. 1: 720. 1762; Gamble, Fl. Madras 1: 46. 1915; Pull. & al., Fl. Andhra Pradesh 1: 117. 2018. *Capparis horrida* L. f., Suppl. Pl. 264. 1781; Hook. f. & Thomson in, Hook. f., Fl. Brit. India 1: 178. 1872. *'Adavi nimma'*

Shrubby straggler, up to 7 m long; stems often zig-zag, spiny, glabrescent; spines recurved; young branches rusty, caducous tomentose. Leaves elliptic-ovate or suborbicular, 3–5 cm long, rounded or cuneate at base, obtuse or mucronate at apex, margins entire, glabrous above, tomentose beneath; petiole up to 8 mm long. Flowers in supraaxillary clusters, or solitary, 3 cm across. Sepals 4, ovate-elliptic, 7 mm long, concave, rusty tomentose without. Petals 4, elliptic-oblong or orbicular, 1.5 cm long, obtuse. Stamens numerous. Ovary elliptic. Berry ellipsoid- obovoid, *c.* 2.5 cm across, crimson red. Seeds numerous, embedded in pulp.

Fl. & Fr.: Jan.–Apr.

Habitat: Common in dry areas, outskirts in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. CRATEVA L.

India: 4 spp. & 1 subsp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a. Leaf bearing when flowering; flowers few in corymbs; fruit yellow-grey, turning to brown when ripe **2. C. magna**
1b. Mostly leafless when flowering; flowers many in corymbs; fruit orange yellow, turning to reddish when ripe **1. C. adansonii**

1. Crateva adansonii DC., Prodr. 1: 243. 1824. subsp. **odorata** (Buch.-Ham.) Jacobs, Blumea 12: 198. 1964; Pull. & al., Fl. Andhra Pradesh 1: 125. 2018. *Crateva religiosa* var. *roxburghiana* (R.Br.) Hook. f., Fl. Brit. India 1: 172. 1872. *Crateva religiosa* sensu Dunn in Gamble, Fl. Madras 1: 47. 1915 *p.p.* non Forst. f., 1782. **(Plate 50A)**

Medium sized, deciduous trees, up to 10 m high; bark greyish; branches glabrous. Leaves digitately trifoliate; leaflets ovate-elliptic, 5–8 cm long, coriaceous, oblique at base, acute-acuminate at apex, margins entire, glabrous on both sides; petiolule short. Flowers in terminal corymbose cymes, 3 cm across, greenish-white. Sepals elliptic, acuminate, petaloid. Petals 4, imbricate, clawed. Stamens 20 or more. Ovary ovoid. Berry globose, *c.* 3.5 cm long, orange yellow, reddish when ripe. Seeds elliptic, embedded in yellow pulp.

Fl. & Fr.: Feb.–Oct.

Habitat: Occasional in open waste lands, in dry deciduous forest.

Specimen examined: Maredupudi, Darapalli, Chigurumamidi, *Y. Mahesh* 010125, 010128, 011398 (BSID).

Field notes: Flowers initially greenish white, turning yellow when mature.

2. Crateva magna DC., Prodr. 1: 243. 1824; Pull. & al., Fl. Andhra Pradesh 1: 125. 2018. *Capparis magna* Lour., Fl. Cochinch. 1: 331. 1790. *Crateva religiosa* Forst. f. var. *nurvala* (Buch.-Ham) Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 172. 1872. *Crateva religiosa* sensu Dunn in Gamble, Fl. Madras 1:47. 1915. *p.p.* non. Forst. F. 1786. **(Plate 50B)** *'Ulimidi chettu'*.

Medium sized, deciduous trees, up to 7 m high; bark greyish, smooth; branches smooth. Leaves digitately trifoliate; petiole up to 10 cm long; leaflets ovate-lanceolate, 4–7.5 cm long, middle one larger than laterals, oblique at base, acuminate at apex, margins entire, glabrous above, pale below; petiolule short. Flowers in lax terminal corymbs, many flowered, yellowish white. Sepals 4, oblong-ovate. Petals 4, obovate, obtuse, clawed. Stamens numerous. Ovary ellipsoid. Berry ovoid-ellipsoid, *c.* 4.5 cm across. Seeds numerous, reniform, embedded in pulp.

Fl. & Fr.: Jan.–May.

Habitat: Occasional along streams, Godavari River bank.

Specimen examined: Valamuru, *Y. Mahesh* 011780 (BSID).

4. MAERUA Forssk.

India: 3 spp.; Andhra Pradesh: 2 spp.' PNP: 1 sp.

1. Maerua oblongifolia (Forssk.) A. Rich. in Guill. & Perr. Fl. Seneg. Tent. 1: 1: 32. t. 6. 1847; Pull. & al., 1: 128. 2018. *Capparis oblongifolia* Forssk., Fl. Aegypt.-Arab.: 99. 1775. *Maerua arenaria* (DC.) Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 172. 1872. Gamble, Fl. Madras, 1: 42. 1915. *Niebuhria arenaria* DC., Prodr. 1: 244. 1824. **(Plate 50C)**

Scandent or straggling shrubs, up to 5 m high; branches divaricate, glabrous. Leaves linear-elliptic or ovate-oblong, 3–6 cm long, chartaceous, obtuse at base, obtuse, mucronate at apex, margins entire; petioles 6 mm long. Flowers in axillary and terminal corymbs, 1.5 cm across, greyish, pedicellate. Sepals 4, petaloid, connate near base, lobes elliptic, pubescent along margins. Petals 4, ovate-lanceolate or oblong, 8 mm long. Stamens many. Ovary elongated, cylindrical. Berry elongate, *c.* 4.2 cm long, deeply constructed between seeds. Seeds globose, echinate.

Fl. & Fr.: Feb.–Dec.

Habitat: Occasional in open waste lands, along roadsides.

Specimen examined: Manturu, *Y. Mahesh* 011709 (BSID).

75. CLEOMACEAE

India: 1 genus, 18 spp., 3 var.; Andhra Pradesh: 1 genus, 8 spp., 1 var.; PNP: 1 genus; 4 spp.

1. CLEOME L.

India: 18 spp. & 3 var.; Andhra Pradesh: 8 spp. & 1 var.; PNP: 4 spp.

Key to the species

1a.	Androgynophore absent	2
1b.	Androgynophore present	**2. C. gynandra**
2a.	Leaves compound	3
2b.	Leaves simple	**3. C. monophylla**
3a.	Plants without viscous gland stalked hairs	**4. C. chelidonii**
3b.	Plants with viscous gland stalked hairs	**1. C. viscosa**

1. Cleome chelidonii L.f., Suppl. Pl. 300. 1782; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 170. 1872; Gamble, Fl. Madras 1: 41. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 203. 1999; Pull. & al., Fl. Andhra Pradesh 1: 120. 2018.

An erect, strigose, suffruticose herb, up to 80 cm high; stem slightly angular. Leaves 3–9-foliolate; petiole up to 6 cm long; leaflets obovate, 2–3 cm long, cuneate at base, obtuse at apex, margins entire, appressed glandular hairy on both surfaces; petiolule short. Flowers in axillary or terminal, corymbose racemes, pinkish. Sepals 4, elliptic or obovate, narrowly imbricate, sparsely hairy outside. Petals 4, elliptic-ovate, rounded, glabrous. Stamens numerous; filaments swollen at tips. Ovary sessile, linear. Siliqua cylindric, *c.* 6 cm long, glandular hairy. Seeds numerous, suborbicular, muricate, tuberculed.

Fl. & Fr.: Sep.–Mar.

Habitat: Occasional along river beds, in black solis in plains

Specimen examined: Devipatnam, *Y. Mahesh* 011705 (BSID).

Field notes: Its worth to introduce in gardens due to its pinkish flowers

2. Cleome gynandra L., Sp. Pl. 2: 671. 1753; R.S. Rao & al., Fl. E. Godavari Dist. 203. 1999; Pull. & al., Fl. Andhra Pradesh 1: 122. 2018. *Gynandropsis pentaphylla* (L.) DC., Prodr. 1: 238. 1824; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 171. 1872. *'Vaminta'*

Annual, erect, glandular pubescent herb, up to 1 m high; stems striate, clothed with white gland tipped hairs. Leaves 3–5-foliolate; petiole up to 5 cm long; leaflets subsessile, obovate-oblanceolate, 3 cm long, glandular hairy, cuneate at base, acuminate at apex, margins crenulate-dentate, ciliate, glabrous. Flowers in corymbose racemes, 1.5 cm across, white, pedicellate, bracteate. Sepals 4, lanceolate-obovate, 6 mm long. Petals 4, obovate-oblanceolate, 1 cm long, clawed at base. Stamens 6; filaments maroon. Ovary oblong-linear, glandular hairy, unilocular. Siliqua cylindrical, up to 7.5 cm long, glandular hairy, obliquely striate. Seeds numerous, rugose, muricate.

Fl. & Fr.: Sep.–Nov.

Habitat: Common as weed in cultivated fields, open waste lands.

Specimen examined: Gulletiwada, *Y. Mahesh* 010586 (BSID).

3. Cleome monophylla L., Sp. Pl. 2: 672. 1753; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 168. 1872; Gamble, Fl. Madras 1: 41. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 204. 1999; Pull. & al., Fl. Andhra Pradesh 1: 123. 2018.

Erect, branched, hirsute herb, up to 50 cm high; stems and branches striate, glandular hirsute. Leaves alternate, linear-lanceolate or ovate, 2.8–4 cm long, sparsely hairy, rounded-truncate at base, acute at apex, margins entire, ciliate, hirtullus above, on nerves below; petiole up to 2.8 cm long. Flowers in axillary or terminal racemes, 1.2 cm across, light pink with blue tinge, bracteate. Sepals 4, linear, 5 mm long, with gland tipped hairs. Petals 4, subequal, oblong, spathulate, 1 cm long, clawed. Stamens 6. Ovary glandular hairy, unilocular; style short. Siliqua on short gynandrophore, elongate, *c.* 7 cm long, striate, pubescent, narrowed at ends. Seeds numerous, reniform, with concentric ribs, brown.

Fl. & Fr.: Jul.–Dec.

Habitat: Common weed near cultivated fields, open moist localities.

Specimen examined: Shivagiri, *Y. Mahesh* 011621 (BSID).

4. Cleome viscosa L., Sp. Pl. 2: 672. 1753; Hook. f. & Thomson in Hook. f., Fl. Brit. India 1: 170. 1872; Gamble, Fl. Madras 1: 41. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 204. 1999. Var. *viscosa* Pull. & al., Fl. Andhra Pradesh 1: 123. 2018. *'Kukkavaminta'*

Erect, gregarious, viscid, copiously glandular pubescent herb, up to 90 cm high; stems much branched, finely ribbed. Leaves 3–5 foliolate, up to 9 cm long; petioles 2 cm long; leaflets sessile, elliptic-obovate, 3–4.5 cm long, cuneate at base, acute at apex, margins entire, ciliate, glandular hairy on both surfaces. Flowers in axillary or terminal, solitary or many leafy racemes, 1.1 cm across, yellow. Sepals 4, oblong, 5 mm long, glandular hairy. Petals 4, subequal, obovate or oblanceolate, 1 cm long, veined, clawed. Stamens *c.* 18. Ovary densely glandular, hairy, oblong; style short. Siliqua cylindric, elongate, *c.* 6 cm long, tapering into persistent style, glandular hairy, sticky pubescent. Seeds numerous, small, dark brown, transversely grooved.

Fl. & Fr.: Jun.–Dec.

Habitat: Common weed in agricultural fields, waste places.

Specimen examined: Kakeshnur, Pochavaram, *Y. Mahesh* 010692, 011572 (BSID).

Field notes: Whole plant with viscid glandular hairs, sticky to touch.

76. BRASSICACEAE

India: 74 genera, 258 spp., 4 subspp., 3 var.; Andhra Pradesh: 7 genera, 9 spp.; PNP: 1 genus; 1 sp.

1. RORIPPA Scop.

India: 9 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Rorippa indica (L.) Hiern, Cat. Afr. Pl. Welw. 1: 26. 1896; R.S. Rao & al., Fl. E. Godavari Dist. 201. 1999; Pull. & al., Fl. Andhra Pradesh 1: 107. 2018. *Sisymbrium indicum* L., Mant. 1: 1763. *Nasturtium indicum* (L.) DC., Prodr. 1: 139. 1824; Hook. f. & T. Anderson in Hook. f. Fl. Brit. India1: 134. 1872; Gamble, Fl. Madras 1: 37. 1915.

Procumbent, much branched herb, up to 30 cm high. Lower leaves pinnatipartite, obovate, 5–7 cm long, bluntly toothed, membranous, with long petioled, upper ones sessile, entire, cuneate at base, acute at apex, margins dentate, glabrous. Flowers many in terminal, long peduncled racemes. Sepals 4, 2.5 mm long. Petals 4, linear, 3.5 mm long. Stamens short. Stigma obscurely 2-lobed. Pods straight, *c.* 1.5 cm long, shortly beaked, dehiscent. Seeds numerous, variously shaped, orange red.

Fl. & Fr.: Apr.–Sep.

Habitat: Common weed in moist localities, along paddy fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

77. OLACACEAE

India: 7 genera, 17 spp.; Andhra Pradesh: 2 genera, 3 spp.; PNP: 2 genera; 2 spp.

Key to the genera

1a.	Staminodes absent; calyx enveloping the drupe only at base	**2. Ximenia**
1b.	Staminodes present; calyx enveloping the drupe to the half or more the length	**1. Olax**

1. OLAX L.

India: 6 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Olax scandens Roxb., Pl. Coromandel 2: 2, t. 102. 1799; Masters in Hook. f., Fl. Brit. India 1: 575. 1875; Gamble, Fl. Madras 1: 190. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 259. 1999. *Olax psittacorum* (Willd.) Vahl, Enum. Pl. 2: 33. 1805; Pull. & al., Fl. Andhra Pradesh 1: 336. 2018. **(Plate 50D)**

Scandent shrub, up to 4.5 m high; branches terete, thorny, pubescent. Leaves alternate, oblong-elliptic, 3–7 cm long, cuneate at base, sub-acute or abruptly acuminate at apex, margins entire, ciliate glaucous, glabrous on both sides; petiole very short. Flowers in axillary racemes, 5 mm long, white, sweet scented, shortly pedicellate, bracteate. Calyx small, cupular, accrescent in fruits, lobes 5, finely ciliate at margins. Petals 3–5, connate, lobes linear, deeply cleft. Stamens 8, fertile 3, staminodes 5, bifid. Ovary ovoid; style glabrous. Drupe, subglobose, 8 mm, basal half covered by accrescent calyx except at the tip, orange when ripen. Seed 1.

Fl. & Fr.: Apr.–Jul.

Habitat: Common in sloppy areas, scrub jungles.

Specimen examined: Buruguwada, Geediguppa, *Y Mahesh,* 010093 011587 (BSID).

2. XIMENIA Plum. ex L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Ximenia americana L., Sp. Pl. 2: 1193. 1753; Masters in Hook. f., Fl. Brit. India 1: 574. 1875; Gamble, Fl. Madras 1: 189. 1915; Pull. & al., Fl. Andhra Pradesh 1: 336. 2018. **(Plate 50E)** *'Nakkera'*

Small, armed trees, up to 3.5 m high; bark rugged, reddish brown; young branchlets glabrous, tip ending with a spine. Leaves alternate, elliptic-ovate or obovate, 3–5 cm long, coriaceous, acute at base, obtuse or emarginate at apex, margins entire, glabrous on both surfaces; petiole very short. Flowers few in axillary cymes or terminating short branches, 1 cm long, shortly pedicelled, greenish yellow. Calyx 5-lobed, 4 mm long, lobes ovate, rounded, sparsely ciliate. Petals 5, oblong, up to 1 cm long, acute, pubescent within. Stamens 8; filaments dilated with sigmoid apex. Ovary 4-angled; style columnar. Drupe, ellipsoid, *c.* 3 cm across, deep orange, pulp edible. Seed 1

Fl. & Fr.: Apr.–Jul.

Habitat: Common in outskirts, open areas in the forest.

Specimen examined: Kavadiguntla East, *Y. Mahesh* 011370 (BSID).

78. OPILIACEAE

India: 4 genera, 4 spp.; Andhra Pradesh: 2 genera, 2 spp.; PNP: 1 genus, 1 sp.

1. OPILIA Roxb.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Opilia amentacea Roxb., Pl. Coromandel 2: 31, t. 158. 1802; Masters in Hook. f., Fl. Brit. India 1: 583. 1875; Gamble, Fl. Madras 1: 192. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 26. 1999; Pull. & al., Fl. Andhra Pradesh 1: 339. 2018. **(Plate 50F)**

A large, scandent shrub, up to 7 m high; branchlets drooping, faintly striate, densely pubescent. Leaves alternate, elliptic-lanceolate, 3.5–6 cm long, coriaceous, obtuse or rounded at base, acute at apex, margins entire, glabrous; petiole short. Flowers small, in axillary clustered racemes, 1.5 cm long, greenish yellow, numerous, concealed by rhomboid, ciliate bracts; racemes before flowering resembling small cones. Calyx small, annular, obscurely 5-lobed. Petals 5, oblong, short, 1.5 mm long, obtuse, inflexed at apex. Disk glands 5, oblong, alternating with stamens. Stamens 5, antipetalous. Ovary ellipsoid. Drupe ovoid, *c.* 2.8 cm long, yellow-red when ripe. Seed 1, ovoid, black.

Fl. & Fr.: Apr.–Jul.

Habitat: Occasional in drydeciduous forest

Specimen examined: Buruguwada, *Y. Mahesh* 010092 (BSID).

79. SANTALACEAE

India: 13 genera, 35 sp.; Andhra Pradesh: 3 genera, 8 spp.; PNP: 1 genus, 2 spp.

(Including Viscaceae)

1. VISCUM L.

India: 16 spp.; Andhra Pradesh: 6 spp.; PNP: 2 spp.

Key to the species

1a. Plants leafless; internodes flattened or angular **1. V. articulatum**
1b. Plants leafy; internodes terete **2. V. orientale**

1. Viscum articulatum Burm.f., Fl. Ind. 1768; Hook. f., Fl. Brit. India 2: 226. 1886; Gamble, Fl. Madras 5: 1257. 1825; R.S. Rao & al., Fl. E. Godavari Dist. 610. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1618. 2018. *Viscum nepalense* Spreng, Syst. Curi-Post. 47. 1827. **(Plate 50G)** *'Badhanica'*

Suffruticose, semi-parasitic shrub, up to 1 m long; stems articulated, terete in main, flattened in lateral ones; branches dichotomously branched, green, drooping, devoid of leaves, jointed with flattened internodes, furrowed. Leaves reduced to minute scales. Flowers in axillary 3–4-flowered fascicles, small, 2.5 mm across, green, central usually female, lateral male, subsessile. Perianth small, 4-lobed; lobes triangular, vulvate. Stamens 4, adnate to the perianth lobes. Ovary inferior, glabrous. Berry globose, 5 mm across, smooth.

Fl. & Fr.: Sep.–Apr.

Habitat: Parasite on bushes, usually on *Morinda tinctoria*, *Mangifera indica* etc.

Specimen examined: Bhupathipalem, *Y. Mahesh* 011436 (BSID).

Field notes: Branches turning yellow when dry.

2. Viscum orientale Willd., Sp. Pl. 4: 737. 1806; Hook. f., Fl. Brit. India 5: 224. 1886; Gamble, Fl. Madras 2: 1258. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 612. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1620. 2018. **(Plate 50H)** *'Chettu Badanica'*

A large bushy, much branched, semi-parasitic shrubs; up to 60 cm long; younger branches angled, swollen at internodes, glabrous. Leaves obovate-spathulate, 4 cm long, coriaceous, base narrowed into a obscure petiole, 3-nerved from base, obtuse at apex, margins entire. Flowers in axillary, 2–5-flowered clusters, 3 mm long. Male flowers lateral. subsessile; perianth lobes 4, ovate, concave. Stamens 4. Female flowers middle, larger than male; perianth lobes 4. Ovary inferior; style short. Berry ovoid, *c.* 3 mm long, acute at both ends, minutely tuberculed.

Fl. & Fr.: Feb.–Sep.

Habitat: Common parasite on most of the tree species.

Specimen examined: Kondamodalu, *Y. Mahesh* 011446 (BSID).

80. PLUMBAGINACEAE

India: 7 genera, 16 spp.; Andhra Pradesh: 1 genus, 2 spp.; PNP: 1 genus, 2 spp.

1. PLUMBAGO Tourn. ex L.

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a. Corolla reddish; tube more than 2 cm long **1. P. indica**
1b. Corolla white, tube up to 1.5 cm long **2. P. zeylanica**

1. Plumbago indica L., Herb. Amb. 24. 1754; Pull. & Karupp., Fl. Andhra Pradesh 3: 1014. 2018. *P. rosea* L., Sp. Pl. ed. 2. 1: 215. 1762; Hook. f., Fl. Brit. India 3: 481. 1882; Gamble, Fl. Madras 2: 745. 1921. **(Plate 51A)** *'Erra chitramulam'*

Erect or spreading, much branched undershrub, up to 1.2 cm; stem and branches glabrous. Leaves alternate, ovate-oblong, 6–12 cm long, slightly drooping, tapering at base, acute or obtuse at apex, margins entire, wavy, glabrous on both sides. Flowers in axillary and terminal 10–25 cm long racemes, bright red. Calyx tubular, up to 1 cm long; lobes 5, lanceolate, covered with stalked glands. Corolla tube slender, up to 2 cm long; lobes 5, ovate-rounded, limb up to 2.5 cm in diam. Capsule oblong.

Fl. & Fr.: Nov.–Mar.

Habitat: Occasional in plains of deep forest.

Specimen examined: GM Valasa, *Y. Mahesh* 010035 (BSID).

Field notes: This species is easily distinguished by its red flowers.

Uses: Root past used as medicine for wounds.

2. Plumbago zeylanica L., Sp. Pl. 1: 151. 1753; Hook. f., Fl. Brit. India 3: 480. 1882; Gamble, Fl. Madras 2: 744. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 442. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1014. 2018. *'Chithramulam'*

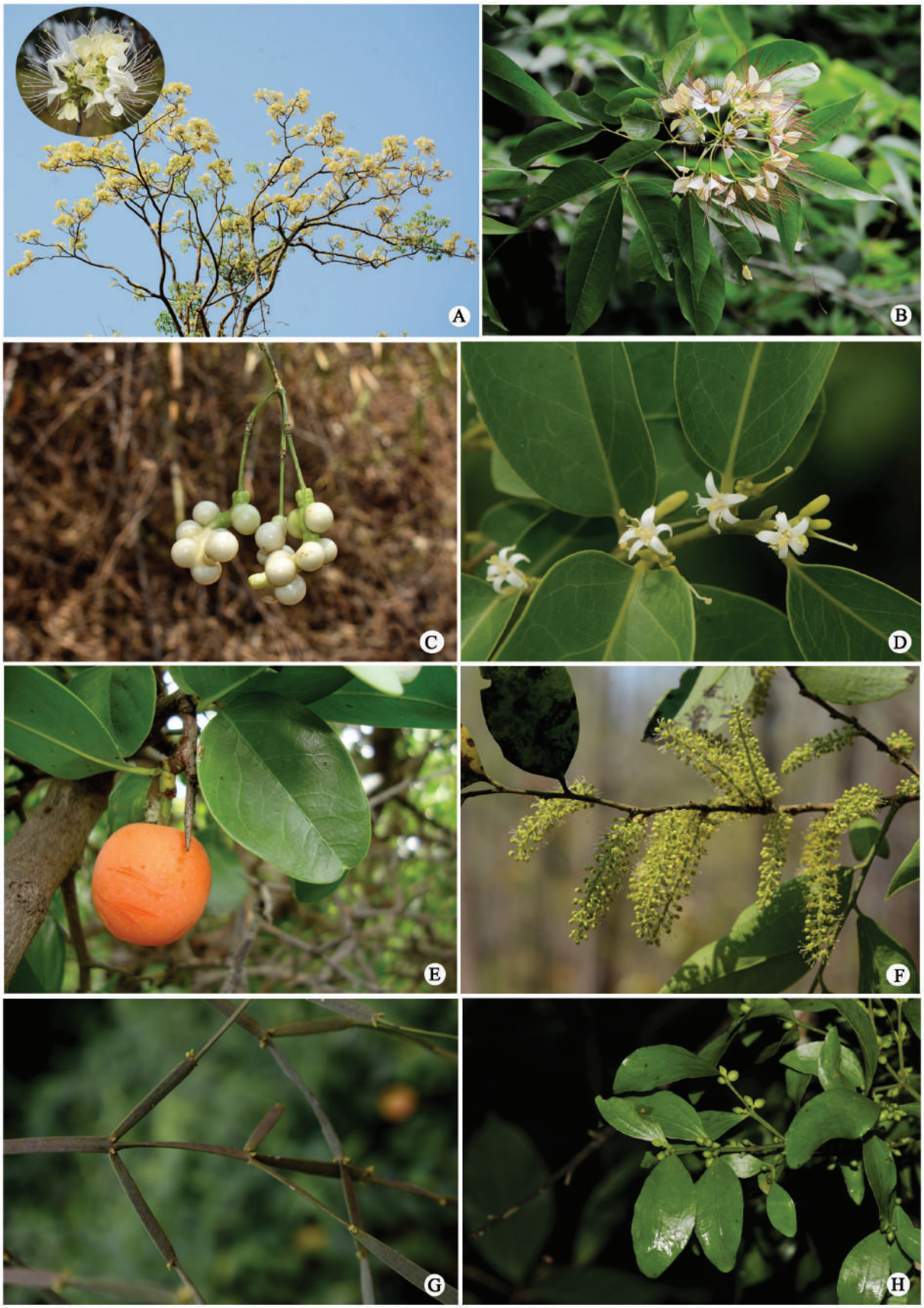


Plate 50: A. *Crateva adansonii* DC.; **B.** *Crateva magna* (Lour.) DC.; **C.** *Maerua oblongifolia* (Forssk.) A. Rich.; **D.** *Olax scandens* Roxb.; **E.** *Ximenia americana* L.; **F.** *Opilia amentacea* Roxb.; **G.** *Viscum articulatum* Burm.f.; **H.** *Viscum orientale* Willd.

Subscandent, glabrous herbs, up to 1.3 m high; branches striate, slightly zig-zag, glabrous. Leaves alternate, ovate-elliptic, 4–10 cm long, base rounded or narrowed in to a short, stalk with two basal amplexicaul, auricles, subacute at apex, margins entire. Flowers in axillary and terminal, simple or branched spikes, about 2.2 cm long, white. Calyx tubular, 1.3 cm long, covered with stalked glands, persistent in fruit. Corolla campanulate, 2.2 cm long, glabrous; lobes 5, oblong-obovate, apiculate. Stamens 5. Ovary ovoid, unilocular; style slender, filiform. Capsule oblong, 2 cm long, 5-volved. Seed 1, ovoid-oblong, brown, pointed at apex.

Fl. & Fr.: Sep.–Dec.

Habitat: Common straggler along forest hedges, open scrub forests.

Specimen examined: Sirivaka, *Y. Mahesh* 011602 (BSID).

81. POLYGONACEAE

India: 16 genera, 143 taxa; Andhra Pradesh: 5 genera, 25 spp.; PNP: 2 genera, 4 spp.

Key to the genera

1a.	Flowers in axillary fascicles; perianth 3-5 lobed; stamens 4-8; style 2 or 3; nutlets compressed (rarely trigonous)	**1. Persicaria**
1b.	Flowers in heads or in racemes; perianth 3-5 lobed; stamens 8; styles 3; nutlets trigonous	**2. Polygonum**

1. PERSICARIA Mill.

India: 36 spp. & 14 var.; Andhra Pradesh: 10 spp. & 1 var.; PNP: 3 spp.

Key to the species

1a.	Inflorescence elongate raceme or branched spikes	2
1b.	Inflorescence in globose or capitate heads	**2. P. chinensis**
2a.	Racemes short, stout, spicate; bracts shortly ciliate on margins; nutlets 3-gonous	**1. P. barbata**
2 b.	Racemes paniculate; bracts ciliate on margins; nutlets biconvex	**3. P. glabra**

1. Persicaria barbata (L.) H. Hara, Fl. E. Himalaya 70: 1966; Pull. & al., Fl. Andhra Pradesh 4: 1583. 2018. *Polygonum barbatum* L., Sp. Pl. 1: 362. 1753; Hook. f., Fl. Brit. India 5: 37. 1886; Gamble, Fl. Madras 2: 1189. 1925; R.S. Rao & al., Fl. E. Godavari Dist.597. 1999. **(Plate 51B)**

Erect herbs, up to 1.2 m high; stems striate, rooting at nodes, glabrous. Leaves sessile, alternate, lanceolate-elliptic, 8–15 cm long, cuneate at base, acuminate at apex, margins entire, glabrous, sparsely hirsute on nerves below. Stipules 1.8 cm long, strigose, outside, fimbriate at apex. Flowers in axillary and terminal spikes, 4 mm long, pinkish-white, shortly pedicellate, bracteate. Perianth hyaline, lobes 5, oblong-lanceolate, 2 mm long. Stamens 8; filaments dilated. Ovary trigonous, glabrous; styles 3, short. Nuts trigonous, 3 mm long, brown. Seeds trigonous, shiny.

Fl. & Fr.: Throughout the year.

Habitat: Common along streams, canals in cultivated fields.

Specimen examined: PK Valasa, *Y. Mahesh* 010994 (BSID).

2. Persicaria chinensis (L.) H. Gross, Bot. Jahrb. Syst. 49: 269. 1913; Pull. & al., Fl. Andhra Pradesh 4: 1584. 2018. *Polygonum chinense* L., Sp. Pl. 363. 1753; Hook. f., Fl. Brit. India 5: 44. 1886, incl. var. *ovalifolia* Meissn; Gamble, Fl. Madras 2: 1190. 1925; R.S. Rao & al., Fl. E. Godavari Dist.598. 1999.

Erect, scrambling undershrub, up to 1.3 m high; branches striate, hairy. Ochreae membranous, up to 3.5 cm long, acuminate. Leaves alternate, oblong-elliptic, 6–15 cm long, rounded at base, acuminate at apex, margins entire, glabrous above, scabrous on nerved below; petiole up to 1.8 cm long. Flowers in terminal, corymbose panicles, pale pink, pedunculate; pedicels short, articulate. Perianth up to 3 mm long, segments 4, obovate-rounded, glabrous. Ovary glabrous; styles united at base. Nutlets trigonous, 2 mm long, blackish.

Fl. & Fr.: Sep.–Mar.

Habitat: Common along stream banks, water courses in the forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Persicaria glabra (Willd.) M. Gomez, Anales Inst. Segunda Ensen. 2: 278. 1896; Pull. & al., Fl. Andhra Pradesh 4: 1585. 2018. *Polygonum glabrum* Willd., Sp. Pl. 2: 447. 1799; R.S. Rao & al., Fl. E. Godavari Dist. 598. 1999, incl. var. *glabrum*; Hook. f., Fl. Brit. India 5: 34. 1889; Gamble, Fl. Madras 2: 1189. 1925.

An erect, glabrous subshrub, up to 2 m high; nodes swollen, dark chocolate brown. Ochreae glabrous. Leaves alternate, narrowly lanceolate, 8–15 cm long, cuneate at base, acuminate at apex, margins entire, glandular

punctate. Flowers in terminal, lax spikes, pinkish. Perianth hyaline, boat shaped, 4 mm long, lobes 5. Ovary compressed; style bifid. Nutlets orbicular, *c.* 3 mm across, flattened, blackish.

Fl. & Fr.: Throughout the year.

Habitat: Common along streams, water courses in cultivated fields.

Specimen examined: Sirivaka, *Y. Mahesh* 011608 (BSID).

2. POLYGONUM L.

India: 11 spp. & 3 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Polygonum plebeium R.Br., Prodr. Fl. Nov. Holl. 420.1810; R.S. Rao & al., Fl. E. Godavari Dist. 599. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1588. 2018; Hook. f., Fl. Brit. India 5: 27. 1886 (incl. var. *indica*); Gamble, Fl. Madras 2: 1188. 1925. *Polygonum indicum* Heyne ex Roth, Nov. Pl. Sp. 208. 1821. *'Chantisaga chettu'*

Prostrate or diffusely branched herb with stout woody root stock, up to 80 cm long; stems angled, grooved, faintly hirtullus; branches many, spreading, glabrous. Leaves sessile, linear-oblong or obovate, 1–1.5 cm long, attenuate at base, obtuse or subacute at apex, margins entire, glabrous. Stipules scarious, 8 mm long, fimbriate at apex. Flowers in axillary, grouped in to 2–3, minute, 4 mm long, pink or white. Perianth lobes 5, lanceolate, acuminate, hooded at apex. Stamens 8; filaments dilated. Ovary trigonous, glabrous; styles 3. Nutlets trigonous, 2 mm across, black with persistent style.

Fl. & Fr.: Jan.–Aug.

Habitat: Common weed in canals of cultivated fields, wastelands, dry tank beds.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011377 (BSID).

82. DROSERACEAE

India: 2 genera, 4 spp.; Andhra Pradesh: 1 genus, 2 spp.; PNP: 1 genus, 1 sp.

1. DROSERA L.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Drosera indica L., Sp. Pl. 1: 282. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 424. 1878; Gamble, Fl. Madras 1: 452. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 354. 1999; Pull. & K. Sri Rama Murthy, Fl. Andhra Pradesh 2: 708. 2018. **(Plate 51C)**

Small decurrent herb, up to 7 cm long, sparingly branched; stem and branches glandular pubescent. Leaves linear, 3 cm long, glandular pubescent, with numerous gland tipped tentacles. Flowers leaf opposed, racemes or helicoid cymes, with glandular pubescent, light rose. Sepals 5, connate; lobes oblong-lanceolate. Petals 5, oblong-spathulate. Stamens 5, glabrous. Ovary ovoid, unilocular, glabrous; style 5, glabrous. Capsule 3-volved.

Fl. & Fr.: Oct.–Jan.

Habitat: Commonly associated with grasses on hills, rocky boulders.

Specimen examined: Kambam Konda, *Y. Mahesh* 011553 (BSID).

83. CARYOPHYLLACEAE

India: 30 genera, 147 spp., 2 subspp., 12 var.; Andhra Pradesh: 3 genera, 4 spp., 1 var.); PNP: 1 genus, 1 sp.

1. POLYCARPAEA Lam.

India: 6 spp. & 2 var.; Andhra Pradesh: 2 spp. & 1 var.; PNP: 1 sp.

1. Polycarpaea corymbosa (L.) Lam., Tabl. Encycl. 2: 129. 1797; Edgew. & Hook. f. in Hook. f., Fl. Brit. India 1: 245. 1874; Gamble, Fl. Madras 1: 65. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 207. 1999; Pull. & al., Fl. Andhra Pradesh 1: 157. 2018. *Achyranthes corymbosa* L. in Sp. Pl.: 205. 1753. *'Rajuma'*

An erect, much branched herb, up to 30 cm high; root stock woody; branches slender, hoary tomentose. Leaves many, in whorls at nodes, sessile, linear-lanceolate, 1.6 cm long, cuneate at base, mucronate at apex, margins entire, glabrous. Stipules ovate- caudate. Flowers in terminal, dense cymose panicles, 3 mm long, pedicellate, silvery white or brown. Sepals 5, ovate, 3 mm long, scarious, longer than fruit. Petals 5, shorter

than sepals, oblong, scarious, light brown. Stamens 5. Ovary globose; style short. Capsule ovoid, *c.* 1.5 mm long, reddish-brown, shining. Seeds few, obovoid.

Fl. & Fr.: Jun.–Nov.

Habitat: Common weed in cultivated fields, roadsides, open rocky places.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

84. AMARANTHACEAE

India: 18 genera, 61 taxa; Andhra Pradesh: 15 genera, 39 spp., 5 var.; PNP: 9 genera, 12 spp.

Key to the genera

1a.	Bracteole winged, wings adnate to midrib; staminodes fimbriate	**1. Achyranthes**
1b.	Bracteole not winged; staminodes not fimbriate	2
2a.	Ovary with 2 or more ovules; style persistent	**5. Celosia**
2b.	Ovary with single ovule; style not persistent	3
3a.	Stems rooting at nodes; flowers spinous	**3. Alternanthera**
3b.	Stems not rooting at nodes; flowers not spinescent	4
4a.	Spikes tomentose	5
4b.	Spikes not tomentose	6
5a.	Perianth lobes 4	**9. Trichuriella**
5b.	Perianth lobes 5	**7. Ouret**
6a.	Flowers bisexual	7
6b.	Flowers unisexual	**4. Amaranthus**
7a.	Leaves alternate	**2. Allmania**
7b.	Leaves opposite	8
8a.	Pseudostaminodes present	**6. Cyathula**
8b.	Pseudostaminodes absent	**8. Pupalia**

1. ACHYRANTHES L.

India: 4 spp. & 3 var.; Andhra Pradesh: 2 spp. & 3 var.; PNP: 1 sp.

1. Achyranthes aspera var. **porphyristachya** (Wall. ex Moq.) Hook. f., Fl. Brit. India 4: 730. 1885; Gamble, Fl. Madras 2: 1176. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1552. 2018. *Achyranthes porphyristachya* Wall. ex Moq. Prodr. 13(2): 316. 1849. *'Erra maddiaaku'*

An erect, annual, branched herb, up to 1.1 m high; stems woody at base; branches sub-quadrangular, pubescent. Leaves ovate-elliptic or broadly rhomboid, 5–10 cm long, rounded or cuneate at base, acuminate at apex, margins entire, adpressed pubescent on both sides; petiole up to 1.2 cm long. Flowers in terminal, slender spikes, 5 mm across, greenish white; spikes up to 25 cm, long, bracteate. Bracts membranous; bracteoles long-aristate, spinose, winged at base. Perianth lobes 5, subequal, lanceolate, 5 mm long, hyaline margins. Stamens 5; filaments connate at base. Ovary glabrous; style slender. Utricle ovoid, 5 mm long, surrounded by perianth.

Fl. & Fr.: Jul.–Dec.

Habitat: Occasional weed in pathways in deep forest, along roadsides.

Specimen examined: Chilukaluru, *Y. Mahesh* 011616 (BSID).

2. ALLMANIA R.Br. ex Wight

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Allmania nodiflora (L.) R.Br. ex Wight, J. Bot. (Hooker) 1: 226. 1834; R.S. Rao & al., Fl. E. Godavari Dist. 590. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1556. 2018. *Celosia nodiflora* L., Sp. Pl. 1: 205. 1753. *Allmania nodiflora* (L.) R. Br. ex. Wight var. *aspera* (Roth) Hook. f., Fl. Brit. India 4: 717. 1885; Gamble, Fl. Madras 2: 1167. 1925. *Celosia aspera* Roth, Nov. Pl. Sp. 172. 1821. *Allmania longipedunculata* (Trimen) Gamble, Fl. Madras 2: 1168. 1925. *Allmania nodiflora* (L.) R. Br. ex Wight var. *nodiflora*; Hook. f., Fl. Brit. India 4: 716. 1885; Gamble, Fl. Madras 2: 1167. 1925. *Allmania albida* R. Br. ex Hook. f. Fl. Brit. India 4: 717. 1885. *Allmania nodiflora* (L.) R. Br. ex Wight var. *angustifolia* Hook. f., Fl. Brit. India 4: 717. 1885; Gamble, Fl. Madras 2: 1167. 1925. *Allmania nodiflora* (L.) R. Br. ex Wight var. *procumbens* Hook. f., Fl. Brit. India 4: 717. 1885; Gamble, Fl. Madras 2: 1162. 1925. *Allmania nodiflora* (L.) R. Br. ex Wight var. *roxburghii* Hook. f., Fl. Brit. India 4: 717. 1885. *'Erra maddiaaku'*

Procumbent, pubescent herb, variable in size, 60 cm long, branches ascending, angular, grooved, pubescent. Leaves subsessile, elliptic-obovate, 3–6 cm long, cuneate at base, apiculate at apex, pubescent; petiole short. Flowers sessile, leaf-opposed, capitate spikes, 8 mm dia., pale green; bracts and bracteoles ovate-lanceolate, 5 mm long, pubescent without. Perianth lobes 5, scarious, oblong-lanceolate, 4 mm across. Stamens 5; filaments

connate at base, glabrous. Ovary globose, unilocular; style short. Capsule circumscissile in the middle, 2 mm, glabrous. Seeds compressed, black, arillate.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weed in cultivated fields, open marshy areas, along roadsides.

Specimen examined: Pedanunthalu, *Y. Mahesh* 011509 (BSID).

3. ALTERNANTHERA Forssk.

India: 7 spp.; Andhra Pradesh: 4 spp.; PNP: 3 spp.

Key to the species

1a.	Bracts and bracteoles hairy	**1. A. ficoidea**
1b.	Bracts and bracteoles glabrous	2
2a.	Prostrate herbs; bracts and bracteoles spinous	**2. A. pungens**
2b.	Erect or decumbent herbs; bracts and bracteoles not spinous	**3. A. sessilis**

1. Alternanthera ficoidea (L.) Sm., Cycl. 39: (2. Suppl.) 8. 1818; Pull. & al., Fl. Andhra Pradesh 4: 1557. 2018. *Gomphrena ficoidea* L., Sp. Pl. 1: 225. 1753. *Alternanthera tenella* Colla var. *verscolor* (Lem.) Veldkamp, Taxon 30: 208. 1981. *Telanthera ficoides* var. *versicolor* Lem., III. Hortic. 12, t. 440. 1865.

Decumbent or erect herb, up to 1.1 m high; branches angular with appressed hairs. Leaves opposite, elliptic-oblong or obovate, 2–5 cm long, attenuate above, apiculate at apex, margins entire, densely clothed with appressed hairs below, less above, dotted on both sides; petiole up to 1 cm long. Flowers in terminal spikes, 2–3 spikes together, usually at the top of the branches, light yellow or silvery. Bracts and bracteoles lanceolate, acute, hairy. Perianth 5-lobed, lobes ovate, 4 mm long, hairy. Stamens 5. Ovary oblong; style broader than long. Utricle oblong, *c.* 2 mm long, compressed.

Fl. & Fr.: Throughout the year.

Habitat: Occasional in water courses, moist localities, waste places.

Specimen examined: PK Valasa, *Y. Mahesh* 012122 (BSID).

2. Alternanthera pungens Kunth, Nov. Gen. Sp. 2: 206. 1818; R.S. Rao & al., Fl. E. Godavari Dist. 591. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1558. 2018. *Achyranthus repens* L., Sp. Pl. 205. 1753. *Alternanthera repens* (L.) Link, Enum. Pl. Hort. Berol. 1: 154. 1821. *'Mulla Ponnagantikura'*

Prostrate or procumbent, pubescent herb, up to 60 more cm long; stems zig-zag, slightly grooved, often rooting at nodes. Leaves unequal pairs, broadly ovate-obovate or orbicular, 1.5–3 cm long, with unequal pairs, narrowed and unequal at base, apiculate at apex, margins entire, glabrous on both surfaces. Flowers heads in axillary, condensed spikes, 3 mm long, creamy white. Bracts and bracteoles ovate-lanceolate, 2.5 mm long, spinous. Perianth 5-lobed, 4 mm long; lobes unequal, ovate, oblong, hairy. Stamens 5; filaments connate at base, glabrous. Ovary globose, unilocular. Utricle globose, enclosed *c.* 1 mm long, by persistent perianth, bract and bracteoles.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in waste places, along roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Alternanthera sessilis (L.) R.Br. ex DC., Cat. Horti. Monsp. 77. 1813; Hook. f., Fl. Brit. India 4: 731. 1885; R.S. Rao *& al.*, Fl. E. Godavari Dist. 592. 1999; Pull. *& al.*, Fl. Andhra Pradesh 4: 1558. 2018. *Gomphrena sessilis* L., Sp. Pl. 1: 225. 1753. *Alternanthera triandra* Lam., Encycl. 1: 95. 1783; Gamble, Fl. Madras 2: 1179. 1925. *Alternanthera nodiflora* R. Br., Prodr. 417. 1810; Hook. f., Fl. Brit. India 4: 732. 1885. *'Ponnagantikura'*

Decumbent herb, up to 50 cm high; stems sub-quadrangular, grooved, hirsute near nodes; branches purplish, rooting at lower nodes, hairy at younger nodes. Leaves opposite, linear-lanceolate or oblanceolate, 3.5–5 cm long, cuneate at base, subacute at apex, margins entire or obscurely denticulate, glabrous; petiole short. Flower heads in axillary, condensed spikes, 3 mm long, white, shining. Bracts and bracteoles short, not spinous. Perianth lobes 5, unequal, ovate-lanceolate, scarious. Stamens 3; filaments connate at base. Ovary obcordate, unilocular; style short. Utricle obcordate, *c.* 2 mm long, compressed. Seeds suborbicular.

Fl. & Fr.: Throughout the year.

Habitat: Common weed in cultivated fields, waste lands, along stream banks.

Specimen examined: Kintukuru, *Y. Mahesh* 011453 (BSID).

4. AMARANTHUS L.

India: 14 spp. & 4 subsp.; Andhra Pradesh: 14 spp.; PNP: 1 sp.

1. Amaranthus spinosus L., Sp. Pl. 2: 991. 1753; Hook. f., Fl. Brit. India 4: 718. 1885; Gamble, Fl. Madras 2: 1170. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1563. 2018; R.S. Rao & al., Fl. E. Godavari Dist. 592. 1999. *'Chikakatotakura'*

An erect, spinous herb, up to 90 cm high; spines axillary, sharp, divaricate; branches grooved, glabrous. Leaves alternate, ovate-lanceolate, 2.5–4 cm long, narrowed at base, apiculate at apex, margins entire, glabrous; petioles up to 4 cm long. Flowers in axillary and terminal interrupted spikes, 3 mm long, pale green. Bracts spinous, grooved above; bracteoles ovate, acuminate. Perianth of male flowers 5, subequal, lanceolate, spathulate, 3 mm log. Stamens 5, included; filaments free. Ovary globose; styles 3, minute. Utricle ovoid or suborbicular, 2 mm across, rugose. Seeds black.

Fl. & Fr.: Aug.–Nov.

Habitat: Common weed of roadsides, in open waste lands.

Specimen examined: Shivagiri, *Y. Mahesh* 011627 (BSID).

Field notes: Leaves often used as vegetable.

5. CELOSIA L.

India: 3 spp.; Andhra Pradesh: 3 spp. & 1 var.; PNP: 1 sp.

1. Celosia argentea L., Sp. Pl. 1: 205. 1753; Hook. f., Fl. Brit. India 4: 714. 1885; Gamble, Fl. Madras 2: 1166. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 593. 1999. var. *argentea* Pull. & al., Fl. Andhra Pradesh 4: 1565. 2018. *'Gunugu'*

An erect, much branched, glabrous herb, 1.2 m high; stems and branches grooved, glabrous. Leaves variable, ovate-lanceolate or linear-elliptic or obovate, 2.5–6 cm long, cuneate or acute at base, acute-acuminate at apex, margins entire, undulate, glabrous on both sides; petiole short. Flowers in terminal uninterrupted, conical spikes, 6 mm long, pink or white; spikes up to 8 cm long. Bracts and bracteoles ovate-acuminate. Perianth 5-lobed; lobes oblong-lanceolate, 6 mm long, scarious, striate in the middle; stamens 5; filaments united. Ovary broadly ovoid; style sparsely pubescent. Utricle ellipsoid, *c.* 3 mm across, circumscissilely dehiscing. Seeds small, black.

Fl. & Fr.: Aug.–Nov.

Habitat: Common weed in cultivated fields, along river banks, exposed small hilly slopes, associated with grasses.

Specimen examined: Shivagiri, *Y. Mahesh* 010082 (BSID).

Field notes: Branches delicate; flowers many, pink when young, white at mature.

6. CYATHULA Blume

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cyathula prostrata (L.) Blume, Bijdr. Fl. Ned. Ind. 11: 549. 1826; Hook. f., Fl. Brit. India 4: 723. 1885; Gamble, Fl. Madras 2: 1172. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1567. 2018. *Achyranthus prostrata* L., Sp. Pl. ed. 2.1: 296. 1762.

Erect herbs, up to 45 cm high; stems obtusely quadrangular, pubescent on nodes. Leaves opposite, ovate-elliptic or obovate, 4–10 cm long, rounded at base, subacute at apex, margins entire, ciliate, densely hairy on both sides; petiole very short. Flowers in terminal long spikes; spikes up to 20 cm long. Tepals 5, elliptic, unequal. Stamens 5, alternating with pseudostaminodes. Ovary rounded; style short, filiform. Urticle smooth.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional as weed in open dry fields.

Specimen examined: Valamuru, *Y. Mahesh* 010937 (BSID).

7. OURET Adans.

India: 4 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 2 spp.

Key to the species

1a. Leaves opposite-decussate, ovate-lanceolate; seeds reniform **2. O. sanguinolenta**

1b. Leaves alternate or subopposite, obovate-oblong or suborbicular; seeds angular **1. O. lanata**

1. Ouret lanata (L.) Kuntze, Revis. Gen. Pl. 2: 544. 1891. *Aerva lanata* (L.) Juss., Ann. Mus. Natl. Hist. Paris 2: 131. 1803; Hook. f., Fl. Brit. India 4: 728. 1885; Gamble, Fl. Madras 2: 1178. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 589. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1554. 2018. *Achyranthes lanata* L., Sp. Pl. 204. 1753. *'Tella pindikura'*

Erect herbs, up to 1 m high; branching from base; branches striate, pubescent. Leaves alternate, rarely subopposite, obovate-oblong or suborbicular, 2–5 cm long, attenuate at base, obtuse at apex, margins entire, pubescent above, tomentose below; petiole very short. Flowers in axillary, condensed spikes, very small, white. Bracts ovate-caudate, pilose without. Perianth 5-lobed, 1 mm long; lobes broadly ovate, scarious, densely white woolly without. Stamens 5; filaments slender, connate at base. Ovary ovoid, unilocular; style short. Utricle broadly ovoid, small. Seeds small, angular, black.

Fl. & Fr.: Throughout the year.

Habitat: Common weed in most of the areas, cultivated fields, outskirts of forests.

Specimen examined: GM Valasa, *Y. Mahesh* 010003 (BSID).

2. Ouret sanguinolenta (L.) Kuntze, Revis. Gen. Pl. 2: 544. 1891. *Aerva sanguinolenta* (L.) Blume, Bijdr. Fl. Ned. Ind. 11: 547. 1826; R.S. Rao & al., Fl. E. Godavari Dist. 590. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1555. 2018. *Achyranthes sanguinolenta* L., Sp. Pl., ed. 2. 1: 294. 1762. *Aerva scandens* Wall. ex Moq. in DC., Prodr. 13: 302. 1849; Hook. f., Fl. Brit. India 4: 727. 1885; Gamble, Fl. Madras 2: 1178. 1925.

Straggling herbs, up to 1.5 m high; stems and branches terete, striate, appressed hairy. Leaves opposite-decussate, subsessile, ovate-lanceolate, 3.5–7 cm long, attenuate at base, acute, apiculate at apex, margins entire, puberulous above, densely pubescent beneath. Flowers polygamous, in axillary and terminal cylindric spikes, 5 mm long, white-woolly. Bracts and bracteoles ovate, mucronate, pilose. Tepals 5, concave, ovate-elliptic, acuminate, 4 mm long, hairy without, outer 2 mucronate, inner 3 subobtuse. Stamens 5, alternating with pseudostaminodes; filaments connate. Ovary glabrous, compressed; style slender. Urticle very small. Seed reniform, black.

Fl. & Fr.: Jul.–Apr.

Habitat: Common in rocky areas on hills, open places.

Specimen examined: Kakaramatta, Pochvaram, *Y. Mahesh* 010146 (BSID).

Field notes: Flowers often clustered at ends of branches.

8. PUPALIA Juss.

India: 1 spp. & 2 var.; Andhra Pradesh: 1 sp. & 2 var.; PNP: 1 sp.

1. Pupalia lappacea (L.) Juss., Ann. Mus. Natl. Hist. Nat. 2: 132. 1803; Hook. f., Fl. Brit. India 4: 724. 1885; Gamble, Fl. Madras 2: 1173. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 594. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1572. 2018. *Achyranthes lappacea* L., Sp. Pl. 1: 204. 1753. *Pupalia atropurpurea* (Lam.) Moq. in DC., Prodr. 13: 331. 1849; Hook. f., Fl. Brit. India 4: 723. 1885; Gamble, Fl. Madras 2: 1173. 1925. *Achyranthes atropurpurea* Lam., Encycl. 1: 546. 1785. *'Tellauttareni'*

Straggling undershrubs, up to 1.5 m high; stems and branches striate, pubescent. Leaves opposite, ovate-elliptic, 3–8 cm long, rounded or shortly cuneate at base, apiculate at apex, margins ciliate, pubescent; petiole up to 7 mm long. Flowers in axillary and terminal sticky spikes, 5 mm long, pale green or whitish. Bracts broadly ovate, spinous at apex, pilose outside. Perianth 5 lobed, 5 mm long; lobes subequal, elliptic-lanceolate, villous, stellately spreading hooked awns. Stamens 5; filaments connate at base. Ovary obovoid; style short. Utricle broadly oblong, 3 mm long, tapering in to a persistent style. Seeds compressed, black.

Fl. & Fr.: Sep.–Dec.

Habitat: Common along hedges, pathways, foot hills, hedges of cultivated fields.

Specimen examined: Kintukuer, *Y. Mahesh* 011414 (BSID).

Field notes: This species is easily identified by its hooked bracts.

9. TRICHURIELLA Bennet

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Trichuriella monsoniae (L.f.) Bennet, Indian J. Forest. 8: 86. 1985. Pull. & al., Fl. Andhra Pradesh 4: 1573. 2018. *Illecebrum monsoniae* L. f., Suppl. Pl. 161. 1781. *Aerva monsoniae* (Retz.) Mart., Nova. Act. Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 13: 291. 1826; Hook. f., Fl. Brit. India 4: 728. 1885; Gamble, Fl. Madras 2: 1178. 1925.

Perennial, spreading herb, up to 70 cm high; root stock woody; stems angled, grooved; branches pubescent. Leaves sessile, whorled at nodes, linear-filiform, 2.1 cm long, shortly spinous at apex, margins excurved, pubescent. Flowers in terminal and axillary cylindric spikes, 2 mm long, pale pinkish-white; spikes solitary or 1–4 together. Bracteoles aristate, pilose. Perianth 4-lobed, 3 mm long; lobes ovate-lanceolate, acuminate, hyaline, curving towards apex, densely pilose along margins. Stamens 5; filaments connate at base. Ovary globose; style short. Utricle very short, ovoid. Seeds ovoid, reddish brown.

Fl. & Fr.: Aug.–Jan.

Habitat: Common in dry cultivated lands, along roadsides.

Specimen examined: Geediguppa, *Y. Mahesh* 011581 (BSID).

85. NYCTAGINACEAE

India: 5 genera, 12 spp.; Andhra Pradesh: 4 genera, 8 spp.; PNP: 3 genera, 3 spp.

Key to the genera

1a.	Prostrate or erect herbs, rarely shrubs, up to 1.2 m high	2
1b.	Climbing stragglers, small trees or shrubs up to 10 m or more long	**3. Pisonia**
2a.	Plants undershrubs; flowers 1-3, showy with prominent bracts; perianth funnel shaped	**2. Mirabilis**
2b.	Plants herbs; flowers in heads or umbels, small, bracts not prominent	**1. Boerhavia**

1. BOERHAVIA Vaill. ex L.

India: 4 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Boerhavia diffusa L., Sp. Pl. 1: 3. 1753; Gamble, Fl. Madras 2: 1162. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 585. 1999; Pull. *& al.*, Fl. Andhra Pradesh 4: 1546. 2018. *Boerhavia repens* L., Sp. Pl. 3. 1753; Hook. f., Fl. Brit. India 4: 709. 1885. *'Punarnava','Atukamamidi'*

A variable, diffuse, prostrate herb, up to 80 cm long; branches striate, pubescent. Leaves opposite in unequal pairs at nodes, broadly ovate-elliptic or orbicular, 1.5–3 cm long, rounded or cordate at base, subacute, margins with few crenations, pale below, pubescent; petiole up to 1.2 cm long. Flowers in axillary and terminal capitate or umbellate clusters, 3 mm long, pale pink, bracteate, bracteolate. Perianth connate, 5-lobed. Stamens 3, exserted slightly; filaments glabrous. Ovary stalked; style short. Anthocarp clavate, 5 mm long, 5-ribbed, glandular along ribs.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in open waste lands and cultivated fields.

Specimen examined: Koida, *Y. Mahesh* 011347 (BSID).

2. MIRABILIS Riv. ex L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Mirabilis jalapa L., Sp. Pl. 1: 177. 1753; Gamble, Fl. Madras 2: 1164. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 587. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1547. 2018. *'Chandrakantha'*

An erect under shrub, up to 80 cm high; stems succulent, obscurely quadrangular, grooved; branches fleshy. Leaves opposite, ovate, 4–8 cm long, cordate or truncate at base, acuminate or acute at apex, margins entire, glabrous on both sides; petiole up to 3 cm long. Flowers in terminal corymbs, 3.5 cm long, bracteate, variously coloured, purple, showy. Perianth funnel shaped, 5-lobed. Stamens 5, exserted; filaments glabrous. Ovary glabrous; style filiform. Anthocarp ovate, *c.* 1 cm across, sculptured. Seed 1, black.

Fl. & Fr.: Throughout the year.

Habitat: Occasionally planted near home gardens in tribal gudems.

Specimen examined: GM Valasa, *Y. Mahesh* 010484 (BSID).

3. PISONIA Plum. ex L.

India: 3 spp.; Andhra Pradesh: 2 spp.

1. Pisonia aculeata L., Sp. Pl. 2: 1026. 1753; Hook. f., Fl. Brit. India 4: 711. 1885; Gamble, Fl. Madras 2: 1163. 1925; Pull. & al., Fl. Andhra Pradesh 4: 1548. 2018. **(Plate 51D)** *'Embuddi chettu'*

Scandent, evergreen, spinous shrub, up to 2.5 m high, spines at leaf axils, recurved; young branches velvety pubescent. Leaves opposite, alternate, ovate-elliptic, 4–6 cm long, papery, rounded or wedge shaped at base, obtuse or subacute at apex, margins entire, glabrous; petiole up to 1.8 cm long. Flowers in axillary and terminal cymes, 5 mm across, velvety pubescent, bracteolate. Perianth funnel shaped, 10-lobed, alternately long and short, pubescent; lobes triangular. Stamens up to 8. Ovary elongate, glabrous; style short. Anthocarp oblong.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional along roadsides, open forest areas.

Specimen examined: Kothuru, *Y. Mahesh* 011660 (BSID).

86. MOLLUGINACEAE

India: 5 genera, 12 spp.; Andhra Pradesh: 4 genera, 8 spp.; PNP: 5 genera, 6 spp.

Key to the genera

1a.	Flowers in axillary fascicles; fruit syncarp; seeds arillate, aril filiform-appendaged; indumentum aften stellate hairs	**1. Glinus**
1b.	Flowers in terminal cymes; fruit apocarp; seeds exarillate or aril minute, not appendaged; indumentum of glandular hairs	2
2a.	Stipules present at least on upper leaves	3
2b.	Stipules absent	4
3a.	Flowers umbel-like cymes	**2. Hypertelis**
3b.	Flowers in raceme of panicle like cymes	**5. Trigastrotheca**
4a.	Leaves all radical, alternate, either all crowded in a basal rosette or scattered along shoots	**4. Paramollugo**
4b.	Leaves in false whorls at nodes	**3. Mollugo**

1. GLINUS L.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 2 sp.

Key to the species

1a.	Whole plant densely, stellately tomentose; stamens 10; capsule 5-volved, hairy	**1. G. lotides**
1b.	Whole plant glabrous; stamens 5; capsule 3-valved; glabrous	**2. G. oppositifolius**

1. Glinus lotoides L., Sp. Pl. 1: 463. 1753; R.S. Rao & al., Fl. E. Godavari Dist. 386. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 813. 2018. *Mollugo lotoides* (L.) Kuntze, Revis Gen. Pl. 214. 1891; Gamble, Fl. Madras 1: 552. 1919. *Mollugo hirta* Thunb., Prodr. Fl. Cap. 24. 1794; C.B. Clarke in Hook. f., Fl. Brit. India 2: 662. 1879.

Prostrate or ascending, herb, up to 30 cm long; branches arise from base; whole plant covered with stellately pubescent hairs; branches arise from the base. Leaves whorled at the nodes, obovate-spathulate or suborbicular, 1.6 cm long, narrowed at base, rounded at apex, margins entire, slightly undulate, densely tomentose; petiole up to 1 cm long. Flowers in axillary clusters, 8 mm long, greenish-white, shortly pedicelled. Calyx lobes ovate 8 mm long, densely tomentose without, 5-nerrved, enlarged in fruit. Petals absent. Stamens 10. Ovary globose, pentalocular; styles 5, short. Capsule oblong, 5 mm long, 5-volved. Seeds with a white hilum, which encircling the seed, black.

Fl. & Fr.: Apr.–Sep.

Habitat: Common in dry sandy soils, along river banks, cultivated fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Glinus oppositifolius (L.) A. DC., Bull. Herb. Boissier ser. 2. 1: 559. 1901; R.S. Rao & al., Fl. E. Godavari Dist. 386. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 813. 2018. *Mollugo oppositifolia* L., Sp. Pl. 89. 1753; Gamble, Fl. Madras 1: 559. 1919. *Mollugo spergula* L., Syst. Nat. ed. 10. 881. 1759; C.B. Clarke in Hook. f., Fl. Brit. India 2: 662. 1879.

Prostrate or decumbent, diffusely branched herb; branches terete, thinly hispidulous when young. Leaves opposite or whorled with 4–5 at each node, unequal, oblanceolate or elliptic-lanceolate, 1.5–2 cm long, narrowed at base, obscurely apiculate at apex, margins entire, glabrous; petiole short. Flowers in axillary fascicles, with long slender pedicels, 5 mm long, pale green. Calyx lobes 5, oblong, 5 mm long, scarious margined. Petals absent. Stamens 5; staminodes 5. Ovary ellipsoid, trilocular; styles 3, short. Capsule ellipsoid, 4 mm long, 3-volved, covered by calyx. Seeds numerous, minute, reddish black.

Fl. & Fr.: Throughout the year.

Habitat: Common along hedges of lakes, ponds, along streams, cultivated sandy soils.

Specimen examined: PK Valasa, *Y. Mahesh* 012108 (BSID).

2. HYPERTELIS E. Mey. ex Fenzl

India: 5 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Hypertelis cerviana (L.) Thulin, in Taxon 65: 787. 2016. Mollugo cerviana (L.) Ser., Prodr.1: 392. 1824; C.B. Clarke in hook. f., Fl. Brit. India 2: 663. 1879; Gamble, Fl. Madras 1:553. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 387. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 814. 2018. *Pharnaceum cerviana* L., Sp. Pl. 1: 272. 1753.

A spreading, glabrous herb, up to 15 cm high; branching from the base. Radical leaves sessile or subsessile, rosulate, narrow; cauline leaves 5–7 in whorled at nodes, linear, 1.5 cm, attenuate or narrowed at base, obtuse or obscurely acute at apex, margins entire, glaucous. Flowers small, in axillary and terminal trichotomous, umbellate cymes, white. Calyx lobes 5, elliptic-obovate. Petals absent. Stamens 5. Capsule ellipsoid or sub globose, 3 mm long, glabrous. Seeds numerous, small, brown.

Fl. & Fr.: Jul.–Nov.

Habitat: Found in sandy areas of Godavari river beds, cultivated fields, waste lands.

Specimen examined: GM Valasa, *Y. Mahesh* 010980 (BSID).

3. MOLLUGO L.

India: 5 spp. & 1 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Mollugo disticha Ser. in DC., Prodr. 1: 392. 1824; C.B. Clarke in Hook. f., Fl. Brit. India 2: 663. 1879; Gamble, Fl. Madras 1: 553. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 387. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 814. 2018.

An erect or prostrate, glabrous herb; stems obscurely angled. Leaves subsessile, 3–5 whorled at each node, ovate-obovate, 1.5–2.8 cm long, cuneate at base, acute or rounded at apex, margins entire, sparsely pubescent. Flowers in leaf opposed or terminal, 5 cm long cymes, 5 mm long, white, branches often extending in to elongated racemes. Calyx lobes 5, greenish white, with white hyaline margins, overlapping, enclosing in fruit. Petals absent. Stamens 5. Capsule small, ovoid, thin walled.

Fl. & Fr.: Jul.–Nov.

Habitat: Common in cultivated fields, waste sandy soils.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

4. PARAMOLLUGO Thulin

India: 5 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Paramollugo nudicaulis (Lam.) Thulin, Taxon 65: 786. 2016. *Mollugo nudicaulis* Lam., Encycl. 4: 234. 1797; C.B. Clarke in Hook. f., Fl. Brit. India 2: 664. 1879; Gamble, Fl. Madras 1: 553. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 387. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 814. 2018. *'Pedaparipata'*

An erect, annual herb, up to 25 cm high; branches glabrous or sparsely hairy. Leaves all radical, close at base, obovate-spathulate, 2–3 cm long, attenuate or narrowed at base, retuse at apex, margins entire, glabrous on both sides. Flowers in many peduncled, trichotomously branched racemes, white; pedicels filiform. Calyx lobes 5, elliptic, 3 mm long, woody. Petals absent. Stamens 5. Ovary oblong, trilobed; styles 3. Capsule ellipsoid or ovoid, *c.* 2 mm long, brown. Seeds trigonous, granular.

Fl. & Fr.: Aug.–Dec.

Habitat: Common weed in sandy soils, along river beds, cultivated fields

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

5. TRIGASTROTHECA F. Muell.

India: 5 spp. & 1 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Trigastrotheca pentaphylla (L.) Thulin, Taxon 65: 784. 2016. *Mollugo pentaphylla* L., Sp. Pl. 1: 89. 1753; Gamble, Fl. Madras 1: 553. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 388. 1999; Pull. & Sri Rama Murthy, Fl. Andhra

Pradesh 2: 815. 2018. *Mollugo stricta* sensu C.B. Clarke in Hook. f., Fl. Brit. India 2: 663. 1879. p.p. non. L., 1762.

Prostrate, glabrous herb, up to 30 cm high; branches ascending, quadrangular, grooved. Leaves whorled with 3–7 at each node, obovate-oblanceolate or spathulate, 1.6–3 cm long, attenuate at base, acute, apiculate at apex, margins entire, glabrous; petioles very short. Flowers in terminal, rarely axillary, paniculate, 15 cm long cymes, 3 mm long, pale green or white, pedicellate. Calyx lobes 5, free, elliptic-ovate, 3 mm long, obtuse, trinerved, glabrous. Petals absent. Stamens 3. Ovary globose, trilocular; styles 3, short. Capsule globose, 3 mm across, 3-lobed. Seeds numerous, reniform or rounded, dark brown.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weed in cultivated fields, open sandy soils, roadsides, forest paths.

Specimen examined: Tekuru, *Y. Mahesh* 011636 (BSID).

87. TALINACEAE

India: 5 genera, 12 spp.; Andhra Pradesh: 4 genera, 8 spp.; PNP: 1 genera, 1 spp.

1. TALINUM Adans.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Talinum portulacifolium (Forssk.) Asch. ex Schweinf., Bull. Herb. Boissier 4. App. 2. 172. 1896; R.S. Rao & al., Fl. W. Godavari Dist. 86. 1986. Pull. & al., Fl. Andhra Pradesh 1: 163. 2018. *Orygia portulacifolia* Forssk. Fl. Aegypt.-Arab. 103. 1775. *Talinum cuneifolium* (Cahl) Willd., Sp. Pl. 2: 864. 1799; Dyer in Hook. f., Fl. Brit. India 1: 247. 1874; Gamble, Fl. Madras 1: 66. 1915. *Portulaca cuneifolia* Vahl, Symb. Bot. 1: 33. 1790.

An erect, semi-succulent, glabrous herb, up to 80 cm high; branches delicate, glabrous. Leaves alternate, subsessile, obovate or oblanceolate, 3.5–7 cm long, cuneate or attenuate at base, obtuse or rounded, mucronate at apex, margins entire, glabrous. Flowers in terminal panicles, 2 cm across, pinkish, pedicellate; bracts linear. Sepals 2, ovate-lanceolate, 5 mm long, acuminate. Petals 5, obovate, 1 cm long. Stamens many; filaments unequal. Ovary uniloculed, globose; style 3. Capsule globose, 5 mm across. Seeds ovoid, black.

Fl. & Fr.: Sep.–Nov.

Habitat: Occasional in sandy soils, along Godavari River bed.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

88. CACTACEAE

India: 6 genera, 18 spp.; Andhra Pradesh: 3 genera, 5 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a. Stems flattened, jointed, areoles with glochids; perianth rotate, free; stamens inserted on the receptacle **2. Opuntia**
1b. Stems angular, not jointed, areoles without glochids; perianth funnel like, united; stamens inserted on the perianth **1. Cereus**

1. CEREUS Mill.

India: 5 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cereus pterogonus Lem., Cact. Gen. Sp. Nov. 59. 1839; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 808. 2018. **(Plate 51E)**

A large, winged shrub, up to 5 m high; stem columnar, 3–9 angled, fleshy, spinous, greenish; wings 2–3 cm long; aeroles echinate. Spines up to 15, unequal, 2.5–4.5 cm long. Leaves absent. Flowers lateral, 15 cm long, funnel shaped, with few scales at base. Outer sepals green, inner white. Petals whitish. Stamens numerous, inserted on perianth. Ovary subterete, angular; carpels many.

Fl. & Fr.: Feb.–Jul.

Habitat: Occasional in deciduous forest hedges, dry rocky areas.

Specimen examined: Kondamodalu, *Y. Mahesh* 011735 (BSID).

Field notes: Winged, spiny succulent; spines very sharp.

2. OPUNTIA Mill.

India: 8 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Opuntia stricta (Haw.) Haw., Syn. Pl. Succ. 191. 1812; R.S. Rao & al., Fl. E. Godavari Dist. 384. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 810. 2018; *Cactus strictus* Haw., Misc. Nat. 188. 1803. *Opuntia dillenii* (Ker- Gawl.) Haw., Suppl. Pl. Succ. 79. 1819; C.B. Clarke in Hook. f., Fl. Brit. India 2: 657. 1879; Gamble, Fl. Madras 1: 548. 1919. *Cactus dillenii* Ker-Gawl., Bot. Reg. 3: t. 255. 1818. *'Nagajemudu'*

A fleshy, thorny, succulent shrub, up to 3 m high; stem segments flattened, 10-20 cm long, jointed, with many aeroles, green, spinous. Spines 6–11 per aeroles, straight, brown. Leaves reduced to scales. Flowers on the margin, showy, solitary, *c.* 3 cm long, yellow. Calyx tube with clusters of short spines on cushions. Corolla multiseriate. Stamens numerous, inserted on the receptacle. Ovary unilocular. Berry pear-shaped or ellipsoid, truncate, purple. Seeds subcircular with slightly irregular surface; girdle protruding.

Fl. & Fr.: Mar.–Aug.

Habitat: Common in open dry deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

89. CORNACEAE

India: 3 genera, 17 spp.; Andhra Pradesh: 1 genus, 2 spp., 1 subsp.; PNP: 1 genus, 1 sp.

1. ALANGIUM Lam.

India: 5 spp.; Andhra Pradesh: 2 spp. & 1 subsp.; PNP: 1 sp.

1. Alangium salviifolium (L.f.) Wangerin in Engler, Pflanzenr, 4 (220b), Heft. 41: 9. 1910; Gamble, Fl. Madras 1: 572. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 395. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 835. 2018. *Grewia salvifolia* L.f., Suppl. 409. 1782. *Alangium lamarckii* Thwaites, Enum. Pl. Zeyl. 133. 1859; C.B. Clarke in Hook. f., Fl. Brit. India 2: 741. 1879. **(Plate 51F)** *'Uduga chettu'*

Small trees, up to 8 m high; bark brown with deep vertical lines; branches pubescent; young branchlets drooping, often thorny, pubescent. Leaves alternate, elliptic-ovate or lanceolate-oblong, 6–12 cm long, oblique at base, acuminate at apex, margins entire, undulate, trinerved from base, hairy above, puberulous below. Flowers in axillary, few flowered fascicles, 2 cm long, white, with ovate bracts. Calyx 6- lobed, pubescent; lobes up to 10, triangular. Petals 6, linear, 2 cm long, reflexed, pubescent without. Stamens numerous; filaments connate at base. Ovary turbinate, unilocular; style stout. Berry globose-ovoid, 2 cm long, red, pubescent, crowned by persistent calyx. Seed 1.

Fl. & Fr.: Feb.–Jul.

Habitat: Common in deciduous forests along roadsides, outskirts.

Specimen examined: Kakeshnur, *Y. Mahesh* 010199 (BSID).

Field notes: Fruits enclosed with calyx lobes.

90. BALSAMINACEAE

India: 2 genera, 300 spp.; Andhra Pradesh: 2 genera, 4 spp., 2 var.; PNP: 1 genus, 2 spp.

1. IMPATIENS Riv. ex L.

India: 279 spp., 18 var. & 2 forma.; Andhra Pradesh: 4 spp. & 2 var.; PNP: 2 spp.

Key to the species

1a.	Leaves opposite, leaf base rounded or subcordate	**2. I. chinensis**
1b.	Leaves alternate, leaf base decurrent in to a glandular petiole	**1. I. balsamina**

1. Impatiens balsamina L.Sp. Pl. 938. 1753; Hook. f., Fl. Brit. India 1: 453. 1874; Gamble, Fl. Madras 1: 142. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 245. 1999; Pull. & al., Fl. Andhra Pradesh 1: 281. 2018; Hook. f., Fl. Brit. India 1: 453. 1874; Gamble, Fl. Madras 1: 142. 1915. *'Konda gorinta'*

An erect, delicate, annual herb, up to 65 cm high; branches glabrous. Leaves alternate, linear-lanceolate, 4–10 cm long, cuneate at base, acute or acuminate at apex, margins serrate, sparsely pubescent; petiole up to 2.5 cm long. Flowers solitary or in 2–3 clusters, pale pinkish. Sepals ovate-lanceolate. Lip cymbiform, petaloid, with yellowish blotch; spur filiform, shorter or slightly longer than petals, incurved; standard with a crest, terminating in to a mucro; wings obovate, deeply notched. Capsule oblong-ellipsoid, *c.* 1.2 cm long, tapering at both ends, tomentose.

Fl. & Fr.: Sep.–Dec.

Habitat: Common as undergrowth on open hill tops.

Specimen examined: GM Valasa, Valamuru, *Y. Mahesh* 010466, 010478 (BSID).

Field notes: Easily identified with its pinkish flowers having filiform spur.

2. Impatiens chinensis L., Sp. Pl. 2: 937. 1753; Hook. f., Fl. Brit. India 1: 444. 1874; Gamble, Fl. Madras 1: 139. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 246. 1999; Pull. & al., Fl. Andhra Pradesh 1: 283. 2018.

An erect annual herb, up to 60 cm high; branches rooting at lower nodes, glabrous or hairy. Leaves variable, subsessile, opposite-decussate, lanceolate, 2.8–6 cm long, obtuse at base, obtuse or acute at apex, margins serrate, whitish below, villous on both surfaces, pinkish nerved, stipulate; stipules recurved, subulate, glandular. Flowers pinkish, solitary or in clusters of 2 or 3, 1.2–2.4 cm long. Lateral sepals linear; lip bucciniform with some markings on one side, abruptly constricted into spur; spur slender, curved, at least twice as long as wings; standard suborbicular, white; wings 1.5 cm long. Capsule ellipsoid, 1.3–2.0 cm long, tapering at both ends.

Fl. & Fr.: Sep.–Dec.

Habitat: Common on the barren hill tops,under shady areas of large boulders.

Specimen examined: Maredumilly, *Y. Mahesh* 012157, (BSID).

91. LECYTHIDACEAE

India: 4 genera, 10 taxa; Andhra Pradesh: 3 genera, 3 spp.; PNP: 2 genera, 2 spp.

Key to the genera

1a. Leaves puberulous beneath; flowers pink in long drooping racemes; stamens all perfect; fruit angular, fibrous **1. Barringtonia**

1b. Leaves glabrous on both sides; flowers white or creamy white in dense spikes; stamens partly without anthers; fruit globose, not fibrous **2. Careya**

1. BARRINGTONIA J.R. Forst. & G. Forst.

India: 5 spp. & 1 subsp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Barringtonia acutangula (L.) Gaertn., Fruct. Sem. Pl. 2: 97. t. 101. 1791; Bedd., Fl. Sylv. t. 204. 1872; C.B. Clarke in Hook. f., Fl. Brit. India 2: 508. 1879; Gamble, Fl. Madras 1: 487. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 364. 1999; Pull. & al., Fl. Andhra Pradesh 1: 742. 2018. *Eugenia acutangula* L., Sp. Pl. 471. 1753. **(Plate 51G)** *'Kurpachettu'*

Moderate sized tree, up to 10 m high; bark grey with furrowed; young branches pale, glabrous or sparsely tomentose. Leaves alternate, crowded at ends of branchlets, obovate or oblanceolate, 8–15 cm long, coriaceous, attenuate or narrowed at base, rounded at apex, margins crenate-serrulate, glossy, glabrous above, puberulous on nerves beneath; petiole short. Flowers in axillary, long drooping, spicate racemes, up to 1 cm long, pale red; racemes up to 30 cm long, bracteate, bracteolate. Calyx 3 mm long, lobes ovate, imbricate, glabrous. Petals cauducous, oblong-ovate, 6 mm long, adnate to the staminal tube. Stamens numerous; filaments exserted, red. Ovary tetralocular, glabrous; style short. Berry fibrous, oblong, 2.5 cm long, obtusely quadrangular, crowned with persistent calyx. Seed 1.

Fl. & Fr.: Apr.–Nov.

Habitat: Common along stream banks and swampy areas.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011376 (BSID).

Field notes: Conspicuous by its drooping spicate racemes.

2. CAREYA Roxb.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Careya arborea Roxb., Pl. Coromandel 3: 14. t. 218. 1819; C.B. Clarke in Hook. f., Fl. Brit. India 2: 511. 1879; Gamble, Fl. Madras 1: 488. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 365. 1999; Pull. & al., Fl. Andhra Pradesh 1: 743. 2018. **(Plate 52A)** *'Elakavarapuchettu'*

A branching tree, 12 m high; bark grey with deep vertical lines; young branches glabrous, with persistent leaf scares. Leaves alternate, crowded at ends of branches, oblong-obovate, 8–15 cm long, coriaceous, attenuate or narrowed at base, rounded or subacute at apex, margins crenate-serrate, glabrous above, puberulous on nerves below; petiole short. Flowers in terminal spicate racemes, up to 3 cm across, creamy white or greenish yellow,

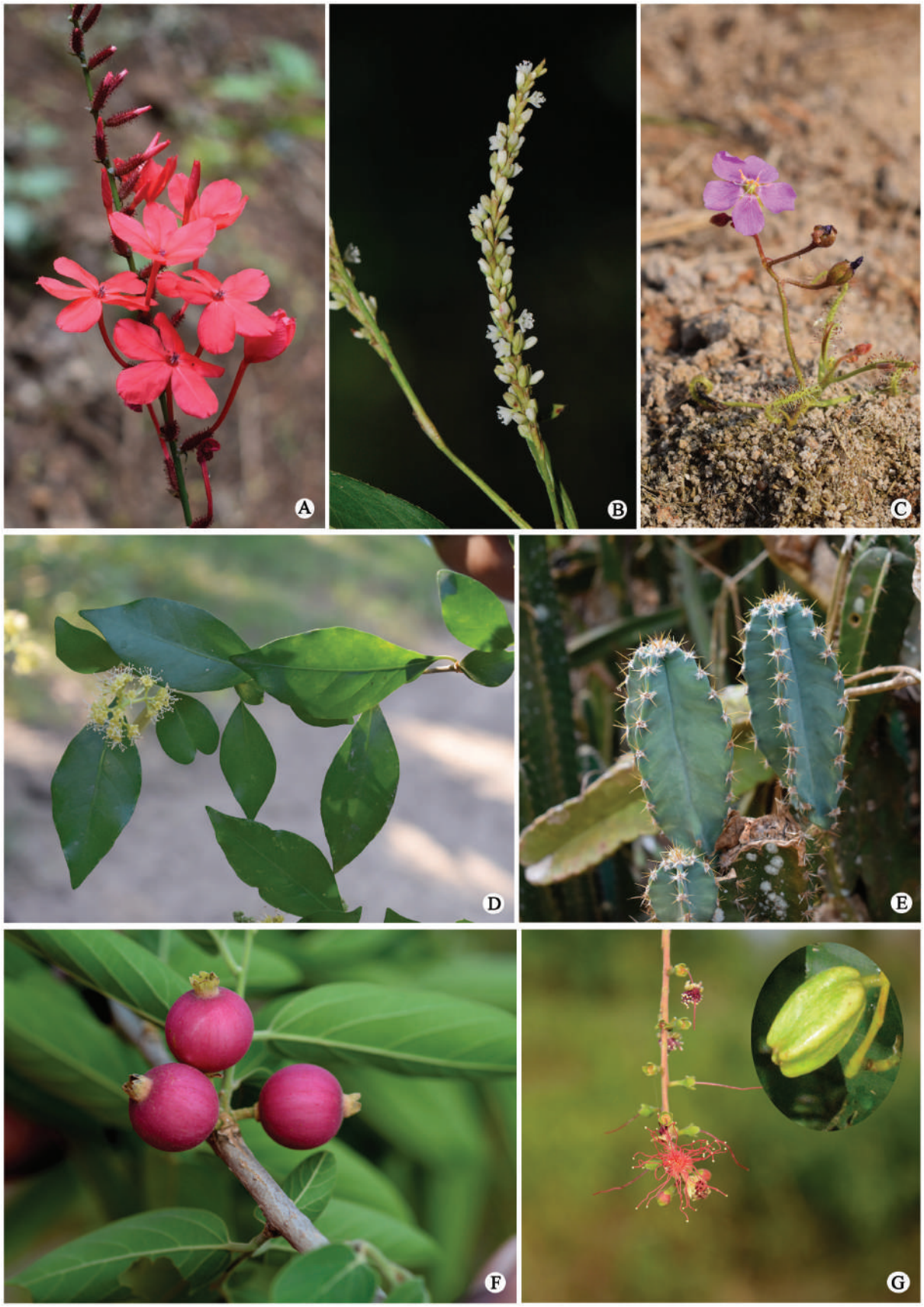


Plate 51: A. *Plumbago indica* L.; **B.** *Persicaria barbata* (L.) H. Hara; **C.** *Drosera indica* L.; **D.** *Pisonia aculeata* L.; **E.** *Cereus pterogonus* Lem.; **F.** *Alangium salviifolium* (L.f.) Wangerin; **G.** *Barringtonia acutangula* (L.) Gaertn.

bracteate, bracteolate; bracteoles narrow. Calyx 3 mm long, glabrous; lobes 4, imbricate, suborbicular. Petals 4, elliptic-oblong or ovate, 6 mm, adnate to the base of staminal tube. Stamens numerous, multiseriate, white; filaments exserted. Ovary tetralocular; style 3.5 cm long. Berry globose, 3.5 cm long, fleshy, green. Seed 1.

Fl. & Fr.: Feb.–Jul.

Habitat: Common in dry deciduous forests, outskirts.

Specimen examined: Tekupally, *Y Mahesh,* 010170 (BSID).

Field notes: Fruit crowned with persistent calyx.

92. SAPOTACEAE

India: 13 genera, 46 taxa; Andhra Pradesh: 6 genera, 8 spp., 1 var.; PNP: 3 genera, 3 spp.

Key to the genera

1a.	Calyx lobes 1-seriate	**3. Xantolis**
1b.	Calyx lobes 2-seriate	2
2a.	Calyx lobes 8; stamens 8; staminodes present	**2. Manilkara**
2b.	Calyx lobes 4; stamens 12 or more; staminodes absent	**1. Madhuca**

1. MADHUCA Buch.-Ham. ex J.F. Gmel.

India: 4 spp. & 1 var.; Andhra Pradesh: 1 sp. & 1 var.; PNP: 1 sp.

1. Madhuca longifolia (J. Koenig ex L.) J.F. Macbr. var. **latifolia** A. Chev., Rev. Int. Bot. Appl. Agric. Trop. 23: 149. 1943; Pull. & Karupp., Fl. Andhra Pradesh 3: 1024. 2018. *Bassia latifolia* Roxb., Pl. Coromandel t. 19. 1795 & Fl. Ind. 2: 256. 1832; Hook. f., Fl. Brit. India 3: 544. 1882; Gamble, Fl. Madras 2: 763. 1921. **(Plate 52B)** *'Ippa chettu'*

Deciduous trees, up to 15 m high; bark greyish-white, with vertical lines; branchlets spreading, pubescent when young. Leaves clustered near the ends of branches, chartaceous, elliptic-oblong, 10–18 cm long, rounded at base, shortly acuminate at apex, margins entire glabrescent, glaucous beneath, lateral nerves up to 10 pairs; petiole short. Flowers in terminal dense fascicles, at the ends of the drooping branches, pale yellow, tomentose. Calyx lobes 4, ovate-lanceolate, outer valvate, inner imbricate, rusty tomentose. Corolla lobes 6-12 in two series, obovate, obtuse. Stamens 12 or more. Ovary ovoid, hispid; style glabrous. Berry globose, fleshy, rusty pubescent, few seeded.

Fl. & Fr.: Feb.–Jul.

Habitat: Common in deciduous forests, forest outskirts, near tribal villages.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011306 (BSID).

Field notes: Flowers fragrant.

2. MANILKARA Adans.

India: 4 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Manilkara hexandra (Roxb.) Dubard., Ann. Inst. Bot. Geol. Colon. Marseille (Ser.3) 23. 9. f. 2. 1915; R.S. Rao & al., Fl. E. Godavari Dist. 446. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1027. 2018. *Mimusops hexandra* Roxb., Pl. Coromandel t. 15. 1795; Hook. f., Fl. Brit. India 3: 549. 1882; Gamble, Fl. Madras 2: 766. 1921. **(Plate 52C)** *'Nimmi'*

Moderate sized, evergreen trees, up to 15 m high; bark pale, fissured, with large patches; young branches towny tomentose. Leaves clustered near the ends of branches, obovate-oblong, 6–10 cm long, coriaceous, obtuse or rounded at base, emarginated at apex, margins entire, glabrous; petiole up to 1.8 cm long. Flowers in axillary, solitary or clustered fascicles of 3–7, 5 mm long, pale green, with short pedicelled. Calyx lobes 6, (3+3) outer reflexed, ovate, rusty tomentose without. Corolla lobes broadly elliptic, linear-oblanceolate, short, glabrous. Stamens 6; filaments connate with fimbriate staminodes. Ovary pubescent; style subulate. Berry oblong, up to 1.2 cm long, reddish yellow when ripe. Seed 1.

Fl. & Fr.: Sep.–Jan.

Habitat: Frequent in hill slopes in the forest.

Specimen examined: Kavadiguntla East, *Y. Mahesh* 011369 (BSID).

3. XANTOLIS Raf.

India: 3 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Xantolis tomentosa (Roxb.) Raf., Sylva Tellur. 35. 1838; R.S. Rao & al., Fl. E. Godavari Dist. 446. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1031. 2018. *Sideroxylon tomentosum* Roxb., Pl. Coromandel 1. 28.t. 28. 1795; Hook. f., Fl. Brit. India 3: 538. 1882; Gamble, Fl. Madras 2: 759. 1921. **(Plate 52D)** *'Bejjerun, Kunduruchettu'*

An evergreen, tall tree, up to 13 m high; bark grey; branches armed with spines, younger parts with brown tomentose. Leaves elliptic-obovate, 7–10 cm long, acute at base, obtuse or obscurely acute at apex, margins entire, glabrous above, tomentose below; petiole up to 1 cm long. Flowers in axillary clusters, creamy white, fragrant, drooping. Calyx lobes 5, one seriate, ovate, unequal. Corolla lobes 5, lanceolate, acuminate. Stamens 5. Ovary ovoid, hairy. Berry globose, *c.* 2 cm across, yellow when ripe, tomentose. Seed 1.

Fl. & Fr.: Apr.–Oct.

Habitat: Occasional along moist hilly slopes, along streams in deep valleys.

Specimen examined: Valamuru, *Y. Mahesh* 010953 (BSID).

Field notes: This species is distinguished by its drooping flowers.

93. EBENACEAE

India: 1 genus, 65 taxa; Andhra Pradesh: 1 genus, 10 spp.; PNP: 1 genus, 6 spp..

1. DIOSPYROS L.

India: 61 spp. & 4 infraspecific; Andhra Pradesh: 10 spp.; PNP: 6 spp.

Key to the species

1a. Flowers tetra or penta merous; ovary 4–10 loculed; fruit calyx accrescent (except *D. chloroxylon*	2
1b. Flowers trimerous; ovary 3– loculed; fruiting calyx not accrescent	**3. D. ferrea**
2a. Leaves pubescent or tomentose on lower or both surfaces	3
2b. Leaves glabrous on both surfaces	4
3a. Petiole up to 1.5 cm long; female flowers pedicellate; calyx lobes enlarged in fruit	**4. D. melanoxylon**
3b. Petiole up to 0. 5 cm long; female flowers sessile; calyx lobes hardly enlarged in fruit	**1. D. chloroxylon**
4a. Leaves not black when dry; male flowers in umbels or fascicles; berry smooth	5
4b. Leaves black when dry; male flowers in cymes; berry rusty tomentose	**6. D. sylvatica**
5a. Leaves elliptic–obovate; stamens 16 in pairs	**5. D. montana**
5b. Leaves oblong–elliptic; stamens to 6–12 in uneven groups	**2. D. ebenum**

1. Diospyros chloroxylon Roxb., Pl. Coromandel t. 4. 1795 & Fl. Ind. 2: 538. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 3: 560. 1882; Gamble, Fl. Madras 2: 776. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 448. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1033. 2018. *'Ullinthachettu'*

Small evergreen, early branching trees, up to 10 m high; bark dark grey with patches. Leaves alternate, elliptic-oblong, 4–6 cm long, coriaceous, rounded or acute at base, subacute at apex, margins entire, thinly pubescent above, densely fulvous pubescent below; petiole 5 mm long. Flowers unisexual, tetramerous, 5 mm long, axillary, sessile, white, deciduous. Male flowers in fascicles on short peduncle. Calyx lobes orbicular, ovate, 2 mm long, pubescent outside; corolla lobes 4, obovate, 5 mm long, hairy on back. Stamens numerous. Female flowers sessile, solitary in leaf axils. Calyx and corolla larger than male. Ovary 8-celled; styles 4. Berry globose 8 mm across, glabrous, shiny. Seeds 2–3.

Fl. & Fr.: Jul.–Nov.

Habitat: Common in open dry deciduous forests.

Specimen examined: Shivagiri, *Y. Mahesh* 010072 (BSID).

2. Diospyros ebenum J. Koenig ex Retz., Physiogr. Salsk. Hand 1: 176. 1780; C.B. Clarke in Hook. f., Fl. Brit. India 3: 558. 1882; Gamble, Fl. Madras 2: 775. 1921; Pull. & Karupp., Fl. Andhra Pradesh 3: 1034. 2018. *Diospyros assimilis* Beddome, Rep. For. Madras 20. 1866; C.B. Clarke in Hook. f., Fl. Brit. India 3: 558. 1882; Gamble, Fl. Madras 2: 775. 1921. *'Nallauti'*

Small, evergreen trees, up to 10 m high; bark grey with deep fissured; young branches tomentose. Leaves alternate, elliptic-oblong, 6–12 cm long, coriaceous, acute at base, subacute at apex, margins entire thinly hairy above, glabrous below; petiole up to 8 mm long. Flowers in axillary, solitary, greenish-yellow, shortly pedicelled. Male flowers axillary, solitary, shortly pedicelled. Calyx tubular, lobes 4, ovate, acute. Corolla lobes oblong, 8 mm long. Stamens 12, in uneven groups. Female flowers: Stigma 4-lobed. Berry globose, *c.* 2 cm across, sunk at the base in cup shaped calyx. Seeds 3–6, black.

Fl. & Fr.: Mar.–Jul.

Habitat: Occasional in rocky soils, along stream hedges in the forest.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011386, 011388 (BSID).

Field notes: Wood very hard; bark and fruits used as fish poison.

3. Diospyros ferrea (Willd.) Bakh., Gard. Bull. Straits Settlem. 7: 162. 1933. *Ehretia ferrea* Willd. in Phytographia 1: 4, pl. 2, f. 2. 1794. *Diospyros vera* (Lour.) A. Chev., Jard. Bot. Saigon 31: 65. 1919; Pull. & Karupp., Fl. Andhra Pradesh 3: 1042. 2018. *Ebenoxylum verum* Lour., Fl. Cochinch. 2: 613. 1790. *Maba buxifolia* (Rottb.) A. L. Juss., Ann. Mus. Natl. Hist. Nat. 5: 418. 1804; C.B. Clarke in Hook. f., Fl. Brit. India 3: 551.1882; Gamble, Fl. Madras 2: 768. 1921. *Pisonia buxifolia* Rottb., Nyesaml. Kongel Danske Viden S. K. Selsk. Skr. 2: 536. t. 4.f. 2. 1783. **(Plate 52E)** *'Alli chettu'*

Trees, up to 7 m high; bark grey, rough; branchlets glabrous. Leaves alternate, obovate-spathulate, 1.4–2 cm long, coriaceous, acute at base, obtuse or emarginate at apex, margins entire, glabrous on both sides; petiole very short. Flowers 3-merous, bisexual, in axillary fascicles, 5 mm long, white. Ovary oblong, glabrous. Berry oblong, *c.* 8 mm across, black when ripe, covered by persistent calyx, 1-seeded.

Fl. & Fr.: Apr.–Jul.

Habitat: Common in hilly slopes and plains in dry deciduous forests.

Specimen examined: Darapalli, Kakeshnur, *Y. Mahesh* 010136, 010695 (BSID).

4. Diospyros melanoxylon Roxb., Pl. Coromandel t. 46. 1795 & Fl. Ind. 2: 530. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 3: 564. 1882; Gamble, Fl. Madras 2: 772. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 448. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1037. 2018. *'Thuniki, Beedi aaku'*

Moderate sized trees, up to 15 m high; young branches tawny tomentose. Leaves alternate or subopposite, elliptic-oblong, 8–15 cm long, rounded at base, subacute at apex, margins entire, glabrous above, pubescent below; petiole up to 1.1 cm long, pubescent. Flowers axillary, dioecious. Male flowers in cymose panicles, 5 mm long, few. Female flowers pedicellate, axillary, solitary. Calyx pubescent, lobes 4–6, deltoid, subequal. Corolla 5 or 6 lobed, pubescent. Stamens 16 in pairs. Ovary globose, pubescent, 6-celled; style 3, stout, hairy. Berry globose, *c.* 2.8 cm across, glabrous, yellow when ripe, sparsely covered with persistent calyx. Seeds few, oblong, flattened, brown.

Fl. & Fr.: Oct.–Mar.

Habitat: Common in deciduous forest.

Specimen examined: Kakeshnur, *Y. Mahesh* 011317 (BSID).

Uses: Leaves used in Beedi making.

5. Diospyros montana Roxb., Pl. Coromandel t. 45. 1795 & Fl. Ind. 2. 538. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 3: 555. 1882; Gamble, Fl. Madras 2: 776. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 449. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1038. 2018. **(Plate 52F)** *'Erragata'*

Medium sized tree, up to 8 m high. Leaves alternate, ovate-elliptic or oblong, 4–8 cm long, obtuse at base, acute at apex, margins entire, pubescent when young, glabrous at old; petiole short, up to 8 mm long. Flowers dioecious, in axillary, solitary or clustered, white, fragrant. Male flowers in short panicles or dichasial cymes, few flowered. Calyx lobes 4, ovate, 4 mm long, acute. Corolla greenish, campanulate; lobes 4, ovate. Stamens 16, in 4 bundles. Female flowers axillary, solitary. Ovary globose; style 4, bifid. Berry globose, *c.* 3.5 cm across, black when ripe, with accrescent calyx. Seeds 5.

Fl. & Fr.: Oct.–May.

Habitat: Common in dry deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. Diospyros sylvatica Roxb., Pl. Coromandel t. 47. 1795; C.B. Clarke in Hook. f., Fl. Brit. India 3: 559. 1882; Gamble, Fl. Madras 2: 773. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 450. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1040. 2018. **(Plate 52G)***'Tellagatha'*

Tall evergreen trees, up to 15 m high; branchlets slender, glabrous. Leaves alternate, elliptic-obovate, 5–12 cm long, coriaceous, narrowed or obtuse at base, acuminate at apex, margins entire, glabrous, black when dry; petiole

up to 1.2 cm long. Flowers dioecious, greenish-white. Male flowers in axillary, dichasial cymes, 6–8 flowered, 6 mm across. Calyx bell shaped; lobes 4, ovate. Corolla lobes 4, triangular, blunt. Stamens to 20. Female flowers solitary, larger than male flowers. Calyx longer than male, lobes ovate-oblong, pointed. Corolla similar to male. Ovary ovoid. Berry globose or spherical, 2 cm across, rusty tomentose, with persistent, reflexed calyx. Seeds 2–6.

Fl. & Fr.: Jan.–May.

Habitat: Common along streams in moist deciduous forests.

Specimen examined: PK Valasa, *Y. Mahesh* 012133 (BSID).

Field notes: After fall of the fruits, the knobbed peduncles remain on the tree, which makes identification easy.

94. PRIMULACEAE

India: 8 genera, 210 taxa; Andhra Pradesh: 2 genera, 5 spp.; PNP: 1 genus, 1 spp.

1. ARDISIA Sw.

India: 21 spp. & 2 infraspecic; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Ardisia solanacea Roxb., Pl. Coromandel t. 27. 1795 & Fl. Ind.1: 580. 1832; Gamble, Fl. Madras 2: 756. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 444. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1021. 2018. *Ardisia humilis* auct. non Vahl: C.B. Clarke in Hook. f., Fl. Brit. India 3: 529. 1882. **(Plate 52H)** *'Kondamayuri, Kuntichettu'*

An evergreen shrub, up to 5 m high; branches stout, glabrous. Leaves crowded at the ends of branchlets, somewhat succulent when fresh, elliptic-ovate or oblanceolate, 15–25 cm long, narrowed at base, sub-acuminate at apex, margins entire, shining, glabrous on both surfaces; petiole very short. Flowers in axillary, corymbose racemes, 1.5–2 cm across, pale pink. Calyx lobes 5, concave, scarious at margins. Corolla lobes 5, ovate, acute at tip, spotted. Stamens 5. Ovary ovoid; style subulate, short. Drupe globose, *c.* 1 cm across, black when ripe, tipped with style base.

Fl. & Fr.: Aug.–Apr.

Habitat: Occasional along stream banks and moist shady localities.

Specimen examined: Valamuru, Kondamodalu, *Y. Mahesh* 010939, 011724 (BSID).

95. RUBIACEAE

India: 101 genera, 572 spp., 14 subspp., 51 var.; Andhra Pradesh: 45 genera, 88 spp., 1 subspp., 2 var.; PNP: 26 genera, 42 spp.

Key to the genera

1a.	Annual herbs or undershrubs	2
1b.	Shrubs or trees	11
2a.	Plants with stipules	3
2b.	Plants without stipules	**7. Galium**
3a.	Branches terete; leaves and flowers foetid when crushed	**19. Paederia**
3b.	Plants not as above	4
4a.	Corolla lobes 5	10
4b.	Corolla lobes 4	5
5a.	Ovule single in each cell	6
5b.	Ovules more than 1 in each cell	7
6a.	Flowers in terminal corymbs, dimorphic	**13. Knoxia**
6b.	Flowers in axillary fascicles, monomorphic	**22. Spermacoce**
7a.	Ovary globose or rounded	8
7b.	Ovary hemispheric, never globose	9
8a.	Stems 4-angled, pubescent; seeds without ventral cavity	**14. Mitracarpus**
8b.	Stems terete or 4-angled, mostly glabrous; seeds with ventral cavity	**17. Neanotis**
9a.	Plants undershrubs	**10. Hedyotis**
9b.	Plants herbaceous	**18. Oldenlandia**
10a.	Erect herbs; capsule dehiscent	**2. Argostemma**
10b.	Prostrate herbs; capsule indehiscent	**6. Dentella**
11a.	Ovules usually many in each cell	12
11b.	Ovule single in each cell	22
12a.	Flowers in dense globose heads	13
12b.	Flowers not in dense globose heads	16
13a.	Fruit aggregate capsule	15

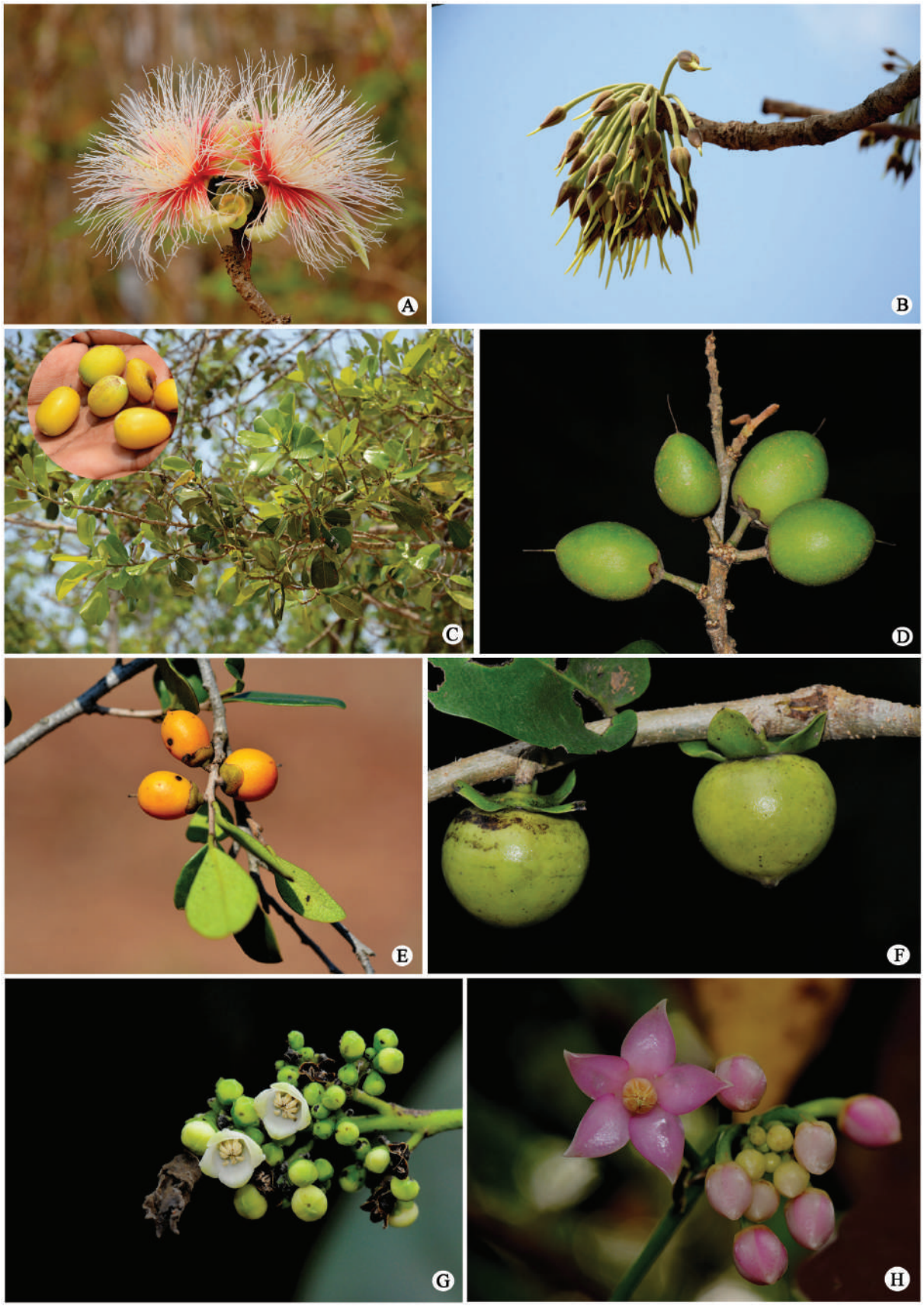


Plate 52: A. *Careya arborea* Roxb.; **B.** *Madhuca longifolia* var. *latifolia* (Roxb.) A. Chev.; **C.** *Manilkara hexandra* (Roxb.) Dubard; **D.** *Xantolis tomentosa* (Roxb.) Raf.; **E.** *Diospyros ferrea* (Willd.) Bakh.; **F.** *Diospyros montana* Roxb.; **G.** *Diospyros sylvatica* Roxb.; **H.** *Ardisia solanacea* Roxb.

13b.	Fruit a syncarpium	14
14a.	A climbing shrub	**9. Gynochthodes**
14b.	Medium or small trees	**16. Morinda**
15a.	Calyx lobed; stigma clavate	**1. Adina**
15b.	Calyx not lobed; stigma mitriform	**15. Mitragyna**
16a.	Fruit capsule	17
16b.	Fruit berry or drupe	18
17a.	Corolla lobes valvate; seeds with wings	**11. Hymenodictyon**
17b.	Corolla lobes imbricate; seeds without wings	**26. Wendlandia**
18a.	Flowers in axillary or terminal panicles or corymbose cymes	19
18b.	Flowers solitary or in fascicles	**8. Gardenia**
19a.	Shrubs, armed	20
19b.	Trees or shrubs, not armed	**5. Coffea**
20a.	Seeds numerous, embedded in pulp	21
20b.	Seeds few not embedded in pulp	**3. Benkara**
21a.	Spines long; fruit globose, slightly ribbed	**4. Catunaregum**
21b.	Spines short; fruit ovoid, smooth	**24. Tamilnadia**
22a.	Corolla lobes valvate	23
22b.	Corolla lobes contorted	24
23a.	Ovary with more than 2-celled	**23. Spermadictyon**
23b.	Ovary 2-celled	**21. Psydrax**
24a.	Plants with intrapetiolar stipules	25
24b.	Plants with interpetiolar stipules	**12. Ixora**
25a.	Flowers 5-merous; style hairy	**25. Tarenna**
25b.	Flowers 4-merous; style glabrous	**20. Pavetta**

1. ADINA Salisb.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Adina cordifolia (Roxb.) Hook. f. & Benth., Forest Fl. N.W. India 263. 1874; Hook. f., Fl. Brit. India 3: 24. 1880; Gamble, Fl. Madras 2: 584. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 396. 1999. *Nauclea cordifolia* Roxb., Pl. Coromandel 1: 40. t. 53. 1796. *Haldina cordifolia* (Roxb.) Ridsdale, Blumea 24: 361. 1978; Pull. & Karupp., Fl. Andhra Pradesh 3: 854. 2018. *'Bandaru, Rudra ganapu'*

Moderate sized trees, up to 12 m high; young branches pubescent. Leaves opposite, orbicular or broadly ovate, 12–22 cm long, cordate at base, shortly acuminate at apex, margins entire, ciliolate glabrescent above, pubescent below; petiole up to 7.5 cm long, pubescent; stipules *c.* 2.8 cm long, deciduous. Flowers in axillary, globose heads, up to 2.5 cm across, yellowish-green, on 6 cm long peduncle. Calyx 3 mm long, pubescent; lobes 5, cupular, spathulate, valvate. Corolla funnel shaped, 6.5 mm long, tube pubescent outside; lobes 5, ovate, recurved. Stamens 5. Ovary bilocular; style filiform, exserted; stigma club shaped. Capsule cuneate, 4 mm long, densely downy. Seeds elongate, winged.

Fl. & Fr.: Jul.–Oct.

Habitat: Occasional along pathways in deciduous forest.

Specimen examined: Shivagiri, *Y. Mahesh* 011625 (BSID).

Field notes: Wood is economically important.

2. ARGOSTEMMA Wall.

India: 9 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Argostemma verticillatum Wall. in Roxb., Fl. Ind. ed. 2: 325. 1824; Hook. f., Fl. Brit. India 3: 43. 1880; Gamble, Fl. Madras 2: 616. 1921; Pull. & Karupp., Fl. Andhra Pradesh 3: 841. 2018. **(Plate 53A)**

An erect, delicate herb, up to 12 cm long. Leaves in a whorl of 4, subequal, ovate-lanceolate, 2.5–4.5 cm long, membranous, oblique at base, acuminate at apex, margins entire, glabrous above, sparsely pubescent beneath. Flowers in terminal umbels, few flowered, 5-merous, white, bracteate. Bracts below the umbels, conspicuous, lanceolate or linear. Calyx very short, triangular, up to 2 mm long; lobes 5, acuminate, curved at tip. Corolla short, 3 mm across, 5-lobed from base; lobes ovate. Stamens 5; filaments short. Ovary glabrous; style linear. Capsule ovoid, dehiscing. Seeds small.

Fl. & Fr.: Jul.–Sep.

Habitat: Occasional on moss covered huge rocks under shady areas in the forest.

Specimen examined: Ijjaluru, *Y. Mahesh* 010964 (BSID).

3. BENKARA Adans.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1

1. Benkara malabarica (Lam.) Tirveng., Taxon 32: 440. 1983. *Randia malabarica* Lam., Encycl. 3: 25. 1789; Hook. f., Fl. Brit. India 3: 111. 1880; Gamble, Fl. Madras 2: 616. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 413. 1999. **(Plate 53B)** *'Pedali'*

An erect, armed, much branched shrub, up to 4 m high; spines short, straight. Leaves clustered, elliptic-oblong or obovate, 3–5.5 cm long, coriaceous, obtuse or cuneate at base, obtuse with short apiculate at apex, margins entire, glabrous; petiole up to 6 mm long; stipules connate, interpetiolar. Flowers in axillary corymbs, pale yellow or white, bracteate, bracteolate. Calyx campanulate, 4 mm across, 5-lobed; lobes triangular, valvate, acute. Corolla salver shaped, hairy at mouth, 5-lobed; lobes ovate, 4 mm across, recurved. Stamens 5; filaments short. Ovary short; style minute. Berry hard, globose, *c.* 9 mm across, red when ripe, with calyx marks on top. Seeds conical.

Fl. & Fr.: Feb.–Jul.

Habitat: Common in thorny scrub forests.

Specimen examined: Sirivaka, Kondamodalu, *Y. Mahesh* 011601, 011732 (BSID).

4. CATUNAREGAM Wolf

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Stipules triangular; flowers solitary, yellowish-white	**2. C. tomentosa**
1b.	Stipules ovate; flowers in corymbs, greenish white	**1. C. spinosa**

1. Catunaregam spinosa (Thunb.) Tirveng., Bull. Mus. Natl. Hist. Nat., Ser. 3. Bot. 35: 13. 1978 & Taxon 27: 515. 1978; Pull. & Karupp., Fl. Andhra Pradesh 3: 844. 2018. *Gardenia spinosa* Thunb., Gardenia. 16. 1780. *Randia dumetorum* (Retz.) Poir. var. *floribunda* (DC.) Gamble, Fl. Madras 2: 616. 1921. *Gardenia dumetorum* Retz., Observ. Bot. 2: 14. 1781. *Randia brandisii* Gamble, Fl. Madras 2: 616. 1921. *'Chinnamanga chettu'*

Small, spinous shrub; up to 3 m high; spines in axillary pairs, straight, sharp. Leaves clustered on branchlets, near spines, obovate, lanceolate, 2–3.2 cm long, narrowly acute at base, obtuse or acute at apex, margins entire, sparsely pubescent above, densely pubescent beneath; petiole up to 6 mm long; stipules ovate, acuminate. Flowers in axillary corymbs, subsessile cymes, greenish white. Calyx tube short, lobes 5, hairy outside. Corolla tubular, 6 mm long, 5-lobed; lobes ovate, obtuse, hairy without. Stamens 5, attached to the lobse ner base; filaments short. Ovary bilocular; style long, 6 mm. Berry, ovoid or globose, *c.* 1.5 cm across, glabrous, crowned by calyx tube, yellow when ripe. Seed rounded.

Fl. & Fr.: Feb.–Jun.

Habitat: Common in scrub forests.

Specimen examined: Pocharam, Eruwada*, Y Mahesh,* 010139, 011559 (BSID).

Field notes: Flowers white when young, turning yellow with age.

2. Catunaregam tomentosa (Blume ex DC.) Tirveng., Taxon 27: 515. 1978; Pull. & Karupp., Fl. Andhra Pradesh 3: 844. 2018. *Gardenia tomentosa* Blume ex DC., Prodr. 4: 379. 1830. *Randia tomentosa* (Blume ex DC.) Hook. f., Fl. Brit. India 3: 110. 1880. non Wight & Arn. *'Kotuvaga chettu'*

Small, spinous tree, up to 5 m high; bark greyish, rough; spines in pairs, woody, up to 3 cm long, sharp at tip; branchlets glabrous. Leaves oblong-obovate or spathulate, 3–7 cm long, cuneate at base, obtuse at apex, margins entire, glabrous above, sparsely tomentose beneath; petiole up to 1 cm long; stipules triangular. Flowers axillary on spines, solitary, yellowish-white, aromatic. Calyx cupular, pubescent outside, 5-lobed; lobes vulvate, ovate, 7 mm long, acute or obtuse. Corolla tubular, 8 mm long; lobes 5 or 9, obovate, orbicular, slightly narrowed at base, obtuse at tip. Stamens 9, attached on corolla lobes. Ovary globose. Berry globose, *c.* 2.6 cm across, glabrous. Seed 1.

Fl. & Fr.: Mar.–Sep.

Habitat: Common in deciduous forest.

Specimen examined: Kintukuru, *Y. Mahesh* 011491 (BSID).

5. COFFEA L.

India: 6 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Coffea arabica L., Sp. Pl. 1: 172. 1753; Hook. f., Fl. Brit. India 3: 153. 1880; Gamble, Fl. Madras 2: 636. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 418. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 847. 2018. *'Cofee chettu'*

Large, evergreen, glabrous shrub, up to 3 m high. Leaves elliptic-oblong or obovate, 8–18 cm long, narrow-rounded at base, sub-acuminate at apex, margins entire, glaucous above, dark beneath, glabrous; petiole up to 1 cm long; stipules interpetiolar, lanceolate. Flowers in axillary, 1–3-clustered cymes, bracteate, white, fragrant; bracts and bracteoles lanceolate. Calyx truncate, up to 3 mm long. Corolla tube up to 1.5 cm long; lobes 5, ovate, 1 cm long. Stamens 5, inserted at corolla tube apex; style short, filiform. Drupe oblong-subglobose, *c.* 1.5 cm long, deep crimson when ripe, 2-pyrened

Fl. & Fr.: Apr.–May.

Habitat: Planted in Maredumilli forest area.

Specimen examined: PK Valasa, *Y. Mahesh* 11769 (BSID).

Field notes: Planted for its coffee beverage obtained from seeds.

6. DENTELLA J.R. Forst. & G. Forst.

India: 1 sp. & 1 var.; Andhra Pradesh: 1 sp. & 1 var.; PNP: 1 sp.

1. Dentella repens (L.) J.R. Forst. & G. Forst., Char. Gen. Pl. 13. 1776; Hook. f., Fl. Brit. India 3: 42. 1880; Gamble, Fl. Madras 2: 590. 1921; Pull. & Karupp., Fl. Andhra Pradesh 3: 848. 2018. *Oldenlandia repens* L., Mant. Pl. 1: 40. 1767.

Prostrate, hairy herb; branches dichotomous, strigose, delicate, rooting at nodes. Leaves opposite, elliptic-oblong, 5 mm long, thick, attenuate at base, obtuse at apex, margins entire; petiole very short. Flowers axillary or forks of branchlets, solitary, subsessile, white. Calyx campanulate, 2 mm long, 5-lobed; lobes valvate, linear, hairy without. Corolla campanulate, 3 mm across, 5-lobed, each 3-partite, midlobe oblong, lateral lobes shorter, membranous, villous inside the throat. Stamens 5. Ovary bilocular, rounded; stigma subulate. Capsule globose, 3 mm, indehiscent, densely pubescent. Seeds small.

Fl. & Fr.: Apr.–Nov.

Habitat: Common along stream banks, canals and marshy sandy soils.

Specimen examined: Geediguppa, *Y. Mahesh* 010163 (BSID).

7. GALIUM L.

India: 31 spp., 1 subsp. & 10 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Galium asperifolium Wall., in Roxb. Fl. Ind. 1: 381. 1820; Gamble, Fl. Madras 656. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 400. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 849. 2018. *Galium mollugo* auct non L. 1753; Hook. f., Fl. Brit. India 3: 42. 1880.

Prostrate, scabrid herb; stems 4-angled, branched. Leaves subsessile, 5-8, whorled at each node, linear-oblong, or oblanceolate, 1.6 cm long, acute at base, apiculate at apex, margins entire, scabrous. Flowers in axillary or terminal panicled cymes, white, bracteolate. Capsule globose, 2 mm across, didymous, black when dry.

Fl. & Fr.: Mar.–Jul.

Habitat: Occasional in moist shady localities..

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

8. GARDENIA J. Ellis

India: 6 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 3 spp.

Key to the species

1a.	Leaves ovate-elliptic; lateral nerves close, more than 18 pairs	2
1b.	Leaves obovate-suborbicular; lateral nerves not close, less than 18 pairs	**2. G. latifolia**
2a.	Leaves sessile; flowers sessile	**1. G. gummifera**
1b.	Leaves petiolate; flowers pedicellate	**3. G. resinifera**

1. Gardenia gummifera L.f., Suppl. Pl. 164. 1782; Hook. f., Fl. Brit. India 3: 116. 1880; Gamble, Fl. Madras 2: 618. 1921; Pull. & Karupp., Fl. Andhra Pradesh 3: 849. 2018. **(Plate 53C)** *'Chinnamitta', Bikki'*

Small trees, up to 5 m high; bark grey; young parts pubescent. Leaves opposite, sessile, elliptic-oblong, 4–8 cm long, rounded at base, apex subacute, margins entire, ciliate when young, shining, glabrous; lateral nerves more than 15 pairs, prominent; petiole short, 6 mm long. Flowers axillary, terminal, solitary, 8 cm long, white. Calyx 7 mm long, pubescent, lobes 5, subequal, triangular, obtuse. Corolla tube 4.5 cm long, pubescent; lobes 5, oblong, 2 cm long, obtuse. Stamens 5, epipetalous. Ovary ovoid, pubescent, unilocular; style glabrous; stigma bifid. Berry ellipsoid, 3 cm long, glabrous, edible. Seeds many, compressed.

Fl. & Fr.: Mar.–Jun.

Habitat: Common in hilly slopes of deciduous forests.

Specimen examined: Eruwada, Kondamodalu, *Y. Mahesh* 010674, 011720 (BSID).

2. Gardenia latifolia Aiton, Hort. Kew. 1: 294. 1789; Hook. f., Fl. Brit. India 3: 116. 1880; Gamble, Fl. Madras 2: 619. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 400. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 851. 2018. *'Pedda manga', 'Pedda bikkiri chettu'*

Moderate sized trees, up to 10 m high; young parts pubescent. Leaves opposite, broadly obovate-suborbicular, 10–20 cm long, rounded or narrowed at base, obtusely acuminate at apex, margins entire, appressed ciliate, sparsely pubescent; lateral nerves prominent below; petiole very short. Flowers axillary, solitary, 6.5 cm long white, turning into yellow. Calyx 1.4 cm long, densely pubescent, deeply divided in to 8–9 lobed. Corolla tube up to 5 cm long, puberulous without, lobes 9, obliquely obovate, 2.6 cm long. Stamens 8–9, epipetalous. Ovary ovoid, pubescent, unilocular; style pubescent; stigma club shaped. Berry hard, globose, *c.* 4.5 cm across, hard. Seeds many, flattened.

Fl. & Fr.: Aug.–Jul.

Habitat: Occasional along hilly areas and slopes.

Specimen examined: Maredupudi, *Y. Mahesh* 010106 (BSID).

3. Gardenia resinifera Roth, Nov. Pl. Sp. 150. 1821; R.S. Rao & al., Fl. E. Godavari Dist. 400. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 852. 2018. *Gardenia lucida* Roxb., Fl. Ind. 2: 553. 1824; Hook. f., Fl. Brit. India 3: 115. 1880; Gamble, Fl. Madras 2: 618. 1921. **(Plate 53D)** *'Karinga', Konda manga'*

Small trees, up to 5 m high; young branches pubescent. Leaves opposite, subsessile, elliptic-oblong, 12–18 cm long, chartaceous, obtuse, rounded at base, subacute at apex, margins entire, shining, sparsely pubescent; lateral nerves more than 20 pairs; petiole short. Flowers axillary, solitary, 4.5 cm long, white or pale yellow, pedicellate. Calyx 1 cm long; lobes 5, unequal, linear-subulate, pubescent without. Crolla tube narrow, 4 cm long; lobes 5, obovate, obtuse, pubescent. Stamens 5, epipetalous. Ovary narrow, unilocular; style glabrous; stigma bifid. Berry ovoid-ellipsoid, 4 cm long, with slightly enlarged calyx lobes. Seeds numerous, flattened.

Fl. & Fr.: Apr.–Sep.

Habitat: Occasional in deciduous forests

Specimen examined: Eruwada, *Y. Mahesh* 010644 (BSID).

9. GYNOCHTHODES Blume

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Gynochthodes umbellata (L.) Razafim. & B. Bremer, Adansonia 33: 296. 2011. *Morinda umbellata* L., Sp. Pl. 1: 176. 1753; Hook. f., Fl. Brit. India 3: 157. 1880; Gamble, Fl. Madras 2: 652. 1921; Pull. & Karupp., Fl. Andhra Pradesh 3: 872. 2018.

A climbing shrub, up to 4 m high. Leaves opposite, elliptic-obovate or lanceolate, 8–15 cm long, cuneate at base, acute at apex, margins entire, shining, glabrous above, tomentose beneath; petiole up to 2.5 cm long; stipules acuminate. Flowers in terminal umbellate heads, white. Calyx truncate, 4-lobed; lobes triangular. Corolla tube, 5 mm long, hairy, 4-lobed; lobes oblong, recurved. Stamens 4, included. Fruit synacarp, *c.* 6 mm.

Fl. & Fr.: Apr.–Aug.

Habitat: Occasional in the forest pathways.

Specimen examined: Gokavaram, *Y. Mahesh* 011415 (BSID).

10. HEDYOTIS L.

India: 47 spp., 2 subsp. & 3 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Hedyotis neesiana Arn., Nova Acta Acad. Caes. Leop.-Carol. German. Nat. Cur. 18: 341. 1836; Pull. & Karupp., Fl. Andhra Pradesh 3: 855. 2018. *Hedyotis nitida* Wight & Arn., Prodr. Fl. Ind. Orient.412. 1834; Hook. f., Fl. Brit. India 3: 61. 1880; R.S. Rao & al., Fl. E. Godavari Dist. 405. 1999. *Oldenlandia nitida* (Wight & Arn.) Gamble, Fl. Madras 2: 597. 1921. **(Plate 53E)** *'Gadithimokka'*

Prostrate or decumbent herb; up to 45 cm high; stem ascending, 4-angled. Leaves opposite, elliptic-lanceolate, or ovate, 3–5 cm long, sub-coriaceous, attenuate at base, acute at apex, margins entire, wavy, recurved, glabrous; petioles short. Flowers in axillary, few flowered clusters, small, 5 mm long, white. Calyx tubular, 2 mm long, 4-lobed; lobes ovate. Corolla 4 mm long, 4-lobed, glabrous; lobes lanceolate, reflexed. Stamens included. Ovary glabrous; style simple. Capsule ovoid, *c.* 5 mm long, glabrous. Seeds numerous, minute, angled.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in moist localities in the forest.

Specimen examined: Ijjaluru, *Y. Mahesh* 010536 (BSID).

11. HYMENODICTYON Wall.

India: 3 spp.; Andhra Pra*des*h: 2 spp.; PNP: 1 sp.

1. Hymenodictyon orixense (Roxb.) Mabb.in Taxon 31: 66. 1982; R.S. Rao & al., Fl. E. Godavari Dist. 406. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 856. 2018. *Cinchona orixensis* Roxb., Bot. Descr. Swetenia 21. 1793. *Hymenodictyon exelsum* (Roth) Wall., in Roxb., Fl. Ind. 2: 149. 1824; Hook. f., Fl. Brit. India 3: 35. 1880; Gamble, Fl. Madras 2: 589. 1921. *'Potaka', 'Dudippa'*

Moderate sized trees, up to 15 m high; young parts brown pubescent. Leaves opposite, ovate-elliptic or obovate, 15–25 cm long, abruptly acuminate or narrow at base, acuminate, apiculate at apex, margins entire, sparsely pubescent above, densely so beneath; petiole up to 7 cm long; stipules ovate. Flowers in axillary and terminal, spiciform, pubescent, panicles, small, 2 mm long, white, bracteate. Calyx short, lobes 5, ovate, acute, pubescent. Corolla 2.5 mm long, pubescent without, lobes 5. Stamens 5, epipetalous. Ovary bilocular, pubescent; style stout. Capsule ellipsoid, *c.* 2 cm long, loculicidal, 2-volved, brown. Seeds many, winged.

Fl. & Fr.: Jul.–Nov.

Habitat: Occasional in rocky hills of dry deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

12. IXORA L.

India: 33 spp. & 3 var.; Andhra Pradesh: 5 spp.; PNP: 3 spp.

Key to the species

1a.	Calyx lobes equal to the corolla tube	**3. I. undulata**
1b.	Calyx lobes reduced to teeth or 0	2
2a.	Flower buds globose; corolla tube less than 1 cm long	**1. I. brachiata**
2b.	Flower buds ellipsoid; corolla tube more than 1 cm long	**2. I. pavetta**

1. Ixora brachiata Roxb., Fl. Ind. 1: 381. 1820; Hook. f., Fl. Brit. India 3: 142. 1880; Gamble, Fl. Madras 2: 631. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 407. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 858. 2018. *'Koripala', 'Korivichettu'*

A medium sized, evergreen tree, up to 8 m high. Leaves opposite, oblong-elliptic, 8–15 cm long, thinly coriaceous, acute-narrow at base, acuminate at apex, margins entire, glabrous; petiole up to 1.2 cm long. Flower buds globose in terminal, sessile cymes; flowers white. Corolla tube slender, 6 mm long; lobes 4; buds globose. Capsule globose, reddish-black when ripe. Seeds globose, large.

Fl. & Fr.: Feb.–Sep.

Habitat: Common along stream banks.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Ixora pavetta Andrews, Bot. Repos. 2: t. 78. 1799; R.S. Rao & al., Fl. E. Godavari Dist. 407. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 858. 2018. *Ixora parviflora* Vahl, Symb. Bot. 3: 11, t. 52: 1794; Hook. f., Fl. Brit. India 3: 142. 1880; Gamble, Fl. Madras 2: 631. 1921.

Small, evergreen tree, up to 6 m high; branches glabrous. Leaves opposite, elliptic-obovate, 8–12 cm long, coriaceous, rounded or subcordate at base, acute at apex, margins entire, glabrous, shining; petiole short, 3

mm long; stipules sheathing, acuminate. Flower buds ellipsoid in terminal branched cymes, 1 cm long; flower white, tetramerous. Calyx truncate, glabrous; lobes 4, triangular, toothed. Corolla tube stout, 1.2 cm long; lobes 4, lineor-oblong, obtuse, recurved. Stamens 4, excerted. Ovary globose; style filiform. Berry globose, *c.* 6 mm across, red, didynomous, shining. Seeds flattened.

Fl & Fr.: Mar.–Jun.

Habitat: Common in scrub jungles and along pathways in dry deciduous forest.

Specimen examined: Buruguwada, Tekupally, Kondamodalu, *Y. Mahesh* 010090, 010173, 011763 (BSID).

3. Ixora undulata Roxb., Fl. India. 1: 395. 1820; Hook. f., Fl. Fl. Brit. India 3: 147.1880; Gamble, Fl. Madras 2: 631. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 408. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 861. 2018.

Small shrubs, up to 2.5 m high. Leaves opposite, elliptic-lanceolate or oblong-obovate, 10–20 cm long, coriaceous, attenuate at base, acuminate at apex, margins entire, undulate, glabrous; petiole up to 1.2 cm long. Flowers in terminal, slender branched peduncles, bracteate, white. Calyx tube smooth, very short; lobes 4, equal to the corolla tube. Corolla salver shaped, tube up to 8 mm long, glabrous without, lobes 4. Stamens 4. Ovary globose; style filiform. Berry globose, *c.* 5 mm across, succulent, dull purple.

Fl. & Fr.: Apr.–Sep.

Habitat: Occasional along pathways in dry deciduous forest.

Specimen examined: Geediguppa, *Y. Mahesh* 010154 (BSID).

13. KNOXIA L.

India: 4 spp., 1 subsp. & 4 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Knoxia sumatrensis (Retz.) DC., Prodr. 4: 569. 1830; Pull. & Karupp., Fl. Andhra Pradesh 3: 863. 2018. *Spermacoce sumatrensis* Retz., Observ. Bot. 4: 23. 1786. *Knoxia mollis* R.Br. ex Wight & Arn., Prodr. Fl. Ind. Orient. 439. 1834; Hook. f., Fl. Brit. India 3: 129. 1880; Gamble, Fl. Madras 2; 622. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 408. 1999.

An erect, branched, pubescent herb, up to 1.2 m high; branches obtusely quadrangular. Leaves opposite, linear-lanceolate or elliptic, 6–10 cm long, attenuate at base, acute-acuminate at apex, margins entire, sparsely pubescent above, densely pubescent below; petiole up to 6 mm long. Flowers in axillary and terminal, corymbose cymes, mostly axils of upper most leaves, densely grey pubescent, 2 mm long, violet or white. Calyx very short, hairy; lobes 4, deltoid, acute. Corolla lobes 4, oblong, 5 mm long, hispid, apex hooded. Stamens 4. Ovary obovoid, glabrous; style filiform. Capsule ellipsoid, *c.* 3 mm long, angled, breaking into two 1-seeded mericarps. Seeds 2, angled.

Fl. & Fr.: Aug.–Dec.

Habitat: Common as undergrowth in the deciduous forest.

Specimen examined: PK Valasa, Kavadiguntla East, *Y. Mahesh* 010457, 011367 (BSID).

14. MITRACARPUS Zucc.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Mitracarpus hirtus (L.) DC., Prodr. 4: 572. 1830; Pull. & Karupp., Fl. Andhra Pradesh 3: 868. 2018. *Spermacoce hirta* L., Sp. Pl., ed. 2. 1: 148. 1762. *Mitracarpus villosus* (Sw.) DC., Prodr. 4: 572. 1830. **(Plate 53F)**

An erect herb, up to 30 cm high; stems 4-angled, hairy. Leaves decussate, subsessile, elliptic-lanceolate, 1.5–2.8 cm long, attenuate at base, acute at apex, margins entire, pubescent below. Stipules interpetiolar. Flowers in axillary and terminal capitate cymes, white. Calyx up to 5 mm long; lobes 4, pubescent. Corolla lobes 4, pubescent without. Stamens 4. Ovary filiform. Capsule globose, *c.* 3 mm long. Seeds oblong, brown.

Fl. & Fr.: Nov.–Mar.

Habitat: Common weed in cultivated fields, along roadsides and waste lands.

Specimen examined: PK Valasa, Ijjaluru, *Y. Mahesh* 010438, 010966 (BSID).

15. MITRAGYNA Korth.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Mitragyna parvifolia (Roxb.) Korth., Obs. Naucl. Ind. 19. 1839; Gamble, Fl. Madras 2: 585. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 409. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 869. 2018. *Nauclea parvifolia* Roxb., Pl. Coeomandel t. 52, 1796 & Fl. Ind. 1: 513. 1832. *Stephegyna parvifolia* Korth., Verh. Nat. Gescm. Ned. Bezitt. Bot. 161. 1840; Hook. f., Fl. Brit. India 3: 25. 1880. **(Plate 53G)** *'Pacha pasari', Batakanagu'*

Medium sized trees, up to 20 m high; young branches pubescent. Leaves opposite, ovate-obovate or oblong, 10–15 cm long, rounded at base, subacute at apex, margins entire, puberulous; petioles up to 4 cm long; stipules oblong, up to 1.2 cm long, deciduous. Flowers in terminal, globose heads, 6 mm long, creamy-white; heads *c.* 2.2 cm across. Calyx truncate, 2 mm long; lobes 5, pilose without. Corolla lobes 5, ovate-triangular, recurved. Stamens 5. Ovary bilocular; style exserted. Fruit oblong- obovoid or globose, *c.* 5 mm long, head of capsule, faintly ribbed.

Fl. & Fr.: Apr.–Oct.

Habitat: Occasional in hilly slopes of deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

16. MORINDA L.

India: 4 spp. & 2 var.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Morinda coreia Buch.-Ham., Trans. Linn. Soc. London 13: 537. 1822. *Morinda pubescens* Sm., Cycl. 24: n. 3. 1813; R.S. Rao & al., Fl. E. Godavari Dist. 410. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 871. 2018; Verdc., Kew Bull. 37: 543. 1983. *Morinda tinctoria* Roxb., Fl. Ind. 2: 197. 1824, non Noronha, 1790; Hook. f., Fl. Brit. India 3: 156. 1880; Gamble, Fl. Madras 2: 652. 1921. **(Plate 53H)** *'Togarumaddi'*

Small trees, up to 6 m high. Leaves opposite, elliptic-ovate or obovate, 8–15 cm long, acute or attenuate at base, acuminate at apex, margins entire, pubescent on both surfaces; petiole up to 1.4 cm long; stipules short, ovate. Flowers in axillary, leaf opposed globose receptacle, 1.6 cm long, white. Calyx truncate, 4 mm long. Corolla tube 1.8 cm long, 5-lobed, pubescent without; lobes ovate. Stamens 5. Style bilobed. Fruit subglobose, irregular syncarpium formed by succulent accrescent calyx, *c.* 2.5 cm across. Seeds flattened, winged.

Fl. & Fr.: Apr.–Oct.

Habitat: Common in deciduous forest.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011387 (BSID).

17. NEANOTIS W.H.Lewis

India: 24 spp. & 3 var.; Andhra Pradesh: 1 sp.; PNP: 2 spp.

Key to the species

1a.	Flowers sessile in clusters	**2. N. tubulosa**
1b.	Flowers pedicelled and sessile in dichasial cymes	**1. N. calycina**

1. Neanotis calycina (Wall. ex Hook.f.) W.H. Lewis, Ann. Missouri Bot. Gard. 53: 37. 1966; Pull. & Karupp., Fl. Andhra Pradesh 3: 872. 2018. *Anotis calycina* Wall. ex Hook. f., Fl. Brit. India 3: 73. 1880; Gamble, Fl. Madras 2: 605. 1921.

Small, erect herb, up to 22 cm high; stems 4-angled, decumbent below. Leaves ovate-lanceolate, rounded at base, acuminate at apex, margins ciliate. Flowers few, in axillary and terminal cymes, 0.4 cm long, white. Capsule biloculed, broader than long, *c.* 0.42 cm broad, hairy, bilocular. Seeds numerous.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in shady rocky localities.

Specimen examined: Kondrukota, *Y. Mahesh* 011652 (BSID).

2. Neanotis tubulosa (G. Don) Mabb. in Manilal, Bot. Hist. Hort. Malab. 92. 1980; Mahesh & al. in Indian Forester 148 (11): 1160. 2022. *Oldenlandia tubulosa* G.Don. Gen. Syst. 3: 531. 1834 p.p. *Anotis quadrilocularis* (Thwaites) Hook. f. Fl. Brit. India 3: 74. 1880; Gamble, Fl. Madras 2: 427. 1957. *Hedyotis quadrilocularis* Thwaites, Enum. Pl. Zeyl. 144.1859; Bedd., Ic. t. 28. 1868 - 1874. *Neanotis quadrilocularis* (Thwaites) W.H. Lewis in Ann. Missouri Bot. Gard. 53: 40. 1966. **(Plate 54)**

Erect annual herb, 8-30 cm high; rooting at basal nodes; stems terate at base, quadrangular above, glabrous. Leaves ovate or ovate–lanceolate, 1.0-3.5 cm long, membranous, sparsely pubescent above, sparsely pubescent on nerves below, acute at apex, base rounded, attenuate, margin entire; petiole 2-6 mm long; stipules membranous, sheath truncate, Inflorescence axillary, terminal cyme. Flowers salverform; lavender-light purple. Calyx 4, lobes triangular, ovate-oblong, 0.7-1.3 mm long, glabrous, fimbriate on margins. Corolla 4; tube 3.2-4.5

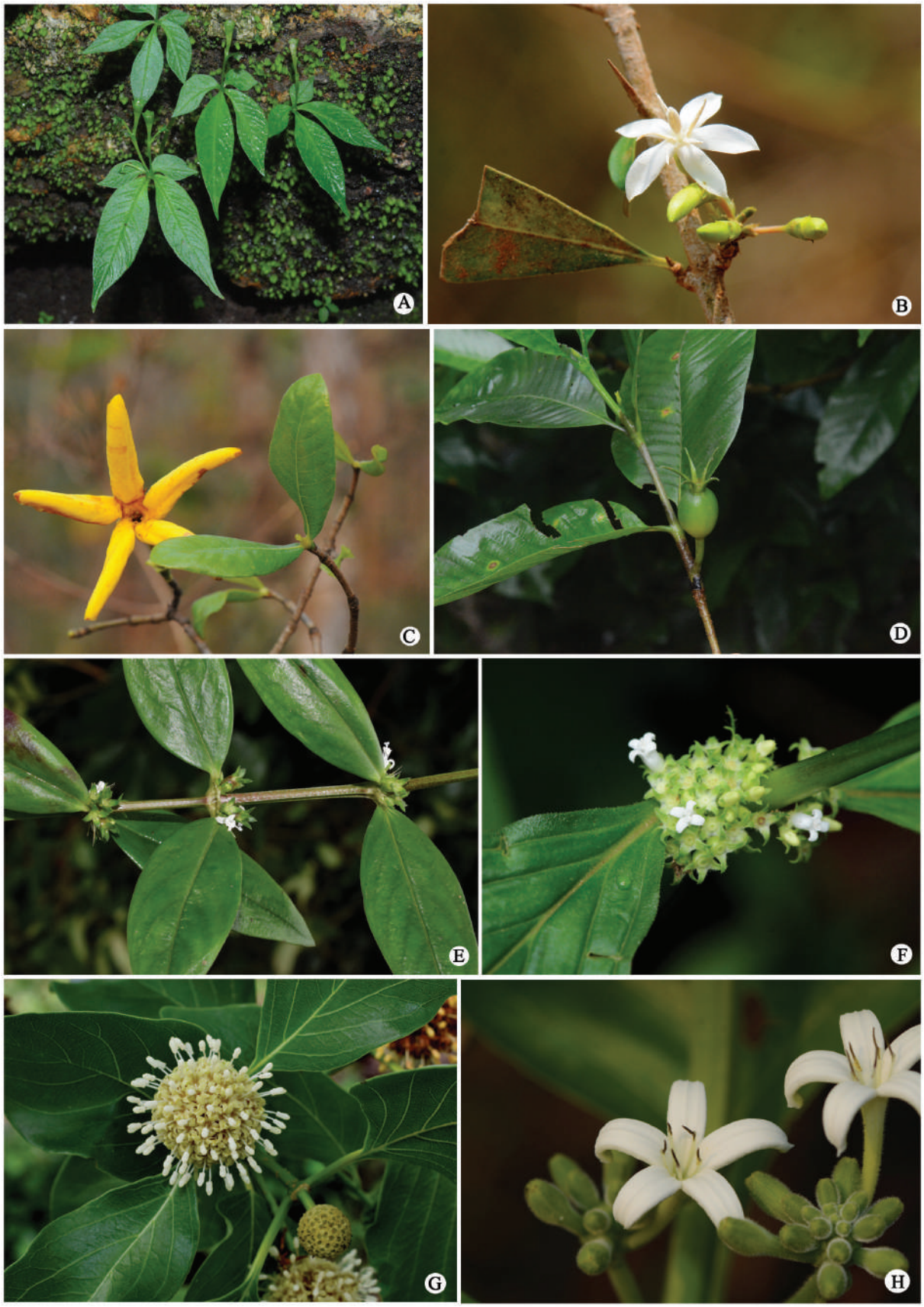


Plate 53: A. *Argostemma verticillatum* Wall.; **B.** *Benkara malabarica* (Lam.) Tirveng.; **C.** *Gardenia gummifera* L.f.; **D.** *Gardenia resinifera* Roth; **E.** *Hedyotis neesiana* Arn.; **F.** *Mitracarpus hirtus* (L.) DC.; **G.** *Mitragyna parvifolia* (Roxb.) Korth.; **H.** *Morinda coreia* Buch.-Ham.

mm long; lobes ovate, elliptic or deltoid, 1.1-2.2 mm long, hairy near apex. Stamens exserted; filaments 0.4-0.8 mm long. Capsule 4-locular; loculicidal dehiscent, obovoid, 1.4-2 mm long. Seeds 3-5 per locule, cancavo-convex, cymbiform, reticulate on both sides, dark brown.

Flowering & Fruiting: Aug.-Oct.

Habitat: Rare on rocky crevices of the hills.

Specimen examined: Valamuru , *Y. Mahesh* 010477 (BSID).

18. OLDENLANDIA L.

India: 23 spp.; Andhra Pradesh: 13 spp.; PNP: 4 spp.

Key to the species

1a.	Capsule 4-winged or angled; seeds hardly angled, testa pitted	**3. O. ovatifolia**
1b.	Capsule terete; seeds angular, testa reticulate	2
2a.	Flowers 1-many, white, black when dry	**4. O. umbellata**
2b.	Flowers 1-4, white	3
3a.	Erect herbs; corolla tube slender; capsule valves slender	**2. O. herbacea**
3b.	Diffuse herbs; corolla tube short and broad; capsule valves short	**1. O. corymbosa**

1. Oldenlandia corymbosa L., Sp. Pl. 1: 119. 1753; Hook. f., Fl. Brit. India 3: 64. 1880; Gamble, Fl. Madras 2: 600. 1921; Pull. & Karupp., Fl. Andhra Pradesh 3: 877. 2018. *Hedyotis corymbosa* (L.) Lam., Encycl. 1: 272. 1792; R.S. Rao & al., Fl. E. Godavari Dist. 404. 1999.

Diffuse or erect, branched herbs, up to 25 cm high; stems obscurely angled, glabrous. Leaves decussate, linear-lanceolate, 2–3.5 cm long, decurrent at base, acute at apex, margins entire, recurved, glabrous; petiole short; stipules truncate, membranous. Flowers in dichotomously branched, axillary cymes, 2-flowered, 2 mm long, white, shortly pedicelled. Calyx small, lobes 4, narrow, triangular, slightly winged. Corolla short, lobes 4, ovate, acute. Stamens 4. Ovary bilocular; style short. Capsule globose, *c.* 2.5 mm across, loculicidal, somewhat pyriform, didymous. Seeds many, minute, yellowish-brown.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weed along roadsides and moist waste places.

Specimen examined: Shivagiri, *Y. Mahesh* 011623 (BSID).

2. Oldenlandia herbacea (L.) Roxb., Fl. Ind. 1: 445. 1820; Gamble, Fl. Madras 2: 601. 1921; Pull. & Karupp., Fl. Andhra Pradesh 3: 878. 2018. *Hedyotis herbacea* L., Sp. Pl. 102. 1753; R.S. Rao & al., Fl. E. Godavari Dist. 404. 1999. *Oldenlandia heynii* R. Br. ex G. Don, Gen. Syst. 3: 531. 1834; Hook. f., Fl. Brit. India 3: 65. 1880.

Small erect, annual herbs, up to 25 cm high; stem quadrangular, glabrous. Leaves decussate, linear-lanceolate, 1.5–3 cm long, chartaceous, decurrent at base, acute at apex, margins entire, glabrous. Flowers solitary or 2-4 together in axillary filiform peduncles, shortly pedicellate, white. Calyx short, lobes 4, lanceolate. Corolla tube slender, up to 2 mm long, lobes 4, ovate, acute. Stamens 4. Ovary short; style minute. Capsule loculicidal, with numerous seeds, *c.* 3 mm across, crown protruded. Seeds many, small.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in moist localities and water course areas.

Specimen examined: Geediguppa, *Y. Mahesh* 011586 (BSID).

3. Oldenlandia ovatifolia (Cav.) DC., Prodr. 4: 427. 1820; Pull. & Karupp., Fl. Andhra Pradesh 3: 879. 2018. *Hedyotis ovatifolia* Cav., Ic. 6: 52. 1801; R.S. Rao & al., Fl. E. Godavari Dist. 405. 1999. *Oldenlandia nudicaulis* Roth, Nov. Pl. Sp. 95. 1821; Hook. f., Fl. Brit. India 3: 70. 1880; Gamble, Fl. Madras 2: 602. 1921.

A small, erect herb, up to 15 cm high; stem angled, grooved. Leaves subsessile, 4 in a whorl, radical, broadly elliptic-ovate or oblong, 2.2–4.5 cm, suddenly acute or rounded at base, acute at apex, margins entire, sparsely hairy; stipules small, ovate. Flowers small, 3 mm long, in terminal, dichotomously branched cymes, white, bracteate, pedicellate; pedunculus up to 5 cm long. Calyx 4-lobed, accrescent; lobes ovate-triangular. Corolla campanulate, 2 mm long; lobes 4, obovate, hairy near throat. Stamens 4. Ovary obscure. Capsule small *c.* 3 mm across, with rounded base, loculicidally dehiscent. Seeds small, few, pitted.

Fl. & Fr.: Oct.–Jan.

Habitat: Common along stream banks and waste places in the forest.



Plate 54: *Neanotis tubulosa* (G. Don) Mabb. **A.** Habit; **B.** Overview of Flower; **C.** Capsule; **D.** Flower with sepals; **E.** Stamens; **F.** Style and Stigma; **G.** Dorsal view of Seed; **H.** Ventral View of Seed.

Specimen examined: Ijjaluru, *Y. Mahesh* 010533 (BSID).

4. Oldenlandia umbellata L., Sp. Pl. 1: 119. 1753; Hook. f., Fl. Brit. India 3: 66. 1880; Gamble, Fl. Madras 2: 601. 1921; Pull. & Karupp., Fl. Andhra Pradesh 3: 882. 2018. *Hedyotis umbellata* (L.) Lam. Tabl. Encycl. 1: 272. 1792; R.S. Rao & al., Fl. E. Godavari Dist. 406. 1999. *Oldenlandia wightii* Hook. f., Fl. Brit. India 3: 66. 1880; Gamble, Fl. Madras 2: 601. 1921. *'Chiruveru'*

Procumbent herb; up to 15 cm high; stem ascending, obscurely angular, scaberulous. Leaves fascicled, sessile, linear-ovate, 1.4 cm long, decurrent at base, acute at apex, margins recurved, scaberulous along margins, glabrous; stipules 3–5, long bristly. Flowers in axillary umbellate cymes, 8–12-flowered, 5 mm long, white, bracteate. Calyx 3 mm long, 4-lobed; lobes narrow-triangular, ciliolate along margins. Corolla 3 mm long, 4-lobed; lobes oblong, hairy near throat. Stamens 4, epipetalous. Ovary bilocular; style short, slender. Capsule globose, *c.* 2 mm across, loculicidal. Seeds many, angular, brown.

Fl. & Fr.: Sep.–Nov.

Habitat: Common weed in cultivated fields, along roadsides and open waste lands.

Specimen examined: Kothuru, *Y. Mahesh* 011658 (BSID).

19. PAEDERIA L.

India: 2 spp. & 1 subsp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Paederia foetida L., Mant. Pl. 52. 1767; Hook. f., Fl. Brit. India 3: 195. 1880; Pull. & Karupp., Fl. Andhra Pradesh 3: 885. 2018. **(Plate 55A)**

A large, climbing shrub, foetid when bruished. Leaves opposite, elliptic-ovate, 5–9 cm long, rounded at base, acute or acuminate at apex, margins entire, glabrous; petiole up to 5 cm long; stipules short, interpetiolar. Flowers in axillary and terminal, trichotomously branched cymes, up to 2 cm long, purple, puberulous, bracteate, bracteolate. Calyx funnel shaped, tomentose, 5-lobed, lobes deltoid. Corolla funnel shaped, pubescent, 5-lobed. Stamens 5. Ovary compressed; style short, slender. Fruit *c.* 8 mm long, compressed.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in open areas in deciduous forests.

Specimen examined: Kintukuru, L. Rasingam & *Y. Mahesh* 011462 (BSID).

20. PAVETTA L.

India: 18 spp. & 6 var.; Andhra Pradesh: 4 spp.; PNP: 3 spp.

Key to the species

1a.	Leaves tomentose; stipules caudate, hairy	**3. P. tomentosa**
1b.	Leaves glabrous; stipules short, broad	2
2a.	Leaves obovate-oblong or oblanceolate, chartaceous	**1. P. indica**
2b.	Leaves elliptic-oblong, coriaceous	**2. P. madrassica**

1. Pavetta indica L., Sp. Pl. 1: 110. 1753; Hook. f., Fl. Brit. India 3: 150. 1880; Gamble, Fl. Madras 2: 633. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 411. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 886. 2018. *'Tellapapidi'*

Large shrubs or small trees, up to 3 m high; young parts tomentose. Leaves opposite, oblong or obovate-oblanceolate, 8–15 cm long, chartaceous, rounded at base, obtuse at apex, margins entire, sparsely pubescent above, tomentose beneath; petiole up to 1.3 cm long; stipules short, membranous, ovate. Flowers in axillary and terminal, trichotomous corymbose panicles, 1.4 cm long, white, fragrant, bracteate. Calyx very short, lobes 4, deltoid, pubescent. Corolla tube narrow, up to 1.4 cm long, glabrous, lobes 4, oblong. Stamens 4. Ovary bilocular, pubescent; style slender, exserted. Drupe globose, *c.* 6 mm across, pubescent, black when ripe. Seed 1.

Fl. & Fr.: May–Oct.

Habitat: Common in open deciduous forests.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Pavetta madrassica Bremek., Repert. Spec. Nov. Regni Veg. 37: 91. 1934; Ahmedullah & Nayar, Endemic pl. Indian Region 45. 1987; Pull. & Karupp., Fl. Andhra Pradesh 3: 887. 2018.

An erect, much branched shrub, up to 3.5 m high; young branches puberulous. Leaves elliptic-oblong, 4–10 cm long, coriaceous, acute at base, subacute at apex, margins entire, glabrous above, pubescent beneath; petiole

up to 1.2 cm long; stipules short, interpetiolar. Flowers in terminal trichotomously branched, corymbose cymes, pedunculate, bracteate. Calyx tube short, pubescent without, lobes triangular. Corolla tube cylindrical, up to 2 cm long, pubescent within, glabrous without; lobes 6, oblong-obovate. Ovary slender. Drupe subglobose, *c.* 6 mm long, didymous, black when ripe. Seeds 1 or 2.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in hil slopes and along streams in plain.

Specimen examined: PK Valasa, *Y. Mahesh* 012115 (BSID).

3. Pavetta tomentosa Roxb. ex Sm., in Rees, Cyclop. 26: n. 2. 1819; Gamble, Fl. Madras 3: 1879. 1935; Pull. & Karupp., Fl. Andhra Pradesh 3: 887. 2018. *Pavetta indica* L. var. *tomentosa* (Roxb. ex Sm.) Hook. f., Fl. Brit. India 3: 150. 1880; Gamble, Fl. Madras 2: 683. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 412. 1999. **(Plate 55B)**

Small bushy shrub, up to 4 m high; young branches and leaves tomentose. Leaves opposite, elliptic-ovate or oblong, 6–10 cm long, rounded at base, acute at apex, margins entire. sparsely tomentose above, densely pubescent beneath; petioles short; stipules hairy, caudate. Flowers in terminal, dichotomously branched corymbose cymes, 1 cm long, white, fragrant. Calyx lobes short, tomentose. Corolla tube up to 7 mm long, pubescent; lobes 5, ovate. Stamens 5. Ovary globose; style short, much exserted, hispid. Berry subglobose, black when ripe.

Fl. & Fr.: May–Jan.

Habitat: Common along pathways in open dry deciduous forest.

Specimen examined: Kintukuru, Kondamodalu, *Y. Mahesh* 011406, 011444 (BSID).

21. PSYDRAX Gaertn.

India: 6 spp. & 1 var.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1b.	Flowers in umbels; fruits obovoid	**2. P. umbellata**
1b.	Flowers in cymes; fruits globose	**1. P. dicoccos**

1. Psydrax dicoccos Gaertn., Fruct. Sem. Pl. 1: 125. 1788; Pull. & Karupp., Fl. Andhra Pradesh 3: 889. 2018. *Canthium dicoccum* (Gaertn.) Merr., Philipp. J. Sci. 35: 8. 1928; R.S. Rao & al., Fl. E. Godavari Dist. 398. 1999. *Plectronia didyma* (Gaertn.) Kurz., For. Fl. Burma 2: 35. 1877; Gamble, Fl. Madras 2: 624.1921. *Canthium didymium* Gaertn., Fruct. 3: 94, t. 26. 1805; Hook. f., Fl. Brit. India 3: 132. 1880. *'Nllabalusu'*

Small tree, up to 4 m high; branches glabrous. Leaves opposite, oblong-lanceolate or ovate, 5–10 cm long, coriaceous, acute at base, acuminate or obtusely caudate at apex, margins entire, glabrous on both surfaces; petiole up to 6 mm long. Flowers pentamerous, in axillary fascicled cymes, greenish-white. Calyx up to 3 mm long, lobes 6, pubescent without. Corolla tube 3 mm long, hairy within, lobes 6, oblong, 4 mm long, acute, reflexed. Stamens 6; filaments short. Drupe globose, *c.* 1.5 cm long, didymous, glabrous.

Fl. & Fr.: Dec.–Apr.

Habitat: Occasional in open moist deciduous forest.

Specimen examined: Maredumilli, *Y. Mahesh* 011531 (BSID).

2. Psydrax umbellatus (Wight) Bridson, Kew Bull. 48: 762. 1993; Pull. & Karupp., Fl. Andhra Pradesh 3: 891. 2018. *Canthium umbellatum* Wight, Icon. Pl. Ind. Orient. t. 1034. 1845; Hook. f., Fl. Brit. India 3: 132. 1880. *Plectronia didyma* (Gaertn.) Kurz. var. *umbellate* (Wight) Gamble, Fl. Madras 2: 624. 1921. **(Plate 55C)** *'Nallabalasu'*

Densely foliaceous, small tree, up to 8 m high; branches green, glabrous, 4-angled when young. Leaves opposite, elliptic-lanceolate or oblong-obovate, 6–15 cm long, coriaceous, acute at base, acuminate at apex, margins entire, glabrous on both surfaces; petiole up to 1 cm long; stipules small, lanceolate. Flowers in axillary, pedunculate umbels. Calyx tube short, 4-lobed. Corolla tube up to 3 mm long, hairy within, 4-lobed; lobes oblong, acute. Stamens 4. Ovary short, up to 2 mm long; style short. Drupe obovoid, *c.* 7 mm across.

Fl. & Fr.: Dec.–May.

Habitat: Common along stream banks in the deciduous forests.

Specimen examined: Buruguwada, Tekupally, *Y. Mahesh* 010105, 010172 (BSID).

22. SPERMACOCE L.

India: 9 spp.; Andhra Pradesh:5 spp.; PNP: 4 spp.

Key to the species

1a.	Seeds transversely rugose	**4. S. remota**
1b.	Seeds not transversely rugose	2
2a.	Erect herbs; leaves linear-lanceolate	**3. S. pusilla**
2b.	Diffuse or erect herbs; leaves elliptic-lanceolate or ovate-obovate	3
3a.	Much branched bushy herb; flowers white	**2. S. ocymoides**
3b.	Prostrate herbs; flowers pale pink	**1. S. articularis**

1. Spermacoce articularis L.f., Suppl. Pl. 119. 1782; Pull. & Karupp., Fl. Andhra Pradesh 3: 894. 2018. *Borreria articularis* (L.f.) F.N. Williams, Bull. Herb Boissier, Ser. 2. 5: 956. 1905; R.S. Rao & al., Fl. E. Godavari Dist. 397. 1999. *'Madanaka'*

Pubescent, procumbent herb, up to 30 cm high; stems ascending, quadrangular, grooved, hispid. Leaves opposite, subsessile, ovate-elliptic or oblong, 2–3.5 cm long, obtuse or rounded at base, acute at apex, margins entire, scabrid on both surfaces; stipules interpetiolar, hirsute, with bristles. Flowers in axillary and terminal, up to 9-flowered fascicles, 1.6 cm long, purple, covered by stipules. Calyx 2 mm long, hispid; lobes short, narrow, acute, reflexed. Corolla tube funnel shaped; lobes 4, oblong. Stamens 4. Ovary ellipsoid; style short, filiform. Capsule ellipsoid, *c.* 3 mm long, pubescent, 2-seeded. Seeds grooved, black.

Fl. & Fr.: Aug.–Jan.

Habitat: Common weed in cultivated fields, moist waste localities.

Specimen examined: PK Valasa, Kondamodalu, *Y. Mahesh* 010425, 011443 (BSID).

2. Spermacoce ocymoides Burm.f., Fl. Ind. 34. 1768. *Borreria repens* DC., Prodr. 4: 542. 1830; R.S. Rao & al., Fl. E. Godavari Dist. 398. 1999.

A much-branched, bushy herb, up to 35 cm high; stems glabrous. Leaves sessile, opposite, sessile or subsessile, lanceolate-obovate, 3–4.5 cm long, narrowed at base, acute at apex, margins entire, glabrous. Flowers in axillary or terminal fascicles, white. Calyx short; lobes 4, narrow, subequal. Corolla tube very short, tube funnel shaped; lobes 4, lanceolate, acute. Stamens 4. Style short, Fruit globose, 2 mm across.

Fl. & Fr.: Mar.–Sep.

Habitat: Common near stream banks and moist localities.

Specimen examined: Gulletiwada, *Y. Mahesh* 10595 (BSID).

3. Spermacoce pusilla Wall. in Roxb., Fl. Ind. 1: 379. 1820; Pull. & Karupp., Fl. Andhra Pradesh 3: 896. 2018. *Borreria pusilla* DC., Prodr. 4: 543. 1830; R.S. Rao & al., Fl. E. Godavari Dist. 397. 1999. *Borreria stricta* (L.f.) K. Schumach., in Engler & Prantl, Pflanzenfam. 4: 143. 1891; Gamble, Fl. Madras 2: 654. 1921. *Spermacocce stricta* L.f., Suppl. 120. 1781; Hook. f., Fl. Brit. India 3: 200. 1880.

An erect, branched herb, up to 30 cm high; stem quadrangular, scabrid. Leaves opposite, subsessile, lanceolate-oblong, 3 cm long, obtuse or attenuate at base, acute at apex, margins entire, scabrous on both sides; stipules interpetiolar, membranous, pubescent. Flowers in axillary, densely flowered fascicles, surrounded by bracts, white. Calyx short, lobes 4, linear, unequal, acute. Corolla tube cylindric, lobes 4, narrow, acute. Stamens 4, exserted. Style short. Capsule ellipsoid, *c.* 3 mm long, pubescent in upper half.

Fl. & Fr.: Aug.–Nov.

Habitat: Common weed in cultivated fields.

Specimen examined: Kondamodalu, *Y. Mahesh* 011497 (BSID).

4. Spermacoce remota Lam., Tabl. Encycl. 1: 273. 1792; Pull. & Karupp., Fl. Andhra Pradesh 3: 898. 2018. *Spermacoce assurgens* Ruiz & Pavon, Fl. Peruv. 1: 60. 1798; Verdc. in Kew Bull. 37: 547. 1983.

An erect herb, up to 32 cm high; stems minutely pubescent. Leaves opposite, elliptic-lanceolate, 2.5 cm long, cuneate at base, acute at apex, margins entire, scabrid on both the surfaces; stipules interpetiolar, hirsute. Flowers in axillary and terminal, fascicles, white. Calyx small, pubescent; lobes 4, narrow, acute. Corolla tube funnel shaped; lobes 4, lanceolate, acute. Stamens 4. Style short, filiform. Capsule oblong, *c.* 3 mm long, pubescent.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in moist localities and near stream banks.

Specimen examined: Ijjaluru, *Y. Mahesh* 010965 (BSID).

23. SPERMADICTYON Roxb.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Spermadictyon suaveolens Roxb., Pl. Coromandel 3: 32. t. 236. 1815; R.S. Rao & al., Fl. E. Godavari Dist. 416. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 898. 2018. *Hamiltonia suaveolens* Roxb., Fl. Ind. 2. 223. 1824; Hook. f., Fl. Brit. India 3: 197. 1880; Gamble, Fl. Madras 2: 650. 1921. **(Plate 55D)** *'Erramogi', 'Kondamuritida'*

A small shrub, up to 3.5 m high; branches spreading, glandular pubescent when young. Leaves opposite, ovate, lanceolate-elliptic or ovate, 8–18 cm long, membranous, acute at base, obtuse at apex, margins entire; petiole up to 8 mm long. Flowers in terminal trichotomously branched, panicles, pentamerous, subsessile, 1.5 cm long, light pink. Calyx truncate, 4-lobed; lobes triangular. Corolla tube cylindric, hairy; lobes 4, ovate. Stamens 4. Ovary ellipsoid; style short; stigma 5-lobed. Capsule ellipsoid, *c.* 5 mm long. Seeds 5, angled.

Fl. & Fr.: Nov.–Apr.

Habitat: Occasional in dry deciduous forest

Specimen examined: Gulletiwada, *Y. Mahesh* 010582 (BSID).

24. TAMILNADIA Tirveng & Sastre

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Tamilnadia uliginosa (Retz.) Tirveng. & Sastre, Mauritius Inst. Bull. 8: 85. 1979; Pull. & Karupp., Fl. Andhra Pradesh 3: 899. 2018. *Gardenia uliginosa* Retz., Observ. Bot. 2. 14 1781. *Randia uliginosa* (Retz.) DC., Prodr. 4: 386. 1830; Hook. f., Fl. Brit. India 3: 110. 1880; Gamble, Fl. Madras 2: 615. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 414. 1999. **(Plate 55E)** *'Pedda manga'*

Small trees, up to 5 m high; bark greyish-yellow with white patches; branches glabrous, terminating into spines. Leaves fascicled on suppressed branches, obovate, or elliptic-ovate, 7.5-20 cm long, narrowed at base, obtuse, apex, margins entire, glabrous on both surfaces; petiole up to 1 cm long; stipules broadly ovate, short. Flowers solitary, at the ends of the branches, 3.5 cm across, white, pedicellate. Calyx tube 1 cm long, lobes 5, rounded, obtuse, scarious. Corolla 2 cm long; lobes 5, hairy at mouth; lobes orbicular. Stamens 5. Ovary obovoid, glabrous; style stout; stigma club shaped. Fruit ovoid, *c.* 5 cm long, yellow, many seeded.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in open dry deciduous forests.

Specimen examined: Kintukuru, *Y. Mahesh* 011749 (BSID).

25. TARENNA Gaertn.

India: 15 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Tarenna asiatica (L.) Kuntze ex K. Schum., Bot. Tidsskr. 24: 332. 1902; R.S. Rao & al., Fl. E. Godavari Dist. 417. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 900. 2018. *Chomelia asiatica* (L.) Kuntze, Revis. Gen. Pl. 1: 278. 1891; Gamble, Fl. Madras 2: 613. 1921. *Randeletia asiatica* L., Sp. Pl. 172. 1753. *Webera corymbosa* Willd., Sp. Pl. 1: 1224. 1798; Hook. f., Fl. Brit. India 3:102. 1880. **(Plate 55F)**

Glabrous shrub, up to 4 m high; young parts slightly angle, resinous, glabrous. Leaves opposite, elliptic-oblong, 5–10 cm long, coriaceous, acute at base, acute-acuminate at apex, margins entire, shining above, glabrous, turning black on drying; petiole up to 2 cm long. Flowers in terminal, trichotomous corymbose cymes, 6 mm long, white, fragrant, pedunculate. Calyx tube 2 mm long, pubescent; lobes 5, deltoid, obtuse, puberulous without. Corolla tube 5 mm long, villous at mouth; lobes 5, oblong, reflexed. Stamens 5, excreted. Ovary ellipsoid, pubescent; style pubescent. Berry globose, *c.* 6 mm across, black. Seeds 6-8, flattened.

Fl. & Fr.: Apr.–Nov.

Habitat: Common in the open scrub forest.

Specimen examined: Kakeshnur, *Y. Mahesh* 010697 (BSID).

26. WENDLANDIA Bartl. ex DC.

India: 17 spp.; Andhra Pradesh: 8 spp. & 1 subsp.; PNP: 2 spp.

Key to the species

1a.	Leaves ovate-lanceolate; anthers exserted	**2. W. heynei**
1v.	Leaves elliptic-oblong; anthers inserted	**1. W. gamblei**

1. Wendlandia gamblei Cowan, Notes Roy. Bot. Gard. Edinb. 16: 271. 1932; Gamble, Fl. Madras 3: 1875. 1936; Pull. & Karupp., Fl. Andhra Pradesh 3: 902. 2018.

Small, evergreen tree, up to 5 m high; branches glabrous, nodes covered by stipules. Leaves opposite, elliptic-oblong, 5–10 cm, coriaceous, cuneate at base, acute or shortly acuminate at apex, margins entire, glabrous; petiole up to 2 cm long. Flowers in terminal and axillary, paniculate cymes, pedunculate, white, fragrant. Calyx urceolate, glabrous outside, 5- lobed; lobes lanceolate, acute. Corolla tube 5 mm long, glabrous, lobes 5, oblong, acute, hairy middle. Stamens 5; anthers inserted. Ovary globose; style short. Fruit globose.

Fl. & Fr.: Apr.–Nov.

Habitat: Occasional along high altitudes and ghat roads in deciduous forest.

Specimen examined: Valamuru, *Y. Mahesh* 011791 (BSID).

2. Wendlandia heynei (Roem. & Schult.) Santapau & Merchant, Bull. Bot. Surv. India 3: 110. 1962; R.S. Rao & al., Fl. E. Godavari Dist. 417. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 902. 2018. *Rondeletia heynei* Roem. & Schult., Syst. Veg. 5: 234. 1819. *Wendlandia exserta* (Roxb.) DC., Prodr. 4: 411. 1830; Hook. f., Fl. Brit. India 3: 37. 1880; Gamble, Fl. Madras 2: 587. 1921. **(Plate 55G)** *'Konkupucca chettu'*

Small evergreen tree, up to 8 m high; young branches grey pubescent. Leaves opposite, ovate-lanceolate, 7–18 cm long, coriaceous, acute at both ends, margins entire, pubescent above, grey pubescent below; petiole up to 2 cm long; stipules ovate. Flowers in terminal or axillary cymose panicles, 5 mm across, white, fragrant. Calyx pubescent, lobes lanceolate, rounded. Corolla tube bell shaped, white, lobes oblong-ovate, obtuse. Stamen 5; filaments as long as anthers; anthers exserted. Ovary globose; style divided in to two. Capsule globose, 3 mm long, pubescent, covered by calyx.

Fl. & Fr.: Mar.–Jun.

Habitat: Occasional in hilly areas in the forests

Specimen examined: Kondamodalu, *Y. Mahesh* 011723 (BSID).

96. GENTIANACEAE

India: 21 genera, 207 taxa; Andhra Pradesh: 6 genera, 12 spp.; PNP: 4 genera, 8 spp.

Key to the genera

1a.	Ovary 1- celled; stamens away from style, included	2
1b.	Ovary 2-celled; stamens connivant around style, exserted	**4. Exacum**
2a.	Flowers regular	3
2b.	Flowers irregular	**1. Canscora**
3a.	Leaves lanceolate-oblong; flowers sessile; corolla white	**3. Enicostemma**
3b.	Leaves elliptic or obovate; flowers pedicelled; corolla pink	**2. Centaurium**

1. CANSCORA Lam.

India: 9 spp.; Andhra Pradesh: 5 spp.; PNP: 3 spp.

Key to the species

1a.	Stems narrowly 4-angled; leaves sessile; calyx prominently winged	**1. C. alata**
1b.	Stems 4 angled, or 4 winged; leaves with short petiole; Calyx not winged	2
2a.	Pedicels of central flower absent	**3. C. heteroclita**
2b.	Pedicel of central flower capillary	**2. C. diffusa**

1. Canscora alata (Roth) Wall., Numer. List 4363. 1831; Pull. & Karupp., Fl. Andhra Pradesh 3: 1148. 2018. *Exacum alatum* Roth, Syst. Veg. 3: 159. 1818. *Canscora decussata* (Roxb.) Schult. & Schult. f., Mant. 3: 229. 1827; C.B. Clarke in Hook. f., Fl. Brit. India 4: 104. 1883; Gamble, Fl. Madras 2: 879. 1923. *Pladera decussata* Roxb., Fl. Ind. 1: 418. 1820. **(Plate 55H)** *'Chitti achinta'*

An erect herb, up to 35 cm high; stems narrowly 4-angled, trichotomously branched, winged. Leaves opposite, ovate-lanceolate, 1.5–3 cm long, membranous, rounded or obtuse at base, acute, acuminate at apex, margins entire, scabrid, palmately 3-nerved from base, sessile or shortly petioled. Flowers in axillary, sub-trichotomous cymes, white or pale pink, 1.4 cm long, with winged pedicelled. Calyx tube very short, winged; lobes 4, 3 mm long, acuminate, prominently winged. Corolla tube up to 1 cm long; lobes 4, unequal, oblong, 6 mm long. Stamens 4.

Ovary bicarpelled; style filiform. Capsule linear-oblong, *c.* 1 cm long. Seeds many, minute.

Fl. & Fr.: Nov.–Apr.

Habitat: Common herb along stream banks, near ponds and marshy localities.

Specimen examined: Gulletiwada, Shivagiri, *Y. Mahesh* 010556, 011614 (BSID).

2. Canscora diffusa (Vahl) R.Br., Prodr. 451. in Obs. 1810; R.S. Rao & al., Fl. E. Godavari Dist. 483. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1149. 2018. *Gentiana diffusa* Vahl, Symb Bot. 3: 47. 1794; C.B. Clarke in Hook. f., Fl. Brit. India 4: 103. 1883; Gamble, Fl. Madras 2: 878. 1923. *Canscora decurrens* Dalzell, Hook. J. Bot. Kew Misc. 2: 136. 1850; C.B. Clarke in Hook. f., Fl. Brit. India 4: 103. 1993; Gamble, Fl. Madras 2: 878. 1923. **(Plate 55I)** *'Janjada'*

An erect, much branched herb, up to 50 cm high; stems dichotomously branched, obtusely 4-angled, glabrous. Leaves opposite, of two types, upper ones sessile, ovate-lanceolate, 2 cm long, membranous, trinerved, lower ones elliptic, up to 3.5 cm long, glabrous, acute or rounded at base, acute at apex, margins entire. Flowers tetramerous, axillary and terminal, much branched, paniculate cymes, 1 cm long, pinkish, bracteate; pedicel of central flowers capillary. Calyx tube up to 6 mm long, lobes 4, short, lanceolate. Corolla 4-lobed; lobes unequal, oblong. Stamens 4. Ovary linear-oblong; style short. Capsule oblong, cylindric, 5 mm long, membranous, septicidally 2-volved. Seeds several, minute.

Fl. & Fr.: Nov.–Apr.

Habitat: Common along streams banks and moist sandy soils.

Specimen examined: Maredupudi, *Y. Mahesh* 010118 (BSID).

3. Canscora heteroclita (L.) Gilg in Engler & Prantl, Pflanzenfam. 4: 76. 1895; Pull. & Karupp., Fl. Andhra Pradesh 3: 1150. 2018. *Gentiana heteroclita* L. in Mant. Pl. 2: 560. 1771. *Canscora sessiliflora* Roem. & Schult. f., Mant. Syst. Veg. 3: 230. 1827; C.B. Clarke in Hook. f., Fl. Brit. India 4: 104. 1883; Gamble, Fl. Madras 2: 879. 1923.

Small, erect herbs, up to 28 cm high; stems 4-angled, 4-winged. Leaves opposite, ovate, 1.6 cm long, rounded at base, apiculate at apex, margins entire, glabrous . Flowers tetramerous, in axillary, dichasial cymes, rose coloured; central flowers sessile. Calyx tube short; lobes 4, trinerved, acuminate. Corolla 4-lobed; lobes oblong. Stamens 4. Ovary oblong. Capsule oblong, 7 mm long, compressed, brown. Seeds many, rounded, small.

Fl. &Fr.: Nov.–Mar.

Habitat: Occasional near stream banks.

Specimen examined: Tekupalli, *Y. Mahesh* 011687 (BSID).

2. CENTAURIUM Hill

India: 3 spp. & 1 infraspecific; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Centaurium pulchellum (Sw.) Hayek ex Hand.-Mazz., Stadlm., Janch. & Faltis, Oesterr. Bot. Z. 56: 70. 1906. *Gentiana pulchella* Sw. Kongl. Vetensk. Scad. Nya Handl. 84. t. 3. 1783. *Centaurium meyeri* (Bunge) Druce, Rep. Bot. Soc. Exch. Club. Brit. Isles 4: 613. 1916; Pull. & Karupp., Fl. Andhra Pradesh 3: 1151. 2018. *Erythraea meyeri* Bunge in Ledeb., Fl. Al. 1: 220. 1829; C.B. Clarke in Hook. f., Fl. Brit. India 4: 102. 1883. *Centaurium centaurioides* (Roxb.) Rolla Rao & Hemadri, J. Bombay Nat. Hist. Soc. 67: 357. 1970; R.S. Rao *& al.*, Fl. E. Godavari Dist. 484. 1999. **(Plate 56A)**

A small, erect, branched herb, up to 25 cm high; stems obscurely winged, glabrous. Radical leaves opposite, sessile, elliptic-oblong, 2 cm long, obtuse; cauline leaves narrow. Flowers in dichasial branched cymes, up to 1.2 cm long, pinkish. Calyx lobes 5, small, subulate-linear, glabrous. Corolla tube short; lobes 5, ovate-elliptic or oblong, acuminate, spreading. Stamens inserted in the throat; stigma branched, yellow. Capsule oblong, up to 8 mm long.

Fl. & Fr.: Feb.–May.

Habitat: Occasional open marshy waste places and dryed paddy fields.

Specimen examined: Koida, *Y. Mahesh* 011357 (BSID).

3. ENICOSTEMA Blume

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Enicostema axillare (Poir. ex Lam.) A. Raynal, Adansonia ser. 9: 75. 1969; Pull. & Karupp., Fl. Andhra Pradesh 3: 1152. 2018. *Gentiana axillaris* Poir. ex Lam., Tabl. Encycl. 1: 487. 1793.

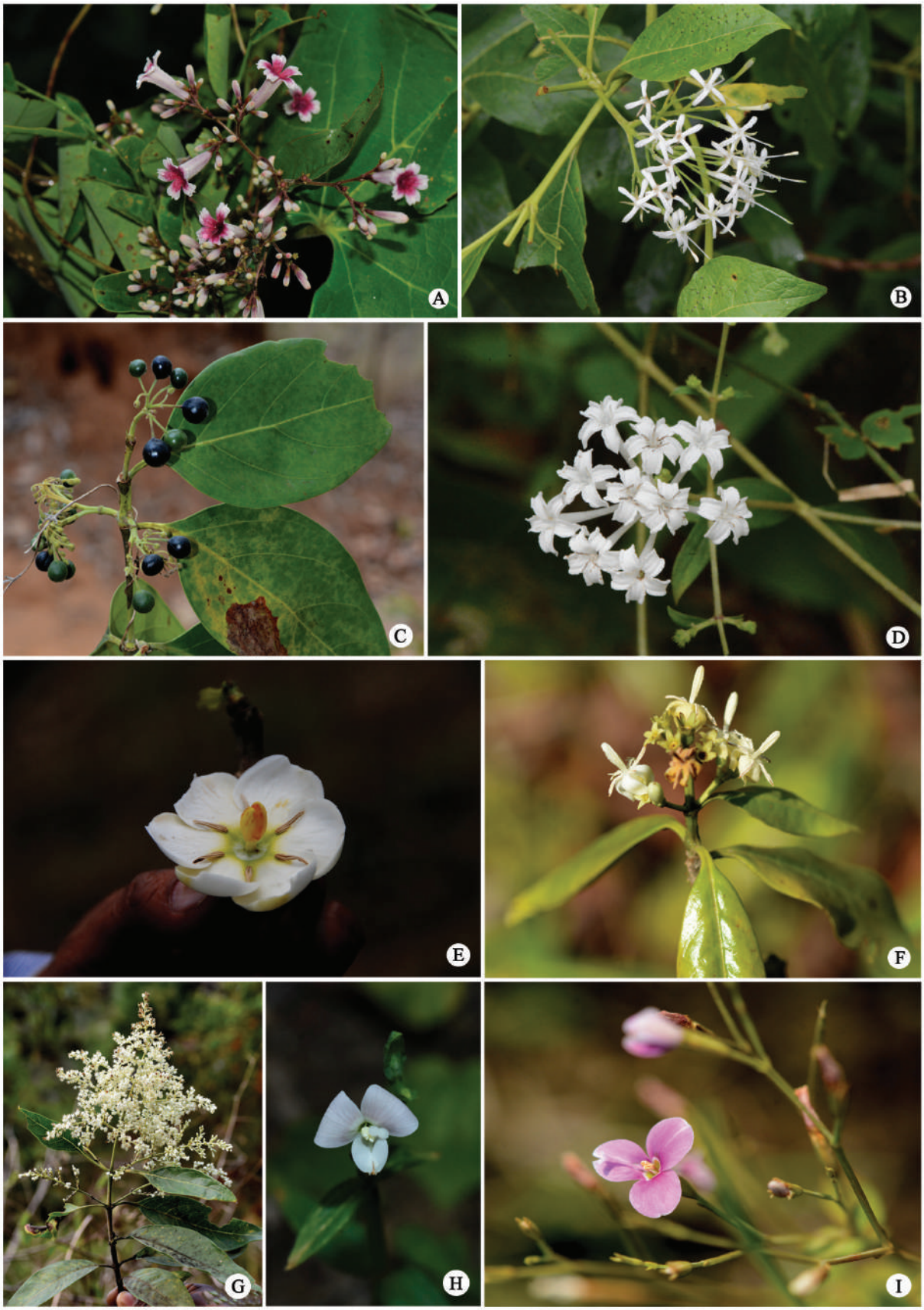


Plate 55: A. *Paederia foetida* L.; **B.** *Pavetta tomentosa* Roxb. ex Sm.; **C.** *Psydrax umbellatus* (Wight) Bridson; **D.** *Spermadictyon suaveolens* Roxb.; **E.** *Tamilnadia uliginosa* (Retz.) Tirveng. & Sastre; **F.** *Tarenna asiatica* (L.) Kuntze ex K.Schum.; **G.** *Wendlandia heynei* Santapau & Merchant; **H.** *Canscora alata* Wall.; **I.** *Canscora diffusa* (Vahl) R.Br. ex Roem. & Schult.

Erect, glabrous herb, up to 45 cm high; stems quadrangular. Leaves opposite, sessile, linear-oblong or lanceolate, 4–7 cm long, cuneate or attenuate at base, subacute at apex, margins entire, trinerved, glabrous. Flowers in axillary, clusters of 2–3 flowered, 8 mm long, white, bracteate. Calyx tube short, 1 mm long; lobes 5, oblong, 3 mm long, with scarious sides, tips revolute. Corolla tube cylindric, 5 mm long, infundibuliform in the upper; lobes 5, linear-oblong, 3 mm long. Stamens 5. Ovary ellipsoid, unilocular; style short. Capsule septicidal, ellipsoid, *c.* 4 mm long, 2-volved. Seeds many, globose, light brown.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional stream banks in the forest.

Specimen examined: Tekupally, *Y. Mahesh* 011684 (BSID).

4. EXACUM L.

India: 18 spp. & 1 infraspecific; Andhra Pradesh: 3 spp.; PNP: 3 spp.

Key to the species

1a.	Herbs up to 25 cm high; leaves usually 3-ribbed; corolla lobes less than 1 cm long	**1. E. pedunculatum**
1b.	Herbs more than 25 cm high; leaves usually 5-ribbed; corolla lobes more than 1 cm long	2
2a.	Leaves elliptic-ovate; capsule septicidal, globose	**2. E. petiolare**
2b.	Leaves ovate- lanceolate; capsule loculicidal, ellipsoid	**3. E. tetragonum**

1. Exacum pedunculatum L., Sp. Pl. 1: 112. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 97. 1883; Gamble, Fl. Madras 2: 874. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 485. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1153. 2018. **(Plate 56B)**

Erect, glabrous herb, up to 25 cm high; stems obtusely tetragonal, narrowly winged. Leaves opposite, elliptic or elliptic-oblong, 3 cm long, cuneate at base, acute at apex, margins entire, trinerved from base, glabrous; petiole up to 3 mm long. Flowers terminal, much branched, panicled cymes, 8 mm long, bluish purple, pedicellate, bracteate. Calyx campanulate, lobes 4, ovate-lanceolate, acuminate, winged. Corolla tube up to 3 mm long, lobes 4, elliptic, 5 mm long. Stamens 4. Ovary globose, bilocular; style short. Capsule globose, *c.* 4 mm long, septicidal, 2-volved. Seeds numerous, minute, light brown.

Fl. & Fr.: Feb.–May.

Habitat: Occasional in irrigation canals, open moist localities and stream beds.

Specimen examined: Ijjaluru, *Y. Mahesh* 012126 (BSID).

2. Exacum petiolare Griseb., Prodr. 9: 46. 1845; C.B. Clarke in Hook. f., Fl. Brit. India 4: 98. 1883; Gamble, Fl. Madras 2: 874. 1923; Pull. & Karupp., Fl. Andhra Pradesh 3: 1153. 2018. **(Plate 56C)**

Small erect, glabrous herb, up to 20 cm high; stem tetragonal, narrowly winged along margins. Leaves opposite, elliptic-ovate, 3.5 cm long, base decurrent on petiole, sub-acute at apex, margins entire, 5-nerved, glabrous. Flowers in axillary or terminal cymes, 8 mm long, bluish-violet, pedicellate. Calyx up to 5 mm long, winged on lobes and tube, accrescent in fruit; lobes lanceolate, prominently nerved. Corolla up to 7 mm long; lobes 4, lanceolate. Stamens 4. Ovary globose, bilocular; style short. Capsule septicidal, globose, 2-volved.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in damp localities.

Specimen examined: Eruwada, Valamuru, Kothuru, *Y. Mahesh* 010663, 010943, 011653 (BSID).

3. Exacum tetragonum Roxb., Fl. Ind. 1: 413. 1820; R.S. Rao & al., Fl. E. Godavari Dist. 485. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1154. 2018. *Exacum bicolour* Roxb., Fl. Ind. 1: 413. 1820; C.B. Clarke in Hook. f., Fl. Brit. India 4: 96. 1883; Gamble, Fl. Madras 2: 873. 1923.

A long, erect herb, up to 65 cm high; stem 4-angled. Leaves opposite, sessile, ovate-lanceolate, 5.5 cm long, united at base, acute at apex, margins entire, glabrous ; 5-nerved from base. Flowers in terminal panicles, *c.* 1.5 cm long, blue. Calyx lobes 4, ovate, acute. Corolla lobes 4, oblong-lanceolate, acuminate. Stamens 4. Ovary elliptic, glabrous; style 2.1 cm long. Capsule ellipsoid, loculicidal.

Fl. & Fr.: Oct.–Jan.

Habitat: Occasional in marshy areas.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

97. LOGANIACEAE

India: 7 genera, 28 spp.; Andhra Pradesh: 4 genera, 9 spp.; PNP: 3 genera, 5 spp.

Key to the genera

1a.	Herbs	2
1b.	Trees	**3. Strychnos**
2a.	Flowers in 2–3-chotomous cymes, pentamerous	**2. Mitreola**
2b.	Flowers solitary or clustered, tetramerous	**1. Mitrasacme**

1. MITRASACME Labill.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Stems and leaves pubescent; leaves elliptic-ovate; flowers few, lax in terminal umbels; seeds smooth	**2. M. pygmaea**
1b.	Stems and leaves glabrous; leaves lanceolate or linear; flowers in axillary, fascicled, 1-3; seeds with reticulate testa	**1. M. prolifera**

1. Mitrasacme prolifera R.Br., Prodr. Fl. Nov. Holland. 453. 1810. *Mitrasacme indica* Wight, Icon. Pl. Ind. Orient. 4: t. 1601. 1850 & I11. t. 156. f. 1-13. 1850; Pull. & Karupp., Fl. Andhra Pradesh 3: 1142. 2018. *Mitrasacme alsionoides* auct. non. R. Br., 1810; Hook. f., Fl. Brit. India 4: 80. 1883; Gamble, Fl. Madras 2: 864. 1923. **(Plate 56D)**

A slender, erect herb, up to 18 cm high; stems terete, glabrous. Leaves opposite, sessile, linear-lanceolate, 1.5–3.5 cm long, narrow at base, acute at apex, margins entire, glabrous. Flowers in axillary, fascicles of 2–3 flowers, white. Calyx cuspidate in fruit. Corolla tube short, lobes ovate-suborbicular, obtusely acute. Capsule sub-globose, glabrous, with few seeds.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in moist localities and near water courses.

Specimen examined: PK Valasa, *Y. Mahesh* 010520 (BSID).

2. Mitrasacme pygmaea R.Br., Prodr. 453. 1810; Pull. & Karupp., Fl. Andhra Pradesh 3: 1143. 2018. *Mitrasacme malaccensis* Wight. Ic. t. 1601. 1850. *Mitrasacme polymorpha* auct. non. R. Br.; Gamble Fl. Madras 2: 864.1923. **(Plate 56E)**

Annual hispid herb, up to 22 cm high. Leaves opposite, subsessile, elliptic-ovate, 5 cm long, acute at both ends, margins entire, glabrous. Flowers in axillary or terminal, few flowered umbels, white. Calyx campanulate, hispid outside, lobes ovate. Corolla 4-fid, campanulate with valvate lobes; lobes ovate, obtuse at apex. Stamens 4. Ovary 2-celled; styles 2, at base connate at the tip. Capsules subglobose, truncate, crowned by styles. Seeds many, minute.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in moist localities and shady places.

Specimen examined: Valamuru, *Y. Mahesh* 010915 (BSID).

2. MITREOLA L.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Mitreola petiolata (J.F.Gmel.) Torr. & A. Gray, Fl. N. Amer. 2: 45. 1841; Pull. & Karupp., Fl. Andhra Pradesh 3: 1143. 2018. *Cynoctonum petiolatum* J.F. Gmel., Syst. Nat. 2: 443. 1791. *Mitreola oldenlandioides* Wall. ex DC., Prodr. 9: 9. 1845; Hook. f., Fl. Brit. India 4: 79. 1883; Gamble, Fl. Madras 2: 863. 1923.

A slender, erect herb, up to 55 cm high; stem 4-angled, faintly winged. Leaves opposite, ovate-oblong or elliptic, 5 cm long, acute-tapering at base, acuminate at apex, margins entire, glabrous, sparsely puberulous along margins; petiole short; stipules ovate, small. Flowers in axillary and terminal, unilateral panicles, small, 2 mm long, white, shortly pedicelled. Calyx tube very short; lobes 5, minute, ovate. Corolla tube urceolate; lobes 5, 3 mm long. Stamens epipetalous. Ovary subglobose; style short. Capsule compressed, unilateral, 2-horned, glabrous.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional along moist localities in deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. STRYCHNOS L.

India: 15 spp.; Andhra Pradesh: 5 spp.; PNP: 2 spp.

Key to the species

1a.	Bark grey, smooth; fruit orange when ripe; seeds many	**1. S. nux-vomica**
1b.	Bark blackish, cracked; fruit black when ripe; seeds 1-2	**2. S. potatorum**

1. Strychnos nux-vomica L., Sp. Pl. 1: 189. 1753; Hook. f., Fl. Brit. India 4: 90. 1882; Gamble, Fl. Madras 2: 868. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 481. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1145. 2018. **(Plate 56F)** *'Mushinichettu, Vishamusti'*

A moderate sized tree, up to 15 m high; branches glabrous, swollen at nodes. Leaves opposite, broadly elliptic, suborbicular, 5–10 cm long, rounded at base, acute at apex, margins entire, glabrous ; 3–5-nerved from base; petiole up to 1 cm long. Flowers in axillary and terminal, branched cymes, 1.5 cm long, greenish-white, pubescent. Calyx tube short, lobes ovate, deltoid. Corolla tube up to 1 cm long, hairy within; lobes 5, narrowly oblong. Stamens 5. Ovary ovoid; style glabrous. Berry globose, *c.* 4 cm across, orange when ripe. Seeds 4. Flattened.

Fl. & Fr.: Mar.–Dec.

Habitat: Common tree along foothills and hilly areas in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010017 (BSID).

2. Strychnos potatorum L.f., Suppl. Pl. 148. 1782; Hook. f., Fl. Brit. India 4: 90. 1882; Gamble, Fl. Madras 2: 868. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 482. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1145. 2018. **(Plate 56G)***'Chillaginja, chilakamushini'*

Moderate sized tree, up to 12 m high; young branches glabrous. Leaves opposite, ovate-elliptic, 6–12 cm long, coriaceous, rounded at base, subacute at apex, margins entire glabrous; 3-nerved from base; petiole up to 5 mm long. Flowers in axillary cymes, 5 mm long, white, bracteate, glabrous. Calyx tube short; lobes 5, ovate, acuminate. Corolla tube 3 mm long, puberulous within; lobes 5, oblong, acute. Stamens 5. Ovary ovoid, bilocular; style short. Berry globose, *c.* 1.6 cm across, black when ripe. Seeds 1or 2, flattened.

Fl. & Fr.: Jun.–Nov.

Habitat: Common along pathways and near villages.

Specimen examined: Buruguwada, *Y. Mahesh* 010104 (BSID).

Field notes: Seeds are used to clear turbid water.

98. APOCYNACEAE

India: 91 genera, 444 spp.; Andhra Pradesh: 45 genera, 89 spp., 5 var.; PNP: 21 genera, 23 spp., 1 var.
(Including Asclepiadaceae)

Key to the genera

1a.	Trees or shrubs	2
1b.	Herbs or twiners or climbing shrubs	8
2a.	Armed shrubs; fruit berry	**5. Carissa**
2b.	Unarmed shrubs or trees; fruit a follicle, drupe or capsule	3
3a.	Trees	4
3b.	Shrubs	7
4a.	Corolla lobes overlapping to right	**14. Holarrhena**
4b.	Corolla lobes overlapping to left	5
5a.	Corolla throat with corona scales	**21. Wrightia**
5b.	Corolla throat without corona scales	6
6a.	Corolla funnel shaped	**18. Plumeria**
6b.	Corolla salver shaped	**2. Alstonia**
7a.	Flowers yellow; fruit a fleshy drupe	**6. Cascabela**
7b.	Flowers pinkish-purple; fruit a follicle	**3. Calotropis**
8a.	More or less leafless succulent plants	9
8b.	Leaves well developed	10
9a.	Stems jointed; cylindrical	**10. Cynanchum**
9b.	Stems not jointed; more or less quadrangular	**4. Caralluma**
10a.	Herbs or undershrubs	11
10b.	Twiners or climbing shrubs	12
11a.	Undershrubs; leaves opposite	**19. Rauvolfia**

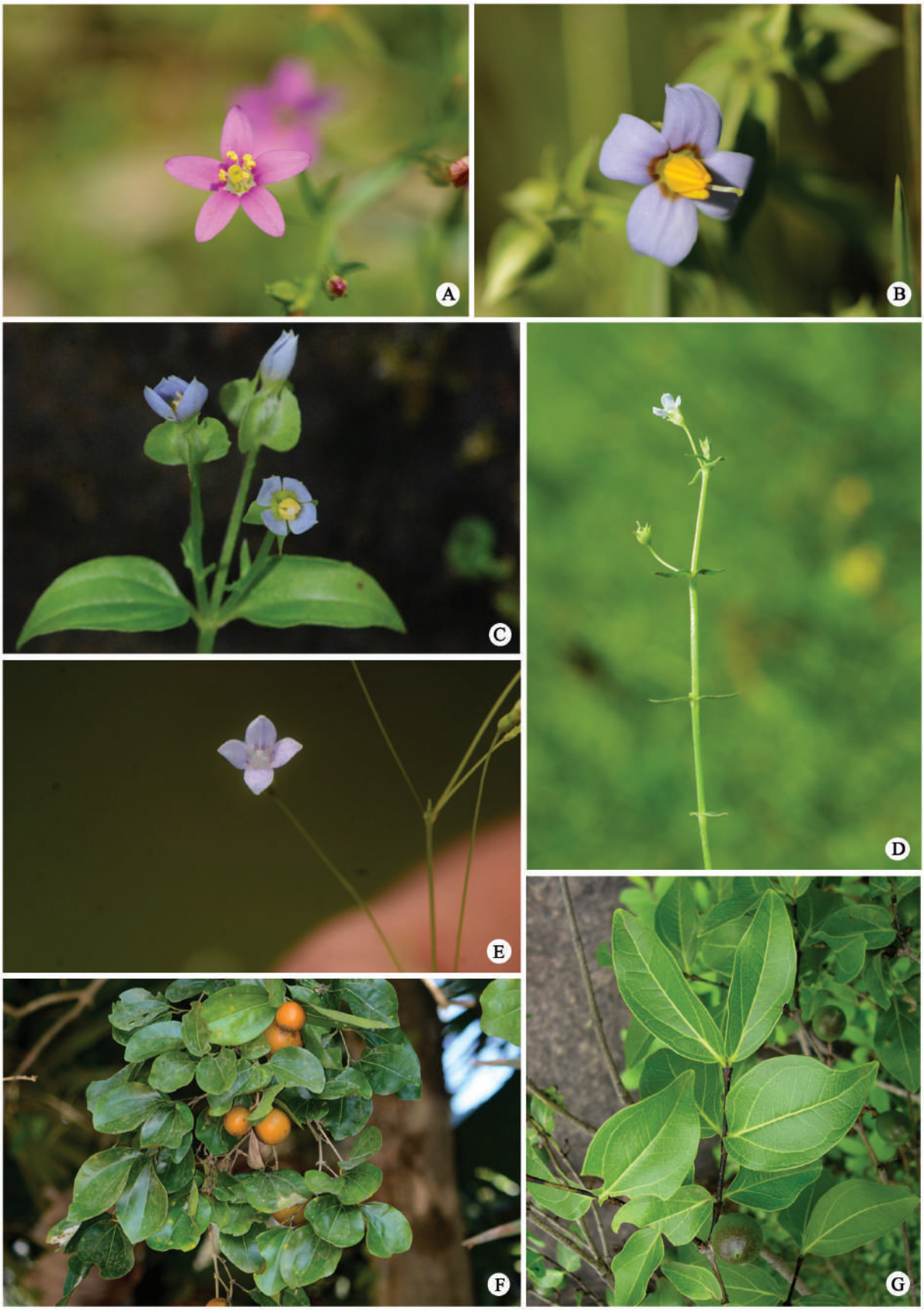


Plate 56: A. *Centaurium pulchellum* (Sw.) Hayek & al.; **B.** *Exacum pedunculatum* L.; **C.** *Exacum petiolare* Griseb.; **D.** *Mitrasacme prolifera* R.Br.; **E.** *Mitrasacme pygmaea* R.Br.; **F.** *Strychnos nux-vomica* L.; **G.** *Strychnos potatorum* L.f.

11b.	Herbs; leaves whorled	**7. Catharanthus**
12a.	Corona absent; pollen masses not collected in pollinia	13
12b.	Corona present; pollen masses collected in pollinia	14
13a.	Calyx divided below the middle; corolla tube shorter than lobes	**1. Aganosma**
13b.	Calyx divided above the middle; corolla tube longer than lobes	**15. Ichnocarpus**
14a.	Corona single	20
14b.	Corona double	15
15a.	Corolla urceolate, salver shaped or companulate	16
15b.	Corolla rotate	19
16a.	Corona coralline	**12. Gymnema**
16b.	Corona staminal	17
17a.	Corolla lobes valvate	18
17b.	Corolla lobes imbricate	**9. Cryptolepis**
18a.	Plants pubescent or tomentose	**11. Finlaysonia**
18b.	Plants glabrous	**13. Hemidesmus**
19a.	Corolla green or yellowish green with purple spots	**8. Cosmostigma**
19b.	Corolla not as above	**20. Vincetoxicum**
20a.	Flowers large in lax racemes; corolla rotate	**16. Oxystelma**
20b.	Flowers small in axillary umbellate cymes; corolla rotate or campanulate	**17. Pergularia**

1. AGANOSMA (Blume) G. Don

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Aganosma heynei (Spreng.) I.M. Turner, Taxon 62: 156. 2013; Pull. & Karupp., Fl. Andhra Pradesh 3: 1062. 2018. *Echites heynei* Spreng., Syst. Veg. 1: 632. 1824. *Aganosma dichotoma* (Roth) K. Schumach., in Engl. & Prantl, Pflanzenfam. 4: 173. 1895; Gamble, Fl. Madras 2: 819. 1921. Hook. f., Fl. Brit. India 3: 664. 1882. **(Plate 57A)** *'Pala malle'*

Climbing shrub, up to 12 m high; young branches tomentose. Leaves opposite, ovate-elliptic, 8 cm long, coriaceous, obtuse at base, acute at apex, margins entire, pubescent below; petiole up to 1.5 cm long. Flowers in axillary, corymbose cymes, white, pedicellate. Calyx tube short; lobes 5, linear-lanceolate, 1.5 cm long, pubescent. Corolla tube up to 2.8 cm across; lobes 5, spirally twisted. Stamens 5. Ovary pubescent; style short, filiform. Follicles 20 cm long, curved, tomentose.

Fl. & Fr.: Feb.–Sep.

Habitat: Common along foot hills and scrub forests.

Specimen examined: Eruwada, Tekuru, Kothuru, *Y. Mahesh* 010656, 011639, 011659 (BSID).

Field notes: This species can be easily identified by its showy, sweet scented flowers.

2. ALSTONIA R. Br.

India: 8 spp. & 2 infraspecific; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Alstonia scholaris (L.) R. Br., Asclepiadeae 65. 1810; Gamble, Fl. Madras 2: 810. 1923; Pull. & Karupp., Fl. Andhra Pradesh 3: 1064. 2018. *Echites scholaris* L., Mant. Pl. 53. 1767; Hook. f., Fl. Brit. India 3: 642. 1882. *'Edakulapala'*

Large, evergreen trees, up to 15 m high; branches spreading in tires of whorls; branchlets lenticellate. Leaves in whorls of 4–8, elliptic-oblong or obovate, 15 cm long, coriaceous, obtuse or acute at base, subacute or emarginated at apex, margins entire, green above, pale below, glabrous; petiole up to 5 mm long. Flowers in umbellate cymes, greenish-white, fragrant. Calyx tube short; lobes 5, acute. Corolla tube salver shaped; lobes recurved. Follicles cylindric, 20 cm long, pendulous. Seeds numerous, linear-oblong, flattened, hairs longer at both ends.

Fl. & Fr.: Jan.–Sep.

Habitat: Occasional near villages in the forest.

Specimen examined: Eruwada, *Y. Mahesh* 011565 (BSID).

3. CALOTROPIS R.Br.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Calotropis gigantea (L.) W.T. Aiton, Hort. Kew. 2: 78. 1811; Hook. f., Fl. Brit. India 4: 17. 1883; Gamble, Fl. Madras 2: 832. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 469. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1100.

2018. *Asclepias gigantea* L., Sp. Pl. 1: 214. 1753. **(Plate 57B)** *'Jilledu'*

A large, cottony-tomentose, bushy shrub, up to 2.5 m high; latex milky; branchlets ash coloured. Leaves opposite, sessile, obovate-oblong, 8-15 cm long, coriaceous, cordate or semi-amplexicaul at base, acute or shortly acuminate at apex, margins entire, white-tomentose below, less above. Flowers in axillary, umbellate cymes, 2 cm across, pinkish purple, bracteate, pedunculate, pedicellate. Calyx 4 mm long; lobes 5, ovate, acute. Corolla tube up to 6 mm long; lobes 5, deltoid-ovate, revolute when old; corona-lobes 5, shorter than staminal column. Stamens 5, connate, inserted at base of corolla. Ovaries 2; styles 2, slender. Fruit aggregate of 2-follicles; follicles 12 cm long, tapering to point, cyllindric.

Fl. & Fr.: Feb.–Jul.

Habitat: Common in open waste places near villages.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011307, 011308 (BSID).

4. CARALLUMA R.Br.

India: 6 spp. & 3 infraspecific; Andhra Pradesh: 2 spp. & 2 var.; PNP: 1 sp.

1. Caralluma attenuata Wight, Icon. Pl. Ind. Orient. 4: 15. 1848; Hook. f., Fl. Brit. India 4: 76. 1883; Gamble, Fl. Madras 2: 861. 1923. *Caralluma adscendens* var. *attenuata* (Wight) Gravely & Mayur., Bull. Madras Gov. Mus. 4: 13. 1931; Pull. & Karupp., Fl. Andhra Pradesh 3: 1103. 2018. *Stapelia adscendens* Roxb., Pl. Coromandel 1: 28, t. 30. 1795.

A fleshy, perennial herb, up to 50 cm high; stems 4-angled. Leaves small, deciduous at the angles of the stems, often spine-like, Flowers in reduced axillary racemes, solitary or few flowered, 1.5 cm across, brown to dark purple. Follicles in divaricate pairs, linear-lanceolate, narrowly fusiform, 7–10 cm long, glabrous, dehiscent. Seeds oblong-obovoid, dull white, with silky coma.

Fl. & Fr.: Sep.–Mar.

Habitat: Occasional in rocky boulders and drylands in the forest.

Specimen examined: Kondamodalu, *Y. Mahesh* 011768 (BSID).

Field notes: Its worth to introduce in gardens due to its showy dark purple flowers.

5. CARISSA L.

India: 8 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Carissa carandas L., Mant. Pl. 52. 1767; Hook. f., Fl. Brit. India 3: 630. 1882; Gamble, Fl. Madras 2: 804. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 458. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1066. 2018. *'Peddavakkakaya'*

A large, evergreen, thorny shrub, up to 4 m high; branches glabrous, thorny. Leaves opposite, oblong-obovate, 2–4 cm long, thick, rounded at base, obtuse at apex, margins entire, dark green, shining above, glabrous. Flowers in terminal corymbose, cymes, 1.5 cm long, white, fragrant. Calyx tube short; lobes 5, unequal. Corolla tube up to 1.2 cm long; lobes 5, oblong, acute or obtuse, villous. Stamens 5. Ovary ellipsoid; style filiform. Berry ovoid-ellipsoid, *c.* 2.5 cm long, purplish black when ripe.

Fl. & Fr.: Jan.–May.

Habitat: Occasional in open dry regions and forest edges.

Specimen examined: Devipatnam, *Y. Mahesh* 011702 (BSID).

Field notes: Ripen fruit is cooling and acidic in taste.

6. CASCABELA Raf.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cascabela thevetia (L.) Lippold, Feddes Repert. 91: 52. 1980; R.S. Rao & al., Fl. E. Godavari Dist. 465. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1069. 2018. *Cerbera thevetia* L., Sp. Pl. 1: 209. 1753. *Thevetia nerifolia* Juss. ex Stued., Nom. Bot. 2: 680. 1841; Gamble, Fl. Madras 2: 821. 1923. *'Pacchaganneru'*

An evergreen shrub, up to 4 m high; stems and branches with latex, glabrous. Leaves crowded, alternate, linear-lanceolate, 10–20 cm long, acute at base, subacute at apex, margins entire, glabrous. Flowers in axillary cymes, few flowered, yellow, showy. Calyx lobes 5, lanceolate. Corolla tube funnel shaped, 5-lobed, lobes obtuse. Stamens 5. Ovary tetraloculed; style short. Drupe fleshy, broadly turbinate, 4-angled, glabrous. small. Seeds 2–4, flat.

Fl. & Fr.: Throughout the year.

Habitat: Planted in home gardens and occasionally escaped in to wild.

Specimen examined: Seemagandi, *Y. Mahesh* 011429 (BSID).

7. CATHARANTHUS G. Don

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Catharanthus pusillus (Murray) G. Don, Gen. Syst. 4: 95. 1837; R.S. Rao & al., Fl. E. Godavari Dist. 459. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1070. 2018. *Vinca pusilla* Murray, Nov. Comment. Soc. Regiae Sci. Gott. 3: 66. 1733; Hook. f., Fl. Brit. India 3: 640. 1882. *Lochnera pusilla* K. Schum., in Engler & Prantl, Pflanzenfam 4: 145. 1895; Gamble, Fl. Madras 2: 809. 1923. *'Errimirapa'*

Erect, glabrous herb, up to 30 cm high; stem quadrangular, grooved, glabrous. Leaves opposite, subsessile, elliptic-lanceolate, 2.5–5 cm long, attenuate or obtuse at base, acute at apex, margins scaberulous, glabrous. Flowers axillary, solitary or in pairs, 1 cm long, white. Calyx 5 mm long, basally connate; lobes 5, subulate, caudate. Corolla tube 8 mm long, hairy near mouth of the tube; lobes 5, ovate-obovate, 3 mm long. Stamens 5. Ovaries 2, free; style slender. Fruit aggregate of 2-follicles, follicles slightly curved, cylindric, 5 cm long, striate. Seeds numerous, black.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in cultivated fields and moist waste places.

Specimen examined: Sirivaka, *Y. Mahesh* 011611 (BSID).

8. COSMOSTIGMA Wight

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cosmostigma cordatum (Poir.) M.R. Almeida, Fl. Maharashtra 3A: 239. 2001; Pull. & Karupp., Fl. Andhra Pradesh 3: 1113. 2018. *Periploca cordata* Poir., Encycl. 5: 191. 1804. *Cosmostigma racemosum* (Roxb.) Wight, Contrib. Bot. Ind. 42. 1834 & Icon. Pl. Ind. Orient. t. 591. 1842; Hook. f., Fl. Brit. India 4: 46. 1883; Gamble, Fl. Madras 2: 846. 1923. *Asclepias racemosa* Roxb., Fl. Ind. 2: 32. 1832 *'Adavithamalapaku'*

A perennial climber; branches ribbed, with watery latex. Leaves broadly ovate, 10 cm long, cordate at base, acute at apex, margins entire, glabrous; petiole up to 4 cm long. Flowers in corymbs, minute, spirally arranged, green, pedicellate. Calyx 5-lobed; lobed ovate. Corolla rotate; lobes 5, obovate, fleshy. Follicle ovoid, oblong, *c.* 15 cm long, glabrous, with many seeds.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional on hilly areas in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011524 (BSID).

9. CRYPTOLEPIS R. Br.

India: 3 spp.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Main nerves more than 12 pairs, horizontal and parallel, meeting in to a intermarginal ring	**1. C. buchananii**
1b.	Main nerves less than 10 pairs, not as above, usually curving above	**2. C. sinensis**

1. Cryptolepis buchananii Roem. & Schult., Syst. Veg. 4: 409. 1819; Hook. f., Fl. Brit. India 4: 5. 1883; Gamble, Fl. Madras 2: 826. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 479. 1999. *Cryptolepis dubia* (Burm.f.) M.R. Almeida, Fl. Maharashtra 3A: 221. 2001; Pull. & Karupp., Fl. Andhra Pradesh 3: 1114. 2018. *Periploca dubia* Burm.f., Fl. Ind. 70. 1768. *'Adavipalatheega'*

Large, twining shrub; bark papery; branches terete, glabrous with milky latex. Leaves opposite, elliptic-oblong, 6–15 cm long, rounded at base, acuminate at apex, margins entire, recurved, glabrous, glaucous below, many nerved, nerves meeting into a intermarginal ring; petiole up to 7 mm long. Flowers in axillary, cymose panicles, 1 cm long, yellowish-white, bracteate. Calyx tube small; lobes 5, ovate, 3 mm long. Corolla lobes 5, linear-lanceolate, 5 mm long. Corona clavate, fleshy. Ovaries 2, free; style 2. Fruit aggregate of 2 divaricate follicles, 10 cm long, tapering at tips. Seeds numerous, ovate.

Fl. & Fr.: Mar.–Aug.

Habitat: Common along foot hills and shady areas.

Specimen examined: Eruwada, *Y. Mahesh* 011562 (BSID).

2. Cryptolepis sinensis Merr., Philipp. J. Sci. 15: 254. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 480. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1116. 2018. *Pergularia sinensis* Lour., Fl. Cochinch. 1: 169. 1790. *Cryptolepis elegans* Wall. ex Don, Gen. Hist. 4: 82. 1837; Hook. f., Fl. Brit. India 4: 6. 1883; Gamble, Fl. Madras 2: 826. 1923. *'Palateega'*

A slender climber; branches glabrous with milky latex. Leaves opposite, oblong-lanceolate, 3–5 cm long, obtuse at base, apiculate at apex, margins entire, glaucous beneath, less than 10 nerved, nerves curving above; petiole up to 1 cm long. Flowers in axillary and terminal cymes, few flowered, yellow, pedunculate. Calyx tube short. Corolla campanulate, 2 cm long. Corona coralline, 5-lobed, inserted near corolla tube. Follicles paired, slender, *c.* 15 cm long, divaricate. Seeds small, oblong.

Fl. & Fr.: Jul.–Nov.

Habitat: Occasional climber in forest edges.

Specimen examined: Kondamodalu, *Y. Mahesh* 011466 (BSID).

10. CYNANCHUM L.

India: 15 spp. & 2 infraspecific; Andhra Pradesh: 5 spp.; PNP: 1 sp.

1. Cynanchum viminale (L.) L., Mant. Pl. 2: 392. 1771; Pull. & Karupp., Fl. Andhra Pradesh 3: 1120. 2018. *Euphorbia viminalis* L., Sp. Pl. 1: 452. 1753. *Sarcostemma viminale* (L.) R.Br., Mem. Wern. Soc. 1: 51. 1809 printed in 1811; R.S. Rao & al., Fl. E. Godavari Dist. 476. 1999. *Sarcostemma brevistigma* Wight & Arn. in Wight Contrib. Bot. Ind. 59. 1834; Hook. f., Fl. Brit. India 4: 26. 1883; Gamble, Fl. Madras 2: 838. 1923. **(Plate 57C)** *'Pulkada', 'Kada teega'*

A leafless, trailing, jointed shrub; branches green, pendulous; joints up to 10 cm long; young branches sparsely pubescent. Flowers in terminal, umbellate clusters, greenish-white. Calyx campanulate, pubescent; lobes 5, ovate, subacute. Corolla lobes 6 mm long, ovate-oblong. Corona biseriate, outer short, with 10 crenate lobes; inner lobes 5, large, 2 mm long. Staminal column short. Anthers inflexed appendages. Style 2, short. Fruit aggregate of two lanceolate follicles, slightly diverging. Seeds ovate, flattened.

Fl. & Fr.: Nov.–Mar.

Habitat: Occasional in dry rocky localities in open scrub forest.

Specimen examined: Koida, *Y. Mahesh* 012145 (BSID).

Field notes: Stems green, leafless.

11. FINLAYSONIA Wall.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Finlaysonia wallichii (Wight) Venter, Ann. Missouri Bot. Gard. 88: 565. 2001; Pull. & Karupp., Fl. Andhra Pradesh 3: 1123. 2018. *Hemidesmus wallichii* Wight, Contr. Bot. India 63: 1834. *Hemidesmus indicus* (L.) R. Br. var. *pubescens* (Wight & Arn.) Hook. f., Fl. Brit. India 4: 5. 1883; Gamble, Fl. Madras 2: 825. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 481. 1999. *Hemidesmus pubescens* Wight & Arn. in Wight, Contrib. Bot. Ind. 63. 1834. *'Sugandipala'*

A slender, climbing undershrub; branches pubescent with milky white latex. Leaves alternate, variable, linear-lanceolate or elliptic-oblong, 6 cm long, obtuse or rounded at base, acuminate, apiculate at apex, margins entire, pubescent above, velvety tomentose below; petiole short. Flowers in axillary, clustered racemose cymes, 3 mm long, yellow with purple centre, pubescent. Calyx tube short; lobes 5, ovate, glandular hairy. Corolla tube small; lobes 5 mm across, ovate-oblong, glabrous. Corona scales 5, thick, on corolla throat. Stamens 5. Ovary small. Follicle linear, cylindric, 10 cm long, divaricate, pubescent. Seeds numerous, flattened, black.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in dry deciduous forest.

Specimen examined: Geediguppa, *Y. Mahesh* 010155 (BSID).

12. GYMNEMA R.Br.

India: 11 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Gymnema montanum Hook. f., Fl. Brit. India 4: 31. 1883; Pull. & Karupp., Fl. Andhra Pradesh 3: 1124. 2018. *Gymnema tingens* (Roxb.) Wight & Arn. in Wight Contrib. Bot. India 45. 1834; Hook. f., Fl. Brit. India 4: 31. 1883; Gamble, Fl. Madras 2: 840. 1923. *Asclepias tingens* Roxb., Pl. Coromandel t. 239. 1815. **(Plate 57D)**

Large climber; branches glabrous with milky white latex. Leaves lanceolate or oblong, 8 cm long, obtuse or subcordate at base, acuminate at apex, margins entire, glabrous ; secondary nerves up to 7-pairs; petiole up to 1 cm long. Flowers in corymbs, greenish-yellow, pedicellate. Calyx deeply 5-lobed; lobes linear, tomentose. Corolla tube short, up to 8 mm long; lobes 5, pubescent. Corona uniseriate. Follicles lanceolate, narrowed at both ends. Seeds ovate.

Fl. & Fr.: Jun.–Sep.

Habitat: Occasional in open dry deciduous forests.

Specimen examined: Bhupathipalem, *Y. Mahesh* 011437 (BSID).

13. HEMIDESMUS R.Br.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Hemidesmus indicus (L.) R.Br. ex Schult., Syst. Veg. 6: 126. 1820; Hook. f., Fl. Brit. India 4: 5. 1883; Gamble, Fl. Madras 2: 825. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 480. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1125. 2018. *Periploca indica* L., Sp. Pl. 211. 1753. **(Plate 57E)** *'Sugandipala'*

Twining shrub; branches striate, sparsely scaberulous. Leaves alternate, oblong-elliptic or orbicular, 7 cm long, with variegation above, obtuse at base, apex apiculate, margins entire, glabrous. Flowers in sessile, axillary cymose clusters, dark red, in opposite leaf axils at nodes. Calyx tube short; lobes 5, ovate, glandular hairy. Corolla tube small; lobes 4 mm across, ovate-oblong, glabrous. Corona scales 5, thick, on corolla throat. Corona scales inserted at the throat. Stamens 5. Ovaries 2, free. Fruit aggregate of follicle; follicle cylindric, 10 cm long glabrous. Seeds cosmose, flattened, black, silvery white hairs along.

Fl. & Fr.: Sep.–Mar.

Habitat: Common in scrub forest and waste lands.

Specimen examined: Kintukuru, Kondamodalu, *Y. Mahesh* 011450, 011728 (BSID).

Field notes: Roots decoction used by local people for curing fever.

Uses: In ayurveda this plant used to purify blood.

14. HOLARRHENA R.Br.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Holarrhena pubescens (Buch.-Ham.) Wall. & G.Don, Gen. Hist. 4: 78. 1837; R.S. Rao & al., Fl. E. Godavari Dist. 460. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1072. 2018. *Echites pubescens* Buch.-Ham., Trans. Linn. Soc. London 13: 524. 1822. *Holarrhena antidysenterica* Wall., ex DC., Prodr. 8: 413. 1844; Hook. f., Fl. Brit. India 3: 644. 1882; Gamble, Fl. Madras 2: 811. 1923. **(Plate 57F)** *'Pala chettu'*

Small tree, up to 8 m high; young branches glabrous, rarely pubescent. Leaves opposite, ovate-elliptic or ovate-oblong, 10 cm long, rounded or obtuse at base, shortly acuminate at apex, margins entire, faintly wavy, pubescent. Flowers in terminal, corymbose cymes, 1.4 cm long, bracteate, shortly pedicellate, pubescent, white with small yellow in middle. Calyx up to 5 mm long, pubescent without; lobes 5, lanceolate. Corolla tube up to 1.1 cm long, ciliate without; lobes oblong. Stamens 5, included. Ovaries 2, free; style filiform. Fruit aggregate follicles; follicle in pairs, cylindric, 20 cm long, slightly torulose. Seeds linear-oblong, with tuft of brown hairs.

Fl. & *Fr.:* Mar.–Jun.

Habitat: Common in hill slopes in deciduous forest and open lands.

Specimen examined: Buruguwada, Maredupudi, *Y. Mahesh* 010097, 010107 (BSID).

15. ICHNOCARPUS R.Br.

India: 5 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Ichnocarpus frutescens (L.) W.T. Aiton, Hort. Kew. 2: 69. 1811; Hook. f., Fl. Brit. India 3: 669. 1882; Gamble, Fl. Madras 2: 820. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 461. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1073. 2018. *Apocynum frutescens* L., Sp. Pl. 1: 213. 1753. **(Plate 57G)** *'Nalla teega', Korampala teega'*

Large, branched twining shrub; young branches fulvous or rusty tomentose. Leaves opposite, elliptic-lanceolate or obovate, 6.5 cm long, coriaceous, obtuse or rounded at base, acute- acuminate at apex, margins entire, glabrous above, hairy beneath. Flowers in axillary and terminal, paniculate cymose, 8 mm long, white with yellow centre, bracteate. Calyx short, 2 mm long; lobes 5, ovate, sparsely hairy outside. Corolla tube globose, pubescent at throat, 5 mm long; lobes 5, linear-ovate, twisted acumen. Stamens 5. Ovaries 2, free; style glabrous. Fruit aggregate of two divaricate follicles, cylindric, 12 cm long. Seeds linear, comose at apex.

Fl. & Fr.: Sep.–Jan.

Habitat: Common on shrubs, bushes and small trees in open deciduous forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010544 (BSID).

16. OXYSTELMA R.Br.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Oxystelma esculentum (L.f.) Sm., Cycl. 25: 1813; Pull. & Karupp., Fl. Andhra Pradesh 3: 1131. 2018. *Periploca esculenta* L.f., Suppl. Pl. 168. 1782. *Oxystelma esculentum* R. Br. ex Schult. in L. Syst. Veg. 6: 89. 1820; Hook. f., Fl. Brit. India 4: 17. 1883; Gamble, Fl. Madras 2: 833. 1923. *'Dudhipala'*

Twining herb; stems glabrous with milky latex. Leaves opposite, linear-lanceolate, 5–8 cm long, rounded at base, acute at apex, margins entire, glabrous. Flowers in lateral, drooping, raceme like cymes, white with purple veins centre. Calyx short, glabrous. Corolla saucer shaped, lobes sub-campanulate, hairy. Corona of 5 erect lobes in centre. Follicles in pair or often solitary, ovate-lanceolate, *c.* 5 cm long, glabrous.

Fl. & Fr.: Jul.–Nov.

Habitat: Common near water bodies.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011385 (BSID).

17. PERGULARIA L.

India: 2 spp. & 1 infraspecific; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Pergularia daemia (Forssk.) Chiov., Res. Sci. Somalia Ital. 1: 115. 1916; R.S. Rao & al., Fl. E. Godavari Dist. 475. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1134. 2018. *Asclepias daemia* Forssk., Fl. Aegypt.-Arab. 51. 1775. *Daemia extensa* (Jacq.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 50. 1809; Hook. f., Fl. Brit. India 4: 20. 1883. *Pergularia extensa* (Jacq.) N.E. Br. in Thistleton- Dyer, Fl. Cap. 4: 758. 1908; Gamble, Fl. Madras 2: 836. 1923. *'Dhustapu teega'*

Foetid, twining herb; stem striate, pubescent, with long spreading hairs. Leaves opposite, ovate-suborbicular, 4–10 cm long, deeply cordate at base, acuminate at apex, margins entire, ciliate, pubescent above, velvety below; petiole up to 5 cm long. Flowers in extra axillary, corymbose cymes, 8 mm long, greenish-yellow, pedicellate, bracteate. Calyx tube short; lobes 5, free, ovate-lanceolate, pubescent without. Corolla lobes 5, ovate-oblong, 5 mm long, ciliate. Corona biseriate, outer membranous, truncate, adnate the base, inner 5-lobed, with 5 basal spurs, 5 terminal appendages. Staminal column short. Ovaries 2, free; style 2, slender. Fruit aggregate of two reflexed, lanceolate, echinate follicles, up to 6 cm long, softly hirsute. Seeds many, ovate, 7 mm long, flat, densely velvety on both sides.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weedy climber along roadsides on bushes.

Specimen examined: PK Valasa, *Y. Mahesh* 012140 (BSID).

18. PLUMERIA Tourn. ex L.

India: 2 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Plumeria rubra L., Sp. Pl. 1: 209. 1753; Pull. & Karupp., Fl. Andhra Pradesh 3: 1074. 2018. *Plumeria acuminata* W.T. Aiton, Hort. Kew 2: 2. 1789; R.S. Rao & al., Fl. E. Godavari Dist. 466. 1999. *Plumeria acutifolia* Poir. in Lam., Encycl. Suppl. 2: 667. 1812; Hook. f., Fl. Brit. India 3: 641. 1882; Gamble, Fl. Madras 2: 821. 1923.*'Deva ganneru'*

Small tree, up to 5 m high. Leaves broadly lanceolate, obovate-oblong or oblanceolate, 20 cm long, tapering at base, acute at apex, margins entire, glabrous on both sides. Flowers in terminal, many flowered thyrsi, white with yellow eye, fragrant. Fruits a double follicle, cylindrical.

Fl. & Fr.: Throughout the year.

Habitat: Planted as ornamental in home gardens and temples.

Specimen examined: Tekupally, *Y. Mahesh* 011343 (BSID).

19. RAUVOLFIA Plum. ex L.

India: 6 spp.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a. Leaves whorls of 3; flowers white-pinkish; corolla tube inflated **1. R. serpentina**
1b. Leaves whorls of 4; flowers white with pink tinge; corolla tube not inflated **2. R. tetraphylla**

1. Rauvolfia serpentina (L.) Benth. ex Kurz, For. Fl. Burma 2: 171. 1877; Hook. f., Fl. Brit. India 3: 632. 1882; Gamble, Fl. Madras 2: 807. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 462. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1075. 2018. *Ophioxylon serpentinum* L., Sp. Pl. 2: 1043. 1753. **(Plate 57H)** *'Patalagandi, Sarpagandhi'*

An erect undershrub, up to 80 cm high. Leaves in whorls of 3, elliptic-lanceolate, 12 cm long, membranous, attenuate at base, acute at apex, margins entire, shining, glabrous. Flowers in compact, corymbose cymes, white with scarlet calyx. Calyx lobes 5, glabrous. Corolla tube salver shaped, inflated, villous within, lobes 5. Stamens 5. Ovary glabrous; style short. Drupes connate, black when ripe.

Fl. & Fr.: Oct.–Feb.

Habitat: Occasional in moist deciduous forest.

Specimen examined: GM Valasa, *Y. Mahesh* 010987 (BSID).

2. Rauvolfia tetraphylla L., Sp. Pl. 1: 208. 1753; R.S. Rao & al., Fl. E. Godavari Dist. 463. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1076. 2018. *Rauvolfia canescens* L., Sp. Pl. (ed. 2.). 303.1762; Gamble, Fl. Madras 2: 808. 1923. *'Papataku'*

A glabrous, dichotomously branched undershrub, up to 1 m high; stems and branches with milky latex. Leaves whorls of 4 at each node, elliptic-lanceolate or oblong, 5 cm long, unequal in size, cuneate at base, acute at apex, margins entire, dark green above, pale beneath, glabrous. Flowers in axillary and terminal cymose clusters, 5-7 flowered, white, with pink tinge. Calyx reddish, lobes 5. Corolla tube short; lobes 5. Drupe globose, shining, red, turning to black when ripe.

Fl. & Fr.: Sep.–Feb.

Habitat: Occasional in moist deciduous forests.

Specimen examined: Maredumilli, *Y. Mahesh* 012105 (BSID).

20. VINCETOXICUM Wolf

India: 32 spp. & 2 infraspecific; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Vincetoxicum fasciculatum (Buch.-Ham. ex Wight) Kuntze, Revis. Gen. Pl. 2: 424. 1891. *Tylophora fasciculata* Buch.-Ham. ex Wight Contrib. Bot. India 50. 1834; Hook. f., Fl. Brit. India 4: 40. 1883; Gamble, Fl. Madras 2: 842. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 477. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1141. 2018. **(Plate 58A)** *'Papataku'*

An erect, climbing undershrub, up to 45 cm high. Leaves opposite, suborbicular, ovate, 5 cm long, membranous, rounded at base, apex acute, margins entire, glabrous above. Flowers in extra axillary, simple or branched umbels, brownish. Calyx campanulate, lobes 5, small, ovate-lanceolate. Corolla campanulate, lobes 5, rotate, apex minutely bifid. Corona uniseriate. Follicles solitary, ovate, glabrous.

Fl. & Fr.: Aug.–Jan.

Habitat: Occasional as undergrowth in deciduous forest.

Specimen examined: Valamuru, *Y. Mahesh* 010498 (BSID).

21. WRIGHTIA R.Br.

India: 6 spp. & 1 infraspecific; Andhra Pradesh: 2 spp.; PNP: 1 sp. & 1 var.

Key to the species

1a. Leaves pubescent below; flowers white; follicles jointed only at apex, glabrous **2. W. tinctoria** subsp. **rothii**
1b. Leaves soft tomentose on both sides; flowers creamy coloured; follicles connate, rough, tuberculate **1. W. arborea**

1. Wrightia arborea (Dennst.) Mabb., Taxon 26: 533. 1977; R.S. Rao & al., Fl. E. Godavari Dist. 463. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1080. 2018. *Periploca arborea* Dennst., Schluess. Hort Malab. 13. 23 & 25. 1818

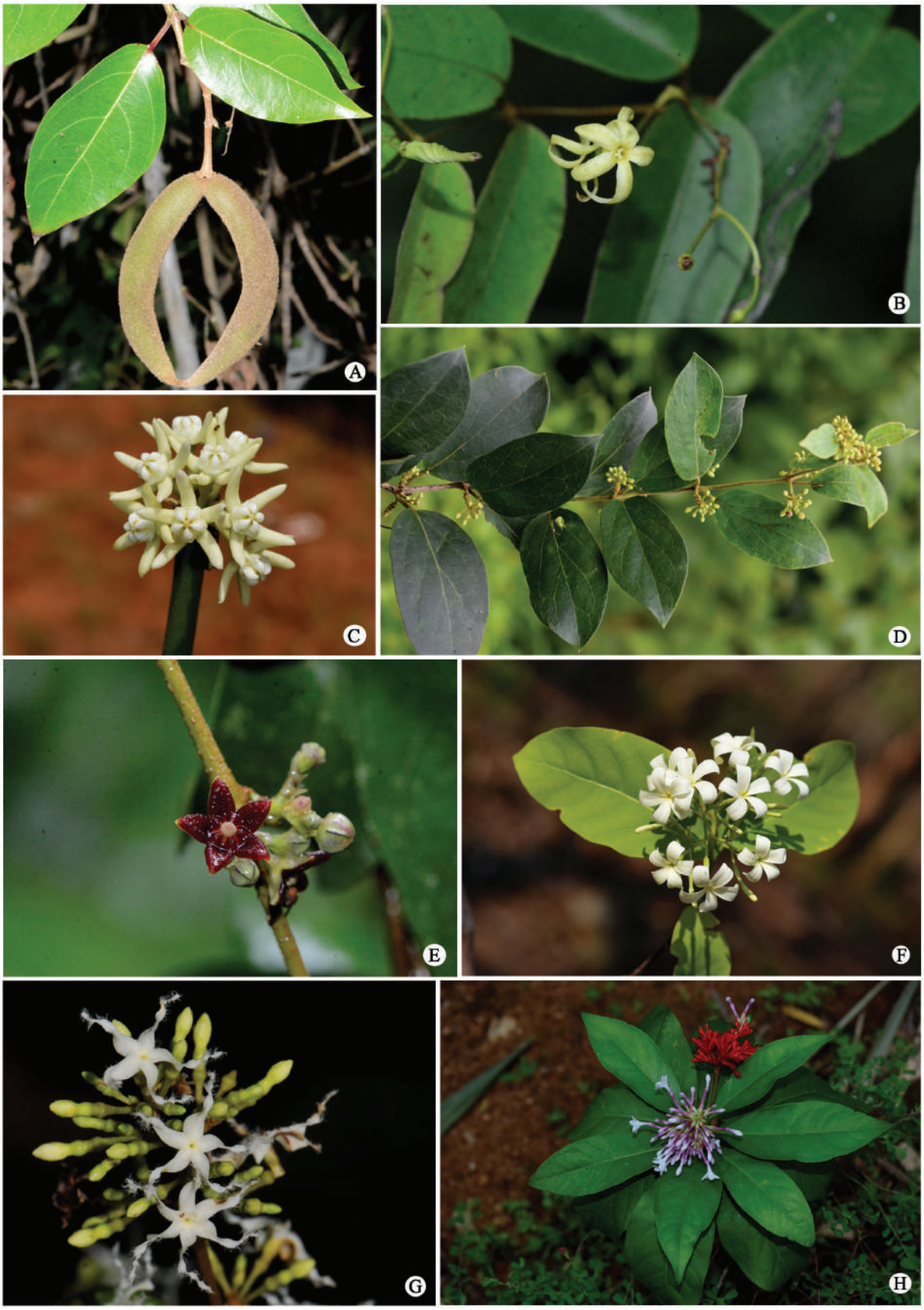


Plate 57: A. *Aganosma heynei* (Spreng.) I. M. Turner; **B.** *Cryptolepis sinensis* (Lour.) Merr.; **C.** *Cynanchum viminale* (L.) L.; **D.** *Gymnema montanum* (Roxb.) Hook.f.; **E.** *Hemidesmus indicus* (L.) R.Br.; **F.** *Holarrhena pubescens* Wall. ex G.Don; **G.** *Ichnocarpus frutescens* (L.) W.T.Aiton; **H.** *Rauvolfia serpentina* (L.) Benth. ex Kurz

& in Forts. Allg. Tentsch. Gaertn. Mag. 3: 2. 41 & 83. 1818. *Wrightia tomentosa* Roem. & Schult. in Syst. Veg. 4: 414. 1819; Hook. f., Fl. Brit. India 3: 653. 1882; Gamble, Fl. Madras 2: 816. 1923. *'Tellapala'*

Small, deciduous tree, up to 8 m high; bark light grey, rugged; branchlets smooth, densely tomentose. Leaves opposite, elliptic-ovate, 7–14 cm long, acute or caudate at base, acuminate at apex, margins entire, sparsely pubescent above, densely so beneath; petiole up to 4 mm long, densely pubescent. Flowers in densely pubescent corymbose cymes, 2 cm long, pale yellow or cream coloured. Calyx up to 3 mm long; lobes 5, oblong, pubescent. Corolla tube salver shaped, 6 mm long, lobes 5, oblong. Corona scales 10, linear. Stamens 5, exserted. Ovary short, glabrous. Follicles 2, cylindrical, *c.* 25 cm long, connate throughout, rough with white tubercules, speckled with white spots, beaked at apex. Seeds many, thin light brown.

Fl. & *Fr.:* Throughout the year.

Habitat: Occasional in open deciduous forest, pathways in the forest

Specimen examined: Buruguwada, *Y. Mahesh* 010100 (BSID).

2. Wrightia tinctoria (Roxb.) R.Br. subsp. **rothii** (G.Don) Ngan, Ann. Missouri Bot. Gard. 52: 144. 1965. *Wrightia rothii* G. Don in Gen. Hist. 4: 86. 1837. *Wrightia tinctoria* B.Heyne ex Roth in Nov. Pl. Sp.: 121. 1821, nom. illeg. **(Plate 58B)** *'Tedlapala'*

Medium sized tree, up to 12 m high; young branches puberulous. Leaves opposite, oblong-lanceolate or elliptic, 5–12 cm long, membranous, obtuse at base, obtusely acuminate at apex, margin entire, pubescent; petiole up to 3 mm long. Flowers in terminal dichotomously branched cymes, 1.5 cm across, white, fragrant, pedunculate, pedicellate. Calyx tube very short, glabrous, lobes 5, broadly oblong, rounded, margins ciliolulate along margins. Corolla tube short, 1 mm long, lobes 5, lanceolate-oblong or spathulate, rounded. Corona scales fimbriate. Stamens 5. Ovaries 2, free; style short. Fruit aggregate of two pendulous follicles, cylindric, *c.* 25 cm long, united at tip. Seeds many, linear, silky hairy at base.

Fl. & Fr.: Apr.–Aug.

Habitat: Common in dry deciduous forest.

Specimen examined: Buruguwada*, Y. Mahesh* 010094 (BSID).

Notes: Differs from the typical variety by its puberulous branches, leaves and inflorescences.

99. BORAGINACEAE

India: 43 genera, 225 taxa; Andhra Pradesh: 7 genera, 26 spp.; PNP: 7 genera; 10 spp.

Key to the genera

1a.	Ovary deeply 4-lobed	2
1b.	Ovary entire or slightly lobed	3
2a.	Style gynobasic	**3. Cynoglossum**
2b.	Style subterminal	**7. Trichodesma**
3a.	Style simple or simply forked; coyyledons not plicate	4
3b.	Style twice forked; cotyledons plicate	**1. Cordia**
4a.	Style usually lobed or parted stigmas 2	5
4b.	Style simple, elongated; stigma single	**5. Heliotropium**
5a.	Fruit dry, breaking into 4 nutlets	**2. Coldenia**
5b.	Fruit drupaceous	6
6a.	Style simple	**6. Rotula**
6b.	Style forked	**4. Ehretia**

1. COLDENIA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Coldenia procumbens L., Sp. Pl. 1: 125. 1753; Hook. f., Fl. Brit. India 4: 144. 1883; Gamble, Fl. Madras 2: 892. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 487. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1159. 2018. *'Hamsapadu', 'Boddasaramaaku'*

Procumbent herb, lying flat on the ground; branches appressed white pilose. Leaves alternate, oblong-obovate, 2.4 cm long, oblique at base, subacute or obtuse at apex, margins with pilose and bullate, irregularly dentate, pilose above, densely hairy below. Flowers extra axillary, solitary, 2 mm long, pale yellow. Calyx 3 mm long, lobes divided at base, ovate, long hairy on both sides. Corolla tube short, glabrous; lobes 4, oblong-ovate. Stamens 4. Ovary conical, 4 lobed; style arms 2, capitate. Drupe dry, pyramidal, 5 mm across, muricate, pubescent, separated

into 4 one seeded pyrenes. Seeds solitary in each locule.

Fl. & Fr.: Mar.–Jun.

Habitat: Common in cultivated fields, near water tanks, ditches

Specimen examined: Koida, *Y. Mahesh* 010187 (BSID).

2. CORDIA L.

India: 17 spp.; Andhra Pradesh: 6 spp.; PNP: 1 sp.

1. Cordia dichotoma G. Forst., Fl. Ins. Austr. 18. 110. 1786; R.S. Rao & al., Fl. E. Godavari Dist. 488. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1175. 2018. *Cordia obliqua* Willd., Phytographia 4. t. 4. 1794; C.B. Clarke in Hook. f., Fl. Brit. India 4: 137. 1883 *p.p.*; Gamble, Fl. Madras 2: 887. 1923. *Cordia wallichii* G. Don, Gen. Syst. 4: 379. 1838; Gamble, Fl. Madras 2: 887. 1923. *'Irikipallu'*

Medium sized deciduous tree, up to 12 m high; young branches drooping, glabrous or sparsely pubescent. Leaves variable, broadly ovate-obovate, 10 cm long, chartaceous, obtuse at base, acute-acuminate at apex, margin entire, sinuate, glabrous above, pubescent below; petiole up to 2.5 cm long. Flowers in axillary or terminal cymose panicles, subsessile, 5 mm across, white. Calyx lobes 5, ovate, pubescent within, prominently nerved, accrescent in fruit. Corolla lobes 5, oblong, obtuse, recurved. Stamens 5, villous at base. Ovary ovoid, tetralocular, glabous; style minute. Drupe ovoid, 1 cm across, apiculate, with saucer-shaped calyx. Seed 1.

Fl. & Fr.: Mar.–May.

Habitat: Common in dry deciduous forests.

Specimen examined: Darapally, Chigurumamidi, *Y. Mahesh* 010132, 011384 (BSID).

Field notes: Fruits gelatinous with mucilaginous pulp.

Uses: Used by tribal people for urinary disordrs.

3. CYNOGLOSSUM L.

India: 8 spp. & 1 infraspecific; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Cynoglossum zeylanicum (Lehm.) Brand, Pflanzenr. IV. 252: 134. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 489. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1160. 2018. *Echinospermum zeylanicum* Lehm., Pl. Asperif. Nucif. 1: 116. 1818. *Cynoglossum denticulatum* A. DC. var. *zeylanicum* (Hornem.) C.B. Clarke in Hook. f., Fl. Brit. India 4: 157. 1883; Gamble, Fl. Madras 2: 900. 1923. *'Kadaanthrina'*

Erect branched herb, up to 90 cm high; branches obtusely 4-angled with bulbous based hairy. Leaves ovate-lanceolate, 4–10 cm long, acute, margin entire, ciliate, bulbous based hairy; petiole up to 6 cm long. Flowers in axillary and terminal, strigose racemes, *c.* 3 mm long, pale lilac or light blue, long pedunculate. Calyx lobes 5, ovate, short, pilose without. Corolla tube 5 mm long, throat with 5 emarginate, pubescent; lobes 5, suborbicular, glabrous. Stamens 5. Ovary 4-lobed, glabrous; style short. Fruit aggregate of 4 nullets, glochidiate.

Fl. & Fr.: Jul.–Nov.

Habitat: Common in moist shady localities and waste places.

Specimen examined: PK Valasa, Kondamodalu, *Y. Mahesh* 010408, 011482 (BSID).

4. EHRETIA P. Browne

India: 13 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Ehretia aspera Willd., Phytographia 4. 1794; Gamble, Fl. Madras 2: 891. 1923. *Ehretia laevis* Roxb., Pl. Coromandel 1: 42. t. 56. 1796 & Fl. Ind. 2: 341. 1824; C.B. Clarke in Hook. f., Fl. Brit. India 4: 141. 1883; Gamble, Fl. Madras 2: 891. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 489. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1182. 2018. *Ehretia laevis* Roxb. var. *aspera* (Willd.) C.B. Clarke in Hook. f., Fl. Brit. India 4: 142. 1883. *Ehretia canarensis* (C.B. Clarke) Gamble, Fl. Madras 2: 891. 1923. *Ehretia laevis* Roxb. var. *canarensis* C.B. Clarke in Hook. f., Fl. Brit. India 4: 142. 1883. *Ehretia. pubescens* Benth. in Royle, Ill. Bot. Himal. 306. 1836; Gamble, Fl. Madras 2: 891. 1923. *Ehretia laevis* Roxb. var. *pubescens* (Benth.) C.B. Clarke in Hook. f., Fl. Brit. India 4: 142. 1883. **(Plate 58C)** *'Chillapaku, Bodidhichettu'*

Small tree, up to 7 m high; young branches pubescence. Leaves alternate, elliptic or elliptic-obovate, 12 cm long, coriaceous, cuneate at base, obtuse at apex, apiculate, margin entire, scaberulous above, pubescent

below; petiole up to 1 cm long. Flowers in axillary and terminal corymbose cymes, 5 mm long, white, pubescent, pedicellate. Calyx 2 mm long; lobes 5, oblong, pubescent without. Corolla tube short; lobes 5, oblong-rounded. Stamens 5, exserted. Ovary ovoid, glabrous; style glabrous. Drupe, globose, *c.* 4 mm, glabrous.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional along foot hills of deciduous forest.

Specimen examined: Valamuru, *Y. Mahesh* 011785 (BSID).

Field notes: Young leaves appear along flowers.

5. HELIOTROPIUM Tourn. ex L.

India: 22 spp. & 5 infraspecific; Andhra Pradesh: 10 spp.; PNP: 4 spp.

Key to the species

1a.	Erect or ascending herbs	2
1b.	Procumbent or spreading herbs	**3. H. supium**
2a.	Inflorescence a spike; stamens free	3
2b.	Inflorescence a raceme; stamens apically connivent	**4. H. zeylanicum**
3a.	Nutlets connate in pairs, angled, apically beaked	**1. H. indicum**
3b.	Nutlets free, rounded, obtuse	**2. H. ovalifolium**

1. Heliotropium indicum L., Sp. Pl. 1: 130. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 152. 1883; Gamble, Fl. Madras 2: 896. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 492. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1163. 2018. *'Nagadanti'*

Much branched, erect, hispid herb, up to 45 cm high. Leaves alternate, ovate-elliptic or oblong, 6 cm long, base narrowed in to petiole, acute at apex, margin undulate, sparsely hairy above, minutely pilose below. Flowers in leaf opposed or terminal unilateral spikes, 3 mm across, pale blue. Calyx lobes 5, linear, scabrous. Corolla tube salver shaped; lobes 5, ovate. Stamens 5. Ovary globose; style short. Nutlets 2-lobed, ribbed, *c.* 3 mm long, apically beaked. Seed 1.

Fl. & Fr.: Throughout the year.

Habitat: Common in cultivated fields and roadsides.

Specimen examined: Koida, *Y. Mahesh* 010190 (BSID).

2. Heliotropium ovalifolium Forssk., Fl. Aegypt.-Arab. 38. 1775; C.B. Clarke in Hook. f., Fl. Brit. India 4: 150. 1883; Gamble, Fl. Madras 2: 896. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 493. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1164. 2018. *'Naga danthi'*

An erect or decumbent, branched herb, up to 35 cm; branches clothed with soft white hairs. Leaves alternate, obovate or spathulate, 2 cm long, cuneate at base, obtusely apiculate at apex, margin entire, silky tomentose; petiole up to 1.4 cm long. Flowers in terminal helicoid cymes, *c.* 2 mm long, white. Calyx lobes 5, lanceolate, strigose without. Corolla campanulate; lobes ovate, pubescent at throat. Stamens 5. Ovary globose. Nutlets 4, rounded, *c.* 3.5 mm across, obtuse, pubescent, 1-seeded.

Fl. & Fr.: Jul.–Jan.

Habitat: Common in rocky crevices and cultivated fields.

Specimen examined: Kakeshnur, *Y. Mahesh* 010198 (BSID).

3. Heliotropium supinum L., Sp. Pl. 1: 130. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 149. 1883; Gamble, Fl. Madras 2: 896. 1923; Pull. & Karupp., Fl. Andhra Pradesh 3: 1169. 2018.

A prostrate or spreading, white villous herb, up to 30 cm long. Leaves alternate, ovate-elliptic, 2.1 cm long, chartaceous, attenuate at base, obtuse at apex, margin entire, softly white pubescent; petiole up to 6 mm long. Flowers in terminal scorpioid, simple or branched spikes, 5 mm long, white. Calyx tube urceolate, densely pubescent without; lobes 5, lanceolate, acute. Corolla pubescent without; lobes 5, broadly ovate-oblong. Stamens 5. Ovary globose; style short. Nutlets ovoid, *c.* 3 mm across, tuberculate.

Fl. & Fr.: Dec.–Apr.

Habitat: Occasional in waste moist places and cultivated fields.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011378 (BSID).

4. Heliotropium zeylanicum Lam., Encycl. 3: 94. 1789; Gamble, Fl. Madras 2: 896. 1923; Pull. & Karupp., Fl. Andhra Pradesh 3: 1170. 2018. *Heliotropium paniculatum* R. Br., Prodr. 494. 1810; C.B. Clarke in Hook. f., Fl. Brit. India 4: 151. 1883.

An erect herb, up to 35 cm high; branches subterete, wite pubescent. Leaves alternate, lanceolate, 2 cm long, base tapering, acute at apex, margins entire, ciliate, appressed hairy; petiole short. Flowers in axillary and terminal spikes, white, 2–4 mm long, appressed hairy, with foliaceous bracts. Calyx lobes 5, ovate, hairy, acute. Corolla lobes 5, short, subacute. Stamens 5. Ovary ovoid, 4-locular; style short. Fruit aggregate of two nutlets, *c.* 3 mm long, appressed hairy.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in cultivated fields androadsides.

Specimen examined: Buruguwada, *Y. Mahesh* 011596 (BSID).

6. ROTULA Lour.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Rotula aquatica Lour., Fl. Cochinch. 1: 121. 1790; Gamble, Fl. Madras 2: 893. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 493. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1185. 2018. *Rhabdia lyciodes* C. Martius, Nov. Gen. Sp. Pl. 2: 137. t. 195. 1827; C.B. Clarke in Hook. f., Fl. Brit. India 4: 145. 1883. **(Plate 58D)** *'Jamchi'*

A small, erect herb, up to 85 cm high; branches purplish, pubescent when young. Leaves alternate or fascicled, obovate-spathulate, 1.6 cm long, attenuate at base, obtuse or retuse at apex, margins serrate, pubescent. Flowers in axillary or terminal, clusters, 4 mm long, purple, 2-bracteate. Calyx campanulate; lobes 5, lanceolate, appressed hairy outside. Corolla lobes 5, elliptic, obtuse. Stamens 5. Ovary ovoid, 4-locular; style short. Drupes red, with 4 one seeded pyrenes, shorter than calyx.

Fl. & Fr.: Feb.–Jul.

Habitat: Common in rocky beds along stream banks.

Specimen examined: Eruwada, *Y. Mahesh* 010657 (BSID).

7. TRICHODESMA R. Br.

India: 7 spp. & 2 infraspecific; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Trichodesma indicum R.Br., Prodr. Fl. Nov. Holl. 496. 1810; C.B. Clarke in Hook. f., Fl. Brit. India 4: 153. 1883; Gamble, Fl. Madras 2: 899. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 494. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1171. 2018. *'Guvvagutti'*

An erect herb, up to 40 cm high; branches pubescent with bulbous based hairs. Leaves opposite, sessile, oblong-lanceolate, hastate, 4 cm long, auriculate at base, subacute at apex, margin entire, hispid above, villous below. Flowers in terminal unilateral racemes, light blue, hispid. Calyx lobes 5, lanceolate with hastate base, hispid. Corolla 1 cm across, throat with 10 yellow glandular spots; lobes 5, deltoid. Stamens 5. Ovary ovoid, glabrous, 4-locular; style short. Fruit pyramidal, *c.* 5 mm long, glabrous, tipped by persistent calyx, breaking into 4 nutlets.

Fl. & Fr.: Sep.–Feb.

Habitat: Common in wasteplaces and sandy stream beds.

Specimen examined: Kakeshnur, *Y. Mahesh* 011316 (BSID).

100. CONVOLVULACEAE

India: 24 genera, 197 taxa; Andhra Pradesh: 14 genera, 63 spp., 1 subsp.; PNP: 12 genera; 23 spp.

Key to the genera

1a.	Leafy, non-parasitic plants without haustoria	2
1b.	Leafless, parasitic plants with haustoria	**3. Cuscuta**
2a.	Pollen grains spinulose	3
2b.	Pollen grains not-spinulose	5
3a.	Fruit indehiscent, woody or fleshy	4
3b.	Fruit dehiscent by valves or irregular	**7. Ipomoea**
4a.	Corolla salver shaped, fruiting calyx woody	**11. Rivea**
4b.	Corolla funnel shaped; fruiting calyx not woody	**1. Argyreia**

5a.	Corolla bifid; style absent; stigma 5-10 rayed	**4. Erycibe**
5b.	Corolla not bifid; style present; stigma one	6
6a.	Styles 2, free	**5. Evolvulus**
6b.	Style 1, entire or two-minute branches concealed by stigma	7
7a.	Outer sepals broader and longer than inner ones	8
7b.	Outer sepals not as above	9
8a.	Leaves with stellate hairs; corolla bluish white; ovary glabrous	**8. Jacquemontia**
8b.	Leaves with simple hairs; corolla pale yellow; ovary hairy	**6. Hewittia**
9a.	Stem winged; capsule enclosed within the accrescent calyx	**10. Operculina**
9b.	Stem not winged; capsule not as above	10
10a.	Stems with two firm outgrowths at nodes	**2. Camonea**
10b.	Stems lacking outgrowths	11
11a.	Corolla campanulate, often gibbous on one side, without a maroon throat; sepals obtuse, rounded, emarginate	**9. Merremia**
11b.	Corolla funnelform, often with a maroon centre; sepals attenuate-acuminate	**12. Xenostegia**

1. ARGYREIA Lour.

India: 42 spp. & 4 infraspecific; Andhra Pradesh: 13 spp.; PNP: 4 spp.

Key to the species

1a.	Ovary 2-celled	**4. A. setosa**
1b.	Ovary 4-celled	2
2a.	Leaves ovate-oblong, cuneate at base, strigose below	**1. A. daltoni**
2b.	Leaves broadly ovate, rounded or cordate at base	**3**
3a.	Leaves silky white tomentose below; calyx lobes ovate, obtuse	**3. A. nervosa**
3b.	Leaves sparsely strigose below; calyx lobes lanceolate, acute	**2. A. involucrata**

1. Argyreia daltonii C.B. Clarke in Hook. f., Fl. Brit. India 4: 190. 1883; Gamble, Fl. Madras 2: 907. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 496. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1190. 2018.

Climber, up to 5 m long; branches pubescent. Leaves alternate, ovate, oblong, 8–15 cm long, cuneate or slightly rounded at base, apex acute, margin entire, glabrous above, pubescent below; petiole 2 cm long. Flowers in axillary, few flowered cymes, 5 cm across. Calyx tube pubescent; lobes 5, ovate-oblong, acuminate. Corolla tube 3.5 cm long; lobes 5, purple. Stamens 5. Ovary ovoid, glabrous; style solitary. Berry globose, *c.* 1.5 cm across, with persistent style. Seeds numerous.

Fl. & Fr.: Sep.–Feb.

Habitat: Common along foot hills, pathways in the forest.

Specimen examined: Valamuru, Kondamodalu, *Y. Mahesh* 010491, 011447 (BSID).

Note: Endemic to peninsular India.

2. Argyreia involucrata C.B. Clarke in Hook. f., Fl. Brit. India 4: 187. 1883; Gamble, Fl. Madras 2: 907. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 497. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1191. 2018.

Large twining shrub; stems hallow at tip. Leaves alternate, narrowly ovate, 7–15 cm long, cordate or rounded at base, acute at apex, margins entire, glabrous above, silky tomentose below; petiole 2.5 cm long. Flowers few in sub-capitate cymes, 4 cm across, purple. Calyx lobes unequal, lanceolate, acuminate. Corolla tube funnel shaped. Stamens 5. Ovary conical; style solitary. Berry with persistent calyx. Seeds 3–4, obovate, black.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in the forest.

Specimen examined: Ijjalueu, Maredumilli, *Y. Mahesh* 010969, 011513 (BSID).

Note: Endemic to peninsular India.

3. Argyreia nervosa (Burm.f.) Bojer, Hortus Maurit. 224. 1837; R.S. Rao & al., Fl. E. Godavari Dist. 497. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1193. 2018. *Convolvulus nervosus* Burm.f., Fl. Ind. 48. 1768. *Argyreia speciosa* (L.f.) Sweet, Hort. Brit. 289. 1827; C.B. Clarke in Hook. f., Fl. Brit. India 4:185. 1883; Gamble, Fl. Madras 2: 907. 1923. *Convolvulus speciosus* L.f., Suppl. 137. 1781. **(Plate 58E)** *'Chandrapala'*

A large climbing shrub; stems and branches densely white tomentose, hallow at tip; young branches with milky latex. Leaves alternate, broadly ovate, cordate, 10–25 cm long, deeply cordate at base, subacute at apex, margin entire, glabrous above, white silky tomentose beneath; petiole up to 15 cm long. Flowers in axillary, stout sub-capitate cymes, 7 cm across, pinkish-blue with purple centre, long pedunculate, bracteate. Calyx lobes 5,

subequal, elliptic, ovate, white silky pubescent, obtuse. Corolla tube funnel shaped; lobes 5, short; bonds silky pubescent. Stamens 5. Ovary ovoid; style solitary. Fruit globose, *c.* 1 cm across, pale brown, crowned with style base, glabrous. Seeds 4.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in forest.

Specimen examined: Valamuru, *Y. Mahesh* 010947 (BSID).

Field notes: Worth to introduce in garden due to showy purple flowers.

4. Argyreia setosa Arn. ex Choisy, Mem. Soc. Phys. Hist. Nat. Geneve 6: 425. 1834; R.S. Rao & al., Fl. E. Godavari Dist. 498. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1195. 2018. *Lettsomia setosa* Roxb., Fl. Ind. 2: 80. 1824; C.B. Clarke in Hook. f., Brit. India 4: 194. 1883; Gamble, Fl. Madras 2: 910. 1923. *'Maya teega'*

Climbing shrub; stems woody, terete, rough, hallow towards apex, with milky latex. Leaves alternate, ovate, 6–15 cm long, cordate at base, acute or abruptly acuminate at apex, margin entire, glabrous above, hairy below; petiole up to 6 cm long. Flowers in axillary, corymbose cymes, 3.5 cm across, pale pink, long pedunculate. Calyx lobes 5, ovate-oblong or orbicular, 1.6 cm long, obtuse, hairy. Corolla tube funnel shaped, 2 cm long, pubescent; lobes shallow. Stamens 5. Ovary ovoid, 2-celled, glabrous; style solitary. Berry ovoid, *c.* 1 cm across, brown. Seeds 3–4.

Fl. & Fr.: Sep.–Nov.

Habitat: Occasional in hilly slopes and foot hills.

Specimen examined: Netteppakota, *Y. Mahesh* 011669 (BSID).

2. CAMONEA Raf.

India: 17 spp. & 1 infraspecific; Andhra Pradesh: 8 spp.; PNP: 1 sp.

1. Camonea vitifolia (Burm.f.) A.R. Simoes & Staples, Bot. J. Linn. Soc. 183: 583. 2017. *Merremia vitifolia* (Burm. f.) Hallier f., Bot. Jahrb. Syst. 16: 5521893; Gamble, Fl. Madras 2: 928. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 508. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1235. 2018. *Convolvulus vitifolius* Burm.f., Fl. Ind. 45. t. 18. f.1. 1768. *Ipomoea vitifolius* (Burm. f.) Blume, Bijdr. 709. 1825; C.B. Clarke in Hook. f., Fl. Brit. India 4: 213. 1883.

Large twining herb; young parts clothed with white hairs. Leaves 3–5-lobed; lobes triangular, divided from above the middle, 6 cm long, cordate at base, apex acuminate, margin dentate, hispid hairy; petiole 4 cm long, hairy. Flowers in axillary cymes, 3 cm across, yellow. Calyx lobes 5, oblong-obovate. Corolla tube 5-lobed at mouth. Stamens inserted. Ovary ovoid; style short. Capsule globose, *c.* 1 cm across, covered with persistent calyx. Seeds 4.

Fl. & Fr.: Nov.–Mar.

Habitat: Common along stream banks and canals.

Specimen examined: Shivagiri, PK Valasa, *Y. Mahesh* 010079, 011779 (BSID).

3. CUSCUTA L.

India: 8 spp. & 2 infraspecific; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Cuscuta chinensis Lam., Encycl. 2: 229. 1786; C.B. Clarke in Hook. f., Fl. Brit. India 4: 226. 1883; Gamble, Fl. Madras 2: 931. 1923; Pull. & Karupp., Fl. Andhra Pradesh 3: 1243. 2018. **(Plate 58F)**

A twining, leafless, parasitic herb; stems succulent, yellow, glabrous. Flowers in clusters, yellowish-white, globular. Calyx lobes 5, triangular, 1.8 cm long, obtuse, glabrous. Corolla tube short; lobes 5, ovate, obtuse, inflexed. Stamens 5. Ovary globose; style short. Capsule globose, glabrous.

Fl. & Fr.: Oct.–Mar.

Habitat: Common parasitic twiner on bushy shrubs in the forest.

Specimen examined: Tekupally, *Y. Mahesh* 011341 (BSID).

4. ERYCIBE Roxb.

India: 7 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Erycibe paniculata Roxb., Pl. Coromandel 2: 31. t. 159. 1802; C.B. Clarke in Fl. Brit. India 4: 180. 1883; Gamble, Fl. Madras 2: 930. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 498. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1201. 2018. **(Plate 58G)** *'Puttapala teega'*

A large, woody climbing shrub; young branches rusty tomentose. Leaves alternate, elliptic-oblong, 8 cm long, acute at base, sharply acuminate at apex, margin entire, glabrous; petiole up to 1 cm long. Flowers in axillary racemes or panicles, 1.2 cm across, yellow. Calyx lobes ovate, obtuse, brown tomentose. Corolla lobes 5, twisted, obovate. Stamens inserted. Ovary globose, glabrous. Berry ellipsoid, with cupular, persistent calyx at base, black when ripe.

Fl. & Fr.: Nov.–May.

Habitat: Common along roadsides.

Specimen examined: Geediguppa, *Y. Mahesh* 011576 (BSID).

Field notes: Worth to introduce in gardens due to its light-yellow clustered flowers.

5. EVOLVULUS L.

India: 2 spp. & 5 infraspecific; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves elliptic-oblong or lanceolate; corolla rotate, blue	**1. E. alsinoides**
1b.	Leaves broadly ovate-orbicular; corolla infundibuliform, white	**2. E. nummularius**

1. Evolvulus alsinoides (L.) L., Sp. Pl., ed. 2. 1: 392. 1762; C.B. Clarke in Fl. Brit. India 4: 220. 1883; Gamble, Fl. Madras 2: 923. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 499. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1201. 2018. *Convolvulus alsinoides* L., Sp. Pl. 157. 1753. *'Vishnukranthi'*

Procumbent herb; branches pubescent. Leaves alternate, elliptic-oblong oe lanceolate, 1.4 cm long, acute at base, obtuse, apiculate at apex, margin entire, ciliate, sparsely appressed hairy on both surfaces; petiole 3 mm long. Flowers in axillary, solitary or 2–3 together on small weak peduncle, light blue, hairy. Calyx lobes 5, lanceolate, acuminate. Corolla rotate, lobes 5, silky pubescent along midpetalous region. Stamens 5, exserted. Ovary sub-globose, hairy; styles 2, each cleft into 2 branches. Capsule globose, 4-volved. Seeds 4, dark brown.

Fl. & Fr.: Aug.–Nov.

Habitat: Common in grassy fields, cultivated fields and roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (l.c.).

2. Evolvulus nummularius (L.) L., Sp. Pl., ed. 2. 1: 391. 1762; R.S. Rao & al., Fl. E. Godavari Dist. 500. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1202. 2018. *Convolvulus nummularius* L., Sp. Pl. 157. 1753. *'Seethammavari jadalu'*

Prostrate herb; stems rooting at nodes. Leaves alternate, broadly ovate- obicular, 2.2 cm long, subcordate at base, rounded at apex, margin entire; petiole short. Flowers axillary, solitary in leaf axils, white. Calyx lobes 5, elliptic sparsely pilose on dorsal side, acute. Corolla tube funnel shaped, infundibuliform, mouth 5 lobed. Stamens subexcerted. Ovary orbicular; styles 2, bifid. Capsule globose, 4-volved. Seeds few.

Fl. & Fr.: Around the year.

Habitat: Common along marshy areas.

Specimen examined: Shivagiri, Maredupudi, *Y. Mahesh* 010075, 010114 (BSID).

6. HEWITTIA Wight & Arn.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Hewittia malabarica (L.) Suresh in Nicolson *& al.*, Inter. Van Rheede's Hort. Malab. 88. 1988; Pull. & Karupp., Fl. Andhra Pradesh 3: 1203. 2018. *Convolvulus malabaricus* L., Sp. Pl. 1: 155. 1753. *Hewittia bicolour* (Vahl) Wight & Arn., Madras J. Lit. Sci. 5: 22. 1837; C.B. Clarke in Hook. f., Fl. Brit. India 4: 216. 1883; Gamble, Fl. Madras 2: 924. 1923. *Hewittia scandens* (Milne) Mab. In Manilal, Bot. Hist. Hort. Malab. 84. 1980; R.S. Rao & al., Fl. E. Godavari Dist. 500. 1999.

A twining herb; stems pubescent. Leaves alternate, cordate, ovate, 5–10 cm long, 5–7-palmately lobed, acute at apex, margin entire, ciliate, pubescent, shining. Flowers in axillary cymes, 1.5 cm long, yellow with purple brown base. Calyx campanulate, lobes 5, ovate, silky brown. Corolla lobes 5, twisted, pilose. Stamens 5. Ovary ovoid; style solitary, filiform. Capsule depressed globose, *c.* 1 cm in diam., covered with persistent calyx. Seeds 2–4.

Fl. & Fr.: Aug.–Dec.

Habitat: Occasional in ghat areas.

Specimen examined: Pedanunthalu, *Y. Mahesh* 011506 (BSID).

7. IPOMOEA L.

India: 55 spp. & 9 infraspecific; Andhra Pradesh: 27 spp.; PNP: 6 spp.

Key to the species

1a.	Erect shrubs	**2. I. carnea**
1b.	Climbers or twiners	2
2a.	Sepals distinctly awned below the apex	**4. I. hederifolia**
2b.	Sepals not as above	3
3a.	Aquatic plants	**1. I. aquatica**
4b.	Terrestrial plants	5
5a.	Sepals entire glabrous	6
5b.	Sepals hairy on outer surfaces	**3. I. eriocarpa**
6a.	Branches with white hairs; seeds dark brown	**6. I. obscura**
6b.	Branches glabrous; seeds black	**5. I. laxiflora**

1. Ipomoea aquatica Forssk., Fl. Aegypt.-Arab. 44. 1775; C.B. Clarke in Hook. f., Fl. Brit. India 4: 210. 1883; R.S. Rao & al., Fl. E. Godavari Dist. 501. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1207. 2018. *Ipomoea reptans* Poir. in Lam., Encycl. (Suppl. 3): 460. 1814, non L.; Gamble, Fl. Madras 2: 916. 1923. *'Thutikura'*

A floating, profusely branched herb; stems rooting at nodes. Leaves variable, alternate, ovate-lanceolate or oblong, 4–8 cm long, chartaceous, hastate or sagittate at base, acute-acuminate at apex, margin entire, glabrous; petiole up to 7 cm long. Flowers in axillary cymes, infundibuliform, 3.5 cm across, bluish-white or pink with purple centre, pedicellate. Calyx lobes 5, subequal, lanceolate-ovate. Corolla tube funnel shaped, 3.5 cm across; lobes orbicular. Stamens 5. Ovary ovoid; style short. Capsule ovoid-globose, *c.* 1 cm across, apiculate with persistent calyx. Seeds many.

Fl. & Fr.: Throughout the year.

Habitat: Common in water logged areas, ponds andrice fields.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011374 (BSID).

2. Ipomoea carnea Jacq., Enum. Syst. Pl. 13. 1760; Gamble, Fl. Madras 2: 919. 1923. subsp. *fistulosa* (Choisy) D. Austin, Taxon 26: 237.1977; Pull. & Karupp., Fl. Andhra Pradesh 3: 1211. 2018. *'Rabbaruchettu'*

Large, erect or straggling herbs; stems woody at base, hallow; branches and leaves with milky latex. Leaves alternate, ovate-triangular, 10–20 cm long, cordate at base, acuminate at apex, margin entire, glabrous above, pubescent below; petiole up to 8 cm long. Flowers in axillary and terminal clustered cymes, 6 cm across, pinkish. Calyx tube greenish; lobes 5, suborbicular, acute or obtuse. Corolla tube funnel shaped, up to 4.5 cm long, mouth 5-lobed. Stamens 5. Ovary ovoid, glabrous; style short. Capsule ovoid, *c.* 1 cm across, 4-volved, glabrous. Seeds 3, oblong, densely pubescent.

Fl. & Fr.: Throughout the year.

Habitat: Common along roadside ditches and lakes.

Specimen examined: Geediguppa, *Y. Mahesh* 011590 (BSID).

3. Ipomoea eriocarpa R. Br., Prodr. Fl. Nov. Holland. 484. 1810; C.B. Clarke in Hook. f., Fl. Brit. India 4: 204. 1883; Pull. & Karupp., Fl. Andhra Pradesh 3: 1214. 2018. *Ipomoea hispida* (Vahl) Roem. & Schult., Syst. Veg. 4: 238.1819; Gamble, Fl. Madras 2: 915. 1923. *'Puriteega'*

A twining, pubescent herb; branches slender, grooved. Leaves alternate, linear-oblong or ovate, 4–8 cm long, chartaceous, hastate, rounded or cordate at base, acute, apiculate at apex, margin entire, glabrous above, pubescent beneath; petiole up to 8 cm long. Flowers subsessile, in axillary, aggregated in capitate clustered cymes, *c.* 1 cm across, pinkish. Calyx lobes 5, up to 6 mm long, ovate-acuminate, densely pubescent without. Corolla up to 1 cm across, densely pubescent on tube without, tube salver shaped, lobed at mouth. Stamens 5, exserted. Ovary oblong; style short. Capsule ovoid-globose, 6 mm across, pubescent. Seeds 4, trigonous, minutely pitted.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in waste localities.

Specimen examined: Eruwada, Kondrukota, *Y. Mahesh* 010628 011650 (BSID).

4. Ipomoea hederifolia L., Syst. Nat., ed. 10. 2: 925. 1759; R.S. Rao & al., Fl. E. Godavari Dist. 502. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1215. 2018. *Quamoclit phoenicea* (Roxb.) Choisy, Mem. Soc. Phys. Geneve 6: 433. 1834; Gamble, Fl. Madras 2: 919. 1923. *Ipomoea coccinea* auct.: C.B. Clarke in Hook. f., Fl. Brit. India 4: 199. 1883. *'Kasiratnamu'*

A climbing herb; stems woody at base, twisted, faintly grooved, sparsely hairy. Leaves alternate, broadly ovate-cordate, 5–10 cm long, cordate at base, acuminate at apex, margin angled, obscurely 3-lobed, glabrous; petiole up to 4 cm long. Flowers in axillary and terminal, long pedunculate, lax cymes, 4 cm across, scarlet red, pedunculate. Calyx 5 mm long; lobes 5, subequal, ovate, awned below the apex. Corolla tube salver shaped, *c.* 4 cm long, 5-lobed at mouth. Stamens exserted. Ovary ovoid, glabrous; style exserted. Capsule ovoid-globose, *c.* 7 mm across, apex apiculate, 4-volved. Seeds 4, trigonous, pointed at end, hairy.

Fl. & Fr.: Sep.–Dec.

Habitat: Common on bushes along roadside.

Specimen examined: Kondamodalu, Tekuru, *Y. Mahesh* 010063, 011634 (BSID).

5. Ipomoea laxiflora H.J. Chowdhery & Debta in Indian J. Forest. 32 (1): 120. 2009; Singh & al. in Indian J. Forest. 34 (3): 335. 2011; Kattee & al. in Rheedea 29 (3): 211.2019; Mahesh & al., Indian Forester, 148 (12): 1274. 2022.

Annual climber, up to 3 m long; stems green when young, turning purplish at oldage, sylindrical, ribbed, glabrous. Leaves simple, variable, ovate, 3.5–9 × 3–7 cm, cordate at base, acuminate at apex, marginentire, distal leaves trilobed, lobes sharp, glabrous on both surfaces, lateral nerves slightly conspicuousabove, 4 pairs at the base of leaf, remaining towards aopex; petioles up to 7 cm long, glabrous.Inflorescence lax, cymose, 1-3–5-6 - flowered; peduncles 5–11 cm long, curved up, swollen at apex;pedicels up to 5 mm in fruit, quadrangular, glabrous, bulged, cushion like below the flower but shrinks when the fruit matures; bracts linear, caducous, 2.5 mm long. Flowers: Sepals 5, subequal, 7–9 × 3 mm, glabrous, faintly veined, purplish at apex, margins white at fruit dehiscence, taller than the capsule,upright; corolla funnel-shaped, pink, 1.4–1.7 cm long; limb 5- lobed, lobes apiculate; stamens 5, filaments subequal, included, 7 mm long, hairy at base; ovary 1 × 1.4 mm, glabrous; style 8 mm long; stigmabilobed; Capsule ovoid, 4×5 mm, 4-partite, glabrous; style-base persistent; the locular partition transparent, has a rim and central axis, 5 × 5 mm, slightly ellipsoidal. Seeds black, glabrous, 4 × 3 mm,with two flat lateral faces and convex back with a shallow ridge at the centre.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional on thorny bushes along forest pathways.

Specimen examined: Kachuluru, *Y Mahesh*, 011504 (BSID).

6. Ipomoea obscura (L.) Ker Gawl., Bot. Reg. 3: t. 239. 1817; C.B. Clarke in Hook. f., Fl. Brit. India 4: 207; Gamble, Fl. Madras 2: 916. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 503. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1220. 2018. *Convolvulus obscurus* L., Sp. Pl. ed. 2. 220. 1762. *'Nallakokkita'*

Slender, climbing herb; branches with white hairs. Leaves alternate, broadly ovate, 5 cm long, cordate at base, shortly acuminate at apex, margin entire, ciliate, glabrous or sparsely pubescent, basal lobes rounded, obtuse. Flowers in axillary, solitary or 2–3, sub-umbellate cymes, 4 cm across, creamy-white or pale yellow, pedunculate. Calyx lobes 5, subequal, entire, glabrous or sparsely pubescent, apiculate. Corolla funnel shaped, 4 cm across, lobes 5, shallow, apiculate, ciliate, hardly enlarged in fruit. Stamens 5. Ovary ovoid, glabrous, bilocular; style short, slender. Capsule ovate-oblong, *c.* 6 mm in diam. Seeds oblong, dark brown, velvety.

Fl. & Fr.: Throughout the year.

Habitat: Common in forest outskirts.

Specimen examined: Kakeshnur, *Y. Mahesh* 011335 (BSID).

8. JACQUEMONTIA Choisy

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Jacquemontia paniculata (Burm.f.) Hallier f., Bot. Jahrb. Syst. 16: 541. 1893; Gamble, Fl. Madras 2: 926. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 506. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1228. 2018. *Ipomoea paniculata* Burm. f., Fl. Ind. 50. t. 21. f. 3. 1768. *Convolvulus parviflorus* Vahl, Symb. Bot. 3: 29. 1794; C.B. Clarke in Hook. f., Fl. Brit. India 4: 220. 1883.

Twining, pubescent herb; stems faintly angled, grooved, glabrous when young. Leaves alternate, ovate, 4–7 cm long, membranous, truncate or subcordate at base, shortly acuminate at apex, margin entire, ciliate, glabrous; petiole up to 3.5 cm long. Flowers in axillary, umbellate cymes, 1 cm long, pale pink. Calyx lobes 5, ovate-lanceolate 6 mm long, unequal, acuminate, pubescent. Corolla infundibuliform, 1 cm long; lobes 5, shallow, apiculate. Stamens 5, included. Ovary obovoid or globose, bilocular; style slender. Capsule ovoid-globose, *c.* 6 mm across, 8-volved, shining. Seeds 4, trigonous, brown, slightly winged along margins.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional on bushes and roadsides.

Specimen examined: Netteppakota, *Y. Mahesh* 011665 (BSID).

9. MERREMIA Dennst. ex Endl.

India: 17 spp. & 1 infraspecific; Andhra Pradesh: 7 spp.; PNP: 3 sp.

Key to the species

1a.	Leaves trilobed or entire; branchlets turbinate; capsule wrinkled	**2. M. hederacea**
1b.	Leaves entire; branchlets glabrous to sparsely hirsute; capsule smooth	2
2a.	Corolla white; capsule valves hard	**3. M. umbellata**
2b.	Corolla pale yellow-white	**1. M. emarginata**

1. Merremia emarginata (Burm.f.) Hallier f., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Madras 2: 928. 1923; Pull. & Karupp., Fl. Andhra Pradesh 3: 1231. 2018. *Evolvulus emarginatus* Burm.f., Fl. Ind. 77. 1768. *Ipomoea reniformis* (Roxb.) Choisy, Mem. Soc. Phys. Geneve 6: 446. 1834; C.B. Clarke in Hook. f., Fl. Brit. India 4: 206. 1883. *'Elikajemudu'*

A creeping, prostrate herb; young branches sparsely hispid. Leaves alternate, ovate or reniform, 3 cm long, chartaceous, cordate at base, obtuse at apex, margin crenate, glabrous; petiole up to 5 cm long. Flowers in axillary, solitary or in few flowered cymes, 8 mm across, yellow, purple near base. Calyx lobes ovate-obovate. Corolla campanulate, 5-lobed at mouth. Stamens exserted. Ovary ovoid; style short. Capsule globose, *c.* 6 mm across, shortly apiculate, glabrous. Seeds rounded, glabrous, brown.

Fl. & Fr.: Sep.–Mar.

Habitat: Common in marshy areas, cultivated fields and along field bunds.

Specimen examined: Sirivaka, *Y. Mahesh* 011606 (BSID).

2. Merremia hederacea (Burm.f.) Hallier f., Bot. Jahrb. Syst. 18: 118. 1893. R.S. Rao & al., Fl. E. Godavari Dist. 507. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1233. 2018. *Evolvulus hederaceus* Burm.f., Fl. Ind. 77. 1768. *Ipomoea chryseides* Ker.-Gawl., Bot. Reg. 4: t. 270. 1818; C.B. Clarke in Hook. f., Fl. Brit. India 4: 206. 1883. *Merremia chryseides* Hallier f., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Madras 2: 929. 1923.

A twining, prostrate herb, rooting at nodes; stems angled, grooved, sparsely hairy. Leaves alternate, ovate, shallowly trilobed, 4 cm long, cordate at base, acuminate at apex, margins entire, wavy, glabrous on both sides, sparsely hairy on midrib on either side; petiole up to 4 cm long. Flowers in axillary, dichasial, racemose cymes, 8 mm across, yellowish with white tube. Calyx lobes 5, subequal, obovate-spathulate, 5 mm long, obtuse. Corolla campanulate, tube 6 mm long, 5-shallowely lobed. Stamens exserted. Ovary ovoid; style short. Capsule broadly ovoid, *c.* 6 mm across, depressed. Seeds 4, rounded, glabrous.

Fl. & Fr.: Sep.–Jan.

Habitat: Common on bushes.

Specimen examined: Sirivaka, *Y. Mahesh* 011607 (BSID).

3. Merremia umbellata (L.) Hallier f., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Madras 2: 928. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 508. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1235. 2018. *Convolvulus umbellatus* L., Sp. Pl. 1: 155. 1753. *Ipomoea cymosa* (Desr.) Roem. & Schult., Syst. 4: 241. 1819; C.B. Clarke in Hook. f., Fl. Brit. India 4: 211. 1883. *Convolvulus cymosus* Desr. in Lam., Encycl. 3: 556. 1791. *'Varremala teega', 'Kappa teega'*

Creeping herb; stems rooting at nodes, slightly angular, pubescent when young. Leaves alternate, variable in size, ovate-oblong 12 cm long, truncate or cordate at base, acute or acuminate at apex, margins entire, glabrous above, sparsely hairy below; petiole 3 cm long. Flowers in axillary, solitary or few flowered, umbellate cymes, 3.5 cm across, white or cream coloured. Calyx lobes 5, subequal, broadly elliptic. Corolla campanulate, tube 5-lobed at mouth. Stamens sub exserted. Ovary conical, glabrous; style sub-exserted. Capsule globose, *c.* 1 cm across, glabrous.

Fl. & Fr.: Oct.–Mar.

Habitat: Common along stream banks and open moist areas.

Specimen examined: Geediguppa, *Y. Mahesh* 010153 (BSID).

10. OPERCULINA Silva Manso

India: 4 spp. & 1 infraspecific; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Operculina turpethum (L.) Silva Manso, Enum. Subst. Braz. 16: 49. 1836; Gamble, Fl. Madras 2: 929. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 509. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1236. 2018. *Convolvulus turpethum* L., Sp. Pl. 1: 155. 1753. *Ipomoea turpethum* (L.) R. Br., Prodr. 485. 1810; C.B. Clarke in Hook. f., Fl. Brit. India 4: 212. 1883.

Stout twiner; stems 3-angled, winged, sparsely hairy. Leaves alternate, variable, ovate-oblong 5–10 cm long, cordate at base, apex acute, margin entire, hairy on both sides. Flowers in axillary cymes, 4 cm across, white. Calyx lobes 5, unequal, ovate, acute, pubescent. Corolla tube funnel shaped, 5-lobed at mouth. Stamens inserted. Ovary smooth; style solitary. Capsule globose, 2 cm across, depressed, enclosed in enlarged, woody calyx.

Fl. & Fr.: Oct.–Feb.

Habitat: Common in open scrub forest and outskirts.

Specimen examined: Buruguwada, Koida, *Y. Mahesh* 010098 010184 (BSID).

11. RIVEA Choisy

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Rivea hypocrateriformis (Desr.) Choisy, Mem. Soc. Phys. Geneve 6: 408. 1833; C.B. Clarke in Hook. f., Fl. Brit. India 4: 184. 1883; Gamble, Fl. Madras 2: 903. 1923; Rao & al., Fl. E. Godavari Dist. 509. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1238. 2018. *Convolvulus hypocrateriformis* Desr. in Lam., Encycl. 3: 561. 1792. *'Bodditeega'*

A twining shrub; stems terete, with adpressed white hairs. Leaves alternate, broadly ovate-orbicular, 5 cm long, truncate or cordate at base, apiculate at apex, margin entire, glabrous above, pubescent below; petiole up to 5 cm long. Flowers in axillary, solitary, 5 cm across, white. Calyx 1 cm long, accrescent in fruit; lobes 5, subequal, oblong-ovate, acute, pubescent without. Corolla tube funnel shaped, 4 cm long, 5-lobed at mouth. Stamens slightly exserted; ovary ovoid, glabrous; style short. Capsule ovoid, *c.* 1.5 cm long, mucronulate, seated on accrescent calyx, indehiscent. Seeds 4.

Fl. & Fr.: Aug.–Jan.

Habitat: Fl. & Fr.: Common in open forest outskirts.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

12. XENOSTEGIA D.F. Austin & Staples

India: 1 sp. & 1 infraspecific; Andhra Pradesh: 1 sp. & 1 subsp.; PNP: 1 sp.

1. Xenostegia tridentata (L.) Austin & Staples, Brittonia 32: 533. 1981; Pull. & Karupp., Fl. Andhra Pradesh 3: 1240. 2018. *Convolvulus tridentatus* L., Sp. Pl. 1: 157. 1753. *Ipomoea tridentata* (L.) Roth in Roem. Arch. Bot. 1: 38. 1798; C.B. Clarke in Hook. f., Fl. Brit. India 4: 205. 1883. *Merremia tridentata* (L.) Hallier f., Bot. Jahrb. Syst. 16: 552. 1893; R.S. Rao & al., Fl. E. Godavari Dist. 507. 1999. **(Plate 58H)**

Herbaceous creeper with woody root-stock; branches angular, pubescent. Leaves alternate, sessile, oblong-obovate, 2.5 cm long, with toothed auricle at base, obtuse at apex, margin entire, tridentate, sparsely pubescent above, glabrous below. Flowers in axillary cymes, 1 cm across, pale yellow or cream coloured. Calyx lobes 5, subequal, elliptic, glabrous. Corolla lobes 5, deltoid. Stamens 5. Ovary globose, bilocular; style slender. Capsule globose, *c.* 8 mm across, 4-volved. Seeds trigonous.

Fl. & Fr.: Sep.–Dec.

Habitat: Common weed in cultivated fields, roadsides, waste places in the forest.

Specimen examined: Seemagandi, *Y. Mahesh* 011426 (BSID).

101. SOLANACEAE

India: 22 genera, 100 taxa; Andhra Pradesh: 9 genera, 29 spp.; PNP: 3 genera; 11 spp.

Key to the genera

1a.	Fruit capsule; corolla funnel or trumpet shaped; lobes shorter than tube	2
1b.	Fruit berry; corolla sub rotate or campanulate; lobes longer than tube	3

2a.	Calyx campanulate; corolla <2 cm across, rose coloured; stamens didynamous; capsule thin walled	**3. Nicotiana**
2b.	Calyx tubular; corolla >4 cm across, white; stamens equal; capsule thick walled	**2. Datura**
3a.	Stamens connivent, anthers longer than filaments	**4. Solanum**
3b.	Stamens not connivent, anthers as long as or shorter than filaments	**1. Capsicum**

1. CAPSICUM L.

1. Capsicum annuum L., Sp. Pl. 1: 188. 1753; Gamble, Fl. Madras 2: 941. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 518. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1247. 2018. *'Mirapa'*

An erect herb, up to 1 m high. Leaves ovate-lanceolate, 4-5 cm, glabrous, obtuse at base, apex acuminate, margins entire. Flowers axillary, pendent, white. Calyx lobe 5, undulate, persistent. Corolla tube 5-lobed at mouth. Anthers shorter than filaments. Ovary short. Berry cylindrical, oblong, pendent, green, red when ripe.

Fl. & Fr.: Throughout the year.

Habitat: Cultivated for chilli powder.

Specimen examined: PK Valasa, *Y. Mahesh* 010005 (BSID).

2. DATURA L.

India: 4 spp.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Branchlets glabrous or sparsely pubescent	**2. D. metel**
1b.	Branchlets whitish pubescent	**1. D. innoxia**

1. Datura innoxia Mill., Gard. Dict., ed. 8. n. 5. 1768; Pull. & Karupp., Fl. Andhra Pradesh 3: 1249. 2018. *Datura metel* auct. non L.: C.B. Clarke in Hook. f., Fl. Brit. India 4: 243. 1883; Gamble, Fl. Madras 2: 941. 1923.*'Ummetha'*

An erect, much branched herb, up to 1.2 m high; branchlets whitish pubescent. Leaves alternate, ovate, 8–20 cm long, unequally rounded at base, obtuse at apex, margins irregularly lobed, pubescent; petiole up to 2 cm long. Flowers axillary, solitary, 15 cm long, white. Calyx tube up to 8 cm long; lobes deltoid, acute. Corolla tube 15 cm long; lobes acuminate with tails in between, ciliate. Stamens 5. Ovary globose, softly prickly; style slender. Capsule globose, 4 cm across, spiny, irregularly dehiscing. Seeds globose.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in cultivated fields and open waste lands.

Specimen examined: Kakeshnur, *Y. Mahesh* 11328 (BSID).

2. Datura metel L., Sp. Pl. 1: 179. 1753; R.S. Rao & al., Fl. E. Godavari Dist. 512. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1250. 2018. *Datura fastuosa* auct. non L., 1759; C.B. Clarke in Hook. f., Fl. Brit. India 4: 242. 1883; Gamble, Fl. Madras 2: 941. 1923. *Datura fastuosa* auct. non L. var. *alba* (Nees) C.B. Clarke in Hook. f., Fl. Brit. India 4: 243. 1883; Gamble, Fl. Madras 2: 941. 1923. *'Ummetha'*

An erect, robust herb, up to 1 m high; stems and branches zig-zag, dark violet, glabrous; young parts glabrous or sparsely puberulous. Leaves broadly ovate, 13 cm long, irregularly 5–8 lobed, unequally rounded at base, acute at apex, margin entire, sparsely pubescent; petiole up to 6 cm long. Flowers axillary, solitary, 12 cm long, violet. Calyx tube 5 cm long, puberulous without; lobes 5, subequal, deltoid, acuminate. Corolla tube up to 12 cm long; lobes 5, shallow, acuminate. Stamens 5. Ovary tuberculate; style slender, pubescent. Capsule globose, 2 cm across, tuberculate and shortly spinous. Seeds numerous, flattened, brown.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in open waste lands and cultivated fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. NICOTIANA L.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 2 sp.

Key to the species

1a.	Corolla tube narrow only below, ventricose	**2. N. tabacum**
1b.	Corolla tube narrow throughout, not ventricose	**1. N. plumbaginifolia**

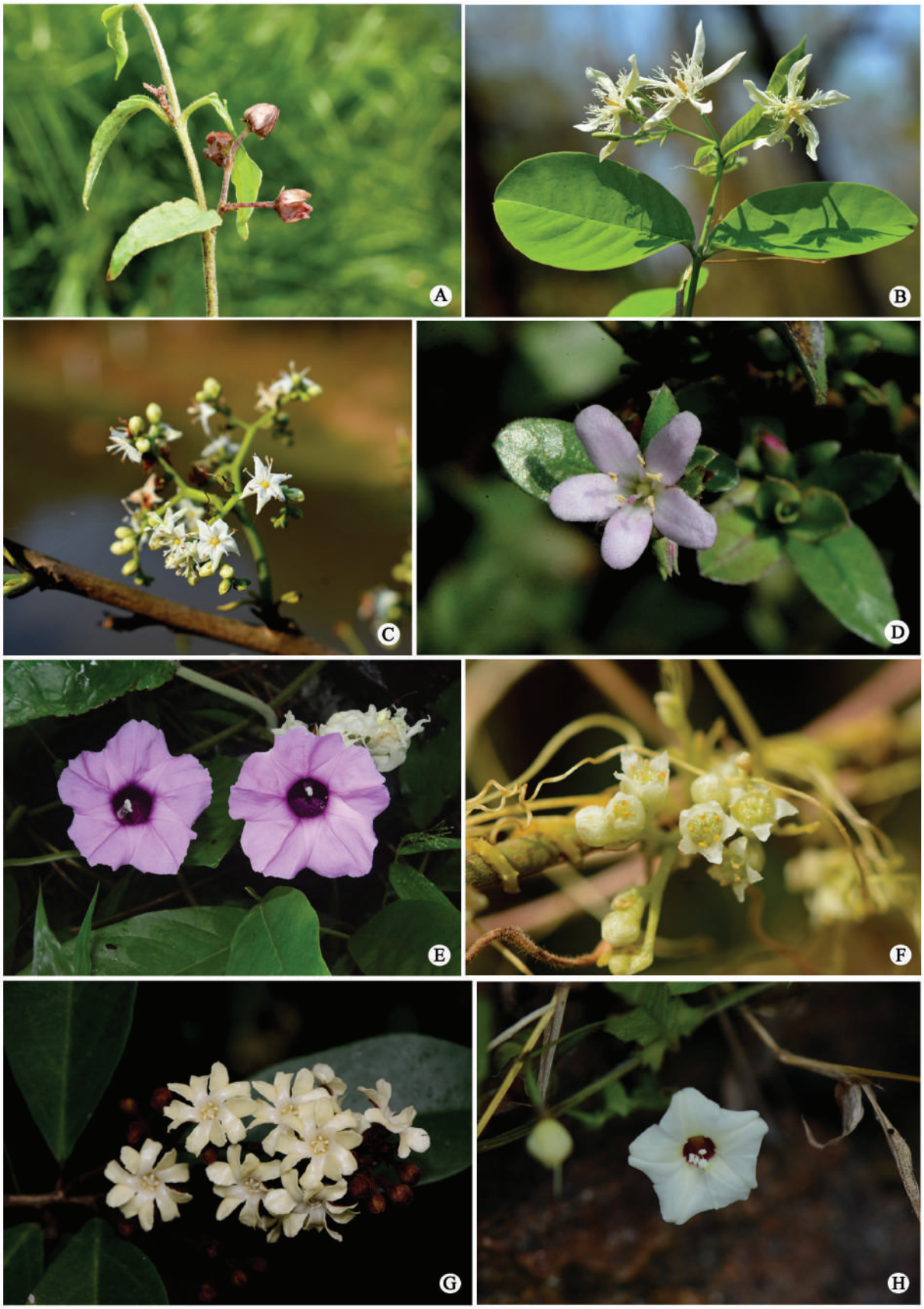


Plate 58: A. *Vincetoxicum fasciculatum* (Buch.-Ham. ex Wight) Kuntze; **B.** *Wrightia tinctoria* subsp. *rothii* (G.Don) Ngan; **C.** *Ehretia aspera* Willd.; **D.** *Rotula aquatica* Lour.; **E.** *Argyreia nervosa* (Burm.f.) Bojer; **F.** *Cuscuta chinensis* Lam.; **G.** *Erycibe paniculata* Roxb.; **H.** *Xenostegia tridentata* (L.) Austin & Staples

1. Nicotiana plumbaginifolia Viv. Elench. Pl. HOI't. Diuegro 26.t.1802; Clarke in Hook. f. Fl. Brit. India 4: 246. 1883; Haines, Bot. Bihar & Orissa 2 647. 1961 (rep. ed.); Chivan & Sabnis in J. Bombay Nat. Hist. Soc. 57: 446. 1960; Mathew & Rani in Fl. Tamilnadu Carnatic 2: 1055. 1983; C.S. Reddy & al. in j. Econ. Taxon. Bot. 23: 685. 1999; SFAP 91. 2008; Mahesh & al., Indian Forester, 148 (12): 1274. 2022.

An erect viscid -pubescent shallow rooted, annual herb, 60 cm tall. Leaves radical and cauline; basal ones form rosette, obovate-spathulate, lyrate, to 15 cm long, base cuniatetodecurrent, cauline leaves elliptic, ovate-elliptic, or lanceolate, clasping the stem. Flowers in terminal racemes; pedicels to 6 mm; calyx tubular, 10 ribbed, glandular hairy; lobes unequal, linear- lanceolate, acuminate, 6 mm corolla salver shaped, pinkish, 1 cm across; tube linear, tube 3-4 cm long, lobes ovate, obtuse, 5–7 mm long, spreading, stamens 5, attached near the throat, at different levels, filaments to 2.5 mm, anthors oblong, - cordate, 1.5 mm long, ovary 2.8 mm long, globose, style 3 cm; Fruit 7 x 5 mm, ovate, glabrous, as long as the calyx, seeds numerous, minute, rugose, light white.

Habitat: Occurs along Musi river bank.

Fl. & Fr.: Feb.–May.

Habitat: Common along river beds.

Specimens examined: Kakeshnur, *Y Mahesh*. 011325 (BSID)

2. Nicotiana tabacum L., Sp. Pl. 1: 180. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 245. 1883; Gamble, Fl. Madras 2: 941. 1923; Rao & al., Fl. E. Godavari Dist. 520. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1253. 2018. *'Pogaku'*

An erect, glandular pubescent herbs, 1 m high. Leaves cauline, broadly elliptic-ovate, 40 cm, cuneate at base, apex acuminate, margin entire. Flowers in axillary and terminal, corymbose panicles, rose coloured. Sepals 5, connate; lobes lanceolate. Petals connate, tube trumpet shaped, narrow below, ventricose above; lobes 5, acuminate. Stamens 5, didynamous. Ovary 2-celled. Capsule ellipsoid, globose, glabrous.

Fl. & Fr.: Throughout the year.

Habitat: Cultivated for its leaves.

Specimen examined: Tekupally, *Y. Mahesh* 010181 (BSID).

4. SOLANUM L.

India: 44 spp. & 3 infraspecific; Andhra Pradesh: 12 spp.; PNP: 7 spp.

Key to the species

1a.	Plants armed	4
1b.	Plants unarmed	2
2a.	Annual herb; leaves glabrous; berry black when ripe	**1. S. americanum**
2b.	Shrubs; leaves dense, stellately tomentose; berries red or yellow when ripe	3
3a.	Flowers white in dichotomous corymbose panicles	**3. S. erianthum**
3b.	Flowers purple in racemose cymes	**5. S. pubescens**
4a.	Erect shrubs or undershrubs	5
4b.	Prostrate or ascending herbs	**7. S. virginianum**
5a.	Flowers mauve coloured	6
5b.	Flowers white with yellow base	**6. S. torvum**
6a.	Leaves tomentose; calyx accrescent in fruit; berry oblong	**4. S. incanum**
6b.	Leaves glabrous or sparsely pubescent; calyx not accrescent in fruit; berry globose	**2. S. anguivi**

1. Solanum americanum Mill., Gard. Dict., ed. 8. n. 5. 1768; Pull. & Karupp., Fl. Andhra Pradesh 3: 1257. 2018. *Solanum nigrum* L., Sp. Pl. 186. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 229. 1883; Gamble, Fl. Madras 2: 936. 1923. *'Kamanchi'*

An erect, unarmed herb, up to 80 cm high. Leaves ovate-lanceolate, 3.5–7.5 cm long, sinuate or lobed, decurrent at base, subacute at apex, margin dentate, membranous, glabrous; petiole up to 4 cm long. Flowers in extra axillary, umbellate cymes, white, shortly pedicelled. Calyx lobes 5, oblong, pubescent. Corolla lobes 5, lanceolate, rotate. Stamens 5. Ovary globose; style pubescent. Berry globose, 7 mm across, black when ripe. Seeds numerous, sub-reniform.

Fl. & Fr.: Throughout the year.

Habitat: Common in moist localities and cultivated fields.

Specimen examined: Valamuru, Tekuru, *Y. Mahesh* 012106, 011637, 012106 (BSID).

2. Solanum anguivi Lam., Tabl. Encycl. 2: 23. 1794; R.S. Rao & al., Fl. E. Godavari Dist. 514. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1258. 2018. *Solanum indicum* auct. non L.; C.B. Clarke in Hook. f., Fl. Brit. India 4: 234. 1883; Gamble, Fl. Madras 2: 938. 1923. **(Plate 59A)** *'Adavichinta'*

An erect, prickly herb, up to 2 m high; stems and branches compressed, yellow with sharp prickles. Leaves alternate, variable, shallowly lobed, ovate, 3.5–7 cm long, obliquely cuneate at base, subacute at apex, margin entire, undulate, glabrous or sparsely pubescent above, stellate pubescent below, with prickles on midrib; petiole up to up to 3.5 cm long. Flowers in extra axillary cymespedunculate, blue. Calyx cupular, prickly; lobes 5, triangular. Corolla lobes 5. Stamens 5. Berry globose, *c.* 1 cm across. yellowish-orange when ripe. Seeds numerous.

Fl. & Fr.: Sep.–Jan.

Habitat: Common along roadsides.

Specimen examined: Kondamodalu, *Y. Mahesh* 011743 (BSID).

3. Solanum erianthum D. Don, Prodr. Fl. Nepal. 96. 1825; Roe, Taxon 17: 176. 1968. R.S. Rao & al., Fl. E. Godavari Dist. 515. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1260. 2018. *Solanum verbascifolium* auct. non L.; C.B. Clarke in Hook. f., Fl. Brit. India 4: 230. 1883; Gamble, Fl. Madras 2: 936. 1923. **(Plate 59B)** *'Buddama kaya', 'Vasaganti'*

Small, stellately fulvous, yellowish tomentose shrub, up to 2 m high. Leaves elliptic-lanceolate, 10–18 cm long, obliquely acute at base, shortly acuminate at apex, margins entire, stellately pubescent above, stellately tomentose below; petiole 2 cm long. Flowers in terminal, dichotomously branched corymbose panicles, white, tomentose. Calyx tube stellately tomentose; lobes 5, deltoid. Corolla tube stellately pubescent; lobes lanceolate. Stamens 5. Ovary globose, glabrous; style glabrous. Berry globose, *c.* 1.1 cm across, stellately pubescent, yellow when ripe. Seeds numerous, muricate.

Fl. & Fr.: Sept.–Jan.

Habitat: Occasional along moist places.

Specimen examined: GM Valasa, Valamuru, *Y. Mahesh* 010982, 011788 (BSID).

4. Solanum incanum L., Sp. Pl. 1: 188. 1753; Pull. & Karupp., Fl. Andhra Pradesh 3: 1262. 2018. *Solanum melongena* L. var. *incanum* (L.) Kuntze, Revis. Gen. Pl. 454. 1891; Gamble, Fl. Madras 2: 937. 1923**.** *Solanum coagulans* Forssk., Fl. Aegypt.-Arab. 47. 1775; C.B. Clarke in Hook. f., Fl. Brit. India 4: 236. 1883. *'Adavivankaya', 'Kandavanka'*

Erect, branched, stellately tomentose, prickly herb, up to 80 cm high. Leaves ovate-oblong, 6–12 cm long, obliquely truncate at base, acute at apex, margin entire, sinuately lobed, prickly along nerves, stellately pubescent above, tomentose below; petiole prickly, up to 3 cm long. Flowers in extra axillary fascicles, 1.5 cm across, violet. Calyx tube short, prickly, tomentose on both sides, accrescent in fruit; lobes 5, lanceolate. Corolla 1 cm long; lobes 5, ovate-oblong, densely pubescent without. Stamens 5. Ovary globose; style slender. Berry oblong or subglobose, *c.* 2.2 cm across, yellow when ripe. Seeds many.

Fl. & Fr.: Oct.–Jan.

Habitat: occasional in forest outskirts and cultivated fields.

Specimen examined: Ijjaluru, *Y. Mahesh* 010976 (BSID).

5. Solanum pubescens Willd., Phytographia 1: 5. 1794; C.B. Clarke in Hook. f., Fl. Brit. India 4: 230. 1883; Gamble, Fl. Madras 2: 936. 1923; Pull. & Karupp., Fl. Andhra Pradesh 3: 1263. 2018. *'Kasivuste', 'Ushti chettu'*

Stellately pubescent, unarmed shrub, up to 1.8 m high; branches terete, pubescent. Leaves ovate-cordate, 5–9 cm long, obliquely truncate or cordate at base, subacute at apex, margins sinuatly lobed, pubescent with simple and stellate hairs; petiole 4 cm long. Flowers in leaf opposed, corymbose cymes, bluish-purple, pubescent. Calyx lobes 5, lanceolate. Corolla 2.2 cm across; lobes 5, ovate, stellately pubescent. Stamens 5. Ovary broadly oblong, pubescent; style curved. Berry globose, *c.* 1 cm across, glabrous, orange red when ripe. Seeds scaly, brown.

Fl. & Fr.: Sep.–Jan.

Habitat: Common along roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

6. Solanum torvum Sw., Prodr. 47. 1788; C.B. Clarke in Hook. f., Fl. Brit. India 4: 234. 1883; Gamble, Fl. Madras 2: 937. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 517. 1999. *Solanum rude-pannum* Dunal, Prodr. 13: 264. 1852;

Pull. & Karuppu., Fl. Andhra Pradesh 3: 1264. 2018. **(Plate 59C)** *'Konda vasti'*

An erect, prickly, undershrub, up to 2.1 m high; branches stellately pubescent. Leaves ovate, shallowly lobed, 7–12 cm long, obliquely subcordate at base, acute at apex, margin entire, sinuate, stellate pubescent above, densely below; petiole 5 cm long. Flowers in extra axillary corymbose cymes, 2 cm across, white with yellow base. Calyx tube glabrous; lobes oblong. Corolla lobes 5, oblong, acute. Stamens 5. Ovary short. Berry globose, 1.3 cm across, glabrous, yellow when ripe. Seeds many, obscurely triangular.

Fl. & Fr.: Sep.–Feb.

Habitat: Occasional in forest outskirts and along pathways.

Specimen examined: Valamuru, *Y. Mahesh* 010502 (BSID).

7. Solanum virginianum L., Sp. Pl. 1: 187. 1753; Pull. & Karupp., Fl. Andhra Pradesh 3: 1267. 2018. *Solanum xanthocarpum* Schrad & Wendl., Sert. Hanov. 1: 8. t.2. 1795; C.B. Clarke in Hook. f., Fl. Brit. India 4: 236. 1883; Gamble, Fl. Madras 2: 938. 1923. **(Plate 59D)** *'Nelamunaka, Nelavankaya'*

Prostrate or ascending, prickly herb; branches stellate pubescent; prickles sharp, 1.5 cm long, yellow. Leaves pinnatifid, elliptic-oblong, 4–10 cm long, attenuate at base, obtuse or subacute at apex, margin sinuate, stellately pubescent; petiole up to 2 cm long. Flowers in extra axillary, few flowered cymes, pedunculate, violet, stellately pubescent. Calyx tube prickly; lobes ovate, acuminate. Corolla pubescent; lobes ovate. Stamens 5. Ovary ovoid. Berry globose, *c.* 1.5 cm across, yellow when ripe. Seeds numerous, flattened.

Fl. & Fr.: Throughout the year.

Habitat: Common in sandy soils and cultivated fields.

Specimen examined: Devipatnam, *G.V.S. Murthy* 24426 (CAL & MH).

102. SPHENOCLEACEAE

India: 1 genus, 1 spp.; Andhra Pradesh: 1 genus, 1 spp.; PNP: 1 genus; 1 spp.

1. SPHENOCLEA Gaertn.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Sphenoclea zeylanica Gaertn., Fruct. Sem. Pl. 1: 113. t. 24. 1788; Hook. f., Fl. Brit. India 3: 438. 1881; Gamble, Fl. Madras 2: 739. 1921; Pull. & Karuppu., Fl. Andhra Pradesh 3: 1010. 2018.

An erect, fibrous rooting herb, up to 45 cm high, stems and branches hallow. Leaves lanceolate, 6 cm long, acute at base, apex subacute, margin entire, glabrous. Flowers in terminal or leaf opposed spikes, white. Calyx lobes 5, ovate. Corolla campanulate; lobes 5, valvate. Stamens 5; style short. Capsule globose with numerous seeds.

Fl. & Fr.: Nov.–Apr.

Habitat: Occasional in paddy fields and lakes near villages.

Specimen examined: Buruguwada, *Y. Mahesh* 011594 (BSID).

103. HYDROLEACEAE

India: 1 genus, 2 taxa; Andhra Pradesh: 1 genus, 1 spp.; PNP: 1 genus, 1 spp.

1. HYDROLEA L.

India: 1 sp. & 1 infraspecific; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Hydrolea zeylanica (L.) Vahl, Symb. Bot. 2: 46. 1791; Hook. f., Fl. Brit. India 4: 133. 1883; Gamble, Fl. Madras 2: 884. 1923; Pull. & Karuppu., Fl. Andhra Pradesh 3: 1157. 2018. *Nama zeylanica* L., Sp. Pl. 226. 1763. **(Plate 59E)** *'Neelinakshtralu'*

Spreading, sub-succulent herb, up to 70 cm long, rooting at nodes; young branches pubescent. Leaves lanceolate-elliptic, 3.5 cm long, chartaceous, narrowed, obtuse at base, acute at apex, margin entire, glabrous above, glaucescent beneath; petiole up to 1.5 cm long. Flowers in axillary or terminal racemes. Calyx glandular pubescent; lobes 5, lanceolate-elliptic, acute. Corolla 1.5 cm across, blue; lobes 5, ovate. Stamens 5. Ovary oblong; style short. Capsule oblong or sub globose, pubescent. Seeds small.

Fl. & Fr.: Sep.–Mar.

Habitat: Occasional in open moist places and paddy fields.

Specimen examined: Kondamaodalu, Koida, *Y. Mahesh* 010068, 011348 (BSID).

Field notes: Worth to introduce in gardens due to its beautiful blue flowers.

104. OLEACEAE

India: 12 genera, 89 taxa; Andhra Pradesh: 6 genera; 24 taxa ; PNP: 4 genera, 6 spp.

Key to the genera

1a.	Trees; fruit a capsule, loculicidally 2-valved	2
1b.	Climbing or scandent shrubs or erect large shrubs; fruit didymous berry	3
2a.	Corolla < 1 cm long; lobes valvate	**1. Chionanthus**
2b.	Corolla > 1 am long; lobes imbricate	**4. Schrebera**
3a.	Leaves smooth, simple or compound; corolla tube greenish	**2. Jasminum**
3b.	Leaves scabrous, simple; corolla tune orange red	**3. Nyctanthes**

1. CHIONANTHUS L.

India: 7 spp. & 2 subsp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Chionanthus ramiflorus Roxb., Fl. Ind. 1: 106. 1820; Pull. & Karupp., Fl. Andhra Pradesh 3: 1046. 2018. *Linociera macrophylla* (Blume) Wall. ex C.B. Clarke in Hook. f., Fl. Brit. India 3: 610. 1882; Gamble, Fl. Madras 2: 794. 1923. **(Plate 59F)** *'Kurmagocchachettu'*

Small tree, up to 6 m high; branches glabrous. Leaves elliptic-oblong or oblanceolate, 8–16 cm long, acuminate at base, subacute at apex, margin entire, shining above, glabrous; petiole up to 2 cm long. Flowers in long panicles, white, bracteate, pedicellate. Calyx lobes 4, ovate, 5 mm long. Corolla tube 5 mm long; lobes 4, oblong with incurved margins. Stamens 2. Ovary oblong; style short. Drupe oblong, *c.* 1.3 cm long, purple when ripe.

Fl. & Fr.: Aug.–Mar.

Habitat: Occasional in moist deciduous forest.

Specimen examined: Kintukuru, *Y. Mahesh* 011746 (BSID).

2. JASMINUM L.

India: 35 spp., 2 subsp. & 3 infraspecific; Andhra Pradesh: 13 spp. & 1 var.; PNP: 3 spp.

Key to the species

1a.	Leaves simple	2
1b.	Leaves compound, trifoliate	**2. J. auriculatum**
2a.	Leaves ovate; calyx lobes minute, up to 2.5 mm long, deltoid	**1. J. arborescens**
2b.	Leaves cordiform to deltoid; calyx lobes 5 mm or more than 5 mm long	**3. J malabaricum**

1. Jasminum arborescens Roxb., Fl. Ind. 1: 94. 1820; C.B. Clarke in Hook. f., Fl. Brit. India 3: 594. 1882; Gamble, Fl. Madras 2: 789. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 451. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1048. 2018. *Jasminum roxburghianum* Wall. ex. C.B. Clarke in Hook. f., Fl. Brit. India 3: 595. 1882; Gamble, Fl. Madras 2: 789. 1923. *'Adavaimalle'*

A subscandent, villous shrub, up to 3 m high; young branches softly pubescent. Leaves opposite, ovate, 6.5 cm long, cordate or rounded at base, acuminate at apex, margin entire, tomentose on both sides; petiole 8 mm long, jointed below the middle. Flowers in terminal, trichotomously branched cymes, white, fragrant. Calyx tube short, 3 mm long; lobes 5, minute, triangular. Corolla tube 1.2 cm long; lobes 9, linear-narrow, acuminate, twisted. Stamens 2. Ovary globose; style short. Berry ellipsoid, *c.* 1.3 cm long, curved, black.

Fl. & Fr.: Feb.–May.

Habitat: Occasional in moist localities.

Specimen examined: Kondamodalu, *Y. Mahesh* 011756 (BSID).

2. Jasminum auriculatum Vahl, Symb. Bot. 3: 1. 1794; C.B. Clarke in Hook. f., Fl. Brit. India 3: 600. 1882; Gamble, Fl. Madras 2: 790. 1923; R.S. Rao & al., Fl. E. Godavari Dist. 452. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1050. 2018. *'Adaviteegamalli'*

Scandent, climbing, pubescent shrub, up to 3 m high; branches pubescent when young. Leaves opposite, trifoliate, up to 6 cm long; lateral leaflets small, *c.* 1 cm long, sometimes wanting; terminal ones large, ovate, 4.5

cm long, rounded at base, apiculate at apex, margin entire, sparsely pubescent above, densely below. Flowers in terminal corymbose cymes, 1 cm in diam., white, fragrant, pubescent. Calyx 2 mm long, pubescent without; lobes 5, minute, ovate-deltoid. Corolla tube up to 1 cm long; lobes 6, elliptic, 9 mm long, acute. Stamens 2. Ovary bilobed; style slender. Berry globose, *c.* 5 mm long, black when ripe.

Fl. & Fr.: Jul.–Oct.

Habitat: Common in outskirts of open forests, along pathways.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

3. Jasminum malabaricum Wight, Icon. Pl. Ind. Orient. t. 1250. 1848; C.B. Clarke in Hook. f., Fl. Brit. India 3: 594. 1882; Gamble, Fl. Madras 2: 789. 1923; Pull. & Karupp., Fl. Andhra Pradesh 3: 1052. 2018. **(Plate 59G)**

A straggling shrub, 2.5 m long; branches terete, purplish. Leaves opposite, elliptic or cordiform-deltoid, 10 cm long, membranous, truncate at base, acuminate or caudate at apex, margin entire, glabrous on both surfaces; petiole up to 2 cm long, jointed above the base. Flowers in terminal, trichotomously cymes, 2 cm long, white, fragrant. Calyx up to 8 mm long, pubescent without; lobes linear-lanceolate. Corolla 2 cm long, glabrous; lobes usually 9, twisted, linear, 1 cm long, acute. Stamens 2. Ovary globose. Berry ovoid-globose, *c.* 8 mm long, black when ripe.

Fl. & Fr.: Sep.–Feb.

Habitat: Occasional along pathways.

Specimen examined: Kakeshnur, Maredumilli, *Y. Mahesh* 010192, 011530 (BSID).

3. NYCTANTHES L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Nyctanthes arbor-tristis L., Sp. Pl. 1: 6. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 3: 603. 1882; Gamble, Fl. Madras 2: 792. 1923; R.S. Rao & al., E. Godavari Dist. 454. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1055. 2018. *'Parijathamu'*

Large shrub or small tree, up to 5 m high; young branches quadrangular, scabridly pubescent. Leaves opposite, ovate, 6–10 cm long, rounded at base, acuminate at apex, marginentire, short bulbous based hairy above, appressed hairy below; petiole short. Flowers in axillary and terminal, trichotomous cymes, white with orange tube, fragrant. Calyx pubescent 6–7-toothed. Corolla tube hairy at base; lobes 6–7, ovate. Stamens 2. Ovary compressed orbicular; style quadrangular. Fruit schizocarp, obcordate, *c.* 1.5 cm across, septicidal, 2-seeded. Seeds obovate, flattened.

Fl. & Fr.: Throughout the year.

Habitat: Occasional in dry deciduous forest and cultivated in home gardens.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

4. SCHREBERA Roxb.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Schrebera swietenioides Roxb., Pl. Coromandel 2: 1. t. 101. 1799 & Fl. Ind. 1: 109.1832; C.B. Clarke in Hook. f., Fl. Brit. India 3: 604. 1882; Gamble, Fl. Madras 2: 792. 1923; R.S. Rao & al., E. Godavari Dist. 455. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1057. 2018. *'Mokkem', Magalingam chettu'*

Large tree, up to 15 m high; young parts pubescent. Leaves opposite, imparipinnate; leaflets 5, ovate-elliptic or lanceolate, 8–12 cm along, unequally attenuate at base, shortly acuminate at apex, margin entire, glabrous; petiolule 8 mm long. Flowers in trichomously branched cymes, 1 cm long, yellowish brown, fragrant. Calyx up to 3 mm long; lobes 5, very short, ovate, pubescent. Corolla tube up to 5 mm long; lobes 8 mm long, glandular ciliate. Stamens 2. Ovary bilocular; style cylondric. Fruit loculicidal capsule, woody, obovoid, *c.* 6 cm long, scabrous with white dots. Seeds winged, brown.

Fl. & Fr.: Apr.–Jul.

Habitat: Occasional in deep forest.

Specimen examined: Kondamodalu, *Y. Mahesh* 011483 (BSID).

105. GESNERIACEAE

India: 27 genera, 144 taxa; Andhra Pradesh: 5 genera; 6 spp.; PNP: 2 genera; 2 spp.

Key to the genera

1a.	Leaf radical, single; flowers white, 2–3 from base of the leaf axile	**2. Microchirita**
1b.	Leaves cauline, few, opposite; flowers blue in dense scorpioid cymes	**1. Epithema**

1. EPITHEMA Blume

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Epithema carnosum Benth., Scroph. Ind. 57. 1835 var. **hispida** C.B. Clarke in DC., Monogr. Phan. 5: 178. 1883; Hook. f., Fl. Brit. India 4: 369. 1884; Gamble, Fl. Madras 2: 992. 1924; R.S. Rao & al., E. Godavari Dist. 531. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1319. 2018.

An erect, succulent, pubescent herb, up to 20 cm high. Leaves sessile, broadly ovate, 6 cm long, cordate at base, obtuse at apex, margins crenate, bristly on both sides. Flowers in axillary, pedunculate, scorpioid cymes, blue. Calyx campanulate; lobes ovate. Corolla tubular, bilipped. Stamens 4. Capsule globose, with hooked hairs.

Fl. & Fr.: Aug.–Oct.

Habitat: Occasional on moist rocky crevices.

Specimen examined: Valamuru, *Y. Mahesh* 010936 (BSID).

2. MICROCHIRITA (C.B. Clarke) Yin Z. Wang

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Microchirita hamosa (R.Br.) Yin Z. Wang, J. Syst. Evol. 49: 60. 2011. *Chirita violoides* (Wall.) M.R. Almeida, Fl. Maharashtra 3B: 437. 2001; Pull. & al., Fl. Andhra Pradesh 4: 1317. 2018. *Chirita hamosa* R.Br., Cyrtandreae 117. 1839; Hook. f., Fl. Brit. India 4: 360. 1884. **(Plate 59H)**

A succulent, tender herb, up to 6 cm high. Leaves solitary, broadly oblong-ovate, 6 cm long, cordate at base, acute at apex, margins entire, hairy on both surfaces. Flowers in axillary clusters, inconspicuous, white. Calyx lobes 5, linear, hairy. Corolla tube white. Stamens 2. Capsule linear, loculicidal, pilose.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional on moist rocky boulders.

Specimen examined: Valamuru, *Y. Mahesh* 010907 (BSID).

106. PLANTAGINACEAE

India: 60 genera, 353 taxa (Including Scrophulariaceae); Andhra Pradesh: 17 genera; 26 spp; PNP: 7 genera; 9 spp.

Key to the genera

1a.	Corolla distinctly bilabiate	2
1b.	Corolla not distinctly bilabiate	**6. Scoparia**
2a.	Calyx 5-partite, segments very unequal, outer 3 ovate-lanceolate, inner 2 linear	**5. Mecardonia**
2b.	Calyx not as above	3
3a.	Stamens 4, included within the corolla tube	4
3b.	Stamens 2, perfect, anterior pair reduced to staminodes, all inserted in the corolla tube	**3. Dopatrium**
4a.	Anther cells stipitate	5
4b.	Anther cells contiguous, not stipitate	**2. Bacopa**
5a.	Stamens 4, 2 or all with one anther cell imperfect	**1. Adenosma**
5b.	Stamens 4 with all cells perfect	6
6a.	Anthers equal; stigma 2-lamellate	**4. Limnophila**
6b.	Anthers unequal; stigma 2-lobed	**7. Stemodia**

1. ADENOSMA Nees

India: 7 spp.; Andhra Pradesh:1 ; PNP: 1 sp.

1. Adenosma indianum (Lour.) Merr. in Trans. Amer. Philos. Soc. n.s. 24:351. 1935; Cramer in Dassan. & Fosberg, Rev. Handb. Fl. Ceylon 3:448. 1981; Mahesh & al., Indian Forester, 148 (12): 1274. 2022.

Annuals, 20-60 cm tall, densely hairy. Stems erect, branched. Petiole 2-6 mm; leaf blade ovate to narrowly elliptic, 1.5-4.5 × 0.5-1.2 cm, densely glandular hairy, abaxially villous along veins and brown when dry, adaxially

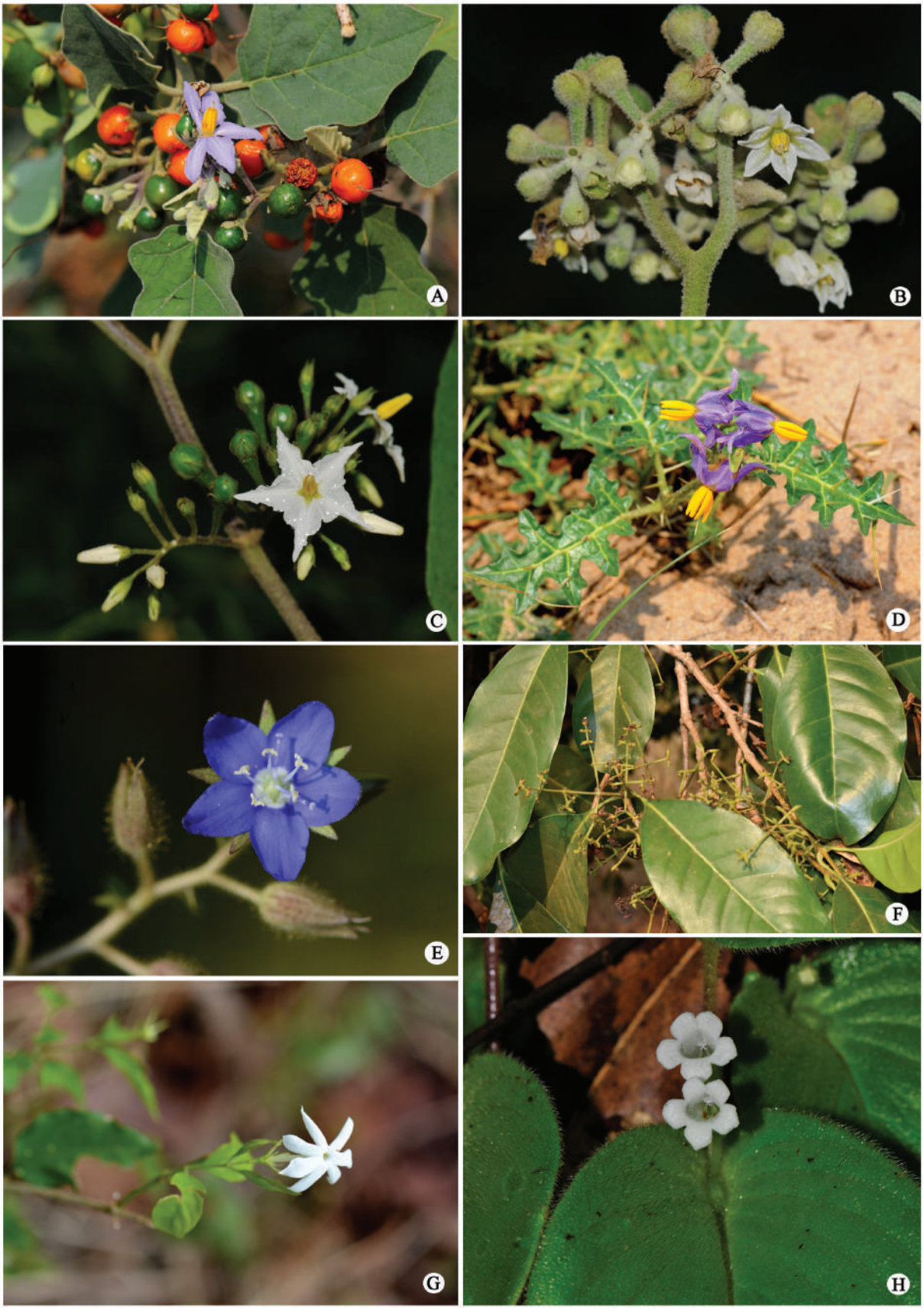


Plate 59: A. *Solanum anguivi* Lam.; **B.** *Solanum erianthum* D. Don; **C.** *Solanum torvum* Sw.; **D.** *Solanum virginianum* L.; **E.** *Hydrolea zeylanica* (L.) Vahl; **F.** *Chionanthus ramiflorus* Roxb.; **G.** *Jasminum malabaricum* Wight; **H.** *Microchirita hamosa* (R.Br.) Yin Z. Wang

villous and blackish when dry, margin serrate, apex obtuse. Inflorescences globose to cylindric spicate, 0.7-2 × 0.7-1.1 cm, dense; bracts narrowly ovate, forming an involucre at base of spikes. Flowers sessile. Bracteoles linear, 3-4 mm. Calyx 4-5 mm; lobes narrowly ovate to oblong-lanceolate, 2-3 mm, apex acuminate. Corolla pale purple to dark blue, *c.* 6 mm; throat hairy; lower lip lobes equal, suborbicular, *c.* 1 × 1-1.2 mm; upper lip retuse to 2-lobed. Anterior anthers with 1 locule fertile; posterior anthers with both locules fertile. Ovary narrowly ovoid. Capsule ovoid, *c.* 3 mm, 2-grooved. Seeds yellow.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in waste places in the forest.

Specimens examined: Gulletiwada, *Y Mahesh*, 010611 (BSID).

2. BACOPA Aubl.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Bacopa monnieri (L.) Wettst., Nat. Pflanzenfam. 4 (3b): 77. 1891; Pull. & Karupp., Fl. Andhra Pradesh 3: 1272. 2018. *Lysimachia monnieri* L., Cent. Pl. 2: 9. 1756. *Monniera cuneifolia* Michaux, Fl. Bor. Am. 2: 22. 1803; Gamble, Fl. Madras 2: 953. 1924. *Herpestis monnieri* (L.) Kunth, Nov. Gen. Sp. 2: 366. 1818, nom. illegit.; Hook. f., Fl. Brit. India 4: 272. 1884. *'Brahmi', Neetisambranii'*

Creeping, semi-succulent, marshy herb, rooting at nodes; branches glabrous. Leaves sessile, oblong-obovate, 2.2 cm long, acute or truncate at base, obtuse at apex, margin entire, glabrous. Flowers axillary, solitary, light blue. Calyx lobes 5, ovate, linear, ciliolate. Corolla up to 7 mm long, obscurely bilabiate; lobes 5, oblong, pubescent. Stamens 4, didynamous. Ovary ovoid, bilocular; style deltoid. Capsule ovoid, *c.* 5 mm long.

Fl. & Fr.: Throughout the year.

Habitat: Common near marshy areas and stream hedges.

Specimen examined: Koida, *Y. Mahesh* 011363 (BSID).

3. DOPATRIUM Buch.-Ham. ex Benth.

India: 3 spp. & 1 infraspecific; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Dopatrium junceum (Roxb.) Buch.-Ham. ex Benth., Scroph. Ind. 31. 1835; Hook. f., Fl. Brit. India 4: 274. 1884; Gamble, Fl. Madras 2: 954.1924; R.S. Rao & al., E. Godavari Dist. 521. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1275. 2018. *Gratiola juncea* Roxb., Pl. Coromandel t. 129. 1800 & Fl. Ind. 1: 142. 1832. **(Plate 60A)**

An erect, slender herb, up to 25 cm high; stems fleshy, glabrous. Leaves distant, decussate, sessile, oblong-obovate, 6-1.2 mm long, lower leaves larger than upper, acute at apex, margins entire, glabrous on both surfaces. Flowers axillary, solitary, 5 mm across, pink or blue, pedicellate. Calyx lobes short, linear-lanceolate, glabrous. Corolla up to 4 mm long, caducous. Stamens 2. Capsule globose, *c.* 4 mm across, obtuse at apex, glabrous. Seeds oblong, with gelatinous dots.

Fl. & Fr.: Jul.–Oct.

Habitat: Common in marshy localities.

Specimen examined: Kondamodalu, *Y. Mahesh* 011494 (BSID).

4. LIMNOPHILA R. Br.

India: 17 spp. & 3 infraspecific; Andhra Pradesh: 6 spp.; PNP: 2 spp.

Key to the species

1a.	All leaves simple	**2. L. repens**
1b.	Lower leaves pinnately dissected, upper ones capillary multifid	**1. L. indica**

1. Limnophila indica (L.) Druce, Rep. Bot. Exch. Club Soc. Brit. Isles 3: 420. 1914; Philcox, Kew Bull. 24: 115. 1970; Pull. & Karupp., Fl. Andhra Pradesh 3: 1278. 2018. *Hottonia indica* L., Syst. Nat., ed. 10: 919. 1759. *Limnophila gratioloides* R. Br., Prodr. 442. 1810; Hook. f., Fl. Brit. India 4: 271. 1884; Gamble, Fl. Mdras 2: 952. 1924. *'Burdabokkena'*

A small, fleshy herb, up to 23 cm high, attached in shallow running water; stems faintly quadrangular, rooting at lower nodes. Lower leaves pinnately dissected, upper ones multifid, whorled or opposite, glabrous; lobes linear-lanceolate or spathulate, 2 cm, long, acute at base, subacute at apex, margins crenate-serrate. Flowers axillary, solitary, up to 1 cm long, white with pink nectar guide. Calyx tube short, glandular; lobes 5, lanceolate, acuminate. Corolla up to 8 mm long, bilabiate. Stamens 4, didynamous. Ovary ovoid, bilocular; style short; stigma 2-lamellate. Capsule broadly ovoid, *c.* 3.5 mm across. Seeds many, black.

Fl. & Fr.: Nov.–Feb.

Habitat: Common in streamlets and water tank borders.

Specimen examined: Koida, Kothuru, *Y. Mahesh* 011360, 011361, 011657 (BSID).

2. Limnophila repens (Benth.) Benth. in DC., Prodr. 10: 387. 1846; Pull. & Karupp., Fl. Andhra Pradesh 3: 1280. 2018. *Stemodia repens* Benth., Edward´s Bot. Reg. 17. Subt. 1470. 1832 & Scroph. Ind. 24. 1835. *Limnophila conferta* Benth. in DC., Prodr 10: 287. 1846; Hook. f., Fl. Brit. India 4: 266. 1884; Gamble, Fl. Madras 2: 951. 1923.

Small, erect or prostrate herb, up to 25 cm high; stems rooting at nodes. Leaves opposite, decussate, elliptic, 2.3 cm long, narrowed at base, acute at apex, margins slightly crenate, glabrous. Flowers axillary, solitary, purple. Calyx lobes 5, subequal, linear-lanceolate. Corolla lobes bilabiate. Stamens 4, didynamous. Ovary ovoid. Capsule ovoid, *c.* 6 mm long. Seeds small.

Fl. & Fr.: Jul.–Jan.

Habitat: Common in moist localities and paddy fields.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011673 (BSID).

5. MECARDONIA Ruiz & Pav.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Mecardonia procumbens (Mill.) Small, Fl. S.E. U.S. 1065. 1903; Pull. & Karupp., Fl. Andhra Pradesh 3: 1292. 2018. *Erinus procumbens* Mill., Gard. Dict., ed. 8. n. 6. 1768.

A procumbent or erect herb, up to 25 cm high; stems rooting at lower nodes. Leaves opposite, ovate-elliptic, 1.6 cm long, obtuse at both ends, margin serrate, glabrous; petiole short. Flowers axillary, solitary, yellow. Calyx lobes 5, unequal, linear, lanceolate, acute, mucronate. Corolla sub-equally 4-lobed, slightly exserted from the calyx. Stamens 4, didynamous. Ovary oblong. Capsule oblong with numerous, minute seeds.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional along stream beds.

Specimen examined: Kondamodalu, Maredupudi, *Y. Mahesh* 010055, 010119 (BSID).

6. SCOPARIA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Scoparia dulcis L., Sp. Pl. 1: 116. 1753; Hook. f., Fl. Brit. India 4: 289. 1884; Gamble, Fl. Madras 2: 964. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 525. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1294. 2018. *'Pottibolli'*

An erect herb, up to 80 cm high; stems 4-angled, glabrous. Leaves whorled, sessile, elliptic, oblanceolate, 1.6 cm long, tapering at base, subacute at apex, margin serrate, glabrous. Flowers axillary, solitary or binate, white. Calyx lobes 4, elliptic-oblong, ciliolate. Corolla rotate, densely bearded in the throat; lobes oblong. Stamens 4. Ovary globose, bilocular; style short. Capsule sub-globose, *c.* 3 mm long. Seeds faintly rugulose, brown.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in marshy localities and stream beds.

Specimen examined: Tekupally, PK Valasa, *Y. Mahesh* 010175, 010433 (BSID).

7. STEMODIA L.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves opposite, sessile; stem quadrangular	**2. S. viscosa**
1b.	Leaves opposite and ternate, petiolate; stem terete	**1. S. verticillata**

1. Stemodia verticillata (Mill.) Hassl., Trab. Mus. Farmacol. no. 21: 110. 1909; 'D' Arcy in Ann. Miss.Bot. Gard. 66(2): 260. 1979; Mahesh & al., Indian J. Forest., 44 (2): 77. 2021. *Erinus verticillatus* Mill. Gard. dict. Ed. 8. No. 5. 1768. *Stemodia verticillata* (Mil.) Sprague in Kew Bull. 1921 nom. Superfl.; Cramer in Dassanayake, Rev. Handb. Fl. Ceylon 3 : 420. 1981.; Ramachandran & al., J. Econ. Tax. Bot. Vol. 5 No. 4 (1984) 943. **(Plate 60B)**

Annual erect herbs up to 20 cm high. Stems much branched, tufted, terete, hirsute. Leaves lower one opposite, upper ones in verticils of three, broadly ovate, 0.4-1.2 × 0.3 -1 cm, obtuse–subacute at apex, cuniate- truncate

at base, margin serrate with 6-9 teeth, sparingly pilose, pinninerved,petioles 4-7 mm long, slender, glandular hispid throughout. Flowers axillary, solitary, pedicelled; pedicels *c.*1.2 mm long, terete, glandular hairy. Calyx deeply 5 lobed, lobes subequal, linear-lanceolate, 2.5 × 0.4 mm long, subacuminate-obtuse at apex, glandular hairy. Corolla bluish violet, 2.7 × 2.3 mm long, tube cylindric, 2 mm long, minutely glandular, white villous indide, limb bilipped, upper lip 2-lobed, lobe retuse at apex, glandular hairs on dorsal side. Lower lip 3-lobed, lobes 0.65 mm long, obovate-orbicular, subequal. Stamens 4, didynomous; filaments glabrous. Anther cells shortly stipitate. Style short, 1.2 mm long, stigma bilobed, bent. Capsule orbicular, 2.5–3 mm across, biconvex, glabrous, 4-volved. Seeds oblong, slightly pear shaped, brownish yellow, longitudinally ribbed.

Fl. & Fr.: Feb.–Apr.

Habitat: Occasional in waste placeas.

Specimen examined: Papikonda National Park, *Y. Mahesh* 011715 (BSID).

2. Stemodia viscosa Roxb., Pl. Coromandel 2: 33. t. 163. 1802; Hook. f., Fl. Brit. India 4: 265. 1884; Gamble, Fl. Madras 2: 949. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 527. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1297. 2018. *'Guntakamini'*

An erect, much branched, viscid-pubescent herb, up to 30 cm high; branches rooting at base. Leaves decussate or ternate, sessile, oblong, 2.6 cm long, amplexicaul or cordate at base, obtuse at apex, margins dentate, scabrid. Flowers axillary, solitary, violet. Calyx lobes 5, subequal, lanceolate. Corolla bilabiate. Stamens 4, didynomous. Style short; stigma 2-lobed. Capsule globose, glabrous. Seeds oblong, smooth.

Fl. & Fr.: Nov.–Feb.

Habitat: Common along moist shady places and cultivated fields.

Specimen examined: Kakeshnur, *Y. Mahesh* 011329 (BSID).

107. LINDERNIACEAE

India: 3 genera, 39 taxa; Andhra Pradesh: 3 genera, 13 species; PNP: 3 genera; 9 species.

Key to the genera

1a.	Flowers showy; calyx winged; stamens 4, perfect	**3. Torenia**
1b.	Flowers small; calyx not winged; stamens 4 or 2 perfect	2
2a.	Seeds with alveolate endosperm, seed surface with rounded pits	**1. Bonnaya**
2b.	Seeds without alveolate endosperm, seed surface smooth or only weakly furrowed	**2. Lindernia**

1. BONNAYA Link & Otto

India: 9 spp.; Andhra Pradesh: 3 spp.; PNP: 3 spp.

Key to the species

1a.	Leaves sharply serrate with fine aristate teeth	**2. B. ciliata**
1b.	Leaves serrate, crenate, or subentire	**2**
2a.	Leaves linear-lanceolate; corolla more than 5 cm across	**3. B. oppositifolia**
2b.	Leaves oblanceolate to obovate-oblong; corolla less than 3 cm across	**1. B. antipoda**

1. Bonnaya antipoda Druce, Bot. Exch. Club Brit. Isles Rep. 3: 415. 1914. *Lindernia antipoda* (L.) Alston, Handb. Fl. Ceylon 6: 214. 1931; Pull. & Karupp., Fl. Andhra Pradesh 3: 1283. 2018. *Ruellia antipoda* L., Sp. Pl. 2: 635. 1753. *Ilysanthes veronicifolia* (Retz.) Urban., Ber. Deutsch. Bot. Ges. 2: 436. 1884; Gamble, Fl. Madras 2: 959. 1924. *Bonnaya veronicifolia* (Retz.) Spreng., Syst. Veg. (ed. 16) 1: 42. 1824; Hook. f., Fl. Brit. India 4: 285. 1884. **(Plate 60C)** *'Neella Pundu'*

A decumbent herb, up to 20 cm long, rooting at lower nodes; stems 4-angled. Leaves opposite, subsessile, oblanceolate-oblong obovate, 2 cm long, narrowed at base, obtuse at apex, margin serrate with minute spines, glabrous. Flowers axillary, solitary, shortly pedicellate, bluish-purple. Calyx lobes free, lanceolate, serrate. Corolla lobes bifid, 1 cm long, obtuse. Stamens 2, hooked. Staminodes 2. Ovary cylindric. Capsule cylindric, *c.* 1.4 cm long, glabrous. Seeds many, small.

Fl. & Fr.: Nov.–Feb.

Habitat: Common in marshy areas and paddy fields.

Specimen examined: Tekupally, PK Valasa, *Y. Mahesh* 010174, 010439 (BSID).

2. Bonnaya ciliata Spreng., Syst. Veg., ed. 1: 41. 1824. *Lindernia ciliata* (Colsm.) Pennell, Brittonia 2: 182. 1936; Philcox, Kew Bull. 22: 51. 1968; R.S. Rao & al., Fl. E. Godavari Dist. 523. 1999; Pull. & Karupp., Fl. Andhra

Pradesh 3: 1283. 2018. *Gratiola ciliata* Colsm., Prodr. Descr. Gratiol. 14. 1793. *Ilysanthes serrata* (Roxb.) Urban, Ber. Deutsch. Bot. Ges. 2: 436. 1884; Gamble, Fl. Madras 2: 962. 1924. *Bonnaya brachiata* Link & Otto, Icon. Pl. Select. 25. t. 11. 1820; Hook. f., Fl. Brit. India 4: 284. 1884. **(Plate 60D)**

Diffusely branched herb, up to 10 cm high; stems 4-angled, glabrous. Leaves opposite, sessile, ovate-oblong, 2 cm long, obtuse, auricled at base, obtuse at apex, margin sharply serrate with aristate teeth, glabrous. Flowers in axillary and terminal racemes, 0.5 cm long, white with a blue patch near base. Calyx lobes 5, lanceolate, 3 mm long, acuminate, ciliolate. Corolla bilabiate, 5 mm long, exserted; lobes rounded. Stamens 2; staminodes 2, obtuse. Ovary elliptic-oblong; style slender. Capsule narrowly oblong, *c.* 1 cm long. Seeds numerous, rugose, yellowish-brown.

Fl. & Fr.: Aug.–Dec.

Habitat: Common along marshy localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010427 (BSID).

3. Bonnaya oppositifolia Spreng., Syst. Veg., (ed. 16) 1: 41. 1824; Hook. f., Fl. Brit. India 4: 286. 1884. *Ilysanthes oppositifolia* (Retz.) Urban., Ber. Deutsch. Bot. Ges. 2: 435. 1884; Gamble, Fl. Madras 2: 962. 1924. *Gratiola oppositifolia* Retz., Obs. Bot. 4: 8. 1786. *Lindernia oppositifolia* (L.) Mukerjee, Journ. Ind. Bot. Soc. 24. 134. 1945; Shivarajan & Mathew, J. Bombay Nat. Hist. Soc. 80: 134. 1983; Pull. & Karupp., Fl. Andhra Pradesh 3: 1288. 2018.

An erect, annual herb, up to 22 cm high. Leaves decussate, sessile, linear-lanceolate or oblong 2.5 cm long, cuneate at base, acute at apex, margins serrate, glabrous on both surfaces. Flowers solitary or in axillary racemes, bluish. Calyx lobes free, lanceolate. Corolla more than 5 cm across; tube short, throat bifid. Stamens 2. ovary linear. Capsule linear, cylindric, glabrous. Seeds many small.

Fl. & Fr.: Sep.–Nov.

Habitat: Occasional near marshy localities and stream banks.

Specimen examined: PK Valasa, *Y. Mahesh* 012134 (BSID).

2. LINDERNIA All.

India: 10 spp. & 1 infraspecific; Andhra Pradesh: 7 spp.; PNP: 3 spp.

Key to the species

1a.	Stamens 2	**1. L. hyssopioides**
1b.	Stamens 4	2
2a.	Erect or procumbent herbs; leaves palmately nerved	**2. L. procumbens**
2b.	Diffuse herbs; leaves pinnately nerved	**3. L. pusilla**

1. Lindernia hyssopioides (L.) Haines, Bot. Bihar & Orissa 2: 635. 1922; Shivarajan & Mathew, J. Bombay Nat. Hist. Soc. 80: 136. 1983; Pull. & Karupp., Fl. Andhra Pradesh 3: 1286. 2018. *Gratiola hyssopioides* L., Mant. Pl. 174. 1771. *Ilysanthes hyssopioides* (L.) Benth. In DC., Prodr. 10: 419. 1846; Hook. f., Fl. Brit. India 4: 283. 1884; Gamble, Fl. Madras 2: 961. 1924. *'Papata Janumu'*

A slender, straggling herb, up to 40 cm high; stems slightly angled. Leaves opposite, sessile, oblong-lanceolate, 3.5–6 cm long, narrowed or obtuse at base, subacute at apex, margin entire or one toothed on either side below the apex, glabrous. Flowers axillary, solitary, blue. Calyx lobes linear, divided to base. Corolla tube up to 1.2 cm long, bifid. Stamens 2; staminodes 2. Ovary ovoid. Capsule ovoid, longer than calyx, glabrous. Seeds many, oblong.

Fl. & Fr.: Sep.–Jan.

Habitat: Common along pond hedges.

Specimen examined: Koida, *Y. Mahesh* 011351 (BSID).

2. Lindernia procumbens (Krock.) Philcox, Taxon 14: 30. 1965; Shivarajan & Mathew, J. Bombay Nat. Hist. Soc. 80: 138. 1983; Pull. & Karupp., Fl. Andhra Pradesh 3: 1290. 2018. *Anagalloides procumbens* Krock., Fl. Siles.2: 398. 1790. *Vandellia erecta* Benth., Scroph. Ind. 36. 1835. *p.p.;* Hook. f., Fl. Brit. India 4: 281. 1884. *Vandellia pyxidaria* (L.) Maxim., Bull. Acad. Petersb. 20: 449. 1875; Gamble, Fl. Madras 2: 960. 1924.

An erect or procumbent herb, up to 22 cm high. Leaves opposite, sessile, elliptic-lanceolate, 2.2 cm long, tapering at base, obtuse at apex, margins entire, glabrous on both surfaces, palmately nerved. Flowers axillary, solitary, white. Calyx cleft the base; lobes linear-lanceolate. Corolla tube up to 5 mm long, bifid. Stamens 4, didynamous. Ovary elliptic. Capsule ellipsoid, glabrous. Seeds numerous, minute.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in moist localities.

Specimen examined: PK Valasa, *Y. Mahesh* 012117 (BSID).

3. Lindernia pusilla (Willd.) Bold., Zakfl. Java 165. 1916; Philcox, Kew Bull. 22:41. 1968; Shivarajan & Mathew, J. Bombay Nat. Hist. Soc. 80: 139. 1983; R.S. Rao & al., Fl. E. Godavari Dist. 524. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1290. 2018. *Gratiola pusilla* Willd., Sp. Pl. 1: 105. 1797. *Vandellia scabra* Benth., Scroph. Ind. 36. 1835; Hook. f., Fl. Brit. India 4: 281. 1884; Gamble, Fl. Madras 2: 959. 1924. **(Plate 60E)**

A procumbent, diffuse, herb, up to 10 cm long; stems 4-angled; branches ascending, sparsely pubescent. Leaves opposite, subsessile, broadly ovate, 1.5 cm long, truncate or cordate at base, subacute at apex, margin coarsely serrate-crenate, excurved, sparsely pilose. Flowers axillary and terminal, solitary or two, 8 mm long, white. Calyx 3 mm long; lobes 5, linear-lanceolate with hairs, margins aristate. Corolla tube up to 7 mm long, bilabiate; lobes short; lip with two light violet spots. Stamens 4, didynamous. Ovary ovoid; style slender. Capsule ovoid, *c.* 3 mm across. Seeds numerous, oblong, faintly rugulose.

Fl. & Fr.: Jul.–Oct.

Habitat: Common as an undergrowth in moist deciduous forest.

Specimen examined: PK Valasa, *Y. Mahesh* 010514 (BSID).

3. TORENIA L.

India: 19 spp.; Andhra Pradesh: 3 spp.; PNP: 3 spp.

Key to the species

1a.	Calyx not winged or keeled, lobes equal; stamens 4 or 2 perfect	**1. T. crustacea**
1b.	Calyx winged or keeled, mouth oblique; stamens 4, perfect	**2**
2a.	Calyx keeled in fruit, hirsute	**3. T. thouarsii**
2b.	Calyx winged, ciliate	**2. T. indica**

1. Torenia crustacea (L.) Cham. & Schltdl., Linnaea 2: 570. 1827. *Lindernia crustacea* (L.) F. Muell., Syst. Census Austral. Pl. 97. 1822; Philcox, Kew Bull. 22: 51. 1968; Shivarajan & Mathew, J. Bombay Nat. Hist. Soc. 80: 133. 1983; R.S. Rao & al., Fl. E. Godavari Dist. 523. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1285. 2018. *Capraria crustacea* L., Mant. Pl. 87. 1767. *Vendellia crustacea* (L.) Benth., Scroph. Ind. 35. 1835; Hook. f., Fl. Brit. India 4: 279. 1884; Gamble, Fl. Madras 2: 959. 1924. **(Plate 60F)** *'Varlakamma kura'*

Erect herb, up to 15 cm high; stems and branches decumbent, 4-angled, sparsely hairy. Leaves opposite, sessile, ovate, 1–1.5 cm long, truncate at base, subacute at apex, margin coarsely serrate; serrations minutely setaceous glabrous. Flowers in axillary or terminal racemes, 5 mm long, pale pink. Calyx up to 4 mm long; lobes 5, short, lanceolate, hairy without along midrib. Corolla up to 8 mm long, bilabiate; lobes obtuse. Stamens 4, didynomous. Ovary oblong-ovoid; style short. Capsule obovoid, *c.* 4 mm long, obtuse, covered by calyx. Seeds numerous, minute.

Fl. & Fr.: Throughout the year.

Habitat: Common in damp and moist localities.

Specimen examined: Gulletiwada, *Y. Mahesh* 010613 (BSID).

2. Torenia indica C.J. Saldanha, Bull. Bot. Surv. India 8: 127. 1967; R.S. Rao & al., Fl. E. Godavari Dist. 529. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1302. 2018. *Torenia cordifolia* auct non Roxb. 1798; Hook. f., Fl. Brit. India 4: 276. 1884; Gamble, Fl. Madras 2: 956. 1924. **(Plate 60G)**

Annual, erect herb, up to 25 cm high; stems 4-angled. Leaves opposite, ovate, 3–5 cm long, obtuse at base, acute at apex, margins serrate, glabrous. Flowers axillary, solitary, or few flowered clusters, pedicellate. Calyx 2-lipped, up to 1.2 cm long, winged, ciliate. Corolla pale blue. Stamens 4. Ovary oblong. Capsule oblong, septicidal, enclosed by persistent calyx. Seeds many, small.

Fl. & Fr.: Sep.–Dec.

Habitat: Common along marshy localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010481 (BSID).

3. Torenia thouarsii (Cham. & Schltdl.) Kuntze, Revis. Gen. Pl. 2: 468. 1891; Pull. & Karupp., Fl. Andhra Pradesh 3: 1302. 2018. *Nortenia thouarsii* Cham. & Schltdl., Linnaea 3: 18. 1828. *Torenia parviflora* Buch.-Ham. ex Benth., Scroph. Ind. 39. 1835; Hook. f., Fl. Brit. India 4: 278. 1884; Gamble, Fl. Madras 2: 957. 1924. **(Plate 60H)**

A small, decumbent herb, up to 22 cm high. Leaves opposite, ovate-lanceolate, 2 cm long, obtuse at base, acute at apex, margins serrate, glabrous on both surfaces. Flowers axillary, clusters of 2–3-flowered. Calyx tube dilated above, hirsute. Corolla blue or whitish. Stamens 4, didynamous. Ovary oblong. Capsule oblong, septicidal. Seeds numerous, rugose.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in hilly areas in the forest.

Specimen examined: Eruwada, *Y. Mahesh* 011552 (BSID).

108. MARTYNIACEAE

India: 1 genus, 1 spp.; Andhra Pradesh: 1 genus; 1 spp.; PNP: 1 genus; 1 sp.

1. MARTYNIA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Martynia annua L., Sp. Pl. 2: 618. 1753; Gamble, Fl. Madras 2: 1003. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 535. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1332. 2018. *Martynia diandra* Gloxin, Obs. Bot. 14. t. 1. 1785; Hook. f., Fl. Brit. India 4: 386. 1884. *'Thelukondi kaya'*

Erect, much branched, viscid, aromatic herb, up to 1.2 m high; stems and branches glandular pubescent. Leaves opposite, broadly ovate-deltoid, 10–20 cm long, sinuately lobed, cordate at base, acute at apex, margin minutely dentate, glandular pubescent. Flowers in axillary racemes, 5 cm long, often drooping, pinkish purple, darkly spotted on the lobes, yellow spotted on lower lip. Calyx lobes 5, rosy green. Corolla tubular, minutely puberulous. Stamens 2. Ovary unicellular; style slender. Drupe ovoid, *c.* 2 cm long, slightly curved, endocarp with two, prominent curved hooks.

Fl. & Fr.: Sep.–Dec.

Habitat: Common along roadside, cultivated fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

109. PEDALIACEAE

India: 2 genera, 6 spp.; Andhra Pradesh: 2 genera; 5 spp.; PNP: 1 genus; 1 sp.

1. SESAMUM L.

India: 4 spp. & 1 infraspecific; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Sesamum indicum L., Sp. Pl. 2: 634. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 387. 1884; Gamble, Fl. Madras 2: 1002. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1336. 2018. *Sesamum orientale* L., Sp. Pl. 634. 1753; R.S. Rao & al., Fl. E. Godavari Dist. 535. 1999. *'Nuvvulu'*

An erect herb, up to 1 m high; branches ascending, tetragonous, hairy. Leaves lanceolate, 5–10 cm long, lower pedatisect, glabrous above, puberulous beneath. Flowers solitary or in axillary, racemes, 2.5 cm long, pinkish-purple, with glandular based pedices. Calyx tube 3 mm long; lobes 5, puberulous. Corolla up to 2.5 cm long, faintly gibbous, bilabiate, ventricose. Stamens 4, didynamous, included. Ovary oblong, densely pubescent; style slender. Fruit loculicidal capsule, oblong, subquadrangular, *c.* 1.5 cm long, grooved, shortly beaked, pubescent. Seeds compressed, black.

Fl. & Fr.: Sep.–Dec.

Habitat: Escaped from cultivated fields to grassy areas.

Specimen examined: Eruwada, *Y. Mahesh* 011546 (BSID).

110. ACANTHACEAE

India: 40 genera, 479 spp., 3 subsp., 43 var. & 1 forma; Andhra Pradesh: 37 genera; 109 spp. & 5 var.; PNP: 20 genera & 34 spp.

Key to the genera

1a.	Stamens 4	11
1b.	Stamens 2	2

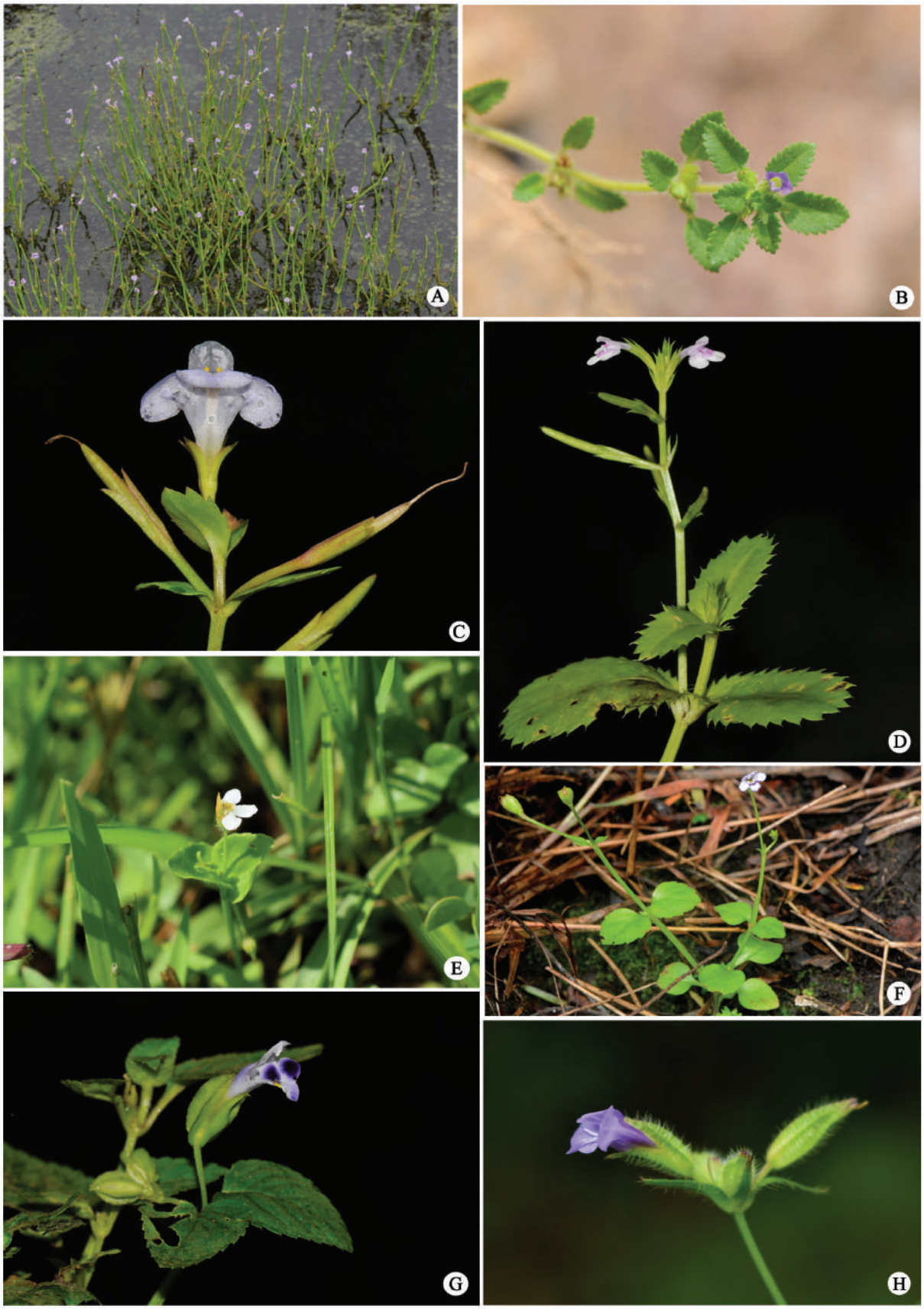


Plate 60: A. *Dopatrium junceum* (Roxb.) Buch.-Ham. ex Benth.; **B.** *Stemodia verticillata* (Mill.) Hassl.; **C.** *Bonnaya antipoda* Druce; **D.** *Bonnaya ciliata* Spreng.; **E.** *Lindernia pusilla* (Willd.) Bold.; **F.** *Torenia crustacea* (L.) Cham. & Schltdl.; **G.** *Torenia indica* C.J. Saldanha; **H.** *Torenia thouarsii* (Cham. & Schltdl.) Kuntze

2a.	Plants acaulescent; bracts rigid; peduncle of spike with scales	**6. Elytraria**
2b.	Plants caulescent; bracts and peduncle not as above	3
3a.	Corolla bilipped, subequal	5
3b.	Corolla 5-lobed, subequal	4
4a.	Calyx 4-partite, unequal, imbricate	**2. Barleria**
4b.	Calyx 5-partite, equal, valvate	**7. Eranthemum**
5a.	Ovules two or occasionally one in each locule	7
5b.	Ovules more than two in each locule	6
6a.	Calyx lobes 5; capsule linear-oblong or elliptic-lanceolate	**1. Andrographis**
6b.	Calyx lobes 4; capsule ovate	**11. Nelsonia**
7a.	Calyx lobes 4	**15. Rostellularia**
7b.	Calyx lobes 5	8
8a.	Inflorescence of dense spikes	10
8b.	Inflorescence panicled	9
9a.	Shrubs	**14. Rhinacanthus**
9b.	Herbs	**4. Dicliptera**
10a.	Placenta separating elastically	**17. Rungia**
10b.	Placenta not separating elastically	**9. Justicia**
11a.	Erect or prostrate or decumbent herbs or under shrubs; seeds supported on retinacula	13
11b.	Erect herbs or Climbers or stragglers; seeds not supported on retinacula	12
12a.	Climbers or stragglers	**20. Thunbergia**
12b.	Erect herbs	**18. Staurogyne**
13a.	Corolla 2-lipped or with 5-subequal lobes	14
13b.	Corolla without an upper lip, lower lip 3-lobed, large	**3. Blepharis**
14a.	Roots tuberous	**16. Ruellia**
14b.	Roots not tuberous	15
15a.	Bracts reniform	**13. Phaulopsis**
15b.	Bracts not reniform	16
16a.	Corolla lobes 5, subequal	17
16b.	Corolla 2-lipped	18
17a.	Ovules 2 in each locule	**12. Petalidium**
17b.	Ovules more than 2 in each locule	**19. Strobilanthes**
18a.	Corolla lobes twisted to the left in bud	19
18b.	Corolla lobes imbricate in bud	**10. Lepidagathis**
19a.	Ovules 2 in each locule	**5. Dyschoriste**
19b.	Ovules more than 2 in each locule	**8. Hygrophila**

1. ANDROGRAPHIS Wall. ex Nees

India: 26 spp. & 1 var.; Andhra Pradesh: 9 spp.; PNP: 2 spp.

Key to the species

1a.	Villous herbs; leaves lanceolate, narrowed at both ends; flowers in axillary slender unilateral racemes; seeds sparsely hairy	**1. A. echioides**
1b.	Glabrous herbs; leaves elliptic-oblong, obtuse at base, cuneate at apex; flowers in elongate racemes or axillary panicles; seeds glabrous	**2. A. paniculata**

1. Andrographis echioides Nees, Pl. Asiat. Rar. 3: 117. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 505. 1884; Gamble, Fl. Madras 2: 1061. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 538. 1999. *Indoneesiella echioides* (L.) Sreem., Phytologia 16: 466. 1968; Pull. & al., Fl. Andhra Pradesh 4: 1393. 2018. *Justicia echioides* L., Sp. Pl. 1: 16. 1753. **(Plate 61A)** *'Potti neelavemu'*

Erectvillous herb, up to 40 cm high; stems 4-angled, grooved. Leaves opposite, sessile, oblong-elliptic or ovate, 4–7 cm long, cuneate at base, obtuse at apex, margin entire, ciliate, sparsely white, hirsute. Flowers in axillary, slender unilateral racemes, villous, 1.2 cm long, white, with dark-pink upper lip, bracteolate. Calyx tube short, hairy; segments 5, linear, 1 cm long. Corolla tube gibbous, ventricose, bilabiate; upper lip rounded; lower lip trilobed. Stamens exserted; filaments dilated. Ovary broadly oblong; style hairy. Capsule elliptic-lanceolate, *c.* 1 cm long, hirsute. Seeds 4, flattened.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in open wasteplaces.

Specimen examined: Bhupathipalem, *Y. Mahesh* 011434 (BSID).

2. Andrographis paniculata (Burm.f.) Wall. ex Nees, Pl. Asiat. Rar. 3: 116. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 501. 1884; Gamble, Fl. Madras 2: 1048. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 539. 1999; Pull. & al.,

Fl. Andhra Pradesh 4: 1346. 2018. *Justicia paniculata* Burm.f., Fl. Ind. 9. 1768. *Andrographis subspathulata* C.B. Clarke in Hook. f., Fl. Brit. India 4: 502. 1884. *'Nelavemu'*

An erect, branched herbs, up to 50 cm high; stems quadrangular, glabrous except few hairs at nodes. Leaves opposite, sessile, linear-lanceolate or oblong, 3.5–7 cm long, tapering at base, acute at apex, margins entire, glabrous. Flowers in axillary and terminal panicles, 7 mm long, white with pink tinge, bracteate. Calyx 3 mm long, glandular pubescent; segments 5, linear-lanceolate, pubescent. Corolla 6 mm long, bilabiate, glandular pubescent, upper lip 2-toothed, lower lip trilobed, puberulous without. Stamens 2. Ovary oblong, pubescent; style pubescent. Capsule linear-oblong, *c.* 2 cm long, glandular pubescent. Seeds up to 8, subquadrangular, pitted, yellowish-brown.

Fl. & Fr.: Sep.–Feb.

Habitat: Common in open waste places and cultivated fields.

Specimen examined: GM Valasa, PK Valasa, *Y. Mahesh* 010010, 010020 (BSID).

2. BARLERIA L.

India: 28 spp., 1 subsp. & 1 var.; Andhra Pradesh: 13 spp.; PNP: 3 spp.

Key to the species

1a.	Armed undershrubs; flowers yellow; seeds one per cell	**2. B. prionitis**
1b.	Unarmed undershrubs; Flowers light pink or blue; seeds 2 or 4 per cell	2
2a.	Plants with strigose leaves	**3. B. strigosa**
2b.	Plants with glabrous or pubescent leaves	**1. B. montana**

1. Barleria montana Wight & Nees ex C.B. Clarke in Hook. f., Fl. Brit. India 3: 487. 1884; Gamble, Fl. Madras 2: 1061. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1356. 2018. *Barleria morrisiana* E. Barnes & C.E.C. Fisch., Bull. Misc. Inform. Kew 1939: 659. 1940. *'Adavi december puvulu'*

An erect undershrub, up to 70 cm high; branches brownish, nodes distant, glabrous. Leaves opposite, elliptic-lanceolate or ovate, 5–12 cm long, attenuate at base, acute at apex, margins entire, glabrous, pale glaucous below; petiole up to 4.5 cm long. Flowers in axillary and terminal spikes or raceme, solitary, blue; bracteoles linear, 2 cm long. Calyx up to 2 cm long, outer lobes ovate, glabrous, prominently nerved; inner lobes linear-lanceolate. Corolla tube funnel shaped; lobes 5, oblong-obovate, 6 cm long. Stamens 2. Capsule oblong, *c.* 2 cm long, acuminate, glabrous. Seeds 4, clothed with silky hairs.

Fl. & Fr.: Sep.–Feb.

Habitat: Common in forest pathways.

Specimen examined: Gulletiwada, *Y. Mahesh* 010557 (BSID).

2. Barleria prionitis L., Sp. Pl. 2: 636. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 482. 1884; Gamble, Fl. Madras 2: 1058. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 541. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1356. 2018. *'Mulla gorinta', 'Gobbi chettu'*

Prickly undershrub, up to 1 m high; branches obscurely 4-gonous, glabrous. Leaves opposite, elliptic, 6–10 cm long, attenuate at base, acute apex, mucronate, margin entire, glabrous above, hirsute below; petiole small. Flowers in axillary and terminal, passing into spikes, 2.5 cm long, yellow, bracteate; bracts foliaceous. Calyx lobes 4, lanceolate, 1.6 cm long, ciliate with spinous tip. Corolla tube 2.3 cm long, pubescent above; lobes 5, obovate. Stamens 4, two long, two short. Ovary ovoid; style slender, with few hairs. Capsule ovoid-oblong, *c.* 1.5 cm long, beak. Seed 1 per cell, compressed, appressed hairy.

Fl. & Fr.: Oct.–Mar.

Habitat: Introduced in home gardens.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011345 (BSID).

3. Barleria strigosa Willd., Sp. Pl. 3: 379. 1800; C.B. Clarke in Hook. f., Fl. Brit. India 4: 498. 1884; Gamble, Fl. Madras 2: 1061. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 541. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1359. 2018. *'Nilambram mokka'*

An erect, branched, strigose shrub, up to 90 cm high. Leaves opposite, elliptic-lanceolate, 10–18 cm long, tapering at base, acuminate at apex, margin entire, sparsely strigose and lineolate above, pubescent below; petiole up to 4 cm long. Flowers in terminal, condensed, strigose spikes, crowded, *c.* 5 cm long, light blue with white tube, bracteate, bracteolate; bracts up to 3 cm long, ovate, denticulate, strigose. Calyx lobes 4, variable,

ovate, lanceolate, 8 mm long, ciliate. Corolla tube up to 3 cm long, pubescent; lobes 5, rounded. Stamens 4, 2-long and 2-short. Ovary oblong; style slender. Capsule oblong- ellipsoid, *c.* 2 cm long, beaked. Seeds 4, flattened.

Fl. & Fr.: Sep.–Dec.

Habitat: Common along stream banks and moist localities.

Specimen examined: Gulletiwada, *Y. Mahesh* 010559 (BSID).

Field notes: Worth to introduce in gardens due to its showy flowers.

3. BLEPHARIS Juss.

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a. Leaves thin, acute; corolla white with pink lines **2. B. maderapatensis**
1b. Leaves thick, obtuse; corolla bluish white **1. B. integrifolia**

1. Blepharis integrifolia (L.f.) E. Mey. & Drege ex Schinz, Vierteljahrsschr. Naturf. Ges. Zurich 60: 416. 1915; Pull. & al., Fl. Andhra Pradesh 4: 1362. 2018. *Acanthus integrifolius* L.f., Suppl. Pl.: 294. 1782. *Blepharis repens* (Vahl) Roth, Nov. Pl. Sp. 321. 1821; R.S. Rao & al., Fl. E. Godavari Dist. 543. 1999. *Acanthus repens* Vahl, Symb. Bot. 2: 76. 1791. *Blepharis molluginifolia* Pers. Syn. Pl. 2: 180. 1806; C.B. Clarke in Hook. f., Fl. Brit. India 4: 479. 1884; Gamble, Fl. Madras 2: 1013. 1924. **(Plate 61B)**

A prostrate, slender herb, up to 60 cm long; rooting at nodes; branches covered with rough hairs. Leaves 4 in whorls, narrowly elliptic, obovate-oblanceolate, 1.6–3.5 cm long, thick, cuneate at base, obtuse at apex, margins entire, strigose above, glaucous below. Flowers axillary, solitary or few, bluish-white; bracts and bracteoles 4 in pairs, obovate with stellate hairy at tip, glochidiate, spionous, toothed. Calyx short, 1 cm long; lobes 4, linear-ovate, mucronate, 3-nerved, hairy along margins, outer one forked. Corolla up to 8 mm long, 2-lipped. Stamens 4. Ovary glabrous. Capsule ellipsoid, *c.* 6 mm long. Seeds 4, flattened, echinate.

Fl. & Fr.: Sep.–Feb.

Habitat: Occasional in dry areas.

Specimen examined: Netteppakota, *Y. Mahesh* 011663 (BSID).

2. Blepharis maderaspatensis (L.) B. Heyne ex Roth, Nov. Pl. Sp. 320. 1821; R.S. Rao *& al.*, Fl. E. Godavari Dist. 542. 1999; Pull. *& al.*, Fl. Andhra Pradesh 4: 1363. 2018. *Acanthus maderaspatensis* L., Sp. Pl. 2: 639. 1753. *Blepharis boerhaviifolia* pers., Syn. Pl. 2: 180. 1806; C.B. Clarke in Hook. f., Fl. Brit. India 4: 478. 1884; Gamble, Fl. Madras 2: 1013. 1924. **(Plate 61C)**

A prostrate, pubescent, herb, rooting at nodes, up to 90 cm long; branches obscurely 4-angled. Leaves whorled, 4 at each node, sessile, elliptic-ovate, 4–10 cm long, acute at base, acute, apiculate at apex, margins remotely serrate or distantly toothed, scaberulous. Flowers axillary, solitary or 2–3 in sessile clusters, up to 2 cm long, white with pink lines; bracts 8, in pairs, oblong-spathulate, toothed, sparsely pubescent without, retrorsely bristles on apical margins, 3-nerved. Calyx divided to the base; lobes lanceolate, 1.5 cm long, pubescent, acute. Corolla 2 cm long, bilabiate, tube hairy at throat; lower lip obovate, 3-lobed, pubescent, upper lip small. Stamens 4, didynamous. Ovary ovoid; style short. Capsule ovoid-oblong, 6 mm long. Seeds 2, flattened, echinate.

Fl. & Fr.: Sep.–Jan.

Habitat: Common along moist shady localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010034 (BSID).

4. DICLIPTERA Juss.

India: 23 spp., 4 var.; Andhra Pradesh: 7 spp.; PNP: 1 sp.

1. Dicliptera paniculata (Forssk.) I. Darbysh., Kew Bull. 62: 122. 2007; Pull. & al., Fl. Andhra Pradesh 4: 1370. 2018. *Dianthera paniculata* Forssk., Fl. Aegypt.-Arab. 7. 1775. *Peristrophe paniculata* (Forssk.) Brummitt, Kew Bull. 38: 451. 1983; R.S. Rao & al., Fl. E. Godavari Dist. 557. 1999. *Peristrophe bicalyculata* (Retz.) Nees in Wall., Pl. Asiat. Rar. 3: 113. 183; C.B. Clarke in Hook. f., Fl. Brit. India 4: 534. 1885; Gamble, Fl. Madras 2: 1084. 1924. *Dianthera bicalyculata* Retz., Acta Holm. 1775. 297. t. 9. 1776. *'Sannapulu'*

An erect, much branched herb, up to 1 m high; stems and branches weak, 6-angled, often decumbent, glabrous. Leaves opposite, ovate-lanceolate, 3–6 cm long, rounded at base, acuminate at apex, margin entire, ciliate, pubescent; petiole up to 1 cm long. Flowers in axillary and terminal divaricate panicles, 1.5 cm long, pink, pubescent; bracts 2, unequal, linear-spathulate; bracteoles 4, decussate, linear, acuminate. Calyx lobes 5, linear,

softly hairy. Corolla tube cylindric, 5 mm long, 2-lipped, twisted; upper lip obtuse, lower trilobed. Stamens 2. Ovary pubescent; style filiform. Capsule ovoid-conical, clavate, *c.* 1 cm long, beaked. Seeds orbicular, flattened, papilose.

Fl. & Fr.: Oct.–Mar.

Habitat: Common along open waste landsand and cultivated filed edges.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011397 (BSID).

5. DYSCHORISTE Nees

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Dyschoriste vagans (Wight) Kuntze, Revis. Gen. Pl. 2: 486. 1891; Gamble, Fl. Madras 2: 718. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 544. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1375. 2018. *Calophanes vagans* Wight, Icon. Pl. Ind. Orient. t. 1526. 1850; C.B. Clarke in Hook. f., Fl. Brit. India 4: 411. 1884. *'Adavineelambram'*

A diffuse, erect or decumbent, pubescent herb, up to 50 cm high; stems 4-angled. Leaves opposite, ovate-elliptic, 2.5–5 cm long, tapering at base, subacute at apex, margins entire, ciliate, appressed and glandular hairy; petiole up to 1 cm long. Flowers in axillary cymes, few flowered, 1.2 cm long, violet, glandular pubescent, bracteate. Calyx tube short, 4 mm long; lobes 5, linear-lanceolate, 8 mm long, pubescent. Corolla tune 1.5 cm long, ventricose at mouth, expanded above; lobes 5, rounded, ciliate. Stamens 4, didynamous. Ovary oblong, glabrous; style pubescent. Capsule oblong, *c.* 1 cm long, laterally compressed, pointed, glabrous. Seeds 4, compressed, orbicular.

Fl. & Fr.: Nov.–Mar.

Habitat: Common as undergrowth and moist localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010045 (BSID).

6. ELYTRARIA Michx.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Elytraria acaulis (L.f.) Lindau, Nat. Pflanzenfam. Nachtr. 1: 304. 1897; Gamble, Fl. Madras 2: 1009. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 545. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1379. 2018. *Justicia acaulis* L.f., Suppl. Pl. 84. 1781. *Elytraria crenata* Vahl, Enum Pl. 1: 106. 1804; C.B. Clarke in Hook. f., Fl. Brit. India 4: 394. 1884. *'Nelavenu'*, *'Yedduadugu'*

A scapigerous herb, up to 20 cm high; stems with woody stock at base, densely pubescent. Leaves radical, crowded at base, oblong-obovate, 10–15 cm long, narrowed at base, obtuse at apex, margin crenate with rounded tips, pubescent below; petiole short. Flowers in scapigerous spikes, 5 mm long, white; scape up to 18 cm long, bracteate. Calyx tube very short; lobes 5, unequal, lanceolate, 4 mm long, acuminate, hairy at top. Corolla tube 3 mm long, bilipped; lobes ovate, 2 mm long. Stamens 2, exserted. Ovary short; style filiform. Capsule oblong-ovoid, 5 mm long, volves recurved. Seeds small, reticulate.

Fl. & Fr.: Oct.–Dec.

Habitat: Occasional in pathways.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011346 (BSID).

7. ERANTHEMUM L.

India: 12 spp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Long erect shrub; bracts foliaceous, ovate-lanceolate, acute, distantly white and green nerve	**2. E. purpurascens**
1b.	Bushy undershrubs; bracts linear-lanceolate, acuminate, indistinctly nerved	**1. E. capense**

1. Eranthemum capense L., Sp. Pl. 1: 9. 1753; R.S. Rao & al., Fl. E. Godavari Dist. 546. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1380. 2018. *Eranthemum montanum* Roxb., Fl. Ind. 1: 100. 1820; Gamble, Fl. Madras 2: 1025. 1924. *Daedalacanthus mintanus* (Roxb.) T. Anderson in Thawaites, Enum. Pl. Zeyl. 229. 1860; C.B. Clarke in Hook. f., Fl. Brit. India 4: 421. 1884. *'Karungu'*

Bushy undershrub, up to 80 cm high; young branches glabrous. Leaves ovate, elliptic, 10 cm long, oblique at base, acuminate at apex, margins entire, glabrous on both surfaces. Flowers axillary 15 cm long spikes or terminal compound panicles, pale blue, bracteate; bracts linear-lanceolate, acuminate, indistinctly nerved, pale greenish.

Calyx lobes 5, pubescent. Corolla tube 2.1 cm long, lobes 5, ovate, twisted. Stamens 2. Ovary oblong. Capsule oblong, overlapped by bracts.

Fl. & Fr.: Nov.–Feb.

Habitat: Common in open places.

Specimen examined: GM Valasa, *Y. Mahesh* 010001 (BSID).

2. Eranthemum purpurascens Wight ex Nees in Wall., Pl. Asiat. Rar. 3: 106. 1832; Gamble, Fl. Madras 2: 1025. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 546. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1382. 2018. *Daedalacanthus purpurascens* (Nees) T. Anderson, J. Linn. Soc., Bot. 9: 488. 1867; C.B. Clarke in Hook. f., Fl. Brit. India 4: 420. 1884.

An erect undershrub, up to 1.1 m high; stems and branches 4-angled, grooved. Leaves opposite, ovate, 8 cm long, coriaceous, cuneate at base, obtuse, acuminate at apex, margin crenate, glabrous; petiole up to 1.8 cm long. Flowers in axillary and terminal racemes, 3 cm long, blue, bracteate, pedunculate; bracts ovate-lanceolate, prominently white and green nerved centre; bracteoles small. Calyx tube 5 mm long; lobes 5, lanceolate, acuminate. Corolla tube slender, cylindric, 1.5 cm long, sparsely hairy, 5-clefted at mouth; lobes obovate, 8 mm long, twisted. Stamens 2; staminodes 2. Ovary glabrous. Capsule oblong, 1 cm long, clavate, glabrous with basal cylindric stalk. Seeds 4, orbicular, reticulate.

Fl. & Fr.: Nov.–Mar.

Habitat: Common along pathways,

Specimen examined: Peddanunthalu. *Y. Mahesh* 011713 (BSID).

8. HYGROPHILA R.Br.

India: 16 spp. & 1 var.; Andhra Pradesh: 5 spp.; PNP: 2 spp.

Key to the species

1a.	Procumbent herbs; leaves subentire to crenate; flowers in terminal spikes	**2. H. polysperma**
1b.	Erect herbs; leaves serrate; flowers in axillary whorls	**1. H. auriculata**

1. Hygrophila auriculata (Schumach.) Heine, Kew Bull. 16: 172. 1962; R.S. Rao & al., Fl. E. Godavari Dist. 549. 1999. *Barleria auriculata* Schumach. & Thonn., Beskr. Guin. Pl. 285. 1827. *Hygrophila schulli* (Buch.-Ham.) M.R. Almeida, J. Bombay Nat. Hist. Soc. (Suppl.): 221. 1986; Pull. & al., Fl. Andhra Pradesh 4: 1391. 2018. *Behel schulli* Buch-Ham., Trans. Linn. Soc. Lond. 14: 289. 1825. *Asteracantha longifolia* (L.) Nees in Wall., Pl. Asiat. Rar. 3: 90. 1832; Gamble, Fl. Madras 2: 1015. 1924. *Barleria longifolia* L., Cent. Pl. 2: t. 22. 1756. *Hygrophila spinosa* T. Anderson in Thwaites, Enum. Pl. Zeyl. 225. 1860; C.B. Clarke in Hook. f., Fl. Brit. India 4: 408. 1884. *'Mullagobbi', Neerugobbi'*

An erect, stout herb, up to 1.2 m high; stem 4-angled, hirsute below the nodes; spines whorled, sharp, up to 3 cm long, grooved, yellowish when old. Leaves whorled, 6-leaves at each node, sessile, lanceolate, 12 cm long, strigose, tapering at base, obtuse at apex, margins minutely serrate, hispid. Flowers in axillary whorls, 3 cm long, purplish, with spine in the axils of subtending leaves. Calyx lobes up to 1 cm long, linear-lanceolate, ciliate along margins. Corolla tube 2 cm long, glabrous above, bilabiate; upper lip shortly bilobed; lower lip trilobed, sparsely villous around callosities. Stamens 4, didynamous. Ovary oblong-ovoid; style filiform. Capsule linear-oblong, *c.* 8 mm long, compressed. Seeds 4, flattened, reticulate.

Fl. & Fr.: Sep.–Mar.

Habitat: Common in water courses and swampy localities.

Specimen examined: Shivagri, Sirivaka, *Y. Mahesh* 010084, 011609 (BSID).

2. Hygrophila polysperma (Roxb.) T. Anderson, J. Linn. Soc. London. 9: 456. 1867; C.B. Clarke in Hook. f., Fl. Brit. India 4: 406. 1884; Gamble, Fl. Madras 2: 1015. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 550. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1390. 2018. *Justicia polysperma* Roxb., Fl. Ind. 1: 120. 1820. **(Plate 61D)**

A small procumbent herb; stems creeping with rooting at nodes. Leaves opposite, subsessile, ovate-oblong, 12 cm long, tapering at base, subacute at apex, margins subentire to crenate, glabrous on both surfaces. Flowers small, in dense terminal spikes or upper most leaf axils, solitary, pale blue, nearly hidden by leaves. Calyx tube pubescent, teeth 5, linear. Corolla bilipped, pubescent. Stamens 2. Ovary oblong. Capsule oblong, *c.* 6 mm long, glabrous. Seeds 20–30, minute, rounded.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in water bodies.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011383 (BSID).

9. JUSTICIA L.

India: 70 spp. & 9 var; Andhra Pradesh: 8 spp. & 2 var.; PNP: 4 spp.

Key to the species

1a.	Herbs; spikes slender linear	2
1b.	Shrubs; spikes stout, cylindric	3
2a.	Calyx lobes 5	**4. J. glauca**
2b.	Calyx lobes 4	**2. J. comosa**
3a.	Bracts smaller than calyx, not scarious, lanceolate	**3. J. gendarussa**
3b.	Bracts longer than calyx, scarious, elliptic-ovate	**1. J. betonica**

1. Justicia betonica L., Sp. Pl. 1: 15. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 525. 1885; Gamble, Fl. Madras 2: 1078. 1925; R.S. Rao & al., Fl. E. Godavari Dist. 552. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1395. 2018. *Justicia trinervia* Vahl, Enum. Pl. 1: 156. 1804; C.B. Clarke in Hook. f., Fl. Brit. India 4: 526. 1885; Gamble, Fl. Madras 2: 1079. 1924. *'Tellaaddasaramu'*

Diffusely, branched undershrub, up to 1 m high; branches striate, glabrous. Leaves alternate, opposite, subsessile, elliptic-oblong or lanceolate, 5–10 cm long, tapering at base, subacute at apex, margins subcrenulate, glabrous; petiole short. Flowers in terminal spikes, 1.5 cm long, white, pedunculate; bracts and bracteoles 1 cm long, ovate, white with green nerves, glabrous. Calyx tube very short; lobes 4 mm long, linear-lanceolate, pubescent. Corolla tube up to 1.4 cm long, bilabiate, pubescent; upper lip emarginate, lower trilobed; Stamens 2. Ovary ovoid, pubescent; style pubescent. Capsule *c.* 1.5 cm long, clavate, apiculate. Seeds 4, spinulose.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional as forest undergrowth.

Specimen examined: Eruwada, *Y. Mahesh* 010655 (BSID).

2. Justicia comosa Vahl, Enum. Pl. 1: 155. 1804. *Justicia vahlii* Roth, Nov. Pl. Sp. 14. 1821; Gamble, Fl. Madras 2: 1081. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 555. 1999; var. *vahlii* Pull. & al., Fl. Andhra Pradesh 4: 1402. 2018. *Justicia diffusa* var. *vahlii* (Roth.) C.B. Clarke in Fl. Brit. India 3: 538. 1885.

An erect, scarcely branched herb, up to 40 cm high; stem 4-angled, grooved, hairy at nodes; young branches with reflexed-strigose. Leaves opposite, linear-lanceolate or elliptic, 4–8 cm long, narrowed at base, acute at apex, margins entire, glabrous, lineate above. Flowers in terminal spikes, 6 mm long, pale pink; bracts and bracteoles linear, 5 mm long, greenish, ciliate along margins. Calyx lobes up to 5 mm long, linear, ciliolate. Corolla tube 6 mm long, bilipped, pubescent; upper lip bilobed; lower lip trilobed. Stamens 2, exserted. Ovary ovoid; style pubescent. Capsule oblong, *c.* 6 mm long, pubescent at apex, grooved on the back. Seeds 4, flattened, tuberculate, brown.

Fl. & Fr.: Oct.–Apr.

Habitat: Common in grasslands.

Specimen examined: Gulletiwada, *Y. Mahesh* 010565 (BSID).

3. Justicia gendarussa Burm.f., Fl. Ind. 10. 1768; C.B. Clarke in Hook. f., Fl. Brit. India 4: 532. 1885; Gamble, Fl. Madras 2: 1079. 1924. *Gendarussa vulgaris* Nees in Wall., Pl. Asiat. Rar. 3: 104. 1832; Pull. & al., Fl. Andhra Pradesh 4: 1384. 2018. *'Nela vavili', 'Nallachali'*

Small, erect shrub, up to 1.5 m high; stems much branched, terete, thickened at nodes; branches glabrous. Leaves opposite, lanceolate or ovate-elliptic, 6–12 cm long, attenuate at base, acute-acuminate at apex, margin entire, glabrous on both surfaces. Flowers in terminal long spikes, subsessile, 1.8 cm long, white with purple streaks; bracts bracteoles smaller than calyx. Calyx lobes linear, scaberulous. Corolla bilipped, glabrous; upper lip slightly hooded; lower lip trilobed, lobes oblong. Capsule oblong, *c.* 1.2 cm long, minutely pubescent or glabrous. Seeds 4.

Fl. & Fr.: Oct.–Mar.

Habitat: Cultivated in home gardens.

Specimen examined: Valamuru, *Y. Mahesh* 011781 (BSID).

4. Justicia glauca Rottler, Ges. Naturf. Freunde Berlin Neue Schriften 4: 219. 1802; C.B. Clarke in Hook. f., Fl. Brit. India 4: 529. 1885; Gamble, Fl. Madras 2: 1079. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 552. 1999; Pull. &

al., Fl. Andhra Pradesh 4: 1398. 2018. **(Plate 61E)** *'Kondapindu'*

Erect, pubescent herb, up to 80 cm high; stems subquadrangular, pinkish at nodes; young branches grooved, hairy. Leaves opposite, ovate-elliptic, 3–6 cm long, lineolate, narrowed or cuneate at base, subacute at apex, margin entire, scaberulous. Flowers in axillary and terminal spikes, 1 cm long, whitish with purple spots, puberulous, long pedunculate; bracts obovate; bracteoles lanceolate, ciliate. Calyx lobes 5, linear-lanceolate. Corolla bilabiate, pubescent except at base, upper lip shortly bilobed; lower lip obovate, trilobed. Stamens 2. Ovary ovoid; style pubescent. Capsule obovoid, *c.* 7 mm long, clavate, pubescent at apex. Seeds 2, orbicular, densely clothed with hairs.

Fl. & Fr.: Oct.–Dec.

Habitat: Common in forest outskirts.

Specimen examined: PK Valasa, Koida, *Y. Mahesh* 010030, 011358 (BSID).

10. LEPIDAGATHIS Willd.

India: 26 spp. & 7 var.; Andhra Pradesh: 7 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves elliptic-lanceolate; seeds 4	**2. L. fasciculata**
1b.	Leaves linear-oblong; seeds 2	**1. L. cristata**

1. Lepidagathis cristata Willd., Sp. Pl. 3: 400. 1800; C.B. Clarke in Hook. f., Fl. Brit. India 4: 516. 1885; Gamble, Fl. Madras 2: 1066. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 555. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1404. 2018. **(Plate 61F)** *'Suryakantha'*

Stiff undershrub, up to 60 cm long; branches procumbent, spreading, 4-angled, narrowly winged, hispidulous. Leaves opposite, sessile, linear-oblong or lanceolate, 2.5–5 cm long, obtuse at base, acute at apex, margin entire, glabrous. Flowers in subradical, globose cushion like spikes at base of root stock, light pink; bracts ovate, spiny, mucronate. Calyx tube up to 6 mm long, hairy; lobes 4, spinescent. Corolla tube extended, mouth 5 mm long, bilipped, pubescent above; upper lip shortly bilobed; lower lip trilobed. Stamens 4, didynamous. Ovary ovoid; style pubescent. Capsule ovoid, glabrous. Seeds 2, clothed with long hygroscopic hairs.

Fl. & Fr.: Oct.–Apr.

Habitat: Common along rocky crevices.

Specimen examined: Gulletiwada, *Y. Mahesh* 010585 (BSID).

2. Lepidagathis fasciculata (Retz.) Nees in Wall., Pl. Asiat. Rar. 3: 95. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 522. 1885; Gamble, Fl. Madras 2: 1068. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 556. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1406. 2018. *Ruellia fasciculata* Retz., Observ. Bot. 4: 28. 1786.

An aromatic, viscous herb, up to 60 cm high, much branched from creeping root stock. Leaves opposite, ovate, elliptic-lanceolate, 5 cm long, cuneate at base, acuminate apex, margins crenate-serrate sparsely hairy above, densely below. Flowers in axillary, subcapitate spikes, white; bracts lanceolate. Calyx 5-partite, pubescent; lobes lanceolate-linear, 3-nerved. Corolla pubescent, bilabiate; upper lip 2-lobed; lower lip trilobed. Stamens 4. Ovary globose; style pubescent. Capsule oblong, beaked, pubescent. Seeds 4, small.

Fl. & Fr.: Nov.–Mar.

Habitat: Common in waste lands.

Specimen examined: PK Valasa, *Y. Mahesh* 012114 (BSID).

11. NELSONIA R.Br.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Nelsonia canescens (Lam.) Spreng., Syst. Veg. 1: 42. 1824; R.S. Rao & al., Fl. E. Godavari Dist. 556. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1410. 2018. *Justicia canescens* Lam., Encycl. 1: 41. 1791. *Nelsonia compestris* R. Br., Prodr. 481. 1810; C.B. Clarke in Hook. f., Fl. Brit. India 4: 394. 1884; Gamble, Fl. Madras 2: 1010. 1924. **(Plate 61G)** *'Verumaddikura'*

Soft trailing, villous herb, up to 45 cm high; branches spreading, decumbent, hairy. Leaves opposite, two types; lower larger, elliptic-oblong, up to 15 cm long, attenuate at base, obtuse or subacute at apex, margins entire, pilose on both surfaces; upper smaller, subsessile, 5 cm long; petioles up to 2.5 cm long. Flowers in terminal, dense cylindrical, spikes, 6 mm long, pinkish-white; spikes 2 cm long, glandular villous; bracts foliaceous, ovate, 5

mm long. Calyx lobes 5, linear-lanceolate or elliptic, 4 mm long, subequal. Corolla 4 mm long, bilipped; Stamens 2. Ovary ovoid. Capsule ovoid, conical, *c.* 4 mm long, 2-volved, glabrous. Seeds 5, in each locule, clavate.

Fl. & Fr.: Dec.–May.

Habitat: Occasional in moist localities.

Specimen examined: VR Puram, Peddanunthala, *Y. Mahesh* 010123, 011714 (BSID).

12. PETALIDIUM Nees

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Petalidium barlerioides (Roth) Nees in Wall., Pl. Asiat. Rar. 3: 82. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 416. 1884; Gamble, Fl. Madras 2: 1021. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1411. 2018. *Ruellia barlerioides* Roth, Nov. Pl. Sp. 310. 1821. **(Plate 61H)**

Straggling undershrub, up to 1.5 m high; stems subterete, glabrous; young branches pubescent. Leaves opposite, broadly ovate, 5–10 cm long, rounded at base, acuminate at apex, margin serrate, glabrous on both sides except on nerves below; petiole up to 4 cm long. Flowers in subcapitate spikes, solitary, white. Calyx tube 4 mm long, glandular hairy; lobes lanceolate-ovate. Corolla 3 cm long, white, pubescent with deflexed hairy. Stamens 4. Ovary glabrous; style hairy. Capsule clavate, *c.* 1.5 cm long, glabrous. Seeds 2, orbicular, softly hairy.

Fl. & Fr.: Jan.–Apr.

Habitat: Common along forest pathways.

Specimen examined: Kachuluru, *Y. Mahesh* 011719 (BSID).

13. PHAULOPSIS Willd.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Phaulopsis imbricata (Forssk.) Sweet, Hort. Brit. 1: 327.1826; R.S. Rao & al., Fl. E. Godavari Dist. 557. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1411. 2018. *Ruellia imbricata* Forssk., Fl. Aegypt.-Arab. 113. 1775. *Micranthus oppositifolius* Wendl., Bot. Beobacht 39. 1798; Gamble, Fl. Madras 2: 1022. 1924. *Phaulopsis parviflora* Willd., Sp.Pl. 3: 342. 1800; C.B. Clarke in Hook. f., Fl. Brit. India 4: 417. 1884. **(Plate 62A)**

Prostrate, much branched, glandular pubescent herb with woody at base, up to 25 cm high. Leaves opposite, ovate-elliptic, 2.3 cm long, scaberulous, oblique at base, acute at apex, margins irregularly crenate, hairy on both surfaces; petiole up to 2.5 cm long. Flowers in axillary and terminal, dense spikes, white, hairy; bracts closely imbricate, reniform. Calyx tube short, hairy; lobes subequal, imbricate. Corolla twisted, bilipped, obtuse; upper lip bilobed; lower lip trilobed. Stamens 4. Ovary oblong; style filiform. Capsule lanceolate, *c.* 6 mm long, clavate, pointed at apex. Seeds 4, small, brown, hairy.

Fl. & Fr.: Sep.–Mar.

Habitat: Common in forest outskirts.

Specimen examined: Ravigudem bangalow, PK Valasa, *Y. Mahesh* 010023, 011618 (BSID).

14. RHINACANTHUS Nees

India: 3 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Rhinacanthus nasutus (L.) Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 39: 79. 1870; Pull. & al., Fl. Andhra Pradesh 4: 1414. 2018. *Justicia nasuta* L., Sp. Pl. 1: 16. 1753. *Rhinacanthus communis* Nees in Wall., Pl. Asiat. Rar. 3: 109. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 541. 1885; Gamble, Fl. Madras 2: 1083. 1924. *'Nagamalli, Pamumalli'*

Suffruticose, puberulous herb, up to 70 cm high. Leaves opposite, oblong-ovate, 6 cm long, narrowed at base, subacute at apex, margins entire, sparsely puberulous above, densely below; petiole up to 1 cm long. Flowers in axillary and terminal, divaricating panicles, glandular pubescent, creamy white with pink dots in the middle of the lower lip; bracts and bracteoles narrow, 3 mm long. Calyx lobes 5, linear, 5 mm long. Corolla tube narrow, bilabiate; upper lip narrow, shortly bilobed; lower lip trilobed. Stamens 2. Ovary oblong, pubescent; style slender. Capsule clavate, stalk like base. Seeds minute.

Fl. & Fr.: Nov.–Mar.

Habitat: Occasional in dry places in the forest.

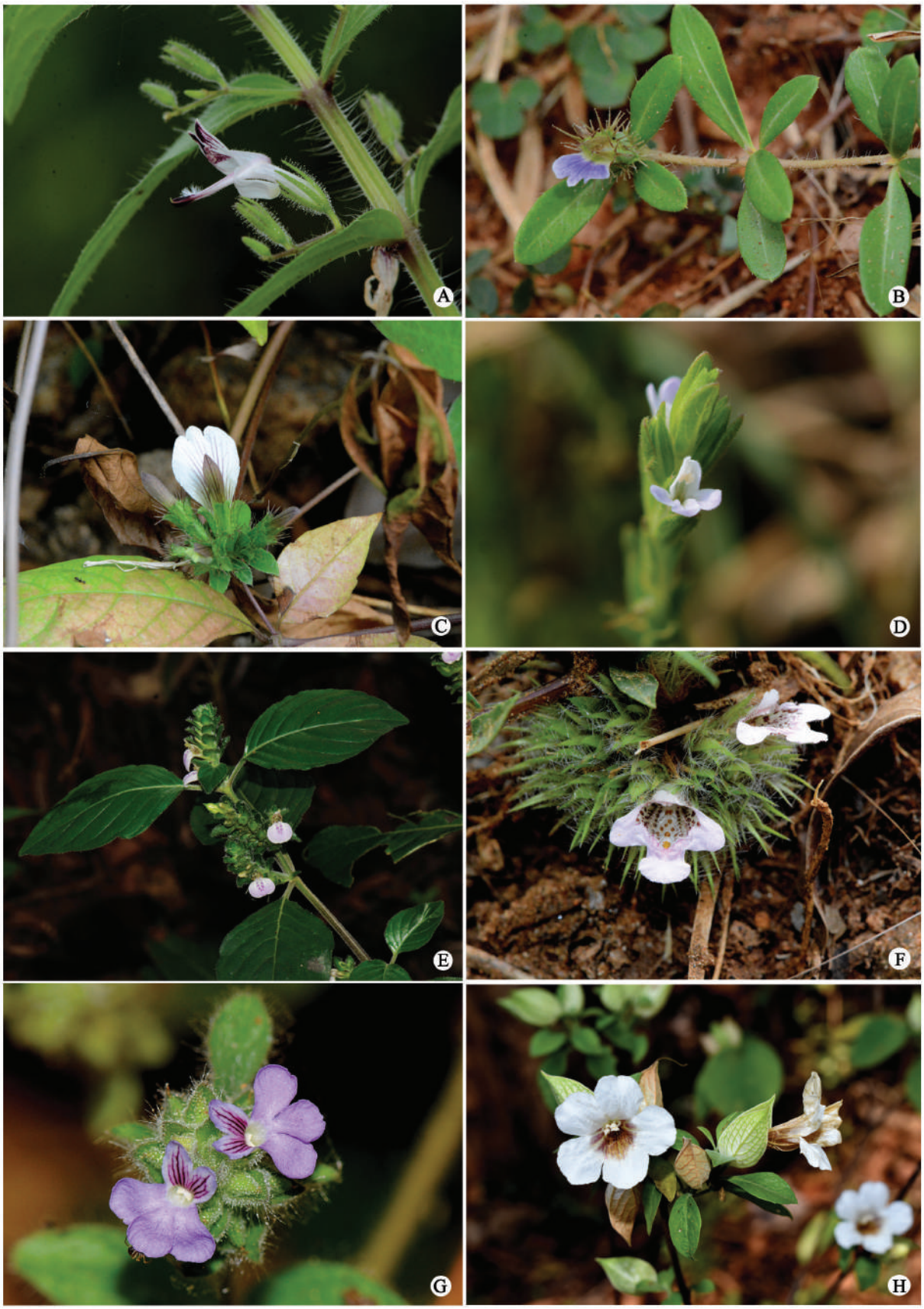


Plate 61: A. *Andrographis echioides* (L.) Nees; **B.** *Blepharis integrifolia* E. Mey. & Drege ex Schinz; **C.** *Blepharis maderaspatensis* (L.) B. Heyne ex Roth; **D.** *Hygrophila polysperma* (Roxb.) T. Anderson; **E.** *Justicia glauca* Rottler; **F.** *Lepidagathis cristata* Willd.; **G.** *Nelsonia canescens* (Lam.) Spreng.; **H.** *Petalidium barlerioides* (B.Heyne ex Roth) Nees

Specimen examined: Valamuru, *Y. Mahesh* 011790 (BSID).

15. ROSTELLULARIA Rchb.

India: spp.; Andhra Pradesh: 6 spp. & 2 var.; PNP: 1 sp.

1. Rostellularia diffusa var. **prostrata** (Roxb. ex C.B. Clarke) J.L. Ellis, Bull. Bot. Surv. India 30: 131. 1990. *Rostellularia prostrata* (Roxb. ex C.B. Clarke) R.B. Majumdar, Bull. Bot. Soc. Bengal 25: 75. 1971; Pull. & al., Fl. Andhra Pradesh 4: 1418. 2018. *Justicia diffusa* Willd. var. *prostrata* Roxb. ex C.B. Clarke in Hook. f., Fl. Brit. India 4: 538. 1885. *Justicia prostrata* (Roxb. ex C.B. Clarke) Gamble, Fl. Madras 2: 1081. 1924.

Procumbent herb; branches ascending, hirsute with white spreading hairs. Leaves opposite, elliptic, 2 cm long, rounded at base, subacute at apex, margins canerulous, glabrous on both surfaces. Flowers in terminal spikes, pinkish; bracts ovate with green midrib. Calyx campanulate, tube short; lobes 4, lanceolate, scarious with green midrib, ciliate. Corolla bilabiate, pubescent; upper lip bilobed; lower lip trilobed. Stamens 2. Ovary ovoid; style pubescent. Capsule oblong, pubescent at apex. 4-seeded.

Fl. & Fr.: Sep.–Jan.

Habitat: Common in waste lands and roadsides.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011399 (BSID).

16. RUELLIA Plum. ex L.

India: 9 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Roots not tuberous; leaves 1.6-4 cm long	**1. R. patula**
1b.	Roots tuberous; leaves 4.5-10 cm long	**2. R. tuberosa**

1. Ruellia patula Jacq., Misc. Austriac. 2: 358. 1781; C.B. Clarke in Hook. f., Fl. Brit. India 4: 412. 1884; Gamble, Fl. Madras 2: 1017. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1420. 2018.

An erect, sarmentose herb, up to 55 cm high; young branches sub-quadrangular, sparsely pubescent. Leaves opposite, elliptic-ovate, 3 cm long, rounded at base, subacute at apex, margins crenate, appressed pubescent; petiole up to 2 cm long. Flowers in axillary, solitary or 2–3-flowered cymes, 1.5 cm long, pinkish, pubescent; bracts oblong-spathulate, 1.5 cm long. Calyx tube very short; lobes 5 linear, pubescent. Corolla tube cylindric, 3.5 cm long, pubescent; lobes elliptic-orbicular. Stamens 4, included. Ovary glabrous; style slender, pubescent. Capsule ovoid, 1.5 cm long, clavate, beaked. Seeds orbicular, flattened.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in moist localities.

Specimen examined: Valamuru, *Y. Mahesh* 012152 (BSID).

2. Ruellia prostrata Poir., Encycl. 6: 349. 1804; C.B. Clarke in Hook. f., Fl. Brit. India 4: 411. 1884; Gamble, Fl. Madras 2: 1017. 1924. *Dipteracanthus prostratus* (Poir.) Nees in Wall., Pl. Asiat. Rar. 3: 81. 1832; R.S. Rao & al., Fl. E. Godavari Dist. 544. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1373. 2018. *'Nelaneelamburam'*

Prostrate herb, up to 50 cm high; young branches sub-quadrangular, pubescent. Leaves opposite, ovate-elliptic or deltoid, 3–5 cm long, cuneate at base, obtuse at apex, margins entire, sparsely hairy above, pubescent below; petiole up to 2 cm long. Flowers axillary, solitary, 2.2 cm long, pale pink; bracteoles ovate-elliptic or orbicular. Calyx tube short; lobes linear, hairy. Corolla tube 1.5 cm long, pubescent; lobes ovate, 5 mm long. Stamens 4, didynamous; ovary ovate. Capsule obovoid, 1.5 cm long, clavate, pubescent. Seeds numerous, orbicular, flattened, hairy along margins.

Fl. & Fr.: Sep.–Feb.

Habitat: Common in sandy areas.

Specimen examined: Maredupudi, *Y. Mahesh* 010115 (BSID).

17. RUNGIA Nees

India: spp.; Andhra Pradesh: 3 spp.; PNP: 2 spp.

Key to the species

1a.	Procumbent branched herbs; bracts similar	**1. R. pectinata**
1b.	Erect herbs; bracts dimorphic	**2. R. repens**

1. Rungia pectinata (L.) Nees in DC., Prodr. 11: 469. 1847; R.S. Rao & al., Fl. E. Godavari Dist. 558. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1423. 2018. *Justicia pectinata* L., Amoen. Acad. 4: 299. 1759. *Rungia parviflora* (Retz.) Nees var. *pectinata* (L.) C.B. Clarke in Hook. f., Fl. Brit. India 4: 1885; Gamble, Fl. Madras 2: 1071. 1924. **(Plate 62B)** *'Pindikunda'*

An erect, diffusely branched herb, up to 25 cm high; branches ascending, distinguished with nodes and internodes, hairy. Leaves variable, opposite, ovate-lanceolate, 2.5–4 cm long, rounded at base, acute at apex, margins entire, glabrous; petiole up to 1.8 cm long. Flowers in axillary and terminal, one sided spikes, shortly bracteate, violet; bracts in two rows, elliptic, villous, ciliate, hyaline along margins. Calyx lobes 5, linear, 4 mm long. Corolla 5 mm long, blipped; upper lip ovate, lower obovate, trilobed. Stamens 2. Style short. Capsule ovate-oblong, *c.* 3 mm long, pubescent at apex. Seeds 4, orbicular, orange.

Fl. & Fr.: Dec.–Apr.

Habitat: Common in moist localities and sandy soils.

Specimen examined: PK Valasa, Eruwada, *Y. Mahesh* 010031, 10658 (BSID).

2. Rungia repens (L.) Nees in Wall., Pl. Asiat. Rar. 3 110. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 549. 1885; Gamble, Fl. Madras 2: 1070. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1425. 2018. *Justicia repens* L., Sp. Pl. 15. 1753. **(Plate 62C)** *'Palakavelli'*

A decumbent, pubescent herb, rooting at lower nodes, about 40 cm high; stems and branches slender, zig-zag, strigose. Leaves opposite, subsessile, elliptic-ovate, 2–4 cm long, obtuse at base, acute at apex, margins entire, sparsely hairy on nerves and margins; petiole up to 0.6 cm long. Flowers in terminal, erect long spikes, 8 mm long, blue or pale violet; bracts ovate-orbicular, 6 mm long, closely imbricate, conspicuously winged. Calyx lobes linear-ovate, 5 mm long, ciliate, glandular hairy. Corolla tube 2 mm long, bilipped, pubescent; upper lip emarginate; lower lip broad, 8 mm long, crested, trilobed. Stamens 2, slightly exserted. Capsule elliptic-oblong, 5 mm long, flattened, pubescent. Seeds 4, orbicular, compressed.

Fl. & Fr.: Sep.–Apr.

Habitat: Common in grasslands.

Specimen examined: Koida, *Y. Mahesh* 011350, 011356 (BSID).

18. STAUROGYNE Wall.

India: 10 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Staurogyne spatulata (Blume) Koord., Exkurs. Fl. Java 3: 11. 1912. *Adenosma spatulata* Blume, Bijdr. Fl. Ned. Ind. 14: 757. 1826. *Staurogyne glauca* Kuntze, Revis. Gen. Pl. 2: 497. 1891; Gamble, Fl. Madras 2: 1011. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1426. 2018. *Embermaiera glauca* Nees in DC., Prodr. 11: 73. 1847; C.B. Clarke in Hook. f., Fl. Brit. India 4: 395. 1884.

An erect, viscid herb, up to 35 cm high; stems striate, glandular pubescent. Leaves opposite, subsessile, spathulate or oblanceolate, 3–6 cm long, attenuate at base, obtuse at apex, margins crenate, glabrous. Flowers in terminal or axillary, solitary or in spikes, 7 mm long, purple with rose lines; bracts spathulate, 1.4 cm long; bracteoles 1 cm long. Calyx lobes 5, subequal, linear, 5 mm long, glandular hairy. Corolla tube cylindric, 8 mm long, bilipped, puberulous without. Stamens 4. Ovary oblong; style slender. Capsule oblong, 8 mm long, glabrous. Seeds up to 10, minute, papillate.

Fl. & Fr.: Nov.–Mar.

Habitat: Occasional along moist localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010021 (BSID).

19. STROBILANTHES Blume

India: 155 spp., 7 var. & 1 forma; Andhra Pradesh: spp.; PNP: 3 spp.

Key to the species

1a.	Small gregarious undershrub	**1. S. heyneanus**
1a.	Erect or diffuse herbs	2
2a.	Leaves sessile or subsessile; longer filaments glabrous in the above half and hairy below	**2. S. hirta**
2b.	Leaves petiolate; longer filaments densely bearded in the above half and glabrous below	**3. S. pavala**

1. Strobilanthes heyneana Nees in Wall., Pl. Asiat. Rar. 3: 85. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 443. 1884; Gamble, Fl. Madras 2: 1041. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1431. 2018; Venu, *Strobilanthes*

in Penin. India 111. 2006. *Nilgirianthus heyneanus* (Nees) Bremek., Verh. Kon. Ned. Akad. Wetensch. Afd. Naturk. Tweede Sect. 41. 173. 1944. **(Plate 62D)**

Small gregarious undershrub, up to 80 cm high; branches grooved. Leaves opposite, ovate-elliptic, 10 cm long, cuneately truncate at base, acuminate at apex, margins dentate; petiole up to 4 cm long. Flowers in short, trichotomous spikes, 1.5 cm long, pale blue; bracts pinkish, orbicular. Calyx campanulate, tube 6 mm long; lobes linear. Corolla tube pubescent; lobes acute. Stamens 4. Capsule oblong, 4-seeded. Seeds minute.

Fl. & Fr.: Oct.–Dec.

Habitat: Very rare along stream banks in deep forest.

Specimen examined: Ijjaluru, *Y. Mahesh* 010957 (BSID).

Field notes: Only two individuals observed.

2. Strobilanthes hirta Blume, Bijdr. Fl. Ned. Ind. 14: 797. 1826. *Hemigraphis hirta* T. Anderson, J. Linn. Soc., Bot. 9: 462. 1867; C.B. Clarke in Hook. f., Fl. Brit. India 4: 422. 1884; Gamble, Fl. Madras 2: 1018. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 548. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1386. *Ruellia hirta* Vahl, Symb. Bot. 3: 84. t. 67. 1794.

An erect or decumbent, white silky hairy herb, up to 20 cm high. Leaves opposite, ovate, 3 cm long, attenuate at base, obtuse at apex, margins crenate, softly hairy on both surfaces; petiole short, up to 4 mm long. Flowers in terminal heads, pale blue, few; bracts elliptic-oblanceolate. Calyx lobes linear, hairy. Corolla tube funnel shaped; lobes 5. Stamens 4, didynamous; longer filaments glabrous in the above half and hairy below. Ovary obovoid. Capsule obovoid, *c.* 8 mm long, glandular hairy at apex. Seeds minute.

Fl. & Fr.: Mar.–Jun.

Habitat: Common along pathways.

Specimen examined: Kakeshnur, *Y. Mahesh* 011320 (BSID).

3. Strobilanthes pavala J.R.I. Wood, Novon 23: 392. 2014. *Hemigraphis latebrosa* Nees in DC., Prodr. 11: 723. 1847; C.B. Clarke in Hook. f., Fl. Brit. India 4: 423. 1884; Gamble, Fl. Madras 2: 1018. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 548. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1387. 2018. *Ruellia latebrosa* Roth, Nov. Pl. Sp. 307. 1821. **(Plate 62E)**

Diffuse herb, with white spreading hairs, up to 30 cm high; stems subquadrangular, hairy. Leaves opposite, ovate-elliptic, 3–7 cm long, cuneate at base, acuminate at apex, margins serrate, hirsute; petiole up to 3 cm long. Flowers in axillary and terminal, shortly pedicelled, capitates cymes, 1.2 cm long, bluish; bracts ovate-elliptic, 1.5 cm long, ciliate. Calyx tube short; lobes 5, linear, 5 mm long, ciliate at top. Corolla tube funnel shaped, 6 mm long, mouth ventricose; lobes 5, subequal, rounded. Stamens 4, didynamous; longer filaments densely bearded in the above half and glabrous below. Ovary ovoid, pubescent; style pubescent. Capsule tetragonous, *c.* 6 mm long, pubescent. Seeds 8, lacinate along margins.

Fl. & Fr.: Nov.–Mar.

Habitat: Common as forest undergrowth.

Specimen examined: PK Valasa, *Y. Mahesh* 010029 (BSID).

20. THUNBERGIA Retz.

India: 12 spp. & 2 var.; Andhra Pradesh: 2 spp. & 1 var.; PNP: 1 sp.

1. Thunbergia fragrans Roxb., Pl. Coromandel 1: 47. t. 67. 1796; C.B. Clarke in Hook. f., Fl. Brit. India 4: 390. 1884; Gamble, Fl. Madras 2: 1007. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 559. 1999. Pull. & al., Fl. Andhra Pradesh 4: 1436. 2018. *Thunbergia fragrans* Roxb. var. *laevis* (Nees) C.B. Clarke in Hook. f., Fl. Brit. India 4: 391. 1884; Gamble, Fl. Madras 2: 1007. 1924. *Thunbergia laevis* Nees in Wall., Pl. Asiat. Rar. 3: 77. 1832.

A large twiner, up to 3 m long; branches slender, sparsely retrorsely hairy. Leaves opposite, ovate, 8 cm long, shallowly lobed, coriaceous, rounded subcordate at base, acute at apex, margins entire scabrous, hispid above, pubescent below; petiole up to 2 cm long. Flowers axillary, solitary, 5 cm across, white with yellow centre, fragrance; bracteoles foliaceous, ovate, 2 cm long, acuminate. Calyx toothed, 4 mm, long, pubescent; teeth 3–12, subequal, lanceolate. Corolla tube 2.5 cm long; lobes 5, orbicular, crenate. Stamens 4, didynamous. Ovary broadly ovoid; style slender. Capsule globose, conical, *c.* 2.5 cm long, beaked. Seed globose.

Fl. & Fr.: Oct.–Dec.

Habitat: Common in forest hedges.

Specimen examined: PK Valasa, Eruwada, *Y. Mahesh* 010024, 010661 (BSID).

111. BIGNONIACEAE

India: 33 genera, 58 taxa; Andhra Pradesh: 9 genera; 12 spp., 1 var.; PNP: 4 genera; 4 spp.

Key to the genera

1a.	Fruit usually cylindrical, often subterete, 4-angled	2
1b.	Fruit compressed, rarely subcylindrical	3
2a.	Capsule ribbed; seeds biseriate in each locule	**4. Stereospermum**
2b.	Capsule not ribbed; seeds multiseriate in each locule	**3. Radermachera**
3a.	Dehiscence septicidal, dehiscing through both the sutures	**2. Oroxylum**
3b.	Dehiscence loculicidal, rarely through the sutures only	**1. Dolichandrone**

1. DOLICHANDRONE (Fenzl) Seem.

India: 4 spp. & 1 infraspecific; Andhra Pradesh: 3 spp. & 1 var.; PNP: 1 sp.

1. Dolichandrone falcata (Wall. ex DC.) Seem., J. Bot. 8: 381. 1870; R.S. Rao & al., Fl. E. Godavari Dist. 532. 1999. Pull. & al., Fl. Andhra Pradesh 4: 1322. 2018. *Spathodea falcata* Wall. ex DC., Prodr. 9: 206. 1845. *'Oddichettu'*

A deciduous tree, up to 12 m high; young branches with grey pubescent. Leaves imparipinnate, 6–10 cm long; leaflets 5–7, elliptic-orbicular or obovate, 3 cm long, obtuse or rounded at base, acute, or retuse, apiculate at apex, margins entire, puberulous; petiolule very short. Flowers in axillary and terminal, few flowered corymbs, 2.5 cm long, white. Calyx tube up to 1.4 cm long, split on one side to the base, curved with mucro at tip, pubescent. Corolla tube 1.8 cm long; lobes 2 cm across, bilipped, criispid. Stamens 4, didynamous. Ovary glabrous. Capsule flat, *c.* 30 cm long, falcate, flattened, twisted. Seeds winged.

Fl. & Fr.: Mar.–Aug.

Habitat: Occasional in dry deciduous forest.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011395 (BSID).

2. OROXYLUM Vent.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Oroxylum indicum (L.) Kurz, Forest Fl. Burma 2: 237. 1877; C.B. Clarke in Hook. f., Fl. Brit. India 4: 378. 1884; Gamble, Fl. Madras 2: 994. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 533. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1327. 2018. *Bignonia indica* L., Sp. Pl. 2: 625. 1753. **(Plate 62F)** *'Bapani chettu', 'Pampini'*

Medium sized tree, 10 m high; bark lenticellate. Leaves 2–3-pinnate, 1.5 m long; petiole striated; leaflets 4 pairs, ovate, elliptic, 6–10 cm long, obliquely rounded at base, acuminate at apex, margins entire, glabrous above, puberulous on nerves below; petiolule up to 1 cm long. Flowers in terminal, long racemes, closely arranged, 7.5 cm long, 6 cm across, dark pinkish-purple without, yellowish green within, pedicellate. Calyx leathery, campanulate, 2.3 cm long, lobes small, crisped. Corolla tube 4 cm long, deciduous, lobes oblong, crisped. Stamens 4, slightly exserted. Ovary glabrous; style filiform. Capsule woody, flat, *c.* 40 cm long, 2-volved, tapering at both ends. Seeds many, papery winged.

Fl. & Fr.: Jul.–Feb.

Habitat: Common in along pathways in the forest.

Specimen examined: Kakeshnur, *Y. Mahesh* 010196 (BSID).

Field notes: Fruits appear ends of the branches.

3. RADERMACHERA Zoll. & Moritzi

India: 5 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Radermachera xylocarpa (Roxb.) K. Schum., in Engl. & Prantl, Nat. Pflanzenfam. 4 (3b): 243. 1895; Gamble, Fl. Madras 2: 999. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1328. 2018. *Bignonia xylocarpa* Roxb., Fl. Ind. 3: 108. 1832. *Stereospermum xylocarpum* (Roxb.) Benth. in Benth. & Hook. f., Gen. Pl. 2: 1047. 1876; C.B. Clarke in Hook. f., Fl. Brit. India 4: 383. 1884. *'Nagadundilam', 'Pullikaya chettu'*

Medium sized, deciduous tree, up to 15 m high; bark greyish-brown, rough, flaking off in irregular scales. Leaves opposite, bipinnate, up to 40 cm long, swollen at base and nodes; leaflets 5-9, opposite, elliptic-oblong,

6–14 cm long, obliquely rounded at base, acuminate at apex, margins coarsely serrate or entire, glabrous; petiolule small. Flowers in axillary corymbs, 4 cm long, pinkish-white, tinged with yellow, fragrant. Calyx bilabiate, irregularly 5-lobed; lobes ovate. Corolla tube funnel shaped, 4 cm long; lobes subequal, crisped. Stamens 4, didynamous. Ovary glabrous; style filiform. Capsule woody, elongate, *c.* 40 cm long, tubercled. Seeds winged.

Fl. & Fr.: Apr.–May.

Habitat: Occasional in hilly slopes of deciduous forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011536 (BSID).

4. STEREOSPERMUM Cham.

India: 2 spp. & 2 infraspecific; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Stereospermum tetragonum DC., Prodr. 9: 210. 1845; Gamble, Fl. Madras 2: 998. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1330. 2018. *Stereospermum chelonoides* auct. non (L.f.) DC.; C.B. Clarke in Hook. f., Fl. Brit. India 4: 382. 1884. *Stereospermum angustifolium* Haines, Kew Bull. 1922: 121. 1922; Gamble, Fl. Madras 2: 999. 1924. *'Garikaya'*

Large deciduous tree, up to 16 m high; bark grey; young parts pubescent. Leaves pinnate, 35 cm long; leaflets 11, opposite, elliptic, 6–10 cm long, coriaceous, obliquely acute at base, acuminate at apex, margins minutely serrate, glabrous on both surfaces; petiolule very short. Flowers in axillary, corymbose, lax panicles, 2.5 cm long, yellow, veined with red lines. Calyx bilabiate. Corolla bell shaped, woolly inside the throat. Stamens 4. Capsule elongate, *c.* 40 cm long, 4-angled, twisted. Seeds trigonous.

Fl. & Fr.: Apr.–Sep.

Habitat: Occasionally found along road sides in dry deciduous forest.

Specimen examined: PK Valasa, *Y. Mahesh* 011540 (BSID).

112. LENTIBULARIACEAE

India: 2 genera, 38 spp.; Andhra Pradesh: 1 genus; 10 spp.; PNP: 1 genus; 2 spp.

1. UTRICULARIA L.

India: 36 spp.; Andhra Pradesh: 10 spp.; PNP: 2 spp.

Key to the species

1a.	Foliar organs orbicular or reniform; seeds with appendages	**2. U. striatula**
1b.	Foliar organs not as above; seeds without appendages	**1. U. caerulea**

1. Utricularia caerulea L., Sp. Pl. 1: 18. 1753; Gamble, Fl. Madras 2: 983. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1308. 2018. *Utricularia racemosa* Wall., ex Walp. in Meyen, Observ. Bot. 19: 401. 1843; Hook. f., Fl. Brit. India 4: 333. 1884. **(Plate 62G)**

An erect herb, up to 8 cm high. Leaves few, linear, 1.8 cm, rounded at apex. Traps minute, ovoid. Bracts and bracteoles attached to the middle. Flowers in racemes, 3–7, pedicellate, deep purple. Calyx lobes 2, unequal, upper lobe broadly ovate, 2.2 cm long, acute, lower lobe smaller than upper lobe, ovate. Corolla bilobed; lower lip flat; upper lip bilobed, obovate, entire, notched at apex. Stamens 2. Capsule globose, papillose. Seeds many, appendaged.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in moist rocky crevices.

Specimen examined: Kondamodalu, *Y. Mahesh* 011489 (BSID).

2. Utricularia striatula Sm. in Rees, Cycl. 37. n. 17. 1818; Gamble, Fl. Madras 2: 983. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1314. 2018. *Utricularia glochidiata* Wight, Icon. Pl. Ind. Orient. t. 1518. 1850. *Utricularia orbiculata* Wall., ex DC., Prodr. 8: 18. 1844; Hook. f., Fl. Brit. India 4: 334. 1884. **(Plate 62H)**

An epiphytic or terrestrial herb, up to 12 cm high. Leaves alternate, orbicular-reniform, 4 mm long, with long petiole, obtuse at apex, margins entire. Flowers in terminal racemes, pedicellate, pinkish. Calyx bilobed; lobes unequal, emarginate; corolla pink or pale blue with orange spots, upper lip longer than calyx; lower lip suborbicular. Stamens 2. Capsule globose. Seeds oblong, without appendages.

Fl. & Fr.: Jul.–Nov.

Habitat: Common along ghat road walls.

Specimen examined: Valamuru, *Y. Mahesh* 010944 (BSID).

113. VERBENACEAE

India: 18 genera, 115 taxa; Andhra Pradesh: 19 genera; 44 species, 2 var.; PNP: 4 genera; 5 species.

Key to the genera

1a.	Perfect stamens 2	**4. Stachytarpheta**
1b.	Perfect stamens 4	2
2a.	Fruit drupaceous, succulent	**1. Lantana**
2b.	Fruit not as above	3
3a.	Erect herbs; leaves ovate-lanceolate	**2. Lippia**
3b.	Prostrate herbs; leaves cuneate-spathulate	**3. Phyla**

1. LANTANA L.

India: 8 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Lantana camara L., Sp. Pl. 2: 627. 1753. *Lantana aculeata* L., Sp. Pl. 627. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 562. 1885; Gamble, Fl. Madras 2: 1087.1924; R.S. Rao & al., Fl. E. Godavari dist. 564. 1999. *'Pulikampa'*

Aromatic, straggling, prickly shrub, up to 3 m high; branches conspicuously armed with recurved prickles, brownish. Leaves petiolate, ovate or ovate-oblong, 6 cm long, rounded, cuneate or cordate at base, acute or shortly acuminate at apex, margins crenate-serrate rugose and scabrous on both the sides; petiole up to 2 cm long. Flowers whitish pink in short axillary and terminal capitate, umbellate spike, scenteds. Bracts lanceolate, strigose. Calyx small, membranous, truncate, obscurely toothed. Corolla hypocrateriform, tube slender, obscurely 2-lipped, 5-lobed, variously coloured, white, yellow, dark crimson. Stamens 4, didynamous. Ovary short; style small. Drupe fleshy, black, globose.

Fl. & Fr.: Throughout the year.

Habitat: Common along pathways and roadsides.

Specimens examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. LIPPIA L.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Lippia alba (Mill.) N.E.Br. ex Britton & P. Wilson, Bot. Porto Rico 6: 141. 1925; Rajendran & Daniel. Indian Verbenaceae 198. 2002; Pull. & al., Fl. Andhra Pradesh 4: 1458. 2018. *Lantana alba* Mill., Gard. Dict. Ed. 8. N. 8. 1768. *Lippia geminata* H.B.K., Nov. Gen. Sp. 2: 266. 1818; C.B. Clarke in Hook. f., Fl. Brit. India 4: 563. 1885; Gamble, Fl. Madras 2: 1088. 1924.

A gregarious, aromatic herb or undershrub, up to 1.8 m high; branches week, obscurely angled, grey pubescent. Leaves opposite, ovate-lanceolate or elliptic, 6 cm long, chartaceous, rounded at base, acute at apex, margins crenate-serrate, sparsely velvet hairy above, silvery hairy below; petiole up to 1 cm long. Flowers in axillary spikes; bracts ovate-lanceolate, pubescent. Calyx copular; lobes 2, lanceolate, accrescent in fruit, velvety hairy. Corolla tube narrow, cylindric, salver shaped, 4-lobed, upper two lobes notched, lower two lobes deflexed. Stamens 4, didynamous. Drupe pyriform, *c.* 2 mm long.

Fl. & Fr.: Throughout the year.

Habitat: Occasional in cultivated fields.

Specimen examined: Kakeshnur, *Y. Mahesh* 011326 (BSID).

3. PHYLA Lour.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Phyla nodiflora (L.) Greene, Pittonia 4: 46. 1899; R.S. Rao & al., Fl. E. Godavari Dist. 565. 1999; Rajendran & Daniel. Indian Verbenaceae 206. 2002; Pull. & al., Fl. Andhra Pradesh 4: 1458. 2018. *Verbena nodiflora* L., Sp. Pl. 1: 20. 1753. *Lippia nodiflora* (L.) A. Rich. in Michaux, Fl. Bor. Amer. 2: 15. 1803; C.B. Clarke in Hook.f.,. Fl. Brit. India 4: 563. 1885; Gamble, Fl. Madras 2: 1088. 1924. *'Bokkenaaku'*

A prostrate, creeping herb; stems minutely hairy, rooting at nodes. Leaves opposite, obovate-spathulate, 1.5 cm long, narrow or cuneate at base, obtuse at apex, margins serrate towards apex, strigose on both surfaces.

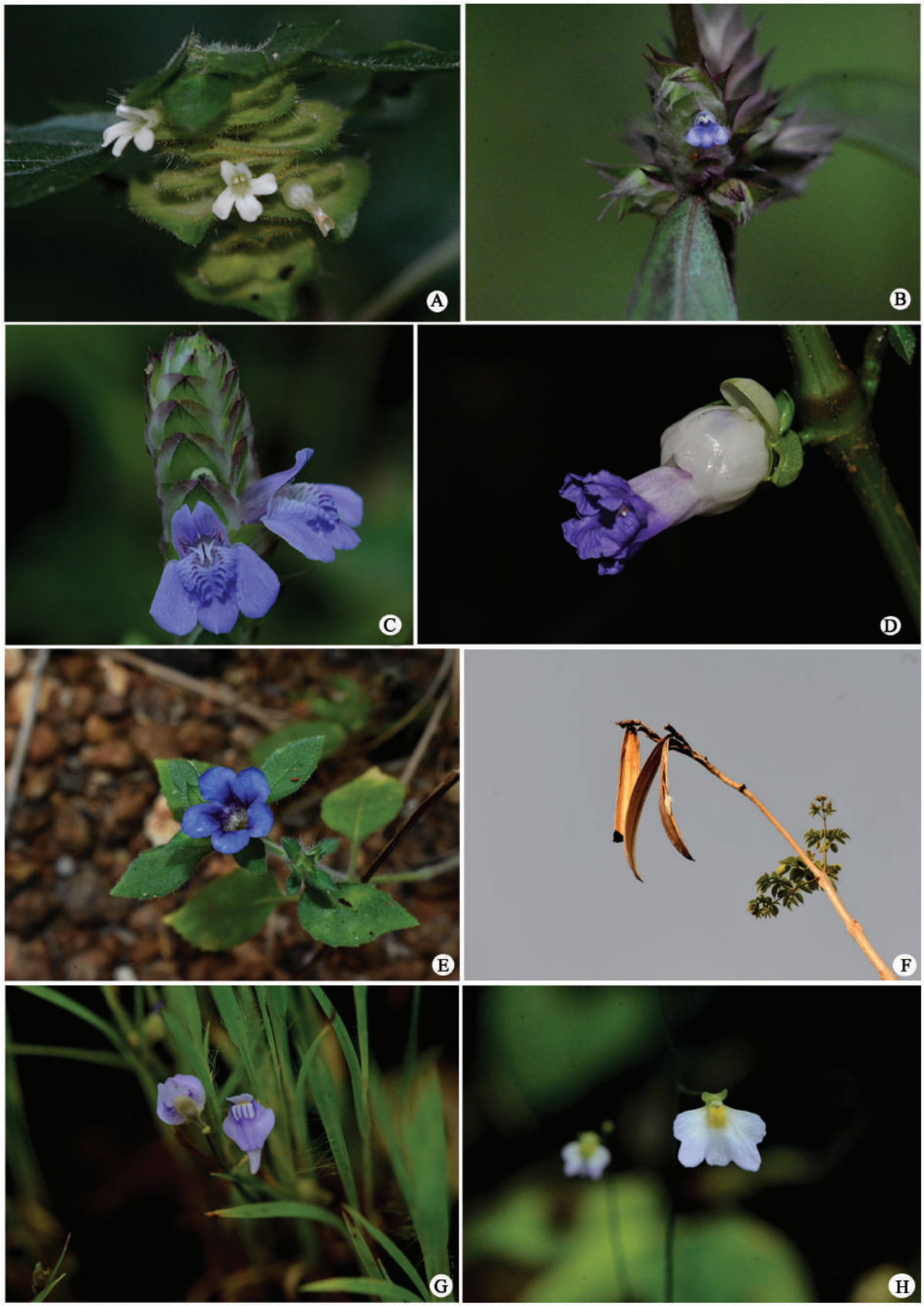


Plate 62: A. *Phaulopsis imbricata* (Forssk.) Sweet; **B.** *Rungia pectinata* (L.) Nees; **C.** *Rungia repens* (L.) Nees; **D.** *Strobilanthes heyneanus* Nees; **E.** *Strobilanthes pavala* (Roxb.) J.R.I. Wood; **F.** *Oroxylum indicum* (L.) Kurz; **G.** *Utricularia caerulea* L.; **H.** *Utricularia striatula* Sm.

Flowers in capitate, cylindric spikes, numerous, 4 mm long, whitish-pink. Calyx small, membranous, 4-lobed, pubescent, covered fruit. Corolla salver shaped, cylindric, bilipped; lobes 5, spreading, upper one two fid, lower 3-lobed. Stamens 4, didynamous. Ovary glabrous; style short. Drupe minute, globose, *c.* 1.5 mm across, enclosing 2, 1-seeded pyrenes.

Fl. & Fr.: Throughout the year.

Habitat: Common in moist localitiesriver beds and cultivated fields.

Specimen examined: Koida, *Y. Mahesh* 011352 (BSID).

4. STACHYTARPHETA Vahl

India: 5 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Leaves large, rounded at base, margin sharply serrate; bracts lanceolate	**2. S. jamaicensis**
1b.	Leaves small, obtuse at base; margins serrate; bracts linear	**1. S. cayennensis**

1. Stachytarpheta cayennensis (Rich.) Vahl, Enum. Pl. 1: 208. 1804; Rajendran & Daniel. Indian Verbenaceae 304. 2002; Pull. & al., Fl. Andhra Pradesh 4: 1468. 2018. *Verbena cayennensis* Rich., Actes Soc. Hist. Nat. Paris 1: 105. 1792.

An undershrub, up to 1.2 m high; branches terete, glabrous. Leaves small, opposite, ovate-elliptic, 3 cm long, cuneate, obtuse at base, subacute at apex, margins serrate-crenate; petiole short, up to 5 mm long. Flowers in axillary and terminal spikes, white; bracts linear. Calyx campanulate, 5-toothed. Corolla hypocrateriform; lobes 5. Stamens 2. Fruit ovoid-oblong, glabrous.

Fl. & Fr.: Jan.–May.

Habitat: Occasional in moist localities.

Specimen examined: Valamuru, *Y. Mahesh* 010942 (BSID).

2. Stachytarpheta jamaicensis (L.) Vahl, Enum. Pl. 1: 206. 1804; R.S. Rao & al., Fl. E. Godavari Dist. 567. 19999; Pull. & al., Fl. Andhra Pradesh 4: 1468. 2018. *Verbena jamaicensis* L., Sp. Pl. 1: 19. 1753. *Stachytarpheta indica* var. *jamaicensis* (L.) Trimen, Cat. Pl. Ceylon 68. 1885 & Handb., Fl. Ceylon 3: 348. 1895; Gamble, Fl. Madras 2: 1090. 1924. *Stachytarpheta indica* sensu, C.B. Clarke in Hook. f., Fl. Brit. India 4: 564; p.p. (auct non (L.) Vahl 1804).

An erect, dichotomously branched herb, up to 1 m high; branches sub-quadrangular, glabrous. Leaves opposite or alternate, obovate-elliptic or ovate, 3–5.5 cm long, rounded or cuneate at base, subacute at apex, margins coarsely serrate or crenate, rough above, pubescent below. Flowers in terminal, large, dichotomously branched panicles, blue; bracts lanceolate. Calyx compressed, teeth 4, minute. Corolla tube slender, cylindric, subrotate; lobes 5 or 7, subequal. Stamens as many as alternating with corolla lobes, exserted. Ovary glabrous; style filiform. Fruit oblong, ribbed, splitting into 2 pyrenes, dark brown, enclosed in pubescent calyx. Seeds 1 per each pyrene, oblong.

Fl.& Fr.: Apr.–Oct.

Habitat: Common in moist localities and waste places.

Specimen examined: PK Valasa, *Y. Mahesh* 010422 (BSID).

114. LAMIACEAE

India: 67 genera, 443 taxa; Andhra Pradesh: 26 genera; 74 spp., 5 var.; PNP: 19 genera; 33 spp.

Key to the genera

1a.	Fruit not drupaceous, separating in to 4 distinct nutlets	9
1b.	Fruit drupaceous, not separating in to 4 nutlets	2
2a.	Leaves digitate	**19. Vitex**
2b.	Leaves simple	3
3a.	Bracts foliaceous, forming an involucre and enlarged in fruit	**17. Symphorema**
3b.	Bracts neither forming an involucre nor enlarged in the fruit	4
4a.	Corolla equal; stamens equal	5
4b.	Corolla 2-lipped; stamens didynomous	6
5a.	Stamens 4; fruit a small globose drupe, supported by the persistent calyx	**2. Callicarpa**
5b.	Stamens 5-6; fruit a drupe enclosed in the enlarged calyx	**18. Tectona**
6a.	Drupe with one 4-celled pyrenes	7
6b.	Drupe with 4, one celled pyrenes	8

7a.	Flowers small; corolla white, 4-lobed; drupe small	**15. Premna**
7b.	Flowers large; corolla yellow, 5-lobed; drupe large	**6. Gmelina**
8a.	Flower buds symmetrical; anthers versatile; stigmatic lobes equal	**3. Clerodendrum**
8b.	Flower buds asymmetrical; anthers basified; stigmatic lobes unequal	**16. Rotheca**
9a.	Stamens declinate	10
9b.	Stamens straight or descending	15
10a.	Lower lip of the corolla flat	11
10b.	Lower lip of the corolla concave or boat shaped	13
11a.	Corolla tube exceeding the calyx; stigma entire	**12. Orthosiphon**
11b.	Corolla tube not exceeding the calyx; stigma 2-fid	12
12a.	Flowers in whorls of 5-9 on the axils of elongate racemes or spikes	**11. Ocimum**
12b.	Flowers in globose heads or panicles	**13. Platostoma**
13a.	Corolla distinctly 2-lipped, lower lip longer than upper	**5. Coleus**
13b.	Corolla 5-lobed, lower lip shorter or equaling the other lobes	14
14a.	Calyx lobes linear	**9. Mesosphaerum**
14b.	Calyx lobes lanceolate	**1. Anisomeles**
15a.	Stamens didynamous	16
15b.	Stamens not didynamous	18
16a.	Calyx more than 10 nerved	**10. Micromeria**
16b.	Calyx 5-10 nerved	17
17a.	Corolla white; upper lip of corolla shorter than the lower lip	**8. Leucas**
17b.	Corolla scarlet or orange; upper lip of corolla longer than the lower lip	**7. Leonotis**
18a.	Flowers dioecious, in bracteates clusters on elongate spikes or racemes	**4. Colebrookea**
18b.	Flowers monoecious, in clusters in whorls on elongate spikes	**14. Pogostemon**

1. ANISOMELES R.Br.

India: 4 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Anisomeles indica (L.) Kuntze, Revis. Gen. Pl. 2: 512. 1891; Gamble, Fl. Madras 2: 1140. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 575. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1485. 2018. *Nepeta indica* L., Sp. Pl. 2: 571. 1753. *Anisomeles ovata* R.Br. in Ait., Hort. Kew. Ed. 2. 2: 364. 1811; Hook. f., Fl. Brit. India 4: 672. 1885. **(Plate 63A)** *'Chinna ranaberi'*

An erect, branched, pubescent, undershrub, up to 1.2 m high; branches acutely quadrangular, pubescent. Leaves opposite, ovate-elliptic, 5–10 cm long, truncate or cuneate at base, acuminate at apex, margins crenate-serrate, pubescent above, densely below; petiole up to 2.5 cm long. Flowers in axillary whorls, passing into terminal spikes, 1.5 cm long, white with rose coloured lower lip, bracteate. Calyx tube 2 mm long, hirsute outside, pilose within; lobes lanceolate, 5 mm long. Corolla tube inflated above, bilabiate; upper lip oblong, rounded; lower lip trilobed, villous within the throat. Stamens 4, didynamous. Ovary deeply 4-lobed; style slender, 2-fid. Fruit aggregate of 4-flattened nutlets.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in waste places.

Specimen examined: Gulletiwada, *Y. Mahesh* 010563 (BSID).

2. CALLICARPA L.

India: 8 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Callicarpa arborea Roxb., Fl. Ind. 1: 405. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 567. 1885; Gamble, Fl. Madras 2: 1092. 1924; R.S. Rao & al., Fl. E. Godavari dist. 560. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1442. 2018. **(Plate 63B)**

A moderate sized, evergreen tree, up to 12 m high; young branches obscurely 4-angled, densely grey-tawny, stellate tomentose. Leaves opposite, ovate-lanceolate, 10–25 cm long, coriaceous, cuneate at base, acuminate apex, margins entire, denticulate, glabrous above, stellate tomentose below; petiole up to 3 cm long. Flowers in axillary, dichotomously branched corymbose cymes, small, purple, fragrant. Calyx campanulate, 4-toothed. Corolla actinomorphic, 4-lobed; lobes obovate. Stamens 4. Ovary globose; style filiform. Drupe globose, succulent, dark purple when mature. Seeds small.

Fl. & Fr.: Oct.–Feb.

Habitat: Occasional in dry deciduous forest.

Specimen examined: Valamuru, *Y. Mahesh* 010945, 011787 (BSID).

3. CLERODENDRUM L.

India: 24 spp. & infraspecific; Andhra Pradesh: 6 spp.; PNP: 2 spp.

Key to the species

1a. Leaves glabrous above, pubescent beneath; inflorescence corymb **1. C. chinense**
1b. Leaves tomentose on both sides; inflorescence cymose panicle **2. C. infortunatum**

1. Clerodendrum chinense (Osbeck) Mabb., Plant book Rev. 707. 1989; Pull. & al., Fl. Andhra Pradesh 4: 1446. 2018. *Cryptanthus chinensis* Osbeck, Dagb. Ostind. Resa 215. 1757. *Cryptanthus fragrans* Hort. Ex Vent., Tard. Mal. 2: t. 70. 1804 pro. Syn. Gamble, Fl. Madras 2: 1100. 1924. *'Mysurmalli'*

A bushy undershrub, up to 2 m high; branches pubescent. Leaves opposite, broadly ovate, 10–20 cm long, rounded at base, acute at apex, margins coarsely toothed, glabrous above, pubescent below; petiole up to 5 cm long. Flowers white, in terminal, corymbose, dense panicles. Calyx deeply 5-lobed, reddish. Corolla double, fragrant. Drupe seated on large red calyx. Seeds small.

Fl. & Fr.: Throughout the year.

Habitat: Common along roadsides.

Specimen examined: Included on the authority of R. S. Rao & al. (*l.c.*).

2. Clerodendrum infortunatum L., Sp. Pl. 2: 637. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 594. 1885; Gamble, Fl. Madras 2: 1100. 1924. *Clerodendrum viscosum* Vent., Jard. Malmaison 1: t. 25. 1803; R.S. Rao & al., Fl. E. Godavari Dist. 563. 1999. *Clerodendrum cordatum* D.Don, Prodr. Fl. Nepal. 103. 1825; Pull. & al., Fl. Andhra Pradesh 4; 1446. 2018. *'Dudlika', 'Bokkuduchettu'*

An erect undershrub, up to 3 m high; branches 4 angled, tawny pubescent. Leaves large, opposite, decussate, ovate-orbicular, cordate, 8–20 cm long, coriaceous, cordate at base, acuminate at apex, margins denticulate-serrate, tomentose on both sides, gland dotted beneath; petiole up to 6 cm long. Flowers bluish-purple, often white with pink spotted, in large terminal, cymose panicles, pubescent; panicles become red when fruiting; bracts leafy, red. Calyx lobes 5, lanceolate, acute at apex, red, accrescent. Corolla lobes 5, oblong. Stamens 4, didynamous, exserted. Style slender. Drupe globose, 4-lobed, succulent, 1-pyrene in each lobe, purple coloured, covered by calyx.

Fl. &Fr.: Oct.–May.

Habitat: Common in moist shady localities.

Specimen examined: Darapally, Y. Mahesh 010483 (BSID).

4. COLEBROOKEA Sm.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Colebrookea oppositifolia Sm., Exot. Bot. 2: 111. t. 115. 1806 "*Colebrookia*"; Hook. f., Fl. Brit. India 4: 612. 1885; Gamble, Fl. Madras 2: 1138. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 576. 1999; Pull. & al., Fl. Andhra Pradesh 4; 1446. 2018. **(Plate 63C)** *'Jolidi', 'Mandrabuttachettu'*

An erect, much branched shrub, up to 1.5 m high; stems and branches quadrangular, grooved, pubescent, pale. Leaves whorled, elliptic-oblong or lanceolate, 10–20 cm long, acute or attenuate at base, acuminate at apex, margins crenate-serrate, sparsely pubescent above, densely so below; petiole up to 1.4 cm long. Flowers in panicled, clustered spikes, 6 mm long, pale green or white. Calyx tube small, lobes subulate, 6 mm long, enlarging in fruit. Corolla 3 mm long, 5-lobed. Stamens 5. Ovary glabrous; style slender, 2-fid. Nutlets obovoid, pubescent at apex.

Fl. & Fr.: Dec.–May.

Habitat: Occasional in moist localities.

Specimen examined: PK Valasa, *Y. Mahesh* 011771 (BSID).

Field notes: Drooping white long spikes are characteristic feature of this species.

5. COLEUS Lour.

India: 36 spp. & 1 var.; Andhra Pradesh: 5 spp.; PNP: 1 sp.

1. Coleus strobilifer (Roxb.) A.J. Paton in Phyto Keys 129: 100. 2019. *Plectranthus strobiliferus* Roxb., Hort. Bengal 45. 1814 & Fl. Ind. 3: 23. 1814. *Anisochilus eriocephalus* Benth. in A.P.de Candolle, Prodr. 12: 81. 1848. Hook.f., Fl.

Brit. India 4: 627. 1885; Gamble, Fl. Madras 2: 1127. 1924; Pull. & al., Fl. Andhra Pradesh 4; 1484. 2018.

Erect herb, up to 65 cm high. Leaves opposite, broadly ovate-suborbicular, 3–6 cm long, thick, truncate at base, subacute at apex, margins crenate, pubescent above, tomentose, glandular below; petiole up to 1.5 cm long. Flowers in terminal, dense cylindrical spikes, pale purple. Calyx bilabiate, densely white silky hairy near mouth; lobes ovate-lanceolate. Corolla inflated, bilipped; lobes pubescent, lower lip boat shaped, pubescent; upper lip 4-lobed. Stamens 4, exserted. Disc 4-lobed. Nutlets orbicular, brown, hairy.

Fl. & Fr.: Nov.–Jan.

Habitat: Common in open rocky areas.

Specimen examined: PK Valasa, *Y. Mahesh* 012141 (BSID).

6. GMELINA L.

India: 5 spp.; Andhra Pradesh: 2 spp.; PNP: 2 spp.

Key to the species

1a.	Unarmed trees; leaves 10-25 cm long; calyx lobes 5	**1. G. arborea**
1b.	Armed shrubs; leaves never exceed 4 cm long; calyx lobes 4	**2. G. asiatica**

1. Gmelina arborea Roxb., Pl. Coromandel 3: 41. 1815; Hook. f., Fl. Brit. India 4: 581. 1885; Gamble, Fl. Madras 2: 1097. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 563. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1453. 2018. **(Plate 63D)** *'Gummaditeku'*

Medium sized, deciduous tree, up to 12 m high; bark yellowish-brown, exfoliating in thick plates; young branches brown pubescent. Leaves opposite, broadly ovate, 10–25 cm long, coriaceous, cordate or slightly deccurrent at base, acuminate at apex, margins entire, sparsely pubescent above, fulvous tomentose beneath; petiole up to 10 cm long. Flowers in axillary and terminal, long panicles of 3-flowered cymes, brownish-yellow, pubescent without. Calyx lobes 5, triangular. Corolla tube 1 cm long, densely pubescent without, unequally bilipped; lower lip longer than the upper, yellow. Stamens 4, didynamous. Ovary pubescent; style slender. Drupe fleshy, obovoid, *c.* 2 cm long, glabrous. Seeds 1–3, oblong.

Fl. & Fr.: Feb.–Jun.

Habitat: Occasional in dry deciduous forest.

Specimen examined: Kakeshnur, *Y. Mahesh* 010191 (BSID).

2. Gmelina asiatica L., Sp. Pl. 2: 626. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 582. 1885; Gamble, Fl. Madras 2: 1098. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 564. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1454. 2018. *'Chirugummudu', 'gummudu'*

An erect or straggling, much branched, armed shrub, up to 3 m high; bark yellowish; stems glabrous, modified in to thorns. Leaves opposite, ovate-elliptic, 3 cm long, cuneate-acute at base, obtuse at apex, margins entire, glabrous on both surfaces; petiole up to 1 cm long. Flowers in axillary and terminal racemes, drooping, 3 cm long, bright yellow. Calyx cupular, 5 mm long, 4-lobed; lobes triangular. Corolla tube slender, 2.5 cm long, tomentose, bilipped; lobes obtuse, recurved. Stamens 4, didynamous. Ovary short; style slender. Drupe obovoid, *c.* 1.5 cm long, yellowish when ripe, glabrous.

Fl. & Fr.: Apr.–Aug.

Habitat: Common in open dry deciduous forest.

Specimen examined: Chigurumamidi, *Y. Mahesh* 011365 (BSID).

7. LEONOTIS (Pers.) R. Br.

India: 1 sp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Leonotis nepetifolia (L.) R.Br., Hort. Kew. 3: 409. 1811; Hook. f., Fl. Brit. India 4: 691. 1885; Gamble, Fl. Madras 2: 1155. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1497. 2018. *Phlomis nepetifolia* L., Sp. Pl. 2: 586. 1753. *'Errathummi chettu' 'Randa beri'*

An erect, aromatic, puberulous herb, up to 2 m high; stems obtusely quadrangular, deeply furrowed. Leaves opposite, ovate, 5–10 cm long, membranous, acute or cuneate at base, acute at apex, margins deeply crenate-serrate, puberulous on both sides; petiole up to 3 cm long. Flowers in axillary, densely globose, many flowered head, 1.2 cm long, deep orange-scarlet; bracts linear, deflexed, spinescent. Calyx tube 1 cm long, oblique at mouth; teeth 8–10, with sharp spinous end. Corolla tube slender, villous above, bilabiate, annulate inside with

3-ringes of white hairs near base; upper lip densely woolly; lower lip 3-lobed. Stamens 4, didynamous. Style slender. Nutlets 4, oblong, *c.* 4 mm long, with deep triangular pit. Seeds minute, oblong.

Fl. & Fr.: Sep.–Jan.

Habitat: Common in waste places.

Specimens examined: Pocharam, *Y. Mahesh* 010138 (BSID).

8. LEUCAS R. Br.

India: 45 spp. & 11 var.; Andhra Pradesh: 26 spp. & 2 var.; PNP: 7 spp.

Key to the species

1a.	Calyx mouth villous within, with definite ring of villous hairs	2
1b.	Calyx mouth glabrous, tomentose or pubescent within, without a definite ring of hairs	3
2a.	Calyx mouth truncate; bracts shorter than the calyx lobes	**4. L. decemdentata**
2b.	Calyx mouth oblique or sub-oblique; bracts as long as or longer than calyx lobes	**3. L. cephalotes**
3a.	Mouth of calyx oblique	4
3b.	Mouth of the calyx truncate	5
4a.	Bracts ciliate with simple hairs	**7. L. zeylanica**
4b.	Bracts ciliate with long bristle or bulbous based hairs	**1. L. aspera**
5a.	Bracts shorter than calyx	6
5b.	Bracts as long as or longer than calyx	**5. L. marrubioides**
6a.	Leaves glabrous or pubescent on both sides	**2. L. biflora**
6b.	Leaves tomentose, velvety or densely hirsute on both sides	**6. L. montana**

1. Leucas aspera (Willd.) Link, Enum. Pl. Hort. Berol. Alt. 2: 113. 1822; Hook. f., Fl. Brit. India 4: 690. 1885; Gamble, Fl. Madras 2: 1150. 1924; V. Singh, Monogr. India Leucas 43. 2001; Pull. & al., Fl. Andhra Pradesh 4: 1500. 2018. *Phlomis aspera* Willd., Enum. Pl. Hort. Berol. 2: 621. 1809. *'Tellathummi', Thummi'*

A stout, coarse, much branched herb, up to 50 cm high; branchlets grooved, sparsely appressed with spreading hairs. Leaves opposite, subsessile, linear-oblong or ovate-lanceolate, 4–8 cm long, base acute, acute at apex, margins serrate, hispid on both surfaces. Flowers in verticils, 1.4 cm long, white; bracts linear, 1.3 cm long, ciliate with long bristle or bulbous based hairs. Calyx tubular, oblique at mouth, longer than bracts, irregularly 8–9 toothed, ciliate. Corolla tube annulated, 1 cm long, bilabiate; lower lip twice as long as upper one, glabrous; upper lip 5 mm long, densely woolly near mouth. Nutlets oblong, *c.* 2.5 mm long, smooth, brown, truncate at apex.

Fl. & Fr.: Throughout the year.

Habitat: Common in cultivated fields and waste lands.

Specimen examined: PK Valasa, *Y. Mahesh* 010402 (BSID).

2. Leucas biflora (Vahl) R.Br. ex Sm., Cycl. 20: 7. 1812; Hook. f., Fl. Brit. India 4: 683. 1885; Gamble, Fl. Madras 2: 1150. 1924; V. Singh, Monogr. India Leucas 49. 2001; R.S. Rao & al., Fl. E. Godavari Dist. 578. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1501. 2018. *Phlomis biflora* Vahl, Symb. Bot. 3: 77. 1784. **(Plate 63E)** *'Gobbi mokka'*

A slender, softly pubescent herb, up to 40 cm high; stem and branches with deflexed hairy. Leaves opposite, ovate-elliptic, 1.5–3 cm long, truncate at base, acute at apex, margins crenate-serrate, glabrous or sparsely pubescent on both the surfaces. Flowers small, in axillary whorls, white; bracts minute, setaceous. Calyx tube up to 8 mm long, mouth 10 toothed, teeth triangular, glandular hairy. Corolla tube as long as calyx or shorter; lobes unequal. Nutlets *c.* 2 mm long, irregularly prominent tubercled, truncate at apex.

Fl. & Fr.: Jul.–Dec.

Habitat: Common along pathways; banks of stream.

Specimen examined: Valamuru, Kothuru, *Y. Mahesh* 010503, 011654 (BSID).

3. Leucas cephalotes (Roth) Spreng., Syst. Veg. 2: 743. 1825; Hook. f., Fl. Brit. India 4: 689. 1885; Gamble, Fl. Madras 2: 1150. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 578. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1501. 2018. *Phlomis cephalotes* Roth, Nov. Pl. Sp. 1821; V. Singh, Monogr. India Leucas 53. 2001. *'Peddathummi'*

An erect, branched, pubescent herb, up to 70 cm high; branches obtusely quadrangular. Leaves opposite, ovate-lanceolate, 2–3.5 cm long, cuneate at base, subacute at apex, margins crenate-serrate, strigose above, pubescent, glandular punctate below. Flowers in terminal, densely globose whorls, white; bracts lanceolate, ciliate,

as long as or longer than calyx. Calyx tubular, 1 cm long, pubescent, oblique at mouth; lobes 10, subulate. Corolla 1.8 cm long, biliabiate, obliquely annulate; upper lip white woolly, lower lip 3-lobed. Stamens 4, didynamous. Style slender. Nutlets oblong-obovoid, *c.* 2 cm long, brown.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in cultivated fields and waste places.

Specimen examined: Pedanunthalu, *Y. Mahesh* 011507 (BSID).

4. Leucas decemdentata (Willd.) R. Br. ex Sm. in Rees, Cycl. 20: 6. 1812; Benth. Lab. Gen. Sp. 609. 1834; in DC. Prodr. 12: 526. 1848; V. Singh, Monogr. India *Leucas* 68. 2001; Pull. & al., Fl. Andhra Pradesh 4: 1503. 2018. *Phlomis decemdentata* Willd., Sp. Pl. 3: 124. 1800. *Leucas flaccida* R. Br., Prodr. 505. 1810; Benth. Lab. Gen. Sp. 609. 1834; Hook. f., Fl. Brit. India 4: 684. 1885. *Leucas mollisima* Wall. ex Benth. var. *scaberula* Hook. f., Fl. Brit. India 4: 682. 1885; Gamble, Fl. Madras 2: 1151. 1924. *Leucas mollisima* Wall., ex Benth. in Wall., Pl. Asiat. Rar. 1: 62. 1830; Hook. f., Fl. Brit. India 4: 684. 1885; Gamble, Fl. Madras 2: 1151. 1924.*'Tella pula thummi'*

An erect herb, up to 70 cm high; branches with deflexed, spreading hairs. Leaves opposite, ovate-lanceolate, 5 cm long, obtuse or rounded at base, acute at apex, margins crenate, villous above, pubescent below; petiole up to 1.8 cm long. Flowers axillary, 1 cm long, white; bracts linear, 1 cm long, subulate, ciliate, shorter than calyx. Calyx tube 8 mm long, pubescent without, truncate at mouth, teeth 9, subulate, 4 mm long. Corolla tube 1 cm long, exserted, bilabiate, upper hooded, densely silky pubescent, lower glabrous. Stamens 4, didynamous. Ovary glabrous; style slender. Nutlets obovate *c.* 2 mm long, smooth.

Fl. & Fr.: Oct.–Mar.

Habitat: Occasional in grasslands.

Specimen examined: Y. Mahesh (BSID).

5. Leucas marrubioides Desf., Mem. Mus. Hist. Nat. 11: 6. 1824; Hook. f., Fl. Brit. India 4: 683. 1885; Gamble, Fl. Madras 2: 1152. 1924; V. Singh, Monogr. India *Leucas* 115. 2001; Pull. & al., Fl. Andhra Pradesh 4: 1510. 2018. **(Plate 63F)**

An erect herb, up to 50 cm high; branches covered with white tomentose. Leaves opposite, ovate, 2–3.5 cm long, rounded or truncate at base, acute at apex, margins crenate-serrate, appressed sericeous above, hoary tomentose below; petiole up to 8 mm long. Flowers axillary verticils, white; bracts filiform, as long as or longer than calyx, villous with soft hairs. Calyx campanulate, 8 mm long, 10-toothed, teeth unequal, filiform, bearded. Corolla tube 8 mm long, oblique, archeol white bearded. Nutlets ellipsoid, *c.* 2 mm long, brown.

Fl. & Fr.: Jul.–Dec.

Habitat: Occasional in grasslands.

Specimen examined: Gulletiwada, *Y. Mahesh* 010564 (BSID).

6. Leucas montana Spreng., Syst. Veg. 2: 742. 1825; Hook. f., Fl. Brit. India 4: 687. 1885; Gamble, Fl. Madras 2: 1151. 1924; V. Singh, Monogr. India *Leucas* 121. 2001; Pull. & al., Fl. Andhra Pradesh 4: 1513. 2018.

An erect, branched suffruticose, deflexed hairy herb, up to 85 cm high; branches tetragonal. Leaves opposite, ovate, 3 cm long, rounded at base, obtuse at apex, margins crenate, pubescent above, velvety villous below. Flowers in axillary whorls, white, 8-12-flowered; bracts linear. Calyx tube 5 mm long, villous; lobes 10, deltoid. Corolla tube 8 mm long, pubescent in upper half, annulated inside; upper lip densely villous, lower lip trilobed. Stamens 4, didynamous. Style slender. Nutlets obovoid, *c.* 3 mm long, glabrous.

Fl. & Fr.: Nov.–Mar.

Habitat: Occasional in moist localities.

Specimen examined: PK Valasa, *Y. Mahesh* 010009 (BSID).

7. Leucas zeylanica (L.)W.T.Aiton, Hort. Kew. 3: 409. 1811; Hook. f., Fl. Brit. India 4: 689. 1885; Gamble, Fl. Madras 2: 1150. 1924; V. Singh, Monogr. India *Leucas* 158. 2001; Pull. & al., Fl. Andhra Pradesh 4: 1520. 2018. *Phlomis zeylanica* L. Sp. Pl. 586. 1753.

An erect, branched, hirsute herb, up to 40 cm high; branches obtusely quadrangular. Leaves opposite, linear-lanceolate, 5 cm, tapering at base, subacute at apex, margins serrulate, ciliate, strigose above, pubescent below. Flowers in terminal, globose whorls, 1.3 cm across, white; bracts linear, ciliate with simple hairs. Calyx tubular with oblique mouth, 1 cm long, hirsute, lobes 10. Corolla tube obliquely annulate, 8 mm long, unequally bilabiate,

pubescent; upper lip woolly; lower lip 3-lobed. Stamens 4, didynamous. Style slender. Nutlets oblong, *c.* 2.5 mm long, brown, glabrous.

Fl. & Fr.: Oct.–Mar.

Habitat: Common in cultivated fields and forest outskirts.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

9. MESOSPHAERUM P.Browne

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Mesosphaerum suaveolens (L.) Kuntze, Revis. Gen. Pl. 2: 525. 1891. *Ballota suaveolens* L., Syst. Nat., ed. 10. 2: 1100. 1759. *Hyptis suaveolens* (L.) Poit., Ann. Mus. Natl. Hist. Nat. 7: 472. 1806; Hook. f., Fl. Brit. India 4: 630. 1885; Gamble, Fl. Madras 2: 1129. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 577. 1999; Pull. *& al.*, Fl. Andhra Pradesh 4: 1494. 2018. *'Seema thulasi'*

An erect, branched, hirsute, glandular pubescent, aromatic undershrub, up to 2 m high; stems and branches tetragonous, glandular hispid. Leaves opposite, ovate-cordate, 3–6 cm long, rounded at base, acute at apex, margins irregularly denticulate, pubescent on both sides. Flowers in axillary, capitate, few flowered cymes, 1 cm long, glandular pubescent, blue, bracteate, pedicellate; bracts subulate. Calyx tube 5 mm long, accrescent in fruit, sparsely hispid without, densely so at throat; lobes subulate, 4 mm long. Corolla tube 5 mm long, 2-lipped, pubescent; lower lip saccate, densely hairy, upper lip rounded. Stamens 4, didynamous, villous. Ovary 4-partite; style short. Nutlets 4, oblong, aggregate, smooth, brown.

Fl. & Fr.: Oct.–Jan.

Habitat: Very common along roadsides, hedges of cultivated fields and waste lands.

Specimen examined: Bhupathipalem, *Y. Mahesh* 011441 (BSID).

10. MICROMERIA Benth.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Micromeria biflora (Buch.-Ham. ex D. Don) Benth., Labiat. Gen. Spec. 378. 1834; Hook. f., Fl. Brit. India 4: 650. 1885; Gamble, Fl. Madras 2: 1138. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1520. 2018. *Thymus biflorus* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 112. 1825. **(Plate 63G)**

An erect undershrub, 40 cm high; stems woody, stellate tomentose. Leaves opposite, elliptic-ovate, 1.5–2.5 cm long, deccurrent at base, acute at apex, margins serrulate, gland dotted below; petiole 1.2 cm long. Flowers in axillary, few flowered, verticillate cymes, 7 mm long, rose to mauve coloured; bracts lanceolate. Calyx with adpressely tomentose. Corolla yellowish-white, puberulous outside, 2-lipped; upper lip notched; lower lip longer than upper. Stamens 4. Nutlets solitary, *c.* 8 mm long, brown.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in moist localities.

Specimen examined: Valamuru, *Y. Mahesh* 010919 (BSID).

11. OCIMUM L.

India: 6 spp.; Andhra Pradesh: 4 spp. & 3 var.; PNP: 2 spp.

Key to the species

1a.	Corolla 0.6 cm long	**1. O. americanum**
1b.	Corolla 1.2 cm long	**2. O. basilicum**

1. Ocimum americanum L., Cent. Pl. I. 15. 1755; H. Keng in Steenis, Fl. Males. Ser. 1. 8: 376. 1978; R.S. Rao & al., Fl. E. Godavari Dist. 581. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1522. 2018. *Ocimum canum* Sims, Curtis Bot. Mag. t. 2452. 1823; Hook. f., Fl. Brit. India 4: 607. 1885; Gamble, Fl. Madras 2: 1111. 1924. *'Kukkathulasi'*

An erect, aromatic, sweet scented herb, up to 60 cm high; stems and branches quadrangular, pubescent. Leaves opposite, elliptic-lanceolate, 3 cm long, acute at both ends, margins serrate, glabrous. Flowers in close whorls of 4-6 on erect long thyrusus, prcicellate, pale violet or purplish-white; bracts ovate-elliptic, acute, stalked. Calyx campanulate, 2-lipped, pubescent, upper lip orbicular, 2-lobed, lower lanceolate, 3-lobed, lobes imbricate, villous within. Corolla tubular, bilabiate, 0.6 cm long; upper lip oblong; lower lip larger, obtuse. Stamens 4, didynamous, declinate, exserted. Ovary bicarpellary; style short. Nutlets ellipsoid, *c.* 2 mm long, pitted, black.

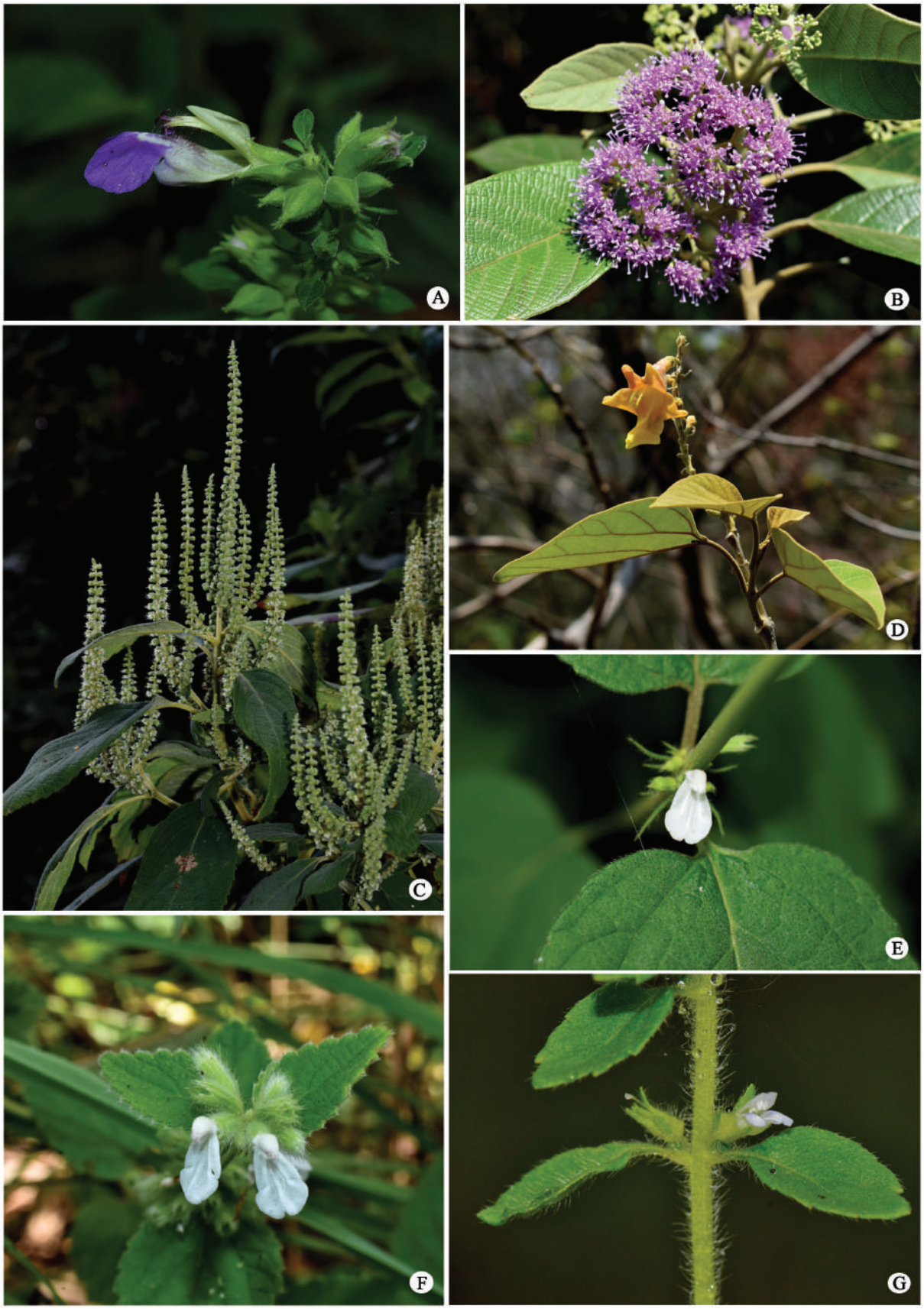


Plate 63: A. *Anisomeles indica* (L.) Kuntze; **B.** *Callicarpa arborea* Roxb.; **C.** *Colebrookea oppositifolia* Sm.; **D.** *Gmelina arborea* Roxb. ex Sm.; **E.** *Leucas biflora* (Vahl) Sm.; **F.** *Leucas marrubioides* Desf.; **G.** *Micromeria biflora* (Buch.-Ham. ex D.Don) Benth.

Fl. & Fr.: Sep.–Mar.

Habitat: Common in moist places.

Specimen examined: Kondamodalu, *Y. Mahesh* 011460 (BSID).

Field notes: Grown by villagers for its seeds.

2. Ocimum basilicum L., Sp. Pl. 2: 597. 1753; Hook. f., Fl. Brit. India 4: 608. 1885; Gamble, Fl. Madras 2: 1111. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 581. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1523. 2018. *'Gaggaraku'*

A large, scented herb, up to 50 cm high; stems quadrangular. Leaves opposite, ovate, 4–8 cm long, cuneate at base, acute at apex, margins slightly toothed, glabrous on both sides. Flowers in thyrsoid racemes, whitish-purple; bracts oblanceolate. Calyx bilobed, upper lip suborbicular; lower lip larger than upper lip. Corolla tube inflated below, 1.2 cm long; lower lip fimbriate. Stamens 4. Ovary oblong; style glabrous. Nutlets oblong, tuberculate, mucilagionous when wetted.

Fl. & Fr.: Aug.–Jan.

Habitat: Cultivated in home gardens for its leaves.

Specimen examined: PK Valasa, *Y. Mahesh* 010452 (BSID).

12. ORTHOSIPHON Benth.

India: 8 spp.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Orthosiphon rubicundus (D. Don) Benth., in Wall. Pl. Asiat. Rar. 2: 14. 1830; R.S. Rao & al. Fl. E. Godavari Dist. 583. 1999; Hook.f., Fl. Brit. India 4: 614. 1885; Gamble, Fl. Madras 2: 1114. 1924; Pull. & al., Fl. Andhra Pradesh 4: 1527. 2018. *Plectranthus rubicundus* D. Don, Prodr. Fl. Nepal. 116. 1825. *Orthosiphon rubicundus* (D. Don) Benth. var. *hohenackeri* Hook. f., Fl. Brit. India 4:615. 1885; Gamble, Fl. Madras 2: 1114. 1924. *'Nelatappidii'*

An erect, branched herb, up to 45 cm high; stems with a woody root stock, glabrous. Leaves opposite, ovate-oblong, 4–8 cm long, papery, cuneate at base, obtuse at apex, margins coarsely serrate except at base, glabrous above, sparsely pubescent below. Flowers in terminal, long racemes, white; bracts ovate-oblong, reflexed. Calyx tubular, 6 mm long, purple red, pubescent, upper lip rounded, teeth of lower lip filiform, decurrent, short awned. Corolla longer than calyx, 1 cm long, upper lip 4 mm long, lower lip, oblong, shorter than upper one. Stamens 4, declinate. Ovary glabrous; style slender. Nutlets suborbicular, *c.* 1.8 mm long, covered by calyx.

Fl. & Fr.: Sep.–Mar.

Habitat: Occasional in sandy localities, moist places in the forest

Specimen examined: PK Valasa, *Y. Mahesh* 010041 (BSID).

13. PLATOSTOMA P. Beauv.

India: 9 spp.; Andhra Pradesh: 4 spp.; PNP: 1 sp.

1. Platostoma hispidum (L.) A.J. Paton, Kew Bull. 52: 273. 1997; Pull. & al., Fl. Andhra Pradesh 4: 1531. 2018. *Gomphrena hispida* L., Sp. Pl. ed. 2. 1: 326. 1762. *Acrocephalus hispidus* (L.) Nicolson & Sivad., Taxon 29: 324. 1980. *Acrocephalus capitatus* (Roth) Benth. in Edward´s Bot.-Reg. 15: sub. t. 1282. 1829; Hook. f., Fl. Brit. India 4: 511. 1885. *Ocimum capitatum* Roth, Nov. Pl. Sp. 276. 1821. *Acrocephalus indicus* (Burm.f.) Kuntz, Revis. Gen. Pl. 2: 511. 1891; Gamble, Fl. Madras 2: 1115. 1924. *Brunella indica* Burm.f., Fl. Indica 130. 1768.

Anerect, branched herb, up to 45 cm high; branches obscurely 4-angled, strigose with reflexed hairs. Leaves lanceolate-elliptic or oblanceolate, 1.5–3 cm long, narrowed at base, acute at apex, margins serrate, glabrous on both sides; petiole up to 1.5 cm long. Flowers small in axillary and terminal ovoid heads, pale purple; bracts imbricate, broad. Calyx bilipped in fruit, upper lip flat; lower lip 4-linear lobed. Corolla small, bilabiate; upper lip 4-lobed. Stamens 4, didynamous. Ovary 4-partite, style slender, 2-fid. Nutlets elliptic, *c.* 2 mm long, smooth, brown.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional in moist localities.

Specimen examined: Eruwada, *Y. Mahesh* 011551 (BSID).

14. POGOSTEMON Desf.

India: 47 spp. & 5 var.; Andhra Pradesh: 6 spp.; PNP: 3 spp.

Key to the species

1a.	Leaves opposite, ovate to lanceolate; Bracts ovate or elliptic	**1. P. benghalensis**
1b.	Leaves 4 in whorls or lower opposite; Bracts linear	2
2a.	Flowers pinkish-rose; bracts linear-spathulate	**3. P. stellatus**
2b.	Flowers purple; bracts linear	**2. P. quadrifolius**

1. Pogostemon benghalensis (Burm.f.) Kuntze, Revis. Gen. Pl. 2: 529. 1891; R.S. Rao & al., Fl. E. Godavari Dist. 583. 1999; Pull. & al., Fl. Andhra Pradesh 4: 1536. 2018. *Origanum benghalense* Burm.f., Fl. Ind. 128. f. 38. f. 3. 1768. *Pogostemon plectranthoides* Desf., Ann. Mus. Natl. Hist. Nat. 2: 156. t. 6. 1808; Hook. f., Fl. Brit. India 4: 632. 1885; Gamble, Fl. Madras 2: 1133. 1924. **(Plate 64A)** *'Kokalachttu'*

A much branched, aromatic, suffruticose undeshrub, up to 1.5 m high; stems and branches sub-quadrangular, purplish, pubescent when young. Leaves opposite, ovate-lanceolate, 6–10 cm long, rounded at base, acute at apex, margins double serrate, glabrous on both sides or sparsely pubescent. Flowers in axillary and terminal, dense spikes, forming pyramid like panicle, bluish-purple, bracteate; bracts ovate-elliptic or rhomboid. Calyx 5-lobed, two teeth rather broader than the other three, villous pubescent. Corolla bilabiate, glabrous; lobes 4; upper lip 3-lobed, lobes rounded, entire; lower lip lanceolate. Stamens 4. Nutlets ellipsoid, minute, smooth.

Fl. & Fr.: Dec.–Mar.

Habitat: Occasional in shady localities.

Specimen examined: Ijjaluru, *Y. Mahesh* 012101 (BSID).

2. Pogostemon quadrifolius (Benth.) Kuntze, Revis. Gen. Pl. 2: 530. 1891; Pull. & al., Fl. Andhra Pradesh 4: 1539. 2018. *Dysophylla quadrifolia* Benth. in Wall., Pl. Asiat. Rar. 1: 30. 1830; Hook. f., Fl. Brit. India 4: 639. 1885; Gamble, Fl. Madras 2: 1137. 1924. **(Plate 64B)**

A stout, much branched, aromatic, grey pubescent, undershrub, up to 1 m high; stems angled, ridged, young branches pubescent. Leaves 4 in whorls, sessile or subsessile, lower opposite, linear-oblong or lanceolate, 6–10 cm long, prominently narrowed from base, acute at apex, margins serrate, softly, grey pubescent on both surfaces. Flowers in whorls in terminal spikes, purple; bracts linear, 3 mm long. Calyx campanulate, with glistening glands, tomentose. Corolla lobes oblong, exserted from calyx. Stamens 4, slightly exserted. Ovary 4-celled; style slender. Nutlets 4, minute, ovoid, black.

Fl. & Fr.: Oct.–Mar.

Habitat: Occasional on rocky boulders in the forest.

Specimen examined: PK Valasa, *Y. Mahesh* 012119 (BSID).

3. Pogostemon stellatus (Lour.) Kuntze, Revis. Gen. Pl. 2: 529. 1891; Pull. & al., Fl. Andhra Pradesh 4: 1540. 2018. *Mentha stellata* Lour. in Fl. Cochinch.: 361. 1790. *Eusteralis stellata* (Lour.) Panigr., Phytologia 32: 474. 1976. var. *roxburghiana* (Keng) Bennet & Raizada, Indian Forester 108: 303. 1982. *Dysophylla quadrifolia* Benth. in Wall., Pl. Asiat. Rar. 1: 30. 1830; Hook. f., Fl. Brit. India 4: 639. 1885; Gamble, Fl. Madras 2: 1137. 1924.

An erect, undershrub, up to 1.2 m high, hirsute. Leaves 4 in whorls, linear-oblong, 8 cm long, narrowed at base, acute at apex, margins serrate, softly pubescent on both surfaces. Flowers in dense spikes, pinkish; bracts linear, hairy. Calyx 5-toothed, teeth triangular, ciliate. Corolla lobes oblong. Stamens 4, exserted; filaments bent at middle. Ovary ovoid; style short. Nutlets minute, ovoid.

Fl. & Fr.: Oct.–Mar.

Habitat: Occasional in open hilly areas.

Specimen examined: Eruwada, Valamuru, *Y. Mahesh* 010629, 010920 (BSID).

15. PREMNA L.

India: 33 spp. & 1 var.; Andhra Pradesh: 6 spp.; PNP: 2 spp.

Key to the species

1a.	Plants stellate pubescent; flowers in paniculate cymes	**2. P. tomentosa**
1b.	Plants not stellate tomentose; flowers in corymbs	**1. P. mollissima**

1. Premna mollissima Roth, Nov. Pl. Sp. 286. 1821; Pull. & al., Fl. Andhra Pradesh 4: 1462. 2018. *Premna*

latifolia Roxb., Fl. Ind. 3: 76. 1832; C.B. Clarke in Hook. fl. Fl. Brit. India 4: 577. 1885; Gamble, Fl. Madras 2: 1096. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 566. 1999. *Premna latifolia* var. *mollissima* (Roth) C.B. Clarke, Fl. Brit. India 4: 578. 1885; Gamble, Fl. Madras 2: 1096. 1924.

Medium sized, deciduous tree, up to 12 m high; branchlets terete, striate, pubescent when young. Leaves opposite, ovate-oblong, 4–9 cm long, chartaceous, rounded at base, acute or shortly acuminate at apex, margins entire, glabrous, sparsely pubescent, black when dry; petiole up to 1.2 cm long. Flowers in 4–8 terminal, dichotomously branched corymbs, small, 3 mm long, densely pubescent, greenish-white. Calyx 2-lipped, pubescent without; lobes 5, upper lip oblong, lower lip 3-lobed. Corolla tube slightly oblique, 3 mm long, densely villous hairy within, pubescent without; lobes, ovate-rounded. Stamens 4, exserted. Ovary glabrous; style filiform; stigma 2-fid. Drupe globose, *c.* 8 mm across, with persistent saucer shaped calyx, black when ripe.

Fl. & Fr.: Apr.–Jul.

Habitat: Common in deciduous forest.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Premna tomentosa Willd., Sp. Pl. 3: 314. 1800; Hook. f., Brit. India 4: 576. 1885; Gamble, Fl. Madras 2: 1095. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 567. 1999; Rajendran & Daniel, Indian Verbenaceae 289. 2002. Pull. & al., Fl. Andhra Pradesh 4: 1464. 2018. **(Plate 64C)** *'Naguru'*

Small, stellate tomentose, deciduous tree, up to 8 m high; bark greyish brown, whole young parts with stellately tawny-tomentose. Leaves opposite, broadly ovate, 7–18 cm long, chartaceous, cordate at base, acuminate at apex, margins entire, sparsely pubescent or glabrous above, stellately tomentose below; petiole up to 4 cm long. Flowers in terminal, paniculate cymes, small, 5 mm long, creamy white, towny tomentose. Calyx 3 mm long, densely tomentose without, 5-lobed, lobes deltoid-shallowly ovate. Corolla tube 4 mm long, with villous throat, bilabiate; lobes ovate, rounded, 1.8 mm long. Stamens 4, didynamous. Ovary tomentose; style glabrous. Drupe ovoid, *c.* 5 mm across, glabrous, dark purplish-black; pyrene 1, rugose.

Fl. & Fr.: Mar.–Jun.

Habitat: Common in dry deciduous forest.

Specimen examined: Kodamodalu, *Y. Mahesh* 011730 (BSID).

Field notes: Crushed leaves gives mango smell; wood is used in furniture.

16. ROTHECA Raf.

India: 24 spp. & 2 infraspecific; Andhra Pradesh: 1 sp. & 1 var.; PNP: 1 sp.

1. Rotheca serrata (L.) Steane & Mabb., Novon 8: 206. 1998. Pull. & al., Fl. Andhra Pradesh 4: 1467. 2018. *Volkameria serrata* L., Mant. Pl. 90. 1767. *Clerodendrum serratum* Moon, Cat. Pl. Ceylon. 46: 1824; R.S. Rao & al., Fl. E. Godavari Dist. 562. 1999; Rajendran & Daniel, Indian Verbenaceae 139. 2002. *Clerodendrum serratum* (L.) Moon, Cat. Pl. Ceylon: 46. 1824; C.B. Clarke in Hook. f., Fl. Brit. India 4: 592. 1885; Gamble, Fl. Madras 2: 1100. 1924. *'Bomalchettu', 'Barangi'*

A tall, branched shrub, up to 2 m high; stems obtusely quadrangular; young branches brown tomentose. Leaves opposite or ternately whorled, elliptic-ovate or suborbicular, 10–25 cm long, attenuate, acute or obtuse at base, acute, acuminate at apex, margins coarsely serrate, glabrous; petiole short. Flowers in axillary and terminal dichotomously branched cymose, 20 cm long panicles, 1 cm long, pale violet, shortly pedicelled; bracts obovate, acuminate. Calyx 3 mm long, shortly lobed, pubescent; lobes triangular. Corolla tube cylindric, up to 1 cm long, curved; lobes 5, oblong, suborbicular, deflexed, ciliate along margins. Stamens 4, didynamous. Ovary glabrous; style slender. Drupe obovoid, *c.* 0.5 cm long, 4-lobed, black when ripe. Pyrene 1.

Fl. & Fr.: Jul.–Nov.

Habitat: Common along ghat roads in the forest.

Specimen examined: Valamuru, *Y. Mahesh* 010507 (BSID).

17. SYMPHOREMA Roxb.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Symphorema involucratum Roxb., Pl. Coromandel 2: 46. t. 186. 1805 & Fl. Ind. 2: 262. 1832; C.B. Clarke in Hook. f., Fl. Brit. India 4: 599. 1885; Gamble, Fl. Madras 2: 1104. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 568. 1999; Pull. & al., Andhra Pradesh 4: 1471. 2018. **(Plate 64D)** *'Konda tekkali', 'Buddamarri chettu'*

A large, deciduous climbing shrub, about 6 m long; young branchlets stellately tomentose. Leaves opposite, ovate, elliptic, 4–10 cm long, cordate or rounded at base, obtuse at apex, margins crenate-serrate, glabrous above, stellate tomentose below; petiole up to 1.2 cm long. Flowers in capitate cymes, 5–7-flowered, white; Involucral bracts 6, foliaceous, lanceolate, 1.5 cm long, pubescent. Calyx tubular, 5 mm long, 7–8 toothed, teeth triangular, stellately tomentose. Corolla tube 8 mm long, cylindric, glabrous, 6–8-lobed, lobes oblong. Stamens up to 6–15, inserted in corolla tube. Ovary 2-celled; style filiform. Fruit globose, *c.* 5 mm across, covered by accrescent bracts.

Fl. & Fr.: Mar.–Jun.

Habitat: Common along hilly areas, outskirts in scrub forest, along foot hills.

Specimen examined: Katchuluru, *Y. Mahesh* 011718 (BSID).

18. TECTONA L.f.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Tectona grandis L.f., Suppl. Pl. 151. 1782; C.B. Clarke in Hook. f., Fl. Brit. India 4: 570. 1885; Gamble, Fl. Madras 2: 1092. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 570. 1999; Rajendran & Daniel, Indian Verbenaceae 320. 2002; Pull. & al., Fl. Andhra Pradesh 4: 1473. 2018. *'Teku chettu'*

Tall, deciduous tree, up to 30 m high; young branches quadrangular, stellate tomentose. Leaves opposite, elliptic-obovate, 25–50 cm long, chartaceous, cuneate or rounded at base, acute or obtuse at apex, margins entire, glabrous, rough and shiny above, tomentose below; petiole short. Flowers in terminal cymose panicles, long peduncled, 5 mm long, white, tomentose; bracts lanceolate. Calyx lobes unequal, ovate, 4 mm long, prominently nerved, accrescent in fruit. Corolla tube 2 mm long, 5-lobed, lobes subequal, spreading. Stamens 5, exserted. Ovary glabrous; style glabrous. Drupe woody, obscurely 4-lobed, *c.* 1.5 cm across, spongy, enclosed in enlarged calyx, densely stellately hirsute. Seeds 1–4, obovoid.

Fl. & Fr.: Jul.–Sep.

Habitat: Planted by forest officials.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

Field notes: Wood is very costly, used in furniture.

19. VITEX L.

India: 13 spp.; Andhra Pradesh: 7 spp.; PNP: 3 spp.

Key to the species

1a.	Shrubs; leaves grey or white pubescent below	**2. V. negundo**
1b.	Trees; leaves glabrous or minutely pubescent below	2
2a.	Petioles winged	**1. V. altissima**
2b.	Petioles not winged	**3. V. pinnata**

1. Vitex altissima L.f., Suppl. Pl. 294. 1782; C.B. Clarke in Hook. f., Fl. Brit. India 4: 584. 1885; Gamble, Fl. Madras 2: 1102. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 568. 1999; Rajendran & Daniel, Indian Verbenaceae 344. 2002; Pull. & al., Fl. Andhra Pradesh 4: 1474. 2018. *'Nemalipadamu, Bushi chettu'*

A moderate sized, deciduous tree, up to 15 m high; young branches angled, brown pubescent. Leaves trifoliate, arising from the top of the petiole; petiole 6 cm long, winged, auriculate at base; leaflets sessile, linear-lanceolate, 5–10 cm long, chartaceous, acute at base, acuminate at apex, margins entire, glabrous above, sparsely pubescent beneath. Flowers in terminal, long drooping panicles, 5 mm long, pale pink or violet-purple, bracteate. Calyx cupular, very short, pubescent outside, teeth ovate-oblong. Corolla tube hairy, 4.5 mm long, bilipped; upper lip bilobed; lower lip trilobed, pubescent. Stamens 4, didynamous. Ovary glabrous; style short. Drupe globose, *c.* 5 mm across, subtended by persistent calyx, blackish-purple when ripe. Seeds 4, oblong.

Fl. & Fr.: Apr.–Jan.

Habitat: Common along moist valleys in the forest.

Specimen examined: Pocharam, *Y. Mahesh* 010143 (BSID).

Field notes: Leaves used for smoke by local tribes; roots used in snake bite.

2. Vitex negundo L., Sp. Pl. 2: 638. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 4: 583. 1885, incl. var. *incisa*; Gamble, Fl. Madras 2: 1102. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 569. 1999; Rajendran & Daniel, Indian

Verbenaceae 361. 2002; Pull. & al., Fl. Andhra Pradesh 4: 1476. 2018. *'Vavili chettu'*

A large, semievergreen tree, up to 8 m high; bark dark grey, cracked vertically; branches quadrangular, white tomentose when young. Leaves 3–5 foliolate; leaflets lanceolate-elliptic or oblong, terminal one largest, 5–12 cm long, cuneate at base, acuminate at apex, margins entire, glabrous above, grey or white pubescent below. Flowers in terminal, 20 cm long paniculate cymes, 5 mm across, white tomentose, violet-purple. Calyx tube with oblique mouth; lobes 5, deltoid. Corolla tube 2 mm long, bilabiate, limb 3 mm long, midlobe of lower lip white tomentose at base. Stamens 4, didynamous. Ovary globose, glabrous; style short. Drupe globose, *c.* 5 mm across, black when ripe. Seeds black.

Fl. & Fr.: Throughout the year.

Habitat: Common along Godavari River banks, outskirts, scrub jungles.

Specimen examined: PK Valasa, *Y. Mahesh* 012131 (BSID).

3. Vitex pinnata L., Sp. Pl. 2: 638. 1753; Mold. & A. L. Mold. In Dassan. & Fosberg, Rev. Handb. Fl. Ceylon 4: 361. 1885; R.S. Rao & al., Fl. E. Godavari Dist. 569. 1999; Rajendran & Daniel, Indian Verbenaceae 370. 2002; Pull. & al., Fl. Andhra Pradesh 4: 1478. 2018. *Vitex pubescens* Vahl, Symb. Bot. 3: 85. 1794; C.B. Clarke in Hook. f., Fl. Brit. India 4: 585. 1885; Gamble, Fl. Madras 2: 1103. 1924. **(Plate 64E)** *'Nemaliadugu'*

A medium sized, deciduous tree, up to 10 m high; bark greyish-brown; young branches 4-angled with tawny tomentose. Leaves digitately 3–5-foliate long petiole; petiole 5 cm long, grooved, not winged; leaflets subsessile, elliptic-lanceolate, 6–15 cm long, acute, rounded at base, abruptly acuminate at apex, margins entire, glabrous above, pubescent below. Flowers in terminal, subcorymbose panicles, bluish-violet, tomentose; bracts foliaceous, persistent. Calyx tube tomentose, lobes 5. Corolla bilabiate, fragrant. Stamens 4, didynamous. Ovary glabrous; style filiform. Drupe obovoid-subglobose, enclosed in accrescent calyx, purplish-black when ripe. Seeds 4.

Fl. & Fr.: Jul.–Nov.

Habitat: Common along foot hills.

Specimen examined: Kondamodalu, Geediguppa, *Y. Mahesh* 011488, 011580 (BSID).

115. OROBANCHACEAE

India: 7 genera, 38 taxa; Andhra Pradesh: 5 genera; 9 spp.; PNP: 5 genera; 6 spp.

Key to the genera

1a.	Leafless herbs	**1. Aegentia**
1b.	Leafy herbs	2
2a.	Corolla bilabiate	**5. Striga**
2b.	Corolla not bilabiate	3
3a.	Corolla tube short, ventricose above	**4. Parasopubia**
3b.	Corolla tube long, slender, not ventricose above	4
4a.	Corolla tube straight or nearly so	**3. Buchnera**
4b.	Corolla tube broad	**2. Alectra**

1. AEGINETIA L.

India: 3 spp. & 1 infraspecific; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Aeginetia indica L., Sp. Pl. 2: 632. 1753; Hook. f., Fl. Brit. India 4: 320. 1884; Gamble, Fl. Madras 2: 974. 1924; R.S. Rao & al., Fl. E. Godavari Dist. 530. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1304. 2018. **(Plate 64F)**

A saprophytic, achlorophyllous herb, up to 25 cm high; dirty brown in colour; subterranean stolons giving roots which end in haustoria; scape slender with 2 bracts, nacked. Leaves absent. Flowers solitary, 2.5 cm long on a slender erect scape, dark red-purple. Calyx tube 2.3 cm long, spathaceous, partly enclosing corolla. Corolla covered with 2-lipped, flat lobes, glabrous. Stamens 4, didynamous. Ovary ovoid; style thick. Capsule 2-valved, enclosed in persistent calyx and corolla, ovoid, beaked.

Fl. & Fr.: Aug.–Dec.

Habitat: Common as undergrowth in shady moist localities and damp soils.

Specimen examined: PK Valasa *Y. Mahesh* 010410 (BSID).

2. ALECTRA Thunb.

India: 3 spp. & 1 infraspecific; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Alectra avensis (Benth.) Merr., Philipp. J. Sci., C 12: 109. 1917. *Glossostylis avensis* Benth., Scroph. Ind. 49. 1835. *Melasma avense* (Benth.) Hand.-Mazz., Symb. Sin. 7: 843. 1936; R.S. Rao & al., Fl. E. Godavari Dist. 525. 1999. *Alectra indica* Benth in DC., Prodr. 10. 339. 1846; Hook. f., Fl. Brit. India 4: 297. 1884.

A long erect, scabrid herb, up to 30 cm high. Leaves opposite, alternate, subsessile, ovate-lanceolate, 2.2–3.8 cm long, cuneate at base, acute at apex, margins shallowly sharp, dentate, scabrous above, scabrid above, pale green, glabrous below. Flowers crowned in clustered spikes, at the end of branches, pubescent, yellow. Calyx broadly campanulate, 5 mm long; lobes triangular, as long as tube. Corolla tube 7 mm long, oblique, lobes 5, rounded, lower lobe larger. Stamens 4, inserted near base of corolla tube. Capsule shorter than calyx, sub-globose, with numerous seeds.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional moist localities.

Specimen examined: Included on the authority R.S. Rao & al. (*l.c.*).

3. BUCHNERA L.

India: 3 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Buchnera hispida Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 91. 1825; Hook. f., Fl. Brit. India 4: 298. 1884; Gamble, Fl. Madras 2: 966. 1924; Pull. & Karupp., Fl. Andhra Pradesh 3: 1274. 2018. **(Plate 64G)**

An erect, annual, hispid herb, up to 45 cm high; stems slender, hairy. Leaves opposite, rosette, subsessile, shorter ones cauline, in distant pairs, linear-oblanceolate, 3–5 cm long, narrowed at base, obtuse at apex, margins toothed, ciliate, hispid with long hairs on both surfaces. Flowers in axillary or terminal spikes, 1 cm long, violet-purple. Calyx 5 mm long, hirtellous without, 10 ribbed, lobes 5, very short, linear. Corolla tube long, slender, 9 mm long, hairy within, 5-lobed; lobes subequal, obovate, 2 mm long, notched at apex. Stamens 4, didynamous. Ovary glabrous; style dilated above the stigma. Capsule oblong, longitudinally striate.

Fl. & Fr.: Sep.–Feb.

Habitat: Occasional in grasslands.

Specimen examined: Gulletiwada, *Y. Mahesh* 010577 (BSID).

4. PARASOPUBIA H.-P. Hofm. & Eb. Fisch.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Parasopubia delphiniifolia (L.) H.-P. Hofm. & Eb. Fisch., Bot. Jahrb. Syst. 125: 357. 2004. *Gerardia delphiniifolia* L., Cent. Pl. 2: 21. 1756. *Sopubia delphiniifolia* (L.) G.Don, Gen. Hist. 4: 560. 1838; R.S. Rao & al., Fl. E. Godavari Dist. 526. 1999; Pull. & Karuppu., Fl. Andhra Pradesh 3: 1295. 2018.

Erect, branched herb, up to 70 cm high; branches grooved, puberulous. Leaves opposite, sessile, 4 cm long, pinnatisect with filiform lobes, ciliolate, acute at apex, scaberulous. Flowers solitary or in axillary racemes, 3 cm long, white with light-violet with nectar guides, bracteate; bracteoles 2, linear, trifid. Calyx tube 5 mm long, 10 ribbed; lobes 5, linear, 6 mm long, scaberulous. Corolla tube infundibuliform, 3 cm long, pubescent, with expanded limb; lobes 5, subequal, rounded, ciliolate. Stamens 4, didynamous. Ovary glabrous; style slender, pubescent. Capsule oblong, *c.* 5 mm long, loculicidal. Seeds numerous, minute.

Fl. & Fr.: Sep.–Dec.

Habitat: Common in cultivated fields.

Specimen examined: Kondamodalu, *Y. Mahesh* 011496 (BSID).

5. STRIGA Lour.

India: 10 spp. & 3 infraspecific; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a.	Flowers white; calyx 15-ribbed	**1. S. angustifolia**
1b.	Flowers pale pink; calyx 10-ribbed	**2. S. gesnerioides**

1. Striga angustifolia (D. Don) Saldanha, Bull. Bot. Surv. India 5: 70. 1963; R.S. Rao & al., Fl. E. Godavari Dist. 527. 1999; Pull. & Karuppu., Fl. Andhra Pradesh 3: 1297. 2018. *Buchnera angustifolia* D. Don, Prodr. Fl. Nepal. 91. 1825. *Striga euphrasioides* Benth., Comp. Bot. Mag. 1: 364. 1835.; Hook. f., Fl. Brit. India 4: 299. 1884; Gamble, Fl. Madras 2: 967. 1924. **(Plate 65A)** *'Ratibadanica mokka'*

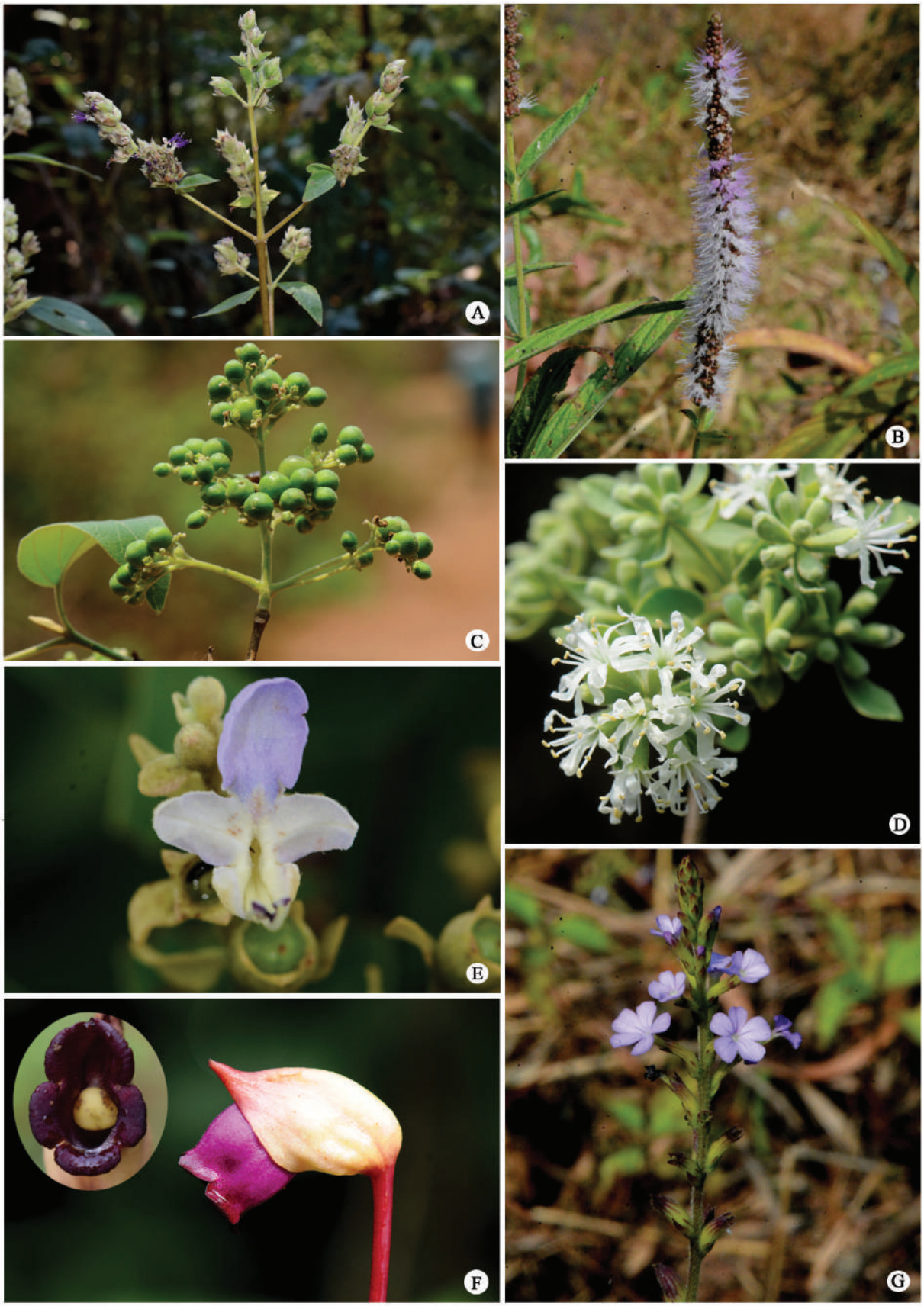


Plate 64: A. *Pogostemon benghalensis* (Burm.f.) Kuntze; **B.** *Pogostemon quadrifolius* F. Muell.; **C.** *Premna tomentosa* Willd.; **D.** *Symphorema involucratum* Roxb.; **E.** *Vitex pinnata* L.; **F.** *Aeginetia indica* L.; **G.** *Buchnera hispida* Buch.-Ham. ex D. Don

An erect, scarsely branched, scabrous herb, 35 cm high; stems grooved. Leaves sessile, linear-oblong, pinnatifid, 2–3 cm long, acute at apex, scabrous. Flowers in axillary spikes, 1.5 cm long, white; spikes up to 20 cm long; bracts foliaceous. Calyx tube 2 mm long, lobes 5, linear, 6 mm long, hirtellous without, 15-ribbed, scabrous. Corolla tube 1.1 cm long, incurved, hairy; lobes unequal, 4 mm long, obtuse, ciliolate. Stamens 4, didynamous. Ovary glabrous; style sparsely villous. Capsule oblong *c.* 5 mm long. Seeds many, small.

Fl. & Fr.: Jul.–Sep.

Habitat: Common on hill tops associated with grasses, moist localities along hill slopes.

Specimen examined: Ijjaluru, *Y. Mahesh* 012125 (BSID).

Field notes: Parasite on roots of other plants.

2. Striga gesnerioides (Willd.) Vatke, Oest. Bot. Z. 25: 11. 1875; Pull. & Karuppu., Fl. Andhra Pradesh 3: 1300. 2018. *Buchnera gesnerioides* Willd., Sp. Pl. 3: 338. 1800. *Striga orobanchoides* Benth., Companion Bot. Mag. 1: 361. 1836; Hook. f., Fl. Brit. India 4: 299. 1884; Gamble, Fl. Madras 2: 967. 1924. **(Plate 65B)**

An erect, root parasitic herb, up to 40 cm high; stems and branches pinkish-red, striate, glabrous. Leaves reduced to scales, sessile, linear, 0.5–1 cm long, truncate at base, acute at apex, scaberulous. Flowers in terminal spikes, 1 cm long, pink-purple; spikes 15 cm long, bracteate, bracteolate. Calyx tube scabrid, usually 10-ribbed; lobes 5, unequal, lanceolate, 4 mm long, acuminate, 1-ribbed, hairy along margins. Corolla up to 6 cm long, tube incurved at top, lobes obtuse, hairy. Stamens 4, didynamous. Ovary glabrous; style short. Capsule ellipsoid-obovoid, *c.* 3 mm long. Seeds many, oblong, reticulate.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional in grasslands.

Specimen examined: Eruwada, *Y. Mahesh* 010641 (BSID).

Field notes: Root parasite on other plants.

116. CAMPANULACEAE

India: 10 genus, 57 taxa; Andhra Pradesh: 3 genera; 3 spp.; PNP: 1 genus; 1 spp.

1. LOBELIA Plum. ex L.

India: 11 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Lobelia alsinoides Lam., Encycl. 3: 588. 1792; Pull. & Karupp., Fl. Andhra Pradesh 3: 1011. 2018. *Lobelia trigona* Roxb., Fl. Ind. 2: 111. 1824; Hook. f., Fl. Brit. India 3: 423. 1881; Gamble, Fl. Fl. Madras 2: 736. 1921. **(Plate 65C)**

Small, erect or decumbent herb, up to 30 cm high; branches ascending shortly trigonous, rooting at base. Leaves subsessile, ovate-elliptic or orbicular, 1.8 cm long, obtuse at base, acute at apex, margins crenate, 3-veined, glabrous. Flowers axillary, solitary, 9 mm long, light blue. Calyx 8 mm long, glabrous, 5-lobed; lobes linear, acuminate. Corolla tube short, bilabiate, 3 mm long, upper lip 2-lobed, lobes ovate, lower lip trilobed, lobes oblong, acute. Stamens 5. Ovary glabrous; style 2-fid. Capsule ellipsoid, *c.* 5 mm long, 2-volved, glabrous. Seeds numerous.

Fl. & Fr.: Apr.–Aug.

Habitat: Common in moist places and paddy fields.

Specimen examined: Kondamodalu, Kintukuru, *Y. Mahesh* 010051, 011457 (BSID).

117. MENYANTHACEAE

India: 2 genera, 10 spp.; Andhra Pradesh: 1 genus; 2 spp.; PNP: 1 genus; 1 spp.

1. NYMPHOIDES Seg.

India: 10 spp. & 1 infraspecific; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Nymphoides hydrophylla (Lour.) Kuntze, Revis. Gen. Pl. 2: 429. 1891; R.S. Rao & al., Fl. E. Godavari Dist. 486. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1156. 2018. *Menyanthes hydrophylla* Lour., Fl. Cochinch. 1: 105. 1790. *Nymphoides cristatum* (Roxb.) Kuntze, Revis. Gen. Pl. 429. 1891. *Menyanthes cristata* Roxb., Pl. Coromandel 2: 3. t. 105. 1798. *Limnanthemum cristata* (Roxb.) Griseb., Gen. & Spec. Gent. 342. 1839; Hook. f., Fl. Brit. India 4: 131. 1883; Gamble, Fl. Madras 2: 883. 1923. **(Plate 65D)** *'Kukka tamara'*

Aquatic, rhizomatic herb; rhizomes short, erect; stems petiole like. Leaves arise from rhizome, floating, orbicular, 10 cm across, deeply cordate at base, margins entire, glabrous and minutely scaberulous above, punctuate below. Flowers in axillary, nodal clusters, solitary, 2 cm long, white, yellow towards base, pedicellate. Calyx tube 2 mm long, lobes 5, spathulate-ovate, 4 mm long, obtuse. Corolla 1 cm long, lobes 5, obovate, rounded, glabrous. Stamens 5. Ovary glabrous; style short. Capsule ovoid-subglobose, *c.* 5 mm long. Seeds 4, ovoid, minute.

Fl. & Fr.: Throughout the year.

Habitat: Common in ponds and stagnant canals in the forest.

Specimen examined: Maredumilli, *Y. Mahesh* 011518 (BSID).

118. ASTERACEAE

India: 193 genera, 1021 spp., 27 subspp., 117 var. & 7 forma; Andhra Pradesh: 65 genera, 115 spp., 7 var.; PNP: 26 genera, 33 spp.

Key to the genera

1a.	Plant a scapigerous herb	**15. Elephantopus**
1b.	Plants otherwise	2
2a.	Heads homogamous	3
2b.	Heads heterogamous	14
3a.	Bracts spinescent	**19. Oligochaeta**
3b.	Bracts not spinescent	4
4a.	Leaves alternate	5
4b.	leaves opposite	10
5a.	Stems winged	**22. Spheranthus**
5b.	Stems not winged	6
6a.	Leaves cauline and radical	7
6b.	leaves cauline	8
7a.	Florets yellow	**21. Sonchus**
7b.	Florets pink or purple	**16. Emilia**
8a.	Capitula white, 1-flowered	**8. Caesulia**
8b.	Capitula other than white, > 10-flowered	9
9a.	Heads drooping	**12. Crassocephalum**
9b.	Heads erect	**13. Cyanthillium**
10a.	Plant a climber	**18. Mikania**
10b.	Plants otherwise	11
11a.	Florets yellow	**2. Acmella**
11b.	Florets white or bluish	12
12a.	Phyllaries 4-6 seriate	**10. Chromolaena**
12b.	Phyllaries 2-3 seriate	13
13a.	Style base enlarged	**3. Ageratina**
13b.	Style base not enlarged	**4. Ageratum**
14a.	Leaves compound or pinnatifid	15
14b.	Leaves simple	16
15a.	Achenes awned	**5. Bidens**
15b.	Achenes unawned	**20. Parthenium**
16a.	Stems winged	**17. Epaltes**
16b.	Stems not winged	17
17a.	Achenes spiny	**1. Acanthospermum**
17b.	Achenes not spiny	18
18a.	Florets yellow	19
18b.	Florets other than yellow	23
19a.	Leaves alternate	**25. Vicoa**
19b.	leaves opposite	20
20a.	Heads sessile	**23. Synedrella**
20b.	Heads pedunculate	21
21a.	Stem rooting at nodes	**9. Calyptocarpus**
21b.	Stem not rooting at nodes	22
22a.	Phyllaries scarious	**24. Tridax**
22b.	Phyllaries not scarious	**26. Wedelia**
23a.	Leaves alternate	24
23b.	Leaves opposite	25
24a.	Bracts with 3 resinous nerves	**11. Conyza**
24b.	Bracts without resinous nerves	**7. Blumea**

25a. Achenes tuberculate; pappus absent **14. Eclipta**
25b. Achnes smooth; pappus present **6. Blainvillea**

1. ACANTHOSPERMUM Schrank

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Acanthospermum hispidum DC., Prodr. 5: 522. 1836; Gamble, Fl. Madras 2: 704. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 421. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 909. 2018.

An erect, dichotomously branched, pubescent herb, 70 cm high; branches dichotomous, with inflorescence at forks. Leaves opposite, sessile, lanceolate-obovate, 2–5 cm long, attenuate at base, subacute at apex, margins serrulate, pubescent on both surfaces. Flowers in axillary, solitary on heterogamous heads, yellowish, outer ray florets female, inner tubular, bisexual. Involucral bracts 5, ovate, 4 mm long, foliaceous, pubescent, ciliate. Pappus absent. Ligule bifid. Stamens 5. Ovary obovoid with hooked spines; style short, slender. Fruit achene, obovoid, with hooked spines and two apical horns.

Fl. & Fr.: Jul.–Dec.

Habitat: Common in cultivated fields and open waste places.

Specimen examined: Daragandi, *Y. Mahesh* 011419 (BSID).

2. ACMELLA Rich. ex Pers.

India: 4 spp. & 1 var.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a. Heads discoid, white; achenes with 2-bristled pappus **1. A. radicans**
1b. Heads rayed, yellow; achenes without pappus **2. A. uliginosa**

1. Acmella radicans (Jacq.) R.K. Jansen, Syst. Bot. Monogr. 8: 69. 1985. *Spilanthes radicans* Jacq., Collectanea. 3: 229. 1791; Pull. & Karupp., Fl. Andhra Pradesh 3: 993. 2018.

An erect herb, up to 70 cm high; branches rooting at lower nodes, trichotomous, pubescent when young. Leaves opposite, ovate-oblong, 2–5 cm long, cuneate at bas, acute at apex, margins distantly serrate, glabrous. Flowers numerous, hermaphrodite, in axillary and terminal few to many heads, white; heads subglobose, turning ovoid at maturity. Involucral bracts biseriate. Corolla tube 2 mm long, 4-lobed, lobes ovate, 1.5 mm long, spreading, glabrous, white. Stamens 4. Achenes dimorphic, biconvex, black; pappus with 2-bristles.

Fl. & Fr.: Sep.–Jan.

Habitat: Common along forest outskirts.

Specimen examined: Eruwada, *Y. Mahesh* 010685 (BSID).

2. Acmella uliginosa (Sw.) Cass. in F. Cuvier, Dict. Sci. Nat., ed. 2. 24: 331. 1822. *Spilanthes uliginosa* Sw., Prodr. 110. 1788; Pull. & Karupp., Fl. Andhra Pradesh 3: 994. 2018.

An erect herb, up to 50 cm high; stems and branches sparsely pilose on internodes and densely so on nodes. Leaves opposite, lanceolate, 5 cm long, attenuately winged at base, obtuse at apex, margins dentate, glabrous. Flowers small in terminal heads; heads solitary of few, heterogamous, rayed, yellow. Involucral bracts 5, uniseriate. Achenes dimorphic, oblong, cuneate, black, glabrous. Pappus absent.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional along marshy areas.

Specimen examined: PK Valasa, *Y. Mahesh* 010037 (BSID).

3. AGERATINA Spach

India: 4 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Ageratina adenophora (Spreng.) R.M. King & H. Rob., Phytologia 19: 211. 1970; Pull. & Karupp., Fl. Andhra Pradesh 3: 913. 2018. *Eupatorium adenophorum* Spreng., Syst. Veg., 3: 420. 1826. Uniyal in Hajra & al., Fl. India 12: 348. 1995. *Eupatorium glandulosum* Kunth. in H.B.K., Nov. Gen. Sp. 4: 122. t. 346. 1820.

Large, bushy herb, up to 1 m high; stems and branches subterete, glandular. Leaves opposite, ovate-elliptic, triangular, 4–10 cm long, cuneate or subcordate at base, acuminate at apex, margins entire at lower part, dentate towards apex, glandular on both sides; petiole up to 3 cm long. Flowers in dense clusters on terminal, corymbose

heads, white, sticky hairy, 6 mm long, numerous, at ends of the branchlets. Involucral bracts lanceolate, 3-seriate. Corolla tube slender, *c.* 4 mm long, lobes 5. Achenes 5-angular, *c.* 2 mm long, black; Pappus with dirty white bristled.

Fl. & Fr.: Throughout the year.

Habitat: Common in forest outskirts.

Specimen examined: Tekupally, *Y. Mahesh* 011337 (BSID).

4. AGERATUM L.

India: 2 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Ageratum conyzoides L., Sp. Pl. 2: 839. 1753; C.B. Clerke in Hook. f., Fl. Brit. India 3: 243. 1881; Gamble, Fl. Madras 2: 672. 1921; Uniyal in Hajra & al., Fl. India 12: 348. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 421. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 913. 2018.

An erect, branched, aromatic, pubescent herb, up to 80 cm high; branches deep purplr, striate, hairy. Leaves alternate, broadly ovate, 4–8 cm long, cuneate at base, subacute at apex, margins crenate, sparsely ciliate, sparsely pubescent, palmately 3-nerved from base; petiole up to 3 cm long. Flowers in terminal, corymbose, homogamous heads, white or blue; florets tubular white. Involucral bracts linear, 3-seriate, oblong-lanceolate, scarious, florets 50-60, with ciliolate margins. Corolla 2 mm long, pubescent, 5-fid. Stamens 5. Achenes 3-angled, black, scabrous; pappus of 5-serrulate, aristate scales.

Fl. & Fr.: Sep.–Mar.

Habitat: Common in cultivated fields and along roadsides.

Specimen examined: PK Valasa, *Y. Mahesh* 010545 (BSID).

5. BIDENS L.

India: 11 spp. & 2 var.; Andhra Pradesh: 2 spp. ; PNP: 1 sp.

1. Bidens biternata (Lour.) Merr. & Sherff, Bot. Gaz. 88: 293. 1929; R.S. Rao & al., Fl. E. Godavari Dist. 422. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 916. 2018. *Coreopsis biternata* Lour., Fl. Cochinch. 2: 508. 1790. *Bidens pilosa* auct. non L. 1753; Hook. f., Fl. Brit. India 3: 309. 1881

An erect herb, up to 1 m high; stems quadrangular, ribbed, glabrous. Leaves opposite, petiolate, sparsely pilose, lower one bipinnately compound, upper one ones one pinnate, up to 10 cm long, bipinnate one with 2–3 lateral secondaries, lateral segments 1–2 pairs, terminal one up to 3 lobed, segments glabrous or sparsely pilose on both surfaces, ovate, narrowed at base, acuminate at apex, margins serrate. Heads yellow, heterogamous, terminal on divaricate branches, solitary. Involucral bracts up to 25, subequal. Receptacle 5 mm across, flat, concave, paleaceous. Achenes linear, black, bearded, up to 1.5 cm long.

Fl. & Fr.: Jun.–Dec.

Habitat: Common in cultivated fields and roadsides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*)

6. BLAINVILLEA Cass.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Blainvillea acmella (L.) Philipson, Blumea 6: 350. 1950; R.S. Rao & al., Fl. E. Godavari Dist. 422. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 919. 2018. *Verbesina acmella* L., Sp. Pl. 2: 901. 1753. *Blainvillea latifolia* (L.f.) DC. in Wight, Contrib. Bot. Ind. 17. 1834. & Prodr. 5: 492. 1836; Hook. f., Fl. Brit. India 3: 305. 1881. *Eclipta dichotoma* L.f., Suppl. 378. 1781. *Blainvillea rhomboidea* Cass., Dict. Sci. Nat. 29: 494. 1823; Gamble, Fl. Madras 2: 706. 1921.

An erect, hispid herb, up to 85 cm high; branches striate, puberulous. Leaves opposite, elliptic-ovate or lanceolate, 4–8 cm long, cuneate at base, acute at apex, margins serrate, hispidly hairy, trinerved from base, softly strigose; petiole up to 3 cm long. Flowers in axillary and terminal heads, heterogamous, 1 cm long, white or yellow, pubescent. Involucral bracts biseriate, pubescent, outer bracts ovate-acuminate; inner compressed. Ray florets 8 mm long, sparsely hairy outside. Disk florets small, lobes ovate. Pappus of 4, basally connate scales, pubescent. Stamens 5. Achenes *c.* 5 mm long, pubescent.

Fl. & Fr.: Oct.–Mar.

Habitat: Common in moist localities and waste places.

Specimen examined: Eruwada, *Y. Mahesh* 010640 (BSID).

7. BLUMEA DC.

India: 34 spp. & 6 var.; Andhra Pradesh: 11 spp. & 3 var.; PNP: 5 spp.

Key to the species

1a.	Leaves pinnatisect or pinnatifid	**4. B. purpurea**
1b.	Leaves not as above	2
2a.	Leaves spiny-toothed	**3. B. oxydonta**
2b.	Leaves not spiny-toothed	3
3a.	Corolla pink or purple	**1. B. axillaris**
3b.	Corolla white or yellow	4
4a.	Heads yellow	**`2. B. lacera**
4b.	Heads white	**5. B. virens**

1. Blumea axillaris (Lam.) DC., Prodr. 5: 434. 1836. *Conyza axillaris* Lam., Encycl 2: 84. 1786. *Blumea wightiana* DC., Contr. Bot. India 14. 1834; Hook. f., Fl. Brit. India 3: 261. 1881; Gamble, Fl. Madras 2: 686. 1921. *Blumea solidaginoides* DC., Prodr. 5: 443. 1836; R.S. Rao & al., Fl. E. Godavari Dist. 424. 1999. *Blumea neilgherriensis* Hook. f., Fl. Brit. India 3: 262. 1881; Gamble, Fl. Madras 2: 686. 1921. *Blumea mollis* Merr., Philipp. J. Sci. 5: 395. 1910; Pull. & Karupp., Fl. Andhra Pradesh 3: 928. 2018.

An erect, pubescent, aromatic herb, up to 90 cm high; stems terete, covered with white pilose hairs. Leaves alternate, upper sessile, lower petiolate, simple, elliptic-obovate, up to 10 cm long, narrow at base, acute or obtusely apiculate at apex, margins with sharp serrate or double dentate; petiole 1.8 cm long, hairy and glandular. Flowers in heads, Heads dense cymes of pinkish or purplish many flowers dense terminal panicles. Achenes 5-7, angular, elliptic, light brownish; pappus shorter than involucral bracts.

Fl. & Fr.: Nov.–Apr.

Habitat: Common in waste places and cultivated fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

2. Blumea lacera (Burm. f.) DC. in Wight Contrib. Bot. Ind. 14. 1834; Hook. f., Fl. Brit. India 3: 263. 1881; Gamble, Fl. Madras 2: 687. 1921; Kumar in Hajra & al., Fl. India 13: 128. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 924. 2018. *Conyza lacera* Burm. f., Fl. Ind. 180. t. 59. f. l. 1768.

Erect, aromatic herb; up to 80 cm high; stems much branched, glandular hairy. Leaves alternate, elliptic-oblong or obovate-oblanceolate, 4–10 cm long, attenuate at base, dentate with sharp teeth, often densely sericeous below. Flowers in axillary or terminal, heterogamous heads, 8 mm across, bright yellow. Involucral bracts 3-seriate, linear, longer than florets, hairy. Receptacle glabrous. Corolla of bisexual florets 5-lobed, pubescent, those of female florets 2-3 lobed, glabrous. Stamens 5. Achenes oblong, obscurely 4-angled, smooth. Pappus uniseriate, white.

Fl. & Fr.: Jan.–Mar.

Habitat: Common weed in waste places and cultivated fields.

Specimen examined: PK Valasa, Chigurumamidi, *Y. Mahesh* 010008, 011391 (BSID).

3. Blumea oxyodonta DC. in Wight Contrib. 15. 1834; Hook. f., Fl. Brit. India 3: 266. 1881; Gamble, Fl. Madras 2: 686. 1921; Kumar in Hajra & al., Fl. India 13: 139. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 931. 2018.

A diffuse herb, up to 35 cm high; branches many, decumbent, white villous. Leaves radical, clustered at base, alternate, subsessile or shortly petioled, elliptic-oblong, 4 cm long, attenuate at base, acute at apex, margins spiny-toothed, thinly hairy on both the surfaces; petiole up to 1 cm long. Flowers in axillary and terminal, heterogamous, yellowish heads. Involucral bracts many, linear, 3-seriate, reflexed at maturity. Receptacle flat, glabrous. Corolla of central florets 5-lobed, pubescent, 2–3-lobed in female florets, pubescent. Achenes oblong, pubescent. Pappus deciduous, white.

Fl. & Fr.: Jan.–Apr.

Habitat: Occasional along streams, in around the villages, cultivated fields.

Specimen examined: Kakeshnur, *Y. Mahesh* 011332 (BSID).

4. Blumea purpurea (Buch.-Ham. ex D. Don) W. P. Li., Plant Syst. Evol. 300: 603. 2014; Chandramohan & al., Indian J. Forest. 43(4): 317. 2020. *Tanacetum purpureum* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 181. 1825.

Cyathocline lyrata Cass. in Ann. Sci. Nat. 17: 420. 1829; Hook. F., Fl. Brit. India 3: 246. 1881; Gamble, Fl. Madras 2: 679. 1921. *Cyathocline purpurea* (Buch.-Ham. Ex D. Don) Kuntze, Revis. Gen. Pl. 1: 333. 1891; Hajra in Hajra *& al.*, Fl. India 12: 111. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 426. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 944. 2018. *Cyathocline purpurea* (Buch.-Ham. ex D. Don) Kuntze var. *alba* Santapau in Kew Bull. 3(3): 490. 1948; Shirodkar & Lakshminarasimhan, Fl. Maharashtra Dicot. 2: 204. 2001; Swamy & al. in Ind. J. Forestry 41: 49-51. 2018. *Cyathocline purpurea* (Buch.-Ham.ex D. Don) Kuntze var. *bicolor* Santapau in Kew Bull. 3(3): 490. 1948; Shirodkar & Lakshmin., Fl. Maharashtra Dicot. 2: 204. 2001. **(Plate 65E)**

An erect herb, up to 50 cm high; young branches hairy. Leaves alternate, sessile, scented, lyrately lobed; lobes ovate, 4–10 cm long, chartaceous, auricled at base, acute at apex, margins dentate, sparsely pilose on both surfaces. Flowers in terminal panicled, heterogamous heads, rose-purple. Involucral bracts 20, biseriate, glandular on outside, linear, acuminate; outer involucral bracts ovate, shorter; inner ones linear, acute. Outer florets female, many, fertile, filiform. Corolla tube short, glabrous, 3-lobed. Inner florets bisexual, 7–15. Corolla short, 5-lobed. Stamens 5. Achenes oblong, smooth. Pappus absent.

Fl. & Fr.: Nov.–Mar.

Habitat: Occasional in moist localities.

Specimen examined: Eruwada, *Y. Mahesh* 010636 (BSID).

5. Blumea virens Wall. ex DC. in Wight Contrib. 14. 1834; Hook. f., Fl. Brit. India 3: 264. 1881; Gamble, Fl. Madras 2: 687. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 424. 1999; Kumar in Hajra & al., Fl. India 13: 143. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 932. 2018.

An erect herb, up to 1 m high; young branches sparsely hairy, glandular. Leaves sessile, obovate, lower deeply lobed or lyrately oblanceolate, terminal ones obovate, 4–15 cm long, attenuate at base, acute at apex, margins serrate with minute teeth, glabrous or sparsely hairy. Flowers in axillary and terminal, heterogamous heads on large panicles. Involucral bracts many, 4-seriate, subulate. Receptacle glabrous. Corolla yellow in bisexual florets, 5-lobed, pubescent, 2–3 lobed in female florets, glabrous. Achenes oblong, ribbed, silky pubescent. Pappus *c.* 4 mm long, white.

Fl. & Fr.: Jan.–May.

Habitat: Occasional in moist deciduous forests.

Specimen examined: PK Valasa, *Y. Mahesh* 010039 (BSID).

8. CAESULIA Roxb.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Caesulia axillaris Roxb., Pl. Coromandel 1: 64. t. 93. 1798; Hook. f., Fl. Brit. India 3: 291. 1881; Gamble, Fl. Madras 2: 702. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 425. 1999; Pant in Hajra & al., Fl. India 13: 2. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 933. 2018.

Prostrate, glabrous herb, up to 50 cm long; stems sparingly branched, erect, glabrous. Leaves alternate, sessile, linear-oblong or lanceolate, 6–10 cm long, semi-amplexicaul at base, acute at apex, margins coarsely serrate, glabrous on both surfaces. Flowers small, in axillary heads, pinkish-white; heads homogamous, 1–1.5 cm across, enclosed by two fleshy compressed violet-purplish involucral bracts. Florets bisexual, campanulate, ovate, deeply 5-fid. Stamens 5, black; anthers linear, exserted. Style branches broad, obtuse. Achenes obovoid, flat, *c.* 2 cm long, brown, glabrous.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasionally in cultivated maize fields and marshy localities.

Specimen examined: Eruwada, *Y. Mahesh* 10665 (BSID).

9. CALYPTOCARPUS Less.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Calyptocarpus vialis Less., Syn. Gen. Compos. 221. 1832; Swetha & B.R.P. Rao, J. Biosci. Res. 4: 10. 2013; Pull. & Karupp., Fl. Andhra Pradesh 3: 935. 2018. *Synedrella vialis* (Less.) A. Gray, Proc. Amer. Acad. 17: 217. 1882; Chowdhery in Hajra & al., Fl. India 12: 415. 1995.

A decumbent, prostrate herb, up to 60 cm long; stems rooting from lower nodes; branches sparsely pubescent. Leaves opposite, ovate, 2.5 cm long, cuneate at base, acute at apex, margins crenate-serrate, scabrid on both sides; petiole very short. Flowers on axillary, solitary, heterogamous heads. Involucral bracts 4, lanceolate, in

2-seriate, hairy, ciliate along margins. Ray florets yellow, unisexual. Disk florets 7–10, tubular, bisexual. Achenes narrow, oblanceolate, *c.* 5 mm long, enclosed with spines. Pappus with 2-divergent awns.

Fl. & Fr.: Jul.–Oct.

Habitat: Occasional in moist and shady localities.

Specimen examined: Eruwada, *Y. Mahesh* 010686 (BSID).

10. CHROMOLAENA DC.

India: 1 sp. & 1 forma; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Chromolaena odorata (L.) R.M. King & H. Rob., Phytologia 20: 204. 1970; Hook. f., Fl. Brit. India 3: 244. 1881; Pull. & Karupp., Fl. Andhra Pradesh 3: 937. 2018. *Eupatorium odoratum* L., Syst. Nat., ed. 10. 2: 1205. 1759.

An erect, bushy undershrub, up to 2 m high; stems woody at base; branches glandular pubescent. Leaves opposite, ovate-deltoid, 4–10 cm long, cuneate at base, acuminate at apex, margins coarsely toothed, pubescent, 3-veined from base. Flowers in axillary and terminal, corymbose, homogamous, cylindrical heads, pale pink–mauve. Involucral bracts 5 seriate, outer ones ovate, shorter, inner ones linear, acute. Corolla tubular, 5-lobed. Stamens 5. Style exserted. Achenes oblanceolate, angular, black, with slightly scabrid ribs. Pappus white hairy.

Fl. & Fr.: Sep.–Jan.

Habitat: Very common in outskirts.

Specimen examined: Tekuru, *Y. Mahesh* 011631 (BSID).

Field notes: Leaves emit a pungent odour when crushed.

11. CONYZA Less.

India: 9 spp. & 1 var.; Andhra Pradesh: 5 spp.; PNP: 1 sp.

1. Conyza stricta Willd., Sp. Pl., ed. 4: 1922. 1803; Hook. f., Fl. Brit. India 3: 258. 1881; Gamble, Fl. Madras 2: 683. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 425. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 941. 2018.

An erect, much pubescent, gelatinous herb, up to 85 cm high; stems striate, white pubescent, glandular. Leaves closely arranged, sessile, alternate, clasped the stem, linear-lanceolate, variable in size, narrowed at base, apiculate at apex, margins entire or minutely lobes, scabrid on both surfaces. Heads yellow in dense terminal cymes or corymbs; Involucral bracts numerous, biseriate. Achenes elliptic or obovate, puberulous, glandular; pappus uniseriate, dirty white, united at base.

Fl. & Fr.: Oct.–May.

Habitat: Common in waste places and cultivated fields.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

12. CRASSOCEPHALUM Moench

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Crassocephalum crepidioides (Benth.) S. Moore, J. Bot. 50. 211. 1912; Mathur in Hajra & al., Fl. India 13: 201. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 943. 2018. *Gynura crepidioides* Benth. in Hook., Niger Fl. 437. 1849. *Erechtites valerianaefolia* sensu Fischer, Rec. Bot. Surv. India 9: 98. 1921 & in Fl. Madras: 1882. 1936, non (Wolf) DC., 1838.

An erect herb, up to 1.2 m high; stems striate, grooved; branches striate, more or less pubescent. Leaves alternate, elliptic-lanceolate, 4–10 cm long, lyrately lobed, attenuate at base, acute at apex, margins coarsely dentate-serrate, often pinnatifid, puberulous; petiole short. Flowers in terminal, corymbs, brick red, homogamous heads; heads drooping, 1.5 cm long, orange red. Calyculus bracts 10–18, filiform, pubescent. Involucral bracts 1-seriate, puberulous; bracts linear. Florets filiform. Corolla tube 5-lobed; lobes linear-lanceolate, acute. Stamens 5; style short. Achenes oblong, *c.* 2 mm long, brown, 10 ribbed. Pappus with 2-deflexed awns.

Fl. & Fr.: Sep.–Mar.

Habitat: Common in moist localities.

Specimen examined: Ijjaluru, *Y. Mahesh* 010967 (BSID).

13. CYANTHILLIUM Blume

India: 47 spp., 1 subsp. & 3 var.; Andhra Pradesh: 1 sp.; PNP: 2 spp.

Key to the species

1a.	Annual, erect or decumbent herb; leaves glabrous	**2. C. cinerea**
1b.	Annual or perennial undershrub; leaves whitish tomentose below	**1. C. albicans**

1. Cyanthillium albicans (DC.) H. Rob., Proc. Biol. Soc. Washington 112: 229. 1999. *Vernonia albicans* DC., in Wight, Contrib. Bot. Ind. 6. 1834; Gamble, Fl. Madras 2: 473. 1921; Unyal in Hajra & al., Fl. India 13: 351. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 438. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 999. 2018.

An erect herb, up to 1.2 m high; stems hairy. Leaves ovate-elliptic, 2.5 cm long, cuneate at base, acute at apex, apiculate, margins dentate, pilose, yellow glandular on both surfaces. Flowers in terminal corymbose heads, small, purplish, distinctly. Involucral bracts many, 5-seriate, pubescent. Receptacle flat; florets numerous. Corolla 5-lobed. Stamens 5. Achenes oblong, ribbed, white hairy, brown; pappus biseriate, persistent scales, ciliate at apex.

Fl. & Fr.: Oct.–Dec.

Habitat: Common weed in open forests and cultivated fields.

Specimen examined: PK Valasa, *Y. Mahesh* 012148 (BSID).

2. Cyanthillium cinereum (L.) H. Rob., Proc. Biol. Soc. Washington 103: 252. 1990. *Vernonia cinerea* (L.) Less., Linnaea 4: 291. 1829; Unyal in Hajra & al., Fl. India 13: 367. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 438. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 1002. 2018.

An erect, pubescent herb, up to 60 cm high; stems striate. Leaves alternate, variable, elliptic or lanceolate, 3–6 cm long, cuneate at base, acute, mucronate at apex, margins irregularly toothed, pubescent; shortly petioled. Flowers in terminal divaricate, corymbose heads; florets tubular, bisexual, pinkish-violet. Involucral bracts campanulate, multiseriate, aristate. Receptacle convex. Corolla tube narrow, 5-lobed. Stamens 5. Style arms subulate, hairy. Achenes obovate, appressed hairy; pappus caducous, biseriate, with an outer ring of long persistent hairs.

Fl. & Fr.: Throughout the year.

Habitat: Common weed in forests pathways, open waste lands.

Specimen examined: Y. Mahesh (BSID).

14. ECLIPTA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Eclipta prostrata (L.) L., Mant. Pl. Altera 286. 1771; Chowdhery in Hajra & al., Fl. India 12: 381. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 427. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 949. 2018. *Verbesina prostrata* L., Sp. Pl. 2: 902. 1753. *Eclipta alba* (L.) Hassk., Pl. Jav. Rar. 528. 1848; Hook. f., Fl. Brit. India 3: 304. 1880; Gamble, Fl. Madras 2: 705. 1921.*Verbesina alba* L., Sp. Pl. 902. 1753. *'Guntagalagaraku'*

An erect or decumbent, branched, strigose herb, up to 45 cm high. Leaves opposite, sessile, lanceolate, 2.5–5 cm long, obtuse at base, acute at apex, margins subentire with irregular serrations, strigose on both surfaces. Flowers in axillary, solitary or binate, heterogamous heads, whitish. Involucral bracts 8, ovate. Pappus of minute, puberulous scales; ligule bilobed. Ray florets numerous, 2-seriate. Disc florets few, tubular, 4-lobed. Stamens 5. Anthers with obtuse base. Achenes obovoid, *c.* 3 mm long, compressed, warty projections, narrowly winged, crowned by 3–5-minute pappus scales.

Fl. & Fr.: Throughout the year.

Habitat: Common in paddy fields and near ponds.

Specimen examined: PK Valasa, *Y. Mahesh* 012123 (BSID).

15. ELEPHANTOPUS L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Elephantopus scaber L., Sp. Pl. 2: 814. 1753; Hook. f., Fl. Brit. India 3: 242. 1881; Gamble, Fl. Madras 2: 676. 1921; Uniyal in Hajra & al., Fl. India 13: 333. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 428. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 950. 2018.

An erect, scapigerous, dichotomously branched herb, up to 30 cm high. Leaves radical, oblanceolate or obovate, 6–15 cm long, amplexicaul, cuneate at base, obtuse at apex, margins serrate, hairy on both surfaces. Flowers in terminal homogamous heads, pinkish, subtended by conspicuous, 3-leafy cordate bracts. Involucral bracts biseriate, lanceolate, spinose tipped. Corolla 5 lobed, glabrous. Stamens 5. Styles subulate. Achenes truncate, 10-ribbed, hairy. Pappus of 5 rigid, scabrid hairs.

Fl. & Fr.: Sep.–Dec.

Habitat: Occasional along forest paths and moist shady localities.

Specimen examined: Gulletiwada, *Y. Mahesh* 010584 (BSID).

16. EMILIA Cass.

India: 8 spp. & 2 var.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Emilia sonchifolia (L.) DC. in Wight Contrib. Bot. Ind. 24. 1834; Hook. f., Fl. Brit. India 3: 336. 1881; Gamble, Fl. Madras 2: 716. 1921; Mathur in Hajra & al., Fl. India 13: 212. 1995. R.S. Rao & al., Fl. E. Godavari Dist. 428. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 952. 2018. *Cacalia sonchifolia* L., Sp. Pl.: 835. 1753.

Annual, decumbent, branched, glabrous herb, up to 60 cm high; stems weak, often branched from base, sparingly hairy. Leaves both radical and cauline, lyrately lobed; lobes ovate-obovate, 5–12 cm long, auricled at base, subacute at apex, margins irregularly toothed, glabrous; upper leaves small, alternate, coarsely toothed, clasping on stem. Flowers in terminal, lax dichotomously branched, corymbose heads; heads homogamous, pink or purplish, many flowered. Involucral bracts linear, uniseriate; bisexual, narrowly cylindric, in loose corymbs. Corolla slender, tubular, 5-lobed. Stamens 5; anther bases obtuse; style branches truncate. Achenes linear, 5-ribbed, brown, crowned by white pappus hairs.

Fl. & Fr.: Nov.–Mar.

Habitat: Common in forest undergrowth.

Specimen examined: PK Valasa, *Y. Mahesh* 010042, 010455 (BSID).

17. EPALTES Cass.

India: 3 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Epaltes divaricata (L.) Cass., Bull Sci. Philom. Paris 139. 1818; Hook. f., Fl. Brit. India 3: 274. 1881; Gamble, Fl. Madras 2: 691. 1921; Kumar in Hajra & al., Fl. India 13: 147. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 953. 2018. *Ethulia divaricata* L., Mant. Pl. 110. 1767.

An erect, branched herb, up to 15 cm high; branches spreading, winged, pubescent. Leaves alternate, deccurrent, sessile, linear-oblong, 4 cm long, acute at apex, margins distantly toothed, glabrous on both surfaces. Flowers in terminal, solitary, heads; heads heterogamous, purple. Outer florets female; inner ones male with abortive pistils. Involucral bracts pubescent, multiseriate, lanceolate, acuminate. Corolla 2-lobed in female florets, 5-lobed in male florets. Stamens 5; anthers with sagittate bases. Style glabrous. Achenes oblong-obovoid, *c.* 8 mm long, ribbed. Pappus absent.

Fl. & Fr.: Nov.–Mar.

Habitat: Common in moist places.

Specimen examined: Tekupally, *Y. Mahesh* 011686 (BSID).

18. MIKANIA Willd.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Mikania micrantha Kunth in H.B.K., Nov. Gen. Sp. 4: 105. 1818; Uniyal in Hajra & al., Fl. India 12: 357. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 976. 2018. *Mikania scandens* auct.; C.B. Clarke, Comp. Ind. 34. 1876, non Willd., 1803.

Perennial, evergreen climbing herb, up to 4 m long; stems slender, obscurely angled, sparsely pubescent. Leaves opposite, broadly ovate-hastate, cordate, 6–12 cm long, cordate at base, acute, acuminate at apex, margins distantly blunt toothed, wavy, 5-nerved from base, glabrous or sparsely hairs; petiole 5 cm long. Flowers in corymbose, panicled heads; heads white. Involucral bracts in 2-rows, obovate-oblong, greenish-white, glabrous. Achenes oblong, 5-ribbed, black. Pappus hairy, uniseriate.

Fl. & Fr.: Sep.–Jan.

Habitat: Common weed along forest outskirts on bushes, pathways, roadsides.

Specimen examined: Kothuru, *Y. Mahesh* 011655 (BSID).

19. OLIGOCHAETA K.Koch

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Oligochaeta ramosa (Roxb.) Wagenitz, Veroff. Geobot. Inst. 37: 323. 1962; Pull. & Karupp., Fl. Andhra Pradesh 3: 977. 2018. *Carduus ramosus* Roxb., Hort. Bengal. 3: 407. 1832. *Volutarella divaricata* Benth. in Benth. & Hook. f., Gen. Pl. 2: 476. 1873; Hook. f., Fl. Brit. India 3: 383. 1881; Gamble, Fl. Madras 2: 727. 1921.

An erect, stiff, dichotomously branched herb, up to 40 cm high; young branches pubescent. Leaves alternate, pinnatifid, obovate, 2.5–5 cm long, narrowed at base, acute at apex, gland dotted. Flowers in terminal, solitary, spinescent, homogamous heads; heads ovoid, 1.5 cm long, pale purple or pinkish. Involucral bracts ovate, 5-seriate, with spinescent apex. Receptacle flat, glabrous. Florets more than 20. Corolla tube cylindrical, glabrous, 5-lobed. Stamens 5. Achenes obovoid, *c.* 5 mm long, ribbed, angled, glabrous, pitted, dull brown. Pappus many seriate, *c.* 1 cm long, brown, silvery.

Fl. & Fr.: Nov.–Mar.

Habitat: Occasionally in sandy soils of Godavari river beds.

Specimen examined: Kakeshnur, *Y. Mahesh* 011330 (BSID).

20. PARTHENIUM L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP; 1 sp.

1. Parthenium hysterophorus L., Sp. Pl. 2: 988. 1753; Chowdhery in Hajra & al., Fl. India 12: 403. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 432. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 978. 2018.

Annual erect, pubescent herb, up to 1.3 m high; stems furrowed, appressed pubescent. Leaves alternate, oblong-obovate, 7 cm long, bipinnatifid, pubescent; lobes ovate, acute; petiole up to 3 cm long. Heads creamy, heterogamous, in terminal, lax, dichotomous cymes, white, heterogamous, rayed. Involucre campanulate; bracts 5, biseriate, ovate-elliptic, imbricate, herbaceous, pubescent, acute. Receptacles convex. Disc floret: Corolla tubular, 5-lobed. Stamens 5, anther bases acute. Pappus absent. Ray floret: Ligule white; obovate, guarded by 2 auriculate scales. Achenes compressed, triquertous, black; pappus of 2 strongly reflexed awns running parallel to the angles of the achene; awns smooth as long as the achene.

Fl. & Fr.: Around the year.

Habitat: Common in waste lands, fallow lands and forest fringes.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

21. SONCHUS L.

India: 5 spp., 1 subsp. & 1 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Sonchus oleraceus L., Sp. Pl. 2: 794. 1753; Hook. f., Fl. Brit. India 3: 414. 1881; Gamble, Fl. Madras 2: 732. 1921; Mamgain & R.R. Rao in Hajra & al., Fl. India 12: 321. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 436. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 987. 2018.

An erect, branched, glabrous herb, up to 60 cm high; branches striate, with yellow juice. Leaves variable, cauline and radical; rosette leaves at base, oblong, spathulate, pinnatifid, 8–12 cm long, auricled, semi-amplexicaul at base, acute at apex, margins irregularly dentate, glabrous on both surfaces. Flowers in terminal, umbellate, homogamous heads; heads yellow, 1.2 cm in diam. Involucral bracts multiseriate, oblong, glabrous with scarlet margins. Pappus hairs copious, white. Stamens 5; anthers linear with sagittate base. Style slender. Achenes obovoid, *c.* 4 mm long, compressed, 3-ribbed on the face, transversely rugose by presence of small tubercles, light brown.

Fl. & Fr.: Oct.–Mar.

Habitat: Occasional weed in waste places and along roadsides.

Specimen examined: Eruwada, *Y. Mahesh* 010639 (BSID).

22. SPHAERANTHUS L.

India: 4 spp.; Andhra Pradesh: 2 spp.; PNP: 1 sp.

1. Sphaeranthus indicus L., Sp. Pl. 2: 927. 1753; Hook. f., Fl. Brit. India 3: 275. 1881; Gamble, Fl. Madras 2: 692. 1921; Kumar in Hajra & al., Fl. India 12: 321. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 436. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 988. 2018.

An erect or ascending, branched herb, up to 65 cm high; stems and branches striate, irregularly serrate-dentate winged; wings pubescent, glandular hairy. Leaves alternate, sessile, elliptic-ovate or obovate, 1.5–3.5 cm long, narrowed at base, decurrent, amplexicaul, rounded at apex, margins irregularly dentate with spinous tips, pubescent, glandular hairy on both surfaces. Flowers in terminal, heterogamous, heads, 3 mm long, pinkish-purple; heads globose, 1.2 cm across, with outer female fertile florets; with 2–3 fertile and 3–4 sterile inner bisexual florets. Involucral bracts 12, linear, ciliate; pappus absent. Corolla tube linear, 3 mm long, 3-toothed. Stamens 5. Achenes compressed, *c.* 3 mm long, glabrous, stalked.

Fl. & Fr.: Nov.–Mar.

Habitat: Common near lake boundaries and cultivated fields.

Specimen examined: Geediguppa, *Y. Mahesh* 010162 (BSID).

23. SYNEDRELLA Gaertn.

India: 2 spp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Synedrella nodiflora (L.) Gaertn., Fruct. Sem. Pl. 2: 456. t. 171. 1791; Hook. f., Fl. Brit. India 3: 308. 1881; Gamble, Fl. Madras 2: 708. 1921; Chowdhery in Hajra & al., Fl. India 12: 413. 1995; R.S. Rao & al., Fl. E. Godavari Dist. 437. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 994. 2018. *Verbesina nodiflora* L., Cent. Pl. 1. 28. 1755. **(Plate 65F)**

An erect, stout, glabrous herb, up to 45 cm high; branches obtusely angled, grooved, sparsely pilose when young. Leaves opposite, ovate-lanceolate, 4–9 cm long, rounded or narrowed at base, acute at apex, margins crenate-serrate, 3-nerved from base, scabrous on both surfaces; petiole up to 2 cm long. Flowers in axillary and terminal, heterogamous, yellow, heads, 5 mm long. Involucral bracts 4, biseriate, lanceolate, ciliate on margins. Receptacle narrow. Female florets 5. Bisexual 10. Corolla lobes 3, glabrous. Stamens 5; anthers with sagittate base. Achenes elliptic, *c.* 3 mm long, winged, 3-ribbed. Pappus two with short awns.

Fl. & Fr.: Oct.–Mar.

Habitat: Common in moist shady localities.

Specimen examined: Valamuru, *Y. Mahesh* 012153 (BSID).

24. TRIDAX L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Tridax procumbens (L.) L., Sp. Pl. 900. 1753; Hook. f., Fl. Brit. India 3: 311. 1881; Gamble, Fl. Madras 2: 711. 1921; R.S. Rao & al., Fl. E. Godavari Dist. 437. 1999; Pull. & Karupp., Fl. Andhra Pradesh 3: 997. 2018. 'Bellamaku, Nallaalam'

Annual aromatic, procumbent herb, up to 35 cm long; stems procumbent, terete, hairy. Leaves alternate, opposite, petiolate, ovate to lanceolate, 2–4 cm long, coarsely toothed or lobed; lobes serrate, cuneate at base, acute to acuminate, margins dentate or lobed, hairy on both the sides; petiole short. Heads solitary, terminal, yellow, on very long peduncles, radiate, heterogamous; ray florets; disc florets bisexual. Involucre bracts 10, campanulate, 2-3 seriate, densely hirsute. Outer broad, herbaceous; inner scarious. Corollas of female florets creamy-white, deeply 3-lobed. Corolla of bisexual florets tubular, 2-lobed. Stamens 5; anther bases acute. Achenes obconical, black, densely white, hairy. Pappus multiseriate, of short, unequal hairs, aristate, acuminate.

Fl. & Fr.: Around the year.

Habitat: Common in cultivated fields and road sides.

Specimen examined: Included on the authority of R.S. Rao & al. (*l.c.*).

25. VICOA Cass.

India: 3 spp. & 1 var.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Vicoa indica (L.) DC., in Wight, Contrib. 10. 1834; R.S. Rao & al., Fl. E. Godavari Dist. 439. 1999. *Inula indica* L., Sp. Pl. ed. 2. 1236. 1763. *Pentanema indicum* (L.) Ling, Acta Phytotax. Sin. 10: 179. 1965; Kumar in Hajra & al., Fl. India 13: 28. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 978. 2018. *Vicoa auriculata* Cass., Ann. Sci. Nat. Ser.

1. 17: 418. 1829; Hook. f., Fl. Brit. India 3: 247. 1881. *Vicoa indica* (L.) DC. in Wight Contrib. Bot. Ind. 10. 1834; Gamble, Fl. Madras 2: 493. 1921.

An erect, branched herb, up to 1 m high; branches ascending, striate, pubescent. Leaves alternate, sessile, ovate-oblong or lanceolate, 4–8 cm long, amplexicaul, auricled at base, acute at apex, margins serrate, rough with short puberulous on both sides. Flowers in terminal or leaf opposed, rayed, heterogamous heads, 5 mm long, yellow, with few linear, pubescent bracts. Florets yellow. Ray florets ligulate. Corolla 3 mm long, glabrous. Involucral bracts multiseriate, inner linear, sparsely pubescent. Pappus absent in female, hairs scanty in bisexual florets. Stamens 5; anther linear with sagittate, trilobed base; style slender. Achenes terete, *c.* 1 mm long, pubescent.

Fl. & Fr.: Oct.–Feb.

Habitat: Occasional in foot hills and pathways in deep forest.

Specimen examined: Kondamodalu, Gulletiwada, *Y. Mahesh* 010048, 010579 (BSID).

26. WEDELIA Jacq.

India: 3 spp. & 3 var.; Andhra Pradesh: 3 spp.; PNP: 1 sp.

1. Wedelia urticifolia DC. in Wight Contrib. Bot. Ind. 18. 1834; Hook. f., Fl. Brit. India 3: 306. 1881; Gamble, Fl. Madras 2: 707. 1921; Chowdhery in Hajra & al., Fl. India 12: 426. 1995; Pull. & Karupp., Fl. Andhra Pradesh 3: 1006. 2018.

An erect, hispid branched herb, up to 50 cm high; branches angled, grooved, sparsely pilose. Leaves opposite, ovate, 4–8 cm long, obliquely rounded to shortly acute at base, acute at apex, margins coarsely serrate, hairy, scabrous on both sides; petiole up to 3 cm long. Flowers in terminal, solitary, rayed, heterogamous heads, yellow; heads 1.2 cm long, 2 cm wide. Involucral bracts 2-seriate, lanceolate, hairy; ray florets 10. Corolla lobes hairy in disk florets, 5 mm long; bisexual florets 15, corolla lobes 5. Stamens 5, black; anthers exserted with sagittate base. Pappus cup shaped in bisexual florets, absent in ray florets. Achenes obovate, *c.* 3 mm long, 3–4-ribbed.

Fl. & Fr.: Sep.–Jan.

Habitat: Common in forest pathways.

Specimen examined: Valamuru, *Y. Mahesh* 010474 (BSID).

119. APIACEAE

India: 71 genera, 283 taxa; Andhra Pradesh: 10 genera, 15 spp.; PNP: 2 genera; 3 spp.

Key to the genera

1a. Prostrate herbs, rooting at nodes; leaves simple, orbicular-reniform; umbels simple; flowers pink or red **1. Centella**

1b. Erect herbs; not rootin at nodes; leaves trifoliate, leaflets oblong-lanceolate; umbels compound; flowers white **2. Pimpinella**

1. CENTELLA L.

India: 1 sp.; Andhra Pradesh: 1 sp.; PNP: 1 sp.

1. Centella asiatica (L.) Urb.in Mart., Fl. Bras. 11: 287, t. 78, f. 1. 1879; Gamble, Fl. Madras 1: 556. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 391. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 823. 2018. *Hydrocotyle asiatica* L., Sp. Pl. 1: 234. 1753; C.B. Clarke in Hook. f., Fl. Brit. India 2: 669. 1879. *'Saraswathi aaku'*

A slender, prostrate herb, 60 cm long; stems creeping with stolons, sparsely hairy, rooting at nodes. Leaves in rosettes, 1–4 at each node, orbicular-reniform, 2.5–4 cm long, cordate at base, rounded at apex, margins dentate or crenate, 5-nerved from base, pubescent; petiole up to 15 cm long, sheathing at base. Flowers in axillary, fasciculate, 1 cm long umbels, 2–4- flowered, 3 mm long, pink. Calyx 2 mm long, lobes 5, deltoid or truncate. Corolla 5 mm long, lobes 5, ovate, obtuse. Stamens red. Ovary flattened; style bifid. Fruit ovoid, with compressed, indehiscent mericarps.

Fl. & Fr.: Throughout the year.

Habitat: Common trailing herb along stream banks and cultivated fields.

Specimen examined: Kakeshnur, *Y. Mahesh* 011314 (BSID).

Field notes: Leaves used in ayurvedic medicine for blood purification.



Plate 65: A. *Striga angustifolia* C.J. Saldanha; **B.** *Striga gesnerioides* (Willd.) Vatke; **C.** *Lobelia alsinoides* Lam.; **D.** *Nymphoides hydrophylla* (Lour.) Kuntze; **E.** *Blumea purpurea* (Buch.-Ham. ex D. Don) W. P. Li.; **F.** *Synedrella nodiflora* (L.) Gaertn.; **G.** *Pimpinella wallichiana* (Miq.) Gandhi

2. PIMPINELLA L.

India: 25 spp. & 2 var.; Andhra Pradesh: 4 spp.; PNP: 2 spp.

Key to the species

1a. All leaves 3–5 foliolate; fruit glabrous **1. P. heyneana**
1b. Basal leaves simple; fruit papillose, scabrid **2. P. wallichiana**

1. Pimpinella heyneana (DC.) Benth. in Benth. & Hook. f., Gen. Pl. 1: 894. 1867; C.B. Clarke in Hook. f., Fl. Brit. India 2: 684. 1879; Gamble, Fl. Madras 1: 560. 1919; R.S. Rao & al., Fl. E. Godavari Dist. 392. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 827. 2018. *Helosciadium heyneanum* DC., Prodr. 4: 106. 1830.

An erect, unsershrub, up to 1.5 m high; stems and branches striate, glabrous. Leaves trifoliate, up to 6 cm long; leaflets lanceolate-oblong or partite, 2.5–4.5 cm long, obtuse at base, acute at apex, margins serrate or dentate, glabrous; petiole up to 8 cm long. Flowers in terminal, compound umbels, white or pale pink, minute; primary umbels, to 20 rayed, secondary umbels 12 flowered; pedicels unequal, filiform; bracts 2, lanceolate; bracteoles 1–3, acicular, caducous. Sepals absent. Petals 5, ovate, 6 mm long. Stamens 5. Ovary small; style short. Fruit subglobose, with glabrous mericarps.

Fl. & Fr.: Oct.–Jan.

Habitat: Rare on hilly slope areas at 650 m alevation.

Specimen examined: Eruwada, *Y. Mahesh* 010688 (BSID).

2. Pimpinella wallichiana (Miq.) Gandhi in Saldanha & Nicolson, Fl. Hassan Dist. 417. 1976; R.S. Rao & al., Fl. E. Godavari Dist. 393. 1999; Pull. & Sri Rama Murthy, Fl. Andhra Pradesh 2: 829. 2018. *Helosciadium wallichianum* Miq. Bot. Zeitung 7: 775. 1849. *Pimpinella monoica* Dalz., Hooker´s J. Bot. Kew Gard. Misc. 3: 212. 1851; C.B. Clarke in Hook. f., Fl. Brit. India 2: 687. 1879; Gamble, Fl. Madras 1: 560. 1919. **(Plate 65G)**

A well branched herb, up to 1.8 m high; branches striate, glabrous. Basal leaves simple, broadly ovate, triangular, 7 cm long; upper leaves 2-pinnate, trifoliate, petiole up to 10 cm long; leaflets ovate-lanceolate, 8–4 cm long, often lateral leaflets pedately lobed, truncate or cordate-obtuse at base, acute at apex, margins serrate or dentate, sparsely hairy on both surfaces, 9-nerved from base. Flowers in axillary and terminal, dichotomously branched umbels, 2 mm long, white; rays 6, up to 15-flowered per ray. Sepals absent. Petals 5, ovate. Stamens 5. Fruit ovoid or subglobose, scabrid, with papillose mericarps.

Fl. & Fr.: Sep.–Jan.

Habitat: Occasional along hilly slopes, marshy localities inside the forest.

Specimen examined: Eruwada, *Y. Mahesh* 010625 (BSID).

7. INDEX TO THE SCIENTIFIC NAMES

ABRUS Adans. **139**
Abrus precatorius L. **139**
ABUTILON Mill. **255**
Abutilon graveolens (Roxb. ex Homem.) Wight & Arn. var. *hirtum* (Lam.) Masters 255
Abutilon hirtum (Lam.) Sweet **255**
Abutilon indicum (L.) Sweet **255**
Abutilon indicum var. *populifolium* (Lam.) Wight & Arn. ex Masters 255
Abutilon persicum (Burm.f.) Merr. **255**
Abutilon polyandrum (Roxb.) Wight & Arn. 255
Acacia arabica auct. non (Lam.) Willd. 178
Acacia caesia (L.) Willd. 171
Acacia catechu (L.f.) Willd. 171
Acacia chundra (Roxb. ex Rottl.) Willd. 171
Acacia ferruginea DC. 171
Acacia leucophloea (Roxb.) Willd. 177
Acacia nilotica (L.) Willd. ex Delile 178
Acacia pennata (L.) Willd. 171
Acacia torta (Roxb.) Craib 172
ACAMPE Lindl. **38**
Acampe praemorsa (Roxb.) Blatt. & Mc Cann **38**
Acampe wightiana Lindl. 38
ACANTHACEAE **351**
Acanthospermum hispidum DC. **386**
ACANTHOSPERMUM Schrank **386**
Acanthus integrifolius L.f. 355
Acanthus maderaspatensis L. 361
Acanthus repens Vahl 361
ACHYRANTHES L. **281**
Achyranthes aspera var. **porphyristachya** (Wall. ex Moq.) Hook.f. **281**
Achyranthes atropurpurea Lam. 290
Achyranthes corymbosa L. 280
Achyranthes lanata L. 284
Achyranthes lappacea L. 284
Achyranthes porphyristachya Wall. ex Moq. 281
Achyranthes sanguinolenta L. 284
Achyranthus prostrata L. 283
Achyranthus repens L. 282
ACMELLA Rich. ex Pers. **386**
Acmella radicans (Jacq.) R.K. Jansen **386**
Acmella uliginosa (Sw.) Cass. **386**
Acratherum pumilum Hochst. ex A. Rich. 85
Acrocephalus capitatus (Roth) Benth. 377
Acrocephalus hispidus (L.) Nicolson & Sivad. 377
Acrocephalus indicus (Burm.f.) Kuntz 377
Adelia retusa J. Graham ex Wight 215
ADENIA Forssk. **208**
Adenia wightiana (Wall. ex Wight & Arn.) Engl. **208**
Adenosma spatulata Blume 363
ADENOSMA Nees **344**
Adenosma indianum (Lour.) Merr. **344**
ADINA Salisb. **297**
Adina cordifolia (Roxb.) Hook.f. & Benth. **297**
AEGINETIA L. **381**
Aeginetia indica L. **381**
AEGLE Correa **244**
Aegle marmelos (L.) Correa **244**
AERIDES Lour. **38**
Aerides radicosa A. Rich. 38
Aerides ringens (Lindl.) C.E.C. Fisch. **38**
Aerides testacea Lindl. 46
Aerva lanata (L.) Juss. 284
Aerva monsoniae (Retz.) Mart. 285
Aerva sanguinolenta (L.) Blume 284
Aerva scandens Wall. ex Moq 284
AESCHYNOMENE L. **140**
Aeschynomene aspera L. **140**
AGANOSMA (Blume) G. Don **318**
Aganosma dichotoma (Roth) K. Schumach. 318
Aganosma heynei (Spreng.) I.M. Turner **318**
AGERATINA Spach **386**
Ageratina adenophora (Spreng.) R.M. King & H. Rob. **386**
AGERATUM L. **387**
Ageratum conyzoides L. **387**
AGLAIA Lour. **251**
Aglaia elaeagnoidea (A. Juss.) Benth. **251**
Aglaia roxburghiana (Wight & Arn.) Miq. var. *beddomei* Gamble 251
Agrostis diandra Retz. 124
Agrostis maxima Roxb. 124
Agrostis procera Retz. 107
AILANTHUS Desf. **249**
Ailanthus excelsa Roxb. **249**
Aira indica L. 120
ALANGIUM Lam. **289**
Alangium lamarckii Thwaites 289
Alangium salviifolium (L.f.) Wangerin **289**
ALBIZIA Durazz. **140**
Albizia amara (Roxb.) Boivin **140**
Albizia lebbeck (L.) Benth. **140**
Albizia odoratissima (L.f.) Benth. **141**
ALECTRA Thunb. **381**
Alectra avensis (Benth.) Merr. **382**
Alectra indica Benth 382
ALISMATACEAE **30**
ALLMANIA R.Br. ex Wight **281**
Allmania albida R.Br. ex Hook.f. 281
Allmania longipedunculata (Trimen) Gamble 281
Allmania nodiflora (L.) R.Br. ex Wight **281**
Allmania nodiflora (L.) R.Br. ex Wight var. *angustifolia* Hook.f. 281
Allmania nodiflora (L.) R.Br. ex Wight var. *nodiflora*; Hook.f. 281
Allmania nodiflora (L.) R.Br. ex Wight var. *procumbens* Hook.f. 281
Allmania nodiflora (L.) R.Br. ex Wight var. *roxburghii* Hook.f. 281
Allmania nodiflora (L.) R.Br. ex. Wight var. *aspera* (Roth) Hook.f. 281
ALLOTEROPSIS J. Presl **82**
Alloteropsis cimicina (L.) Stapf **82**
ALOCASIA (Schott) G.Don **28**
Alocasia decipiens Schott **28**
ALSTONIA R.Br. **318**
Alstonia scholaris (L.) R.Br. **318**
ALTERNANTHERA Forssk. **282**
Alternanthera ficoidea (L.) Sm. **281**
Alternanthera nodiflora R.Br. 282
Alternanthera pungens Kunth **282**
Alternanthera repens (L.) Link 282
Alternanthera sessilis (L.) R.Br. ex DC. **282**
Alternanthera tenella Colla var. *verscolor* (Lem.) Veldkamp 282
Alternanthera triandra Lam. 282
ALYSICARPUS Desv. **141**
Alysicarpus heyneanus Wight & Arn. **141**
Alysicarpus monilifer (L.) DC. **141**
Alysicarpus ovalifolius (Schumach.) J. Leonard **141**
Alysicarpus rugosus (Willd.) DC. var. *heyneanus* (Wight & Arn.) Baker 141
Alysicarpus vaginalis (L.) DC. **142**
AMARANTHACEAE **281**
AMARANTHUS L. **283**
Amaranthus spinosus L. **283**
AMARYLLIDACEAE **47**
Amerimnon horridum Dennst. 151
AMMANNIA L. **232**

Ammania pentandra Roxb. var. *fimbriata* (Wight) C.B. Clarke 233
Ammannia baccifera L. **232**
Ammannia lanceolata B. Heyne ex C.B. Clarke 232
Ammannia multiflora Roxb. **232**
Ammannia prostrata Buch.-Ham. ex Dillwyn **238**
Amomum roseum Roxb. 62
AMORPHOPHALLUS Blume ex Decne. **28**
Amorphophallus paeoniifolius (Dennst.) Nicolson **28**
AMPELOCISSUS Planch. **132**
Ampelocissus latifolia (Roxb.) Planch. **132**
Ampelocissus tomentosa (Roth) Planch. **133**
Amphilophis glabra (Roxb.) Stapf 86
Amphilophis pertusa (L.) Nash ex Stapf 87
Amyris heptaphylla Roxb. ex DC. 247
ANACARDIACEAE **240**
ANACARDIUM L. **240**
Anacardium occidentale L. **240**
Anagalloides procumbens Krock. 349
ANDROGRAPHIS Wall. ex Nees **353**
Andrographis echioides Nees **353**
Andrographis paniculata (Burm.f.) Wall. ex Nees **353**
Andrographis subspathulata C.B. Clarke 354
ANDROPOGON L. **83**
Andropogon aciculatus Retz. 89
Andropogon annulatus Forssk. 96
Andropogon assimilis Steud. 87
Andropogon bladhii Retz. 86
Andropogon brevifolius Sw. 121
Andropogon caesius Nees ex Steud. ex Hook. & Arn. 92
Andropogon confertiflorus Steud. 94
Andropogon contortus L. 110
Andropogon crinitus Thunb. 118
Andropogon fastigiatus Sw. 98
Andropogon gidarba Buch. -Ham. ex Steud. 93
Andropogon glaucopsis Steud. 87
Andropogon hackelii Hook.f. 91
Andropogon halepensis (L.) Brot. 123
Andropogon huegelii Hack. 88
Andropogon intermedius R.Br. 86
Andropogon jwarancusa Jones 93
Andropogon lancifolius Trin. 85
Andropogon martini Roxb. 93
Andropogon microphyllus Trin. 85
Andropogon monticola Roem. & Schult. var. *robustus* Hook.f. 91
Andropogon nardus (L.) Rendle 94
Andropogon nardus L. subsp. *nilagiricus* Hack. 94
Andropogon nardus var. *coloratus* Hook.f. 93
Andropogon pertusus (L.) Willd. 87
Andropogon pilosus J.G. Klein ex Willd. 111
Andropogon polyphyllus Hack. ex Hook.f. 91
Andropogon prostratus L. 112
Andropogon pumilus Roxb. **83**
Andropogon quadrivalvis L. 125
Andropogon schoenanthus L. var. *gracillimus* Hook.f. 92
Andropogon schoenanthus var. *martini* (Roxb.) Hook.f. 93
Andropogon tridentatus Roxb. 113
Andropogon trispicatus Schult. 119
Andropogon umbellatus Hack. 119
Aneilema dimorphum Dalzell 56
Aneilema lineolatum (Blume) Kunth 56
Aneilema nudiflorum (L.) R.Br. 56
Aneilema spiratum (L.) R.Br. 57
Anisochilus eriocephalus Benth. 371
ANISOMELES R.Br. **370**
Anisomeles indica (L.) Kuntze **370**
Anisomeles ovata R.Br. 370
ANNONA L. **23**
Annona asiatica L. 23
Annona reticulata L. **23**
Annona squamosa L. **23**
ANNONACEAE **23**
Anogeissus acuminata (Roxb. ex DC.) Guill. & Perr. 231
Anogeissus latifolia (Roxb. ex DC.) Wall. ex Guill. & Perr. 229
Anogeissus phillyreifolia Van Heurck & Mull. Arg. 231
Anotis calycina Wall. ex Hook.f. 303
Anotis quadrilocularis (Thwaites) Hook.f. 303
Anthistiria ciliata L.f. 125
Anthistiria imberbis Retz. 125
Anthistiria laxa Anderss. 125
Anthoxanthum indicum L. 117
ANTIDESMA L. **221**
Antidesma acidum Retz. **221**
Antidesma bunius (L.) Spreng. **221**
Antidesma diandrum (Roxb.) Spreng. 221
Antidesma ghaesembilla Gaertn. **221**
APHYLLODIUM (DC.) Gagnep. **142**
Aphyllodium biarticulatum Gagnep. **142**
APIACEAE **395**
APLUDA L. **83**
Apluda aristata L. 83
Apluda mutica L. **83**
Apluda varia Hack. subsp. *aristata* (L.) Hack. 83
APOCOPIS Nees **83**
Apocopis wightii Nees ex Thw. var. *vaginata* (Hack) Hook.f. 83
APOCYNACEAE **316**
Apocynum frutescens L. 322
APONOGETON L.f. **31**
Aponogeton crispus Thunb. **32**
Aponogeton echinatus Roxb. 32
Aponogeton monostachyon L.f. 32
Aponogeton natans (L.) Engl. & Krause **32**
APONOGETONACEAE **31**
Aquilicia sambucina L. 135
ARACEAE **27**
Arachis fruticosa Retz. 175
ARDISIA Sw. **295**
Ardisia humilis auct. non Vahl 295
Ardisia solanacea Roxb. **295**
ARECACEAE **51**
Arethusa plicata Andr. 43
ARGEMONE L. **128**
Argemone mexicana L. **128**
ARGOSTEMMA Wall. **297**
Argostemma verticillatum Wall. **297**
ARGYREIA Lour. **330**
Argyreia daltonii C.B. Clarke **330**
Argyreia involucrata C.B. Clarke **330**
Argyreia nervosa (Burm.f.) Bojer **330**
Argyreia setosa Arn. ex Choisy **331**
Argyreia speciosa (L.f.) Sweet 336
ARISAEMA Mart. **28**
Arisaema tortuosum (Wall.) Schott **28**
ARISTIDA L. **84**
Aristida hystrix L.f. **84**
Aristida setacea Retz. **84**
ARISTOLOCHIA L. **21**
Aristolochia indica L. **21**
ARISTOLOCHIACEAE **21**
ARTHRAXON P. Beauv. **84**
Arthraxon echinatus (Nees) Hochst. 84
Arthraxon lanceolatus (Roxb.) Hochst. **84**
Arthraxon lancifolius (Trin.) Hochst. **85**
Arthraxon microphyllus (Trin.) Hochst. 85
Arthraxon spathaceus Hook.f. 84
ARTOCARPUS J.R. Forst. & G. Forst. **188**
Artocarpus heterophyllus Lam. **188**
Artocarpus integrifolius auct. non L.f. 188
Artocarpus lacucha Roxb. ex Buch.-Ham. **188**

Arum esculentum L. 28
Arum fornicatum Wight 28
Arum tortuosum Wall. 28
Arum viviparum Roxb. 30
ARUNDINELLA Raddi **85**
Arundinella agrostoides Hook.f. 85
Arundinella ciliata (Roxb.) Nees ex Miq. **85**
Arundinella holcoides auct. non (Kunth)Trin 85
Arundinella pumila (Hochst. ex A. Rich.) Steud. **85**
Arundinella setosa Trin. **86**
Arundinella tenella Nees & Wight ex Steud. 85
Arundo bambos L. 86
Asclepias daemia Forssk. 323
Asclepias gigantea L. 319
Asclepias racemosa Roxb. 320
Asclepias tingens Roxb. 322
ASPARAGACEAE **48**
Asparagus racemosus Willd. **48**
ASPIDOPTERYS A. Juss. ex Endl. **207**
Aspidopterys indica (Willd.) W. Theob. **207**
Aspidopterys roxburgiana A. Juss. 207
Asteracantha longifolia (L.) Nees 357
ASTERACEAE **391**
ATALANTIA Correa **246**
Atalantia monophylla (L.) DC. **246**
Atalantia racemosa Wight & Arn. **246**
Atragene zeylanica L. 130
Atylosia albicans (Wight & Arn.) Benth. 144
Atylosia scarabaeoides Benth. 144
Axonopus cimicinus (L.) P. Beauv. 82
AZADIRACHTA A. Juss. **251**
Azadirachta indica A. Juss. **251**
AZANZA Alef. **256**
Azanza lampas Alef. **256**
AZIMA Lam. **270**
Azima tetracantha Lam. **271**
BACOPA Aubl. **346**
Bacopa monnieri (L.) Wettst **346**
BALANITES Delile **136**
Balanites aegyptiaca sensu Basak 136
Balanites roxburghii Planch. **136**
BALIOSPERMUM Blume **211**
Baliospermum axillare Blume 211
Baliospermum montanum (Willd.) Mull. Arg. 211
Baliospermum solanifolium (Burm.) Suresh **211**
Ballota suaveolens L. 375
BALSAMINACEAE **289**
BAMBUSA Schreb. **86**
Bambusa arundinacea (Retz.) Willd. 86
Bambusa bambos (L.) Voss **86**
Bambusa stricta Roxb. 96
Banisteria benghalensis L. 208
Banksea speciosa J. Koenig 58
BARLERIA L. **354**
Barleria auriculata Schumach. & Thonn. 357
Barleria longifolia L. 357
Barleria montana Wight & Nees ex C.B. Clarke **354**
Barleria morrisiana E. Barnes & C.E.C. Fisch. 354
Barleria prionitis L. **354**
Barleria strigosa Willd **354**
BARRINGTONIA J.R. Forst. & G. Forst. **290**
Barringtonia acutangula (L.) Gaertn. 290
Bassia latifolia Roxb. 292
BAUHINIA Plum. ex L **142**
Bauhinia acuminata L. **142**
Bauhinia malabarica Roxb. 165
Bauhinia parviflora Vahl 143
Bauhinia purpurea L. **143**
Bauhinia racemosa Lam. **143**
Bauhinia vahlii Wight & Arn. 165
BEGONIA L. **202**
Begonia picta Sm. **202**
BEGONIACEAE **202**
Behel schulli Buch-Ham. 357
BEILSCHMIEDIA Nees **26**
Beilschmiedia roxburghiana Nees in Wall. **26**
BENINCASA Savi **197**
Benincasa cerifera Savi 198
Benincasa hispida (Thunb.) Cogn. **197**
BENKARA Adans. **298**
Benkara malabarica (Lam.) Tirveng. **298**
Bergera koenigii L. 248
Berghausia elata Arn. ex Miq. 109
Berghausia tenella Arn. ex Miq. 109
BIANCAEA Tod. **143**
Biancaea decapetala (Roth) O. Deg. **143**
BIDENS L. **387**
Bidens biternata (Lour.) Merr. & Sherff **387**
Bidens pilosa auct. non L. 387
Bignonia indica L. 365
Bignonia xylocarpa Roxb. 365
BIGNONIACEAE **365**
BIOPHYTUM DC. **204**
Biophytum candolleanum Wight 204
Biophytum nervifolium Thwaites **204**
Biophytum reinwardtii (Zucc.) Klotzsch **204**
Biophytum sensitivum (L.) DC. **204**
Biophytum sensitivum DC. var. *nervifolium* (Thwaites) Edgew. & Hook.f. 204
BIXA L. **269**
Bixa orellana L. **269**
BIXACEAE **269**
BLAINVILLEA Cass. **387**
Blainvillea acmella (L.) Philipson **387**
Blainvillea latifolia (L.f.) DC. 387
Blainvillea rhomboidea Cass. 387
Blakwellia napaulensis DC. 210
BLEPHARIS Juss. **355**
Blepharis boerhaviifolia pers. 355
Blepharis integrifolia (L.f.) E. Mey. & Drege ex Schinz **355**
Blepharis maderaspatensis (L.) B. Heyne ex Roth **355**
Blepharis molluginifolia Pers. 355
Blepharis repens (Vahl) Roth 355
BLUMEA DC. **388**
Blumea axillaris (Lam.) DC. **388**
Blumea mollis Merr. 388
Blumea neilgherriensis Hook.f. 388
Blumea purpurea (Buch.-Ham. ex D. Don) W. P. Li. **388**
Blumea solidaginoides DC. 388
Blumea wightiana DC. 388
Blumea lacera (Burm.f.) DC. **388**
Blumea oxyodonta DC. **388**
Blumea virens Wall. ex DC. **389**
BOEHMERIA Jacq. **195**
Boehmeria glomerulifera Miq. **195**
Boehmeria macrophylla Hornem. 195
Boehmeria malabarica Wedd. 195
Boehmeria platyphylla D. Don 195
Boehmeria virgata (G.Forst.) Guill. var. **macrophylla** (Hornem.) Friis & Wilmot-Dear **195**
BOERHAVIA Vaill. ex L. **285**
Boerhavia diffusa L. **285**
Boerhavia repens L. 285
Bombax pentandrum L. 256
Bombax religiosum L. 270
BONNAYA Link & Otto **348**
Bonnaya antipoda Druce **348**
Bonnaya brachiata Link & Otto 349

Bonnaya ciliata Spreng. **348**
Bonnaya oppositifolia Spreng. **349**
Bonnaya veronicifolia (Retz.) Spreng. 348
BORAGINACEAE **326**
BORASSUS L. **51**
Borassus flabellifer L. **51**
Borreria articularis (L.f.) F.N. Williams 309
Borreria pusilla DC. 309
Borreria repens DC. 309
Borreria stricta (L.f.) K. Schumach. 309
BOTHRIOCHLOA Kuntze **86**
Bothriochloa bladhii (Retz.) S.T. Blake **86**
Bothriochloa glabra (Roxb.) A. Camus 86
Bothriochloa pertusa (L.) A. Camus **87**
BRACHIARIA (Trin.) Griseb. **87**
Brachiaria eruciformis (Sm.) Griseb. 113
Brachiaria remota (Retz.) Haines **87**
Brachiaria reptans (L.) C.A. Gardner & C.E. Hubb. 126
Bradburya pubescens (Benth.) Kuntze 146
Bradleia zeylanica Gaertn. 225
BRASSICACEAE **275**
BREYNIA J.R. Forst. & G. Forst. **221**
Breynia quadrangularis (J.G. Klein ex Willd.) Chakrab. & N.P. Balakr. **222**
Breynia rhamnoides (Willd.) Mull. Arg. 222
Breynia rigida (Thwaites) Chakrab. & N.P. Balakr. **222**
Breynia vitis-idaea (Burm.f.) C.E.C. Fisch. **222**
BRIDELIA Willd. **222**
Bridelia retusa (L.) A. Juss. **222**
Bridelia retusa (L.) Spreng. 222
Bryonia amplexicaulis Lam. 200
Bryonia grandis L. 198
Bryophyllum calycinum Salisb. 132
Bryophyllum pinnatum (Lam.) Oken 132
Buchanania angustifolia Roxb. 240
BUCHANANIA Spreng. **240**
Buchanania axillaris (Desr.) T.P. Ramamoorthy **240**
Buchanania cochinchinensis (Lour.) M.R. Almeida **241**
Buchanania lanzan Spreng. 241
Buchanania latifolia Roxb. 241
BUCHNERA L. **382**
Buchnera angustifolia D. Don 382
Buchnera gesnerioides Willd. 384
Buchnera hispida Buch.-Ham. ex D. Don **382**
BULBOSTYLIS Kunth **64**
Bulbostylis barbata (Rottb.) Kunthex C.B. Clarke **64**
Bursera serrata Wall. ex Coleb. 239
BURSERACEAE **239**
BUTEA Roxb. ex Willd. **143**
Butea frondosa Roxb. 238
Butea monosperma (Lam.) Taub. **143**
Butea superba Roxb. ex Willd. **144**
BUXACEAE **131**
BYTTNERIA Loefl. **256**
Byttneria herbacea Roxb. **256**
Cacalia sonchifolia Hort ex L. 392
CACTACEAE **288**
Cactus dillenii Ker-Gawl. 289
Cactus strictus Haw. 289
CADABA Forssk. **271**
Cadaba fruticosa Druce **271**
Cadaba indica Lam. 271
Caesalpinia bonduc (L.) Roxb. 159
Caesalpinia decapetala (Roth) Alston 143
Caesalpinia digyna Rottler 162
Caesalpinia sepiaria Roxb. 143
CAESULIA Roxb. **389**
Caesulia axillaris Roxb. **389**
CAJANUS Adans. **144**
Cajanus albicans (Wight & Arn.) Maesen **144**
Cajanus scarabaeoides (L.) Thouars **144**
CALAMUS L. **51**
Calamus rotang L. **51**
Calamus viminalis var. *fasciculatus* (Roxb.) Becc. 51
Calamus viminalis Willd. **51**
CALLICARPA L. **370**
Callicarpa arborea Roxb. **370**
Calophanes vagans Wight 356
CALOTROPIS R.Br. **318**
Calotropis gigantea (L.) W.T. Aiton **318**
Calycopteris floribunda (Roxb.) Lam. ex Poir. 228
CALYPTOCARPUS Less. **389**
Calyptocarpus vialis Less. **389**
CAMONEA Raf. **331**
Camonea vitifolia (Burm.f.) A.R. Simoes & Staples **331**
CAMPANULACEAE **384**
Campylus sinensis Lour. 129
CANAVALIA DC. **145**
Canavalia africana Dunn ex Hutch. **145**
Canavalia ensiformis DC. var. *virosa* (Roxb.) Baker 145
Canavalia ensiformis sensu Baker 145
Canavalia gladiata (Jacq.) DC. **145**
Canavalia virosa (Roxb.) Wight & Arn. 145
CANNABACEAE **186**
CANSCORA Lam. **311**
Canscora alata (Roth) Wall. **311**
Canscora decurrens Dalzell 312
Canscora decussata (Roxb.) Schult. & Schult. f. 311
Canscora diffusa (Vahl) R.Br. **312**
Canscora heteroclita (L.) Gilg **312**
Canscora sessiliflora Roem. & Schult. f. 312
Cantharospermum albicans Wight & Arn. 144
Canthium dicoccum (Gaertn.) Merr. 308
Canthium didymium Gaertn. 308
Canthium umbellatum Wight 308
CAPILLIPEDIUM Stapf **87**
Capillipedium assimile (Steud.) A. Camus **87**
Capillipedium glaucopsis (Steud.) Stapf in Hook. 87
Capillipedium huegelii (Hack.) A. Camus **88**
CAPPARACEAE **271**
CAPPARIS Tourn. ex L. **271**
Capparis horrida L. f. 272
Capparis magna Lour. 273
Capparis oblongifolia Forssk. 273
Capparis sepiaria L. **271**
Capparis zeylanica L. **272**
Capraria crustacea L. 350
CAPSICUM L. **337**
Capsicum annuum L. **337**
CARALLUMA R.Br. **319**
Caralluma adscendens var. *attenuata* (Wight) Gravely & Mayur. 319
Caralluma attenuata Wight **319**
CARDIOSPERMUM L. **242**
Cardiospermum halicacabum L. **242**
Carduus ramosus Roxb. 393
CAREX L. **64**
Carex condensata Nees 64
Carex cruciata Wahlenb. **64**
Carex ovata Burm.f. 76
Carex speciosa Kunth **64**
CAREYA Roxb. **290**
Careya arborea Roxb. **290**
CARISSA L. **319**
Carissa carandas L. **319**
Carpopogon atropurpureus Roxb. 163
CARYOPHYLLACEAE **280**
CARYOTA L. **52**
Caryota urens L. **52**

CASCABELA Raf. **319**
Cascabela thevetia (L.) Lippold **319**
CASEARIA Jacq. **209**
Casearia elliptica Willd. 209
Casearia graveolens Dalzell **209**
Casearia tomentosa Roxb. **209**
CASSIA L. **145**
Cassia absus L. 145
Cassia alata L. 172
Cassia auriculata L. 172
Cassia fistula L. **145**
Cassia hirsuta L. 173
Cassia mimosoides L. 146
Cassia occidentalis L. 173
Cassia tora L. 173
Cassine glauca (Rottb.) Kuntze 203
Cassine paniculata (Wight & Arn.) Lobr. Callen 203
CASSYTHA L. **26**
Cassytha filiformis L. **26**
CATHARANTHUS G. Don **320**
Catharanthus pusillus (Murray) G. Don **320**
CATUNAREGAM Wolf **298**
Catunaregam spinosa (Thunb.) Tirveng. **298**
Catunaregam tomentosa (Blume ex DC.) Tirveng. **298**
CAUSONIS Raf. **133**
Causonis trifolia (L.) Mabb. & J. Wen **133**
CAYRATIA Juss. **133**
Cayratia auriculata (Roxb.) Gamble 135
Cayratia carnosa (Lam.) Gagnep. 133
Cayratia pedata (Lam.) Juss. ex Gagnep. **133**
Cayratia trifolia (L.) Domin 133
CEIBA Mill. **256**
Ceiba pentandra (L.) Gaertn. **256**
CELASTRACEAE **202**
CELASTRUS L. **202**
Celastrus emarginatus Willd. 203
Celastrus oppositus Wall. 203
Celastrus paniculatus Willd. **202**
CELOSIA L. **283**
Celosia argentea L. **283**
Celosia aspera Roth 281
Celosia nodiflora L. 281
CELTIS L. **186**
Celtis cinnamomea Lindl. ex Planch. 186
Celtis orientalis L. 188
Celtis timorensis Span. **186**
CENCHRUS L. **88**
Cenchrus granularis L. 110
Cenchrus lappaceus L. 89
Cenchrus pedicellatus (Trin.) Morrone **88**
Cenchrus polystachios (L.) Morrone **88**
CENTAURIUM Hill **312**
Centaurium centaurioides (Roxb.) Rolla Rao & Hemadri 312
Centaurium meyeri (Bunge) Druce 312
Centaurium pulchellum (Sw.) Hayek ex Hand.-Mazz. **312**
CENTELLA L. **395**
Centella asiatica (L.) Urb. **395**
CENTOTHECA Desv. **88**
Centotheca lappacea (L.) Desv. **89**
Centotheca latifolia (Osb.) Trin. 89
CENTROSEMA (DC.) Benth. **146**
Centrosema pubescens Benth. **146**
Cephalandra indica Naudin 198
Cerbera thevetia L. 319
CEREUS Mill. **288**
Cereus pterogonus Lem. **288**
Chalcas paniculata L. 248
CHAMAECRISTA Moench **146**
Chamaecrista absus (L.) H.S. Irwin & Barneby **146**
Chamaecrista mimosoides (L.) Greene **146**
Chamaeraphis spinescens (R.Br.) Poir. 119
Chavica betle Miq. 20
Chionachne gigantea (J. Koenig) Veldkamp 118
Chionachne koenigii (Spreng.) Thw. 118
CHIONANTHUS L. **342**
Chionanthus ramiflorus Roxb. **342**
Chirita hamosa R.Br. 344
Chirita violoides (Wall.) M.R. Almeida 344
CHLORIS Sw. **89**
Chloris barbata Sw. **89**
Chloris dolichostachya Lag. 103
Chloris incompleta Roth 103
Chloris inflata Link 89
CHLOROPHYTUM Ker Gawl. **48**
Chlorophytum arundinaceum Baker **50**
Chlorophytum tuberosum Baker **50**
CHLOROXYLON DC. **246**
Chloroxylon swietenia DC. **246**
Chomelia asiatica (L.) Kuntze 310
CHROMOLAENA DC. **390**
Chromolaena odorata (L.) R.M. King & H. Rob. **390**
CHROZOPHORA A. Juss. **211**
Chrozophora rottleri (Geiseler) Spreng. **211**
CHRYSOPOGON Trin. **89**
Chrysopogon aciculatus (Retz.) Trin. **89**
Chrysopogon fulvus (Spreng.) Chiov. **91**
Chrysopogon hackelii (Hook.f.) C.E.C. Fisch. **91**
Chrysopogon montanus Trin. ex Spreng. 91
Chrysopogon polyphyllus (Hack. ex Hook.f.) Blatt. & Mc Cann **91**
Chrysopogon zizanioides (L.) Roberty **91**
Cinchona orixensis Roxb. 301
CIPADESSA Blume **252**
Cipadessa baccifera (Roth.) Miq. **252**
Cipadessa fruticosa Blume 252
CISSAMPELOS L. **158**
Cissampelos pareira L. **128**
CISSUS L. **134**
Cissus auriculata Roxb. 135
Cissus pedata Lam. 133
Cissus quadrangularis L. **134**
Cissus repens Lam. **134**
Cissus vitiginea L. **134**
CITRULLUS Schrad. ex Eckl. & Zeyh. **198**
Citrullus colocynthis (L.) Schrad. **198**
CITRUS L. **247**
Citrus aurantiifolia (Christm.) Swingle **247**
Citrus medica L. var. *acida* (Roxb.) Hook.f. 247
CLAUSENA Burm.f. **247**
Clausena austroindica B.C. Stone & K. Narayanan 247
Clausena heptaphylla (Roxb.) Wight & Arn **247**
Cleisostoma mannii Rchb.f. 44
Cleisostoma wendlandorum Rchb.f. 44
CLEISTANTHUS Hook.f. ex Planch. **223**
Cleistanthus collinus (Roxb.) Benth. & Hook.f. **223**
Cleistanthus patulus (Roxb.) Mull.Arg. **223**
CLEMATIS L. **130**
Clematis zeylanica (L.) Poir. **130**
CLEOMACEAE **274**
CLEOME L. **274**
Cleome chelidonii L.f. **274**
Cleome fruticosa L. 271
Cleome gynandra L. **274**
Cleome monophylla L. **274**
Cleome viscosa L. **275**
CLERODENDRUM L. **371**
Clerodendrum serratum (L.) Moon var. *serratum*; C.B. Clarke 379
Clerodendrum chinense (Osbeck) Mabb. **371**
Clerodendrum cordatum D.Don 371

Clerodendrum infortunatum L. **371**
Clerodendrum serratum Moon 379
Clerodendrum viscosum Vent. 371
CLITORIA L. **147**
Clitoria ternatea L. **147**
Clutia collina Roxb. 223
Clutia patula Roxb. 223
Clutia retusa L. 222
COCCINIA Wight & Arn. **198**
Coccinia grandis (L.) Voigt **198**
COCCULUS DC. **128**
Cocculus hirsutus (L.) Diels 129
Cocculus hirsutus (L.) W. Theob. **128**
Cocculus villosus (Lam.) DC. 129
COCHLOSPERMUM Kunth **270**
Cochlospermum Gossypium DC. 270
Cochlospermum religiosum (L.) Alston **270**
COFFEA L. **299**
Coffea arabica L. **299**
COIX L. **92**
Coix gigantea J. Koenig 118
Coix koenigii Spreng. 118
Coix lacryma-jobi L. **92**
COLCHICACEAE **36**
COLDENIA L. **326**
Coldenia procumbens L. **326**
COLEBROOKEA Sm. **371**
Colebrookea oppositifolia Sm. **371**
COLEUS Lour. **371**
Coleus strobilifer (Roxb.) A.J. Paton **371**
COLOCASIA Schott **28**
Colocasia antiquorum Schott 28
Colocasia esculenta (L.) Schott **28**
COMBRETACEAE **228**
COMBRETUM Loefl. **228**
Combretum albidum G.Don **228**
Combretum album Pers. **228**
Combretum decandrum Roxb. 228
Combretum ovalifolium Roxb. 228
Combretum roxburghii Spreng. 228
COMMELINA Plum. ex L. **53**
Commelina axillaris L. 54
Commelina benghalensis L. **53**
Commelina clavata C.B. Clarke **53**
Commelina cristata L. 54
Commelina japonica Thunb. 56
Commelina nudiflora L. 56
Commelina obliqua Buch.-Ham ex D.Don 53
Commelina paludosa Blume **53**
Commelina spirata L. 57
COMMELINACEAE **53**
COMMIPHORA Jacq. **239**
Commiphora caudata (Arn.) Engl. **239**
Conocarpus acuminatus Roxb. ex DC. 231
Conocarpus latifolius Roxb. ex DC. 229
CONVOLVULACEAE **329**
Convolvulus alsinoides L. 332
Convolvulus cymosus Desr. 335
Convolvulus hypocrateriformis Desr. 336
Convolvulus malabaricus L. 332
Convolvulus nervosus Burm.f. 330
Convolvulus nummularius L. 332
Convolvulus obscurus L. 334
Convolvulus parviflorus Vahl 334
Convolvulus speciosus L.f. 330
Convolvulus tridentatus L. 336
Convolvulus turpethum L. 336
Convolvulus umbellatus L. 335
Convolvulus vitifolius Burm.f. 331
CONYZA Less. **390**
Conyza axillaris Lam. 388
Conyza lacera Burm.f. 388
Conyza stricta Willd. **390**
CORCHORUS L. **257**
Corchorus acutangulus auct. non. Forssk. 257
Corchorus aestuans L. **257**
Corchorus fascicularis Lam. **257**
Corchorus olitorius L. **257**
CORDIA L. **327**
Cordia dichotoma G. Forst. **327**
Cordia obliqua Willd. 327
Cordia wallichii G. Don 327
Cordyla concolor Blume 43
Coreopsis biternata Lour. 387
CORNACEAE **289**
COSMOSTIGMA Wight **320**
Cosmostigma cordatum (Poir.) M.R. Almeida **320**
Cosmostigma racemosum (Roxb.) Wight 320
COSTACEAE **58**
Costus speciosus (J. Koenig) Sm. 58
Costus speciosus var. *nepalensis* (Rosc.) Baker 58
Cotyledon pinnata Lam. 132
Courtoisia cyperoides (Roxb.) Nees 733
Cracca maxima L. 176
Cracca purpurea L. 176
Cracca villosa L. 176
CRASSOCEPHALUM Moench **390**
Crassocephalum crepidioides (Benth.) S. Moore **390**
CRASSULACEAE **132**
CRATEVA L. **273**
Crateva adansonii DC. **273**
Crateva magna DC. **273**
Crateva marmelos L. 244
Crateva religiosa Forst. f. var. *nurvala* (Buch.-Ham) Hook.f. & Thomson 273
Crateva religiosa sensu Dunn 273
Crateva religiosa var. *roxburghiana* (R.Br.) Hook.f. 273
Crinum asiaticum L. **47**
CRINUM L. **47**
Crinum defixum Ker Gawl. 48
Crinum viviparum (Lam.) R. Ansari & V.J. Nair **48**
CROTALARIA L. **147**
Crotalaria albida B. Heyne ex Roth **147**
Crotalaria albida B. Heyne ex Roth var. *epunctata* (Dalzell) Baker 148
Crotalaria calycina Schrank **147**
Crotalaria epunctata Dalzell **148**
Crotalaria hebecarpa (DC.) Rudd **148**
Crotalaria humifusa Graham ex Benth. **148**
Crotalaria linifolia L.f. **148**
Crotalaria medicaginea Lam. **150**
Crotalaria pallida Aiton **150**
Crotalaria prostrata Rottler **150**
Crotalaria striata DC. 150
Crotalaria tecta B. Heyne ex Roth 148
Crotalaria verrucosa L. **150**
Croton moluccanus L. 215
Croton philippensis Lam. 215
Croton repandus Rottler 217
Croton rottleri Geisel. 211
Croton solanifolius Burm. 211
Cryptanthus chinensis Osbeck 371
Cryptanthus fragrans Hort. Ex Vent. 371
CRYPTOLEPIS R.Br. **320**
Cryptolepis buchananii Roem. & Schult. **320**
Cryptolepis dubia (Burm.f.) M.R. Almeida 320
Cryptolepis elegans Wall. ex Don 321
Cryptolepis sinensis Merr. **321**

CUCUMIS L. **198**
Cucumis colocynthis L. 198
Cucumis maderaspatanus L. **198**
Cucumis melo L. **199**
Cucumis sativus L. **199**
Cucurbita hispida Thunb. 198
Cucurbita siceraria Molina 199
CUCURBITACEAE **197**
CULLEN Medik. **151**
Cullen corylifolium (L.) Medik. **151**
CURCULIGO Gaertn. **47**
Curculigo orchioides Gaertn. **47**
Curculigo trichocarpa (Wight) Bennet & Raizada **47**
CURCUMA L. **59**
Curcuma montana sensu Baker 59
Curcuma pseudomontana J. Graham **59**
CUSCUTA L. **331**
Cuscuta chinensis Lam. **331**
CYANOTIS D. Don **54**
Cyanotis arachnoidea C.B. Clarke **54**
Cyanotis axillaris (L.) D. Don ex Sweet **54**
Cyanotis cristata (L.) D. Don **54**
Cyanotis fasciculata (B. Heyne ex Roth) Schult. & Schult.f. **56**
CYANTHILLIUM Blume **391**
Cyanthillium albicans (DC.) H. Rob. **391**
Cyanthillium cinereum (L.) H. Rob. **391**
Cyathocline lyrata Cass. 389
Cyathocline purpurea (Buch.-Ham. ex D. Don) Kuntze 389
Cyathocline purpurea (Buch.-Ham. ex D. Don) Kuntze var. *alba* Santapau 389
Cyathocline purpurea (Buch.-Ham.ex D. Don) Kuntze var. *bicolor* Santapau 389
CYATHULA Blume **283**
Cyathula prostrata (L.) Blume **283**
Cylista scariosa Roxb. 165
CYMBIDIUM Sw. **39**
Cymbidium aloifolium (L.) Sw. **39**
CYMBOPOGON Spreng. **92**
Cymbopogon caesius (Nees ex Steud. ex Hook. & Arn.) Stapf **92**
Cymbopogon coloratus (Nees ex Steud. ex Hook.f.) Stapf **93**
Cymbopogon confertiflorus (Steud.) Stapf 94
Cymbopogon gidarba (Buch. -Ham. ex Steud.) A. Camus **93**
Cymbopogon martini (Roxb.) S. Watson **93**
Cymbopogon nardus (L.) Rendle var. **confertiflorus** (Steud.) Stapf ex Bor. **94**
Cymbopogon jwarancusa (Jones) Schult. **93**
CYNANCHUM L. **321**
Cynanchum viminale (L.) L. **321**
Cynoctonum petiolatum J.F. Gmel. 315
CYNODON Rich **94**
Cynodon arcuatus J. Presl 94
Cynodon dactylon (L.) Pers. var. *intermedius* (Rang. & Tadul.) C.E.C. Fisch. 94
Cynodon intermedius Rang. & Tadul. 94
Cynodon radiatus Roth ex Roem. & Schult. **94**
Cynodon ternatus A. Rich. 101
CYNOGLOSSUM L. **327**
Cynoglossum denticulatum A. DC. var. *zeylanicum* (Hornem.) C.B. Clarke 327
Cynoglossum zeylanicum (Lehm.) Brand **327**
Cynosurus aegyptius L. 96
Cynosurus indicus L. 103
CYPERACEAE **64**
CYPERUS L. **70**
Cyperus albescens (Steud.) Larridon & Govaerts **66**
Cyperus alopecuroides Rottb. **66**
Cyperus brevifolius (Rottb.) Endl. ex Hassk. **66**
Cyperus ceylanicus T. Koyama **66**
Cyperus clarkei T. Cooke **66**
Cyperus compactus Retz. **67**
Cyperus corymbosus Rottb. **67**
Cyperus corymbosus var. *pangorei* (Rottb.) C.B. Clarke 71
Cyperus cuspidatus Kunth **67**
Cyperus cyperoides (Roxb.) Sojak 73
Cyperus diffusus Vahl **67**
Cyperus distans L.f. **68**
Cyperus flavidus Retz. **68**
Cyperus flavidus Retz: sensu C.B. Clarke 74
Cyperus haspan L. **68**
Cyperus iria L. **68**
Cyperus laevigatus L. **70**
Cyperus mindorensis (Steud.) Huygh **70**
Cyperus neochinensis (Tang & F.T. Wang) Bauters **70**
Cyperus niveus Retz. **70**
Cyperus pangorei Rottb. **71**
Cyperus paniceus (Rottb.) Boeckeler **71**
Cyperus pilosus Vahl **71**
Cyperus polystachyos Rottb. **71**
Cyperus procerus Rottb. **73**
Cyperus pseudokyllingioides Kuk. **73**
Cyperus sanguinolentus Vahl **73**
Cyperus squarrosus L. **73**
Cyperus tegetum Roxb. 71
Cyperus tenuispica Steud. **74**
Cyperus uncinatus sensu C.E.C. Fisch. 67
CYPHOSTEMMA (Planch.) Alston **134**
Cyphostemma auriculatum (Roxb.) P. Singh & B.V. Shetty **135**
CYRTOCOCCUM Stapf **94**
Cyrtococcum accrescens (Trin.) Stapf **95**
Cyrtococcum longipes (Wight & Arn. ex Hook.f.) A. Camus **95**
Cyrtococcum oxyphyllum (Steud.) Stapf **95**
Cyrtococcum trigonum (Retz.) A. Camus **95**
Cytisus pinnatus L. 166
DACTYLOCTENIUM Willd. **96**
Dactyloctenium aegyptium (L.) Willd. **96**
Daedalacanthus mintanus (Roxb.) T. Anderson 356
Daedalacanthus purpurascens (Nees) T. Anderson 357
Daemia extensa (Jacq.) R.Br. 323
DALBERGIA L.f. **151**
Dalbergia horrida (Dennst.) Mabb. **151**
Dalbergia latifolia Roxb. **151**
Dalbergia scandens Roxb. 152
Dalbergia sissoo Roxb. **152**
Dalbergia spinosa Roxb. 151
Dalbergia sympathetica Nimmo 151
Dalbergia volubilis Roxb. **152**
DATURA L. **337**
Datura fastuosa auct. non L. 337
Datura fastuosa auct. non L. var. *alba* (Nees) C.B. Clarke 337
Datura innoxia Mill. **337**
Datura metel auct. non L.: C.B. Clarke 337
Datura metel L. **337**
DEBREGEASIA Gaudich. **196**
Debregeasia longifolia (Burm.f.) Wedd. **196**
Debregeasia velutina Gaudich. 196
DENDROCALAMUS Nees **96**
Dendrocalamus strictus (Roxb.) Nees **96**
DENDROLOBIUM (Wight & Arn.) Benth. **152**
Dendrolobium triangulare (Retz.) Schindl. **152**
DENTELLA J.R. Forst. & G. Forst. **299**
Dentella repens (L.) J.R. Forst. & G. Forst. **299**
DERRIS Lour. **152**
Derris scandens (Roxb.) Benth. **152**
Desmodium benthamii N.P. Balakr. 158
Desmodium biarticulatum (L.) F. V. Muell. 142
Desmodium brachystachyum Graham ex Benth. 158
Desmodium cephalotes Wall. ex Wight & Arn. 152
Desmodium gangeticum (L.) DC. 166

Desmodium heterocarpon (L.) DC. 158
Desmodium laxiflorum DC. 174
Desmodium ormocarpoides sensu Baker 174
Desmodium polycarpum (Poir.) DC. 158
Desmodium triangulare (Retz.) Merr. 152
Desmodium triflorum (L.) DC. 158
Desmodium zonatum Miq. 174
Dialium coromandelinum Houtt. 241
Dianthera bicalyculata Retz. 355
Dianthera paniculata Forssk. 355
Dicerma biarticulatum (L.) DC. 142
DICHANTHIUM P.Willemet **96**
Dichanthium annulatum (Forssk.) Stapf **96**
Dichanthium caricosum (L.) A. Camus var. **bilobum** Mahesh & al. **98**
DICHROSTACHYS (A.DC.) Wight & Arn. **153**
Dichrostachys cinerea (L.) Wight & Arn. **153**
DICLIPTERA Juss. **355**
Dicliptera paniculata (Forssk.) I. Darbysh. **355**
DIECTOMIS Kunth **98**
Diectomis fastigiata (Swartz) Kunth **98**
DIGITARIA Haller **98**
Digitaria abludens (Roem. & Schult.) Veldkamp **100**
Digitaria adscendens (Kunth) Henrard 100
Digitaria ciliaris (Retz.) Koeler **100**
Digitaria ciliaris subsp. *chrysoblephara* (Fig. & De Not.) Henrard 100
Digitaria granularis (Trin.) Henrard 100
Digitaria longiflora (Retz.) Pers. **100**
Digitaria marginata var. *fimbriata* (Link) Stapf 100
Digitaria pedicellaris (Hook.f.) Prain 100
Digitaria setigera Roth ex Roem. & Schult. **100**
Digitaria ternata (A. Rich.) Stapf **101**
Digitaria tomentosa (J. Koenig ex Willd.) Henrard **101**
DILLENIA L. **131**
Dillenia indica L. **131**
Dillenia pentagyna Roxb. **131**
DILLENIACEAE **131**
DIMERIA R.Br. **101**
Dimeria bialata C.E.C. Fisch. **101**
Dimeria connivens Hack. in DC. **101**
Dimeria ornithopoda Trin. **102**
Dimorphocalyx glabellus Thwaites 220
DIOSCOREA Plum. ex L. **32**
Dioscorea anguina Roxb. 34
Dioscorea bulbifera L. **32**
Dioscorea hamiltonii Hook.f. **34**
Dioscorea jacquemontii Hook.f. 34
Dioscorea lanceolata Heyne ex Hook.f. 34
Dioscorea oppositifolia L. **34**
Dioscorea pentaphylla L. **34**
Dioscorea pubera Blume **34**
Dioscorea tomentosa J. Koenig ex Spreng. **35**
DIOSCOREACEAE **32**
DIOSPYROS L. **293**
Diospyros assimilis Beddome 293
Diospyros chloroxylon Roxb. **293**
Diospyros ebenum J. Koenig ex Retz. **293**
Diospyros ferrea (Willd.) Bakh. **294**
Diospyros melanoxylon Roxb. **294**
Diospyros montana Roxb. **294**
Diospyros sylvatica Roxb. **294**
Diospyros vera (Lour.) A. Chev. 294
DIPLACHNE P. Beauv. **102**
Diplachne fusca P. Beauv. 102
Diplachne malabarica (L.) Merr. **102**
Dipteracanthus prostratus (Poir.) Nees 362
Distemon indicum Wedd. 197
DODONAEA Mill. **243**
Dodonaea angustifolia L.f. 243
Dodonaea viscosa Jacq. **243**
DOLICHANDRONE (Fenzl) Seem. **365**
Dolichandrone falcata (Wall. ex DC.) Seem. **365**
DOLICHOS L. **153**
Dolichos falcatus Klein ex Willd. 153
Dolichos gladiatus Jacq. 145
Dolichos minimus L. 170
Dolichos pruriens L. 163
Dolichos scarabaeoides L. 144
Dolichos trilobatus L. 179
Dolichos trilobus L. **153**
Dolichos virosus Roxb. 144
DOPATRIUM Buch.-Ham. ex Benth. **346**
Dopatrium junceum (Roxb.) Buch.-Ham. ex Benth. **346**
DRACAENA Vand. ex L. **50**
Dracaena roxburghiana (Schult.f.) Byng & Christenh. **50**
Dracontium paeoniifolium Dennst. 28
DRIMIA Jacq. ex Willd. **50**
Drimia indica (Roxb.) Jessop **50**
DROSERA L. **280**
Drosera indica L. **280**
DROSERACEAE **280**
DUNBARIA Wight & Arn. **153**
Dunbaria ferruginea Wight & Arn. **153**
DYSCHORISTE Nees **356**
Dyschoriste vagans (Wight) Kuntze **356**
Dysophylla quadrifolia Benth. 378
Dysophylla quadrifolia Benth. 378
EBENACEAE **293**
Ebenoxylum verum Lour. 294
ECHINOCHLOA P.Beauv. **102**
Echinochloa crus-galli (L.) P. Beauv. **103**
Echinochloa colona (L.) Link **102**
Echinospermum zeylanicum Lehm. 327
Echites heynei Spreng. 318
Echites pubescens Buch.-Ham. 322
Echites scholaris L. 318
Eclipta alba (L.) Hassk. 391
Eclipta dichotoma L.f. 387
ECLIPTA L. **391**
Eclipta prostrata (L.) L. **391**
Ehretia aspera Willd. **327**
EHRETIA P. Browne **327**
Ehretia canarensis (C.B. Clarke) Gamble 327
Ehretia ferrea Willd. 294
Ehretia laevis Roxb. 327
Ehretia laevis Roxb. var. *aspera* (Willd.) C.B. Clarke 327
Ehretia laevis Roxb. var. *canarensis* C.B. Clarke 327
Ehretia pubescens Benth. 327
Eichhornia crassipes (Mart.) Solms 57
ELAEODENDRON Jacq. **202**
Elaeodendron glaucum (Rottb.) Pers. **203**
Elaeodendron paniculatum Wight & Arn. 203
Elate sylvestris L. 52
ELATOSTEMA J.R. Forst. & G. Forst. **196**
Elatostema cuneatum Wight **196**
ELEOCHARIS R.Br. **74**
Eleocharis acutangula (Roxb.) Schult. **74**
Eleocharis fistulosa (Poir.) Schult. 74
ELEPHANTOPUS L. **391**
Elephantopus scaber L. **391**
ELEUSINE Gaertn. **103**
Eleusine aegyptia (L.) Desf. 96
Eleusine indica (L.) Gaertn. **103**
ELYTRARIA Michx **356**
Elytraria acaulis (L.f.) Lindauv **356**
Elytraria crenata Vahl 356
Embermaiera glauca Nees 363
Emblica officinalis Gaertn. 226
EMILIA Cass. **392**

Emilia sonchifolia (L.) DC. **392**
ENICOSTEMA Blume **312**
Enicostema axillare (Poir. ex Lam.) A. Raynal **312**
ENSETE Bruce ex Horan. **58**
Ensete glaucum (Roxb.) Cheesman **58**
ENTADA Adans. **154**
Entada pursaetha DC. 154
Entada rheedei Spreng. **154**
Entada scandens auct. non. Benth. 154
ENTEROPOGON Nees **103**
Enteropogon dolichostachyus (Lag.) Keng **103**
EPALTES Cass. **392**
Epaltes divaricata (L.) Cass. **392**
Epidendrum aloifolium L. 39
Epidendrum praemorsum Roxb. 38
Epidendrum tessellatem Roxb. 46
EPITHEMA Blume **344**
Epithema carnosum Benth. **344**
ERAGROSTIELLA Bor **104**
Eragrostiella bifaria (Vahl) Bor **104**
Eragrostiella nardoides (Trin.) Bor **104**
ERAGROSTIS Wolf **104**
Eragrostis amabilis auct. non Wight & Arn. ex Nees 107
Eragrostis atrovirens (Desf.) Trin. ex Steud. **104**
Eragrostis bifaria (Vahl) Wight ex Steud. 104
Eragrostis cilianensis (All.) Vignolo ex Janch. **105**
Eragrostis ciliaris (L.) R.Br. **105**
Eragrostis coarctata Stapf **105**
Eragrostis diarrhena (Schult.) Steud. 106
Eragrostis elegantula Nees ex Steud. 106
Eragrostis interrupta Stapf 106
Eragrostis japonica (Thunb.) Trin. **105**
Eragrostis maderaspatana Bor **106**
Eragrostis major Host 105
Eragrostis nardoides Trin. 104
Eragrostis nutans (Retz.) Nees ex Steud. ex Steud. **106**
Eragrostis pilosa (L.) P. Beauv. **106**
Eragrostis plumosa (Retz.) Link 107
Eragrostis riparia (Willd.) Nees **107**
Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult. var. *plumosa* (Retz.) Stapf 107
Eragrostis tenella (L.) P. Beauv. ex Roem. & Schult. **107**
Eragrostis tenella P. Beauv. var. *riparia* Stapf 107
Eragrostis unioloides (Retz.) Nees ex Steud. **107**
Eragrostis willdenowiana Nees ex Steud. ex Stapf 105
ERANTHEMUM L. **356**
Eranthemum capense L. **356**
Eranthemum montanum Roxb. 356
Eranthemum purpurascens Wight ex Nees **357**
Erechtites valerianaefolia sensu Fischer 390
Erinus procumbens Mill. 346
Erinus verticillatus Mill. 347
ERIOCAULACEAE **62**
ERIOCAULON L. **62**
Eriocaulon quinquangulare L. **62**
Eriocaulon truncatum Buch.-Ham. **62**
ERIOCHLOA Kunth **107**
Eriochloa polystachya sensu Hook.f. 107
Eriochloa procera (Retz.) C.E. Hubb. **107**
Eriodendron pentandrum (L.) Kurz 256
Erioglossum edule Blume 243
ERIOLAENA DC. **257**
Eriolaena candollei var. **hookeriana** (Wight & Arn.) K.C. Mohan **257**
Eriolaena hookeriana Wight & Arn. 257
ERYCIBE Roxb. **331**
Erycibe paniculata Roxb. **331**
Erythraea meyeri Bunge 312
ERYTHRINA L. **154**
Erythrina monosperma Lam. 143
Erythrina suberosa Roxb. **154**
Erythrina subumbrans (Hassk.) Merr. **154**
ERYTHROXYLACEAE **205**
ERYTHROXYLUM P. Browne **205**
Erythroxylum monogynum Roxb. **205**
Ethulia divaricata L. 392
Eugenia acutangula L. 290
Eugenia heyneana Duthie 237
Eugenia jambolana Lam. 236
EULALIA Kunth **109**
Eulalia phaeothrix (Hack.) Kuntze **109**
Eulalia trispicata (Schult.) Henrard 119
Eulalia tristachya (Roxb.) Kuntze 119
EUONYMUS L. **203**
Euonymus glaber Roxb. **203**
Eupatorium adenophorum Spreng. 386
Eupatorium glandulosum Kunth. 386
Eupatorium odoratum L. 390
EUPHORBIA L. **211**
Euphorbia cattimandoo Elliot ex Wight **212**
Euphorbia dracunculoides Lam. **212**
Euphorbia elegans Spreng. **212**
Euphorbia heyneana Spreng. **212**
Euphorbia hirta L. **214**
Euphorbia microphylla Heyne ex Roth 212
Euphorbia nivulia Buch.-Ham. **214**
Euphorbia pilulifera sensu Hook.f. 214
Euphorbia prostrata Aiton **214**
Euphorbia rosea Retz. **214**
Euphorbia thymifolia L. **215**
Euphorbia trigona Hook.f. 212
Euphorbia viminalis L. 321
EUPHORBIACEAE **210**
Eusteralis stellata (Lour.) Panigr. 378
EVOLVULUS L. **332**
Evolvulus alsinoides (L.) L. **332**
Evolvulus emarginatus Burm.f. 335
Evolvulus hederaceus Burm.f. 335
Evolvulus nummularius (L.) L. **332**
EXACUM L. **314**
Exacum alatum Roth 311
Exacum bicolour Roxb. 314
Exacum pedunculatum L. **314**
Exacum petiolare Griseb. **314**
Exacum tetragonum Roxb. **314**
FABACEAE **136**
Feronia elephantum Correa 247
FICUS Tourn. ex L. **189**
Ficus amplissima Sm. **189**
Ficus asperrima Roxb. 190
Ficus benghalensis L. **189**
Ficus benjamina L. **190**
Ficus cunia Buch.-Ham. ex Roxb. 192
Ficus exasperata Vahl **190**
Ficus geniculata Kurz **190**
Ficus gibbosa Blume 192
Ficus glomerata Roxb. 191
Ficus hispida L.f. **190**
Ficus indica L. 189
Ficus infectoria Roxb. 193
Ficus microcarpa L.f. **191**
Ficus mollis Vahl **191**
Ficus nervosa B. Heyne ex Roth **191**
Ficus racemosa L. **191**
Ficus religiosa L. **192**
Ficus retusa auct. non L. 191
Ficus rumphii Blume **192**
Ficus semicordata Buch.-Ham. ex J. E. Sm. **192**
Ficus tomentosa Roxb. ex Willd. 191

Ficus tsiela Roxb. ex Buch.-Ham. 189
Ficus virens Aiton **193**
Ficus tinctoria G. Forst. subsp. **gibbosa** (Blume) Corner **192**
FIMBRISTYLIS Vahl **74**
Fimbristylis aestivalis (Retz.) Vahl **74**
Fimbristylis bisumbellata (Forssk.) Bubani **75**
Fimbristylis dichotoma (L.) Vahl **75**
Fimbristylis dichotoma C.B. Clarke 75
Fimbristylis falcata (Vahl) Kunth **75**
Fimbristylis junciformis (Nees) Kunth 75
Fimbristylis littoralis Gaudich. **75**
Fimbristylis miliacea (L.) Vahl 75, 76
Fimbristylis monostachyos (L.) Hassk. 76
Fimbristylis ovata (Burm.f.) J. Kern **76**
Fimbristylis polytrichoides (Retz.) R.Br. **76**
Fimbristylis quinquangularis (Vahl) Kunth **76**
Fimbristylis schoenoides (Retz.) Vahl **76**
Fimbristylis tenera Roem. & Schult. **77**
FINLAYSONIA Wall. **321**
Finlaysonia wallichii (Wight) Venter **321**
Fioria vitifolia (L.) Mattei 262
FIRMIANA Marsili **258**
Firmiana colorata (Roxb.) R.Br. **258**
FLACOURTIA Comm. ex L. Her **210**
Flacourtia indica (Burm.f.) Merr. **210**
Flacourtia ramontchi L Her. 210
FLEMINGIA Roxb. ex W.T.Aiton **156**
Flemingia lineata (L.) W. T. Aiton **156**
Flemingia stricta Roxb. **156**
Flemingia stricta Roxb. var. *pteropus* Baker 156
Flemingia strobilifera (L.) W.T. Aiton **156**
Fleurya interrupta (L.) Gaudich. 196
FLUEGGEA Willd. **223**
Flueggea virosa (Roxb. ex Willd.) Voigt **223**
FUIRENA Rottb. **77**
Fuirena ciliaris (L.) Roxb. **77**
Fuirena glomerata Lam. 77
Fuirena uncinata (Willd.) Kunth **77**
GALACTIA P. Browne **156**
Galactia longifolia Benth. **157**
Galactia striata (Jacq.) Urb. var. **villosa** (Wight & Arn.) Verdc. **157**
Galactia tenuiflora (Klein ex Willd.) Wight & Arn. var. *lucida* Baker 157
Galactia tenuiflora Willd. ex Wight & Arn. 157
GALIUM L. 299
Galium asperifolium Wall. 299
Galium mollugo auct non L. 299
GARDENIA J. Ellis **299**
Gardenia dumetorum Retz. 298
Gardenia gummifera L.f. **299**
Gardenia latifolia Aiton **300**
Gardenia lucida Roxb. 300
Gardenia resinifera Roth **300**
Gardenia spinosa Thunb. 298
Gardenia tomentosa Blume ex DC. 298
Gardenia uliginosa Retz. 310
GARNOTIA Brongn. **109**
Garnotia elata (Arn. ex Miq.) Janowski **109**
Garnotia scoparia Stapf ex Hook.f. 109
Garnotia stricta sensu Hook.f. 109
Garnotia tenella (Arn. ex Miq.) Janowski **109**
Garnotia tenuiglumis Stapf ex Hook.f. 109
GARUGA Roxb. **239**
Garuga pinnata Roxb. **239**
Gendarussa vulgaris Nees 358
Gentiana axillaris Poir. ex Lam. 312
Gentiana diffusa Vahl 312
Gentiana pulchella Sw. 312
GENTIANACEAE **311**
GEODORUM Andrews **39**
Geodorum densiflorum (Lam.) Schltr. **39**
Geodorum purpureum R.Br. 39
Gerardia delphiniifolia L. 382
GESNERIACEAE **344**
GETONIA Roxb. **228**
Getonia floribunda Roxb. **228**
GIVOTIA Griff. **215**
Givotia moluccana (L.) Sreem. **215**
Givotia rottleriformis Griff. 215
GLINUS L. **286**
Glinus lotoides L. **286**
Glinus oppositifolius (L.) A. DC. **286**
GLIRICIDIA Kunth **157**
Gliricidia maculata (Kunth) Steud. 157
Gliricidia sepium (Jacq.) Kunth ex Walp. **157**
GLOBBA L. **59**
Globba bulbifera Roxb. 61
Globba marantina L. **61**
Globba ophioglossa Wight 61
Globba sessiliflora Sims **61**
GLOCHIDION J.R. Forst. & G. Forst. **225**
Glochidion heyneanum (Wight & Arn.) Wight ex Bedd. **225**
Glochidion velutinum Wight 225
Glochidion zeylanicum (Gaertn.) A.Juss. **225**
Glochidion zeylanicum (Gaertn.) A.Juss., var. **tomentosum** (Dalzell) Trimen **225**
Glochidion zeylanicum (Gaertn.) A.Juss., var. var. **zeylanicum** **225**
GLORIOSA L. **36**
Gloriosa superba L. **36**
Glossostylis avensis Benth. 382
Glycine abrus L. 139
Glycine involucrata Wall. 173
Glycine labialis L.f. 177
Glycine suaveolens L.f. 170
GLYCOSMIS Correa **247**
Glycosmis mauritiana (Lam.) Tanaka **247**
GMELINA L. **372**
Gmelina arborea Roxb. **372**
Gmelina asiatica L. **372**
Gmelina indica Burm.f. 210
Gomphrena ficoidea L. 282
Gomphrena hispida L. 377
Gomphrena sessilis L. 282
Goniogyna hebecarpa DC. 148
GOUANIA Jacq. **183**
Gouania leptostachya DC. **183**
Gratiola ciliata Colsm. 349
Gratiola hyssopioides L. 349
Gratiola juncea Roxb. 346
Gratiola oppositifolia Retz. 349
Gratiola pusilla Willd. 350
GREVILLEA R.Br. ex Knight **130**
Grevillea robusta A. Cunn. ex R.Br. **130**
GREWIA L. **258**
Grewia abutilifolia Vent. ex Juss. **258**
Grewia damine Gaertn. **259**
Grewia excelsa auct. non Vahl 259
Grewia hirsuta Vahl **259**
Grewia oppositifolia Buch.-Ham. ex DC. **259**
Grewia orientalis auct. non L. 259
Grewia rhamnifolia B. Heyne ex Roth 259
Grewia rothii DC. **259**
Grewia salvifolia L.f. 289
Grewia salviifolia Heyne ex Roth 259
Grewia tiliifolia Vahl **260**
GRONA Lour. **157**
Grona brachystachya (Graham ex Benth.) H. Ohashi & K. Ohashi **158**
Grona heterocarpon (L.) H. Ohashi & K. Ohashi **158**

Grona triflora (L.) H. Ohashi & K. Ohashi **158**
GUILANDINA L. **158**
Guilandina bonduc L. **159**
GYMNEMA R.Br. **321**
Gymnema montanum Hook.f. **322**
Gymnema tingens (Roxb.) Wight & Arn. 322
GYMNOSPORIA (Wight & Arn.) Hook.f. **203**
Gymnosporia emarginata (Willd.) Thwaites **203**
Gynandropsis pentaphylla (L.) DC. 274
GYNOCHTHODES Blume **300**
Gynochthodes umbellata (L.) Razafim. & B. Bremer **300**
Gynoon heyneanum Wight & Arn. 225
Gynura crepidioides Benth. 390
HABENARIA Willd. **39**
Habenaria barbata Wight ex Hook.f. **40**
Habenaria commelinifolia Wall. ex Lindl. **40**
Habenaria digitata Lindl. **40**
Habenaria furcifera Lindl. **40**
Habenaria ovalifolia Wight 40
Habenaria plantaginea Lindl. **42**
Habenaria platyphylla (Willd). Spreng. 42
Habenaria reniformis (D. Don) Hook.f. **42**
Habenaria roxburghii Nicolson 42
Habenaria susannae auct. non. (L.) R.Br. ex Spreng. 44
Habenaria wightii Trimen 44
HACKELOCHLOA Kuntze **110**
Hackelochloa granularis (L.) Kuntze **110**
Haldina cordifolia (Roxb.) Ridsdale 297
Hamiltonia suaveolens Roxb. 310
HEDYCHIUM J. Koenig **61**
Hedychium coronarium var. *flavescens* (Carey ex Roscoe) Baker 61
Hedychium flavescens Carey ex Roscoe **61**
HEDYOTIS L. **300**
Hedyotis corymbosa (L.) Lam. 305
Hedyotis herbacea L. 305
Hedyotis neesiana Arn. **301**
Hedyotis nitida Wight & Arn. 301
Hedyotis ovatifolia Cav. 305
*Hedyotis quadriloculari*s Thwaites 303
Hedyotis umbellata (L.) Lam. 307
Hedysarum biarticulatum L. 142
Hedysarum gangeticum L. 166
Hedysarum hamatum L. 175
Hedysarum heterocarpon L. 158
Hedysarum lagopodioides L. 177
Hedysarum lineatum L. 156
Hedysarum linifolium L.f. 160
Hedysarum moniliferum L. 141
Hedysarum ovalifolium Schumach. 141
Hedysarum polycarpon Poir. 158
Hedysarum strobiliferum L. 156
Hedysarum triangulare Retz. 152
Hedysarum triflorum L. 158
Hedysarum tuberosum Roxb. Ex Willd. 168
Hedysarum vaginale L. 142
Hedysarum viscidum L. 167
HELICTERES Pluk. ex L. **260**
Helicteres isora L. **260**
HELIOTROPIUM Tourn. ex L. **328**
Heliotropium indicum L. **328**
Heliotropium ovalifolium Forssk. **328**
Heliotropium paniculatum R.Br. 329
Heliotropium supinum L. 328
Heliotropium zeylanicum Lam. **328**
HELLENIA Retz. **58**
Hellenia speciosa (J. Koenig) S.R. Dutta **58**
Helosciadium heyneanum DC. 397
Helosciadium wallichianum Miq. 397
HEMIDESMUS R.Br. **322**
Hemidesmus indicus (L.) R.Br. ex Schult. **322**
Hemidesmus indicus (L.) R.Br. var. *pubescens* (Wight & Arn.) Hook.f. 321
Hemidesmus pubescens Wight & Arn. 321
Hemidesmus wallichii Wight 321
Hemigraphis hirta T. Anderson 364
Hemigraphis latebrosa Nees 364
Herpestis monnieri (L.) Kunth 346
HETEROPOGON Pers. **110**
Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult. **110**
HEWITTIA Wight & Arn. **332**
Hewittia bicolour (Vahl) Wight & Arn. 332
Hewittia malabarica (L.) Suresh **332**
Hewittia scandens (Milne) Mab. 332
Heylandia latebrosa sensu Baker 148
HEYNEA Roxb. **252**
Heynea trijuga Roxb. ex Sims **252**
HIBISCUS L. **260**
Hibiscus aculeatus Roxb. **260**
Hibiscus furcatus Roxb. ex DC. 260
Hibiscus lampas Cav. 256
Hibiscus lobatus (Murray) Kuntze **261**
Hibiscus micranthus L.f. **261**
Hibiscus populnea L. 267
Hibiscus solandra L'Herit. 261
Hibiscus surattensis L. **261**
Hibiscus vitifolius L. **262**
Hibiscus zeylonicus L. 264
HIPTAGE Gaertn. **207**
Hiptage benghalensis (L.) Kurz **207**
Hiptage madablota Gaertn. 208
Holarrhena antidysenterica Wall. 322
HOLARRHENA R.Br. **322**
Holarrhena pubescens (Buch.-Ham.) Wall. & G.Don **322**
Holcus ciliates Roxb. 85
Holcus halepensis L. 123
Holcus pertusus L. 87
HOLOPTELEA Planch. **186**
Holoptelea integrifolia (Roxb.) Planch. **186**
HOMALIUM Jacq. **210**
Homalium napaulense (DC.) Benth. **210**
HOMONOIA Lour. **215**
Homonoia retusa (Graham ex Wight) Mull. Arg. **215**
Homonoia riparia Lour. **215**
Hottonia indica L. 346
HUBERANTHA Chaowasku **23**
HUGONIA L. **220**
Hugonia mystax L. **220**
HYBANTHUS Jacq. **208**
Hybanthus enneaspermus (L.) F. Muell. **208**
HYDRILLA Rich. **31**
Hydrilla verticillata (L.f.) Royle **31**
HYDROCHARITACEAE **31**
Hydrocotyle asiatica L. 395
HYDROLEA L. **341**
Hydrolea zeylanica (L.) Vahl **341**
HYDROLEACEAE **341**
HYGROPHILA R.Br. **357**
Hygrophila auriculata (Schumach.) Heine **357**
Hygrophila polysperma (Roxb.) T. Anderson **357**
Hygrophila schulli (Buch.-Ham.) M.R. Almeida 357
Hygrophila spinosa T. Anderson 357
HYMENODICTYON Wall. **301**
Hymenodictyon exelsum (Roth) Wall. 301
Hymenodictyon orixense (Roxb.) Mabb **301**
Hypaphorus subumbrans Hassk. 154
HYPERTELIS E. Mey. ex Fenzl **286**
Hypertelis cerviana (L.) Thulin **286**
Hypolytrum gracile Rich. ex Pers. 66

HYPOXIDACEAE **47**
Hypoxis trichocarpa Wight 47
Hyptis suaveolens (L.) Poit. 375
ICHNOCARPUS R.Br. **322**
Ichnocarpus frutescens (L.) W.T. Aiton **322**
Illecebrum monsoniae L. f. 285
Ilysanthes hyssopioides (L.) Benth. 349
Ilysanthes oppositifolia (Retz.) Urban. 349
Ilysanthes serrata (Roxb.) Urban 349
Ilysanthes veronicifolia (Retz.) Urban. 348
IMPATIENS Riv. ex L. **289**
Impatiens balsamina L. **289**
Impatiens chinensis L. **290**
IMPERATA Cirillo **110**
Imperata arundinacea Cirillo 110
Imperata cylindrica (L.) Raeusch. **110**
Imperata cylindrica (L.) Raeusch. var. *major* (Nees) C.E. Hubb. 110
Imperata cylindrica var. *koenigii* (Retz.) T.A. Durands Sching 110
INDIGOFERA L. **159**
Indigofera aspalathoides Vahl ex DC. **159**
Indigofera astragalina DC. **159**
Indigofera barberi Gamble 161
Indigofera cassioides Rottler ex DC. **160**
Indigofera enneaphylla L. 160
Indigofera hirsuta sensu Baker 159
Indigofera linifolia (L.f.) Retz. **160**
Indigofera linnaei Ali **160**
Indigofera mysorensis Rottler ex DC. **160**
Indigofera prostrata Willd. **161**
Indigofera pulchella auct. non Roxb. 160
Indigofera trifoliata L. **161**
Indigofera trifoliata sensu Baker 161
Indigofera trita L.f. **161**
Indoneesiella echioides (L.) Sreem. 353
Inula indica L. 394
Ionidium suffruticosum (L.) Ging. 208
IPHIGENIA Kunth **36**
Iphigenia indica (L.) A. Gray ex Kunth **36**
IPOMOEA L. **333**
Ipomoea aquatica Forssk. **333**
Ipomoea carnea Jacq. **333**
Ipomoea chryseides Ker-Gawl. 335
Ipomoea coccinea auct.: C.B. Clarke 334
Ipomoea cymosa (Desr.) Roem. & Schult. 335
Ipomoea eriocarpa R.Br. **333**
Ipomoea hederifolia L. **334**
Ipomoea hispida (Vahl) Roem. & Schult. 333
Ipomoea laxiflora H.J. Chowdhery & Debta **334**
Ipomoea obscura (L.) Ker Gawl. **334**
Ipomoea paniculata Burm.f. 334
Ipomoea reniformis (Roxb.) Choisy 335
Ipomoea reptans Poir. 333
Ipomoea tridentata (L.) Roth 336
Ipomoea turpethum (L.) R.Br. 336
Ipomoea vitifolius (Burm.f.) Blume 331
ISACHNE R.Br. **111**
Isachne australis R.Br. 111
Isachne dispar non Trin. 111
Isachne globosa (Thunb.) Kuntze **111**
ISCHAEMUM L. **111**
Ischaemum aristatum auct. non L. 118
Ischaemum ciliare Retz. 118
Ischaemum indicum (Houtt.) Merr. 118
Ischaemum pilosum (Klein ex Willd.) Wight 111
Ischaemum polystachyum J. Presl **111**
Ischaemum rugosum Salisb. **111**
ISEILEMA Andersson **112**
Iseilema prostratum (L.) Andersson **112**
Iseilema wightii Andersson 112
Isolepis senegalensis Steud. 78
IXORA L. **301**
Ixora brachiata Roxb. **301**
Ixora parviflora Vahl 301
Ixora pavetta Andrews **301**
Ixora undulata Roxb. **302**
JACQUEMONTIA Choisy **334**
Jacquemontia paniculata (Burm.f.) Hallier f. **334**
JASMINUM L. **342**
Jasminum arborescens Roxb. **342**
Jasminum auriculatum Vahl **342**
Jasminum malabaricum Wight **343**
Jasminum roxburghianum Wall. ex. C.B. Clarke 342
JATROPHA L. **216**
Jatropha gossypifolia L. **216**
Juncellus alopecuroides (Rottb.) C.B. Clarke 66
Juncellus laevigatus (L.) C.B. Clarke 70
Jussiaea adscendens L. 235
Jussiaea hyssopifolia G. Don 235
Jussiaea octonervia f. *sessiliflora* Mich. 236
Jussiaea peruviana L. 236
Jussiaea speciosa Ridely 236
Jussiaea suffruticosa L. 236
JUSTICIA L. **358**
Justicia acaulis L.f. 356
Justicia betonica L. **358**
Justicia canescens Lam. 359
Justicia comosa Vahl **358**
Justicia diffusa var. *vahlii* (Roth.) C.B. Clarke 358
Justicia diffusa Willd. var. *prostrata* Roxb. ex C.B. Clarke 362
Justicia echioides L. 353
Justicia gendarussa Burm.f. 358
Justicia glauca Rottl. **358**
Justicia nasuta L. 360
Justicia paniculata Burm.f. 354
Justicia pectinata L. 363
Justicia polysperma Roxb. 585
Justicia prostrata (Roxb. ex C.B. Clarke) Gamble 362
Justicia repens L. 363
Justicia trinervia Vahl 358
Justicia vahlii Roth 358
KALANCHOE Adans. **132**
Kalanchoe pinnata (Lam.) Pers. **132**
Kavalama urens (Roxb.) Raf. 267
Kirganelia reticulata (Poir.) Bail. 227
KNOXIA L. **302**
Knoxia mollis R.Br. ex Wight & Arn. 302
Knoxia sumatrensis (Retz.) DC. **302**
KYDIA Roxb. **262**
Kydia calycina Roxb. **262**
Kyllinga albescens Steud. 66
Kyllinga albescens Steud. 66
Kyllinga brevifolia Rottb. 66
Kyllinga mindorensis Steud. 66
Kyllinga monocephala Rottb. 66
Kyllinga nemoralis (J.R. Forst. & G. Forst.) Dandy 70
Kyllinga panacea Rottb. 71
LAGENARIA Ser. **199**
Lagenaria siceraria (Molina) Standl. **199**
Lagenaria vulgaris Ser. 199
LAGERSTROEMIA L. **233**
Lagerstroemia parviflora Roxb. **233**
Lagurus cylindricus L. 110
LAMIACEAE **369**
LANNEA A. Rich. **241**
Lannea coromandelica (Houtt.) Merr. **241**
Lantana aculeata L. 367
LANTANA L. **367**
Lantana alba Mill. 367

Lantana camara L. **367**
Lantana camara L. var. *camara* Pull. & al. 367
LAPORTEA Gaudich. **196**
Laportea interrupta (L.) Chew **196**
LAURACEAE **26**
LAWSONIA L. **233**
Lawsonia inermis L. **233**
LECYTHIDACEAE **290**
LEEA D. Royen **135**
Leea asiatica (L.) Ridsdale **135**
Leea indica (Burm.f.) Merr. **135**
Leea macrophylla Roxb. ex Hornem. & Roxb. **135**
Leea sambucina (L.) Willd. 135
Leea venkobarowii Gamble 135
Leea crispa L. 135
LEERSIA Sw. **112**
Leersia hexandra Sw. **112**
LENTIBULARIACEAE **366**
LEONOTIS (Pers.) R.Br. **372**
Leonotis nepetifolia (L.) R.Br. **372**
Leontice leontopetaloides L. 35
LEPIDAGATHIS Willd. **359**
Lepidagathis cristata Willd. **359**
Lepidagathis fasciculata (Retz.) Nees **359**
LEPISANTHES Blume **243**
Lepisanthes rubiginosa (Roxb.) Leenh. **243**
LEPTOCHLOA P. Beauv. **112**
Leptochloa chinensis (L.) Nees **112**
Leptochloa fusca (L.) Kunth 102
Lettsomia setosa Roxb. 331
LEUCAS R.Br. **373**
Leucas aspera (Willd.) Link **373**
Leucas biflora (Vahl) R.Br. ex Sm. **373**
Leucas cephalotes (Koen ex Roth) Spreng. **373**
Leucas decemdentata (Willd.) R.Br. ex Sm. **374**
Leucas flaccida R.Br. 374
Leucas marrubioides Desf. **374**
Leucas mollisima Wall. 374
Leucas mollisima Wall. ex Benth. var. *scaberula* Hook.f. 374
Leucas montana Spreng. **374**
Leucas zeylanica (L.) R.Br. **374**
Limnanthemum cristata (Roxb.) Griseb. 384
LIMNOPHILA R.Br. **346**
Limnophila conferta Benth. 347
Limnophila gratioloides R.Br. 346
Limnophila indica (L.) Druce **346**
Limnophila repens (Benth.) Benth. **347**
LIMNOPHYTON Miq. **30**
Limnophyton obtusifolium (L.) Miq. **30**
Limodorum densiflorum Lam. 39
LIMONIA L. **247**
Limonia acidissima auct. non. L. 248
Limonia acidissima L. **247**
Limonia alata Wight & Arn. 249
Limonia aurantiifolia Christm. 247
Limonia crenulata Roxb. 248
Limonia mauritiana Lam. 247
Limonia monophyla L. 246
LINACEAE **220**
LINDERNIA All. **348**
Lindernia antipoda (L.) Alston 348
Lindernia ciliata (Colsm.) Pennell 348
Lindernia crustacea (L.) F. Muell. 350
Lindernia hyssopioides (L.) Haines **349**
Lindernia oppositifolia (L.) Mukerjee 349
Lindernia procumbens (Krock.) Philcox **349**
Lindernia pusilla (Willd.) Bold. **350**
LINDERNIACEAE **348**
Linociera macrophylla (Blume) Wall. ex C.B. Clarke 342
LIPARIS Rich. **43**
Liparis bituberculata Lindl. 43
Liparis nervosa (Thunb.) Lindl. **43**
Lipocarpha argentea (Vahl) R.Br. ex Nees 66
Lipocarpha chinensis (Osbeck) J. Kern 66
Lipocarpha gracilis (Rich. ex Pers.) Nees 66
Lipocarpha squarrosa (L.) Goetgh. 70
Lipocarpha triceps Nees 66
LIPPIA L. **367**
Lippia alba (Mill.) N.E.Br. ex Britton & P. Wilson **367**
Lippia geminata H.B.K. 367
Lippia nodiflora (L.) A. Rich. 367
Listera reniformis D. Don 42
LITSEA Lam. **26**
Litsea chinensis Lam. 26
Litsea glutinosa (Lour.) C.B. Rob. **26**
Litsea monopetala (Roxb.) Pers. **27**
Litsea polyantha Juss. 27
LOBELIA Plum. ex L. **384**
Lobelia alsinoides Lam. **384**
Lobelia trigona Roxb. 384
Lochnera pusilla K. Schum. 320
LOGANIACEAE **315**
LOPHOPOGON Hack. **113**
Lophopogon tridentatus (Roxb.) Hack. **113**
LUDWIGIA L. **235**
Ludwigia adscendens (L.) H. Hara **235**
Ludwigia hyssopifolia (G. Don) Exell **235**
Ludwigia octovalvis (Jacq.) P.H. Raven **236**
Ludwigia parviflora Roxb. 236
Ludwigia perennis L. **236**
Ludwigia peruviana (L.) H. Hara **236**
Lysimachia monnieri L. 346
LYTHRACEAE **232**
Lythrum fruticosum L. 235
Maba buxifolia (Rottb.) A. L. Juss. 294
MACARANGA Thouars **216**
Macaranga peltata (Roxb.) Mull. Arg. **216**
Macaranga roxburghii Wight 216
MACHILUS Nees **27**
Machilus glaucescens (Nees) Wight **27**
Machilus macrantha Nees 27
MACLURA Nutt. **193**
Maclura spinosa (Willd.) C.C. Berg **193**
Macronyx strigosus Dalzell 176
MADHUCA Buch.-Ham. ex J.F. Gmel. **292**
Madhuca longifolia (J. Koenig ex L.) J.F. Macbr. var. **latifolia** A. Chev. **292**
MAERUA Forssk. **273**
Maerua arenaria (DC.) Hook.f. & Thomson 273
Maerua oblongifolia (Forssk.) A. Rich. **273**
MAGNOLIA Plum. ex L. **21**
Magnolia champaca (L.) Baill. ex Pierre **21**
MAGNOLIACEAE **21**
MALLOTUS Lour. **216**
Mallotus nudiflorus (L.) Kulju & Welzen **217**
Mallotus philippensis (Lam.) Mull.Arg. **217**
Mallotus repandus (Rottler) Mull. Arg. **217**
Mallotus rhamnifolius Mull. Arg. **217**
MALPIGHIACEAE **207**
Malva coromandeliana L. 262
MALVACEAE **253**
MALVASTRUM A.Gray **262**
Malvastrum coromandelianum (L.) Garcke **262**
MANGIFERA L. **241**
Mangifera axillaris Desr. 240
Mangifera glauca Rottb. 203
Mangifera indica L. **241**
MANILKARA Adans. **292**

Manilkara hexandra (Roxb.) Dubard. **292**
Manisuris granularis (L.) L.f. 110
Mariscus bulbosus C.B. Clarke 66
Mariscus compactus (Retz.) Bold. 67
Mariscus microcephalus J. Presl & C. Presl 67
Mariscus paniceus (Rottb.) Vahl 71
Mariscus squarrosus (L.) C.B. Clarke 73
MARTYNIA L. **351**
Martynia annua L. **351**
Martynia diandra Gloxin 351
MARTYNIACEAE **351**
Maytenus emarginata (Willd.) Ding Hou 203
MECARDONIA Ruiz & Pav. **347**
Mecardonia procumbens (Mill.) Small **347**
Melanthium indicum L. 36
Melasma avense (Benth.) Hand.-Mazz. 382
MELASTOMA L. **237**
Melastoma malabathricum L. **237**
MELASTOMATACEAE **237**
MELIA L. **252**
Melia azadirachta L. 251
Melia baccifera Roth 252
Melia composita Willd. 252
Melia dubia Cav. **252**
MELIACEAE **251**
Melica latifolia Roxb. ex Hornem. 126
MELILOTUS Mill. **161**
Melilotus albus Medik. **161**
MELOCHIA L. **262**
Melochia corchorifolia L. **262**
Melochia cordata Burm.f. 266
Melothria maderaspatana (L.) Cogn. 198
MEMECYLON L. **237**
Memecylon edule Roxb. **237**
MENISPERMACEAE **128**
Menispermum acuminatum Lam. 129
Menispermum cordifolium Willd. 129
Menispermum hirsutum L. 129
MENYANTHACEAE **384**
Menyanthes hydrophylla Lour. 384
MERREMIA Dennst. ex Endl. **335**
Merremia chryseides Hallier f. 335
Merremia emarginata (Burm.f.) Hallier f. **335**
Merremia hederacea (Burm.f.) Hallier f. **335**
Merremia tridentata (L.) Hallier f. 336
Merremia umbellata (L.) Hallier f. **335**
Merremia vitifolia (Burm.f.) Hallier f. 331
MESOSPHAERUM P.Browne **375**
Mesosphaerum suaveolens (L.) Kuntze **375**
Michelia champaca L. 21
Micranthus oppositifolius Wendl. 360
MICROCHIRITA (C.B. Clarke) Yin Z. Wang **344**
Microchirita hamosa (R.Br.) Yin Z. Wang **34** **4**
MICROMERIA Benth. **375**
Micromeria biflora (Buch.-Ham. ex D. Don) Benth. **375**
MICROSTACHYS A. Juss. **219**
Microstachys chamaelea (L.) Mull. Arg. **219**
Mikania micrantha Kunth **392**
MIKANIA Willd. **392**
Mikania scandens auct.; C.B. Clarke 392
Milium cimicinum L. 82
Milium globosum Thunb. 111
Milium tomentosum J. Koenig ex Rottler 101
MILIUSA Lesch. ex A. DC. **24**
Miliusa tomentosa (Roxb.) Finet & Gagnep. **24**
MIMOSA L. **162**
Mimosa amara Roxb. 140
Mimosa caesia L. 171
Mimosa chundra Rox. & Rottler 171
Mimosa cineraria L. 167
Mimosa cinerea L. 153
Mimosa dulcis Roxb. 166
Mimosa entada L. 154
Mimosa juliflora Sw. 167
Mimosa lebbeck L. 140
Mimosa leucophloea Roxb. 177
Mimosa nilotica L. 178
Mimosa odoratissima L.f. 141
Mimosa pennata L. 171
Mimosa prostrata Lam. 163
Mimosa pudica L. **162**
Mimosa rubicaulis Lam. **162**
Mimosa torta Roxb. 172
Mimosa xylocarpa Roxb. 179
MIRABILIS Riv. ex L. **285**
Mimusops hexandra Roxb. 292
Mirabilis jalapa L. **285**
MITRACARPUS Zucc. **302**
Mitracarpus hirtus (L.) DC. **302**
Mitracarpus villosus (Sw.) DC. 302
MITRAGYNA Korth. **302**
Mitragyna parvifolia (Roxb.) Korth. **303**
MITRASACME Labill. **315**
Mitrasacme alsionoides auct. non. R.Br. 315
Mitrasacme indica Wight 315
Mitrasacme malaccensis Wight. 315
Mitrasacme polymorpha auct. non. R.Br. 315
Mitrasacme prolifera R.Br. **315**
Mitrasacme pygmaea R.Br. **315**
MITREOLA L. **315**
Mitreola oldenlandioides Wall. ex DC. 315
Mitreola petiolata (J.F.Gmel.) Torr. & A. Gray **315**
Modecca wightiana Wall. ex Wight & Arn. 208
Molineria trichocarpa (Wight) N.P. Balakr. 47
MOLLUGINACEAE **286**
MOLLUGO L. **287**
Mollugo disticha Ser. **287**
Mollugo hirta Thunb. 286
Mollugo lotoides (L.) Kuntze 286
Mollugo nudicaulis Lam. 287
Mollugo oppositifolia L. 286
Mollugo pentaphylla L. 287
Mollugo spergula L. 286
Mollugo stricta sensu C.B. Clarke 288
MOMORDICA L. **199**
Momordica charantia L. **199**
Monniera cuneifolia Michaux 346
Monochoria vaginalis (Burm.f.) C. Presl. 57
MOOROCHLOA Veldkamp **113**
Moorochloa eruciformis (Sm.) Veldkamp **113**
MORACEAE **188**
MORINDA L. **303**
Morinda coreia Buch.-Ham. **303**
Morinda pubescens Sm. 303
Morinda tinctoria Roxb. 303
Morinda umbellata L. 300
MORINGA Adans. **270**
Moringa concanensis Nimmo ex Dalzell & A. Gibson **270**
MORINGACEAE **270**
MOULLAVA Adans. **162**
Moullava digyna (Rottler) Gagnon & G.P. Lewis **162**
MUCUNA Adans. **163**
Mucuna atropurpurea (Roxb.) DC. ex Wight & Arn. **163**
Mucuna monosperma DC. ex Wight **163**
Mucuna pruriens (L.) DC. **163**
Mucuna prurita Wight 163
Mukia scabrella (L.f.) Arn. 198
MURDANNIA Royle **56**

Murdannia dimorpha (Dalzell) G. Bruckner 56
Murdannia japonica (Thunb.) Faden **56**
Murdannia nudiflora (L.) Brenan **56**
Murdannia spirata (L.) G. Brueckner **57**
MURRAYA J. Koenig ex L. **248**
Murraya exotica L. 248
Murraya koenigii (L.) Spreng. **248**
Murraya paniculata (L.) Jack **248**
MUSA L. **58**
Musa ornata Roxb. **59**
Musa rosea sensu Baker 59
Musa x paradisiaca L. **59**
MUSACEAE **58**
Myrobalanus bellirica Gaertn. 229
Myrobalanus chebula (Retz.) Gaertn. 231
MYRTACEAE **236**
Myrtus cumini L. 236
Nama zeylanica L. 341
Naravelia zeylanica (L.) DC. 130
NARINGI Adans. **248**
Naringi crenulata (Roxb.) Nicolson **248**
Nasturtium indicum (L.) DC. 275
Nauclea cordifolia Roxb. 297
Nauclea parvifolia Roxb. 303
NEANOTIS W.H.Lewis **303**
Neanotis calycina (Wall. ex Hook.f.) W.H. Lewis **303**
Neanotis quadrilocularis (Thwaites) W.H. Lewis 303
Neanotis tubulosa (G. Don) Mabb. 500, **303**
NELSONIA R.Br. **359**
Nelsonia canescens (Lam.) Spreng. **359**
Nelsonia compestris R.Br. 359
Nelumbium speciosum Willd. 130
NELUMBO Adans. **130**
Nelumbo nucifera Gaertn. **130**
NELUMBONACEAE **130**
Nemedra elaeagnoidea A. Juss. 250
NEODISTEMON Babu & A.N. Henry **197**
Neodistemon indicus (Wedd.) Babu & Henry **197**
Nepeta indica L. 370
NEPTUNIA Lour. **163**
Neptunia oleracea Lour. 163
Neptunia prostrata (Lam.) Baill. **163**
NERVILIA Comm. ex Gaudich. **43**
Nervilia aragoana Comm ex Gaudich 43
Nervilia concolor (Blume) Schltr. **43**
Nervilia plicata (Ander.) Schltr. **43**
Nesaea lanceolata (B. Heyne ex C.B. Clarke) Koehne 232
NICOTIANA L. **337**
Nicotiana plumbaginifolia Viv. **339**
Nicotiana tabacum L. **339**
Niebuhria arenaria DC. 273
Nilgirianthus heyneanus (Nees) Bremek. 364
Nortenia thouarsii Cham. & Schltdl. 350
NYCTAGINACEAE **285**
NYCTANTHES L. **343**
Nyctanthes arbor-tristis L. **343**
NYMPHAEA L. **19**
Nymphaea lotus sensu Hook.f. & Thomson 20
Nymphaea lotus var. *pubescens* (Willd.) Hook.f. & Thomson 20
Nymphaea nouchali Burm.f. **20**
Nymphaea pubescens Willd. **20**
Nymphaea stellata Willd. 20
NYMPHAEACEAE **19**
NYMPHOIDES Seg. **384**
Nymphoides cristatum (Roxb.) Kuntze 384
Nymphoides hydrophylla (Lour.) Kuntze **384**
OBERONIA Lindl. **43**
Oberonia wightiana Lindl. **44**
OCHNA L. **205**
Ochna beddomei Gamble 207
Ochna gamblei King ex Brands **207**
Ochna obtusata DC. **207**
Ochna obtusata DC. var. *gamblei* (King ex Brandis) Kanis 207
Ochna squarrosa sensu A. W. Benn. 207
OCHNACEAE DC. **205**
OCIMUM L. **375**
Ocimum americanum L. **375**
Ocimum basilicum L. **377**
Ocimum canum Sims 375
Ocimum capitatum Roth 377
Odina wodier Roxb. 241
Oenothera octovalvis Jacq. 236
OLACACEAE **275**
OLAX L. **275**
Olax psittacorum (Willd.) Vahl 276
Olax scandens Roxb. **276**
OLDENLANDIA L. **305**
Oldenlandia corymbosa L. **305**
Oldenlandia herbacea (L.) Roxb. **305**
Oldenlandia heynii R.Br. ex G. Don 305
Oldenlandia nitida (Wight & Arn.) Gamble 301
Oldenlandia nudicaulis Roth 305
Oldenlandia ovatifolia (Cav.) DC. **305**
Oldenlandia repens L. 299
Oldenlandia tubulosa G.Don. 303
Oldenlandia umbellata L. **307**
Oldenlandia wightii Hook.f. 307
OLEACEAE **342**
OLIGOCHAETA K.Koch **393**
Oligochaeta ramosa (Roxb.) Wagenitz **393**
ONAGRACEAE **235**
OPERCULINA Silva Manso **336**
Operculina turpethum (L.) Silva Manso **336**
Ophioxylon serpentinum L. 324
Ophrys nervosa Thunb. 43
OPILIA Roxb. **276**
Opilia amentacea Roxb. **276**
OPILIACEAE **276**
OPLISMENUS P.Beauv. **113**
Oplismenus burmanni (Retz.) P. Beauv. **113**
Oplismenus compositus (L.) P. Beauv. **114**
Opuntia dillenii (Ker- Gawl.) Haw. 289
OPUNTIA Mill. **288**
Opuntia stricta (Haw.) Haw. **289**
ORCHIDACEAE **38**
Orchis gigantea Sm. 44
Orchis plantaginea (Roxb.) Hook.f. 42
Origanum benghalense Burm.f. 378
OROBANCHACEAE **381**
OROXYLUM Vent. **365**
Oroxylum indicum (L.) Kurz **365**
ORTHOSIPHON Benth. **377**
Orthosiphon rubicundus (D. Don) Benth. **377**
Orthosiphon rubicundus (D. Don) Benth. var. *hohenackeri* Hook.f. 377
Orygia portulacifolia Forssk. 288
ORYZA L. **114**
Oryza granulata Nees & Arn ex Watt. 114
Oryza malampuzhaensis Krish. & Chandr. 114
Oryza meyeriana (Zoll. & Moritzi) Baill. **114**
Oryza officinalis Wall. ex Watt **114**
OSBECKIA L. **238**
Osbeckia chinensis L. **238**
Osbeckia muralis Naudin **238**
Osbeckia truncata D. Don ex Wight & Arn. 238
Osbeckia zeylanica L.f. **238**
Osyris peltata Roxb. 216
OTTELIA Pers. **31**

Ottelia alismoides (L.) Pers. **31**
OURET Adans. **283**
Ouret lanata (L.) Kuntze **284**
Ouret sanguinolenta (L.) Kuntze **284**
OXALIDACEAE **204**
OXALIS L. **205**
Oxalis corniculata L. **205**
Oxalis reinwardtii Zucc. 204
Oxalis sensitiva L. 204
OXYSTELMA R.Br. **323**
Oxystelma esculentum (L.f.) Sm. **323**
Oxystelma esculentum R.Br. ex Schult. 323
Pachysandra coriacea Hook. 131
Padia meyeriana Zoll. & Moritzi 114
PAEDERIA L. **307**
Paederia foetida L. **307**
PANICUM L. **116**
Panicum abludens Roem. & Schult. 100
Panicum austroasiaticum Ohwi 116
Panicum brevifolium L. **116**
Panicum burmanni Retz. 113
Panicum ciliare Retz. 100
Panicum colonum L. 102
Panicum compositum L. 114
Panicum crus-galli L. 103
Panicum curviflorum Hornem. **116**
Panicum eruciformis Sm. 113
Panicum flavidum Retz. 121
Panicum humile Nees ex Steud. **116**
Panicum indicum L. 120
Panicum indicum L. var. *angustum* (Trin.) Hook.f. 120
Panicum interruptum Willd. 121
Panicum isachne Roth ex Roem. & Schult. 113
Panicum longipes Wight & Arn. ex Hook.f. 95
Panicum montanum Roxb. 117
Panicum notatum Retz. **117**
Panicum ovalifolium Poir. 116
Panicum oxyphyllum Hochst. ex Steud. 95
Panicum palmifolium J.Koenig 123
Panicum paludosum Roxb. **117**
Panicum pilipes Nees & Arn. ex Buse 95
Panicum plicatum Willd. 123
Panicum polystachion L. 88
Panicum proliferum sensu Hook.f. 117
Panicum prostratum Lam. 126
Panicum pumilum Poir. 123
Panicum remotum Retz. 87
Panicum reptans L. 126
Panicum spinescens R.Br. 119
Panicum subegluma Trin. 101
Panicum trigonum Retz. 95
Panicum trypheron Schult. 116
Panicum verticillatum L. 123
Panicum walense Mez. 116
PAPAVERACEAE **128**
PARACALYX Ali **165**
Paracalyx scariosus (Roxb.) Ali **165**
PARAMOLLUGO Thulin **287**
Paramollugo nudicaulis (Lam.) Thulin **287**
Parasopubia delphiniifolia (L.) H.-P. Hofm. & Eb. Fisch. **382**
PARASOPUBIA H.-P. Hofm. & Eb. Fisch. **382**
Parietaria zeylanica L. 197
PARTHENIUM L. **393**
Parthenium hysterophorus L. **393**
Paspalidium flavidum (Retz.) A. Camus 121
PASPALUM L. **117**
Paspalum commersonii Lam. 117
Paspalum longiflorum Retz. 100
Paspalum orbiculare G. Forst. 117
Paspalum pedicellare Trin. ex Hook.f. 100
Paspalum sanguinale var. *ciliare* (Retz.) Hook.f. 100
Paspalum sanguinale var. *extensum* Hook.f. 100
Paspalum scrobiculatum L. **117**
Paspalum ternatum (A. Rich.) Hook.f. 101
Passiflora foetida L. **209**
PASSIFLORA L. **209**
PASSIFLORACEAE **208**
PAVETTA L. **307**
Pavetta indica L. **307**
Pavetta indica L. var. *tomentosa* (Roxb. ex Sm.) Hook.f. 308
Pavetta madrassica Bremek. **307**
Pavetta tomentosa Roxb. ex Sm. **308**
Pavonia odorata Willd. **264**
PAVONIA Ruiz **264**
Pavonia zeylonica (L.) Cav. **264**
PECTEILIS Raf. **44**
Pecteilis gigantea (Sm.) Raf. **44**
Pecteilis susannae (L.) Raf. 44
PEDALIACEAE **351**
Pennisetum pedicellatum Trin. 88
Pennisetum setosum (Sw.) Rich. 88
Pentanema indicum (L.) Ling 394
PENTAPETES L. **264**
Pentapetes acerifolia L. 265
Pentapetes phoenicea L. **264**
Pentaptera arjuna Roxb. ex DC. 229
Pentaptera tomentosa Roxb. ex DC. 231
PERGULARIA L. **323**
Pergularia daemia (Forssk.) Chiov. **323**
Pergularia extensa (Jacq.) N.E. Br. 323
Pergularia sinensis Lour. 321
Periploca arborea Dennst. 324
Periploca cordata Poir. 320
Periploca dubia Burm.f. 320
Periploca esculenta L.f. 323
Periploca indica L. 322
Peristrophe bicalyculata (Retz.) Nees 355
Peristrophe paniculata (Forssk.) Brummitt 355
PERISTYLUS Blume **44**
Peristylus plantagineus Lindl. **44**
PEROTIS Aiton **117**
Perotis indica (L.) Kuntze **117**
Perotis latifolia Ait. 117
Persea macrantha (Nees) Kosterm. 27
Persicaria barbata (L.) H. Hara **279**
Persicaria chinensis (L.) H. Gross **279**
Persicaria glabra (Willd.) M. Gomez **279**
PERSICARIA Mill. **279**
PETALIDIUM Nees **360**
Petalidium barlerioides (Roth) Nees **360**
Phalaris zizanioides L. 91
PHANERA Lour. **165**
Phanera purpurea (L.) Benth. 143
Phanera vahlii (Wight & Arn.) Benth. **165**
Pharnaceum cerviana L. 287
Phaseolus aconitifolius Jacq. 178
Phaseolus mungo L. 178
Phaseolus mungo L. var. *radiates* (L.) Baker 179
Phaseolus radiatus L. 179
Phaseolus trilobatus (L.) Schreb. 179
PHAULOPSIS Willd. **360**
Phaulopsis imbricata (Forssk.) Sweet **360**
Phaulopsis parviflora Willd. 360
Phleum indicum Houtt. 118
Phlomis aspera Willd. 373
Phlomis biflora Vahl 373
Phlomis cephalotes Koem. Ex Roth 373
Phlomis decemdentata Willd. 374

Phlomis nepetifolia L. 372
Phlomis zeylanica L. 374
PHOENIX L. **52**
Phoenix loureiroi Kunth. **52**
Phoenix sylvestris (L.) Roxb. **52**
PHYLA Lour. **367**
Phyla nodiflora (L.) Greene **367**
PHYLLANTHACEAE **220**
PHYLLANTHUS L. **226**
Phyllanthus amarus Schumach. & Thonn. **226**
Phyllanthus emblica L. **226**
Phyllanthus fraternus G.L. Webster **226**
Phyllanthus niruri auct. non. L. 226
Phyllanthus niruri sensu Hook.f. 226
Phyllanthus quadrangularis J.G. Klein ex Willd. 222
Phyllanthus reticulatus Poir. **227**
Phyllanthus rheedei Wight **227**
Phyllanthus simplex Retz. 227
Phyllanthus urinaria L. **227**
Phyllanthus virgatus G.Forst. **227**
Phyllanthus virosus Roxb. ex Willd. 223
Phyllochlamys spinosa Bureau 195
Phytolacca asiatica L. 195
PILIOSTIGMA Hochst. **165**
Piliostigma malabaricum (Roxb.) Benth. **165**
PIMPINELLA L. **397**
Pimpinella heyneana (DC.) Benth. **397**
Pimpinella monoica Dalz. 397
Pimpinella wallichiana (Miq.) Gandhi **397**
PIPER L. **20**
Piper betle L. **20**
Piper latifolium Hunter 20
Piper longum L. **20**
Piper nigrum L. **21**
PIPERACEAE **20**
PISONIA Plum. ex L. **286**
Pisonia aculeata L. **286**
Pisonia buxifolia Rottb. 294
Pistacia oleosa Lour. 244
PITHECELLOBIUM Mart. **166**
Pithecellobium dulce (Roxb.) Benth. **166**
Pladera decussata Roxb. 311
PLANTAGINACEAE **344**
PLATOSTOMA P. Beauv. **377**
Platostoma hispidum (L.) A.J. Paton **377**
Plecospermum spinosum (Roxb. ex Willd.) Trecul 193
Plectranthus rubicundus D. Don 377
Plectranthus strobiliferus Roxb. 371
Plectronia didyma (Gaertn.) Kurz. 308
Plectronia didyma (Gaertn.) Kurz. var. *umbellate* (Wight) Gamble 308
PLEIOSPERMIUM Swingle **249**
Pleiospermium alatum (Wight & Arn.) Swingle **249**
PLEUROLOBUS J.St.-Hil. **166**
Pleurolobus gangeticus (L.) J.St.-Hil. ex H. Ohashi & K. Ohashi **166**
PLEUROSTYLIA Wight & Arn. **203**
Pleurostylia opposita (Wall. ex Carey) Alston **203**
Pleurostylia wightii Wight & Arn. 203
PLUKENETIA L. **219**
Plukenetia corniculata Sm. **219**
PLUMBAGINACEAE **277**
Plumbago indica L. **277**
Plumbago zeylanica L. **277**
PLUMERIA Tourn. ex L. **323**
Plumeria acuminata W.T. AitOn 323
Plumeria acutifolia Poir. in Lam. 323
Plumeria rubra L. **323**
Poa atrovirens Desf. 105
Poa bifaria Vahl 104
Poa chinensis L. 112
Poa cilianensis All. 105
Poa ciliaris L. 105
Poa japonica Thunb. 106
Poa malabarica L. 102
Poa nutans Retz. 106
Poa pilosa L. 106
Poa riparia Willd. 107
Poa tenella L. 107
Poa unioloides Retz. 107
POACEAE **79**
POGONATHERUM P. Beauv. **118**
Pogonatherum crinitum (Thunb.) Kunth **118**
Pogonatherum paniceum sensu C.E.C. Fisch. 118
POGOSTEMON Desf. **378**
Pogostemon benghalensis (Burm.f.) Kuntze **378**
Pogostemon plectranthoides Desf. 378
Pogostemon quadrifolius (Benth.) Kuntze **378**
Pogostemon stellatus (Lour.) Kuntze **378**
Pollinia argentea Trin. 119
Pollinia fulva Spreng. 91
Pollinia phaeothrix Hack. 109
POLYALTHIA Blume **24**
Polyalthia cerasoides (Roxb.) Hook.f. & Thomson 23
POLYCARPAEA Lam. **280**
Polycarpaea corymbosa (L.) Lam. **280**
Polydontia ceylanica Wight 183
Polydontia wightianum Blume ex C. Muell. 183
POLYGALA Tourn. ex L. **181**
Polygala arvensis Willd. **181**
Polygala chinensis auct. non. L. 181
POLYGALACEAE **181**
POLYGONACEAE **279**
POLYGONUM L. **280**
Polygonum barbatum L. 279
Polygonum chinense L. 279
Polygonum glabrum Willd. 279
Polygonum indicum Heyne ex Roth 279
Polygonum plebeium R.Br. **280**
POLYTOCA R.Br. **118**
Polytoca barbata (Roxb.) Stapf ex Hook.f. 118
Polytoca gigantea (J. Koenig) Mabb. **118**
POLYTRIAS Hack. **118**
Polytrias indica (Houtt.) Veldkamp **118**
POMATOCALPA Breda **44**
Pomatocalpa mannii J.J.Sm. 46
Pomatocalpa spicatum Breda **44**
PONGAMIA Adans. **166**
Pongamia glabra Vent. 166
Pongamia pinnata (L.) Pierre **166**
PONTEDERIA L. **57**
Pontederia crassipes Mart. **57**
Pontederia vaginalis Burm.f. **57**
PONTEDERIACEAE **57**
Portulaca cuneifolia Vahl 288
Pothos decursivus Roxb. 30
POUZOLZIA Gaudich. **197**
Pouzolzia indica Gaud. 197
Pouzolzia zeylanica (L.) Benn. **197**
PREMNA L. **378**
Premna latifolia Roxb. 378
Premna latifolia var. *mollissima* (Roth) C.B. Clarke 379
Premna mollissima Roth **378**
Premna tomentosa Willd. **379**
PRIMULACEAE **295**
PROSOPIS L. **167**
Prosopis chilensis auct. Pullaiah & Chennaiah 167
Prosopis cineraria (L.) Druce **167**
Prosopis juliflora (Sw.) DC. **167**

Prosopis spicigera L. 167
PROTEACEAE **130**
PROTIUM Burm.f. **239**
Protium caudatum Wight & Arn. 239
Protium serratum (Wall. ex Colebr.) Engl. **239**
PRUNUS L. **183**
Prunus ceylanica (Wight) Miq. **183**
PSEUDANTHISTIRIA (Hack.) Hook.f. **119**
Pseudanthistiria umbellata (Hack.) Hook.f. **119**
PSEUDARTHRIA Wight & Arn. **167**
Pseudarthria viscida (L.) Wight & Arn. **167**
PSEUDOPOGONATHERUM A. Camus **119**
Pseudopogonatherum trispicatum (Schult.) Ohwi **119**
PSEUDORAPHIS Griff. ex Pilg. **119**
Pseudoraphis aspera (Koen.) Pilg. 119
Pseudoraphis spinescens (R.Br.) Vickery **119**
Psoralea corylifolia L. 151
PSYDRAX Gaertn. **308**
Psydrax dicoccos Gaertn. **308**
Psydrax umbellatus (Wight) Bridson **308**
PTEROCARPUS Jacq. **168**
Pterocarpus marsupium Roxb. **168**
PTEROLOBIUM R.Br. ex Wight &Arn. **168**
Pterolobium hexapetalum (Roth) Santapau & Wagh **168**
Pterolobium indicum A. Rich. 168
PTEROSPERMUM Schreb. **265**
Pterospermum acerifolium (L.) Willd. **265**
Pterospermum heyneanum wall. ex Wight & Arn. 265
Pterospermum xylocarpum (Gaertn.) Oken **265**
PUERARIA DC. **168**
Pueraria tuberosa (Roxb. ex Willd.) DC **168**
PUPALIA Juss. **284**
Pupalia atropurpurea (Lam.) Moq. 284
Pupalia lappacea (L.) Juss. **284**
Pycreus flavidus (Retz.) T. Koyama 68
Pycreus odoratus Urban. 71
Pycreus polystachyos **(**Rottb.) P. Beauv. 71
Pycreus sanguinolentus (Vahl) Nees ex C.B. Clarke 73
Quamoclit phoenicea (Roxb.) Choisy 334
RADERMACHERA Zoll. & Moritzi **365**
Radermachera xylocarpa (Roxb.) K. Schum. **365**
Randeletia asiatica L. 310
Randia brandisii Gamble 298
Randia dumetorum (Retz.) Poir. var. *floribunda* (DC.) Gamble 298
Randia malabarica Lam. 298
Randia tomentosa (Blume ex DC.) Hook.f. 298
Randia uliginosa (Retz.) DC. 310
RANUNCULACEAE **130**
RAUVOLFIA Plum. ex L. **324**
Rauvolfia canescens L. 324
Rauvolfia serpentina (L.) Benth. ex Kurz **324**
Rauvolfia tetraphylla L. **324**
Reichardia decapetala Roth 143
Reichardia hexapetala Roth 168
REMUSATIA Schott **30**
Remusatia vivipara (Roxb.) Schott **30**
RHAMNACEAE **183**
Rhamnus jujuba L. 185
Rhamnus myrtina Burm.f. 184
Rhamnus oenoplia L. 185
Rhamnus vitis-idaea Burm.f. 222
Rhamnus xylopyrus Retz. 185
RHAPHIDOPHORA Hassk. **30**
RHAPHIDOPHORA Hassk. **30**
Rhaphidophora decursiva (Roxb.) Schott **30**
Rhaphidophora eximia Schott 30
RHINACANTHUS Nees **360**
Rhinacanthus communis Nees 360
Rhinacanthus nasutus (L.) Kurz **360**
Rhus paniculata Wall. ex G.Don 242
RHYNCHOSIA Lour. **170**
Rhynchosia minima (L.) DC. **170**
Rhynchosia suaveolens (L.f.) DC. **170**
RIVEA Choisy **336**
Rivea hypocrateriformis (Desr.) Choisy **336**
Robinia sepium Jacq. 157
Rondeletia heynei Roem. & Schult. 311
RORIPPA Scop. **275**
Rorippa indica (L.) Hiern **275**
ROSACEAE **183**
Rostellularia diffusa var. **prostrata** (Roxb. ex C.B. Clarke) J.L. Ellis **362**
Rostellularia prostrata (Roxb. ex C.B. Clarke) R.B. Majumdar 362
ROSTELLULARIA Rchb. **362**
ROTALA L. **233**
Rotala fimbriata Wight **233**
ROTHECA Raf. **379**
Rotheca serrata (L.) Steane & Mabb. **379**
ROTHIA Pers. **170**
Rothia indica (L.) Druce **170**
Rothia trifoliata (Roth) Pers. 170
ROTTBOELLIA L.f. **120**
Rottboellia cochinchinensis (Lour.) Clayton **120**
Rottboellia exaltata L.f. 120
ROTULA Lour. **327**
Rotula aquatica Lour. **327**
RUBIACEAE **295**
RUBUS L. **183**
Rubus ellipticus Sm. **183**
Ruellia antipoda L. 348
Ruellia barlerioides Roth 360
Ruellia fasciculata Retz. 359
Ruellia hirta Vahl 364
Ruellia imbricata Forssk. 360
Ruellia latebrosa Roth 364
RUELLIA Plum. ex L. **362**
Ruellia patula Jacq. **362**
Ruellia prostrata Poir. **362**
RUNGIA Nees **362**
Rungia parviflora (Retz.) Nees var. *pectinata* (L.) C.B. Clarke 363
Rungia pectinata (L.) Nees **363**
Rungia repens (L.) Nees **363**
RUTACEAE **244**
Saccharum spontaneum L. **120**
SACCHARUM L. **120**
Sacciolepis indica (L.) Chase **120**
Sacciolepis interrupta (Willd.) Stapf **121**
SACCIOLEPIS Nash **120**
Saccolabium praemorsum Hook.f. 38
Saccolabium ringens Lindl. 38
Saccolabium wightianum Hook.f. 68
Saccopetalum tomentosum (Roxb.) Hook.f. & Thomson 24
Sagittaria obtusifolia L. 30
SALICACEAE **209**
SALOMONIA Lour. **181**
Salomonia cantoniensis Lour. **181**
Salomonia cantoniensis var. *edentula* (DC.) Gagnep. 181
Salomonia edentula DC. 181
SALVADORACEAE **270**
Sansevieria roxburghiana Schult.f. 50
Sansevieria zeylanica Roxb. 50
SANTALACEAE **276**
SAPINDACEAE **242**
Sapindus emarginatus Vahl **243**
Sapindus rubiginosus Roxb. 243
SAPINDUS Tourn. ex L. **243**
Sapindus trifoliatus sensu Hiern 243
SAPOTACEAE **292**

SARCOCOCCA Lindl. **131**
Sarcococca coriacea (Hook.) Sweet **131**
Sarcococca trinervia Wight 131
Sarcostemma brevistigma Wight & Arn. 321
Sarcostemma viminale (L.) R.Br. 321
Sauropus compressus Mull. Arg. var. *puberulus* (Kurz) Chakrab. & M. Gangop. 222
Sauropus quadrangularis (J.G. Klein ex Willd.) Mull. Arg. 222
Sauropus rigidus Thwaites 222
Saururus natans L. 32
SCHIZACHYRIUM Nees **121**
Schizachyrium brevifolium (Sw.) Nees ex Buse **121**
SCHLEICHERAWilld. **244**
Schleichera oleosa (Lour.) Merr. **244**
Schleichera trijuga Willd. 244
SCHOENOPLECTIELLA Lye **77**
Schoenoplectiella articulata (L.) Lye **78**
Schoenoplectiella mucronata (L.) J. Jung & H.K. Choi **78**
Schoenoplectiella senegalensis (Steud.) Lye **78**
Schoenoplectus articulatus (L.) Pall 78
Schoenoplectus mucronatus (L.) Palla 78
Schoenoplectus senegalensis (Hochst. ex Steud.) Palla 78
SCHREBERA Roxb. **343**
Schrebera swietenioides Roxb. **343**
Scilla indica Roxb. 50
Scirpus acutangulus Rox. 74
Scirpus aestivalis Retz. 74
Scirpus articulatus L. 78
Scirpus barbatus Rottb. 64
Scirpus bisumbellatus Forssk. 75
Scirpus chinensis Osbeck 66
Scirpus ciliaris L. 77
Scirpus dichotomus L. 75
Scirpus falcatus Vahl 75
Scirpus fistulosus Poir. 74
Scirpus jacobi C.E.C. Fisch. 78
Scirpus lithospermus L. 79
Scirpus mucronatus L. 78
Scirpus neochinensis Tang & F.T. Wang 70
Scirpus polytrichoides Retz. 76
Scirpus quinquangularis Vahl 76
Scirpus schoenoides Retz. 76
Scirpus squarrosus L. 70
Scirpus uncinatus Willd. 70
SCLERIA P.J. Bergius **78**
Scleria chinensis Kunth. var. *biauriculate* C.B. Clarke 79
Scleria cochinchinensis (Lour.) Druce 79
Scleria corymbosa Roxb. **78**
Scleria lithosperma (L.) Sw. **79**
Scleria ridleyi C.B. Clarke 79
Scleria terrestris (L.) Fassett **79**
SCOPARIA L. **347**
Scoparia dulcis L. **347**
Scopolia aculeata Smith 249
SCUTIA (Comm. ex DC.) Brongn. **184**
Scutia indica Brongn. 184
Scutia myrtina (Burm.f.) Kurz **184**
SEARSIA F.A. Barkley **242**
Searsia paniculata (Wall. ex G.Don) Moffett **242**
Sebastiania chamaelea (L.) Mull. Arg. 219
Sebifera glutinosa Lour. 26
Securinega virosa (Roxb. ex Willd.) Baill. 223
SEMECARPUS L.f. **242**
Semecarpus anacardium L.f. **242**
SENEGALIA Raf. **170**
Senegalia caesia (L.) Maslin **171**
Senegalia chundra (Roxb. ex Rottler) Maslin **171**
Senegalia ferruginea (DC.) Pedley **171**
Senegalia pennata (L.) Maslin **171**
Senegalia torta (Roxb.) Maslin **172**
SENNA Mill. **172**
Senna alata (L.) Roxb. **172**
Senna auriculata (L.) Roxb. **172**
Senna hirsuta (L.) H.S. Irwin & Barneby **173**
Senna occidentalis (L.) Link **173**
Senna tora (L.) Roxb. **173**
Serpicula verticillata L.f. 31
SESAMUM L. **351**
Sesamum indicum L. **351**
Sesamum orientale L. 351
SETARIA P. Beauv. **121**
Setaria flavida (Retz.) Veldkamp **121**
Setaria pallide-fusca (Schumach.) Stapf & C.E. Hubb. 123
Setaria palmifolia (J.Koenig) Stapf **123**
Setaria pumila (Poir.) Roem. & Schult. **123**
Setaria verticillata (L.) P. Beauv. **123**
SHUTERIA Wight & Arn. **173**
Shuteria glabrata Wight & Arn. 173
Shuteria involucrata (Wall.) Wight & Arn. **173**
SIDA L. **265**
Sida acuta Burm.f. **265**
Sida carpinifolia sensu Masters 235
Sida cordata (Burm.f.) Borss. **266**
Sida cordifolia L. **266**
Sida hirta Lam. 255
Sida humillis Cav. 266
Sida indica L. 255
Sida persica Burm.f. 255
Sida rhomboidea Roxb. ex Fleming 266
Sida veronicifolia Lam. 266
Sida rhombifolia L. **266**
Sideroxylon tomentosum Rox. 293
SIMAROUBACEAE **249**
Sisymbrium indicum L. 275
SMILACACEAE **36**
SMILAX L. **36**
Smilax macrophylla Roxb. 36
Smilax zeylanica L. **36**
SMITHIA Aiton **174**
Smithia conferta Sm. **174**
Smithia geminiflora Roth 174
SOHMAEA H. Ohashi & K. Ohashi **174**
Sohmaea laxiflora (DC.) H. Ohashi & K. Ohashi **174**
Sohmaea zonata (Miq.) H. Ohashi & K. Ohashi **174**
SOLANACEAE **336**
Solandra lobata Murr. 261
SOLANUM L. **339**
Solanum americanum Mill. **339**
Solanum anguivi Lam. **340**
Solanum coagulans Forssk. 340
Solanum erianthum D. Don **340**
Solanum incanum L. **340**
Solanum indicum auct. non L. 340
Solanum melongena L. var. *incanum* (L.) Kuntze 340
Solanum nigrum L. 339
Solanum pubescens Willd. **340**
Solanum rude-pannum Dunal 340
Solanum torvum Sw. **340**
Solanum verbascifolium auct. non L.; C.B. Clarke 340
Solanum virginianum L. **341**
Solanum xanthocarpum Schrad & Wendl. 341
SOLENA Lour. **200**
Solena amplexicaulis (Lam.) Gandhi **200**
SONCHUS L. **393**
Sonchus oleraceus L. **393**
Sopubia delphiniifolia (L.) G.Don 382
SORGHUM Moench **123**
Sorghum halepense (L.) Pers. **123**

Sorghum miliaceum (Roxb.) Sw. 124
SOYMIDA A.Juss. **253**
Soymida febrifuga (Roxb.) A. Juss. **253**
Spathodea falcata Wall. ex DC. 365
SPERMACOCE L. **309**
Spermacoce stricta L.f. 309
Spermacoce articularis L.f. **309**
Spermacoce assurgens Ruiz & Pavon 309
Spermacoce hirta L. 302
Spermacoce ocymoides Burm.f. **309**
Spermacoce pusilla Wall. **309**
Spermacoce remota Lam. **309**
Spermacoce sumatrensis Retz. 302
SPERMADICTYON Roxb. **310**
Spermadictyon suaveolens Roxb. **310**
SPHAERANTHUS L. **393**
Sphaeranthus indicus L. **394**
SPHENOCLEA Gaertn. **341**
Sphenoclea zeylanica Gaertn. **341**
SPHENOCLEACEAE **342**
Spilanthes radicans Jacq. 386
Spilanthes uliginosa Sw. 386
SPOROBOLUS R.Br. **124**
Sporobolus diandrus (Retz.) P. Beauv. **124**
Sporobolus indicus (L.) R.Br. 124
Sporobolus piliferus (Trin.) Kunth **124**
Sporobolus wallichii Munro ex Trimen **124**
STACHYTARPHETA Vahl **369**
Stachytarpheta cayennensis (Rich.) Vahl **369**
Stachytarpheta indica sensu C.B. Clarke 369
Stachytarpheta indica var. *jamaicensis* (L.) Trimen 369
Stachytarpheta jamaicensis (L.) Vahl **369**
Stapelia adscendens Roxb. 319
Staphylea indica Burm.f. 135
STAUROGYNE Wall. **363**
Staurogyne glauca Kuntze 363
Staurogyne spatulata (Blume) Koord. **363**
Stegosia cochinchinensis Lour. 120
STEMODIA L. **347**
Stemodia repens Benth. 347
Stemodia verticillata (Mil.) Sprague 347
Stemodia verticillata (Mill.) Hassl. **347**
Stemodia viscosa Roxb. **348**
STEMONA Lour. **35**
Stemona tuberosa Lour. **35**
STEMONACEAE **35**
Stenophyllus barbatus (Rottb.) T. Cooke 64
Stephegyna parvifolia Korth. 303
STERCULIA L. **266**
Sterculia colorata Roxb. 258
Sterculia urens Roxb. **267**
Sterculia villosa Roxb. ex Sm. **267**
STEREOSPERMUM Cham. **366**
Stereospermum angustifolium Haines 366
Stereospermum chelonoides auct. non (L.f.) DC. 366
Stereospermum tetragonum DC. **366**
Stereospermum xylocarpum (Roxb.) Benth. 365
Stratiotes alismoides L. 31
STREBLUS Lour. **193**
Streblus asper Lour. **193**
Streblus taxoides (B.Heyne ex Roth) Kurz. **195**
STRIGA Lour. **382**
Striga angustifolia (D. Don) Saldanha **382**
Striga euphrasioides Benth. 382
Striga gesnerioides (Willd.) Vatke **384**
Striga orobanchoides Benth. 384
STROBILANTHES Blume **363**
Strobilanthes heyneana Nees **363**
Strobilanthes hirta Blume **364**
Strobilanthes pavala J.R.I. Wood **364**
STRYCHNOS L. **316**
Strychnos nux-vomica L. **316**
Strychnos potatorum L.f. **316**
STYLOSANTHES Sw. **175**
Stylosanthes fruticosa (Retz.) Alston **175**
Stylosanthes hamata (L.) Taub. **175**
Stylosanthes mucronata Willd. 175
Swietenia febrifuga Roxb. 253
SYMPHOREMA Roxb. **379**
Symphorema involucratum Roxb. **379**
SYNEDRELLA Gaertn. **394**
Synedrella nodiflora (L.) Gaertn. **394**
Synedrella vialis (Less.) A. Gray 389
SYZYGIUM Gaertn. **236**
Syzygium cumini (L.) Skeels **236**
Syzygium heyneanum (Duthie) Wall. ex Gamble 237
Syzygium jambolanum (Lam.) DC. 236
Syzygium salicifolium (Wight) J.Graham **237**
TACCA J.R. Forst. & G. Forst. **35**
Tacca leontopetaloides (L.) Kuntze **35**
Tacca pinnatifida J.R. Forst. & G. Forst. 35
TALINACEAE **288**
TALINUM Adans. **288**
Talinum cuneifolium (Cahl) Willd. 288
Talinum portulacifolium (Forssk.) Asch. ex Schweinf. **288**
TAMARINDUS L. **175**
Tamarindus indica L. **175**
TAMILNADIA Tirveng. & Sastre **310**
Tamilnadia uliginosa (Retz.) Tirveng. & Sastre **310**
Tanacetum purpureum Buch.-Ham. ex D. Don 388
TARENNA Gaertn. **310**
Tarenna asiatica (L.) Kuntze ex K. Schum. **310**
TECTONA L.f. **380**
Tectona grandis L.f. **380**
Telanthera ficoides var. *versicolor* Lem. 282
TEPHROSIA Pers. **175**
Tephrosia hamiltonii J.R. Drumm. 176
Tephrosia hirta (Buch. -Ham.) Benth. 176
Tephrosia maxima (L.) Pers. **176**
Tephrosia purpurea (L.) Pers. **176**
Tephrosia purpurea (L.) Pers. var. *maxima* (L.) Baker 176
Tephrosia strigosa (Dalzell) Santapau & Maheshw. **176**
Tephrosia tenuis Wall. ex Dalzell & A. Gibson 176
Tephrosia villosa (L.) Pers. **176**
TERAMNUS P. Browne **177**
Terminalia alata B.Heyne ex Roth 231
Teramnus labialis (L.f.) Spreng. **177**
TERMINALIA L. **229**
Terminalia anogeissiana Gere & Boatwr. **229**
Terminalia arjuna (Roxb. ex DC.) Wight & Arn. **229**
Terminalia bellirica (Gaertn.) Roxb. **229**
Terminalia chebula Retz. **231**
Terminalia elliptica Willd. **231**
Terminalia phillyreifolia (Van Heurck & Mull. Arg.) Gere & Boatwr **231**
Terminalia tomentosa (Roxb. ex DC.) Wight & Arn. 231
Tetranthera monopetala Roxb. 27
THEMEDA Forssk. **125**
Themeda laxa (Anderss.) A. Camus **125**
Themeda quadrivalvis (L.) Kuntze **125**
Themeda triandra Forssk. **125**
THESPESIA Sol. ex Correa **267**
Thespesia lampas (Cav.) Dalzell & Gibson 256
Thespesia populnea (L.) Sol. ex Correa **267**
Thevetia nerifolia Juss. ex Stued. 319
Thryocephalon nemorale J.R. Forst. & G. Forst. 70
THUNBERGIA Retz. **364**
Thunbergia fragrans Roxb. **364**

Thunbergia fragrans Roxb. var. *laevis* (Nees) C.B. Clarke 364
Thunbergia laevis Nees 364
Thymus biflorus Buch.-Ham. ex D. Don 375
THYSANOLAENA Nees **126**
Thysanolaena agrostis Nees 126
Thysanolaena latifolia (Roxb. ex Hornem.) Honda **126**
Thysanolaena maxima (Roxb.) Kuntze 126
TILIACORA Colebr. **129**
Tiliacora acuminata (Lam.) Miers **129**
Tiliacora racemosa Colebr. 129
TINOSPORA Miers **129**
Tinospora cordifolia (Willd.) Miers ex Hook.f. & Thomson **129**
Tinospora malabarica (Lam.) Miers 129
Tinospora sinensis (Lour.) Merr. **129**
Toddalia asiatica (L.) Lam. 249
Toluifera cochinchinensis Lour. 241
TORENIA L. **350**
Torenia cordifolia auct non Roxb. 350
Torenia crustacea (L.) Cham. & Schltdl. **350**
Torenia indica C.J. Saldanha **350**
Torenia parviflora Buch.-Ham. ex Benth. 350
Torenia thouarsii (Cham. & Schltdl.) Kuntze **350**
Tradescantia fasciculata B. Heyne ex Roth 56
TRAGIA Plum. ex L. **219**
Tragia cannabina L.f. 219
Tragia chamaelea L. 219
Tragia involucrata L. **219**
Tragia involucrata L. var. *cannabina* (L.f.) Mull. Arg. 219
Tragia plukenetii Radcl.-Sm **219**
TREMA Lour. **186**
Trema orientale (L.) Blume **186**
Trewia nudiflora L. 217
Trewia polycarpa Benth. 217
TRIBULUS L. **136**
Tribulus terrestris L. **136**
Trichilia connaroides (Wight & Arn.) Bentv. 252
Trichilia trijuga Vell. 252
TRICHODESMA R.Br. **329**
Trichodesma indicum R.Br. **329**
TRICHOSANTHES L. **200**
Trichosanthes anguina L. 200
Trichosanthes cucumerina L. **200**
Trichosanthes palmata Roxb. 200
Trichosanthes tricuspidata Lour. **200**
TRICHURIELLA Bennet **285**
Trichuriella monsoniae (L.f.) Bennet **285**
TRIDAX L. **394**
Tridax procumbens (L.) L. **394**
TRIGASTROTHECA F. Muell. **287**
Trigastrotheca pentaphylla (L.) Thulin **287**
Trigonella indica L. 170
Triopteris indica Willd. 207
TRIPOGON Roem. & Schult. **126**
Tripogon capillatus Jaub. & Spach **126**
TRITAXIS Baill. **220**
Tritaxis glabella (Thwaites) R.Y. Yu & Welzen **220**
TRIUMFETTA Plum. ex L. **268**
Triumfetta bogotensis DC. **268**
Triumfetta neglecta Wight & Arn. 268
Triumfetta pentandra A. Rich **268**
Triumfetta pilosa Roth 268
Triumfetta rhomboidea Jacq. **268**
Triumfetta rotundifolia Lam. **268**
Trophis spinosa Roxb. ex Willd. 193
Trophis taxoides B. Heyne ex Roth 194
Tylophora fasciculata Buch.-Ham. ex Wight 324
ULMACEAE **186**
Ulmus integrifolia Roxb. 186
URARIA Desv. **177**
Uraria lagopodioides (L.) DC. **177**
URENA Dill. ex L. **269**
Urena lobata L. **269**
Urginea coromandeliana (Roxb.) Hook.f. 50
Urginea wightiana Hook.f. 50
UROCHLOA P. Beauv. **126**
Urochloa reptans (L.) Stapf **126**
Urtica interrupta L. 196
Urtica longifolia Burm.f. 196
URTICACEAE **195**
UTRICULARIA L. **366**
Utricularia caerulea L. **366**
Utricularia glochidiata Wight 366
Utricularia orbiculata Wall. 366
Utricularia racemosa Wall. 366
Utricularia striatula Sm. **366**
UVARIA L. **24**
Uvaria cerasoides Roxb. 23
Uvaria hamiltonii Hook.f. & Thomson **24**
Uvaria suberosa Roxb. 24
Uvaria tomentosa Roxb. 24
VACHELLIA Wight & Arn. **177**
Vachellia leucophloea (Roxb.) Maslin **177**
Vachellia nilotica (L.) P.J.H. Hurter & Mabb. **178**
VANDA R.Br. **46**
Vanda parviflora Lindl. 46
Vanda tessellata (Roxb.) Hook. ex G. Don **46**
Vanda testacea (Lindl.) Rchb.f. **46**
Vandellia erecta Benth. 349
Vandellia pyxidaria (L.) Maxim. 349
Vandellia scabra Benth. 350
VANILLA Plum. ex Mill. **46**
Vanilla walkerae Wight **46**
Vanilla wightiana Lindl. 46
Velago xylocarpa Gaertn. 265
Vendellia crustacea (L.) Benth. 350
VENTILAGO Gaertn. **184**
Ventilago calyculata Tul. 184
Ventilago denticulata Willd. **184**
Verbena cayennensis Rich. 369
Verbena jamaicensis L. 369
Verbena nodiflora L. 367
VERBENACEAE **367**
Verbesina acmella L. 387
Verbesina alba L. 391
Verbesina nodiflora L. 394
Verbesina prostrata L. 391
Vernonia albicans DC. 391
Vernonia cinerea (L.) Less. 391
Vetiveria zizanioides Nash 91
VICOA Cass. **394**
Vicoa auriculata Cass. 394
Vicoa indica (L.) DC. **394**
Vigna aconitifolia (Jacq.) Marechal **178**
Vigna mungo (L.) Hepper **178**
Vigna radiata (L.) R. Wilczek **179**
VIGNA Savi **178**
Vigna trilobata (L.) Verdc. **179**
Vilfa pilifera Trin. 124
Vinca pusilla Murray 320
VINCETOXICUM Wolf **324**
Viola enneasperma L. 208
Vincetoxicum fasciculatum Kuntze **324**
Viola suffruticosa L. 208
VIOLACEAE **208**
VISCUM L. **276**
Viscum articulatum Burm.f. **277**
Viscum nepalense Spreng 277
Viscum orientale Willd. **277**

VITACEAE **132**
Vitex altissima L.f. **380**
VITEX L. **380**
Vitex negundo L. **380**
Vitex pinnata L. **381**
Vitex pubescens Vahl 381
Vitis auriculata (Roxb.) Wall. ex Lawson 135
Vitis carnosa (Lam.) Wall. ex Lawson 133
Vitis latifolia Roxb. 132
Vitis linnaei Wight & Arn. 134
Vitis quadrangularis (L.) Wall. ex Wight 134
Vitis repens (Lam.) Wight & Arn. 134
Vitis tomentosa Roth 133
Vitis trifolia L. 133
Volkameria serrata L. 379
Volutarella divaricata Benth. 393
WALTHERIA L. **269**
Waltheria indica L. **269**
Webera corymbosa Willd. 310
WEDELIA Jacq. **395**
Wedelia urticifolia DC. **395**
WENDLANDIA Bartl. ex DC. **310**
Wendlandia exserta (Roxb.) DC. 311
Wendlandia gamblei Cowan **311**
Wendlandia heynei (Roem. & Schult.) Santapau & Merchant **310**
WOODFORDIA Salisb. **233**
Woodfordia floribunda Salisb. 235
Woodfordia fruticosa (L.) Kurz. **235**
WRIGHTIA R.Br. **324**
Wrightia arborea (Dennst.) Mabb. **324**
Wrightia rothii G. Don 326
Wrightia tinctoria (Roxb.) R.Br. subsp. **rothii** (G.Don) Ngan **326**
Wrightia tinctoria B.Heyne ex Roth 326
Wrightia tomentosa Roem. & Schult. 326
XANTOLIS Raf. **292**
Xantolis tomentosa (Roxb.) Raf. **293**
XENOSTEGIA D.F. Austin & Staples **336**
Xenostegia tridentata (L.) Austin & Staples **336**
XIMENIA Plum. ex L. **276**
Ximenia aegyptica L. 136
Ximenia americana L. **276**
XYLIA Benth. **179**
Xylia dolabriformis Benth. 179
Xylia xylocarpa (Roxb.) Taub. **179**
ZANTHOXYLUM L. **249**
Zanthoxylum asiaticum (L.) Appelhans **249**
Zanthoxylum connaroides Wight & Arn. 252
ZINGIBER Mill. **61**
Zingiber cassumunar Roxb. 61
Zingiber purpureum Roscoe **61**
Zingiber roseum (Roxb.) Roscoe **61**
ZINGIBERACEAE **59**
Zizania terrestris L. 79
ZIZIPHUS Mill. **184**
Ziziphus glabrata B. Heyne ex Roth **184**
Ziziphus jujuba (L.) Gaertn. 185
Ziziphus mauritiana Lam. **185**
Ziziphus oenopolia (L.) Mill. **185**
Ziziphus rugosa Lam. **185**
Ziziphus trinervia Roxb. 184
Ziziphus xylopyrus (Retz.) Willd. **185**
ZORNIA J.F. Gmel. **179**
Zornia diphylla auct non (L.) Pers. 179
Zornia gibbosa Span. **179**
ZYGOPHYLLACEAE **136**