



**Flora of the  
Indravati Tiger Reserve**

**Anand Kumar**

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# FLORA OF THE INDRAVATI TIGER RESERVE

ANAND KUMAR

*Editor*

P. S. N. RAO



भारतीय वनस्पति सर्वेक्षण  
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View of the Indravati River from Pengunda



*Homonoia retusa* (Garh. ex Wight) Muell. - Arg. in bed of the Indravati River at Pasewada



*Flemingia bracteata* (Roxb.) Wight in moist deciduous forest at Pharsegarh



Dry deciduous forest in Dudepalli with *Ochna obtusata* DC. var. *gamblei* (King ex Brandis) Kanis, *Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. & Perr., *Terminalia alata* Heyne ex Roth etc.



Dense growth of *Dendrocalamus strictus* (Roxb.) Nees in Kerpe Valley.



View of a dried up stream in Bijapur Ghati with *Memecylon umbellatum* Burm.f. – an evergreen tree.



View of a pond in Kutru with dry deciduous forest in the background showing abundant growth of *Cyperus platystylis* R. Br. in the middle.



View of a pond in Dudepalli with dry deciduous forest in the background – the pond is largely used by local people and wildlife for drinking water.





Population of *Costus speciosus* (Koen.) J. E. Smith  
on outskirts of forest in Bijapur Ghati



A tiger's den on the top of a hill in Pengunda with strewn rock boulders and  
trees – *Boswellia serrata* Roxb. ex Colebr., *Sterculia urens* Roxb.,  
*Diospyros melanoxylon* Roxb. Etc.



A paddy (*Oryza sativa* L.) field in Pharsegarh inside the Reserve.



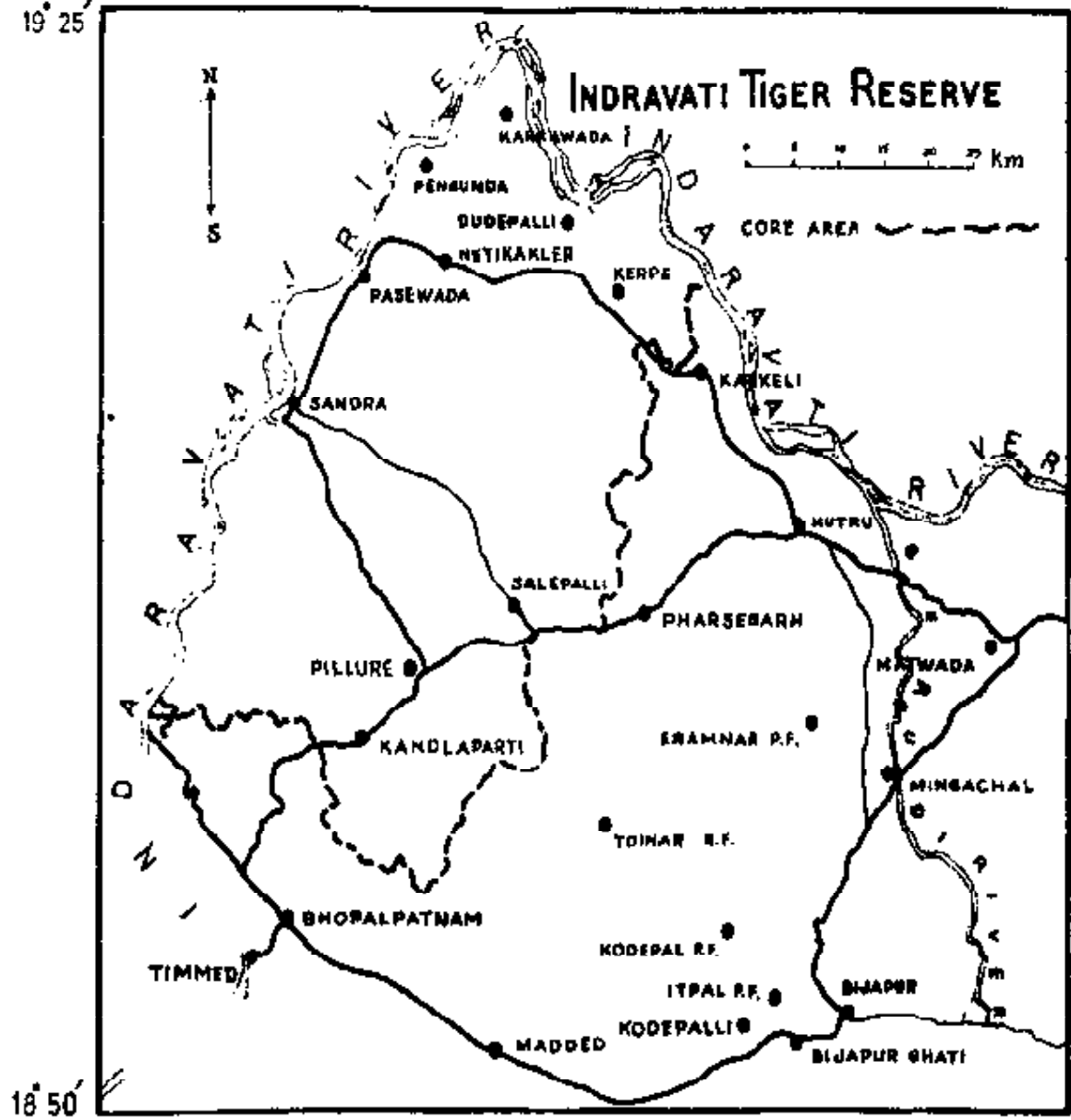
Two Gond ladies collecting spikelets of *Oryza rufipogon* Griff. for the grains.

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19° 25' 80° 15'

80° 45'



18° 50'

INDRAVATI TIGER RESERVE

## INTRODUCTION

The 'Project Tiger' was initiated in India on 1st April, 1973, as a Centrally Sponsored Plan Scheme, with a view to conserve and increase the tiger population in their natural habitats for scientific, economic, aesthetic, cultural and ecological values; and to preserve for all times areas of such biological importance as a natural heritage for the benefit, education and employment of the people.

Presently, there are 25 Tiger Reserves in India, spread throughout the country in 16 States, covering over 33,875 sq. km. forest area, representing different forest types of the Indian vegetation.

The botanical account of various Tiger Reserves is a prerequisite in evaluation of the habitat requirement for tigers, as well as for other animals and plants, commonly found in association with tigers. The various Tiger Reserves in India are : Bandipur (Karnataka), Corbett (Uttaranchal), Kanha (Madhya Pradesh), Manas (Assam), Melghat (Maharashtra), Palamau (Bihar), Ranthambhor (Rajasthan), Simlipal (Orissa), Sunderbans (West Bengal), Periyar (Kerala), Sariska (Rajasthan), Buxa (West Bengal), Indravati (Chhattisgarh), Nagarjunasagar (Andhra Pradesh), Namdapha (Arunachal Pradesh), Dudhwa (Uttar Pradesh), Kalakad-Mudathurai (Tamil Nadu), Valmiki (Bihar), Pench (Madhya Pradesh), Tadoba-Andheri (Maharashtra), Bandhavgarh (Madhya Pradesh), Panna (Madhya Pradesh), Dampha (Mizoram), Bhadra (Karnataka) and Pench (Maharashtra). The Nagarjunasagar Tiger Reserve (Andhra Pradesh) is the largest (3,568 sq. km.), whereas the Pench Tiger Reserve (Maharashtra) is the smallest in area (257 sq. km.).

## GEOGRAPHY

The Indravati Tiger Reserve, Project Tiger area in Bijapur tehsil of Dantewada district in the State of Chhattisgarh, is named after the

Indravati National Park which forms core area of the Tiger Reserve. The name of the National Park is derived from perennial Indravati river, which forms northern and western boundary between the States of Chhattisgarh and Maharashtra in this tract.

Total area of the Tiger Reserve is 2,799 sq. km., which includes core area of 1,258 sq. km. The core area was declared as Sanctuary in 1978 and National Park in 1981. In 1982-'83, it was included under the 'Project Tiger'. The core area of the Reserve extends to the Indravati river in the north and the west. Buffer zone of the core area is in the eastern and the southern parts of the Reserve. The northern and the western parts of the core area beyond the Indravati river are included in Chandrapur district of the Maharashtra State. (Map 1).

The Indravati Tiger Reserve lies approximately between  $18^{\circ} 51'$ - $19^{\circ} 24'$  N and  $80^{\circ} 16'$ - $80^{\circ} 44'$  E. It is situated in the south-western part of Dantewada district and is bounded in the east by the Jagdalpur-Bhopalpatnam P.W.D. road from meeting place of the Berudi river with the Indravati river; in the north by the Indravati river; in the west by the Indravati river forming inter State boundary between Chhattisgarh and Maharashtra; and in the south by the Bhopalpatnam-Jagdalpur P.W.D. road starting from the Indravati river to the Berudi river.

### CLIMATE

There are three distinct seasons : winter, summer and rainy. The winter season is from November to February, the coldest months being December and January. The lowest temperature of  $2.8^{\circ}$  C was recorded in the year 1946. The summer season begins from March till middle of June. The maximum temperature reaches up to  $41^{\circ}$  C, however, in May 1973 maximum temperature of  $45^{\circ}$  C was recorded. The rainy season is from second week of June to middle of September. The average annual rainfall is 1,778 mm and 1,820 mm in Bhopalpatnam and Bijapur

respectively. Most of the rainfall received in the tract is under the influence of south-west monsoon. Some rain is also received in winter from the retreating monsoon. Pre-monsoon showers from March to May are also not uncommon.

### **TERRAIN AND DRAINAGE SYSTEM**

Most of the Reserve area is usually flat with hill features distributed all over. Altitude of some important places of the Reserve is as follows: Bijapur (463.2 m), Kutru (286.4 m), Pharsegarh (295.6 m), Kerpe (250 m), Dudepalli (252 m), Karkawada (225 m), Pengunda (192 m).

The Indravati river and its tributary, Berudi, are perennial and form main source of water during the peak period. Besides these, there are several streams, ponds (Kerpe, Dudepalli, Kutru etc.) and tanks (Pengunda, Salepalli etc.), which are also important source of water to wild animals and local people. One anicut, near Sendra village, and some temporary bunds have also been constructed. Number of tube-wells is also increasing in the Reserve to provide drinking water to the villagers. In dry stream-beds and along edges of ponds villagers dig 'Jhiras' i.e. shallow pits to obtain drinking water during the summer season.

### **GEOLOGY**

Different rocks, generally met in the area, may be grouped into following two major formations :

(i) Cuddapah : The Cuddapahs are represented by quartzite, shale and limestone. These rocks occur near Kutru, Toinar, Pasewada and Pillure.

(ii) Archaean : It consists of quartzite, ferruginous quartzite, charnokites and granitiferous gneisses.

Soils are formed as a result of disintegration of the local rocks. The soils found are generally deep, loamy and well drained. Alluvial deposits are also not uncommon. Low lying plains of the area carry fairly deep and black clayey soil, which is capable of retaining water for a long period. Occurrence of this type of soil is noticeable in the vicinity of Kutru, Pasewada, Sendra and Kerpe. The alluvial soil is usually met at the foot of hills and along stream-banks, and is silty in nature. At the foot-hills, ingredients of coarse materials are generally more if associated with granite gneiss, quartzite etc. Soils derived from shales are uniformly fine textured.

### **WILDLIFE**

Population of wildlife in the Reserve is much less in comparison to its vast area and is mainly due to human interference. In interior inaccessible areas still a good number of wild animals are present. During past few years, there has been considerable increase in population of the wildlife. Population census of various wild animals in the Indravati Tiger Reserve as recorded in 1994 (Tiwari, 1998) was as follows : tiger (14), leopard (21), wild dog (151), wolf (32), hyena (19), jackal (184), bear (103), spotted deer (2233), sambar (298), barking deer (100), mouse deer (215), nilgai (689), chousinga (175), gaur (172) and wild-buffalo (214). Main attraction of the Reserve is wild-buffalo (*Bubalus bubalis*), which is also found in the East Raipur Forest Division (Chhatisgarh) and some parts of Assam.

The Reserve is an excellent sanctuary for tigers. Important prey animals of tiger in the Reserve are nilgai, sambar, wild boar, spotted deer, barking deer, langur, wild-buffalo, gaur and barasinga. The ridges in broken rocks and gorges of major streams, crevices of broken rocks, small cage like spaces between base and over-hanging rocks, lower slopes and valley areas near streams with dense bamboo growth, and forest-floors with thick growth of herbaceous cover during the rains form ideal shelter places for tigers and provide immense scope for hunting the prey animals.



Herbivores are well dispersed all over the area, including the hills and slopes during the rainy and winter season when water and fodder are abundant. However, during summer there is movement of the animals towards the lower valleys and the plains near water sources. The migration increases pressure on lower meadows during summer. Some common plants grazed by the herbivores are *Eriolaena hookeriana*, *Millettia extensa*, *Bauhinia purpurea*, *Tephrosia purpurea*, *Xanthium indicum*, *Dicliptera verticillata*, *Blepharis maderaspatensis*, *Rungia pectinata*, *Indigofera cassioides*, *Ludwigia perennis*, *L. octovalvis*, *Abutilon indicum*, *Cassia occidentalis*, *C. tora*, *Elephantopus scaber*, *Celosia argentea*, *Triumfetta rhomboidea*, *T. pentandra*, *Emilia sonchifolia*, *Atylosia scarabaeoides*, *Polygala arvensis*, *Desmodium laxiflorum*, *Scoparia dulcis*, *Tenagocharis latifolia*, *Apluda mutica*, *Themeda laxa*, *T. quadrivalvis*, *Heteropogon contortus*, *Iseilema anthephoroides*, *I. laxum*, *I. prostratum*, *Cynodon dactylon*, *Bothriochloa pertusa*, *B. intermedia*, *Dichanthium annulatum*, *Chloris virgata*, *Digitaria ciliaris*, *Echinochloa colona*, *Imperata cylindrica* var. *major*, *Hackelochloa granularis*, *Ophiuros exaltatus*, *Oplismenus burmannii*, *Paspalidium flavidum*, *Rottboellia cochinchinensis*, *Sacciolepis interrupta*, *Sporobolus diander*, *Sorghum halepense*, etc. Besides these, fruits and seeds of some trees such as *Madhuca longifolia* var. *latifolia*, *Dillenia pentagyna*, *Cassia fistula*, *Acacia leucophloea*, *Gardenia resinifera*, *Bauhinia purpurea*, *Ficus* spp., *Buchanania lanzan* and saplings of various trees are also relished by the herbivores.

#### VEGETATION

The topography, soil and bioclimate have resulted in different kinds of vegetation cover in the area. Vegetation of the Reserve chiefly comprises of the Southern tropical deciduous forests intermixed with grasslands.

Most of the plain area is inhabited by tribal hamlets and is usually

under paddy cultivation during the rainy season. In addition to the cultivated fields, there are degraded tropical dry deciduous forests, characterized by stunted trees of *Butea monosperma*, *Madhuca longifolia* var. *latifolia*, *Buchanania lanzan*, *Terminalia alata*, *T. bellirica*, *Aegle marmelos*, *Eriolaena hookeriana*, *Dillenia pentagyna*, *Pterocarpus marsupium*, *Ochna obtusata* var. *gamblei*, *Lannea coromandelica*, *Schrebera swietenoides*, *Sterculia urens*, *Casearia graveolens*, *Holarrhena pubescens*, *Wrightia tinctoria*, *Cleistanthus collinus*, *Cassia fistula*, *Tamarindus indica*, *Catunaregam spinosa*, *Tamilnadia uliginosa*, *Flacourtia indica*, *Cochlospermum religiosum*, *Mitragyna parvifolia* etc. with some climbers such as *Cryptolepis buchanani*, *Ventilago denticulata*, *Celastrus paniculatus*, *Acacia pennata* etc. The ground flora mainly comprises of grasses and other herbs which are almost grazed during the winter. *Vanda tessellata* is common epiphytic orchid on various trees, viz., *Pterocarpus marsupium*, *Butea monosperma*, *Diospyros melanoxylon*, *Madhuca longifolia* var. *latifolia* etc.

The forests of the area can be classified into the following categories (Champion & Seth, 1968) :

1. Southern tropical moist deciduous forests : These are usually found on lower hill slopes in some parts of Bijapur Ghati, Pharsegarh and Dudepalli. In this type of forests, dominants are mainly deciduous but sub-dominants and lower storeys are mainly evergreen, giving the forests as a whole more or less evergreen appearance most of the time during the year. Top canopy is over 25 m high and dense. Middle canopy comprises of 10-18 m tall trees. Understorey comprises mainly of shrubs. In the undergrowth various herbs are present but grasses are not abundant. Climbers and lianas are abundant. Bamboo (*Dendrocalamus strictus*) forms dense thickets along streams and on slopes in Bijapur Ghati and Pharsegarh. Chief feature of the moist deciduous forests is a leafless period in the dry season which may or may not begin with the cold season. Typical rainfall for the type as a

climax is 1,500 - 1,820 mm with mean temperature of the year from 24° to 27° C and dry season of 4 - 5 months. These forests predominate on rapidly drained slopes with porous soil.

Since these forests are usually associated with a drier climate and so dry deciduous forests are usually intermixed intimately with it, occupying exposed aspects, dry ridges and shallow or impervious soils.

Floristic composition of this type of forests is as follows :

Top canopy : It is mainly constituted by tall tree species, viz., *Pterocarpus marsupium*, *Terminalia alata*, *T. bellirica*, *Dillenia pentagyna*, *Gmelina arborea*, *Haldina cordifolia*, *Stereospermum chelonoides*, *Lannea coromandelica*, *Schleichera oleosa* etc.

Second storey trees : *Grewia tiliifolia*, *Cassia fistula*, *Syzygium cumini*, *Embllica officinalis*, *Antidesma indicum*, *Embelia bassal*, *Semecarpus anacardium*, *Mallotus philippensis*, *Bridelia hamiltoniana*, *Kydia calycina*, *Bauhinia semla*, *Dendrocalamus strictus*, *Heterophragma quadriloculare*, *Holarrhena pubescens*, *Gardenia latifolia*, *G. resinifera*, *Nyctanthes arbor-tristis*, *Cordia obliqua* etc. are dominant species in the second storey.

Shrubs : *Grewia rothii*, *G. hirsuta*, *Morinda pubescens*, *Flemingia bracteata*, *Woodfordia fruticosa*, *Costus speciosus*, *Petalidium barlerioides*, *Phoenix acaulis* etc.

Lianas and climbers : *Bauhinia vahlii*, *Calycopteris floribunda*, *Opilia amentacea*, *Cansjera rheedii*, *Symphorema polyandrum*, *Smilax zeylanica*, *Merremia umbellata*, *Erycibe paniculata*, *Dioscorea bulbifera*, *D. glabra*, *Cissampelos pareira* var. *hirsuta* etc. are commonly met, which spread on the top canopy and second storey trees and shrubs.

Herbs and grasses : *Desmodium gangeticum*, *Hemigraphis latebrosa*, *Andrographis paniculata*, *Cyperus niveus*, *Eranthemum purpurascens*, *Sesamum orientale*, *Dipteracanthus prostratus*, *Sida cordata*, *S. cordifolia*, *Orthosiphon rubicundus*, *Mnesithea laevis*, *Rottboellia cochinchinensis*, *Arthraxon lancifolius*, *Oplismenus burmannii*, *O. compositus* etc. are commonly noticeable amongst the undergrowth vegetation.

In Bijapur Ghati, on wet rocks where water drips during the rains, dense population of *Elatostema cuneatum*, *Sonerila tenera*, *Osbeckia muralis*, *Adiantum philippense* and *Selaginella repanda* is commonly found.

2. Southern tropical dry deciduous forests : This type is most commonly distributed in the plains as well as on the upper hill slopes. Number of species is much less than the moist deciduous type. The upper canopy in climax is closed though usually rather uneven and not very dense, and is formed by a number of trees which are deciduous during the dry season and are typically 8 - 20 m high. The understorey plants are likewise deciduous or so, consisting of small trees and shrubs. Bamboo (*Dendrocalamus strictus*) is often present but not luxuriant. Climbers and lianas are comparatively few but mostly include large, woody species. Typical rainfall for the type is between 850 mm to 1,300 mm and mean annual temperature lies between 29° C and 35° C. These forests are developed on various types of dry rocks or soils.

The forests can be grouped into the following two classes according to presence or absence of teak (*Tectona grandis*) :

(a) Mixed forests with teak : These forests are found in some places such as Kandlaparti, Bhopalpatnam, Itpal, Kodepal, Jaitalur, Annapur etc. Teak occurs with other species but it shows preference for the plain regions, stream-banks and gentle slopes, where soil is generally well drained and loamy with fair depth. Regeneration of teak

is inadequate. The proportion of teak varies from 5 to 25%. Bamboo occurs scattered along the streams and on the upper hill slopes. The herbaceous flora is poor. Common associates of teak are *Anogeissus latifolia*, *Haldina cordifolia* and *Mitragyna parvifolia*. Floristic composition of this type of forest is given below :

Top and middle canopy : *Tectona grandis*, *Stereospermum chelonoides*, *Sterculia urens*, *Dalbergia paniculata*, *Terminalia alata*, *T. chebula*, *Anogeissus latifolia*, *Haldina cordifolia*, *Mitragyna parvifolia*, *Madhuca longifolia* var. *latifolia*, *Albizia odoratissima*, *Bombax ceiba*, *Cassia fistula*, *Boswellia serrata*, *Dendrocalamus strictus*, *Emblica officinalis*, *Careya arborea*, *Chloroxylon swietenia*, *Soyimida febrifuga*, *Bauhinia racemosa*, *Dillenia pentagyna*, *Ziziphus xylopyrus*, *Z. jujuba* etc.

Shrubs : *Indigofera cassioides*, *Woodfordia fruticosa*, *Euphorbia nivulia*, *Helicteres isora*, *Petalidium barlerioides*, *Desmodium gangeticum*, *Waltheria indica*, *Phoenix acaulis* etc.

Climbers and lianas : *Butea superba*, *Bauhinia vahlii*, *Smilax zeylanica*, *Millettia extensa*, *Acacia pennata* etc.

Herbs and grasses : *Nelsonia canescens*, *Urena lobata*, *Flemingia semialata*, *Blepharis maderaspatensis*, *Hemigraphis latebrosa*, *Arthraxon lancifolius*, *Oplismenus burmannii*, *O. compositus* etc.

(b) Mixed forests without teak : These types of forests are found in most parts of the Reserve, viz., Pasewada, Kerpe, Dudepalli, Bhopalpatnam, Pengunda, Netikakler, Karkeli etc. These occur in various types of soils, topography and geological formations. The density of the forests varies from lax to dense, chiefly governed by the climatic conditions especially the rainfall. The height of trees is between 10 - 20 m

and number of climbers is rather few. Dense growth of *Dendrocalamus strictus* is found in the Kerpe valley, Kandlaparti and Pharsegarh Ghati. In Netikakler and Pillure thick growth of tall grasses, forming patches of grasslands, is met in the underground. Species diversity is comparatively more in this type. *Butea monosperma*, *Madhuca longifolia* var. *latifolia*, *Diospyros melanoxylon* and *Buchanania lanzan* are almost found everywhere and form dominant tree species. The composition of the forests is as follows :

**Top and middle canopy :** *Madhuca longifolia* var. *latifolia*, *Buchanania lanzan*, *Diospyros melanoxylon*, *Oroxylum indicum*, *Schleichera oleosa*, *Sterculia urens*, *Hymenodictyon orixense*, *Anogeissus latifolia*, *Careya arborea*, *Boswellia serrata*, *Ochna obtusata* var. *gamblei*, *Terminalia bellirica*, *Dillenia pentagyna*, *Pterocarpus marsupium*, *Mitragyna parvifolia*, *Schrebera swietenoides*, *Hardwickia binata*, *Lannea coromandelica*, *Garuga pinnata*, *Trema orientalis*, *Cleistanthus collinus*, *Holarrhena pubescens*, *Dendrocalamus strictus*, *Cassia fistula*, *Semecarpus anacardium*, *Alangium salvifolium*, *Ougeinia oojeinensis*, *Butea monosperma*, *Emblica officinalis*, *Eriolaena hookeriana*, *Gardenia latifolia*, *Casearia graveolens*, *Flacourtia indica*, *Wrightia tinctoria*, *Catunaregam spinosa*, *Tamilnadia uliginosa* etc.

**Shrubs :** *Ixora pavetta*, *Indigofera cassioides*, *Waltheria indica*, *Woodfordia fruticosa*, *Desmodium triquetrum*, *D. velutinum*, *Phoenix acaulis* etc.

**Climbers and lianas :** *Cryptolepis buchanani*, *Cissus repanda*, *Hemidesmus indicus*, *Ventilago denticulata*, *Mucuna pruriens*, *Combretum albidum*, *C. roxburghii*, *Butea superba*, *Olax scandens*, *Ichnocarpus frutescens*, *Erycibe paniculata* etc.

**Herbs and grasses :** *Tridax procumbens*, *Blepharis maderaspatensis*, *Hemigraphis latebrosa*, *Pentanema indicum*, *Blumea*

*fistulosa*, *B. lacera*, *B. mollis*, *Urena lobata*, *Rungia pectinata*, *Phaulopsis imbricata*, *Oplismenus burmannii*, *Chionachne koenigii*, *Bothriochloa pertusa*, *Apluda mutica*, *Chrysopogon fulvus*, *Heteropogon contortus*, *Dichanthium annulatum* etc.

3. Dry evergreen forests : It is interesting to note that some evergreen patches are found intermixed with the dry deciduous forests. These are confined to perennial streams and scattered in various parts of the Reserve, viz., Bijapur Ghati, Kandlaparti (Jalavagu nala), Pharsegarh, the Indravati river (Pengunda) etc. Some common species met along this type of forests are *Manilkara hexandra*, *Vitex leucoxylon*, *Syzygium heyneanum*, *Ficus racemosa* and *Diospyros malabarica*.

4. Grasslands : There are several grasslands scattered in the Reserve especially in the plains. Luxuriant growth of grasses is also met in the dry deciduous forests at Netikakler and Pillure, where tree canopy is open due to the poor density of trees. Grasses form an excellent fodder resource to various herbivores. In Pillure, vast stretch of grassland is found and it is ideal place for food and shelter of the wild-buffaloes and other herbivores. Dominant species of grasses are *Apluda mutica*, *Heteropogon contortus*, *Iseilema anthephoroides*, *I. laxum*, *Bothriochloa intermedia*, *Chionachne koenigii*, *Cymbopogon martinii*, *Ischaemum indicum*, *Imperata cylindrica* var. *major*, *Themeda quadrivalvis* etc. *Atylosia scarabaeoides* is very common twiner in grasslands. Other common herbs in grasslands are *Alysicarpus vaginalis*, *Desmodium gangeticum*, *Crotalaria linifolia*, *Polygala arvensis*, *Vernonia cinerea*, *Scoparia dulcis*, *Cassia occidentalis* etc. Common grasses in undergrowth of dry deciduous forests in Netikakler are *Apluda mutica*, *Chionachne koenigii*, *Heteropogon contortus*, *Iseilema laxum* etc. Around the Salepalli tank almost pure formation of *Eragrostis namaquensis* var. *diplachnoides* was observed. Although it is not liked by the herbivores but provides shelter to various animals.

### AQUATIC PLANTS

There is a considerable representation of aquatic flora in the region due to presence of several ponds, tanks, rivers, streams and puddles. In the Indravati river bed near Pasewada, dense population of *Homonoia retusa* was observed. In the Kutru pond, a large population of *Cyperus platystylis* was recorded. *Oryza rufipogon*, a wild species of paddy, grows abundantly in marshy and water-logged areas in the plains throughout the Reserve in the rainy season; its grains are regularly harvested and consumed by local people, especially during fast. *Cyperus procerus*, a rare sedge, grows abundantly in paddy fields and puddles at Pharsegarh. *Hydrolea zeylanica* forms thick mats along the edges of the Salepalli tank. Aquatic vegetation of the Reserve may be classified into the following seven categories on the basis of their general habit :

1. Free floating hydrophytes : Such plants have no contact with soil. They float on the surface of water and are in contact with air and water only e.g. *Pistia stratiotes*.

2. Suspended submerged hydrophytes : These plants remain suspended in water but have no contact with soil. Their flowers may or may not come above the water level e.g. *Utricularia exoleta*, *Ceratophyllum demersum* etc.

3. Anchored submerged hydrophytes : Such plants remain in contact with soil and water. Their vegetative portion remains completely submerged in water while the flowers may come out of the water surface e.g. *Hydrilla verticillata*, *Vallisnaria natans*, *Lagarosiphon alternifolia*, *Najas indica* etc.

4. Anchored hydrophytes with floating leaves : These plants are attached to the muddy floor. Their stem (mostly rhizome) remains under the water in contact with soil and water, while the leaves float on the water surface e.g. *Aponogeton natans*, *Tenagocharis latifolia*,



*Nymphoides hydrophylla*, *N. indica*, *Nelumbo nucifera*, *Nymphaea nouchali* etc.

5. Anchored hydrophytes with floating shoots : Such plants are attached to the muddy floor by their roots but shoots come out and float on the surface of water. Examples of this category are *Ludwigia adscendens*, *Ipomoea aquatica*, *Panicum paludosum*, *Cyperus platystylis* and *Marsilea minuta*.

6. Emergent amphibious hydrophytes : These plants are attached to the soil, covered with water but most of their vegetative parts come out of the water surface e.g. *Aeschynomene indica*, *Sesbania bispinosa*, *Ludwigia perennis*, *L. octovalvis*, *L. prostrata*, *Smithia conferta*, *Rotula aquatica*, *Rotula densiflora*, *R. indica*, *Limnophila indica*, *L. repens*, *Hygrophila auriculata*, *H. balsamica*, *Utricularia bifida*, *Drosera indica*, *Polygonum glabrum*, *P. barbatum*, *Monochoria vaginalis*, *Crinum defixum*, *Amischophacelus axillaris*, *Murdannia nudiflora*, *M. vaginata*, *Cyperus iria*, *C. alulatus*, *C. compressus*, *C. exaltatus*, *C. halpan*, *C. tenuispica*, *C. distans*, *C. cyperoides*, *C. procerus*, *C. pangorei*, *Fimbristylis ferruginea*, *F. miliacea*, *F. schoenoides*, *Fuirena ciliaris*, *Lipocarpa chinensis*, *Scleria annularis*, *S. biflora*, *Scirpus articulatus*, *S. lateriflorus*, *Coix gigantea*, *Echinochloa colona*, *E. stagnina*, *Oryza rufipogon*, *Paspalidium punctatum*, *P. scrobiculatum*, *Sacciolepis indica*, *S. interrupta*, *Vetiveria zizanioides*, *Ceratopteris thalictroides* etc.

7. Wetland hydrophytes : This category includes those plants which are rooted to the soil saturated with water and may also survive in dried conditions in later part of their life cycle. A large number of species fall under this group e.g. *Ammannia baccifera*, *A. multiflora*, *Bergia ammannioides*, *Osbeckia zeylanica*, *Drosera burmannii*, *Hydrolea zeylanica*, *Lobelia alsinoides*, *L. heyneana*, *Cynoctonum*

*mitreola*, *Microcarpaea minima*, *Mitrasacme indica*, *Lindernia anagallis*, *Eriocaulon quinquangulare*, *Isachne globosa*, *Panicum sumatrense*, *Cyperus pumilus*, *C. brevifolius*, *Scirpus squarrosus* etc.

Herbivorous animals live on plants - terrestrial and aquatic. Aquatic plants have potential for exploitation as animal feed, human food, soil additives, fuel production and waste-water treatment. Although preferring terrestrial plants, wild-buffaloes and other herbivores also relish aquatic vegetation. Unlike other herbivores, wild buffaloes also feed under water on submerged aquatic plants. Various aquatic plants grazed by the herbivores are *Nelumbo nucifera*, *Ipomoea aquatica*, *Ceratopteris thalictroides*, *Amischophacelus axillaris*, *Aponogeton natans*, *Tenagocharis latifolia*, *Smithia conferta*, *Ludwigia adscendens*, *L. octovalvis*, *L. perennis*, *L. prostrata*, *Marsilea minuta*, *Aeschynomene indica*, *Limnophila indica*, *Hygrophila balsamica*, *Murdannia vaginata*, *M. nudiflora*, *Cyperus alulatus*, *C. brevifolius*, *C. iria*, *C. compressus*, *C. exaltatus*, *Fimbristylis miliacea*, *F. schoenoides*, *Fuirena ciliaris*, *Scirpus articulatus*, *S. lateriflorus*, *Echinochloa colona*, *E. stagnina*, *Paspalidium punctatum*, *Paspalum scrobiculatum*, *Sacciolepis indica*, *S. interrupta*, *Ammannia baccifera*, *A. multiflora*, *Bergia ammannioides* etc.

### PLANT RESOURCES

Even today, many tribals depend chiefly upon wild plants for their major requirements like food, shelter, medicines etc. During plant exploration in the Reserve, various medicinal and economic plants were recorded. Cottage industries based on these plants may be set up to uplift economic status of the tribals and for their rehabilitation outside the core area. The plants have grouped into various categories according to their utility :

1. Edible plants : The tribals chiefly depend upon *Madhuca longifolia* var. *latifolia* (flowers), *Diospyros melanoxylon* (fruits) and

*Buchanania lanzan* (fruits) for requirement of food. Besides these, *Aegle marmelos* (fruits), *Antidesma acidum* (leaves and fruits), *Bauhinia vahlii* (seeds), *Catunaregam spinosa* (fruits), *Tamilnadia uliginosa* (fruits), *Costus speciosus* (rhizomes), *Dillenia pentagyna* (buds and fruits), *Diospyros malabarica* (fruits), *Dioscorea bulbifera* (tubers and bulbils), *Dendrocalamus strictus* (apical part of the culm and grains), *Emblica officinalis* (fruits), *Ficus racemosa* (fruits), *F. hispida* (fruits), *Garuga pinnata* (fruits), *Indigofera cassioides* (inflorescence), *Ipomoea aquatica* (branches), *Manilkara hexandra* (fruits), *Marsilea minuta* (leaves) *Moringa oleifera* (leaves, flowers and fruits), *Nelumbo nucifera* (rhizomes and seeds), *Oryza rufipogon* (grains), *Paspalum scrobiculatum* (grains), *Phoenix acaulis* (fruits), *Semecarpus anacardium* (hypocarp and kernel), *Schleichera oleosa* (fruits), *Tamarindus indica* (fruits), *Ziziphus oenoplia* (fruits) are also consumed by the people.

2. Timber plants : The best quality timber is obtained from *Tectona grandis*. Other important timber yielding plants are *Albizia lebeck*, *A. odoratissima*, *Buchanania lanzan*, *Careya arborea*, *Cassia fistula*, *Chloroxylon swietenia*, *Dalbergia latifolia*, *Dendrocalamus strictus*, *Dillenia pentagyna*, *Gmelina arborea*, *Grewia tiliifolia*, *Haldina cordifolia*, *Hardwickia binata*, *Hymenodictyon orixense*, *Lagerstroemia parviflora*, *Mitragyna parvifolia*, *Ougeinia oojeinensis*, *Pterocarpus marsupium*, *Schleichera oleosa*, *Terminalia alata*, *T. arjuna*, *T. bellirica* etc.

3. Fibre yielding plants : Bark of *Bauhinia vahlii* is commonly used by the tribals as a substitute for rope. Other common fibre yielding plants are *Butea superba* (roots and young branches), *Calotropis gigantea* (bark), *Corchorus olitorius* (stem), *C. capsularis* (stem), *Cochlospermum religiosum* (bark), *Cryptolepis buchanani* (stem), *Dillenia pentagyna* (bark), *Eriolaena hookeriana* (bark), *Ficus benghalensis* (bark and aerial roots), *Grewia tiliifolia* (bark), *Hardwickia binata* (bark), *Helicteres isora* (bark), *Kydia calycina*

(bark), *Millettia extensa* (bark and stem), *Sida acuta* (bark and stem), *Soymida febrifuga* (bark), *Sterculia urens* (bark), *Thespesia lampus* (stem), *Urena lobata* (stem), *Waltheria indica* (bark) etc.

4. Tannin yielding plants : Following tannin yielding plants occur in the area : *Acacia nilotica* subsp. *indica* (bark), *Anogeissus latifolia* (leaves and twigs), *Barringtonia acutangula* (bark), *Bauhinia purpurea* (bark), *Bridelia retusa* (bark), *Buchanania lanzan* (bark), *Careya arborea* (leaves), *Casearia graveolens* (bark), *Cassia fistula* (bark), *Cleistanthus collinus* (leaves, bark and fruits), *Dillenia pentagyna* (bark), *Diospyros melanoxylon* (bark and fruits), *Embllica officinalis* (bark, leaves and fruits), *Ficus benghalensis* (bark), *F. racemosa* (bark), *Flacourtia indica* (bark), *Hymenodictyon orixense* (bark), *Manilkara hexandra* (bark), *Lagerstroemia parviflora* (bark and leaves), *Nyctanthes arbor-tristis* (bark), *Ougeinia oojeinensis* (bark), *Soymida febrifuga* (bark), *Terminalia alata* (bark), *T. arjuna* (bark and fruits), *T. bellirica* (bark and fruits), *T. chebula* (fruits), *Trema orientalis* (bark) and *Ziziphus xylopyrus* (bark and fruits).

5. Gum producing plants : *Acacia nilotica* subsp. *indica*, *A. leucophloea*, *Aegle marmelos*, *Albizia lebbeck*, *A. odoratissima*, *Anogeissus latifolia*, *Azadirachta indica*, *Boswellia serrata*, *Buchanania lanzan*, *Butea monosperma*, *Cochlospermum religiosum*, *Gardenia resinifera*, *Lannea coromandelica*, *Manilkara hexandra*, *Pterocarpus marsupium*, *Bombax ceiba*, *Schrebera swietenioides*, *Soymida febrifuga*, *Sterculia urens*, *Terminalia alata* are commonly available gum producing plants in the area.

6. Plants useful in paper industry : Bamboo (*Dendrocalamus strictus*) is the main plant used in paper industry. Other plants useful in paper industry are *Boswellia serrata*, *Bothriochloa intermedia*, *Helicteres isora*, *Heteropogon contortus*, *Imperata cylindrica* var. *major*, *Kydia calycina*, *Sterculia urens* and *Trema orientalis*.

7. Oil yielding plants : *Argemone mexicana*, *Azadirachta indica*, *Buchanania lanzan*, *Cymbopogon martinii*, *Madhuca longifolia* var. *latifolia*, *Bombax ceiba*, *Ricinus communis*, *Schleichera oleosa* and *Vetiveria zizanioides* are the important oil yielding plants found in the region.

8. Dye yielding plants : Flowers of *Butea monosperma* are well known source of yellow dye. Other dye yielding plants in the Reserve are *Lannea coromandelica*, *Mallotus philippensis*, *Memecylon umbellatum*, *Nyctanthes arbor-tristis*, *Pterocarpus marsupium*, *Wrightia tinctoria* etc.

9. Plants useful in fish poisoning : A large number of plants used in fish poisoning are found in the area, viz., *Barringtonia acutangula* (bark), *Careya arborea* (bark, twigs and fruits), *Casearia graveolens* (fruits), *Dolichandrone falcata* (bark), *Cleistanthus collinus* (bark, leaves and fruits), *Catunaregam spinosa* (roots and unripe fruits), *Tamilnadia uliginosa* (unripe fruits), *Millettia extensa* (roots) and *Ougeinia oojeinensis* (bark).

10. Beverage plants : Flowers of *Madhuca longifolia* var. *latifolia* and fruits of *Diospyros melanoxylon* are largely used in the preparation of distilled liquor. Besides these, *Borassus flabellifer* and *Phoenix sylvestris* (sap) are also used to manufacture liquor.

11. Host plants for lac insect : *Butea monosperma* and *Schleichera oleosa* are the hosts for lac insect. The finest quality of lac is obtained from twigs of the latter.

12. Bee pasturage plants : Some plants growing in the Reserve are nectar yielding and constitute an important source of honey. Some of the important plants are *Anogeissus latifolia*, *Azadirachta indica*, *Albizia lebeck*, *A. odoratissima*, *Argemone mexicana*, *Aegle marmelos*, *Bauhinia vahlii*, *Butea monosperma*, *B. superba*, *Bombax ceiba*, *Cassia fistula*, *Cochlospermum religiosum*, *Dendrophthoe*

*falcata*, *Ixora pavetta*, *Justicia adhatoda*, *Madhuca longifolia* var. *latifolia*, *Moringa oleifera*, *Nelumbo nucifera*, *Nymphaea nouchali*, *Sesamum orientale*, *Syzygium cumini*, *Ventilago denticulata* and *Woodfordia fruticosa*.

13. Medicinal plants : Some well known medicinal plants found in the Reserve are as follows . *Abrus precatorius*, *Aegle marmelos*, *Andrographis paniculata*, *Asparagus racemosus*, *Bombax ceiba*, *Butea monosperma*, *Boerhaavia diffusa*, *Catunaregam spinosa*, *Tamilnadia uliginosa*, *Calotropis gigantea*, *Careya arborea*, *Cassia fistula*, *C. occidentalis*, *Cassytha filiformis*, *Celosia argentea*, *Celastrus paniculatus*, *Cissampelos pareira* var. *hirsuta*, *Cocculus hirsutus*, *Costus speciosus*, *Dioscorea bulbifera*, *Eclipta alba*, *Embllica officinalis*, *Ficus benghalensis*, *F. racemosa*, *Gloriosa superba*, *Helicteres isora*, *Hemidesmus indicus*, *Holarrhena pubescens*, *Ichnocarpus frutescens*, *Ixora pavetta*, *Justicia adhatoda*, *Madhuca longifolia* var. *latifolia*, *Mucuna pruriens*, *Pterocarpus marsupium*, *Semecarpus anacardium*, *Sida cordata*, *Soymida febrifuga*, *Syzygium cumini*, *Tephrosia purpurea*, *Terminalia arjuna*, *T. bellirica*, *T. chebula*, *Uraria picta*, *Vanda tessellata*, *Vitex leucoxydon*, *Wrightia tinctoria*.

14. Other economic plants :

- (i) *Gloriosa superba* (tubers) and *Iphigenia indica* (corms) are source of colchicine.
- (ii) Silky cotton (floss) covering the seeds of *Bombax ceiba* and *Calotropis gigantea* is used for stuffing cushions and pillows.
- (iii) Leaves of *Diospyros melanoxylon* are used in 'bidi' making due to their flavour and resistance to decay and are main source of revenue for local people.

- (iv) Twigs of *Combretum roxburghii*, *Ichnocarpus frutescens* and stripes of *Dendrocalamus strictus* are used for making baskets.
- (v) Leaves of *Phoenix acaulis*, *P. sylvestris*, *Borassus flabellifer* and plants of *Aristida setacea* are used for making brooms.
- (vi) Twigs of *Bridelia hamiltoniana*, *Breynia vitisidaea* and *Azadirachta indica* are used for brushing-teeth.
- (vii) Wood of *Bombax ceiba*, *Boswellia serrata*, *Hymenodictyon orixense* and *Buchanania lanzan* are used for making match-sticks and match-boxes.
- (viii) Plates and bowls are prepared from leaves of *Bauhinia vahlii*, *Butea monosperma*, *Dillenia pentagyna* and *Madhuca longifolia* var. *latifolia*.

### FLORISTIC ANALYSIS

There is no full published account of the flora of former Bastar district (presently divided in Dantewada, Kanker and Bastar districts). However, some workers have contributed towards various parts of the flora of the district, viz., Mooney (1942), Jain (1963, 1964, 1965), Subramanyam & Henry (1966), Arora (1968), Saxena (1973), Saxena & Khotele (1976) and Das (1984). Casual reference of the district has also been made by Tiwari (1954, 1955, 1963), Tiwari & Maheshwari (1963, 1964, 1965), Panigrahi *et al.* (1965, 1966, 1967), Ram Lal & Panigrahi (1967), Shukla & Panigrahi (1967), Verma & Chandra (1981), Jagdish Lal & Kumar (1983), Roy (1984), Kumar & Jagdish Lal (1985). There are a few collections from the Reserve area by Saxena & Khotele (*l.c.*) and Tiwari & Maheshwari (1964).

The Flora of the Indravati Tiger Reserve deals with 553 species in 349 genera belonging to 101 families of angiosperms. Out of these, 390 species in 261 genera and 81 families belong to the dicotyledons, and 163 species in 88 genera and 20 families belong to the monocotyledons. Proportion of the monocotyledons to the dicotyledons is 1 : 2.4 and total genera to species is 1 : 1.3. Hooker (1904) gives proportion of the monocotyledons to the dicotyledons as 1 : 2.3 and genera to species as 1 : 7 taking into account entire Indian subcontinent.

The flora represents 104 species of trees, 36 species of shrubs, 366 species of herbs and undershrubs and 47 species of climbers. Number of the epiphytes is less, being represented only by a few species, viz., *Dendrophthoe falcata*, *Viscum articulatum*, *V. orientale* and *Vanda tessellata*. Insectivorous plants are *Drosera burmannii*, *D. indica*, *Utricularia bifida* and *U. exoleta*. Ten dominant families of angiosperms in the Indravati Tiger Reserve are as follows : Poaceae (72 species), Leguminosae s.l. (77 species), Cyperaceae (42 species), Acanthaceae (26 species), Asteraceae (21 species), Euphorbiaceae (21 species), Rubiaceae (18 species), Scrophulariaceae (14 species), Lamiaceae (12 species) and Convolvulaceae (11 species).

Present field observations in the Indravati Tiger Reserve, data from the herbarium collections and perusal of the available literature revealed occurrence of the following plants, which are considered as rare in the flora of Chhattisgarh : *Naravelia zeylanica*, *Cansjera rheedii*, *Opilia amentacea*, *Drosera burmannii*, *D. indica*, *Calycopteris floribunda*, *Osbeckia muralis*, *Canscora heteroclita*, *Heterophragma quadriloculare*, *Hygrophila balsamica*, *Leucas stricta*, *Rhinacanthus nasutus*, *Staurogyne glauca*, *Elatostema cuneatum*, *Amorphophallus sylvaticus*, *Cyperus procerus*, *Fimbristylis argentea*, *Scleria annularis*, *Arudinella benghalensis* and *Eragrostis namaquensis* var. *diplachnoides*.

Some plants collected from the Reserve are new records for the



flora of Chhattisgarh, viz., *Opilia amentacea*, *Canscora heteroclita*, *Staurogyne glauca*, *Lippia javanica*, *Homonoia retusa* and *Cyperus procerus*.

One set of the specimens, collected from the Reserve has been deposited in the Central National Herbarium (CAL), and the other in the Herbarium of the Ecology Section of the Botanical Survey of India at Howrah.

Families of the angiosperms have been arranged according to the Bentham & Hooker's System of Classification (1862 - 1883) with slight modifications. Dichotomous keys to the families, genera and species have been provided. The genera and species under each family have been arranged alphabetically. For each species correct botanical name, basionym (if any), citation of J. D. Hooker's Flora of British India, local name/s (if any), brief description, flowering and fruiting period, ecological notes, place of occurrence alongwith collection number have been provided. Specimens collected first time from a locality have been given field number and subsequently only their place of occurrence has been mentioned. Collector's name for all the field numbers is Anand Kumar, unless stated otherwise.

## TAXONOMIC ACCOUNT

*Key to the families*

- 1a. Cotyledons usually 2; leaves usually reticulately veined; flowers usually 4-5-merous :
- 2a. Perianth absent or 1-seriate :
- 3a. Plants submerged; leaves dichotomously divided Ceratophyllaceae
- 3b. Plants not submerged; leaves not dichotomously divided :
- 4a. Perianth absent; flowers in cyathia Euphorbiaceae
- 4b. Perianth present; flowers otherwise :
- 5a. Ovary inferior :
- 6a. Plants stem-parasites Loranthaceae
- 6b. Plants non-parasitic :
- 7a. Perianth corolline; disc absent Nyctaginaceae
- 7b. Sepals not corolline; petals present or absent; disc present Combretaceae
- 5b. Ovary superior :
- 8a. Twinning parasites Lauraceae (*Cassytha*)
- 8b. Plants non-parasitic :

- 9a. Pistils 2 or more, carpels free :
- 10a. Trees Sterculiaceae
- 10b. Herbs or climbing shrubs Ranunculaceae
- 9b. Pistil 1, carpels solitary or united :
- 11a. Ovary 2-5-locular :
- 12a. Ovules many in each locule Molluginaceae
- 12b. Ovules 1-3 in each locule :
- 13a. Placenta axile Euphorbiaceae
- 13b. Placenta usually basal :
- 14a. Plants armed; leaves simple, 3-nerved Rhamnaceae
- 14b. Plants unarmed; leaves compound or if simple then not 3-nerved Sapindaceae
- 11b. Ovary 1-locular :
- 15a. Plants twining; female flower with a single petal; male flower with a corolline cupule Menispermaceae
- 15b. Plants otherwise :
- 16a. Ochreate stipules present Polygonaceae
- 16b. Ochreate stipules absent :
- 17a. Plants woody :

- 18a. Style branched :
- 19a. Anthers inflexed and reversed in bud Moraceae
- 19b. Anthers erect in bud :
- 20a. Ovule 1, apical Ulmaceae
- 20b. Ovules 2, basal Euphorbiaceae
- 18b. Style unbranched :
- 21a. Placentation parietal Flacourtiaceae
- 21b. Placentation otherwise :
- 22a. Ovule basal Urticaceae
- 22b. Ovule apical Moraceae
- 17b. Plants herbaceous :
- 23a. Leaves pinnately nerved; perianth scarious; stamens usually connate below Amaranthaceae
- 23b. Leaves 3-nerved from the base; perianth not scarious; stamens free Urticaceae
- 2b. Perianth present, 2-many seriate :
- 24a. Petals all free or some united :
- 25a. Ovary fully inferior; perianth and stamens perigynous :
- 26a. Stamens more than twice the number of petals :
- 27a. Aquatic plants Nymphaeaceae
- 27b. Terrestrial plants :

- 28a. Leaves alternate, eglandular Lecythidaceae
- 28b. Leaves opposite, glandular Myrtaceae
- 26b. Stamens twice the number of petals or less :
- 29a. Inflorescence umbellate; fruits of 2 mericarps Apiaceae
- 29b. Inflorescence and fruits not as above :
- 30a. Fruits mostly winged Combretaceae
- 30b. Fruits not winged :
- 31a. Small trees; ovary 1-celled; ovule 1, pendulous Alangiaceae
- 31b. Mostly herbs; ovary 1-many celled; ovules on axile, parietal or free central placenta :
- 32a. Leaves pinnately veined; anthers opening by slits Onagraceae
- 32b. Leaves palmately veined; anthers opening by pores Melastomataceae
- 25b. Ovary fully superior or at least one whorl of the perianth hypogynous or stamens hypogynous or inserted on the top of a hypogynous disc, in which ovary may be immersed :

- 33a. Stamens more than twice  
the number of petals :
- 34a. Leaves peltate, floating or raised  
above the water surface; carpels  
many, embedded in a receptacle Nymphaeaceae
- 34b. Leaves and carpels not as above :
- 35a. Stamens in 5 planges  
of 3 stamens each Sterculiaceae
- 35b. Stamens free or all united  
by filaments :
- 36a. Stamens all united  
by filaments :
- 37a. Trees; leaves digitate;  
fruit a woody capsule Bombacaceae
- 37b. Plants not as above Malvaceae
- 36b. Stamens free :
- 38a. Pistils more than one :
- 39a. Perianth 2-seriate,  
5-merous Dilleniaceae
- 39b. Perianth 3-seriate,  
3-merous Annonaceae
- 38b. Pistil one :
- 40a. Ovary on a  
stalk (gynophore) Capparaceae
- 40b. Ovary sessile :

- 41a. Stamens perigynous Lythraceae
- 41b. Stamens hypogynous :
- 42a. Flowers unisexual Euphorbiaceae
- 42b. Flowers bisexual :
- 43a. Leaves pinnately veined :
- 44a. Herbs; sepals 2 Papaveraceae
- 44b. Trees or shrubs; sepals 5 :
- 45a. Leaves with pellucid,  
                    aromatic glands, trifoliolate Rutaceae
- 45b. Leaves without pellucid,  
                    aromatic glands, simple Ochnaceae
- 43b. Leaves palmately veined :
- 46a. Flowers more  
                than 7 cm across;  
                placentation parietal Cochlospermaceae
- 46b. Flowers less than  
                2 cm across;  
                placentation axile Tiliaceae
- 33b. Stamens twice the number of petals  
    or fewer (often many in Mimosaceae) :
- 47a. Leaves much reduced, scale like Tamaricaceae
- 47b. Leaves well developed :
- 48a. Leaves simple :
- 49a. Ovary 1-celled :
- 50a. Climbers; flowers  
                    3-merous Menispermaceae

- 50b. Plants not as above :
- 51a. Fruits circumsciss Portulacaceae
  - 51b. Fruits not circumsciss :
    - 52a. Placentation free central :
      - 53a. Stamens alternating with petals Caryophyllaceae
      - 53b. Stamens opposite the petals Myrsinaceae
    - 52b. Placentation parietal :
      - 54a. Plants glandular-hairy, insectivorous Droseraceae
      - 54b. Plants otherwise :
        - 55a. Ovary situated on a gynophore Capparaceae
        - 55b. Ovary sessile :
          - 56a. Anther-connective produced beyond the cells Violaceae
          - 56b. Anther-connective not produced Flacourtiaceae
  - 49b. Ovary 2 or more celled :
    - 57a. Flowers irregular, inner 2 sepals petaloid Polygalaceae
    - 57b. Flowers regular :
      - 58a. Leaves usually opposite :
        - 59a. Ovule 1 or 2 in each cell Oleaceae
        - 59b. Ovules many in each cell :



- 60a. Style 1; ovules free central Lythraceae
- 60b. Styles 2-5; ovules axile Elatinaceae
- 58b. Leaves alternate :
- 61a. Flowers unisexual :
- 62a. Pistil 1 Euphorbiaceae
- 62b. Pistils 3-6 Menispermaceae
- 61b. Flowers bisexual or mixed with unisexuals :
- 63a. Plants with tendrils Vitaceae
- 63b. Plants without tendrils :
- 64a. Leaves glandular Rutaceae
- 64b. Leaves eglandular :
- 65a. Petals 3, of which 2 bifid Olacaceae
- 65b. Petals 4-5, entire :
- 66a. Stamens opposite the petals :
- 67a. Plants root-parasites Opiliaceae
- 67b. Plants non-parasitic Rhamnaceae
- 66b. Stamens alternating with petals :
- 68a. Leaves pinnately veined Celastraceae
- 68b. Leaves palmately veined :

- 69a. Stamens free Tiliaceae
- 69b. Stamens united below Sterculiaceae
- 48b. Leaves compound (simple or compound in Anacardiaceae) :
- 70a. Ovary 1-celled :
- 71a. Styles 3-4 Anacardiaceae
- 71b. Style 1 :
- 72a. Trees with 2-3-pinnate leaves; stamens 5, staminodes 5-7; fruit a ribbed, 3-valved capsule Moringaceae
- 72b. Plants otherwise :
- 73a. Petals valvate; stamen 4-many Mimosaceae
- 73b. Petals imbricate; stamens 10 (-5) :
- 74a. Upper petal interior in bud Caesalpiaceae
- 74b. Upper petal exterior Fabaceae
- 70b. Ovary 2 or more celled :
- 75a. Plants herbaceous Oxalidaceae
- 75b. Plants woody :
- 76a. Climbers with tendrils Vitaceae
- 76b. Trees or shrubs without tendrils :
- 77a. Leaves gland-dotted Rutaceae
- 77b. Leaves eglandular :

- 78a. Filaments with scales  
at the base Simaroubaceae
- 78b. Filaments without scales :
- 79a. Disc extra-staminal Sapindaceae
- 79b. Disc intra-staminal :
- 80a. Filaments united into a tube Meliaceae
- 80b. Filaments free or united  
at the base only Burseraceae
- 24b. Petals united throughout or atleast at the base :
- 81a. Plants insectivorous or root-parasites :
- 82a. Plants insectivorous Lentibulariaceae
- 82b. Plants root-parasites Orobanchaceae
- 81b. Plants otherwise :
- 83a. Flowers in involucrate  
heads (capitulum) Asteraceae
- 83b. Flowers otherwise :
- 84a. Stamens more than petals :
- 85a. Flowers unisexual Ebenaceae
- 85b. Flowers bisexual Sapotaceae
- 84b. Stamens as many as or  
less than petals :
- 86a. Ovary inferior or semi-inferior :
- 87a. Climbers with tendrils Cucurbitaceae
- 87b. Plants of various habit;  
tendrils absent :

- 88a. Stipules absent; anthers syngenesious      Campanulaceae
- 88b. Stipules present; anthers free      Rubiaceae
- 86b. Ovary superior :
- 89a. Stamens opposite the corolla-lobes :
- 90a. Ovary 1-celled with free  
central placentation      Myrsinaceae
- 90b. Ovary 2-many celled with  
axile placentation :
- 91a. Stamens free :
- 92a. Flowers unisexual      Ebenaceae
- 92b. Flowers bisexual      Sapotaceae
- 91b. Stamens united by filaments      Leeaceae
- 89b. Stamens alternating with the corolla-lobes :
- 93a. Corolla regular :
- 94a. Leaves alternate :
- 95a. Flowers in scorpioid  
cymes or calyx with  
appendaged sinuses :
- 96a. Style terminal; fruit  
many seeded capsule      Hydrophyllaceae
- 96b. Style gynobasic; fruit of  
4-nutlets, rarely a drupe      Boraginaceae
- 95b. Flowers and calyx otherwise :
- 97a. Placentation parietal      Gentianaceae

- 97b. Placentation axile :
- 98a. Fruit a berry Solanaceae
- 98b. Fruit not a berry :
- 99a. Sepals free Convolvulaceae
- 99b. Sepals united Boraginaceae
- 94b. Leaves opposite :
- 100a. Latex present :
- 101a. Carpels united at  
the stigmatic disc;  
pollens in pollinia Asclepiadaceae
- 101b. Carpels and pollens  
not as above Apocynaceae
- 100b. Latex absent :
- 102a. Stamens 2 Oleaceae
- 102b. Stamens more than 2,  
often 4 or 5 or as many  
as the corolla-lobes :
- 103a. Fruits of 4-nutlets Boraginaceae
- 103b. Fruits otherwise :
- 104a. Placentation  
parietal Gentianaceae
- 104b. Placentation axile Loganiaceae
- 93b. Corolla irregular :
- 105a. Seeds attached on a retinacula Acanthaceae

105b. Seeds not attached on retinacula :

106a. Ovules many :

107a. Leaves compound;  
seeds winged Bignoniaceae

107b. Leaves simple;  
seeds not winged :

108a. Placentation axile Scrophulariaceae

108b. Placentation parietal Gentianaceae

106b. Ovules few :

109a. Style gynobasic;  
ovary 4-lobed Lamiaceae

109b. Style terminal;  
ovary not lobed :

110a. Plants viscid hairy Pedaliaceae

110b. Plants not viscid hairy Verbenaceae

1b. Cotyledon 1; leaves usually parallel  
veined; flowers usually 3-merous :

111a. Trees or shrubs with plicate or pinnate  
leaves; flowers 3-merous in fleshy spikes  
or panicles with spathe like bracts Areaceae

111b. Plants not as above :

112a. Flowers in small heads  
subtended by involucre bracts Eriocaulaceae

112b. Plants not as above :

- 113a. Perianth not petaloid, reduced  
to scales or bristles or absent :
- 114a. Inflorescence a spadix  
subtended by a spathe Araceae
- 114b. Inflorescence not subtended  
by a spathe :
- 115a. Ovary inferior Hydrocharitaceae
- 115b. Ovary superior :
- 116a. Submerged aquatic plants Najadaceae
- 116b. Plants not as above :
- 117a. Stem 3-gonous;  
flowers subtended  
by a single glume;  
anthers basifixed;  
fruit a nut Cyperaceae
- 117b. Stem terete; flowers  
enclosed by 2 glumes,  
lemma and palea;  
anthers dorsifixed;  
fruit a caryopsis Poaceae
- 113b. Perianth petaloid,  
at least in part :
- 118a. Stamen and style  
united into a column Orchidaceae
- 118b. Stamen and style not  
united into a column :
- 119a. Ovary inferior or semi-inferior :

- 120a. Aquatic submerged  
herbs Hydrocharitaceae
- 120b. Terrestrial or epiphytic :
- 121a. Climbers; capsules  
winged Dioscoreaceae
- 121b. Plants not as above :
- 122a. Inflorescence umbellate :
- 123a. Ovary 1-celled Taccaceae
- 123b. Ovary 3-celled Amaryllidaceae
- 122b. Inflorescence otherwise :
- 124a. Flowers actinomorphic Hypoxidaceae
- 124b. Flowers zygomorphic :
- 125a. Leaves 2-ranked,  
sheaths open Zingiberaceae
- 125b. Leaves spirally  
arranged; sheaths  
closed Costaceae
- 119b. Ovary superior :
- 126a. Carpels many, free :
- 127a. Inflorescence spicate Aponogetonaceae
- 127b. Inflorescence umbellate Butomaceae
- 126b. Carpels solitary or united :
- 128a. Perianth biseriate with the  
outer whorl sepaloid and the  
inner whorl petaloid Commelinaceae



- 128b. Perianth uniseriate or if  
biseriate then both whorls  
similar and often petaloid  
or united into a tube below :
- 129a. Inflorescence subtended  
by a spathe like leaf-sheath Pontederiaceae
- 129b. Inflorescence not subtended  
by a spathe like leaf-sheath :
- 130a. Leaves mostly with  
parallel nerves and  
veins; flowers mostly bisexual Liliaceae
- 130b. Leaves 3-5-nerved with  
reticulate venation;  
flowers unisexual Smilacaceae

## RANUNCULACEAE

### NARAVELIA DC.

**Naravelia zeylanica** (L.) DC., Syst. 1 : 167. 1817; Hook.f. & Thoms. in Hook. f., Fl. Brit. India 1 : 7. 1872. *Atrugene zeylanica* L., Sp. Pl. 542. 1753.

Woody, climbing shrubs. Leaves opposite; terminal leaflet modified into branched tendrils; lateral leaflets up to 11 × 8 cm, ovate or ovate-elliptic, acuminate, dentate, 5-7-nerved from the base. Flowers pale or maroon, in axillary and terminal panicles, up to 7.5 cm long. Achenes with persistent, twisted, plumose styles.

*Fl. & Fr.*: Oct.- Feb.

In the vicinity of dry deciduous forests. Rare.

Mingachal, 15617.

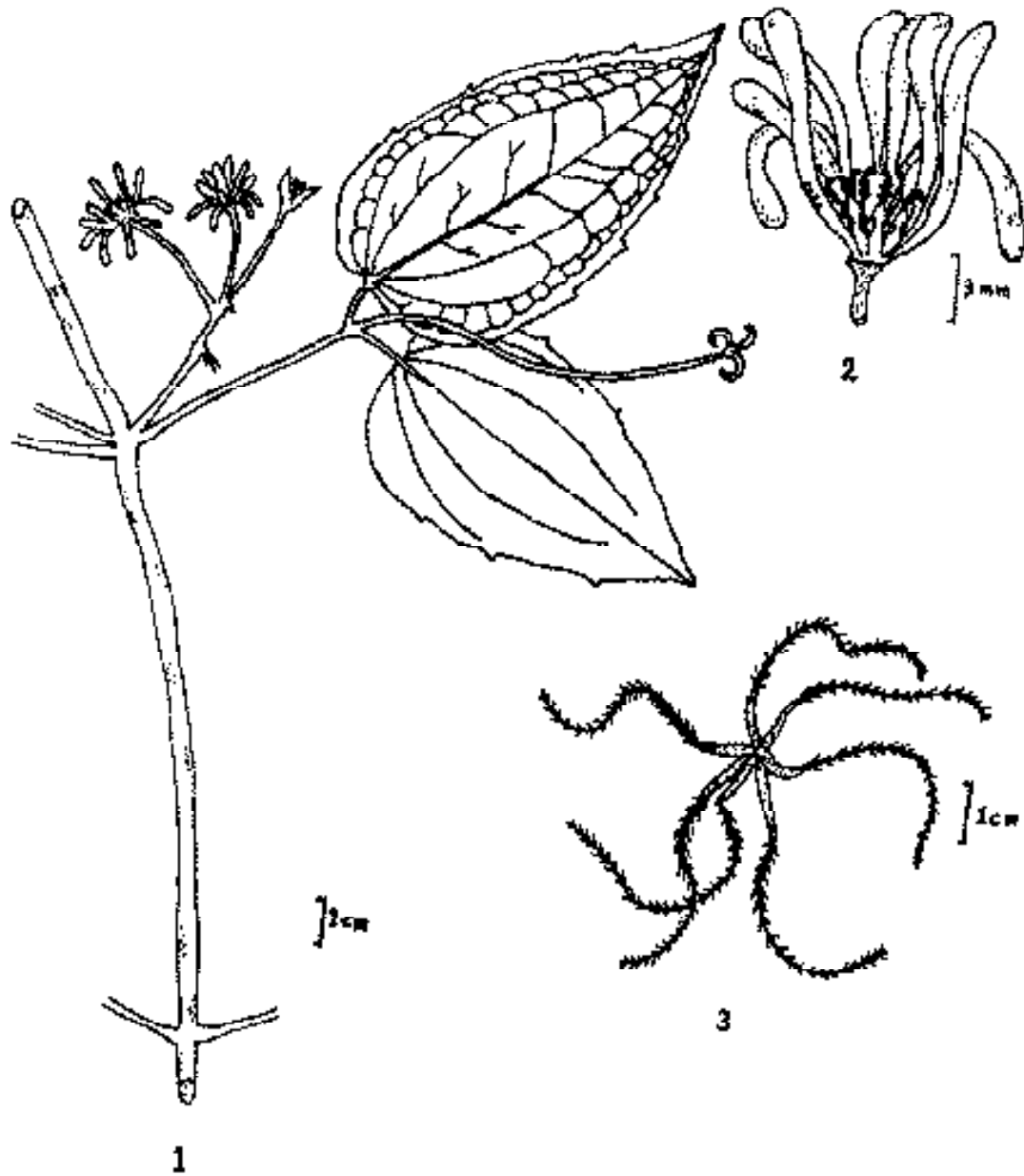


Fig. 1 : *Naravelia zeylanica* (L.) DC.  
1. twig; 2. flower & 3. achene.

## DILLENACEAE

## DILLENIA L.

**Dillenia pentagyna** Roxb., Pl. Cor. 1 : 21. t.20. 1795; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 38. 1872.

*'Michhi' 'Mitmara'*

Deciduous trees, up to 20 m tall; bark smooth, ash coloured. Leaves up to 45 × 20 cm, obovate-oblong, obtuse, dentate. Flowers 2-6, fasciculate on short, leafless shoots. Fruits globose, orange-red, enclosed in calyx; seeds ovoid.

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

In moist deciduous forests. Sparse.

Itpal forest, 16245; Dudepalli; Kandlaparti.

Crushed dried fruits are said to be used as spice.

## ANNONACEAE

## ANNONA L.

- |  |                         |
|--|-------------------------|
| 1a. Fruits reddish or yellow on ripening with flat areoles         | 1. <i>A. reticulata</i> |
| 1b. Fruits green or greenish-black on ripening with raised areoles | 2. <i>A. squamosa</i>   |

**1. Annona reticulata** L., Sp. Pl. 537. 1753; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 78. 1872.

*'Ram-Sita phal'*

Trees up to 5 m tall; bark ash coloured. Leaves up to 15 × 5 cm, elliptic-lanceolate, acute or obtuse. Flowers 2 - 4, leaf-opposed, greenish-yellow. Fruits globose, syncarpous, areoles 5-angled.

*Fl.*: May. *Fr.*: Oct.- Dec.

Planted near habitations for the fruits.

Kutru, 16359.

**2. *Annona squamosa* L.**, Sp. Pl. 537. 1753; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 78. 1872.

'Sita-phal'

Trees, up to 6 m tall; bark greyish-black. Leaves up to 10 × 4 cm, elliptic-lanceolate, acute or obtuse. Flowers greenish-yellow, 1-3, on extra-axillary peduncles. Fruits greenish-black, subglobose, syncarpous, areoles ovoid.

*Fl.*: May. *Fr.*: Oct.- Dec.

Planted for the delicious fruits; also found as an escape.

Kutru, 16361.

#### MENISPERMACEAE

- |                                      |                |
|--------------------------------------|----------------|
| 1a. Leaves peltate; stamens connate  | 1. CISSAMPELOS |
| 1b. Leaves not peltate; stamens free | 2. COCCULUS    |

#### 1. CISSAMPELOS L.

***Cissampelos pareira* L.**, var. ***hirsuta*** (Buch.-Ham. ex DC.) Forman in Kew Bull. 22 : 356. 1968. *C. hirsutus* Buch.-Ham. ex DC., Syst. 1 : 535. 1817. *C. pareira auct. non L.* 1753; Hook. f. & Thoms. in Hook.f., Fl. Brit. India 1 : 103. 1872.

Twining herbs; young branches tomentose. Leaves up to 7.5 × 7 cm, broadly ovate or orbicular, glaucous beneath. Flowers pale green, unisexual. Male flowers in axillary cymes; bracts ovate; anthers 4. Female flowers sessile, in pendulous axillary cymes; bracts orbicular. Drupes

scarlet, ovoid, compressed, ridged along margin.

*Fl. & Fr.*: Sept.-Feb.

In moist deciduous forests, over shrubs. Common.

Madded, 16624; Kerpe Valley.

## 2. COCCULUS DC.

**Cocculus hirsutus** (L.) Diels in Engl., *Pflanzenr.* 46 : 236. 1910. *Menispermum hirsutum* L., *Sp. Pl.* 341. 1753. *M. villosum* Lam., *Encycl.* 4 : 97. 1797. *Cocculus villosus* (Lam.) DC., *Syst.* 1 : 525. 1817; Hook. f. & Thoms. in Hook.f., *Fl. Brit. India* 1 : 101. 1872.

Climbing, villous herbs. Leaves up to 5 × 3 cm, ovate, apiculate, base rounded or cordate, 5-nerved. Flowers greenish-yellow, unisexual. Male flowers in axillary panicles; petals obovate. Female flowers in axillary clusters; petals auricled at base. Drupes reddish-black, 3-5 mm across, rugose.

*Fl. & Fr.*: Jan.-Apr.

Over small trees, in dry deciduous forests. Sparse.

Pasewada, 15567.

Leaf-juice is used in gonorrhoea and eczema.

## NYMPHAEACEAE

- |   |             |
|---|-------------|
| 1a. Leaves glaucous, raised above<br>water surface    | 1. NELUMBO  |
| 1b. Leaves not glaucous, floating<br>on water surface | 2. NYMPHAEA |

## 1. NELUMBO Adans.

**Nelumbo nucifera** Gaertn., Fruct. 1 : 73. t.19. f.2. 1788.  
*Nelumbium speciosum* Willd., Sp. Pl. 2 : 1258. 1800; Hook.f. & Thoms.  
 in Hook.f., Fl. Brit. India 1 : 116. 1872.

'Kamal'

Aquatic, rhizomatous, perennial herbs. Leaves up to 30 cm across, orbicular; petioles prickly. Flowers pink, solitary, up to 15 cm across; sepals 4-5; petals many; anthers appendaged; carpels many, 1-celled, sunk in obconic torus with flat top.

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

In ponds. Abundant.

Kutru, 16357.

Leaves are grazed by herbivores.

## 2. NYMPHAEA L.

**Nymphaea nouchali** Burm.f., Fl. Ind. 120: 1768. *N. stellata* Willd., Sp. Pl. 2 : 1154. 1799; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 114. 1872 (incl. vars.).

Aquatic, perennial herbs. Leaves up to 20 cm across, orbicular; margin sinuate or entire, green above, reddish beneath. Flowers white, solitary, 4-7 cm across, on long peduncles; sepals 4; petals many; stamens yellow, many, filaments dilated at base, anthers appendaged.

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

In ponds. Abundant.

Dudepalli, 16334.

## PAPAVERACEAE

## ARGEMONE L.

**Argemone mexicana** L., Sp. Pl. 508. 1753; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 117. 1872.

'*Koiya-mara*'

Prickly herbs, up to 60 cm tall. Leaves up to 14 × 5 cm, pinnatifid, margin spiny. Flowers solitary, terminal, 2.5-4 cm across; petals 4-6, bright yellow, caducous; stamens many, anthers yellow; stigmas purple. Capsules up to 3.5 × 1.5 cm, elliptic, erect; seeds black, scrobiculate.

*Fl. & Fr.*: Feb.- May.

Naturalized throughout in waste lands and near habitations.

Pharsegarh, 16295; Dudepalli.

Plant-juice is used as a purgative and in skin diseases.

## CAPPARACEAE

- |  |             |
|--|-------------|
| 1a. Shrubs; fruit a berry, indehiscent | 1. CAPPARIS |
| 1b. Herbs; fruit a siliqua, dehiscent  | 2. CLEOME   |

## 1. CAPPARIS L.

**Capparis zeylanica** L., Sp. Pl. ed. 2. 720. 1762 (non Hook.f. & Thoms. 1872). *C. horrida* L.f., Suppl. 264. 1781; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 178. 1872.

Armed, climbing shrubs; spines recurved. Leaves up to 7.5 × 4 cm, ovate-elliptic, acute or obtuse, coriaceous. Flowers pinkish-white, 4-5 cm across, solitary, axillary or 2-3 in supra-axillary rows; sepals concave; petals oblong; stamens many, pink or red. Berries up to 5 × 3.5 cm, scarlet, ellipsoid.

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

Over small trees, along roadsides. Not common.

Madded, 15604.

## 2. CLEOME L.

**Cleome viscosa** L., Sp. Pl. 672. 1753; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 170. 1872; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 22. 1976.

Glandular-pubescent herbs, up to 50 cm tall. Leaflets 3-5, up to  $3.5 \times 1.8$  cm, elliptic-oblong-lanceolate or obovate, acute or obtuse. Flowers yellow in axillary racemes; sepals oblong-lanceolate, glandular-pubescent dorsally; petals oblong-obovate. Siliqua up to 7 cm long, cylindrical, beaked, striate; seeds striate.

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

In waste places. Sparse.

Bhopalpatnam (Saxena & Khotele *l.c.*).

## VIOLACEAE

### HYBANTHUS Jacq.

**Hybanthus enneaspermus** (L.), F.v. Muell., Fragm. Phyt. Austr. 10 : 81. 1876. *Viola enneasperma* L., Sp. Pl. 937. 1753. *V. suffruticosa* L., Sp. Pl. 937. 1753. *Ionidium suffruticosum* (L.) Roem. & Schult., Syst. Veg. 5 : 394. 1819; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 185. 1872.

Perennial, branching herbs, up to 30 cm tall. Leaves alternate, up to  $4.5 \times 0.7$  cm, linear-lanceolate. Flowers purple or violet, solitary, axillary, irregular; sepals lanceolate; petals 5, lowest spurred. Capsules 4-6 mm across, subglobose, 3-valved; seeds ovoid, striate.



*Fl. & Fr.*: Sept.- Dec.

In moist and dry deciduous forests. Very common.

Bijapur Ghati, 16432; Madded; Pharsegarh; Kutru; Kerpe Valley.

The plant is used as a tonic.

## COCHLOSPERMACEAE

### COCHLOSPERMUM Kunth

**Cochlospermum religiosum** (L.) Alston in Trimen, Handb. Fl. Ceylon 6 (Suppl.) : 14. 1931. *Bombax religiosum* L., Sp. Pl. 512. 1753. *Cochlospermum gossypium* DC., Prodr. 1 : 527. 1824; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 190. 1872.

'Ponga'

Deciduous trees, up to 6 m tall; bark ash coloured. Leaves up to 22 × 19 cm, palmately lobed, lobes acute or acuminate, base cordate. Flowers bright yellow, up to 10 cm across, in terminal few flowered panicles; sepals ovate-deltoid; petals obovate, emarginate. Capsules obovate, 5-valved; seeds reniform, brownish-woolly.

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

In dry deciduous forests. Frequent.

Kerpe, 15549; Bijapur Ghati.

Wood is source of 'Kutira Gum'; silky-floss is used for stuffing purpose.

## FLACOURTIACEAE

- 1a. Flowers bisexual; stamens alternating with staminodes; fruit a capsule

### 1. CASEARIA

- 1b. Flowers unisexual; staminodes absent,  
fruit a berry

## 2. FLACOURTIA

## 1. CASEARIA Jacq.

**Casearia graveolens** Dalz. in Journ. Bot. (Hook.) 4 : 107. 1852;  
Clarke in Hook.f., Fl. Brit. India 2 : 592. 1879.

'Girich', 'Swarnmul'

Trees, up to 5 m tall; bark grey, smooth. Leaves up to 14 × 6 cm, elliptic, obtuse or subacuminate, margin crenate. Flowers green, in leafless axillary clusters; calyx 5-lobed; petals absent; stamens 6-8. Capsules green, yellow on ripening, up to 2 × 1 cm, ellipsoid; seeds arillate.

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

In dry deciduous forests. Very common.

Bijapur Ghati, 16213.

## 2. FLACOURTIA L' Herit.

**Flacourtia indica** (Burm. f.) Merr., Interpr. Rumph. Herb. Amb. 377. 1917. *Gmelina indica* Burm.f., Fl. Ind. 132. 1768. *Flacourtia ramontchi* L' Herit., Strip. Nov. 3 : 59. tt. 30. & 30b. 1786; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 193. 1872. *F. sepiaria* Roxb., Pl. Cor. 1 : 48. t. 68. 1795; Hook.f. & Thoms. in Hook.f., Fl. Brit. India 1 : 194. 1872.

'Kakai' 'Mudvedma'

Armed trees, up to 15 m tall; bark greyish-black. Leaves up to 9 × 4 cm, elliptic, elliptic-obovate or suborbicular, acute or acuminate, margin crenate-serrate. Flowers green, dioecious, solitary or clustered in short racemes; sepals 4-5; petals absent. Berries green, changing to red on ripening, globular, fleshy.

*Fl. & Fr.*: Mar.- May.

In dry deciduous forests. Sparse.

Dudepalli forest, 16345.

## POLYGALACEAE

### POLYGALA L.

***Polygala arvensis*** Willd., Sp. Pl. 3 : 876. 1802. *P. chinensis* auct. non L. 1753; Bennett in Hook.f., Fl. Brit. India 1 : 204. 1872 p.p.

Erect, annual herbs, up to 25 cm tall. Leaves up to 3 × 2.5 cm, elliptic, obovate or suborbicular, mucronate. Flowers yellow, in axillary or extra-axillary, few flowered, up to 2 cm long racemes; staminal sheath violet. Capsules up to 6 × 5 mm, didynamous, margin ciliate; caruncle with 3 membranous appendages.

*Fl. & Fr.*: Sept.- Feb.

In waste lands and grassy fields. Frequent.

Pharsegarh, 16127; Kutru; Pillure.

Leaves are consumed occasionally.

## CARYOPHYLLACEAE

### POLYCARPON L.

***Polycarpon prostratum*** (Forsk.) Aschers & Schweinf. in Oesterr. Bot. Zeitschr. 39 : 128. 1889. *Alsine prostrata* Forsk., Fl. Aeg.-Arab. 207. 1775. *Hapalosa loeflingiae* Wall. ex Wight & Arn., Prodr. 358. 1834. *Polycarpon loeflingiae* (Wall. ex Wight & Arn.) Benth. & Hook., Gen. Pl. 1 : 153. 1862; Edgew. & Hook.f., Gen. Pl. 1 : 153. 1862; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1 : 245. 1874.

Prostrate or ascending, diffuse, perennial herbs; branches up to 15 cm long. Leaves whorled up to 1.5 × 0.4 cm, linear-oblong. Flowers greenish-white in dense, dichotomous, terminal cymes; sepals oblong;

petals linear. Capsules ellipsoid, 3-valved; seeds light brown, ovoid, reticulate.

*Fl. & Fr.*: Apr.- May.

In dried river-beds. Sparse.

Indravati river, 16321.

## PORTULACACEAE

### PORTULACA L.

**Portulaca oleracea** L., Sp. Pl. 445. 1753; Thiselton Dyer in Hook.f., Fl. Brit. India 1 : 246. 1874.

Prostrate or ascending, succulent herbs. Leaves up to 2 × 1 cm, oblanceolate, obovate or spatulate, apex round or retuse. Flowers yellow, solitary or clustered; sepals 2, connate below; petals 5, obovate; stamens 8-12. Capsules globose, circumscissile; seeds black, concentrically striate.

*Fl. & Fr.*: Oct.- Feb.

In waste lands. Abundant.

Kutru, 15585.

Leaves are consumed as a vegetable.

## TAMARICACEAE

### TAMARIX L.

**Tamarix ericoides** Rottl., Ges. Naturf. Fr. Berl. Neue Schr. 4 : 214. 1803; Thiselton Dyer in Hook.f., Fl. Brit. India 1 : 249. 1874; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 22. 1976.

Shrubs, up to 1.5 m tall. Leaves minute, scale-like, ovate-lanceolate, acuminate, base amplexicaul. Flowers pink or mauve, in 8-15 cm long

terminal racemes; sepals 5; petals 5, elliptic-obovate; stamens 10. Capsules up to 1.5 cm long; seeds plumose at apex.

*Fl. & Fr.*: Oct.- Jan.

In river-beds. Sparse.

Bhopalpatnam (Sexena & Khotele *l.c.*).

## ELATINACEAE

### BERGIA L.

**Bergia ammannioides** Roxb., Hort. Beng. 34. 1814 ('*ammanoides*'); Thiselton Dyer in Hook.f., Fl. Brit. India 1 : 251. 1874.

Prostrate herbs, sometimes suberect, up to 30 cm tall. Leaves opposite, up to 3 × 1 cm, elliptic-oblong, acute, margin serrulate. Flowers subsessile, in axillary clusters; sepals 5, reddish; petals 5, white, shorter than sepals; stamens 3-5. Capsules ovoid; seeds polished, linear-oblong or ovoid.

*Fl. & Fr.*: Sept.- May.

In river-beds. Frequent.

Indravati river, 16344.

## MALVACEAE

- 1a. Style-branches and stigmas  
twice as many as carpels;  
fruits glochidiate

6. URENA

- 1b. Style-branches and stigmas  
as many as carpels or style  
unbranched and stigmas entire;  
fruits not glochidiate :

- 2a. Fruits schizocarpic :
- 3a. Seed 1 in each mericarp 4. SIDA
- 3b. Seeds 2 or more in each mericarp 2. ABUTILON
- 2b. Fruits capsular :
- 4a. Ovary 3-celled; epicalyx-segments winged in fruits 3. KYDIA
- 4b. Ovary 5-10-celled; epicalyx-segments not winged :
- 5a. Style branched 1. ABELMOSCHUS
- 5b. Style unbranched 5. THESPESIA

### 1. ABELMOSCHUS Medic.

**Abelmoschus moschatus** Medic., Malv. 46. 1787. *Hibiscus abelmoschus* L., Sp. Pl. 696. 1753; Mast. in Hook.f., Fl. Brit. India 1 : 342. 1874.

Annual, villous herbs, up to 1.5 m tall. Leaves variable, angular or 3-7-lobed, lobes triangular or oblong, base cordate or hastate. Flowers axillary or in few flowered racemes; epicalyx-segments linear; calyx spathaceous; corolla 5-7 cm across, yellow with purple centre. Capsules up to 5 cm long, oblong-lanceolate; seeds subreniform.

*Fl. & Fr.*: Sept.- Oct.

In moist and dry deciduous forests. Sparse.

Pharsegarh, 16106; Karkeli.

### 2. ABUTILON P. Mill.

**Abutilon indicum** (L.) Sw., Hort. Brit. ed. 1. 54. 1826; Mast. in Hook.f., Fl. Brit. India 1 : 326. 1874. *Sida indica* L., Cent. Pl. 2 : 26. 1756.  
'Jhapipak'

Annual, tomentose herbs, up to 1.5 m tall. Leaves up to 10 × 6 cm, broadly ovate or orbicular, dentate-serrate. Flowers yellow, solitary, axillary; corolla up to 2 cm across. Mericarps 15-18, acute; seeds black, scrobiculate.

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

In waste lands. Common.

Pasewada, 15564.

Plant is grazed by herbivores.

### 3. KYDIA Roxb.

**Kydia calycina** Roxb., Pl. Cor. 3 : 12. t. 215. 1811; Mast. in Hook.f., Fl. Brit. India 1 : 348. 1874.

*'Baranga'*

Trees, up to 8 m tall; bark grey. Leaves up to 12 × 10 cm, ovate-orbicular, 3-7-lobed, rusty-tomentose beneath. Flowers white, in axillary and terminal panicles; epicalyx-segments 4-6, accrescent; petals spatulate, emarginate. Capsules up to 5 mm across, globose, subtended by accrescent, spatulate, epicalyx-segments.

*Fl. & Fr.*: Oct.- Jan.

In moist and dry deciduous forests. Sparse.

Pharsegarh, 16111.

### 4. SIDA L.

1a. Leaf-base cuneate or rounded;  
petioles much shorter than blade :

2a. Leaves glabrous on  
both surfaces

1. *S. acuta*

- 2b. Leaves glabrous above,  
stellate-hairy beneath 4. *S. rhombifolia*
- 1b. Leaf-base cordate; petioles  
more than half of blade :
- 3a. Mericarps 5 2. *S. cordata*
- 3b. Mericarps 7-10 3. *S. cordifolia*

**1. *Sida acuta*** Brum.f., Fl. Ind. 147. 1768. *S. carpinifolia* sensu Mast. in Hook.f., Fl. Brit. India 1 : 323. 1874 *non* L.f. 1781.

Woody, branched herbs, up to 50 cm tall. Leaves up to 7 × 1.2 cm, ovate-lanceolate or lanceolate, serrate. Flowers yellow, in leaf-axils, 1-3 together; corolla 7-9 mm across; pedicels jointed about the middle. Mericarps 5-7 with 2 short awns.

*Fl. & Fr.*: Oct.- Dec.

In waste lands and in the vicinity of deciduous forests. Abundant.

Bijapur Ghati, 16405.

**2. *S. cordata*** (Burm.f.) Borssum in Blumea 14 : 182. 1966. *Melochia cordata* Burm.f., Fl. Ind. 143. 1768. *Sida humilis* Cav., Diss. 5 : 227. t.134. f.2. 1788; Mast. in Hook.f., Fl. Brit. India 1 : 322. 1874.

Trailing, slender herbs; branches up to 75 cm long. Leaves up to 5 × 4 cm, ovate-orbicular, acute or acuminate, dentate, 7-9-nerved. Flowers yellow, solitary, axillary or in few flowered racemes; corolla up to 8 mm across; pedicels jointed above the middle. Mericarps with 2 short awns.

*Fl. & Fr.*: Oct.-Dec.

In moist, shaded places in deciduous forests. Common.

Bijapur Ghati, 16415; Madded; Kutru.



Leaves are used as a tonic.

**3. *Sida cordifolia* L., Sp. Pl. 684. 1753; Mast. in Hook.f., Fl. Brit. India 1 : 324. 1874.**

Branched herbs, up to 1 m tall. Leaves up to 5 × 3.5 cm, ovate-orbicular, obtuse or subacute, crenate. Flowers cream coloured, axillary, solitary or 2-5 together; corolla up to 1.5 cm across; pedicels jointed above the middle. Mericarps with 2 retrorsely hairy awns, almost equalling mericarps.

*Fl. & Fr.*: Sept.- Oct.

In deciduous forests and along borders of cultivated fields. Common.

Bijapur Ghati, 16411; Pharsegarh; Karkeli.

**4. *S. rhombifolia* L., Sp. Pl. 684. 1753; Mast. in Hook.f., Fl. Brit. India 1 : 323. 1874.**

Bushy undershrubs, up to 60 cm tall. Leaves up to 6 × 2.5 cm, rhomboid, lanceolate or obovate, acute or obtuse, serrate. Flowers yellow; corolla up to 1.5 cm across; pedicels jointed above the middle. Mericarps muticous or shortly awned.

*Fl. & Fr.* : May Sept.

In waste lands. Common.

Bijapur, 16205.

#### 5. *THESPESIA* Soland. ex Corr.

***Thespesia lampas* (Cav.) Dalz. & Gibs., Bombay Fl. 19. 1861; Mast. in Hook.f., Fl. Brit. India 1 : 345. 1874. *Hibiscus lampas* Cav., Diss. 3 : 154. t. 56. f.2. 1787.**

'Bondki', 'Gupar'

Shrubs, up to 2 m tall. Leaves up to 15 × 10 cm, orbicular or ovate-triangular, 3-5-lobed, acute or acuminate, tomentose beneath. Flowers solitary or in few flowered racemes; epicalyx-segments 6, subulate, deciduous; corolla 7-10 cm across, yellow with purple base within. Capsules 2-3 cm long, ovoid.

*Fl. & Fr.*: Oct.- Feb.

In moist and dry deciduous forests. Frequent.

Bijapur Ghati, 16456; Madded; Pharsegarh; Kerpe Valley.

#### 6. URENA L.

**Urena lobata** L., Sp. Pl. 692. 1753; Mast. in Hook.f., Fl. Brit. India I : 329. 1874.

Woody undershrubs, up to 1.5 m tall. Leaves up to 10 × 9 cm, ovate-orbicular, shallowly lobed, lobes acute or acuminate. Flowers pink, in clusters; calyx campanulate, 5-lobed; petals 5, up to 1.5 cm long. Capsules glochidiate.

*Fl. & Fr.*: Sept.- Dec.

In the vicinity of moist and dry deciduous forests. Very common.

Bijapur Ghati, 16404; Kutru; Pharsegarh; Kerpe Valley; Karkeli.

### BOMBACACEAE

#### BOMBAX L.

**Bombax ceiba** L., Sp. Pl. 511. 1753. *B. malabaricum* DC., Prodr. I : 479. 1824; Mast. in Hook.f., Fl. Brit. India I : 349. 1874.

'Semal'

Prickly, deciduous trees, up to 25 m tall; bark grey. Leaves palmate; leaflets 4-7, up to 14.5 × 5 cm, elliptic or lanceolate, cuspidate. Flowering

when the plant is leafless; calyx fleshy; corolla up to 7 cm across, petals up to 7.5 cm long, red, reflexed; stamens many, in 5 groups. Capsules up to 12 × 6.5 cm long, elliptic, woody, 5-valved; seeds many, ovoid, cottony-hairy.

*Fl. & Fr.*: Feb.- Apr.

In deciduous forests. Common.

Bijapur Ghati, 16656; Kutru; Pharsegarh; Kerpe Valley; Pengunda.

Cotton from seeds is used for stuffing pillows etc.

### STERCULIACEAE

- |  |               |
|--|---------------|
| 1a. Flowers unisexual; petals absent               | 5. STERCULIA  |
| 1b. Flowers bisexual; petals present :             |               |
| 2a. Herbs or undershrubs :                         |               |
| 3a. Petals with filiform tip; capsules echinate    | 1. BYTTNERIA  |
| 3b. Petals without filiform tip; capsules smooth : |               |
| 4a. Petals clawed; capsules 2-valved               | 6. WALTHERIA  |
| 4b. Petals not clawed; capsules 5-valved           | 4. MELOCHIA   |
| 2b. Tall shrubs or trees :                         |               |
| 5a. Flowers yellow, actinomorphic                  | 2. ERIOLAENA  |
| 5b. Flowers scarlet, zygomorphic                   | 3. HELICTERES |

## 1. BYTTNERIA Loeffl.

**Byttneria herbacea** Roxb., Pl. Cor. 1 : 28. t.29. 1795; Mast. in Hook.f., Fl. Brit. India 1 : 376. 1874.

Slender herbs, up to 1 m tall. Leaves up to 6 × 3 cm, ovate or ovate-lanceolate, acute, base cordate or rounded, margin dentate. Flowers purple, in axillary cymes; petals 5, clawed, base concave, tip filiform. Capsules 5-6 mm across, globose, echinate.

*Fl. & Fr.*: Sept.- Nov.

In moist and dry deciduous forests. Frequent.

Bijapur Ghati, 16438; Madded, Pharsegarh; Kutru, Kerpe Valley.

## 2. ERIOLAENA DC.

**Eriolaena hookeriana** Wight & Arn., Prodr. 70. 1834; Mast. in Hook.f., Fl. Brit. India 1 : 370. 1874.

'Kunje'

Trees, up to 8 m tall. Leaves up to 13 × 9 cm, ovate-orbicular, acuminate, base cordate, margin crenate-serrate, grey-tomentose beneath. Bracts laciniate, multisect; sepals lanceolate, stellately spreading; petals yellow, reflexed. Capsules up to 2.5 cm long, ovoid, woody, acute, 6-7-valved, smooth or tubercled; seeds winged.

*Fl. & Fr.*: Persisting most parts of the year.

In dry deciduous forests. Sparse.

Pengunda, 16298; Dudepalli.

## 3. HELICTERES L.

**Helicteres isora** L., Sp. Pl. 963. 1753; Mast. in Hook.f., Fl. Brit. India 1 : 365. 1753.

'Ainthe'

Shrubs, up to 2.5 m tall. Leaves up to 15 × 10 cm, broadly oblong or obovate, acuminate, base obliquely cordate, margin crenate-serrate, sometimes lobed or angled. Flowers scarlet, in axillary clusters; calyx bilipped; petals unequal. Follicles up to 7.5 cm long, spirally twisted; seeds angled.

*Fl. & Fr.*: Sept.- Feb.

In dry and moist deciduous forests. Common.

Bijapur Ghati, 16409; Pharsegarh; Madded; Kerpe.

A strong fibre is extracted from the bark. The fruit is said to be useful in diarrhoea.

#### 4. MELOCHIA L.

**Melochia corchorifolia** L., Sp. Pl. 675. 1753; Mast. in Hook.f., Fl. Brit. India 1 : 374. 1874.

Branched, woody, perennial herbs, up to 75 cm tall. Leaves up to 7 × 3 cm, ovate-oblong, acute, base cordate or rounded. Flowers pink, in dense terminal clusters; petals oblong-cuneate. Capsules pink, 5-6 mm across, globose.

*Fl. & Fr.*: Sept.- Nov.

In waste lands and deciduous forests. Very common.

Bijapur, 16389; Kutru; Pharsegarh; Madded; Kerpe.

#### 5. STERCULIA L.

**Sterculia urens** Roxb., Pl. Cor. 1 : 25. t.24. 1795; Mast. in Hook.f., Fl. Brit. India 1 : 355. 1875.

*'Kullu'*

Trees, up to 25 m tall; bark ash coloured, smooth. Leaves up to 30 × 35 cm, palmately 4-6-lobed, lobes caudate-acuminate, base cordate.

Panicles up to 15 cm, pinkish-green, viscid-pubescent. Follicles up to 3 cm long, 4-6, ovoid-oblong, covered with stinging hairs; seeds black.

*Fl. & Fr.* : Feb.-Apr.

In dry deciduous and teak forests.

Dudepalli, 15554; Kandlaparti.

Gum is obtained by cutting the outer portion of stem, near the base.

#### 6. WALTHERIA L.

*Waltheria indica* L., Sp. Pl. 673. 1753; Mast. in Hook.f., Fl. Brit. India 1 : 374. 1874.

Undershrubs, up to 1.5 m tall. Leaves up to 4 × 2.5 cm, ovate or oblong-lanceolate, obtuse, base rounded or cordate, serrate. Flowers yellow, 5-7 mm across, in axillary capitate cymes; petals 5. Capsules enclosed in calyx; seed solitary.

*Fl. & Fr.* : May-Sept.

In dry deciduous forests; also common in open places.

#### TILIACEAE

- |  |               |
|--|---------------|
| 1a. Petals eglandular                                | 1. CORCHORUS  |
| 1b. Petals glandular at base :                       |               |
| 2a. Fruit a capsule, covered<br>with hooked bristles | 3. TRIUMFETTA |
| 2b. Fruit a drupe, without<br>hooked bristles        | 2. GREWIA     |

#### 1. CORCHORUS L.

- |                                   |                         |
|-----------------------------------|-------------------------|
| 1a. Capsules globose, beak absent | 2. <i>C. capsularis</i> |
|-----------------------------------|-------------------------|

1b. Capsules elongate, beak present :

2a. Capsules cylindric, beak entire 3. *C. olitorius*

2b. Capsules angled, beak 3-fid 1. *C. aestuans*

**1. *Corchorus aestuans* L.**, Syst. Nat. ed. 10. 1079. 1759. *C. acutangulus* Lam., Encycl. 2 : 104. 1786; Mast. in Hook.f., Fl. Brit. India 1 : 398. 1874.

Branched, annual herbs, up to 35 cm tall. Leaves up to 7.5 × 3 cm, ovate or ovate-lanceolate, acute, crenate-dentate, lower teeth sometimes with a filiform appendage on each side. Flowers yellow, in leaf-opposed cymes. Capsules up to 3.5 cm long, 6-angled, 3-winged; seeds truncate.

*Fl. & Fr.*: Sept.- Dec.

In waste lands, cultivated fields and in the vicinity of forests.

Bijapur, 16384; Pharsegarh; Madded; Karkeli.

**2. *C. capsularis* L.**, Sp. Pl. 529. 1753; Mast. in Hook.f., Fl. Brit. India 1 : 397. 1874.

Annual herbs, up to 1 m tall. Leaves up to 10 × 2.5 cm, oblong or ovate-lanceolate, acute or acuminate, serrate, lower serratures sometimes with a filiform appendage on each side. Flowers yellow, in cymes. Capsules up to 1 cm across, depressed globose, ribbed, muricate, 5-valved; seeds wedge-shaped.

*Fl. & Fr.*: Sept.- Nov.

In waste lands. Sparse.

Pharsegarh, 16123.

**3. *C. olitorius* L.**, Sp. Pl. 529. 1753; Mast. in Hook.f., Fl. Brit. India 1 : 397. 1874.

Annual herbs, up to 60 cm tall. Leaves up to 9 × 4.5 cm, elliptic or ovate-oblong, acute or acuminate, lower serratures with a filiform appendage on each side. Buds obovoid, cuspidate; petals yellow, spatulate. Capsules up to 5.5 cm long, cylindrical, 10-ribbed, 5-valved; seeds 3-angled.

*Fl. & Fr.*: Sept.- Nov.

In waste lands. Sparse.

Pharsegarh, 16124.

The stem is source of jute fibre.

## 2. GREWIA L.

1a. Trees

4. *G. tiliifolia*

1b. Shrubs :

2a. Lower surface of leaves glaucous

3. *G. rothii*

2b. Lower surface of leaves not glaucous :

3a. Flowers bisexual

1. *G. abutilifolia*

3b. Flowers polygamous

2. *G. hirsuta*

**1. *Grewia abutilifolia* Vent. ex Juss., Ann. Mus. Nat. Hist. 4 : 92. 1804; Mast. in Hook.f., Fl. Brit. India 1 : 390. 1874.**

Shrubs, up to 1.5 m tall. Leaves up to 15 × 12.5 cm, ovate-orbicular, lobed at the apex, acute or acuminate, base subcordate, serrulate. Flowers in umbellate, axillary cymes, shorter than petiole; petals yellow, about ¼th of length of sepals. Drupes *ca* 1 cm across, depressed globose, obscurely 2-4-lobed, stellate hairy.

*Fl. & Fr.*: May-Aug.

In dry deciduous forests. Sparse.



Itpal forest, 16248.

**2. *Grewia hirsuta*** Vahl, Symb. Bot. 1 : 34. 1790; Mast. in Hook.f., Fl. Brit. India 1 : 391. 1874.

Hairy shrubs, up to 2.5 m tall. Leaves up to 7 × 3 cm, oblong-lanceolate, acute, base rounded, serrate, tomentose beneath. Flowers in axillary cymes; peduncles up to 1 cm long; petals white, changing to yellow. Drupes 6-9 mm across, globose, 2-4-lobed, pilose.

*Fl. & Fr.*: Sept.- Dec.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16437.

**3. *G. rothii*** DC., Prodr. 1 : 509. 1824. *G. excelsa auct. non Vahl* 1790; Mast. in Hook.f., Fl. Brit. India 1 : 385. 1874 *p.p.*

Shrubs, up to 1.5 m tall. Leaves up to 10.5 × 4.5 cm, ovate-lanceolate, acute, base rounded or subcordate, serrulate, greyish-white beneath. Flowers yellow, in axillary cymes. Drupes 4-5 mm across, globose, hairy, purple.

*Fl. & Fr.*: May-Oct.

In moist deciduous forests. Common.

Bijapur Ghati, 16220; Kerpe Valley.

**4. *G. tiliifolia*** Vahl, Symb. Bot. 1 : 35. 1790; Mast. in Hook.f., Fl. Brit. India 1 : 386. 1874. *p.p.* (*'tiliaefolia'*).

*'Dhaman'*, *'Wada'*

Trees, up to 12 m tall; bark light brown. Leaves up to 15 × 7.5 cm, elliptic or ovate, acuminate, base cordate, crenate. Flowers yellow, in axillary cymes; petals about half of length of sepals. Drupes 5-7 mm across, globose, 2-lobed.

*Fl. & Fr.*: May-Sept.

In moist deciduous forests. Sparse.

Parsegarh, 16287; Dudepalli.

Crushed bark is given in delayed child birth.

### 3. TRIUMFETTA L.

1a. Bristles on capsules glabrous

2. *T. rhomboidea*

1b. Bristles on capsules hispid-ciliate

1. *T. pentandra*

**1. *Triumfetta pentandra*** A. Rich. in Guill. & Perr., Fl. Seneg. Tent. 93. t.19. 1831. *T. neglecta* Wight & Arn., Prodr. 75. 1834; Mast. in Hook.f., Fl. Brit. India 1 : 396. 1874.

Perennial herbs, up to 60 cm tall. Leaves up to 6 × 4 cm, broadly ovate or rhomboid, usually 3-lobed in the upper half, crenate-serrate. Flowers yellow; petals spatulate. Capsules 4-6 mm across, globose or ellipsoid, covered with hooked or straight bristles.

*Fl. & Fr.*: Sept.- Nov.

In waste lands and in the vicinity of forests.

Bijapur, 16387A.

**2. *T. rhomboidea*** Jacq., Enum. Pl. Carib. 22. 1760; Mast. in Hook.f., Fl. Brit. India 1 : 395. 1874.

Branched, woody herbs, up to 60 cm tall. Leaves up to 10 × 8 cm, orbicular or rhomboid, usually 3-lobed, upper leaves small and narrow. Flowers yellow, in terminal and leaf-opposed cymes. Capsules 4-6 mm across, ellipsoid or subglobose, covered with hooked bristles.

*Fl. & Fr.*: Sept.- Nov.

In waste lands. Abundant.

Bijapur, 16387B.

OXALIDACEAE

1a. Leaflets 3; capsules with valves  
attached to the central axis 2. OXALIS

1b. Leaflets 6 or more; capsules with  
valves separating from the axis 1. BIOPHYTUM

1. BIOPHYTUM DC.

1a. Sepals about as long as petals,  
 $1\frac{1}{2}$ -2 times longer than fruit 2. *B. sensitivum*

1b. Sepals about half as long as  
petals, nearly equalling fruit 1. *B. reinwardtii*

**1. *Biophytum reinwardtii* (Zucc.) Klotzsch** in Peters, *Reise Mossamb. Bot.* 1 : 85. 1862; Edgew. & Hook.f. in Hook.f., *Fl. Brit. India* 1 : 437. 1874. *Oxalis reinwardtii* Zucc., *Abh. K. Ak. Wiss.* 1 : 274. 1830.

Slender, unbranched herbs, up to 15 cm tall. Leaves whorled at the apex of stem; terminal leaflets up to  $2 \times 0.8$  cm, obovate, asymmetric; other leaflets smaller and symmetric. Flowers in terminal pseudoumbel; petals yellow with a red streak in centre. Capsules 2-3 mm long; seeds transversely ridged.

*Fl. & Fr.*: Sept.- Oct.

In damp, shaded places, as undergrowth in moist and dry deciduous forests.

Bijapur Ghati, 16429.

**2. *B. sensitivum* (L.) DC.**, *Prodr.* 1 : 690. 1824; Edgew. & Hook.f. in Hook.f., *Fl. Brit. India* 1 : 436. 1874 *p.p.* *Oxalis corniculata* L., *Sp. Pl.* 434. 1753 *p.p.*

Unbranched, annual herbs, up to 25 cm tall. Leaves in tufts at apex of stem; terminal leaflets up to 2 × 1 cm, falcate-obovate, asymmetric, other leaflets symmetric and elliptic. Flowers orange coloured, in terminal pseudumbel. Capsules 3-4 mm long; seeds transversely ridged.

*Fl. & Fr.*: Sept.- Nov.

In moist and dry deciduous forests. Sparse.

Madded, 16631.

## 2. OXALIS L.

*Oxalis corniculata* L., Sp. Pl. 435. 1753; Edgew. & Hook.f. in Hook.f., Fl. Brit. India 1 : 436. 1874; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 22. 1976.

'Kodey'

Procumbent, slender, perennial herbs. Leaflets up to 1.5 × 1 cm, obcordate, margin ciliate. Flowers yellow, in axillary subumbellate racemes; petals oblong, apex rounded or emarginate. Capsules up to 2 cm long, cylindrical, beaked, erect; seeds brown, ovoid, transversely striate.

*Fl. & Fr.*: Sept.- Apr.

In waste lands. Common.

Bhopalpatnam (Saxena & Khotele *l.c.*); Bijapur; Kutru.

Leaves are cooked and eaten.

## RUTACEAE

1a. Leaves 3-foliolate; stamens many;  
fruits indehiscent

1. AEGLE

1b. Leaves abruptly pinnate; stamens 10;  
fruits dehiscent

2. CHLOROXYLON

## 1. AEGLE CORR.

**Aegle marmelos** (L.) Corr. in Trans: Linn. Soc. Lond. 5 : 223. 1800; Hook.f., Fl. Brit. India 1 : 516. 1875. *Crateva marmelos* L., Sp. Pl. 444. 1753.

'Bael'

Armed trees, up to 15 m tall; bark black. Leaflets up to 8 × 4 cm, ovate, elliptic or elliptic-lanceolate, subacuminate, aromatic. Flowers greenish-white, in axillary or subterminal panicles; petals 4, oblong. Berries up to 12.5 cm across, globose, green changing to yellow on ripening; pulp slimy, sweet.

*Fl.*: Apr.; *Fr.*: Most parts of the year.

In dry deciduous forests. Common.

Dudepalli, 15552; Pengunda.

Fruit pulp is used in bowel complaints.

## 2. CHLOROXYLON DC.

**Chloroxylon swietenia** DC., Prodr. 1 : 625. 1824; Hiern in Hook.f., Fl. Brit. India 1 : 569. 1875.

'Bhirra', 'Halbilla'

Trees, up to 10 m tall; young stem reddish. Leaves paripinnate; leaflets up to 10-18 pairs, up to 3 × 1.2 cm, oblong, inequilateral, glaucous beneath. Flowers white, in axillary and terminal panicles; disc 10-lobed, thick. Capsules up to 3.5 cm long, oblong, 3-locular; seeds compressed, winged above.

*Fl. & Fr.*: Apr.- Aug.

In dry deciduous forests. Abundant.

Bijapur Ghati, 15600.

## SIMAROUBACEAE

## AILANTHUS Desf.

**Ailanthus excelsa** Roxb., Pl. Cor. 1 : 24. t.23. 1795; Bennet in Hook.f., Fl. Brit. India 1 : 518. 1875.

*'Mahaneem'*

Trees, up to 20 m tall; bark black. Leaves clustered at tips of branches, up to 75 cm long, pinnate; leaflets up to 15 × 6 cm, shape variable, inequilateral, acute or subacuminate, margin toothed. Flowers cream coloured, unisexual, in up to 50 cm long terminal, axillary panicles; petals reflexed. Samaras up to 5.5 × 1.5 cm, lanceolate, 1-seeded.

*Fl. & Fr.*: Feb.- Apr.

Near habitations. Not common.

Pasewada, 15575.

Crushed bark is used in dysentery by the local people.

## OCHNACEAE

## OCHNA L.

**Ochna obtusata** DC. var. **gamblei** (King ex Brandis) Kanis in Blumea 16 : 34. 1968. *O. gamblei* King ex Brandis, Indian Trees 128. 1906.

*'Deme'*

Trees, up to 12 m tall; bark light grey. Leaves clustered at the tips of branches, up to 15 × 6.5 cm, elliptic or elliptic-obovate, obtuse, serrulate or sub-entire, glaucous. Flowers yellow, in corymbose racemes, on short lateral branches; petals 5-10, obovate. Drupelets 2-11, oblong, cylindrical, erect, up to 1 cm long.

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

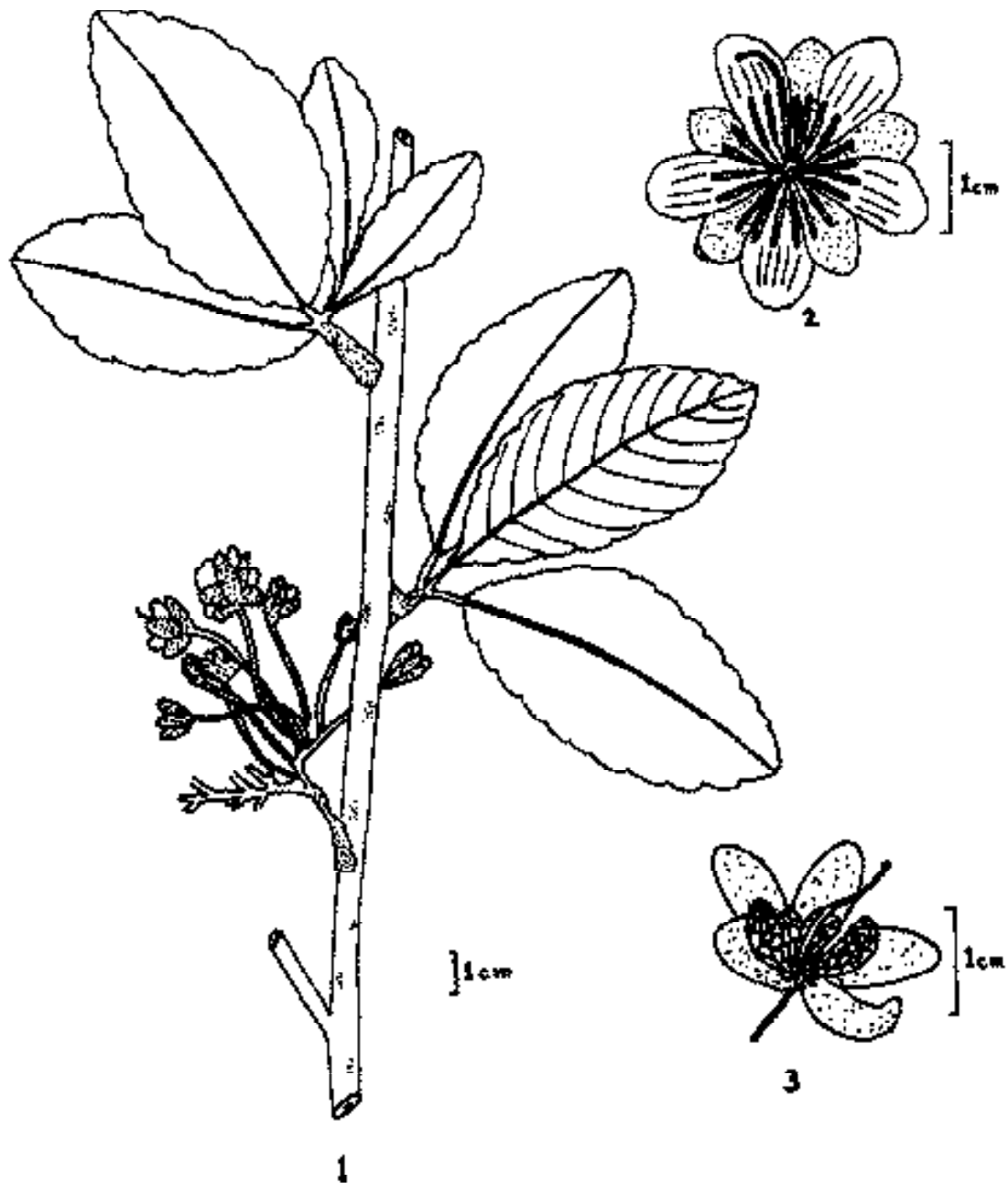


Fig. 2. *Ochna obtusata* DC. var. *gamblei* (King ex Brandis) Kanis  
 1. flowering branch; 2. flower & 3. fruits.

In dry deciduous forests. Common.

Itpal forest, 16244; Dudepalli.

### BURSERACEAE

- |   |              |
|---|--------------|
| 1a. Stamens 10, 5 long and<br>5 short; drupes dehiscent | 1. BOSWELLIA |
| 1b. Stamens 10, equal;<br>drupes indehiscent            | 2. GARUGA    |

#### 1. BOSWELLIA Roxb. ex Colebr.

**Boswellia serrata** Roxb. ex Colebr., As. Res. 9 : 379. t.5. 1807;  
Bennet in Hook.f., Fl. Brit. India 1 : 528. 1875.

'Salai'

Resiniferous trees, up to 20 m tall; bark ash coloured, papery, peeling in flakes. Leaves up to 35 cm long, clustered at the tips of branches, imparipinnate; leaflets up to 6.5 × 3 cm, ovate-lanceolate, obtuse, serrate, inequilateral. Flowers white, in axillary up to 25 cm long racemes; petals ovate; disc annular. Drupes up to 1.2 × 0.8 cm, ellipsoid, 3-angled; seeds compressed.

*Fl. & Fr.*: Jan.- May.

In dry deciduous forests. Common.

Pillure, 15529; Dudepalli; Pengunda; Kandlaparti.

Wood is used in making match-sticks.

#### 2. GARUGA Roxb.

**Garuga pinnata** Roxb., Pl. Cor. 3 : 5. t. 208. 1811; Bennet in Hook.f., Fl. Brit. India 1 : 528. 1875.

'Gharri'



Trees, up to 15 m tall; bark grey. Leaves clustered at the tips of branches, up to 40 cm long, imparipinnate; leaflets up to 10 × 4 cm, ovate or lanceolate, acuminate, crenate. Flowers yellow, polygamous, in 10-15 cm long panicles. Drupes up to 1.5 cm across, globose, sour.

*Fl. & Fr.*: Mar.-May.

In deciduous forests. Sparse.

Kutru, 16366.

Fruits are edible.

#### MELIACEAE

1a. Leaflets serrate; disc absent 1. AZADIRACHTA

1a. Leaflets entire; disc present 2. SOYMIDA

#### 1. AZADIRACHTA A. L. Juss.

***Azadirachta indica*** A. L. Juss., Mem. Mus. Hist. Nat. Paris 19: 221. t.2. f.5. 1830; *Melia azadirachta* L., Sp. Pl. 385. 1753; Hiern in Hook.f., Fl. Brit. India 1 : 544. 1875.

‘*Neem*’

Trees, up to 25 m tall; bark black. Leaves up to 30 cm long, imparipinnate; leaflets 5-9 pairs, obliquely lanceolate or falcate, acuminate. Flowers white, in axillary, up to 25 cm long panicles. Drupes up to 1.5 cm long, green changing to yellow, oblong, 1-seeded.

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

Planted near habitations.

Madded, 16265.

The tree is well known for its medicinal value.

## 2. SOYMIDA A. L. JUSS.

**Soymida febrifuga** (Roxb.) A. L. Juss., Mem. Mus. Hist. Nat. Paris 19: 251. 1830; Hiern in Hook.f., Fl. Brit. India 1: 567. 1875. *Swietenia febrifuga* Roxb., Pl. Cor. 1: 18. t.17. 1795.

'Omee', 'Rohan'

Trees, up to 20 m tall; bark black, fissured. Leaves up to 40 cm long, paripinnate; leaflets 3-6 pairs, up to 11 × 6 cm, obliquely elliptic, obtuse. Flowers white, in terminal or axillary, up to 45 cm long panicles; petals clawed, emarginate. Capsules up to 6 × 4 cm, ellipsoid or obovoid, woody, 5-valved; seeds many, brown, winged at both ends.

*Fl. & Fr.*: Mar.- May.

In dry deciduous forests. Common.

Kodepalli, 16263; Pengunda; Pharsegarh; Dudepalli.

Wood is extremely durable.

## OLACACEAE

## OLAX L.

**Olax scandens** Roxb., Pl. Cor. 2: 2. t. 102. 1799; Mast. in Hook.f., Fl. Brit. India 1: 575. 1875.

'Kusur-tonda'

Small trees with scandent branches; bark grey, smooth; old branches thorny. Leaves up to 9.5 × 4 cm, elliptic or elliptic-oblong, obtuse. Flowers 6-8 mm long, in axillary up to 5 cm long racemes; calyx accrescent; petals linear; staminodes bifid. Drupes ca 1 cm long, oblong-globose, 1-seeded.

*Fl. & Fr.*: May-Sept.

In dry deciduous forests. Common.

Itpal forest, 16243; Dudepalli; Pharsegarh.

Crushed fruits are applied in eye-diseases.

### OPILIACEAE

- 1a. Leaves opaque; flowers sessile; petals united 1. CANSJERA
- 1b. Leaves subcoriaceous; flowers pedicelled; petals free 2. OPILIA

#### 1. CANSJERA A. L. Juss.

**Cansjera rheedii** Gmel., Syst. 2 : 280. 1791; Mast. in Hook.f., Fl. Brit. India 1 : 582. 1875.

Climbing shrubs; bark light brown; branches usually armed. Leaves up to 7 × 3 cm, ovate-lanceolate, acuminate, base often oblique. Flowers 2-3 mm long, in axillary, pubescent, 1-2.8 cm long spikes; corolla white, urceolate, lobes recurved. Drupes up to 1.2 cm long, ellipsoid or ovoid, scarlet, 1-seeded.

*Fl. & Fr.*: Jan.- May.

In moist deciduous forests. Rare.

Itpal forest, 16235.

#### 2. OPILIA Roxb.

**Opilia amentacea** Roxb., Pl. Cor. 2 : 31. t. 158. 1872; Mast. in Hook.f., Fl. Brit. India 1 : 583. 1875.

Scandent shrubs. Leaves up to 6 × 2.5 cm, ovate-lanceolate, subacuminate or acuminate. Flowers cream coloured, in axillary, up to 4.5 cm long racemes; petals 4-5, oblong, obtuse. Drupes up to 1.3 cm long, ovoid, 1-seeded.

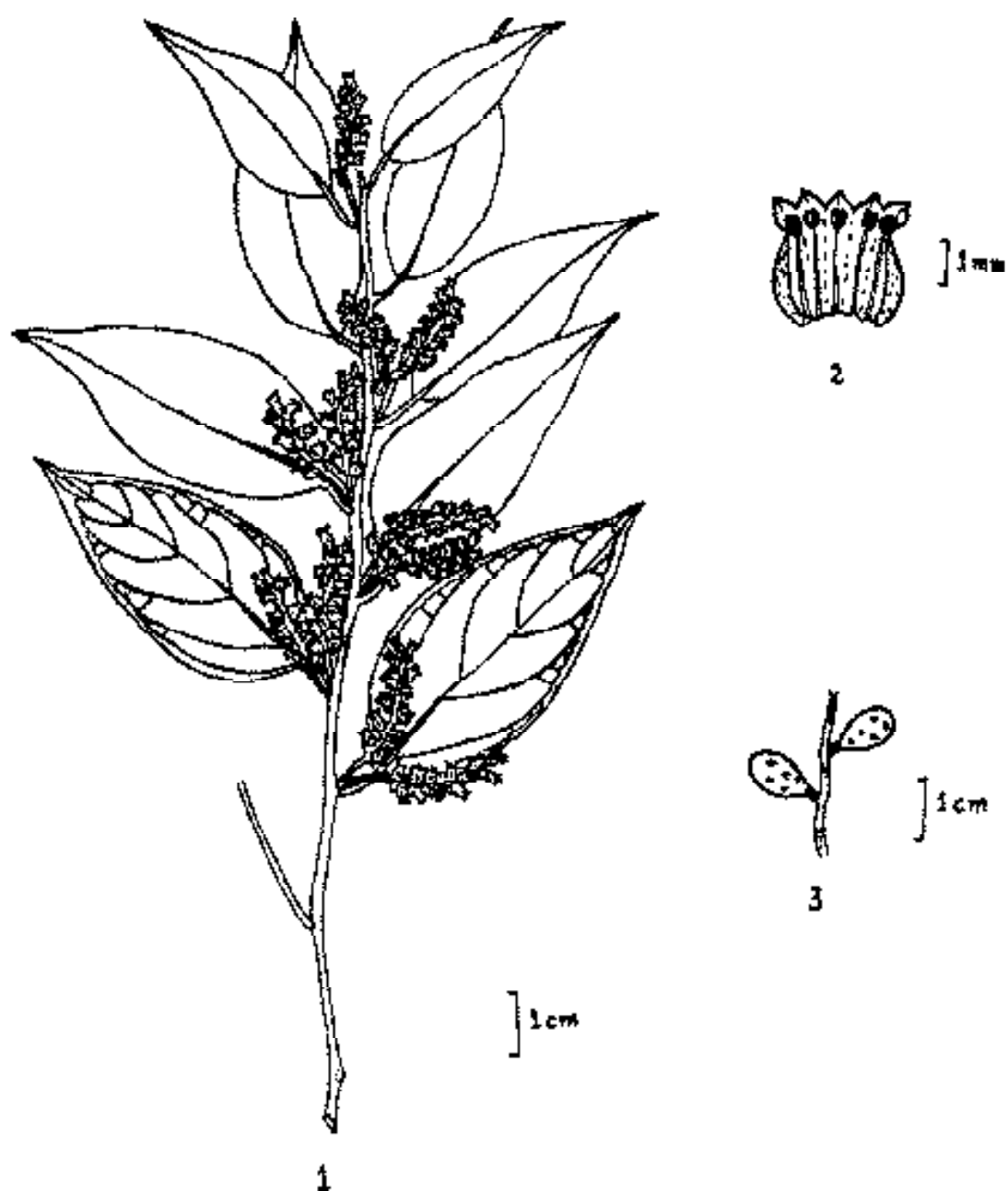


Fig. 3. *Cansjera rheedii* Gmel.  
1. twig; 2. flower, cut open & 3. drupes.



Fig. 4. *Opilia amentacea* Roxb.  
 1. twig; 2. flower & 3. drupes.

*Fl. & Fr.*: Apr.- May.

In moist deciduous forests. Rare.

Pharsegarh, 16288.

### CELASTRACEAE

- |                                     |              |
|-------------------------------------|--------------|
| 1a. Trees; seeds exarillate         | 1. CASSINE   |
| 1b. Scandent shrubs; seeds arillate | 2. CELASTRUS |

#### 1. CASSINE L.

**Cassine glauca** (Rottb.) O. Ktze., Rev. Gen. Pl. 1 : 114. 1891. *Mangifera glauca* Rottb. in Nye Saml. Kongel. Danske Vidensk. Selsk. Skr. 2 : 534, t.4. f.1. 1783. *Elaeodendron glaucum* Pers., Syn. Pl. 1 : 241. 1806; Lawson in Hook.f., Fl. Brit. India 1 : 623. 1875 p.p.

Trees, up to 12 m tall; bark black. Leaves up to 13.5 × 5.5 cm, variable, elliptic or elliptic-orbicular, subacuminate with acumen often folded, crenate-serrate. Flowers greenish-white, in axillary or extra-axillary, dichotomously branched panicles. Drupes up to 1.2 cm long, ovoid, apiculate, 1-seeded.

*Fl. & Fr.*: Sept.- Jan.

In dry deciduous forests. Sparse.

Netikakler forest, 15621.

Wood is beautifully variegated; used for ornamental purpose.

#### 2. CELASTRUS L.

**Celastrus paniculatus** Willd., Sp. Pl. 1 : 1125. 1797; Lawson in Hook.f., Fl. Brit. India 1 : 617. 1875.

'Peng'

Climbing shrubs; branches grey. Leaves up to 10 × 6 cm, elliptic or elliptic-obovate, subacuminate, crenate. Flowers greenish-yellow, dioecious, in terminal, 7-16 cm long pyramidal panicles. Capsules up to 1 cm across, globose, 3-valved, tipped by persistent style; seeds ovoid, striate, aril scarlet.

*Fl. & Fr.*: May-Oct.

In dry and moist deciduous forests. Common.

Bijapur Ghati, 16222.

### RHAMNACEAE

- |                                       |              |
|---------------------------------------|--------------|
| 1a. Plants not prickly; fruits winged | 1. VENTILAGO |
| 1b. Plants prickly; fruits not winged | 2. ZIZIPHUS  |

#### 1. VENTILAGO Gaertn.

**Ventilago denticulata** Willd., Ges. Naturf. Fr. Neue Schr. 3 : 417. 1801. *V. calyculata* Tul. in Ann. Sci. Nat. Bot. ser. 4. 8 : 124. 1857; Lawson in Hook.f., Fl. Brit. India 1 : 631. 1875.

Branched climbers; young stem green. Leaves up to 14 × 6 cm, elliptic or elliptic-oblong, acute, base oblique, entire or crenate. Flowers cream coloured, fragrant, in axillary and terminal panicles. Capsules globose, more than half surrounded by the calyx-tube; wing up to 4 cm long, terminal, oblong or linear, flat.

*Fl. & Fr.*: Oct.- May.

In dry deciduous forests and along river-banks over small trees. Very common.

Eramnar, 16698; Kutru; Pharsegarh.

Flowers are frequently visited by honey-bees for nectar.

## 2. ZIZIPHUS P. Mill.

1a. Styles united; fruits less than 1 cm across 1. *Z. oenoplia*1b. Styles distinct; fruits more than 1 cm across 2. *Z. xylopyrus*

1. **Ziziphus oenoplia** (L.) P. Mill., Gard. Dict. Abr. ed. 8. n.3. 1768; Lawson in Hook.f., Fl. Brit. India 1 : 634. 1875. *Rhamnus oenoplia* L., Sp. Pl. 194. 1753.

‘Mahakuru’

Prickly, straggling or climbing shrubs; young parts rusty-tomentose. Leaves up to 5.5 × 3 cm, elliptic-oblong, acute, base oblique; stipular spines solitary. Flowers fascicled in axillary, pubescent cymes; petals yellow. Drupes globose or obovoid-globose, 5-7 mm across, black.

*Fl. & Fr.*: Oct.- Apr.

In dry deciduous forests. Sparse.

Bijapur Ghati, 16408; Kutru.

Fruits are eaten by local people and herbivores.

2. **Z. xylopyrus** (Retz.) Willd., Sp. Pl. 1 : 1104. 1798; Lawson in Hook.f., Fl. Brit. India 1 : 634. 1875. *Rhamnus xylopyrus* Retz., Obs. Bot. 2 : 11. 1781.

‘Ghont’, ‘Godia’

Prickly shrubs or trees, up to 6 m tall, sometimes straggling. Leaves up to 8 × 5.5 cm, ovate-oblong or elliptic-oblong, rounded or mucronate, base rounded or subcordate, inequilateral, serrate; stipular prickles paired when present. Flowers in paniculate cymes; petals white. Drupes up to 2 cm across, globose.

*Fl. & Fr.*: Oct.- Jan.

In dry deciduous forests. Common.



Bijapur Ghati, 16218; Pengunda.

### VITACEAE

- 1a. Tendrils on inflorescence-  
peduncles; berries 2-4-seeded 1. AMPELOCISSUS
- 1b. Tendrils on branches, leaf-opposed;  
berries 1-seeded 2. CISSUS

#### 1. AMPELOCISSUS Planch.

**Ampelocissus latifolia** (Roxb.) Planch. in J. Vigne Am. Vitic. Eur. 8 : 374. 1884. *Vitis latifolia* Roxb., Fl. Ind. 1 : 661. 1820; Lawson in Hook.f., Fl. Brit. India 1 : 652. 1875.

Climbers; rootstock tuberous. Leaves up to 15 × 14 cm, orbicular, 3-7-angled or lobed, crenate-serrate, base cordate. Flowers red, in compact cymes. Berries 6-8 mm across, globose, black.

*Fl. & Fr.*: May-Oct.

In moist and dry deciduous forests. Common.

Bijapur Ghati, 16223; Kutru; Pharsegarh.

#### 2. CISSUS L.

**Cissus repanda** Vahl, Symb. Bot. 3 : 18. 1794. *Vitis repanda* (Vahl) Wight & Arn., Prodr. 125. 1834; Lawson in Hook.f., Fl. Brit. India 1 : 648. 1875.

‘Dawad-tonda’

Large, woody climbers; young branches ferruginous-tomentose. Leaves up to 18 × 14 cm, broadly ovate or sub-orbicular, acuminate, margin repand, base cordate, crenate-dentate, tomentose beneath, glabrescent later on. Flowers pink, in umbellate cymes. Berries 6-8 mm

long, pyriform, purple on ripening.

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

In dry deciduous forests. Sparse.

Dudepalli, 16327.

Crushed bark in water is said to be used in ulcers of stomach.

### LEEACEAE

#### LEEA van Royen ex L.

**Leea asiatica** (L.) Ridsdale in Manilal, Bot. Hist. Hort. Malab. 189. 1890. *Phytolacca asiatica* L., Sp. Pl. 474. 1753. *Leea crispa* L., Syst. Nat. ed. 12, 2 : 627. 1767; Lawson in Hook.f., Fl. Brit. India 1 : 665. 1875. *L. aspera* Edgew. in Trans. Linn. Soc. Lond. 20 : 36. 1846 non Wall. ex G. Don 1831; Lawson *l.c.* 1 : 665. 1875.

Sub-herbaceous shrubs; stem usually winged. Leaves 1 or 2-pinnate, 5-7-foliolate; leaflets up to 20 × 8.5 cm, ovate-oblong or elliptic-oblong, acuminate, base cordate or rounded, crenate-serrate. Flowers greenish-white, 5-merous, in leaf-opposed corymbose cymes. Berries 7-11 mm across, depressed globose, purple-black, usually 6-seeded.

*Fl. & Fr.*: Sept.- Nov.

In moist and dry deciduous forests. Very common.

Bijapur Ghati, 16416; Madded; Kutru; Pharsegarh.

### SAPINDACEAE

#### SCHLEICHERA Willd.

**Schleichera oleosa** (Lour.) Oken, Allg. Naturgesch. 3(2) : 1341. 1841. *Pistacia oleosa* Lour., Fl. Cochinch. 2 : 615. 1790. *Schleichera trijuga*

Willd., Sp. Pl. 4 : 1096. 1805; Hiern in Hook.f., Fl. Brit. India 1: 681. 1875.

*'Kusum', 'Pusi'*

Trees, up to 15 m tall; bark greyish-white. Leaves bright red when young, pinnate; leaflets 2-4 pairs, up to 16 × 7 cm, elliptic or elliptic-oblong, acute or obtuse. Flowers greenish-white, fascicled in interrupted racemes or panicles; petals absent. Drupes up to 2 × 1.2 cm, ovoid or ellipsoid with persistent style, smooth or prickly; seeds arillate.

*Fl. & Fr.*: Mar.- May.

In dry deciduous forests. Common.

Kutru, 16365; Pengunda; Dudepalli.

Plant is well known host for lac insect. Seed-oil is used for cooking. Wood is hard and durable. Fruits are edible.

### ANACARDIACEAE

1a. Leaves compound

3. LANNEA

1b. Leaves simple :

2a. Stamens as many as  
petals or fewer :

3a. Leaves obovate, apex  
broadly rounded; drupes  
situated on a fleshy hypocarp

5. SEMECARPUS

3b. Leaves oblong or oblong-lanceolate,  
apex acute, acuminate or sub-obtuse;  
drupes not situated on receptacle

4. MANGIFERA

2b. Stamens twice the number of petals :

- 4a. Flowers polygamous; style 1 1. ANACARDIUM  
4b. Flowers bisexual; styles 5-6 2. BUCHANANIA

### 1. ANACARDIUM L.

**Anacardium occidentale** L., Sp. Pl. 383. 1753; Hook.f., Fl. Brit. India 2 : 20. 1876.

*'Kaju'*

Trees, up to 3.5 m tall; bark greyish-white. Leaves up to 12.5 × 6 cm, obovate, rounded or emarginate. Flowers in up to 25 cm long, terminal, pubescent panicles; petals green with reddish veins, reflexed. Nuts 2-3 cm long, on a fleshy hypocarp; seeds reniform.

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

Cultivated for its edible cotyledons.

Kutru, 16296; Pengunda; Bijapur.

### 2. BUCHANANIA Spreng.

**Buchanania lanzan** Spreng. in Journ. Bot. (Schrad.) 1800(2) : 234. 1802. *B. latifolia* Roxb., Fl. Ind. 2 : 385. 1832; Hook.f., Fl. Brit. India 2 : 23. 1876.

*'Char'*, *'Reka'*

Trees, up to 18 m tall; bark black, rough. Leaves up to 20 × 12.5 cm, oblong or elliptic-oblong, obtuse or emarginate. Flowers white, in up to 15 cm long panicles. Drupes 5-8 mm across, lenticular, black.

*Fl. & Fr.*: Feb.- May.

In dry deciduous forests. Very common.

Pharsegarh, 15525; Dudepalli; Pengunda; Bijapur; Bhopalpatnam.

Seeds constitute one of the important foods of the tribals.

### 3. LANNEA A. Rich.

**Lannea coromandelica** (Houtt.) Merr. in Journ. Arn. Arb. 19 : 353. 1938. *Dialium coromandelicum* Houtt. in Nat. Hist. ser. 2. 2 : 39. t.5. f.2. 1774. *Odina wodier* Roxb., Fl. Ind. 2 : 293. 1832; Hook.f., Fl. Brit. India 2 : 29. 1876.

'Mudga'

Trees, up to 10 m tall; bark ash coloured, smooth. Leaves imparipinnate; leaflets up to 12.5 × 5 cm, ovate-oblong, acuminate, base inequilateral. Flowers greenish-yellow, unisexual, in racemes at the apex of branches. Drupes up to 1.5 × 0.7 cm, red, reniform, 1-seeded.

*Fl. & Fr.*: Mar.- May.

In dry deciduous forests. Common.

Itpal forest, 16253; Dudepalli.

### 4. MANGIFERA L.

**Mangifera indica** L., Sp. Pl. 200. 1753; Hook.f., Fl. Brit. India 2: 13. 1876.

'Aam'

Evergreen trees, up to 15 m tall; bark black. Leaves up to 17.5 × 5 cm, oblong or oblong-lanceolate, acute, entire. Flowers cream coloured, fragrant, in dense, terminal up to 35 cm long panicles; petals reflexed; fertile stamen 1, staminodes 3-4. Drupes up to 15 cm long, yellow when ripe, pyriform, edible; seed 1.

*Fl. & Fr.*: Feb.- May.

Planted along roadsides; also found along water courses.

Pharsegarh, 15580; Bijapur; Bhopalpatnam.

5. SEMECARPUS L.f.

**Semecarpus anacardium** L.f., Suppl. 182. 1781; Hook.f., Fl. Brit. India 2 : 30. 1876.

*'Bhelwa', 'Kohka'*

Trees, up to 12 m tall; bark black. Leaves up to 35 × 20 cm, obovate, tomentose beneath. Flowers greenish-yellow, in terminal up to 25 cm long panicles; stamens 5. Drupes up to 2.5 cm long, black on ripening, ovoid or oblong, flat.

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

In dry and moist deciduous forests. Sparse.

Pharsegarh, 15524.

Hypocarp is edible. Fruit-sap is said to be useful for healing wounds.

MORINGACEAE

MORINGA Adans.

**Moringa oleifera** Lam. Encycl. 1 : 398. 1785. *M. pterygosperma* Gaertn., Fruct. 2 : 314. t.147. f.2. 1791; Hook.f., Fl. Brit. India 2 : 45. 1876.

*'Munga'*

Trees, up to 8 m tall. Leaves 2-3-pinnate; pinnules up to 2.5 × 1.5 cm, elliptic-oblong, obtuse or emarginate. Flowers white, in effuse panicles; 5 stamens fertile, alternating with 5-7 sterile stamens. Capsules up to 40 cm long, pendulous, more or less cylindrical or trigonous, ribbed; seeds 3-angled, winged.

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

Planted near habitations.

Pasewada, 15574.

Flowers and fruits are cooked as a vegetable.

### FABACEAE

#### 1a. Trees or large woody climbers :

##### 2a. Leaflets 3 :

3a. Pods tomentose, 1-seeded 5. BUTEA

3b. Pods glabrous, 2-5-seeded 14. OUGEINIA

##### 2b. Leaflets 5 or more :

4a. Fruits orbicular 16. PTEROCARPUS

##### 4b. Fruits not orbicular :

5a. Leaflets alternate 7. DALBERGIA

5b. Leaflets opposite 12. MILLETTIA

#### 1b. Herbs, shrubs or small herbaceous climbers :

##### 6a. Stamens monadelphous :

7a. Pods jointed 22. ZORNIA

##### 7b. Pods not jointed :

8a. Leaves abruptly pinnate 1. ABRUS

8b. Leaves simple or digitately 3-7-foliolate 6. CROTALARIA

## 6b. Stamens diadelphous :

## 9a. Stamens 5 + 5 :

10a. Stipules present; pods  
twisted, enclosed in calyx 18. SMITHIA

10b. Stipules absent; pods  
straight, exerted  
from calyx 2. AESCHYNOMENE

9b. Stamens 9 + 1 (In *TEPHROSIA*  
monadelphous in beginning) :

11a. Joints of pods folded  
on one another 20. URARIA

11b. Joints of pods not folded  
on one another :

12a. Hairs medifixed 11. INDIGOFERA

12b. Hairs basifixed,  
if present :

13a. Venation conspicuously  
striate 19. *TEPHROSIA*

## 13b. Venation reticulate :

14a. Pods viscid 15. *PSEUDARTHRIA*

## 14b. Pods not viscid :

15a. Anthers dimorphous 13. *MUCUNA*

## 15b. Anthers uniform :

16a. Pods septate  
between the seeds :



- 17a. Leaves paripinnate 1. SESBANIA
- 17b. Leaves imparipinnate :
- 18a. Pods dehiscent 4. ATYLOSIA
- 18b. Pods breaking in 1-seeded indehiscent joints :
- 19a. Joints of pods flat 8. DESMODIUM
- 19b. Joints of pods turgid 3. ALYSICARPUS
- 16b. Pods not septate between the seeds :
- 20a. Leaves gland dotted beneath 9. FLEMINGIA
- 20b. Leaves not gland dotted beneath :
- 21a. Style hairy 21. VIGNA
- 21b. Style glabrous 10. GALACTIA

1. ABRUS Adans.

**Abrus precatorius** L., Syst. Nat. ed. 12. 2 : 472. 1767; Baker in Hook.f., Fl. Brit. India 2 : 175. 1876.

Perennial twiners. Leaves paripinnate, up to 10.5 cm long; leaflets 10-20 pairs, up to 2.5 × 0.5 cm, oblong. Flowers cream coloured, in dense axillary racemes. Pods up to 3 × 1.2 cm, oblong, beaked; seeds 3-5, subglobose, scarlet with a black base, sometimes white.

*Fl. & Fr.*: Sept.- Dec.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16635.

Leaves are given in diseases of throat; seeds poisonous.

## 2. AESCHYNOMENE L.

**Aeschynomene indica** L., Sp. Pl. 713. 1753; Baker in Hook.f., Fl. Brit. India 2 : 151. 1876.

Undershrubs, up to 2 m tall; stem spongy at the base. Leaves imparipinnate, up to 10.5 cm long; leaflets 21-71, up to 0.6 × 0.2 cm, linear-oblong, obtuse. Flowers cream coloured, in 1-4-flowered, axillary racemes, viscid. Pods up to 3.5 × 0.4 cm, linear-oblong, acute, indented on lower suture, 6-12-jointed.

*Fl. & Fr.*: Sept.- Nov.

In marshy places. Common.

Madded, 16613; Kutru.

## 3. ALYSICARPUS Necker ex Desv.

- |   |                        |
|---|------------------------|
| 1a. Calyx shorter than first joint of pod | 1. <i>A. hamosus</i>   |
| 1b. Calyx exceeding first joint of pod    | 2. <i>A. vaginalis</i> |

**1. Alysicarpus hamosus** Edgew. in Journ. As. Soc. Beng. 21 : 171. 1853; Baker in Hook.f., Fl. Brit. India 2 : 157. 1876.

Prostrate, annual herbs; branches spreading-hairy. Leaves 1-foliolate, up to 3 × 2.2 cm, broadly elliptic or sub-orbicular, rounded or mucronate. Flowers purple, often paired, in axillary up to 6.5 cm long racemes. Pods up to 2 × 0.3 cm, reticulately veined, 4-6-jointed, hairy.

*Fl. & Fr.*: Sept.- Feb.

In deciduous forests. Abundant.

Bijapur Ghati, 16478.

**2. A. vaginalis** (L.) DC., Prodr. 2 : 353. 1825; Baker in Hook.f., Fl. Brit. India 2 : 158. 1876. *Hedysarum vaginale* L., Sp. Pl. 746. 1753.

Diffuse, procumbent, glabrous herbs. Leaves 1-foliolate, up to 5.5 × 1.8 cm, oblong or ovate-oblong, obtuse or acute. Flowers pink, in up to 7.5 cm long racemes. Pods subterete, reticulate, pubescent, 4-8-jointed.

*Fl. & Fr.*: Sept.- Feb.

Bijapur Ghati, 16417.

Plant is an important fodder for herbivores.

#### 4. ATYLOSIA Wight & Arn.

*Atylosia scarabaeoides* (L.) Benth., Pl. Jungh. 3 : 243. 1852; Baker in Hook.f., Fl. Brit. India 2 : 215. 1876. *Dolichos scarabaeoides* L., Sp. Pl. 726. 1753.

Herbaceous twiners. Leaves 3-foliolate; leaflets up to 5 × 2.2 cm, elliptic or elliptic-oblong, acute, gland dotted and grey pubescent beneath. Flowers orange-red, in up to 2.2 cm long, axillary racemes. Pods up to 2.8 × 0.6 cm, linear-oblong, septate; seeds 4-6, strophiolate.

*Fl. & Fr.*: Oct.- Feb.

In forests, grasslands and cultivated fields. Very common.

Bijapur, 16397; Pillure.

#### 5. BUTEA Koen. ex Roxb.

1a. Trees; lowest calyx tooth shorter than laterals

1. *B. monosperma*

1b. Woody climbers; lowest calyx tooth equal to laterals

2. *B. superba*

**1. *Butea monosperma*** (Lam.) Taub. in Engl. & Prantl, Pflanzenf. 3(3) : 366. 1894. *Erythrina monosperma* Lam., Encycl. 1 : 391. 1783. *Butea frondosa* Koen. ex Roxb., As. Res. 3 : 469. 1792; Baker in Hook.f., Fl. Brit. India 2 : 194. 1876.

'Palas'

Trees, up to 10 m tall. Leaves 3-foliolate; leaflets up to 20 × 22.5 cm, ovate-rhomboid, obtuse or retuse, inequilateral. Flowers scarlet, in up to 15 cm long racemes. Pods up to 15 × 5.5 cm, oblong, compressed, tomentose, reticulately veined, 1-seeded.

*Fl. & Fr.*: Feb.- May.

In dry deciduous forests. Common.

Kutru, 15508; Dudepalli; Pengunda; Kutru; Bhopalpatnam; Kandlaparti; Netikakler.

Lac insect principally lives on this tree; the leaves are used for making plates; the flowers yield a fine yellow dye.

**2. *Butea superba*** Roxb., Pl. Cor. 1 : 23. t.22. 1795; Baker in Hook.f., Fl. Brit. India 2 : 195. 1876.

*'Palas-bel'*

Woody climbers. Leaves 3-foliolate; leaflets up to 35 × 30 cm, rhomboid or broadly ovate. Flowers orange-scarlet, in up to 25 cm long racemes. Pods up to 15 × 5 cm, falcate-oblong, compressed, woody, tomentose, 1-seeded.

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

In dry deciduous forests. Common.

Kutru, 15509; Pharsegarh; Netikakler; Kerpe; Kandlaparti.

## 6. CROTALARIA L.

1a. Pods hairy

3. *C. juncea*

1b. Pods glabrous :

2a. Stipules prominent,  
ovate-lanceolate

6. *C. spectabilis*

- 2b. Stipules minute or absent :
- 3a. Corolla about half as long as the calyx 2. *C. calycina*
- 3b. Corolla about as long as or longer than the calyx :
- 4a. Racemes leaf-opposed 5. *C. prostrata*
- 4b. Racemes terminal :
- 5a. Pods oblong 1. *C. albida*
- 5b. Pods globose 4. *C. linifolia*

**1. *Crotalaria albida* Heyne ex Roth, Nov. Pl. Sp. 333. 1821; Baker in Hook.f., Fl. Brit. India 2 : 71. 1876.**

Branched herbs, up to 60 cm tall. Leaves up to 4 × 0.8 cm, linear-oblong or oblanceolate, obtuse or retuse, silky-pubescent beneath. Flowers yellow, in up to 11.5 cm long terminal racemes. Pods up to 1.5 cm long, glabrous, 6-8-seeded.

*Fl. & Fr.*: Dec.- Mar.

In dry deciduous forests. Abundant.

Pharsegarh, 15511.

**2. *C. calycina* Schrank, Pl. Rar. Hort. Monac. t.12. 1817; Baker in Hook.f., Fl. Brit. India 2 : 72. 1876; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 23. 1976.**

Erect herbs, up to 50 cm tall; brown silky-hairy. Leaves up to 8 × 2.2 cm, linear-lanceolate, acute. Flowers yellow, in terminal racemes. Pods included, sub-cylindric, brown, 20-30-seeded.

*Fl. & Fr.*: Sept.- Nov.

In moist deciduous forests. Sparse.

Bijapur (Saxena & Khotele *l.c.*).

**3. *Crotalaria juncea* L., Sp. Pl. 714. 1753; Baker in Hook.f., Fl. Brit. India 2 : 79. 1876.**

*'Jangli-san'*

Stiff herbs, up to 1.5 m tall, silky-pubescent. Leaves up to 8.5 × 1 cm, linear or oblong, obtuse, apiculate. Flowers yellow, in up to 20 cm long, terminal and lateral racemes. Pods up to 3 cm long, linear-oblong, velvety, 10-15-seeded.

*Fl. & Fr.*: Oct.- Feb.

In grasslands. Sparse.

Pillure, 15537.

Stem yields a fibre.

**4. *C. linifolia* L.f., Suppl. 322. 1781; Baker in Hook.f., Fl. Brit. India 2 : 72. 1876.**

Branched herbs, up to 30 cm tall; branches appressed-pubescent. Leaves up to 5 × 1.2 cm, oblanceolate or oblong, obtuse, apiculate. Flowers yellow, in 10-20-flowered, up to 25 cm long racemes. Pods globose, included, 6-10-seeded.

*Fl. & Fr.*: Sept.- Nov.

In dry and moist deciduous forests. Common.

Bijapur, 16658.

**5. *C. prostrata* Rottl. in Willd., Enum. Pl. Hort. Berol. 2 : 747. 1809; Baker in Hook.f., Fl. Brit. India 2 : 67. 1876.**

Erect, branched herbs, up to 25 cm tall; branches hairy. Leaves up to 3 × 1.5 cm, obliquely obovate-oblong, rounded or obtuse, more or

less silky hairy. Flowers yellow, in 2-4-flowered, leaf-opposed racemes. Pods up to 1.5 cm long, linear-oblong, 10-20-seeded.

*Fl. & Fr.*: Oct.- Feb.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16433.

**6. *Crotalaria spectabilis*** Roth, Nov. Pl. Sp. 341, 1821. *C. sericea* Retz., Obs. Bot. 5 : 26. 1789; Baker in Hook.f., Fl. Brit. India 2 : 75. 1876.

Undershrubs, up to 1.5 m tall. leaves up to 12.5 × 3.5 cm, oblanceolate or obovate, acute. Flowers yellow, in up to 25 cm long, terminal racemes; bracts foliaceous. Pods up to 5 × 0.8 cm, linear-oblong, glabrous, many seeded.

*Fl. & Fr.*: Dec.- Apr.

Along stream-banks. Sparse.

Kerpe Valley, 15560.

#### 7. DALBERGIA L.f.

1a. Stamens 9, monadelphous

1. *D. latifolia*

1b. Stamens 5 + 5, isodiadelphous

2. *D. paniculata*

**1. *Dalbergia latifolia*** Roxb., Pl. Cor. 2 : 7. t.113. 1799; Baker in Hook.f., Fl. Brit. India 2 : 231. 1876.

Trees, up to 10 m tall; bark black. Leaves up to 15 cm long; leaflets 3-7, up to 5.5 × 4 cm, elliptic-obovate or suborbicular, rounded or emarginate, base cuneate, coriaceous. Flowers creamy-white, in up to 10 cm long, axillary or extra-axillary panicles. Pods up to 8.5 × 2 cm, oblong-lanceolate, 1-4-seeded.

*Fl. & Fr.*: Oct.- Jan.

Along streams. Frequent.

Netikakler, 15561.

Wood is a valuable timber.

**2. *Dalbergia paniculata*** Roxb., Pl. Cor. 2 : 8. t.114. 1799; Baker in Hook.f., Fl. Brit. India 2 : 236. 1876.

*'Dhobin'*

Trees, up to 18 m tall; bark greyish-white, smooth. Leaves up to 17.5 cm long; leaflets 7-15, up to 3 × 1.9 cm, obovate or elliptic-oblong, obtuse, emarginate. Flowers white, in terminal (sometimes axillary), up to 10 cm long panicles. Pods up to 7 × 2 cm, oblong, 1-3-seeded.

*Fl. & Fr.*: May.- Jan.

In dry deciduous forests. Sparse.

Pengunda, 16300.

#### 8. DESMODIUM Desv.

1a. Trailing herbs

6. *D. triflorum*

1b. Erect herbs or shrubs :

2a. Flowers concealed  
in orbicular bracts

5. *D. pulchellum*

2b. Flowers not concealed;  
bracts not orbicular :

3a. Petioles winged

7. *D. triquetrum*

3b. Petioles not winged :



- 4a. Leaves 1-foliolate :
- 5a. Branches terete; leaves  
fulvous-tomentose beneath 8. *D. velutinum*
- 5b. Branches angled; leaves  
appressed-pubescent beneath 1. *D. gangeticum*
- 4b. Leaves 3-foliolate (or 1 and  
3-foliolate intermixed) :
- 6a. Lateral leaflets conspicuously smaller  
than terminal or sometimes absent 4. *D. motorium*
- 6b. Lateral leaflets not as above :
- 7a. Joints of pods as long as broad 2. *D. heterocarpon*
- 7b. Joints of pods more than  
twice as long as broad 3. *D. laxiflorum*

**1. *Desmodium gangeticum* (L.) DC.**, Prodr. 2 : 327. 1825; Baker in Hook.f., Fl. Brit. India 2 : 168. 1876. *Hedysarum gangeticum* L., Sp. Pl. 746. 1753.

'Taptude'

Herbs or undershrubs, up to 40 cm tall. Leaves 1-foliolate; leaflets up to 15 × 5.5 cm, ovate-lanceolate or ovate-oblong, acute, base rounded or subcordate. Flowers purple, in up to 30 cm long, terminal and axillary racemes. Pods up to 2 × 0.3 cm, curved, hooked-hairy; joints 4-7, reticulate.

*Fl. & Fr.*: May-Dec.

In moist and dry deciduous forests. Common.

Bijapur Ghati, 16225; Dudepalli.

Crushed roots are given internally in snake-bite.

**2. *Desmodium heterocarpon* (L.) DC.**, Prodr. 2 : 337. 1825. *Hedysarum heterocarpon* L., Sp. Pl. 747. 1753. *H. polycarpum* Poir. in Lam., Encycl. 6 : 413. 1805. *Desmodium polycarpum* (Poir.) DC., Prodr. 2 : 334. 1825; Baker in Hook.f., Fl. Brit. India 2 : 171. 1876 (incl. var. *trichocaulon*).

Undershrubs, up to 1.5 m tall. Leaves 3-foliolate; leaflets up to 5.5 × 2.5 cm, obovate or oblanceolate. Flowers violet, in axillary and terminal, up to 7.5 cm long racemes; flowers 2 in axis of each ovate-cuspidate bract. Pods up to 3 × 0.4 cm, linear, joints 5-8.

*Fl. & Fr.*: Sept.-Dec.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16461.

**3. *D. laxiflorum* DC.**, in Ann. Sci. Nat. Paris ser. 1. 4 : 100. 1825; Baker in Hook.f., Fl. Brit. India 2 : 168. 1876.

Undershrubs, up to 2 m tall. Leaves 3-foliolate; leaflets up to 15.5 × 7.5 cm, ovate-lanceolate or rhomboid, acute. Flowers violet, in terminal and axillary, up to 35 cm long racemes. Pods up to 4.5 cm long, linear, 6-10-jointed, hooked-hairy.

*Fl. & Fr.*: Oct.-Dec.

In moist deciduous forests. Frequent.

Bijapur Ghati, 16457.

**4. *D. motorium* (Houtt.) Merr.** in Journ. Arn. Arb. 19 : 345. 1938. *Hedysarum motorium* Houtt. in Nat. Hist. 10 : 246. 1778. *H. gyrans* L.f., Suppl. 332. 1781. *Desmodium gyrans* (L.f.) DC., Prodr. 2 : 326. 1825; Baker in Hook.f., Fl. Brit. India 2 : 174. 1876.

Shrubs, up to 2.25 m tall. Leaves 1-3-foliolate; terminal leaflet up to 9.5 × 2.5 cm; lateral leaflets up to 2 × 0.5 cm, often moving in jerks, oblong-lanceolate, obtuse. Flowers pink, in axillary and terminal, up to 15 cm long

racemes. Pods up to  $5 \times 0.8$  cm, oblong, 5-10-jointed.

*Fl. & Fr.*: Aug.- Oct.

In dry deciduous forests. Sparse.

Kutru, 16132; Karkeli.

**5. *Desmodium pulchellum* (L.) Benth.**, Fl. Hongk. 83. 1861; Baker in Hook.f., Fl. Brit. India 2 : 162. 1876. *Hedysarum pulchellum* L., Sp. Pl. 747. 1753.

'Dhekna', 'Nadak'

Undershrubs, up to 1.5 m tall. Leaves 3-foliolate; leaflets up to  $12.5 \times 5.5$  cm, elliptic or ovate-oblong, obtuse or subacute. Flowers white, in axillary and terminal, up to 25 cm long racemes. Pods up to 0.7 cm long, apiculate, usually 2-jointed.

*Fl. & Fr.*: Sept.- Feb.

In moist and dry deciduous forests. Common.

Bijapur Ghati, 16442; Chinger; Karkeli.

**6. *D. triflorum* (L.) DC.**, Prodr. 2 : 334. 1825; Baker in Hook.f., Fl. Brit. India 2 : 173. 1876. *Hedysarum triflorum* L., Sp. Pl. 749. 1753.

Trailing, annual herbs. Leaves 3-foliolate; leaflets up to  $0.8 \times 0.6$  cm, obovate, truncate or emarginate, base cuneate. Flowers purple, 1-5 together, axillary. Pods up to  $1.2 \times 0.3$  cm, curved, 3-5-jointed, reticulate.

*Fl. & Fr.*: Sept.- Mar.

In waste lands and in the vicinity of forests.

Bijapur Ghati, 16401; Kutru.

**7. *D. triquetrum* (L.) DC.**, Prodr. 2 : 326. 1825; Baker in Hook.f., Fl. Brit. India 2 : 163. 1876 *p.p.* *Hedysarum triquetrum* L., Sp. Pl. 746. 1753.

Undershrubs, up to 1.5 m tall; branches triquetrous. Leaves 1-foliolate; leaflets up to 14 × 5 cm, ovate-lanceolate, acuminate, base subcordate or truncate. Flowers violet, in axillary and terminal, up to 20 cm long racemes. Pods up to 5 × 0.5 cm, oblong, joints 4-8, appressed-pubescent.

*Fl. & Fr.*: Oct.- Feb.

In dry and moist deciduous forests. Sparse.

Kerpe Valley, 16129; Pharsegarh.

**8. *Desmodium velutinum*** (Willd.) DC., Prodr. 2 : 328. 1825. *Hedysarum velutinum* Willd., Sp. Pl. 3 : 1174. 1802. *H. latifolium* Roxb. ex Ker., Bot. Reg. 5 : t.355. 1819. *Desmodium latifolium* (Roxb. ex Ker.) DC., Prodr. 2 : 328. 1825 (excl. *D. virgatum* Zoll.).

'Latakni'

Undershrubs, up to 1.5 m tall; branches fulvous-hairy. Leaves 1-foliolate; leaflets up to 12.5 × 8.5 cm, broadly ovate, acute or obtuse, base truncate or cordate. Flowers purple, in axillary and terminal, up to 25 cm long racemes. Pods up to 2 × 0.3 cm, linear, 4-6-jointed, hooked-hairy.

*Fl. & Fr.*: Oct.- Dec.

In dry and moist deciduous forests. Abundant.

Bijapur Ghati, 16425; Pharsegarh; Kerpe Valley.

#### 9. FLEMINGIA Roxb. ex W. Aiton & W. T. Aiton

1a. Leaves 1-foliolate

1. *F. bracteata*

1b. Leaves 3-foliolate :

2a. Erect shrubs with tall stem;  
flowering with leaves

3. *F. semialata*

2b. Dwarf shrubs with stout short stem; flowering when leafless

2. *F. nana*

1. **Flemingia bracteata** (Roxb.) Wight, Ic. t.268. 1840. *Hedysarum bracteatum* Roxb., Fl. Ind. 3 : 351. 1832. *Flemingia strobilifera* R. Br. ex Aiton var. *bracteata* (Roxb.) Baker in Hook.f., Fl. Brit. India 2 : 227. 1876.

Undershrubs, up to 1.5 m tall. Leaflets up to 12.5 × 5 cm, ovate-lanceolate, acuminate, base rounded or subcordate. Flowers violet or pink, in up to 8.5 cm long terminal panicles; bracts up to 2.5 × 2.8 cm, foliaceous, orbicular-ovate. Pods up to 1 cm long, oblong, enclosed in the bracts.

*Fl. & Fr.*: Nov.- Feb.

In moist deciduous forests. Common.

Kerpe Valley, 15558; Pharsegarh.

2. **F. nana** Roxb. ex W. T. Aiton, Hort. Kew. ed. 2. 4 : 350. 1812. *F. congesta* Roxb. var. *nana* Baker in Hook.f., Fl. Brit. India 2 : 229. 1876.

Dwarf shrubs, up to 25 cm tall; stem short, stout, subterranean. Leaflets up to 20 × 12.5 cm, terminal obovate-cuneate, laterals obliquely oblong. Flowers pink, in up to 15 cm long racemes or panicles; calyx and pods covered with ferruginous glands. Pods up to 1 cm long, oblong; seeds brown, round.

*Fl. & Fr.*: Feb.- Apr.

In dry and moist deciduous forests. Common.

Bijapur Ghati 15597; Kandlaparti.

3. **F. semialata** Roxb. ex W. T. Aiton, Hort. Kew. ed. 2. 4 : 349. 1812. *F. congesta* Roxb. var. *semialata* (Roxb.) Baker in Hook.f., Fl. Brit. India 2 : 229. 1876 p.p.

Undershrubs, up to 1.5 m tall. Leaflets up to 14.5 × 4.5 cm, lanceolate or ovate-lanceolate, acuminate; lateral leaflets oblique. Flowers purple, in up to 15 cm long, terminal and axillary racemes. Pods up to 1.2 cm long; seeds black, shining.

*Fl. & Fr.*: Jan.- Apr.

In mixed teak forests. Sparse.

Kandlaparti, 15611.

#### 10. GALACTIA P. Browne

***Galactia tenuiflora*** (Klein ex Willd.) Wight & Arn., Prodr. 206. 1834; Baker in Hook.f., Fl. Brit. India 2 : 192. 1876. *Glycine tenuiflora* Klein ex Willd., Sp. Pl. 3 : 1059. 1802.

Herbaceous twiners. Leaves 3-foliolate; leaflets up to 5 × 2.5 cm, ovate-oblong or oblong-lanceolate, obtuse or subacute, silky-pubescent beneath. Flowers bluish-purple, paired, in up to 15 cm long racemes. Pods up to 5 × 0.7 cm, linear, flat, 5-9-seeded.

*Fl. & Fr.*: Aug.- Oct.

In moist deciduous forests, over shrubs. Rare.

Bijapur Ghati, 16637.

#### 11. INDIGOFERA L.

1a. Leaves simple :

2a. Leaves linear; pods globose, smooth

3. *I. linifolia*

2b. Leaves obovate; pods  
curved, echinate

4. *I. nummularifolia*

1b. Leaves imparipinnate :

3a. Leaflets 13-23 2. *I. cassioides*

3b. Leaflets 5-11 :

4a. Pods quadrangular, densely hairy 1. *I. astragalina*

4b. Pods cylindrical, glabrous  
or puberulous 5. *I. tinctoria*

**1. *Indigorefa astragalina*** DC., Prodr. 2 : 228. 1825. *I. hirsuta* Baker in Hook.f., Fl. Brit. India 2 : 98. 1876 *p.p.* non L.

Annual, branched herbs, up to 1 m tall; grey hairy. Leaflets 7-11, up to 4.5 × 2 cm, elliptic-oblong, pilose. Flowers orange-yellow or red, in up to 15 cm long racemes. Pods up to 2.2 × 0.3 cm, deflexed, 4-6-seeded.

*Fl. & Fr.*: Sept.- Dec.

In waste lands and along forest-roads. Common.

Karkeli, 15629; Bhopalpatnam.

**2. *I. cassioides*** Rottl. ex DC., Prodr. 2 : 225. 1825. *I. pulchella* sensu Baker in Hook.f., Fl. Brit. India 2 : 101. 1876 *p.p.* non Roxb.

Shrubs, up to 3.5 m tall. Leaflets 13-23, up to 3.5 × 1.2 cm, elliptic-oblong. Flowers purple, in up to 15 cm long, axillary racemes. Pods up to 5.5 cm long, cylindrical, straight, 8-12-seeded.

*Fl. & Fr.*: Dec.- Mar.

In dry deciduous and mixed teak forests. Common.

Pharsegarh, 15515; Kerpe; Dudepalli; Netikakler; Bijapur Ghati; Kandlaparti.

**3. *I. linifolia*** (L.f.) Retz., Obs. Bot. 4 : 29. 1786; Baker in Hook.f., Fl. Brit. India 2 : 92. 1876. *Hedysarum linifolium* L.f., Suppl. 331. 1781.

Branched, prostrate herbs, grey-pubescent. Leaves up to 2.5 × 0.3 cm, linear-oblong, acute. Flowers purple, in sessile or short peduncled, 6-8-flowered racemes. Pods ca 2 mm across, globose, grey-pubescent, mucronate, 1-seeded.

*Fl. & Fr.*: Sept.- Feb.

Common in waste places.

Bijapur, 16393; Pharsegarh; Bhopalpatnam.

**4. *Indigofera nummularifolia* (L.) Livera ex Alston** in Trimen, Handb. Fl. Ceylon 6 (suppl.) : 72. 1931. *Hedysarum nummularifolium* L., Sp. Pl. 746. 1753. *Indigofera echinata* Willd., Sp. Pl. 3 : 1222. 1802; Baker in Hook.f., Fl. Brit. India 2 : 92. 1876.

Prostrate or ascending herbs; branches up to 30 cm long. Leaves up to 2.5 × 1.8 cm, obovate, obtuse, sparsely hairy. Flowers pink, in axillary, up to 2 cm long racemes. Pods up to 8 mm long, sickle-shaped, flat, beaked, prickly, 1-seeded.

*Fl. & Fr.*: Aug.- Nov.

Amidst rock boulders in the vicinity of forests. Rare.

Bijapur Ghati, 16479.

**5. *I. tinctoria* L., Sp. Pl. 751. 1753; Baker in Hook.f., Fl. Brit. India 2 : 99. 1876.**

Undershrubs, up to 1 m tall. Leaflets up to 2.5 × 1.1 cm, elliptic-oblong, obtuse, apiculate. Flowers pink, in up to 11 cm long, axillary, subsessile racemes. Pods up to 3.5 × 0.2 cm, linear, turgid, slightly curved, apiculate, deflexed, 6-12-seeded.

*Fl. & Fr.*: Oct.- Mar.

In waste lands. Abundant.



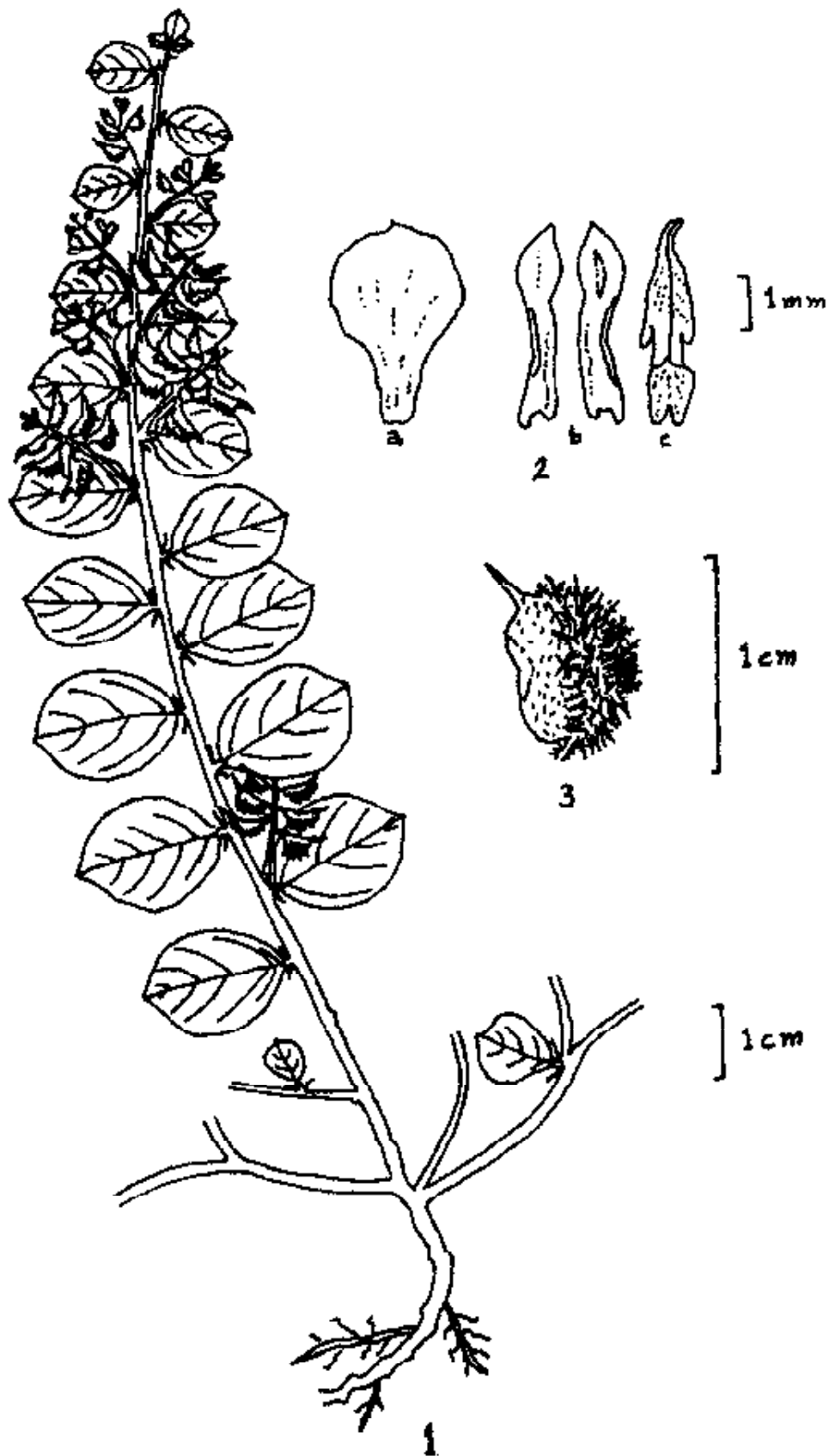


Fig. 5. *Indigofera nummularifolia* (L.) Livera ex Alston  
 1. habit; 2. corolla; (a) standard, (b) wings, (c) keels & 3. pod.

Bhopalpatnam, 15609.

Plant is a source of indigo.

### 12. MILLETTIA Wight & Arn.

**Millettia extensa** (Benth.) Baker in Hook.f., Fl. Brit. India 2 : 109. 1876. *Otosesma extensa* Benth. in Miq., Pl. Jungh. 249. 1852. *Millettia auriculata* Baker ex Brandis, For. Fl. N. W. & C. India 138. 1874; Baker in Hook.f., Fl. Brit. India 2 : 108. 1876.

'*Nasmata*'

Woody climbers. Leaves up to 25 cm long; leaflets 7-9, up to 15 × 5 cm, obovate-oblong, cuspidate, silky-pubescent beneath. Flowers cream coloured, in axillary and terminal, up to 25 cm long racemes. Pods up to 15.5 × 6 cm, flat, woody, tomentose.

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

Over small trees, in dry deciduous forests. Common.

Kandlaparti, 15612; Netikakler.

Leaves are good fodder for herbivores; seeds consumed after roasting.

### 13. MUCUNA Adans.

**Mucuna pruriens** (L.) DC., Prodr. 2 : 405. 1825; Baker in Hook.f., Fl. Brit. India 2 : 187. 1876. *Dolichos pruriens* L. in Stickm. Herb. Amb. 23. 1754.

'*Badok*'

Twining. Leaves 3-foliolate; leaflets up to 13 × 7.5 cm, ovate-rhomboid, subacute, grey-pubescent beneath, lateral leaflets unequal sided. Flowers purple, in up to 17.5 cm long, axillary racemes. Pods up to 12.5 × 1.5 cm, turgid, curved at both ends, covered with yellowish-brown irritant hairs; 4-6-seeded.

*Fl. & Fr.*: Nov.- Mar.

In dry deciduous forests, over small trees. Sparse.

Dudepalli, 15553; Bijapur Ghati.

Seeds are used as a tonic.

#### 14. OUGEINIA Benth.

**Ougeinia oojeinensis** (Roxb.) Hochr. in Bull. Soc. Bot. Soc. Geneve 13 & 14 : 51. 1909 ('oogeinsis'). *Dalbergia oojeinensis* Roxb., Fl. Ind. 3 : 220. 1832. *Ougeinia dalbergioides* Benth. in Miq., Pl. Jungh. 216. 1852; Baker in Hook.f., Fl. Brit. India 2 : 161. 1876.

'Airi' 'Tinsa'

Trees, up to 15 m tall; bark black, fissured. Leaves 3-foliolate; leaflets up to 15 × 11.5 cm, broadly ovate. Flowers white or pink, in short, axillary racemes. Pods up to 7.5 × 2 cm, linear-oblong, flat, 2-5-jointed.

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

In dry deciduous forests. Sparse.

Pharsegarh, 15526.

Wood is very durable. Pounded bark is said to be used during pain in any part of the body.

#### 15. PSEUDARTHRIA Wight & Arn.

**Pseudarthria viscida** (L.) Wight & Arn., Prodr. 209. 1834; Baker in Hook.f., Fl. Brit. India 2 : 154. 1876. *Hedysarum viscidum* L., Sp. Pl. 747. 1753.

Viscid-pubescent, delicate undershrubs, up to 1.5 m tall. Leaves 3-foliolate; leaflets up to 8.5 × 7.5 cm, ovate-rhomboid, cuspidate-

acuminate, repand, silky-pubescent beneath, membranous. Flowers pink, fascicled, in up to 20 cm long, terminal and axillary racemes. Pods up to  $2.2 \times 0.7$  cm, linear-oblong, flat, viscid-hairy, 3-6-seeded; seeds black, subreniform.

*Fl. & Fr.*: Sept.- Nov.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16633; Pharsegarh.

#### 16. PTEROCARPUS Jacq.

**Pterocarpus marsupium** Roxb., Pl. Cor. 2 : 9. t. 116. 1799; Baker in Hook.f., Fl. Brit. India 2 : 239. 1876.

'Bija' 'Vengo'

Evergreen trees, up to 25 m tall; bark greyish-black. Leaves imparipinnate; leaflets 5-7, up to  $9 \times 4.5$  cm, ovate-elliptic or oblong, obtuse or retuse, coriaceous. Flowers yellow, in up to 25 cm long, terminal panicles. Pods up to 4.2 cm across, orbicular, winged, 1-seeded.

*Fl. & Fr.*: Oct.- Mar.

In moist and dry deciduous forests. Common.

Dudepalli, 15550; Bijapur Ghati; Pharsegarh; Netikakler.

Plant is source of 'Kino' gum and yields durable timber. Crushed stem is said to be used in urinary troubles.

#### 17. SESBANIA Scop.

**Sesbania bispinosa** (Jacq.) W.F. Wight in U. S. Dept. Agr. Bur. Pl. Ind. Bull. no. 137 : 15. 1909. *Aeschynomene bispinosa* Jacq., Ic. Pl. Rar. 3 : 13. t.564. 1792. *Coronilla aculeata* Willd., Sp. Pl. 3 : 1147. 1802. *Sesbania aculeata* (Willd.) Poir. in Lam., Encycl. 7 : 128. 1806; Baker in Hook.f., Fl. Brit. India 2 : 114. 1876.

Prickly shrubs, up to 2.5 m tall. Leaves up to 25 cm long, abruptly pinnate; leaflets up to 1.5 × 0.3 cm, linear-oblong, obtuse. Flowers orange-yellow, in up to 12.5 cm long, axillary and terminal, lax racemes. Pods up to 17.5 cm long, linear or subfalcate, beaked; seeds black, linear-oblong.

*Fl. & Fr.*: Sept.- Nov.

In water-logged places. Common.

Bijapur, 16664.

#### 18. SMITHIA W. Aiton

**Smithia conferta** J. E. Smith in Rees, Cyclop. 33 : no. 2. 1819. *S. geminiflora* Roth, Nov. Pl. Sp. 352. 1821; Baker in Hook.f., Fl. Brit. India 2 : 149. 1876 [incl. var. *conferta* (J. E. Smith) Baker].

'Titalboti'

Diffuse, annual herbs, up to 30 cm tall. Leaves up to 3 cm long, paripinnate; leaflets 3-6 pairs, up to 1.2 × 0.2 cm, linear-oblong, obtuse or subacute, margin bristly. Flowers yellow, 1-2, in the upper leaf-axils. Pods up to 8 mm long, moniliform, 3-6-jointed, joints twisted; seeds reniform.

*Fl. & Fr.*: Sept.- Nov.

Common in marshy places.

Bijapur, 16665.

Plant is relished by herbivores.

#### 19. TEPHROSIA Pers.

1a. Flowers 1-3, fascicled in leaf axils

1. *T. pumila*

1b. Flowers several, in racemes

2. *T. purpurea*

**1. *Tephrosia pumila*** (Lam.) Pers., Syn. Pl. 2 : 230. 1807. *Galega pumila* Lam., Encycl. 2 : 599. 1788. *Tephrosia purpurea* L. var. *pumila* (Lam.) Baker in Hook.f., Fl. Brit. India 2: 113. 1876.

Diffusely branched, pilose herbs; branches up to 35 cm long. Leaves imparipinnate; leaflets 5-13, up to 2.2 × 0.9 cm, obovate-oblongate, sericeous beneath. Flowers white or pink, 1-3, fascicled in leaf-axils. Pods up to 3.5 × 0.4 cm, linear, flat, 7-11-seeded.

*Fl. & Fr.*: Sept.- Nov.

In moist and dry deciduous forests. Abundant.

Bijapur Ghati, 16490; Kerpe Valley; Pharsegarh.

**2. *T. purpurea*** (L.) Pers., Syn. Pl. 2 : 329. 1807; Baker in Hook.f., Fl. Brit. India 2: 112. 1876 *p.p.* *Cracca purpurea* L., Sp. Pl. 752. 1753.

Undershrubs, up to 60 cm tall. Leaves imparipinnate; leaflets 9-11, up to 2.5 × 1 cm, oblongate, obtuse or retuse, mucronate, base cuneate, appressed-pubescent beneath. Flowers purple, in up to 12 cm long, leaf-opposed racemes. Pods up to 4.5 × 0.4 cm, linear, flat, slightly curved, 5-6-seeded.

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

In waste places. Abundant.

Bijapur, 16386; Bijapur Ghati Kutru.

## 20. URARIA DESV.

1a. Leaves linear-oblong; flowers  
in dense racemes

1. *U. picta*

1b. Leaves obovate or broadly  
elliptic; flowers in lax racemes

2. *U. rufescens*

**1. *Uraria picta*** (Jacq.) Desv. ex DC., Prodr. 2 : 324. 1825; Baker in Hook.f., Fl. Brit. India 2 : 155. 1876. *Hedysarum pictum* Jacq., Coll. Bot. 2 : 262. 1788.

Undershrubs, up to 1 m tall. Leaves imparipinnate; leaflets 5-7, up to 17.5 × 1.8 cm, linear-oblong, acute, with pale green blotches along the midrib on upper surface. Flowers purple, in up to 20 cm long racemes. Pods 3-6-jointed, greyish, polished, joints folded on one another.

*Fl. & Fr.*: Sept.- Oct.

In moist and dry deciduous forests. Sparse.

Chinger, 16101; Pharsegarh.

**2. *U. rufescens*** (DC.) Schindl. in Fedd. Rep. 21 : 14. 1925. *Desmodium rufescens* DC. in Ann. Sci. Nat. 4 : 101. 1825. *Uraria hamosa* Wall. ex Wight & Arn., Prodr. 222. 1834; Baker in Hook.f., Fl. Brit. India 2 : 156. 1876.

Undershrubs, up to 1.5 m tall, hairy. Leaves 1-3-foliolate; leaflets up to 10 × 6.5 cm, obovate or broadly elliptic, obtuse or retuse. Flowers purple, in up to 22.5 cm long racemes. Pods 4-8-jointed, greyish-brown, pubescent, joints placed on one another.

*Fl. & Fr.*: Sept.- Nov.

In moist, shaded places as undergrowth in moist deciduous forests. Sparse.

Bijapur, 16659.

## 21. VIGNA Savi

1a. Inflorescence 8-12-flowered;  
flowers up to 1 cm long

1. *V. umbellata*

1b. Inflorescence 2-6-flowered;  
flowers 2-3.5 cm long

2. *V. vexillata*

**1. *Vigna umbellata* (thunb.) Ohwi & Ohashi** in Journ. Jap. Bot. 44 : 31. 1961. *Dolichos umbellatus* Thunb. in Trans. Linn. Soc. Lond. 2 : 339. 1794. *Phaseolus calcaratus* Roxb., Fl. Ind. 3 : 289. 1832; Baker in Hook.f., Fl. Brit. India 2 : 203. 1876.

Twining herbs; branches hairy. Leaves 3-foliolate; leaflets up to 10 × 5 cm, ovate-elliptic, acute or acuminate. Flowers yellow, 8-12, on axillary, up to 17.5 cm long peduncles. Pods up to 7.5 × 0.3 cm, linear, compressed, glabrous, 8-12-seeded.

*Fl. & Fr.*: Sept.- Dec.

Over herbs and shrubs in moist and dry deciduous forests. Common.

Bijapur Ghati, 16471; Pharsegarh; Kutru; Madded.

**2. *V. vexillata* (L.) A. Rich** in Sagra, Hist. Fis. Polit. Nat. Cuba 11 : 191. 1845; Baker in Hook.f., Fl. Brit. India 2 : 206. 1876. *Phaseolus vexillatus* L., Sp. Pl. 724. 1753.

Twining; stem purple, glabrous or pubescent. Leaves 3-foliolate; leaflets up to 8.5 × 3.5 cm, ovate-lanceolate, acute or acuminate. Flowers pink, 2-6, on axillary, up to 15.5 cm long peduncles. Pods up to 10.5 × 0.4 cm, oblong, hirsute, glabrescent with age.

*Fl. & Fr.*: Sept.- Nov.

In moist deciduous forests. Sparse.

Pharsegarh, 16109.

## 22. ZORNIA Gmel.

***Zornia gibbosa* Span.** in Linnaea 15 : 192. 1841. *Z. diphylla auct. non* (L.) Pers. 1807; Baker in Hook.f., Fl. Brit. India 2 : 147. 1876 p.p.



Prostrate, branched herbs. Leaves digitately 2-foliolate; leaflets up to 4 × 0.5 cm, lanceolate, acute, gland-dotted. Flowers yellow, in up to 7.5 cm long, lax spikes; flowers enclosed in a pair of foliaceous bracts. Pods up to 1 × 0.2 cm, 2-5-jointed, echinate.

*Fl. & Fr.*: Sept.- Nov.

In grassy fields and in the vicinity of forests. Abundant.

Bijapur, 16392; Madded; Pharsegarh.

### CAESALPINIACEAE

- 1a. Leaves simple, more or less deeply cleft from the apex 1. BAUHINIA
  - 1b. Leaves pinnate :
    - 2a. Leaves 1-pinnate :
      - 3a. Leaflets 1-paired; petals absent 4. HARDWICKIA
      - 3b. Leaflets more than 1-paired; petals present :
        - 4a. Petals 3 5. TAMARINDUS
        - 4b. Petals 5 3. CASSIA
    - 2b. Leaves 2-pinnate 2. CAESALPINIA
1. BAUHINIA L.
- 1a. Woody climbers 4. *B. vahlii*
  - 1b. Trees :
    - 2a. Fertile stamens 3-5 :
      - 3a. Petals less than 1.2 cm long 3. *B. semla*

3b. Petals 4-5 cm long 1. *B. purpurea*

2b. Fertile stamens 10 2. *B. racemosa*

**1. *Bauhinia purpurea* L., Sp. Pl. 375. 1753; Baker in Hook.f., Fl. Brit. India 2 : 284. 1878.**

'*Dhondar*' '*Kodel*'

Trees, up to 15 m tall; bark greyish-black. Leaves up to 20 × 17.5 cm, half cleft or more, 9-11-nerved, lobes obtuse or subacute, base cordate. Flowers purple or white, in terminal and axillary, few flowered panicles; fertile stamens 3-4. Pods up to 18 × 2.2 cm, flat, linear-oblong, pointed at both ends.

*Fl. & Fr.*: Oct.- Feb.

Scattered in grasslands.

Pillure, 15538.

Young leaves are cooked as a vegetable.

**2. *B. racemosa* Lam., Encycl. 1 : 390. 1785; Baker in Hook.f., Fl. Brit. India 2 : 276. 1878.**

'*Kollari*'

Trees, up to 8 m tall; bark black, fissured. Leaves up to 5 × 5.5 cm, rotundate, half cleft, 7-9-nerved, lobes round at apex, cordate at base, glaucous beneath. Buds falcate. Flowers white, in up to 12.5 cm long, terminal or extra-axillary racemes; calyx spathaceous. Pods up to 22 × 2.5 cm, more or less turgid, often twisted.

*Fl.* : May; *Fr.*: Most parts of the year.

In dry deciduous forests. Common.

Itpal forest, 16232.

Bark is used for making ropes.

**3. *Bauhinia semla*** Wunderlin in Taxon 25 : 362. 1976. *B. retusa* Roxb., Fl. Ind. 2 : 322. 1832 *non* Poir. 1811.

Trees, up to 15 m tall; bark black. Leaves up to 15.5 × 17.5 cm, rotundate, 9-nerved, entire or retuse, base cordate. Flowers in lax, terminal panicles; petals yellow, upper 3 purple mottled on the margins; fertile stamens 3-5. Pods up to 17 × 4.2 cm, flat, obtuse.

*Fl. & Fr.*: Oct.- Mar.

In moist deciduous forests. Sparse.

Pharsegarh, 16120.

**4. *B. vahlii*** Wight & Arn. in Wight, Cat. 38. 1833 & Prodr. 297. 1834; Baker in Hook.f., Fl. Brit. India 2 : 279. 1878.

'Mahul' 'Paur'

Large, tendril climbers; young parts brown-tomentose. Leaves up to 30 × 27 cm, suborbicular, about half cleft, 9-13-nerved, obtuse, base cordate, tomentose beneath. Flowers white, in terminal, subcorymbose racemes; petals obovate, margin crisped; fertile stamens 3, filaments white. Pods up to 25 × 6 cm, woody, rusty-tomentose.

*Fl.* Apr.- May; *Fr.*: Nov.- Feb.

In moist and dry deciduous forests. Common.

Pharsegarh, 16291; Dudepalli.

Bark is used for making ropes; roasted seeds are eaten.

## 2. CAESALPINIA L.

***Caesalpinia bonduc*** (L.) Roxb., Fl. Ind. 2 : 362. 1832; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 24. 1976. *Guilandina*

*bonduc* L., Sp. Pl. 381. 1753. *G. bonducella* L., Sp. Pl. ed.2. 545. 1762. *Caesalpinia bonducella* (L.) Fleming in As. Res. 11 : 150. 1810.  
'Ghataran'

Prickly, scandent shrubs; stipules foliaceous. Leaves 2-pinnate, up to 60 cm long; pinnae 5-8 pairs; leaflets 6-13 pairs, up to 4 × 2 cm, elliptic-oblong, mucronate. Flowers yellow, in up to 30 cm long, terminal and extra-axillary racemes; stamens 10, declinate. Pods up to 8 × 5 cm, oblong, prickly.

*Fl. & Fr.*: Aug.- Oct.

In the vicinity of dry deciduous forests. Sparse.

Bhopalpatnam (Saxena & Khotele *l.c.*)

### 3. CASSIA L.

#### 1a. Trees :

2a. Fertile stamens 10; pods cylindrical                      2. *C. fistula*

2b. Fertile stamens 6-7; pods flat                                      7. *C. siamea*

#### 1b. Herbs or shrubs :

##### 3a. Leaflets 10-many pairs :

4a. Gland on the petiole sessile;  
fertile stamens 10                                      3. *C. mimosoides*

4b. Gland on the petiole stipitate;  
fertile stamens 5                                      6. *C. pumila*

##### 3b. Leaflets 2-6 pairs :

5a. Branches and pods viscid-glandular  
hairy; flowers orange-red                                      1. *C. absus*

- 5b. Branches and pods without viscid-glandular hairs; flowers yellow :
- 6a. Leaflets ovate-elliptic or elliptic-oblong, apex acute or acuminate 5. *C. occidentalis*
- 6b. Leaflets obovate, apex obtuse :
- 7a. Gland present between the lowest pair of leaflets only 4. *C. obtusifolia*
- 7b. Gland present between the 2 lowest pairs of leaflets 8. *C. tora*

1. **Cassia absus** L., Sp. Pl. 376. 1753; Baker in Hook.f., Fl. Brit. India 2 : 265. 1878.

Viscid-glandular hairy herbs, up to 1.5 m tall. Leaflets 2 pairs, up to 4 × 2.5 cm, elliptic or obovate, obtuse or subacute, oblique. Flowers orange-red, in terminal or leaf-opposed, up to 10 cm long racemes. Pods up to 4 × 1 cm, flat, oblique, glandular-hairy, 4-8-seeded; seeds black, shining, ovoid.

*Fl. & Fr.*: Sept.- Nov.

In moist deciduous forests. Common.

Bijapur Ghati, 16447.

2. **C. fistula** L., Sp. Pl. 377. 1753; Baker in Hook.f., Fl. Brit. India 2 : 261. 1878.

*'Amaltas'* *'Railla'*

Trees, up to 10 m tall; bark ash coloured, smooth. Leaves up to 35 cm long; leaflets 3-8 pairs, up to 15 × 8 cm, ovate-oblong, acute, coriaceous. Flowers bright yellow, in up to 40 cm long, drooping racemes. Pods up to 60 cm long, cylindrical, many seeded; seeds broadly ovate.

*Fl.*: Mar.- May; *Fr.*: Throughout the year.

In dry deciduous and mixed teak forests. Very attractive when in bloom.

Itpal forest, 16231; Dudepalli.

Crushed bark in water is given internally in snake-bite; fruit-pulp is used as a purgative.

**3. *Cassia mimosoides* L., Sp. Pl. 379. 1753; Baker in Hook.f., Fl. Brit. India 2 : 266. 1878.**

Branched herbs, up to 75 cm tall. Leaves up to 10 cm long; petiole with a sessile gland; leaflets many, up to 0.5 × 0.2 cm, linear, subacute, unequal sided. Flowers yellow, solitary, axillary. Pods up to 4.5 × 0.4 cm, flat, linear, pubescent, many seeded; seeds obliquely obovoid.

*Fl. & Fr.*: Mar.- Sept.

In marshy fields. Not common.

Indravati Tiger Reserve, Pandey 73 (specimen deposited in herbarium of the Indravati Tiger Reserve at Bijapur).

**4. *C. obtusifolia* L., Sp. Pl. 377. 1753; *C. tora* sensu Baker in Hook.f., Fl. Brit. India 2 : 263. 1878 non L.**

*'Karota'*

Branched herbs or undershrubs, up to 2 m tall. Leaves up to 9 cm long; leaflets 3 pairs with a gland between the lowest pair of leaflets only; leaflets up to 4 × 2 cm, obovate, obtuse. Flowers yellow, in axillary, subsessile pairs. Pods up to 17.5 × 0.4 cm, subterete, septate, many seeded; seeds rhomboid.

*Fl. & Fr.*: Sept.- Mar.

In the vicinity of forests. Abundant.

Bijapur Ghati, 16410; Bijapur.

**5. *Cassia occidentalis* L., Sp. Pl. 377. 1753; Baker in Hook.f., Fl. Brit. India 2 : 262. 1878.**

Undershrubs, up to 1.5 m tall. Leaves up to 20 cm long; petiole with a sessile gland near the base; leaflets 3-6 pairs, up to 8.5 × 3.5 cm, ovate-elliptic or elliptic-oblong, acute or acuminate. Flowers yellow, 2-6, in axillary and terminal, corymbose racemes. Pods up to 13.5 × 0.8 cm, flat, many seeded; seeds ovoid, oblique.

*Fl. & Fr.*: Sept.- Feb.

Along roadsides and in the vicinity of forests. Common.

Bijapur Ghati, 16412.

Plant is grazed by herbivores. Leaves are used as antidote for poisoning.

**6. *C. pumila* Lam., Encycl. 1 : 651. 1785; Baker in Hook.f., Fl. Brit. India 2 : 266. 1878.**

Erect or procumbent, branched, annual herbs, up to 40 cm long. Leaves pinnate, up to 6 cm long; petiole with a stipitate gland just below the leaflets; leaflets 8-25 pairs, up to 1.2 × 0.3 cm, linear-oblong, apiculate. Flowers yellow, 1-3, axillary. Pods up to 3.5 × 0.5 cm, linear, flat, pubescent, 6-16-seeded; seeds obovoid.

*Fl. & Fr.*: Aug.- Oct.

Common as undergrowth in forests.

Bijapur Ghati, 16430; Karkeli; Pharsegarh.

**7. *C. siamea* Lam., Encycl. 1 : 648. 1785; Baker in Hook.f., Fl. Brit. India 2 : 264. 1878.**

'*Samia*'

Trees, up to 18 m tall; bark light black. Leaves up to 25 cm long; leaflets up to 15 pairs, up to  $6.5 \times 2.2$  cm, oblong or elliptic-oblong, apex retuse with a short mucro from the sinus. Flowers bright yellow, in axillary and terminal panicles. Pods up to  $30 \times 1.5$  cm, oblong, flat.

*Fl.*: Nov.; *Fr.*: Apr.- May.

Planted in the vicinity of dry deciduous forests.

Bhopalpatnam, 16269.

**8. *Cassia tora* L.**, Sp. Pl. 376. 1753; Baker in Hook.f., Fl. Brit. India 2 : 263. 1878 *p.p.*

'*Carota*'

Fetid herbs, up to 2 m tall. Leaves up to 10 cm long; leaflets 3-5 pairs with a gland between the lowest pair of leaflets; leaflets up to  $4.5 \times 2.2$  cm, obovate, obtuse, apiculate. Flowers yellow, in axillary, subsessile pairs, upper clustered. Pods up to  $17.5 \times 0.4$  cm, subtetragonous, curved, apiculate, many seeded; seeds rhomboid.

*Fl. & Fr.*: Sept.- May.

In waste lands and in the vicinity of forests. Abundant.

Karkeli, 16130; Bijapur.

#### 4. *HARDWICKIA* Roxb.

***Hardwickia binata* Roxb.**, Pl. Cor. 3 : 6.t. 209. 1819; Baker in Hook.f., Fl. Brit. India 2 : 270. 1878.

'*Anjan*'

Trees, up to 25 m tall; bark greyish-white. Leaflets 2, up to  $5.5 \times 3$  cm, ovate-rhomboid, oblique, obtuse, 3-6-nerved. Flowers small, in axillary and terminal panicles; sepals yellowish-green, ovate-oblong; petals absent. Pods up to  $12.5 \times 1.5$  cm, strap-shaped; seed 1, near the apex.



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

In grasslands. Sparse.

Pillure, 15539.

Wood is very durable. Leaves are grazed by herbivores.

### 5. TAMARINDUS L.

**Tamarindus indica** L., Sp. Pl. 34. 1753; Baker in Hook.f., Fl. Brit. India 2 : 273. 1878.

*'Imli'*

Trees, up to 20 m tall; bark black. Leaves pinnate, up to 15 cm long; leaflets 8-20 pairs, up to 2 × 0.4 cm, oblong, obtuse. Flowers in lax, many flowered, terminal racemes; petals 3, bright yellow with red veins. Pods up to 12.4 × 2.5 cm, brown, oblong, indehiscent; seeds black, rectangular.

*Fl. & Fr.:* May-Dec.

In dry deciduous forests; also planted near habitations.

Madded, 16267; Dudepalli.

Fruits are eaten due to their sour taste.

*Delonix regia* (Boj. ex Hook.) Rafin. and *Peltophorum pterocarpum* (DC.) Backer ex Meyne are planted along avenues for their beautiful flowers.

### MIMOSACEAE

1a. Stamens many :

2a. Stamens free

1. ACACIA

2b. Stamens connate at the base

2. ALBIZIA

1b. Stamens 8-10 :

3a. Flowers 4-merous; pods membranous 3. MIMOSA

3b. Flowers 5-merous; pods woody 4. XYLIA

1. ACACIA P. Mill.

1a. Climbing shrubs 4. *A. pennata*

1b. Trees :

2a. Flowers in globose heads :

3a. Pods moniliform, grey pubescent 3. *A. nilotica*  
ssp. *indica*

3b. Pods oblong, brown tomentose 2. *A. leucophloea*

2b. Flowers in elongated spikes :

4a. Branches pubescent 5. *A. polycantha*

4b. Branches glabrous 1. *A. catechu*

1. *Acacia catechu* (L.f.) Willd., Sp. Pl. 4 : 1079. 1806; Baker in Hook.f., Fl. Brit. India 2 : 295. 1878. *Mimosa catechu* L.f., Suppl. 439. 1781.

'*Khair*'

Trees, up to 8 m tall; bark black. Stipular spines up to 6 mm long. Petiole with a gland near the middle. Leaves up to 15.5 cm long; pinnae 10 to 25 pairs, up to 4.5 cm long; leaflets 30-40 pairs, linear. Flowers pale yellow, in axillary, up to 10.5 cm long spikes. Pods up to 8.5 × 1.5 cm, flat, beaked.

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

In dry open forests. Sparse.

Madded, 16602.

Heart wood is source of catechu.

**2. *Acacia leucophloea* (Roxb.) Willd., Sp. Pl. 4 : 1083. 1806;** Baker in Hook.f., Fl. Brit. India 2 : 294. 1878. *Mimosa leucophloea* Roxb., Pl. Cor. 2 : 27. t.150. 1800.

*'Safed-babool'*

Trees, up to 15 m tall; bark greyish-black. Stipular spines straight, up to 3 cm long. Petiole with a gland below the first pair of pinnae. Leaves up to 5.5 cm long; pinnae 5-13 pairs, up to 3 cm long; leaflets 12-25 pairs, linear-oblong. Heads globose, in terminal panicles; flowers yellowish-white. Pods up to 15.5 × 1.2 cm, oblong, obtuse, 8-15-seeded.

*Fl. & Fr.*: Sept.- Feb.

In dry deciduous forests. Sparse.

Madded, 15602; Bhopalpatnam.

Seeds are eaten by birds.

**3. *A. nilotica* (L.) Willd. ex Del. subsp. *indica* (Benth.) Brenan** in Kew Bull. 12 : 84. 1957. *A. arabica* (Lam.) Willd. var. *indica* Benth. in Journ. Bot. (Hook.) 1 : 500. 1842. *A. arabica auct. non Willd.*; Baker in Hook.f., Fl. Brit. India 2 : 293. 1878.

*'Babool'*

Trees, up to 8 m tall; bark black, fissured. Stipular spines straight, up to 5 cm long. Rhachis often with a gland between the terminal and the lowest pair of pinnae; pinnae 4-9 pairs, up to 4.5 cm long; leaflets 15-25 pairs, linear-oblong. Heads globose, in axillary fascicles; petals yellow. Pods up to 17.5 × 1.2 cm, moniliform.

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

Along roadsides and open dry forests. Sparse.

Madded, 15603.

Plant is source of a gum; wood is very durable; leaves are of fodder value; bark and pods are used in tanning.

**4. *Acacia pennata* (L.) Willd., Sp. Pl. 4 : 1090. 1805; Baker in Hook.f., Fl. Brit. India 2 : 297. 1878. p.p. *Mimosa pennata* L., Sp. Pl. 522. 1753.**

'*Ekum*', '*Iktonda*'

Prickly, climbing shrubs; young branches and inflorescence brown tomentose. Petiole with a gland below the middle. Leaves up to 16 cm long; pinnae 8-18 pairs, up to 6.5 cm long; leaflets 40-60 pairs, linear. Flowers white, in terminal, up to 25 cm long panicles; heads *ca* 2 cm across. Pods up to 17 × 3 cm, oblong, flat; seeds ovoid-oblong.

*Fl. & Fr.*: May-Dec.

In dry deciduous forests. Not common.

Dudepalli, 16325.

**5. *A. polycantha* (L.) Willd., Sp. Pl. 4 : 1097. 1806. *Mimosa suma* Roxb., Fl. Ind. 2 : 563. 1832. *A. suma* (Roxb.) Buch.-Ham. ex Voigt, Hort. Sub. Calc. 260. 1845; Baker in Hook.f., Fl. Brit. India 2 : 294. 1878.**

Trees, up 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, up to 5.5 cm long; leaflets 30-50 pairs, linear. Flowers white, in up to 10.5 cm long spikes. Pods up to 13.5 × 2 cm, flat, beaked.

*Fl.*: Apr.- May; *Fr.*: Nov.- Dec.

In dry deciduous forests. Sparse.

Pengunda, 16297.

## 2. ALBIZIA Durazz.

1a. Heads 1-4, axillary; flowers pedicelled 1. *A. lebbeck*

1b. Heads many, in terminal  
panicles; flowers sessile 2. *A. odoratissima*

**1. Albizia lebbeck** (L.) Willd., Sp. Pl. 4 : 1066. 1806; Baker in Hook.f., Fl. Brit. India 2 : 298. 1878. *Mimosa lebbeck* L., Sp. Pl. 516. 1753.

'Kala-siris'

Trees, up to 20 m tall; bark grey. Leaves 2-pinnate; rachis up to 15 cm long; pinnae 2-4 pairs; leaflets 5-9 pairs, up to 4.5 × 2.5 cm; lateral leaflets elliptic-oblong; terminal obovate-oblong, oblique, obtuse. Flowers cream coloured, in globose, axillary heads. Pods straw-coloured, up to 30 × 4 cm, oblong, shining; seeds ellipsoid-oblong.

*Fl.*: May; *Fr.*: Most part of the year.

Planted along roadsides, occasionally wild.

Kutru, 16370; Bijapur.

Wood is used for making cheap quality timber.

**2. A. odoratissima** (L.f.) Benth. in Journ. Bot. (Hook.) 3 : 88. 1844; Baker in Hook.f., Fl. Brit. India 2 : 299. 1878. *Mimosa odoratissima* L.f., Suppl. 437. 1781.

'Chichola', 'Siris'

Trees, up to 25 m tall; bark grey. Leaves 2-pinnate; pinnae 2-5 pairs; up to 12.5 cm long; leaflets 8-24 pairs, up to 3 × 1 cm; oblong, obtuse, oblique. Heads white, ca 2 cm across, in terminal panicles. Pods brown, up to 25 × 3 cm, oblong; seeds yellow, ovate.

*Fl.*: May; *Fr.*: Sept.- Apr.

In dry deciduous and teak forests. Common.

Kandlaparti, 16273.

### 3. MIMOSA L.

**Mimosa himalayana** Gamble in Kew Bull. 1920 : 4. 1920. *M. rubicaulis* Baker in Hook.f., Fl. Brit. India 2 : 291. 1878 *p.p. non* Lam.

Prickly shrubs or small trees, up to 5 m tall. Leaves 2-pinnate, up to 20 cm long; pinnae 5-10 pairs; leaflets 7-10 pairs, up to 1 × 0.3 cm, linear-oblong, obtuse, mucronate. Heads *ca* 1.2 cm across, 1-2, in leaf-axils and terminal panicles; petals red. Pods up to 10 × 1.2 cm, falcate, flat, 4-10-jointed; joints falling on ripening; sutures persistent, smooth or prickly.

*Fl. & Fr.*: Sept.- Apr.

In open dry places. Sparse.

Kutru, 16695.

### 4. XYLIA Benth.

**Xylia xylocarpa** (Roxb.) Taub., Bot. Contrabl. 47 : 397. 1891. *Mimosa xylocarpa* Roxb., Pl. Cor. t.100. 1798. *Xylia dolabriformis* Benth. in Journ. Bot. (Hook.) 4 : 417. 1842; Baker in Hook.f., Fl. Brit. India 2 : 286. 1878.

*'Kadee'*

Trees, up to 10 m tall; bark grey, smooth; young parts tomentose. Leaves 2-pinnate; pinnae 2, up to 15.5 cm long; petiole with a gland at the tip; leaflets 2-6 pairs, becoming smaller downwards; up to 20 × 5.5 cm, oblong, acute. Flowers yellowish-white, in heads. Pods up to 20 × 5 cm, oblong, falcate, woody, brown-pubescent; seeds 6-11, brown, shining, oblong-ellipsoid.

*Fl.*: May; *Fr.*: Most parts of the year.

Dudepalli, 16329.

Roasted seeds are consumed.

## DROSERACEAE

### DROSERA L.

- |   |                        |
|---|------------------------|
| 1a. Acaulescent herbs; leaves<br>ovate or sub-orbicular | 1. <i>D. burmannii</i> |
| 1b. Caulescent herbs; leaves linear                     | 2. <i>D. indica</i>    |

**1. *Drosera burmannii*** Vahl, *Symb. Bot.* 3 : 50. 1794; Clarke in *Hook.f., Fl. Brit. India* 2 : 424. 1878.

Acaulescent, insectivorous herbs. Leaves in basal rosette, appressed to ground; up to 1.2 × 0.8 cm, green with purple centre, margin glandular-hairy. Flowers white with pinkish tinge, in up to 12.5 cm long scapes; calyx 5-lobed, segments elliptic-oblong; petals 5, obovate. Capsules ellipsoid, 5-valved; seeds black, reticulate.

*Fl.*: & *Fr.*: Apr. - May.

Along river-banks. Rare.

Indravati river, 16318.

**2. *D. indica*** L., *Sp. Pl.* 282. 1753; Clarke in *Hook.f., Fl. Brit. India* 2 : 424. 1878.

Slender, glandular-hairy, insectivorous herbs, up to 20 cm tall. Leaves up to 5 cm long, linear, recurved, glandular-hairy. Flowers pink, 5-9 mm across, in leaf-opposed up to 15 cm long racemes; sepals 5, oblong-lanceolate; petals 5, obovate. Capsules 3-valved; seeds obovoid, reticulate.

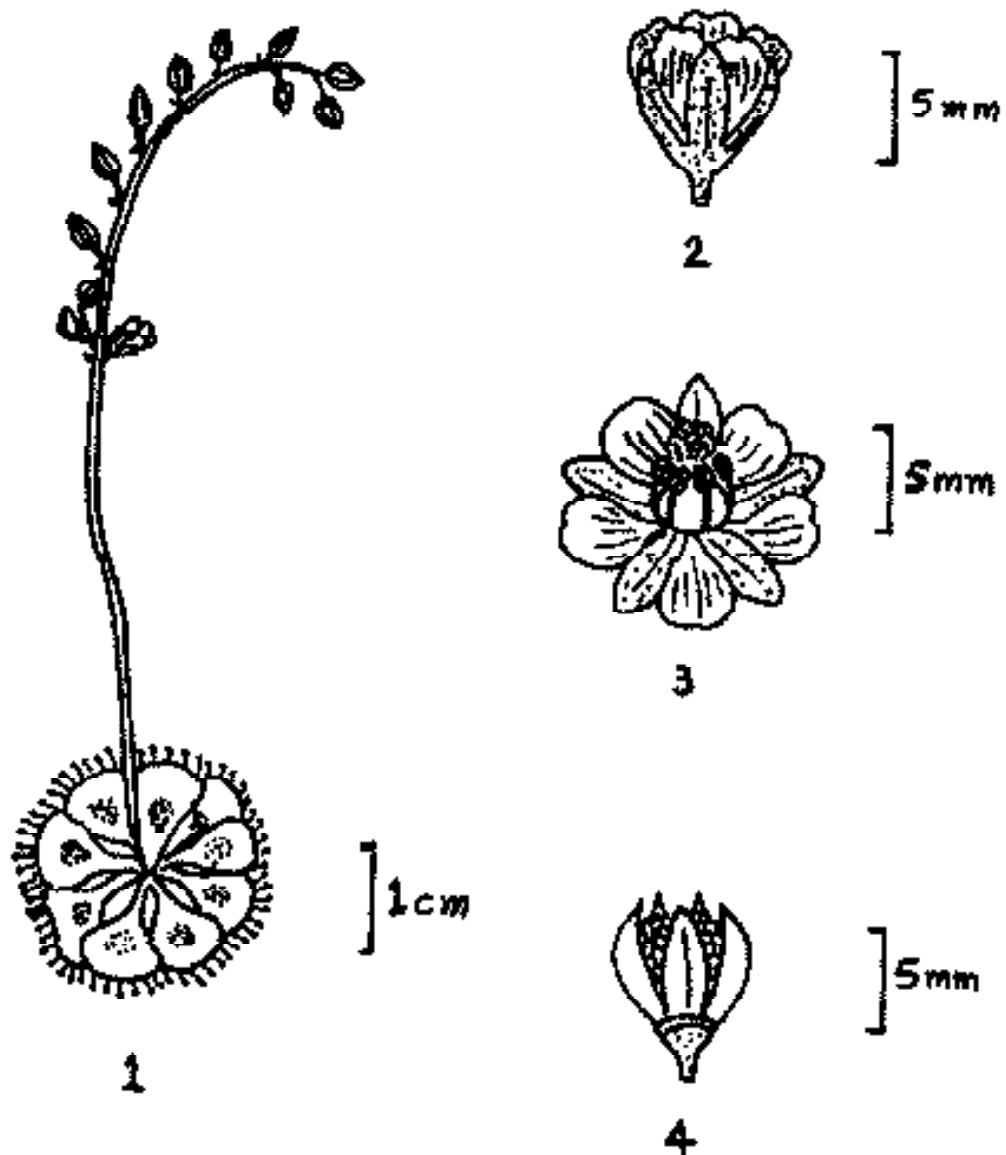


Fig. 6. *Drosera burmannii* Vahl

1. habit; 2. flower, half open; 3. flower, fully opened & 4. capsule, dehiscent.



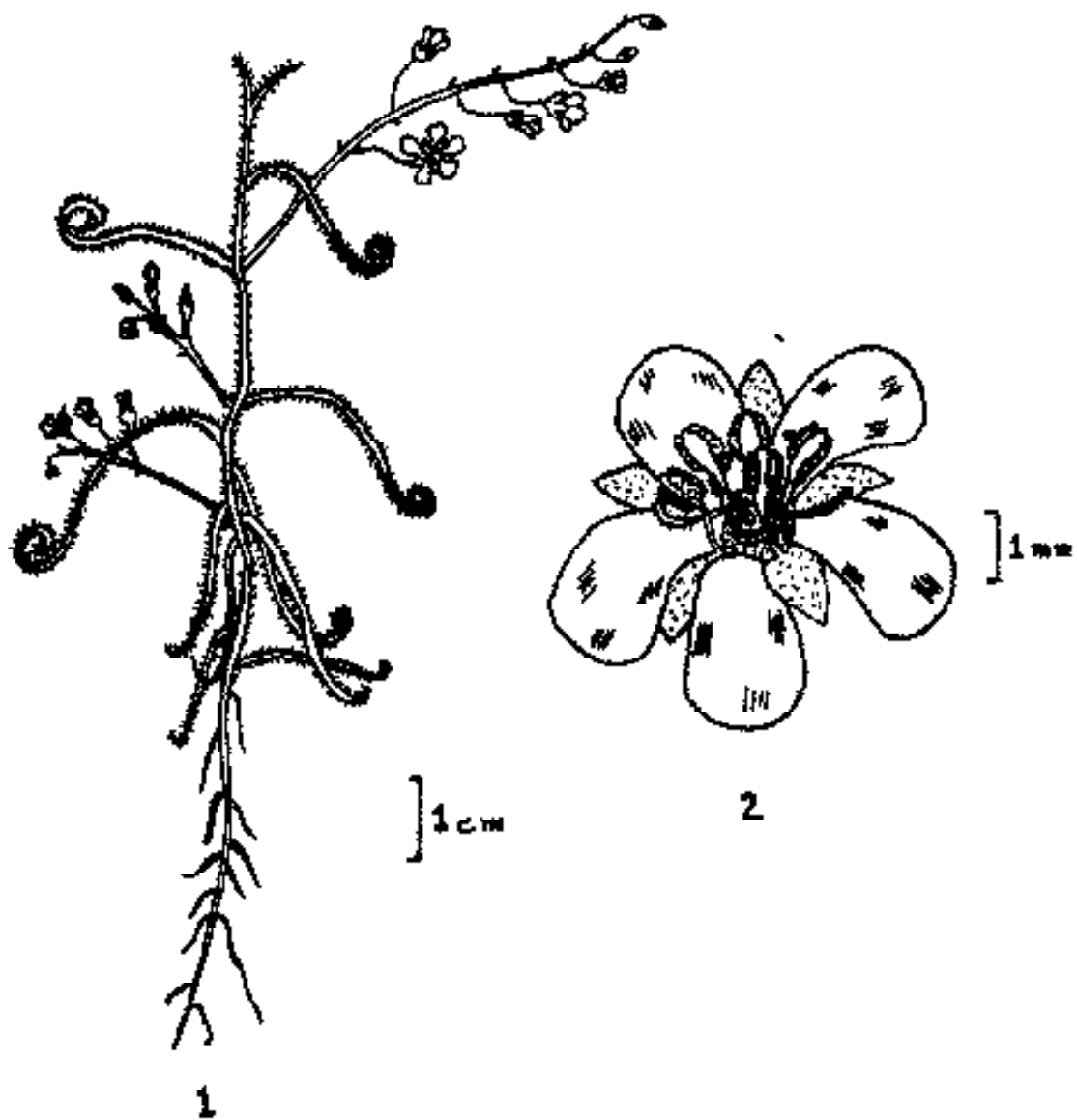


Fig. 7. *Drosera indica* L.  
1. habit & 2. flower.

*Fl. & Fr.*: Sept.- Oct.

In marshy-fields. Rare.

Katru, 16694.

### COMBRETACEAE

- 1a. Flowers in globose heads 1. ANOGEISSUS
- 1b. Flowers in spikes, racemes or panicles :
  - 2a. Petals present 3. COMBRETUM
  - 2b. Petals absent :
    - 3a. Calyx-lobes persistent, accrescent 2. CALYCOPTERIS
    - 3b. Calyx-lobes caducous, not accrescent 4. TERMINALIA

#### 1. ANOGEISSUS (DC.) Guill., Perr. & A. Rich.

- 1a. Calyx-cup completely pubescent without 3. *A. sericea*
- 1b. Calyx-cup glabrous or pubescent only at the base :
  - 2a. Persistent calyx-stalk much shorter than fruit 2. *A. pendula*
  - 2b. Persistent calyx-stalk as long as or longer than fruit 1. *A. latifolia*

*Anogeissus latifolia* (Roxb. ex DC.) Wall. ex Guill. & Perr., Fl. Seneg. Tent. 7 : 280. 1832; Clarke in Hook.f., Fl. Brit. India 2 : 450. 1878. *Conocarpus latifolia* Roxb. ex DC., Prodr. 3 : 16. 1828.

‘Dhawda’, ‘Vedma’

Trees, up to 15 m tall; bark grey, smooth. Leaves up to 12.5 × 5.5 cm, elliptic or ovate-elliptic, obtuse. Flowers cream coloured, in axillary

and terminal racemes; flower-heads 2-5, 0.8-1.2 cm across. Fruits up to 5 × 6 mm; persistent calyx-stalk 5-6 mm long, curved.

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

In dry deciduous and mixed teak forests. Common.

Bijapur, 16682; Kutru; Pharsegarh.

Stem is source of a fine gum; wood is used for making poor quality timber.

**2. *Anogeissus pendula*** Edgew. in Journ. As. Soc. Bengal 21 : 171. 1853; Clarke in Hook.f., Fl. Brit. India 2 : 451. 1878; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 24. 1976.

Trees, up to 8 m tall; branches pendulous. Leaves up to 4 × 2 cm, elliptic or obovate, silky-hairy when young, obtuse or subacuminate, base cuneate. Flowers yellow, in axillary and terminal solitary heads, up to 1.5 cm across. Fruits 5-6 × 6 mm, more or less orbicular; wings narrow, jagged at the apex; calyx-stalk 2-4 mm long.

*Fl. & Fr.*: Aug.- Mar.

In dry deciduous forests. Sparse.

Bhopalpatnam (Saxena & Khotele *l.c.*).

**3. *A. sericea*** Brandis in Indian For. 25 : 287. 1900.

Trees, up to 25 m tall; bark black, fissured. Leaves up to 5 × 2.5 cm, broadly elliptic, acute or subacuminate or mucronate, silky-hairy on both surfaces. Inflorescence axillary and terminal; heads up to 2 cm across, globose. Flowers yellow. Fruits *ca* 3.5 × 5 mm, persistent calyx-stalk 4-5 mm long; wings jagged at the apex and sides.

*Fl. & Fr.*: Feb.- Apr.

Common along river-banks.

Mingachal river, 16153.

## 2. CALYCOPTERIS Lam.

**Calycopteris floribunda** (Roxb.) Lam., *Encycl.* 2 : 485. t.357. 1797; Clarke in Hook.f., *Fl. Brit. India* 2 : 449. 1878. *Getonia floribunda* Roxb., *Pl. Cor.* 1 : 61. t.87. 1798.

Scandent shrubs; young branches fulvous-tomentose. Leaves up to 12.5 × 4.5 cm, ovate-elliptic, acute or acuminate, base rounded or subcordate. Flowers yellowish-green, in terminal, up to 30 cm long, leafy-panicles. Fruits up to 8 × 3 mm, ellipsoid, 5-ribbed, villous, crowned by 5, accrescent, calyx-lobes; 1-seeded.

*Fl. & Fr.*: Feb.- May.

In moist and dry deciduous forests. Common.

Itpal forest, 16247; Dudepalli; Kutru.

## 3. COMBRETUM Loefl.

1a. Dwarf undershrubs

2. *C. nanum*

1b. Climbing shrubs or woody climbers :

2a. Flowers 4-merous; fruits 4-winged

1. *C. albidum*

2b. Flowers 5-merous; fruits 5-winged

3. *C. roxburghii*

**1. Combretum albidum** G. Don in *Trans. Linn. Soc. Lond.* 15 : 429. 1827. *C. ovalifolium* Roxb., *Fl. Ind.* 2 : 226. 1832; Clarke in Hook.f., *Fl. Brit. India* 2 : 458. 1878.

Climbers. Leaves up to 12.5 × 7.5 cm, elliptic or ovate-elliptic, acuminate or obtuse, base acute. Flowers cream coloured, subsessile, in dense, axillary and terminal, up to 35 cm long, paniced spikes; petals white. Fruits up to 2.5 × 2 cm, pale golden-brown; seeds 4-angled.

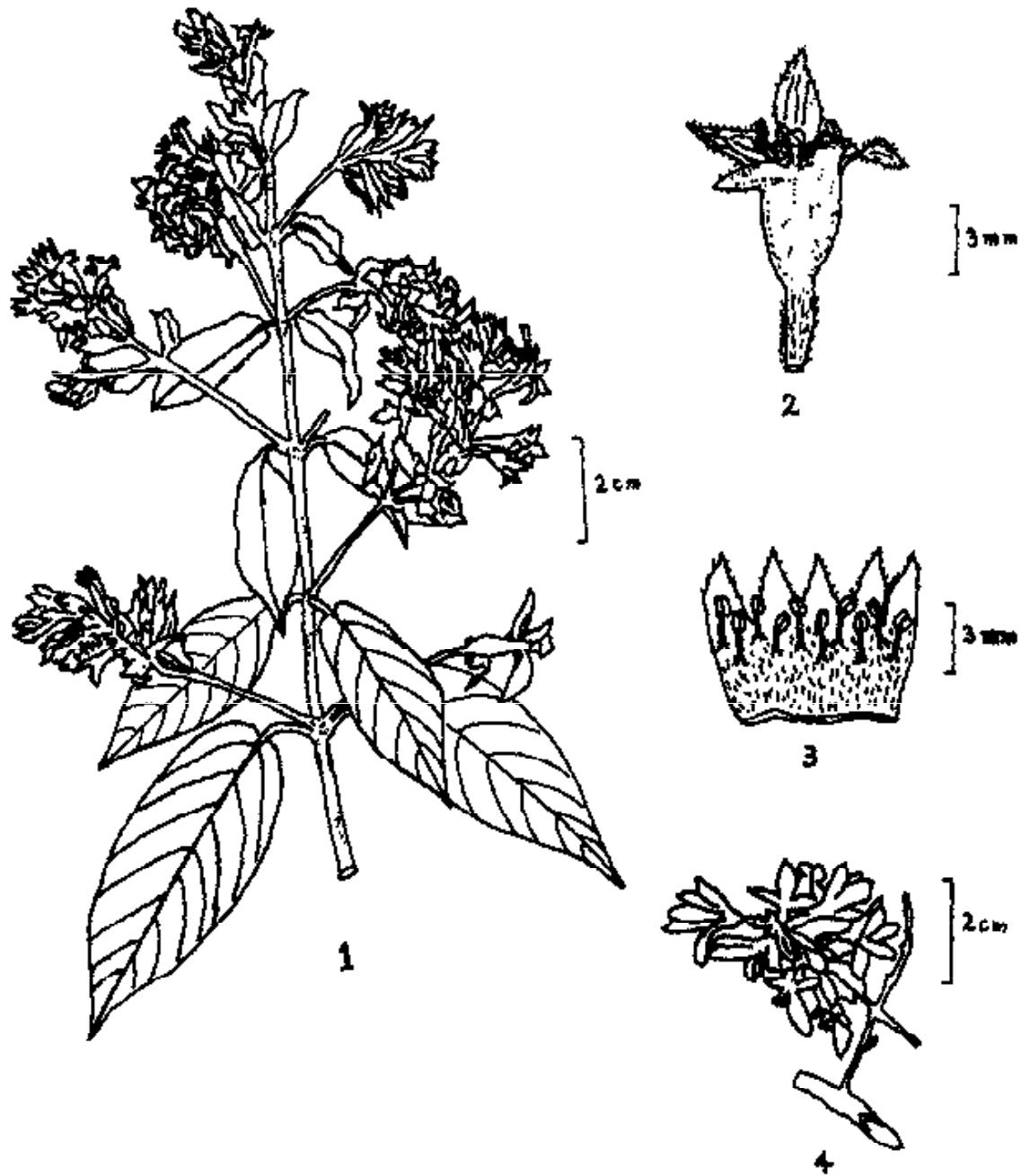


Fig. 8. *Calycopteris floribunda* (Roxb.) Lam.  
 1. flowering branch; 2. flower; 3. flower, opened & 4. fruits.

*Fl.*: & *Fr.*: Feb.- May.

In dry deciduous forests. Common.

Bhopalpatnam, 15608.

**2. *Combretum nanum*** Buch.-Ham. in D. Don, Prodr. Fl. Nep. 219. 1825; Clarke in Hook.f., Fl. Brit. India 2 : 457. 1878.

Dwarf, woody undershrubs, up to 25 cm tall. Leaves up to 3 × 1.5 cm, ovate, obtuse or subacute. Flowers cream coloured, 4-merous, in axillary and subterminal racemes. Fruits up to 3.5 × 2.5 cm, bright red, 4-winged.

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

In undergrowth of dry deciduous forests. Sparse.

Dudepalli, 16341.

**3. *C. roxburghii*** Spreng., Syst. 2 : 331. 1825. *C. decandrum* Roxb., Pl. Cor. 1 : 49. t.59. 1795 non Jacq. 1760; Clarke in Hook.f., Fl. Brit. India 2 : 452. 1878.

Climbers. Leaves up to 14 × 5.5 cm, elliptic or elliptic-oblong, acuminate. Flowers white, in terminal and axillary, up to 25 cm long panicles; bracts foliaceous, creamy-white; petals ovate, acuminate, hairy. Fruits up to 2.5 × 1.5 cm, oblong or elliptic.

*Fl.* & *Fr.*: Oct.- Apr.

In dry and moist deciduous forests and along the streams. Common.

Somanpalli nala, 15577; Bijapur Ghati; Bhopalpatnam.

#### 4. TERMINALIA L.

1a. Fruits 5-winged :

2a. Leaves glabrous; wings of fruits with ascending veins

2. *T. arjuna*

- 2b. Leaves tomentose beneath; wings  
of fruits with horizontal veins 1. *T. alata*
- 1b. Fruits not winged; more or less 5-ribbed :
- 3a. Leaves clustered at the ends of  
branches; drupes brown-tomentose 3. *T. bellirica*
- 3b. Leaves not clustered; drupes glabrous 4. *T. chebula*

1. *Terminalia alata* Heyne ex Roth, Nov. Pl. Sp. 379. 1821. *T. tomentosa* (Roxb. ex DC.) Wight & Arn., Prodr. 314. 1834; Clarke in Hook.f., Fl. Brit. India 2 : 447. 1878. *Pentaptera tomentosa* Roxb. ex DC., Prodr. 3 : 14. 1828.

'Saja'

Trees up to 20 m tall; bark black, fissured. Leaves up to 18 × 7.5 cm, elliptic-oblong or ovate-oblong, acute or rounded, base truncate-cordate; gland near the base of midrib stalked. Flowers greenish-yellow, in axillary and terminal, tomentose panicles. Drupes up to 5 × 3.5 cm; wings 5, horizontally veined.

*Fl.*: Apr.- May; *Fr.*: Most part of the year.

In dry and moist deciduous forests. Common.

Bijapur Ghati, 16484; Pharsegarh; Kutru.

Bark is used in tanning; wood yields good quality timber.

2. *T. arjuna* (Roxb. ex DC.) Wight & Arn., Prodr. 314. 1834; Clarke in Hook.f., Fl. Brit. India 2 : 447. 1878. *Pentaptera arjuna* Roxb. ex DC., Prodr. 3 : 14. 1828.

'Kohwa'

Evergreen trees, up to 20 m tall; bark white, smooth. Leaves up to 12 × 4.5 cm, oblong or oblong-lanceolate, margin entire or crenulate,

obtuse or subacute, base rounded or subcordate; glands usually 2. Flowers cream coloured, in axillary spikes and terminal panicles. Drupes up to 3.5 cm long; wings 5 with ascending veins.

*Fl.*: Apr.- May; *Fr.*: Persisting throughout the year.

In forests, especially along streams.

Madded, 16266.

Wood is very durable.

**3. *Terminalia bellirica*** (Gaertn.) Roxb., Pl. Cor. 2 : 54. t.198. 1805 ('*bellerica*'); Clarke in Hook.f., Fl. Brit. India 2 : 445. 1878. *Myrobalnus bellirica* Gaertn., Fruct. 2 : 90. t.97. f.a-d. 1791 ('*bellirina*').

'Baheda', 'Tanka'

Trees, up to 20 m tall; bark greyish-black, fissured. Leaves up to 20 × 13.5 cm, broadly elliptic or elliptic-obovate, obtuse or subacute, base cuneate; gland absent. Flowers cream coloured, in terminal clustered spikes. Drupes up to 3 × 2 cm, pyriform, brown-tomentose.

*Fl.*: Apr.- May; *Fr.*: Oct.- June.

In dry deciduous forests. Common.

Dudepalli, 15551; Pharsegarh; Netikakler; Pengunda.

Fruits medicinal; also used for tanning.

**4. *T. chebula*** Retz., Obs. Bot. 5 : 31. 1789; Clarke in Hook.f., Fl. Brit. India 2 : 446. 1878 *p.p.*

'Harra', 'Karka'

Trees, up to 15 m tall; bark black, fissured; young parts silky-hairy. Leaves up to 13.5 × 8 cm, ovate-elliptic, acute or obtuse, silky-hairy when young, glabrous afterwards; glands 2. Flowers cream coloured, in terminal panicles. Drupes up to 3.5 × 2 cm, obovoid-ellipsoid,



faintly 5-ribbed.

*Fl & Fr.*: Apr.- Nov.

In deciduous forests. Common.

Bijapur Ghati, 16219; Pharsegarh.

Fruits medicinal; also used for tanning.

*Quisqualis indica* L. - an ornamental, scandent shrub or climber with beautiful white flowers, turning to red at maturity, is frequently planted in houses.

## MYRTACEAE

### SYZYGIUM Gaertn.

- 1a. Leaves more than 3 cm broad;  
berries 1.5-2.5 cm long

1. *S. cumini*

- 1b. Leaves less than 2.5 cm broad;  
berries up to 1.2 cm long

2. *S. heyneanum*

1. *Syzygium cumini* (L.) Skeels in U.S.D.A. Bur. Pl. Industr. Bull. 248 : 2. 1912. *Myrtus cumini* L., Sp. Pl. 471. 1753. *Eugenia jambolana* Lam., Encycl. 3 : 198. 1789; Duthie in Hook.f., Fl. Brit. India 2 : 499. 1879.

'Jamun' 'Nendi'

Evergreen trees, up to 10 m tall; bark light grey, smooth. Leaves up to 12 × 5.5 cm, ovate-elliptic or elliptic-oblong, acute or subacuminate, coriaceous. Flowers 4-8 mm across, white, in lax paniced cymes. Berries up to 2.5 cm long; ellipsoid-oblong, dark purple at maturity, 1-seeded.

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

In moist deciduous forests. Common.

Bijapur Ghati, 16229.

Wood is very durable under water; fruits edible.

2. **Syzygium heyneanum** (Duthie) Wall. ex Gamble, Fl. Pres. Madras 482. 1919. *Eugenia heyneana* Duthie in Hook.f., Fl. Brit. India 2 : 500. 1879.

'Jamun'

Shrubs or small trees, up to 7 m tall; bark white, smooth. Leaves up to 10.5 × 2.5 cm, oblong-lanceolate, obtuse or subacute, coriaceous. Flowers white, 5-6 mm across, in short peduncled cymes. Berries *ca* 1 cm long, oblong, purple on ripening.

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

Along river banks. Sparse.

Indravati river, 16303.

### LECYTHIDACEAE

1a. Flowers in elongated racemes; seed solitary 1. BARRINGTONIA

1b. Flowers in condensed spikes; seeds numerous 2. CAREYA

1. BARRINGTONIA J. R. Forst. & J. G. A. Forst.

**Barringtonia acutangula** (L.) Gaertn., Fruct. 2 : 97, t.101. 1791; Clarke in Hook.f., Fl. Brit. India 2 : 508. 1879. *Eugenia acutangula* L., Sp. Pl. 471. 1753.

'Pingra'

Trees, up to 6 m tall; bark light brown. Leaves clustered at the apex of branches; up to 17.5 × 10.5 cm, obovate or elliptic-obovate, obtuse or subacute. Flowers bright red, in up to 30 cm long, pendulous racemes; petals 4, imbricate; stamens multiseriate, connate at the base. Berries up to 3 × 1.8 cm, globose, 4-gonous, 1-seeded.

*Fl. & Fr.*: May-Sept.

Along river banks. Sparse.

Indravati river, 16302.

## 2. CAREYA Roxb.

**Careya arborea** Roxb., Pl. Cor. 3 : 14. t.218. 1811; Clarke in Hook.f., Fl. Brit. India 2 : 511. 1879.

*'Kumbhi'*

Trees, up to 15 m tall; bark black. Leaves clustered at the apex of branches; up to 25 × 17.5 cm, broadly obovate, rounded or subacuminate, margin crenulate. Flowers yellowish-white, 5-8 cm across, in short spikes; stamens reddish, many. Berries up to 8.5 × 6.5 cm, globose, crowned with persistent calyx-lobes; seeds many.

*Fl. & Fr.*: Apr.- Aug.

In dry deciduous forests. Common.

Dudepalli, 16330.

Pounded root is said to be useful in stomach disorders.

## MELASTOMATACEAE

- |  |              |
|--|--------------|
| 1a. Ovary 1-celled; fruits 1-2-seeded      | 1. MEMECYLON |
| 1b. Ovary 3-5-celled; fruits many seeded : |              |
| 2a. Flowers 3-merous                       | 3. SONERILA  |
| 2b. Flowers 4-5-merous                     | 2. OSBECKIA  |

### 1. MEMECYLON L.

**Memecylon umbellatum** Brum.f., Fl. Ind. 87. 1768; Gamble, Fl. Pres. Madras 1 : 355. 1957 (repr. ed.).

Evergreen trees, up to 10 m tall; bark black. Leaves up to 6.5 × 3.5 cm, elliptic or ovate-lanceolate, acute or subacuminate, coriaceous. Flowers in umbellate cymes, arising from the axils of fallen leaves. Berries 5-6.5 mm across, globose, black.

*Fl. & Fr.*: May-Aug.

Along the streams and rivers in dry evergreen forests. Frequent.

Jalavagu nala (Kandlaparti), 16285; Indravati river (Pengunda).

## 2. OSBECKIA L.

1a. Petals 2-4 mm long; anthers oblong, not twisted 1. *O. muralis*

1b. Petals 6-8 mm long; anthers ovate,  
attenuate in a narrow beak, twisted 2. *O. zeylanica*

1. *Osbeckia muralis* Naud. in Ann. Sci. Nat. Bot. ser. 3. 14 : 56. 1850. *O. truncata* D. Don ex Wight & Arn., Prodr. 1 : 322. 1834; Clarke in Hook.f., Fl. Brit. India 2 : 514. 1879.

Annual, erect herbs, up to 20 cm tall; stem patently hairy. Leaves up to 4 × 2.2 cm, elliptic, acute, hairy. Flowers in terminal clusters, 4-merous; sepals ciliate; petals purple, broadly elliptic-obovate; stamens 8. Capsules up to 5 × 3 mm, ribbed.

*Fl. & Fr.*: Sept.- Nov.

On moist, shaded rocks. Abundant.

Bijapur Ghati, 16462.

2. *O. zeylanica* L.f., Suppl. 215. 1781; Clarke in Hook.f., Fl. Brit. India 2 : 516. 1879.

Annual, branched herbs, up to 25 cm tall; stem appressed hairy. Leaves up to 3.5 × 1.1 cm, elliptic-obovate, acute, pubescent. Flowers

4-merous, in terminal clusters; sepals ovate-triangular, ciliate; petals pink or purple, obovate, ciliate at the apex; stamens 8. Capsules up to 5 × 2.5 mm, ribbed.

*Fl. & Fr.*: Oct.- Nov.

In marshy-fields and on moist rocks. Abundant.

Bijapur Ghati, 16150; Kutru.

### 3. SONERILA ROXB.

**Sonerila tenera** Royle, *Illus. Bot. Himal.* 215. t.45. f.2. 1835; Clarke in *Hook.f., Fl. Brit. India* 2 : 530. 1879.

Annual, slender herbs, up to 15 cm tall; stem glandular-pilose. Leaves membranous, up to 2 × 1.2 cm, ovate or ovate-elliptic, sparsely hairy. Flowers pink, in scorpioid cymes; petals 3, ovate; stamens 3. Capsules 5-6 mm long, trigonous; seeds smooth, ovoid.

*Fl. & Fr.*: Sept.- Oct.

On moist, shaded rocks. Abundant.

Bijapur Ghati, 16634.

## LYTHRACEAE

1a. Trees or shrubs :

2a. Calyx-tube tubular, slightly curved; capsules membranous, included in the calyx

5. WOODFORDIA

2b. Calyx-tube campanulate, not curved; capsules woody, not included in the calyx

2. LAGERSTROEMIA

1b. Herbs :

3a. Placenta of ovary continuous with style 3. NESAEA

3b. Placenta of ovary not continuous with style :

4a. Capsules circumscissile or opening  
irregularly, the walls smooth 1. AMMANNIA

4b. Capsules dehiscent by  
valves, the valves striate 4. ROTALA

1. AMMANNIA L.

1a. Cymes sessile; petals absent 1. *A. baccifera*

1b. Cymes pedunculate; petals present 2. *A. multiflora*

**1. *Ammannia baccifera* L.**, Sp. Pl. 120. 1753; Clarke in Hook.f., Fl. Brit. India 2 : 569. 1879; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 24. 1976.

Annual, branched, pinkish-green herbs. Leaves sessile, up to 5 × 1 cm, linear-oblong or elliptic-lanceolate, subacute or obtuse. Flowers purple, in dense axillary cymes or clusters. Capsules red, depressed globose; seeds sub-hemispherical, excavated on the plane face.

*Fl. & Fr.*: Sept.- Jan.

Along river banks and ponds. Sparse.

Bhopalpatnam (Saxena & Khotele *l.c.*).

**2. *A. multiflora* Roxb.**, Fl. Ind. 1 : 426. 1820; Clarke in Hook.f., Fl. Brit. India 2 : 570. 1879.

Annual, erect, pinkish-green herbs, up to 25 cm tall. Leaves up to 3 × 0.5 cm, linear-oblong or elliptic-oblong, base auricled. Flowers pink, in axillary, pedunculate cymes; calyx campanulate with 8 vertical ribs. Capsules red, globose; seeds excavated on the plane face.

*Fl. & Fr.*: Sept.- Dec.

Along the streams and ponds. Common.

Bijapur, 16662; Kutru.

## 2. LAGERSTROEMIA L.

**Lagerstroemia parviflora** Roxb., Pl. Cor. 1 : 47. t.66. 1795;  
Clarke in Hook.f., Fl. Brit. India 2 : 575. 1879.

'Batsivna', 'Pidindel'

Trees, up to 12 m tall; bark grey, peeling in flakes. Leaves up to 8.5 × 3 cm, ovate-lanceolate, acute or subacuminate, green above, white-pubescent beneath. Flowers white, fragrant, in axillary and terminal panicles; petals obovate, clawed, crisped. Capsules up to 3 × 1.5 cm, ellipsoid; seeds winged.

*Fl. & Fr.*: May-Dec.

In moist and dry deciduous forests. Very common.

Bijapur Ghati, 16214.

Wood is valued for its durable timber; pounded bark is said to be useful in snake-bite.

## 3. NESAEA Comm. ex H.B.K.

**Nesaea brevipes** Koch. in Engl., Bot. Jahrb. Syst. 3 : 326. 1882.  
*Ammannia cordata* Wight & Arn., Prodr. 304. 1834; Clarke in Hook.f.,  
Fl. Brit. India 2 : 570. 1879.

Annual, erect or ascending herbs, up to 25 cm tall, rooting at lower nodes. Leaves sessile, up to 2.5 × 1 cm, oblong, acute, base cordate or subamplexicaul. Flowers 2-5, sessile, in axillary clusters; calyx-tube with short appendages. Capsules red, globose; seeds many, hemispheric, excavated on the plane face.

*Fl. & Fr.*: Feb.-Mar.

In stream-beds. Rare.

Bijapur Ghati, 15622.

#### 4. ROTALA L.

1a. Flowers 5-merous

1. *R. densiflora*

1b. Flowers 4-merous

2. *R. indica*

**1. *Rotala densiflora*** (Roth ex Roem. & Schult.) Koeh. in Bot. Jahrb. 1 : 164. 1880. *Ammannia densiflora* Roth ex Roem. & Schult., Syst. 3 : 304. 1818. *A. pentandra* Clarke in Hook.f., Fl. Brit. India 2 : 568. 1879 *p.p.*

Annual, erect herbs, up to 25 cm tall. Leaves up to 2 × 0.5 cm, lanceolate; floral leaves much smaller. Flowers solitary or in up to 5.5 cm long, leafy-spikes; petals pink, obovate. Capsules 3-valved.

*Fl. & Fr.*: Sept.- Jan.

Abundant in marshy fields.

Kutru, 16688.

**2. *R. indica*** (Willd.) Koeh. in Bot. Jahrb. 1 : 172. 1880. *Peplis indica* Willd., Sp. Pl. 2 : 244. 1799. *Ammannia peploides* Spreng., Syst. 1 : 444. 1825; Clarke in Hook.f., Fl. Brit. India 2 : 566. 1879.

Annual, decumbent herbs, rooting at lower nodes. Leaves up to 1.5 × 0.7 cm, elliptic-lanceolate or spatulate. Flowers pink, axillary, solitary or in up to 5 cm long leafy-spikes; petals obovate; stamens included. Capsules 2-valved; seeds minute, reddish.

*Fl. & Fr.*: Dec.- Feb.

Along edges of tanks. Sparse.



Kerpe, 15545.

### 5. WOODFORDIA Salisb.

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

Tall shrubs or small trees, up to 5 m tall; bark grey, smooth. Leaves subsessile, up to 9 × 2 cm, ovate-lanceolate, acute, white-pubescent beneath, base rounded or cordate. Flowers red, in axillary, fascicled cymes; mouth of calyx tube oblique; petals 6, longer than calyx; stamens 12. Capsules ca 1 cm long, ellipsoid, included; seeds obovoid.

*Fl. & Fr.*: Dec.- May.

In dry and moist deciduous forests, often along water courses. Common.

Bijapur Ghati, 16224; Kerpe Valley; Dudepalli; Pharsegarh; Pillure; Kandlaparti.

Leaves and flowers are used in tanning.

## ONAGRACEAE

### LUDWIGIA L.

1a. Stamens 4 (rarely 5) :

2a. Seeds uniseriate in each cell of capsule      4. *L. prostrata*

2b. Seeds pluriseriate in each cell of capsule      3. *L. perennis*

1b. Stamens 8 or 10 :

3a. Branches floating; sepals and petals 5      1. *L. adscendens*

3b. Branches erect; sepals and petals 4                      2. *L. octovalvis*

1. *Ludwigia adscendens* (L.) Hara in Journ. Jap. Bot. 28 : 290. 1953. *Jussiaea adscendens* L., Mant. 1 : 69. 1767. *J. repens* L., Sp. Pl. 1 : 388. 1753 non *Ludwigia repens* Forst. 1771; Clarke in Hook.f., Fl. Brit. India 2 : 587. 1879.

Succulent herbs; branches floating; rooting at nodes. Leaves up to 6.5 × 2.2 cm, oblanceolate, obtuse. Flowers solitary, axillary; sepals lanceolate; petals white, yellow at the base within, obovate; stamens 10. Capsules up to 3 × 0.3 cm, cylindrical, 10-ribbed; seeds uniseriate in each cell.

*Fl. & Fr.*: Feb.- May.

In ponds. Abundant.

Kutru, 16352.

2. *L. octovalvis* (Jacq.) Raven in Kew Bull. 15 : 476. 1962. *Oenothera octovalvis* Jacq., Enum. Pl. 19. 1760. *Jussiaea suffruticosa* L., Sp. Pl. 388. 1753; Clarke in Hook.f., Fl. Brit. India 2 : 587. 1879.

Branched herbs, up to 75 cm tall. Leaves up to 12.5 × 3 cm, lanceolate, acute. Flowers solitary, axillary; sepals ovate or lanceolate; petals yellow, obovate, emarginate; stamens 8. Capsules up to 4 × 0.7 cm, cylindrical, 8-ribbed; seeds pluriseriate in each cell, ovoid.

*Fl. & Fr.*: Oct.- Mar.

Common in marshy habitats.

Kutru, 16149.

3. *L. perennis* L., Sp. Pl. 119. 1753. *L. parviflora* Roxb., Fl. Ind. 1 : 440. 1820; Clarke in Hook.f., Fl. Brit. India 2 : 588. 1879.

Herbs, up to 60 cm tall. Leaves up to 10 × 2.5 cm, elliptic-lanceolate,

subacute. Flowers yellow, solitary, axillary; sepals ovate, acute; petals elliptic; stamens 4(-5). Capsules up to 2 cm long, cylindrical, irregularly loculicidal; seeds ellipsoid.

*Fl. & Fr.*: Oct.- Mar.

Along edges of ponds. Common.

Kerpe, 15547.

**4. *Ludwigia prostrata* Roxb., Fl. Ind. 1 : 441. 1820; Clarke in Hook.f., Fl. Brit. India 2 : 588. 1879.**

Herbs, up to 50 cm tall. Leaves up to 10.5 × 2.2 cm, elliptic, acute. Flowers yellow; sepals 4, deltoid; petals 4, narrowly spatulate; stamens 4. Capsules up to 2 × 0.2 cm, 4-angled, irregularly loculicidal; seeds ovoid.

*Fl. & Fr.*: Sept.- Dec.

In puddles. Sparse.

Bijapur Ghati, 16498.

#### CUCURBITACEAE

- |   |                       |
|---|-----------------------|
| 1a. Tendrils bifid                                    | 2. DIPLOCYCLOS        |
| 1b. Tendrils simple :                                 |                       |
| 2a. Anther-cells conduplicate                         | 1. CUCUMIS            |
| 2b. Anther-cells straight or curved, not conduplicate | 3. MELOTHRIA          |
| 1. CUCUMIS L.   |                       |
| 1a. Male flowers solitary; fruits smooth              | 1. <i>C. callosus</i> |
| 1b. Male flowers fasciculate; fruits tuberculate      | 2. <i>C. sativus</i>  |

**1. *Cucumis callosus*** (Rottl.) Cogn. in Engl., Pflanzenr. 88 : 129. 1924. *Bryonia callosa* Rottl., Ges. Naturf. Fr. Berlin Neue Schriften 4 : 210. 1803 ('*callosa*'). *Cucumis trigonous* Roxb., Fl. Ind. 2 : 722. 1824; Clarke in Hook.f., Fl. Brit. India 2 : 619. 1879.

'*Badeli*'

Slender, prostrate, monoecious herbs. Leaves up to 5.5 × 4.5 cm, suborbicular, palmately 5-7-lobed, margin dentate, base cordate. Male flowers yellow; stamens 3, one 1-locular, two 2-locular, connective produced. Berries greenish-white, obovoid; seeds oblong.

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

In the vicinity of forests. Sparse.

Bijapur Ghati, 16480.

**2. *C. sativus*** L., Sp. Pl. 1012. 1753;; Clarke in Hook.f., Fl. Brit. India 2 : 620. 1879.

'*Boda*'

Prostrate, hairy, monoecious herbs. Leaves up to 15 × 13.5 cm, broadly ovate, palmately 3-5-lobed, hispid, margin dentate, base cordate. Male flowers yellow; stamens 3, one 1-locular, two 2-locular. Female flowers solitary or fascicled. Berries oblong, tubercled, green with white stripes.

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

Along borders of cultivated fields and near habitations. Not common.

Kutru, 16135.

## 2. *DIPLOCYCLOS* (Endl.) Post & O. Ktze.

***Diplocyclos palmatus*** (L.) Jeffrey in Kew Bull. 15 : 352. 1962.  
*Bryonia palmata* L., Sp. Pl. 1012. 1753 *excl. syn.*

Monoecious climbers. Leaves up to 10 × 8 cm, palmately 3-5-lobed, lobes obtuse, margin entire or dentate. Flowers yellow, in fascicles; stamens 3, anther-loculi linear. Berries green with white stripes, up to 1.5 cm across, globose; seeds ovate.

*Fl. & Fr.*: Aug. - Nov.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16657.

### 3. MELOTHRIA L.

1a. Plants monoecious; fruits globose                      2. *M. maderaspatana*

1b. Plants dioecious; fruits oblong                              1. *M. heterophylla*

**1. *Melothria heterophylla* (Lour.) Cogn. in DC., Monogr. Phan. 3 : 618. 1881. *Solena heterophylla* Lour., Fl. Cochin. 1 : 514. 1790. *Zehneria umbellata* Thw., Enum. 125. 1853; Clarke in Hook.f., Fl. Brit. India 2 : 625. 1879 p.p.**

Climbing herbs. Leaves up to 17.5 cm long, ploymorphous, coriaceous, punctate above, more or less whitish beneath. Male flowers cream coloured; anthers sub-orbicular, loculi arcuate, ciliate. Berries up to 5.5 × 2.3 cm, oblong, ribbed; seeds sub-spherical.

*Fl. & Fr.*: Sept. - Feb.

Over small trees in forests. Sparse.

Bijapur Ghati, 16639; Pharsegarh.

**2. *M. maderaspatana* (L.) Cogn. in DC., Monogr. Phan. 3 : 623. 1881. *Cucumis maderaspatana* L., Sp. Pl. 1012. 1753. *Bryonia scabrella* L.f., Suppl. 424. 1781. *Mukia scabrella* (L.f.) Arn. in Journ. Bot. (Hook.) 3 : 276. 1841; Clarke in Hook.f., Fl. Brit. India 2 : 623. 1879 p.p.**

Scabrous, climbing herbs. Leaves up to 13 × 11.5 cm, ovate, membranous, angular or 3-5-lobed, scabrous above. Male flowers yellow; anthers oblong, ciliate, appendiculate, base bifid. Berries green with white stripes, changing to red on maturity, globose, ca 1 cm across; seeds ovoid-oblong.

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

Common near habitations and in the vicinity of forests.

Indravati Tiger Reserve, *Pandey s.n.* (specimen present in herbarium of the Indravati Tiger Reserve at Bijapur).

#### MOLLUGINACEAE

1a. Staminodes present; seeds strophiolate 1. GLINUS

1b. Staminodes absent; seeds estrophiolate 2. MOLLUGO

#### 1. GLINUS L.

1a. Plants stellate hairy; stamens 10; styles 5 1. *G. lotoides*

1b. Plants glabrous; stamens 5; styles 3 2. *G. oppositifolius*

**1. *Glinus lotoides* L.** Sp. Pl. 463. 1753. *Mollugo hirta* Thunb., Prodr. Fl. Cap. 1 : 24. 1794; Clarke in Hook.f., Fl. Brit. India 2 : 662. 1879.

Prostrate, branched, annual herbs. Leaves opposite or whorled, up to 2 × 1.5 cm, obovate-rotundate, apiculate or obtuse. Flowers in axillary fascicles; sepals 5, greenish-white, elliptic-lanceolate; stamens and staminodes 10 each. Capsules 5-valved, ovoid; seeds black, reniform, tubercled.

*Fl. & Fr.*: Mar.- May.

In dried up beds of rivers and streams. Abundant.

Jalavagu nala 16280; Indravati river.

**2. *Glinus oppositifolius* (L.) A. DC.** in Bull. Herb. Boiss. ser. 2. 1 : 552. 1901. *Mollugo oppositifolia* L., Sp. Pl. 89. 1753. *M. spergula* L., Syst. Nat. ed. 10. 881. 1759; Clarke in Hook.f., Fl. Brit. India 2 : 662. 1879.

Prostrate or ascending, branched, slender herbs. Leaves whorled, up to 3 × 0.8 cm, oblanceolate or oblong-spathulate, obtuse or acute. Flowers 2-6, in axillary fascicles; stamens and staminodes 5 each. Capsules 2.5-3.5 mm long, ellipsoid, 3-valved; seeds brownish-black, subreniform, tubercled.

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

Common in beds of streams and rivers.

Jalavagu nala, 16282.

## 2. MOLLUGO L.

***Mollugo pentaphylla* L., Sp. Pl. 89. 1753. *M. stricta* L., Sp. Pl. ed. 2. 131. 1762; Clarke in Hook.f., Fl. Brit. India 2 : 663. 1879.**

Branched, annual herbs. Leaves whorled, up to 3.5 × 0.9 cm, linear-lanceolate, oblanceolate or spathulate, acute or obtuse. Flowers white, in axillary and terminal cymes; sepals 5, ovate; stamens 3. Capsules subglobose or ellipsoid; seeds dark brown, subreniform, tubercled.

*Fl. & Fr.*: Aug.- Nov.

In moist habitats. Abundant.

Bijapur Ghati, 16402; Madded.

## APIACEAE

### PIMPINELLA L.

***Pimpinella wallichiana* (Miq.) Gandhi** in Sald. & Nicols., Fl. Hass. Dist. 417. 1976. *Helosciadium wallichianum* Miq., Bot. Zeit. 7 : 775.

1849. *Pimpinella monoica* Dalz. in Journ. Bot. (Hook.) 3 : 212. 1851; Clarke in Hook.f., Fl. Brit. India 2 : 687. 1879.

Herbs, up to 1.5 m tall. Radical leaves (if present) simple, ovate, serrate, acute, base cordate; lower cauline leaves 3-foliolate, leaflets up to 9 × 4 cm, ovate, acuminate, base cordate; upper cauline leaves 3-foliolate or segmented. Flowers white, in compound umbels, polygamous. Cremocarps black, ovoid, laterally compressed, didymous, papillose, vittae 2-3 between the ribs.

*Fl. & Fr.*: Oct.- Feb.

In moist, shaded places as undergrowth in moist deciduous forests. Rare.

Pharsegarh, 15513.

## ALANGIACEAE

### ALANGIUM Lam.

*Alangium salvifolium* (L.f.) Wang in Engl., Pflanzenr. 41 : 9. 1910. *Grewia salvifolia* L.f., Suppl. 409. 1781. *Alangium lamarckii* Thw., Enum. Pl. Zeyl. 133. 1859; Clarke in Hook.f., Fl. Brit. India 2 : 741. 1879.

'Akol'

Armed or unarmed trees, up to 8 m tall; bark grey. Leaves up to 12.5 × 3 cm, elliptic-oblong or ovate-oblong, acute or subacute. Flowers white, in axillary fascicles; petals 10, linear-oblong, tomentose without; stamens *ca* 20. Drupes up to 2 × 1 cm, ellipsoid, black on ripening, 1-seeded.

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

In dry deciduous forests. Sparse.

Madded, 16264.



Twigs are used for brushing teeth.

### RUBIACEAE

- 1a. Corolla-lobes twisted in bud :
- 2a. Ovule 1 in each cell 8. IXORA
- 2b. Ovules many in each cell :
- 3a. Ovary 1-celled 4. GARDENIA
- 3b. Ovary 2-celled :
- 4a. Leaves up to 8 cm long;  
berries globose 2. CATUNAREGAM
- 4b. Leaves 10-20 cm long;  
berries ovoid 13. TAMILNADIA
- 1b. Corolla-lobes valvate :
- 5a. Trees or shrubs, more than 1.5 m high :
- 6a. Flowers in globose heads :
- 7a. Leaf-base deeply cordate 5. HALDINA
- 7b. Leaf-base rounded or acute :
- 8a. Flowers yellow; ovules  
many in each cell 10. MITRAGYNA
- 8b. Flowers white; ovule  
1 in each cell 11. MORINDA
- 6b. Flowers not in globose heads :
- 9a. Ovary 5-celled; ovule  
1 in each cell 12. SPERMADICTYON

- 9b. Ovary 2-celled; ovules  
many in each cell 7. HYMENODICTYON
- 5b. Herbs, up to 1 m high :
- 10a. Ovule 1 in each cell :
- 11a. Seeds with a ventral cavity 1. BORRERIA
- 11b. Seeds without a cavity 9. KNOXIA
- 10b. Ovules 2-many in each cell :
- 12a. Stipules entire; flowers  
5-merous 3. DENTELLA
- 12b. Stipules lobed or fimbriate;  
flowers 4-merous :
- 13a. Leaves linear or linear-lanceolate;  
seeds not pitted 6. HEDYOTIS
- 13b. Leaves broadly ovate-oblong;  
seeds pitted 14. THECAGONUM
1. BORRERIA G.F.W. Meyer
- 1a. Procumbent herbs; leaf-base rounded 1. *B. articularis*
- 1b. Erect herbs; leaf-base attenuate 2. *B. pusilla*

**1. *Borreria articularis* (L.f.) F.N. Will. in Bull. Herb. ser. 2. 5 : 956. 1905. *Spermacoce articularis* L.f., Suppl. 119. 1781. *S. hispida* L., Sp. Pl. 102. 1753; Hook.f., Fl. Brit. India 3 : 200. 1881.**

Procumbent herbs; branches up to 35 cm long, hispid. Leaves up to 4.5 × 1.6 cm, elliptic or oblong, acute or mucronate, margin scabrid. Flowers violet, 4-6 at the tip of short, axillary branches. Capsules ca 4

mm long, ellipsoid or obovoid, hispid or pubescent; one mericarp dehiscing ventrally.

*Fl. & Fr.*: Sept.- Dec.

In open fields and in the vicinity of forests. Common.

Bijapur, 16385; Kerpe Valley; Kutru; Pharsegarh.

Plant is used as a tonic.

**2. *Borreria pusilla*** (Wall.) DC., Prodr. 4 : 543. 1830. *Spermacoce pusilla* Wall. in Roxb., Fl. Ind. 1 : 379. 1820. *S. stricta* L.f., Suppl. 120. 1781; Hook.f., Fl. Brit. India 3 : 200. 1881.

Erect, annual herbs, up to 25 cm tall. Leaves up to 5.5 × 1 cm, linear-oblong, acute, scabrous. Flowers white, in dense, terminal clusters, surrounded by 3-6 linear bracts; bracteoles filiform. Capsules ca 3 mm long, obovoid, hispid, both mericarps dehiscing ventrally.

*Fl. & Fr.*: Sept.- Dec.

In the vicinity of forests and dry habitats. Common.

Bijapur Ghati, 16458; Kerpe Valley.

## 2. CATUNAREGAM Wolf

**Catunaregam spinosa** (Thunb.) Tirvengadam in Bull. Mus. Hist. Nat. Paris ser. 3. 35 : 13. 1778. *Gardenia spinosa* Thunb., Diss. Gard. 7 : 16. t.2. f.4. 1780. *G. dumetorum* Retz., Obs. Bot. 2 : 14. 1781. *Randia dumetorum* (Retz.) Poir. in Lam., Encycl. Suppl. 2 : 829. 1811; Hook.f., Fl. Brit. India 3 : 110. 1880.

'Katwa'

Armed trees, up to 7 m tall; bark greyish-black. Leaves fascicled, up to 8 × 3 cm, oblanceolate or obovate, obtuse or subacute, base cuneate. Flowers fragrant, 1-2, terminal; corolla 2-3 cm across, white, turning to

yellow later on. Berries 2-3 cm across, globose, yellow; seeds flat.

*Fl.*: May; *Fr.*: Oct.- Jan.

In dry deciduous forests. Sparse.

Kodepalli, 16261.

Fruits are used as a fish-poison.

### 3. DENTELLA J.R. Forst. & J.G.A. Forst.

**3. *Dentella repens*** J.R. Forst. & J.G.A. Forst., Char. Gen. 25. t. 13. 1776; Hook.f., Fl. Brit. India 3: 42. 1880 *p.p.*

Delicate herbs; branches prostrate, rooting at nodes. Leaves up to 9 + 3.5 mm, linear-oblongate. Flowers white, solitary, axillary, ca 2 mm long; corolla campanulate, 5-lobed. Capsules 2-3 mm across, globose; seeds angled.

*Fl. & Fr.*: May.

In river-beds. Abundant.

Indravati river, 16305.

### 4. GARDENIA J. Ellis

1a. Calyx-lobes recurved; berries smooth 1. *G. latifolia*

1b. Calyx-lobes erect; berries vertically ribbed 2. *G. resinifera*

***Gardenia latifolia*** Ait., Hort. Kew. ed. 1. 1: 1294. 1879; Hook.f., Fl. Brit. India 3: 116. 1880.

‘*Bhainsa-kurru*’, ‘*Kalvirgi*’

Trees, up to 6 m tall; bark grey, smooth. Leaves up to 20 × 14 cm, obovate or broadly elliptic, obtuse or subacuminate. Flowers white, changing to yellow, fragrant, 1-2 together, subsessile; corolla-tube up to

6 cm long, lobes obovate-oblong. Berries 3-5 cm across, globose, green with white speckles.

*Fl.*: May; *Fr.*: Most parts of the year.

In dry and moist deciduous forests. Sparse.

Itpal forest, 16258; Dudepalli.

Crushed bark is said to be useful in stomach pain.

**2. *G. resinifera* Roth, Nov. Pl. Sp. 150. 1821. *G. lucida* Roxb., Fl. Ind. 2 : 553. 1824; Hook.f., Fl. Brit. India 3 : 115. 1880.**

'*Kurru*'

Trees, up to 5 m tall; branches resiniferous; bark grey, smooth. Leaves up to 12.5 × 5.5 cm, elliptic-oblong, subacuminate. Flowers white, fragrant, solitary, axillary; corolla-tube up to 5 cm long, lobes obovate. Berries up to 2 cm across, ellipsoid or globose; seeds reddish, flat.

*Fl.*: May; *Fr.*: Sept.- Mar.

In dry and moist deciduous forests. Sparse.

Itpal forest, 16227; Bijapur Ghati.

#### 5. HALDINA Ridsdale

***Haldina cordifolia* (Roxb.) Ridsdale in Blumea 24 : 361. 1978. *Nauclea cordifolia* Roxb., Pl. Cor. 1 : 40. t.53. 1795. *Adina cordifolia* (Roxb.) Hook.f. ex Brandis, For. Fl. N. W. & C. India 263. t.33. 1874; Hook.f., Fl. Brit. India 3 : 24. 1880.**

'*Haldu*', '*Hardi-mundi*'

Trees, up to 20 m tall; bark greyish-black. Leaves up to 20 × 17.5 cm, broadly ovate or orbicular, pubescent, acuminate, base cordate. Flowers yellow, 5-merous, in globose heads; heads up to 3 cm across, 1-3, fascicled, axillary. Capsules 3-4 mm long, cuneate; seeds oblong, winged.

*Fl. & Fr.*: Oct.- Mar.

In moist deciduous forests. Common.

Pharsegarh, 15527.

Wood is of timber value.

## 6. HEDYOTIS L.

1a. Corolla-tube 7-10 mm long 2. *H. gracilis*

1b. Corolla-tube 2-5 mm long :

2a. Capsules rounded at the apex 3. *H. herbacea*

2b. Capsules flat at the apex 1. *H. corymbosa*

**1. *Hedyotis corymbosa*** (L.) Lam., Encycl. 1 : 272. 1791. *Oldenlandia corymbosa* L., Sp. Pl. 119. 1753; Hook.f., Fl. Brit. India 3: 64. 1880 excl. syn. *O. burmanniana* R. Br.

Erect or ascending, branched, slender, annual herbs, up to 25 cm tall. Leaves up to 3.5 × 0.3 cm, linear, acute. Peduncles slender, 1-4 flowered, axillary. Capsules globose, didymous; seeds angular, pale brown.

*Fl. & Fr.*: Sept.- May.

Common in river beds.

Indravati river (Pengunda), 16307.

**2. *H. gracilis*** Wall. in Roxb., Fl. Ind. 1 : 371. 1820. *Oldenlandia gracilis* (Wall.) Hook.f., Fl. Brit. India 3 : 68. 1880.

Erect, slender herbs, up to 25 cm tall. Leaves up to 3.5 × 0.3 cm, linear or linear-oblong, acuminate. Flowers cream coloured, in terminal, lax cymes; corolla-lobes linear, obtuse. Capsules 4-6 mm long, oblong-globose.

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

In forest-undergrowth. Not common.

Dudepalli, 16340.

**3. *Hedyotis herbacea* L., Sp. Pl. 102. 1753. *Oldenlandia heynii* R. Br. ex G. Don, Gen. Syst. 3 : 531. 1834; Hook.f., Fl. Brit. India 3 : 65. 1880.**

Slender, dichotomously branched, annual herbs, up to 25 cm tall. Leaves up to 2.5 × 0.3 cm, linear or linear-lanceolate, acute, margin recurved. Flowers 1 or 2, in axillary, filiform peduncles. Capsules 2-3 mm across, subglobose or ovoid; seeds ellipsoid.

*Fl. & Fr.*: Sept.- Nov.

In grassy-fields. Abundant.

Kutru, 16691.

#### 7. HYMENODICTYON Wall.

***Hymenodictyon orixense* (Roxb.) Mabb. in Taxon 31 : 66. 1982. *Cinchona orixensis* Roxb., Bot. Descr. Swietenia 21. 1793 & in Med. Facts Obs. 6 : 152. 1795. *Hymenodictyon excelsum* (Roxb.) Wall. in Roxb., Fl. Ind. 2 : 149. 1824; Hook.f., Fl. Brit. India 3 : 35. 1880. *Cinchona excelsa* Roxb., Pl. Cor. t.106. 1799.**

'Maanch'

Deciduous trees, up to 20 m tall; bark greyish-black. Leaves up to 17.5 × 10 cm, ovate-elliptic, pubescent, acuminate, base acute. Flowers greenish-white, in dense, terminal, spiciform racemes, up to 12.5 cm long; corolla campanulate; styles exserted. Capsules brown, white speckled, ellipsoid, up to 2 × 1 cm, on decurved; seeds winged.

*Fl. & Fr.*: Sept.- Feb.

In dry deciduous forests. Sparse.

Dudepalli, 15555.

### 8. IXORA L.

***Ixora pavetta*** Andrews in Bot. Rep. t. 78. 1799. *I. parviflora* Vahl, Symb. Bot. 3 : 11. t.52. 1794 *non* Lam. 1791; Hook.f., Fl. Brit. India 3 : 142. 1880.

'Lohkhandi', 'Petereka'

Evergreen trees, up to 6 m tall; bark white, smooth. Leaves up to 12.5 × 5 cm, elliptic or elliptic-oblong, obtuse, coriaceous. Flowers white, fragrant, in terminal cymes; corolla-tube up to 1 cm long, lobes linear-oblong. Capsules up to 6 mm across, didymous, black on ripening.

*Fl. & Fr.*: Jan.- May.

In dry deciduous forests. Common.

Bhopalpatnam, 16271; Pharsegarh; Indravati river.

### 9. 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.

Annual herbs, up to 1 m tall. Leaves up to 10.5 × 2.5 cm, elliptic-lanceolate, acute, veins prominent on under surface; stipules 3-6, appendaged at the apex. Flowers 4-merous, in axillary and terminal, corymbose cymes; corolla white with violet tinge. Fruits white, changing to black on maturity, up to 2 mm long, ellipsoid; seeds 2, angled.

*Fl. & Fr.*: Sept.- Dec.

In dry and moist deciduous forests. Abundant.

Bijapur Ghati, 16446; Madded; Kutru; Pharsegarh; Kerpe Valley.



## 10. MITRAGYNA Korth.

**Mitragyna parvifolia** (Roxb.) Korth., Obs. Naocl. Ind. 19. 1839. *Nauclea parvifolia* Roxb., Pl. Cor. t.52. 1796. *Stephegyne parvifolia* (Roxb.) Korth., Verh. Nat. Ges. Bot. 161. 1842; Hook.f., Fl. Brit. India 3 : 25. 1880.

'Moondi'

Deciduous trees, up to 10 m tall; bark grey, smooth. Leaves up to 12 × 7.5 cm, obovate, elliptic-obovate or sub-orbicular, obtuse or sub-acuminate, base rounded or acute; stipules pink, oblong-spathulate. Flowers yellow, in globose, solitary, terminal, peduncled heads; heads ca 3.5 cm across. Capsules ca 3 mm long, oblong, ribbed; seeds flat.

*Fl.*: May-Aug.; *Fr.*: Persisting throughout the year.

In dry deciduous forests. Common.

Itpal forest, 16251; Dudepalli.

## 11. MORINDA L.

**Morinda pubescens** J.E. Smith in Rees, Cyclop. 24. n.3. 1813. *M. tinctoria* Roxb., Fl. Ind. 1 : 543. 1832; Hook.f., Fl. Brit. India 3 : 156. 1880 *non* Noronha 1790.

Shrubs or small trees, up to 8 m tall; young branches tomentose; bark fissured. Leaves up to 13.5 × 6.5 cm, broadly elliptic, acuminate, tomentose. Flowers white, in leaf-opposed heads; corolla-tube up to 2 cm long, pubescent without, lobes oblong. Fruits 2-3 cm across, globose of pseudo-berries due to fusion of succulent calyces; pyrenes stony; seeds oblong.

*Fl. & Fr.*: May-Sept.

In moist deciduous forests. Common.

Itpal forest, 16249.

## 12. SPERMADICTYON Roxb.

**Spermadictyon suaveolens** Roxb., Pl. Cor. 3 : 32. t.236. 1815.  
*Hamiltonia suaveolens* Roxb., Fl. Ind. 2 : 223. 1824; Hook.f., Fl. Brit.  
 India 3 : 197. 1881 *p.p.*

Shrubs, up to 2.5 m tall. Leaves up to 17.5 × 7.5 cm, ovate-elliptic or elliptic-lanceolate, acute at both ends. Flowers clustered in terminal, pubescent, panicles; corolla up to 1 cm long, pale blue, hairy. Capsules up to 4 mm long, ellipsoid; seeds arillate.

*Fl. & Fr.*: Nov.- Feb.

In moist deciduous forests. Rare.

Bijapur Ghati, 15598.

## 13. TAMILNADIA Tirvengadam &amp; Sastre

**Tamilnadia uliginosa** (Retz.) Tirvengadam & Sastre in Mauritius Inst. Bull. 8(4) : 85. 1979. *Gardenia uliginosa* Retz., Obs. Bot. 2 : 14. 1781. *Randia uliginosa* (Retz.) DC., Prodr. 4 : 386. 1830; Hook.f., Fl. Brit. India 3 : 110. 1881.

'*Thelka*'

Spiny trees, up to 10 m tall; some branches ending in a pair of thorns; bark brownish-black. Leaves fascicled on short branches, 10-20 × 3.5-5.5 cm, oblanceolate or obovate-oblong, obtuse, base acute. Flowers white, fragrant, at the apex of small branches; corolla 4-5 cm across, lobes 5-6. Berries up to 7.5 × 4 cm, ovoid, yellow on ripening; seeds black, oblong.

*Fl. & Fr.*: May-Nov.

In dry deciduous forests. Sparse.

Kodepalli, 16259.

Ripe fruits are eaten.

## 14. THECAGONUM Babu

**Thecagonum ovatifolium** (Cav.) Babu in Bull. Bot. Surv. India 11 : 214. 1971. *Hedyotis ovatifolia* Cav., Descr. Pl. Ic. 6 : 52. 1802. *Oldenlandia nudicaulis* Roth, Nov. Pl. Sp. 95. 1821; Hook.f., Fl. Brit. India 3 : 70. 1880.

Annual herbs, up to 15 cm tall; branches angled. Leaves in whorls of 4 (sometimes 2), up to 5 × 2 cm, ovate-oblong, pubescent beneath. Flowers white, in dichotomously branched cymes. Capsules up to 3 × 3 mm, hemispheric, crowned with calyx-lobes; seeds brown, ovoid-globose, pitted.

*Fl. & Fr.*: Sept.- Nov.

In moist places as undergrowth in forests. Sparse.

Bijapur Ghati, 16247; Madded; Kutru; Pharsegarh; Kerpe Valley.

## ASTERACEAE

- |   |   |
|---|---|
| 1a. Shrubs, 3-4 m tall                                | 5. CHROMOLAENA<br>( <i>C. odorata</i> ) |
| 1b. Herbs, up to 1.5 m tall :                         |   |
| 2a. Involucral bracts spiny or prickly :              |   |
| 3a. Leaves sessile, lamina entire                     | 1. ACANTHOSPERMUM                       |
| 3b. Leaves petioled, lamina lobed                     | 18. XANTHIUM                            |
| 2b. Involucral bracts without<br>spines or prickles : |   |
| 4a. Plants white-woolly                               | 11. GNAPHALIUM                          |
| 4b. Plants not white-woolly :                         |   |
| 5a. Stem with toothed wings                           | 14. SPHAERANTHUS                        |

## 5b. Stem not winged :

6a. Leaves bipinnatifid 7. CYATHOCLINE

## 6b. Leaves not as above :

7a. Heads compound, of  
a cluster of heads 9. ELEPHANTOPUS

## 7b. Heads simple :

8a. Leaves opposite or  
upper alternate :9a. Heads with tubular  
florets only 2. AGERATUM9b. Heads with both tubular  
and ligulate florets :

10a. Heads white 8. ECLIPTA

## 10b. Heads yellow :

11a. Procumbent herbs;  
receptacle not elongate 16. TRIDAX11b. Erect herbs;  
receptacle elongate 15. SPILANTHES

## 8b. Leaves alternate :

12a. Outer florets ligulate,  
inner tubular 13. PENTANEMA

## 12b. Florets all tubular :

13a. Pappus a short tube 12. GRANGEA

- 13b. Pappus of many hairs or bristles :
- 14a. Involucral bracts 1-2-seriate :
- 15a. Involucral bracts  
1-seriate 10. EMILIA
- 15b. involucral bracts  
2-seriate 6. CRASSOCEPHALUM
- 14b. Involucral bracts many seriate :
- 16a. All florets bisexual  
and of same type 17. VERNONIA
- 16b. Marginal florets usually female,  
inner usually bisexual with its  
corolla different from that of the  
marginal florets :
- 17a. Anther-cells with a filiform  
basal appendage 3. BLUMEA
- 17b. Anther-cells  
without appendage 4. BLUMEOPSIS
1. ACANTHOSPERMUM Schrank

**Acanthospermum hispidum** DC., Prodr. 5 : 522. 1836.

Dichotomously branched, hispid herbs, up to 50 cm tall. Leaves up to 4.5 × 2.5 cm, obovate or obovate-spathulate, acute, base cuneate, margin serrate-dentate. Heads yellow, up to 2 cm across, in forks of cyme-branches. Achenes compressed with 2 horn-like spines at the apex.

*Fl. & Fr.*: Aug.- Feb.

In the vicinity of forests and edges of ponds. Sparse.

Bijapur Ghati, 16422.

## 2. AGERATUM L.

*Ageratum conyzoides* L., Sp. Pl. 839. 1753; Hook. f., Fl. Brit. India 3 : 243. 1881.

Annual herbs, up to 50 cm tall. Leaves up to 7.5 × 5 cm, ovate-rhomboid, obtuse or acute, base truncate or sub-cordate, margin crenate. Heads 4-6 mm across, white or violet, in terminal corymbs; involucre bracts 2-3-seriate; anthers appendaged at the apex. Achenes oblong, 5-angled; pappus of 5 paleaceous, serrate scales, aristate at the tip.

*Fl. & Fr.*: Oct.- Feb.

In waste lands and in the vicinity of forests. Very common.

Bijapur Ghati, 16396A.

## 3. BLUMEA DC.

- |   |                        |
|---|------------------------|
| 1a. Prostrate or decumbent herbs            | 4. <i>B. oxyodonta</i> |
| 1b. Erect herbs :                           |                        |
| 2a. Corolla pink                            | 3. <i>B. mollis</i>    |
| 2b. Corolla yellow :                        |                        |
| 3a. Heads glomerulate in interrupted spikes | 1. <i>B. fistulosa</i> |
| 3b. Heads paniculate                        | 2. <i>B. lacera</i>    |

**1. *Blumea fistulosa*** (Roxb.) Kurz in Journ. As. Soc. Beng. 46(2) : 187. 1877. *Conyza fistulosa* Roxb., Fl. Ind. 3 : 429. 1832; *Blumea glomerata* DC. in Wight, Contrib. 15. 1834; Hook.f., Fl. Brit. India 3 : 262. 1881.

Erect herbs, up to 1.25 m tall. Leaves up to 12.5 × 5 cm, oblong-lanceolate or broadly oblanceolate, margin incised or coarsely

serrate-dentate. Heads up to 5 mm across, sessile, in globose clusters, in interrupted spikes; bracts purple. Achenes 4-angled, ribbed, sparsely hairy.

*Fl. & Fr.*: Dec.- Mar.

In the vicinity of dry and moist deciduous forests. Common.

Pharsegarh, 15521; Kerpe; Netikakler; Bijapur Ghati; Kandlaparti.

**2. *Blumea lacera*** (Burm.f.) DC. in Wight, Contrib. 14. 1834; Hook.f., Fl. Brit. India 3 : 263. 1881. *Conyza lacera* Burm.f., Fl. Ind. 180. t.59. f.1. 1768.

Aromatic, viscid, erect herbs, up to 1 m tall. Leaves up to 5.5 × 2.5 cm, obovate-oblong or elliptic-oblong, margin entire or serrate, glandular-hairy. Heads yellow, 4-6 mm across, in short panicles; involucre bracts linear, glandular-hairy. Achenes terete or sub-tetragonous, hairy.

*Fl. & Fr.*: Oct.- Feb.

In waste lands and forest-undergrowth.

Pharsegarh, 15517; Bhopalpatnam; Netikakler.

**3. *B. mollis*** (D. Don) Merr. in Philipp., Journ. Sci. (Bot.) 5 : 395. 1910. *Erigeron molle* D. Don, Prodr. 172. 1825. *Blumea wightiana* DC. in Wight, Contrib. 14. 1834; Hook.f., Fl. Brit. India 3 : 261. 1881.

Aromatic herbs, up to 50 cm tall. Leaves up to 8 × 3 cm, elliptic or obovate, rounded or acute, base cuneate, margin coarsely-serrate. Heads 4-6 mm across, in terminal, spiciform panicles; involucre bracts reflexed, linear. Achenes 4-5-angled, pubescent; pappus 1-seriate, white.

*Fl. & Fr.*: Oct.- Feb.

In shaded places as undergrowth in forests. Common.

Pharsegarh, 15514.

**4. *Blumea oxyodonta* DC.** in Wight, Contrib. 15. 1834; Hook.f., Fl. Brit. India 3 : 266. 1881.

Herbs, branches prostrate or decumbent. Leaves near the base of stem up to 10 × 5 cm, obovate-oblong, rounded at the apex, margin serrate with spinulose teeth; leaves on branches up to 3 × 2 cm, obovate, silky-hairy. Heads yellow, in axillary and terminal corymbs, up to 1 cm across. Achenes puberulous.

*Fl. & Fr.*: Feb.- May.

Very common in waste lands.

Bijapur, 16210; Kutru.

#### 4. BLUMEOPSIS Gagnep.

***Blumeopsis flava* (DC.) Gagnep.** in Bull. Mus. Hist. Nat. Paris 26 : 76. 1920. *Blumea flava* DC., Prodr. 5 : 439. 1836. *Laggera flava* (DC.) Benth. in Benth. & Hook.f., Gen. Pl. 2 : 290. 1873; Hook.f., Fl. Brit. India 3 : 270. 1881.

Annual herbs, up to 50 cm tall. Lower leaves in rosettes, obovate or oblanceolate; cauline leaves smaller, lanceolate. Heads yellow, up to 3.5 mm across, in corymbose panicles; involucrel bracts many seriate. Achenes ribbed; pappus hairs white.

*Fl. & Fr.*: Dec.-Mar.

In forests-undergrowth. Abundant.

Pharsegarh, 15519.

#### 5. CHROMOLAENA DC.

***Chromolaena odorata* (L.) King & Robinson** in Phytologia 20 : 204. 1970. *Eupatorium odoratum* L., Syst. Nat. ed. 10. 1205. 1759; Hook.f., Fl. Brit. India 3 : 244. 1881.



Shrubs, up to 4 m tall. Leaves up to 9 × 4.5 cm, ovate-rhomboid, acute or subacuminate, base cuneate, margin crenate-serrate, 3-nerved at the base. Heads purple, in terminal corymbs; involucre bracts many seriate. Achenes oblong, 5-angled; pappus 1-seriate, denticulate, white.

*Fl. & Fr.*: Nov.- Feb.

Along forest-roads. Abundant.

Saknapalli (Kutru-Bijapur road), 15587.

#### 6. CRASSOCEPHALUM Moench

**Crassocephalum crepidioides** (Benth.) S. Moore in Journ. Bot. 50 : 211. 1912. *Gynura crepidioides* Benth. in Hook., Fl. Niger 438. 1849.

Annual herbs, up to 1 m tall. Leaves up to 17 × 5 cm, elliptic-lanceolate, entire or lobed, acute or acuminate, base attenuate, margin crenate-serrate. Heads purple, in terminal corymbs; involucre bracts 1-2-seriate. Achenes ribbed; pappus hairs silky, denticulate, white.

*Fl. & Fr.*: Dec.- Feb.

Along banks of rivers and ponds. Common.

Kutru, 15503.

#### 7. CYATHOCLINE Cass.

**Cyathocline purpurea** (Buch.- Ham. ex D. Don) O. Ktze., Rev. Gen. Pl. 1 : 338. 1891. *Tanacetum purpureum* Buch.- Ham. ex D. Don, Prodr. 181. 1825. *Cyathocline lyrata* Cass. in Ann. Sci. Nat. ser. 1. 17: 420. 1829; Hook.f., Fl. Brit. India 3 : 246. 1881.

Aromatic, annual herbs, up to 60 cm tall. Leaves up to 15 cm long, pinnatisect, segments serrate-dentate to lobed. Heads 2-4 mm across, purple, in terminal, corymbose panicles; bracts 2-seriate. Achenes ovoid

or oblong; pappus absent.

*Fl. & Fr.*: Dec.-Feb.

Along river-banks. Abundant.

Somanpalli nala (Pharsegarh), 16122.

#### 8. ECLIPTA L.

*Eclipta alba* (L.) Hassk., Pl. Jav. Rar. 528. 1848; Hook.f., Fl. Brit. India 3 : 304. 1881. *Verbesina alba* L., Sp. Pl. 902. 1753.

'*Bhringraj*'

Prostrate or erect herbs. Leaves up to 5 × 2 cm, elliptic, oblong or lanceolate, appressed hairy, acute. Heads white, axillary, up to 1 cm across; bracts 2-seriate. Achenes cuneate, compressed, minutely toothed at the apex; pappus absent.

*Fl. & Fr.*: All seasons.

In moist, waste places. Common.

Bijapur 16390.

Plant-sap is used to stop hair-fall and in fever.

#### 9. ELEPHANTOPUS L.

*Elephantopus scaber* L., Sp. Pl. 814. 1753; Hook. f., Fl. Brit. India 3 : 242. 1881.

'*Punjki*'

Perennial herbs, up to 75 cm tall. Leaves sessile, radical, up to 25 × 7.5 cm, oblanceolate, sub-acuminate, base cuneate, margin entire or serrate. Florets purple, in compound heads, up to 2.5 × 1 cm, subtended by 3, ovate-deltoid, cordate bracts. Achenes oblong, truncate, finely 10-ribbed, pubescent; pappus 1-seriate, rigid, white.

*Fl. & Fr.*: Sept.- Dec.

In moist places as forest-undergrowth. Common.

Madded, 16609; Bijapur Ghati; Kerpe Valley; Kutru.

Plant is relished by herbivores.

#### 10. EMILIA Cass.

**Emilia sonchifolia** (L.) DC. in Wight, Contrib. 24. 1834; Hook.f., Fl. Brit. India 3 : 336. 1881. *Cacalia sonchifolia* L., Sp. Pl. 835. 1753.

Erect herbs, up to 20 cm tall. Leaves variable, up to 8 × 3.5 cm; radical leaves simple, lyrate-pinnatifid or lobed; upper cauline leaves lanceolate or oblong-lanceolate, margin entire or dentate, base auricled. Heads pink, solitary or in terminal, lax corymbs. Achenes oblong, 5-ribbed, hairy on the ribs; pappus white.

*Fl. & Fr.*: Oct.- Feb.

Common as forest-undergrowth.

Bijapur Ghati, 16645; Pharsegarh.

#### 11. GNAPHALIUM L.

**Gnaphalium polycaulon** Pers., Syn. Pl. 2 : 421. 1807. *G. indicum auct. non L.* 1753; Hook.f., Fl. Brit. India 3 : 289. 1881.

Woolly, annual herbs, up to 15 cm tall. Leaves up to 3 × 1.5 cm, oblanceolate, woolly. Heads yellow, 2-4 mm across, in clusters, on terminal, leafy-spikes; involucre bracts many seriate, outer woolly, inner glabrous. Achenes oblong, papillose; pappus hairs 1-seriate, white.

*Fl. & Fr.*: Feb.- May.

Along river-banks. Common.

Indravati river, 16315.

## 12. GRANGEA Adans.

**Grangea maderaspatana** (L.) Poir. in Lam., Encycl. 2 : 825. 1811; Hook.f., Fl. Brit. India 3 : 247. 1881. *Artemisia maderaspatana* L., Sp. Pl. 849. 1753.

Prostrate, annual herbs; branches spreading from the centre, up to 15 cm long. Leaves up to 5 × 2 cm, pinnatifid, serrate-dentate, pubescent. Heads yellow, globular, ca 1 cm across, 1-2, on leaf-opposed peduncles. Achenes sub-terete, glandular; pappus tubular with ciliate mouth.

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

Common in river-beds.

Indravati river, 16306.

## 13. PENTANEMA Cass.

**Pentanema indicum** (L.) King in Acta Phytotax. Sinica 10 : 179. 1965. *Inula indica* L., Sp. Pl. ed. 2. 1236. 1762. *Vicoa indica* (L.) DC. in Wight, Contrib. 10. 1834. *V. auriculata* Cass. in Ann. Sci. Nat. ser. 1. 17 : 418. 1829; Hook.f., Fl. Brit. India 3 : 297. 1881.

Erect herbs, up to 50 cm tall. Leaves sessile, up to 5.5 × 2 cm, oblong-lanceolate, acute, base auricled. Heads bright yellow, up to 1.5 cm across, solitary or in terminal panicles. Achenes oblong, terete, hairy; pappus 1-seriate, white.

*Fl. & Fr.*: Dec.- Apr.

In dry and moist deciduous forests and mixed teak forests.

Pharsegarh, 15510; Pillure; Netikakler; Kerpe; Kandlaparti.

## 14. SPHAERANTHUS L.

**Sphaeranthus indicus** L., Sp. Pl. 927. 1753; Hook.f., Fl. Brit. India 3 : 275. 1881 *p.p.*

Aromatic, viscid, prostrate or ascending herbs; branches with toothed wings. Leaves up to 7 × 2 cm, obovate or oblong, rounded or obtuse-mucronate, base narrowed, margin dentate. Compound heads 1-2 cm across, purple; bracts many, lanceolate, margin toothed. Achenes oblong or obovate, subglabrous or glandular-hairy; pappus absent.

*Fl. & Fr.*: Oct.- Feb.

In waste lands, fallow fields and stream-beds. Common.

Pharsegarh, 15523; Bhopalpatnam; Pasewada; Kutru; Dudepalli.

#### 15. SPILANTHES Jacq.

*Spilanthus calva* DC. in Wight, Contrib. 19. 1834; *S. acmella auct. non* (L.) Murr.; Hook.f., Fl. Brit. India 3 : 307. 1881.

Prostrate or ascending, annual herbs. Leaves up to 3.5 × 2 cm, ovate-lanceolate, acute, base cuneate, margin crenate. Heads yellow, up to 8 mm across, solitary, terminal; involucre bracts ovate-elliptic or oblong-lanceolate. Achenes oblong, dorsally compressed; pappus absent.

*Fl. & Fr.*: Oct.- Feb.

In moist, shaded places along river-banks.

Indravati river (Pasewada), 15572.

#### 16. TRIDAX L.

*Tridax procumbens* L., Sp. Pl. 900. 1753; Hook.f., Fl. Brit. India 3 : 311. 1881.

Prostrate or ascending, branched, perennial herbs. Leaves up to 5.5 × 3 cm, ovate-elliptic or oblong, acute, margin toothed or lobed, glandular-hairy on both surfaces. Heads solitary on 15-30 cm long peduncles. Achenes black, oblong, sericeous.

*Fl. & Fr.*: All seasons.

In waste lands and in the vicinity of forests.

Itpal forests, 16238; Bijapur.

### 17. *VERNONIA* Schreb.

*Vernonia cinerea* (L.) Less. in *Linnaea* 4 : 291. 1829; Hook.f., *Fl. Brit. India* 3 : 233. 1881. *Conyza cinerea* L., *Sp. Pl.* 862. 1753.

Annual herbs, up to 50 cm tall. Leaves variable, up to 5.5 × 2.5 cm, ovate-elliptic or lanceolate, acute or obtuse, base attenuate, margin entire or dentate. Heads violet or pink, in terminal, paniculate cymes; involucre bracts 3-4-seriate. Achenes obovate, appressed silky hairy; pappus 2-seriate, white.

*Fl. & Fr.*: Oct.- Mar.

Very common along roadsides and in the vicinity of forests.

Bijapur, 16396B; Pharsegarh; Netikakler.

### 18. *XANTHIUM* L.

*Xanthium indicum* Koen. in *Roxb., Fl. Ind.* 3 : 601. 1832. *X. strumarium* L., *Sp. Pl.* 987. 1753; Hook.f., *Fl. Brit. India* 3 : 303. 1881.

'Gukhru', 'Usri'

Branched, annual herbs, up to 1.5 m tall. Leaves up to 12.5 × 10 cm, ovate-triangular, acute, base cuneate, margin entire or crenate, 3-lobed, glandular. Heads greenish-yellow, monoecious, in leaf-axils; bracts of female heads connate, forming an involucre covered with hooked spines and tipped by 2 spinescent hooks. Achenes 2, oblong-ovoid, enclosed within spinescent involucre; pappus absent.

*Fl. & Fr.*: Oct.- Mar.

In waste lands and near habitations. Common.

Pasewada, 15562.

Leaves are grazed by herbivores.

### CAMPANULACEAE

- |  |                 |
|--|-----------------|
| 1a. Corolla zygomorphic; anthers connate | 1. LOBELIA      |
| 1b. Corolla actinomorphic; anthers free  | 2. WAHLENBERGIA |

#### 1. LOBELIA L.

- |   |                         |
|---|-------------------------|
| 1a. Seeds trigonous                             | 1. <i>L. alsinoides</i> |
| 1b. Seeds ellipsoid, more<br>or less compressed | 2. <i>L. heyneana</i>   |

**1. *Lobelia alsinoides* Lam., Encycl. 3 : 588. 1791. *L. trigona* Roxb., Fl. Ind. 2 : 111. 1824; Clarke in Hook.f., Fl. Brit. India 3 : 423. 1881.**

Erect or ascending herbs, up to 25 cm tall; stem trigonous. Leaves up to 2.2 × 1 cm, ovate or oblong, acute, margin crenate. Flowers violet, solitary, axillary; corolla 4-6 mm long, 2-lipped; anthers penicillate at the apex. Capsules ellipsoid, 2-valved, dehiscent; seeds yellow.

*Fl. & Fr.*: Sept.- Nov.

In wet grassy-fields. Abundant.

Bijapur Ghati, 16497.

**2. *L. heyneana* Schult. in Roem. & Schult., Syst. Veg. 5 : 50. 1819. *L. trialata* Buch.- Ham. ex D. Don, Prodr. Fl. Nep. 157. 1825; Clarke in Hook.f., Fl. Brit. India 3 : 425. 1881.**

Annual herbs, up to 20 cm tall; stem trigonous. Leaves up to 2.3 × 1.6 cm, ovate, elliptic or lanceolate, margin crenate-serrate. Flowers white or violet, solitary; corolla 4-6 mm long, 2-lipped; only 2 anthers penicillate at the apex. Capsules obconical, 2-valved; seeds yellow.

*Fl. & Fr.*: Sept.- Oct.

In moist, shaded places as undergrowth in moist deciduous forests.  
Sparse.

Bijapur Ghati, 16467.

## 2. WAHLENBERGIA Schrad. ex Roth

**Wahlenbergia marginata** (Thunb.) A. DC., Monogr. Camp. 143. 1830. *Campanula marginata* Thunb., Fl. Jap. 89. 1784. *C. gracilis* Forst., Prodr. 15. 1786. *Wahlenbergia gracilis* (Forst.) A. DC., Monogr. Camp. 142. 1830; Clarke in Hook.f., Fl. Brit. India 3 : 429. 1881.

Perennial, branched herbs, up to 25 cm tall. Leaves sessile, up to 3 × 0.6 cm, linear-lanceolate, margin entire or slightly toothed. Flowers violet, solitary or in few flowered cymose panicles; corolla up to 9 mm long, campanulate, lobes ovate or elliptic; filaments broadened at the base. Capsules obconical, 3-valved; seeds ellipsoid.

*Fl. & Fr.*: Dec.- Feb.

In river-beds. Common.

Indravati river (Pasewada), 15568.

## MYRSINACEAE

### EMBELIA Burm.f.

**Embelia basaal** (Roem. & Schult.) A. DC. in Trans. Linn. Soc. Lond. 17 : 131. 1837. *Ardisia basaal* Roem. & Schult., Syst. Veg. 4 : 517. 1819. *Embelia robusta* sensu Clarke in Hook.f., Fl. Brit. India 3 : 515. 1882 *p.p.* quoad *E. basaal* in syn.

Shrubs or small trees, up to 4 m tall. Leaves up to 10.5 × 5.5 cm, elliptic or elliptic-obovate, subacuminate, base cuneate, margin entire or



serrate, glabrous above, more or less rusty-pubescent beneath. Flowers white or greenish-white, in axillary racemes; sepals glandular; petals papillose inside. Drupes red, globose with persistent style forming a beak, 1-seeded.

*Fl. & Fr.*: Aug.- Nov.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16439.

### SAPOTACEAE

- |                                  |              |
|----------------------------------|--------------|
| 1a. Sepals 4; staminodes absent  | 1. MADHUCA   |
| 1b. Sepals 6; staminodes present | 2. MANILKARA |

#### 1. MADHUCA Gmel.

**Madhuca longifolia** (Koen.) Mac Br. var. **latifolia** (Roxb.) Chev. in Rev. Bot. Appl. 23 : 149. 1943. *Bassia latifolia* Roxb., Pl. Cor. 1 : 20. t.19. 1795; Clarke in Hook.f., Fl. Brit. India 3 : 544. 1882.

*'Idukmara', 'Mahua', 'Moda'*

Trees, up to 20 m tall; bark black, fissured. Leaves clustered at the tips of branches, up to 17.5 × 10 cm, broadly elliptic, acute or subacuminate, coriaceous. Flowers white or cream coloured, fascicled at the tips of branches; pedicels and calyx brown-tomentose; stamens 20-30 in 3-whorls. Berries ovoid; seeds ellipsoid.

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

In dry deciduous and mixed teak forests. Common.

Kodepalli, 16262; Pharsegarh; Pengunda; Dudepalli; Kutru; Bijapur.

Dried flowers are eaten raw or dried and cooked; also used for preparing a liquor. Seeds oil is used in cooking.

## 2. MANILKARA Adans.

**Manilkara hexandra** (Roxb.) Dub. in Ann. Inst. Bot.- Goel. Colon. Marseille 23 : 10. t.2. 1915. *Mimusops hexandra* Roxb., Pl. Cor. 1 : 16. t.15. 1795; Clarke in Hook.f., Fl. Brit. India 3 : 549. 1882.

Evergreen trees, up to 8 m tall; bark light black. Leaves clustered near the tips of branches, up to 10 × 4.5 cm, elliptic-obovate, apex rounded or emarginate, coriaceous. Flowers white, soliatry or fascicled; sepals brown-tomentose; petals with a pair of petaloid appendage; stamens 6, staminodes 6. Berries yellow, ellipsoid-oblong.

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

In dry evergreen forests, along the banks of rivers and streams. Not common.

Jalavagu nala (Kandlaparti), 16284.

Ripe fruits are edible.

## EBENACEAE

### DIOSPYROS L.

- 1a. Leaves glabrous :
  - 2a. Leaves with prominent, reticulate venation; stamens usually 40 1. *D. malabarica*
  - 2b. Leaves with obscure, reticulate venation; stamens 13-22 4. *D. sylvatica*
- 1b. Leaves pubescent or tomentose :

3a. Staminodes 8-10; styles 2

2. *D. melanoxyton*

3b. Staminodes 4; styles 4

3. *D. montana*

1. ***Diospyros malabarica*** (Desr.) Kostel., All. Med. Pharm. Fl. 3 : 709. 1834. *Garcinia malabarica* Desr. in Lam., Encycl. 3 : 701. 1792. *Diospyros embryopteris* Pers., Syn. Pl. 2 : 624. 1807; Clarke in Hook.f., Fl. Brit. India 3 : 556. 1882.

'Kidindi', 'Tirka'

Trees, up to 10 m tall. Leaves up to 20 × 5.5 cm, oblong, obtuse or acute, coriaceous. Flowers white, fragrant, 4-merous. Male flowers in umbellate cymes. Female flowers solitary, axillary, drooping; styles 4. Berries up to 5 cm across, globose, covered with brown deciduous scurf, fruiting calyx reflexed.

*Fl.*: Mar.- Apr.; *Fr.*: May-Sept.

Common along water-courses.

Pharsegarh, 16292; Dudepalli.

Fruits used as a fish-poison.

2. ***D. melanoxyton*** Roxb., Pl. Cor. 1 : 36. t.46. 1795; Clarke in Hook.f., Fl. Brit. India 3 : 564. 1882.

'Tendu'

Deciduous trees, up to 8 m tall; bark black, fissured; young parts brown-tomentose. Leaves alternate or sub-opposite, up to 15 × 6.5 cm, elliptic-oblong, subacute or obtuse, pubescent beneath. Male flowers 4-6-merous, in drooping cymes, stamens 10-20. Female flowers solitary, axillary or from the axils of fallen leaves, 4-5-merous. Berries up to 3.5 cm across, globose, with persistent, reflex-margined calyx, yellow on ripening.

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

In dry deciduous forests. Very common.

Bhopalpatnam, 16272; Dudepalli; Pharsegarh; Pengunda.

Leaves are used in 'bidi' industry for wrapping tobacco. Ripe fruits are delicious.

**3. *Diospyros montana* Roxb., Pl. Cor. 1 : 37. t.48. 1795; Clarke in Hook.f., Fl. Brit. India 3 : 555. 1882 *p.p.***

Trees, up to 10 m tall; bark black. Leaves up to 9.5 × 5 cm, ovate-oblong or elliptic-oblong, subacute, base rounded or subcordate. Male flowers white, in few flowered cymes; stamens 8 + 8, anthers awned. Female flowers green or yellow, solitary, axillary. Berries up to 2.5 cm across, globose, greenish-yellow; persistent calyx-lobes accrescent, flat.

*Fl & Fr.*: May-Sept.

Along stream-banks, in forests. Sparse.

Pharsegarh, 16293.

Wood is used for making ornamental furniture.

**4. *D. sylvatica* Roxb., Pl. Cor. 1 : 37. t.47. 1795; Clarke in Hook.f., Fl. Brit. India 3 : 559. 1882.**

Trees, up to 6 m tall; bark ash-coloured. Leaves up to 11.5 × 4.5 cm, elliptic, acute or subacuminate, turning black on drying. Male flowers usually 4-merous, in axillary, peduncled cymes; stamens 13-22, often paired. Female flowers solitary, 3-4-merous, styles 3-4, staminodes 4. Berries up to 2 cm across, globose with persistent, flat, accrescent calyx.

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

In moist deciduous forests. Common.

Itpal forest, 16239.

## OLEACEAE

- 1a. Leaves simple; capsules suborbicular, compressed; seeds not winged 1. NYCTANTHES
- 1b. Leaves compound; capsules pyriform, turgid; seeds winged 2. SCHREBERA

## 1. NYCTANTHES L.

*Nyctanthes arbor-tristis* L., Sp. Pl. 6. 1753; Clarke in Hook.f., Fl. Brit. India 3 : 603. 1882.

'Harsingar'

Trees, up to 8 m tall; bark grey. Leaves up to 10.5 × 5 cm, ovate, acute or acuminate, margin distantly toothed, scabrous above, pubescent beneath. Flowers fragrant, in axillary and terminal 3-chotomous cymes; corolla-tube orange-coloured, lobes white. Capsules up to 1.8 × 2 cm, 2-celled; seeds flat, 1 in each cell.

*Fl. & Fr.*: Oct.- Dec.

In deciduous forests. Sparse.

Bijapur Ghati, 16431.

Flowers yield an orange-coloured dye.

## 2. SCHREBERA Roxb.

*Schrebera swietenoides* Roxb., Pl. Cor. 2 : 1. t.101. 1799; Clarke in Hook.f., Fl. Brit. India 3 : 604. 1882.

'Karanji', 'Mokha'

Trees, up to 15 m tall; bark grey. Leaves imparipinnate; leaflets 7-9, up to 10.5 × 4 cm, ovate or oblong, subacuminate or acuminate. Flowers white, in terminal, 3-chotomous cymes. Capsules pendulous, up to 5.5 × 3 cm, obovoid, woody, brown, white speckled, 2-celled; seeds brown, oblong, winged, 3-4 in each cell.

*Fl.*: May; *Fr.*: Jan.- Apr.

In dry deciduous forests. Sparse.

Dudepalli, 16346.

### APOCYNACEAE

- |  |                |
|--|----------------|
| 1a. Climbers   | 2. ICHNOCARPUS |
| 1b. Trees or shrubs :                                    |                |
| 2a. Anthers exserted; corolla<br>with a corona of scales | 3. WRIGHTIA    |
| 2b. Anthers included; corolla<br>without corona          | 1. HOLARRHENA  |

#### 1. HOLARRHENA R. Br.

**Holarrhena pubescens** (Buch.- Ham.) Wall. ex G. Don, Gen. Syst. 4 : 78. 1838. *Echites pubescens* Buch.- Ham. in Trans. Linn. Soc. Lond. 13 : 524. 1822. *Holarrhena antidysenterica* sensu Wall., Num. List. No. 1672. 1829 *non* (L.) Wall.; sensu Hook.f., Fl. Brit. India 3 : 654. 1882.

'Kuddai', 'Pale'

Shrubs or trees, up to 6 m tall; bark grey, smooth. Leaves up to 22.5 × 10 cm, broadly ovate or ovate-elliptic, obtuse or acute. Flowers white, fragrant, in terminal, corymbose cymes. Follicles up to 25 cm long, cylindrical with lenticels; seeds linear-oblong, comose at the apex.

*Fl.*: May; *Fr.*: Sept.- Mar.

In dry deciduous forests. Very common.

Bijapur Ghati, 16212; Pharsegarh; Kutru.

Bark is very efficacious in cure of dysentery.

## 2. ICHNOCARPUS R. Br.

**Ichnocarpus frutescens** (L.) R. Br. in Ait., Hort. Kew. ed.2. 2 : 69. 1811; Hook.f., Fl. Brit. India 3 : 669. 1882. *Apocynum frutescens* L., Sp. Pl. 213. 1753.

Woody, profusely branched climbers; branches rusty-tomentose. Leaves up to 9.5 × 3.5 cm, elliptic-oblong, acute or sub-acuminate. Flowers white, in axillary and terminal panicles; corolla-lobes twisted. Follicles up to 12.5 cm long, slender; seeds comose.

*Fl. & Fr.*: Sept.- Dec.

Over small trees, in dry deciduous forests. Common.

Kutru, 16699; Pharsegarh; Chinger.

## 3. WRIGHTIA R. Br.

**Wrightia tinctoria** (Roxb.) R. Br. in Mem. Wiern. Nat. Hist. Soc. 1 : 47. 1811; Hook.f., Fl. Brit. India 3 : 653. 1822. *Nerium tinctorium* Roxb., Orient. Repert. 1 : 39. 1791.

*'Kuddi'*

Trees, up to 6 m tall; bark smooth, ash-coloured. Leaves up to 15.5 × 5 cm, elliptic-oblong or lanceolate, sub-acuminate or acuminate, base rounded or acute. Flowers white, in terminal cymes; corona-scales divided into linear segments. Follicles up to 40 cm long, curved, united at the apex; seeds comose at the base.

*Fl. & Fr.*: Jan.- Apr.

Frequent in dry deciduous forests.

Kutru, 15586; Bijapur Ghati; Bhopalpatnam.

## ASCLEPIADACEAE

- |                              |                |
|------------------------------|----------------|
| 1a. Follicles echinate       | 4. PERGULARIA  |
| 1b. Follicles not echinate : |                |
| 2a. Shrubs                   | 1. CALOTROPIS  |
| 2b. Twiners :                |                |
| 3a. Corolla-lobes valvate    | 3. HEMIDESMUS  |
| 3b. Corolla-lobes imbricate  | 2. CRYPTOLEPIS |

## 1. CALOTROPIS R. Br.

**Calotropis gigantea** (L.) R. Br. in Ait., Hort. Kew. ed. 2. 2 : 78. 1811; Hook.f., Fl. Brit. India 4 : 17. 1883. *Asclepias gigantea* L., Sp. Pl. 214. 1753.

*'Jeeludi'*, *'Phunder'*

Shrubs, up to 2.5 m tall. Leaves sessile or sub-sessile, up to 15 × 8 cm, ovate-oblong, elliptic or obovate, acute, base cordate, glaucous. Flowers white with violet tinge, in umbellate cymes; buds ovoid. Follicles up to 12.5 × 4 cm, ventricose, paired, recurved; seeds ovate, margined, comose.

*Fl. & Fr.*: Apr.- Oct.

Along banks of streams and in waste lands. Sparse.

Itpal forest, 16254.

Latex and root-bark are used as a medicine. Silky-floss from seeds is used for stuffing pillows.

## 2. CRYPTOLEPIS R. Br.

**Cryptolepis buchanani** Roem. & Schult., Syst. Veg. 4 : 409. 1819; Hook.f., Fl. Brit. India 4 : 5. 1883.

*'Indrajao'*



Twiners. Leaves up to 12.5 × 6 cm, elliptic-oblong, apiculate, whitish beneath. Flowers cream coloured, in cymes; corolla-lobes linear-lanceolate, corona clavate. Follicles up to 10 cm long, divaricate, terete; seeds brown or black, ovate-oblong, coma up to 3 cm long.

*Fl. & Fr.*: May-Dec.

In forests over small trees. Sparse.

Bijapur Ghati, 16215.

### 3. HEMIDESMUS R. Br.

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

'Tatdi'

Twiners. Leaves opposite or in whorls of 4, up to 10 × 2.5 cm, variable, elliptic, elliptic-oblong or linear, apiculate. Flowers greenish-purple, in axillary, opposite or crowded, subsessile cymes; corolla-lobes green without, purple within; corona-scales 5, arising below the sinuses. Follicles up to 17.5 cm long, slender, terete; seeds oblong, ending in a long, white, silky coma.

*Fl. & Fr.*: Sept.- Dec.

In dry and moist deciduous forests. Common.

Bijapur Ghati, 16419; Pharsegarh; Kutru; Kerpe.

Roots are medicinal.

### 4. PERGULARIA L.

*Pergularia daemia* (Forsk.) Chiov. in Result. Sci. Miss. Sefan-Paoli Somal. Ital. 1 : 115. 1916; Saxena & Khotele in Journ. Bombay

Nat. Hist. Soc. 73 : 26. 1976. *Asclepias daemia* Forsk., Fl. Aegpt.-Arab. 51. 1775. *Cynanchum extensum* Jacq., Misc. 2 : 353. 1782. *Daemia extensa* (Jacq.) R. Br. in Ait., Hort. Kew. ed. 2. 2 : 76. 1811; Hook.f., Fl. Brit. India 4 : 20. 1883.

Hirsute twiners. Leaves up to 12 × 10 cm, ovate or suborbicular, acuminate, base deeply cordate. Flowers greenish-white, cymose; corolla lobes ovate-oblong, ciliate; corona 2-seriate. Follicles up to 8 × 1.5 cm, paired, lanceolate, beaked, echinate; seeds ovate, truncate, velvety-pubescent, coma up to 3 cm long.

*Fl. & Fr.*: Aug.- Jan.

Over bushes. Sparse.

Bhopalpatnam (Saxena & Khotele *l.c.*).

#### LOGANIACEAE

- |                      |                |
|----------------------|----------------|
| 1a. Flowers 5-merous | 1. CYNOCOTONUM |
| 1b. Flowers 4-merous | 2. MITRASACME  |

#### 1. CYNOCOTONUM Gmel.

*Cynocotnum mitreola* (L.) Britt. in Mem. Torr. Bot. Cl. 5 : 258. 1894. *Ophiorrhiza mitreola* L., Sp. Pl. 150. 1753. *Mitreola oldenlandioides* G. Don, Gard. Dict. 4 : 172. 1837; Clarke in Hook.f., Fl. Brit. India 4 : 79. 1883.

Annual herbs, up to 20 cm tall. Leaves up to 5.5 × 2.5 cm, elliptic-ovate or lanceolate, membranous, acute or acuminate, base decurrent. Flowers white, unilateral, in 2-3-chotomous, terminal or axillary cymes; corolla 1-2 mm long, urceolate. Capsules laterally compressed, 2-horned; seeds many, oblong.

*Fl. & Fr.*: Aug.- Oct.

On moist, shaded rock-boulders. Abundant.

Bijapur Ghati, 16460; Madded.

## 2. MITRASACME Labill.

**Mitrasacme indica** Wight, Ic. 4 : 15. t.1601. 1850. *M. alsinoides* Clarke in Hook.f., Fl. Brit. India 4 : 80. 1883. *non* R. Br. 1810.

Slender, annual herbs, up to 15 cm tall. Leaves up to 9 × 1.5 mm, linear or linear-oblong, 1-nerved, sheathing at the base. Flowers white, axillary, 1-3 together on filiform pedicels; corolla 2-3.5 mm long, campanulate. Capsules *ca* 2 mm across, 2-horned at the apex.

*Fl. & Fr.*: Sept.- Oct.

In marshy habitats. Abundant.

Kutru, 16103.

## GENTIANACEAE

- |  |                          |
|--|--------------------------|
| 1a. Terrestrial herbs; leaves<br>opposite; flowers irregular | 1. CANSCORA              |
| 1b. Aquatic herbs; leaves<br>alternate; flowers regular      | 2. NYMPHOIDES            |
| 1. CANSCORA Lam.   |                          |
| 1a. Calyx prominently winged                                 | 2. <i>C. decussata</i>   |
| 1b. Calyx not winged :                                       |                          |
| 2a. Stem 4-angled  | 3. <i>C. diffusa</i>     |
| 2b. Stem 4-winged :  |                          |
| 3a. Central flower of the<br>cyme sessile                    | 4. <i>C. heteroclita</i> |

3b. All flowers of the  
cyme pedicellate

1. *C. decurrens*

1. ***Canscora decurrens*** Dalz. in Journ. Bot. (Hook.) 2 : 136. 1850; Clarke in Hook.f., Fl. Brit. India 4 : 103. 1883.

Slender, annual herbs, up to 25 cm tall; 2-3-chotomously branched above; stem winged. Leaves up to 3.5 × 1.2 cm, 3-nerved, membranous, lower oblong, lanceolate or elliptic, upper ovate-lanceolate. Flowers pink, in cymes. Capsules 3-4 mm long, linear-oblong.

*Fl. & Fr.*: Oct.- Feb.

In moist, shaded places as forest-undergrowth. Sparse.

Pharsegarh, 15623.

2. ***C. decussata*** (Roxb.) Schult. & Schult.f., Mant. 3 : 229. 1827; Clarke in Hook.f., Fl. Brit. India 4 : 104. 1883. *Pladera decussata* Roxb., Fl. Ind. 1 : 418. 1820.

Annual herbs, up to 20 cm tall, mostly 3-chotomously branched; stem, branches and pedicels 4-winged. Leaves up to 4 × 1.5 cm, ovate or lanceolate, acute, 3-nerved. Flowers white, solitary; calyx 0.7-1 cm long with lanceolate veined wings. Capsules oblong.

*Fl. & Fr.*: Sept.- Oct.

In moist, shaded places as forest-undergrowth. Common.

Bijapur Ghati, 16434; Madded; Pharsegarh; Kutru; Kerpe Valley.

3. ***C. diffusa*** (Vahl) R. Br., Prodr. 451. 1810; Clarke in Hook.f., Fl. Brit. India 4 : 103. 1883. *Gentiana diffusa* Vahl, Symb. Bot. 3 : 47. 1794.

Slender, branched, annual herbs, up to 25 cm tall. Leaves up to 3 × 1.1 cm; lower elliptic, petioled; upper ovate, acute at both the ends.

Flowers pink, in lax cymes, pedicels filiform; calyx 5-6 mm long; corolla-lobes 2.5-4 mm long. Capsules linear-oblong.

*Fl. & Fr.*: Oct.- Feb.

In moist, shaded places as undergrowth in forests. Common.

Pharsegarh, 15518; Bijapur Ghati: Kandlaparti.

**4. *Canscora heteroclita* (L.) Gilg in Engl. & Prantl, Pflanzenf. 4(2) : 76. 1895. *Gentiana heteroclita* L., Mant. 560. 1771. *Canscora sessiliflora* Schult. & Schult.f., Mant. 3 : 230. 1827; Clarke in Hook.f., Fl. Brit. India 4 : 104. 1883.**

Annual herbs, up to 25 cm tall; stem 4-winged. Leaves sessile, up to 1.2 × 1 cm, ovate, obtuse or sub-acute. Flowers purple, in cymes, cyme-branches winged, central flower sessile, lateral flowers usually bracteate and pedicelled; calyx 6-9 mm long, keeled; corolla-tube 3.5-6 mm long, lobes obovate. Capsules oblong; seeds many, subrhomboid or ovate-suborbicular, reticulate, yellow.

*Fl. & Fr.*: Sept.- Nov.

In moist places as forest-undergrowth. Rare.

Madded, 16617.

## 2. NYMPHOIDES J. Hill.

- |  |                          |
|--|--------------------------|
| 1a. Corolla-lobes keeled on inner surface, not fimbriate | 1. <i>N. hydrophylla</i> |
| 1b. Corolla-lobes not keeled, fimbriate                  | 2. <i>N. indica</i>      |

**1. *Nymphoides hydrophylla* (Lour.) O. Ktze., Rev. Gen. Pl. 2 : 429. 1891. *Menyanthes hydrophylla* Lour., Fl. Cochinch. 1 : 129. 1790. *Limnanthemum cristatum* Griseb., Gen. & Sp. Gent. 342. 1839; Clarke in Hook.f., Fl. Brit. India 4 : 131. 1883.**

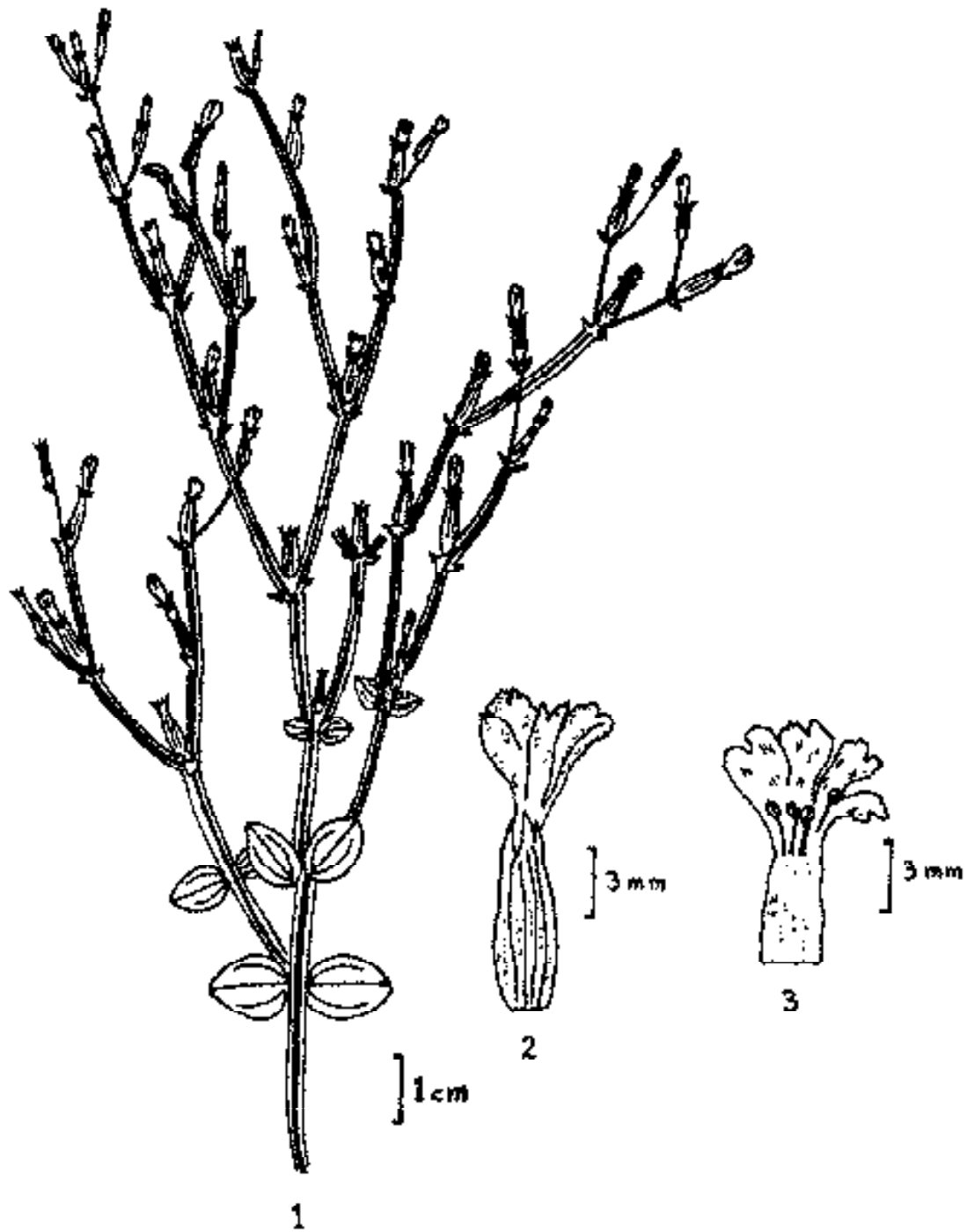


Fig. 9. *Canscora heteroclita* (L.) Gilg  
1. flowering branch; 2. flower & 3. corolla, cut open.

Stoloniferous herbs. Leaves floating, up to 11 × 11.5 cm, ovate-orbicular, base cordate. Flowers in clusters at the nodes; corolla ca 2 cm across, throat yellow within, lobes obovate. Capsules 5-6 mm across, ovoid or subglobose; seeds yellow, tuberculate.

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

Abundant in Ponds.

Dudepalli, 16336.

**2. *Nymphoides indica* (L.) O. Ktze.**, Rev. Gen. Pl. 2 : 429. 1891. *Menyanthes indica* L., Sp. Pl. 145. 1753. *Limnanthemum indicum* Thw., Enum. 205. 1860; Clarke in Hook.f., Fl. Brit. India 4 : 131. 1883.

Stoloniferous herbs. Leaves floating, up to 22 cm, across, orbicular, base cordate. Flowers in clusters; corolla white, 2-3 cm across; lobes oblong, fimbriate; stamens 6, anthers green. Capsules 6-9 mm across, sub-globose; seeds smooth, yellow.

*Fl. & Fr.*: May-Dec.

In ponds. Abundant.

Dudepalli, 16332.

## HYDROPHYLLACEAE

### HYDROLEA L.

***Hydrolea zeylancia* (L.) Vahl**, Symb. Bot. 2 : 46. 1791; Clarke in Hook.f., Fl. Brit. India 4 : 133. 1883. *Nama zeylanica* L., Sp. Pl. 226. 1753.

Procumbent herbs, rooting at the nodes. Leaves alternate, up to 5 × 1.2 cm, lanceolate or linear-lanceolate, acute. Flowers blue, 5-merous, in short racemes; calyx-lobes glandular-pubescent; filaments dilated at the base, anthers sagittate. Capsules globose or ovoid, enclosed in persistent calyx; seeds oblong, minute.

*Fl. & Fr.*: Dec.- Feb.

Abundant along the banks of rivers and ponds.

Karkeli, 15544; Salepalli tank; Indravati river; Kutru.

### BORAGINACEAE

#### 1a. Shrubs or trees :

2a. Leaves fasciculate; style simple 4. ROTULA

2b. Leaves alternate or sub-opposite;  
style twice 2-partite 2. CORDIA

#### 1b. Herbs :

3a. Nutlets glochidiate 3. CYNOGLOSSUM

#### 3b. Nutlets smooth :

4a. Leaves dentate, oblique;  
anthers free 1. COLDENIA

4b. Leaves entire, symmetric;  
anthers connate into a cone 5. TRICHODESMA

#### 1. COLDENIA L.

*Coldenia procumbens* L., Sp. Pl. 125. 1753; Clarke in Hook.f.,  
Fl. Brit. India 4 : 144. 1883.

*'Jamrasia'*

Prostrate herbs, appressed to ground, hairy. Leaves up to 3 × 1.5 cm, elliptic-obovate, apex rounded, margin dentate-serrate or pinnatifid, hairy. Flowers pale yellow, subsessile, solitary, axillary. Drupes up to 3 × 4 mm, ovoid, 4-lobed, hairy.

*Fl. & Fr.*: Apr.- May.



Common in waste lands, harvested fields and beds of stream and rivers.

Bijapur, 16211; Jalavagu nala; Indravati river; Dudepalli; Pengunda.

## 2. *CORDIA* L.

***Cordia obliqua*** Willd., *Phytogr.* 1 : 4. f.1. 1794; Clarke in Hook.f., *Fl. Brit. India* 4 : 137. 1883. *C. myxa auct. non L.* 1753; Clarke in Hook.f., *Fl. Brit. India* 4 : 136. 1883.

'Bual'

Deciduous trees, up to 8 m tall; bark black, fissured. Leaves up to 12.5 × 7.5 cm, elliptic-oblong or obovate, obtuse, margin more or less serrate in the upper part. Flowers white, polygamous, in terminal and axillary corymbs; calyx campanulate, persistent; corolla-lobes reflexed. Drupes ca 1 cm long, ovoid or globose.

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

In moist deciduous forests. Sparse.

Itpal forest, 16255.

## 3. *CYNOGLOSSUM* L.

***Cynoglossum lanceolatum*** Forsk., *Fl. Aegypt.- Arab.* 41. 1775; Clarke in Hook.f., *Fl. Brit. India* 4 : 156. 1883; Saxena & Khotele in *Journ. Bombay Nat. Hist. Soc.* 73 : 156. 1976.

'Choti-likanda' 'Latkana'

Perennial herbs or undershrubs, up to 1.5 m tall. Leaves up to 10 × 3 cm, lanceolate, acute, stiff with bulbous based hairs. Flowers white, in up to 30 cm long, slender racemes. Fruits of 4, glochidiate nutlets.

*Fl. & Fr.*: Sept.- Dec.

In moist deciduous forests. Rare.

Bijapur (Saxena & Khotele *l.c.*).

#### 4. ROTULA Lour.

**Rotula aquatica** Lour., Fl. Cochinch. 121. 1790. *Rhabdia lycioides* Mart., Nov. Gen. & Sp. 2 : 137. t.195. 1826; Clarke in Hook.f., Fl. Brit. India 4 : 145. 1883.

Shrubs, up to 1.5 m tall; young branches deep red. Leaves subsessile, fasciculate, up to 1.8 × 0.8 cm, oblanceolate, apex rounded or apiculate. Flowers pink, 1-3, on short, lateral branches; sepals persistent; corolla campanulate. Drupes 2-3 mm across, sub-globose, orange-coloured on ripening.

*Fl. & Fr.*: Sept.- Mar.

Abundant among rock-boulders in river-beds.

Indravati river, 16343.

#### 5. TRICHODESMA R. Br.

**Trichodesma indicum** (L.) R. Br., Prodr. 496. 1810; Clarke in Hook.f., Fl. Brit. India 4 : 153. 1883. *Borago indica* L., Sp. Pl. 137. 1753.

Hispid herbs, up to 30 cm tall. Leaves sessile, opposite, up to 5.5 × 0.9 cm, oblong-lanceolate, sub-acute, base amplexicaul, strigose. Flowers solitary; calyx-lobes ovate, acuminate, hastate, accrescent; corolla white or pale blue, lobes with twisted tail-like acumen; anthers bearded below, connectives spirally contorted. Nutlets 4.

*Fl. & Fr.*: Sept.- Dec.

In the vicinity of dry deciduous forests. Sparse.

Chinger, 16700; Kutru.

## CONVOLVULACEAE

- |                                     |              |
|-------------------------------------|--------------|
| 1a. Style absent; stigma 1, sessile | 2. ERYCIBE   |
| 1b. Style(s) present; stigmas 2 :   |              |
| 2a. Pollens spinulose :             |              |
| 3a. Capsules dehiscent              | 4. IPOMOEA   |
| 3b. Capsules indehiscent            | 1. ARGYREIA  |
| 2b. Pollens not spinulose :         |              |
| 4a. Style 1                         | 5. MERREMIA  |
| 4b. Styles 2                        | 3. EVOLVULUS |

## 1. ARGYREIA LOUR.

**Argyreia involucrata** Clarke in Hook.f., Fl. Brit. India 4 : 187. 1883.

Twiners, appressed hairy. Leaves up to 15 × 9 cm, ovate, acute or acuminate, base rounded or sub-cordate, veins purple. Flowers violet, in subcapitate cymes; bracts stellately spreading; sepals ovate-lanceolate, acuminate, unequal; corolla up to 5.5 cm long, funnel-shaped. Capsules 5-7 mm across, globose.

*Fl. & Fr.*: Oct.- Dec.

In dry and moist deciduous forests. Common.

Bijapur Ghati, 16440; Pharsegarh; Kutru; Kerpe Valley; Netikakler.

## 2. ERYCIBE ROXB.

**Erycibe paniculata** Roxb., Pl. Cor. 2 : 31. t. 159. 1802; Clarke in Hook.f., Fl. Brit. India 4 : 180. 1883.

Woody climbers; young branches rusty-tomentose. Leaves up to  $9 \times 5.5$  cm, elliptic-oblong or obovate-oblong, acuminate, coriaceous. Flowers yellow, fragrant, in terminal, up to 20 cm long, brown tomentose panicles; corolla infundibuliform, lobes deeply notched in 2-lobules. Berries up to 1.5 cm long, ovoid-ellipsoid.

*Fl. & Fr.*: May-Oct.

Along banks of rivers and in moist deciduous forests. Sparse.

Indravati river, 16324; Pharsegarh.

Plant may be introduced in gardens for its attractive, fragrant flowers.

### 3. EVOLVULUS L.

- 1a. Plant silky-hairy; branches not rooting at nodes; leaves elliptic or linear-oblong, less than 5 mm broad      1. *E. alsinoides*
- 1b. Plants not silky-hairy; branches rooting at nodes; leaves orbicular or broadly ovate, more than 5 mm broad      2. *E. nummularius*

**1. *Evolvulus alsinoides* (L.) L.**, Sp. Pl. ed. 2. 1 : 392. 1762; Clarke in Hook.f., Fl. Brit. India 4 : 220. 1883. *Convolvulus alsinoides* L., Sp. Pl. 157. 1753.

'Karabuta' 'Phulka'

Prostrate or ascending, diffuse, perennial herbs, silky-hairy. Leaves up to  $1.5 \times 0.5$  cm, elliptic or linear-oblong, acute. Flowers violet, 1-2, axillary; pedicels slender; sepals lanceolate; corolla 5-6 mm long, rotate. Capsules globose; seeds black, ovoid.

*Fl. & Fr.*: Aug.- Mar.

Common in waste lands.

Bijapur Ghati, 16487; Kutru.

**2. *Evolvulus nummularius* (L.) L., Sp. Pl. ed. 2. 1 : 391. 1762;**  
*Convolvulus nummularius* L., Sp. Pl. 157. 1753.

Prostrate herbs, rooting at nodes, branches glabrous or pilose. Leaves up to 1.2 × 1 cm, ovate or orbicular, rounded or emarginate. Flowers white, 1-2, axillary; sepals ovate-elliptic; corolla 5-8 mm long, campanulate. Capsules globose; seeds sub-globose.

*Fl. & Fr.*: Most parts of the year.

In waste lands. Abundant.

Bijapur, 16303; Pharsegarh; Netikakler.

#### 4. IPOMOEA L.

- |   |                           |
|---|---------------------------|
| 1a. Plants aquatic  | 1. <i>I. aquatica</i>     |
| 1b. Plants terrestrial :                                  |                           |
| 2a. Erect or straggling shrubs                            | 2. <i>I. carnea</i>       |
| 2b. Twining herbs :                                       |                           |
| 3a. Leaves entire   | 4. <i>I. obscura</i>      |
| 3b. Leaves palmately lobed :                              |                           |
| 4a. Leaves slightly or deeply<br>3-lobed; corolla scarlet | 3. <i>I. hederifolia</i>  |
| 4b. Leaves deeply 5-9-lobed;<br>corolla white or pink     | 5. <i>I. pes-tigrides</i> |

**1. *Ipomoea aquatica* Forsk., Fl. Aegypt.- Arab. 44. 1775; Clarke in Hook.f., Fl. Brit. India 4 : 210. 1883.**

'Mendka'

Floating or trailing herbs, rooting at the nodes. Leaves up to 12 × 5 cm, ovate-triangular, ovate-oblong or lanceolate, acute or obtuse, base truncate or cordate-hastate. Flowers in axillary, 1-few flowered cymes; corolla purple, funnel-shaped. Capsules up to 9 mm across, globose; seeds 2-4.

*Fl. & Fr.*: Feb.- Mar.

In ponds. Abundant.

Kutru, 16146.

**2. *Ipomoea carnea* Jacq., Enum. Pl. Craib. 13. 1760.**

'*Besharam*'

Erect or straggling shrubs, up to 2 m tall; stem hollow or solid. Leaves up to 15 × 10 cm, ovate, acuminate, base cordate. Flowers purple, in axillary and terminal cymes; corolla funnel-shaped or tubular. Capsules up to 1 cm across, ovoid; seeds 3-4, villous.

*Fl. & Fr.*: Jan.- Mar.

Along the banks of tanks. Naturalized.

Salepalli tank (Pharsegarh), 15582.

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

Slender, annual twiners. Leaves up to 10 × 7.4 cm, ovate-orbicular, acuminate, base cordate, margin slightly or deeply 3-lobed. Flowers scarlet, in few to many flowered lateral and terminal cymes; sepals awned; corolla salverform, up to 3.5 cm long. Capsules up to 6 mm across, globose; seeds 4, pubescent.

*Fl. & Fr.*: Jan.- Mar.

Probably found as an escape near habitations. Occasional.

Pasewada, 15566.

4. *Ipomoea obscura* (L.) Ker-Gawl. in Bot. Reg. 3 : t.239. 1817; Clarke in Hook.f., Fl. Brit. India 4 : 207. 1883. *Convolvulus obscurus* L., Sp. Pl. ed. 2. 1 : 220. 1762.

Herbaceous twiners. Leaves up to 6 × 5.5 cm, ovate-orbicular, acute or acuminate, base cordate, glabrous or pubescent. Flowers 1-3, in axillary cymes; sepals reflexed in fruits; corolla cream coloured, deep red at the throat within, funnel-shaped. Capsules up to 7 mm across, ovoid or ellipsoid; seeds 4, puberulous.

*Fl. & Fr.*: Sept.- Nov.

In moist deciduous forests. Common.

Bijapur Ghati, 16420.

Leaves are said to be used as dressing for boils.

5. *I. pes-tigridis* L., Sp. Pl. 162. 1753; Clarke in Hook.f., Fl. Brit. India 4 : 204. 1883.

Slender twiners, covered with patent brown hairs. Leaves up to 5 × 6 cm, palmately 5-9-lobed, segments elliptic-oblong, subacuminate, hairy. Flowers in dense, pedunculate, axillary heads; bracts subequal; sepals lanceolate or linear-lanceolate, hairy; corolla white or pale pink, funnel-shaped. Capsules ovoid; seeds 4, tomentose.

*Fl. & Fr.*: Oct.- Nov.

In grasslands and in the vicinity of forests. Sparse.

Bijapur, 16398; Bijapur Ghati.

#### 5. MERREMIA Dennst. ex Endl.

- |   |                        |
|---|------------------------|
| 1a. Corolla glabrous outside, yellow                      | 1. <i>M. hederacea</i> |
| 1b. Corolla more or less hairy<br>outside, cream coloured | 2. <i>M. umbellata</i> |

1. **Merremia hederacea** (Burm.f.) Hall.f. in Bot. Jahrb. 18 : 118. 1894. *Evolvulus hederaceus* Burm.f., Fl. Ind. 77. t.30. f.2. 1768. *Ipomoea chryseides* Ker-Gawl. in Bot. Reg. 4 : t.270. 1818; Clarke in Hook.f., Fl. Brit. India 4 : 206. 1883.

Herbaceous twiners. Leaves up to 5.5 × 3.5 cm, ovate, obtuse, base cordate, entire or 3-lobed, glabrous or sparsely hairy. Flowers in dense, axillary, dichasial cymes; corolla up to 1 cm long, campanulate. Capsules up to 6 mm long, globose or conical, 4-valved; seeds usually 4, pubescent.

*Fl. & Fr.*: Dec.- Feb.

In the vicinity of dry deciduous forests. Sparse.

Mingachal river. 15618.

Plant is grazed by herbivores.

2. **M. umbellata** (L.) Hall. f. in Bot. Jahrb. 16 : 552. 1893. *Convolvulus umbellatus* L., Sp. Pl. 155. 1753. *C. cymosus* Desr. in Lam., Encycl. 3 : 556. 1791. *Ipomoea cymosa* (Desr.) Roem. & Schult., Syst. 4 : 241. 1819; Clarke in Hook.f., Fl. Brit. India 4 : 211. 1883.

'Pandri-tonde'

Twiners. Leaves up to 7.5 × 5 cm, lower ovate, upper lanceolate, obtuse or acute, base rounded or cordate. Flowers cream coloured, in axillary umbellate cymes; corolla infundibuliform; anthers twisted. Capsules up to 8 mm across, ovoid-conical, mucronate; seeds 4, hairy.

*Fl. & Fr.*: Apr.- Dec.

Common in the vicinity of forests.

Itpal forest, 16257; Netikakler; Kerpe Valley; Kandlaparti; Saknapalli.

Plant is grazed by herbivores.



## SOLANACEAE

- 1a. Anthers dehiscing longitudinally,  
not connivent; berries enclosed  
in inflated accrescent calyx 1. *PHYSALIS*
- 1b. Anthers poricidal, connivent in a  
cone; berries partially enclosed in calyx 2. *SOLANUM*

1. *PHYSALIS* L.

*Physalis minima* L., Sp. Pl. 183. 1753; Clarke in Hook.f., Fl. Brit. India 4 : 238. 1883.

'Makoi' 'Patasmara'

Branched herbs, up to 25 cm tall. Leaves up to 5 × 2.2 cm, ovate, acute, base rounded, margin entire, sinuate or toothed. Flowers solitary, axillary; calyx campanulate, accrescent; corolla cream coloured, brown at the base within. Berries 5-7 mm across, globose, enclosed in inflated calyx; seeds discoid, compressed, more or less rugose.

*Fl. & Fr.*: Sept.- Feb.

Along the river-banks. Sparse.

Indravati river (Pasewada), 15571.

2. *SOLANUM* L.

- 1a. Undershrubs, prickles recurved;  
flowers unisexual 1. *S. incanum*
- 1b. Diffuse herbs, prickles straight;  
flowers bisexual 2. *S. surattense*

1. *Solanum incanum* L., Sp. Pl. 188. 1753. *S. coagulans* Forsk., Fl. Aegpt.- Arab. 46. 1775; Clarke in Hook.f., Fl. Brit. India 4 : 236. 1883.

'Aapa', 'Jangli-bhata'

Prickly undershrubs, up to 1.5 m tall; stellate-hairy. Leaves up to 10 × 6 cm, ovate-elliptic, subacute, margin sinuate, stellate-tomentose above, woolly beneath, mid vein prickly. Flowers pale purple; male flowers racemose; female flowers solitary; calyx and corolla stellate-hairy. Berries 2-2.5 cm across, ovoid or sub-globose.

*Fl. & Fr.*: Sept.- Feb.

In waste lands. Not common.

Pasewada, 15565.

**2. *Solanum surattense*** Burm.f., Fl. Ind. 57. 1768. *S. xanthocarpum* Schrad. & Wendl., Sert. 1 : 8. t.2. 1795; Clarke in Hook.f., Fl. Brit. India 4 : 236. 1883.

'*Bhejra*', '*Koye*'

Prickly, diffuse, perennial herbs. Leaves up to 10.5 × 4.5 cm, ovate-elliptic or oblong, pinnatifid, obtuse or subacute, base unequal, stellate-hairy or glabrous. Flowers violet, in 2-6-flowered cymes; calyx hairy and prickly without; corolla-lobes ovate-deltoid, acute; anthers bright yellow. Berries 1-1.5 cm across, green with white blotches, turning yellow.

*Fl. & Fr.*: All seasons.

In stream-beds and waste places. Common.

Jalavagu nala, 16281; Dudepalli; Kutru; Pasewada; Bhopalpatnam.

Plant-juice is said to be given in fever.

## SCROPHULARIACEAE

1a. Plants minute, tufted; branches interlacing      6. MICROCARPAEA

1b. Plants and branches otherwise :

2a. Calyx spathaceous, split on one side      1. CENTRANTHERA

- 2b. Calyx not as above :
  - 3a. Bracteoles absent :
    - 4a. Leaves usually 3-whorled;  
calyx 4-lobed 7. SCOPARIA
    - 4b. Leaves 2, opposite;  
calyx 5-lobed :
      - 5a. Upper leaves in remote pairs;  
anther-cells parallel 2. DOPATRIUM
      - 5b. Upper leaves not remote;  
anther-cells divergent 4. LINDERNIA
  - 3b. Bracteoles 2 :
    - 6a. Anthers 1-celled 8. SOPUBIA
    - 6b. Anthers 2-celled :
      - 7a. Anther-cells sessile 9. STRIGA
      - 7b. Anther-cells stalked :
        - 8a. Flowers yellow 5. MECARDONIA
        - 8b. Flowers white,  
violet or bluish-purple 3. LIMNOPHILA  
*(L. indica and L. repens)*

1. CENTRANTHERA R. Br.

**Cantranthera tranquebarica** (Spreng.) Merr. in 150th Anniv. Vol. Roy. Bot. Gard. Calcutta 57. 1942. *Razumovia tranquebarica* Spreng., Mant. Fl. Hal. 45. 1807. *Centranthera humifusa* Wall. ex Benth., Scroph. Ind. 50. 1835; Hook. f., Fl. Brit. India 4 : 301. 1884.

Hemiparasitic, scabrid herbs, up to 25 cm tall. Leaves opposite below, alternate above, up to  $2.5 \times 0.3$  cm, linear, sparsely tubercular-hispid. Flowers axillary; calyx 4-6 mm long, spathaceous; corolla orange-yellow, 7-9 mm long, tubular, lobes subequal. Capsules subglobose; seeds cuneate, reticulate.

*Fl. & Fr.*: Sept.- Oct.

In grasslands. Not common.

Eramnar, 16693; Kutru.

### 2. DOPATRIUM Buch.- Ham. ex Benth.

**Dopatrium junceum** (Roxb.) Buch.- Ham. ex Benth., *Scroph.* Ind. 31. 1835; Hook.f., *Fl. Brit. India* 4 : 274. 1884. *Gratiola juncea* Roxb., *Pl. Cor.* 2 : 16. t.129. 1800.

Erect, branched herbs, up to 25 cm tall; branches swollen and spongy below, slender above. Leaves sessile, up to  $2.2 \times 0.5$  cm, gradually reduced upwards, ovate-lanceolate or oblong, rounded at the apex. Flowers purple, solitary, axillary; calyx 5-partite; corolla 4-6 mm long. Capsules globose; seeds tuberculate.

*Fl. & Fr.*: Aug.-Oct.

In water-logged areas. Abundant.

Mdded, 16611.

### 3. LIMNOPHILA R. Br.

- |   |                     |
|---|---------------------|
| 1a. Flowers pedicelled; Calyx not striate | 1. <i>L. indica</i> |
| 1b. Flowers subsessile; calyx striate     | 2. <i>L. repens</i> |

**1. Limnophila indica** (L.) Druce, *Rep. Bot. Exch. Club. Brit. Isles* 3 : 420. 1914. *Hottonia indica* L., *Syst. Nat.* ed. 10. 919. 1759.

*Limnophila gratioloides* R. Br., Prodr. 442. 1810; Hook.f., Fl. Brit. India 4 : 271. 1884.

Amphibious, erect, branched herbs, up to 20 cm tall; stem rooting at the lower nodes. Leaves whorled, upper ones opposite, up to 2 × 0.5 cm, lower pinnatifid, upper entire, linear-oblong, 3-nerved. Flowers white, solitary, axillary or in terminal racemes; bracteoles linear-subulate; calyx glandular-hairy, lobes ovate-lanceolate; corolla 8-10 mm long. Capsules up to 4 mm long, ellipsoid or subglobose.

*Fl. & Fr.*: May-Dec.

Along the edges of ponds. Abundant.

Kutru, 16372.

**2. *Limnophila repens* (Benth.) Benth.** in DC., Prodr. 10 : 387. 1846. *Stemodia repens* Benth. in Edward's Bot. Reg. 17 : sub t. 1470. sp. 11. 1832. *Limnophila conferta* Benth. in DC., Prodr. 10 : 387. 1846; Hook.f., Fl. Brit. India 4 : 266. 1884.

Annual herbs, up to 25 cm tall. Leaves opposite, up to 2 × 0.8 cm, aromatic, elliptic or elliptic-lanceolate, margin serrate-crenate. Flowers violet, axillary, solitary or racemose or corymbose; bracteoles 2; calyx 3-5 mm long; corolla 7-9 mm long, villous within. Capsules ca 3 mm long, ovoid.

*Fl. & Fr.*: Oct.- Feb.

In marshy habitats. Not common.

Kutru, 15504.

#### 4. LINDERNIA All.

1a. Leaves palmately 3-5-nerved

5. *L. parviflora*

1b. Leaves penninerved :

- 2a. Calyx lobed for about 1/3 of the length of the tube or less 4. *L. crustacea*
- 2b. Calyx lobed for about 2/3 of the length of the tube or almost to the base :
- 3a. Stamens 4 1. *L. anagallis*
- 3b. Stamens 2, staminodes 2 :
- 4a. Leaf-serrations aristate-dentate 3. *L. ciliata*
- 4b. Leaf-serrations crenate-dentate 2. *L. antipoda*

**1. *Lindernia anagallis*** (Burm.f.) Pennell in Journ. Arn. Arb. 24 : 252. 1943. *Ruellia anagallis* Burm.f., Fl. Ind. 135. 1768. *Vandellia pedunculata* Benth., Scroph. Ind. 37. 1835; Hook.f., Fl. Brit. India 4 : 282. 1884.

Diffusely branched, erect or decumbent herbs, up to 12 cm tall. Leaves up to 3 × 1.2 cm, oblong or ovate, margin crenate-serrate, subacute, base rounded or subcordate. Flowers violet, solitary, axillary; calyx 4-5 mm long; corolla 7-10 mm long. Capsules up to 1.5 cm long, linear-lanceolate; seeds ellipsoid, alveolate.

*Fl. & Fr.*: May-Sept.

Common in river-beds.

Indravati river, 16323.

**2. *L. antipoda*** (L.) Alston in Trimen, Handb. Fl. Ceyl. 6 (Suppl.) : 214. 1931. *Ruellia antipoda* L., Sp. Pl. 635. 1753. *Gratiola veronicifolia* Retz., Obs. Bot. 4 : 8. 1786. *Bonnaya veronicifolia* (Retz.) Spreng., Syst. Veg. 1 : 41. 1824; Hook.f., Fl. Brit. India 4 : 285. 1884.

Erect or creeping, branched, annual herbs, rooting at the nodes. Leaves up to  $2.8 \times 0.7$  cm, linear-elliptic, distantly crenate-dentate, obtuse. Flowers solitary, axillary or racemose; corolla 6-9 mm long, violet. Capsules up to 1.3 cm long, cylindric; seeds somewhat 4-gonous.

*Fl. & Fr.*: All seasons.

In river-beds. Sparse.

Indravati river, 16154.

**3. *Lindernia ciliata*** (Colsm.) Pennell in *Brittonia* 2 : 182. 1936. *Gratiola ciliata* Colsm., *Prodr. Descr. Grat.* 14. 1793. *Bonnaya brachiata* Link & Otto,  *Ic. Pl. Select.* 2 : 25. t.11. 1820; Hook.f., *Fl. Brit. India* 4 : 284. 1884.

Annual herbs, up to 15 cm tall. Leaves sessile, up to  $2.2 \times 0.8$  cm, ovate-elliptic or oblong, serrations aristate-dentate. Flowers in lax, bracteate racemes; corolla white with violet blotch within, 6-8 mm long. Capsules up to 1.3 cm long, cylindric; seeds irregular, alveolate.

*Fl. & Fr.*: Sept.- Nov.

In moist places. Abundant.

Bijapur Ghati, 16491.

**4. *L. crustacea*** (L.) F.v. Muell., *Syst. Census Austr. Pl.* 1 : 97. 1882. *Capraria crustacea* L., *Mant.* 87. 1767. *Vandellia crustacea* (L.) Benth., *Scroph. Ind.* 35. 1835; Hook.f., *Fl. Brit. India* 4 : 279. 1884.

Annual, branched herbs, up to 20 cm tall. Leaves up to  $2 \times 1.3$  cm, ovate, subacute, entire or serrate. Flowers solitary, axillary or in terminal racemes; corolla violet, 7-9 mm long. Capsules up to 5 mm long, ovoid-oblong; seeds pale yellow, ellipsoid.

*Fl. & Fr.*: May-Oct.

In moist habitats. Common.

Indravati river, 16304; Bijapur Ghati.

**5. *Lindernia parviflora*** (Roxb.) Haines, Bot. Bihar & Orissa 635. 1922. *Gratiola parviflora* Roxb., Pl. Cor. 3 : 3. t.204. 1811. *Illysanthes parviflora* (Roxb.) Benth. in DC., Prodr. 10 : 419. 1846; Hook.f., Fl. Brit. India 4 : 283. 1884.

Slender, erect, annual herbs, up to 10 cm tall. Leaves up to 1.5 × 0.7 cm, ovate or oblong, obtuse. Flowers white or violet, in axillary and terminal racemes; pedicels filiform; corolla 5-7 mm long. Capsules up to 6 mm long, ovoid-oblong; seeds rugose.

*Fl. & Fr.*: Sept.- May.

In river-beds. Sparse.

Indravati river, 16320.

#### 5. MECARDONIA Ruiz & Pavon

***Mecardonia procumbens*** (Mill.) Small, Fl. Southeast U.S. 1065, 1338. 1903. *Erinus procumbens* Mill., Gard. Dict. Abr. ed. 8. no. 6. 1768.

Diffuse, branched, annual herbs; turning black on drying. Leaves up to 1.5 × 0.9 cm, ovate-lanceolate, glandular beneath. Flowers yellow, solitary, axillary; corolla 6-9 mm long, slightly exserted. Capsules 5-7 mm long, ovoid-ellipsoid.

*Fl. & Fr.*: May-Nov.

In river-beds. Sparse.

Indravati river, 16309.



## 6. MICROCARPAEA R. Br.

**Microcarpaea minima** (Retz.) Merr. in Philip., Journ. Sci. Bot. 7 : 100. 1912. *Paederota minima* Retz., Obs. Bot. 5 : 10. 1789. *Microcarpaea mucosa* R. Br., Prodr. 436. 1810; Hook.f., Fl. Brit. India 4 : 287. 1884.

Minute, branched, slender, creeping herbs; branches interlacing, rooting at the nodes. Leaves sessile, 2-4 mm long, linear-oblong, obtuse. Flowers green, minute, sessile, solitary, axillary; calyx tubular, lobes recurved and ciliate; corolla-tube shorter than calyx, 5-lobed; stamens 2. Capsules ellipsoid, included in the calyx; seeds ellipsoid.

*Fl. & Fr.*: Jan.- Feb.

Along the edges of ponds. Abundant.

Kuenar (Kutru-Bijapur road), 15592.

## 7. SCOPARIA L.

**Scoparia dulcis** L., Sp. Pl. 116. 1753; Hook.f., Fl. Brit. India 4 : 289. 1884.

'Ghoda-tulsi', 'Mithi-patti'

Branched herbs, up to 30 cm tall; stem 4-6-angled. Leaves opposite or in whorls of 3, up to 3 × 1.5 cm, elliptic or elliptic-lanceolate, serrate or entire, apex rounded, base narrowed. Flowers white, solitary or in axillary racemes. Capsules globose; seeds pitted.

*Fl. & Fr.*: Aug.- Feb.

In grassy-fields and waste lands. Common.

Bijapur, 16399; Karkeli; Kutru.

Plant is relished by herbivores.

## 8. SOPUBIA Buch.- Ham. ex D. Don

**Sopubia delphiniifolia** (L.) G. Don, Gen. Syst. 4 : 560. 1837 ('*delphinifolia*'); Hook.f., Fl. Brit. India 4 : 302. 1884. *Gerardia delphiniifolia* L., Cent. Pl. 2 : 21. 1756.

Branched, hemiparasitic herbs, up to 1 m tall. Leaves up to 3 cm long, pinnatisect with filiform segments. Flowers solitary, axillary or in few flowered terminal racemes; corolla purple, 2-3 cm long, lobes broad. Capsules 5-6 mm long, oblong; seeds cuneate or oblong, striate.

*Fl. & Fr.*: Sept.- Nov.

Common in paddy fields.

Eramnar, 16696; Karkeli; Pharsegarh.

Plant-juice is applied to sores.

## 9. STRIGA Lour.

**Striga angustifolia** (D. Don) Sald. in Bull. Bot. Surv. India 5 : 70. 1963. *Buchnera angustifolia* D. Don, Prodr. Fl. Nep. 91. 1825. *Striga eupharsioides* auct.; Hook.f., Fl. Brit. India 4 : 299. 1884 non. Benth. 1836.

Parasitic herbs, up to 30 cm tall, turning black on drying. Leaves up to 4 × 0.3 cm, linear, scabrid. Flowers in lax spikes or racemes; calyx campanulate, 15-ribbed, each lobe with 3 ribs terminating at the apex; corolla white with violet tinge, up to 1 cm long. Capsules 4-5 mm long, oblong-ellipsoid; seeds striate.

*Fl. & Fr.*: Sept.-Nov.

In grasslands and as forest-undergrowth. Common.

Madded, 16616; Pharsegarh; Kutru; Bijapur; Kerpe.

## OROBANCHACEAE

## AEGINETIA L.

**Aeginetia indica** L., Sp. Pl. 632. 1753; Hook.f., Fl. Brit. India 4 : 320. 1884.

Parasitic, leafless herbs. Scapes up to 20 cm long, slender, naked. Flowers usually solitary; calyx spathaceous, split on the anterior side; corolla deep purple-red, obscurely 2-lipped; stamens 4, didynamous; anthers 2-celled, one cell imperfect, spurred; placentas multifid. Capsules 2-valved, enclosed in the calyx; seeds many, reticulate.

*Fl. & Fr.*: Sept.- Oct.

In the vicinity of moist deciduous forests. Rare.

Indravati Tiger Reserve, Pandey 36 (Specimen is deposited in herbarium of the Indravati Tiger Reserve at Bijapur).

## LENTIBULARIACEAE

## UTRICULARIA L.

- |   |                      |
|---|----------------------|
| 1a. Terrestrial herbs; bladders with basal mouth; spur curved       | 1. <i>U. bifida</i>  |
| 1b. Free-floating herbs; bladders with lateral mouth; spur straight | 2. <i>U. exoleta</i> |

**1. Utricularia bifida** L., Sp. Pl. 18: 1753; Clarke in Hook.f., Fl. Brit. India 4 : 332. 1884.

Annual, slender herbs. Leaves up to 1.5 cm long, linear-spathulate, 1-nerved; bladders globose. Scape up to 20 cm long, slender; scales, bracts and bracteoles basifixed; flowers 2-7; corolla bright yellow, upper lip obovate, lower lip orbicular, palate bigibbous. Capsules obovoid, laterally compressed; seeds rotund, reticulate.

*Fl. & Fr.*: Aug.- Oct.

Common in marshy habitats.

Eramnar, 16690; Kutru.

2. *Utricularia exoleta* R. Br., Prodr. 430. 1810; Clarke in Hook.f., Fl. Brit. India 4 : 329. 1884.

Aquatic herbs, up to 15 cm tall. Leaves much dissected into capillary segments; bladders ovoid. Flowers yellow, in few flowered racemes; corolla 5-8 mm long, bilipped, palate prominently raised. Capsules globose; seeds minute, orbicular with an irregular corky wing.

*Fl. & Fr.*: May-Sept.

Abundant in ponds.

Dudepalli, 16327.

### BIGNONIACEAE

- |   |                  |
|---|------------------|
| 1a. Leaves 2-3-pinnate; perfect stamens 5       | 3. OROXYLUM      |
| 1b. Leaves 1-pinnate; perfect stamens 4 :       |                  |
| 2a. Calyx spathaceous                           | 1. DOLICHANDRONE |
| 2b. Calyx not spathaceous :                     |                  |
| 3a. Capsules with a<br>4-angled septum          | 2. HETEROPHRAGMA |
| 3b. Capsules with a cylindric,<br>spongy septum | 4. STEREOSPERMUM |

1. DOLICHANDRONE (Fenzl) Seem.

*Dolichandrone falcata* (Wall. ex DC.) Seem. in Journ. Bot. 8 : 381. 1870; Clarke in Hook.f., Fl. Brit. India 4 : 380. 1884. *Spathodea falcata*

Wall. ex DC., Prodr. 9 : 206. 1845.

*'Dokemaria'*

Trees, up to 10 m tall. Leaves opposite, up to 15 cm long; leaflets up to 3 × 2 cm, opposite, obovate, subacuminate. Flowers white, in terminal racemes; corolla up to 2.5 cm long, more or less tubular, lobes obovate with crisped margins. Capsules up to 35 × 2 cm, curved, flat, brown; seeds up to 3 × 1 cm, more or less rectangular, winged at both ends.

*Fl.*: May; *Fr.*: Most parts of the year.

In dry deciduous forests. Rare.

Madded, 16286.

## 2. HETEROPHRAGMA DC.

**Heterophragma quadriloculare** (Roxb.) K. Schum. in Pfamilien. 4(3B) : 243. 1895. *Bignonia quadriloculare* Roxb., Pl. Cor. 2 : 24. t.145. 1800.

*'Padded'*

Trees, up to 10 m tall; bark grey. Leaves clustered at the apex, up to 50 cm long. Leaflets 7-11, up to 12.5 × 6.5 cm, elliptic-oblong, serrulate, obtuse or sub-acuminate, base often inequilateral. Flowers white with pinkish tinge, fragrant, in terminal, woolly panicles; corolla up to 5 cm long, tubular-ventricose, lobes subequal with crisped margins. Capsules up to 25 × 4.5 cm, linear, 4-celled; seeds up to 3 × 2.5 cm, compressed with a membranous wing on both sides.

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

In dry deciduous forests. Not common.

Kodepalli, 15601; Bijapur; Madded.

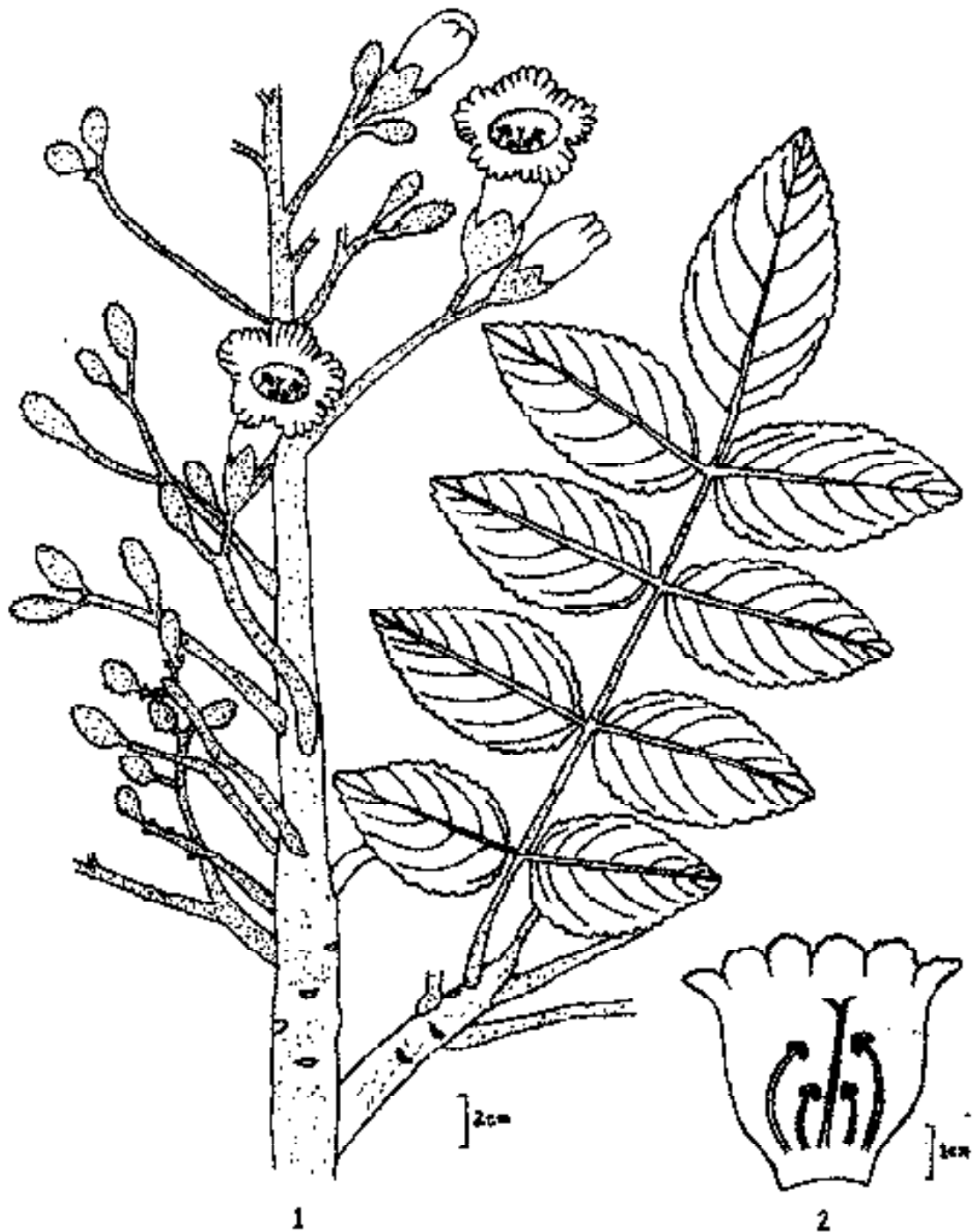


Fig. 10. *Heterophragma quadriloculare* (Roxb.) K. Schum.  
1. flowering branch & 2. corolla, cut open.

## 3. OROXYLUM Vent.

**Oroxylum indicum** (L.) Vent., Dec. Gen. Nov. 8. 1808; Clarke in Hook.f., Fl. Brit. India 4 : 378. 1884. *Bignonia indica* L., Sp. Pl. 625. 1753.

Trees, up to 12 m tall; bark grey. Leaves up to 1.5 m long; leaflets up to 12.5 × 7.5 cm, ovate or ovate-oblong, acuminate. Flowers reddish-purple, foetid, in up to 40 cm long terminal racemes; corolla up to 7.5 cm long, campanulate, lobes round with crisped margins. Capsules up to 50 × 7.5 cm, pendulous, falcate, flat, white speckled, woody; seeds up to 4 × 4.5 cm, rectangular with papery wings.

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

In dry deciduous forests. Rare.

Dudepalli, 16375.

## 4. STEREOSPERMUM Chamisso

**Stereospermum chelonoides** (L.f.) DC., Bibl. Univ. Geneve II. 17 : 125. 1838. *Bignonia chelonoides* L.f., Suppl. 282. 1781 p.p. *Bignonia suaveolens* Roxb., Fl. Ind. 3 : 104. 1832. *Stereospermum suaveolens* (Roxb.) DC., Prodr. 9 : 211. 1845; Clarke in Hook.f., Fl. Brit. India 4 : 382. 1884.

'Bhivi', 'Padri', 'Padded'

Trees, up to 20 m tall; bark greyish-black, fissured. Leaves up to 50 cm long; leaflets up to 15 × 7.5 cm, elliptic, acuminate, viscid-hairy. Flowers purple, in terminal viscid-hairy panicles; corolla up to 3.5 cm long, infundibuliform, lobes round with crisped-crenate margins. Capsules up to 35 cm long, cylindrical, green, white speckled; seeds up to 3.5 × 1.5 cm with a membranous wing at each end.

*Fl.*: Mar.- Apr; *Fr.*: May-Dec.

In mixed teak and dry deciduous forests. Common.

Kandlaparti, 16276; Pengunda; Dudepalli.

## PEDALIACEAE

### SESAMUM L.

**Sesamum orientale** L., Sp. Pl. 634. 1753. *S. indicum* L., Sp. Pl. 634. 1753; Clarke in Hook.f., Fl. Brit. India 4 : 387. 1884.

Branched, glandular-pubescent herbs, up to 1 m tall. Leaves opposite below, alternate above, up to 12.5 cm long; lower leaves lobed or palmatisect, lobes usually serrate; upper leaves entire, lanceolate. Flowers solitary, axillary; calyx 5-lobed; corolla violet, tube with a yellow spot within, up to 3 cm long, 2-lipped, pubescent without. Capsules up to 2.5 cm long, oblong, 4-angled, apiculate, dehiscence from above to about half way down; seeds black or white, oblong, smooth or rugose, margined.

*Fl. & Fr.*: Oct.- Nov.

Common in moist deciduous forests during the rainy season.

Bijapur Ghati, 16404; Pharsegarh.

Seed-oil is used for cooking.

## ACANTHACEAE

- |  |                |
|--|----------------|
| 1a. Corolla without upper lip;<br>lower lip large, 3-lobed | 3. BLEPHARIS   |
| 1b. Corolla 2-lipped or with 5 subequal lobes :            |                |
| 2a. Retinacula absent :                                    |                |
| 3a. Calyx 4-lobed; stamens 2                               | 12. NELSONIA   |
| 3b. Calyx 5-lobed; stamens 4                               | 18. STAUROGYNE |
| 2b. Retinacula present :                                   |                |



- 4a. Calyx 4-lobed :
- 5a. Calyx-lobes unequal 2. **BARLERIA**
- 5b. Calyx-lobes equal :
- 6a. Plants armed 9. **HYGROPHILA**
- 6b. Plants unarmed 10. **JUSTICIA**
- 4b. Calyx 5-lobed :
- 7a. Corolla-lobes contorted  
in buds :
- 8a. Stamens 2 7. **ERANTHEMUM**
- 8b. Stamens 4 :
- 9a. Ovules 1 or  
2 in each locule :
- 10a. Corolla up to 5 mm  
across; corolla-tube  
slender 15. **PHAULOPSIS**
- 10b. Corolla 1.5-4 cm  
across; corolla-tube  
ventricose :
- 11a. Bracteoles  
foliaceous;  
corolla white 14. **PETALIDIUM**
- 11b. Bracteoles  
subulate;  
corolla violet 6. **DYSCHORISTE**

- 9b. Ovules 3-10 in each locule :
- 12a. Capsules clavate with a solid base, bearing seeds only in the upper part      5. DIPTERACANTHUS
- 12b. Capsules bearing seeds throughout :
- 13a. Corolla 2-lipped      9. HYGROPHILA
- 13b. Corolla not 2-lipped      8. HEMIGRAPHIS
- 7b. Corolla-lobes imbricate in buds :
- 14a. Stamens 4      11. LEPIDAGATHIS
- 14b. Stamens 2 :
- 15a. Ovules 3-many in each locule      1. ANDROGRAPHIS
- 15b. Ovules 1-2 in each locule :
- 16a. Anther-cells(1 or both) spurred at the base :
- 17a. Bracts foliaceous with scarious margins      17. RUNGIA
- 17b. Bracts not foliaceous without scarious margins      10. JUSTICIA
- 16b. Anther-cells not spurred at the base :
- 18a. Herbs :

- 19a. Cymules in dense clusters                      4. DICLIPTERA  
 19b. Cymules in lax panicles                      13. PERISTROPHE  
 18b. Undershrubs or shrubs                      16. RHINACANTHUS

1. ANDROGRAPHIS Wall. ex Nees

- 1a. Plants hairy; flowers in axillary racemes                      1. *A. echioides*  
 1b. Plants glabrous; flowers in lax panicles                      2. *A. paniculata*

**1. *Andrographis echioides* (L.) Nees in Wall., Pl. As. Rar. 3 : 117. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 505. 1884. *Justicia echioides* L., Sp. Pl. 16. 1753.**

Annual herbs, up to 30 cm tall. Leaves up to 7 × 2.5 cm, elliptic-oblong, obtuse, sparsely hairy, base cuneate. Flowers white or pink, on upper side of the rachis of axillary racemes; rachis and calyx glandular-hairy; upper lip of corolla obovate-oblong, lower 3-lobed; anthers bearded. Capsules up to 1.5 cm long, elliptic-lanceolate, acute, hairy; seeds many, oblong, rugose.

*Fl. & Fr.*: Sept.- Dec.

In dry deciduous forests. Sparse.

Madded, 16615; Kandlaparti; Pharsegarh.

**2. *A. paniculata* (Burm.f.) Wall. ex Nees in Wall., Pl. As. Rar. 3 : 116. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 501. 1884. *Justicia paniculata* Burm.f., Fl. Ind. 9. 1768.**

'*Bhui-limb*', '*Kaikati*'

Annual herbs, up to 40 cm tall. Leaves up to 5 × 2.5 cm, lanceolate, acute, glabrous. Flowers pink, in axillary and terminal panicles; pedicels and calyx glandular-hairy; upper lip of corolla 2-lobed, lower deeply 3-lobed; anthers bearded at the base. Capsules up to 2 cm long, linear-

oblong, acute, sparsely hairy; seeds many, sub-quadrangular, rugose.

*Fl. & Fr.*: Apr.- May.

In undergrowth of forests. Common.

Bijapur Ghati, 16230; Dudepalli.

## 2. BARLERIA L.

- |                          |                       |
|--------------------------|-----------------------|
| 1a. Outer sepals spinous | 1. <i>B. cristata</i> |
| 1b. Outer sepals ciliate | 2. <i>B. strigosa</i> |

**1. *Barleria cristata* L.**, Sp. Pl. 636. 1753; Clarke in Hook.f., Fl. Brit. India 4 : 488. 1884.

Herbs or shrubs, up to 60 cm tall. Leaves up to 7.5 × 3.5 cm, elliptic-oblong, acute or acuminate, hairy. Flowers solitary or paired, in axils or terminal clusters; outer sepals broadly lanceolate, margin spinous, inner sepals linear-lanceolate; corolla violet, 3-5 cm long, lobes obovate-oblong. Capsules up to 1.5 cm long, ellipsoid, acute; seeds 4, orbicular, silky-hairy.

*Fl. & Fr.*: Sept.- Feb.

In dry deciduous and mixed teak forests. Abundant.

Madded, 16625; Kerpe Valley; Kutru; Pharsegarh.

**2. *B. strigosa* Willd.**, Sp. Pl. 3 : 379. 1800; Clarke in Hook.f., Fl. Brit. India 4 : 489. 1884.

Undershrubs, up to 1.5 m tall. Leaves up to 20 × 7.5 cm, ovate, acuminate, base decurrent. Flowers in dense, terminal, strigosely-hairy spikes; outer sepals ovate, ciliate, inner linear-lanceolate and hirsute; corolla blue, 2-5 cm long, lobes obovate. Capsules up to 1.8 cm long, ellipsoid, acute; seeds 4, ellipsoid, silky-hairy.

*Fl. & Fr.*: Oct.- Feb.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16638 & 15595.

### 3. BLEPHARIS A. L. Juss.

**Blepharis maderaspatensis** (L.) Heyne ex Roth, Nov. Pl. Sp. 320. 1821. *Acanthus maderaspatensis* L., Sp. Pl. 639. 1753. *Blepharis boerhaviaefolia* Pers., Syn. Pl. 2 : 180. 1807; Clarke in Hook.f., Fl. Brit. India 4 : 478. 1884.

Climbing or prostrate herbs. Leaves whorled, up to 4 × 2 cm, oblong-lanceolate, acute or acuminate, glaucous beneath, membranous. Flowers axillary, solitary or 2-3 together; bracteoles with glochidiate, spinous teeth; corolla pinkish-white with a brown spot on the lower lip, upper lip obsolete. Capsules up to 7 mm long, ovoid; seeds usually 2 in each cell, echinate.

*Fl. & Fr.*: Nov.- Feb.

Common in moist, shaded places as forest-undergrowth.

Karkeli, 15541; Pharsegarh; Kandlaparti; Bijapur; Madded.

Plant is grazed by herbivores.

### 4. DICLIPTERA A. L. Juss.

**Dicliptera verticillata** (Forsk.) C. Christensen in Dansk. Bot. Arkiv. 4 : 11. 1923. *Dianthera verticillata* Forsk., Fl. Aegypt.-Arab. 9. 1775. *Dicliptera micranthes* Nees in Wall., Pl. As. Rar. 3 : 112. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 553. 1885.

Stiff, branched herbs, up to 35 cm tall. Leaves up to 5 × 3 cm, ovate-elliptic, subacuminate. Flowers sessile, in axillary clusters; bracts obovate-oblong, cuspidate-acuminate, margin ciliate in the lower half;

corolla purple, 4-5 mm long, pubescent without. Capsules *ca* 4 mm long, ellipsoid, pubescent at the apex; seeds 4, orbicular, echinate.

*Fl. & Fr.*: Oct.- Feb.

In dry deciduous and mixed teak forests. Common.

Kutru, 15507.

Plant is much grazed by herbivores.

#### 5. DIPTERACANTHUS Nees

**Dipteracanthus prostratus** (Poir.) Nees in Wall., Pl. As. Rar. 3 : 81. 1832. *Ruellia prostrata* Poir. in Lam., Encycl. 6 : 349. 1804; Clarke in Hook.f., Fl. Brit. India 4 : 411. 1884 (incl. var. *dejecta* Clarke).

Prostrate or ascending, branched herbs. Leaves up to 5 × 2.8 cm, ovate or ovate-elliptic, acute. Flowers sessile, usually solitary, axillary; bracteoles foliaceous; corolla violet, 2-3 cm long, caducous. Capsules up to 2 cm long, clavate, acute; seeds 16-20, *ca* 4 mm across, orbicular, margin hairy.

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

In moist deciduous forests. Common.

Itpal forest, 16240.

#### 6. DYSCHORISTE Nees

**Dyschoriste vagans** (Wight) O. Ktze., Rev. Gen. Pl. 1 : 486. 1891. *Calophanes vagans* Wight, Ic. t. 1526. 1850; Clarke in Hook.f., Fl. Brit. India 4 : 411. 1884.

Slender, glandular-pubescent herbs, up to 25 cm tall. Leaves up to 5 × 2.5 cm, ovate-lanceolate, acute. Flowers axillary, solitary or in fascicles; corolla 1.5-2 cm long, violet, 2-lipped; anthers spurred at the

base. Capsules up to 1 cm long, oblong; seeds 4, orbicular, compressed.

*Fl. & Fr.*: Dec.- Mar.

Common as forest-undergrowth.

Pharsegarh, 15572.

#### 7. ERANTHEMUM L.

**Eranthemum purpurascens** Nees in Wall., Pl. As. Rar. 3 : 106. 1832. *Daedalacanthus purpurascens* (Nees) T. Anders. in Journ. Linn. Soc. (Bot.) 9 : 488. 1867; Clarke in Hook.f., Fl. Brit. India 4 : 420. 1884.

Undershrubs, up to 1 m tall. Leaves up to 15.5 × 7 cm, ovate, acuminate, base rounded, upper leaves sub-sessile with cordate base. Flowers blue, in 2-7.5 cm long spikes, forming loose panicles; bracts foliaceous; corolla-tube 4-5 cm long, lobes obovate. Capsules clavate, base solid; seeds 4, discoid, hairy.

*Fl. & Fr.*: Oct.- Feb.

Common as undergrowth in forests.

Kutru, 16148; Pharsegarh; Kandlaparti.

#### 8. HEMIGRAPHIS Nees

**Hemigraphis latebrosa** (Heyne ex Roth) Nees in DC., Prodr. 11 : 723. 1847; Clarke in Hook.f., Fl. Brit. India 4 : 423. 1884. *Ruellia tuberosa* Heyne ex Roth, Nov. Pl. Sp. 307. 1821.

Annual, hairy herbs, up to 20 cm tall. Leaves up to 6 × 2.5 cm, ovate, acuminate, crenate-serrate. Flowers blue or violet, in axillary and terminal, capitate spikes; corolla 1-1.3 cm long, lobes obovate. Capsules 4-5 mm long, 4-angled; seeds 6, discoid, compressed, hairy.

*Fl. & Fr.*: Oct.- Feb.

In moist, shaded places as undergrowth in forests.

Pharsegarh, 15516; Kerpe; Netikakler; Kandlaparti.

#### 9. HYGROPHILA R. Br.

- |                                |                         |
|--------------------------------|-------------------------|
| 1a. Plants spiny               | 1. <i>H. auriculata</i> |
| 1b. Plants not spiny :         |                         |
| 2a. Flowers in axillary whorls | 2. <i>H. balsamica</i>  |
| 2b. Flowers in terminal spikes | 3. <i>H. polysperma</i> |

**1. *Hygrophila auriculata*** (K. Schum.) Heine in Kew Bull. 16 : 172. 1962. *Barleria auriculata* K. Schum., Beskr. Guin. Pl. 285. 1827. *Hygrophila spinosa* T. Anders. in Thw., Enum. 225. 1860; Clarke in Hook.f., Fl. Brit. India 4 : 408. 1884.

Hispid herbs, up to 50 cm tall; stem spiny at the nodes. Leaves whorled, up to 17 × 4 cm, lanceolate, acute-acuminate. Flowers in axillary whorls, surrounded by spines; corolla violet, 2.2-3 cm long, 2-lipped, lobes oblong-oblongate. Capsules 5-7 mm long, linear-oblong; seeds 4-8, hairy.

*Fl. & Fr.*: Oct.- Mar.

Abundant in paddy fields and along the edges of ponds.

Pharsegarh, 16115.

**2. *H. balsamica*** (L.f.) Rafin., Fl. Tellur. 4 : 66. 1838. *Ruellia balsamica* L.f., Suppl. 289. 1781. *Cardanthera balsamica* (L.f.) Benth. ex Clarke in Hook.f., Fl. Brit. India 4 : 404. 1884. *Adenosma verticillata* Nees in Wall., Pl. As. Rar. 3 : 79. 1832. *Cardanthera verticillata* (Nees) Benth. ex Clarke in Hook.f., Fl. Brit. India 4 : 404. 1884.

Erect or decumbent, branched, annual herbs, up to 20 cm tall.



Leaves up to 5 × 1 cm, obovate or oblong, crenate-serrate. Flowers violet, in axillary whorls; corolla 2-lipped. Capsules sessile, narrow; seeds many, ovoid, more or less compressed.

*Fl. & Fr.*: Dec.- Feb.

In harvested paddy fields and along the edges of ponds. Common.

Bijapur-Bhopalpatnam road, 15605; Kutru.

**3. *Hygrophila polysperma* (Roxb.) T. Anders.** in Journ. Linn. Soc. (Bot.) 9 : 456. 1867; Clarke in Hook.f., Fl. Brit. India 4 : 406. 1884. *Justicia polysperma* Roxb., Fl. Ind. 1 : 119. 1832.

Prostrate, branched herbs; branches up to 20 cm long, rooting at the nodes. Leaves up to 2.5 × 0.8 cm, ovate or oblong, obtuse. Flowers pale blue, in 3-10 cm long, terminal spikes; corolla 6-8 mm long, 2-lipped, pubescent. Capsules 6-8 mm long, oblong; seeds many, ovoid, compressed, hairy.

*Fl. & Fr.*: Oct.- Feb.

Abundant along the edges of ponds.

Kutru, 15502.

#### 10. JUSTICIA L.

- |  |                       |
|--|-----------------------|
| 1a. Shrubs   | 1. <i>J. adhatoda</i> |
| 1b. Herbs :  |                       |
| 2a. Bracts and bracteoles<br>foliaceous, prominently<br>nerved; calyx 5-lobed  | 2. <i>J. betonica</i> |
| 2b. Bracts and bracteoles<br>neither foliaceous nor<br>nerved; calyx 4-lobed : |                       |

- 3a. Bracts and bracteoles shorter than the calyx 3. *J. diffusa*
- 3b. Bracts and bracteoles equalling the calyx 4. *J. quinqueangularis*

**1. *Justicia adhatoda* L., Sp. Pl. 15. 1753. *Adhatoda vasica* Nees in Wall., Pl. As. Rar. 3 : 103. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 540. 1885.**

Evergreen shrubs, up to 3 m tall. Leaves up to 20 × 7.5 cm, elliptic-lanceolate, acuminate, dark green above. Flowers white, in dense, 5-10 cm long, axillary, peduncled spikes, at the apex of branches; bracts up to 2.5 × 1.5 cm, elliptic; corolla-tube 1.2-1.5 cm long, upper lip slightly notched, lower 3-lobed. Capsules up to 3 × 0.8 cm, clavate, subacute, pubescent; seeds more or less orbicular, verrucose.

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

Planted as a hedge for fencing, also found as an escape.

Kutru, 16362.

Leaves are useful in respiratory diseases.

**2. *J. betonica* L., Sp. Pl. 15. 1753; Clarke in Hook.f., Fl. Brit. India 4 : 525. 1885.**

Herbs, up to 75 cm tall. Leaves up to 10 × 4.5 cm, ovate-elliptic, entire or slightly crenate-serrate, acute or acuminate. Flowers in terminal, 4-15 cm long, paniced spikes; corolla white with pink patches, 1.5-1.8 cm long, 2-lipped, pubescent without. Capsules 6-10 mm long, clavate, pubescent; seeds 4, sub-orbicular, rugose.

*Fl. & Fr.*: Sept.- Dec.

Common as forest-undergrowth.

Madded, 16608; Bijapur Ghati.

Leaves are used to cure diarrhoea.

**3. *Justicia diffusa*** Willd., Sp. Pl. 1 : 87. 1797; Clarke in Hook.f., Fl. Brit. India 4 : 538. 1885.

Annual herbs, up to 20 cm tall. Leaves up to 3.5 × 1.5 cm, elliptic, acute. Flowers in 5-10 cm long, axillary and terminal spikes; corolla violet, 5-7 mm long, 2-lipped, pubescent without. Capsules 4-5 mm long, oblong; seeds 4, rugose.

*Fl. & Fr.*: Oct.- Feb.

In grassy-fields and as forest-undergrowth. Common.

Bijapur Ghati, 16424; Kutru; Pharsegarh.

**4. *J. quinqueangularis*** Koen. ex Roxb., Fl. Ind. 1 : 134. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 536. 1885.

Annual herbs, up to 35 cm tall. Leaves up to 5 × 0.7 cm, linear or lanceolate, sub-acute or sub-obtuse. Flowers in lax, terminal, up to 7.5 cm long spikes; corolla violet with a purple blotch on inner side of the upper lip. Capsules 5-7 mm long, oblong, acute; seeds 4, rugose.

*Fl. & Fr.*: Oct.- Dec.

Common in marshy habitats.

Pharsegarh, 16105; Kutru.

#### 11. *LEPIDAGATHIS* Willd.

***Lepidagathis hamiltoniana*** Nees in Wall., Pl. As. Rar. 3 : 96. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 516. 1885.

Herbs with perennial rootstock; stem up to 25 cm long. Leaves up

to 7.5 × 0.5 cm, linear, margin more or less ciliate. Flowers white, in congested spikes, forming prickly cushions, appressed to ground; bracts, bracteoles and sepals with acuminate apex ending in a spine; corolla 4-5 mm long, 2-lipped, silky-hairy. Capsules 4-5 mm long, lanceolate, compressed; seeds 2-4, sub-orbicular, compressed.

*Fl. & Fr.*: Dec.- Feb.

In grasslands. Sparse.

Pillure, 15533.

## 12. NELSONIA R. Br.

*Nelsonia canescens* (Lam.) Spreng., Syst. 1 : 42. 1825. *Justicia canescens* Lam., Encycl. 1 : 1141. 1783. *Nelsonia campestris* R. Br., Prodr. 481. 1810; Clarke in Hook.f., Fl., Brit. India 4 : 394. 1884.

Diffuse, villous herbs; roots fusiform. Lower leaves up to 15 cm long, petiolate; the upper up to 5 cm long, sub-sessile, elliptic-oblong, obtuse, densely hairy. Flowers purple, in 1-5.5 cm long spikes; bracts ovate, silky-hairy; bracteoles represently by two tufts of hairs; corolla 5-7 mm long, lobes obtuse. Capsules 5-7 mm long, ovoid-conic; seeds ellipsoid, granular.

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

In mixed teak and bamboo dominated forests.

Kandlaparti, 16275.

## 13. PERISTROPHE Nees

*Peristrophe paniculata* (Forsk.) Brummitt in Kew Bull. 38 : 451. 1983. *Dianthera paniculata* Forsk., Fl. Aegypt.- Arab. 7. 1775.

Branched, hispid herbs, up to 1 m tall; stem 6-angled. Leaves up to 5.5 × 2 cm, ovate, acute or acuminate, hairy. Flowers pink, in lax

panicles of cymules; calyx-lobes linear; corolla-tube 4-5 mm long, 2-lipped. Capsules 5-7 mm long, stipitate, oblong, beaked; seeds ovoid, glandular-papillose.

*Fl. & Fr.*: Oct.- Feb.

In waste lands. Sparse.

Pasewada, 15576.

#### 14. PETALIDIUM Nees

**Petalidium barlerioides** (Roth) Nees in Wall., Pl. As. Rar. 3 : 82. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 416. 1884. *Ruellia barlerioides* Roth, Nov. Pl. Sp. 319. 1821.

Straggling shrubs, up to 1.75 m tall. Leaves up to 10 × 5.5 cm, ovate, acute, acuminate, crenate-serrate. Flowers solitary, often clustered in sub-capitate spikes; bracteoles ovate, acuminate, white with green nerves; corolla white, 2-3 cm long, pubescent without, fulvous hairy within; anthers spurred. Capsules up to 1.2 cm long, clavate, cuspidate; seeds 2, orbicular, hairy.

*Fl. & Fr.*: Dec.- Feb.

In dry deciduous, mixed teak and bamboo dominated forests. Common.

Kerpe Valley, 15556; Bijapur Ghati; Pharsegarh; Kandlaparti; Madded.

Flowers are attractive.

#### 15. PHAULOPSIS Willd.

**Phaulopsis imbricata** (Forsk.) Sw., Hort. Brit. ed. 1. 327. 1827. *Ruellia imbricata* Forsk., Fl. Aegypt.- Arab. 113. 1775. *Phaulopsis parviflora* Willd., Sp. Pl. 3 : 342. 1800 ('*Phaylopsis*'); Clarke in Hook.f.,

Fl. Brit. India 4 : 417. 1884.

Perennial, branched herbs, up to 60 cm tall. Leaves up to 7 × 3 cm, ovate, acuminate, entire or sub-crenate, sparsely hairy. Flowers in dense, capitate spikes; bracts up to 0.9 × 1.3 cm, reniform or orbicular, base cordate, glandular-hairy; corolla white or light violet, 6-8 mm long, lobes rounded. Capsules 4-6 mm long, oblong or clavate, acute; seeds 4, orbicular, compressed, hairy.

*Fl. & Fr.*: Dec.- Feb.

In waste lands and in the vicinity of dry deciduous forests. Common.

Kutru, 15506; Pasewada.

#### 16. RHINACANTHUS Nees

**Rhinacanthus nasutus** (L.) Kurz in Journ. As. Soc. Beng. 39 : 79. 1870. *Justicia nasuta* L., Sp. Pl. 16. 1753. *Rhinacanthus communis* Nees in Wall., Pl. As. Rar. 3 : 109. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 541. 1885.

Shrubs, up to 2 m tall; branches slender. Leaves up to 12 × 5 cm, elliptic-lanceolate, acute, base attenuate. Flowers 1-3, in lax, terminal panicles; bracts and bracteoles glandular-pubescent; corolla white, 2-3 cm long, upper lip linear, bifid, lower lip 3-lobed. Capsules up to 2.5 cm long, clavate, pubescent; seeds 4, sub-orbicular, tubercled.

*Fl. & Fr.*: Dec.- Mar.

In moist deciduous forests. Rare.

Bijapur Ghati, 15596.

#### 17. RUNGIA Nees

1a. Bracts barren and fertile both

1. *R. pectinata*



Fig. 11. *Rhinacanthus nasutus* (L.) Kur?  
 1. flowering branch; 2. flower; 3. stamens; 4. capsule-entire &  
 5. capsule-dehisced.

## 1b. Bracts all fertile

2. *R. repens*

1. *Rungia pectinata* (L.) Nees in DC., Prodr. 11 : 470. 1847. *Justicia pectinata* L., Amoen. Acad. 4 : 299. 1759. *Rungia parviflora* Nees var. *pectinata* (L.) Clarke in Hook.f., Fl. Brit. India 4 : 550. 1885.

Decumbent or erect, annual herbs, up to 25 cm tall. Leaves up to 4 × 2 cm, elliptic or lanceolate, acute. Flowers violet, in terminal and axillary, 1-2.5 cm long spikes; barren bracts lanceolate, cuspidate; fertile bracts obovate-orbicular, cuspidate; corolla 4-5 mm long, 2-lipped. Capsules up to 3 mm long, ovoid, apex pubescent; seeds 2-4, orbicular, echinulate.

*Fl. & Fr.*: Oct.- Feb.

Common in dry deciduous, mixed teak and bamboo dominated forests.

Madded, 16632; Kerpe Valley; Kandlaparti.

Plants are grazed by herbivores.

2. *R. repens* (L.) Nees in Wall., Pl. As. Rar. 3 : 110. 1832; Clarke in Hook.f., Fl. Brit. India 4 : 549. 1885. *Justicia repens* L., Sp. Pl. 15. 1753.

Erect or decumbent herbs, up to 30 cm tall, rooting at the lower nodes. Leaves up to 5.5 × 3 cm, elliptic or elliptic-lanceolate, acute or sub-acuminate. Flowers violet, in up to 6 cm long spikes; bracts ovate-orbicular, cuspidate; corolla 0.8-1.2 cm long, pubescent without, 2-lipped. Capsules up to 5 mm long, ovoid-oblong, compressed; seeds sub-orbicular, rugose.

*Fl. & Fr.*: Oct.- Dec.

Common in dry deciduous and mixed teak forests.

Madded, 16630; Kutru.



## 18. STAUROGYNE Wall.

*Staurogyne glauca* (Nees) O. Ktze., Rev. Gen. Pl. 1 : 497. 1891.  
*Ebermareira glauca* Nees in DC., Prodr. 11 : 73. 1847; Clarke in Hook.f.,  
 Fl. Brit. India 4 : 395. 1884.

Annual herbs, up to 30 cm tall; stem viscous-pubescent in the upper portion. Lower leaves opposite, upper alternate, up to 8 × 1.7 cm, spatulate, obtuse, base attenuate. Flowers violet, in up to 12 cm long spikes; basal bracts leaf-like, becoming smaller upwards; bracteoles 2, oblong, glandular-hairy; calyx-lobes linear-oblong, one lobe longer, glandular-hairy; corolla 6-9 mm long, 2-lipped. Capsules oblong; seeds many, globose, retinacula absent.

*Fl. & Fr.*: Dec.- Feb.

In stream-beds. Rare.

Karkeli, 15542; Kutru.

## VERBENACEAE

- |   |               |
|---|---------------|
| 1a. Bracts accrescent, forming involucre in fruit                               | 5. SYMPHOREMA |
| 1b. Bracts not accrescent, hardly enlarged in fruit and not forming involucre : |               |
| 2a. Corolla regular   | 6. TECTONA    |
| 2b. Corolla irregular :   |               |
| 3a. Leaves digitately-foliolate   | 7. VITEX      |
| 3b. Leaves simple :   |               |
| 4a. Inflorescence spicate :   |               |

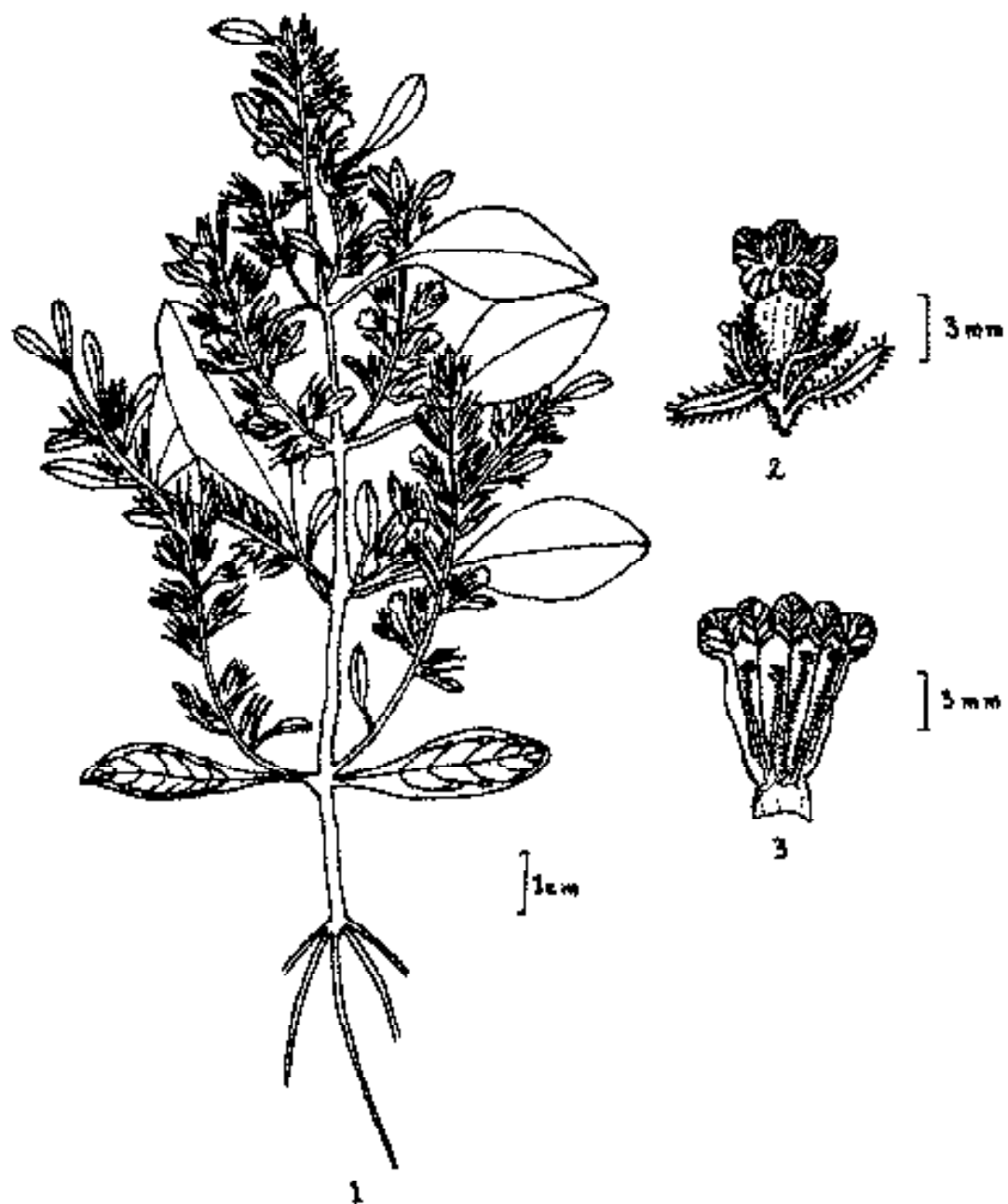


Fig. 12. *Staurogyne glauca* (Nees) O. Ktze.  
1, habit; 2, flower & 3, corolla, cut open.

- 5a. Calyx cupular; drupes dry            4. LIPPIA
- 5b. Calyx truncate;  
      drupes fleshy                         3. LANTANA
- 4b. Inflorescence paniculate :
- 6a. Stamens exerted            1. CLERODENDRUM
- 6b. Stamens included            2. GMELINA

### 1. CLERODENDRUM L.

**Clerodendrum serratum** (L.) Moon, Cat. 46. no. 382. 1824; Clarke in Hook.f., Fl. Brit. India 4 : 592. 1885. *Volkameria serrata* L., Mant. 90. 1767.

Shrubs, up to 2.5 m tall. Leaves ternate and opposite, up to 20 × 8 cm, elliptic-oblong, acute, serrate. Flowers white or pale blue, in terminal, up to 25 cm long, pyramidal panicles; calyx campanulate, truncate; corolla 5-lobed, lower lobe lip-like; stamens 4, hairy at the base. Drupes up to 5 × 6 mm, obovoid, 4-lobed; seeds oblong.

*Fl. & Fr.*: Sept.- Oct.

In moist and dry deciduous forests. Common.

Bijapur Ghati, 16455; Pharsegarh; Kerpe Valley; Kutru.

### 2. GMELINA L.

**Gmelina arborea** Roxb., Pl. Cor. 3 : 42. t.246. 1819; Clarke in Hook.f., Fl. Brit. India 4 : 581. 1885.

'Seona'

Deciduous trees, up to 20 m tall; bark grey. Leaves opposite, up to 15 × 12 cm, broadly ovate, acuminate, base truncate or cordate, glabrous above, tomentose beneath. Flowers yellow, in up to 24 cm long, tomentose

panicles; calyx campanulate, fulvous hairy; corolla brownish-yellow, 2-lipped. Drupes up to  $2 \times 1.5$  cm, obovoid, yellow on ripening; seeds oblong.

*Fl. & Fr.*: Apr.- May.

In moist deciduous forests. Sparse.

Itpal forest, 16233.

Wood is an excellent timber; fruits are edible.

### 3. LANTANA L.

*Lantana camara* L., Sp. Pl. 627. 1753; Clarke in Hook.f., Fl. Brit. India 4 : 562. 1885.

Straggling, prickly shrubs, up to 2 m tall. Leaves up to  $5 \times 3$  cm, ovate, acute, base rounded or sub-cordate, margin crenate-serrate. Flowers in axillary, pedunculate, capitate spikes; central flowers of the heads yellow, outer pink; corolla 4-6 mm across, 2-lipped. Drupes 2-4 mm across, globular, black on maturity.

*Fl. & Fr.*: Feb.- May.

Abundant along river-banks.

Mingachal river, 15616; Indravati river.

### 4. LIPPIA L.

*Lippia javanica* (Burm.f.) Spreng., Syst. 2 : 752. 1825. *Verbena javanica* Burm.f., Fl. Ind. 12. t.6. f.2. 1768. *Lippia geminata* H.B.K., Nov. Gen. et. Sp. 2 : 266. 1818; Clarke in Hook.f., Fl. Brit. India 4 : 563. 1885.

Slender, aromatic shrubs, up to 1.5 m tall. Leaves  $4 \times 1.5$  cm, ovate-lanceolate, acute, base cuneate or attenuate, margin crenate-

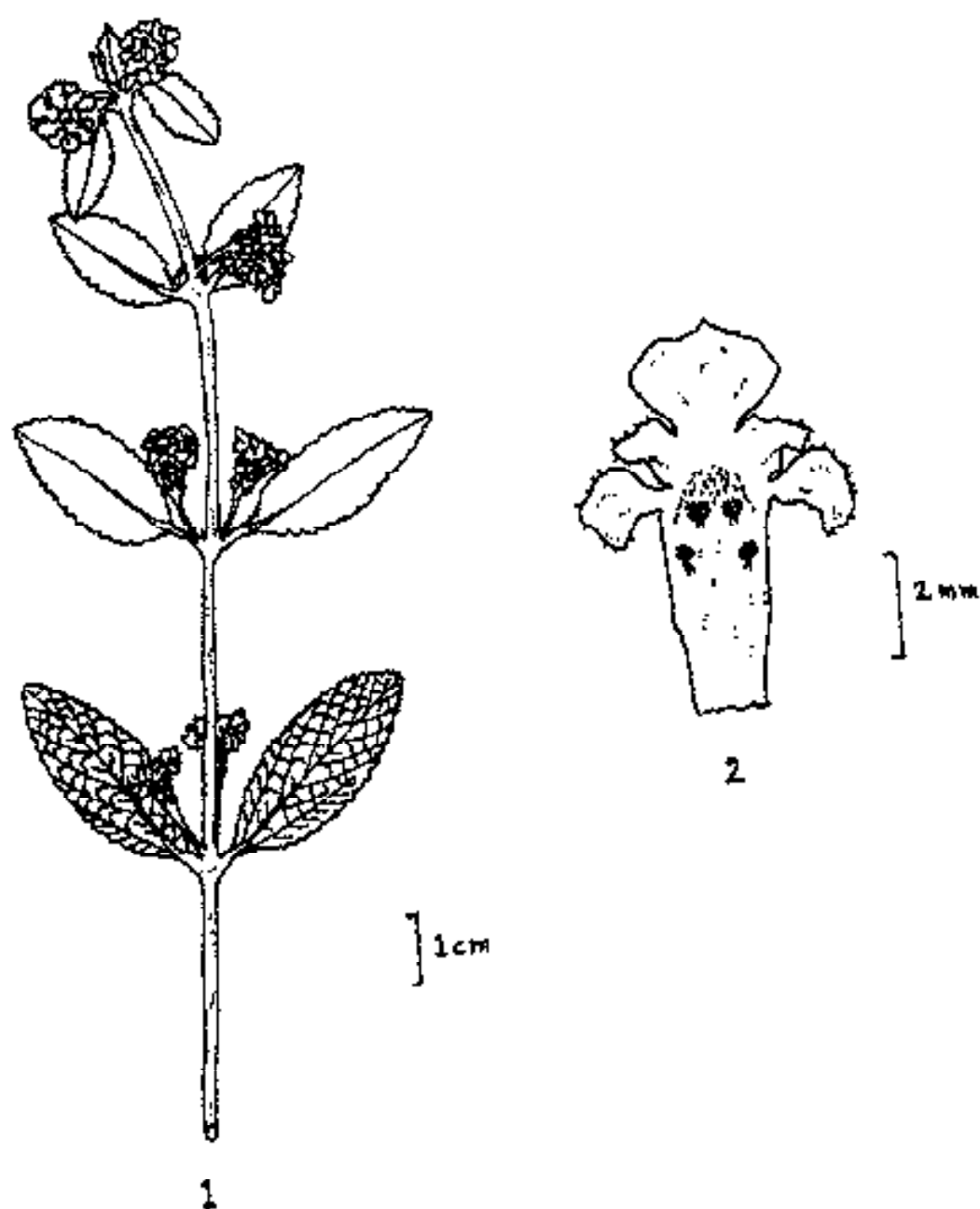


Fig. 13. *Lippia javanica* (Burm.f.) Spreng.  
1. twig & 2. corolla, cut open.

serrate, veins impressed on the upper surface. Flowers in capitate spikes, on axillary, up to 1 cm long peduncles; corolla light violet, throat yellow. Drupes 2-3 mm across, globose with two 1-seeded pyrenes.

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

Along river-beds. Common.

Indravati river, 16342.

#### 5. SYMPHOREMA Roxb.

**Symphorema polyandrum** Wight, Ic. t.363. 1840; Clarke in Hook.f., Fl. Brit. India 4 : 599. 1885.

Scandent shrubs; young parts tomentose. Leaves sessile, up to 12 × 7.5 cm, broadly ovate or sub-orbicular, acuminate, margin dentate, stellate-hairy. Flowers white, in capitate, pedunculate cymes with an involucre of 6, foliaceous, obovate, tomentose, accrescent bracts; calyx 6-8-lobed, campanulate, accrescent; corolla up to 1 cm long, 12-16-lobed. Drupes 6-8 mm across, enclosed in persistent calyx; 1-seeded.

*Fl. & Fr.*: Mar.- May.

Common over small trees in dry and mixed deciduous forests.

Itpal forest, 16250; Pengunda.

#### 6. TECTONA L.f.

**Tectona grandis** L.f., Suppl. 151. 1781; Clarke in Hook.f., Fl. Brit. India 4 : 570. 1885.

'Sagon'

Trees, up to 20 m tall; young parts tomentose; bark black. Leaves up to 45 × 30 cm, elliptic, acute or acuminate, scabrous above, stellate-tomentose beneath. Flowers white, in up to 50 cm long, terminal, tomentose panicles; calyx campanulate, accrescent; corolla 4-5 mm

across. Drupes up to 1 cm across, globose, stellate-tomentose, enclosed in inflated calyx; seeds oblong.

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

Often planted for its valuable timber.

Madded, 16601; Kandlaparti; Pillure.

#### 7. VITEX L.

*Vitex leucoxydon* L.f., Suppl. 293. 1781; Clarke in Hook.f., Fl. Brit. India 4 : 587. 1885

'*Neun-mara*'

Shrubs or small trees, up to 6 m tall; bark white, smooth. Leaves 3-5-foliolate, digitate; leaflets up to 10 × 2.5 cm, elliptic or lanceolate, sub-coriaceous, obtuse or acute. Flowers white, in axillary, lax, corymbose cymes. Drupes up to 2 × 1.2 cm, ellipsoid-obovoid; seeds 4, obovate.

*Fl. & Fr.*: Mar.- May.

Along the banks of streams and rivers. Common.

Jalavagu nala (Kandlaparti), 16283; Indravati river.

#### LAMIACEAE

- |  |               |
|--|---------------|
| 1a. Calyx-teeth 8-10                               | 5. LEUCAS     |
| 1b. Calyx-teeth or lobes 5 :                       |               |
| 2a. Stamens erect :                                |               |
| 3a. Aromatic herbs; corolla distinctly 2-lipped    | 3. ANISOMELES |
| 3b. Non-aromatic herbs; corolla obscurely 2-lipped | 9. POGOSTEMON |

## 2b. Stamens declinate :

## 4a. Inflorescence capitate :

5a. Corolla distinctly 2-lipped 2. ANISOCHILUS

5b. Corolla obscurely 2-lipped 1. ACROCEPHALUS

## 4b. Inflorescence various, not capitate :

6a. Lower lip of corolla  
exceeding the upper lip 8. PLECTRANTHUS6b. Lower lip of corolla equal  
or shorter than the upper lip :

7a. Whorls of flowers axillary 4. HYPTIS

7b. Whorls of flowers in  
terminal racemes :8a. Stamens exerted;  
stigma entire, capitate 7. ORTHOSIPHON8b. Stamens included;  
stigma 2-fid, not  
capitate 6. OCIMUM

## 1. ACROCEPHALUS Benth.

**Acrocephalus hispidus** (L.) Nicolson & Sadasivan in *Taxon* 29 : 324. 1980. *Gomphrena hispida* L., *Sp. Pl.* ed. 2. 1 : 326. 1762. *Ocimum capitatum* Roth, *Nov. Pl. Sp.* 276. 1821. *Acrocephalus capitatus* (Roth) Benth. in *Edwards' Bot. Reg.* t. 1282. 1829; *Hook. f., Fl. Brit. India* 4 : 611. 1885.

Annual, pubescent herbs, up to 20 cm tall. Leaves up to 2.8 × 1 cm, membranous, narrowly ovate, distantly serrate, acute, base cuneate.



Inflorescence capitate, up to 8 mm across; corolla violet, obscurely 2-lipped, lips subequal, upper lip shallowly 4-lobed, lower lip declinate, flat. Nutlets *ca* 1 mm long, oblong-ellipsoid, compressed, brown.

*Fl. & Fr.*: Oct.- Jan.

In moist, shaded places as forest-undergrowth. Abundant.

Bijapur Ghati, 16486; Kerpe Valley; Pharsegarh; Madded; Kutru.

### 2. ANISOCHILUS Wall. ex Benth.

**Anisochilus carnosus** (L.f.) Wall. ex Benth. in Wall., Pl. As. Rar. 2 : 18. 1831; Hook.f., Fl. Brit. India 4 : 627. 1885. *Lavandula carnosus* L.f., Suppl. 273. 1781.

Annual herbs, succulent, pinkish-green, up to 1.5 m tall. Leaves up to 5.8 × 4.2 cm, membranous, ovate, serrate, subacute or obtuse, base rounded or sub-cordate, deciduous. Inflorescence capitate, up to 3.5 cm long; corolla violet or purple, up to 1.5 cm long, lobes of the upper lip sub-orbicular, lower lip broadly ovate. Nutlets *ca* 1 mm long, ovoid-suborbicular, compressed, dark brown, shining.

*Fl. & Fr.*: Oct.- Dec.

In undergrowth of moist deciduous forests. Sparse.

Bijapur Ghati, 16469.

Plant is grazed by herbivores.

### 3. ANISOMELES R. Br.

**Anisomeles indica** (L.) O. Ktze., Rev. Gen. Pl. 2 : 512. 1891. *Nepeta indica* L., Sp. Pl. 571. 1753. *A. ovata* R. Br. in Ait., Hort. Kew. ed. 2, 3 : 364. 1811; Hook.f., Fl. Brit. India 4 : 672. 1885.

Undershrubs, up to 2 m tall; stem villous-pilose. Leaves up to

7 × 4 cm, ovate, crenate-serrate, acute, base cordate-cuneate or truncate. Spikes up to 25 cm long with distant verticils; calyx 10-nerved, hirsute; corolla purple, up to 1.5 cm long, upper lip entire, lower lip 4-lobed. Nutlets ca 2 mm long, ellipsoid, sub-trigonal, black, shining.

*Fl. & Fr.*: Sept.- Dec.

In the vicinity of forests. Sparse.

Pharsegarh, 16121.

#### 4. *HYPTIS* Jacq.

***Hyptis suaveolens* (L.) Poit.** in Ann. Mus. Nat. Hist. Paris 7 : 472. t.29. f.2. 1806; Hook.f., Fl. Brit. India 4 : 630. 1885. *Ballota suaveolens* L., Syst. Nat. ed. 10. 1100. 1759.

Undershrubs, up to 2.5 m tall. Leaves up to 7.5 × 6 cm, ovate-suborbicular, crenate-serrulate, obtuse, base rounded, sparsely pilose above, densely so beneath. Flowers violet, in axillary fascicles; calyx 10-nerved, hispidulous on the nerves, mouth oblique; corolla obscurely 2-lipped, upper lip 2-lobed, lower lip shorter. Nutlets 2-3 mm long, oblong, compressed with a central ridge on either face, pubescent.

*Fl. & Fr.*: All seasons.

In the vicinity of dry deciduous forests and along the borders of cultivated fields. Common.

Maddur, 16610; Pharsegarh.

#### 5. *LEUCAS* R. Br.

- |                                    |                      |
|------------------------------------|----------------------|
| 1a. Verticils 2-4-flowered         | 1. <i>L. biflora</i> |
| 1b. Verticils 6 or more flowered : |                      |
| 2a. Calyx-mouth oblique            | 2. <i>L. indica</i>  |

2b. Calyx-mouth not oblique :

3a. Leaves linear-oblong,  
margin entire

4. *L. stricta*

3b. Leaves ovate, margin  
coarsely serrate

3. *L. mollissima*

**1. *Leucas biflora* (Vahl) R. Br., Prodr. 504. 1810; Hook.f., Fl. Brit. India 4 : 683. 1885 (excl. syn. *L. procumbens* Thw.). *Phlomis biflora* Vahl, Symb. Bot. 3 : 77. 1794.**

Procumbent, branched herbs. Leaves up to 4 × 2 cm, ovate or ovate-lanceolate or ovate-deltoid, crenate-serrate, acute or obtuse, base truncate or rounded, scabrid-hirsute above, finely tomentose beneath. Verticels distant, 2-4-flowered; corolla white, up to 1.5 cm long, tube villous within, lower lip broadly ovate-oblong. Nutlets ovoid.

*Fl. & Fr.*: Sept.- Dec.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16459.

**2. *L. indica* (L.) R. Br. ex Vatke in Oesterr. Bot. Z. 25 : 95. 1875. *Leonurus indicus* L., Syst. Nat. ed. 10. 1101. 1759. *Phlomis linifolia* Roth, Nov. Pl. Sp. 260. 1821. *Leucas linifolia* (Roth) Spreng., Syst. 2 : 743. 1825; Hook.f., Fl. Brit. India 4 : 690. 1885.**

Branched, perennial herbs, up to 60 cm tall. Leaves up to 7 × 1.3 cm, linear-lanceolate, distantly serrate, obtuse. Flowers white, in axillary and terminal verticels; corolla up to 1.3 cm long, upper lip lanate. Nutlets 2-3 mm long, oblong, trigonous.

*Fl. & Fr.*: Apr.- May.

Along river-banks in sandy soil. Not common.

Indravati river, 16312.

**3. *Leucas mollissima*** Wall. ex Benth. in Wall., Pl. As. Rar. 1 : 62. 1830; Hook.f., Fl. Brit. India 4 : 682. 1885.

Straggling or ascending, annual or perennial herbs. Leaves up to 5 × 2.5 cm, ovate to ovate-deltoid, serrate, acute, base sub-acute or truncate, appressed tomentose above, lanate-tomentose beneath. Verticels 6-10-flowered, axillary; corolla white, up to 1.5 cm long, tube linear, upper lip villous dorsally, lower lip orbicular-spathulate. Nutlets ovoid, smooth.

*Fl. & Fr.*: Sept.- Nov.

In dry deciduous forests. Sparse.

Kutru, 16141.

**4. *L. stricta*** Benth. in Wall., Pl. As. Rar. 1 : 61. 1830; Hook.f., Fl. Brit. India 4 : 688. 1885.

Annual, hispid herbs, up to 20 cm tall. Leaves up to 3 × 0.3 cm, linear-oblong, entire, subacute or obtuse, tapering at the base, hispid-hairy. Flowers white, in terminal, solitary, many flowered verticels; corolla up to 1.5 cm long, upper lip villous. Nutlets *ca* 3 mm long, oblong, rounded dorsally, angular ventrally, brown.

*Fl. & Fr.*: Sept.- Nov.

In dry deciduous forests. Rare.

Madded, 16151.

## 6. OCIMUM L.

***Ocimum americanum*** L., Cent. Pl. 1 : 15. 1755. *O. canum* Sims in Bot. Mag. t.2452. 1823; Hook.f., Fl. Brit. India 4 : 607. 1885.

Annual, branched herbs, up to 60 cm tall. Leaves up to 3.8 × 1.9 cm, ovate-lanceolate or ovate-oblong, serrulate, acute, base acute or rounded. Racemes up to 12.5 cm long; pedicels recurved; corolla violet, 5-6 mm long, lobes of the upper lip villous dorsally, style linear. Nutlets 1.5 × 1 mm, ovoid, sub-trigonous.

*Fl. & Fr.*: Sept.- Dec.

In open, waste places. Common.

Bijapur, 16650; Netikakler; Pengunda.

#### 7. ORTHOSIPHON Benth.

**Orthosiphon rubicundus** (D. Don) Benth. in Wall., Pl. As. Rar. 2 : 14. 1831; Hook.f., Fl. Brit. India 4 : 614. 1885. *Plectranthus rubicundus* D. Don, Prodr. Fl. Nep. 116. 1825 ('*Plectranthes rubicunda*').

'*Ban-kikir*'

Perennial herbs, up to 20 cm tall; roots fusiform. Leaves often in basal clusters, up to 9 × 2 cm, elliptic-oblong, crenate-serrate, obtuse. Racemes up to 20 cm long, terminal, verticels 6-flowered, distant; calyx pinkish-green; corolla 2-lipped, upper lip 3-4-lobed, lower lip entire. Nutlets sub-orbicular, compressed.

*Fl. & Fr.*: Apr.- May.

Common as forest-undergrowth.

Bijapur Ghati, 16216.

#### 8. PLECTRANTHUS L'Herit.

**Plectranthus mollis** (Ait.) Spreng., Syst. 2 : 690. 1825. *Ocimum molle* Ait., Hort. Kew. ed. 1. 2 : 322. 1789. *Plectranthus incanus* Link,

Enum. Hort. Berol. 2 : 120. 1822; Hook.f., Fl. Brit. India 4 : 621. 1885.

Succulent, pubescent herbs, up to 1.5 m tall. Leaves up to 10 × 7.5 cm, membranous, ovate, acute, base cordate. Racemes up to 15 cm long, terminal, paniculately branched; corolla 6-8 mm long, violet, upper lip 4-lobed, lower lip entire, boat-shaped. Nutlets *ca* 2 mm across, sub-globose.

*Fl. & Fr.*: Aug.- Oct.

In waste lands and in the vicinity of forests. Common.

Bijapur, 16661.

#### 9. POGOSTEMON Desf.

**Pogostemon parviflorus** Benth. in Wall., Pl. As. Rar. 1 : 31. 1830; Hook.f., Fl. Brit. India 4 : 632. 1885.

Shrubs, up to 2.5 m tall. Leaves up to 12 × 5.8 cm, ovate, dentate, acute or acuminate, base cuneate. Flowers violet, in pyramidal, lax panicles; calyx glandular-pubescent on outer side; corolla 5-7 mm long, obscurely 2-lipped. Nutlets *ca* 1 mm long, ellipsoid, rounded on the outer face, angular on the inner face.

*Fl. & Fr.*: Jan.- Mar.

In the vicinity of dry deciduous forests. Common.

Mingachal river, 15615.

### NYCTAGINACEAE

#### BOERHAVIA L.

**Boerhavia diffusa** L., Sp. Pl. 3. 1753. *B. repens* L., Sp. Pl. 3. 1753; Hook.f., Fl. Brit. India 4 : 709. 1885.

Prostrate or ascending, diffuse, annual herbs. Leaves opposite, up to 2.8 × 2.2 cm, ovate, margin undulate, obtuse or acute, base rounded-cordate, whitish on under surface. Flowers pink, in sub-capitate umbels, forming a panicle; perianth 3-4 mm long, tubular, constricted in the middle. Anthocarp up to 3.5 mm long, clavate, glandular along the 5 ribs.

*Fl. & Fr.*: Aug.- Oct.

Common weed in waste places and in the vicinity of forests.

Bijapur Ghati, 16414.

*Bougainvillea spectabilis* Willd.— a native of Brazil and *Mirabilis jalapa* L.— a native of Mexico are often planted for their beautiful flowers in houses.

#### AMARANTHACEAE

- 1a. Leaves alternate :
  - 2a. Utricle many seeded 6. CELOSIA
  - 2b. Utricle 1-seeded :
    - 3a. Pseudo-staminodes present 2. AERVA
    - 3b. Pseudo-staminodes absent :
      - 4a. Flowers bisexual;  
seeds arillate 3. ALLMANIA
      - 4b. Flowers unisexual;  
seeds not arillate 5. AMARANTHUS
- 1b. Leaves opposite :
  - 5a. Filaments united almost  
to the top 7. GOMPHRENA

- 5b. Filaments united at the base only or free :
- 6a. Pseudo-staminodes absent 8. PSILOTRICHUM
- 6b. Pseudo-staminodes present :
- 7a. Leaves linear-filiform; utricle circumscissile at the tip and longitudinally split below when mature 9. TRICHURIELLA
- 7b. Leaves not linear-filiform; utricle indehiscent or irregularly rupturing :
- 8a. Flowers in elongate, pedunculate spikes 1. ACHYRANTHES
- 8b. Flowers in dense, axillary heads 4. ALTERNANTHERA

1. ACHYRANTHES L.

*Achyranthes aspera* L., Sp. Pl. 204. 1753; Hook.f., Fl. Brit. India 4 : 730. 1885.

Woody herbs, up to 1 m tall. Leaves up to 10 × 5 cm, elliptic or elliptic-oblong, acute or acuminate, base narrowed, pubescent beneath. Flowers hermaphrodite, in up to 25 cm long, pedunculate spikes; tepals 5, pale green or purple, lanceolate, acute; stamens 5, alternating with subquadrate pseudo-staminodes. Utricles indehiscent; seeds cylindrical, smooth.

*Fl. & Fr.*: Sept.- Jan.

Common weed of waste places; also found in the vicinity of forests.



Bijapur, 16651; Kutru.

## 2. AERVA Forsk.

**Aerva lanata** (L.) Juss. ex Schult. in Ann. Mus. Nat. Hist. Paris 11 : 131. 1808; Hook.f., Fl. Brit. India 4 : 728. 1885. *Achyranthes lanata* L., Sp. Pl. 205. 1753.

Prostrate or erect, branched herbs, up to 25 cm tall. Leaves up to 4 × 2 cm, sub-orbicular or ovate-elliptic, acute or obtuse, base cuneate, sparsely pubescent above, densely so beneath. Flowers white, in dense, axillary, up to 1.5 cm long spikes; tepals 1-1.5 mm long, oblong, mucronate, lanate without. Utricle rotund, compressed; seeds reniform.

*Fl. & Fr.*: May-Sept.

In waste places. Common.

Bijapur, 16208; Kutru; Pillure.

Plant is grazed by herbivores.

## 3. ALLMANIA R. Br. ex Wight

**Allmania nodiflora** (L.) R. Br. ex Wight in Journ. Bot. (Hook.) 1 : 226. 1834; Hook.f., Fl. Brit. India 4 : 716. 1885. *Celosia nodiflora* L., Sp. Pl. 205. 1753.

Erect or ascending, branched, annual herbs, up to 25 cm tall. Leaves up to 7.5 × 2 cm, linear to elliptic, oblong or spatulate, rounded or sub-acuminate, base cuneate to attenuate. Flowers bisexual, in terminal and leaf-opposed, globose, pendulous heads; tepals 5, red, elliptic-lanceolate; stamens 5, slightly united at the base. Capsules ovoid; seeds black, lenticular with a cupular aril at the base.

*Fl. & Fr.*: Sept.- Nov.

Common as undergrowth in dry deciduous forests.

Madded, 16628; Pharsegarh.

#### 4. ALTERNANTHERA Forsk.

*Alternanthera sessilis* (L.) R. Br. ex DC., Cat. Pl. Hort. Bot. Monspef. 4 : 77. 1813; Hook.f., Fl. Brit. India 4 : 731. 1885. *Gomphrena sessilis* L., Sp. Pl. 225. 1753.

Prostrate or ascending, annual or perennial herbs. Leaves up to 2.5 × 0.8 cm, linear-lanceolate to oblong or obovate-spathulate, rounded or acute, base cuneate. Flowers white, bisexual, in axillary, sub-globose heads; tepals 5, ovate-elliptic, obtuse to acuminate; stamens 5, filaments united at the base. Utricle obcordate or cordate-orbicular, compressed; seeds brown, discoid, finely reticulate.

*Fl. & Fr.*: Sept.- Dec.

Common in dried-up stream-beds.

Pharsegarh, 16118; Pendgunda; Netikakler.

Plant is grazed by herbivores; its juice is said to be used in rheumatism.

#### 5. AMARANTHUS L.

- |  |                       |
|--|-----------------------|
| 1a. Leaf-axils with a pair of spines           | 1. <i>A. spinosus</i> |
| 1b. Leaf-axils without spines :                |                       |
| 2a. Capsules dehiscent by a circumscissile lid | 2. <i>A. tricolor</i> |
| 2b. Capsules indehiscent                       | 3. <i>A. viridis</i>  |

**1. *Amaranthus spinosus* L., Sp. Pl. 991. 1753; Hook.f., Fl. Brit. India 4 : 718. 1885.**

Annual herbs, up to 1.5 cm tall. Leaves up to 5.5 × 2.2 cm, ovate to rhomboid-ovate or elliptic. Flowers green, unisexual, in axillary clusters towards the lower part of the plant and in simple or branched spikes towards the apex of stem; tepals 5, lanceolate-oblong. Capsules ovoid-urceolate, regularly or irregularly circumscissile or rarely indehiscent; seeds compressed, dark brown.

*Fl. & Fr.*: Sept.- Dec.

Common in waste lands, roadsides etc.

Bijapur, 16555.

**2. *A. tricolor* L., Sp. Pl. 989. 1753. *A. mangostanus* L., Cent. Pl. 1 : 32. 1755; Hook.f., Fl. Brit. India 4 : 720. 1885. *A. gangeticus* L., Syst. Nat. ed. 10. 2 : 1268. 1759; Hook.f., Fl. Brit. India 4 : 719. 1885.**

Prostrate or erect, annual herbs. Leaves variable in size (up to 7 cm long), broadly ovate, rhomboid-ovate or elliptic or lanceolate-oblong, obtuse or emarginate, base cuneate or attenuate, decurrent. Flowers pinkish-white, unisexual, in axillary clusters and terminal spikes; tepals 3, elliptic, awned. Capsules ovoid-urceolate, circumscissile, membranous; seeds black, sub-orbicular.

*Fl. & Fr.*: Jan.- Mar.

In waste lands. Not common.

Kutru, 15501.

Plant is cooked as a vegetable.

**3. *A. viridis* L., Sp. Pl. ed. 2. 2 : 1405. 1763; Hook.f., Fl. Brit. India 4 : 720. 1885.**

Annual herbs, up to 40 cm tall. Leaves up to 5.5 × 3.8 cm, ovate-deltoid to rhomboid-oblong, obtuse or emarginate, base cuneate or sub-truncate. Flowers green, unisexual, in slender, axillary or terminal paniculate spikes; tepals 3, ovate-oblong. Capsules sub-globose, indehiscent, rugose; seeds brown or black, orbicular, reticulate.

*Fl. & Fr.*: Sept.- Dec.

Common weed in waste lands and along roadsides.

Bijapur, 16653; Kutru.

#### 6. CELOSIA L.

*Celosia argentea* L., Sp. Pl. 205. 1753; Hook.f., Fl. Brit. India 4: 714. 1885.

*'Khodia-lingri'*

Simple or branched, annual herbs, up to 1 m tall. Leaves variable, up to 12.5 × 3 cm, lanceolate-oblong to linear, acute or obtuse, mucronate, base tapering. Flowers pinkish-white, in dense, up to 10 cm long, terminal spikes; tepals narrowly elliptic-oblong, mucronate, margin hyaline; filaments united at the base into a short sheath. Capsules ovoid or globular, circumscissile; seeds black, lenticular.

*Fl. & Fr.*: Sept.- Dec.

Common in the vicinity of forests, waste lands and dried up river-beds.

Bijapur Ghati, 16476; Kandlaparti; Pharsegarh; Kutru; Netikakler; Pengunda.

Plant is grazed by herbivores.

#### 7. GOMPHRENA L.

*Gomphrena celosioides* Mart. in Beitr., Amar. 93. 1825.

Prostrate or ascending, diffuse, hairy, annual herbs. Leaves up to 5 × 1.5 cm, oblong-spathulate, obtuse, mucronate. Flowers hermaphrodite, in terminal, globose-cylindric spikes, up to 3 cm long; tepals white, narrowly lanceolate, acute, outer 3 lanate at the base only, inner 2 densely lanate almost to the tip. Utricle pyriform, compressed; seeds ovoid, compressed, faintly-reticulate.

*Fl. & Fr.*: Apr.- May.

In waste places. Common.

Bijapur, 16209; Kutru; Pengunda; Pharsegarh.

Plant is liked by herbivores.

#### 8. *PSILOTRICHUM* BL.

***Psilotrichum ferrugineum* (Roxb.) Moq. in DC., Prodr., 13(2) : 279. 1849; Hook.f., Fl. Brit. India 4 : 725. 1885. *Achyranthes ferruginea* Roxb., Fl. Ind. 2 : 502. 1824. *Psilotrichum trichotomum* Bl., Bijdr. 545. 1825; Hook.f., l.c. 4 : 725. 1885; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 29. 1976.**

Erect or ascending, branched, annual herbs, up to 25 cm tall. Leaves up to 5 × 1.8 cm, oblanceolate or oblong, mucronate. Flowers hermaphrodite, in terminal, up to 2.5 cm long spikes; tepals 2-2.5 mm long, lanceolate, acute, 3-5-nerved. Utricle 1-1.5 mm long, ellipsoid, dehiscent irregularly; seeds compressed, ovoid, shining black.

*Fl. & Fr.*: Oct.- Feb.

In moist places. Sparse.

Bijapur (Saxena & Khotele l.c.).

## 9. TRICHURIELLA S.S.R. Bennet

**Trichuriella monsoniae** (L.f.) S.S.R. Bennet in Indian Journ. For. 8 : 86. 1985. *Illecebrum monsoniae* L.f., Suppl. 161. 1781. *Aerva monsoniae* (L.f.) Mart., Nov. Act. Phys.- Med. Acad. Caes. Leop. Carol. Nat. Curios 13(1) : 291. 1826; Hook.f., Fl. Brit. India 4 : 728. 1885.

Prostrate or ascending, tufted, annual herbs, up to 25 cm tall. Leaves opposite or in fascicles, up to 2.5 cm long, linear-filiform, spinuous-tipped. Flowers hermaphrodite, pinkish-white, in up to 2.5 cm long, cylindric, silky-hairy, terminal spikes; tepals 4, ca 2 mm long, lanceolate, hyaline with a green midrib, lanate dorsally. Utricle ovoid; seeds ovoid-ellipsoid, brown, shining.

*Fl. & Fr.*: Oct.- Mar.

In moist, sandy river-beds. Sparse.

Indravati river, 15573.

## POLYGONACEAE

## POLYGONUM L.

- |  |                       |
|--|-----------------------|
| 1a. Prostrate or decumbent herbs;<br>leaves less than 4 mm broad | 3. <i>P. plebeium</i> |
| 1b. Erect herbs; leaves more<br>than 10 mm broad :               |                       |
| 2a. Nuts trigonous   | 1. <i>P. barbatum</i> |
| 2b. Nuts biconvex :  |                       |
| 3a. Ochrae glabrous  | 2. <i>P. glabrum</i>  |

3b. Ochrae strigosely-hairy

4. *P. pulchrum*

**1. *Polygonum barbatum* L.**, Sp. Pl. 362. 1753; Hook.f., Fl. Brit. India 5 : 37. 1886. *P. stagninum* Meisn. in Wall., Pl. As. Rat. 3 : 56. 1832; Hook.f., l.c. 5 : 37. 1886.

‘*Chati-bhaji*’

Erect, branched, perennial herbs, up to 1.5 m tall. Leaves up to 15.5 × 2.5 cm, linear-lanceolate, acute, appressed-hairy; ochrae strigose-ciliate at the mouth. Flowers white, in paniced pseudo-spikes; perianth-lobes 5, elliptic. Nuts *ca* 2 mm long, trigonous, black.

*Fl. & Fr.*: Jan.- May.

Along the edges of ponds. Abundant.

Kutra, 16367.

**2. *P. glabrum* Willd.**, Sp. Pl. 2 : 447. 1799; Hook.f., Fl. Brit. India 5 : 34. 1886.

Branched herbs, up to 1.25 m tall. Leaves up to 20 × 1.8 cm, lanceolate, acuminate, base attenuate, gland-dotted; ochrae tubular, truncate at the apex, glabrous. Flowers pink, in terminal, paniced racemes; perianth-lobes 5, oblong-obovate. Nuts *ca* 2 mm long, sub-orbicular, biconvex, reddish-brown, smooth.

*Fl. & Fr.*: Dec.- Mar.

In river and stream-beds; also along the edges of ponds. Common.

Mingachal river, 15619; Indravati river.

**3. *P. plebeium* R.Br.**, Prodr. 420. 1810; Hook.f., Fl. Brit. India 5 : 27. 1886.

Prostrate or decumbent, branched, purplish-green herbs; rootstock woody. Leaves up to 1.5 × 0.3 cm, linear-oblong, obtuse, sessile. Flowers white or pink, 1-3-together in leaf-axils; perianth-lobes 5. Nuts 1-2 mm long, trigonous, black, smooth.

*Fl. & Fr.*: Jan.- May.

Along the edges of ponds and dried up river-beds. Abundant.

Dudepalli, 16338; Indravati river.

**4. *Polygonum pulchrum*** Bl., Bijdr. 530. 1826. *P. tomentosum* Willd., Sp. Pl. 2 : 447. 1799; Hook.f., Fl. Brit. India 5 : 30. 1886; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 29. 1976.

Robust, annual herbs, up to 1 m tall. Leaves up to 16 × 3 cm, lanceolate, sub-acuminate, silky-hairy; ochrae tubular, mouth ciliate with bristles. Flowers white, in paniculate spikes; perianth-lobes 5, ovate-oblong, obtuse. Nuts orbicular, biconvex.

*Fl. & Fr.*: Nov.- Mar.

In wet places. Sparse.

Sangam-Bhopalpatnam (Saxena & Khotele *l.c.*).

## LAURACEAE

### CASSYTHA L.

***Cassytha filiformis*** L., Sp. Pl. 35. 1753; Hook.f., Fl. Brit. India 5 : 188. 1886.

Twining, parasitic herbs; stem filiform, pale green, much branched. Leaves reduced to scales or absent. Flowers white, bisexual, lax, in up to



3 cm long, lateral spikes; bracts deciduous; bracteoles 3, persistent, rounded, ciliate; perianth-lobes 6, outer 3 smaller and ciliate; stamens in 3 whorls. Drupes green, turning to white, globose, smooth, enclosed in accrescent perianth, 1-seeded; seeds black.

*Fl. & Fr.*: Dec.- Mar.

Over small trees in dry deciduous forests and in grasslands.

Pillure, 15530; Pharsegarh.

## LORANTHACEAE

- |   |                 |
|---|-----------------|
| 1a. Leaves with a midrib; flowers bisexual                | 1. DENDROPHTHOE |
| 1b. Leaves when present without midrib; flowers unisexual | 2. VISCUM       |

### 1. DENDROPHTHOE C.F.P. Mart.

**Dendrophthoe falcata** (L.f.) Etting in Denkschr., Akad. Wissen. Nat. 32 : 52. t.13. f.14. 1872. *Loranthus falcatus* L.f., Suppl. 211. 1781. *L. longiflorus* Desr. in Lam., Encycl. 3 : 598. 1789; Hook.f., Fl. Brit. India 5 : 214. 1886.

Semiparasitic, bushy undershrubs, up to 1.25 m tall. Leaves up to 10 × 5.5 cm, ovate-elliptic or elliptic-oblong, obtuse, coriaceous. Flowers in secund racemes, axillary or often clustered in the axils of fallen leaves; corolla-tube pink, lobes green and reflexed. Berries red, ovoid-oblong, crowned by persistent cup-like calyx.

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

A common parasite on various trees.

Itpal forest, 16242; Bhopalpatnam; Pengunda.

## 2. VISCUM L.

- 1a. Plants leafy 2. *V. orientale*  
 1b. Plants leafless 1. *V. articulatum*

**1. *Viscum articulatum*** Burm.f., Fl. Ind. 311. 1768; Hook.f., Fl. Brit. India 5 : 226. 1886.

‘Aanka’

Semiparasitic, leafless, dichotomously-branched shrubs; branches jointed, flat, readily disarticulating at the joints, pale green. Flowers cream coloured, in fascicles at the nodes; bracts cup-like; tepals ovate-triangular, caducous. Berries greenish-yellow, globose, 4-5 mm across.

*Fl. & Fr.*: Apr.- May.

On *Diospyros melanoxylon*, in dry deciduous forests.

Pharsegarh, 16290; Dudepalli.

Plants' paste is tied on the fractured bones.

**2. *V. orientale*** Willd., Sp. Pl. 4 : 737. 1805; Hook.f., Fl. Brit. India 5 : 224. 1886.

Semiparasitic undershrubs; branches terete or angular, grooved. Leaves opposite, up to 3.2 × 1.5 cm, elliptic or elliptic-lanceolate, obtuse or rounded, base tapering, 3-5-nerved at the base. Flowers green, monoecious, sessile or shortly pedunculate, in axillary clusters of 3-5. Berries 5-7 mm long, ovoid or sub-globose.

*Fl. & Fr.*: Apr.- May.

In dry deciduous forests over trees. Sparse.

Pharsegarh, 16289.

## EUPHORBIACEAE

- 1a. Flowers naked, arranged in cyathia 7. EUPHORBIA
- 1b. Flowers with perianth, not arranged in cyathia :
- 2a. Leaves palmately veined :
- 3a. Filaments branched 11. RICINUS
- 3b. Filaments underbranched :
- 4a. Herbs; petals present 4. CHROZOPHORA
- 4b. Trees; petals absent 9. MALLOTUS
- 2b. Leaves pinnately veined :
- 5a. Herbs :
- 6a. Ovule 1 per locule 12. SEBASTIANIA
- 6b. Ovules 2 per locule 10. PHYLLANTHUS
- 5b. Shrubs or trees :
- 7a. Ovule 1 per locule 8. HOMONOIA
- 7b. Ovules 2 per locule :
- 8a. Petals present :
- 9a. Ovary 2-celled;  
fruit a drupe 3. BRIDELIA
- 9b. Ovary 3-celled;  
fruit a capsule 5. CLEISTANTHUS

8b. Petals absent :

10a. Male flowers in spikes or racemes 1. ANTIDESMA

10b. Male flowers in fascicles :

11a. Leaves linear, less than 3 mm  
broad; disc present in female  
flowers 6. EMBLICA

11b. Leaves elliptic, more than 8 mm  
broad; disc absent in female flowers 2. BREYNIA

1. ANTIDESMA L.

1a. Leaf-apex acute or acuminate; stamens 2 1. *A. acidum*

1b. Leaf-apex obtuse; stamens 4-7 2. *A. ghaesembilla*

**1. *Antidesma acidum* Retz., Obs. Bot. 5 : 30. 1788. *A. diandrum*  
Roth, Nov. Pl. Sp. 369. 1821; Hook.f., Fl. Brit. India 5 : 361. 1887.**

'Ami'

Shrubs, up to 4 m tall. Leaves alternate, up to 10 × 5.5 cm, elliptic or elliptic-obovate, acute or acuminate, base acute. Flowers pedicellate, unisexual, in slender racemes. Male flowers : calyx 4-lobed; stamens 2. Female flowers : calyx deeply 4-lobed; styles 2. Drupes 3-4 mm across, compressed, purple.

*Fl. & Fr.*: Sept.- Nov.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16443.

Leaves and fruits are sour in taste.

2. **Antidesma ghaesembilla** Gaertn., Fruct. 1 : 189. t.39. 1788; Hook.f., Fl. Brit. India 5 : 357. 1887.

Trees, up to 5 m tall; bark black, fissured; young branches fulvous tomentose. Leaves alternate, up to 9 × 4.5 cm, elliptic, obtuse, fulvous hairy beneath. Flowers sessile, unisexual, in paniculate spikes. Male flowers : calyx 5-7-lobed, fulvous hairy; stamens 4-7. Female flowers : calyx 5-7-lobed, fulvous hairy; stigmas recurved. Drupes 3-5 mm across, sub-globose, reddish-purple.

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

In moist deciduous forests. Sparse.

Bijapur Ghati, 16228.

## 2. BREYNIA J.R. Forst. & J.G.A. Forst.

**Breynia vitsidaea** (Burm.f.) Fischer in Bull. Misc. Inform. 1932 : 65. 1932. *Rhamnus vitsidaea* Burm.f., Fl. Ind. 61. 1768. *Breynia rhamnoides* Muell.- Arg. in DC., Prodr. 15 : 440. 1866; Hook.f., Fl. Brit. India 5 : 330. 1887.

*'Pudri-datun'*

Shrubs with spreading branches; bark grey. Leaves distichous, up to 1.5 × 0.9 cm, elliptic or elliptic-oblong, obtuse or sub-acute. Flowers minute, monoecious or sometimes dioecious, pink; male flowers fascicled; female flowers usually solitary. Berries 2-6 mm across, globular, succulent, black.

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

Common in dry deciduous forests.

Itpal forest, 16234; Kurtu.

Twigs are used as tooth brush by local people.

### 3. BRIDELIA Willd.

- 1a. Secondary nerves of leaves 5-10  
pairs; flowers monoecious 1. *B. hamiltoniana*
- 1b. Secondary nerves of leaves 15-25  
pairs; flowers dioecious 2. *B. retusa*

**1. *Bridelia hamiltoniana*** Wall. ex Muell.- Arg. in *Linnaea* 34 : 77. 1865-66; Hook.f., *Fl. Brit. India* 5 : 271. 1887.

‘*Goichudi*’

Straggling trees, up to 5 m tall; bark black. Leaves alternate, up to 9 × 4 cm, elliptic-obovate or rhomboid, obtuse, base cuneate. Flowers green, minute, in axillary and spicate, sessile clusters; petals of female flowers ovate, those of male flowers orbicular-rhomboid. Drupes 4-5 mm across, globose, black on ripening.

*Fl. & Fr.*: Sept.- Dec.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16474.

Twigs are used as tooth brush; fruits are edible.

**2. *B. retusa*** (L.) Spreng., *Syst.* 3 : 48. 1826; Hook.f., *Fl. Brit. India* 5 : 268. 1887 *p.p.* *Clusia retusa* L., *Sp. Pl.* 1042. 1753 (‘*Cluytia*’).

Trees, up to 18 m tall; bark greyish-black. Leaves alternate, up to 15 × 6.5 cm, elliptic, obtuse or subacute, base rounded or cuneate. Flowers greenish-yellow, in axillary or spicate clusters; male and female flowers intermixed; petals obovate in male flowers and spatulate in female flowers. Drupes 5-7 mm across, globose, purplish-black on maturity.

*Fl. & Fr.*: Sept.- Nov.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16641.

#### 4. CHROZOPHORA A.L. JUSS.

- |   |                        |
|---|------------------------|
| 1a. Prostrate herbs; leaves reddish-brown | 1. <i>C. prostrata</i> |
| 1b. Erect herbs; leaves pale green        | 2. <i>C. rottleri</i>  |

**1. *Chrozophora prostrata*** Dalz. in Dalz. & Gibs., Bombay Fl. 233. 1861. *C. plicata* form 3. Hook.f., Fl. Brit. India 5 : 410. 1887.

Stellately-woolly, prostrate, annual herbs; branches spreading from the base; petioles and leaves reddish-brown. Leaves up to 3.5 × 2.5 cm, ovate-orbicular, rounded or obtuse, base truncate or cordate. Flowers in axillary racemes, unisexual. Capsules 5-7 mm across, stellately-woolly.

*Fl. & Fr.*: Jan.- Apr.

Common in harvested fields.

Kuenar (Kurtu-Bijapur road), 15591.

**2. *C. rottleri*** (Geis.) A. Juss., Euphorb. Tent. 28. 1824. *Croton rottleri* Geis., Crot. Monogr. 57. 1807. *Chrozophora plicata* form 1. Hook.f., Fl. Brit. India 5 : 409. 1887.

Erect, branched, pale green, stellate-hairy, annual herbs, up to 50 cm tall. Leaves up to 10 × 7.5 cm, ovate-orbicular, often 3-lobed, rounded or obtuse, base cordate or truncate. Flowers yellow, in stellate-hairy racemes, unisexual. Capsules 6-8 mm across, stellate-hairy.

*Fl. & Fr.*: Feb.- Apr.

Abundant in harvested paddy fields.

Kuenar (Kurtu-Bijapur road), 15590.

### 5. *CLEISTANTHUS* Hook.f. ex Planch.

***Cleistanthus collinus* (Roxb.) Benth. ex Hook.f., Fl. Brit. India 5 : 274. 1887. *Clutia collina* Roxb., Pl. Cor. 2 : 37. t.169. 1802 ('*Cluytia*').  
'*Karra*', '*Varsa*'**

Trees, up to 8 m tall; bark black, fissured; branches greyish. Leaves alternate, up to 4 × 2.8 cm, obovate, orbicular or elliptic-obovate, apex rounded, glaucous beneath. Flowers green, monoecious, appearing when the tree is leafless. Capsules up to 3 × 2 cm, globose, green, turning to black on maturity.

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

Very common in dry deciduous forests.

Bijapur, 16621; Pharsegarh; Pengunda; Dudepalli.

Bark is used as a fish-poison.

### 6. *EMBLICA* Gaertn.

***Emblica officinalis* Gaertn., Fruct. 2 : 122. t.108. 1790. *Phyllanthus emblica* L., Sp. Pl. 982. 1753; Hook.f., Fl. Brit. India 5 : 289. 1887.**

'*Aonla*'

Trees, up to 10 m tall; bark grey. Leaves up to 1.5 × 0.25 cm, distichous, linear, obtuse. Flowers greenish-white, unisexual, in fascicles; sepals 6, oblong in both male and female flowers. Drupes 2-3 cm across, globose with 6 obscure vertical lines, succulent, green, sour; seeds 6, trigonous.



*Fl. & Fr.*: Sept.- Jan.

Common in dry deciduous and mixed teak forests.

Bijapur, 16645; Kutru; Netikakler.

Fruits are eaten.

### 7. EUPHORBIA L.

- |   |                         |
|---|-------------------------|
| 1a. Spiny shrubs                                    | 2. <i>E. nivulia</i>    |
| 1b. Smooth herbs :                                  |                         |
| 2a. Erect or ascending herbs;<br>leaves 1-3 cm long | 1. <i>E. hirta</i>      |
| 2b. Prostrate herbs; leaves<br>0.3-0.6 cm long      | 3. <i>E. thymifolia</i> |

**1. *Euphorbia hirta* L.**, Sp. Pl. 454. 1753. *E. pilulifera auct. non L.* 1753; Hook.f., Fl. Brit. India 5 : 250. 1887.

Erect or ascending, hairy, perennial herbs, up to 25 cm tall! Leaves opposite, up to 3 × 1.2 cm, elliptic-oblong, serrulate, acute, base oblique. Involucres minute, clustered in axillary, globose cymes. Capsules sub-globose, appressed pubescent; seeds ovoid-trigonous, rugose, reddish-brown.

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

In waste lands. Common.

Bijapur, 16202.

**2. *E. nivulia* Buch.- Ham.** in Trans. Linn. Soc. Lond. 14 : 286. 1825; Hook.f., Fl. Brit. India 5 : 255. 1887.

*Jangli-Garud* 'Phalemaru'

Succulent shrubs, up to 2.5 m tall; stem cylindrical with paired spines arranged spirally. Leaves caducous, clustered towards the apex of branches, up to 20 × 6 cm, obovate, rounded at the apex. Cymes 3-flowered, central flower male and lateral ones bisexual. Involucres yellowish, 3-7 in a cyme, involucral-lobes fimbriate. Capsules obovoid, compressed; seeds smooth.

*Fl. & Fr.*: Feb.- Apr.

In dry deciduous and mixed teak forests. Rare.

Kandlaparti, 16278; Dudepalli.

**3. *Euphorbia thymifolia* L.**, Sp. Pl. 454. 1753; Hook.f., Fl. Brit. India 5 : 252. 1887.

Prostrate, branched, annual herbs. Leaves up to 6 × 4 mm, ovate-oblong, serrate, apex rounded, sides unequal; stipules fimbriate. Involucres 1-3, axillary, pink. Capsules trigonous, pubescent; seeds tetragonous, furrowed.

*Fl. & Fr.*: Most parts of the year.

In waste lands and river-beds. Common.

Bijapur, 16201; Indravati river, 16314.

#### 8. *HOMONOIA* Lour.

- |   |                      |
|---|----------------------|
| 1a. Leaves obovate, apex<br>emarginate; spikes stout    | 1. <i>H. retusa</i>  |
| 1b. Leaves linear-oblong, apex<br>acute; spikes slender | 2. <i>H. riparia</i> |

**1. Homonoia retusa** (Grah. ex Wight) Muell.- Arg. in *Linnaea* 34 : 200. 1865; Hook.f., *Fl. Brit. India* 5 : 456. 1887. *Adelia retusa* Grah. ex Wight, *lc. t.* 1869. 1852.

'Jende'

Shrubs, up to 2.5 m tall; branches pink. Leaves up to 4 × 1.8 cm, coriaceous, obovate, emarginate, base cuneate, dentate at the apex. Flowers sessile, in up to 2.5 cm long spikes. Male flowers : sepals 3, elliptic, concave, filaments branched. Female flowers : sepals 5, ovate-lanceolate, styles plumose. Capsules 2-3 mm across, globose, tomentose; seeds rounded on the outer face, angular on the inner.

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

In river-beds. Abundant.

Indravati river, 15570.

**2. H. riparia** Lour., *Fl. Cochinch.* 637. 1790; Hook.f., *Fl. Brit. India* 5 : 455. 1887.

Evergreen shrubs, up to 3 m tall; stem reddish. Leaves up to 16 × 1.5 cm, linear-oblong, acute at both ends. Flowers sessile, dioecious, in axillary, up to 15 cm long spikes. Male flowers : sepals 3, elliptic, stamens many. Female flowers : sepals 5, ovate, styles 3, papillose. Capsules globular, tomentose; seeds rounded on the outer face, angular on the inner.

*Fl. & Fr.*: Mar.- May.

Abundant amidst rock-boulders in river-beds.

Indravati river, 16311.

#### 9. MALLOTUS LOUR.

**Mallotus philippensis** (Lam.) Muell.- Arg. in *Linnaea* 34 : 196. 1865; Hook.f., *Fl. Brit. India* 5 : 442. 1887. *Croton philippense* Lam., *Encycl.* 2 : 206. 1786.

'Sendur'

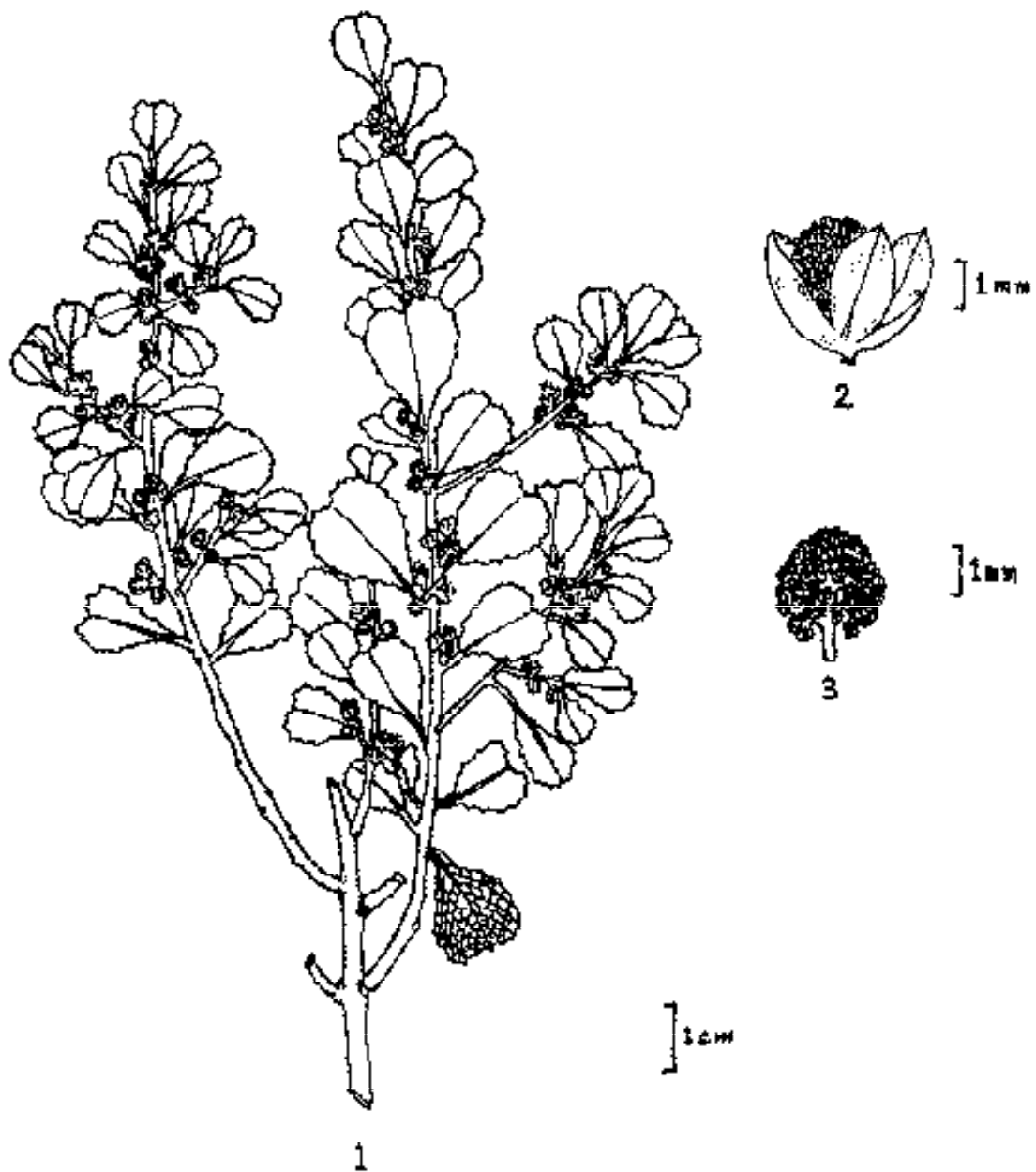


Fig. 14. *Homonoia retusa* (Grah. ex Wight) Muell.- Arg.  
1. twig; 2. male flower & 3. stamen.

Evergreen trees, up to 10 m tall; bark greyish-black. Leaves alternate, up to 12 × 7.5 cm, ovate, acuminate, base rounded or acute, glabrous above, pubescent and gland dotted beneath. Flowers dioecious, in stiff, terminal spikes; male flowers clustered; female solitary. Capsules 4-6 mm across, covered with red powder; seeds sub-globose, black.

*Fl. & Fr.*: Oct.- Mar.

In dry and moist deciduous forests. Common.

Pharsegarh, 15579; Bhopalpatnam.

Fruits are source of red dye.

#### 10. PHYLLANTHUS L.

- |  |                         |
|--|-------------------------|
| 1a. Anthers oblong, vertically dehiscent;<br>capsules tubercled                            | 3. <i>P. urinaria</i>   |
| 1b. Anthers subglobose or reniform,<br>transversely dehiscent; capsules<br>not tubercled : |                         |
| 2a. Stipules peltate   | 4. <i>P. virgatus</i>   |
| 2b. Stipules simple, not peltate :   |                         |
| 3a. Disc gland of male flowers<br>minute; styles minutely<br>2-lobed                       | 2. <i>P. fraternus</i>  |
| 3b. Disc gland of male flowers<br>stellately lobed; styles bifid<br>with recurved branches | 1. <i>P. airyshawii</i> |

1. *Phyllanthus airyshawii* Brunel & Roux in Nord. Journ. Bot. 4 : 470. 1984. *P. debilis* Herb. Ham. ex Hook.f., Fl. Brit. India 5 : 299. 1887.

Perennial herbs, up to 25 cm tall. Leaves alternate, up to  $1.5 \times 0.9$  cm, elliptic or elliptic-obovate, acute, membranous; stipules subulate. Flowers monoecious, axillary, sepals 6, filaments connate, anthers oblong. Capsules *ca* 2 mm across, oblate; seeds brown, 1-1.5 mm long, 3-angled, ribbed on the back.

*Fl. & Fr.*: May-Oct.

Common as forest-undergrowth.

Bijapur Ghati, 16217; Pharsegarh; Netikakler.

**2. *Phyllanthus fraternus*** Webster in Contrib. Gray Herb. 176 : 53. 1955. *P. niruri auct. non L.* 1753; Hook.f., Fl. Brit. India 5 : 298. 1887.

Annual herbs, up to 30 cm tall. Leaves distichous, up to  $1.2 \times 0.5$  cm, oblong, obtuse; stipules lanceolate-subulate. Flowers cream coloured, axillary, males 1-3, female solitary. Male flowers : sepals 5, orbicular; stamens 3, filaments connate. Female flowers : sepals 5, oblong; disc annular, lobed. Capsules 2-3 mm across, oblate; seeds ribbed on the back.

*Fl. & Fr.*: Sept.- Nov.

Common in waste lands.

Karkeli, 16136; Pengunda; Kutru; Bijapur.

**3. *P. urinaria*** L., Sp. Pl. 982. 1753; Hook.f., Fl. Brit. India 5 : 293. 1887.

Annual herbs, up to 35 cm tall. Leaves sessile, distichous, up to  $1.1 \times 0.4$  cm, oblong, mucronate, inequilateral; stipules peltate. Flowers cream coloured, solitary, axillary, monoecious; perianth *ca* 1 mm, oblong.

Capsules pinkish-green, *ca* 2.5 mm across, globose, tubercled; seeds trigonous, transversely ribbed on the back.

*Fl. & Fr.*: Sept.- Jan.

In forest-undergrowth. Common.

Bijapur Ghati, 16489; Dudepalli; Kerpe Valley.

Plant is diuretic.

**4. *Phyllanthus virgatus*** Forst.f., *Fl. Inst. Austr. Prodr.* 65. 1786.  
*P. simplex* Retz., *Obs. Bot.* 5 : 29. 1788; Hook.f., *Fl. Brit. India* 5 : 295.  
1887.

Tufted, annual herbs, up to 20 cm tall. Leaves sub-sessile, distichous, overlapping, up to 2.5 × 0.5 cm, oblong, obtuse, apiculate; stipules sagittate, peltate. Flowers monoecious, solitary, axillary; perianth green with pinkish tinge, oblong. Capsules 2-2.5 mm across, globose; seeds 1-1.5 mm long, trigonous, tubercled.

*Fl. & Fr.*: May-Sept.

Common as forest-undergrowth.

Itpal forest, 16237; Pillure; Kutru.

## 11. RICINUS L.

***Ricinus communis*** L., *Sp. Pl.* 1007. 1753; Hook.f., *Fl. Brit. India* 5 : 457. 1887.

'Jada', 'Nerudi'

Evergreen shrubs or small trees, up to 4 m tall. Leaves up to 20 cm across, peltate, membranous, 5-11-lobed; lobes oblong to linear, serrate, acute or acuminate. Flowers monoecious, in terminal, sub-panicled racemes, the upper male, the lower female; petals absent; stamens many,

filaments branched. Capsules up to 2 cm across, globose, echinate; seeds oblong, mottled.

*Fl. & Fr.*: Jan.- Mar.

In waste lands. Sparse.

Pasewada, 15563.

Seed-oil is used for burning and as a laxative.

## 12. SEBASTIANIA Spreng.

**Sebastiania chamaelia** (L.) Muell.- Arg. in DC., Prodr. 15(2) : 1175. 1866; Hook.f., Fl. Brit. India 5 : 475, 1887. *Tragia chamaelia* L., Sp. Pl. 1391. 1753.

Annual herbs, up to 50 cm tall. Leaves alternate, up to 6 × 1 cm, linear or oblong-elliptic, obtuse, base tapering, crenulate. Flowers greenish-yellow, in short, terminal spikes. Male flowers : sepals 5, ovate; petals absent; stamens 3. Female flowers : sepals 3, obovate, lacerate; petals absent; styles 3. Capsules 5-8 mm long, sub-globose, 3-lobed, each lobe with 2 rows of spinules on the outer face; seeds yellow, ellipsoid-oblong.

*Fl. & Fr.*: Sept.- Nov.

Very common as undergrowth in forests during the rainy season.

Bijapur Ghati, 16421; Madded; Kutru; Pharsegarh; Kerpe Valley.

## URTICACEAE

ELATOSTEMA J.R. Forst. & J.G.A Forst.

**Elatostema cuneatum** Wight, Ic. t.2091. f.3. 1853 ('*Elatostema cuneata*'); Hook.f., Fl. Brit. India 5 : 568. 1888.



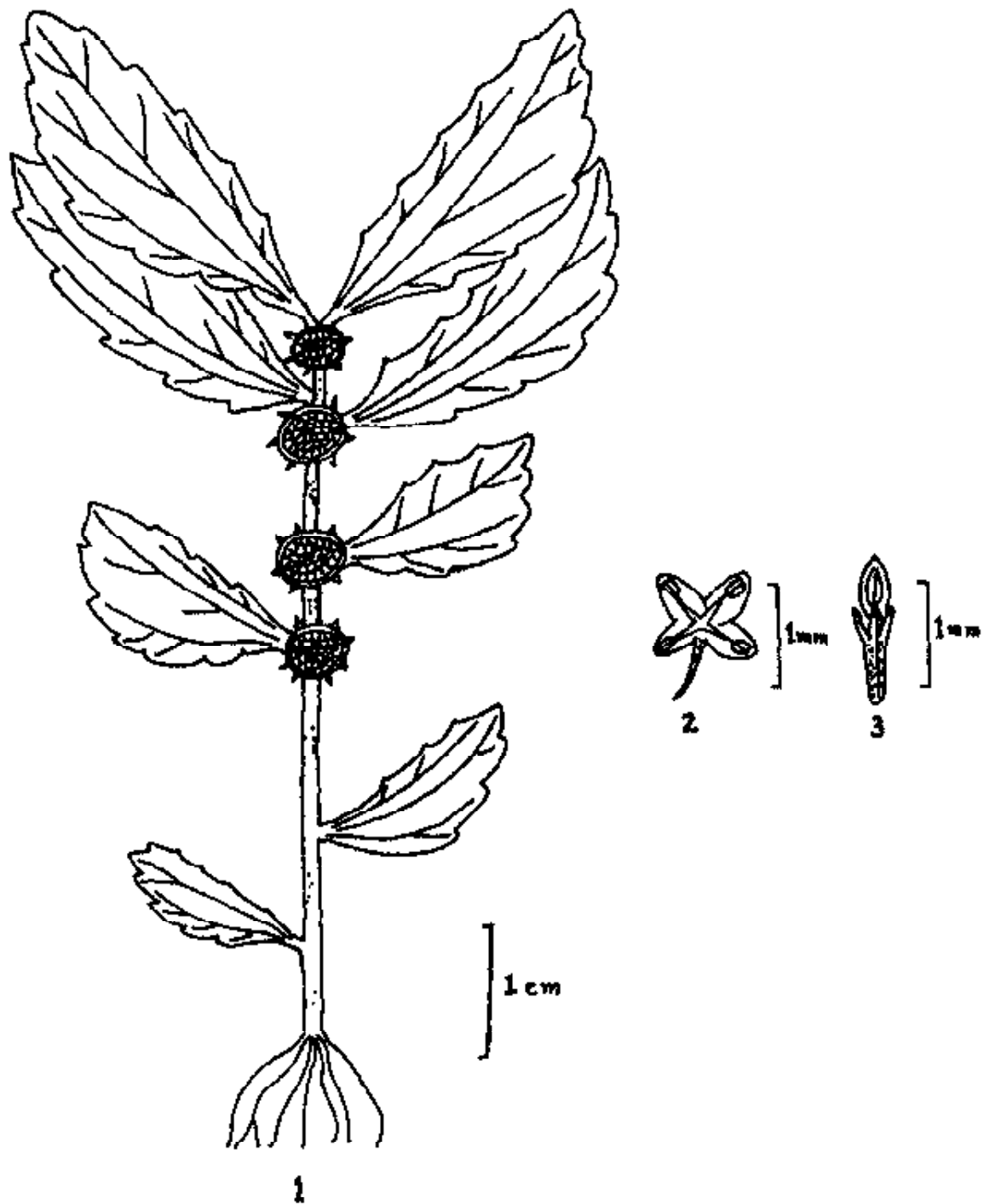


Fig. 15. *Elatostema cuneatum* Wight  
 1. habit; 2. male flower & 3. female flower.

Delicate, annual herbs, up to 8 cm tall. Leaves sessile, alternate, up to 3.5 × 1.3 cm, acute, base oblique, margin crenate. Flowers green, unisexual, in axillary clusters. Male flowers : perianth-lobes 4, broadly ovate; stamens 4. Female flowers : perianth-lobes 3, ovary tipped with a persistent style. Achenes yellow, ellipsoid, ribbed.

*Fl. & Fr.*: Sept.- Oct.

Abundant on moist, shaded rock-boulders.

Bijapur Ghati, 16636; Pharsegarh; Dudepalli.

## ULMACEAE

### TREMA LOUR.

**Trema orientalis** (L.) Bl., Mus. Bot. 2 : 62. 1856; Hook.f., Fl. Brit. India 5 : 484. 1888. *Celtis orientalis* L., Sp. Pl. 1044. 1753.

Trees, up to 10 m tall; bark grey, fissured; young branches and stipules white pubescent. Leaves up to 12 × 5.5 cm, obliquely ovate or lanceolate, acuminate, base rounded or subcordate, serrulate, canescent beneath. Flowers unisexual, in axillary cymes; tepals greenish-white, 5, valvate and caducous in male, imbricate and persistent in female. Drupes 4-5 mm long, ovoid, sub-compressed, black.

*Fl. & Fr.*: May-Oct.

In moist deciduous forests. Sparse.

Itpal forest, 16256.

## MORACEAE

1a. Flowers in syconia

1. FICUS

1b. Flowers exposed

2. STREBLUS

## 1. FICUS L.

## 1a. Cauliferous :

- |                              |                       |
|------------------------------|-----------------------|
| 2a. Leaves spiral, smooth    | 4. <i>F. racemosa</i> |
| 2b. Leaves opposite, scabrid | 3. <i>F. hispida</i>  |

## 1b. Not cauliferous :

- |                  |  |
|------------------|--|
| 3a. Figs stalked | 6. <i>F. tinctoria</i> ssp.<br><i>parasitica</i> |
|------------------|--|

## 3b. Figs sessile :

- |   |                        |
|---|------------------------|
| 4a. Leaves ovate-cordate with<br>caudate-acuminate apex | 5. <i>F. religiosa</i> |
|---|------------------------|

## 4b. Leaves not as above :

- |   |                           |
|---|---------------------------|
| 5a. Leaf-apex obtuse;<br>figs 2-3 cm across | 2. <i>F. benghalensis</i> |
|---|---------------------------|

- |  |                         |
|--|-------------------------|
| 5b. Leaf-apex acute or<br>sub-acuminate; figs<br>1-1.2 cm across | 1. <i>F. amplissima</i> |
|--|-------------------------|

**1. *Ficus amplissima*** J.E. Smith in Rees, Cyclop. 14 : no.1. 1810;  
*F. tsiela* Roxb. ex Buch.- Ham. in Trans. Linn. Soc. Lond. 15 : 149.  
1826; King in Hook.f., Fl. Brit. India 5 : 515. 1888.

'Aali'

Epiphytic, weak trees; bark white, smooth. Leaves up to 12 × 7.5 cm, ovate or elliptic-lanceolate, acute or sub-acuminate, base rounded or cuneate, coriaceous. Figs axillary and on the twigs below the leaves, sessile, sub-globose or obovoid, green, ripening to purple.

*Fl. & Fr.*: Apr. to June.

In the vicinity of dry deciduous forests. Sparse.

Kodepalli (Bijapur-Bhopalpatnam road), 16260.

Crushed bark with water is said to be useful in stomach disorders.

**2. *Ficus benghalensis* L., Sp. Pl. 1059. 1753; King in Hook.f., Fl. Brit. India 5 : 499. 1888.**

*'Bad', 'Marad'*

Trees, up to 25 m tall, with aerial roots from the spreading branches; bark grey, smooth. Leaves up to 18 × 11 cm, ovate, obtuse, base cordate, coriaceous. Figs sessile, axillary, paired, depressed-globose, orange-red coloured on ripening.

*Fl. & Fr.*: Apr.- Oct.

In dry deciduous forests and along roadsides. Sparse.

Dudepalli, 16399; Kutru; Bijapur.

**3. *F. hispida* L.f., Suppl. 442. 1781; King in Hook.f., Fl. Brit. India 5 : 522. 1888.**

Trees, up to 5 m tall; bark grey, smooth. Leaves up to 25 × 10 cm, ovate, oblong or sub-obovate, apiculate or sub-acuminate, base rounded or sub-cordate, margin crenate-serrate to subentire, scabrid on both the sides. Figs axillary to cauliferous on leafless twigs, 1-2 cm across, depressed globose, hispid, faintly ribbed, pale yellow.

*Fl. & Fr.*: Apr.- Sept.

Along the banks of streams and rivers. Common.

Itpal forst, 16252; Indravati river; Netikakler.

4. *Ficus racemosa* L., Sp. Pl. 1060. 1753. *F. glomerata* Roxb., Pl. Cor. 2 : 13. t.123. 1799; King in Hook.f., Fl. Brit. India 5 : 535. 1888.

'Dumar' 'Toya'

Trees, up to 20 m tall; bark white, smooth. Leaves up to 15 × 6 cm, ovate-oblong or elliptic-lanceolate, sub-acute or sub-acuminate, base rounded or acute, sub-coriaceous. Figs in clusters on the main branches and trunk or on leafless twigs, 2-3 cm across, sub-globose or pyriform, often lenticellate-verrucose, turning to red on ripening; peducles up to 1 cm long.

*Fl. & Fr.*: May-Sept.

Common along the banks of rivers and streams.

Kandlaparti, 16227; Dudepalli; Indravati river.

Latex is applied on swellings for relief; fruits eaten by local people and herbivores; wood is very durable under water.

5. *F. religiosa* L., Sp. Pl. 1059. 1753; King in Hook.f., Fl. Brit. India 5 : 513. 1888.

'Peepal'

Trees, up to 20 m tall; bark white, smooth. Leaves up to 15 × 9 cm, ovate, caudate-acuminate, base truncate or cordate, subcoriaceous. Figs axillary, paired, sessile, ripening pink or black, 0.8-1.2 cm across, sub-globose.

*Fl. & Fr.*: May-Aug.

Often planted near habitations.

Kutru, 16364; Bijapur; Bhopalpatnam.

Leaves are of fodder value; latex is used in skin-diseases.

**6. *Ficus tinctoria* Forst.f. subsp. *parasitica* (Willd.) Corner** in Gard. Bull. Singapore 17 : 476. 1960. *F. parasitica* Willd., Mem. Acad. Roy. Sci. Hist (Berlin) 2 : 102. 1798.

Epiphytic shrubs, up to 2.5 m tall. Leaves distichous, up to 13.5 × 7.5 cm, ovate-elliptic or rhomboid, acute or acuminate, base cuneate and often unequal, margin entire or sinuate, usually scabrid on the undersurface. Figs axillary, 0.8-1.1 cm across, pyriform or sub-globose, ripening to yellow.

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

Common in dry deciduous forests.

Kutru, 16371; Pharsegarh.

## 2. STREBLUS LOUR.

***Streblus asper* Lour.**, Fl. Cochinch. 2 : 615. 1790; King in Hook.f., Fl. Brit. India 5 : 489. 1888.

Evergreen trees, up to 6 m tall; bark grey. Leaves up to 12.5 × 5.5 cm, elliptic-obovate, acute or sub-acute, base attenuate or sub-cordate, asymmetric, margin serrate, dentate or crenulate, scabrid, rigid to coriaceous. Male capitula 5-15-flowered; male flowers fragrant, perianth ca 1 mm long, stamen white. Female flowers green, solitary. Drupes 6-8 mm long, globose or slightly 2-humped at the apex, orange-coloured; seeds globose, greyish-white.

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

In dry deciduous forests. Sparse.

Bhopalpatnam, 15607.

## CERATOPHYLLACEAE

## CERATOPHYLLUM L.

**Ceratophyllum demersum** L., Sp. Pl. 392. 1753; Hook.f., Fl. Brit. India 5 : 639. 1888.

Submerged, branched herbs, up to 30 cm tall. Leaves whorled, up to 3 cm long, dichotomously branched, filiform, margin distantly toothed. Flowers minute, axillary, sessile, unisexual, monoecious. Male flowers : tepals 6-12, linear with a few bristles near the apex, stamens 8-30. Female flowers : tepals 6-12, with a few bristles near the apex, ovary ovoid, style subulate. Nutlets black, 3-4 mm long, ovoid or ellipsoid with persistent style and 2-horn like basal appendages.

*Fl. & Fr.*: Oct.- Dec.

Abundant in ponds.

Kutru, 16353; Dudepalli.

## HYDROCHARITACEAE

- |  |                 |
|--|-----------------|
| 1a. Acaulescent herbs; leaves radical  | 3. VALLISNERIA  |
| 1b. Caulescent herbs; leaves cauline : |                 |
| 2a. Leaves alternate                   | 2. LAGAROSIPHON |
| 2b. Leaves whorled                     | 1. HYDRILLA     |

## 1. HYDRILLA L.C. Rich.

**Hydrilla verticillata** (L.f.) Royle, Illus. Bot. Himal. t.376. 1839; Hook.f., Fl. Brit. India 5 : 659. 1888. *Serpicula verticillata* L.f., Suppl. 416. 1781.

Submerged, stoloniferous herbs, up to 40 cm tall. Leaves sessile, 0.7-2.5 cm long, linear-oblong, entire or serrulate, whorled. Flowers dioecious, minute, axillary; sepals 3; petals 3, white. Staminate flowers axillary, stamens 3. Pistillate flowers included in spathe, styles 2-3, stigmas fimbriate. Fruits smooth or muricate; seeds 2-3, apiculate at both the ends.

*Fl. & Fr.*: Dec.- Feb.

Abundant in ponds.

Dudepalli, 16333.

## 2. LAGAROSIPHON W.H. Harvey

**Lagarosiphon alternifolia** (Roxb.) Druce in Rep. Exch. Cl. Brit. Is. 1916: 630. 1917. *Vallisneria alternifolia* Roxb., Pl. Cor. t.165. 1802. *Nechamandra roxburghii* Planch. in Ann. Sci. Nat. ser.3. 11 : 78. 1849. *Lagarosiphon roxburghii* (Planch.) Benth. in Benth. & Hook.f., Gen. Pl. 3 : 151. 1883; Hook.f., Fl. Brit. India 5 : 659. 1888.

Slender, dioecious, pinkish-green, submerged herbs, up to 25 cm tall. Leaves alternate, 4-8 mm long, linear, acute. Staminate flowers minute, white, pedicellate, in bifid axillary spathe. Pistillate flowers sessile, in tubular, bifid spathe; ovary lanceolate with filiform beak; staminodes absent. Fruits linear-oblong; seeds many.

*Fl. & Fr.*: Oct.

In water-logged places. Abundant.

Eramnar, 16684; Bijapur; Kutru.

## 3. VALLISNERIA L.

**Vallisneria natans** (Lour.) Hara in Journ. Jap. Bot. 49 : 136. 1974. *Physkium natans* Lour., Fl. Cochinch. 663. 1790. *Vallisneria spiralis* auct.;



Hook.f., Fl. Brit. India 5 : 660. 1888 *p.p. non* L. 1753.

Submerged, dioecious herbs, up to 25 cm tall. Leaves radical, 7-30 cm long, linear, translucent. Staminate flowers : spathes ovoid, flowers white, stamens 1-3, pistillode absent. Pistillate flowers on long coiled scapes, spathes cylindric, styles 3. Fruits linear; seeds many, cylindric.

*Fl. & Fr.*: Jan.- Apr.

Abundant along the river-banks.

Indravati river, 16310.

#### ORCHIDACEAE

- |  |               |
|--|---------------|
| 1a. Epiphytic herbs  | 4. VANDA      |
| 1b. Terrestrial herbs :                                      |               |
| 2a. Inflorescence lateral on a<br>separate shoot from leaves | 1. EULOPHIA   |
| 2b. Inflorescence terminal on<br>the same shoot as leaves :  |               |
| 3a. Spur linear-filiform;<br>stigmas free                    | 2. HABENARIA  |
| 3b. Spur scrotiform;<br>stigmas connate                      | 3. PERISTYLUS |

1. EULOPHIA R.Br. ex Lindl.

**Eulophia explanata** Lindl., Gen. & Sp. Orch. 180. 1833; Hook.f., Fl. Brit. India 6 : 3. 1890.

Herbs; pseudobulbs ovoid, annulated. Leaves up to 25 × 8 cm,

elliptic-lanceolate, acuminate. Racemes up to 20 cm long, arising laterally from the base of pseudobulbs when the plant is leafless. Flowers *ca* 1 cm across, green with purple tinge; lip saccate at the base.

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

In dry deciduous forests. Abundant.

Dudepalli, 16349.

## 2. HABENARIA Willd.

- |   |                             |
|---|-----------------------------|
| 1a. Leaves present on whole stem; spur 4-4.5 cm long              | 1. <i>H. commelinifolia</i> |
| 1b. Leaves present only at the base of stem; spur up to 3 cm long | 2. <i>H. plantaginea</i>    |

**1. *Habenaria commelinifolia*** Wall. ex Lindl., Gen. & Sp. Orch. 325. 1835; Hook.f., Fl. Brit. India 6 : 143. 1890.

Robust herbs, up to 40 cm tall; tubers ellipsoid. Leaves up to 15 × 3 cm, oblong or oblong-lanceolate, finely acuminate. Spikes up to 20 cm long. Flowers white, up to 2 cm across; lateral sepals gibbous, dorsal orbicular; petals oblong; lip linear at the base, then 3-lobed, side lobes filiform, mid lobe shorter; spur slender, incurved.

*Fl. & Fr.*: Aug.- Oct.

In grassy-fields and as forest-undergrowth. Sparse.

Indravati Tiger Reserve, *Pandey* 19 (specimen present in herbarium of the Indravati Tiger Reserve at Bijapur).

**2. *H. plantaginea*** Lindl., Gen. & Sp. Orch. 323. 1835; Hook.f., Fl. Brit. India 6 : 141. 1890.

Herbs, up to 35 cm tall. Leaves 3-7, at the base of stem, appressed to the ground, up to 15 × 4 cm, lanceolate, acute or obtuse. Spikes up to 40 cm long. Flowers white; sepals ovate; petals narrowly lanceolate; lip with narrow mid lobe and falcately oblong lateral lobes; spur slender, longer than the ovary.

*Fl. & Fr.*: Oct.

Common as undergrowth in dry and moist deciduous forests.

Bijapur Ghati, 16428; Pharsegarh; Madded; Kerpe valley.

### 3. PERISTYLUS Bl.

**Peristylus plantagineus** Lindl., Gen. & Sp. Orch. 300. 1835. *Habenaria wightii* Trim., Cat. Ceyl. Pl. 91. 1885; Hook.f., Fl. Brit. India 6 : 162. 1890.

Robust herbs, up to 60 cm tall; tubers ellipsoid. Leaves 4-8, clustered about the middle of stem, up to 20 × 8 cm, elliptic, acute or acuminate. Spikes up to 20 cm long, many-flowered. Flowers small, pinkish-brown; lateral sepals oblong, dorsal sepal orbicular or broadly ovate; petals obliquely orbicular; lip shorter than the sepals, slightly 3-lobed.

*Fl. & Fr.*: Sept.- Oct.

In moist deciduous forests. Rare.

Bijapur Ghati, 16448.

### 4. VANDA R.Br.

**Vanda tessellata** (Roxb.) Hook.ex G. Don in Loud., Hort. Brit. 372. 1830. *Epidendrum tessellatum* Roxb., Pl. Cor. 1 : 34. t.42. 1795. *Vanda roxburghii* R.Br., Bot. Reg. 6 : t.506. 1820; Hook.f., Fl. Brit. India 6 : 52. 1890.

'Aanka'

Herbs, up to 45 cm tall. Leaves distichous, up to 20 × 2 cm, linear-oblong, recurved, apex unequally 2-lobed. Racemes up to 25 cm long. Flowers 3-4 cm across; sepals and petals white without, brown tessellated within, obovate, margin undulate; lip with small lateral lobes and notched mid lobe; spur 5-7 mm long, conical.

*Fl. & Fr.*: Apr.- Oct.

In dry deciduous forests on *Butea monosperma* and *Pterocarpus marsupium*. Common.

Madded, 16268; Dudepalli.

Leaf-paste is applied on fractured-bones.

### ZINGIBERACEAE

- |  |             |
|--|-------------|
| 1a. Inflorescence with a terminal plume of sterile bracts      | 1. CURCUMA  |
| 1b. Inflorescence without a terminal plume of sterile bracts : |             |
| 2a. Inflorescence racemose or paniculate; ovary 1-locular      | 2. GLOBBA   |
| 2b. Inflorescence spicate; ovary 3-locular                     | 3. ZINGIBER |

#### 1. CURCUMA L.

- |   |                            |
|---|----------------------------|
| 1a. Inflorescence lateral; corolla-lobes pink   | 1. <i>C. aromatica</i>     |
| 1b. Inflorescence central; corolla-lobes yellow | 2. <i>C. pseudomontana</i> |

**1. *Curcuma aromatica*** Salisb., *Parad. Lond.* t.96. 1805; Baker in Hook.f., *Fl. Brit. India* 6 : 210. 1890.

Aromatic, rhizomatous herbs, up to 1.5 m tall; roots ending in oblong tubers. Leaves up to 75 × 24 cm, elliptic-oblong, acuminate. Peduncles up to 27.5 cm long, appearing with or before the leaves; corolla-tube 2-3 cm long; lip yellow, obovate.

*Fl. & Fr.*: Oct.

In the vicinity of forests. Abundant during the rainy season.

Bijapur Ghati, 16647; Pharsegarh; Dudepalli; Kerpe Valley; Netikakler, Bhopalpatnam.

**2. *C. pseudomontana*** Grah., *Cat. Pl. Bombay* 210. 1839. *C. montana* Baker in Hook.f., *Fl. Brit. India* 6 : 214. 1890. *p.p. non* Rosc.

Rhizomatous herbs, up to 1 m tall; roots ending in fusiform tubers. Leaves up to 50 × 15 cm, lanceolate-oblong, acuminate. Peduncles up to 20 cm long, covered by leaf-sheaths; bracts white with purple tips; lip obovate, yellow.

*Fl. & Fr.*: Oct.

In dry and moist deciduous forests. Common.

Bijapur Ghati, 16683; Pharsegarh; Netikakler; Kerpe Valley.

## 2. GLOBBA L.

***Globba bulbifera*** Roxb. in *As. Res.* 11 : 358. 1810; Baker in Hook.f., *Fl. Brit. India* 6 : 206. 1890.

Rhizomatous herbs, up to 50 cm tall. Leaves up to 25 × 7 cm, oblong-lanceolate, acuminate, base rounded. Panicles up to 20 cm long.

Bracts foliaceous, imbricate, persistent, usually enclosing a globose-ellipsoid bulbil. Flowers yellow; anthers with bifid wings; filaments long, curved.

*Fl. & Fr.*: Sept.- Oct.

In moist deciduous forests. Abundant.

Bijapur Ghati, 16465.

### 3. ZINGIBER Boeh.

**Zingiber capitatum** Roxb. in As. Res. 11 : 348. 1810; Baker in Hook.f., Fl. Brit. India 6 : 248. 1892; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 30. 1976.

'Gerkan'

Rhizomatous, aromatic herbs, up to 1.5 m tall. Leaves sessile, up to 40 × 2.5 cm, linear, acuminate. Spikes up to 12.5 cm long; bracts up to 6 × 1.5 cm, lanceolate or ovate-lanceolate, reddish; flowers yellow; corolla-lobes 2.5-3 cm long, mid lobe of the lip orbicular, lateral lobes of the lip oblong; anther with a long, curved beak.

*Fl. & Fr.*: Sept.-Oct.

In dry deciduous forests. Rare.

Bhopalpatnam (Saxena & Khotele *l.c.*).

## COSTACEAE

### COSTUS L.

**Costus speciosus** (Koen.) J.E. Smith, Trans. Linn. Soc. Lond. 1 : 249. 1791; Baker in Hook.f., Fl. Brit. India 6 : 249. 1892. *Banksea speciosa* Koen. in Retz., Obs. Bot. 3 : 75. 1783.

Perennial, rhizomatous herbs, up to 2 m tall. Stem spirally twisted. Leaves up to 25 × 10 cm, elliptic-obovate or oblanceolate, caudate-acuminate. Spikes up to 12 cm long, terminal, ovoid or ellipsoid; bracts bright red, ovate, spinescent at the apex; corolla white or pale pink; corolla-tube 1-2.5 cm long; corolla-lobes up to 4 × 2 cm, elliptic, acute; lip 3-8 cm long, obovate-orbicular.

*Fl. & Fr.*: Sept.-Oct.

In moist, shaded places in the vicinity of forests. Common.

Bijapur Ghati, 16454; Madded; Pharsegarh; Kutru; Kerpe Valley; Karkeli; Bhopalpatnam.

Rhizomes are said to be consumed.

## AMARYLLIDACEAE

### CRINUM L.

*Crinum defixum* Ker-Gawl. in Journ. Sci. & Arts 3 : 105. 1817; Hook.f., Fl. Brit. India 6 : 281. 1892.

Acaulescent, bulbous herbs; bulbs up to 8 cm across, ovoid. Leaves radical, up to 90 × 5.5 cm, linear, channelled, obtuse or acute. Scapes up to 75 cm long. Flowers white, 6-12, in umbel, subtended by 2 spathaceous bracts, bracteoles linear; perianth-tube up to 12.5 cm long, lobes up to 8 cm long; filaments pink, anthers purple. Capsules up to 4 cm across, sub-globose.

*Fl. & Fr.*: Sept.-Oct.

Along the banks of streams and rivers. Abundant.

Karkeli, 16126; Pharsegarh; Indravati river.

*Agave americana* L. is commonly cultivated as a hedge plant.

## HYPOXIDACEAE

## CURCULIGO Gaertn.

**Curculigo orchioides** Gaertn., Fruct. 1 : 63. t.16. 1788; Hook.f., Fl. Brit. India 6 : 279. 1892.

Acaulescent, perennial herbs. Leaves radical, up to 25 × 2.5 cm, lanceolate, plicate. Scape short, concealed among the leaf-bases. Flowers in racemes, sub-sessile, the upper staminate, lower bisexual; tepals yellow, 5-7 mm long, elliptic-oblong, ciliate; stamens about half of length of the perianth-segments, anthers linear; ovary separated from the perianth by a stipe, style filiform, stigmas 3.

*Fl. & Fr.*: Sept.-Oct.

Very common as forest-undergrowth during the rainy season.

Chinger, 16102; Dudepalli; Madded; Kutru; Bhopalpatnam; Kandlaparti; Netikakler.

Roots are said to be used as a tonic.

## TACCACEAE

## TACCA J.R. Forst. &amp; J.G.A. Forst.

**Tacca leontopetaloides** (L.) O. Ktze., Rev. Gen. Pl. 2 : 704. 1891. *Leontice leontopetaloides* L., Sp. Pl. 313. 1753. *Tacca pinnatifida* J.R. Forst. & J.G.A. Forst., Char. Gen. Pl. 70. t.35. 1778; Hook.f., Fl. Brit. India 6 : 287. 1892.

Perennial herbs, up to 1.25 m tall; root-stock globose, up to 8 cm across. Leaves radical, 1-3, 30-75 cm long. Scape up to 1.25 m long, hollow, striped with light and dark green patches. Flowers 10-40, in umbel, bracts 6-12, bracteoles filiform; perianth 6-lobed. Berries globose, up to



2.5 cm across, 6(-8)-ribbed, green changing to yellow.

*Fl. & Fr.*: Sept.-Oct.

In moist deciduous forests. Sparse.

Pharsegarh, 16128.

## DIOSCOREACEAE

### DIOSCOREA L.

- |  |                        |
|--|------------------------|
| 1a. Leaves alternate; seeds<br>winged at the base only | 1. <i>D. bulbifera</i> |
| 1b. Leaves opposite; seeds<br>winged throughout        | 2. <i>D. glabra</i>    |

1. *Dioscorea bulbifera* L., Sp. Pl. 1033. 1753. *D. sativa* Thunb., Fl. Jap. 151. 1784 *non* L.; Hook.f., Fl. Brit. India 6 : 295. 1892 (excl. *D. cliffortiana* Lam.).

‘Kanda’

Twiners; tubers up to 15 cm across, globose or pyriform. Stems twining to left; bearing numerous brown, warted bulbils in leaf-axils; bulbils up to 2.5 cm across. Leaves up to 25 × 20 cm, ovate, acuminate, base cordate. Male spikes in slender, axillary panicles, up to 15 cm long; perianth-lobes linear; stamens 6. Female spikes 1-3-together, up to 25 cm long; staminodes 6. Capsules up to 2 × 1 cm, oblong.

*Fl. & Fr.*: Aug.- Dec.

Very common in forests during the rainy season.

Bijapur Ghati, 16472; Pharsegarh; Kerpe Valley.

**Tubers are consumed.**

**2. *Dioscorea glabra* Roxb., Fl. Ind. 3 : 803. 1832; Hook.f., Fl. Brit. India 6 : 294. 1892.**

Twiners; tubers 1 or more, 6-10 cm across. Stems twining to right, prickly below. Leaves up to 10 × 7.5 cm, ovate-hastate, base rounded or truncate, apex acuminate. Male spikes up to 5 cm long; stamens 6. Female spikes up to 10 cm long, axillary. Capsules up to 2 × 3 cm, obovate, apex retuse.

*Fl. & Fr.*: Aug.- Oct.

In forest-undergrowth during the rainy season. Common.

Bijapur Ghati, 16642; Kutru; Pharsegarh.

### LILIACEAE

- |  |                 |
|--|-----------------|
| 1a. Leaves minute, reduced to spinescent scales, bearing axillary needle-like cladodes | 1. ASPARAGUS    |
| 1b. Leaves well developed, without cladodes :  |                 |
| 2a. Leaves radical :   |                 |
| 3a. Rootstock of fascicled, fleshy roots   | 2. CHLOROPHYTUM |
| 3b. Rootstock a bulb   | 3. DRIMIA       |
| 2b. Leaves cauline :   |                 |
| 4a. Climbing herbs; leaf-apex tendrillar   | 4. GLORIOSA     |
| 4b. Erect herbs; leaf-apex not tendrillar  | 5. IPHIGINEA    |

## 1. ASPARAGUS L.

**Asparagus racemosus** Willd., Sp. Pl. 2 : 152. 1799; Hook.f., Fl. Brit. India 6 : 316. 1892.

*'Dashmool'*

Scandent herbs, up to 60 cm tall. Cladodes 2-6-nate, up to 2.5 cm long, crowded, triquetrous, falcate, acuminate; spines decurved. Flowers white, in up to 9 cm long, solitary or fascicled racemes; pedicels jointed; tepals 6, linear-oblong. Berries globose.

*Fl. & Fr.*: Sept.- Nov.

Common in moist, shaded places in forests.

Bijapur Ghati, 16452; Madded; Pharsegarh; Kerpe Valley; Kutru.

Roots are medicinal and possess tonic properties.

## 2. CHLOROPHYTUM Ker-Gawl.

- |   |                           |
|---|---------------------------|
| 1a. Flowers distant                                 | 2. <i>C. laxum</i>        |
| 1b. Flowers dense :                                 |                           |
| 2a. Leaves lanceolate or<br>ob lanceolate, petioled | 1. <i>C. arundinaceum</i> |
| 2b. Leaves falcate, without petiole                 | 3. <i>C. tuberosum</i>    |

**1. Chlorophytum arundinaceum** Baker Journ. Linn. Soc. (Bot.) 15 : 323. 1876; Hook.f., Fl. Brit. India 6 : 333. 1892.

Robust herbs; roots tuberous. Leaves up to 75 × 5 cm. Scape up to 80 cm long. Perianth white, segments 6, 6-11 mm long; anthers longer than the filaments. Capsules depressed-globose, 6-7 mm across.

*Fl. & Fr.*: Sept.- Oct.

On hill-slopes as undergrowth in moist deciduous forests.  
Abundant.

Bijapur Ghati, 16468.

**2. *Chlorophytum laxum*** R.Br., Prodr. 277. 1810; Hook.f., Fl. Brit. India 6 : 336. 1892.

Rootstock tuberous. Leaves up to 40 × 0.8 cm, linear-lanceolate, recurved, grass-like. Scape up to 10 cm long, slender. Flowers distant, solitary or paired; perianth-segments 3-5 mm long, filaments longer than the anthers. Capsules up to 4 × 6 mm, broadly obovate, 3-winged; seeds black, angled.

*Fl. & Fr.*: Sept.- Oct.

In grassy-fields. Common.

Bijapur Ghati, 16395; Pillure.

**3. *C. tuberosum*** (Roxb.) Baker in Journ. Linn. Soc. (Bot.) 15 : 332. 1876; Hook.f., Fl. Brit. India 6 : 334. 1892. *Anthericum tuberosum* Roxb., Fl. Ind. 2 : 149. 1832.

Herbs with tuberous roots. Leaves sessile, up to 20 × 2 cm, linear, acuminate, margin undulate. Scape up to 20 cm long. Flowers white, 1-2 cm across; pedicels jointed at or below the middle; perianth-segments 6, elliptic. Capsules up to 1 × 0.6 cm, obovoid, emarginate; seeds black, sub-orbicular.

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

On hill-tops in open situations. Abundant.

Kerpe, 16350.

## 3. DRIMIA Jacq. ex Willd.

**Drimia indica** (Roxb.) Jessop in Journ. S. Afr. Bot. 43 : 272. 1977. *Scilla indica* Roxb., Fl. Ind. 2 : 147. 1824. *Urginea indica* (Roxb.) Kunth, Enum. Pl. 4 : 333. 1843; Hook.f., Fl. Brit. India 6 : 347. 1892.

Bulbous herbs. Bulbs white, up to 4 × 3.5 cm. Leaves few (often 3), radical, up to 40 × 2 cm, linear-oblong, acute, glaucous. Flowers in up to 75 cm long, slender scapes; perianth campanulate, lobes 6, pale brown with white margin, oblong or oblong-ovate; stamens 6, filaments flat, anthers yellow. Capsules up to 1.5 × 0.4 cm, oblong or oblong-ovate; seeds many, black, compressed.

*Fl. & Fr.*: Apr.- May.

In open situations on hill-tops. Rare.

Kerpe, 16161.

## 4. GLORIOSA L.

**Gloriosa superba** L., Sp. Pl. 305. 1753; Hook.f., Fl. Brit. India 6 : 358. 1892.

Climbing herbs, rootstock tuberous. Leaves sessile, up to 15 × 5 cm, linear to ovate-lanceolate, apex tendril-like. Flowers solitary, axillary; perianth-segments 6, 4-7 cm long, yellow turning to scarlet at maturity, linear, margin undulate. Capsules up to 4 cm long, oblong.

*Fl. & Fr.*: Sept.- Nov.

In the vicinity of forests. Common.

Maddur, 16604 : Kutru; Karkeli; Pharsegarh.

Tubers are medicinal and are source of colchicine.

## 5. IPHIGENIA Kunth

***Iphigenia indica* (L.) A. Gray** in Kunth, Enum. Pl. 4 : 213. 1843; Hook.f., Fl. Brit. India 6 : 357. 1892. *Melanthium indicum* L., Mant. 2 : 226. 1771.

Cormous herbs; stem up to 30 cm long, slender. Leaves few, up to 15 × 0.6 cm, linear-lanceolate. Flowers axillary, solitary or few, corymbose; perianth-segments 6, deep purple; stamens 6, purple. Capsules oblong or sub-globose, many-seeded.

*Fl. & Fr.*: Sept.- Oct.

In moist, shaded places as forest-undergrowth. Rare.

Bijapur Ghati, 16463.

Seeds used to extract colchicine.

## SMILACACEAE

## SMILAX L.

***Smilax zeylanica* L., Sp. Pl. 1029. 1753; Hook.f., Fl. Brit. India 6 : 309. 1892.**

*'Dokar-vela'*

Prickly, climbing shrubs. Leaves variable, up to 20 × 15 cm, lanceolate, elliptic, broadly oblong or orbicular, acute or cuspidate, 5-7-costate; petioles up to 5 cm long. Inflorescence of 1-3 umbels, on axillary peduncles. Flowers dioecious, 6-merous; perianth greyish-white, stamens 6, pistillode absent; staminodes 3 in pistillate flowers. Berries green, globose.

*Fl. & Fr.*: Nov.- Apr.

Common in forests.

Pharsegarh, 15522; Bijapur Ghati; Kerpe Valley; Netikakler; Kandlaparti.

Twigs are used for tying and brushing teeth.

## PONTEDERIACEAE

### MONOCHORIA Presl

***Monochoria vaginalis*** (Burm.f.) Presl, Rel. Haenk. 1 : 128. 1827; Hook.f., Fl. Brit. India 6 : 363. 1892, *Pontederia vaginalis* Burm.f., Fl. Ind. 80. 1768.

Perennial, succulent, tufted herbs, up to 30 cm tall. Leaves radical, solitary, variable, up to 12 × 5 cm, linear, ovate or ovate-lanceolate, acuminate, base rounded or cordate. Racemes 3-25-flowered, deflexed, partly hidden within leaf-sheath when young; tepals 6, lilac-blue, 3 inner broader; stamens 6, one longer. Capsules ellipsoid.

*Fl. & Fr.*: Oct.- Mar.

Abundant in marshy and water-logged places.

Madded, 16622 : Kutru; Pharsegarh; Karkeli; Bijapur.

## COMMELINACEAE

1a. Inflorescence a panicle 4. MURDANNIA

1b. Inflorescence a cyme :

2a. Leaf-sheaths swollen 1. AMISCHOPHACELUS

2b. Leaf-sheaths not swollen :

- |  |              |
|--|--------------|
| 3a. Fertile stamens 3, staminodes 2-3    | 2. COMMELINA |
| 3b. Fertile stamens 6, staminodes absent | 3. CYANOTIS  |

### 1. AMISCHOPHACELUS Rolla Rao & Kammathy

**Amischophacelus axillaris** (L.) Rolla Rao & Kammathy in Journ. Linn. Soc. (Bot.) 59 : 306. 1966. *Commelina axillaris* L., Sp. Pl. 42. 1753. *Cyanotis axillaris* (L.) D. Don, Prodr. Fl. Nep. 46. 1825; Hook.f., Fl. Brit. India 6 : 388. 1892.

‘Pani-kena’

Ascending, branched, succulent herbs; branches up to 50 cm long. Leaves up to 14 × 0.8 cm, linear-lanceolate, acute. Cymes in swollen leaf-sheaths. Flowers blue. Capsules ellipsoid, 3-celled; seeds brown, sub-cylindric, pitted.

*Fl. & Fr.*: Sept.- Nov.

In marshy and water-logged places. Common.

Maddur, 16629; Bijapur; Bhopalpatnam.

### 2. COMMELINA L.

- |   |                           |
|---|---------------------------|
| 1a. Capsules 2-celled                     | 4. <i>C. suffruticosa</i> |
| 1b. Capsules 3-celled :                   |                           |
| 2a. Spathe about as long as broad         | 1. <i>C. benghalensis</i> |
| 2b. Spathe distinctly longer than broad : |                           |
| 3a. Seeds appendaged                      | 3. <i>C. longifolia</i>   |
| 3b. Seeds without appendage               | 2. <i>C. hasskarlii</i>   |



**1. *Commelina benghalensis* L., Sp. Pl. 41. 1753; Hook.f., Fl. Brit. India 6 : 370. 1892.**

Scandent herbs, up to 50 cm tall; underground stem with cleistogamous flowers. Leaves up to 6.5 × 3.5 cm, ovate, acute or obtuse, base cuneate or rounded. Spathes 1-3, axillary or terminal. Flowers blue. Capsules pyriform, 5-seeded; seeds grey, oblong, pitted.

*Fl. & Fr.*: Sept.- Dec.

In forest-undergrowth, paddy fields and along the edges of ponds. Common.

Bijapur Ghati, 16407; Kutru; Pharsegarh.

**2. *C. hasskarlii* Clarke, Comm. & Cyrt. Beng. 13. t.3. 1874; Hook.f., Fl. Brit. India 6 : 370. 1892.**

Ascending, branched herbs; rooting at the lower nodes. Leaves sessile, up to 7.5 × 1.8 cm, lanceolate. Spathe up to 3 cm long, cordate, complicate. Flowers bluish-purple. Capsules quadrate; seeds cylindric, smooth.

*Fl. & Fr.*: Sept.- Dec.

Common in marshy places.

Bijapur Ghati, 16500; Kutru.

**3. *C. longifolia* Lam., Ill. Gen. 1 : 129. 1791. *C. salicifolia* Roxb., Fl. Ind. 1 : 176. 1820; Hook.f., Fl. Brit. India 6 : 370. 1892.**

Slender, diffuse herbs, up to 25 cm tall. Leaves up to 10 × 1.2 cm, ovate or linear-lanceolate. Spathe up to 4 cm long, solitary, axillary, complicate, acuminate, base rounded. Cymes 1-2-flowered. Flowers blue. Capsules quadrate; seeds black, sub-globose, appendaged.

*Fl. & Fr.*: Sept.- Nov.

Common as forest-undergrowth.

Bijapur Ghati, 16446; Pharsegarh; Kutru; Kerpe.

**4. *Commelina suffruticosa* Bl.**, Enum. Pl. Java ed. 1 : 3. 1827; Hook.f., Fl. Brit. India 6 : 374. 1892.

Robust, sub-erect herbs, up to 1 m tall; roots more or less tuberous. Leaves sessile, up to 20 × 5.5 cm, lanceolate, acuminate. Spathe ovate-cordate, short peduncled. Flowers white or blue. Capsules 2-celled; seeds brown, ellipsoid, rugose.

*Fl. & Fr.*: Sept.- Oct.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16447.

### 3. *CYANOTIS* D. Don

***Cyanotis cristata* (L.) D. Don**, Prodr. Fl. Nep. 46. 1825; Hook.f., Fl. Brit. India 6 : 385. 1892. *Commelina cristata* L., Sp. Pl. 42. 1753.

Spreading, branched or unbranched, succulent herbs; rooting at the nodes. Leaves up to 7.5 × 1.5 cm, elliptic-lanceolate, acute or apiculate. Spathe up to 1.5 cm long. Flowers violet in scorpioid cymes. Capsules 3-lobed; seeds black, trigonous, pitted.

*Fl. & Fr.*: Aug.- Oct.

Abundant in the vicinity of forests.

Bijapur Ghati, 16482; Kerpe Valley; Pharsegarh; Netikakler; Pengunda.

## 4. MURDANNIA Royle

- 1b. Leaves on stem reduced to sheaths only; roots fusiform 1. *M. edulis*
- 1b. Leaves on stem well developed; roots fibrous :
- 2a. Leaves ovate-lanceolate, margin undulate 3. *M. spirata*
- 2b. Leaves linear, margin not undulate :
- 3a. Flowers 1-3, fascicled in axils of distant bracts 4. *M. vaginata*
- 3b. Flowers in sub-corymbose cymes at ends of branches of panicle 2. *M. nudiflora*

**1. *Murdannia edulis*** (Stokes) Faden in Taxon 29 : 77. 1980. *Commelina edulis* Stokes in Bot. Mat. Med. 1 : 184. 1812. *C. scapiflora* Roxb., Fl. Ind. 1 : 175. 1820. *Aneilema scapiflorum* (Roxb.) Kostel. in Allg. Med.- Pharm. Fl. 1 : 127. 1831; Hook.f., Fl. Brit. India 6 : 375. 1892.

Tufted herbs. Radical leaves up to  $22 \times 1.3$  cm, lanceolate, acute, margin undulate. Stems 1-5-together, up to 35 cm long, separate from the leaves, with a few apiculate sheaths. Flowers in up to 15 cm long panicles; sepals 3, green with pinkish tinge; petals 3, violet, 7-9 mm long, obovate. Capsules obovoid; seeds trigonous, reticulate.

*Fl. & Fr.*: May.

In dry deciduous forests. Rare.

Dudepalli, 16347.

**2. *Murdannia nudiflora* (L.) Brenan** in Kew Bull. 7 : 189. 1952. *Commelina nudiflora* L., Sp. Pl. 41. 1753 *p.p.* *Aneilema nudiflorum* R. Br., Prodr. 271. 1810 (in adnot.); Hook.f., Fl. Brit. India 6 : 378. 1892.

Diffuse, slender herbs. Leaves up to 7.5 × 0.9 cm, linear, acute or acuminate. Flowers violet, in terminal panicles. Capsules globose, locules 2-celled; seeds brown, truncate at one end, tuberculate.

*Fl. & Fr.*: Sept.- Oct.

Common in marshy habitats.

Bijapur, 16400; Kutru; Netikakler; Dudepalli.

**3. *M. spirata* (L.) Brueckn.** in Engl. & Prantl, Pflanzenfam. ed. 2. 15A : 173. 1930. *Commelina spirata* L., Mant. 2 : 176. 1771. *Aneilema spiratum* R.Br., Prodr. 271. 1810; Hook.f., Fl. Brit. India 6 : 377. 1892.

Dwarf, decumbent herbs. Leaves up to 3.5 × 0.9 cm, ovate-lanceolate, base cordate and sub-amplexicaul. Flowers violet, in divaricately branched panicles. Capsules oblong, 3-7-seeded; seeds brown, minute, angled.

*Fl. & Fr.*: Sept.- Nov.

In moist grassy-fields and forest-undergrowth.

Bijapur Ghati, 16494; Kutru; Pharsegarh.

**4. *M. vaginata* (L.) Brueckn.** in Engl. & Prantl, Pflanzenfam. ed.2. 15A : 173. 1930. *Commelina vaginata* L., Mant. 2 : 177. 1771. *Aneilema vaginatum* R. Br., Prodr. 271. 1810; Hook.f., Fl. Brit. India 6 : 381. 1892.

Tufted, annual herbs, up to 25 cm tall. Leaves up to 15 × 0.8 cm,

sessile, linear, acuminate. Flowers violet. Capsules globose, cuspidate; seed 1 in each locule, black, rugose.

*Fl. & Fr.*: Sept.- Oct.

In marshy habitats. Sparse.

Bijapur Ghati, 16494; Kutru; Pharsegarh.

### ARECACEAE

- |   |             |
|---|-------------|
| 1a. Leaves simple, fan-like; drupes<br>sub-globose, 12.5-20 cm long   | 1. BORASSUS |
| 1b. Leaves pinnate; drupes oblong<br>or oblong-ellipsoid, 1-3 cm long | 2. PHOENIX  |

#### 1. BORASSUS L.

**Borassus flabellifer** L., Sp. Pl. 1187. 1753; Beccari & Hook.f. in Hook.f., Fl. Brit. India 6 : 482. 1893.

'Tad'

Unbranched trees, up to 15 m tall. Leaves up to 1.5 m in diam., segments linear-lanceolate, folded; petioles up to 1 m long, margin spiny. Flowers dioecious. Spadix branched with many spathes; male flowers in spikes at the apex of branches, minute; female flowers 2-2.5 cm across, perianth accrescent. Drupes brown; pyrenes 1-3, fibrous.

*Fl. & Fr.*: Mar.- Aug.

Planted near habitations.

Kutru, 16369; Bhopalpatnam.

Stem is tapped for a liquor ('taddy' 'sulfi') at the time of flowering; fruits are consumed.

## 2. PHOENIX L.

- 1a. Dwarf plants; stem absent or reduced                      1. *P. acaulis*  
 1b. Tall plants; stem 10-15 m long                              2. *P. sylvestris*

**1. Phoenix acaulis** Buch.- Ham. ex Roxb. in Trans. Linn. Soc. Lond. 15 : 87. 1826; Beccari & Hook.f. in Hook.f., Fl. Brit. India 6 : 426. 1892.

'Chhind', 'Indi'

Undershrubs; stem almost underground, 15-20 cm in diam. Leaves up to 1 m long; leaflets up to 30 × 2 cm, fasciculate; petiole spiny. Spadix up to 25 cm long, branched; male flowers cream coloured; female flowers with leathery perianth. Drupes 1-2 cm long, orange-red, oblong.

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

Very common in forests.

Itpal, 16241; Kandlaparti; Pharsegarh; Kerpe; Dudepalli; Netikakler.

Crushed roots are said to be useful in diarrhoea; fruits edible.

**2. P. sylvestris** (L.) Roxb., Fl. Ind. 3 : 787. 1832; Beccari & Hook.f. in Hook.f., Fl. Brit. India 6 : 425. 1892. *Elate sylvestris* L., Sp. Pl. 1189. 1753.

'Khajuri'

Trees, up to 15 m tall. Leaves up to 2.5 m long, forming a crown at the apex of stem; leaflets up to 35 × 3 cm, stiff, in fascicles; petiole spiny. Spadix up to 1 m long with filiform branches; spathes 25-40 cm long, separating in 2 boat-shaped valves. Male flowers white. Female flowers : perianth 3 + 3, carpels 3, stigmas sessile. Drupes 2-3 cm long, orange to reddish-brown, oblong-ellipsoid.

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

Often planted near habitations.

Bhopalpatnam, 16270; Kutru.

Stem is tapped near the inflorescence and a liquor ('*sulfi*') is made from the juice which oozes from the cut part; leaves used for making brooms and mats; fruits eaten.

ARACEAE

- 1a. Floating herbs; leaves in a rosette 3. PISTIA
- 1b. Terrestrial herbs; leaves not as above :
  - 2a. Flowers appear before the leaves 1. AMORPHOPHALLUS
  - 2b. Flowers and leaves appear together :
    - 3a. Leaves peltate; stamens united 2. COLOCASIA
    - 3b. Leaves not peltate; stamens free 4. THERIOPHONUM

1. AMORPHOPHALLUS Bl, ex Decaisne

**Amorphophallus sylvaticus** (Roxb.) Kunth, Enum. 3 : 34. 1841.  
*Arum sylvaticum* Roxb., Fl. Ind. 3 : 511. 1832. *Synantherias sylvatica* Scott, Gen. Aroid t.28. 1858; Hook.f., Fl. Brit. India 6 : 518. 1893.

Tuberous herbs; tubers *ca* 4 cm across. Leaf solitary, up to 40 cm long; leaflets 7-25 cm long, lanceolate, acute or sub-acuminate. Peduncle up to 35 cm long, green with purple blotches; spathe up to 7 × 5 cm, convolute at the basal half, green on outer side, purple blotched at the base within; female flowers at the base of spadix, yellow, stigmas 3;

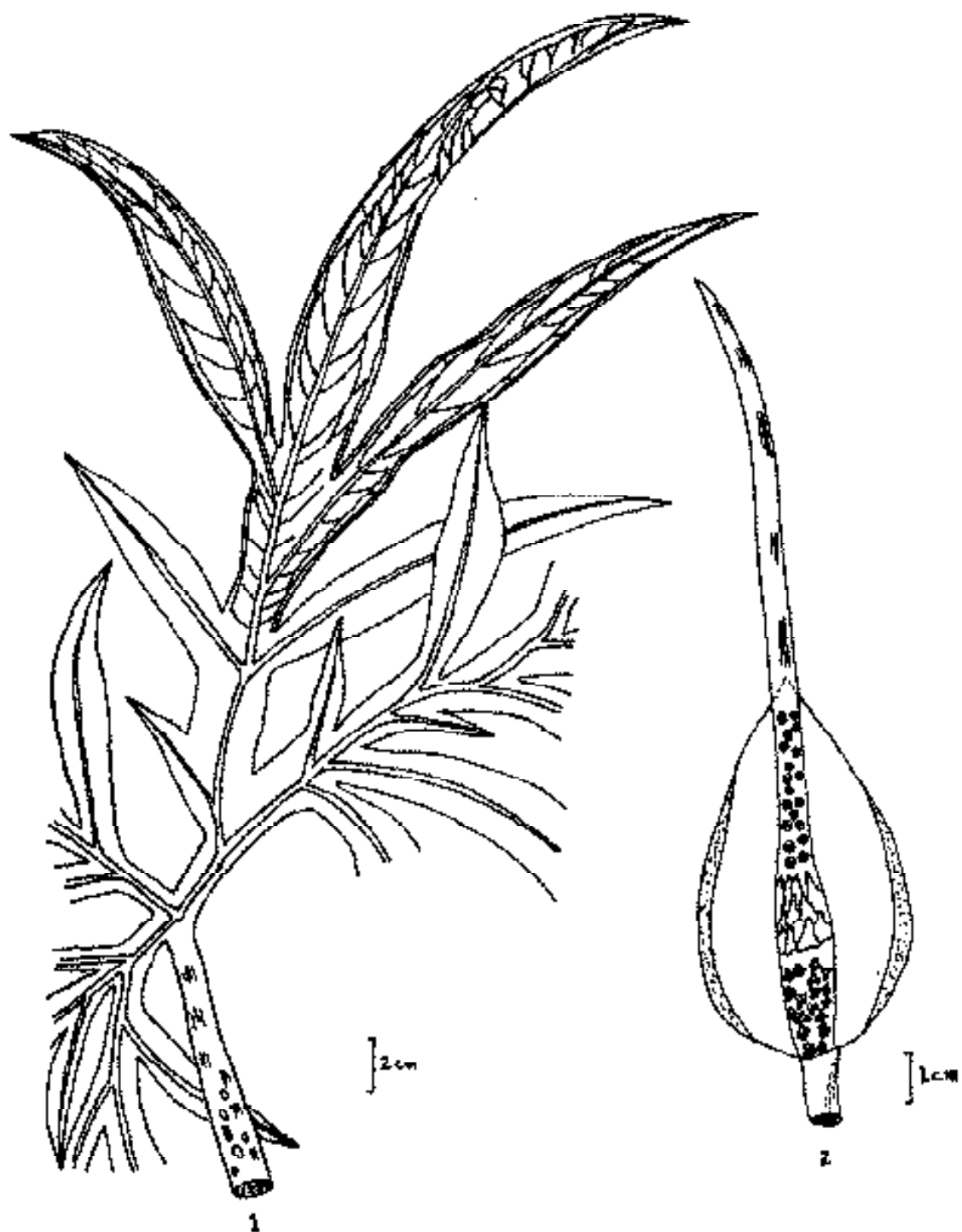


Fig. 16. *Amorphophallus sylvaticus* (Roxb.) Kunth  
1. stem, apical part & 2. inflorescence.



neuters light purple; male flowers yellow; appendage green, up to 9 cm long.

*Fl.*: May.

In mixed teak forests as undergrowth. Rare.

Kandlaparti, 16279.

## 2. COLOCASIA Schott

***Colocasia esculenta* (L.) Schott** in Schott & Endl., Melet. Bot. 1 : 18. 1832. *Arum esculentum* L., Sp. Pl. 965. 1753. *Colocasia antiquorum* Schott l.c. 1 : 18. 1832; Hook.f., Fl. Brit. India 6 : 523. 1893.

Tuberous herbs. Leaves up to 40 cm long, ovate or ovate-triangular, base cordate or sagittate. Spathe up to 35 cm long, pale yellow, caudate-acuminate; male and female flowers separated by a zone of neuters.

*Fl. & Fr.*: Sept.- Oct.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16147.

Tubers are used as a vegetable.

## 3. PISTIA L.

***Pistia stratiotes* L.**, Sp. Pl. 963. 1753; Hook.f., Fl. Brit. India 6 : 497. 1893.

Stoloniferous, rosulate herbs. Rosettes up to 10 cm across; leaves obovate, retuse, flabellately-nerved, pubescent on both the surfaces, fleshy. Spathes 1-1.5 cm long, yellowish-green, obliquely campanulate; male and female portions separated by a zone of neuters.

*Fl. & Fr.*: Aug.- Nov.

Abundant in ponds.

Kutru, 16354; Dudepalli.

#### 4. THERIOPHONUM Bl.

***Therophonum minutum*** (Willd.) Baill., Hist. Pl. 13 : 457. 1895.  
*Arum minutum* Willd., Sp. Pl. 4 : 481. 1805 (excl. Rheede illustr. cited).  
*A. crenatum* Wight in Bot. Misc. 2 : 100. suppl. t.3. 1831. *Therophonum crenatum* (Wight) Bl. in Rumphia 1 : 128. 1837; Hook.f., Fl. Brit. India 6 : 512. 1893.

Cornous herbs; corms up to 2 cm across. Leaves with petioles up to 15 cm long; lamina 3-lobed to hastate, lobes broad or narrow. Peduncles up to 5 cm long. Spathes up to 15 cm long; spadix up to 7.5 cm long with basal pistillate portion, short sterile portion, staminate portion, a second sterile portion and a purple appendage. Berries 6-9 on deflexed peduncles; seeds 2-3, broadly ovoid or obovoid.

*Fl. & Fr.*: Aug.- Sept.

In moist, shaded places as forest-undergrowth. Rare.

Pharsegarh, 16110.

### BUTOMACEAE

#### TENAGOCHARIS Hochst.

***Tenagocharis latifolia*** (D. Don) Buchen. in Abh. Naturw. Ver. Bremen 2 : 2,3,6. 1868. *Butomus latifolius* D. Don, Prodr. Fl. Nep. 22. 1825.

Annual herbs, up to 35 cm tall. Leaves up to 14 × 5 cm, oblong-lanceolate or oblanceolate, acute; petioles up to 14 cm long. Flowers in

umbels, on up to 30 cm long peduncles; pedicels up to 12 cm long; sepals up to 8 mm long, green, elliptic-obovate; petals up to 1.5 cm long, white, ovate or obovate; stamens 8-9; ovaries 8-9, styles short. Follicles up to 1.5 cm long; seeds brown, minute, elliptic.

*Fl. & Fr.*: Oct.- Feb.

In marshy places and along the edges of ponds. Common.

Kerpe, 15548; Kuenar; Kutru.

Plant is grazed by herbivores.

## NAJADACEAE

### NAJAS L.

**Najas indica** (Willd.) Cham. in *Linnaea* 4 : 501. 1829. *Caulinia indica* Willd., *Mem. Acad. R. Sc. Berl.* 89. t.1. f.3. 1801. *Najas minor* Hook.f., *Fl. Brit. India* 6 : 569. 1893, *pro maj. parte* (non All. 1785).

Submerged, dichotomously branched herbs, up to 25 cm tall. Leaves up to 12.5 × 0.2 cm, linear, margin with spinules. Spathes ellipsoid, subtending male flowers only, anthers 1-celled. Achenes 2-3 mm long; seeds areolate.

*Fl. & Fr.*: Oct.- Dec.

In still water and ponds. Abundant.

Kutru, 16138; Dudepalli.

## APONOGETONACEAE

### APONOGETON L.f.

**Aponogeton natans** (L.) Engl. & Krause in *Engl., Pflanzenr.* 24 : 11. 1906. *Saururus natans* L., *Mant.* 2 : 227. 1771. *Aponogeton*

*monostachyon* L.f., Suppl. 214. 1781; Hook.f., Fl. Brit. India 6 : 564. 1893.

Aquatic, tuberous herbs with floating leaves. Leaves up to 6 × 1.5 cm, lanceolate or oblong, obtuse or acute, base rounded or cordate; petioles up to 15 cm long. Flowers white or pink, in solitary, 3-10 cm long spikes; tepals 2, obovate; stamens 6. Follicles sub-globose; seeds 4-8, oblong, striate.

*Fl. & Fr.*: Sept.- Nov.

In ponds. Sparse.

Dudepalli, 16335.

## ERIOCAULACEAE

### ERIOCAULON L.

1a. Leaves green; anthers white or yellow                      1. *E. cinereum*

1b. Leaves red; anthers black                                      2. *E. quinquangulare*

1. *Eriocaulon cinereum* R. Br., Prodr. 254. 1810. *E. sieboldianum* Sieb. & Zucc. ex Steud., Syn. Pl. 2 : 272. 1855; Hook.f., Fl. Brit. India 6 : 577. 1893.

Tufted, annual herbs, up to 15 cm tall. Leaves in rosette, linear-subulate, acute. Heads ca 3 mm across, globose or ovoid. Bracts linear-oblong or oblanceolate. Male florets : corolla-lobes with an apical gland. Female florets : sepals hyaline; petals linear, eglandular. Seeds ellipsoid-ovoid.

*Fl. & Fr.*: Sept.- Nov.

In wet and marshy habitats. Abundant.

Eramnar, 16686; Kutru; Bijapur.

**2. Eriocaulon quinquangulare** L., Sp. Pl. 87. 1753; Hook.f., Fl. Brit. India 6 : 582. 1893.

Acaulescent, annual herbs, up to 15 cm tall. Leaves up to 9 × 0.5 cm, linear-lanceolate. Peduncles up to 15 cm long. Heads globose or ovoid, 3-5 mm across, greyish-white; involucre bracts linear or oblong; floral bracts obovate, acuminate. Male florets : 2 sepals connate, apex hairy; corolla hairy at the apex, glandular. Female florets : sepals 3, apex hairy; petals oblanceolate, ciliate with apical gland. Seeds sub-globose, smooth.

*Fl. & Fr.*: Sept.- Oct.

In wet and marshy habitats. Abundant.

Bijapur Ghati, 16493; Kutru.

### CYPERACEAE

- |   |                 |
|---|-----------------|
| 1a. Nuts borne on a disk                          | 9. SCLERIA      |
| 1b. Nuts without disk :                           |                 |
| 2a. Flowers naked, without perianth :             |                 |
| 3a. Style base persisting<br>like a minute button | 1. BULBOSTYLIS  |
| 3b. Style base not persistent :                   |                 |
| 4a. Style articulate with ovary                   | 4. FIMBRISTYLIS |
| 4b. Style continuous with ovary :                 |                 |
| 5a. Glumes distichous                             | 2. CYPERUS      |

- 5b. Glumes spiral 8. SCIRPUS
- 2b. Flowers with a perianth :
- 6a. Perianth of bristles :
- 7a. Inflorescence reduced  
to a solitary spikelet 3. ELEOCHARIS
- 7b. Inflorescence of paniculate  
or umbellate spikelets :
- 8a. Nuts beaked 7. RHYNCHOSPORA
- 8b. Nuts not beaked 8. SCIRPUS
- 6b. Perianth of scales  
alternating with bristles :
- 9a. Inflorescence paniculate 5. FIURENA
- 9b. Inflorescence more or less lobed 6. LIPOCARPHA

### 1. BULBOSTYLIS Kunth

**Bulbostylis barbata** (Rottb.) Clarke in Hook.f., Fl. Brit. India  
6 : 651. 1893. *Scirpus barbatus* Rottb., Progr. 27. 1772.

Delicate, annual herbs, up to 15 cm tall. Leaves short, capillary.  
Inflorescence capitate. Heads 0.5-1.5 cm across; spikelets ovate-oblong,  
acute, brown, 3.5-7 × 1-1.5 mm, sessile; glumes ovate, mucronate; stamen  
1. Nuts obovate, triquetrous.

*Fl. & Fr.*: Oct.

In wet places. Abundant.

Bijapur Ghati, 16160; Kutru.

2. CYPERUS L.

1a. Style 2-fid; nuts lenticular :

2a. Each spikelet maturing many nuts;  
inflorescence umbellate or capitate :

3a. Glumes muticous    20. *C. sanguinolentus*

3b. Glumes mucronate :

4a. Inflorescence capitate                                        18. *C. pygmaeus*

4b. Inflorescence simple  
or sub-compound umbel    17. *C. pumilus*

2b. Each spikelet maturing one nut;  
inflorescence capitate of 1-5  
sessile glomerules :

5a. Rhizome horizontally creeping                                2. *C. brevifolius*

5b. Rhizome densely caespitose                                        22. *C. triceps*

1b. Style 3-fid; nuts trigonous :

6a. Nuts corky-thickened at the angles                                15. *C. platystylis*

6b. Nuts not corky-thickened  
at the angles :

7a. Glumes with a strong  
recurved mucro    5. *C. cuspidatus*

7b. Glumes without recurved  
mucro :

- 8a. Rhachilla of spikelets  
caducous :
- 9a. Spikes globose 3. *C. compactus*
- 9b. Spikes cylindric 6. *C. cyperoides*
- 8b. Rhachilla of spikelets  
persistent :
- 10a. Inflorescence capitate :
- 11a. Spikelets white 12. *C. niveus*
- 11b. Spikelets green  
or brown :
- 12a. Stamens 1-2 7. *C. difformis*
- 12b. Stamens 3 4. *C. compressus*
- 10b. Inflorescence umbellate :
- 13a. Rhachis much  
longer than the  
spikelets :
- 14a. Glumes orbicular  
or broadly ovate :
- 15a. Keel of glume  
7-nerved with  
serrate margin  
at the apex 1. *C. alulatus*
- 15b. Keel of glume  
3-5-nerved  
with smooth margin 11. *C. iria*



- 14b. Glumes linear-lanceolate  
or ovate-oblong :
- 16a. Spikelets dense, ascending 13. *C. nutans*  
var. *eleusinoides*
- 16b. Spikelets lax, spreading :
- 17a. Rhizome very short 9. *C. exaltatus*
- 17b. Rhizome stoloniferous 16. *C. procerus*
- 13b. Rhachis obscure, shorter or as  
long as the spikelets :
- 18a. Spikelets digitate, up to 2 cm long :
- 19a. Spikelets many 7. *C. difformis*
- 19b. Spikelets 2-5 :
- 20a. Rhachilla concealed by  
ascending, appressed  
glumes 10. *C. halpan*
- 20b. Rhachilla visible between  
spreading glumes 21. *C. tenuispica*
- 18b. Spikelets spicate, up to  
6 cm long :
- 21a. Glumes distinctly mucronate 4. *C. compressus*
- 21b. Glumes muticous or  
mucronulate :
- 22a. Leaves absent  
or solitary 14. *C. pangorei*

22b. Leaves 2-many :

23a. Spikelets acicular,

ca 1 mm broad

8. *C. distans*

23b. Spikelets compressed,

1.5-3 mm broad

19. *C. rotundus*

1. ***Cyperus alulatus*** Kern in Reinwardtia 1(4) : 463. f.1. 1952.

Annual herbs, up to 25 cm tall. Leaves 2-3 mm broad, equalling or exceeding the culm. Inflorescence simple or compound; spikelets 2.5-6 × 2-2.5 mm, oblong, green changing to yellow at maturity; glumes ca 2 × 1.5 mm, ovate. Nuts reddish-brown, obovoid, apiculate.

*Fl. & Fr.*: Oct.

In marshy places. Sparse.

Madded, 16606B.

2. ***C. brevifolius*** (Rottb.) Hassk., Cat. Hort. Bog. 24. 1844. *Kyllinga brevifolia* Rottb., Descr. & Ic. 13. t.4. f.3. 1773; Clarke in Hook.f., Fl. Brit. India 6 : 588. 1893.

Perennial, rhizomatous herbs. 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 across; spikelets up to 3 × 1 mm, compressed, green; glumes keeled, mucronulate. Nuts yellowish-brown, ovoid or elliptic.

*Fl. & Fr.*: Oct.- Feb.

Abundant in wet, grassy-fields and along the edges of ponds.

Bijapur, 16666; Kutru; Pillure.

**3. *Cyperus compactus* Retz.,** Obs. Bot. 5 : 10. 1789. *Mariscus microcephalus* Presl, Rel. Haenk. 1 : 182. 1828; Clarke in Hook.f., Fl. Brit. India 6 : 624. 1893.

Perennial herbs, up to 1.5 m tall. Leaves up to 1 cm broad, rigid, septate-nodulose; sheaths reddish-brown, spongy. Inflorescence compound or decomposed; spikes globose or sub-globose, dense, 1.5-2 cm across, greenish-brown; spikelets linear-lanceolate; glumes 2.5-4 × 1-1.5 mm, oblong-lanceolate, convolute. Nuts brown, oblong-linear or ellipsoid, apex apiculate-rostrate.

*Fl. & Fr.*: Oct.

In marshy-fields and along the edges of ponds. Abundant.

Madded, 16607; Kutru.

**4. *C. compressus* L.,** Sp. Pl. 46. 1753; Clarke in Hook.f., Fl. Brit. India 6 : 605. 1893.

Tufted, annual (sometimes perennial) herbs, up to 30 cm tall. Leaves 2.5-4 mm broad; lower sheaths reddish-brown. Inflorescence simple, lax; spikes green, ovoid; spikelets sub-digitate, compressed, linear-oblong, 1.5-3 cm long; glumes 3-4 mm long, ovate, strongly-keeled, mucronate. Nuts deep brown to black, obovoid, stipitate.

*Fl. & Fr.*: Oct.- Feb.

In wet and marshy places. Abundant.

Madded, 16605; Kutru; Pharsegarh; Netikakler; Kerpe; Bijapur.

**5. *C. cuspidatus* H.B.K.,** Nov. Gen. & Sp. 1 : 204. 1815; Clarke in Hook.f., Fl. Brit. India 6 : 598. 1893.

Annual herbs, up to 15 cm tall. Leaves filiform. Inflorescence

often a solitary head of digitate, stellately spreading, 1-2 cm long spikes; glumes *ca* 2 mm long, ovate, aristate, keel 3-nerved. Nuts brown, obovoid to oblong-obovoid, apiculate.

*Fl. & Fr.*: Oct.

In wet places. Sparse.

Bijapur Ghati, 16423A.

**6. *Cyperus cyperoides* (L.) O. Ktze., Rev. Gen. Pl. 3, 2 : 333. 1898. *Scirpus cyperoides* L., Mant. 2 : 181. 1771. *Mariscus sieberianus* Nees ex Clarke in Hook.f., Fl. Brit. India 6 : 622. 1893.**

Perennial, rhizomatous herbs, up to 40 cm tall. Leaves 3-5 mm broad, long attenuate. Inflorescence simple or sub-compound; spikes green, 2-4 cm long, cylindrical; spikelets 3.5-5 mm long; glumes ovate, acute, membranous, appressed. Nuts reddish-brown, linear, slightly curved, apiculate.

*Fl. & Fr.*: Oct.- Feb.

Along stream-banks. Sparse.

Pharsegarh, 16108.

**7. *C. difformis* L., Cent. Pl. 2 : 6. 1756; Clarke in Hook.f., Fl. Brit. India 6 : 599. 1893.**

Annual herbs, up to 30 cm tall. Leaves 2-5 mm broad, shorter than the culm. Spikelets 3-5 mm long, green or brown, linear-oblong, in dense globose heads; glumes *ca* 1 mm long, obovate, mucicous, 3-nerved. Nuts yellow to brown, obovoid, apiculate.

*Fl. & Fr.*: May.

Common in river-beds.

Indravati river, 16317.

**8. *Cyperus distans*** L.f., Suppl. 103. 1781; Clarke in Hook.f., Fl. Brit. India 6 : 607. 1893.

Rhizomatous, perennial herbs, up to 75 cm tall. Leaves 4-8 mm broad, shorter or equalling the culm. Inflorescence compound or decomposed; spikes pyramidal; spikelets up to 5 cm long, brown, spreading at right angles, linear; glumes elliptic or oblong-ovate, appressed. Nuts deep brown, ellipsoid, stipitate.

*Fl. & Fr.*: Oct.

Common in marshy habitats.

Kutru, 16143; Bijapur; Bhopalpatnam.

**9. *C. exaltatus*** Retz., Obs. Bot. 5 : 11. 1789; Clarke in Hook.f., Fl. Brit. India 6 : 617. 1893.

Tufted, perennial herbs, up to 1.75 m tall. Leaves up to 1.3 cm broad, coriaceous, flat or plicate. Inflorescence compound or decomposed; spikes digitate, up to 4 cm long; spikelets spicately arranged, up to 1 cm long, sub-distichous, linear-lanceolate. Nuts pale yellow or white, ellipsoid, stipitate.

*Fl. & Fr.*: Oct.

In marshy places and along the edges of ponds. Abundant.

Madded, 16603; Pharsegarh; Kutru; Pasewada.

**10. *C. halpan*** L., Sp. Pl. 45. 1753 ('*haspan*'); Clarke in Hook.f., Fl. Brit. India 6 : 600. 1893.

Tufted, perennial herbs, up to 40 cm tall. Leaves 2-5 mm broad,

often shorter than the culm. Inflorescence compound or decomposed; spikelets pale green or reddish, 4-9 mm long, stellately spreading, linear; glumes ca 1.5 mm long, ovate-oblong, keeled, mucicous. Nuts yellow, obovoid, apiculate, verruculose.

*Fl. & Fr.*: Oct.

Abundant in water-logged places.

Madded, 16623B; Bhopalpatnam.

**11. *Cyperus iria* L.**, Sp. Pl. 45. 1753; Clarke in Hook.f., Fl. Brit. India 6 : 606. 1893.

Tufted, annual herbs, 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-obovate, mucronulate, keel 3-5-nerved. Nuts brown or black, obovoid, stipitate.

*Fl. & Fr.*: Oct.

In marshy habitats. Sparse.

Madded, 16606A.

**12. *C. niveus* Retz.**, Obs. Bot. 5 : 12. 1788; Clarke in Hook.f., Fl. Brit. India 6 : 601. 1893.

Perennial herbs, up to 25 cm tall; rhizomes short, creeping. Leaves 1.5-3 mm broad, often smaller than the culms. Inflorescence capitate; spikelets 1-2.5 cm long, white, oblong, compressed; glumes 4-5 mm long, ovate-oblong or ovate-lanceolate, mucronulate. Nuts brown, obovoid.

*Fl. & Fr.*: May.

As forest-undergrowth and on hill-tops. Common.

Bijapur Ghati, 16226 : Kerpe Valley.

**13. *Cyperus nutans* Vahl var. *eleusinoides* (Kunth) Haines,** Bot. Bihar & Orissa 5 : 898. 1924. *C. eleusinoides* Kunth, Enum. 2 : 39. 1837; Clarke in Hook.f., Fl. Brit. India 6 : 608. 1893.

Perennial herbs, up to 1.25 m tall; rootstock woody. Leaves up to 1.2 cm broad, usually shorter than the culm. Inflorescence compound; spikes ascending, up to 4 cm long; spikelets 6-8 mm long, linear-oblong; glumes elliptic-oblong, mucronate. Nuts yellowish-brown, obovoid-oblong, apiculate.

*Fl. & Fr.*: Oct.

Along stream-banks in forests. Sparse.

Pharsegarh, 16125.

**14. *C. pangorei* Rottb.,** Descr. & Ic. 3. t.7. f.3. 1773. *C. tegetum* Roxb., Fl. Ind. 1 : 208. 1832; Clarke in Hook.f., Fl. Brit. India 6 : 613. 1893.

Rhizomatous, perennial herbs, up to 2 m tall. Leaves absent or sometimes one leaf present. Inflorescence compound or decomposed; spikelets up to 2.5 cm long, linear, brown, narrowly obovoid-oblong, apiculate.

*Fl. & Fr.*: Oct.

Abundant along stream-banks.

Bijapur Ghati, 16451; Pengunda; Indravati river.

**15. *C. platystylis* R. Br.,** Prodr. 214. 1810; Clarke in Hook.f., Fl. Brit. India 6 : 598. 1893.

Perennial herbs, up to 3 m tall. Leaves 5-9 mm broad, septate-nodulose. Inflorescence compound or decomposed; spikelets up to 2 cm long, green with brownish tinge, ovate-lanceolate, congested; glumes 2-2.5 × 1 mm, ovate, keel 3-nerved. Nuts ellipsoid with thick corky, white margins.

*Fl. & Fr.*: Oct.- May.

Abundant in ponds.

Kutru, 16356.

**16. *Cyperus procerus*** Rottb., *Descr. & Ic.* 29. t.5. f.3. 1773; Clarke in *Hook.f., Fl. Brit. India* 6 : 610. 1893.

Robust, stoloniferous herbs, 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 2.5-4 mm long, ovate or elliptic, 5-7-nerved. Nuts blackish-brown, obovoid.

*Fl. & Fr.*: Oct.

In paddy fields. Abundant.

Pharsegarh, 16117.

**17. *C. pumilus*** L., *Cent. Pl.* 2 : 6. 1756. *Pycneus pumilus* Nees ex Clarke in *Hook.f., Fl. Brit. India* 6 : 591. 1893, *quoad. basion., excl. descr.*

Slender, tufted, annual herbs, up to 15 cm tall. Leaves 1-2.5 mm broad, shorter or longer than the culms. Inflorescence simple or sub-compound; spikelets up to 1.2 cm long, brown, oblong-linear, compressed; glumes ovate, cuspidate, keel 3-5-nerved. Nuts brown, oblong-obovate, apiculate.



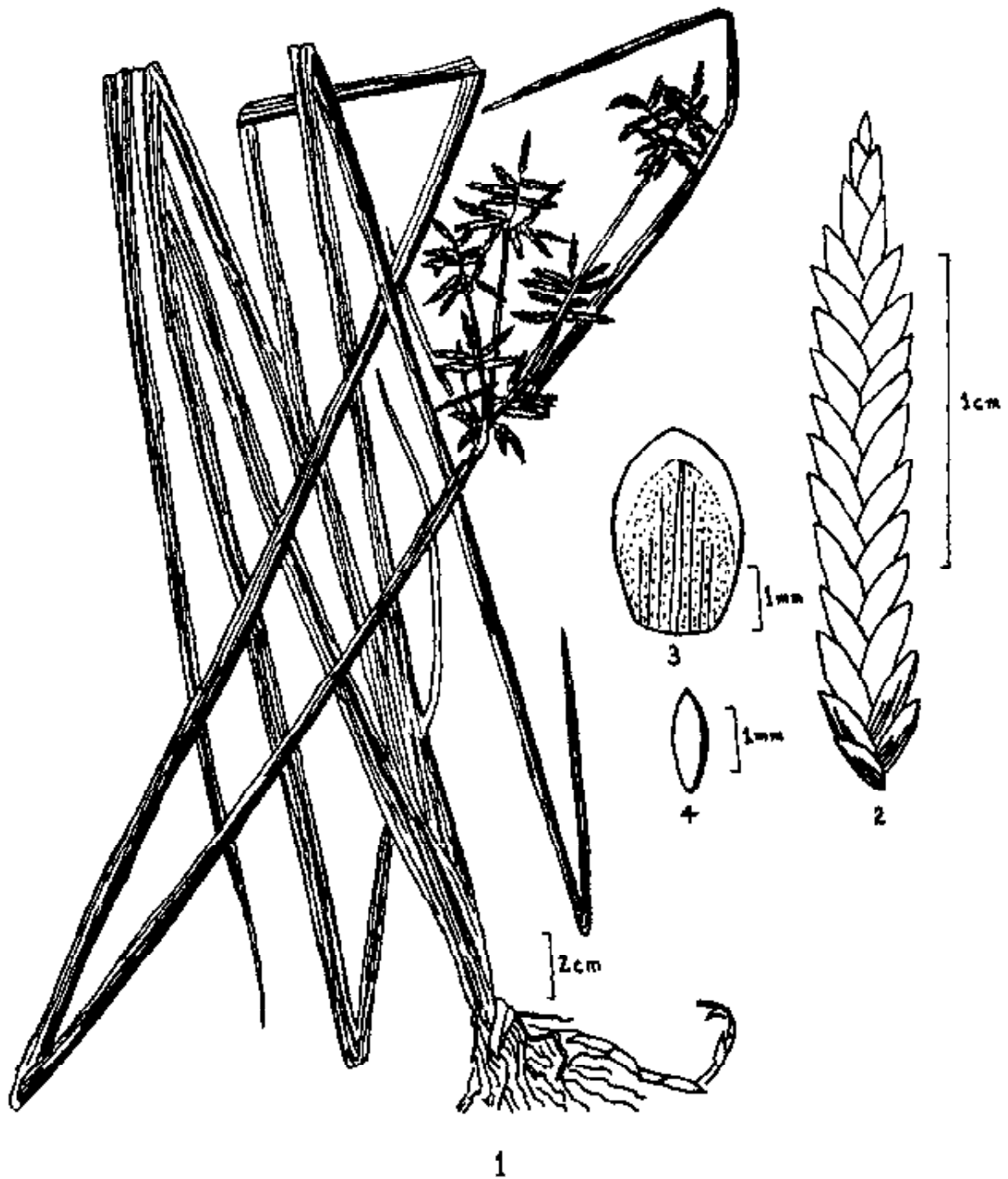


Fig. 17. *Cyperus procerus* Rottb.  
1. habit; 2. spikelet; 3. glume & 4. nut.

*Fl. & Fr.*: Oct.

Common in wet habitats.

Bijapur Ghati, 16423B; Kutru; Pasewada.

**18. *Cyperus pygmaeus*** Rottb., *Descr. & Ic.* 20, t.14, f. 4 & 5. 1773. *Juncellus pygmaeus* Clarke in Hook.f., *Fl. Brit. India* 6 : 596. 1893.

Tufted, annual herbs, with prostrate, stellately spreading branches. Leaves 1-2.5 mm broad, shorter or equalling the culm. Inflorescence capitate; spikelets green, 4-5 mm long, ovate, compressed; glumes oblong-lanceolate, cuspidate, keeled. Nuts brown, oblong or ellipsoid.

*Fl. & Fr.*: Feb.- Apr.

Common along the edges of ponds.

Kerpe, 15546; Dudepalli.

**19. *C. rotundus*** L. *Sp. Pl.* 45. 1753; Clarke in Hook.f., *Fl. Brit. India* 6 : 614. 1893.

Stoloniferous, perennial herbs, 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.*: Oct.- May.

In wet waste lands. Common.

Bijapur, 16207.

**20. *C. sanguinolentus*** Vahl, *Enum. Pl.* 2 : 351. 1806. *Pycneus sanguinolentus* Nees in *Linnaea* 9 : 283. 1834; Clarke in Hook.f., *Fl.*

Brit. India 6 : 590. 1893.

Annual herbs, up to 40 cm tall. Leaves up to 2.5-4 mm broad. Inflorescence simple or capitate; spikelets up to 1 cm long, ovate or oblong, deep brown; glumes broadly ovate, keeled, reddish-brown. Nuts brown, obovate or sub-orbicular, apiculate.

*Fl. & Fr.*: Oct.

In marshy places. Common.

Kutru, 16140; Bijapur.

**21. *Cyperus tenuispica* Steud., Syn. 2 : 11. 1855.**

Slender, tufted, annual herbs, up to 40 cm tall. Leaves 2-3 mm broad. Inflorescence compound or decomposed; spikelets stellately spreading, up to 7 mm long; linear-oblong; glumes lax, ovate-oblong. Nuts pale yellow, obovoid.

*Fl. & Fr.*: Oct.

In marshy places. Rare.

Madded, 16623A.

**22. *C. triceps* Endl., Cat. Hort. Ac. Vindob. 1 : 94. 1842. *Kyllinga triceps* Rottb., Descr. & Ic. 14. t.4. f.6. 1773 *nom. illeg.*; Clarke in Hook.f., Fl. Brit. India 6 : 587. 1893.**

Annual or perennial herbs, up to 30 cm tall. Leaves 1-4 mm broad. Inflorescence capitate, 1-5-lobed; spikelets white or pale green, *ca* 2 mm long; glumes 1-1.5 mm long, ovate-oblong. Nuts yellowish-brown, oblong or ellipsoid-oblong.

*Fl. & Fr.*: Oct.

In wet fields. Common.

Kutru, 16156; Bijapur.

### 3. ELEOCHARIS R. Br.

- |                                |                           |
|--------------------------------|---------------------------|
| 1a. Stigmas 2; nuts lenticular | 1. <i>E. atropurpurea</i> |
| 1b. Stigmas 3; nuts trigonous  | 2. <i>E. retroflexa</i>   |

**1. *Eleocharis atropurpurea*** (Retz.) Presl, Rel. Haenk. 1 : 196. 1828, *excl. specim. cit.*; Clarke in Hook.f., Fl. Brit. India 6 : 627. 1893. *Scirpus atropurpureus* Retz., Obs. Bot. 5 : 14. 1789.

Annual, tufted herbs; up to 15 cm tall. Spikelets deep brown, oblong-ovoid, 3-5 mm long; glumes elliptic, keeled; perianth-bristles 3-7, equalling the nuts. Nuts black, obovoid.

*Fl. & Fr.*: Feb.

Abundant along the edges of ponds.

Kerpe, 15626.

**2. *E. retroflexa*** (Poir.) Urb., Symb. Ant. 165. 1900. *Scirpus retroflexus* Poir. in Lam., Encycl. 6 : 753. 1804. *Eleocharis chaetaria* Roem. & Schult., Syst. Veg. 2 : 154. 1817; Clarke in Hook.f., Fl. Brit. India 6 : 529. 1893.

Annual, tufted herbs, 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.*: Oct.

In wet grassy-fields. Abundant.

Kutru, 16689.

4. FIMBRISTYLIS Vahl

1a. Stigmas 3 :

2a. Leaves dorsoventrally flattened 7. *F. miliacea*

2b. Leaves laterally compressed 6. *F. littoralis*

1b. Stigmas 2 :

3a. Nuts linear with nearly parallel sides 9. *F. tetragona*

3b. Nuts obovoid or sub-orbicular :

4a. Inflorescence with 1-3 spikelets :

5a. Glumes *ca* 1 mm long;  
stamen 1 2. *F. argentea*

5b. Glumes 2.5-3.5 mm long;  
stamens 3 (sometimes 2) 8. *F. schoenoides*

4b. Inflorescence with  
4-many spikelets :

6a. Leaves eligulate 1. *F. aestivalis*

6b. Leaves ligulate :

7a. Glumes puberulous,  
at least in the  
upper part 5. *F. ferruginea*

7b. Glumes glabrous :

8a. Spikelets terete,  
2.5-3 mm broad 4. *F. dichotoma*

8b. Spikelets angular,  
1-1.5 mm broad

3. *F. bisumbellata*

**1. *Fimbristylis aestivalvis* (Retz.) Vahl**, Enum. Pl. 2 : 288. 1806; Clarke in Hook.f., Fl. Brit. India 6 : 637. 1893 *p.p.*; *Scirpus aestivalvis* Retz., Obs. Bot. 4 : 12. 1768.

Annual, tufted herbs, up to 20 cm tall. Culms filiform, angular. Leaves setaceous. Inflorescence compound or decomposed; spikelets 3-6 mm long, pale brown, elliptic-oblong; glumes ovate, mucronulate, keel 3-nerved; stamen 1. Nuts obovate, biconvex.

*Fl. & Fr.*: Feb.

Abundant along the edges of tanks.

Salepalli tank, 15625.

**2. *F. argentea* (Rottb.) Vahl**, Enum. Pl. 2 : 294. 1806; Clarke in Hook.f., Fl. Brit. India 6 : 640. 1893. *Scirpus argenteus* Rottb., Progr. 27. 1772.

Annual, tufted herbs, up to 15 cm tall. Culms filiform, angular. Leaves filiform, shorter than the culm. Spikelets 4-9 mm long, green with brownish tinge, oblong, terete, in terminal, sessile, globose heads; glumes ovate, obtuse, keel 3-nerved. Nuts obovate, biconvex, trabeculate, umbonate, margined.

*Fl. & Fr.*: May.

In river-beds. Abundant.

Indravati river, 16316.

**3. *F. bisumbellata* (Forsk.) Bub.**, Dodec. 30. 1850; *Scirpus bisumbellatus* Forsk., Fl. Aeg.-Arab. 1 : 15. 1775. *Fimbristylis dichotoma*

*auct.*; Clarke in Hook.f., Fl. Brit. India 6 : 635. 1893. *non* Vahl 1806.

Annual, glaucous herbs, up to 20 cm tall. Leaves 1-2 mm broad, linear; ligule a fringe of minute hairs. Inflorescence compound or decomposed; spikelets 4-7 mm long, elliptic-oblong, angular; glumes ovate, mucronulate, keel green, stamen 1. Nuts obovate, biconvex, with 5-9 trabeculate ribs on either sides.

*Fl. & Fr.*: Feb.- May.

In river-beds. Abundant.

Indravati river, 16308.

**4. *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.

Annual or perennial tufted herbs, up to 50 cm tall. Leaves 2-4 mm broad. Inflorescence simple or compound; spikelets 5-10 mm long, brown, ovoid; glumes broadly ovate, mucronulate; stamens 1-3. Nuts obovate, biconvex, 5-10-ribbed on either side, trabeculate, umbonate.

*Fl. & Fr.*: Oct.

In marshy habitats. Abundant.

Madded, 16627; Bijapur.

**5. *F. ferruginea* (L.) Vahl, Enum. Pl. 2 : 291. 1806; Clarke in Hook.f., Fl. Brit. India 6 : 638. 1893. *Scirpus ferrugineus* L., Sp. Pl. 50. 1753.**

Annual herbs, 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.: Oct.*

In marshy places. Rare.

Kutru, 16144.

**6. *Fimbristylis littoralis*** Gaud. in Freyc., Voy. Bot. 413. 1826; Saxena & Khotele in Journ. Bombay Nat. Hist. Soc. 73 : 32. 1976. *F. miliacea* Vahl, Enum. Pl. 2 : 287. 1806, *excl. basion.*; Clarke in Hook.f., Fl. Brit. India 6 : 644. 1893.

'Kondi-buti'

Annual or perennial herbs, up to 60 cm tall. Leaves 2-3 mm broad, equitant. Inflorescence compound or decomposed, lax. Spikelets 3-5 mm long, brown, solitary, sub-cylindric; glumes ovate-oblong, mucicous, 3-nerved; stamens 1-2. Nuts obovoid, verruculose, stipitate.

*Fl. & Fr.: Sept.- Jan.*

Along stream-banks. Sparse.

Bijapur (Saxena & Khotele *l.c.*).

**7. *F. miliacea*** (L.) Vahl, Enum. Pl. 2 : 287. 1806, *quoad. basion.* *Scirpus miliaceus* L., Syst. Veg. 10 : 868. 1759. *Fimbristylis quinqueangularis* Kunth, Enum. 2 : 229. 1837; Clarke in Hook.f., Fl. Brit. India 6 : 644. 1893.

Annual, tufted herbs, up to 60 cm tall. Leaves 2-3 mm broad, shorter or longer than the culm. Inflorescence compound or decomposed, 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.*: Oct.

Abundant in marshy habitats.

Maddur, 16620.

**8. *Fimbristylis schoenoides* (Retz.) Vahl**, Enum. Pl. 2 : 286. 1806; Clarke in Hook.f., Fl. Brit. India 6 : 634. 1893. *Scirpus schoenoides* Retz., Obs. Bot. 5 : 14. 1789.

Annual, tufted herbs, up to 25 cm tall. Leaves narrowly linear, shorter than the culm. Inflorescence simple or reduced to a single spikelet; spikelets up to 1 cm long, brown, ovoid; glumes ovate or sub-orbicular, mucronulate. Nuts suborbicular, biconvex, stipitate.

*Fl. & Fr.*: Oct.

Abundant in water-logged places.

Bijapur, 16679 & 16681; Pharsegarh.

**9. *F. tetragona* R. Br.**, Prodr., 226. 1810; Clarke in Hook.f., Fl. Brit. India 6 : 631. 1893.

Annual or perennial, tufted, leafless herbs, up to 40 cm tall. Spikelets brown, solitary, 5-10 mm long, ovoid-globose, terete, obtuse; glumes broadly ovate, 3-nerved; stamens 1-2. Nuts linear-oblong or sub-cylindric, slightly curved, trabeculate due to the surface-cells arranged in vertical rows.

*Fl. & Fr.*: Oct.

In wet grassy-fields. Abundant.

Bijapur, 16654; Kutru.

#### 5. *FUIRENA* ROITB.

***Fuirena ciliaris* (L.) Roxb.**, Fl. Ind. 1 : 184. 1820. *Scirpus ciliaris* L., Mant. 2 : 182. 1771. *Fuirena glomerata* Lam., Encycl. 1 : 150.

1791; Clarke in Hook.f., Fl. Brit. India 6 : 666, 1893.

Slender, annual herbs, up to 40 cm tall. Leaves 3-6 mm broad, pubescent. Inflorescence of 1-2, terminal or lateral, green clusters; glumes obovate; bristles short; hypogynous scales sub-quadrate, clawed, tridentate at the apex; stamens 3. Nuts elliptic to obovate, trigonous, stipitate.

*Fl. & Fr.*: Oct.

In marshy fields. Abundant.

Kutru, 16685.

#### 6. LIPOCARPHA R. Br.

**Lipocarpa chinensis** (Osb.) Kern in Blumea Suppl. 4 : 167, 1958. *Scirpus chinensis* Osb., Dagb. Ostind. Resa 220, 1757. *Lipocarpa argentea* R. Br. ex Nees in Linnaea 9 : 287, 1835; Clarke in Hook.f., Fl. Brit. India 6 : 667, 1893.

Annual or perennial, tufted herbs, up to 35 cm tall. Leaves 2-4 mm broad, much shorter than the culm. Inflorescence capitate, with 3-7, whitish, 4-8 mm long, oblong-ovoid spikelets; glumes spatulate; hypogynous scales oblong, 5-7-nerved; stamens 1-2. Nuts oblong-obovate, straight or slightly curved.

*Fl. & Fr.*: Oct.

In marshy habitats. Abundant.

Bijapur, 16667; Pharsegarh.

#### 7. RHYNCHOSPORA Vahl

**Rhynchospora longisetis** R. Br., Prodr. 230, 1810; Clarke in Hook.f., Fl. Brit. India 6 : 669, 1893.

Annual, tufted herbs, up to 30 cm tall. Leaves 1-2 mm broad, short. Inflorescence a globose or sub-globose head; spikelets 1-1.5 cm long, linear-lanceolate, acuminate; glumes 6-7, distichous, acute, keeled; bristles 6 in the lower flower, absent in the upper flower; stamens 2. Nuts oblong, compressed, minutely puncticulate, hispidulous or tuberculate especially towards the apex.

*Fl. & Fr.*: Oct.

In marshy fields. Abundant.

Kutru, 16692.

#### 8. SCIRPUS L.

- |                                |                           |
|--------------------------------|---------------------------|
| 1a. Culms transversely-septate | 1. <i>S. articulatus</i>  |
| 1b. Culms not septate :        |                           |
| 2a. Glumes mucronate           | 2. <i>S. lateriflorus</i> |
| 2b. Glumes aristate            | 3. <i>S. squarrosus</i>   |

**1. *Scirpus articulatus* L.**, Sp. Pl. 47. 1753; Clarke in Hook.f., Fl. Brit. India 6 : 656. 1893.

Annual or perennial, tufted herbs, 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 sub-orbicular, appressed, many nerved; stamens 3. Nuts obovoid, trigonous, transversely wavy-wrinkled.

*Fl. & Fr.*: Feb.

Abundant along the edges of ponds.

Kunear, 15593; Kutru.

Plant is grazed by herbivores.

**2. *Scirpus lateriflorus*** Gmel., Syst. Veg. 1 : 127. 1791. *S. supinus* var. *uninoides* Clarke in Hook.f., Fl. Brit. India 6 : 656. 1893.

Tufted, slender, annual herbs, up to 25 cm tall. Leaves reduced to 2-3 sheaths. Inflorescence pseudolateral, with 4-12 spikelets, sometimes capitate; spikelets 5-12 mm long, oblong-ovoid; glumes ovate, keeled; bristles absent; stamens 3. Nuts obovate, trigonous, compressed, transversely wavy-wrinkled.

*Fl. & Fr.*: Most parts of the year.

Along the edges of ponds. Common.

Kutru, 15624.

**3. *S. squarrosus*** L., Mant. 2 : 181. 1771; Clarke in Hook.f., Fl. Brit. India 6 : 663. 1893.

Slender, annual herbs, up to 15 cm tall. Leaves 0.5-1 mm broad, shorter than the culm. Inflorescence capitate or pseudolateral; spikelets 1-4, sessile, green, 4-7 mm long, oblong or globose; glumes obovate-rhomboid; stamens 1-2. Nuts obovate, trigonous, apiculate.

*Fl. & Fr.*: Oct.- May.

Common along river-beds and in wet habitats.

Indravati river, 16322; Bijapur Ghati.

#### 9. *SCLERIA* Berg.

1a. Disk not lobed

1. *S. annularis*

1b. Disk deeply 3-lobed

2. *S. biflora*

**1. *Scleria annularis*** Nees ex Steud., Syn. 2 : 176. 1855 *ex descr.*; Clarke in Hook.f., Fl. Brit. India 6 : 687. 1894.

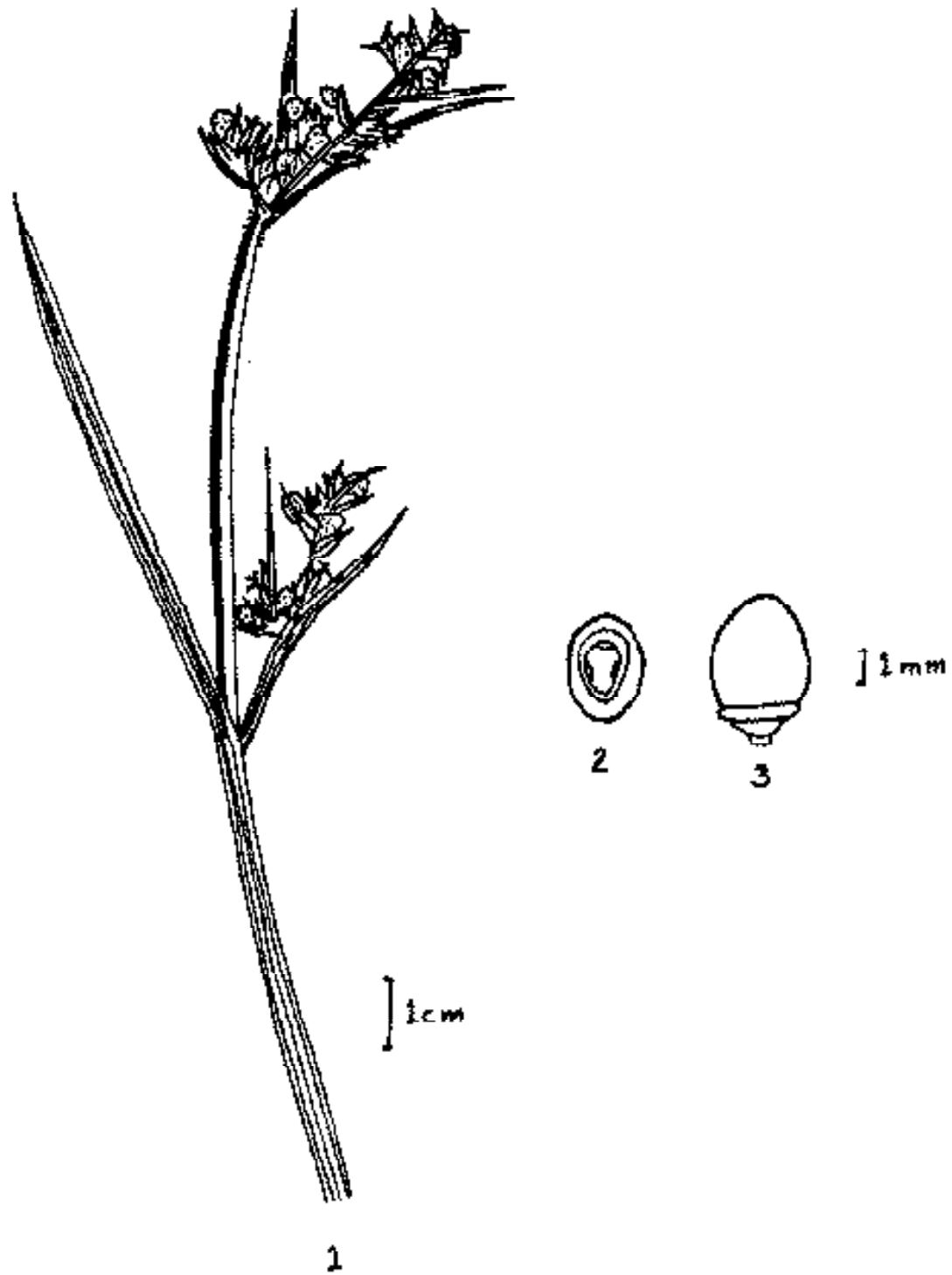


Fig. 18. *Scleria annularis* Nees ex Steud.  
 1. flowering branch; 2. nut, basal view & 3. nut, lateral view.

Annual herbs, up to 1 m tall. Leaves 3-6 mm broad. Spikelets almost sessile, bisexual and male, or male part in the nut bearing ones reduced to a sterile glume; males 3-4 ~~mm~~ long, lanceolate, stamens 2-3; females 4-5 mm long; glumes ovate lanceolate mucronulate, scabrid on the keel. Nuts ovoid, obtusely trigonous, 3-6 ~~mm~~ long.

*Fl. & Fr.*: Oct.

Abundant in paddy fields.

Pharsegarh, 16116.

**2. *Scleria biflora*** Roxb., Fl. Ind. 3 : 573. 1832; Clarke in Hook.f., Fl. Brit. India 6 : 687. 1894.

Annual herbs, up to 30 cm tall. Leaves 4-7 mm broad. Spikelets all unisexual or sometimes male and bisexual; ~~males sessile~~ or on up to 2.5 mm long peducles, linear-lanceolate, *ca* 3 mm long; females *ca* 5 mm long, obovoid; glumes ovate, mucronulate; ~~stamens 2-3~~. Nuts globose or terete, cancellate, beaked.

*Fl. & Fr.*: Oct.

Abundant in marshy fields.

Bijapur Ghati, 16495.

## POACEAE

1a. Plants arborescent

15. DENDROCALAMUS

1b. Plants herbaceous :

2a. Spikelets 1-many flowered, breaking up at maturity above more or less persistent glumes, or if falling entire then not 2-flowered with the lower floret male and barren and the upper hermaphrodite :

- 3a. Spikelets borne in a spike with long, capillary awns 35. PEROTIS
- 3b. Spikelets borne in loose or contracted or spike-like panicles, awns when present not capillary :
- 4a. Spikelets usually with 2 or more fertile florets, or if with 1 floret then with sterile reduced florets above it :
  - 5a. Tall, reed-like grasses with large plumose panicles 36. PHRAGMITES
  - 5b. Low or moderately tall grasses, panicles otherwise :
    - 6a. Rhachis produced into a mucro 14. DACTYLOCTENIUM
    - 6b. Rhachis not produced into a mucro :
      - 7a. Inflorescence paniculate 20. ERAGROSTIS
      - 7b. Inflorescence of digitate or sub-digitate spikes :
        - 8a. Spikelets not secund 19. ELEUSINE
        - 8b. Spikelets secund :
          - 9a. Spikelets with 1 fertile floret only 13. YNODON

- 9b. Spikelets with 1  
fertile and other  
imperfect florets 9. CHLORIS
- 4b. Spikelets with 1 fertile floret, with or  
without 1 or 2 male or empty florets  
below it, the latter often much reduced :
- 10a. Glumes very minute or suppressed 30. ORYZA
- 10b. Glumes well developed :
- 11a. Spikelets 1-flowered :
- 12a. Spikelets unawned 41. SPOROBOLUS
- 12b. Spikelets with trifid awn 3. ARISTIDA
- 11b. Spikelets 2-flowered :
- 13a. Glumes equal in size,  
upper lemma unawned 24. ISACHNE
- 13b. Glumes unequal in size,  
upper lemma awned or  
with a bristle 5. ARUNDINELLA
- 2b. Spikelets 2-flowered, falling entire at  
maturity, with the lower floret male or  
barren and the upper hermaphrodite :
- 14a. Grains enclosed in hard,  
shining, white fruit-case :
- 15a. Fruit-case ovoid to globose, turgid 11. COIX
- 15b. Fruit-case oblong, compressed 8. CHIONACHNE



- 14b. Grains not enclosed in hard,  
shining, white fruit-case :
- 16a. Spikelets solitary or paired, more  
or less similar; glumes usually  
membranous, the lower usually  
smaller or sometimes suppressed;  
upper lemma usually awnless :
- 17a. Spikelets with an involucre  
of bristles :
- 18a. Bristles persistent, upper  
lemma transversely rugose 39. SETARIA
- 18b. Bristles caducous, upper  
lemma smooth 34. PENNISETUM
- 17b. Spikelets without bristles :
- 19a. Spikelets arranged in open  
or cylindric spike-like panicles :
- 20a. Spikelets more or  
less gibbous 38. SACCIOLEPIS
- 20b. Spikelets not gibbous 31. PANICUM
- 19b. Spikelets arranged in  
one-sided spikes or  
spike-like racemes;  
spikes or racemes  
digitate or scattered :
- 21a. Lemma of the upper  
floret thinly cartilagineous  
with flat margins :

- 22a. Spikelets awned 1. ALLOTEROPSIS
- 22b. Spikelets unawned 17. DIGITARIA
- 21b. Lemma of the upper floret more or less crustaceous or coriaceous with narrowly inrolled margins :
- 23a. Lower glume turned towards the rhachis, spikelets adaxial 7. BRACHIARIA
- 23b. Lower glume (when present) turned away from the rhachis, spikelets abaxial :
- 24a. Lower glume absent, spikelets plano-convex 33. PASPALUM
- 24b. Lower glume present :
- 25a. Glumes awnless 32. PASPALIDIUM
- 25b. Glumes awned or acuminate :
- 26a. Leaf-blades ovate-lanceolate; culms creeping or ascending 29. OPLISMENUS
- 26b. Leaf-blades linear; culms erect 18. ECHINOCHLOA
- 16b. Spikelets often paired, with one sessile and other pedicelled, those of each pair similar or more often dissimilar, rarely solitary and all alike; glumes as long as the spikelets and enclosing the florets; upper lemma usually awned :

- 27a. Spikelets arranged in silvery-panicles 23. IMPERATA
- 27b. Spikelets arranged in racemes,  
which are solitary or many; digitate  
or arranged along a very short main  
axis when many :
- 28a. Sessile spikelets sunk in a  
depression or cavity :
- 29a. Sessile spikelets in pairs  
at each node of the axis 27. MNESITHEA
- 29b. Sessile spikelets solitary  
at each node of the axis :
- 30a. Spikelets solitary,  
sessile 28. OPHIUROS
- 30b. Spikelets paired,  
one sessile and the  
other pedicelled 37. ROTTBOELLIA
- 28b. Sessile spikelets not sunk  
in a depression or cavity :
- 31a. Joints of rhachis and  
pedicel of the pedicelled  
spikelets swollen :
- 32a. Sessile spikelets  
spherical 21. HACKELOCHLOA
- 32b. Sessile spikelets  
not spherical :

- 33a. Racemes 1-noded, enclosed  
in a boat-shaped spathe 2. APLUDA
- 33b. Racemes many noded, not  
enclosed in a spathe 25. ISCHAEMUM
- 31b. Joints of rhachis and pedicel not swollen :
- 34a. Spikelets in racemes, uninterrupted  
by spathes; racemes arranged in  
whorled panicles :
- 35a. Spikelets dorsally compressed 40. SORGHUM
- 35b. Spikelets laterally compressed :
- 36a. Lower glume tuberculate 43. VETIVERIA
- 36b. Lower glume smooth 10. CHRYSOPOGON
- 34b. Panicles of racemes interrupted  
by spathes, or the espatheate  
racemes; racemes digitate or in  
pairs or solitary and terminal :
- 37a. Upper lemma of the sessile  
spikelet with a basal awn 4. ARTHRAXON
- 37b. Upper lemma of the sessile  
spikelet awned from the tip  
or from the cleft or upper  
lemma reduced to hyaline  
base of the awn :
- 38a. Margins of the lower glume  
of the sessile spikelets inturred  
and rounded at the sides, keel  
absent or only upwards :

- 39a. Racemes without an involucre 22. *Heteropogon*
- 39b. Racemes involucrate :
- 40a. Involucral spikelets  
pedicellate, caducous 26. *Iseilema*
- 40b. Involucral spikelets  
sessile, not caducous 42. *Themeda*
- 38b. Margin of the lower glume of the sessile  
spikelets sharply infolded, 2-keeled :
- 41a. Racemes in pairs,  
spathaceous 12. **CYMOPOGON**
- 41b. Racemes many  
(rarely solitary),  
espathaceous :
- 42a. Joints and pedicels  
with a translucent  
longitudinal furrow 6. **BOTHRIOCHLOA**
- 42b. Joints and pedicels  
without a translucent  
furrow 16. **DICHANTHIUM**

### 1. **ALLOTEROPSIS Presl**

**Alloteropsis cimicina** (L.) Stapf in Prain, Fl. Trop. Afr. 9 : 487. 1919. *Milium cimicinum* L., Mant. 184. 1771. *Axonopsus cimicinus* (L.) P. Beauv., Ess. Agrost. 12. 1812; Hook.f., Fl. Brit. India 7 : 64. 1896.

**Tufted, erect or decumbent, hairy herbs, up to 40 cm tall. Leaves**

2.5-12 × 0.8-1.5 cm, ovate-lanceolate, base cordate, margin hairy. Racemes 3-10, whorled; spikelets 4-6 mm long; upper glume with purple ciliate margins.

*Fl. & Fr.*: Aug.- Oct.

Along cultivated fields and in forests. Abundant.

Bijapur Ghati, 16644; Pharsegarh; Kutru; Pengunda; Netikakler.

Grazed by herbivores.

## 2. APLUDA L.

*Apluda mutica* L., Sp. Pl. 82. 1753. *A. varia* Hack. in DC., Monogr. Phan. 6 : 196. 1889; Hook.f., Fl. Brit. India 7 : 150. 1896.

Erect herbs, up to 2.5 m tall. Leaves 10-40 cm long. Inflorescence up to 35 cm long, paniculate, leafy; each raceme enclosed within a spatheole; racemes of 1-sessile and 2-pedicelled spikelets.

*Fl. & Fr.*: Aug.- Feb.

Abundant in grasslands and forests.

Bijapur Ghati, 16449; Pharsegarh; Pillure; Kerpe; Netikakler.

Plant is grazed by wild-buffaloes when young.

## 3. ARISTIDA L.

*Aristida setacea* Retz., Obs. Bot. 4 : 22. 1786; Hook.f., Fl. Brit. India 7 : 225. 1896.

Perennial, tufted herbs, up to 70 cm tall. Leaves 15-50 cm long. Panicles contracted, up to 30 cm long; lower glume up to 1.7 cm long,

the upper up to 2 cm long including the awn; lemma with trifid awn; anthers yellow; styles purple.

*Fl. & Fr.*: Oct.- May.

In dry deciduous forests. Abundant.

Itpal, 16236; Bijapur; Dudepalli.

Plant is used for making brooms.

#### 4. ARTHRAXON P. Beauv.

**Arthraxon lancifolius** (Trin.) Hochst. in Flora 39 : 188. 1856.  
*Andropogon lancifolius* Trin. in Mem. Acad. Sci. Petersb. ser. 6. 2 : 271. 1832. *Arthraxon microphyllum* Hook.f., Fl. Brit. India 7 : 147. 1896  
*non* (Trin.) Hochst. 1856.

Annual, filiform herbs, up to 35 cm tall. Leaves up to 3 × 0.8 cm, ovate or elliptic, membranous. Racemes 4-10, silky-silvery, digitate; spikelets 2.5-3 mm long; stamens 2.

*Fl. & Fr.*: Sept.- Oct.

On moist rock-boulders. Abundant.

Bijapur Ghati, 16470; Madded; Pharsegarh; Kutru; Kerpe Valley.

#### 5. ARUNDINELLA Raddi

1a. Perennial, stout herbs; panicles contracted 1. *A. bengalensis*

1b. Annual, slender herbs; panicles effuse 2. *A. pumila*

**1. Arundinella bengalensis** (Spreng.) Druce in Rep. Bot. Exch. Club, Brit. Isles 605. 1916 *Panicum bengalense* Spreng., Syst. Veg. 1 :

311. 1825. *Arundinella wallichii* Nees ex Steud., Syn. Pl. Glum. 1 : 114. 1854; Hook.f., Fl. Brit. India 7 : 75. 1896.

Tufted, stout, perennial herbs; up to 1.5 m tall. Leaves radical, up to 40 × 2 cm, lanceolate, acuminate. Panicles 10-30 cm long, cylindrical; branches up to 4 cm long, stiff, spiciform; glumes hispidulous.

*Fl. & Fr.*: Oct.- Feb.

In the vicinity of forests. Rare.

Kerpe, 15559.

**2. *Arundinella pumila*** (Hochst. ex A. Rich.) Steud., Syn. Pl. Glum. 1 : 114. 1854. *Acratherum pumilum* Hochst. ex A. Rich., Tent. Fl. Abyss. 2 : 414. t.100. 1851. *Arundinella tenella* Steud., l.c. 115; Hook.f., Fl. Brit. India 7 : 71. 1896.

Annual herbs, up to 50 cm tall. Leaves up to 20 × 2 cm, ovate to linear-lanceolate, acuminate, membranous. Panicles up to 20 cm long, effuse, branches capillary; spikelets up to 2 mm long; upper lemma bearing a geniculate awn.

*Fl. & Fr.*: Sept.- Nov.

Common as undergrowth in moist deciduous forests.

Bijapur Ghati 16485; Pharsegarh.

#### 6. *BOTHRIOCHLOA* O. Ktze.

1a. Lower racemes shorter than the rachis      1. *B. intermedia*

1b. Lower racemes longer than the rachis :

2a. Racemes 2-8, up to 5.5 cm long      3. *B. pertusa*

2b. Racemes 10-15, up to 7.5 cm long      2. *B. kuntzeana*



1. **Bothriochloa intermedia** (R. Br.) A. Camus in Ann. Soc. Lyon. n.s. 76 : 164. 1931. *Andropogon intermedius* R. Br., Prodr. 202. 1810; Hook.f., Fl. Brit. India 7 : 175. 1896.

Tufted, perennial herbs, up to 1.5 m tall. Leaves up to 45 × 1 cm, linear, glaucous. Panicles pyramidal-thyriform, primary axis 3-8 cm long; spikelets reddish, ca 4 mm long.

*Fl. & Fr.*: Jan.- Feb.

In grasslands and in the vicinity of forests. Common.

Pillure, 15528; Netikakler; Pasewada.

Plant is grazed by herbivores.

2. **B. kuntzeana** (Hack.) Henr. in Blumea 3 : 456. 1940. *Andropogon kuntzeanus* Hack. in DC., Monogr. Phan. 6 : 478. 1889; Hook.f., Fl. Brit. India 7 : 175. 1896.

Herbs, up to 1 m tall. Leaves up to 25 × 0.7 cm, linear, glaucous. Racemes corymbose, slender, silky, purplish; sessile spikelets ca 5 mm long, lower glume not pitted; lower glume of pedicellate spikelets pitted.

*Fl. & Fr.*: Sept.- Oct.

Abundant in grassy-fields and waste lands.

Bijapur, 16388; Kutru; Eramnar; Karkeli.

3. **B. pertusa** (L.) A. camus in Ann. Soc. Lyon n.s. 76 : 164. 1931. *Holcus pertusus* L., Mant. 2 : 301. 1771. *Andropogon pertusus* (L.) Willd., Sp. Pl. 4 : 922. 1806; Hook.f., Fl. Brit. India 7 : 173. 1896.

Annual or perennial, prostrate or ascending herbs, up to 40 cm tall. Leaves up to 20 × 0.4 cm, linear. Racemes sub-digitate on the rhachis; spikelets green with pinkish tinge; sessile spikelets ca 4 mm long with 1

or 2 pits on the lower glume.

*Fl. & Fr.*: Most parts of the year.

In waste lands and grassy-fields. Common.

Bijapur, 16206; Pillure; Netikakler; Pasewada.

Plant is grazed by herbivores.

#### 7. BRACHIARIA (Trin.) Griseb.

1a. Spikelets 2.5-3 mm long

1. *B. distachya*

1b. Spikelets 1-2 mm long

2. *B. reptans*

**1. *Brachiaria distachya* (L.) Stapf** in Prain, Fl. Trop. Afr. 9 : 565. 1919. *Panicum distachyon* L., Mant. 183. 1771; Hook.f., Fl. Brit. India 7 : 37. 1896.

Annual, slender, ascending herbs, up to 30 cm tall. Leaves up to 12 × 0.6 cm, linear-lanceolate. Racemes 2-4, spreading; spikelets green or pink, widest above the middle, secund on the rachis.

*Fl. & Fr.*: Oct.

Common in fields.

Bijapur, 16673; Bhopalpatnam; Kutru.

**2. *B. 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 ascending herbs, rooting at the lower nodes. Leaves up to 5.5 × 1.2 cm, ovate-lanceolate, base cordate-amplexicaul. Racemes 4-10; spikelets pinkish-green, paired; lower glume truncate.

*Fl. & Fr.*: Sept.- Oct.

In the vicinity of forests. Common.

Bijapur Ghati, 16418; Netikakler; Kandlaparti.

Plant is a good fodder for herbivores.

#### 8. CHIONACHNE R. Br.

**Chionachne koenigii** (Spreng.) Thw., Enum. Pl. Zeyl. 357. 1864. *Coix koenigii* Spreng., Syst. 1 : 239. 1825. *C. barbata* Roxb., Fl. Ind. 3 : 569. 1832. *Polytoca barbata* (Roxb.) Stapf in Hook.f, Fl. Brit. India 7 : 102. 1896.

Tufted herbs, up to 3 m tall. Leaves up to 40 × 2 cm, glabrous or scabrid. Inflorescence of spike-like racemes, enclosed in spathaceous bracts. Racemes up to 4.5 cm long, either male or with a solitary female spikelet at the base. Nuts flat, ellipsoid.

*Fl. & Fr.*: Oct.- Feb.

In grasslands and dry deciduous forests. Common.

Pillure, 15535; Netikakler.

#### 9. CHLORIS Sw.

- |   |                             |
|---|-----------------------------|
| 1a. Spikes 12.5-25 cm long,<br>widely spreading; spikelets<br>dorsally compressed | 1. <i>C. dolichostachya</i> |
| 1b. Spikes 3-10 cm long, ascending;<br>spikelets laterally compressed             | 2. <i>C. virgata</i>        |

1. **Chloris dolichostachya** Lagasca, Gen. et Sp. Pl. 5. 1816. *C. incompleta* Roth, Nov. Pl. Sp. 60. 1821; Hook.f., Fl. Brit. India 7 : 290. 1896.

Erect or decumbent, perennial herbs, up to 1.5 m tall. Leaves 10-25 × 0.4-1 cm, acuminate. Spikes 4-6 in terminal whorls; spikelets 4-6 mm long, narrowly lanceolate.

*Fl. & Fr.*: Feb.

Abundant in the vicinity of forests.

Kandlaparti, 15614; Netikakler.

**2. *Chloris virgata* Sw.**, Fl. Ind. Occ. 1 : 203. 1797; Hook.f., Fl. Brit. India 7 : 291. 1896.

Decumbent, branched herbs; flowering-culms up to 50 cm long. Leaves 2-6 mm broad, acute. Spikes 5-9, ascending; spikelets 3-4 mm long, 2-awned.

*Fl. & Fr.*: Sept.- Oct.

In the vicinity of forests. Common.

Bijapur Ghati, 16137; Bhopalpatnam.

Plant is a good fodder for herbivores.

#### 10. CHRYSOPOGON Trin.

***Chrysopogon fulvus* (Spreng.) Chiov.**, Fl. Somala 1 : 327. 1929. *Pollinia fulva* Spreng., Pugill. 2 : 10. 1815. *Andropogon monticola* Roem. & Schult., Syst. Veg. 2. Mant. 665. 1827; Hook.f., Fl. Brit. India 7 : 192. 1896.

Perennial, tufted herbs, up to 60 cm tall. Leaves up to 30 × 0.4 cm, linear, acute. Spikelets yellowish-brown in 5-12 cm long panicles. Raceme of 1-sessile and 2-pedicellate spikelets; sessile spikelets 5-6 mm long; pedicellate spikelets 4-6 mm long.

*Fl. & Fr.*: Sept.- Oct.

In grasslands and in the vicinity of forests. Common.

Madded, 16619; Pharsegarh; Kutru; Karkeli.

Plant is grazed by herbivores.

### 11. COIX L.

*Coix gigantea* Koen. ex Roxb., Fl. Ind. 3 : 570. 1832.

Erect, perennial herbs, up to 2 m tall. Leaves up to 50 × 3 cm, flat. Racemes many, axillary and terminal; lower spikelets solitary; female enclosed in a hard, polished, nut-like bract through the apex of it male portion of spike protudes; lower glume of male spikelets broadly winged.

*Fl. & Fr.*: Oct.

Abundant in paddy fields and water-logged places during the rainy season.

Pharsegarh, 16107; Kutru.

### 12. CYMBOPOGON Spreng.

*Cymbopogon martinii* (Roxb.) Wats. in Aitkins., Gaz. N. W. Prov. Ind. 392. 1882. *Andropogon martinii* Roxb., Fl. Ind. 1 : 280. 1820. *A. schoenanthus* L., var. *martinii* Hook.f., Fl. Brit. India 7 : 204. 1896.

Tufted, perennial, aromatic herbs, up to 3 m tall. Leaves large, lanceolate, base cordate-amplexicaul. Racemes 1.5-2 cm long, 2 in each spathe forming a pseudo-panicle, up to 30 cm long; lower glume of sessile spikelets with a narrow slit-like groove in the lower half.

*Fl. & Fr.*: Dec.- Feb.

In grasslands. Abundant.

Pillure, 15536.

Plant-oil is fragrant; used in rheumatism.

### 13. CYNODON L. C. Rich.

**Cynodon dactylon** (L.) Pers., Syn. Pl. 1 : 85. 1805; Hook.f., Fl. Brit. India 7 : 288. 1896. *Panicum dactylon* L., Sp. Pl. 58. 1753.

Prostrate, tufted, perennial herbs with erect or ascending flowering culms, up to 25 cm long. Leaves 2-8 × 0.1-0.3 cm, linear-lanceolate. Racemes 2-7 cm long in whorls of 4-6; spikelets green, 1-2.5 mm long.

*Fl. & Fr.*: Most parts of the year.

In grassy-fields and waste places. Common.

Kutru, 16368; Bijapur; Bhopalpatnam.

Plant is an excellent fodder for herbivores.

### 14. DACTYLOCTENIUM Willd.

**Dactyloctenium aegyptium** (L.) Willd., Enum. Pl. Hort. Berol. 1029. 1809. *Cynosurus aegyptius* L., Sp. Pl. 72. 1753. *Eleusine aegyptiaca* (L.) Desf., Fl. Atlant. 1 : 85. 1798; Hook.f., Fl. Brit. India 7 : 295. 1896.

Prostrate or ascending, branched herbs, up to 50 cm tall. Leaves up to 10 × 0.4 cm, linear. Spikes 1-5 cm long, in whorls of 2-7; rachis produced in to a mucro; spikelets 2-4 mm long, upper glume sub-orbicular with a curved awn.

*Fl. & Fr.*: Oct.- Feb.

In waste lands. Abundant.

Bijapur, 16379; Kutru; Karkeli; Pharsegarh.

### 15. DENDROCALAMUS Nees

**Dendrocalamus strictus** (Roxb.) Nees in *Linnaea* 9 : 476. 1834; Gamble in *Hook.f., Fl. Brit. India* 7 : 404. 1896. *Bambos stricta* Roxb., *Pl. Cor.* 1 : 58. t.80. 1795.

'Bans' 'Kati'

Deciduous, tufted trees, up to 15 m tall. Stem-sheaths golden-brown hairy on the back, ciliate-margined. Leaves up to 25 × 3 cm, linear-lanceolate. Spikelets hairy, spinescent, in dense, globose clusters on the branches of a panicle. Seeds ovoid to sub-globose, brown, shining.

*Fl. & Fr.*: Feb.- May.

In dry and moist deciduous forests; sometimes as pure formation. Very common.

Kandlaparti, 16274; Dudepalli; Kerpe; Netikakler.

Young culms consumed as a vegetable; grains eaten like rice.

### 16. DICHANTHIUM Will.

**Dichanthium annulatum** (Forsk.) Stapf in *Prain, Fl. Trop. Afr.* 9 : 178. 1917. *Andropogon annulatus* Forsk., *Fl. Aegypt.- Arab.* 173. 1775; *Hook.f., Fl. Brit. India* 7 : 196. 1896.

Erect or ascending, perennial herbs, up to 50 cm tall. Leaves up to 20 × 0.6 cm, linear. Racemes 2.5-6 cm long, brown, 2-8, sub-digitate on peduncles; sessile and pedicellate spikelets 4-5 mm long.

*Fl. & Fr.*: Sept.- Dec.

In grasslands and waste places. Common.

Bijapur, 16145; Pillure; Pasewada; Netikakler.

Plant is an excellent fodder for herbivores.

### 17. DIGITARIA Heister ex Fabr.

- |     |   |                         |
|-----|---|-------------------------|
| 1a. | Hairs on the spikelets always verrucose                     | 3. <i>D. longiflora</i> |
| 1b. | Hairs on the spikelets when present not verrucose :         |                         |
| 2a. | Spikelets 2-3.5 mm long, binate in the centre of racemes    | 2. <i>D. ciliaris</i>   |
| 2b. | Spikelets 1-1.8 mm long, ternate in the centre of racemes : |                         |
| 3a. | Pedicels glabrous at the apex                               | 1. <i>D. albudens</i>   |
| 3b. | Pedicels hairy at the apex                                  | 4. <i>D. stricta</i>    |

**1. Digitaria albudens** (Roem. & Schult.) Veldk. in Blumea 21 : 53. 1973. *Panicum albudens* Roem. & Schult., Syst. Veg. 2 : 457. 1817. *Paspalum pedicillare* Trin. ex Hook.f., Fl. Brit. India 7 : 19. 1896.

Annual, branched herbs, up to 25 cm tall. Leaves up to 15 × 0.4 cm, linear-lanceolate. Spikes 2-10, 2-7 cm long, racemose, on a slender peduncle; tips of pedicels somewhat thickened; upper glume and lower lemma with clavate hairs.

*Fl. & Fr.*: Oct.

Among rock-crevices in the vicinity of moist deciduous forests. Sparse.



Bijapur Ghati, 16481.

**2. *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.**

Slender, ascending, annual herbs, up to 1 m tall. Leaves up to 13 × 0.8 cm, linear or linear-lanceolate. Spikes 2-10, 5-15 cm long, digitate; spikelets 2.5-4 mm long, glabrous, ciliate or villous, acute. Caryopsis ca 2 mm long.

*Fl. & Fr.*: Sept.- Oct.

Common in waste lands.

Bijapur, 16391; Bijapur Ghati; Kutru; Karkeli.

Plant is grazed by herbivores.

**3. *D. longiflora* (Retz.) Pers., Syn. Pl. 1 : 85. 1805. *Paspalum longiflorum* Retz., Obs. Bot. 4 : 15. 1786; Hook.f., Fl. Brit. India 7 : 17. 1896.**

Annual or perennial, ascending, stoloniferous herbs, up to 30 cm tall. Leaves up to 8 × 0.4 cm, linear-lanceolate. Spikes usually 2, 2-4 cm long, digitate; spikelets ca 1.5 mm long, ternate in the centre of racemes; lower glume a hyaline rim, the upper as long as the spikelet; styles purple.

*Fl. & Fr.*: May.

In river-beds. Sparse.

Indravati river, 16319.

**4. *D. stricta* Roth ex Roem. & Schult., Syst. Veg. 2 : 474. 1817. *Paspalum royleanum* Nees ex Thw., Enum. Pl. Zeyl. 358. 1864; Hook.f.,**

Fl. Brit. India 7 : 18. 1896.

Slender, tufted, perennial herbs, up to 30 cm tall. Leaves up to 20 × 0.5 cm, linear. Spikes 3-12, 4-10 cm long, sub-digitate; spikelets 1-1.5 mm long, clavate hairy; lower glume absent; anthers brown; styles purple. Caryopsis ellipsoid, brown or black.

*Fl. & Fr.: Oct.*

In waste lands and in the vicinity of forests. Common.

Bijapur, 16376; Kutru; Pharsegarh; Netikakler.

#### 18. ECHINOCHLOA P. Beauv.

- |  |                       |
|--|-----------------------|
| 1a. Ligule absent; spikelets unawned                             | 1. <i>E. colona</i>   |
| 1b. Ligule present at least in the lower leaves; spikelets awned | 2. <i>E. stagnina</i> |

**1. Echinochloa colona** (L.) Link, Hort. Berol. 2 : 209. 1833.  
*Panicum colonum* L., Syst. Nat. ed. 10. 2 : 870. 1759; Hook.f., Fl. Brit. India 7 : 32. 1896.

Diffuse, annual herbs, up to 50 cm tall. Leaves up to 14 × 0.7 cm, linear-lanceolate. Spikes 6-15, 1-3 cm long, usually distant on the rachis; spikelets 2-3 mm long; lower lemma and upper glume acute or cuspidate. Caryopsis ca 1.25 mm long, broadly elliptic.

*Fl. & Fr.: Oct.*

Common in waste lands and marshy places.

Bijapur, 16382; Kutru; Karkeli.

Plant is an excellent fodder for herbivores.

**2. Echinochloa stagnina** (Retz.) P. Beauv., Ess. Agrost. 53, 161 & 171. 1812. *Panicum stagninum* Retz., Obs. Bot. 5 : 17. 1789. *P. crusgalli* sensu Hook.f., Fl. Brit. India 7 : 30. 1896.

Annual or perennial herbs, up to 1.25 m tall; rooting at the lower nodes. Leaves up to 40 × 1.3 cm, linear; ligule a fringe of white hairs. Panicles 8-20 cm long, of 3-8 sub-erect, 2.5 cm long racemes; spikelets 5-7.5 mm long, awned. Caryopsis 3-4 mm long.

*Fl. & Fr.*: Oct.

Abundant in paddy fields and water-logged areas.

Bijapur, 16676; Pharsegarh; Kutru.

#### 19. ELEUSINE Gaertn.

**Eleusine indica** (L.) Gaertn., Fruct. 1 : 8. 1788; Hook.f., Fl. Brit. India 7 : 293. 1896. *Cynosurus indicus* L., Sp. Pl. 72. 1753.

Tufted, erect, annual herbs, up to 70 cm tall. Leaves up to 50 × 0.6 cm, linear, distichous. Spikes 2-7 (-10), 4-10 cm long, digitate or sub-digitate; spikelets 3-6-flowered, 2-4.5 mm long. Caryopsis 1-1.5 mm long, reddish-brown, oblong, obtusely trigonous.

*Fl. & Fr.*: Oct.- Feb.

In waste lands and near habitations. Abundant.

Bijapur, 16377; Kutru; Karkeli; Pasewada.

#### 20. ERAGROSTIS N. M. Wolf

1a. Spikelets falling from below upwards :

- 2a. Annuals :
- 3a. Spikelets ovate to ovate-oblong;  
paleas deciduous 9. *E. uniolooides*
- 3b. Spikelets narrowly oblong;  
paleas persistent 2. *E. cilianensis*
- 2b. Perennials :
- 4a. Spikelets 1 mm wide;  
lemmas 1.25 mm long 7. *E. nutans*
- 4b. Spikelets 2-2.5 mm wide;  
lemmas 1.5-2 mm long 1. *E. atrovirens*
- 1b. Spikelets falling from above downwards :
- 5a. Tall, robust, tufted herbs,  
more than 2 m high 6. *E. namaquensis*  
var. *diplachnoides*
- 5b. Plants not as above :
- 6a. Lemmas up to 1 mm long :
- 7a. Keel of the palea  
scabrid or smooth 5. *E. diarrhena*
- 7b. Keel of the palea ciliate 8. *E. tenella*
- 6b. Lemmas 1.25-2.5 mm long :
- 8a. Lemmas obtuse 4. *E. coarctata*
- 8b. Lemmas cuspidate 3. *E. ciliata*

1. *Eragrostis atrovirens* (Desf.) Trin. ex Steud., Nom. Bot. ed.2.  
1 : 562. 1840. *Poa atrovirens* Desf., Fl. Atlant. 1 : 73. t.14. 1798.

Tufted herbs, up to 1.25 m tall. Panicles 5-25 cm long, more or less contracted; spikelets pale green, 3-9 mm long; lemmas elliptic-oblong with acute apex; paleas deciduous. Caryopsis up to 1 mm long, oblong.

*Fl. & Fr.*: Oct.

In the vicinity of dry deciduous forests. Abundant.

Kutru, 16133; Dudepalli.

**2. *E. cilianensis* (All.) Lut.** in *Malpighia* 18 : 386. 1904. *Poa cilianensis* All., *Fl. Pedem.* 2 : 246. 1785. *Eragrostis major* Host, *Gram. Austr.* 4 : 14. t.24. 1809; Stapf in *Hook.f., Fl. Brit. India* 7 : 320. 1896.

Diffuse herbs, up to 75 cm tall. Panicles 5-18 cm long, ovate-oblong; spikelets pinkish-green in colour; lemmas 2-2.5 mm long, ovate or ovate-oblong; paleas persistent. Caryopsis sub-globose.

*Fl. & Fr.*: Oct.

Abundant in waste lands.

Bijapur, 16378; Karkeli; Kutru; Bijapur Ghati; Madded.

**3. *E. ciliata* (Roxb.) Nees,** *Agrost. Bras.* 512. 1829; Stapf in *Hook.f., Fl. Brit. India* 7 : 313. 1896. *Poa ciliata* Roxb., *Fl. Ind.* 1 : 336. 1820.

Erect or ascending, perennial herbs, up to 1.25 m tall. Panicles 4-9 cm long, cylindric, compact; spikelets 2-4 mm long, green with pinkish tinge; glumes, lemmas and paleas ciliate. Caryopsis ovoid-ellipsoid or terete.

*Fl. & Fr.*: Feb.

Along the edges of tanks. Abundant.

Salepalli tank, 15584.

**4. *Eragrostis coarctata*** Stapf in Hook.f., Fl. Brit. India 7 : 313. 1896.

Perennial, tufted herbs, up to 60 cm tall. Panicles 4-13 cm long, spiciform; spikelets 2-4 mm long, pinkish-green; lemmas and keels of paleas ciliate. Caryopsis more or less ovoid.

*Fl. & Fr.*: Feb.

Abundant in dried up stream-beds.

Kutru, 15557; Pharsegarh.

**5. *E. diarrhena*** (Schult.) Steud., Syn. Pl. Glum. 1 : 266. 1854. *Poa diarrhena* Schult., Mant. 2 : 616. 1827. *Eragrostis interrupta* (R. Br.) P. Beauv. var. *diarrhena* (Schult.) Stapf in Hook.f., Fl. Brit. India 7 : 316. 1896. *E. koenigii* Link, Hort. Herol. 2 : 294. 1833. *E. interrupta* var. *koenigii* (Link) Stapf in Hook.f., l.c. 7 : 316. 1896.

Annual or perennial, erect herbs, up to 1 m tall. Panicles 10-35 cm long, linear-oblong, branches solitary; spikelets clustered, 2-3 mm long, 8-14-flowered, greenish-white; lemmas ovate-oblong; paleas linear-oblong. Caryopsis ca 0.5 mm long, reddish-brown, ovoid.

*Fl. & Fr.*: Oct.

Along the edges of ponds. Sparse.

Kutru, 16142.

**6. *Eragrostis namaquensis* Schrad. var. *diplachnoides* (Steud.) Clayton in Kew Bull. 25 : 251. 1971. *E. diplachnoides* Steud, Syn. Pl. Glum. 1 : 268. 1854. *E. interrupta* (R. Br.) P. Beauv. var. *diplachnoides* (Steud.) Stapf in Hook.f., Fl. Brit. India 7 : 316. 1896.**

Stout, branched, tufted herbs, up to 2.5 m tall. Panicles very long, made up of solitary or 2-3 branches in a whorl; branches 5-12.5 cm long; spikelets minute, pinkish-green, 6-12-flowered. Caryopsis ca 0.5 mm long.

*Fl. & Fr.*: Feb.

Abundant along the edges of dried up ponds.

Salepalli, 15583.

An ideal grass for shelter of wild animals.

**7. *E. nutans* (Retz.) Nees ex Steud., Nom. Bot. ed. 2. 563. 1840. *Poa nutans* Retz., Obs. Bot. 4 : 19. 1786. *Eragrostis stenophylla* Stapf in Hook.f., Fl. Brit. India 7 : 318. 1896 *p.p.* non Hochst. 1851.**

Perennial, tufted herbs, up to 50 cm tall. Panicles narrow, up to 12.5 cm long; spikelets green, crowded; lemmas oblong-acute with straight lateral nerves; stamens 3. Caryopsis globose-ellipsoid.

*Fl. & Fr.*: Oct.

In grassy-fields and in the vicinity of forests. Abundant.

Bijapur, 16380; Madded.

**8. *E. tenella* (L.) P. Beauv. ex Roem. & Schult., Syst. Veg. 2 : 576. 1817; Stapf in Hook.f., Fl. Brit. India 7 : 315. 1896. *Poa tenella* L., Sp. Pl. 69. 1753.**

Tufted, slender, erect or ascending, annual herbs, up to 30 cm tall. Panicles effuse, 2-10 cm long; spikelets pinkish-green, 3-9-flowered, 1-2 mm long, ovate; stamens 3. Caryopsis *ca* 0.5 mm long, brown, ovoid or elliptic.

*Fl. & Fr.*: Oct.- May.

In waste lands and grassy-fields. Very common.

Bijapur, 16204; Kutru; Pillure; Salepalli.

Good fodder for herbivores.

**9. *Eragrostis unioloides* (Retz.) Nees ex Steud., Syn. Pl. Glum.** 1 : 264. 1854. *Poa unioloides* Retz., Obs. Bot. 5 : 19. 1789. *Eragrostis amabilis auct. non Poa amabilis* L. 1753; Stapf in Hook.f., Fl. Brit. India 7 : 317. 1896.

Erect or ascending, annual herbs, up to 30 cm tall. Panicles 5-15 cm long, ovate or oblong; spikelets 3-8 mm long, green with pinkish tinge; lemmas *ca* 2 mm long, ovate or ovate-elliptic; stamens 3. Caryopsis compressed, obovoid or ellipsoid.

*Fl. & Fr.*: Oct.- Feb.

Abundant in stream-beds.

Kutru, 15543.

## 21. HACKELOCHLOA O. Ktze.

**Hackelochloa granularis** (L.) O. Ktze., Rev. Gen. Pl. 2 : 776. 1891. *Cenchrus granularis* L., Mant. 2 : 575. 1771. *Manisuris granularis* L.f., Nov. Gram. Gen. 40. 1779; Hook.f., Fl. Brit. India 7 : 159. 1896.



Annual, hairy herbs, up to 30 cm tall. Leaves up to 20 × 0.8 cm, linear-lanceolate. Racemes 0.5-2.5 cm long, solitary or fascicled, axillary; sessile spikelets 1-1.5 mm long, globose, pitted, arranged like small beads on the rachis. Caryopsis ovoid.

*Fl. & Fr.*: Oct.

Common as forest-undergrowth.

Bijapur Ghati, 16426; Pharsegarh.

Plant is a good fodder for herbivores.

## 22. HETEROPOGON Pers.

**Heteropogon contortus** (L.) P. Beauv. ex Roem. & Schult., *Syst. Veg.* 2 : 836. 1817. *Andropogon contortus* L., *Sp. Pl.* 1045. 1753; Hook.f., *Fl. Brit. India* 7 : 199. 1896.

Tufted, perennial herbs, up to 2 m tall. Leaves 10-30 cm long, linear, rigid. Racemes 4-10 cm long; spikelets closely imbricating, 6-7 mm long; lower 2-8 sessile spikelets awnless, upper sessile spikelets with long, spirally twisted awns. Caryopsis 1.5-2 mm long, hairy.

*Fl. & Fr.*: Oct.

In grasslands and in the vicinity of forests. Common.

Maddur, 16621; Pillure; Netikakler.

Young plant is grazed by herbivores.

## 23. IMPERATA Cyr.

**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.

Erect, stiff, perennial herbs, up to 60 cm tall; roots stoloniferous. Leaves 10-35 cm long, linear. Panicles 6-17 cm long, silvery-white, spiciform; spikelets 3-4 mm long, lanceolate; stamens 2. Caryopsis 1-1.5 mm long, oblong.

*Fl. & Fr.*: Oct.- Feb.

Common along forest-roads.

Pillure, 15628; Bhopalpatnam.

#### 24. ISACHNE R. Br.

**Isachne globosa** (Thunb.) O. Ktze., Rev. Gen. Pl. 2 : 778. 1891. *Milium globosum* Thunb., Fl. Jap. 49. 1784. *Isachne australis* R. Br., Prodr. 196. 1810; Hook.f., Fl. Brit. India 7 : 24. 1896.

Ascending, tufted, perennial herbs, up to 50 cm tall. Leaves 3-10 cm long, lanceolate or linear-lanceolate. Panicles 4-12 cm long, lax, ovoid or pyramidal; spikelets *ca* 2 mm in diam., globose, green or purple. Caryopsis *ca* 1 mm long, pink.

*Fl. & Fr.*: Oct.

In water-logged places. Abundant.

Bijapur, 16670; Kutru; Karkeli.

#### 25. ISCHAEMUM L.

- 1a. Margins of lower glume of sessile spikelets inturred from the base to the apex

3. *I. rugosum*

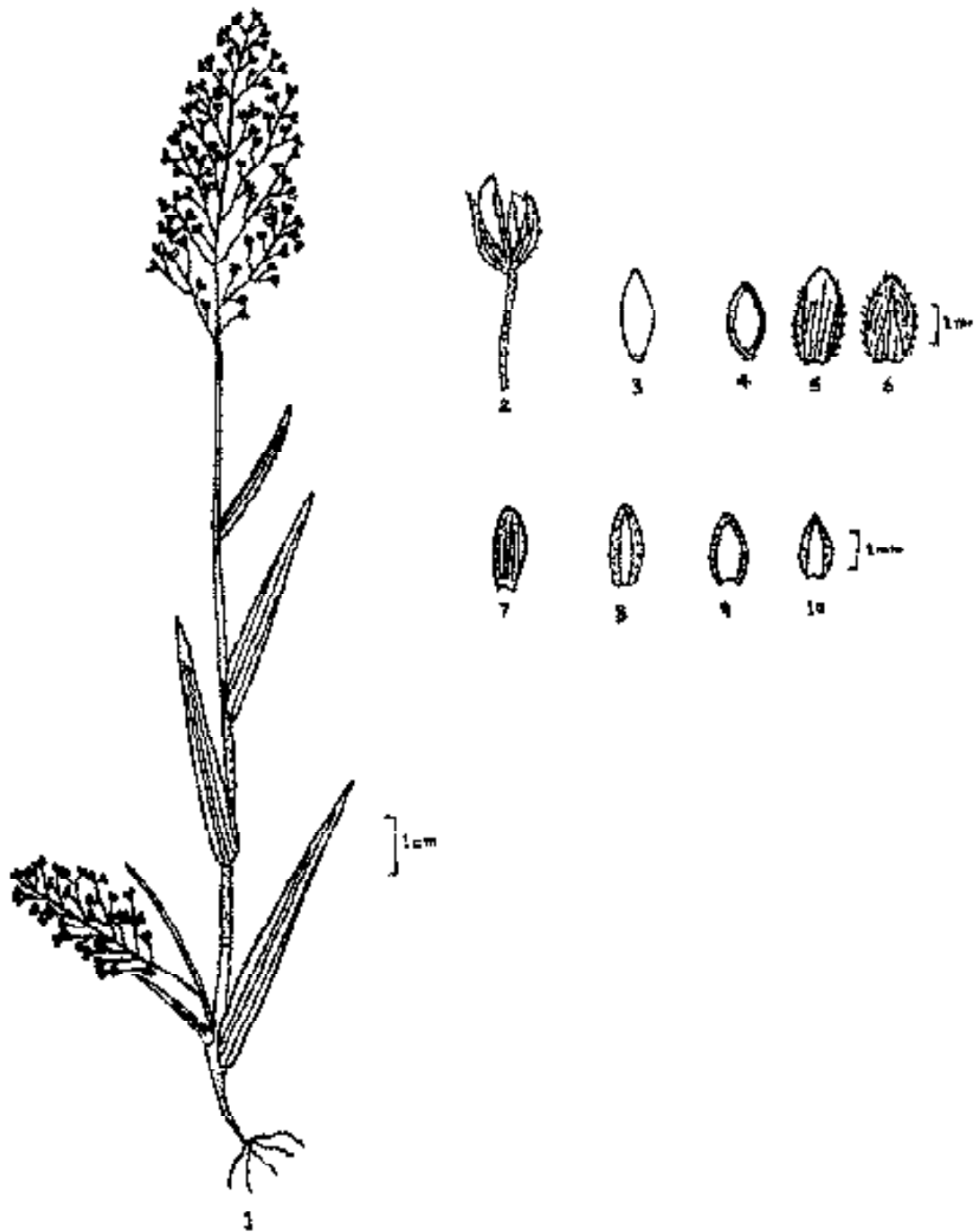


Fig. 19. *Isachne globosa* (Thunb.) O. Ktze.

1. habit; 2. spikelet; 3. lower floret; 4. upper floret; 5. lower glume;  
 6. upper glume; 7. lower lemma of lower floret; 8. lower palea of lower floret;  
 9. upper lemma of upper floret & 10. upper palea of lower floret.

- 1b. Margins of lower glume of sessile spikelets expanded below the middle :
- 2a. Leaves glabrous or puberulous 1. *I. indicum*  
var. *indicum*
- 2b. Leaves densely appressed-pubescent 2. *I. indicum*  
var. *indicum*  
subvar. *malcophyllum*

**1. *Ischaemum indicum*** (Houtt.) Merr. in Journ. Arn. Arb. 19 : 320. 1938. var. **indicum**. *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.

Erect or ascending herbs, rooting at the lower nodes, up to 40 cm tall. Leaves 4-12 cm long, linear or linear-lanceolate, glabrous or puberulous. Spikes usually 2, 2-5 cm long, rachis fragile; lower glume of sessile spikelets winged in the upper half.

*Fl. & Fr.*: Oct.

In marshy-fields. Abundant.

Bijapur, 16675; Kutru.

**2. *I. indicum* var. *indicum* subvar. *malcophyllum*** (Hochst. ex Steud.) Bor, Grass. Burm. Ceyl. Ind. & Pak. 180. 1960. *Andropogon malcophyllus* Hochst. ex Steud., Syn. Pl. Glum. 1 : 372. 1854.

Densely, appressed-hairy herbs. Abundant.

*Fl. & Fr.*: Feb.

In grasslands. Abundant.

Pillure, 15532.

Plant is grazed by herbivores.

**3. *Ischaemum rugosum*** Salisb., Icon. Stirp. Rar. 1. t.1. 1791; Hook.f., Fl. Brit. India 7 : 127. 1896.

Annual, erect herbs, up to 60 cm tall. Leaves 7-20 cm long, linear-lanceolate. Spikes often 2, 3-7.5 cm long, erect, light yellow; spikelets up to 6 mm long, lower glume of sessile spikelets chartaceous with 3-6 deep ridges in the lower two-third part.

*Fl. & Fr.*: Jan.- Apr.

In cultivated fields. Not common.

Indravati Tiger Reserve, Pandey 88 (specimen deposited in the herbarium of the Indravati Tiger Reserve at Bijapur).

#### 26. *ISEILEMA* Anderss.

- |  |                             |
|--|-----------------------------|
| 1a. Pedicels of involucrel spikelets as broad as long        | 1. <i>I. anthephoroides</i> |
| 1b. Pedicels of involucrel spikelets longer than broad :     |                             |
| 2a. Hermaphrodite spikelets as long as involucrel spikelets  | 3. <i>I. prostratum</i>     |
| 2b. Hermaphrodite spikelets longer than involucrel spikelets | 2. <i>I. laxum</i>          |

**1. *Iseilema anthephoroides*** Hack. in DC., Monogr. Phan. 6 : 683. 1889; Hook.f., Fl. Brit. India 7 : 219. 1896.

Perennial herbs, up to 1.5 m tall. Leaves 5-20 cm long, linear. Branches of panicle enclosed in spatheoles; involucre spikelets 4.5-6.5 mm long, ciliate on the margins; lower glume of the hermaphrodite spikelets convexly humped, ciliate at the margins.

*Fl. & Fr.*: Feb.

In grasslands. Abundant.

Pillure, 15531.

Very good fodder grass for herbivores.

**2. *Iseilema laxum* R.** Br., Prodr. 205. 1810; Hook.f., Fl. Brit. India 7 : 218. 1896.

Perennial herbs, up to 1.25 m tall; rootstock hard. Leaves 5-15 cm long, linear. Panicles very long; spathes 0.6-1.5 cm long; involucre spikelets *ca* 4 mm long; hermaphrodite spikelets 4-6 mm long. Caryopsis *ca* 3.5 mm long, oblong.

*Fl. & Fr.*: Oct.- Feb.

In grasslands and in the vicinity of forests. Common.

Pillure, 16119; Pharsegarh; Dudepalli.

An excellent fodder for herbivores.

**3. *Iseilema prostratum* (L.) Anderss.** in Nov. Act. Rep. Soc. Sci. Upsal. ser.3. 2 : 251. 1856. *Andropogon prostratus* L., Mant. 2 : 304. 1771. *Iseilema wightii* Anderss., l.c. ser.3. 2 : 251. 1856; Hook.f., Fl. Brit. India 7 : 218. 1896.

Prostrate or ascending, slender, perennial herbs; culms up to 1.5 m

tall. Leaves 10-20 cm long, linear. Panicles large : spatheoles tuberculate; involucrel and hermaphrodite spikelets 3.5-4.5 mm long; nodes bearded. Caryopsis ca 2 mm long.

*Fl. & Fr.*: Oct.- Dec.

In the vicinity of forests and grasslands. Common.

Pharsegarh, 16114; Pillure.

Plant is grazed by herbivores.

## 27. MNESITHEA Kunth

**Mnesithea laevis** (Retz.) Kunth, Rev. Gram. 1 : 154. 1829. *Rottboellia laevis* Retz., Obs. Bot. 3 : 11. 1783. *R. perfoliata* Roxb., Pl. Corom. 2 : 43. t.182. 1798; Hook.f., Fl. Brit. India 7 : 158. 1896.

Simple or branched herbs, up to 1 m tall. Leaves up to 50 × 0.4 cm, linear. Spikes green, 3-10 cm long; pedicellate spikelets suppressed; sessile spikelets 3-4 mm long, lower glume oblique.

*Fl. & Fr.*: Oct.

In grasslands and in the vicinity of forests. Abundant.

Bijapur, 16660B; Pillure.

## 28. OPHIUROS Gaertn.f.

**Ophiuros exaltatus** (L.) O. Ktze., Rev. Gen. Pl. 2 : 780. 1891. *Aegilops exaltatus* L., Mant. 2 : 575. 1771. *Rottboellia corymbosa* L.f., Suppl. 114. 1781. *Ophiuros corymbosus* (L.f.) Gaertn.f., Fruct. 3 : 4. t.181. 1805; Hook.f., Fl. Brit. India 7 : 160. 1896.

Perennial herbs, up to 1.5 m tall; culms erect from a tuberous base. Leaves up to 50 × 1.5 cm, linear-lanceolate. Spikes 5-12 cm long, corymbosely fascicled; spikelets *ca* 3 mm long; lower glume cartilaginous with longitudinal row of pits on the back. Caryopsis oblong.

*Fl. & Fr.*: Sept.- Oct.

In the vicinity of forests. Sparse.

Bijapur, 16660A.

#### 29. OPLISMENUS P. Beauv.

- |                                |                         |
|--------------------------------|-------------------------|
| 1a. Awns capillary, barbellate | 1. <i>O. burmannii</i>  |
| 1b. Awns stiff, smooth         | 2. <i>O. compositus</i> |

**1. *Oplismenus burmannii* (Retz.) P. Beauv.**, Ess. Agrost. 54, 168, 169. 1812; Hook.f., Fl. Brit. India 7 : 68. 1896. *Panicum burmannii* Retz., Obs. Bot. 3 : 10. 1783.

Prostrate or ascending, branched herbs, rooting at the lower nodes. Leaves up to 4 × 1 cm, ovate-lanceolate. Inflorescence 2-5 cm long, paniculate; spikelets 2-2.5 mm long, green. Caryopsis 2-2.5 mm long.

*Fl. & Fr.*: Oct.

In moist, shaded places. Abundant.

Bijapur Ghati, 16413; Pharsegarh; Madded; Kerpe; Kutru.

**2. *O. compositus* (L.) P. Beauv.**, Ess. Agrost. 54, 168, 169. 1812; Hook.f., Fl. Brit. India 7 : 66. 1896. *Panicum compositum* L., Sp. Pl. 57. 1753.



Ascending, branched herbs, up to 1 m tall, rooting at the lower nodes. Leaves up to 12 × 2 cm, ovate or ovate-lanceolate. Inflorescence 8-20 cm long; racemes 3-10 cm long, distant on the rhachis; spikelets 3-3.5 mm long, lanceolate-ellipsoid, in distant pairs. Caryopsis *ca* 3 mm long.

*Fl. & Fr.*: Oct.

In dry and moist deciduous forests. Sparse.

Bijapur Ghati, 16444; Kerpe.

### 30. ORYZA L.

**Oryza rufipogon** Griff., Notul. 3 : 5. 1851.

'Doosa'

Annual herbs, up to 1.25 m tall. Leaves up to 25 × 1 cm, flat, margin scabrid; ligule of the lower leaves 1-1.5 cm long. Panicles 7-13 cm long, dense; spikelets 7-9 mm long, oblong, flat, caducous, green with 4-9 cm long reddish awns. Caryopsis 4-5 mm long, oblong.

*Fl. & Fr.*: Sept.- Oct.

Grows abundantly in marshy and water-logged places during the rainy season.

Madded, 16612; Kutru; Pharsegarh; Dudepalli; Bhopalpatnam; Pasewada; Pengunda.

Grains are cooked especially during fast by local people.

*Oryza sativa* L. is cultivated in most parts of the Reserve for its grains.

### 31. PANICUM L.

1a. Lower glume cuspidate-acuminate

1. *P. curviflorum*

- 1b. Lower glume not cuspidate-acuminate :
- 2a. Spikelets narrowly lanceolate;  
culms floating 3. *P. paludosum*
- 2b. Spikelets ovate-oblong or  
elliptic; terrestrial :
- 3a. Lower glume about three-fourth  
the length of the spikelet 2. *P. notatum*
- 3b. Lower glume less than half  
the length of the spikelet 4. *P. sumatrense*

**1. *Panicum curviflorum*** Hornem., Bot. Hafn. Suppl. 116. 1819;  
*P. trypheron* Schult., Mant. 2 : 244. 1824; Hook.f., Fl. Brit. India 7 : 47.  
1896.

Tufted, annual herbs, up to 30 cm tall. Leaves up to 20 × 0.5 cm, linear. Panicles 6-20 cm long, effuse; spikelets green or purple, 3-4 mm long, elliptic-oblong; lower glume cuspidate-acuminate. Caryopsis ca 2.5 mm long.

*Fl. & Fr.*: Oct.

Common in wet grassy-fields.

Bijapur, 16394 & 16663; Kutru.

**2. *P. notatum*** Retz., Obs. Bot. 4 : 18. 1786. *P. montanum* Roxb.,  
Fl. Ind. 1 : 315. 1820; Hook.f., Fl. Brit. India 7 : 53. 1896.

Perennial herbs, up to 2.5 m tall. Leaves up to 16 × 2.5 cm, linear-oblong. Panicles 12-20 cm long, lax; spikelets 2-2.5 mm long, ellipsoid; lower glume ovate, 3-5-nerved; lower floret epaleate. Caryopsis

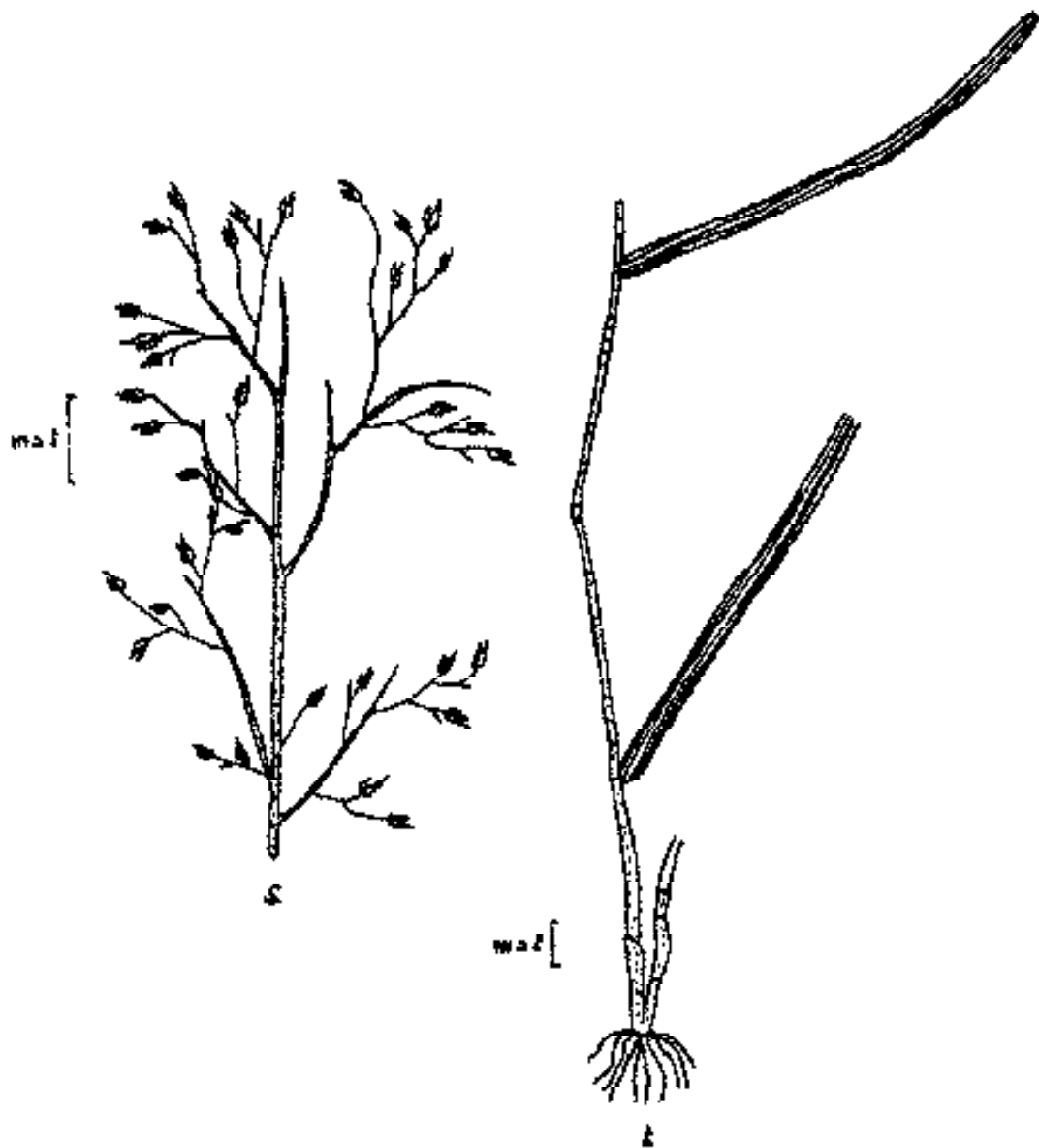


Fig. 20. *Panicum curviflorum* Hornem.  
1. basal part of the plant & 2. inflorescence.

*ca* 2 mm long.

*Fl. & Fr.*: Oct.

In moist deciduous forests. Sparse.

Bijapur Ghati, 16453.

**3. *Panicum paludosum* Roxb.**, Fl. Ind. 1 : 310. 1820. *P. proliferum* Hook.f., Fl. Brit. India 7 : 50. 1896. *non* Lam. 1797.

Floating, perennial herbs; culms spongy, rooting at the lower nodes. Leaves up to 20 × 1.5 cm, linear or ensiform. Panicles 8-20 cm long, lower branches whorled and fascicled; spikelets green, 3-4 mm long, lanceolate; lower glume orbicular. Caryopsis *ca* 2.5 mm long.

*Fl. & Fr.*: Oct.

Abundant in ponds.

Kutru, 16139.

**4. *P. sumatrense* Roth ex Roem. & Schult.**, Syst. Veg. 2 : 434. 1817. *P. psilopodium* Trin., Diss. Alt. 217. 1826; Hook.f., Fl. Brit. India 7 : 46. 1896. *P. psilopodium* Trin. var. *coloratum* Hook.f., Fl. Brit. India 7 : 47. 1896.

Slender, tufted, annual herbs, up to 60 cm tall. Leaves up to 20 × 0.9 cm, linear. Panicles 5-18 cm long, effuse; spikelets 2-3.5 mm long, green or purple, turgid, lower glume ovate with truncate to acute apex; spikelets deciduous. Caryopsis *ca* 2 mm long.

*Fl. & Fr.*: Oct.

In waste lands and grassy-fields. Abundant.

Bijapur, 16381; Kutru, 16157.

*Panicum miliaceum* L. is cultivated in some places for the grains.

### 32. PASPALIDIUM Stapf

- 1a. Spikes shorter than the internodes;  
upper lemma granular 1. *P. flavidum*
- 1b. Spikes longer than the internodes;  
upper lemma rugulose 2. *P. punctatum*

**1. *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 herbs, up to 30 cm tall, decumbent at the base. Leaves up to 10 × 0.6 cm, linear-lanceolate. Spikes 0.5-2.5 cm long, distant on the rachis; spikelets green, 2-3 mm long, ovoid; lower glume sub-orbicular or orbicular. Caryopsis ca 1.5 mm long.

*Fl. & Fr.*: Oct.- Feb.

Common in waste lands and grassy-fields.

Bijapur, 16652.

Plant is grazed by herbivores.

**2. *P. punctatum* (Burm.f.) A. Camus** in Lecomte, Fl. Gen. Indo-Chine 7 : 419. 1922. *Panicum punctatum* Burm.f., Fl. Ind. 26. 1768; Hook.f., Fl. Brit. India 7 : 29. 1896.

Perennial herbs, up to 1.25 m tall; culms spongy at the base. Leaves

up to 18 × 0.8 cm, linear. Spikes 1-2.5 cm long, several, distant, appressed to the rachis; spikelets green, 1.5-3 mm long, ovate-oblong; lower glume *ca* 1 mm long, orbicular. Caryopsis orbicular.

*Fl. & Fr.*: Oct.

In marshy places. Sparse.

Bijapur, 16668.

Plant is grazed by herbivores.

### 33. PASPALUM L.

**Paspalum scrobiculatum** L., Mant. 1 : 29. 1767; Hook.f., Fl. Brit. India 7 : 10. 1896.

Tufted, erect, annual herbs, up to 50 cm tall. Leaves up to 30 × 0.8 cm, acuminate. Spikes 2.5-8 cm long, 2-8, digitate or scattered along the rachis; spikelets greenish-white, arranged in 2-rows, orbicular, *ca* 2.5 mm across; lower glume absent; lower lemma 7-nerved.

*Fl. & Fr.*: Oct.

In marshy habitats. Abundant.

Maddur, 16618; Kutru; Pharsegarh; Karkeli.

Plant is cultivated in some areas for its edible grains.

### 34. PENNISETUM L.C. Rich. ex Pers.

**Pennisetum pedicellatum** Trin. in Mem. Acad. Sci. Petrsb. ser. 6. 3 : 184. 1834; Hook.f., Fl. Brit. India 7 : 86. 1896.

Annual herbs, up to 1.5 m tall. Leaves up to 23 × 1 cm, flat. Spikes 6-12 cm long, densely flowered; spikelets greenish-white, 4-6 mm long, solitary or in groups of 2-5; bristles purple, villous below the middle. Caryopsis oblong.

*Fl. & Fr.*: Oct.

In the vicinity of forests. Sparse.

Bijapur Ghati, 16475.

Grazed by herbivores.

### 35. PEROTIS W. Aiton

**Perotis indica** (L.) O. Ktze., Rev. Gen. Pl. 2 : 787. 1891. *Anthoxanthum indicum* L., Sp. Pl. 28. 1753. *Perotis latifolia* W. Aiton, Hort. Kew. 1 : 85. 1789; Hook.f., Fl. Brit. India 7 : 98. 1896.

Ascending, perennial herbs, up to 40 cm tall, rooting at the lower nodes. Leaves up to 6 × 1 cm, ovate-lanceolate, base amplexicaul. Spikes 4-20 cm long, slender; spikelets 2-3 mm long, linear, greenish-white; glumes long, purple-awned. Caryopsis ca 1.5 mm long, cylindrical.

*Fl. & Fr.*: Oct.

In the vicinity of forests. Abundant.

Pharsegarh, 16113; Netikakler.

### 36. PHRAGMITES Adans.

**Phragmites 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.

Perennial herbs; rhizome creeping; culms up to 3 m tall. Leaves up to 40 × 3.5 cm, linear. Panicles 15-50 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. Caryopsis sub-cylindric.

*Fl. & Fr.*: Oct.- Feb.

Abundant along the banks of streams.

Pharsegarh, 15581.

### 37. ROTTBOELLIA L.f.

**Rottboellia cochinchinensis** (Lour.) Clayton in Kew Bull. 35 : 817. 1981. *Stegosia cochinchinensis* Lour., Fl. Cochin. 1 : 51. 1790. *Rottboellia exaltata* L.f., Suppl. 114. 1781; Hook.f., Fl. Brit. India 7 : 156. 1896.

Annual, erect herbs, up to 2.5 m tall. Leaves up to 50 × 2 cm, linear-lanceolate. Racemes green, fragile, 6-15 cm long with reduced spikelets in terminal slender part; sessile spikelets 4-5 mm long, ovate-oblong, 2-flowered; pedicellate spikelets 1-2-flowered, more or less sterile. Caryopsis broadly oblong.

*Fl. & Fr.*: Oct.

Common in forest-undergrowth.

Bijapur Ghati, 16473; Kerpe Valley.

Plant is grazed by wild-buffaloes.

### 38. SACCIOLEPIS Nash

- 1a. Spikelets 2-3.5 mm long,  
in continuous pseudospikes

1. *S. indica*



- 1b. Spikelets 4-5 mm long, in  
interrupted fascicles

2. *S. interrupta*

**1. *Sacciolepis indica* (L.) A. Chase** in Proc. Biol. Soc. Wash. 21 : 8. 1908. *Aira indica* L., Sp. Pl. 1753 in 'Errata'. *Panicum indicum* L., Mant. 2 : 184. 1771 *non* Mill. 1768; Hook.f., Fl. Brit. India 7 : 41. 1896.

Annual herbs, up to 35 cm tall. Leaves linear. Inflorescence a spiciform, dense, cylindrical panicle, 2-6 cm long, green; spikelets ovate-lanceolate, acuminate, straight or curved, sometimes hispid; lower glume half of the length of the spikelets.

*Fl. & Fr.*: Oct.

In wet grassy-fields. Abundant.

Bijapur, 16492; Kutru.

**2. *S. interrupta* (Willd.) Stapf** in Prain, Fl. Trop. Afr. 9 : 757. 1920. *Panicum interruptum* Willd., Sp. Pl. 1 : 341. 1798; Hook.f., Fl. Brit. India 7 : 40. 1896.

'*Hathilid*'

Stout herbs, up to 75 cm tall; culms spongy at the base. Leaves up to 40 cm long, flat. Panicles 8-20 cm, narrow, spike-like, frequently interrupted; spikelets green, ellipsoid, spreading, smooth or hispidulous; lower glume less than half the length of the spikelets. Caryopsis obovoid, apiculate.

*Fl. & Fr.*: Feb.

In marshy places. Sparse.

Kutru, 15505; Bijapur; Bhopalpatnam.

Plant is grazed by herbivores.

39. *SETARIA* P. Beauv.

- |  |                           |
|--|---------------------------|
| 1a. Inflorescence a cylindric<br>spike-like raceme | 2. <i>S. pumila</i>       |
| 1b. Inflorescence a pyramidal panicle :            |                           |
| 2a. Bristles antrorsely barbed                     | 1. <i>S. intermedia</i>   |
| 2b. Bristles retrorsely barbed                     | 3. <i>S. verticillata</i> |

1. *Setaria intermedia* Roem. & Schult., Syst. Veg. 2 : 489. 1817;  
Hook. f., Fl. Brit. India 7 : 79. 1896.

Erect or ascending, annual herbs, up to 60 cm tall. Leaves up to 20 × 1.5 cm, linear-lanceolate. Panicles 5-15 cm long; spikelets *ca* 2 mm long, green, ellipsoid; upper lemma rugose; bristles up to 8 mm long, 3-6 in an involucl. Caryopsis *ca* 1.5 mm long.

*Fl. & Fr.*: Oct.

Common in waste lands.

Bijapur, 16648; Kutru; Pengunda.

2. *S. pumila* (Poir.) Roem. & Schult., Syst. Veg. 2 : 891. 1817.  
*Panicum pumilum* Poir. in Lam. Encycl. 4 : 273. 1816. *Setaria glauca*  
*auct. non* (L.) P. Beauv.; Hook. f., Fl. Brit. India 7 : 78. 1896.

Simple or branched, annual herbs, up to 35 cm tall. Leaves up to 20 × 0.9 cm, linear. Panicle a spiciform raceme, 2-7.5 cm long; spikelets 2-2.5 mm long, green, ellipsoid; upper lemma rugose; bristles 6-12 in involucl, up to 1 cm long, antrorsely barbed, brown. Caryopsis *ca* 2 mm long.

*Fl. & Fr.*: Oct.

In waste lands and grassy-fields. Abundant.

Bijapur, 16383; Kutru; Pasewada.

**3. *Setaria verticillata* (L.) P. Beauv.**, Ess. Agrost. 51, 178. 1812; Hook.f., Fl. Brit. India 7 : 80. 1896. *Panicum verticillata* L., Sp. Pl. ed.2. 1 : 82. 1762.

Tufted, erect, annual herbs, up to 75 cm tall. Leaves up to 20 × 1.3 cm, linear-lanceolate. Panicles 4-13 cm long, narrow, slightly lobed; spikelets *ca* 2 mm long, green, ellipsoid; upper lemma rugulose; bristles 3-7 mm long, 1(-3) in each involucre. Caryopsis *ca* 1.5 mm long, finely rugose.

*Fl. & Fr.*: Feb.

In waste lands. Abundant.

Pasewada, 15627.

#### 40. SORGHUM Moench

***Sorghum halepense* (L.) Pers.**, Syn. Pl. 1 : 101. 1805. *Holcus halepensis* L., Sp. Pl. 1047. 1753. *Andropogon halepensis* Brot., Fl. Lusit. 1 : 89. 1804; Hook.f., Fl. Brit. India 7 : 182. 1896.

Perennial herbs, up to 3 m tall; rhizome creeping. Leaves up to 40 × 3 cm, linear-lanceolate. Panicles 15-40 cm long, pyramidal, effuse; spikelets purple or deep brown; sessile spikelets 4.5-5.5 cm long, elliptic, glumes coriaceous; pedicellate spikelets linear-lanceolate. Caryopsis *ca* 1.5 mm long.

*Fl. & Fr.*: Feb.

Along the banks of streams. Abundant.

Kandlaparti, 15613.

#### 41. SPOROBOLUS R. Br.

**Sporobolous diander** (Retz.) P. Beauv., *Ess. Agrost.* 26, 147, 148. 1812; Hook.f., *Fl. Brit. India* 7 : 247. 1896. *Agrostis diandra* Retz., *Obs. Bot.* 5 : 19. 1789.

Tufted, perennial herbs, up to 75 cm tall. Leaves up to 18 × 0.15 cm, flat or convolute. Panicles 6-20 cm long, effuse; spikelets *ca* 1.5 mm long, pale green, lanceolate; lower glume truncate, upper acute; stamens 2. Caryopsis *ca* 0.7 mm long, obovoid, truncate.

*Fl. & Fr.*: Oct.

In waste lands and in the vicinity of forests. Abundant.

Karkeli, 16134; Bijapur Ghati; Kutru; Dudepalli.

#### 42. THEMEDA Forsk.

1a. Panicles lax, leafy

1. *T. laxa*

1b. Panicles congested, not leafy

2. *T. quadrivalvis*

**1. Themeda laxa** (Anderss.) A. Camus in *Bull. Mus. Hist. Nat. Paris* 26 : 423. 1920. *Anthistiria laxa* Anderss., *Nov. Act. Sci. Upsal. ser.3.* 2 : 243. 1856; Hook.f., *Fl. Brit. India* 7 : 213. 1896.

Profusely branched, perennial herbs, up to 2 m tall. Culms leafy; leaves long, narrow. Spikelets in lax, leafy-panicles; spikelets 3.5-4 mm

long, heteromorphous, awns up to 4 cm long, brown; glumes with long, tubercle-based hairs, especially in the upper part.

*Fl. & Fr.*: Oct.

Along the borders of cultivated fields and in grasslands. Common.

Chinger, 16104; Madded; Pillure; Netikakler.

2. ***Themeda quadrivalvis*** (L.) O. Ktze., *Rev. Gen. Pl.* 2 : 794. 1891. *Andropogon quadrivalvis* L. in Murr., *Syst. Veg.* ed. 13. 758. 1774. *Anthistiria ciliata* L.f., *Suppl.* 113. 1781; Hook.f., *Fl. Brit. India* 7 : 213. 1896.

Sub-erect or ascending, annual herbs, up to 2.5 m tall. Leaves 10-25 cm long, linear. Panicles large, sub-erect or dense clusters; spikelets 5-6 mm long; lower glumes of involucrel spikelets slightly strigose with tubercle-based hairs mainly at the apex; awns 3-4 cm long.

*Fl. & Fr.*: Feb.

In paddy fields and as undergrowth in dry deciduous forests. Abundant.

Pillure, 15540; Netikakler; Pharsegarh.

Plant is grazed by wild-buffaloes.

#### 43. VETIVERIA St. Vincent

***Vetiveria zizanioides*** (L.) Nash in Small, *Fl. South-east U.S.* 67. 1903. *Phalaris zizanioides* L., *Mant.* 2 : 183. 1771. *Andropogon squarrosus* Hook.f., *Fl. Brit. India* 7 : 186. 1896.

'*Khus-khus*'

Tufted, perennial herbs, up to 2.5 m tall; roots aromatic. Leaves up to 100 × 1.5 cm, narrow, erect, margin scabrid. Panicles 12-35 cm long, purple, with whorls of fragile 2-5 cm long racemes; spikelets yellow or brown, 3-3.5 mm long; lower glume of sessile spikelets muriculate. Caryopsis ca 2 mm long.

*Fl. & Fr.*: Oct.- Feb.

Along water-courses and in marshy places. Common.

Bijapur Ghati, 16450; Kutru; Pharsegarh.

### MANAGEMENT STRATEGIES FOR THE INDRAVATI TIGER RESERVE

In general, management system of the Tiger Reserves should be of two fold objectives. The primary objective should be oriented towards preservation, protection and improvement of the indigenous flora and fauna. In this context, priorities should be given for protection of the plant resources and creating the most favourable living conditions for the wild animals to have an improved and balanced ecosystem in the Reserve. The secondary objective should be to provide maximum facilities to the visitors intending to enjoy the wildlife in their natural habitats, and the researchers to study the flora and fauna in the original ecosystem.

Keeping in view the above objectives, some suggestions have been mentioned below, in respect of the Indravati Tiger Reserve, based on field studies conducted in the area.

1. It has been observed that human population, inhabiting the core area of the Indravati Tiger Reserve, adversely affects population rate of wild animals and plants' community. Therefore, to improve the ecosystem removal of the adverse human factors from the core area of the Reserve is essential as per Action Plan proposed under the Project Tiger. To facilitate rehabilitation of the tribals cottage industries based on the useful forest plants should be established.

Due emphasis should be given for eco-development of the buffer zone in order to increase its biomass productivity, so as to ensure the availability of adequate firewood and fodder to meet requirements of the people shifted from the core area.

2. The Indravati Tiger Project provides the largest and the best potential habitat for wild-buffaloes (*Bubalus bubalis*). Shifting of the tribal hamlets present in the central and northern parts of the Reserve would also create extensive grasslands amidst dense woodlands.

3. Supply of water especially in the core area is inadequate except during the rainy season. Water scarcity directly affects wildlife of the region. Only a few water holes remain with just a few gallons of water, which is insufficient to support the animals. It results in frequent movement of the wild animals from the core area towards nearby water sources. Therefore, judicial water sources development projects should be urgently undertaken for restoration and improvement of the wildlife habitat. Construction of wallows, pools, tanks etc. in the core area should be immediately undertaken on a large scale and chemical analysis of water should be carried out every year to test its purity.

4. Grasslands of the Reserve should be regularly burnt in the beginning of the dry season to improve quality of the fodder grasses. It has been observed that burning prevents invasion of woody species in the grasslands, as well as increases the productivity. Besides, forage produced in the burnt land is more palatable.

5. Special care should be taken to provide adequate shelter to the tigers by planting bamboo (*Dendrocalamus strictus*) in the core area, as presence of the tigers is often noticed in bamboo rich areas.

6. Due care should also be taken especially for control of noise pollution in the core area to avoid any adverse effect on natural behaviour of the wild animals.



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