# FLORA OF CHAPRAMARI WILDLIFE SANCTUARY
# WEST BENGAL




भारतीय वनस्पति सर्वेक्षण
BOTANICAL SURVEY OF INDIA


**BOTANICAL SURVEY OF INDIA**
**MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE**
**GOVERNMENT OF INDIA**
**2025**


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# FLORA OF CHAPRAMARI WILDLIFE SANCTUARY WEST BENGAL


***Authors***

Jayasri Bhattacharya
K.L. Maity



**Botanical Survey of India**
**Ministry of Environment, Forest and Climate Change**
**Government of India**
**2025**

# FLORA OF CHAPRAMARI WILDLIFE SANCTUARY, WEST BENGAL

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1. *Solanea sterculiacea* (Benth.) Rehd. & Wilson
2. *Cheilanthes farinosa* Kaul.f. *var. albomarginata* (C.B. Clarke) Bedd.
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4. *Hibiscus surratensis* L.

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1. *Couroupita guianensis* Abul.

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प्रतिभा गुप्ता
प्रभारी निदेशक
**PRATIBHA GUPTA**
**DIRECTOR IN-CHARGE**

सत्यमेव जयते

**भारत सरकार**
**GOVERNMENT OF INDIA**
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
**MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE**
भारतीय वनस्पति सर्वेक्षण
**BOTANICAL SURVEY OF INDIA**

# FOREWORD

India's protected areas are vital pillars of its biodiversity conservation framework. These include National Parks, Wildlife Sanctuaries, Biosphere Reserves, all established to conserve the country's extraordinary bioresources in *in-situ* condition. Protected areas play a key role in sustaining this natural wealth by safeguarding threatened species and their habitats. They also function as valuable sites for *in-situ* conservation, ecological research, education, and environmental monitoring.

Botanical Survey of India (BSI) has been actively involved in documenting the flora of protected areas and fragile ecosystem. It has undertaken various projects aimed at studying and recording the plant diversity in the protected areas, aligning with the Government of India's initiatives to safeguard the country's rich biodiversity through a well-established protected area network. BSI plays a crucial role in conducting floristic studies and contributes to biodiversity conservation by sharing valuable information with researchers and the general public. In this endeavour the '*Flora of Chapramari Wildlife Sanctuary, West Bengal*' has been completed by the scientists of BSI which has resulted in the documentation of 442 taxa of flowering plants under 324 genera in 102 families.

I am happy to present this e-publication containing important information on the floristic composition of Chapramari Wildlife Sanctuary which is situated at the Terai and Duars region of West Bengal. The Sanctuary offers a unique floristic component owing to its geographical position, topography and sub-Himalayan climatic condition. This e-book is expected to serve as a valuable reference for students, researchers, forest officials, and all those involved in biodiversity conservation efforts in our country. I sincerely appreciate and congratulate the authors for their commendable work in bringing out this important publication.

P Gupta

Pratibha Gupta
(Director In-charge)

सी॰जी॰ ओ॰ कॉम्प्लेक्स / CGO COMPLEX, तृतीय एम॰ एस। ओ॰ भवन / 3RD MSO BUILDING, पंचबा एवं छठा तल / 5TH & 6TH FLOOR, डी॰ एफ॰ ब्लॉक, सैक्टर १ / DF BLOCK, SECTOR I, साल्ट लेक, कोलकाता - ७०००६४ / SALT LAKE, KOLKATA – 700064, E-mail ID: hq@bsi.gov.in; drpratibha2024@gmail.com

# PREFACE

The alarming decline of plant species-driven by rapid industrialization, population growth, unplanned development, and unsustainable harvesting-underscores the urgent need for comprehensive botanical surveys in protected areas. Documenting and cataloguing plant biodiversity before irreversible loss occurs is essential, as over-exploitation of wild plants for timber, medicine, and industry threatens countless species. Up to 70 % of commercially in-demand medicinal plants now come from wild harvesting, often destructively impacting populations and genetic diversity. Without baseline inventories, mismanagement and overuse of forest vegetation are almost inevitable, since resource users lack awareness of what exists. Conducting detailed plant inventories is a crucial first step toward effective ecological management, enabling targeted conservation, sustainable use, and restoration planning. In short, botanical exploration and documentation offer the foundation for protecting plant resources, ensuring ecological balance and safeguarding biodiversity for future generantions.

Chapramari Wildlife Sanctuary, located just north of the Chalasa-Nagrakota Road in the Nagrakota block of Jalpaiguri district, West Bengal, exemplifies the need and value of such documentation. Originally declared as a reserve forest in 1895, the area was formally established as a wildlife sanctuary in 1998. Its unique combination of topography, climate, and soil conditions supports a diverse and abundant plant community including many species with medicinal and economic importance.

The book represents 442 species in 324 genera belonging to 102 families of Angiosperm, out of these, 336 species in 247 genera belonging to Dicotyledons; 106 species in 77 genera and 17 families belonging to Monocotyledons. Systematic treatment contains proper and easy key for each genus and species for its delimitations. Each species is provided with its correct nomenclature, proper protologue, citations, descriptions along with flowering-fruiting and specimen examined. Coloured photographs have also been provided for the easy identification of the plants in field.

The authors are thankful to Dr. Pratibha Gupta, Director in Charge and Dr. A.A. Mao, former Director. Also authors are grateful to Head of Office, Central National Herbarium, BSI, Howrah for providing necessary facilities. Thanks are due to Dr. D.K. Agrawala, Scientist E & In-charge Publication Section, BSI Hqrs., Kolkata and Dr. S.S. Dash Scientist F & In-charge Technical Section, BSI Hqrs., Kolkata for their support in publishing this work. It is pertinent to mention all the technical staff of Central National Herbarium, BSI, Howrah for their continuous support during field collections and herbarium preparations. Also Thanks are due to the authorities of Forest Department, Government of West Bengal for providing necessary permissions and help during field expeditions and specimen collections.

This work is designed to appeal to forest managers, scholars, decision-makers, scientists, educators, and naturalists. It aims to bolster conservation planning and biodiversity strategy development specifically for Chapramari Wildlife Sanctuary ensuring that the region's invaluable plant diversity is recognized, conserved, and managed wisely.

**(Authors)**

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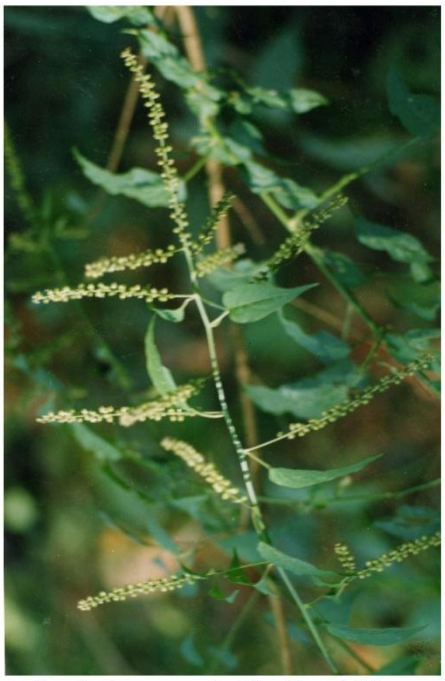

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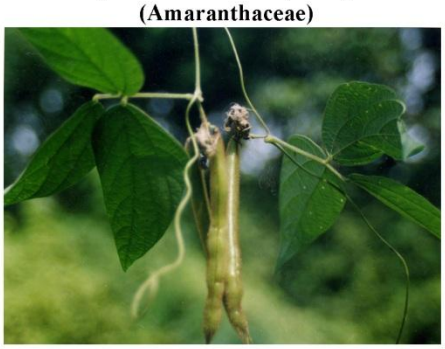

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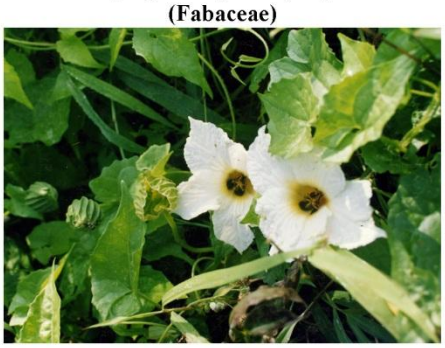

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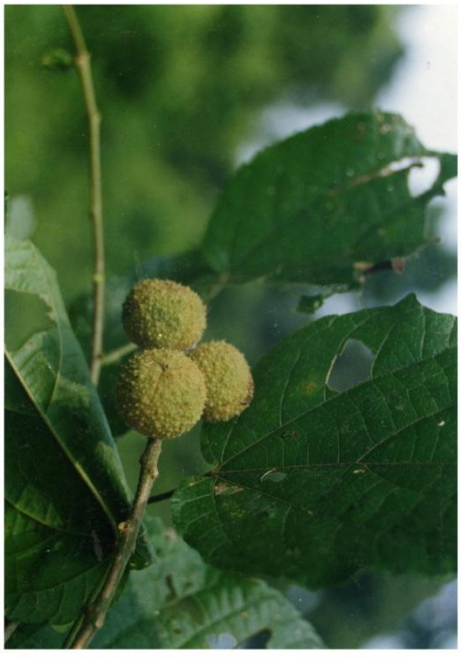

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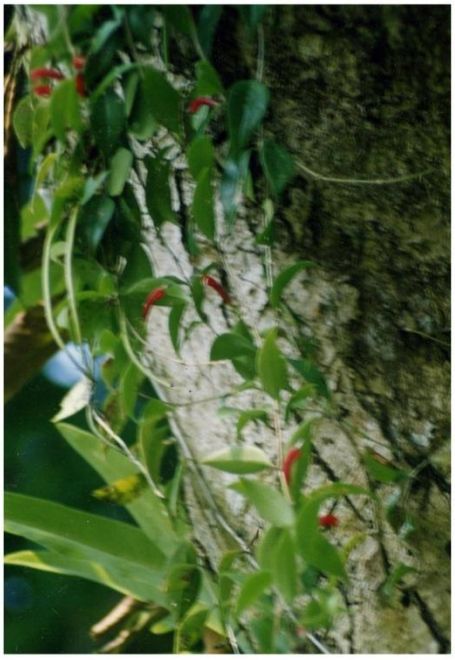

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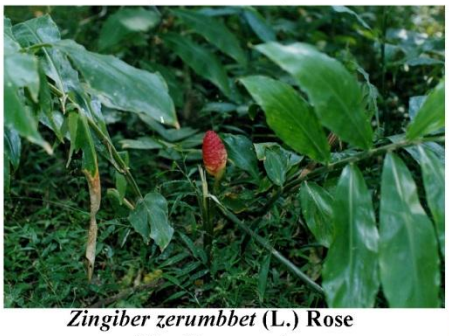

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# INTRODUCTION

Chapramari Wildlife Sanctuary situated in the foot hills of Eastern Himalaya in Jalpaiguri District, is the land of fascinating flora and fauna. This is one of the most oldest Wild Life Sancturary in India. In 1939 with 2129 acres of forest area was declared as Chapramari game sanctuary. The forest and vegetation is greatly influenced by the mixed plain forest of Darjeeling. Excellent climate and rich edaphic factors support the luxuriant growth of the forest along with the rich biodiversity of floral assemblages, mainly Terai grassland interspersed with mixed Dry and Wet vegetations including Sal forestation (cultivated). Apart from the rich biodiversity with great flora and fauna this sanctuary provides a breathtakingly beautiful view of forest against the backdrop of Kanchanjhangha and other Himalayan peaks.

Due to the density and quick development of various kinds of vegetation including gigantic woody lianas and thick grassland surrounding the marshy and swampy pool area located inside, favoured Chapramari to develop an ideal wildlife sanctuary in the Dianan forest range area of the North Eastern part of the Jalpaiguri district.

To conserve such an important habitat and to study the direct relationship with this submontain forest, detail investigation of flora and vegetation is essential. With this idea Botanical Survey of India launched a research programme, which would study thoroughly the floristic accountability, their status, utilization of forest resources and feeding habit of herbivores (fodder resources) seasonally where Elephants, Gour, and other hervivores ramble frequently including Rhino (occasionally).

In view of the above object several collection trips were undertaken (2002-03) accordingly, information on habit/habitat, flowering, fruiting period, forest stratification, etc. was recorded. The specimens thus collected with field numbers (few are missing) were deposited to CAL Herbarium, after following the proper herbarium methodology other relavant information related with the Plant Specimens were collected from local inhabitants and regional DFO Wild Life Div. II, District Jalpaiguri.

**Brief history of the forest**

Chapramari WLS is one of the oldest sanctuaries in India. In the year 1939, 2129 acre of forest area was declared as game sanctuary (notification 1209 dated 24.11.1939). Subsequently 960.31 hectares area was notified as Chapramari Game Santuary on 18.11.1940. Later under Wild Life Protection Act 1972 and 1976, intension was taken to declare the forest as Wild Life Sanctuary which is finally notified 2777/11b-14/98 dated 19th August. Then it recovered large status as Wild Life Santuary. The management of this sanctuary has been taken by Jalpaiguri Wild Life Division II. The Divisional Headquarter is placed in Jubileepark, Jalpaiguri.

**Area and topography**

Chapramari WLS is situated on the north of Chalasa-Nagrakota road in Nagrakota block of Jalpaiguri district in West Bengal. Geographical jurisdiction extend between the latitude in $88^0$45′ North and longitude $89^0$08′ East with the altitude 120-135 m. It is bounded on the north by Indong railway line to Bhutan border in the northern part of West Bengal, on the East by Khunnier railway line, on the South by N.E. railway and on the West bound by Murti river. The sanctuary consist of 960.31 hectares, is more or less flat without any slope but intermingled with one or two natural wallows and streams. The western arm of the sanctuary is drained by the river Murti, by the side of it few hectares of land are occupied for food and fodder cultivation. The sanctuary can be approached by road and from Jalpaiguri by 70 km or Siliguri by 90km, near Airport Bagdogra (85 km).

**Climate**

The sanctuary in the foothill enjoys a subtropical climate. The main season noted here is cold season from November to February, hot season from April to June and rainy season occupy the month July to September (to October).

**Temperature**

In the sanctuary the temperature normally ranges from $10^0$C in the January to $35^0$C in June. The maximum winter temperature exceeds $20^0$C where as the minimum summer temperature remains below $22^0$C.

**Rainfall**

Main source of rainfall is South-East monsoon. Rainfall occurs from middle of May to end of September. July and August is the season of highest rainfall. Average annual rainfall is 5650 mm. Pre-monsoon showers often accompanied by hail in the month of April and May.

**Humidity**

The humidity of the sanctuary remains adequately humid throughout the year. Maximum humidity recorded 80-90% often below 75% with maximum in June to September and minimum in December to February.

**Frost & Fog**

November to February the nights are very cold with much frost and dew and fogged till 9 am.

**Soil**

The soil of the sanctuary consist of two types of soil. River gravels and alluvium along the bed of Murti river which is very common. Another type of soil made of alluvium with deposit sandy to sandy loam, rich in mineral and nutrients with thick layers of humus. The sanctuary is well watered by the perennial river Murti. During monsoon low lying area flooded and permanent swamps are found mainly in the north western part of the sanctuary.

**Drainage System**

The Murti river is the main source of water during peak period. There are 2 streams and 2 pools within the forest are also important water sources to wild animals. Out of these the pool at the front of Bunglow provides adequate water throughout the year, but the other one behind the old watch tower reains dry during hot summer. Besides a long strech of water logged and marshy area is visible in the eastern side of the forest which also attract herbivores not only for dipping in muddy water but for luxuriant growths of fodders.

**Wild Life**

The sanctuary is excellent for its diversity of Wildlife species such as Elephants. Gours, Monkeys, Samber, Indian Pangolin, Barking deer, Assamese Macaque, Gaint Squirrel, Pythons and occasional visits of Rhinoceros and Leopard from the adjacent Gorumara Nationla Park. The shallow swampy pools at the front and the side of forest rest house attracts wide variety of avi-fauna like Phaesants, Barbets, Hornbills, Parrots, Cuckoos, Minivets, Parakeets, Partridges, Moynas, Oriole, Owls,Wood peckers, Swallows, Swifts, and Sunbirds, their beautiful presence add color and life to this zone of wilderness.

**Vegetation**

The topography, excellent climate and edaphic factors have resulted in different kind of vegetation cover in this Chapramari Wild Life Sanctuary. Based on the composition of major floristic components of this wildlife sanctuary can be categorized into 5 major groups (Champion & Seth, 1968)

a. Tropical Wet Semi-evergreen Forest
b. Moist Deciduous Forest.
c. Dry Deciduous Forest
d. Sal Forest
e. Grassland

Of these semi-evergreen and moist deciduous components occupy half of the area interspersed with dry deciduous components, alluvial grassland and Savannah woodland formation. Extensive growth of climbers with special type of vegetation of convolvulaceae in the gentle slopes of Murti river along

the growing climbing shrubs like *Mukuna macrocarpa, Mezoneuron cuculatum, Milletia auriculata* and several others belonging to the, *Piper attenuatum,Piper longum, Cissus repanda Cissus adnata Cissus repens***,** *Ampelocissus latifolia Ampelocissus tomentosa, Dioscorea belophylla, Dioscorea bulbifera etc.* jointly make the canopy almost impenetrable for the sunlight. Epiphytes and ferns are quite common.

a. **Tropical Wet Semi-evergreen Forest:** In the north eastern part of the sanctuary this type of tree formation is visible. The upper storey is mainly composed of *Cinnamomum glaucescens, C. bijolghota, Bauhinia purpurea, Actinodaphne obovata, Beilschmiedia sikkimensis, B. roxburghiana, Elaeocarpus lucidus, Alstonia scholaris, Premna bengalensis, Mallotus philippensis, Callicarpa arborea, Sizygium cumini, Aphanamixis polystachye, Ficus microcarpa, Gmelina arborea, Phoebe pallida, Mussenda frondosa* etc.

b. **Moist Deciduous Forest:** This type of formation occurs in the northeast and north part of the sanctuary. Upper storeyy is mainly covered by the genera *Elaeocarpus, Eugenia, Litsea, Dillenia, Bauhinia, Terminalia, Woodfordia, Nyctanthus, Hymenodictyon*. Some of the well associated herbs and shrubby elements like *Callicarpa arborea, Maesa indica, Phlogacanthus thrysiflorus, Thunbergia coccinea, Coffea bengalensis, Lepidagathis incurva, Cheilocostus speciosus, Mallotus phillippenses,* Bridelia retusa large climber of *Trichosanthes bracteata* with attractive red fruits, *Dioscorea belophylla, D. bulbifera* are commonly found in the border area of the forest. Considerable quantity of grasses like *Setaria, Eragrostis, Oplismenus* etc, are also found in this area.

c. **Dry Deciduous Forest:** The vegetation of this forest type is mainly covered with *Shorea robusta* along with *Lagerostreomia parviflora, Wrightia tomentosa, Sloanea sterculiacea, Mallotus phillippensis, Zizyphus rugosa, Z. oenoplia* and strongly shrubs *Holmskioldia sanguinea, Murraya paniculata, Toddalia asiatica* etc, common herbaceous undergrowth like *Dicliptera bupleurioides, Nelsonia canescens, Ludwigia octovalvis, Elephantopus scaber, Oplismenus compositus, Vernonia cineria, Oxalis corniculata, Urena lobata* are frequently found along with the climbers of *Butea superba, Bauhinia vahlli, Cissampelos pareira* var. *hirsuta, Piper attenuatum, P. chaba, P. longum, P. sylvaticum, Leea guinensis, L. indica* on different shrubby species. The ferns are also commonly grown like *Asplenium, Lygodium* etc. These grow as undergrowth of the forest area.

d. **Sal Forest:** The forest of *Shorea robusta* in this area are generally cultivated by the forest department. *Shorea robusta* is commonly associated with *Lagerstroemia parviflora, Schima wallichi, Terminalia bellerica, Aphanamixis polystachya, Masea indica* etc, and small shrubs and undershrubs like *Coffea bengalensis, Asparagus racemosus, Strobilanthes capitata, Barleria strigosa, Phalyopsis parviflora* are also found.

e. **Grassland:** Impressive wet alluvial grassland is found mainly in low-lying areas.The shallow swampy pool area along with the river banks which, in response of moist habitat support the luxuriant growth of grasses of the genera like *Cyperus, Eleocharis, Fimbristylis, Hymenachane, Cynodon Mariscus, Scirpus, Digitaria, Setaria, Apluda, Paspalum, Arundinella, Themeda, Sporobolus, Pennisetum* etc. Some notable trees characteristically present in the grassland area with their sparse distribution of *Albizzia procera, Bischofia javanica, Bridalia retusa, Macaranga denticulata* etc. Some of the common species in the open grassy situation in this forest formation are *Clerodendron viscosum, Tridax procumbens, Scoparia dulcis, Blumea lacera, Trichodesma indicum, Potamogeton pectinatus, Floscopa scandens, Monocharia hastate, Panicum palludosum, Hygrophila auriculata* etc.

**Aquatic & Terrestial Plants**

Due to presence of only impressive two swampy pool and the Murti river bank area the vegetation of aquatic and terrestrial flora is not much rich except wet alluvial grassland mainly in lowlying swampy areas. Still this group has potential for exploitation as for Bison, Wild buffaloes,

Elephants and large group of avifauna. The group comprises of that *Murdannia vaginata, M. nudiflora, Persicaria glabra, Limnophila indica, Hygrophila schulii, H. polysperma, Ludwigia perennis, Cuphea balsamona, Enhydra flactuans, Nymphaea pubiscense, Fimbristylis ferriguinia, F. miliacea, Fuirena ciliaris, Cyperus iria, C. distans, C. procerus, Echinocloa crus-galli, Paspalidium scorbiculatum* etc.

To protect such an important habitat and to study the direct relationship with this submontane forest detail investigation of flora and vegetation is needed. With this idea Botanical Survey of India launched a research programme which would study thoroughly the floristic accountability, their status, utilization of forest resources and feeding habit of harbivors (fodder resources) seasonally where elephant, gour and bison ramble frequently.

In view of the above intensive field studies have been done during July 2002, February 2003 and November 2003. All possible plant specimens and other relevant information were collected from local inhabitants and regional D.F.O. Wild Life Div. 2, Jalpaiguri.

**Plant Resources**

During Plant exploration it is revealed that the vegetation and flora of the Sanctuary have immense value. The area is full of medicinally and economically important plant species. Which have been grouped under various categories according to their utility.

**Medicinal Plants:**

*Adhatoda zeylinica, Aerva lanata, Alstonia scholaris, Alternanthera sesilis Andrographis paniculata, Aristolochia indica, Argemone maxicana, Asparagus racemosus, Azardirachta indica, Ampelocissus toemontosa, Barleria strigosa, Bacopa moneri, Butea monosperma, Clerodendrum indicum, Clerodendrum viscosum, Calotropis gigantica, Capparis zeylanica, Cissampelos parrerea, Centella asiatica, Costus speciosus, Curcuma longa, Datura metel, Dioscorea bulbifera, Drymeria cordata, Eclipta prostrata, Elephantopus scaber, Ficus racemosus, Hemidesmus indicus, Holarrhena antidysenterica, Hedychium ellipticum, Hygrophila schulli* (*= H. spinosa), Justicia adhatoda, Limnophila indica, Lasia spinosa, Oroxylum indicum, Oscimum sanctum, Paederia foetida, Phyllanthus emblica, Mallotus philippenesis, Nyctanthes arbor-tristis, Piper longum, Rauvolfia serpentina, Solanum nigrum, Terminalia bellerica, Trema orientalis, Zingiber zerumbet*.

**Edible Plants:**

*Achyranthes aspera, Alternanthera sessilis, Antidesma acidum, Artocarpus heterophyllus, Artocarpus lackoocha, Asparagus racemosus, Bauhinia purpurea, Bauhinia vahlii, Brachiaria ramosa, Bridelia retusa, Cardamine flexuosa, Careya arborea, Cayratia pedata, Cissampelos pareira, Cinnamomum bijolgota, Cissus adanata, Colocasia esculenta, Coix lacryma-jobi, Costus speciosus, Girardiana diversifolia, Curcuma longa, Dalbergia stipulacea, Dillenia indica, Dioscoria bulbifera, Diplocyclos palmatus, Eleusine indica, Eclipta prostrata, Emilia sonchifolia, Enhydra fluctuans, Euphorbia hirta, Ficus hispida, Ficus racemosa, Fleminga stricta, Hodgsonia macrocarpa, Hibiscus sabdariffa, Hyptis suaveolens, Impatiens balsamina, Klenhovia hospita, Lantana camara, Launaea procumbens, Lasia spinosa, Leea indica, Leucas lavandulaefolia, Litsea glutinosa, Lagerostroemia parviflora, Macarnga peltata, Malva sylvestris, Mangifera indica, Melochia corchorifolia, Meynia spinosa, Michelia champaca, Monochoria hastata, Momordica charantia, Momordica dioica, Moringa oleifera, Mucuna pruriens, Murdannia nudiflora, Oroxylum indicum, Oxalis corniculata, Paederia foetida, Panicum paludosum, Panicum sumatrense, Paspalidium flavidum, Paspalum conjugatum, Pavetta indica, Persicaria chinensis, Persicaria glabra, Persicaria microcephalum, Phyllanthus emblica, Piper attenuatum, Piper chaba, Piper longum, Pistia stratiotes, Pogostemon heyneanus, Pogostemon pubescens, Portulaca oleracea, Pterospermum acerifolium, Sauropus androgynous, Smilax ovalifolia, Spermacoce hispida, Hyptis suaveolens, Tetrastigma bracteolatum, Tetrastigma serrulatum, Thunbergia grandiflora, Toddalia asiatica, Tridex procumbens, Turpinia cochin-chinensis, Turpinia pomifera, Vallaris solanacea, Ziziphus rugosa, Ziziphus oneoplia*.

**Wood and Furniture:**

*Alangium chinense, Albizzia lebbek, Albizzia odoratissima, Albizzia procera, Alstonia scholaris, Aphanamixis polystachya, Artocarpus heterophyllus, Artocarpus lakoocha, Azadirachta indica, Bauhinia purpurea, Bridelia monoica, Callicarpa arborea, Careya arborea, Castanopsis indica, Cinnamomum bijolgota, Cinnamomum glanduliferum, Cleistanthus collinus, Dysoxylum binectariferum, Glochidion oblatum, Holarrhena pubescens, Kydia calycina, Lagerostroemia parviflora, Lagerostroemia speciosa, Litsea albescens, Litsea glutinosa, Magnolia pterocarpa, Mangifera indica, Meliosma simplicifolia, Phoebe lanceolata, Protium serrata, Pterospermum acerifolium, Saurauia roxburghii, Schima wallichii, Shorea robusta, Syzygium cumini, Termenallia bellerica, Trema orientalis, Trewia nodiflora, Turpinia pomifera, Vitex peduncularis, Wrightia arborea.*

**Fibre yielding:**

*Butea monosperma, Calotropis gigantea, Cissampelos pareira, Cissus adnata, Cissus repens, Hemidesmus indicus, Hibiscus surattensis, Kleinhovia hospita, Kydia calycina, Lagerostroemia parviflora, Melochia corchorifolia, Milletia extensa, Molineria capetulata, Naravelia zeylanica, Pederia foetida, Phanera vahlii, Pupalia lappacea, Sida acuta, Sida cordifolia, Sida rhombifolia, Smilax ovalifolia, Themeda arundinacea, Triumfetta rhomboidea, Urena lobata*.

**Tannin Yielding / Bark Yielding**

*Acacia pennata, Acacia suma, Aerva lanata, Albizzia lebbek, Artocarpus lackoocha, Bauhinia purpurea, Bridelia retusa, Careya arborea, Casearia tomentosa, Costanopsis indica, Costanopsis kurzii, Cheilanthes farinosa, Ficus racemosa, Lagerostroemia parviflora, Lagerostroemia speciosa, Nyctanthes arbor-tristis, Phyllanthus emblica, Terminalia bellerica, Terminalia paniculata, Trema orientalis, Woodfordia fruticosa, Ziziphus oenoplia*.

**Gum yielding:**

*Albizzia lebbek, Albizzia odoratissima, Bauhinia purpurea, Butea monosperma, Macaranga peltata, Mangifera indica, Terminalia bellerica, Woodfordia fruticosa*.

**Resin Yeilding:**

*Calotropis gigantea, Clerodendrum indicum, Euphorbia hirta, Lagerostroemia speciosa, Phyllanthus airyshawii, Phyllanthus amarus, Shorea robusta, Vallaris solanacea*.

**Oil Yielding:**

*Ageratum conyzoides, Argemone mexicana, Artemisia nilagirica, Azadirachta indica, Glochidion lanceolarium, Hodgsonia macrocarpa, Litsea cubeba, Mallotus phillippensis, Momordica charantia, Momordica dioica, Moringa oleifera, Ocimum tennuiflorum, Shorea robusta, Thevetia peruviana, Turpinia cochin-chinensis, Zingiber zerumbet*.

**Dye yielding:**

*Butea monosperma, Datura metal, Flemingia stricta, Hibiscus sabdariffa, Justicia adhatoda, Lagerostroemia parviflora, Mallotus phillippensis, Michelia champaca, Mussenda roxburghii, Nyctanthes arbor-tristis, Phyllanthus airyshawii, Phyllanthus amarus, Piper chaba, Potentilla nepalensis, Psychotria calocarpa, Rubia cordifolia, Symplocos racemosa, Terminalia bellerica, Terminalia paniculata, Woodfordia fruticosa*.

**Cosmetics & related Industry:**

*Azadirachta indica, Cinnamomum glanduliferum, Cymbopogon martini, Eclipta prostrata, Michelia champaca, Moringa oleifera, Pavetta indica, Phyllanthus emblica, Pistia stratiotes, Vetiveria zizanioides*.

**Religious Purposes:**

*Careya arborea, Curcuma longa, Cynodon dactylon, Leucas indica, Mangifera indica, Ocimum tenuiflorum, Phanera vahlii*.

**Animal fodder:**

*Azadirachta indica, Cyperus brevifolius, Cyperus haspan, Desmodium heterocarpon, Desmodium motorium, Digitaria ciliaris, Digitaria radicosa, Ficus oppositifolia, Ficus hispida, Ficus racemosa, Murdannia nudiflora, Imperata cylindrica, Mallotus phillippensis, Meynia spinosa, Mimosa invisa, Mucuna pruriens, Oplismenus compositus, Panicum brevifolium, Panicum paludosum, Panicum sumatrense, Paspalidium flavidum, Pennisetum polystachyon, Phyllanthus emblica, Phyllanthus urinaria, Sauropus androgynous, Shorea robusta, Shuteria vestita, Themeda arundinacea, Tithonia diversifolia, Turpinia pomifera, Vetiveria zizanoides*.

**Host for Lac Insects/ Silkworm:**

*Alangium chinense, Butea monosperma, Ficus raceomosa, Litsea cubeba, Mangifera indica, Protium serrata, Shorea robusta, Ziziphus oenoplia*.

**Beverages:**

*Artabotrys hexapetala, Azadirachta indica, Chloranthus elatior, Coix lacryma-jobi, Hibiscus sabdariffa, Imperata cylindrica, Launaea procumbens, Syzygium cumini*.

**Fish Poisoning:**

*Cleistanthus collinus, Dalbergia stipulacea, Kleinhovia hospita, Maesa indica, Milletia extensa, Milletia pachycarpa, Phyllanthus urinaria*.

**Plant useful in Paper industry / Rayon Industry**

*Anthocephalus chinensis, Arundo donax, Imperata cylindrica, Lantana camara, Macaranga peltata, Phragmitis karka, Shorea robusta, Themeda arundinellea*.

## ENUMERATION AND ECOLOGICAL NOTES ON VASCULAR PLANTS RESOURCES OF THE CHAPRAMARI WILD LIFE SANCTUARY

The urgent need for detail botanical account of the sanctuary, in general, is mainly due to the alarming rate at which several plants are vanishing from many regions on the earth. Rapid industrialization, relentless pressure of an ever increasing population, unplanned developmental activities and over exploitation of raw plant materials are some of the major causes for disappearance of many plants. Therefore, it becomes imperative to make intensive plant explorations for preparing at least an inventory of all the plants of the sanctuary before some disturbing factors affects the valuable plants of the natural ecosystem. Over-exploitation of the forest produce for industrial uses, in various ways have become injurious factors to the natural vegetation in several regions in India. Acquisition of forest areas for rehabilitation, cultivation of more food crops, construction of dams for hydroelectric projects for more electric power and open cut-mining activities have further threatened the vegetation of forest ecosystem in many parts of the country. The question is how this over exploitation of our valuable plant resources could be saved. It is obvious that mis-utilization or over-utilization of a forest asset is bound to happen if one is not fully aware of it. Intensive plant exploration, and documentation of the plant resources will be prerequisite for ensuring their protection and conservation to avoid over-exploitation.

Therefore, it is inevitable, in order to have a sound ecological development of a forest ecosystem, first to identify and enumerate its plant resources available in the reserve and then to plan their management and optimum utilization.

Previous botanical works on the forest of Jalpaiguri district revealed that when compared with the intensive botanical activities elsewhere in the North Bengal forest since the time of Prain (1903), Gamble (1910), Burkill, I.H. (1916), Cowan and Cowan (1929) and others, the forest of the

Chapramari Wild Life Sanctuary area and adjacent has escaped due botanical recognition except some sporadic references to the Coach-Behar or Jalpaiguri forest division. However, after a long gap Mukherjee (1965) and Chowdhury (1969), B. Krishna *et al*. (1972), S.K. Jain *et al*. (1972) and J.K. Sikdar (1981-1983) have published some interesting data on the vegetation and ecology of Jalpaiguri district and other North Bengal regions respectively but the Chapramari Wlidlife Sanctuary has mostly been ignored except J.K. Sikdar (1981) enumerated few grasses of this sanctuary. Other than this forest department of West Bengal has published few pamphlets and brochures with some floral and faunal information.

In this context an intensive plant exploration, enumeration of the floral resources along with vegetation of the Chapramari Wild Life Sanctuary would ber a great value for providing the detail botanical account and the purpose of its *in-situ* conservation which will support the forest ecosystem and species in vulnerable status.

The total plants collected from the area belong to 442 species in 324 genera belonging to 102 familes of Angiosperm, out of these, 336 species in 247 genera belonging to Dicotyledons; 106 species in 77 genera and 17 families belonging to Monocotyledons (Table - I).

**Table - I: Flora of Chapramari Wild Life Sanctuary**

| Plant Groups | No. of Families | No. of Genera | No. of Species |
|---|---|---|---|
| **Angiosperms** | 102 | 324 | 442 |
| Dicotyledons | 85 | 247 | 336 |
| Monocotyledons | 17 | 77 | 106 |
| **Pteridophytes** | 9 | 14 | 18 |

A list of Pteridophytes have been given along with their citation and short description.

The flora represents 49 species of large trees, 37 species of small trees, 83 species of shrubs, 177 species of herbs, 66 species of lianas and climbers, 12 species of crrepers and 11 species of epiphytes. 12 dominated families of Angiosperm in the Chapramari Wild Life Sanctuary are show in Table - II.

**Table - II: Dominat Families of Flowering Plants of Chapramari Wild Life Sanctuary**

| Family | No. of Genera | No. of Species |
|---|---|---|
| Poaceae | 27 | 41 |
| Asteraceae | 18 | 20 |
| Rubiaceae | 16 | 17 |
| Acanthaceae | 14 | 17 |
| Euphorbiaceae | 13 | 20 |
| Fabaceae | 12 | 21 |
| Cyperaceae | 10 | 23 |
| Vitaceae | 8 | 12 |
| Orchidaceae | 8 | 8 |
| Zingiberaceae | 7 | 10 |
| Commelinaceae | 6 | 8 |
| Malvaceae | 5 | 9 |

All the collected specimens of this sanctuary have been deposited in the Central National Herbarium (CAL). Families of the Angiosperms have been arranged according to the Bentham & Hooker's system of classification (1862-1883) with some modification as given in recent works. Key to the families, genera and species have been provided. The genera and speies under each family have been arranged alphabetically. For each taxa correct botanical name, basionym (if any), citation of J.D. Hokker's Flora British India, local name(s) (if any), brief description, flowering and fruiting period, ecological notes along with field numbers have been provided. Collector's name for all the field number is J. Bhattacharya & Party.

## DICOTYLEDONS

### RANUNCULACEAE

### 1. CLEMATIS L.

1a. Leaves 3–5–7-foliate; petioles connate **2. C. Connata**
1b. Leaves 3-foliate; petioles not connate **1. C. Acuminata** subsp. **Sikkimensis**

**1. Clematis acuminata** DC. subsp. **sikkimensis** (Hook.f. & Thoms.) Bruhl in Ann. Roy. Bot. Gard. Calcutta 5: 75. 1896; M.A. Rau in Sharma & al., Fl. India 1: 54. 1993; *C. acuminata* var. *sikkimensis* Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 526. 1872.

Woody climber, branches sulcate, glabrous. Leaves pinnately 3-foliate, to 22 cm long; leaflets ovate or lanceolate, lateral leaflets to 9 × 4 cm, terminal one to 11 × 8 cm long, chartaceous, subcuneate at apex, subcordate at base. Flowers in axillary compound panicle, 3–5 flowered, flower pale yellowish. Achene ovate, dark brownish, hairy, tail to 35 mm long.

*Fl. & Fr.:* June – November.

**2.Clematis connata** DC., Prodr. 1: 4. 1824; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 6. 1872; M.A. Rau in Sharma & al., Fl. India 1: 61. 1993; B.P. Uniyal & al. in Fl. W. Bengal 1: 122. 1997.

Large woody climbers. Leaves 3–5(–7) foliate, to 30 cm long, leaflet broadly ovate, ovate-lanceolate, serrate, acute to acuminate; petiole winged, connate, forming *c.* 12 mm broad collar around the node; Inflorescence a corymbosely flowered, to 10 cm long, panicle; flowers nearly 5 cm across, showy, light yellowish-creamy or white. Sepals recurved. Achenes ovate or obovate, to 5 cm long, feathery silky hairs tails.

*Fl. & Fr.:* July – October.

*J. Bhatt. & Maity* 33349.

### 2. NARAVELIA DC. *nom. cons.*

**Naravelia zeylanica** (L.) DC., Syst. Nat. 1: 167. 1817; M.A. Rau in Sharma & al., Fl. India 1: 106. 1993; B.P. Uniyal in Fl. W. Bengal 1: 113. 1997. *Atragene zeylanica* L., Sp. Pl. 542. 1753.

*Vern.: Chaul-bati, Muruche* (Beng.)

Large woody spreading climbers to 12 m long. Leaves trifoliate, to 14 cm long, lateral leaflet modified into 3-fid hooked tendril, leaflet rounded-truncate. Panicles divaricately branched, terminal and axillary to 12 cm long. Flower greenish-white. Sepals caducous; petals 6–12, narrow-oblong; stamens yellowish, many. Fruits a head of tailed achenes.

*Fl. & Fr.:* October – March.

In the vicinity of dry deciduous forests, Rare

*J. Bhatt. & Maity* 32423

*Use:* Stem used medicinally for toothache and pain reliever. The root relieves pain.

## DILLENIACEAE

### DILLENIA L.

1a. Flowers 15–20 cm across, carpels 14–20; seeds reniform **1. D. indica**
1b. Flowers 3–12 cm across, carpel 5–12; seeds ovoid **2. D. pentagyna**

**1. Dillenia indica** L., Sp. Pl. 1: 535. 1753; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 36. 1872; Mazumdar in B.D. Sharma & al., Fl. India 1: 155. 1993.

*Vern.: Chalta* (Beng.)

Evergreen trees, to 30 m tall. Leaves oblong or elliptic, to 30 × 12 cm, base rounded or attenuate, acute to acuminate at apex, serrated, glabrous above; petioles winged. Flowers solitary, terminal, white, pendant. Sepals 5, ovate, fleshy; petals obovate, caducous; stamens many; carpels 15–25, yellowish green, indehiscent, subglobose, enclosed by persistent sepals. Fruiting carpels each with 5 seeds embedded in the pulp. Seeds reniform, compressed.

*Fl. & Fr.:* June – February.

*J. Bhatt. & Maity* 31160

*Use:* Thickened sepals are sour and used for making jams, jellies and chatneys. Woods are used for furniture and making plywood.

**2. Dillenia pentagyna** Roxb., Pl. Corom. 1: 21. t. 20. 1795; Hook.f. et Thoms. in Hook.f., Fl. Brit. India 1: 38. 1872; Mazumdar in B.D. Sharma & al., Fl. India 1: 156. 1993.

*Vern.: Karkotta* (Beng.)

Deciduous trees, to 20 m high; bark smooth, reddish brown or ash coloured. Levaes to 45 × 20 cm, obovate-oblong, obtuse, dentate. Flowers 2–6, fascicled on leafless shoots. Petals yellow. Stamens in two whorls. Carpel 6. Fruit globose, orange-red, enclosed in fleshy calyx. Seeds ovoid, exarillate.

*Fl. & Fr.:* April – June.

In moist deciduous forest, sparse

*Use:* Wood used for furniture and matchsticks. Fruits are edible.

## MAGNOLIACEAE

### 1. MAGNOLIA L.

**Magnolia pterocarpa** Roxb., Pl. Corom. 3: 62. t. 266. 1820. *M. sphaerocarpa* Hook.f. et Thomson in Hook.f., Fl. Brit. India 1: 41. 1872; Raju in B.D. Sharma & al., Fl. India 1: 172. 1993.

Evergreen branched trees. Leaves obovate-oblong, coriaceous, to 30 × 13 cm, acute at apex and base. Flowers white, fragrant. Tepals 9; outer 3 sepaloid, *c.* 4 × 3 cm, ovate. Petals 6, fleshy in buds. Stamens numerous. Carpels *c.* 80, beaked. Fruits *c.* 10 cm long, ripe carpel oblong. Seeds 2, orange in color.

*Fl. & Fr.:* June – December.

*Use:* Ornamental.

### 2. MICHELIA L.

**Michelia champaca** L., Sp. Pl. 536. 1753; Hook.f. & Thomson in Hook.f., Fl. Brit. India 1: 42. 1872; Raju in B.D. Sharma & al., Fl. India 1: 175. 1993.

Evergreen tree to 25 m tall. Leaves elliptic, to 18 × 8 cm, base cuneate, long acuminate at apex, shining. Stipular scar 1–2 cm; bracts spathoid. Flowers solitary, axillary, creamy or light yellow,

fragrant. Perianth petaloid, fleshy. Fruiting receptacle cone-like to 10 cm long, drooping, ovoid-ellipsoid. Seeds many.

*Fl. & Fr.:* April – June.

*Uses:* Flowers used medicinally for dyspepsia, fever & renal troubles, oil is useful in cephalagia, gout, and rheumatism. Seeds for healing the cracks. Flowers used for making dye & perfume. Wood used for making toys and pencils. Fruit is edible.

## ANNONACEAE

### ARTABOTRYS R.Br.

**Artabotrys hexapetalus** (L.f.) Bhand. in Baileya 12: 147. 1964; Mitra in Sharma & al., Fl. India 1: 251. fig. 40. 1993; D. Mitra in Fl. W. Bengal 1: 145. 1997. *Annona hexapetala* L.f., Suppl. Pl. 270. 1781. *Artabotrys odoratissimus* R.Br. in Bot. Reg. 5: t. 423. 1820; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 54. 1872.

*Vern.: Kanthalichampa* (Beng.).

Bushy branched shrubs. Leaves ovate-oblong, to 12 × 5 cm, shortly acuminate at base. Flower solitary or in pairs, drooping. Sepals reflexed; petals 6, yellow, sweet scented, clawed limb lanceolate; stamens many; carpel sickle-shaped. Ripe carpels 6–10, narrowly ovoid, stalk very short. Seed 1.

*Fl. & Fr.:* September – February.

*J. Bhatt. & Maity* 31162

*Use:* Decoction of leaves is used as contraceptive & cholera. Pericarp is used as cardiac stimulant. An essential oil is used in perfumery which is prepared from the flower.

## MENISPERMACEAE

### 1. CISSAMPELOS L.

**Cissampelos pareira** L. var. **hirsuta** (Buch.-Ham. ex DC.) Forman in Kew Bull. 22(3): 356. 1968; Gangopadhyay in Sharma & al., Fl. India 1: 317. 1993 et Fl. W. Bengal 1: 156. 1997;

*Vern.: Akleja* (Beng.)

Slender, twining, softly tomentose, perennial, herbaceous climbers. Leaves ovate to orbicular, to 3.8–4.8 cm, apiculate, peltate, cordate at base, densely hairy beneath. Female inflorescence longer than the male, with many conspicuous imbricate bracts. Flowers greenish-white. Drupes ovoid-subglobose, red, pilose with sub-basal persistent stylar scars.

*Fl. & Fr.:* June – January.

In moist deciduous forest, over shrubs, common

*F.No.:* 32407

*Use:* The root and leaves are useful in cardiac disease dyspepsia, diarrhea, dropsy, cough, urinary troubles and blood pressure. Leaves used externally for sores & itches. Stem fibres used for making rope. The leaves are eaten as pot herb and cooling.

### 2. COCCULUS DC. *nom. cons.*

**Cocculus hirsutus** (L.) Diels in Engler, Pflazen. 46: 236. 1910; Pramanik in Sharma & al., Fl. India 1: 318. 1993 et Fl. W. Bengal 1: 157. 1997. *Menispermum hirsutum* L., Sp. Pl. 341. 1753. *Cocculus villosus* DC., Syst. 1: 525. 1817; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 103. 1885.

*Vern.: Huver* (Beng.)

A slender, perennial, deciduous, softly villous herb. Leaves deltoid to ovate-oblong, *c.* 7 × 5 cm, obtuse at base, softly pubescent. Male flowers in axillary short peduncled capitate cymes; female

peduncles usually 1–3 flowered, axillary, minute, greenish. Drupes transversely rugose, deep purple when ripe.

*Fl. & Fr.:* November – May.

Over small trees, in dry deciduous forests, sparse

*Use:* The whole plant is used as medicinal purpose.

**3. CYCLEA** Arn. ex Wight

**Cyclea meeboldii** Diels in Engl. & Prantl, Pflazen. 46: 315. 1910; Gangopadhyay in Sharma & al., Fl. India 1: 325. 1993.

Tall climbing shrub; branches striate, pilose. Leaves broadly cordate, to 13 × 10 cm, acuminate, entire, nerves palmate. Male inflorescence paniculate, to 12 cm long, hispid; branched cymules capitate with ebracteate, congested flowers. Sepals 4, petals 4. Female inflorescence subsessile, hispid. Drupes hispid; endocarp tuberculate.

*Fl. & Fr.:* October – March.

*J. Bhatt. & Maity* 32314

**4. DIPLOCLISIA** Miers.

**Diploclisia glaucescens** (Blume) Diels in Engl. & Prantl, Pflanzenfam. 46: 225. f. 77 A-L. 1910; Pramanik in Shrama & al., Fl. India 1: 327. 1993. *Cocculus glaucescens* Blume, Bijdr. 25. 1825. *Cocculus macrocarpus* Wight & Arn., Prodr. 13. 1834; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 101. 1872.

Deciduous, woody climbers, to 30 m tall. Leaves broadly ovate to suborbicular, rounded at base, acuminate to rounded at apex. Inflorescence cauliflorus, to 50 cm long panicles. Flowers yellowish green, to 0.3 cm across. Drupes to 2.5 cm long, obovoid, yellow to orange. Seeds reniform.

*Fl. & Fr.:* March – October.

*J. Bhatt. & Maity* 32315

*Uses:* The leaves along with milk is useful in biliousness, gonorrhea and syphilis. Leaves contain saponin.

**5. PARABAENA** Miers.

**Parabaena sagittata** Miers ex Hook.f. & Thoms., Fl. Ind. 181. 1855 et in Hook.f., Fl. Brit. India 1: 96. 1872.

Climbers with milky juice. Leaves ovate-cordate or sagittate, to 24 × 15 cm, base deeply cordate with acute basal lobes, acuminate at apex; petiole 4–9 cm long, pubescent. Flowers yellow, unisexual, axillary, solitary or few to many *c.* 8 cm long, hirsute, dichotomous cymes, occasionally thyrsoid. Drupes globose, sharp tubercled on back, orange.

*Fl. & Fr.:* March – November.

*J. Bhatt. & Maity* 31190.

**6. STEPHANIA** Lour.

**Stephania japonica** (Thunb.) Miers., Contrib. Bot. 3: 213. 1871; Gangopadhyay in Sharma & al., Fl. India 1: 334. 1993 et Fl. W. Bengal 1: 159. 1997. *Menispermum japonicum* Thunb., Fl. Jap. 193. 1784. *Stephania hernandifolia* (Willd.) Walp., Rep. Bot. Syst. 1: 96. 1842; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 103. 1872.

*Vern.: Nemukkha, Kanadi* (Beng.).

Climbing glabrous herb. Leaves peltate-ovate, to 17 × 15 cm, narrowly acute from broad rounded base. Flowers sessile in compound bracteate umbels. Male flower: sepal 6–10, free; petals 3–5. Female flower: sepal 3–5; petals 3–5. Fruit red, to 0.7 cm long, dorsally rigid.

*Fl. & Fr.:* April – December.

*J. Bhatt. & Maity* 31148

*Use:* Roots are used in medicine. Crushed leaves are used in breast infections. Root is useful in fever, diarrhoea, dyspepsia and urinary troubles.

## NYMPHAEACEAE

### NYMPHAEA L.

**Nymphaea pubescence** Willd., Sp. Pl. 2: 1154. 1799; R.L. Mitra in Sharma & al., Fl. India 1: 431. 1993 et Fl. West Bengal 1: 170. 1997. *N. lotus sensu* Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 114. 1872.

*Vern.: Shapla, Saluk* (Beng.)

Rhizome subglobose, large. Leaves peltate, orbicular, to 50 × 45 cm, sharply dentate at margin, dark green above, reddish pink beneath. Flowers solitary, to 15 cm in diam., white or reddish, slightly fragrant. Petals oblanceolate. Stamens 25–70. Berries 2.5–4.0 cm across. Seeds ellipsoid, longitudinally marked with rows of irregular papillae.

*Fl. & Fr.:* July – November

In ponds, Abundant.

*J. Bhatt. & Maity* 32300.

*Use:* The flowers are used as astringent and cardiac tonic also used in skin diseases and to stop bleeding from stomach. Peduncle, unripe fruits, seeds and rhizome eaten as vegetables.

## PAPAVARACEAE

### ARGEMONE L.

**Argemone mexicana** L., Sp. Pl. 508. 1753; Hook. f. & Thomson in Hook.f., Fl. Brit. India 1: 117. 1872; Debnath & Nayar in Sharma & al., Fl. India 2: 2. 1993 et Fl. West Bengal 1: 180. 1997.

*Vern.: Bara Shial-kanta* (Beng.)

Herb to 1 m tall. Leaves sessile, elliptic-oblong, pinnatifid, sinuate-lobulate, lower surface prickly, to 20 × 8 cm. Flowers yellow, 4–7 cm across, subtended by bracts. Petals 4–6, obovate. Capsules elliptic or elliptic-oblong, *c.* 4 × 2 cm. Seeds to 0.2 cm long, suborbicular.

*Fl. & Fr.:* February – April.

Naturalized throughout in waste lands and near habitation.

*Use:* Latex used as medicine for dropsy and jaundice. Seed oil used as medicine for ulcer, eruption, skin diseases. And also used as illuminant, lubricant and in paint industry.

## BRASSICACEAE

### CARDAMINE L.

**Cardamine flexuosa** Wither., Bot. Arr. Br. Ed. 3, 3: 578. 1976; Hazra & Chowdhery in B.D. Sharma & al., Fl. India 2: 110. 1993; G.H. Bhowmik in Fl. W. Bengal 1: 189. 1997. *C. hirsuta* L. var. *sylvatica* (Link.) Hook.f. & T. Anders. in Hook.f., Fl. Brit. India 1: 138. 1872.

Annual herb to 30 cm high. Stems much branched, erect or creeping. Leaves variable, to 25 × 20 cm, basal leaves form a rosette imparipinnate; petioled; leaflets 5–13, orbicular, irregularly toothed; cauline leaves petioled or subsessile. Inflorescence racemose, to 20 cm long. Flowers 3–5 mm across, white. Sepals oblong; petals obovate-cuneate. Fruits cylindric, to 25 mm long. Seeds 6–12 in either side of septum.

*Fl. & Fr.:* March – September.

*J. Bhatt. & Maity* 32366

*Uses:* Plant is edible and is stimulant and diuretic.

## CAPPARIDACEAE

### 1. CAPPARIS L.

**Capparis olacifolia** Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1: 178. 1872; Raghavan in Sharma & al., Fl. India 1: 283. 1993; A. Bhattacharya in Fl. W. Bengal 1: 205. 1997.

Twining herb of *c.* 5 m high with thorny branches; young parts tomentose. Leaves ovate-lanceolate, to 18 × 6.5 cm, base rounded or subacute, acute to acuminate at apex, glabrous. Flowers white, axillary, 2 from each node, 3–4 cm across. Sepals densely tomentose; petals obovate-oblong, inner pair with purple or yellow blotch; stamens 32–38. Fruits globose, apically beaked. Seed 1, globose, brown.

*Fl. & Fr.:* March – February.

*J. Bhatt. & Maity* 32427

### 2. STIXIS Lour.

**Stixis suoveolens** (Roxb.) Pierre., Bull. Soc. L.. Paris 1: 654. 1887; Raghavan in Sharma & al., Fl. India 1: 333. 1993. *Roydsia suoveolens* Roxb., Pl. Corom. 3: 87. t. 289. 1819; Hook.f & Thoms. in Hook.f., Fl. Brit. India 1: 180. 1872; A. Bhattacharya in Fl. W. Bengal 1: 213. 1997.

Small trees with lenticelled branches. Leaves to 14 × 6 cm, oblanceolate, coriaceous, acuminate. Raceme axillary or terminal. Sepals 8–10 in two series. Petals 0. Fruits ovoid drupes to 2 cm across, shortly stalked.

*Fl. & Fr.:* October – February.

*F. No.:* 32401.

*Uses:* The pulpy, ripe fruits are aromatic and sweetish to eat.The plants is worth cultivating in gardens for its fragrant flowers.

## FLACOURTIACEAE

### 1. CASEARIA Jacq.

**Casearia tomentosa** Roxb., Fl. Ind. 2: 421. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 2: 593. 1879; Mitra in Sharma & al., Fl. India 2: 397. 1993; Pramanik in Fl. W. Bengal 1: 228. 1997;

*Vern.: Maun* (Beng.)

Shrubs or small trees to 8 m tall; branches temontose. Leaves ovate-lanceolate, to 22 × 4 cm, obliquely rounded at base, acuminate at apex, coriaceous. Flowers greenish-white, 5–8 mm across, in dense axillary glomerules. Calyx elliptic. Stamens 8; staminode clavate. Capsule ellipsoid, to 2 cm long, shining, 3-valved. Seeds embedded in scarlet pulpy aril.

*Fl. & Fr.:* April – August.

*J. Bhatt. & Maity* 33336

*Uses:* The bark is useful in anemia and root decoction in diabetes. Fruit pulp is diuretic, seeds in sprain.Fruits are used for making pickle.

### 2. GYNOCARDIA R. Br.

**Gynocardia odorata** R.Br. in Roxb., Pl. Corom. 3: 95. t. 299. 1820; Hook.f. & Thoms. in Hook. f., Fl. Brit. India 1: 195. 1872; Mitra in Sharma & al., Fl. India 1: 407. 1993; Pramanik in Fl. W. Bengal 1: 231. 1997. *Chaulmoogra odorata* Roxb., Fl. Ind. 3: 835. 1832.

*Vern.: Chaulmoogra* (Beng.)

Large evergreen, dioecious trees to 30 m tall with slender branches; barks grey and warty. Leaves bifarious, oblong, coriaceous, caudate-acuminate at apex, cuneate at base. Flowers pale yellow in axillary fascicles. Calyx leathery, numerous. Fruits on the trunk, globose with a thick hard rind. Seeds *c.* 25 mm long, obovoid.

*Fl. & Fr.:* March – September.

*J. Bhatt. & Maity* 32377

*Use:* Fruits pulp used for poisoning fish. Wood used for posts.

## CARYOPHYLLACEAE

### 1. DRYMERIA Willd.

**Drymeria diandra** Blume, Bijdr. 62. 1825; Mazumdar in Sharma & al., Fl. India 2: 533. 1993 et Fl. W. Bengal 1: 243. 1997. *D. cordata sensu* Edgew & Hook.f. in Hook.f., Fl. Brit. India 1: 244. 1874 *pro parte*.

Annular diffuse, glabrous herb. Leaves deltoid-ovate to subreniform, to 25 × 2 cm, cordate at base, acute or mucronate at apex; stipular, bristles many. Flowers white, in axillary and terminal cymes. Styles 3–fid. Fruits ovoid to subglobose, 2–3 valved. Seeds 1 or few.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 33404

### 2. POLYCARPON L.

**Polycarpon prostratum** (Forssk.) Asch. & Schweinf. in Osterr. Bot. Zeitschr. 39: 128. 1889. *Alsine prostrata* Forssk., Fl. Aeg.-Arab. 207. 1775; Mazumdar in Sharma & al., Fl. India 2: 553. 1993 et Fl. W. Bengal 1: 245. 1997.

Small, diffuse, wiry, dichotomously branched, pubescent herb to 25 cm long. Leaves linear-oblong or spathulate, to 2 × 0.5 cm, narrowed at base, acute at apex. Flowers white, in dense cymes. Sepals ovate-oblong, keeled; petals shorter than the sepals, linear, toothed at apex. Capsules to 0.2 cm long, membranous, enclosed in sepals.

*Fl. & Fr.:* April – June.

In dried river beds, sparse

*J. Bhatt. & Maity* 32442

*Uses:* The leaves are useful in cough with fever and also in measles.

### 3. STELLARIA L.

**Stellaria media** (L.) Vill., Cyr. Ess. Pl. Char. 36. 1784; Edgew. & Hook. f. in Hook. f., Fl. Brit. India 1: 230. 1874; Mazumdar in Sharma & al., Fl. India 2: 585. 1993 et Fl. W. Bengal 1: 250. 1997. *Alsine media* L., Sp. Pl. 272. 1753.

Herb, to 60 cm tall, suberect or procumbent. Leaves ovate with rounded, to 3 × 1.5 cm, rarely subcordate base, lower leaves long petioled, upper sessile, elliptic. Flowers numerous, greenish-white in terminal leafy cymes. Capsules ovoid-cylindric, longer than the sepals. Seeds brown, tuberculate.

*Fl. & Fr.:* November – March.

*J. Bhatt. & Maity* 32444

*Uses:* The plant is useful in inflamed digestive, renal, respiratory and reproductive tracts and bone fracture.

## PORTULACACEAE

### PORTULACA L.

**Portulaca oleracea** L., Sp. Pl. 445. 1753; Dyer in Hook. f., Fl. Brit. India 1: 246. 1874; Rao in Sharma & al., Fl. India 3: 4. 1993; Dam & Malick in Fl. W. Bengal 1: 253. 1997.

*Vern.: Boro-nunya* (Beng.)

Erect or prostrate, subsucculent annual herb, to 30 cm high. Stem reddish with swollen nodes and scales. Leaves obovate or spathulate, cuneate-obtuse, usually truncate. Flowers yellow, sessile, solitary or in clusters or cymes, supported by a whorl of leaves. Petals oblong-obovate, notched. Capsules dehiscing above the base. Seeds reniform, black, granulate.

*Fl. & Fr.:* Throughout the year.

In waste lands, abundant

*J. Bhatt. & Maity* 33567

*Uses:* The herb is useful in scurvy, liver diseases spleen, kidney & bladder. cardiovascular diseases, haematuria, gonorrhoea, dysentery, sore of nipples. Used as pot herb, salad and soups. Fleshy stem are pickled.

## HYPERICACEAE

### HYPERICUM L.

**Hypericum japonicum** Thunb. ex Murray, Syst. Veg. ed. 14. 702. 1784; Dyer in Hook. f., Fl. Brit. India 1: 256. 1874; Biswas in Sharma & al., Fl. India 3: 69. 1993 et Fl. W. Bengal 1: 264. 1997.

Annual herb, to 20 cm high; suberect, often prostrate with numerous short branches. Leaves ovate or elliptic-oblong, to 0.8 × 0.5 cm, base rounded, obtuse at apex, 3-nerved. Flowers 1 to many in terminal dichasial or monochasial cymes, 0.5–0.8 cm across. Petals 5, yellow. Capsule ovoid, smooth. Seeds oblong, transversely ribbed.

*Fl. & Fr.:* November – March.

*J. Bhatt. & Maity* 33401

## CLUSIACEAE

### MUSEA L. *emend*. Kosterman

**Musea floribunda** (Wall.) Kosterm. in Reinward. 7: 427. 1969; Singh in Sharma & al., Fl. India 3: 139. 1993; Ghosh in Fl. W. Bengal 1: 272. 1997. *Keya floribunda* Wall., Pl. Asiat. Rar. 3: 5. t. 210. 1832.

A large evergreen tree with greenish bark. Leaves to 35 cm long, oblong to lanceolate, acuminate, coriaceous. Flowers in terminal panicles. Sepals accrescent in fruit. Petals white with pink edges. Anthers golden yellow. Fruits sub-drupaceous, 1–4 seeded.

*Fl. & Fr.:* April – July.

*J. Bhatt. & Maity* 33568

*Use:* Used as timber yielding plant.

## TERNSTROEMIACEAE

### SCHIMA Reinw. ex Bl.

**Schima wallichii** (DC.) Korthals in Temminck, Verh. Nat. Gesch. Ned. Bezilt. Bot. 5: 143. 1842; Dyer in Hook. f., Fl. Brit. India 1: 289. 1874; Chauhan & Paul in Sharma & al., Fl. India 3: 168. 1993; A. Bhattacharya in Fl. W. Bengal 1: 276. 1997. *Gordonia wallichii* DC., Prod. 1: 528. 1824.

*Vern.: Makrisal* (Beng.)

Large trees, 40 m tall. Leaves elliptic-oblong, to 15 × 6 cm, entire, coriaceous. Flowers *c.* 4.0 cm across, axillary, solitary or paired, white, scented. Petals 2.0 cm long, obovate; stamens many; anthers yellow; ovary globose with persistent calyx. Capsule globose, 2–3 cm in diam. Seeds 2–6 in each locule, winged.

*Fl. & Fr.:* March – January.

*J. Bhatt. & Maity* 32402

*Use:* Bark used as anthelmintic and used in gonorrhoea.

## SAURAURIACEAE

### SAURAUIA Willd.

**Saurauia roxburghii** Wall., Pl. Asiat. Rar. 2: 40. 1831; Dyer in Hook. f., Fl. Brit. India 1: 257. 1874; Paul in B.D. Sharma & al., Fl. India 3: 203. 1993; T.K. Pal & R.B. Ghosh in Fl. W. Bengal 1: 280. 1997.

*Vern.: Gogun* (Nep.)

Small trees, to 12 m high with reddish-grey coloured bark, young parts scurfy tomentose, scaly. Leaves elliptic-lanceolate, to 30 × 6 cm, often smaller, long acuminate, base cuneate, minutely serrated. Inflorescence to 4 cm long. Flower pink, *c.* 1 cm across. Sepals ovate-lanceolate; petals pale-pink, recurved at tips. Berries to 0.5 cm across, subglobose, white.

*Fl. & Fr.:* March – October.

*J. Bhatt. & Maity* 32355

*Use:* Ripe fruits are edible. Leaves used as fodder, extraction used for hair pomade and wood for house construction.

## DIPTEROCARPACEAE

### SHOREA Roxb. ex Gaertn.

**Shorea robusta** Roxb. ex Gaertn. f., Suppl. Carp. 3: 48. t. 186. 1865; Dyer in Hook. f., Fl. Brit. India 1: 306. 1874; Janardhanan in B.D. Sharma & al., Fl. India 3: 237. 1993; R.B. Ghosh & U.P. Sammadar in Fl. W. Bengal 1: 283. 1997.

*Vern.: Sal* (Beng.)

Trees to 30 m high. Bark black,. Leaves alternate, ovate-oblong, to 35 × 15 cm, cordate at base, subacuminate at apex, coriaceous. Flowers creamish, in axillary or terminal panicles. Sepals 5, ovate to triangular, grey pubescent. Petals to 11 cm long, orange-coloured within. Stamens many. Fruits ovoid, to 1.2 cm long crowned with tapering style, covered by the accrescent sepals, of which 3 sepals unusually longer (wings.). Seeds to 1 cm, ovoid, acute.

*Fl. & Fr.:* March – June.

*J. Bhatt. & Maity* 33330

*Use:* The fruit is used in diarrhea. Wood is used as building construction, furniture & railway slippers. Bark yield tannin & resin. Leaves are commercially used for plates and bowls.The oil is used in soap industries and chocolate industries.

## MALVACEAE

### 1. HIBISCUS L. *nom. cons.*

1a. Epicalyx bi-furcate or spathulate 2. **H. surattensis**
1b. Epicalyx not bi-furcate, adnate to the calyx, becoming fleshy after flowering 1. **H. sabdariffa**

**1. Hibiscus sabdariffa** L., Sp. Pl. 695. 1753; Mast. in Hook.f., Fl. Brit. India 1: 340. 1874; T.K. Paul in B.D. Sharma & al., Fl. India 3: 327. 1993 et Fl. W. Bengal 1: 299. 1997.

*Vern.: Lal musta, Patwa, Chukar* (Beng.)

Annual, erect herb, to 2 m high; stems and petioles usually purple red. Leaves suborbicular, serrate-dentate, 5–10 cm across, palmately 3–5 lobed or lower sometimes entire, middle lobe longest, often with a purple blotch. Flowers solitary, axillary, large, showy. Epicalyx lobes 10, lanceolate, adnate to the calyx. Calyx fleshy, red-purple. Corolla *c.* 7 cm across, pink or yellow, often with a dark purple center. Capsules ovoid, 1.5 cm across. Seeds reniform.

*Fl. & Fr.:* August – January.

*Use:* An infusion of the calyces is used medicinally in digestion problem, as well as cadiac and neurological disorder. Its fibres is like jute but harsh & coarse. It can be mixed with jute. Calyx used as vegetables and also for the preparation of jelly and drinks.

**2. Hibiscus surattensis** L., Sp. Pl. 696. 1753; Mast. in Hook.f., Fl. Brit. India 1: 334. 1874; T.K. Paul in B.D. Sharma & al., Fl. India 3: 327. 1993 et in Fl. W. Bengal 1: 300. 1997.

Herb or undershrubs, to 2 m high with recurved transparent prickles. Leaves 7 × 8 cm, suborbicular or ovate, lower one 3–4 palmi-lobed, upper one 5-palmilobed; lobes linear-lanceolate, base subcordate, acute at apex, prickly along the nerves beneath. Flowers solitary, axillary, epicalyx bristly, persistent. Calyx campanulate; lobes ovoid with reflexed prickles without. Corolla yellow with purple center; petals obovoid. Capsules ovoid, covered with bristly hairs. Seeds reniform, black, brown.

*Fl. & Fr.:* September – February.

*J. Bhatt. & Maity* 33324

*Use:* The decoction of leaves and stems used medicinally.The stem and leaves paste is used to cure venereal sores and urethritis. Stem yields a strong fibre of good quality.

**2. KYDIA** Roxb.

**Kydia calycina** Roxb., Pl. Corom. 3: 11. t. 215. 1811; Mast. in Hook.f., Fl. Brit. India 1: 348. 1874; T.K. Paul in B.D. Sharma & al., Fl. India 3: 344. 1993 et in Fl. W. Bengal 1: 302. 1997. *Kydia fratena* Roxb., Pl. Corom. 3: 12. t. 216. 1819.

*Vern.: Pola, Bonukpos* (Beng.).

Medium sized tree to 20 m high. Leaves suborbicular, 8–15 cm across, shallowly lobed with a large gland on the nerves beneath. Flowers copious in large dense panicles. Epicalyx lobes 4–6, oblong-spathulate, *c.* 1 cm long in fruits forming a dry stramineus wing. Corolla rotate, white or cream-coloured with age, *c.* 15 mm across; petals obcordate, long-clawed, hairy. Capsules *c.* 7 mm across, subglobose, hard, depressed. Seeds 3 × 2 mm, reniform-ellipsoid, brown.

*Fl. & Fr.:* August – March.

In moist and dry deciduous forests, sparse.

*J. Bhatt. & Maity* 32387

*Uses:* The bark is used in preparation of coarse rope. Young bark is used in preparation of gur from sugarcane juice. Wood is used for building construction.

**3. MALVA** L.

**Malva sylvestris** L., Sp. Pl. 689. 1753; Mast. in Hook.f., Fl. Brit. India 1: 320. 1874; T.K. Paul in B.D. Sharma & al., Fl. India 3: 363. 1993.

Binneal or perennial herb to 2 m high. Stem erect, pubescent with stellate hairs. Leaves reniform to suborbicular, to 8 × 1 cm, 3–7 lobed, 3–7 nerved at base. Flowers 1–4 in axillary fascicles; pedicels 0.5–2.5 cm. Calyx 3–7 × 2–4 mm, broadly triangular. Corolla dark purple; petals

1.5–2.5 × 0.5–1.0 cm, obovate; staminal column *c.* 4 mm, hairy. Schizocarp 4–10 mm across., 2–3 mm in height, discoid, mericarp 10, 2 mm in diam. Seeds 1.5–2.0 mm long, reniform, brownish black.

*Fl. & Fr.:* August – March.

*F.No.:* 32391

*Use:* The leaves and seeds are eaten as vegetables, except root the whole plant is used as medicinal.Plant is good source of carotene and calcium and used in pulmonary and urinary affection. Leaves are stimulant.

**4. SIDA** L.

| | |
|---|---|
| 1a. Mericarp without prominent reticulation; seeds dispersed by withering of the wall; leaves palminerved | 2. **S. cordata** |
| 1b. Mericarp with prominent reticulation; seeds dispersed bydehiscing the mericarp at apex; leaves penninerved | 2 |
| 2a. Stipule of each pair dissimilar; one linear to lanceolate and linear to filiform | 1. **S. acuta** |
| 2b. Stipules of each pair similar | 3 |
| 3a. Mericarp with retrosely hairy awns; calyx tomentose | 3. **S. cordifolia** |
| 3b. Mericarp without awns; calyx vellutinous to glabrous | 4. **S. rhombifolia** |

**1. Sida acuta** Burm. f., Fl. Ind. 147. 1768; T.K. Paul in B.D. Sharma & al., Fl. India 3: 281. 1993 et in Fl. W. Bengal 1: 308. 1997. *Sida carpinifolia* Mast. in Hook.f., Fl. Brit. India 1: 323. 1874.

*Vern.: Kureta* (Beng.)

Annual herb or undershrubs, to 2 m high, sparsely hairy or glabrous. Leaves mostly linear-lanceolate, to 9 × 2 cm, acute, serrate, sometimes a few lower ovate-oblong. Flowers axillary, solitary or 2–8 in clusters. Calyx campanulate. Corolla 12–15 cm across, pale yellow or whitish. Mericarp 6–10 tetrahedral, *c.* 2 mm long, usually with 2 awns at apex. Seeds ovoid, *c.* 2 mm across.

*Fl. & Fr.:* August – January.

In waste lands and in the vicinity of deciduous forest, abundant

*J. Bhatt. & Maity* 32475

*Uses:* Yield good quality of fibres for making baskets, mats etc. The leaves are diuretic and useful in elephantiasis and testicular swellings. The root, leaves decoction is used in hemorrhoids and impotence. The root is useful in nervous & urinary complaints.

**2. Sida cordata** (Burm. f.) Borss. in Blumea 14: 182. 1966; T.K. Paul in B.D. Sharma & al., Fl. India 3: 283. 1993 et in Fl. W. Bengal 1: 309. 1997. *Melochia cordata* Burm.f., Fl. Ind. 143. 1768.

Annual hairy herb, mostly branching of the base with slender prostrate or ascending branches, to 50 cm long. Leaves broadly ovate or orbicular, cordate, acuminate, 1–5 cm long, crenate-serrate. Flowers solitary, racemed or panicled; pedicels slender, jointed in the middle. Calyx campanulate, *c.* 5 mm across. Corolla 7–9 mm across, yellow; petals ovate, ciliate at base. Mericarp tetrahedral, *c.* 2.5 mm long, awnless. Seeds ovoid, *c.* 2 mm long.

*Fl. & Fr.:* Throughout the year.

In moist, shaded places in deciduous forests, common.

*Use:* Stem, leaves and root barks are used as medicine. Stem yields as good fibre.

**3. Sida cordifolia** L., Sp. Pl. 684. 1753; Mast. in Hook.f., Fl. Brit. India 1: 324. 1874; T.K. Paul in B.D. Sharma & al., Fl. India 3: 285. 1993 et in Fl. W. Bengal 1: 309. 1997.

*Vern.: Barela* (Beng.)

Profusely branched, tomentose herb or undershrubs, to 1 m tall. Leaves ovate-oblong, shallowly cordate or truncate, to 6 cm long, crenate-serrate. Flowers axillary, mostly solitary, sometimes 2–5 together. Calyx campanulate, 5–8 mm across. Corolla 12–15 mm across, pale yellow. Mericarp 8–10,

compressed, trigonous, 3.0–3.5 mm long with 2 retrosely hairy awns at the apex. Seeds reniform, *c.* 2.5 mm long.

*Fl. & Fr.:* August – October.

In deciduous forests and along borders of cultivated fields, common.

*J. Bhatt. & Maity* 32471

*Use:* Whole plant is used as medicine.Yield fibre and root bark is useful in micturition and leucorrhoea.

**4. Sida rhombifolia** L., Sp. Pl. 684. 1753; Mast. in Hook.f., Fl. Brit. India 1: 323. 1874; T.K. Paul in B.D. Sharma & al., Fl. India 3: 289. 1993 et in Fl. W. Bengal 1: 310. 1997.

*Vern.: Lal-barela* (Beng.)

Erect herb or undershrubs, to 1.5 m tall, usually covered with shining stellate hairs; branches often red-tinged. Leaves usually ovate-oblong or rhomboid, sometimes lanceolate, to 10 cm long, usually serrate-crenate in the upper part. Flowers axillary, solitary or 2–5 together. Calyx campanulate. Corolla yellow or orange; petals obovate. Mericarp 9–12, flattened trigonous, 2.5–3.5 mm long, mostly muticous, sometimes with two small awns.

*Fl. & Fr.:* September – April.

In wastelands, common.

*J. Bhatt. & Maity* 32459

*Use:* Whole plants are used medicinally & also yield fibre.

**5. URENA** L.

**Urena lobata** L., Sp. Pl. 692. 1753; Mast. in Hook.f., Fl. Brit. India 1: 329. 1874; T.K. Paul in B.D. Sharma & al., Fl. India: 380. 1993 et Fl. W. Bengal 1: 312. 1997.

*Vern.: Banokra* (Beng.)

Annual or perennial undershrubs, to 2.0 m high. Stems, petioles, pedicels minute, stellate hairy. Leaves extremely variable in size, shape, usually ovate to orbicular; petioles *c.* 5–12 cm, stipule 2–4 mm. Flowers axillary, solitary or 2–3 in clusters. Calyx campanulate; segments narrowly triangular. Corolla pink with purple center. Fruits schizocarp, globose, 0.5–0.8 cm. Seeds reniform.

*Fl. & Fr.:* Agust – December. In the vicinity of moist and dry deciduous forests, very common.

*J. Bhatt. & Maity* 31154

*Uses:* Yield fibres used for making sack and twine. Root is useful in rheumatism.

## STERCULIACEAE

**1. KLEINHOVIA** L.

**Kleinhovia hospita** L., Sp. Pl. ed. 2, 1365. 1763; K.C. Malick in B.D. Sharma & al., Fl. India 3: 434. 1993 et Fl. W. Bengal 1: 324. 1997.

Tall trees with smooth barks. Leaves ovate, subreniform, deltoid, to 12 × 16 cm, base cordate, truncate, apex shortly acuminate. Flowers in lax terminal cymose panicles, tomentose. Petals unequal, 5, 4 gibbous at base. Staminal column bearing 15 divergent anthers. Capsules pyriform, 5-winged, inflated. Seed 1 in each cell.

*Fl. & Fr.:* October – January.

Cultivated.

*Uses:* Leaves and flowers edible. The leaves are useful in skin diseases. The root bark & leaves are used for hair wash to kill lice.

### 2. MELOCHIA L.

**Melochia corchorifolia** L., Sp. Pl. 675. 1753; Mast. in Hook.f., Fl. Brit. India 1: 374. 1874; K.C. Malick in B.D. Sharma & al., Fl. India 3: 441. 1993 et Fl. W. Bengal 1: 442. 1997.

*Vern.: Tiji-okra, Thuik* (Beng.)

Herb or undershrubs to 1 m high; branches terete, sparsely stellately tomentose. Leaves to 5 × 3 cm, ovate, elliptic-lanceolate, faintly lobes, Slightly cordate at base, serrate or serrulate, glabrous; Flowers pink *c.* 5 mm long in terminal clustered, sessile racemes. Sepals linear-lanceolate, slightly falcate; petals obovate or spathulate, clawed at base, persistent; stamens 5. Capsules to 5 mm across, ovoid-globose. Seeds trigonous, mottled black and brown.

*Fl. & Fr.:* May – September.

In wastelands and deciduous forests, very common

*J. Bhatt. & Maity* 33391

*Use:* Stem yield fibres, leaves are edible and used as poultice in case of sores & swellings of the abdomen.

### 3. PTEROSPERMUM Schreb.

**Pterospermum acerifolium** (L.) Willd., Sp. Pl. 3: 729. 1801; Mast. in Hook.f., Fl. Brit. India 1: 368. 1874; S.K. Chandra in B.D. Sharma & al., Fl. India 3: 448. 1993 et Fl. W. Bengal 1: 328. 1997. *Pentapetes acerifolia* L., Sp. Pl. 698. 1753.

*Vern.: Kanak champa* (Beng.)

A large tree of *c.* 15 m high. Leaves oblong, obovate, orbicular or rectangular, cordate, often peltate, 25–35 × 15–30 cm, margin wavy or distantly coarse toothed, tomentose. Flowers mostly solitary, 10–15 cm long and across, creamish, fragrant. Sepals linear-lanceolate, united at base into a short tube, thick, reflexed, deciduous. Petals linear-oblong to obovate, 6–12 cm long, reflexed. Capsule 5-angled, 8–10 × 4–6 cm. Seeds obliquely ovoid, compressed.

*Fl. & Fr.:* September – May.

*J. Bhatt. & Maity* 32332

*Use:* Leaves, barks and flowers are used as medicine. Barks used for small pox. Flower is insect repellant.Timber is moderately heavy used for planks, packing boxes, furniture & toys.

### 4. STERCULIA L.

1a. Leaves simple, follicles oblong-lanceolate **1. S. hamiltonii**
1b. Leaves digitate or palmately lobed; follicle radiating **2. S. urens**

**1. Sterculia hamiltonii** (O. Kuntze) Adelb. in Blumea 5: 506. 1945, K.C. Malick in B.D. Sharma & al., Fl. India 3: 464. 1993 et Fl. W. Bengal 1: 332. 1997. *Clompanus hamiltonii* O. Kuntze, Rev. Gen. Pl. 1: 77. 1871. *Sterculia coccinea* Roxb., Fl. Ind. 3: 151. 1832; Mast. in Hook.f., Fl. Brit. India 1: 350. 1874.

Shrubs or small trees, to 10 m tall. Leaves oblanceolate or oblong-elliptic, to 33 × 15 cm, coriaceous. Flowers in axillary, about 10–25 cm long, drooping panicles, pinkish red, velvety without. Male flowers- staminal column short, curved, glabrous. Female flowers- ovary hairy with sterile anthers at base. Follicles 2–5, oblong-lanceolate, drooping, spreading, crimson red within, valvety without, compressed. Seeds black, ovoid, smooth.

*Fl. & Fr.:* April – October.

*J. Bhatt. & Maity* 33356

**2. Sterculia urens** Roxb., Pl. Corom. t. 24. 1795; Mast. in Hook.f., Fl. Brit. India 1: 353. 1874; K.C. Malick in B.D. Sharma & al., Fl. India 3: 470. 1993 et Fl. W. Bengal 1: 332. 1997.

*Vern.: Kuhu* (Beng.)

Trees to 6 m high; bark peeling off in flakes. Leaves 18 × 25 cm across, palmate 3–5 lobed, cordate at base, entire, pubescent to tomentose beneath, 6-nerved from base; petioles *c.* 12 cm long. Flowers pale green within with bright red center, yellowish or yellowish-red without, scented, terminal panicles *c.* 15 cm long. Calyx *c.* 5 × 5 cm, 5-lobed at top, campanulate; tube 3 cm long, filaments connate to form staminal column; anthers 2-lobed. Carpels 5; stigma peltate. Follicles 4–6, 4 × 2 cm, ovoid-oblong, woody, covered with rusty brown staining hairs. Seeds black, oblong.

*Fl. & Fr.:* January – April;

In dry deciduous teak forests.

*J. Bhatt. & Maity* 31130

*Use:* Yields gum "Kotila" used as medicine. Seeds are roasted and eaten.

## TILIACEAE

### 1. GREWIA L.

**Grewia serrulata** DC., Prodr. 1: 510. 1824; Daniel & Chandrabose in B.D. Sharma & al., Fl. India 3: 509. 1993; R.N. Banerjee in Fl. W. Bengal 1: 338. 1997. *G. laevigata auct. non* Vahl 1790; Mast. in Hook.f., Fl. Brit. India 1: 389. 1874.

*Vern.: Panisara* (Beng.)

Trees, to 5 m high. Leaves lanceolate, to 18 × 7 cm long, serrate-dentate, 3-ribbed, rounded or narrowed at base, acute to acuminate at apex. Flowers white, in axillary cymes. Sepals lanceolate. Petals greenish white, pubescent outside. Drupes glabrous on maturity dark brown.

*Fl. & Fr.:* October – April.

*J. Bhatt. & Maity* 33357

### 2. TRIUMFETTA L.

| | |
|---|---|
| 1a. Spines on capsules glabrous | **2. T. rhomboidea** |
| 1b. Spines on capsules pubescent or tomentose | 3 |
| 2a. Spines straight | **3. T. tomentosa** |
| 2b. Spines uncinate | **1. T. pilosa** |

**1. Triumfetta pilosa** Roth., Nov. Pl. Sp. 223. 1821; Mast. in Hook.f., Fl. Brit. India 1: 394. 1874; Daniel & Chandrabose in B.D. Sharma & al., Fl. India 3: 519. 1993; R.N. Banerjee in Fl. W. Bengal 1: 343. 1997.

Erect undershrubs or decumbent suffrutescent herb of 1.5 m high. Leaves elliptic-acuminate, to 13 × 6 cm, irregularly crenate-serrate, hirsute below. Flowers yellow, axillary and terminal fascicled cymes. Sepals 3 mm long, connate, apiculate. Petals 5 mm long, obovate, clawed at base. Styles filiform; stigma 5-fid. Capsules globose, *c.* 12 mm across; bristles conspicuously recurved at tips, hairy. Seeds dark brown, shining.

*Fl. & Fr.:* Almost throughout the year.

**2. Triumfetta rhomboidea** Jacq., Enum. Pl. Carib 22. 1760; Mast. in Hook.f., Fl. Brit. India 1: 395. 1874; Daniel & Chandrabose in B.D. Sharma & al., Fl. India 3: 520. 1993; R.N. Banerjee in Fl. W. Bengal 1: 343. 1997.

*Vern.: Ban-okra* (Beng.)

Erect, woody herb to 1 m high; Leaves ovate-elliptic, rhomboid or suborbicular, to 9 × 8 cm, often 3-lobed, irregularly serrate, acuminate. Flowers yellow in axillary and terminal, 4–6 flowered

cymes. Sepals linear, spathulate, pubescent. Petals obovate-oblong, cuculate, clawed at base. Capsules *c.* 6 mm across, ovoid, hairy, echinate with hooked glabrous bristles. Seeds dark brown, pointed at top.

*Fl. & Fr.:* August – November.

In wastelands, abundant

*J. Bhatt. & Maity* 31180

*Uses:* The root is used in dysentery.The bark and fresh leaves in diarrhea. The leaves and the flowers are used against leprosy. Inner bark of stem yield a soft and glossy fibre (much use in Tamil Nadu). The plant is used as a pot herb in times of scarcity.

**3. Triumfetta tomentosa** Bojer ex Bouton in Rapp. Annual Trav. Soc. Hist. Nat. Ile Maurice 12: 19. 1842; Mast. in Hook.f., Fl. Brit. India 1: 394. 1874; Daniel & Chandrabose in B.D. Sharma & al., Fl. India 3: 522. 1993.

Suffruticose, herb or undershrubs to 2 m high. Leaves ovate-lanceolate, to 12 × 7 cm, rounded at base, acuminate at apex, crenate-serrate margin. Flowers 5–7 mm across in extra-axillary fascicles of cymes. Sepals apiculate. Petals orange-yellow. Carpels globose, hispid. Capsules globose, 5–8 mm across, covered with 4–6 mm long, pilose spines.

*Fl. & Fr.:* June – December.

*J. Bhatt. & Maity* 33373

## ELAEOCARPACEAE

### SOLANEA L.

**Solanea sterculiacea** (Benth.) Rehder & Wilson in Sarg., Pl. Wilson 2: 362. 1916, *pro parte*. *Echinocarpus sterculiaceus* Benth. in J. L.. Soc. 5. Suppl. 2: 72. 1861; Mast. in Hook.f., Fl. Brit. India 1: 400. 1874; S.K. Murti in B.D. Sharma *& al.*, Fl. India 3: 566. 1993; A. Bhattacharya in Fl. W. Bengal 1: 348. 1997.

Trees, to 25 m tall, often buttressed. Leaves to 25 × 10 cm; ovate, obovate or elliptic, subcordate at base, acute to abruptly acuminate, serrulate, coriaceous. Flowers creamy white, to 3 cm across, axillary or few flowered fascicled. Sepals 4, 6–9 mm long, unequal; petals 4, to 9 mm; stamen numerous; filaments 2–4 mm long. Capsule globose, to 7 cm across, yellow, 4–5 valved, valves covered with dense, pointed 1–2 mm long, stiff spines. Seeds black with red waxy aril.

*Fl. & Fr.:* April – October.

*J. Bhatt. & Maity* 31198

## BALSAMINACEAE

### IMPATIENS L.

**Impatiens balsamina** L., Sp. Pl. 935. 1753; Hook.f., Fl. Brit. India 1: 453. 1874; Vivekananthan & al. in Hajra & al., Fl. India 4: 123. 1997; L.K. Ghora in Fl. W. Bengal 1: 361. 1997.

*Vern.: Dupati* (Beng.)

A stout succulent herb of to 70 cm high. Leaves variable in size, lanceolate, to 13 × 3 cm, base narrowed, apex acute, margin serrate. Flower 2.0–2.5 cm across, axillary, solitary, rosy purple. Sepals broad; lip cymbiform, spur filiform, incurved, wing obovate. Capsules ellipsoid-oblong, to 2 cm long, tomentose. Seeds globose, black.

*Fl. & Fr.:* March – October.

*J. Bhatt. & Maity* 31103

*Uses:* The flowers are mucilaginous, used for lumbago and intercostals neuralgia. Seeds are edible. Seed oil is used for cooking and for burning lamps.

## OXALIDACEAE

### 1. BIOPHYTUM DC.

**Biophytum sensitivum** (L.) DC., Prodr. 1: 690. 1824; Edgew. & Hook. f. in Hook.f., Fl. Brit. India 1: 436. 1874; M.K. Manna in Hazra & al., Fl. India 4: 238. 1997; L.K. Ghora in Fl. W. Bengal 1: 372. 1997. *Oxalis sensitivum* L., Sp. Pl. 434. 1753.

*Vern.: Ban-narange* (Beng.)

A small herb with a spreading crown of sensitive leaves. Stems to 15 cm long. Leaves to 12 cm long; leaflets 6–15 pairs, very variable in size, to 1.5 cm long, in terminal row. Flowers yellow; Sepals rigid, subulate, glandular and hispid, usually much exceeding the capsules. Petals usually twice as long as sepals. Capsules elliptic, shining; cells few seeded. Seeds variable, minute with transverse oblique or acute ridges which are broken up into tubercles.

*Fl. & Fr.:* March – October.

In moist dry deciduous forests, sparse

*J. Bhatt. & Maity* 31126

*Use:* Plant is used as tonic, stimulant and useful in cramps as well as in chest complain. The leaves are diuretic, antiseptic and its paste is used to cure wounds.

### 2. OXALIS L.

1a. Petals yellow **1. O. corniculata**
1b. Petals pinkish-white, whitish or violet **2. O. corymbosa**

**1. Oxalis corniculata** L., Sp. Pl. 435. 1753; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1: 436. 1874; M.K. Manna in Hazra & al., Fl. India 4: 242. 1997; L.K. Ghora in Fl. W. Bengal 1: 373. 1997.

A perennial appressed herb with long creeping or subterranean stems, rooting at nodes. Leaves digitately 3-foliate; leaflets obcordate, long petioled. Flowers axillary, subumbellate; peduncles solitary, to 8 cm long, deflexed in fruit. Sepals lanceolate-oblong, Petals oblanceolate, notched, yellow, as long as sepals. Capsules subcylindric, 5-angled, shortly beaked. Seeds transversely ribbed, numerous, brown.

*Fl. & Fr.:* Throughout the year.

In wastelands, common.

*J. Bhatt. & Maity* 32407

*Use:* The whole plant is used as medicinaly for curing dyspepsia, piles, anemia & fevers, dysentery, scurvey, biliousness. Leaves are eaten both raw as a Salad and cooked as pot herb, also used for making chutney and pickles. They are injurious if eaten in excess.

**2. Oxalis corymbosa** DC., Prodr. 1: 696. 1824; Calder in Rec. Bot. Surv. India 6: 337. 1919; M.K. Manna in Hazra & al., Fl. India 4: 246. 1997. *O. maritime* Zucc. in Denks. Koen. Akad. Wiss. Muench. 9: 144. 1823-1824; L.K. Ghora in Fl. W. Bengal 1: 374. 1997.

Herb, acaulescent, bulbous at base, produce many lateral bulbils, outer scales numerous, thin, papery. Leaves 9–12, stipulate, trifoliate; petioles very thin, 13–24 cm long, sparsely hairy. Inflorescence pseudoumbellate. Sepals 5, elliptic, 5–6 cm long. Petals 5, cuneate, *c.* 1.5 × 0.5 cm, violet. Stamens 10 in 2 series, alternately long and short; filaments 3 mm long, hairy, shorter one flattened. Ovary 5-angled, oblong, *c.* 3 mm long; ovules 3–8 in each locule.

*Fl. & Fr.:* September – January.

*J. Bhatt. & Maity* 31191

## RUTACEAE

### 1. MICROMELUM Blume

**Micromelum integerrima** (Roxb. ex DC.) Roem. in Fam. Nat. Reg. Veg. 1: 47. 1846; Nayar & Nayar in Hazra & al., Fl. India 4: 349. 1997; R.B. Ghosh in Fl. West Bengal 1: 385. 1997. *Bergera integerrima* Roxb., Fl. Ind. 2: 376. 1832. *M. pubescence* Hook.f. in Hook.f., Fl. Brit. India 1: 501. 1874 *non* Blume.

*Vern.: Ban-kunch* (Beng.)

Small evergreen trees to 10 m high. Leaves to 50 cm long; leaflets 10–15, ovate-lanceolate, cuneate at base, cordate-acuminate at apex. Flowers dull-white, strongly scented in terminal corymbose-cyme. Petals 5, shortly stipitate, hairy; style articulate. Fruits an ellipsoid berry, 8–12 mm, orange-yellow. Seeds 2–3, green, bean-shaped, compressed.

*Fl. & Fr.:* January – September.

*J. Bhatt. & Maity* 32418

*Use:* Root tuber is used medicinally in any chest trouble.

### 2. MURRAYA Koen. ex L.

**Murraya paniculata** (L.) Jack. in Malayan Misc. 1(5): 31. 1820; Nayar & Nayar in Hazra & al., Fl. India 4: 352. 1997; R.B. Ghosh in Fl. West Bengal 1: 386. 1997. *Chalcas paniculata* L., Mant. Pl. 1: 68. 1767. *M. exotica* L., Mant. Pl. Alt. 563. 1771; Hook.f. in Hook.f., Fl. Brit. India 1: 502. 1874.

*Vern.: Kamini* (Beng.)

Small evergreen trees or shrubs to 10 m high. Leaflets 3–9, obovate to rhomboid, to 20 cm long, shining, dark green. Flowers white, fragrant in few flowered terminal or axillary panicles. Berries 10–20 mm long, red or deep orange. Seeds 12.

*Fl. & Fr.:* April – July.

*Use:* Bark, leaves and roots used as medicinally for diarrhea, rheumatism, cough & hysteria. Plant is ornamental.

### 3. TODDALIA Juss.

**Toddalia asiatica** (L.) Lamk., Illus. 2: 110. 1793; Nayar & Nayar in Hazra & al., Fl. India 4: 403. 1997. *Paullinia asiatica* L., Sp. Pl. 365. 1753. *Toddalia aculeate* Pers., Syn. Pl. 247. 1805; Hook.f. in Hook.f., Fl. Brit. India 497. 1874; Prain, Bengal Pl. 207. 1903.

*Vern.: Kadatodali ( Beng.)*

A prickly rambling tomentose shrubs. Leaves digitately trifoliate; petiole 4–5 cm. Leaflets sessile; 6 × 10 × 4 cm, elliptic, obovate, crenulate, acute, cyme axillary. Flowers in axillary or terminal panniculate cyme, panicles to 2 cm long. Flower white or creamish white. Ovary 5-celled. Berry 5-grooved.

*Fl. & Fr.:* April – October.

*J. Bhatt. & Maity* 33350

*Use:* Roots and root barks are aromatic, antidiarrhoeic, astringent. Fresh leaves are eaten for stomach pain. Ripe berries are used as pickled.

## SIMAROUBACEAE

### QUASSIA L.

**Quassia amara** L., Sp. Pl. (ed. 2) 553. 1762; Nooteb. in Steenis, Fl. Males. Sr. I. 6: 199. 1962; Basak in Fasc. Fl. India 4: 18. 1980.

Trees, 2–3 m high. Leaves compound, pentaphyllous; leaflets elliptic-oblong; petiole winged. Flowers *c.* 4 cm long, racemes, crimson red.

*Fl. & Fr.:* March – October.

*Note:* Native of Tropical America from Brazil to Mexico and West Indies. Introduced often naturalized in Tropical Old World countries for medicinal purposes. Grows in garden for attractive foliage and showy flower.

*Uses:* Wood is used for making furnitures. Root bark contain quassion, malic acids, gallic acid etc.

## BURSERACEAE

### PROTIUM Burm.f.

**Protium serrata** (Wall. Ex Colebr.) Eng. in DC., Monogr. Phan. 4: 88. 1883; Chitra & Henry in Hazra & al., Fl. India 4: 451. 1997. *Bursera serrata* Wall. ex Colebr. in Trans. L.. Soc. 15: 361. t. 4. 1827; Bennett in Hook.f., Fl. Brit. India 1: 530. 1875; R. Dutta in Fl. W. Bengal 1: 394. 1997.

*Vern.: Chitrikau* (Beng.).

Large trees, to 20 m tall; young branches tomentose; bark grayish brown. Leaves 15 × 30 cm long; leaflets oblong, shortly petiolate, 7–15 cm long, entire or distantly serrulate. Flowers in lax axillary panicles, 2–3 mm across, green. Petals 5–lobed. Drupe globular, often furrowed, *c.* 2 cm across, reddish pink; 1–3 seeded nuts. Pulp edible.

*Fr.:* April – July.

*Use:* Stem is used as valuable timber for making house construction, plywood & furniture. Fruits are edible.

## MELIACEAE

### 1. APHANAMIXIS Blume

**Aphanamixis polystachya** (Wall.) R. Parker in Indian Forest. 57: 486. 1931; S.S. Jain & S.S.R. Bennet in Hazra & al., Fl. India 4: 477. 1997; M.K. Manna in Fl. W. Bengal 1: 399. 1997. *Aglaia polystachya* Wall. in Roxb., Fl. Ind. 2: 429. 1824. *Andersonia rohituka* Roxb., Fl. Ind. 2: 213. 1832. *Amoora rohituka* (Roxb.) Wight & Arn. in Hook.f., Fl. Brit. India 1: 559. 1875.

*Vern.: Tiktaraj* (Beng.)

Trees, evergreen, 5–20 m high with dense umbrella shaped crown. Leaves alternate, 20–70 cm long, rachis to 12 cm long; leaflets 9–19, opposite, oblong-ovate or oblanceolate, abruptly acuminate at apex, to 25 × 10 cm long. Flowers bracteate, sessile, dull-white. Male spikes panicle; female spike much shorter. Female flower larger than male. Petals 3, broadly elliptic to orbicular; anther 6; disk conical; Capsule obovoid, coriaceous, yellow or purple, fleshy. Seeds oblong with scarlet aril.

*Fl. & Fr.:* January – December.

*J. Bhatt. & Maity* 32470

*Use:* Oil obtained from the seeds is used for illumination, rheumatism, also applied in sores and bast fibre used for astringent.

**2. AZADIRACHTA** A. Juss.

**Azadirachta indica** A. Juss. in Mem. Mus. Hist. Nat. 19: 221. t. 13. f. 5. 1820; S.S. Jain & S.S.R. Bennet in Hazra & al., Fl. India 4: 478. 1997; M.K. Manna in Fl. W. Bengal 1: 399. 1997. *Melia azadirachta* L., Sp. Pl. 385. 1753; Hiern. in Hook.f., Fl. Brit. India 1: 544. 1875;

*Vern.: Neem* (Beng.)

Trees to 20 m high. Leaves peri-pinnate, to 45 cm long; leaflets 9–18, opposite to alternate, ovate-lanceolate, oblique at base, serrated at margin. Panicle as long as or shorter than the leaves. Flowers white, scented. Sepals 5, rounded. Petals 5, free. Ovary globose; style terete; stigma with light colour rim at base. Drupes 1.5–2.0 cm long, smooth, yellow.

*Fl. & Fr.:* February – September.

*J. Bhatt. & Maity* 132424

*Use:* Bark, leaves, flowers, fruits and seeds are used medicinally. Specially it has Wood used for furniture. Leaves used as vegetable. Seeds are used as oil yielding plant.

**3. DYSOXYLUM** Blume

**Dysoxylum binectariferum** (Roxb.) Hook.f. ex Beddome in Trans. L.. Soc. London 25: 212. 1866; S.S. Jain & S.S.R. Bennet in Hazra & al., Fl. India 4: 486. 1997; M.K. Manna in Fl. W. Bengal 1: 403. 1997. *Guarea binectarifera* Roxb., Fl. Ind. 2: 240. 1830.

*Vern.: Rata* (Beng.)

Evergreen tree, to 30 m tall. Leaves to 75 cm long; leaflets 6–8, to 17 × 5 cm, thinly coriaceous, glabrous. Panicles to 30 cm long. Flowers shortly pedicellate, 4-merous, 3–5 mm long, pale white. Petals 4, velvety. Staminal tube 4-angled with 8 obscurely bifid teeth. Capsule obovoid, 4-seeded. Pale yellow turning orange. Seed shining, purple with a large yellow hilum and white aril.

*Fl. & Fr.:* March – January.

*Uses:* Timber is used in various construction purposes.

**4. SPHAEROSACME** Wall. ex Roem.

**Sphaerosacme decandra** (Wall.) Penn. in Blumea 22: 489. 1975; S.S. Jain & S.S.R. Bennet in Hazra & al., Fl. India 4: 502. 1997. *Aglaia decandra* Wall. in Roxb., Fl. Ind. 2: 427. 1824. *Amoora decandra* (Wall.) Hiern. in Hook.f., Fl. Brit. India 1: 562. 1875.

Large spreading trees with a thick trunk. Leaves rarely peripinnate, to 50 cm long; rachis to 15 cm long; leaflets 7–13, oblong, obovate-lanceolate, cuneate at base, acuminate at apex. Flowers bracteate, glabrous, yellow, fragrant. Petals 5. Capsules globose, 5-valved, ovoid, 4 cm across, 5-seeded.

*Fl. & Fr.:* May – December.

*J. Bhatt. & Maity* 31156

**5. TOONA** (Endl.) M. Roem.

**Toona ciliata** Roem., Syn. Hesper. 139. 1846; S.S. Jain & S.S.R. Bennet in Hazra & al., Fl. India 4: 504. 1997; M.K. Manna in Fl. W. Bengal 1: 406. 1997. *Cedrella toona* Roxb. ex Rottl., Ges. Naturf. Freunde Berlin News Schr. 2: 198. 1803; Hiern. in Hook.f., Fl. Brit. India 1: 568. 1875;

*Vern.: Toon* (Beng.)

Large, evergreen trees, to 25 m tall with dark grey or reddish brown bark. Leaves peripinnate, 70 cm long; leaflets ovate-oblong, acuminate. Flowers greenish or creamish yellow, 10–45 cm long, in shortly pedunculate panicles. Calyx 5-lobed. Petals 5. Capsules ovate-oblong, to 3 × 1.5 cm, blackish when ripe. Seeds winged at both ends.

*Fl.:* December.

*J. Bhatt. & Maity* 32476

*Use:* Barks and flowers used in medicine.Wood is used for furniture.

## ICACINACEAE

### NATSIATUM Buch.-Ham.

**Natsiatum herpeticum** Buch.-Ham. ex Arn. in Edinb. Philos. J. 16: 314. 1834; Mast. in Hook.f., Fl. Brit. India 1: 595. 1875; K.L. Maity in Fl. W. Bengal 1: 411. 1997; R. Mathur in N.P. Singh & al., Fl. India 5: 30. 2000.

Dioecious climbing shrubs; roots tuberous; stem and branches sensely strigose. Leaves broadly ovate, to 15 × 10 cm, cordate at base, acute to acuminate at apex, dentate at margin, chartaceous. Inflorescence pendulous, spike-like racemes, *c.* 10–12 cm long. Flowers unisexual. Calyx deeply 5-lobed, linear-lanceolate. Corolla 5, lanceolate, 2–5 mm long. Male flower: short; anther sagittate. Female flowers: staminode subulate. Ovary hairy; style 2–3 lobed. Drupe 8 × 6 mm.

*Fl. & Fr.:* December – February.

*J. Bhatt. & Maity* 33388/ 32476/ 32447

*Use:* The leaves and tender shoots are eaten by the Miris. It is cooked as pot herb especially with fish.

## RHAMNACEAE

### 1. GOUANIA Jacq.

**Gouania nepalensis** Wall. in Roxb., Fl. Ind. ed. Carey 2: 417. 1824; Lawson in Hook.f., Fl. Brit. India 1: 644. 1875; G. Sengupta & B. Safui in Fl. W. Bengal 1: 426. 1997; M.M. Bhandari & A.K. Bansal in N.P. Singh & al., Fl. India 5: 176. 2000.

Extensive climbing shrubs. Tendrils terminal or basal or racemes. Leaves ovate or cordate, to 16 × 5.0 cm, acuminate at apex, cuspidate; stipule membranous. Inflorescence terminal, cylindric, 4–6 flowered racemes or panicle. Flowers 5–6 mm across, white pubescent; pedicels to 4 mm long; bracteoles lanceolate, deciduous. Calyx to 3 mm long; Petals to 2.0 mm long. Disc saucer-shaped. Style 3-cleft. Capsules 3-winged, semi-circular, 1.2 cm long, separately 3 single seeded cocci. Seeds 5.5 × 3.5 mm.

*Fl. & Fr.:* June – November.

*J. Bhatt. & Maity* 32326

*Use:* Young leaves eaten as vegetable. Fruit is said to be medicinal.

### 2. ZIZIPHUS Mill.

1a. Climbers; petals 5 **1. Z. oenoplia**
1b. Trees; petals 0 **2. Z. rugosa**

**1. Zizyphus oenoplia** (L.) Mill., Gard. Dict. ed. 8. 3. 1768; Lawson in Hook.f., Fl. Brit. India 1: 634. 1875; G. Sengupta & B. Safui in Fl. W. Bengal 1: 433. 1997; M.M. Bhandari & A.K. Bansal in N.P. Singh & al., Fl. India 5: 236. 2000. *Rhamnus oenoplia* L., Sp. Pl. 194. 1753.

*Vern.: Makua, Shyakul, Makhora* (Beng.)

Straggling or climbing, rusty shrubs. Leaves alternate, ovate to ovate-lanceolate, entire or crenate, acute, base oblique; stipule prickly recurved. Flowers in axillary paniculate cyme. Calyx tomentose out side; lobes ovate, acute. Corolla hooked shorter than the calyx lobes, greenish. Stamens 5. Disc 10-lobed. Ovary 2-celled, sunk in the disc; style 2. Drupe black, small, globose.

*Fl. & Fr.:* May – October.

In dry deciduous forests, sparse

*Use:*Bark is used to expel the ascaris and for cure the wound. The sweet or somewhat acidic fruits are edible . Thorny branches used as hedges.

**2. Ziziphus rugosa** Lamk., Encycl. 3: 319. 1789; G. Sengupta & B. Safui in Fl. W. Bengal 1: 433. 1997; M.M. Bhandari & A.K. Bansal in N.P. Singh & al., Fl. India 5: 237. 2000.

A large straglling shrubs, to 6 m high. Stems with dark grey bark and recurved spines. Leaves ovate or elliptic, serrate, acute, to 13 × 11 cm. Flowers in axillary cymes or terminal panicle, yellowish green, 0.5–0.6 cm across. Calyx pubescent outside; lobes acute. Corolla absent. Disc 5-lobed,. Ovary 2-celled, style 2, connate. Drupe one seeded, globose or pyriform, to 1.2 × 1.0 cm, fleshy. Seeds 2(–1), compressed, black.

*Fl. & Fr.:* March – June.

*J. Bhatt. & Maity* 32430

*Use:* Bark powdered and applied to the swelling of teeth. Flowers used as medicine for menorrhagia. Fruits are edible. Leaves are used as fodder.

## VITACEAE

### 1. AMPELOCISSUS Planch.

1a. Herbaceous climbers; inflorescence a paniculate cymes **1. A. latifolia**
1b. Woody climbers; inflorescence an umbellate cyme **2. A. tomentosa**

**1. Ampelocissus latifolia** (Roxb.) Planch. in J. Vigne Amer. 374. 1883; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 435. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 256. 2000. *Vitis latifolia* Roxb., Fl. Ind. 1: 661. 1820; Lawson in Hook.f., Fl. Brit. India 1: 652. 1875.

*Vern.: Gowalia lata* (Beng.)

Large twining herbaceous climbers; stem hollow. Leaves simple, pentagonous, orbicular-cordate, 3–5 shallowly lobed, to 16 × 18 cm; petioles to 15 cm long, upper deeply grooved. Inflorescence small, compact, pyramidal cymes, puberulous. Flowers reddish brown, 5-furrowed, 0.2 cm long. Berries globose to 1 cm, 2–4 seeded, black when ripe. Seeds elliptic-oblong, broad longitudinal ridge adaxially with groove on either side a prominent fissure abaxially.

*Fl. & Fr.:* May – November.

In moist and dry decidous forests, common

*Use:* Roots are medicinal. Fruits are edible. Young leaves are edible as vegetables.

**2. Ampelocissus tomentosa** (Heyne ex Roxb.) Planch. in J. Vigne Amer. 374. 1883; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 436. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 261. 2000. *Vitis tomentosa* Heyne ex Roth, Nov. Pl. Sp. 157. 1821; Lawson in Hook.f., Fl. Brit. India 1: 650. 1875.

Large woody, stout climbers, covered with reddish tomentose hairs. Leaves orbicular, cordate at base, 3–7 lobed, to 12 × 14 cm; lobes obovate, acute, floccose with woolly tomentose. Flowers sessile, scarlet in thick, branched woolly dense, umbellate cymes; peduncles leaf-opposed, tendril bearing and stout. Berries ovoid, 0.5 × 0.4 cm, black. Seeds 1, obcordate, furrowed and keeled in ventral side.

*Fl. & Fr.:* May – August.

*Use:* Roots are applied to cure body swelling.

## 2. CAYRATIA Juss.

1a. Leaves digitately trifoliate; leaves opposed tendril forked once; flowers white **2. C. trifolia**
1b. Leaves 5–11 foliate; tendril 2–3 times forked at the end; flowers yellow **1. C. pedata**

**1. Cayratia pedata** (Lam.) Juss. ex Gagnep. in Lecomte, Notul. Yst. (Paris) 1: 346. 1911; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 438. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 271. 2000. *Cissus pedata* Lam., Encycl. 1: 31. 1783. *Vitis pedata* Wall. ex Lawson in Hook.f., Fl. Brit. India 1: 661. 1875;

Climbing herb with leaf opposed tendril forked at the end. Leaves pedately, 5–11 foliate, softly villous; leaflets elliptic, ovate, to 20 × 6cm, acumiante, base rounded. Flowers white in axillary pedunculate sub-corymbose cymes. Berries globose, 0.5–1.0 cm, cream coloured when ripe. Seeds 4, hemispheric, flat with deep circular pit.

*Fl. & Fr.:* April – October.

*J. Bhatt. & Maity* 32436

*Use:* The leaves are often used in the form of poultice in the treatment of boils. Decoction is used to check uterine reflexes.

**2. Cayratia trifolia** (L.) Domin. in Biblioth. Bot. 86: 371. 1927; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 439. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 275. 2000. *Vitis trifolia* L., Sp. Pl. 203. 1753. *Vitis carnosa* Wight & Arn. ex Lawson in Hook.f., Fl. Brit. India 1: 654. 1875;

Slender herbaceous climbing herb with wiry branched tendrils. Leaves 3-foliate on long petioles, pubescent; leaflets ovate, to 8 × 5 cm, serrate, acute at apex, subcordate at base. Tendrils wiry, 2–3 times forked, apices often discoid. Flowers pale yellow in umbellate cymes on 10–15 cm long peduncles. Berries globose, turbinate, fleshy, 2–4 seeded. Seeds trigonous.

*Fl. & Fr.:* June – November.

*J. Bhatt. & Maity* 33421

*Use:* Leaves used as fodder.

## 3. CISSUS L.

1a. Leaves glabrous beneath; flowers greenish red **3. C. repens**
1b. Leaves pubescent or tomentose beneath 2
2a. Leaves ferrugenous, longer than broad; seeds pitted with angled facets throughout **1. C. adnata**
2b. Leaves with woolly tomentose, nearly as long as broad; seeds not facets throughout **2. C. repanda**

**1. Cissus adnata** Roxb., Fl. Ind. 1: 423. 1820; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 441. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 279. 2000. *Vitis adnata* Wall. ex Wight & Arn., Prodr. 1: 126. 1834; Lawson in Hook.f., Fl. Brit. India 1: 649. 1875.

Slender climbing herb with rusty pubescent branches; tendril leaf opposed, bifid, hard. Leaves simple, ovate to orbicular, base cordate, acute to acuminate at apex, bristly serrate, glabrescent above, rusty-tomentose beneath; petioles 2–5 cm long. Cymes axillary drooping, umbelliform, pedunculate. Flowers greenish-yellow. Berries obovoid, blue-black, smooth, 1-seeded.

*Fl. & Fr.:* June – December.

*J. Bhatt. & Maity* 33336

*Uses:* Leaves are edible. Decoction of dry tubers is alternative, diuretic, and blood purifying. Root is used to cure cut and fracture.

**2. Cissus repanda** Vahl, Symb. Bot. 3: 18. 1794; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 439. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 290. 2000. *Vitis repanda* (Vahl) Wight & Arn., Prodr. 105. 1834; Lawson in Hook.f., Fl. Brit. India 1: 648. 1875.

Large, subwoody climbing shrubs with wrinkled soft stem; young branches ruffous-tomentose. Leaves ovate-orbicular, to 18 × 14.0 cm, cordate, acuminate, crenate-dentate, wooly tomentose; petioles 6–10 cm long; tendril twisted, forked with flattened disc. Flowers deep pinkish in leaf opposed umbellate cymes. Paduncles to 7 cm long, pink, slender; bracts and bracteoles pinkish-red. Flowers tetramerous, pink. Fruits pyriform, tipped by numerous style, 1-seeded.

*Fl. & Fr.:* February – August.

In moist decidous forests, sparse

*J. Bhatt. & Maity* 33322

*Use:* Stems contain a large qauntity of potable water.

**3. Cissus repens** Lamk., Encycl. Math. Bot. 1: 31. 1783; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 444. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 290. 2000. *Vitis repens* (Lamk.) Wight & Arn., Prodr. 125. 1834; Lawson in Hook.f., Fl. Brit. India 1: 646. 1875;

Glabrous climbers. Stems quadrangular; shoots milky-white. Leaves simple, ovate to triangular, acute, to 12 × 9 cm, deeply cordate, pale green, membranous, 4-pairs; petioles to 12.5 cm. Tendril weak, forked. Flowers greenish-red in compound umbellate cymes. Calyx triangular. Petals ovate-triangular. Berries ellipsoid to 2 cm, black when ripe.

*Fl. & Fr.:* June – December.

*J. Bhatt. & Maity* 31151

*Use:*Tender leaves eaten as vegetables. Stem used for making ropes.

**4. TETRASTIGMA** (Miq.) Planch.

| | |
|---|---|
| 1a. Leaves trifoliate | **1. T. bracteolatum** |
| 1b. Leaves 5–7 foliate | 2 |
| 2a. Leaflets digitate | **5. T. planicaule** |
| 2b. Leaflets pedate | 3 |
| 3a. Slender climber with bifid tendrils; leaflets small | **6. T. serrulatum** |
| 3b. Woody climber with simple tendril; leaflet broad | |
| 4a. Terminal leaflets oblong-lanceolate; floral disc restricted at the base of the ovary; berries globose | **3. T. leucostaphyllum** |
| 4b. Terminal leaflets obovate to broadly elliptic; floral disc encircling the lower half of the ovary; berries ellipsoid | 5 |
| 5a. Berries oblong, 2-seeded | **2. T. dubium** |
| 5b. Berries ellipsoid, 1–3-seeded | **4. T. obovata** |

**1. Tetrastigma bracteolatum** (Wall.) Planch. in DC., Monogr. Phan. 5: 428. 1887; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 447. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 310. 2000. *Vitis bracteolata* Wall. in Roxb., Fl. Ind. 2: 483. 1824; Lawson in Hook.f., Fl. Brit. India 1: 654. 1875.

Climbers; stem woody, glabrous; tendril simple. Leaves 3-foliate; leaflets ovate or ovate-lanceolate, 18 × 8 cm, rounded or cuneate at base of terminal leaflets, oblique in lateral, acuminate at apex, cuspidate-serrate, membranous. Inflorescence in corymbose divericate cymes, axillary, to 5 cm long. Flowers very small, whitish, tetramerous. Berries globose, black, 1–3 seeded. Seed horizontally wrinkled.

*Fl. & Fr.:* August – March.

*J. Bhatt. & Maity* 32340

*Note:* Smallest flower amongst the Indian Vitaceae

*Uses:* Fruits, tender stems and leaves are edible.

**2. Tetrastigma dubium** (Laws.) Planch. in DC., Monog. Phen. 5: 437.1887. J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 447. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 310. 2000. *Vitis dubia* Laws. in Hook.f., Fl.Brit.Ind. 1:661.1875.

Climbers, glabrous, branches slender, striatate. Leaves 3–5 foliate, membranous, leaflet ovate, lanceolate or elliptic, serrulate; tendril leaves simple. Inflorescence compact, shorter than petiole, not tendril bearing. Fruits globose, 0.6–0.7 cm across. Black when ripe, one to two seeded. Seeds rugose

*Fl. & Fr.:* Feb. – June

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**3. Tetrastigma leucostaphyllum** (Dennet.) Alston ex Mabb. in Taxon 2: 539. 1977; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 448. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 314. 2000. *Cicuss leucostaphylla* Dennst., Schliiss. Hort.-Malab. 17, 19. 33. 1818. *Vitis lanceolaria* Roxb., Fl. Ind. ed. Carey 1: 412. 1820.

Large glabrous climber except inflorescence. Stem woody, often flat with tubercles. Tendril leaf opposed, simple. Leaves 5–7 foliate; petioles to 15 cm long; leaflets elliptic,to 20 × 8 cm. Flowers *c.* 0.4 cm across, yellow in axillary cymes; male cymes paniculate but female cyme corymbose. Calyx truncate. Corolla ovate-oblong, hooked. Berries *c.* 2 cm across, globose, brown-red. Seeds 2, pyriform.

*Fl. & Fr.:* March – October.

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*Use:* Fruits are edible.

**4. Tetrastigma obovata** (Lawson) Gagnepain in Notul. Syst. 1: 266. 1910; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 448. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 315. 2000. *Vitis obovata* Lawson in Hook.f., Fl. Brit. India 1: 658. 1875.

Large climbers with flattened pubescent stems; tendrils leaf opposed, simple. Leaves digitately 3–5 foliate; petioles to 15 cm long, covered with brown hairs; leaflets obovate or elliptic, acute at base, acumiante at apex, crenate-serrate, Inflorescence umbellate cymes, divaricately or trichotomously branched, shortly peduncled. Flowers greenish yellow. Berries ellipsoid-globose, 1–3 seeded, black.

*Fl. & Fr.:* January – November.

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*Use:* Poultice of leaves is applied on boils. Juice of the plant is used in cough.

**5. Tetrastigma planicaule** (Hook.f.) Gagnep. in Notule Syst. (Paris) 1: 314. 1911; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 448. 1997; Shetty & P. Singh in Singh & al., Fl. India 5: 317. 2000. *Vitis planicaulis* Hook.f. in Bot. Mag. t. 5685. 1868; Lawson in Hook.f., Fl. Brit. India 1: 658. 1875.

Large glabrous climbers. Stems strongly flattened, striated. Leaves digitately 5-foliate; leaflets oblong or ovate, to 20 × 10 cm, subacuminate; petioles to 18 cm long. Flowers tetramerous, green in axillary cymes. Stigma quadrifid. Berries ovoid, cherry-like, 2–3 cm. Seeds elliptic, *c.* 2 cm.

*Fl. & Fr.:* April – December.

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**6. Tetrastigma serrulatum** (Roxb.) Planch. in DC., Monogr. Phan. 5: 439. 1887; J. Bhattacharya & T.K. Paul in Fl. W. Bengal 1: 449. 1997; Shetty & P. Singh in Singh & al., Fl. India

5: 319. 2000. *Cissus serrulata* Roxb., Fl. Ind. ed. Carey 1: 432. 1832. *C. capriolata* D. Don, Prodr. 188. 1825; Lawson in Hook.f., Fl. Brit. India 1: 659. 1875;

Scandent, dioceous glabrous creeper. Leaves pedately 5-foliate, apical leaflet to 9.5 × 3.5 cm and lateral 3.5 × 1.75 cm, obovate, acuminate, serrate; petioles 2–6 cm; petiolules *c.* 0.2–1.5 cm. Tendril leaf opposed forked near the apex. Inflorescence *c.* 2.5 cm long; cymes umbellate. Flowers yellow-green, tetramerous. Berries globose, hard, smooth. Seeds 2–4, obovoid, shortly beaked.

*Fl. & Fr.:* June – February.

*J. Bhatt. & Maity* 32436

*Use:*Fruits are edible. Aerial parts of the plant is used medicinally.

## LEEACEAE

**LEEA** van Royen ex L.

| | |
|---|---|
| 1a. Petals and inflorescence red | **2. L. guineensis** |
| 1b. Petals green or white; inflorescence not red | 2 |
| 2a. Stems and leaflets glabrous, glandular; mature fruit orange yellow | **3. L. indica** |
| 2b. Stems and leaflets pubescent, eglandular; mature fruit purple black | **1. L. compactiflora** |

**1. Leea compactiflora** Kurz. in J. Asiat. Soc. Bengal 42: 65. 1873 & 44: 179. 1875; R.N. Banerjee in Fl. W. Bengal 1: 451. 1997; B.D. Naithani in N.P. Singh & al., Fl. India 5: 332. 2000. *L. trifolia* Lawson in Hook.f., Fl. Brit. India 1: 667. 1875 *pro parte*.

Straggling with creeping root-stocks, to 5 m tall shrubs. Leaves trifoliate with 2 vestigial leaflets below; petiole to 20 cm long; stipules to 8 cm; rachis to 20 cm long; leaflets elliptic-lanceolate to ovate-oblong, to 25 × 11 cm. Flowers leaf oppose corymbose; cymes to 15 cm long, greenish-white. Corolla tube with staminal lobes. Fruits 0.7–1.0 cm across, orange-yellow, black when ripe.

*Fl. & Fr.:* April – January.

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**2. Leea guineensis** G. Don, Gen. Hist. 1: 712. 1831; R.N. Banerjee in Fl. W. Bengal 1: 452. 1997; B.D. Naithani in N.P. Singh & al., Fl. India 5: 336. 2000. *L. wightii* C.B. Clarke in J. Bot. 19: 105. 1881;

Undershrubs or small trees, to 5 m tall; stem articulated, furrowed. Leaves 2–3 pinnate; leaflets many, oblong or elliptic-oblong, to 24 × 10 cm, rounded to cuneate at base, acuminate at apex, dentate at margin; petioles to 20 cm; stipules obovate, caducous. Flowers *c.* 2 mm across, red, crowded and compact corymbs. Corolla tube with staminal lobes; lobes red. Berry orange-red, 1.0–1.5 cm across, blue-black at maturity.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 32365

*Use:* The stems are used as substitute for bamboos in building of temporary construction in scarcity of bamboos.

**3. Leea indica** (Burm.f.) Merr. in Philip. J. Sci. Bot. 14: 245. 1919; R.N. Banerjee in Fl. W. Bengal 1: 452. 1997; B.D. Naithani in N.P. Singh & al., Fl. India 5: 337. 2000. *Staphylea indica* Burm. f., Fl. Ind. 75. t. 24. f. 2. 1768. *L. sambucina* (L.) Willd., Sp. Pl. 1: 1177. 1797; Lawson in Hook.f., Fl. Brit. India 1: 666. 1875.

*Vern.: Kukur Jiwhva* (Beng.)

Shrubs, to 5 m tall. Leaves 2–3 pinnate, to 1 m long; leaflets oblong, ovate-lanceolate, to 15 × 9 cm, apex long acuminate, base acute or truncate, margin serrate; stipules obovate, caducous. Cymes

peduncled in subterminal corymbs. Flowers pale green. Berries subglobose, 5–7 mm across, red–black, 3-seeded. Seeds 4–6 grooved.

*Fl. & Fr.:* June – December.

*F.No.:* 31132

*Use:* Whole plant is used in blood dysentery and piles. Young leaves are cooked and eaten as vegetables by local people.

## STAPHYLLACEAE

### TURPINIA Venetant *nom. cons.*

1a. Leaves about 30 cm long; leaflets elliptic-oblong; flowers 3.5-4.0 mm in diam.; pericarp somewhat fleshy **2. T. pomifera**

1b. Leaves about 20 cm long; leaflets obovate or variable in shape; flowers 2.0-2.5 mm in diam.; pericarp scarcely fleshy **1. T. cochin-chinensis**

**1. Turpinia cochin-chinensis** (Lour.) Merr. in J. Arn. Arb. 19: 43. 1938; D. Mitra in Fl. W. Bengal 1: 470. 1997; P.C. Pant in N.P. Singh & al., Fl. India 5: 415. 2000. *Triceros cochin-chinensis* Lour., Fl. Cochinch. 184. 1790. *T. pomifera* (Roxb.) DC., in Hook.f., Fl. Brit. India 1: 698. 1875.

Trees to 7 m tall; bark grey corky. Leaves to 20 cm long; leaflets 3–5, obovate or variable in shape, acuminate at apex, cuneate at base. Flowers in axillary or terminal panicles, greenish white. Sepals 5. Petals 5, spathulate. Nuts subglobose, stipulate, to 8 mm across, seed 1-3 mm across.

*Fl. & Fr.:* April – October.

*Uses:* Wood is used in making of tea boxes and carving toys.Leaves used as fodder.

**2. Turpinia pomifera** (Roxb.) DC., Prodr. 2: 3. 1825; Hiern. in Hook.f., Fl. Brit. India 3: 698. 1874; Bengal Pl. 1: 245. 1903; D. Mitra in Fl. W. Bengal 1: 471. 1997; P.C. Pant in N.P. Singh & al., Fl. India 5: 415. 2000. *Dalrymplea pomifera* Roxb., Pl. Corom. 3: 76. t. 279. 1819.

*Vern.: Janoki Jam* (Beng.)

Tree to 20 m tall. Leaves to 40 cm long; leaflets usually elliptic-oblong, long acuminate, to 15 × 6 cm. Inflorescence panicle, much branched, to 30 cm long, axillary or terminal. Flowers white. Sepals 5, ovate, 2–3 mm long. Petals 5, spathulate. Stamens 5. Fruits globular with 3 grooves at apex. Paricarp very thick. Seeds small, brown and glossy.

*Fl. & Fr.:* June – February.

*J. Bhatt. & Maity* 31116, 32498

*Use:* Leaves used as fodder. Fruit is edible. Seed is used as oil yielding.

## SABIACEAE (MELIOSMACEAE)

### MELIOSMA Blume

**Meliosma simplicifolia** (Roxb.) Walp., Rep. Bot. Syst. 1: 423. 1842; S.C. Majumdar in Fl. W. Bengal 1: 473. 1997 et in N.P. Singh & al., Fl. India 5: 425. 2000. *Millingtonia simplicifolia* Roxb., Pl. Corom. 3: 50. t. 254. 1820. *Meliosma yunnanensis* Franchet, Bull. Soc. Bot. Fr. 33: 465. 1886.

*Vern.: Patpati, Dantrangi* (Beng.)

An evergreen trees to 20 m tall. Leaves elliptic to lanceolate or ovate-lanceolate, to 50 × 18 cm, entire or often dentate. Panicle terminal, rarely axillary, pubescent, many flowered. Flowers small, sessile; empty bracts ovate, unequal. Sepals 4–5. Petals 6, white; inner petals shallowly to deeply bifid. Fruits globose, 4–10 mm across.

*Fl. & Fr.:* November – June.

*J. Bhatt. & Maity* 32440

*Use:* Flowers and young leaves eaten by natives. Timber is used for various purposes.

## ANACARDIACEAE

### MANGIFERA L.

**Mangifera indica** L., Sp. Pl. 200. 1753; Hook. in Hook.f., Fl. Brit. India 2: 13. 1876; Prain, Beng. Pl. 1: 248. 1963 (rep. ed.); Chandra & Mukherjee in N.P. Singh & al, Fl. India 5: 466. 2000.

*Vern.: Aam* (Beng.)

Large tree, to 45 m tall with an oval crown. Laeves oblong-lanceolate or lanceolate-elliptic, to 30 × 8 cm, base cuneate, acuminate at apex, coriaceous. Panicles over 25 cm long, branched, terminal. Flowers *c.* 0.5 cm across, polygamous, greenish yellow, Sepals 5, tomentose. Petals 5, pinkish-white. Stamen 5, 1 fertile. Drupes obovoid or oblong, 8–10 × 2–3 cm, fleshy, yellow when ripe.

*Fl. & Fr.:* November – June.

Planted along roadside, also found along water courses.

*Use:* Powdered seeds used as astringent in bleeding piles.Fruits are edible in both raw and ripen. Barks are used as dye yielding agent.

## MORINGACEAE

### MORINGA Adans.

**Moringa oleifera** Lam., Encycl. Meth. Bot. 1: 398. 1785; Uniyal in N.P. Singh & al., Fl. India 5: 516. 2000. *M. pterygosperma* Gaertn., Fruct. 2: 314. 1791; Hook. in Hook.f., Fl. Brit. India 2: 45. 1876; Prain, Beng. Pl. 1: 252. 1963 (rep. ed.).

*Vern.: Sajina* (Beng.)

Medium sized trees with soft wood. Leaves to 50 cm long; rachis thickened and articulated at base; leaflets 3–11, obovate, to 2.4–1.5 cm, terminal one larger, orbicular at apex. Flowers harmaphrodite in axillary panicles, to 2 cm long. Calyx petaloid, reflexed, hairy. Corolla white. Stamens 5; anther reflexed. Capsules elongate, ribbed. Seeds many; testa corck, winged.

*Fl. & Fr.:* February – January.

Planted near habitations.

*Use:* Plant used as medicinal purpose in ascites, rheumatism, and venome bites. It also act as cardiac and circulatory stimulant .Seed oil is used in cosmectics. Leaves, flower and fruits edible.

## FABACEAE

### 1. ABRUS Adans.

**Abrus pulchellus** Wallich ex Thwaites, Enum. Pl. Zeyl. 91. 1859; Baker in Hook.f., Fl. Brit. India 2: 176. 1876; Prain, Beng. Pl. 1: 262. 1963 (rep. ed.).

Twining subshrubs to 80 cm long. Leaves peripinnate to 12 cm long; leaflets oblong, obtuse to mucronate at base, attenuate at apex, glabrous above, pubescent beneath; stipules lanceolate. Peduncles to 12 cm long, accrescent. Flowers pinkish, keeled; petals curved and pointed. Pods oblong to 10 cm long, 8–12 seeded. Seeds oblong, compressed, brown.

*Fl. & Fr.:* September – December.

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**2. BUTEA** Roxb. ex Willd.

**Butea monosperma** (Lam.) Taub. in Engl. & Prantl., Nat. Pflanzenfam. 3: 365. 1894. *Erythrina monosperma* Lam., Encycl. 2: 391. 1786. *Butea frondosa* Roxb. ex Willd., Sp. Pl. 3: 917. 1802; Baker in Hook.f., Fl. Brit. India 2: 194. 1876; Prain, Beng. Pl. 1: 286. 1963 (rep. ed.).

*Vern.: Palas* (Beng.)

Medium sized to 20 m tall tree; young parts softly sliky; bark rough. Leaves large to 50 cm long, 3-foliate, common petiole; leaflets obliquely ovate, rhomboid, terminal, broadly obovate, glabrescent, shining above, tomentose below. Flowers in dense racemes forming terminal panicle, bright orange-red. Calyx densely valvety brown, pubescent. Petals silvery tomentose without. Standard strongly upcurved. Pods oblong to 10 cm long, brownish, 1-seeded. Seeds dark, brown.

*Fl. & Fr.:* February – August.

In deciduous forests, common

*Use:* Gum is astingent and used in chronic diarrhea. Seed is used as antihelmintic. Flowers are used for making dye. Used as ornamental plant.

**3. CROTALARIA** L.

| | |
|---|---|
| 1a. Leaves simple | **1. C. albida** |
| 1b. Leaves trifoliate | 2 |
| 2a. Raceme rarely terminal;pods oblong-elliptic, seeds | **2. C. cystisoides** |
| 2b. Racemes always terminal; pod oblong; seeds many | **3. C. pallida** |

**1. Crotalaria albida** Heyne ex Roth, Nov. Pl. Sp. 333. 1821; Baker in Hook.f., Fl. Brit. India 2: 176. 1876; Prain, Beng. Pl. 1: 266. 1963 (rep. ed.); Deb & Dutta in J. Econ. Tax. Bot. 10(1): 34. 1987.

Herb to 75 cm high with numerous appressed branches. Leaves simple, linear-oblong to oblanceolate, to 3 × 0.5 cm long, obtuse-mucronate at apex; stipule minute, subulate. Racemes terminal, hairy, to 15 cm long, 5–15 flowered. Flowers yellow, 1–2 cm long. Calyx silky, 5-teeth. Standard petal suborbicular, often with purple streaked. Pods oblong to 6 cm long, apiculate, glabrous, 20–30 seeded.

*Fl. & Fr.:* July – December.

In dry deciduous forests, abundant

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**2. Crotalaria cystisoides** Roxb. [Hort. Beng. 54. 1814, *nom. nud.*] ex DC., Prodr. 2: 131. 1825; Deb & Dutta in J. Econ. Tax. Bot. 10(1): 34. 1987. *Priotropis cystisoides* (Roxb. ex DC.) Wight & Arn., Prodr. 180. 1834; Baker in Hook.f., Fl. Brit. India 2: 65. 1876.

Bushy shrubs to 5 m tall. Leaves 3-foliate; leaflets elliptic-oblong to lanceolate, to 7 × 3 cm, base attenuate, acute at apex, pale beneath. Racemes to 14 cm long, usually leaf opposed, often terminal, 10–50 flowered. Corolla yellow with standard and wings, purple-brown. Pods oblong-elliptic, to 4 × 1.5 cm long, acute at both ends, 2–8 seeded. Seeds reniform, black.

*Fl. & Fr.:* May – January.

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**3. Crotalaria pallida** Dryand in Ait., Hort. Kew ed. 1. 3: 20. 1789. *C. striata* DC., Prodr. 2: 131. 1825; Baker in Hook.f., Fl. Brit. India 2: 84. 1876; Prain, Beng. Pl. 1: 264. 1963 (rep. ed.).

Undershrubs to 2 m tall, branched. Leaves 3-foliate, common petioles to 5 cm long; leaflets obovate, to 7 × 4 cm, obtuse-mucronate at apex, membranous, glaucous. Racemes to 30 cm. Long, terminal and lateral. Calyx lobes lanceolate. Corolla yellow lined with reddish purple; keel fulcate. Pods oblong, to 5 × 0.7 cm, inflated, glabrous. Seeds many, kidney shaped, brownish.

*Fl. & Fr.* November – April.

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**4. DALBERGIA** L.f.

**Dalbergia stipulacea** Roxb., Fl. Ind. ed. 2. 3: 233. 1832; Baker in Hook.f., Fl. Brit. India 2: 237. 1876; Prain, Beng. Pl. 1: 293. 1963 (rep. ed.); Deb & Dutta in J. Econ. Tax. Bot. 10(1): 34. 1987.

Scandent shrubs or sprawling trees to 10 m tall. Leaves to 20 cm long; leaflets 17–25, alternate, oblong, base rounded or cuneate, obtuse at apex. Stipules oblong, deciduous. Panicles axillary to 12 cm long with ascending racemose branches. Flowers reddish-purple. Stamen 2 sheaths of 5 each. Pods oblong-elliptic to 10 cm long, 1-seeded. Seeds flat, brown.

*Fl. & Fr.:* March – November.

*J. Bhatt. & Maity* 31127, 31140

*Uses:* Bark is used in fish poisioning. Seeds are edible.

**5. DESMODIUM** Desve. *nom. cons.*

| | |
|---|---|
| 1a. Flowers hidden in persistent, orbicular, bifarious bracts; stamens monadelphous | 4. **D. pulchellum** |
| 1b. Flowers not hidden; bracts not orbicular | 2 |
| 2a. Flowers in short axillary umbels; stamens monadelphous | 5. **D. triangulare** |
| 2b. Flowers in racemes or few flowered axillary fascicles; stamens diadelphous | 6. **D. triflorum** |
| 3a. Pods deeply constricted between seed joints dehiscent | 1. **D. heterocarpon** |
| 3b. Pods scarcely constricted between seeds joints indehiscent | 4 |
| 4a. Leaflets usually acute; pods linear, not indented towards inner side; flower bluish violet | 2. **D. laxiflorum** |
| 4b. Leaflets usually obtuse; pods oblong intended towards inner side; flowers pink | 3. **D. motorium** |

**1. Desmodium heterocarpon** (L.) DC., Prodr. 2: 337. 1825. *Hedysarum heterocarpon* L., Sp. Pl. 747. 1753. *Desmodium polycarpon* (Poit.) DC., Prodr. 2: 334. 1825; Baker in Hook.f., Fl. Brit. India 2: 171. 1876; Prain, Beng. Pl. 1: 304. 1963 (rep. ed.).

Erect undershrubs to 1.5 m tall. Leaves trifoliate; leaflets elliptic-obovate, obtuse, notched at apex, pubescent beneath. Flowers in axillary or terminal racemes, 5–10 cm long, purple blue in racemes. Pods linear, hooked hairs on suture, joints 3–7, dehiscing by lower suture.

*Fl. & Fr.:* June – December.

In moist deciduous forests, sparse

*J. Bhatt. & Maity* 33430, 33421

**2. Desmodium laxiflorum** DC. in Ann. Sci. Nat. (Paris) Ser. 1. 4: 100. 1825; Baker in Hook.f., Fl. Brit. India 2: 164. 1876; Prain, Beng. Pl. 1: 304. 1963 (rep. ed.).

Erect, pubescent undershrubs to 2 m tall; branches angular. Leaves 3-foliate; leaflets ovate-lanceolate, terminal, longer, silky-hairy beneath; stipules triangular. Flowers pale pink, fascicled. Calyx viscid-glandular. Pods falcate, joints with hooked hairs, strongly nerved.

*Fl. & Fr.:* July – December.

In moist decidous forest, frequent

*J. Bhatt. & Maity* 33402, 32316

**3. Desmodium motorium** (Houtt.) Merr. in J. Arn. Arb. 19: 345. 1938. *Hedysarum motorium* Houtt., Nat. Hist. 2. 10: 246. 1779. *H. gyrans* L.f., Suppl. 332. 1781. *Desmodium gyrans* (L.f.) DC., in Hook.f., Fl. Brit. India 2: 174. 1876; Prain, Beng. Pl. 1: 305. 1963 (rep. ed.).

Undershrubs to 3 m tall; branched. Leaves 3-foliate, terminal one large, linear-lanceolate to 10 × 3 cm long, lateral leaflets very small, to 1 × 0.2 cm long. Racemes terminal and axillary, to 12 cm

long. Flowers to 6 cm long, pink to orange or yellow with red streaks. Pods linear, curved, pubescent with hooked hairs. Seeds elliptic, black.

*Fl. & Fr.:* October – February.

*J. Bhatt. & Maity* 33301

*Use:* Often cultivated as an ornamental.

**4. Desmodium pulchellum** (L.) Benth., Fl. Hongk. 33. 1861; Baker in Hook.f., Fl. Brit. India 2: 162. 1876; Prain, Beng. Pl. 1: 304. 1963 (rep. ed.). *Hedyserum pulchellum* L., Sp. Pl. 747. 1753.

Shrubs to 3 m high. Leaves 3-foliate; leaflets elliptic to ovate-oblong, terminal leaflet twice as large as lateral ones, undulated margins. Flowers in axillary and terminal raceme, densely pubescent stalks with series of paired leafy elliptic bracts. Flowers in 2–6 fascicles. Calyx hairy. Corolla white or pale yellow. Pods small, brown, 1–3 segmented, apiculate.

*Fl. & Fr.:* June – December.

In dry deciduous forest, common

*J. Bhatt. & Maity* 33383

*Use:* The bark and flowers are used as medicine.

**5. Desmodium triangulare** (Retz.) Merr. in J. Arn. Arb. 23: 170. 1942. *Hedyserum triangulare* Retz., Obs. Bot. 3: 40. 1783. *Desmodium cephalotes* (Roxb.) Wallich ex Wight & Arn., in Hook.f., Fl. Brit. India 2: 161. 1876; Prain, Beng. Pl. 1: 304. 1963 (rep. ed.).

An erect shrubs to 2 m tall; stems covered with white sericeous hairs when young. Leaves trifoliate; leaflets oblong-elliptic to 13 × 6 cm, acute at both ends, densely grey, silky beneath. Inflorescence axillary, umbels or corymbose. Corolla white or yellowish. Pods linear, breaking into 2–5 squarish segments.

*Fl. & Fr.:* June – November.

*J. Bhatt. & Maity* 33339

**6. Desmodium triflorum** (L.) DC., Prodr. 2: 334. 1825; Baker in Hook.f., Fl. Brit. India 2: 173. 1876; Prain, Beng. Pl. 1: 303. 1963 (rep. ed.). *Hedyserum triflorum* L., Sp. Pl. 749. 1753, *excl.* var.

Much branched, wiry, trailing herb. Leaflets 3, small, obovate, cuneate, truncate or emerginate at apex, white, hairy beneath. Flowers 1–5 together, axillary from upper laef, blue or violet, standard pinkish. Pods linear, often curved.

*Fl. & Fr.:* August – December.

In waste lands and in the vicinity of forests

*J. Bhatt. & Maity* 33402

*Uses:* Leaves are used for curing of wounds and absecesses.

**6. DOLICHOVIGNA** Hay.

**Dolichovigna pilosa** (Willd.) Niyomdham in Nord. J. Bot. 12: 341. 1992. *Dolichos pilosus* Willd., Sp. Pl. 3: 1043. 1800. *Vigna pilosa* (Willd.) Baker in Hook.f., Fl. Brit. India 2: 207. 1876; Prain, Beng. Pl. 1: 276. 1963 (rep. ed.); Sanj., Legumes of India 275. 1991.

Climbing herb with slender branches. Leaves shallowly 3-foliate; leaflets ovate, lanceolate, to 11 × 6 cm, base rounded, apex acuminate. Racemes to 12 cm long, axillary, 10–20 flowered. Calyx silky. Corolla reddish, keel curved. Pods linear, beaked to 7 × 0.8 cm, densely hirsute, 8–12 seeded. Seeds oblong, black.

*Fl. & Fr.:* July – October.

*J. Bhatt. & Maity* 32307, 32328, 33360

**7. FLEMINGIA** Roxb. ex W. Ait. & W.T. Ait. (*nom. cons.*)

**Flemingia stricta** Roxb., Pl. Corom. 3: t. 248. 1815; Baker in Hook.f., Fl. Brit. India 2: 228. 1876; Prain, Beng. Pl. 1: 268. 1963 (rep. ed.); Deb & Dutta in J. Econ. Tax. Bot. 10(1): 25. 1987. *Moghania stricta* (Roxb.) O. Kuntze, Rev. Gen. Pl. 1: 199. 1891.

Shrubs to 4 m tall with angular hairy branches. Leaves 3-foliate with angular paetiole; leaflets ovate-lanceolate, to 26 × 12 cm, subcoriaceous. Stipules 4–6 cm, lanceolate, silky without. Raceme to 13 cm long, densely flowered. Flowers purple. Pods ellipsoid, 1.0–1.5 cm long, glabrescent.

*Fl. & Fr.:* January – September.

*J. Bhatt. & Maity* 32432

**8. MILLETIA** Wight & Arn.

1a. Standard pubescent or sericeous dorsally; pods tomentose leaves 5–6 foliate **1. M. extensa**
1b. Standard glabrous dorsally; pods glabrous; leaves 11–17 foliate **2. M. pachycarpa**

**1. Milletia extensa** (Benth.) Baker in Hook.f., Fl. Brit. India 2: 109. 1876. *Otosesma extensa* Benth. in Miq, Jungh. 249. 1852. *Milletia auriculata* Baker ex Brandis, Forest Fl. N. W. India 138. 1874; Baker in Hook.f., Fl. Brit. India 2: 108. 1876; Prain, Beng. Pl. 1: 293. 1963 .

A large robust woody climber. Leaves to 35 cm long; leaflets obovate-oblong, to 15 × 5 cm, cuspidate, silky pubescent beneath. Flowers cream coloured in axillary and terminally, to 25 cm long racemes. Pods straight, very hard, 10–15 cm long, flat, suture thickened.

*Fl. & Fr.:* June – December.

*J. Bhatt. & Maity* 32308

*Use:*Root is insect repellent & used for fish poisioning.

**2. Milletia pachycarpa** Benth. in Miq., Pl. Jungh. 1: 250. 1852; Baker in Hook. f., Fl. Brit. India 2: 106. 1876.

Tall climbers; younger parts velvety. Leaves to 50 cm long, young are silvery, 11–17 foliate; leaflets obovate or oblanceolate, to 15 × 5 cm, base cuneate, abruptly acuminate at apex, brownish tomentose beneath, glabrous above. Panicle to 30 cm long, brown, velvety; flowers pink or mauve. Calyx densely brown pubescent. Pods to 20 × 6 cm, woody, constricted between seeds. Seeds reniform, 1–3 seeded.

*Fl. & Fr.:* February – June.

*J. Bhatt. & Maity* 32478

*Use:* The barks, roots and pods are apparently used as fish poison.

**9. MUCUNA** Adans. *nom. cons.*

1a. Woody twinner; flowers borne on wood; pods linear, straight covered with non irritant bristles; seeds 8–15 **1. M. macrocarpa**
1b. Semi woody twinner; flowers bornes in axils of leaves; pods ‘S’ shaped, covered with irritant bristles; seeds 5–6 **2. M. pruriens**

**1. Mucuna macrocarpa** Wall., Pl. Asiat. Rar. 1: 41. t. 47. 1830; Baker in Hook.f., Fl. Brit. India 2: 186. 1876.

Woody twinner. Leaves subcoriaceous; leaflets ovate; petioles to 15 cm. Racemes borne on old defoliated wood, to 20 cm long. Calyx tube covered with brownish bristles. Standard to 3 cm, greenish white wing dark purple; keel greenish purple. Pods to 45 × 5 cm., pods constricted between the seeds, 8–15 seeds.

*Fl. & Fr.:* March – April.

*J. Bhatt. & Maity* 32374

**2. Mucuna pruriens** (L.) DC., Prodr. 2: 405. 1825; Baker in Hook.f., Fl. Brit. India 2: 187. 1876. *Dolichos pruriens* L. in Stickman, Diss. Herb. Amb. 23. 1754. *Mukuna prurita* Hook., Bot. Mis. 2: 384. 1834 (*nom. superfl.*); Prain, Beng. Pl. 1: 285. 1963 (rep. ed.).

Annual climbers with silvery pubescent stems. Leaves trifoliate; leaflets elliptic-ovate, to 15 × 12 cm., obtuse to acute at apex, rounded at base. Racemes to 20 cm long, 10–20 flowered; flowers dark purple. Calyx bilipped, tomentose, Pods S-shaped, turgid, to 8 cm long, terete, 5–6 seeded, oblong, ellipsoid. Seeds blackish, glossy.

*Fl. & Fr.:* January – December.

In dry deciduous forests, over small tree sparse

*J. Bhatt. & Maity* 33306

*Use:* Roots having medicinal value in nervous system, kidney troubles, and dropsy.Seeds are used as a tonic. Young pods are edible and also used as fodder.

**10. PUERARIA** DC.

**Pueraria phaseoloides** (Roxb.) Benth. in J. L.. Soc. 9: 126. 1867; Baker in Hook.f., Fl. Brit. India 2: 19. 1876. *Dolichos phaseoloides* Roxb., Fl. Ind. 3: 316. 1832.

Stems wide-twining, hairy. Stipules small. Leaflets thin membranous, clothed with bristly hairs, variable in size and shape, ovate or orbicular, shallowly 3-lobed, 9–12 cm long. Flowers fascicled in long peduncled racemes. Corolla reddish; petals distinctly spurred. Pods glabrescent, 5–8 cm long.

*Fl. & Fr.:* January – December.

*J. Bhatt. & Maity* 33374, 32306, 33415

**11. SHUTERIA** Wight & Arn. (*nom. cons.*)

**Shuteria vestita** (Wall.) Wight & Arn., Prodr. 207. 1834; Baker in Hook.f., Fl. Brit. India 2: 182. 1876.

Climbers with patently hairy stems. Leaves trifoliate; leaflets ovate or ovate-oblong, to 5 × 3.5 cm, base rounded, obtuse-mucronate at apex. Racemes axillary, short and crowded, many flowered. Flowers purplish, small. Pods linear, to 3 × 0.6 cm, brownish, pubescent, apically beaked. Seeds 5–6, shiny, dark brown.

*Fl. & Fr.:* November – January.

*J. Bhatt. & Maity* 32461.

**12. TEPHROSIA** Pers. (*nom. cons.*)

**Tephrosia candida** (Roxb.) DC., Prodr. 2: 249. 1825; Baker in Hook.f., Fl. Brit. India 2: 111. 1876; Prain, Beng. Pl. 1: 289. 1963 (rep. ed.); Deb & Dutta in J. Econ. Tax. Bot. 10(1): 36. 1987. *Robinia candida* Roxb., Fl. Ind. 3: 327. 1832.

Shrubs, to 4 m tall with densely brown tomentoes stems. Leaves 20 cm long, imparipinnate; leaflets 11–25, elliptic-oblong, base cuneate, acute-mucronate at apex, revolute at margin. Stipule deltoid. Racemes terminal to 20 cm long. Flowers in fascicles of 2–4. Corolla creamy white, silky without. Pods linear, to 10 × 1 cm, with persistent style, 10–12 seeded. Seeds oblong, ellipsoid, brown.

*Fl. & Fr.:* August – January.

*J. Bhatt. & Maity* 32496, 32389, 33346

## CAESALPINIACEAE

### 1. BAUHINIA L.

1a. Climbing shrubs, branches bearing tendrils; flowers small to medium size; leaves densely brown, pubescent beneath **2. B. vahlii**
1b. Trees without tendril; flowers mostly large 2
2a. Flower buds pentagonous with 5 longitudinal ridges; petals 3-3.5 cm; fertile stamens 3 **1. B. purpurea**
2b. Flower buds smooth, without ridges; petals 4-4.5 cm; fertile stamens 5 **3. B. variegata**

**1. Bauhinia purpurea** L., Sp. Pl. 375. 1753; Baker in Hook.f., Fl. Brit. India 2: 284. 1878; Prain, Beng. Pl. 1: 317. 1963 (rep. ed.).

Bushy evergreen trees, to 7 m. Leaves ovate, to 15 × 13 cm, cordate at base, obtuse or subacute at apex. Flowers pale purple with dark pinkish veins; buds fusiform. Calyx spatheceous, tomentose. Petals oblong-lanceolate, long clawed, reddish. Pods strap-shaped, flat, to 25 cm long, 12–15 seeded. Seeds flattened, smooth, orbicular, brown.

*Fl. & Fr.:* September – December.

Scattered in grasslands.

*Uses:* Leaves are used as fodder, bark for tanning.Flower as a pot herb.Wood having low value in furniture.

**2. Bauhinia vahlii** Wight & Arn., Prodr. 297. 1834; Baker in Hook.f., Fl. Brit. India 2: 279. 1878. *Phanera vahlii* (Wight & Arn.) Benth. in Miq., Pl. Jungh. 263. 1852; Prain, Beng. Pl. 1: 317. 1963 .

A gigantic climber with rusty tomentose branches; branches ended with strong circinate tendrils. Leaves to 45 cm long, cleft to one third way down; lobes rounded with broad sinus. Flowers white or creamy coloured in terminal corymbose racemes. Calyx densely villous. Corolla clothed with silky hairs. Pods to 30 × 5 cm, woolly, rusty tomentose. Seeds 8–12, dark brown.

*Fl. & Fr.:* February – May.

In moist deciduous forests, sparse.

*Uses:* Leaves are used for making umbrella, plates and for thatched the roof. Seeds are eaten raw and cooked as well.

**3. Bauhinia variegata** L., Sp. Pl. 375. 1753; Baker in Hook.f., Fl. Brit. India 2: 284. 1878. *B. candida* Ait., Hort. Kew ed. 1. 2: 49. 1789. *Phanera variegata* (L.) Benth. in Miq., Pl. Jungh. 262. 1852; Prain, Beng. Pl. 1: 317. 1963 (rep. ed.).

Medium sized trees with tomentose young shoots. Leaves ovate, suborbicular, cordate at base, united about 1/3 upwards. Flowers in few flowered corymbose racemes from leafless axils. Calyx spathaceous, tomentose. Corolla white or purplish pink. Pods flat, *c.* 2 cm across, glabrous.

*Fl. & Fr.:* September – April.

*Use:* Stem bark used medicinally and yield gum.Wood used for agricultural implements.Tender leaves and bark are edible.

### 2. CAESALPINIA L.

**Caesalpinia cucullatum** Roxb., Fl. Ind. 358. 1832. *Mezoneuron cucullatum* (Roxb.) Wight & Arn., Prodr. 283. 1834; Baker in Hook.f., Fl. Brit. India 2: 258. 1878; Prain, Beng. Pl. 1: 322. 1963 (rep. ed.).

Large climbing shrubs; stems with corky protuberances, bearing a pair of hooked thorns. Leaflets 3–6 pairs, elliptic-ovate, to 10 × 6 cm, bluntly acuminate at apex, rounded at base, glabrous.

Flowers yellow in long panicles or racemes, to 18 cm long. Upper petals 2-lobed. Pods oblong-lanceolate, 10 × 3 cm, reddish-brown with papery wings, 1-seeded.

*Fl. & Fr.:* March – June.

*J. Bhatt. & Maity* 32479

*Uses:* Seed powder given to cattle as vermifuge.

## MIMOSACEAE

### 1. ACACIA Mill.

| | |
|---|---|
| 1a. Trees | **3. A. suma** |
| 1b. Climbing shrubs | 2 |
| 2a. Leaflets 5–50 pairs, sessile | **1. A. pennata** |
| 2b. Leaflets 8–25 pairs, subsessile | **2. A. sinuata** |

**1. Acacia pennata** (L.) Willd., Sp. Pl. 4: 1090. 1806; Baker in Hook.f., Fl. Brit. India 2: 297. 1878. *pro parte*; Prain, Beng. Pl. 1: 331. 1963 (rep. ed.). *Mimosa pennata* L., Sp. Pl. 522. 1753.

Large prickly, scandent or climbing shrubs. Leaf rachis to 20 cm long; leaflets 5–50 pairs, sessile, linear-oblong, to 6 × 1 mm, overlapping, acute at apex, semi-truncate at base. Flowers white, 1–4 together in terminal tomentose paniculate heads. Pods stalked, strap-shaped with thick sutures, to 18 × 3 cm. Seeds 5–10 seeded, oblong, dark brown.

*Fl. & Fr.:* July – February.

In dry deciduous forests, not common

*J. Bhatt. & Maity* 32349

*Uses:* Bark yield tannin and used to tan fishing nets.

**2. Acacia sinuata** (Lour.) Merr. in Trans. Amer. Philos. Soc. Philadel. 24: 186. 1935. *Mimosa sinuata* Lour., Fl. Cochinch. 653. 1790. *Acacia concinna* Willd., Sp. Pl. 4: 1039. 1806. *Mimosa concinna* Willd., Sp. Pl. 4: 1039. 1806.

*Vern.: Bon hitha, Sikakai* (Beng.)

Woody climbing shrubs, armed with small hooked prickles. Leaves bipinnate, to 12 cm long; pinna 4–8 pairs; leaflets subsessile, 8–25 pairs, linear, unequal at apex. Inflorescence globose, fascicled or other forming terminal racemes or panicle, to 25 cm long. Flowers sessile, creamy-white or yellowish. Corolla lobes lanceolate. Pods strap-shaped, 6.0 × 2.5 cm, thick, fleshy, wrinkled, when dry, 6–10 seeded.

*Fl. & Fr.:* April – February.

*J. Bhatt. & Maity* 32500

*Use:* Seeds are used for washing hairs, woollen and silky fibres. Fruits are used for fish poison.

**3. Acacia suma** (Roxb.) Kurz in Brandis, For. Fl. N.W. India. 187. 1874; Baker in Hook.f., Fl. Brit. India 2: 294. 1878. *Mimosa suma* Roxb., Fl. India. 2: 563. 1832. *A. catechu auct. non* L.

Trees to 12 m tall. Stipular spines straight. Petiole with a gland near the middle. Leaves up to 13.5 cm long; pinnae 10–30 pairs, to 5.5 cm long; leaflets 30–50 pairs, linear. Flowers white, to 10.5 cm long spikes. Pods to 13.5 × 2.0 cm, flat, beaked.

*Fl. & Fr.:* April – December.

## 2. ALBIZZIA Durazz.

| | |
|---|---|
| 1a. Flowers head in corymbose racemes, pedicellate; leaflets 5–12 pairs; stamens greenish white | **2. A. lebbeck** |
| 1b. Flowers head in axillary or terminal panicles, sessile; leaflets more than 12 pairs; stamens white | 2 |
| 2a. Stipules large; leaflets 20–60 pairs, falcate | **1. A. chinensis** |
| 2b. Stipules small or minute; leaflets upto 15 pairs | 3 |
| 3a. Pinnae 2–6 pairs; rachis and calyx teeth glabrous | **4. A. procera** |
| 3b. Pinnae 10–15 pairs; rachis and calyx teeth pubescent | **3. A. odoratissima** |

**1. Albizzia chinensis** (Osbeck.) Merr. in Amer. J. Bot. 3: 575. 1916. *Mimosa chinensis* Osb. Dag. Ostind. Resa 233. 1757. *Albizzia stipulata* (DC.) Boiv. Encycl. 19e, siecle 2: 33. 1834; Baker in Hook.f., Fl. Brit. India 2: 300.1878.

Deciduous trees,to 10–25 m high. Pinnae 4 pairs; leaflets 5–40 pairs, oblong, lanceolate; 0.8–1.0 cm. Flowers white, in large panicle, fragrant. Calyx and corolla densly hairy, oblong, glabrous. Pods thick, brown.

*Fl.:* April – December.

*Use:* Cultivated in gardens as shade tree. Timber is used for packing boxes and plank etc.

**2. Albizzia lebbek** (L.) Benth. in Hook., London J. Bot. 3: 87. 1844. *Mimosa lebbek* L., Sp. Pl. 516. 1753; Baker in Hook.f., Fl. Brit. India 2: 298. 1878.

*Vern.: Siris, Karai Khiris* (Beng.)

An unarmed deciduous trees, yellowish brown. Leaves bipinnate; rachis to 22 cm long; petiole to 8 cm long; pinna 2–4 pairs, pubescent; leaflets 3–9 pairs, linear to lanceolate. Inflorescence terminal-globose; heads with 25–40 dimorphic flowers; peduncles to 9 cm long. Flowers yellowish-green to creamy white, fragrant. Corolla funnel shaped. Pods strap shaped, flat, 8–20 cm long, straw coloured. Seeds 1–9 in a pod.

*Fl.:* January – April; *Fr.:* August – February.

Planted along roadside, occasionally wild

*Use:* Timbers is useful for furniture and railway carriage. It is also valued for firewood. Bark is for tannin.

**3. Albizzia odoratissima** (L.f.) Benth. in Hook., London J. Bot. 3: 88. 1844; Baker in Hook.f., Fl. Brit. India 2: 299. 1878; Prain, Beng. Pl. 1: 461. 1963 (rep. ed.). *Mimosa odoratissima* L.f., Suppl. 437. 1781.

*Vern.: Belati Amloki* (Beng.),

Large deciduous trees with grayish bark and brown hairy young parts. Leaves alternate, pubescent; rachis to 20 cm long with a large black gland near the base and another between the upper most pairs of pinnae; pinnae 2–5 pairs, to 15 cm long. Leaflets 6–24 pairs, elliptic or obliquely oblong. Flowers pale yellow, sessile in solitary or panicled heads. Pods to 30 × 3.5 cm, reddish-brown, 8–12 seeded.

*Fl. & Fr.:* April – December.

In dry deciduous and teak forests, common

*Use:* Bark is used as medicine for leprosy; leaf is used for cough and cold. The timber is used for making construction of house, agricultural implements, furnitures, carts, etc.

**4. Albizzia procera** (Roxb.) Benth. in Hook., London J. Bot. 3: 89. 1844; Baker in Hook.f., Fl. Brit. India 2: 299. 1878; Prain, Beng. Pl. 1: 461. 1963 (rep. ed.). *Mimosa procera* Roxb., Pl. Corom. 2: 121. 1798.

Large deciduous trees with greenish-white or grayish bark. Leaves alternate, bipinnate; rachis to 45 cm long with a large gland near the base; pinnae 2–6 pairs, to 15 cm long; leaflets 4–16 pairs, obliquely oblong, to 5.6 × 3 cm, cuneate or truncate at base, subacute at apex. Flowers heads white, fragrant, fascicled or in axillary or terminal panicles. Pods to 20 cm long, shortly stalked, 8–12 seeded.

*Fl. & Fr.:* June – December.

*Use:* All parts of the plant is reported to show anti cancer activity. Frequently cultivated in the tea gardens as a shade tree. Timber is used for making furnitures and construction of houses, tea boxes, etc.

### **3. MIMOSA** L.

| | |
|---|---|
| 1a. Leaves sensitive, digitately arranged | **2. M. pudica** |
| 1b. Leaves not sensitive, bipinnate | 2 |
| 2a. Pods glabrous | **3. M. rubicaulis** |
| 2b. Pods densely covered with scabrous hairs | **1. M. invisa** |

**1. Mimosa invisa** Mart ex Colla, Herb. Pedom. 2: 255. 1834. *Schrankia brachycarpa* Benth in Hook., London Journ. Bot. 2: 130. 1843; Sanj., Legumes India 68. 1992.

Shrubs with 4–6 angled branches, densely covered with scabrous hairs. Leaves bipinnate; pinnae 3–5 pairs; leaflets 10–12 pairs, spinicent. Flowers axillary, globose with numerous pinkish flowers; corolla 4-lobed, ovate. Legumes flat, compressed, transversely septate. Seeds 4–5.

*Fl. & Fr.:* October – May.

*Use:* Plant is also used as green manure, and cultivated for making hedge.

**2. Mimosa pudica** L., Sp. Pl. 518. 1753; Baker in Hook.f., Fl. Brit. India 2: 291. 1878; Cowan & Cowan, Trees N. Bengal 56. 1929; Prain, Beng. Pl. 1: 329. 1963 (rep. ed.).

*Vern.: Lajjabati-lata* (Beng.)

Prostrate, scandent to decumbent, to 1 m high; stems armed with hooked prickles. Leaves bipinnate; primary rachis rachis to 2.5 cm long, angular, persistent stipules; pinnae 1 to 2 subdigitate pairs; pinnules 1–25 pairs in close sets, oblong-lanceolate. Flowers pink in shortly ovoid pedunculate heads. Corolla divided into 4 subobtuse lobes. Pods clustered, densely setose,prickly, yellowish in colour, 3–4 seeded.

*Fl. & Fr.:* March – November.

*Use:* Whole plant is given to cattle to increase lactation. Root decoction is useful in urinary complaints.Oil extracted from the whole plant used as medicine.

**3. Mimosa rubicaulis** Lam., Encycl. 1: 20. 1783; Baker in Hook.f., Fl. Brit. India 2: 291. 1870; Prain, Beng. Pl. 1: 329. 1963 (rep. ed.); Sanj., Legumes India 69. 1992.

*Vern.: Shiah-kanta* (Beng.)

A straggling shrubs, branches grooved, covered with yellowish hooked prickles. Leaves bipinnate to 18 cm long. Pinnae 5–11 pairs; leaflets to 16 pairs. Flowers in globose heads. Pods to 10 × 1.5 cm, flat, falcate.

*Fl. & Fr.:* June – October.

*J. Bhatt. & Maity* 33415

*Uses:* Wood charcoal is used as gun powder.

## ROSACEAE

### 1. POTENTILLA L.

**Potentilla nepalensis** Hooker, Exot. Fl. t. 88. 1824; Hook.f., Fl. Brit. India 2: 355. 1878.

Suberect herb, more or less hairy with woody perennial root stock, whitish pilose throughout. Leaves 5-foliate; leaflets obovate or elliptic-obovate, to 3 × 2.5 cm. Flowers in dichotomous panicles, yellowish. Calyx lobes ovate. Achenes globose, hairy.

*Fl. & Fr.:* February – April.

*F.No.:* 32354

*Use:* Roots impart a red colour usese as dye staff for wool and woods, its ash mixed with oil is applied on burn injuries.The root is exported under the name of "Rattanjot"

### 2. RUBUS L.

**Rubus birmanicus** Hook.f., Fl. Brit. India 2: 331. 1878; Kanjilal & al., Fl. Assam 2: 196. 1938.

Straggling shrubs; branches with bristly hairs and hooked prickles. Leaves palmately 5-lobed, base cordate, to 12 × 12 cm, pale brownish tomentose beneath. Flowers in large axillary panicles, white. Calyx subacute, tomentose. Petals orbicular, clawed. Stamens and carpels many. Receptacles villous. Fruit yellowish, fleshy.

*Fl. & Fr.:* July – September.

## HYDRANGEACEAE

### HYDRANGEA L.

**Hydrangea aspera** D. Don, Prodr. Fl. Nep. 211. 1825; C.B. Clarke in Hook.f., Fl. Brit. India 2: 404. 1879; H. Hara in Fl. & Fauna Nepal Himal. 1: 142. 1952. *H. vestita* var. *fimbricata* Wall. cat. No. 440 B. 1831, *nom. nud.*

Arbosrescent, to 9.0 m high. Leaves ovate-oblong, to 18 × 9 cm, upper surface with scattered minute hairs, lower surfaces densely clothed with long white hairs, margin coarsely serrate. Flowers in terminal corymbose, 5–7 mm across, blue. Capsule subhemispheric, ribbed, many seeded.

*Fl. & Fr.:* November – June.

*J. Bhatt. & Maity* 32351

## COMBRETACEAE

### 1. COMBRETUM L.

**Combretum alatum** Pers., Syn. Pl. 411. 1805. *C. roxburghii* Spreng., Syst. 2: 331. 1825. *C. decandrum* Roxb., Pl. Corom. 1: 49. t. 59. 1795 *non* Jacq. 1766; C.B. Clarke in Hook.f., Fl. Brit. India 2: 452. 1878; Prain, Beng. Pl. 1: 349. 1963 (rep. ed.).

Gigantic evergreen, scandent shrubs; bark with reddish fissure. Leaves opposite, elliptic-lanceolate, to 15 × 8 cm, abruptly acuminate at apex. Spike dense to 7 cm long, arranged in terminal or axillary panicle. Flowers pentamerous, greenish-white, brownish-red or purplish-brown; bracts large creamy. Calyx cup-shaped. Petals oblong. Fruits axillary, oblong, 5-winged.

*Fl. & Fr.:* November – April.

*J. Bhatt. & Maity* 32434

*Use:* The bark is chewed as substitute of betle nut.

### 2. QUISQUALIS L.

**Quisqualis indica** L., Sp. Pl. ed. 2. 556. 1762; C.B. Clarke in Hook.f., Fl. Brit. India 2: 459. 1878.

Woody climbers. Leaves opposite, ovate-elliptic, tomentose or glabrous, rounded at base, acuminate at apex. Flowers white turning to red or orange, showy, fragrant in terminal axillary spikes. Fruits dark brown, ovate-elliptic, 5-winged.

*Fl. & Fr.:* Throughout the year.

*Use:* Ornamental. Tender shoots are edible. Roasted seeds are used in diarrhea, fever, rickets and anthelimentic. Macerated seed oil is used in skin disease. Fruits are used to make pickles.

### 3. TERMINALIA L. (*nom. cons.*)

1a. Drupes winged; spikes panicled **2. T. paniculata**
1b. Drupes not winged; spikes simple or spaesely branched **1. T. bellerica**

**1. Terminalia bellerica** (Gaertn.) Roxb., Pl. Cor. t. 198. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 2:445. 1875; Prain, Beng. Pl. 1: 348. 1963 (rep. ed.). *Myrobalanus bellerica* Gaertn., Fruct. 2:90. t. 97. 1791.

*Vern.: Bahera* (Beng.)

Deciduous trees, to 30 m. Leaves whorled at the end of the branches, broadly elliptic, to 15 × 8 cm, base cuneate, acuminate at apex; petioles long. Flowers pale greenish-yellow, in simple spikes, foetid, swelling, pubescent. Drupes ovoid, to 3 × 2 cm, grey tomentose.

*Fl. & Fr.:* March - December.

In dry deciduous forests, common

*J. Bhatt. & Maity* 31124

*Use:* The fruit is used in indigenous medicinal practices. The kernel is edible.Wood is used for making packing cases, and home building. Seed oil is used as hair oil.

**2. Terminalia paniculata** Roth, Nov. Pl. Sp. 383.1821; C.B. Clarke in Hook.f., Fl. Brit. India 2:448. 1878.

*Vern.: Kinjal*

Deciduous trees, to 20 m high; young part silky pubescent. Leaves oblong-lanceolate, to 15 × 6 cm, rounded-cordate at base, sessile glands at base beneath. Flowers white, in branched panicles. Drupe brownish-red with two short and one long wings.

*Fl. & Fr.:* October - February.

*J. Bhatt. & Maity* 31143

*Use:* The fresh flowers are used in cholera.

## MYRTACEAE

### SYZYGIUM Gaertn.

1a. Leaves more than 20 × 8 cm; flower pink to red;
berries globose, white or pinkish **2. S. formosum**
1b. Leaves not more than 16 × 6 cm; flowers white or greenish white;
berries oblong-ellipsoid, red-purple to black **1. S. cumini**

**1. Syzygium cumini** (L.) Skeels in U.S.D.A. Bur. Pl. Industr. Bull. 284: 2. 1912; Banerjee in Rec. Bot. Surv. India 19(2): 45. 1966. *Myrtus cumini* L., Sp. Pl. 471. 1753. *Euginea jambolana* Lam., Encycl. 3: 198. 1789; Duthie in Hook.f., Fl. Brit. India 2: 499. 1879; Prain, Bengal Pl. 1: 356. 1963 (rep. ed.).

Evergreen trees, to 10 m tall; bark light grey, smooth. Leaves ovate-elliptic or elliptic-oblong, to 15 × 9 cm; acute to acuminate at apex, coriaceous; petioled. Flowers 3–8 together, white in lax panicled cymes. Petals free, orbicular, creamy, white, greenish-yellow. Berries ellipsoid-oblong, dark bluish-black. Seed one, rounded oval.

*Fl. & Fr.:* February – August.

In moist deciduous forests, common.

*J. Bhatt. & Maity* 33346

*Use:* Leaves are used as green manure and also as fodder. Bark is astringent. Fruits are edible and are used for preparing wine and jelly, dry seed powder and decoction of bark is used to control diabetes.

**2. Syzygium formosum** (Wall.) Musam., Enum. Phan. Born. 528. 1942. *Euginea formosa* Wall., Pl. As. Rar. 2: 6. t. 108. 1830; Duthiee in Hook.f., Fl. Brit. India 2: 471. 1879; Kanjilal & al., Fl. Assam 2: 262. 1938.

Trees to 10 m tall. Leaves elliptic-oblong to lanceolate, to 30 × 14 cm, rounded or narrowly subcordate at base, bluntly acuminate at apex. Cymes corymbose; flowers pale pink or red; receptacle turbinate, purplish. Berries globose, shiny white or pinkish.

*Fl. & Fr.:* March – August.

*Use:* Fruits are edible.

## LECYTHIDACEAE

### CAREYA Roxb.

**Careya arborea** Roxb., Pl. Corom. 3: 14, t. 214. 1811; C.B. Clarke in Hook.f., Fl. Brit. India 2: 511. 1879; Prain, Bengal Pl. 1: 357. 1963 (rep. ed).

*Vern.: Kumbhi* (Beng.)

Large trees, to 18 m tall; bark thick, dark brown, Leaves broadly oblong-obovate, old leaves often red or purple. Flowers sessile; bracts elliptic-lanceolate. Calyx tube campanulate, segments 4, persistent. Petals 4, cream or white, elliptic-oblong, revolute along margins, caduceus, Berry green, glabrous, somewhat as an apple in appearance, 5–8 cm across.

*Fl. & Fr.:* March – August.

In dry deciduous forests, common

*J. Bhatt. & Maity* 31157

*Use:* Cultivated for its durable timbers and flowers and fruits are used medicinally. Timber used for agricultural implements. Bark is used to make coarse ropes .

## MELASTOMATACEAE

### MELASTOMA L.

**Melastoma malabathricum** L., Sp. Pl. 390. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 2: 523. 1879. *M. malabathricum* L. var. *adpressum* Wall. ex C.B. Clarke in Hook.f., Fl. Brit. India 2: 523. 1879; Prain, Beng. Pl. 1: 360. 1963 .

Undershrubs to 3 m high; scales brown, broadly triangular. Leaves elliptic, to 13 × 6 cm, scaly and brown. Flowers in terminal, condense panicle or compound corymbose; Calyx tube campanulate. Corolla pink. Stamens twice the number of petals; larger stamens with anthers large purple and smaller stamen with small yellow anthers. Berries widened at top, fruiting calyx tube scaly.

*Fl. & Fr.:* February – December.

It grows in moist deciduous forest, common

*J. Bhatt. & Maity* 32449, 33411

*Use:* Leaves and roots yield pink dye. Fruits yield a black or purple dye. Silk worms feed on this plant produce a good quality of silk and leaves used as remedy of skin diseases.

## LYTHRACEAE

### 1. CUPHEA P. Br.

**Cuphea carthagensis** (Jacq.) Macbride in Publ. Field. Mus. Nat.Hist. Chicago, Bot.Ser.8:124.1930. *Lythrum carthagensis* Jacq. Strip. Amar. Hist.148.1763. *Cuphea balsamona* Cam. & Schult. In Linnaea 2:363.1827.

An ascending much branched herb to 70 cm high; young parts pubescent. Leaves shortly petioled, elliptic-oblong, to 2.5 × 1.0 cm, narrowed at base, acute at apex. Flowers solitary, axillary or in leafy racemes, deep pink. Calyx tubular with basal spur. Petals oblong-obovate. Capsules enclosed by hypanthium. Seeds 2–6, orbicular.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 33446, 32413

### 2. LAGEROSTROEMIA L.

| | |
|---|---|
| 1a. Hypanthium ribbed | **2. L. speciosa** |
| 1b. Hypanthium not ribbed | **1. L. parviflora** |

**1. Lagerostroemia parviflora** Roxb., Pl. Corom. 1: 47. t. 66. 1795; C.B. Clarke in Hook.f., Fl. Brit. India 2: 575. 1879; Prain, Beng. Pl. 1: 366. 1963 .

*Vern.: Sida,* (Beng.)

Tall deciduous tree to 35 m high; the bark peeling in flakes. Leaves ovate or ovate-lanceolate, to 10 × 4.5 cm, base orbicular, green above, white pubescent beneath. Flowers in axillary or terminal panicles, white, fragrant. Petals orbicular, caduceus. Capsule ellipsoid, to 3 × 1.5 cm. seeds winged.

*Fl. & Fr.:* April – December.

In moist dry deciduous forests, very common

*J. Bhatt. & Maity* 32322

*Use:* Timber is durable and used for building constructions fencing, bridges, boats, oars, and agricultural implements. It yields a sweety edible gum.

**2. Lagerostroemia speciosa** (L.) Pers., Syn. 2: 72. 1806. *Munchansia speciosa* L. in Munch. Der. Hans. 1: 357. 1770. *L. flosrenigae* Retz., Obs. Bot. 5: 25. 1787; C.B. Clarke in Hook.f., Fl. Brit. India 2: 577. 1879.

Trees to 18 m tall, smooth bark. Leaves elliptic, oblong-elliptic or oblong-lanceolate, to 20 × 8 cm, rounded at base, acuminate at apex. Flowers in terminal panicles, of 25 cm; calyx greenish, tomentose corolla, 5–8 cm across, fragrant. Capsules oblong-ovoid, 2–3 cm across, oblong-ovoid to subglobbose, seed winged.

*Fl. & Fr.:* June – December.

*Use:* The leaves are purgative and diuretic. Leaves and fruits are used in diabetes It is also cultivated for its valuable timber.

### 3. WOODFORDIA Salisb.

**Woodfordia fruticosa** (L.) Kurz in Journ. Asiat. Soc. Bengal 40(2): 56. 1871. *Lythrum fruticosum* L., Syst. Nat. ed. 10. 2: 1045. 1759. *Woodfordia floribunda* Salisb., Parad. Lond. t. 42. 1806; C.B. Clarke in Hook.f., Fl. Brit. India 2: 572. 1879.

Tall shrubs or small trees, to 5 m tall; bark grey, smooth. Leaves subsessile, ovate-lanceolate, to 11 × 3 cm, acuminate at apex, base rounded or cordate, white-pubescent beneath. Flowers red in axillary fascicled cymes; mouth of calyx tube oblique. Petals longer than calyx. Stamens 12; filaments red. Capsules *c.* 1 cm long, ellipsoid, Seeds obovoid.

*Fl. & Fr.:* December – May.

In dry and moist deciduous forests, often along water courses, common

*J. Bhatt. & Maity* 32464

*Use:* Dry flowers yield a red dye for silk, are used as astringant and stimulant and used in ayurvedic preparartion.

## ONAGRACEAE

### LUDWIGIA L.

**Ludwigia perennis** L., Sp. Pl. 119.1753. *L. parviflora* Roxb., Fl. Ind.1: 440. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 2:588. 1879; Prain, Beng. Pl. 1: 567. 1903.

Annual herb of 3 m high. Leaves linear-lanceolate, to 11 × 2.5 cm, subacute at apex, narrowly cuneate at base, glabrous. Flowers axillary, yellow, solitary, 4-merous. Calyx lobes acute. Petals elliptic. Capsules to 2 × 0.2 cm, thin walled, narrowed below, 4 ribbed, glabrous. Seeds multiseriate, ovoid.

*Fl. & Fr.:* February – December.

Along edges of ponds, common

*J. Bhatt. & Maity* 33416, 33387, 32445

*Use:* Plants boiled with oil and applied to the body externally in fever.

## CUCURBITACEAE

### 1. DIPLOCYCLOS (Endl.) P. & K. Corr.

**Diplocyclos palmatus** (L.) Jeffery in Kew Bull. 15: 352. 1962. *Bryonia palmate* L., Sp. Pl. 1012. 1753, *excl.* syn. *B. laciniosa sensu* Wight, Ic. t. 500. 1841, *non* L. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 2: 622. 1879; Prain, Beng. Pl. 1: 383. 1903;

Slender, tuberous herb with elongated stems. Leaves palmately 5-lobed, to 12 cm, margin denticulate; tendril bifurcate. Flowers dull yellow, in fascicles. Corolla shortly papillose. Stamens 3, free. Berries ovoid, to 1.5 cm in diam., brick-red, white lined.

*Fl. & Fr.:* October – January.

In moist deciduous forest, sparse

*J. Bhatt. & Maity* 33307

*Uses:* It is a bitter tonic, febrifuge. Cooked leaves are edible.

### 2. HODGSONIA Hook. f. & Thoms.

**Hodgsonia macrocarpa** (Bl.) Cogn. in DC., Monogr. Phan. 3: 349. 1881. *Trichosanthes macrocarpa* Bl., Bijdr. 935. 1826. *Hodgsonia heteroclita* Hook.f., & Thoms in Proc. L.. Soc. 2: 257. 1853; C.B. Clarke in Hook.f., Fl. Brit. India 2: 606. 1879; Prain, Beng. Pl. 1: 376. 1963 .

*Vern.: Gulur* (Beng.)

Robust climbers; stem angular, to 30 cm long, glabrous. Leaves large, deeply 3–5 lobed, to 8 cm long; lobes acuminate, glabrous, truncate or emarginate at base; petioles 5–7 cm long; tendril robust usually bifid. Flowers light yellow, tomentose. Male flowers in racemes; peduncles 10–25 cm long, bracteate. Female flowers solitary; peduncles short. Fruits reddish-brown, tomentose, grooved. Seeds 3-6 pairs, flat-elliptic.

*Fl. & Fr.:* February – August.

*J. Bhatt. & Maity* 32362, 33359

*Uses:* Seed is bitter but edible after roasting . Seed oil is substitute for coconut oil for cooking in Malaya, used as medicinal oil.

### 3. MOMORDICA L.

1a. Plants monoecious **1. M. charantia**
1b. Plants dioecious **2. M. dioica**

**1. Momordica charantia** L., Sp. Pl. 1009. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 2:616. 1879; Prain, Beng. Pl. 1: 380. 1963 .

*Vern.: Karala* (Beng.); *Uchhe* (small variety).

Slender twiners, to 2 m long. Leaves orbicular-reniform, deeply pedately 5–7 lobed; lobes ovate-oblong, to 12 cm long, lobulate or dentate. Flowers monoecious, yellow, male solitary; bracteate at middle; bracts foliaceous. Female peduncles to 10 cm long often bracteate at base. Fruits large, oblong, muricate-tuberculate. Seeds compressed.

*Fl. & Fr.:* October – January.

*J. Bhatt. & Maity* 31169

*Use:* Fruits are used in diabetes, rheumatism gout, liver and spleen diseases .

**2. Momordica dioica** Roxb. ex Willd., Sp. Pl. 4: 605. 1805; C.B. Clarke in Hook.f., Fl. Brit. India 2: 6217. 1879; Prain, Beng. Pl. 1: 380. 1963 (rep. ed.).

*Vern.: Kankrole* (Beng.)

Perennial climbers, profusely branched with slender stems and tuberous roots, to 3 cm high. Leaves ovate, to 10 × 8 cm, base emarginate, mucronate, membranous; tendril filiform, dioecious. Male flower solitary, bracteate, bracts sessile, cucullate, often enclosing half of male flower; calyx tubes lanceolate; corolla yellow. Female flowers ebracteate bigger than male one. Fruits ovoid. Seeds pale yellow, ovoid.

*Fl. & Fr.:* June – October.

*J. Bhatt. & Maity* 33319

*Use:* Tubers of the female plants useful in bleeding piles, expectorant and sedative. Root used in fever & urinary complaints. Fruits are eaten as vegetable.

### 4. MELOTHRIA L.

**Melothria leucocarpa** (Blume) Cogn. in DC., Monogr. Phan. 3: 601. 1881. *Bryonia leucocarpa* Blume, Bijdr. 924. 1826. *Melothria odorata* Hook. & Thoms. ex C.B. Clarke in Hook.f., Fl. Brit. India 2: 626. 1879; Chakrabarty, H.L., Fasc. Fl. India 11: 82. 1982; Prain, Beng. Pl. 1: 384. 1963.

Stems slender, sulcate; Leaves petioled, to 10 × 7 cm; lamina triangular-oblong, basal sinus broadly round; upper surface scabrous; tendril filiform. Flower monoecious. Male flowers fasciculate; pedicels subulate; corolla white, lobes ovate-oblong, acute; staminal filament, obconic; female flowers solitary; calyx and corolla same as male one. Fruits globose, thick. Seeds oblong, grayish brown.

*Fl. & Fr.:* January – November.

*J. Bhatt. & Maity* 33358

**5. TRICHOSANTHES** L.

**Trichosanthes cordata** Roxb., Fl. Ind. 3: 703. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 2: 608. 1879; Prain, Beng. Pl. 1: 377. 1963 .

*Vern.: Bhoi-kumra* (Beng.)

Plants dioecious; stem robust, elongate, branched; roots tuberous. Leaves broadly ovate, to 20 × 12 cm, basal lobes broadly round, apex acute, cordate; tendril robust, sulcate, puberulous. Male peduncles to 20 cm long, striate, 4–8 flowered; pedicels stout. Female flowers subsessile; ovary oblong. Fruits globose, small, red, smooth. Seeds ovate-oblong, smooth.

*Fl. & Fr.:* June – December.

*J. Bhatt. & Maity* 31165

*Uses:* Root is tonic and along with oil is useful in ulcers. Fruit is edible.

**APIACEAE**

**1. CENTELLA** L.

**Centella asiatica** (L.) Urban in Mart., Fl. Bras. 11:287.1879. *Hydrocotyle asiatica* L., Sp. Pl. 234.1753; Clarke in Hook.f., Fl. Brit. India 2:669.1879.

*Vern.: Thankuni* (Beng.)

Trailing herb with perennial rootstock, rooting at nodes. Leaves orbicular-reniform, long petioled, crenate, sheathing at base. Flowers in 2–4 flowered umbel, white, stylopodium depressed, Fruits ovate to orbicular.

*Fl. & Fr.:* April – September.

*J. Bhatt. & Maity* 31186

*Use:* The plant is used in disease of skin leprosy, nerves and blood. The leaves are taken for increase memory and digestive complaints.

**2. HYDROCOTYLE** L.

**Hydrocotyle sibthorpioides** Lam., Encycl. 3: 153. 1789. *H. rotundifolia* Roxb., Fl. Ind. 2: 38. 1824; C.B. Clarke in Hook.f., Fl. Brit. India.

Plants slender, creeping; stem rooting at nodes. Leaves petiolate, almost orbicular, 5–20 cm broad, pubescent on vertical surface, 7–9-veined. Flowers 3–10 in an umbel, subsessile. Fruits orbicular, *c.* 1 mm across.

*Fl. & Fr.:* March.

*J. Bhatt. & Maity* 32384

Native of Mauritius.

*Uses:* The plant is useful in rheumatism, pulmonary, digestive complaints, syphilis and other skin diseases. It is also act as vermifuge and diuretic.

## ARALIACEAE

### SCHEFFLERA J.R. & G. Forst. *nom. cons.*

**Schefflera eliptica** (Blume) Harms in Eng. & Prantl., Pflanzenfam. 3(8): 39. 1894. *Sciadophyllum ellipticum* Blume, Bijdr 878.1826. *Schefflera venulosa* (Wight & Arn.) Harms in Engl. & Prantl. *Heptapleurum venulosum* (Wight & Arn.) Saem. in J. Bot. London 3:80. 1865; C.B. Clarke in Hook.f., Fl. Brit. India 2:729. 1879; Prain, Beng. Pl. 1: 398. 1963 .

A small scandent woody shrubs, often epiphytic. Leaves digitate, 5–7 foliate; leaflets oblanceolate, elliptic-oblong, to 10 × 7 cm, subacute at base, acute apex. Panicle highly branched, to 30 cm long; bracts large. Flowers white or yellowish green. Fruits globose, *c.* 0.5 cm across, fleshy, crowned by conical disc.

*Fl. & Fr.:* May – July.

*J. Bhatt. & Maity* 31133, 31177, 32372

*Uses:* Root mixed with rice is eaten to cure dropsy.

## ALANGIACEAE

### ALANGIUM Lam. *nom. cons.*

**Alangium chinense** (Lour.) Harms in Ber. Deutsch. Bot. Ges. 15: 24. 1897. *Stylidium chinense* Lour., Fl. Cochinch. 1: 221. 1790. *Marlea begoniifolia* Roxb., Pl. Corom. 3: 80. 1820; C.B. Clarke in Hook.f., Fl. Brit. India 2:743. 1879; Prain, Beng. Pl. 1: 399. 1963 .

*Vern.: Merleza* (Beng.)

Trees, to 20 m tall with horizontally spreading branches. Leaves very variable, alternate, bifarious, orbicular to broadly-oblong, to 11 × 8 cm, truncate at base, acuminate at apex, entire. Flowers in axillary dichotomously branched pedunculate cymes, 8–12 flowered, white or creamy. Fruits ovoid, 0.8–0.6 cm, dark purple when ripe.

*Fl. & Fr.:* April – October.

*J. Bhatt. & Maity* 31152, 31154, 31159

*Use:* Leaves used as fodder for cattle in the Himalayas and wood for building construction. Plant is true host of Lac insects.

## RUBIACEAE

### 1. ANTHOCEPHALUS A. Rich.

**Anthocephalus chinensis** (Lamk.) A. Rich. Ex Walp., Repart 2: 491. 1843. *Cephalanthus chinensis* Lamk., Encycl. 1: 678. 1785. *Anthocephalus cadamba* (Roxb.) Miq., Fl. Ind. Bat. 2: 135. 1856; Hook.f., Fl. Brit. India 3: 23. 1880; Prain, Beng. Pl. 1: 403. 1963.

Large deciduous tree. Leaves large, ovate or elliptic-oblong, coriaceous, acute, pubescent beneath, subcordate at base; stipules caduceus, lanceolate. Inflorescence a solitary terminal head. Flowers in heads, yellow or reddish-orange. Pseudocarp large, fleshy. Seeds minute, angular.

*Fl.:* May – July; *Fr.:* Persisting till next year.

*Uses:* Wood used for making tea boxes, & pulp is used for making paper.

### 2. CATUNAREGAM Wolf.

**Catunaregam spinosa** (Thunb.) Tirveng., Bull. Mus. Hist. Nat. (Paris) 3, Bot. 35: 13. 1978. *Gardenia spinosa* Thunb., Diss. Bot. Gard. 7: 16, 19, Pl. 2, f. 4. 1780. *Randia dumetorum* (Retz.) Poir. in Lamk., Encycl. Suppl. 2: 829. 1811; Hook.f., Fl. Brit. India 3: 110. 1880, *pro parte*;

Shrubs; spines axillary, hard. Leaves oblong-obovate, obcordate or spathulate, to 5 × 2 cm, base and apex acute, pubescent; stipules ovate, acuminate. Flowers fragrant, whitish yellow, solitary or 2–3 together on short branches. Calyx campanulate; lobes spathulate. Corolla whitish yellow, fragrant, silky hairy; lobes ovate to oblong. Stigma fusiform. Berries subglobose, yellow.

*Fl. & Fr.:* April – January.

In dry deciduous forests, sparse.

*J. Bhatt. & Maity* 32359

**3. HEDYOTIS** L.

**Hedyotis scandens** Roxb. ex D. Don, Prodr. Fl. Nep. 134. 1825; Hook.f., Fl. Brit. India 3: 57. 1880; Deb in Bull. Bot. Surv. India 3: 310. 1961.

Scrubby climbers; young shoot pubescent. Leaves elliptic-lanceolate, to 15 × 4 cm, apex acuminate, glabrous; stipules connate, bicuspidate, purple dotted. Flowers white in axillary or terminal trichotomous subcorymbs. Capsules obovoid, 2-celled, septicidally dehiscent. Seeds planoconvex, numerous.

*Fl. & Fr.:* December – July.

*J. Bhatt. & Maity* 32320

**4. KNOXIA** L..

**Knoxia sumatrensis** (Retz.) DC., Prodr. 4:569. 1830. *Spermacoce sumatrensis* Retz., Obs. Bot. 4:23. 1786. *Knoxia corymbosa* Willd., Sp. Pl. 1: 582. 1798; Hook.f., Fl. Brit. India 3:128. 1880; Prain, Beng. Pl. 1: 424. 1963.

Erect, woody herb to 1 m tall. Leaves elliptic-lanceolate, 10 × 2.5 cm, acute, grey-pubescent; stipules 3–6 with subulate, hirsute bristles. Flowers axillary and terminal, blue or pale purple in corymbose cymes. Calyx 4 lobed, acute. Corolla lobes 4. Fruit ellipsoid, white, changing to black on maturity. Seeds 2.

*Fl. & Fr.:* October – December.

In dry and moist deciduous forests, abundant

*J. Bhatt. & Maity* 32356, 33443.

**5. MEYNIA** Roxb. ex Link

**Meynia spinosa** Roxb. ex Link in Jahrb. Cewach. 1(3): 32. 1820. *Vangueria spinosa* Roxb., Fl. Ind. 2: 172. 1824; Hook. f., Fl. Brit. India 3: 186. 1880; Prain, Beng. Pl. 1: 421. 1963 (rep. ed.).

Shrubs or small trees of 5–8 m tall with supra axillary spines. Leaves ovate-elliptic, to 14 × 6 cm, shortly acuminate at apex, attenuate at base, glabrous or sparsely pilose beneath. Flowers in axillary or superaxillary, shortly peduncled cymes of 1–3 flowers; corolla greenish white. Drupe globose, yellowish green.

*Fl. & Fr.:* December – April.

*J. Bhatt. & Maity* 31187

*Uses:* The dry fruits are used to cure boils, dysentery and diptheria. Leaves and fruits are edible.

**6. MITRACARPUS** Zucc.

**Mitracarpus hirtus** (L.) DC., Prodr. 4:572. 1830. *Spermacoce hirta* L., Sp. Pl. ed. 2. 148. 1762. Nicholson, Taxon 26:574.1977.

Erect, branched, pubescent annual herb. Leaves sessile, ovate-lanceolate; stipule segments linear, ciliate. Flowers white, in axillary fascicles, numerous, subglobose. Calyx unequally 4-lobed, oblong-lanceolate, ciliated, corolla 4-lobed. Fruits circumsessile. Seeds ellipsoidalrectangular.

*Fl. & Fr.:* April – December.

*J. Bhatt. & Maity* 31187

**7. MUSSENDA** L.

1a. Calyx deciduous as soon as fruits enlarge **1. M. macrophylla**
1b. Calyx persistent till fruits ripe **2. M. roxburghii**

**1. Mussenda macrophylla** Wall. in Roxb., Fl. Ind. 2: 228. 1824; Hook.f., Fl. Brit. India 3: 89. 1880. *M. hispida* D. Douprod., Fl. Nepal 139. 1825.

*Vern.: Nagballi* ( Beng.)

Branched shrubs. Stem hairy. Leaves broadly elliptic, less commonly ovate, to 15 × 7 cm, shortly acuminate at both ends, pilose on veins; stipule triangular, recurved. Flowers in a lax trichotomously branched corymb with lateral overtopping the central flower. Calyx oblong or oblong-elliptic, deciduous. Corolla orange; tube hirsute; lobes ovate, acuminate. Berry oblong-ellipsoid, calyx deciduous as soon as fruits enlarged.

*Fl. & Fr.:* May – September.

*J. Bhatt. & Maity* 31179

**2. Mussenda roxburghii** Hook.f., Fl. Brit. India 3: 87. 1880; C.E.C. Fischer in Rec. Bot. Surv. India 12(2): 101. 1938; Prain, Beng. Pl. 1: 411. 1963 (rep. ed.).

*Vern.: Nagbali* ( Beng.)

Much branched shrubs, to 4.5 m. Leaves usually elliptic, rarely ovate, to 25 × 9 cm, acuminate at both ends; stipules broadly triangular. Flowers in dense terminal heads with many flowers. Calyx lobes white, filiform, silky hairy, persistent. Corolla lobes orange to yellow, ovate, silky hairy. Berry globose, glabrous. Calyx persistent until fruit is ripe.

*Fl. & Fr.:* May – August.

*J. Bhatt. & Maity* 31117

*Uses:* Ornamental shrub suitable for gardens. Leaves are eaten as vegetable and used for colouring baskets.

**8. OLDENLANDIA** L.

**Oldenlandia diffusa** (Willd.) Roxb., Fl. Ind. 1: 444. 1820. *Hedyotis diffusa* Willd., Sp. Pl. 1: 566. 1798; Prain, Beng. Pl. 1: 404. 1963 ( rep. ed.); Sivarajan & Biju in Taxon 39: 672. 1990. *Oldenlandia pseudocorymbosa* (Bakh. f.) Babu, Herb. Fl. Dehra Dun 227. 1977.

Annual herb of 10–35 cm high. Stem erect or semi-prostrate, often rooting at nodes. Leaves linear-lanceolate, to 3 × 0.6 cm; peduncle 1-3 per axil. Flowers isostylous, 3–7. Hypanthium globose. Calyx tube short; lobes triangular. Corolla tube long; lobes ovate, to 1 mm long. Filament short; anther globose. Stigma bifid. Capsule subglobose.

*Fl. & Fr.:* May – December.

*J. Bhatt. & Maity* 32489.

**9. PAEDERIA** L.

**Paederia foetida** L., Mant. 1: 52. 1767; Hook.f., Fl. Brit. India 3: 195. 1881; Prain, Beng. Pl. 1: 423. 1963 (rep. ed.).

*Vern.: Gandha bhadulia* (Beng.)

Trailing shrubby climbers, foetid when crushed. Leaves elliptic-ovate or lanceolate, to 12 × 7 cm, acuminate at apex, rounded or subcordate at base, membranous, glabrous, petiolate. Flowers in axillary, terminal panicles; corolla purplish, tomentose. Fruits reddish, ellipsoid. Seeds compressed.

*Fl. & Fr.:* October – April.

*J. Bhatt. & Maity* 32330

*Uses:* Leaves are tonic, astringent. It is also used in urinary retention & rheumatism. Root is used to cure pile. Leaves are used in soups & other food preparations for bowel complaints.

**10. PAVETTA** L.

**Pavetta indica** L., Sp. Pl. 110. 1753; Hook.f., Fl. Brit. India 3: 150. 1880; Prain, Beng. Pl. 1: 417. 1963 .

*Vern.: Kukura-chura* (Beng.)

Shrubs, 3–9 m tall. Leaves elliptic-ovate or oblanceolate, to 18 × 7 cm, acute or shortly acuminate at apex, acute at base, subcoriaceous, pubescent or glabrous, petiolate; stipules ovate, acute. Flowers white, fragrant, in terminal or axillary corymbose panicles. Fruits globose, greenish black.

*Fl. & Fr.:* May – December.

*J. Bhatt. & Maity* 33344

*Uses:* Flowers and ripe fruits are edible. Root and leaves have medicinal importance.

**11. PSYCHOTRIA** L.

**Psychotria calocarpa** Kurz. in J. Asiat. Soc. Bengal 41(2): 315. 1872; Hook.f., Fl. Brit. India 3: 173. 1880.

Shrubs or undershrubs, to 2.5 m tall. Leaves oblong-elliptic, to 21 × 9 cm, acuminate at apex, narrowed at base, coriaceous; stipules bifid, hyaline, caduceus. Flowers in axillary or terminal, peduncled, umbellate cyme. Calyx 4-lobed, persistent. Corolla red. Fruits oblong-elliptic, yellow to red.

*Fl. & Fr.:* April – January.

*J. Bhatt. & Maity* 32350

*Uses:* Leaves bark and stem juice are used for skin effectively against bites of poisonous insects. Leaves yield red dye.

**12. PSILANTHUS** L.

**Psilanthus bengalensis** (Schult..) Leroy. in Ass. Sci. Intermeet, Café qe Colloque 481. 1980. *Coffea bengalensis* Heyne ex Roem. & Schult., Syst. Veg. 5: 200. 1819; Hook. f., Fl. Brit. India 3: 153. 1880; Prain, beng. Pl. 1: 419. 1963.

*Vern.: Coffee* (Beng.)

Deciduous shrubs of 0.5–3.5 m high with spreaded branches. Leaves elliptic or ovate, to 9 × 5.5 cm, base narrowed, apex acute; petioles 2–3 cm long; stipule setaceous. Flowers fragrant, axillary or terminal. Calyx truncate, toothed. Corolla white, salver-shaped. Drupes glabrous or ovoid, black. Seeds grooved.

*Fl. & Fr.:* February – December.

*F.No.:* 31163

*Uses:* Seed are used as substitute of coffee.

**13. RICHARDIA** L.

**Richardia scabra** L., Sp. Pl. 330. 1753. *R. pilosa* Ruiz. & Pav., Fl. Peru 3: 50. t. 279b. 1802. *Richarsonia pilosa* (Ruiz. & Pav.) Kunth in Humbl., Bonpl. & Kunth, Nov. Gen. Sp. 3: 350. 1820.

Herb with densely pilose, spreaded tetragonous branches. Leaves ovate or oblong-lanceolate, *c.* 2 × 1 cm; stipule copular with setaceous appendages. Flowers white, terminal, subcapitate. Calyx and corolla 6-partite. Capsules turbinate, subglobose. Seeds solitary in each cell.

*Fl. & Fr.:* May – January.

*J. Bhatt. & Maity* 31192

**14. RUBIA** L.

**Rubia cordifolia** L., Sp. Pl. 397. 1753; Hook.f., Fl. Brit. India 3: 202. 1881; Prain, Beng. Pl. 1: 425. 1963.

*Vern.: Manjith* (Beng.)

Climbers to 3 m high. Leaves ovate, ovate-lanceolate, to 8 × 4 cm, acuminate at apex, rounded or subcordate at base, hispid above. Flowers greenish-yellow, terminal, umbellate panicles cymes. Fruit globose, deep purple with purple juice.

*Fl. & Fr.:* June – December.

*Uses:* Root yield dye. Plants having medicinal value to cure several diseases like paralysis, amenorrhoea, urinary obstruction.

**15. SPERMACOCE** L.

**Spermacoce hispida** L., Sp. Pl. 102. 1793; Hook.f., Fl. Brit. India 3: 200. 1881; Sivarajan & Nayar in Taxon 35: 366. 1986. *Borreria hispida* (L.) K. Schum. in Engler & Prantl., Pflanzehfam. 4(4): 144. 1891.

Perennial, to 50 cm, erect. Stem, hispid; stipule broad, connate to the petiole, Leaves broadly elliptic to obovate, to 3.0 × 1.5 cm, coriaceous; Flowers in axillary, clusters. Hypanthium 2.5–3.0 mm long. Calyx 4. Corolla somewhat campanulate, pink; lobes. Anther oblong, exserted. Capsule obovoid, hispid. Seeds broadly ellipsoidal, black.

*Fl. & Fr.:* July – December.

*Uses:* Seeds are used as substitute of coffee.

**16. UNCARIA** Schreb.

**Uncaria macrophylla** Wall. in Roxb., Fl. Ind. 2: 132. 1824; Hook.f., Fl. Brit. India 3: 32. 1880.BP

Woody climbers; young shoot rusty tomentose. Leaves ovate-lanceolate or elliptic, base subcordate, rounded, apex acute. Flowers in axillary and terminal, pedunculate, bracteate heads. Calyx lobes linear. Corolla hirsute outside. Capsules spindle-shaped, stalked.

*Fl. & Fr.:* December – February.

*J. Bhatt. & Maity* 32433

**ASTERACEAE**

**1. ADENOSTEMMA** Forst.

1a. Achenes smooth **1.2.** var. **reticulatum**
1b. Achenes lightly or densely muricate or tuberculate **1.1.** var. **lavenia**

**1.1. Adenostemma lavenia** (L.) O. Kuntze, Rev. Gen. Pl. 1: 304. 1841; P.K. Hajra & al., Fl. India 12: 347. 1995. *Verbesina lavenia* L., Sp. Pl. 902. 1753. *Adenostemma viscosum* var. *lavenia* Hook.f., Fl. Brit. India 3: 242. 1881, *pro parte*; Prain, Beng. Pl. 1: 433. 1963 (rep. ed).

var. **lavenia**

*Vern.: Vailenhlo* (Lushai)

Erect, annual herb. Stem decumbent, ascending. Leaves opposite, alternate, sessile, petiolate, elliptic-deltoid or oblong-ovate, to 25 × 14 cm, rounded or attenuate at base, acute to acuminate at apex, margin serrate. Flowers white in terminal corymbose panicles; involucral bracts glandular hairy. Achene laxly triangulate. Pappus clavate, hairy.

*Fl. & Fr.:* March – January.

*J. Bhatt. & Maity* 33321

**1.2. Adenostemma lavenia** (L.) Kurz. var. **reticulatum** (DC.) Panigrahi in Kew Bull. 30(4): 654. 1975; P.K. Hajra & al., Fl. India 12: 348. 1995. *Adenosma reticulatum* DC. in Wight, Contrib. Bot. Ind. 8. 1834. *A. viscosum* J.R. & G. Forst. var. *reticulatum* (DC.) C.B. Clarke in Hook.f., Fl. Brit. India 3: 243. 1881.

Annual herb. Stem decumbent-ascending, often rooting at nodes. Leaves variously shaped, prominently reticulate beneath. Head corymbose; involucral bracts smooth on back, sometimes connate at base. Achenes smooth, tuberculate. Pappus hairy.

*Fl. & Fr.:* April – January.

*J. Bhatt. & Maity* 33456

**2. AGERATUM** L.

**Ageratum conyzoides** L., Sp. Pl. 839.1753; Hook.f., Fl. Brit. India 3: 243.1881; P.K. Hajra & al., Fl. India 12: 348. 1995; Prain, Beng. Pl. 2: 433. 1963 (rep. ed.).

*Vern.: Uchunti* (Beng.)

Erect, soft-hairy annual herb, Leaves opposite, ovate or rhomboid-ovate, to 10 × 7 cm, crenate, palmately 3-nerved. Flowers white or blue, in many flowered heads. Bracts acute, linear, hairy. Achene 5-angled, glabrous or hairy. Pappus free.

*Fl. & Fr.:* August - October.

Grows in waste lands and in the vicinity of forests, very common

*J. Bhatt. & Maity* 31188

*Use:* Leaf juice applied on cuts wounds & sores.

**3. ARTEMISIA** L.

**Artemisia nilagirica** (Clarke) Pamp. In Nuov. Giorn. Bot. Ital. 33: 452. 1926; P.K. Hajra & al., Fl. India 12: 37. 1995. *A. vulgaris* L. var. *nilagirica* C.B. Clarke, Comp. Ind. 162. 1876. *A. vulgaris auct non* L. 1753; Hook.f., Fl. Brit. India 3: 325. 1881.

Erect, aromatic, branched, perennial undershrubs to 1.5 m tall. Stems paniculate branched. Leaves deeply lobed, cuneate at base, to 18 × 12 cm; lobes lanceolate-oblong, entire, sparsely hairy above and densely white wooly beneath. Involucral bracts ovate-oblong; ligules glandular. Flowers white in small heads; heads hermaphrodite, globose, campanulate, exceedingly tomentose. Achenes glabrous.

*Fl. & Fr.:* January – April.

*J Bhatt. & Maity* 33452

*Uses:* Leaves and flowers are used in nervous & spasmodic affections. The seed oil is insecticidal.

**4. BIDENS** L.

**Bidens bipinnata** L., Sp. Pl. 832. 1753; P.K. Hajra & al., Fl. India 12: 367. 1995. *B. pilosa* L. var. *bipinnata* Hook.f., Fl. Brit. India 3: 309. 1881. *B. pilosa* L., Hook.f., Fl. Brit. India 3: 309. 1881; Prain, Beng. Pl. 2: 453. 1963.

Herb, erect, branched to 1 m high; stem 4-angled, glabrous. Leaves 2–3 pinnate, to 20 cm long; segments ovate-lanceolate, serrate. Heads yellow on 1–8 cm long peduncle, 6–10 cm across. Involucral bracts in 2-series; outer linear spathulate and inner ovate-lanceolate. Achene 6–20 mm long. Pappus setae 2–4, 2–3 mm long, retrosely bristly.

*Fl. & Fr.:* March – November.

*J. Bhatt. & Maity* 31152, 31153

*Uses:* The plant infusion is useful in cough.

**5. CRASSOCEPHALUM** Moench.

**Crassocephalum crepioides** (Benth.) S. Moor in J. Bot. 1: 211. 1912; P.K. Hajra & al., Fl. India 13: 201. 1995. *Gynura crepidioides* Benth. in Hook.f., Fl. Nigeria 438. 1849. *Erechtites valerianaefolia sensu* Fischer in Rec. Bot. Surv. India 9: 98. 1921.

Herb, annual, to 60 cm high; stems corymbosely branches, greenish-brown. Leaves elliptic-oblanceolate, to 14 × 5 cm, base alternate, margin mucronately dentate with 1–2 pairs of oblong lateral segments; petioles 3 cm long. Capitula discoid, cylindric, arranged in loose terminal corymb, purplish. Involucre cylindrical, puberulous. Disc floret pink or brick red or dark orange, filiform. Achene dark brown, oblong, *c.* 2 mm long. Pappus hair white, 10–12 mm long.

*Fl. & Fr.:* March – December.

Along the bank of rivers and ponds, common.

*J. Bhatt. & Maity* 31194.

**6. ECLIPTA** L..

**Eclipta prostrata** (L.) Mant. Pl. 2: 286. 1771; P.K. Hajra & al., Fl. India 12: 381. 1995. *Verbasina alba* L., Sp. Pl. 902.1753. *Eclipta alba* (L.) Hassk., Pl. Jav. Rar. 528.1848; Hook.f., Fl. Brit. India 3:304. 1881; Prain, Beng. Pl. 2: 448. 1963 (rep. ed).

Annual creeping and ascending strigosely hirsute herb of to 50 cm high. Leaves opposite, sessile, lanceolate-oblong, to 7.5 – 2.5 cm, mucronate at apex, cuneate at base. Flowers heads white, solitary or fascicled, axillary. Ray florets in 2–3 series; disc florets numerous. Achenes dark brown, sharply angled with a ring of thick apical pappus.

*Fl. & Fr.:* All seasons.

*J. Bhatt. & Maity* 28256

*Uses:* Leaves juice mixed with oil for blackening and luxuriant growth of the hair. It is also useful in elephantiasis.

**7. ELEPHANTOPUS** L..

**Elephantopus scaber** L., Sp. Pl. 814.1753; Hook.f., Fl. Brit. Ind. 3:242.1881; Prain, Beng. Pl. 2: 433. 1963 (rep. ed); P.K. Hajra & al., Fl. India 13: 333. 1995.

*Vern.: Gobhi(Hindi)*

Perennial, stiff, appressed-pubescent, subscapigerous herb of *c.* 60 cm high. Leaves (basal) obovate-oblong, to 20 × 5 cm, sparsely hairy, obtuse. Heads axillary and terminal; bracts 3 at the top of peduncle, flowers purple in clusters. Achenes finely 10-ribbed, cuneate below; pappus bristly hairy.

*Fl. & Fr.:* October-December.

In moist places as forest undergrowth, common.

*F.No.:* 31168

*Use:* Useful in all poisoining from bites or nails of animals.

### 8. ELEUTHERANTHERA Poit.

**Eleutheranthera ruderalis** (Sw.) Sch. Bip. In Bot. Seil. 24: 165. 1866; Bennett in Curr. Sci. 34: 411. 1965; Hajra & al., Fl. India 12: 383. 1995. *Melampodium ruderalis* Sw., Fl. Ind. Occ. 3: B 72. 1806.

Annual herb up to 50 cm high; stem slender, branched. Leaves ovate to ovate-lanceolate, to 6 × 2.5 cm, shallowly crenate, faintly attenuate at base. Heads homogamous, solitary or 2–4 in each axil, peduncle to 2 cm long. Involucral bracts unequal, densely hispid. Florets 6–9, bisexual, subtended by receptacular bracts. Corolla yellow, tubular. Achenes verrucose, whitish.

*Fl. & Fr.:* May – November.

*J. Bhatt. & Maity* 32342.

### 9. EMILIA Cass.

**Emilia sonchifolia** (L.) DC. ex Wight, Contrib. Bot. Ind. 24.1834; Hook.f., Fl. Brit. India 3:336. 1881; P.K. Hajra & al., Fl. India 13: 212. 1995.Annual weak, erect, branched herb of *c*. to 40 cm high. Leaves (lower) lyrately pinnatifid with ovate triangular to orbicular terminal segments, *c*. to 10 × 4.0 cm, membranous; upper ones sagitate, dentate, acute. Involucres 1–10, lanceolate. Flowers purple, ebracteolate; peduncle 2–3 bracteate. Achenes ribbed, hairy, brown, pappus of soft white hairs.

*Fl. & Fr.:* Throughout the year.

Common as forest undergrowth

*J. Bhatt. & Maity* 31160

*Uses:* The leaves & stems are cooked & eaten as vegetable. Decoction of leaves is used as febrifuge in infantile tympanites and in bowel complaints and also for sore & night blindness.

### 10. ENHYDRA Lour.

**Enhydra fluctuans** Lour., Fl. Cochinch. 511. 1790; Hook.f., Fl. Brit. India 3: 304. 1881; Prain, Beng. Pl. 1: 448. 1963 (rep. ed); P.K. Hajra & al., Fl. India 12: 384. 1995.

*Vern.: Hingcha* (Beng.)

Herb, decumbent, submerged, aquatic, rooting at nodes; stem purple at nodes, base fleshy, hollow. Leaves simple, opposite, linear-oblong, to 3.5 × 0.5 cm, fleshy, entire or subcrenate, sessile, Heads yellow, axillary or terminal surrounded by leafy involucral bracts. Receptacles rounded to concave. Ray florets: female corolla white with purple tinged, 3-lobed, 2.0–2.5 mm long. Disc floret campanulate, apically 5-lobed. Achenes oblong, 4–5 mm long, compressed. Pappus absent.

*Fl. & Fr.:* January – April.

*J. Bhatt. & Maity* 32441

*Uses:* Leaves and young twig are eaten as vegetable. Plant having some medicinal value too.

### 11. EUPATORIUM L.

**Eupatorium odoratum** L., Syst. Nat. ed. 10. 1205. 1759; Hook.f., Fl. Brit. India 3: 244. 1881; Prain in Bengal. Pl. 1: 433. 1963.

Erect or straggling, aromatic undershrubs, 1.5–3 m high. Leaves opposite, petioled, triangulate-ovate, deltoid or ovate-lanceolate, 3.5–12 × 2–6 cm, acute-long acuminate, cuneate at base; heads more or less cylindrical, up to 1.5 cm long, 20–30 flowered, in terminal corymbs. Involucral bracts multi-seriate. Florets whitish purple, odorous. Achenes 5 angled, blackish; pappus white.

*Fl. & Fr.:* September – March.

*Uses:* Herb extract used as antiseptic for healing wounds.

### 12. GNAPHALIUM L.

1a. Leaves linear, obovate or oblanceolate-spathulate **1. G. polycaulon**
1b. Leaves spathulate **2. G. purpureum**

**1. Gnaphalium polycaulon** Pers., Syn. Pl. 2: 421. 1807; P.K. Hajra & al., Fl. India 13: 91. 1995. *G. indicum auct non* L. 1753; Hook.f., Fl. Brit. India 3: 289. 1881; Prain, Beng. Pl. 1: 442. 1963.

An erect decumbent herb of 50 cm high with soft wooly white tomentum. Leaves sessile, narrowly linear, obovate or oblanceolate-spathulate, obtuse, densely white woolly beneath. Heads in dense terminal and axillary (leafy spikes or crowded into ovoid clusters). Involucral bract pale brown, glistering, linear-oblong. Achene oblong, minute. Pappus hairs white.

*Fl. & Fr.:* Throughout the year.

Along river banks, common.

*J. Bhatt. & Maity* 32364, 32385

**2. Gnaphalium purpureum** L., Sp. Pl. 854. 1753; Hook.f., Fl. Brit. India 3: 289. 1881; P.K. Hajra & al., Fl. India 13: 92. 1995.

An erect herb to 50 cm high with thin cottony tomentum. Leaves spathulate, narrowed at base, puberulous. Heads on short spicate clusters. Involucral bracts 3–4 seriate; outer most bract brown or pinkish. Ray florets female, disc florets bisexual. Achenes oblong. Pappus hairs white.

*Fl. & Fr.:* August – May.

*J. Bhatt. & Maity* 31193, 32363

### 13. LAUNAEA Cass.

**Launaea procumbens** (Roxb.) Ramayya & Rajagopal in Kew Bull. 23(3): 465. 1969; P.K. Hajra & al., Fl. India 12: 309. 1995. *Prenanthes procumbens* Roxb., Fl. Ind. ed. 2. 3: 404. 1832. *L. nudicaulis* (L.) Hook.f. sensu stricto Fl. Brit. India 3: 416. 1881; Prain, Beng. Pl. 1: 464. 1963.

Annual, much branched, glabrous herb, to 40 cm high; stems naked or leaf-bearing. Leaves in basal rosette, to 20 cm, pinnatifid, obovate-oblong or spathulate, dentate; teeth cartilaginous. Heads cylindric, remotely sub-racemose along the branches. Involucral bracts 3-seriate; outer bracts small, ovate; inner ones 10–12 mm long, linear-oblong with scarious margins. Corolla ligulate, 5-toothed.Achenes 2.5–3.0 mm long, compressed, thick, 4-ribbed, rugulose. Pappus hairs with a fibrous disk.

*Fl. & Fr.:* August – October.

*J. Bhatt. & Maity* 31189.

### 14. MYRIACTIS Less.

**Myriactis wightii** DC. in Wight, Contrib. Bot. 10. 1834 et Prodr. 5: 308. 1836; Hook.f., Fl. Brit. India 3: 247. 1881; P.K. Hajra & al., Fl. India 12: 135. 1995.

Erect herb, pubescent or villous, to 90 cm high. Basal leaves ovate or lyrate, to 10 cm, long petioled, distantly serrate, upper obovate-oblong, entire or distantly serrate. Heads 6–8 mm across, long peduncled. Involucral bracts acute, scarious at margin. Ligule white at first, purplish at maturity. Disc floret yellow. Achene shortly beaked, glabrous.

*Fl. & Fr.:* April – August.

### 15. SPILANTHES Jacq.

**Spilanthes calva** DC. in Wight, Contrib. Bot. Ind. 19. 1834; P.K. Hajra & al., Fl. India 12: 409. 1995. *S. acmella auct. non* (L.) Murr. 1774; Hook.f., Fl. Brit. India 3: 307. 1881; Prain, Beng. Pl. 1: 451. 1963.

*Vern.: Marhata tiga* (Beng.)

Erect, hairy herb to 40 cm high. Leaves ovate-lanceolate, to 8 × 4 cm, acute, cuneate at base. Heads solitary on long peduncle. Bracts ovate to oblong or lanceolate, ciliate. Florets bisexual, outer few sterile, yellow or white. Achenes narrowly obovate, glabrous, dark brown to black, enclosed within paleae.

*Fl. & Fr.:* February – April.

In moist, shaded places along river banks

*J. Bhatt. & Maity* 31128

*Uses:* Plant is used to cure headache, paralysis, etc.

**16. SYNEDRELLA** Gaertn.

**Synedrella nodiflora** (L.) Gaertn., Fruct. 2: 456.1791. Hook.f., Fl. Brit. India 3: 308. 1881; Prain, Beng. Pl. 2: 451. 1963 (rep. ed.); P.K. Hajra & al., Fl. India 12: 413. 1995. *Verbesina nodiflora* L., Cent. Pl. 28. 1755.

Annual erect herb to 1.5 m tall. Stems terete with whitish hairs. Leaves ovate to elliptic, to 10 × 1.5 cm, rounded at base, acute at apex. Heads aggregated 1-4 at the leaf axils. Outer most bracts green. Ray florets 5–8. Corolla yellow. Disc florets several. Styles branches. Achenes black, compressed.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 32348

**17. TITHONIA** Desf.

**Tithonia diversifolia** (Hemsl.) A. Gray in Proc. Amer. Acad. Arts. 19: 5. 1883; P.K. Hajra & al., Fl. India 12: 416. 1995. *Mirasolia diversifolia* Hemsl., Biol. Centr. Amer. Bot. 2: 165. t. 47. 1881.

Shrubs of 2.5–5.0 m tall with subterranean stolons. Leaves deltoid, 3–5 lobed, *c.* 7–33 × 22 cm, acuminate at base. Ray florets 7–14. Corolla yellow. Achenes white to yellow. Pappus absent. Disc florets numerous. Achenes black.

*Fl. & Fr.:* September – May.

*Uses:* Plant is green manure and flower is used to cure cuts & wounds.

**18. TRIDEX** L..

**Tridex procumbens** L., Sp. Pl. 900.1753; Hook.f., Fl. Brit. India 3:311.1881; Prain, Beng. Pl. 2: 454. 1963 .

Procumbent herb, Leaves elliptic-ovate, to 8.0 × 0.5 cm, deeply incisodentate or pinnatisect, acute at apex, cuneate at base, hairy. Flowers yellow, solitary, pedunculate heads. Bracts 2–3 seriate, outer herbaceous, inner scarious, pinkish. Achenes turbinate, silky-villous; pappus bristles plumose.

*Fl. & Fr.:* Through out the seasons.

In waste lands as well as in the vicinity of forests.

*Uses:* Leaves are used as vegetable. Besides that leaves have some medicinal properties also.

**19. VERNONIA** Schreb.

**Vernonia cinerea** (L.) Less in Linnaea 4:291.1829; Hook.f., Fl. Brit. India 3:233.1881; Prain, Beng. Pl. 2: 432. 1963; P.K. Hajra & al., Fl. India 13: 367. 1995. *Conyza cinerea* L., Sp. Pl. 862. 1753.

Annual herb, to 75 cm high. Leaves ovate-elliptic, *c.* 8.5 × 3.5 cm, base decurrent into petiole, crenate, hairy, bracts ovate-lanceolate, hairy. Flowers pink, in lax corymbose panicles. Achenes 2–3 angled, villous. Pappus biseriate.

*Fl. & Fr.:* October- January.

Very common along roadside and in the vicinity of forests.

*Use:* Juice of plants given in piles. Flowers administered for conjunctivitis. Seeds used for skin disease, cough and intestinal colics.

## CAMPANULACEAE

### CAMPANULA L.

**Campanula aristata** Wall. in Roxb., Fl. Ind. 2: 98. 1824; Hook.f., Fl. Brit. India 3: 441. 1881; V.K. Haridasan & P.K. Mukherjee in Fl. Ind. Fasc. 22: 40. 1996.

Slender glabrous, erect, ascending herb, to 40 cm tall. Basal leaves petiolate, crowded, elliptic, ovate; upper leaves sessile, linear, attenuate at base, obtuse to acuminate at apex. Flowers terminal, solitary, deflexed. Calyx longer than corolla. Corolla infundibuliform-campanulate, 5-partite, blue; petals obconical. Capsule cylindrical to elongate-obovoid, dehiscing apically.

*Fl. & Fr.:* June – September.

*J. Bhatt. & Maity* 32417.

## MYRSINACEAE

### MAESA Forskal.

**Maesa indica** (Roxb.) DC. in Trans. L. Soc. London.17:134. 1834. *Baeobotrys indica* Roxb., Fl. Ind. 2:230. 1824. *M. dubia* C.B. Clarke in Hook.f., Fl. Brit. India 3:510. 1882; Prain, Beng. Pl. 1: 473. 1963.

*Vern.: Ramjani* (Beng.)

Large shrubs, to 10 m high. Leaves ovate-lanceolate, to 18 × 6 cm, acuminate at apex, cuneate at base, crenate at margin. Flowers white, dense, in axillary simple or branched racemes. Petals 5. Berries fleshy with persistent calyx, creamy yellow to dull green.

*Fl. & Fr.:* July-December.

*J. Bhatt. & Maity* 32408

*Use:* Roots use in syphilis. Leaves as fish poison. Wood is used in house post & as fuel. Fruits are edible and considered anthelmintic.

## SYMPLOCACEAE

### SYMPLOCOS Jacq.

**Symplocos racemosa** Roxb., Fl. Ind. 2: 539. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 3: 576. 1882; Prain, Beng. Pl. 1: 483. 1963. *S. racemosa* var. *khasiana* C.B. Clarke in Hook.f., Fl. Brit. India 3: 582. 1882.

*Vern.: Lodh* (Beng.)

Shrubs or trees, to 15 m tall. Leaves narrowly to broadly elliptic, acuminate to blunt at apex, cuneate to rounded at base, entire, undulate or serrulate at margin; petiole short. Flowers in axillary, simple or branched racemes, 3–4 cm long. Corolla white, mildly fragrant. Drupes narrowly-ellipsoid, to 1.2 cm, purplish black, crowded by persistent calyx.

*Fl. & Fr.:* September – May.

*Use:* Bark used for conjunctivitis, dysentery & menorrhagia. Bark and leaves yield yellow dye.

## OLEACEAE

### 1. JASMINUM L.

**Jasminum amplexicaule** G. Don, Gen. syst. 4: 60. 1837. *J. undulatum* Ker.-Gawl., Bot. Reg. 6: 1. 436. 1820 *non* Willd. 1797; C.B. Clarke in Hook.f., Fl. Brit. India 3: 592. 1882.

Erect or scandent shrubs; branches of 2 m high. Leaves simple, opposite, ovate-lanceolate, to 6 × 2.5 cm, acute to acuminate at apex, rounded or subcordate at base, pubescent on the nerves beneath. Flowers in axillary few-flowered cymes, fragrant. Calyx lobes filiform. Corolla white, *c.* 2.5 cm; lobes ovate. Berries ellipsoid, red.

*Fl. & Fr.:* August – April.

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### 2. NYCTANTHUS L.

**Nyctanthes arbor-tristis** L., Sp. Pl. 6. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 3: 603. 1882; Prain, Bengal Pl. 1: 486. 1963 (rep. ed.).

Large shrubs or small trees of 2–4 m high with quadrangular branches. Leaves ovate, to 16 × 8 cm, acute at apex, truncate at base, margin serrate scabrid, coriaceous. Flowers in trichotomous cymes, fragrant. Corolla lobes white, 5–7 with orange tube. Capsules suborbicular, *c.* 2 cm long.

*Fl. & Fr.:* September – January.

*Use:* Leaves used in fever and anthelmintic. Corolla tube yield dye.

## APOCYNACEAE

### 1. ALSTONIA R. Br. *nom. cons.*

**Alstonia scholaris** (L.) R.Br. in Mem. Wern. Nat. Hist. Soc. 1: 76. 1811; Wight, Ic. t. 422. 1841; Hook.f., Fl. Brit. India 3: 642. 1882; Prain, Beng. Pl. 1: 498. 1963. *Echites scholaris* L., Mant. 53. 1767.

*Vern.: Chhatim* (Beng.),

Large trees to 25 m tall, branched. Leaves coriaceous, elliptic-oblong, to 25 × 6 cm, glabrous, white bloom beneath, obtuse at apex. Flowers pale yellowish-white, pubescent compact cymes. Corolla tube pubescent, pilose at mouth. Follicles cylindric, pendulous, 35–65 cm long. Seeds ciliate at margin, coma *c.* 2 cm.

*Fl. & Fr.:* October – March.

*Use:* Bark, latex and leaves are used as medicine. Flowers yield an essential oil. Wood is employed in various purposes.

### 2. CASCABELA L. *nom. cons.*

**Cascabela thevetia** (L.) H.Lippold in Feddles Repert, 91(1-2):52.1980. *C. thevatia* L., Sp. Pl. 209. 1753. *Thevetia neriifolia* Juss. ex Steud., Nom. 2: 680. 1841; Prain, Beng. Pl. 1: 495. 1963

*Vern.: Kalke phul* (Beng.)

Large, glabrous shrubs, to 5 m high. Leaves crowded, linear, to 14 × 0.8 cm, tapering at both ends. Cymes terminal or subterminal, few or 1-flowered. Corolla funnel shaped, bright yellow or, throat with pilose scales. Drupe to 5 cm across, angular, green.

*Fl. & Fr.:* November – July.

*Use:* Bark and leaves are used as febrifuge, emetic and purgative. Seeds are employed as poisonous to cattle. Kernel oil is used in skin diseases.

### 3. HOLARRHENA R.Br.

**Holarrhena pubescens** (Buch.-Ham.) Wall. ex G. Don, Gen. Syst. 4:78.1837-38. *Echites pubescens* Buch.-Ham. in Trans. L.. Soc. London 13:524. 1821. *Holarrhena antidysentrica* Wall. ex A. DC. in DC., Prodr. 8:413. 1844; Hook.f., Fl. Brit. India 3:644. 1882; Prain, Beng. Pl. 1: 499. 1963 .

*Vern.: Kurchi* (Beng.)

Shrubs or small trees, 3–5 m tall. Leaves ovate-oblong or elliptic, to 11 × 7 cm, pubescent, base rounded to obtuse, abruptly acuminate at apex. Flowers 1–3 cm across, white in corymbose cymes, sweet scented. Coralla tube pubescent; lobes oblong, overlapping to right. Follicles 2, slender, 35–45 cm long, pendulous. Seeds to 1 cm long, linear-oblong; coma about twice as long as seed.

*Fl. & Fr.:* March - December.

In dry deciduous forests, very common

*J. Bhatt. & Maity* 31139, 32414

*Use:* The Stem, root and bark is used in dysentery & febrifuge. Wood is used for making tobacco pouch and comb.

### 4. ICHNOCARPUS R. Br. *nom. cons.*

**Ichnocarpus frutescens** (L.) R.Br. in Aiton, Hort. Kew. ed. 2. 2: 69.1811; Hook.f., Fl. Brit. India 3:669.1882; Prain, Beng. Pl. 1: 504. 1963 (rep. ed.). *Apocynum frutescens* L., Sp. Pl. 213. 1753.

*Vern.: Dudhi lata* (Beng.)

Woody, rusty-villous, climbing shrubs. Leaves lanceolate-ovate, to 5 × 1.5 cm, acute at base, acuminate at apex. Flowers dull white, in axillary or terminal pedunculate cymes. Calyx eglandular. Corolla lobes pubescent, reflexed. Folicles 2, slender, divergent, to 12 cm long. Seeds linear, grooved with coma to 2 cm long.

*Fl. & Fr.:* October – December.

Over small trees, in dry deciduous forests, common

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*Use:* Powdered root is used in diabetes, Stem decoction is given in fever, and leaves are useful in cut and wounds.Branches used in basket making and as cordage.

### 5. NERIUM L.

**Nerium indicum** Mill., Gard. Dict. Ed. 8.no. 2. 1768. *N. odorum* Sol. in Aiton, Hort. Kew. 1: 297. 1789; Hook.f., Fl. Brit. India 3: 655. 1882; Prain, Beng. Pl. 2: 501. 1963 .

*Vern.: Karabi* (Beng.)

Large evergreen shrubs, to 3 m, high with milky sap. Leaves linear-lanceolate, to 45 cm long, acuiminate at apex, shining above. Flowers in terminal corymbose cyme. Corolla red rosy, fragrant. Follicle spreading to 22 cm long.

*Fl. & Fr.:* April – August.

*Use:* Leaves are used as medicine while bark and root are poisonous. Root oil is used in skin diseases.

### 6. RAUVOLFIA L.

**Rauvolfia serpentina** (L.) Benth. ex Kurz., Forest Fl. Burma 2: 171. 1877; Hook.f., Fl. Brit. India 3: 632. 1882; Prain, Beng. Pl. 1: 497. 1963. *Ophioxylon serpentinum* L., Sp. Pl. 1043. 1753.

*Vern.: Chandra, Sarpagandha* (Beng.)

Glabrous branched undershrubs of to 1 m high. Leaves 3–4 whorled, lanceolate or oblanceolate, to 14 × 4 cm, acuminate at apex, attenuate at base; pedicels red. Flowers white in corymbose cyme of

*c.* 3–5 cm across. Calyx red. Corolla lobes pinkish, elliptic-oblong; tube slender. Drupes purplish, 5 mm in diam.

*Fl. & Fr.:* June - December.

*J. Bhatt. & Maity* 31170

*Use:* The root is anthelmintic and used in many poisonous effect,astma antidote for high blood pressure.

**7. TABERNAEMONTANA** L.

**Tabernaemontana divaricata** (L.) R. Br. in Roem. & Schult., Syst. Veg. 4: 427. 1819. *Nerium divaricatum* L., Sp. Pl. 209. 1753. *Tabernaemontana canaria* (Jacq.) Willd., Enum. Pl. 275. 1809; Hook.f., Fl. Brit. India 3: 646. 1882; Prain, Beng. Pl. 1: 498. 1963.

*Vern.: Tagar, Sadaphul* (Beng.)

Shrubs, bushy, evergreen, dichotomously branched glabrous. Leaves oblong-lanceolate, to 18 × 6 cm, acute or acuminate at apex, cuneate at base, dark green and shining above; petioles 1.0–1.5 cm long. Flowers in axillary corymbose cymes, white to 4 cm across, cyclic, fragrant. Follicles spreading, recurved beaked or unbeaked, sessile or shortly stipulate, 3-ribbed, 3–6 seeded. Seeds ovoid or oblong, striated, fleshy with red aril.

*Fl. & Fr.:* May – August.

*J. Bhatt. & Maity* 31155

*Use:* Roots chewed for relief from toothache.

**8. VALLARIS** Burm.f.

**Vallaris solanacea** (Roth) Kuntze, Rev. Gen. Pl. 417. 1891. *Peltanthera solanacea* Roth, Nov. Pl. Sp. 132. 1821. *Vallaris heynei* Spreng., Syst. Veg. 1: 635. 1824; Hook.f., Fl. Brit. India 3: 650. 1882; Prain, Beng. Pl. 1: 500. 1963 (rep. ed.).

*Vern.: Hapar,* Mali (Beng.)

Large shrubs, woody; bark ash-coloured. Leaves elliptic or oblong-lanceolate, to 9 × 3 cm, acuminate at apex, acute at base, shining above, glabrous or pubescent; pedicels 1–2 cm long with glands in the axils. Flowers white in subcorymbose axillary cymes, fragrant, pedunculate; bracts linear or lanceolate, acute-pubescent. Follicles oblong, 10–15 cm long. Seeds ovoid, beaked, silvery white.

*Fl. & Fr.:* December – April.

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*Uses:* Twigs are used for making baskets. Plant is also cultivated for fragrant flowers. The flower and fruit is edible. The latex is irritant and is applied to wounds and sores.

**9. WRIGHTIA** R. Br.

**Wrightia arborea** (Dennst.) Mabberley in Taxon 26: 533. 1977. *Periploca arborea* Dennst., Schlussd Hortus Malab. 13, 23, 25. 1818. *Wrightia tomentosa* Roem. & Schult., Syst. Veg. 4: 414. 1819; Hook.f., Fl. Brit. India 3: 653. 1882.

*Vern.: Dudhi* (Beng.)

Small deciduous tomentose tree, to 26 m high. Leaves elliptic-oblong, to 15 cm long, cordate-acuminate at apex, acute at base. Flowers in subsessile corymbose cyme; bracts caduceus. Corolla white with pink tinge, turning pale yellow; tube twice the length of calyx. Follicle connate throughout, to 30 cm long, subcylindrical.

*Fl. & Fr.:* August – December.

*J. Bhatt. & Maity* 31138, 32409

*Use:* Bark is referred to antidote to snake bite and scorpion sting and used in diarrhoea and piles.

## ASCLEPIADACEAE

### 1. CALOTROPIS R. Br.

**Calotropis gigantea** (L.) R.Br. in Ait. f., Hort. Kew ed. 2. 2: 78. 1811; Hook.f., Fl. Brit. India 4: 17. 1883.

*Vern.: Akanda,* Gurtakand ( Beng.)

Undershrubs or shrubs of 3 m high, with ash-coloured bark. Leaves elliptic-ovate or obovate, to 20 × 14 cm, acute at apex, clasping at base, glabrous or white floccose. Flowers in umbelliform cymes. Corolla purple to white; lobes deltoid, revolute. Corona lobes 1.2 cm long. Follicle recurved to 10 × 4 cm. Seeds ovoid, flat; coma white sliky.

*Fl. & Fr.:* March – May.

Along the banks of stream and in waste lands, Sparse

*Use:* Bast fibres obtained from the stem. The floss from seed is used for stuffing. The plant is medicinal. Latex is used in tanning. Leaves is used for rheumatic swelling.

### 2. DISCHIDIA R.Br.

**Dischidia benghalensis** Colebr. in Trans. L.. Soc. 12: 357.f. 15. 1818; Hook.f., Fl. Brit. India 4: 50. 1883. *D. spathulata* Blume, Bijdr. 1060. 1826-27; Singh in Fasc. Fl. India 24: 74. 1999.

An extensive twining, slender epiphytes with pendulous branches to 1 m, glabrous. Leaves very coriaceous with variable shapes like linear-elliptic to oblanceolate, 4.5 × 2.0 cm, apex obtuse-apiculate to acute, base cuneate. Calyx lobes ovate. Corolla lobes urceolate, ovate-triangular, fleshy. Gynostegium 0.1 cm high. Follicle paired or single, 4–5 × 2–3 cm, milky white, *c.* 2 cm long. Rooting on the bark of tree.

*Fl. & Fr.:* June – December.

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### 3. HETEROSTIGMA Wight & Arn.

**Heterostigma alatum** Wight, Contrib. Bot. Ind. 42. 1834; Hook.f., Fl. Brit. India 4: 47. 1883; Singh in Fasc. Fl. India 24: 246. 1999; Kanjilal & al., Fl. Assam 3: 300. 1939.

Twining slender branched shrubs. Leaves broadly ovate or ovate-oblong, to 15 × 9 cm, apex acuminate, base cuneate to orbicular, nerves distinctly winged below. Flowers bright yellow with purple-red center, 3–6 flowered axillary umbels. Calyx lobes triangular. Corolla lobes triangular; tube 2–3 mm. Coronal lobes *c.* 1 mm. Follicle 6–8 × 0–5 cm, linear, straight, tapered cylindric. Seeds ovate, margined, coma long.

*Fl. & Fr.:* July – August.

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### 4. HOYA R.Br.

**Hoya arnotiana** Wight, Contrib. 36. 1834; Hook.f., Fl. Brit. India 4: 60. 1883; Kanjilal & al., Fl. Assam 3: 306. 1939; Singh in Fasc. Fl. India 24: 96. 1999.

An extensive creepers with wiry stems, glabrous; latex milky white. Leaves large, variable, ovate to elliptic or elliptic-lanceolate to acuminate, to 12 × 8 cm, apex acute to acuminate, base cuneate, fleshy with subcoriaceous surface. Flowers in terminal, sessile umbels, creamy to pale yellowish-pink, scented, *c.* 1.0–1.5 cm braod. Calyx lobes ovate-rounded. Corolla rorate-campanulate, acute at apex. Staminal coronal scale longer than corolla tube, creamy to pinkish towards center. Follicle paired, to 16 × 6 cm, slender, many seeded.

*Fl. & Fr.:* April – July.

**5. TOXOCARPUS** Wight & Arn.

**Toxocarpus himalensis** Falc. ex Hook.f., Fl. Brit. India 4: 13. 1883; Kanjilal & al., Fl. Assam 3: 281. 1939; Jagtap et Singh in Fasc. Fl. India 24: 281. 1999.

Twining climbers with to 15 cm long internodes; young stems and petioles rusty pubescent. Leaves elliptic to obovate, to 12 × 7 cm, apex abruptly cuspidate, base cuneate, subcoriaceous above, glabrous below with browny hairs. Inflorescence with conspicuous linear-lanceolate bracts and bracteoles. Corolla creamy; lobes long and strap shaped, recurved and twisted. Corona staminal, 5-lobed. Follicles divaricately paired narrowly cylindric, to 6–9 cm, tapered to incurved apex.

*Fl. & Fr.:* July – December.

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## PERIPLOCACEAE

**HEMIDESMUS** R. Br.

**Hemidesmus indicus** (L.) R. Br. in Aiton. f., Hort. Kew ed. 2. 2: 75. 1811; Hook.f., Fl. Brit. India 4: 5. 1883; Prain, Beng. Pl. 1: 508. 1963. *Periploca indica* L., Sp. Pl. 211. 1753.

*Vern.: Anantamul* (Beng.)

Perennial slender twining shrubs, root stock aromatic; stem slender. Leaves highly variable, elliptic-oblong or obovate-oblong, to 7 × 2 cm, acuminate at apex, truncate at base, dark green with white streaks above. Flowers in axillary cymose clusters. Corolla deep pinkish-brown with and yellowish-green without. Follicles to 12 × 0.7 cm, slender, tapered at apex. Seeds elliptic-oblong, black, compressed.

*Fl. & Fr.:* August – November.

*Use:* Roots used in rheumatism, urinary troubles and skin diseases.Root is also a blood purifier.

## CONVOLVULACEAE

**1. ARGYREIA** Lour.

1a. Climber with milky latex; stems sparsely hispid with yellowish hairs; leaves hairy beneath; stamen and style exserted **2. A. strigosa**

1b. Climber without silky latex; stems densely appressed with whitish hairs; leaves hairy both surfaces; stamens and style included **1. A. roxburghii**

**1. Argyreia roxburghii** Choisy, Mem. Soc. Phy. Genev. 6: 419. 1833; C.B. Clarke in Hook.f., Fl. Brit. India 4: 185. 1883; Prain, Bengal Pl. 551. 1963.

A large climber. Leaves broadly ovate, to 10 × 7 cm, deeply cordate at base, acuminate at apex, softly villous in upper surfaces; petioles 4–10 cm. Flowers in widely branched lax panicles; bracts oblong, villous. Sepals villous, fruiting sepals reflexed. Corolla limb 3–4 cm broad, campanulate, purplish with darker throat. Capsule ovoid, to 8 mm long, green, persistent calyx forming reddish green wing.

*Fl & Fr.:* September – December.

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**2. Argyreia strigosa** (Roth) Roberty in Candollea 14: 44. 1952. *Ipomoea strigosa* Roth, Nov. Pl. Sp. 113. 1821. *Lettsomia setosa* Roxb., Fl. Ind. 2: 80. 1824; C.B. Clarke in Hook.f., Fl. Brit. India 4: 194. 1883; Prain, Beng. Pl. 1: 551. 1963 .

Large climbers. Leaves ovate, acute to acuminate at apex, cordate at base. Glabrous above, appressed hairy beneath. Flowers in lax corymbose cyme; peduncles 12–20 cm long; bracts ovate, obtuse, persistent, appresedly strigose. Sepals ovate-elliptic, longer than the bracts, glabrous inside, densely appressed hairy outside. Corolla mauve, densely setose. Berries subglobose.

*Fl. & Fr.:* October – December.

*J. Bhatt. & Maity* 33323.

**2. IPOMOEA** L.

1a. Stout climber; stems glabrous; flowers red **2. I. hederifolia**
1b. Slender twinners; stems warted; flowers white **1. I. alba**

**1. Ipomoea alba** L., Sp. Pl. 161. 1753. *I. bona-nox* L., Sp. Pl. 228. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 4: 197. 1883; Prain l.c.552

Large subscandent glabrous climbers; stems warted. Leaves ovate, to 13 × 11 cm, acuminate, apiculate, cordate, glabrous, entire to angled. Flowers few to many flowers cymes, dull white, large; peduncles to 24 cm long. Corolla salver form, white. Stamens exserted. Capsules ovoid-globose, to 2.5 cm long, glabrous. Seeds yellow.

*Fl. & Fr.:* November – April.

*J. Bhatt. & Maity* 33309, 33373

*Use:* It is an ornamental plant.

**2. Ipomoea hederifolia** L., Syst. Nat. ed. 10. 925. 1759. *I. coccinea auct. non* L. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 4: 199. 1883.

Twinners, annual; stems glabrous or sparsely pubescent. Leaves ovate to suborbicular, to 20 × 13 cm, acute to acuminate at apex, cordte at base, entire or 3-lobed, glabrous. Flowers solitary or in few to several flowered cymes. Flowers scarlet-red, hypocrateriform. Capsules subglobose. Seed pyriform, dark brown, glabrous.

*Fl. & Fr.:* September – March.

Probably found as an escape near habitations, occasional

*J. Bhatt. & Maity* 32453, 33316

**3. MERREMIA** Denst. ex Endl. *nom. cons.*

1a. Plant hairy; leaf segments 5–7 lobed, dentate; flowers in cyme **3. M. vitifolia**
1b. Plants glabrous; leaf segment 3-lobed, entire 2
2a. Inflorescence subumbelliform; corolla funnel form, pilose on upper portion **2. M. umbellata**
2b. Inflorescence solitary or loosely cymes; corolla campanulate, glabrous **1. M. hederacea**

**1. Merremia hederacea** (Burm.f.) Hall. f., Bot. Jahrb. Syst. 18: 118. 1893; Prain, Beng. Pl. 2: 543. 1963. *Evolvulus hederaceus* Burm.f., Fl. Ind. 77. t. 30. fig. 2. 1768. *Ipomoea polyantha* Miq., C.B. Clarke in Hook.f., Fl. Brit. India 4: 206. 1883.

Stem twining or prostrate, often rooting at nodes or internodes. Leaves ovate to 5 × 3.5 cm long, broadly cordate at base, obtuse and mucronate at apex, shallowly or deeply 3-lobed. Flowers in 1 to many in dichasial or monochasial cyme, campanulate, pedunculate. Calyx broadly ovate, deeply notched at the apex, mucronulate, often pilose abaxially. Corolla to 1 cm across, yellow, campanulate. Fruits capsular, broadly conical, somewhat quadrangular. Seeds *c.* 2.5 mm, blackish.

*Fl. & Fr.:* July – December.

In the vicinity of dry deciduous forest, sparse

*J. Bhatt. & Maity* 22339, 33390

**2. Merremia umbellata** (L.) Hall. f. in Bot. Jahrb. Syst. 16: 552. 1893; Prain, Beng. Pl. 2: 542. 1963 (rep. ed.). *Convolvulus umbellatus* L., Sp. Pl. 155. 1753. *Ipomoea cymosa* (Desr.) Roem. & Schult., Syst. Veg. 4: 241. 1819; C.B. Clarke in Hook.f., Fl. Brit. India 4: 211. 1883.

Woody, prostrate or twining herb, to 3 m. long. Young stems with milky latex. Leaves ovate, triangular to broadly-ovate, to 12 cm long, truncate, acuminate at apex, rounded, cordate or hastate at base. Flowers in umbellate cyme, white, pedicellate. Calyx ovate-lanceolate, obtuse, apiculate. Corolla campanulate, to 3.5 cm long. Capsule obovoid, to 1.2 cm long, mucronate. Seeds dark brown, 5 mm long.

*Fl. & Fr.:* February – April.

Common in the vicinity of forest

*J. Bhatt. & Maity* 32333

*Uses:* The plant is used to cure fistula, tumour, cuts & sores. Seed is asperient and act as alternative in cutaneous diseases.

**3. Merremia vitifolia** (Burm. f.) Hall. f. in Bot. Jahrub. Syst. 16:552. 1893; Prain, Beng. Pl. 2: 542. 1963 (rep. ed.); C.B. Clarke in Hook.f., Fl. Brit. India 4: 213. 1883. *Convolvulus vitifolius* Burm. f., Fl. Ind. 45. t. 18, f. 10. 1768.

Twiners; Stems bristly long hairy. Leaves ovate, to 7.5 × 5.0 cm, cordate, digitately 5–7 lobed; lobes dentate, ovate, acuminate. Flowers yellow, in pedunculate cyme; peduncle to 10 cm long. Calyx ovate-lanceolate, unequal, mucronate, hairy. Coralla campanulate, glabrescent. Capsules globose, yellow. Seeds usually 4, glabrous.

*Fl. & Fr.:* October- February.

*J. Bhatt. & Maity* 32406

*Uses:* Plant juice is diuretic and cooling and root is stomachic.

**4. PORANA** Burm.f.

**Porana paniculata** Roxb., Pl. Corom. 3: 31. t. 235. 1815; C.B. Clarke in Hook.f., Fl. Brit. India 4: 222. 1883; Prain, Beng. Pl. 2: 538. 1963 .

Large woody twinners with greenish tomentose stems. Leaves small ovate, acuminate at apex, cordate at base, softly white tomentose. Flowers in axillary or terminal panicles. Flowers white or pale yellow. Capsules indehiscent, ovoid-globose, 0.5 cm long, with wing like enlarged 3 sepals. Seeds ovoid-brown.

*Fl. & Fr.:* November – March.

*J. Bhatt. & Maity* 32481

*Use:* Stems used to making coarse baskets and as rough cordages.

## SOLANACEAE

### 1. DATURA L.

**Datura metal** L., Sp. Pl. 179. 1753. *Datura fastuosa* L. ex C.B. Clarke in Hook.f., Fl. Brit. India 4: 242. 1883. *D. fastuosa* L. var. *alba* (Nees) Clarke in Hook.f., Fl. Brit. India 4: 243. 1883.

*Vern.: Dhutura* (Beng.)

A course, stout shurbs to 1.5 m high. Leaves irregularly lobed to 16 × 12 cm, broadly ovate, base unequal, pubescent. Flowers axillary, solitary, erect, pedunculate. Corolla to 12 cm long, pinkish white. Stigma exserted. Capsules globose.

*Fl. & Fr.:* September – December.

*Use:* Leaves use in rheumatic pain. Seeds is narcotic.

### 2. PHYSALIS L.

**Physalis minima** L., Sp. Pl. 183. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 4: 238. 1883; Prain, Beng. Pl. 2: 558. 1963 .

*Vern.: Ban-tipariya* (Beng.)

Erect, glabrous, branched herb to 1m tall. Leaves ovate, to 5 × 2.2 cm, acute, sinuate or toothed, rounded at base. Flowers yellow, solitary, axillary, nodding. Calyx campanulate, accrescent, hairy; lobes triangular, acute. Corolla yellow with deep purple spots. Berries enclosed in the bladder-like calyx, 5–7 mm across.

*Fl & Fr.:* July – December.

Along the river banks, sparse

*Uses:* Fruit juice is purgative and diuretic and useful in bleeding ulcer.Plant paste is used to restored breast.

### 3. SOLANUM L.

1a. Calyx sparingly hairy **2. S. torvum**
1b. Calyx glabrous to glabrescent **1. S. nigrum**

**1. Solanum nigrum** L., Sp. Pl. 186. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 4: 229. 1883; Prain, Beng. Pl. 2: 554. 1963.

*Vern.: Gurkhi, Gurkamai* ( Beng)

Branching, rambling herb, to 90 cm high. Leaves ovate-lanceolate, to 15 × 9.0 cm, membranous, sinuate-toothed; petioles to 8.0 cm long. Flowers white, in umbellate cymes. Corolla lobes rotate, oblong, white, subacute. Berries globose, glabrous, purple to black.

*Fl. & Fr.:* Throughout the year.

*Use:* Roots are used in various skin diseases. Juice of the plant use for all sorts of swelling. Fruits are edible and used as tonic, diuretic and diaphoretic for a long time. It is also used in fever, diarrhoea, angina pectoris, cough, piles, hiccough and cure mental diseases.

**2. Solanum torvum** Sw., Prodr. 47. 1788. C.B. Clarke in Hook.f., Fl. Brit. India 4:243. 1883; Prain, Beng. Pl. 2: 555. 1963.

*Vern.: Begun (Beng.)*

Large, stellate-hairy, prickly shrubs, 2–4 m high. Leaves ovate-lanceolate with shallow triangular lobes, cordate-oblique at base, shortly acuminate at apex. Calyx glandular-hairy. Corolla white, many in dense cymes, stellate-pubescent outside. Berries globose, glabrous, shining yellow when ripe. Seeds brown.

*Fl. & Fr.:* Throughout the year

*J. Bhatt. & Maity* 32487, 31166

*Uses:* The plant have a good medicinal value. Fruit is eaten as vegetable.

## SCROPHULARIACEAE

### 1. BACOPA Aubl. *nom. cons.*

**Bacopa monnieri** (L.) Pennel in Proc. Acad. Nat. Sci. Philadelphia 98: 94. 1946. *Lysimachia monnieri* L., Cent. Pl. 2: 9. 1956. *Herpestis monnieri* (L.) Kunth ex Hook.f., Fl. Brit. India 4: 272. 1884; Prain, Beng. Pl. 2: 569. 1963.

*Vern.: Brahmi* (Beng.)

Glabrous, decumbent herb, to 30 cm high, rooting at nodes. Leaves ovate-oblong, to 12 × 3 mm, obtuse at apex, narrowed at base. Flowers solitary, axillary. Corolla white or pale violet, 2-lipped. Capsule oblong-ovoid, enclosed in persistent calyx.

*Fl. & Fr.:* June – December.

*Use:* Eaten as vegetable and the plant extract is used as purgative and also used in skin eruptions.

**2. LIMNOPHILA** R. Br.

1a. Flowers in paniculate cyme; corolla violet 1. **L. chinensis**
1b. Flowers in terminal racemes; corolla white 2. **L. indica**

**1. Limnophila chinensis** (Osb.) Merr. in Amer. J. Bot. 3: 581. 1916. *Columnea chinensis* Osb., Dagb. Ostind. Resa 230. 1757. *Limnophila hirsute* (Heyne ex Benth.) Benth. in DC., Prodr. 10: 388. 1846; Hook. f., Fl. Brit. India 4: 268. 1884; Prain, Beng. Pl. 2: 569. 1963 .

Herb, annual, erect, glabrous to hirsute, purplish; stem hollow, creeping below, rooting at nodes. Leaves opposite, nately whorled, broadly elliptic or linear-oblong, semi amplexicaul at base, serrulate. Flowers in axillary, solitary or in paniculate cymes at the end of the branches; pedicellate, bracteate. Calyx glandular or hirsute, striate in fruit. Corolla violet, pubescent outside, inside reddish. Capsules ellipsoid.

*Fl. & Fr.:* August – December.

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**2. Limnophila indica** (L.) Druce in Rep. Bot. Exch. Club Brit. Isles 1913, 3: 420. 1914; Merr. in Philipp. J. Sci. Bot. 9: 140. 1914. *Hottonia indica* L. Sp. Pl., ed. 2; 208. 1762. *Limnophila gratioloides* R. Br., Prodr. 442. 1810; C.B. Clarke in Hook.f., Fl. Brit. India 4: 271. 1884; Prain, Beng. Pl. 2: 568. 1963 .

Amphibious, erect branched herb, to 33 cm tall, rooting at lower nodes. Leaves whorled, upper ones opposite, to 2 × 0.5 cm, lower pinnatifid, upper entire, linear-oblong, trinerved. Flowers white, solitary, axillary or in terminal racemes;bracteoles linear-subulate. Calyx glandular hairy; lobe ovate, ovate-lanceolate. Corolla 8–10 mm long, white or pale yellow. Capsules ellipsoid, to 4 mm long. Seeds numerous, black.

*Fl. & Fr.:* August – December.

Along the edges of ponds, abundant

*J. Bhatt. & Maity* 33327

*Use:* It is used as antiseptic and its juice is rubbed over the body in perstent fever. Its juice combined with ginger, cumin and other aromatics is also given in stomach disorder.

**3. LINDERNIA** All.

1a. Flowers solitary, axillary; corolla pink or violet 1. **L. anagallis**
1b. Flowers in lax raceme; corolla white with violet blotch 2. **L. ciliata**

**1. Lindernia anagallis** (Burm.f.) Pennell in J. Arn. Arb. 24: 252. 1943; *Ruellia anagallis* Burm.f., Fl. Ind. 135. 1768. *Lindernia cordifolia* (Colsm.) Merr., Enum. Philipp. Fl. Pl. 3: 437. 1923. *Vandellia pedunculata* Benth., Scroph. Ind. 37. 1835; Hook.f., Fl. Brit. India 4: 282. 1884.

Diffusely branched erect or decumbent herb, to 12 cm high, glabrous, rooting at nodes; stems and branches 4-angled, striate. Leaves somewhat variable in shape, oblong, elliptic, ovate or obovate-lanceolate, to 3 × 1.2 cm, truncate-cordate at base, obscurely serrate, sessile or shortly petiolate. Flowers in axillary, solitary or in terminal racemes. Corolla pink, blue or violet, to 1.5 cm long. Capsules linear-lanceolate. Seeds ellipsoid.

*Fl. & Fr.:* January – November.

Common in river beds.

*J. Bhatt. & Maity* 32386

**2. Lindernia ciliata** (Colsm.) Pennell in Brittonia 2: 182. 1936. *Gratiola ciliata* Colsm., Prodr. Descrip. Gart. 14. 1793. *Bonnaya brachiata* Link. & Otto, Ic. Pl. Select. 25. t. 11. 1820; Hook. f., Fl. Brit. India 4: 284. 1884; Prain, Beng. Pl. 2: 573. 1963 .

*Vern.: Bhumi-nim* (Beng.)

Annual, stiff erect herb to 20 cm tall. Stem quadrangular. Leaves oblong-obtuse, to 2.2 × 0.8 cm, glabrous aristate-dentate. Flowers in lax racemes, bracteate. Corolla white with blotch within, 6–8 mm long. Capsule linear-oblong, to 1.3 cm long. Seeds irregular, alveolate.

*Fl. & Fr.:* August – October.

In moist places, abundant

*J. Bhatt. & Maity* 33381

**4. MAZUS** Lour.

**Mazus pumilus** (Burm.f.) Steenis in Nova Guinea (n. s.) 9: 31. 1958. *Lobelia pumila* Burm.f., Fl. Ind. 186. t. 60. f. 3. 1768. *Lindernia japonica* Thunb., Fl. Jap. 253. 1784. *Mazus japonicus* (Thunb.) Kuntze, Rev. Gen. 11: 462. 1891. *M. rugosus* Lour., Fl. Cochinch. 385. 1790; Hook.f., Fl. Brit. India 4: 259. 1884; Prain, Beng. Pl. 2: 565. 1963 .

Annual, erect ascending herbs; radical leaves in rosette, oblanceolate to spathulate, 2.0–7.5 cm long, crenate, petiolate, upper alternate leaves sessile, Flowers in leafless or leafy to 25 cm long, lax raceme to 6 cm long. Calyx lobes ovate to 8 mm,elongated in flowering . Corolla white or pale blue, lower lip with brown spots and bearded. Capsules subglobose with persistent calyx. Seeds minute, pale yellow.

*Fl. & Fr.:* June to March.

*J. Bhatt. & Maity* 33386

*Uses:* infusion of plants is used as tonic and febrifuge.

**5. MECARDONIA** Ruiz & Pav.

**Mecardonia procumbens** (Mill.) Small, Fl. Southeast U.S. 1065, 1338. 1903. *Erinus procumbens* Mill., Gard. Dict. ed. 8. n. 6. 1768. *Bacopa procumbens* (Mill.) Greenm., Field Columb. Mus. Bot. Ser. 2. 261. 1907. *Mecardonia dianthera* (Sw.) Pennell in Proc. Acad. Nat. Sci. Philadelphia 98: 87. 1946.

Herb, annual, prostrate, glabrous; stems 4-angled; rooting at lower nodes. Leaves opposite, decussate, ovate-rounded or ovate-lanceolate, crenate-serrate, glandular beneath, sessile or subsessile. Flowers in axillary, solitary, pedicellate, bracteate. Calyx with or without basal, bent appendages. Corolla lemon-yellow, hairy. Capsules cylindrical. Seeds reticulae.

*Fl. & Fr.:* July – September.

*J. Bhatt. & Maity* 32495

**6. TORENIA** L.

| | |
|---|---|
| 1a. Calyx glabrous | **1. T. bicolor** |
| 1b. Calyx hirsute | **2. T. hirsuta** |

**1. Torenia bicolor** Dalz. in Hook., Kew J. Bot. 3: 38. 1851; Hook.f., Fl. Brit. India 4: 278. 1884.

Trailing herb, rooting at nodes. Leaves deltoid-ovate, crenate, sparsely hirsute, subcordate. Flowers dark violet, solitary, pedicellate. Calyx tubular, keeled, decurrent on pedicels. Corolla bilipped; upper purple; lower white. Capsules oblong, included in calyx.

*Fl. & Fr.:* September.

*J. Bhatt. & Maity* 31121, 31124

**2. Torenia hirsuta** Willd., Sp. Pl. 3: 2661. 1800. *T. asiatica* L. var *hirsuta* (Willd.) Hook.f., Fl. Brit. India 4:277. 1884.

Stout, hirsute, diffuse herb. Leaves deltoid-ovate, serrate, pubescent, acute, truncate-cordate at base. Flowers white. Calyx hirsute. Coralla white on the mid lobe of lower lip, deep blue on side lobes. Pale blue on the upper lip.

*Fl. & Fr.:* October.

Rare.

## LENTIBULARIACEAE

### UTRICULARIA L.

**Utricularia stelaris** L.f. suppl.86.1781.; C.B. Clarke. in Hook.f. Fl. Brit. Ind. 4: 328. 1884.

*Vern.:* Jhangi ( Beng.)

Aquatic herbs, floating by floats below inflorescence, leaves submerged; pinnae bladders near their bases, flowers yellow 6–12 on scape. Calyx subequal, lobes orbicular, upper leaves of corolla truncate-emerginate; Spurs appressed to lower leaves.Capsule globose.

*Fl. & Fr.*: October – Novomber

## GESNERIACEAE

### 1. AESCHYNANTHUS Jack.

**Aeschynanthus acuminatus** DC., Prodr. 9: 263. 1845; C.B. Clarke in Hook.f., Fl. Brit. India 4: 341. 1884; Kanjilal & al., Fl. Assam 3: 391. 1939.

Slender epiphytes. Leaves elliptic, up to10 × 5 cm, leathery cuneate at base, acuminate at apex. Cymes 1–4 flowered, axillary; peduncled 1–3 cm; bracts ovate. Calyx lobes oblong, divided nearly to base. Corolla tubular, straight, crimson red; stamen far exerted. Fruit linear, up to 12 cm long. Seeds with single long hair at each end.

*Fl. & Fr.:* October – February.

*J. Bhatt. & Maity* 32302, 31130

### 2. RHYNCHOTECHUM Bl.

**Rhynchotechum ellipticum** (Dietr.) A. DC., Prodr. 9: 285. 1845; C.B. Clarke in Hook.f., Fl. Brit. India 4: 373. 1884. *Corysanthora elliptica* Dietr., Syn. Pl. 3: 582. 1843.

Shrubs of 1–2 m; young parts villous. Leaves elliptic, to 30 × 15 cm, acumiante at both ends, dentate at margin, subglabrous. Cymes trichotomously paniculate in lower axils or on leafless lower nodes. Calyx lobes linear, pinkish. Corolla *c.* 0.6 cm. Berries globose, *c.* 0.8 cm in diam., indehiscent, white.

*Fl. & Fr.:* August – January.

*J. Bhatt. & Maity* 32358

## BIGNONIACEAE

### 1. OROXYLUM Vent.

**Oroxylum indicum** (L.) Venten., Dec. Gen. Nov. 8. 1808; C.B. Clarke in Hook.f., Fl. Brit. India 4: 378. 1884; Prain, Beng. Pl. 2: 587. 1963. *Bignonia indica* L., Sp. Pl. 625. 1753.

*Vern.:* Sonpatti (Beng.)

Trees, to 15 m high, irregularly branched. Leaves usually tufted towards twigs end, to 1.5 m tall, long petiolate; leaflets ovate-elliptic, acuminate at apex, entire or coarsely serrate-dentate, shining, dark green above. Flowers solitary on a tubercle, arranged in erect terminal racemes; peduncles to 40–50 cm long. Calyx dirty-violet, campanulate, turning woody in fruit. Corolla deep maroon, glandular outside. Capsules flat, pendent, to 70 × 9 cm, tapering at both ends. Seeds with papery white wing.

*Fl. & Fr.:* June – March.

In dry deciduous forest, rare

*Uses:* The bark and seed used in veterinary medicine.

Young shoots and unripe fruit is eaten as vegetable.

### 2. STEROSPERMUM Cham.

**Stereospermum colais** (Buch.-Ham. Ex Dillw.) Mabberley in Taxon 27: 553. 1978. *Bignonia colais* Dillwyn, Rev. Hortus Malab. 28. 1839; C.B. Clarke in Hook.f., Fl. Brit. India 4: 382. 1884; Prain, Beng. Pl. 2: 589. 1963. *S. personatum* Chatterjee in Bull. Bot. Soc. Bengal 2: 70. 1948.

*Vern.: Dharmar* (Beng.)

Trees, deciduous, to 20 m tall; bark grayish-black, fissured. Leaves to 50 cm long, imparipinnate; leaflets 3–6 pairs, oblong, elliptic-oblong or lanceolate-oblong, to 15 × 7.5 cm, caudate-acuminate at apex, cuneate at base, entire, glabrous. Flowers in drooping terminal hairy panicles. Calyx purple. Corolla pale yellow with red-streaks; lobes rounded with crisped crenate margin. Capsules to 50 cm long, 4-angled, curled or spirally twisted. Seeds to 3.5 × 1.5 cm, winged.

*Fl. & Fr.:* May – August.

In mixed teak and dry deciduous forests, common

*Uses:* Root decoction is useful in asthma, cough, etc . Leaf juice is usful in rheumatism.

## ACANTHACEAE

### 1. ACANTHUS L.

**Acanthus ilicifolius** L., Sp. Pl. 639. 1753; Roxb., Fl. Ind. ed. Carey 3:32. 1832; C.B.Clarke in Hook.f., Fl. Brit. India 4: 480. 1885; Prain, Bengal Pl. 2: 596. 1961.

*Vern.: Harkuch, Harkat, Kantu* (Beng.)

A gregarious erect stem to 2 m high, sparingly branched, glabrous. Leaves oblong, 12 × 6 cm, pinnatifid or shallowly pinnately lobed, margin with few large spines, acute at base, coriaceous; 2 stipule like spines at base. Flowers crowded in *c.* 20 cm strobilate spikes. Corolla 3–4 cm long, pale to bright blue. Stamens exserted. Capsule ovoid, 1.8–3.4 cm, glabrous.

*Fl. & Fr.:* October – March.

*J. Bhatt. & Maity* 24570.

*Note:* The spine at the base of the leaves may be confused as stipule, but they are the lowest serration of the leaves.

*Use:* Leaves used in neuralgea and rheumatism.The root is used in asthma, paralysis and debility.

**2. BARLERIA** L.

**Barleria strigosa** Willd., Sp. Pl. 3: 379. 1803; C.B.Clarke in Hook.f., Fl. Brit. India 4: 486. 1885; Prain, Bengal Pl. 2: 606. 1963 .

*Vern.: Dasi* (Beng.)

An erect undershrubs, to 1.0 m high. Leaves broadly ovate or elliptic, to 19 × 10 cm. Flowers subsessile in dense shortly pedunculate, unilateral axillary or terminal cymes. Calyx 4, densely strigose; outer lobes rhomboid-ovoid, pectinate; inner lobes linear-lanceolate, bidentate with a prominent notch. Coralla purplish blue, 5.0–6.5 cm. Capsules oblong, ellipsoid, *c.* 2 cm. Seeds 4, compressed with silky hairs.

*Fl. & Fr.:* September – June.

In moist deciduous forests, sparse

*Uses:* Plant is bitter; useful in ulcers, skin disease, leucoderma. Root is used for remedy of cough.

**3. BLEPHARIS** Juss.

**Blepharis maderaspatensis** (L.) Roth., Nov. Fl. Spl. 320. 1821; Bremek. in Verh. Nederl. Acakd. Wet. (II) 45(2): 10. 1948. *Acanthus maderaspatensis* L., Sp. Pl. 892. 1953. *Blepharis boerhavifolia* Pers., Syn. Pl. 2: 180. 1806; C.B. Clarke in Hook.f., Fl. Brit. India 4: 478. 1885; Prain, Bengal Pl. 2: 596. 1963.

A diffuse prostrate much branched perennial herb, to 12 cm high, rooting at nodes. Leaves 4-unequal in a whorl, obovate or ovate-elliptic, to 8.0 × 3.5 cm, Flowers axillary, 2–3 together; bracteole 8 in opposite pairs, all are hyaline with green veins. Corolla white, 2 cm pubescent outside, tube ventricose upward. Stamens 4; anther spurred. Capsule ovoid, 0.5 cm reddish brown, clavate.

*Fl. & Fr.:* February – April.

Sparse in moist, shaded places as forest undergrowth.

**4. DICLIPTERA** Juss.

**Dicliptera roxburghiana** Nees in Wall., Pl. Asiat. Rar. 3: 111. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4: 553. 1885. *D. roxburghiana* Nees. var. *bupleuroides* (Nees) C.B. Clarke in Hook.f., Fl. Brit. India 4: 553. 1885; Prain, Bengal Pl. 2: 613. 1963 .

Erect or decumbent, ascending herb, to 80 cm high, often rooting from lower woody base. Leaves decussate, to 10.0 × 6.0 cm, ovate. Flowers small in axillary and terminal capitate cymes; bracts 2, leafy, unequal. Calyx to 0.6 cm long, subequal. Corolla bilipped, rosy-purple with violet spots. Capsules clavate, to 0.8 cm, puberulous. Seeds usually 2, verrucose.

*Fl. & Fr.:* November – April.

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*Use:* The plant used as a tonic in Punjab.

**5. ERANTHEMUM** L.

**Eranthemum nervosus** (Vahl) R.Br. ex Roem. & Schlt., Syst. Veg. 1: 174. 1817; *Justicia nervosa* Vahl., Enum. 1: 164. 1804. *Daedalacanthus nervosus* (Vahl) T. Anders. in J. L. Soc. Bot. 9: 487. 1867; C.B. Clarke in Hook.f., Fl. Brit. India 4: 418. 1885; Prain, Bengal Pl. 2: 602. 1963.

An erect stout herb, to 1.0 m long. Stem quadrangular, scabrous. Leaves ovate or ovate-elliptic-oblong, to 22 × 10 cm long. Flowers in a short dense terminal spikes forming close panicles; bracts white with green prominent nerve. Corolla purple, to 4.5 cm long; lobes subequal, rounded, glabrous. Stamens 2, perfect. Capsules 1.5 cm long, oblong, glabrous.

*Fl. & Fr.:* October – March.

*J. Bhatt. & Maity* 33397

## 6. HYGROPHILA R.Br.

1a. Plants armed; calyx 4 3. **H. schulii**
1b. Plants unarmed; calyx 5 2
2a. Leaves linear-oblong to elliptic-oblong, to 11 × 2.5 cm; flowers clusters in axillary whorls 2. **H. ringens**
2b. Leaves broadly elliptic to oblanceolate, to 0.8–0.3 cm; flowers 1–3 in axil 1. **H. polysperma**

**1. Hygrophila ringens** (L.) R.Br. ex Steud., Nom. Bot. ed. 1. 1: 418. 1821, ed. 2. 2: 783. 1841. *Ruellia ringens* L., Sp. Pl. 635. 1753. *Hygrophila salicifolia* (Vahl) Nees in Wall., Pl. As. Rar. 3: 81. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4: 407. 1885. *H. quadrivalvis* (Buch.-Ham.) Nees in Wall., Pl. As. Rar. 3: 90. 1832.

Erect herbs to 70 cm high, rooting at lower nodes. Leaves linear-oblong to elliptic-oblong, to 11 × 2.5 cm, attenuate base. Flowers clusters in axillary whorls; bracts oval-lanceolate; Calyx lobes linear-lanceolate. Corolla purplish-blue, bilobed, lower one ovate-oblong, palate rugose. Fertile stamens 4. Capsule linear-oblong to ovoid. Seeds many, 20–24, globose to ovoid.

*Fl. & Fr.:* November – April.

*J. Bhatt. & Maity* 33432

*Uses:* The leaves are diuretic. The seeds are used in headache & fever.

**2. Hygrophila schulli** (Buch.-Ham.) M.R. & S.N. Almeida in J. Bombay Nat. Hist. Soc. 83(Suppl.): 221. 1986; Bahel schulli, Buch.-Ham., Trans. Linn. Soc. London 14: 289. 1824. *Hygrophila spinosa* T. Anders. in Thw., Enum. Pl. Zeyl. 225. 1860; C.B. Clarke in Hook.f., Fl. Brit. India 4: 408. 1885; Prain, Bengal Pl. 2: 802. 1963.

*Vern.: Kulekhara, Kanta, Kalika* (Beng.)

Stout, hispid herb of 1.5 m high. Leaves in whorls of 6,subsessile, elliptic-lanceolate or linear-lanceolate, to 15 × 1.5 cm, obtuse at base, acute or subacute at apex; axillary persistent spines to 2.5 cm long, stout yellow. Flowers sessile, axillary whorls or about 8 flowers in each node; bracts lanceolate,cilate. Corolla bright blue or bluish-purple, 2-lipped; upper lip 2-fid; lower lips deeply 3-lobed. Stamens 4, exserted. Capsule linear-oblong, *c.* 0.8 cm long, 4–8 seeded, apex pointed.

*Fl. & Fr.:* October – February.

*F.No.:* 33431

*Uses:* The roots, leaves and seeds are used as diuretics jaundice, dropsy, rheumatism and of urino-genital diseases.

**3. Hygrophila polysperma** (Roxb.) T. Anders in J. L. Soc. Bot. 9: 456. 1876; C. B. Clarke in Hook.f., Fl. Brit. India 4: 406. 1885; Prain, Bengal Pl. 2: 801. 1963. *Hemiadelphus polysperma* (Roxb.) Nees in Wall., Pl. As. Rar. 3: 30. 1832. *Justicia polysperma* Roxb., Fl. Ind. ed. Carey & Wall. 1: 120. 1820.

Rhizomatous, terrestrial or aquatic herb to 36 cm tall. Leaves elliptic to oblanceolate, to 0.8 × 0.3 cm; upper leaves oblong-ovate or oblong-elliptic, crenate, apex obtuse, narrowed at base, lower leaves often pinnatifid, lobes oblong, serrate, decurrent. Flowers 1–3 in axils, into terminal spikes. Calyx 5 partite, linear. Corolla bilobed; upper lip erect, oval-oblong, notched, lower lip 3-lobed. Stamens 4, slightly exserted. Capsule *c.* 1 cm long, linear-oblong. Seeds 14–20.

*Fl. & Fr.:* March – July.

Abundant, adjacent to the lake area.

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### 7. JUSTICIA L.

**Justicia adhatoda** L., Sp. Pl. 15. 1753; Roxb., Fl. Ind. ed. Carey 3: 126. 1832; *Adhatoda vasica* Nees in Wall., Pl. As. Rar. 3: 103. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4:540. 1885; Prain, Bengal Pl. 2: 611. 1963 .

*Vern.: Vasaka* (Beng.)

An erect much branched gregarious shrubs to *c.* 4 m high. Leaves elliptic to elliptic-lanceolate, to 21 × 8 cm, subacuminate, entire. Spikes terminal and axillary *c.* 10.5 cm long. Bracts oval-oblong, 3-nerved .Calyx lobes 5, linear-oblong to linear-lanceolate, *c.* 1.0 × 0.3 cm, 3-nerved, acute. Corolla bilipped white; upper lip erect, ovate-oblong; lower lip 3-lobed, oblong-orbicular. Stamen 2, exserted. Capsules obovoid, stipitate, *c.* 2.5 cm long, 4-seeded.

*Fl. & Fr.:* October – April.

*Uses:* A decoction of boiled plants taken as remedy against cough, asthma, fever, leprosy, vomiting, jaundice, tumour and for loss of memory. The root is used for leucorrhoea.

### 8. LEPIDAGATHIS Willd.

**Lepidagathis incurva** D. Don, Prodr. 119. 1825; Yamazaki, Fl. E. Himal. 303. 1966. *Lepidagathis hyaline* Nees in Wall., Pl. As. Rar. 3: 95. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4: 521. 1885; Prain, Bengal Pl. 2: 608. 1963 .

Erect herbs with woody root stock, to 70 cm high. Leaves variable in shape and size, oblong-ovate or linear-oblong or lanceolate, to 15 × 4 cm long. Spikes numerous 2–8 together with variable size. Bracts dense, imbricate, scarious. Corolla white with mottled brown palate, 2-lipped, Stamens 4, Capsule oblong-lanceolate, acute, beaked. Seeds 4, orbicular.

*Fl. & Fr.:* October – May.

*J. Bhatt. & Maity* 32388

### 9. MACKAYA Harv.

**Mackaya indica** (Nees) Ensermu in Kew Bull. 47(4): 672. 1992. *Thrysacanthus indicus* Nees in DC., Prodr. 11: 335. 1847. *Eranthemum indicum* (Nees) C.B. Clarke in Hook.f., Fl. Brit. India 4: 497. 1885. *Pseudoeranthemum indicum* (Nees) A.M. Cowan & J.N. Cowan in Trees Northern Bengal 98. 1929.

Shrubs, 1.0–2.5 m high. Stems erect. Leaves elliptic, to 18 × 8.0 cm, shortly acuminate, cuneate at base. Inflorescence of lax terminal and axillary racemes, raceme 2–19 cm; Flowers usually in opposite pairs. Bracts linear-triangular. Calyx lobes lanceolate, acuminate. Corolla white or pink with darker red veins, 5-lobed. Stamens included. Styles persistent. Capsules 2.5–3.0 cm, glabrous.

*Fl. & Fr.:* December – April.

*J. Bhatt. & Maity* 32381.

### 10. NELSONIA R. Br.

**Nelsonia canescens** (Lam.) Spreng., Syst. Veg. 1: 42. 1825. *Nelsonia campestris* R.Br., Prodr. Fl. Nov. Holl. 1. 1810; C. B. Clarke in Hook.f., Fl. Brit. India 4: 394. 1885; Prain, Bengal Pl. 2: 797. 1963 .

*Vern.: Paramul* (Beng.)

Trailing or diffused decumbent, villous herb. Leaves dimorphic, to 10 × 5 cm, to 4 × 2.5 cm respectively. Flowers in ovate or cylindric spikes, terminally on the lateral branches, to 5.0 cm long; bracts broadly ovate, 5–7 nerves. Calyx quadripartite.Corolla bilabiate; posterior longer 2-lobed, anterior shorter 3-lobed. Capsule ovoid-oblong. Seeds many, retinacula absent.

*Fl. & Fr.:* November - March.

*J. Bhatt. & Maity* 33400

### 11. PHAULOPSIS Nees

**Phaulopsis imbricata** (Forssk.) Sweet, Hort. Brit. ed. 1. 327. 1827. *Ruellia imbricata* Forssk., Fl. Aegypt.-Arb. 113. 1775. *Phaulopsis parviflora* Willd., Sp. Pl. 3: 342. 1800; C.B. Clarke in Hook.f., Fl. Brit. India 4: 417. 1885; Prain, Bengal Pl. 2: 601. 1963 .

A much branched diffuse, suffruticose herb, to 70 cm long. Stem straggling. Leaves simple, ovate or elliptic, to 8.5 × 3.8 cm in unequal pair, acuminate, serrulate, base tapering. Flowers in dense terminal hispid spikes; bracts reniform to orbicular, enclosing 1–3 flowers. Calyx lobes 5, very unequal. Corolla white. Stamens 4, included. Capsule clavate, to 6 × 0.2 cm, stalked, 4-seeded. Seeds orbicular.

*Fl. & Fr.:* September - December.

In waste lands and in the vicinity of dry deciduous forests.

*J. Bhatt. & Maity* 33364/ 24409

### 12. PHLOGACANTHUS Nees

**Phlogacanthus thrysiformis** (Hardw.) Mabberley in K.S.Manilal, Bot. Hist.Hortus Malbaricus 83.1980. *Phlogacanthus thrysiflorus* (Roxb.) Nees in Wall., Pl. As. Rar. 3: 99. 1832; DC., Prodr. 11: 32. 1847; C.B. Clarke in Hook.f., Fl. Brit. India 4: 512. 1885. *Justicia thrysiflorus* Roxb., Fl. Ind. 1: 114. 1820; Prain, Beng. Pl. 2: 803. 1963 .

An evergreen shrubs of to 3.0 m high. Leaves elliptic-obovate to oblanceolate, to 28 × 8 cm, dark glossy green. Flowers, *c.* to 25 × 5 cm, elongated, uninterrupted, terminal thryses, usually solitary, rarely 2–3. Calyx lobes 5, linear, setaceous. Corolla orange brown, to 2.5 cm, wide-tubular, curved, *c.* 0.8 cm wide at mouth, closely villous, 2-lipped; upper lip suberect. Stamens shortly exserted. Capsule nearly clavate or oblanceolate, 12–14 seeded.

*Fl. & Fr.:* August - February.

*J. Bhatt. & Maity* 33366

*Uses:* Flowers are eaten as cooked vegetable. Leaves and fruits are used by ethnic people as medicine for specific fever.

### 13. RUNGIA Nees

**Rungia parviflora** (Retz.) Nees in Wall., Pl. As. Rar. 3: 110. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4: 550. 1885. *Justicia parviflora* Retz., Obs. 5: 9. 1789; *R. repens* T. Anders. in J. L.. Soc. Bot. 9: 518. 1867; Prain, Beng. Pl. 2: 613. 1963 (repr. ed.).

Herbs, stem rooting lower nodes, *c.* 50 cm high. Leaves variable in size and shape; upper ones linear-oblong to oval elliptic or broadly ovate,7–9 × 0.6–1.8 cm. Spikes often terminal, sessile; sterile bracts 1-ranked, oblong-lanceolate, narrowly scarious margined; fertile bracts obliquely oval-oblong, scarious margined. Corolla white, bilipped. Capsules ovoid, to 0.3 × 0.15 cm long.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 24399/ 33368

*Uses:* Dried plant are used in cough and fever and act as vermifuges and diuretic.It is also as skin oientment.

### 14. STROBILANTHES Blume

**Strobilantus discolor** (Nees) T. Anders in J.L. Soc. 9: 477. 1867. *Goldfussia discolor* Nees in DC., Prodr. 11: 172. 1847. *Difflugossa ragensis* Brem. 2141(1): 237. 1944.

A branched, decumbent shrubs, rooting at nodes. Leaves broadly elliptic or ovate, shortly acuminate, to 7.0 × 5.0 cm. Flowers in dense peduncled elongate head with many flowers; bracts obovate, herbaceous, persistent till the flowers fall; bracteoles oblanceolate. Calyx segments 5, linear.

Corolla blue, glabrous, gently curved, lobes ovate, rounded, *c.* 0.6 cm across. Capsules to 1.2 cm long, oblong-ellipsoid, 4-seeded.

*Fl. & Fr.:* September – February.

*J. Bhatt. &* Maity 33374

**15. THUNBERGIA** Retz.

1a. Stems slender; leaves entire, 3–5 nerved at base; flowers usually solitary or paired in axil of leaves; corolla bluish or white 1. **T. fragrans**
1b. Stems woody; leaves palmatified, 5–7 nerved; flowers in racemes, usually pendant; corolla always white 2. **T. grandiflora**

**1. Thunbergia fragrans** Roxb., Pl. Coromand. t. 67. 1795 & Fl. Ind. ed. Carey 3: 33. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4: 390. 1885; Prain, Bengal Pl. 2: 593. 1963 .

A large slender climber. Leaves oblong or ovate, to 6 × 2.5 cm, rounded, truncate, subcordate or hastate base, apex acute or obtuse. Petiole to 6.0 cm, winged. Flowers axillary, usually solitary, often paired, large, white or bluish. Calyx cup shaped, teeth, lanceolate. Corolla white, to 6 cm, narrowly infundibular; lobes 4–5, subequal, orbicular, fragrant. Capsules to 8 cm long, grey, shinning, curved upward with a beak. Seeds 4 or less.

*Fl. & Fr.:* August – March.

Almost throughout the year.

*Uses:* Tender leaves used as vegetables and also cultivated as garden plant for showy flowers.

**2. Thunbergia grandiflora** (Roxb. ex Rottle) Roxb., Hort. Beng. 45. 1814 & Fl. Ind. ed. Carey 3: 84. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4: 392. 1885; Prain, Bengal Pl. 2: 593. 1963. *Flemingia grandiflora* Roxb. ex Rottle, Ges. Nat. Fr.Neue Schr. 4: 202. 1803.

*Vern.: Nil lata* ( Beng.)

An extensive woody climber with pendent branches. Leaves deltoid to ovate-lanceolate, to 16 × 14 cm long, shallowly or deeply palmately lobed. Petiole to 14 cm, racemes usually stout, elongate; bracts deciduous, elliptic. Calyx , nectariferous all over, reduced to an entire ring. Corolla white; lobes 3–4 cm across. Stamens 4; anther cell spurred. Capsules to 8 cm. Seeds flat, subtrigonous, to 8 cm.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 33440

*Uses:* Cultivated as an ornamental plant in the garden.

**VERBENACEAE**

**1. CALLICARPA** L.

**Callicarpa arborea** Roxb., Fl. Ind. 1: 390. 1832; C.B. Clarke in Hook.f., Fl. Brit. India 4: 567. 1885; Prain, Beng. Pl. 2: 618. 1963 .

*Vern.: Bormalla* (Beng.)

Tree, to 8 m tall. Leaves elliptic or ovate-oblong, subacuminate at apex, cuneate at base, entire, glabrous above, tomentose beneath. Flowers in dichotomous cymes. Corolla lilac-purple. Drupes globose, purple. Seeds more or less, pale yellow.

*Fl. & Fr.:* May – November.

**2. CLERODENDRUM** L.

1a. Leaves linear; corolla more than 0.8 cm long **1. C. indicum**
1b. Leaves not linear; corolla less than 0.8 cm long 2

2a. Leaves mostly cordate at base, margin entire **3. C. splendens**
2b. Leaves truncate at base, margin not entire 3
3a. Leaves margin sharply serrate; flowers in pyramidal panicles; calyx green; corolla white **4. C. viscosum**
3b. Leaves margin irregularly dentate; flowers in terminal corymbose; calyx red; corolla pink **2. C. philippinum**

**1. Clerodendrum indicum** (L.) Kuntze, Rev. Gen. Pl. 2: 586. 1891. *Siphonanthus indicum* L., Sp. Pl. 109. 1753. *C. siphonanthus* R.Br. in W.T. Ait., Hortus Kew. ed. 2. 4: 65. 1812; C.B. Clarke in Hook.f., Fl. Brit. India 4: 595. 1885; Prain, Beng. Pl. 2: 624. 1963.

*Vern.: Bamanhati* (Beng.)

Woody shrubs to 2.5 m tall, erect. Leaves lanceolate to oblong, to 20 × 4 cm, acute or subacuminate at apex, acute at base. Flowers in axillary, 3–7 flowered cymes. Corolla white. Drupes 4-lobed, green, turning reddish black; fruiting calyx accrescent red, fleshy.

*Fl. & Fr.:* September – October.

*J. Bhatt. & Maity* 33315

*Uses:* It is used as astrigent and useful in rheumatism. Leaves used as vermifuge and ashma.

**2. Clerodendron philippinum** Schau. in DC., Prodr. 11: 667. 1847. *C. fragrans* Willd., Enum. Hort. Berol. 659. 1809; C.B. Clarke in Hook.f., Fl. Brit. India 4: 589. 1885.

Shrubs, erect, pubescent throughout. Leaves broadly ovate, to 25 × 20 cm, acute-acuminate at apex, cuneate at base. Flowers pinkish white in terminal corymbose panicles; calyx pertite. Fruit drupaceous.

*Fl. & Fr.:* July – October.

*F.No.*:31123

*Use:* It is a garden plant with fragrant white flowers and reddish calyx in shady umbels.

**3. Clerodendrum splendens** G. Don ex James, Edinb. New Philos. 11: 349. 1824. *non* A. Cheval, 1920; Naik, Fl. Marathwada 2: 700. 1998.

Shrubs, scandent. Leaves variable, elliptic, elliptic-ovate to ovate, oblong-orbicular, suborbicular or narrowly lanceolate, to 10 × 8 cm, acuminate at apex, cordate at base, pubescent on nerves beneath. Flowers in supra axillary and terminal corymbose cymes. Calyx campanulate, glabrous. Corolla deep red to crimson hypocrateriform, showy. Drupes black, shining.

*Fl. & Fr.:* January – March.

*J. Bhatt. & Maity* 32392

*Use:* Ornamental.

**4. Clerodendrum viscosum** Venten, Jard. Malm. 1: t. 25. 1803. *C. infortunatum* Dnnst. Schluess., Hort. Malab.27:1753, *nec* Garten.,1788 .C.B. Clarke in Hook.f., Fl. Brit. India 4: 594. 1885; Prain, Beng. Pl. 2: 623. 1963.

*Vern.: Bhant, Ghentu* (Beng.)

Shrubs to 3 m. high. Leaves ovate, to 20 × 15 cm, acuminate at apex, denticulate at margin, scabrous above and pubescent beneath. Flowers in terminal panicle, white, fragrant. Drupe globose, subtended by red accrescent calyx.

*Fl. & Fr.:* February – June.

*Use:* Roots, barks and flowers are used for skin diseases. Leaves are used as cheap substitute of "Chiretta".

### 2. HOLMSKIOLDIA Retz.

**Holmskioldia sanguinea** Retz., Obs. Bot. 6: 31. 1791; C.B. Clarke in Hook.f., Fl. Brit. India 4: 596. 1885; Prain, Beng. Pl. 2: 624. 1963.

Shrubs or small trees, straggling; branches drooping, angular. Leaves ovate-oblong, to 10 × 5 cm, acute to acuminate at apex, crenate-serrate or subentire at margin. Flowers in axillary or terminal racemes. Calyx red. Corolla brick-red, tubular, oblique, bilabiate. Drupes globose, brown.

*Fl. & Fr.:* November – March.

*J. Bhatt. & Maity* 32421

### 3. LANTANA L.

**Lantana camara** L. var **aculeata** (L.) Moldenke in Torreya 34: 9. 1974; Santap. in Bull. Bot. Surv. India 3: 18. 1961. *L. aculeata* L., Sp. Pl. 627.1753; Clarke in Hook.f., Fl. Brit. India 4:562. 1885; Prain, Beng. Pl. 2: 615. 1963 .

Straggling, aggressive shrubs. Leaves ovate, to 9 × 6 cm, acute at apex, cuneate, rounded or cordate at base. Flowers orange, red or pink in spikes. Bracts lanceolate. Corolla pubescent. Drupes globose, bluish-black.

*Fl. & Fr.:* October – April.

*J. Bhatt. & Maity* 32452

*Use:* Powdered roots with milk is used for colic pain, stomachache; stem is used for basket preparation; leaves are inferior beverages and used medicinally for fistula,tumors, eczema and rheumatism.

### 4. STACHYTERPHETA Vahl

**Stachytarpheta jamaicensis** (L.) Vahl., Enum. Pl. 1: 206. 1804. *Verbena jamaicensis* L., Sp. Pl. 19. 1753. *Stachytarpheta indica* (L.) Vahl var. *jamaicansis* (L.) Trimen, Handb. Fl. Ceylon 3: 348. 1895. C.B. Clarke in Hook.f., Fl. Brit. India 4: 564. 1885; Prain, Beng. Pl. 2: 616. 1963.

Tall herb, to 60 cm. Leaves obovate-elliptic, gradually narrowed and decurrent, serrate. Flowers violet in long slender spikes; bracts ovate-lanceolate, scarious. Calyx teeth 4. Corolla lobes 5. Stamens 2. Drupes oblong-cylindric.

*Fl. & Fr.:* February – October.

*J. Bhatt. & Maity* 31171

*Uses:* Young twig is edible, leaves used in cardiac problem.

### 5. VITEX L.

**Vitex peduncularis** Wall. Ex Schau. in DC., Prodr. 11: 687. 1847; C.B. Clarke in Hook.f., Fl. Brit. India 4: 587. 1885; Prain, Beng. Pl. 1: 618. 1963 .

*Vern.: Boruna, Goda* (Beng.)

Trees to 10 m high. Leaves 3-foliate; leaflets oblanceolate, to 9 × 4 cm, shortly acuminate at apex, thinly coriaceous. Flowers in lax dichasial cymes, axillary racemose panicles, to 25 cm long. Calyx yellow-spotted. Corolla cream coloured with blue tinge. Drupe obovoid

*Fl. & Fr.:* April – August.

*Uses:* Leaf infusion is useful in malarial fever and is antibacterial and antihaemolytic.

## LAMIACEAE

### 1. ANISOMELES R.Br.

**Anisomeles indica** (L.) Kuntze, Rev. Gen. Pl. 2:512. 1891. *Nepeta indica* L., Sp. Pl. 571. 1753. *Anisomeles ovata* R.Br. in Ait., Hort. Kew. ed 2. 2:364. 1811; Hook.f., Fl. Brit. India 4:672.1885; Prain, Beng. Pl. 2: 637. 1963 .

*Vern.: Gobura* (Beng.)

Undershrubs to 2 m tall. Stems villous-pilose. Leaves ovate, to 7 × 4 cm, acute at apex, cordate to cuneate or truncate at base, crenate-serrate at margin. Spikes to 20 cm long. Calyx 10-nerved, hirsute. Corolla purple, to 1.5 cm tall; upper lip entire, lower lip 4-lobed. Nutlet ellipsoid, 2 mm long, subtrigonous, black.

*Fl. & Fr.:* September – December.

In boundaries of the forests, sparse

*J. Bhatt. & Maity* 33394, 32483

### 2. GOMPHOSTEMMA Wall.

**Gomphostemma parviflorum** Wall. (*nom. nud.*) ex Benth. in Wall. Pl. Asiat. Rar. 2: 12. 1831; Hook.f., Fl. Brit. India 4: 697. 1885; Prain, Beng. Pl. 2: 642. 1963.

Tall, robust herb, to 3 m; stems woody, subterete. Leaves broadly or narrowly lanceolate, often elliptic-ovate, to 25 × 10 cm, acute to acuminate at apex, rounded or cuneate at base. Flowers yellow, in lax axillary cymes. Nutlets usually solitary, 0.5 cm, brown in colour.

*Fl. & Fr.:* August – November.

*J. Bhatt. & Maity* 31167

### 3. HYPTIS Jacq.

**Hyptis suaveolens** (L.) Poit. in Ann. Mus. Paris 7: 472. t. 29. f. 2. 1806; Hook.f., Fl. Brit. India 4: 630. 1885; Prain, beng. Pl. 2: 633. 1963 (rep. ed.). *Ballota suaveolens* L., Syst. Nat. ed. 10. 1100. 1759.

*Vern.: Bilati Tulsi* ( Beng.)

Undershrubs, erect, much branched, 0.5–1.5 m high, strongly aromatic, Stem hirsute, quadrangular. Leaves 3–6 × 2–4 cm, ovate, sparsely; Flowers, bluish- violet, in contracted, 1–5 fasicled cymes; Calyx 0.3–0.5 cm long (0.8–1.0 cm in fruits), 10 ribbed, mouth villous; Corolla *c.* 0.6 cm long, Nuts ovoid, rugose.

*Fl. & Fr.:* October – November.

Abundant in dry deciduous forests

*Uses:* Shoot tops are edible. Plant is used as green manure. Leaves are stimulant and carminative, used for headache.

### 4. LEUCAS Jacq.

**Leucas indica** (L.) R.Br. ex Vatke in Oster. Bot. 25: 95. 1875. *Leonurus indicus* L., Syst. Nat. ed. 10. 1101. 1759. *L. linifolia* (Roth) Spreng., Syst. Veg. 2: 743. 1825; Hook.f., Fl. Brit. India 4: 690. 1885; Prain, Beng. Pl. 2: 639. 1963;

*Vern.: Guma, Hal-kusha* (Beng.)

Puberulous herb. Leaves linear-lanceolate, subserrate, membranous. Flowers white. Calyx tube curved; mouth oblique, 8-toothed. Corolla annulate within; upper lip shorter than lower.

*Fl. & Fr.:* May.

Along the river banks in sandy soil, not common

*J. Bhatt. & Maity* 32491.

**5. OCIMUM** L.

**Ocimum tenuiflorum** L., Sp. Pl. 597. 1753. *O. sanctum* L., Syst. Nat. ed. 12, 2: 402. 1767; Hook.f., Fl. Brit. India 4: 609. 1885.

*Vern.: Tulshi* (Beng.)

Herb or undershrubs, annual or perennial, much branched; stem quadrangular. Leaves elliptic-ovate or elliptic-oblong, to 4 × 2.5 cm, obtuse at both ends, entire at margin, dotted with oil glands on both surfaces. Flowers reddish-pink in close whorl, racemes to 12 cm long; bracts suborbicular. Calyx campanulate. Corolla tubulat-campanulate; lobes of upper lip oblong-orbicular; lower ones ovate-oblong. Nutlets ellipsoid, dark brown.

*Fl. & Fr.:* September – February.

*F.No.:* 33045

*Uses:* Oil have antibacterial properties. The leaves are used as condiment, expectorant and useful in skin diseases and malarial fever.

**6. POGOSTEMON** Desf.

1a. Erect herb or shrubs; inflorescence panicled; nutlets suborbicular 2
1b. Procumbent herb; inflorescence not panicled; nutlets broadly ellipsoid to obovoid **1. P. auricularis**
2a. Bracts ovate to suborbicular; corolla tube exserted; stamens 5–6 mm long 3
2b. Bracts lanceolate or rarely elliptic; corolla tube not exserted; stamens 3–4 mm long **3. P. heyneanus**
3a. Shrubs, 1.5–2.0 cm high; verticillasters congested, compact; bracts imbricate, persistent **2. P. benghalensis**
3b. Herb or undershrubs, 60–120 cm high; verticillaster not congested, continuous or distant; bracts ovate, not imbricate, deciduous **4. P. pubescens**

**1. Pogostemon auricularias** (L.) Hassk. in Taydsch. Nat. Gesch. 10: 127. 1843. *Mentha auricularia* L., Mant. Pl. 1: 81. 1761. *Dysophylla auricularia* (L.) Bl., Bijdr. 826. 1826; Hook.f., Fl. Brit. India 4: 638. 1885.

*Vern.: Pani Kula ( Bengali)*

Slender, flaccid, erect herb of 40–60 cm high, villous or hirsute with spreading hairs or shaggy. Leaves elliptic-oblong, 2.5–7.0 cm long, subacute at apex, rounded at base, serrate; petioles subsessile. Flowers pink or plae lilac in slender spicate racemes of 5–10 cm long. Nutlets 4, broadly ellipsoid, smooth.

*Fl. & Fr.:* June – December.

**2. Pogostemon benghalensis** (Burm.f.) Kuntze, Rev. Gen. Pl. 2:529.1891. *Criganum benghalensis* Burm.f., Fl. Ind. 128. t. 38. f. 3.1768. *Pogostemon plectrantoides* Desf. in Ann. Mus. Paris 2:156. t. 6. 1808; Hook.f., Fl. Brit. India 4: 632.1885; Prain, Beng. Pl. 2: 634. 1963 .

*Vern.: Jui-lata* (Beng.)

Erect, aromatic shrubs, to 3 m high. Leaves ovate-lanceolate, bi-serrate, pubescent beneath, acute, rounded at base. Flowers pink, in white-tomentose dense panicles; Bracts lanceolate, leafy, tawny-pubescent. Calyx teeth 5, shorter than tube. Stamens 4, unequal.

*Fl. & Fr.:* February- April.

*J. Bhatt. & Maity* 32336

*Uses:* Leaves used as stimulant and styptic. Leaves juice is given for colic fever.

**3. Pogostemon heyneanus** Benth. in Wall., Pl. Asiat. Rar. 1: 31. 1830. *P. patchouli* Hook.f., Fl. Brit. India 4: 633. 1885 *non* Pellet 1844.

Aromatic tomentose herb. Leaves membranous, ovate, crenate-serrate, acute. Flowers pale pink-white in globose clusters to spicate recemes; bracts ovate, ciliate. Calyx-lobes 5, pubescent.Corolla lobes 4.

*Fl. & Fr.:* October – November.

**4. Pogostemon pubescens** Benth. in DC. Prodr. 12:152. 1848. *P. Parviflorus* Benth. in Wall., Pl. Asiat. Rar. 1:31. 1830. *pro parte*; Hook.f., Fl. Brit. India 4:632. 1885; Prain, Beng. Pl. 2: 634. 1963 .

Stout herb or undershrubs, to 2.5 m high. Leaves ovate-lanceolate, to 12.5 × 5.5 cm, acuminate at apex, cuneate at base, serrate at margin, tomentose beneath, long-petioled. Flowers pink, in grayish-tomentose pyramidal lax panicles, whorls close, sessile. Calyx glandular pubescent, shorter than bracts. Corolla upper lip 3-lobes; lower lip entire, 5×7 mm long. Nutlets ellipsoid, orbicular, *c.* 1 mm long, angular on the inner face.

*Fl. & Fr.:* January – March.

*J. Bhatt. & Maity* 32420

## NYCTAGINACEAE

### BOERHAVIA L.

**Boerhavia diffusa** Enelm. & A. Gray in Bost. Jr. Nat. Hist. 5:259.1847. *B. rupens* L., Sp. Pl. 3. 1753; Prain, Beng. Pl. 2: 645. 1963. *B. procumbens* Banks ex Roxb., Fl. Ind.1:148. 1830 *nom. superfl*.

*Vern.: Seupune* (Beng.)

Diffuse, ascending herb. Leaves thick, in unequal pairs, ovate-oblong, to 2.8 × 2.3 cm, rounded-subcordate at base, margin undulate, white beneath. Flowers bright pink, in panicles of subcapitate umbels. Perianth urceolate, 5-ribbed. Stamens 1–3. Fruits clavate, glandular-viscid along the 5-ribs.

*Fl. & Fr.:* October.

Common weed in waste place and in the vicinity of forests

*J. Bhatt. & Maity* 32492

*Uses:* Root is laxative, diuretic, expectorant, and used in asma. It is eaten as pot herb.

## AMARANTHACEAE

### 1. ACHYRANTHES L.

1a. Bracteoles ovate, tipped with a spiny staminodes, fimbriate **1. A. aspera**
1b. Brateoles reduced to spine; staminodes toothed, but not fimbriate **2. A. bidentata**

**1. Achyranthes aspera** L., Sp. Pl. 204. 1753; C.B. Clarke in Hook.f., Fl. Brit. India 4: 730. 1885; Prain, Beng. Pl. 2: 654. 1963 .

*Vern.: Apang* (Beng.)

An erect herb to 1 m high. Leaves bluish purple to glaucous, broadly ovate or obovate, to 10 × 5 cm, acute to rounded at apex, obtuse at base. Flowers hermaphrodite, red, in erect, dense axillary and terminal spikes to 25 cm long. Stamens alternate with subquadrate pseudo-staminodes. Utricles 3–5 mm long, indehiscent. Seeds subcylindric, smooth.

*Fl. & Fr.:* September – April.

Common weed of waste places, also found in the vicinity of forests

*Use:* Flowering spikes and seeds grounds into paste and are used for poisonous insect bites. The whole plant is used medicinally.

**2. Achyranthes bidentata** Bl., Bijdr. 545. 1826; Hook.f., Fl. Brit. India 4: 730. 1885; Prain, Beng. Pl. 2: 654. 1963 .

A straggling subscandent herb, 75–150 cm high. Leaves oblanceolate to elliptic-ovate, acuminate at apex. Flowers dull reddish in slender rachis of spikes; bracts lanceolate, awned; bracteoles spines with 2 auricled at base. Perianth lobes 5, lanceolate.

*Fl. & Fr.:* October - December.

*J. Bhatt. & Maity* 33343

*Use:* Plant paste as astringent and diuretic.

**2. AERVA** Forsk.

**Aerva lanata** (L.) Juss in Ann. Mus. Nat. Hist. Paris 11:131. 1808. Hook.f., Fl. Brit. India 4:728.1885; Prain, Beng. Pl. 2: 653. 1963. *Achyranthes lanata* L., Sp. Pl. 205. 1753.

*Vern.: Chaya* (Beng.)

Annual, tomentose herb, branching from woody rootstock. Leaves obovate-orbicular, to 4 × 2 cm, acute at apex, tapering at base, entire at margin. Flowers white, 5-merous, in axillary, to 1.5 cm long spikes. Bracts and bracteoles ovate, ciliate. Perianth lobes thin, to 1.0–1.5 mm long, oblong. Utricles compressed, rotund. Seeds reniform.

*Fl. & Fr.:* July.

On waste places, common

*J. Bhatt. & Maity* 31173

*Use:* Dry leaves and flowers are used for the treatment of bronchitis, asthma and jaundice. Dry leaves grazed by herbivores.

**3. ALTERNANTHERA** L.

| | |
|---|---|
| 1a. Heads pedunculate except the terminal ones | **2. A. philoxeroides** |
| 1b. Heads sessile, sometimes on pseudo-peduncles | 2 |
| 2a. Tepals 1-nerved throughout; anthers 3 | **3. A. sessilis** |
| 2b. Tepals 3-nerved in the lower half; anthers 5 | **1. A. paranychioides** |

**1. Alternanthera paronychioides** St. Hill., Voy. Distr. Diam. 2: 439. 1833; Mears & Gills in J. Arn. Arb. 58: 62. 1977.

Herb, perennial, prostrate, mat-forming, rootstock stout; branches rooting at nodes. Leaves elliptic, ovate or obovate, white villous when young, sparsely hairy beneath, petiolate. Flowers in axillary, solitary or 2–3 together globose or ovoid, sessile heads; heads white. Utricle orbicular-obcordate, compressed. Seeds minute, discoid, brownish, shining.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 32494

**2. Alternanthera philoxeroides** (Mart.) Griseb. in Goett. Abh. 24: 36. 1879. *Bucholzia philoxeroides* Mart., Beitr. Amarantac. 107. 1825 et in Nova Acta Leop. 13: 315. 1826.

Herb, perennial, floating; stems thick, rooting at nodes. Leaves variable, obovate-spathulate or linear-lanceolate to oblong, acute at apex, narrowed at base. Flowers in axillary, solitary, globose, pedunculate heads; heads white, apical heads sessile, smaller. Utricle obcordate with thick margin. Seeds discoid, brown.

*Fl. & Fr.:* August – October.

*Uses:* Leaves are edibile as vegetable like spinash. Very good fodder.

**3. Alternanthera sessilis** (L.) R.Br. ex DC. in Cat. Hort. Monspet. 4: 77. 1813; C.B. Clarke in Hook.f., Fl. Brit. India 4: 731. 1885; Prain, Beng. Pl. 2: 655. 1963. *Gomphrena sessilis* L., Sp. Pl. 225. 1753. *A. triandra* Lamk., Encycl. 1: 95. 1783.

Branched prostrate herb, yellowish-green, shining; rooting at lower nodes; stems quadrangular. Leaves lanceolate or linear-oblong, to 2.5 × 0.8 cm, acute at apex, cuneate at base. Flowers white with pinkish tinge, in globose or elongated axillary heads. Perianth lobes 5, glabrous. Stamens 3–5, alternate with staminodes. Utricles obcordate. Seeds ovoid, brown, discoid.

*Fl. & Fr.:* Throughout the year.

Common in dried up stream beds.

*Use:* Plants is used as fodder. Its juice is said to be used in rheumatism. Medicinally it is also used in night blindness, diarrhoea, dysentery and externally for boils. The young leaves twig is used as spinach.

**4. AMARANTHUS** L.

**Amaranthus viridis** L., Sp. Pl. ed. 2. 1405. 1763; C.B. Clarke in Hook.f., Fl. Brit. India 4: 720. 1885; Prain, Beng. Pl. 2: 651. 1963. *A. gracilis* Desf., Tabl. Ec. Bot. 43. 1804.

An erect or diffuse armed herb. Leaves long petioled, broadly ovate-rhomboid, subacute, emerginate at apex, tapering at base. Flowers very small, green or purplish brown in axillary or terminal panicle of *c.* 12 cm long. Stamens 3. Utricle indehiscent, subconical, wrinkled. Seeds shining, smooth.

*Fl. & Fr.:* Throughout the year.

*Use:* It is used against urine-troubles and skin-diseases.

**5. DEERINGIA** R. Br.

**Deeringia amaranthoids** (Lam.) Merr., Interpr. Rumph. Herb. Amb. 211. 1917; Fl. As. 4: 3. 1940. *Achyranthes amaranthoides* Lam., Encycl. 1: 548. 1785. *Deeringia celosioides* R.Br., Prodr. 413. 1810; Hook.f., Fl. Brit. India 4: 714. 1885; Prain, Beng. Pl. 2: 647. 1963 .

*Vern.: Gola-mohani* (Beng.)

Subscandent shrubs; branches pendulous, glabrous. Leaves ovate or oblong-lanceolate, acuminate at apex, rounded at base, entire or undulate at margin. Flowers in terminal and axillary racemes; usually paniculate. Tepals elliptic-oblong, membranous. Berries globose.

*Fl. & Fr.:* September – December.

*J. Bhatt. & Maity* 33399

*Uses:* Leaves are used in sores. Root is stimulant and ripe fruit juice is used a substitute for red ink.

**6. PSILOTRICHUM** Bl.

**Psilotrichum ferrugineum** (Roxb.) Miq. in DC., Prodr. 13(2): 279. 1849. *Achyranthes ferruginea* Roxb., Fl. Ind. 1: 675. 1882; Prain, Beng. Pl. 2: 651. 1963. *Psilotrichum trichotomum* Bl., Bijdr. 545. 1825; Hook.f., Fl. Brit. India 4: 825. 1885.

Herb, 10–70 cm high, prostrate. Leaves obovate-oblong or linear, to 2.0 × 0.8 cm, acute at apex, acute to cuneate at base. Spikes terminal and in the forks. Flowers dull red or pink. Perianth segments lanceolate, glabrous. Stamens 5. Seeds ovoid, to 1 mm long, shining black or blackish brown.

*Fl. & Fr.:* August – December.

In moist places, sparse

*J. Bhatt. & Maity* 33372

*Status:* Rare.

*Uses:* Fruit is edible tonic anticorbutic and ulnerary.

**7. PUPALIA** Juss.

**Pupalia lappacea** (L.) Juss. in Ann. Mus. Paris 2:132.1803; Hook.f., Fl. Brit. India 4:724. 1885; Prain, Beng. Pl. 2: 652. 1963 (rep. ed.). *Achyranthes lappacea* L., Sp. Pl. 204. 1753.

Slender, erect herb. Leaves ovate-oblong to lanceolate, appressed-pubescent, acute. Flowers pale pink, in lax spikes; Imperfect flowers reduced to hooked bristles. Perianth lobes 5, lanceolate-oblong, mucronate. Stamens 5; anthers purplish. Capsules depressed-globose.

*Fl. & Fr.:* September – October.

*J. Bhatt. & Maity* 31182, 32493

*Uses:* Yield inferior quality of wool. Fruit is used in cuts.

## POLYGONACEAE

### PERSICARIA L.

| | |
|---|---|
| 1a. Racemes spike-like to filiform, often branched | 2 |
| 1b. Racemes ovoid or subglobose at the end of the branch | 3 |
| 2a. Stamens 6–8; style 2; nuts biconvex | **2. P. glabra** |
| 2b. Stamens 5; style 3; nuts trigonous | **5. P. posumba** |
| 3a. Stems, petioles and veins beneath bearing recurved spines | **6. P. sagittate** |
| 3b. Stems and petioles without recurved spines | 4 |
| 4a. Erect shrubs with divaricate branches; spikes many in widely branched corymbose | **1. P. chinensis** |
| 4b. Decumbent herb; spikes few in once or twice forked panicles | 5 |
| 5a. Leaves hastately ovate-lanceolate; petioles and peduncles glabrous, eglandular | **3. P. microcephalum** |
| 5b. Leaves triangular-rhomboidal or elliptic-lanceolate; petiole base and peduncles all with hispid gland-tipped hairs | **4. P. nepalensis** |

**1. Persicaria chinensis** (L.) H. Grosss in Eng. Bot. Jahrb. 49: 314. 1913. *Polygonum chinense* L., Sp. Pl. 363. 1753; Hook.f. Fl. Brit. India 5:44. 1886; Prain, Beng. Pl. 2: 664. 1963 .

Scandent, glabrous undershrubs. Leaves elliptic or ovate, to 12 × 7 cm, crenulate, pubescent beneath; acute, truncate at base. membranous, obliquely cleft. Bracts ovate, acute, glabrous. Flowers in rounded heads. Perianth white or pink, in corymbose panicles. Perianth lobes 5, ovate, concave, white or pink. Nutlets trigonous.

*Fl. & Fr.:* October – April

*J. Bhatt. & Maity* 32457 / 32426

*Uses:* Fruits are edible .

**2. Persicaria glabra** (Willd.) Gomez in Ann. Ins. Segunda Ensef. Habana 2: 278. 1896. *Polygonum glabrum* Willd., Sp. Pl. 2: 447. 1799; Hook.f., Fl. Brit. India 5: 34. 1886; Prain, Bengal Pl. 2: 663. 1963 .

Amphibious, glabrous, erect herb. Rooting from the lower nodes, to 1.5 m. Leaves linear-lanceolate, to 13 × 3 cm, long-acuminate, base cuneate, gland-dotted. Ochreae tubular, glabrous. Bracts oblong, glabrous. Flowers pink, in terminal racemes. Perianth lobes 5, oblong. Stamens 5. Style 2. Nuts biconvex, orbicular.

*Fl. & Fr.:* October – March.

J. Bhatt. & Maity 32383

Leaf infusion is given in colic and used as febrifuge. Root is useful in piles, jaundice, and in antibacterial.

**3. Persicaria microcephala** (D. Don) H. Gross in Bot. Jahrb. 49: 312. 1913. *Polygonum microcephalum* D. Don, Prodr. Fl. Nepal. 70. 1825.

Perennial, suberect or prostrate herb, woody root-stock. Leaves ovate, to 8.0 × 3.5 cm, acuminate at apex, rounded or cordate at base, winged decurrent lamina. Ochreae 1 cm, truncate. Flowers head globoes, usually 2–3 from axils of deeply cordate, upper leaves on peduncle without an involucral leaves. Perianth white. Stamen 8. Style 2–3. Achene trigonous.

*Fl. & Fr.:* September – December.

*J. Bhatt. & Maity* 31123

**4. Persicaria nepalensis** (Meissn.) H. Gross in Eng. Bot. Jahrb. 49: 277. 1913. *Polygonum nepalensis* Meissn., Monogr. Polyg. 84. t. 7, f. 2. 1826. *P. alatum* Buch.-Ham. ex Spreng., Syst. Veg. Cur. Post. 154. 1827, *nom. illegit.*; Hook.f., Fl. Brit. India 5: 41. 1886.

Annual prostrate herb to 70 cm long with ascending branches, rooting at lower nodes. Leaves deltoid-ovate, to 5 × 3.5 cm, acute at apex, subcordate or cuneate at base. Ochreae obliquely cleft, acute or obtuse. Peduncles to 2 cm long, glandular-hairy at apex. Perianth whitish-pink. Nuts *c.* 0.2 cm across, broadly ovoid, minutely punctate. Seeds black.

*Fl. & Fr.:* August – November.

*J. Bhatt. &* Maity 31122

**5. Persicaria posumba** (Hamilt ex D.Don) N (Elmer) Sojak in Perslia 46(2): 154.1974;. *Polygonum posumba* Buch.-Ham. ex D. Don, Prodr. Fl. Nepal. 71. 1825; Hook. f., Fl. Brit. India 5: 38. 1886.

Slender, flaccid herb, to 50 cm high. Leaves ovate-elliptic, to 7 × 1.5 cm, acuminate at apex, cuneate at base. Ochreae 6–10, long. Racemes 5–9 flowered, very slender, interrupted on 5–7 cm long peduncle. Perianth eglandular, white to pinkish. Stamen 5. Style 3. Achenes dark brown to black, trigonous, *c.* 2.5 mm long.

*Fl. & Fr.:* April – December.

**6. Persicaria sagittata** (L.) H. Gross in Bot. Jahrb. 49: 314. 1913. *P. sagittatum* L., Sp. Pl. 363. 1753.

Annual, erect or subscandent herb, to 25 cm high. Stem angular, bearing small recurved spines. Leaves oblong-ovate, acute at apex, base cordate-sagittate with acute lobes bearing often hooked spines on the midrib beneath. Flowers head solitary, 5–10 flowered, white. Perianth segment pink. Achene trigonous, pale brown, smooth.

*Fl. & Fr.:* July – October.

## PIPERACEAE

### 1. PEPEROMIA Ruiz & Pav.

**Peperomia pellucida** (L.) Kunth in Humb., Bonpl. & Kunth, Nov. Gen. Pl. 1: 64. 1816. *Piper pellucidum* L., Sp. Pl. 30. 1753. Prain, D. Beng. Pl.2:669.1963.

An erect herb, rarely rooting at lower nodes. Stems glabrous, pellucid. Leaves deltoid-ovate, to 3 × 2.5 cm, cordate at base, 5-nerved. Flowers in axillary, terminal or leaf-opposed spikes, to 3 cm long. Fruit globose, brownish black, sulcately striate, pointed at apex.

*Fl. & Fr.:* September – December.

*Use:* The plants is sometimes used as vegetables. Leaves are used in headache, fever and abdominal pain.

**2. PIPER** L.

1a. Bracts of male and female spikes basifixed with decurrent wings, never peltate or medifixed **1. P. attenuatum**
1b. Bracts of male and female spike peltate, stalked or often sessile and medifixed 2
2a. Female flowering and fruiting spikes borne on short peduncles **4. P. sylvaticum**
2b. Female flowering and fruiting spikes borne on longer peduncles 3
3a. Leaves with 7 pairs of veins from base; veins minutely puberulous beneath **3. P. longum**
3b. Leaves with 3–6 pair of veins from base, glabrous **2. P. chaba**

**1. Piper attenuatum** Ham. ex Miq., Syst. Pip. 306. 1843, *non* Herb. ex Link 1820. *P. trioicum* Roxb., Fl. Ind. 1: 151. 1820. *P. sylvestre sensu* Wight, Ic. t. 1937.

Climbing shrubs. Leaves broadly ovate, to 9 × 6.5 cm, shortly acuminate, base truncate, 7–9 veined. Flowering spikes slender, to 12 cm on short peduncle. Bracts adnate medianly to axis, margins free, overlapping to cover flowers. Flowers white. Berry globose, dorsally aggregated.

*Fl. & Fr.:* August – November.

*J. Bhatt. & Maity* 32448, 32437

*Uses:* Roots are excellent diuretic. Fruits used as carminative and condiments.

**2. Piper chaba** Hunter in Asiat. Res. 9: 391. 1807; Roxb., Fl. Ind. 1: 156. 1820; Hook.f., Fl. Brit. India 5: 83. 1886; Prain, Beng. Pl. 2: 668. 1963 .

*Vern.: Choi* (Beng.)

A stout climber with rooting at nodes. Leaves very short petioled, oblong-ovate or lanceolate, to 15 × 6.5 cm, acuminate at apex, base variable, pale when dry, nerves 3–6 pairs. Fruiting spike stoutly peduncled, conico-cylindric, with globose fruits in aggregate.

*Fl. & Fr.:* February – August.

*Uses:* Root decoction cure colic and used for dyspepsia and gastrities. Fruits stimulant and carminitive used in haemorrhoidal affection, digestive and other disorders.

**3. Piper longum** L., Sp. Pl. 29. 1753; Hook.f., Fl. Brit. India 5: 83. 1886; Prain, Beng. Pl. 2: 668. 1963 .

*Vern.: Pipul* (Beng.)

A slender creeper with erect flowering branches. Leaves ovate-cordate, to 10 × 6 cm, acuminate at apex, basal lobes equal, 7-nerved; lower leaf long petioled, to 2.5 cm long; upper sessile. Spikes slender, yellow; bracts peltate; fruiting spikes to 2.5 cm long, fleshy, 1-seeded berry.

*Fl. & Fr.:* July – October.

J. Bhatt. & Maity 31164

*Status:* Rare.

*Uses:* Fruits are used as condiment and to treat in cough and cold. Leaves are chewed like bettle leaves.

**4. Piper sylvaticum** Roxb., Fl. Ind. 1: 152. 1820. *P. thomsonii* (C. DC.) Hook.f., Fl. Brit. India 5: 87. 1886. *Chavica thomsonii* C. DC. in DC. Prodr. 16(1): 389. 1869.

*Vern.: Pahari Pipal* (Beng.)

Scandent shrubs. Leaves ovate to elliptic-oblong, to 13 × 6 cm, acute to acuminate at apex, truncate to acute at base, basal nerves 5. Spikes on short peduncle; female spikes subglobose or cylindric. Berries sessile, globose, red, densely aggregated.

*Fl. & Fr.:* March – August.

*J. Bhatt. & Maity* 31196

*Uses:* Leaves are used as betal leaves and root is diuretic.

## ARISTOLOCIACEAE

### ARISTOLOCHIA L.

1a. Climbers glabrous; leaves ovate-oblong with shallowly cordate cuneate base; petioles to 1–1.5 cm long;flowers in axillary racemes **1. A. indica**

1b. Climbers villous; leaves broadly ovate or ovate-elliptic, deeply cordate at base; petioles to 1 cm long; flowers solitary in axil **2. A. serata**

**1. Arislochia indica** L., Sp. Pl. 960. 1753; Hook.f., Fl. Brit. India 5: 75. 1886; Prain, Beng. Pl. 2: 891. 1963. *A. lanceolata* Wight, Ic. t. 1858. 1852.

Twinners. Stem 5 ribbed, solid, greenish. Leaves obovate-oblong, to 9 × 4 cm, acuminate to apiculate at apex, shallowly cordate-cuneate at base, with a shallow sinus near base on each side otherwise entire; petioles 1.0–1.5 cm long. Flowers in a short axillary raceme. Perianth slightly curved, base globose. Seeds deltoid-ovoid, flat.

*Fl. & Fr.:* August – December.

*Uses:* Used to cure snake bite, flatulence dyspepsia, malaria fever. Root with honey is useful in leucoderma.

**2. Arislochia serata** Wall., Pl. Asiat. Rar. 2, t. 103. 1830; Graham in Bot. Mag. 65: t. 3640. 1839; Hook.f., Fl. Brit. India 5: 76. 1886.

Large woody extrose twinner; stem terete. Leaves broadly ovate or ovate-lanceolate, acuminate at apex, deeply cordate at base, entire at margin. Flowers axillary, solitary. Capsules obovoid, many angled.

*Fl. & Fr.:* March – August.

*F.No.:* 32488

## CHLORANTHACEAE

### CHLORANTHUS Swartz.

**Chloranthus eletior** R.Br. ex Link. in Bot. Mag. t. 2190. 1820; Haridasan & rao, Forest Fl. Meghalaya 2: 709. 1987. *C. officinalis* Blume, Enum. Pl. Java 79. 1827; Hook.f., Fl. Brit. India 5: 100. 1886.

An erect stem of to 1 m. Leaves elliptic, to 20 × 9 cm, shortly acuminate, base cuneate, margin finally serrated; petiole 4–8 mm. Spikes often paniculately branched, 3–5 cm. Bracts in opposite, distant pairs, ovate, each subtending ovary. Staminal scales ovate, 3-lobed. Drupe ovoid, 5 mm long, white.

*Fl. & Fr.:* May – October.

*J. Bhatt. &* Maity 32343

*Use:* Leaves used as vegetables.

## LAURACEAE

### 1. ACTINODAPHNE Nees

**Actinodaphne obovata** Bl., Mus. Bot. Lugd. Bot. 1: 342. 1851; Allen in Ann. Miss. Bot. Gard. 25: 404. 1938.

Trees to 20 m, young growth reddish-brown, tomentose. Leaves drooping, obovate, to 40 × 17 cm, acute at apex, base cuneate, glaucous beneath; lateral veins 5–7 pairs, strongly prominent beneath. Male panicle to 5 cm. Female panicle shorter. Fruits ellipsoid to 2 cm, borne on enlarged perianth cup.

*Fl. & Fr.:* March – April.

*J. Bhatt. & Maity* 32426

### 2. CINNAMOMUM Blume

1a. Leaves opposite, 3-nerved; fruit ellipsoid **1. C. bijolgota**
1b. Leaves alternate, penninerved; fruit globose **2. C. glanduliferum**

**1. Cinnamomum bijolgota** (Buch.-Ham.) Sweet, Hort. Brit. 344. 1827; Kosterm. & Chart. in Enum. Pl. Nepal. 3: 183. 1982. *C. obtusifolium* Roxb. ex Hook. f., Fl. Brit. India 5: 128. 1886; Prain, Beng. Pl. 2: 673. 1963 .

Trees to 20 m. Leaves coriaceous, opposite, elliptic to 40 × 12 cm, obtuse and bluntly acuminate, base cuneate, glossy above, 3-nerved. Panicles 12–20 cm. Perianth segments ovate. Fruits ellipsoid, *c.* 1.5 ×1 cm, borne on enlarged perianth cup.

*Fl. & Fr.:* March – May.

*J. Bhatt. & Maity* 32435

**2. Cinnamomum glanduliferum** Meissn. in DC., Prodr. 15(1): 25. 1864; Hook. f., Fl. Brit. India 5: 135. 1886.

Shrubs or small trees to 15 m high. Leaves alternate, elliptic-ovate, to 13 × 6 cm, acuminate at apex, base cuneate; lateral veins 3–4 pairs. Panicles 3–5 per shoot, distant in leaf axils, 6–12 cm. Perianth to 0.3 cm, segment ovate, caducous. Fruits globose, borne on obconical perianth.

*Fl. & Fr.:* January – March.

*J. Bhatt. & Maity* 33368

*Use:* Wood camphor-scented. Used for planking.

### 3. LITSEA Lamk.

1a. Umbel arranged in corymbs; fruits borne on small disc shaped perainth tube **1. L. glutinosa**
1b. Umbel arranged in axillary clusters; fruits borne on enlarged cup shapd perianth tubes 2
2a. Umbel borne on sessile clusters of 3–6; leaves glabrous **2. L. laeta**
2b. Umbel borne on pedunculate cluster of 6–18;
leaves minutely silky pubescent beneath **3. L. salicifolia**

**1. Litsea glutinosa** (Lour.) Robinson in Philipp. J. Sci. Bot. 6: 321. 1911. *Sabifera glutinosa* Lour., Fl. Cochinch. 2: 638. 1790. *L. sabifera* Pers., Syn. Pl. 2: 4. 1806; Hook.f., Fl. Brit. India 5: 157. 1886; Prain, Beng. Pl. 2: 675. 1963 .

*Vern.: Kukur-chita, Ratum garur* (Beng.)

Trees, to 15 m tall; branches white, pubescent. Leaves ovate-lanceolate or ovate, to 20 × 9 cm, acute at apex, rounded or cuneate at base, glabrous or pubescent beneath. Flowers in large, compound umbels, usually in subumbellate clusters at apex of slender stalks, white pubescent. Fruits globose, on small, thickened, perianth-tube.

*Fl. & Fr.:* August – November.

*J. Bhatt. &* Maity 31145

*Status:* Rare.

*Uses:* Bark is astringent & useful in sprains and rheumatism etc. Leaf infusion applied on wounds, bruises. Fruit is edible. Seed oil is used in soap industries.

**2. Litsea laeta** ( Nees) Hook.f. in Fl. Brit. Ind. 5:169. 1886. *Tetranthera laeta* Nees in Wall. Pl. As. Rar. 2: 67. 1831; Prain. Beng. Pl. 2:675. 1963

Shrubs or small tree, to 8 m. Leaves oblong- elliptic, to 20 × 5 cm, glabrous, white beneath when dry. Lateral veins 5–7 pairs, petiole to 1.8 cm. Flower on axillary pedunculate or in sessile cluster. Fruit obovoid or subglobose, *c.* 1.5 × 1.2 cm, borne on enlarge fleshy cup shaped perainth with thickend fleshy base.

*Fl. & Fr.:* November – January

J. Bhatt. & Maity 33347

**3. Litsea salicifolia** (Nees) Hook.f: 5:167.1886. *Tetranthera salicifolia* Nees in Wall. Pl.As. Rar. 2:66. 1831, 30. 1836., Beng. Pl. 2 .676.1963.

Evergreen shrubs or small tree, to 6 m. Leaves oblong, variable in size, to 20–30 × 2.5– 8.5 cm, dark brown when dry, minutely pale silky pubescent beneath, Lateral veins, to 10–15 pairs, umbels 6–18 in dense axillary clusters on peduncles. Fruits ellipsoid *c.*1 cm, apiculate on slightly enlarged peraianth cup.

*Fl. & Fr.*: February – April

*J. Bhatt. & Maity* 32419

**4. PERSEA** Mill.

**Persea glaucescens** (Nees) D.G. Long in Notes R.B.G. Edinburgh 41(3): 521. 1984. *Ocotea glaucescens* Nees in Wall., Pl. Asiat. Rar. 2: 71. 1831. *Mechilus villosa* (Roxb.) Hook.f., Fl. Brit. India 5: 860. 1890; Prain, Beng. Pl. 2: 673. 1963. *Laurus villosa* Roxb., Fl. Ind. ed. 2. 2: 310. 1832.

Trees to 20 m; shoots without scars. Leaves coriaceous, usually elliptic, to 20 × 6 cm, acuminate at base, cuneate, pale reddish-brown beneath, lateral veins 6–9 pairs, prominent above; reticulate beneath. Panicles numerous, often spreading, 10–17 cm, densely reddish-brown when dry. Perianth *c.* 3–5 mm. Fruits globose.

*Fl. & Fr.:* March – April.

*J. Bhatt. & Maity* 32345

**5. PHOBE** Nees

**Phobe lanceolata** (Nees). Syst. Laurin.109. 1836; Hook.f., Fl. Brit. India 5:141. 1886; Prain, Beng. Pl. 2: 674. 1963. *Ocotea lanceolata* Nees in Wall., Pl. Asiat. Rar. 2:71. 1831.

Trees, to 15 m high; young branches yellowish. Leaves lanceolate, glabrous, caudate-acuminate, cuneate at base. Flowers pale yellow, in panicles. Perianth lobes pubescent. Berries ellipsoid, black with cupular perianth, glabrous.

*Fl. & Fr.:* January – March.

*J. Bhatt. & Maity* 31107.

**LORANTHACEAE**

**1. HELIXANTHERA** Lour.

**Helixanthera wallichiana** (Schult.) Danser in Bull. Jard. Bot. Buit. Ser. 3. 10: 319. 1929. *Loranthus wallichianus* Schult in Roem. & Schult., Syst. Nat. 7: 109. 1829; Hook.f., Fl. Brit. India 5: 205. 1886. *L. polystachyus* Wall. In Roxb., Fl. Ind. 2: 217. 1824.

Evergreen shrubs. Leaves often alternate, sessile, ovate, elliptic, to 12 × 6 cm, acute at both ends, very coriaceous. Racemes slender, fascicled. Flowers regular, subtended by a single bracts; petals 4, free to base, scarlet red. Fruit ovoid or ellipsoid.

*Fl. & Fr.:* April – October.

*J. Bhatt. & Maity* 33304

**2. LORANTHUS** L.

**Loranthus involucrata** Roxb., Fl. Ind. 1: 552. 1820; Prain, Beng. Pl. 2: 681. 1963 .

A slender bushy branched parasite. Stems woody, with large lenticels. Leaves elliptic, ovate, to 15 × 8 cm, base acute, apex obtuse. Clusters of flowers or solitary in axil of leaves. Bracts 4, broad leafy, ovate, involucrate, much wider than flower. Corolla equally 5-cleft to the middle. Style very stout with large obscurely lobed. Fruit tomentose.

*Fl. & Fr.:* October – May.

*J. Bhatt. & Maity* 32318

## BALANOPHORACEAE

**BALANOPHORA** J. R. & J.G. A. Forst.

**Balanophora dioica** Royle, Illus. Bot. Himal. 330. 1836. t. 99. 1839; Hook.f., Fl. Brit. India 5: 237. 1886.

Herb, parasite on roots; root stock tuberous, lobed or branched; rhizome branched. Stem yellowish or reddish, 5–15 cm long, bearing rows of overlapping leaves. Leaves oblong, 1.0–2.5 × 1 cm, obtuse, sheathing at base. Male heads ovoid, to 3 × 1.5 cm. Flowers actinomorphic. Perianth segment, *c.* 0.2 × 0.1 cm, all alike. Staminal column subglobose loculi con-duplicate. Female heads ellipsoid, to 4.0 × 2.0 cm long.

*Fl. & Fr.:* November – February.

*Status*: Rare.

## EUPHORBIACEAE

**1. ACALYPHA** L.

**Acalypha indica** L., Sp. Pl. 1003. 1753; Wight, Ic. t. 877. 1844-45; Hook.f., Fl. Brit. India 5: 416. 1887.

Annual erect herb, to 60 cm tall; branches pubescent. Leaves ovate-rhomboid, to 7 × 4.5 cm, acute at apex or subobtuse, cuneate at base, crenate-serrate at margin. Spikes axillary. Male flowers minute at apex of spikes; spikes to 7 cm long. Capsules to 2 × 2.5 mm, hispid, enclosed by bracts. Seeds ovoid, smooth.

*Fl. & Fr.:* June – November.

*J. Bhatt. & Maity* 33119

*Uses:* Leaves are used as purgative. Plant is anthlemintic and leaves have parasitical properties.

**2. ANTIDESMA** L.

**Antidesma acidum** Retz., Obs. Bot. 5: 30. 1788. *A. diandrum* (Heyne) ex Roth., Nov. Pl. Sp. 369. 1821; Hook.f., Fl. Brit. India 5: 361. 1887, *pro parte*; Prain, Beng. Pl. 2: 703. 1963 .

Deciduous shrubs, to 5 m high, dioecious, young vegetative part glabrous, or rusty pubiscent; Leaves, to 13 × 5 cm, obovate, often elliptic, pubescence. Flower greenish yellow, in pubiscent racemes; male flower pedicelate with cup shaped calyx, horse shoe shaped 2 stamens; Female flowers with calyx deeply lobed. Drupes 0.5, purple red, ellipsoid.

*Fl. & Fr.* July – October.

In moist deciduous forest, sparse.

*J. Bhatt. & Maity* 31120

**3. BRIDELIA** Willd.

1a. Leaves elliptic-oblong, coriaceous, deciduous, veins parallel; flowers dioecious **2. B. retusa**

1b. Leaves linear-lanceolate, thin, persistent, veins more or less arching; flowers monoecious **1. B. monoica**

**1. Bridelia monoica** (Lour.) Merr. in Philip. J. Sci. Bot. 13: 142. 1918. *Cluytia monoica* Lour., Fl. Cochinch. 638. 1790. *Bridelia tomentosa* Bl., Bijdr. 597. 1826; Hook.f., Fl. Brit. India 5: 271. 1887.

*Vern.: Mindri, Sirai* (Beng.)

Trees, 3–14 m high with reddish branches; branchlets rusty-pubescent. Leaves lanceolate to linear-lanceolate, acute or obtuse at base, subacute at apex; lateral nerves 8–14 pairs; stipules subulate. Flowers 5–6 in each axillary cluster. Fruits globose, purple-black.

*Fl. & Fr.:* March – December.

*J. Bhatt. & Maity* 32473

**2. Bridelia retusa** (L.) Spreng., Syst. Veg. 3:48. 1826; Hook.f., Fl. Brit. India 5:268. 1887, *pro parte*; Prain, Beng. Pl. 2: 694. 1963. *Clutia retusa* L., Sp. Pl. 1042. 1753.

*Vern.: Kaja* ( Beng.)

Large Trees, to 10 m high;stems thorny when young. Leaves alternate, elliptic-oblong, to 15 × 6 cm, glabrous, chartaceous, retuse at apex, obtuse at base. Flowers yellow, in clusters or in spikes with male and female flowers; female larger than males. Drupes globose, purple black.

*Fl. & Fr.:* July – December.

In moist deciduous forests, sparse

*J. Bhatt. & Maity* 32451

*Uses:* Fruits are edible, leaves used as fodder, wood is used for making house posts, agricultural implements.

**4. CLEISTANTHUS** Hook. f.

**Cleistanthus collinus** (Roxb.) Benth. in Benth & Hook.f., Gen. Pl. 3:268. 1880; Hook.. Fl. Brit. India 5: 274. 1887; Prain, Beng. Pl. 2: 695. 1963. *Clutia collina* Roxb., Pl. Cor. t. 169. 1802.

Small deciduous trees, 5–7 m. Leaves alternate, coriaceous, elliptic-obovate to orbicular, retuse at apex. Flowers greenish-yellow, in axillary clusters, villous. Calyx lobes lanceolate. Petals linear. Capsule a hard, dark brown, shining.

*Fl. & Fr.:* February – April.

*J. Bhatt. & Maity* 33328

*Use:* Fruit extremely poisonous. Wood is used for house posts. Leaves, bark, roots, & fruits are used as fish poison.

**5. CROTON** L.

**Croton caudatus** Geisl., Croton Monograph. 73. 1807; Hook. f., Fl. Brit. India 5: 388. 1887; Prain, Beng. Pl. 2: 707. 1963 .

*Vern.: Nan bhantur* (Beng.)

Large scandent shrubs, 5–20 m tall. Leaves ovate, to 15 × 9 cm, acute to acuminate at apex, cordate at base,nerves palmitifid; stipules pinnatisect. Racemes terminal, solitary, 10–25 cm long; flowers in dense fascicle along rachis. Capsules subglobose, worty, rusty-pubescent. Seeds longitudinally furrowed, 1.0–1.5 cm across.

*Fl. & Fr.:* February – September.

*J. Bhatt. & Maity* 31129

**6. EUPHORBIA** L.

**Euphorbia hirta** L., Sp. Pl. 454. 1753; Hook.f., Fl. Brit. India 5: 251. 1887; Prain, Beng. Pl. 2: 692. 1963. *E. pilulifera* L., Amoen. Acad. 3: 114. 1756.

*Vern.: Bara kerui* (Beng.)

Low, diffuse, milky herb with yellowish hairy stems. Leaves obliquely elliptic-lanceolate, to 2.5 × 1.5 cm, serrulate, acute, hairy. Flowers pale greenish, in capitate cymose of pairs. Limb of glands minute. Female pendulous. Cocci appressed-pubescent.

*Fl. & Fr.:* Throughout the year.

In wastelands, common

*J. Bhatt. & Maity* 31185

*Uses:* Plant tincture is useful in cough, asthma, and urino-genital diseases and used as vermifuge. Latex used for warts.

**7. GLOCHIDION** Forst.

1a. Capsules depressed-globose, distinctly lobed, base and apex intruded **1. G. lanceolarium**
1b. Capsule depressed or globose, very obscurely lobed,
not deeply intruded base and apex **2. G. oblatum**

**1. Glochidion lanceolarium** (Roxb.) Voigt, Hort. Suburb. Calc. 153. 1845; Hook.f., Fl. Brit. India 5: 308. 1887. *Bridealia lanceolaria* Roxb., Fl. Ind. 3: 697. 1832; Prain, Beng. Pl. 2: 697. 1963. *Phyllanthus lanceolaria* Muell.-Arg. in Flora 48: 371. 1865.

*Vern.: Anguti* (Beng.)

Shrubs or small trees. Leaves elliptic-oblong or lanceolate, to 17 × 8 cm, acuminate at apex, coriaceous, glabrous, dark green above, pale beneath. Male flowers many, yellowish; stamens 4–6. Female flowers few, green, sessile; ovary 4–6 locular. Capsules subglobose. Seeds red, smooth.

*Fl. & Fr.:* January – October.

*J. Bhatt. & Maity* 32323

**2. Glochidion oblatum** Hook.f., Fl. Brit. India 5: 312. 1887; Kanjilal & al., Fl. Asssam 4: 184. 1940.

Trees, 4–8 m. Leaves oblong or elliptic-lanceolate, to 8 × 3.5 cm, subequally acute to obtuse at base, acute at apex. Male flowers *c.* 4 mm across, yellowish; pedicels filiform. Female flowers minute, tomentose, sessile. Capsules depressed-globose, pubescent.

*Fl. & Fr.:* March – December.

*J. Bhatt. & Maity* 31144.

**8. MACARANGA** Thou.

**Macaranga peltata** (Roxb.) Muell.-Arg. in DC., Prodr. 15:1010. 1886. *Osyris peltata* Roxb., Fl. Ind. 3:855. 1832. *Macaranga roxburghii* Wight, Ic. t. 1949. f. 4. 1853; Hook.f., Fl. Brit. India 5:448.1887; Prain, Beng. Pl. 2: 713. 1963.

Trees, to 10 m; branchlets glabrous. Leaves orbicular, to 18 × 14 cm, acuminate at apex, rounded at base, entire at margin, red-glandular and villous beneath. Flowers in panicles. Bracts cupular, close enclosing the flowers. Calyx pubescent. Stamens 2–3. Capsules glandular, muricate.

*Fl. & Fr.:* January – April.

*Status:* Rare.

*J. Bhatt. & Maity* 32497, 32331

*Uses:* Plant gum is useful in veneral sores. Leaves decoction is used to wash ulcer. Wood is suitable for matches and paper pulp industries.

### 9. MALLOTUS Lour.

**Mallotus philippensis** (Lam.) Muell.-Arg. in Linnaea 34:196. 1865; Hook.f., Fl. Brit. India 5:442. 1887; Prain, Beng. Pl. 2: 712. 1963. *Croton philippense* Lam., Encycl. 2:206. 1786.

*Vern.: Kamala* (Beng.)

Trees 7–15 m. Leaves ovate-lanceolate, to 15 × 9 cm; serrate, red-glandular beneath acuminate. Flowers pale yellow in racemes. Perianth lobes 4 in male, 3 in female. Stamens numerous. Capsules globose, 3-valved, red-glandular.

*Fl. & Fr.:* July – December.

In dry and moist deciduous forest, common

*J. Bhatt. & Maity* 32429, 31175

*Uses:* Plant yields dye. Kamala powder is anthlmintic. Seed is used in paint industries.Seed cake is used as manure. Whole plant is useful in skin diseases.

### 10. PHYLLANTHUS L.

| | |
|---|---|
| 1a. Herb, to 30 cm, woody at base | 2 |
| 1b. Shrubs or small trees | 4 |
| 2a. Shoots puberulous; capsules echinate; seeds transversely ribbed | **6. P. urinaria** |
| 2b. Shoots glabrous; capsules smooth; seeds with irregular ribs on back or vertically muricate | 3 |
| 3a. Leaves distichous, obtuse or rounded at apex; style minute, bilobed; seeds vertically muricate | **2. P. amarus** |
| 3b. Leaves not as above; style 2, distinct with reflexed and recurved arms; seeds 5 with irregular ribs on back | **1. P. airyshawii** |
| 4a. Capsules papillose-puberulous | **5. P. sikkimensis** |
| 4b. Capsules fleshy | 5 |
| 5a. Leaves linear-oblong; flowers greenish yellow | **3. P. emblica** |
| 5b. Leaves elliptic-obovate; flowers pale pinkish | **4. P. reticulatum** |

**1. Phyllanthus airyshawii** Brunel & Roux in Nord. J. Bot. 4: 470. 1984. *P. debilis* Herb Ham. ex Hook.f., Fl. Brit. India 5: 299. 1887.

Perennial herb, to 25 cm tall. Leaves alternate, oblong, to 1.5 × 0.5 cm, obtuse; stipules lanceolate. Flowers pale yellow, axillary, male 1–3; female solitary. Male flowers- sepals, orbicular; stamens 5. Female flowers- sepals, oblong; disc annular, lobed. Capsules oblate, 2–4 mm across.

*Fl. & Fr.:* October – February.

Common as forest undergrowth.

*J. Bhatt. & Maity* 32319

*Uses:* Fruit is astrigent, diuretic and antiseptic. Stem leaves yields dye.

**2. Phyllanthus amarus** Schum.& Thonn. in Kongl. Danske Vidensk. Selsk. Skr. 4:195. 1829. *P. niruri auct. non.* L. 1753; Hook.f., Fl. Brit. India 5:298. 1887; Prain, Beng. Pl. 2: 700. 1963 .

*Vern.: Bhui-amla* (Beng)

An erect herb with slender branches, to 40 cm tall. Leaves oblong-elliptic, to 14 × 5 mm, glaucous, obtuse. Stipules lanceolate, scarious. Male flowers few, terminal. Perianth lobes 5, ovate. Stamens 3; filaments connate. Female flowers many; Perianth lobes 5, oblong. Capsules depressed-globose, glabrous with brownish, tuberculate seeds.

*Fl. & Fr.:* July – September.

*J. Bhatt. & Maity* 31141

**3. Phyllanthus emblica** L., Sp. Pl. 98.1753; Hook.f., Fl. Brit. India 5:289. 1887; Prain, Beng. Pl. 2: 700. 1963. *Emblica officinalis* Gaertn., Fruct. 2:122. 1791.

*Vern.: Amla* (Beng.)

Small, deciduous trees, to 5–7 m high. Leaves linear-oblong, to 14 × 3 mm, apiculate, obliquely subcordate at base. Flowers greenish yellow, in fascicles towards lower portion of branchlets. Perianth lobes 6. Stamens 6. Styles 3. Drupes globose, 3–5 cm across, fleshy, juicy, and indehiscent.

*Fl. & Fr.:* March – December.

Common in dry deciduous and mixed teak forests.

*Use:* The fruits are richest sources of Vitamin C and consumed in various forms. Fruit is edible used for making hair oil and dye and also used in bronchial disease.

**4. Phyllanthus reticulatus** Poir. in Lam., Encycl. 5:298. 1804; Hook.f., Fl. Brit. India 5: 288. 1887. *Kirganelia reticulata* (Poir.) Baill. Etud. Gen. Euphorb. 614. 1856.

Straggling shrubs, branching profusely. Leaves elliptic-obovate or spathulate, to 27 × 15 mm, acute at apex, rounded at base, membranous. Flowers pale pinkish, in fascicles. Perianth lobes 5, oblong, outer 2 longer; inner 3 smaller. Stamens 5. Berries fleshy, globose, purple.

*Fl. & Fr.:* November – February.

*J. Bhatt. & Maity* 32451

**5. Phyllanthus sikkimensis** Muell.-Arg. in Linnaea 32: 48.1863. *P. hamiltonianus* Muell.-Arg. in Linneae 34: 75.1866.; Hook. in Hook.f., Fl. Brit. India 5: 304. 1887.

A small shrubs with terete branches. Leaves elliptic or broadly ovate, to 4 × 1.8 cm, acute, membranous, rounded at base. Male flowers in axillary fascicles, in axillary and terminal racemes. Male flower: sepals 4, orbicular; staminal column very short. Female flower: sepals 6; disc saucer-shaped. Capsules globose, rufous.

*Fl. & Fr.:* October – February.

*J. Bhatt. & Maity* 31104

**6. Phyllanthus urinaria** L., Sp. Pl. 982. 1753; Hook.f., Fl. Brit. India 5: 293. 1887; Prain, Beng. Pl. 2: 701. 1963; Airy Shaw in Kew Bull. 37(1): 34. 1982.

*Vern.: Hazar muni* (Beng.)

Annual herb, to 25 cm high. Leaves oblong or linear-oblong, to 15 × 6 mm, obtuse-mucronate at apex, rounded base; stipules triangular, acuminate. Flower small, axillary, but borne on a continuous row on undersurface of branchlet. Male flower 0.3 cm long; disc globose. Female flower to 0.2 cm in diam., pedicels to 0.2 cm long. Disc obscurely crenulate. Capsules warty. Seeds trigonous.

*Fl. & Fr.:* July – December.

In forest undergrowth, common

*J. Bhatt. & Maity* 33420

*Use:* The plant is referred for the treatment of diarrhoea and dysentery. It is an excellent diuretic, leaf juice with coconut milk is apitizer.

**12. SAUROPUS** Bl.

**Sauropus androgynous** (L.) Merr. in Philip. Bur. For. Bull. 1:30.1903. *Clutia androgyna* L., Mant. 128. 1967; Hook.f., Fl. Brit. India 5:332. 1887.

Erect shrubs 2 m high with weak glabrous stems. Leaves ovate or lanceolate, glaucous beneath, obtuse. Flowers minute in axillary clusters. Perianth lobes 6, obovate, imbricate. Petals 0; disk 0; stamens 3; 3-celled ovary with 2 ovules in each cell. Capsules white, large inflated.

*Fl. & Fr.:* September – October.

*J. Bhatt. & Maity* 33331

*Uses:* Leaves and tender shoot are eaten raw as well cooked. A decoction of the root is recommended in fever and stricture of the bladder. Leaf juice is also used in eye trouble. Plant is source of high vitamin contains.

**13. TRAGIA** L.

**Tragia muelleriana** Pax & Hoffm. in Pflanzenr. 55:80. 1919. *T. involucrata* L. var *cordata* Muell.- Arg. in DC., Prodr. 15:943. 1866; Hook. f., Fl. Brit. India 5: 465. 1887; Prain, Beng. Pl. 2: 714. 1963 .

*Vern.: Bichati* (Beng.)

Slender, stinging, climbing herb. Leaves membranous, ovate, cordate, to 9 × 4 cm, glabrous, coarsely serrate, acuminate at apex, rounded at base. Flowers androgynous racemes. Fruiting calyx lobes 6, ovate, toothed, densely white, strigose on margins.

*Fl. & Fr.:* October – December.

*Status:* Rare.

**14. TREWIA** L..

**Trewia nodiflora** L. Sp. Pl. 1193.1753; Hook.f. Fl. Brit. Ind. 5:423.1887; Prain, Beng. Pl. 2: 711. 1963 .

*Vern.: Pitali* (Beng.)

Deciduous trees, to 15 m. Leaves to 20 × 13 cm, broadly ovate, 3-ribbed, glabrous, shortly acuminate at apex, cordate at base. Flowers yellowish in long racemes; female few, perianth lobes ovate, concave, reflexed. Drupes globose, to 2 cm across.

*Fl. & Fr.:* February – May.

**URTICACEAE**

**1. ELATOSTEMA** Forst. & Forst.

**Elatostema rupestre** (D. Don) Wedd. in Arch. Mus. Hist. Nat. Pari 9: 364. 1856; Hook.f., Fl. Brit. India 5: 564. 1888; Prain, Beng. Pl. 2: 722. 1963. *Procris rupestris* D. Don, Prodr. Fl. Nepal. 60. 1825.

Herb to 50 cm high, often epiphytic. Leaves elliptic-lanceolate, cuneate at base, acuminate, crenate-serrate, to 14 × 2 cm, lateral nerves 8–12 pairs; stipules linear-lanceolate. Male receptacle pale yellow-green. Female receptacle pale green. Achene longitudinally ribbed.

*Fl. & Fr.:* March – July.

*J. Bhatt. & Maity* 32360

**2. GIRARDINIA** Gaudich.

**Girardinia diversifolia** (Link.) Friis in Kew Bull. 36:145. 1981. *Urtica diversifolia* Link, Enum. Pl. Hort. Bot. Berol. Alt. 2:385. 1822. *non* Bl.. *Girardinia heterophylla* Decne var. *palmata* Hook.f., Fl. Brit. India 5:551. 1753; Prain, Beng. Pl. 2: 721. 1963 .

Suffruticose herb with stinging hairs. Leaves alternate, 3–5 lobed, crenate-serrate, appressed hairy with stinging hairs, truncate or cordate at base. Cystoliths punctate. Stipules foliaceous, connate. Flowers dull white, in simple spikes. Tepals 4–5, free, united in female. Stamens 4. Achenes with persistent styles.

*Fl. & Fr.:* November – December.

*J. Bhatt. & Maity* 32368

*Use:* The plant ash is highly medicinal for ringworm and eczema.

**3. POIKILOSPERMUM** Zipp.

**Poikilospermum suoveolens** (Bl.) Merr. in Contr. Arn. Arb. 8: 47. 1934. *Conocephalus suoveolens* Bl., Bijdr. 483. 1825; Hook.f., Fl. Brit. India 5: 545. 1888; Prain, Beng. Pl. 2: 728. 1963 .

Large scandent shrubs or lianous, to 25 m. Leaves broadly ovate or oblong-ovate, to 30 × 20 cm, acute at apex, obtuse, rounded at base; lateral nerves 13–15 pairs; heads 5–7 mm across in short forked cymes, purple, fragrant. Achenes oblong-lanceolate, enclosed in thin fleshy perianth.

*Fl. & Fr.:* January – September.

*J. Bhatt. & Maity* 32338

**4. POUZOLZIA** Gaudich.

**Pouzolzia zeylanica** (L.) Benn. Pl. Jav. Rar. 67. 1838. *Parietaria zeylanica* L., Sp. Pl. 1052. 1753. *Pouzolzia indica* (L.) Gaudich in Freye. Voy. Uranie 503. 1830; Hook.f., Fl. Brit. India 5: 581. 1888; Prain, Beng. Pl. 2: 724. 1963 .

Slender, erect or procumbent, hirsute herb. Leaves linear, lanceolate to ovate-lanceolate, to 3 × 1.5 cm, acute at apex, rounded at base, hoary-pubescent, hirsute or glabrous. Flower pale pinkish-green strigose. Tepals 4, ovate-lanceolate, concave; bracts 2, concave. Stamens 4. Achenes ovoid, 2–4 winged, shining black.

*Fl. & Fr.:* July – December.

*J. Bhatt. & Maity* 31161

**ULMACEAE**

**TREMA** Lour.

**Trema orientalis** (L.) Bl. Mus. Bot. Lugd.-Bat 2:61. 1856; Hook.f., Fl. Brit. India 5:484. 1888; Prain, Beng. Pl. 2: 720. 1963. *Celtis orientalis* L., Sp. Pl. 1044. 1753.

*Vern.: Chikun* (Beng.)

Fast growing evergreen trees, to 10 m; young parts pubescent. Leaves ovate-lanceolate, to 15 × 5.5 cm, acuminate at apex, obliquely cordate at base, grayish brown tomentose beneath. Flowers unisexual in axillary cymes, tepals greenish-white. Sepals 5, persistent in female only. Stamens 5. Ovary sessile. Drupes ovoid with persistent styles, black when ripe.

*Fl. & Fr.:* April – November.

In moist deciduous forests, sparse

*Use:* The wood is used for making tea chests, yokes, match boxes and as charcoal. Stem fibre is used for making ropes. Root extract is used for diarrhoea and passing blood during urination.

## MORACEAE

### 1. ARTOCARPUS Forst.

1a. Leaves glabrous; syncarp oblong, to 50 cm long, tuberculate **1. A. heterophyllus**
1b. Leaves pubescent beneath; syncarps subglobose, 5–8 cm across, not tuberculate **2. A. lakoocha**

**1. Artocarpus heterophyllus** Lam., Encycl., 3: 209. 1789. *A. integrifolia auct. non* L.f., 1782; King in Hook.f., Fl. Brit. India 5: 541. 1888.

*Vern.: Kathal* (Beng.)

Trees, to 15 m high. Leaves obovate, to 16 × 9 cm, dark green, glossy. Stipules large. Flowers in cylindrical heads; young ones enclosed within leathery caduceus sheath. Syncarp oblong, to 50 cm long, tuberculate, stalk hanging from the trunk. Seeds oblong.

*Fl. & Fr.:* November – June.

*Use:* Fruit are edible. Seed extract stimulate heart and lower down the blood pressure. Fruits are used in preparation of jam & jelly etc.Wood is used for various purpose.

**2. Artocarpus lakoocha** Roxb., Fl. Ind. 3: 524. 1832; King in Hook.f., Fl. Brit. India 5: 543. 1888; Prain, Beng. Pl. 2: 729. 1963 .

*Vern.: Mandar, Danpo* (Beng.)

Lofty, deciduous trees, to 30 m high. Latex milky. Leaves ovate-lanceolate to 28 × 10 cm., entire, grey-pubescent beneath. Flowers in axillary short stalked head. Syncarpous subglobose, to 8 cm across, yellow orange when ripe, smooth. irregularly lobulate with a long peduncle. Seeds oblong.

*Fr.:* March – July.

*J. Bhatt. & Maity* 31106

*Use:* Fruits are edible. Bark is chewed in Assam as a substitute of bettle nuts. It is also used for tanning. Wood is durable.

### 2. FICUS L.

1a. Shrubs or small trees **1. F. hispida**
1b. Large stout tree 2
2a. Leaves elliptic-oblong or rhomboid-lanceolate, cuneate at base **3. F. tinctoria**
2b. Leaves elliptic or lanceolate, acute at base **2. F. racemosa**

**1. Ficus hispida** L.f., Suppl. 442. 1781.King in Ann. Roy. Bot. Gard. Calcutta, 2: 16, t.154. 1888 & in Hook.f., Fl. Brit. India 5: 522.1888; Prain in Bengal.Pl. 2.736.1963.

Shrubs or small trees, hispid throughout with hollow internodes. Leaves oblong, to 20 × 8 cm, abruptly acuminate at apex, truncate-cordate at base. Figs clustered on the tubercles or on leafless branches forming racemes, peduncled, obovoid, 2 cm across, pubescent.

*Fl. & Fr.:* October – December.

Along the banks of rivers and streams, common

*Uses:* Fruits are eaten as vegetable, ripe fruits are used in jam. Leaves are fodder to elephant.

**2. Ficus racemosa** L., Sp. Pl. 1060. 1753; Barrett, Bull. Torrey Bot. Club 73: 312. 1946. *F. glomerata* Roxb., Pl. Corom. 2: 13. f. 123. 1798; Hook.f., Fl. Brit. India 5: 535. 1888.

*Vern.: Jaggidumur* (Beng.)

Large stout trees to 20 m high with milky latex; barks pinkish-brown. Leaves elliptic or lanceolate, to 16 × 3 cm, tapering at apex, acute at base. Figs in large cluster on main branches, 2–3 cm across, subglobose to pyriform; bracts ovate-triangular. Ovary red spotted.

*Fl. & Fr.:* March – July.

Common along the banks of rivers and streams.

*Use:* Leaves used as fodder. Roots used in diarrhoea and diabetes. Fruits eaten by local people. Latex used in piles.

**3. Ficus tinctoria** Forst. in Fl. Ins. Austr. 76. 1786 ssp. **parasitica** (Willd.) Corner in gard. Bull. Singapore 17: 476. 1959. *F. gibbosa* Bl. var. *parasitica* (Willd.) King. in Ann. Roy. Bot. Gard. (Calcutta) 1: 6. t. 2a-b. 1887; Hook.f., Fl. Brit. India 5: 497. 1888.

Trees, to 20 m high with aerial roots. Leaves elliptic-oblong or rhomboid-lanceolate, entire or shallowly lobed, acute or acuminate at apex, cuneate at base, sparsely hairy or glabrous. Receptacles usually paired or fascicled, subglobose, shortly peduncled, yellow. achenes smooth.

*Fl. & Fr.:* October – April.

Common in dry deciduous forests.

*J. Bhatt. & Maity* 33333

*Status:* Rare.

## FAGACEAE

### CASTANOPSIS Spach.

| | |
|---|---|
| 1a. Walls of capsules concealed by densely arranged spines | **1. C. indica** |
| 1b. Walls of capsules not concealed by spines, but undulating spaced ridged | **2. C. kurzii** |

**1. Castanopsis indica** (Roxb.) DC. in Seems J. Bot. 1: 182. 1863; Hook.f., Fl. Brit. India 5: 620. 1888; Prain, Beng. Pl. 2: 741. 1963; Kanjilal & al., Fl. Asssam 4: 321. 1940. *Castanea indica* Roxb., Fl. Ind. 3: 643. 1832.

Trees, to 25 m high. Leaves elliptic-oblong or lanceolate, to 20 × 10 cm, acute or acuminate at apex, rounded or obtuse at base. Male spikes to 25 cm. Female spikes solitary, axillary. Capsules 2.5–3.0 cm across, densely covered with subulate, persistent *c.* 1.5 cm long spines. Nuts ovoid, brown.

*Fl. & Fr.:* February – December.

*J. Bhatt. & Maity* 32480, 33305

*Uses:* Wood is moderately heavy, shiny, when finish, not much durable. Nuts are edible.

**2. Castanopsis kurzii** (Hance) S.N. Biswas in Bull. Bot. Surv. India 11: 189. 1969 (1971). *Quercus kurzii* Hance in Seems J. Bot. 16: 328. 1878. *Q. lanceifolia* Roxb., Fl. Ind. 3: 634. 1834 (*non* Schl. & Cham. 1830); Hook.f., Fl. Brit. India 5: 616. 1888. *Q. lanceifolia* Roxb. var. *semicristata* King in Hook.f., Fl. Brit. India 5: 616. 1888.

Tree, to 15 m high. Leaves lanceolate, oblong-lanceolate, to 15 × 6 cm, acuminate at apex, acute or rounded at base; lateral nerves 9–11 pairs; spikes erect, stiff to 20 cm long. Capsules enclosed the nut, splits irregularly. Nuts ovoid, *c.* 2 × 1 cm.

*Fl. & Fr.:* May – December.

*J. Bhatt. & Maity* 31142, 32319.

# MONOCOTYLEDONS

## ORCHIDACEAE

### 1. BULBOPHYLLUM Thou.

**Bulbophyllum careyanum** (Hook.) Sprengl, syst. Veg.3:732.1826; Hook.f., Fl.Brit. Ind. 5:760.1890. *Anisopetalum careyanum* Hook., Fl. Exot. T. 149.1825.

Epiphytic herbs, pseudobulbs ovoid, distant racemosa at the base of pseudobulbs, much shorted than leaves, densly many flowered. Flowers yellowish with purple spots.

*Fl. & Fr.:* October – December

### 2. COELOGYNE Lindl.

**Coelogyne prolifera** Lindl., Gen. & Sp. Orchid. 40. 1830. *C. flavida* Wall. ex Lindl., Fol. Orch. Codog. 10. 1854; Hook.f., Fl. Brit. India 5: 839. 1890.

Plants epiphytic, to 30 cm tall; rhizome slender, 2 sheathed. Pseudobulbs ovoid or sub-globbose, to 3–6 × 1–2 cm, yellow or brown glossy sheathed at base. Leaves 2, narrowly lanceolate. Inflorescence hysteranthus, erect, 4–8 flowered. Flowers *c.* 1.0–1.5 cm across, light greenish-yellow. Labellum 3-lobed, to 8 × 6 cm. Column straight, winged, apex 2-lobed, to 5 mm long. Pollinia 4, 0.5 mm long.

*Fl.& Fr.:* March – August.

### 3. ERIA Lindl. (*nom. cons.*)

**Eria lasiopetala** (Willd.) Ormerod in Ope. Bot. 124: 22. 1995. *Aerides lasiopetala* Willd., Sp. Pl. ed 4(1): 130. 1805. *Dendrobium pubescens* Hook., Exot. Fl. t. 124. 1825. *Octomeria pubescens* (Hook.) Spreng., Syst. Veg. ed. 16(4): 310. 1827.

Plants epiphytic, to 30 cm tall. Rhizome woody, sheathed. Pseudobulbs borne at intervals of 4–5 cm along rhizome. Leaves 2–5, lanceolate-oblong, acute to acuminate, petiolate. Inflorescence lateral arising from base of pseudobulbs, erect, racemose, 7–10 flowered. Lip 3-lobed, lateral lobes short, truncate. Column 5 mm long. Pollinia 8.

*Fl. & Fr.:* April – August.

In dry deciduous forests, not common

### 4. EULOPHIA R.Br. ex Lindl.

**Eulophia bicallosa** (D. Don) P.F. Hunt & Summerh. in Kew Bull. 20: 60. 1966. *Bletia bicallosa* D. Don, Prodr. Fl. Nepal. 30. 1825.

Plants terrestrial. Pseudobulbs tuberous-rhizomatous, cylindric, irregular, compressed. Leaves 1, linear to lanceolate. Inflorescence racemose, terminal, laxly few to 20 flowered; peduncle grooved, sheathed, 40 cm tall. Lip 3-lobed, lateral lobes obliquely crescentric to triangular; spur sub-conical. Column slender, curved, *c.* 0.6 mm long; foot long at right angles to the column. Pollinia 4, broadly triangular.

*Fl. & Fr.:* February – April.

### 5. FLICKINGERIA A.D. Hawkes

**Flickingeria macraei** (Lindl.) Seidenf. in Dansk. Bot. Arkiv. 34: 46. 1980. *Dendrobium macraei* Lindl., Gen. Sp. Orch. 75. 1830; Hook.f., Fl. Brit. India 5: 714. 1890. *Ephamerantha macraei* (Lindl.) Hunt & Summerh in Taxon 10: 105. 1961.

Plants epiphytic. Rhizomes creeping. Pseudobulbs to 5.7 cm long with a single terminal leaf. Leaves sessile, solitary, linear-oblong. Flowers solitary, fragrant, white speckled with red. Lip 3-lobed; floral bracts shorter than the stalked ovary. Column short. Pollinia 4, in 2 appressed pairs.

*Fl. & Fr.:* May – July.

**6. LUISIA** Gaudichaud

**Luisia trichorrhiza** (Hook.) Bl., Bot. Luigd. Bot. 1: 63. 1849. *Vanda trichorrhiza* Hook., Exot. Fl. 1: t. 72. 1825. *Cymbidium triste sensu* Lindl., Gen. & Sp. Orchid Pl. 167. 1833 *non* (Forst.) Willd.

Plants epiphytic; roots basal. Leaves distichous, fleshy, terete, rugose, jointed. Inflorescence leaf-opposed, stout, short, 3–4 flowered; peduncle attenuate; rachis thick. Flowers 1.0–1.5 cm across. Lip dark purple with faint green lines. Column purplish. Foot lacking. Pollinia 2, subglobose.

*Fl. & Fr.:* March – May.

**7. PAPILIONANTHE** Schltr.

**Papilionanthe teres** (Roxb.) Schltr. in Orchis. 9: 78. t. 12. 1915. *Dendrobium teres* Roxb., Fl. Ind. 3: 485. 1832. *Vanda teres sensu* Lindl., Gen. & Sp. Orchid. 217. 1833, *non* Roxb. 1832; Hook.f., Fl. Brit. India 6: 49. 1890.

Plant epiphytic; root piercing through leaf sheath. Stem branched, terete, covered by leaf sheaths. Leaves terete, curved. Inflorescence leaf-opposed, 4–5 flowered. Petals sub-orbicular, pale pink with crimson spotted lines. Lip 3-lobed; spur funnel shaped. Column greenish-white, pubescent in front. Pollinia 2, broadly ovoid.

*Fl.& Fr.:* May – July.

*J. Bhatt. & Maity* 31199

**8. TROPIDIA** Lindl.

**Tropidia angulosa** (Lindl.) Bl., Orch. Arch. Ind. 12. 1859; Hook.f., Fl., Brit. India 6: 92. 1890. *Cnemidia angulosa* Lindl., Gen. & Sp. Orchid. 463. 1840. *Tropidia bellii* Blatt & McCann in J. Bombay Nat. His. Soc. 35: 730.1932.

Terrestrial herb, to 30 cm tall. Leaves 2, elliptic to broadly ovate. Inflorescence subglobose to conical, 5–10 flowered. Flowers white, non-resupinate, to 2 cm long. Lip oblanceolate-oblong, entire, concave to base, adnate to the column; spur basal, blunt, 4–6 mm long. Pollinia 2, granular.

*Fl. & Fr.:* September – January.

*J. Bhatt. & Maity* 32375

**9. VANDA** Jones ex R. Br.

**Vanda tesselata** (Roxb.) Loddiges in Bot. Cab. 11: Cat. Pl. 17. 1826. *Epidendrum tessellatum* Roxb., Pl. Corom. 1: 34. t. 42. 1795.

Plants epiphytic. Stems sheathed. Leaves patent recurved, linear,obtusely strap-shaped, to lobed to 10 cm, entire, the apex praemorse with usually 2 unequal rounded lobes and an acute one in between. Racemes usually longer than leaves, 2–10 flowered. Flowers bracteate, pedicellate. Capsules oblong, shaprly winged, pedicellate.

*Fl. & Fr.:* March – October.

In dry deciduous forests on *Butea monosperma* and *Pterocarpus marsupium*, Common.

*Uses:* Root extract is antipyretic. Leaf paste applied during rheumatic fever.

**ZINGIBERACEAE**

**1. ALPINIA** Roxb. (*nom. cons.*)

1a. Bracteoles tubular, persistent; fruit black **2. A. nigra**
1b. Bracteoles open to base, deciduous; fruit orange-red **1. A. malaccensis**

**1. Alpinia malaccensis** (Burm.) Rosc. var nobilis Ridl. I.M. Turner in Novon 6(2): 223.1996. *Maranta malaccensis* Burm.f., Fl. Ind. 2. 1768. *Alpinia calcarata* (Burm.) Rosc. in. Trans. L.. Soc. 8: 345. 1807; Baker in Hook.f., Fl. Brit. India 6: 255. 1892; Prain, Beng. Pl. 2: 786. 1963 .

Leafy shoots to 3 m high, robust. Leaves lanceolate, acuminate, to 50 × 7 cm, pubescent beneath; petioles 3–5 cm. Inflorescence pubescent; bracts absent; bracteoles white, deciduous when flowers open. Flowers with yellow lip having deep red and yellow at center. Capsules globose, yellowish to orange-red.

*Fl. & Fr.:* April – November.

*Use:* An essential oil "*Amodi*" is obtained from rhizome.

**2. Alpinia nigra** (Gaertn.) Burtt. In Notes Roy. Bot. Gard. Edinb. 35: 213. 1977; *Zinziber nigrum* Gaertn., Fruct. 1: 35. t. 12. 1788. *Alpinia allughas* (Retz.) Rosc. Baker in Hook.f., Fl. Brit. India 6: 253. 1892; Prain, Beng. Pl. 2: 787. 1963 .

*Vern.: Kulanjan* (Beng.)

Perennial herb, to 1.5 m high, tuberous roots, aromatic. Leaves to 40 × 10cm, sessile or nearly so, oblong-lanceolate, acuminate, cuspidate, base acute. Panicle to 30 cm long. Flowers pink. Capsule to 2 cm across, thin globose, black. Seeds many, small, black, angular.

*Fl. & Fr.:* May – August.

*Use:* Used as fodder and paper pulp.

**2. AMOMUM** L.

**Amomum subulatum** Roxb., Pl. Corom. 3: 75. t. 277. 1819; Baker in Hook.f., Fl. Brit. India 6: 240. 1892.

Herb with leafy shoots to 2 m. Leaves subsessile, lanceolate, acuminate, sessile or very shortly petiolate, to 60 × 10 cm, ligule emarginated, urceolate. Inflorescence subglobose to ovoid; peduncle 5–7 cm; bracts reddish-brown, ovate-obtuse; bracteoles tubular. Calyx pinkish-white, dentate. Corolla yellow; lip yellow; anther connective, prolonged. Capsule reddish, subglobose, to 2.5 cm, echinate.

*Fl. & Fr.:* April – November.

*Use:* Seeds are used for flavouring food. It is stimulative and purgative and oil is applied to yield to ally inflammation.

**3. CURCUMA** L.

**Curcuma longa** L., Sp. Pl. 2. 1753, *pro max parte*; Baker in Hook.f., Fl. Brit. India 6: 214. 1890. Prain, in Beng. Pl.2:783.1963.

*Vern.: Halud, Haldi* (Beng.)

Herb, tall; rootstock ovoid; sessile tuber cylindric. Leaves oblong-lanceolate, to 50 × 8 cm, caudate-acuminate at apex, tapering at base. Spikes to 15 cm long. Corolla white; flowering bracts pale green.

*Fl. & Fr.:* June – November.

In the vicinity of the forest, abundant during rainy season.

*Uses:* Used in all religious observation in Hindu house holds. Used as spices for cooking & food industry. Used medicinally in skin and many other diseases.

**4. CURCUMORPHA** A.S. Rao & D.M. Verma

**Curcumorpha longiflora** (Wall.) Rao & Verma in Bull. Bot. Surv. India 13: 339. 1971. *Gastrochilus longiflora* Wall., Pl. Asiat. Rar. 1: 22. t. 25. 1829; Baker in Hook.f., Fl. Brit. India 6: 251. 1892.

Leaf shoots to 50 cm long, rhizome short, faintly aromatic. Leaves oblong-lanceolate, loosely clasping, to 45 × 13 cm, caudate-acuminate at apex, slightly cordate at base. Flowers white and pink. Corolla tube to 12.5 cm; lip oblong-cuneate, with fleshy red median band base streak with red. Staminodal cup long, white.

*Fl. & Fr.:* July – September.

*J. Bhatt. & Maity* 31125

### 5. GLOBBA L.

**Globba bulbifera** Roxb. in Asiat. Res. 11:358. 1810; Baker in Hook.f., Fl. Brit. India 6:206. 1890; Prain, Beng. Pl. 2: 779. 1963 .

Erect herb; stems to 50 cm. Leaves to 15 × 5 cm, oblong to elliptic-lanceolate, caudate, rounded at base, pubescent below. Flowers yellow, in spikes, bracts oblong. Calyx funnel-shaped, 3-lobed. Calyx and corolla with globose, dark glands. Lips bifid, auricled.

*Fl. & Fr.:* November.

In moist deciduous forest, abundant

*J. Bhatt. & Maity* 31109, 31126

### 6. HEDYCHIUM J. Konig.

**Hedychium ellipticum** Buch.-Ham. ex J.E. Smith in Rees. Cyclop. 17. n. 2. 1811; Baker in Hook.f., Fl. Brit. India 6: 228. 1892; Rao & Verma in Bull. Bot. Surv. India 14: 131. 1972.

Leafy shoots to 1.5 m. Leaves elliptic, shortly acuminate, to 30 × 15 cm; ligule bright-red. Spikes densely flowered, ellipsoid, flat topped; bracts imbricating, ovate, subtended by a single white flap, flower sheath pink margined, ligule *c.* 1cm, pink spike to 11 cm, bract ovate-oblong, 2.3–3.0 × 0.8–1.0 cm, flowers white, becoming yellow, fragrant. Stamen orange-red, exerted much longer than leaves.

*Fl. & Fr.:* June – August.

*J. Bhatt. & Maity* 32346

Ornamental.

### 7. ZINGIBER Boehm.

1a. Spikes very short and dense; leaves pubescent beneath; lip spotted and streaked with red; corolla lobes red **1. Z. rubens**

1b. Spikes terminally elongated peduncle beset with sheathing bracts; lip pale yellow; corolla lobes white **2. Z. zerumbet**

**1. Zingiber rubens** Roxb. in Asiat. Res. 11: 348. 1810; Baker in Hook.f., Fl. Brit. India 6: 243. 1892; Prain, Beng. Pl. 2: 785. 1963; Hajra & al., Fl. Sikkim 1: 134. 1996.

Herb with stout leafy stem, to 2.5 m high. Leaves sessile, oblong-lanceolate, to 35 × 15 cm, acuminate, puberulous beneath along midrib. Spikes subglobose. Corolla lobes red; lip yellowish-white with red spots and streaks. Capsules ellipsoid, reddish.

*Fl. & Fr.:* August – September.

**2. Zingiber zerumbet** (L.) Rosc. Ex J.E. Smith, Exot. Bot. 2: 105, 112. 1804. *Amomum zerumbet* L., Sp. Pl. 1. 1753; Hook.f., Fl. Brit. India 6: 247. 1892; Prain, Beng. Pl. 2: 785. 1963.

*Vern.: Mahabari Bach (Beng.)*

Herb with tuberous rhizome and stout leafy stems,to 1.5 m high. Leaves oblong-lanceolate, glabrous beneath. Spikes very dense, oblong. Bracts ovate, green. Flowers with bright yellow lip. Stamens purple. Capsules white, oblong.

*Fl. & Fr.:* August – October.

*J. Bhatt. & Maity* 31158

*Use:* Rhizome is edible & used medicinally. Leaves and stems are used for tanning.

## COSTACEAE

### COSTUS L.

**Costus speciosus** (Koen.) Smith in Trans. L.. Soc. London 1: 249. 1791; Baker in Hook.f., Fl. Brit. India 6: 249. 1892; Prain, Beng. Pl. 2: 787. 1963. *Banksea speciosa* Koen. in Retz., Obs. Bot. 3: 75. 1783.

*Vern.: Kust, Ken* (Beng & Hindi)

Tall erect herb, to 2 m with twisting stem. Leaves elliptic-obovate, to 45 × 15 cm, glabrous above, silky pubescent beneath; bracts oblong-ovate, bright red. Flowers white in very dense spikes, to 8 × 7 cm. Bracts red. Calyx red; lobes ovate, ending in hardened prickles; corolla lips suborbicular, hairy at base, white outside, yellow in centre. Fruits ellipsoid, to 3 cm, woody.

*Fl. & Fr.:* October – November.

In moist, shady places in the vicinity of forest, common

*J. Bhatt. & Maity* 31176

*Use:* Rhizome are said to be consumable.

## HAEMODORACEAE

### 1. OPHIOPOGON Ker-Gawl.

**Ophiopogon micranthus** Hook.f., Fl. Brit. India 6: 269. 1892.

Scapigerous herb, *c.* 90 cm high with stout root-stock. Leaves elongate, linear-lanceolate, *c.* 45 × 1.5 cm, flaccid petiole, tip obtuse. Scape rather stout. Racemes subterete, elongate. Flowers subsolitary, *c* 0.8 cm across; anther sessile, oblong, obtuse. Seeds globose, minute.

*Fl. & Fr.:* October – March.

*J. Bhatt. & Maity* 33385.

### 2. PELIOSANTHES Andr.

**Peliosanthes macrophylla** Wall. ex Baker in J. L.. Soc. 17: 505. 1879; Hook.f., Fl. Brit. India 6: 266. 1892.

A large stout herb.Leaves elliptic-lanceolate, densely longitudinal veined. Scape long bearing flower less bracts, racemes, 30–60 flowered, each bract bearing single flower; bracts scarious. Flowers greenish or purple, tepal blunt, outer ovate, inner linear, pedicels recurved, anther oblonged.

*Fl. & Fr.:* February – May

*J. Bhatt. & Maity* 32463.

## AMARYLLIDACEAE

### PANCRATIUM L.

**Pancratium triflorum** Roxb., Fl. Ind. 2:126.1832; Hook.f., Fl. Brit. India 6:285. 1892. *P. verecundum* Wight, Ic. t. 2023. 1853; Prain, Beng. Pl. 2: 798. 1963 .

Bulbs globose, to 5 cm diam., scapigerous herb. Leaves linear-lanceolate, to 30 × 1.5 cm, acute, thin, glabrous. Flowers white fragrant, in terminal umbels. Spathes 2. Perianth lobes 6, linear. Staminal cup with bifid teeth between long filaments. Fruit 3-angled, ovoid.

*Fl. & Fr.:* March – April.

*J. Bhatt. & Maity* 33392.

## HYPOXIDACEAE

### 1. CURCULIGO Gaertn.

**Curculigo orchioides** Gaertn., Fruct. 1: 63. t. 16. 1788; Hook.f., Fl. Brit. India 6: 279. 1892; Prain, Beng. Pl. 2: 796. 1963 .

Acaulescent, perennial herb. Leaves radical, to 25 × 2.5 cm, lanceolate, plicate, scape short, concealed among the leaf bases. Flowers in racemes, subsessile, the upper staminode, lower bisexual. Tepals yellow 5–7 cm long, elliptic-oblong, ciliate. Stamens about half of the length of the perianth-segments; anther linear. Ovary separated from the perianth by a stipe; style filiform; stigma 3.

*Fl. & Fr.:* September – October.

Very common as forest undergrowth during the rainy season.

*Uses:* Roots are said to be used as tonic.

### 2. MOLINERIA Colla

**Molineria capetulata** (Lour.) Herb. Amaryllid. 84. 1837. *Leucojum capetulatum* Lour., Fl. Cochinch. 199. 1790. *Curculigo recurveta* Dryand. in Ait., ort. Kew ed. 1. 2: 253. 1811; Hook.f., Fl. Brit. ndia 6: 278. 1892.

Rhizome elongated. Leaves lanceolate, to 90 × 15.0 cm, plicate; petioles *c.* 30 cm long. Scapes 7.5–22.5 cm long, stout. Flowers yellow in heads, 5–10 cm in diam. Berries 0.6–0.7 cm across, globose, hairy.

*Fl. & Fr.:* July – August.

*J. Bhatt. & Maity* 32378

## DIOSCOREACEAE

### DIOSCOREA L.

1a. Stems climbing to right; seeds reddish-brown; wing all round — 1. **D. belophylla**
1b. Stems climbing to left; seeds winged towards base only — 2. **D. bulbifera**

**1. Dioscorea belophylla** (Prain) Haines, Fl. Chota Nagpur 530. 1910. *D. numularia* Lam. var. *belophylla* Prain, Beng. Pl. 2: 802. 1963. *D. glabra* Roxb., Fl. Ind. 3: 803. 1832; Hook.f., Fl. Brit. India 6: 294. 1802.

*Vern.: Shora-alu* (Beng.)

Large twinners, tuberous; stems twining to right, prickly below; bulbil not produced. Leaves ovate-hastate, to 12 × 7.5 cm, base rounded or truncate, apex acuminate. Male spikes, to 5 cm long. Stamens 6. Female spikes to 10 cm long, axillary. Capsules obovate, apex retuse.

*Fl. & Fr.:* August – October.

Very common in forest during rainy seasons

*J. Bhatt. & Maity* 32322

**2. Dioscorea bulbifera** L., Sp. Pl. 1033. 1753; Hook.f., Fl. Brit. India 6: 296. 1892; Prain & Burkill in Ann. Roy. Bot. Gard. Calcutta 14(1): 188. t.77. 1936.

Slender tuberous twiners; Stems 4-angular, ribbed, unarmed. Leaves alternate, ovate to suborbicualar, to 24 × 17 cm, cordate at base, acuminate at apex. Bulbils common on leaf axils, warted. Flowers white in pendulous spikes. Tepals linear, female spikes 1–3 together. Male spikes axils of main stems, to 10 cm long; female spike to 25 cm long. Stamens 6. Staminodes 6. Capsules quadrately oblong, winged. Seeds winged at base, brown.

*Fl. & Fr.:* September – November.

Very common in forest during the rainy season

*J. Bhatt. & Maity* 33370, 31150, 33397

*Uses:* Tubers and bulbil are eaten as vegetable after eliminated poisonous alkaloids, volatiles acid & calcium oxalate. Tubers used medicinally for ulcer, piles, dysentery & syphilis.

## LILIACEAE

### ASPARAGUS L.

**Asparagus racemosus** Willd., Sp. Pl. 152. 1799; Hook.f., Fl. Brit. India 6: 316. 1892; Prain, Beng. Pl. 2: 805. 1963.

*Vern.: Satamuli* (Beng)

Scandent herb. Cladodes 2–6 nate, to 2.5 cm long, crowded, triquetrous, falcate, acuminate; spines decurved. Flowers white, solitary or fascicled rcemes; pedicels jointed. Tepals 6, linear-oblong. Berries globose.

*Fl. & Fr.:* September – November.

Common in moist shaded place in forest.

*Use:* Roots are eaten as vegetables, increase milk in cattle. Used medicinally for uterine spontaneous mobility.

## SMILACACEAE

### SMILAX L.

**Smilax ovalifolia** Roxb., Fl. Ind. 3: 794. 1832. *S. macrophylla* Roxb., Fl. Ind. 3: 793. 1832, *non* Willd. 1805; Hook.f., Fl. Brit. India 6: 310. 1892.

Coarse scandent vine with terete zigzag flowering branches. Leaves thick, herbaceous when young, coriaceous at length, short, cuneate at base, mucronate at apex. Umbels 1–3, axillary, many flowered. Berries globose, 1(-2) seeded.

*Fl. & Fr.:* July – September.

Common in forest

*J. Bhatt. & Maity* 33354

*Uses:* Fruits are edible, root are used for the treatment of veneral diseases applied in rheumatism. Stem fibres used for brushes and short twig as tooth picks.

## PONTEDERIACEAE

### MONOCHORIA K.B. Presl.

**Monochoria hastata** (L.) Solms in A. DC., Monogr. Phan. 4: 523. 1883. *Pontederia hastate* L., Sp. Pl. 288. 1753. *Monochoria hastaefolia* Presl., Rel. Haenk. 2: 128. 1835; Hook.f., Fl. Brit. India 6: 362. 1892; Prain, Beng. Pl. 2: 812. 1963 .

Herb to 1.3 m high; stem obliquely erect; rootstock creeping. Leaves triangular-ovate, hastate, to 20 × 5 cm. Flowers peduncled. Tepals purplish-blue, persistent, becoming twisted and enclosed the capsule. Capsule ellipsoid or subglobose, membranous.

*Fl. & Fr.:* October – December.

Abundant in marshy and water logged places.

*J. Bhatt. & Maity* 33432, 32393

*Uses:* Tender stalks and leaves are eaten as vegetable, rootstocks are used as ford for cattle. Leaves is applied in boils.

## COMMELINACEAE

### 1. AMISCHOTOLYPE Hassk.

**Amischotolype hookeri** (Hassk.) Hara in Fl. E.Himal.399.1966. *Forrestia hookeri* Hassk. in Flora 625. 1864; Hook.f., Fl. Brit. India 6: 384. 1892; Prain, Beng. Pl. 2: 817. 1963 .

A stout herb; stems to 1.5 m. Leaf blade elliptic, finely acuminate to caudate, narrowed to petiole like base, sheaths widely cylindric, mouth with long slender cilia. Inflorescence with *c.* 15-flowered. Calyx oblong, hooked, keeled. Petals white or pink, oblong. Capsules narrowly ellipsoid-trigonous, with long scattered hairs, apex acute, 2-seeded. Seeds D-shaped.

*Fl. & Fr.:* May – October.

In moist and water logged places, common

### 2. COMMELINA L.

**Commelina erecta** L., Sp. Pl. 41. 1753. *C. kurzii* Clarke in J. L.Soc.Bot. 11: 444. 1871; Hook.f., Fl. Brit. India 6:373. 1892.

Stout herbs. Leaves narrowly lanceolate, acuminate, hirsute; sheaths ciliate, glaucous below. Spathes sessile, cuculate, broadly cordate. Flowers blue, capsules ellipsoid, glabrous, 3-seeded.

*Fl. & Fr.:* July – October.

In marshy areas .

*J. Bhatt. & Maity* 31110, 32309

### 3. CYANOTIS D. Don

**Cyanotis cristata** (L.) D. Don, Prodr. Fl. Nepal 46. 1825; Hook.f., Fl. Brit. India 6:385. 1892; Prain, Beng. Pl. 2: 816. 1963. *Tradescantia cristata* L., Sp. Pl. 42. 1753.

Decumbent branching herb, rooting at nodes. Leaves ovate-oblong, to 7.5 × 1.5 cm, glabrous, obtuse at apex, rounded cordate at base. Bracteoles ovate-falcate. Flowers purple, enclosed in recurved falcate cymes. Sepals oblong-lanceolate, hirsute. Petals oblong-spathulate. Filaments violet hairy. Capsules subglobose, *c.* 2 cm long, trigonous.

*Fl. & Fr.:* July – October.

Abundant in the vicinity of forests.

*J. Bhatt. & Maity* 31127

### 4. FLOSCOPA Lour.

**Floscopa scandens** Lour., Fl. Cochinch. 193. 1790; Hook. f., Fl. Brit. Ind. 6: 390. 1892; Prain, Beng. Pl. 2: 817. 1963 .

Slender herb, subscandent, to 5 cm high. Leaves elliptic-lanceolate, to 6 × 2 cm, acuminate at apex, scaberulous above. Sheaths to 10 cm long, mouth long, hairy. Flowers purple, in clustered panicles. Capsules suborbicular, *c.* 0.3 cm across, 2-seeded. Seeds ellipsoid, rugose.

*Fl. & Fr.:* September – December.

*J. Bhatt. & Maity* 31127

### 5. MURDANNIA Royle

| | |
|---|---|
| 1a. Flowers white | 2 |
| 1b. Flowers blue or pinkish | 3 |
| 2a. Robust herb; leaves ovate-lanceolate | **1. M. japonica** |
| 2b. Slender herb; leaves narrowly lanceolate | **4. M. zeylanica** |

3a. Flowers in lax terminal cymose panicle **2. M. nudiflora**
3b. Flower solitary or 2–6 in fascicled in axil **3. M. vaginata**

**1. Murdannia japonica** (Thunb.) Faden in Taxon 26:142. 1971. *Commelina japonica* Thunb. in Trans L.Soc. London 2:332. 1794. *Aneilema lineolatum* Kunth, Enum. 4:69. 1843; Hook.f., Fl. Brit. India 6:376. 1892; Prain, Beng. Pl. 2: 816. 1963 .

Robust, erect, tuberous herb of *c.* 1.5 m tall; tubers spindle shaped. Leaves ovate-lanceolate or elliptic-oblong, to 5 cm long, acute, rounded at base. Flowers white, in short dichotomously branched panicles, glandular, pubescent. Sepals brown. Filaments bearded. Capsules linear-oblong, pale yellow. Seeds yellow, glandular - pubescent.

*Fl. & Fr.:* August - October.

In marshy low landed area.

*J. Bhatt. & Maity* 31102

**2. Murdannia nudiflora** (L.) Brenan in Kew Bull. 7: 189. 1952. *Commelina nudiflora* L., Sp. Pl. ed. 2. 412. 1762. *Aneilema nudiflorum* (L.) R.Br., Prodr. 271. 1810; Hook.f., Fl. Brit. Ind. 6: 378. 1822; Prain, Beng. Pl. 2: 816. 1963 .

Procumbent herb, rooting at nodes; branchlets reddish, radiating, ascending. Leaves linear-lanceolate to oblong, acute, base cordate or rounded. Sheaths ciliate. Flowers pinkish in lax terminal cymose panicles. Capsules globose, 6-seeded.

*Fl.:* August.

Common in marshy habitats.

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**3. Murdannia vaginata** (L.) Brueck. in Eng. & Prantl, Pflanzenfam. ed. 2. 15a: 173. 1930. *Aneilema vaginatum* (L.) R.Br., Prodr. 271. 1810; Hook.f., Fl. Brit. India 6: 381. 1892; Prain, Beng. Pl. 2: 816. 1963 .

Herb with fleshy root-stock; stems to 25 cm tall. Leaves sessile, linear-lanceolate, to 15 × 1.5 cm, acuminate at apex. Flowers blue, solitary or 2–6 fascicled in axils of persistent bracts. Capsules globose, 0.4 cm across. Seeds trigonous, one end abruptly truncate, other end narrow, black, rugose.

*Fl. & Fr.:* July – November.

In marshy habitats, sparse.

**4. Murdannia zeylanica** (Clarke) Brucckn. var. **longiscapa** (Clarke) Rao & Kammathy in Bull. Bot. Surv. India 3: 394. 1961. *Aneilema zeylanicum* Clarke var. *longiscapa* Clarke in Hook.f., Fl. Brit. India 6: 376. 1892.

Slender herb. Leaves narrowly lanceolate or ovate-lanceolate, acuminate, base cuneate, rounded or cordate. Flowers white in terminal, sessile panicles. Capsules ellipsoid, 3–5 seeded. Seeds brown with white powder.

*Fl.:* July – October

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## **6. POLLIA** Thunb.

**Pollia subumbellata** C.B. Clarke in J. L.. Soc. Bot. 11: 451. 1850; Hook.f., Fl. Brit. India 6: 368. 1892. *Aclisia subumbellata* (Clarke) Brneck. in Engl. & Prantl, Pflanzenfam. ed. 2. 15a: 176. 1930.

Stems to 65 cm long, grooved when dry with remnant leaf sheaths at base. Leaves oblanceolate-narrwoly elliptic, symmetrically narrowed at apex and base, to 14 × 4 cm. Inflorescence subumbellate,

epidenticulate, overtopped by leaves; branches subglabrous, deflexed. Flowers white with 3 fertile and 3 sterile anthers. Capsules 0.5 cm.

*Fl. & Fr.:* June – October.

## STRELITZIACEAE

### HELICONIA L.

**Heliconia rostrata** Ruiz. & Pav., Fl. Peruv. 3: 71. t. 305. 1802.

Herb, to 1.75 m high. Pseudostem 50–90 cm long. Leaves lanceolate-oblong, to 70 × 18 cm, acuminate at apex, rounded at base; petioles to 70 cm long, sheathing at base. Inflorescence pendulous, to 40 cm long; rachis bright red; floral spathe bright red at base, yellow at apex. Fruit fleshy.

*Fl. & Fr.:* September – November.

## ARACEAE

### 1. COLOCASIA Schott.

**Colocasia esculenta** (L.) Schott in Schott & Endl., Melet. Bot. 1: 18. 1832. *Arum esculentum* L., Sp. Pl. 965. 1753. *Colocasia antiquorum* Schott. in Schott & Endl., Melet. Bot. 1: 18. 1832; Hook.f., Fl. Brit. India 6: 523. 1893; Prain, Beng. Pl. 2: 287. 1963 .

*Vern.: Kachhu* (Beng.)

A stout herb with tuberous root-stocks. Leaves peltate-ovate, to 50 cm long, cordate at base;. Spathe pale-yellow, to 40 cm long; tube greenish, oblong. Spathix much shorter than the spathe. Female inflorescence as long as male (sterile) inflorescence. Berries oblong, many seeded.

*Fl. & Fr.:* September – October.

In moist deciduous forests, sparse

*Use:* Leaves, stalks and tubers are edible.

### 2. LASIA Lour.

**Lasia spinosa** (L.) Thwaites, Enum. Pl. Zeyl. 336. 1864. *Draconitum spinosum* L., Sp. Pl. 967. 1753. *Lasia heterophylla* (Roxb.) Schott in Schott & Endl., Melet. Bot. 1: 21. 1832; Hook.f., Fl. Brit. India 6: 550 1892; Prain, Beng. Pl. 2: 840. 1963 .

*Vern.: Kanta-kachu* (Beng.)

A stout, suberect spinous herb with prickly rhizome. Leaves when young hastate, sagittate, to 30 × 16 cm, mature leaves pinnatifid, to 41 × 48 cm with scattered prickles abaxially. Flowers in long prickly peduncles, bisexual. Spathe very long, thick, twisted, dull purplish brown, to 60 cm across. Tepals pink. Berries *c.* 1.5 × 1.4 cm, muricate at apex. Seeds laterally compressed, subconic.

*Fls. & Frts.:* January – November.

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*Uses:* Tender leaves, fruits are eaten. Plant having medicinal value also.

### 3. PISTIA L.

**Pistia stratiotes** L., Sp. Pl. 963. 1753; Hook.f., Fl. Brit. India 6: 497. 1893; Prain, Beng. Pl. 2: 831. 1963.

*Vern.: Takapana* (Beng.)

Stoloniferous, rossette herb; roots of tufted white fibres clothed with fibrillae. Rosettes to 10 cm across. Leaves obovate, retuse, flabellately-nerved, pubescent on both the surfaces, fleshy. Spathes to 1.3 cm long, yellowish-white, obliquely campanulate, gibbose, contracted above the middle. Male and female portions separated by a zone of neuters. Fruit membranous, ovoid. Seeds many.

*Fl. & Fr.:* August – November.

Abundant in ponds.

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*Use:* The ashes of plant used for ringworm. Leaves are used for skin diseases and also anthelmintic.Leaves are used for leprosy, piles, ulcers and syphilis.

**4. POTHOS** L.

1a. Leaves narrowly, ovate oblong, berries hexagonal cylindric **1. P.cathcartii**
1b. Leaves lanceolate, berries oblong **2. P. scandes**

**1. Pothos cathcartii** Schott. in Aroid 1: 22. t. 44-45. 1857; Hook.f., Fl. Brit. India 6: 552. 1893.

Root climbers. Stems to 18 m high. Leaves narrowly ovate-oblong, to 18 cm long, acuminate at apex, narrowed at base; petioles narrowly triangular; bracts sheathing lower part of peduncle. Spathe spreading, suborbicular, coriaceous; spadix cream, subglobose. Tepals square, apex hooked, keeled. Berry hexagonal-cylindric, scarlet.

*Fl.:* November; *Fr..:* May – June.

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**2. Pothos scandes** L., Sp. Pl.. 968.1753; Hook.f., Fl. Brit. India. 6:551.1893.

Climbing, evergreen herbs, leaves simple, lanceolate, acuminate. Petioles winged, semi amplexicauli, Peduncle axillary, solitary, spathe sub-orbicular, apiculate, spadices globose, yellow deflaxed. Berries oblong red.

*Fl. & Fr.:* October – December.

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**ERIOCAULACEAE**

**ERIOCAULON** L.

**Eriocaulon duthiei** Hook.f., Fl. Brit. Ind. 6:578.1893.

Herbs, roots stock absent. Leaves linear; flowering head, dioecious, peduncle, 8–14cm long, sheathed. Male flowers; sepals 2, free black, linear, not keeled, glabrous, Anther black. Female flower; sepals 2, not keeled, glabrous; Petals 3, hyaline, linear. Seeds, ovoid, oblong, *c.* 0.2–0.4 mm.

*Fl. & Fr.:* August – December

**CYPERACEAE**

**1. BULBOSTYLIS** Kunth

**Bulbostylis densa** (Wall.) Hand.-Mazz. in Karsten & Schenk, Veget. 20(7): 16. 1930. *Scirpus densus* Wall. in Roxb., Fl. Ind. 1: 231. 1820. *Bulbostylis capillaris* Kunth var. *trifida* (Nees) C.B. Clarke in Hook.f., Fl. Brit. India 6: 652. 1893.

Delicate, tufted, annual herb. Leaves glabrous, sheaths membranous, usually with white hairs on the hyaline orifice. Spikelets few, solitary, elliptic, 3–5 × 1.5–3 mm; glumes dark, broadly ovate, laxly imbricate. Nuts obovate, triquetrous, verruculose.

*Fl. & Fr.:* September – November.

*Uses:* Used as fodder.

**2. CAREX** L.

**Carex indica** L., Mant. Pl. 2: 574. 1771; C.B. Clarke in Hook. f., Fl. Brit. India 6: 714. 1894.

Perennial, up to 50 cm tall, rhizomatous. Leaves coriaceous, linear, longer than stem. Panicles up to 20 cm long; spikelets androgynous, divaricate, unisexual; glumes lanceolate. Utricle ellipsoid to subglobose. Nuts stipitate, ovoid-subglobose.

*Fl. & Fr.:* September – October.

**3. CYPERUS** L.

| | |
|---|---|
| 1a. Spikelets spicately arranged | 2 |
| 1b. Spikelets digitately arranged | 6 |
| 2a. Glumes sharply keeled | 3 |
| 2b. Glumes hardly keeled or keel absent | 4 |
| 3a. Annuals with fibrous roots glumes loosely arranged, nut triquetrous | **5. C. iria** |
| 3b. Stoloniferous, perrenial with stolons ending in tubers, glumes closely arranged, nut trigonous | **9. C. rotundus** |
| 4a. Leaves with well developed blades | 5 |
| 4b. Leaves reduced to sheaths ( Only upper 1 or 2 with a short blade | **1. C. corymbosus** |
| 5a. Rachilla straight, hardly winged, nut trigonous, oblong | **3. C. distans** |
| 5b. Rachilla flexuous, winged, nut triquetrous, obvoid to ellipsoid | **8. C. procerus** |
| 6a. Annuals with fibrous roots, stem trigonous, inflorescence simple, often reduced to a single head | **2. C. cuspidatus** |
| 6b. Perennials with short rhizome, stem triquetrous, inflorescence compound to decompound | 7 |
| 7a. Rachilla narrowly winged, nut triquetrous | **6. C. laxus** subsp. **macrostachyus** |
| 7b. Rachilla wingless, nut trigonous | 8 |
| 8a. Leaves not septate nodulose, stamen 1, nut not with thicknened corky angles | **4. C. halpan** |
| 8b. Leaves septate nodulose, stamen 3, nut with thickened corky angles | **7. C. platystylis** |

**1. Cyperus corymbosus** Rottb. Descr. Ic.42, t.7, f.4.1773; C.B.Cl. in Hook.f., Fl. Brit. India. 6: 612.1893.

Herbs, perennial; root-stock tuberous; stem erect, 1–2 m high, subtrigonous. Spikelets alternate, 0.3–1.0 × 0.1 cm, greenish brown, ovate. Nut obovoid, apiculate

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**2. Cyperus cuspidatus** Kunth in H.B.K., Nov. Gen. & Sp. Pl. 1: 204. 1815; Clarke in Hook.f., Fl. Brit. India 6: 598. 1893.

Annual herb, up to 15 cm tall. Leaves filiform. Inflorescence often a solitary head of digitate, stellately spreading, 1–2 cm long spikes; glumes ovate, aristate, keel 3-nerved. Nuts brown, obovoid to oblong-obovoid, apiculate.

*Fl. & Fr.:* October.

In wet places, sparse.

**3. Cyperus distans** L.f., Suppl. 103. 1781; Clarke in Hook.f., Fl. Brit. India 6: 607. 1893; Prain, Beng. Pl. 2: 861. 1963 .

*Vern.: Pani-malanga* (Beng.)

Rhizomatous, perennial herb, up to 75 cm tall. Leaves 4–8 mm broad, shorter or equalling the culm. Inflorescence compound or decompound; spikes pyramidal, spikelets up to 5 cm long, brown, spreading at right angles, linear, glumes elliptic or oblong-ovate, appressed. Nut deep brown, ellipsoid, apiculate.

*Fl. & Fr.:* October.

Common in marshy habitats.

*Use:* Used as fodder.

**4. Cyperus haplan** L., Sp. Pl. 45. 1753 (*haspan*); C.B. Clarke in Hook. *f*., Fl. Brit. India 6: 600. 1893.

Herb, slender perennial; rhizome short, creeping; stem up to 20 cm tall. Leaves usually shorter than stem, 0.3–0.4 cm wide. Spikelets in simple or compound umbels, 3–8 together, *c.* 1 cm long; glumes elliptic or ovate-oblong, *c.* 0.1 cm long, obtuse, sometimes shortly mucronate, dark brown. Stamen usually 1, rarely 2. Stigma 3. Nuts 0.04–0.05 cm long, sharply angular, trigonous, smooth, to slightly warty.

*Fl. & Fr.:* October – February.

Abundant in water loddged places.

**5. Cyperus iria** L., Sp. Pl. 45. 1753; Clarke in Hook.f., Fl. Brit. India 6: 606. 1893; Prain, Beng. Pl. 2: 860. 1963 .

*Vern.: Bara-chancha* (Beng.)

Tufted, annual herb, up to 25 cm tall. Leaves 3–6 mm broad, shorter or longer than the culm. Inflorescence simple or compound; spikelets 4–8 mm long, green changing to yellow, linear-oblong, glumes up to 3 mm long, elliptic-ovate, mucronate, keeled, 3–5 nerved. Nuts brown or black, obovate, stipitate.

*Fl. & Fr.:* October.

In marshy habitats, sparse.

**6. Cyperus laxas** subsp. **macrostachyus** (Boeck.) V.P. Prasad & N.P. Singh in Phytotaxonomy 1: 64.2001. *Cyperus diffuses* Vahl var. *macrostachyus* Boeck. in Linnaea 35:534.1868. *C. pubesquama* Steud. Syn. Pl. Glum. 2:20.1854; Clarke in Hook.f. in Fl. Brit. Ind. 6: 604.1893.

Stout, leafy perennial, with triangular tall stem. Leaf flat, acuminate, scabrid. Sheaths purplish, spikelet 1–4, linear, 20–30 flowered. Glumes closely clasping, appressed ovate deltoid, mucronate. Nuts elliptic, small

**7. Cyperus platystylis** R. Br., Prodr. Fl. Nov. Hall. 214.1810; Clarke in Hook.f., Fl.Brit. Ind.6:598.1893. *C. pallidus* Nees in Wight, Contr. Bot. Ind. 79.1834.

Perrenial with short rhizome, stolon absent; stem stout, triquetrous, up to 80 cm tall. Leaves basal, as long as or longer than stem. Sheath light brown. Inflorescence compound, corymbose, up to 20 cm across, with numerous spikelets, arranged digitately, rachila persistent . Glumes ovate, thick membranous, keel broad, strongly three nerved. Nuts ellipsoid glaucous- brownish with stramineous angles.

*Fl. & Fr.:* May- November

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**8. Cyperus procerus** Rottb., Descr. & Ic. 29, t. 5. f. 3. 1773; Clarke in Hook.f., Fl. Brit. India 6: 610. 1893.

Robust, stoloniferous herb, perennial, up to 1.5 m tall. Leaves up to 1.5 cm broad, coriaceous. Inflorescence compound; spikelets, up to 3 cm long, linear-oblong, brown; glumes up to 4.0 mm long, ovate or elliptic, 5–7 nerved. Nuts blackish-brown, obovoid.

*Fl. & Fr.:* October.

Abundant.

**9. Cyperus rotundus** L., Sp. Pl. 45. 1753; Clarke in Hook.f., Fl. Brit. India 6: 614. 1893; Prain, Beng. Pl. 2: 862. 1963.

*Vern.: Motha* (Beng.)

Stoloniferous, perennial herb, up to 30 cm tall. Leaves 2–4 mm broad. Inflorescence simple or compound; spikelets up to 3 cm long, reddish-brown, linear, acute, slightly curved, compressed; glumes ovate-oblong, acute, 3–7 nerved. Nuts black, obovoid.

*Fl. & Fr.:* October – May.

In wet waste lands, common

**4. ELEOCHARIS** R.Br.

| | |
|---|---|
| 1a. Style 2 fid, nut smooth | 1. **E. atropurpurea** |
| 1b. Style 3 fid, nut coarsely prominently cancellate | 2. **E. retroflexa** |

**1. Eleocharis atropurpurea** (Retz.) Presl., Rel. Haenk. 1: 196. 1828 *excl. specim. Cit.*; Clarke in Hook.f., Fl. Brit. India 6: 627. 1893; Prain, Beng. Pl. 2: 865. 1963. *Scirpus atropurpureus* Retz., Obs. Bot. 5: 14. 1789.

Annual, tufted herb; to 15 cm tall. Sheath membranous, up to 2.5 cm long, oblique at mouth, usually attenuate at apex, often purplish towards base. Spikelets deep brown, oblong-ovoid, 3–5 mm long; glumes elliptic, keeled; perianth bristles 3–7, equalling the nuts. Stamens 1 or 2; filaments minute, apiculate. Style bifid. Nuts black, obovoid, smooth.

*Fl. & Fr.:* October – February.

Abundant along the edges of lake or pool.

**2. Eleocharis retroflexa** (Poir.) Urb. Symb. Ant. 2:165. 1900. *Scirpus retroflexus* Poir. in L., Encycl. 6: 753. 1804. *Eleocharis chaetaria* Roem & Schult., Syst. Veg. 2: 154. 1817; Clarke in Hook. f., Fl. Brit. India 6: 629. 1893.

Annual, tufted herb, up to 20 cm tall. Spikelets brown, 3–5 mm long, ovoid; glumes ovate, keeled; perianth-bristles 6, rather longer than the nut. Nuts brown, obovoid, cancellate.

*Fl. & Fr.:* October.

In wet grassy fields, abundant.

**5. FIMBRISTYLIS** Vahl.

| | |
|---|---|
| 1a. Stamen 1 | 2 |
| 1b. Stamens 2 or 3 | 3 |
| 2a. Stigmas-2, nut biconvex | **1. F. aestivalis** |
| 2b. Stigmas 3, nut obtusely trigonous | **4. F. miliacea** |
| 3a. Stamens 2, glumes strongly keeled, keels protruding above the apex as a mucro | **2. F. dichotoma** |
| 3b. Stamens 3, glumes slightly keeled, puberalous towards the apex | **3. F. ferruginea** |

**1. Fimbristylis aestivalis** (Retz.) Vahl, Enum. 2: 288. 1806; Clarke in Hook.f., Fl. Brit. India 6: 637. 1893. *pro parte*. *Scirpus aestivalvis* Retz., Obs. Bot. 4: 12. 1768.

Annual, tufted herb, up to 20 cm tall. Culms filiform, angular. Leaves setaceous. Inflorescence compound or decompound; spikelets 3–6 mm long, pale brown, elliptic-oblong; glumes ovate, mucronate, keel 3-nerved; stamen 1. Nuts obovate, biconvex.

*Fl. & Fr.:* February.

Abundant along the edge of tanks

**2. Fimbristylis dichotoma** (L.) Vahl., Enum. Pl. 2: 287. 1806 *p. p. Scirpus dichotomous* L., Sp. Pl. 50. 1753. *Fimbristylis diphylla* Vahl, Enum. Pl. 2: 289. 1806; Clarke in Hook.f., Fl. Brit. India 6: 636. 1893; Prain, Beng. Pl. 2: 868. 1963 .

Annual or perennial tufted herb, up to 50 cm tall. Leaves 2–4 mm broad. Inflorescence simple or compound; spikelets 5–10 mm long, brown, ovoid; glumes broadly ovate, mucronlate; stamens 1–3. Nuts obovate, biconvex, 5–10 ribbed on either side, tuberculate, umbonate.

*Fl. & Fr.:* October.

In marshy habitats, abundant

*Use:* Used as fodder.

**3. Fimbristylis ferruginea** (L.) Vahl, Enum. Pl. 2: 291. 1806; C.B. Clarke in Hook.f., Fl. Brit. India 6: 638. 1893. *Scirpus ferrugineus* L., Sp. Pl. 50. 1753.

Annual herb, up to 35 cm tall. Leaves few or absent. Inflorescence simple or compound; spikelets 6–9 mm long, ellipsoid, deep brown; glumes ovate, acute, keel green; stamens 2–3. Nuts obovate, lenticular, umbonate, narrowly margined.

*Fl. & Fr.:* October.

In marshy place, rare.

**4. Fimbristylis miliacea** (L.) Vahl, Enum. Pl. 2: 287. 1806. C.B. Clarke in Hook.f., Fl. Brit. India 6: 644.1893. *Scirpus miliaceus* L., Syst. Veg. 10: 868. 1759. *Fimbristylis quinquengularis* Kunth, Enum. Pl. 2: 229. 1837; Clarke in Hook.f., Fl. Brit. India 6: 644. 1893.

Annual, tufted herb, up to 60 cm tall. Leaves 2–3 mm broad, shorter or longer than the culm. Inflorescence compound or decompound, lax. Spikelets brown, 2–4 mm long, ovoid or ellipsoid; glumes ovate, mucronulate. Nuts sub-globose or broadly ellipsoid, verruculose, surface cells in 4–6 vertical rows on each side.

*Fl. & Fr.:* June – February.

Abundant in marshy habitats.

## **6. FUIRENA** Rottb.

**Fuirena ciliaris** (L.) Roxb., Fl. Ind. 1: 184. 1820. *Scirpus ciliaris* L., Mant. Pl. Alt. 182. 1771. *Fuirena glomerata* Lam., Illustr. 1: 150. 1791; C.B. Clarke in Hook.f., Fl. Brit. India 6: 666. 1893.

Herb, annual up to 30 cm high. Leaves linear-lanceolate, 3.5 × 0.2 cm. Spikelets clustered, up to 2 cm long, oblong. Nuts 0.1 cm long, ellipsoid or obovoid, stipitate, trigonous, beaked.

*Fl. & Fr.:* October – February.

In marshy fields, abundant

## **7. KYLLINGA** Rottb.

1a. Stem triquetrous, base not bulbous, glume with a spinulose keel, nut obovate or elliptic 1. **K. brevifolia**

1b. Stem obtusely trigonous, at base forming an ovoid enlargement, covered by brownish fibre, glumes with smooth keel, nut oblong 2. **K. bulbosa**

**1. Kyllinga brevifolia** Rottb., Descr. Ic. Rar. Nov. Pl. 13, t. 4, f. 3. 1773; Clarke in Hook.f., Fl. Brit. India 6: 588. 1893; Prain, Beng. Pl. 2: 855. 1963. Hook.f., Fl. Brit. India 6: 588. 1893. *Cyperus brevifolius* (Rottb.) Hassk., Cat. Hort. Bog. 24. 1844.

Perennial, rhizomatous herb. Culms up to 20 cm long. Leaves 1–3 mm broad, shorter or equalling the culm. Flowers in capitate globose to ovoid heads up to 1 cm broad; spikelets 3 × 1 mm, compressed, green; glumes keeled, mucronulate. Nuts yellowish-brown, ovoid or elliptic.

*Fl. & Fr.:* October – February.

Abundant in wet, grassy fields and along the edges of ponds.

**2. Kyllinga bulbosa** Beauv**.** Fl. D'Oware & Benin 1:11, t,8,f.1.1804; Koyama in Dassanayake & Fosberg, Rev. Handb. Fl.Ceylon 5: 245. 1985. *Kyllinga triceps* Rottb., Descr. & Ic. 14. t. 4. f. 6. 1773 *nom. illegit.*; Clarke in Hook.f., Fl. Brit. India 6: 587. 1893.

Annual or perennial herb, upto 30 cm tall. Leaves 1–4 mm broad. Inflorescence capitate, 1–5 lobed; spikelets white or pale green, *c.* 2 mm long; glumes 1.0–1.5 mm long, ovate-oblong. Nuts yellowish-brown, oblong or ellipsoid-oblong.

*Fl. & Fr.:* October.

In wet fields, common

### 8. MARISCUS Vahl.

1a. Spike globose or subglobose, spikelets stellately arranged, glumes 2–7 nerved, keel not prominent **1. M. compactus**

1b. Spike cylindrical, spikelets spreading of right angls to rachis, glumes faintly many nerved, keel prominently 3-nerved **2. M. sumatrensis**

**1. Mariscus compactus** (Retz.) Boldingh. Zakfl. Landb. Java. 77.1916. Cyperus compactus Retz. Obs. Bot., 5: 10.1789. *M. microcephalus* Presl, Rel. Haenk. 1: 182. 1828; C.B. Clarke in Hook.f., Fl. Brit. India 6: 624. 1893.

Perennial herb, up to 1.5 m tall. Leaves up to 1 cm broad, septate-nodulose, sheaths reddish-brown, spongy. Inflorescence compound or decompound; spikes globose or subglobose, dense, up to 2.0 cm across, greenish-brown; spikelets linear-lanceolate, glumes 2.5–4.0 × 1.0–1.5 mm, oblong-lanceolate, convolute. Nuts brown, oblong-linear or ellipsoid, apex apiculate-rostrate.

*Fl. & Fr.:* October.

In marshy fields and along the edges of ponds, abundant

**2. Mariscus sumatrensis** (Retz.) J. Raynal in Adansonia 15: 110. 1975. *Kyllinga sumatrensis* Retz., Obs. Bot. 4: 13. 1768. *Mariscus sieberianus* Nees ex C.B. Clarke in Hook.f., Fl. Brit. India 6: 222. 1893. *Cyperus cyperoides* (L.) O. Ktze., Rev. Gen. Pl. 3, 2: 333. 1898. *Scirpus cyperoides* L., Mant. Pl. 2: 181. 1771.

Perennial up to 45 cm high rhizomatous herb. Leaves linear, up to 30 cm long. Inflorescence of terminal, compound umbels. Spikelets linear-lanceolate, *c.* 2 × 1 cm, green. Nuts oblong, apiculate, trigonous, green.

*Fl. & Fr.:* July – January.

Along stream banks, sparse.

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### 9. RHYNCHOSPORA Vahl

**Rhynchospora rubra** (Lour.) Makino in Bot. Mag. Tokyo 17: 180. t. 7. f. 1A-B. 1903. *Schoenus ruber* Lour., Fl. Cochinch. 141. 1790. *Rhynchospora wallichiana* Kunth, Enum. Pl. 2: 289. 1837.

Perennial, tufted herb up to 50 cm tall. Leaves shorter than or as long as stem, linear. Spikelets borne in globose heads, up to 0.8 cm long, linear-lanceolate. Glumes ovate, up to 0.5 cm long, reddish-brown. Nuts ovoid, biconvex, brown.

*Fl. & Fr.:* August – October.

### 10. SCHOENOPLECTUS (Reichb.) Palla

**Schoenoplectus articulatus** (L.) Palla in Bot. Jahrb. Syst. 10: 299. 1888. *Scirpus articulatus* L., Sp. Pl. 47. 1753; Clarke in Hook.f., Fl. Brit. India 6: 656. 1893.

Annual or perennial tufted herb, up to 30 cm tall. Inflorescence pseudolateral near the base, capitate, globose, 1–3 cm across; spikelets sessile, ovoid to ovoid-oblong, up to 1.5 cm long; glumes ovate to suborbicular, appressed, many nerved; stamens 3. Nuts obovoid, trigonous, transversely wavy-wrinkled.

*Fl. & Fr.:* June – May.

*Use:* Used as fodder.

### 11. SCLERIA Berg.

**Scleria terrestris** (L.) Fass. In Rodora 26: 159. 1924. *Zizania terrestris* L., Sp. Pl. 991. 1753. *Scleria radule* Hance in Ann. Sci. Nat. Bot. 18: 232. 1862; C.B. Clarke in Hook.f., Fl. Brit. India 6: 691. 1894.

Herb, robust, stems up to 1.5 m tall, stem sharply triangular, angles scabrid. Leaves 60 × 1.5 cm, 3-nerved. Sheath triquetrous. Inflorescence of large panicles. Spikelets sessile, unisexual up to 4 cm long; female spikelet ovate, male spikelet lanceolate. Nuts globose, white or pale-brown; disc bluntly 3-lobed; lobes short.

*Fl. & Fr.:* September – October.

*Uses:* Used as fodder.

## POACEAE

### 1. APLUDA L.

**Apluda mutica** L., Sp. Pl. 82. 1753. *A. varia* Hack. subsp. *mutica* Hack. in A. DC., Monogr. Phan. 6: 197. 1889; Hook.f., Fl. Brit. India 7: 150. 1896.

Perennial, erect or creeping herb, up to 2.5 m tall. Leaves elliptic-lanceolate, up to 40 cm long. Inflorescence up to 35 cm long, paniculate, leafy; false panicle up to 50 cm long, each raceme enclosed within a purple or green broadly elliptic spatheole, racemes of 1-sessile and 2 pedicelled spikelets. Stamen 3, style slender, stigma feathery pink. Caryopsis oblong.

*Fl. & Fr.:* August – February.

Abundant in grasslands and forests

*J. Bhatt. & Maity* 32388

*Uses:* Used as fodder.

### 2. ARTHRAXON P. Beauv.

1a. Stamens 3, anthers large, nearly as long as glume **1. A. hispidus**
1b. Stamens 2, anthers not half the length of glume **1. A. quartinianus**

**1. Arthraxon hispidus** (Thunb.) Makino in Bot. Mag. Tokyo, 26:214.1912. *A. ciliaris* P. Beauv. E.S.S. Agrost. 3. 111, 152, t. 11, f. 6. 1812; Hook.f., Fl. Brit. India 7: 145. 1896. *A. submuticus* ( Nees ex Steud.) Hochst. op. cit. Hook.f. op. cit. 144.

var. **hispidus**

Herb, erect or procumbent, up to 45 cm tall,rooting at lower nodes, slender, nodes thickened. Leaves ovate, 4 × 1.3 cm, apex acuminate, base cordate, racemes 3–6 often more, spikelets, up to 4 cm long, greenish to greenish purple; lower glume scabrid on back, upper glume hispid at apex, grain 2.5 cm long, linear brown.

*Fl. & Fr.:* September – November

Common in moist and rocky area.

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**2. Arthraxon quartinianus** (A. Rich) Nash in N. Amer. Fl. 17:99. 1912. *Alectoridia quartiniana* A. Rich., Tent. Fl. Abyss. 2:448. t. 99. 1851. *A. ciliar*is *sensu* Hook.f., Fl. Brit. India 7:145.1896, *pro parte*, *non* P. Beauv; Prain, Beng. Pl. 2: 903. 1963.

Annuals. Culms up to 50 cm long, slender, creeping or lanceolate. Leaves ovate-acuminate or lanceolate, up to 6 cm long. Ligules ovate, membranous, fimbriate. Racemes 3–5 in number, each 1–3 cm long, joints linear. Sessile spikelets lanceolate, awned. Lower glume ovate-lanceolate. Upper glume boat-shaped. Lower floret empty. Upper floret bisexual. Stamens 2. Stigmas cream coloured. Caryopsis linear, up to 1.5 mm long.

*Fl. & Fr.:* June – January.

*J. Bhatt. & Maity* 33444

### 3. ARUNDINELLA Raddi

**Arundinella bengalensis** (Spreng.) Druce in Rep. Bot. Exch. Club Brit. Isles 605. 1916. *Panicum bengalensis* Spreng., Syst. Veg. 1: 311. 1825. *Arundinella wallichii* Ness ex Steud., Syn. Pl. Glum. 1: 114. 1854; Hook.f., Fl. Brit. India 7: 75. 1896; Prain, Beng. Pl. 2: 916. 1963 .

*Vern.: Ganga bena* (Beng.)

Tufted, stout, perennial herb, up to 1.5 m. tall. Leaves radical, to 40 × 2 cm, lanceolate, acuminate at apex. Panicles up to 30 cm long, cylindrical; branches up to 4 cm long, stiff, spiciform; glumes hispidulous, lower floret male, upper bisexual. Anther yellow. Caryopsis oblong.

*Fl. & Fr.:* October – February.

In the vicinity of forests, rare

*Use:* Used as fodder and also in cottage industry.

### 4. ARUNDO L.

**Arundo donax** L., Sp. Pl. 81. 1753; Hook.f., Fl. Brit. India 7: 302. 1896.

Herb, up to 3 m high, perennial. Leaves lanceolate, 50 × 6 cm, amplexicaul at base. Panicles large, decompound, up to 45 cm long. Spikelets up to 1.5 cm long, laterally compressed, lanceolate. Grains oblong.

*Fl. & Fr.:* September – June.

### 5. BOTHRIOCHLOA Kuntze

1a. Racemes whorled, sessile; spikelets under 4.5 mm long, very narrow, lower glume pitted **1. B. bladhii**

1b. Racemes digitate, sessile; spikelets over 5 mm, broader, lower glumes not pitted **2. B. ischaemum**

**1. Bothriochola bladhii** (Retz.) S.T. Blake in Proc. Roy. Soc. Queensland 80: 62. 1969. *B. intermedia* (R.Br.) A. Camus in Ann. Soc. Linn. Lyon. 1930 n. s. 76: 164. 1931. *Andropogon intermedius* R.Br., Prodr. 202. 1810; Hook.f., Fl. Brit. India 7: 175. 1896; Prain, Beng. Pl. 2: 907. 1963.

Tufted, perennial herb, up to 1.5 m tall. Leaves *c.* 45 × 1 cm, linear, acuminate at apex, glaucous. Ligules shallow, membranous. Panicles pyramidal-thyrsiform, primary axis 3–8 cm long; spikelets reddish, *c.* 4 mm long. Lower glume ovate-lanceolate, 7-nerved; upper glume 3-nerved. Caryopsis 1.2 mm long.

*Fl. & Fr.:* January – February.

**2. Bothriochloa ischaemum** (L.) Keng in Contrib. Biol. Lab. Sc. Soc. China. Bot. Ser. 10, 201.1936. *Andropogon ischaemum* L., Sp. Pl. 1047. 1753; Hook. f., Fl. Brit. India 7: 171. 1896.

Tufted perennial, up to 80 cm unbranched herb. Leaves dense at base, sheathing glabrous. Racemes digitate, *c*. 8. Spikelets larger, pedicellate, well developed, purple. Glume green, lower glumes not pitted.

*Fl. & Fr.:* July – September.

*J. Bhatt. & Maity* 33320

**6. BRACHIARIA** Griseb.

1a. Spikelets 0.25–0.45 cm long, turgid; lower glume truncate to rounded **1. B. ramosa**
1b. Spikelets 0.1–0.2 cm long, not turgid; lower glume truncate **2. B. reptans**

**1. Brachiaria ramosa** (L.) Stapf. in Prain, Fl. Trop. Afr. 9:542. 1919. *Panicum ramosum* L., Mant. Pl. 1:29. 1767; Hook.f., Fl. Brit. India 7:36. 1896; Prain, Beng. Pl. 2: 886. 1963 .

Annuals or perennials. Culms, up to 75 cm long, creeping or decumbent. Leaves lanceolate, cordate at base. Sheaths slightly keeled. Ligules a row of hairs. Racemes 3–16, alternate. Rachis angular. Spikelets in pairs. Lower glume ovate or obovate, 3 mm long. Upper glume broadly ovate, 2 mm long. Lower floret empty. Upper floret bisexual. First lemma broadly ovate,. Palea equalling lemma. Caryopsis ovoid, brown.

*Fl. & Fr.:* July – October.

*J. Bhatt. & Maity* 33448

*Uses:* Cultivated in Chennai & Mysore for its grains. The flour is mixed with raghi.

**2. Brachiaria reptans** (L.) Gardn. & Hubb. in Hook., Ic. Pl. t. 3363. 1938. *Panicum reptans* L., Syst. Nat. ed. 10. 870. 1759. *P. prostratum* Lam., Encycl. 1: 171. 1791; Hook.f., Fl. Brit. India 7: 33. 1896.

Annual, prostrate or creeping, rarely erect herb, up to 30 cm long, rooting at the lower nodes. Leaves *c*. 5.5 × 1.2 cm, lanceolate, base cordate, amplexicaul. Ligules a rows of hairs, racemes 3–6; spikelets small, elliptic, pinkish-green; pedicel with long white bristles, paired; lower glume truncate, upper glume ovate. Lower floret empty, upper floret bisexual, stamens 3. Caryopsis flattened, ovoid.

*Fl. & Fr.:* September – October.

In the vicinity of forests, common

*Use:* Grains are used as food by tribals and also during famine. Also used as fodder.

**7. COIX** L.

**Coix lacryma-jobi** L., Sp. Pl. 972. 1753; Hook.f., Fl. Brit. Ind. 7:100. 1896; Prain, Beng. Pl. 2: 912. 1963

*Vern.: Gurgar, Kunch* (Beng.)

Annuals. Culms, up to 2 m high, robust branched herb. Leaves lanceolate or linear-lanceolate, up to 50 cm long, cordate at base, ligules narrow membranous. Inflorescence of suberect spikes, male spikelets terminal; female spikelet basal, ovoid, surrounded by hardened bract like involucre, yellowish white or grey. Stamens 3, orange-yellow. Caryopsis globose, bluish grey, polished.

*Fl. & Fr.:* March – December.

*J. Bhatt. & Maity* 33428

Used as fodder. The utricles are made into necklace. It is also used as a major food grain in some parts of Bhutan.

### 8. CYRTOCOCCUM Stapf.

**Cyrtococcum patens** (L.) A. Camus in Bull. Mus. Hist. Nat. Paris 27:118. 1921; *Panicum patens* L., Sp. Pl. 58. 1753. *Cyrtococcum radicans* (Retz.) Stapf. in Hook., Icon. Pl. subtab. 3096.1922. *Panicum radicans* Retz., Obs. Bot. 4:18. 1786.

Annuals. Culms, up to 50 cm long. Leaves ovate-lanceolate, acuminate at apex, rounded at base. Sheaths softly villous. Ligules ovate. Panicles up to 20 cm long, lax. Spikelets purplish-green. Lower glume ovate. Upper glume ovate or obovate. Lower floret empty. Upper floret bisexual. First lemma ovate, chartaceous. Second lemma deltoid, crustaceous. Palea ovate-oblong, crustaceous. Stamens 3, cream coloured. Stigmas white or pink.

*Fl. & Fr.:* February – December.

*J. Bhatt. & Maity* 33400.

### 9. CYMBOPOGON Spreng.

**Cymbopogon martinii** (Roxb.) Wats. in Atkins, Gaz. N. W. Prov. Ind. 392. 1892; *Andropogon martini* Roxb., Fl. Ind. 1:280. 1820. *A. schoenanthus* L. var. *martinii* (Roxb.) Hook.f., Fl. Brit. India 7:100. 1896; Prain, Beng. Pl. 2: 906. 1963 .

Perennials. Culms up to 2 m high. Leaves lanceolate-acuminate. Ligules ovate. Panicles narrow, up to 60 cm long. Inflorescence a compound panicle. Racemes densely villous, sessile spikelets oblong or elliptic; callus hairy; lower glume oblong, upper glume elliptic-lanceolate; lower floret empty; upper floret bisexual; pedicelled spikelets oblong-lanceolate; lower glume elliptic-lanceolate, upper glume lanceolate; lower floret empty, upper floret male; stamens 3, caryopsis oblong.

*Fl. & Fr.:* August – December.

In grasslands, abundant

*J. Bhatt. & Maity* 33429

*Uses:* Plant oil is fragrant; used in rheumatism.

### 10. CYNODON Stapf.

**Cynodon dactylon** (L.) Pers., Syn. Pl. 1: 85. 1805; Hook.f., Fl. Brit. India 7: 288. 1896. *Panicum dactylon* L., Sp. Pl. 58. 1753.

*Vern.: Durba* (Beng.)

Perennial. Culm, up to 40 cm long, stoloniferous creeper. Leaves narrow, linear; ligules ciliate. Racemes 3–6, digitate. Spikelets sessile. Lower glume narrow, oblong, keeled; upper glumes similar to lower glumes. Lemma acute, 3-nerved. Caryopsis 1.5 mm long.

*Fl. & Fr.:* Throughout the year.

In grassy fields and waste places, common.

*Use:* Uses in religious occasion. Excellent fodder for herbivores.

### 11. DIGITARIA Halter, *nom. cons*

| | |
|---|---|
| 1a. Ascending herb; leaves linear; lower glumes absent | 1. **D. ciliaris** |
| 1b. Decumbent herb; leaves elliptic; lower glumes present | 2. **D. radicosa** |

**1. Digitaria ciliaris** (Retz.) Koel., Descr. Gram. 27. 1802. *Panicum ciliare* Retz., Obs. Bot. 4: 16. 1786. *Paspalum sanguinale* L. var. *ciliare* Hook.f., Fl. Brit. India 7: 15. 1896. *Digitaria sanguinalis* Scop. var. *ciliaris* Prain, Beng. Pl. 2: 889. 1963 .

*Vern.: Mukur-Jali* (Beng.)

Slender, ascending, annual herb, up to 1 m tall. Sheath with spreading hairs. Leaves *c*. 13 × 0.8 cm, linear. Spikes, up to 15 cm long, digitate; spikelets lanceolate, ciliate or villous, acute. Lower floret barren; upper floret bisexual. Lemma with its hyaline margin enfolding most of the palea, dorsally compressed. Caryopsis oblong, acute to subacute, 2 mm long.

*Fl. & Fr.:* September – October.

Common in waste lands

*Uses:* Plant is grazed by herbivores.

**2. Digitaria radicosa** (Presl) Miq., Fl. Ind. Bat. 3:437.1857. *Panicum radicosum* Presl, Rel. Haenk. 1:297. 1830. *Digitaria timorensis* (Kunth) Bal. in Morot, J. Bot. 4:138. 1890.

Annual, decumbent herb, up to 30 cm high. Culms much bracnched, slender. Leaves narrowly elliptic, *c*. 4.2 × 0.4 cm. Racemes 2(-3), very slender, erect up to 6.5 cm; spikelets paired narrow; upper glume half of the spikelet; lower glume small. Stamens 3

*Fl. & Fr.:* April – December.

*J. Bhatt. & Maity* 31101

**12. ECHINOCHLOA** P. Beauv., *nom. cons.*

**Echinochloa crus-galli** (L.) P. Beauv. Ess. Agrost. 53:161.1812. *Panicum crus-galli* L., Sp. Pl. 56. 1753; Hook.f., Fl. Brit. India 7:30.1896. Prain, Beng. Pl. 2: 886. 1963 .

*Vern.: Bara shama* (Beng.)

Annuals. Culms up to 80 cm high, robust, erect, tufted. Leaves lanceolate, acuminate at apex. Sheaths slightly keeled. Ligules absent. Panicles ovate or pyramidal, 3–20 cm long, congested; racemes 5–15. Spikelets ovate-lanceolate, hispid. Lower glume ovate, cuspidate. Upper glume ovate-lanceolate. Lower floret male or barren. Upper floret bisexual. Stamens 3, anthers yellow. Stigmas white. Caryopsis ellipsoid.

*Fl. & Fr.:* March – September.

Common in waste land and marshy places.

*J. Bhatt. & Maity* 33422, 33445

*Uses:* Good fodder for cattle. The grains are used as food in times of scarcity, used medicinally for spleen disease.

**13. ELEUSINE** Gaertn.

**Eleusine indica** (L.) Gaertn., Fruct. Sem. Pl. 1: 8. 1789; Hook.f., Fl. Brit. India 7: 293. 1896. *Cynosurus indicus* L., Sp. Pl. 72. 1753.

Herb, annual, erect, tufted, up to 25 cm high; culms slightly compressed. Leaves linear, *c*. 12 × 0.3 cm, flat. Spikes 2–7 or more; spikelets up to 0.3 cm long, ovoid, green. Grains oblong or globose.

*Fl. & Fr.:* September – February.

In waste lands and near habitations, abundant

*Uses:* Used as fodder.

**14. ERAGROSTIS** N.M.Wolf.

**Eragrostis gangetica** (Roxb.) Steud., Syn. Pl. Glum. 1:266.1854; Prain, Beng. Pl. 2: 921. 1963. *Poa gangetica* Roxb., Fl. Ind. 1:341. 1820. *Eragrostis stenophylla* Hochst. ex. Miq. in Verh. Konink. Nederl. Inst. 3,4, 39.1851, *pro parte*; Hook.f., Fl. Brit. India 7: 318. 1896.

Annual. Culms tufted, slender up to 60 cm high, erect. Leaves lanceolate or linear-lanceolate. Ligules truncate, fimbriate, membranous. Panicles congested up to 15 cm long, ovate-oblong, grey. Spikelets ovate-oblong up to 0.6 cm long, 5–20 flowered. Lemmas loosely imbricate. Paleas

deciduous. Stamens 3 or 2; anthers violet with white connectives. Stigmas white. Grains oblong, brown.

*Fl. & Fr.:* June – December.

Abundant along the edge of Murti River

*J. Bhatt. & Maity* 33440

**15. HYMENACHNE** P. Beauv.

**Hymenachne acutigluma** (Steud.) Gilliland in Gard. Bull. Singap. 20:314.1963. *Panicum acutiglumum* Steud., Syn. Pl. Gram.66.1854. *Hymenachne pseudointerrupta* C. Muell. in Bot. Z. 19:333. 1861. *Panicum myuros auct. non*. Lam.1791: Hook. f., Fl. Brit. India 7:39.1896.

Perennial. Culms up to 2 m long, creeping herbs. Leaves linear-lanceolate. Sheaths ciliated, ligules truncate, narrow, membranous. Panicles spiciform, interrupted, up to 35 cm long, densely spiculate. Spikelets narrowly elliptic-lanceolate. Lower glume ovate, acuminate. Upper glume linear-lanceolate, with aristate apex. Lower floret barren. Upper floret bisexual. First lemma similar to upper glume. Palea small.

*Fl. & Fr.:* June – October.

*J. Bhatt. & Maity* 33427

**16. IMPERATA** Cyrillo

**Imperata cylindrica** (L.) P. Beauv. var. **major** (Nees) C.E. Hubb. ex Hubb. & Vaughan, Grass Maur. 96. 1940. *I. koenigii* (Retz.) P. Beauv. var. *major* Nees, Fl. Afr. Austr. 90. 1841.

*Vern.: Ulu ghas* (Beng.)

Erect, stiff, perennial herb up to 60 cm tall. Leaves up to 33 cm long, linear, stiffy erect, shorter than culm. Panicles 6–17 cm long, silvery-white, spiciform; spikelets 3–4 mm long, lanceolate; lower glume oblong-lanceolate, lower lemma 2 mm, ovate, acuminate, stamens 2. Caryopsis oblong.

*Fl. & Fr.:* April – November.

Common along forest roads.

*Uses:* Good soil binder, fodder for cattle. Leaves are used for making ropes, brushes, and used for packing materials. A decoction of root stock is given in diarrhoea.

**17. ISCHAEMUM** L.

**Ischaemum indicum** (Houtt.) Merr. in Journ. Arn. Arb. 19: 320. 1938. *Phleum indicum* Houtt., Nat. Hist. Ser. 2, 13: 198. t. 90. f. 2. 1782. *Ischaemum ciliare* Retz., Obs. Bot. 6: 36. 1791; Hook.f., Fl. Brit. India 7: 133. 1896.

Perennial, erect or ascending herb, rooting at the lower nodes, up to 50 cm high. Leaves up to 14 cm long, linear or linear-lanceolate, apex acuminate, hirsute on both sides, ligules membranous; spikes usually 2, 2–5 cm long, terminal, sessile, spikelets up to 0.5 cm long; lower glume of sessile spikelets winged in the upper half, apex emerginate, beak smooth.

*Fl. & Fr.:* October – December.

In marshy fields, abundant

*J. Bhatt. & Maity* 33313

*Uses:* Used as fodder and also as soil binder.

**18. OPLISMENUS** Beauv.

**Oplismenus compositus** (L.) P. Beauv, Ess. Agrost. 54: 168. 1812; Hook.f., Fl. Brit. India 7:66. 1896. *Panicum compositum* L., Sp. Pl. 57.1753.

Annual or perennial. Culms up to 1 m long, rambling herb or trailing; rooting at the lower nodes. Leaves ovate-elliptic to lanceolate. Sheaths covered with tubercle based hairs. Ligules row of hairs. Inflorescence up to 30 cm long; racemes 4–8, rhachis triquetrous. Spikelets paired, elliptic or elliptic-lanceolate. Lower glume 5-nerved, awned. Upper glume 7–9 nerved, aristate. Lower floret barren, Upper floret bisexual. First lemma ovate. Palea lanceolate. Stamens 3, anthers violet. Stigmas pink or crimson-red. Caryopsis dorsally compressed.

*Fl. & Fr.:* Throughout the year.

In dry and moist deciduous forests, sparse.

*J. Bhatt. & Maity* 32377

*Uses:* Used as fodder.

## 19. PANICUM L.

| | |
|---|---|
| 1a. Leaves broadly ovate, acuminate amplexicaul; spikelets slightly gibbous; lower glumes nearly as long as the spikelets | **1. P. brevifolium** |
| 1b. Leaves narrowly elliptic, lanceolate or linear, rounded or shallowly cordate base, but nerve amplexicaul; spikelets symmetrical | 2 |
| 2a. Lower glume less than half the length of the spikelet: | |
| 2b. Lower glume three fourth the length of the spikelets | 4 |
| 3a. Spikelets oblong-lanceolate to narrowly lanceolate, acute; lower glume orbicular, obtuse | **5. P. paludosum** |
| 3b. Spikelets ovate- oblong to elliptic, acute or obtuse; lower glume broadly ovate, acute | **6. P. sumatrense** |
| 4a. Ligules fimbriate | 5 |
| 4b. Ligules truncate | **3. P. khasianum** |
| 5a. Annual, leaves lanceolate, panicle cylindric | **4. P. notatum** |
| 5b. Perrenial, leaves linear, panicle pyramidal | **2. P. curviflorum** |

**1. Panicum brevifolium** L., Sp. Pl. 59. 1753. *P. ovalifolium* Poir. in Lam., Encycl. Suppl. 4: 279.1816; Hook.f., Fl. Brit. India 7:44. 1896.

Annuals. Culms up to 50 cm long, slender, creeping or geniculate. Leaves ovate, glabrous or with scattered hairs on both surfaces. Sheaths ciliate along one margin. Ligules membranous, ciliate. Panicles ovate or pyramidal, 2–16 cm long, effuse; spikelets ovate or elliptic. Lower glume ovate-oblong. Upper glume ovate-acute. Lower floret male. Upper floret bisexual. Stamens 3. Second lemma ovate, shining. Palea ovate or elliptic, hyaline. Caryopsis ovate, ellipsoid.

*Fl. & Fr.:* May – December.

*J. Bhatt. & Maity* 33450, 32371

*Uses:* Good fodder

**2. Panicum curviflorum** Hornem., Bot. Hafn. Suppl. 116. 1819. *P. trypheron* Schult., Mant. 2: 244. 1824; Hook.f., Fl. Brit. India 7: 47. 1896: Prain, Beng. Pl. 2: 888. 1963 .

Tufted, annual herb, up to 30 cm tall. Leaves linear, *c*. 8 × 0.5 cm, acute at apex, truncate at base, hairy beneath, ligules a rim of hairs. Panicles up to 20 cm long, pyramidal, lax; spikelets purple, 3–4 mm long, elliptic-oblong; lower glume ovate, strongly 3-veined, cuspidate-acuminate. Upper glume lanceolate, 7-veined. Caryopsis *c*. 2.5 mm long.

*Fl. & Fr.:* May – October.

Common in wet grassy fields.

**3. Panicum khasianum** Munro ex Hook.f., Fl. Brit. India 7: 54. 1896.

Large perennial. Culm up to 2 m tall, decumbent. Leaves lanceolate, up to 24 cm long, sheaths ciliated, ligules truncate, membranous. Panicle *c*. 33 × 25 cm, broadly ovoid, lax. Spikelets green or

purple. Lower glume ovate, obscurely veined; upper glume oblong-lanceolate, acute, 5-nerved. Lower floret epaleate, upper lemma creamy with green tip. Palea elliptic, acute.

*Fl. & Fr.:* July – November.

**4. Panicum notatum** Retz., Obs. Bot. 4: 18. 1786. *P. montanum* Roxb., Fl. Ind. 1: 315. 1820; Hook.f., Fl. Brit. India 7: 53. 1896: Prain, Beng. Pl. 2: 888. 1963 .

Large perennial herb up to 2.5 m tall. Leaves lanceolate, *c*. 16 × 2.5 cm, acuminate at apex, cordate at base,margin long ciliated. Panicles up to 36 cm long, broadly cylindric, spikelets up to 2.5 mm long, ellipsoid, usually green; lower glume ovate, 3–5 nerved; upper glume ovate-elliptic, acute to blunt. Lower floret epaleate; upper floret paleate; palea elliptic, acute, hyaline. Caryopsis *c*. 2 mm long.

*Fl. & Fr.:* May – December.

In moist deciduous forests, sparse

**5. Panicum paludosum** Roxb., Fl. Ind. 1: 310. 1820. *P. proliferum* Hook.f., Fl. Brit. India 7: 50. 1896; Prain, Beng. Pl. 2: 888. 1963 .

*Vern.: Kalas-nar* (Beng.)

Floating, perennial herb; culms spongy, rooting at the lower nodes. Leaves linear-lanceolate, *c*. 20 × 1.5 cm, margins hispid; ligules very short. Panicles up to 20 cm long; lower branches whorled and fascicled; spikelets green, 3–4 mm long, lanceolate; lower glume whitish or orbicular. Upper glumes narrowly lanceolate. Lower floret lemma similar to upper glume; upper floret lemma creamy; anther orange. Caryopsis *c.* 2.5 mm long.

*Fl. & Fr.:* May – December.

Aabundant in ponds.

*Uses:* Favourite fodder for elephant and buffalo. Grain is used in flour for making cake by hill tribes.

**6. Panicum sumatrense** Roth ex Roem. & Schult., Syst. Veg. 2: 434. 1817. *P. miliare auct. non* Lam., 1791; Hook.f., Fl. Brit. India 7: 46. 1896.

Annual. Culms up to 1 m tall, erect or geniculate. Leaves linear, flat, ligules ciliate. Inflorescence contracted panicle. Spikelets green or purple tinged, elliptic. Lower glumes acuminate, 3–5 nerved; upper glumes ovate, concave. Lower floret barren; upper floret bisexual. Lemma coriaceous, shining; anther purple. Caryopsis creamy, subglobose.

*Fl. & Fr.:* July – October.

In waste lands and grassy fields, abundant

*J. Bhatt. & Maity* 32439

*Uses:* Used as fodder for cattle. Grain is used as flour for making cakes.

**20. PASPALIDIUM** Stapf.

**Paspalidium flavidum** (Retz.) A. Camus in Lecomte, Fl. Gen. Indo-Chine 7: 419. 1922. *Panicum flavidum* Retz., Obs. Bot. 4: 15. 1786; Hook.f., Fl. Brit. India 7: 28. 1896.

Annual herb, up to 30 cm tall, decumbent at the base. Leaves *c*. 10 × 0.6 cm, linear-lanceolate; spike *c*. 0.5–2.5 cm long, distant on the rachis; spikelets green, 2–3 mm long, ovoid; lower glume sub-orbicular or orbicular. Caryopsis *c.* 1.5 mm long.

*Fl. & Fr.:* October – February.

Common in waste lands and grassy fields.

*Uses:* Used as fodder.

## 21. PASPALUM L.

1a. Upper glume 2-nerved, stigmas white **1. P. conjugatum**
1b. Upper glume 3–5 nerved, stigmas cream yellow, reddish brown or violet **2. P. scorbiculatum**

**1. Paspalum conjugatum** Berg. in Act. Helv. Phys. Math.7:129. t.8. 1772. Hook.f., Fl. Brit. India 7:11. 1896.

Perennials. Culms up to 1 m long, stoloniferous. Leaves lanceolate, *c*. 8 × 1 cm. Sheaths compressed, keeled, ciliate along one margin. Racemes 2, up to 15 cm long. Spikelets elliptic,greenish yellow. Lower glume, 0. Upper glume ovate or orbicular, 2-nerved. Lower floret barren. Upper floret bisexual. First lemma membranous, second lemma crustaceous. Stamens 3, Stigmas white.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 31122

*Uses:* Used as fodder.

**2. Paspalum scrobiculatum** L., Mant. Pl. 1:29. 1767; Hook.f., Fl. Brit. India 7:10. 1896. *P. commersonii* Lam., Tab. Encycl. 1:175. t.43/1. 1791; Bor, Grass. Bur. Cey. Ind. Pak. 335. t.38. 1960.

Annuals or perennials. Culms up to 1 m high, tufted and erect or creeping rarely trailing or geniculate. Leaves lanceolate. Sheaths slightly keeled. Ligules membranous .Racemes usually 2, rarely 3 or 4, up to 10 cm long . Spikelets ovate, obovate or orbicular. Lower glume 0, upper glume membranous, 3–5-nerved. Lower floret barren. Upper floret bisexual. First lemma membranous, second lemma ovate, crustaceous. Palea ovate-oblong or orbicular, crustaceous, inflexed. Anthers yellow or brownish. Stigmas cream yellow, reddish-brown or violet.

*Fl. & Fr.:* Throughout the year.

In marshy habitats, abundant

*J. Bhatt. & Maity* 33409

## 22. PENNISETUM Rich.

**Pennisetum polystachyon** (L.) Schult., Syst. Veg. Mant. 2:146. 1824. *Panicum polystachyon* L., Syst. Nat. ed. 10. 2:870. 1759. *Pennisetum setosum* (Sw.) L.C. Rich in Pers., Syn. Pl. 1:72. 1805; Hook.f., Fl. Brit. Ind. 7:87.1896; Prain, Beng. Pl. 2: 880. 1963 .

*Vern.: Swati* (Beng.)

Annuals or perennials. Culms up to 2 m high. Leaves lanceolate. Sheaths keeled, tubercle based, hairy. Ligules membranous, fimbriate. Panicles spiciform up to 20 cm long, cream-yellow or purplish. Rhachis angular with sharp-edged decurrent wings, glabrous. Involucre enclosing one sessile spikelet. Spikelets lanceolate. Lower floret male or barren. Upper floret bisexual. First lemma ovate-lanceolate, chartaceous. Palea short, hyaline. Second lemma oblong-acute, coriaceous. Palea oblong or ovate-oblong, coriaceous. Anthers yellow. Stigmas golden-yellow.

*Fl. & Fr.:* Throughout the year.

*J. Bhatt. & Maity* 33314

*Uses:* Cultivated as dryland fodder grass.

## 23. PHRAGMITIS Trin.

**Phragmitis karka** (Retz.) Trin. ex Steud., Nom. Bot. ed. 2. 324. 1841; Hook.f., Fl. Brit. India 7: 304. 1896. *Arundo karka* Retz., Obs. Bot. 4: 21. 1786; Prain, Beng. Pl. 2: 919. 1963 .

Perennial herb; rhizome creeping; culms up to 3 m tall. Leaves *c*. 40 × 3.5 cm, linear. Panicles up to 40 cm long, profusely branched; spikelets up to 1.3 cm long, brown; pedicels capillary,

glabrous; lower glume 3–4 mm long; upper glume 5–6 mm long. Glumes purplish, drying brown. Caryopsis subcylindric.

*Fl. & Fr.:* October – December.

Abundant along the banks of streams.

**24. PSEUDOECHINOLAENA** (Hook.f.) Stapf

**Pseudoechinolaena polystachya** (H.B.K.) Stapf. in Prain, Fl. Trop. Afr. 9:495. 1919. *Echinolaena polystachya* H.B.K., Nov. Gen. et Sp. 1:119. 1816. *Panicum uncinatum* Raddi, Agrost. Bras. 41. 1823; Hook.f., Fl. Brit. Ind. 7:58. 1896.

Annuals or perennials. Culms up to 60 cm long, creeping or decumbent. Leaves oblong-lanceolate, elliptic or elliptic-lanceolate, finely acuminate. Ligules truncate or lacerate. Panicles up to 25 cm long, of 4–8 racemes. Spikelets ovate-lanceolate, glistening in dew. Lower glume ovate-lanceolate. Upper glume boat-shaped, hooked. Lower floret empty. Upper floret bisexual. First lemma boat-shaped. Palea oblong-lanceolate. Second lemma ovate-lanceolate. Palea ovate-lanceolate, crustaceous. Anthers cream yellow. Stigmas white.

*Fl. & Fr.:* Throughout the year.

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*Fl. & Fr.:* Throughout the year.

**25. SACCHARUM** L.

**Saccharum spontaneum** L., Mant. Pl. 2: 183. 1771; Hook.f., Fl. Brit. India 7: 118. 1896.

Herb, perennial, rhizomatous, erect, tufted, up to 3 m high. Leaves narrowly linear, *c*. 60 × 0.5 cm; sheath smooth with fimbriate mouth; ligules ovate, membranous. Panicles large, with silvery silky hairs. Spikelets lanceolate.

*Fl. & Fr.:* September – March.

**26. SETARIA** Beauv.

1a. Inflorescence contracted, narrow, lobed or spiciform, cylindric, leaves flat not folded 2
2a. inflorescence a cylinderic false spike **4. S. pumila**
2b. Inflorescence a narrow, lobed panicle **2. S. intermedia**
1b. Inflorescence lax, widely spreading, leaves plicately folded at least towards the base 3
3a Leaves plietely folded from base to apex; panicle often lax, rarely contracted, but then shorter **3. S. pamifolia**
3b. Leaves plicately folded only at the base; panicles contracted, narrow **1. S. barbata**

**1. Setaria barbata** (Lam.) Kunth, Rev. Gram.1:47. 1829. *Panicum barbatum* Lam,. Tab. Encycl. Meth. Bot.1:171. 1791. *P. flavescens auct.non* Sw. 1788: Hook.f., Fl. Brit. India 7: 56. 1896; Prain, Beng. Pl. 2: 888. 1963 .

*Vern.: Banaspati ghas* (Beng.)

Annuals. Culms up to 60 cm long, creeping or decumbent. Leaves elliptic or elliptic-lanceolate, *c*. 11 × 9 cm. Sheaths keeled. Ligules row of hairs. Panicles narrow, up to 15 cm long, lax. Spikelets elliptic or elliptic-lanceolate. Lower glume ovate. Upper glume ovate-oblong . Lower floret male. Upper floret bisexual. First lemma chartaceous. Palea elliptic, hyaline. Second lemma crustaceous, rugose. Palea elliptic, crustaceous, rugose. Stigmas purple.

*Fl. & Fr.:* September – March.

*J. Bhatt. & Maity* 33408

*Use:* Used as fodder.

**2. Setaria intermedia** Roth. ex Roem. & Schult., Syst. Veg. 2: 489. 1817; Hook.f., Fl. Brit. India 7: 79. 1896; Prain, Beng. Pl. 2: 881. 1963 .

Erect or ascending, annual herb up to 60 cm tall. Leaves *c*. 20 × 1.5 cm, linear-lanceolate. Panicles 5–15 cm long; spikelets *c.* 2 mm long, green, ellipsoid; upper lemma rugose; bristles up to 8 mm long, 3–6 in an involucre. Caryopsis *c.* 1.5 mm long.

*Fl. & Fr.:* October.

Common in waste lands.

**3. Setaria palmifolia** (Koen.) Stapf. in J. Linn. Soc. (Bot.) 42:186. 1914. *Panicum palmaefolium* Koen. in Naturf. 23:208. 1788. *P. plicatum sensu* Hook.f., Fl. Brit. India 7:55.1896, *pro parte non* Lam. 1791; Prain, Beng. Pl. 2: 888. 1963 .

Perennials. Culms up to 1.5 m high, ascending herbs. Leaves elliptic or elliptic-lanceolate. Ligules row of hairs or fimbriate membrane. Panicles up to 40 cm long, lax, bristles angular. Spikelets elliptic or lanceolate, sessile or shortly pedicelled. Lower glume ovate. Upper glume elliptic. Lower floret barren. Upper floret bisexual. First lemma elliptic chartaceous. Palea absent or a triangular hyaline scale. Second lemma crustaceous. Palea elliptic, crustaceous, rugose. Stigmas small.

*Fl. & Fr.:* August – December.

*J. Bhatt. & Maity* 33334

**4. Setaria pumila** (Poir.) Roem. & Schult., Syst. Veg. 2:891. 1817. *Panicum pumilum* Poir., Encycl. Meth. Bot. Suppl. 4:273. 1816. *Setaria glauca sensu* Hook.f., Fl. Brit. India 7:78. 1896, *pro parte*; Prain, Beng. Pl. 2: 880. 1963 .

*Vern.: Pinginatchi* (Beng.)

Annuals. Culms up to 1.2 m high. Leaves oblong *c*. 17 × 0.6 cm, sheaths keeled. Ligules ovate. Panicles spiciform, cylindric, up to 12 cm long, yellowish. Bristles numerous, golden or often purplish. Spikelets ovate or subglobose. Lower glume ovate 3-veined. Upper glume orbicular, 5-veined. Lower floret male or barren. Upper floret bisexual. First lemma ovate-elliptic. Palea elliptic, hyaline. Second lemma boat-shaped, palea green, beaked, coarsely rugose. Palea ovate-oblong. Stigmas small.

*Fl. & Fr.:* May – December.

In waste lands and grassy fields, abundant

*J. Bhatt. & Maity* 32831

## 27. SPOROBOLUS R. Br.

**Sporobolus indicus** (L.) R.Br. var. **major** (Buse) Baaijens in Blumea 35: 437. 1991. *Sporobolus diandrus* (Retz.) Beauv. var. *major* Buse in Miq., Pl. Jungh. 3: 343. 1854. *Sporobolus fertilis* (Steud.) W.D. Clayton in Kew Bull. 19: 291. 1965. *Sporobolus indicus auct. non* (L.) R.Br. 1810; Hook.f., Fl. Brit. India 7: 247. 1896.

Stout tufted perennial. Culm up to 55 cm long. Leaves *c*. 28 × 0.6 cm linear to oblong,. Inflorescence narrowly cylindric up to 60 × 2 cm. Spikelets silvery grey. Lower glume oblong-ovate; upper glume similar to lower but larger. Lemma narrowly lanceolate. Palea broadly oblong-lanceolate. Anther 3. Caryopsis minute, *c*. 1.2 × 0.7 mm, oblong, apex truncate.

*Fl. & Fr.:* March – December.

## 28. THEMEDA Forssk.

**Themeda arundinacea** (Roxb.) Ridley in Trans. L.. Soc. 2, 3: 401. 1893. *Anthistiria arundinacea* Roxb., Fl. Ind. 1: 256. 1820. *A. gangetica* Cav. ssp. *arundinacea* (Roxb.) Hack in DC., Monogr. Phan. 6: 674. 1889; Hook.f., Fl. Brit. India 7: 217. 1896.

Annual. Culm up to 6 m. Leaves distichous, mainly basal, blade widest in upper half, gradually narrowed to base, margin brown hyaline. Inflorescence erect, spathodes, 3–8 cm, peduncle *c*. 1 cm, swollen, apex hairy, involucre spikelet *c* 1.5 cm. Lower glume lanceolate, covered with golden hair at back, many nerved; upper glume trinerved, bisexual spikelet *c*. 8 mm, bearded with brown hairs; lower glume oblong, two teethed brown.

*Fl. & Fr.:* August – December.

**29. VETIVERIA** Bory.

**Vetiveria zizanioides** (L.) Nash in Small, Fl. South-east U.S. 67. 1903. *Phalaris zizanioides* L., Mant. Pl. 2: 183. 1771. *Andropogon squarrosus* Hook.f., Fl. Brit. India 7: 186. 1896; Prain, Beng. Pl. 2: 907. 1963 .

*Vern.: Bena, khas-khas* (Beng.)

Tufted, perennial herb up to 2.5 m tall; roots aromatic. Leaves *c*. 90 × 1.5 cm, narrow, erect, margin scabrid. Panicles to 35 cm long, purple, with whorls of fragile 2–5 cm long racemes; spikelets yellow or brown, up to 3.5 mm long; lower glume of sessile spikelets oblong, spines on back, acute at tip, muricate; upper glume oblong, acute; lower lemma broadly lanceolate, up to 2.5 mm; upper lemma 2.2 mm. Caryopsis *c.* 2 mm long.

*Fl. & Fr.:* February – August.

Along water courses and in marshy places, common.

*Use:* The aromatic root are the source of Vetiver oil, used in the manufacture of perfume. Recently it is used as soil binder.

## ACCOUNTS OF PTERIDOPHYTIC FLORA

### ADIANTACEAE

### ADIANTUM L.

**Adiantum philippense** L., Sp. Pl. 2: 1094. 1753; Ellis in Journ. Andaman Sci. Assoc. 3(2): 66. 1987. *A. lunulatum* Burm.f., Fl. Ind. 235. 1768; Bedd., Handb. Ferns Brit. India 82. 1883.

Stipes 10–15 cm long. Fronds 15–25 cm long, simply pinnate, often elongated and rooting at the apex. Pinnae subdimidiate the lower edge, oblique with the petiole, upper edge rounded, sides usually more or less lobed. Sori continuous lines along the edge.Grows abundantly in dry area.

*J. Bhatt. & Maity* 33363

### CHEILANTHES Sw.

**Cheilanthes farinose** Kaul.f. var. **albomarginata** (Clarke) Bedd., Handb. Ferns Brit. India Suppl. 2. 1892. *Aluritopteris albomarginata* (Clarke) Ching, Hongkong Naturalist 10: 199. 1941.

Roots tufted; stipes more or less elongated, ebenous, glossy; fronds subcoriaceous, to 40 cm long, deltoidly lanceolate or lanceolate, glabrous, white and powdery beneath, pinnate, the apex pinnatifid, acuminate. Involucers brown, scarious, rounded, margin entire or toothed and jagged.

### POLYPODIACEAE

### 1. DRYNERIA (Borry) J. Sm.

**Dryneria quercifolia** (L.) J. Sm. in Hook. Journ. Bot. 3: 398. 1841; Bedd., Handb. Ferns Brit. India 341. t. 191. 1883. *Polypodium quercifolium* L., Sp. Pl. 2: 1087. 1753.

Rhizome creeping, short, stout, densely scaly; scales very dark brown, closely finely toothed, 40 cm long and 30 cm wide. Nest leaves deeply lobed; lobes broad, rounded. Stipes of foliage leaves about 30 cm long; lamina to about 100 cm long and 40 cm wide, lobed; lobes oblique, shortly acuminate. Sori in a rather regular row on each side of each main vein.

### 2. PYRROSIA Mirb.

**Pyrrosia lanceolata** (L.) Farwell., Amer. Midl. Nat. 12:245, 1931. *Acrostichma lanceolatum* L. Sp.pl. 1067, 1753. *Polypodium spissum* Bory ex Willd. Sp.pl. 5: 246.1810.

Rhizome widely creeping, scaly, bearing fronds at intervals of 1.0–3.0cm. Frond simple linear to lanceolate or narrowly elliptical, appressed tomentose below, more or less glabrous above. Apex narrowly reflexed composed of uniform stellate hairs. Sori emergent through the tomentum

*F.No.:* 33366.

### 3. PHLEGMARIURUS (Herter.) Holub.

**Phlegmariurus phlemaria** (L.) Sen et Sen, Fern Gaz. 11(6): 421. f. Sw, syn. Fil. 176. 1806; Chowdhury, Trans. Nat. Inst. Sci. India 1: 193. 1937; Mehra & Bir, Res. Bull. (N.S.) Punjab Univ. 15(1&2): 102. 1964.

Plant epiphytic, stem tufted, more or less decidedly pendulous, 15–75cm long, usually more than two times dichotomously forked, (rarely once forked branches with much slender stem). Leaves lax to close, 6–8 whorled, horizontally spreading, spike terminal or branchlets 20 cm long, sporophylls, lax small triangular.

### 4. SPHAEROSTEPHANOS J. Sm.

**Spharostephanos unitus** (L.) Holhum, Fl. S. Afr. Bot. 40: 165. 1974; Sledge, Bull. Brit. Mus. Nat. Hist. Bot. 8(1): 44. 1981. *Polypodium unitum* L. syst. Nat. 10$^{th}$ ed. 2: 1326.1759.

Rhizome long creeping, covered with narrow brown scales. Stipe 30–50cm. Rachis densly hairy. Lamina 40–60cm long, pinnate with 15–25 pairs of pinnae except several pairs of abruptly reduced auricle line lower pinnae. Upper surface of pinnae glabrous except costae with scattered short hairs, lower surface rather densly clothed with pale stiff hairs, sori on veins, indusium persistant.

Grows from plains to 1200 m alt.

## PTERIDACEAE

### PTERIS L.

**1. Pteris biaurita** L., Sp. Pl. 2: 1076. 1753; Clarke, Trans. L.. Soc. London II. Bot. 1: 469. 1880; Hope in Journ. Bombay Nat. Hist. Soc. 13: 455. 1901. *Campteria biaurita* (L.) Hook., Gen. Fil. t. 65A. 1841; Bedd., Handb. Ferns Brit. India 116. 1883.

Stock erect, short, covered with many slender roots; scales on apex of stock and bases of stipes dark brown with pale yellow. Sterile and fertile fronds slightly dimorphic. Sori often continuous, round the sinuses but not reaching the apices of the lobes; spores tetrahedral.

Grows under shade near water stream.

*J. Bhatt. & Maity* 33360

**2. Pteris nemoralis** Willd. Enum. *P. normalis* D. Don. *Compteria nemoralis* J. Sin. Bot. Mag.72; *P. biaunita* Kook. et Bak. syn. *P.biaunta* var *intermittens* C. Chr. U.S. Nat. Herb. 26: 312. 1931.

Rhizome erect or suberect brown scales. Stipe up to 60 cm long base glabrous, Lamina slightly dimorphous, deeply pinnatified. Venation variable. Sori continious round the sinus but not reaching the apices of the lobes.

Grown under shade near pool area.

*J. Bhatt. & Maity* 33361.

## SELAGINELLACEAE

### SELAGINELLA P. Beauv.

**1. Selaginella repanda** (Desv. ex Poir.) Spring in Gaudinch., Voy. Bonite Bot. 1: 329. 1846; Panigrahi & Dixit in Journ. Ind. Bot. Soc. 46(2 & 3): 224, t. 1, f. 9, text-fig. 9. 1967.

Stems 2.5–5.0 cm, suberect to erect, branches from the base; branches erecto-patent, pinnate compound. Leaves heteromorphic, contiguous, lateral leaves spreading, ovate, sub-fulcate. Strobili tetragonous. Sporophylls uniform, ovate, acuminate.

**2. Selaginella semicordata** (Wall. ex Hook et Grev.) Spring, Mart. Fl. Bras. 1(2): 122. 1840; Mem. Acad. Sci. Belg. 24(2): 107. 1850; Bak., Handb. Fern Allies 48. 1887; Alston, Proc. nat. Inst. Sci. Ind. 11: 222. 1945; Reed, Mem. Soc. Broter. 18: 207. 1966. *Lycopodium semicordata* Wall. ex Hook. et Grev. in Hook. Bot. Misc. 2: 396. 1831. *Selaginella burghallii* Roxb., Sim. Cat. 61. 1858 (*nomen. nud.*).

Stems 35–150 cm, trailing, slender, sulcate, drying straw coloured, branched from the base. Rhizophores thick, long, almost throughout the stem. Leaves heteromorphic. Strobili tetrastichous, 10–15 × 1–2.5 mm. Sporophyllus uniform, ovate, acute, entire.

## THELYPTERIDACEAE

### 1. CHRISTELLA H. Lev.

**1. Christella appendiculata** (Presl.) Holtt. in Kew Bull. 31(2): 311. 1976. *Nephrodium appendiculatum* Presl., Epim. Bot. 47. 1851. *N. extensum* var. *microsorum* Clarke in Trans. L.. Soc. London II. Bot. 1: 530. 1880.

Rhizomes wide creeping; stipes furnished with linear-subulate long, soft, brown, persistent scales. Fronds about 75 cm long. Pinnae 12 cm long and 2.5 cm braod; veins 13 pairs. Sori minute, sometimes only near the costa of the pinnae and scattered extending to the lobes.

**2. Christella arida** ( D. Don) Holttum in the B.K. Nayar et Kaur, comp. Bedd. Handb. 206.1974. *Aspidium aridum* D. Don. Prod. H. Nepal.4:1825. *Polypodium acuminatum* Roxb. in Calc. J. Nat. His.4.490.1844;

Rhizome long creeping. Stipe 15–30 cm. Glabrous. Frond to 150 cm, Pinnae about 30 pairs. Costules 3–4 mm apart, veins to 10 pairs. Sori medial; lower one diverging.

Growing in open grassy places in moist places, near galls from plains to 1200 m alt.

*J. Bhatt. & Maity* 31135

**3. Christella dentata** (Forsk.) Brownsey & Jermey in Brit. Fern. Gaz. 10: 338. 1973; Ellis in J. Andaman Sci. Assoc. 3(2): 71. 1987; *Polypodium dentatum* Forssk., Fl. Aegypt-Arab. 185. 1773.

Rhizome tufted or more rarely creeping. Fronds oblong-lanceolate, 1–3 cm long, pinnate, lower ones reduced, texture herbaceous, veins 608 pairs. Involucrcess reniform, glabrous or hairy.

Wide spread species common at moist places near pool

*J. Bhatt. & Maity* 33325

### 2. PRONEPHERIUM C. Presl.

**Pronepherium nudatum** (Roxb. ex Griff.) Holtt. in Blumea 21(1): 111. 1972. *Polypodium nudatum* Roxb. ex Griff., Calc. Journ. Nat. Hist. 4: 491. 1844. *Nephrodium moulmeinense* Bedd., Ferns Brit. India Suppl. 18. 1876.

Stipes firm, erect, *c.* 80 cm long. Fronds upto 1.5 cm long. Pinnate narrow, oblong, caudate at apex, margin sharply serrate, veins 16–21 pairs. Sori medial. Indusium reniform.

Growing at 200–300 m alt. By the side of stream, bark and moist places. Commonest terrestrial fern through out the forest floor.

*J. Bhatt. & Maity* 33303, 31136.

## WOODSIACEAE

### DIPLAZIUM Sw.

**Diplazium esculentum** (Retz.) Sw. in Schard. Journ. Bot. 1801: 312. 1803; Ellis in Journ. Andaman Sci. Assoc. 3(2): 74. 1987. *Anisogonium esculentum* (Retz.) Presl., Tent. Pterid. 116. 1836; Bedd., Handb. Ferns Brit. ndia 192. 1883.

Caudex erect; stipes upto 80 cm long, strong. Fronds to 15 cm, bipinnate. Lower pinnae 30–45 cm long, 15–25 cm braod. Pinnules acuminate at the apex, edge lobes, base often auricled. Sori often on all the lateral veinlets.

Grow along ponds, ditched, channel, streams from plains to 1000m alt.

*J. Bhatt. & Maity* 33455

## OLEANDRACEAE

### NEPHROLEPIS Schott.

**Nephrolepis auriculata** (L.) Trimen, J.L.. Soc. Bot. Lond. 24:152.1887, Pichi-Sermolli, Ind. Fil.Suppl,. 4:209,228.1965. *Polypodium auriculatum* L., Sp. Pl. 2:1088, 1753, pp. excl. syn. Burm. *Nephrolepsis tuberosa* (Bory ex willd.) Presl.

Stock, stipe tufted, shining, to 10cm long. Frond erect, 30–60cm.long, Smply pinnate, narrowed only in upper and lower part of lamina. Pinnae numerous, sessile, sterile and fertile. Veins mostly one forked, sori round, about midway between the midrib and margin, Indusium reniform attached by the broad base.

Growing on the rocky crevices.

*J. Bhatt. & Maity* 33410.

## VITTERIACEAE

### VITTERIA Sm.

**Vitteria elongata** Sw. syn. Fil.109.302, 1806; Dixit, J.Econ.Tax.Bot.2:210,1981. *V. elongata* Sensu Bedd. Handb. 404, 1883. *V. elongata* Sw. var. *angustifolia* Panigrahi in Bull. Bot. Surv. Ind. 2:314, 1960. non. Holtum,1955.

Rhizome slender, creeping, fronds tufted, 15–50 cm long, 3–4 mm broad, sessile, texture thin, Sori continious, immersed in 2-lipped marginal slit.

Grows on epiphytic from plain to 1200 m alt.

*J. Bhatt. & Maity* 33310.

## SINOPTERIDACEAE

### ALEURITOPTERIS Fee

**Aleuritopteris albamarginata** (Clarke) Ching. In Hong Kong Nat. 10:109. 1941. *Cheilanthus albomarginata* Clarke; Trans L.. Soc.Ser. 2.Bot. 1:456, t. 52, 1800; Bedd. Handb. 94, 1883.

Rhizome and stipe scales bicolors, rhizome erect, stipe to 20 cm long. Lamina deltoid to deltoid–lanceolate, bipinnatifid when young clothed with scales, rachis scaly, surface with white farinose underneath, pinnae to 10 pairs, sessile. Indusia confluent.

Common grows on rocks from 1200–3000m alt.

*J. Bhatt. & Maity* 33362

## MANAGEMENT

The principal object of management of the wildlife sanctuary is mainly preservation and improvement of indigenous flora and fauna. The entire scheme of management in Chapramari Wildlife Sanctuary is oriented towards providing the protection of forest resources and creating most favorable living conditions of wild animals. The secondary aim of management is to give maximum facilities to the visitors, intending to watch and enjoy the wild life in their original habitat and the researchers to study the wild flora and fauna in a natural condition. With these in view some special objectives of the management programme of the sanctuary may be mentioned as follows:

1. Tree felling should be prohibited.
2. Controlled burning: To improve regeneration of fodder grasses controlled burning should be practiced every year at the beginning of dry season. Burning of grass should not be started at a time in all the forest blocks but on a rotational basis and the entire burning must be completed by the end of December.
3. Fire Lines: All the fire lines should be cleared up by the middle of November each year for using observation lines and providing a suitable edge effect to the animals too.
4. Water resources: Before the summer, natural wallow pools should be improved and chemical test of the river water should be performed each year for determining any deliberate poisoning of the water.
5. Another 2 tall watch towers should be erected at different points and some more wireless sets should be installed for protection of the sanctuary.
6. Hunting, shooting, fishing, trapping, grazing and cutting of thatch should be prohibited.
7. Regular census should be done according to the existing practice.
8. Physical removal of weeds, replanting the infested area with supplementary fodder grasses and controlled burning should be done each year for improving the wild life habitat.
9. Special care should be taken with constant checking on the entry of unauthorized persons and commercially motivated, externally financed, high powered organised gangs in the sanctuary.

## THREAT TO FOREST RESOURCES

Human persecution to forest resources in any sanctuary is more or less unavoidable due to unstable economic condition and multifaceted problems of the people living near by. This situation has become more acute in case of Chapramari Wild Life Sanctuary like all other sanctuaries in North Bengal. There were plans to remove all people from this area and convert it to sanctuary for reducing vulnerability arising from human interference.

The forest produce has now attracted organized gangs and fostered illicit trade. The problem was worsened with the soaring prices of timber during the past ten years. The price of the most common timber ‘Sal’ is almost five times than what it was ten years ago. It is learnt that many people illegally collect firewood, poles and timber from the forests. The valuable forest resources are thus being depleted and seriously threatened inspire of the efforts made by the Forest Department to protect the assets. During the past eight years much forest produce has been recovered from the North Bengal forest circles- Jalpaiguri, Buxa, Baikunthapur and Cooch Behar. Recently, five forest personnel had been seriously assaulted when they caught a group involved in the theft of forest produce.

The Forest Department feels that unless the existing police organization at different levels in North Bengal is geared to meet all the exigencies of the situation, it would be almost impossible to stop organized vandalism. The role of police in protecting the forest produce was taken into consideration at the time of preparation of the Indian Forest Act 1972. They had been given all the powers of forest officers in the matter of detection and prevention of such offences.

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## About the book

*Flora of Chapramari Wildlife Sanctuary, West Bengal* is an extensive botanical study published by Botanical Survey of India. It focuses on one of the country's oldest wildlife sanctuaries, located in the foothills of the Eastern Himalayas in Jalpaiguri district, West Bengal. The book presents a detailed account of the sanctuary's flora, documenting 442 species of angiosperms and 18 species of pteridophytes, spread across 324 genera and 102 families. It offers ecological notes, flowering and fruiting patterns, vernacular names, traditional uses, and conservation significance of the recorded species. By combining scientific research with traditional knowledge, this work serves as an essential resource for botanical fraternity, nature conservationists and policy makers while also stressing the critical importance of in-situ biodiversity conservation in the face of habitat loss, over exploitation and climate change.

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