

FLORISTIC AND ETHNOBOTANICAL STUDIES OF KULDIHA WILDLIFE SANCTUARY ODISHA



BOTANICAL SURVEY OF INDIA
Ministry of Environment, Forest and Climate Change



2025



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Authors

**R. Saravanan
Sujana K.A.**



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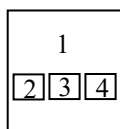
This e-book is a part of the mission to complete quick publication of manuscripts and the research results addressing a portion of the larger prospective on the subject for the projects carried out at Botanical Survey of India. This is for the immediate dissemination of research findings in the public 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.

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Front Cover: 1. Vegetation along water bodies at Kuldiha Wildlife Sanctuary

Back Cover:



1. Vegetation of Kuldiha Wildlife Sanctuary
2. *Erycibe paniculata* Roxb.
3. *Discospermum abnorme* (Korth.) S.J. Ali & Robbr.
4. *Uvaria hamiltonii* Hook.f. & Thomson

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ए.ए. माओ
निदेशक
A. A. Mao
Director



भारत सरकार
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FOREWORD

Protected areas have been considered as Ecologically Sensitive Zones (ESZ) and serve as in-situ conservation sites. Effectively managed protected areas are important tool for safeguarding bio-diversity and for maintaining the functional aspect of the ecosystem. Documenting the floristic inventory and respective uses of biotic elements are necessary to understand the forest ecosystem. The traditional knowledge associated with plants provide important lead for drug discovery and efficacy of the plant-based products.

On these aspects, Botanical Survey of India has completed the floristic and ethnobotanical studies in Kuldiha Wildlife Sanctuary, Odisha during the year 2013-2016. The results of this study have been presented here as an e-book “Floristic and Ethnobotanical studies of Kuldiha Wildlife Sanctuary, Odisha” which include both taxonomic as well as the ethnobotanical information on the plant species available in the sanctuary. Kuldiha Wildlife Sanctuary is located in Balasore district of Odisha which is home to indigenous tribe ‘Santhals’ thus making this publication important to understand the traditional knowledge associated with this tribe.

I believe, this e-book will definitely serve as a reference material for the students, researchers, forest officials and common people in understanding the floristic wealth, its utilization and conservation in our country.

I congratulate the efforts of the authors bringing out this important document.

(A.A. Mao)



PREFACE

Floristic inventories and diversity assessments at different levels worldwide are necessary to understand forest biodiversity. The availability of comparable floristic inventory could help us locate areas for conservation with scarce resources, as uncontrolled anthropogenic activities on forests significantly impact local, regional and global diversity and the health and functioning of natural ecosystems.

Ethnobotanical study has the potential to unearth numerous uses of plants and various aspects of tribal life. The study of ethnobotany can unravel economic possibilities that may lead to new information regarding unexploited natural resources. All this valuable information can be gathered, documented and formed into a database through ethnobotanical explorations. Kuldiha Wildlife Sanctuary (KWLS) lies in the central part of Eastern Ghats. There are scanty floristic or ethnobotanical works carried out in Kuldiha till date. There are few records of floristic or ethnobotanical works from Kuldiha Wildlife Sanctuary.

This book is an outcome of extensive plant explorations carried out in Kuldiha Wildlife Sanctuary by the authors from 2013 to 2016 under the Approved Annual Research Programme of the Botanical Survey of India (BSI). The results of the study are presented in two parts. The first part is Taxonomic evaluation and systematic treatment; the other is Ethnobotanical documentation of folklore traditions of indigenous communities in the area. The systematic enumeration includes keys up to species. Families are arranged as per Bentham & Hooker's System of Classification, but, concerning the delimitation of taxa, some deviations were made to bring it in consonance with the current understanding of the concerned taxa. The best attempt has been made for the accepted and corrected nomenclature according to current taxonomic standards. Genera and species are treated in alphabetical order under the respective families and genera. Ethnobotanical data thus collected are arranged alphabetically according to the botanical names of the plants along with local names, a brief mode of administration and use value. The ethnobotanical data revealed that the Santhal tribes and the natives of this area mostly dwell around this sanctuary.

The authors wish to express their sincere gratitude to Dr. A. A. Mao, Director and Dr. P. Singh, former Director of the Botanical Survey of India for providing the infrastructure and research facilities. Dr. A. Pramanik and Dr. Harish Singh former Head of Office Central Botanical Laboratory, Howrah and all the scientific staff of CBL are thankfully acknowledged. Dr. S.S. Dash and Dr. Dinesh Kumar Agrawala are thanked for their continuous support. The authors are grateful to the officials of the Odisha Forest Department for permission and logistics. The authors thank Village Communities, Medicinal Men, *Vaidhyas*, *Kavirajs* and the local people who depend on Kuldiha Wildlife Sanctuary and also for sharing their knowledge on plants.

**R. Saravanan
Sujana K.A.**

LIST OF ABBREVIATIONS

KWLS	Kuldiha Wildlife Sanctuary
RF	Reserve Forest
UV	Use-value
Rfc	Relative frequency of citation
ICF	Informant Consensus Factor
Ed	Edible
Tim	Timber
Fod	Fodder
Fu	Fuel
Fib	Fibre
Med	Medicine
Mis	Miscellaneous
Fl. & Fr.	Flowering and Fruiting

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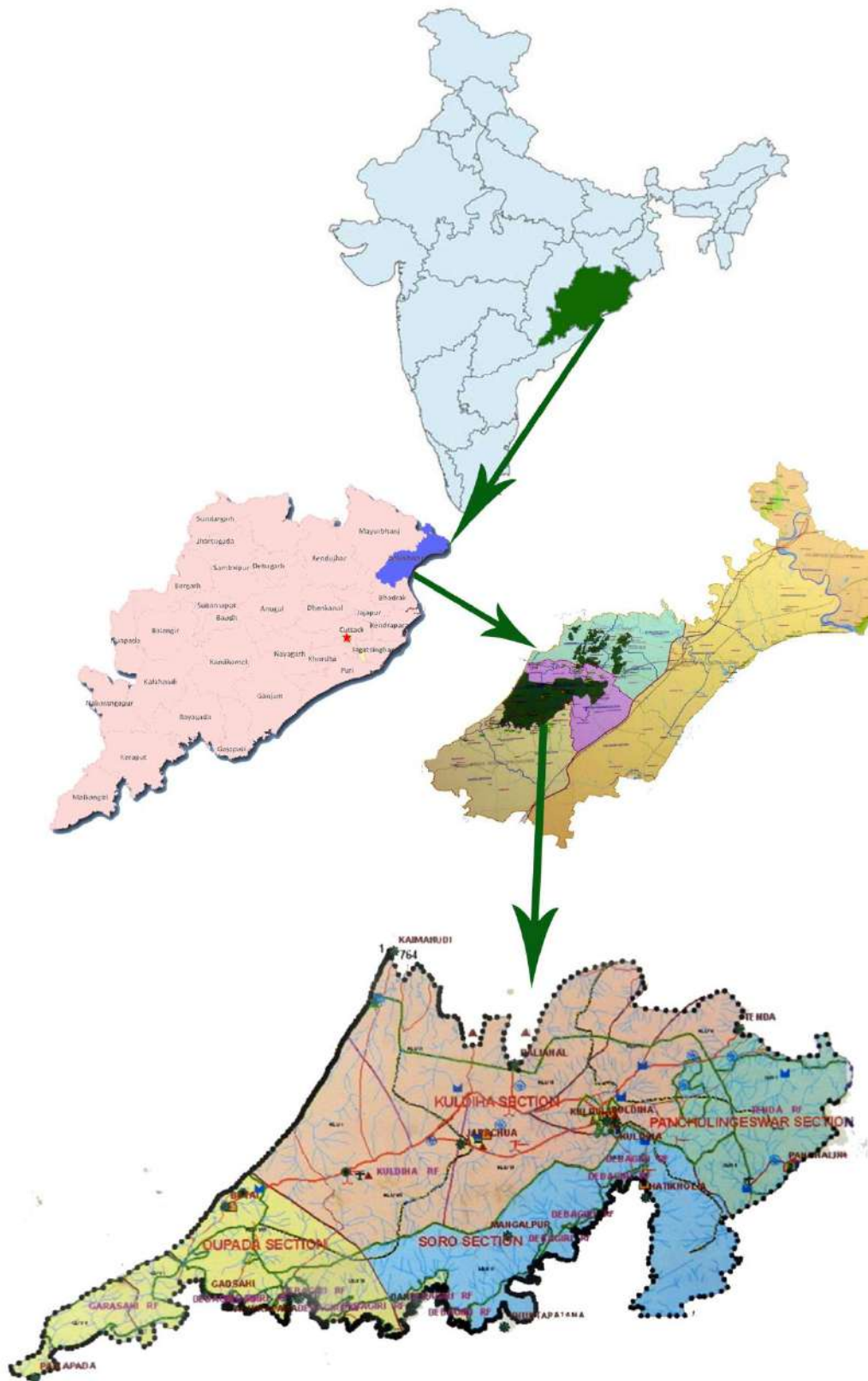


Plate 1: Study Area
Kuldiha Wildlife Sanctuary

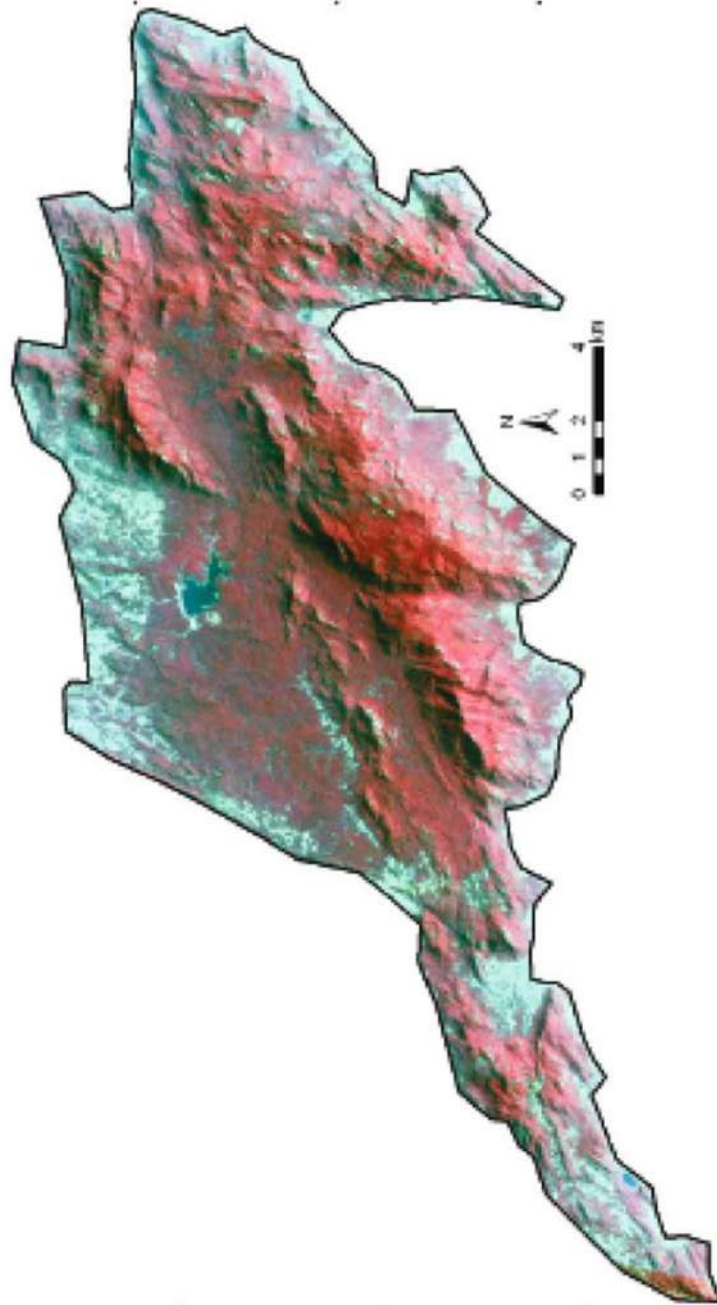


Plate 2: False Colour Composite image of Kuldihia wildlife sanctuary
(Courtesy Dr. C. S. Reddy)

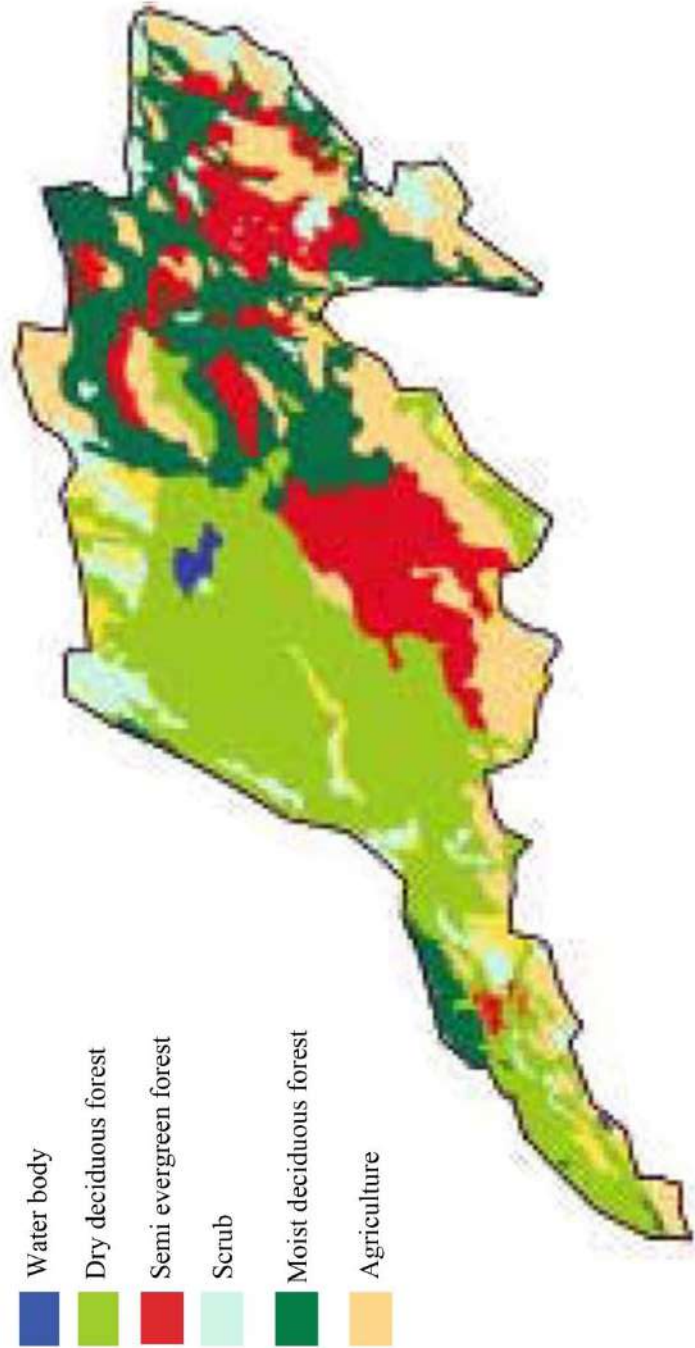


Plate 3: Vegetation types of Kuldiha Wildlife Sanctuary
(Courtesy Dr. C. S. Reddy)



Plate 4: Floristic survey of KWLS

a & b: Collection of plant specimens; c: On field preservation of specimens; d: Laying of plots for ecological studies; e & f: Engaged in ecological studies; g: With the locals of KWLS; h: With forest officials of KWLS.

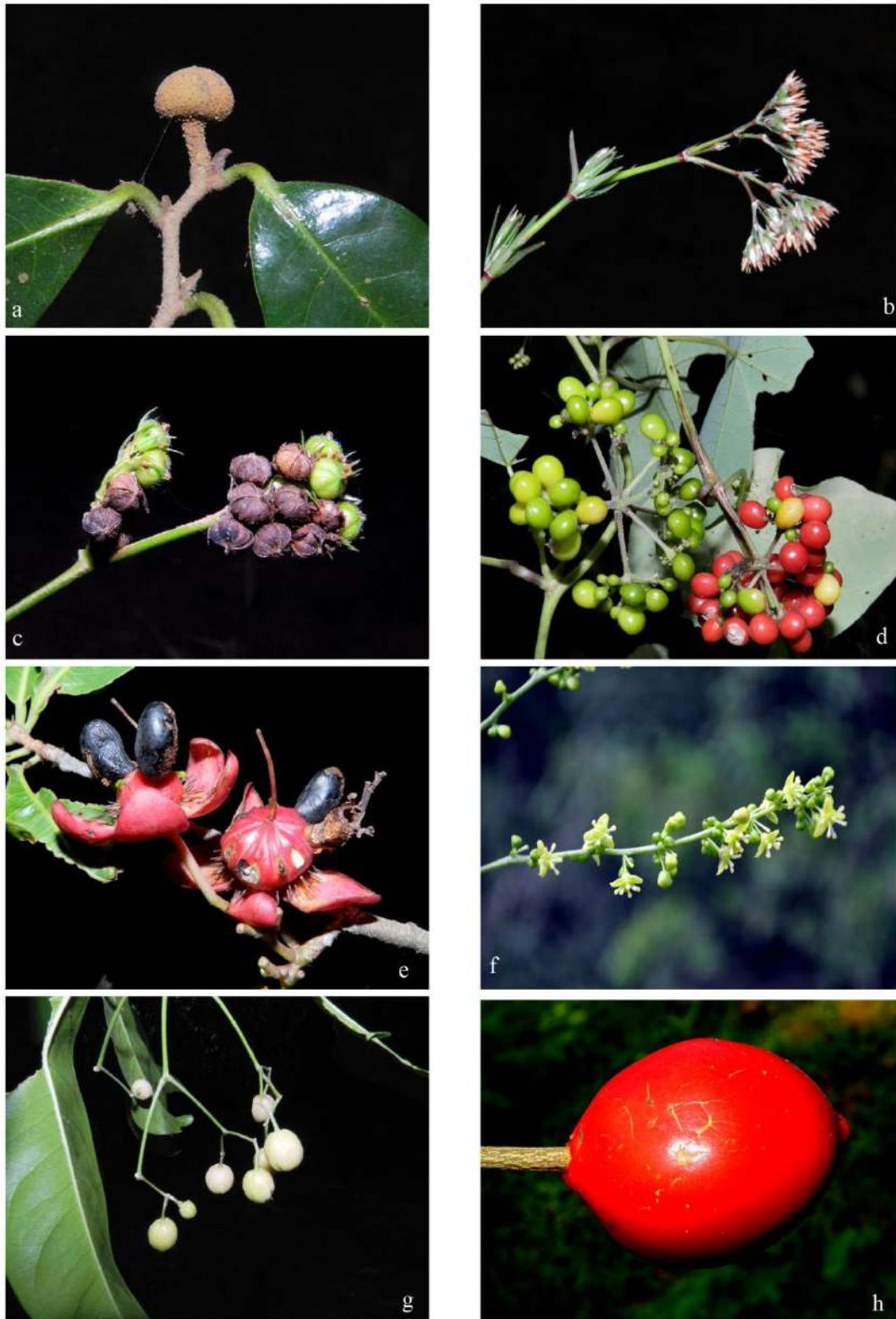


Plate 5: Flora of KWLS

a: *Uvaria eucinata* Bedd. ex Dunn; b: *Polycarpaea corymbosa* (L.) Lam.; c: *Melochia corchorifolia* L.; d: *Cissampelos pareira* L.; e: *Ochna obtusata* DC. ; f: *Tiliacora racemosa* Colebr.; g: *Acronychia pedunculata* (L.) Miq.; h: *Capparis zeylanica* L.

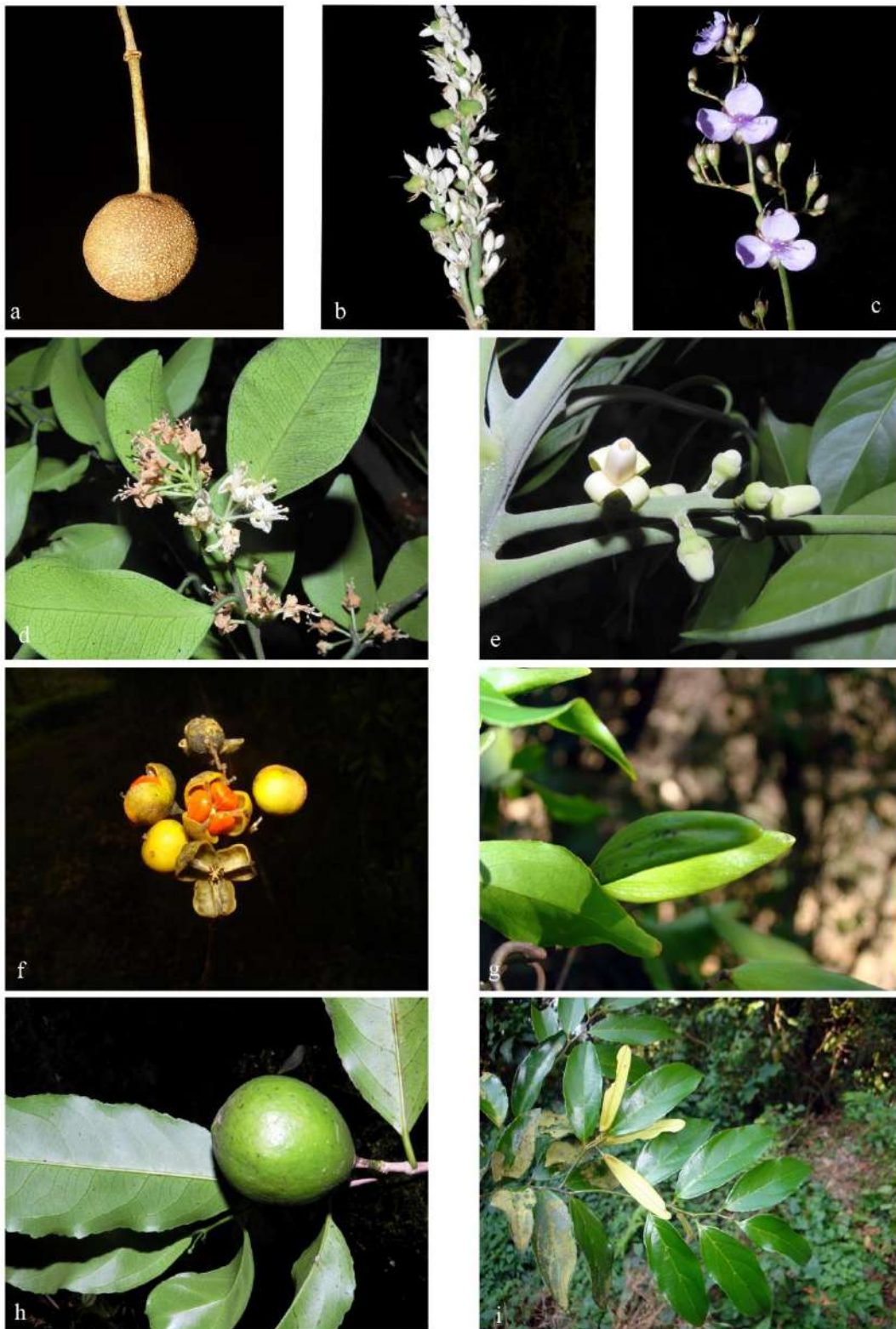


Plate 6: Flora of KWLS

a: *Crateva religiosa* G.Forst.; b: *Chlorophytum arundinaceum* Baker; c: *Murdannia nudiflora* (L.) Brenan; d: *Atalantia monophylla* DC.; e: *Dysoxylum gotadhora* (Buch.-Ham.) Mabb.; f: *Celastrus paniculatus* Willd.; g: *Reissantia indica* (Willd.) N.Halle; h: *Siphonodon celastrineus* Griff.; i: *Ventilago maderaspatana* Gaertn.



Plate 7: Flora of KWLS

a: *Cardiospermum halicacabum* L.; b: *Ceriscoides turgida* (Roxb.) Tirveng.; c: *Smithia sensitiva* Aiton; d: *Melastoma malabathricum* L.; e: *Nothopegia heyneana* Gamble; f: *Acacia leucophloea* (Roxb.) Willd.; g: *Millettia orissae* Panigrahi & S.C.Mishra; h: *Ludwigia hyssopifolia* (G. Don) Exell

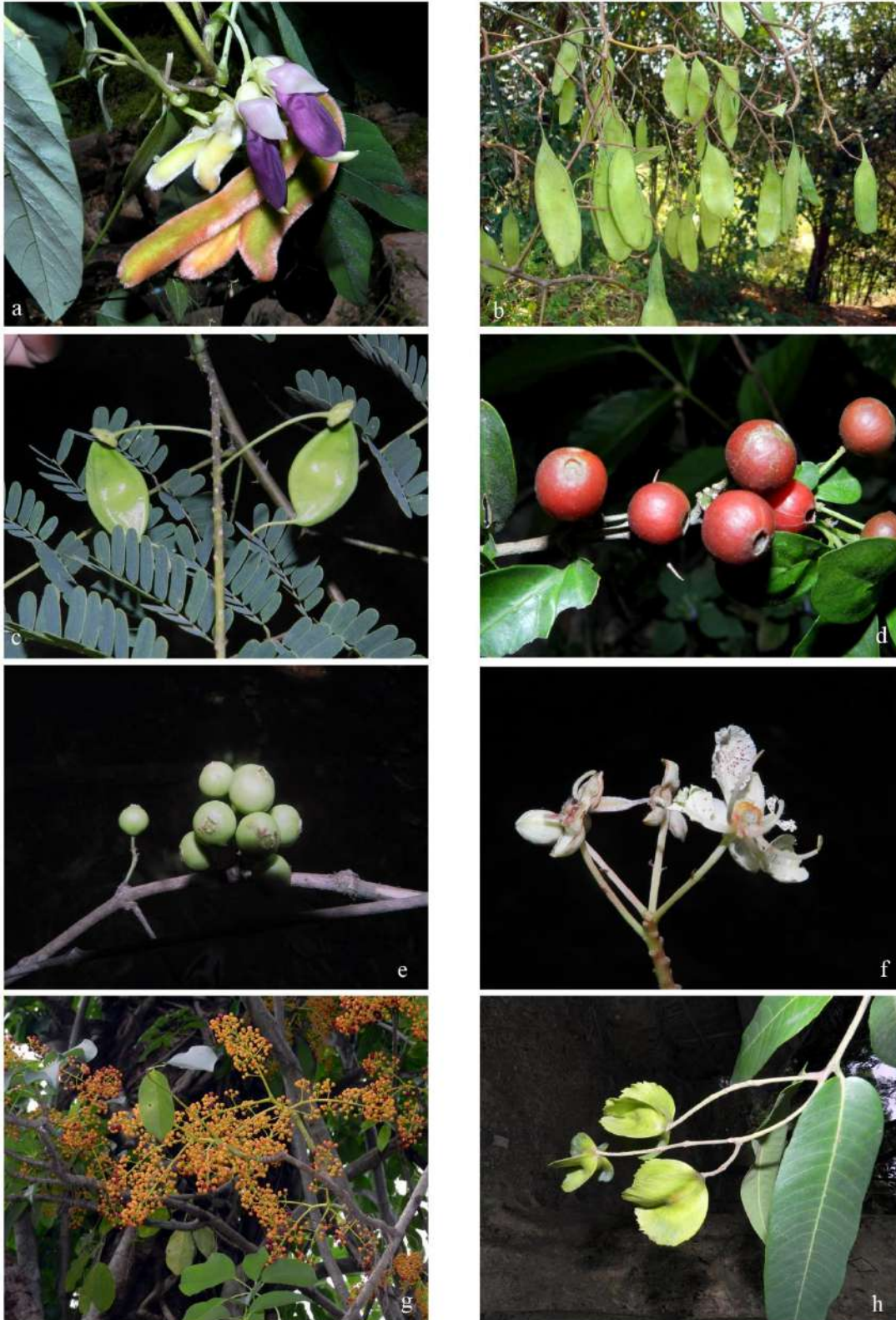


Plate 8: Flora of KWLS

a: *Mucuna pruriens* (L.) DC.; b: *Dalbergia volubilis* Roxb.; c: *Caesalpinia digyna* Rottler;
d: *Canthium glabrum* Blume; e: *Memecylon ovatum* Sm.; f: *Bauhinia semla* Wunderlin; g:
Schefflera stellata (Gaertn.) Baill.; h: *Terminalia alata* Heyne ex Roth

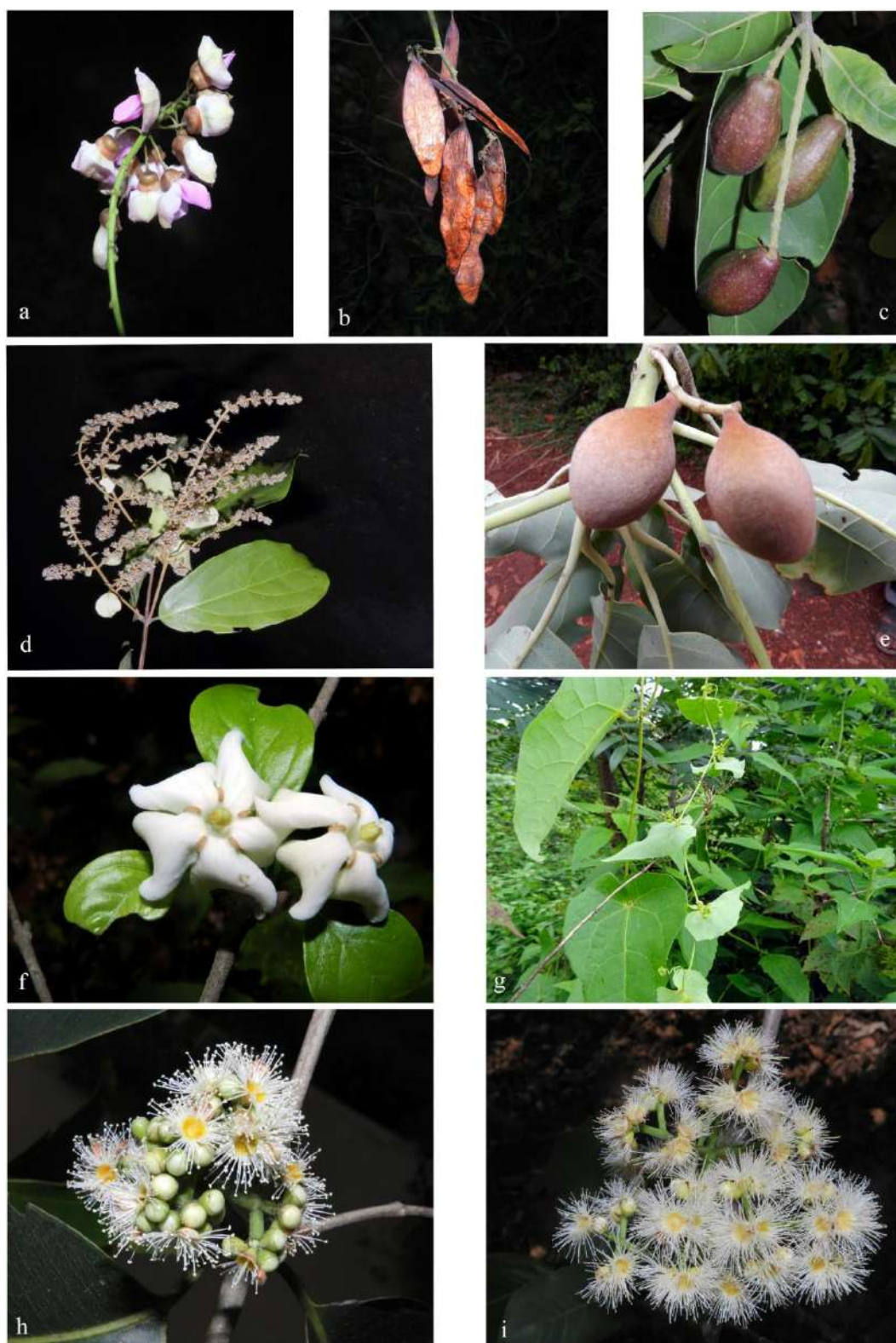


Plate 9: Flora of KWLS

a: *Pongamia pinnata* (L.) Pierre; b: *Dalbergia pinnata* (Lour.) Prain; c: *Terminalia chebula* Retz.; d: *Combretum latifolium* Blume; e: *Terminalia bellirica* (Gaertn.) Roxb.; f: *Catunaregam spinosa* (Thunb.) Tirveng.; g: *Solena amplexicaulis* (Lam.) Gandhi; h: *Syzygium cumini* (L.) Skeels; i: *Syzygium nervosum* A. Cunn. ex DC.

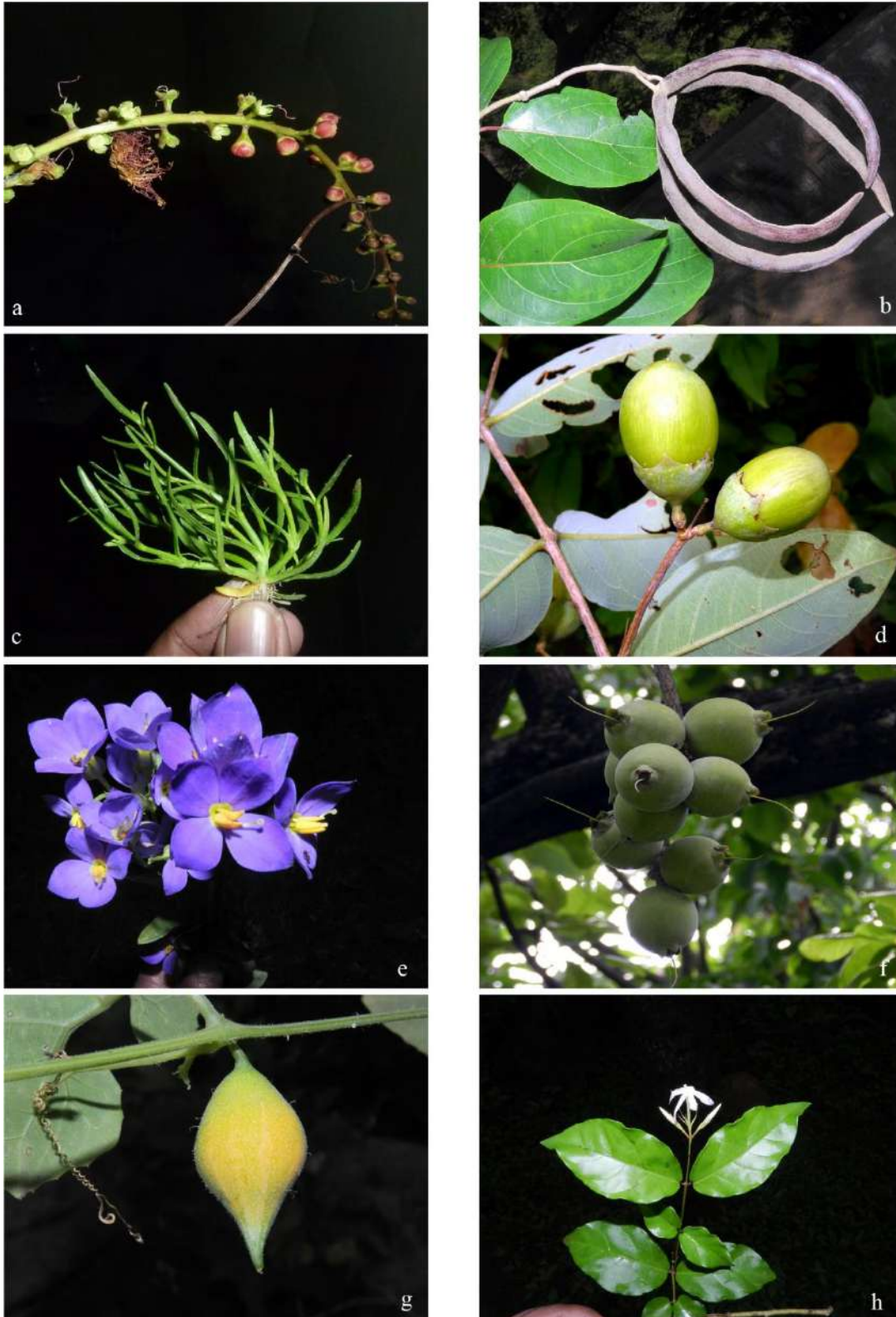


Plate 10: Flora of KWLS

a: *Barringtonia acutangula* (L.) Gaertn.; b: *Aganosma caryophyllata* G.Don; c: *Lindernia tenuifolia* (Colsm.) Alston; d: *Lagerstroemia parviflora* Roxb.; e: *Exacum grande* Klack.; f: *Careya arborea* Roxb.; g: *Trichosanthes cucumerina* L.; h: *Jasminum scandens* (Retz.) Vahl

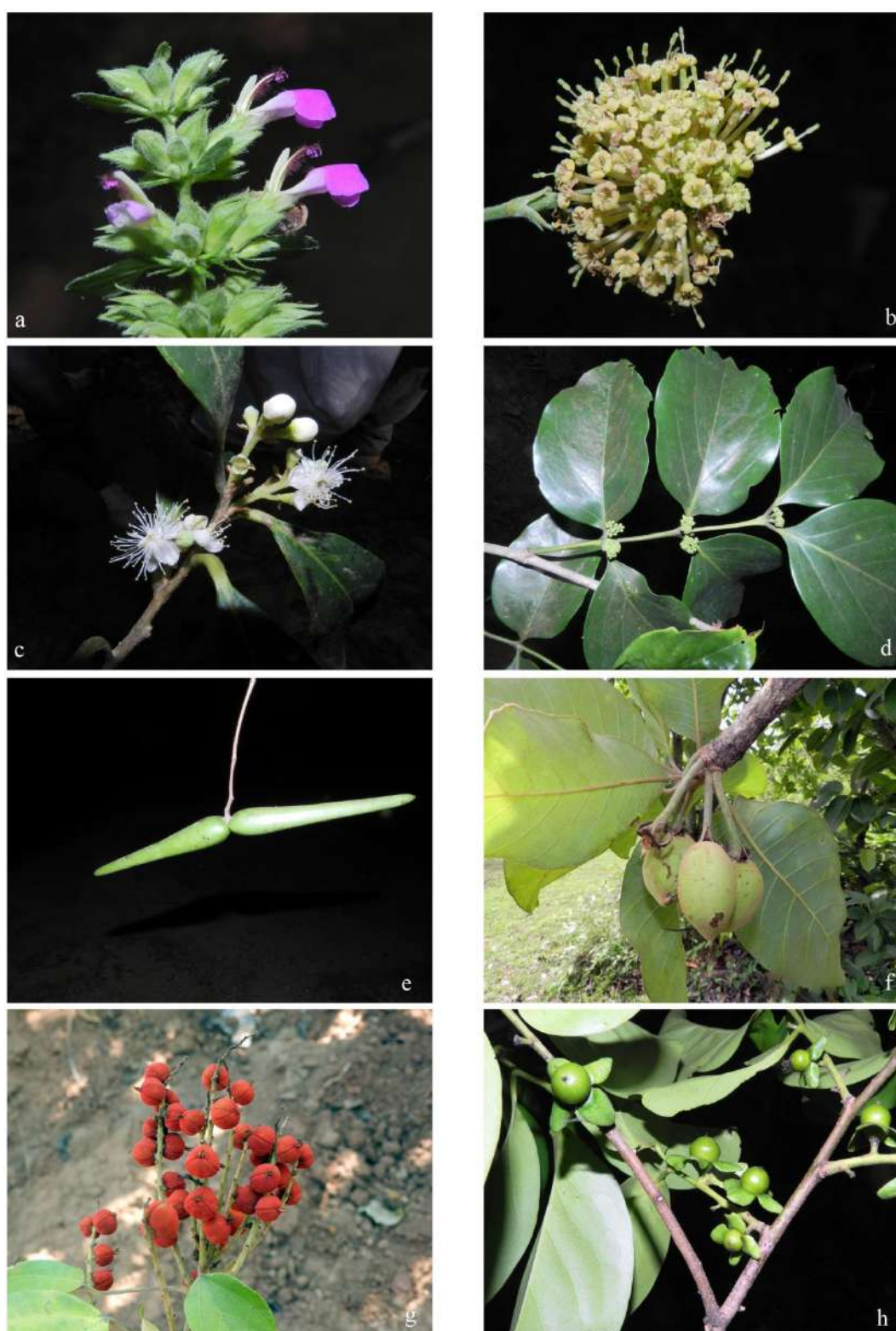


Plate 11: Flora of KWLS

a: *Anisomeles indica* (L.) Kuntze; b: *Uncaria sessilifructus* Roxb.; c: *Suregada multiflora* (A. Juss.) Baill.; d: *Psydrax dicoccos* Gaertn.; e: *Anodendron paniculatum* A. DC.; f: *Madhuca longifolia* (Koenig) Macbr. var. *latifolia* (Roxb.) A. Chev.; g: *Mallotus philippensis* (Lam.) Mull.-Arg.; h: *Diospyros sylvatica* Roxb.



Plate 12: Flora of KWLS

a: *Embelia tsjeriam-cottam* (Roem. & Schult.) A.DC.; b: *Ixora pavetta* Andr.; c: *Blepharis integrifolia* (L.f.) E.Mey. & Drège ex Schinz (Photo Karthik B.); d: *Stemodia viscosa* Roxb.; e: *Eclipta prostrata* (L.) L.; f: *Morinda citrifolia* L.; g: *Meyna spinosa* Roxb. ex Link; h: *Strophanthus wallichii* A.DC..

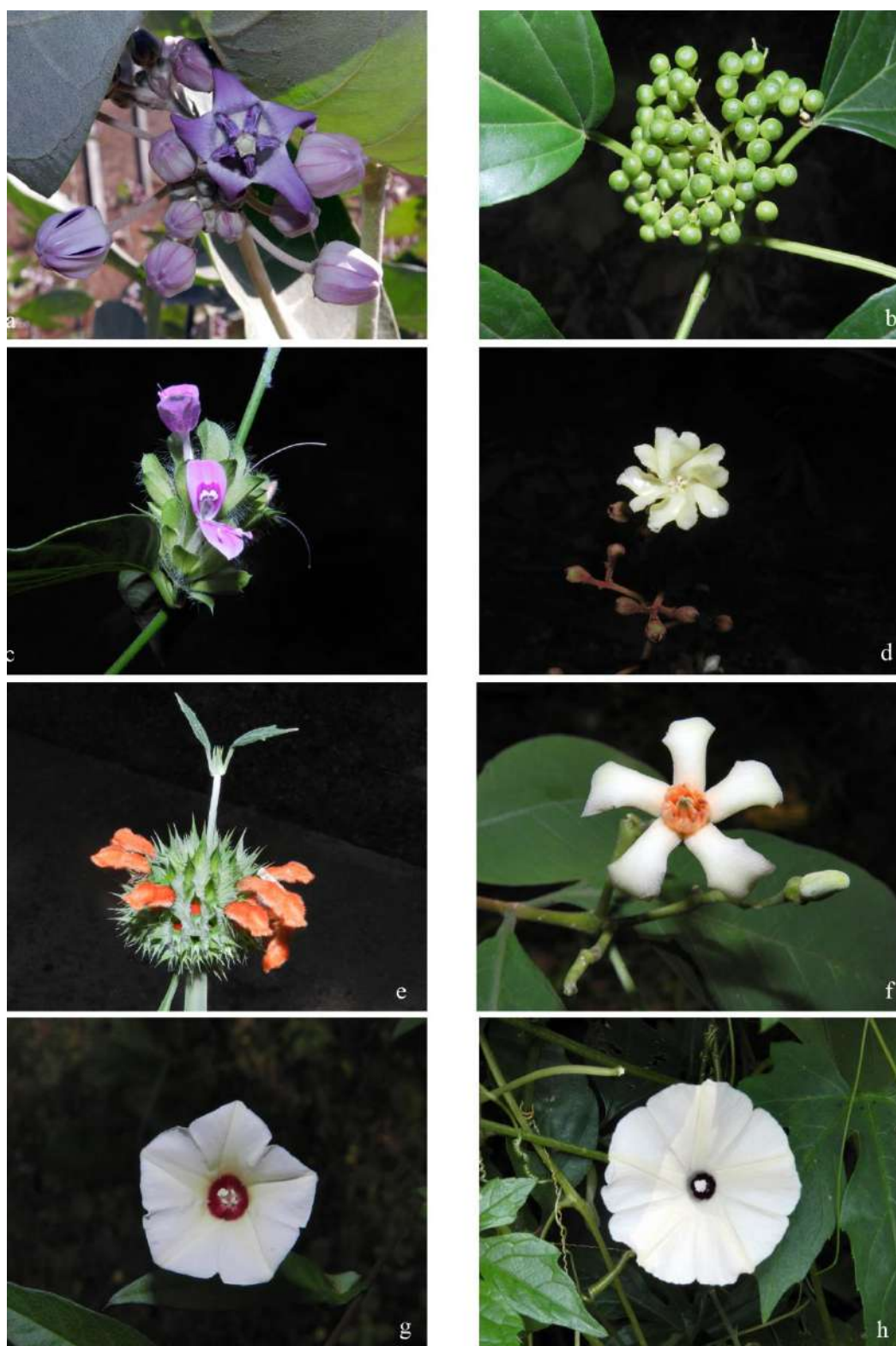


Plate 13: Flora of KWLS

a: *Calotropis gigantea* (L.) Dryand.; b: *Premna mollissima* Roth; c: *Dicliptera foetida* (Forssk.)Blatt.; d: *Erycibe paniculata* Roxb.; e: *Leonotis nepetifolia* (L.) R.Br.; f: *Wrightia arborea* (Dennst.) Mabb.; g: *Merremia tridentata* (L.)Hallier.f.; h: *Merremia umbellata* (L.)Hallier.f.

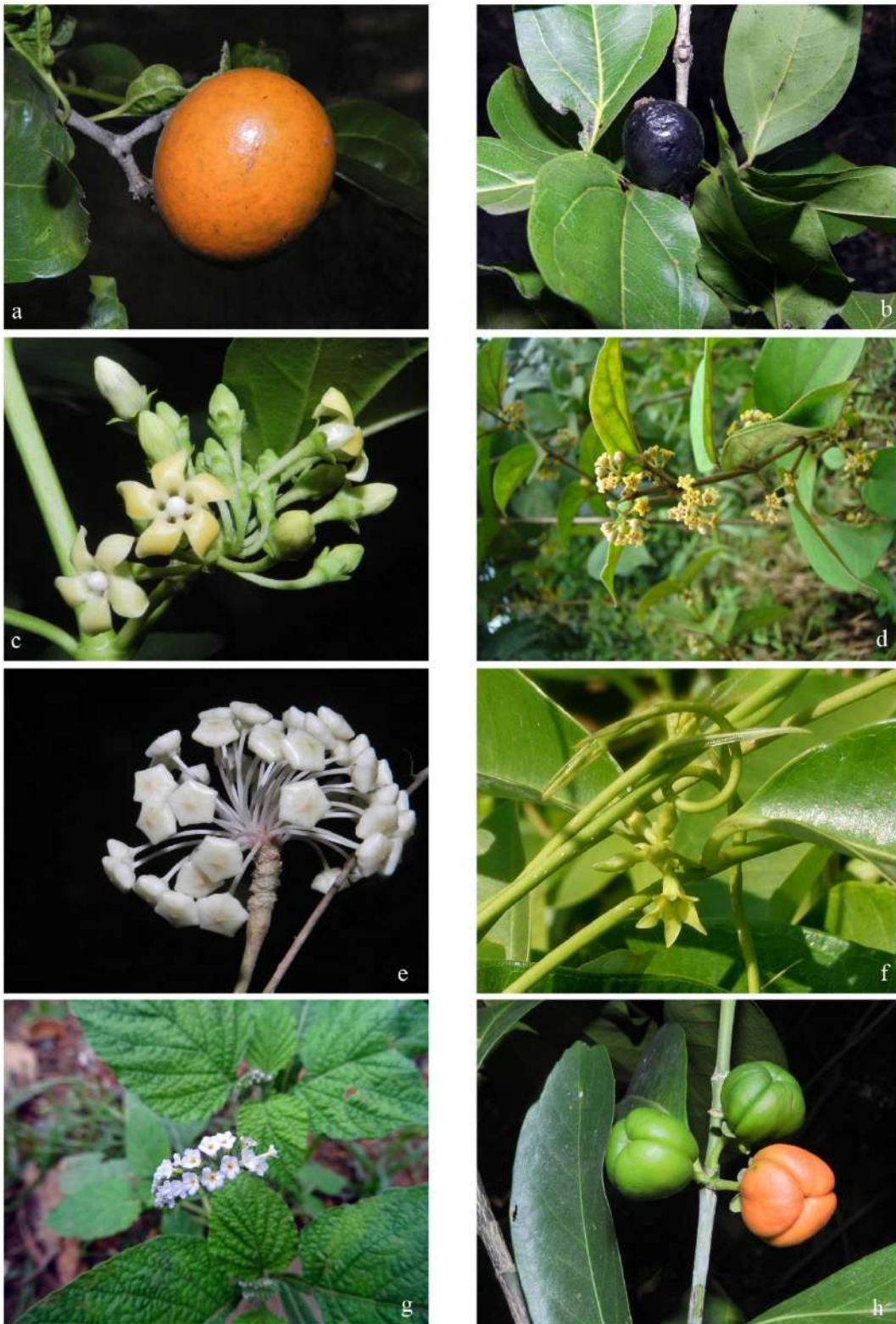


Plate 14: Flora of KWLS

a: *Strychnos mix-vomica* L.; b: *Strychnos potatorum* L.f.; c: *Gymnema montanum* Hook. f.; d: *Gymnema sylvestre* (Retz.) R. Br. ex Sm.; e: *Hoya parasitica* Wall. ex Traill; f: *Cryptolepis dubia* (Burm.f.) M.R.Almeida; g: *Heliotropium indicum* L.; h: *Suregada multiflora* (A. Juss.) Baill.



Plate 15: Flora of KWLS

a: *Breyenia retusa* (Dennst.) Alston; b: *Litsea monopetala* (Roxb.) Pers.; c: *Clerodendrum infortunatum* L.; d: *Aristolochia indica* L.; e: *Leucas biflora* (Vahl) Sm.; f: *Ficus benghalensis* L.; g: *Ficus racemosa* L.; h: *Ficus semicordata* Buch.-Ham. ex Sm.



Plate 16: Flora of KWLS

a: *Macrosolen capitellatus* (Wight & Arn.) Danser; b: *Vitex pinnata* L.; c: *Utricularia caerulea* L.; d: *Lepidagathis incurva* Buch.-Ham.ex D.Don.; e: *Hygrophila ringens* (L.)R. Br. ex Spreng.; f: *Artocarpus gomezianus* Wall. ex Trecul; g: *Cleistanthus collinus* (Roxb.) Benth. ex Hook.f.; h: *Cleistanthus patulus* (Roxb.) Mull.-Arg.



Plate 17: Flora of KWLS

a: *Cosmostigma racemosum* Wight; b: *Glochidion lanceolarium* (Roxb.) Voigt.; c: *Phyllanthus rheedei* Wight; d: *Eranthemum capense* L.; e: *Stereospermum suaveolens* (Roxb.) DC.; f: *Lantana camara* L.; g: *Anisochilus carnosus* (L. f.) Wall; h: *Barleria strigosa* Willd.



Plate 18: Orchids of KWLS

a: *Acampe praemorsa* (Roxb.) Blatt. & McCann; b: *Geodorum densiflorum* (Lam.) Schltr.; c: *Pelatantheria insectifera* (Reichb. f.) Ridley; d: *Rhynchostylis retusa* (L.) Blume; e: *Cymbidium aloifolium* (L.) Sw.; f: *Vanda tessellata* (Roxb.) Hook. ex D. Don; g: *Bulbophyllum careyanum* (Hook.) Spreng.; h: *Nervilia plicata* (Andr.) Schltr.; i: *Dienia ophrydis* (J.Koenig) Seidenf.

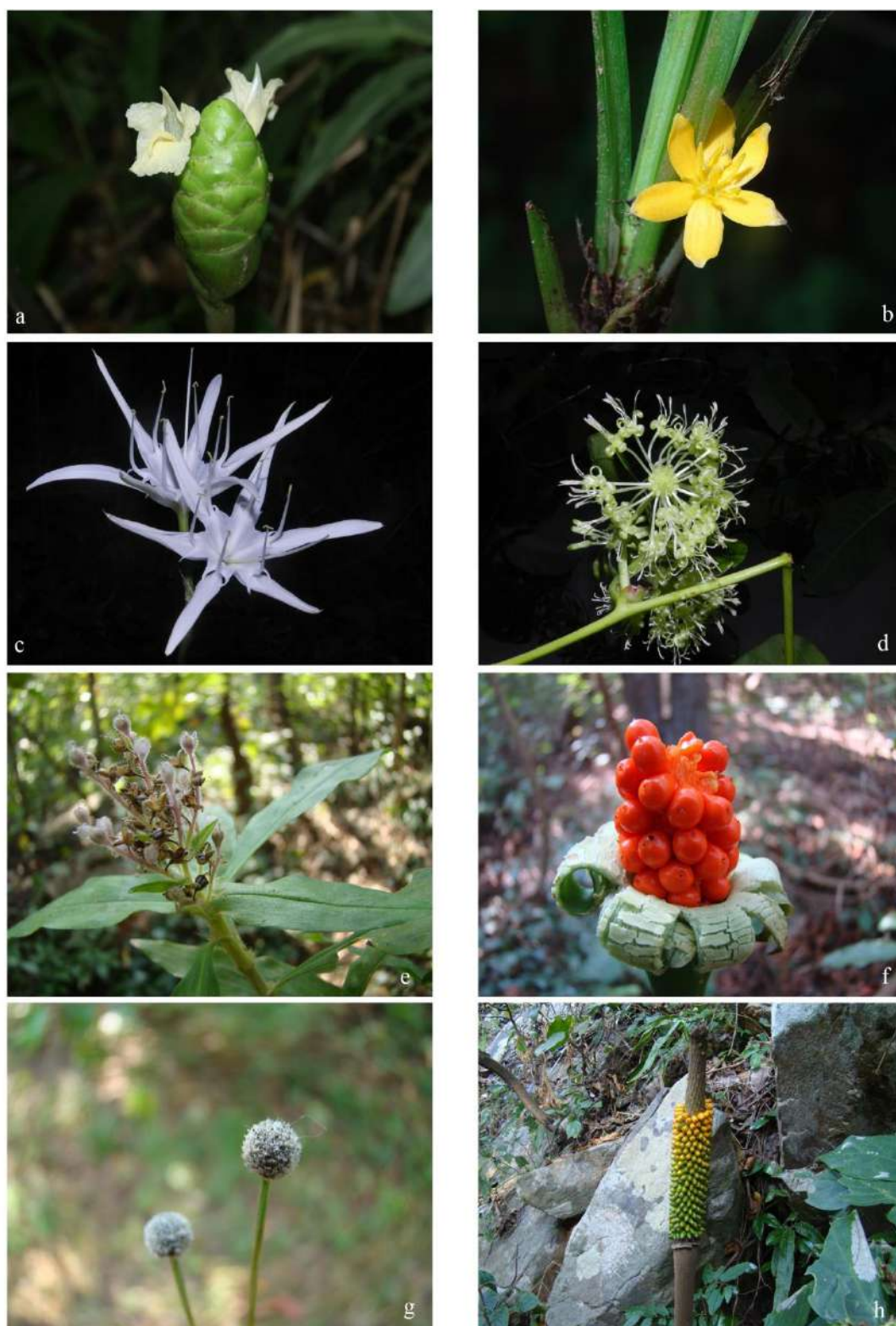


Plate 19: Flora of KWLS (Monocot)

a: *Zingiber zerumbet* (L.) Roscoe ex Sm.; b: *Curculigo orchyioides* Gaertn.; c: *Pancratium triflorum* Roxb.; d: *Smilax zeylanica* L.; e: *Floscopa scandens* Lour.; f: *Alocasia fornicata* (Roxb.) Schott; g: *Eriocaulon quinquangulare* L.; h: *Amorphophallus commutatus* (Schott) Engl.



Plate 20: Grasses and hedges of KWLS

a: *Cyperus compressus* L.; b: *Cyperus tenuispica* Steud.; c: *Cyperus rotundus* L.; d: *Cyperus cyperoides* (L.) Kuntze; e: *Fimbristylis dichotoma* (L.) Vahl; f: *Fimbristylis aestivalis* Vahl; g: *Fimbristylis schoenoides* (Retz.) Vahl; h: *Kyllinga brevifolia* Rottb.; i: *Scleria levis* Retz.; j: *Sporobolus diandrus* (Retz.) P. Beauv.; k: *Desmostachya bipinnata* (L.) Stapf.; l: *Schoenoplectiella articulata* (L.) Lye



Plate 21: Threats of biodiversity at KWLS

a: Clearing of forest for agriculture; b: Cutting of trees for fuel and timber; c: Forest fire; d: Mining; e: Over grazing; f: Tourism affecting biodiversity; g: Waste disposal at natural pond; h: Alteration of vegetation by over growth of invasive species (*Mikania sp.*)



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a: *Shorea robusta* Gaertn.; b: *Firmiana colorata* (Roxb.) R. Br.; c: *Derris scandens* (Roxb.) Benth.; d: *Spatholobus parviflorus* (DC.) Kuntze; e: *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.; f: *Mitragyna parvifolia* (Roxb.) Korth.; g: *Discospermum abnorme* (Korth.) S. J. Ali & Robbr.; h: *Bauhinia vahlii* Wight & Arn.; i: *Getonia floribunda* Roxb.

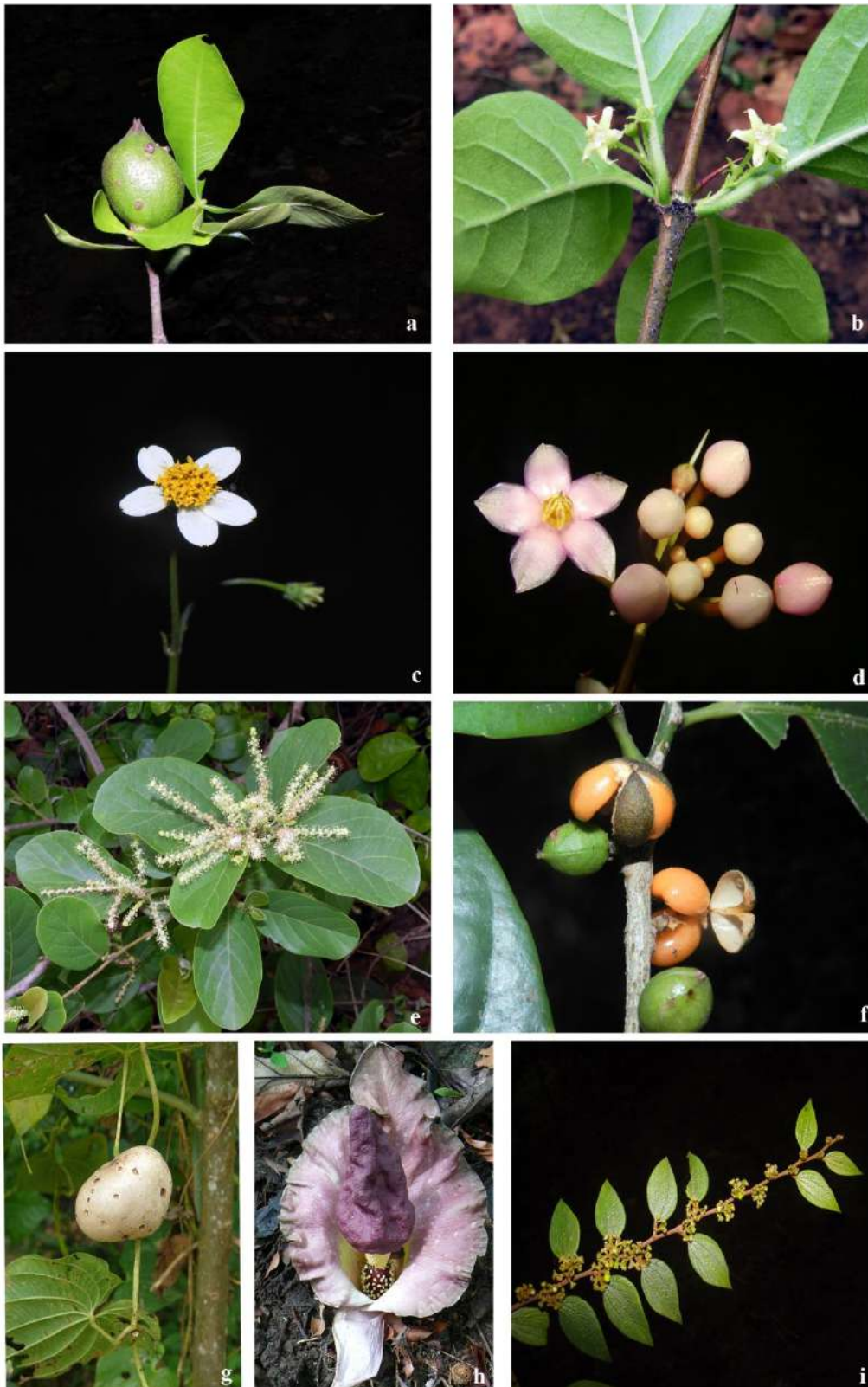


Plate 24: Wild edible plants of KWLS

a: *Gardenia gummiifera* L. f.; b: *Canthium coromandelicum* (Burm. f.) Alston; c: *Bidens pilosa* L.; d: *Ardisia solanacea* (Poir.) Roxb.; e: *Antidesma ghaesembilla* Gaertn.; f: *Aporosa octandra* (Buch.-Ham. ex D. Don) Vickery; g: *Dioscorea bulbifera* L.; h: *Amorphophallus paeoniifolius* (Dennst.) Nicolson; i: *Ziziphus oenoplia* (L.) Mill.

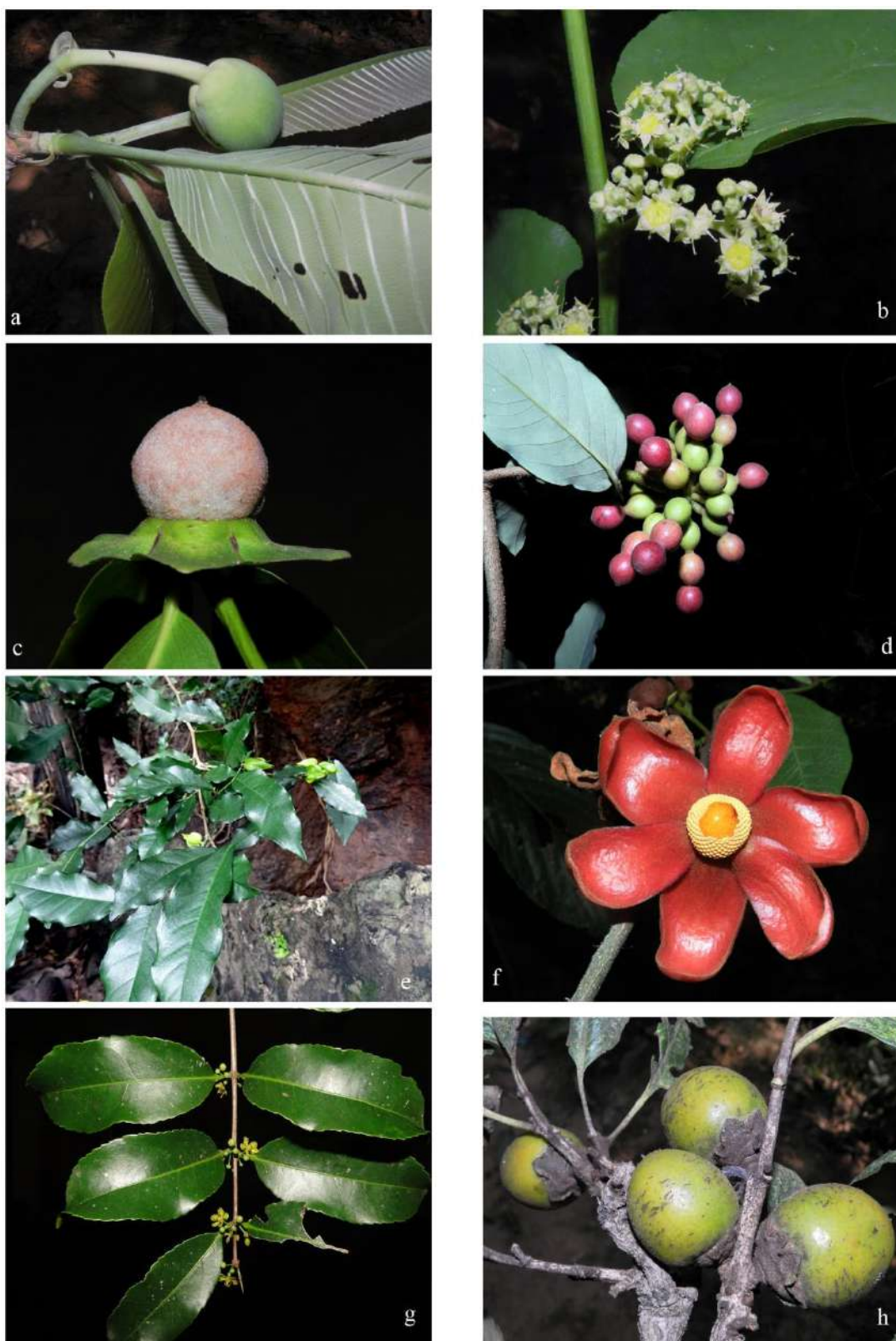


Plate 25: Wild edible plants of KWLS

a: *Dillenia aurea* Sm.; b: *Ziziphus funiculosa* Buch.-Ham. ex Wall; c: *Diospyros malabarica* (Desr.) Kostel.; d: *Desmos chinensis* Lour.; e: *Streblus taxoides* (Roth) Kurz; f: *Uvaria hamiltonii* Hook.f. & Thomson; g: *Salacia chinensis* L.; h: *Diospyros melanoxylon* Roxb.

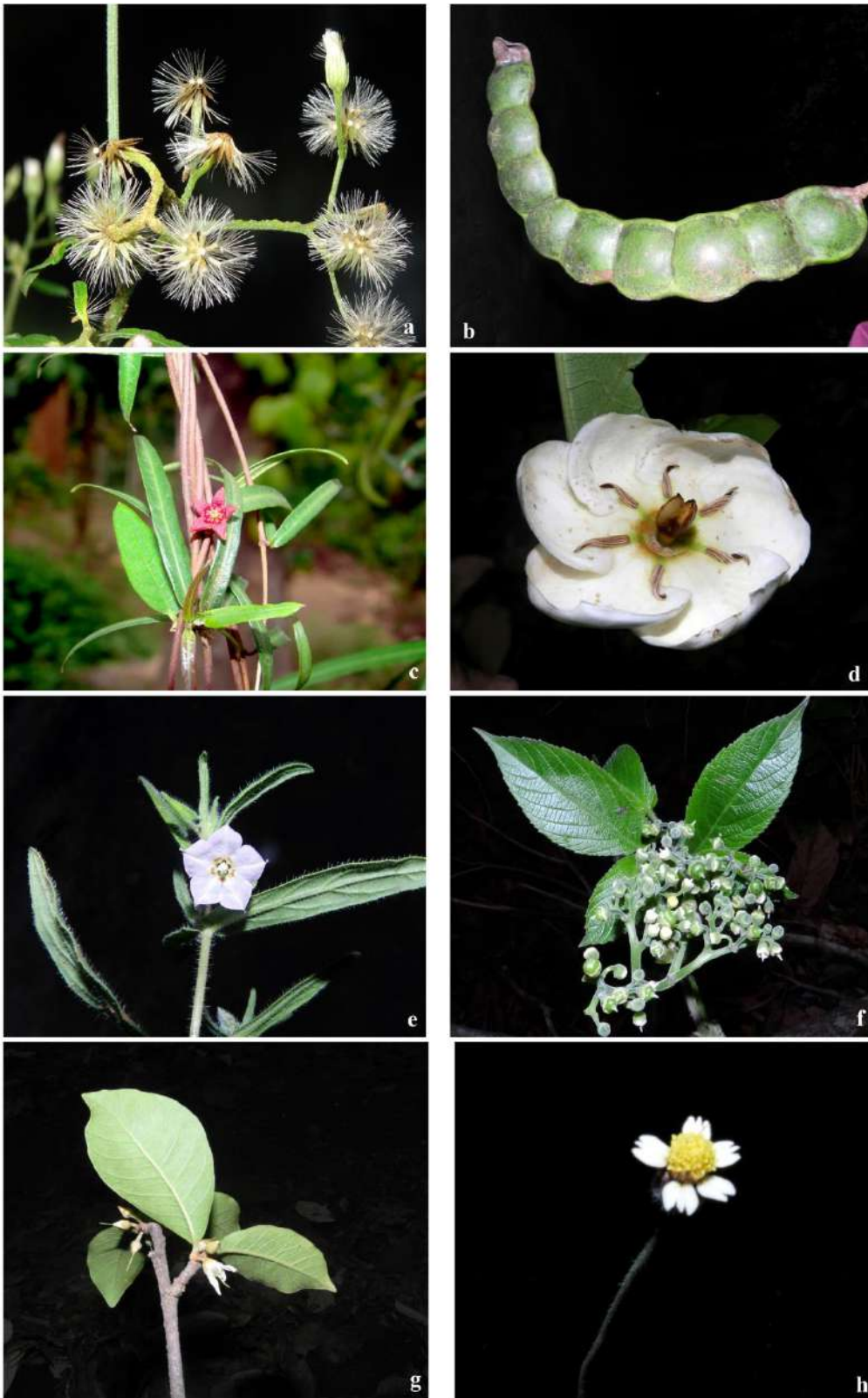


Plate 26: Ethno-medicinal Plants of KWLS

a: *Cyanthillium cinereum* (L.) H. Rob; b: *Entada rheedii* Spreng.; c: *Hemidesmus indicus* (L.) R. Br. ex Schult.; d: *Tamilnadia uliginosa* (Retz.) Tirveng. & Sastre; e: *Trichodesma indicum* (L.) Lehm.; f: *Cayratia pedata* (Lam.) Gagnep.; g: *Xantolis tomentosa* (Roxb.) Raf.; h: *Tridax procumbens* (L.) L.

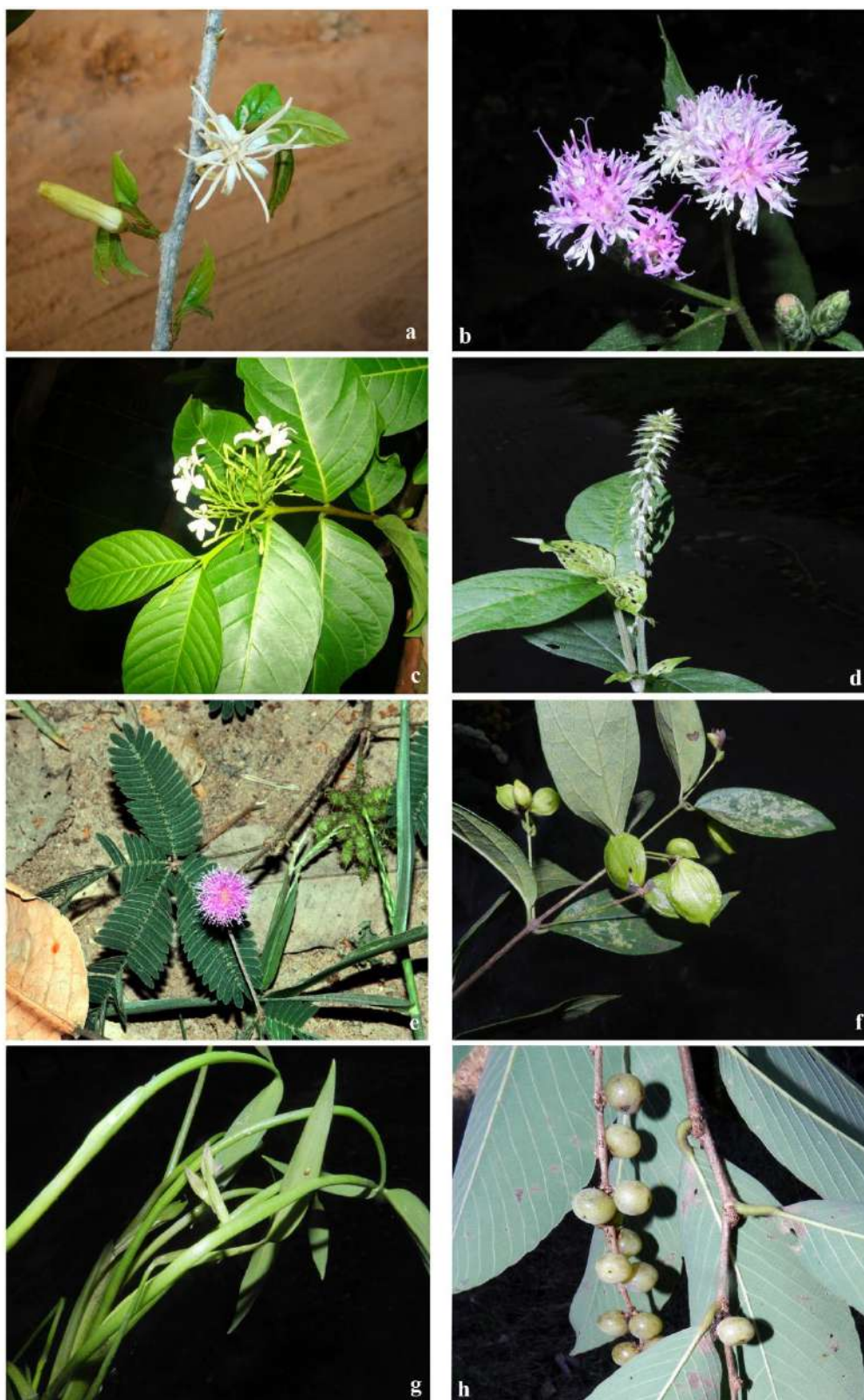


Plate 27: Ethno-medicinal Plants of KWLS

a: *Alangium salviifolium* (L. f.) Wangerin; b: *Baccharoides anthelmintica* (L.) Moench; c: *Holarrhena pubescens* Wall. ex G.Don; d: *Achyranthes aspera* L.; e: *Mimosa pudica* L.; f: *Nyctanthes arbor-tristis* L.; g: *Monochoria vaginalis* (Burm. f.) C.Presl; h: *Bridelia retusa* (L.) A. Juss.

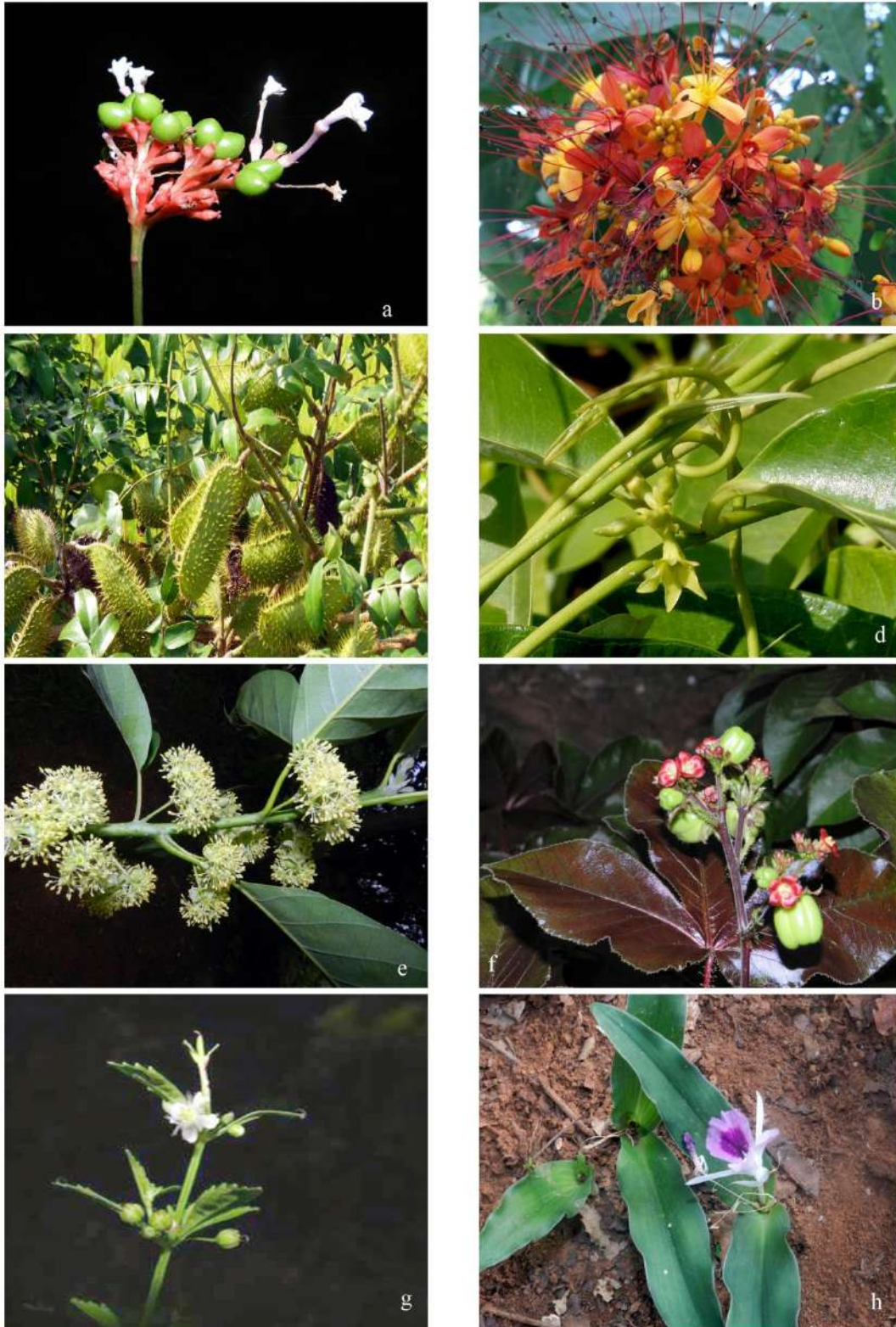


Plate 28: Ethno-medicinal plants of KWLS

a: *Rauvolfia serpentina* (L.) Benth. ex Kurz.; b: *Saraca asoca* (Roxb.) Willd.; c: *Caesalpinia bonduc* (L.) Roxb.; d: *Cryptolepis dubia* (Burm.f.) M.R.Almeida; e: *Litsea glutinosa* (Lour.) C.B.Rob.; f: *Jatropha gossypifolia* L.; g: *Scoparia dulcis* L.; h: *Kaempferia angustifolia* Roscoe

INTRODUCTION

Physiographical nature of, the Indian mainland may be divided into three distinct regions: the Himalaya, the Indo-gangetic plain and the Peninsular India. The flowering plants of India comprise about 15,000 species and represent 6% of the world's known flowering plants. About 400 families and 2250 genera of flowering plants are known to occur in India in different ecosystems from the humid tropic of Western Ghats to the alpine zone of the Himalayas and from mangroves of tidal Sunderban to the dry desert of Rajasthan (Singh & al., 2002). A total of about 4381 endemic species has been recorded from India (Singh & al., 2015).

Floristic inventory is a prerequisite for fundamental research in tropical community ecology and also for understanding species distributions, to establish species diversity modelling studies (Phillips & al., 2003). Conservation of biodiversity is essential for the proper functioning of ecosystems and for the maintenance of the environmental services they provide (Lopez-del-Tora & al., 2009). The importance of diversity-related studies were identified only recently and apart from inventory, disturbance intensity on regeneration (Kennard & al., 2002; Denslow, 1995), phenological assessment (Frankie & al., 1974), comparison of tree species diversity (Pitman & al., 2002), monitoring (Sukumar & al., 1992), species area and species individual relationship (Condit & al., 1996) have been studied by researchers through floristic analysis.

Tropical forest biomes are diverse and include desert, semi-arid savannas, dry forest, open woodlands, rain forest, mountain forest and mangroves (Trochain, 1980). Tropical forest contributes around 69% of earth's biological productivity which is due to the high rate of carbon and nutrient turnover in soil and contains nearly 40% of carbon stored as terrestrial biomass (Dixon & al., 1994). In forest ecosystem, the plant component is more important than the other living component of the system for the determination of its structure and function (Richards, 1996). Raunkier (1934) proposed a life form system for the description of vegetation on physiognomic basis. This system is ecologically oriented and based primarily on the position of perennating organs or buds from which new shoots or foliage developed after an unfavorable season. Anthropogenic activities such as overgrazing, deforestation, bush fires, shifting cultivation, and developmental activities like mining, urbanization and dam and road construction inside protected areas were found to be the major causes of deterioration of biodiversity. Due to the heavy anthropogenic pressure forests are under great and forest biomes require proper monitoring of the ecosystem through biodiversity analysis and utilization and hence the overall biodiversity, productivity and sustainability of the forests can be maintained (Kumar & al., 2002).

There has been an increasing awareness in recent years regarding the importance of germplasm diversity in crop plants and their wild relatives for use in crop improvement through conventional as well as the use of new tools of biotechnology and genetic engineering. Conservation of biological diversity has assumed considerable significance

today as compared to a few decades ago. This has been due to ever increasing human population and depleting natural resources, particularly the plant wealth. Efforts have been made at global level to preserve biodiversity, through in situ and ex situ methods are being directed all over the world to diversify methods and new strategies to achieve genetic conservation. Recently in vitro technology and cryopreservation have received attention to complement the already existing methods such as seed storage in gene bank, maintenance under field conditions, orchards, plantations and botanic gardens (Chandel and Chaudhury, 1990). Hence, germplasm collection and conservation of medicinally important plant taxa stands essential.

Importance of Floristic composition

India covers an area of 324 million square kilometers approximately with varied climatic and geographic conditions. Plants have long been used in treatment of diseases. For their proper utilization of our floristic wealth, it is essential to study to acquire more precise information of their occurrence, exact distribution, frequency and phenology.

Creating floristic inventories and diversity assessments are necessary to understand forest biodiversity. Inventory and diversity studies have been taken up at different levels all over the world to fill the gaps in the biodiversity knowledge. The availability of comparable floristic inventory datasets could help us to locate areas for in situ conservation and to efficiently allocate available scarce resources, as anthropogenic activities on forest lands will have a significant impact on local, regional and global diversity, and the health and functioning of natural ecosystems (Kimmins, 1997).

The Hooker's flora of British India (1875-1897) compiled during the last decade provides the culmination of floristic and taxonomic researches of a team of dedicated scientists. The flora proved a useful tool all these years and accelerated the preparation of many floras like the Flora of Madras Presidency (1915-1936), Flora of Bombay Presidency (1958, Reprinted), Flora of Upper Gangetic Plains (1973, Reprinted) etc. Since taxonomical research have advanced much thereafter, it was necessary to revise the Hooker's flora on modern lines (The Project already launched by the Botanical Survey of India and many floras has been published).

The Flora of Orissa in four volumes by Saxena & Brahmam (1994 – 1996) is the first compilation on the floristic account of the state, following reorganization of 30 district boundaries (then 13 districts). An analysis on floristic diversity and conservation strategy prepared by Botanical Survey of India (Sahoo, et.al, 1999), reveals about 2774 plant species (Angiosperms: 2630, Pteridophytes: 141, Gymnosperms: 3) under 1128 genera and 237 families are available in Odisha. These documents provide a glimpse on vegetation that includes forest, scrubs, grassland as well as on aquatic species. A statistical analysis made on dominant families and genera of state is compared with the status of India. A conspectus of families of flowering plants of state arranged alphabetically providing the number of genera and species. Simlipal (ca 2750 sq km), the only Biosphere Reserve in north, Bhitarkanika (ca

537 sq km), the only National Park in east coast and 19 Wild Life Sanctuaries (ca 5668 sq km) distributed in 15 districts along with Chilka, the largest lagoon in India, located in southern coast are the research field of botanist, naturalist and eco-tourist.

Though there are lot many treaties on Odisha flora not many have been undertaken in Kuldiha Wildlife Sanctuary (KWLS). The most recent study on KWLS using remote sensing technology evaluated a total of 3.9 per cent area was found to posses very high plant richness followed by high (21.2%), medium (42.1%) and low (32.8%) in the sanctuary (Pattanaik & al., 2010). However, a detail floristic account is still lacking. This situation calls for a detailed work on the floristic account of this region. The fringe areas of the sanctuary are more disturbed because most of the small villages which are relocated from sanctuary are settled in those areas.

Study Site

Kuldiha Wildlife Sanctuary (KWLS) designated on 04 Jan. 1984; is situated in the southern part of the district of Balasore of Odisha State, lies between 21° 20' 31" to 21° 29' 08" N latitude and 86° 25' 23" to 86° 44' 50"E longitude. The sanctuary spreads across an area of 272.75 square kilometers. The forests of the region cover the Nato hills and the Sukhupata hills merging with the Similipal National Park. It lies close to Nilagiri forest towards north and Mayurbhanj forest in northwest. Through Gadasahi forests on the south west, Kuldiha have a disjointed link with Baula RF.

Three small rivers, Tangna, Kamala and Usatalnala are the main water sources of the sanctuary. There are two reservoirs in Kuldiha. The Rissia reservoir flows in northwest direction over, discharges into the River Tangana and Sindhua reservoir flows in southeast direction, which discharges to the River Uastal Nala. Rising from 169m above sea level, some prominent hills that form the landscape include Asta Pahar (423m) occupying a Central position; Devgiri Pahar (682m) in south; Ranga matia (629m) in north; Kolia Parbat (495m) in east. KWLS is a house of single village with 7–8 hamlets, 1018 population. 'Santhal' community is the major tribal population in the area.

Floristic analysis

A total of 3.9% area has been shown by geospatial modelling to cover with very high plant richness, followed by high (21%), medium (42%) and low (32.8%) in the sanctuary (Pattanaik & al., 2010). The vegetation in the district ranges from tropical semi-evergreen to dry-deciduous to grasslands with varying species composition. According to Champion and Seth (1968) the forest harbours vegetations characteristic of tropical deciduous forest dominated mostly by *Shorea robusta*, but in particular it is intermediate between dry deciduous and moist peninsular type. Depending on the local micro-climate diversity, species composition and effect of different biotic and edaphic factors, the vegetation of the region can be divided into the subtypes given below.

(a) Tropical Semi Evergreen forests

The semi-evergreen forests are predominant along the stream courses, moist valleys, gorges and waterfalls. This vegetation is recorded at different localities in the sanctuary. The semi-evergreen forest is the climatic climax of the hill complex and is found mostly in undisturbed state. Four distinct storeys are recognised. The main tree components of the top storey are *Artocarpus lakoocha*, *Bridelia retusa*, *Careya arborea*, *Dillenia pentagyna*, *Diospyros malabarica*, *Mangifera indica*, *Mitragyna parvifolia*, *Protium serratum*, *Syzygium cumini*, *Terminalia arjuna* which forms the top canopy. Small sized trees and large shrubs like *Alstonia scholaris*, *Actinodaphne angustifolia*, *Ardisia solanacea*, *Litsea monopetala*, *Macaranga peltata*, *Murraya paniculata*, *Mallotus philippensis*, *Nyctanthes arbor-tristis*, *Ochna obtusata*, and few others form the second storey. The thick growth of climbers and lianas forming the dense netted mass among the trees and shrubs constitute the third storey of which *Butea superba*, *Combretum latifolium*, *Dioscorea bulbifera*, *Dioscorea pubera*, *Millettia racemosa* occur in profusion. The fringes of the swift mountain streams are inhabited by typical association of trees like *Barringtonia acutangula*, *Diospyros malabarica*, *Oroxylon indicum* and *Syzygium cumini*. Along the margins of the water streams the species like *Melastoma malabathricum* with several ferns enhance the beauty of the surroundings. At few places near the foothills, the tree trunks are covered with dense netted growth of *Entada rheedii*, *Butea superba*, and *Uncaria sessilifructus*. The fourth storey is the ground flora which is rich in herbaceous species all through the year. Of these, *Arisaema tortuosum*, *Costus speciosus*, *Elephantopus scaber*, *Lepidagathis incurva* needs special mention. Some of the terrestrial ground orchids like *Dienia ophrydis*, *Geodorum densiflorum*, and *Nervilia plicata* are found in moist and damp places under the shade of trees.

(b) Tropical Dry Deciduous forests

The hill slopes, foothill and greater part of the region are covered with dry deciduous type of vegetation. The lower elevation is predominant with *Shorea robusta*. But it does not occur in pure formation. It occurs in association with other plant species such as *Anogeissus latifolia*, *Bombax ceiba*, *Bridelia retusa*, *Buchanania lanzan*, *Chloroxylon swietenia*, *Dalbergia latifolia*, *Diospyros melanoxylon*, *Gardenia latifolia*, *Haldinia cordifolia*, *Kydia calycina*, *Lannea coromandelica*, *Madhuca latifolia*, *Pterocarpus marsupium*, *Schleichera oleosa*, *Syzygium cumini*, *Terminalia alata*, *Trema orientalis* and *Xylia xylocarpa* constituting the top storey. The small trees and shrubs like *Bauhinia racemosa*, *Cassia fistula*, *Cleistanthus collinus*, *Grewia hirsuta*, *Helicteres isora*, *Holarrhena pubescens*, *Lagerstroemia parviflora*, *Phyllanthus emblica* constitute the intermediate storey. *Asparagus racemosus*, *Bauhinia vahlii*, *Butea superba*, *Celastrus paniculatus*, *Cryptolepis buchananii*, *Dioscorea bulbifera*, *Mucuna pruriens*, *Passiflora foetida*, *Smilax zeylanica*, *Ventilago madraspatana* are some of the notable lianas/climbers/ twidders frequently met with in such localities. The ground cover constitute the under shrubs or herbs of which *Ageratum conyzoides*, *Andrographis paniculata*, *Cassia tora*, *Helicteres isora*, *Justicia adhatoda*, *Mimosa pudica*, *Sida cordata*, *Urena lobata* and several grasses are of profuse occurrence.

The epiphytes like *Vanda tessellata* and parasitic plants like *Viscum articulatum*, *Viscum monoicum* are also abundant in these forests.

(c) Scrub Woodlands

The foot hills, steep slopes and other exposed dry areas are under this type of vegetation. This forest type is derived due to over-exploitation of deciduous forests. Due to severe destruction factors such as cutting and looping, the tree cover has been reduced much and become less dense. The tree species found here are *Cassia fistula*, *Diospyros melanoxylon*, *Phyllanthus emblica*, *Shorea robusta* and *Terminalia alata*. The undergrowth contains shrubby, spiny and unpalatable species such as *Flacourtia indica*, *Holarrhena pubescens*, *Lantana camara*, *Woodfordia fruticosa* and *Ziziphus oenoplia*. On the steep rock slopes plants like *Acacia catechu*, *Cochlospermum religiosum*, *Gardenia latifolia*, *Soymida febrifuga* and *Sterculia urens* are commonly encountered.

(d) Scrub forests

Scrub forest is generally found at the lower elevations especially on pediments and plains adjoining the hill range. This type of vegetation has originated due to human intervention such as forest-fire, practice of shifting cultivation, over grazing by domesticated animals and over exploitation of wild plants. In this forest type, the tree species either have disappeared or of reduced and shrubby stature. Few stunted trees such as *Azadirachta indica*, *Alangium salvifolium*, *Cassia fistula*, *Cleistanthus collinus*, *Diospyros melanoxylon*, *Phyllanthus emblica*, *Shorea robusta*, *Strychnos potatorum* and shrubs like *Clerodendrum infortunatum*, *Flacourtia indica*, *Holarrhena pubescens* and *Lantana camara* are notable in respect of their abundance. *Capparis zeylanica*, *Combretum roxburghii*, *Mucuna pruriens*, *Tragia involucrata* and *Ziziphus oenoplia* are remarkable species among the climbers and stragglers. At few places, the herbaceous cover is completely removed from the surface due to overgrazing and forest-fire.

(e) Grasslands

Several areas in the hill range are covered with grasses and also interspersed with several stunted trees and shrubs. The dominant plant species in these grasslands are *Eragrostis viscosa*, *Eulalia quadrinervis*, *Oplismenus compositus*, *Panicum curviflorum*, *Heteropogon contortus*, *Leersia hexandra* and few others. Few stunted shrubs like *Acacia catechu*, *Albizia odoratissima*, *Lannea coromandelica*, *Lagerstroemia purviflora*, *Phyllanthus emblica* and *Woodfordia fruticosa* are found sporadically in these grasslands.

(f) Riverine vegetation

The vegetation along the course of rivers, rivulets streams and in the sandy river beds and banks is quite characteristic and some of the common trees available are *Terminalia arjuna*, *Bombax cieba*, *Aegle marmelos*, *Dalbergia sissoo*, *Ficus hispida*, *F. racemosa*, *Sapindus emarginatus* and *Strychnos potatorum*. The shrubby vegetation is represented by *Justicia adhatoda*, *Calotropis gigantea*, *Vitex negundo*, *Lantana camara*, *Tragia involucrata*,

Jatropha gossypifolia, and *Cassia alata*. Besides, the herbaceous flora is represented by the *Alternanthera sessilis* *Boerhavia diffusa*, *Cyperus rotundus*, *Fimbristylis aestivalis*, *Heliotropium indicum*, *H. strigosum*, *Indigofera tinctoria* and *Phyla nodiflora*.

Floristic diversity and analysis

An analysis of the flora revealed about 534 species belonging to 345 genera under 84 families. All the species are enumerated in alphabetical order of families (Table 1). It is evident that flowering plants constitute the principal component of vegetation. Dicotyledonous species out-number the monocotyledons ones. The former with 436 species belongs to 69 families and the latter with 98 species belongs to 15 families.

Table 1: Enumeration of Floristic composition in KWLS

Sl. No.	Family	Genus (no. of species)	Sl. No.	Family	Genus (no. of species)
1	Acanthaceae	15 (21)	21	Combretaceae	4 (10)
2	Amaranthaceae	3 (3)	22	Commelinaceae	4 (10)
3	Amaryllidaceae	2 (2)	23	Compositae	14 (17)
4	Anacardiaceae	4 (4)	24	Convolvulaceae	7 (12)
5	Annonaceae	4 (8)	25	Cornaceae	1 (1)
6	Apocynaceae	16 (20)	26	Costaceae	1 (1)
7	Araceae	5 (6)	27	Cucurbitaceae	4 (5)
8	Araliaceae	1 (1)	28	Cyperaceae	8 (21)
9	Arecaceae	1 (2)	29	Dilleniaceae	1 (2)
10	Aristolochiaceae	1 (1)	30	Dioscoreaceae	1 (6)
11	Asparagaceae	4 (5)	31	Dipterocarpaceae	1 (1)
12	Bignoniaceae	3 (4)	32	Ebenaceae	1 (7)
13	Bixaceae	1 (1)	33	Eriocaulaceae	1 (2)
14	Boraginaceae	3 (5)	34	Euphorbiaceae	8 (12)
15	Campanulaceae	1 (2)	35	Gentianaceae	2 (4)
16	Cannabaceae	1 (1)	36	Haloragaceae	1 (1)
17	Capparaceae	2 (2)	37	Hypoxidaceae	1 (2)
18	Caryophyllaceae	1 (1)	38	Lamiaceae	14 (27)
19	Celastraceae	5 (5)	39	Lauraceae	5 (6)
20	Clusiaceae	1 (2)	40	Lecythidaceae	2 (2)

Floristic and Ethnobotanical Studies of Kuldiha Wildlife Sanctuary, Odisha

41	Leguminosae	31 (56)	63	Piperaceae	1 (1)
42	Lentibulariaceae	1 (1)	64	Plantaginaceae	3 (3)
43	Linderniaceae	1 (7)	65	Poaceae	21 (26)
44	Loganiaceae	1 (2)	66	Polygonaceae	1 (1)
45	Loranthaceae	3 (4)	67	Pontederiaceae	1 (1)
46	Lythraceae	3 (3)	68	Primulaceae	2 (3)
47	Malvaceae	16 (24)	69	Rhamnaceae	3 (7)
48	Melastomataceae	3 (3)	70	Rhizophoraceae	1 (1)
49	Meliaceae	3 (3)	71	Rubiaceae	23 (31)
50	Menispermaceae	3 (3)	72	Rutaceae	9 (9)
51	Molluginaceae	1 (1)	73	Salicaceae	4 (5)
52	Moraceae	3 (11)	74	Santalaceae	1 (2)
53	Myrtaceae	1 (2)	75	Sapindaceae	5 (7)
54	Nyctaginaceae	1 (1)	76	Sapotaceae	3 (3)
55	Ochnaceae	1 (1)	77	Smilacaceae	1 (3)
56	Olacaceae	1 (1)	78	Solanaceae	2 (2)
57	Oleaceae	3 (6)	79	Symplocaceae	1 (2)
58	Onagraceae	1 (3)	80	Ulmaceae	1 (1)
59	Orchidaceae	9 (9)	81	Urticaceae	1 (1)
60	Oxalidaceae	2 (2)	82	Verbenaceae	1 (1)
61	Passifloraceae	1 (2)	83	Vitaceae	4 (9)
62	Phyllanthaceae	10 (23)	84	Zingiberaceae	2 (2)

ARTIFICIAL KEY TO THE FAMILIES OF ANGIOSPERMS

- | | |
|---|---------------------------|
| 1a. Plants with tap root system; cotyledons two | I. Dicotyledons |
| 1b. Plants with fibrous root system; cotyledons one | II. Monocotyledons |

I. DICOTYLEDONS

- | | |
|-----------------------------------|--------------------------|
| 1a. Perianth uniseriate or absent | 3. Monochlamydeae |
| 1b. Perianth 2 or more seriate | 2 |
| 2a. Petals free. | 1. Polypetalae |
| 2b. Petals united | 2. Gamopetalae |

1. POLYPETALAE

- | | |
|---|-------------------------|
| 1a. Flowers unisexual | Menispermaceae |
| 1b. Flowers bisexual | 2 |
| 2a. Flowers 3-merous | Annonaceae |
| 2b. Flowers 4 or 5-merous | 3 |
| 3a. Stamens more than 20 | Clusiaceae |
| 3b. Stamens 10 or less | 4 |
| 4a. Gynophore or gynandrophore present | 5 |
| 4b. Gynophore or absent | 7 |
| 5a. Tendrils present | Passifloraceae |
| 5b. Tendrils absent | 6 |
| 6a. Calyx generally 4, usually free, imbricate | Capparaceae |
| 6b. Calyx 5, connate, valvate | Malvaceae |
| 7a. Carpels 3 or more | Dilleniaceae |
| 7b. Carpels 1 | 8 |
| 8a. Fruits dehiscent | 9 |
| 8b. Fruits indehiscent | 32 |
| 9a. Fruit a legume | Leguminosae |
| 9b. Fruits otherwise | 10 |
| 10a. Seeds rugose | Caryophyllaceae |
| 10b. Seeds not rugose | 11 |
| 11a. Disk below the ovary, intra-staminal or absent | 12 |
| 11b. Disk below the ovary extra-staminal | 23 |
| 12a. Stamens opposite to petals | 13 |
| 12b. Stamens alternate to petals | 14 |
| 13a. Fruits winged capsule or berry | Rhamnaceae |
| 13b. Fruit a wingless berry or drupe | Vitaceae |
| 14a. Sepals valvate | Dipterocarpaceae |
| 14b. Sepals imbricate | 15 |
| 15a. Stamens 3 only, filaments curved out | Celastraceae |
| 15b. Stamens 5–10; filaments erect | 16 |
| 16a. Leaves gland-dotted | Rutaceae |
| 16b. Leaves not gland-dotted | 17 |

17a. Leaves simple	20
17b. Leaves pinnate or palmate	18
18a. Stamens 10; flowers umbellate	Oxalidaceae
18b. Stamens 5 or 6; flowers in panicles	19
19a. Disk very prominent; stamens seen standing on the disc	Ochnaceae
19b. Disk not prominent; stamens free from disc	Anacardiaceae
20a. Sepals free	Sapindaceae
20b. Sepals more or less united at the base	21
21a. Leaves opposite, gland dotted	Myrtaceae
21b. Leaves alternate, not gland-dotted	22
22a. Flowers bisexual; sepals equal	Lecythidaceae
22b. Flowers unisexual; sepals unequal	Haloragaceae
23a. Leaves sheathing at base	24
23b. Leaves not sheathing at base	Araliaceae
24a. Plants tendrillar; placentation parietal	Cucurbitaceae
24b. Plants non-tendrillar; placentation not parietal	25
25a. Flowers all bisexual	26
25b. Flowers polygamous	Combretaceae
26a. Leaves opposite	27
26b. Leaves alternate or whorled	28
27a. Petals smaller than sepals	Rhizophoraceae
27b. Petals larger than sepals	Melastomataceae
28a. Ovules few	Cornaceae
28b. Ovules many in each cell	29
29a. Flowers with distinct sepals and petals	Onagraceae
29b. Sepals and petals not distinct	30
30a. Perianth lobes free	Molluginaceae
30b. Perianth lobes united	Lythraceae
31a. Trees; leaves compound	Meliaceae
31b. Shrubs or small trees	32
32a. Flowers in short; pubescent	Olacaceae
32b. Flowers in terminal; tomentose	Bixaceae

2. GAMOPETALAE

1a. Ovary inferior	2
1b. Ovary superior	7
2a. Inflorescence a head; calyx modified into pappus; fruit an achene	Asteraceae
2b. Inflorescence other than head; calyx regular; fruit other than achene	3
3a. Leaves opposite, stipulate	Rubiaceae
3b. Leaves alternate, exstipulate	4
4a. Stamens 5 or 10; filaments equal	5
4b. Stamens 15 or more; filaments unequal	Symplocaceae
5a. Flowers regular; ovary 1-celled	Primulaceae
5b. Flowers zygomorphic; ovary 2-celled	6

6a. Stamens 2; capsules linear	Linderniaceae	
6b. Stamens 5; capsules ellipsoid to subglobose	Campanulaceae	
7a. Stamens more than the number of corolla lobes		8
7b. Stamens as many as corolla lobes or fewer		9
8a. Plants with milky latex; flowers unisexual	Sapotaceae	
8b. Plants without milky latex; flowers bisexual	Ebenaceae	
9a. Corolla actinomorphic		17
9b. Corolla zygomorphic		10
10a. Fruit elastically dehiscent; seeds often supported by retinacula	Acanthaceae	
10b. Fruit dehiscence not as above; seeds not supported by retinacula		11
11a. Ovules less than 5		12
11b. Ovules more than 15		13
12a. Stamens 2	Verbenaceae	
12b. Stamens 4	Lamiaceae	
13a. Leaves pinnate; seeds winged	Bigoniaceae	
13b. Leaves simple, entire or lobed; seeds not winged		14
14a. Ovary 2-celled	Plantaginaceae	
14b. Ovary 1-celled		15
15a. Small delicate herbs with insectivorous bladders; corolla spurred at back	Lentibulariaceae	
15b. Plants without insectivorous bladders; corolla not spurred		16
16a. Flowers 5-merous; corolla imbricate or valvate	Nyctaginaceae	
16b. Flowers 3 or 4-merous; corolla contorted	Gentianaceae	
17a. Leaves alternate (lower leaves sometimes opposite in <i>Heliotropium</i>)		18
17b. Leaves opposite		20
18a. Ovules numerous	Solanaceae	
18b. Ovules 4 or less		19
19a. Stems quadrangular; calyx winged; fruit a capsule	Gentianaceae	
19b. Stems not quadrangular; calyx not winged; fruits of 4 nutlets or drupe	Boraginaceae	
20a. Plants twining or scandent; fruits a capsule or berry	Convolvulaceae	
20b. Plants erect; fruits of 4 nutlets or drupe or capsule		21
21a. Stamens 2	Oleaceae	
21b. Stamens 4 or more		22
22a. Calyx persistent, enclosing the fruits	Verbenaceae	
22b. Calyx deciduous, if persistent not enclosing the fruits		23
23a. Plants with milky latex; seeds often comose	Apocynaceae	
23b. Plants without milky latex; seeds ecomose		24
24a. Plants stellate-tomentose; flowers pink or violet; fruit a drupe	Lamiaceae	
24b. Plants usually glabrous, if hairy not stellate; flowers white or greenish white; fruits capsule or berry	Loganiaceae	

3. MONOCHLAMYDEAE

1a. Flowers without perianth		2
1b. Flowers with perianth		3

2a. Herbs or climbers; ovule solitary; fruit a 1-seeded berry	Piperaceae
2b. Trees; ovules 4–8; fruit a 2-valved capsule	Salicaceae
3a. Ovary inferior	4
3b. Ovary superior	6
4a. Ovary 3 or 4-celled	Aristolochiaceae
4b. Ovary 1-celled	5
5a. Flowers unisexual	Santalaceae
5b. Flowers bisexual	Loranthaceae
6a. Ovary 2 or 3-celled	Euphorbiaceae
6b. Ovary 1-celled	7
7a. Leaves with ochreate stipules	Polygonaceae
7b. Stipules not ochreate or absent	8
8a. Anthers at apex of filaments	Amaranthaceae
8b. Anthers adnate to filament by	9
9a. Flowers in heads subtended by involucre of bracts	Cannabaceae
9b. Flowers and bracts not as above	10
10a. Stamens in 3 or 4; anthers dehisces through valves; filaments often appendaged	Lauraceae
10b. Stamens in one whorl or solitary; anthers dehiscence by lateral slits	11
11a. Plants with milky latex	Moraceae
11b. Plants without milky latex	12
12a. Style branched	13
12b. Style undivided, often penicillate	Urticaceae
13a. Ovule solitary	Ulmaceae
13b. Ovules 2	Phyllanthaceae

II. MONOCOTYLEDONS

1a. Perianth reduced or scale like or absent	2
1b. Perianth well-developed, usually in two series of 3 each	4
2a. Inflorescence subtended by leafy spathe; flowers arranged variously, not subtended by chaffy bracts; ovary 1–3-celled; ovules 1–3	Araceae
2b. Inflorescence not subtended by leafy spathe; flowers spike or spikelets, subtended by chaffy bracts; ovary 1-celled and 1-ovuled	3
3a. Leaves with closed sheaths; fruits achene or seed free from pericarp	Cyperaceae
3b. Leaves with open sheaths, fruits caryopsis or seed usually adherent to pericarp	Poaceae
4a. Leaves pinnate, palmate or pedatisect	5
4b. Leaves not as above	6
5a. Perennial shrubs or trees or climbers; leaves palmate or pinnatisect	Arecaceae
5b. Tuberous perennial herbs; leaves pedatisect	Dioscoreaceae
6a. Flowers in dense globose heads	Eriocaulaceae
6b. Flowers not in globose heads	7
7a. At least inner perianth series petaliod	8
7b. Both the perianth series sepaloïd	12

8a. Both perianth series petaloid	9
8b. Outer perianth series sepaloid, inner petaloid	11
9a. Stamens 1–3	Commelinaceae
9b. Stamens 4 or more than 4	10
10a. Plants armed; flowers unisexual	Smilacaceae
10b. Plants unarmed; flowers bisexual	Araceae
11a. Scandent or climbing plants	Pontederiaceae
11b. Erect plants	13
12a. Leaves replaced by cladodes	Asparagaceae
12b. Leaves well-developed	14
13a. Flowers regular	15
13b. Flowers irregular	Costaceae
14a. Plants climbing shrubs or twiners	Dioscoreaceae
14b. Plants erect or scapigerous	16
15a. Stamens and styles fused to form column; seeds minute, numerous	Orchidaceae
15b. Stamens and styles not fused; seeds large, very	17
16a. Rootstock tuberous, elongated or globose; leaves plicate; flowers yellow	Hypoxidaceae
16b. Rootstock bulbous; leaves not plicate; flowers white	Amaryllidaceae
17a. Aerial stems straight; leaves 2-ranked; sheaths open	Zingiberaceae
17b. Aerial stems twisting; leaves spirally arranged; sheaths closed	Costaceae

SYSTEMATIC TREATMENT

DILLENACEAE

Dillenia L.

Key to the species

- 1a. Flowers 10–12 cm across; anthers apically dehiscent by pores **1. *D. aurea***
1b. Flowers 2.5–3 cm across; anthers longitudinally dehiscent by slits **2. *D. pentagyna***

1. *Dillenia aurea* Sm., Exot. Bot. 2: 65. 1806; Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 37. 1872; Haines, Bot. Bihar Orissa 1: 7. 1921; Hoogland, Blumea 7: 128. 1952; Majumdar in B.D. Sharma & al., Fl. India 1: 153, f. 21. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 10. 1994.

Local Names: *Korkotta, Rai*.

Tree, 10–15 m high. Leaves oblong-elliptic to oblanceolate, 21–41 × 10–24 cm, acute at apex, entire or undulate at margins, chartaceous, soft-pubescent beneath. Flowers solitary or in pairs, 10–12 cm across, yellow. Stamens numerous, with linear anthers. Carpels 10–12. Pseudocarps subglobose, indehiscent, 3–3.5 cm, enclosed by accrescent calyx, yellow; seeds obovoid, *c.* 4 × 3 mm, dark brown.

Fl. & Fr.: April–June.

Habitat: Mixed forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Uttar Pradesh, West Bengal. KWLS: Bonun Choko; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36543 (CAL).

2. *Dillenia pentagyna* Roxb., Pl. Coromandel 1(1): 21, t. 20. 1795; Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 38. 1872; Dunn in Gamble, Fl. Madras: 8. 1915; Haines, Bot. Bihar Orissa 1: 7. 1921; Majumdar in B.D. Sharma & al., Fl. India 1: 156. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 12. 1994.

Local Names: *Kirmilla, Rai*.

Deciduous tree, to 25 m high. Leaves obovate to oblong-lanceolate, 15–60 × 10–25 cm, serrate to undulate at margins, scabrous, puberulent beneath. Flowers in fascicles, 2.5–3 cm across, fragrant, yellow. Stamens numerous, 2-seriate, yellow. Carpels 5–10. Berries in aggregate, subglobose, *c.* 1.5 × 1.3 cm, indehiscent, fleshy, yellow, orange-red; seeds numerous, ovoid, *c.* 5 × 3.5 mm, black.

Fl. & Fr.: March–May.

Habitat: Moist deciduous forest.

Distribution: India: Almost throughout. KWLS: Bonun Choko; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35696 (CAL).

ANNONACEAE

Key to the genera

- | | |
|--|----------------------|
| 1a. Scandent shrubs | 2 |
| 1b. Trees or shrubs | 3 |
| 2a. Petals imbricate in bud | 4. Uvaria |
| 2b. Petals valvate in bud | 1. Desmos |
| 3a. Anthers concealed by connectives | 3. Polyalthia |
| 3b. Anthers not concealed by connectives | 2. Miliusa |

1. *Desmos* Lour.

Desmos chinensis Lour., Fl. Cochinch. 1: 352. 1790; Debika Mitra in B.D. Sharma & al., Fl. India 1: 257, f. 41. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 21. 1994. *Unona discolor* Vahl, Symb. Bot. 2: 63, t. 36. 1791; Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 59. 1872.

Scandent shrub, to 3 m high. Leaves elliptic, ovate or oblong-lanceolate, 6–9(–18) × 2–4.5(–7) cm, acute or acuminate at apex, membranous, pubescent beneath. Flowers extra-axillary or leaf-opposed, greenish yellow, fragrant; receptacle convex, brown-pubescent. Stamens many, oblong, *c.* 1.5 mm long; connectives obtuse. Carpels oblong, *c.* 2 mm long, densely brown-tomentose; stigmas clavate, grooved. Fruitlets ovoid, 1–1.5 cm long, beaked.

Fl. & Fr.: October–December.

Habitat: Hill forest.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Tripura. KWLS: Jodachua Chowk; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34515 (CAL).

2. *Miliusa* Lesch. ex A. DC.

Key to the species

- | | |
|---|-------------------------------|
| 1a. Inner petals saccate at base; ovules 6 or more | 1. <i>M. tomentosa</i> |
| 1b. Inner petals not saccate at base; ovules 1 or 2 | 2. <i>M. velutina</i> |

1. *Miliusa tomentosa* (Roxb.) Finet & Gagnep., Bull. Soc. Bot. France 53(Mem. 4[2]): 153. 1906; H.O. Saxena & Brahmam, Fl. Orissa 1: 22. 1994; Debika Mitra in B.D. Sharma & al., Fl. India 1: 221. 1993.

Local Names: *Gandha palasa*, *Patmosso*.

Large deciduous tree, 15–20 m high. Leaves ovate or oblong-ovate, 8–17 × 2–10 cm, acute at apex, chartaceous, tomentose above when young, tomentose beneath. Flowers solitary or a few together in leaf-opposed or subterminal cymes, tomentose, greenish yellow. Stamens many, connectives apiculate, not concealing the anthers. Carpels many, broadly ovate, brown tomentose. Berries in aggregate; fruitlets subglobose, c. 2.5 cm across, succulent, purple; seeds 4 or 5.

Fl. & Fr.: May–July.

Habitat: Mixed forests.

Distribution: India: Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Mizoram, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Bula Gadia; common.

Specimens examined: R. Saravanan & K.A. Sujana 34834, 35643 (CAL).

2. *Miliusa velutina* (Dunal) Hook.f. & Thomson, Fl. Ind. 1: 151. 1855; Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 87. 1872; Dunn in Gamble, Fl. Madras: 21. 1915; Haines, Bot. Bihar Orissa 1: 13. 1921; Debika Mitra in B.D. Sharma & al., Fl. India 1: 222. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 23. 1994.

Local Name: *Gandha Palasa*.

Deciduous tree, to 10 m high; young branches tomentose. Leaves broadly ovate-elliptic to obovate, to 25 × 10 cm, pilose to subtomentose above, tomentose beneath. Flowers 3–6, extra-axillary or terminal on short, lateral branches, yellowish, dense appressed golden-hairy outside; receptacle convex, glabrous. Stamens orbicular, c. 1 mm, connective scarcely exceeding the locules. Carpel 2–2.5 mm long; ovary densely woolly dorsally. Monocarps many, ovoid, pilose, 1 or 2-seeded.

Fl. & Fr.: May–July.

Habitat: Moist deciduous forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Chhattisgarh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Jodachua Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35699 (CAL).

3. *Polyalthia* Blume

Key to the species

- | | |
|--|--------------------------------|
| 1a. Leaf apex rounded or obtuse | 3. <i>P. suberosa</i> |
| 1b. Leaf apex acute or acuminate | 2 |
| 2a. Leaves pubescent beneath or prominently pubescent on the veins | 1. <i>P. cerasoides</i> |
| 2b. Leaves glabrous or nearly so | 2. <i>P. simiarum</i> |

1. *Polyalthia cerasoides* (Roxb.) Bedd., Fl. Sylv. S. India: t. 1. 1869; Dunn in Gamble, Fl. Madras: 17. 1915; Haines, Bot. Bihar Orissa 1: 12. 1921; Debika Mitra in B.D. Sharma & al., Fl. India 1: 270. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 24. 1994.

Local Names: *Champati, Potmossu*.

Evergreen tree, to 15 m high. Leaves oblong-lanceolate or ovate, 4–20 × 2–4 cm, acute or acuminate at apex, coriaceous, pubescent beneath. Flowers solitary or 2 or 3 in axillary or extra-axillary fascicles, 8–13 mm across, green. Stamens numerous, cuneate. Carpels many, oblong-linear. Berries in aggregate, red; fruitlets ellipsoid to broadly ovoid, 1.5–1.8 cm long, puberulent; seed 1, globose.

Fl. & Fr.: April–August.

Habitat: Moist deciduous forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu, West Bengal. KWLS: Ambada; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34542, 34576, 35636, 35714 (CAL).

2. *Polyalthia simiarum* (Buch.-Ham. ex Hook.f. & Thomson) Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 63. 1872; Haines, Bot. Bihar Orissa 1: 12. 1921; Debika Mitra in B.D. Sharma & al., Fl. India 1: 276, f. 43. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 26. 1994.

Tree, to 10 m high. Leaves elliptic, elliptic-oblong or oblong, 12–28 × 5–10 cm, acuminate at apex, subcoriaceous, minutely punctate. Flowers 3–5, from axils of fallen leaves or on older branches, 3–4 cm across, yellowish green. Stamens numerous. Carpels many, c. 1 mm long. Ripe carpels many, ellipsoid, 3–3.5 cm long, bright orange; seed 1, oblong-ovoid.

Fl. & Fr.: March–June.

Habitat: Mixed forests.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Sikkim, Tripura, West Bengal. KWLS: Jodachua Beat Chowk; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34596 (CAL).

3. *Polyalthia suberosa* (Roxb.) Thwaites, Enum. Pl. Zeyl.: 398. 1864; Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 65. 1872; Dunn in Gamble, Fl. Madras: 16. 1915; Haines, Bot. Bihar Orissa 1: 12. 1921; Debika Mitra in B.D. Sharma & al., Fl. India 1: 278. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 27. 1994.

Local Names: *Burhi Chamri, Karadia*.

Tree, 4–6 m high. Leaves oblong, elliptic-oblong or oblong-lanceolate, 3–12 × 1–3.5 cm, obtuse or obtusely acute at apex, submembranous, pubescent and pale beneath. Flowers

solitary, rarely in pairs, extra-axillary, 8–10 mm long, yellowish green. Stamens numerous, *c.* 1 mm long, connectives slightly convex at top. Carpels many, *c.* 2 mm long, pubescent. Berries in aggregate; fruitlets subglobose, *c.* 5 mm, puberulous, purple; seed 1, globose, smooth.

Fl. & Fr.: April–November.

Habitat: Mixed forests and scrub jungles.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Punjab, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Ashun Chua; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 35906, 36491, 36526 (CAL).

4. *Uvaria* L.

Key to the species

- | | |
|------------------------|--------------------------------|
| 1a. Flowers bisexual | 2. <i>U. hamiltonii</i> |
| 1b. Flowers polygamous | 1. <i>U. eucincta</i> |

1. *Uvaria eucincta* Bedd. ex Dunn, Bull. Misc. Inform. Kew 1914(5): 182. 1914 & in Gamble, Fl. Madras: 13. 1915; Debika Mitra in B.D. Sharma & al., Fl. India 1: 290. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 28.1994.

Scandent shrub. Leaves oblong, 15–25 × 4.5–6 cm, short-acuminate at apex, coriaceous, rusty-pubescent beneath. Flowers solitary, leaf-opposed, *c.* 1 cm across, pendulous, puberulous, brown. Stamens many, *c.* 2 mm long, with truncate connective. Ripe carpels oblongoid, to 1.5 cm long; seeds many, biseriate.

Fl. & Fr.: May–November.

Habitat: On hill slopes near riparian forest.

Distribution: India: Andaman & Nicobar Islands, Assam, Bihar, Kerala, Maharashtra, Meghalaya, Sikkim, Tamil Nadu, West Bengal. KWLS: Bhaibhoni Ghatti; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34476 (CAL).

2. *Uvaria hamiltonii* Hook.f. & Thomson, Fl. Ind. 1: 96. 1855 & in Hook.f., Fl. Brit. India 1: 48. 1892; Dunn in Gamble, Fl. Madras: 12. 1915; Haines, Bot. Bihar Orissa 1: 10. 1921; Debika Mitra in B.D. Sharma & al., Fl. India 1: 290. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 28. 1994.

Local Name: *Lakankuli*.

Scandent shrub. Leaves elliptic to elliptic-oblong or obovate, 15–2.5(–30) × 7–11 cm, acuminate, obtusely acuminate to rounded at apex, stellate-pubescent above, densely rufous-stellate-tomentose beneath. Flowers solitary or 2 or 3 together, extra-axillary, *c.* 5 cm across,

brown-tomentose, scarlet. Stamens *c.* 4 mm long; anthers linear, top of connective oblong, pubescent. Carpels *c.* 4 mm long. Ripe carpels *c.* 10, subglobose, 1.5–2.5 cm, tomentose, orange; seeds many, flat, shining.

Fl. & Fr.: May–September.

Habitat: Hill forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Meghalaya, Sikkim, Tripura, Uttar Pradesh, West Bengal. KWLS: Bhaibhoni; occasional.

Note: Rare in Odisha.

Specimens examined: R. Saravanan & K.A. Sujana 34517, 36539 (CAL).

MENISPERMACEAE

Key to the genera

- | | |
|---|-----------------------|
| 1a. Leaves mostly peltate | 1. Cissampelos |
| 1b. Leaves not peltate | 2 |
| 2a. Leaves glabrous; petals not bifid | 3. Tiliacora |
| 2b. Leaves villous or pubescent; petals bifid | 2. Cocculus |

1. *Cissampelos* L.

Cissampelos pareira L., Sp. Pl. 2: 1031. 1753; Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 103. 1872; Dunn in Gamble, Fl. Madras: 30. 1915; H.O. Saxena & Brahmam, Fl. Orissa 1: 33. 1994. *C. hirsuta* Buch.-Ham. ex DC., Syst. Nat. 1: 535. 1817. *C. pareira* L. var. *hirsuta* (Buch.-Ham. ex DC.) Forman, Kew Bull. 22: 356. 1968; A. Pramanik & M. Gangop. in B.D. Sharma & al., Fl. India 1: 317. 1993.

Local Names: *Akanbindi*, *Shantimul*.

Slender climber Leaves broadly ovate, orbicular or reniform, 4–5 × 6–7 cm, cordate base, apiculate at apex, chartaceous, tomentose. Male flowers sessile, in axillary cymes, *c.* 3 mm across, green to yellow; stamens 4, connate in a peltate head. Female flowers 3–8, in axillary racemes, 1–1.5 mm across; ovary densely hairy; styles 3. Drupes globose, *c.* 4 mm, red; seed 1, black.

Fl. & Fr.: June–January.

Habitat: Mixed forest and waste lands.

Distribution: India: Almost throughout. KWLS: Nandu Gutta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33527, 34533, 36448, 36489 (CAL).

2. *Cocculus* DC.

Cocculus hirsutus (L.) W. Theob. in Mason, *Burmah*, ed. 3, 2: 657. 1883; Mabb., *Taxon* 34(1): 155. 1985. *C. hirsutus* (L.) Diels in Engl., *Pflanzenr.* IV, 94(46): 236. 1910, isonym; Gamble, *Fl. Madras* 29. 1915; A. Pramanik & M. Gangop. in B.D. Sharma & al., *Fl. India* 1: 318. 1993; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 34. 1994. *Menispermum villosum* Lam., *Encycl.* 4(1): 97. 1797. *Cocculus villosus* (Lam.) DC., *Syst. Nat.* 1: 525. 1817; Hook.f. & Thomson in Hook.f., *Fl. Brit. India* 1: 101. 1872.

Climbing shrub. Leaves ovate-cordate, 5–7 × 3–4 cm, obtuse at apex, hirsute. Male flowers in c. 5 cm long, axillary panicles, green; stamens 6, free, included. Female flowers in axillary fascicles or racemes, green; carpels 3. Drupes globose, slightly laterally compressed, to 8 mm, green, turning purple-black when ripe.

Fl. & Fr.: April–May.

Habitat: Moist deciduous forest.

Distribution: India: Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Nuarasta Chowk; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35307 (CAL).

3. *Tiliacora* Colebr., *nom. cons.*

Tiliacora racemosa Coleb., *Trans. Linn. Soc. London* 13(1): 67. 1821; Hook.f. & Thomson in Hook.f., *Fl. Brit. India* 1: 99. 1872; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 445. 1995. *Menispermum acuminatum* Lam., *Encycl.* 4(1): 101. 1797. *Tiliacora acuminata* (Lam.) Miers, *Ann. Mag. Nat. Hist. ser. 2*, 7(37): 39. 1851; Hook.f. & Thomson, *Fl. Ind.*: 187. 1855; Gamble, *Fl. Madras*: 28. 1915; Haines, *Bot. Bihar Orissa* 1: 19. 1921; A. Pramanik & M. Gangop. in B.D. Sharma & al., *Fl. India* 1: 343. 1993; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 38. 1995.

Local Name: *Kalajatinoi*.

Climbing shrub. Leaves ovate or lanceolate, 8–14 × 3.5–8 cm, truncate or cordate at base, acuminate at apex, chartaceous. Flowers in axillary panicles of 3.5–10 cm long, pubescent. Male flowers 2–7 at apex of inflorescence, yellow; stamens 6. Female flower solitary; carpels 8–12. Drupes oblongoid to obovoid, 10–15 × 6–7 mm, green turning red when ripe.

Fl. & Fr.: April–December.

Habitat: Mixed forests.

Distribution: India: Andhra Pradesh, Bihar, Karnataka, Kerala, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Pahadi Rashta; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34600, 35904, 36525 (CAL).

CAPPARACEAE

Key to the genera

- 1a. Straggling or climbing shrub, armed; leaves simple **1. Capparis**
1b. Tree, unarmed; leaves palmately trifoliolate **2. Crateva**

1. *Capparis* L.

Capparis zeylanica L., Sp. Pl.: 720. 1762; Dunn in Gamble, Fl. Madras: 46. 1915; Sundararagh. in B.D. Sharma & N.P. Balakr., Fl. India 2: 298. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 60. 1994.

Local Name: *Asadua*.

Straggling or climbing shrub. Leaves ovate, 7–10 × 5–6 cm, mucronate at apex, coriaceous; stipular spines in pairs, c. 5 mm long, recurved. Flowers in supra-axillary rows, 3–4 cm across, white, buds densely pubescent. Stamens many, long-exserted, white, turning pink or purple. Gynandrophore as long as or longer than filaments; ovary ellipsoid, c. 2.5 mm long, green. Fruits globose or ellipsoid, c. 5 cm, red or purple; seeds many, embedded in pulp.

Fl. & Fr.: March–May.

Habitat: Dry deciduous forests and scrub jungles.

Distribution: India: Almost throughout. KWLS: Ashun Chua; common.

Specimen examined: R. Saravanan & K.A. Sujana 36405 (CAL).

2. *Crateva* L.

Crateva magna (Lour.) DC., Prodr. 1: 243. 1824; Sundararagh. in B.D. Sharma & N.P. Balakr., Fl. India 2: 324. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 67. 1994. *Capparis magna* Lour., Fl. Cochinch. 1: 331. 1790.

Local Names: *Barun*, *Varuna*.

Tree, to 10 m high. Leaves digitately trifoliolate; leaflets ovate, ovate-lanceolate or broadly elliptic, 10–20 × 3.5–6 cm, unequal, acute or acuminate at apex, coriaceous. Flowers in terminal corymbs, 4-merous, creamy white, often purple-tinged; disk incurved, nectariferous. Stamens many, free, with spreading filaments. Gynophore 4–5 cm long at anthesis. Berries globose or ovoid, 4–5 × 2.5–3.5 cm, with woody rind, yellowish grey; seeds brown, embedded in pulp.

Fl. & Fr.: May–March.

Habitat: Mixed forest near streams.

Distribution: India: Andhra Pradesh, Bihar, Kerala, Maharashtra, Manipur, Meghalaya, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh. KWLS: Pancharjuna Pond; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33506, 35907 (CAL).

BIXACEAE

Cochlospermum Kunth

Cochlospermum religiosum (L.) Alston in Trimen, Handb. Fl. Ceylon 6(Suppl.): 14. 1931; H.O. Saxena & Brahmam, Fl. Orissa 1: 84. 1994; N.P. Balakr. in B.D. Sharma & N.P. Balakr., Fl. India 2: 383, f. 71. 1993. *Bombax religiosum* L., Sp. Pl. 1: 512. 1753. *C. gossypium* DC., Prodr. 1: 527. 1824; Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 190. 1872; Dunn in Gamble, Fl. Madras: 50. 1915.

Local Names: *Ganiari, Kapasia, Pithalu.*

Deciduous tree, to 10 m high. Leaves simple to 3–5-lobed, elliptic or elliptic-lanceolate, 5–15 × 7–20 cm, entire or crenate at margins, acute or acuminate at apex, coriaceous, white-tomentose beneath, basally 5–7-veined. Flowers in terminal, grey-tomentose panicles, 7.5–10 cm across, bright yellow; stamens many, shortly connate at base. Capsules obovoid, 6–8 × 4–5 cm, 5-valved, leathery, brown; seeds many, c. 6 mm long, black, white-woolly.

Fl. & Fr.: February–May.

Habitat: Dry deciduous forest.

Distribution: India: Andhra Pradesh, Bihar, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Chau Rashta; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35730 (CAL).

SALICACEAE

Key to the genera

- | | |
|--|----------------------|
| 1a. Plants dioecious | 2. Flacourtia |
| 1b. Plants monoecious | 2 |
| 2a. Petals absent; stamens 6–8 | 1. Casearia |
| 2b. Petals present; stamens 4 or numerous | 3 |
| 3a. Bark smooth, peeling off in flakes; petals 4 | 3. Homalium |
| 3b. Bark rough with raised lenticels; petals 5 | 4. Scolopia |

1. *Casearia* Jacq.

Casearia graveolens Dalzell in Hooker's J. Bot. Kew Gard. Misc. 4: 107. 1852; Hook.f., Fl. Brit. India 2: 592. 1879; Gamble, Fl. Madras: 520. 1919; R.L. Mitra in B.D. Sharma & N.P. Balakr., Fl. India 2: 394. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 76. 1994.

Local Names: *Giridi, Kokra*.

Shrub or small tree, to 8 m high. Leaves broadly elliptic or ovate, 10–20 × 4–8 cm, rounded at base, subentire or crenulate at margins, obtuse or acute to acuminate at apex. Flowers in dense axillary clusters; calyx lobes 5, oblong-ovate, gland-dotted, pubescent at base, green. Stamens 6–8. Fruits subglobose to broadly ellipsoid, 2–2.5 cm long, orange-yellow; seeds 10–12, ovoid, *c.* 5 × 3 mm.

Fl. & Fr.: November–July.

Habitat: Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Manipur, Meghalaya. KWLS: Panchalingeshwar; common.

Specimen examined: R. Saravanan & K.A. Sujana 35608 (CAL).

2. *Flacourtia* Comm. ex L'Hér.

Key to the species

- 1a. Berries 0.5–1 cm across, dark purple when ripe; seeds pale yellow **1. *F. indica***
1b. Berries 1–1.5 cm across, bright red; seeds reddish **2. *F. montana***

1. *Flacourtia indica* (Burm.f.) Merr., *Interpr. Rumph. Herb. Amboin.*: 377. 1917; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 78. 1994.

Local Names; *Konta Dhawra, Kontaikuli*.

Shrub or small tree, armed with simple and branched thorns. Leaves elliptic-ovate to oblong or suborbicular, 1.5–4 × 1–3 cm, coarsely crenate at margins, obtuse or emarginate at apex, subcoriaceous. Flowers solitary or a few, in axillary racemose clusters, *c.* 4 mm across, yellowish green. Stamens many. Berries subglobose, 0.5–1 cm, dark purple when ripe; seeds obovoid, pale yellow.

Fl. & Fr.: December–May.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Ampada, Ashun Chua, Bagudi, Nandugutta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33736, 34336, 35802, 36550 (CAL).

2. *Flacourtia montana* Graham, *Cat. Pl. Bombay*: 10. 1839; Gamble, *Fl. Madras*: 54. 1919.

Local Name: *Kontaikuli*.

Tree, to 8 m high, armed with thorns. Leaves ovate to elliptic, 12–22 × 6–8, crenate-serrate at margins, acute or acuminate at apex, coriaceous. Flowers in axillary pubescent

cymes; sepals 4 or 5, tomentose; petals absent. Stamens many; anthers versatile. Berries globose, 1–1.5 cm, bright red; seeds reddish.

Fl. & Fr.: June–January.

Habitat: Mixed forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni, Parchondi; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34597, 36516 (CAL).

3. *Homalium* Jacq.

Homalium nepalense Benth., Haines, Bot. Bihar Orissa 1: 35. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 81. 1994.

Tree, 9–13 m high. Leaves elliptic or elliptic ovate, 6–20 × 3.5–10 cm, coarsely serrate at margins, each tooth with a gland at vein ending. Flowers in panicles, pyramidal, 5–12 cm long, dense, pubescent; calyx lobes 6–8, linear, spreading; corolla lobes as many as calyx, linear-oblong, longer and broader than sepals. Stamens as many as petals, alternating with fleshy glands; anther-lobes short. Ovary hairy; style 3–5.

Fl. & Fr.: April–June.

Habitat: Valleys of hill forests.

Distribution: India: Arunachal Pradesh, Assam, Himachal Pradesh, Uttarakhand. KWLS: Panchalingeshwar; occasional.

Note: Rare in Odisha.

Specimen examined: R. Saravanan & K.A. Sujana 35757 (CAL).

4. *Scolopia* Schreb.

Scolopia crenata (Wight & Arn.) Clos, Ann. Sci. Nat. Bot. ser. 4, 8: 250. 1857; Hook.f., Fl. Brit. India 1: 191. 1872; Gamble, Fl. Madras: 52. 1915.

Evergreen tree, to 15 m high, armed with thorns. Leaves elliptic-lanceolate to ovate or obovate, 5–14 × 2.5–6 cm, rounded or acute at base, crenate or serrate at margins, caudate-acuminate or acute at apex, coriaceous. Flowers in axillary racemes of 5–7 cm long; calyx lobes 4–6, ovate, *c.* 3 × 2 cm, ciliate; corolla lobes 4–6, oblong, *c.* 1.5 mm long, white. Stamens numerous. Berries globose, 8–10 mm, with persistent style; seeds few.

Fl. & Fr.: April–November.

Habitat: Mixed Forests.

Distribution: India: Arunachal Pradesh, Assam, Meghalaya. KWLS: Bhaibhoni Ghatti; rare.

Specimen examined: R. Saravanan & K.A. Sujana 33797 (CAL).

CARYOPHYLLACEAE

Polycarpaea Lam.

Polycarpaea corymbosa (L.) Lam., Tabl. Encycl. 2: 129. 1792; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 245. 1874; Dunn in Gamble, Fl. Madras: 65. 1915; Majumdar in B.D. Sharma & N.P. Balakr., Fl. India 2: 549. 1993. *Achyranthes corymbosa* L., Sp. Pl. 1: 205. 1753.

Local Name: *Pasanavedi*.

Annual, erect with long tap root, densely tomentose to glabrescent. Leaves pseudovericillate, linear to linear-oblong or linear-lanceolate, 5–18 × 1–3 mm, apiculate at apex; stipules lanceolate, 2–4 mm long, fimbriate, scarious. Flowers in deanse, terminal dichasial cymes, arranged in corymbs, reddish. Stamens 5. Capsules ovoid, c. 2 mm long, 3-valved; seeds many, reniform, light brown.

Fl. & Fr.: October–November.

Habitat: Open sandy or rocky localities in deciduous forests.

Distribution: India: Andhra Pradesh, Bihar, Goa, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Punjab, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Guajari Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 36492 (CAL).

CLUSIACEAE

Garcinia L.

Key to the species

- | | |
|--|--------------------------|
| 1a. Stamens many; ovary 8–10-locular; berries 4–8-grooved | 1. G. cowa |
| 1b. Stamens 10–20; ovary 6–8-locular; berries 8–10-grooved | 2. G. gummi-gutta |

1. *Garcinia cowa* Roxb. ex DC., Prodr. 1: 561. 1824; T. Anderson in Hook.f., Fl. Brit. India 1: 262. 1874; Dunn in Gamble, Fl. Madras: 74. 1915; Haines, Bot. Bihar Orissa 1: 53. 1921; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3: 108. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 116. 1994.

Local Names: *Rajkusuma*, *Sankadu*, *Sarbana*.

Evergreen tree, to 15 m high, with yellow exudate. Leaves elliptic-oblong, oblanceolate or broadly lanceolate, 8–17 × 2.5–7 cm, acute or obtuse at apex, thick-coriaceous. Male flowers 3–8 in axillary or terminal fascicles, to 1 cm across, yellow; stamens many. Female flowers 2–5 in terminal fascicles, to 1.5 cm across; staminodes in a ring of 4 bundles of 3–8; ovary subglobose, 6–8-locular; stigma sessile, flat with 6–8, wedge-shaped rays. Berries depressed-globose, with 4–8 vertical grooves, beaked, yellow; seeds 4–8, oblong, arillate.

Fl. & Fr.: April–August.

Habitat: Moist deciduous forest.

Distribution: India: Andaman and Nicobar Islands, Assam, Bihar, Kerala, Meghalaya, Nagaland, Sikkim, Tamil Nadu, Tripura, West Bengal. KWLS: Jodachua Ghatta; occasional.

Note: Rare in Odisha.

Specimen examined: R. Saravanan & K.A. Sujana 36554 (CAL).

2. *Garcinia gummi-gutta* (L.) N. Robson, Brittonia 20: 103. 1968; N.P. Singh in B.D. Sharma & Sanjappa, Fl. India 3: 109. 1993. *Cambogia gummi-gutta* L., Gen. Pl., ed. 5: 522. 1754. *Mangostana cambogia* Gaertn., Fruct. Sem. Pl. 2: 106, t. 106. 1790. *Garcinia cambogia* (Gaertn.) Desr. in Lam., Encycl. 3: 701. 1792, *nom. illeg.*; T. Anderson in Hook.f., Fl. Brit. India 1: 261. 1874.

Evergreen tree, to 20 m high, with pale yellow, exudate. Leaves elliptic or elliptic-oblongate or lanceolate, 7–15 × 2–8 cm, acute or shortly obtusely acuminate at apex, coriaceous, shining. Flowers polygamodioecious. Male flowers 3–5 in short axillary fascicles, pale white or green; stamens 10–20 or more; rudimentary pistil absent or minute. Female flowers 1–3 in terminal and axillary fascicles; staminodes 10–20; ovary globular, 8–10-locular; stigmatic rays 8–10, spreading. Berries ovoid to subglobose, 4–5 cm across, 8–10-grooved, yellow or red; seeds 6–8, ovoid, pale brown, arillate.

Fl. & Fr.: January–September.

Habitat: Evergreen forests, along stream banks, also cultivated.

Distribution: India: Goa, Kerala, Maharashtra, Tamil Nadu. KWLS: Ambada Nala; rare.

Note: New record to the state of Odisha.

Specimen examined: R. Saravanan & K.A. Sujana 34497 (CAL).

DIPTEROCARPACEAE

Shorea Roxb. ex C.F. Gaertn.

Shorea robusta C.F. Gaertn., Suppl. Carp.: 48. 1805; Dyer in Hook.f., Fl. Brit. India 1: 306. 1874; Dunn in Gamble, Fl. Madras: 83. 1915; Haines, Bot. Bihar Orissa 1: 56. 1921; K.P. Janardh. in B.D. Sharma & Sanjappa, Fl. India 3: 237, f. 62. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 122. 1994.

Local Name: *Sal*.

Tree, 10–45 m high. Leaves ovate or ovate-oblong, 10–25 × 5–15 cm, acute to bluntly acuminate at apex, coriaceous; stipules falcate, 6–12 mm long, pubescent. Panicles 4–6-flowered, to 20 cm long, pubescent or tomentose. Flowers *c.* 1.5 cm across, white to cream. Stamens 30–50; anthers hairy at the tip, appendages bearded; filaments broadened at base.

Fruits an indehiscent nut, ovoid, c. 1.2 cm long, with five unequal, more or less pubescent wings.

Fl. & Fr.: October–December.

Habitat: Deciduous forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Kuldiha Beat Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33711, 34455 (CAL).

MALVACEAE

Key to the genera

1a. Trees	2
1b. Herbs or undershrubs	14
2a. Armed tree	3
2b. Unarmed tree	4
3a. Flowers deep red	2. Bombax
3b. Flowers creamy white	3. Ceiba
4a. Flowers bisexual	5
4b. Flowers polygamo-dioecious or polygamous	15
5a. Calyx lobes over 8cm long, capsule over 10 cm long	12. Pterospermum
5b. Calyx and capsule not as above	6
6a. Fruits woody, tubercled, indehiscent	7. Guazuma
6b. Fruits not as above	7
7a. Fruit a drupe	6. Grewia
7b. Fruit a capsule	8
8a. Trees, shrubs or scandent shrubs	9
8b. Erect or prostrate herbs	13
9a. Capsule linear, valved	11. Melochia
9b. Capsule suborbicular to ovoid or globose	10
10a. Antheriferous filaments lateral to column; styles twice the number of carpels	16. Urena
10b. Antheriferous filaments terminal to column, styles as many as carpels	11
11a. Shrubs erect or climbing	9. Hibiscus
11b. Herbs or undershrubs	12
12a. Herbs; ovules 1 per locule; cocci 1-seeded	13. Sida
12b. Undershrubs; ovules 2 to many per locule; cocci 2 to many-seeded	1. Abutilon
13a. Sepals appendages dorsally near apex; fruits echinate with hooked bristles	15. Triumfetta
13b. Sepals without appendage; fruits smooth	4. Corchorus

- | | |
|--|----------------------|
| 14a. Fruit with up to 6 radiating follicles; each follicle 2–3 cm long | 14. Sterculia |
| 14b. Fruit a subglobose capsule, 3-valved, 2–4 mm across | 10. Kydia |
| 15a. Petal present; fruits not as above | 8. Helicteres |
| 15b. Petals absent; fruits of spreading follicles | 5. Firminiana |

1. *Abutilon* Mill.

Abutilon indicum (L.) Sweet, Hort. Brit.: 54. 1826; Masters in Hook.f., Fl. Brit. India 1: 326. 1874; Gamble, Fl. Madras: 91. 1915; Haines, Bot. Bihar Orissa 1: 61. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 135. 1994; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 266. 1993. *Sida indica* L., Cent. Pl. 2: 26. 1756.

Local Names: *Mirubaha*, *Pedi-Pedika*.

Shrub, to 2 m high. Leaves ovate-orbicular, 3–8 × 4–7 cm, cordate at base, crenate-dentate in margins, acute or acuminate at apex, velvety, sparsely stellate-hairy above, glaucous beneath with dense stellate indumentum, 5–7-veined. Flowers axillary, solitary, orange-yellow. Schizocarps globular with a flattened apex, to 1.2 × 2 cm; mericarps 15–20; seeds ovoid or reniform, to 3 mm long, warty, black.

Fl. & Fr.: July–April.

Habitat: Moist Deciduous Forests, and on roadsides.

Distribution: India: Throughout. KWLS: Bulagadia; common.

Specimen examined: R. Saravanan & K.A. Sujana 36426 (CAL).

2. *Bombax* L.

Bombax ceiba L., Sp. Pl.: 511. 1753; M.P. Nayar & M.C. Biswas in B.D. Sharma & Sanjappa, Fl. India 3: 398. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 124. 1994.

Local Names: *Semulo*, *Simal*.

Deciduous tree, to 45 m high; bole straight, buttressed, armed with conical prickles. Leaves digitately compound; leaflets 5–7, elliptic-ovate or elliptic-obovate, 10–20 × 2–6 cm, caudate-acuminate at apex, chartaceous. Flowers solitary or 2–5 together, 6–7 cm across, dark crimson; stamens 65–80. Capsules cylindrical, 8–10 × c. 3 cm, tomentose, glabrous on maturity; seeds many, pyriform, dark brown, embedded in white cotton.

Fl. & Fr.: January–March.

Habitat: Margins of Deciduous Forests and also planted.

Distribution: India: Throughout. KWLS: Jodachua Beat Rasta, Nilgiri Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33673, 33965 (CAL).

3. *Ceiba* Mill.

Ceiba pentandra (L.) Gaertn., Fruct. Sem. Pl. 2: 244. 1791; M.P. Nayar & M.C. Biswas in B.D. Sharma & Sanjappa, Fl. India 3: 400. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 126. 1994. *Bombax pentandrum* L., Sp. Pl.: 511. 1753.

Local Name: *Kapok Gocho*.

Tree, to 20 m high, buttressed at base, spiny. Leaves digitately compound, clustered towards branchlets apex; leaflets 5–9, elliptic, obovate-oblong or ovate-oblong, 4–14.5 × 1.5–4 cm, acute or acuminate at apex, chartaceous. Flowers usually in clusters of 3–10, rarely solitary, axillary, creamy white. Capsules ellipsoid to fusiform, 7.5–25 × 3–4 cm, narrowed at ends, green when young; seeds many, subpyriform, black with copious white silky fibres.

Fl. & Fr.: January–June.

Habitat: Planted.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Kerala, Maharashtra, Tamil Nadu, West Bengal. KWLS: Kuajahari Nala, Pahadi Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33645, 35822 (CAL).

4. *Corchorus* L.

Key to the species

- 1a. Capsules 6-angled
- 1b. Capsules 3-angled

- 1. ***C. aestuans***
- 2. ***C. trilocularis***

1. *Corchorus aestuans* L., Syst. Nat., ed. 10: 1079. 1759; Haines, Bot. Bihar Orissa 1: 88. 1921; P. Daniel & Chandrab. in B.D. Sharma & Sanjappa, Fl. India 3: 485. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 192. 1994.

Local Names: *Bananalita*, *Buda Nalita*.

Annual with reddish stems. Leaves ovate to elliptic-lanceolate, 2.5–7 × 1.5–3.5 cm, rounded at base, serrate at margins, acute at apex. Flowers 2 or 3 in leaf-opposed, shortly pedunculate cymes, yellow; stamens many. Capsules 1–3 × 0.4–0.6 cm, 6-angled, 3 of the angles winged, 3-loculed; seeds numerous, dark brown.

Fl. & Fr.: July–December.

Habitat: Open areas of forests.

Distribution: India: Throughout. KWLS: Koimutiya Gaon, Nandugutta Rasta; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 33578 (CAL).

2. Corchorus trilocularis L., Mant. Pl. 1: 77. 1767; Masters in Hook.f., Fl. Brit. India 1: 397. 1874; Gamble, Fl. Madras: 122. 1915; P. Daniel & Chandrab. in B.D. Sharma & Sanjappa, Fl. India 3: 488. 1993.

Annual, 30–150 cm high. Leaves narrowly oblong-lanceolate to broadly oblong-elliptic, 1.3–10 × 0.4–3.5 cm, crenate-serrate at margins, basal serrations extending into filiform processes or not, obtuse at apex, sparsely hairy. Flowers 1–3 in leaf-opposed cymes, c. 1.2 cm across, yellow; stamens 15–20. Capsules 3-angled, 2–7 × c. 2.5 mm, beaked, scabrous-tubercled; seeds subtrigonus, 1–1.2 mm long, truncate at ends, black.

Fl. & Fr.: July–December.

Habitat: Open forests.

Distribution: India: Throughout. KWLS: Bonun Chowk; common.

Specimen examined: R. Saravanan & K.A. Sujana 33671 (CAL).

5. Firmiana Marsili

Firmiana colorata (Roxb.) R. Br., Pterocymbium: 235. 1844; Gamble, Fl. Madras: 107. 1915; Malick in B.D. Sharma & Sanjappa, Fl. India 3: 420. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 176. 1994. *Sterculia colorata* Roxb., Pl. Coromandel 1(1): 26, t. 25. 1795.

Local Names: *Kodalo, Pani Kodal.*

Deciduous tree, to 25 m high. Leaves palmately 3–5-lobed, clustered at branchlets tips; lobes oblong, 10–36 × 8–29 cm, cordate or subcordate at base, caudate-acuminate, coriaceous, 3–8-veined from base. Flowers in paniculate racemes, terminal, scarlet with orange-red tomentum. Follicles 5 in aggregate, 6–7.5 cm long, greenish pink; seeds 2, ovoid, yellow.

Fl. & Fr.: April–September.

Habitat: Deciduous Forests.

Distribution: India: Throughout. KWLS: Jodachua Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36541 (CAL).

6. Grewia L.

Grewia tiliifolia Vahl, Symb. Bot. 1: 35. 1790; Masters in Hook.f., Fl. Brit. India 1: 386. 1874; Gamble, Fl. Madras: 118. 1915; P. Daniel & Chandrab. in B.D. Sharma & Sanjappa, Fl. India 3: 511. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 204. 1994.

Tree, c. 10 m high. Leaves broadly ovate or obliquely ovate to round, 6–36 × 3–24 cm, obliquely cordate or subcordate at base, double-serrate or crenate-serrate at margins, acute at apex, coriaceous, pubescent beneath. Flowers 3–6 in axillary cymes, yellow. Drupes distinctly 2 globose-lobed, 2–5 × 7–10 mm, sparsely hairy, reddish purple.

Fl. & Fr.: February–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Rangamatia; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36566 (CAL).

7. **Guazuma** Mill.

Guazuma ulmifolia Lam., *Encycl.* 3: 52. 1789; Malick in B.D. Sharma & Sanjappa, *Fl. India* 3: 424. 1993; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 178. 1994.

Local Name: *Debodaru*.

Tree, to 10 m high. Leaves ovate-oblong or oblong-lanceolate, 3.5–12 × 2–5 cm, obliquely cordate at base, serrulate at margins, acuminate at apex, scabrous above, stellate-tomentose beneath, basally 3-veined. Flowers in axillary or terminal cymes, c. 8 mm across, yellow. Capsules subglobose, c. 2 cm across, woody, tubercled; seeds black, c. 3 mm long.

Fl. & Fr.: April–February.

Habitat: An escape from gardens and naturalised.

Distribution: India: Throughout. KWLS: Jodachua Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35717 (CAL).

8. **Helicteres** L.

Helicteres isora L., *Sp. Pl.*: 963. 1753; Masters in Hook.f., *Fl. Brit. India* 1: 365. 1874; Gamble, *Fl. Madras*: 107. 1915; Haines, *Bot. Bihar Orissa* 1: 78. 1921; Malick in B.D. Sharma & Sanjappa, *Fl. India* 3: 423. 1993; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 178. 1994.

Local Names: *Kukurbicha*, *Murmuria*.

Large shrub or small tree. Leaves obovate to suborbicular, 5–12 × 3–8 cm, cordate at base, irregularly crenate-serrate at margins, acute or acuminate at apex, scabrous above and stellate-tomentose beneath, basally 3–5-veined. Flowers axillary, solitary or in few-flowered cymes, crimson. Follicles 5, spirally twisted, 4–6 cm long, beaked, stellate-tomentose; seeds 2–3 mm long, angular, wrinkled, black.

Fl. & Fr.: April–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Kuldiha Pahad, Nuarasta Chowk; common.

Specimens examined: R. Saravanan & K.A. Sujana 34482, 35751 (CAL).

9. Hibiscus L.

Key to the species

- | | |
|--|----------------------------|
| 1a. Leaves not lobed | 2. H. rosa-sinensis |
| 1b. Leaves lobed or partite | 2 |
| 2a. Corolla pink with dark eye | 1. H. platanifolius |
| 2b. Corolla yellow with a dark purple centre | 3.H. vitifolius |

1. Hibiscus platanifolius (Willd.) Sweet, Hort. Brit. 2: 51. 1827; Gamble, Fl. Madras: 98. 1915; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 338. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 146. 1994. *Pavonia platanifolia* Willd., Mag. Neuesten Entdeck. Gesammten Naturk. Ges. Naturf. Freunde Berlin 4: 220. 1810.

Tree, to 8 m high. Leaves shallowly 3–5-lobed, 6–12 × 5–12 cm, cordate at base, acuminate, densely hairy. Flowers axillary, solitary, 7–8 cm across, pink with dark eye. Capsules globose, 2.5–3.5 cm, densely setose; seeds many, c. 5 × 5 mm, glabrous.

Fl. & Fr.: August–April.

Habitat: Semi-evergreen Forests.

Distribution: India: Andhra Pradesh, Kerala, Maharashtra, Tamil Nadu, West Bengal. KWLS: Nuasai Gaon; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36481 (CAL).

2. Hibiscus rosa-sinensis L., Sp. Pl.: 694. 1753; Masters in Hook.f., Fl. Brit. India 1: 334. 1874; Haines, Bot. Bihar Orissa 1: 69. 1921; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 391. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 146. 1994.

Local Name: *Mondaro*.

Shrub, 1.5–3 m high. Leaves ovate to ovate-lanceolate, 5–11 × 3–6 cm, serrate to dentate at margins, acuminate at apex, basally 3–5-palmately veined. Flowers solitary, axillary, red. Capsules oblong or rounded, rarely formed, rarely ripen and the seeds are abortive.

Fl. & Fr.: Throughout the year.

Habitat: Planted as hedge or in gardens.

Distribution: India: Throughout. KWLS: Nilgiri Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 33626 (CAL).

3. Hibiscus vitifolius L., Sp. Pl.: 696. 1753; Masters in Hook.f., Fl. Brit. India 1: 338. 1874; Gamble, Fl. Madras: 98. 1915. *Fioria vitifolia* (L.) Mattei, Boll. Reale Orto Bot. Giardino Colon. Palermo Ser. 2, 2: 71. 1917; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 310. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 137. 1994.

Herb or undershrub, 1–2 m high. Leaves broadly ovate to orbicular, 3–5(–7)-lobed, 2.5–12 cm across, subcordate at base, crenate-serrate at margins, acute to acuminate at apex, stellate-pubescent to tomentose. Flowers solitary, axillary, 5–6.5 cm across, yellow with purple centre. Capsules suborbicular, 1.5–2 cm, shortly beaked, 5-winged; seeds 2–4 in each locule, reniform, 2–3 mm across, verruculose, brown or black.

Fl. & Fr.: March–December.

Habitat: Dry Deciduous and Semi-evergreen forests, also in plains.

Distribution: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Champo-Soro; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36477 (CAL).

10. *Kydia* Roxb.

Kydia calycina Roxb., Pl. Coromandel 3: 11. 1811; Masters in Hook.f., Fl. Brit. India 1: 348. 1874; Gamble, Fl. Madras: 93. 1915; Haines, Bot. Bihar Orissa 1: 73. 1921; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 344. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 151. 1994.

Local Names: *Bankapasia*, *Kapasia*.

Tree, to 15 m high. Leaves 3–5-lobed, broadly ovate to suborbicular, 5–15 × 4–13 cm, cordate or truncate at base, crenate-dentate or subentire at margins, obtuse or acute at apex, coriaceous, stellate-tomentose above, velvety beneath. Flowers in axillary and terminal panicles, white; peduncle stellate-tomentose. Capsules subglobose, 3–6 mm across, stellate-tomentose, enclosed in calyx; seeds 1 in each locule, reniform, striated, brownish.

Fl. & Fr.: September–December.

Habitat: Semi-evergreen Forests.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34307 (CAL).

11. *Melochia* L.

Melochia corchorifolia L., Sp. Pl.: 675. 1753; Masters in Hook.f., Fl. Brit. India 1: 374. 1874; Gamble, Fl. Madras: 110. 1915; Haines, Bot. Bihar Orissa 1: 82. 1921; Malick in B.D. Sharma & Sanjappa, Fl. India 3: 441. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 183. 1994.

Local Names: *Das Karolon*, *Telpuri*.

Herb. Leaves ovate-oblong, 2–5 × 1–2.5 cm, cordate or attenuate at base, serrate at margins, acute at apex, sparsely hairy on veins. Flowers in terminal, capitate cymes, pink; stamens 5. Capsules, subglobose, 3–4 mm, 5-valved; seeds angular, dark brown or greyish.

Fl. & Fr.: July–December.

Habitat: Degraded Deciduous Forest areas.

Distribution: India: Throughout. KWLS: Ampada; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34548 (CAL).

12. *Pterospermum* Schreb.

Pterospermum acerifolium (L.) Willd., Sp. Pl. 3: 729. 1800; Masters in Hook.f., Fl. Brit. India 1: 368. 1874; Haines, Bot. Bihar Orissa 1: 79. 1921; S.K. Chandra in B.D. Sharma & Sanjappa, Fl. India 3: 448. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 184. 1994.

Local Name: *Kanaka Champa*.

Tree, to 15 m high. Leaves obovate to orbicular or oblong, 18–32 × 10–28 cm, entire or sinuately lobed, cordate or peltate at base, serrate at margins, grey-tomentose beneath. Flowers axillary, solitary or in 2 or 3 in cymes, fragrant. Capsules oblong, 7.5–14 cm long, 5-angled, brown-tubercled; seeds obliquely ovoid, compressed with a large membranous wing.

Fl. & Fr.: March–December.

Habitat: Mixed Forests.

Distribution: India: Throughout. KWLS: Andheri Nala, Nilgiri Rasta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34432, 35707 (CAL).

13. *Sida* L.

Key to the species

- | | |
|---|--------------------------------|
| 1a. Styles and mericarps 5 | 2 |
| 1b. Styles and mericarps 6–12 | 3 |
| 2a. Erect herb, glandular-hairy; pedicels 4–15 mm long | 4. <i>S. mysorensis</i> |
| 2b. Diffuse herb, not glandular-hairy; pedicels 15–25 mm long | 2. <i>S. cordata</i> |
| 3a. Leaves sparsely hairy or glabrous, basally 3-veined; maricarp awns glabrous | 1. <i>S. acuta</i> |
| 3b. Leaves densely velvety-tomentose, basally 5–7-veined;
mericarp awns retrorsely hairy | 3. <i>S. cordifolia</i> |

1. *Sida acuta* Burm.f., Fl. Ind.: 147. 1768; Gamble, Fl. Madras: 90. 1915; Haines, Bot. Bihar Orissa 1: 61. 1921; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 281. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 159. 1994.

Local Names: *Ancharna*, *Bajramuli*.

Undershrub, to 70 cm high. Leaves lanceolate to ovate, 3–6 × 1–2 cm, truncate at base, serrate at margins, acute or acuminate at apex, sparsely hairy or glabrous, basally 3-veined. Flowers solitary, axillary, cream-yellow. Schizocarps to 5 mm long; mericarps 6–8, c. 3 × 2 mm, trigonous, reticulate, apically 2-awned; seeds c. 2 mm long, trigonous.

Fl. & Fr.: September–May.

Habitat: Dry and Moist Deciduous Forests, also in plains.

Distribution: India: Throughout. KWLS: Ashun Chua, Jodachua Ghatti, Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33600, 34521, 34544 (CAL).

2. *Sida cordata* (Burm.f.) Borss.Waalk., Blumea 14: 182. 1966; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 283. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 160. 1994. *Melochia cordata* Burm.f., Fl. Ind.: 143. 1768.

Local Names: *Bajramuli*, *Veshkhapri*.

Prostrate herb. Leaves broadly ovate or orbicular, 2–5.5 × 1.5–4.5 cm, cordate at base, serrate-crenate at margins, acute to acuminate at apex, basally 5–7-veined, stellate-tomentose. Flowers axillary, solitary, yellow. Schizocarps *c.* 2.5 mm long; mericarps 5, *c.* 3 × 2 mm, trigonous with rounded angles, shortly 2-beaked, completely enclosed in accrescent calyx; seeds reniform, *c.* 2 mm long, brownish black.

Fl. & Fr.: Throughout the year.

Habitat: All types of habitats.

Distribution: India: Throughout. KWLS: Champo-Soro, Jodachua Beat Chowk; common.

Specimens examined: R. Saravanan & K.A. Sujana 34593, 36420 (CAL).

3. *Sida cordifolia* L., Sp. Pl.: 684. 1753; Masters in Hook.f., Fl. Brit. India 1: 324. 1874; Gamble, Fl. Madras: 89. 1915; Haines, Bot. Bihar Orissa 1: 59. 1921; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 285. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 161. 1994.

Local Names: *Bajramuli*, *Bisvokopari*.

Undershrub, to 1.5 m high. Leaves ovate, rarely suborbicular, 1.5–5.5 × 1–3.5 cm, cordate at base, serrate at margins, subobtuse or acute at apex, soft tomentose above, densely stellate-tomentose beneath, basally 3–5-veined. Flowers solitary or aggregated terminally in congested corymb, yellow. Schizocarps 6–7 mm across, pubescent towards apex; mericarps 8–10, *c.* 3 × 2 mm, trigonous with acute angles, apically 2-awned; seeds brown or black.

Fl. & Fr.: August–January.

Habitat: On roadsides, sandy sea coasts and wastelands.

Distribution: India: Throughout. KWLS: Gurajari Chowk, Jodachua; common.

Specimens examined: R. Saravanan & K.A. Sujana 33825, 34362 (CAL).

4. *Sida mysorensis* Wight & Arn., Prodr. Fl. Ind. Orient.: 59. 1834; Masters in Hook.f., Fl. Brit. India 1: 322. 1874; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 286. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 162. 1994.

Undershrub, to 70 cm high, odorous. Leaves broadly ovate, 3–5 × 2–3.5 cm, cordate at base, serrate-crenate at margins, acute to acuminate at apex, pubescent with stellate and simple hairs intermingled with gland-hairs on both surfaces, basally 5–7-veined. Flowers axillary, solitary or often in 5–7-flowered in lax racemes, yellow. Schizocarps *c.* 3 mm long; mericarps 5, to 3 × 2 mm, trigonous; seeds reniform, *c.* 2 mm long, brown-black.

Fl. & Fr.: September–February.

Habitat: Moist Deciduous and Semi-evergreen Forests.

Distribution: India: Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Meghalaya, Rajasthan, Tamil nadu, West Bengal. KWLS: Ampada Nala; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35840 (CAL).

14. *Sterculia* L.

Key to the species

- | | |
|---|-----------------------------|
| 1a. Flowers in simple axillary cymes, glandular-hairy, white | 1. <i>S. guttata</i> |
| 1b. Flowers in axillary panicles, tomentose, not glandular-hairy, greenish yellow | 2. <i>S. urens</i> |

1. *Sterculia guttata* Roxb. ex DC., Prodr. 1: 482. 1824; Masters in Hook.f., Fl. Brit. India 1: 355. 1874; Gamble, Fl. Madras: 106. 1915; Malick in B.D. Sharma & Sanjappa, Fl. India 3: 462. 1993.

Tree, to 20 m high. Leaves broadly ovate-oblong, 12–25 × 6–15 cm, obtuse, subcordate or truncate at base, acuminate or caudate-acuminate at apex, coriaceous, stellate-tomentose beneath. Flowers arranged in simple cymes of 3, axillary, white, pink-dotted; petals absent. Follicles aggregate of 1–5, obovoid, red-tomentose; seeds ovoid, black, shining.

Fl. & Fr.: September–March.

Habitat: Semi-evergreen and Moist Deciduous Forests, also in plains.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Assam, Kerala, Maharashtra, Tamil Nadu. KWLS: Parchondi; common.

Specimen examined: R. Saravanan & K.A. Sujana 36403 (CAL).

2. *Sterculia urens* Roxb., Pl. Coromandel 1: 25, t. 24. 1795; Masters in Hook.f., Fl. Brit. India 1: 355. 1874; Gamble, Fl. Madras: 106. 1915; Haines, Bot. Bihar Orissa 1: 76. 1921;

Malick in B.D. Sharma & Sanjappa, Fl. India 3: 470. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 187. 1994.

Local Names: *Genduli, Kudalo*.

Tree, to 15 m high. Leaves palmately 3–5-lobed, clustered at branchlets tips, orbicular, 15–30 × 18–30 cm, cordate or sagittate at base, acuminate or caudate-acuminate at apex, coriaceous, velvety-pubescent beneath. Flowers in axillary panicles, sticky-tomentose with glandular, stellate hairs, greenish yellow. Follicles 4–6 in aggregates, densely pubescent, mixed with stinging hairs, red; seeds 3–6, oblong, brown or black.

Fl. & Fr.: December–August.

Habitat: Semi-evergreen and Moist Deciduous Forests, also in plains.

Distribution: India: Almost throughout, except Himalayas. KWLS: Kenduna Gaon; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36535 (CAL).

15. *Triumfetta* L.

Triumfetta rhomboidea Jacq., Enum. Syst. Pl.: 22. 1760; Masters in Hook.f., Fl. Brit. India 1: 395. 1874; Gamble, Fl. Madras: 120. 1915; Haines, Bot. Bihar Orissa 1: 85. 1915; P. Daniel & Chandrab. in B.D. Sharma & Sanjappa, Fl. India 3: 520. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 207. 1994.

Local Name: *Chitki*.

Undershrub. Leaves generally rhomboid-ovate, basal leaves palmately 3-lobed, 2.5–7 × 2.5–6 cm, rounded or cordate at base, irregularly serrate at margins, acute or acuminate at apex, stellate-pubescent to glabrescent. Flowers in terminal or leaf-opposed cymes, 5–6 mm across; stamens 8–15. Capsules subglobose, 4–5 mm across, setose, setae c. 2 mm long, hooked.

Fl. & Fr.: June–February.

Habitat: Forest margins.

Distribution: India: Throughout. KWLS: Jodachua Ghatti, Nua Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34449, 35731 (CAL).

16. *Urena* L.

Key to the species

- | | |
|--|-----------------------------|
| 1a. Leaves angled or shallowly lobed; epicalyx cupular in fruit, appressed to the mericarps; segments long, triangular | 1. <i>U. lobata</i> |
| 1b. Leaves deeply palmatilobed or fid; epicalyx spreading or reflexed in fruits; segments linear to lanceolate | 2. <i>U. sinuata</i> |

1. *Urena lobata* L., Sp. Pl.: 692. 1753; Masters in Hook.f., Fl. Brit. India 1: 329. 1874; Gamble, Fl. Madras: 92. 1915; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 380. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 171. 1994.

Local Name: *Banokra*.

Undershrub, to 2 m high. Leaves simple to 3–5 shallowly lobed, broadly to narrowly ovate, upper most leaves sometimes lanceolate, 3–10 × 3–9 cm, cordate at base, crenate-serrate at margins, acute or acuminate at apex, stellate-pubescent. Flowers axillary, usually solitary, sometimes 2 or 3 in clusters, pink with dark centre. Schizocarps globose, 1–1.2 cm; mericarps 5, trigonous, stellate-pubescent, glochidate; seeds reniform, to 4 mm long, angular.

Fl. & Fr.: August–December.

Habitat: Degraded forests, also in plains.

Distribution: India: Throughout. KWLS: Ashun Chua, Nandu Gutta, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33683, 35943, 36417 (CAL).

2. *Urena sinuata* L., Sp. Pl.: 692. 1753; Masters in Hook.f., Fl. Brit. India 1: 329. 1874; Gamble, Fl. Madras: 92. 1915. *U. lobata* L. subsp. *sinuata* (L.) Borss. Waalk, Blumea 14: 142. 1966; Haines, Bot. Bihar Orissa 1: 63. 1921; T.K. Paul in B.D. Sharma & Sanjappa, Fl. India 3: 382. 1993; H.O. Saxena & Brahmam, Fl. Orissa 1: 171. 1994.

Local Name: *Kunjia*.

Annual. Leaves palmately deeply lobed, c. 6 × 7 cm, truncate at base, velvety-tomentose, to 7-ribbed at base. Flowers axillary, usually solitary, sometimes 2 or 3 in clusters, pink with dark centre. Schizocarps globose, 1–1.2 cm; mericarps 5, trigonous, to 8 × 5 mm, densely stellate-pubescent, glochidate; seeds reniform, to 4 mm long, angular.

Fl. & Fr.: August–December.

Habitat: Forest margins.

Distribution: India: Throughout. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34351 (CAL).

OXALIDACEAE

Key to the genera

- | | |
|--|---------------------|
| 1a. Leaves pinnately many-foliolate; capsules ellipsoid; seeds rugose | 1. Biophytum |
| 1b. Leaves pinnately 3-foliolate; capsules linear-oblong; seeds striated | 2. Oxalis |

1. *Biophytum* DC.

Biophytum sensitivum (L.) DC., Prod. 1: 690. 1824; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 436. 1874; Gamble, Fl. Madras: 133. 1915; Haines, Bot. Bihar Orissa 1: 156. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 219. 1994; Manna in Hajra & al., Fl. India 4: 238. 1997.

Local Names: *Chhotalajakuli, Lokachana*.

Annual, c. 20 cm high. Leaves pinnate, crowded at apex; leaflets opposite, 10–13 pairs, oblong, to 5 × 3 mm, pubescent, with midvein oblique. Flowers in terminal umbels, c. 6 mm across, yellow. Stamens 10. Capsules lanceolate, c. 3 mm long, enclosed in accrescent calyx; seeds rugose.

Fl. & Fr.: July–December.

Habitat: Open places.

Distribution: India: Throughout. KWLS: Nanda Gutta; Frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34552 (CAL).

2. *Oxalis* L.

Oxalis corniculata L., Sp. Pl.: 435. 1753; Hook.f., Fl. Brit. India 1: 436. 1874; Gamble, Fl. Madras 132. 1915; Haines, Bot. Bihar Orissa 1: 157. 1921; Saxena & Brahmam, Fl. Orissa 1: 220. 1994; Manna in Hajra & al., Fl. India 4: 242, f. 60. 1997.

Local Names: *Ambiliti*.

Prostrate herb, with creeping stem, rooting at lower nodes. Leaves 3-foliolate; leaflets broadly obcordate, 0.5–1.5 × 0.6–2 cm, cuneate at base, emarginate at apex. Flowers solitary or in axillary umbels, yellow. Stamens 10, in two rows. Capsules linear, 0.8–1.5 × 0.3–0.5 cm, puberulous outside; seeds many, minute, brown.

Fl. & Fr.: Throughout the year.

Habitat: Moist deciduous forests.

Distribution: India: Throughout. KWLS: Andheri Nala; Frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33640, 34889 (CAL).

RUTACEAE

Key to the genera

- | | | |
|-----|----------------------------|-----------------|
| 1a. | Ovules 4-many in each cell | 2 |
| 1b. | Ovules 2-1 in each cell | 4 |
| 2a. | Leaves 3-foliolate | 2. Aegle |
| 2b. | Leaves pinnate | 3 |

3a.	Branches armed; leaflets not oblique; fruit 1-celled, indehiscent	6. Limonia
3b.	Branches unarmed; leaflets very oblique; fruit 3-celled, dehiscent	4. Chloroxylon
4a.	Leaves 1-foliolate	5
4b.	Leaves 3-foliolate	6
5a.	Branches unarmed; flowers in long-peduncled corymbs	1. Acronychia
5b.	Branches usually armed with axillary thorns; flowers axillary	3. Atalantia
6a.	Petiole and rachis winged	9. Naringi
6b.	Petiole and rachis not winged	7
7a.	Style not atriculate, persistent	5. Glycosmis
7b.	Style articulate at top of ovary, deciduous	9
8a.	Petals valvate; cotyledons much crumpled	7. Micomelum
8b.	Petals imbricate; cotyledons plano-convex	8. Murraya

1. *Acronychia* J.R. Forst. & G. Forst.

Acronychia pedunculata (L.) Miq., Fl. Ind. Bat. Suppl.: 532. 1861; H.O. Saxena & Brahman, Fl. Orissa 1: 227. 1994.

Evergreen tree. Leaves obovate-oblong or oblanceolate, 4.3–15 × 1.8–7.5 cm, obtuse-acuminate at apex, chartaceous. Flowers in axillary corymbose cymes, 4-merous, yellowish white; stamens 8, 2-seriate. Berries subglobose, pale brown, obscurely lobed; seeds black.

Fl. & Fr.: June–December.

Habitat: Semi-evergreen Forests.

Distribution: India: Andaman Islands, Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha and Tamil Nadu, KWLS: Bhaibhoni Ghatti; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34398 (CAL).

2. *Aegle* Corrêa

Aegle marmelos (L.) Corrêa, Trans. Linn. Soc. London 5: 223. 1800; Hook.f., Fl. Brit. India 1: 516. 1875; Gamble, Fl. Madras: 161. 1915; Haines, Bot. Bihar Orissa 1: 167.1921; H.O. Saxena & Brahman, Fl. Orissa 1: 228. 1994.

Local Names: *Bael*, *Belo*.

Tree, to 12 m high. Leaves 3-foliolate, sometimes 5-foliolate; leaflets subsessile, ovate-elliptic or elliptic-lanceolate, oblique at base, shallowly crenate-serrate at margins, membranous, pellucid-punctate. Flowers in axillary and terminal, racemose or corymbose cymes, 4–5 cm long, greenish white or yellow, fragrant. Stamens many in 2 or 3 series. Berries ovoid, 6–10 cm across, woody, yellowish; seeds many.

Fl. & Fr.: March–April.

Habitat: Scrub and open forests; often planted near temples and villages.

Distribution: India: Almost throughout. KWLS: Jodachua FRH, Kuldiha Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33627, 34569, 35621 (CAL).

3. *Atalantia* Corrêa

Atalantia monophylla (L.) DC., Prodr. 1: 535. 1824; Hook.f., Fl. Brit. India 1: 511. 1875; Gamble, Fl. Madras: 159. 1915; Haines, Bot. Bihar Orissa 1: 161. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 229. 1994.

Local Names: *Narangi*, *Narguni*.

Small armed tree. Leaves ovate or elliptic, 3–7 × 2–4 cm, obtuse or emarginate at apex, coriaceous. Flowers in axillary racemes, white. Stamens 8 or 10, unequal, basally connate into a tube. Fruits globose, c. 1.5 cm, yellowish green, gland-dotted; seeds few, c. 6 mm long.

Fl. & Fr.: February–June.

Habitat: Scrub and open forests.

Distribution: India: Eastern and Western ghats. KWLS: Kuldiha Beat Rasta, Bonun Chowk, Koimutiya; common.

Specimens examined: R. Saravanan & K.A. Sujana 33570, 34500, 35748, 36478 (CAL).

4. *Chloroxylon* DC.

Chloroxylon swietenia DC., Prodr. 1: 625. 1824; Hook.f., Fl. Brit. India 1: 569. 1875; Gamble, Fl. Madras: 152. 1915. *Swietenia chloroxylon* Roxb., Pl. Coromandel 1: 46, t. 64. 1796; H.O. Saxena & Brahmam, Fl. Orissa 1: 231. 1995.

Deciduous tree, to 15 m high. Leaves pinnate; leaflets 12–40, subsessile, oblong, 1–2 × 0.4–0.7 cm, oblique at base, obtuse at apex, chartaceous, gland-dotted. Flowers in axillary and terminal panicles, pubescent, white; stamens 10, free. Capsules c. 2.5 × 1 cm, loculicidal; seeds many, 15–18 mm long, flat, winged apically.

Fl. & Fr.: March–June.

Habitat: Hill forests.

Distribution: India: Andhra Pradesh, Chhattisgarh, Karnataka, Kerala, Maharashtra, Odisha and Tamil Nadu. KWLS: Kuldiha Pahad; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33955 (CAL).

5. *Glycosmis* Correa

Glycosmis pentaphylla (Retz.) DC., Prodr. 1: 538. 1824; Hook.f., Fl. Brit. India 1: 499. 1875; H.O. Saxena & Brahmam, Fl. Orissa 1: 240. 1994.

Local Names: *Chauli, Choaldua*.

Small erect shrub. Leaves 3–7-foliolate; leaflets subopposite, elliptic-lanceolate, 7–15 × 2–5.5 cm, acute to rounded at apex, entire to minutely crenulate-serrate at margins, glandular. Flowers in terminal or axillary, spiciform panicles, white; stamens 8–10. Berries ovoid, 1–1.2 cm across, white turning pink; seed 1 or 2.

Fl. & Fr.: October–April.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Jodachua Ghatti, Nilgiri Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33529, 35856, 35857 (CAL).

6. *Limonia* L.

Limonia acidissima L., Sp. Pl.: 554. 1762; H.O. Saxena & Brahmam, Fl. Orissa 1: 241. 1994.

Local Names: *Behenta, Kaitho*.

Deciduous tree, to 20 m high. Leaves imparipinnate, 1–3 in a cluster; leaflets 4–7, sessile, opposite, obovate, 1.3–3.8 × c. 1.3 cm, obtuse at apex, coriaceous, pellucid-punctate; rachis often narrowly winged. Flowers in axillary cymes, dull red; stamens 10–12. Berries globose, 5–7.5 cm, whitish brown, rind hard and woody; seeds many.

Fl. & Fr.: November–April.

Habitat: Dry Deciduous Forests, also grown in homesteads.

Distribution: India: Andhra Pradesh, Assam, Chhattisgarh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Tamil Nadu, Uttar Pradesh. KWLS: Kuldiha Pahad; fairly common.

Specimens examined: R. Saravanan & K.A. Sujana 33618 (CAL).

7. *Micromelum* Blume

Micromelum minutum (G. Forst.) Wight & Arn., Prod. Fl. Ind. Orient. 1: 1448. 1834; H.O. Saxena & Brahmam, Fl. Orissa 1: 243. 1994.

Local Name: *Soidani*.

Small tree. Leaves compound; leaflets 5–11, 4.5–20 × 2.5–8.5 cm, obliquely rounded, rarely acute or cordate at base, acuminate at apex, pubescent. Flowers in corymbs, pubescent or tomentose, white. Berries ovoid, 8–12 × 6–7 mm, orange.

Fl. & Fr.: December–May.

Habitat: Mixed Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Tamil Nadu. KWLS: Kenduna; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36521 (CAL).

8. *Murraya J. Koenig*

Murraya paniculata (L.) Jack., Malay. Misc. 1: 31. 1820; H.O. Saxena & Brahmam, Fl. Orissa 1: 246. 1994.

Local Names: *Ban Mallika, Harkankali*.

Shrubs or small tree. Leaves 3–7-foliolate; leaflets ovate to elliptic-ovate or rhomboid, 3–5 × 1.5–3 cm, attenuate at base, short-acuminate at apex. Flowers few in panicles, white; stamens 10. Berries ellipsoid, 1–1.2 cm long, red.

Fl. & Fr.: April–January.

Habitat: Evergreen and Semi-evergreen forests; also grown in plains.

Distribution: India: Almost throughout. KWLS: Jodachua, Panchalingeshwar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33796, 34541, 35745, 36528 (CAL).

9. *Naringi Adans.*

Naringi crenulata (Roxb.) Nicolson in Saldanha & Nicolson, Fl. Hassan Dist.: 387. 1976; H.O. Saxena & Brahmam, Fl. Orissa 1: 247. 1994.

Local Names: *Baintha, Benta*.

Tree, to 10 m, armed. Leaves imparipinnate; leaflets 3–7, sessile, elliptic or elliptic-obovate, 1–6 × 0.7–2.5 cm, crenate at margins, obtuse to emarginate at apex, coriaceous, pellucid-gland-dotted; rachis winged. Racemes few-flowered, axillary; flowers 4-merous, white; stamens 8. Berries subglobose, 6–8 mm, glandular, bluish black; seeds 1–4, dull yellow.

Fl. & Fr.: April–December.

Habitat: Semi-evergreen and Moist Deciduous Forests; also in plains.

Distribution: India: Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu. KWLS: Nuarasta Chowk, Panhcalingeshwar; fairly common.

Specimens examined: R. Saravanan & K.A. Sujana 34431, 35614 (CAL).

OCHNACEAE

Ochna L.

Ochna obtusata DC., Ann. Mus. Natl. Hist. Nat. 17: 411. 1811; Haines, Bot. Bihar Orissa 1: 169. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 259. 1994.

Local Names: *Bhuinchampa*, *Kaniari*.

Small deciduous tree. Leaves lanceolate, 5–12 × 2.5–4 cm, subcoriaceous. Flowers in axillary or terminal umbels, yellow; sepals 5, ovate, *c.* 1.5 × 0.7 cm; petals 5, obovate, *c.* 2 × 0.5 cm. Stamens many; ovary *c.* 2 mm long, 10-lobed. Drupes 3–10-lobed, to 1 cm long.

Fl. & Fr.: March–July.

Habitat: Riparian vegetation in mixed forests.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Uttar Pradesh. KWLS: Panchalingeshwar, Parchondi; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 35650, 36510 (CAL).

MELIACEAE

Key to the genera

- | | |
|-------------------------------------|---------------------|
| 1a. Leaves 2 or 3-pinnate | 2. <i>Melia</i> |
| 1b. Leaves 1-pinnate or 3-foliolate | 2 |
| 2a. Ovules several in each cell | 3. <i>Soymida</i> |
| 2b. Ovules 2 in each cell | 1. <i>Dysoxylum</i> |

1. *Dysoxylum* Blume

Dysoxylum gotadhora (Buch.-Ham.) Mabb., Fl. China 11: 127. 2008.

Tree, to 25 m high. Leaves imparipinnate; rachis to 20 cm long, swollen at base; leaflets 5–9, ovate-lanceolate to elliptic-oblong, 6–17 × 2.5–8 cm, acute or acuminate at apex, coriaceous. Flowers in axillary panicles; calyx cupular, *c.* 3 × 5 mm, subentire at margins, coriaceous, pubescent; petals 4, oblong, *c.* 10 × 3 mm, puberulous, white; staminal tube cylindrical, *c.* 1 cm long, 4-angled, terminating in 8 obscurely 2-fid teeth; anthers 8. Capsules obovoid, 5–8 × *c.* 6 cm, red; seeds 4, *c.* 5 × 2.5 cm, dark purple with yellow hilum, white-arillate, shiny.

Fl. & Fr.: March–January.

Habitat: Semi-evergreen Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Kuldiha Pahad, Panchalingeshwar; rare.

Specimens examined: R. Saravanan & K.A. Sujana 34587, 35728 (CAL).

2. *Melia* L.

Melia azedarach L., Sp. Pl.: 384. 1753; Hook.f., Fl. Brit. India 1: 544. 1875; Gamble, Fl. Madras: 176. 1915; Haines, Bot. Bihar Orissa 1: 177. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 276. 1994.

Local Name: *Mahanimbo*.

Tree, to 20 m high. Leaves bipinnate; rachis to 35 cm long, scurfy-tomentose, swollen at base; leaflets 3–11, opposite or subopposite, ovate-obovate, or oblong, 3–6.5 × 1–3 cm, irregularly serrate at margins, acuminate at apex, scurfy-puberulent. Panicles axillary, to 15 cm long; calyx lobes 5, ovate, c. 1.5 mm long, pubescent outside; petals 5, lanceolate, c. 8 × 3 mm, glabrescent, lilac; staminal tube c. 7 mm long, puberulous, dark purple, 10-toothed; anthers 10. Drupes globose, c. 2 cm; seed one.

Fl. & Fr.: March–December.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti, Pancharjuna; common.

Specimens examined: R. Saravanan & K.A. Sujana 33568, 34545 (CAL).

3. *Soymida* A. Juss.

Soymida febrifuga A. Juss., Mém. Mus. Hist. Nat. 19: 251. 1832; Hiern in Hook.f., Fl. Brit. India 1: 567. 1875; Gamble, Fl. Madras: 185. 1915; Haines, Bot. Bihar Orissa 1: 175. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 277. 1994.

Local Name: *Rohini*.

Tree, to 8 m high. Leaves 22–45 cm long; leaflets 3–6 pairs, broadly oblong or suborbicular, 4.5–15 × 4–15 cm, unequal at base, obtuse or rounded at apex, with small peltate glands. Flowers 7.5–10 mm across, white. Capsules septifragal, obovoid to oblongoid, c. 7.5 × 5 cm, woody; seeds oblong, c. 4 × 1.5 cm, compressed.

Fl. & Fr.: February–June.

Habitat: Mixed Deciduous Forests.

Distribution: India: Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Nandugutta, Parchondi; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34823, 35660 (CAL).

OLACACEAE

Olax L.

Olax scandens Roxb., Pl. Coromandel 2: 2, t. 102. 1798; Masters in Hook.f., Fl. Brit. India 1: 575. 1875; Gamble, Fl. Madras 1: 190. 1915; Haines, Bot. Bihar Orissa 1: 2. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 288. 1994; Uniyal in N.P. Singh, Fl. India 5: 9, f. 3. 2000.

Local Name: *Badalia*.

Shrub or small tree, with fulvous-pubescent branches, armed with blunt thorns when old. Leaves ovate to oblong-elliptic, 3–12 × 1.8–6 cm, obtuse at apex, glabrous or puberulous beneath. Flowers in short, pubescent racemes, 6–7.5 mm long, white. Stamens 3; staminodes 2-fid. Drupes subglobose, 0.8–1.5 cm across, yellow or orange fleshy, partially enclosed in the accrescent calyx.

Fl. & Fr.: March–December.

Habitat: Deciduous forests and scrub jungles.

Distribution: India: Andhra Pradesh, Bihar, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Nandu Ghatti, Nuarasta Chowk; common.

Specimens examined: R. Saravanan & K.A. Sujana 33798, 34309, 34365, 35611 (CAL).

CELASTRACEAE

Key to the genera

- | | |
|---|-----------------------|
| 1a. Trees | 2 |
| 1b. Shrubs | 3 |
| 2a. Bark grey, smooth; leaves simple, opposite-decussate | 1. Cassine |
| 2b. Bark grey, slightly rough; leaves elliptic or elliptic-oblong | 5. Siphonodon |
| 3a. Leaves alternate, entire or crenulated | 2. Celastrus |
| 3b. Leaves opposite, entire or toothed | 4 |
| 4a. Ovary superior or more or less confluent with the disk | 3. Hippocratea |
| 4b. Ovary conical, more or less sunk in the disk | 4. Salacia |

1. **Cassine** L.

Cassine albens (Retz.) Kosterm., Gard. Bull. Singapore 39: 178. 1986; Ramam. in N.P. Singh & al., Fl. India 5: 80, f. 17. 2000.

Tree, to 20 m high. Leaves elliptic-oblong to obovate, 7–9 × 2.5–4 cm, acute or cuneate at base, crenate at margins, acute or obtusely acuminate at apex, coriaceous. Inflorescence axillary, dichasial corymbose cymes. Flowers c. 1 cm across, greenish yellow. Stamens 5. Drupes globose to ellipsoid, c. 2.5 × 1.5 cm, apiculate; seeds one, erect.

Fl. & Fr.: February–May.

Habitat: Dry deciduous forests.

Distribution: India: Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, West Bengal. KWLS: Pancharjuna Pond; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33918 (CAL).

2. *Celastrus* L.

Celastrus paniculatus Willd., Sp. Pl.: 1125. 1797; Hook.f., Fl. Brit. India 1: 617. 1875; Gamble, Fl. Madras: 208. 1918; Haines, Bot. Bihar Orissa 1: 188. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 295. 1994; Ramam. in N.P. Singh & al., Fl. India 5: 87, f. 18. 2000.

Local Names: *Karsanao*, *Katta Pengu*, *Pengu*.

Climbing shrub. Leaves broadly ovate, 7–12 × 4–7 cm, rounded or acute at base, crenulated at margins, abruptly acuminate at apex. Panicles terminal, to 15 cm long. Flowers unisexual, c. 6 mm across, green. Stamens 5. Capsules loculicidal, to 1 cm across, yellow; seeds 3, with reddish aril.

Fl. & Fr.: April–January.

Habitat: Deciduous forests.

Distribution: India: Almost throughout. KWLS: Ambada Nala; common.

Specimens examined: R. Saravanan & K.A. Sujana 33694, 34462, 35687, 36545 (CAL).

3. *Hippocratea* L.

Hippocratea indica Willd., Sp. Pl.: 193. 1797; Hook.f., Fl. Brit. India 1: 625. 1875; Gamble, Fl. Madras: 213. 1918. *Reissantia indica* (Willd.) N. Hallé, Bull. Mus. Natl. Hist. Nat. ser. 2, 30: 466. 1958; Ramam. & B.D. Naithani in N.P. Singh & al., Fl. India 5: 149. 2000.

Rambling or scandent shrub. Leaves elliptic or somewhat obovate, rarely lanceolate, 3.7–8.7 cm long, cuneate at base, shallowly crenate-serrate, sometimes nearly entire at margins, acuminate at apex. Inflorescences dichasial or 3-chotomous decomposed cymes. Flowers c. 2.5 mm across, fragrant, yellow. Samaras 1–3, oblong 2.5–3.7 cm long.

Fl. & Fr.: April–May.

Habitat: Semi-evergreen and moist deciduous forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, West Bengal. KWLS: Andheri Nala; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35852 (CAL).

4. *Salacia* L.

Salacia chinensis L., Mant. Pl. 2: 293. 1771; H.O. Saxena & Brahmam, Fl. Orissa 1: 304. 1994; Ramam. & B.D. Naithani in N.P. Singh & al., Fl. India 5: 152. 2000.

Local Name: *Batra*.

Shrub. Leaves oblong-ovate or lanceolate, 4–8 × 1.5–2.5 cm, crenate-serrate on margins, acute-acuminate at apex. Inflorescence axillary umbels. Flowers 6–7 mm across, greenish yellow. Stamens 3. Berries globose, 0.7–1 cm.

Fl. & Fr.: March–April.

Habitat: Moist deciduous forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Daman and Diu, Goa, Kerala, Maharashtra, Meghalaya, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Nandu Gutta; rare.

Specimens examined: R. Saravanan & K.A. Sujana 34339, 34485, 35706 (CAL).

5. *Siphonodon* Griff.

Siphonodon celastrineus Griff., *Calcutta J. Nat. Hist.* 4: 247. 1844; M.A. Lawson in Hook.f., *Fl. Brit. India* 1: 629. 1875; Haines, *Bot. Bihar Orissa* 1: 190. 1921; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 305. 1994; Ramam. in N.P. Singh & al., *Fl. India* 5: 136, f. 24. 2000.

Tree. Leaves elliptic or elliptic-oblong, 8–20 × 3.5–8.7 cm, rounded or acute at base, crenate at margins, acute or acuminate at apex. Inflorescences 3–7-flowered cymes. Flowers 1.2–1.5 cm across, white. Stamens 5, *c.* 1 mm long. Fruits obovoid or broadly pyriform, 5–7 × 4–5 cm, yellowish to orange.

Fl. & Fr.: April–December.

Habitat: Damp forests.

Distribution: India: Andhra Pradesh, Bihar, Jharkhand. KWLS: Ashun Chua; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34577, 36532 (CAL).

RHAMNACEAE

Key to the genera

- | | |
|--|----------------------------|
| 1a. Climbing shrubs with tendrils; fruiting calyx epigynous | 1. <i>Gouania</i> |
| 1b. Trees or shrubs or climbers without tendrils;
fruiting calyx hypogynous or perigynous | 2 |
| 2b. Stems armed; fruit drupaceous baccate or capsular | 3. <i>Ziziphus</i> |
| 2a. Stems unarmed; fruits samaroid | 2. <i>Ventilago</i> |

1. *Gouania* Jacq.

Gouania microcarpa DC., *Prodr.* 2: 40. 1825; Hook.f., *Fl. Brit. India* 1: 643. 1875; Gamble, *Fl. Madras*: 225. 1928.

Large tendrillar climber. Leaves ovate, 10–15 × *c.* 5 cm, rounded or cordate at base, acuminate at apex, fulvous-hairy beneath. Inflorescence a terminal panicle, to 25 × 20 cm, tomentose; flowers *c.* 4 mm across; calyx lobes 5, triangular, *c.* 1.5 mm, densely hairy; corolla lobes obovate, *c.* 1.5 × 1 mm, curved; stamens 5. Capsules *c.* 7 × 10 mm, 3-winged, yellow; seeds 3, obovoid, *c.* 2.5 × 2.5 mm, compressed, dark brown.

Fl. & Fr.: October–March.

Habitat: Semi-evergreen forests.

Distribution: India: Western ghats. KWLS: Bhaibhoni Ghatti, Kuldiha; rare.

Specimens examined: R. Saravanan & K.A. Sujana 33744, 34557 (CAL).

2. *Ventilago* Gaertn.

Key to the species

- | | |
|--|-----------------------------------|
| 1a. Calyx-tube saucer-like, adnate only to the base of the nut | 2. <i>V. maderaspatana</i> |
| 1b. Calyx-tube cup-like, adnate to the lower part of the nut | 1. <i>V. denticulata</i> |

1. *Ventilago denticulata* Willd., *Neue Schriften Ges. Naturf. Freunde Berlin* 3: 417. 1801; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 317. 1994; Bhandari & Bhansali in N.P. Singh & al., *Fl. India* 5: 217. 2000.

Local Name: *Pitchauli*.

Liana. Leaves ovate-lanceolate, 3–15 × 2–6 cm, oblique at base, crenate-serrate at margins, obtuse or subacute at apex, subcoriaceous, pubescent. Flowers greenish yellow; calyx lobes deltoid, 2–2.5 mm long, hairy; corolla lobes spathulate, 1–1.5 mm long, emarginate; stamens 1–1.5 mm long; disk 5-lobbed; ovary villous, 2-loculed; stigmas 2, divergent.

Fl. & Fr.: September–April.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Bonun Chowk; fairly common.

Specimen examined: R. Saravanan & K.A. Sujana 34436 (CAL).

2. *Ventilago maderaspatana* Gaertn., *Fruct. Sem. Pl.* 1: 223. 1788; Hook.f., *Fl. Brit. India* 1: 631. 1875; Gamble, *Fl. Madras*: 218. 1918; Haines, *Bot. Bihar Orissa* 1: 193. 1921; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 317. 1994.

Local Name: *Raktapita*.

Climbing shrub. Leaves ovate-elliptic, *c.* 8 × 3.5 cm, obtuse at ends, crenate at margins, coriaceous. Flowers in axillary and terminal, *c.* 15 cm long, grey-pubescent; calyx lobes triangular, *c.* 2 mm; corolla lobes obovate, *c.* 1 mm long; stamens 5; ovary half-inferior, pubescent; style *c.* 0.5 mm long; stigma shortly bifid.

Fl. & Fr.: September–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Panchalingeshwar Pahad; common.

Specimen examined: R. Saravanan & K.A. Sujana 35754 (CAL).

3. *Ziziphus* Mill.

Key to the species

- | | |
|---|-------------------------|
| 1a. Leave acute or acuminate | 2 |
| 1b. Leaves obtuse or rounded | 3 |
| 2a. Leaves glabrous; drupes 1.2 cm in diam. | 1. <i>Z. funiculosa</i> |
| 2b. Leaves silky-pubescent beneath; drupes under 0.8 cm in diam. | 4. <i>Z. oenoplia</i> |
| 3a. Leaves mostly elliptic, 1.2–3.7 cm long; thorns strong | 2. <i>Z. jujuba</i> |
| 3b. Leaves mostly orbicular, 0.7–1.8 cm long; thorns very slender | 3. <i>Z. nummularia</i> |

1. *Ziziphus funiculosa* Buch.-Ham. ex M.A. Lawson in Hook.f., Fl. Brit. India 1: 536. 1875; Haines, Bot. Bihar Orissa 1: 196. 1921; Mooney, Suppl. Bot. Bihar Orissa 42. 1950; H.O. Saxena & Brahmam, Fl. Orissa 1: 319. 1995.

Local Name: *Chunkoli*.

Climbing shrub, armed with recurved thorns. Leaves elliptic-lanceolate or ovate, 3.7–10 × 2.5–5 cm, crenate at margins, acuminate at apex, coriaceous. Flowers in cymes, 1.8–5 cm long, brown-pubescent; corolla lobes 5, cucullate; disk faintly 10-lobed; ovary 2-celled; style 2, divided. Drupes obovoid or globose, c. 1.2 cm across, tomentose when young; seed 1.

Fl. & Fr.: February–May.

Habitat: Deep moist, cool ravines.

Distribution: India: Assam, Meghalaya. KWLS: Nandugutta; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34411 (CAL).

2. *Ziziphus jujuba* Mill., Gard. Dict., ed. 8: 1. 1768; Haines, Bot. Bihar Orissa 1: 194. 1921.

Local Name: *Jharberi*.

Tree, to 10 m high, armed with spines. Leaves elliptic-ovate to elliptic-orbicular, 1.5–4 × 1.5–3 cm, subcordate or rounded at base, glandular-denticulate or serrate at margins, rounded at apex. Flowers 15–20 in axillary fascicles, greenish yellow; calyx tube c. 0.5 mm long, woolly outside; lobes 5, triangular, keeled inside; corolla lobes 5, cucullate, round at apex; stamens 5. Drupes oblong-globose, c. 1 × 0.5 cm, yellow or orange; seeds 1 or 2, compressed.

Fl. & Fr.: August–February.

Habitat: Scrub Forests.

Distribution: India: Throughout. KWLS: Guajhari, Gudisai, Jodachua FRH, Nilgiri Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33559, 34430, 35698, 36508 (CAL).

3. *Ziziphus nummularia* (Burm.f.) Wight & Arn., Prodr. Fl. Ind. Orient.: 162. 1834; Hook.f., Fl. Brit. India 1: 633. 1875; Haines, Bot. Bihar Orissa 1: 196. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 322. 1995.

Local Name: *Jangulikoli*.

Straggling shrub, 2–5 m high, armed with spines. Leaves ovate-elliptic or orbicular, 1–2.5 × 0.5–1.8 cm, oblique or rounded at base, serrate at margins, acute or obtuse at apex, glabrous or tomentose above, tomentose to white-wooly beneath, 3-veined at base. Flowers 10–20 in axillary cymes; calyx lobes deltoid, 1.7–2.2 mm, acute; petals obovate-spathulate, 1–1.5 mm long, rounded or truncate; stamens 0.8–1.2 mm long; disk faintly 10-lobed; ovary 2-loculed; style 2-cleft. Drupes globose, c. 8 mm, shining, black-red; seeds 1 or 2, compressed, black.

Fl. & Fr.: October–February.

Habitat: Scrub Forests.

Distribution: India: Almost throughout. KWLS: Jodachua; common.

Specimens examined: R. Saravanan & K.A. Sujana 33695, 34582 (CAL).

4. *Ziziphus oenoplia* (L.) Mill., Gard. Dict., ed. 8: 3. 1768; Hook.f., Fl. Brit. India 1: 634. 1875; Gamble, Fl. Madras: 220. 1918; H.O. Saxena & Brahmam, Fl. Orissa 1: 445. 1995.

Scandent shrub, thorny. Leaves (sub)sessile, ovate, 4–6.5 × 2–3 cm, acuminate, densely fulvous-hairy. Flowers 6–20 in axillary clusters; calyx lobes triangular, hispid outside; corolla lobes clawed, concave, greenish yellow; disk flat. Drupes globose, c. 6 mm, black.

Fl. & Fr.: October–February.

Habitat: Scrub Forests.

Distribution: India: Almost throughout. KWLS: Rangamatia; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34433, 36453 (CAL).

VITACEAE

Key to the genera

- | | |
|--|-----------------------|
| 1a. Erect herbs or shrubs without tendrils; ovary 3–6-celled; cells 1-ovuled | 3. Leea |
| 1b. Climbers, usually with tendrils; ovary 2-celled; cells 2-ovuled | 2 |
| 2a. Leaves simple, angular to lobed; berries 1-seeded | 2. Cissus |
| 2b. Leaves 3–7-foliolate; berries 2–4-seeded | 3 |
| 3a. Stipules obscure; flowers polygamodioecious; seeds deeply furrowed | 4. Tetrastigma |
| 3b. Stipules prominent; flowers bisexual; seeds deeply pitted | 1. Cayratia |

1. *Cayratia* Juss. ex Guill.

Key to the species

- 1a. Leaves always 5-foliolate; seeds on adaxial surface with a longitudinal ridge at middle and an elongated pit on either side **1. *C. japonica***
- 1b. Leaves (3–)5–9(–11)-foliolate; seeds on adaxial surface with a circular pit at middle **2. *C. pedata***

1. *Cayratia japonica* (Thunb.) Gagnep., Notul. Syst. (Paris) 1: 349. 1911; Gamble, Fl. Madras: 237. 1918; B.V. Shetty & P. Singh in N.P. Singh & al., Fl. India 5: 269. 2000.

Local Names: *Kanjikanjia*, *Ludri*.

Scandent herb, with tendrils branched or not. Leaves 5-foliolate, glabrous to pubescent; leaflets ovate to orbicular-ovate, 2.5–8.5 × 1.5–4 cm, serrate at margins. Inflorescences 7–16 cm long, with greenish white flowers. Berries *c.* 7 mm across, with 3 or 4 obovoid seeds.

Fl. & Fr.: July–December.

Habitat: Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu, West Bengal. KWLS: Jadachua; fairly common.

Specimen examined: R. Saravanan & K.A. Sujana 35865 (CAL).

2. *Cayratia pedata* (Lam.) Juss. ex Gagnep., Notul. Syst. (Paris) 1: 346. 1911; Gamble, Fl. Madras 236. 1915; H.O. Saxena & Brahmam, Fl. Orissa 1: 329. 1994; B.V. Shetty & P. Singh in N.P. Singh & al., Fl. India 5: 271. 2000.

Local Name: *Pitapotala*.

Climber with minutely hispid stems. Leaves pedately 5–9-foliolate; leaflets ovate, 7–15 × 3–6 cm, serrate at margins. Cymes *c.* 7 × 8 cm, hispid. Flowers *c.* 6 mm across, greenish. Berries *c.* 1 cm, 2–4-lobed, rusty tomentose, with rugose seeds.

Fl. & Fr.: August–January.

Habitat: Mixed forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Maharashtra, Tamil Nadu, West Bengal. KWLS: Ampada; Common.

Specimens examined: R. Saravanan & K.A. Sujana 33730, 35866, 36410 (CAL).

2. *Cissus* L.

Key to the species

- 1a. Stems quadrangular **4. *C. quadrangularis***
- 1b. Stems terete 2

- | | |
|-----------------------------------|---------------------------------|
| 2a. Inflorescence leaf-opposed | 3. <i>C. latifolia</i> |
| 2b. Inflorescence axillary | 3 |
| 3a. Flowers <i>c.</i> 1.5 mm long | 1. <i>C. glyptocarpa</i> |
| 3b. Flowers <i>c.</i> 3 mm long | 2. <i>C. heyneana</i> |

1. *Cissus glyptocarpa* Thwaites, Enum. Pl. Zeyl.: 62. 1858; Gamble, Fl. Madras: 235. 1918; B.V. Shetty & P. Singh in N.P. Singh & al., Fl. India 5: 285, f. 62. 2000. *Vitis glyptocarpa* (Thwaites) M.A. Lawson in Hook.f., Fl. Brit. India 1: 645. 1875.

Climber, branches with corky wings. Leaves ovate, to 10 × 7 cm, cordate at base, serrate at margins, acuminate at apex, puberulous. Cymes extra-axillary, *c.* 3 cm across. Flowers many, *c.* 1.5 mm long, greenish; petals oblong, *c.* 2 mm long. Berries oblique pyriform, *c.* 5 mm across, purple; seed 1, 5–6 mm long, with grooves and ridges on sides.

Fl. & Fr.: April–October.

Habitat: Forests in valleys.

Distribution: India: Karnataka, Kerala, Tamil Nadu. KWLS: Nanda Gutta; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33775 (CAL).

2. *Cissus heyneana* Steud., Nomencl. Bot. 1: 372. 1840; Gamble, Fl. Madras: 234. 1918; B.V. Shetty & P. Singh in N.P. Singh & al., Fl. India 5: 285. 2000.

Climber, with terete, glaucous stems. Leaves ovate, to 9 × 7 cm, cordate at base, 6-veined. Cymes *c.* 10 cm long, axillary, thin-hairy. Flowers *c.* 3 mm across, greenish; petals oblong-ovate, *c.* 2 mm long. Berries obovoid, *c.* 8 × 6 mm, white.

Fl. & Fr.: April–October.

Habitat: Forests in valleys.

Distribution: India: Kerala, Tamil Nadu. KWLS: Bulagadia; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 35661, 36549 (CAL).

3. *Cissus latifolia* Lam., Encycl. 1: 30. 1783; B.V. Shetty & P. Singh in N.P. Singh & al., Fl. India 5: 287. 2000.

Large, climbing shrub, with thick, glaucous stems, and usually forked tendrils. Leaves simple, alternate, broadly ovate-cordate or orbicular, 8–16 × 6–13 cm, serrate at margins, serrations with bristly tip, acuminate at apex, glaucous beneath. Cymes leaf-opposed. Flowers globose, *c.* 2 mm, greenish white. Stamens 4. Berries ovoid, *c.* 1 cm across, purplish; seed 1, *c.* 6 mm long, tessellated.

Fl. & Fr.: April–October.

Habitat: Mixed forests.

Distribution: India: Goa, Karnataka, Kerala, Tamil Nadu; KWLS: Kenduna Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 33773 (CAL).

4. *Cissus quadrangularis* L., Mant. Pl. 1: 39. 1767; Gamble, Fl. Madras: 233. 1915; H.O. Saxena & Brahmam, Fl. Orissa 1: 333. 1994 B.V. Shetty & P. Singh in N.P. Singh & al., Fl. India 5: 288. 2000.

Local Names: *Hadasinkida, Hadbhanga, Hadsara.*

Rambling, succulent, tendrillar shrub, with 4-angular, winged stems with constricted nodes. Leaves simple, entire or 3-lobed, 2–5 × 2–5 cm, ovate-suborbicular to subreniform, distantly spinulose-crenate at margins, thick-coriaceous. Flowers in leaf-opposed, umbellate cymes, greenish yellow. Stamens 4. Berries subglobose, c. 7 mm across, with smooth, black seeds.

Fl. & Fr.: April–January.

Habitat: Deciduous forest.

Distribution: India: Almost throughout. KWLS: Nuasai Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 33567 (CAL).

3. *Leea* D. Royen ex L.

Key to the species

- | | |
|--|------------------------------|
| 1a. Leaflets 5–7-veined at base; corymbs small, 2–12 cm long | 1. <i>L. asiatica</i> |
| 1b. Leaflets 3-veined; corymbs large, 10–25 cm long | 2. <i>L. indica</i> |

1. *Leea asiatica* (L.) Ridsdale in Manilal, Bot. Hist. Hort. Malab.: 189. 1980; H.O. Saxena & Brahmam, Fl. Orissa 1: 337. 1994; B.D. Naithani in N.P. Singh & al., Fl. India 5: 330, f. 72. 2000. *Phytolacca asiatica* L., Sp. Pl.: 474. 1753. *Leea crispa* L., Syst. Nat. ed. 12, 2: 627. 1767; M.A. Lawson in Hook.f., Fl. Brit. India 1: 665. 1875.

Shrub to small tree, to 5 m high. Leaves 1 or 2-pinnate; leaflets 5–7, broadly ovate to elliptic, 10–20 × 4–9 cm, rounded to cordate at base, sharply serrate at margins, acuminate to caudate at apex, densely hairy beneath with sparse globose glands. Inflorescences 2–12 cm long, glabrous or pubescent. Flowers in corymbs, greenish white. Staminal lobes deeply 2-fid; stamens free. Berries depressed-globose, c. 12 mm across, purple black; seeds 6, c. 5 × 3 mm.

Fl. & Fr.: July–December.

Habitat: Mixed forests.

Distribution: India: Almost throughout. KWLS: Bonun Chowk; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34525 (CAL).

2. *Leea indica* (Burm.f.) Merr., Philipp. J. Sci. 14: 245. 1919; H.O. Saxena & Brahmam, Fl. Orissa 1: 339. 1994; B.D. Naithani in N.P. Singh & al., Fl. India 5: 337, f. 74. 2000. *Staphylea indica* Burm.f., Fl. Ind.: 75, t. 24, f. 2. 1768. *Leea sambusina* Willd., Sp. Pl. 1: 1177. 1798; M.A. Lawson in Hook.f., Fl. Brit. India 1: 666. 1875.

Local Name: *Kalad Chana*.

Shrub to small tree, c. 4 m high. Leaves 2 or 3-pinnate; leaflets oblong or elliptic-lanceolate, 11–14 × 3–5 cm, serrate-dentate at margins, caudate-acuminate at apex, bright-red when young. Cymes to 6 × 8 cm, lax or dense, glabrous to pubescent. Flowers 5-merous, greenish white. Staminal tube shortly lobed at apex; anthers combined. Berries c. 6 mm across, purple; seeds 4–6, grooved, densely red-glandular.

Fl. & Fr.: August–December.

Habitat: Mixed forests.

Distribution: India: Almost throughout. KWLS: Panchalingeshwar Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35724 (CAL).

4. **Tetrastigma** (Miq.) Planch.

Tetrastigma leucostaphylum (Dennst.) Alston ex Mabb., Taxon 26: 539. 1977; B.V. Shetty & P. Singh in N.P. Singh & al., Fl. India 5: 314. 2000. *Cissus leucostaphyla* Dennst., Schlüssel Hortus Malab.: 17, 19, 33. 1818.

Woody scandent shrub, with strongly verrucose stems and simple tendrils. Leaves pedately 5-foliolate to simple; leaflets oblong-lanceolate, 4–13 × 2–6 cm, cuneate at base, coarsely serrate at margins, acute at apex, coriaceous, the laterals unequal-sided. Cymes subcorymbose, 3–5 cm long. Flowers c. 4 mm across, white. Stamens 4. Berries subglobose, c. 1.3 cm across, creamy white; seeds 2–4, oblong, transversely rugose.

Fl. & Fr.: May–August.

Habitat: Semi-evergreen forests.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Meghalaya, Tamil Nadu. KWLS: Panchalingeshwar Pahad; Occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34537 (CAL).

SAPINDACEAE

Key to the genera

- 1a. Climbing herbs with tendrils; leaves biternate
- 1b. Trees or shrubs; leaves not biternate

2. **Cardiospermum**

2

- | | |
|---|------------------------|
| 2a. Shrubs; leaves 3-foliolate | 1. Allophylus |
| 2b. Trees; leaves pinnate | 4 |
| 3a. Flowers regular; disk annular or absent | 3 |
| 3b. Flowers irregular; disk often unilateral or lobed | 3. Lepisanthes |
| 4a. Petals present; ovary lobed | 4. Sapindus |
| 4b. Petals absent; ovary entire | 5. Schleicheria |

1. *Allophylus* L.

Key to the species

- | | |
|---|--------------------------|
| 1a. Erect shrub; branchlets smooth | 2. A. subfalcatus |
| 1b. Straggling shrub; branchlets lenticellate | 1. A. serratus |

1. *Allophylus serratus* (Roxb.) Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 44(3): 185. 1876; Gamble, Fl. Madras: 246. 1918; Haines, Bot. Bihar Orissa 1: 211. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 344. 1994; P.C. Pant in N.P. Singh & al., Fl. India 5: 349, f. 77. 2000.

Local Names: *Kontakura, Rakhalphul*.

Straggling shrub. Leaflets ovate, *c.* 18 × 9 cm, acuminate at apex. Flowers 3–5-together, each *c.* 4 mm across, 4-merous, creamish or white. Drupes globose to subglobose, *c.* 4 mm across, puberulus, orange red when ripe.

Fl. & Fr.: July–October.

Habitat: Scrub forest.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Karnataka, Kerala, Odisha, Tamil Nadu, Tripura, West Bengal. KWLS: Jodachua; common.

Specimen examined: R. Saravanan & K.A. Sujana 35901 (CAL).

2. *Allophylus subfalcatus* Radlk., Rec. Bot. Surv. India 3: 342. 1907; Mukerjee, Indian Forester 98: 493. 1972; P.C. Pant in N.P. Singh & al., Fl. India 5: 351. 2000.

Shrub. Leaflets ovate-lanceolate, 7–24 × 0.5–8 cm, distantly serrate-dentate, unequal at base, repand at margins, long-acuminate at apex, glabrous to glossy. Racemes dense-flowered, unbranched; flowers greenish white with puberulous disk. Stamens 8. Fruits clavate-ellipsoid, orange red; seeds arillate.

Fl. & Fr.: July–October.

Habitat: Semi-ever green forests.

Distribution: India: Assam, Meghalaya, Odisha. KWLS: Balia Nala; rare.

Specimen examined: R. Saravanan & K.A. Sujana 34441 (CAL).

2. *Cardiospermum* L.

Cardiospermum halicacabumL., Sp. Pl.: 366. 1753; Hiern in Hook.f., Fl. Brit. India 1: 670. 1875; Gamble, Fl. Madras: 244. 1918; Haines, Bot. Bihar Orissa 1: 211. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 346. 1994; P.C. Pant in N.P. Singh & al., Fl. India 5: 356. 2000.

Local Names: *Mayajal*, *Phatka*.

Climbing or trailing herb. Leaves alternate, biternate; leaflets ovate-lanceolate, 2–4 × 1–2.5 cm, deeply dentate or lobed at margins, acute to acuminate at apex, membranous. Flowers 3–7 in axillary cymes, white with basal scales. Stamens 8. Capsules 3-lobed, chartaceous, winged; seeds one in each chamber, black with a white eye.

Fl. & Fr.: April–November.

Habitat: Open places, often climbing over hedges, thickets.

Distribution: India: Throughout tropical and subtropical regions. KWLS: Bonun Chowk; common.

Specimens examined: R. Saravanan & K.A. Sujana 33801, 35934 (CAL).

3. *Lepisanthes* Blume

Lepisanthes tetraphylla (Vahl) Radlk., Sitzungsber. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. München 8: 276. 1878; Gamble, Fl. Madras: 247. 1918; Haines, Bot. Bihar Orissa 1: 247. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 350. 1994; P.C. Pant in N.P. Singh & al., Fl. India 5: 372, f. 81. 2000. *Sapindus tetraphyllus* Vahl, Symb. Bot. 3: 54. 1794. *Lepisanthes cuneata* Heirn in Hook.f., Fl. Brit. India 1: 680. 1875.

Local Name: *Panikusum*.

Small tree. Leaflets in 2 pairs, narrowly oblong or elliptic oblong, 8–20 × 2.5–8 cm, acute or rounded at apex, with yellow-tomentose petiolules when young. Flowers in axillary fascicles, 2.5–6.5 cm or elongating to 12.5 cm; flowers 6–7.5 mm or sometimes 10 mm long, white. Stamens 8, with villous filaments. Drupes c. 2 cm long, coriaceous, yellow-tomentose; seed 1, oblong.

Fl. & Fr.: April–May.

Habitat: Moist deciduous forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Meghalaya. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34402 (CAL).

4. *Sapindus* L.

Key to the species

- | | |
|--|---------------------------|
| 1a. Leaflets obtuse or emarginated at apex | 1. <i>S. emarginatus</i> |
| 1b. Leaflets acuminate at apex | 2. <i>S. trifoliatius</i> |

1. *Sapindus emarginatus* Vahl, Symb. Bot. 3: 54. 1794; Gamble, Fl. Madras: 250. 1918; Haines, Bot. Bihar Orissa 1: 215.1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 352. 1994; P.C. Pant in N.P. Singh & al., Fl. India 5: 381. 2000. *S. trifoliatus* sensu Heirn in Hook.f., Fl. Brit. India 1: 682. 1875, non L. 1753.

Local Names: *Maktamanji, Rentha*.

Tree, to 10 m high. Leaflets 4 or 6, opposite or subopposite, oblong-obovate to oblanceolate, 3–15 × 1.5–5.5 cm, obtuse or rounded at apex, coriaceous, glabrescent above, soft-tomentose beneath and along midrib above. Flowers in terminal and axillary panicles, pubescent; petals greenish white, with 1 or 2 tufts of white hairs above the claw; disk annular, 5-lobed, strigose. Stamens 8. Drupes of 3 indehiscent cocci, combined about half way separating with saponaceous fibrous pericarp; pubescent when young, glabrous later; seeds globose, smooth, black.

Fl. & Fr.: November–April.

Habitat: Dry deciduous forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan. KWLS: Ampada; common.

Specimen examined: R. Saravanan & K.A. Sujana 35726 (CAL).

2. *Sapindus trifoliatus* L., Sp. Pl. 1: 367. 1753; Heirn in Hook.f., Fl. Brit. India 1: 682. 1875; Haines, Bot. Bihar Orissa 1: 215. 1921; H.O. Saxena & Brahmam, Fl. Orissa 1: 353. 1994; P.C. Pant in N.P. Singh & al., Fl. India 5: 382. 2000.

Local Names: *Maktamanji, Rentha*.

Tree, to 18 m high. Leaflets 4–6, opposite or subopposite, elliptic-oblong to elliptic-lanceolate, 6.5–25 × 2.5–11.5 cm, acuminate at apex, chartaceous. Flowers in axillary or terminal panicles, densely pubescent, greenish white, softly woolly on the inner surface, scales minute or absent; disk concave. Stamens 8. Drupes globose, 16–18 mm, fulvous-hairy when young, wrinkled when ripe, greenish-yellow; seeds 2 or 3, globose, black.

Fl. & Fr.: November–April.

Habitat: Moist deciduous forests, also in the plains.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu, West Bengal. KWLS: Nua Rasta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33816, 34585 (CAL).

5. *Schleichera* Willd.

Schleichera oleosa (Lour.) Oken, Allg. Naturgesch. 3(2): 1341. 1841; Heirn in Hook.f., Fl. Brit. India 1: 681. 1875; H.O. Saxena & Brahmam, Fl. Orissa 1: 353. 1994; P.C. Pant in N.P. Singh & al., Fl. India 5: 384. 2000.

Local Name: *Kusum*.

Deciduous tree, to 20 m high. Leaflets 4–6, opposite or subopposite, elliptic-oblong, ovate or obovate, 5–15 × 1.8–4.5 cm, acute or obtuse at apex, coriaceous. Flowers in axillary spicate panicles, 5–6 mm across, greenish yellow. Male flowers: stamens 7 or 8, free, inserted within the disk. Bisexual flowers: ovary c. 2 mm long, 3-celled, ovule 1 in each cell. Drupes globose, 1.5–1.8 cm, often echinate with blunt prickles, green; seed 1 or 2, enclosed in a pulpy aril, brown.

Fl. & Fr.: February–August.

Habitat: Moist deciduous forests, also in the plains.

Distribution: India: Arunachal Pradesh, Assam, Madhya Pradesh, Meghalaya, West Bengal. KWLS: Kuldiha, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33887, 35739 (CAL).

ANACARDIACEAE

Key to the genera

- | | |
|---|----------------------|
| 1a. Drupe seated on fleshy hypocarp | 1. Anacardium |
| 1b. Drupe not seated on fleshy hypocarp | 2 |
| 2a. Flowers usually 4-merous; filaments short-hairy; drupes striated | 4. Nothopegia |
| 2b. Flowers usually 5-merous; filaments glabrous; drupes not striated | 3 |
| 3a. Petals at base gland-crested; fertile stamens 1 or 2 | 3. Mangifera |
| 3b. Petals not gland-crested at base; fertile stamens 10 | 2. Buchanania |

1. *Anacardium* L.

Anacardium occidentale L., Sp. Pl.: 583. 1753; Hook.f., Fl. Brit. India 2: 20. 1876; Gamble, Fl. Madras: 260. 1918; Haines, Bot. Bihar Orissa 1: 220. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 359. 1994; D. Chandra & S.K. Mukh. in N.P. Singh & al., Fl. India 5: 437, f. 92. 2000.

Local Names: *Kaju*, *Lanka Amba*.

Evergreen tree, to 15 m high. Leaves alternate, somewhat crowded on twig apices, obovate, 6–15.5 × 3–8 cm, obtuse, round or retuse at apex, coriaceous, shiny above, with glands on axils of main veins and its branches. Flowers in terminal prominently bracteate panicles; yellow, streaked with pink. Stamens 8–10, one usually longer than others. Fruit a reniform nut, 2–3 cm long, grey, seated on a large pyriform fleshy body formed of enlarged disk; seed reniform, ascending.

Fl. & Fr.: March–May.

Habitat: As a plantation especially near the coast and almost naturalized in some parts.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Bihar, Goa, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu. KWLS: Pahadi Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33662, 35921 (CAL).

2. *Buchanania* Spreng.

Buchanania cochinchinensis (Lour.) M.R. Almeida, Fl. Maharashtra 1: 287. 1996. *B. lanzan* Spreng. in Schrad., J. Bot. 2: 234. 1800; D. Chandra & S.K. Mukh. in N.P. Singh & al., Fl. India 5: 443, f. 93. 2000.

Local Name: *Char*.

Semi-deciduous tree, to 18 m high. Leaves alternate, broadly oblong, 10–23.5 × 5–12 cm, obtuse or emarginate at apex, glabrous above and densely tomentose beneath, coriaceous. Flowers sessile, in pubescent terminal and axillary panicles, greenish white. Stamens 10, inserted at the base of fleshy disk. Drupes oblongoid, 10–13 × c. 8 mm, laterally compressed, black; stone hard, 2-valved; seed one.

Fl. & Fr.: January–May.

Habitat: Deciduous forests.

Distribution: India: Himachal Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Jodachua Ghatti; common.

Specimens examined: R. Saravanan & K.A. Sujana 33718, 34829 (CAL).

3. *Mangifera* L.

Mangifera indica L., Sp. Pl.: 200. 1753; Hook.f., Fl. Brit. India 2: 13. 1876; Gamble, Fl. Madras: 259. 1918; Haines, Bot. Bihar Orissa 1: 220. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 362. 1994; D. Chandra & S.K. Mukh. in N.P. Singh & al., Fl. India 5: 466, f. 100. 2000.

Local Names: *Amba*, *Ambo*.

Evergreen tree, to 30 m high. Leaves alternate, clustered at the tips of branchlets, elliptic-lanceolate, linear-oblong, 9.2–40 × 2.5–8 cm, acuminate, acute or obtusely acute at apex, coriaceous. Flowers polygamous, in terminal panicles, yellowish green. Stamens 4 or 5, inserted inside or on the disk, fertile stamens 1 or 2. Drupes variable, oblongoid or subreniform, 5–15 cm long, compressed, yellowish red when ripe, mesocarp fleshy, endocarp fibrous; seed 1, subreniform.

Fl. & Fr.: January–May.

Habitat: Riparian forests and also on cultivation.

Distribution: India: Throughout. KWLS: Nua Rasta Chowk; common.

Specimens examined: R. Saravanan & K.A. Sujana 33851, 34495, 35868 (CAL).

4. *Nothopegia* Blume

Nothopegia heyneana (Hook.f.) Gamble, Fl. Madras: 268. 1918; Haines, Bot. Bihar Orissa 1: 221. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 363. 1994; D. Chandra & S.K. Mukh. in N.P. Singh & al., Fl. India 5: 474. 2000.

Tree, to 15 m high. Leaves alternate, elliptic or elliptic-oblong, 4–15 × 1.2–4.5 cm, acute at ends, coriaceous. Flowers polygamous, in axillary racemes, sometimes subterminal, creamish white. Stamens 4, inserted under the margin of the disk. Drupes ovoid, fleshy, acute at apex, blue, pericarp thick filled with black resin cells; seed pendulous.

Fl. & Fr.: May–August.

Habitat: Rare in rocky ravines.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Kanchipaani; rare.

Note: Threatened in Odisha.

Specimen examined: R. Saravanan & K.A. Sujana 35734 (CAL).

LEGUMINOSAE

Subfamily Caesalpinioideae

Key to the genera

- | | |
|--|-----------------------|
| 1a. Herbs, shrubs or small trees | 2 |
| 1b. Trees, 10–20 m high; bark 2–3 mm thick | 4 |
| 2a. Large climbers with circinate tendrils | 5. Phanera |
| 2b. Large, much branched scrambling shrub | 3 |
| 3a. Seeds ovoid, c. 6 mm long, longitudinal | 7. Senna |
| 3b. Seeds transverse, ovate to orbicular or reniform, compressed | 5 |
| 4a. Leaves 1-pinnate | 6. Saraca |
| 4b. Leaves 2-pinnate | 3. Cassia |
| 5a. Pods prickly | 2. Caesalpinia |
| 5b. Pods unarmed | 6 |
| 6a. Leaflets 1.2–2.5 × 0.4–1 cm; pods flat, dry | 1. Biancaea |
| 6b. Leaflets 0.7–1.2 × 0.3–0.4 cm; pods thick, fleshy | 4. Moullava |

1. *Biancaea* Tod.

Biancaea decapetala (Roth) O. Deg., Fl. Hawaiiensis K7. 1936; E. Gagnon & G.P. Lewis, PhytoKeys 71: 69. 2016. *Caesalpinia decapetala* (Roth) Alston in Trimen, Handb. Fl. Ceylon 6(Suppl.): 89. 1931; Sanjappa, Legumes India: 11. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 381. 1994. *Reichardia decapetala* Roth, Nov. Pl. Sp.: 212. 1821.

Local Names: *Aila, Gilo*.

Thorny shrub. Leaves bipinnate, to 30 × 20 cm; leaflets oblong, to 15 × 6 mm, obtuse, densely hispid. Flowers *c.* 2.5 cm across, many in terminal racemes, to 25 cm long, yellow. Pods elliptic-oblong, 7 × 2.2 cm, flat, sharp beak at apex; seeds 2 or 3.

Fl. & Fr.: December–May.

Habitat: Gardens and hedges.

Distribution: India: Arunachal Pradesh, Bihar, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Sikkim, Uttar Pradesh, West Bengal. KWLS: Nuarasta Chowk; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33808 (CAL).

2. *Caesalpinia* L.

Caesalpinia bonduc (L.) Roxb., Fl. India 2: 362. 1832; Sanjappa, Legumes India: 9. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 378. 1994.

Local Names: *Gilo Gila, Kotakoleja*.

Scandent shrub, armed. Leaves bipinnate, to 50 cm long, pinnae 4 or 5 pairs; leaflets 5–8 pairs per pinna, ovate or elliptic-oblong, 2–5 × 0.8–2.2 cm, rounded at base, obtuse-mucronate. Flowers many, in supra-axillary or terminal racemes, to 15 cm long, yellow. Stamens 10. Pods elliptic, 4.5–9 × 3.5–4.5 cm, beaked, turgid, covered with straight, puberulent spines; seeds 1 or 2, subglobose, 1–1.5 cm, greyish white.

Fl. & Fr.: August–April.

Habitat: Scrub forests.

Distribution: India: Throughout. KWLS: Kuldiha FRH; common.

Specimen examined: R. Saravanan & K.A. Sujana 33654 (CAL).

3. *Cassia* L.

Cassia fistula L., Sp. Pl.: 377. 1753; Baker in Hook.f., Fl. Brit. India 2: 201. 1878; Gamble, Fl. Madras: 400. 1919; Haines, Bot. Bihar Orissa 2: 302. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 386. 1994.

Local Names: *Argavada, Bhalutherga, Sonari*.

Tree, to 15 m high. Leaves paripinnate; rachis 14–35 cm, pulvinate; leaflets 6–16, opposite, ovate-lanceolate or oblong-ovate, 5–18.5 × 3–6.5 cm, acuminate at apex, coriaceous, glaucous and puberulent beneath. Flowers 3.5–5 cm across, in axillary drooping racemes, yellow; stamens 10, all fertile. Pods cylindrical, 30–60 × 1–1.5 cm, black, indehiscent, woody; seeds 25–100, ovoid, 6–8 mm across, immersed in pulp, pale brown.

Fl. & Fr.: April–March.

Habitat: Forests, often also planted.

Distribution: India: Throughout, often cultivated. KWLS: Ashun Chua, Nandugutta Rasta, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33712, 34345, 35847 (CAL).

4. *Moullava* Adans.

Moullava digyna (Rottler) Gagnon & G.P. Lewis, *PhytoKeys* 71: 67. 2016. *Caesalpinia digyna* Rottler, *Neue Schriften Ges. Naturf. Freunde Berlin* 4: 200. t. 3. 1803; Baker in Hook.f., *Fl. Brit. India* 2: 256. 1878; Gamble, *Fl. Madras*: 394. 1919; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 381. 1994.

Local Names: *Gilo, Tari*.

Scrambling shrub, copiously armed with recurved prickles. Leaf rachis 12.5–27 cm long, geminate prickles at each pair of pinnae, pubescent or fulvous-hairy; pinnae 8–12 pairs, oblong, 0.5–1.2 × 0.3–0.35 cm, subcordate at base, obtuse or subtruncate at apex. Flowers 1.4–1.8 cm across, in supra-axillary racemes, often curved, 1.8–3 cm long, yellow. Pods oblong, 2.5–5 × c. 1.5 cm, fleshy, smooth; seeds 1–4, roundish, 1–1.2 cm, hard, dark brown.

Fl. & Fr.: August–March.

Habitat: Forests, often near streams.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. KWLS: Jodachua Pond, Pancharjuna Rasta; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34341, 34575 (CAL).

5. *Phanera* L.

Key to the species

- | | |
|---------------------------|----------------------------|
| 1a. Liana with tendrils | 2. <i>P. vahlii</i> |
| 1b. Tree without tendrils | 1. <i>P. retusa</i> |

1. *Phanera retusa* Benth. in Miq., *Pl. Jungh.*: 263. 1852; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 374. 1994; Bandyop. in P. Singh & Bandyop., *Fasc. Fl. India* 26: 67. 2014. *Bauhinia retusa* Roxb., *Fl. Ind.* 2: 322. 1832, non Poir. 1811. *B. semla* Wundelin, *Taxon* 25: 362. 1976.

Tree, to 5 m high. Leaves reniform, 6–18 × 10–22 cm, cordate at base, emarginate at apex, 7–11-veined. Flowers c. 2.5 cm across, in corymbose racemes, arranged in terminal panicles, white; fertile stamens 3. Pods suboblong, 12–18 × 3–4.5 cm, obtuse, red.

Fl. & Fr.: November–February.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Himachal Pradesh, Madhya Pradesh, Maharashtra, Uttar Pradesh, West Bengal. KWLS: Bhaibhoni Ghatti, Kenduna Pahad; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34555, 35738 (CAL).

2. Phanera vahlii (Wight & Arn.) Benth. in Miq., Pl. Jungh.: 263. 1852; Bandyop. in P. Singh & Bandyop., Fasc. Fl. India 26: 41. 2014. *Bauhinia vahlii* Wight & Arn. in Wight, Cat. Ind. Pl.: 38. 1833; Baker in Hook.f., Fl. Brit. India 2: 279. 1878; Gamble, Fl. Madras 1: 408. 1919; Haines, Bot. Bihar Orissa 2: 310. 1922. H.O. Saxena & Brahmam, Fl. Orissa 1: 376. 1994.

Local Names: *Sehar, Siali, Sialpatra*.

Climber; tendrils circinate, leaf-opposed. Leaves deeply lobed, 8–10 × 8–25 cm, deeply cordate at base, lobes rounded with a very stout point from the sinus, tomentose beneath, 11–13-veined. Flowers in tomentose often paniced corymbs, white or cream. Pods oblong, 15–30 × 3.7–6.5 cm, woody, velvety-rusty; seeds oblong-ellipsoid, 6–12 cm, polished.

Fl. & Fr.: April–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Guajhari Nala; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34360 (CAL).

6. Saraca L.

Saraca asoca (Roxb.) W.J. de Wilde, Blumea 15(2): 393. 1968; H.O. Saxena & Brahmam, Fl. Orissa 1: 401. 1994. *Jonesia asoca* Roxb., Asiat. Res. 4: 355. 1795.

Local Name: *Ashoko*.

Tree, to 10 m high. Leaves paripinnate; rachis 4–25 cm long; leaflets 6–12, oblong-ovate or ovate-lanceolate, 7–28.5 × 2–8.5 cm, acute or acuminate, coriaceous. Flowers in dense axillary, paniculate corymbs, yellow-orange or red; petals 0; stamens 7 or 8. Pods oblong, 10–5 × 2–5 cm, flat, woody, tapering at ends; seeds 2–8, ovoid, c. 3.8 cm long.

Fl. & Fr.: March–September.

Habitat: Planted.

Distribution: India: Andhra Pradesh, Bihar, Kerala, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Jodachua Rasta, Panchalingeswar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33726, 34586 (CAL).

7. *Senna* Mill.

Key to the species

- | | |
|---|-----------------------------|
| 1a. Pods terete or subterete | 2. <i>S. hirsuta</i> |
| 1b. Pods otherwise | 2 |
| 2a. Pods indehiscent; seeds <i>c.</i> 20 × 5 mm, chestnut brown | 3. <i>S. tora</i> |
| 2b. Pods dehiscent; seeds many, <i>c.</i> 7 × 5 mm, dark brown | 1. <i>S. alata</i> |

1. *Senna alata* (L.) Roxb., Fl. Ind. 2: 349. 1832; V. Singh, Monogr. Ind. Cassiinae: 99. 2001. *Cassia alata* L., Sp. Pl.: 378. 1753; Baker in Hook.f., Fl. Brit. India 2: 264. 1878.

Shrub, to 4 m high. Leaves 28–60 cm long; leaflets 6–12 pairs, oblong to obovate-oblong, 4–13 × 2–6 cm, rounded to subcordate at base, rounded at apex. Flowers many, in terminal or axillary, spicate racemes, 40–60 cm long, yellow; stamens 10. Pods linear, 9–14 × 1.5–2 cm, 4-winged, septate; seeds many, rhomboid, 5–7 × 4–5 mm, compressed, dark brown.

Fl. & Fr.: July–January.

Habitat: Plains and in degraded forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Ampada; common.

Specimen examined: R. Saravanan & K.A. Sujana 33873 (CAL).

2. *Senna hirsuta* (L.) Irwin & Barneby, Phytologia 44: 499. 1979; V. Singh, Monogr. Ind. Cassiinae: 137. 2001. *Cassia hirsuta* L., Sp. Pl.: 378. 1753; H.O. Saxena & Brahmam, Fl. Orissa 1: 386. 1994.

Local Name: *Bado Chakunda*.

Undershrub, densely hirsute. Leaves to 18 cm long; rachis 8–12 cm long, a large black gland on the rachis just below the lowest leaflets; leaflets 3–5, ovate or elliptic, 3.5–6 × 2–3.5 cm, rounded at base, acuminate at apex. Racemes few-flowered, axillary and terminal. Flowers *c.* 1.5 cm across, yellow; stamens 10, unequal, 6 or 7 fertile. Pods linear, 10–15 × 0.6–0.8 cm, subterete, curved, densely hirsute; seeds many, orbicular, 2.5–3 mm, light brown.

Fl. & Fr.: October–December.

Habitat: Degraded forests.

Distribution: India: Naturalised, throughout. KWLS: Nuarasta Chowk, Parchondi; common.

Specimens examined: R. Saravanan & K.A. Sujana 34886, 35823 (CAL).

3. *Senna tora* (L.) Roxb., Fl. Ind. 2: 340. 1832; V. Singh, Monogr. Ind. Cassiinae: 137. 2001. *Cassia tora* L., Sp. Pl.: 376. 1753; Baker in Hook.f., Fl. Brit. India 2: 263. 1878; H.O. Saxena & Brahmam, Fl. Orissa 1: 392. 1994.

Local Names: *Chakunda*, *Dhola chakunda*.

Herb or undershrub, to 1 m high. Leaves to 15 cm long, cylindrical gland on the rachis between leaflets of the lower 2 pairs; leaflets 2–4 pairs, obovate-oblong, 1.5–4.5 × 1.5–2.5 cm, oblique at base, obtuse at apex, pubescent beneath. Racemes few-flowered, axillary. Flowers c. 1.5 cm across, yellow; stamens 10, fertile 7, staminodal 3. Pods linear, 8–14 × 0.3–0.6 cm, subtetragonous, septate between seeds; seeds 20–30, oblong, 4–5 mm long, brown.

Fl. & Fr.: September–December.

Habitat: Degraded forests.

Distribution: India: Throughout. KWLS: Andheri, Bonun Chowk, Koimutiya; common.

Specimens examined: R. Saravanan & K.A. Sujana 33753, 34809, 35801 (CAL).

Subfamily Mimosoideae

Key to the genera

- | | |
|---|--------------------------|
| 1a. Plants armed | 2 |
| 1b. Plants unarmed | 3 |
| 2a. Pinnae 1 or 2 pairs | 6. Pithecellobium |
| 2b. Pinnae 3 or more pairs | 5. Mimosa |
| 3a. Stamens indefinite | 4 |
| 3b. Stamens usually 10 | 5 |
| 4a. Stamens free | 7 |
| 4b. Stamens connate below or monadelphous | 3. Albizia |
| 5a. Flowers in globose heads | 7. Xylia |
| 5b. Flowers in spikes | 6 |
| 6a. Large climber with tendrils; pods very large, splitting transversely into 1-seeded segments | 4. Entada |
| 6b. Tree; pods not very large, spirally twisted after dehiscing | 2. Adenantha |
| 7a. Inflorescence capitate, stipules spinescent | 8 |
| 7b. Inflorescence spicate, stipules not spinescent | 7. Senegalia |
| 8a. Trees, leaflets with ciliate margin | 8. Vachellia |
| 8b. Climbers, leaflets with without ciliate margin | 1. Acacia |

1. *Acacia* Mill.

Key to the species

- | | |
|--|----------------------|
| 1a. Pods thick, fleshy, much-wrinkled when dry; sutures indented | 2. A. sinuata |
| 1b. Pods thin, flat, coriaceous; sutures straight | 4 |
| 2a. Pinnae 6–8 pairs; leaflet 8–15 pairs | 1. A. caesia |
| 2b. Pinnae 8–20 pairs; leaflets 30–80 pairs | 3. A. torta |

1. *Acacia caesia* (L.) Willd., Sp. Pl. 4: 1090. 1806; Gamble, Fl. Madras: 428. 1919; Sanjappa, Legumes India: 37. 1992. *Mimosa caesia* L., Sp. Pl. 1: 522. 1753.

Local Name: *Dantari*.

Stout Rambler; old stems 4–6-angled, prickled. Leaves 20–25 cm long; pinnae 5–8 pairs, to 7 cm long; leaflets 18–22 pairs, oblong, to 11 × 3.5 mm, truncate at base, apiculate, thin-pubescent beneath, 3-veined at base. Heads terminal, paniced. Pods oblong, to 13 × 2.2 cm, acuminate at ends, flat.

Fl. & Fr.: May–December.

Habitat: Mixed Forests.

Distribution: India: Bihar, Madhya Pradesh, Punjab, Rajasthan, Uttar Pradesh, West Bengal. KWLS: Panchalingeshwar; common.

Specimen examined: R. Saravanan & K.A. Sujana 36562 (CAL).

2. *Acacia sinuata* (Lour.) Merr., Trans. Amer. Philos. Soc. 24: 186. 1935; H.O. Saxena & Brahmam, Fl. Orissa 1: 414. 1994. *Mimosa sinuata* Lour., Fl. Cochinch. 2: 653. 1790.

Local Names: *Shiaikakai*, *Sikai*.

Large climbing shrub, armed; rachis 7.5–14 cm long, pubescent, prickled, glands between 2 uppermost pinnae; pinnae 3–8 pairs; leaflets 9–15 pairs, linear, 6–15 × 1–2 mm, truncate at base, obtuse to apiculate. Flowers 2.5–3 mm long, sessile, cream (or pink), in axillary corymbs, 1–1.2 cm across. Pods 6–10 × 1.8–2.5 cm, thick, much-wrinkled when dry, sutures indented between seeds.

Fl. & Fr.: April–March.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, West Bengal. KWLS: Pancharjuna Rasta; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34550 (CAL).

3. *Acacia torta* (Roxb.) Craib, Bull. Misc. Inform., Kew 1915: 410. 1915; Gamble, Fl. Madras: 428. 1919; Haines, Bot. Bihar Orissa 2: 327. 1922; Sanjappa, Legumes India: 44. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 415. 1994.

Local Names: *Dantari*, *Konti*.

Rambling shrub. Leaves to 24 cm long; pinnae 12 pairs; leaflets oblong, c. 8 × 3 mm, subcordate at base, obtuse at apex, slightly pubescent, 1-veined from base. Flowers many, c. 3 mm long, in terminal panicles. Pods c. 16 × 2.5 cm, flat, papery, densely glandular, yellowish brown.

Fl. & Fr.: May–March.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34826 (CAL).

2. *Adenanthera* L.

Adenanthera pavonina L., Sp. Pl.: 384. 1753; Baker in Hook.f., Fl. Brit. India 2: 287. 1878; Gamble, Fl. Madras: 418. 1919; Haines, Bot. Bihar Orissa 2: 319. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 417. 1994.

Local Names: *Manda Kaincha*, *Raktakanchan*.

Tree, to 15 m high. Leaves 2-pinnate; pinnae 4–6 pairs; leaflets 5–6 pairs, oblong, 1.8–3.2 cm long, obtuse-apiculate, puberulous. Flowers in axillary and paniced spiciform racemes, 5–15 cm long, yellowish. Pods 15–22.5 × 1.2 cm, falcate; seeds c. 10, globose, bright scarlet.

Fl. & Fr.: March–May.

Habitat: Gardens and village sides.

Distribution: India: Almost throughout. KWLS: Koimutiya; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35798 (CAL).

3. *Albizia* Durazz.

Key to the species

1a. Flowers pedicelled

1. ***A. lebbeck***

1b. Flowers sessile or subsessile

2. ***A. odoratissima***

1. *Albizia lebbeck* (L.) Benth., London J. Bot. 3: 87. 1844; Baker in Hook.f., Fl. Brit. India 2: 298. 1878; Gamble, Fl. Madras: 432. 1919; Haines, Bot. Bihar Orissa 2: 332. 1922; Sanjappa, Legumes India: 56. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 420. 1994.

Local Names: *Siris*, *Siriso*.

Deciduous tree, to 25 m high. Leaves bipinnate; pinnae 2–4 pairs, 5.5–12 cm long; leaflets 8–20, obliquely oblong, 2.7–5 × 1–2.5 cm, obtuse at apex, coriaceous, slightly pubescent beneath, a gland in between leaflets. Flowers c. 3.5 cm long, solitary or 2–4 in axillary corymbose racemes, greenish white; stamens many, green or pink. Pods oblong, 20–30 × 4–5 cm, obtuse, flat, straw-coloured, turgid; seeds 8–12, ovate, 6–10 × 5–8 mm, flat, brown.

Fl. & Fr.: April–January.

Habitat: Planted and wild along streams in some parts.

Distribution: India: Throughout. KWLS: Nuasai, Panchalingeswar; common.

Specimens examined: R. Saravanan & K.A. Sujana 34818, 35932 (CAL).

2. *Albizia odoratissima* (L.f.) Benth., London J. Bot. 3: 88. 1844; Baker in Hook.f., Fl. Brit. India 2: 299. 1878; Gamble, Fl. Madras: 431. 1919; Haines, Bot. Bihar Orissa 2: 333. 1922; Sanjappa, Legumes India: 57. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 421. 1994. *Mimosa odortissima* L.f., Suppl. Pl.: 437. 1782.

Local Names: *Kala Siriso, Tinia*.

Tree, to 30 m high. Leaves bipinnate; rachis 20–30 cm long, a gland at base; pinnae 2–8 pairs, 5–13 cm long, glands between the junctions of 1 or 2 distal pairs of pinnae; leaflets 14–40, oblong, 1.8–2.5 × 0.5–1.2 cm, obtuse-apiculate, coriaceous. Flowers bisexual, in globose heads forming terminal panicles, white; stamens many. Pods 15–20 × 2.5–3.7 cm, strap-shaped, rounded to rostrate at apex, reddish brown; seeds 6–12, orbicular.

Fl. & Fr.: May–February.

Habitat: Chiefly in valleys.

Distribution: India: Throughout. KWLS: Jodachua Beat Chowk; common.

Specimen examined: R. Saravanan & K.A. Sujana 34866 (CAL).

4. *Entada* Adans.

Entada rheedei Spreng., Syst. Veg., ed. 16, 2: 325. 1825; H.O. Saxena & Brahmam, Fl. Orissa 1: 65. 1994.

Local Name: *Gilo*.

Liana, tendrillar. Leaves bipinnate; pinnae 2 or 3 pairs, the terminal pair modified into a tendril; leaflets 4–7 pairs, curved-oblong, *c.* 5 × 2.5 cm, obtuse. Flowers *c.* 3 mm long, densely packed, in spikes of *c.* 35 cm long, axillary, solitary or paired, yellow; stamens 10. Pods, to 1 m long, woody, crenate on both sutures; seeds many, orbicular, *c.* 5 cm, brown.

Fl. & Fr.: March–May.

Habitat: Along rivulets in Semi-evergreen Forests.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh. KWLS: Guajhari Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 34481 (CAL).

5. *Mimosa* L.

Key to the species

- 1a. Small prostrate or ascending undershrub; pinnae digitate; stamens as many as petals
- 1b. Large erect shrub; pinnae pinnate; stamens diplostemonous

2. ***M. pudica***
1. ***M. himalayana***

1. *Mimosa himalayana* Gamble, Kew Bull. 1920: 4. 1920; Haines, Bot. Bihar Orissa 2: 322. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 427. 1995.

Shrub, 2–3.5 m high, (sub)erect, prickly. Leaf rachis 12–20 cm long, prickly; pinnae 7–12 pairs; leaflets 14–20 pairs, oblong, $5-7 \times c. 1.75$ mm, obtuse-mucronate, pubescent beneath. Flowers in heads, axillary, in long thyriform racemes, pink; stamens 8.

Fl. & Fr.: September–December.

Habitat: Common in scrub forests.

Distribution: India: Assam, Bihar, Himachal Pradesh, Rajasthan, Sikkim, Uttarakhand, Uttar Pradesh. KWLS: Ashun Chua, Kenduna, Kuldiha FRH; common.

Specimens examined: R. Saravanan & K.A. Sujana 33762, 34330, 36454 (CAL).

2. *Mimosa pudica* L., Sp. Pl.: 518. 1753; Baker in Hook.f., Fl. Brit. India 2: 291. 1878; Gamble, Fl. Madras: 421. 1919; H.O. Saxena & Brahmam, Fl. Orissa 1: 430. 1994.

Local Names: *Lajkui*, *Lajkuli*.

Straggling herb. Leaves to 12 cm long; rachis tomentose; pinnae 5–10 pairs; leaflets c. 20 pairs, oblong, $3-7 \times 0.75-1$ mm, oblique-truncate at base, acute-mucronate at apex. Flowers pink. Lomentum flat, margins with recurved prickles; seeds 3–5, subrhombic.

Fl. & Fr.: August–May.

Habitat: Damp areas and degraded forests.

Distribution: India: Throughout. KWLS: Kuldiha Gate, Parchondi Gaon; common.

Specimens examined: R. Saravanan & K.A. Sujana 33604, 35876 (CAL).

6. *Pithecellobium* Mart.

Pithecellobium dulce (Roxb.) Benth. in London J. Bot. 3: 199. 1844; Baker in Hook.f., Fl. Brit. India 2: 302. 1878; Gamble, Fl. Madras: 434. 1919; Haines, Bot. Bihar Orissa 2: 335. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 432. 1994.

Local Name: *Simakoina*.

Tree, to 20 m high, armed; branchlets densely tomentose. Leaves bipinnate; rachis 1–3 cm long, pubescent, grooved above, a solitary gland at the top on upper side; pinnae 2; leaflets 2, opposite, oblong-oblongate, $1.5-3.5 \times 0.5-1.5$ cm, base and apex obtuse, chartaceous. Flowers bisexual, c. 5 mm across, creamy, heads arranged in axillary or terminal paniced spikes; stamens many, monadelphous. Pods circinate or falcate, moniliform, c. 8×1 cm, turgid, dehiscent; seeds orbicular.

Fl. & Fr.: January–June.

Habitat: Scrub forests and coastal sand dune forests.

Distribution: India: Throughout. KWLS: Ampada, Nuasai; common.

Specimens examined: R. Saravanan & K.A. Sujana 33576, 36493 (CAL).

7. *Senegalia* Raf.

Senegalia polyacantha (Willd.) Seigler & Ebinger, *Phytologia* 91(1): 28. 2009. *Acacia polyacantha* Willd., *Sp. Pl.*: 4. 1079. 1806; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 413. 1994.

Local Names: *Gonhareu*, *Saikanta*.

Tree, to 15 m high. Leaves paripinnate; pinnae 15–25 pairs, 4–5 cm long, pubescent; glands between uppermost 4 pairs; leaflets 30–50, opposite, 5–7 × 0.5–1 mm, truncate at base, ciliate at margins, subacute or obtuse at apex, densely pubescent, chartaceous. Flowers c. 4 mm across, in axillary solitary or paired spikes, to 8 cm long, white; stamens many. Pods oblong, c. 8 × 1.5 cm, horned, woody, grey; seeds 5–8.

Fl. & Fr.: August–April.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Chattisgarh, Goa, Gujarat, Jharkhand, Karnataka, Kerala, Maharashtra, Rajasthan, Tamil Nadu, West Bengal. KWLS: Panchalingeshwar; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35813 (CAL).

8. *Vachellia* Wight & Arn.

2. *Vachellia leucophloea* (Roxb.) Maslin, Seigler & Ebinger, *Blumea* 58(1): 42. 2013. *Acacia leucophloea* (Roxb.) Willd., *Sp. Pl.*: 4: 1083. 1806; Hook.f., *Fl. Brit. India* 2: 294. 1878; Gamble, *Fl. Madras*: 427. 1919; Haines, *Bot. Bihar Orissa* 2: 325. 1922; Sanjappa, *Legumes India*: 41. 1992; H.O. Saxena & Brahmam, *Fl. Orissa* 1: 411. 1994. *Mimosa leucophloea* Roxb., *Pl. Coromandel* 2: 27, t. 150. 1798.

Local Names: *Gohira*, *Kanta Sariso*.

Tree, to 20 m high. Leaves bipinnate; pinnae 5–15 pairs, 3.5–6 cm long, with a gland in between terminal pinnae and also between basal pairs, pubescent; leaflets 30–54, linear, 5–10 × 2–3 mm, oblique-truncate at base, ciliate at margins, subacute at apex, chartaceous, pubescent beneath. Flowers c. 1 mm, in heads arranged in terminal panicles, cream-yellow; stamens many. Pods 6–15 × 0.8–1 cm, straight or sometimes curved, minutely brown-tomentose; seeds 5–12, ovate, 5–6 × 3–4 mm.

Fl. & Fr.: August–December.

Habitat: Dry open localities.

Distribution: India: Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Kuldiha FRH; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 33957 (CAL).

9. *Xylia* Benth.

Xylia xylocarpa (Roxb.) Taub., Bot. Centralbl. 47: 395. 1891; Gamble, Fl. Madras: 417. 1919; Haines, Bot. Bihar Orissa 2: 321. 1922; H.O. Saxena & Brahmam; Fl. Orissa 1: 436. 1994.

Local Name: *Tangini*.

Deciduous tree, to 20 m high. Leaves bipinnate; rachis 4–18 cm long, with an orbicular gland at tip; pinnae 2, 8–30 cm long; leaflets 4–18, elliptic or elliptic-oblong, 5–33.5 × 2.5–6 cm, acute or acuminate at apex, coriaceous, with a gland between each pairs. Flowers sessile, dull yellow, in axillary globose heads; stamens 10. Pods 10–15 × 5–6 cm, flat, broadly falcate, woody, dehiscent; seeds 4–10, oblong, compressed, shining, brown.

Fl. & Fr.: April–February.

Habitat: Moist Deciduous Forests, also in the plains.

Distribution: India: Andhra Pradesh, Bihar, Goa, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Tamil Nadu, West Bengal. KWLS: Kaimagudi; common.

Specimen examined: R. Saravanan & K.A. Sujana 33715 (CAL).

Subfamily Papilionoideae

Key to the genera

- | | |
|---|------------------------|
| 1a. Leaves paripinnate | 2 |
| 1b. Leaves imparipinnate (1 to many-foliolate) | 3 |
| 2a. Climber; stamens 9 | 1. Abrus |
| 2b. Herbs; stamens 10 | 17. Smithia |
| 3a. Bracts dimorphic, clustered as primary and secondary | 8. Desmodium |
| 3b. Bracts similar, not clustered as primary and secondary | 4 |
| 4a. Pods with oblique or transverse lines between seeds | 3. Cajanus |
| 4b. Pods neither oblique nor transversely lined between seeds | 5 |
| 5a. Trees or large woody climbers | 6 |
| 5b. Herbs or shrubs, erect or climbing | 9 |
| 6a. Pods neither samaroid nor winged | 15. Pongamia |
| 6b. Pods samaroid or with wing-like structures | 7 |
| 7a. Leaves 3-foliolate | 2. Butea |
| 7b. Leaves many-foliolate | 8 |
| 8a. Flowers yellow; pods orbicular, with a broad wing | 16. Pterocarpus |
| 8b. Flowers not yellow; pods oblong-lanceolate, not winged | 6. Dalbergia |
| 9a. Stamens monadelphous | 10 |
| 9b. Stamens diadelphous | 12 |

10a. Leaves alternate	7. Derris
10b. Leaves simple. 3-folioate	11
11a. Herbs, undershrubs or shrubs	5. Crotalaria
11b. Gigantic evergreen climber	18. Spatholobus
12a. Ovary sessile, short, 2-ovuled	10. Flemingia
12b. Ovary sessile or subsessile, 1 or 2 or many-ovulate	13
13a. Pods 1 or 2-seeded	14
13b. Pods 3 to more-seeded	15
14a. Pods densely covered with irritant bristles	13. Mucuna
14b. Pods glabrous	11. Indigofera
15a. Leaves many-foliolate	12. Millettia
15b. Leaves 1 or 3-foliolate	16
16a. Herbs or shrubs, erect or prostrate	8. Desmodium
16b. Trees to 15m high	17
17a. Pods falcate, sinuate between seeds	9. Erythrina
17b. Pods septate between the seeds	18
18a. Standard appendaged at back	4. Centrosema
18b. Standard appendaged within	19
19a. Seeds orbicular	14. Phyllodium
19b. Seeds quadrate	19. Vigna

1. *Abrus* Adans.

Abrus precatorius L., Syst. Nat. 2: 472. 1767; Baker in Hook.f., Fl. Brit. India 2: 175. 1876; Gamble, Fl. Madras: 349. 1919; Haines, Bot. Bihar Orissa 2: 247. 1922; Sanjappa, Legumes India: 74. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 445. 1994.

Local Names: *Kaicho, Kainch, Lalgunj.*

Woody perennial twining shrub. Leaves even-pinnate; leaflets 12–16 pairs, oblong to elliptic, 0.8–2.5 × 0.4–1 cm, obtuse at ends, sparsely pubescent beneath. Flowers in axillary racemes, pink; stamens 9, monadelphous. Pods oblong, 3–4 × 1–1.5 cm, slightly inflated, fulvo-puberulent; seeds many, subglobose, 5–7 × 4–5 mm, scarlet red with black eyes.

Fl. & Fr.: August–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Jodachua Ghatti, Nandugutta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33508, 33946 (CAL).

2. *Butea* Roxb. ex Willd.

Key to the species

- | | |
|---|--------------------------------|
| 1a. Tree; lowest calyx tooth much shorter than the side one | 1. <i>B. monosperma</i> |
| 1b. Large climber; lowest calyx-tooth equal to the side one | 2. <i>B. superba</i> |

1. *Butea monosperma* (Lam.) Taub. in Engl. & Prantl, Nat. Pflanzenfam. 3(3): 366. 1894; H.O. Saxena & Brahmam, Fl. Orissa 1: 460. 1994.

Local Name: *Palasha*.

Deciduous tree, to 10 m high. Leaves trifoliolate; rachis 12–20 cm long, pubescent; lateral leaflets broadly oblong-ovate or suborbicular, 8.5–13.5 × 5.5–11 cm, oblique at base, obtuse at apex, terminal leaflet widely rhomboid, 11–15 × 12.5–15 cm, emarginate, coriaceous, silky-pubescent beneath. Flowers c. 5 cm long, in terminal or axillary, densely fascicled racemes, bright red; stamens 10 (9+1). Pods oblong, 12.5–28 cm long, the base flat, wing-like and indehiscent, the tip splitting round the apical seed; seed obovate, compressed.

Fl. & Fr.: February–July.

Habitat: Dry forests.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti, Guajhari Nala; common.

Specimens examined: R. Saravanan & K.A. Sujana 33703, 34832 (CAL).

2. *Butea superba* Roxb., Pl. Coromandel 1: 23, t. 22. 1795; Baker in Hook.f., Fl. Brit. India 2: 195. 1876; Gamble, Fl. Madras: 357. 1918; Haines, Bot. Bihar Orissa 2: 280. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 462. 1994.

Local Names: *Lat Palas, Noi Palas*.

Climber. Leaflets attaining 30–45 cm, subrugose and dull above, thin-hairy, especially on veins beneath, terminal usually subrhomboid with obtuse apex. Flowers 4–6.5 cm long, bright red, in racemes up to 30 cm long. Pods long-stalked, 12–15 cm long, densely rusty tomentose.

Fl. & Fr.: March–July.

Habitat: Hill forests.

Distribution: India: Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh, Bihar, West Bengal. KWLS: Kuldiha Pahad, Panchalingeshwar, Parchondi; common.

Specimens examined: R. Saravanan & K.A. Sujana 33795, 34434, 35774 (CAL).

3. *Cajanus* DC.

Key to the species

- 1a. Pod villous
- 1b. Pods tomentose

- 1. *C. heynei*
- 2. *C. scarabaeoides*

1. *Cajanus heynei* (Wight & Arn.) Maesen, Agric. Univ. Wageningen Pap. 85(4): 129. 1986; Sanjappa, Legumes India: 101. 1992. *Dunbaria heynei* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 258. 1834.

Twining herb, with patently hairy stem. Leaflets obovate, to 7×4.5 cm, caudate-acuminate; lateral leaflets oblique at base, tomentose. Flowers *c.* 2 cm long, confined towards the tip of axillary racemes; calyx pubescent, red; petals yellow. Pods *c.* 3 cm long, villous; seed 4 or 5.

Fl. & Fr.: June–February.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Bihar, Assam, Karnataka, Kerala, Maharashtra, Tamil Nadu, West Bengal. KWLS: Jodachua Ghatti, Kuldiha Beat Rasta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33939, 34387 (CAL).

2. *Cajanus scarabaeoides* (L.) Thouars, Dict. Sci. Nat. 6: 617. 1817; Sanjappa, Legumes India: 100. 1992. *Dolichos scarabaeoides* L., Sp. Pl. 2: 726. 1753.

Local Names: *Tur, Tuver.*

Slender twining herb; stem brown-tomentose. Leaves 3-foliolate; leaflets obovate or elliptic, to 4×2.5 cm, obtuse at apex. Flowers *c.* 8 mm long, racemose or paniculate, axillary, solitary or in pairs, pale yellow; stamens 10 (9+1); anthers uniform. Pods 2–2.5 cm long, brown-tomentose, obliquely deeply grooved between seeds; seeds strophiolate.

Fl. & Fr.: June–February.

Habitat: Frequently cultivated.

Distribution: India: Throughout. KWLS: Ashun Chua, Koimutiya Gaon; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34837, 36449 (CAL).

4. *Centrosema* (DC.) Benth.

***Centrosema molle* Mart. ex Benth., Commentat. Legum. Gen.: 55. 1837. *C. pubescens* sensu Sanjappa Legumes India: 111. 1992, non Benth. 1837.**

Twiner, pubescent. Leaves 3-foliolate; leaflets ovate or elliptic, $3-6.2 \times 1.5-4$ cm, rounded at base, acuminate at apex, the terminal larger than laterals, pubescent. Flowers 5–8, 2.5–3.2 cm long, in axillary racemes, violet; stamens 10 (9+1). Pods linear, $7-12 \times 0.4-0.6$ cm; seeds 15–18, oblong, 4–6 mm long, apical horn to 1 cm long, brown with darker mottling.

Fl. & Fr.: June–January.

Habitat: Mixed Forests.

Distribution: India: Throughout. KWLS: Jodachua; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33760 (CAL).

5. *Crotalaria* L.

Key to the species

- | | |
|---------------------------------------|----------------------------------|
| 1a. Racemes 3–8-flowered | 2. <i>C. evolvuloides</i> |
| 1b. Racemes 6–20-flowered | 2 |
| 2a. Calyx oblong, obtuse, very silky | 1. <i>C. albida</i> |
| 2b. Calyx teeth lanceolate, pubescent | 3. <i>C. retusa</i> |

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: 295. 1918; Haines, Bot. Bihar Orissa 2: 280. 1922; Sanjappa, Legumes India: 116. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 472. 1994.

Local Name: *Ban Methi*.

Diffuse herb. Leaves oblanceolate, to 1.5 × 0.5 cm, obtuse at apex, hairy beneath. Racemes to 6 cm long, terminal. Flowers *c.* 1 cm long, yellow; calyx *c.* 9 mm long; lobes unequal; standard orbicular, *c.* 8 mm, hairy on back; wings *c.* 8 × 3 mm, rugose; keel glabrous. Pods obovate, *c.* 9 × 3 mm; seeds few.

Fl. & Fr.: June–March.

Habitat: Open forest.

Distribution: India: Throughout. KWLS: Ampada, Jodachua Ghatti; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34338, 34420 (CAL).

2. *Crotalaria evolvuloides* Wight ex Wight & Arn., Prodr. Fl. Ind. Orient.: 188. 1834; Baker in Hook.f., Fl. Brit. India 2: 68. 1876; Gamble, Fl. Madras: 292. 1918; Sanjappa, Legumes India: 119. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 474. 1994.

Prostrate herb. Leaves simple, elliptic-ovate, orbicular-oblong, 1.7–3.5 × 1–2 cm, obtuse and oblique at base, involute at margins, mucronulate, glabrescent above, pale, hispid-pubescent beneath. Flowers 1–5, in leaf-opposed or terminal racemes, yellow. Pods oblong or obovate-oblong, 1.0–1.5 × *c.* 0.5 cm, hirsute; seeds 6–10, reniform, 1.5–2.0 × 0.5–2.0 mm, black.

Fl. & Fr.: June–February.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Rajasthan, Tamil Nadu. KWLS: Bonun Chowk; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34836 (CAL).

3. *Crotalaria retusa* L., Sp. Pl.: 715. 1753; Baker in Hook.f., Fl. Brit. India 2: 75. 1876; Gamble, Fl. Madras: 293. 1918; Sanjappa, Legumes India: 128. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 483. 1994.

Local Names: *Bhil-jhanjhan*, *Biljhunhun*.

Herb or undershrub, to 1.5 m high. Leaves oblanceolate or obovate, 2–8 × 1–3 cm, obtuse or retuse at apex, puberulent and glaucous below. Flowers in few to many-flowered terminal racemes, yellow. Pods oblong, 3–4 × 0.8–1 cm, cylindrical; seeds 15–20, *c.* 3 mm long, light brown to black.

Fl. & Fr.: June–February.

Habitat: Forest margins and roadsides.

Distribution: India: Throughout. KWLS: Kuldiha FRH; common.

Specimen examined: R. Saravanan & K.A. Sujana 33657 (CAL).

6. *Dalbergia* L.f., *nom. cons.*

Key to the species

- | | |
|--|---------------------------------|
| 1a. Climbers | 2 |
| 1b. Trees | 3 |
| 2a. Stamens monadelphous | 3. <i>D. pinnata</i> |
| 2b. Stamens diadelphous | 5. <i>D. volunili</i> |
| 3a. Stamens 10, isodiadelphous | 1. <i>D. lanceolaria</i> |
| 3b. Stamens 9, monadelphous | 4 |
| 4a. Leaflets 3–5; flowers creamy yellow; ovary pubescent | 4. <i>D. sissoo</i> |
| 4b. Leaflets 3–9; flowers white; ovary glabrous | 2. <i>D. latifolia</i> |

1. *Dalbergia lanceolaria* L.f., Suppl. Pl.: 316. 1781; Baker in Hook.f., Fl. Brit. India 2: 235. 1876; Gamble, Fl. Madras: 383. 1918; Haines, Bot. Bihar Orissa 2: 296. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 490. 1994.

Local Names: *Chakundia*, *Puradobi*.

Tree, to 15 m high. Leaves 15–25 cm long; leaflets 13 or 15, oblong-elliptic, to 4 × 2 cm, emarginate, slightly coriaceous. Panicles terminal and axillary, 5–15 cm long; stamens 10, isodiadelphous. Pods oblong-lanceolate, *c.* 8 × 2 cm, stipitate, coriaceous. acute at ends; seeds 1–3.

Fl. & Fr.: April–January.

Habitat: Mixed hill forests.

Distribution: India: Throughout. KWLS: Guajhari Hill, Panchalingeshwar Pahad; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33700, 35626 (CAL).

2. *Dalbergia latifolia* Roxb., Pl. Coromandel 2: 7. 1799; Baker in Hook.f., Fl. Brit. India 2: 231. 1876; Gamble, Fl. Madras: 383. 1918; Haines, Bot. Bihar Orissa 2: 294. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 491. 1994.

Local Names: *Jadimari*, *Sissoo*.

Tree, to 25 m high. Leaves imparipinnate, rarely 1-foliolate; leaflets 3–9, alternate, orbicular, 2.5–10 × 2.5–10 cm, obtuse or emarginate at apex, coriaceous, glaucous beneath. Flowers 5–6 mm long, in axillary, short corymbose panicles, white; stamens 9, monadelphous. Pods oblong-lanceolate, 5–7.5 × 1.5–1.8 cm, obtuse, indehiscent; seeds 1–4, reniform, brown.

Fl. & Fr.: August–September.

Habitat: Moist Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Rajasthan, Sikkim, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Guajhari Pahad, Kuldiha Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 33738, 34404 (CAL).

3. *Dalbergia pinnata* (Lour.) Prain, Ann. Roy. Bot. Gard. Calcutta 10: 48. 1904; Thoth., Taxon. Rev. Dalbergie Ind. Subcont.: 119. 1987; Sanjappa, Legumes India: 139. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 492. 1994. *Derris pinnata* Lour., Fl. Cochinch.: 432. 1790.

Climbing shrub. Leaves imparipinnate; leaflets linear-oblong, 1.2–2 × c. 0.6 cm, obtuse at apex. Flowers numerous in axillary panicles, white; stamens 10, monadelphous. Pods samaroid, narrowly ligulate, long-stipitate; seeds 1 or 2, reniform, brown.

Fl. & Fr.: June–February.

Habitat: Moist Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Sikkim, Uttar Pradesh, West Bengal. KWLS: Bonun Chowk, Kenduna; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34463, 36518 (CAL).

4. *Dalbergia sissoo* Roxb., Fl. Ind. 3: 223. 1832; Baker in Hook.f., Fl. Brit. India 2: 237. 1876; Gamble, Fl. Madras: 384. 1918; Sanjappa, Legumes India: 140. 1992; Haines, Bot. Bihar Orissa 2: 293. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 494. 1994.

Local Name: *Sisso*.

Tree, to 10 m high. Leaves imparipinnate; leaflets 3–5, orbicular-ovate, 2.5–6 × 2–5.5 cm, rounded at base, cuspidate or acuminate at apex, coriaceous, puberulous to pubescent when young. Flowers 6–8 mm long, axillary and terminal in panicles, 5–7 cm long, densely pubescent, cream-coloured; stamens 9, monadelphous. Pods linear-oblong or oblong-elliptic, 5–7 × 0.8–1 cm, cuneate at base, acute at apex, light yellowish green; seeds 1–3.

Fl. & Fr.: March–February.

Habitat: Moist Deciduous Forests; often planted.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti, Pancharjuna Pond; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33932, 34813 (CAL).

5. *Dalbergia volubilis* Roxb., Pl. Coromandel 2: 48. 1805; Baker in Hook.f., Fl. Brit. India 2: 235. 1876; Gamble, Fl. Madras: 384. 1918; Haines, Bot. Bihar Orissa 2: 295. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 495. 1994

Climber. Leaves 8–10-foliolate; leaflets obovate-oblong, to 3 × 1.5 cm, obtuse at apex. Flowers c. 1 cm across, in terminal panicles of c. 25 × 10 cm, bluish pink; stamens isodiadelphous. Pods elliptic, to 3.5 × 1.5 cm, stalked, obtuse, shortly cuspidate; seed 1.

Fl. & Fr.: February–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti, Nilgiri Rasta; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34323, 35690 (CAL).

7. *Derris* Lour.

Derris scadens (Roxb.) Benth., J. Linn. Soc., Bot. 4(Suppl.): 103. 1860; Baker in Hook.f., Fl. Brit. India 2: 240. 1876; Gamble, Fl. Madras: 387. 1918; Sanjappa, Legumes India: 148. 1992.

Climber. Leaves c. 25 cm long; leaflets c. 16 pairs, oblong-lanceolate or oblanceate, 4–10 × 1–3 cm, obtuse at apex, thin-coriaceous, pubescent beneath when young. Flowers 3–6, in axillary and terminal panicles, c. 15 cm long, white with brown-red calyx tube. Pods oblong, flat, upper suture-winged; seed 1 or 2, reniform.

Fl. & Fr.: March–June.

Habitat: Riparian Forests.

Distribution: India: Throughout. KWLS: Jodachua Ghatti; rare.

Specimen examined: R. Saravanan & K.A. Sujana 33684 (CAL).

8. *Desmodium* Desv.

Key to the species

- | | |
|---------------------------------------|----------------------------------|
| 1a. Trailing herb | 4. <i>D. triflorum</i> |
| 1b. Erect or suberect herbs or shrubs | 2 |
| 2a. Leaves 1-foliolate | 1. <i>D. gangeticum</i> |
| 2b. Leaves 3-foliolate | 3 |
| 3a. Racemes to 15–35 cm long | 3. <i>D. laxiflorum</i> |
| 3b. Racemes to 2.5–10 cm long | 2. <i>D. heterocarpon</i> |

1. *Desmodium gangeticum* (L.) DC., Prodr. 2: 327. 1825; Baker in Hook.f., Fl. Brit. India 2: 168. 1876; Gamble, Fl. Madras: 345. 1918; Haines, Bot. Bihar & Orissa 2: 256. 1922; Sanjappa, Legumes India: 153. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 502. 1994. *Hedysarum gangeticum* L., Sp. Pl.: 746. 1753.

Local Names: *Saloporni, Salpheni*.

Undershrub, to 1.2 m high. Leaves 1-foliolate, ovate to elliptic, 5–10 × 1–5 cm, rounded at base, acute at apex, densely appressed-hairy beneath, often grey-blotched. Flowers white, fascicled in terminal and axillary, 15–25 cm long racemes. Pods oblong, 1.2–2.3 × 0.1–0.15 cm, 4–7-jointed, with hooked hairs, constricted in ventral suture.

Fl. & Fr.: May–January.

Habitat: Undergrowth in moist or mixed forests.

Distribution: India: Throughout. KWLS: Kanchipaani; common.

Specimen examined: R. Saravanan & K.A. Sujana 33772 (CAL).

2. *Desmodium heterocarpon* (L.) DC., Prodr. 2: 337. 1825; Sanjappa, Legumes India: 154. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 504. 1994. *Hedysarum heterocarpon* L., Sp. Pl.: 747. 1753.

Local Names: *Dongerbuta, Krishaparni, Salparni*.

Undershrub. Leaves 3-foliolate; leaflets obovate or broadly elliptic-oblong, 1.5–4 × 1–2.2 cm, rounded or retuse at apex, appressed-pubescent beneath. Flowers 5–6 mm long, in terminal racemes, 2.5–4.5 cm long, purple. Pods 1.2–2 × 0.3–0.4 cm, 5–7-jointed.

Fl. & Fr.: August–January.

Habitat: Undergrowth in moist or mixed forests.

Distribution: India: Throughout. KWLS: Guajhari Pahad, Nuarasta Chowk; common.

Specimens examined: R. Saravanan & K.A. Sujana 34354, 34819 (CAL).

3. *Desmodium laxiflorum* DC., Ann. Sci. Nat. 4: 100. 1825; Baker in Hook.f., Fl. Brit. India 2: 164. 1876; Gamble, Fl. Madras: 344. 1918; Haines, Bot. Bihar Orissa 2: 256. 1922; Sanjappa, Legumes India: 156. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 506. 1994.

Local Name: *Dongarmuli*.

Herb, to 35 cm high. Leaves 3-foliolate; terminal leaflet ovate, to 13 × 10 cm, rounded at base, acute, densely hairy beneath. Flowers solitary or paired, in axillary or terminal racemes, to 35 cm long, pink. Pods oblong, 6–9-jointed, longitudinally striate.

Fl. & Fr.: August–January.

Habitat: Undergrowth in moist or mixed forests.

Distribution: India: Throughout. KWLS: Jodachua Ghatti; common.

Specimens examined: R. Saravanan & K.A. Sujana 33935 (CAL).

4. *Desmodium triflorum* (L.) DC., Prodr. 2: 334. 1825; Baker in Hook.f., Fl. Brit. India 2: 173. 1876; Gamble, Fl. Madras: 347. 1918; Haines, Bot. Bihar Orissa 2: 266. 1922; Sanjappa, Legumes India: 163. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 512. 1994.

Local Names: *Kaansisna, Katkana, Kuradiagachha.*

Prostrate herb. Leaves 3-foliolate; leaflets obovate, 0.3–1.5 × 0.3–1.4 cm, emarginate at apex; lateral leaflets smaller than the terminal one. Flowers 3–4 mm long, 1–4 together in the axils of leaves, pink to violet. Pods 1–1.5 cm long, 3–5-jointed, hairy or glabrous, reticulate.

Fl. & Fr.: Throughout the year.

Habitat: Moist or mixed forests.

Distribution: India: Throughout. KWLS: Bulagadia, Guajhari Pahad; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33952, 35941, 36436 (CAL).

9. *Erythrina* L.

Erythrina stricta Roxb., Fl. Ind. 3: 251. 1832; Baker in Hook.f., Fl. Brit. India 2: 189. 1876; Gamble, Fl. Madras: 354. 1918; Haines, Bot. Bihar Orissa 2: 285. 1922; Sanjappa, Legumes India: 173. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 522. 1994.

Local Names: *Chaldua, Madar.*

Tree, to 15 m high, armed. Leaves 3-foliolate; leaflets deltoid, 5–12.5 × 3.7–10 cm, truncate or obtuse at base, subacute at apex, membranous. Flowers c. 5 × 1.8 cm, in terminal racemes, red; stamens 10, monadelphous. Pods lanceolate, 5–10 cm long; seeds 3–6, black.

Fl. & Fr.: January–February.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, West Bengal. KWLS: Bonun Chowk, Guajhari Nala, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33885, 34599, 35662 (CAL).

10. *Flemingia* Roxb. ex W.T. Aiton

Key to the species

- | | |
|------------------------|---|
| 1a. Leaves 1-foliolate | 2 |
| 1b. Leaves 3-foliolate | 3 |

- | | |
|---|---------------------------|
| 2a. Erect shrub, 1–2 m high; branchlets terete, pubescent | 1. F. chappar |
| 2b. Erect shrub, to 1 m high; branchlets tomentose | 4. F. strobilifera |
| 3a. Petioles <i>c.</i> 5 cm long, triquetrous | 2. F. grahamiana |
| 3b. Petioles to 7 cm long, narrowly winged | 3. F. macrophylla |

1. Flemingia chappar Buch.-Ham. ex Benth. in Miq., Pl. Jungh.: 244. 1852; Baker in Hook.f., Fl. Brit. India 2: 277. 1876; Gamble, Fl. Madras: 378. 1918; Haines, Bot. Bihar Orissa 2: 267. 1922; Sanjappa, Legumes India: 175. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 526. 1994.

Local Names: *Bhandari, Rani Kathi.*

Shrub, 1–2 m high. Leaves unifoliolate broadly ovate or orbicular-ovate, 5–12 cm long, cordate at base, acuminate or cuspidate at apex, very downy and dotted beneath. Flowers white, 5–12.5 mm long, in racemes, axillary. Pods 1–1.2 cm long, with glistening red glands.

Fl. & Fr.: January–May.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Bihar, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Nandugutta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34349 (CAL).

2. Flemingia grahamiana Wight & Arn., Prodr. Fl. Ind. Orient.: 242. 1834; Baker in Hook.f., Fl. Brit. India 2: 228. 1876; Gamble, Fl. Madras: 378. 1918; Sanjappa, Legumes India: 175. 1992.

Shrub, *c.* 1 m high. Leaves 3-foliolate; leaflets obovate, *c.* 10 × 5 cm, obtusely acute at apex, grey-tomentose beneath. Flowers 1–3 together, densely arranged in racemes of 3–5 cm long, densely yellowish brown hairy, purple. Pods obliquely oblong, *c.* 10 × 5 mm, beaked, pubescent; seeds 2, subreniform, *c.* 2 mm, dark brown.

Fl. & Fr.: January–May.

Habitat: Mixed Forests.

Distribution: India: Karnataka, Kerala, Tamil Nadu. KWLS: Jodachua Beat Rasta; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35777 (CAL).

3. Flemingia macrophylla (Willd.) Prain ex Merr., Philipp. J. Sci. 5: 130. 1910; H.O. Saxena & Brahmam, Fl. Orissa 1: 528. 1994; Sanjappa, Legumes India: 176. 1992;

Local Names: *Gariguri, Thlikur, Thutokur.*

Shrub. Leaflets subequal, elliptic-lanceolate, 5–14 × 2–5 cm, acute to acuminate at apex, tomentose on veins. Flowers 7–10 mm long, in axillary racemes, clustered or single, 2.5–5.5 cm long, villous, reddish. Pods oblong, 0.8–1.2 × 0.4–0.6 cm, turgid, red-powdery.

Fl. & Fr.: January–May.

Habitat: Mixed Forests.

Distribution: India: Throughout. KWLS: Ashun Chua; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34578 (CAL).

4. *Flemingia strobilifera* (L.) W.T. Aiton, Hort. Kew. 4: 350. 1812; Baker in Hook.f., Fl. Brit. India 2: 227. 1876; Gamble, Fl. Madras: 377. 1918; Sanjappa, Legumes India: 178. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 532. 1994.

Local Name: *Kussunt*.

Shrub, to 1 m high. Leaves 1-foliolate, ovate, elliptic to broadly lanceolate, 6–15 × 2.5–7 cm, acute to acuminate at apex, pubescent or hairy on veins beneath. Flowers *c.* 1 cm long, in axillary and terminal racemes, flexuous, tomentose, white. Pods oblong, 6–10 × 4–0.6 cm, pubescent, enclosed by the bracts.

Fl. & Fr.: March–April.

Habitat: Mixed Forests.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34348 (CAL).

11. *Indigofera* L.

***Indigofera tinctoria* L., Sp. Pl.: 751. 1753; Baker in Hook.f., Fl. Brit. India 2: 99. 1876; Gamble, Fl. Madras: 312. 1918; Haines, Bot. Bihar Orissa 2: 239. 1922; Sanjappa, Legumes India: 195. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 546. 1994.**

Local Name: *Nili*.

Herb, to 1.5 m high. Leaves pinnately 5–13-foliolate; leaflets opposite, elliptic to obovate, 5–22 × 5–12 mm, rounded at base and apex, black on drying. Flowers 5–7 mm long, in axillary spicate-racemes, red. Pods linear, 2–3 × *c.* 0.2 cm, terete; seeds 8–12.

Fl. & Fr.: September–January.

Habitat: Deciduous Forests.

Distribution: India: Throughout. KWLS: Parchondi Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 36567 (CAL).

12. *Millettia* Wight & Arn.

***Millettia racemosa* Benth. in Miq., Pl. Jungh.: 249. 1852; Baker in Hook.f., Fl. Brit. India 2: 105. 1876; Sanjappa, Legumes India: 213. 1992.**

Climber. Leaves 30–40 cm long; rachis tomentose; leaflets 5–8 pairs, obovate-oblong, 4–10 × 2–5 cm (terminal largest), obtusely cuspidate at apex. Flowers 1–1.5 cm long, crowded in long axillary racemes of 15–30 cm long, cream or pinkish. Pods linear, 10–22 × 1–1.5 cm, straight, torulose, dehiscent when ripe.

Fl. & Fr.: April–October.

Habitat: Hill forests.

Distribution: India: Andhra Pradesh, Bihar, Karnataka, Maharashtra, Tamil Nadu. KWLS: Bhaibhoni Ghatti, Bonun Chowk, Panchalingeshwar Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 33764, 34331, 35691 (CAL).

13. *Mucuna* Adans.

Mucuna pruriens (L.) DC., Prodr. 2: 405. 1825; Baker in Hook.f., Fl. Brit. India 2: 187. 1876; H.O. Saxena & Brahmam, Fl. Orissa 1: 562. 1994; Sanjappa, Legumes India: 217. 1992. *Dolichos pruriens* L., Herb. Amboin.: 23. 1754.

Local Names: *Baidonko*, *Kaicho*.

Climber. Leaves 3-foliolate; leaflets 5–13 × 2.5–8 cm; terminal leaflet ovate-rhomboid or elliptic; lateral ones broadly ovate, rounded or truncate at base, obtuse or acute at apex, adpressed-pubescent. Flowers c. 3.5 cm long, in axillary tomentose, pendulous racemes, dark purple. Pods linear-oblong, 5–7.5 × 1.2–1.5 cm, S-shaped, turgid, covered with irritant bristles; seeds 4–6, ovoid, to 8 × 7 mm, brown or black.

Fl. & Fr.: September–April.

Habitat: Mixed Forests.

Distribution: India: Throughout. KWLS: Panchalingeshwar; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36452 (CAL).

14. *Phyllodium* Desv.

Phyllodium pulchellum (L.) Desv., J. Bot. 2, 1: 124, t. 5. f. 24. 1813; Ohasi, Ginkgona 1: 276. 1973. *Hedysarum pulchellum* L., Sp. Pl.: 747. 1753. *Desmodium pulchellum* (L.) Benth., Fl. Hongk.: 83. 1861; Baker in Hook.f., Fl. Brit. India 2: 162. 1876; Gamble, Fl. Madras: 344. 1918; Haines, Bot. Bihar Orissa 2: 261. 1922.; H.O. Saxena & Brahmam, Fl. Orissa 1: 509. 1994; Sanjappa, Legumes India: 160. 1992.

Undershrub or shrub, to 2 m high. Leaves 3-foliolate; leaflets ovate, elliptic or ovate-oblong, 2.5–11 × 2–5 cm, wavy at margins, obtuse or subacute at apex, thin-coriaceous, finely downy and pale beneath. Flowers in racemes, terminal or axillary, 7–16 cm long, yellowish; primary bracts 10–18, orbicular, 1.2–1.5 cm, leafy, each enclosing 1–5 flowers. Pods 4–6 × 3–4 mm, sessile, joints usually 2, pubescent; seeds orbicular.

Fl. & Fr.: June–March.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Kuldiha Pahad; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33936 (CAL).

15. *Pongamia* Adans.

Pongamia pinnata (L.) Pierre, Fl. Forest. Cochinch. 3(Fasc. 25): 385. 1899; H.O. Saxena & Brahmam, Fl. Orissa 1: 570. 1994; Sanjappa, Legumes India: 230. 1992. *Cytisus pinnatus* L., Sp. Pl. 2: 741. 1753.

Local Name: *Karanjo*.

Evergreen tree, to 18 m high. Leaves imparipinnate; leaflets 5–7, ovate or ovate-elliptic, 4.5–12 × 2–7 cm, acuminate at apex, thick-chartaceous. Flowers 15–18 mm long, in lax axillary racemes, purplish white; stamens 10, monadelphous. Pods obliquely oblong, 4–5 × 2–2.5 cm, flat, thick, pointed at ends, indehiscent, green; seed 1, reniform.

Fl. & Fr.: May–January.

Habitat: Mixed Forests and plains.

Distribution: India: Throughout. KWLS: Ampada, Jodahcua FRH, Nuasai; common.

Specimens examined: R. Saravanan & K.A. Sujana 33650, 34393, 35672 (CAL).

16. *Pterocarpus* Jacq., *nom. cons.*

Pterocarpus marsupium Roxb., Pl. Coromandel 2: t. 116. 1799; Baker in Hook.f., Fl. Brit. India 2: 239. 1876; Gamble, Fl.

Madras: 385. 1918; Haines, Bot. Bihar Orissa 2: 297. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 574. 1994; Sanjappa, Legumes India: 232. 1992.

Local Names: *Bija*, *Piasal*.

Deciduous tree, to 30 m high. Leaves imparipinnate; leaflets 5–7, elliptic-oblong to oblong-ovate, 3.5–12.5 × 2–7 cm, obtuse-emarginate at apex, coriaceous. Flowers 1–1.2 cm long, in terminal and axillary panicles, yellow; stamens 10, monadelphous. Pods orbicular-reniform, 2.5–5 cm across, broadly winged; seed 1, subreniform.

Fl. & Fr.: April–October.

Habitat: Moist Deciduous Forests.

Distribution: India: Bihar, Uttar Pradesh. KWLS: Jodachua Ghatti, Kuldiha Pahad; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33723, 33938 (CAL).

17. *Smithia* Aiton, *nom. cons.*

Smithia sensitiva Aiton, Hort. Kew. 3: 496. 1789; Baker in Hook.f., Fl. Brit. India 2: 148. 1876; Gamble, Fl. Madras: 329. 1918; Haines, Bot. Bihar Orissa 2: 253. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 591. 1994; Sanjappa, Legumes India: 248. 1992.

Prostrate trailing herb. Leaves to 2.5 cm long; leaflets linear-oblong, 4–12 × 2–4 mm, bristly ciliate at margins, obtuse at apex. Flowers 1–6 in axillary capitate racemes, yellow; calyx to 1 cm long, equally 2-lipped, 5–7 mm long; standard ovate, to 7–9 mm long; keels to 5 × 3 mm, incurved, obtuse; stamens 5+5. Lomentum enclosed in calyx, 4–6-articulate, papillose.

Fl. & Fr.: September–November.

Habitat: Wetlands.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh. KWLS: Champo-Soro, Parchondi Gaon; common.

Specimens examined: R. Saravanan & K.A. Sujana 36464, 36495 (CAL).

18. *Spatholobus* Hassk.

Spatholobus parviflorus (Roxb. ex DC.) Kuntze, Revis. Gen. Pl. 1: 205. 1891. *Butea parviflora* Roxb. ex DC., Prodr. 2: 415. 1825; Haines, Bot. Bihar Orissa 2: 280. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 461. 1994; Sanjappa, Legumes India: 251. 1992.

Local Name: *Latapalash*.

Climber. Leaflets ovate, rounded at base, obtuse-acute at apex, densely hairy beneath. Flowers *c.* 9 × 8 mm, in panicles of *c.* 20 × 15 cm, axillary, densely hispid; calyx *c.* 4 mm long, densely villous inside; standard *c.* 8 × 6 mm, pale pink; wings *c.* 6 mm long, long-clawed; keel obovoid, *c.* 9 mm long. Pods *c.* 14 × 4.5 cm, *c.* 3 cm long-stalked.

Fl. & Fr.: August–March.

Habitat: Moist Forests.

Distribution: India: Throughout. KWLS: Panchalingeshwar Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34508 (CAL).

19. *Vigna* Savi

Vigna trilobata (L.) Verdc., Taxon 17: 172. 1968; Sanjappa, Legumes India: 276. 1992; H.O. Saxena & Brahmam, Fl. Orissa 1: 620. 1994. *Dolichos trilobatus* L., Mant. Pl. 1: 101. 1767.

Local Names: *Sanomungo*, *Mungam*.

Twiner, pilose. Leaflets to 3.5×2.5 cm, obtuse to acute apex, pilose. Racemes, axillary, to 15 cm long. Flowers yellow; calyx campanulate, tube *c.* 1.5 mm long, 5-lobed; petals *c.* 4 mm long; keel *c.* 6×2 mm, curved, produced into a beak. Pods *c.* 4×0.2 cm, terete, puberulous.

Fl. & Fr.: September–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Jodachua FRH; common.

Specimen examined: R. Saravanan & K.A. Sujana 34838 (CAL).

HALORAGACEAE

Myriophyllum L.

Myriophyllum tuberculatum Roxb., Fl. Ind. 1: 471. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 2: 432. 1878; H.O. Saxena & Brahmam, Fl. Orissa 2: 646. 1995.

Aquatic herb, 10–60 cm high. Submerged leaves triangular, pinnatifid, *c.* 3 cm long with opposite filiform lobes; aerial leaves sessile, linear-spathulate, to 2.5×0.2 – 0.3 cm, minutely dentate at margins, acute at apex. Spikes with male flowers on the upper whorls; lower whorls female and bisexual solitary, axillary, subsessile, pinkish white. Stamens 4 in bisexual flowers and 2 in male flowers. Ovary 4-celled; styles 4, pinkish; stigma fimbriate, pink. Drupes 4-angled, *c.* 3 mm long, with minute warty projections, pinkish; seeds ovate-lenticular, *c.* 1.5×1 mm.

Fl. & Fr.: July–September.

Habitat: Wetlands.

Distribution: India: Assam, Bihar, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Tripura, Uttarakhand, West Bengal. KWLS: Bagudi; rare.

Specimen examined: R. Saravanan & K.A. Sujana 34842 (CAL).

RHIZOPHORACEAE

Carallia Roxb.

Carallia brachiata (Lour.) Merr., Philipp. J. Sci. 15: 249. 1919; Mooney, Suppl. Bot. Bihar Orissa: 65. 1950; H.O. Saxena & Brahmam, Fl. Orissa 2: 652. 1995. *Diatoma brachiata* Lour., Fl. Cochinch. 1: 296. 1790. *Carallia integerrima* DC., Prodr. 3: 33. 1828; Gamble, Fl. Madras: 459. 1920.

Local Names: *Jur*, *Kierpa*, *Manj*.

Evergreen tree, to 25 m high. Leaves obovate or obovate-oblong, 4–11 × 2–7 cm, acute or obtuse at apex, coriaceous. Flowers sessile, in axillary trichotomously branching cymes, cream-coloured; petals 5–8, orbicular-cordate, clawed, deeply lacerate at margins, reddish. Stamens 10–16. Drupes filiform, 5–6 mm across, red; seed 1, subreniform, bright orange.

Fl. & Fr.: December–September.

Habitat: On the banks of streams.

Distribution: India: Andaman and Nicobar Islands, Assam, Maharashtra, West Bengal, Eastern Himalayas and southern India. KWLS: Kanchi Paani; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34496 (CAL).

COMBRETACEAE

Key to the genera

- | | |
|---|----------------------|
| 1a. Trees | 2 |
| 1b. Sarmentose or climbing shrubs | 3 |
| 2a. Flowers in globose heads | 1. Anogeissus |
| 2b. Flowers in simple or paniced spikes | 4. Terminalia |
| 3a. Calyx accrescent; petals 0 | 3. Getonia |
| 3b. Calyx not accrescent; petals 4 or 5 | 2. Combretum |

1. **Anogeissus** (DC.) Guill. & Perr.

Key to the species

- | | |
|---|------------------------|
| 1a. Bark black, cracked; leaves acute at apex | 1. A. acuminata |
| 1b. Bark whitish, smooth; leaves obtuse at apex | 2. A. latifolia |

1. *Anogeissus acuminata* (Roxb. ex DC.) Guill. & Perr., Fl. Seneg. Tent. 7: 280. 1832; Hook.f., Fl. Brit. India 2: 450. 1878; Gamble, Fl. Madras: 467. 1919; Haines, Bot. Bihar Orissa 2: 355. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 662. 1995.

Local Name: *Phansi*.

Tree, to 20 m high. Leaves opposite to subopposite, elliptic to oblong-elliptic or ovate to suborbicular, 3–8 × 1.5–3 cm, acute, obtuse or mucronate or sometimes shortly acuminate at apex, thin-coriaceous, sparsely adpressed-greyish pilose or tomentellous or glabrous. Flowers solitary or in pairs, axillary and terminal, 1–2 cm across; calyx tube 2–4 mm long, tawny-tomentellous, 5 or 6-toothed; petals 0. Fruits 3–7 × 5–8 mm (excluding beak), puberulous to glabrous, reddish brown, 2-winged; seeds ovoid, 3–5 × 2.5–3 mm.

Fl. & Fr.: March–May.

Habitat: Along streams and rivers.

Distribution: India: Andhra Pradesh, Bihar, Jharkhand, Kerala, Uttar Pradesh. KWLS; Ampada; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34484 (CAL).

2. *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. & Perr., Fl. Seneg. Tent. 7: 280. 1832; Hook.f., Fl. Brit. India 2: 450. 1878; Gamble, Fl. Madras: 466. 1919; Haines, Bot. Bihar Orissa 2: 355. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 663. 1995.

Local Name: *Dhau*.

Deciduous tree, to 18 m high. Leaves opposite to alternate, elliptic-oblong, suborbicular or oblong-obovate, 2.5–18 × 1.5–9 cm, obtuse, emarginate or mucronate at apex, subcoriaceous. Flowers 5–6 mm across, in axillary aggregated globose heads, pale green or yellow; calyx tube 2-winged, 3–5.5 mm long, villous inside, 5-toothed. Stamens 10, 2-series. Drupes circular, 6–8 mm, beaked, puberulous, greenish yellow, 2-winged; seed 1, obovate.

Fl. & Fr.: June–April.

Habitat: Dry deciduous forests.

Distribution: India: Andhra Pradesh, Bihar, Goa, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Nuarasta Chowk; common.

Specimen examined: R. Saravanan & K.A. Sujana 34531 (CAL).

2. *Combretum* Loefl.

Key to the species

- | | |
|--------------------------------|-------------------------|
| 1a. Large climbing shrubs | 2 |
| 1b. Small undershrub | 3. <i>C. nanum</i> |
| 2a. Hypanthium less than 1 cm | 2. <i>C. latifolium</i> |
| 2b. Hypanthium more than 10 cm | 1. <i>C. indicum</i> |

1. *Combretum indicum* (L.) De Filippis, Useful Pl. Dominica: 277. 1998.

Climbing shrub. Leaves oblong-lanceolate to elliptic, acuminate, the petiole bases persistent and thorn-like. Flowers in terminal drooping spikes, fragrant. Calyx tube *c.* 8 cm long; lobes short, triangular. Petals white, becoming red. Fruit narrowly ellipsoid, 5-angled.

Fl. & Fr.: February–March.

Habitat: Often planted and self grown.

Distribution: India: Throughout. KWLS: Jodachua FRH; common.

Specimen examined: R. Saravanan & K.A. Sujana 33938 (CAL).

2. Combretum latifolium Blume, Bijdr. 641. 1826; H.O. Saxena & Brahmam, Fl. Orissa 2: 667. 1995.

Climbing shrub. Leaves opposite or subopposite, elliptic-obovate to oblong-elliptic, 7–12 × 3.5–6 cm, obtusely acuminate at apex, subcoriaceous. Inflorescence of long-peduncled axillary spikes, forming terminal pendulous panicles. Flowers subsessile, polygamo-dioecious, greenish white. Sepals 4, triangular, *c.* 2 mm. Petals 4, rounded, *c.* 2 mm, greenish yellow. Stamens 8. Drupes 3–3.5 cm long, 4-winged, *c.* 1 cm wide, transversely striate.

Fl. & Fr.: February–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Andaman & Nicobar Islands, Andhra Pradesh, Assam, Goa, Karnataka, Kerala, Maharashtra, Meghalaya, Mizoram, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Nandu Gutta; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34386 (CAL).

3. Combretum nanum Buch.-Ham. in D. Don, Prodr.: 219. 1825; C.B. Clarke in Hook.f., Fl. Brit. India 2: 457. 1878; Haines, Bot. Bihar Orissa 2: 358. 1922; H.O. Saxena & Brahmam, Fl. Orissa 1: 667. 1995.

Local Name: *Andaika*.

Undershrub. Leaves opposite or alternate, orbicular, obovate or lanceolate, 2–5(–10) cm long, often reddish. Flowers in dense racemes, 2–3(–20) cm long, white or yellowish white. Petals exceeding the sepals. Fruits 2.5–3.5 cm long, 4-winged, pink or crimson.

Fl. & Fr.: December–April.

Habitat: Way sides of hill forests.

Distribution: India: Bihar, Jammu & Kashmir, Jharkhand, Madhya Pradesh, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Guajhari; common.

Specimens examined: R. Saravanan & K.A. Sujana 33689 (CAL).

3. Getonia Roxb.

Getonia floribunda Roxb., Pl. Coromandel 1: 61. 1795. *Calycopteris floribunda* Lam., Tabl. Encycl. 2: 485, t. 357. 1793; Hook.f., Fl. Brit. India 2: 449. 1878; Gamble, Fl. Madras: 467. 1919; Haines, Bot. Bihar Orissa 2: 372. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 664. 1995.

Local Names: *Dubopatli*, *Kokundia*.

Scandent shrub. Leaves ovate to elliptic, 4–9 × 2–3 cm, acute or acuminate-caudate at apex, rounded at base, densely pubescent, punctate. Flowers in dense axillary racemes,

crowded in dense panicles at top of branches, with leafy bracts; calyx tube 4–5 mm long, 5-lobed, cream-coloured, velvety, accrescent; petals absent. Stamens 10 (5+5), 2-series. Drupes 6–8 mm long, with 5 spreading accrescent calyx lobes; seed 1.

Fl. & Fr.: March–May.

Habitat: Mixed Forests.

Distribution: India: Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Panchalingeshwar, Salt peat Rasta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34456, 35692, 35862 (CAL).

4. *Terminalia* L., *nom. cons.*

Key to the species

- | | |
|---|------------------------|
| 1a. Fruits not winged | 2 |
| 1b. Fruit winged | 3 |
| 2a. Leaves clustered towards ends of branchlets, alternate; spikes simple | 3. T. bellirica |
| 2b. Leaves not clustered towards ends of branchlets, more or less subopposite; spikes usually paniced | 4. T. chebula |
| 3a. Bark smooth, grey or pale green; wings of fruits marked with ascending striations | 2.T. arjuna |
| 3b. Bark rough, cracked into oblong segments, dark; wings of fruits marked with horizontal striations | 1. T. alata |

1. *Terminalia alata* B. Heyne ex Roth, Nov. Pl. Sp.: 379. 1821; H.O. Saxena & Brahmam, Fl. Orissa 2: 671. 1995.

Local Names: *Kala Sahaja*, *Sahaja*.

Deciduous tree, to 30 m high. Leaves opposite to subopposite, elliptic-oblong or elliptic-ovate, 13–20 × 5–13 cm, oblique at base, acute, round or obtuse at apex, entire or crenulate at margins, coriaceous, midrib with 2-stalked glands near base beneath. Flowers 2–3 mm across, in terminal and axillary paniculate spikes, dull yellow; calyx tube 1–2 × 1–1.8 mm, 5-lobed, densely villous inside, yellow; petals absent. Stamens 10 in 2 rows. Drupes c. 3.5 × 5.5 cm, longitudinally 5-winged, coriaceous, pubescent, reddish brown; seed 1.

Fl. & Fr.: May–February.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Ampda, Bualgadia; common.

Specimens examined: R. Saravanan & K.A. Sujana 34425, 35663 (CAL).

2. Terminalia arjuna (Roxb. ex DC.) Wight & Arn., Prodr. Fl. Ind. Orient.: 314. 1834; Hook.f., Fl. Brit. India 2: 447. 1878; Gamble, Fl. Madras: 465. 1919; Haines, Bot. Bihar Orissa 2: 353. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 672. 1995.

Local Name: *Arjun*.

Evergreen tree, to 30 m high. Leaves opposite to alternate, elliptic, oblong-ovate or oblong-obovate, 7.5–16 × 3.5–8.5 cm, obtuse or round at apex, crenulate or entire at margins, coriaceous, 2 glands at base on lower side. Flowers 2–3 mm across, in short axillary spikes, dull yellow; calyx tube 0.5–2 × 1–1.5 mm, pubescent, 5-lobed; petals 0. Stamens 10, in 2 rows. Drupes oblong, c. 6 × 3 cm, 5–7-winged; seed 1.

Fl. & Fr.: May–February.

Habitat: Near water courses.

Distribution: India: Almost throughout. KWLS: Jodachua Nala; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33560 (CAL).

3. Terminalia bellirica (Gaertn.) Roxb., Pl. Coromandel: t. 198. 1805; Hook.f., Fl. Brit. India 2: 445. 1878; Gamble, Fl. Madras: 463. 1919; Haines, Bot. Bihar Orissa 2: 352. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 673. 1995.

Local Name: *Bahada*.

Deciduous tree, to 35 m high. Leaves opposite or alternate, clustered at tip of branchlets, obovate or obovate-elliptic, 9–35 × 5–15 cm, obtusely acuminate at apex, coriaceous, pubescent when young. Flowers 5–6 mm across, in axillary spikes; calyx tube 2–2.5 × 1.3–2 mm, rusty pubescent, 5-lobed, tomentose; petals absent. Drupes obovoid, 2–2.5 × c. 1.8 cm, obscurely 5-ridged, horned, tomentose, yellowish brown; seed 1, ellipsoid.

Fl. & Fr.: March–December.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Bonun Chowk, Kuldiha Pahad, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33859, 34421, 35784, 35922 (CAL).

4. Terminalia chebula Retz., Observ. Bot. 5: 31. 1789; Hook.f., Fl. Brit. India 2: 446. 1878; Gamble, Fl. Madras: 464. 1919; Haines, Bot. Bihar Orissa 2: 352. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 674. 1995.

Local Names: *Hara*, *Harida*.

Deciduous tree, to 25 m high. Leaves opposite to alternate, elliptic, ovate, obovate or elliptic-obovate, 9.5–28 × 4–12 cm, acute, acuminate, obtuse or apiculate at apex, oblique or subtruncate at base, tawny-villous beneath, coriaceous, petioles with 2 sessile glands at top.

Flowers 5–6 mm across, in terminal and axillary spikes, greenish white; calyx tube 1.5–2.5 × 0.8–1 mm, villous, 5-lobed; petals 0. Stamens 10 in 2 rows. Drupes obovoid, 3–4 × 2–2.5 cm, woody, obscurely 5-angled, greenish yellow; seed 1.

Fl. & Fr.: March–December.

Habitat: Sal and mixed forests.

Distribution: India: Almost throughout. KWLS: Nilgiri Rasta, Panchalingeshwar Pahad; fairly common.

Specimens examined: R. Saravanan & K.A. Sujana 34830, 35770 (CAL).

MYRTACEAE

Syzygium R. Br. ex Gaertn.

Key to the species

- | | |
|-----------------------------|------------------------------|
| 1a. Berries more than 1 cm | 1. <i>S. cumini</i> |
| 1b. Berries less than 10 mm | 2. <i>S. nervosum</i> |

1. *Syzygium cumini* (L.) Skeels, Bull. Bur. Pl. Industr. U.S.D.A. 248: 25. 1912; H.O. Saxena & Brahmam, Fl. Orissa 2: 682. 1995.

Local Name: *Jamun*.

Medium-sized tree. Leaves ovate to oblong, to 18 × 8 cm, acuminate at apex. Panicles on leafless branchlets, to 10 cm across. Flowers subsessile, 6–9 mm across; calyx tube turbinate, c. 3 mm across; filaments c. 7 mm long. Berries obovoid, c. 12 × 7 mm, deep blue.

Fl. & Fr.: April–August.

Habitat: Moist Deciduous Forests, planted as avenue tree.

Distribution: India: Throughout. KWLS: Guajhari, Kenduna, Nandugutta, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33913, 34304, 35899, 36544 (CAL).

2. *Syzygium nervosum* A. Cunn. ex DC., Prodr. 3: 260. 1828; H.O. Saxena & Brahmam, Fl. Orissa 1: 445. 1995.

Local Name: *Chota Jamun*.

Tree. Leaves opposite, broadly elliptic-obovate or rounded, rarely oblong-oblancheolate or ovate, 12–18 × 7–13 cm, acuminate at apex, membranous, glossy. Flowers in trichotomously branched lateral panicles, sessile, 4–5 mm across, white. Stamens many, free. Berries globose or ovoid, 6.5–12 mm long, purple.

Fl. & Fr.: April–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti, Bulagadia, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 34337, 35609, 36531 (CAL).

LECYTHIDACEAE

Key to the genera

- 1a. Evergreen trees; flowering with leaf **1. Barringtonia**
1b. Deciduous trees; flowering when leafless **2. Careya**

1. *Barringtonia* J.R. Forst. & G. Forst.

Barringtonia acutangula (L.) Gaertn., Fruct. Sem. Pl. 2: 97, t. 101. 1790; Hook.f., Fl. Brit. India 2: 508. 1879; Gamble, Fl. Madras: 487. 1919; Haines, Bot. Bihar Orissa 2: 368. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 688. 1995.

Local Names: *Hijal, Hinjal.*

Evergreen tree, to 15 m high. Leaves clustered towards tips of branchlets, oblanceolate to elliptic-obovate, 7–18 × 2.5–7 cm, finely serrate at margins, obtuse to rounded at apex, subcoriaceous. Flowers in terminal pendulous racemes, 6–8 mm across, red. Stamens many, in several rows; filaments filiform, c. 1.5 cm long, exserted, pink. Berries oblong-ovoid, 2.5–3.8 cm long, bluntly quadrangular, fibrous; seed 1, ovoid.

Fl. & Fr.: April–September.

Habitat: On the banks of streams.

Distribution: India: Almost throughout. KWLS: Nandugutta, Pancharjuna Pond; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34342, 34464, 35627 (CAL).

2. *Careya* Roxb.

Careya arborea Roxb., Fl. Ind.: 52. 1814; Hook.f., Fl. Brit. India 2: 511. 1879; Gamble, Fl. Madras: 488. 1919; Haines, Bot. Bihar Orissa 2: 367. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 689. 1995.

Local Names: *Kumbhi, Kumbre.*

Deciduous tree, to 12 m high. Leaves clustered at the tips of branchlets, obovate to oblong-obovate, 15–30 × 5–15 cm, crenate-serrate at margins, rounded or shortly acuminate at apex. Flowers in terminal spikes, 5–10 mm across, greenish white; calyx lobes 4, ovate, imbricate; petals 4, elliptic-oblong, revolute at margins. Stamens numerous in several rows, slightly connate at base; filaments purple, exserted, inner and outer rows without anthers. Berries globose, 5–7.5 cm, green, crowned with sepals and style.

Fl. & Fr.: April–August.

Habitat: Forests, chiefly in valleys.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti, Jodachua, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33702, 34310, 35694 (CAL).

MELASTOMATACEAE

Key to the genera

- | | |
|--|---------------------|
| 1a. Leaves penni-veined; ovary 1-celled; ovules <i>c.</i> 9,
on free short central placenta | 2. Memecylon |
| 1b. Leaves 3-or more-nerved from the base; ovary 3-6 celled;
ovules numerous, on axile placenta | 2 |
| 2b. Flowers in scorpioid spikes, 3-merous | 3. Sonerila |
| 2a. Flowers not spicate, 4 or 5, rarely 6 or 7-merous | 1. Melastoma |

1. *Melastoma* Blume

Melastoma malabathricum L., Sp. Pl.: 390. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 2: 523. 1879; Gamble, Fl. Madras: 495. 1919; Haines, Bot. Bihar Orissa 2: 371. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 692. 1995.

Local Names: *Korali, Koroti*.

Shrubs to 1.3 m high. Leaves elliptic-oblong, 4–11 × 1.5–4 cm, acute at apex, lineolate above, tomentose beneath. Flowers solitary or a few in clusters, *c.* 5 cm across; calyx tube campanulate, *c.* 1 cm long; lobes 5, ovate-lanceolate, 5–7 × 4–5 mm; petals 5, obovate, to 2 × 1 cm, reddish purple; stamens 10. Capsules ovoid, 1–1.5 × 0.8–1 cm; seeds many, minute.

Fl. & Fr.: February–December.

Habitat: Moist areas.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Bihar, Karnataka, Kerala, West Bengal. KWLS: Jodachua Ghatti, Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34311, 35620 (CAL).

2. *Memecylon* L.

Memecylon edule Roxb., Pl. Coromandel 1(4): 59, t. 82. 1798; C.B. Clarke in Hook.f., Fl. Brit. India 2: 563. 1879; Gamble, Fl. Madras: 504. 1919.

Local Name: *Bonohorono*.

Shrub, to 2 m high. Leaves ovate-oblong or elliptic, 2.5–5 × 1.5–3 cm, obtuse to rounded at apex, coriaceous. Umbels many-flowered, 1.5–3 cm across; calyx truncate or shallowly 4-lobed, 2–3 mm wide, pale bluish; petals elliptic-ovate to orbicular, blue. Berries globose, *c.* 7 mm, initially yellowish green; mature fruit bluish black.

Fl. & Fr.: March–September.

Habitat: Along banks of streams.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Bonun Chowk, Champo-soro; common.

Specimens examined: R. Saravanan & K.A. Sujana 34308, 35601 (CAL).

3. *Sonerila* Roxb.

Sonerila erecta Jack, Malayan Misc. 1: 7. 1820. *S. tenera* Royle, Ill. Bot. Himal. Mts.: 215, t. 45, f. 2. 1835; H.O. Saxena & Brahmam, Fl. Orissa 2: 700. 1995.

Annual, 5–20 cm high. Leaves ovate or elliptic, 1–3 × 0.5–1.8 cm, entire or finely serrate at margins, obtuse or subacute at apex, sometimes with long sparse hairs above. Flowers 1–8, in terminal racemes or spikes, 2.5–5 cm long; calyx tube 4–6 mm long, with short hairs and gland-hairs; lobes ovate, cuspidate; petals broadly oblong, *c.* 3 mm long, pink. Capsules oblongoid, 3-gonous, 6–7 × *c.* 2 mm, hairy; seeds *c.* 0.4 mm long, with a raphe, brown.

Fl. & Fr.: October–November.

Habitat: Moist places.

Distribution: India: Andhra Pradesh, Kerala, Sikkim, Uttarakhand, Uttar Pradesh. KWLS: Koimutiya; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35792 (CAL).

LYTHRACEAE

Key to the genera

- | | |
|------------------------------------|--------------------------------|
| 1a. Large or small trees | 2 |
| 1b. Herbs | 3. <i>Rotala</i> |
| 2a. Flowers 4-merous; stamens 8 | 2. <i>Lawsonia</i> |
| 2b. Flowers 6-merous; stamens many | 1. <i>Lagerstroemia</i> |

1. *Lagerstroemia* L.

Lagerstroemia parviflora Roxb., Pl. Coromandel: t. 66. 1795; Gamble, Fl. Madras: 514. 1919; Haines, Bot. Bihar Orissa 2: 375. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 710. 1995.

Local Names: *Chhena, Sidha*.

Deciduous tree, to 15 m high. Leaves opposite, elliptic to obovate-elliptic or oblong, 3.5–7.5 × 2–3 cm, acute to acuminate at apex, coriaceous, glabrous or shortly pubescent beneath. Flowers in lax axillary panicles, *c.* 2 mm across, white, fragrant; calyx tube campanulate, *c.* 7 mm long, 6-lobed; lobes to 3 mm long. Petals 6, ovate-suborbicular, to 6 mm long. Stamens many. Capsules ovoid, *c.* 3 × 1.5 cm, 3 or 4-valved, brown; seeds many; wing terminal.

Fl. & Fr.: April–December.

Habitat: Mixed forests.

Distribution: India: Almost throughout. KWLS: Jodachua Ghatti, Kuldiha Pahad, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33699, 34301, 35715 (CAL).

2. *Lawsonia* J. Agardh

Lawsonia inermis L., Sp. Pl.: 349. 1753; Gamble, Fl. Madras: 514. 1919; Haines, Bot. Bihar Orissa 2: 374. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 712. 1995.

Local Names: *Manghati, Manjuati*.

Shrub or small tree, glabrous, much-branched; branches often ending in thorns. Leaves sessile or shortly petioled, elliptic or broadly lanceolate, 2–5 × 0.6–2.5 cm, acute or obtuse at apex, often mucronate. Flowers *c.* 0.6 mm across, white or cream-coloured, fragrant. Capsules depressed-globose, 6–7.5 mm across, red when young, with small calyx lobes, crowned with the style.

Fl. & Fr.: August–December.

Habitat: Grown as hedge plant.

Distribution: India: Almost throughout. KWLS: Kuldiha FRH; common.

Specimen examined: R. Saravanan & K.A. Sujana 33615 (CAL).

3. *Rotala* L.

Rotala rotundifolia (Buch.-Ham. ex Roxb.) Koehne in Engl., Bot. Jahrb. Syst. 1: 175. 1880; Gamble, Fl. Madras: 509. 1919; H.O. Saxena & Brahmam, Fl. Orissa 2: 720. 1995.

Local Name: *Painlatkana*.

Herb, to 15 cm high. Stems 4-angled, reddish. Leaves sessile, oblong-orbicular, *c.* 8 × 6 mm, 5-veined. Flowers in racemes, 1–1.5 cm long; calyx tube *c.* 2.5 mm long; lobes triangular, acute at apex; corolla lobes obovate, *c.* 1.5 × 1 mm. Filaments attached near the base of calyx tube. Ovary obovoid, *c.* 1 × 1 mm; style *c.* 1 mm long; stigma truncate.

Fl. & Fr.: September–March.

Habitat: Along streams and in marshy areas.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Tamil Nadu. KWLS: Parchondi; common.

Specimen examined: R. Saravanan & K.A. Sujana 36558 (CAL).

ONAGRACEAE

Ludwigia L.

Key to the species

- | | |
|-------------------------------------|---------------------------|
| 1a. Flowers 5-merous | 1. L. adscendens |
| 1b. Flowers 4-merous | 2 |
| 2a. Stamens twice as many as sepals | 2. L. hyssopifolia |
| 2b. Stamens as many as sepals | 3. L. perennis |

1. Ludwigia adscendens (L.) Hara, J. Jap. Bot. 28: 290. 1953; H.O. Saxena & Brahmam, Fl. Orissa 2: 726. 1995.

Local Name: *Jagal*.

Aquatic floating herb; aerophores fusiform, spongy, white. Leaves obovate to oblanceolate, 1.5–3.5 × 0.5–1.5 cm, attenuate at base, obtuse at apex, glossy beneath. Flowers solitary, axillary, to 4 cm across; calyx lobes 5, narrow-lanceolate, tube *c.* 1 cm long, pubescent; petals 5, obovate, emarginate or rounded at apex, cream with yellow blotch inside. Stamens 10. Capsules *c.* 2.5 cm long, terete, 10-ribbed, dehiscing by 4 or 5 valves.

Fl. & Fr.: December–July.

Habitat: Wetlands.

Distribution: India: Throughout. KWLS: Nuasai, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 35820, 35913 (CAL).

2. Ludwigia hyssopifolia (G. Don) Exell, Garcia de Orta 5: 471. 1957; H.O. Saxena & Brahmam, Fl. Orissa 2: 726. 1995.

Herb with angled or winged branchlets. Leaves elliptic-lanceolate, 2.5–5 × 1–2 cm, acute to acuminate at apex, membranous. Flowers solitary; calyx lobes 4, lanceolate, *c.* 3 mm long; petals 4, obovate, yellow. Stamens 8. Capsules linear, *c.* 2 cm long, terete, 8-ribbed; seeds dimorphic.

Fl. & Fr.: October–January.

Habitat: Wetlands.

Distribution: India: Andhra Pradesh, Bihar, Kerala, Tamil Nadu, Uttar Pradesh. KWLS: Pancharjuna Pond, Bhaibhoni Ghatti; common.

Specimens examined: R. Saravanan & K.A. Sujana 33667, 34820, 34851 (CAL).

3. *Ludwigia perennis* L., Sp. Pl.: 119. 1753; Raven in Steenis, Fl. Males. 1, 8: 103. 1977; H.O. Saxena & Brahmam, Fl. Orissa 1: 445. 1995.

Local Name: *Latkera*.

Annual, 20–45 cm high. Leaves linear-lanceolate or linear-oblong, 3.7–7.5 × 0.5–2 cm, subacute at apex. Flowers solitary; sepals usually 4, deltoid, c. 2.5 mm long, acute; petals elliptic-oblong, as long as sepals, yellow. Stamens 4 or 5. Capsules oblongoid, 7.5–10 mm long, inflated; seeds ellipsoid, brown.

Fl. & Fr.: October–January.

Habitat: Wet places.

Distribution: India: Andhra Pradesh, Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Kerala, Tamil Nadu, Uttar Pradesh. KWLS: Jodachua Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34556 (CAL).

PASSIFLORACEAE

Passiflora L.

Key to the species

- | | |
|---------------------|-----------------------------|
| 1a. Climbing shrub | 1. <i>P. edulis</i> |
| 1b. Herbaceous vine | 2. <i>P. foetida</i> |

1. *Passiflora edulis* Sims, Curtis, Bot. Mag. 45: t. 1989. 1818; Gamble, Fl. Madras: 524. 1919.

Climbing shrub. Leaves palmately 3-lobed; lobes oblong, c. 9.5 × 8.2 cm, serrulate at margins, acute or acuminate at apex, basally 3-veined; stipules linear. Flowers axillary, solitary, white; calyx lobes 5; petals 5, inserted at the throat of calyx tube; corona tinged violet. Stamens 5. Berries c. 4 cm across.

Fl. & Fr.: November–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 35322 (CAL).

2. *Passiflora foetida* L., Sp. Pl.: 959. 1753; Gamble, Fl. Madras: 524. 1919; Haines, Bot. Bihar Orissa 2: 384. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 734. 1995.

Local Name: *Bisripi*.

Herbaceous vine. Leaves 3–5-lobed; lobes suborbicular to ovate, 5–7 × 3–5 cm, cordate at base, acuminate at apex, adpressed-glandular-pubescent; bracts and bracteoles deeply pinnatisect, glandular-pubescent. Flowers axillary, solitary, 3–4 cm across, white; calyx lobes 5, broadly ovate, 1–1.5 × 0.6–0.8 cm, apically spurred; coronal segments in 2 whorls; outer coronal hairs many, c. 1 cm; inner ones 2–3 mm. Stamens 5. Berries subglobose, 1.5–2 cm across, yellow; seeds many, ovate, 4–5 mm across, pitted.

Fl. & Fr.: November–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Assam, Bihar, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Koimutiya; common.

Specimen examined: R. Saravanan & K.A. Sujana 36527 (CAL).

CUCURBITACEAE

Key to the genera

- | | |
|---|--------------------------------|
| 1a. Petals fimbriate | 3. <i>Trichosanthes</i> |
| 1b. Petals entire or shortly dentate | 2 |
| 2a. Anther-cells flexuose or conduplicate | 1. <i>Momordica</i> |
| 2b. Anthers cells straight or curved not flexuose or conduplicate | 3 |
| 3a. All stamens 2-celled; connective and filaments ciliate | 4. <i>Zehneria</i> |
| 3b. Stamens both 1-celled and 2-celled; connective and filaments glabrous | 2. <i>Solena</i> |

1. *Momordica* L.

Key to the species

- | | |
|------------------------|-------------------------------|
| 1a. Flowers monoecious | 1. <i>M. charantia</i> |
| 1b. Flowers dioecious | 2. <i>M. dioica</i> |

Momordica charantia* L.**, Sp. Pl.: 1009. 1753, var. ***charantia; Hook.f., Fl. Brit. India 2: 616. 1879; Gamble, Fl. Madras: 532. 1919; Haines, Bot. Bihar Orissa 2: 394. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 747. 1995.

Local Names: *Kalara, Korola*.

Climber. Leaves orbicular-cordate, to 8 × 8 cm, 5–7-lobed; lobes dentate-lobulate at margins, acute or acuminate at apex. Flowers dioecious, axillary, solitary; corolla lobes 5, obovate, to 3 cm across, villous, yellow; stamens 3; pistillodes 3; ovary fusiform. Fruits

oblongoid, 10–15 cm long, echinate; seeds ovoid, 1–1.5 cm long, base and apex subtridentate, sculptured.

Fl. & Fr.: June–February.

Habitat: Cultivated.

Distribution: India: Cultivated throughout. KWLS: Kuldiha FRH; fairly common.

Specimen examined: R. Saravanan & K.A. Sujana 33621 (CAL).

2. *Momordica dioica* Roxb. ex Willd., Sp. Pl.: 605. 1805; Hook.f., Fl. Brit. India 2: 617. 1879; Gamble, Fl. Madras: 531. 1919; Haines, Bot. Bihar Orissa 2: 394. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 748. 1995.

Local Names: *Kankad, Kankud*.

Climbing herb with tuberous roots; tendrils simple. Leaves broadly ovate, 4–8 × 3–6 cm, deeply 3–5-lobed, cordate at base, denticulate at margins, acute at apex, membranous. Flowers dioecious, axillary, solitary; corolla lobes oblong, *c.* 2.5 × 1 cm, obtuse, yellow; stamens 3; ovary oblong. Fruits ovoid, *c.* 3 × 2.2 cm, softly echinate; seeds ovoid, 6–7 × 5–6 mm, emarginate, pale yellow.

Fl. & Fr.: August–November.

Habitat: Mixed Forests.

Distribution: India: Assam, Bihar, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Tamil Nadu, Uttar Pradesh. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34822 (CAL).

2. *Solena* Lour.

Solena amplexicaulis (Lam.) Gandhi in Saldanha & Nicolson, Fl. Hassan Dist.: 179. 1976; H.O. Saxena & Brahmam, Fl. Orissa 2: 750. 1995.

Local Names: *Ban Kundri, Matka*.

Prostrate or climbing scabrid herb; tendrils simple. Leaves ovate-deltoid, 4–8 × 3–7 cm, angular or shallowly 3–5-lobed, cordate at base, denticulate at margins, acuminate at apex, scabrid; corolla lobes 5, ovate-oblong, *c.* 3 mm long, obtuse, yellow; stamens 3; ovary villous. Fruits globose, *c.* 1.2 cm, red; seeds lenticular, rugose.

Fl. & Fr.: April–November.

Habitat: Hedges and thickets.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Maharashtra, Manipur, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Jodachua Chowk, Nuarasta, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33706, 35783, 35874 (CAL).

3. *Trichosanthes* L.

Trichosanthes cucumerina L., Sp. Pl.: 1008. 1753; Hook.f., Fl. Brit. India 2: 609. 1879; Gamble, Fl. Madras: 529. 1919; Haines, Bot. Bihar Orissa 2: 388. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 752. 1995.

Local Name: *Banpotol*.

Climber. Leaves broadly ovate or suborbicular, 8–11 × 8–10 cm, palmately 3–5-lobed, truncate-cordate at base, distantly denticulate at margins, acute at apex, chartaceous, glandular-pubescent beneath; corolla lobes oblong-lanceolate, fimbriate, white; stamens 3; pistillodes 3; ovary ribbed, pubescent. Fruits ovoid-fusiform, beaked, green with white strips when young, yellow when ripe.

Fl. & Fr.: August–January.

Habitat: Hedges and thickets.

Distribution: India: cultivated throughout. KWLS: Guajhari, Nandugutta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33533, 33923, 36479 (CAL).

4. *Zehneria* Endl.

Zehneria maysorensis (Wight & Arn.) Arn. in Hook.f., J. Bot. 3: 275. 1841; H.O. Saxena & Brahmam, Fl. Orissa 2: 754. 1995.

Climber, with simple tendrils. Leaves broadly ovate, 7–8 × 6.5–8 cm, shallowly 3-angled, cordate at base, serrate at margins, acute-acuminate at apex, minutely and densely punctate above, glabrous to minutely papillate beneath. Flowers monoecious, cream-yellow; male flowers in umbels; stamens 3; female flowers solitary, axillary; staminodes 3. Fruits oblongoid, c. 1.7 × 1 cm, finely reticulate-rugose; seeds obovate, c. 3.5 × 2 mm, smooth.

Fl. & Fr.: August–January.

Habitat: In hedges and thickets.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu. KWLS: Panhcharjuna; common.

Specimen examined: R. Saravanan & K.A. Sujana 34803 (CAL).

MOLLUGINACEAE

Glinus L.

Glinus oppositifolius (L.) A. DC., Bull. Herb. Boissier 2(1): 559. 1901; H.O. Saxena & Brahmam, Fl. Orissa 2: 768. 1995. *Mollugo oppositifolia* L., Sp. Pl. 1: 89. 1753; Gamble, Fl.

Madras: 552. 1920. *M. spergula* L., Syst. Nat. ed. 10, 2: 881. 1759; C.B. Clarke in Hook.f., Fl. Brit. India 2: 662. 1879.

Local Names: *Pitagama*, *Pitasag*.

Herb, diffuse or prostrate. Leaves sessile, in whorls of 3–5, unequal, obovate-spathulate, 7–20 × 3–8 mm, obtuse or acute at apex, fleshy. Flowers 5–8, in axillary fascicles, white. Stamens 5. Capsules loculicidal, oblongoid, c. 3 mm long, enclosed in accrescent calyx; seeds many, reniform, tubercled, reddish brown, with a pair of unequal white hilar appendages.

Fl. & Fr.: March–October.

Habitat: Degraded forests and moist localities.

Distribution: India: Throughout. KWLS: Koimutiya, Soro; common.

Specimens examined: R. Saravanan & K.A. Sujana 33597, 33924, 35789, 35937 (CAL).

ARALIACEAE

Schefflera J.R. Forst. & G. Forst.

Schefflera stellata Baill., Hist. Pl. 7: 161. 1879; Gamble, Fl. Madras: 570. 1919; H.O. Saxena & Brahmam, Fl. Orissa 2: 798. 1995.

Straggling shrub. Leaves digitate; leaflets 3–5, obovate, c. 12 × 8 cm, emarginate or slightly obtuse at apex; petioles 10–15 cm long, sheathing; petiolules to 5 cm long. Panicles to 35 cm long; pedicels to 7 mm long. Calyx tube united with ovary forming a rim. Petals 7 or 8, triangular, c. 3 × 1.5 cm, white. Stamens 7 or 8; filaments c. 1.5 mm long; anthers c. 1.5 mm long. Ovary 7 or 8-celled, seated on the calyx cup. Drupes globose.

Fl. & Fr.: May–June.

Habitat: Semi-epiphyte in mixed forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Nua Rasta; rare.

Specimens examined: R. Saravanan & K.A. Sujana 34895, 35701 (CAL).

CORNACEAE

Alangium Lam.

Alangium salviifolium (L.f.) Wangerin in Engl. & Prantl, Pflanzenr. IV, 220B, Heft 41: 9. 1910; Gamble, Fl. Madras: 572. 1919; K.M. Matthew in M.P. Nayar & al., Fasc. Fl. Ind. 19: 4. 1988; H.O. Saxena & Brahmam, Fl. Orissa 2: 800. 1995 (CAL).

Local Names: *Aisa*, *Dhalaankol*.

Tree, to 15 m high. Leaves alternate, oblong, elliptic or ovate, 7–15 × 3–4 cm, oblique or obtuse at base, acute at apex, chartaceous, puberulous beneath. Flowers *c.* 1.5 cm across, in axillary cymes or fascicles, white, fragrant; calyx cupular, adnate to ovary, tomentose, 10-lobed; petals 10, linear-oblong, *c.* 2.5 × 5 cm, tomentose. Stamens to 20. Berries subglobose, 2–3 × 1–1.5 cm, pubescent, brownish red, crowned with calyx lobes; seed 1, ovoid.

Fl. & Fr.: March–July.

Habitat: Waste ground, waysides and mixed forests.

Distribution: India: Andhra Pradesh, Assam, Goa, Karnataka, Kerala, Maharashtra, Uttar Pradesh. KWLS: Kuldiha Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 33562, 34572, 35752 (CAL).

RUBIACEAE

Key to the genera

1a. Trees or shrubs	2
1b. Herbs or climbing shrubs	19
2a. Trees 5-merous	3
2b. Shrub 5-merous	7
3a. Flowers closely arranged in globose heads	4
3b. Flowers otherwise	11
4a. Plants 4-merous	11. Ixora
4b. Plants 5-merous	5
5a. Large trees; inflorescence axillary	8. Haldina
5b. Medium-sized trees; inflorescence terminal	6
6a. Leaves <i>c.</i> 15 × 10 cm; flowers pinkish white	14. Mitragnyna
6b. Leaves <i>c.</i> 28 × 10 cm; flowers orange	16. Neolamarckia
7a. Armed	8
7b. Unarmed	9
8a. Berries to 1.5 cm, scarlet	2. Benkara
8b. Berries to 7.5 cm, grey	5. Ceriscoides
9a. Young parts of the plant often resinous	7. Gardenia
9b. Young parts of the plant not resinous	10
10a. Flowers 4-merous	17. Pavetta
10b. Flowers 5-merous	19. Psychotira
11a. Flowers 4-merous	6. Discospermum
11b. Flowers 5-merous	12
12a. Plants armed or occasionally armed	13
12b. Plants unarmed	16
13a. Ovary 5-celled	13. Meyna
13b. Ovary 2-celled	14
14a. Branchlets obtusely 4-angled	3. Canthium

14b. Branchlets not angled	15
15a. Fruit ellipsoid-ovoid, 5–7 cm	21. Tamilnadia
15b. Fruit globose-ovoid, 2–4 cm	4. Catunaregam
16a. Fruit a drupe	20. Psydrax
16b. Fruit a capsule	17
17a. Flowers yellow or pink	23. Wendlandia
17b. Flowers white	18
18a. Fruit a drupe	15. Morinda
18b. Fruit a capsule	10. Hymenodictyon
19a. Herbs; flowers 4 or 5-merous	20
19b. Climbing shrubs; flowers 5-merous	22
20a. Herb 5-merous	1. Argostemma
20b. Herb 4-merous	21
21a. Flowers pink or purple	12. Knoxia
21b. Flowers white	9. Hedyotis
22a. Flowers pedicellate; corolla pink	18. Pseudaidia
22b. Flowers sessile; corolla white	22. Uncaria

1. *Argostemma* Wall.

Argostemma verticillatum Wall. in Roxb., Fl. Ind. 2: 325. 1824; Hook.f., Fl. Brit. India 3: 43. 1880; Gamble, Fl. Madras: 590. 1921; H.O. Saxena & Brahmam, Fl. Orissa 2: 808. 1995.

Herb. Leaves subsessile, in whorls of 3 or 4, linear-lanceolate, *c.* 5 × 1 cm, membranous, mostly confined to the apex of stem. Flowers few in terminal umbels; calyx lobes ovate-acute; corolla lobes ovate-acuminate, white; staminal filaments short; anthers connate, poricidal; ovules many on projected placenta; style filiform; stigma capitate.

Fl. & Fr.: July–October.

Habitat: On moist and shady banks and rocks among moss.

Distribution: India: Tropical Himalayas and southern region. KWLS: Bulagadia; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35729 (CAL).

2. *Benkara* Adans.

Benkara malabarica (Lam.) Tirveng., Taxon 32: 440. 1983; Gamble, Fl. Madras: 616. 1921; Haines, Bot. Bihar Orissa 2: 433. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 809. 1995. *Randia malabarica* Lam., Encycl. 3: 25. 1789; Hook.f., Fl. Brit. India 3: 111. 1880.

Local Names: *Pedalli*, *Phiriki*.

Armed shrub; spines in axillary pairs. Leaves elliptic, oblanceolate or obovate, 2–7 × 1.5–3.5 cm, obtuse or rounded at apex, coriaceous. Flowers in axillary corymbose cymes; calyx tubular, *c.* 4 mm long; teeth 5, triangular-acute; corolla salver-shaped, *c.* 1.8 cm across; tube 5–7 mm long, 5-lobed, white; stamens 5. Berries subglobose, 0.8–1.2 cm, scarlet.

Fl. & Fr.: February–December.

Habitat: Scrub Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Kanchipaani; common.

Specimen examined: R. Saravanan & K.A. Sujana 34580 (CAL).

3. *Canthium* Lam.

Key to the species

- 1a. Flowers 4-merous
- 1b. Flowers 5-merous

1. *C. coromandelicum*

2. *C. glabrum*

1. *Canthium coromandelicum* (Burm.f.) Alston in Trimen, Handb. Fl. Ceylon (Suppl.) 6: 152. 1903. *Gmelina coromandelica* Burm.f., Fl. Ind.: 132. 1768. *Canthium parviflorum* Lam., Encycl. 1: 602. 1785; Hook.f., Fl. Brit. India 3: 136. 1880.

Armed shrub. Leaves ovate, elliptic-ovate to obovate, 1.8-4.2 × 1.3-3 cm, subacute at apex. Flowers in axillary, sessile cymes, greenish; calyx cupular, 4-toothed; corolla campanulate to globose, 4–5 mm across, mouth villous; lobes 4, ovate, acute; stamens 4, subsessile, exserted. Fruits subglobose, 1–1.5 cm, yellow.

Fl. & Fr.: February–May.

Habitat: Near streams.

Distribution: India: Throughout. KWLS: Balia Nala, Champo Pond, Kuldiha Pahad, Parchondi Gaon; fairly common.

Specimens examined: R. Saravanan & K.A. Sujana 35637, 35761, 36467, 36511 (CAL).

2. *Canthium glabrum* Blume, Bijdr: 967. 1827; Hook.f., Fl. Brit. India 3: 133. 1880; Haines, Bot. Bihar Orissa 2: 437. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 811. 1995.

Local Name: *Rainsera*.

Small or medium-sized tree. Leaves ovate or oblong-lanceolate or elliptic, 12–22 cm long, tapering or abruptly acuminate at apex, green, paler beneath. Flowers in cymes; corolla tube c. 2 mm long, 5-lobed; stigma mitriform, notched. Fruits globose, 2–2.5 cm, green, areole conspicuous; pyrenes 2, triangular, smooth; seed 1.

Fl. & Fr.: July–January.

Habitat: Hills and valleys.

Distribution: India: Andaman and Nicobar Islands, Assam, Meghalaya. KWLS: Kuldiha Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34334 (CAL).

4. *Catunaregam* Wolf

Catunaregam spinosa (Thunb.) Tirveng., *Adansonia* 35: 13. 1978; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 813. 1995. *Gardenia spinosa* Thunb., *Gardenia* 7: 16, t. 2, f. 4. 1780.

Local Names: *Kalai kanta*, *Mohana*, *Patteia*.

Tree, c. 3 m high, armed. Leaves obovate, c. 4.5 × 2 cm, obtuse at apex, tomentose beneath. Flowers solitary, terminal on lateral branches, pedicellate; calyx tube c. 5 mm long; lobes obovate, hispid; corolla tube c. 6 mm long, villous at base inside; lobes 5, obovate, c. 12 mm long, twisted, white; stamens 5. Berries obovoid, c. 4 × 3 cm; seeds many, embedded in pulp.

Fl. & Fr.: March–January.

Habitat: Scrub and open or dense forests.

Distribution: India: Almost throughout. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34347 (CAL).

5. *Ceriscoides* (Hook.f.) Tirveng.

Ceriscoides turgida (Roxb.) Tirveng., *Adansonia* 35: 15. 1978; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 814. 1995. *Gardenia turgida* Roxb., *Fl. Ind.* 2: 557. 1824.

Local Names: *Bhamenia*, *Kurdu*.

Tree, to 8 m high, deciduous, spines leaf-bearing. Leaves ovate, 1.5–9 × 1–5 cm, acute-apiculate at apex, thick-chartaceous, hispid above, hirsute beneath. Flowers solitary or in lax cymes, white turning yellow; calyx urceolate, c. 1.5 cm long, 5-lobed; corolla salverform; lobes 5, obovate, c. 1.5 cm long; stamens 5. Berries globose, 4–5 cm, turgid; seeds many, embedded in fleshy pulp, testa smooth.

Fl. & Fr.: March–December.

Habitat: Scrub and open or dense forests.

Distribution: India: Eastern and Western Ghats. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34816 (CAL).

6. *Discospermum* Dalzell

Discospermum abnorme (Korth.) S.J. Ali & Robbr., *Blumea* 35(2): 300. 1991. *Gynopachis abnormis* Korth., *Ned. Kruidk. Arch.* 2: 182. 1851. *Diplospora singularis* Korth., *Ned. Kruidk. Arch.* 2: 201. 1851; Hook.f., *Fl. Brit. India* 3: 123. 1880; Haines, *Bot. Bihar Orissa* 2: 448. 1922.

Tree. Leaves oblong or elliptic-oblong, 10–16.5 cm long, acuminate or caudate at apex, shining, often gland-pitted in vein axils and hairy round the gland. Flowers in capitate

cymes; calyx tubular-campanulate, *c.* 3 mm long, 4-lobed; corolla salver-shaped, tube small; lobes oblong, *c.* 7.5 mm long, acute, villous at base, green. Fruits globose, 1.8–2 cm, areolate; seeds 4–7 in each cell, oblong, *c.* 6.2 mm long, flat.

Fl. & Fr.: April–June.

Habitat: Along the streams.

Distribution: India: Assam, Meghalaya. KWLS: Parchondi Gaon; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36540 (CAL).

7. *Gardenia* J. Ellis

Key to the species

- 1a. Flowers sessile
- 1b. Flowers pedicelled

- 1. *G. gummifera*
- 2. *G. latifolia*

1. *Gardenia gummifera* L.f., Suppl. Pl.: 164. 1781; Hook.f., Fl. Brit. India 3: 116. 1880; Haines, Bot. Bihar Orissa 2: 429. 1922; Gamble, Fl. Madras: 618. 1921; H.O. Saxena & Brahmam, Fl. Orissa 2: 823. 1995.

Local Names: *Gurudu, Kurlu.*

Tree, to 8 m high. Leaves ovate to obovate-oblong, 4–8 × 1.5–4 cm, rounded or subcordate at base, acute or obtuse at apex, coriaceous, puberulent when young, shiny. Flowers solitary or in lax cymes, axillary, white turns to yellow; calyx *c.* 4.5 mm long, 5-lobed; corolla cylindrical; lobes 5, obovate, *c.* 2.5 × 1.5 cm, obtuse, puberulous outside; stamens 5. Berries ellipsoid or oblong, *c.* 4 × 3 cm; seeds rugose.

Fl. & Fr.: March–August.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Odisha and Tamil Nadu. KWLS: Ashunchua, Bonun Chowk, Koimutiya Gaon; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33899, 34502, 35810 (CAL).

2. *Gardenia latifolia* Aiton, Hort. Kew. 1: 294. 1789; Hook.f., Fl. Brit. India 3: 116. 1800; Gamble, Fl. Madras: 619. 1921; Haines, Bot. Bihar Orissa 2: 431. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 824. 1995.

Local Names: *Damkudum, Dimaru.*

Small tree. Leaves opposite or 3-nate, subsessile, broadly elliptic, orbicular or obovate, to 37 × 18 cm, obtuse or rounded at base, glandular-hairy in the axils beneath. Flowers solitary, 7.5–10 cm across, white; calyx 1.2–2 cm long, pubescent, unequally lobed; corolla tube 5–6.2 cm long, funnel-shaped above, hairy, 5–9-lobed. Fruits globose, 3.7–5 cm, slightly scabrous.

Fl. & Fr.: December–June.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Odisha and Tamil Nadu. KWLS: Kuldiha Pahad; rare.

Specimen examined: R. Saravanan & K.A. Sujana 34502 (CAL).

8. *Haldina* Ridsdale

Haldina cordifolia (Roxb.) Ridsdale, *Blumea* 24(2): 361. 1978; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 826. 1995. *Nauclea cordifolia* Roxb., *Pl. Coromandel* 1(3): 49, t.53. 1796.

Local Names: *Maldu, Mandi*.

Deciduous tree, to 30 m high. Leaves orbicular or ovate or broadly ovate, 10–20 × 10–20 cm, cordate at base, acuminate at apex, chartaceous, pubescent beneath. Flowers bisexual, 3–4 mm long, in axillary globose heads, yellow; calyx cupular, 1.5–2 mm long; corolla 7–9 mm long, 5-lobed, densely hairy; stamens 5. Capsules of 2 dehiscent cocci, 2–3 mm long, turbinate, brown; seeds many with tail at one end and a bifid wing other end.

Fl. & Fr.: November–May.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu. KWLS: Kuldiha Pahad; common.

Specimen examined: R. Saravanan & K.A. Sujana 33876 (CAL).

9. *Hedyotis* L.

Hedyotis neesiana Arn., *Nova Acta Acad. Caes. Leop.-Carol. German. Nat. Cur.* 18: 341. 1836; R. Dutta & Deb, *Taxon. Rev. Hedyotis*: 174. 2004.

Prostrate herb. Leaves linear-lanceolate to elliptic, to 7 × 1 cm, coriaceous, pale beneath. Flowers sessile in axillary clusters, 1–3 together; calyx *c.* 4 mm long, lobes acute, ciliate at margins; corolla 4–5 mm long; lobes spreading, white. Capsules ovoid, *c.* 3 × 2 mm; seeds ovoid, angled, deep brown.

Fl. & Fr.: April–December.

Habitat: Open Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala. KWLS: Ampada, Nua Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34549, 35781 (CAL).

10. *Hymenodictyon* Wall.

Hymenodictyon orixense (Roxb.) Mabb., *Taxon* 31: 66. 1982; Haines, *Bot. Bihar Orissa* 2: 425. 1922; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 843. 1995.

Local Name: *Bhurkunda*.

Deciduous tree, to 20 m high. Leaves ovate or elliptic-ovate, 10–25 × 8–20 cm, acute or acuminate at apex, chartaceous, pubescent. Flowers bisexual, pale green, 5–6 mm long, in axillary and terminal racemes; stamens 5. Capsules elliptic, c. 2.5 cm long, flat, 2-valved, brown; seeds many, broadly winged.

Fl. & Fr.: August–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 35755 (CAL).

11. *Ixora* L.

Key to the species

- | | |
|---|------------------------|
| 1a. Trees | 2 |
| 1b. Shrubs | 3 |
| 2a. Flowers fragrant; fruits red-purple | 1. <i>I. brachiata</i> |
| 2b. Flowers not fragrant; fruits black | 3. <i>I. pavetta</i> |
| 3a. Corolla scarlet; tube 3–3.5 cm long | 2. <i>I. coccinea</i> |
| 3b. Corolla pink; tube 0.8–1 cm long | 4. <i>I. undulata</i> |

1. *Ixora brachiata* Roxb. ex DC., Prodr. 4: 488. 1830; Hook.f., Fl. Brit. India 3: 142. 1880; Gamble, Fl. Madras: 631. 1921.

Evergreen tree, to 8 m high. Leaves elliptic-oblong, obovate, or elliptic-oblong, 7.5–20 × 3–7 cm, obtuse at apex, coriaceous. Flowers in paniced cyme, bisexual, white, fragrant, sessile, terminal; stamens 4. Berries globose, c. 5 mm, red-purple.

Fl. & Fr.: January–May.

Habitat: Semi-evergreen Forests.

Distribution: India: Throughout. KWLS: Koimutiya Gaon; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36509 (CAL).

2. *Ixora coccinea* L., Sp. Pl.: 110. 1753; Hook.f., Fl. Brit. India 3: 145. 1880; Gamble, Fl. Madras 631. 1921; H.O. Saxena & Brahmam, Fl. Orissa 2: 847. 1995.

Shrub. Leaves sessile, elliptic to oblong, 6–10 × 2.5–3 cm, round to slightly cordate at base, shortly acute at apex. Flowers in corymbs, 5–8 cm across, scarlet. Berries didymous, 6–8 mm across; seeds 2, globose, 3–4 cm.

Fl. & Fr.: Throughout the year.

Habitat: Naturalised and often planted in gardens.

Distribution: India: Throughout. KWLS: Andheri Nala, Bagudi, Bhaibhoni Ghatti; often planted.

Specimens examined: R. Saravanan & K.A. Sujana 33721, 35612, 35897 (CAL).

2. *Ixora pavetta* Andr., Bot. Repos. t. 78. 1799. H.O. Saxena & Brahmam, Fl. Orissa 2: 845. 1995.

Local Names: *Kalakrya, Kila Kerua, Telkurma, Telokyra*.

Tree, to 10 m high. Leaves elliptic or obovate-oblong, 6–14 cm × 3.5–7.5 cm, obtuse or rounded at base, obtuse at apex, thick-coriaceous. Flowers bisexual 5–6 mm long, in terminal panicles, white. Berries globose, 5–6 mm, succulent, black; pyrenes 2, planoconvex.

Fl. & Fr.: May–December.

Habitat: Semi-evergreen forests.

Distribution: India: Almost throughout. KWLS: Kuldiha Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34343 (CAL).

4. *Ixora undulata* Roxb., Fl. Ind. 1: 385. 1832; Hook.f., Fl. Brit. India 3: 147. 1880; Gamble, Fl. Madras: 631. 1921; Haines, Bot. Bihar Orissa 2: 435. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 846. 1995.

Local Name: *Karuna*.

Large shrub. Leaves elliptic to elliptic-lanceolate, 8–15 × 2.5–6 cm, acuminate at apex. Cymes branches and flowers articulated; calyx tube *c.* 1 mm long, persistent in fruits; lobes *c.* 1 mm long; corolla pink; tube *c.* 1 cm long. Berries subglobose, 5–7 mm, didymous.

Fl. & Fr.: April–September.

Habitat: Semi-evergreen forests.

Distribution: India: Andhra Pradesh, Assam, Kerala, Meghalaya. KWLS: Bulagadia, Nandugutta, Panhcalingeshwar; fairly common.

Specimens examined: R. Saravanan & K.A. Sujana 33783, 35665, 36507 (CAL).

12. *Knoxia* L.

Knoxia sumatrensis (Retz.) DC., Prodr. 4: 570. 1830; R. Bhattacharjee & Deb, J. Econ. Taxon. Bot. 6: 91. 1985; H.O. Saxena & Brahmam, Fl. Orissa 2: 849. 1995. *Spermacoce sumatrensis* Retz., Observ. Bot. 4: 23. 1786.

Erect or diffuse, pubescent herb. Leaves linear-lanceolate to oblanceolate, 6–10 × 1.5–3 cm, acuminate at apex, glabrescent above and pubescent beneath. Flowers in terminal elongating lax corymbose cymes, 4-merous, pubescent near throat, pale violet; stamens 4. Capsules narrowly ellipsoid, 2–2.5 mm long; seeds 2, small, reddish brown.

Fl. & Fr.: June–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Assam, Karanataka, Kerala, Maharashtra, Manipur, Tamil Nadu. KWLS: Bonun Chowk, Jodachua Ghatti, Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34543, 34879, 35811 (CAL).

13. *Meyna* Roxb. ex Link

Key to the species

- | | |
|-----------------------------------|-------------------------------|
| 1a. Corolla throat densely hairy | 1. <i>M. laxiflora</i> |
| 1b. Corolla throat thinly villous | 2. <i>M. spinosa</i> |

1. *Meyna laxiflora* Robyns, Bull. Jard. Bot. État Bruxelles 11: 228. 1928.

Large shrub to small tree, armed. Leaves elliptic-lanceolate, 4–7.5 × 2–4 cm, acuminate at apex. Flowers in axillary, cymose fascicles, greenish white; calyx tube cupular, 2–3 mm long, 5-lobed; corolla tube 3–4 mm long, densely hairy, 5-lobed; stamens 5; ovary 5-locular; ovules solitary in each, pendulous. Drupes globose, 2–2.5 cm; pyrenes 5.

Fl. & Fr.: April–July.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Kuldiha FRH; common.

Specimen examined: R. Saravanan & K.A. Sujana 33698 (CAL).

2. *Meyna spinosa* var. ***pubescens*** Robyns, Bull. Jard. Bot. État Bruxelles 11: 231. 1928. H.O. Saxena & Brahmam, Fl. Orissa 1: 851. 1994.

Local Name: *Nangal Kanta*.

Small tree or large shrub, armed. Leaves ovate, elliptic or oblong, 7.5–15 × 2.5–7.5 cm, acute or acuminate at apex, more or less pubescent. Flowers small, in dense axillary subglobose cymes, green; corolla 3–3.2 mm long, throat thinly villous, not densely woolly at mouth; stamens 5. Drupes subglobose, 1.8–2.5 cm; pyrenes 5 or 6, flat.

Fl. & Fr.: April–December.

Habitat: Open forests or scrub forests.

Distribution: India: Andhra Pradesh, Gujarat, Rajasthan. KWLS: JodachuaGhatti, Kuldiha Pahad, Panchalingeshwar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33949, 34448, 35605 (CAL).

14. *Mitragyna* Korth.

Mitragyna parvifolia (Roxb.) Korth., Observ. Naocl. Ind.: 19. 1839; Gamble, Fl. Madras: 585. 1921; Haines, Bot. Bihar Orissa 2: 422. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 853. 1995. *Nauclea parvifolia* Roxb., Pl. Coromandel 1(2): 40, t. 52. 1795.

Local Names: *Gudi Kaima, Mundi*.

Deciduous tree, to 20 m high. Leaves ovate, orbicular, elliptic or ovate-oblong, 5–16 × 2.5–10 cm, attenuate, acute or subcordate at base, obtuse or rounded at apex, coriaceous. Flowers bisexual, 10–12 mm long, in terminal heads, creamy white; stamens 5. Capsules in globose heads, ribbed, separating in to two cocci, brown; seeds many, small, 10-ribbed.

Fl. & Fr.: March–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti, Kenduna, Pahadi Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33860, 34356, 35647 (CAL).

15. *Morinda* L.

Morinda citrifolia L., Sp. Pl.: 176. 1753; Hook.f., Fl. Brit. India 3: 155. 1880; Gamble, Fl. Madras: 651. 1921; H.O. Saxena & Brahmam, Fl. Orissa 2: 855. 1995.

Local Name: *Achu, Atsu*.

Evergreen shrub or small crooked tree. Leaves elliptic-lanceolate, 12–50 × 5–17 cm, acute to shortly acuminate to apex. Flowers bisexual, fragrant, in dense globose heads; calyx tube hemispheric, limb truncate; corolla funnel-shaped, to 1.5 cm long, 5-lobed; stamens 5. Drupes ovoid, 3–10 × 2–3 cm, yellow-white; seeds 2, black.

Fl. & Fr.: April–May.

Habitat: Moist Deciduous Forests.

Distribution: India: Andaman & Nicobar Islands, Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Gudisai Gaon, Jodachua Ghatti; common.

Specimens examined: R. Saravanan & K.A. Sujana 33705, 36515 (CAL).

16. *Neolamarckia* Bosser

Neolamarckia cadamba (Roxb.) Bosser, Adansonia ser. 4, 6: 247. 1984. *Nauclea cadamba* Roxb., Fl. Ind. 2: 121. 1824. *Anthocephalus chinensis* Walp., Repert. Bot. Syst. 2: 491. 1843; H.O. Saxena & Brahmam, Fl. Orissa 2: 807. 1995.

Local Names: *Kadamba, Kadambo*.

Deciduous tree, to 20 m high. Leaves ovate or elliptic-oblong, 10–25 × 6–12 cm, truncate or obtuse at base, acuminate at apex, pubescent beneath. Flowers bisexual, in globose heads, 2–4.5 cm, yellow; calyx tube globose, 2–3 mm, 5-lobed; corolla tube 6–8 mm long, 5-lobed; stamens 5. Capsules 3.5–5 cm across, on a fleshy globose receptacle, membranous, orange- yellow; seeds many, angular, minute.

Fl. & Fr.: May–October.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Nilgiri Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 35863 (CAL).

17. Pavetta L.

Pavetta indica L., Sp. Pl.: 110. 1753, var. **indica**; Hook.f., Fl. Brit. India 3: 150. 1880; Gamble, Fl. Madras: 633. 1921. *P. tomentosa* Roxb. ex Sm. in Rees, Cyclop. 26: 2. 1813; H.O. Saxena & Brahmam, Fl. Orissa 2: 866. 1995.

Local Names: *Macharanka*, *Pengu*.

Shrub. Leaves ovate-elliptic or oblanceolate, 7–11 × 3–4 cm, acuminate at apex, chartaceous. Flowers in terminal corymbs; calyx minutely 4-toothed, to 3 mm long; corolla tube c. 1.5 cm long, sparsely pilose inside; lobes obovate, white; stamens 4. Berries globose, 6–9 mm, black.

Fl. & Fr.: May–December.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti, Nandugutta, Panchalingeshwar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33507, 34527, 35658 (CAL).

18. Pseudaidia Tirveng.

Pseudaidia speciosa (Bedd.) Tirveng., Adansonia 3: 287. 1986.

Climbing shrub. Leaves ovate or elliptic, obtusely acuminate at apex, to 18 × 10 cm, chartaceous. Calyx puberulous, limb 5-toothed. Corolla white with pink shades, tube to 1 cm long, lobes as long as the tube, reflexed. Stamens exserted. Berries globose, to 1 cm.

Fl. & Fr.: April–August.

Habitat: Moist Deciduous Forests.

Distribution: India: Karnataka, Kerala, Tamil Nadu. KWLS: Ampada, Kanchipaani; common.

Specimens examined: R. Saravanan & K.A. Sujana 33691, 33812 (CAL).

19. Psychotria L.

Key to the species

- 1a. Leaves with glands at the axils of secondary veins
- 1b. Leaves without glands

1. P. adenophylla
2

2a. Calyx lobes villous; pyrenes with 4 furrows on back

2. P. monticola

2b. Calyx lobes ciliate; pyrenes with smooth back

3. P. nigra

1. Psychotria adenophylla Wall. in Roxb., Fl. Ind. 2: 166. 1824; Hook.f., Fl. Brit. India 3: 164. 1880; Haines, Bot. Bihar Orissa 2: 440. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 867. 1995.

Local Name: *Chelianthua*.

Shrub, 1–2 m high. Leaves elliptic, elliptic-oblong or oblong-obovate, 10–15 × 3.5–7 cm, abruptly short-acuminate at apex, gland-pits in axils of many of the secondary veins. Flowers *c.* 2.5 mm long, pubescent, in dense cymes at intervals along the rachis of a raceniform panicle, 7.5–10 cm long, white. Fruits obovoid, 4–6 mm across; seed corrugate.

Fl. & Fr.: May–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Tamil Nadu. KWLS: Panchalingeshwar Pahad; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34306 (CAL).

2. Psychotria monticola Kurz, J. Asiat. Soc. Bengal 2: 315. 1872; H.O. Saxena & Brahmam, Fl. Orissa 3: 1449. 1995.

Large shrub. Leaves elliptic or elliptic-obovate, to 20 × 9 cm, acute or acuminate at apex, submembranous. Flowers sessile or subsessile, in cymes, yellowish or whitish. Fruits *c.* 7 × 5 mm, villous, deeply furrowed, red; pyrenes with 4 furrows on the back.

Fl. & Fr.: May–November.

Habitat: Moist Deciduous Forests.

Distribution: India: Assam, Manipur, Meghalaya and Odisha. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34410 (CAL).

3. Psychotria nigra (Gaertn.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.): 152. 1931.

Large shrub, 2–3 m high. Leaves obovate, *c.* 19 × 8.5 cm, obtuse, broadly apiculate at apex, domatia in axils of veins glandular. Flowers 3–6 together, *c.* 5 mm long, in globose cymes, 1–1.5 cm, densely fulvous-hairy, white. Drupes subglobose, *c.* 6 mm across; pyrenes smooth.

Fl. & Fr.: May–November.

Habitat: Moist Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Meghalaya, Nagaland, Tamil Nadu. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 35753 (CAL).

20. **Psydrax** Gaertn.

Psydrax dicoccos Gaertn., Fruct. Sem. Pl. 1: 125, t. 26, f. 2. 1788. *Canthium dicoccum* (Gaertn.) Teijsm. & Binnend., Cat. Hort. Bog.: 113. 1866.

Local Names: *Chikni, Dolsingh, Karuna, Kurma.*

Evergreen tree, to 12 m high. Leaves elliptic-lanceolate to ovate-lanceolate, 7–12 × 2.4–4.5 cm, acuminate at apex, shiny coriaceous. Flower in axillary cymes, c. 1 cm long, white; stamens 5. Drupes globose, c. 8 mm; pyrenes rugose.

Fl. & Fr.: April–December.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Nandugatta, Nuarasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34333, 34815 (CAL).

21. **Tamilnadia** Tirveng. & Sastre

Tamilnadia uliginosa (Retz.) Tirveng. & Sastre, Mauritius Inst. Bull. 8: 85. 1979; H.O. Saxena & Brahmam, Fl. Orissa 2: 875. 1995.

Local Name: *Telkur.*

Deciduous tree, to 7 m high, armed. Leaves obovate, oblanceolate or obovate-oblong, 5–18 × 2–8 cm, obtuse or rounded at apex, pubescent and glaucous beneath. Flowers bisexual, white, c. 5 cm across, solitary, at the end of branchlets, cream-yellow; stamens 5. Berries ovoid or ellipsoid, 4–5 × 2.5–3.5 cm, yellow; seeds smooth, compressed.

Fl. & Fr.: April–January.

Habitat: Scrub Forests and hill forests.

Distribution: India: Almost throughout. KWLS: Jodachua Ghatti, Nandugatta, Nuasai, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 34524, 34355, 35618, 35673 (CAL).

22. **Uncaria** Burch.

Uncaria sessilifructus Roxb., Fl. Ind. 2: 130. 1824.

Liana. Leaves elliptic or elliptic-oblong, 8–12 × 4–6.5 cm, acute or acuminate at apex, puberulent on principal veins beneath, glaucous above. Flowers in axillary or terminal, flowering heads 5–10 mm across, strigillose to glabrescent, yellowish white. Fruiting head 2.5–3.5 cm in diam.; fruits fusiform, 1–1.5 cm long, sericeous.

Fl. & Fr.: March–December.

Habitat: Dense forests or thickets in valleys.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Uttar Pradesh, West Bengal.
KWLS: Bonun Chowk; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34567 (CAL).

23. *Wendlandia* Willd.

Wendlandia gamblei Cowan, Notes Roy. Bot. Gard. Edinburgh 16: 271 1932; C.E.C. Fisch. in Gamble, Fl. Madras: 1875. 1935. H.O. Saxena & Brahmam, Fl. Orissa 2: 878. 1995.

Small evergreen tree. Leaves ovate-oblong, oblong-lanceolate or elliptic-oblong, 5–14 × 2–5 cm, acuminate at apex; petiole up to 1.7 cm long. Flowers white or yellowish, 7–11 mm long; calyx tube glabrous. Fruit a capsule.

Fl. & Fr.: March–May.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Madhya Pradesh, Meghalaya. KWLS: Kuldiha Pahad; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34352 (CAL).

COMPOSITAE

Key to the genera

- | | |
|--|------------------------|
| 1a. Radical leaves always present; heads 1–4-flowered; compound heads surrounded by three large bracts | 9. Elephantopus |
| 1b. Radical leaves absent; heads more than 4-flowered; compound heads or head-like clusters not surrounded by leafy bracts | 2 |
| 2a. Florets similar | 3 |
| 2b. Florets dissimilar | 7 |
| 3a. Pappus of 5 aristate scales | 1. Ageratum |
| 3b. Pappus of 3–5 short gland-tipped bristles | 4 |
| 4a. Involucral bracts uniseriate | 5 |
| 4b. Involucral bracts many-seriate | 6 |
| 5a. Scandent herbs or shrubs; heads 4-flowered | 11. Mikania |
| 5b. Erect herbs or shrubs; heads many-flowered | 10. Emilia |
| 6a. Flowers few to many, similar; corolla c. 5 mm long, white | 5. Chromolaena |
| 6b. Flowers 5–10, similar; corolla c. 3 mm long, bluish purple | 7. Cyanthillium |
| 7a. Anther bases tailed | 4. Blumea |
| 7b. Anther bases not tailed | 8 |
| 8a. Corollas of marginal floerets slightly ligulate | 6. Conyza |
| 8b. Corollas marginal floerets and bisexual florets all tubular | 9 |

9a. Bristles retrorsely barbed	10
9b. Bristles without retrorse barbs	11
10a. Herbs with leafy stems; pappus bristles erect	3. Bidens
10b. Stout herbs; pappus paleaceous, fimbriate	2. Baccharoides
11a. Pappus of disc florets 0; pappus of ray florets of 2, strongly reflexed	12. Parthenium
11b. Pappus not strongly reflexed	12
12a. Leaves ovate, 3–6 × 1.5–3 cm	13. Tridax
12b. Leaves oblong-elliptic, 1–3 × 0.2–0.5 cm	8. Eclipta

1. *Ageratum* L.

Ageratum conyzoides L., Sp. Pl.: 839. 1753; Hook.f., Fl. Brit. India 3: 243. 1881; Gamble, Fl. Madras: 677. 1921; Haines, Bot. Bihar Orissa 2: 462. 1922; Uniyal in Hajra & al., Fl. India 12: 348. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 889. 1995.

Local Names: *Dengsingi, Poksunga*.

Herb, viscid-hairy. Leaves ovate, 5–7 × 3–5 cm, rounded at base, crenate at margins, acute at apex. Heads to 7 mm across, in terminal corymbose panicle, white. Achenes linear, c. 2 mm long, 5-angled, hirsute along the angles; pappus many, 3–4 mm long, setaceous.

Fl. & Fr.: Throughout the year.

Habitat: Forest margins.

Distribution: India: Throughout. KWLS: Jodachua Ghatti; common.

Specimens examined: R. Saravanan & K.A. Sujana 34320, 35667 (CAL).

2. *Baccharoides* Moench

Baccharoides anthelmintica (L.) Moench, Methodus: 578. 1794. *Vernonia anthelmintica* (L.) Willd., Sp. Pl. 3: 1634. 1803; Hook.f., Fl. Brit. India 3: 236. 1881; Haines, Bot. Bihar Orissa 2: 460. 1921; Uniyal in Hajra & al., Fl. India 13: 357. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 965. 1995.

Local Name: *Somraj*.

Herb, to 1.5 m high. Leaves elliptic, to 13 × 5 cm, acute at apex and base, sharply serrate, scabrous. Heads c. 15 × 12 mm, in lax corymbose panicles, purple. Achenes c. 4 × 1 mm, glandular between ribs, pubescent; pappus c. 6 mm long, reddish.

Fl. & Fr.: September–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Kanchi Paani; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34317 (CAL).

3. *Bidens* L.

Bidens pilosa L. var. **minor** (Blume) Sherff, Bot. Gaz. 80: 387. 1925; H.J. Chowdhery in Hajra & al., Fl. India 12: 373. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 894. 1995.

Local Name: *Magha Latenga*.

Herb. Leaves pinnate, 12–18 cm long; lobes ovate-lanceolate, to 6 × 3 cm, truncate at base, serrate at margins, acute at apex, hairy. Heads to 1 cm across, yellow. Achenes *c.* 2.5 mm, setae 2–4, *c.* 3 mm long.

Fl. & Fr.: September–April.

Habitat: Waste places.

Distribution: India: Throughout. KWLS: Kuldiha Pahad; common.

Specimen examined: R. Saravanan & K.A. Sujana 34562 (CAL).

4. *Blumea* DC.

Key to the species

- | | |
|--------------------------------|-------------------------------|
| 1a. Prostrate herb | 4. <i>B. oxyodonta</i> |
| 1b. Erect herbs | 2 |
| 2a. Corolla to 3 mm long | 1. <i>B. axillaris</i> |
| 2b. Corolla 4–6 mm long | 3 |
| 3a. Stems terete, glabrous | 2. <i>B. lacera</i> |
| 3b. Stems branched, puberulous | 3. <i>B. obliqua</i> |

1. *Blumea axillaris* (Lam.) DC., Prodr. 5: 434. 1836.

Herbs, 30–70 cm high. Leaves nearly sessile, obovate, to 5 × 3 cm, glandular-serrate at margins, obtuse at apex, covered with simple and glandular hairs. Heads *c.* 5 × 6 mm, in axillary and terminal thyriform clusters; bracts linear, *c.* 5 mm long, hairy; bisexual flowers around 10, in middle; corolla *c.* 3 mm long, glandular; female flowers many; corolla slender. Achenes ellipsoid, ribbed, hairy; pappus *c.* 3 mm long.

Fl. & Fr.: January–November.

Habitat: Deciduous forests and grasslands.

Distribution: India: Throughout. KWLS: Ashun Chua; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34490 (CAL).

2. *Blumea lacera* (Burm.f.) DC. in Wight, Contr. Bot. India: 14. 1834; Hook.f., Fl. Brit. India 3: 263. 1881; Gamble, Fl. Madras: 687. 1921; Haines, Bot. Bihar Orissa 2: 469. 1922; S. Kumar in Hajra & al., Fl. India 13: 128. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 904. 1995. *Conyza lacera* Burm.f., Fl. Ind.: 180, t. 89. 1768.

Local Names: *Bara püksung, Kukursunga, Pokasunga*.

Herb. Leaves broadly elliptic, to 10×5 cm, acute at ends, irregularly toothed. Heads globose, *c.* 7×7 mm, terminal and upper axillary, 10–15 together; bracts *c.* 7×1 mm, hairy at apex; bisexual flowers few; corolla 4–6 mm long, glandular. Achenes ribbed, hairy.

Fl. & Fr.: February–June.

Habitat: Common weed.

Distribution: India: Throughout. KWLS: Panchalingeswar.

Specimen examined: R. Saravanan & K.A. Sujana 35705 (CAL).

3. *Blumea obliqua* (L.) Druce, Bot. Exch. Club. Brit. Isles 4: 609. 1917; S. Kumar in Hajra & al., Fl. India 13: 137. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 909. 1995. *Erigeron obliquum* L., Mant. Pl. 2: 573. 1771.

Herb, 5–50 cm high. Leaves elliptic oblong to lanceolate, $0.5\text{--}5 \times 0.2\text{--}2$ cm, half-amplexicaul to obtuse at base, serrate-dentate at margins, apiculate, scabrid to velutinous. Heads solitary, terminal and axillary, 6–10 mm across, yellow; involucre bracts linear-lanceolate, 1–8 mm long, hairy outside, reflexed at maturity; corolla of bisexual florets tubular, 4–5 mm long, 5-lobed; corolla of female florets filiform, 3–4 mm, 2 or 3-lobed. Achenes oblong, dark brown, not-ribbed, pubescent; pappus 3–4 mm long, yellowish white.

Fl. & Fr.: July–March.

Habitat: Open localities.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34377 (CAL).

4. *Blumea oxyodonta* DC. in Wight, Contr. Bot. India: 15. 1834; Hook.f., Fl. Brit. India 3: 266. 1881; Gamble, Fl. Madras: 686. 1921; Haines, Bot. Bihar Orissa 2: 468. 1922; S. Kumar in Hajra & al., Fl. India 13: 139. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 910. 1995.

Herb. Radical leaves oblanceolate, $5\text{--}8 \times 2\text{--}3$ cm, dentate at margins, obtuse; cauline leaves sessile, smaller. Heads few, globose, *c.* 8 mm, in terminal panicles; bracts tomentose; outer lanceolate *c.* 3 mm; inner linear, *c.* 6 mm; female flowers many, yellow; corolla *c.* 3 mm long; lobes glandular-hairy; bisexual flowers few; corolla *c.* 4 mm long. Achenes, *c.* 3 mm long, ribbed, pubescent.

Fl. & Fr.: January–June.

Habitat: Wet or marshy places.

Distribution: India: Almost throughout. KWLS: Gurajari, Nuarasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34862 (CAL).

5. *Chromolaena* DC.

Chromolaena odorata (L.) R.M. King & H. Rob., Phytologia 20: 204. 1970; Uniyal in Hajra & al., Fl. India 12: 354. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 916. 1995. *Eupatorium odoratum* L., Syst. Nat. ed. 10: 1205. 1759.

Local Names: *Phulgandhuri*, *Rukusi*.

Shrub, glandular-hairy. Leaves ovate, 8–12 × 5–8 cm, crenate at margins, acute at apex, hispid. Heads to 10 mm long, in terminal corymbose cymes; bracts 3–5-seriate, ovate, to 8 mm long. Flowers few to many, similar, bisexual; corolla tubular, *c.* 5 mm long, pubescent at apex, 5-lobed, white. Achenes linear, *c.* 4 mm long, 5-angled, scabrous, black; pappus many, 4–7 mm long, setaceous, yellowish.

Fl. & Fr.: October–December.

Habitat: Introduced and naturalized.

Distribution: India: Naturalised throughout. KWLS: Kuldiha, Salt Peat Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34568 (CAL).

6. *Conyza* L.

Conyza japonica (Thunb.) Less., Syn. Gen. Comp.: 204. 1832; Hook.f., Fl. Brit. India 3: 258. 1881; Gamble, Fl. Madras: 683. 1921; Haines, Bot. Bihar Orissa 2: 466. 1922; Hajra in Hajra & al., Fl. India 12: 105. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 920. 1995.

Herb, 25–35 cm high, hispid. Leaves obovate, to 5 × 2.5 cm, obtuse at apex. Heads globose, 7–9 mm, 5–8 together, in terminal clusters; bracts lanceolate, *c.* 3 mm long; female corolla *c.* 1.5 mm long; bisexual florets a few, at the centre; corolla *c.* 2.5 mm long, yellow. Achenes oblong, *c.* 1 mm long, compressed, thin-hairy; pappus *c.* 4 mm long, setaceous.

Fl. & Fr.: February–April.

Habitat: Wet places, near streams.

Distribution: India: Almost throughout. KWLS: Gurajari Nuarasta, Panchalingeswar; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36534 (CAL).

7. *Cyanthillium* Blume

Cyanthillium cinereum (L.) H. Rob., Proc. Biol. Soc. Wash. 103: 252. 1990. *Vernonia cinerea* (L.) Less., Linnaea 4: 291. 1829; Hook.f., Fl. Brit. India 3: 233. 1881; Gamble, Fl. Madras: 676. 1921; Uniyal in Hajra & al., Fl. India 13: 367. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 966. 1995.

Local Name: *Puksunga*.

Annual or perennial herb. Leaves variable, ovate, 2–8 × 1–3 cm, acute at ends, thin-hairy beneath. Heads *c.* 5 × 3 mm, in terminal corymbose cymes; outer bracts minute, inner oblong, cuspidate, hairy. Flowers 5–10, similar; corolla *c.* 3 mm long, bluish purple. Achenes *c.* 1.5 mm long, hairy; pappus *c.* 1–3 mm long, setaceous.

Fl. & Fr.: Most of the year.

Habitat: Open localities.

Distribution: India: Throughout. KWLS: Bonunchowk, Nandugutta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33601, 34319, 34558 (CAL).

8. *Eclipta* L.

Eclipta prostrata (L.) L., Mant. Pl. 2: 286. 1771; H.J. Chowdhery in Hajra & al., Fl. India 12: 381. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 926. 1995. *Verbesina prostrata* L., Sp. Pl.: 902. 1753.

Local Names: *Bhringaraj, Bhrungaraj, Kesarda.*

Herb, caespitose, to 25 cm high. Leaves (sub)sessile, oblong-lanceolate or oblong-elliptic, 1–3 × 0.2–0.5 cm, acute or subacuminate at apex, densely strigose. Heads 4–5 mm across; involucre bracts 10 (5+5), ovate-elliptic, c. 3 mm, strigose outside, 4 or 9-veined. Ray florets 2 or 3-seriate, female, c. 4 mm long; disc florets numerous, c. 3 mm long, 4-lobed. Achenes oblong-turbinate, hairy at apex, yellowish brown; pappus of scales forming a cone at apex.

Fl. & Fr.: August–April.

Habitat: Wetlands.

Distribution: India: Throughout. KWLS: Pancharjuna Pond, Rangamatia; common.

Specimens examined: R. Saravanan & K.A. Sujana 33756, 35828 (CAL).

9. *Elephantopus* L.

Elephantopus scaber L., Sp. Pl.: 814. 1753; Hook.f., Fl. Brit. India 3: 242. 1881; Gamble, Fl. Madras: 676. 1921; Haines, Bot. Bihar Orissa 2: 461. 1922; Uniyal in Hajra & al., Fl. India 13: 333, f. 102. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 927. 1995.

Local Names: *Mayur Chandrika, Mayur Chulia, Tatmul, Tutamuli.*

Scapigerous herb. Leaves radical, obovate to oblong or oblanceolate, 6–18 × 2–5 cm, crenate at margins, obtuse at apex, strigose above; cauline leaves sessile, small, amplexicaule. Heads homogamous, sessile, aggregated in stalked glomerules, subtended by 3 reduced leaves; involucre bracts 2-seriate, scarious. Flowers 2–5, bisexual; corolla tube 5–6 mm long, 5-lobed, purple. Achenes 4–5 mm long, 10-ribbed; pappus of 4–6 spiny bristles, c. 5 mm long.

Fl. & Fr.: August–December.

Habitat: Waste places.

Distribution: India: Throughout. KWLS: Koimutiya Gaon, Nandugutta, Nuarasta Chowk, Pahadi rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33741, 33774, 34325, 35763 (CAL).

10. *Emilia* Cass.

Emilia sonchifolia (L.) DC. in Wight, Contr. Bot. India: 24. 1834; Hook.f., Fl. Brit. India 3: 336. 1881; Gamble, Fl. Madras: 716. 1921; Haines, Bot. Bihar Orissa 2: 489. 1922; R. Mathur in Hajra & al., Fl. India 13: 212. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 929. 1995. *Cacalia sonchifolia* L., Sp. Pl.: 835. 1753.

Local Name: *Sarkara*.

Erect or diffuse herb. Leaves radical and cauline; radical leaves lyrate-pinnatifid, 4–10 × 1–3 cm, with large terminal suborbicular lobes; cauline leaves small, obovate to spatulate. Heads homogamous, not rayed, 1–3 on long slender peduncles; involucre bracts uniseriate, oblong-lanceolate, 6–8 mm long; florets bisexual; corolla 3–3.5 mm long, 5-lobed, pink. Achenes 1–2 mm long, 5-ribbed, hispid; pappus 5–6 mm long, white silky.

Fl. & Fr.: August–December.

Habitat: Waste places.

Distribution: India: Throughout. KWLS: Andheri Nala, Kuajahari Nala; common.

Specimens examined: R. Saravanan & K.A. Sujana 33606, 34472 (CAL).

11. *Mikania* Willd.

Mikania micrantha Kunth, Nov. Gen. Sp. 4: 134. 1820; Uniyal in Hajra & al., Fl. India 12: 357. 1995.

Climber. Leaves ovate, 5–8 × 4–6 cm, cordate at base, crenate at margins, acute at apex. Heads c. 5 mm across, in axillary panicles; bracts 2-seriate; outer 2 smaller; inner 3–5, ovate, c. 4 × 1.5 mm, obtuse. Flowers 3–5, bisexual; corolla c. 3 mm long, tubular, lobes 5, glandular, white. Achenes c. 2 mm long, 5-ribbed, black; pappus c. 4 mm long, many, hispid.

Fl. & Fr.: February–April.

Habitat: Forest plantations and in moist localities.

Distribution: India: Naturalised throughout. KWLS: Kuldiha Pahad, Nuarasta Chowk, Pahadi Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33690, 33805, 33960 (CAL).

12. *Parthenium* L.

Parthenium hysterophorus L., Sp. Pl.: 988. 1753; H.J. Chowdhery in Hajra & al., Fl. India 12: 403, f. 113. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 950. 1995.

Herb. Leaves deeply pinnatisect, lobes oblong-lanceolate, 7–10 × c. 1 cm, acute at apex, pubescent. Heads in terminal, lax panicles; bracts 2-seriate, ovate, to 3 × 1.5 mm, ciliate

at margins, obtuse. Florets dissimilar; outer florets 5, female, rayed; inner florets tubular, male, white. Achenes *c.* 2 × 1.5 mm; pappus absent or with two short hooks.

Fl. & Fr.: October–April.

Habitat: Forest plantations and in moist localities.

Distribution: India: Throughout. KWLS: Nilgiri Rasta, Panchalingeshwar Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33748, 36485 (CAL).

13. *Tridax* L.

Tridax procumbens L., Sp. Pl.: 900. 1753; Hook.f., Fl. Brit. India 3: 311. 1881; Gamble, Fl. Madras: 711. 1921; Haines, Bot. Bihar Orissa 2: 486. 1922; H.J. Chowdhery in Hajra & al., Fl. India 12: 418, f. 119. 1995; H.O. Saxena & Brahmam, Fl. Orissa 2: 963. 1995.

Local Names: *Bormundi*, *Visalwakarani*.

Herb. Leaves ovate, 3–6 × 1.5–3 cm, serrate at margins, acute at apex, bulbous-based-hairy. Heads *c.* 1.3 × 1.5 cm, solitary on long peduncle; bracts in 3-series, lanceolate, hairy; ligulate flowers female, limb *c.* 3 × 2 mm, 3-toothed, white; tubular flowers bisexual, corolla *c.* 6 mm long, 5-lobed, yellow. Achenes obovoid, *c.* 2 mm long, hairy; pappus many, setaceous.

Fl. & Fr.: Throughout the year.

Habitat: Roadsides.

Distribution: India: Throughout. KWLS: Kuldiha FRH; common.

Specimen examined: R. Saravanan & K.A. Sujana 33552 (CAL).

CAMPANULACEAE

Lobelia L.

Key to the species

- | | |
|--|--------------------------------|
| 1a. All anthers apically bearded; seeds trigonous | 1. <i>L. alsinoides</i> |
| 1b. Only the two anthers apically bearded; seeds ellipsoid | 2. <i>L. heyneana</i> |

1. *Lobelia alsinoides* Lam., Encycl. 3: 588. 1792; Harid. & P.K. Mukh. in M.P. Nayar & al., Fasc. Fl. India 19: 42. 1988; H.O. Saxena & Brahmam, Fl. Orissa 2: 987. 1995. *L. trigona* Roxb., Fl. Ind. 2: 111. 1824; C.B. Clarke in Hook.f., Fl. Brit. India 3: 423. 1881; Gamble, Fl. Madras: 736. 1921.

Local Name: *Painmali*.

Decumbent herb, rooting from lower nodes. Stems 3-winged. Leaves alternate, ovate-orbicular, 1–2 × 1–1.5 cm, crenate at margins, obtuse at apex; petioles *c.* 3 mm long. Flowers in terminal raceme; sepals lanceolate, *c.* 5 mm long; corolla *c.* 1 cm long; upper 3 lobes

obovate; lower 2 lobes narrower, blue; anterior 2 filaments densely ciliate; anthers 0.75–1.2 mm long. Capsules *c.* 6 mm long, glabrous; seeds trigonous, brown.

Fl. & Fr.: September–December.

Habitat: Wetlands.

Distribution: India: Throughout. KWLS: Pancharjuna Rasta; common. Note: Threatened in Odisha.

Specimens examined: R. Saravanan & K.A. Sujana 34368, 34369, 34370, 34841 (CAL).

2. *Lobelia heyneana* Schult. in Roem. & Schult., Syst. Veg. 5: 50. 1819; Harid. & P.K. Mukh. in M.P. Nayar & al., Fasc. Fl. India 19: 51. 1988; H.O. Saxena & Brahmam, Fl. Orissa 2: 988. 1995. *L. trialata* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 157. 1825; C.B. Clarke in Hook.f., Fl. Brit. India 3: 425. 1881; Gamble, Fl. Madras: 736. 1921.

Diffuse herb. Stems 3-winged. Leaves obovate, *c.* 3 × 1.5 cm, narrowly winged at base on the petiole, crenate-serrate at margins, obtuse or acute at apex; leaves sessile towards apex. Flowers in terminal, short racemes; sepals lanceolate, *c.* 4.5 × 1 mm; corolla *c.* 1 cm long, lateral and dorsal lobes lanceolate, blue; filaments basally free; anthers *c.* 2.5 mm long, 2 anthers with penicillate black hairs at apex. Capsules obovoid, 3–5 × 1–1.8 mm; seeds ellipsoid, *c.* 0.3 mm long.

Fl. & Fr.: September–December.

Habitat: Wetlands.

Distribution: India: Throughout. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34870 (CAL).

PRIMULACEAE

Key to the genera

- | | |
|--|--------------------------|
| 1a. Corolla lobes contorted in buds, pink; anthers sagittate | 1. <i>Ardisia</i> |
| 1b. Corolla lobes imbricate, white or greenish; anthers ovate-oblong | 2. <i>Embelia</i> |

1. *Ardisia* Sw.

Key to the species

- | | |
|---------------------------------|---------------------------------|
| 1a. Berries bright red-coloured | 1. <i>A. solanacea</i> |
| 1b. Berries pink-coloured | 2. <i>A. sonchifolia</i> |

1. *Ardisia solanacea* Roxb., Pl. Coromandel 1: 27 1795; Gamble, Fl. Madras: 756. 1921; Haines, Bot. Bihar Orissa 2: 509. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1003. 1995.

Local Names: *Hadokonkali, Kadna, Katapenga.*

Tree, to 6 m high. Leaves obovate to oblanceolate, 10–18 × 4–6 cm, entire or obscurely crenate at margins, acuminate or acute at apex, coriaceous, glaucous beneath, gland-dotted. Flowers in axillary or lateral umbels of *c.* 1.3 cm across; calyx lobes 5, ovate, *c.* 3 × 1.5 mm, ciliate at margins, obtuse at apex, persistent, leathery; corolla *c.* 2.5 cm across; lobes 5, ovate, *c.* 10 × 7 mm, thick, punctate, bright pink. Stamens 5. Berries globose, *c.* 8 mm, bright red.

Fl. & Fr.: March–January.

Habitat: Forests close to streams.

Distribution: India: Assam, Kerala. KWLS: Champo-Soro, Kanchipaani; common.

Specimens examined: R. Saravanan & K.A. Sujana 34388, 35773 (CAL).

2. *Ardisia sonchifolia* Mez in Engl., Pflanzenr. IV, 236: 116. 1902; Gamble, Fl. Madras: 755. 1921.

Local Names: *Bantala, Kudna, Tinkoli.*

Shrub. Leaves oblanceolate, 10–22 × 4–6 cm, attenuate and auricled at base, acute to acuminate at apex. Flowers 5–15 in terminal umbel of *c.* 5 cm across; sepals ovate, *c.* 3 × 1.5 mm, acute at apex, hairy; corolla lobes ovate, *c.* 4 mm long, acute at apex, punctate, pink. Berries 6–7 mm across, pink.

Fl. & Fr.: March–January.

Habitat: Near streams.

Distribution: India: Assam, Kerala, Meghalaya. KWLS: Parchondi; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35838 (CAL).

2. *Embelia* Burm.f.

Embelia tsjeriam-cottam (Roem. & Schult.) DC., Trans. Linn. Soc. London 17: 131. 1834; Gamble, Fl. Madras: 753. 1921; H.O. Saxena & Brahmam, Fl. Orissa 2: 1005. 1995.

Local Names: Baibedanga, Baibiring, Nuninunika.

Large, deciduous shrub, to 5 m high. Leaves elliptic-obovate, 3–7 × 2–4 cm, attenuate at base, serrulate at margin, caudate-acuminate at apex. Racemes axillary, 2.5–4 cm long; peduncle brown-pubescent; calyx lobes triangular, *c.* 1 mm; corolla lobes 1.5–2 mm long, yellow with a thick callous at base inside, punctate. Drupes subglobose, 3–4 mm across, red.

Fl. & Fr.: May–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Assam, Meghalaya, Western ghats. KWLS: Pancharjuna Pond; rare.

Specimens examined: R. Saravanan & K.A. Sujana 34460, 35713 (CAL).

SAPOTACEAE

Key to the genera

- | | |
|---|---------------------|
| 1a. Calyx lobes 5, 1-seriate, imbricate; stamens 5 | 3. Xantolis |
| 1b. Calyx lobes 4 or 6–8, 2-seriate, outer series valvate; stamens 6–16 | 2 |
| 2a. Calyx lobes 4; corolla lobes without petaloid appendages | 1. Madhuca |
| 2b. Calyx lobes 6–8; corolla lobes with petaloid appendages | 2. Manilkara |

1. Madhuca J.F. Gmel.

Madhuca longifolia (Koenig) Macbr. var. **latifolia** (Roxb.) A. Chev., Rev. Int. Bot. Appl. Agric. Trop. 23: 149. 1943.

Local Names: *Madgi, Moha*.

Tree, to 20 m high, with milky exudation. Leaves elliptic, 10–25 × 6–12 cm, acute, acuminate or apiculate at apex, coriaceous. Flowers axillary, cream-coloured; calyx lobes 4, obovate, acute, fulvous; corolla lobes 6–12, oblong. Stamens 16, in 3-series. Berries ovoid, tawny-tomentose, fleshy; seeds 2.

Fl. & Fr.: February–July.

Habitat: Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti, Bulagadia; common.

Specimens examined: R. Saravanan & K.A. Sujana 34900, 35919 (CAL).

2. Manilkara Adans.

Manilkara zapota (L.) P. Royen, Blumea 7: 410. 1953; H.O. Saxena & Brahmam, Fl. Orissa 2: 1012. 1995.

Local Name: *Sapota*.

Tree, to 15 m high. Leaves elliptic-obovate or elliptic-oblong, 7–15.5 × 2.5–4.5 cm, acuminate with retuse tip at apex, coriaceous. Flowers solitary or in pairs, axillary, white; sepals 6, 6.5–10 mm long; corolla campanulate; lobes 6, irregularly 2 or 3-toothed, greenish white or cream-coloured. Stamens 6. Berries ovoid or ellipsoid, 3.5–8 × 3–6 cm, scaly; seeds many, 1.5–2.5 cm long, black.

Fl. & Fr.: February–July.

Habitat: Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Nuarasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 33635 (CAL).

3. Xantolis Raf.

Xantolis tomentosa (Roxb.) Rafin., Sylv. Tellur, 35. 1838; Haines, Bot. Bihar Orissa 2: 511. 1922; H.O. Saxena & Brahmam; Fl. Orissa 2: 1014. 1995.

Local Name: *Kantaboro*.

Tree, to 18 m high. Leaves elliptic-obovate or obovate, 4–8 × 1.5–3.5 cm, obtusely acute at apex, coriaceous, woolly beneath when young, glabrous when mature. Flowers fascicled at leafless nodes, white or yellowish white; sepals 6, ovate, *c.* 6 × 3 mm, acute at apex, hairy; corolla campanulate, densely hairy at throat; lobes 5 or 6, lanceolate, *c.* 10 mm long; stamens 6; staminodes 4. Berries ovoid, *c.* 2.5 × 1.5 cm, green; seeds ellipsoid, brown.

Fl. & Fr.: April–February.

Habitat: Moist areas in mixed forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Nagaland. KWLS: Amapada Nala, Panchalingeshwar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34540, 35642 (CAL).

EBENACEAE

Diospyros L.

Key to the species

- | | |
|--|---------------------------------|
| 1a. Endosperm ruminant | 2 |
| 1b. Endosperm not ruminant | 4 |
| 2a. Male flowers as well as female flowers in close axillary fascicles | 1. <i>D. candolleana</i> |
| 2b. Male flowers in short cymes, female flowers solitary | 3 |
| 3a. Calyx lobes of female flowers 4, rounded, reflexed, margins not wavy | 7. <i>D. sylvatica</i> |
| 3b. Calyx lobes of female flowers 4 or 5, cordate, the margins wavy | 4. <i>D. melanoxylon</i> |
| 4a. Corolla tubular | 2. <i>D. ebenum</i> |
| 4b. Corolla campanulate or urceolate | 5 |
| 5a. Ovary hairy; flowers subsessile | 6. <i>D. ovalifolia</i> |
| 5b. Ovary glabrous; flowers pedicelled | 6 |
| 6a. Petioles 1–1.5 cm long | 3. <i>D. malabarica</i> |
| 6b. Petioles 0.3–0.8 cm | 5. <i>D. montana</i> |

1. *Diospyros candolleana* Wight, Icon. Pl. Ind. Orient. 4(1): 9, tt. 1221, 1222. 1850; C.B. Clarke in Hook.f., Fl. Brit. India 3: 566. 1882; Gamble, Fl. Madras: 773. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1016. 1995; V. Singh, Monogr. Ind. Diospyros: 63, f. 11. 2005.

Dioecious tree, to 15 m high. Leaves oblong or elliptic-oblong, 7–15 × 2.5–5 cm, obtusely acuminate at apex, coriaceous, adpressed-fulvous-hairy beneath when young, soon glabrescent on both surfaces. Flowers unisexual, pale yellow, sessile, in dense tawny-tomentose, axillary fascicles; male flowers 7–8 mm across, sessile; stamens 10; female flowers 10–12 mm across. Berries globose, *c.* 2.5 cm, green; seeds 3 or 4.

Fl. & Fr.: January–March.

Habitat: Moist Forest.

Distribution: India: Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Jodachua Ghatti, Kuldiha Pahad; occasional.

Note: Endemic to Peninsular India.

Specimens examined: R. Saravanan & K.A. Sujana 33809, 34519, 36530 (CAL).

2. *Diospyros ebenum* Koenig, *Physiogr. Salsk. Handl.* 1: 176. 1776; C.B. Clarke in Hook.f., *Fl. Brit. India* 3: 558. 1882; Gamble, *Fl. Madras*: 775. 1923; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 1018. 1995; V. Singh, *Monogr. Ind. Diospyros*: 89, f. 19. 2005.

Local Name: *Kendu*.

Evergreen, dioecious tree, to 15 m high. Leaves elliptic-oblong, oblong-lanceolate, obovate or obovate-oblong, 4.5–15 × 4–7 cm, obtuse, emarginate or subacute at apex, coriaceous. Flowers unisexual, sessile, greenish yellow; male flowers 3–15 in short, axillary, umbellate clusters; stamens 6–12; female flowers solitary, axillary. Berries subglobose, *c.* 2 × 1.8 cm, beaked, with calyx enlarged; seeds 3–8, ellipsoid or wedge-shaped, black.

Fl. & Fr.: March–June.

Habitat: Moist Forest.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Assam, Bihar, Goa, Jharkhand, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: NuaRasta; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36427 (CAL).

3. *Diospyros malabarica* (Desr.) Kostel., *Allg. Med.-Pharm. Fl.* 3: 1099. 1834; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 1022. 1995. *Diospyros peregrina* (Gaertn.) Gurke in Engl. & Prantl, *Nat. Pflanzenfam.* 4(1): 164, t. 87. 1891; V. Singh, *Monogr. Ind. Diospyros*: 192, f. 45. 2005. *Embryopteris peregrina* Gaertn., *Fruct. Sem. Pl.* 1: 145, f. 29. 1788. *Garcinia malabarica* Desr. in Lam., *Encycl. Meth. Bot.* 3(2): 701. 1792.

Local Name: *Kola Kendu*.

Evergreen, dioecious or polygamous tree, to 10 m high. Leaves linear-oblong to broadly oblong, 10–23 × 2.5–6.5 cm, acute, subacute or obtuse at apex. Flowers white, fragrant; male flowers 3–7, in umbellate cymes; stamens 20–35 or more; female flowers solitary, *c.* 2.5 cm across. Fruit globose, 4.5–7.5 cm, covered with deciduous red scurf; seeds 4–8, reniform.

Fl. & Fr.: April–December.

Habitat: Riparian forest.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Goa, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Rajasthan, Sikkim,

Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Ampada Nala, Kuldiha Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 34316, 35619 (CAL).

4. *Diospyros melanoxyton* Roxb., Pl. Coromandel 1: 36, t. 46. 1795; C.B. Clarke in Hook.f., Fl. Brit. India 3: 564. 1882; Haines, Bot. Bihar Orissa 2: 519. 1922; Gamble, Fl. Madras: 772. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1023. 1995; V. Singh, Monogr. Ind. Diospyros: 149, f. 36. 2005.

Local Name: *Kendu*.

Tree, 2–10 m high. Leaves subopposite, broadly ovate, oblong-elliptic, elliptic or orbicular, 10–22 × 5–12.5 cm, acute or rounded at base, acute, obtuse or rounded at apex, coriaceous, glabrous above, pubescent, tomentose or glabrescent beneath. Male flowers 4–6-merous, in peduncled 3–12-flowered, villous, often drooping cymes; stamens 12–16; female flowers solitary, axillary or from the leaf scars, subsessile; staminodes 8–10; ovary densely hairy, 4–8-celled. Fruits globose, 2.5–5 cm, smooth, yellow; seeds (1–)3 or 4, or 5–8, rugose, shining.

Fl. & Fr.: April–December.

Habitat: Moist Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Nandu Ghatta, Ampada; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33714, 35787 (CAL).

5. *Diospyros montana* Roxb., Pl. Coromandel 1: 37, t. 48. 1795; C.B. Clarke in Hook.f., Fl. Brit. India 3: 555. 1882; Gamble, Fl. Madras: 776. 1923; Haines, Bot. Bihar Orissa 2: 516. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1024. 1995; V. Singh, Monogr. Ind. Diospyros: 166, f. 38. 2005.

Local Names: *Halda, Kossekuli, Pita Kalkha*.

Dioecious tree, to 20 m high. Leaves alternate, ovate, ovate-oblong, elliptic-oblong, 4–10 × 2–4 cm, rounded, obtuse, subcordate or acute at base, obtuse, subacute or obtusely acuminate at apex, chartaceous, more or less softly pubescent when young. Flowers unisexual, white; male flowers 2–6 in axillary umbels; stamens 16; female flowers solitary, axillary; staminodes 4; ovary globose, c. 0.7 mm, glabrous, 8-celled. Berries ovoid to obconical, 1.5–2 cm across, yellow to orange, glaucous; seeds 3–6, rough, black.

Fl. & Fr.: April–March.

Habitat: Moist Forests.

Distribution: India: Almost throughout. KWLS: Pancharjuna Rasta; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34523 (CAL).

6. *Diospyros ovalifolia* Wight, Icon. Pl. Ind. Orient. 4(1): 10, t. 1227. 1848; C.B. Clarke in Hook.f., Fl. Brit. India 3: 559. 1882; Gamble, Fl. Madras: 777. 1923; Haines, Bot. Bihar Orissa 2: 518. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1024. 1995; V. Singh, Monogr. Ind. Diospyros: 185, f. 43. 2005.

Dioecious tree, to 20 m high. Leaves alternate, elliptic, obovate or obovate-oblong, 6.5–15 × 2–7 cm, cuneate or acute at base, subacute, obtuse or rounded at apex, coriaceous. Flowers unisexual, yellowish white, in short fascicles, usually in the axils of fallen leaves; male flowers: stamens 14–20; female flowers subsessile, *c.* 1 cm across; ovary globose, *c.* 3 mm, appressed-pubescent, 4-celled. Berries 1–2 cm across, pubescent when young.

Fl. & Fr.: May–June.

Habitat: Moist Forest.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu. KWLS: Kuldiha Pahad, Panchalingeshwar Pahad; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34528, 36553 (CAL).

7. *Diospyros sylvatica* Roxb., Pl. Coromandel 1: 37, t. 47. 1795; C.B. Clarke in Hook.f., Fl. Brit. India 3: 559. 1882; Gamble, Fl. Madras: 773. 1923; Haines, Bot. Bihar Orissa 2: 578. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1025. 1995; V. Singh, Monogr. Ind. Diospyros: 231, f. 57. 2005.

Local Names: *Kalicha, Kanchia, Khalijya.*

Dioecious tree, to 18 m high. Leaves alternate, elliptic-oblong or elliptic-obovate, 5–15 × 2–5 cm, acute, acuminate or obtusely acuminate at apex, shining, membranous. Flowers unisexual, white; male flowers 6–10 in axillary cymes, *c.* 6 mm across; stamens *c.* 24; female flowers solitary or 3 together, 8–10 mm across; staminodes 4; ovary globose, pubescent, 6–8-celled. Berries globose, 16–18 mm, dark green; seeds 2–8, oblong, rugose, shining.

Fl. & Fr.: May–July.

Habitat: Moist Forest.

Distribution: India: Andhra Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Jodachua Ghatti, Kanchipaani; common.

Specimens examined: R. Saravanan & K.A. Sujana 34498, 35858, 36475, 36533 (CAL).

SYMPLOCACEAE

Symplocos Jacq.

Key to the species

- | | |
|--|-------------------------------------|
| 1a. Flowers in racemes or panicles; stamens 50–100; fruits ellipsoid | 2. <i>S. racemosa</i> |
| 1b. Flowers in spikes; stamens 40–50; fruits flask-shaped | 1. <i>S. cochinchinensis</i> |

1. *Symplocos cochinchinensis* (Lour.) S. Moore, J. Bot. 52: 148. 1914; Hore in M.P. Nayar & al., Fasc. Fl. India 20: 144, f. 30. 1990; H.O. Saxena & Brahmam, Fl. Orissa 2: 1029. 1995. *Dicalix cochinchinensis* Lour., Fl. Cochinch. 1: 663. 1790. *Symplocos ferruginea* var. *polystachya* C.B. Clarke in Hook.f., Fl. Brit. India 3: 575. 1882.

Local Names: *Bhaunri*, *Kotoro*.

Evergreen tree, to 15 m high. Leaves elliptic-lanceolate or elliptic-oblong, 5.5–15 × 2.5–6 cm, crenate-serrate to revolute at margins, acute or acuminate at apex. Spikes simple or branched, c. 7 cm long, pubescent. Flowers white to yellowish white. Stamens 40–50, arranged in 5 groups. Drupes flask-shaped, 8 mm across, purple; seeds 1–3, oblongoid.

Fl. & Fr.: December–June.

Habitat: Hill forests.

Distribution: India: Almost throughout. KWLS: Gurajari Pahad; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33724 (CAL).

2. *Symplocos racemosa* Roxb., Fl. Ind. 2: 539. 1832; Hook.f., Fl. Brit. India 3: 576. 1882; Hore in M.P. Nayar & al., Fasc. Fl. India 20: 166. 1990; H.O. Saxena & Brahmam, Fl. Orissa 2: 1030. 1995.

Local Names: *Lodh*, *Lodhra*.

Tree, to 10 m high. Leaves elliptic or elliptic-obovate, 7–15 × 3–6 cm, crenate-serrate at margins, acute to acuminate at apex, coriaceous. Racemes to 12 cm long, fulvous-tomentose. Flowers white, slightly fragrant. Stamens 50–100, unequal, many-seriate. Drupes ellipsoid, c. 15 × 5 mm, shallowly furrowed, yellow; seeds 1 or 2, oblongoid.

Fl. & Fr.: October–May.

Habitat: Damp forests.

Distribution: India: Almost throughout. KWLS: Gurajari Pahad, Parchondi, Bhaibhoni Ghatti; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33685, 34313, 34344, 36547 (CAL).

OLEACEAE

Key to the genera

- | | |
|--|------------------------------|
| 1a. Corolla tube absent | 1. <i>Chionanthus</i> |
| 1b. Corolla with distinct tube | 2 |
| 2a. Shrubs, usually scandent, rarely undershrubs; leaves not scabrous; corolla-tube not orange | 2. <i>Jasminum</i> |
| 2b. Small trees; leaves very scabrous; corolla-tube orange | 3. <i>Nyctanthes</i> |

1. Chionanthus L.

Key to the species

- | | |
|---|--------------------------|
| 1a. Stems smooth without tubercles or lenticels | 3. C. zeylanicus |
| 1b. Stems with warty tubercles or lenticels | 2 |
| 2a. Bark with warty lenticels | 1. C. mala-elengi |
| 2b. Bark with minutely warty tubercled | 2.C. ramiflorus |

1. Chionanthus mala-elengi (Dennst.) P.S. Green, Bull. Bot. Surv. India 26: 124. 1984; H.O. Saxena & Brahmam, Fl. Orissa 2: 1032. 1995.

Local Name: *Pochandia*.

Tree, to 12 m high. Leaves opposite, obovate or elliptic-oblong, 5–10 × 2.5–5.5 cm, obtuse or shortly acuminate at apex, glaucous beneath. Flowers sessile, in axillary clusters, c. 6 mm long, yellowish white. Stamens 2. Drupes ellipsoid, c. 10 × 5 mm, slightly curved, ridged.

Fl. & Fr.: January–April.

Habitat: Semi-evergreen forests, near streams.

Distribution: India: Karnataka, Kerala. KWLS: Nuarasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34383 (CAL).

2. Chionanthus ramiflorus Roxb., Fl. Ind. 1: 106. 1820; S.K. Srivast. & Kapoor, J. Econ. Taxon. Bot. 15: 133. 1991; H.O. Saxena & Brahmam, Fl. Orissa 2: 1033. 1995.

Tree, to 20 m high. Leaves opposite, elliptic to obovate, 5–20 × 2.5–6 cm, acuminate at apex. Flowers in axillary or terminal panicles, white. Stamens 2. Drupes oblongoid, 1.2–2 cm long, black; seed 1.

Fl. & Fr.: March–August.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Nandugutta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34530 (CAL).

3. Chionanthus zeylanicus L., Sp. Pl.: 8. 1753; S.K. Srivast. & Kapoor, J. Econ. Taxon. Bot. 15: 140. 1991.

Tree, to 10 m high. Leaves opposite, obovate or elliptic, 4.5–12 × 3–5.5 cm, acute or emarginate at apex. Flowers in axillary panicles of c. 5 cm long, cream-coloured. Stamens 2. Drupes obovoid, c. 6 × 4 mm.

Fl. & Fr.: March–August.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Panchalingeswar; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35723 (CAL).

2. *Jasminum* L.

Key to the species

- 1a. Leaves to 18 cm long and *c.* 10 cm across **1. *J. arborescens***
1b. Leaves to 13 cm long and *c.* 4 cm across **2. *J. scandens***

1. *Jasminum arborescens* Roxb., Fl. Ind. 1: 95. 1820; Hook.f., Fl. Brit. India 3: 594. 1882; Gamble, Fl. Madras: 789. 1923; Haines, Bot. Bihar Orissa 2: 525. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1035. 1995.

Local Names: *Bonomali, Kalamukhi.*

Large shrub. Leaves opposite, ovate, variable in size, to 18 × 10 cm, rounded or cordate at base, acute or acuminate at apex, soft-tomentose when young. Flowers in lax trichotomous cymes, fragrant; calyx teeth 5 or 6, linear, 1–2 mm long; corolla lobes usually 9, lanceolate, 1–1.5 cm long, acute, white. Berries ellipsoid, 1–1.5 cm long, black when ripe.

Fl. & Fr.: October–June.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Jodachua Ghatti, Panchalingeswar; common.

Specimens examined: R. Saravanan & K.A. Sujana 34443, 35670 (CAL).

2. *Jasminum scandens* (Retz.) Vahl, Haines, Bot. Bihar Orissa 2: 524.1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1039. 1995.

Local Name: *Ban Malli.*

Scandent shrub, climbing by means of recurved, hardened petiole-bease. Leaves ovate-lanceolate or ovate-oblong, 2.8–13.5 × 1.8–3.7 cm, rounded at base, acuminate at apex. Cymes subcapitate, axillary and terminating short lateral branches, 3-chotomous, branches 3-flowered; calyx lobes usually 6, subulate, 2.5–3.7 mm long, pubescent, recurved or curled; corolla lobes linear-oblong, 6–7.5 mm long. Berries ellipsoid, *c.* 1 × 0.7 cm, black.

Fl. & Fr.: November–May.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Meghalaya, Sikkim, West Bengal. KWLS: Bhaibhoni Ghatti, Parchondi; common.

Specimens examined: R. Saravanan & K.A. Sujana 33910, 35860 (CAL).

3. *Nyctanthes* L.

Nyctanthes arbor-tristis L., Sp. Pl.: 6. 1753; Hook. f., Fl. Brit. India 3: 603. 1882; Haines, Bot. Bihar Orissa 2: 526. 1922; Gamble, Fl. Madras 792. 1923; Saxena & Brahmam, Fl. Orissa 2: 1041. 1995.

Local Names: *Gangaseoli, Singhara.*

Large shrub or small tree, to 8 m high. Leaves ovate to oblong, 3.5–13 × 2–9 cm, rounded or cordate at base, entire to coarsely and unequally glandular-dentate or serrate at margins, acute or acuminate at apex, scabrous above with whitish bulbous-based hairs, densely short-pubescent beneath. Panicles terminal, leafy, 2–7 flowered; calyx campanulate, 5-toothed, c. 5 mm long; corolla hypocrateriform, with spreading, 5–8(usually 6 or 7)-parted, obliquely triangular or elliptic lobes, 5–6 mm across, white; tube 5–15 mm long, orange-red. Stamens 2. Capsules cordate or suborbicular, c. 2 × 3 cm mucronate; seeds 1 per cell, compressed.

Fl. & Fr.: September–January.

Habitat: Mixed Forests.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti, Nandugutta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33732, 34385 (CAL).

APOCYNACEAE

Key to the genera

1a. Trees or small trees	2
1b. Scandent herbs or shrubs, climbers or lianas	4
2a. Leaves alternate, spiral	9. Holorrhena
2b. Leaves opposite	3
3a. Seeds commate at ends	2. Alstonia
3b. Seeds comose at one end	16. Wrightia
4a. Herbs or slender twiners	5
4b. Shrubs or subshrubs climbing shrubs or lianas	7
5a. Stems glabrous	6. Cosmostigma
5b. Stems pubescent	6
6a. Petioles 2.5–6.5 mm long	8. Hemidesmus
6b. Petioles 1.5–6 cm long	15. Toxocarpus
7a. Climbing shrubs or lianas	8
7b. Erect shrubs, strangling subshrubs	15
8a. Climbing shrubs	11. Gymnema
8b. Large climbers or lianas	9
9a. Lianas	10

- 9b. Large climbers 11
- 10a. Leaves 20–25 × 15–22 cm, broadly elliptic or ovate-orbicular, cordate at base, short-acuminate at apex 5. **Chonemorpha**
- 10b. Leaves decussate, 8–22 × 4–8 cm, elliptic-oblong or elliptic-obovate, apex obtusely acute, base rounded 3. **Anodendron**
- 11a. Flowers yellow 12
- 11b. Flowers white or purple 13
- 12a. Inflorescence axillary dichotomous cymes; corolla greenish-yellow 7. **Cryptolepis**
- 12b. Inflorescence terminal cymes, corolla yellowish, purple-veined inside 14. **Strophanthus**
- 13a. Inflorescence axillary umbelliform racemes 10. **Hoya**
- 13b. Inflorescence terminal or axillary paniced cymes or corymbose cymes 14
- 14a. Calyx c. 1 mm long; lobes ovate, acute, pubescent 12. **Ichnocarpus**
- 14b. Calyx 1.5–3 cm long, lobes linear, spreading, rusty-tomentose 1. **Aganosma**
- 15a. Seeds obovate 4. **Calotropis**
- 15b. Seeds oblong 13. **Rauvolfia**

1. **Aganosma** G. Don

Key to the species

- 1a. Cymes laxly corymbose 1. **A. caryophyllata**
- 1b. Cymes densely corymbose 2. **A. cymosa**

1. *Aganosma caryophyllata* (Roxb. ex Sims) G. Don, Gen. Syst. 4: 77. 1837; Hook.f. Fl. Brit. India 3: 664. 1882; Haines, Bot. Bihar Orissa 2: 541. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1047. 1995.

Local Names: *Gandhomalati, Raten.*

Climber. Leaves elliptic to ovate-oblong, 4–13.7 × 2–7.5 cm, rounded or obtuse at base, acute or shortly acuminate at apex, glabrous or tomentose beneath, 3–5-veined. Flowers in corymbose cymes, lax, pubescent, white; calyx lobes linear, 1.5–3 cm long, rusty-tomentose; corolla lobes obliquely ovate, 1–1.2 cm long, tip slightly spiral. Follicles 10–35 × 0.7–1.8 cm, tapering at apex, yellow-tomentose when young; seeds 1.5–2.5 cm long with a long coma.

Fl. & Fr.: July–April.

Habitat: Rocky valleys.

Distribution: India: Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, Uttarakhand. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 36476 (CAL).

2. *Aganosma cymosa* (Roxb.) G. Don, Gen. Hist. 4: 77. 1838; Hook.f., Fl. Brit. India 3: 663. 1882; Gamble, Fl. Madras: 819. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1048. 1995.

Local Names: *Madiki, Malti*.

Climber. Leaves elliptic, 10–15 × 3–5 cm, obtuse or acute at apex, reddish brown. Flowers in terminal cymes; calyx lobes lanceolate, *c.* 7 mm long, acuminate, pubescent; corolla tube *c.* 8 mm long, inflated below the middle, pubescent outside; lobes ovate, *c.* 5 mm long, acute. Follicles oblong, *c.* 20 cm long, acuminate, densely tomentose; seeds *c.* 15 × 5 mm, comose.

Fl. & Fr.: July–April.

Habitat: Mixed forests near streams.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Kuldiha Pahad, Panchalingeshwar: common.

Specimens examined: R. Saravanan & K.A. Sujana 34346, 35760 (CAL).

2. *Alstonia* R. Br.

Alstonia scholaris (L.) R. Br., Mem. Wern. Nat. Hist. Soc. 1: 76. 1811; Hook.f., Fl. Brit. India 3: 642. 1882; Gamble, Fl. Madras: 810. 1923; Haines, Bot. Bihar Orissa 2: 539. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1050. 1995.

Local Names: *Chhatin, Khiromula*.

Tree, to 30 m high, with milky white latex. Leaves whorled, oblanceolate or obovate-oblong, 5–20 × 3–7 cm, obtuse or emarginate at apex, subcoriaceous. Flowers in terminal umbellate cymes, greenish white; calyx cupular, unequally 5-lobed, puberulous; corolla salver-shaped, 5-lobed. Mericarps, linear, 30–40 cm long, green; seeds 5–6 mm long, commate at ends.

Fl. & Fr.: November–September.

Habitat: Valleys; often planted.

Distribution: India: Throughout. KWLS: Andheri Nala, Ampada, Nuasai; common.

Specimens examined: R. Saravanan & K.A. Sujana 33653, 34574, 35896 (CAL).

3. *Anodendron* A. DC.

Anodendron paniculatum (Roxb.) A. DC. in DC., Prodr. 8: 444. 1844; Hook.f., Fl. Brit. India 3: 668. 1882; Haines, Bot. Bihar Orissa 2: 545. 1922; Gamble, Fl. Madras: 820. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1052. 1995.

Local Name: *Sangetu*.

Large woody climber, with watery latex. Leaves elliptic-oblong or elliptic-obovate, 8–22 × 4–8 cm, rounded at base, obtuse-acute at apex, subcoriaceous. Flowers in axillary and terminal lax paniculate cymes; calyx lobes 5, ovate, *c.* 1 mm, alternating 5 small glandular

scales; corolla salver-form, tube *c.* 1.5 mm long, inflated over stamens, 5-lobed. Follicles divaricate, 9–14 × 2–3 cm, tapering; seeds obovate, 2–2.5 cm long, beaked, comose at apex.

Fl. & Fr.: January–April.

Habitat: Moist and cool ravines.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu. KWLS: Bonun Chowk; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34479 (CAL).

4. *Calotropis* R. Br.

Calotropis gigantea (L.) R. Br. in Aiton, Hort. Kew 2: 78. 1811; Hook.f., Fl. Brit. India 4: 17. 1883; Haines, Bot. Bihar Orissa 4: 550. 1922; Gamble, Fl. Madras: 832. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1082. 1995.

Local Names: *Akand*, *Arko*.

Shrub. Leaves elliptic-ovate to obovate, 10–16 × 8–10 cm, cordate at base, acute or obtuse at apex, adpressed-pubescent when young. Flowers pale purple or greenish-white; calyx lobes *c.* 3 mm long; corolla campanulate, tube short, lobes ovate to oblong, recurved. Fruits saccate, ovoid, *c.* 6 × 3 cm; seeds many.

Fl. & Fr.: December–June.

Habitat: Open waste ground.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Lakshadweep, Maharashtra, Meghalaya, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Panchalingeshwar, Soro; common.

Specimens examined: R. Saravanan & K.A. Sujana 33591, 34469 (CAL).

5. *Chonemorpha* G. Don

Chonemorpha fragrans (Moon) Alston, Ann. Roy. Bot. Gard. 11: 203. 1929; H.O. Saxena & Brahmam, Fl. Orissa 2: 1072. 1995.

Local Name: *Barkla dudhia*.

Climber. Leaves broadly elliptic or ovate-orbicular, 20–25 × 15–22 cm, cordate at base, short-acuminate at apex, pubescent above, tomentose beneath. Flowers in paniculate cymes, terminal, tomentose, white; calyx *c.* 1 cm long, glandular inside; corolla salver-shaped. Follicles subtetragonous, to 30 × 2 cm; seeds *c.* 2 cm long, coma *c.* 4.5 cm long, white.

Fl. & Fr.: May–July.

Habitat: Gardens.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Karnataka, Kerala, Meghalaya, Sikkim, Tamil Nadu, Uttarakhand. KWLS: Pancharjuna Rasta; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34806 (CAL).

6. *Cosmostigma* Wight

Cosmostigma cordatum (Poir.) M.R. Almeida, Fl. Maharashtra 3: 239. 2001. *Cosmostigma racemosum* (Roxb.) Wight, Contr. Bot. India: 42. 1834; Hook.f., Fl. Brit. India 4: 46. 1883; Gamble, Fl. Madras: 846. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1089. 1995.

Climber. Leaves ovate, 6–10 × 3–5 cm, rounded or subcordate at base, acute or acuminate at apex, with a few small black-glandular papillae at base. Flowers in racemes, to 2.5 cm long; calyx lobes ovate to orbicular, ciliate; corolla lobes ovate, c. 4 mm long, greenish yellow with brown dots. Gynostegium c. 2 mm; corona lobes orbicular, emarginate, membranous.

Fl. & Fr.: May–August.

Habitat: Moist Deciduous Forest.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Panchalingeshwar; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35695 (CAL).

7. *Cryptolepis* R. Br.

Cryptolepis dubia (Burm.f.) M.R. Almeida., Fl. Maharashtra 3: 221. 2001. *Cryptolepis buchananii* Roem. & Schult., Syst. Veg. 4: 409. 1819; Hook.f., Fl. Brit. India 4: 5. 1883; Haines, Bot. Bihar Orissa 2: 576. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1075. 1995.

Local Names: *Dudhimal, Khirkaichi, Kongha.*

Climber, with milky latex. Leaves elliptic or oblong-lanceolate, 5–10 × 2–4.5 cm, obtuse or apiculate at apex, glaucous beneath. Inflorescence axillary dichotomous cymes; calyx lobes 5, ovate-acute, 2–2.5 cm long, 5 scales at base on inner side; corolla tube cylindrical, 1–2 mm long; lobes 5, linear-lanceolate, 3–5 mm, greenish yellow. Follicles 2, c. 7 cm long, woody; seeds flat, with silky coma.

Fl. & Fr.: April–June.

Habitat: Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu and Kashmir, Karnataka, Maharashtra, Meghalaya, Sikkim, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Bhaibhoni Ghatti; rare.

Specimen examined: R. Saravanan & K.A. Sujana 33713 (CAL).

8. *Gymnema* R. Br.

Key to the species

- | | |
|---|--------------------------------|
| 1a. Branchlets glabrous | 2. <i>G. montanum</i> |
| 1b. Branchlets densely tomentose | 2 |
| 2a. Leaves opposite, to 11 × 7.5 cm, broadly elliptic | 1. <i>G. latifolium</i> |
| 2b. Leaves 4–7 × 3–5 cm, elliptic to ovate or obovate | 3. <i>G. sylvestre</i> |

1. *Gymnema latifolium* Wall. ex Wight, Contr. Bot. India: 45. 1834.

Climber. Leaves broadly elliptic, *c.* 11 × 7.5 cm, truncate at base, acute or acuminate at apex, subcoriaceous, densely tomentose beneath, sparsely so above. Flowers in axillary umbellate cymes; calyx lobes oblong, *c.* 1 mm long, acute; corolla campanulate, *c.* 3 mm long, lobes triangular, ciliolate along the margins, yellow; corona adnate to tube.

Fl. & Fr.: October–November.

Habitat: Moist Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Kerala, Maharashtra, Tamil Nadu. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34808 (CAL).

2. *Gymnema montanum* (Roxb.) Hook.f., Fl. Brit. India 4: 31. 1883; Gamble, Fl. Madras 840. 1923.

Twining shrub. Leaves ovate or oblong, to 16 × 10 cm, truncate or rounded at base, acute or acuminate, few small glands at base. Flowers 5–30 in cymes; calyx lobes linear-oblong, *c.* 2 mm long, ciliate; corolla tube globose, *c.* 3 mm; lobes oblong, *c.* 3 × 2 mm, greenish white; corolline corona 5 pairs of densely pubescent ridges; gynostegium *c.* 4 × 2 mm, ridged.

Fl. & Fr.: May–August.

Habitat: Moist Deciduous Forests.

Distribution: India: Karnataka, Kerala, Sikkim, Tamil Nadu, Uttarakhand, West Bengal. KWLS: Bagudi, Koimutiya Gaon, Kuldiha FRH, Nuarasta Chowk; common.

Specimens examined: R. Saravanan & K.A. Sujana 34409, 34810, 35656, 35835 (CAL).

3. *Gymnema sylvestre* (Retz.) R. Br. ex Schult. in Roem. & Schult., Syst. Veg. 6: 57. 1820; Hook.f., Fl. Brit. India 4: 29. 1883; Gamble, Fl. Madras: 839. 1923; Haines, Bot. Bihar Orissa 2: 556. 1921; H.O. Saxena & Brahmam, Fl. Orissa 2: 1091. 1995.

Local Name: *Mera Singi*.

Twining subshrub. Leaves elliptic to ovate or obovate, 4–7 × 3–5 cm, truncate or obtuse at base, obtuse-acute at apex, subcoriaceous, densely tomentose beneath. Flowers in umbellate cymes; calyx lobes linear-oblong, *c.* 1.5 mm long, ciliate; corolla campanulate, *c.* 2.5 mm long. Follicles lanceolate, *c.* 7.5 × 0.8 cm; seeds *c.* 10 × 5 mm.

Fl. & Fr.: August–March.

Habitat: Moist Deciduous Forests and plains.

Distribution: India: Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, Tripura, Uttarakhand. KWLS: Kuldiha Pahad, Nandugutta, Panchalingeshwar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33861, 34807, 35938 (CAL).

9. *Hemidesmus* R. Br.

Hemidesmus indicus (L.) R. Br. in Aiton, Hort. Kew. 2: 75. 1811; Hook.f., Fl. Brit. India 4: 5. 1883; Haines, Bot. Bihar Orissa 2: 546. 1922; Gamble, Fl. Madras: 825. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1079. 1995.

Local Names: *Dudhi, Sugandhi.*

Climber with aromatic root-stock. Leaves in distant pairs, variable in shape, linear, oblong, ovate-oblong, broadly elliptic or rarely obovate or lanceolate, 2–10 × 0.8–2.5 cm, acute, obtuse or apiculate at apex, glabrous or pubescent, pale beneath. Flowers in cymes; calyx lobes spreading; corolla lobes fleshy, green outside and purplish-brown inside. Follicles cylindrical, 10–12 × *c.* 0.5 cm, slender, gradually narrowed towards tip.

Fl. & Fr.: August–February.

Habitat: Moist Deciduous Forests and plains.

Distribution: India: Throughout. KWLS: Bulagadia, Champo, Kuldiha Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 33515, 34363, 35785, 36499 (CAL).

10. *Holarrhena* R. Br.

Holarrhena pubescens Wall. ex G. Don, Gen. Hist. 4: 78. 1837–1838; H.O. Saxena & Brahmam, Fl. Orissa 2: 1061. 1995.

Local Names: *Indrajalo, Kherwa.*

Tree, to 8 m high, with milky-white latex. Leaves broadly ovate, ovate-oblong or ovate-lanceolate, 7–18 × 3–12 cm, obtuse at base, acute or acuminate at apex, entire at margin, membranous. Flowers in terminal and axillary corymbose cymes, creamy-white, slightly fragrant; calyx lobes 5, oblong-lanceolate, *c.* 2.5 mm, ciliate, glandular inside at base; corolla salver-shaped; tube *c.* 1.3 cm long, puberulous, ring of hair at mouth. Mericarps connected at tips, *c.* 25 × 1 cm; seeds oblong, *c.* 8 mm long, silky brown comose at apex.

Fl. & Fr.: May–February.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Jodachua, Pancharjuna rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33710, 34327 (CAL).

11. *Hoya* R. Br.

Hoya parasitica (Roxb.) Wall. ex Traill, Trans. Hort. Soc. London 7: 23 1830; Saxena & Brahmam, Fl. Orissa 2: 1095. 1995.

Climber, epiphytic. Leaves lanceolate, elliptic-oblong or ovate-elliptic, 7–12.5 × 2.4–4.5 cm, rounded at base, acute at apex, fleshy, yellowish green. Flowers in axillary umbelliform racemes, white or purple, fragrant; corolla deeply cleft, lobes ovate-lanceolate, fleshy, inflexed; coronal processes 5, ovate, acute, inserted on the stamina tube; pollen mass sessile, oblong, *c.* 1 mm long.

Fl. & Fr.: June–July.

Habitat: Moist Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Meghalaya. KWLS: Kuldiha Nuarasta, Nuasai Gaon; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34480, 35825 (CAL).

12. *Ichnocarpus* R. Br.

Ichnocarpus frutescens (L.) R. Br. in Aiton, Hort. Kew. ed. 2, 2: 69. 1811; Haines, Bot. Bihar Orissa 2: 546. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1062. 1995. *Apocynum frutescens* L., Sp. Pl.: 213. 1753.

Local Names: *Madhobi, Sugandhi Mal.*

Climber. Leaves ovate, 4–6 × *c.* 3 cm, rounded at base, obtusely acute at apex, brown-pubescent beneath. Flowers in terminal or axillary paniced cymes; calyx *c.* 1 mm long, lobes ovate, acute at apex, pubescent; corolla salver-shaped, contracted at mouth, tube *c.* 2 mm long, throat densely white-villous, lobes twisted. Mericarps to 15 cm long, slender, rusty puberulous; seeds many, compressed, crowned with long-silky coma.

Fl. & Fr.: September–April.

Habitat: Moist Deciduous Forests and plains.

Distribution: India: Throughout. KWLS: Guajarai Nala, Jodachua Ghatti, Parchondi; common.

Specimens examined: R. Saravanan & K.A. Sujana 33701, 34445, 35788 (CAL).

13. *Rauvolfia* L.

Rauvolfia serpentina (L.) Benth. ex Kurz, Forest Fl. Burma 2: 171. 1877; Hook.f., Fl. Brit. India 3: 632. 1882; Gamble, Fl. Madras: 807. 1923; Haines, Bot. Bihar Orissa 2: 539. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1067. 1995.

Local Names: *Patal Garur*, *Patal Giridi*.

Undershrub, with watery sap. Leaves oblanceolate, 7–10 × *c.* 3 cm, acuminate at ends. Flowers in axillary and terminal, densely flowered cymes, white; sepals oblong, *c.* 4 mm long; corolla tube *c.* 15 mm long; lobes oblong, *c.* 5 mm long, obtuse. Mericarps ovoid, *c.* 5 mm across, obtuse, black, with crimson fruiting calyx.

Fl. & Fr.: June–August.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Ashunchua, Panchalinnageshwar Pahad; rare.

Specimens examined: R. Saravanan & K.A. Sujana 34487, 35644 (CAL).

14. *Strophanthus* DC.

Strophanthus wallichii A. DC. in DC., Prodr. 8: 418. 1844; Hook.f., Fl. Brit. India 3: 155. 1882; Haines, Bot. Bihar Orissa 2: 542. 1922; Gamble, Fl. Madras: 817. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1068. 1995.

Climber. Leaves oblong, 7.5–10 × *c.* 3.5 cm, cuspidate or shortly caudate, with intrapetiolar glands. Cymes terminal, dichotomous, 7.5–10 cm long, lax; calyx-lobes linear-subulate, *c.* 1.2 cm long, nearly free; corolla-tube constricted about the middle, *c.* 1.8 cm long, throat with 5 deeply 2-fid scales; lobes long-twisted, caudate, often *c.* 5 cm long, yellowish, purple-veined within. Follicles 15–20 cm long, on woody peduncles.

Fl. & Fr.: April–January.

Habitat: Riparian Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Meghalaya. KWLS: Gurajari Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34475 (CAL).

15. *Toxocarpus* Wight & Arn.

Toxocarpus kleinii Wight & Arn. in Wight, Contr. Bot. India: 61. 1834; Hook.f., Fl. Brit. India 4: 14. 1883; Gamble, Fl. Madras: 830. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1106. 1995.

Twiner. Leaves decussate, elliptic to obovate, to 8 × 4 cm, obtuse at base, apex short-acuminate, subcoriaceous, puberulous beneath. Cymes dichasial, lax; calyx lobes 5, ovate, c. 4 mm, rusty-puberulous outside; corolla broadly campanulate, c. 1 cm across, 5-lobed, cream-coloured. Follicles fusiform, c. 15 × 1 cm; seeds oblong, c. 1.5 × 0.6 cm; coma silky.

Fl. & Fr.: May–January.

Habitat: Mixed Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Bonun Chowk; common.

Specimen examined: R. Saravanan & K.A. Sujana 34446 (CAL).

16. *Wrightia* R. Br.

Key to the species

- | | |
|---|-------------------------------|
| 1a. Leaves always tomentose on both surfaces;
corona scales entire, lobed or toothed | 1. <i>W. arborea</i> |
| 1b. Leaves glabrous; corona scales fimbriate | 2. <i>W. tinctoria</i> |

1. *Wrightia arborea* (Dennst.) Mabb., *Taxon* 26: 533. 1977; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 1070. 1995.

Local Names: *Harido*, *Phadkurwan*.

Deciduous tree, to 12 m high, with yellow latex. Leaves elliptic-ovate to obovate, 6–15 × 3–6.5 cm, acuminate at apex, chartaceous, tomentose. Flowers in dense terminal or pseudo-axillary, tomentose cymes, greenish yellow; calyx lobes 5, ovate, c. 4 mm long, obtuse, pubescent outside, glandular inside; corolla salver-shaped; tube c. 5 mm long; lobes c. 1.5 × 1 cm, puberulous, throat with 1 or 2 series of corona scales, orange. Mericarps cylindrical, c. 16 × 2 cm, beaked, sparsely white-tubercled, green; seeds linear, comose at one end.

Fl. & Fr.: April–February.

Habitat: Moist Deciduous and Dry Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Bhaibhoni Ghatti, Nanda Gutta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34529, 35722 (CAL).

2. *Wrightia tinctoria* (Roxb.) R. Br., *Mem. Wern. Nat. Hist. Soc.* 1: 47. 1811; Hook.f., *Fl. Brit. India* 3: 653. 1882; Haines, *Bot. Bihar Orissa* 2: 541. 1922; H.O. Saxena & Brahmam; *Fl. Orissa* 2: 1071. 1995; Gamble, *Fl. Madras*: 815. 1923.

Local Names: *Dudhokriya*, *Kryo*.

Tree, to 15 m high, with milky-white latex. Leaves oblong-lanceolate or elliptic-ovate, 3.5–11 × 2–4 cm, acuminate or caudate at apex, chartaceous, glaucous beneath. Flowers in terminal cymes, scented, white; calyx lobes 5, ovate, *c.* 2 mm long, obtuse, ciliate with membranous margins, glandular inside; corolla salver-shaped; tube 1.5–2 mm long; throat with 1 or 2 series of fimbriate corona scales. Mericarps cylindric, 15–45 cm long, cohering at tip, green; seeds *c.* 1.5 cm long, black, commate at one end.

Fl. & Fr.: February–November.

Habitat: Moist and Dry Deciduous Forests, also in plains.

Distribution: India: Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttarakhand. KWLS: Parchondi Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 35759 (CAL).

LOGANIACEAE

Strychnos L.

Key to the species

- | | |
|---|--------------------------------|
| 1a. Fruits 3–5 cm across, yellowish red or orange | 1. <i>S. nux-vomica</i> |
| 1b. Fruits 1.5–1.8 cm across, black | 2. <i>S. potatorum</i> |

1. *Strychnos nux-vomica* L., Sp. Pl.: 189. 1753; Hook.f., Fl. Brit. India 4: 90. 1883; Haines, Bot. Bihar Orissa 2: 564. 1922; Gamble, Fl. Madras: 868. 1923; Saxena & Brahmam, Fl. of Orissa 2: 1113. 1995.

Local Names: *Kochila*, *Kosilla*.

Tree, to 20 m high. Leaves opposite, elliptic or elliptic-ovate, 16–14 × 2–9 cm, acute or obtuse at apex, 3–5-veined from base. Flowers in terminal cymes, tomentose, greenish white; calyx lobes 4, triangular, *c.* 1 mm; corolla tube *c.* 10 mm long, slightly hairy inside near base; lobes 4, oblong, *c.* 4 × 1.5 mm, greenish yellow. Stamens 4. Berries globose, 3–5 cm, yellowish red or orange; seeds 3 or 4, orbicular, 2–2.5 cm, flat.

Fl. & Fr.: March–January.

Habitat: Moist deciduous forests and scrub forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Koimutiya Gaon; common.

Specimens examined: R. Saravanan & K.A. Sujana 33882, 36425 (CAL).

2. *Strychnos potatorum* L.f., Suppl. Pl.: 148. 1781; Hook.f., Fl. Brit. India 4: 90. 1883; Haines, Bot. Bihar Orissa 2: 564. 1922; Gamble, Fl. Madras: 868. 1923; H.O. Saxena & Brahmam, Fl. Orissa 1: 445. 1995.

Local Names: *Katako, Nirmali*.

Tree, to 12 m high. Leaves opposite, elliptic to elliptic-ovate, 5–15 × 3.5–7.5 cm, acute at apex, 3–5-veined from base. Flowers in short axillary cymes, white; calyx lobes 5; corolla salver-shaped, 5-lobed. Stamens 5. Berries globose, 1.5–1.8 cm, black; seeds 1 or 2, orbicular, 1–1.2 cm, flat, yellow.

Fl. & Fr.: May–February.

Habitat: Moist deciduous forests.

Distribution: India: Andhra Pradesh, Bihar, Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu and Uttar Pradesh. KWLS: Ashun Chua, Pancharjuna Rasta; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34478, 35727, 36520 (CAL).

GENTIANACEAE

Key to the genera

- 1a. Ovary 1-celled; capsules linear-oblong **1. *Canscora***
- 1b. Ovary 2-celled; capsules ovoid to subglobose **2. *Exacum***

1. *Canscora* Lam.

Key to the species

- 1a. Calyx prominently winged **1. *C. alata***
- 1b. Calyx not winged **2. *C. diffusa***

1. *Canscora alata* (Roth) Wall., Numer. List: 4363. 1831; Shahina & Nampy, Phytotaxa 164(4): 203. 2014. *Exacum alatum* Roth in Roem. & Schult., Syst. Veg., ed. 15bis 3: 159. 1818. *Pladera decussata* Roxb., Fl. Ind. 1: 418. 1820. *Canscora decussata* (Roxb.) Schult. & Schult.f., Syst. Veg. 3: 229. 1827; Hook.f., Fl. Brit. India 4: 104. 1883; Haines, Bot. Bihar Orissa 2: 569. 1922; Gamble, Fl. Madras: 879. 1923; S. Garg, Ind. Gentianac.: 1. 1988; H.O. Saxena & Brahmam, Fl. Orissa 2: 1122. 1995.

Local Names: *Dankuni, Paincki Mircha*.

Herb, to 35 cm high, with narrowly 4-winged stem. Leaves sessile, elliptic-lanceolate, 1.5–2.5 × 0.8–1.5 cm, rounded and 3-veined at base, acute at apex. Cymes dichasial, axillary or terminal; calyx lobes lanceolate, 3–4 mm long, acute, winged; corolla lobes 4, obovate to orbicular, 5–6 × 4–5 mm, white; tube 7–8 mm long. Stamens 4, each with

a circular membranous ring below the anther. Capsules linear-oblong, 8–10 × 2–4 mm; seeds angular.

Fl. & Fr.: September–December.

Habitat: Moist and shady places.

Distribution: India: Almost throughout. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34322 (CAL).

2. *Canscora diffusa* (Vahl) R. Br. ex Roem. & Schult., Syst. Veg. 3: 301. 1820; Hook.f., Fl. Brit. India 4: 103. 1883; Gamble, Fl. Madras 878. 1923; S. Garg, Ind. Gentianac.: 1. 1988; H.O. Saxena & Brahmam, Fl. Orissa 2: 1122. 1995; Shahina & Nampy, Phytotaxa 164(4): 205. 2014.

Local Name: *Burrurria*.

Stem 4-angular. Lower leaves elliptic, 2 x 1.5 cm; upper leaves ovate, 3-ribbed, glabrous. Bracts ovate. Flowers many in terminal cymes; pedicel *c.* 1 cm long, filiform. Calyx 5-toothed, 6 mm long, glabrous. Corolla lobes lanceolate, acute at apex; tube cylindrical, 9 mm long, white. stamens 4, fertile 2, sterile 2. Capsule linear-oblong, *c.* 5 mm long.

Fl. & Fr.: Most part of the year.

Habitat: Moist places, hillsides and river banks.

Distribution: India: Almost throughout. KWLS: Pancharjuna Nala; common.

Specimens examined: R. Saravanan & K.A. Sujana 34865, 34867, 34877 (CAL).

2. *Exacum* L.

Key to the species

- | | |
|--|-----------------------------|
| 1a. Plant to 120 cm high; leaves 1.5–5 cm across, amplexicaule | 1. <i>E. grande</i> |
| 1b. Plants to 18 cm high; leaves to 0.5 cm across, cuneate at base | 2. <i>E. pumilum</i> |

1. *Exacum grande* Klack., Opera Bot. 84: 43. 1985; S. Garg, Ind. Gentianac.: 6. 1988. *E. tetragonum* var. *grande* (Klack.) Shahina & Nampy, Int. J. Adv. Research 4(3): 1677, f. 11. 2016.

Herb, to 1.2 m high, with narrowly winged stems. Leaves elliptic, 5–8.5 × 1.5–5 cm, amplexicaule, acute at apex, basally 3–5-veined. Flowers many in terminal cymes; calyx lobes 4, acuminate, *c.* 1.2 cm long, winged; corolla lobes ovate, *c.* 3 × 1 mm, acute, blue; anthers *c.* 1 cm long, eglandular. Capsules ovoid, 1–2 × 0.5–0.8 cm; seeds many, irregular or tetrahedral, 0.2–0.4 mm, brown.

Fl. & Fr.: December–February.

Habitat: Grasslands.

Distribution: India: Andhra Pradesh, Kerala, Karnataka, Maharashtra, Tamil Nadu. KWLS: Andheri Nala; rare.

Note: Endemic to Peninsular India.

Specimen examined: R. Saravanan & K.A. Sujana 34857 (CAL).

2. *Exacum pumilum* Griseb. in DC., Prodr. 9: 46. 1845; Hook.f., Fl. Brit. India 4: 98. 1883; Gamble, Fl. Madras: 875. 1923; Mooney, Suppl. Bot. Bihar Orissa: 255. 1950; Klack., Opera Bot. 84: 50. 1985; S. Garg, Ind. Gentianac.: 7. 1988; H.O. Saxena & Brahmam, Fl. Orissa 2: 1127. 1995; Shahina & Nampy, Int. J. Adv. Research 4(3): 1671, f. 8. 2016.

Herb, to 18 cm high, with 4-angled stems. Leaves sessile, ovate-lanceolate, to 1.2 × 0.5 cm, 1 or 3-veined. Flowers 1–5, in lax cymes; calyx lobes *c.* 1 mm long, narrowly winged, green; corolla lobes oblong-obovate, *c.* 5 × 3.5 mm, bluish. Capsules subglobose, 4–6 × 3–4 mm; seeds many, tetrahedral with sunken pits, *c.* 0.2 mm, brown.

Fl. & Fr.: September–December.

Habitat: Grasslands.

Distribution: India: Andhra Pradesh, Dadra, Goa, Gujarat, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Pancharjuna Nala; rare.

Note: Endemic to Peninsular India.

Specimens examined: R. Saravanan & K.A. Sujana 34859, 35675 (CAL).

BORAGINACEAE

Key to the genera

- | | |
|--|-------------------------------|
| 1a. Trees or shrubs, sometimes subscandent | 1. <i>Cordia</i> |
| 1b. Herbs, glabrous or often scabrid or hispid | 2 |
| 2a. Ovary not lobed | 2. <i>Heliotropium</i> |
| 2b. Ovary 4-lobed | 3. <i>Trichodesma</i> |

1. *Cordia* L.

Key to the species

- | | |
|--------------------------------|-------------------------------|
| 1a. Filaments villous at base | 1. <i>C. dichotoma</i> |
| 1b. Filaments glabrous at base | 2. <i>C. monoica</i> |

1. *Cordia dichotoma* G. Forst., Fl. Ins. Austr. 18, n. 110. 1786; H.O. Saxena & Brahmam, Fl. Orissa 1: 445. 1995.

Local Name: *Ambota*.

Tree, to 10 m high. Leaves elliptic-oblong to broadly ovate or obovate, 6–12 cm long, entire to remotely dentate or sinuate at margins, scarcely scabrid above with minute white dots. Flowers in corymbs; calyx campanulate, 4–5 mm long, accrescent; corolla lobes linear-oblong, *c.* 4.5 mm long, tube as long as the calyx, white, fragrant. Drupes ovoid, 1.2–1.8 cm long, yellowish or pinkish; seed 1.

Fl. & Fr.: March–September.

Habitat: Mixed Forests.

Distribution: India: Assam, Andhra Pradesh, Goa, Gujarat, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Punjab, Tamil Nadu, Uttarakhand. KWLS: Panchalingeshwar; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34833 (CAL).

2. *Cordia monoica* Roxb., Pl. Coromandel 1(3): 43, t. 58. 1796; Hook.f., Fl. Brit. India 4: 137. 1883; Gamble, Fl. Madras: 888. 1923; Haines, Bot. Bihar Orissa 2: 574. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1137. 1995.

Tree, to 10 m high. Leaves elliptic-ovate, 4–10 × 1.5–7 cm, acute or obtuse at apex, coriaceous, scabrous with prominent whitish points above, villous or tomentose beneath. Flowers in densely tomentose, paniculate cymes; calyx unevenly 3 or 4-lobed; lobes triangular, *c.* 5 mm long, accrescent; tube *c.* 8 mm long, densely tomentose outside; corolla funnel-shaped, 4 or 5-lobed, white. Stamens 4 or 5. Drupes ovoid with a mucronate tip, *c.* 2.5 × 1.5 cm, fulvous-pubescent, yellow; seed one.

Fl. & Fr.: May–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Jharkhand, Karnataka, Kerala, Tamil Nadu. KWLS: Kuldiha Pahad; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35657 (CAL).

2. *Heliotropium* L.

Key to the species

- | | |
|------------------------------------|-------------------------------|
| 1a. Stamens free; stigma conical | 1. <i>H. indicum</i> |
| 1b. Stamens included; stigma lobed | 2. <i>H. strigosum</i> |

1. *Heliotropium indicum* L., Sp. Pl.: 130. 1753; Hook.f., Fl. Brit. India 4: 152. 1883; Haines, Bot. Bihar Orissa 2: 578. 1921; Gamble, Fl. Madras: 896. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1146. 1995.

Local Name: *Hatisundha*.

Herb, to 50 cm high. Leaves to subdeltooid or broadly ovate, *c.* 11 × 6 cm, truncate at base, undulate at margins, acute at apex, chartaceous. Spikes terminal or leaf-opposed, curved, to 20 cm long; calyx lobes 5, linear, 1.5–2 mm long, acute; corolla salverform; tube 3–4 mm long, slightly constricted distally, 5-lobed; lobes ovate, *c.* 1 mm across, pale violet or pink. Stamens 5. Nutlets 2–3 mm long, connate in pairs, separating later, ribbed.

Fl. & Fr.: Throughout the year.

Habitat: Degraded forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Maharastra, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Bonun Chowk, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33583, 35830 (CAL).

2. *Heliotropium strigosum* Willd. subsp. *brevifolium* (Wall.) Kazmi, J. Arnold Arbor. 51: 153. 1970; H.O. Saxena & Brahmam, Fl. Orissa 2: 1148. 1995.

Herb, to 25 cm high. Leaves ovate, to 8 × 4 cm, abruptly narrowed and decurrent at base, flexuous at margins, obtuse or acute at apex, sparsely strigose beneath on veins. Flowers in long, terminal, one-sided scorpioid cymes, to 15 cm long; calyx lobes 5, *c.* 2.5 mm long, subequal, bulbous-based hairy outside; corolla lobes 5, triangular, 3–4 mm long, plicate, villous, white. Stamens 5. Nutlets 4; seeds brownish black.

Fl. & Fr.: Throughout the year.

Habitat: Degraded forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Punjab, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Bualgadia, Nuasai; common.

Specimen examined: R. Saravanan & K.A. Sujana 35935, 36124 (CAL).

3. *Trichodesma* R. Br.

***Trichodesma indicum* (L.) Lehm., Pl. Asperif. Nucif.: 193. 1818; Hook.f., Fl. Brit. India 4: 153. 1883; Gamble, Fl. Madras: 899. 1923; Haines, Bot. Bihar Orissa 2: 580. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1150. 1995. *Borago indica* L., Sp. Pl. 1: 137. 1753.**

Local Name: *Hetamundia*.

Herb, to 50 cm high. Leaves opposite and alternate, linear-oblong, 4–5 × 0.5–1 cm, auricled at base, obtuse at apex, scabrous. Flowers solitary, axillary or in lax racemes; calyx lobes sagittate, *c.* 8 mm long, acuminate at apex, hairy, 1-veined; corolla salverform; lobes *c.* 9 mm long, acuminate; anthers united, pubescent; connective *c.* 5 mm long. Nutlets 4, oblong-ovoid, smooth; seed 1.

Fl. & Fr.: Throughout the year.

Habitat: Wastelands and cultivated lands.

Distribution: India: Almost throughout. KWLS: Kaimagudi; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 33620 (CAL).

CONVOLVULACEAE

Key to the genera

- | | |
|--|---------------------|
| 1a. Cymes in terminal panicles | 2. Erycibe |
| 1b. Cymes axillary | 2 |
| 2a. Style 2, free | 3. Evolvulus |
| 2b. Style 1, entire or minutely branched | 3 |
| 3a. Outer 2 or 3 sepals enlarged, much longer and broader than inner | 4. Hewittia |
| 3b. Outer and inner sepals equal or subequal | 4 |
| 4a. Corolla usually yellow to yellowish with a red or purple eye or white; pollen smooth | 6. Merremia |
| 4b. Corolla variously coloured but often purple; pollen spinulose | 5 |
| 5a. Fruits capsular, thin walled, opening by valves or irregularly dehiscent | 5. Ipomoea |
| 5b. Fruits indehiscent, fleshy, woody or leathery | 6 |
| 6a. Corolla salverform; stigma linear-oblong | 7. Rivea |
| 6b. Corolla funnel form to campanulate; stigmas biglobose | 1. Argyreia |

1. *Argyreia* Lour.

Key to the species

- | | |
|---------------------------|--------------------------|
| 1a. Stems adpressed-hairy | 1. A. daltonii |
| 1b. Stems glabrous | 2. A. populifolia |

1. *Argyreia daltonii* C.B. Clarke in Hook.f., Fl. Brit. India 4: 190. 1883; Gamble, Fl. Madras: 907. 1923; Haines, Bot. Bihar Orissa 2: 587. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1158. 1995.

Slender climber. Leaves ovate, to 14 × 6 cm, acute at apex, thinly pubescent beneath. Cymes axillary; bracts 1.5–2 cm long, leaf-like; calyx lobes ovate, c. 4 mm long, obtuse at apex. Corolla c. 4 × 3 cm, pink. Berries c. 1.5 cm across.

Fl. & Fr.: September–February.

Habitat: Hill Forests.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Bhaibhoni Ghatti, Jodachua Ghatti; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34350, 35827, 36523 (CAL).

2. *Argyreia populifolia* Choisy in DC., Prodr. 9: 329. 1845; C.B. Clarke in Hook.f., Fl. Brit. India 4: 187. 1883; Gamble, Fl. Madras: 907. 1923.

Shrubby climber. Leaves broadly ovate, 8–20 × 5–15 cm, cordate to rounded at base, acute to short-acuminate at apex, densely pubescent beneath. Cymes corymbose, dense, axillary, many-flowered; calyx lobes 5–6 mm long, sparsely hairy outside; corolla funnel-shaped, 4–6 cm across, pinkish white. Berries globose, 1–1.5 cm, with persistent calyx; seeds 2–4.

Fl. & Fr.: July–October.

Habitat: Mixed forests.

Distribution: India: Karnataka, Kerala, Tamil Nadu, Uttar Pradesh. KWLS: Bhaibhoni Ghatti; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33677 (CAL).

2. *Erycibe* Roxb.

Erycibe paniculata Roxb., Pl. Coromandel: t. 159. 1802; C.B. Clarke in Hook.f., Fl. Brit. India 4: 180. 1883; Haines, Bot. Bihar Orissa 2: 605. 1922; Gamble, Fl. Madras: 930. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1164. 1995.

Local Name: *Chain Katho, Durkuri*.

Large woody climber with densely rusty-tomentose young branches. Leaves broadly elliptic or elliptic-obovate, 4–8 × 2–5 cm, rounded at base, obtusely acuminate at apex, coriaceous, densely rusty-tomentose. Cymes in terminal panicles. Flowers 6–8 mm across, fragrant, creamy-white. Stamens 10, exserted. Berries ovoid or ellipsoid, 6–8 × 3–3.5 mm; seed 1.

Fl. & Fr.: March–June.

Habitat: Semi-evergreen and Moist Deciduous Forests.

Distribution: India: Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Jharkhand, Karnataka, Kerala, Uttar Pradesh. KWLS: Andheri; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34488, 35685 (CAL).

3. *Evolvulus* L.

Key to the species

- | | |
|---|--------------------------------|
| 1a. Leaves linear to broadly elliptic; capsules 2-celled | 1. <i>E. alsinoides</i> |
| 1b. Leaves orbicular to broadly ovate, cordate; capsules 1-celled | 2. <i>E. nummularis</i> |

1. *Evolvulus alsinoides* (L.) L., Sp. Pl.: 392. 1762; C.B. Clarke in Hook.f., Fl. Brit. India 4: 220. 1883; Haines, Bot. Bihar Orissa 2: 585. 1922; Gamble, Fl. Madras: 922. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1165. 1995.

Local Names: *Krishna Ankaranti*.

Annual or perennial, trailing or prostrate herb. Leaves linear to broadly elliptic, 5–25 × 2–8 mm, obtuse or acute at ends, densely appressed-hairy on both sides or silky beneath. Flowers 1–3 in axillary cymes, bluish white or rarely white. Style 2, free. Capsules globose, 3–3.5 mm, 2–4-valved.

Fl. & Fr.: July–February.

Habitat: Moist Deciduous Forest and plains.

Distribution: India: Assam, Bihar, Gujarat, Karnataka, Kerala, Maharastra, Rajasthan, Tamil Nadu, Uttar Pradesh. KWLS: Bulagadia, Nandugutta, Kanchipaani; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33541, 35930, 36468 (CAL).

2. *Evolvulus nummularius* (L.) L., Sp. Pl.: 391. 1762; Mooney, Suppl. Bot. Bihar Orissa: 91. 1950; H.O. Saxena & Brahmam, Fl. Orissa 2: 1166. 1995.

Prostrate perennial herb. Leaves broadly ovate to orbicular, 5–15 × 4–10 mm, subcordate at base, obtuse to emarginate at apex, glabrous or sparsely hairy beneath. Flowers 1 or 2, in leaf-axils, white. Capsules globose, 3–4 mm; seeds brown to black.

Fl. & Fr.: July–November.

Habitat: Moist Deciduous Forests and plains.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Guajhari Nala, Jodachua Rasta, Rangamatiya; common.

Specimens examined: R. Saravanan & K.A. Sujana 34371, 34553, 35686 (CAL).

4. *Hewittia* Wight & Arn.

***Hewittia malabarica* (L.) Suresh** in Nicolson & al., Interp. Hort. Malab.: 88. 1988. *Convolvulus sublobatus* L.f., Suppl. Pl.: 135. 1782. *Hewittia sublobata* (L.f.) Kuntz, Revis. Gen. Pl. 2: 441. 1891; H.O. Saxena & Brahmam, Fl. Orissa 2: 1167. 1995.

Herb, twining or prostrate, pubescent. Leaves ovate, 4–7 × 3–4 cm, cordate at base, entire or angled at margins, acute at apex, puberulent, basally 3-veined. Flowers solitary to a few, in axillary cymes, yellowish or cream-coloured with a purple centre. Capsules subglobose, 8–10 mm across, 4-valved; seeds 4 or less, subtrigonus, 5–6 mm long, black.

Fl. & Fr.: July–November.

Habitat: Moist Deciduous and degraded forests.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Tamil Nadu. KWLS: Pancharjuna Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34595 (CAL).

5. *Ipomoea* L.

Key to the species

- 1a. Erect shrub **1. *I. carnea***
1b. Creeping or twining herb **2. *I. marginata***

1. *Ipomoea carnea* Jack. (Mart. ex Choisy) Austin, Taxon 26: 237. 1977; H.O. Saxena & Brahmam, Fl. Orissa 2: 1175. 1995.

Local Names: *Besharam, Omori*.

Shrub, erect or ascending, 1–2.5 m high, with fistulose or solid stem with milky sap. Leaves ovate or ovate-oblong, 15–25 × 10–15 cm, cordate at base, acuminate at apex, with a gland beneath on either side of the midrib at lamina base. Cymes several-flowered, axillary and terminal, minutely pubescent; calyx lobes 5, ovate-oblong or rounded, *c.* 6 × 4.5 mm; corolla funnel-shaped, 5–7.5 cm long, purple. Stamens 5, unequal. Capsules ovoid, brown.

Fl. & Fr.: October–January.

Habitat: Wastelands, scrub jungles and roadsides.

Distribution: India: Almost throughout. KWLS: Jodachua Pond, Kanchipaani, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33793, 33963, 35843 (CAL).

2. *Ipomoea marginata* (Desr.) Verdc., Kew Bull. 42(3): 658. 1987. *Ipomoea sepiaria* Roxb., Fl. Ind. 2: 90. 1824; C.B. Clarke in Hook.f., Fl. Brit. India 4: 209. 1883; Haines, Bot. Bihar Orissa 2: 598. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1182. 1995 (CAL).

Local Names: *Mindhi, Mushakani*.

Twiner. Leaves ovate or triangular, 2.5–7 cm long, cordate or hastate at base, acute, acuminate or shortly caudate at apex, glabrous or puberulous. Flowers 3–9 in axillary, subumbellate cymes, light purple or white with deep purple centre. Capsules ovoid, 6–7.5 mm long; seeds 2–4, black, tomentose, often with longer hairs along the edges.

Fl. & Fr.: October–April.

Habitat: In hedges and thickets.

Distribution: India: Almost throughout. KWLS: Kenduna; common.

Specimen examined: R. Saravanan & K.A. Sujana 36483 (CAL).

6. *Merremia* Dennst. ex Endl.

Key to the species

- 1a. Trailing herb with long slender branches and thick root-stock **1. *M. tridentata***
1b. Stout twiners 2

- 2a. Corolla yellow
- 2b. Corolla white

3. M. vitifolia
2. M. umbellata

1. Merremia tridentata (L.) Hall.f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Madras: 928. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1193. 1995.

Trailing herb. Leaves sessile to subsessile, linear-lanceolate, 2–4 × 0.5–1.2 cm, auricled and toothed at base, acute to mucronate at apex. Flowers a few in axillary cymes, sometimes solitary, cream-coloured or yellow with a purplish eye at centre. Stamens 5. Capsules subglobose, 5–8 mm across; seeds 4, brown.

Fl. & Fr.: July–April.

Habitat: Open forests and coastal sand dune forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Nilgiri Rasta, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33915, 34366 (CAL).

2. Merremia umbellata (L.) Hall.f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Madras: 928.1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1195.1995.

Local Name: *Paninoi*.

Twiner. Leaves ovate-lanceolate, 4–7 × 1.5–3.5 cm, cordate or rounded at base, acuminate at apex, pubescent beneath. Flowers in axillary umbelliform cymes, white, pubescent outside. Stamens 5, unequal. Capsules ovoid, 8–10 × 5–6 mm; seeds long-hairy, black.

Fl. & Fr.: January–April.

Habitat: Roadsides and open forests.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Gujarat, Jharkhand, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Kenduna, Nuasai; common.

Specimens examined: R. Saravanan & K.A. Sujana 36471, 36484 (CAL).

3. Merremia vitifolia (Burm.f.) Hall.f. in Engl., Bot. Jahrb. Syst. 16: 552. 1893; Gamble, Fl. Madras: 928. 1923; Haines, Bot. Bihar Orissa 2: 601. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1196. 1995.

Twining shrub. Leaves lobed, 6–12 × 5–11 cm, cordate at base, dentate-serrate at margins, sparsely fulvous-hairy on both surfaces, basally 7-ribbed. Flowers 1–3 in axillary cymes, yellow. Capsules globose, 1–1.2 cm, with accrescent calyx; seeds 4, ovoid, 6–8 mm long.

Fl. & Fr.: July–April.

Habitat: Roadsides and open forests.

Distribution: India: Arunachal Pradesh, Andaman and Nicobar Islands, Assam, Bihar, Gujarat, Jharkhand, Karnataka, Kerala, Meghalaya, Sikkim, Uttarakhand, West Bengal. KWLS: Nilgiri Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34559 (CAL).

7. *Rivea* Choisy

Rivea ornata (Roxb.) Choisy, Convolv. Orient.: 27. 1834; C.B. Clarke in Hook.f., Fl. Brit. India 4: 183. 1883; Gamble, Fl. Madras: 903. 1923.

Climbing shrubs, with white-tomentose stems. Leaves cordiform, *c.* 6 × 5.5 cm, deeply cordate at base, obtuse to shortly apiculate at apex, white-tomentose beneath, with pits at the base of lamina. Flowers 1–3 in axillary cymes, white. Berries globose, yellow.

Fl. & Fr.: July–April.

Habitat: Roadsides and open forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Bulagadia; common.

Specimen examined: R. Saravanan & K.A. Sujana 35939 (CAL).

SOLANACEAE

Key to the genera

- | | |
|--|---------------------------|
| 1a. Calyx inflated, enclosing the fruits | 1. <i>Physalis</i> |
| 1b. Calyx neither inflated nor completely enclosing the fruits | 2. <i>Solanum</i> |

1. *Physalis* L.

Physalis minima L., Sp. Pl.: 183. 1753; Hook.f., Fl. Brit. India 4: 238. 1883; Haines, Bot. Bihar Orissa 2: 607. 1922; Gamble, Fl. Madras: 939. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1212. 1995.

Local Name: *Tipai*.

Annual. Leaves ovate or elliptic-lanceolate, 3–7 × 1.5–3 cm, dentate or sinuate, sometimes entire at margins, acute at apex, glabrous or sparsely pubescent. Flowers axillary, solitary; calyx campanulate, 5-toothed; corolla campanulate, *c.* 8 mm across, pale yellow with a purple base. Stamens 5. Berries globose, 6–8 mm across, enclosed by the inflated calyx; seeds many, discoid, minutely rugose.

Fl. & Fr.: August–January.

Habitat: On waysides and open forests.

Distribution: India: Almost throughout. KWLS: Koimutiya, Kuldiha Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33563, 35851 (CAL).

2. Solanum L.

Solanum torvum Sw., Prodr.: 47. 1788; Hook.f., Fl. Brit. India 4: 234. 1883; Gamble, Fl. Madras: 937. 1923; H.O. Saxena & Brahmam, Fl. Orissa 2: 1218. 1995.

Local Names: *Dengabheji, Kathkoli.*

Shrub, to 2 m high, prickled. Leaves 2 or 3-sinuate, ovate, 7–14 × 5–10 cm, obliquely subcordate at base, acute at apex, chartaceous, stellate-pubescent on both surfaces, scattered with a few prickles on midrib and petiole. Flowers many in supra-axillary, corymbose cymes; calyx campanulate; corolla lobes ovate, 5–6 mm long, pubescent outside, white. Berries globose, 1–1.5 cm, pale green turning dull orange; seeds discoid, smooth.

Fl. & Fr.: Throughout the year.

Habitat: On waysides and open forests.

Distribution: India: Almost throughout. KWLS: Pancharjuna Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34928 (CAL).

LINDERNIACEAE

Lindernia All.

Key to the species

- | | |
|---|----------------------------|
| 1a. Leaves 3-ribbed from base | 5. L. procumbens |
| 1b. Leaves penninerved | 2 |
| 2a. Perfect stamens 2; staminodes 2 | 3 |
| 2b. Perfect stamens 4; staminodes absent | 5 |
| 3a. Leaves closely serrate | 6. L. tenuifolia |
| 3b. Leaves crenate, entire or distantly serrate | 4 |
| 4a. Leaves 3-4-nerved, ovate-lanceolate, 7-10 mm wide; prostrate herb | 2. L. antipoda |
| 4b. Leaves 5-7-nerved; linear-oblong; 4 mm broad; suberect herbs | 4. L. oppositifolia |
| 5a. Flowers axillary; capsule longer than the calyx | 1. L. anagallis |
| 5b. Flowers terminal; capsule equal to the calyx | 6 |
| 6a. Stems green; leaves densely hairy | 7. L. viscosa |
| 6b. Stem bluish; leaves glabrous | 3. L. crustacea |

1. Lindernia anagallis (Burm.f.) Pennell, J. Arnold Arbor. 24: 252. 1943; H.O. Saxena & Brahmam, Fl. Orissa 2: 1244. 1995.

Diffuse herb; rooting at lower nodes. Leaves sessile, ovate to elliptic, 0.8–2 × 0.5–1 cm, crenate-serrate at margins, subacute at apex. Flowers axillary, solitary or rarely 2-per node; calyx lobes 5, linear-lanceolate, 3–6 mm long; corolla limb 2-lipped, white or pink. Stamens 4. Capsules linear, to 1.3 mm long; seeds ellipsoid, *c.* 0.5 mm long.

Fl. & Fr.: May–December.

Habitat: Wetlands and marshy areas.

Distribution: India: Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Andheri Nala, Champo-Soro, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33663, 35817 (CAL).

2. *Lindernia antipoda* (L.) Alston in Trimen, Handb. Fl. Ceylon 6: 214. 1931; H.O. Saxena & Brahmam, Fl. Orissa 2: 1245. 1995.

Prostrate or diffuse herb, rooting at the nodes. Leaves subsessile, opposite, elliptic-obovate, 1.5–2.5 × 0.5–1 cm, subentire to serrate at margins, obtuse at apex. Flowers solitary, axillary or in terminal racemes; calyx lobes lanceolate, *c.* 4 mm long, scarious at margins; corolla 6–8 mm long, bluish with an yellow mouth, internally short pilose between the staminodes; stamens 2; staminodes 2, hooked. Capsules linear-lanceolate, 1–1.5 cm long; seeds ridged, yellow.

Fl. & Fr.: September–February.

Habitat: Wetlands and marshy areas.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu. KWLS: Ampada, Champo-Soro, Nuasai; common.

Specimens examined: R. Saravanan & K.A. Sujana 34868, 35676, 35816 (CAL).

3. *Lindernia crustacea* (L.) F. Muell., Syst. Census. Austral. Pl. 1: 97. 1882; H.O. Saxena & Brahmam, Fl. Orissa 2: 1248. 1995.

Prostrate, diffusely branched herb, rooting at nodes. Stems 4-angled, slightly winged on angles. Leaves opposite, ovate, 0.8–1.5 × 0.7–1.2 cm, serrate at margins, subacute at apex. Flowers solitary or 2 per node, in axillary terminal racemes; calyx lobes 5, elliptic-lanceolate, *c.* 4 mm long, ciliate at margins, ribbed; corolla tube *c.* 5 mm long, rose to purple. Stamens 4, didynamous. Capsules ovoid, *c.* 5 × 2–3 mm; seeds many.

Fl. & Fr.: July–December.

Habitat: Wetlands and marshy areas.

Distribution: India: Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Kerala, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh. KWLS: Champo-Soro, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 35639, 35910 (CAL).

4. *Lindernia oppositifolia* (Retz.) Mukerjee, J. Indian Bot. Soc. 24: 134. 1945.

Procumbent herb. Leaves sessile, opposite, linear-oblong, *c.* 4 × 0.5 cm, distantly serrate at margins, acute at apex. Flowers in terminal racemes, to 13 cm long; calyx lobes linear-lanceolate, *c.* 7 mm long; corolla *c.* 1.2 cm long; upper lip entire or emarginate, lower lip equally 3-lobed. Anthers divaricate; staminodes linear, bulged at apex. Capsules *c.* 17 × 1.5 mm; seeds obovoid, *c.* 0.3 mm across, minutely muriculate.

Fl. & Fr.: June–December.

Habitat: Wetlands and marshy areas.

Distribution: India: Andhra Pradesh, Assam, Chattisgarh, Jharkhand, Kerala, Madhya Pradesh, Tamil Nadu, Uttar Pradesh. KWLS: Champo-Soro; common.

Specimen examined: R. Saravanan & K.A. Sujana 35790 (CAL).

5. *Lindernia procumbens* (Krock.) Philcox, Taxon 14: 30. 1965 & Kew Bull. 22: 29. 1968.

Annual, erect, to 15 cm high. Leaves sessile, elliptic to ovate-elliptic, 1–2.5 × 0.5–1 cm, entire or sub-crenate at margins, scabrid, 3–5-veined from base. Flowers solitary, axillary; calyx lobes 5, linear-lanceolate, 2–3 mm long; corolla 3–6 mm long, upper lip almost circular, white. Stamens 4, anterior filaments with a small globular or slender spur at base. Capsules ellipsoid; seeds compressed-cylindric, yellow.

Fl. & Fr.: September–April.

Habitat: Wetlands and marshy areas.

Distribution: India: Assam, Bihar, Kerala, Maharashtra, Tamil Nadu. KWLS: Champo-Soro; common.

Specimen examined: R. Saravanan & K.A. Sujana 35677 (CAL).

6. *Lindernia tenuifolia* (Colsm.) Alston in Trimen, Handb. Fl. Ceylon 6: 214. 1931.

Annual. erect or diffused, to 40 cm high. Leaves opposite, linear-oblong, 1.3–5.2 × 0.2–0.4 cm, entire or distantly serrulate at margins, subacute at apex. Flowers solitary, axillary, *c.* 8 mm long; calyx lobes linear, *c.* 3 × 0.8 mm; corolla upper lip oblong-pyramidal, rounded at apex; lower lip pale blue to bluish violet. Stamens 2; staminodes exerted. Capsules linear-cylindric, 5–12 × *c.* 1 mm; seeds ellipsoid, 0.5–0.7 mm long, tawny.

Fl. & Fr.: April–December.

Habitat: Wetlands and marshy areas.

Distribution: India: Andhra Pradesh, Assam, Goa, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu. KWLS: Andheri Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 33822 (CAL).

7. *Lindernia viscosa* (Hornem.) Merr., Sp. Blanc.: 14. 1918; H.O. Saxena & Brahmam, Fl. Orissa 2: 1254. 1995.

Annual, erect or diffuse, rooting at lower nodes. Leaves broadly ovate to obovate, 1.5–5 × 1–3 cm, crenate-serrate at margins, obtuse at apex, hirsute. Flowers many in terminal raceme; peduncle and pedicels glandular-pubescent; calyx lobes linear-lanceolate, 3–4 mm long, glandular-hispid; corolla c. 5 mm long, upper lip pale brown, lower lip white with yellow spots at mouth. Stamens 4; longer pair of filaments with a knee-like appendage. Capsules ovoid, c. 2.5 mm across; seeds shortly cylindrical, straw-coloured.

Fl. & Fr.: August–October.

Habitat: Wetlands and marshy areas.

Distribution: India: Andaman and Nicobar Islands, Assam, Bihar, Goa, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Jodachua Pond; common.

Specimen examined: R. Saravanan & K.A. Sujana 34850 (CAL).

LENTIBULARIACEAE

Utricularia L.

Utricularia caerulea L., Sp. Pl.: 18. 1753; Gamble, Fl. Madras: 983. 1924; Haines, Bot. Bihar Orissa 2: 645. 1922; M.K. Janarth. & A.N. Henry, Bladderw. India: 42, f. 9. 1992; H.O. Saxena & Brahmam, Fl. Orissa 2: 1279. 1995.

Annual; rhizoids to 2.5 cm long; stolons capillary, to 2 cm long. Foliar organs rosulate, narrowly obovate, to 1 cm long, rounded at apex. Traps numerous, ovoid, 1–1.5 mm long, stalked. Racemes 2.5–6 cm long, terete; flowers to 4 mm long, purple or cream; spur 3–4 mm long, slightly curved forwards. Stamens 2. Capsules subglobose, 1.5–2 mm across; seeds ovoid or ellipsoid, reticulate.

Fl. & Fr.: October–December.

Habitat: Wetlands and marshy localities.

Distribution: India: Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttarakhand. KWLS: Andheri Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 34880 (CAL).

BIGNONIACEAE

Key to the genera

- 1a. Leaves 2 or 3-pinnate
- 1b. Leaves 1-pinnate

2. *Oroxylum*
2

- 2a. Calyx spathaceous
2b. Calyx not spathaceous

1. Dolichandrone
3. Stereospermum

1. Dolichandrone (Fenzl) Seem.

Dolichandrone falcata (Wall. ex DC.) Seem., Fl. Vill.-Nov. App.: 151. 1880; C.B. Clarke in Hook.f., Fl. Brit. India 4: 380. 1884; Haines, Bot. Bihar Orissa 2: 658. 1922; Gamble, Fl. Madras 2: 996. 1924; H.O. Saxena & Brahmam, Fl. Orissa 2: 1296. 1995.

Local Name: *Belsrung*.

Small or moderate-sized tree. Leaves pinnate or subpinnate; leaflets 5–13, elliptic to obovate, 1.2–3.7 cm long, acute at apex, pubescent beneath, often tomentose with forked or stellate hairs. Flowers in corymbose racemes, pubescent, white. Pods 30–45 cm long, curved; seeds with membranous wings.

Fl. & Fr.: March–June.

Habitat: Dry Deciduous Forests.

Distribution: India: Andhra Pradesh, Bihar, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh. KWLS: Nandu Gutta; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34394 (CAL).

2. Oroxylum Vent.

Oroxylum indicum (L.) Benth. ex Kurz, Forest Fl. Burma 2: 238. 1877; Hook.f., Fl. Brit. India 4: 378. 1884; Haines, Bot. Bihar Orissa 2: 417. 1922; Gamble, Fl. Madras: 994. 1924; H.O. Saxena & Brahmam, Fl. Orissa 2: 1300. 1995.

Local Names: *Phampan*, *Phemphana*.

Tree, to 12 m high. Leaves 2 or 3-pinnate; leaflets 3–5, opposite, ovate, 7.5–15 × 4–9 cm, cordate or truncate at base, acuminate at apex, chartaceous, puberulent beneath along veins. Flowers in lax terminal racemes, 30–50 cm long, reddish purple outside, pinkish yellow within. Stamens 5. Capsules 40–75 × 5–8 cm, 2-valved; seeds papery, 5–6 cm long, winged.

Fl. & Fr.: July–March.

Habitat: Dry Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Nuarasta, Panchalingeswar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33926, 34453, 35749 (CAL).

3. *Stereospermum* Cham.

Key to the species

- 1a. Flowers in terminal lax panicles; fruits a capsule, 25–35 × *c.* 0.7 cm **2. *S. tetragonum***
1b. Flowers in drooping panicles; fruits a capsule, 30–60 × *c.* 0.5 cm **1. *S. chelonoides***

1. *Stereospermum colais* (Buch.-Ham. ex Dillw.) Mabb., *Taxon* 27: 553. 1979, var. **colais**; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 1304. 1995.

Local Names: *Padal*, *Pamphunia*.

Tree, *c.* 30 m high. Leaves imparipinnate; leaflets 7–13, opposite, elliptic-oblong, ovate or obovate, 4.5–13 × 2–4.5 cm, oblique or obtuse at base, entire or serrate at margins, acuminate at apex, chartaceous, puberulent beneath. Flowers in terminal lax panicles, yellow, red-streaked. Stamens 4. Capsules to 35 × 0.7 cm, subtetragonus; seeds *c.* 8 mm long, winged.

Fl. & Fr.: April–February.

Habitat: Dry Deciduous Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Sikkim. KWLS: Nilgiri Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 35640 (CAL).

2. *Stereospermum suaveolens* (G. Don) DC., *Prodr.* 9: 211. 1845; Hook.f., *Fl. Brit. India* 4: 382. 1884; Gamble, *Fl. Madras*: 998. 1924. *S. chelonoides* DC., *Biblioth. Universelle Geneve* 17: 124. 1838; H.O. Saxena & Brahmam, *Fl. Orissa* 2: 1304. 1995.

Local Names: *Pamphunia*.

Deciduous tree, to 25 m high. Leaves imparipinnate; leaflets 5–11, opposite, elliptic or ovate, 7.5–16 × 5–7.5 cm, acuminate at apex, oblique, entire or serrulate at margins, acute or unequally rounded at base, coriaceous, pubescent beneath. Flowers in drooping panicles, *c.* 1.8 cm long, pubescent, dull crimson. Stamens 4. Capsules 30–60 cm long, nearly terete, lenticellate, grey; seeds *c.* 3 cm long, wedge-shaped, trigonous, membranous-winged.

Fl. & Fr.: April–February.

Habitat: Dry Deciduous Forests.

Distribution: India: Assam, Andhra Pradesh, Arunachal Pradesh, Himachal Pradesh, Karnataka, Kerala, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Uttarakhand. KWLS: Ampada, Ashun Chua, Pancharjuna; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33707, 34546, 34888 (CAL).

ACANTHACEAE

Key to the genera

- | | |
|---|--------------------------|
| 1a. Seeds not supported by retinacula | 13. Staurogyne |
| 1b. Seeds supported on retinacula | 2 |
| 2a. Corolla with a single 3-lobed spreading lower lip; upper lip obsolete | 3. Blepharis |
| 2b. Corolla 2 lipped or with 5 subequal lobes | 3 |
| 3a. Corolla lobes twisted to the left in bud | 4 |
| 3b. Corolla lobes imbricate in bud | 8 |
| 4a. Ovules more than 2 per cell; capsules usually with 6 or more seeds | 5 |
| 4b. Ovules 2 per cell; capsules with 4 or fewer seeds | 6 |
| 5a. Corolla distinctly 2-lipped | 7. Hygrophila |
| 5b. Corolla subequally 5-lobed | 11. Ruellia |
| 6a. Placentae separating elastically from the base of the ripe capsule | 10. Phaulopsis |
| 6b. Placentae not separating elastically from the base of the ripe capsule | 7 |
| 7a. Corolla tube long, linear, slender; stamens 2 | 6. Eranthemum |
| 7b. Corolla tubular-ventricose; stamens 4 or 2 in some species | 14. Strobilanthes |
| 8a. Ovules 3–10 in each cell | 1. Andrographis |
| 8b. Ovules 2 or rarely 1 per cell | 9 |
| 9a. Corolla subequally 5-lobed | 2. Barleria |
| 9b. Corolla distinctly 2-lipped | 10 |
| 10a. Stamens 4 | 8. Lepidagathis |
| 10b. Stamens 2 | 11 |
| 11a. Flowers in spikes | 12 |
| 11b. Flowers in 1 to few-flowered cymes | 13 |
| 12a. Bracts membranous or hyaline, 2 or 4-ranked, dimorphous | 12. Rungia |
| 12b. Bracts in cylindrical or 4-farious spikes, homomorphous | 5. Ecbolium |
| 13a. Placentae separating elastically from the valves from the base upwards | 4. Dicliptera |
| 13b. Placentae not separating elastically from the valves | 9. Peristrophe |

1. Andrographis Wall. ex Nees

Key to the species

- | | |
|-----------------------------------|-------------------------|
| 1a. Anthers bearded at a base | 2. A. paniculata |
| 1b. Anthers not bearded at a base | 1. A. ovata |

1. Andrographis ovata (Bedd.) C.B. Clarke in Hook.f., Fl. Brit. India 4: 502. 1884; Gamble, Fl. Madras: 1049. 1924; Mooney, Suppl. Bot. Bihar Orissa: 18. 1950; H.O. Saxena & Brahmam, Fl. Orissa 3: 1328. 1995.

Herb with hispid or glandular-pubescent stems. Leaves ovate, to 10 × 3.5 cm, acute or obtuse at apex. Flowers in elongated racemes, sometimes subpaniculate; calyx lobes setaceous, 1.5–1.7 mm long, glandular-pubescent; corolla only obscurely 2-lipped, c. 8 mm long, white-purple or pinkish. Capsules linear-oblong, c. 1.3 mm long; retinacula acute.

Fl. & Fr.: October–April.

Habitat: Mixed forest in the hills.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu.
KWLS: Jodachua Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 33728 (CAL).

2. *Andrographis paniculata* (Burm.f.) Wall. ex Nees in Wall., Pl. Asiat. Rar. 3: 116. 1832; Hook.f., Fl. Brit. India 4: 501. 1884; Haines, Bot. Bihar Orissa 2: 699. 1922; Gamble, Fl. Madras: 1048. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1328. 1995.

Local Names: *Bhuinimbo*, *Kalmeg*.

Herb. Leaves elliptic, to 9×1.5 cm, acuminate at apex. Panicles terminal and upper axillary, glandular-hairy. Flowers many, distant; calyx lobes linear, *c.* 3 mm long, hairy; corolla *c.* 1.4 cm long, glandular-hairy. Capsules oblong, $20\text{--}30 \times c.$ 3 mm, acute, hairy; retinacula spoon-shaped; seeds 8.

Fl. & Fr.: September–May.

Habitat: Scrub forests.

Distribution: India: Throughout. KWLS: Bulagadia, Nua Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34324, 36455 (CAL).

2. *Barleria* L.

Key to the species

- | | |
|---|------------------------------|
| 1a. Spikes dense; corolla pink | 1. <i>B. cristata</i> |
| 1b. Spikes often few-flowered; corolla blue | 2. <i>B. strigosa</i> |

1. *Barleria cristata* L., Sp. Pl.: 636. 1753; Hook.f., Fl. Brit. India 4: 488. 1884; Haines, Bot. Bihar Orissa 2: 683. 1922; Gamble, Fl. Madras: 1060. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1331. 1995.

Local Names: *Banpatoli*, *Daskarada*.

Shrub. Leaves elliptic, to 6.5×2.5 cm, apex acute. Cymes axillary, dense; flowers pink; calyx lobes dissimilar, outer two larger, elliptic, many-veined from base, scarious, spine-tipped at margins; inner two oblong, *c.* 7×2 mm, ciliate; corolla *c.* 4 cm across, pink. Capsules oblong-ellipsoid, *c.* 1.5 cm long; seeds orbicular, 4–5 mm, silky hairy.

Fl. & Fr.: September–February.

Habitat: Grasslands and hillsides.

Distribution: India: Throughout. KWLS: Balia Nal; common.

Specimen examined: R. Saravanan & K.A. Sujana 34946 (CAL).

2. *Barleria strigosa* Willd., Sp. Pl.: 3: 379. 1800; C.B. Clarke in Hook.f., Fl. Brit. India 4: 489. 1884; Haines, Bot. Bihar Orissa 2: 682. 1922; Gamble, Fl. Madras: 1061. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1334. 1995.

Local Name: *Saptaphena*.

Undershrub, to 1.2 m high; branches strigose. Leaves elliptic or ovate, 4–25 × 2.5–12.5 cm, acuminate or sometimes acute, strigose on veins beneath, lineolate above. Flowers in dense second spikes, 2.5–7.5 cm long; two larger calyx lobes imbricate in a row on the upper side of the spike and the bracteoles in two lateral rows; outer calyx lobes 2.5–3 cm, ciliate; corolla tube 3–5 cm long; lobes 1.5–1.8 cm. Capsules *c.* 1.8 cm long, 4-seeded.

Fl. & Fr.: November–May.

Habitat: Moist and shady places in forests.

Distribution: India: Throughout. KWLS: Ashunchua; fairly common.

Specimen examined: R. Saravanan & K.A. Sujana 34405 (CAL).

3. *Blepharis* Juss.

Key to the species

- | | |
|--|-------------------------------------|
| 1a. Leaves sessile, thick and fleshy, obtuse; bracteoles present | 1. <i>B. integrifolia</i> |
| 1b. Leaves petiolate, thin, acute; bracteoles absent | 2. <i>B. maderaspatensis</i> |

1. *Blepharis maderaspatensis* (L.) Roth, Nov. Pl. Sp.: 320. 1821; H.O. Saxena & Brahmam, Fl. Orissa 3: 1335. 1995.

Local Name: *Ukaro*.

Prostrate herb. Leaves ternate, unequal, 3–5 × 2 cm, obovate, distantly serrate at margins, apiculate at apex, puberulous. Flowers axillary; outer calyx lobes oblong, *c.* 1.3 × 1.8 cm, 3-veined; inner *c.* 8 mm long; corolla tube urceolate, *c.* 5 mm long; lower lip reduced, upper lip 3 lobed, *c.* 1.8 × 1.2 cm, white with pink veins; filaments 4 and 5 mm, anthers 1-celled, apiculate, bearded; ovary oblong, *c.* 2.5 mm long; style *c.* 1 cm long, with a basal ring.

Fl. & Fr.: November–May.

Habitat: Waste, open places in forests.

Distribution: India: Throughout. KWLS: Pancharjuna Rasta; fairly common.

Specimen examined: R. Saravanan & K.A. Sujana 34908 (CAL).

2. *Blepharis integrifolia* (L.f.) E. Mey. & Drège ex Schinz, Vierteljahrsschr. Naturf. Ges. Zürich 60: 416. 1915. *Blepharis repens* (Vahl) Roth, Nov. Pl. Sp.: 321. 1821; H.O. Saxena & Brahmam, Fl. Orissa 3: 1335. 1995.

Diffuse herb. Leaves sessile, narrowly elliptic, oblanceolate or obovate, $0.7\text{--}2.8 \times c.$ 0.5 cm, obtuse at apex. Spikes sessile, dense, ovoid; bracts $8\text{--}10$ mm long, spinescent-ciliate, usually only one in a spike, $6\text{--}8$ mm long. Corolla lip *c.* 3.7 mm broad, minutely pubescent.

Fl. & Fr.: August–March.

Habitat: Dry areas.

Distribution: India: Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Ashunchua; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34906 (CAL).

4. *Dicliptera* Juss.

Dicliptera foetida (Forssk.) Blatt., Rec. Bot. Surv. Ind. 8: 361. 1921; Karthik. & al., Fl. Pl. India 1: 10. 2009. *Justicia foetida* Forssk., Fl. Aegypt.-Arab.: 5. 1775.

Shrub, $1\text{--}2$ m high. Leaves elliptic, to 7×3.5 cm, acute at ends, glabrous except veins beneath. Flowers in axillary cymes; bracts deltoid, *c.* 1.5×1.3 cm, cuspidate; calyx lobes lanceolate, *c.* 4 mm long, acuminate; corolla *c.* 2 cm long, bilipped, pink; stamens 2. Capsules ovate, $6\text{--}8$ mm, acute, glandular-hairy; seeds 4 , $2\text{--}3 \times 1.5\text{--}3$ mm, compressed, tuberculate.

Fl. & Fr.: August–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Pancharjuna Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 35814 (CAL).

5. *Ecbolium* Kurz

Ecbolium viride (Forssk.) Alston in Trimen, Handb. Fl. Ceylon 6: 229. 1931; Haines, Bot. Bihar Orissa 2: 695. 1922; H.O. Saxena & Brahmam, Fl. Orissa 3: 1343. 1995; Karthik. & al., Fl. Pl. India 1: 14. 2009.

Undershrub, to 1.2 m high. Leaves ovate-lanceolate or elliptic, $7\text{--}23.5 \times 3\text{--}8$ cm, acute to acuminate or caudate, puberulous on veins. Flowers in dense spikes, $2.5\text{--}7.5$ cm long; calyx segments linear-subulate, *c.* 3.7 mm long; corolla to 4.5 cm long, with slender tube, soft-hairy, white or bluish. Capsules obovoid, *c.* 1.8 cm long, cuspidate, lower barren base compressed; seeds 1 in each cell, ovate, *c.* 5 mm long, papillose.

Fl. & Fr.: August–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34539 (CAL).

6. *Eranthemum* L.

Key to the species

- 1a. Bracts linear or linear-lanceolate, not imbricating **1. *E. capense***
1b. Bracts obovate, white with very prominent raised green veins **2. *E. roseum***

1. *Eranthemum capense* L., Sp. Pl.: 9. 1753; Hook.f., Fl. Brit. India 4: 525. 1885; Gamble, Fl. Madras: 1078. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 1345. 1996; Karthik. & al., Fl. Pl. India 1: 15. 2009.

Undershrub, 60–90 cm high. Leaves broadly ovate or elliptic ovate, 5–19 × 2.5–7 cm, short-acuminate, pubescent. Flowers in spikes of 7.5–10 cm long, lateral or terminal, densely viscid-glandular; bracts linear-lanceolate, 1–1.5 cm long; bracteoles linear; corolla blue, tube c. 3 cm long; limb c. 2.5 cm across. Capsules linear-oblong, 1–2.5 cm long; seeds rounded-elliptic, c. 2.5 mm long, brown, margined.

Fl. & Fr.: August–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Guajhari; common.

Specimen examined: R. Saravanan & K.A. Sujana 33771 (CAL).

2. *Eranthemum roseum* (Vahl) R. Br., Prodr. 1: 477. 1810; Gamble, Fl. Madras: 1024. 1924; Karthik. & al., Fl. Pl. India 1: 16. 2009. *Justicia rosea* Vahl, Enum. Pl. 1: 165. 1804.

Shrub, c. 2 m high. Leaves oblong-lanceolate, 12–20 × 3.8–7.5 cm, acuminate, lineolate. Flowers borne in linear, lax, axillary and terminal spikes to 15 cm long, blue or purple, foetid; bracts obovate, c. 1.5 cm long, white, green-veined. Capsules clavate, c. 1 cm long; seeds 3–4 mm, hygroscopic-hairy.

Fl. & Fr.: August–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Goa, Karnataka, Kerala, Maharashtra. KWLS: Balia Nal, Jodachua; common.

Specimens examined: R. Saravanan & K.A. Sujana 34364, 35737 (CAL).

7. *Hygrophila* R. Br.

***Hygrophila ringens* (L.) Steud.**, Nomencl. Bot. 1: 418. 1821 Karthik. & al., Fl. Pl. India 1: 22. 2009. *Ruellia ringens* L., Sp. Pl.: 635. 1753. *Hygrophila salicifolia* (Vahl) Nees in Wall., Pl. Asiat. Rar. 3: 81. 1832; H.O. Saxena & Brahmam, Fl. Orissa 3: 1355. 1995.

Undershrub, rooting at lower nodes. Leaves linear-lanceolate, to 10 × 1 cm, strigose on veins. Flowers in axillary clusters, sessile; bracts linear, *c.* 6 mm long; bracteoles minute; calyx tubular, *c.* 12 mm long; corolla *c.* 1.5 cm long, bilabiate, pale pink; tube slender, ventricose above; stamens 4. Capsules *c.* 14 × 2 mm, terete; seeds many, densely hairy.

Fl. & Fr.: May–December.

Habitat: Wet and marshy areas.

Distribution: India: Throughout. KWLS: Champo-Soro, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 34814, 36474 (CAL).

8. *Lepidagathis* Willd.

Key to the species

- | | |
|--|---------------------------------|
| 1a. Erect undershrub | 1. <i>L. cristata</i> |
| 1b. Prostrate herb | 2 |
| 2a. Bracts <i>c.</i> 1.5 mm across, scarious | 3. <i>L. incurva</i> |
| 2b. Bracts <i>c.</i> 5 mm across, herbaceous | 2. <i>L. fasciculata</i> |

1. *Lepidagathis cristata* Willd., Sp. Pl.: 3: 400. 1800; C.B. Clarke in Hook.f., Fl. Brit. India 4: 516. 1885; Gamble, Fl. Madras: 1066. 1924; Brahman & H.O. Saxena, J. Bombay Nat. Hist. Soc. 81: 509. 1984; Karthik. & al., Fl. Pl. India 1: 30. 2009.

Undershrub. Leaves sessile, linear-oblong, 1–3 × 0.3–0.6 cm, obtuse, mucronate, hispidulous beneath on veins and margins. Spikes aggregated at the base of stems in globose cushions, 2.5–3 cm; bracts broadly ovate, long-spinous-mucronate, with densely soft silky hairs; calyx lobes long, spinous-mucronate, densely soft silky-hairy; corolla white, brown-purple-spotted. Capsules 2-seeded, 2-valved from the subsolid tip.

Fl. & Fr.: January–June.

Habitat: Wet and shady areas.

Distribution: India: Andhra Pradesh, Chhattisgarh, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu. KWLS: Ampada Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 33958 (CAL).

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: 1068. 1924; Haines, Bot. Bihar Orissa 2: 688. 1922; H.O. Saxena & Brahmam, Fl. Orissa 3: 1370. 1995; Karthik. & al., Fl. Pl. India 1: 31. 2009. *Ruellia fasciculata* Retz., Observ. Bot. 4: 28. 1786.

Local Name: *Rasna*.

Herb, to 50 cm high. Leaves elliptic, 3–6 × 1.5–3 cm, serrate at margins, acute at apex, pubescent. Spikes condensed, axillary or terminal; bracts elliptic-ovate, *c.* 0.8 × 0.4 cm,

ciliate; bracteoles ovate-lanceolate, *c.* 6 × 1 mm; calyx lobes 5, ovate-lanceolate or linear, 4–5 × *c.* 1 mm, hirsute and glandular-hairy on the top; corolla tube *c.* 5 mm long, bilipped, white; upper lip *c.* 3 mm; lower lip *c.* 4 mm; stamens 4. Capsules oblong, *c.* 0.5 × 0.1 cm.

Fl. & Fr.: January–June.

Habitat: Wet and shady areas.

Distribution: India: Throughout. KWLS: Andheri Nala; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34869 (CAL).

3. *Lepidagathis incurva* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal.: 119. 1825; Haines, Bot. Bihar Orissa 2: 688. 1922; H.O. Saxena & Brahmam, Fl. Orissa 3: 1371. 1995; Karthik. & al., Fl. Pl. India 1: 31. 2009.

Herb, 30–60 cm high. Leaves oblong-lanceolate, ovate or linear, 4–14 × 1–3.5 cm, acute, pubescent on veins beneath. Spikes 1.2–4 × 1 cm, often clustered in upper leaf axils; bracts dense, 4-farious, ovate-oblong, 7.5–10 mm long, mucronate, 1-veined, glandular-hairy; bracteoles similar; outer lobes oblong, glandular-hairy, subaristate, 3-veined. Corolla tubular-ventricose, 2-lipped, 7–8 mm long, white, brown-mottled. Capsules oblong, 5–6.5 mm long, short-beaked; seeds *c.* 1 mm.

Fl. & Fr.: December–May.

Habitat: Wet and shady areas.

Distribution: India: Almost throughout. KWLS: Pancharjuna; common.

Specimens examined: R. Saravanan & K.A. Sujana 34314, 34863 (CAL).

9. *Peristrophe* Nees

Peristrophe paniculata Forssk., Fl. Aegypt.-Arab.: 7. 1775; H.O. Saxena & Brahmam, Fl. Orissa 3: 1375. 1995. *Dicliptera paniculata* (Forssk.) I. Darbysh. & Vollesen, Kew Bull. 62: 122. 2007; Karthik. & al., Fl. Pl. India 1: 11. 2009.

Herb. Leaves ovate, 4.5–6 × 2–3 cm, rounded or truncate at base, acute at apex, tomentose beneath. Flowers in axillary trichotomous cymes; bracts 2, unequal, *c.* 11 × 8 mm; bracteoles 4, linear, *c.* 6 mm, hirsute; calyx lobes 5, linear, *c.* 4 mm; corolla 2-lipped, pink; tube *c.* 5 mm long, hairy; stamens 2. Capsules ellipsoid, tomentose; seeds 4, glochidiate-papillose.

Fl. & Fr.: November–March.

Habitat: Wet and open forests.

Distribution: India: Almost throughout. KWLS: Parchondi; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35814 (CAL).

10. *Phaulopsis* Willd.

Phaulopsis dorsiflora (Retz.) Santapau, Kew Bull. 1948: 276. 1948. *Ruellia dorsiflora* Retz., Observ. Bot. 6: 31. 1791. *Phaulopsis imbricata* auct. Non (Forssk.) Sweet, 1827: H.O. Saxena & Brahmam, Fl. Orissa 3: 1378. 1995; Karthik. & al., Fl. Pl. India 1: 34. 2009.

Diffuse herb, with glandular-hairy branches. Leaves in unequal pairs, elliptic, $3-5 \times c.$ 2 cm, acuminate at ends. Spikes axillary, $c.$ 2×1 cm, 1-sided; bracts paired, orbicular, 6–7 mm, long-ciliate at margins; bracteoles absent. Flowers small, scarcely seen above the bracts; calyx lobes 5, unequal; corolla $c.$ 8 mm long, bilabiate; tube slender; lobes obtuse, white with pink spots; stamens 4. Capsules $c.$ 3 mm long; seeds 4, compressed.

Fl. & Fr.: November–March.

Habitat: Wet and shady areas.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34428 (CAL).

11. *Ruellia* L.

Ruellia patula Jacq., Misc. Austriac. 2: 358. 1781; C.B. Clarke in Hook.f., Fl. Brit. India 4: 412. 1884; Karthik. & al., Fl. Pl. India 1: 37. 2009. *Dipteracanthus patulus* (Jacq.) Nees in Wall., Pl. Asiat. Rar. 3: 82. 1832.

Herb. Leaves broadly ovate, $c.$ 5.5×4 cm, truncate at base, apex acute at apex, pubescent. Flowers axillary, solitary, blue; bracteoles 1.2×1 cm, ovate, pubescent; calyx lobes 1.3 cm, narrow linear, hairy; corolla funnel-shaped; tube to 1 cm long; lobes $c.$ 5 mm long, spreading; filaments basally united in pairs. Capsules clavate, $c.$ 1.5 cm long, solid-stalked.

Fl. & Fr.: Throughout.

Habitat: Degraded forests and way sides.

Distribution: India: Throughout. KWLS: Champo-Soro; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35793 (CAL).

12. *Rungia* Nees

Rungia pectinata (L.) Nees in DC., Prodr. 11: 469. 1847; H.O. Saxena & Brahmam, Fl. Orissa 3: 1381. 1995; Karthik. & al., Fl. Pl. India 1: 39. 2009. *Justicia pectinata* L., Amoen. Acad. 4: 299. 1759.

Local Name: *Sankh*.

Herb. Leaves $4-6 \times c.$ 2 cm, ovate to linear-oblong or obovate. Spikes $c.$ 2×0.7 cm, 2–5 together, axillary, sessile. Flowers small, densely packed; sepals linear, acuminate,

hyaline, hairy; corolla *c.* 4 mm long, upper lip entire, white; upper anthers hairy. Capsules *c.* 2.5 mm long; seeds orbicular, rugose, brown.

Fl. & Fr.: May–July.

Habitat: Wet and shady areas.

Distribution: India: Throughout. KWLS: Ampada Nala; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 33585 (CAL).

13. *Staurogyne* Wall.

Staurogyne glutinosa (Wall. ex C.B. Clarke) Kuntze, Revis. Gen. Pl.: 1891; Haines, Bot. Bihar Orissa 2: 668. 1922; H.O. Saxena & Brahmam, Fl. Orissa 3: 1383. 1995.

Herb. Leaves oblanceolate, to 2–8 × 1 cm, acuminate, hirtus above, puberulous beneath. Spikes axillary and terminal, to 7 × 1 cm, cylindrical. Flowers few; sepals 5, unequal, linear, hirtus; corolla *c.* 5 mm long, tube short, upper part broad, 2-lipped, violet–blue with darker rim, pubescent; stamens 4; staminode 1; ovary oblong; style linear; stigma 2-lobbed. Capsules oblong, *c.* 7 mm long; seeds 8–10 pairs, rugose, brown; retinacula absent.

Fl. & Fr.: December–March.

Habitat: Moist shady places.

Distribution: India: Jharkhand, Karnataka, Kerala, Uttarakhand, Uttarpradesh, West Bengal. KWLS: Koimutiya; common.

Specimen examined: R. Saravanan & K.A. Sujana 35942 (CAL).

15. *Strobilanthes* Blume

Strobilanthes scaber Nees in Wall., Pl. Asiat. Rar. 3: 84. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4: 446. 1885; Haines, Bot. Bihar Orissa 2: 678. 1922; Mooney, Suppl. Bot. Bihar Orissa: 114. 1950; H.O. Saxena & Brahmam, Fl. Orissa 3: 1392. 1995.

Local Name: *Khakusa*.

Herb or undershrub, 30–90 cm high. Leaves elliptic or obovate, 6–15 × 2.3–5 cm, crenate-serrate or entire at margins, acute, stiff, hispid or pubescent, scabrous above. Spikes 2.5–5 cm long, often in short terminal panicles; sepals linear, *c.* 1.2 cm long, often glandular-hairy; corolla narrowly tubular for 6 mm then ventricose, villous inside; stamens 4. Capsules 7.5(–12) mm long, downy; seeds 4, discoid with broad margins and long silky hairs.

Fl. & Fr.: January–May.

Habitat: Wet and shady areas.

Distribution: India: Assam, Uttarakhand, West Bengal. KWLS: Ampada; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34444, 34461 (CAL).

VERBENACEAE

Lantana L.

***Lantana camara* L.**, Sp. Pl.: 627. 1757; H.O. Saxena & Brahmam, Fl. Orissa 3: 1413. 1995; A. Rajendran & P. Daniel, Indian Verbenac.: 180. 2002.

Local Names: *Nagaboiri, Nagauri*.

Shrub, 3–12 cm high, armed with recurved prickles. Leaves opposite, cordate or ovate-oblong, 3–9 × 1.5–6 cm, serrate or crenate at margins, acuminate at apex, densely resinous-punctate and sparsely pubescent on veins beneath. Spike cylindrical or subumbellate, axillary, c. 1 × 1–1.5 cm, bracteate. Flowers sessile, zygomorphic, pinkish red to scarlet red. Stamens 4, didynamous. Drupes ovoid, 3–5 mm, fleshy, green, purplish black when ripe.

Fl. & Fr.: Throughout the year.

Habitat: Degraded forests, waysides, often planted.

Distribution: India: Throughout. KWLS: Rangamatia; common.

Specimen examined: R. Saravanan & K.A. Sujana 33574 (CAL).

LAMIACEAE

Key to the genera

1a. Trees or shrubs	2
1b. Herbs or undershrubs	5
2a. Corolla large, campanulate	5. Gmelina
2b. Corolla small, infundibuliform or hypocrateriform	3
3a. Flowers white	13. Premna
3b. Flowers lilac	4
4a. Leaves compound, 3–7-foliolate	14. Vitex
4b. Leaves simple	3. Callicarpa
5a. Corolla 5-lipped	7. Hyptis
5b. Corolla 2-lipped	6
6a. Flowers in terminal panicle or spike	7
6b. Flowers in axillary dense whorls	11
7a. Terminal panicle	4. Clerodendrum
7b. Terminal spike	8
8a. Plant with sub-fleshy stem	1. Anisochilus
8b. Plants otherwise	9
9a. Stigma capitate or clavate	11. Orthosiphon
9b. Stigma bifid	10
10a. Corolla villous, without glands	12. Pogostemon
10b. Corolla gland dotted near base	10. Ocimum
11a. Flowers white or greenish white	12
11b. Flowers orange or yellow	13

- 12a. Flowers greenish white; stigmatic lobes equal
12b. Flowers white; stigmatic upper lobe obsolete
13a. Flowers yellow; calyx teeth 5
13b. Flowers orange; calyx teeth 8–10

2. **Anisomeles**
9. **Leucas**
6. **Gomphostemma**
8. **Leonotis**

1. Anisochilus Wall. ex Benth.

Anisochilus carnosus (L.f.) Wall. ex Benth. in Wall., Pl. Asiat. Rar. 2: 18. 1830; Hook.f., Fl. Brit. India 4: 627. 1885; Gamble, Fl. Madras: 1127. 1924; Haines, Bot. Bihar Orissa 2: 733. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1440. 1995. *Lavandula carnosus* L.f., Suppl. Pl.: 273. 1782.

Local Names: *Bennia*, *Paunsia*.

Semisucculent annual. Leaves broadly ovate, 2–5 × 2–3.5 cm, truncate or cordate at base, crenate-serrate at margins, obtuse at apex, verrucose above, pubescent beneath. Flowers in panicles, 1.5–3 cm long, purple; stamens 4, exserted. Nutlets 4, ovoid; seeds orbicular.

Fl. & Fr.: September–February.

Habitat: Rocky places and steep hill sides.

Distribution: India: Throughout. KWLS: Nuasai Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 36413 (CAL).

2. Anisomeles R. Br.

Anisomeles indica (L.) Kuntze, Revis. Gen. Pl. 2: 512. 1891; Gamble, Fl. Madras: 1140. 1924; Haines, Bot. Bihar Orissa 2: 745. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1441. 1995. *Nepeta indica* L., Sp. Pl.: 571. 1753.

Herb, aromatic, to 1.5 m high; stems 4-angled, grooved on opposite sides, densely pubescent. Leaves broadly ovate to obovate, 3–7 × 2.5–4.5 cm, truncate at base, serrate-crenate at margins, acute at apex, coarsely tomentose on both sides. Flowers in axillary sessile clusters or in terminal interrupted spikes, pale pink; stamens 4, didynamous, exserted; filaments hairy. Nutlets 4, lenticular, reddish brown.

Fl. & Fr.: September–March.

Habitat: Wastelands and on waysides.

Distribution: India: Throughout. KWLS: Parchondi Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 36428 (CAL).

3. Callicarpa L.

Callicarpa tomentosa (L.) Murray, Syst. Veg. ed. 13: 130. 1774; H.O. Saxena & Brahmam, Fl. Orissa 3: 1403. 1995; A. Rajendran & P. Daniel, Indian Verbenac.: 53. 2002. *Tomex tomentosa* L., Sp. Pl.: 118. 1753.

Local Names: *Badopatri*, *Serali*.

Tree, to 4 m high. Leaves ovate or elliptic, 13–30 × 8–20 cm, truncate, acute or rounded at base, entire or dentate at margin, acuminate at apex, subcoriaceous, densely white stellate-tomentose beneath. Flower in axillary corymbose cymes, densely tomentose, pinkish purple; stamens 4, exserted. Drupes globose, *c.* 3 mm, black; seeds 3 or 4, oblong, angular.

Fl. & Fr.: April–December.

Habitat: Moist Deciduous Forests.

Distribution: India: Goa, Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Bhaibhoni Ghatti, Jodachua Beat Rasta, Panchalingeshwar; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34435, 34532, 35654 (CAL).

4. *Clerodendrum* Burm.

Key to the species

- | | |
|---|----------------------------------|
| 1a. Corolla tube <i>c.</i> 8 cm or more | 1. <i>C. indicum</i> |
| 1b. Corolla tube under 5 cm | 2. <i>C. infortunatum</i> |

1. *Clerodendrum indicum* (L.) Kuntze, Revis. Gen. Pl. 2: 586. 1891; H.O. Saxena & Brahmam, Fl. Orissa 3: 1405. 1995; A. Rajendran & P. Daniel, Ind. Verbenac.: 109. 2002. *Siphonanthus indica* L., Sp. Pl.: 109. 1753.

Local Names: *Jathia*, *Nagri*, *Pudanargi*.

Undershrub, to 2 m high. Leaves sessile or subsessile, in whorls of 3 or 4, linear-lanceolate or elliptic-lanceolate, 7–22 × 2–4 cm, entire or more or less toothed at margins, acute or acuminate at apex. Flowers in terminal panicles, white; stamens 4, exserted; filaments purple. Drupes globose, *c.* 1 cm, 4-lobed, blue-black; fruiting calyx fleshy, bright red; seed 1.

Fl. & Fr.: June–December.

Habitat: Mixed Forests.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. KWLS: Panchalingeshwar Pahad; common.

Specimen examined: R. Saravanan & K.A. Sujana 35617 (CAL).

2. *Clerodendrum infortunatum* L., Sp. Pl.: 637. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 4: 594. 1885; Gamble, Fl. Madras: 1100. 1924; A. Rajendran & P. Daniel, Ind. Verbenac.: 116. 2002. *C. viscosum* sensu H.O. Saxena & Brahmam, Fl. Orissa 3: 1408. 1995, non Vent. 1804.

Local Names: *Anguti*, *Bada Rasna*, *Buhasin*, *Kunti*.

Shrub, to 4 m high. Leaves ovate or orbicular, 8–17 × 6–12 cm, cordate at base, entire or denticulate at margins, acuminate at apex, tomentose above, villous beneath, basally 5–7-veined. Panicles terminal, 14–20 cm long, villous. Flowers fragrant, white; stamens 4. Drupes globose, 6–8 mm, bluish black; fruiting calyx enlarged, pink; seeds 2–4, globose, 2–3 mm.

Fl. & Fr.: January–July.

Habitat: Mixed Forests.

Distribution: India: Andaman and Nicobar Islands, Goa, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Ampada Nala, Guajari Nala; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33575, 33815 (CAL).

5. *Gmelina* L.

Gmelina arborea Roxb., Hort. Bengal.: 46. 1814; C.B. Clarke in Hook.f., Fl. Brit. India 4: 581. 1885; Gamble; Haines, Bot. Bihar Orissa 2: 719. 1922; Gamble, Fl. Madras: 1097. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1411. 1995; A. Rajendran & P. Daniel, Ind. Verbenac.: 155. 2002.

Local Names: *Bhodropornni*, *Gambhari*.

Deciduous tree, to 18 m high. Leaves opposite, broadly ovate or ovate, 7.5–25 × 6–20 cm, cordate truncate or rounded at base, acute or acuminate at apex, coriaceous, tomentose beneath. Flowers in terminal panicles, 3–3.7 cm long, yellow with orange-pink shade; stamens 4, didynamous. Drupes ovoid, 2.5–3.5 × 1–1.5 cm, pulpy, yellow; seeds 2–4, elliptic.

Fl. & Fr.: March–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Almost throughout. KWLS: Kanchipaani; common.

Specimen examined: R. Saravanan & K.A. Sujana 33579 (CAL).

6. *Gomphostemma* Wall. ex Benth.

Gomphostemma parviflorum Wall. ex Benth in Wall., Pl. Asiat. Rar. 2: 12. 1830–31; Hook.f. Fl. Brit. India 4: 697. 1885; H.O. Saxena & Brahmam, Fl. Orissa 3: 1449. 1995.

Undershrub, 2.5–3 m high. Leaves elliptic or elliptic-ovate, 1.8–25 × 5–11 cm, entire to serrulate at margins, acute or acuminate at apex, hirsute above, densely stellate-tomentose beneath. Flowers in lax or dense axillary cymes; calyx 1–1.2 cm long, adpressedly white-tomentose or hirsute, 5-lobed; corolla 2–2.2 cm long, straight, sparsely puberulous outside, yellow. Nutlets usually solitary, c. 6 mm long, brown.

Fl. & Fr.: April–May.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Meghalaya, Sikkim. KWLS: Nuarasta Chowk; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34828 (CAL).

7. *Hyptis* Jacq.

Hyptis suaveolens (L.) Poit., Ann. Mus. Natl. Hist. Nat. Paris 7: 472. 1806; Hook.f., Fl. Brit. India 4: 630. 1885; Gamble, Fl. Madras: 1129. 1924; Haines, Bot. Bihar Orissa 2: 736. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1451. 1995.

Local Name: *Ganga Tulsi*.

Shrub, to 1.5 m high. Leaves ovate, acute at apex, hispid below. Flowers in clusters of 1–12; calyx tubular, tube *c.* 8 mm long, glandular-hairy, 10-ribbed; teeth spinulose, *c.* 4 mm long; corolla *c.* 5 mm long, 5-lobed, blue. Nutlets *c.* 4 × 2.5 mm, compressed, with a ridge on dorsal surface, pubescent, deep brown, mucilaginous when wet.

Fl. & Fr.: September–January.

Habitat: Degraded Forests.

Distribution: India: Throughout; naturalised exotic. KWLS: Jodachua Ghatti, Kuldiha Pahad, Pancharjuna Rasta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33595, 33893, 36419 (CAL).

8. *Leonotis* R. Br.

Leonotis nepetifolia (L.) R. Br., Prodr.: 504. 1810; Hook.f., Fl. Brit. India 4: 691. 1885; Haines, Bot. Bihar Orissa 2: 752. 1924; Gamble, Fl. Madras: 1155. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1453. 1995. *Phlomis nepetiifolia* L., Sp. Pl.: 586. 1753.

Local Names: *Baroh*, *Kontosidho*.

Shrub. Leaves ovate, to 11 × 8 cm, truncate at base, deeply crenate at margins, acute at apex, minutely punctate, pubescent, basally 3-veined. Thyrsus axillary and terminal; calyx oblique; 7-toothed, spinescent; tube *c.* 1.3 cm long; corolla tube *c.* 1 cm long, lower lip *c.* 1.5 cm, concave, villous, red; stamens 4, didynamous; ovary *c.* 1 mm long; style *c.* 2 cm long.

Fl. & Fr.: October–January.

Habitat: Degraded Forests.

Distribution: India: Throughout. KWLS: Panchalingehwar Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 36414 (CAL).

9. *Leucas* R. Br.

Key to the species

- | | |
|--------------------|---|
| 1a. Prostrate herb | 2 |
| 1b. Erect herb | 3 |

- | | |
|---|-------------------------|
| 2a. Verticils axillary | 1. L. angularis |
| 2b. Verticils terminal | 4 |
| 3a. Plant upto 70cm tall, corolla tube 2.5 cm | 4. L. cephalotes |
| 3b. Plant upto 40cm tall, corolla tube 0.6 cm | 2. L. aspera |
| 4a. Calyx tube finely strigose | 3. L. biflora |
| 4b. Calyx tube ciliate | 5. L. ciliata |

1. Leucas angularis Benth. in Wall., Pl. Asiat. Rar. 1: 62. 1830; Hook.f., Fl. Brit. India 4: 684. 1885; Gamble, Fl. Madras: 1151. 1924; V. Singh, Monogr. Ind. Leucas: 38, f. 2. 2001.

Prostrate herb. Leaves ovate, *c.* 3.5 × 1.5 cm, rounded or truncate at base, serrate at margins, pubescent. Verticils axillary, 4–6-flowered; calyx tube *c.* 8 mm long, 10-toothed, to 2 mm long, ciliate at margins; corolla tube *c.* 9 mm long; stamens 4, didynamous; filaments *c.* 5 and *c.* 7 mm long, pubescent; ovary *c.* 1 mm long; style *c.* 1.2 mm long.

Fl. & Fr.: July–January.

Habitat: Degraded Forests.

Distribution: India: Kerala, Tamil Nadu. KWLS: Koimutiya, Nandugutta Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34332, 35666 (CAL).

2. Leucas aspera (Willd.) Link, Enum. Hort. Berol. Alt. 2: 113. 1822; Hook.f., Fl. Brit. India 4: 690. 1885; Haines, Bot. Bihar Orissa 2: 751. 1924; Gamble, Fl. Madras: 1150. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1455. 1995; V. Singh, Monogr. Ind. Leucas: 43, f. 4. 2001. *Phlomis aspera* Willd., Enum. Pl.: 621. 1809.

Local Names: *Durab, Gaiso.*

Herb, to 40 cm high. Leaves linear-lanceolate, 3–8 × 1–2 cm, serrate, acute, puberulous. Verticils terminal and axillary; calyx *c.* 6 mm long, tubular; mouth oblique, 10-ribbed, 10-toothed, upper half strigose outside; corolla tube *c.* 6 mm long, white, 2-lipped; upper lip *c.* 3 mm long, villous outside; lower lip 7–8 mm long; stamens 4; style *c.* 8 mm long.

Fl. & Fr.: July–January.

Habitat: Degraded Forests and Roadsides.

Distribution: India: Throughout. KWLS: Parchondi Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 35940 (CAL).

3. Leucas biflora (Vahl) R. Br., Prodr.: 504. 1810; Hook.f., Fl. Brit. India 4: 683. 1885; Gamble, Fl. Madras: 1150; H.O. Saxena & Brahmam, Fl. Orissa 3: 1456. 1995. *Phlomis biflora* Vahl, Symb. Bot. 3: 77. 1794.

Diffuse or scandent herb. Leaves broadly ovate, to 3.5×2 cm, obtuse at base, crenate, acute, membranous. Flowers solitary; calyx tubular, *c.* 7 mm long, finely strigose; corolla *c.* 1.4 cm long, annulate-villous inside at middle, white. Nutlets oblong, truncate.

Fl. & Fr.: July–January.

Habitat: Degraded Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Nuarasta Chowk, Panchalingeshwar Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 33755, 35794 (CAL).

4. *Leucas cephalotes* (Roth) Spreng., Syst. Veg. 2: 743. 1825; Hook.f., Fl. Brit. India 4: 689. 1885; Gamble, Fl. Madras: 1150. 1924; H.O. Saxena & Brahmam, Fl. Orissa 2: 1457. 1995.

Local Name: *Goyoso*.

Herb, to 70 cm high. Leaves lanceolate-oblong or elliptic-oblong, $3.7\text{--}10 \times 1\text{--}3.7$ cm, remotely serrate or crenate-serrate at margins, acute at apex, shortly densely pubescent and punctate beneath. Flowers in whorls, dense, globose, 2.5–5 cm, terminal or subterminal, being usually surmounted by a pair of leaves; calyx tubular, 1.5–1.8 cm long, mouth oblique, 10 ribbed, 10-toothed; teeth subaristate, 1–1.5 mm long, hispidulous; corolla *c.* 2.5 cm long, white. Nutlets *c.* 3 mm long, smooth, brown.

Fl. & Fr.: August–December.

Habitat: Waste lands.

Distribution: India: Assam, Bihar, Gujarat, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Panchalingeshwar; common.

Specimen examined: R. Saravanan & K.A. Sujana 35327 (CAL).

5. *Leucas ciliata* Benth. ex Wall., Pl. Asiat. Rar. 1: 61. 1830; Hook.f., Fl. Brit. India 4: 687. 1885; Gamble, Fl. Madras: 1153. 1924; V. Singh, Monogr. Ind. Leucas: 61, f. 8. 2001.

Herb, subscaudent, hispid. Leaves ovate, *c.* 8×3 cm, acute, densely hispid. Flowers 30–40, in terminal globose verticils, *c.* 3 cm; calyx tube *c.* 12 mm long; teeth *c.* 5 mm long, ciliate; corolla white, tube *c.* 10 mm long, 2-lipped; upper lip 2, obovate, concave, hairy, brown; lower lip 3-lobed, *c.* 10×8 mm; midlobe orbicular. Nutlets, *c.* 3×1.5 mm, 3-angled, brown.

Fl. & Fr.: August–January.

Habitat: Degraded forests and way sides.

Distribution: India: Almost throughout. KWLS: Ashun Chua; common.

Specimen examined: R. Saravanan & K.A. Sujana 33686 (CAL).

10. *Ocimum* L.

***Ocimum tenuiflorum* L.**, Sp. Pl.: 597. 1753. *O. sanctum* L., Mant. Pl.: 85. 1767; H.O. Saxena & Brahmam, Fl. Orissa 3: 1470. 1995.

Local Name: *Tulsi*.

Undershrub. Leaves elliptic-oblongate, 1.3–3 × 0.6–2 cm, obtuse at ends, coarsely serrate at margins, puberulous. Flowers in racemes, to 11 cm long; calyx campanulate, c. 3 mm long, purplish, 5-lobed; corolla to 4 mm long, tubular-campanulate, reddish pink; stamens 4; filaments villous at the base of upper pair. Nutlets ellipsoid, c. 1.5 mm long, dark brown.

Fl. & Fr.: December–January.

Habitat: Planted.

Distribution: India: Throughout. KWLS: Kaimagudi; common.

Specimen examined: R. Saravanan & K.A. Sujana 33528 (CAL).

11. *Orthosiphon* Benth.

Key to the species

- | | |
|------------------------------------|---------------------------------|
| 1a. Nutlets suborbicular, punctate | 1. <i>O. rubicundus</i> |
| 1b. Nutlets orbicular, pitted | 2. <i>O. thymiflorus</i> |

1. *Orthosiphon rubicundus* (D. Don) Benth. in Wall., Pl. Asiat. Rar. 2: 14. 1830; Hook.f., Fl. Brit. India 4: 614. 1885; Haines, Bot. Bihar Orissa 2: 730. 1924; Gamble, Fl. Madras: 1114. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1472. 1995.

Local Name: *Chandua*.

Herb. Leaves sessile, ovate or ovate-lanceolate, crenate-serrate at margins. Flowers in verticillasters, combined into an interrupted, raceme-like inflorescence; calyx hairy; lower lip with 4 subulate teeth; corolla white or pink. Nutlets suborbicular, punctate.

Fl. & Fr.: April–June.

Habitat: Open Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Karnataka, Kerala, Maharashtra, Uttarakhand, Uttar Pradesh. KWLS: Champo; common.

Specimen examined: R. Saravanan & K.A. Sujana 36559 (CAL).

2. *Orthosiphon thymiflorus* (Roth) Sleesen, Reinwardtia 5: 42. 1959; H.O. Saxena & Brahmam, Fl. Orissa 3: 1473. 1995. *Ocimum thymiflorum* Roth, Nov. Pl. Sp.: 269. 1821.

Local Name: *Bhutiari*.

Herb. Leaves ovate, *c.* 5 × 3 cm, rounded or cordate at base, acute at apex, thin-tomentose beneath. Flowers 5 or 6 in a whorl, forming terminal racemes, 15–20 cm long; calyx 6–7 mm long, 2-lipped; lobes subulate, hairy; corolla tube cylindric, *c.* 9 mm long, *c.* 1.2 cm long, 2-lipped; stamens 4. Nutlets 2–4, orbicular, pitted.

Fl. & Fr.: August–December.

Habitat: Open Forests.

Distribution: India: Andhra Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Panchalingeshwar; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35809 (CAL).

12. *Pogostemon* Desf.

Key to the species

- | | |
|---|----------------------------------|
| 1a. Leaves opposite, petioled; nutlets broadly ellipsoid | 1. <i>P. benghalensis</i> |
| 1b. Leaves 4 in a whorl, sessile or subsessile; nutlets ovoid | 2. <i>P. stellatus</i> |

1. *Pogostemon benghalensis* (Burm.f.) Kuntze, Revis. Gen. Pl. 2: 517. 1891; H.O. Saxena & Brahmam, Fl. Orissa 3: 1481. 1995.

Local Names: *Gonda Dulia*, *Puka Sunga*.

Shrub, to 1.5 m high. Leaves ovate to ovate-lanceolate, *c.* 11 × 5 cm, irregularly serrate-dentate at margins, acute at apex, chartaceous. Flowers many, densely packed in terminal spikes, to 15 cm long; calyx *c.* 4 mm long, 5-lobed; corolla 4-lobed, villous, pale pink; stamens 4; filaments bearded with moniliform hairs. Nutlets ellipsoid, smooth, brown.

Fl. & Fr.: January–April.

Habitat: Open forests.

Distribution: India: Andaman Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Goa, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Ampada, Nuarasta Chowk; common.

Note: Endemic to India.

Specimens examined: R. Saravanan & K.A. Sujana 33682, 34560 (CAL).

2. *Pogostemon stellatus* var. *roxburghianus* (H. Keng) H. Keng in Steenis, Fl. Males. 8: 352. 1978. *Dysophylla stellata* var. *roxburghiana* H. Keng, Gard. Bull. Singapore 24: 72. 1969. *Mentha stellata* Lour., Fl. Conchinch. 2: 361. 1790. *Eusteralis stellata* (Lour.) Panigrahi, Phytologia 32(6): 474. 1976; H.O. Saxena & Brahmam, Fl. Orissa 2: 1446. 1995.

Herb or undershrub, to 1 m high. Leaves 4 in a whorl or the lower opposite, narrowly lanceolate or linear-oblong, 2–10 × 0.4–2 cm, serrate at margins, acute to subacute at apex, tomentose. Flowers in spikes, dense, 7.5–15 cm long, sometimes subpanicled; calyx campanulate, 5-toothed; corolla *c.* 3 mm long, pinkish. Nutlets ovoid, small.

Fl. & Fr.: November–April.

Habitat: Open forests.

Distribution: India: Assam, Meghalaya. KWLS: Guajhari Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34584 (CAL).

13. *Premna* L.

Key to the species

- | | |
|-------------------|--------------------------------|
| 1a. Tree | 1. <i>P. coriacea</i> |
| 1b. Climbers | 2 |
| 2a. Calyx tubular | 3. <i>P. tomentosa</i> |
| 2b. Calyx cupular | 2. <i>P. mollissima</i> |

1. *Premna coriacea* C.B. Clarke in Hook.f., Fl. Brit. India 4: 573. 1885, var. **coriacea**; Haines, Bot. Bihar Orissa 2: 714. 1922; Gamble, Fl. Madras: 1095. 1923; H.O. Saxena & Brahmam, Fl. Orissa 3: 1418. 1995; A. Rajendran & P. Daniel, Indian Verbenac.: 226. 2002.

Large climbing shrub. Leaves ovate-oblong, to 18 × 10 cm, cordate at base, abruptly acuminate at apex. Flowers in terminal corymbose cymes, pilose; calyx truncate, *c.* 1 mm long, puberulous, pinkish brown; corolla *c.* 3.5 mm long, hairy, creamy white. Drupes obovoid, *c.* 3 × 1 mm, black; fruiting calyx saucer-shaped, obscurely lobed.

Fl. & Fr.: April–May.

Habitat: Mixed Forests.

Distribution: India: Andaman and Nicobar Islands, Goa, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu. KWLS: Jodachua Ghatti, Kenduna; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34817, 35641, 36552 (CAL).

2. *Premna mollissima* Roth, Nov. Pl. Sp.: 286. 1821; Gamble, Fl. Madras: 1096. 1924. *P. latifolia* var. *mollissima* (Roth) C.B. Clarke in Hook.f., Fl. Brit. India 4: 578. 1885; A. Rajendran & P. Daniel, Indian Verbenac.: 254. 2002.

Local Names: *Dankaroni*, *Gandhana*.

Tree, to 8 m high. Leaves ovate or elliptic ovate, 4–10 × 2–5 cm, truncate or cordate at base, entire or serrate at margins, acuminate at apex, membranous, puberulent above. Flowers in terminal corymbose cymes, to 7 cm long, greenish white; calyx cupular, *c.* 1.5 mm

long, obscurely 2-lipped; corolla tube *c.* 2 mm long, densely villous inside; lobes ovate, obtuse at apex; stamens 4, didynamous. Drupes globose, *c.* 4 mm, black.

Fl. & Fr.: April–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Guajhari Chowk, Panchalingeshwar Pahad; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33931, 35725 (CAL).

3. *Premna tomentosa* Willd., Sp. Pl. 3: 314. 1800; Haines, Bot. Bihar Orissa 2: 718. 1922; Gamble, Fl. Madras: 1095. 1923; H.O. Saxena & Brahmam, Fl. Orissa 3: 1422. 1995; A. Rajendran & P. Daniel, Indian Verbenac.: 289. 2002.

Tree, to 15 m high. Leaves broadly ovate, 6–25 × 5–15 cm, acuminate at apex, obtuse or cordate at base, chartaceous, densely tawny yellow stellate-tomentose. Flowers in terminal and axillary corymbs, *c.* 7 cm long, yellow; calyx tubular, stellate-pubescent, 5-lobed, 5-ribbed; corolla *c.* 7.5 mm long, 5-lobed; stamens 4, didynamous. Drupes ovoid, 5–6 × 3–4 mm, hairy, black; seeds 4.

Fl. & Fr.: April–July.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Tamil Nadu. KWLS: Bhaibhoni Ghatti; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34447 (CAL).

14. *Vitex* L.

Key to the species

- | | |
|--|----------------------------------|
| 1a. Petioles winged | 2 |
| 1b. Petioles not winged | 4 |
| 2a. Petioles broadly winged, wings articulate at base | 1. <i>V. altissima</i> |
| 2b. Petioles narrowly winged, wings not articulate at base | 3 |
| 3a. Inflorescence axillary, lax panicles, bracts subulate | 3. <i>V. peduncularis</i> |
| 3b. Inflorescence terminal, dense panicle, bract subfoliaceous | 4. <i>V. pinnata</i> |
| 4a. Drupe ellipsoid 1.7 cm in diameter | 2. <i>V. leucoxydon</i> |
| 4b. Drupe globose 0.6 cm in diameter | 5. <i>V. trifolia</i> |

1. *Vitex altissima* L.f., Suppl. Pl.: 294. 1781; C.B. Clarke in Hook.f., Fl. Brit. India 4: 584. 1885; Gamble, Fl. Madras: 1102. 1924; A. Rajendran & P. Daniel, Indian Verbenac.: 344. 2002.

Local Name: *Begunia*.

Tree, to 30 m high. Leaves 3-foliolate, occasionally 5-foliolate; leaflets 3–5, lanceolate, elliptic-lanceolate, or oblanceolate, 6–18 × 2–5 cm, acuminate at apex, chartaceous, pubescent or glabrescent on veins beneath; rachis 3.5–6 cm long, pubescent, winged. Flowers in terminal panicles, white tinged with blue; stamens 4, didynamous, exserted. Drupes globose, *c.* 5 mm, blue, supported by enlarged calyx; seeds 4, obovate.

Fl. & Fr.: March–July.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Ampada, Bonun Chowk; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34835, 35732 (CAL).

2. *Vitex leucoxylo* L.f., Suppl. Pl.: 293. 1781; C.B. Clarke in Hook.f., Fl. Brit. India 3: 587. 1885; Gamble, Fl. Madras: 1103. 1923; H.O. Saxena & Brahmam, Fl. Orissa 3: 1429. 1995; A. Rajendran & P. Daniel, Indian Verbenac.: 356. 2002.

Local Name: *Panijamu*.

Deciduous tree, to 20 m high. Leaves 3–5-foliolate; leaflets whorled, elliptic, elliptic-oblong or lanceolate, 2.5–16 × 1.5–4 cm, acute or obtusely acuminate at apex, coriaceous, puberulent beneath. Flowers in axillary corymbose cymes, to 17 cm long, white, purplish pubescent; stamens 4. Drupes ellipsoid, 1.2–2 cm long, fleshy, purple-black.

Fl. & Fr.: March–February.

Habitat: Along river banks.

Distribution: India: Andaman and Nicobar Island, Andhra Pradesh, Bihar, Goa, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Panchalingeswar Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35772 (CAL).

3. *Vitex peduncularis* Wall. ex Schauer in DC., Prodr. 11: 687.1847; C.B. Clarke in Hook.f., Fl. Brit. India 4: 587. 1885; Haines, Bot. Bihar Orissa 2: 712. 1922; Gamble, Fl. Madras: 1103. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1430. 1995; A. Rajendran & P. Daniel, Indian Verbenac.: 367. 2002.

Local Name: *Bhadu*.

Tree, 7–18 m high. Leaves usually 3, rarely 4-foliolate; leaflets lanceolate, oblong-lanceolate or narrow-elliptic, acuminate at apex, chartaceous; middle leaflets 10–20 × 3–5 cm; lateral leaflets 8.5–15 × 3–4 cm, with dense minute rounded yellow resinous glands beneath. Flowers in axillary panicles, 20–28 cm long, yellow or cream-coloured; stamens 4, didynamous. Drupes globose, *c.* 7 mm, red; fruiting calyx platelliform, membranous.

Fl. & Fr.: March–September.

Habitat: Moist Deciduous Forests near streams.

Distribution: India: Andhra Pradesh, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. KWLS: Koimutiaya, Nandugutta Rasta, Pahadi Rasta, Salt Peat Jodachua; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33688, 34561, 34893, 35697 (CAL).

4. *Vitex pinnata* L., Sp. Pl.: 638. 1753; H.O. Saxena & Brahmam, Fl. Orissa 3: 1431. 1995; A. Rajendran & P. Daniel, Indian Verbenac.: 370. 2002.

Local Name: *Mudia*.

Tree, to 15 m high. Leaves 3–5-foliolate; leaflets elliptic, lanceolate or oblanceolate, 7–16 × 1.8–4.9 cm, entire or coarsely serrate at margins, acuminate at apex, chartaceous, yellow gland-dotted beneath; rachis 3.5–7 cm, slender, winged. Flowers in lax axillary panicles of dichasia, to 25 cm long, pubescent outside, cream-coloured with yellow throat; stamens 4, didynamous, exserted. Drupes obovoid, c. 1.3 cm long, supported by enlarged calyx; seeds 4.

Fl. & Fr.: August–February.

Habitat: Banks of streams in Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Meghalaya, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. KWLS: Panchalingeshwar Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35684 (CAL).

5. *Vitex trifolia* L., Sp. Pl.: 638. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 4: 583. 1885; Haines, Bot. Bihar Orissa 2: 712. 1922; Gamble, Fl. Madras: 1102. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1432. 1995; A. Rajendran & P. Daniel, Indian Verbenac.: 377. 2002.

Local Name: *Panisamalu*.

Shrub, 3–6 m high. Leaves 1–3-foliolate; leaflets ovate-oblong or obovate, 2.5–6.5 × 1–3.5 cm, acuminate at apex, chartaceous, dark green-pubescent with resinous glands above, white-or grey-tomentose beneath. Flowers in terminal and supra-axillary panicles, 5–26 cm long, fragrant, densely villous at throat, glandular outside, violet, purple or blue; stamens 4. Drupes globose, 5–6 mm, black; fruiting calyx cupular, c. 1 cm across, membranous, pubescent.

Fl. & Fr.: May–July.

Habitat: Banks of streams in moist deciduous forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Assam, Goa, Karnataka, Kerala, Maharashtra, Manipur, Tamil Nadu, West Bengal. KWLS: Pancharjuna Rasta, Parchondi; common.

Specimens examined: R. Saravanan & K.A. Sujana 34454, 35779 (CAL).

PLANTAGINACEAE

Key to the genera

- | | |
|--------------------------------------|----------------------|
| 1a. Terrestrial herb | 2. Scoparia |
| 1b. Aquatic or amphibious herb | 2 |
| 2a. Capsule ovoid or oblong | 3. Stemodia |
| 2b. Capsule ellipsoid or sub-globose | 1. Linnophila |

1. *Linnophila* R. Br.

Linnophila indica (L.) Druce, Rev. Bot. Soc. Exch. Club. Br. Isles, 3: 420. 1914; H.O. Saxena & Brahmam, Fl. Orissa 2: 1238. 1995.

Local Name: *Odishata*.

Annual. Leaves dimorphic, sessile; submerged leaves deeply dissected with flattened or capillary lobes; upper leaves decussate to whorled, dissected, linear-lanceolate, 5–15 × 4–6 mm, serrulate at margins, acute at apex, basally 3-veined. Flower solitary, axillary; corolla 8–10 mm long, tube white, mouth yellow with purple shades; stamens 4. Capsules ellipsoid or subglobose *c.* 3 mm across; seeds numerous, angular, black.

Fl. & Fr.: September-February.

Habitat: Wetlands or marshy areas.

Distribution: India: Throughout. KWLS: Balianal; common.

Specimen examined: R. Saravanan & K.A. Sujana 36447 (CAL).

2. *Scoparia* L.

Scoparia dulcis L., Sp. Pl.: 116. 1753; Hook.f., Fl. Brit. India 4: 289. 1884; Gamble, Fl. Madras: 964. 1924; Haines, Bot. Bihar Orissa 2: 637. 1922; H.O. Saxena & Brahmam, Fl. Orissa 2: 1262. 1995.

Local Names: *Chirarita*, *Khelopapada*.

Erect annual or perennial herb. Leaves decussate to whorled, obovate-oblong, 1–3 × 0.5–1.5 cm, crenate-serrate at margins, acute at apex. Flowers 1 or 2, axillary; corolla 4–6 mm long; throat densely hairy, white; stamens 4. Capsules globose, 1–2 mm; seeds 4-angled, reticulate.

Fl. & Fr.: Throughout the year.

Habitat: Degraded forests way sides.

Distribution: India: Almost throughout. KWLS: Bulagadia; common.

Specimen examined: R. Saravanan & K.A. Sujana 35629 (CAL).

3. *Stemodia* L.

Stemodia viscosa Roxb., Pl. Coromandel: t. 163. 1802; Hook.f., Fl. Brit. India 4: 265. 1844; Gamble, Fl. Madras: 949. 1921.

Local Name: *Nukachuni*.

Herb, glandular-hairy. Leaves decussate or ternate, elliptic-oblong, *c.* 3 × 1 cm, auriculate at base, serrate at margins, acute at apex, pubescent. Flowers in axillary or terminal raceme; corolla tube *c.* 1 cm long, blue to violet, 5-lobed; stamens 4. Capsules oblong, *c.* 7 mm long, septicidal and loculicidal, 2-valved; seeds oblong.

Fl. & Fr.: December–March.

Habitat: Marshy areas.

Distribution: India: Andhra Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Madhya Pradesh, Maharashtra, Meghalaya, Rajasthan, Uttar Pradesh, West Bengal. KWLS: Jodachua Ghatti; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34473 (CAL).

NYCTAGINACEAE

Boerhavia L.

Boerhavia diffusa L., Sp. Pl.: 3. 1753; Gamble, Fl. Madras 1162. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1492. 1995.

Local Names: *Kechna, Kharkharia, Parni*.

Herb with long trailing branches; stems tomentose, reddish. Leaves unequal, ovate, obtuse at apex, undulate at margins, truncate to subcordate at base, tomentose. Flowers 4–10 in umbels, in axillary or terminal panicles, *c.* 4 mm long, purple. Stamens 3. Anthocarps club-shaped, *c.* 2.5 mm long, glandular, green.

Fl. & Fr.: Almost throughout the year.

Habitat: Open localities, roadsides.

Distribution: India: Throughout. KWLS: Kuldiha FRH, Nilgiri Rasta; fairly common weed.

Specimen examined: R. Saravanan & K.A. Sujana 33543 (CAL).

AMARANTHACEAE

Key to the genera

- 1a. Fertile flowers subtended by modified sterile flowers bearing strongly accrescent hooked or glochidiate spines, forming a burr in fruit **3. Cyathula**
- 1b. Fertile flowers not subtended by such modified sterile flowers **2**
- 2a. Flowers in dense, sessile axillary heads **2. Alternanthera**
- 2b. Flowers in elongated, pedunculate spikes **1. Achyranthes**

1. Achyranthes L.

Achyranthes aspera L., Sp. Pl.: 204. 1753, Hook.f., Fl. Brit. India 4: 730. 1885; Haines, Bot. Bihar Orissa 2: 767. 1924; Gamble, Fl. Madras: 1176. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1498. 1995.

Local Names: *Apamaranga, Chir Chiri.*

Herb, to 60 cm high. Leaves broadly elliptic to obovate, 6–10 × 3–6 cm, abruptly acuminate at apex, tomentose. Spikes to 20 cm long, hispid; bracts lanceolate, *c.* 6 mm long, aristate; bracteoles aristate. Flowers deflexed; tepals elliptic, *c.* 7.5 × 2 mm, acute, equal; ovary truncate at apex. Achenes, ovoid, *c.* 3 mm long, brown.

Fl. & Fr.: October–February.

Habitat: Roadsides.

Distribution: India: Throughout. KWLS: Ampada, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33607, 34406, 34506 (CAL).

2. Alternanthera Forssk.

Alternanthera sessilis (L.) R. Br. ex. DC., Cat. Hort. 4: 77. 1813; Hook.f., Fl. Brit. India 4: 731. 1885; Haines, Bot. Bihar Orissa 2: 768. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1506. 1995.

Local Names: *Kolamsago, Madaranga Saga.*

Decumbent herb. Leaves elliptic-oblong to oblanceolate, 3–4 × *c.* 1 cm, attenuate into a petiole, crenate at margins, obtuse at apex. Spikes 7–12 × *c.* 5 mm, solitary or 2–3 together; bracts and bracteoles similar, broadly ovate, *c.* 1 mm long, acute. Flowers yellowish red; tepals equal, ovate, *c.* 2.5 × 1.5 mm, acute, 3-veined; stamens 3. Achenes obovoid, *c.* 2 × 2 mm; seed orbicular, brown.

Fl. & Fr.: July–January.

Habitat: Marshy localities.

Distribution: India: Throughout. KWLS: Nilgiri Rasta, Nuasai; common.

Specimens examined: R. Saravanan & K.A. Sujana 34846, 36408 (CAL).

3. *Cyathula* Lour.

Cyathula prostrata (L.) Blume, Bijdr.: 549. 1826; Hook.f., Fl. Brit. India 4: 722. 1885; Gamble, Fl. Madras: 1172. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1515. 1995.

Decumbent herb. Leaves rhomboid, 5–7 × 2–3.5 cm, acute at ends, thin-pubescent. Spikes terminal, to 18 cm long. Flowers in a group of 3–5, one perfect and others neuter; bracts and bracteoles similar, lanceolate, c. 1.5 mm long, acuminate, pubescent; tepals 5, elliptic, c. 3 × 1 mm, acute, hooked awn-like in neuters; stamens 5; staminodes membranous, alternating stamens, fimbriate. Achenes, obovoid, c. 2 × 1 mm, compressed, golden brown.

Fl. & Fr.: October–February.

Habitat: Shade localities in mixed forest.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti.; common.

Specimen examined: R. Saravanan & K.A. Sujana 34598 (CAL).

POLYGONACEAE

Persicaria Mill.

Persicaria hydropiper (L.) Delarbre, Fl. Auvergne ed. 2: 518. 1800; H. Hara in H. Hara & al., Enum. Fl. Pl. Nepal 3: 176. 1982; S.K. Dixit & al., J. Econ. Taxon. Bot. 15: 314. 1991. *Polygonum hydropiper* L., Sp. Pl.: 361. 1753; Hook.f., Fl. Brit. India 5: 39. 1886; Gamble, Fl. Madras: 1189. 1925.

Herb, somewhat ascending. Leaves linear-lanceolate, 3–7 × 1–2.2 cm, attenuate at base, acuminate at apex, gland-dotted; ocrea tubular, to 1.5 cm long, glabrous, mouth with a few slender bristles. Racemes to 7 cm long, slender, lax, drooping; perianth white with pink shades, gland-dotted, 5-lobed; lobes ovate-obtuse, c. 2 mm long. Stamens 5. Nuts biconvex.

Fl. & Fr.: April–February.

Habitat: Wet and marshy areas.

Distribution: India: Throughout. KWLS: Balia Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 35853 (CAL).

ARISTOLOCHIACEAE

Aristolochia L.

Aristolochia indica L., Sp. Pl.: 960. 1753; Hook.f., Fl. Brit. India 5: 75. 1886; Haines, Bot. Bihar Orissa 2: 785. 1924; Gamble, Fl. Madras: 1202. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1550. 1995.

Local Names: *Gopa kanna*, *Iswarmula*, *Panairi*.

Twining, perennial herb. Leaves ovate-lanceolate or ovate-oblong, 3.5–8 × 2–3.5 cm, truncate at base, acute to acuminate at apex, 3–5-veined at base. Racemes axillary, few-flowered. Perianth tube 1–1.5 cm long, dull brown, bulbous base 3–5 mm across, green; limb linear-oblong, 2–2.5 cm long, greyish green. Stamens 6. Capsules globose-pyriform, 1.5–3 × 1.5–2 cm, 6-ridged, dehiscent from base, after dehiscence parachute-like; seeds broadly deltoid, 4–6 mm across, flat, winged.

Fl. & Fr.: July–February.

Habitat: Open forests.

Distribution: India: Almost throughout. KWLS: Jodachua Ghatti, Kuldiha Pahad, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33786, 34509, 35812, 36546 (CAL).

PIPERACEAE

Piper L.

Piper longum L., Sp. Pl.: 29. 1753; Hook.f., Fl. Brit. India 5: 83. 1886; Haines, Bot. Bihar Orissa 3: 787. 1924; Gamble, Fl. Madras: 1205. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1554. 1995.

Local Name: *Pipli*.

Scandent or straggling shrub, sometimes ascending and climbing. Leaves alternate, ovate, *c.* 8 × 4 cm, cordate and strongly oblique at base, acute at apex, membranous. Female spikes stout, erect; peduncles *c.* 1.5 cm long; bracts peltate, orbicular. Male spikes to 7 cm long, erect, slender; stamens 2. Berries globose, *c.* 2 mm, glabrous, black or deep red.

Fl. & Fr.: July–January.

Habitat: Undergrowth in semi-evergreen forests.

Distribution: India: Throughout, also on cultivation. KWLS: Kuldiha Pahad; common.

Specimen examined: R. Saravanan & K.A. Sujana 34401 (CAL).

LAURACEAE

Key to the genera

- | | |
|--|------------------------|
| 1a. Leafless, filiform twining parasites | 2. Cassytha |
| 1b. Leafy trees or shrubs | 2 |
| 2a. Flowers unisexual | 3 |
| 2b. Flowers bisexual | 4 |
| 3a. Leaves usually subverticillate; involucre bracts deciduous | 1. Actinodaphne |
| 3b. Leaves alternate or opposite; involucre bracts persistent | 3. Litsea |

- 4a. Fruiting perianth lobes reflexed, not indurate **4. Persea**
4b. Fruiting perianth lobes erect, indurate and clasping the base of fruit **5. Phoebe**

1. *Actinodaphne* Nees

Actinodaphne hookeri Meisn. in DC., Prodr. 15(1): 218. 1864. *A. angustifolia* (Blume) Nees in Wall., Pl. Asiat. Rar. 3: 31. 1832; Hook.f., Fl. Brit. India 5: 512. 1886; Haines, Bot. Bihar Orissa 2: 792. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1559. 1994.

Local Names: *Sabalia*, *Tengeda*.

Tree, to 10 m high, dioecious. Leaves narrowly elliptic to oblanceolate, 12–27 × 4–6.5 cm, acuminate at apex, fulvous-tomentose when young. Flowers unisexual; female flowers in umbels on short peduncle. Berries globose, to 1 cm; seed 1.

Fl. & Fr.: August–May.

Habitat: Valleys.

Distribution: India: Andhra Pradesh, Madhya Pradesh, Maharashtra, Tamil Nadu. KWLS: Koimutiya; rare.

Specimen examined: R. Saravanan & K.A. Sujana 36514 (CAL).

2. *Cassytha* Osbeck

Cassytha filiformis L., Sp. Pl.: 35. 1753; Hook.f., Fl. Brit. India 5: 188. 1886; Haines, Bot. Bihar Orissa 3: 798. 1924; Gamble, Fl. Madras: 1241. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1561. 1995.

Local Names: *Akasbel*, *Nirmuli*.

Leafless twiner. Spikes terminal or axillary. Flowers 3-merous, subsessile, *c.* 3 mm across; tepals 6, biseriate, ovate-orbicular, *c.* 1.2 mm long, white; stamens 9; filaments *c.* 1.5 mm long, glandular; staminodes 3, *c.* 1mm. Drupes globose, enclosed within perianth; seed 1.

Fl. & Fr.: October–February.

Habitat: Scrub forests.

Distribution: India: Throughout. KWLS: Guajhari Pahad, Jodachua Ghtati; fairly common

Specimens examined: R. Saravanan & K.A. Sujana 33517, 33929, 35920 (CAL).

3. *Litsea* Lam.

Key to the species

- 1a. Perianth very incomplete or 0 **1. *L. glutinosa***
1b. Perianth complete, with 4–6 subequal lobes **2. *L. monopetala***

1. *Litsea glutinosa* (Lour.) C.B. Rob., Philipp. J. Sci., C 6: 321. 1911; H.O. Saxena & Brahmam, Fl. Orissa 3: 1565. 1995. *Sebifera glutinosa* Lour., Fl. Cochinch. 2: 638. 1790.

Local Names: *Ledha Chhali*.

Tree, to 10 m high, dioecious. Leaves elliptic-oblong or obovate, 6–23.5 × 3–10 cm, acute at apex, grey-pubescent beneath. Flowers in umbels, 5–6 mm across, yellow; perianth funnel-shaped; stamens 9–12, in 4 rows; filaments *c.* 2 mm long, hairy, fourth series glandular; staminodes 9–12. Berries depressed-globose, 5–6 mm, purple.

Fl. & Fr.: June–November.

Habitat: Moist Deciduous and Semi-evergreen Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Ampada, Kuldiha Pahad, Nua Rasta, Parchondi; common.

Specimens examined: R. Saravanan & K.A. Sujana 34570, 35651, 35693, 36500 (CAL).

2. *Litsea monopetala* (Roxb.) Pers., Syn. Pl. 2(1): 4. 1806. *Tetranthera monopetala* Roxb., Pl. Coromande 2(2): 26. 1800; H.O. Saxena & Brahmam, Fl. Orissa 3: 1566. 1995.

Local Name: *Burlo*.

Tree. Leaves elliptic to oblanceolate-oblong or orbicular-oval, 5–22.5 × 3–10 cm, obtuse or subacute at apex, glaucous or tomentose beneath. Flowers *c.* 5 in axillary umbels, tomentose; perianth lobes 5, linear-oblong; stamens 9–13; filaments hairy, reduced to 2-glandular staminodes in female flowers. Fruits ellipsoid or ovoid, 6–10 mm long, seated on saucer-shaped perianth tube.

Fl. & Fr.: March–August.

Habitat: Valleys.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Karnataka, Tripura, Uttarakhand, West Bengal. KWLS: Gudisai; common.

Specimen examined: R. Saravanan & K.A. Sujana 36519 (CAL).

4. *Persea* Mill.

Persea macrantha (Nees) Kosterm., Reinwardtia 6: 193. 1962; H.O. Saxena & Brahmam, Fl. Orissa 3: 1570. 1995. *Machilus macrantha* Nees in Wall., Pl. Asiat. Rar. 2: 70. 1831.

Evergreen tree, to 30 m high. Leaves elliptic-oblong or ovate-oblong, 6.5–20 × 3.7–10 cm, obtuse or acute at apex, glaucous beneath. Flowers in axillary panicles, 10–12 mm across, pale yellow; tepals 6, obovate, 4–5 mm long, puberulous; stamens 9 perfect, 3-seriate;

filaments of third row glandular; staminodes 3. Berries globose, 1.5–1.8 cm, green, white-speckled; seed 1, globose.

Fl. & Fr.: April–May.

Habitat: Moist Deciduous and Semi-evergreen Forests.

Distribution: India: Andhra Pradesh, Goa, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu. KWLS: Bonun Chowk; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33854 (CAL).

5. *Phoebe* Nees.

Phoebe lanceolata (Nees) Nees, Syst. Laur.: 109. 1836; Hook.f., Fl. Brit. India 5: 141. 1886; Gamble, Fl. Madras: 1228. 1925; Haines, Bot. Bihar Orissa 3: 796. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1572. 1995. *Ocotea lanceolata* Nees in Wall., Pl. Asiat. Rar. 2(8): 71. 1831.

Local Name: *Haulia*.

Evergreen tree, to 12 m high. Leaves elliptic-obovate or elliptic-oblongate, 8–25 × 2.5–6.5 cm, long-acuminate at apex. Flowers in axillary, slender panicles, 2–5 mm across, yellowish green; perianth lobes 6, ovate, tomentose; stamens 9 perfect, 3-seriate, filaments of third row with 2 large stipitate glands at base. Drupes ovoid or ellipsoid, c. 1 cm long, black.

Fl. & Fr.: March–July.

Habitat: Moist Deciduous and Semi-evergreen Forests.

Distribution: India: Assam, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Meghalaya, Sikkim, Tamil Nadu, Uttarakhand. KWLS: Nuasai Gaon; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36524 (CAL).

LORANTHACEAE

Key to the genera

- | | |
|--|------------------------|
| 1a. Flowers 5-merous | 1. Dendrophthoe |
| 1b. Flowers 6-merous | 2 |
| 2a. Peduncle subtended by 1–4 whorls of bracts | 2. Elytranthe |
| 2b. Peduncles not subtended by whorl of bracts | 3. Macrosolen |

1. *Dendrophthoe* Mart.

Dendrophthoe falcata (L.f.) Blume in Schult.f., Syst. Veg. 7: 1730. 1830; H.O. Saxena & Brahmam, Fl. Orissa 3: 1579. 1995; Rajasek. in N.P. Balakr. & al., Fl. India 23: 3. 2012. *Loranthus falcatus* L.f., Suppl. Pl.: 211. 1782. *L. longiflorus* Desr. in Lam., Encycl. 3: 598. 1789; Hook.f., Fl. Brit. India 5: 214. 1886.

Local Name: *Madang*.

Parasitic, woody shrub. Leaves sessile or shortly petioled, alternate and opposite, ovate-oblong to lanceolate, 5–10 × 3–4.5 cm, acute or obtuse at apex, coriaceous. Flowers in axillary or supra-axillary pseudoracemose, 3–5 cm long; calyx 2–3 mm long; corolla tube 2.5–3.5 cm long, curved, pink; lobes linear, *c.* 1 × 0.2 cm, recurved, green. Stamens 5. Berries oblongoid, *c.* 1.5 × 0.3 cm, crimson.

Fl. & Fr.: November–April.

Habitat: Mixed forests.

Distribution: India: Throughout India. KWLS: Kanjipanni; common.

Specimen examined: R. Saravanan & K.A. Sujana 34321 (CAL).

2. *Elytranthe* (Blume) Blume

Elytranthe parasitica (L.) Danser, Bull. Jard. Bot. Buitenzorg, sér. 3, 10: 315. 1929; Rajasek. in N.P. Balakr. & al., Fl. India 23: 9. 2012. *Lonicera parasitica* L., Sp. Pl.: 175. 1753. *Loranthus loniceroides* L., Sp. Pl. ed. 2: 473. 1762; Hook.f., Fl. Brit. India 5: 221. 1886.

Parasitic shrub. Leaves opposite, ovate-lanceolate, acuminate at apex, with obscure veins. Racemes 1–3 in each axil, each 2–4-flowered. Flowers 4–5 cm long, scarlet-red with green lobes; corolla tube terete, splitting into 6 lobes, *c.* 2 cm long, yellow inside; lobes linear-elliptic, reflexed, *c.* 3.5 cm long, pink and green. Stamens 6. Berries ovoid, *c.* 6 × 4 mm, crowned with tubular calyx, green.

Fl. & Fr.: November–April.

Habitat: Mixed forests.

Distribution: India: Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Nuasai Gaon; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35708 (CAL).

3. *Macrosolen* (Blume) Rchb.

Key to the species

- 1a. Anther thecae with 8–10 vertically elongated locelli; fruits smooth **1. *M. capitellatus***
 1b. Anther thecae not as above; fruits rugulose **2. *M. cochinchinensis***

1. *Macrosolen capitellatus* (Wight & Arn.) Danser, Blumea 2: 36. 1936. *Loranthus capitellatus* Wight & Arn., Prodr. Fl. Ind. Orient. 1: 382. 1834; Hook.f., Fl. Brit. India 5: 221. 1886. *Elytranthe capitellata* (Wight & Arn.) Engl. in Engl. & Prantl, Pflanzenfam. 3(1): 189. 1889; Rajasek. in N.P. Balakr. & al., Fl. India 23: 8. 2012.

Parasitic shrub. Leaves opposite, elliptic-lanceolate, 5–8 × 2–3 cm, acute at apex, coriaceous, obscurely 2 or 3-veined. Inflorescence axillary, 2–4-flowered. Flowers 1.5–2 cm long, flesh-coloured inside, dark red outside; calyx tubular, toothed, *c.* 2.5 mm long; corolla funnel-shaped, with 4–7 mm long terete tube, splitting into 6 lobes. Stamens 6. Berries urceolate, *c.* 6 × 5 mm, beaked with persistent calyx tube, smooth, red.

Fl. & Fr.: November–April.

Habitat: Mixed forests.

Distribution: India: Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Jodachua Ghatti; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34442 (CAL).

2. *Macrosolen cochinchinensis* (Lour.) Tiegh., Bull. Soc. Bot. France 41: 122. 1894; H.O. Saxena & Brahmam, Fl. Orissa 3: 1580. 1995; Rajasek. in N.P. Balakr. & al., Fl. India 23: 20. 2012. *Loranthus cochinchinensis* Lour., Fl. Cochinch. 1: 195. 1790. *L. ampullaceus* Roxb., Fl. Ind. 1: 189. 1820; Hook.f., Fl. Brit. India 5: 220. 1886.

Local Name: *Chotta-Madang*.

Parasitic shrub, to 1 m high. Leaves opposite, elliptic-lanceolate to ovate, 5–10 × *c.* 2.5 cm, acute to acuminate at apex, coriaceous. Inflorescences axillary, pseudoracemes, 3–5-flowered, 1.2–4 cm long. Flowers 6-merous, 1.8–2 cm long; calyx truncate with undulate margins, *c.* 0.4 mm long; corolla tube terete, equally splitting into 6 reflexed lobes. Stamens 6. Fruits urceolate, rugulose *c.* 5 mm, yellow.

Fl. & Fr.: January–May.

Habitat: Deciduous forests.

Distribution: India: Andaman and Nicobar Islands, Assam, Bihar, Meghalaya, Sikkim, Tripura, West Bengal. KWLS: Kenduna; common.

Note: Parasitic on the trees of *Mangifera indica* L.

Specimen examined: R. Saravanan & K.A. Sujana 35712 (CAL).

SANTALACEAE

Viscum L.

Key to the species

- 1a. Leafy plants
- 1b. Leafless plants

- 2. ***V. monoicum***
- 1. ***V. articulatum***

1. *Viscum articulatum* Burm.f., Fl. Ind.: 211. 1768; Hook.f., Fl. Brit. India 5: 226. 1886; Haines, Bot. Bihar Orissa 3: 804. 1921; Gamble, Fl. Madras: 1259. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1584. 1995.

Local Name: *Malang*.

Parasitic, leafless herb; branches usually pendulous, sometimes whorled, yellowish green; basal internodes often rounded; succeeding internodes decussately flattened, longitudinally striated. Flowers subtended by two coalescent bracteoles at nodes; pistillate flowers often solitary; staminate flowers smaller and less prevalent. Fruits suborbicular, c. 4 mm, whitish.

Fl. & Fr.: December–April.

Habitat: Moist Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Rajasthan, Tamil Nadu. KWLS: Kuldiha Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 33811 (CAL).

2. *Viscum monoicum* Roxb. ex DC., Prodr. 4: 278. 1830; Hook.f., Fl. Brit. India 5: 224. 1886; Haines, Bot. Bihar Orissa 3: 803. 1921; Gamble, Fl. Madras: 1258. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1585. 1995.

Local Name: *Banda*.

Parasitic herb, decussately branched basally; internodes generally terete, pale green. Leaves sessile, elliptical-lanceolate, often falcate, 5–8 × 1–2.5 cm, acute to subacuminate at apex, distinctly 3–5-veined. Inflorescence mostly axillary, c. 6 per node; peduncles bearing 3–5 flowers, subtended by 2 coalesced bracts, forming a naviculate involucre. Fruits mostly oblongoid, c. 5 × 2–3 mm, slightly rounded at base, truncated at apex.

Fl. & Fr.: December–April.

Habitat: Moist Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Meghalaya. KWLS: Panchalingeshwar; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35653 (CAL).

EUPHORBIACEAE

Key to the genera

- | | |
|---|------------------|
| 1a. Filaments erect, rarely inflexed; pistillode present, conspicuous | 2 |
| 1b. Filaments inflexed in bud; pistillode absent | 2. Croton |
| 2a. Calyx in male flower valvate | 3 |
| 2b. Calyx in male flower imbricate, usually much reduced | 6 |

- | | |
|---|------------------------|
| 3a. Style connate | 7. Tragia |
| 3b. Style free or only slightly connate | 4 |
| 4a. Anthers 4 celled or 2 celled and 4 valved | 4. Macaranga |
| 4b. Anthers 2 celled | 5 |
| 5a. Style linear | 8. Trevia |
| 5b. Style plumose | 5. Mallotus |
| 6a. Petals present in male flowers | 3. Jatropha |
| 6b. Petals 0 in male flowers | 7 |
| 7a. Disc of male flower outside the stamens | 1. Baliospermum |
| 7b. Disc in male flower absent | 6. Suregada |

1. *Baliospermum* Blume

Baliospermum solanifolium (Burm.) Suresh, Interpr. Rheede's Hort. Malab.: 106. 1988. *Croton solanifolius* Burm., Fl. Malab.: 6. 1769. *Jatropha montana* Willd., Sp. Pl. 4: 563. 1805. *Baliospermum montanum* (Willd.) Müll. Arg. in DC., Prodr. 15: 1125. 1866; Haines, Bot. Bihar Orissa 1: 119. 1921; Gamble, Fl. Madras: 1342. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1608. 1995.

Local Names: *Danti, Dumbojoda, Konaka.*

Undershrub. Leaves broadly ovate, 10–15 × 6–10 cm, often 3-lobed, rounded at base, inciso-crenate at margins, acute or acuminate at apex, 3–5-ribbed, tomentose on veins beneath, with a pair of glands at base of lamina; perianth lobes 4, *c.* 1.5 mm long, pubescent. Capsules 3-lobed, *c.* 1.2 cm long; seeds ovoid.

Fl. & Fr.: October–April.

Habitat: Along field borders and shady places.

Distribution: India: Andhra Pradesh, Assam, Bihar, Goa, Karnataka, Kerala, Tripura, West Bengal. KWLS: Jodachua Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34516 (CAL).

2. *Croton* L.

Key to the species

- | | |
|--|-----------------------------------|
| 1a. Small tree | 3. <i>C. persimilis</i> |
| 1b. Herbs or undershrubs | 2 |
| 2a. Capsules ovoid, 5–6 mm across, warty | 1. <i>C. bonplandianus</i> |
| 2b. Capsules obovoid, <i>c.</i> 2 × 1.7 cm, densely stellate-hairy | 2. <i>C. caudatus</i> |

1. *Croton bonplandianus* Baill., Adansonia 4: 339. 1864; H.O. Saxena & Brahmam, Fl. Orissa 3: 1623. 1995.

Herb, young parts stellate-pubescent and viscous-glandular. Leaves ovate-lanceolate, 2–5 × 1–2 cm, faintly serrulate at margins, acute at apex, stellate-scaly when young. Racemes to 10 cm long; male flowers 3–4 mm across; perianth 2-seriate, greenish white; outer *c.* 1 mm; inner *c.* 2 mm; stamens many; female flowers few, towards base, 2.5–3 mm across; perianth 1-seriate, 5-lobed. Capsules ovoid, 5–6 mm across, warty; seeds 3, globose, carunculate.

Fl. & Fr.: June–August.

Habitat: Open areas and paddy fields.

Distribution: India: Throughout. KWLS: Ampada Nala, Nuasai Gaon; common.

Specimens examined: R. Saravanan & K.A. Sujana 33556, 35875 (CAL).

2. *Croton caudatus* Geiseler, *Croton. Monogr.*: 73. 1807; Hook.f., *Fl. Brit. India* 5: 388. 1887; Gamble, *Fl. Madras*: 1315. 1925; Haines, *Bot. Bihar Orissa* 1: 105. 1921; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1624. 1996.

Local Name: *Furudi*.

Scandent shrub. Leaves ovate, to 11 × 6 cm, cordate at base, irregularly crenate at margins, acuminate at apex, stellate-hairy. Racemes to 20 cm long, densely tomentose; male flowers many; female flowers *c.* 8 mm across; sepals ovate; petals similar to sepals; stamens many. Capsules obovoid, *c.* 2 × 1.7 cm, retuse, densely stellate-hairy.

Fl. & Fr.: April–August.

Habitat: Near rivulets of mixed forests.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Jharkhand, Karnataka, Kerala, Meghalaya, Nagaland, Sikkim, Tamil Nadu, West Bengal. KWLS: Bhaibhoni Ghatti, Panchalingeshwar Pahad; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34588, 35736 (CAL).

3. *Croton persimilis* Müll. Arg., *Linnaea* 34: 116. 1865; Chakrab. & N.P. Balakr., *J. Econ. Taxon. Bot.* 30: 298. 2006; N.P. Balakr. & Chakrab., *Fl. India* 23: 215. 2007.

Small tree. Leaves spiral, turning red before falling, elliptic-obovate, elliptic-oblong-lanceolate or oblong-lanceolate, 11–23 × 3–7.5 cm, crenate at margins, acute at apex, coriaceous. Flowers unisexual, solitary or fascicled in the axils of minute bracts, pale yellowish green; males in the upper part of the raceme, the females in the lower part; petals woolly; stamens 12, inflexed in buds. Capsules depressed-subglobose, slightly 3-lobed, lepidote-scaly; seeds 3.

Fl. & Fr.: December–February.

Habitat: Mixed Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Gujarat, Jharkhand, Karnataka, Kerala, Meghalaya, Uttar Pradesh, West Bengal. KWLS: Kuldiha Pahad; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 33933 (CAL).

3. *Jatropha* L.

Key to the species

- 1a. Flowers yellowish green; capsules *c.* 2.5 cm long **1. *J. curcas***
1b. Flowers red with yellow centre; capsules 1 cm long **2. *J. gossypiifolia***

1. *Jatropha gossypiifolia* L., Sp. Pl.: 1006. 1753; Hook.f., Fl. Brit. India 5: 383. 1887; Haines, Bot. Bihar Orissa 1: 101. 1921; Gamble, Fl. Madras: 1340. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1651. 1995.

Local Names: *Baigoba, Johadi*.

Shrub. Leaves suborbicular, 6–12 cm across, palmately 3–5-lobed; lobes obovate, shortly obtusely acute at apex, entire at margin with densely glandular-hairy. Flowers in glandular corymbose cymes, red with yellow centre; stamens 10–12. Capsules *c.* 1 cm long.

Fl. & Fr.: July–October.

Habitat: Plains.

Distribution: India: Naturalized throughout. KWLS: Nuarasta, Kuldiha FRH; common.

Specimens examined: R. Saravanan & K.A. Sujana 33641, 35867 (CAL).

2. *Jatropha curcas* L., Sp. Pl.: 1006. 1753; Hook.f., Fl. Brit. India 5: 383. 1887; Haines, Bot. Bihar Orissa 1: 101. 1921; Gamble, Fl. Madras: 1340. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1650. 1995.

Local Names: *Duma Jada, Jode*.

Shrub or small tree. Leaves broadly ovate or orbicular, entire or 3–5-angled, 6–15 × 4.5–12 cm, cordate at base, acute or caudate at apex. Flowers small, in terminal cymose panicles, yellowish green; stamens 10. Capsules subglobose or ellipsoid, *c.* 2.5 cm long.

Fl. & Fr.: August–May.

Habitat: Hedge plant.

Distribution: India: Almost throughout. KWLS: Kaimagudi, Nilgiri Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33649, 33956 (CAL).

4. *Macaranga* Thouars

Macaranga peltata (Roxb.) Müll. Arg. in DC., Prodr. 15: 1010. 1866; Haines, Bot. Bihar Orissa 1: 108. 1921; Gamble, Fl. Madras: 1326. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1656. 1995.

Local Names: *Gondaguria*, *Jinka*.

Dioecious tree, to 18 m high. Leaves ovate-orbicular, deltoid-ovate, 11–25 × 9–20 cm, peltate, acute or acuminate at apex, coriaceous, pubescent with reddish glands beneath. Flowers unisexual, greenish yellow; male flowers in axillary, much-branched, dense, tomentose panicles, concealed in large bracts; stamens 2–8; female flowers in panicles. Capsules globose, 5–6 mm, hairy, glandular, black; seed 1, black.

Fl. & Fr.: March–April.

Habitat: Moist Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Bihar, Goa, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Sikkim, Tamil Nadu, West Bengal. KWLS: Gurajari Ghatti, Kuldiha Pahad, Panchalingeshwar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33693, 34426, 35703 (CAL).

5. *Mallotus* Lour.

Mallotus philippensis (Lam.) Müll. Arg., *Linnaea* 34: 196. 1865; Hook.f., *Fl. Brit. India* 5: 442. 1887; Gamble, *Fl. Madras*: 1322. 1925; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1658. 1995. *Croton philippensis* Lam., *Encycl.* 2: 206. 1786.

Local Names: *Kumkumo*, *Sinduri*.

Dioecious tree, to 12 m high. Leaves ovate or ovate-lanceolate, 5–20 × 2–8 cm, entire or sparsely serrate at margins, acuminate or acute at apex, coriaceous, greyish pubescent to fulvous-tomentose with minute red glands beneath. Flowers unisexual, brick red, in rusty puberulous, terminal spicate panicles; male flowers *c.* 4.5 mm across; stamens many; female flowers *c.* 4 mm across. Capsules globose, 7–8 mm, 3-lobed, loculicidal, 3-valved, densely red-glandular-pubescent; seeds 1–4, globose, black.

Fl. & Fr.: October–March.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout. KWLS: Nandu Gatta, Pancharjuna Rasta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34414, 35733 (CAL).

6. *Suregada* Roxb. ex Rottler

Key to the species

- | | |
|--|--------------------------------|
| 1a. Flowers fewer fascicled; capsules 0.7–1 cm across | 1. <i>S. lanceolata</i> |
| 1b. Flowers in contracted cymes; capsules 1.2–1.8 cm in across | 2. <i>S. multiflora</i> |

1. *Suregada lanceolata* (Willd.) Kuntze, *Revis. Gen. Pl.* 2: 619 1891. *Suregada angustifolia* (Müll. Arg.) Airy Shaw in *Kew Bull.* 23: 128. 1969; Chakarab. & N.P. Balakr. in N.P. Balakr. & al., *Fl. India* 23: 247. 2012. *Gelonium angustifolium* Müll. Arg. in DC., *Prodr.* 15(2): 1128.

1866. *G. lanceolatum* auct. non Willd. 1806: Hook.f., Fl. Brit. India 5: 459. 1887, p.p.; Gamble, Fl. Madras: 1343. 1925.

Evergreen tree. Leaves elliptic, ovate, oblanceolate or oblong, 5–15 × 2–5.5 cm, obtuse or subacute at apex, coriaceous, shining. Flowers greenish; male flowers 5–6 mm across, in small fascicles; stamens usually 40; female flowers solitary or 2–4 together. Capsules 7.5–10 mm across, smooth, deeply lobed; seeds globose, 3–4.3 mm, testa with large, shallow pits.

Fl. & Fr.: March–August.

Habitat: Hill Forests.

Distribution: India: Andhra Pradesh, Chhattisgarh, Karnataka, Kerala, Tamil Nadu. KWLS: Panchalingeshwar Pahad; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 36409 (CAL).

2. Suregada multiflora (A. Juss.) Baill., Etude Euphorb.: 396. 1858; H.O. Saxena & Brahmam, Fl. Orissa 3: 1685. 1995; Chakarb. & N.P. Balakr. in N.P. Balakr. & al., Fl. India 23: 247. 2012. *Gelonium multiflorum* A. Juss., Euphorb. Gen.: 111, t. 10, f. 31A. 1812; Hook.f., Fl. Brit. India 5: 459. 1887; Gamble, Fl. Madras: 1343. 1925.

Local Names: *Ganari, Khakra*.

Small tree. Leaves elliptic or elliptic-oblong, 8–17 × 3–6 cm, with few serrations towards apex, acute at apex, coriaceous. Flowers rather large, many, in cymes or clusters; calyx in male flowers 5, in female of 5 or 6 narrower lobes, concave orbicular, imbricate; stamens 10–60. Capsules obscurely lobed, 1.2–1.8 cm across; seeds subglobose, crustaceous, arillate.

Fl. & Fr.: March–August.

Habitat: Hill forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Kerala, Sikkim, Uttar Pradesh, West Bengal. KWLS: Bonun Chowk, Nuarasta, Gurajari Ghatti, Panchalingeshwar; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33674, 34536, 34882, 35747 (CAL).

7. *Tragia* L.

Tragia involucrata L., Sp. Pl.: 980. 1753; Hook.f., Fl. Brit. India 5: 465. 1888; Gamble, Fl. Madras: 1332. 1925; Haines, Bot. Bihar Orissa 1: 115. 1921; H.O. Saxena & Brahmam, Fl. Orissa 3: 1687. 1995; Chakarb. & N.P. Balakr. in N.P. Balakr. & al., Fl. India 23: 196. 2012.

Local Name: *Bichhuati*.

Slender, twining herb with stinging hairs. Leaves ovate or elliptic, 6–10 × 3–5.5 cm, serrate at margins, acuminate at apex, hispidulous. Spikes axillary, monoecious, to 2 cm long; male flowers above; female flowers 1 or 2 at base; male flowers *c.* 1.5 mm across; stamens 3; female flowers *c.* 3 mm across. Capsules *c.* 0.6 × 1 cm, 3-lobed, hispid; seeds globose.

Fl. & Fr.: October–April.

Habitat: Waste places.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti, Nuasai, Rangamatia; common.

Specimens examined: R. Saravanan & K.A. Sujana 33751, 35923, 36441 (CAL).

8. *Trewia* L.

Trewia nudiflora L., Sp. Pl.: 1193. 1753; Hook.f., Fl. Brit. India 5: 423. 1887; Gamble, Fl. Madras: 1319. 1925; Haines, Bot. Bihar Orissa 1: 105. 1921; H.O. Saxena & Brahmam, Fl. Orissa 3: 1689. 1995; Susila & N.P. Balakr. in N.P. Balakr. & al., Fl. India 23: 168. 2012.

Local Name: *Tobu*.

Deciduous dioecious tree, to 20 m high. Leaves broadly ovate or deltoid, 6–20 × 9–15 cm, truncate or cordate at base, caudate-acuminate at apex, glaucous beneath, chartaceous. Flowers unisexual, pale green; male flowers 3–5 mm across, numerous; stamens many; female flowers 5–9 mm across, 4 or 5 on axillary racemes. Capsules 2–3 cm across, woody, dark brown, broadly rounded, 3 or 4-loculed, pericarp very thick; seeds globose.

Fl. & Fr.: February–January.

Habitat: Dry forests and way sides.

Distribution: India: Almost throughout. KWLS: Champo, Jodachua, Kanchipaani; common.

Specimens examined: R. Saravanan & K.A. Sujana 33770, 34391, 35741 (CAL).

PHYLLANTHACEAE

Key to the genera

- | | |
|---|------------------------|
| 1a. Calyx lobes valvate; petals present | 2 |
| 1b. Calyx lobes imbricate; petals 0 | 3 |
| 2a. Ovary 2-celled; fruits a drupe with 2 pyrenes | 5. Bridelia |
| 2b. Ovary 3-celled; fruits a capsule | 6. Cleistanthus |
| 3a. Disk present | 4 |
| 3b. Disk absent | 8 |
| 4a. Disk not combined with calyx lobes | 5 |
| 4b. Disk combined with calyx lobes | 7 |
| 5a. Flowers in spikes or racemes, often paniced | 1. Antidesma |
| 5b. Flowers in clusters, not paniced | 6 |

- | | |
|--|-----------------------|
| 6a. Fruits a fleshy drupe or berry | 9. Phyllanthus |
| 6b. Fruits dry or fleshy drupe with 6 cocci | 7. Fluggea |
| 7a. Anthers sessile on the angle of column;
calyx of both the male and female flowers spreading | 10. Sauropus |
| 7b. Anthers adnate to the column;
calyx of male turbinate, of female spreading | 4. Breynia |
| 8a. Stamens connate by their connectives in column | 8. Golchidion |
| 8b. Stamens free or rarely connate by their filaments | 9 |
| 9a. Stamens 1–5; seeds without an aril | 2. Aporosa |
| 9b. Seeds with an aril; stamens 4–8 | 3. Baccaurea |

1. *Antidesma* L.

Key to the species

- | | |
|--|---------------------------|
| 1a. Shrub | 1. A. acidum |
| 1b. Trees | 2 |
| 2a. Drupe compressed-orbicular, black | 3. A. ghaesembilla |
| 2b. Drupe slightly compressed suborbicular to ovoid or wide ellipsoid, red | 2. A. bunius |

1. *Antidesma acidum* Retz., *Observ. Bot.* 5: 30. 1788; Airy Shaw, *Kew Bull.* 26: 352. 1932; Mandal & Panigrahi, *J. Econ. Taxon. Bot.* 4: 258. 1983; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1602. 1995; Chakrab. & N.P. Balakr., *Indo-Burm. Phyllanthac.*: 34. 2018.

Local Names: *Jamala*, *Manmudi*, *Nunnunia*.

Large shrub. Leaves elliptic or obovate, 3–9 × 2–4 cm, shortly acuminate at apex. Spikes terminal, single or 2-branched, 2.5–3 cm long; perianth greenish yellow; lobes 4, c. 1.5 mm long, brown hairy inside. Drupes globose, 4–6 mm.

Fl. & Fr.: May–December.

Habitat: Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Bihar, Jammu and Kashmir, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Andheri Nala, Jodachua Ghatti; fairly common.

Specimens examined: R. Saravanan & K.A. Sujana 34504, 34891 (CAL).

2. *Antidesma bunius* (L.) Spreng., *Syst. Veg.* 1: 826. 1825; Hook.f., *Fl. Brit. India* 5: 358. 1887; Gamble, *Fl. Madras*: 1298. 1925; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1604. 1995; Chakrab. & N.P. Balakr., *Indo-Burm. Phyllanthac.*: 40. 2018.

Local Name: *Anepu*.

Tree, to 10 m high. Leaves elliptic, elliptic-oblong or elliptic-obovate, oblong-lanceolate, 7–19 × 3–8 cm, acuminate or apiculate at apex, coriaceous. Flowers unisexual, in spikes, terminal or axillary, solitary or 2 or 3 together, reddish; stamens 3; female flowers

terminal and axillary, solitary or in pair. Drupes suborbicular to ovoid, 5–6 × 4–6 mm, red when ripe.

Fl. & Fr.: April–August.

Habitat: Hill forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Bihar, Karnataka, Kerala, Sikkim, Uttarakhand, Uttar Pradesh. KWLS: Kenduna forest; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36555 (CAL).

3. *Antidesma ghaesembilla* Gaertn., *Fruct. Sem. Pl.* 1: 189. 1788; Hook.f., *Fl. Brit. India* 5: 357. 1887; Gamble, *Fl. Madras*: 1298. 1925; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1605. 1995; Chakrab. & N.P. Balakr., *Indo-Burm. Phyllanthac.*: 45. 2018.

Local Names: *Kath Marmuri*, *Sunakali*.

Tree, to 12 m high. Leaves oblong-elliptic, obovate, suborbicular or ovate, 2.5–14 × 1.5–10 cm, rounded, retuse or apiculate at apex, chartaceous, grey-tomentellous beneath. Flowers unisexual, terminal and axillary, reddish yellow; male flowers in branched spikes; female flowers in branched or simple racemes. Drupes orbicular, 4–6 mm, reddish brown or black.

Fl. & Fr.: April–October.

Habitat: Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Bihar, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Guajhari; common.

Specimens examined: R. Saravanan & K.A. Sujana 35924, 35604 (CAL).

2. *Aporosa* Blume

Aporosa octandra (Buch.-Ham. ex D. Don) Vickery in Hara & al., *Enum. Fl. Pl. Nepal* 3: 193. 1982; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1606. 1995; Chakrab. & N.P. Balakr., *Indo-Burm. Phyllanthac.*: 88. 2018.

Local Names: *Dumbojoda*.

Tree, to 5 m high. Leaves elliptic-oblong or oblong-lanceolate, 6–17.5 × 2.5–7.5 cm, entire or slightly dentate at margins, obtuse or acuminate at apex. Male flowers 1–3-nate, yellowish spikes, 1.8–3 cm long, from the leaf axils and scars of fallen leaves; female flowers sessile or subsessile, usually 4–6, in ovoid spikes, c. 7.5 mm long. Fruits globose, 1–1.2 cm, apiculate.

Fl. & Fr.: October–April.

Habitat: On field borders and shady places.

Distribution: India: Arunachal Pradesh, Assam, Meghalaya, Mizoram, Sikkim, Uttar Pradesh. KWLS: Bhaibhoni Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35607 (CAL).

3. *Baccaurea* Lour.

Baccaurea ramiflora Lour., Fl. Cochinch.: 661. 1790; Airy Shaw, Kew Bull. 26: 221. 1972; H.O. Saxena & Brahmam, Fl. Orissa 3: 1607. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 103. 2018.

Local Names: *Kataphal, Latuqua, Lutco, Rajkoli.*

Tree. Leaves elliptic-obovate, oblanceolate or obovate, 10–24 × 4.5–9 cm, repand at margins, acuminate or obtuse at apex. Racemes from leaf scars, trunk and old branches, hoary-tomentose or pubescent; male flowers sessile, c. 3.7 mm across; female flowers c. 1.2 mm across, yellow. Fruits globose-oblong, 2.5–3 cm across, hairy; seed c. 1.8 mm, red.

Fl. & Fr.: April–June.

Habitat: Banks of river.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Meghalaya, Mizoram, Sikkim, Tripura, West Bengal. KWLS: Ashun Chua; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33842 (CAL).

4. *Breynia* J.R. Forst. & G. Forst., *nom. cons.*

Key to the species

- | | |
|--|---------------------------------|
| 1a. Male flowers c. 3 mm across; calyx enlarging to 1.2 cm in fruits | 1. <i>B. retusa</i> |
| 1b. Male flowers c. 2 mm; calyx small in fruit | 2. <i>B. vitis-idaea</i> |

1. *Breynia retusa* (Dennst.) Alston, Ann. Royal Bot. Gard. 11: 204. 1929; H.O. Saxena & Brahmam, Fl. Orissa 3: 1610. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 178. 2018.

Local Names: *Jajan, Raktatrichuli, Tina.*

Shrub, 1–1.5 m high. Leaves broadly elliptic or ovate, 1.3–2.5 × 0.7–1.3 cm, obtuse at apex, glaucous beneath, black on drying. Flowers unisexual, solitary, axillary; male flowers c. 3 mm across; stamens 3; female flowers 5–6 mm across; perianth campanulate, 3–4 mm long, 5 or 6-lobed. Capsules depressed-globose, c. 1.5 cm across, orange-red on ripening.

Fl. & Fr.: April–August.

Habitat: Open Forests.

Distribution: India: Andaman and Nicobar Islands, Karnataka, Kerala, Maharashtra, Sikkim, Uttar Pradesh. KWLS: Nilgiri Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 35652 (CAL).

2. *Breynia vitis-idaea* (Burm.f.) C.E.C. Fisch., Bull. Misc. Inform. Kew 1932: 65. 1932; H.O. Saxena & Brahmam, Fl. Orissa 3: 1611. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 187. 2018.

Local Names: *Jhanjika, Pohalakuli*.

Shrub, 3–4 m high. Leaves ovate or elliptic, 2–3 × 1.5–2.5 cm, acute at apex, dark brown above and lighter beneath on drying. Male flowers 2–5, in axillary fascicles; perianth turbinate, 5-lobed, yellow; stamens 3; female flower solitary, axillary, c. 1.5 mm across, reddish. Fruits globose, 3–4 mm, red on ripening, later purple.

Fl. & Fr.: March–February.

Habitat: Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Karnataka, Kerala, Sikkim, Uttarakhand, Uttar Pradesh. KWLS: Bulagadia; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36494 (CAL).

5. *Briedelia* Willd.

Briedelia retusa (L.) A. Juss., Euphorb. Gen.: 109. 1824; Hook.f., Fl. Brit. India 5: 268. 1887; Haines, Bot. Bihar Orissa 1: 119. 1921; Gamble, Fl. Madras: 1280. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1615. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 118. 2018.

Local Names: *Kasi, Pani Kasi*.

Tree, to 20 m high. Leaves elliptic-oblong or obovate, 5–22 × 3–11 cm, obtuse or cordate at base, entire or slightly crenulate at margins, obtuse-retuse at apex, coriaceous, glaucous, fine-tomentose beneath. Flowers unisexual, in dense axillary or terminal spikes, greenish yellow; male flowers c. 7 mm across; stamens 5; female flowers c. 6.5 mm across. Drupes 7–8 mm across, purplish black, seated on slightly enlarged calyx; pyrenes 2.

Fl. & Fr.: August–January.

Habitat: Forests, especially in valleys.

Distribution: India: Almost throughout. KWLS: Kuldiha Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 33880, 34534 (CAL).

6. *Cleistanthus* Hook.f. ex Planch.

Key to the species

- | | |
|--|------------------------------|
| 1a. Leaves obovate, orbicular or broadly elliptic; ovary glabrous; capsules 1.8–2.2 cm | 1. <i>C. collinus</i> |
| 1b. Leaves ovate to lanceolate; ovary villous; capsules sessile, 0.5–1.5 cm | 2. <i>C. patulus</i> |

1. *Cleistanthus collinus* (Roxb.) Benth. ex Hook.f., Fl. Brit. India 5: 274. 1887; Gamble, Fl. Madras: 1282. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1620. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 137. 2018.

Local Names: *Karada, Kargalli*.

Tree, to 15 m high. Leaves elliptic, suborbicular or obovate, 3–11.5 × 1.5–8 cm, rounded, retuse or apiculate at apex, chartaceous, glaucous beneath. Flowers unisexual, in glomerules, yellowish green; male glomerules 3–5-flowered; female glomerules to 3-flowered. Capsules subglobose or wide oblong, 18–22 × 17–22 mm, truncate at apex, shallowly 3-lobed and 3-angled, glossy, black or dark brown; seeds 3, globose, black.

Fl. & Fr.: April–May.

Habitat: Deciduous Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Uttarakhand. KWLS: Nilgiri Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34389 (CAL).

2. *Cleistanthus patulus* (Roxb.) Müll.Arg. in DC., Prodr. 15: 505. 1866; Hook.f., Fl. Brit. India 5: 279. 1887; Gamble, Fl. Madras: 1282. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1621. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 148. 2018.

Local Names: *Sanahati, Sonohat*.

Tree, to 5 m high. Leaves oblong-elliptic or ovate-lanceolate, 3.5–13 × 1–5.5 cm, acuminate, caudate or sometimes apiculate at apex, chartaceous to thin-coriaceous. Glomerules few-flowered, 2–8 cm long, from leafless branchlets, rarely arising on main leafy branches. Capsules depressed-subglobose, 5–12 × 10–15 mm, deeply 3-lobed, adpressed golden-brown pilose, brown or black; seeds globose, *c.* 5 mm.

Fl. & Fr.: April–May.

Habitat: Deciduous Forests.

Distribution: India: Andhra Pradesh, Kerala, Tamil Nadu. KWLS: Jodachua Ghatti, Kanchipaani, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 34397, 34573, 34897, 35735 (CAL).

7. *Flueggea* Willd.

Key to the genera

- 1a. A large stiff straggling shrub; branchlets ends in spine
- 1b. Small tree, unarmed

- 1. ***F. leucopyrus***
- 2. ***F. virosa***

1. *Flueggea leucopyrus* Willd., Sp. Pl. 4: 757. 1806; Hook.f., Fl. Brit. India 5: 328. 1887; Gamble, Fl. Madras: 1296. 1925; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 190. 2018.

Shrub. Leaves obovate, to 2.5×1.5 cm, cuneate at base, membranous. Flowers greenish white; male flowers in axillary clusters; stamens 5. Capsules globose, c. 5 mm, white.

Fl. & Fr.: February–June.

Habitat: Moist marginal forest.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Pahadi Rasta; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34422, 35648 (CAL).

2. *Flueggea virosa* (Roxb. ex Willd.) Voigt, Hort. Suburb. Calcutt.: 152. 1845; Gamble, Fl. Madras: 1296. 1925. *Securinega virosa* (Roxb. ex Willd.) Baill., Adansonia 6: 334. 1866; H.O. Saxena & Brahmam, Fl. Orissa 3: 1682. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 191. 2018.

Local Names: Bhoji Bhaji, Patri.

Dioecious shrub, to 3 m high. Leaves obovate, $1.5\text{--}3.5 \times 1\text{--}2$ cm, obtuse at apex, chartaceous, glaucous beneath. Flowers minute in axillary clusters; male flowers numerous; stamens 5; pistillodes 3; female flowers c. 2 mm across. Fruits globose, c. 4 mm, white.

Fl. & Fr.: May–October.

Habitat: Scrub forests.

Distribution: India: Almost throughout. KWLS: Parchondi; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36537 (CAL).

8. *Glochidion* J.R. Forst. & G. Forst., nom. cons.

Key to the species

- | | |
|--|----------------------------------|
| 1a. Plant glabrous; female flowers green | 1. <i>G. lanceolarium</i> |
| 1b. Plant pubescent; female flowers red | 2. <i>G. zeylanicum</i> |

1. *Glochidion lanceolarium* (Roxb.) Voigt, Hort. Suburb. Calcutt.: 153. 1845; Haines, Bot. Bihar Orissa 1: 131. 1921; H.O. Saxena & Brahmam, Fl. Orissa 3: 1646. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 229. 2018.

Small tree or shrub, to 2 m high. Leaves elliptic, $7.5\text{--}16 \times 2.5\text{--}7$ cm, acute to acuminate at apex, coriaceous. Male flowers numerous in axillary clusters, 5–8 mm across, yellow; female flowers 1–3 or more together, c. 3 mm long, green. Capsules globose, 1.5–2 cm, somewhat depressed; seeds red, persisting after dehiscence.

Fl. & Fr.: March–June.

Habitat: Mixed Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Meghalaya, Nagaland. KWLS: Guajhari Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 34458 (CAL).

2. *Glochidion zeylanicum* (Gaertn.) A. Juss., Euphorb. Gen.: 107. 1824; Hook.f., Fl. Brit. India 5: 310. 1887; Haines, Bot. Bihar Orissa 1: 132. 1921; Gamble, Fl. Madras: 1306. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1647. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 248. 2018.

Local Names: *Berlu*, *Kalchia*.

Small tree, quite glabrous or densely pubescent. Leaves oblong or ovate-lanceolate, 10–22.5 × 6–8.3 cm, rounded or cordate at base, acute, shortly acuminate or obtuse at apex. Flowers monoecious, male several in the same cluster with females; male flowers c. 6.2 mm across, yellowish green; stamens 5–7. Capsules depressed-globose, 7.5–10 mm.

Fl. & Fr.: February–October.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 35610 (CAL).

9. *Phyllanthus* L.

Key to the species

- | | |
|--|-------------------------------------|
| 1a. Trees, shrubs or climbing shrubs | 2 |
| 1b. Herbs or undershrubs | 4 |
| 2a. Tree | 2. <i>P. emblica</i> |
| 2b. Climbing shrubs or shrubs | 3 |
| 3a. Climbing shrubs; stamens 4–7; fruits baccate | 5. <i>P. reticulatus</i> |
| 3b. Shrubs; stamens 3; fruits capsular | 3. <i>P. lawii</i> |
| 4a. Capsules verrucose | 8. <i>P. urinaria</i> |
| 4b. Capsules smooth | 5 |
| 5a. Woody herbs, to 80 cm high | 6. <i>P. rheedei</i> |
| 5b. Herbs, below 40 cm high | 6 |
| 6a. Male flowers in clusters | 4. <i>P. maderaspatensis</i> |
| 6b. Male flowers solitary | 7 |
| 7a. Stipules sub-sagiattate or peltate | 7. <i>P. simplex</i> |
| 7b. Stipules not sub-sagiattate or peltate | 1. <i>P. amarus</i> |

1. Phyllanthus amarus Schumach. & Thonn., Beskr. Guin. Pl.: 421. 1827; R.L. Mitra & S.K. Jain in Bull. Bot. Surv. India 27: 164. 1987; H.O. Saxena & Brahmam, Fl. Orissa 3: 1669. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 333. 2018. *P. nanus* Hook.f., Fl. Brit. India 5: 298. 1887; Haines, Bot. Bihar Orissa 2: 127. 1921.

Local Names: *Badi Aonla, Bhui Anal.*

Herb, to 30 cm high. Leaves oblong, 6–8 × 3–4 mm, oblique at base, obtuse to acute at apex, glaucous beneath. Male flowers towards tip of branchlets, solitary, axillary; tepals 5, ovate; stamens 3, exserted; disk of 5 glands; female flowers *c.* 1.5 mm across. Capsules globose, *c.* 2 mm; seeds 6, *c.* 1 mm, trigonous, with 5 or 6 longitudinal ribs on the back, brown.

Fl. & Fr.: June–November.

Habitat: Degraded forests and way sides.

Distribution: India: Throughout. KWLS: Jodachua FRH; common.

Specimen examined: R. Saravanan & K.A. Sujana 34361 (CAL).

2. Phyllanthus emblica L., Sp. Pl.: 982. 1753; Hook.f., Fl. Brit. India 5: 289. 1887; H.O. Saxena & Brahmam, Fl. Orissa 3: 1671. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 267. 2018.

Local Names: *Amla, Anola.*

Deciduous tree, to 15 m high. Leaflets subsessile, oblong or linear-oblong, 0.4–1.5 × 2–4 mm, rounded at base, obtuse or shortly apiculate at apex, membranous. Flowers unisexual, densely clustered in leaf axils, 2–3 mm across, greenish yellow; male flowers: tepals 6, oblanceolate, *c.* 1.5 mm long, obtuse; stamens 3; female flowers: tepals 6, oblanceolate, obtuse. Capsules globose, 1.5–2.5 cm, light green, dehiscent into 6 cocci.

Fl. & Fr.: April–December.

Habitat: Mixed Forests.

Distribution: India: Throughout. KWLS: Andheri Nala, Bonun Chowk: common.

Specimens examined: R. Saravanan & K.A. Sujana 33883, 34315 (CAL).

3. Phyllanthus lawii J. Graham, Cat. Pl. Bombay: 181. 1839; Hook.f., Fl. Brit. India 5: 290. 1887; Haines, Bot. Bihar Orissa 1: 124. 1921; Gamble, Fl. Madras: 1290. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1673. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 322. 2018.

Local Name: *Jhar.*

Shrub, to 1 m high. Leaves linear-oblong, 3–5 × 2–2.5 mm, rounded or subcordate at base, rounded often apiculate at apex. Flowers axillary, the males solitary or few together, the

female solitary; sepals of male and female flowers 6, linear-oblong, obtuse; stamens 3. Capsules slightly depressed-globose, *c.* 4 mm; seeds *c.* 2.3 mm long, 3-gonous.

Fl. & Fr.: January–May.

Habitat: Degraded forests and way sides.

Distribution: India: Andhra Pradesh, Jharkhand, Karnataka, Kerala, Maharashtra, Tamil Nadu, West Bengal. KWLS: Bhaibhoni Ghatti, Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33525, 34466 (CAL).

4. *Phyllanthus maderaspatensis* L., Sp. Pl.: 982. 1753; Hook.f., Fl. Brit. India 5: 292. 1887; Haines, Bot. Bihar Orissa 1: 124. 1921; Gamble, Fl. Madras: 1289. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1674. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 301. 2018.

Herb, to 50 cm high. Leaves obovate, to 3.5 × 1.5 cm, obtuse to mucronate at apex, chartaceous to thin-coriaceous, glaucous. Flowers axillary, unisexual; male flowers subsessile, in clusters; sepals 6, obovate, *c.* 2 mm long, with green margins. Capsules subglobose, slightly depressed, 1.5–3.5 mm, shallowly to deeply 3–6-lobed, smooth, brown or black; seeds trigonous, verruculose with concentric lines of minute tubercles.

Fl. & Fr.: October–April.

Habitat: Degraded Forests and way sides.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttarakhand. KWLS: Panchalingeshwar; common.

Specimen examined: R. Saravanan & K.A. Sujana 35671 (CAL).

5. *Phyllanthus reticulatus* Poir. in Lam., Encycl. 5: 298. 1804; Hook.f., Fl. Brit. India 5: 288. 1887; H.O. Saxena & Brahmam, Fl. Orissa 3: 1674. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 312. 2018.

Local Name: Jandaki.

Shrub, to 3 m high. Leaves elliptic, 1.5–2 × 1–1.5 cm, acute or obtuse at apex. Male flowers in axillary fascicles; tepals 5, unequal, obovate, imbricate; stamens 5; female flowers solitary; ovary globose, 5–12-locular; styles 3, bifid. Fruits baccate, globose, 5–7 mm, fleshy, black; seeds 8–10, trigonous, smooth.

Fl. & Fr.: Throughout the year.

Habitat: Ravine forests, hedges and thickets.

Distribution: India: Throughout. KWLS: Bhaibhoni Ghatti, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33588, 33617, 34590, 35898 (CAL).

6. *Phyllanthus rheedei* Wight, Icon. Pl. Ind. Orient. 5: 25, t. 1895. f. 1. 1852; Hook.f., Fl. Brit. India 5: 293. 1887; Gamble, Fl. Madras: 1289. 1925; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 354. 2018.

Herb, woody, to 80 cm high. Leaves obovate, *c.* 2.5 × 1.5 cm, obtusely acute, glaucous beneath. Flowers solitary or fascicled; sepals 6, obovate, *c.* 4.5 × 2 mm, obtuse, green with narrow white margins; ovary globose; styles 3, bifid, radiating. Capsules depressed-subglobose, 1.8–2.5 mm, smooth; seeds *c.* 2 mm, trigonous, 5–7 longitudinal ribs on back.

Fl. & Fr.: Throughout the year.

Habitat: Near grasslands and wetlands.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Uttarakhand. KWLS: Nuasai; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35624 (CAL).

7. *Phyllanthus simplex* Retz., Observ. Bot. 5: 29. 1789; Hook.f., Fl. Brit. India 5: 295. 1887; Gamble, Fl. Madras: 1289. 1925; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 307. 2018. *P. virgatus* auct. non G. Forst., 1786; Chakrab. & N.P. Balakr., J. Econ. Taxon. Bot. Addit. Ser. 9: 98. 1992; H.O. Saxena & Brahmam, Fl. Orissa 3: 1677. 1995.

Local Name: *Bhui Aonla*.

Erect or diffuse herb with woody rootstock. Leaves narrowly oblong, 1.5–2.2 × 0.4–0.6 cm, apiculate at apex. Flowers solitary, axillary; male flowers minute, subsessile; tepals 5, orbicular; stamens 3; female flowers: tepals 6, oblong, acute; styles 3, spreading; disk saucer-shaped, wavy. Capsules depressed-globose, 3–4 mm across; seeds minutely tubercled.

Fl. & Fr.: July–February.

Habitat: Degraded Forests.

Distribution: India: Almost throughout. KWLS: Kuldiha Beat Rasta, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33661, 35681 (CAL).

8. *Phyllanthus urinaria* L., Sp. Pl.: 982. 1753; Hook.f., Fl. Brit. India 5: 293. 1887; Haines, Bot. Bihar Orissa 1: 125. 1921; Gamble, Fl. Madras: 1289. 1925; H.O. Saxena & Brahmam, Fl. Orissa 3: 1676. 1995; Chakrab. & N.P. Balakr., Indo-Burm. Phyllanthac.: 360. 2018.

Local Name: *Bhuin Amla*.

Herb, to 40 cm high. Leaves oblong, 0.6–1.2 × 0.4–0.6 cm, oblique at base, ciliate at margins, acute to apiculate at apex. Male flowers in axillary clusters; tepals 6, orbicular; stamens 5; disk 6-lobed; female flowers in lower axils, solitary; tepals 6, obovate-oblong;

ovary warted; stigmas 3, each 2-fid. Capsules globose, 2–3 mm, 3-lobed, verrucose; seeds 6, trigonous.

Fl. & Fr.: July–December.

Habitat: Way sides.

Distribution: India: Throughout. KWLS: Bulagadia; common.

Specimen examined: R. Saravanan & K.A. Sujana 35818 (CAL).

10. *Sauropus* Blume

Sauropus quadrangularis (Willd.) Müll. Arg., *Linnaea* 32: 73. 1863; Hook.f., *Fl. Brit. India* 5: 335. 1887; Haines, *Bot. Bihar Orissa* 2: 135. 1921; Gamble, *Fl. Madras*: 1303. 1925; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1680. 1995. *Breynia quadrangularis* (Klein ex Willd.) Chakrab. & N.P. Balakr., *Bangladesh J. Pl. Taxon.* 19(2): 121. 2012; Chakrab. & N.P. Balakr., *Indo-Burm. Phyllanthac.*: 174. 2018.

Shrub, to 1.5 m high. Leaves ovate, elliptic or orbicular-obovate, to 4 × 2.5 cm, obtuse, mucronulate at apex, glaucous beneath, black when dried. Flowers solitary, axillary; male flowers *c.* 3 mm across; sepals ovate, *c.* 1.2 mm long, acute; stamens 3. Capsules subglobose, *c.* 1 cm across, smooth.

Fl. & Fr.: Throughout the year.

Habitat: Mixed Forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 33754 (CAL).

ULMACEAE

Holoptelea Planch.

Holoptelea integrifolia (Roxb.) Planch., *Ann. Sci. Nat., Bot. ser.* 3, 10: 259. 1848; Haines, *Bot. Bihar Orissa* 3: 807. 1924; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1695. 1995.

Local Names: *Dauranja*, *Dharanj*.

Deciduous tree, to 25 m high. Leaves ovate-oblong to elliptic-ovate, 6–12.5 × 2.5–6.5 cm, rounded or subcordate at base, acuminate at apex, coriaceous, appressed-pubescent and punctate beneath. Flowers unisexual, in axillary fascicles, 5–8 mm across, greenish purple; anthers pubescent. Samara orbicular, *c.* 3 cm, with veined wings; seed 1.

Fl. & Fr.: March–June.

Habitat: Semi-evergreen and moist deciduous forests.

Distribution: India: Almost throughout, except Arunachal Pradesh, Himachal Pradesh, Jammu and Kashmir and Sikkim. KWLS: Kuldiha Pahad; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33656, 34335, 34450, 34526 (CAL).

CANNABACEAE

Trema Lour.

Trema orientale (L.) Blume, Mus. Bot. 2(1–8): 62. 1856; Hook.f., Fl. Brit. India 5: 484. 1888; Haines, Bot. Bihar Orissa 3: 809. 1924; Gamble, Fl. Madras: 1350. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1696. 1995. *Celtis orientalis* L., Sp. Pl. 2: 1044. 1753.

Local Names: *Jivani*, *Kharkas*.

Dioecious tree, to 15 m high. Leaves alternate, ovate-lanceolate to oblong-lanceolate, 7.5–15 × 2.5–6 cm, obliquely cordate at base, serrulate at margins, acuminate at apex, chartaceous, scabrid above, tomentose beneath, basally 3–5-veined. Flowers unisexual, 3–4 mm across, in axillary fascicles or cymes, greenish. Drupes globose, 3–5 mm, black; seeds broadly ovoid, somewhat compressed, *c.* 3 mm in diam.

Fl. & Fr.: Throughout the year.

Habitat: Mixed forests.

Distribution: India: Andaman and Nicobar Islands, Assam, Bihar, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Tamil Nadu, West Bengal. KWLS: Nuasai Gaon; fairly common.

Specimens examined: R. Saravanan & K.A. Sujana 34518, 35649, 36536 (CAL).

MORACEAE

Key to the genera

- | | |
|--|-----------------------------|
| 1a. Thorny or thornless shrubs | 3. <i>Streblus</i> |
| 1b. Thornless trees | 2 |
| 2a. Flowers enclosed in receptacles forming synconia | 2. <i>Ficus</i> |
| 2b. Flowers exposed on receptacle, not in synconia | 1. <i>Artocarpus</i> |

1. *Artocarpus* J.R. Forst. & G. Forst.

Artocarpus gomezianus Wall. ex Trecul subsp. ***zeylanicus*** Jarrett, J. Arnold Arbor. 41: 90. 1960. *A. lakoocha* sensu C.E.C. Fisch. in Gamble, Fl. Madras: 1369. 1928, non Roxb. 1832

Medium-sized to large tree. Leaves elliptic-oblong, to 16 × 8 cm, truncate or subcordate at base, acuminate at apex, subscabrous beneath. Male spikes globose, *c.* 8 mm. Syconium subglobose, fleshy, greenish yellow.

Fl. & Fr.: December–June.

Habitat: Moist Deciduous Forests.

Distribution: India: Assam, Goa, Karnataka, Kerala, Maharashtra, Meghalaya, Tamil Nadu.

KWLS: Bulagadia; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 36542 (CAL).

2. *Ficus* L.

Key to the species

1a. Leaves usually opposite	3. <i>F. hispida</i>
1b. Leaves alternate	2
2a. Leaves scabrous or hispid above	3
2b. Leaves neither scabrous nor hispid above	4
3a. Leaves semi-sagittate	7. <i>F. semicordata</i>
3b. Leaves not semi-sagittate	8. <i>F. tinctoria</i>
4a. Figs distinctly peduncled	5. <i>F. racemosa</i>
4b. Figs sessile	5
5a. Leaves pubescent or tomentose when young	1. <i>F. benghalensis</i>
5b. Leaves glabrous	6
6a. Lateral veins and secondary nerves not close and parallel	6. <i>F. rumphii</i>
6b. Lateral veins and secondary nerves very close and parallel	7
7a. Petioles rarely over 1.5 cm long	4. <i>F. microcarpa</i>
7b. Petioles 2.5–6.2 cm long	2. <i>F. elastica</i>

1. *Ficus benghalensis* L., Sp. Pl.: 1059. 1753; King in Hook.f., Fl. Brit. India 5: 499. 1888; Gamble, Fl. Madras: 361. 1928; Haines, Bot. Bihar Orissa 3: 834. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1708. 1995.

Local Name: *Baro*.

Large spreading evergreen tree. Leaves elliptic-ovate, 12–18 × 5–8 cm, obtuse or rounded at ends, coriaceous, glabrescent or pubescent beneath. Syconia in axillary pairs, sessile, globose, silky-pubescent, scarlet red when ripe.

Fl. & Fr.: Throughout the year.

Habitat: Often planted.

Distribution: India: Throughout. KWLS: Jodachua, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33818, 34890 (CAL).

2. *Ficus elastica* Roxb. ex Hornem., Hort. Bot. Hafn. Suppl.: 7. 1819; King in Hook.f., Fl. Brit. India 5: 508. 1888; Gamble, Fl. Madras: 1369. 1928; Haines, Bot. Bihar Orissa 3: 829. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1712. 1995.

Erect shrub or small tree. Leaves oblong, elliptic or oblong-elliptic, 7.5–30 × 3.7–13.7 cm, abruptly caudate at apex, coriaceous. Scyconium sessile, in axillary pairs and at leaf-scars, ovate-oblong or ovoid, c. 1.2 cm long, smooth, greenish yellow.

Fl. & Fr.: March–January.

Habitat: Mixed Forests.

Distribution: India: Arunachal Pradesh, Bihar, Jammu and Kashmir, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh. KWLS: Nandu Guttu; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 33832 (CAL).

3. *Ficus hispida* L.f., Suppl. Pl.: 442. 1781; King in Hook.f., Fl. Brit. India 5: 522. 1888; Gamble, Fl. Madras: 1367. 1928; Haines, Bot. Bihar Orissa 3: 836. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1714. 1995.

Local Names: *Baidimiri*, *Dimiri*.

Tree, to 10 m high. Leaves elliptic-oblong or obovate-oblong, 7–20 × 6–10 cm, rounded, subcordate or cuneate at base, minutely dentate at margins, abruptly acute or acuminate at apex, scabrid, hispid-pubescent, membranous. Syconia dioecious, fascicled on trunk, depressed-globose, 2–2.5 cm across, sticky-pubescent outside, faintly ribbed, yellow.

Fl. & Fr.: Throughout.

Habitat: Mixed Forests, hedges and thickets.

Distribution: India: Almost throughout. KWLS: Nua Rasta, Kanchipaani; common.

Specimens examined: R. Saravanan & K.A. Sujana 33602, 34547, 35864 (CAL).

4. *Ficus microcarpa* L.f., Suppl. Pl.: 442. 1781. *F. retusa* King, Ann. Roy. Bot. Gard. 1: 50. 1887 & in Hook.f., Fl. Brit. India 5: 511. 1888; Gamble, Fl. Madras: 1362. 1928; Haines, Bot. Bihar Orissa 3: 828. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1716. 1995.

Local Name: *Jida*.

Evergreen tree, to 18 m high, aerial roots numerous. Leaves elliptic to obovate, 4–12 × 2–5 cm, acute or retuse at apex, coriaceous. Syconia in axillary pairs, globose, 8–10 mm, pink with yellow shades when ripe.

Fl. & Fr.: October–April.

Habitat: Mixed Forests.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Gujarat, Jammu and Kashmir, Maharashtra, Madhya Pradesh, Sikkim, Uttarakhand, WestBengal. KWLS: Panchalingeshwar Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35842 (CAL).

5. *Ficus racemosa* L., Sp. Pl.: 1060. 1753; H.O. Saxena & Brahmam, Fl. Orissa 3: 1718. 1995.

Local Name: *Pipalo*.

Deciduous trees, to 30 m high. Leaves elliptic-ovate to oblong-obovate, 6–15 × 3.5–6 cm, blunt or acute at apex. Syconia on short leafless branches, subglobose to pyriform, c. 2.5 × 2 cm, smooth, often lenticellate-verrucose, orange, pink or dark crimson.

Fl. & Fr.: March–June.

Habitat: Valleys and village surroundings.

Distribution: India: Andhra Pradesh, Assam, Bihar, Goa, Gujarat, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Nilgiri Rasta; fairly common.

Specimen examined: R. Saravanan & K.A. Sujana 33869 (CAL).

6. *Ficus rumphii* Blume, Bijdr.: 437. 1825; King in Hook.f., Fl. Brit. India 5: 512. 1888; Haines, Bot. Bihar Orissa 3: 831. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1720. 1995.

Tree, sometimes epiphytic. Leaves broadly ovate or cordate, subcoriaceous, acuminate at apex. Syconia in small clusters, axillary on leafy branchlets, sessile or subsessile, globose, dark purple when mature, black when ripe.

Fl. & Fr.: March–June.

Habitat: Mixed Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Assam, Bihar, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Punjab, Rajasthan, Tripura, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Panchalingeshwar Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35880 (CAL).

7. *Ficus semicordata* Buch.-Ham. ex Sm. in Rees, Cyclop. 14: 71. 1810; H.O. Saxena & Brahmam, Fl. Orissa 3: 1720. 1995.

Local Name: *Bhuidumri*.

Tree. Leaves elliptic to ovate-oblong, 6–33.5 × 3.3–12 cm, obliquely semi-sagittate at base, entire, serrate or coarsely toothed at margins, acute or acuminate at apex, scabrous above, hirsute or pubescent beneath. Syconia short-peduncled or sessile, in pairs or clusters, mostly on leafless branches, globose or pyriform, 1–1.8 cm, hispid, warted, red-brown when ripe.

Fl. & Fr.: November–June.

Habitat: Near streams and in cool damp places.

Distribution: India: Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Punjab, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Bulagadia; common.

Specimen examined: R. Saravanan & K.A. Sujana 36563 (CAL).

8. *Ficus tinctoria* subsp. *parasitica* (Willd.) Corner, Gard. Bull. Straits Settlements. 17: 476. 1960; H.O. Saxena & Brahmam, Fl. Orissa 3: 1723. 1995.

Local Names: *Jhirang, Jhori*.

Small tree, usually hemiepiphyte. Leaves elliptic to ovate-elliptic, acute at apex, entire or toothed at margin, coriaceous. Syconia axillary on leafy shoots, solitary and paired, globose.

Fl. & Fr.: September–April.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Bihar, Kerala, Tamil Nadu, Uttar Pradesh. KWLS: Kenduna; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35844 (CAL).

3. *Streblus* Lour.

Key to the species

- | | |
|--|------------------------------|
| 1a. Branches armed; leaves smooth; fruiting tepals foliaceous | 2. <i>S. taxoides</i> |
| 1b. Branches unarmed; leaves rough; fruiting not tepals foliaceous | 1. <i>S. asper</i> |

1. *Streblus asper* Lour., Fl. Cochinch.: 615. 1790; King in Hook.f., Fl. Brit. India 5: 489. 1888; Haines, Bot. Bihar Orissa 3: 820. 1924; Gamble, Fl. Madras 1353. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1729. 1995.

Local Names: *Sara, Sahada, Sahara*.

Evergreen, dioecious or rarely monoecious tree, to 10 m high. Leaves elliptic-obovate or rhomboid, 3–10 × 1.2–5 cm, serrate or subentire at margins, acute or acuminate at apex, scabrid. Flowers unisexual, axillary, 4-merous, greenish yellow; male flowers in clusters; stamens 4; female flowers solitary or 2–5 in clusters. Drupes globose, 6–8 mm, obscurely 2-humped, yellow to orange; seed one, globose, 4–5 mm, greyish white.

Fl. & Fr.: March–June.

Habitat: Open forests, scrub forests and wastelands.

Distribution: India: Andhra Pradesh, Assam, Delhi, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal. KWLS: Ampada, Kanchipaani; common.

Specimens examined: R. Saravanan & K.A. Sujana 33655, 34503, 34801 (CAL).

2. *Streblus taxoides* (B. Heyne ex Roth) Kurz, Forest Fl. Burma 2: 465. 1877; H.O. Saxena & Brahmam, Fl. Orissa 3: 1729. 1995.

Local Names: *Phutkuli, Sukali*.

Large shrub with stout axillary spines. Leaves elliptic or ovate to obovate, acute to acuminate at apex, dentate along distal half at margins, *c.* 12 × 5 cm. Male inflorescence axillary, in groups of 1–4 with 8–12 flowers. Female solitary, axillary. Drupes ellipsoid, *c.* 1 cm across, yellow, subtended by the enlarged foliaceous tepals, *c.* 2 cm long.

Fl. & Fr.: March–June.

Habitat: Scrub Forests and Damp Forests.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Ashun Chua, Bhaibhoni Ghatti; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33871, 34591 (CAL).

URTICACEAE

Pouzolzia Gaudich

Pouzolzia zeylanica (L.) Benn., Pl. Jav. Rar. 1: 67. 1838; H.O. Saxena & Brahmam, Fl. Orissa 3: 1749. 1995. *Parietaria zeylanica* L., Sp. Pl.: 1052. 1753. *P. indica* L., Mant. Pl.: 128. 1767. *Pouzolzia indica* (L.) Gaudich., Voy. Uranie 12: 503. 1830; Hook.f., Fl. Brit. India 5: 581. 1888; Gamble, Fl. Madras: 1382. 1928.

Herb, to 50 cm high. Leaves alternate, ovate-elliptic, 1.5–3 × 1–2 cm, rounded at base, acute at apex, sparsely strigose. Flowers unisexual, in axillary, subsessile clusters; male flowers 3–4 mm across; tepals 4, ovate-lanceolate, 1.5–2 mm long, sparsely villous; stamens 4; female flowers: tepals connate. Achenes 2-winged.

Fl. & Fr.: August–November.

Habitat: Damp or marshy areas.

Distribution: India: Throughout. KWLS: Nuasai; common.

Specimens examined: R. Saravanan & K.A. Sujana 33734, 36437 (CAL).

ORCHIDACEAE

Key to the Genera

- | | |
|--|-------------------------|
| 1a. Terrestrial or saprophytic plants | 2 |
| 1b. Epiphytic or lithophytic plants | 3 |
| 2a. Racemes 50–60 cm long; flowers white or pinkish | 5. Geodorum |
| 2b. Scapes to 16 cm long, 2-flowered; flowers brown-purple | 6. Nervillia |
| 3a. Plants pseudobulbous; pseudobulbs often elongated and stem-like | 4 |
| 3b. Plants without pseudobulbs | 5 |
| 4a. Leaves thick–coriaceous, 20–25 cm long; inflorescence lateral; lip with calli or keels at base | 3. Cymbidium |
| 4b. Leaves thin, not exceeding 15 cm in length; inflorescence terminal; lip without calli or keels | 2. Bulbophyllum |
| 5a. Column not prolonged into a foot or if prolonged; foot indistinct | 6 |
| 5b. Column prolonged into distinct foot | 8 |
| 6a. Side lobes of lip large | 9. Vanda |
| 6b. Side lobes of lip small | 7 |
| 7a. Spur without any callosities inside | 1. Acampe |
| 7b. Spur with thickening inside | 4. Dienia |
| 8a. Interior of saccate spur with calli and a vertical septum dividing it into 2 vertical chambers | 7. Pelatantheria |
| 8b. Spur without callus or septum inside | 8. Rhyncostylis |

1. Acampe Lindl.

Acampe praemorsa (Roxb.) Blatt. & McCann, J. Bombay Nat. Hist. Soc. 35: 495. 1932; Abraham & Vatsala, Introd. Orchids: 450. 1981; H.O. Saxena & Brahmam, Fl. Orissa 3: 1771. 1995.

Local Names: *Gaccho-janaya*, *Kano-kato*.

Epiphytic shrub, 20–50 cm high. Leaves distichous, linear, 12–20 × 2–3 cm, sheathing, apex unequally 2-lobed, coriaceous. Flowers in corymbs, 0.8–1 cm across; sepals ovate-lanceolate, 0.8–1 × 0.3–0.5 cm, cream-yellow with reddish brown transverse bands; lip ovate-lanceolate, c. 8 × 4 mm, 3-lobed, margins crispate, fleshy, cream-white, red-streaked, saccate at base; spur short. Capsules to 4 cm long, cylindrical, ribbed.

Fl. & Fr.: April–December.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Assam, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura. KWLS: Jodachua Ghatti, Kanchipaani, Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34427, 35689, 35804 (CAL).

2. *Bulbophyllum* Thouars

Bulbophyllum careyanum (Hook.) Spreng., Syst. Veg. 3: 732. 1826; Hook.f., Fl. Brit. India 5: 760. 1890; Sathish & Manilal, Orchid Memor.: 168. 2004; H.O. Saxena & Brahmam, Fl. Orissa 3: 1778. 1995.

Epiphytic herb; pseudobulbs globose ovoid or oblong. Leaf oblong or linear-oblong, 10–20 × 2.5–5 cm. Scape 7–12 cm long, many-sheathed. Flowers in racemes, 6–8 mm long, orange-yellow or greenish, more or less spotted or suffused with red-brown or purple, sometimes almost all blue-purple, decurved; sepals oblong-ovate, acute; petals broadly ovate, aristate, 1-veined; auricled of shortly stipitate lip subentire; columnar spurs long-aristate; anthers 2-celled; pollinia 4 (2 rarely suppressed).

Fl. & Fr.: October–December.

Habitat: Mixed Forests.

Distribution: India: Arunachal Pradesh, Assam, Kerala, Manipur, Meghalaya. KWLS: Kuldiha Pahad; rare.

Note: Rare in Odisha.

Specimen examined: R. Saravanan & K.A. Sujana 34457 (CAL).

3. *Cymbidium* Sw.

Cymbidium aloifolium (L.) Sw., Nov. Acta Regiae Soc. Upsal. 6: 73. 1799; Hook.f., Fl. Brit. India 6: 8. 1890; Gamble, Fl. Madras: 1436. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1790. 1995.

Robust epiphytic herb. Leaves oblong, 30–35 × 1.5–2 cm, obtuse. Flowers in lax slender racemes, pendulous; sepals linear-lanceolate, c. 25 × 5 mm, acute, 7-veined; petals oblong-lanceolate, c. 20 × 6 mm, acute, 5-veined; lip 3-lobed, c. 17 × 10 mm; lateral lobes obliquely oblong, obtuse; midlobe ovate, acute.

Fl. & Fr.: May–April.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Karnataka, Kerala, Maharashtra, Meghalaya, Sikkim, Uttar Pradesh. KWLS: Bhaibhoni Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34438 (CAL).

4. *Dienia* Lindl.

Dienia ophrydis (J. Koenig) Seidenf., Contr. Orchid Fl. Thailand 13: 18 1997. *Malaxis latifolia* Sm. in Rees, Cyclop. 22: No. 3. 1812; H.O. Saxena & Brahmam, Fl. Orissa 3: 1843. 1995.

Stout herb with leafy stem, 5–15 cm high, covered with large dry sheaths, 2.5–7.5 cm long below, base tuberous. Leaves sessile or short-petioled, elliptic, rarely ovate or lanceolate, 6.2–17.5 cm long, rounded at base. Racemes dense, 5–10 cm long; flowers *c.* 5 mm long; perianth *c.* 2.5 mm long, pale dirty reddish or yellow and greenish; lip subquadrately ovate, 3-lobed. Capsules 7.5–10 mm long, obscurely ridged between ribs.

Fl. & Fr.: October–December.

Habitat: Grasslands.

Distribution: India: Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Himachal Pradesh, Karnataka, Kerala, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Uttarakhand. KWLS: Jodachua Ghatti; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34898 (CAL).

5. *Geodorum* Andrews

Geodorum densiflorum (Lam.) Schltr., Feddes Repert. 4: 259. 1919; Gamble, Fl. Madras: 1437. 1928; Abraham & Vatsala, Introd. Orchids: 327. 1981; H.O. Saxena & Brahmam, Fl. Orissa 3: 1812. 1995.

Local Names: *Guttika Mul*, *Tejraj*.

Terrestrial herb, 60–70 cm high; pseudobulbs ovoid, *c.* 5 × 2.5 cm. Leaves elliptic-oblong or lanceolate, 30–50 × 7–10 cm, acuminate. Flowers in raceme, 50–60 cm long, from the base of the pseudobulb, white or pinkish; dorsal sepal oblanceolate-oblong, *c.* 13 × 4.5 mm, acute to apiculate, 5-veined; lateral sepals elliptic-oblong, *c.* 13 × 5 mm, acute, 7-veined; petals oblanceolate, *c.* 12.5 × 6 mm, obtuse; lip cymbiform, faintly bilobed.

Fl. & Fr.: June–October.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Panchalingeshwar Pahad, Pancharjuna Rasta; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33959, 35778 (CAL).

6. *Nervilia* Comm. ex Gaudich.

Nervilia plicata (Andr.) Schltr. in Engl., Bot. Jahrb. Syst. 45: 403. 1911; Gamble, Fl. Madras: 1458. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1848. 1995.

Tubers subglobose, *c.* 1.5 × 2 cm, white. Leaf sessile, orbicular, *c.* 7 × 6 cm, cordate at base, margins wavy, obtuse at apex, hairy, green with purple blotches. Scape to 16 cm long, 2-flowered; sepals and petals similar, oblong to lanceolate, *c.* 20 × 4 mm, acute, brownish; lip elliptic, *c.* 18 × 10 mm, margins wavy, obtuse, dark violet.

Fl. & Fr.: June–July.

Habitat: Moist Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Karnataka, Kerala, Maharashtra, West Bengal. KWLS: Champo-Soro; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35805 (CAL).

7. *Pelatantheria* Ridl.

Pelatantheria insectifera (Reichb. f.) Ridley, J. Linn. Soc. 32: 373. 1896; Seidnf. & Arora, Nordic J. Bot. 3: 23. 1982.

Small epiphyte with elongate creeping stem. Leaves 2-farious, oblong, 1.2–5 × 1–1.5 cm, amplexicaul, obtusely bilobed, coriaceous, keeled. Flowers few, in corymbs, c. 1.5 cm long, shortly peduncled, pink (lip pink, central part yellow, side lobes brown); lateral sepals broadly oblong, c. 5 mm long, slightly falcate, green with brown streak each side; petals similar to the sepals; lip c. 1 cm long, fleshy, base with a saccate spur; column short, 2-horned; pollinia round, waxy, strongly attached by caudicle to a broad membranous gland.

Fl. & Fr.: May–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Uttar Pradesh. KWLS: Ampada, Nuarasta Chowk; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34359, 34486 (CAL).

8. *Rhynchostylis* Blume

Rhynchostylis retusa (L.) Blume, Bijdr.: 286. 1825; Hook.f., Fl. Brit. India 6: 32. 1890; Haines, Bot. Bihar Orissa 3: 1178. 1924; Gamble, Fl. Madras: 1440. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1869. 1995.

Epiphyte, to 40 cm high. Leaves lorate, to 30 × 2 cm, obliquely bilobed with a mucro in between rounded lobules. Flowers violet pink, closely packed in 30–40 cm long raceme; sepals and petals similar; petals oblong-ovate, c. 6 × 3 mm, obtuse; lip oblong, pink, claw deeply inflexed, cuneiform; spur c. 5 mm long, laterally compressed, emarginate, puberulous inside; column short; pollinia 2, globose, with long caudicle.

Fl. & Fr.: May–December.

Habitat: Moist Deciduous Forests.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura, Uttarakhand, West Bengal. KWLS: Bhaibhoni Ghatti, Nandugutta; common.

Specimens examined: R. Saravanan & K.A. Sujana 35688, 35839 (CAL).

9. Vanda Jones ex R. Br.

Vanda tessellata (Roxb.) Hook. ex D. Don in Loud., Hort. Brit.: 372. 1830; Gamble, Fl. Madras: 1445. 1928; Haines, Bot. Bihar Orissa 3: 1096. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1879. 1995.

Scandent epiphytic shrub. Leaves 2-ranked, oblong, to 15 × 2.2 cm, recurved, conduplicate, 2-lobed, base sheathing, coriaceous, closely packed. Flowers in axillary racemes, c. 5 cm across, greenish yellow outside, inner tessellate with brown spots; petals to 5 cm long; lip bluish dotted with purple, 3-lobed; side lobes c. 7 mm long; spur conical, c. 5 mm long; column c. 5 mm long.

Fl. & Fr.: August–March.

Habitat: Dry and Moist Deciduous Forests, also in the plains.

Distribution: India: Throughout. KWLS: Guajhari Chowk, Panchalingeshwar Pahad; common.

Specimens examined: R. Saravanan & K.A. Sujana 34812, 35803 (CAL).

ZINGIBERACEAE

Key to the genera

- | | |
|---|----------------------|
| 1a. Plants with stem; lateral staminodes adnate to labellum; anther-crest elongated, embracing the style | 2. Zingiber |
| 1b. Plants without stem; lateral staminodes free from the labellum; anther with or without a crest, not embracing the style | 1. Kaempferia |

1. Kaempferia L.

Kaempferia angustifolia Roscoe, Trans. Linn. Soc. London 8: 351 1807; Haines, Bot. Bihar Orissa 3: 1137. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1906. 1995.

Stemless herb; rootstock tuberous. Leaves lanceolate, 15–20 × c. 2.5 cm, contemporaneous with the flowers. Spikes central, radical, c. 5 cm long. Staminodes oblong, 1.2–1.8 cm long, erect, white. Labellum deeply cut into two obovate lobes, lilac. Anther-crest quadrate with suborbicular lobes.

Fl. & Fr.: April–June.

Habitat: Mixed forests.

Distribution: India: Sikkim, West Bengal. KWLS: Rangamatia; common.

Specimen examined: R. Saravanan & K.A. Sujana 36551 (CAL).

2. Zingiber Mill.

Zingiber zerumbet (L.) Sm., Exot. Bot. 2: 105. 1804; Baker in Hook.f., Fl. Brit. India 6: 247. 1892; Gamble, Fl. Madras: 1490. 1928; H.O. Saxena & Brahmam, Fl. Orissa 1: 445. 1995; M. Sabu, Zingiberac. Costac. S. India: 247, f. 66. 2006.

Local Name: *Pinecone Ginger*.

Rhizomatous herb. Leafy stem to 1.2 m high. Leaves oblong or oblong-lanceolate, 15–35 × 4–7.5 cm, obtuse at base, acuminate at apex, pubescent beneath. Spikes ovoid or oblong, 5–8 × 3.5–6 cm. Calyx tube 1–1.5 cm long, 3-lobed. Corolla to 2.5 cm long, dorsal lobe ovate-acuminate. Labellum *c.* 2 × 2 cm, 3-lobed; mid-lobe suborbicular; lateral lobes ovate, *c.* 1.2 cm long. Capsules oblongoid, 2–2.5 × *c.* 1 cm; seeds globose, 2–3 mm.

Fl. & Fr.: April–June.

Habitat: Moist areas in mixed forests.

Distribution: India: Throughout. KWLS: Nandu Ghatta Rasta; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34399 (CAL).

COSTACEAE

Hellenia Retz.

Hellenia speciosa (J. Koenig) S.R. Dutta, Pleione 7: 228. 2013. *Banksea speciosa* J. Koenig in Retz., 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; Gamble, Fl. Madras: 1490. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1893. 1995; M. Sabu, Zingiberac. Costac. S. India: 259, f. 70. 2006.

Herb, 1.5–2.5 m high, rhizomatous. Leaves spiral, oblong or oblanceolate-oblong, 8–24 × 3–7 cm, abruptly acuminate at apex, hairy beneath. Spikes terminal, globose, elongated on age, 4–9 × 2–5 cm; corolla lobes elliptic-oblong, to 4 × 0.8 cm, white; labellum suborbicular, 5–8 cm, white with a creamy-yellow median band. Stamen median, on an oblong petaloid process. Capsules 2.5–3 × 2–2.5 cm, bright red; seeds 6–8 mm, black, white-fleshy arilate.

Fl. & Fr.: July–December.

Habitat: Mixed forest.

Distribution: India: Throughout. KWLS: Ampada Nala, Kuldiha Pahad; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33725, 35782 (CAL).

AMARYLLIDACEAE

Key to the genera

- 1a. Ovules 1 or 2 in each cell
2a. Ovules many in each cell

- 1. Crinum**
2. Pancratium

1. Crinum L.

Crinum asiaticum L., Sp. Pl.: 292. 1753; Hook.f., Fl. Brit. India 6: 280. 1892; Gamble, Fl. Madras: 1504. 1928; Haines, Bot. Bihar Orissa 3: 1180. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1920. 1995.

Local Name: *Arsa*.

Herb, bulbous; bulbs globose, 10–12 cm. Leaves oblong, 70–100 × 1.5–8.5 cm, flat, gradually tapering at apex, coriaceous. Scapes to 30 × 1–2 cm; umbels 10–17 cm long, 30(–50)-flowered; flowers to 16.5 × 10 cm; perianth salver-shaped; lobes oblong-linear, to 7 × 1.2 cm, white. Ovary 3-celled; ovule(s) 1 or 2.

Fl. & Fr.: May–July.

Habitat: Grasslands near water courses.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Andheri Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 33848 (CAL).

2. Pancratium L.

Pancratium triflorum Roxb., Fl. Ind. 2: 126. 1832; Hook.f., Fl. Brit. India 6: 285. 1892; Gamble, Fl. Madras: 1505. 1928.

Local Name: *Ku-Kanda*.

Bulbous herb; bulbs globose, to 5 cm. Leaves linear-lanceolate, 12–22 × 1–2 cm, flat, subacute at apex, thin-coriaceous. Scapes to 40 cm high. Flowers 2–8 in scapose umbels, c. 3 cm across, white; perianth funnel-shaped, tube to 2 cm long, lobes 6, linear, c. 2 cm long. Stamens 6. Ovary oblong, 5–6 mm long, 3-locular; ovules many. Capsules subglobose.

Fl. & Fr.: May–July.

Habitat: Deciduous Forests.

Distribution: India: Andhra Pradesh, Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu, West Bengal. KWLS: Champo-Soro; common.

Specimen examined: R. Saravanan & K.A. Sujana 36506 (CAL).

HYPOXIDACEAE

Key to the genera

- 1a. Hypanthium produced above the ovary into an elongated beak **1. Curculigo**
1b. Hypanthium not produced above the ovary **2. Molineria**

1. *Curculigo* Gaertn.

Curculigo orchioides Gaertn., Fruct. Sem. Pl. 1: 63. 1788; Hook.f., Fl. Brit. India 6: 279. 1892; Haines, Bot. Bihar Orissa 3: 1112. 1924; C.E.C. Fisch. in Gamble, Fl. Madras: 1502. 1928; H.O. Saxena & Brahmam, Fl. Orissa 4: 1935. 1995.

Local Names: *Kovaakand*, *Mania Kanda*, *Talmuli*.

Herb, to 20 cm high, tuberous. Leaves subsessile, lanceolate, 10–15 × c. 2 cm, base sheathing, plicate, pilose. Perianth lobes 6, oblong-elliptic, 5–8.5 mm long, sparsely pilose outside, yellow. Stamens 6. Berries oblongoid, 1.5–2 cm long, green; seeds subglobose, c. 1.5 mm, beaked, black.

Fl. & Fr.: May–July.

Habitat: Open or shade localities in mixed deciduous forests.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35613 (CAL).

2. *Molineria* Colla

Molineria trichocarpa (Wight) N.P. Balakr., J. Bombay Nat. Hist. Soc. 63: 330. 1967. *Hypoxis trichocarpa* Wight, Icon. Pl. Ind. Orient. 6: 22, t. 2045. 1853. *Curculigo trichocarpa* (Wight) Bennet & Raizada, Indian J. Forest. 4: 68. 1981; H.O. Saxena & Brahmam, Fl. Orissa 3: 1936. 1995.

Herb, to 50 cm high, tuberous. Leaves elliptic-lanceolate, 23–30 × 3–5 cm, attenuate at base, acuminate at apex, plicate. Racemes 4–8 cm long; bisexual flowers towards base; male towards apex. Perianth lobes oblong-obtuse, c. 7 mm long, villous outside, yellow. Stamens 6. Berries oblongoid, c. 1 cm long; seeds globose, beaked, reticulate, black.

Fl. & Fr.: July–October.

Habitat: Damp and moist localities.

Distribution: India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu. KWLS: Jodachua Ghatti; common.

Specimens examined: R. Saravanan & K.A. Sujana 33709, 34802 (CAL).

ASPARAGACEAE

Key to the genera

- | | |
|---|------------------------|
| 1a. Leaves reduced to small non-photosynthetic, often spinescent scales; cladodes present | 1. Asparagus |
| 1b. Leaves well-developed, always green; cladodes absent | 2 |
| 2a. Rootstock a bulb or corm | 4. Drimia |
| 2b. Rootstock small with fibrous, fleshy or tuberous roots | 4 |
| 3a. Fruits normally opening capsule | 2. Chlorophytum |
| 3b. Fruits a berry | 3. Dracaena |

1. Asparagus L.

Asparagus racemosus Willd., Sp. Pl.: 152. 1799; Hook.f., Fl. Brit. India 6: 316. 1892; Gamble, Fl. Madras: 1517. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1958. 1995.

Local Names: *Chhataori, Gaichero, Hateri Kanda.*

Woody perennial climber, often spinescent, with fascicled tuberous roots. Cladodes from the axils of scale leaves in clusters of 2–6, linear-falcate, 0.8–1.5 × 0.1–0.3 cm, acute at apex, slightly triquetrous. Flowers in axillary, solitary or clustered racemes, 2.5–5 cm long; perianth lobes 6, oblong, *c.* 3 × 0.5 mm, acute, white. Stamens 6. Berries globose, 4–6 mm, purple; seeds 2–5, globose, *c.* 2 mm.

Fl. & Fr.: September–December.

Habitat: Moist Deciduous Forests.

Distribution: India: Throughout India. KWLS: Bhaibhoni Ghatti, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 34318, 35764 (CAL).

2. Chlorophytum Ker Gawl.

Key to the species

- | | |
|--|---------------------------|
| 1a. Racemes continuous; bracts oblong-lanceolate, apex acute | 1. C. arundinaceum |
| 1b. Racemes interrupted, flowering at top; bracts elliptic, apex rounded | 2. C. tuberosum |

1. Chlorophytum arundinaceum Baker, J. Linn. Soc., Bot. 15: 323. 1876; Hook.f., Fl. Brit. India 6: 333. 1892; Haines, Bot. Bihar Orissa 3: 1098. 1924; Gamble, Fl. Madras 1526. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1960. 1995.

Local Names: *Jhinka, Saphed Musali.*

Scapigerous herb, tuberous. Leaves lanceolate-acuminate, to 15 × 3 cm. Scapes to 40 cm long; flowers in pairs; tepals 6, oblong, *c.* 8 mm long, white. Stamens 6. Capsules 3-lobed; seeds orbicular, rugose.

Fl. & Fr.: March–December.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Uttar Pradesh, West Bengal. KWLS: Panchalingeswar; common.

Specimen examined: R. Saravanan & K.A. Sujana 35616 (CAL).

2. Chlorophytum tuberosum (Roxb.) Baker, J. Linn. Soc., Bot. 15: 332. 1876; Hook.f., Fl. Brit. India 6: 334. 1892; Gamble, Fl. Madras: 1526. 1928.

Leaves ensiform, 15–25 × 1–1.5 cm, sheathing. Scapes 25–35 cm long; flowers towards tip of spike, white. Capsules oblongoid, 1–1.5 × 0.8–1 cm, triquetrous; seeds 3–3.5 mm long, irregularly pitted.

Fl. & Fr.: March–December.

Habitat: Mixed Forests.

Distribution: India: Andhra Pradesh, Assam, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Panchalingeswar; common.

Specimen examined: R. Saravanan & K.A. Sujana 35617 (CAL).

3. *Dracaena* Vand.

Dracaena terniflora Roxb., Fl. Ind. 2: 159. 1832; Hook.f., Fl. Brit. India 6: 328. 1892; Gamble, Fl. Madras: 1521. 1928; Haines, Bot. Bihar Orissa 3: 1089. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1930. 1995.

Local Name: *Rakthakhai*.

Subshrub. Leaves spiral, elliptic-lanceolate, to 24 × 5.5 cm, acuminate at apex, closely packed. Flowers in closely packed terminal racemes, 15–25 cm long, erect; perianth lobes 6, c. 2 cm long. Stamens 6. Berries c. 1.5 cm across, 3-lobed.

Fl. & Fr.: May–June.

Habitat: Moist Deciduous Forest.

Distribution: India: Andhra Pradesh, Assam, Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Bonun Chowk, Panchalingeswar; common.

Specimens examined: R. Saravanan & K.A. Sujana 34594, 35841 (CAL).

4. *Drimia* Jacq. ex Willd.

Drimia indica (Roxb.) Jessop, J. S. African Bot. 43: 272. 1977. *Scilla indica* Roxb., Fl. Ind. 2: 147. 1832. *Urginea indica* Kunth, Enum. Pl. 4: 333. 1843; Hook.f., Fl. Brit. India 6: 347.

1892; Gamble, Fl. Madras: 1527. 1928; Haines, Bot. Bihar Orissa 3: 1096. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1968. 1995.

Local Names: *Banpyoj*, *Banuli*.

Scapigerous, bulbous herb; bulbs globose-conical, 2.5–6.5 cm across. Leaves linear, lanceolate or lorate, 13–25 × 0.6–2.5 cm. Scapes 17–45 cm long, 4–15-flowered, reddish green or dull green; perianth lobes 6, linear-oblong, 0.8–1 × 0.3–0.4 cm, subacute. Stamens 6. Capsules 10–20 × 5–10 mm, brownish yellow; seeds 4–10 per cell, 4–7 × 3–4 mm, winged.

Fl. & Fr.: March–July.

Habitat: Dry Deciduous Forests, and in plains.

Distribution: India: Andhra Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra. KWLS: Nuasai; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35796 (CAL).

SMILACACEAE

Smilax L.

Key to the species

- | | |
|-------------------------------------|---------------------------------|
| 1a. Stems unarmed; umbels solitary | 1. <i>S. lanceifolia</i> |
| 1b. Stems armed; umbels more than 1 | 2 |
| 2a. Branches terete | 2. <i>S. guianensis</i> |
| 2b. Branches 4-angled | 3. <i>S. zeylanica</i> |

1. *Smilax guianensis* Vitman, Summa Pl. 5: 422. 1791; Hook.f., Fl. Brit. India 6: 310. 1892; H.O. Saxena & Brahmam, Fl. Orissa 3: 1972. 1995. *S. macrophylla* Roxb., Fl. Ind. 3: 793. 1832; Hook.f., Fl. Brit. India 6: 310. 1892.

Climber with prickles. Leaves ovate-oblong or ovate-lanceolate, 6–12 × 3–6.5 cm, rounded or cordate at base, acute to short-cuspidate, coriaceous, tendril from either side of petiole. Flowers in 1–3 umbels, axillary; perianth lobes 6, oblong, *c.* 7 mm long, greenish; stamens in male flowers 6; ovary in female flowers 3-lobed, 3-celled; ovules 1 or 2 per cell; style 3-fid; staminodes 3–6. Berries 0.8–1 × 0.6–0.8 cm; seeds 1–3, globose, 3–4 mm.

Fl. & Fr.: April–July.

Habitat: Moist Deciduous Forests.

Distribution: India: Assam, Karnataka, Kerala, Meghalaya, Odisha and West Bengal. KWLS: Kuldiha Pahad; common.

Specimen examined: R. Saravanan & K.A. Sujana 34522 (CAL).

2. *Smilax lanceifolia* Roxb., Fl. Ind. 3: 792. 1832; Hook.f., Fl. Brit. India 6: 308. 1892; Haines, Bot. Bihar Orissa 3: 1087. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1971. 1995

Local Name: *Ramdantuni*.

Climber. Leaves lanceolate to ovate-oblong, 6–17 × 2–8 cm; petiole 1–2.5 cm long, narrowly winged; tendrils usually present. Flowers 20–30, in umbels, basally prophyllate; peduncle 1–1.5 cm long, proximally articulate. Male flowers: perianth lobes 3–4.5 × c. 1 mm, yellowish green; stamens 3–4 mm long; female flowers: perianth lobes 1.5–2 × c. 0.6 mm; staminodes 6. Berries globose, 6–7 mm, yellowish red to black.

Fl. & Fr.: April–July.

Habitat: Moist Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Madhya Pradesh, Nagaland, Tamil Nadu, West Bengal. KWLS: Bhaibhoni Ghatti; common.

Note: Endangered in Odisha.

Specimen examined: R. Saravanan & K.A. Sujana 34312 (CAL).

3. *Smilax zeylanica* L., Sp. Pl.: 1029. 1753; Hook.f., Fl. Brit. India 6: 309. 1892; Gamble, Fl. Madras: 1518. 1928; Haines, Bot. Bihar Orissa 3: 1088. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1972. 1995.

Climber with prickles. Leaves ovate-oblong, 6–10 × 3–5 cm, rounded at base, cuspidate at apex, coriaceous, 3–5-costate from base; petioles to 2 cm long, tendril from either side of petiole. Umbels axillary, 1–3. Flowers unisexual; perianth lobes 6, oblong, c. 5 mm long, green; stamens in male flowers 6; ovary in female flowers 3-lobed, 3-celled; ovules 1 or 2 per cell; style 3-fid; staminodes 3–6. Berries subglobose, c. 1 cm; seeds 1–3, globose, 2–2.5 mm.

Fl. & Fr.: April–January.

Habitat: Moist Deciduous Forests.

Distribution: India: Arunachal Pradesh, Assam, Karnataka, Kerala, Tamil Nadu. KWLS: Jodachua Beat Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 33927 (CAL).

DIOSCOREACEAE

Dioscorea L.

Key to the species

- | | |
|--------------------------|---|
| 1a. Leaves 3–5-foliolate | 2 |
| 1b. Leaves simple | 3 |

- | | |
|--|--------------------------|
| 2a. Fertile stamens 6; staminodes 0 | 4. D. hispida |
| 2b. Fertile stamens 3; staminodes 3 | 5. D. pentaphylla |
| 3a. Stems twining to the left | 2. D. bulbifera |
| 3b. Stems twining to the right | 4 |
| 4a. Stems glabrous | 5 |
| 4b. Stems densely pubescent, woody | 6. D. pubera |
| 5a. Stems prominently winged and angled; axis of male flowers zigzag | 3. D. hamiltonii |
| 5b. Stems not winged and angled; axis of male flowers not zigzag | 1. D. alata |

1. Dioscorea alata L., Sp. Pl.: 1033. 1753; Hook.f., Fl. Brit. India 6: 296. 1892; Gamble, Fl. Madras: 1512. 1928; Haines, Bot. Bihar Orissa 3: 1122. 1922; H.O. Saxena & Brahmam, Fl. Orissa 3: 1944. 1995.

Local Names: *Khambo-alu, Kham-alu*.

Twiner, tuberous one to several; stems twining to right, 4 or 5-winged; bulbils globose or obpyriform. Leaves opposite, ovate or deltoid-ovate, 7–18 × 4–10 cm, cordate or subsagittate at base, acuminate at apex; male flowers in paniculate spikes, flowers *c.* 1.5 mm long; tepals broadly ovate, 1–1.5 mm long, obtuse; stamens 6; pistillode conical; female spikes solitary; ovary *c.* 3 mm long; staminodes 6. Capsules broadly obcordate, 2–2.5 mm long.

Fl. & Fr.: October–December.

Habitat: Mixed forest, and also planted.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti, Nandugutta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33742, 33943, 34571 (CAL).

2. Dioscorea bulbifera L., Sp. Pl.: 1033. 1753; Hook.f., Fl. Brit. India 6: 296. 1892; Gamble, Fl. Madras: 1511. 1928; Haines, Bot. Bihar & Orissa 3: 1122. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1946. 1995.

Local Names: *Pita-alu, Pita Kanda*.

Vine, tuberous, twining to left. Leaves ovate-suborbicular, 9–25 × 8–23 cm, cordate at base, acuminate to short-caudate at apex, membranous, basally 9–11-ribbed; bulbils frequent in leaf axils and inflorescence; male flowers in axillary paniced spikes, pendulous, to 18 cm long; perianth lobes 6, linear-oblong, *c.* 2.5 mm long, light green; stamens 6; female spikes 1–3 together; staminodes 3. Capsules oblong, 1.5–2.3 × 1–1.5 cm, 3-winged.

Fl. & Fr.: August–December.

Habitat: Mixed forest, and also planted.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 35756 (CAL).

3. *Dioscorea hamiltonii* Hook.f., Fl. Brit. India 6: 295. 1892; Gamble, Fl. Madras: 1512. 1928; Haines, Bot. Bihar Orissa 3: 120. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1949. 1995.

Local Names: *Palru, Suta-alu*.

Vine with angled stems. Leaves ovate or lanceolate, to 11 × 5 cm, truncate or cordate at base, acuminate at apex, basally 7-ribbed; male flowers in slender axillary spikes, to 12 cm long; perianth lobes ovate, *c.* 1.5 mm long; stamens 6; female spikes to 2 cm long. Fruits orbicular, *c.* 2.2 × 3 cm, glabrous.

Fl. & Fr.: September–February.

Habitat: In valleys.

Distribution: India: Andhra Pradesh, Assam, Bihar, Jharkhand, Karnataka, Kerala, Sikkim. KWLS: Bhaibhoni Ghatti, Panchalingeshwar; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 34408, 35710 (CAL).

4. *Dioscorea hispida* Dennst., Schlüssel Hortus Malab. 15, 20, 33. 1818; Gamble, Fl. Madras: 1511. 1928; H.O. Saxena & Brahmam, Fl. Orissa 3: 1949. 1995.

Local Names: *Bainya-alu, Kolo*.

Vine, twining to the left. Leaves 3–5-foliolate; leaflets obovate, to 17 × 12 cm, cuneate at base, abruptly acuminate at apex, thinly hispid along veins beneath, prominently 5-ribbed; lateral leaflets gibbous at base. Flowers in axillary panicles, to 45 cm long.

Fl. & Fr.: September–February.

Habitat: Moist Deciduous Forest.

Distribution: India: Andhra Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Karnataka, Kerala, Maharashtra, Uttar Pradesh. KWLS: Nuarasta Chowk, Parchondi; common.

Specimens examined: R. Saravanan & K.A. Sujana 33727, 35716 (CAL).

5. *Dioscorea pentaphylla* L., Sp. Pl.: 1032. 1753; Hook.f., Fl. Brit. India 6: 281. 1892; Gamble, Fl. Madras: 1511. 1928; Haines, Bot. Bihar Orissa 3: 1123. 1924; H.O. Saxena & Brahmam, Fl. Orissa 3: 1951. 1995.

Local Names: *Karba, Karwa, Pittalo Kanda*.

Climber, tuberous, twining to left, usually armed with prickles; bulbils frequent at leaf axils. Leaves 3–5-foliolate; leaflets elliptic-ovate, 3.5–8 × 2.5–5 cm, acute or attenuate at base, acute at apex, glabrous or pubescent beneath; male flowers in axillary or terminal spikes, tomentose; perianth lobes 6, ovate or lanceolate, 1–1.5 mm long, tomentose, greyish; stamens 3; staminodes 3; female spikes solitary, tomentose; perianth lobes 6, ovate, *c.* 1 mm long. Capsules oblong, *c.* 2 cm long, 3-winged, glabrescent.

Fl. & Fr.: October–December.

Habitat: Mixed Forest, also planted.

Distribution: India: Andhra Pradesh, Bihar, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Maharashtra, Uttar Pradesh. KWLS: Balianal, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 35718, 36450 (CAL).

6. *Dioscorea pubera* Blume, Enum. Pl. Javae 1: 21. 1827; H.O. Saxena & Brahmam, Fl. Orissa 3: 1952. 1995.

Local Names: *Chekka-alu, Dang-alu, Kosa Kanda*.

Vine, twining to the right. Leaves very rarely alternate, broadly elliptic, to 7×3.5 cm, abruptly acuminate at apex, 5-ribbed; male spikes solitary or 2 or 3 together, *c.* 12×4 mm, drooping; peduncle to 12 cm long, densely tomentose; perianth lobes ovate, obtuse, glabrous; anthers oblong.

Fl. & Fr.: October–December.

Habitat: Mixed Forest.

Distribution: India: Assam, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Uttar Pradesh. KWLS: Panchalingeshwar Pahad; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35716 (CAL).

PONTEDERIACEAE

Monochoria C. Presl

Monochoria vaginalis (Burm.f.) C. Presl ex Kunth, Enum. Pl. 4: 134. 1843; Haines, Bot. Bihar Orissa 3: 1101. 1924; Gamble, Fl. Madras: 1529. 1931; H.O. Saxena & Brahmam, Fl. Orissa 3: 1977. 1995.

Local Name: *Mirmira*.

Semiaquatic herb, 15–45 cm high. Leaves obovate, $3-8 \times 1.5-4.5$ cm, cordate at base, abruptly acuminate at apex, thin-coriaceous. Inflorescence terminal raceme, to 9 cm long. Flowers *c.* 2 cm across; perianth campanulate, deeply lobed, deep blue. Stamens 6. Capsules oblong, to 1×0.8 cm; seeds many, oblong, *c.* 6 mm long, ribbed, transversely striated.

Fl. & Fr.: August–November.

Habitat: Ponds and marshy places.

Distribution: India: Almost throughout. KWLS: Pancharjuna Rasta; occasional.

Specimens examined: R. Saravanan & K.A. Sujana 33823, 36456 (CAL).

COMMELINACEAE

Key to the genera

- | | |
|--|---------------------|
| 1a. Inflorescence a cyme | 2 |
| 1b. Inflorescence a panicle or flowers in an irregular cluster | 3 |
| 2a. Bracts foliar; bracteoles 2-seriate, second; petals connate into a tube; fertile stamens 6, hairy | 2. Cyanotis |
| 2b. Bracts spathaceous; bracteoles neither 2-seriate, nor second; petals free; fertile stamens 3, glabrous | 1. Commelina |
| 3a. Fertile stamens 6; inflorescences dense, many-flowered | 3. Floscopa |
| 3b. Fertile stamens 3; inflorescences lax, few-flowered | 4. Murdannia |

1. *Commelina* L.

Key to the species

- | | |
|---|----------------------------|
| 1a. Seeds appendaged | 1. C. appendiculata |
| 1b. Seeds not appendaged | 2 |
| 2a. Capsules 2-valved, the dorsal cell indehiscent, deciduous; seeds adnate to the cell | 2. C. erecta |
| 2b. Capsules subequally 3-valved; seeds free in the cells | 3 |
| 3a. Seeds dark brown, smooth | 3. C. paleata |
| 3b. Seeds leadcoloured, margin marbelled | 4. C. paludosa |

1. *Commelina appendiculata* C.B. Clarke, *Commelyn. Cyrtandr. Bengal.*: 13. 1874; Hook.f., *Fl. Brit. India* 6: 374. 1892; Haines, *Bot. Bihar Orissa* 3: 1076. 1924; H.O. Saxena & Brahmam, *Fl. Simli-pahar*: 170. 1989; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1984. 1995.

Diffusely branched herb, 30–90 cm high. Leaves sessile, linear or narrowly lanceolate, 6–15 × 0.6–1.5 cm, narrowed at ends, hairy or nearly glabrous. Spathes ovate-lanceolate or lanceolate, 3.5–7 × c. 1.5 cm, broadly cordate at base, caudate-acuminate at apex, copiously minutely dotted outside, hairy inside. Flowers blue. Capsules c. 6 mm long, 2-valved and 2-celled; seeds oblongoid, 3.5–4 mm across, smooth with membranous appendages at ends.

Fl. & Fr.: May.

Habitat: Wet places.

Distribution: India: Assam, Odisha and West Bengal. KWLS: Guajhari, Parchondi; common.

Specimens examined: R. Saravanan & K.A. Sujana 33550, 33800, 35742 (CAL).

2. *Commelina erecta* L., *Sp. Pl.*: 41. 1753; H.O. Saxena & Brahmam, *Fl. Orissa* 3: 1986. 1995.

Decumbent herb, to 40 cm high. Leaves narrowly elliptic-lanceolate, 8–12 × c. 2.5 cm, scabrid. Spathes c. 1 × 2 cm, acute on one side. Flowers 2–4 in cymes, few in a spathe,

blue. Stamens 3, one anther shorter than other. Capsules 3-celled; seeds oblongoid, *c.* 4 × 3 mm, powdery.

Fl. & Fr.: August–December.

Habitat: Wet places.

Distribution: India: Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Uttar Pradesh. KWLS: Champo-Soro; common.

Specimen examined: R. Saravanan & K.A. Sujana 35776 (CAL).

3. *Commelina paleata* Hassk. in Miq., Pl. Jungh.: 139. 1852; Hook.f., Fl. Brit. India 6: 372. 1892; Gamble, Fl. Madras: 1540. 1931.

Herb. Leaves lanceolate, *c.* 8 × 1 cm, acuminate at apex. Spathes ovate-acuminate, *c.* 3.5 × 1.8 cm. Flowers blue. Stamens 3. Capsules oblongoid, *c.* 6 × 4 mm, constricted in the middle and pointed; seeds *c.* 2.8 mm long.

Fl. & Fr.: August–December.

Habitat: Wet and marshy places.

Distribution: India: Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Kenduna; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36473 (CAL).

4. *Commelina paludosa* Blume, Enum. Pl. Jav. 1: 2. 1827; H.O. Saxena & Brahmam, Fl. Orissa 3: 1989. 1995.

Diffuse herb. Leaves lanceolate, 8–13 × 3–4 cm, acute or acuminate at apex, scabrous or soft-villous; sheaths to 2 cm, mouth rufous-haired. Spathes infundibular, cordate at base, to 2 × 1.5 cm. Flowers to 1 cm across, solitary in terminal heads, blue. Capsules *c.* 4 mm long, trigonous; seeds 3.

Fl. & Fr.: August–January.

Habitat: Damp areas in forests.

Distribution: India: Andhra Pradesh, Assam, Himachal Pradesh, Karnataka, Kerala, Maharashtra, West Bengal. KWLS: Kanchipaani; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34805 (CAL).

2. *Cyanotis* D. Don

Cyanotis axillaris (L.) D. Don, Prodr. Fl. Nepal.: 46. 1825; Hook.f., Fl. Brit. India 6: 388. 1892; Gamble, Fl. Madras: 1550. 1931.

Fleshy decumbent, glabrous herb, rooting at lower nodes. Leaves linear, 3–7 × 0.5–0.8 cm, acute or acuminate at apex. Flowers in axillary cymose clusters, enclosed within the leaf sheath, violet-blue. Stamens 6. Capsules oblongoid, 5–6 mm long, beaked; seeds 6, oblongoid, *c.* 2 mm, pitted.

Fl. & Fr.: July–January.

Habitat: Damp and moist localities.

Distribution: India: Almost throughout. KWLS: Bhaibhoni Ghatti. Rangamatiya; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33827, 34419, 36418 (CAL).

3. *Floscopa* Lour.

Floscopa scandens Lour., Fl. Cochinch.: 193. 1790; Hook.f., Fl. Brit. India 6: 390. 1892; Gamble, Fl. Madras: 1522. 1931; H.O. Saxena & Brahmam, Fl. Orissa 3: 1994. 1995.

Creeping or suberect herb. Leaves scattered, elliptic-lanceolate, 5–10 × 2–1.5 cm, acuminate at apex. Panicles 3–6 cm long, pubescent; sheaths tubular, mouth oblique, hairy. Flowers rose-coloured. Stamens 6. Capsules broadly ovoid; seeds ellipsoid, wrinkled, grey.

Fl. & Fr.: June–November.

Habitat: Marshy localities.

Distribution: India: Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Maharashtra, Manipur, Tamil Nadu, Uttar Pradesh, West Bengal. KWLS: Bonun Chowk, Jodachua Pond; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34824, 34860 (CAL).

4. *Murdannia* Royle, *nom. cons.*

Key to the species

- | | |
|----------------------------------|-------------------------------|
| 1a. Leaves in basal rosette | 1. <i>M. edulis</i> |
| 1b. Leaves basal and cauline | 2 |
| 2a. Capsules globose, beaked | 3. <i>M. japonica</i> |
| 2b. Capsules globose, not beaked | 3 |
| 3a. Seeds deeply pitted | 4. <i>M. nudiflora</i> |
| 3b. Seeds echinate | 2. <i>M. gigantea</i> |

1. *Murdannia edulis* (Stokes) Faden, Taxon 29: 77. 1980; H.O. Saxena & Brahmam, Fl. Orissa 3: 1995. 1995.

Herb. Leaves in basal rosette, linear-ensiform, 6.2–25 × 0.7–2.5 cm, acuminate at apex. Scapes to 50 cm long, leafless, appearing before or with the young leaves. Flowers in panicles, purple-blue. Capsules ellipsoid, *c.* 6 mm long, mucronate, trigonous; seeds 1-seriate, 3–6 superposed in each cell, brown, with minutely reticulate glandular epidermis.

Fl. & Fr.: April–May.

Habitat: Damp localities in forest.

Distribution: India: Bihar, Goa, Jharkhand, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh. KWLS: Soro; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35628 (CAL).

2. *Murdannia gigantea* (Vahl) Brueck. in Engl. & Prantl, Nat. Pflanzenfam. 15: 173. 1930; H.O. Saxena & Brahmam, Fl. Orissa 1: 445. 1995.

Herb. Leaves cauline and radical, linear-lanceolate, radical leaves 20–40 × 1–3 cm; cauline leaves 10–20 × 1–1.5 cm, broadly sheathing, acuminate at apex. Flowers in long-peduncled, racemose panicles. Stamens 3; staminodes 3; filaments bearded. Capsules *c.* 1 × 0.5 cm; seeds echinate.

Fl. & Fr.: April–May.

Habitat: Deciduous forests.

Distribution: India: Assam, Karnataka, Kerala, Maharashtra, West Bengal. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 33720 (CAL).

3. *Murdannia japonica* (Thunb.) Faden, Taxon 26: 142. 1977; H.O. Saxena & Brahmam, Fl. Orissa 3: 1996. 1995.

Herb, tuberous. Leaves basal and cauline, sessile, ovate, to 23 × 6 cm, cordate at base, acute at apex, coriaceous. Panicles to 20 × 10 cm, terminal, lax. Flowers solitary or 2 or 3 together, pale blue or white. Stamens 3, filaments bearded; staminodes 2-lobed, bearded. Capsules globose, beaked; seeds *c.* 2 × 1 mm, trigonous, with two round markings, tuberculate or reticulate, dark brown.

Fl. & Fr.: August–October.

Habitat: Deciduous forests.

Distribution: India: Assam, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu. KWLS: Panchalingeswar, Parchonidi; common.

Specimens examined: R. Saravanan & K.A. Sujana 35664, 35800 (CAL).

4. *Murdannia nudiflora* (L.) Brenan, Kew Bull. 1952: 189. 1952; H.O. Saxena & Brahmam, Fl. Orissa 3: 1997. 1995.

Procumbent herb, rooting at lower nodes. Leaves sessile, linear or linear-lanceolate, 6–11 × 0.5–1.2 cm, rounded at base, acute or acuminate at apex. Flowers in terminal and axillary few-flowered, subcorymbose panicles, bluish purple. Staminal filaments bearded;

staminodes 3, filaments bearded or not. Capsules globose, 2.5–3.7 mm; seeds 2 per locule, cuboid, *c.* 1 mm, deeply pitted.

Fl. & Fr.: August–November.

Habitat: Damp localities in forests.

Distribution: India: Assam, Kerala. KWLS: Nuasai; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36439 (CAL).

ARECACEAE

Phoenix L.

Key to the species

1a. Stems short, *c.* 30 cm high

1b. Stems tall, 10–16 m high

1. **P. acaulis**

2. **P. sylvestris**

1. Phoenix acaulis Buch.-Ham. ex Roxb., Fl. Ind. 3: 783. 1832; Becc. & Hook.f. in Hook.f., Fl. Brit. India 6: 426. 1892; Haines, Bot. Bihar Orissa 3: 882. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 2023. 1996.

Stems very short, thick and ovoid, not more than 30 cm high and about as broad as high, covered with the persistent petiole bases or stem 0. Leaves 0.6–1.8 cm long; leaflets stiff, more or less fascicled and in different planes, 25–50 × 0.7–1.8 cm, finely acuminate, lowest reduced to strong spines, 5–15 cm long. Spadix 15–25 cm long in flower, elongating to 30–90 cm in fruit, suberect. Drupes oblong-ellipsoid, 1.2–1.5 cm long, orange-red, finally black.

Fl. & Fr.: April–June.

Habitat: Open and dry forests.

Distribution: India: Throughout India except Jammu & Kashmir, Himachal Pradesh, Sikkim, Arunachal Pradesh. KWLS: Jodachua Ghatti, Nuarasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34329, 34821 (CAL).

2. Phoenix sylvestris (L.) Roxb., Fl. Ind. 3: 787. 1832; Becc. & Hook.f. in Hook.f., Fl. Brit. India 6: 425. 1892; Haines, Bot. Bihar Orissa 3: 881. 1924; Gamble, Fl. Madras: 1559. 1931; H.O. Saxena & Brahmam, Fl. Orissa 4: 2025. 1996.

Local Names: *Khajuri, Khejur.*

A graceful palm 10–16 m high, with a large crown and rough trunk covered with persistent leaf bases. Leaves 3–4.5 m long, with a few short spines at base; pinnules numerous, linear, 15–45 × 2–2.5 cm, ending in short points. Flowers in spadix: male flowers

white, female greenish; fruiting spadix *c.* 90 cm long. Berries oblong-ellipsoid 2.5–3.2 cm long, orange-yellow when ripe; seed *c.* 1.7 cm long, grooved with rounded ends.

Fl. & Fr.: May–October.

Habitat: Open Forests.

Distribution: India: Throughout India. KWLS: Kuldiha FRH, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33791, 33864, 35870 (CAL).

ARACEAE

Key to the genera

- | | |
|---|--------------------------|
| 1a. Terrestrial creepers | 5. Raphidophora |
| 1b. Terrestrial herbs | 2 |
| 2a. Leaves trichotomously decompound | 2. Amorphophallus |
| 2b. Leaves simple or pedately or pinnately compound | 3 |
| 3a. Leaves pedately compound | 3. Arisaema |
| 3b. Leaves simple, peltate or hastate | 1. Alocasia |

1. *Alocasia* (Schott) G. Don

Alocasia fornicata (Roxb.) Schott, Oesterr. Bot. Wochenbl. 4: 410. 1854; Hook.f., Fl. Brit. India 6: 526. 1893; Haines, Bot. Bihar Orissa 3: 870. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 2035. 1996.

Perennial herb, to 10 cm long. Leaves 2–5 together, ovate, 30–44 × 20–25 cm, acute at apex, shortly peltate; petioles to 45 cm long, canaliculate, sheathing. Peduncles 2–4 together, to 40 cm long, slender; spathe 12–14 cm long, yellow; tubular part *c.* 5 cm long; limb ovate, acuminate; spadix 10–12 cm long, pistillate lower part *c.* 1.5 cm long, sterile middle portion *c.* 2 cm long, staminate part *c.* 2 cm long; appendix *c.* 6 cm long.

Fl. & Fr.: June–September.

Habitat: Along streams under shade.

Distribution: India: Andhra Pradesh, Assam, Karnataka, Kerala. KWLS: Jodachua Pond; common.

Specimens examined: R. Saravanan & K.A. Sujana 33778, 34551 (CAL).

2. *Amorphophallus* Blume ex Decne.

Key to the species

- | | |
|---|----------------------------|
| 1a. Spathe 17–18 cm long differentiated into a basal tube and an upper limb | 1. A. commutatus |
| 1b. Spathe 38 cm across campanulate | 2. A. paeoniifolius |

1. *Amorphophallus commutatus* (Schott) Engl. in A. & C. DC., Monogr. Phan. 2: 319. 1879; Hook.f., Fl. Brit. India 6: 515. 1893.

Local Names: *Olkunda, Olua*.

Herb, cormous. Leaves tripartitely compound, to 50 m long; leaflets elliptic, caudate-acuminate at apex, membranous; petioles to 50 cm long. Peduncles 8–10 cm long, yellowish; cataphylls 4; spathe ovate-acute, 17–18 × 4–5 cm, differentiated into a basal tube and an upper limb separated by a slight constriction; spadix to 25 cm long; female zone *c.* 1.5 cm long; male zone *c.* 3 cm long; appendix narrowly conical, 18–20 cm long, yellowish brown.

Fl. & Fr.: April–November.

Habitat: Moist Deciduous Forests.

Distribution: India: Goa, Karnataka, Kerala, Maharashtra. KWLS: Pahadi Rasta; rare.

Note: Endemic to Western Ghats.

Specimen examined: R. Saravanan & K.A. Sujana 34566 (CAL).

2. *Amorphophallus paeoniifolius* (Dennst.) Nicolson, Taxon 26: 337. 1977, var. ***paeoniifolius*** Sivad., Taxon 32: 128. 1983; H.O. Saxena & Brahmam, Fl. Orissa 4: 2038. 1996.

Local Names: *Goda garia, Olaka*.

Herb, cormous; corms depressed-globose, to 20 cm across, tubercled, pale pink inside. Lamina 70–120 cm across; lobes ovate, to 14 × 5.5 mm, acuminate at apex; petioles to 50 cm long, green with brown patches. Spathe campanulate, *c.* 38 cm across, undulate, dull greenish brown; spadix as long as spathe; appendage obovoid, 20–25 cm across, rugose, deep pink. Flowers on the lower half of the spadix. Berries obovoid, *c.* 15 × 10 mm, orange-red.

Fl. & Fr.: April–November.

Habitat: Cultivated often near villages.

Distribution: India: Assam, Karnataka, Kerala, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh. KWLS: Kaimagudi, Nilgiri Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33625, 35765 (CAL).

3. *Arisaema* Mart.

Arisaema tortuosum (Wall.) Schott in Schott & Endl., Melet. Bot. 1: 17. 1832; Hook.f., Fl. Brit. India 6: 502. 1893; Haines, Bot. Bihar Orissa 3: 863. 1924; Gamble, Fl. Madras: 1584. 1931; H.O. Saxena & Brahmam, Fl. Orissa 4: 2040. 1996.

Local Name: *Bhaiabimula*.

Herb, cormous; corms 2–3 cm across. Leaflets 8–10, oblanceolate, 8–12 × 3–4 cm, abruptly acuminate at apex, sparsely hispid beneath; petioles to 35 cm long. Peduncles usually shorter than the petiole; spathe 8–12 cm long, green; limb ovate, acuminate, white and purple-streaked; tube 4–6 cm long; spadix 12–18 cm long, sigmoidally curved; appendage narrow.

Fl. & Fr.: July–November.

Habitat: Open hill forests.

Distribution: India: Andhra Pradesh, Arunachal Pradesh, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttarakhand. KWLS: Nuasai; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35795 (CAL).

4. *Rhaphidophora* Hassk.

Rhaphidophora pertusa (Roxb.) Schott, *Bonplandia* 5: 45. 1857; Hook.f., *Fl. Brit. India* 6: 546. 1893; Gamble, *Fl. Madras*: 1598. 1931; H.O. Saxena & Brahmam, *Fl. Orissa* 4: 2051. 1996.

Climber. Leaves broadly ovate, 25–35 × 25–30 cm, pinnatisect or rarely entire, apex acute; petioles 20–35 cm long, channelled. Inflorescence solitary, axillary; spathe ovate-oblong, to 20 × 8 cm, concave, creamy white; spadix *c.* 12 × 2 cm. Flowers unisexual, densely packed; male flowers above; stamens 4–6; female flowers basal; ovary obconical, 1-celled, 1-ovuled.

Fl. & Fr.: August–September.

Habitat: Semi-evergreen Forests.

Distribution: India: Karnataka, Kerala, Tamil Nadu. KWLS: Panchalingeswar; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35775 (CAL).

ERIOCAULACEAE

Eriocaulon L.

Key to the species

- 1a. Male flowers with 3 sepals; cells of seed coat transversely elongated **1. *E. quinquangulare***
1b. Male flowers with 2 sepals; cells of seed coat vertically elongated **2. *E. truncatum***

1. *Eriocaulon quinquangulare* L., *Sp. Pl.*: 87. 1753; Hook.f., *Fl. Brit. India* 5: 582. 1893; C.E.C. Fisch. in Gamble, *Fl. Madras*: 1620. 1931; Haines, *Bot. Bihar Orissa* 3: 1068. 1924; H.O. Saxena & Brahmam, *Fl. Orissa* 4: 2085. 1996; R. Ansari & N.P. Balakr., *Family Eriocaulac. India*: 97, f. 41. 2009.

Acaulescent herb. Leaves falcate, to 6 × 0.6 cm, acuminate at apex, glabrous. Peduncles numerous, to 30 cm long; heads ovoid, c. 6 × 5 mm; male sepals truncate, united into a split sheath, minutely hairy, black; petal equal, hairy; anthers 6, black; female sepals 3, linear, equal, sparsely hairy, black; petals 3, spatulate, hoary with a black gland; seeds oblongoid or ovoid, appendages 2–4 from the transverse, radial walls.

Fl. & Fr.: May–January.

Habitat: Moist and damp localities.

Distribution: India: Throughout. KWLS: Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34373, 34871, 36460 (CAL).

2. Eriocaulon truncatum Bunch.-Ham. ex Mart. in Wall., Pl. Asiat. Rar. 3: 29. 1832; Hook.f., Fl. Brit. India 6: 578. 1893; Gamble, Fl. Madras: 1619. 1931; Haines, Bot. Bihar Orissa 3: 1070. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 2089. 1996; R. Ansari & N.P. Balakr., Family Eriocaulac. India: 110, f. 48. 2009.

Acaulescent herb. Leaves rosulate, oblong-lanceolate, to 5 × 0.6 cm, acuminate at apex. Peduncles many, to 15 cm long, virgate; heads hemispherical, c. 4 mm across, white or straw-coloured; male sepals connate, obovate, to 1.5 mm long, 2-lobed, black; petals 3, subequal, ovate, hairy, with a black gland; anthers 6, oblong, black; female sepals oblong or linear, free, to 1.5 mm long; petals 3, spatulate, subequal, c. 1.2 mm long, free, sparsely hoary with a black gland; seeds oblongoid or ovoid, c. 0.5 mm long, pale yellow; appendages ribbon-like bands.

Fl. & Fr.: May–January.

Habitat: Moist and damp localities.

Distribution: India: Throughout. KWLS: Jodachua Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34876 (CAL).

CYPERACEAE

Key to the genera

- | | |
|---|-----------------------------|
| 1a. Contraligule present; florets unisexual | 8. Scleria |
| 1b. Contraligule absent; florets bisexual | 2 |
| 2a. All leaves reduced to sheaths | 3 |
| 2b. Leaves well-developed | 4 |
| 3a. Inflorescence a pseudolateral head or corymbose | 7. Schoenoplectiella |
| 3b. Inflorescence terminal | 2. Cyperus |
| 4a. Style 2-fid | 5 |
| 4b. Style 3-fid | 6 |

- | | |
|-----------------------------------|-------------------------|
| 5a. Rachilla deciduous as a whole | 5. Kyllinga |
| 5b. Rachilla persistent | 3. Diplacrum |
| 6a. Rachilla deciduous | 1. Actinoscirpus |
| 6b. Rachilla persistent | 7 |
| 7a. Style base persistent | 4. Fimbristylis |
| 7b. Style base deciduous | 6. Pycreus |

1. Actinoscirpus (Ohwi) R.W. Haines & Lye

Actinoscirpus grossus (L.f.) Goetgh. & D.A. Simpson, Kew Bull. 46(1): 171. 1991. *Scirpus grossus* L.f., Sp. Pl.: 104. 1782.

Stoloniferous perennial herb, c. 2 m high; culms sharply trigonous, edges scabrous, sides concave. Leaves 6–10 × 0.5–2.5 cm, greyish green, slightly revolute at margins, scabrous. Spikes ovoid, 3–7 × 2–4 mm; glumes cymbiform, 2.4–2.7 mm, margins narrowly fringed, rounded with short mucro, barbed, brown; perianth bristles slightly longer than fruit; stamens 3. Nuts widely obovoid, c. 1.5 × 1–1.2 mm, apiculate, finely papillose, glossy, brown.

Fl. & Fr.: July–November.

Habitat: Moist localities.

Distribution: India: Assam, Karnataka, Kerala, Maharashtra, Uttar Pradesh. KWLS: Champo-Soro; common.

Specimen examined: R. Saravanan & K.A. Sujana 35912 (CAL).

2. Cyperus L.

Key to the species

- | | |
|--|--------------------------|
| 1a. Spikeletsspically arranged | 2 |
| 1b. Spikelets digitately arranged | 4 |
| 2a. Spikelets 3–5 mm wide | 1. C. compressus |
| 2b. Spikelets narrower | 3 |
| 3a. Each spikelet maturing into 1 or 2(–3) nuts only | 2. C. cyperoides |
| 3b. Each spikelet maturing into several to many nuts | 4. C. rotundus |
| 4a. Angles of the nut corky-thickened | 3. C. platystylis |
| 4b. Angles of the nut not corky-thickened | 5. C. tenuispica |

1. Cyperus compressus L., Sp. Pl.: 46. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 605. 1893; Gamble, Fl. Madras: 1640. 1931; Haines, Bot. Bihar Orissa 3: 896. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 2118. 1996.

Annual, 15–40 cm high. Leaves few, basal, linear, 10–25 × 0.2–0.4 cm, acuminate at apex, flat or folded. Inflorescence simple, 5–12 cm long an as wide; leafy bracts 2–5. Spikelets oblong to linear, 7–20 × 2.5–4 mm, compressed, greenish and turning straw-

coloured at full maturity; glumes ovate-mucronate, $3-4 \times 2-2.5$ mm, keeled, pale green; stamens 3. Nuts obovoid, *c.* 1.5×1 mm, triquetrous, apiculate, dark brown.

Fl. & Fr.: July–December.

Habitat: Wet and marshy areas.

Distribution: India: Throughout. KWLS: Nuasai, Pancharjuna Rasta: common.

Specimens examined: R. Saravanan & K.A. Sujana 33547, 36504 (CAL).

2. *Cyperus cyperoides* (L.) Kuntze, Revis. Gen. Pl. 3: 333. 1898; H.O. Saxena & Brahmam, Fl. Orissa 4: 2121. 1996. *Scirpus cyperoides* L., Mant. Pl. Altera: 181. 1771.

Stoloniferous herb. Leaves to 3.5×0.5 cm. Umbels terminal, rays usually 9; bracts 4–8, 5–25 cm long; spikelets 1-flowered, deciduous above the 2 basal glumes, leaving a knob; basal glumes *c.* 1×0.75 mm, distichous, nut bearing glumes *c.* 3 mm, 1-veined; stamens 3. Nut *c.* 2 mm long, brown.

Fl. & Fr.: June–September.

Habitat: Mixed Forests.

Distribution: India: Throughout. KWLS: Panchalingeshwar: common.

Specimen examined: R. Saravanan & K.A. Sujana 35615 (CAL).

3. *Cyperus platystylis* R. Br., Prodr.: 214. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 6: 598. 1893; Gamble, Fl. Madras: 1134. 1931; Haines, Bot. Bihar Orissa 3: 893. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 2124. 1996.

Perennial herb, 35–80 cm high; culms triquetrous. Leaves basal, linear, $32-70 \times 0.5-1$ cm, scabrid on margins and midrib, acuminate at apex, subcoriaceous. Inflorescence compound to decompound, corymbiform; primary rays 10–14. Spikelets digitate in groups of 3–7, linear-lanceolate, $6-15 \times 3-4$ mm, golden brown; glumes ovate-obtuse, $2-2.5 \times 1.5-2$ mm, mucronulate, brown; stamens 3. Nuts oblong-ovate, $1.5-2 \times 0.5-1$ mm, trigonous, brown.

Fl. & Fr.: April–February.

Habitat: Damp localities.

Distribution: India: Almost throughout. KWLS: Pancharjuna Pond; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34379 (CAL).

4. *Cyperus rotundus* L., Sp. Pl.: 45. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 6: 614. 1893; Gamble, Fl. Madras: 1641. 1931; Haines, Bot. Bihar Orissa 3: 903. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 2149. 1996.

Local Names: *Motha*, *Mutha*.

Perennial herb, tuberous-rhizomatous; culms 12–45 cm high, triquetrous. Leaves linear, 3–28 × 0.2–0.5 cm, acuminate. Inflorescence simple or compound, 2–11 cm across; primary rays to 8. Spikelets linear, 1–2.3 × 0.15–0.3 cm, acute, compressed, brown; glumes ovate-elliptic, 3–3.5 × 1.5–2 mm, keeled, ferruginous brown with pale narrow hyaline margins; stamens 3. Nuts obovate-oblong, 1–1.5 × c. 0.5 mm, trigonous, apiculate, brown.

Fl. & Fr.: June–September.

Habitat: Waste places.

Distribution: India: Throughout. KWLS: Ampada Nala, Jodachua; common.

Specimens examined: R. Saravanan & K.A. Sujana 33837, 34437 (CAL).

5. *Cyperus tenuispica* Steud., Syn. Pl. Glumac. 2: 11. 1855; Gamble, Fl. Madras: 1640. 1931; Haines, Bot. Bihar Orissa 3: 863. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 2155. 1996.

Annual; culms to 30 cm high, triquetrous. Leaves basal, linear, 5–20 × 0.2–0.3 cm, flat, scabrid on upper margins, acuminate. Inflorescence compound to decomposed, 5–12 cm long; primary rays 5–12. Spikelets digitate in clusters of 3–9, linear-oblong, 3–7 × 1–1.5 mm, flat; glumes ovate-oblong, 0.5–1 × c. 0.5 mm, obtuse-mucronate, straw-coloured; stamens 1 or 2. Nuts obovate, c. 0.5 mm long, trigonous, minutely tuberculate, white.

Fl. & Fr.: August–December.

Habitat: Wet places and paddy fields.

Distribution: India: Throughout. KWLS: Andheri Nala, Bulagadia, Nuarasta, Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33747, 34381, 34874, 36442 (CAL).

3. *Diplacrum* R. Br.

Diplacrum caricinum R. Br., Prodr. 1: 241. 1810; C.E.C. Fisch. in Gamble, Fl. Madras: 1678. 1931.

Annual, to 15 cm high; culms 3-angled. Leaves linear, 2–4 × 0.2–0.4 cm, scabrid on upper margins, acute. Inflorescence of several, small globular axillary clusters of 4–6 mm; spikelets with 3 or 4 glumes, lower glumes nearly setaceous; staminate glumes lanceolate, 1-veined; pistillate glumes ovate-lanceolate, strongly folded, c. 2.5 mm long, several-veined, greenish, 3-lobed; stamen 1. Nuts globose, c. 1 mm, irregularly ribbed, white.

Fl. & Fr.: September–November.

Habitat: Marshy localities.

Distribution: India: Andaman and Nicobar Islands, Karnataka, Kerala, Maharashtra. KWLS: Bonun Chowk; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 34864 (CAL).

4. *Fimbristylis* Vahl, *nom. cons.*

Key to the species

1a. Glumes exactly distichous	8. <i>F. thomsonii</i>
1b. Glumes spirally arranged	2
2a. Stigma 3	5. <i>F. falcata</i>
2b. Stigma 2	3
3a. Nuts coarsely rugulose	6. <i>F. lawiana</i>
3b. Nuts smooth or verruculose	4
4a. Leaves ligulate	5
4b. Leaves eligulate	6
5a. Nuts smooth, distinctly stipitate	7. <i>F. schoenoides</i>
5b. Nuts trabeculate or cancellate, usually shortly stipitate	4. <i>F. dichotoma</i>
6a. Spikelets larger, 2-4 mm wide	3. <i>F. cymosa</i>
6b. Spikelets small, 1-1.5 mm wide	7
7a. Inflorescence capitate, globose or semiglobose	2. <i>F. argentea</i>
7b. Inflorescence anthelate	1. <i>F. aestivalis</i>

1. *Fimbristylis aestivalis* Vahl, Enum. Pl. 2: 288. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 637. 1893; H.O. Saxena & Brahmam, Fl. Orissa 4: 2169. 1996.

Annual; culms 5–17 cm high, trigonous. Leaves few, basal, 3–8 × *c.* 0.1 cm, margins incurved, acuminate, sparsely pilose. Inflorescence laxly corymbose, 2–4 cm across; rays 3–7; spikelets solitary, oblong, 2.5–6 × 1–1.5 mm, acute, greenish brown; glumes spiral, ovate, *c.* 1 × 0.7 mm, yellow-brownish, keel excurrent into a straight or recurved cusp; stamen 1. Nuts obovate, *c.* 0.5 mm long, yellowish.

Fl. & Fr.: July–May.

Habitat: Marshy areas.

Distribution: India: Almost throughout. KWLS: Champo, Jodachua Pond, Nilgiri Rasta Pond, Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 35655, 35837, 35908, 36557 (CAL).

2. *Fimbristylis argentea* (Rottb.) Vahl, Enum. Pl. 2: 294. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 6: 640. 1893; C.E.C. Fisch. in Gamble, Fl. Madras: 1659. 1931; H.O. Saxena & Brahmam, Fl. Orissa 4: 2170. 1996. *Scirpus argenteus* Rottb., Descr. Icon. Rar. Pl.: 51. 1773.

Annual, 5–10 cm high; culms tufted, trigonous. Leaves linear, 3–10 × *c.* 0.1 cm, flat, involute. Spikelets in capitates, oblong-cylindric, 5–8 × 1–1.5 mm, obtuse, brown; glumes spiral, ovate, 1–1.5 mm long, acute, 3-veined, margins hyaline, yellowish; stamen 1. Nuts obovoid, biconvex, *c.* 0.5 mm long, obscurely vertically striate, yellowish.

Fl. & Fr.: July–May.

Habitat: Marshy areas.

Distribution: India: Asasam, Karnataka, Kerala, Maharashtra, Meghalaya, Uttar Pradesh. KWLS: Kuldiha Pahadi Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 35771 (CAL).

3. *Fimbristylis cymosa* R. Br., Prodr.: 228. 1810; H.O. Saxena & Brahmam, Fl. Orissa 4: 2174. 1995.

Perennial herb, tufted, 10–20 cm high; culms rigid, terete to triangular, deeply grooved, smooth. Leaves less than half of culm length, falcate, 1–1.5 mm across, mucronate, involute or flat, margins barbed towards apex. Spikelets ovoid, 2–5 × 1–2.5 mm, more or less terete, greyish brown to brown; glumes 1.8–2 × 1–1.2 mm, keeled, light brown, margins widely scarious; stamens 2. Nuts ovoid, lenticular, c. 0.8 × 0.6 mm, slightly rugulose, dark brown.

Fl. & Fr.: October–March.

Habitat: Marshy areas.

Distribution: India: Andaman and Nicobar Islands, Andhra Pradesh, Bihar, Jharkhand, Karnataka, Kerala, Maharashtra, Tamil Nadu, Uttar Pradesh. KWLS: Rangamatia, Soro; common.

Specimen examined: R. Saravanan & K.A. Sujana 36502 (CAL).

4. *Fimbristylis dichotoma* (L.) Vahl, Enum. Pl. 2: 287. 1805; C.E.C. Fisch. in Gamble, Fl. Madras: 1658. 1931; H.O. Saxena & Brahmam, Fl. Orissa 4: 2174. 1996. *Scirpus dichotomus* L., Sp. Pl. 1: 50. 1753.

Local Name: *Bada Swanli*.

Annual, tufted, 7–25 cm high; culms trigonous. Leaves shorter to somewhat longer than culms, 1–2 mm across, acuminate, scabrid at margins towards apex. Spikelets many, oblong-ovoid, 2.5–4 mm long, acute, angular; glumes ovate, 1.2–1.5 mm long, acute-mucronate, membranous, strongly keeled, green, margins hyaline; stamen 1. Nuts obovate, biconvex, 0.6–0.7 mm long, short-stipitate, trabeculate, stramineous.

Fl. & Fr.: July–November.

Habitat: Marshy areas.

Distribution: India: Throughout. KWLS: Bonun Chowk, Kanchi Paani; common.

Specimens examined: R. Saravanan & K.A. Sujana 33670, 33806, 34423 (CAL).

5. *Fimbristylis falcata* (Vahl) Kunth, Enum. Pl. 2: 239. 1837; H.O. Saxena & Brahmam, Fl. Orissa 4: 2176. 1996. *Scirpus falcatus* Vahl, Enum. Pl. 2: 275. 1806.

Perennial herb; culms 30–50 cm high, 4 or 5-angled. Leaves falcate, to 15 × 0.4 cm, basal, sheath rounded, closed. Umbel c. 10 × 6 cm; bracts 4 or 5, filiform, to 1 cm long. Spikelets 3–8 together, ovate, 5–7 × c. 2.5 mm, acute; glumes many, ovate, c. 3 × 2 mm, acute, 5-veined, reddish brown. Nuts trigonous, c. 1.2 × 1 mm, tubercled, reddish brown.

Fl. & Fr.: April–September.

Habitat: Marshy areas.

Distribution: India: Throughout. KWLS: Nuasai Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 35831 (CAL).

6. *Fimbristylis lawiana* (Boeckeler) J. Kern, Reinwardtia 4: 96. 1956. *Scirpus lawianus* Boeckeler, Linnaea 36(4): 497. 1870. *Fimbristylis digitata* Boeckeler, Flora 61: 35. 1878; C.B. Clarke in Hook.f., Fl. Brit. India 6: 648. 1894.

Annual or perennial herb, scapose. Leaves with or without ligule, upper, cauline, leaves short or, sometimes, present as bladeless sheaths only. Spikes solitary or geminate; glumes spirally arranged, to 40 or more; perianth bristles 0; stamens 1–3. Nuts lenticular or globose.

Fl. & Fr.: August–November.

Habitat: Marshy areas.

Distribution: India: Goa, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu. KWLS: Jodachua Ghatti Rasta; rare.

Note: New record to Odisha state.

Specimen examined: R. Saravanan & K.A. Sujana 34873 (CAL).

7. *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: 1658. 1931; H.O. Saxena & Brahmam, Fl. Orissa 4: 2185. 1996. *Scirpus schoenoides* Retz., Observ. Bot. 5: 14. 1788.

Annual or perennial herb, 25–50 cm high; culms slender, terete or compressed, deeply grooved, grey-green. Leaves c. 1/2 of culm length, involute at margins, resembling stem, flat, scabrous. Spikes 1–3, ovoid or ellipsoid, 5.4–6.2 × 3.8–4.2 mm; glumes cymbiform, 2.5–3 mm long, obtuse to acute at apex, yellowish brown, with 4–6 paler veins, glossy; stamens 3. Nuts obovoid, 1.5–2 × 1–1.2 mm, fine-reticulate, glossy, pale yellow-brown.

Fl. & Fr.: January–May.

Habitat: Marshy areas.

Distribution: India: Throughout. KWLS: Champo-Soro, Kaimagudi Pond; common.

Specimens examined: R. Saravanan & K.A. Sujana 36463, 36438 (CAL).

8. *Fimbristylis thomsonii* Boeckeler, Linnaea 37: 37. 1871.

Annual or perennial herb, often rhizomatous; culms usually tufted, slender, 3- or 5-angled or flattened. Leaves linear or rarely ensiform, usually compressed and canaliculate, often adaxially cellular-reticulate, sometimes reduced to a bladeless sheath. Spikelets solitary or fascicled, ovoid, ellipsoid or subglobose, terete or flat, with several to many flowers; glumes spirally imbricate, distichous; stamens 1–3. Nuts biconvex, reticulate or verruculose.

Fl. & Fr.: June–December.

Habitat: Marshy areas.

Distribution: India: Assam, Bihar, Maharashtra, Uttar Pradesh. KWLS: Ampada, Kuldiha FRH; occasional.

Specimen examined: R. Saravanan & K.A. Sujana 35625 (CAL).

5. *Kyllinga* Rottb.

Kyllinga brevifolia Rottb., Descr. Icon. Rar. Pl.: 13, t. 4, f. 3. 1773; C.B. Clarke in Hook.f., Fl. Brit. India 6: 588. 1893; Haines, Bot. Bihar Orissa 3: 897. 1924. *Cyperus brevifolius* (Rottb.) Hassk., Cat. Hort. Bot. Bogor.: 24. 1844; H.O. Saxena & Brahmam, Fl. Orissa 4: 2115. 1996.

Herb, rhizomatous; culms triquetrous, 3–40 cm long. Leaves 25–75 × 1.7–4.3 mm, canaliculated, scabrid on margins. Heads terminal, globose to ovoid, 6–10 mm across, white; involucre bracts 3 or 4, 2.5–10 cm long. Spikelets oblong or oblong-lanceolate, 1 or 2-flowered, 2–4 × c. 1 mm; glumes ovate, mucronate, scarious, 4–6 veins on either side; stamens 3. Nuts biconvex, ellipsoid, 1–1.5 mm long, obtuse-apiculate, yellowish brown.

Fl. & Fr.: May–October.

Habitat: Marshy areas.

Distribution: India: Throughout. KWLS: Jodachua Pond, Pancharjuna Pond; common.

Specimens examined: R. Saravanan & K.A. Sujana 33638, 33895, 34847, 34848 (CAL).

6. *Pycneus* P. Beauv.

Key to the species

- 1a. Culms 15–30 cm high; spikelets 0.7–1.5 × 0.25–0.35 cm, compressed
1b. Culms 7–18 cm high; spikelets 5–12 × 2–2.5 mm, flat

2. *P. sanguinolentus*
1. *P. pumilus*

1. *Pycneus pumilus* (L.) Nees, Linnaea 9: 283. 1835; C.B. Clarke in Hook.f., Fl. Brit. India 6: 591. 1893; Gamble, Fl. Madras: 1627. 1931. *Cyperus pumilus* L., Cent. Pl. 2: 6. 1756; H.O. Saxena & Brahmam, Fl. Orissa 4: 2146. 1996

Annual; culms 7–18 cm high, triquetrous. Leaves few, basal, linear, 5–12 × 0.1–0.2 cm, flat, acuminate at apex. Spikelets oblong, 5–12 × 2–2.5 mm, subacute at apex, flat, light greenish; glumes distichous, closely imbricate, ovate-obtuse, 1–1.5 × c. 1 mm, midvein excurrent into a distinct mucronate tip, sharply keeled; stamens 2. Nuts ellipsoid, to 1 × 0.5 mm, biconvex, apiculate, punctulate, brown.

Fl. & Fr.: August–December.

Habitat: Marshy areas.

Distribution: India: Throughout. KWLS: Kuldiha Pahadi rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34856 (CAL).

2. *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: 1627. 1931. *Cyperus sanguinolentus* Vahl, Enum. Pl. 2: 351. 1806; H.O. Saxena & Brahmam, Fl. Orissa 4: 2150. 1996.

Herb; culms 15–30 cm high, decumbent, rooting from lower nodes. Leaves 5–15 × 0.2–0.35 cm, flat; sheath c. 3 cm long, closed, mouth truncate. Umbels 1.5–6 cm long; bracts 3–5, unequal; rays 2–6, spreading. Spikelets compressed, 0.7–1.5 × 0.25–0.35 cm, acute; glumes 16–22 in each spikelets, c. 2.5 × 1.8 mm, obtuse, 5–7-veined. Nuts biconvex, c. 1.2 × 1 mm, reticulate, dark brown.

Fl. & Fr.: July–February.

Habitat: Marshy areas.

Distribution: India: Throughout. KWLS: Koimutiya Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 36461 (CAL).

7. *Schoenoplectiella* Lye

Key to the species

- | | |
|------------------------------------|---------------------------------|
| 1a. Stigmas shorter than the style | 1. <i>S. articulata</i> |
| 1b. Stigmas as long as the style | 2. <i>S. lateriflora</i> |

1. *Schoenoplectiella articulata* (L.) Lye, Lidia 6: 20. 2003. *Scirpus articulatus* L., Sp. Pl. 1: 47. 1753; C.E.C. Fisch. in Gamble, Fl. Madras: 1666. 1931.

Perennial herb, 25–35 cm high; culms terete, transversely septate, hollow, green. Leaves well-developed in young, base of the culms covered with 2 or 3 bladeless sheaths when old. Spikelets cylindrical, 8–15 × 3–4 mm, acute; glumes spiral, 4–5 × 3–4 mm, ovate-acute, many-veined, margins hyaline; hypogynous bristles absent; stamens 3. Nuts obovate, triquetrous, 1.5–1.8 × 1.2–1.3 mm, apiculate, inconspicuously wavy ridged, dark brown.

Fl. & Fr.: June–October.

Habitat: Marshy areas.

Distribution: India: Throughout. KWLS: Jodachua Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 34844 (CAL).

2. Schoenoplectiella lateriflora (Gmel.) Lye, Lidia 6: 25. 2003. *Scirpus lateriflorus* Gmel., Syst. Veg. 1: 127. 1791. *S. supinus* auct. non L. 1753: C.B. Clarke in Hook.f., Fl. Brit. India 6: 655. 1894; C.E.C. Fisch. in Gamble, Fl. Madras: 1666. 1931.

Annual, 10–40 cm high; culms tufted, smooth. Leaves reduced to bladeless sheaths; sheaths 2 or 3, 4–12 cm long, membranous, mouth truncate. Spikelets oblong-acute, 5–8 × 2–3 mm, straw-coloured; glumes spiral, ovate-acute, 1.5–2.5 × 1.5–2 mm, mucronate, 3-veined, margins hyaline; hypogynous bristles absent; stamens 3. Nuts obovoid, 1–1.5 × c. 1 mm, trigonous, apiculate, transversely wrinkled, black.

Fl. & Fr.: August–December.

Habitat: Marshy areas.

Distribution: India: Throughout. KWLS: Bulagadia; common.

Specimen examined: R. Saravanan & K.A. Sujana 35915 (CAL).

8. Scleria P.J. Bergius

Scleria laevis Retz., Observ. Bot. 4: 13. 1786; C.B. Clarke in Hook.f., Fl. Brit. India 6: 694. 1894; C.E.C. Fisch in Gamble, Fl. Madras: 1678. 1931; H.O. Saxena & Brahmam, Fl. Orissa 4: 2216. 1996

Perennial herb, to 1 m high; culms trigonous, scabrid. Leaves scattered all along culms, linear, 20–32 × 0.3–0.6 cm, margins scabrid, acute apex. Spikelets unisexual, in clusters of 2–4; male spikelets oblong, c. 4 mm long; female spikelets ovate, 5–7 mm long; glumes ovate-acute, c. 3 × 2 mm, 1-veined; stamens 3. Nuts globose, 2–3 mm, apiculate, white.

Fl. & Fr.: July–October.

Habitat: Damp areas in forests.

Distribution: India: Arunachal Pradesh, Assam, Bihar, Kerala, Meghalaya, Nagaland. KWLS: Ampada Nala, Kuajahari Nala; common.

Specimens examined: R. Saravanan & K.A. Sujana 34378, 35632 (CAL).

POACEAE

Key to the genera

- 1a. Spikelets 2-flowered, falling entire at maturity, usually with the upper floret bisexual and the lower male or barren and if the latter, often reduced to the lemma or rarely the lemma entirely absent, all alike or more often differing in size, shape and structure, frequently dorsally compressed 2

- 1b. Spikelets 1-many flowered, breaking up at maturity above the more or less persistent glumes, or if falling entire, then not 2-flowered, with the lower floret male or barren and the upper bisexual, usually more or less laterally compressed or terete or if 2-flowered and falling entire, the glumes and lemma all membranous 9
- 2a. Spikelets often paired, with one sessile and the other pedicelled, rarely solitary; glumes more or less rigid and firmer than the lemmas which are both hyaline and membranous. upper lemma usually awned 3
- 2b. Spikelets solitary or paired, more or less similar; glumes usually membranous; lower lemma mostly resembling the upper glume in texture; upper lemma usually awnless 4
- 3a. Spikelets of each pair similar, the sessile and the pedicelled bisexual; joints of the panicle thin, linear or somewhat expanded at the top **1. Apocopis**
- 3b. Spikelets in each pair dissimilar, the sessile bisexual, the pedicelled male or sterile, or completely absent; joints of the raceme and the pedicel thick and swollen **11. Heteropogon**
- 4a. Spikelets arranged in more or less open panicles, or with the panicles contracted and spike like 5
- 4b. Spikelets arranged in one-sided spikes or spike like racemes; spikes or racemes digitate or scattered, rarely solitary 6
- 5a. Spikelets distinctly gibbous and laterally much-compressed **6. Cyrtococcum**
- 5b. Spikelets not or only slightly gibbous **15. Panicum**
- 6a. Lower glume turned towards the rachis, the back of the upper lemma turned away from it, i.e. spikelets adaxial **3. Brachiaria**
- 6b. Lower glume (when present) turned away from the rachis of the raceme or spike, the back of upper lemma facing it, i.e. spikelets abaxial 7
- 7a. Lower glume usually 0; spikelets plano-convex **17. Paspalum**
- 7b. Lower glume developed, although sometimes small 8
- 8a. Glumes awnless, if acuminate, then with the upper lemma mucronate **16. Paspalidium**
- 8b. Glumes acuminate or awned, rarely acute; upper lemma not mucronate **14. Oplismenus**
- 9a. Shrubs or trees with woody often tall persistent culms **8. Dendrocalamus**
- 9b. Perennial or annual herbs 10
- 10a. Spikelets sessile or shortly pedicelled along one side of the rachis of solitary, digitate or scattered spikes, spike-like racemes or on opposite sides of the rachis of solitary spikes or racemes **5. Cynodon**
- 10b. Spikelets borne in open or contracted or spike like panicles less often in racemes or spikes 11
- 11a. Spikelets usually with 2 or more fertile florets, or with one fertile floret then with sterile reduced florets above it 12
- 11b. Spikelets with one fertile floret, with or without one or two male or barren florets below it, the latter often much reduced 15
- 12a. Lemmas usually 5 to many-veined **4. Centotheca**
- 12b. Lemma 1–3-veined 13
- 13a. Glumes aristate or aristate-acuminate **9. Dinebra**
- 13b. Glumes obtuse, acute or acuminate 14
- 14a. Spikelets in open, contracted or spike-like panicles **10. Eragrostis**
- 14b. Spikelets sessile or very short pedicelled, in digitate or racemosely arranged spikes or spike-like racemes **7. Desmostachya**

- 15a. Glumes minute or suppressed; fertile lemma and palea very similar in shape and texture **12. Leersia**
 15b. Glumes well developed; fertile lemma and palea not similar 16
 16a. Spikelets with 1 or 2 florets **20. Thysanolaena**
 16b. Spikelet with 1 fertile floret 17
 17a. Lemmas indurated or rigid at maturity, terete or dorsally compressed **2. Aristida**
 17b. Lemmas hyaline or membranous at maturity, rarely indurated, laterally compressed 18
 18a. Annuals; culms less than 30 cm long, erect **19. Sporobolus**
 18b. Perennials; culms more than 80 cm long, creeping or stoloniferous 19
 19a. Upper glume always 5–13-veined **18. Sacciolepis**
 19b. Upper glumes 5–7-veined **13. Ottochloa**

1. *Apocopis* Nees

Apocopis courtallumensis (Steud.) Henrard, *Blumea* 4: 524. 1941; H.O. Saxena & Brahmam, *Fl. Orissa* 4: 2244. 1996. *Andropogon courtallumensis* Steud., *Syn. Pl. Glumac.* 1: 377. 1854.

Culms tufted, geniculate, to 25 cm high. Leaves flat, 1–3.5 × 0.2–0.35 cm, densely tubercled-ciliate on both surfaces and margins; ligule membranous, to 0.2 cm long. Racemes paired, to 2.5 cm long. Spikelets to 5 mm long. Lower glume oblong-truncate, to 4.5 mm long, 7-veined, upper margin lacerate and ciliolate; upper glume lanceolate-oblong, to 0.5 cm long, sparsely ciliate at margin. Lower lemma to 4.7 mm long, scarious, paleate; upper lemma to 0.45 cm long, awn to 2 cm long.

Fl. & Fr.: July–October.

Habitat: Open Grasslands.

Distribution: India: Karnataka, Kerala, Tamil Nadu. Endemic. KWLS: Pancharjuna Rasta; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35683 (CAL).

2. *Aristida* L.

Aristida setacea Retz., *Observ. Bot.* 4: 22. 1786; Hook.f., *Fl. Brit. India* 7: 225. 1896; Haines, *Bot. Bihar Orissa* 3: 977. 1924; C.E.C. Fisch. in Gamble, *Fl. Madras*: 1809. 1934; H.O. Saxena & Brahmam, *Fl. Orissa* 4: 2250. 1996.

Local Name: *Ghora-lenji*.

Perennial. Culms 50–120 cm high, erect, tufted. Leaves linear or linear-lanceolate, 10–34 × 0.2–0.5 cm, rounded at base, acuminate at apex, convolute, glaucous. Panicles 15–35 cm long, contracted. Spikelets linear-lanceolate or lanceolate, 1–1.8 cm long. Glumes lanceolate, 7–12 × 0.5–1 mm, aristate, 1-veined; arista 2–4 mm long. Lemma linear, 8–12 × c. 1 mm, convolute, 3-awned, awns 1–3 cm long; palea small, hyaline. Stamens 3; anthers c. 3 mm long, yellow. Ovary linear, to 2 mm long; stigmas 3–4 mm long, pink.

Fl. & Fr.: August–February.

Habitat: Fairly common in open lands.

Distribution: India: Almost throughout, except northeastern region. KWLS: Kuldiha FRH, Panchalingeshwar; common.

Specimens examined: R. Saravanan & K.A. Sujana 33928, 35917 (CAL).

3. *Brachiaria* (Trin.) Griseb.

Brachiaria deflexa (Schumach.) C.E. Hubb. ex Robyns, Bull. Jard. Brux 9: 177. 1932; Bor Grass. Burma Ceylon India Pakistan: 281. 1960; H.O. Saxena & Brahmam, Fl. Orissa 4: 2275. 1996. *Panicum deflexum* Schumach., Beskr. Guin. Pl.: 63. 1827.

Erect or ascending herb, to 70 cm high. Leaves linear to oblong-lanceolate, 6–20 × 0.4–1.2 cm, acuminate. Racemes 4–9 cm long, alternate. Spikelets solitary, rarely paired, laxly scattered, elliptic-oblong to obovate, 3–3.5 mm long, apiculate. Glumes 5 or 7-veined.

Fl. & Fr.: July–September.

Habitat: Damp places.

Distribution: India: Andhra Pradesh, Bihar, Karnataka, Kerala, Maharashtra, Tamil Nadu. KWLS: Kaimagudi, Kenduna; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 36465 (CAL).

4. *Centotheca* Desv.

Centotheca lappacea (L.) Desv., Nouv. Bull. Soc. Philom. 2: 189. 1810; Hook.f., Fl. Brit. India 7: 332. 1896; C.E.C. Fisch. in Gamble, Fl. Madras: 1848. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2285. 1996. *Cenchrus lappaceus* L., Sp. Pl. ed. 2, 2: 1488. 1763.

Perennial. Culms 30–80 cm high, tufted. Leaves elliptic-lanceolate, 6–20 × 1.3–3.2 cm, acute or acuminate at apex. Panicles 8–20 cm long, pyramidal, lax. Spikelets elliptic-oblong, 5–8 mm long, 2 or 3-flowered. Glumes ovate-lanceolate, 2–3 × 1–1.5 mm, 5-veined. Lemmas oblong, 3–4 × 1–2 mm, 5–7-veined, tubercle-based bristles on margins. Paleas elliptic, c. 3 × 1 mm, 2-keeled. Stamens 2 or 3. Caryopsis obovoid, to 1.5 mm long.

Fl. & Fr.: September–December.

Habitat: Moist, shade places.

Distribution: India: Almost throughout. KWLS: Guajhari Nala; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34375 (CAL).

5. *Cynodon* Rich.

Cynodon dactylon (L.) Pers., Syn. Pl. 1: 85. 1805; Hook.f., Fl. Brit. India 7: 288. 1896; C.E.C. Fisch. in Gamble, Fl. Madras: 1835. 1934; Haines, Bot. Bihar Orissa 3: 966. 1924; H.O. Saxena & Brahmam, Fl. Orissa 4: 2313. 1996.

Local Names: *Dhubo*, *Duba*, *Dubbula ghanso*, *Dubghas*.

Slender, stoloniferous creeping perennials. Leaves linear-lanceolate, 1–10 × 0.1–0.5 cm, acuminate at apex, glaucous. Spikes terminal, 3 or 4 in digitate, 1-sided, oblong, to 5 cm long. Spikelets oblong-lanceolate, 2–3 mm long, 1-flowered. Stamens 3. Caryopsis *c.* 1 mm.

Fl. & Fr.: Throughout the year.

Habitat: Wet or waste places.

Distribution: India: Throughout. KWLS: Andheri Nala; common.

Specimen examined: R. Saravanan & K.A. Sujana 35911 (CAL).

6. *Cyrtococcum* Stapf

Cyrtococcum oxyphyllum (Steud.) Stapf in Hook., Ic. Pl. t. 3096. 1922; C.E.C. Fisch. in Gamble, Fl. Madras 1786. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2315. 1996. *Panicum oxyphyllum* Steud., Syn. Pl. Glumac. 1: 65. 1854.

Perennial or annual; culms 20–50 cm high, slender, trailing or erect, rooting from lower nodes. Leaves lanceolate, 5–15 × 0.2–1.5 cm, margins ciliate; ligule membranous. Panicles contracted, erect. Spikelets *c.* 1.5 × 1 mm, with short pedicels. Lower glumes ovate, *c.* 1 × 1 mm; upper larger. First lemma *c.* 1.5 × 1 mm, epaleate; second lemma *c.* 1 × 1 mm, 3-veined. Palea *c.* 1 × 0.5 mm, 2-veined.

Fl. & Fr.: August–December.

Habitat: Wet places, near streams.

Distribution: India: Almost throughout, except northern and northwestern parts. KWLS: Ampada Rasta, Bhaibhoni Ghatti; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33826, 34494 (CAL).

7. *Dendrocalamus* Nees

Key to the species

- 1a. Culms 30–35 m high
- 1b. Culms to 15 m high

- 1. ***D. giganteus***
- 2. ***D. strictus***

1. *Dendrocalamus giganteus* Wall. ex Munro, Trans. Linn. Soc. London 26: 150. 1868; Gamble, Ann. Roy. Bot. Gard. 7: 87. 1896.

Culms 30–35 m high; internodes rather short; culm sheaths to 50 cm long, deciduous, strigose with golden hairs. Leaves 13–38 × *c.* 9 cm, serrate, cuspidate-acuminate; ligules 5–13 cm long. Panicles large, branchlets slender, curved; spikelet clusters to 2.5 cm across. Spikelets ovate, 1–2 cm long, acute, several-flowered. Glumes 2 or 3, ovate, mucronate; florets 3–6. Lemmas 3–6, mucronate. Stamens 6. Caryopsis oblong, *c.* 6 mm long, hirsute at apex.

Fl. & Fr.: December–March.

Habitat: Often planted in gardens.

Distribution: India: Northeastern parts; also on cultivation in southern states. KWLS: Bonun Chowk, Kuldiha FRH Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 33572, 34894 (CAL).

2. Dendrocalamus strictus (Roxb.) Nees, *Linnaea* 9: 476. 1834; Hook.f., *Fl. Brit. India* 7: 404. 1897; C.E.C. Fisch. in Gamble, *Fl. Madras*: 1858. 1934; Haines, *Bot. Bihar Orissa* 3: 947. 1924; H.O. Saxena & Brahmam, *Fl. Orissa* 4: 2319. 1996.

Local Names: *Salia Banso*, *Salimbo Banso*.

Culms to 15 m high, unarmed. Leaves ovate-lanceolate, to 16 × 1.5 cm, long-acuminate, spinescent; ligule dentate. Heads of spikelets globose, to 2.5 cm; spikelets ovate, *c.* 6 mm long. Lower glume *c.* 4 mm long; upper glume ovate, *c.* 4.5 mm long. Lemmas 2, broadly ovate, *c.* 5 mm long, mucronate. Stamens 6; anthers oblong, *c.* 2.5 mm long.

Fl. & Fr.: December–March.

Habitat: Deciduous Forests.

Distribution: India: Throughout. KWLS: Jodachua Pond, Pancharjuna Pond; common.

Specimens examined: R. Saravanan & K.A. Sujana 33631, 33940, 35926 (CAL).

8. Desmostachya Stapf

Desmostachya bipinnata (L.) Stapf in Dyer, *Fl. Cap.* 7: 632. 1900; C.E.C. Fisch. in Gamble, *Fl. Madras*: 1818. 1934; H.O. Saxena & Brahmam, *Fl. Orissa* 4: 2321. 1996. *Briza bipinnata* L., *Syst. Nat.* ed. 10, 2: 875. 1759.

Local Name: *Kusa*.

Perennial; culms stout, to 1.2 m. Leaves to 65 × 1 cm, when unrolled; lower leaf sheaths leathery. Panicles to 60 cm long; spikes clustered or spaced, *c.* 14 cm long. Spikelets 3–17-flowered, ovate to linear-oblong, 3–10 mm long; lower glume 0.7–1.5 mm long, upper glume 1.1–2.0 mm long. Lemmas straw-coloured or suffused with purple, 1.8–2.7 mm long.

Fl. & Fr.: June–November.

Habitat: Damp areas.

Distribution: India: Throughout, except northeast. KWLS: Panchalingeshwar Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 35631 (CAL).

9. *Dinebra* Jacq.

Dinebra retroflexa (Vahl) Panz., Denkschr. Koenigl. Akad. Wiss. Muenchen: 270, t. 12. 1814; C.E.C. Fisch. in Gamble, Fl. Madras: 1841. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2343. 1996. *Cynosurus retroflexus* Vahl, Symb. Bot. 2: 20. 1791.

Culms 30–90 cm high, tufted. Leaves 7.5–25 × 0.25–0.75 cm, finely acuminate at apex, sparsely hairy. Panicles 10–30 cm long, with close or distant spikes. Spikes 1.2–5 cm long, alternate, opposite or whorled, green or yellow, at first erect, then spreading or deflexed. Spikelets close, imbricate. Glumes subequal, c. 5 mm long, aristate, rigid. Lemmas 2–2.5 mm long. Palea nearly as long. Caryopsis oblong, c. 1.2 mm long, 3-angled, acute, brown.

Fl. & Fr.: June–December.

Habitat: Wet places, near streams.

Distribution: India: KWLS: Panchalingeshwar Rasta; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35635 (CAL).

10. *Eragrostis* Wolf

Key to the species

- | | |
|--|------------------------------|
| 1a. Spikelets breaking up from above downwards; rachis fragile | 1. <i>E. tenella</i> |
| 1b. Spikelets breaking up from below upwards; rachis tough | 2. <i>E. unioides</i> |

1. *Eragrostis unioides* (Retz.) Nees ex Steud., Syn. Pl. Glumac. 1: 264. 1854; C.E.C. Fisch. in Gamble, Fl. Madras: 1826. 1934; Hook.f., Fl. Brit. India 7: 317. 1896; H.O. Saxena & Brahmam, Fl. Orissa 4: 2369. 1996. *Poa unioides* Retz., Observ. Bot. 5: 19. 1789.

Local Name: *Phur Phuri*.

Annual; culms tufted, 10–55 cm high. Leaves linear-lanceolate or lanceolate, 3–18 × 0.2–0.5 cm, rounded or shallowly cordate at base, acuminate at apex; sheaths to 5 cm long; ligules membranous. Panicles 5–15 cm long, lax. Spikelets broadly ovate or ovate-oblong, 4–6 × 2–4 mm, 10–32-flowered, purplish. Glumes lanceolate or ovate-lanceolate, 1–2 × 0.5–1 mm, 1-veined. Lemmas ovate, 1.5–2.5 × 1–1.5 mm, 3-veined. Paleas elliptic, 1–2 × c. 1 mm, 2-keeled. Stamens 3, violet. Caryopsis ellipsoid, c. 1 mm, reddish brown.

Fl. & Fr.: September–March.

Habitat: Wet places, plains, open grasslands.

Distribution: India: Almost throughout. KWLS: Ampada Nala, Jodachua Ghatti; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34492, 34878 (CAL).

2. *Eragrostis viscosa* (Retz.) Trin., Mem. Acad. Sci. Petersb. 1: 397. 1830; C.E.C. Fisch. in Gamble, Fl. Madras: 1826. 1934; Haines, Bot. Bihar Orissa 3: 957. 1924. H.O. Saxena & Brahmam, Fl. Orissa 4: 2370. 1996. *Poa viscosa* Retz., Observ. Bot. 4: 20. 1786.

Local Name: *Banka Sigarantha*.

Annual or perennial; culms 14–35 cm high. Leaves lanceolate, 3–9 × 0.2–0.4 cm, rounded or shallowly cordate at base, acuminate at apex; ligules membranous, fimbriate. Panicles oblong, 5–14 cm long, culms viscous below panicles. Spikelets oblong-lanceolate, 1–1.5 mm wide, pale yellow, 4–10-flowered. Glumes ovate-lanceolate, 0.5–1 mm long, 1-veined. Lemmas ovate-oblong, 1–1.5 × c. 0.5 mm, 3-veined. Paleas c. 1 × 0.5 mm, falcate, 2-keeled. Stamens 3. Caryopsis ellipsoid, c. 0.5 mm long.

Fl. & Fr.: September–December.

Habitat: Plains and open grasslands.

Distribution: India: Throughout, except northeastern region. KWLS: Champo-Soro, Pancharjuna Rasta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33548, 36443 (CAL).

11. *Heteropogon* Pers.

Heteropogon contortus (L.) P. Beauv. ex Roem. & Schult., Syst. Veg. 2: 836. 1817; Haines, Bot. Bihar Orissa 3: 1040. 1924; C.E.C. Fisch. in Gamble, Fl. Madras: 1743. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2386. 1996. *Andropogon contortus* L., Sp. Pl.: 1405. 1753; Hook.f., Fl. Brit. India 7: 199. 1896.

Local Names: *Dauria*, *Sinkulia*.

Perennial; culms 30–90 cm high. Leaves linear-lanceolate, 3.5–20 × 0.3–0.5 cm, rounded at base, acute or blunt at apex; sheaths to 4 cm long; ligules truncate, membranous, fimbriate. Raceme solitary, 2–5 cm long, with lower homogamous spikelet pairs and upper heterogamous ones, awns forming a twisted spire. Homogamous spikelets linear-lanceolate, 5–8 mm long, sessile; heterogamous spikelets elliptic-lanceolate, 5–8 mm long, pedicelled.

Fl. & Fr.: September–January.

Habitat: Wet places, plains and open grasslands.

Distribution: India: Throughout. KWLS: Guajhari Nala, Kuldiha Pahadi Rasta; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 34483, 34511 (CAL).

12. *Leersia* Sw.

Leersia hexandra Sw., Prodr.: 21. 1788; Hook.f., Fl. Brit. India 7: 94. 1896; Haines, Bot. Bihar Orissa 3: 981. 1924; C.E.C. Fisch. in Gamble, Fl. Madras 1845. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2407. 1996.

Perennial; culms 45–160 cm high, erect or trailing; nodes bearded. Leaves linear-lanceolate, 4–17 × 0.4–1 cm, rounded at base, acuminate at apex, scaberulous; ligules membranous. Panicles 5–12 cm long, lax. Spikelets oblong, 4–5 mm long, compressed, 1-flowered, cream-yellow. Glumes reduced to a rim. Lemma oblong, 4–5 × 1.5–2 mm, coriaceous, 5-veined. Palea linear-oblong, 2–3 × c. 1 mm, coriaceous, 3-veined, ciliate on keels. Stamens 6.

Fl. & Fr.: July–February.

Habitat: Wet places, plains, open grasslands.

Distribution: India: Almost throughout. KWLS: Nandugutta Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 34512 (CAL).

13. *Oplismenus* P. Beauv.

Oplismenus compositus (L.) P. Beauv., Ess. Agrostogr.: 54. 168, 169. 1812; Hook.f., Fl. Brit. India 7: 66. 1896; Haines, Bot. Bihar Orissa 3: 999. 1924; C.E.C. Fisch. in Gamble, Fl. Madras: 1778. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2419. 1996. *Panicum compositum* L., Sp. Pl.: 57. 1753.

Local Names: *Kauguria*, *Mohara*.

Annual; culms 25–80 cm high, creeping, rooting at lower nodes. Leaves elliptic-lanceolate or ovate-lanceolate, 1.5–7 × 0.8–2 cm, oblique at base, wavy at margins, acuminate at apex, hispid; ligule a row of hairs. Inflorescence 8–20 cm long, lax; racemes 4–8, each 1.5–11 cm long. Spikelets paired, elliptic, 3–4 mm long, sessile. Glumes lanceolate or ovate-elliptic, 2–3 × c. 1 mm, aristate, awned; awn 4–6 mm long; lower floret barren; upper floret bisexual. Stamens 3. Caryopsis ellipsoid, c. 1 mm long.

Fl. & Fr.: October–December.

Habitat: Wet and shady places and grasslands.

Distribution: India: Throughout. KWLS: Ampada Nala; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 34513 (CAL).

14. *Ottochloa* Dandy

Ottochloa nodosa (Kunth) Dandy, J. Bot. 69: 55. 1931; C.E.C. Fisch. in Gamble, Fl. Madras: 1778. 1934. *Panicum nodosum* Kunth, Enum. Pl. 1: 97. 1833; Hook.f., Fl. Brit. India 7: 43. 1896.

Perennial; culms 25–80 cm long, creeping, rooting at lower nodes. Leaves elliptic-lanceolate, 3–11 × 0.5–1.3 cm, rounded at base, acuminate at apex; ligules narrow, membranous. Panicles 6–14 cm long, lax. Spikelets elliptic-lanceolate, 3–4 mm long. Glumes ovate-lanceolate or elliptic-lanceolate, 1.5–2 × c. 1 mm, 3–7-veined; lower floret barren, epaleate; upper floret bisexual. Stamens 3.

Fl. & Fr.: July–September.

Habitat: Margins of forests and banks of streams.

Distribution: India: Assam, Karnataka, Kerala, Manipur, Meghalaya, Nagaland, Sikkim, Tamil Nadu. KWLS: Kanchipaani, Jodachua Nala; Rare.

Note: New record to state.

Specimens examined: R. Saravanan & K.A. Sujana 35634, 35799 (CAL).

15. *Panicum* L.

Key to the species

- | | |
|--|---------------------------------|
| 1a. Leaves ovate-acuminate, amplexicaul | 1. <i>P. brevifolium</i> |
| 1b. Leaves linear or narrowly lanceolate | 2. <i>P. curviflorum</i> |

1. *Panicum brevifolium* L., Sp. Pl.: 59. 1753; C.E.C. Fisch. in Gamble, Fl. Madras: 1783. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2431. 1995.

Annual; culms 15–75 cm high. Leaves ovate, 1.5–6.5 × 1–2.5 cm, cordate or amplexicaul, tubercle-ciliate at margins, acute or acuminate; ligule membranous, ciliate at margin. Panicles 6–14 cm long, pyramidal; branches to 6.5 cm long, alternate or fascicled. Spikelets ovate, 1.5–2 mm long, slightly gibbous. Glumes ovate-oblong, 1.5–2 × 0.5–1 mm, obtuse; lower floret male; upper floret bisexual. Stamens 3. Caryopsis ovate, c. 1 mm long.

Fl. & Fr.: September–December.

Habitat: Paddy fields, banks of backwaters and streams.

Distribution: India: Southern, eastern and northeastern regions. KWLS: Nilgiri Rasta: common.

Specimen examined: R. Saravanan & K.A. Sujana 34407 (CAL).

2. *Panicum curviflorum* Hornem., Suppl. Hort. Bot. Hafn.: 116. 1819; Veldkamp & al., Blumea 34: 79. 1989. *P. trypheron* Schult., Mant. 2: 244. 1824; Hook.f., Fl. Brit. India 7: 47. 1896; C.E.C. Fisch. in Gamble, Fl. Madras: 1783. 1934.

Local Name: *Adavi Sathagaddi*.

Annual, tufted; culms 15–120 cm high. Leaves usually basal only, narrowly lanceolate or linear, 5–32 × c. 1 cm, usually copiously hairy on both surfaces with tubercle-based hairs, rarely glabrous; ligule short, fimbriate. Panicles open, narrow; branches suberect, to 22 cm long. Spikelets c. 3 mm long, in pairs and solitary, pedicelled. Glumes 1.2–2.5 mm long, amplexicaul at base, cuspidate-acuminate or aristulate, 4 or 5 or 9-veined. Caryopsis elliptic, c. 1.2 × 1 mm, acute to obtuse, brown.

Fl. & Fr.: July–March.

Habitat: Open places.

Distribution: India: Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Meghalaya, Tripura, and southern and eastern regions. KWLS: Bonun Chowk; common.

Specimen examined: R. Saravanan & K.A. Sujana 34520 (CAL).

16. *Paspalidium* Stapf

Paspalidium punctatum (Burm.f.) A. Camus in Lecomte, Fl. Indo-Chine 7: 419. 1922; Haines, Bot. Bihar Orissa 3: 1001. 1924; C.E.C. Fisch. in Gamble, Fl. Madras: 1774. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2441. 1996. *Panicum punctatum* Burm.f., Fl. Ind.: 26. 1768; Hook.f., Fl. Brit. India 7: 29. 1896.

Perennial; culms 30–90 cm high; nodes often black. Leaves linear, 5.5–22.5 × 0.75–1 cm, acuminate at apex. Spikes 1.2–3.2 × *c.* 0.25 cm. Spikelets elliptic or ovate-lanceolate, *c.* 3 mm long, acute at apex. Lower glume *c.* 0.75 mm long, membranous; upper glume obovate, 1.5–1.75 mm long, thin, obtuse, 3-veined. Lemmas elliptic, acute or apiculate at apex, with inflexed edges and depressed 3-veined back, rugulose.

Fl. & Fr.: July–December.

Habitat: Paddy fields, banks of backwaters and streams.

Distribution: India: Almost throughout. KWLS: Pancharjuna Rasta; common.

Specimen examined: R. Saravanan & K.A. Sujana 35833 (CAL).

17. *Paspalum* L.

Paspalum scrobiculatum L., Mant. Pl. 1: 29. 1767; Hook.f., Fl. Brit. India 7: 10. 1896; C.E.C. Fisch. in Gamble, Fl. Madras: 1772. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2445. 1996.

Annual or perennial; culms 15–80 cm high. Leaves lanceolate to linear, 3.5–36 × 0.4–1 cm, rounded at base, acuminate; ligules membranous, ciliate. Racemes usually 2, rarely 3–5, 2.5–7 cm long. Spikelets 2-ranked or 3-ranked, ovate-orbicular or obovate, 2–3.5 mm long, obtuse; lower glume absent; upper glume ovate or orbicular, 2–3.5 × 2–2.5 mm, membranous; lower floret barren; upper floret bisexual. Stamens 3. Caryopsis oblong, *c.* 1 × 0.5 mm, truncate at apex, brown.

Fl. & Fr.: Throughout the year.

Habitat: Marshy localities.

Distribution: India: Throughout. KWLS: Nandugutta Rasta, Kuldiha Beat Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34853, 35767 (CAL).

18. *Sacciolepis* Nash

Key to the species

- | | |
|--|---------------------------------|
| 1a. Spikelet subglobose, tips blunt | 3. <i>S. myosuroides</i> |
| 1b. Spikelets obliquely lanceolate or narrowly ovoid, tips acute | 2 |
| 2a. Culms robust, usually spongy | 2. <i>S. interrupta</i> |
| 2b. Culms slender, never spongy | 1. <i>S. indica</i> |

1. *Sacciolepis indica* (L.) A. Chase, Proc. Biol. Soc. Wash. 21: 8. 1908; Haines, Bot. Bihar Orissa 3: 990. 1924; C.E.C. Fisch. in Gamble, Fl. Madras: 1787. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2476. 1996. *Aira indica* L., Sp. Pl.: 1753 (in errata). *Panicum indicum* (L.) L., Mant. Pl. 2: 184. 1771, non Mill. 1768; Hook.f., Fl. Brit. India 7: 41. 1896.

Annual; culms 10–50 cm high. Leaves linear-lanceolate, 4–10 × 0.2–0.5 cm, narrow at rounded at base, acuminate at apex; ligules membranous. Panicles 1–6 cm long, spiciform. Spikelets ovate-acute, 2–3 mm long, slightly gibbous. Lower glume ovate-acute, 1–1.5 × c. 1 mm; upper glume ovate-oblong, 2–3 × 0.5–1 mm; lower floret male or barren; upper floret bisexual. Caryopsis oblong to elliptic, c. 1 mm, turgid, acute at ends, greenish brown.

Fl. & Fr.: August–November.

Habitat: Marshy localities.

Distribution: India: Throughout. KWLS: Jodachua Nala, Pancharjuna Rasta; common.

Specimens examined: R. Saravanan & K.A. Sujana 34376, 34843, 35808 (CAL).

2. *Sacciolepis interrupta* (Willd.) Stapf in Prain, Fl. Trop. Africa 9: 757. 1920; Haines, Bot. Bihar Orissa 3: 991. 1924; C.E.C. Fisch. in Gamble, Fl. Madras: 1787. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2477. 1996. *Panicum interruptum* Willd., Sp. Pl. ed. 4, 1: 341. 1798; Hook.f., Fl. Brit. India 7: 40. 1896

Annual; culms 25–90 cm high. Leaves lanceolate or linear, 5–30 × 0.3–1.2 cm, acute or acuminate; ligules ovate, membranous. Panicles spiciform, 4–25 cm long, interrupted. Spikelets ovate-lanceolate, 3–5 mm long. Glumes ovate-oblong or ovate-lanceolate, 1–5 × 1–2 mm; lower floret male or barren; upper floret bisexual. Caryopsis ovoid, c. 2 mm long.

Fl. & Fr.: July–February.

Habitat: Marshy localities.

Distribution: India: Almost throughout. KWLS: Nuasai Gaon; common.

Specimen examined: R. Saravanan & K.A. Sujana 36440 (CAL).

3. *Sacciolepis myosuroides* (R. Br.) A. Camus in Lecomte, Fl. Indo-Chine 7: 460. 1922; Haines, Bot. Bihar Orissa 3: 990. 1924; C.E.C. Fisch. in Gamble, Fl. Madras: 1787. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2478. 1996. *Panicum myosuroides* R. Br., Prodr. Fl. Nov. Holland.: 189. 1810; Hook.f., Fl. Brit. India 7: 42. 1896.

Annual; culms 40–70 cm high. Leaves linear, 10–25 × 0.2–0.5 cm, rounded at base; ligule membranous. Panicles cylindrical, 10–20 × *c.* 0.5 cm, interrupted at base. Spikelets *c.* 1.5 × 1 mm. Lower floret barren, upper bisexual. Stamens 3. Caryopsis elliptic, *c.* 1 mm long, turgid, compressed.

Fl. & Fr.: September–January.

Habitat: Marshy localities.

Distribution: India: Almost throughout, except northwestern region. KWLS: Bhaibhoni Ghatti; common.

Specimen examined: R. Saravanan & K.A. Sujana 34872 (CAL).

19. *Sporobolus* R. Br.

Sporobolus diandrus (Retz.) P. Beauv., Ess. Agrostogr.: 26, 147, 178. 1812; Hook.f., Fl. Brit. India 7: 247. 1896; C.E.C. Fisch. in Gamble, Fl. Madras: 1817. 1934.

Perennial; culms 30–75 cm high, tufted. Leaves linear-lanceolate or oblong, 6–34 × 0.2–0.6 cm, acuminate, flat or convolute, glaucous; ligules fimbriate at margin, membranous. Panicles 10–30 cm long, pyramidal. Spikelets ellipsoid, 1–2 mm long, greyish, 1-flowered. Glumes oblong or ovate, 0.5–1 mm long. Stamens 2. Caryopsis oblong, to 1 mm long.

Fl. & Fr.: June–January.

Habitat: Forest margins and stream banks.

Distribution: India: Almost throughout. KWLS: Andheri Nala, Pancharjuna Pond; frequent.

Specimens examined: R. Saravanan & K.A. Sujana 33546, 34854 (CAL).

20. *Thysanolaena* Nees

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. *Agrostis maxima* Roxb., Fl. Ind. 1: 319. 1820. *Thysanolaena maxima* (Roxb.) Kuntze, Revis. Gen. Pl. 2: 794. 1891; C.E.C. Fisch. in Gamble, Fl. Madras: 1854. 1934; H.O. Saxena & Brahmam, Fl. Orissa 4: 2512. 1996.

Local Names: *Phul Badhuni*, *Phuljharu Ghas*.

Culms to 3 m high. Leaves lanceolate, 30–60 × 3–10 cm, sub-amplexicaul, acuminate at apex, coriaceous. Panicles 30–60 cm long, branches erect or suberect. Spikelets lanceolate, 12–1.8 mm long. Glumes subequal, ovate, 0.5–0.8 mm long, subacute to sub-rotund at apex. Sterile lemma glabrous; fertile lemma ciliate at margins. Caryopsis elliptic, *c.* 0.5 mm long.

Fl. & Fr.: September–April.

Habitat: Margins of streams.

Distribution: India: Throughout. KWLS: Panchalingeshwar Pahad; frequent.

Specimen examined: R. Saravanan & K.A. Sujana 35819 (CAL).

ETHNOBOTANICAL STUDIES

India has over 38 million tribals inhabiting varied geographical regions and climatic zones. The total number of tribal communities is around 550 and has acquired unique knowledge about the uses of natural resources. The tribal people are the repository of knowledge of indigenous flora and fauna. They have their own methods of conserving many species of plants and animals which they felt are at the verge of extinction.

Like the wild animals living in forests, human beings too in the days of their primitiveness used the plant resources for food, shelter and even curing their maladies. The utility of all the wild plants for various purposes was not acknowledged in a day, but it is a result of the escalating development of human civilization and culture. The earliest reference to the use of medicinal herbs as a remedy for diseases is found in the manuscript of "Eber Papyrus", which dates back to 1500 B.C. (Schultes, 1962 and Aikman, 1974). In India the sacred Vedas dating back between 3500 B.C., and 800 B.C., give many references of medicinal plants. The "Ayurveda" the practice of which was recorded in Sanskrit by legendary figures of Indian Medicine-Charaka, Sushruta, Nagarjuna, Atreya etc, appeared much later.

The first consequence of civilization is the loss of plants for human welfare. Our challenge, therefore, is to salvage some of the native medico-botanical lore before it gets entombed with the culture that gave it birth (Schultes 1962). In the deluge of modernism, valuable and time-tested ethnobiological knowledge connected with agriculture, folkmedicine etc., is fast disappearing. Although there are many examples of such information, having been the source of modern medicine, techniques etc., such knowledge provided by the natives is generally overlooked. As a result this rich and useful source of information has almost dried up. Before this is completely lost to the civilization, efforts to record such information and to preserve the gene pool concerned should be taken up on an emergency basis (Manilal 1997). India with its vastness, multiethnic tribes and diverse vegetation, is one of the greatest emporia of ethnobotanical wealth.

Ethnobotanical studies and analysis in KWLS

Ethnobotanical studies have been done in Odhisa, the medicinal plants available in this remote area have not been explored thoroughly. While and no previous records on ethnobotanical knowledge from within the study area are available. Though the sanctuary has a tribal population of about 1000 but there has been a lacuna in documenting the traditional uses of plants therein. A single study by Pattanaik & Reddy (2008) investigated plant material used for medicinal purposes within communities located in the study area and documented 49 plant species used ethnomedicinally. Much later Saravanan & al. (2017, 2018), published the ethnomedicinally important plants of KWLS used for gastrointestinal disorders and joint pains respectively. Ethnobotanical uses of plants can further be explored in detail for sustainable utilization as well as economic upliftment of the tribal society.

Usage pattern

Ethnobotanical data thus collected are arranged alphabetically according to the botanical names of the plants in Table 2. The botanical names are followed by local name(s), habit, uses of the plant and use code. The description of the plants with updated nomenclature is provided in the previous chapter. The data revealed that the Santhal tribes and the natives of this area who mostly dwell around this sanctuary a total of 236 species of 82 genera 63 families for various purposes. This includes 45% (106) trees, 20% (48) shrubs, 18% (43) herbs and 17% (39) climbers. The preference of using trees over other life forms may be attributed to the relative abundance of trees naturally occurring in the area. Among them **2 species** (*Mucuna pruriens* and *Flacourtia indica*) are **endemic**, **4 species** (*Uvaria hamiltonii*, *Rauvolfia serpentina*, *Garcinia cowa* and *Homalium nepalense*) are **rare**, **1 species** (*Smilax lanceifolia*) **endangered** and **2 species** (*Dysoxylum gotadhora* and *Gouania microcarpa*) are **new record** to the state. The ethnobotanical use of rare endangered plants would result in large scale extraction and hence conservation of these species becomes essential. The most dominant family in terms of ethnobotanical use includes Leguminosae (33), followed by Euphorbiaceae (16), Rubiaceae (15 species) and Malvaceae (13).

The variety of uses has been categorized broadly as medicinal, wild edibles, fodder, timber, fibre, fuel and other miscellaneous uses which include fish poison, fencing material, leaf plate, broom etc. A total of 46.61% plants were used as medicine, 35.86% plants as wild edibles, 20.25% as fodder for domestic animals or consumed by the wild animals of the sanctuary, 11.81% as source of timber, 8.86% as source of fibre, 4.64% as fuel wood and 18.14% plants were identified having various miscellaneous uses.

Plants used as timber, fuel wood and fibre

The use of timber included making agricultural implements, furnitures, match sticks and construction. The 28 plants identified belonged to 15 families (Table 3). Maximum exploitation was observed from the members of Rubiaceae, Combretaceae and Leguminosae as source of timber. *Shorea robusta*, *Dalbergia sissoo* and *Dalbergia latifolia*, all have an Rfc value of 1 proving its importance as timber for making furniture. Based on the calculated Rfc value, the use of *Xylia xylocarpa*, *Syzygium cumini*, *Limonia acidissima*, *Chionanthus ramiflorus* and *Cassia fistula* as timber plants, are of least importance (Table 8). 6 species (*Vitex leucoxydon*, *Dalbergia latifolia*, *Dalbergia sissoo*, *Diospyros exsculpta*, *Discospermum abnorme* and *Dysoxylum gotadhora*) were identified that were used only for their timber value. *Dysoxylum gotadhora* is a new record for the state (Saravanan & al., 2014). Extraction of timber results in large scale felling of trees which is one of the cause of deforestation of various parts of this sanctuary. Proper afforestation measures need to be undertaken as well as the natives need to be made aware about the protection of this forest. At the same time alternative for timber for various uses must be made available for use.

For use as fuel dry twigs and braches are preferred. Dry twigs and stems of *Cassia fistula*, *Cleistanthus patulus*, *Suregada lanceolate*, *Acanthus ilicifolius* are preferred source of

fire wood. The tribal people never used plants like *Ficus benghalensis* and *Haldina cordifolia* as fuel because they are worshipped as the holy trees. A similar pattern of conservation of certain plants was observed by the *Maher tribe* of Porbander district of Gujrat where the tribals avoided burning of trees that they worship (Odedra, 2009).

Stems or barks of 22 plants are used as source of fibre for making ropes, threads, carpets and as floss (Table 4). Members of Leguminosae and Malvaceae are the most exploited plants for this purpose; followed by members of Convolvulaceae, Combretaceae, Vitaceae and Apocynaceae. Barks of 10 plants are used for making ropes which makes it favourable from conservation point of view. Use of stems for extraction of fibre would result in sufficient loss of the plants. A study conducted on fibre yielding plants of Orissa, covering Mayurbhanj, Sundargarh, Keonjhar, Deogarh, Koraput, Rayagada districts reported 146 plants (Sahu & al., 2013). Based on Rfc values, the use of bark of *Bauhinia vahlii* (Rfc 0.92) for making ropes appeared to be the most important fibre yielding plant, followed by *Acacia torta*, *Butea superba* and *Spatholobus parviflorus* all with Rfc value of 0.83. The uses of other plants as fibre sources are relatively less known. The survey confirmed the use of 11 species exclusively as fibre source. *Calycopteris floribunda*, *Kydia calycina* and *Urena lobata* are also used as fodder. *Dalbergia volubilis* and *Triumfetta rhomboidea* are also used as medicine. *Bauhinia vahlii* and *Urena sinuata* are also used for making plates and brooms respectively. Floss from fruits of *Bombax ceiba* and *Ceiba pentandra* are used for making pillows. Extraction of fibre can serve as a source of economy for the tribals of this region. Further study of these plants and awareness could lead to making an alternative to the commercial natural fibres and plastics. Commercialization of these bio-degradable and eco-friendly natural fibres should be a point of focus for the state which already has an enriched source of fibre yielding plants. These widely available, inexpensive sources of fibre would prove to be beneficial both for mankind and our environment. At the same time the traditional art of making ropes and carpets from the extracted fibre should also be conserved as it is now being practised by the old natives of this area.

Plants used as fodder

Fodder plants are of immense importance as most of the tribals of this area rear cattles. Even though, Kuldiha has been declared a sanctuary, portions of it till continue to be utilized for fodder sources. Grasses provide for the grazing habit of the animals, mostly after harvesting of cultivated crops, pre and post monsoon. The arboreal species provide foliage and young pod to cattle during the odd periods. The plants identified as fodder not only includes the cattle feed but also the plants that provide food to the wild animals. Out of 49 plants identified (Table 5) 25 are used as fodder plants and 24 are consumed by the wildlife of the sanctuary which includes the elephants, monkeys, *chital* deer, birds and giant squirrel. Mostly leaves are considered as fodder followed by fruit and bark. Local people consider leaves to be significant source of nutrition at the time of scarcity. Tree leaves have higher protein content (12 – 30%) whereas grasses show a protein content of 3 – 10% (Boitumelo, 2000). *Merremia tridentata*, *Phyllanthus lawii*, *Polyalthia suberosa*, *Vitex peduncularis*,

Combretum latifolium and *Dalbergia lanceolaria* are only used as fodder; the rest 42 have reported to have other uses. Based on Rfc values *Ficus benghalensis* and *Madhuca longifolia* (Koenig) Macbr. var. *latifolia* both with Rfc value of 1, appeared to be the most important plant species used as fodder, whereas *Acanthus ilicifolius* (Rfc 0.33) is the least important species as fodder plant (Table 10). The present finding indicates that this region holds rich reserve of fodder plants and the wisdom of forage utilization should be included in modern management practices.

Plants used as wild edibles

The present study shows that the tribal people of Kuldiha wildlife sanctuary have substantial knowledge regarding the wild edible plants. A total of 85 plant species have been documented belonging to 42 families with edible values (Table 6) of which 14% (12) constitutes herbs, 13% (11) climbers, 21 % (18) shrubs and 52% (44) trees. The plant parts used were fruits, leaves and shoots, tuber, flowers, seeds gums and calyx. Some of the plant species have been reported as edible by different workers from various parts of the country (Yesodharan and Sujana, 2007; Nadanakunjidam, 2003; Basu and Mukherjee, 1996). Out of 85 wild edibles studies 65 species showed Rfc value above 0.5 indicating the wide acceptance of plants as wild edibles. *Memecylon ovatum* as wild edible showed the lowest Rfc value indicating its low credibility as wild edible. It is worthy of mention that about 18 plants out the reported wild edibles have been used for its medicinal value which again indicates proper conservation needs of these plants. *Leucas ciliata*, *Monochoria vaginalis*, *Alternanthera sessilis* and *Flemingia macrophylla* are consumed as medicine. This overlap indicates the close relationship between health and food. Overlapping between foods and medicines is quite well known in traditional societies (Pieroni & al., 2005). It is to be noted that the use of these wild edibles are now practiced rarely and are gradually being lost. Wild edible fruits is still being used by children. Keeping the idea of food security in mind these plants should be furthered be studied as low-cost nutrients alternatives. Proper awareness and promotion is required for introduction of these vegetables in markets which would improve the livelihood of the locals.

Medicinal uses

The study provides information about ethnomedicinal use of 111 different plant species by native of KWLS. Leguminosae is the dominant family with 19 species followed by Rubiaceae with 8 species, Apocynaceae with 6 species and Euphorbiaceae with 5 species being used ethnomedicinally. The other families contributed with one species each. Analysis of the habit wise distribution of these species indicates that trees are mostly used as medicine, followed by herbs. Maximum plants are to treat gastrointestinal disease, rheumatism, skin disease, cuts, cold and cough, fever, head ache and others. Different portions of the plants are used in preparation of medicine, frequently used parts are leaves, barks and roots. Natives rely primarily on plant sources to cure ailments. Except those plants from which the drugs are obtained from leaves or latex, the use of seeds, roots or stems in plants are found to be a

destructive means of obtaining the herbal remedies for ailments. The parts utilized show that for the preparation of herbal medicines mostly leaves are being used.

The medicinal plants have been broadly categorized based on the mode of uses like gastroenteric disorders, rheumatism, skin care, cuts and wounds, anthelmintic etc. 15 plants species have been reported in this study to be used for treatment of rheumatism (Table 7), *Semecarpus anacardium* L.f., *Olex scandens* Roxb., *Calotropis procera* W.T. Aiton, *Oroxylum indicum* (L.) Benth. ex Kurz, *Celastrus paniculatus* Willd. have been reported to be widely used (Pattanaik & al., 2008; Singh & al., 2010) as chronic joint pain remedies and hence these species need to be conserved effectively through sustainable utilization.

5 plants are reported in the treatment of piles (Table 8), of which *Catunaregam spinosa*, *Cyanthillium cinereum* are specifically applied as topical application. The use of *Acyranthes aspera* on piles has been reported widely (Silja & al., 2008). The Rfc values ranged between 0.75-0.5, which is an obvious indication that the treatment of piles by the locals is relatively low.

Gastrointestinal problem is a very common ailment in tribal societies, and includes constipation, diarrhea, dysentery, dyspepsia, indigestion, flatulence and stomach pain (Table 9). Tribal people are very much prone to these problems due to their unhygienic habitat, food habits, improper sanitation and inadequate availability of pure drinking water. A total of 47 species were identified to be useful in treating gastrointestinal disorders. Various parts of the plants were utilized in preparation of gastrointestinal herbal remedies in this area. The Rfc value ranged between 0.92-0.42. 37 plants showed an Rfc value above 0.6 which again stipulate the wide spread use of herbal remedies in treating gastrointestinal disorders.

This study reports the use of 5 plants in the treatment of tooth ache (Table 10). The use of tender twigs as tooth brush is a well-practised method. The use of *Anacardium occidentale* in North India and *Mangifera indica* in both India and Cameroon (Gupta & al., 2015) is well known. This is also evident from the high Rfc value (0.83) for *M. indica*.

Helminth infection is a very common ailment all over the world, and plants are regarded as the primary sources of treating this infection. The herbal healers of Kuldiha also identify 9 plants that are used as anthelmintic (Table 11). The use of *J. curcas* as anthelmintic, having the highest Rfc value of 0.75, has a wider use amongst the people of this area. Most anthelmintic drug preparation involved seed, fruit followed by root this calls for urgent conservation measures.

Skin diseases like eczema, scabies, ring worm infection and other rashes and boils can be treated using herbal medicines, herbalists of KWLS reported 16 plants used in various skin related diseases (Table 12). The use of *S. oleosa* on scabies and *Leucas aspera* on skin eruption is widely accepted which is noticeable from their high Rfc value of 0.83.

The use of plants in treating venomous bites is also observed, however this requires special knowledge as confirmed by the healers who insisted that the use varies with the type

of insect or snake. 6 plants have been recorded to be used in treating poisonous bites (Table 13). Treatment of poisonous bites mostly involves topical application of the plant parts on the bites, only *Mimosa pudica* is recorded to be administered orally. The Rfc value ranged between 0.50-0.75 with *Aristolochia indica* having the highest value.

Cuts and wounds are very common in tribal life. In spite of the absence of proper dressing or modern treatment, none of them become ulcerous. It confirms the efficacy of ethnomedicine used in wound healing. 11 plants are recorded that are used to treat cuts and wounds (Table 14). Most of the uses are as topical application on wounds. *Cissus latifolia* and *Macaranga peltata* are used to stop bleeding. The use of *Ageratum conyzoides*, *Croton bonplandianus*, *Evolvulus alsinoides*, *Macaranga peltata* have been variously reported from different parts of Odhisa (Pattanaik & al., 2008). This is also distinct from the Rfc values of *C. latifolia* and *A. conyzoides* both have the highest value of 0.83 in reference to their application in cuts and wounds. *Mucuna pruriens*, endemic to Odhisa has been reported to be used in constipation, and cough and cold (Girach & al., 1997) but it's used in wound healing is relatively new.

Herbal treatment for sexual wellness and other gynaecological problems have been reported from the locals and are represented in table 15 and 16 respectively. Pattanaik & al. (2008) reported the use of *Caesalpinia bonduc* in hydrocele. In other publications (Singh & al., 2014; Panda and Padhy, 2008) *Asparagus racemosus*, *Curculigo orchioides* and has been reported to be used in the treatment of leucorrhoea but our study reports its use in spermatorrhoea. The use of *C. orchioides* and *T. procumbens* in spermatorrhoea and hydrocele showed the maximum Rfc value of 0.83 each, validating its use. The Rfc values relating to female diseases is observed to be low ranging between 0.33 to 0.67, which can be due to the lack of awareness or cultural hindrance that does not allow the people to talk openly about the diseases or its treatment. The use of *S. asoca* and *C. dubia* has a broader acceptance over other plants as indicated by the Rfc values.

For the treatment of jaundice and malaria 5 and 3 plants are identified respectively (Table 17). The use of *Andrographis paniculata* (Pani & al., 2015) having Rfc value of 0.92 and *Nyctanthes arbor-tristis* (Girach, 1992) having Rfc value of 0.42 has been variously reported in the therapy of malaria. The high Rfc values are also indicative of the same for KWLS. The interviewed traditional healers identified jaundice according to the symptoms like nausea, yellow discoloration of the eyes, tongue, skin, and urine, dull pain in the liver region. The reported plants were mostly administered as decoction, extracts, paste and infusion. However the Rfc value of *S. dulcis* (0.83) is the highest which shows greater cultural acceptance of other previously reported plants like *C. dubia* or *C. bonduc*. There are few plants recorded for the use in other ailments and are listed in Table 18. The use of *Abrus precatorius* in mumps, *Jatropha gossypifolia* in leprosy and *Holarrhena pubescens* are few of the interesting findings.

The methods of using ethnomedicinally valuable plants varied according to the nature of diseases. In a single case, a combination is reported for treatment otherwise single plant

parts are used. In a majority of the cases, a decoction made of leaves, stems, barks, fruits and roots is administered or rubbed on the body for curing diseases. Most of the decoctions are prepared by crushing the plant parts with the help of mortar and pestle, but some are made by boiling plant part. Some herbal medicines were prescribed for the period while some of the medication was taken till cure. The method of use of these plants varied according to the nature of different compounds present in different parts of the plants, with specific doses and nature of diseases (Phondani & al., 2010). The dosages are not standardized and are determined by experience of individual herbalist and on the age and physical appearance of the patient, explanation of the illness (Addis & al., 2001).

Miscellaneous uses

The local people depend on the forest resources largely. This is obvious from the variety of usages of these plants as fish poison, pesticide, soap, tooth brush, mats and brooms, in fencing, preparation of liquors (Table 19). The selection of plants varies with availability of the species. The locals use 8 plant species as fish poison (Table 20). In this study *C. collinus* and *O. scandens* have high frequency of citation of 0.67, whereas *C. spinosum* has the lowest Rfc value of 0.33, demonstrating the preference of the earlier two species ver others. The use *Elaphantopus scaber* in fortifying local liquor is relatively less known. The concept use of leaves of *Butea monosperma*, *Bauhinia vahlii* and *Shorea robusta* for preparing disposable plates and has recorded the highest citation factor of 1. This can be commercialized as environment friendly alternatives to plastics which would also help in the economic upliftment of the society. *Symplocos cochinchinensis* and *Sterospermum tetragonum* has been recorded for their magico-religious property in curing headache and fever. Efforts in conserving and promoting local knowledge in utilizing food, medicine, fibres in their natural habitat for multiple usages deserves due recognition and reward. Sustainable use and conservation of these resources will not only lead to assured food security but also to a better environment for our coming generations.

Quantitative analysis

Use value helps to identify the relative importance of the species to the local community. In the present study, the UV (Table 2) ranged between 0.33 and 1.33. Based on UV data, 71 plants were identified that had UV ranging between 1 and 1.33. These species were used for diverse purposes, as medicine, food, fodder or as fuel and timber. These findings indicate the extensive use of above mentioned species in the treatment of various ailments by local inhabitants/healers. The least used species were *Pouzolzia zeylanica* and *Polyalthia cerasoides*, with the lowest UV and were solely used to treating lice and as wild edible respectively. *Ageratum conyzoides*, *Andrographis paniculata* and *Madhuca longifolia* showed high UV in both the study. On the contrary *Nyctanthes arbortristis* and *Achyranthes aspera* showed comparatively lower UV with respect to KWLS, but these plants were of more importance in Palpa district of Nepal.

The informant consensus factor (ICF) shows the agreement of amongst the informants for treating different ailments. ICF value ranges between 0 and 1, high ICF value is an obvious marker of higher degree of agreement whereas low value indicates disagreement. ICF for 12 ailments is represented in Table 21 and is observed to range between 0.90 and 0.80. Maximum agreement was observed for malaria and the lowest was observed for fracture. This shows the persistent use of traditional medicinal plants by local people. This also highlights the fact that though local people gradually succumb to government health care systems, still herbal medicine has not lost its importance. High ICF values can be used as a tool to identify plant groups having to bioactive compounds to treat specific diseases (Canales & al., 2005).

Table 2: Enumeration of species of ethnobotanical importance from KWLS with use value and use code

Sl. No.	Name of the plants	Family	Local Name	Habit	Use Code	Use value
1	<i>Abrus precatorius</i> L.	Leguminosae	Kaicho, Kainch	Shrub	Med	0.67
2	<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	Pedi-Pedika, Mirubaha	Shrub	Med	0.83
3	<i>Acacia caesia</i> (L.) Willd.	Leguminosae	Dantari	Climber	Fib	1
4	<i>Acacia sinuata</i> (Lour.) Merr.	Leguminosae	Sikai, Shaikakai	Climber	Mis	1.17
5	<i>Acacia torta</i> (Roxb.) Craib	Leguminosae	Dantari, Konti	Climber	Fib	0.76
6	<i>Acanthus ilicifolius</i> L.	Acanthaceae	Harkach, Holithi konti	Shrub	Med, Fu, Fod	1
7	<i>Achyranthes aspera</i> L.	Amaranthaceae	Apamaranga, Chir chiri	Herb	Med	0.92
8	<i>Adenanthera pavonina</i> L.	Leguminosae	Manda kaincha, Raktakanchan	Tree	Ed	0.58
9	<i>Aegle marmelos</i> (L.) Correa	Rutaceae	Belo, Bael	Tree	Med, Ed	1.25
10	<i>Ageratum conyzoides</i> L.	Asteraceae	Poksunga, Dengsingi	Herb	Med	1
11	<i>Alangium salviifolium</i> (L. f.) Wang.	Cornaceae	Aisa, Dhalaankol, Ankula	Tree	Med, Ed, Tim	1
12	<i>Albizia lebeck</i> (L.) Benth.	Leguminosae	Siriso, Siris	Tree	Med	0.67
13	<i>Alstonia scholaris</i> (L.) R. Br.	Apocynaceae	Khiromula, Sapta parna	Tree	Med	0.5
14	<i>Alternanthera sessilis</i> (L.) R. Br. ex. DC.	Amaranthaceae	Kolamsago, Madaranga saga	Herb	Med, Ed	1.25
15	<i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson	Araceae	Olaka, Goda garia	Herb	Ed	1
16	<i>Anacardium occidentale</i> L.	Anacardiaceae	Kaju, Lanka amba	Tree	Med, Ed	1.17
17	<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees	Acanthaceae	Bhuinimbo, Kalmeg	Herb	Med	1.33
18	<i>Anogeissus acuminata</i> (Roxb. ex DC.) Guill. & Perr.	Combretaceae	Passi, Phansi	Shrub	Tim, Fu	1
19	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guill. & Perr.	Combretaceae	Dhau, Dhou	Tree	Tim, Fu	1
20	<i>Antidesma buniis</i> (L.) Spreng.	Euphorbiaceae	Anepu	Tree	Ed	0.83

21	<i>Antidesma ghaesembilla</i> Gaertn.	Euphorbiaceae	Sunakali, Kath marmuri	Tree	Ed	0.83
22	<i>Aporosa octandra</i> (Buch.-Ham. ex D. Don) Vickery	Euphorbiaceae	Dumbojoda, Konaka	Tree	Ed	0.67
23	<i>Ardisia solanacea</i> Roxb.	Primulaceae	Katapenga, Hadokonkali	Tree	Ed	0.75
24	<i>Argyreia daltonii</i> Clarke	Convolvulaceae		Climber	Fib	0.5
25	<i>Argyreia populifolia</i> Choisy	Convolvulaceae		Climber	Fib	0.58
26	<i>Aristolochia indica</i> L.	Aristolochiaceae	Panairi, Gopa kanna, Iswar mula	Herb	Med	0.83
27	<i>Asparagus racemosus</i> Willd.	Asparagaceae	Chhataori, Gaichero, Hateri Kanda	Climber	Med	1
28	<i>Atalantia monophylla</i> (L.) DC.	Rutaceae	Narguni, Narangi	Tree	Ed	0.75
29	<i>Baccharoides</i> <i>anthelmintica</i> (L.) Moench	Asteraceae	Somraj	Herb	Med	0.75
30	<i>Barringtonia acutangula</i> (L.) Gaertn.	Lecythidaceae	Hinjal, Hijal	tree	Med, Mis	0.83
31	<i>Bauhinia vahlii</i> Wight & Arn.	Leguminosae	Siali, Sialpatra, Sehar	Climber	Ed, Fib, Mis	1.25
32	<i>Bidens pilosa</i> L. var. <i>minor</i> (Blume) Sherff	Asteraceae	Magha latenga	Herb	Ed	0.58
33	<i>Boerhavia diffusa</i> L.	Nyctaginaceae	Kharkharia, Parni, Kechna	Herb	Ed	0.92
34	<i>Bombax ceiba</i> L.	Malvaceae	Semulo, Simili	Tree	Ed, Fib, Tim	1.17
35	<i>Briedelia retusa</i> (L.) A. Juss.	Euphorbiaceae	Kasi, Pani kasi	Tree	Med, Ed, Fod, Tim	1.33
36	<i>Buchanania</i> <i>cochinchinensis</i> (Lour.) M.R.Almeida	Anacardiaceae	Char	Tree	Ed	0.58
37	<i>Butea monosperma</i> (Lam.) Taub.	Leguminosae	Palasha	Tree	Fod, Mis	1.08
38	<i>Butea superba</i> Roxb.	Leguminosae	Noi palas, Lat palas	Climber	Fib	1
39	<i>Caesalpinia bonduc</i> (L.) Roxb.	Leguminosae	Kotakoleja, Gilo Gila	Shrub	Med	0.83
40	<i>Callicarpa tomentosa</i> (L.) L.	Lamiaceae	Badopatri, Serali	Tree	Ed	0.67
41	<i>Calotropis gigantea</i> (L.) R. Br.	Apocynaceae	Arko, Akand	Shrub	Med	0.92

42	<i>Calycopteris floribunda</i> Lam.	Combretaceae	Dubopatli, Kokundia	Shrub	Fib, Fod	0.75
43	<i>Canthium coromandelicum</i> (Burm. f.) Alston	Rubiaceae		Shrub	Ed	1
44	<i>Capparis zeylanica</i> L.	Capparaceae	Asadua	Shrub	Med, Ed	0.83
45	<i>Careya arborea</i> Roxb.	Lecythidaceae	Kumbhi	Tree	Med, Ed, Fib, Fod	0.75
46	<i>Cassia fistula</i> L.	Leguminosae	Sonari, Argavada, Bhalutherga	Tree	Med, Fod, Tim, Fu	1.33
47	<i>Catunaregam spinosa</i> (Thunb.) Tirveng.	Rubiaceae	Kalai kanta, Patteia, Mohana	Tree	Med, Ed, Mis	1.17
48	<i>Cayratia japonica</i> (Thunb.) Gagnep	Vitaceae	Ludri, Kanjikanjia	Herb	Fib	0.58
49	<i>Cayratia pedata</i> (Lam.) A. Juss. ex Gagnep.	Vitaceae	Pitapotala	Climber	Med	0.5
50	<i>Ceiba pentandra</i> (L.) Gaertn.	Malvaceae	Kapok gocho	Tree	Fib, Tim	0.83
51	<i>Celastrus paniculatus</i> Willd.	Celastraceae	Karsanao, Katta pengu	Climber	Med	1
52	<i>Chionanthus ramiflorus</i> Roxb.	Oleaceae		Tree	Fod, Tim	1
53	<i>Chlorophytum arundinaceum</i> Baker	Asparagaceae	Jhinka, Saphed musali	Herb	Med, Ed	0.67
54	<i>Chloroxylon swietenia</i> DC.	Rutaceae		Tree	Mis	0.58
55	<i>Cissampelos pareira</i> (Ham. ex DC.) Forman	Menispermaceae	Okanbindu, Shantimul	Climber	Vet	0.75
56	<i>Cissus latifolia</i> Lam.	Vitaceae		Climber	Med	0.83
57	<i>Cissus quadrangularis</i> L.	Vitaceae	Hadbhanga, Hadasinkida	Shrub	Med	1.17
58	<i>Cleistanthus collinus</i> (Roxb.) Benth. Ex Hook.f.	Euphorbiaceae	Karada, Kargalli Deciduous trees, to	Tree	Mis	0.83
59	<i>Cleistanthus patulus</i> (Roxb.) Muell.-Arg.	Euphorbiaceae	Sonohat, Sanahati	Tree	Fu	0.75
60	<i>Cocculus hirsutus</i> (L.) Diels	Menispermaceae		Climber	Med	0.67
61	<i>Combretum latifolium</i> Blume	Combretaceae		Climber	Fod	0.67
62	<i>Cordia dichotoma</i> G.Forst. Saxena & Brahmam	Boraginaceae	Ambota	Tree	Ed	0.83

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63	<i>Cordia monoica</i> Roxb.	Boraginaceae		Tree	Ed	0.83
64	<i>Crataeva magna</i> (Lour.) DC.	Capparaceae	Barun	Tree	Fod, Fu	0.75
65	<i>Crotalaria retusa</i> L.	Leguminosae	Bhil-jhanjhan, Biljhunhun	Herb	Med	0.67
66	<i>Croton bonplandianus</i> Baill.	Euphorbiaceae		Herb	Med	0.83
67	<i>Cryptolepis dubia</i> (Burm.f.) M.R.Almeida	Apocynaceae	Khira kaichi, Dudhimal, Kongha	Climber	Med	0.83
68	<i>Curculigo orchoides</i> Gaertn.	Hypoxidaceae	Talmuli, Mania kanda, Kovaakand.	Herb	Med	0.67
69	<i>Cyanthillium cinereum</i> (L.) H.Rob	Asteraceae	Puksunga	Herb	Med	0.75
70	<i>Cyathula prostrata</i> (L.) Blume	Amaranthaceae		Herb	Ed	0.5
71	<i>Cyperus tenuispica</i> Steud.	Cyperaceae		Herb	Mis	0.92
72	<i>Dalbergia lanceolaria</i> L. f.	Leguminosae	Chakundia, Puradobi	Tree	Fod	0.58
73	<i>Dalbergia latifolia</i> Roxb.	Leguminosae	Sisua, Sissoo, Jadimari	Tree	Tim	1.33
74	<i>Dalbergia sissoo</i> Roxb.	Leguminosae	Sissoo	Tree	Tim	1.17
75	<i>Dalbergia volubilis</i> Roxb.	Leguminosae		Climber	Med, Fib	0.83
76	<i>Dendrocalamus strictus</i> (Roxb.) Nees	Poaceae	Salia banso, Salimbo banso	Herb	Ed, Fod, Mis	1.17
77	<i>Derris scadens</i> (Dalz.) Baker	Leguminosae		Climber	Fib	0.75
78	<i>Desmos chinensis</i> Lour.	Annonaceae		Shrub	Ed	0.67
79	<i>Dillenia aurea</i> Sm.	Dilleniaceae	Rai, Korkotta	Tree	Ed, Fod	1.08
80	<i>Dillenia pentagyna</i> Roxb.	Dilleniaceae	Rai, Kirmilla	Tree	Ed, Fod	1.25
81	<i>Dioscorea alata</i> L.	Dioscoreaceae	Khambo alu, Kham-alu	Climber	Ed	1
82	<i>Dioscorea bulbifera</i> L.	Dioscoreaceae	Pita kanda, Pita alu	Climber	Ed	1
83	<i>Dioscorea hamiltonii</i> Hook.f.	Dioscoreaceae	Palru, Suta alu	Climber	Ed	1
84	<i>Dioscorea hispida</i> Dennst.	Dioscoreaceae	Bainya alu, Kolo	Climber	Ed	1
85	<i>Dioscorea pentaphylla</i> L.	Dioscoreaceae	Pittalo kanda, Karwa, Karba	Climber	Ed	1
86	<i>Dioscorea pubera</i> Blume	Dioscoreaceae	Kosa kanda, Dang alu, Chekka alu.	Climber	Ed	1

87	<i>Diospyros exsculpta</i> Buch.-Ham.	Ebenaceae	Kendu, Kendhu	Tree	Tim	1.17
88	<i>Diospyros malabarica</i> (Desr.) Kostel.	Ebenaceae	Mankar kendu, Kola kendu	Tree	Ed, Fod	1.33
89	<i>Diospyros melanoxylon</i> Roxb.	Ebenaceae	Kendu	Tree	Ed, Fod, Mis	1.33
90	<i>Diospyros sylvatica</i> Roxb.	Ebenaceae	Kanchia, Khalijya	Tree	Fod, Fu	1
91	<i>Discospermum abnorme</i> (Korth.) S. J. Ali & Robbr.	Rubiaceae		Tree	Tim	0.83
92	<i>Drimia indica</i> (Roxb.) Jessop	Asparagaceae	Banpyoj, Banuli	Herb	Med	0.75
93	<i>Dysoxylum gotadhora</i> (Buchanan-Hamilton) Mabberley	Meliaceae		Tree	Tim	0.83
94	<i>Elephantopus scaber</i> L.	Asteraceae	Tatmuli, Mayur chandrika	Herb	Mis	0.92
95	<i>Entada rheedii</i> Spreng.	Leguminosae		Climber	Med	0.83
96	<i>Erycibe paniculata</i> Roxb.	Convolvulaceae	Chain katho, Jorai kuli, Durkuri	Climber	Ed	0.58
97	<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae	Krishna ankaranti, Bichhamalia	Herb	Med	0.83
98	<i>Ficus benghalensis</i> L.	Moraceae	Baro	Tree	Fod, Mis	1.25
99	<i>Ficus semicordata</i> Buch.-Ham.ex J.E.Sm.	Moraceae	Bhuidumri	Tree	Ed	1
100	<i>Firmiana colorata</i> (Roxb.) R. Br.	Malvaceae	PaniKodal, Kodalo	Tree	Fib	0.67
101	<i>Flacourtia indica</i> (Burm. f.) Merr.	Salicaceae	Baincho, Konta dhawra	Shrub	Ed	0.92
102	<i>Flacourtia montana</i> Graham	Salicaceae	Kontaikuli	Tree	Ed	1
103	<i>Flemingia chappar</i> Buch.-Ham.ex Benth.	Leguminosae	Rani kathi, Bhandari	Shrub	Med	0.67
104	<i>Flemingia grahamiana</i> Wight & Arn.	Leguminosae		Shrub	Med	0.67
105	<i>Flemingia macrophylla</i> (Willd.) Prain ex Merr.	Leguminosae	Thutokur, Gariguri	Shrub	Med, Ed	0.67
106	<i>Flueggea leucopyrus</i> Willd.	Euphorbiaceae		Shrub	Ed	0.83
107	<i>Flueggea virosa</i> (Roxb. Ex Willd.) Voigt.	Euphorbiaceae		Shrub	Ed, Fod	0.75
108	<i>Garcinia cowa</i> Roxb.ex DC.	Clusiaceae	Sankadu, Sarvana, Rajkusuma	Tree	Ed	0.92

109	<i>Gardenia gummifera</i> L. f.	Rubiaceae	Gurudu, Kurlu	Tree	Ed	0.75
110	<i>Gardenia latifolia</i> Ait.	Rubiaceae	Damkudum, Dimaru	Tree	Ed, Fod, Tim	1
111	<i>Glinus oppositifolius</i> (L.) Aug.DC.	Molluginaceae	Pitagama, Pitasag	Herb	Ed	0.75
112	<i>Glochidion lanceolarium</i> (Roxb.) Voigt.	Phyllanthaceae		Tree	Med	0.58
113	<i>Glycosmis pentaphylla</i> (Retz.) DC.	Rutaceae	Chauli, Choealdua	Shrub	Ed, Fod, Fu, Mis	0.67
114	<i>Gmelina arborea</i> Roxb. ex Sm.	Lamiaceae	Gambhari, Bhodroporanni	Tree	Ed, Tim	1.08
115	<i>Gouania microcarpa</i> DC.	Rhamnaceae		Climber	Med	0.67
116	<i>Grewia tiliifolia</i> Vahl	Malvaceae		Tree	Fib	0.58
117	<i>Haldina cordifolia</i> (Roxb.) Ridsd.	Rubiaceae	Maldu, Mandi	Tree	Tim, Mis	0.75
118	<i>Hemidesmus indicus</i> (L.) R. Br.	Apocynaceae	Sugandhi, Dudhi	Climber	Med	0.83
119	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Parijat, Mondaro	Shrub	Med	1
120	<i>Holarrhena pubescens</i> Wall. ex G.Don	Apocynaceae	Kherwa, Indrajalo	Tree	Med	0.92
121	<i>Holoptelea integrifolia</i> Planch.	Ulmaceae	Dauranja	Tree	Med, Fu	0.75
122	<i>Homalium nepalense</i> Benth.	Salicaceae		Tree	Med, Mis	0.75
123	<i>Hymenodictyon orixense</i> (Roxb.) Mabb.	Rubiaceae	Bhurkunda, Bohramal	Tree	Fod, Tim	0.67
124	<i>Hyptis suaveolens</i> (L.) Poit.	Lamiaceae	Ganga tulsi	Shrub	Mis	0.5
125	<i>Ipomoea carnea</i> Jack.	Convolvulaceae	Omori, Besharam	Shrub	Med, Mis	1.17
126	<i>Ixora coccinea</i> L.	Rubiaceae		Shrub	Med	0.67
127	<i>Ixora pavetta</i> Andr.	Rubiaceae	Kila Kerua, Telkurma	Tree	Med, Ed	0.67
128	<i>Jasminum scandens</i> (Retz.) Vahl	Oleaceae	Ban malli	Shrub	Mis	0.83
129	<i>Jatropha curcas</i> L.	Euphorbiaceae	Duma jada, Jode	Shrub	Med, Mis	1
130	<i>Jatropha gossypifolia</i> L.	Euphorbiaceae	Johadi, Baigoba	Shrub	Med	0.92
131	<i>Kaempferia angustifolia</i> Rosc.	Zingiberaceae		Herb	Med	0.67
132	<i>Kydia calycina</i> Roxb.	Malvaceae	Bankapasia, Kapasia	Tree	Fib, Fod	0.75
133	<i>Lagerstroemia parviflora</i>	Lythraceae	Chhena, Sidha	Tree	Ed,	0.75

	Roxb.				Fod, Tim	
134	<i>Lawsonia inermis</i> L.	Lythraceae	Manjuati	Shrub	Med	0.58
135	<i>Leucas aspera</i> (Willd.)Link	Lamiaceae	Gaiso, Durab	Herb	Med	0.75
136	<i>Leucas ciliata</i> Benth.ex Wall.	Lamiaceae		Herb	Med, Ed	0.75
137	<i>Limonia acidissima</i> L.	Rutaceae	Kaitho, Behenta	Tree	Ed, Tim	0.67
138	<i>Litsea glutinosa</i> (Lour.) Robins.	Lauraceae	Ledha chhali	Tree	Med, Fod, Mis	1.08
139	<i>Macaranga peltata</i> (Roxb.) Muell.-Arg.	Euphorbiaceae	Gondaguria, Jinka	Tree	Med, Fod	1.17
140	<i>Madhuca longifolia</i> (Koenig) Macbr. var. <i>latifolia</i> (Roxb.) A. Chev.	Sapotaceae	Moha, Madgi	Tree	Fod, Mis	1.33
141	<i>Mallotus nudiflorus</i> (L.) Kulju & Welzen	Euphorbiaceae	Tobu	Tree	Fod, Fu	0.67
142	<i>Mallotus philippensis</i> (Lam.) Muell.-Arg.	Euphorbiaceae	Sinduri, Kumkumo	Tree	Fod, Mis	0.83
143	<i>Mangifera indica</i> L.	Anacardiaceae	Ambo	Tree	Med, Ed, Mis	1.33
144	<i>Manilkara zapota</i> (L.) P.Royen	Sapotaceae	Sapota	Tree	Ed	0.67
145	<i>Melastoma malabathricum</i> L.	Melastomataceae	Korali, Koroti	Shrub	Ed	0.5
146	<i>Melia azedarach</i> L.	Meliaceae	Mahanimbo	Tree	Mis	0.83
147	<i>Memecylon ovatum</i> Roxb.	Melastomataceae	Bonohorono, Dalsudaro	Shrub	Ed	0.5
148	<i>Merremia tridentata</i> (L.)Hall.f.	Convolvulaceae		Herb	Fod	0.58
149	<i>Meyna laxiflora</i> Robyns	Rubiaceae		Shrub	Mis	0.58
150	<i>Micromelum minutum</i> (Forst.f.) Wight & Arn. Prod.	Rutaceae	Soidani	Tree	Med	0.5
151	<i>Miliusa tomentosa</i> (Roxb.) Finet & Gagnep.	Annonaceae	Patmosso, Gandha palasa	Tree	Ed, Tim, Fod	0.75
152	<i>Miliusa velutina</i> (Dunal) Hook. f. & Thoms.	Annonaceae	Gandha palasa	Tree	Ed	0.67
153	<i>Millettia racemosa</i> Benth.	Leguminosae		Climber	Mis, Med	0.75
154	<i>Mimosa pudica</i> L.	Leguminosae	Lajkui	Herb	Med	0.92
155	<i>Mitragyna parvifolia</i> (Roxb.) Korth.	Rubiaceae	Gudi kaima, Mundi	Tree	Med, Tim	0.83

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156	<i>Momordica dioica</i> Roxb.ex Willd.	Cucurbitaceae	Kankad, Kankud	Climber	Med	0.75
157	<i>Monochoria vaginalis</i> (Burm. f.) Presl	Pontederiaceae	Mirmira	Herb	Med, Ed	0.58
158	<i>Morinda citrifolia</i> L.	Rubiaceae	Achu, Atsu	Shrub	Med	0.67
159	<i>Mucuna pruriens</i> (L.) DC.	Leguminosae	Kaicho, Baidonko	Climber	Med	0.75
160	<i>Naringi crenulata</i> (Roxb.) Nicolson	Rutaceae	Baintha	Tree	Med	1
161	<i>Nervilia plicata</i> (Andr.) Schltr.	Orchidaceae		Herb	Med	0.83
162	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Gangaseoli, Singhara	Tree	Med	0.92
163	<i>Olox scandens</i> Roxb.	Olacaceae	Badalia	Shrub	Med, Ed, Mis	1
164	<i>Oroxylum indicum</i> (L.)Benth.ex Kurz	Bignoniaceae	Phemphana	Tree	Med, Mis	0.92
165	<i>Oxalis corniculata</i> L.	Oxalidaceae	Ambiliti, Kumari	Herb	Med	0.75
166	<i>Passiflora edulis</i> Sims	Passifloraceae		Climber	Ed	0.67
167	<i>Pavetta indica</i> L.	Rubiaceae	Pengu, Macharanka	Shrub	Med, Fod	0.75
168	<i>Persicaria hydropiper</i> (L.) Spach.	Amaranthaceae		Herb	Med	0.58
169	<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	Khajuri	Tree	Ed, Mis	1
170	<i>Phyllanthus emblica</i> L.	Phyllanthaceae	Anola, Amla	Tree	Med, Ed, Fod	1.25
171	<i>Phyllanthus lawii</i> Graham ex Muell.-Arg.	Phyllanthaceae	Jhar	Shrub	Fod	0.58
172	<i>Phyllanthus reticulatus</i> Poir.	Phyllanthaceae	Jandaki	Shrub	Fod, Mis	0.83
173	<i>Phyllanthus urinaria</i> L.	Phyllanthaceae	Bhuin amla	Herb	Med	0.83
174	<i>Physalis minima</i> L.	Solanaceae	Tipai	Herb	Ed, Fod	0.83
175	<i>Pinellia ternata</i> (Thunberg) Tenore ex Breitenbach	Araceae		Herb	Med	0.75
176	<i>Piper longum</i> L.	Piperaceae		Shrub	Med	1
177	<i>Pithecellobium dulce</i> (Roxb.) Benth.	Leguminosae	Simakoina	Tree	Ed, Fod	0.83
178	<i>Pogostemon</i> <i>benghalensis</i> (Burm. f.) O. Ktze.	Lamiaceae	Gonda dulia, Puka sunga	Shrub	Ed	0.75
179	<i>Polyalthia cerasoides</i> (Roxb.) Bedd.	Annonaceae	Potmossu, Champati	Tree	Ed	0.42

180	<i>Polyalthia suberosa</i> (Roxb.) Thw.	Annonaceae	Karadia, Burhi chamri	Tree	Fod	0.67
181	<i>Pongamia pinnata</i> (L.) Pierre	Leguminosae	Karanjo	Tree	Mis	1
182	<i>Pouzolzia zeylanica</i> (L.) Bennett	Urticaceae		Herb	Mis	0.33
183	<i>Pseudaidea speciosa</i> (Bedd.)Tirveng.	Rubiaceae		Climber	Med	0.67
184	<i>Pterocarpus marsupium</i> Roxb	Leguminosae	Bija, Piasal	Tree	Med	0.41
185	<i>Pterospermum acerifolium</i> (L.) Willd.	Malvaceae	Kanaka champa	Tree	Fib	0.83
186	<i>Rauwolfia serpentina</i> (L.) Benth. ex Kurz	Apocynaceae	Patal goruda	Shrub	Med	0.92
187	<i>Salacia chinensis</i> L.	Celastraceae	Batra	Shrub	Ed	0.75
188	<i>Sapindus trifoliata</i> L.	Sapindaceae	Rentha, Maktamanji	Tree	Mis	0.83
189	<i>Saraca asoca</i> (Roxb.) Willd.	Leguminosae	Ashoko	Tree	Med, Fod, Mis	1.25
190	<i>Schleichera oleosa</i> (Lour.) Oken	Sapindaceae	Kusum	Tree	Med, Ed, Fod	1.33
191	<i>Scoparia dulcis</i> L.	Plantaginaceae	Chirarita, Khelopapada	Herb	Med	0.83
192	<i>Senna alata</i> (L.) Roxb.	Leguminosae		Shrub	Med	0.83
193	<i>Senna hirsuta</i> (L.) Irwin & Barneby	Leguminosae	Bado chakunda	Shrub	Med	0.67
194	<i>Senna tora</i> (L.) Roxb.	Leguminosae	Dhola chakunda	Shrub	Med, Vet	0.92
195	<i>Shorea robusta</i> Gaertn.	Dipterocarpaceae	Sal	Tree	Med, Tim, Mis, Fod	1.33
196	<i>Sida acuta</i> Burm. f.	Malvaceae	Bajramuli, Ancharna	Shrub	Mis	0.83
197	<i>Sida cordata</i> (Burm. f.) Borss.	Malvaceae	Bajramuli, Veshkhapri	Herb	Med	0.67
198	<i>Smilax lanceifolia</i> Roxb.	Asparagaceae	Ramdantuni	Climber	Mis, Med	0.83
199	<i>Solena amplexicaulis</i> (Lam.) Gandhi in Saldanha& Nicolson	Cucurbitaceae	Ban kundri, Matka	Herb	Med, Ed	0.83
200	<i>Spatholobus parviflorus</i> (Roxb. ex DC.) O. Ktze.	Leguminosae	Latapalash	Climber	Fib	0.58
201	<i>Stereospermum tetragonum</i> DC.	Bignoniaceae	Pamphunia, Padal	Tree	Mis	0.5
202	<i>Streblus asper</i> Lour.	Moraceae	Sara,Sahada	Tree	Med, Ed, Fod	0.83

203	<i>Streblus taxoides</i> (Heyne ex Roth) Kurz	Moraceae	Sukali, Phutkuli	Shrub	Ed	0.67
204	<i>Strychnos nux-vomica</i> L.	Loganiaceae	Kochila	Tree	Mis	1
205	<i>Strychnos potatorum</i> L.f.	Loganiaceae	Katako, Nirmali	Tree	Mis	0.58
206	<i>Suregada lanceolata</i> (Willd.) Kuntze	Euphorbiaceae		Tree	Fu	0.5
207	<i>Suregada multiflora</i> (A. Juss.) Baill.	Euphorbiaceae	Khakra, Ganari	Tree	Ed, Tim	0.67
208	<i>Symplocos cochinchinensis</i> (Lour.) Moore	Symplocaceae	Kotoro, Bhaunri	Tree	Med, Mis	0.83
209	<i>Symplocos racemosa</i> Roxb.	Symplocaceae	Lodh, Lodhra	Tree	Med	0.75
210	<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jamu	Tree	Med, Fod, Tim	1.17
211	<i>Syzygium nervosum</i> A.Cunn. ex DC.	Myrtaceae	Jamu	Tree	Ed	1
212	<i>Tamilnadia uliginosa</i> (Retz.) Tirveng. & Sastre	Rubiaceae	Telkur	Tree	Med, Ed, Fod	0.83
213	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn.	Combretaceae	Kahua, Arjun	Tree	Med, Fod, Tim	1.33
214	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Bahada	Tree	Med, Fod	1.17
215	<i>Terminalia chebula</i> Retz.	Combretaceae	Harida, Hara	Tree	Med, Fod, Tim	1.33
216	<i>Thysanolaena latifolia</i> (Roxb. ex Hornem.) Honda	Poaceae	Phuljharughas, Phulbadhuni	Herb	Mis	0.67
217	<i>Tiliacora racemosa</i> Coleb.	Menispermaceae		Climber	Med	0.5
218	<i>Toxicarpus kleinii</i> Wight & Arn.	Apocynaceae		Climber	Fib	0.67
219	<i>Trema orientalis</i> (L.) Blume	Cannabaceae	Jivani, Kharkas	Tree	Fu, Fod	0.58
220	<i>Trichodesma indicum</i> (L.) Lehm.	Boraginaceae	Hetamundia	Herb	Med	0.75
221	<i>Tridax procumbens</i> L.	Asteraceae	Bormundi, Visalwakarani	Herb	Med	0.83
222	<i>Triumfetta rhomboidea</i> Jacq.	Malvaceae	Chitki	Shrub	Med, Fib	0.92
223	<i>Urena lobata</i> L.	Malvaceae	Banokra	Shrub	Fod, Fib	0.83
224	<i>Urena sinuata</i> L.	Malvaceae	Kunjia	Herb	Fib, Mis	0.75
225	<i>Uvaria hamiltonii</i> Hook.f. & Thoms.	Annonaceae	Lakankuli	Shrub	Ed	0.67

226	<i>Ventilago denticulata</i> Willd.	Rhamnaceae	Pitchauli	Climber	Med	0.67
227	<i>Vitex leucoxydon</i> L. f.	Lamiaceae	Panijamu	Tree	Tim	0.58
228	<i>Vitex peduncularis</i> Wall. ex Schauer	Lamiaceae	Bhadu	Tree	Fod	0.5
229	<i>Xantolis tomentosa</i> (Roxb.) Rafin.	Sapotaceae	Kantaboro	Tree	Med, Fod	0.83
230	<i>Xylia xylocarpa</i> (Roxb.) Taub.	Leguminosae	Tangini	Tree	Med, Tim	0.75
231	<i>Zehneria maysorensis</i> (Wight & Arn.) Arn.	Cucurbitaceae		Climber	Ed	0.58
232	<i>Zingiber zerumbet</i> (L.) J.E. Smith	Zingiberaceae	Gada	Herb	Med	0.83
233	<i>Ziziphus funiculosa</i> Buch.-Ham. ex Lawson	Rhamnaceae	Chunkoli	Climber	Ed	1
234	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	Jharberi	Tree	Med, Ed	1.17
235	<i>Ziziphus nummularia</i> (Burm.f.) Wight & Arn.	Rhamnaceae	Jangulikoli	Shrub	Ed	1
236	<i>Ziziphus oenoplia</i> (L.) Mill.	Rhamnaceae		Shrub	Ed	1

Table 3: Plants used as Timber sources in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Alangium salviifolium</i> (L. f.) Wang. (Cornaceae)	Furniture, musical instruments	0.67
2	<i>Anogeissus acuminata</i> (Roxb. ex DC.) Guill. & Perr. (Combretaceae)	Agricultural and household implements	0.58
3	<i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall. ex Guill. & Perr. (Combretaceae)	House construction, agricultural and household implements	0.58
4	<i>Bombax ceiba</i> L. (Malvaceae)	Manufacturing matches.	0.67
5	<i>Briedelia retusa</i> (L.) A. Juss. (Euphorbiaceae)	Furniture, agricultural implements	0.83
6	<i>Cassia fistula</i> L. (Leguminosae)	Agriculture implements	0.50
7	<i>Ceiba pentandra</i> (L.) Gaertn. (Malvaceae)	Manufacture of matches.	0.75
8	<i>Chionanthus ramiflorus</i> Roxb. (Oleaceae)	House building, agricultural implements	0.50
9	<i>Dalbergia latifolia</i> Roxb. (Leguminosae)	Furniture, agricultural implements, local gun	1.00
10	<i>Dalbergia sissoo</i> Roxb. (Leguminosae)	Furniture, picture frames, musical instruments, tool handles and local household implements	1.00
11	<i>Diospyros exsculpta</i> Buch.-Ham. (Ebenaceae)	Tools and household implements, doors and windows, furniture, frames, toys	0.75

12	<i>Discospermum abnorme</i> (Korth.) S. J. Ali & Robbr. (Rubiaceae)	Agriculture implements	0.67
13	<i>Dysoxylum gotadhora</i> (Buchanan-Hamilton) Mabberley (Meliaceae)	Agriculture implements	0.83
14	<i>Gardenia latifolia</i> Ait. (Rubiaceae)	Light toys, comb	0.58
15	<i>Gmelina arborea</i> Roxb. ex Sm. (Lamiaceae)	Furniture, boxes, doors etc.	0.67
16	<i>Haldina cordifolia</i> (Roxb.) Ridsd. (Rubiaceae)	Furniture	0.67
17	<i>Hymenodictyon orixense</i> (Roxb.) Mabb. (Rubiaceae)	Toys, box-planking, light furniture.	0.67
18	<i>Lagerstroemia parviflora</i> Roxb. (Lythraceae)	House construction, agricultural implements.	0.83
19	<i>Limonia acidissima</i> L. (Rutaceae)	Furniture	0.50
20	<i>Milium tomentosum</i> (Roxb.) Finet & Gagnep. (Annonaceae)	Agricultural implements	0.67
21	<i>Mitragyna parvifolia</i> (Roxb.) Korth. (Rubiaceae)	Furniture and agricultural implements	0.83
22	<i>Shorea robusta</i> Gaertn. (Dipterocarpaceae)	House building, furniture	1.00
23	<i>Suregada multiflora</i> (A. Juss.) Baill. (Euphorbiaceae)	Agricultural implements.	0.67
24	<i>Syzygium cumini</i> (L.) Skeels (Myrtaceae)	Furniture.	0.50
25	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn. (Combretaceae)	Agricultural implements, boat and house building	0.83
26	<i>Terminalia chebula</i> Retz. (Combretaceae)	Agricultural implements.	0.92
27	<i>Vitex leucoxydon</i> L. f. (Lamiaceae)	Roof of house, agricultural implements.	0.67
28	<i>Xylia xylocarpa</i> (Roxb.) Taub. (Leguminosae)	Furniture	0.50

Table 4: Plants used as Fibre sources in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Acacia caesia</i> (L.) Willd. (Leguminosae)	Bark extracting as rope for tying purposes.	0.67
2	<i>Acacia torta</i> (Roxb.) Craib (Leguminosae)	Bark extracting as rope for tying purposes.	0.83
3	<i>Argyrea daltonii</i> Clarke (Convolvulaceae)	Stem used as rope for tying purposes.	0.67
4	<i>Argyrea populifolia</i> Choisy (Convolvulaceae)	Stem used as rope for tying purposes.	0.50
5	<i>Bauhinia vahlii</i> Wight & Arn. (Leguminosae)	Bark is used as thread for tying purposes, making ropes.	0.92
6	<i>Bombax ceiba</i> L. (Malvaceae)	Flosses used for making pillows.	0.58

7	<i>Butea superba</i> Roxb. (Leguminosae)	Stem bark yields fibre for tying purposes.	0.83
8	<i>Calycopteris floribunda</i> Lam. (Combretaceae)	Bark is used as rope for tieing woods	0.67
9	<i>Careya arborea</i> Roxb. (Lecythidaceae)	bark also provides good cordage	0.67
10	<i>Cayratia japonica</i> (Thunb.) Gagnep (Vitaceae)	Stem used as rope for tying purposes.	0.50
11	<i>Ceiba pentandra</i> (L.) Gaertn. (Malvaceae)	Flosses used for making pillows.	0.58
12	<i>Dalbergia volubilis</i> Roxb. (Leguminosae)	Stem yields fibre used for making rope.	0.67
13	<i>Derris scandens</i> (Dalz.) Baker (Leguminosae)	Stem is used for making rope which is very strong in nature.	0.67
14	<i>Firmiana colorata</i> (Roxb.) R. Br. (Malvaceae)	Fibre is obtained from the stem bark for tying purposes.	0.50
15	<i>Grewia tiliifolia</i> Vahl (Malvaceae)	Bark extracted for making rope	0.75
16	<i>Kydia calycina</i> Roxb. (Malvaceae)	Fibre extracting from bark is used for making rope for tying purposes, carpets.	0.67
17	<i>Pterospermum acerifolium</i> (L.) Willd. (Malvaceae)	Stem bark is used as rope for tying the bundle of wood.	0.67
18	<i>Spatholobus parviflorus</i> (Roxb. ex DC.) O. Ktze. (Leguminosae)	Bark yields fiber for rope making.	0.83
19	<i>Toxicarpus kleinii</i> Wight & Arn. (Apocynaceae)	Stem used as rope for tying purposes	0.50
20	<i>Triumfetta rhomboidea</i> Jacq. (Malvaceae)	The fibre extracted from stem is used as jute substitute.	0.67
21	<i>Urena lobata</i> L. (Malvaceae)	Stem yeilds fiber similar to jute, used for making rope, carpets.	0.67
22	<i>Urena sinuata</i> L. (Malvaceae)	Stem yields fibre for tying purposes, making ropes.	0.67

Table 5: Plants used as Fodder sources in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Acanthus ilicifolius</i> L. (Acanthaceae)	Leaves used as fodder	0.33
2	<i>Briedelia retusa</i> (L.) A. Juss. (Euphorbiaceae)	The leaves are also excellent fodder for wild ungulates and elephants. Elephants also like the bark of the tree. The petiole and fruits are eaten by giant squirrel	0.58
3	<i>Calycopteris floribunda</i> Lam. (Combretaceae)	Leaves are used as fodder for goats	0.67
4	<i>Cassia fistula</i> L. (Leguminosae)	Leaves and branches are eaten by elephant, where as leaves and fruits are by bear and chital. Also used as cattle fodder	0.83

5	<i>Chionanthus ramiflorus</i> Roxb. (Oleaceae)	Ripe fruits are eaten by birds, monkeys and giant squirrels	0.50
6	<i>Combretum latifolium</i> Blume (Combretaceae)	Leaves used as fodder	0.67
7	<i>Crataeva magna</i> (Lour.) DC. (Capparaceae)	Plant is used as fodder	0.75
8	<i>Careya arborea</i> Roxb. (Lecythidaceae)	The pale green fleshy fruits are eaten by bears, monkeys and elephants and other herbivores. Leaves are also eaten by elephants.	0.50
9	<i>Dalbergia lanceolaria</i> L. f. (Leguminosae)	Plant is used as cattle fodder	0.75
10	<i>Dendrocalamus strictus</i> (Roxb.) Nees (Poaceae)	Plant is used as fodder	0.83
11	<i>Dillenia aurea</i> Sm.(Dilleniaceae)	The fruits are also much liked by elephants	0.58
12	<i>Dillenia pentagyna</i> Roxb. (Dilleniaceae)	The fruits are also eaten by monkeys and other herbivores. The petioles, tender leaves and fruits are eaten by giant squirrels	0.67
13	<i>Diospyros malabarica</i> (Desr.) Kostel. (Ebenaceae)	Monkeys and birds also like the fruits. Leaves are eaten by elephants	0.83
14	<i>Diospyros melanoxylon</i> Roxb. (Ebenaceae)	Roots of young plants are eaten by elephant	0.83
15	<i>Diospyros sylvatica</i> Roxb. (Ebenaceae)	Plant is used as cattle fodder	0.83
16	<i>Ficus benghalensis</i> L. (Moraceae)	Figs are very much liked by birds, bats, herbivore and monkeys. The leaves and twigs are an excellent fodder for elephant and cattle	1.00
17	<i>Flueggea virosa</i> (Roxb. Ex Willd.) Voigt. (Euphorbiaceae)	Ripe fruits are eaten by birds	0.58
18	<i>Gardenia latifolia</i> Ait. (Rubiaceae)	Ripen fruits are eaten by birds and other herbivores animals.	0.67
19	<i>Glycosmis pentaphylla</i> (Retz.) DC. (Rutaceae)	Plant is also used as fodder for goats	0.67
20	<i>Hymenodictyon orixense</i> (Roxb.) Mabb. (Rubiaceae)	The leaves are good fodder	0.50
21	<i>Kydia calycina</i> Roxb. (Malvaceae)	The leaves and barks are good fodder for elephant	0.42
22	<i>Lagerstroemia parviflora</i> Roxb. (Lythraceae)	Plant is lopped for fodder. Barks are eaten by elephants	0.75
23	<i>Litsea glutinosa</i> (Lour.) Robins. (Lauraceae)	Ripe fruits are much liked by birds.	0.67
24	<i>Macaranga peltata</i> (Roxb.) Muell.- Arg. (Euphorbiaceae)	Leaves are eaten by elephants.	0.83
25	<i>Madhuca longifolia</i> (Koenig) Macbr. var. <i>latifolia</i> (Roxb.) A. Chev. (Sapotaceae)	The flowers are also eaten by elephant and other herbivores. It provides much needed food to wildlife during summer	1.00

26	<i>Mallotus philippensis</i> (Lam.) Muell.- Arg. (Euphorbiaceae)	Excellent fodder for elephants	0.92
45	<i>Mallotus nudiflorus</i> (L.) Kulju & Welzen (Euphorbiaceae)	Fruits are used as fodder	0.50
27	<i>Merremia tridentata</i> (L.) Hall.f. (Convolvulaceae)	Plant used as fodder	0.50
28	<i>Miliusa tomentosa</i> (Roxb.) Finet & Gagnep. (Annonaceae)	Leaves are eaten by Chital	0.75
29	<i>Pavetta indica</i> L. (Rubiaceae)	Leaves are eaten by goat	0.75
30	<i>Phyllanthus emblica</i> L. (Phyllanthaceae)	Monkeys and other herbivores like the ripen fruit. Leaves are eaten by the elephants	0.67
31	<i>Phyllanthus lawii</i> Graham ex Muell.- Arg. (Phyllanthaceae)	Plant is used as fodder	0.50
32	<i>Phyllanthus reticulatus</i> Poir. (Phyllanthaceae)	Leaves are used as fodder	0.50
33	<i>Physalis minima</i> L. (Solanaceae)	Plant is used as fodder	0.58
34	<i>Pithecellobium dulce</i> (Roxb.) Benth. (Leguminosae)	Leaves are used as fodder	0.67
35	<i>Polyalthia suberosa</i> (Roxb.) Thw. (Annonaceae)	Ripen fruits are eaten by birds and herbivores	0.75
36	<i>Saraca asoca</i> (Roxb.) Willd. (Leguminosae)	Leaves are used as fodder for cattle	0.67
37	<i>Schleichera oleosa</i> (Lour.) Oken (Sapindaceae)	Leaves are used as fodder for goats. Leaves are eaten by elephants and other herbivores, where as bark and fruits are eaten by giant squirrel.	0.58
38	<i>Shorea robusta</i> Gaertn. (Dipterocarpaceae)	Bark is eaten by elephant, whereas leaves are eaten by Chital and Sambar	0.67
39	<i>Streblus asper</i> Lour. (Moraceae)	Leaves are used as fodde	0.50
40	<i>Syzygium cumini</i> (L.) Skeels (Myrtaceae)	Fruits are eaten by bears, monkeys, civets, giant squirrel and many other herbivores. Leaves are eaten by elephant.	0.83
41	<i>Tamilnadia uliginosa</i> (Retz.) Tirveng. & Sastre (Rubiaceae)	The leaves are good fodder.	0.67
42	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn. (Combretaceae)	Leaves are eaten by sambar deer. Fruits are eaten by giant squirrel	0.75
43	<i>Terminalia bellirica</i> (Gaertn.) Roxb. (Combretaceae)	Monkeys, giant squirrels, elephants and other herbivores feed on the leaves and fruits	0.92
44	<i>Terminalia chebula</i> Retz. (Combretaceae)	Monkeys and giant squirrels eat the fruit. Leaves are eaten by elephants and other herbivores	0.83
49	<i>Trema orientalis</i> (L.) Blume	Ripe fruits are eaten by birds	0.42 0.50
46	<i>Urena lobata</i> L. (Malvaceae)	Plant is used as fodder	0.50

47	<i>Vitex peduncularis</i> Wall.ex Schauer (Lamiaceae)	Leaves are used as fodder	0.42
48	<i>Xantolis tomentosa</i> (Roxb.) Rafin. (Sapotaceae)	Elephant likes the leaves and bark, while the petiole, fruit and bark are eaten by giant squirrel	0.58

Table 6: Plants used as wild edible sources in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Adenanthera pavonina</i> L. (Leguminosae)	Seed kernels are eaten occasionally.	0.33
2	<i>Aegle marmelos</i> (L.) Correa (Rutaceae)	Ripen fruits are eaten and made into sharbat (Belpana).	0.58
3	<i>Alangium salviifolium</i> (L. f.) Wang. (Cornaceae)	Fruits are edible.	0.67
4	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC. (Amaranthaceae)	Leaves used as leafy vegetable	0.83
5	<i>Amorphophallus paeoniifolius</i> var. <i>paeoniifolius</i> Sivad. (Araceae)	Tubers are edible.	0.50
6	<i>Anacardium occidentale</i> L. (Anacardiaceae)	Roasted and raw kernels are eaten as a dessert, employed in confectionery and are highly nutritious	0.67
7	<i>Antidesma bunius</i> (L.) Spreng. (Euphorbiaceae)	Ripen fruits are eaten. Leaves used as vegetables.	0.75
8	<i>Antidesma ghaesembilla</i> Gaertn. (Euphorbiaceae)	Ripen fruits are eaten.	0.50
9	<i>Aporosa octandra</i> (Buch.-Ham. ex D. Don) Vickery (Euphorbiaceae)	Ripen fruits are eaten.	0.75
10	<i>Ardisia solanacea</i> Roxb. (Primulaceae)	Flowers are edible.	0.83
11	<i>Atalantia monophylla</i> (L.) DC. (Rutaceae)	Fruits are edible, also used for making sharbat and pickles.	0.58
12	<i>Bauhinia vahlii</i> Wight & Arn. (Leguminosae)	Seeds are edible.	0.67
13	<i>Bidens pilosa</i> L. var. <i>minor</i> (Blume) Sherff (Asteraceae)	Leaves used as vegetable.	0.83
14	<i>Boerhavia diffusa</i> L. (Nyctaginaceae)	Plant used as vegetable.	0.83
15	<i>Bombax ceiba</i> L. (Malvaceae)	Young capsules are also cooked for preparing curry.	0.83
16	<i>Briedelia retusa</i> (L.) A. Juss. (Euphorbiaceae)	Ripen fruits are eaten.	1.00
17	<i>Buchanania cochinchinensis</i> (Lour.) M.R.Almeida (Anacardiaceae)	Fruits are edible.	0.58
18	<i>Callicarpa tomentosa</i> (L.) L. (Lamiaceae)	Leaves are used as vegetable.	0.67
19	<i>Canthium coromandelicum</i> (Burm. f.) Alston (Rubiaceae)	Fruit is edible.	0.67
20	<i>Capparis zeylanica</i> L. (Capparaceae)	Ripen fruits are eaten.	0.50

21	<i>Careya arborea</i> Roxb. (Lecythidaceae)	Fruits are edible.	0.42
22	<i>Carissa spinarum</i> L. (Apocynaceae)	Fruits are edible.	0.75
23	<i>Catunaregam spinosa</i> (Thunb.) Tirveng. (Rubiaceae)	The ripe fruits are edible	0.67
24	<i>Chlorophytum arundinaceum</i> Baker (Asparagaceae)	Leaves are used as vegetable.	0.83
25	<i>Cordia dichotoma</i> G.Forst. Saxena & Brahmam (Boraginaceae)	Ripen fruits are eaten.	1.00
26	<i>Cordia monoica</i> Roxb. (Boraginaceae)	Ripen fruits are eaten.	0.92
27	<i>Cyathula prostrata</i> (L.) Blume (Amaranthaceae)	The plant is used as a green vegetable.	0.50
28	<i>Dendrocalamus strictus</i> (Roxb.) Nees (Poaceae)	Young shoot is eaten.	0.75
29	<i>Desmos chinensis</i> Lour. (Annonaceae)	Ripen fruits are eaten.	0.75
30	<i>Dillenia aurea</i> Sm.(Dilleniaceae)	Ripen fruits are eaten by tribal people.	0.67
31	<i>Dillenia pentagyna</i> Roxb. (Dilleniaceae)	The flower buds and young fruits are eaten raw or cooked and these are pleasantly acidic.	0.50
32	<i>Dioscorea alata</i> L. (Dioscoreaceae)	Tubers are edible.	0.50
33	<i>Dioscorea bulbifera</i> L. (Dioscoreaceae)	Tubers are edible.	0.58
34	<i>Dioscorea hamiltonii</i> Hook.f. (Dioscoreaceae)	Tubers are edible.	0.67
35	<i>Dioscorea hispida</i> Dennst. (Dioscoreaceae)	Tubers are edible.	0.75
36	<i>Dioscorea pentaphylla</i> L. (Dioscoreaceae)	Tubers are edible.	0.67
37	<i>Dioscorea pubera</i> Blume (Dioscoreaceae)	Tubers are edible.	0.58
38	<i>Diospyros malabarica</i> (Desr.) Kostel. (Ebenaceae)	Ripe fruits are edible by tribal communities	0.67
39	<i>Diospyros melanoxyton</i> Roxb. (Ebenaceae)	The ripen fruits are edible	0.50
40	<i>Erycibe paniculata</i> Roxb. (Convolvulaceae)	Ripen fruits are eaten.	0.83
41	<i>Ficus semicordata</i> Buch.-Ham.ex J.E.Sm. (Moraceae)	Ripen fruits are edible.	0.67
42	<i>Flacourtia indica</i> (Burm. f.) Merr. (Salicaceae)	Fruits and flower buds are edible.	0.75
43	<i>Flacourtia montana</i> Graham (Salicaceae)	Ripen fruits are eaten.	0.92
44	<i>Flemingia macrophylla</i> (Willd.) Prain ex Merr.(Leguminosae)	Pods are eaten.	0.83
45	<i>Flueggea leucopyrus</i> Willd. (Euphorbiaceae)	Ripen fruits are eaten.	0.42
46	<i>Flueggea virosa</i> (Roxb. Ex Willd.) Voigt. (Euphorbiaceae)	Ripe fruits are eaten by tribal people	0.50
47	<i>Garcinia cowa</i> Roxb.ex DC. (Clusiaceae)	Ripen fruits are eaten.	0.42

48	<i>Gardenia gummifera</i> L. f. (Rubiaceae)	Fruits are edible.	0.58
49	<i>Gardenia latifolia</i> Ait. (Rubiaceae)	Fruits are eaten	0.50
50	<i>Glinus oppositifolius</i> (L.) Aug.DC. (Molluginaceae)	Plant is used as leafy vegetable.	0.33
51	<i>Glycosmis pentaphylla</i> (Retz.) DC. (Rutaceae)	Fruits are edible	0.58
52	<i>Gmelina arborea</i> Roxb. ex Sm. (Lamiaceae)	Fruits edible.	0.67
53	<i>Ixora pavetta</i> Andr. (Rubiaceae)	Ripen fruits are eaten by tribal people.	0.83
54	<i>Lagerstroemia parviflora</i> Roxb. (Lythraceae)	Plants yield an edible gum.	0.50
55	<i>Leucas ciliata</i> Benth.ex Wall. (Lamiaceae)	Leaves are used as vegetable helping in reducing the diabetes.	0.67
56	<i>Limonia acidissima</i> L. (Rutaceae)	Fruits are edible.	0.75
57	<i>Mangifera indica</i> L. (Anacardiaceae)	Ripe and unripe fruits are edible	0.50
58	<i>Manilkara zapota</i> (L.) P.Royen (Sapotaceae)	Fruits are edible.	0.75
59	<i>Melastoma malabathricum</i> L. (Melastomataceae)	Calyx is edible.	0.83
60	<i>Memecylon ovatum</i> Roxb. (Melastomataceae)	Fruits are edible.	0.58
61	<i>Miliusa tomentosa</i> (Roxb.) Finet & Gagnep. (Annonaceae)	Ripen fruits are tasty and eaten by tribal people.	0.67
62	<i>Miliusa velutina</i> (Dunal) Hook. f. & Thoms. (Annonaceae)	The fruit is eaten by local tribal people.	0.83
63	<i>Monochoria vaginalis</i> (Burm. f.) Presl (Pontederiaceae)	Leaves consumed as vegetables.	0.83
64	<i>Olox scandens</i> Roxb. (Olacaceae)	Pulp of the fruits is edible.	0.83
65	<i>Passiflora edulis</i> Sims in Curtis (Passifloraceae)	Fruits are edible.	1.00
66	<i>Phoenix sylvestris</i> (L.) Roxb. (Arecaceae)	Fruits are eaten after ripening.	0.58
67	<i>Phyllanthus emblica</i> L. (Phyllanthaceae)	Fruits are edible and used in preparation of pickles.	0.67
68	<i>Physalis minima</i> L. (Solanaceae)	Ripen fruits are eaten.	0.67
69	<i>Pithecellobium dulce</i> (Roxb.) Benth. (Leguminosae)	Fruits are edible.	0.50
70	<i>Pogostemon benghalensis</i> (Burm. f.) O. Ktze. (Lamiaceae)	Plant is used as vegetable.	0.42
71	<i>Polyalthia cerasoides</i> (Roxb.) Bedd. (Annonaceae)	Ripen fruits are eaten by local tribal people.	0.75
72	<i>Salacia chinensis</i> L. (Celastraceae)	Fruits are edible.	0.67
73	<i>Schleichera oleosa</i> (Lour.) Oken (Sapindaceae)	Fruits are edible.	0.83
74	<i>Solena amplexicaulis</i> (Lam.) Gandhi in Saldanha & Nicolson (Cucurbitaceae)	The young (unripe fruit) is used as vegetable.	1.00
75	<i>Streblus asper</i> Lour. (Moraceae)	Ripen fruits are edible.	0.92

76	<i>Streblus taxoides</i> (Heyne ex Roth) Kurz (Moraceae)	Leaves and fruits are edible.	0.50
77	<i>Suregada multiflora</i> (A. Juss.) Baill. (Euphorbiaceae)	Ripen fruits are eaten by tribal people	0.75
78	<i>Syzygium nervosum</i> A. Cunn. Ex DC. Saxena & Brahmam (Myrtaceae)	Fruits are edible.	0.75
79	<i>Tamilnadia uliginosa</i> (Retz.) Tirveng. & Sastre (Rubiaceae)	The unripe fruits are boiled or roasted as a vegetable for curry.	0.67
80	<i>Uvaria hamiltonii</i> Hook.f. & Thoms. (Annonaceae)	Ripen fruits are eaten.	0.50
81	<i>Zehneria maysorensis</i> (Wight & Arn.) Arn. (Cucurbitaceae)	Leaves and young fruits are used as vegetable.	0.50
82	<i>Ziziphus funiculosa</i> Buch.-Ham. ex Lawson (Rhamnaceae)	Fruits are edible.	0.58
83	<i>Ziziphus mauritiana</i> Lam. (Rhamnaceae)	Fruits are edible. Ripen fruits are dried and then used for making chutney.	0.67
84	<i>Ziziphus nummularia</i> (Burm.f.) Wight & Arn. (Rhamnaceae)	Fruits are edible.	0.75
85	<i>Ziziphus oenoplia</i> (L.) Mill. (Rhamnaceae)	Fruits are edible.	0.67

Table 7: Plants used to treat joint pain in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Acanthus ilicifolius</i> L. (Acanthaceae)	Leaf paste is applied on joints with rheumatic pains	0.50
2	<i>Alstonia scholaris</i> (L.) R. Br. (Apocynaceae)	Stem bark with latex is pasted and applied externally on rheumatism	0.50
3	<i>Anacardium occidentale</i> L. (Anacardiaceae)	Seed oil applied on joints with rheumatic pain	0.67
4	<i>Caesalpinia bonduc</i> (L.) Roxb. (Leguminosae)	Leaf paste is applied on joints with rheumatic pain	0.42
5	<i>Calotropis gigantea</i> (L.) R. Br. (Apocynaceae)	Leaf paste is applied on joint pain	0.92
6	<i>Capparis zeylanica</i> L. (Capparaceae)	Root juice taken in rheumatic pain	0.50
7	<i>Catunaregam spinosa</i> (Thunb.) Tirveng. (Rubiaceae)	Bark decoction is taken to cure joint pain	0.50
8	<i>Celastrus paniculatus</i> Willd. (Celastraceae)	Seed oil is applied on joints to relief pain	0.67
9	<i>Cryptolepis dubia</i> (Burm.f.) M.R. Almeida (Apocynaceae)	Latex of the plant is applied externally on joints with rheumatic pains	0.75
10	<i>Drimia indica</i> (Roxb.) Jessop (Asparagaceae)	Oil is boiled with paste of the bulb and applied externally for one month to cure rheumatic pain	0.58
11	<i>Mitragyna parvifolia</i> (Roxb.) Korth. (Rubiaceae)	Root paste applied on joints with rheumatic pain	0.67

12	<i>Nyctanthes arbor-tristis</i> L. (Oleaceae)	Bark paste applied on joints with pains	0.67
13	<i>Oxalis scandens</i> Roxb. (Oxalaceae)	Leaf paste applied on joints with rheumatic pain	0.50
14	<i>Oroxylum indicum</i> (L.) Benth. ex Kurz (Bignoniaceae)	Bark and seeds paste is applied on rheumatic pain	0.83
15	<i>Xantolis tomentosa</i> (Roxb.) Rafin. (Sapotaceae)	Root bark is crushed and taken in rheumatism, bark paste is applied on pain	0.67

Table 8: Plants used to treat piles in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Achyranthes aspera</i> L. (Amaranthaceae)	Plant infusion is taken internally and applied on piles, till cure	0.67
2	<i>Catunaregam spinosa</i> (Thunb.) Tirveng. (Rubiaceae)	Fruit paste is applied on piles	0.50
3	<i>Cyanthillium cinereum</i> (L.) H. Rob (Asteraceae)	Leaf paste is prescribed as topical application for piles in case of irritation	0.50
4	<i>Holarrhena pubescens</i> Wall. ex G. Don (Apocynaceae)	Stem bark paste is taken to stop bleeding from piles	0.75
5	<i>Tridax procumbens</i> L. (Asteraceae)	The plant paste is given 3 spoons thrice a day for 5 days in piles	0.67

Table 9: Plants used to treat gastrointestinal disorder in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Abutilon indicum</i> (L.) Sweet (Malvaceae)	Root paste given once in day for 3 days to treat blood dysentery.	0.75
2	<i>Aegle marmelos</i> (L.) Correa (Rutaceae)	Leaves are chewed to cure stomach ache. Unripe fruit-pulp sun-dried, powdered and given in blood dysentery	0.83
3	<i>Ageratum conyzoides</i> L. (Asteraceae)	Herb infusion is given in stomach ailments such as diarrhoea, dysentery and intestinal colic with flatulence.	0.83
4	<i>Alternanthera sessilis</i> (L.) R. Br. ex DC. (Amaranthaceae)	Leaf is used for indigestion, burning sensation, diarrhoea	0.67
5	<i>Asparagus racemosus</i> Willd. (Asparagaceae)	Root extract is used for stomach pain	0.67
6	<i>Barringtonia acutangula</i> (L.) Gaertn. (Lecythidaceae)	Leaf juice is given in diarrhea	0.75
7	<i>Briedelia retusa</i> (L.) A. Juss. (Euphorbiaceae)	Bark and roots are used in the treatment of indigestion	0.58
8	<i>Caesalpinia bonduc</i> (L.) Roxb. (Leguminosae)	Seed paste given in stomach disorder	0.67

9	<i>Calotropis gigantea</i> (L.) R. Br. (Apocynaceae)	Powdered root bark is taken twice daily to cure dysentery	0.58
10	<i>Careya arborea</i> Roxb. (Lecythidaceae)	Bark layer is used for diarrhoea	0.83
11	<i>Cassia fistula</i> L. (Leguminosae)	Root paste with water is taken in stomach pain. Fruit, seed and flower paste are taken in constipation and gastric problems	0.75
12	<i>Catunaregam spinosa</i> (Thunb.) Tirveng. (Rubiaceae)	Bark paste is taken in diarrhoea and dysentery	0.58
13	<i>Cissus quadrangularis</i> L. (Vitaceae)	Plant paste is taken orally for easy digestion	0.50
14	<i>Crotalaria retusa</i> L. (Leguminosae)	Root powder mixed with spices is used as a remedy for colic	0.42
15	<i>Dalbergia volubilis</i> Roxb. (Leguminosae)	Bark juice prescribed in stomach disorders	0.67
16	<i>Entada rheedii</i> Spreng. (Leguminosae)	Stem powder is taken to cure diarrhoea	0.83
17	<i>Evolvulus alsinoides</i> (L.) L. (Convolvulaceae)	Herb infusion is used to cure dysentery	0.67
18	<i>Flemingia chappar</i> Buch.-Ham.ex Benth. (Leguminosae)	The fruit powder given as purgative	0.50
19	<i>Glochidion lanceolarium</i> (Roxb.) Voigt. (Phyllanthaceae)	Bark powder is taken to cure diarrhoea	0.67
20	<i>Hemidesmus indicus</i> (L.) R. Br. (Apocynaceae)	Root and pepper paste is used in stomach pain and diarrhoea	0.75
21	<i>Hibiscus rosa-sinensis</i> L. (Malvaceae)	Leaf paste is given to cool stomach	0.83
22	<i>Holarrhena pubescens</i> Wall. ex G.Don (Apocynaceae)	Root paste is taken in stomach pain. Stem bark and root extract is prescribed in dysentery	0.92
23	<i>Holoptelea integrifolia</i> Planch. (Ulmaceae)	Stem bark warmed and kept on stomach for pain relief	0.67
24	<i>Homalium nepalense</i> Benth. (Salicaceae)	Bark paste is given in stomach ache	0.58
25	<i>Jatropha gossypifolia</i> L. (Euphorbiaceae)	Bark paste is taken orally to cure dysentery	0.50
26	<i>Lawsonia inermis</i> L. (Lythraceae)	Leaf paste is given with water to cool stomach.	0.58
27	<i>Litsea glutinosa</i> (Lour.) Robins. (Lauraceae)	The bark is used as a remedy for dysentery	0.67
28	<i>Mangifera indica</i> L. (Anacardiaceae)	Leaf extract and stem bark paste is taken to cure dysentery and diarrhoea	0.67
29	<i>Monochoria vaginalis</i> (Burm. f.) Presl (Pontederiaceae)	Leaf paste given to constipation	0.50
30	<i>Pavetta indica</i> L. (Rubiaceae)	Roots are grounded with water and given 2 days in the treatment of blood dysentery	0.75
31	<i>Persicaria hydropiper</i> (L.) Spach. (Amaranthaceae)	Whole plant paste is taken orally in stomach pain	0.67
32	<i>Phyllanthus emblica</i> L. (Phyllanthaceae)	It is also an important medicine and used in preparation of ayurvedic medicine such as "Triphala", bowel tonic	0.83

33	<i>Phyllanthus urinaria</i> L. (Phyllanthaceae)	Plant decoction is given twice a day for 3 days in dysentery	0.75
34	<i>Rauvolfia serpentina</i> (L.) Benth. ex Kurz (Apocynaceae)	Root paste is used for stomach pain	0.67
35	<i>Saraca asoca</i> (Roxb.) Willd. (Leguminosae)	Bark decoction is an efficacious remedy for dysentery	0.83
36	<i>Senna hirsuta</i> (L.) Irwin & Barneby (Leguminosae)	Decoction of leaves taken to cure constipation	0.50
37	<i>Shorea robusta</i> Gaertn. (Dipterocarpaceae)	Leaf extract is given to check dysentery	0.67
38	<i>Streblus asper</i> Lour. (Moraceae)	Roots are used in dysentery by local tribal people	0.67
39	<i>Symplocos cochinchinensis</i> (Lour.) Moore (Symplocaceae)	Leaves decoction is taken in stomach pain	0.75
40	<i>Symplocos racemosa</i> Roxb. (Symplocaceae)	Root is grind in water and given in stomach pain up to cure	0.75
41	<i>Syzygium cumini</i> (L.) Skeels (Myrtaceae)	Stem bark powder mixed with milk is taken orally to cure dysentery	0.67
42	<i>Tamilnadia uliginosa</i> (Retz.) Tirveng. & Sastre (Rubiaceae)	The roasted fruit pulp is used as a remedy for diarrhoea and dysentery	0.67
43	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn. (Combretaceae)	Bark is used as medicine for dysentery and asthma	0.58
44	<i>Terminalia bellirica</i> (Gaertn.) Roxb. (Combretaceae)	Fruit powder used to treat stomach pain	0.67
45	<i>Trichodesma indicum</i> (L.) Lehm. (Boraginaceae)	Plant paste is given to cure stomach ache	0.75
46	<i>Triumfetta rhomboidea</i> Jacq. (Malvaceae)	Powder of dry roots given for 3 days to treat dysentery	0.67
47	<i>Xylia xylocarpa</i> (Roxb.) Taub. (Leguminosae)	Fruits are used for digestion	0.50

Table 10: Plants used for treating toothache in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Anacardium occidentale</i> L. (Anacardiaceae)	Bark and leaf infusion is used to relieve toothache and sore gums	0.67
2	<i>Kaempferia angustifolia</i> Rosc. (Orchidaceae)	Dry rhizome chews to control tooth ache	0.50
3	<i>Mangifera indica</i> L. (Anacardiaceae)	Bark and leaves are used as brush to treat tooth ache	0.83
4	<i>Sida cordata</i> (Burm. f.) Borss. (Malvaceae)	The stem is used as tooth brush to cures teeth and gum diseases	0.83
5	<i>Smilax lanceifolia</i> Roxb. (Asparagaceae)	Root paste is applied on tooth ache	0.58

Table 11: Plants used for treating anthelmintic in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Baccharoides anthelmintica</i> (L.) Moench (Asteraceae)	Seed paste is given in deworming.	0.58
2	<i>Flemingia grahamiana</i> Wight & Arn. (Leguminosae)	Exudation from pod is used as anthelmintic.	0.42
3	<i>Flemingia macrophylla</i> (Willd.) Prain ex Merr. (Leguminosae)	Exudation from pod used as anthelmintic	0.42
4	<i>Holarrhena pubescens</i> Wall. ex G.Don (Apocynaceae)	Bark paste has anthelmintic properties	0.67
5	<i>Jatropha curcas</i> L.(Euphorbiaceae)	Leaf juice given de-worming	0.75
6	<i>Micromelum minutum</i> (Forst.f.) Wight & Arn. Prod. (Rutaceae)	Paste of the young leaves is used to treat worm infection.	0.50
7	<i>Senna alata</i> (L.) Roxb. (Leguminosae)	Leaf paste useful to expell intestinal worm	0.50
8	<i>Senna tora</i> (L.) Roxb. (Leguminosae)	Seed powder taken to cure intestinal worms	0.50
9	<i>Triumfetta rhomboidea</i> Jacq. (Malvaceae)	Powder of dry roots given for 3 days to treat intestinal worms	0.67

Table 12: Plants used for treating skin diseases in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Achyranthes aspera</i> L. (Amaranthaceae)	Plant decoction is applied on skin eruptions	0.67
2	<i>Albizia lebbek</i> (L.) Benth. (Leguminosae)	Juice of flowers is applied on boils and eruptions.	0.67
3	<i>Cassia fistula</i> L. (Leguminosae)	Bark and fruits paste is applied on eczema	0.50
4	<i>Cayratia pedata</i> (Lam.) A. Juss. ex Gagnep. (Vitaceae)	Fruit paste is used to treat skin diseases like scabies as an antiseptic. Also applied on boils.	0.42
5	<i>Celastrus paniculatus</i> Willd. (Celastraceae)	Seed oil is applied on scabies	0.58
6	<i>Croton bonplandianus</i> Baill. (Euphorbiaceae)	Leaf paste applied on eruptions and rashes	0.67
7	<i>Cryptolepis dubia</i> (Burm.f.) M.R.Almeida (Apocynaceae)	Latex of the plant is applied externally on boils and blisters	0.75
8	<i>Holarrhena pubescens</i> Wall. ex G.Don (Apocynaceae)	Stem bark and root extract is applied on itching and skin rashes	0.75
9	<i>Ixora coccinea</i> L. (Rubiaceae)	Flowers paste is applied externally on scabies.	0.50
10	<i>Ixora pavetta</i> Andr. (Rubiaceae)	Leaf paste applied on boils for suppuration	0.50
11	<i>Leucas aspera</i> (Willd.)Link (Lamiaceae)	Leaf juice is used for chronic skin eruptions and painful swellings.	0.83
12	<i>Nervilia plicata</i> (Andr.) Schltr. (Orchidaceae)	Tubers are burned and pasted and externally applying over boils to suppuration.	0.67

13	<i>Schleichera oleosa</i> (Lour.) Oken (Sapindaceae)	Oil extracted from seeds used is applied on scabies	0.83
14	<i>Senna alata</i> (L.) Roxb. (Leguminosae)	Leaf paste is applied on ring worm infection till cure	0.67
15	<i>Senna tora</i> (L.) Roxb. (Leguminosae)	Seed pasted with water applying over ringworm infection	0.67
16	<i>Tiliacora racemosa</i> Coleb. (Menispermaceae)	Leaf paste applied externally to treat scabies.	0.50

Table 13: Plants used for treating poisonous bites in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Acanthus ilicifolius</i> L. (Acanthaceae)	Leaf paste is applied on snake bites	0.58
2	<i>Aristolochia indica</i> L. (Aristolochiaceae)	Leaf paste applying externally to treat poisonous bites	0.75
3	<i>Millettia racemosa</i> Panig. & Mishra (Leguminosae)	Root juice is applied on tick bites until cure	0.67
4	<i>Mimosa pudica</i> L. (Leguminosae)	Root paste in the water collected after washing raw rice is given orally for snake bite	0.50
5	<i>Pseudaidia speciosa</i> (Bedd.)Tirveng. (Rubiaceae)	Root is grind and pasted on the snake bite site for antivenom property	0.50
6	<i>Zingiber zerumbet</i> (L.) J.E. Smith (Zingiberaceae)	Rhizome paste used to treat snake poison	0.67

Table 14: Plants used for treating cuts and wounds in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Ageratum conyzoides</i> L. (Asteraceae)	Leaf paste is used for cuts and wounds	0.83
2	<i>Alangium salviifolium</i> (L. f.) Wang. (Cornaceae)	Bark is pasted and applied on fresh cuts as a healing agent	0.58
3	<i>Cissus latifolia</i> Lam. (Vitaceae)	Bark paste is applied on cuts and wounds to stop bleeding and also acts as antiseptic	0.83
4	<i>Croton bonplandianus</i> Baill. (Euphorbiaceae)	Leaves paste applied on cuts and wounds	0.67
5	<i>Cyanthillium cinereum</i> (L.) H.Rob (Asteraceae)	Leaf paste is used for headache and cut and wound as poultice	0.50
6	<i>Evolvulus alsinoides</i> (L.) L. (Convolvulaceae)	Herb infusion is applied as antiseptic on wounds	0.58
7	<i>Ipomoea carnea</i> Jack. (Convolvulaceae)	Milky latex is used for healing wounds	0.50
8	<i>Litsea glutinosa</i> (Lour.) Robins. (Lauraceae)	The bark is used for treating bruises and wounds	0.42

9	<i>Macaranga peltata</i> (Roxb.) Muell.-Arg. (Euphorbiaceae)	Latex obtained from the tree is used to prevent bleeding	0.58
10	<i>Morinda citrifolia</i> L. (Rubiaceae)	Fruit paste is used to cure wounds	0.50
11	<i>Mucuna pruriens</i> (L.) DC. (Leguminosae)	Leaf paste with water used to heal wounds and ulcers	0.42

Table 15: Plants used for male sexual wellnes in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Asparagus racemosus</i> Willd. (Asparagaceae)	Roots extract or powder is given in spermatorrhoea for 10-15 days	0.67
2	<i>Caesalpinia bonduc</i> (L.) Roxb. (Leguminosae)	Leaf paste is applied on hydrocele for suppuration	0.75
3	<i>Curculigo orchoides</i> Gaertn. (Hypoxidaceae)	Rhizome powder (1 spoon) are given in milk for 3 days in spermatorrhoea, impotency and as tonic in weakness	0.83
4	<i>Solena amplexicaulis</i> (Lam.) Gandhi in Saldanha & Nicolson (Cucurbitaceae)	Roots are used to increase production of semen in body	0.67
5	<i>Tridax procumbens</i> L. (Asteraceae)	The plant paste is applied in hydrocele as poultice	0.83

Table 16: Plants used for female diseases in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Aristolochia indica</i> L. (Aristolochiaceae)	Roots are pasted with water and 4 spoonfuls is given to 3-4 months pregnant woman for inducing abortion	0.58
2	<i>Asparagus racemosus</i> Willd. (Asparagaceae)	Roots extract or powder is given in leucorrhoea for 10-15 days	0.50
3	<i>Cryptolepis dubia</i> (Burm.f.) M.R.Almeida (Apocynaceae)	The plant juice with honey is given to women after child birth to increase lactation	0.67
4	<i>Naringi crenulata</i> (Roxb.) Nicolson (Rutaceae)	Stem bark decoctin is given to mother after delivery to relieve pain	0.50
5	<i>Pinellia ternata</i> (Thunberg) Tenore ex Breitenbach (Araceae)	The poisonous tubers are used externally for treating mastitis	0.33
6	<i>Saraca asoca</i> (Roxb.) Willd. (Leguminosae)	Aqueous extract of bark is taken in menstrual disorders	0.67
7	<i>Solena amplexicaulis</i> (Lam.) Gandhi in Saldanha & Nicolson (Cucurbitaceae)	One spoonful root paste given once in a day for 30 days to women to conceive	0.42

Table 17: Plants used for jaundice and malaria in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Caesalpinia bonduc</i> (L.) Roxb. (Leguminosae)	Seed paste given in jaundice	0.50
2	<i>Cryptolepis dubia</i> (Burm.f.) M.R. Almeida (Apocynaceae)	Root extract taken orally to cure jaundice	0.67
3	<i>Evolvulus alsinoides</i> (L.) L. (Convolvulaceae)	Herb infusion is used to cure jaundice	0.67
4	<i>Phyllanthus urinaria</i> L. (Phyllanthaceae)	Plant decoction is given twice a day for 3 days in jaundice	0.75
5	<i>Scoparia dulcis</i> L. (Scrophulariaceae)	Leaves are pasted and given with sugar candy for 1 week to treat jaundice.	0.83
6	<i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees (Acanthaceae)	Leaves are pasted with (Bhuiamla) <i>Phyllanthus fraternus</i> and seed of fenugreek (Methi) and boiled in water. This decoction is given with honey in the treatment of malarial fever	0.92
7	<i>Nyctanthes arbor-tristis</i> L. (Oleaceae)	Leaves and roots are taken with water for 3 weeks to cure malaria	0.58
8	<i>Terminalia chebula</i> Retz. (Combretaceae)	In Malaria, 2-3 fruits are given with water once in morning, empty stomach, till cure	0.33

Table 18: Plants used for other ailments in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Abrus precatorius</i> L. (Leguminosae)	Leaves are pasted with honey and applied to treat mums twice in day up to cure	0.33
2	<i>Acanthus ilicifolius</i> L. (Acanthaceae)	Leaf decoction is prescribed in asthma	0.33
3	<i>Achyranthes aspera</i> L. (Amaranthaceae)	Plant decoction is useful for pneumonia and renal dropsy	0.50
4	<i>Careya arborea</i> Roxb. (Lecythidaceae)	Bark crushing together with bark of <i>Butea monosperma</i> and tied as bandage during bone fracture.	0.50
		The bark juice is used to cure coughs and colds by local people.	0.67
5	<i>Chlorophytum arundinaceum</i> Baker (Asparagaceae)	Tuber used to preparing tonic for vigour and strength	0.25
6	<i>Cissampelos pareira</i> (Ham. ex DC.) Forman (Menispermaceae)	Plant paste (50 gm) is applied on mastitis in cattles.	0.50
7	<i>Cissus quadrangularis</i> L. (Vitaceae)	Plant paste is applied on bone fracture after little heating of plant	0.92
8	<i>Cocculus hirsutus</i> (L.) Diels (Menispermaceae)	Leaf paste applied on forehead to cool the body during summer.	0.33
9	<i>Crotalaria retusa</i> L. (Leguminosae)	Leaves are used in fever	0.17

10	<i>Cyanthillium cinereum</i> (L.) H. Rob (Asteraceae)	Leaf paste is used for headache as poultice	0.42
11	<i>Evolvulus alsinoides</i> (L.) L. (Convolvulaceae)	Herb infusion is used to cure chronic bronchitis	0.25
12	<i>Gouania microcarpa</i> DC. (Rhamnaceae)	Plant juice is applied on chicken pox to cure.	0.33
13	<i>Holarrhena pubescens</i> Wall. ex G. Don (Apocynaceae)	Leaf juice taken twice daily for 3 days in spleen disorders.	0.42
14	<i>Jatropha gossypifolia</i> L. (Euphorbiaceae)	Roots are used for leprosy. Leaves prescribed as blood purifier.	0.50
15	<i>Leucas ciliata</i> Benth. ex Wall. (Lamiaceae)	Leaves are used as vegetable helping in reducing the diabetes.	0.33
16	<i>Mimosa pudica</i> L. (Leguminosae)	Leaf paste is applied to glandular swellings	0.67
17	<i>Momordica dioica</i> Roxb. ex Willd. (Cucurbitaceae)	The burned fruit powder is given in fever and cough and cold	0.50
18	<i>Oxalis corniculata</i> L. (Oxalidaceae)	25-50 gm plant is pasted with ginger (2gm) and given in cough up to cure.	0.50
19	<i>Phyllanthus urinaria</i> L. (Phyllanthaceae)	Plant decoction is given in mouth ulcer till cure	0.50
20	<i>Pinellia ternata</i> (Thunberg) Tenore ex Breitenbach (Araceae)	The poisonous tubers are used for treating coughs, reducing phlegm, stopping vomiting and otitis media.	0.42
21	<i>Piper longum</i> L. (Piperaceae)	Dried fruits are given with honey in the treatment of cold and cough.	0.67
22	<i>Pterocarpus marsupium</i> Roxb.	Piece of stem kept in a glass of water over night and the extract is given in empty stomach, one glass daily to diabetic patients	0.42
23	<i>Terminalia arjuna</i> (Roxb. ex DC.) Wight & Arn. (Combretaceae)	Bark is used as for asthma	0.42
24	<i>Terminalia chebula</i> Retz. (Combretaceae)	Fruits are given in cough.	0.50
25	<i>Trichodesma indicum</i> (L.) Lehm. (Boraginaceae)	Leaf extract is given to improve blood circulation	0.25
26	<i>Ventilago denticulata</i> Willd. (Rhamnaceae)	Root paste applied on forehead to treat head ache.	0.58
27	<i>Ziziphus mauritiana</i> Lam. (Rhamnaceae)	Leaf squeezed and the juice is applied on head to reduce fever	0.42

Table 19: Plants with miscellaneous ethnic uses in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Acacia sinuata</i> (Lour.) Merr. (Leguminosae)	Fruit powder used as soap to wash hair and body	0.50
2	<i>Bauhinia vahlii</i> Wight & Arn. (Leguminosae)	Leaves are used for making plates.	1.00

3	<i>Butea monosperma</i> (Lam.) Taub. (Leguminosae)	The flowers are used for making orange-yellow dye that is used at the festival of Holi.	0.33
		Leaves are used for making disposable dinner plates.	0.33
4	<i>Catunaregam spinosa</i> (Thunb.) Tirveng. (Rubiaceae)	The thorns are used for piercing ears.	0.25
5	<i>Chloroxylon swietenia</i> DC. (Rutaceae)	Leaves used as mosquito repellent	0.42
6	<i>Cyperus tenuispica</i> Steud. (Cyperaceae)	Leaves are used for preparing mats.	0.83
7	<i>Dendrocalamus strictus</i> (Roxb.) Nees (Poaceae)	Plant is used for making baskets.	1.00
8	<i>Diospyros melanoxyton</i> Roxb. (Ebenaceae)	The leaves are collected by local people and used for wrapping bidis (country cigarette).	1.00
9	<i>Elephantopus scaber</i> L. (Asteraceae)	Root is used for the fortification of country liquor (rum) mixed with rice.	0.25
10	<i>Ficus benghalensis</i> L. (Moraceae)	The tree is worshipped by Hindus.	0.92
11	<i>Glycosmis pentaphylla</i> (Retz.) DC. (Rutaceae)	Tender twigs are used as tooth brush and also for mouth freshness	0.42
12	<i>Haldina cordifolia</i> (Roxb.) Ridsd. (Rubiaceae)	The tree is worshipped by many tribal communities.	0.83
13	<i>Homalium nepalense</i> Benth. (Salicaceae)	The bark is used in preparation of local rice liquor. For this reason a number of trees of this species have destroyed due to overexploitation of its bark by the local people.	0.42
14	<i>Hyptis suaveolens</i> (L.) Poit. (Lamiaceae)	Used as mosquito repellent.	0.33
15	<i>Ipomoea carnea</i> Jack. (Convolvulaceae)	Stem is used for fencing.	0.83
16	<i>Jasminum scandens</i> (Retz.) Vahl (Oleaceae)	Flowers are used for worship.	0.75
17	<i>Jatropha curcas</i> L. (Euphorbiaceae)	Tender twigs are used as toothbrush to clean teeth.	0.58
18	<i>Litsea glutinosa</i> (Lour.) Robins. (Lauraceae)	The trunk is used in preparation of incense sticks for which severe depletion of this species has occurred in the past	0.50
		The trunk is used preparation of dye	0.33
19	<i>Madhuca longifolia</i> (Koenig) Macbr. var. <i>latifolia</i> (Roxb.) A. Chev. (Sapotaceae)	Flowers are fermented to prepare country liquor.	1.00
		Seeds yields oil.	0.83
20	<i>Mallotus philippensis</i> (Lam.) Muell.- Arg. (Euphorbiaceae)	A natural dye is obtained from the fruit coat	0.83
21	<i>Mangifera indica</i> L. (Anacardiaceae)	The leaves are used in rituals.	0.83
22	<i>Melia azedarach</i> L. (Meliaceae)	Seed oil is used for worship and for illumination purposes.	0.67

23	<i>Oroxylum indicum</i> (L.) Benth. ex Kurz (Bignoniaceae)	Seeds are also used for decoration purpose.	0.50
24	<i>Phoenix sylvestris</i> (L.) Roxb. (Arecaceae)	Dried leaves are used as brooms. It is also used in fencing.	0.42 0.50
25	<i>Phyllanthus reticulatus</i> Poir. (Phyllanthaceae)	Leaf paste used as shampoo.	0.42
26	<i>Pongamia pinnata</i> (L.) Pierre (Leguminosae)	Leaves used as pesticides against storage pests. Seeds yield oil.	0.33 0.58
27	<i>Pouzolzia zeylanica</i> (L.) Bennett (Urticaceae)	Whole plant paste is applied on head for killing lice.	0.33
28	<i>Sapindus trifoliata</i> L. (Sapindaceae)	Fruits pericarp is used for washing the clothes.	0.50
29	<i>Saraca asoca</i> (Roxb.) Willd. (Leguminosae)	Flowers used in rituals.	0.67
30	<i>Shorea robusta</i> Gaertn. (Dipterocarpaceae)	Leaves are used for making plates to serve food. The young twigs are used as tooth brush. The resin (Jhuna) is used as an incense and for socio-religious purposes.	1.00 0.50 0.50
31	<i>Sida acuta</i> Burm. f. (Malvaceae)	Plant is used for making broom.	0.58
32	<i>Smilax lanceifolia</i> Roxb. (Asparagaceae)	Stem is used as toothbrush	0.42
33	<i>Stereospermum tetragonum</i> DC. (Bignoniaceae)	Seeds are tied in neck during fever and headache to cure.	0.50
34	<i>Strychnos nux-vomica</i> L. (Loganiaceae)	Seeds are used as rat poison	0.25
35	<i>Strychnos potatorum</i> L.f. (Loganiaceae)	The seed powder is used to clear muddy water.	0.33
36	<i>Symplocos cochinchinensis</i> (Lour.) Moore (Symplocaceae)	Fruits are worn in neck by tribal people to get relief from headache.	0.42
37	<i>Thysanolaena latifolia</i> (Roxb. ex Hornem.) Honda (Poaceae)	Plant used for making brooms.	0.50
38	<i>Urena sinuata</i> L. (Malvaceae)	Plant used as broom.	0.67

Table 20: Plants used as fish poison in KWLS

Sl. No.	Name of the plant (Family)	Uses	Rfc
1	<i>Acacia sinuata</i> (Lour.) Merr. (Leguminosae)	Fruit powder used as piscicide	0.33
2	<i>Barringtonia acutangula</i> (L.) Gaertn. (Lecythidaceae)	Bark is used for fish poisoning.	0.42
3	<i>Catunaregam spinosa</i> (Thunb.) Tirveng. (Rubiaceae)	The unripe fruit is used to poison fish.	0.33

4	<i>Cleistanthus collinus</i> (Roxb.) Benth. Ex Hook.f. (Euphorbiaceae)	The fruits are used for fish poisoning by local people.	0.67
5	<i>Meyna laxiflora</i> Robyns (Rubiaceae)	Fruits are used for stupefying fishes and thus catch them easily.	0.50
6	<i>Millettia racemosa</i> Benth. (Leguminosae)	Leaves used as piscicide.	0.42
7	<i>Olex scandens</i> Roxb. (Olacaceae)	Seed paste is used as piscicides	0.67
8	<i>Strychnos nux-vomica</i> L. (Loganiaceae)	Seeds are used for fishcatching	0.50

Table 21: Informant Consensus Factor (ICF) by category of ailment within KWLS

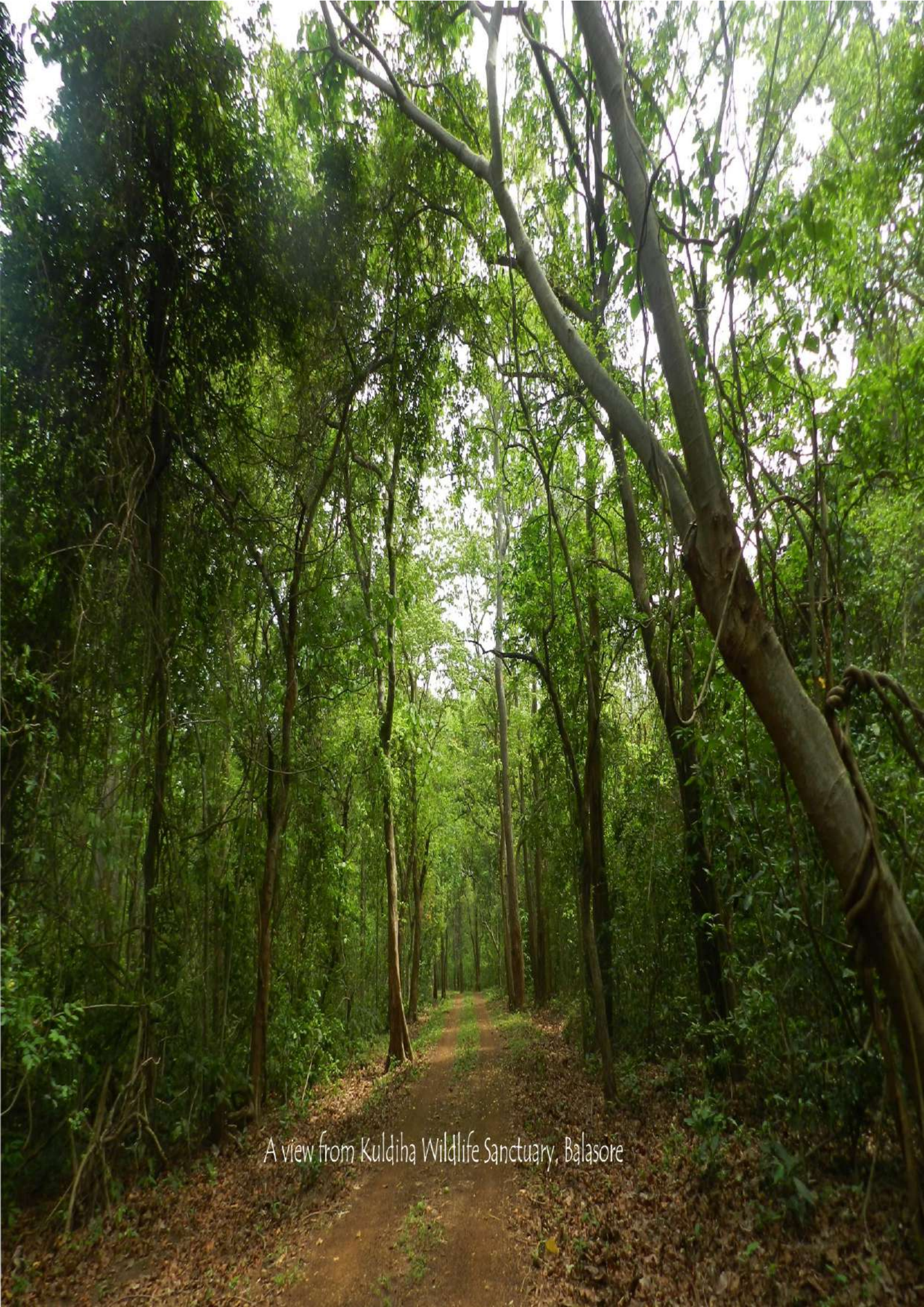
Sl. No.	Category of ailments	No. of use reports	No. of species	Information Consensus Factor (ICF)
1	Rheumatism	112	15	0.87
2	Gastro intestinal disorder (Gastritis, diarrhea, dysentery, constipation, digestive aid, piles, carminative, flatulence, indigestion, colic, anthelmintic)	411	51	0.88
3	Oral care (Tooth ache, gum care)	41	5	0.90
4	Skin diseases (Scabies, ring worm, boils and eruptions, eczema)	122	16	0.88
5	Poisonous bites (Snake bite, scorpion sting, tick bite)	44	6	0.88
6	Cuts and wounds	77	11	0.87
7	Sexual wellness and others (Spermatorrhoea, hydrocele, impotency, abortion, leucorrhoea, post partum care)	89	12	0.88
8	Malaria	17	3	0.88
9	Micobial Infection (Jaundice, mums, chicken pox, leprosy)	55	8	0.87
10	Blood circulation and Diabetes	12	3	0.82
11	Fracture	11	2	0.90
12	Respiratory and General disorder (Asthma, bronchitis, pneumonia, fever, cough and cold)	58	10	0.84

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A view from Kuldiha Wildlife Sanctuary, Balasore

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ABOUT THE BOOK

The book "Floristic and Ethnobotanical studies of Kuldiha Wildlife Sanctuary, Odisha" presents a comprehensive documentation of the floristic diversity, ethnobotanical account and ecological study of the tree species of KWLS. The book reports 534 angiosperm species belonging to 345 genera under 84 families are documented. The other part is the Ethnobotanical documentation of folklore and traditions documented 236 species of 184 genera under 64 families. The systematic enumeration includes keys up to species. The report will be fruitful for the development of data resources of our country and further analysis for its sustainable usage. The statistical analysis provided gives a preliminary idea of plant species that requires conservation. The ecological analysis is expected to be helpful for the evaluation of the forest nature and layout future conservation strategies. It is believed that the book will be helpful to the students, researchers, forest managers and the policy makers.

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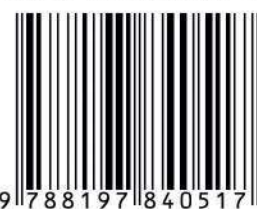
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