

# FLORA OF ANDAMAN-NICOBAR ISLANDS

VOL. I : RANUNCULACEAE TO COMBRETACEAE



**BOTANICAL SURVEY OF INDIA**  
Ministry of Environment and Forests

## Mangrove Vegetation

*Xylocarpus moluccensis* (Lam.) M. Roemer

# FLORA OF ANDAMAN & NICOBAR ISLANDS

VOLUME I  
(RANUNCULACEAE TO COMBRETACEAE)

*Editors:*

P.K. HAJRA  
P.S.N. RAO  
V. MUDGAL.



भारतीय वनस्पति सर्वेक्षण  
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## FOREWORD

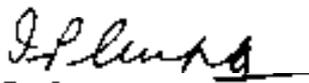
I am glad to know that the Botanical Survey of India, Andaman & Nicobar Circle, Port Blair is bringing out a book on Flora of Andaman and Nicobar Islands (Vol. I).

The isles, endowed with a rich heritage of varied Flora and Fauna, are often described as a 'natural garden' or 'green emeralds' in the lap of Bay of Bengal. As the verdure in the form of forests occupies over eighty five per cent of the total geographical area in this biogeographical zone, the islands are fascinating and becoming a cynosure for many of the nature lovers. With their pristine glory and historical background the islands have been getting transformed into a botanical as well as tourist paradise in our country.

The plant wealth, a part of which is portrayed in this publication, it is hoped, will certainly be of much use for the islanders as a source of food, shelter and medicine. While 'A Forest Flora of Andaman Islands' published by Parkinson (1923) had dealt with the plants of Andaman islands, the present volume has been devoted to Nicobar Islands also besides Andaman Islands so that the plant resources are utilised on sustainable basis. This endeavour is likely to supplement our efforts in conserving the rare and endangered insular species especially in the protected areas, thus enabling us to pass over this heritage to the posterity.

The editors deserve all praise for making the volume available at a time when environmental issues are of major concern to the mankind.

Raj Niwas,  
30-09-98.

  
(I.P. Gupta)  
Lieutenant Governor  
A & N Islands.

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Thanks are also extended to the scientists and staff who happened to work in these remote islands and in making available the present volume.

They are highly indebted to the former Directors of Botanical Survey of India in initiating this project and for their guidance in various ways. The technical assistance extended by the staff and officers of the Publication Section of BSI at Calcutta deserve special mention.



Saddle Peak National Park in North Andaman



*Pterocarpus dalbergioides* Roxb.  
(Padauk)



A panoramic view of the Andaman coast



Littoral forest in Rutland



*Orophea katschallica* Kurz -  
Flower with the inner petals clawed and vaulted



*Orophea katschallica* Kurz  
(Fruiting)



*Cyathostemma viridiflorum* Griff.



*Goniiothalamus* sp.



*Garcinia andamanica* King



*Garcinia* sp.



*Dillenia indica* L.



*Goniothalamus macranthus* (Kurz) Boerl.



*Casearia andamanica* King



*Calophyllum inophyllum* L. - Inset: Flowering & Fruiting



*Dipterocarpus alatus* Roxb.



*Thespesia populnea* Correa



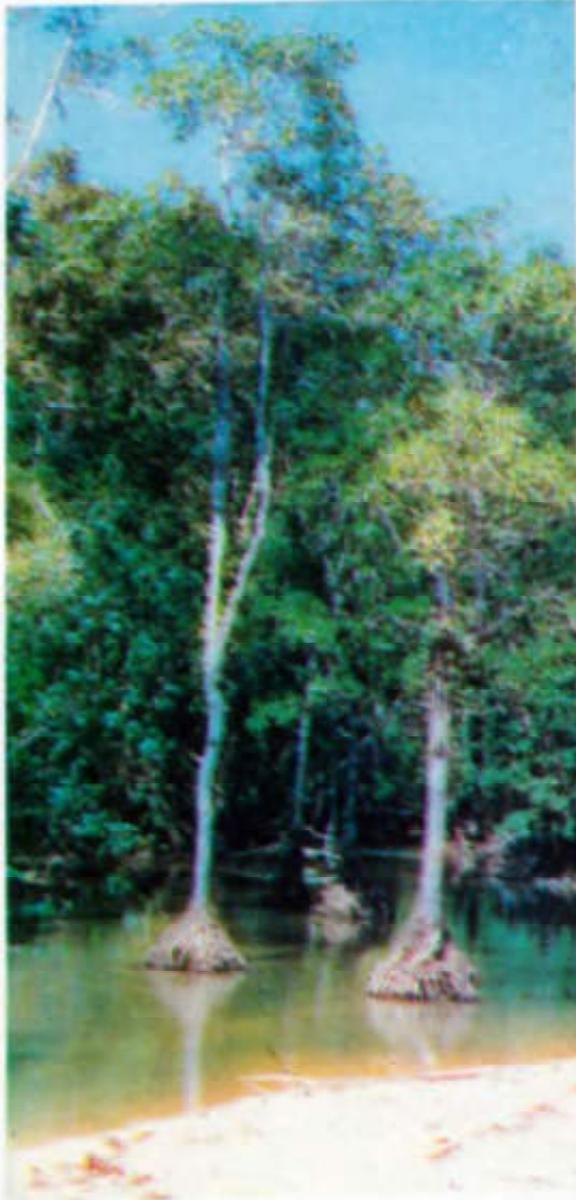
*Sterculia villosa* Roxb.



*Heritiera littoralis* Dryander



*Heritiera littoralis* Dryander - (curving buttresses)



*Bruguiera gymnorhiza* Lam.



*Rhizophora mucronata* Lam.



*Xylocarpus moluccensis* (Lam.) M. Roemer



*Micromelum minutum* (Forst. f.) W. & A.



*Byttneria andamanensis* Kurz



*Leea indica* (Burm. f.) Merr.



*Strongylodon lucidus* (Forst.) Seemann



*Combretum extensum* Roxb.



*Nymphaea nouchali* Burm.



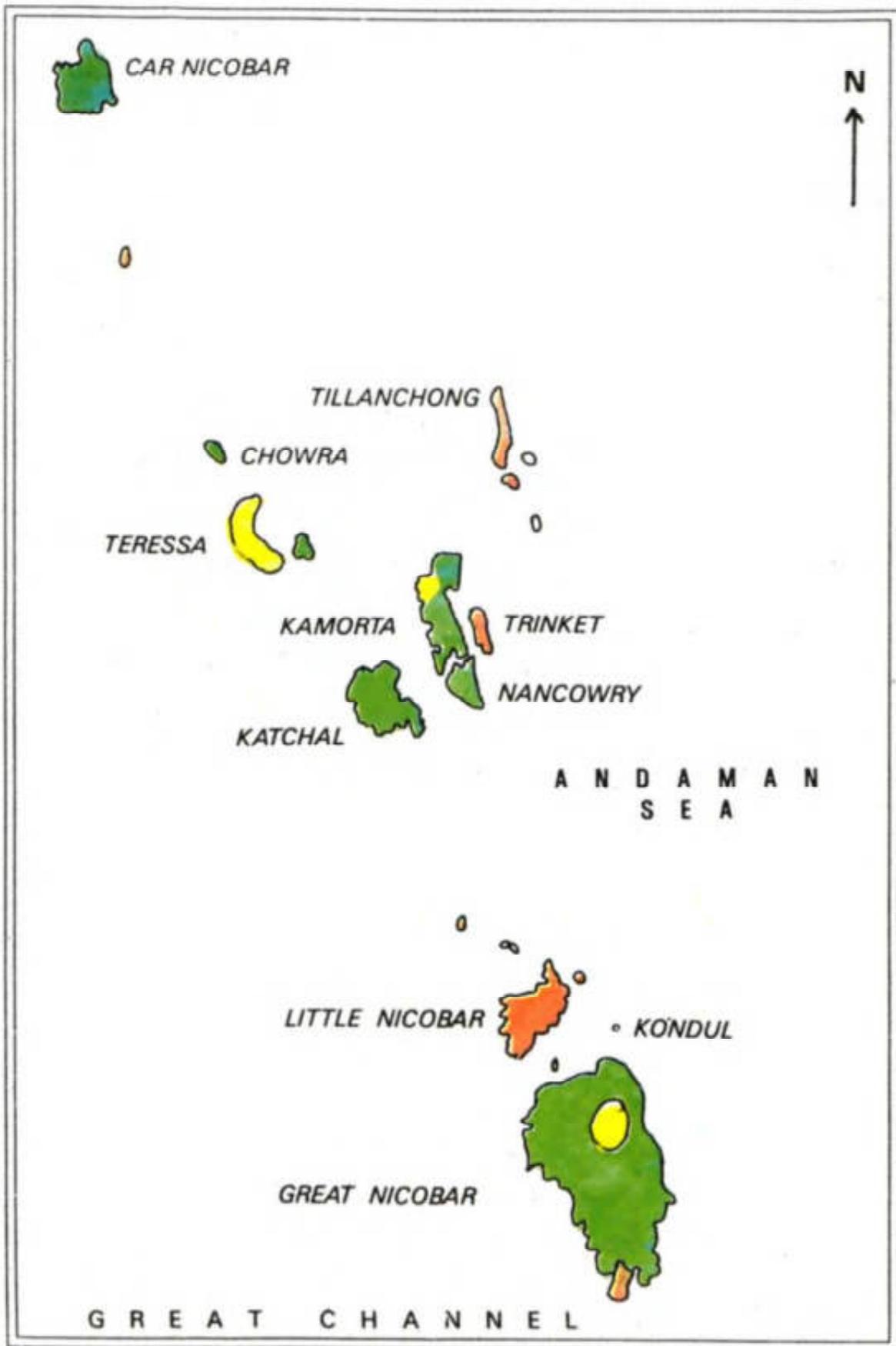
Mangrove Vegetation

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**MAP OF NICOBAR ISLANDS**

# INTRODUCTION

(P.S.N. Rao)

The Andaman & Nicobar Archipelago consisting of about 572 islands and islets lies in the lap of the Bay of Bengal (6-14° N. Lat. and 92-94° E. Long.). Often described as islands of the marigold sun, they were known throughout the country as KALAPANI because of their having been a penal settlement under British rule, a reputation fast shedding since independence. Oriented in a north-south direction and simulating an arc stretching over a length of about 912 km the islands have a maximum width of 57 km. The northernmost Landfall island is separated by sea of about 190 km from the mainland of Myanmar and the southernmost Great Nicobar island is about 150 km away from Sumatra. The Andaman group of islands is separated from the Nicobar group by a 150 km wide under sea deep channel situated at 10° N latitude, also called Ten degree channel. The islands have a total land area of 8249 sq km with a coastline of 1962 km which is highly indented and several creeks penetrate into the island from inland bays. The highest hill in the Andaman group is Saddle Peak reaching a height of about 720 m and in the Nicobar group is Mt. Thullier with an altitude of about 670 m above msl.

Among all the States and Union Territories of India, the Union Territory of Andaman & Nicobar Islands is unique because of the tropical humid climate and insular nature with no contiguity of land with rest of the country. Classified to be one of the 12 biogeographical zones in India, the Andaman & Nicobar Islands have a biodiversity profile of over 5500 animal species, 2000 indigenous and several non-indigenous angiospermic species besides many cryptogamic species in three important natural ecosystems viz., the forest ecosystem, the marine ecosystem and the interface between the two, the mangrove ecosystem. The topographical features, the climatic regime and the soil characteristics are the foundations on which these interconnected systems are built up and the linkages between these natural ecosystems are governed by geological and physiographic conditions. Within each of these natural systems there are several interlinked subsystems constituting cycles of energy, matter and nutrients. The rich heritage of the biological wealth is directly and indirectly dependent on these cycles for sustenance.

## GEOLOGY

The islands are mainly of thick Eocene sediments deposited on pretertiary fine grey sandstone, shales and silt stones in which basic and

ultrabasic igneous rocks are found to be intrusive. The calcareous sandstones and sand rocks are interspersed with conglomerates and intercalated clays. Higher elevations are characterised by serpentine and gabbro- formations while coral reef formations of recent origin are important geological formations in the intertidal belt. The rock formations of southernmost Great Nicobar island are said to be of younger tertiary age and are geologically similar to the south-west coast of Sumatra and younger in origin than that of the Andaman group of islands. The soils are immature, loose in texture, poor in drainage and low in moisture retaining capacity. As the soils are poor in nutrient content, the entire nutrient capital necessary for the continuous growth of lush green tropical vegetation is tied up in the living plant itself. Sandy alluvial soil is generally found in the creeks and sheltered coasts. The richer grey, brown and red soils are found in the inland forests and humus is not able to accumulate much as it is washed away by torrential rains.

## CLIMATE

The monsoonal regime of South-East Asia governs the climate of the islands. The general climatic condition of the islands is that of warm and humid tropics with the temperature ranging between 22°C and 30°C. The islands receive heavy rainfall from both the south-west and north-east monsoon, the former from May to September and the latter from October to December with the average annual rainfall ranging from 3000 to 3500 mm. Cyclone winds accompanied by thunder and lightning are frequent in the islands. January to March show fairly dry weather with scanty rainfall. The mean relative humidity is rather high and usually remains between 82 to 85% throughout the year.

## PEOPLE

The A. & N. islands were inhabited only by a little over 5000 native aboriginals till the end of the 18th century. In the late 18th century the seafaring nations of the West made their contact with these islands so as to replenish their supply of the drinking water. The British who might have appreciated the strategic importance of the islands made a first attempt at establishing a settlement at Port Cornwallis in 1788 at Port Blair and the land was cleared for a prison and a penal colony established. Nearby Chatham island became the headquarters of the forest department and Ross island was reserved for the British residents. In the subsequent

years a number of convicts were permitted to settle in small villages so that they could be self-supporting by agriculture and cattle rearing but in a primitive way. The Bhandu, Mopla and other settlements came up but lived in harmony with the nature. The post -1950 period witnessed a large scale increase in the population although there was a decrease in 1942 with the occupation of islands in 1942 by the Japanese. The population increased from 30,971 to 1,88,741 between 1951 and 1981. As per the 1991 census the total population of A. & N. islands is 2,80,661 which may be much less than the unofficial figures.

## TRIBALS

There are six aboriginal groups viz. Andamanese, Onges, Jarawas and Sentineles who are negrito hunter-gatherers in some of the Andaman islands while Nicobarese and Shompens belong to Mongoloid race and live in Nicobar islands. But many of the Nicobarese are now inhabiting even in Andaman islands due to more literacy and employment.

### **Andamanese and Onges**

The Andamanese and Onge populations have dwindled to such low figures that their long-term survival is doubtful. As per the 1981 census they are only 26 and 97 respectively and it is doubted that their contact with settler population from mainland has caused their quasi extinction.

### **Sentinelese**

They are putting up a last ditch stand in their island hideout in South Andaman. In 1961 they were about 50 but no figures are available as per 1981 census. They are said to be most ferocious and never spare the trespassers. Attempts made by the local administration to befriend them have not been successful.

### **Jarawas**

The Jarawas segregated in their reserves in South and Middle Andaman are anywhere between 100 and 300 but no exact figures are available. They mostly engage in hunting-gathering and consume wild pigs and yams available in the interiors of the forest.

### **Shompens**

The Great Nicobar forests are the home of this semi-nomadic, monogamous aboriginal tribe with mongoloid features. They now number 223 and live in groups and move from place to place in the forests of the central uplands where probably they were pushed into inaccessible area by the Nicobarese who have several settlements along the coast. Their home, their food, their medicine are all from within the forest and they have also been known to fish.

### **Nicobarese**

The Nicobarese constitute the largest tribal group in A. & N. islands and most of them live in all the inhabited islands of Nicobar district. Numbering around 22,000 their greatest concentration being in Car Nicobar they have good coconut plantations and also grow tuber and fruit crops. They rear pigs, fowl, and some cattle. Physically sturdy they augment their resources by fishing in the sea with harpoons or nets cast from their traditional boats. Influenced by Christianity under the leadership of late Bishop Richardson, they are able to cope up with some of the development of an external civilisation while retaining their tribal traditional and social culture. Encouraged by the Church and Civil administration, about 18 per cent of them are literate. Several studies are available on the life, customs, habits, house construction and boat making skills of the peace loving Nicobarese.

### **Settlers**

There are different types of settlers in the Bay islands. In Andaman group of islands it is mostly the people from Ranchi and Chotanagpur from mainland, the privileged settlers who are the refugees from Bangladesh and other groups of people from Tamilnadu, Andhra Pradesh and Kerala who have settled by being in service organisations. There are three types of settlers viz., 337 families of ex-servicemen in southern islands of Nicobar, Sri Lankan repatriates or Bangladesh refugees settled in Little Andaman and Katchal island, and the labourers with their families who have settled for long having been engaged by local contractors for work in ALHW, FPDC and GREF etc.

## VEGETATION

The insular nature of the territory, physical isolation between the islands and also from the neighbouring mainlands through millions of years has resulted in the evolution of a rare and distinct flora, which though related to the mainland Indian flora, shows much closer affinity with the Myanmar, Malaysian and Indonesian floras. The rich natural vegetation of the Andaman and Nicobar Islands can be broadly classified as tropical evergreen. Balakrishnan (1989) has dealt with the vegetation and floristics and based on the proximity of the sea and salinity of the soil, the vegetation is placed into two types as Littoral and Inland types.

ANDAMAN ISLANDS : The forests are further classified as follows:

- |             |   |                                  |
|-------------|---|----------------------------------|
| A. LITTORAL | : | 1. Mangrove forests.             |
|             |   | 2. Strand (or Beach) vegetation. |
|             |   | 3. Tidal or Swamp forests.       |
|             |   |                                  |
| B. INLAND   | : | 1. Evergreen forests.            |
|             |   | 2. Deciduous forests.            |
|             |   | 3. Grasslands.                   |
|             |   | 4. Hydrophytic vegetation.       |

### A. LITTORAL :

#### 1. Mangrove forests

The irregular and deeply indented coastline of these islands results in innumerable creeks, bays and estuaries which facilitate the development of rich and extensive mangrove forests. The mangroves develop well in areas which are covered with brackish water during high tides, protected against heavy wave action and somewhat sheltered from high winds. They prefer clayey soil. They are found in large areas in Austin, Strait (North Andamans), Bomlungta and Charulungta (Middle Andamans), Baratang, Havelock and Wrafter creeks (South Andamans) and Little Andaman.

The mangrove vegetation is evergreen and simple in structure varying from 6 to 24 m in height. In some places like Baratang, Austin and Strait Islands the species *Rhizophora apiculata* and *Bruguiera gymnorhiza* may attain size of 50 cm in diameter and 50 m in height. With light green foliage

and almost uniformly sized, the mangroves form an easily discernible transitional zone between the forests on land and the open sea. Considered to be one of the most important surviving formations in the world, mangroves in Andaman & Nicobar islands are estimated to occupy 1,15,000 h i.e. 11.5 per cent of the territory of which 50,000 h are in the Andaman group. Their stilt roots anchoring the plants and the upwardly turned breathing roots enable them to thrive the pull and push of the tides, the limitations of the waterlogged slush and the salinity gradients of the creeks. Seedlings are nurtured on parent trees until they are capable of securing independent existence. The mangrove creeks are plentiful of organic detritus which nourishes a wide variety of marine fauna viz. fishes, prawns and marsh crocodiles.

The most common trees are *Rhizophora mucronata*, *R. conjugata*, *Bruguiera gymnorhiza*, *B. parviflora* and *Ceriops tagal*. *Avicennia marina* is frequent forming small patches. Some of the less common species are *Lumnitzera littorea*, *L. racemosa*, *Aegiceras corniculatum*, *Excoecaria agallocha* and *Xylocarpus granatum*. *Nypa fruticans* is a palm found in the mangrove forests. The mangrove fern *Acrostichum aureum* is associated with *Acanthus ilicifolius*.

## 2. Strand vegetation

The vegetation occupying the sandy coastal belt exhibits several species of plants. These include herbaceous dune formations on the open beach and wooded beach forests towards the interior. In the sandy beach, found along the coast, the foreground is marked by *Ipomoea pes-caprae*, *Cassipouita filiformis*, *Vigna marina* and *Phyla nodiflora*. Immediately behind these plants are a number of littoral shrubs. *Scaevola sericea* is seen fringing the coast as a green hedge, especially in Little Andamans. Behind the dense growth of *Scaevola sericea* are other shrubby plants like *Ximena americana*, *Hibiscus tiliaceus*, *Colubrina asiatica*, *Caesalpinia crista*, *Desmodium umbellatum* and *Crinum asiaticum*. *Mucuna gigantea* is a common climber.

Along retreating coasts, the dominant tree is *Barringtonia asiatica* which is often associated with trees like *Guettarda speciosa*, *Calophyllum inophyllum* and *Pongamia pinnata* and shrubs like *Pemphis acidula*, *Messerschmidia argentea*, *Vitex trifolia*, *Pandanus andamanensium* and *P. tectorius*.

The beach forests occur behind the sand dune zone and *Barringtonia* formations are comprised of trees like *Hernandia peltata*, *Thespesia populnea*, *Pandanus* spp., *Manilkara littoralis*, *Intsia bijuga*, *Syzygium samarangense*, *Sophora tomentosa* and *Glochidion calocarpum*. *Cycas rumphii* occurs in the beach forests in large populations in North Andamans. The herbaceous plants include *Ischaemum muticum*, *Acalypha indica*, *Euphorbia hirta*, *Centotheca lappacea*, *Ophiorrhiza mungos*, *Aerva lanata* and *Cyperus kyllinga*. Climbers found on the trunks of many trees include *Dischidia bengalensis*, *D. nummularia*, *Pothos scandens*, and *Hoya*. Epiphytic orchids like *Dendrobium crumenatum*, *Luista teretifolia*, *Bulbophyllum lepidum*, *Cybidium aloifolium*, *Eria andamanica* and ferns like *Polypodium phymatodes* and *Drynaria quercifolia* are also common.

### 3. Tidal or Swamp forests

It is typically a closed evergreen forest of medium sized trees which have adapted in various ways to live on tidal mud which is permanently wet with salt water and submerged at every tide. A peculiarity of the tidal forest trees is the occurrence of special root formations, stilt roots supporting stem base, plank buttress root formations, conically thickened stem bases of small erect aerial roots emerging from the mud. These help to improve the air supply to the root system or to support and protect the trees against strong winds. Trees like *Cerbera odollam*, *Heritiera littoralis* and *Barringtonia racemosa* are common in association with *Ficus retusa*, *Cynometra ramiflora*, *Scyphiphora hydrophyllacea*, *Excoecaria agallocha*, *Lumnitzera racemosa*, *Xylocarpus granatum*, *Sonneratia acida* and *Dolichandrone rheedii*. *Phoenix paludosa* a slender erect palm is also common. *Cuesalpinia crista*, *Derris scandens*, *D. heterophylla* and *Flagellaria indica* are the common woody climbers and stragglers. *Sarcolobus carinatus*, *Hoya parasitica* and *Dischidia bengalensis* are other climbers. Epiphytic orchids like *Dendrobium*, *Bulbophyllum*, *Eria*, etc. and ferns like *Drymoglossum*, *Lepisorus* and *Asplenium* grow on trunks and branches of the trees.

## B. INLAND

### 1. Evergreen forests

These represent the climax vegetation with a close compact community of diverse tropical plants. The canopy is closed and consists

of three storeys. There is little sunlight penetrating to the forest floor. The soil is composed of clayey loam with micaceous sandstones below.

The vegetation is mainly composed of tall trees laden with lianas and other epiphytes. *Dipterocarpus griffithii*, *D. turbinatus*, *Sideroxylon longipetiolatum*, *Hopea odorata*, *Endospermum malaccense*, *Planchonia andamanica* occur in the upper storey. The second storey consists of smaller trees like *Baccaurea sapida*, *Myristica* sp., *Buchanania splendense*, *Randia pulcherrima*, *Pometia pinnata*, etc. Shrubs like *Clerodendrum viscosum*, *Leea indica*, *Dinochloa andamanica*, *Maesa andamanica*, etc., occur. Amongst the climbers the common ones include *Calamus longisetus*, *Daemonorops manii*, *D. kurzianus*, *Entada pursaetha*, *Mezoneuron cucullatum* etc. *Phragmites karka* and *Saccharum spontaneum* occur sometimes in open places and edges of forests. *Asplenium nidus* and *Drymoglossum piloselloides* are the epiphytic ferns. *Dendrobium aphyllum* and *D. secundum* are the epiphytic orchids commonly seen.

## 2. Deciduous forests

Such forests occur in undulating ground on hills where the soil is comparatively dry as compared to evergreen forests. They are found in North, Middle and some parts of South Andamans. *Pterocarpus dalbergioides* is associated with *Terminalia procera*, *T. bialata*, *T. manii*, *Canarium euphyllum*, *Parishia insignis*, *Albizia lebbeck* etc. The second storey consists of small trees like *Lanea coromandelica*, *Sageraea elliptica*, *Sterculia villosa*, *Semecarpus kurzii* etc. The third storey is represented by *Licuala spinosa*, *Grewia disperma*, *Cordia grandis*, etc. Among the shrubs *Actephila exelsa*, *Ixora grandifolia*, *Bridelia griffithii* and *Rinorea bengalensis* occur. Canes are sparsely distributed. *Sphenodesma unguiculata* and *Dinochloa andamanica* are common climbers. Herbaceous vegetation is represented by *Paspalum conjugatum*, *Echinochloa crus-galli*, *Dichanthium annulatum* and also the fern *Pteris quadriaurita*. Epiphytic plants are less which include *Dendrobium aphyllum*, *Cymbidium aloifolium* and *Pholidota imbricata*.

## 3. Grasslands

Several disturbed, deforested and denuded hillocks exhibit grasslands with *Imperata cylindrica* and *Saccharum spontaneum* as dominant

species. Grasses like *Heteropogon contortus*, *Chrysopogon aciculatus* and *Eragrostis unioides* are found associated with sedges like *Scleria cochinchinensis* and the ferns *Dicranopteris linearis* and *Lygodium flexuosum*. The herbs and undershrubs include *Uraria lagopodioides*, *Desmodium heterocarpon*, *Triumfetta rhomboidea* and *Urena lobata*. Large shrubby plants are rare and comprise *Melastoma malabathricum* and *Erycibe paniculata*.

#### 4. Hydrophytic vegetation

The scarcity of natural stagnant pools, lakes, etc. results in a rather poor fresh water flora in these islands. In the few ponds and paddy fields plants like *Ipomoea aquatica*, *Lemna perpusilla*, *Najas indica*, *Hydrilla verticillata*, *Nymphaea nouchali* are seen. Among the fresh water marshy plants, notable ones are *Ludwigia perennis*, *Blyxa roxlburghii*, *Monochoria vaginalis*, *Polygonum barbatum*, *Fuirena glomerata*, *Hydrophila erecta* and various species of sedges.

**NICOBAR ISLANDS** : The nature of vegetation and floristic composition differ from north to south. In Car Nicobar, there is a well defined beach forest followed by inland vegetation comprising shrubs, trees and grasslands. The island being more or less flat and the soil consisting of sandy alluvium with rocks beneath, evergreen forests are absent. Mangrove forests, common in the Central and Southern group do not find a place here.

The mangrove forests in the Central and Southern group are followed by Beach forest at the coast and evergreen forest in the interior. The vegetation can be classified into the following:

- |             |   |                             |
|-------------|---|-----------------------------|
| A. LITTORAL | : | 1. Strand or Beach forests. |
|             |   | 2. Mangrove forests.        |
| B. INLAND   | : | 1. Evergreen forests.       |
|             |   | 2. Deciduous forests.       |
|             |   | 3. Grasslands.              |

## A. LITTORAL

### 1. Strand or Beach forests

These are restricted to the beaches of fine calcareous sand which stretch along the shores. It is pronounced in Car Nicobar. Creepers like *Ipomoea pes-caprae*, *Vigna marina*, *Ischaemum muticum*, *Phyla nudiflora*, etc. are found along the coast. Immediately behind these occur *Scaevola sericea*. Associated with it are *Clerodendrum viscosum* and *Desmodium umbellatum*. *Tournefortia argentia* is common in Katchal, Kamorta and Great Nicobar Islands. *Pandanus lerram*, *P. tectorius*, and *P. fruticans* grow in this forest. *Ixora brunnescens* and *Glochidion calocarpum* flourish well. The shrubby layer is followed by a few trees like *Barringtonia asiatica*, *Calophyllum inophyllum*, *Hernandia peltata*, *Heritiera littoralis*, *Syzygium samarangense* etc. *Cycas rumphii*, *Cerbera manghas* and *C. odollam* occur in the shade of these trees. *Casuarina equisetifolia* is found in Casuarina Bay in Great Nicobar. Climbers like *Cyclea peltata*, *Entada pursaetha*, etc., are not uncommon. The ground cover consists of *Centothacea lappacea*, *Oplismenus compositus* etc. intermingled with *Aerva lanata*, *Ophiorrhiza mungos* etc. The tree trunks are clothed with *Dischidia bengalensis*, *D. nummularis* and *Pothos scandens*. *Aerides emericii*, *Dendrobium anceps* and *Luisia teretifolia* are the common epiphytic orchids. *Asplenium nidus* and *Vittaria elongata* are the common epiphytic ferns.

### 2. Mangrove forests

They are found in West Katchal Bay, the harbours of Kamorta and Nancowrie islands, Little Nicobar and Ganges harbour, mouths of Galathea, Dogmar and Alexandra rivers in Great Nicobar. The dominant species are *Rhizophora mucronata*, *Bruguiera gymnorrhiza*, *Excoecaria agallocha*, *Carallia brachiata*, *Sonneratia acida*, *Timonius jumbosella* and *Nipa fruticans*.

## B. INLAND

### 1. Evergreen forests

They are common in Great Nicobar, Kamorta and Katchal islands. The most common and dominant tree species in Great Nicobar are

*Callophyllum soulattri*, *Sideroxylon longipetiolatum*, *Garcinia xanthochymus*, *Pisonia excelsa*, *Mangifera sylvatica*, etc. In moist valleys and along rivers *Anthocephalus cadamba*, *Pometia pinnata*, *Elaeocarpus tuberculatus* etc. occur. *Cyathea albo-setacea*, a tree fern, is common. *Dinochloa andamanica* is a most extensive climbing bamboo on the high hills.

The evergreen forests of Kamorta and Katchal islands include lofty trees like *Artocarpus peduncularis*, *Radermachera lobbi*, *Symplocos leiostachya*, *Bentinckia nicobarica*, *Callophyllum soulattri*, etc. Growing well under the cover of these trees are *Maesa ramentacea*, *Barringtonia racemosa*, *Syzygium claviflorum*, etc. *Cyathea albo-setacea* is common tree fern. Important climbers are *Derris thyrsiflora*, *Dinochloa andamanica*, *Dioscorea glabra*, etc. The forest floor is covered with *Blumea myriocephala*, *Adenostemma viscosum* etc. A few grasses and sedges like *Sclera sumatrensis*, *Oplismenus compositus* also grow. Ferns like *Nephrodium molle*, *Asplenium nidus* and *Vittaria elongata* are plentiful. *Pholidota imbricata*, *Oberonia* sp., *Lycopodium phlegmeria* grow on branches of trees.

## 2. Deciduous forests

*Terminalia procera* and *T. bialata* occur at low elevations in Great Nicobar. They grow in association with *Pterocymbium tinctorium* and *Albizia* sp.

## 3. Grasslands

These are peculiar to Nicobars and are situated on hilly plateau areas of Kamorta, Katchal, Nancowrie and open areas of Car Nicobar. *Imperata cylindrica* occurs with *Saccharum spontaneum*, *Heteropogon contortus*, *Chloris barbata*, *Chrysopogon aciculatus*, *Scleria cochinchinensis*, etc. Often *Dicranopteris linearis*, and *Lycopodium cernuum* grow amidst these grasses. *Urena lobata*, *Desmodium heterocarpon* etc. are the herbs and undershrubs. The common shrubs are *Erycibe paniculata*, *Helicteres angustifolia* var. *obtusata* etc.

## **BOTANICAL HISTORY OF ANDAMAN & NICOBAR ISLANDS**

A knowledge of the botanical history of any geographical area is of paramount importance for understanding its phytogeography. As known from the literature, the botanical history of the Andaman and Nicobar Islands dates back to 1791 when Colonel Kyd visited the island and introduced to the Royal Botanic Gardens, Calcutta, some Andaman plants which were later described in Roxburgh's Flora of India. In 1839, Helfer, a Russian scientist and geologist visited the islands with a view to ascertaining their mineral resources and also made extensive botanical collections but these, after his murder by aborigines on the North Andaman, were unfortunately mixed up with his Tenasserim plants and all were labelled 'Tenasserim and Andaman' which resulted in a great deal of confusion. In the year 1866 Kurz, a German botanist and then Curator of the herbarium of the Royal Botanic Gardens, Calcutta, was sent by the Government of India to collect materials for a flora of the Andaman Islands. He made extensive collections and published a report in 1870 on the vegetation of the South Andaman Islands. Subsequently, several botanists like Parish, Prain, King and Rogers made extensive botanical studies between 1870 and 1903, which together with his own efforts enabled Parkinson (1923) to bring out a flora of the Andaman Islands dealing mainly with the woody elements. Since then, vegetational accounts of the Nicobar Islands, especially Great Nicobar island, published by Sahni (1953), Thothathri (1962), Balakrishnan (1987), the preliminary and supplementary lists of angiosperms of Andaman and Nicobar islands by Vasudeva Rao (1986) and Lakshminarasimhan and P.S.N. Rao (1996) respectively and the phytogeographical account by P.S.N. Rao (1996) have greatly contributed towards understanding the floristic composition of the archipelago and in knowing their phytogeographical significance.

### **FLORISTIC DIVERSITY AND PHYTOGEOGRAPHY**

The presence of over 2000 indigenous and 500 non-indigenous angiospermic species within a land area of 8290 sq km is a significant feature of the Andaman and Nicobar Islands, making them a cynosure not only for plant taxonomists but also for conservationists. The rare and distinct flora which evolved through millions of years due to the insular nature of the territory, physical isolation between the islands and also from

the neighbouring continental landmasses, is unique to India. Though related to the mainland Indian flora, the flora of the Andaman group shows much closer affinity with the Myanmar flora while that of Nicobars have affinity towards the Sunda biogeographical zone. Representing 700 genera and belonging to 140 families, about 14% of the angiosperm species are endemic to the islands (Table 1.) At the generic level endemism is rather less with only two genera viz. *Sphyrantha* (Euphorbiaceae) with two species and *Pubistylis* (Rubiaceae) with one species. The islands also have a rich fern flora with a little over 100 species represented, of which the tree fern *Cyathea* is the most interesting with significant population density in Great Nicobar.

Among the non-endemic angiosperm species about 40% are not found in mainland India but extend their distribution to South East Asia including Burma, Thailand, Malaya and Sumatra (Table 2). As the flora of the Nicobar Islands is essentially Malesian it is also called a subcontinental island flora (Balakrishnan, 1989). The flora of the Andaman group of islands is distinctly different from that of the Nicobars which is evident from the fact that the genera *Pterocarpus* and *Dipterocarpus*, while common in the Andaman islands, are not found in the Nicobar islands while the Melastomaceous genera *Otanthera* and *Astronia*, the Gesnariaceous genus *Cyrtandra*, *Stemonurus* of the Icacinaceae, *Bentinckia* and *Rhopaloblaste* of the Arecaceae, *Spathoglottis* of the Orchidaceae and many more species occurring in the Nicobar islands are totally absent in the Andaman islands. The striking dissimilarities between the flora of the Andaman group and Nicobar group are owing to the reason that the Andaman islands have more species common to Northeast India, Myanmar and Thailand while Nicobar islands have more species common with Malaysia in the east and Indonesian in the south. To cite a few, some rare orchids of Northeast India such as *Porpax merix* and *Ascocentrum ampullaceum* find a place on the Saddle Peak in North Andaman. Other species which share their distribution between Northeast India, Myanmar, Thailand and the Andaman islands are *Coelogyne trinervis*, *C. thailandica*, *Thunia alba* and *Hopsea helferi*.

The climatic conditions of the Western Ghats of peninsular India and Sri Lanka are similar to that of the Andaman and Nicobar Islands as all these areas lie in the tropical zone and experience heavy rainfall from the south-west and north-east monsoons. Although the two zones are not

contiguous and are separated from each other by the Bay of Bengal, they show striking resemblance in their floristic composition. Several rare plants especially orchids common to peninsular India and the Bay islands are *Calanthe triplicata*, *Corymborchis veratrifolia*, *Geodorum densiflorum*, *Eulophia graminifolia*, *Nervilia aragona*, *Porpax reticulata* and *Thrixspermum album*. Other species which are common between the two areas are *Burmannia chamienii*, *Christisonia alba*, *Floscopa scandens*, *Myxospermum smilacifolium*, *Phylloclamis spinosa*, *Osbeckia tenera* and several other species. For example, the palm genus *Bentinckia* has two species in the world, one of them *B. condapanna* is found in the Western Ghats of peninsular India while the other *B. nicobarica* occurs in the Nicobar Islands. Thus, the Andaman and Nicobar Islands stretching from Arakkan-Yoma in Myanmar to Sumatra in Indonesia are characterised by a rare and distinct flora although exhibiting phytogeographical affinity with the neighbouring biogeographic zones of South - East Asian countries and North-East, Western Ghats and Deccan peninsular biogeographic zones of mainland India by virtue of which the islands constitute a transition zone phytogeographically. More interestingly the southernmost Great Nicobar island with a mixture of Malaysian and Indonesian species and northernmost Andaman islands with several Myanmar elements exhibit a striking resemblance to that of neighbouring biogeographical zones rendering them truly transitional from a floristic point of view. The floristic analysis also indicates that while 14% of angiosperm species are endemic to the islands about 54% also occur in mainland India. The remaining 32% extend to the South-east Asian countries and Malesia but are not recorded in mainland India. The phytogeographical distinction between the Andaman islands and the Nicobar group of islands is evident from the fact that only 28% of the angiosperm plants reportedly have a common distribution on both the Andaman group and the Nicobar group, whereas the remaining 72% occur either on the Andaman islands or on the Nicobars, that is, 47% on the former and 25% on the latter.

Among the 137 families representing the angiospermic flora of the islands, the families Annonaceae, Rubiaceae, Euphorbiaceae, Moraceae, Cyperaceae and Poaceae are more predominant in terms of density as well as number of species followed by Orchidaceae in terms of number of species only with smaller populations. Besides, the plant group which contributes to a great extent to the plant diversity and richness of the flora in the transition zones like Great Nicobar island, a place rich in species

with Sundaic affinity, is the pteridophytic flora comprising of about 100 species of which the populations of tree-fern constitute a major fraction of the vegetation at certain places along the hilly slopes of the interior forests. Another aspect of the vegetation of the Andaman and Nicobar Islands is that over 11% of the total geographical area is constituted by the mangrove forests with more than twenty species which are perhaps the best formations in the entire South-East Asia providing natural habitats for a varied aquatic life offshore and climbing and epiphytic plants on shore.

During the last few decades several exotic species of rattans, bamboos, teak and rubber have been introduced by clearing the virgin forests in view of the settlements. Even though the aboriginals viz. Shompens and Nicobarese have raised coconut plantations in deforested areas, a few weeds such as *Chloronema*, *Mikanta cordata*, *Cyperus*, *Fimbristylis* and *Chrysopogon* have also come up very fast as secondary formations due to deforestation in the cleared areas of the islands.

### **Paleobotanical studies**

The only fossil record known to date is that of *Larinoxylon felix* (Lauraceae) from flyschoid gritty sandstone of Baratang island in South Andaman (Awasthi and Jafar, 1990) while undertaking paleobotanical studies on the carbonised wood fragments collected from the Nayagarh mud volcano.

### **Forestry**

About 86 per cent of the geographical area is under forest cover, that is, 7,144 sq km out of a total area of 8,249 sq km out of which 41 per cent of the area constitutes tribal reserves. Out of the remaining 4,115 sq km, small wooded islands occupy a considerable area and the timber available here is not commercially exploitable. Owing to this realistic picture only around 30 per cent forest area can be earmarked for timber extraction although there is 86 per cent of area is under forest canopy.

The number of commercially exploitable species has gone up from 4 in 1952 to 40 today as the post-1950 period was characterised by an increasing demand for timber within the islands and also for consumption

in mainland India. In 1986 the extractions have touched 1,45,000 cu m/annum while it was only 49,000 cu m/annum in 1950. The logs of *Pterocarpus dalbergioides* (Padauk), *Dipterocaropus alatus* (Gurjan) and *Terminalia bialata* (White chuglam) have a ready market. Presently, there are as many as 34 wood-based industries in A. & N. Islands of which 3 plywood, 24 saw mills and 7 are match and pencil wood industries. The Government Saw Mill at Chatham is considered to be largest in the South East Asia employing thousands of people.

Natural regeneration of indigenous timber species and Andaman Canopy Lifting System have been regarded as the most suitable ways of restocking the island forests. The Working Plan by Chengappa in 1952 regarding the post-harvest regeneration operations had two main objectives (a) to convert the irregular natural forests into uniform forests of native timber species (b) to realise maximum yield of timber. This entailed a series of clearing, girdling and canopy lifting operations spread over several years. The rotation period prescribed by him was 150 years but reduced to 75 years subsequently, the exploitable girth now being 150 cm of gbh.

As the wood of mangrove trees is of high calorific value, it has been used both in industrial and domestic sectors until recently. Consequent upon this, apprehensions of imminent ecological damage have been expressed because of the depletion of mangroves necessitating a total ban by the administration in 1986. The local plywood industries have been encouraged to use wood shavings and sawdust for their boilers instead of mangrove fuel.

### **Plantations**

The Andaman Forest Department initiated work on Red Oil Palm (*Elaeis guineensis*) plantations in Little Andaman which was taken over by the Forest Plantation Development Corporation in 1980. FPDC also developed Rubber Plantations in Katchal island and there are several other proposals for more plantations in the islands. Today, the important issue is whether a unique type of vegetation that now covers the island should be destroyed for the sake of a commercial crop for improving the island economy.

## Agriculture

Agriculture has not been a mainstay in A. & N. Islands as it could be only at the expense of forest land. The area under cultivation in 1981 was 16,544 hectares. However, according to the Agriculture Department the area cleared for agriculture, plantations and horticulture in all the islands stands at 48,000 hectares. The main categories of agricultural crops are (a) Non-vegetable field crops (b) Vegetable field crops and (3) Plantation and fruit crops. Since rice is staple food of many of the settlers, the largest area is set apart for paddy cultivation. North Andaman, Little Andaman and Neil and Havelock islands are main centres of vegetable growing. The giant African snail (*Acantina fulica*) a harmful introduction into the islands, is a serious pest on all vegetables. Mango, Citrus, Sapota and Papaya have been tried. Cinnamon, Clove, Nutmeg and Pepper are grown in about 560 hectares in the islands. Oilseed crops and pulses planted in rotation with rice have been remunerative. Areca and coconut are more economical and popular. A track record of over two decades conveys that the land which could support the giant evergreen forest has not been able to support worthwhile agriculture.

## Fisheries

The Exclusive Economic Zone (EEZ) of the islands extending to 200 nautical miles from the shoreline is approximately 6 lakh sq km. The economic potential of this enormous real estate comprising 30 per cent of the EEZ of India is realised, of late, for the expansion of Fisheries sector. Although estimates place the annual available catch at 50,000 to 4,74,000 tonnes, the actual catch in 1986 was 10,638 tonnes. There are many other marine products such as shell fish viz. *Trochus*, *Turbo* and *Tridacna*. However, steps should be taken not to encourage mining of corals from the coastline as this destabilises the substratum for varied marine fauna. Prawns, lobsters, mussels and crabs are being fished in limited quantities.

## Tourism

Tourism industry is most ideal for these islands in case it is in the form of 'ecotourism'. An IUCN study *Ecological Guidelines for Island Development* by McEachern and Towle has given guidelines for the

development of tourism in island settings. Upmarket tourism, of late, has been considered more beneficial for improving the island economy. This has to be environment friendly and not to the detriment of island ecology.

## CONSERVATION

The insular species are generally characterised by a small gene pool, reduced interspecific competition, inbreeding and small population size by virtue of which they are more vulnerable to extinction due to habitat destruction. With the Bay islands being no exception to this, conservation of rare and threatened endemic species as well as the species common for the islands and the nearby mainlands has become inevitable for ensuring the preservation of species diversity. The establishment of national parks and biosphere reserves in Great Nicobar (Mt. Thullier) and North Andaman (Saddle Peak) is under the active consideration of the Government of India for habitat conservation in the centres of speciation. So far, the conservation strategies have been species oriented. As this may lead to overplaying the role of that particular species in the ecosystem causing certain imbalances, it has become imperative to give due weightage to all the components of environment to cover the total ecosystem. With the increasing population beyond carrying capacity and recent spurt in developmental activities in the inhabited islands several measures are suggested by Saldanha (1989) to strike a balance between development and conservation so that wild germplasm resources such as canes, rattans, bamboos, orchids and timber yielding tree species are well taken care of. The Botanical Survey of India on its part has already brought out a list of rare and threatened plants of Andaman and Nicobar Islands as a part of Red Data Books for conservation purposes in its Botanic Garden at Port Blair where economically important endemic species such as *Myristica andamanica*, *Knema andamanica*, *Vanilla andamanica* etc., are also successfully propagated and grown while the local Forest Department has been concentrating on *in situ* conservation of rattans, palms, tree-ferns etc., by setting aside more than 50% of the forests as tribal reserves, wild life sanctuaries, national parks and biosphere reserves (Table 1) which are 'in-violate'. Efforts are also afoot to grow several plant species of phytogeographical significance and aesthetically important endemic orchid species which are threatened in their natural habitats owing to habitat deterioration.

**Table 1**  
**Sanctuaries, National Parks and Biosphere Reserves in**  
**Andaman and Nicobar Islands**

| <b>Wild Life Sanctuaries</b> |                              |
|------------------------------|------------------------------|
| 1. Bingham Island            | 35. West Island              |
| 2. Sir Hugh Rose Island      | 36. Peacock Island           |
| 3. Pitman Island             | 37. White Cliff              |
| 4. Jame Island               | 38. Reef Island              |
| 5. Potanma Island            | 39. Mayo Island              |
| 6. Kyd Island                | 40. Pagat Island             |
| 7. Patric Island             | 41. Shearime Island          |
| 8. Defence Island            | 42. Point Island             |
| 9. Montgomery Island         | 43. Ox Island                |
| 10. Clyde Island             | 44. Shark Island             |
| 11. Sandy Island             | 45. North Island             |
| 12. Snake Island             | 46. Kwangtang Island         |
| 13. Cinque Island            | 47. Rowe Island              |
| 14. Passage Island           | 48. Latouche Island          |
| 15. Sister Island            | 49. Jungle Island            |
| 16. North Brother Island     | 50. Trilby Island            |
| 17. South Brother Island     | 51. Table (Excelsior. Island |
| 18. Loha Barrack             | 52. Table (Delgasno. Island  |
| 19. Bluff Island             | 53. Temple Island            |
| 20. Spike Island             | 54. Turtle Island            |
| 21. Talai Kacha Island       | 55. Ross Island              |
| 22. South Sentinel Island    | 56. Brush Island             |
| 23. Mangrove Island          | 57. Bamboo Island            |
| 24. Stoat Island             | 58. Blister Island           |
| 25. Belle Island             | 59. Dot Island               |
| 26. Ariel Island             | 60. Curie Island             |
| 27. East or English Island   | 61. Oliva Island             |
| 28. Dunnean Island           | 62. Orchid Island            |
| 29. Oyster Island            | 63. Curku (BPP. Island       |
| 30. Perkinson Island         | 64. Egg Island               |
| 31. Barren Island            | 65. Swamp Island             |
| 32. Cane Island              | 66. Dottrel Island           |
| 33. Land Fall Island         | 67. Gurjan Island            |
| 34. East Island              | 68. Sea Serpent Island       |
|                              | 69. Snake Island             |
|                              | 70. Bondeville Island        |

|                       |  |
|-----------------------|--|
| 71. Buchanan Island   | <b>Nicobar District Wildlife Sanctuaries</b> |
| 72. Surat Island      |  |
| 73. Entrance Island   | 91. Batti Mally Island                       |
| 74. Bennet Island     | 92. Tillangchang Island                      |
| 75. Roper Island      | 93. Megapode Island                          |
| 76. South Reef Island |  |
| 77. Mark Island       | <b>National Parks</b>                        |
| 78. Tuft Island       | 1. Mahatma Gandhi Marine National Park       |
| 79. Hump Island       | 2. Rani Jhansi Marine National Park          |
| 80. Gander Island     | 3. Mount Harriet                             |
| 81. Goose Island      | 4. Saddle Peak                               |
| 82. Flat Island       |  |
| 83. Spike Island      | <b>Biosphere Reserves</b>                    |
| 84. Ranger Island     | 1. Great Nicobar Biosphere Reserve           |
| 85. Wharaf Island     |  |
| 86. Tree Island       |  |
| 87. Channel Island    | <b>Zoological Garden</b>                     |
| 88. Narcondum Island  | 1. Mini Zoo                                  |
| 89. North reef Island |  |
| 90. Interview Island  |  |

**Table 2**  
**Ten dominant families according to the number of species in decreasing order**

| S.N | Families      | Genera | Species |
|-----|---------------|--------|---------|
| 1.  | POACEAE       | 70     | 150     |
| 2.  | RUBIACEAE     | 40     | 115     |
| 3.  | EUPHORBIACEAE | 40     | 110     |
| 4.  | ORCHIDACEAE   | 50     | 98      |
| 5.  | CYPERACEAE    | 12     | 80      |
| 6.  | FABACEAE      | 29     | 60      |
| 7.  | MORACEAE      | 7      | 52      |
| 8.  | ANNONACEAE    | 18     | 50      |
| 9.  | ARECACEAE     | 20     | 37      |
| 10. | MELIACEAE     | 11     | 31      |

**Table 3**  
**A comparison between ten largest families of Andaman & Nicobar Islands with those in Hooker (1904) Flora of British India**

| S.N. | Flora of British India | Flora of A. & N. Islands |
|------|------------------------|--------------------------|
| 1.   | ORCHIDACEAE            | POACEAE                  |
| 2.   | LEGUMINOSAE            | RUBIACEAE                |
| 3.   | POACEAE                | EUPHORBIACEAE            |
| 4.   | RUBIACEAE              | ORCHIDACEAE              |
| 5.   | EUPHORBIACEAE          | CYPERACEAE               |
| 6.   | ACANTHACEAE            | FABACEAE                 |
| 7.   | ASTERACEAE             | MORACEAE                 |
| 8.   | CYPERACEAE             | ANNONACEAE               |
| 9.   | LAMIACEAE              | ARECACEAE                |
| 10.  | URTICACEAE             | MELIACEAE                |

**Table 4**  
**Important Timber Yielding Plants**

| Botanical Name | Local Name |
|----------------|------------|
|----------------|------------|

**Hard wood :**

|                                  |               |
|----------------------------------|---------------|
| <i>Pterocarpus dalbergioides</i> | Padauk        |
| <i>Manilkara littoralis</i>      | Khari Mahua   |
| <i>Albizia lebbeck</i>           | Koko          |
| <i>Calophyllum soulattri</i>     | Lalchini      |
| <i>Terminalia procera</i>        | White Bombway |
| <i>T. hialata</i>                | White chuglam |
| <i>T. manii</i>                  | Black chuglam |
| <i>Artocarpus chaplasha</i>      | Toungpeinne   |

**Soft wood :**

|                                |        |
|--------------------------------|--------|
| <i>Dipterocarpus</i> spp.      | Gurjan |
| <i>Pterocymbium tinctorium</i> | Papita |

|                                    |             |
|------------------------------------|-------------|
| <i>Pterygota alata</i>             |             |
| <i>Bombax insigne</i>              | Didu        |
| <i>Canarium euphyllum</i>          | Dhup        |
| <i>Planchonia andamanica</i>       | Red Bombway |
| <i>Sideroxylon longipetiolatum</i> | Lamba pathi |

**Table 5**  
**Less Known Timber Yielding Plants**

| Botanical Name                   | Families         |
|----------------------------------|------------------|
| <i>Sageraea elliptica</i>        | Annonaceae       |
| <i>Scolopia crenata</i>          | Ficourtiaceae    |
| <i>Xanthophyllum andamanicum</i> | Xanthophyllaceae |
| <i>Cratoxylum formosum</i>       | Hypericaceae     |
| <i>Sterculia macrophylla</i>     | Sterculiaceae    |
| <i>Ailanthus kurzii</i>          | Simaroubaceae    |
| <i>Garuga pinnata</i>            | Burseraceae      |
| <i>Amoora rohituka</i>           | Meliaceae        |
| <i>Dracontomelon mangiferum</i>  | Anacardiaceae    |
| <i>Mangifera camptosperma</i>    | Anacardiaceae    |
| <i>Adenanthera pavonina</i>      | Mimosaceae       |
| <i>Chydenanthus excelsus</i>     | Baringtoniaceae  |
| <i>Duabanga grandiflora</i>      | Sonneratiaceae   |
| <i>Tetrameles nudiflora</i>      | Tetramelaceae    |

**Table 6**  
**Wild Food Plants Used by the Tribals of Bay Islands**

| Part used     | Plants                        | Ni. | Sh. | On. |
|---------------|-------------------------------|-----|-----|-----|
| <b>Bulbs</b>  | <i>Dioscorea glabra</i>       | +   | +   | +   |
| <b>Tubers</b> | <i>Yacca leontopetaloides</i> | +   | +   |     |
|               | <i>Colocasia esculenta</i>    |     | +   |     |

|                         |                                |                           |   |   |  |
|-------------------------|--------------------------------|---------------------------|---|---|--|
| Fruits                  | <i>Morinda citrifolia</i>      | +                         | + |   |  |
|                         | <i>Nypa fruticans</i>          | +                         |   |   |  |
|                         | <i>Sterculia rubiginosa</i>    | +                         |   |   |  |
|                         | <i>Syzygium samarangense</i>   | +                         |   |   |  |
|                         | <i>Annona squamosa</i>         | +                         |   |   |  |
|                         | <i>Pandanus leram</i>          | +                         | + | + |  |
|                         | <i>Artocarpus incisa</i>       | +                         | + |   |  |
|                         | <i>A. integrifolia</i>         | +                         | + |   |  |
|                         | <i>Baccaurea sapida</i>        |                           |   | + |  |
|                         | <i>Careya valida</i>           |                           |   | + |  |
|                         | <i>Champereia griffithiana</i> |                           |   | + |  |
|                         | <i>Cyclea peltata</i>          |                           |   | + |  |
|                         | <i>Hunteria zeylanica</i>      |                           |   | + |  |
|                         | <i>Manilkara litoralis</i>     |                           |   | + |  |
|                         | <i>Pometia pinnata</i>         |                           |   | + |  |
|                         | <i>Salacia chinensis</i>       |                           |   | + |  |
|                         | <i>Semicarpus kurzii</i>       |                           |   | + |  |
|                         | <i>Ximenia americana</i>       |                           |   | + |  |
|                         | <i>Ardisia solanacea</i>       |                           | + |   |  |
|                         | <i>Calamus</i> spp.            |                           | + |   |  |
|                         | <i>Citrus</i> spp.             |                           | + |   |  |
|                         | <i>Terminalia catappa</i>      |                           | + |   |  |
|                         | <i>T. manii</i>                |                           | + |   |  |
|                         | Stem/Leaf                      | <i>Flagellaria indica</i> |   | + |  |
|                         |                                | <i>Celosia argentea</i>   |   | + |  |
| <i>Ipomoea aquatica</i> |                                |                           | + |   |  |

Ni : Nicobarese Sh : Shompens On : Onges.

**Table 7**  
**List of Medicinal Plants Used by the Tribals of**  
**Andaman & Nicobar Islands**

| Plants                     | Plant part | Diseases                |
|----------------------------|------------|-------------------------|
| <i>Adenia penangiana</i>   | lf         | Body & chest pain       |
| <i>Adenostemma lavenia</i> | lf         | Chest pain              |
| <i>Aerva lanata</i>        | lf         | Fever                   |
| <i>Ageratum conyzoides</i> | lf         | Piles, wounds, eye pain |

| Plants                        | Plant part | Diseases                                 |
|-------------------------------|------------|--|
| <i>Alstonia macrophylla</i>   | rt, bk     | Fever, stomachache                       |
| <i>A. kurzii</i>              | rt, bk     | Fever                                    |
| <i>Amomum fenzlii</i>         | rh         | Fever, stomach disorder                  |
| <i>Ardisia solanacea</i>      | lf         | Mumps                                    |
| <i>Ardisia oxyphylla</i>      | lf         | Fertility                                |
| <i>Argyreia hookeri</i>       | lf         | Swellings                                |
| <i>Aristolochia tagala</i>    | lf         | Malarial fever                           |
| <i>Blumea balsamifera</i>     | lf         | Chest pain                               |
| <i>Breynia retusa</i>         | lf         | Swellings & pain                         |
| <i>Caesalpinia bonduc</i>     | sd         | M. Fever, colic pain                     |
| <i>Callicarpa longifolia</i>  | lf         | Cuts, wounds                             |
| <i>Calophyllum inophyllum</i> | lf, resin  | Night blindness, bone fracture           |
| <i>Casearia grawiaefolia</i>  | lf         | Dysentery                                |
| <i>Cassia alata</i>           | lf         | Skin diseases                            |
| <i>Cassia occidentalis</i>    | lf         | Skin diseases, fever                     |
| <i>Catharanthus roseus</i>    | lf         | Eye diseases                             |
| <i>Celosia argentea</i>       | lf         | Cuts, wounds                             |
| <i>Claoxylon indicum</i>      | lf         | Wounds, Headache                         |
| <i>Clerodendrum inerme</i>    | lf         | Body & joints pain                       |
| <i>C. viscosum</i>            | bk         | Malarial fever                           |
| <i>C. paniculatum</i>         | lf         | Ulcer, wounds                            |
| <i>Colubrina asiatica</i>     | lf         | Malarial fever                           |
| <i>Cordia grandis</i>         | lf         | Stomachache                              |
| <i>Costus speciosus</i>       | rh         | Asthma, anthelmentic<br>Stomach disorder |
| <i>Crataeva religiosa</i>     | lf         | Rheumatic pain                           |
| <i>Croton argyratus</i>       | sd         | Stomach disorder                         |
| <i>Cycas rumphii</i>          | bk         | Swellings                                |
| <i>Desmodium umbellatum</i>   | lf         | Fever                                    |
| <i>Dischidia major</i>        | lf         | Bone fracture                            |
| <i>Donax cannaeformis</i>     | rt, lf     | Fever, spinal pain                       |

| Plants                         | Plant part  | Diseases                |
|--------------------------------|-------------|-------------------------|
| <i>Dracaena angustifolia</i>   | lf          | Stomacache              |
| <i>Drynaria quercifolia</i>    | lf          | Anthelmintic, body pain |
| <i>Eclipta alba</i>            | whole plant | Filaria, jaundice       |
| <i>Eria bractescens</i>        | lf          | Malarial fever          |
| <i>Erioglossum rubiginosum</i> | lf, fr.     | Antifertility           |
| <i>Eupatorium odoratum</i>     | lf          | Cuts, wounds            |
| <i>Euphorbia atoto</i>         | lf          | Ulcer, skin diseases    |
| <i>E. hirta</i>                | lf          | Dysentery, wounds       |
| <i>Garcinia nervosa</i>        | lf          | Body pain               |
| <i>Globa marantia</i>          | rh          | Asthma, Eye trouble     |
| <i>Glochidion calocarpum</i>   | sd          | Skin diseases           |
| <i>Glycosmis arborea</i>       | lf          | Headache                |
| <i>Hedyotis biflora</i>        | lf          | Ulcer, headache         |
| <i>Hernandia peltata</i>       | lf          | Ulcer, headache         |
| <i>Hibiscus tiliaceus</i>      | lf          | Urinary trouble, sores  |

lf : Leaf; rt : Root; bk : Bark; rh : Rhizome; sd : Seed

**Table 8**  
**List of Rare & Endangered Endemic Taxa of**  
**Andaman & Nicobar Islands**

|                                       |             |  |    |
|---------------------------------------|-------------|--|----|
| <b>ACANTHACEAE</b>                    |             |  |    |
| <i>Hypoestis andamanensis</i> Thoth.  | M. Andaman  |  | TC |
| <i>Strobilanthes andamansis</i> Bor.  | Andaman     |  | TC |
| <b>AMARYLLIDACEAE</b>                 |             |  |    |
| <i>Crinum pusillum</i> Herb.          | Nicobar Is. |  | TC |
| <b>ANACARDIACEAE</b>                  |             |  |    |
| <i>Mangifera andamanica</i> King      | S. Andaman  |  | TL |
| <b>ANNONACEAE</b>                     |             |  |    |
| <i>Atrabotrys nicobarianus</i> D. Das | Gt. Nicobar |  | TC |

|  |              |    |
|--|--------------|----|
| <i>Miliusa tectona</i> Hutch. ex Parkin.                         | Andaman      | TL |
| <i>Mitrephora andamanica</i> Thoth. & Das                        | Baratang Is. | TL |
| <i>Orophaea salicifolia</i> Hutch.                               | M. Andaman   | TC |
| <i>O. torulosa</i> Hutch.  | M. Andaman   | TC |
| <i>Popowia parvifolia</i> Kurz                                   | Nicobar Is.  | TC |
| <i>Sageraea Ilsteri</i> var.<br><i>andamanica</i> Chatt. & Mukh. | Andaman      | TL |
| <i>Uvaria hamiltonii</i> var. <i>kurzii</i> King                 | Andaman      | TC |
| <i>U. nicobarica</i> Raiz. & Sahn                                | Gt. Nicobar  | TC |

**ARACEAE**

|  |             |    |
|--|-------------|----|
| <i>Aglaonema nicobarica</i> Hk. f.                 | Nicobar Is. | TC |
| <i>Amorphophalus carnosus</i> Engl.                | Andaman     | TC |
| <i>A. longistylus</i> Kurz ex Hk.f.                | S. Andaman  | TC |
| <i>A. oncophyllus</i> Prain ex Hk.f.               | S. Andaman  | TC |
| <i>Arisaema saddlepeakense</i> Rao &<br>Srivastava | N. Andaman  | TC |

**ARECACEAE**

|                                    |              |    |
|------------------------------------|--------------|----|
| <i>Bentinckia nicobarica</i> Becc. | Kamorta Is.  | TL |
| <i>Calamus dilaceratgus</i> Becc.  | Andaman      | TC |
| <i>C. nicobaricus</i> Becc.        | Nicobar Is.  | TC |
| <i>Corypha macropoda</i> Kurz.     | S. Andaman   | TC |
| <i>Korthalsia rogersii</i> Becc.   | Havelock Is. | TL |

**BOMBACACEAE**

|  |               |    |
|--|---------------|----|
| <i>Bombax insigne</i> var. <i>polystemon</i> Prain | Narcondam Is. | TC |
|--|---------------|----|

**CAESALPINIACEAE**

|  |             |    |
|--|-------------|----|
| <i>Bauhinia nicobarica</i> (Balak. &<br>Thoth.) Bennet | Gt. Nicobar | TL |
|--|-------------|----|

**CELASTRACEAE**

|                                    |             |    |
|------------------------------------|-------------|----|
| <i>Hippocratea andamanica</i> King | S. Andaman  | TC |
| <i>H. nicobarica</i>               | Nicobar Is. | TC |

**CLUSIACEAE**

|                                   |             |    |
|-----------------------------------|-------------|----|
| <i>Garcinia cadelliana</i> King   | S. Andamans | TC |
| <i>G. calycina</i> Kurz           | Kamorta Is. | TC |
| <i>G. kingii</i> Pierre ex Vesque | Andaman     | TC |
| <i>Mesua manii</i> (King) Kost.   | S. Andaman  | TC |

**CONNARACEAE**

|                                     |             |    |
|-------------------------------------|-------------|----|
| <i>Connarus nicobaricus</i> King    | Gt. Nicobar | TC |
| <i>Ellipanthus calophyllus</i> Kurz | S. Andaman  | TL |

**CYPERACEAE**

|   |            |    |
|---|------------|----|
| <i>Cyperus kurzii</i> Cl.               | Andaman    | TC |
| <i>Hypolytrum balakrishnani</i> Nooteb. | M. Andaman | TC |

**DICHAPE'TALACEAE**

|   |            |    |
|---|------------|----|
| <i>Dichapetalum gelonoides</i> var.<br><i>andamanicum</i> (King) Leenh. | S. Andaman | TL |
|---|------------|----|

**DIOSCOREACEAE**

|   |         |    |
|---|---------|----|
| <i>Dioscorea rogersii</i> Prain & Burk. | Andaman | TC |
| <i>D. vexans</i> Prain & Burk.          | Andaman | TC |

**EUPHORBIACEAE**

|  |             |    |
|--|-------------|----|
| <i>Antidesma andamanicum</i> Hook f.                               | S. Andaman  | TC |
| <i>Cnesmone javanica</i> var.<br><i>glabriuscula</i> Balak. & Nair | S. Andaman  | TC |
| <i>Bridelia kurzii</i> Hook. f.                                    | Kamorta Is. | TC |
| <i>Drypetes andamanica</i> (Kurz) Pax &<br>Hoffm.                  | S. Andaman  | TL |
| <i>D. leiocarpa</i> (Kurz) Pax & Hoffm.                            | S. Andaman  | TC |
| <i>Excoecaria rectinervis</i>                                      | Katchal Is. | TC |
| <i>Glochidion andamanicum</i> Kurz                                 | S. Andaman  | TL |
| <i>Sphyrantha lutescens</i> (Kurz) Pax &<br>Hoffm.                 | M. Andaman  | TC |

**GESNERIACEAE**

|                                       |             |    |
|---------------------------------------|-------------|----|
| <i>Cyrtandra burttii</i> Balak.       | Gt. Nicobar | TL |
| <i>C. occidentalis</i> Balak. & Burt. | Gt. Nicobar | TL |

**ICACINACEAE**

|                               |            |    |
|-------------------------------|------------|----|
| <i>Gomphandra comosa</i> King | S. Andaman | TC |
|-------------------------------|------------|----|

**LAMIACEAE**

|                                     |            |    |
|-------------------------------------|------------|----|
| <i>Scutellaria andamanica</i> Prain | S. Andaman | TL |
|-------------------------------------|------------|----|

**LAURACEAE**

|                                      |             |    |
|--------------------------------------|-------------|----|
| <i>Cryptocarya ferrasi</i> King      | M. Andaman  | TC |
| <i>Litsea leiantha</i> (Kurz) Hk.f.  | S. Andaman  | TL |
| <i>Neolitsea andamanica</i> Kosterm. | Andaman     | TC |
| <i>N. nicobarica</i> Kosterm         | Nicobar Is. | TC |

**LOGANIACEAE**

|                                      |               |    |
|--------------------------------------|---------------|----|
| <i>Strychnos narcondamensis</i> Hill | Narcondam Is. | TC |
|--------------------------------------|---------------|----|

**LORANTHACEAE**

|                                |            |    |
|--------------------------------|------------|----|
| <i>Ginolla andamanica</i> Kurz | S. Andaman | TC |
|--------------------------------|------------|----|

**MARANTACEAE**

|   |             |    |
|---|-------------|----|
| <i>Phrynium cadellianum</i> King ex Baker | Andaman     | TC |
| <i>P. paniculatum</i> Balakr.             | Gt. Nicobar | TL |

**MELIACEAE**

|                           |            |    |
|---------------------------|------------|----|
| <i>Aglaiia fusca</i> King | Andaman    | TC |
| <i>Amoora manii</i> King  | S. Andaman | TL |

**MENISPERMACEAE**

|                                   |            |    |
|-----------------------------------|------------|----|
| <i>Stephania andamanica</i> Diels | S. Andaman | TC |
| <i>Tinospora andamanica</i> Diels | Andamans   | TC |

**MORACEAE**

|                                |            |    |
|--------------------------------|------------|----|
| <i>Ficus andamanica</i> Corner | S. Andaman | TC |
|--------------------------------|------------|----|

**MYRISTICACEAE**

|  |         |    |
|--|---------|----|
| <i>Horsfieldia macrocarpa</i> var.<br><i>canarioides</i> (King) Sinclair | Andaman | TC |
|--|---------|----|

**MYRSINACEAE**

|  |             |    |
|--|-------------|----|
| <i>Ardisia andamanica</i> var. <i>effusa</i> Cl. | S. Andaman  | TC |
| <i>Embelia microcalyx</i> Kurz                   | Katchal Is. | TC |

**MYRTACEAE**

|   |             |    |
|---|-------------|----|
| <i>Cleistocalyx nicobaricus</i> (King) Merr.<br>& Perry | Katchal Is. | TL |
| <i>Syzygium andamanicum</i> (King) Balak.               | Andaman     | TL |
| <i>S. kurzii</i> var. <i>andamanicum</i> King           | S. Andaman  | TL |
| <i>S. manii</i> (King) Balak.                           | M. Andaman  | TL |

**OLEACEAE**

|   |               |    |
|---|---------------|----|
| <i>Jasminum andamanicum</i> Balak. & Nair | S & M Andaman | TC |
| <i>J. unifoliolatum</i> Balak. & Nair     | N. Andaman    | TC |

**ORCHIDACEAE**

|   |               |    |
|---|---------------|----|
| <i>Anoectochilus nicobaricus</i><br>Balak. & Chakrab. | Gt. Nicobar   | TL |
| <i>Dendrobium gunnarii</i> P.S.N. Rao                 |               |    |
| <i>D. tenuicaule</i> Hk.f.                            | M. Andaman    | TL |
| <i>Eulophia nicobarica</i> Balak. & Nair              | Car Nicobar   | TL |
| <i>Habenaria andamanica</i> Hk.f.                     | S. Andaman    | TL |
| <i>Malleola andamanica</i> Balak. & Bharg.            | S & L Andaman | TC |
| <i>Phalaenopsis speciosa</i> Reichb.f.                | Andaman       | TC |
| <i>Taeniophyllum andamanicum</i><br>Balak. & Bharg.   | Baratang Is.  | TC |
| <i>Zeuxine andamanica</i> K. & P.                     | S. Andaman    | TL |
| <i>Z. rolifiana</i> K. & P.                           | S. Andaman    | TC |

**RUBIACEAE**

|   |                             |    |
|---|-----------------------------|----|
| <i>Diplospora andamanica</i> Balak. & Nair        | N. Andaman                  | TL |
| <i>Hedyotis andamanica</i> Kurz                   | S. Andaman<br>& Nicobar Is. | TC |
| <i>H. congesta</i> var. <i>nicobarica</i> King    | Nicobar Is.                 | TC |
| <i>Ixora andamanica</i> Bremek.                   | Andaman                     | TC |
| <i>I. capituliflora</i> Bremek.                   | Andaman                     | TC |
| <i>I. cuneifolia</i> var. <i>macrocarpa</i> Kurz  | Pulo Milo                   | TC |
| <i>I. hymenophylla</i> Bremek.                    | Andaman                     | TC |
| <i>I. longibracteata</i>                          | Nicobar Is.                 | TC |
| <i>I. tenuifolia</i>                              | Nicobar Is.                 | TC |
| <i>Nauclea gageana</i> (King) Merr.               | Andaman                     | TC |
| <i>Ophiorrhiza nicobarica</i> Balak.              | Gt. Nicobar                 | TL |
| <i>Prismatomeris andamanica</i> Ridl.             | S. Andaman                  | TC |
| <i>Psychotria andamanica</i> Kurz                 | Andaman                     | TC |
| <i>P. helferi</i> var. <i>angustifolia</i> King   | S. Andaman                  | TC |
| <i>P. nicobarica</i> Kurz                         | Katchal                     | TC |
| <i>P. pendula</i> Hk.f.                           | S. Andaman                  | TC |
| <i>P. polyneura</i> var.<br><i>longipetiolata</i> | Andaman                     | TC |
| <i>P. tylophora</i> Kurz                          | Katchal Is.                 | TC |
| <i>Pubistylis andamanensis</i> Thoth.             | S. Andaman                  | TC |
| <i>Urophyllum andamanicum</i>                     | S. Andaman                  | TL |
| <i>Wendlandia andamanica</i> Cowan                | N. Andaman                  | TL |

**SANTALACEAE**

|                               |             |    |
|-------------------------------|-------------|----|
| <i>Henslowia erythrocarpa</i> | Kamorta Is. | TC |
|-------------------------------|-------------|----|

**SAPOTACEAE**

|                              |         |    |
|------------------------------|---------|----|
| <i>Mimusops andamanensis</i> | Andaman | TC |
|------------------------------|---------|----|

**VERBENACEAE**

|   |            |    |
|---|------------|----|
| <i>Clerodendrum lankawiense</i> var.<br><i>andamanense</i> Moldenke | S. Andaman | TL |
| <i>Vitex wimperleyii</i> Kurz                                       | S. Andaman | TL |

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**VITACEAE**

|   |         |    |
|---|---------|----|
| <i>Tetrastigma andamanicum</i> (King)<br>Suesseng | Andaman | TC |
|---|---------|----|

**ZINGIBERACEAE**

|   |            |    |
|---|------------|----|
| <i>Buesenbergia albo-lutea</i>              | Andaman    | TC |
| <i>Globba pauciflora</i> King ex Baker      | S. Andaman | TL |
| <i>Kaempferia siphonantha</i> King ex Baker | N. Andaman | TC |

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TL : Type Locality TC : Type Collection.



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**Key to the Families**

(P.M. Padhey and B.K. Sinha)

|       |   |                   |
|-------|---|-------------------|
| 1 a.  | Ovules naked .....  | 138               |
| b.    | Ovules enclosed.....  | 3                 |
| 2 a.  | Leaves usually reticulately veined; flowers 4-5 merous; cotyledons 2.....   | 4                 |
| b.    | Leaves parallel veined; flowers 3-merous; cotyledon 1.....  | 140               |
| 3 a.  | Perianth present, biseriate or multiseriate.....  | 4                 |
| b.    | Perianth absent or if present uniseriate .....  | 110               |
| 4 a.  | Petals all free; stamens not epipetalous .....  | 5                 |
| b.    | Petals united; stamens mostly epipetalous .....   | 77                |
| 5 a.  | Sepals usually free or rarely connate at the base; petals and stamens hypogynous; ovary superior .....  | 6                 |
| b.    | Sepals united at least at the lower half; petals and stamens perigynous; ovary inferior or superior often enclosed within the hypanthium.....   | 55                |
| 6 a.  | Sepals distinct, not adnate to the ovary; stamens indefinite.....   | 7                 |
| b.    | Sepals adnate to the ovary; stamens usually definite, inserted upon the inner or outer face of the disc forming a ring or a cushion at the base of ovary or break up into glands..... | 33                |
| 7 a.  | Carpels many, rarely one, free .....  | 8                 |
| b.    | Carpels usually 1 or 2, sometimes more, united or rarely free.....  | 13                |
| 8 a.  | Fresh water plants.....   | 6. NYMPHAEACEAE   |
| b.    | Terrestrial plants .....  | 9                 |
| 9 a.  | Flowers unisexual.....  | 5. MENISPERMACEAE |
| b.    | Flowers bisexual.....   | 10                |
| 10 a. | Perianth 2-many seriate, flowers 3-4 merous.....  | 11                |
| b.    | Perianth 2-seriate; flowers 5-merous.....   | 12                |
| 11 a. | Leaves gland dotted, exstipulate; anthers extrorse .....  | 4. ANNONACEAE     |
| b.    | Leaves coriaceous, stipulate; anthers introrse.....   | 3. MAGNOLIACEAE   |
| 12 a. | Trees or woody climbers; sepals persistent .....  | 2. DILLENIACEAE   |
| b.    | Climbing shrubs; sepals caducous .....  | 1. RANUNCULACEAE  |

- 13 a. Ovary 1-celled .....14  
 b. Ovary 2-many celled..... 20
- 14 a. Placentation free central .....19. **PORTULACACEAE**  
 b. Placentation parietal .....15
- 15 a. Gynophore/androgynophore present.....7. **CAPPARACEAE**  
 b. Plants not as above .....16
- 16 a. Herbs.....17  
 b. Trees or shrubs .....18
- 17 a. Plants with milky juice; leaves deeply incised; sepals 2-3, sometimes caducous; petals usually 4 .....15. **PAPAVERACEAE**  
 b. Plants devoid of milky juice; leaves not as above; sepals usually 4-5; petals usually as many as sepals .....16. **BRASSICACEAE**
- 18 a. Stipules present; anther connectives produced beyond the cells.....  
 .....8. **VIOLACEAE**  
 b. Stipules usually none or rarely minute; anther connectives not produced  
 .....19
- 19 a. Fruits echinate .....17. **BIXACEAE**  
 b. Fruits not echinate .....9. **FLACOURTIACEAE**
- 20 a. Stamens monoadelphous or in bundles .....21  
 b. Stamens free..... 26
- 21 a. Leaves opposite, gland dotted/pellucid, papery ...13. **HYPERICACEAE**  
 b. Leaves alternate, not gland dotted .....22
- 22 a. Anthers 1-celled .....23  
 b. Anthers 2-celled .....24
- 23 a. Tall trees; leaves digitately compound; pollen grains smooth; style as many as carpels; fruit a woody capsule .....24. **BOMBACACEAE**  
 b. Herbs, shrubs or rarely small trees; leaves simple, lobed; pollen grains rough or granular; styles connate below or throughout their length; fruit a dehiscent capsule, not woody.....23. **MALVACEAE**
- 24 a. Staminal filaments united at least at the base.....25. **STERCULIACEAE**  
 b. Staminal filaments free near to the base.....25

|       |   |                                       |
|-------|---|---------------------------------------|
| 25 a. | Leaves palmnerved; petals not fringed .....   | 26. TILIACEAE                         |
| b.    | Leaves palmnerved; petals fringed.....  | 27. ELAEOCARPACEAE                    |
| 26 a. | Stamens 4-8, hypogynous .....   | 27                                    |
| b.    | Stamens indefinite, subperigynous .....   | 29                                    |
| 27 a. | Herbs or rarely shrubs .....  | 11. POLYGALACEAE                      |
| b.    | Trees.....  | 28                                    |
| 28 a. | Leaves spirally arranged; bark warty with prominent light brown lenticels; racemes terminal ..... | 10. PITTOSPORACEAE                    |
| b.    | Leaves alternate; bark pale grey, smooth; racemes axillary.....                                   | 12. XANTHOPHYLLACEAE                  |
| 29 a. | Woody climbers; branches sympodial with circinate woody hooks.....                                | 22. ANCISTROCLADACEAE                 |
| b.    | Trees or shrubs; woody hooks absent .....   | 30                                    |
| 30 a. | Leaves opposite; flowers unisexual or polygamous, rarely bisexual.....                            | 14. CLUSIACEAE                        |
| b.    | Leaves alternate; flowers bisexual.....   | 31                                    |
| 31 a. | Calyx lobes usually enlarged in fruits .....  | 21. DIPTEROCARPACEAE                  |
| b.    | Calyx lobes not as above.....   | 32                                    |
| 32 a. | Anthers opening by apical pores or short slits .....  | 20. ACTINIDIACEAE (Saurauiceae)       |
| b.    | Anthers opening longitudinally, rarely poricidal.....   | 19. THEACEAE (incl. Ternstroemiaceae) |
| 33 a. | Placentation parietal; fruits 3-valved elongate capsule .....                                     | 47. MORINGACEAE                       |
| b.    | Placentation axile; fruits not elongated .....  | 34                                    |
| 34 a. | Ovules pendulous .....  | 35                                    |
| b.    | Ovules erect or ascending .....   | 48                                    |
| 35 a. | Raphe ventral.....  | 36                                    |
| b.    | Raphe dorsal .....  | 44                                    |
| 36 a. | Disc annular, obscure .....   | 37                                    |
| b.    | Disc large, tumid .....   | 39                                    |

- 37 a. Leaves opposite; fruits samaroid, winged nut .....30. **MALPIGHIACEAE**  
 b. Leaves alternate; fruits not as above .....38
- 38 a. Perfect stamens as many as petals; fruits capsular .....28. **LINACEAE**  
 b. Perfect stamens twice as many as petals; fruit a drupe.....  
 .....29. **ERYTHROXYLACEAE**
- 39 a. Resinous trees .....34. **BURSERACEAE**  
 b. Plants not as above .....40
- 40 a. Leaves usually strongly aromatic, dotted with translucent glands .....  
 .....31. **RUTACEAE**  
 b. Leaves not as above .....41
- 41 a. Leaves simple .....42  
 b. Leaves compound .....43
- 42 a. Stamens many; fruits of 3-10 sessile drupes .....33. **OCHNACEAE**  
 b. Stamens 10; fruits of 1-5, 1-seeded samaroid.....32. **SIMAROUBACEAE**
- 43 a. Staminal filaments united to form a deep tube, scales absent .....  
 .....35. **MELIACEAE**  
 b. Staminal filaments not united, often with a scale at the base.....  
 .....32. **SIMAROUBACEAE**
- 44 a. Leaves stipulate .....36. **DICHAPETALACEAE**  
 b. Leaves exstipulate .....45
- 45 a. Fertile stamens anisomerous .....37. **OLACACEAE**  
 b. Fertile stamens isomerous .....46
- 46 a. Stamens alternate with petals .....38. **ICACINACEAE**  
 b. Stamens opposite to the petals .....47
- 47 a. Stamens adnate to the base of perianth segments .....37. **OLACACEAE**  
 b. Stamens free or slightly adnate to the base of perianth segments .....  
 .....39. **OPILIACEAE**
- 48 a. Calyx segments imbricate or valvate; stamens as many as petals,  
 antipetalous .....49  
 b. Calyx segments always imbricate; stamens twice as many as petals,  
 alternate with petals .....53

|       |  |                     |
|-------|--|---------------------|
| 49 a. | Staminal disc conspicuous, cup-shaped .....  | 40. CELASTRACEAE    |
| b.    | Staminal disc not as above .....   | 50                  |
| 50 a. | Fruit a drupe, capsule or samaroid .....   | 41. RHAMNACEAE      |
| b.    | Fruit a berry.....   | 51                  |
| 51 a. | Plants without tendrils .....  | 48. CONNARACEAE     |
| b.    | Plants with tendrils .....   | 52                  |
| 52 a. | Plants usually scandent, cirrhose shrubs; stamens distinct, free; ovary usually 2-celled ..... | 42. VITACEAE        |
| b.    | Erect shrubs, ecirrhose; stamens connate with disc; ovary 3-6 celled ... ..                    | 43. LEEACEAE        |
| 53 a. | Plants with milky or acrid juice; flowers regular .....  | 46. ANACARDIACEAE   |
| b.    | Plants not as above; flowers irregular .....   | 54                  |
| 54 a. | Flowers polygamous; fruit indehiscent capsule sometimes winged .....                           | 44. SAPINDACEAE     |
| b.    | Flowers bisexual; fruit drupe; 1-celled, 1-seeded .....  | 45. SABIACEAE       |
| 55 a. | Fruits leguminous (Pod) .....  | 56                  |
| b.    | Fruits various but not as above .....  | 58                  |
| 56 a. | Flowers actinomorphic.....   | 51. MIMOSACEAE      |
| b.    | Flowers zygomorphic .....  | 57                  |
| 57 a. | Flowers papilionaceous, odd petal adaxial .....  | 49. FABACEAE        |
| b.    | Flowers not as above; odd petal abaxial .....  | 50. CAESALPINIACEAE |
| 58 a. | Leaves fleshy .....  | 54. CRASSULACEAE    |
| b.    | Leaves not fleshy .....  | 59                  |
| 59 a. | Corona in corolla and gynophore present .....  | 65. PASSIFLORACEAE  |
| b.    | Flowers not as above .....   | 60                  |
| 60 a. | Stamens indefinite .....   | 61                  |
| b.    | Stamens definite .....   | 67                  |
| 61 a. | Calyx free; ovary superior .....   | 62                  |
| b.    | Calyx more or less adnate to the ovary; ovary inferior .....                                   | 63                  |

- 62 a. Leaves stipulate .....52. **ROSACEAE**  
 b. Leaves exstipulate .....61. **LYTHRACEAE**
- 63 a. Herbs; leaves oblique at the base; flowers unisexual; capsule winged ...  
 .....67. **BEGONIACEAE**  
 b. Trees; leaf base equal; flowers bisexual; fruit a berry or fibrous drupes,  
 never winged .....64
- 64 a. Leaves opposite, punctately glandular, with intramarginal nerves .....  
 .....57. **MYRTACEAE**  
 b. Leaves alternate, not glandular, without intramarginal nerves .....65
- 65 a. Ovary 2-4 celled .....58. **LECYTHIDACEAE**  
 b. Ovary 1-celled .....66
- 66 a. Fruit a berry, crowned by enlarged calyx limb .....71. **ALLANGIACEAE**  
 b. Fruit a capsule, opening at vertex (top) .....68. **DATISCACEAE**
- 67 a. Ovary inferior or half superior .....68  
 b. Ovary superior .....76
- 68 a. Plants always with tendrils; flowers unisexual; stamens syngenesious ...  
 .....66. **CUCURBITACEAE**  
 b. Plants without tendrils; flowers not as above; stamens not syngenesious  
 .....69
- 69 a. Fruits angular or winged .....56. **COMBRETACEAE**  
 b. Fruits not winged .....70
- 70 a. Mangrove plants; leaves opposite, stipulate; fruits covered with persistent  
 calyx teeth; seeds with viviparous germination .....  
 .....55. **RHIZOPHORACEAE**  
 b. Plants not as above; leaves usually alternate, if opposite then exstipulate;  
 fruit and seed not as above .....71
- 71 a. Flowers in compound umbels or paniced heads .....69. **ARALIACEAE**  
 b. Flowers not as above .....72
- 72 a. Ovules usually basal, sometimes half ascending .....73  
 b. Ovules pendulous .....75
- 73 a. Anthers opening by slits .....64. **ONAGRACEAE**

- b. Anthers opening by pores .....74
- 74 a. Leaves palmately nerved; ovary usually 4-5 (rarely 3-6) celled .....  
.....59. MELASTOMATACEAE
- b. Leaves pinnately nerved; ovary 1-celled .....60. MEMYCYLACEAE
- 75 a. Leaves opposite or sub-opposite .....53. ESCALIONACEAE
- b. Leaves usually alternate .....70. CORNACEAE
- 76 a. Fruits capsular 2 celled .....63. CRYPTERONIACEAE
- b. Fruits many celled, berry .....62. SONNERATIACEAE
- 77 a. Ovary completely inferior or half superior .....78
- b. Ovary superior .....82
- 78 a. Inflorescence an involucre head; calyx absent or variously modified into  
pappus; anthers united into a tube around the style .....73. ASTERACEAE
- b. Inflorescence not as above; calyx present; anthers free or connivent in a  
ring around the style .....79
- 79 a. Leaves opposite, stipulate; stipule inter or intrapetiolar .....  
.....72. RUBIACEAE
- b. Leaves alternate or radical, exstipulate .....80
- 80 a. Plants succulent .....74. GOODENIACEAE
- b. Plants not as above .....81
- 81 a. Flowers in compact, conical spike; capsules circumscissile .....  
.....76. SPHENOCLEACEAE
- b. Flowers solitary, axillary; capsules loculicidal, 2-valved.....  
.....75. LOBELIACEAE
- 82 a. Plants insectivorous or parasite .....83
- b. Plants not as above .....85
- 83 a. Insectivorous plants .....95. LENTIBULARIACEAE
- b. Plants not as above .....84
- 84 a. Stem parasites .....91. CUSCUTACEAE
- b. Root parasites .....94. OROBANCHACEAE
- 85 a. Carpels more than 2 .....86
- b. Carpels 2 .....90

- 86 a. Flowers usually 1-sexual; stamens inserted on the receptacle .....80. **EBENACEAE**  
 .....80. **EBENACEAE**  
 b. Flowers bisexual; stamens inserted in the corolla tube .....87
- 87 a. Herbs or undershrubs; calyx glandular; fruits linear, capsule exerted from the calyx .....77. **PLUMBAGINACEAE**  
 b. Trees, shrubs or woody twiners; calyx eglandular; fruit a berry with hard wall .....88
- 88 a. Plants with milky latex .....79. **SAPOTACEAE**  
 b. Plants devoid of milky juice, if at all then watery sap.....89
- 89 a. Stamens usually 3-5 or 7; ovary 1-celled .....78. **MYRSINACEAE**  
 b. Stamens many in 1 or several series. Ovary 2-many celled .....81. **SYMPLOCACEAE**  
 .....81. **SYMPLOCACEAE**
- 90 a. Plants with greenish-yellow sap or latex .....91  
 b. Plants not as above .....92
- 91 a. Pollinia absent; style 1; stigma dumbel shaped .....83. **APOCYNACEAE**  
 b. Pollinia present; styles usually 2; stigma 5 angled or flat or broadly conical or produced beyond the column .....84. **ASCLEPIDACEAE**  
 .....84. **ASCLEPIDACEAE**
- 92 a. Flowers zygomorphic .....93  
 b. Flowers actinomorphic .....102
- 93 a. Leaves compound; fruit elongate, loculicidal or septicidally 2-valved capsule, seeds winged .....97. **BIGNONIACEAE**  
 .....97. **BIGNONIACEAE**  
 b. Leaves usually simple; fruits and seeds not as above .....94
- 94 a. Stem with swollen joints; bracts conspicuous .....95  
 b. Stem not as above; bracts minute or absent .....96
- 95 a. Lianas; bracteoles large like spathaceous calyx; calyx minute, annular or 10-16 toothed; corolla lobes contorted; ovules 2 in each locule .....100. **THUNBERGIACEAE**  
 .....100. **THUNBERGIACEAE**  
 b. Herbs or shrubs; bracteoles not as above; calyx distinct 4-5 fid; corolla lobes not contorted; ovules more than 2 in each locule .....99. **ACANTHACEAE**  
 .....99. **ACANTHACEAE**
- 96 a. Flowers with extra floral glands at the base of pedicel .....97  
 b. Flowers not as above.....98

- 97 a. Placentation axile.....98. **PEDALIACEAE**
- b. Placentation parietal .....86. **GENTIANACEAE**
- 98 a. Ovules 1 or 2 in each cell .....99
- b. Ovules many in each cell .....101
- 99 a. Inflorescences verticillasters; style gynobasic .....103. **LAMIACEAE**
- b. Inflorescences not as above; style terminal .....100
- 100 a. Plants with pneumatophores; fruit compressed capsule; seed germination viviparous.....102. **AVICENNIACEAE**
- b. Plants devoid of pneumatophores; fruit usually drupe; seed germination not as above.....101. **VERBENACEAE**
- 101 a. Placentae thick, axile; seeds endospermic...93. **SCROPHULARIACEAE**
- b. Placentae deeply inflexed and recurved or parietal; seeds non-endospermic or scanty.....96. **GESNERIACEAE**
- 102 a. Inflorescences usually secund or one-sided cyme .....103
- b. Inflorescences not as above .....105
- 103 a. Ovules many; fruit a capsule.....87. **HYDROPHYLLACEAE**
- b. Ovules few; fruit a drupe or 4-nutlets .....104
- 104 a. Herbs or undershrubs; style entire or shortly 2-lobed.....  
.....88. **BORAGINACEAE**
- b. Trees or scandent shrubs; style 1-forked or 2 .....89. **EHRETIACEAE**
- 105 a. Leaves alternate.....106
- b. Leaves opposite or alternate.....107
- 106 a. Plants erect or diffuse shrubs but not twining; carpels 2, placed obliquely; ovary 2-celled, ovules many in each locule ....92. **SOLANACEAE**
- b. Plants usually twining, diffuse or erect herbs sometimes scandent shrubs; placement of carpels medianly, ovary 2-celled, ovules 2 in each locule or 4-celled with one ovule in each locule.....90. **CONVOLVULACEAE**
- 107 a. Stamens 2 .....82. **OLEACEAE**
- b. Stamens 4-5 .....108
- 108 a. Trees or scandent shrubs .....85. **LOGANIACEAE**
- b. Plants usually dichotomously branched herbs .....109

- 109 a. Ovary 1-celled, placentation parietal .....86. **GENTIANACEAE**  
 b. Ovary 2-celled, placentation axile .....93. **SCROPHULARIACEAE**
- 110 a. Ovary superior .....111  
 b. Ovary inferior .....135
- 111 a. Flowers bisexual .....112  
 b. Flowers unisexual .....121
- 112 a. Vascular bundle in stem scattered; perianth absent .....109. **PIPERACEAE**  
 b. Vascular bundles not as above; perianth present .....113
- 113 a. Plants parasitic, leafless; stem filiform .....114. **CASSYTHEACEAE**  
 b. Plants not parasitic; stem not filiform .....114
- 114 a. Leaves with sheathing, tubular, membranous ochreate stipules .....  
 .....107. **POLYGONACEAE**  
 b. Leaves exstipulate .....115
- 115 a. Trees .....116  
 b. Herbs, undershrubs or woody lianas.....117
- 116 a. Fruits membranous, enclosed in hardened perianth tube, viscid .....  
 .....104. **NYCTAGINACEAE**  
 b. Fruits not as above (fleshy) .....111. **MYRISTICACEAE**
- 117 a. Perianth petaloid.....104. **NYCTAGINACEAE**  
 b. Perianth usually not petaloid, if petaloid, bracts and bracteoles scarious.  
 .....118
- 118 a. Perianth with densely, silky hairs or scales at the base .....119  
 b. Perianth not as above .....120
- 119 a. Stamens usually 10 or twice as many as the lobes; style long, filiform;  
 stigma capitate; fruits enclosed in perianth .....117. **THYMELAEACEAE**  
 b. Stamens 4; style linear, included; stigma lateral; fruits with 8 ribs crowned  
 by perianth at top .....118. **ELAEAGNACEAE**
- 120 a. Tepals scarious, dry; stamens connate at base into a short tube, often  
 alternating with staminodes .....105. **AMARANTHACEAE**  
 b. Tepals not scarious; stamens free, pseudostaminodes absent .....  
 .....106. **BASELLACEAE**

- 121 a. Trees or shrubs .....122
- b. Plants usually herbs, rarely shrubs .....130
- 122 a. Ovary 3-celled .....122. **EUPHORBIACEAE**
- b. Ovary 1-celled .....123
- 123 a. Leaves gland dotted .....124
- b. Leaves not gland dotted .....127
- 124 a. Staminal filaments not glandular at the base .....112. **MONIMIACEAE**
- b. Staminal filaments glandular at base .....125
- 125 a. Fruits broadly winged .....115. **HERNANDIACEAE**
- b. Fruits not as above .....126
- 126 a. Flowers bisexual; stamens 4, anthers 2-celled, hypogynous scales 4 .....  
     .....116. **PROTEACEAE**
- b. Flowers unisexual, rarely bisexual; stamens usually in multiple of perianth  
     tube; anthers 2-4 celled; hypogynous scales 2 .....113. **LAURACEAE**
- 127 a. Leaves much reduced, scale like; flowers in erect or pendulous catkins  
     or spike; fruits 1-seeded samaroid nuts, crowded in woody cone .....  
     .....127. **CASUARINACEAE**
- b. Leaves well developed; inflorescence various, cymose, spike or  
     hypanthium; fruits not as above .....128
- 128 a. Plants with milky juice; leaf base symmetrical; inflorescence hypanthium  
     .....125. **MORACEAE**
- b. Plants with watery sap; leaves oblique at base; inflorescence not  
     hypanthium.....129
- 129 a. Anthers erect in buds; style 2 fid .....126. **ULMACEAE**
- b. Anthers reversed in buds; style undivided .....123. **URTICACEAE**
- 130 a. Aquatic herbs; leaves verticillate, dichotomously cleft into filiform toothed  
     lobes; stamens 20-30 with 2-toothed or truncate connectives .....  
     .....128. **CERATOPHYLLACEAE**
- b. Terrestrial plants; leaves not as above; stamens usually definite,  
     connectives not as above .....131
- 131 a. Ovary 3-celled .....122. **EUPHORBIACEAE**
- b. Ovary 1-celled .....132

- 132 a. Leaves exstipulate; bracts & bracteoles scarious.....105. **AMARANTHACEAE**  
 .....105. **AMARANTHACEAE**  
 b. Leaves stipulate; bracts & bracteoles when present not scarious .....133
- 133 a. Flowers in clusters .....134  
 b. Flowers in terminal or pseudoaxillary simple or paniced spike .....  
 .....110. **CHLORANTHACEAE**
- 134 a. Stamens erect in buds; styles 2-fid .....124. **CANNABINACEAE**  
 b. Stamens inflexed in buds; style undivided or absent.....  
 .....123. **URTICACEAE**
- 135 a. Plants not parasitic; flowers zygomorphic .....  
 .....108. **ARISTOLOCHIACEAE**  
 b. Plants parasitic; flowers actionmorphic .....136
- 136 a. Stem parasites, disc absent .....119. **LORANTHACEAE**  
 b. Root parasitic, disc present .....137
- 137 a. Trees or shrubs with well developed leaves .....120. **SANTALACEAE**  
 b. Glabrous fleshy herbs with tuberous root stalk, warted with lenticels;  
 leaves obscure .....121. **BALANOPHORACEAE**
- 138 a. Lianas with flattened and twisted stem .....129. **GNETACEAE**  
 b. Plants not as above .....139
- 139 a. Palm like trees; stems forked; leaves compound in terminal crown .....  
 .....130. **CYCADACEAE**  
 b. Plants not as above; stem smooth; leaves simple.....  
 .....131. **PODOCARPACEAE**
- 140 a. Plants aquatic or semiaquatic; stem herbaceous; gynoecia apocarpous ...  
 .....141  
 b. Plants usually terrestrial, rarely aquatic or semi-aquatic; stems herbaceous  
 to woody; gynoecia syncarpous .....143
- 141 a. Perianth of conspicuous sepal & tepals; style distinct .....  
 .....132. **HYDROCHARITACEAE**  
 b. Perianth reduced to small scales or none; style indistinct .....142
- 142 a. Plants of fresh water marshes or streams .....157. **NAJADACEAE**  
 b. Plants of marine habitat .....158. **CYMODOCEACEAE**

- 143 a. Plants herbaceous or woody; inflorescence spadix, subtended by spathe like bracts ..... 144  
 b. Plants mostly herbaceous; inflorescence and bracts not as above ..... 147
- 144 a. Perianth usually absent, if present then 4 and uniseriate; spadix dense and unbranched ..... 145  
 b. Perianth 6, biseriate; spadix mostly loose, paniculately branched ..... 153. **ARECACEAE**
- 145 a. Stem herbaceous or woody or climbing, sometimes very short and inconspicuous; leaves without linear blade, petiole conspicuous ..... 146  
 b. Stem usually woody or erect; leaves with linear and dorsoventrally flattened blade, petiole absent ..... 154. **PANDANACEAE**
- 146 a. Plants with distinct stem and leaves; inflorescence a spadix ..... 155. **ARACEAE**  
 b. Plants thalloid, free floating on water; inflorescence not as above ..... 156. **LEMNACEAE**
- 147 a. Perianth much reduced to small scale, needles or tufts of hairs or often none ..... 148  
 b. Perianth well developed, both or at least inner whorl petaloid ..... 149
- 148 a. Stem terete with usually hollow internodes; leaf sheaths usually open; flowers enclosed by 2 glumes; anthers mostly dorsifixed or versatile ..... 161. **POACEAE**  
 b. Stem usually solid, triangular; leaf sheaths usually closed; flowers subtended by a single glume; anthers basifixed ..... 160. **CYPERACEAE**
- 149 a. Perianth components of both whorls petaloid; seed with non starchy endosperm or sometimes absent ..... 150  
 b. Perianth conspicuously differentiated into calyx and corolla; seeds with starchy endosperm. .... 161
- 150 a. Seeds prominent, few, with well differentiated embryo; plants generally without mycorrhiza ..... 151  
 b. Seeds minute, many; embryo not well differentiated; plants generally with mycorrhiza ..... 160
- 151 a. Lianas with broad netted - veined leaf blades; petioles conspicuous ... 152  
 b. Plants not as above; leaf usually with a narrow and parallel veined blade ..... 153

- 152 a. Anthers 2-celled; ovary inferior; fruit capsule... 145. **DIOSCORIACEAE**  
 b. Anthers 1-celled; ovary superior; fruit berry..... 147. **SMILACACEAE**
- 153 a. Stamens 3; leaves equitant..... 141. **IRIDACEAE**  
 b. Stamens (incl. staminodes) 6-8; leaves not equitant ..... 154
- 154 a. Plants arborescent with more or less woody stem or stalk; leaves rigid; perennials ..... 155  
 b. Plants herbaceous; leaves not rigid; annuals ..... 156
- 155 a. Leaves mostly linear and spinulose along the margins; fruits aggregate ...  
 ..... 140. **BROMELIACEAE**  
 b. Leaves not as above; fruits not aggregate ..... 149. **AGAVACEAE**
- 156 a. Placentation parietal ..... 144. **TACCACEAE**  
 b. Placentation axile ..... 157
- 157 a. Flowers umbellate; umbells subtended by an involucre, terminating into a scape; underground part modified into tunicate bulbs.....  
 ..... 142. **AMARYLLIDACEAE**  
 b. Flowers not in umbels; underground parts various but not a tunicate bulb  
 ..... 158
- 158 a. Aquatic emergent or floating herbs; stamens and perianth often irregular; seeds with copious starchy endosperm..... 148. **PONTEDERIACEAE**  
 b. Terrestrial herbs; perianth and stamens regular; endosperm scanty, mostly of fat & proteins ..... 159
- 159 a. Ovary superior ..... 146. **LILIACEAE**  
 b. Ovary inferior ..... 143. **HYPOXIDACEAE**
- 160 a. Stamens 3, free from the pistil; pollen grains not forming pollinia.....  
 ..... 133. **BURMANIACEAE**  
 b. Stamens 1 or 2, adnate to the pistil; pollen grains cohering in pollinia ...  
 ..... 134. **ORCHIDACEAE**
- 161 a. Ovary superior ..... 162  
 b. Ovary inferior ..... 165
- 162 a. Inflorescence a head, subtended by involucre of bracts .....  
 ..... 159. **ERIOCAULACEAE**  
 b. Inflorescence not as above ..... 163

- 163 a. Leaf sheath one sided open; petals connate at the base; placentation perietal ..... 150. **PHILYDRACEAE**
- b. Leaf sheath closed; petals free; placentation axile ..... 164
- 164 a. Plants with erect or scandent stems; leaves not tendrilar; sepals & petals distinct; ovules few..... 151. **COMMELINACEAE**
- b. Plants usually climbers; leaves with apical tendrils; sepals & petals somewhat similar; ovules solitary.....152. **FLAGELLARIACEAE**
- 165 a. Unisexual flowers; staminate flowers with 5 perfect stamens .....166
- b. Bisexual flowers; perfect stamen 1, remaining reduced to staminodes ...  
.....167
- 166 a. Leaves & bracts spirally arranged .....137. **MUSACEAE**
- b. Leaves & bracts distichously arranged ..... 139. **STERLITZIACEAE**
- 167 a. Stamens with 2 anther cells .....136. **ZINGIBERACEAE**
- b. Stamens with single anther cell, the other one gets transformed into a petaloid appendage ..... 168
- 168 a. Petaloid staminode connate only at base; ovules many in each locule ...  
.....138. **CANNACEAE**
- b. Petaloid staminode connate throughout; ovules solitary in each locule ...  
.....135. **MARANTACEAE**

**RANUNCULACEAE**

(P.S.N. Rao)

About 50 genera and 1900 species distributed mostly in N. temperate and alpine regions, some in tropical and subtropical areas; 2 genera and 2 species in A. & N. Islands.

- 1 a. Plants climbing by means of twining petioles; terminal leaflet normal; petals absent .....1. *Clematis*
- b. Plants climbing by means of tendrils; terminal leaflet modified into tendril; petals present .....2. *Naravelia*

**1. Clematis L.**

Climbers, rarely erect or straggling shrubs, branches furrowed. Leaves opposite or fasciated at nodes, simple, 3-foliolate; petioles and petiolules often twining. Flowers actinomorphic, bisexual or unisexual, solitary or in fascicles at the nodes or in axillary or terminal cymes or panicles. Sepals 4-6 (-8), petaloid, uniseriate, free or jointed at lower part, white, yellow, red or purple. Petals absent. Stamens numerous, staminodal in female flowers. Carpels 3-many; style persistent, usually pilose; ovule 1, pendulous. Fruits compressed achenes with persistent hairy styles.

About 250 species with cosmopolitan distribution but chiefly temperate and subtropical; 1 species and 1 subspecies in A. & N. Islands.

***Clematis smilacifolia* Wallich subsp. *andamanica* Kapoor** in Kew Bull. 19: 331, f.1. 1965; Rao in Fl. India 1: 1. 1993.

Woody climbers. Leaves usually simple, sometimes 1-3 foliolate, broadly ovate or elliptic-ovate, broadly cordate or rounded at base, entire or serrulate, subacute or mucronate at apex, 6-18 x 1.8-4 cm, subcoriaceous, glabrous; veins 7-9, distinctly raised beneath; petioles 2-15 cm long, often twining above, ribbed, glabrous. Inflorescences axillary or terminal 3-many flowered, trichotomously branched panicles; peduncles 4-5 cm long, hairy; bracts foliaceous; pedicels 3-15 cm long, ribbed, puberulous. Flowers 3-5 cm across. Sepals 4, sometimes 5-8. Anthers often twisted; filaments linear; connectives elongated. Achenes hairy with ca 7 cm long feathery tails.

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

*Dist.*: Little Andaman.

Endemic.

## 2. *Naravelia* DC., *nom. cons.*

Climbing shrubs. Leaves opposite, 3-foliolate, terminal leaflet usually modified into a trifurcate tendril. Flowers in axillary or terminal panicles, actinomorphic, bisexual. Sepals 4-5, caducous. Staminodes 6-12, petaloid. Stamens many. Carpels with one ovule. Achenes linear, stipitate with persistent twisted feathery tails.

About 4 species distributed in Indo-Malayan region; 1 species in A. & N. Islands.

*Naravelia laurifolia* Wall. ex Hook. f. & Thoms. in Fl. Ind. 3: 1855 & in Hook. f. Fl. Brit. India 1: 7. 1872; Rao in Jour. Econ. Tax. Bot. 8 (1): 109. 1986.

Woody climbing shrubs; stem and branches strong and ribbed. Leaves ovate to ovate-elliptic, ca 8-14 x 4.5-8.5 cm, coriaceous, glabrous. Sepals ovate to oblong, green, often purplish with white tomentum at the margin. Staminodes petaloid usually 12, bright yellow, spreading, linear club-shaped. Stamens 15-23, linear to linear-lanceolate. Carpels 14-16, hairy.

*Fl.*: June

*Dist.*: Lafal in South Nicobar.

## DILLENACEAE

About 14 genera and 400 species distributed in tropical, subtropical regions of the world, centered in Australia and rare in Africa; 2 genera and 5 species in A. & N. Islands.

- 1 a. Trees; flowers solitary or in clusters, white or yellow; stamens with cylindrical filaments and parallel locules; receptacle cical; fruits globose, indehiscent, enclosed by enlarged sepals .....1. *Dillenia*

- b. Shrubs or woody climbers; flowers in terminal panicles; white or reddish white; stamens with thickened filaments and obliquely divergent locules; receptacles flat; fruits of several dehiscent shiny follicles, not enclosed in enlarged calyx .....2. *Tetracera*

### 1. *Dillenia* L.

Trees. Leaves large, sometimes stipulate; petioles channelled above. Flowers showy, solitary or in racemes, sometimes fasciculate; bracts and bracteoles caducous if present. Sepals 5, spreading, enlarged and fleshy in fruits. Petals 5, white or yellow, larger than sepals, caducous. Stamens numerous; filaments equal or unequal in length; anthers linear; inner ones erect and introrse; outer ones recurved and extrorse. Carpels 5-20 on conical receptacles; styles radiating; ovules 4-80. Pseudocarps indehiscent, enclosed by thick sepals.

About 60 species distributed in Madagascar and Seychelles in Africa and India to S.E. Asia, Australia and Fiji Islands; 4 species in A. & N. Islands.

- 1 a. Flowers upto 5 cm across; anthers opening by longitudinal slits .....3. *D. pentagyna*  
 .....3. *D. pentagyna*  
 b. Flowers 10-12 cm across; anthers opening by apical pores .....2
- 2 a. Outer sepals 15 x 12 mm; inner ones 18 x 14 mm; outer stamens ca 7 mm long. ....1. *D. andamanica*  
 .....1. *D. andamanica*  
 b. Outer sepals atleast 25 x 18 mm; inner ones 30 x 20 mm; outer stamens atleast 10 mm long.....2. *D. aurea*  
 .....2. *D. aurea*

1. ***Dillenia andamanica*** Parkinson in Indian For. 61: 425, t. 29. 1935; Majumdar in Fl. India 1: 152. 1993. *D. pilosa* auct. non Ham. (1827), nec Roxb. (1832); Kurz in J. Asiat. Soc. Beng. 41 (2): 291. 1872.

Trees up to 25 m high, deciduous. Leaves narrowly obovate to oblanceolate, acute at base, obtuse at apex, entire or dentate along margins, 25-45 x 10-15 cm, strigose on nerves beneath; lateral nerves 40-45 pairs; petioles 0.5-2.0 cm long. Flowers solitary or in pairs on long shoots, ca 12 cm long; pedicels upto 3.5 cm long, strigose hirsute. Sepals sericeous outside. Inner stamens reflexed at apex. Carpels 6-8 around conical receptacle; ovules 15-20. Fruits ca 2.5 cm across, subglobose, orange in colour.

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

*Distr.*: Baratang in S. Andaman; Campbell Bay in Great Nicobar island.

Endemic to A. & N. islands.

2. ***Dillenia aurea*** J.E. Smith in Exot. Bot. 2: 65, t. 93. 1806; Hook. f. & Thomson in Fl. Brit. India 1: 37. 1872. Majumdar in Fl. India 1: 153. 1993. *D. pulcherrima* Kurz in J. Asiat. Soc. Beng. 40(2): 46. 1871.

Trees up to 14 m high, deciduous. Leaves elliptic-oblong, rounded or truncate at apex, undulate-dentate along margins, 20-40 x 10-25 cm; nerve endings usually with small tuft of hairs; petioles 3-6.5 cm long. Flowers solitary or sometimes in pairs, 10-12 cm across. Sepals ciliate along margins. Petals yellow, obovate. Inner stamens with reflexed apex. Carpels up to 12 with spreading styles. Fruits yellow, 3-3.2 cm across. Seeds obovoid.

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

Described on the authority of Majumdar (l.c).

3. ***Dillenia pentagyna*** Roxb. Pl. Corom. 1: 21, t. 20. 1795; Hook. f. & Thomson in Fl. Brit. India 1: 38. 1872; Parkinson, For. Fl. Andaman Islands 72. 1923. Majumdar in Fl. India 1: 156. 1993.

Trees up to 15 m high, deciduous. Leaves oblong-lanceolate, oblong-obovate, obtuse or cuneate at base, obtuse at apex, nearly entire to dentate along margins, 20-50 x 10-20 cm; lateral nerves 25-50 pairs; petioles 1.5-5 cm long with persistent wing like stipules. Flowers umbellate, yellow; fragrant, ca 3 cm across. Sepals orbicular. Petals obovate. Stamens: 60-90 in outer series; inner series with about 10 stamens. Carpels 5-6, arranged on narrow conical receptacle. Fruits drooping, indehiscent, orange or red. Seeds black, glabrous.

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

*Distr.*: Nancowry island in North Nicobar.

Uncommon but conspicuous in the interior forests when present.

*Cultivated species :*4. ***Dillenia indica* L.**, Sp. Pl. 535, 1753. 'Chalta'

Evergreen trees, up to 25 m high; bark peeling off into small scales. Leaves oblong-lanceolate, elliptic to oblanceolate, attenuate at base, acute to acuminate at apex, margins serrate-dentate, 14-40 x 5-11 cm, glabrous; lateral nerves 30-50 pairs; petioles up to 7 cm long. Flowers white, fragrant, solitary, 15-20 cm across; pedicels up to 8 cm long. Sepals 5, obovate, elliptic, 4-6 x 3-5 cm, fleshy. Petals obovate, rounded at apex, 7-9 x 5-6 cm, white with green nerves. Carpels 14-20, each with 40-80 ovules. Pseudocarps yellowish green. Seeds reniform.

*Fl.*: May-July; *Fr.*: Sept.-Feb.

*Distr.*: South Andaman.

Cultivated by settlers. Flowers used as vegetable.

2. ***Tetracera* L.**

Shrubs, lianas or stragglers; branches flexuous. Leaves simple, usually scabrid. Flowers few to many in panicles, terminal or axillary, fragrant, regular, bisexual, bracteate. Sepals usually 4-5, imbricate, persistent. Petals 3-5, white or reddish white, emarginate at apex, caducous. Stamens many, subequal; connectives broad; anther thecae downwardly divergent. Carpels solitary or 2-4; style straight. Fruits follicular, 1-4 with a short beak; seeds 1-2, glossy, fimbriate or laciniate.

About 40 species distributed in China, S. & S.E. Asia to Australia, Africa and America; 2 in A & N Islands.

- 1 a. Follicles glabrous..... 1. *T. sarmentosa* subsp. *andamanica*  
 b. Follicles hirsute ..... 2. *T. scandens*

1. ***Tetracera sarmentosa* (L.) Vahl subsp. *andamanica* (Hoogl.) Hoogl.** in Blumea 9: 588. 1959; Majumdar in Fl. India 1: 159. 1993. *Delima sarmentosa* L. var. *glabra* Hook. f. & Thomson in Fl. Brit. India 1: 31. 1872; Parkinson, For. Fl. Andaman Islands. 72. 1923.

Climbers; young branches strigose with tufts of hairs. Leaves elliptic, obovate or oblong, rounded or cuneate at base, acute or obtuse at apex, shallowly serrate in upper portion, 5-12 x 2-6 cm, strigose on nerves and midrib beneath; lateral nerves 10-14 pairs, scabrid on both surfaces, sparsely hirsute between nerves; petiole 1-2 cm long. Flowers 7-10 cm across. Sepals broadly elliptic. Petals obovate. Stamens 100-125. Carpels ovoid. Follicles ovoid, beak 2-5 mm long. Seeds ovoid, aril fimbriate.

*Fl.* May-Oct.; *Fr.* June-Feb.

*Distr.*: Wright Myo in South Andaman.

Rough leaves are sometimes used for polishing wood.

2. ***Tetracera scandens*** (L.) Merr., Interpr. Rumph. Herb. Amboin. 365. 1917; Majumdar in Fl. India 1: 161. 1993. *Delima sarmentosa* L. var. *hebecarpa* (DC.) Hook. f. & Thomson in Fl. Brit. India 1: 31. 1872.

Shrubs up to 2 m high or lianas upto 30 m long. Leaves oblong to obovate, 6-15 x 3-7 cm. Flowers around 200 in terminal panicles. Sepals 4-5, scabrid-strigose outside, ciliate along margins. Petals white, yellow or reddish white. Stamens 65-80. Carpels hairy. Follicles with 1-3 mm long beak; seeds 1-2 with fimbriate aril.

*Fl. & Fr.* March-April.

Described on the authority of Majumdar (*l.c.*).

## MAGNOLIACEAE

About 10 genera and 225 species distributed in temperate, subtropical and tropical regions of S.E. Asia, from Himalayas to Japan and Malesia, Eastern U.S.A., West Indies, C. America and E. Brazil; 2 genera and 2 species in A & N Islands.

- 1 a. Flowers terminal; gynoecium sessile.....1. *Magnolia*  
 b. Flowers axillary; gynoecium stipitate.....2. *Michelia*

### 1. *Magnolia* L.

Trees or shrubs. Leaves simple, alternate, entire; stipules adnate to or free from petiole. Flowers solitary, bisexual, terminal, perianth segments 9-21, usually 3-merous or rarely 5-merous, subequal or the outer ones small, sepaloid. Anthers introrse or latrorse; connectives usually produced; gynoecium sessile; carpels numerous or few; ovules 2 or rarely more. Fruiting carpels few, crowded, dehiscent ventrally or dorsally, sometimes woody, circumscissile.

About 120 species distributed in tropical and subtropical regions of Asia from E. Himalayas to S. China, Malesia, S.E. Asia, Mexico, West Indies and S. America; 2 genera and 2 species in A. & N. Islands.

***Magnolia andamanica*** (King) Raju & Nayar in Indian J. Bot. 3: 171. 1980. *Talauma andamanica* King in J. Asiat. Soc. Beng. 58: 372. 1890; Parkinson, For. Fl. Andaman Islands. 73. 1923.

Trees up to 10 m high; branches grey, glabrous. Leaves oblong-lanceolate, narrowed at base, acuminate at apex, 17-36 x 6-13 cm, glossy above; lateral nerves 10-15 pairs; petioles ca 2.5 cm long, pubescent. Flowers solitary, fragrant, ca 6 cm across; peduncles up to 2.5 cm long. Sepals 3, light purple. Petals 6, ovate or obovate. Stamens ca 60, oblong. Carpels ca 50, rhomboid. Fruits globose. Seeds 1 cm across.

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

*Distr.*: Havelock island in South Andaman.

Endemic to Andaman group of islands, fairly common in inland forests.

### 2. *Michelia* L.

Small trees, sometimes flowering as shrubs. Leaves spirally arranged; stipules convoluted, leaving a circular scar. Flowers solitary, white or yellow. Perianths in 3 or more 3-merous series. Carpels spirally arranged on an elongated axis which is on a gynophore.

About 50 species in tropical Asia; 1 in A. & N. Islands.

**Michelia champaka** L., Sp. Pl. 536. 1753; P.S.N. Rao *et al.* in Ind. Jour. For. 19(2): 191-193. 1996

Evergreen trees, up to 20 m high; bark grey or brownish. Leaves ovate-lanceolate, acute or acuminate, coriaceous, 20-25 x 7-9 cm. Flowers solitary, axillary, yellow, fragrant. Perianth lobes ca 9, oblong, fleshy.

*Fl.*: Aug.-Sept.

*Distr.*: S. Andaman.

Cultivated as an ornamental in temple premises.

### ANNONACEAE

About 122 genera and 1200 species distributed in tropical evergreen forests of America, Asia to Australia; 18 genera and 52 species in A. & N. Islands.

- 1 a. Anther locules not concealed at top by connectives; sepals and outer petals not distinguishable .....2
- b. Anther locules concealed at top by connectives .....4
- 2 a. Inner petals mitriform, vaulted over stamens and carpels .....11. *Orophea*
- b. Inner petals not mitriform, not vaulted over stamens and carpels .....3
- 3 a. Outer petals dissimilar to the sepals; both series of petals subequal and larger than sepals .....1. *Alphonsea*
- b. Outer petals small and similar to the sepals ..... 9. *Milusa*
- 4 a. Sepals imbricate, rarely valvate; petals imbricate in one or both series .....5
- b. Sepals valvate; petals valvate in both series .....8
- 5 a. Climbers or scandent shrubs; sepals valvate .....6
- b. Trees or shrubs; sepals imbricate .....7
- 6 a. Flowers not opening wide when mature; petals imbricate only at tips, less than 1 cm long .....4. *Cyathostemma*

- b. Flowers opening wide when mature; petals imbricate, more than 1 cm long .....17. *Uvaria*
- 7 a. Flowers axillary or fascicled on the tubercles; anthers sunk in the truncate and quadrate connectives; ovules usually many .....15. *Sageraea*
- b. Flowers extra-axillary; anthers not sunk in the convex connectives; ovules 1 .....16. *Trivalvaria*
- 8 a. Petals spreading in flowers or the apices free, almost similar and equal.....9
- b. Petals, outer sometimes spreading, inner ones not spreading but remaining erect, dissimilar and unequal.....13
- 9 a. Ripe carpels moniliform with several seeds in a single row; petals usually six, sometimes 4, 3 or 2.....5. *Desmos*
- b. Ripe carpels not moniliform; petals always 6 (rarely 7-8 in *Artabotrys*).....10
- 10 a. Petals conniving at the concave base covering the stamens and carpels.....11
- b. Petals flat, spreading from the base not covering the stamens and carpels... ..12
- 11 a. Peduncles flattened and hooked ..... 3. *Artabotrys*
- b. Peduncles not flattened and not hooked .....6. *Friesodielsia*
- 12 a. Carpel 1.....8. *Mezzettia*
- b. Carpels 2 or more.....12. *Polyalthia*
- 13 a. Inner petals usually triquetrous, sometimes ovate-elliptic (in *Anaxagorea*), touching each other vertically.....2. *Anaxagorea*
- b. Inner petals connivent, arching over the stamens and carpels forming a dome .....14
- 14 a. Flowers unisexual .....14. *Pseuduvaria*
- b. Flowers bisexual.....15
- 15 a. Inner petals longer than outer ones.....13. *Popowia*
- b. Inner petals shorter than outer ones .....16
- 16 a. Flowers axillary; inner petals coriaceous, short and broadly clawed at base; stigma usually bifid .....7. *Goniothalamus*
- b. Flowers extra-axillary; inner petals thin, narrowly clawed; stigma capitate .....10. *Mitrephora*

### 1. *Alphonsea* Hook. f. & Thoms.

Tall trees. Leaves coriaceous, glabrous. Flowers bisexual, solitary or many in fascicles, leaf opposed or extra-axillary; bracts usually present. Sepals 3, valvate, small. Petals 6 (3+3), valvate, subequal. Stamens indefinite, miliusoid; connectives apiculate, not concealing the anther thecae. Carpels 1-8; ovules 4-10 in two rows; stigma almost sessile. Ripe carpels many tomentose, subsessile or stalked, glabrous, tomentose or verrucose.

About 30 species distributed in India, Bangladesh, Sri Lanka, Myanmar and Cambodia, Thailand, Malaysia, Borneo, Indonesia and New Guinea; 1 in A. & N. Islands.

*Alphonsea ventricosa* (Roxb.) Hook. f. & Thomson Fl. Ind. 152. 1855 & in Fl. Brit. India; D. Mitra in Fl. India 1: 211. 1993. *Uvaria ventricosa* Roxb., Fl. India. 2: 658. 1832.

Trees; young branches brown tomentose. Leaves oblong to elliptic-oblong, base rounded or subacute, acuminate, 20-25 x 5-8 cm, pubescent on midrib when young; petiole ca 6 mm long, puberulous. Flowers in racemes; pedicels ca 2 cm long, tomentose. Sepals 3, tomentose outside, margins densely ciliate. Petals 6 (3+3), brown tomentose outside; inner ones smaller than outer petals. Stamens many, ca 1.5 mm long. Carpels ca 10; stigma subsessile, capitate. Ripe carpels 4-5, minutely pubescent, yellowish when ripe; stalk stout, ca 2.0 cm long. Seeds many.

*Fl.*: March; *Fr.*: July-August.

Described on the basis of literature (Vasudeva Rao in J. Econ. Tax. Bot. 8(1) : 110. 1986) wherein it is shown as recorded from Andaman Islands.

### 2. *Anaxagoria* St. Hill.

Shrubs or trees. Flowers bisexual, solitary, terminal, extra-axillary or leaf opposed. Sepals 3, valvate, connate at the base. Petals 6, in two series, valvate, thin, flat, subequal. Torus convex. Stamens many; connectives with a terminal process; anthers extrorse or sublateral. Carpels few to many; ovules 2, sub-basal, collateral; styles variable in length. Ripe carpels follicular, clavate, dehiscent by 2 valves, stalked; seeds 1-2, shining.

About 30 species distributed in India, Sri Lanka, Myanmar, Cambodia, Laos, Thailand, Malaysia, Indonesia, Philippines to Central America and West Indies; 2 in A. & N. Islands.

- 1 a. Petiole *ca* 1 cm long; stigma cone shaped .....1. *A. javanica*  
 b. Petiole up to 1.5 cm long; stigma blunt.....2. *A. luzonensis*

1. **Anaxagorea javanica** Bl., Fl. Jav. Anon. 66. f. 32. et 3A. 1830; Hore in Bull. Bot. Surv. India 26 (1&2): 21. 1984.

Trees up to 3 m high; bark greyish-white. Leaves elliptic-oblong, acute to acuminate, 12-18 x 4-7 cm, glabrous; petiole *ca* 1 cm long. Inflorescence axillary; pedicels *ca* 1 cm long. Flowers greenish outside, fragrant. Sepals glabrous to minutely puberulous, adpressed to petals. Petals (3+3); outer greenish, inner reddish. Stamens many, white; stigma cone shaped, ovaries angled. Ripe carpels red.

*Distr.*: Laful in Great Nicobar island.

Scarcely distributed in inland moist forests.

2. **Anaxagorea luzonensis** A. Gray, Bot. Wilkes. U.S. Explor. Exped. 27. 1854; Hook. f. & Thomson in Fl. Brit. India; D. Mitra in Fl. India 1: 296. 1993.

Shrubs up to 2 m high. Leaves elliptic rarely oblong, cuneate, acuminate, 12-19 x 4-8 cm, glossy green above; petioles *ca* 1.5 cm long, glabrous. Flowers solitary or in pairs, leaf-opposed; pedicels *ca* 3 mm long, slightly puberulous; bracts 1-2, basal. Sepals 3, glabrous. Petals 6 (3+3); inner smaller than outer, thin, glabrous. Stamens many, *ca* 2 mm long, broadly elliptic; connective blunt at top. Carpels *ca* 4, flask shaped, *ca* 3 mm long, slightly pubescent; style prominent; stigma blunt. Ripe carpels follicular, upto 4 cm long, narrowed into a long stalk. Seeds 1-2, shining black.

*Fl.*: July-Aug. ; *Fr.*: Sept.-Nov.

*Distr.*: Rutland island in South Andaman.

Commonly occurring in the evergreen forests.

### 3. *Artabotrys* R. Brown

Scandent shrubs. Leaves shining. Flowers bisexual, solitary or fascicled usually on woody, hooked, recurved leaf-opposed peduncles. Sepals 3, valvate. Petals 6 (3+3), valvate, clawed, base concave, connivent, spreading limb covering stamens and carpels. Stamens oblong cuneate; connectives flat at top. Carpels few or many; style oblong or columnar; ovules 2, erect, collateral. Ripe carpels many, beaked, sessile, ovoid. Seeds 1-2.

About 100 species in Sri Lanka, India, Bangladesh, Myanmar, Cambodia, Thailand to E. Asia, Malasia, Australia and Africa; 2 species in A. & N. Islands.

- 1 a. Flower pedicels 7-12 mm long; peduncles hooked with fasciculate branches .....1. *A. nicobarianus*  
 b. Flower pedicels ca 5 mm long; peduncles hooked without fasciculate branches .....2. *A. speciosus*

1. ***Artabotrys nicobarianus*** D. Das in Bull. Bot. Surv. India 11: 194. 1969; D. Mitra in Fl. India 1: 252. 1993.

Climbing shrubs; stem blackish brown. Leaves elliptic, base cuneate, acuminate or caudate, 10-13.5 x 4-5.5 cm, glabrous; petiole ca 5 mm long. Flowers many in fascicles on recurved hooked peduncles; pedicels 7-12 mm long, pubescent. Sepals 3, tomentose outside. Petals (3+3), unequal; outer ones clawed, limb linear-lanceolate; inner ones united at clawed base, limb free, grey tomentose. Stamens many, ca 1.5 mm long; anthers short. Carpels few, densely strigose. Ripe carpels not known.

*Fl.*: March-April.

*Distr.*: Sipighat near Port Blair in South Andaman.

Endemic to Andaman-Nicobar Islands.

2. ***Artabotrys speciosus*** Kurz ex Hook. f. Thomson in Fl. Brit. India 1: 55; D. Mitra in Fl. India 1: 253. 1993.

Woody climbers; stems dark-coloured, finely furrowed. Leaves oblong-lanceolate, base acute, obtusely acuminate, 15-20 x 5-6 cm, glabrous; petioles 7-10 mm long, thickened. Flowers few, fascicled on recurved hooked peduncles; pedicels ca 5 mm long, puberulous. Sepals 3, puberulous outside. Petals (3+3) yellow; outer petals linear-lanceolate, tapering from the base, appressed pubescent; inner petals connate at clawed base with free limbs. Ripe carpels ca 3-4 cm long, ellipsoid.

*Fl.*: March-April ; *Fr.*: Sept.-Oct.

*Distr.*: Chouldhari and Dhanikhari in South Andaman.

Uncommon but not rare.

#### 4. *Cyathostemma* Griff.

Woody climbers with simple or stellate hairs. Flowers bisexual or unisexual, in clustered or pendulous cymes, leaf opposed or extra-axillary or sometimes terminal. Sepals 3, valvate, connate, hairy. Petals 6 (3+3) clawed, valvate at base, imbricate at top, convex outside. Stamens many, linear; anthers subintrorse; connectives obliquely incurved. Carpels many, pubescent; stigma U-shaped; ovules many in 2 rows. Torus flat. Ripe carpels oblong, ovoid, irregularly bulged. Seeds many.

About 8 species distributed in India, Bangladesh, Myanmar, Thailand, Malaysia, Borneo and New Guinea; 2 in A. & N. Islands.

- 1 a. Flowers in simple cymes; bracts basal and median .....1. *C. micranthum*  
 b. Flowers in dichotomous cymes; bracts distichous giving zig-zag appearance  
 .....2. *C. viridiflorum*

1. ***Cyathostemma micranthum*** (DC.) Sinclair in Gard. Bull. Sing. 14: 225, 1955; D. Mitra in Fl. India 1: 279, 1993. *Guatteria micrantha* DC. in Mem. Soc. Phys. Geneve 5: 218, 1832.

Large woody climber; young branches sometimes twining around. Leaves oblong-lanceolate; slightly cuneate at base, acuminate, 5-8 x 2-4 cm, glabrous except midrib above; petiole ca 3 mm long, dark-brown, pubescent. Flowers leaf-opposed or terminal, 2-5 in cymes; pedicels ca 5-8 mm long; bracts 2, orbicular. Sepals ca 2.5 mm long, pubescent

outside. Petals greenish-yellow; outer petals 4-5 x 3-4 mm, broadly clawed at base. Stamens 1 mm long. Carpels *ca* 1 mm long; stigma bilobed. Ripe carpels many, sub-globose, 5-7 mm in diam.; stalks slender *ca* 2.5 cm long. Seeds in 2 rows, smooth, brown.

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

*Distr.*: Chiriatapu and Poona Nallah in South Andaman.

Growing in inland forests at sea level. Endemic.

2. **Cyathostemma viridiflorum** Griffith, Notul. 4: 70. 154 & in Icon. 4: t. 650. 1854; Hook. f. & Thomson in Fl. Brit. India; D. Mitra in Fl. India 1: 280. 1993.

Climbers or scandent shrubs up to 5 m high. Leaves oblong-lanceolate or oblong-elliptic, slightly subcordate at base, acute, 10-20 x 5-8 cm; petioles *ca* 4 mm long, pubescent. Flowers bisexual. Sepals obtuse, reflexed, *ca* 3 x 5 mm, rusty tomentose. Petals broadly ovate, *ca* 5 x 5 mm; outer petals with a thick and rudimentary claw; inner ones narrowed with a distinct claw. Stamens *ca* 2 mm long, incurved. Carpels 4-5 mm long. Ripe carpels obtuse, irregularly bulged, thick walled; stalks stout, *ca* 2 cm long; seeds 5-6.

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

*Distr.*: Chiriatapu in S. Andaman and Keralapuram in N. Andaman.

Uncommon and growing on the edges of forests.

### 5. **Desmos** Lour.

(*Unona* auct. non L., Hook. f. & Thoms.)

Scandent shrubs or small trees. Leaves shining above and glaucous beneath. Flowers bisexual, usually pendulous or often solitary, extra-axillary or leaf-opposed. Sepals 3, valvate in buds. Petals 6 (3 + 3), sometimes inner ones absent, valvate, clawed at base. Stamens many, anthers linear, extrorse; connectives subglobose or truncate at top. Carpels many, pubescent; style oblong or ovoid; stigma oblong, ovoid or clavate,

opening U-shaped, grooved. Ripe carpels many, moniliform, segmented, sometimes torulose; seed one in each segment.

About 30 species distributed in India, Sri Lanka, Bangladesh, Myanmar, China, Indo-China, Thailand through Malesia to Australia, New Zealand and Pacific islands; 2 species in A. & N. Islands.

- 1 a. Petals 6, in 2 series ..... 1. *D. cochinchinensis*  
 b. Petals 3-4, inner series absent ..... 2. *D. dasymachalus*

1. **Desmos cochinchinensis** Lour., Fl. Cochinch. 1: 352. 1790; D. Mitra in Fl. India 1: 259. 1993. *Unona cochinchinensis* (Lour.) DC., Prodr. 1: 91. 1824.

Climbers or scandent shrubs. Leaves oblong to elliptic-oblong, rounded at base, acute to slightly obtuse, 12-22 x 4-8 cm; petioles 6-10 mm long. Flowers fragrant, solitary, extra-axillary; pedicels 10-15 cm long, slender. Sepals 3, ovate-lanceolate, ca 7 x 3 mm, glabrous inside. Petals 6 (3 + 3), obovate to ovate-lanceolate, longitudinally 3-6 nerved; outer 5-6 x 2.5-3 cm; inner ones shorter. Stamens numerous. Carpels many, brownish hirsute. Ripe carpels numerous, moniliform, constricted, terminally apiculate; stalks 7-18 mm long.

*Fl.*: June-July; *Fr.*: Sept.-Oct.

Included on the authority of Rao in Jour. Econ. Tax. Bot. 8(1): 110. 1986 who has shown as recorded from Nicobar Islands.

2. **Desmos dasymachalus** (Blume) Safford in Bull. Torrey Bot. Club 39: 507. 1912; D. Mitra in Fl. India 1: 259. 1993.

Shrubs; stems black with yellow lenticels when young. Leaves elliptic-oblong to oblong-lanceolate, narrowed at base, acute, 9-28 x 4-9.5 cm, glabrous above, puberulous on midrib beneath; petiole ca 5 mm long. Flowers solitary, axillary or terminal; pedicels upto 7 cm long. Sepals 3, free, triangular, 3-5 x 3-4 mm, silky. Petals 3-4, clawed, broad at base, 4-13 x 1-2 cm, creamy yellow; inner series absent. Stamens numerous. Carpels many, densely villous. Ripe carpels many, moniliform, 2-7 constricted; stalks ca 6 mm long.

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

*Distr.*: Sitanagar in N. Andaman, Hut Bay in L. Andaman and Katchal island in N. Nicobar.

Very common in the inland forests.

## 6. *Friesodielsia* Van Steenis

(*Oxymitra* (Blume) Hook. f. & Thomson)

Climbing shrubs. Leaves mostly parallel-nerved, reticulations scalariform. Flowers bisexual, leaf opposed or extra-axillary. Sepals 3, valvate. Petals 6 (3+3), valvate; outer larger than inner; inner ones conniving over stamens and carpels. Stamens many, linear-oblong or cuneate, truncate; connectives flat or slightly convex at the top. Carpels many, oblong, strigose; ovules 1-2, sub-basal ascending; style short, recurve; stigma subcapitate. Ripe carpels many, ovoid or oblong with stalks. Seed one.

About 55 species distributed in Africa, India, Bangladesh, Myanmar, Malaysia, Thailand, Indonesia and Philippines; 2 species in A. & N. Islands.

- 1 a. Flower pedicels ca 1 cm long .....1. *F. fornicata*  
 b. Flower pedicels 3-4 cm long .....2. *F. khashooi*

1. ***Friesodielsia fornicata*** (Roxb.) D. Das in Bull. Bot. Surv. India 5: 43 & 93. 1963; D. Mitra in Fl. India 1: 264. 1993. *Uvaria fornicata* Roxb., Fl. Ind. 2: 662. 1832. *Oxymitra fornicata* (Roxb.) Hook. f. & Thomson in Fl. Brit. India 1: 71., 1872.

Woody climbing shrubs; young branches brown tomentose. Leaves lanceolate to oblong-lanceolate, rounded at base, acuminate at apex, 10-18 x 3-7 cm, pubescent beneath. Sepals ovate-lanceolate, 5-nerved, densely pubescent on midrib, reddish outside. Petals pale yellow; outer larger than inner with prominent midrib. Stamens many, linear. Carpels few, oblong, strigose. Ripe carpels ca 10 oblong, apiculate; stalks very short, stout, slightly pubescent.

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

*Distr.*: Along East-West Road in Great Nicobar.

Scarcely distributed in disturbed forests.

2. **Friesodielsia khoshooi** Vasud. & T. Chakrab. in J. Econ. Tax. Bot. 6: 435, 1985; D. Mitra in Fl. India 1: 265, 1993.

Climbing or scandent shrubs up to 11 m high; branches terete, densely tawny hirsute, glabrescent when old. Leaves oblong-elliptic, sub-cordate at base, acute to acuminate at apex, 13-23 x 5-10 cm, glabrous above, thinly tawny tomentose beneath. Flowers extra-axillary, solitary, yellow or creamy yellow. Sepals 3, broadly triangular-acuminate, 5-7 x 2.5-3 mm, tawny sericeous outside, adpressed-puberulous inside. Petals 6 (3 + 3); outer petals triquetrous; inner petals ovate-lanceolate. Stamens many, ca 2 mm long. Carpels numerous, oblong, tawny-hirsute. Ripe carpels oblong-ellipsoid, apiculate at apex, ca 1.4 cm long. Stalks ca 5 mm long.

*Fl.*: April-May; *Fr.*: Aug.

*Distr.*: Laful in S. Nicobar.

Endemic.

### 7. **Goniothalamus** (Bl.) Hook. f. & Thoms.

Shrubs or trees. Leaves coriaceous. Flowers solitary or few in fascicles, axillary to extra-axillary or cauliflorous; pedicels with distichous bracts. Sepals 3, valvate, many nerved, sometimes persistent in fruits. Petals 6 (3+3), valvate, coriaceous; outer petals erect, flat; inner petals smaller, clawed at base with the upper part broadened and cohering in a conical vaulted cup over the stamens and carpels. Stamens many, linear-oblong; pollen grains large; connectives oblong or truncate. Carpels many; style linear; stigma simple or bifid; ovules 1-2. Ripe carpels many; seeds 1.

About 115 species occurring in India, Sri Lanka, Bangladesh, Bhutan, Myanmar, Thailand, Cambodia, Malaysia, Indonesia, Philippines, New Guinea and Pacific Island; 2 species in A. & N. Islands.

- 1 a. Outer petals narrowly linear-lanceolate; stamens 3.5-4 mm long; connectives apiculate at top, pubescent ..... 1. *G. macranthus*  
 b. Outer petals ovate - lanceolate; stamens ca 1.5 mm long; connectives flat-topped or convex ..... ? *G. malayanus*

1. ***Goniothalamus macranthus*** (Kurz) Boerl. in Icon. Bogor. 1: 137. 1899; D. Mitra in Fl. India 1: 234. 1993. *Unona macrantha* Kurz, Andaman Rep. 1: app. B.1. 1867, *nom. nud.* *Melodorum macranthum* Kurz in J. Asiat. Soc. Beng. 41: 291. 1872.

**var. *macranthus***

Trees up to 8 m high. Leaves oblong-elliptic to oblong-lanceolate, cuneate at base, obtuse or abruptly acuminate at apex, 15-25 x 5-10 cm, glabrous; petioles ca 1.4 cm long. Flowers solitary, axillary; pedicels 1-2 cm long. Sepals ovate or triangular, 8-10 x 7-9 mm. Petals greenish; outer petals linear-lanceolate, 6-11 x 0.7-1.5 cm, thickly coriaceous with midrib, pubescent; inner ones clawed, triquetrous, ca 2 x 0.6 cm, brown tomentose. Stamens numerous, ca 4 mm long; connectives apiculate at top. Carpels many. Ripe carpels many; 3-6 cm long with 2 or 3 constrictions between seeds, apiculate at apex. Stalks upto 1.6 cm long.

*Fl.*: July-Aug.; *Fr.*: Jan.-Feb.

*Distr.*: Mt. Harriet and Baratang island in S. Andaman.

2. ***Goniothalamus malayanus*** Hook. f. & Thomson, Fl. Ind. 107. 1855 & in Fl. Brit. India 1: 75. 1872; Rao in J. Econ. Tax. Bot. 7. 635. 1985; D. Mitra in Fl. India 1: 236. 1993.

Trees up to 10 m high. Leaves elliptic-oblong, acute at base, acuminate at apex, 8-16 x 3-7 cm, margins wavy, glabrous except midrib below; petioles 0.5-1 cm long. Flowers solitary, axillary or from the axils of fallen leaves, fragrant; pedicels 1-1.8 cm long, pubescent. Sepals broadly triangular, pubescent outside. Outer petals ovate-lanceolate, shortly clawed at base, 3-8 x 1.5-2.5 cm, yellowish green; inner petals clawed, densely silvery white or golden sericeous pubescent outside. Stamens many, closely arranged. Carpels numerous, pubescent. Ripe carpels oblong, often with one constriction, apiculate and stipitate, 2.5-3.5 cm long; stalk 4-5 mm long. Seeds 2-5, shining dark brown, ovoid.

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

*Distr.*: Nevy Dera in S. Nicobar.

Scarce with restricted distribution.

### 8. *Mezzettia* Beccari

Tall trees. Flowers fasciculate or umbellate. Sepals 3, small. Petals 6 (3+3); inner smaller than outer. Stamens 9-15; connectives truncated and concealing the anthers below. Carpels one, flask-shaped with two ovules. Ripe carpels elliptic or globose with 2 seeds in each.

About 7 species distributed in India, Malaysia and Borneo; 1 in A. & N. Islands.

*Mezzettia parviflora* Beccari in Nuovo Giorn. Bot. Ital. 3: 188. 1871; D. Mitra in Fl. India 1: 267. 1993. *M. curtisii* King, Mat. Fl. Malay. Peninsula. (4): 378. 1802; Mathew & Mitra in Indian For. 117. 1077. 1991.

Trees up to 20 m high. Leaves oblong-lanceolate, narrowed at base, acuminate, 7.5-12 x 2.1-3.4 cm, glabrous, petioles upto 1 cm long. Flowers fasciculate, axillary. Sepals semi-orbicular, subacute, reflexed at apex, ca 2 mm long, silky tomentose. Petals silky tomentose; outer ones ligulate, ca 5 mm longer than inner. Stamens ca 14; connectives flat-topped. Carpel 1, ca 2 mm long. Ripe carpels sessile, subglobose; seeds oblong.

*Fl.*: Jan.-Feb.; *Fr.*: July-Aug.

*Distr.*: Shoal Bay in S. Andaman.

### 9. *Miliusa* Leschem. ex DC.

Shrubs or small trees, dioecious or polygamous. Leaves ovate or elliptic, membranous, pubescent or glabrous. Flowers bisexual, sometimes unisexual, axillary or extra-axillary, solitary or 2-3 flowered fascicles or cymes; bracts present. Sepals 3, valvate. Petals 3+3, free; outer petals sepaloid; inner ones larger, cohering when young by margins. Torus elongated. Stamens : anthers ovoid, extrorse; connectives concealing the

anther thecae, sometimes apiculate. Carpels indefinite linear-oblong; ovules 1-10; stigma club-shaped. Ripe carpels many, globose or oblong, stalked or sessile. Seeds one or many.

About 40 species distributed in India, Sri Lanka, Bhutan, Bangladesh, Myanmar, Cambodia, Laos, Vietnam, Thailand, Borneo, Indonesia, Australia and New Zealand; 5 species in A. & N. Islands.

- 1 a. Bracts hirsute; persistent .....3. *M. jainii*
- b. Bracts not hirsute; usually caducous .....3
- 2 a. Inner petals ovate, less than 0.5 cm long, pubescent.....5. *M. tectona*
- b. Inner petals ovate, more than 1.5 cm long, pubescent.....4
- 3 a. Pedicels pubescent; flowers sometimes unisexual, polygamous .....  
.....2. *M. globosa*
- b. Pedicels glabrous; flowers always bisexual
- 4 a. Inner petals ca 1.5 cm long, united at base, thin; stalk of ripe carpels ca  
   10 mm long.....1. *M. andamanica*
- b. Inner petals ca 0.5 cm long, free, thick; stalk of ripe carpels ca 4.5 mm  
   long .....4. *M. mukherjeeana*

1. ***Milium andamanica*** (King) Finet et Gagnepain in Bull. Soc. Bot. Fr. 53 (4): 151. 1906; D. Mitra in Fl. India 1: 213. 1993. *Phaeanthus andamanicus* King in J. Asiat. Soc. Beng. 61 (2): 122. 1892

Undershrubs. Leaves elliptic or elliptic-lanceolate, base slightly narrowed, acuminate, 13-15 x 5-6 cm, glabrous; petioles ca 5 mm long. Flowers bisexual, solitary or in pairs, extra-axillary; pedicels ca 1.5 cm long with pubescent bracts at base. Sepals 3, persistent. Petals 6 (3+3); outer petals larger than sepals; inner ones united at base, ca 15 x 16 mm, thin, slightly pubescent. Stamens many, ca 1 mm long; filaments prominent; connectives apiculate at top. Carpels many, curved, ca 3 mm long, pubescent; ovules 2 in each; style linear, curved; stigma flat. Ripe carpels many, 2-3 cm across with slender stalk. Seeds 2 in each.

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

*Distr.*: Throughout A. & N. islands.

2. **Miliuma globosa** (DC.) Panigr. & S.C. Mishra in *Taxon* 33: 713, 1984; D. Mitra in *Fl. India* 1: 215 1993. *Guatteria globosa* DC. in *Mem. Soc. Phys. Hist. Natur. Geneve* 5: 41 ('43') (Pre-print § 1831.). *Miliuma roxburghiana* (Wallich) Hook. f. & Thomson, *Fl. Ind.* 150, 1855 & in *Fl. Brit. India*: 87, 1872.

Trees up to 4 m; branches softly pubescent. Leaves ovate-lanceolate, rounded at base, acuminate, 10-18 x 3.5-6 cm, thinly coriaceous, pubescent beneath; lateral nerves ca 10 pairs; petioles 1-2 mm long. Flowers bisexual or unisexual, 2-3 together, ca 2.0 cm long; pedicels ca 3 cm long. Sepals 3, reflexed, rusty-tomentose outside. Petals 6 (3+3); outer petals similar to sepals; inner ones 1-1.5 x 0.4-0.8 cm, deep red with dark veins, sparsely pubescent. Stamens many, ca 1 mm long; connectives dome-shaped at top. Carpels many, ca 2 mm long. Ripe carpels many 7-10 mm long, 10-18 mm across, slightly pubescent. Seeds one to few, ovoid.

*Fl.*: Dec.-May; *Fr.*: Aug.-Sept.

*Distr.*: Near Nilambar and Nayashahar in S. Andaman.

3. **Miliuma jainii** Goel & Sharma in *Nord. J. Bot.* 10 (6): 629, 1990.

Trees up to 4 m high. Leaves elliptic to ovate-lanceolate, base rounded or acute, 3.5-18.0 x 1.2-7.5 cm, thinly coriaceous, unequally bilobed; lateral nerves 6-14 pairs; petiole ca 2.0 mm long. Inflorescence 1-3 flowered, axillary or extra-axillary; pedicels 1-2 cm long, stout. Sepals 3, 0.75-2.5 x 1.0-1.75 mm. Petals 3+3, outer unequal, slightly larger than sepals. Stamens in 3 whorls; anthers ca 1.0 mm long, filaments half the size of anthers, connective a triangular ovate, dorsally granulate appendage. Carpels more than 10; ovules 2. Stigma ca 0.75 mm long, club-shaped, black with one vertical groove on ventral surface. Torus with golden, setaceous hairs. Ripe carpels globose, 2-seeded, girdled with a horizontal groove. Seeds ca 9 mm across, sub-globose.

*Fl. & Fr.*: Sept.

*Distr.*: Coastal forests of S. Andaman.

Described on the basis of literature (*l. c.*).

4. *Milium mukherjeeana* D. Mitra et P. Chakrab. in Bull. Bot. Surv. India 33 (1-4): 326. 1991.

Trees up to 8 m high; young branches puberulous. Leaves oblanceolate to lanceolate, base cuneate, obtuse rarely acuminate, 9-16.5 x 4.5 cm, glabrous; lateral nerves *ca* 12 pairs; petiole *ca* 3 mm long. Flowers bisexual, solitary or 2-3 together, axillary, greenish yellow; pedicels slender, *ca* 2 cm long; bracts 2, caducous. Sepals 3, *ca* 1 x 1 mm, pubescent outside. Petals 6 (3+3), outer petals similar to sepals in size and shape; inner ones free, *ca* 5 x 4 mm, very thick, pubescent outside. Stamens *ca* 1 mm long. Carpels numerous, oblong, *ca* 2 mm long; ovules 3-4; style absent; stigma capitate. Ripe carpels numerous, globose to oblong, 5-10 mm across; stalks *ca* 5 mm long. Seeds 1-3.

Endemic to A. & N. Islands, known to grow in hill forests.

Described on the basis of literature (l.c).

5. *Milium tectona* Hutch. ex C.E. Parkinson, For. Fl. Andaman Island. 75. 1923; D. Mitra in Fl. India 1: 220. 1993. *Saccopetalum tectonum* (Hutch. ex C.E. Parkinson) Chatterjee in Kew Bull. 1948: 59. 1948.  
'Jungle-saguam'

Straight stemmed trees up to 25 m high; branches glabrescent. Leaves ovate to elliptic-oblong, base rounded or slightly cordate, acuminate, 10-14 x 4-6 cm, glabrous; petioles *ca* 4 mm long. Flowers bisexual, solitary in leaf axils on leafless branches; pedicels *ca* 1.5 cm long, appressed pubescent; bracts and bracteoles early caducous. Sepals 3, ovate-lanceolate, 6-7 x 2.5-3.0 cm, pubescent, many nerved. Petals 6 (3+3); outer petals sepaloid, larger; inner petals ovate-lanceolate, saccate at base, subacute, 3-3.5 x 1.0 mm, velvety tomentose, reddish; midrib prominent with parallel lateral nerves. Stamens numerous, *ca* 1 mm long; connectives obscurely apiculate. Carpels many, *ca* 2 mm long, hairy; ovules 4-7; stigma subglobose, rugulose. Ripe carpels *ca* 10 mm across.

*Fl.*: May-June.

*Distr.*: Throughout A. & N. Islands.

*Note*: Stem and bark resemble that of teak but otherwise very unlike it. Grows in deciduous forests.

10. *Mitrephora* Hook. f. & Thoms.

Trees or shrubs. Leaves coriaceous with prominent ribs. Flowers bisexual, sometimes unisexual, terminal or leaf opposed, extra-axillary. Sepals 3, orbicular or ovate, valvate. Petals 3+3; outer ones larger than inner, ovate, elliptic-oblong; inner ones narrowly long-clawed at base, mitriform and cohering above. Stamens many, oblong, cuneate; anther-thecae minute, concealed below the flat-topped connectives. Carpels oblong or clavate, furrowed ventrally ovules 1-4, 2-seriate; styles oblong or clavate; stigma usually capitate. Torus hairy. Ripe carpels ovoid, generally stalked, 2-3 seeded.

About 25 species distributed in Sri Lanka, India, Bangladesh, Myanmar, Indo-China, E. Asia to Malesia, Australia and New Zealand. 5 species in India with 1 species in A. & N. Islands.

*Mitrephora andamanica* Thoth. & Das in J. Bombay Nat. Hist. Soc. 54 (3): 430, t. 1, 1968; D. Mitra in Fl. India 1: 242, 1993.

Shrubs up to 1.5 m high; branches puberulous. Leaves ovate-elliptic to oblong, narrowed at base, acute at apex, 8.5-13 x 3.5-5.5 cm, glabrous above except on midrib and nerves beneath; petiole ca 3.6 mm long, puberulous. Flowers 1-2, extra-axillary or leaf opposed; pedicels upto 2 mm long, pubescent; bracts ovate, acute, pubescent outside. Sepals 3, free, triangular ca 2 cm long, pubescent outside. Petals 3+3; outer petals broadly ovate, acute, 3-4 x 3.5 mm, pubescent outside, ciliate; inner petals distinctly clawed 3 x 2-3 mm. Stamens many, ca 1 mm long, connectives flat at top. Carpels 3, oblong, ca 1 mm long, ovules 2-3; stigma discoid.

*Fl.*: April.

Described on the authority of Thoth. & Das (*l.c.*) from Andaman group and as enumerated by Rao (Jour. Econ. Tax. Bot. 8(1): 110, 1986).

11. *Orophea* Bl.

Shrubs or small trees. Flowers axillary or supra-axillary, solitary or 2-seriate in racemes. Sepals 3, valvate. Petals 6 (3+3); outer petals shorter than inner ones clawed, cohering by the margins into a mitriform cap vaulted over stamens and carpels. Stamens 3-9 (-12), ovoid, fleshy; anther cells dorsal; connectives slightly produced at top or not. Carpels 3-15;



Shrubs or small trees up to 4 m high; older branches glabrescent. Leaves oblong-lanceolate or elliptic, subcuneate at base, acuminate at apex, 12-18 x 4-7 cm, glabrous above; petioles *ca* 4 mm long, puberulous in young. Flowers solitary or upto 4 together, creamy white. Sepals *ca* 3 mm long, pubescent outside. Outer petals veined, minutely pubescent outside; inner petals clawed, mitriform *ca* 1.5 mm long; claw slender, glabrous; limb rhomboid, acuminate, pubescent. Stamens 9; outer 3 staminodes; inner 6 fertile. Carpels 3, narrowly ovoid; stigma sessile, truncate. Fruits consisting of 3 carpels, cylindric or linear oblong, constricted between seeds, wrinkled longitudinally when dried, pointed at apex, up to 10 cm long; seeds 6-8.

*Fl.*: June-Sept.; *Fr.*: Dec.-Jan.

*Distr.*: Harmander Bay in L. Andaman, Katchal island in N. Nicobar, Laful forest in S. Nicobar.

Frequently occurs in evergreen forests. Endemic.

Leaf juice used by tribals as honey bee repellent.

3. ***Orophea monosperma*** (Kurz) Craib in Bull. Misc. Inf. Kew 1915; 434, 1915; D. Mitra in Fl. India 1: 226, 1993. *Melodorum monospermum* Kurz, Rep. Veg. Andaman Island. 29, 1870. *O. polycarpa* Hook. f. & Thomson in Fl. Brit. India. 1: 91; 1872, p.p. (non DC.).

Shrubs; branches pubescent when young. Leaves ovate-elliptic, slightly acute or rounded at base, acuminate at apex, 6-9 x 3-4 cm, softly pubescent on midrib and lateral nerves beneath. Flowers solitary or 2-3 together, axillary; pedicels *ca* 1.2 cm long. Sepals broadly ovate, *ca* 1.5 x 1 cm, slightly ciliate along margins, pubescent outside. Petals reddish green or yellowish green; inner petals twice as long as the outer ones; limb revolute, *ca* 7 mm long. Stamens 6; connectives flat at top. Carpels 9-12, oblong; stigma beak-shaped. Ripe carpels few with 1-2 seeds in each.

*Fl.*: March-June; *Fr.*: July-Sept.

Described on the authority of D. Mitra (l.c.).

Endemic to Andaman Islands. One plant of this species is reportedly in cultivation at Indian Botanic Garden, Howrah.

4. **Orophea salacifolia** Hutch. in Bull. Misc. Inf. Kew 1923: 371. 1923; D. Mitra in Fl. India 1: 228. 1993.

Small trees; branches slightly flexuous, almost glabrous. Leaves broadly oblong-elliptic, rounded at base, acuminate at apex. Flowers solitary or in pairs; pedicels *ca* 5 mm long, tomentose with few bracts. Sepals broadly triangular, appressed pilose. Outer petals twice as long as sepals, pilose outside; inner ones longer than outer, clawed. Stamens 6, curved; connectives shortly produced. Carpels few with stigma sessile.

Described on the authority of Rao (Jour. Econ. Tax. Bot. 8(1) : 110. 1986) and Mitra (l.c.).

5. **Orophea torulosa** Hutch. in Bull. Misc. Inf. Kew 1923; 115. 1.; D. Mitra in Fl. India 1: 228. 1993.

Trees; branches glabrescent. Leaves broadly elliptic, rounded at base, abruptly long-acuminate, 10-14 x 4-6 cm, glabrous above. Flowers axillary, minutely pedicelled. Sepals triangular, appressed pilose. Outer petals broadly ovate, densely ciliolate along margins; inner ones clawed; limb *ca* 5 mm long with recurved tips, sparsely puberulous. Stamens 12, biseriate; connectives triangular. Carpels *ca* 7, kidney-shaped; stigma beaked. Ripe carpels torulose, *ca* 7 cm long with one seed in each segment.

*Fl.*: April; *Fr.*: Aug.

Described on the authority of D. Mitra (l.c.).

Endemic to Andaman group of Islands.

## 12. **Polyalthia** Bl.

Shrubs or trees. Leaves mostly glabrous or sometimes pubescent. Flowers bisexual, solitary or few together, axillary, pubescent. Sepals 3, valvate. Petals 6 (3+3), valvate, subequal, spreading. Stamens numerous, cuneate; connectives produced. Carpels indefinite; ovules 1 or 2,

sometimes up to 5, basal or sub-basal. Ripe carpels few to many, berries, stalked or sessile.

About 120 species distributed in Africa, India, Sri Lanka, Bangladesh, Myanmar, Indo-China, Malesia, Australia and New Zealand; 8 species in A. & N. Islands.

- 1 a. Petals up to 1.5 cm long.....2  
 b. Petals more than 1.5 cm long .....4
- 2 a. Petals equal in series .....5. *P. parkinsonii*  
 b. Petals unequal in series.....3
- 3 a. Pedicels up to 1 cm long; petals thick, fleshy.....2. *P. crassa*  
 b. Pedicels 1.5-3 cm long; petals thickly coriaceous .....6. *P. rufescens*
- 4 a. Petals 1-2 cm wide.....5  
 b. Petals less than 1 cm wide; rarely up to 1.2 cm wide.....6
- 5 a. Leaves 10-20 cm long, flowers solitary or in pairs..... 3. *P. jenkinsi*  
 b. Leaves 25-40 cm long, flowers in fascicles.....4. *P. lateriflora*
- 6 a. Petals strap-shaped, 10-12 mm wide.....1. *P. cauliflora*  
 b. Petals linear to oblong-lanceolate, up to 8 mm wide.....7. *P. simiarum*

1. ***Polyalthia cauliflora*** Hook. f. & Thomson var. ***desmantha*** (Hook. f. & Thomson) Sinclair in Gard. Bull. Sing. 15: 295. 1955; Sanjappa & Chatterjee in J. Econ. Tax. Bot. 7: 457, f. 2. 1985; D. Mitra in Fl. India 1: 269. 1993. *Unona desmantha* Hook. f. & Thomson in Fl. Brit. India 1: 61. 1872.

Small trees up to 5 m high; trunk lenticellate and young twigs brown tomentose. Leaves elliptic-lanceolate, base rounded, acutely acuminate at apex, 20-23 x 5.5-6.5 cm, coriaceous, midrib and lateral nerves pubescent beneath; lateral nerves ca 12 pairs curving to form arches near margin; petiole tomentose densely. Flowers axillary from the woody tubercles. Sepals slightly recurved; pubescent outside. Petals brown, strap-shaped; inner ones curving inwards, minutely pubescent. Stamens and carpels many. Ripe carpels constricted between seeds; seeds 1-2.

*Fl.*: May-July; *Fr.*: August onwards.

Described on the authority of Sanjappa & Chatterjee (l.c.) who reported from Great Nicobar Islands as a new record for India.

2. ***Polyalthia crassa*** R. Parker in Indian For. 55: 375. 1929; D. Mitra in Fl. India 1: 271. 1993.

Trees up to 4 m high; branches glabrous. Leaves oblong, acute at base, acuminate at apex, 12-22 x 3-7 cm, glabrous, pale beneath. Flowers solitary or few together on small tubercles; pedicels ca 1 cm long. Sepals ca 4 x 6 mm, puberulous. Petals green, fleshy, puberulous; outer ones slightly smaller than inner. Stamens numerous, spatulate; connectives sub-orbicular at top. Carpels many, hairy; stigma sessile, capitate. Ripe carpels numerous, oblong-ellipsoid on 1-15 cm long stalks.

*Fl.*: Feb.-April; *Fr.*: Nov.-Dec.

Endemic

Described on the authority of D. Mitra (l.c.).

3. ***Polyalthia jenkinsii*** (Hook. f. & Thomson) Hook. f. & Thomson in Fl. Brit. India 1: 64. 1872; D. Mitra in Fl. India 1: 272. 1993. *Guatteria jenkinsii* Hook. f. & Thomson, Fl. Ind. 141. 1855.

Trees; young branches brown tomentose. Leaves oblong-lanceolate, acute or rounded to subcuneate at base, acute or abruptly acuminate at apex, 10-18 x 4-7 cm, glabrous; petioles 6-8 mm long, puberulous; lateral nerves 6-8 pairs. Flowers solitary or in pairs, axillary, fragrant. Sepals 3-5 x 2-4 mm, puberulous outside. Petals greenish yellow, subcoriaceous, faintly nerved. Stamens numerous. Carpels many, linear oblong. Ripe carpels many, slightly apiculate; stalks ca 1.5 cm long.

*Fl.*: Aug.-Oct.; *Fr.*: Dec.-June.

Described on the authority of D. Mitra (l.c.).

4. ***Polyalthia lateriflora*** (Blume) Kurz in J. Asiat. Soc. Beng. 43 (2): 52. 1874; D. Mitra in Fl. India 1: 273. 1993. *Guatteria lateriflora* Blume, Bijdr. 20. 1825. *Polyalthia simiarum* (Hook. f. & Thomson) Hook. f. & Thomson in Fl. Brit. India 1: 63. 1872 p.p.

Trees up to 20 m high. Leaves oblong to elliptic-oblong, subcordate or narrowed to rounded base, acute to shortly acuminate at apex, entire, 25-40 x 8-18 cm. Flowers fascicled from the stem or older branches. Sepals densely and minutely tomentose outside. Petals greenish yellow; inner petals slightly longer than outer. Stamens many. Carpels many, linear, pubescent. Ripe carpels ovoid to ellipsoid, blunt at apex. Seed 1, longitudinally grooved.

*Fl.*: June-July; *Fr.*: Nov.-June.

Described on the authority of D. Mitra (l.c.).

5. ***Polyalthia parkinsonii*** Hutch. in *Bull. Misc. Inf. Kew* 1917: 25. 1917; Parkinson, *For. Fl. Andaman Islands*. 76. 1923; D. Mitra in *Fl. India* 1: 275. 1993.

Small trees up to 20 m high; bark greyish or yellowish. Leaves oblong-elliptic or oblong-lanceolate, slightly oblique, rounded or obtuse at base, long acuminate at apex, glabrous, dark green above, glaucous beneath; petioles ca 10 mm long; lateral nerves faintly visible. Flowers in fascicles on leafless branches; pedicels ca 2 cm long. Sepals coriaceous, minutely pubescent. Petals subequal, tomentose. Stamens numerous, small. Carpels many with stigma sessile. Ripe carpels many, subglobose.

*Fl.*: Dec.; *Fr.*: Feb.-March.

*Distr.*: Nicobar islands and Baratang island in S. Andaman.

Endemic.

6. ***Polyalthia rufescens*** Hook. f. & Thomson in *Fl. Brit. India* 1: 66. 1872; D. Mitra in *Fl. India* 1: 276. 1993.

Shrubs up to 6 m high; branches tomentose when young. Leaves narrowly oblong-lanceolate, base narrowed or obliquely cordate, acuminate at apex, 7.5-10 x 2-3 cm, glabrous except on the midrib beneath; petiole glabrous. Flowers solitary. Sepals ovate, pubescent. Petals: inner ones larger than outer; connectives convex, pubescent. Carpels many, linear, covered with brown hairs; ovules 2; stigma capitate.

*Fl.*: Feb.-May.

*Distr.*: North and Middle Andaman.

7. ***Polyalthia simiarum*** (Hook. f. & Thomson) Hook. f. & Thomson in Fl. Brit. India 1: 63. 1872, p.p.; Parkinson, For. Fl. Andaman Is. 76. 1923; D. Mitra in Fl. India 1: 276. 1993. *Guatteria simiarum* Hook. f. & Thomson, Fl. Ind. 142. 18855.

Trees up to 25 m high. Leaves ovate-oblong to oblong-lanceolate, obliquely cordate at base, acuminate at apex, 12.5-30 x 5-12 cm, glabrous; petiole 5-9 mm long; lateral veins 12-16 pairs. Flowers in fascicles from the leaf axils or the leaf scars; pedicels 10-14 mm long. Sepals small, reflexed, pubescent outside. Petals linear, greenish yellow, subequal. Stamens numerous. Carpels many, stigma spatulate. Ripe carpels numerous, ovoid to ellipsoid, apiculate, 2.5-3.5 cm long, orange red or bluish black; stalks upto 4 cm long. Seed one, transversely ribbed.

*Fl.*: April-June; *Fr.*: July-Nov.

*Distr.*: Katchal island in N. Nicobar.

*Cultivated species:*

8. ***Polyalthia longifolia*** (Sonner.) Thwaites, Enum. Pl. Zeyl. 398. 1864. *Uvaria longifolia* Sonner., Voy. aux Indes 2: 233, t. 131. 892.

Evergreen trees with straight bole and conical crown, up to 20 m high; branches pendulous, spreading. Leaves oblong-lanceolate, long acuminate, 14-25 x 2-4 cm, glabrous, margins undulate. Flowers numerous, fascicled, green. Petals lanceolate, acuminate. Stamens numerous. Ripe carpels numerous, ovoid to ellipsoid, obtuse at both ends, ca 2 cm long, one seeded; stalks ca 1.5 cm long. Seed almost ovoid.

*Fl.*: March-May; *Fr.*: May-Aug.

*Distr.*: All most all the inhabited islands.

Grown in the gardens and as avenue trees.

13. *Popowia* Endl.

Small trees. Leaves glabrous, pubescent or tomentose. Flowers bisexual, small, solitary or few, axillary, extra-axillary or leaf opposed. Sepals 3, valvate, ovate or orbicular. Petals 6 (3+3), valvate, outer petals similar to sepals but larger; inner ones larger than outer, connivent, slightly clawed at base, acute at tip, sometimes inflexed. Stamens short, cuneate; connectives flat-topped or slightly concave; stigma capitate. Ripe carpels numerous, globose or ovoid, stalked or sessile. Seeds 1-4.

About 50 species distributed in India, Myanmar, Thailand, Malaysia, Indonesia to Australia and Africa. 2 species in A. & N. Islands.

- 1 a. Sepals and petals strigose.....1. *P. helferi*  
 b. Sepals and petals pubescent .....2. *P. parvifolia*

1. ***Popowia helferi*** Hook. f. & Thomson in Fl. Brit. India. 1: 69. 1872;  
 D. Mitra in Fl. India 1: 247. 1993.

Small spreading trees; young branches coarsely hairy. Leaves narrow oblong, rounded or suboblique at base, abruptly acutely or obtusely acuminate at apex, 6.5-10 x 2.5-3.5 cm, glabrous above, puberulous on the midrib beneath; petiole ca 2 mm long, subpilose. Flowers minute, globose; peduncles 2-6 mm long, tomentose. Sepals ovate, strigose. Outer petals smaller than inner ones, ovate, strigose; inner ones orbicular, inflexed at tip. Stamens 15. Carpels 6; seeds 4, shining.

*Fl.*: April.

Endemic and rare.

Described on the authority of Mitra, (l.c.).

2. ***Popowia parvifolia*** Kurz in J. Bot. 13: 1875; D. Mitra in Fl. India 1: 247. 1993.

Small trees; young branches hairy. Leaves ovate to elliptic-lanceolate, acute or rounded at base, obtuse to bluntly acuminate at apex, 9-14 x 4-6 cm, appressed pubescent beneath in young leaves; petioles ca 2 mm long, glabrous. Flowers solitary or in pairs, axillary; pedicels ca 3 mm long,

pubescent; bracts minute. Sepals very small, connate at base, ovate or rounded, pubescent outside. Petals minutely pubescent; outer petals smaller, ovate; inner ones triangular to ovate. Stamens many, small, cuneate; connectives flat-topped. Ripe carpels with long stalks; seeds 1-2.

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

Endemic.

Described on the authority of D. Mitra (l.c.).

#### 14. *Pseuduvaria* Miquel

Shrubs or trees. Leaves mostly with parallel nerves. Flowers unisexual, solitary or fascicled. Sepals 3, valvate, membranous. Petals 6, in 2 series, valvate; outer petals larger; inner petals narrow, linear, clawed; limbs united at top to form a mitriform hood. Stamens very small; connectives flat-topped; staminodes present in female flowers. Carpels absent in male flowers, tomentose, elongated, incurved; stigma sessile, sub-capitate with U-shaped split on top and grooved inside. Ripe carpels many, tomentose, smooth or warted; seeds 1 to many.

About 17 species distributed in India, Bangladesh, Indo-China, Myanmar, Thailand, Malaysia, Indonesia, Philippines and New Guinea; 2 species in A. & N. Islands.

- 1 a. Ripe carpels subglobose; minutely pubescent .....1. *P. prainii*  
 b. Ripe carpels globose; verrucose with longitudinal ridge on one side .....  
 .....2. *P. rugosa*

1. ***Pseuduvaria prainii*** (King) Merr. in Philip. J. Sci. (Bot.) 10: 255. 1915; D. Mitra in Fl. India 1: 248. 1993. *Mitrephora prainii* King in J. Asiat. Soc. Beng. 61 (2): 88. 1892.

Small trees up to 8 m high; branches spreading. Leaves elliptic-oblong, cuneate at base, acuminate, 15-23 x 5-8 cm, glabrous except midrib; petiole ca 7 mm long; lateral nerves ca 12 pairs, rather prominent. Flowers yellowish cream, from the axils of the leaves or fallen leaves; pedicels ca 2 cm long. Sepals broadly ovate, acute, 1.5-3.0 x 3 mm, tomentose outside.

Outer petals *ca* 5 mm across, tomentose outside; inner ones longer and narrower than outer, *ca* 6 x 3 mm; limb trapezoid, densely tomentose, claw narrower, as long as the limb, vaulting over the stamens, tomentose on both surfaces. Stamens numerous in male flowers, *ca* 1 mm long; connectives truncate, concealing the apices of anthers. Ripe carpels few, subglobose, minutely pubescent; stalk *ca* 9 mm long. Seeds many.

*Fl.*: March-April; *Fr.*: Sept.-Dec.

*Distr.*: North Andaman.

Usually found in evergreen forests and favouring damp places.

2. ***Pseuduvaria rugosa*** (Bl.) Merr. in Philip. Jour. Sci. (Bot.) 10: 225. 1915. *Uvaria rugosa* Bl. Bijdr. 12. 1825 & in Fl. Java. 47, t. 22. 1830.

Small trees up to 12 m high; young branches minutely puberulous, striate. Leaves oblong-lanceolate, narrowed at base, acute or shortly acuminate, glabrous, thin; lateral nerves *ca* 14 pairs, prominent below, oblique; petiole *ca* 1 cm long. Flowers many in axillary fascicles. Inner petals pubescent on both sides, claw slender. Ripe carpels globose, yellowish-brown tomentose, verrucose with a longitudinal ridge on one side.

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

*Distr.*: Lafu forests in S. Nicobar.

Occurs in hill forests and differs from *P. prainii* in having branches black, globose, ripe carpels with prominent longitudinal ridge on one side.

### 15. ***Sageraea*** Dalz.

Trees. Leaves shining. Flowers small, axillary or terminal, solitary or fasciated on woody tubercles, unisexual or bisexual. Sepals 3, imbricate, orbicular or ovate. Petals 6 (3+3), imbricate, usually orbicular or broadly oblong; anthers dorsal, oblong; connectives produced not concealing the anthers. Carpels 3-6; style short; stigma obtuse or capitate; ovules 1 or 6-14, biseriate on ventral suture. Ripe carpels globose, thick walled, stalked.

About 9 species in Sri Lanka, India, Bangladesh, Myanmar, Thailand, Cambodia, Vietnam & Malesia; 2 in A. & N. Islands.

- 1 a. Flowers unisexual .....1. *S. elliptica*  
 b. Flowers bisexual .....2. *S. listeri* var. *andamanica*

1. ***Sageraea elliptica*** (DC.) Hook. f. & Thoms., Fl. Ind. 93. 1855; D. Mitra in Fl. India 1: 281. 1993. *Uvaria elliptica* DC. in Mem. Soc. Phys. Geneve 5: 23. 1832. *Bocagea elliptica* (DC.) Hook. f. & Thoms., Fl. Brit. India 1: 92. 1872. 'The Andamanese Bow-Wood tree'

Trees up to 27 m high; bark smooth, dark brown with white patches, peeling in long strips. Leaves narrowly oblong, base rounded, acute, 20-30 x 5-7.5 cm, glabrous; petiole ca 4 mm long; lateral nerves 14-16 pairs. Flowers unisexual. Sepals semi-orbicular, ca 4 x 5 mm, margins ciliate; inner ones smaller. Stamens 12-18; anthers extrorse. Carpels 3, ca 2 mm long; stigma sessile, capitate; ovules about 8. Ripe carpels 2-3, subglobose; seeds 4-5 in 2 rows.

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

Described on the basis of literature (Parkinson, For. Fl. Andaman Islands 77. 1923).

Wood heavy, used by the Andamanese in boat building and for making bows.

2. ***Sageraea listeri*** var. ***andamanica*** Chatterjee et Mukerjee in Proc. Linn. Soc. 154: 268. 1941-42. D. Mitra in Fl. India 1: 284. 1993. 'Chooi'

Trees up to 20 m high; bark whitish brown. Leaves elliptic-lanceolate, acute or obtuse at base, acuminate; petiole 1.2 cm long, slightly furrowed above; lateral nerves 8-12 pairs. Flowers solitary, axillary; bracts at the base of the sessile flowers, reniform, ca 10. Petals 6, equal, strap-shaped. Stamen 15, ca 2 mm long.

*Fl.*: March-April; *Fr.*: Oct.-Nov.

*Distr.*: Baratang in S. Andaman.

Endemic to Andaman group of islands. Grows on sand mixed soils in inland forests.

### 16. *Trivalvaria* Miquel

Shrubs or small trees. Leaves large, usually glabrous; midrib prominent; lateral nerves decurrent at the midrib. Flowers polygamous, extra-axillary, solitary or 2-3 together. Sepals 3, free, imbricate. Petals 6(3+3), imbricate, concave or vaulted, tomentose. Torus convex. Stamens many; connectives usually rhomboid at top. Carpels many, villous. Ripe carpels many, ellipsoid, shortly stalked; seed one.

About 7 species distributed in India, Bangladesh, Myanmar, Thailand, Malaysia, Borneo and Indonesia; 2 in A. & N. Islands.

- 1 a. Flowers fascicled on woody tubercles; petals unequal, inner smaller .....1. *T. argentea*  
 b. Flowers solitary or in pairs; petals equal .....2. *T. dubia*

1. *Trivalvaria argentea* (Hook.f. & Thoms.) Sinclair in Sarawak. Mus. J. 5: 603. 1951; D. Mitra in Fl. India-1: 285. 1993. *Polyalthia argentea* Hook. f. & Thoms. in Fl. Brit. India 67. 1872.

Trees up to 5 m high. Leaves oblong-lanceolate, base cuneate, abruptly acuminate, 8-21 x 2.5-7.0 cm, coriaceous, glabrous, glaucous beneath; lateral nerves 8-10 pairs; petiole ca 7 cm long. Flowers in fascicles on woody tubercles, polygamous. Sepals ca 3 x 2 mm. Petals in two series, unequal, pubescent. Male flowers: stamens sessile; connectives capitate at top. Female flowers: carpels numerous on cylindrical torus, abortive stamens at base; stigma capitate. Ripe carpels many, oblong, minutely apiculate, ca 2 cm long; stalks ca 5 mm long.

*Fl.*: June-July; *Fr.*: Sept.-Feb.

*Distr.*: Anderson Island in N. Andaman.

2. *Trivalvaria dubia* (Kurz) Sinclair in Gard. Bull. Singapore 14: 47. 155; D. Mitra in Fl. India 1: 286. 1993. *Polyalthia dubia* Kurz, For. Fl. Brit. Burma 1: 38. 1877.

Shrubs up to 3 m high; branches blackish, furrowed; young shoots pubescent. Leaves broadly oblong-lanceolate or elliptic-oblong, base cuneate, bluntly acuminate, 13-24 x 5-8 cm, glabrous above, slightly pubescent on midrib beneath; lateral nerves 8 - 12 pairs; petiole pubescent, ca 8 mm long. Flowers polygamous, extra-axillary, sessile or on short tomentose pedicels; bracts ovate, tomentose. Sepals orbicular, ca 4 mm across, tomentose outside. Petals concave, 4-7 mm across, glabrous inside, tomentose outside. Stamens many, ca 2 mm long; anthers linear; connectives convex at top. Carpels ca 10, linear, pubescent; stigma clavate. Ripe carpels ca 2 x 1 cm, rugose.

*Fl.*: April-July; *Fr.*: Sept.-Dec.

*Distr.*: Mt. Harriet in S. Andaman and Diglipur area in N. Andaman.

### 17. *Uvaria* L.

Scandent shrubs, usually stellate pubescent. Flowers bisexual, sometimes unisexual, solitary or in cymes, terminal or leaf-opposed, yellow or purple. Sepals 3, often connate below. Petals 6 (3+3), free or connate at base. Stamens numerous, ovoid or oblong; connectives produced at top. Carpels many, linear-oblong; ovules many, 1-seriate or 2-seriate. Torus depressed, tomentose or pubescent. Ripe carpels many, berries. Seeds few to many.

About 150 species distributed in Sri Lanka, India, Bangladesh, Myanmar, China, Indo-China, Thailand, Malaysia, Sumatra, Philippines to New Guinea, Australia, New Zealand and Africa; 6 species and 1 variety in A. & N. Islands.

- 1 a. Flowers unisexual or polygamous .....1. *U. andamanica*
- b. Flowers bisexual .....2
- 2 a. Leaves densely hairy .....3
- b. Leaves glabrous, sometime pubescent when young .....5
- 3 a. Petals less than 1.5 cm long .....6. *U. rufa*
- b. Petals more than 1.5 cm long .....4
- 4 a. Petioles ca 1 cm long; pedicels 7-10 mm long; ripe carpels oblong; stalks 1-1.3 cm long .....2. *U. cordata*

- b. Petioles *ca* 6 mm long; pedicels 2.5-4 mm long; ripe carpels ovoid to subglobose; stalks 2.5-5.5 cm .....3. *U. hamiltonii*
- 5 a. Stalk of oblong-cylindric, ripe carpels 4-15 cm long .....4. *U. lurida*  
 b. Stalk of oblong-cylindric, ripe carpels 1-2 cm long .....5. *U. nicobarica*
1. ***Uvaria andamanica*** King in J. Asiat. Soc. Beng. 61(2): 21. 1892 & in Ann. R. Bot. Gard. Calc. 4: 29. t. 25. 1893; D. Mitra in Fl. India 1: 289. 1993.

Scandent shrubs. Leaves 17-22 x 5.5-7.5 cm, oblong to oblanceolate, base narrowed, acuminate, glabrous above except the puberulous midrib and lateral nerves; stellate-pubescent on the midrib and lateral nerves on lower surface; petiole *ca* 7 mm long, stellate-pubescent. Flowers in terminal or axillary cymes, rarely solitary, stellate rusty tomentose; pedicels *ca* 4 mm long in bud; bracts solitary, orbicular. Sepals 3, *ca* 4 long in bud, orbicular, glabrous inside. Petals 6 (3+3); outer ones *ca* 5 mm diam. in bud; inner ones small, orbicular, fleshy, puberulous outside. Stamens numerous, narrowly elongate, *ca* 1.5 mm long; connectives rounded and flat on top. Ripe carpels many, *ca* 3 cm long, oblong, slightly tuberculate, stellately rusty tomentose, constricted between seeds; seeds *ca* 8 in 2 rows, plano-convex.

*Fl.*: Dec.-Jan. *Fr.*: April onwards.

*Distr.*: Dhanikhari in S. Andaman.

Endemic to Andaman Islands.

2. ***Uvaria cordata*** (Dunal) Alston, Handb. Fl. Ceylon, Suppl. 6: 4. 1931; D. Mitra in Fl. India 1: 289. 1993. *Guatteria cordata* Dunal, Monogr. Fam. Anon. 129, t. 30. 1817.

Large scandent shrubs. Leaves 13-28 x 6.5-13.5 cm, elliptic-oblong to ovate-oblong, abruptly acuminate, cordate, glabrous above except midrib and lateral nerves, densely stellate-pubescent below. Flowers *ca* 4 clustered in extra-axillary cyme; bracts 2, broadly ovate splitting at margins with age, 1.2-1.5 x 0.8-1.0 cm, reddish brown. Stamens many, 5-7 mm long, outer ones staminodes larger; inner ones fertile, shorter, connectives obliquely truncate. Carpels many, linear, narrow, compressed, *ca* 5 mm

long, tomentose. Ripe carpels many, 2-4 cm long, scarlet, glabrous; seeds many in 2 rows, ovoid, compressed, shining, dark brown.

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

*Distr.*: S. Nicobar.

3. *Uvaria hamiltonii* var. *kurzii* King in Ann. R. Bot. Gard. Calc. 4: 17. 1893. D. Mitra in Fl. India 1: 291. 1993.

Scandent shrubs. Leaves 15-25 x 7-11 cm, elliptic-oblong or obovate, rounded or slightly cordate at base, acuminate, stellate-tomentose below, densely pubescent at nerves, lateral nerves 12-16 pairs. Flowers solitary, extra-axillary, bracteate, brown tomentose; bract solitary, suborbicular, 0.5-1.0 cm long; pedicels 1.5-2.0 cm long. Sepals 3, connate at base, broadly ovate, ultimately reflexed, thin, brown tomentose outside, pubescent inside. Petals 6 (3+3), ovate to oblong-ovate, incurved at tips, 1.0-1.5 cm long, coriaceous, reddish-yellow, brown tomentose on both sides. Stamens numerous, ca 4 mm long; anthers linear; connectives pubescent, oblong at top. Carpels many ca 4 mm long, pubescent; stigma sessile, glabrous. Ripe carpels ca 10, 1.5-2.5 cm long, orange coloured, tomentose; seeds many, flat, shining.

*Fl.*: July.

*Distr.*: Poona Nallah in S. Andaman.

Endemic to Andaman & Nicobar Islands.

4. *Uvaria lurida* var. *lurida* Hook. f. & Thomson, Fl. Ind. 101. 1855 & in Fl. Brit. India 1: 50. 1872; D. Mitra in Fl. India 1: 291. 1993.

Large woody climbers; younger parts stellate hairy, rusty. Leaves 16-30 x 3.5-6.5 cm, oblong or oblong-lanceolate, base rounded or subcuneate, acute or shortly acuminate. Flowers 1-2, terminal or leaf opposed; pedicels 1.0-1.5 cm long, thick, ebracteate. Sepals 3, broadly ovate, connate at base, 1.5-2.0 cm long, pubescent inside. Petals 6 (3+3), outer ones broadly ovate with inflexed tips, 2-2.5 x 2.0 cm, brick-red, densely pubescent inside. Stamens numerous, cuneate with truncate tips, 2-3 mm long. Carpels numerous, oblong, ca 4 mm long; stigma sessile, subcapitate. Ripe

carpels many, glabrous, 2-4 cm long, constricted; seeds 3-6 in a single row, compressed, globose.

*Fl.*: Jan.-May *Fr.*: Aug.-Oct.

Described on the authority of Mitra, 1993.

5. *Uvaria nicobarica* Raizada et Sahnii in Indian For. 87: 101. 1961; D. Mitra in Fl. India 1: 293. 1993.

Large woody climbers; young branches dark brown, stellate-pubescent, glabrescent when old. Leaves 15-17 x 9.0-9.5 cm, broadly elliptic to oblanceolate, rarely obovate, acuminate, rounded or faintly cuneate, glabrous, midrib stellate-pubescent; petiole up to 5 mm long, stellate-pubescent. Flowers unknown. Ripe carpels many, 2.5-3.0 cm long, pericarp yellow, seeds ca 8 x 5 mm, uniseriate, dark brown, shining.

*Fr.*: October.

*Distr.*: Trinket Champlong in G. Nicobar.

Endemic and rare, so far known only from type locality.

6. *Uvaria rufa* Blume, Fl. Java 19, t. 4 & 13c. 1828; D. Mitra in Fl. India 1: 293. 1993.

Scandent shrubs; young branches rusty stellate-tomentose. Leaves 10-13 x 4-6 cm, elliptic-lanceolate to oblong, slightly cordate at base, acuminate, scabrid above, stellate-tomentose beneath; petioles 4-5 mm long, brown pubescent. Flowers 1-4 in each cyme, sometimes solitary, extra-axillary, rusty stellate-tomentose; pedicels 0.7-1.5 cm long, tomentose; bracts sub-median. Sepals 3, suborbicular, connate at base, ca 3 x 4 mm, rusty stellate-tomentose. Petals 6 (3+3), free, broadly oblong, obtuse, 7-10x4-5 mm, bright red to dull reddish-purple, minutely pubescent on both surfaces. Stamens numerous, 3-4 mm long; outer ones staminodes; connective broad and flat. Carpels many, quadrate, 4-5 mm long, pubescent; stigma sessile, mucronate, stellate pubescent; seeds many in 2 rows, reddish brown, smooth, shining.

*Fl.*: May-June *Fr.*: Sept.-Dec.

*Distr.*: S. Andaman, N. Andaman and in Car Nicobar & Katchal island in Nicobar group.

*Cultivated Non-indigenous species:*

### 18. *ANNONA* L.

Shrubs or trees. Flowers bisexual, solitary or fascicled. Sepals 3, valvate. Petals 6(3 + 3), valvate, coriaceous; outer lanceolate or ovate, concave at base, fleshy; inner rudimentary or absent. Stamens numerous, ovoid at top of the connectives. Carpels many, subconnate, each one ovuled. Ripe carpels confluent into a many loculed ovoid or globose fruit, sometimes spinescent. Seeds many with fleshy or membranous aril.

India, Africa, Central America, S. America and West Indies; 4 species in A. & N. Islands.

- 1 a. Petals 6, the inner 3 conspicuous.....2
- b. Petals 3, inner absent or rudimentary.....3
- 2 a. Fruits smooth.....1. *A. glabra*
- b. Fruits muricate.....2. *A. muricata*
- 3 a. Leaves acuminate; fruits reticulate, areolate.....3. *A. reticulata*
- b. Leaves obtuse; fruits tuberculate .....4. *A. squamosa*

1. *Annona glabra* L., Sp. Pl. 537. 1753; Sreekumar *et al.* in Mal. Nat. Jour. 50: 81. 1996. *A. palustris* L. Sp. Pl. ed. 2, 757. 1762.

Shrubs or small spreading trees, up to 8 m high; bark cracked, lenticelled. Leaves ovate-oblong or oblong-lanceolate, obtuse at base, acuminate at apex, entire, 6-20 x 3-8 cm; petiole up to 3 cm long. Flowers solitary, cauline, fragrant. Sepals 3, valvate. Petals 6(3 + 3), outer larger. Stamens many. Carpels numerous. Fruit ovoid or subglobose, 6-10 x 5-8 cm.

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

*Distr.*: Port Blair, S. Andaman.

Grown in the vicinity of temples.

2. ***Annona muricata* L.** Sp. Pl. 1:536. 1753.

Small trees. Leaves obovate-oblong, acute at base, shortly acuminate at apex, 11-14 x 4-5 cm, glabrous; petiole ca 5 mm long. Flowers solitary, axillary, minutely bracteate. Sepals 3, triangular, persistent. Petals 6 (3 + 3), yellow. Stamens numerous, linear. Ripe carpels many, muricate. Seeds many.

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

*Distr.*: Andaman islands.

Common in the inhabited islands.

3. ***Annona reticulata* L.**, Sp. Pl. 1: 573.

'Ramphal'

Small deciduous trees, up to 12 m high. Leaves oblong-lanceolate, rounded at base, acute to acuminate at apex, 10-20 x 3-5 cm; petiole ca 1.5 cm long. Flowers extra-axillary or terminal, 2-3 together in cymes. Sepals 3, broadly ovate, pubescent outside. Petals triquetrous, reddish at base inside. Stamens numerous. Carpels many. Fruits ovoid to subglobose, 5-10 cm in diam., reticulate, many loculed, many seeded. Seeds black.

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

Planted in the gardens in some islands.

4. ***Annona squamosa* L.**, Sp. Pl. 1: 537. 1753.

'Sitaphal'

Shrubs or small trees, up to 6 m high. Leaves elliptic-oblong to oblong-lanceolate, acute to cuneate at base, acute to sub-acuminate at apex, glabrous; petiole 0.6-1.5 cm long. Flowers drooping, axillary, solitary or a few together, leaf opposed. Sepals 3, pubescent outside. Petals greenish white or yellow, outer ones keeled inside. Stamens numerous. Carpels many, ovoid. Fruit ovoid-globose, 8-9 cm in diam., tuberculate; pulp white edible. Seeds many, black, arillate, shiny.

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

Cultivated for its edible fruits in many of the isles.

**MENISPERMACEAE**

About 73 genera and 350 species, mainly tropical extending to N. America and temperate Asia: 12 genera and 17 species in A. & N. Islands.

- 1 a. Perianth scarcely differentiated into sepals and petals.....2
- b. Perianth very frequently differentiated into sepals and petals.....4
- 2 a. Endocarp curved, smooth or fibrous, less ornamented.....1. *Anamirta*
- b. Endocarp straight, smooth, sometimes strongly rugose.....3
- 3 a. Leaves subpeltate; lamina 3 (-5) nerved; main basal lateral nerves running along the midrib for 4-15 mm before diverging outwards; inflorescences lax panicles, glabrous; petals absent; endocarp ellipsoid, smooth, rounded at apex .....4. *Fibraurea*
- b. Leaves not peltate; lamina-base 3-5 nerved; all nerves diverging directly from lamina base; inflorescence a raceme, several from protuberances on old stems, ferruginous pubescent; petals 6, with-involute margins; endocarps compressed, rugose or rugulose, acute at apex ...11. *Tinomiscium*
- 4 a. Cotyledons not foliaceous; endosperm non-ruminate.....5
- b. Cotyledons divaricate, foliaceous; endosperm ruminate .....9
- 5 a. Leaves oblong or oblong-lanceolate, acute or rounded at base; style simple ..... 6. *Hypserpu*
- b. Leaves ovate, orbicular or triangular; styles 2-8 partite .....6
- 6 a. Stamens free; synandrium absent; carpels 3 .....7
- b. Stamens connate, forming synandrium; carpels 1 .....8
- 7 a. Leaves both peltate and non-peltate, glabrous; petioles glabrous; sepals 6 ..... 3. *Diptoclisia*
- b. Leaves not peltate, tomentose beneath; petioles pubescent; sepals 9 ..... 8. *Pericampylus*
- 8 a. Inflorescence umbellate or condensed disc-like capitula; sepals and petals free; stigma 3-8 cleft .....10. *Stephania*
- b. Inflorescence paniculate, cymose or raceme; sepals free or connate; petals connate; stigma 3-cleft .....2. *Cyclea*
- 9 a. Drupes shortly horse shoe-shaped .....10
- b. Drupes straight or subrotund to subelliptic .....11

- 10 a. Leaves triplinerved at base; sepals marked with red streaks .....5. *Haematocarpus*  
 b. Leaves pinnately nerved, sometimes subplamately nerved at base; sepals without markings .....9. *Pycnarrhena*
- 11 a. Stamens united into a peltate synandrium; ventral side of endocarp either with a cavity bordered by usually incurved teeth or spines or with a closed inflated chamber .....7. *Parabaena*  
 b. Stamens free; ventral side of endocarp with a well defined central or median groove with a smooth margin .....12. *Tinospora*

### 1. *Anamirta* Colebr.

Large lianas, glabrous. Leaves not peltate, palmately nerved with hairy domatia in nerve axils. Inflorescence usually cauliflorous, paniculate. Male flowers : sepals pedicellate; imbricate; outer 2 minute; inner ones 6 (3+3), imbricate; petals absent; synandrium globular with clusters of 30-45 transversely dehiscent anthers. Female flowers: pedicellate; sepals as in male; staminodes 6-9, minute; carpels 3 (-4); gynophore central, elongating in fruit; stigma recurved. Drupes subreniform on terminal divergent 3 fid gynophore; endocarp woody with 2 small sublateral perforations ventrally. Seed globose; endosperm copious of horny granules.

Monotypic, distributed in India, Sri Lanka, Indo-China to Malasia.

*Anamirta cocculus* (L.) Wight & Arn., Prodr. 1: 446. 1834; Hook. f. & Thomson in Fl. Brit. India 1: 98. 1872; Pramanik in Fl. India 1: 311. 1993. *Menispermum cocculus* L., Sp. Pl. 340. 1753.

Lianas; young stems striate; bark thick, corky. Leaves ovate to broadly ovate, cordate or truncate at base, bluntly sub-acute to acuminate at apex, 11-27 x 8-24 cm, thinly coriaceous, petioles 6-18 (-25) cm long, swollen at base, geniculate at base. Inflorescences paniculate on old branches. Male flowers: sepals yellow; petals 0. Female flowers: staminodes 6; carpels 3-4; style lateral; stigma subcapitate, recurved. Drupes globose, greenish-white; endocarp subreniform.

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

*Distr.*: Car Nicobar in N. Nicobar.

The fruits are used as fish poison. Also used as an antidote and morphine poisoning. The stem produces best fibres.

## 2. *Cyclea* Arn. ex Wight

Climbing shrubs. Leaves usually peltate, palmately nerved. Inflorescence axillary or cauliflorous, racemose or thyrsoid-paniculate. Male flowers: sepals 4 or 5, connate, 4 to 5 lobed; petals 4, free or sometimes connate into a cup; stamens 4 to 5 connate into a peltate synandrium; anthers dehiscing transversely. Female flowers: sepals 1 or 2; petals 1 or 2, rarely absent. Carpel 1 with short style; stigma 3-fid. Drupes obovoid, curved, tubercled. Seeds curved; embryo narrow, terete, embedded in endosperm.

About 29 species distributed in India, Central and South China, Indo-China. Thailand to Malesia; 3 species in A. & N. Islands.

- 1 a. Flowers without bracts and bracteoles .....3. *C. pendulina*
- b. Flowers with bracts and bracteoles .....2
- 2 a. Leaves ciliate or hispid along margins .....1. *C. barbata*
- b. Leaves glabrous along margins .....2. *C. peltata*

- 1. ***Cyclea barbata*** Miers (in Ann. Mag. Nat. Hist. Ser. 3, 18: 19. 1866, *nom. nud.*) Contrib. Bot. 3: 237. 1871; Gangopadhyay in Fl. India 1: 322. 1993. *C. wallichii* Diels in Engler, Pflanzear. 46: 314. 1910.

Slender climbers; young branches hispid. Leaves ovate to deltoid-ovate, truncate or rounded at base, acuminate and mucronate at apex, 6-8 x 4-13 cm, hispid along margins; 9-12 nerved at base; petioles upto 6 cm long. Male inflorescence axillary, solitary or fascicled, corymbose, dense flowered. Sepals triangular. Corolla cyathiform, turbinate. Synandrium exerted. Female inflorescence branched panicles. Flowers sessile in dense heads. Sepals 2. Petals 2, reniform. Ovary curved; stigma 3-fid. Drupes compressed, puberulous.

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

*Distr.*: Kismus area of Car Nicobar in N. Nicobar.

Leaves and roots are said to be medicinally important.

2. ***Cyclea peltata*** (Lam.) Hook. f. & Thomson, Fl. Ind. 201. 1855 & in Fl. Brit. India 1: 104. 1872 p.p.; Gangopadhyay in Fl. India 1: 321. 1993. *Menispermum peltatum*, Encycl. Meth. 4: 96. 1797. *Cyclea burmanii* (Wight & Arn.) Hook.f. & Thomson, Fl. Ind. 201. 1855 & Fl. Brit. India 1: 104. 1872.

Twining shrubs with grooved branches. Leaves triangular ovate, deltoid, elongate-ovate or ovate-oblong, truncate, obtuse or subcordate at base, obtuse, acute, acuminate or apiculate at apex, 5-12 x 4-8 cm, pilose; 5 nerved with 2-5 in long petioles. Male inflorescence paniculate. Flowers green, pedicellate. Calyx campanulate. Petals cyathiform. Stamens 4. Female inflorescence panicles, pilose. Flowers sessile; staminodes 6. Drupes obovoid, 3-4 x 3-4 mm, pilose.

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

*Distr.*: Dugong creek in L. Andaman.

3. ***Cyclea pendulina*** Miers (in Ann. Mag. Nat. Hist. ser. 3, 18: 19. 1866, *nom. nud.*) in Contrib. Bot. 3: 243. 1871; Gangopadhyay in Fl. India 1: 326. 1993.

Climbing shrubs with striated, ferruginous branches. Leaves subovate, rounded or emarginate at base, mucronate at apex, 10-11 x 7-8 cm, glabrous above; basal nerves 5, palmate; petioles inserted peltately on lamina, 3-6 cm long, densely pubescent. Male inflorescence a panicle of pedunculate cymes, slender, upto 18 cm long. Calyx tubular, 4-toothed. Corolla subcampanulate, 4-lobed; synandrium exerted. Female inflorescence ca 20 cm long, pubescent. Sepals small. Petals cuneate-orbicular, retuse at apex. Ovary pilose. Drupes not known

*Fl.*: February.

Endemic to Nicobar Islands.

Described on the authority of Gangopadhyay (*l.c.*).

### 3. *Diploclisia* Miers

Woody climbers. Inflorescence supra-axillary or cauliflorous, racemose cymes. Male flowers: sepals (3+3); outer narrower; petals 6, involute around opposite stamens; stamens 6; filaments free, thickened upwards; anthers 4 lobed, dehiscing transversely. Female flowers: sepals and petals as in male; staminodes 6, filamentose; carpels 3; styles short with recurved stigma. Drupes laterally compressed, curved; endocarp obovate to narrowly obovate-curved, transversely ridged, with depression on each side. Seeds curved with narrow embryo.

2 species distributed in tropical S.E. Asia; 1 species in A. & N. Islands.

*Diploclisia glaucescens* (Blume) Diels in Engler, *Pflanzenr.* 46: 225, f. 77 A-L. 1910; Pramanik in *Fl. India* 1: 327. 1993. *Cocculus macrocarpus* Wight & Arn. *Prodr.* 13. 1834; Hook. f. & Thomson in *Fl. Brit. India.* 1: 101. 1872.

Deciduous woody climbers; stems ca 5 cm thick, glabrous, striated when young. Leaves peltate or not, broadly to suborbicular, rounded to cordate at base, acuminate to rounded at apex, slightly crenate along margins, 6-11 cm across; petioles 5-12 cm long. Inflorescence cauliflorous, up to 50 cm long and ca 8 cm wide. Male flowers pale yellow; female flowers: sepals, petals and staminodes 6 each. Carpels ca 2 mm long. Drupes obovoid, red turning yellow.

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

*Distr.*: Saddle Peak in N. Andaman

### 4. *Fibraurea* Lour.

Lofty climbing shrubs; dioecious stem woody. Leaves ovate or oblong, long petiolate, 3-5 nerved at base; distal lateral nerves 2-4 pairs. Inflorescences lax panicles, often ramiflorous. Male flowers: sepals 6-9, outer ones minute; petals absent; stamens 3-6, anthers longitudinally or obliquely dehiscing. Female flowers: staminodes 6; carpels 3, ovoid. Drupes oblong on knob-like carpophore with subterminal styar scar. Seeds oblong, subellipsoid, ventrally grooved length-wise, reniform in cross section; endosperm copious, horny; cotyledons foliaceous, longitudinally curved; radicles short, cylindric.

2 species distributed in N.E. India, Nicobar islands, Myanmar, Indo-China, S. China and Malesia; 1 species in A. & N. Islands.

**Fibraurea tinctoria** Lour., Fl. Cochinch. 626. 1790; Hook. f. & Thomson in Fl. Brit. India 1: 98. 1872; Pramanik in Fl. India 1: 314. 1993. *Tinomiscium nicobaricum* Balakr. in New Botanist 7: 7-9. f. 1. 1980 p.p.

Woody climbers upto 40 m long; branches striate. Leaves elliptic-ovate or oblong, sometimes subpeltate or usually rounded or obtuse at base, acuminate at apex, 10-26 x 5-14 cm, thinly coriaceous; petioles 4-13 cm long. Inflorescences axillary or ramiflorous, up to 35 cm long. Male flowers: sepals white or yellow broadly elliptic; stamens 6; anthers longitudinally dehiscing. Female flowers: staminodes subulate; carpels ellipsoid. Drupes yellow to orange, on 6-13 mm long pedicels.

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

*Distr.*: Galathea river bank in S. Nicobar and Mildera to Kappa in N. Nicobar.

### 5. **Haematocarpus** Miers

Lianas. Leaves usually not peltate, elliptic, 3-nerved. Inflorescence axillary, terminal, cauliflorous panicle or raceme. Male flowers: sepals 12-15 in 3 whorls, smaller in outer whorl; petals 6, inner clasping the stamens; stamens 6, connectives enlarged. Female flowers: sepals and petals as in male; staminodes 6; carpels 6, style reflexed. Drupes oblong-ellipsoid narrowed into stalk at base.

3 species distributed in N.E. India, Bangladesh to Malesia; 1 species in A. & N. Islands.

**Haematocarpus validus** (Miers) Bakh. f. ex. Forman in Kew Bull. 26: 420. 1972; Rao in Jour. Econ. Tax. Bot. 8 (1): 111. 1986; Gangopadhyay in Fl. India 1: 340 1993. *H. thomsonii* Miers., Hook f. & Thomson in Fl. Brit. India 1: 101. 1872.

Branches puberulous or glabrous. Leaves elliptic, obovate-elliptic or ovate-elliptic, obtuse at base, acuminate or obtuse at base, 7-18 x 4-8 cm;

petioles 1.2 to 3.5 cm long. Inflorescences axillary, usually panicles, up to 40 cm long. Male flowers: sepals and petals with dark red lines and spots; inner sepals larger; petals ovate. Stamens ca 1 mm long; connectives swollen. Female flowers: sepals and petals as in male; staminodes rod-like. Carpels ovoid-ellipsoid. Drupes red.

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

*Distr.*: Katchal island in N. Nicobar.

### 6. *Hypserpa* Miers

Climbing shrubs. Leaves ovate to elliptic, 3-7 nerved at base, sparsely or densely pubescent. Inflorescence axillary to extra-axillary, cymose or paniculate. Male flowers: sepals 7-12, glabrous, imbricate; outer ones minute; petals 5-9, fleshy; stamens 9-10, free or connate. Female flowers: sepals and petals as in male; carpels 2-3; styles solitary, reflexed; stigma entire or reflexed. Drupes subcompressed, curved, obovoid to globose, style scar basal; endocarp perforate or imperforate, rugose to rugulose on dorsal side. Seed curved, narrow, endospermous.

About 9 species distributed in India, China to Malesia; one species in A. & N. Islands.

*Hypserpa nitida* Miers in Hook. Kew J. Bot. 3: 258. 1851; Pramanik in Fl. India 1: 329. 1995. *Limacia cuspidata* Hook. f. & Thomson; Fl. India. 189. 1855. & Fl. Brit. India 1: 100. 1872.

Branches pubescent with yellow hairs when young, glabrescent in old. Leaves elliptic or broadly ovate to oblong-elliptic, obtuse to rounded at base, acuminate to obtuse or mucronate at apex, 4-12 x 1.5-7 cm, glabrous. Male flowers: sepals 7-11, puberulous outside. Petals 5, obovate; stamens 9-10. Female flowers: carpels 2, ellipsoid. Drupes subglobose, yellow to red.

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

Described on the authority of Pramanik (*J.c.*).

### 7. *Parabaena* Miers

Slender woody climbers. Leaves ovate or oblong, cordate or hastate at base, rarely lobed, entire or repand-dentate along margins, palmately nerved at base, papyraceous; petioles swollen and geniculate at base. Inflorescence axillary, dichotomously cymose or tyrsoid. Male flowers: sepals 6, subequal; petals 6; synandrium usually peltate. Female flowers: sepals and petals as in male; staminodes 6, minute; carpels 3; stigma reflexed, lobed or lacinate. Drupes on subglobose carpophore; endocarp bony, ridged or spiny; cotyledons divaricate.

About 6 species distributed in S.E. Asia, from India to Solomon islands; 1 species in A. & N. Islands.

*Parabaena sagittata* Miers ex Hook. F. & Thomson, Fl. Ind. 181. 1855 & in Fl. Brit. India 1: 96. 1872; Pramanik in Fl. India 1: 346. 1993.

Climbers with milky juice; branches finely striate, pubescent. Leaves ovate or oblong, sagittate, cordate or hastate at base, with acute basal lobes, acuminate at apex, entire, 11-24 x 6-15 cm, thinly coriaceous, glabrous above, pubescent beneath; basal nerves 3-5; lateral nerves 3-5 pairs; petiole 4-12 cm, long, pubescent. Inflorescence usually axillary. Male flowers: sepals yellow; petals narrowly obovate; anthers 6. Female flowers: sepals and petals as in male; staminodes 6; carpels 3; style recurved. Drupes ovoid, rostrate, orange; endocarp with 2 rows of spines.

*Fl.*: April-July; *Fr.*: June-Dec.

*Distr.*: Between Lamia Bay and Kalipur in N. Andaman, Car Nicobar in N. Nicobar.

Scarcely distributed along the streams.

### 8. *Pericampylus* Miers

Climbing shrubs. Leaves not peltate, palmately 5-nerved. Flowers mostly in axillary cymes. Sepals 9; outermost 3 narrow, minute, inner 6 imbricate, concave; inner-most 3 broader than others. Petals 6 cuneate. Male flowers: stamens 6, free; anthers dehiscing longitudinally. Female

flowers: staminodes 6, filamentose, carpels 3; stigma deeply bifid. Drupes curved, with basal style-scar; endocarp rotund in outline, laterally concave; condyle septiform, impferforate.

About 3 species in tropical and sub-tropical Asia; 1 in A. & N. Islands.

1. **Pericampylus glaucus** (Lam.) Merr. Interpr. Rumph. Herb. Amboin. 219. 1917; Pramanik in Fl. India 1: 330. 1993. *Pericampylus incanus* (Colebr.) Miers in Ann. Nat. Hist. Ser. 7, 2: 40. 1891; Hook. f. & Thomson in Fl. Brit. India 1: 12. 1872.

Stems striate, yellowish tomentose when young. Leaves suborbicular, cordate at base, obtuse acute or retuse at apex, 5-10 x 2-8 cm, shallowly cuneate along margins, softly pubescent, sparsely pubescent above; petioles 3-7 cm long, yellowish tomentose. Inflorescence fascicled or in paniculate cymes. Male and female flowers white or yellow. Drupes sub-globose, echinate, red-purple.

#### 9. **Pycnarrhena** Hook. f. & Thoms.

Climbing shrubs. Leaves elliptic or oblanceolate, penninerved or subpalmately nerved; petioles swollen at both ends. Inflorescence axillary or ramiflorous, usually cymose. Male flowers: sepals 6-15 in 3 whorls; inner ones larger and concave; petals 0-5, minute; stamens 5-18, clustered; anthers densely clustered; Female flowers: sepals and petals as in male; carpels 3-6, with recurved style and stygma. Drupes subglobose.

About 9 species distributed in S. China, Indo-Malesia to N. Australia; 2 species in A. & N. Islands.

- 1 a. Drupes glabrous .....2. *P. lucida*
- b. Drupes minutely tomentose or puberulous .....1. *P. longifolia*

1. **Pycnarrhena longifolia** (Decne ex Miq.) Becc. Malesia 1: 160. 1877; B.K. Sinha & P.S.N. Rao in Mal. Nat. Jour. 48: 39. 1994. *Cocculus longifolius* Decne ex Miq. Ann. Mus. Bot. Lugd. Bat 4: 84. 1868.

Leaves elliptic to narrowly elliptic to lanceolate elliptic, base obtuse to rounded, apex abruptly to gradually acuminate, 8-12 x 3-6 cm; lateral nerves 6-8 pairs, midrib often puberulous below; petiole 1.8-2.5 cm long,

usually puberulous. Inflorescence ramiflorous, fasciculate, peduncles 1-flowered. Male flowers: outer sepals 2-4; inner sepals 3, yellow; petals 3, oblate; stamens 7-12, closely clustered. Female flowers: outer sepals 1-2; inner sepals 4-6, yellow; petals 3, broadly obovate; carpels 3-4, subellipsoidal, style short; recurved. Drupes globose; endocarp crustaceous.

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

*Distr.*: Dugong creek in L. Andaman and Karmatang in Middle Andaman.

Scarcely distributed.

2. ***Pycnarrhena lucida*** (Teijsm. & Binn.) Miq. in Ann. Mus. Bot. Lugd.-Bat. 4: 87. 1868; Gangopadhyay in Fl. India 1: 341. 1993. *Cocculus lucidus* Teijsm. & Binn., Nat. Tijds. 4: 397. 1853. *Antitaxis fasciculata* Miers, Hook. f. & Thomson in Fl. Brit. India 1: 108. 1872.

Leaves elliptic, acute or obtuse at base, acuminate at apex, 6-12 x 2.5-5.5 cm; main nerves 6; petioles slender up to 2 cm long. Male inflorescence fasciculate; sepals 9-12; outer ones puberulous, small; inner ones 3-6 larger, rotundate, glabrous; petals 3; stamens 6-12. Female flowers not known. Drupes globose, red, glabrous.

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

Described on the authority of Gangopadhyay (l.c.)

#### 10. ***Stephania*** Lour.

Slender woody climbers. Leaves usually peltate, ovate suborbicular or deltoid, palmately 8-13 nerved, glabrous or hairy; petioles usually geniculate at base. Inflorescence axillary or on old leafless stems; flowers usually in umbelliform cymes. Male flowers symmetrical: sepals 6 or 8, in whorls, imbricate; petals 3-4, free; stamens 2-6, connate forming a peltate synandrium. Female flowers: sepals 1-8; petals 2-4, as in male; carpels 1; style 3-6 partite or absent. Drupes obovoid or ovoid; style scar distinct near base; endocarp bony, tubercled or ribbed. Seeds curved.

About 35 species, mostly tropical Africa, Indian sub-continent, Malasia to Australia; 1 species in A. & N. Islands.

- 1 a. Inflorescences from main stem or leafless branches .....1. *S. andamanica*  
 b. Inflorescences from leafy branches .....2. *S. japonica*
1. **Stephania andamanica** Diels in Engler, Pflanzenr. 46: 266. 1910; Gangopadhyay 1: 333. 1993.

Leaves ovate, rounded at base, acute to acuminate at apex, 6-8 x 3-5.5 cm; puberulous beneath, 7-9 nerved; petioles upto 5 cm long, slender. Male inflorescence pendulous panicles; upto 60 cm long. Male flowers: petals inflexed synandrium ca 1.5 mm long; antheriferous disc ca 1 mm across. Female flowers and fruits not known.

*Fl.*: June.

*Distr.*: Rangat in M. Andaman, Saithankhari in S. Andaman.

2. **Stephania japonica** var. *discolor* (Blume) Forman in Kew. Bull. 11. 56. 1956; Gangopadhyay in Fl. India 1: 337. 1993. *Chypea discolor* Blume, Bijdr. 26. 1825.

Branches striate. Leaves ovate-triangular, peltate, truncate or rarely subcordate at base, acute, acuminate or obtusely mucronate at base 4-17 x 4-15 cm, glabrous, puberulous or thinly pubescent below; petioles 3-12 cm long. Inflorescence axillary. Male flowers green; sepals oblanceolate; petals or orbicular, glabrous; stamens with anthers transversely dehiscent. Female flowers yellow. Drupes greenish turning red, glabrous, obovoid or subglobose.

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

*Distr.*: Saddle Peak in N. Andaman.

### 11. **Tinomiscium** Hook. f. & Thoms.

Woody climbers with white latex. Leaves ovate or ovate-elliptic, entire, 3-5 nerved basally with fine nervules; petioles usually long, bent and swollen at the base and often at apex. Inflorescence racemose from

old leafless stems. Male flowers: sepals 9 in 3 whorls, outer ones smaller; petals 6 with involute edges; stamens 6, free, opposite to petals; anthers longitudinally and transversely dehiscent; rudimentary carpels 3; stigma lobed. Drupes 3; style scar terminal; endocarp rugose or rugulose, acute at apex.

Monotypic, native to S.E. Asia from Assam to Malasia; 1 species in A. & N. Islands.

*Tinomisium petiolare* Hook. f. & Thomson, Fl. Ind. 205. 1855 & in Fl. Brit. India 1: 97. 1872; Pramanik in Fl. India 1: 315. 1993. *T. nicobaricum* Balakr. in New Botanist 7: 7-9, ff. 2-7, 1980. p.p.

Branches striate; young twigs densely hairy. Leaves alternate, broadly ovate-truncate or rounded at base, acute or shortly caudate acuminate at apex 11-20 x 4-13 cm coriaceous, glabrous; petioles 6-7.5 cm long with swollen base. Inflorescence racemose, up to 25 cm long, several together, rarely glabrous. Male flowers: sepals white or yellow; petals with incurved edges; stamens ca 2.5 mm long. Female flowers staminodes linear-oblong; carpels curved-ellipsoid. Drupes 3, sometimes with 1 or 2 aborted.

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

*Distr.*: S. Nicobar Islands.

Milky latex medicinally important. Fruits used as fish poison. Seeds sweet and edible.

## 12. *Tinospora* Miers

Woody climbing shrubs, bark exfoliating on drying. Leaves ovate, subcordate, entire or rarely dentate; basal nerves 3-5, palmate; lateral nerves distal, 1-3 pairs, sometimes with domatia or glandular patches; petioles swollen and geniculate at base. Inflorescences thyrsoid, pseudo-paniculate, pseudo-racemose or pseudospicate. Male flowers: sepals 6 in 2 whorls; petals 3-6, obovate, with inrolled edges, glandular papillose, stamens 6, free. Female flowers: sepals and petals as in male; staminodes 6, subulate; carpels 3, curved-ellipsoid; style short; stigma peltate, reflexed. Drupes 3, ovoid or ellipsoid.

About 32 species distributed in Tropical Africa, Madagascar, Asia to Australia and Pacific islands; 2 species in A. & N. Islands.

- 1 a. Male flowers on 8-12 mm long pedicels; drupes radiating from unbranched short columnar carpophore .....2. *T. glabra*  
 b. Male flowers on 2-5 mm long pedicels; drupes radiating from shortly 3-branched or 3-cornered carpophore. ....1. *T. cordifolia*
1. ***Tinospora cordifolia*** (Willd.) Hook. f. & Thomson, Fl. Ind. 184. 1855 & in Fl. Brit. India 1: 97. 1872; Pramanik in Fl. India 1: 347. 1993.

Deciduous climbers; stem striate when young often with lenticels; bark corky. Leaves broadly ovate-cordate, abruptly cuspidate-acuminate at apex, 4-15 x 4.5-13 cm; domatia usually present on lower surface.; petioles up to 7 cm long. Male flowers, fascicled, yellow. Female flowers usually solitary. Drupes globose, red.

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

Described on the authority of Pramanik (l.c.).

2. ***Tinospora glabra*** (Burm. f) Merr. in J. Arn. Arb. 19 : 340, 1938; Pramanik in Fl. India 1: 349. 1993. *T. uliginosa* Miers in Hook. f. & Thomson in Fl. Brit. India 1: 97. 1872. *T. andamanica* Diels in Engler, Pflanzenr. 46. 141. 1910.

Woody climbers; bark smooth. Leaves oblong-ovate, rounded at base, acuminate at apex; domatia present; petioles up to 8 cm long. Inflorescences pseudoracemose, lax-flowered. Male flowers yellow or greenish. Female flowers: staminodes 6, gynophore sub-globose; stigma lobed. Drupes red.

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

Described on the authority of Pramanik (l.c.).

## NYMPHAEACEAE

About 5 genera and 70 species in tropical and temperate regions of the world; 1 genus and 1 species in A. & N. Islands.

**Nymphaea** L. nom. Cons.

Perennial aquatic herbs. Rhizomes stoloniferous. Leaves polymorphic, long-petiolate; juvenile leaves membranous, at first subulate, hastate, sagittate, deltoid or cordate-ovate and submerged later elliptic and cleft upto petiole base and floating; adult leaves coriaceous prominently venose beneath, broadly elliptic to orbicular and deeply cleft near or up to petiole base, floating or emerged, showy. Sepals 4. Petals numerous, a few outermost sometimes sepaloid, innermost ones often transitional to stamens. Stamens numerous, inflexed, outer ones with petaloid filaments and reduced anthers, the inner ones with narrower filaments and longer anthers. Carpels 5-35 with bilobed stigmas. Ovules numerous. Berry globose. Seeds enclosed in bell-shaped aris.

About 50 species inhabiting stagnant fresh water ponds, lakes and swamps in tropical and temperate regions; 1 species in A. & N. Islands.

**Nymphaea nouchali** Burn. f., Fl. Ind. 120. 1768; *N. stellata* Willd., Sp. Pl. 2: 1153. 1799; Hook. f. & Thomson in Fl. Brit. India 1: 114. 1872, incl. var. 1, 2 & 3; Rao in Jour. Econ. Tax. Bot. 8 (1): 111. 1986.

Leaves orbicular or elliptic-sagittate when young, repand to irregularly sinuate-dentate with broad obtuse teeth, or subentire, 8-20 cm in diam., green, sometimes blotched purple above, reddish purple beneath. Flowers violet, pale blue or white upto 17 cm across, solitary. Fruits 1-3 cm across, globose. Seeds ellipsoid, longitudinally striate.

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

*Distr.*: N. Nicobar and Andaman islands.

Tuberous rhizomes and peduncles used as vegetable.

**BARCLAYACEAE**

1 genus and 4 species in S.E. Asia; 1 species in India from A. & N. Islands.

**Barclaya Wallich, *nom. cons.***

Slender, perennial, rhizomatous aquatic, herbs. Leaves long petiolate, heterophyllous, submerged or floating, oblong to suborbicular, cordate or subsagittate at base. Flowers solitary, long peduncled with spirally arranged floral appendages. Sepals 5, persistent. Petals many, connate into a tube, persistent, stamens numerous, arranged on corolla tube, pendulous. Ovary 6-14 loculate with a cup-like depression above, formed by radiating curved stigmas; ovules numerous in each locule; placentation laminar. Fruit many seeded berry, dehiscent, crowned with persistent calyx and corolla. Seeds spinulate.

**Barclaya longifolia** Wallich in Trans. Linn. Soc. Lond. 15: 443, t. 18. 1827; Hook. f. & Thomson in Fl. Brit. India 1: 115. 1872; Mitra in Fl. India 1: 443. 1993.

Leaves linear-oblong, cordate-sagittate at base, obtuse at apex, undulate crispate along margins, 12-28 x 2-6 cm; petioles upto 25 cm long. Flowers purple hardly expanding and emerging above water; pedunculate. Sepals linear-elliptic with midrib drawn into a 3.5 cm long tail. Corolla green outside, purplish inside. Inner stamens fertile. Berry 1-1.5 m across. Seeds globose, spinulose.

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

*Distr.*: S. Andaman between Pachang and Poona Nallah.

Notes : Prain (in J. Asiat. Soc. Beng. 59: 252, 1890) considers the plant doubtfully indigenous to Andaman Flora. The plant is popularly grown in aquaria in continental Europe and N. America (Taxa 33: 517, 1984) and could have been brought to these islands during their colonization as an aquarium plant but subsequently found its way as escape.

**PAPAVERACEAE**

26 genera and about 200 species in temperate and subtropical N. America, Europe, Asia, Australia and S. Africa; 1 genus and 1 species in A. & N. Islands.

**Argemone L.**

Annual or perennial herbs, prickly or sometimes glabrous with yellowish juice. Leaves sessile, elliptic-oblong, pinnatifid, toothed along margins. Flowers solitary, terminal or axillary, usually yellow. Sepals 3, caducous. Petals 6 in two whorls. Stamens many. Ovary ovate-oblong; stigma sessile, radiating, 3-7 lobed. Capsules 4-6 ribbed, dehiscing along sutures; seeds numerous, pitted.

About 22 species; 1 species in A. & N. Islands.

**Argemone mexicana** L., Sp. Pl. 508. 1753; Hook. f. & Thomson in Fl. Brit. India 1 : 117. 1872; Debnath & Nair in Fl. India 2: 1993.

Annuals up to 1 m high, divaricately branched, spinescent or glabrous. Radical leaves 25-35 x 7-9 cm; cauline ones sessile 5-10 x 2.5-4 cm, sinuate-pinnatifid, spiny on margins and veins. Flowers solitary, terminal, yellow. Capsules 3-6 valved with 5-16 erecto-patent spines on each valve. Seeds numerous, reticulate, brownish black.

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

*Distr.* : S. Nicobar around Pygmalion point.

**BRASSICACEAE**

About 340 genera and 3350 species throughout the world primarily in temperate regions; 2 genera and 3 species in A. & N. Islands, all cultivated.

- 1 a. Pods dehiscent.....1. *Brassica*  
 b. Pods didymous or long but not dehiscent.....2. *Raphanus*

**1. Brassica L.**

Herbs with entire, lyrate or pinnatifid leaves. Racemes usually short, corymbose. Flowers yellow or white. Sepals saccate or gibbous at base. Petals clawed. Fruit in siliqua with seedless narrow beak, sometimes 3-4 valved, replum membranous. Seeds few to many, globose.

About 60 species, mostly Mediterranean; 2 species in A. & N. Islands

- 1 a. Upper leaves stalked or narrowed at base.....1. *B. juncea*  
 b. Upper leaves usually amplexicaul, rounded or deeply cordate at base.....  
 .....2. *B. oleracea*

1. ***B. juncea* (L.) Czern., Consp. Fl. Chark. 8. 1859. *Sinapis juncea* L., Sp. Pl. 668. 1753.**

Erect herbs, annual, up to 90 cm high, branched. Basal leaves lyrate pinnatifid; middle ones obovate-oblong, pinnatifid; upper ones lanceolate, entire-dentate. Racemes 20-40 flowered. Flowers yellow, ca 7 mm across. Sepals subequal. Petals obovate, clawed, apex rounded. Pods up to 6 cm long. Seeds black, minute.

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

*Distr.*: S. Andaman.

2. ***Brassica oleracea* var. *botrytis* L., Sp. Pl. 667. 1753.**

'Phoolgobhi'

Annual herbs. Rachises of young inflorescences and pedicels thickened into a dense yellowish white mass. Flowers yellow.

var. *capitata* L., Sp. Pl. 667. 1753.

'Patgobi'

Annual herbs. Leaves densely packed into a subglobose or ellipsoid head with stout nerves. Flowers pale yellow.

## 2. ***Raphanus* L.**

Annual or biennial herbs. Leaves lyrate-pinnate or pinnatifid. Racemes corymbose. Flowers moderate sized, purple or white. Sepals erect, the lateral saccate at base. Pods indehiscent, elongate, terete and swollen, with acuminate beak. Seeds globose, pendulous from short funicle.

About 8 species chiefly Mediterranean; 1 species in A. & N. Islands.

***Raphanus sativus* var. *sativus* L., Sp. Pl. 669. 1753.**

'Muli'

Erect herbs, annual or biennial with fusiform tap root; up to 1 m high. Lower leaves pinnati-partite with sinuate-dentate segments, very variable, 3-5 jugate; upper ones entire or dentate, subsessile or sessile. Racemes 10-30 flowered. Flowers 10-20 mm across, usually white or violet. Pods turgid with compressed, conical, seedless beak; lower part of silique stalk-like.

### CAPPARACEAE

About 47 genera and 550 species in America, S. Europe, Africa, Asia and Australia, mostly in tropical and subtropical regions; 3 genera and 10 species in A. & N. Islands.

- 1 a. Herbs or woody undershrubs with non-baccate fruits .....2. *Cleome*
- b. Shrubs or trees with baccate fruits .....2
- 2 a. Shrubs with simple leaves .....1. *Capparis*
- b. Trees with trifoliolate leaves .....3. *Crateva*

#### 1. *Capparis* L.

Shrubs or trees, generally armed with stipular spines. Leaves petiolate, simple, sometimes reduced and look leafless. Flowers in panicles, racemes, corymbs or umbels, sometimes solitary, axillary or supra-axillary; bracts early caducous. Sepals 4 in two whorls. Petals 4, caducous after anthesis. Receptacle flat with small adaxial disc. Stamens 8 or many on torus. Ovary ovoid, unilocular with 4 or many ovules. Berry on a slender or thickened stipe, globose or ovoid. Seeds one to many.

About 240 species in Africa, Asia, Australia, sometimes in temperate regions of Europe, China, Australia, S. Africa and S. America; 6 species in A. & N. Islands.

- 1 a. Flowers in supra-axillary vertical series of 2-10 or even more .....2
- b. Flowers not in supra-axillary vertical series .....4
- 2 a. Flowers appearing before leaves, hence flowering shoots apparently leafless  
.....6. *C. zeylanica*
- b. Flowers not appearing before leaves, hence flowering shoots always leafy.  
.....3

- 3 a. Cataphylls present .....3. *C. micracantha*  
 b. Cataphylls absent .....5. *C. tenera*
- 4 a. Inflorescence racemose or paniculate or umbels arranged to form a panicle.  
 .....5  
 b. Inflorescence neither racemose, nor paniculate; flowers in solitary umbels,  
 sub-umbels or in corymbs .....4. *C. sepiaria*
- 5 a. Midrib of leaves flat or raised at basal part, panicles dense flowered .....  
 .....2. *C. floribunda*  
 b. Midrib of leaves sunken at basal part, panicles lax flowered .....  
 .....1. *C. cantoniensis*

1. ***Capparis cantoniensis*** Lour. Fl. Cochin. 331. 1790; Raghavan in Fl. India 2: 260. 1993. *C. pumila* Benth.; Hook. f. Thomson in Fl. Brit. India 1: 177. 1872.

Climbing or scandent shrubs. Leaves elliptic, oblong-lanceolate, cuneate or attenuate at base, bluntly acuminate at apex, 6-9 (-15) x 1.5-3.2 (-4.5) cm, glabrous; lateral nerves 6-10 pairs. Flowers white fragrant, pedicellate in few flowered corymbs or umbels arranged in large terminal panicles. Petals white, oblong. Ovary ovoid-oblong, glabrous; gynophore 4-10 mm long. Fruit ellipsoid or globose with pointed tip, faintly ribbed, 0.5-1.8 x 0.4-0.8 cm, reddish.

*Fl.*: Feb.-March; *Fr.*: Nov.-Dec.

*Distr.*: Rangachang and Dhanikhari in S. Andaman.

The leaves in A. & N. Islands are much larger than in mainland specimens.

2. ***Capparis floribunda*** Wight, Illus: 1: 33, t. 14. 1840; Hook. f. & Thomson in Fl. Brit. India 1: 177. 1872; Parkinson in For. Fl. Andaman Islands. 81. 1923. *C. andamanica* King in Ann. Roy. Bot. Gard. Calc. 5: 119. t. 137. 1896.

Scandent, woody shrubs. Leaves oblong or elliptic tapering at base, rounded to obtuse at apex, 4-8 (-13) x 3.5-5 (-5.5) cm, entire; lateral nerves 7-10 pairs. Flowers white, fragrant, at the tops of axillary panicles.

Stamens 8, with slender white filaments. Fruit globose, shortly beaked at apex, orange-red with thin stipe.

*Fl.*: Jan.-April. *Fr.*: May-June.

*Distr.*: Lamia Bay and Ramnagar in N. Andaman and Hut Bay in L. Andaman.

No stipular thorns are observed in Andaman specimens.

3. ***Capparis micracantha*** DC., Prodr. 1: 247. 1824; Hook. f. & Thomson in Fl. Brit. India 1: 179. 1872; Parkinson, For. Fl. Andaman Islands. 82. 1923; Raghavan in Fl. India 2: 275. 1993.

Large shrubs or small trees with few small, stipular recurved thorns. Leaves oblong or broadly lanceolate, rounded at base, acute callous or retuse, 10-24 x 5-8 cm, coriaceous, glabrous. Flowers supra-axillary, 2.5-3 cm across, showy, white or creamy with blue to lavender centre. Fruits globose to ovoid with 4-5 longitudinal sutures, 5-7 x 3-4 cm, orange-red, woody coriaceous when dry with as many bulges as seeds embedded; stalk 3.2-3.5 cm long.

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

*Distr.*: Ray Hills in N. Andaman.

4. ***Capparis sepiaria*** L., Syst. Nat. ed. 10. 2 : 1071. 1759; Hook. f. & Thomson in Fl. Brit. India 1: 176. 1872; Parkinson, For. Fl. Andaman Islands. 81. 1923; Raghavan in Fl. India 1: 289. 1992.

Scandent shrubs with several recurved stipular thorns. Leaves ovate, ovate-elliptic, subcordate at base, acute or often rounded, emarginate or retuse at apex, 1.5-5.5 x 0.4-3.5 cm, herbaceous to subcoriaceous. Flowers 4-8, in axillary umbels, white, fragrant. Fruit edible, globose, wrinkled when dry.

*Fl.*: March-July; *Fr.*: Oct.-Nov.

*Distr.*: Monglutan in S. Andaman and around Saddle Peak in N. Andaman.

5. **Capparis tenera** Dalz. in Hook. J. Bot. Kew Gard. Misc. 2: 41. 1850; Hook. f. & Thomson in Fl. Brit. India 1: 179. 1872; Parkinson, For. Fl. Andaman Islands. 82. 1923; Raghavan in Fl. India 2: 297. 1993.

Scandent shrubs with stipular recurved thorns. Leaves distichous, ovate-elliptic or ovate-oblong, subcordate at base, caudate-acuminate at apex, 5-10 x 2-5 cm, herbaceous to subcoriaceous. Flowers white, fragrant, 2-4 in a row above the axils. Petals tomentose outside. Fruits subglobular, deep orange or red when ripe; seeds 3-4.

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

*Distr.*: Porlob island and Chouldari in S. Andaman.

6. **Capparis zeylanica** L., Sp. Pl. fed. 2: 720. 1762; Raghavan in Fl. India 2: 298. 1993. *C. horrida* L. f., Suppl. 264. 1781; Hook. f. & Thomson in Fl. Brit. India; Parkinson, For. Fl. Andaman Islands. 82. 1923. 'Asaria'

Scandent shrubs densely armed with recurved stipular thorns. Leaves ovate, elliptic, lanceolate or obovate, subcordate or cuneate at base, acute, acuminate or obtuse at apex, 2-7 (-11) x 1.5-5.5 (-8) cm, coriaceous, glabrous. Flowers showy, white, fragrant in supra-axillary rows of 2-6 flowers. Stamens 30-50. Fruits globular or ellipsoid, pustulate ca 5 x 4 cm, woody, reddish orange to purple; style 5-8 cm long; seeds many embedded in scarlet pulp.

*Fl.*: Feb.-Apr. *Fr.*: Aug.-Oct.

*Distr.*: Dhanikhari dam area in S. Andaman.

*Uses*: Fruits are edible and unripe fruits are pickled. Pulverised fruits mixed with berries of *C. moonii* are reportedly used in treating 'Jaundice', liver ailments and tuberculosis.

## 2. **Cleome** L.

Herbs, mostly annuals; stems foetid, generally striate, glabrous to viscid-glandular, occasionally with prickly appendages. Leaves simple or digitately 3-13 foliolate. Flowers yellow, rose or purple, solitary or in terminal racemes, axillary. Sepals 4, spreading. Petals 4, mostly clawed

at base, longer than sepals. Stamens 4 to many, rarely with a few staminodes. Ovary sessile or with a short gynophore, unilocular. Ovules on 2 parietal placentae, style short or absent; stigma sessile, capitate, discoid or truncate. Capsules siliquiform, linear, oblong, terete or flattened, striate, often beaked; seeds reniform or orbicular.

About 150 species in America, Europe, Africa, Asia, extending to Australia in tropical areas; 3 species in A. & N. Islands.

- 1 a. Androgynophore conspicuous, 5 mm or more long .....1. *C. gynandra*
- b. Androgynophore mostly absent, if present less than 3 mm long .....2
- 2 a. Plants with retrorse scattered soft linear prickly appendages .....  
.....2. *C. rutidosperma*
- b. Plants without retrorse or prickly appendages .....3. *C. viscosa*

1. **Cleome gynandra** var. **gynandra** L., Sp. Pl. ed. 1. 671. 1753; Raghavan in Fl. India 2: 309. 1993, *Gynandropsis pentaphylla* (L.) DC. Prodr. 1: 238. 1824; Hook. f. & Thomson in Fl. Brit. India 1: 171. 1872.

Annual herbs up to 1.2 m high, glandular pubescent. Leaves 3 to 5-foliolate, lower long petioled, upper almost sessile; leaflets 3-6.5 x 1.5-3.5 cm, elliptic-obovate to elliptic-lanceolate, denticulate to subentire. Flowers in 5-8 cm long, terminal racemes. Capsules linear-cylindric, viscidly pubescent, obliquely striated, 3-12 cm long, tapering at both ends, many seeded; seeds depressed spherical, with concentric ribs and irregular cross-ribs, black-brown.

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

Described on the authority of Raghavan (l.c.)

2. **Cleome rutidosperma** DC., Prodr. 1: 241. 1824; Mukherjee in Indian For. 95: 237. 1969; Raghavan in Fl. India 2: 313. 1993.

Erect or decumbent annual herbs up to 1 m high; stems weak, ribbed, subglabrous to eglandular-pilose, clothed with soft prickles. Leaves 3-foliolate; lower ones long-petioled; leaflets subsessile, rhombate-elliptic or obovate, oblong-lanceolate, attenuate or cuneate at base, acute or

acuminate at apex. Flowers in lax racemes. Capsules linear-cylindric, attenuate at both ends, ribbed, 4-7 cm long, valves parallel-veined, glabrous; seeds many suborbicular to reniform, with concentric ridges and open cleft, orange-brown, drying black.

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

*Distr.*: Near Megapod Nest in Port Blair, Kamorta in N. Nicobar.

3. **Cleome viscosa** var. **viscosa** L., Sp. Pl. 672. 1753; Hook. f. & Thomson in Fl. Brit. India 1: 170. 1872; Raghavan in Fl. India 2: 317. 1993.

Annual herbs up to 1.2 m high with glandular hairs. Leaves petiolate, 3 to 5 foliolate; leaflets 1.0-5.5 x 0.5-3 cm, obovate to elliptic-oblong. Flowers in lax, leafy racemes. Capsules 2.5-9 cm, cylindric, glandular hairy, shortly beaked, obliquely striated. Seeds numerous, reniform, with faint concentric ribs and strong cross ribs, dark brown.

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

*Distr.*: Rangat Bay in M. Andaman, east-west Road in G. Nicobar.

### 3. **Crateva** L.

(*Crataeva*)

Trees or rarely shrubs. Leaves trifoliate; leaflets often pellucid dotted; terminal one equilateral with acuminate or caudate apex; lateral ones oblique, asymmetrical. Racemes terminal, corymbose. Flowers showy, long pedicelled, unisexual, bisexual, often polygamous, yellow or purple. Receptacle dish-shaped with incurved margins, nectariferous. Sepals equal, ovate-spathulate, green. Petals 4, long clawed. Stamens indefinite, adnate to the base of the gynophore. Ovary long stipitate, unilocular; stigma sessile, discoid. Fruits fleshy berrys, pendulous; rind spongy or hard smooth or papillate, covered by flat whitish warts; stipe woody; seeds embedded in pulp.

About 8 species, pantropical in Africa, Asia, Central and S. America, mostly in lowland forests; 1 species in A. & N. Islands.

**Crateva religiosa** Forester f., Pl. Escul. Ins. Occ. Austral. 45. 1786; Hook. f. & Thomson in Fl. Brit. India 1: 172. 1872; Raghavan in Fl. India 2: 325. 1993.

Deciduous trees up to 15 m high; young shoots lenticelled. Leaves thinly membranous; petioles 4-10 cm long; leaflets 7.5-15 x 2.5-6 cm, lanceolate or elliptic, cuneate at base, tapering or abruptly acuminate at apex. Flowers showy, fragrant in terminal corymbs. Sepals not keeled. Petals clawed. Stamens 16-24. Gynophore 3-6.5 cm long. Fruit obovoid, 3-5.5 cm in diam; many seeded.

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

*Distr.*: Car Nicobar and Katchal island in N. Nicobar.

## VIOLACEAE

About 22 genera and 900 species with cosmopolitan distribution in tropical and temperate regions of the world; 1 genus and 3 species in A. & N. Islands.

### **Rinorea** Aublet

Trees or shrubs. Leaves alternate or rarely opposite or spiral, distichous; secondary nerves often numerous and parallel; stipules caducous to persistent. Flowers bisexual or rarely unisexual, sometimes plants dioecious, regular, solitary, in cymes or racemes, axillary or terminal. Sepals 5, subequal, rigid. Petals 5, subequal, sessile. Stamens 5 inserted on an annular disc; connective produced into a long or short, often broad membranous appendage. Ovary tricarpeal, unilocular; ovules on parietal placentation; style straight; stigma terminal. Fruits 3-valved, few seeded.

About 200 species distributed in America, Africa, Bangladesh, Myanmar, Sri Lanka, Malaysia, Indonesia to N. Australia in tropical areas; three species in A. & N. Islands.

- 1 a. Leaves 2-5 cm long, subsessile, stamens exserted; anthers cohering into a cone ..... 2. *R. heteroclita*
- b. Leaves up to 25 cm long, petiolate, stamens inserted; anthers free. ....2

- 2 a. Flowers in elongated racemes; anthers with distinct ventral appendage ...  
 .....3. *R. longiracemosa*
- b. Flowers fascicled or densely set on short rachis; anthers with a dorsal  
 appendage .....1. *R. bengalensis*
1. ***Rinorea bengalensis*** (Wallich) O. Ktze, Rev. Gen. Pl. 1: 42. 1892;  
 Banerjee and Pramanik in Fl. India 2: 348. 1993. *Alsodeia bengalensis*  
 Wallich in Trans. Med. Phys. Soc. Calc. 7: 224. 1835; Parkinson, For.  
 Fl. Andaman Islands. 83. 1923. *A. griffithii* Hook. f. & Thomson, l.c.  
 187. *A. wallichiana* Hook. f. & Thomson, l.c. 187. *A. zeylanica* (Arn.)  
 Thwaites, Enum. Pl. Zeyl. 21. 1858; Hook. f. & Thomson, l.c. 187.

Shrubs or small trees up to 4 m high. Leaves elliptic-lanceolate or ovate, acute at base, acuminate at apex, crenate or serrate along margins, 6-18 x 2-9 cm, glabrous. Flowers small, white, on slender pedicels in axillary fascicles, globular. Capsules globose, 3-valved, longitudinally dehiscent; seeds 3-4, globose, glabrous.

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

*Distr.*: Myomyo in S. Andaman, Hut Bay in L. Andaman.

One of the commonest shrubs in deciduous forests of the islands. The leaves which resemble those of the tea plant are said to be used to adulterate tea.

2. ***Rinorea heteroclita*** (Roxb.) Craib, Fl. Siam. Enum. 1: 89. 1925;  
 Banerjee & Pramanik in Fl. India 2: 348. 1993. *Vareca heteroclita*  
 Roxb., Fl. Ind. 2: 446. 1824. *Alsodeia roxburghii* Hook. f. & Thomson  
 in Fl. Brit. India 1: 186. 1872; Parkinson, For. Fl. Andaman Islands.  
 83. 1923.

Shrubs or small trees upto 4 m high. Leaves elliptic-lanceolate, cuneate at base, obtuse or apiculate, often blunt, sometimes with a mucro at apex, crenate but entire near base, 2-6 x 1.5-2 cm, glabrous, perforate at nerve axils beneath. Flowers small, white, subsessile in dense axillary clusters. Capsules subglobose, tapering towards apex; seeds one to few, ellipsoid.

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

*Distr.*: Chiriatapu in S. Andaman, towards Parnasala in M. Andaman and Lakshmipur in N. Andaman.

3. **Rinorea longiracemosa** (Kurz) Craib. Fl. Siam. Enum. 1: 90. 1925; Banerjee & Pramanik in Fl. India 2: 350. 1993. *Alsodeia longiracemosa* Kurz in J. Asiatic Soc. Bengal 39 (2): 63. 1870. *A. racemosa* Hook. f. & Thomson in Fl. Brit. India 1: 187. 1872.

Shrubs or small trees up to 3 m high. Leaves oblong-lanceolate to elliptic-obovate, cuneate at base, acuminate at apex, serrate, 5-16 x 2.5-5 cm, glabrous. Racemes axillary, 5-10 cm long. Flowers yellowish-white. Sepals subequal. Petals glabrous, sometimes sparsely ciliate. Capsules subglobose, 3-sided with blunt angles, up to 1.5 cm long; seeds 6.

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

*Distr.*: Katchal island in N. Nicobar.

## BIXACEAE

3 genera and about 28 species; 1 genus and 1 species in A. & N. Islands.

### **Bixa** L.

Shrubs or small trees. Leaves simple. Flowers in terminal panicles, bisexual. Sepals 5, imbricate, deciduous. Petals 5. Anthers opening by 2 terminal pores. Ovary unilocular; style slender, curved; ovules many. Capsules loculicidally 2-valved; seeds many.

**Bixa orellana** L., Sp. Pl. 512. 1753; Hook. f. & Thomson in Fl. Brit. India 1: 190. 1872; Parkinson, For. Fl. Andaman Islands. 83. 1923; Balakrishnan in Fl. India 2: 380. 1993.

Small evergreen trees up to 5 m high. Leaves cordate or truncate at base, long-acuminate at apex, 7-24 x 4-16 cm, glabrous; petiole 5-7 cm long, slender. Flowers white or light red, 2.5-5 cm in diameter. Capsules 4 cm long, ovoid, nearly truncate at base, softly echinate.

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

Introduced and cultivated in settlements, now naturalised especially in Nicobar islands. Seeds are said to provide a red dye for colouring foodstuffs.

*Distr.*; Car Nicobar (near Passa) in N. Nicobar.

### FLACOURTIACEAE

About 79 genera and over 880 species; 5 genera and 10 species in A. & N. Islands.

- 1 a. Petals absent .....2
- b. Petals present .....3
- 2 a. Flowers bisexual .....1. *Casearia*
- b. Flowers unisexual .....2. *Flacourtia*
- 3 a. Leaves distinctly palminerved; stamens numerous .....3. *Pangium*
- b. Leaves penninerved; stamens 4-5 .....4
- 4 a. Racemes elongated; anthers basifixed .....4. *Ryparosa*
- b. Racemes short; anthers dorsifixed .....5. *Scolopia*

#### 1. *Casearia* Jacq.

Shrubs or small trees. Leaves alternate, distichous, entire or slightly serrate; stipules minute, caducous. Flowers bisexual, clustered in axillary fascicles. Calyx 4-5 lobed, imbricate, persistent. Petals absent. Stamens usually 8-10 alternating with the staminodes. Carpels 3, connate into unilocular superior ovary. Capsules succulent, 2-3 valved, globose or ovoid, usually 6-ribbed and dehiscent loculicidally when dry; seeds numerous embedded in fleshy aril.

About 250 species, pantropical, mostly American; 2 species in A. & N. Islands.

- 1 a. Leaves pinnately veined from base; petioles 1-2.5 cm long .....1. *C. andamanica*
- b. Leaves 3-5 pliveined at base; petioles 5-10 mm long .....2. *C. grewiaefolia* var. *gelonoides*

1. ***Casearia andamanica*** King in J. Asiat. Soc. Bengal 67: 16. 1898; Parkinson, For. Fl. Andaman Islands. 181. 1923; P.S.N. Rao in Jour. Econ. Tax. Bot. 15: 3. 683. 1991; Mitra in Fl. India 2: 391. 1993.

Trees up to 15 m high; bark yellowish brown; branchlets glabrous. Leaves oblong to oblong-elliptic, obtuse or cuneate, usually inequilateral at base, acute or shortly acuminate at apex, 9-35 x 4-14 cm, undulate or subentire at margins. Flowers greenish white in densely bracteate glomerules on short tubercles. Calyx deeply 5-lobed. Stamens 10; staminodes pubescent. Capsules ellipsoid or ovoid, 3-5 x 1.5-2 cm, yellow when ripe; aril white, turns pink on drying.

*Fl.*: Jan.-April. *Fr.*: Aug.-Sept.

*Distr.*: Between Diglipur and Kalighat near Yatrik camp in N. Andaman.

Endemic and extremely rare. Birds eat the fleshy fruits which taste mild sweet.

2. ***Casearia grewiaefolia* var. *gelonoides*** (Blume) Slender in Fl. Males. I, 6: 944. 1972; Mitra in Fl. India 2: 394. 1993. *C. hexagona* Decne var. *gelonoides* Blume, Mus. Bot. Lugd.-Bat. 1: 225. 1850. *C. grewiaefolia* var. *deglabrata* Koord. & Val., Bijdr. Booms. Java 1: 174. 1894; *C. insularis* Vasud. T. Chakrab. in J. Econ. Tax. Bot. 16: 717. 1992.

Shrubs or trees up to 10 m high. Leaves oblong to oblong-elliptic, broadly cuneate, rounded subtruncate, subcordate and inequilateral at base, shortly acuminate at apex, 6-19 x 3-8.5 cm. Flowers white or yellowish green, usually many in axillary fascicles. Calyx lobes obovate-concave. Stamens 8-10; staminodes with a tuft of hairs at apex. Capsules in axillary clusters, ellipsoid, 2-3 x 1.2-2 cm, green, turning orange-yellow when ripe; aril orange-red.

*Fl.*: Sept.-April; *Fr.*: Nov.-May.

As opined by Mitra (l.c.) the plants reported as *C. fulifinosa* (Blanco) by Nair (1977) and others belong to this highly variable taxon.

2. *Flacourtia* L' Herit

Small trees or shrubs; trunk often armed with simple or branched thorns. Leaves crenato-serrate or entire. Flowers small, unisexual, usually plants dioecious. Sepals 4-5, subsistent. Petals absent. Stamens numerous; anthers usually dorsifixed, versatile. Carpels connate into 2-8 celled ovary; styles 2 or more; stigmas retuse or bilobed. Fruit fleshy, indehiscent berry with many pyrenes; seeds 1-2, ovoid to obovoid.

About 60 species in tropical Africa, Asia and Polynesia; 3 species in A. & N. Islands.

- 1 a. Berries up to 1.0 cm across .....1. *F. indica*  
 b. Berries up to 2.5 cm across .....2
- 2 a. Lateral nerves of leaves 4-5 pairs; infrutiscences sub corymbose .....  
 .....2. *F. jangomas*  
 b. Lateral nerves of leaves 5-12 pairs; infrutiscences racemiform .....  
 .....3. *F. rukkam*

1. ***Flacourtia indica*** (Burm.f.) Merr., Interpr. Rumph. Herb. Amb. 377. 1917; Mitra in Fl. India 2: 402. 1993. *F. ramontchii* L' Herit., Strip. Nov. 3: 59. t. 30 & 30 B 1786; Hook. f. & Thomson. Fl. Brit. India 1: 193. 1872; *F. sepiaria* Roxb., Pl. Corom. 1: 48, t. 68. 1796; Hook. f. & Thomson, Fl. Brit. India 1: 194. 1872, pro maj. parte excl. var. *latifolia*.

Deciduous shrubs or small trees up to 15 m high; trunks in older trees often armed with branched thorns; younger branches pubescent or glabrous. Leaves ovate to almost orbicular, cuneate and 3-5 plicveined at base, obtuse or acute at apex, crenate to serrate along margins, 1.5-5 x 1-3 cm. Male flowers in short branched clustered racemes or on the thorns. Sepals 4-5, hairy inside. Stamens many. Female flowers solitary or in pairs on short branches. Sepals villous. Ovary glabrous with 3-6 radiating styles; stigma bilobed, recurved. Berries globose or ellipsoid; seeds trigonous.

*Fl.*: Dec.-March; *Fr.*: May-Aug.

Described on the authority of Rao (1986).

2. **Flacourtia jangomas** (Lour.) Raeusch., Nomencl. Bot. ed. 3. 290. 1797; Mitra in Fl. India 2: 403. 1993. *F. cataphracta* Roxb. ex Willd., Sp. Pl. 4: 830. 1806; Hook. f. & Thomson in Fl. Brit. India 1: 193. 1872.

Small trees up to 10 m high, dioecious; trunks and branches with simple and branched thorns when young. Leaves ovate to ovate-lanceolate, cuneate to rounded, 3-5 pliveined at base, acuminate at apex, crenate along margins, 5-11 x 3-5 cm, glabrous above. Flowers greenish white mostly in glabrous racemes. Sepals broadly ovate. Male flowers: Stamens numerous. Female flowers: Ovary flask shaped, contracted at neck. Berries ca 2 cm across, purple when ripe.

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

*Distr.*: Katchal island in N. Nicobar.

Rare and semi wild.

3. **Flacourtia rukkam** Zoll. & Mor., Syst. Verr. 33. 1846; Hook. f. & Thomson in Fl. Brit. India 1:192. 1832; Mitra in Fl. India 2: 407. 1993.

Small trees up to 10 m high; trunk often with long thorns. Leaves oblong-ovate or oblong-elliptic, cuneate at base, acuminate or often obtuse at apex, serrate-crenate along margins, 8-15 x 5-7 cm, brownish black when dry. Flowers greenish yellow in short racemes. Fruits ellipsoid or subglobose, crowned with peg-like free styles.

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

*Distr.*: Katchal island in N. Nicobar.

### 3. **Pangium** Reinw.

Trees, dioecious with dense crown and drooping branches. Leaves alternate, palminerved. Flowers in long corymbs on main stem or older branches. Berry 2-4 together, pendulous from trunk, asymmetric.

Monotypic. India (Great Nicobar island), throughout Malesia, extending to Malanesia and Micronesia.

**Pangium edule** Reinw., Syll. Ratisb. 2: 13. 1825; Hore *et al.* in J. Econ. Tax. Bot. 6: 417. 1985; Mitra in Fl. India 2: 424. 1993.

Trees up to 45 m high; trunk buttressed when old; branchlets marbled with leaf scars when old. Leaves crowded at apices of branches, broadly ovate, cordate to sub-truncate at base, acutely acuminate at apex, 12-30 x 7.5-20 cm, palmately 5-7 veined from base; petioles swollen at base 10-30 cm long. Male flowers: 4-9 in rusty tomentose corymbs. Stamens 20-25, free. Pistillode absent. Female flowers: solitary, or 2-4 together in corymbs. Carpels 2-4, connate into unilocular ovary. Berry mostly ovoid-oblong or ellipsoid-oblong, indehiscent, ca 1-2 kg in wt.; pericarp brown, rufus pubescent; seeds ca 20 embedded in edible pulp.

*Fl.*: April-June. *Fr.*: Prior to rainy season.

*Distr.*: Laful in G. Nicobar.

#### 4. **Ryparosa** Bl.

Trees or shrubs, dioecious. Leaves alternate, exstipulate, pinnately veined; petioles rather long, thickened at both ends. Male flowers in axillary or cauline elongated racemes arising singly or in fascicles of 2-3. Female flowers in shorter racemes. Fruits a capsular berry, globose or variously angular; seeds usually 1-3, ellipsoid or subglobose, ribbed-reticulate or smooth.

About 18 species in rain forests of S.E. Asian countries; one in India (A. & N. Islands).

**Ryparosa javanica** (Blume) Kurz ex Koord. & Valet. Bijdr. Booms. Java 5: 11. 1900; Mitra in Fl. India 2: 426. 1993. *Bergsmia javanica* Bl. in Rumphia 4: 23, t. 178c, f. 2. 1849. *Ryparosa kurzii* King in J. As. Soc. Bengal 59 (2): 125. 1890; Parkinson, For. Fl. Andaman Islands. 84. 1923.

Small trees up to 30 m high; bark grey to light brown; branchlets striate, lenticellate, ferruginous appressed puberulous in younger parts. Leaves elliptic to elliptic-oblong, usually cuneate or obtuse at base, shortly acuminate at apex, 20-30 x 10-15 cm, glaucous beneath; petiole 1.5-6 cm long. Male flowers pale yellow. Female flowers with appressed pubescent staminodes. Berry globose, 1.5 to 2.5 cm across, crowned with remnants of stigmas; seeds ca 2 cm long, yellowish white.

*Fl.*: Jan.-April; *Fr.*: July-Dec.

*Distr.*: Baratang in S. Andaman and East West Road in G. Nicobar.

### 5. *Scolopia* Schreb., *nom. cons.*

Evergreen trees or shrubs; trunk usually armed with spines when young. Leaves alternate, serrate-crenate to subentire, 3-5 plicveined at base, coriaceous, sometimes with a pair of distinct glands at lamina base or apex of petiole. Flowers usually bisexual, arranged in axillary or terminal bracteate racemes or paniculate cymes. Sepals 5-8, connate at base. Petals as sepals but narrower and alternate with sepals. Stamens numerous much longer than petals. Carpels 2-5, connate into an unilocular ovary; styles persistent in fruits; stigma lobed. Berry ellipsoid or globose, apiculate, 2-3 or many seeded.

About 37 species in tropical and subtropical Africa, S.F. Asia to N.E. Australia; 3 species in A. & N. Islands.

- 1 a. Leaves with a pair of distinct glands at lamina base or apex of petiole.... 2
- b. Leaves devoid of distinct glands at lamina base or apex of petiole .....  
       ..... 1. *S. crenata*
- 2 a. Extrastaminal disc glands absent; anther connectives hairy ..... 3. *S. spinosa*
- b. Extrastaminal disc composed of a row of short, thick glands before petals;  
       anther connectives glabrous ..... 2. *S. kermodii*
1. ***Scolopia crenata*** (Wight) Clos in Ann. Sci. Nat. 4, 8: 250. 1857 (excl. specim. Philippin.); Parkinson. For. Fl. Andaman Islands. 84. 1923. *Phoberos crenatus* Wight in Wight & Arn., Prodr. 29. 1834.

Trees up to 20 m high; branches of older trees unarmed. Leaves variable, ovate, ovate-lanceolate, elliptic to elliptic-lanceolate, cuneate or obtuse at base, subacute to bluntly sub-acuminate at apex, minutely crenate to subentire along margins, 5-15 x 2.5-7.5 cm glossy above, glabrous, minutely biglandular at the junction of petiole and lamina. Flowers in axillary or terminal racemes. Sepals ciliolate along margins. Petals glabrous; disc glands absent. Stamens numerous. Berry globose to subglobose, 1.5-1.7 cm across.

*Fl.*: March-April. *Fr.*: July-Oct.

Described on the authority of Parkinson (l.c.) but its occurrence in A. & N. islands is doubtful as the description given by him suggest it to belong to *S. kermodii* or *S. steenisiana* which can be confirmed only when further collections are made and examined.

2. ***Scolopia kermodii*** C. Fischer in Bull. Misc. Inf. Kew 1935: 574, 1935; Mitra in Fl. India 2: 430. 1993. *S. burmanica* N. Mukherjee in J. Bombay Nat. Hist. Soc. 69: 391. 1973.

Trees up to 25 m high; branchlets of older stems usually lenticellate, unarmed, glabrous. Leaves ovate to elliptic or oblong-lanceolate, cuneate or obtuse at base, acutely or obtusely acuminate at apex, remotely serrate to entire along margins, 7-20 x 1.2-6.5 cm, with a pair of glands at the junction of petiole and lamina. Flowers in axillary or terminal lax racemes. Sepals ovate to suborbicular, ciliolate along margins. Petals similar to sepals but ovate-oblong. Disc glands numerous. Berry ellipsoid or globose, 2-2.5 cm across.

*Fl.*: Jan.-March.

Described on the authority of Mitra (l.c.) as no specimens are available at PBL.

3. ***Scolopia spinosa*** (Roxb.) Warb. in Engler & Prantl, Pflanzenfam. 3, 62: 29. 1893; Mitra in Fl. India 2: 431. 1993. *S. roxburghii* (Bonn.) Clos in Ann. Sci. Nat. 4, 8: 250. 1857, nom. illegit; Hook. f. & Thomson in Fl. Brit. India 1: 190. 1832.

Trees up to 20 m high; main stem armed with simple and branched spines upto 7 cm long, unarmed and buttressed in old. Leaves elliptic, ovate-elliptic or oblong-lanceolate, cuneate to rounded at base usually shortly acuminate at apex, remotely crenate or subentire with a basal pair of glands at the junction of petiole and lamina. Flowers fragrant in lax racemes. Sepals ovate, ciliolate along margins. Petals similar to sepals but narrower, ovate-oblong. Disc glands absent. Stamens numerous. Berry sub-globose to ovoid, 1.5-2.0 cm across.

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

## Excluded Species :

*Hydnocarpus castanea* Hook. f. & Thomson in Fl. Brit. India 1: 197. 1872

*Hydnocarpus sharmae* Rao & Sreek. in Nord. J. Bot. 12: 225. 1992.

## PITTOSPORACEAE

9 genera and about 250 species occurring in Asia, Australia and the New Zealand; 1 genus and 1 species in A. & N. Islands.

**Pittosporum** Banks ex Solander, *nom. cons.*

Trees or erect shrubs. Leaves exstipulate, alternate or whorled. Inflorescence terminal or in axils of fallen leaves. Flowers bisexual. Sepals 5, imbricate. Petals 5, hypogynous, imbricate, erect, with connivent or connate claws. Stamens 5, free, erect; anthers versatile, introrse. Ovary sessile, 2-3 celled; style simple; stigma terminal, capitate. Capsules 1-celled, 2-3 valved; seeds smooth, embedded in resinous pulp.

About 150 species in tropical and sub-tropical Africa, Asia, Australia, New Zealand and Pacific islands; 1 in A. & N. Islands.

**Pittosporum ferrugineum** Ait., Hort. Kew. ed. 2: 27. 1811; Hook. f. Thomson in Fl. Brit. India 1: 199. 1872; Nair & Giri in Fl. India 2: 444. 1993.

Trees, up to 20 m high; young branches densely ferruginous tomentose. Leaves elliptic or ovate-lanceolate, acute to cuneate at base, acute to acuminate at apex, entire and wavy along margins, 5-10 (-15) x 2-4 (-5) cm, glabrescent; lateral nerves 6-10 pairs; petiole up to 2 cm long. Inflorescence subumbellate or corymbose, rusty puberulous. Sepals free, acuminate at apex. Petals free, widened towards apex. Stamens: filaments 2-3 mm long; anthers oblong sagittate. Ovary 2 mm long, densely tomentose. Capsules globose-ellipsoid, bivalved, densely tomentose; seeds 8-24, scarlet-red.

*Fl.*: Feb.-Aug. *Fr.*: Mar.-Dec.

*Dist.*: Saddle Peak in N. Andaman and Car Nicobar (near Kakana) in N. Nicobar.

### POLYGALACEAE

12 genera and about 800 species. Cosmopolitan, centered in American and African tropics; 2 genera and 3 species in A. & N. Islands.

- 1 a. Small herbs; stamens 3-6; fruits sessile .....2. *Salomonius*  
 b. Tall herbs; stamens 8; fruits pedicellate .....1. *Polygala*

#### 1. *Polygala* L.

Herbs or shrubs. Leaves simple. Flowers in racemes. Sepals 5, unequal. Petals 3, upper ones basally adnate to the staminal tube, lower one boat-shaped, clawed at base. Stamens 8, monodelphous, ovary 2-loculed, one anatropous ovule in each locule. Capsules flattened-compressed, dehiscent loculicidally, 2-seeded. Seeds hairy, oblong with cap-like caruncle.

- 1 a. Capsules glabrous .....1. *P. longifolia*  
 b. Capsules hispid puberulous .....2. *P. telephioides*

1. ***Polygala longifolia*** Poiret in Lam., *Encycl.* 5: 501. 1804; Banerjee in *Fl. India* 2: 476. 1993. *P. leptalea* DC., *Prodr.* 1: 325. 1824; Bennett in *Fl. Brit. India*.

Erect herbs; stems slender, deeply furrowed, glabrous. Leaves 1-nerved; basal leaves obovate, linear to elliptic or oblong-lanceolate, attenuate at base, rounded at apex 10-25 x 5 mm; upper leaves linear-oblong or linear-lanceolate, narrowed at base, acute to sub-acute and mucronulate at apex, 15-40 x 2-4 mm, glabrous. Flowers pink in terminal racemes. Sepals persistent, inner ones puberulous along margins; wing sepals 3-nerved. Petals pink; middle lobe keeled. Anthers oblong. Ovary obovate; stigma rounded. Capsules narrowly winged along margins.

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

Described on the authority of Banerjee (l.c.).

2. ***Polygala telephioides*** Willd., *Sp. Pl.* 3 (2): 876. 1802; Bennett in *Fl. Brit. India* 1: 205. 1872; Banerjee in *Fl. India* 2: 485. 1993.

Herbs with a woody root stock; stems prostrate, ascending or erect. Leaves subsessile, elliptic-obovate, elliptic-oblong or oblanceolate. Flowers violet or blue crowded in lateral or leaf-opposed racemes. Outer sepals linear-lanceolate to ovate-lanceolate, ciliate along margins; wing sepals obliquely-elliptic, or ovate-lanceolate. Petals blue; middle lobe keeled; lateral petals shorter than the keel. Staminal sheath split 2/3 its length with 2 free filaments with 2 bundles of 3 connate filaments on either side; anthers subsessile. Stigma hooded. Capsule enclosed in wing sepals, emarginate at apex.

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

Described on the authority of Rao (1986) and Banerjee (l.c.).

## 2. *Salomonina* Lour.

Annual herbs, sometimes parasites. Leaves alternate sessile or petiolate, entire, 3-nerved. Flowers minute in dense terminal or axillary spikes. Sepals subequal, inner two larger. Petals 3, adnate at the base with the staminal sheath; keel not crested. Stamens 4 to 6, monadelphous, filaments united in lower half. Ovary 2 celled, each with 1 ovule. Capsules laterally compressed, margins toothed. Seeds scarcely caruncled.

*Salomonina cantoniensis* Lour., Fl. Cochinch. 1: 1790; Banerjee in Fl. India 2: 489, 1993. *S. eduntula* DC., Prodr. 1: 334, 1824; Bennett in Fl. Brit. India 1: 207, 1872.

*var. cantoniensis*.

Herbs up to 15 cm high; stems angular or narrowly winged, dichotomously branched at tips producing spikes. Leaves ovate, lanceolate, cuneate, broadly rounded, cordate at base, acute at apex, 5-25 x 4-16 mm, glabrous or sparsely ciliate, 3-nerved at base; petioles winged. Flowers pinkish red. Sepals 5, scaly, linear-subulate, subequal. Petals 3, connate at base into a cleft tube. Stamens 4 or 6, monadelphous anthers dehiscing apically. Ovary obovate, ca 1 mm long. Capsules sessile with a row of curved triangular teeth or minute hairs along margins. Seeds red or blackish brown, lenticular.

*Fl.*: Jan.-April; *Fr.*: May-Oct.

*Distr.*: Car Nicobar (Arong) in N. Nicobar.

## XANTHOPHYLLACEAE

One genus and *ca* 40 species in South and S.E. Asia from India to N. Australia and Solomon islands, one genus and 2 species in A. & N. Islands.

**Xanthophyllum** Roxb. *nom. cons.*

Trees or shrubs. Leaves alternate; petioles channelled above. Racemes simple or paniculate, patently branched; flowers shortly pedicelled. Sepals 5, inner 2 larger. Petals 5 or rarely 4, free, glabrous; lowest one keeled, other 4 subequal, glabrous; 2 upper ones recurved in upper half. Stamens 8 or rarely 10, 4 coherent with other petals simply at base; anthers 2-locular, erect, dehiscing longitudinally. Disc hypogynous, annular. Ovary 1-loculed or imperfectly 2-loculed; stigma terminal, small. Fruits 1-seeded indchiscent drupes; seeds globose or subglobose; endosperm copious or absent; cotyledons thick, fleshy, planoconvex.

- 1 a. Leaves recurved along margins; sepals glabrous outside ..... 1. *X. andamanicum*  
 .....  
 1 b. Leaves flat or undulate along margins; sepals pubescent throughout..... 2. *X. vitellinum*  
 .....  
 1. **Xanthophyllum andamanicum** King in J. Asiat. Soc. Bengal 59 (2): 135. 1891; Parkinson, For. Fl. Andaman Islands; Banerjee & Balakrishnan in Fl. India 2: 495. 1993.

Evergreen trees, up to 25 m high. Leaves elliptic-ovate to lanceolate, cuneate at base, subacute at apex, 8-13 x 3-5 cm, glaucous beneath; lateral nerves irregular, less prominent as in reticulate venation. Inflorescence paniculate. Sepals *ca* 4 x 2 mm. Petals oblong, *ca* 11 x 4 mm, white with pinkish tinge; 2 petals reflexed and dashed with yellow, 2 spreading, keel petals *ca* 9 mm long. Stamens *ca* 6 mm long; 2 filaments adnate to keel petals and remaining 6 attached to the disc. Ovary sessile. Fruits globose, not verrucose when dry.

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

*Distr.*: Wright Myo in S. Andaman.

2. **Xanthophyllum vitellinum** (Blume) Dietr., Syn. Pl. 2: 1277; Vasudeva Rao & T. Chakrab. in J. Econ. Tax. Bot. 6: 444. 1985;

Banerjee & Balakrishnan in Fl. India 2: 499. 1993. *Jakkia vitellina*  
Blume. cat. 17, 64. 1823.

Small trees, up to 30 m high. Leaves ovate-oblong, rounded or subacute at base, shortly acuminate at apex, 8-25 x 3.5-10 cm, glabrous; secondary nerves usually 7-9 pairs, forming an indistinct intramarginal nerve near apex; glands mostly more than 10, usually near midrib. Inflorescence up to 20 cm long with flowers in triads in basal part, solitary in apical part. Sepal almost wrinkled and thickened at base. Petals yellow to brown; keel petal densely hairy outside; outer petals glabrous outside or rarely with a few hairs at apex. Stamens 8, rarely 9; filaments free or shortly connate at base. Ovary sessile, stipitate, pubescent; style hairy at base; ovules 4. Fruits globular, ca 2 cm in diam; hairy.

*Fl.*: March; *Fr.*: June.

*Distr.*: North-South Road in G. Nicobar.

Mostly confined to low land evergreen forests.

## HYPERICACEAE

About 7 genera and 550 species, cosmopolitan except for Arctic regions and most of Polynesia. 1 genus and 1 species in A. & N. Islands.

### *Cratoxylum* Bl.

Deciduous to evergreen trees or shrubs. Leaves simple, opposite. Flowers in axillary or terminal panicles, sometimes fascicled in axils of fallen leaves, heterodistylous or heterotristylous. Sepals 5, persistent. Petals 5, deep crimson to pink or white. Staminal fascicles 3 or 5, stalked, unequal; anthers dorsifixed, hypogynous, scales 3 alternate with staminal fascicles. Ovary 3-locular, ovules 4 to many in each locule, anatropous on axile placentation. Capsules ovoid-ellipsoid, loculicidally dehiscent into 3 valves. Seeds many, oblong and winged all round or obovate and winged unilaterally.

*Cratoxylum formosum* (Jack) Dyer, Fl. Brit. India 1: 258. 1874; Kurz, Fl. Burma 1: 84. 1877; Parkinson, For. Fl. Andaman Islands. 85. 1923. *Elodea formosa* Jack, Mal. Misc. 2: 24. 1822.

Trees, up to 25 m high; bark thin, yellowish brown, peeling in small, thin irregular flakes, cut reddish with yellow juice of mango smell. Leaves broadly elliptic to oblong, cuneate at base, shortly acute at apex, glabrous; lateral nerves interarching; petiole *ca* 1 cm. Flowers on the leafless branchlets. Sepals red. Petals pure white, fringed. Stamens united in 3 groups. Capsule 1-2 cm long, torpedo-shaped, splitting into 3 valves on drying.

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

*Distr.*: Saddle Peak in N. Andaman and Dhanikhari in S. Andaman.

Frequently found in deciduous forests and when in full blossom look attractive and conspicuous even from a distance.

## CLUSIACEAE

About 40 genera and 1000 species chiefly in Asia and America, rare in Africa; 3 genera and 20 species in A. & N. Islands.

- 1 a. Stigma entire or radiately lobed; fruits baccate .....2. *Garcinia*
- b. Stigma entire, 2-4 fid or lobed or acute stigma; fruits drupaceous or capsular  
      .....2
- 2 a. Leaves with numerous straight and parallel lateral veins with no minor  
   veins; ovary unilocular .....1. *Calophyllum*
- b. Leaves with arcuate and forking lateral veins and with minor veins; ovary  
   otherwise..... 3. *Mesua*

### 1. *Calophyllum* L.

Evergreen trees; bark with lenticellate fissures or longitudinally fissured, anastomising ridges on mature trees. Leaves opposite decussate, glossy, often coriaceous; lateral nerves numerous, slender, close and parallel; petiolate. Inflorescences copious, axillary or terminal, paniculate or racemose, sometimes fascicled. Flowers bisexual or polygamous; bracts usually deciduous. Perianth lobes 4-8, outer 1 or 2 pairs sometimes different from others. Sepals 2-4, decussate. Petals absent or 2-4 or more. Stamens numerous; filaments slender, often flexuous; anthers erect, basifixed, longitudinally dehiscent. Ovary superior, unilocular with

anatropous ovule, placentation basal. Fruits indehiscent drupes. Seed globose or ovoid.

About 187 species in tropical Asia and some in America; 5 species in A. & N. Islands.

- 1 a. Leaves more than 25x7 cm; fruits large .....3. *C. macrocarpum*
- b. Leaves less than 25x7 cm; fruits small .....2
- 2 a. Lamina more than 13 x 5 cm; stone generally with a basal plug .....3
- b. Lamina upto 13 x 5 cm; stone without a plug .....4
- 3 a. Lamina with less than 10 lateral veins; petals present; fruits 2.5-5 x 2.5-4 cm .....2. *C. inophyllum*
- b. Lamina with more than 12 lateral veins; petals absent; fruits 1-1.6 x 0.8-1 cm .....4. *C. soulattri*
- 4 a. Terminal buds more than 6.5 mm long, lamina with 12-20 lateral veins; pedicels 4-6 mm long .....1. *C. calaba* var. *bracteatum*
- b. Terminal buds up to 6.5 mm long; lamina with less than 12 lateral veins; pedicels 7-25 mm long .....5. *C. tetrapterum*

1. ***Calophyllum calaba* L. var. *bracteatum*** (Wight) P. Stevens in J. Arn. Arb. 61: 261. f. 13. 1980; Singh in Fl. India 3: 90. 1993. *C. burmannii* Wight var. *bracteatum* Wight. Ill. Ind. Bot. 1: 129. 1840. *C. amoenum* Wallich ex Choisy, Desc. Guffif. Inde 42. 1849; Parkinson, For. Fl. Andaman Islands 87. 1923. *C. kunstleri* *cauct. non* King 1890, Mahesh. in Bull. Bot. Surv. India 2: 141. 1960.

Trees, up to 30 m high; bark yellowish, with strong horizontal fissures; exudate yellow, watery. Leaves 3-11 x 1.5-4.5 cm, elliptic to oblong-lanceolate, acute to rounded at base, obtuse to shortly acuminate at apex; midrib prominent on both surfaces, lateral nerves parallel, close; new leaves pinkish-yellow. Flowers white or light yellow, bisexual, scented in racemes. Sepals 4. Petals absent. Stamens numerous. Ovary with peltate-infundibular stigmas. Fruits globose or pisiform with spherical stone.

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

*Distr.*: Andaman group of islands.

Common in lowland to hilly mixed rain forests. Fruits edible.

- 2 **Calophyllum inophyllum** L., Sp. Pl. 513. 1753; F. Anderson in Fl. Brit. India 1: 273. 1874; Parkinson. For. Fl. Andaman Islands. 87. 1923; Singh in Fl. India 3: 92. 1993.

Littoral trees, up to 20 m high with spreading crown; bark brown to pale green often with fissures; branchlets compressed, glabrous. Leaves broadly elliptic-oblong obovate, cuneate to rounded at base, retuse or subacute at apex, thinly coriaceous, dark green, glabrous, 15-20 x 5-9 cm; petioles 1-1.5 cm long, stout. Flowers marble white, fragrant, polygamous, bisexual in long racemes. Sepals reflexed, inner ones petaloid. Petals reflexed, rarely glabrous. Stamens numerous; anthers retuse at apex. Ovary 1.5-3.5 mm long, depressed glabrous; styles longer than ovary, twisted; stigmas 3-5 radiate. Drupes 2.5-5 x 2.5-4 cm, globose, shortly apiculate; pericarp thick; stone *ca* 2 cm in diam, globular.

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

*Distr.*: Galathea to Pygmalion Point in S. Nicobar, Dugong creek in L. Andaman, Neil island in S. Andaman and Middle Andaman.

3. **Calophyllum macrocarpum** Hook. f., Fl. Brit. India 1 : 273. 1874; N.P. Singh in Ind. J. For. Addl. ser 1: 305. 1990.

Trees, up to 5 m high; branchlets drying dark brown. Leaves linear-oblong to elliptic-lanceolate, acute at base, acuminate at apex, margin undulate, *ca* 30 x 8.5 cm; venation prominent on both sides. Racemes axillary. Flowers bisexual, up to 2.5 cm in diam; pedicels 1-3.2 cm long. Sepals 4; inner 2 petaloid. Petals 4. Stamens numerous *ca* (230-340), very short; filaments up to 6 mm long; anthers oblong, almost retuse at apex. Ovary upto 2-3 mm long; style short; stigma peltate. Drupes ellipsoid, 8-12.7 x 4.5-6 cm, narrowed at both ends, acute at apex, irregularly and coarsely wrinkled on drying, striate; stone ellipsoid at the centre of fruit, embedded in fibrous pulp.

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

*Distr.*: Campbell Bay and Chengappa Bay in S. Nicobar.

Commonly found growing on loamy soils in low inland forests.

4. **Calophyllum soulattri** Burm. f., Fl. Ind. 2: 121. 1768; Singh in Fl. India 3: 96. 1993. *C. tetrapetalum* Roxb. ex G. Don. Gen. Hist. 1: 622. 1831. *C. wallichiana* auct. non Planch. & Triana 1861: T. Anderson in Fl. Brit. India 1: 273. 1874.

“The Nicobar Canoe Tree”

Trees, up to 40 m high; bark grey or brown with boat-shaped fissures; exudate usually white. Leaves ovate to ovate-oblong or elliptic-oblong, cuneate at base, acute to acuminate at apex; lateral veins 12-28, indistinct, close; petiole glabrous or rusty tomentose. Racemes 7-21 flowered, axillary or terminal. Flowers white, scented. Sepals white, unequal. Petals absent. Stamens numerous. Ovary ovoid, glabrous; stigmas peltate, 3-radiate. Drupes glabrous, mucronate with persistent style base; pericarp thick; stone 0.7-1.1 x 0.65-1 cm, subspherical, basal plug sometimes present.

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

*Distr.*: Campbell Bay in S. Nicobar, and East-west Road, in Gt. Nicobar island.

5. **Calophyllum tetrapterum** Miq., Pl. Jungh. 291. 1854; Singh in Fl. India 3: 97. 1993. *C. pulcherrimum* auct. non Wallich ex Choisy, 1849; T. Anderson in Fl. Brit. India 1: 271. 1874. pp.

*var. tetrapterum.*

Trees, up to 30 m high; bark closely fissured; exudate clear to opaque; branchlets slightly compressed, glabrous. Leaves elliptic to obovate, cuneate to acute at base, acuminate or acute at apex, distinctly pale along margins, 4-13 x 1.5-5 cm; midrib usually raised; lateral veins upto 15; petiole glabrous or transiently puberulent below. Flowers scented in long racemes; Sepals sometimes papillate or puberulent near apex at back. Petals absent or 4, rarely 1-3 or 6, similar to inner sepals. Stamens numerous. Ovary up to 1.3 mm long; stigma slightly lobed. Drupes 6.5-16 x 5-12 mm, ellipsoid to spherical, wrinkled when young; stone 5.5-11 x 5-10 mm, smooth.

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

*Distr.*: Dhanikhari in S. Andaman.

Rarely found growing in mixed forests.

## 2. *Garcinia* L.

Trees or shrubs usually with yellow juice. Leaves evergreen, opposite, simple, coriaceous, more or less lanceolate or oblong, very rarely stipulate. Flowers solitary or in cymes, axillary or terminal, polygamous. Sepals 4-5 decussate or imbricate. Petals 4, rarely 5, imbricate or contorted. Male flowers: Stamens numerous, free or connate into 1-5 lobed mass, usually surrounding the rudimentary ovary; anthers sessile or on short thick filaments, dehiscing longitudinal; rudimentary pistil variously formed or absent. Female flowers: usually solitary; staminodes minute, free or connate. Ovary 2-12 celled; ovules erect or lateral; styles very short or absent; stigma, usually lobed. Fruit a berry with a coriaceous rind. Seeds 1-12, oblong or ovoid embedded in juicy pulp.

About 2000 species in the tropics of the Old World, especially Asia and Africa; 13 species in A. & N. Islands.

- 1 a. Sepals and petals 5, rarely petals 4 or sepals 6 .....2  
 b. Sepals and petals always 4 .....5
- 2 a. Flowers ca 8 mm in diam; sepals and petals always 5 .....1. *G. andamanica*  
 b. Flowers more than 10 mm in diam; sepals and petals sometimes variable .....3
- 3 a. Pedicels ca 1 cm long; berries ellipsoid ca 3 x 2 cm .....6. *G. dulcis*  
 b. Pedicels ca 1.5-5 cm long; berries globose or subglobose, ca 6.5 cm or more in diam. ....4
- 4 a. Leaves up to 45 cm long; petioles 1-2.5 cm long .....13. *G. xanthochymus*  
 b. Leaves 30-60 cm long; petioles 2.5 to 5 cm long .....11. *G. nervosa*
- 5 a. Flowers always in fascicles; petals 3 times the size of sepals .....3. *G. cadelliana*  
 b. Flowers either in fascicles; panicles, or solitary; petals not more than 2 times the size of sepals .....6
- 6 a. Anther dehiscence longitudinal, pyriform or by 2 short clefts .....7  
 b. Anther dehiscence transverse, circumscissile or by 2 or 4 clefts .....11

- 7 a. Shrubs; male flowers solitary, terminal on tetragonous rather thick pedicels ..... 9. *G. kurzii*  
 b. Trees; male flowers usually more than 1 on rather thin pedicels ..... 8
- 8 a. Male flowers more than 2.5 cm in diam.; berries more than 5 cm in diam. .... 12. *G. speciosa*  
 b. Male flowers less than 2.5 cm in diam.; berries less than 3 cm in diam. .... 9
- 9 a. Male flowers ca 1 cm in diam.; stigma rayed or lobed entire ..... 2. *G. brevirostris*  
 b. Male flowers ca 2.5 cm in diam.; stigma rayed or lobed ..... 10
- 10 a. Male flowers with 15 mm long pedicels; staminal lobes opposite petals and rudimentary pistil unlobed ..... 8. *G. kingii*  
 b. Male flowers with 5-10 mm long pedicels; staminal lobes opposite sepals and rudimentary pistil 8-lobed ..... 7. *G. hombroniana*
- 11 a. Male flowers usually 1-3; stamens definite; berries smooth ..... 12  
 b. Male flowers many; stamens numerous; berries with vertical grooves ..... 5. *G. cowa*
- 12 a. Stamens in male flowers less than 20 ..... 4. *G. calycina*  
 b. Stamens in male flowers more than 20 ..... 10. *G. microstigma*
1. **Garcinia andamanica** King in J. Asiat. Soc. Beng. 59: 170, t. 160. 1890; Parkinson, For. Fl. Andaman Islands. 89. 1923; Singh in Fl. India 3: 103, 1993.

Trees, up to 12 m high. Leaves ovate or oblong-ovate, often inequilateral usually subcordate at base, coriaceous; petioles upto 1.5 cm long. Flowers white in fascicles from leaf axils. Sepals 5 imbricate. Petals 5, clawed, imbricate, glabrous. Male flowers: Stamens in 5 bundles; anthers introrse. Disc of 5 broad, corrugated glands. Female flowers: ovary globose, 5-locular, stigma 5-lobed, persistent. Fruits berries, 2.5-4 x 2-3 cm, globose or oval, bright yellow.

- 1 a. Leaves glabrous with subcordate base ..... 1. var. *andamanica*  
 b. Leaves pubescent beneath, tapering at base ..... 2. var. *pubescens*

var. *andamanica*

Fairly frequent in evergreen forests especially in damp places or near streams.

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

*Distr.*: Peel island and Rutland in S. Andamans, Hut Bay in L. Andaman.

*Var. pubescens* King in J. Asiat. Soc. Beng. 9: 170. 1890.

Differs from *var. andamanica* by having young bark blackish, leaves broadly oblong to oblong-ovate, longer and pubescent petioles.

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

Described on the authority of Singh (l.c.) as no specimens are available at PBL.

2. ***Garcinia brevirostris*** Scheff. in Tijdschr. Nederl. Ind. 31: 350. 1870 & in Flora 53: 241. 1870; Singh in Fl. India 3: 106. 1993. *G. eugenifolia* Wallich ex T. Anderson in Fl. Brit. India 1: 268. 1874.

Small trees; branchlets tetragonous. Leaves broadly elliptic-lanceolate, obtuse or acute at base, acute or acuminate at apex, 6-8 x 2.8-3.5 cm, subcoriaceous. Male flowers: in axillary or terminal cymes. Sepals 4, orbicular. Petals 4, orbicular, thickened with coloured fleshy spot at base. Stamens numerous in 4 bundles; anthers bilocular, vertically dehiscent. Female flowers: in cymes. Sepals 4, minute. Petals ciliate. Ovary short; stigma broad. Berries ca 2 cm in diam., brown.

Described on the authority of Singh (l.c.) & Rao (Jour. Econ. Tax. Bot. 8(1):113. 1986).

3. ***Garcinia cadelliana*** King in J. Asiat. Soc. Beng. 59: 154. 1890; Parkinson, For. Fl. Andaman Islands. 90. 1923; Singh in Fl. India 3: 107. 1993.

Trees, up to 9 m high. Leaves elliptic to elliptic-oblong, cuneate at base, acute at apex. Male flowers: in dense axillary fascicles, bracteolate. Sepals 4, small, orbicular. Petals 4, fleshy, concave. Stamens numerous in 4 bundles opposite to petals; anthers 2 loculed, dehiscence longitudinal. Pistil rudimentary. Female flowers and fruits unknown.

Endemic to Andaman islands. No subsequent collections after its type collection. Described on the authority of Parkinson (l.c.).

4. **Garcinia calycina** Kurz in J. Bot. 13: 324. 1875; Singh in Fl. India 3: 107. 1993.

Shrubs, up to 4.6 m high; branchlets tetragonous. Leaves elliptic, cuneate at base, abruptly short caudate-acuminate or subacute, 9-13 x 3-6 cm, pale beneath. Male flowers: solitary axillary. Sepals 4, orbicular, equal. Petals 4, orbicular, veined. Stamens about 20 in a single group. Rudimentary pistil absent. Female flowers: solitary, axillary, larger than male flowers. Sepals ovate, outer pair larger than inner. Stamines *ca* 12. Ovary 4 locular, hidden. Berries ovoid-oblong, 4-seeded with persistent sepals.

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

Endemic to Nicobar islands.

Described on the authority of Singh (l.c.)

5. **Garcinia cowa** Roxb. ex DC., Prodr. 1: 561. 1824; T. Anderson in Fl. Brit. India 1: 262. 1874; Singh in Fl. India 3: 108. 1993.

“The cowa Fruit or the Cowa moangosteen”

Deciduous trees, up to 18 m high; branchlets almost quadrangular, lower ones drooping. Leaves broadly lanceolate, acute at the base, shortly acuminate at apex; lateral nerves rather straight, slender. Male flowers: in axillary or terminal cymes. Sepals 4, unequal, yellow. Petals 4, yellowish pink or red. Stamens many on a fleshy receptacle; anthers tetragonous, dehiscence vartical. Rudimentary pistil absent. Female flowers: Stamines around the ovary. Ovary subglobose; stigma deeply divided into 6-8 wedge-shaped rays. Berries depressed globular with shallow grooves, up to 4 cm in diam.

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

*Distr.*: Lakmipur in N. Andaman, Mt. Harriet in S. Andaman.

6. **Garcinia dulcis** (Roxb.) Kurz in J. Asiat. Soc. Beng. 43. 88. 1874. pp. & For. Fl. Brit. Burma 1: 92. 1877, pp.; Singh in Fl. India 3: 109. 1993. *Xanthochymus dulcis* Roxb., Fl. India. 2: 63. 1832.

Trees; young branches tetragonous, grooved; bark shining. Leaves ovate, elliptic or elliptic-oblong, obtuse or rotundate, sometimes subcordate at base, obtuse or acuminate at apex, 11-25 x 3-14 cm, chartaceous; lateral veins *ca* 20, irregularly parallel, petiole up to 1.5 cm long. Flowers 5-12 in a fascicle. Sepals 4-6. Petals 4 or 5, flabellately veined. Male flowers: Stamens in 5 bundles, rarely 4; anthers didynamous. Female flowers: staminodes few in 5 fascicles. Ovary 5-locular with one ovule in each locule. Berries bright yellow, fleshy, obtusely acuminate at apex. Seeds oblong, embedded in edible pulp.

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

*Distr.*: Milderā (Katchal island) in N. Nicobar.

7. ***Garcinia hombroniana*** Pierre, Fl. Forest. Cochinch. Fasc. 5: 12, t. 79 D-J. 1883; Singh in Fl. India 3: 111. 1993.

Trees; young branches stout, quadrangular; yellowish when dry. Leaves elliptic to oblong-elliptic, cuneate at base, usually abruptly acuminate at apex, 8.5-13 x 5-7 cm, glossy above, pale beneath; lateral nerves *ca* 32, slender, ascending; petiole up to 1.3 cm long, channelled above. Male flowers: 3-6 in terminal fascicles. Sepals 4, ovate-oblong. Petals 4, ovate-orbicular. Stamens indefinite, filaments united; anthers dehiscing vertically. Rudimentary pistil flat. Female flowers: solitary, terminal, staminodes absent. Ovary globose, 8-9 locular; stigma large, peltate. Berries *ca* 3 cm in diam, subglobose, with persistent sepals. Seeds *ca* 6 in juicy aril.

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

Fruits are sour and edible.

Described on the authority of Singh (l.c.) and Rao (Jour. Econ. Tax. Bot. 8(1): 113. 1986).

8. ***Garcinia kingii*** Pierre ex Vesque in DC., Monogr. Phan. 8: 407. 1893; Singh in Fl. India 3: 114. 1993.

Trees; branchlets quadrate-compressed. Leaves elliptic or ovate-oblong, obtuse or acute at base, obtusely acuminate at apex, 12-15 x 4.5-7 cm, glabrous; lateral veins *ca* 15, slender, somewhat arcuate. Male

flowers: Sepals 4, orbiculate. Petals 4, obovate. Stamens indefinite, below cucurliciform rudimentary pistil; anthers bilocular. Rudimentary pistil columnar at base. Berries small.

Endemic and rare.

Described on the authority of Singh (l.c.).

9. *Garcinia kurzii* Pierre, Fl. Forest. Cochinch. Fasc. 5: 14, t. 78. 1883; Singh in Fl. India 3: 115. 1993.

Shrubs; branchlets slightly quadrangular. Leaves elliptic, obtuse or acute at base, acuminate at apex, 16-25 x 8-10 cm, entire or subrepand, coriaceous; lateral veins indefinite; petioles 2-2.5 cm long, channelled above. Male flowers: solitary or paired, pale white. Sepals 4, slightly unequal. Petals 4, suborbicular. Stamens indefinite, in 4 bundles; anthers bilocular. Rudimentary pistil short, apex fimbriate. Female flowers: staminodes absent; stigma radiate or lobed. Berries small.

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

Endemic.

Described on the authority of Singh (l.c.) and Rao (Jour. Econ. Tax. Bot. 8(1): 113. 1986).

10. *Garcinia microstigma* Kurz in J. Bot. 13: 324. 1875; Parkinson, For. Fl. Andaman Islands. 90. 1923; Singh in Fl. India 3: 119. 1993.

Shrubs or small trees; young branches obscurely quadrangular. Leaves elliptic-oblong, sometimes lanceolate, cuneate at base, acute at apex. Male flowers: terminal, solitary or in small axillary cymes, reddish. Sepals and petals 4 each, fleshy. Stamens 20-35; anthers bilocular, dehiscence longitudinal. Rudimentary pistil absent. Female flowers: solitary; ovary globose. Berries reddish, slightly depressed, with persistent sepals.

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

Endemic to Andaman & Nicobar Islands. Fruits are edible. Young leaves are cooked and eaten by tribals.

Described on the authority of Singh (l.c.).

11. **Garcinia nervosa** Miq., Ann. Mus. Bot. Ludg.-Bat. 1: 208. 1864; Singh in Fl. India 3: 121. 1993. *G. andersoni* Hook. f., Fl. Brit. India 2: 270. 1874.

Trees, up to 6 m high; branchlets 4-angled, almost winged when dry. Leaves oblong-lanceolate, narrowed to rounded at base, shortly acuminate apex, 20-56 x 5-15 cm (-22), margins recurved, glossy above, pale yellowish below, midrib angular, elevated; lateral veins up to 20 pairs, prominent; petioles stout. Male flowers: unknown. Female flowers: many in fascicles, yellowish or greenish white. Sepals 5, ciliate, pubescent outside, leathery. Petals 5, imbricate. Stamines 5. Disc 5-lobed. Ovary globose; stigmas 5, divided into linear or oblong lobes. Berries pomiform, crowned by persistent stigma.

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

*Distr.*: Car Nicobar (Arong) in N. Nicobars and Kathchal islands.

12. **Garcinia speciosa** Wallich, Pl. Asiat. Rar. 3: 37, t. 258. 1832; T. Anderson in Fl. Brit. India 1: 260. 1874; Parkinson, For. Fl. Andaman Islands. 90. 1923; Singh in Fl. India 3: 125. 1993.

'Parawa'

Trees, up to 16 m high; young branches slightly tetragonous, grooved; bark peeling in flakes. Leaves elliptic-oblong, narrowed at both ends, 15-35 x 5-10 cm, leathery; lateral nerves faint, almost parallel; petioles up to 2.5 cm long, channelled above, angular. Male flowers: bright yellow, fragrant. Sepals 4, slightly unequal. Petals 4, ca 2 cm long. Stamens many, confluent at base; anthers oblong, dehiscence longitudinal. Rudimentary styles columnar. Female flowers: solitary, fragrant. Stigma lobed. Sepals and petals longer than in male flowers. Ovary subglobular. Berries up to 5 cm in diam, bright red when ripe with persistent sepals.

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

*Distr.*: Rutland Island in S. Andaman and Car Nicobar (Passa) in N. Nicobar.

13. *Garcinia xanthochymus* Hook. f., in Fl. Brit. India 1: 269. 1874;  
Singh in Fl. India 3: 129. 1993.

'Mysore Gamboge'

Trees, up to 15 m high with a dense pyramidal crown; branches 6-8 angular, often dilated just below nodes. Leaves oblong-lanceolate, cuneate at base, acute to acuminate at apex, 12-45 x 4-12 cm, coriaceous; lateral veins 12-15 pairs. Inflorescences axillary, fascicled. Flowers white. Sepals 5, rarely 4 fleshy, unequal. Petals 5, shortly clawed, ciliate. Male flowers: stamens 15-20 in 5 bundles alternating with glands. Rudimentary pistil absent. Female flowers: staminodes few in a ring. Ovary ovoid; stigma divided into 5 rays, persistent. Berries ca 6.5 cm in diam., subglobose, pointed, long peduncled. Seeds up to 4, brown.

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

*Distr.*: Saddle Peak in N. Andaman. Rangat in M. Andaman and Jharnanala tikri in S. Andaman.

Fruits are edible, sometimes used for making sherbets. Resin from the stem is a source of water colour used in dyeing.

### 3. *Mesua* L. emend Kosterm.

Shrubs or medium sized trees with slender, glabrous branches. Leaves polymorphic; midrib conspicuous, lateral nerves often obsolete. Flowers solitary, paired, fasciculate or in panicles, axillary or terminal, bisexual, polygamous. Sepals 4, outer pair smaller than inner, usually accrescent in fruit. Petals 4, large. Stamens numerous, hypogynous, filaments filiform; anthers variously shaped, basifixed. Ovary uni or bilocular; ovules 2 in each locule, anatropous; style flexuous; stigma peltate, obscurely bilobed. Fruits drupes or capsular nuts dehiscing into 2-4 valves. Seeds 1-4 erect, exarillate, exalbuminous.

About 40 species in tropical Asia and Indo-Malesia to Australia; 2 species in A & N Islands.

- I a. Lateral veins of leaves distinct; flowers less than 4 cm across; fruits indehiscent ..... 2. *M. manii*  
b. Lateral veins of leaves almost invisible; flowers more than 4 cm across; fruits dehiscent ..... 1. *M. ferrea*

1. *Mesua ferrea* L., Sp. Pl. 515. 1753; T. Anderson in Fl. Brit. India 1: 277. 1874; Parkinson, For. Fl. Andaman Islands. 88. 1923; Singh in Fl. India 3: 136. 1993.

var. *ferrea*.

Evergreen trees, up to 25 m high with trunk often buttressed at base; bark thin, greyish-brown. Leaves opposite decussate, linear-lanceolate, acute at base, acuminate at apex, dark green, glossy above, rigidly coriaceous, under surface covered with a whitish powder; lateral veins numerous, indistinct; petioles slender, 5-12 mm long. Flowers large, white sweet-scented, axillary and terminal. Sepals orbicular, imbricate, fleshy. Petals large, white, margins curled. Stamens numerous, forming a globose yellow mass. Ovary bilocular, 2 ovules in each locule. Fruits 2.5-3.5 cm, globose with a prominent conical point. Seeds pyriform.

*Fl.*: Jan.-May; *Fr.*: June onwards.

*Distr.*: Wright Myo (Kalatone forest) in S. Andaman.

Yields valuable timber and is called 'Iron wood' by some writers.

2. *Mesua manii* (King) Kosterm. in Reinwardtia 7: 428. 1969; Singh in Fl. India 3: 141. 1993. *Kayea manii* King in Ann. R. Bot. Gard. Calc. 5: 144. t. 174 A. 1876; Parkinson, For. Fl. Andaman Islands. 88. 1923. *K. racemosa* auct. non. Planch. & Triana, 1861; T. Anderson in Fl. Brit. India 1: 276. 1874, pp. *Mesua ferruginea* (Pierre) Kosterm. in Reinwardtia 7: 427. 1969.

Medium-sized, evergreen trees; branchlets slender, glabrous. Leaves opposite, narrowly oblong tapering at each end, acuminate at apex, 10-12 x 2.5-3.5 cm coriaceous; lateral nerves ca 15 pairs, slightly prominent, curved petiole short. Flowers 12-13 mm in diam. in fasciculate racemes. Sepals ovate-orbicular, concave. Petals broadly ovate, concave. Stamens longer than petals; anthers broadly ovate. Ovary-conical. Fruits compressed when unripe, enveloped by accrescent sepals.

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

Described on the authority of Parkinson (l.c.).

## THEACEAE

About 16 genera and 500 species in tropical and sub-tropical regions, mostly in America and Asia; 2 genera and 2 species in A. & N. Islands.

- 1 a. Anthers versatile; fruit a loculicidal or septicidal capsule .....1. *Camellia*  
 b. Anthers basifixed; fruit a berry or achene .....2. *Ternstroemia*

1. *Camellia* L.

Trees or perennial shrubs. Leaves evergreen serrate. Flowers axillary, solitary or fascicled. Sepals 5 to 6, unequal, imbricate. Stamens numerous, unequal, outer stamens partially connate forming a tube or ring, 5-12 inner ones free; anthers versatile. Ovary 3-5 loculed, ovules 3-4 or rarely 8 in each locule, styles 3-5, free or partially connate. Capsules woody, dehiscent loculicidally with a persistent central axis. Seeds subglobose or angular, one in each locule.

About 500 distributed in south west China and extended to South East Asia from Nepal to Vietnam; 1 species in A & N Islands.

*Camellia kissi* Wallich in *Asiat. Res.* 13: 429. 1820 & *Pl. Asiat. Rar.* 3: t. 256. 1832; Chauhan & Pal in *Fl. India* 3: 154. 1993. *C. drupifera* auct. non Lour. 1790; Dyer in *Fl. Brit. India* 1: 293, 1874.

var. *kissi*.

Erect shrubs, up to 15 m high. Leaves elliptic-oblong, oblong-lanceolate to oblanceolate, 4-15 x 1-5 cm, cuneate at base, long acuminate at apex, serrulate, glabrous above excepting puberulous midrib; petiole up to 5 mm long. Flowers white, fragrant. Sepals deciduous. Petals caducous. Stamens up to 10 mm long, outer ones connate at base. Ovary ovoid, woolly, 3-locular, mostly unilocular when aborted; styles 3 fid at apex, hairy towards base. Capsule pyriform, pubescent. Seeds ca 1 cm in diam. brown.

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

*Cultivated species:*

*Camellia sinensis* (L.) O. Kuntze var. *sinensis* was once cultivated during British occupation of the islands, but not now.

2. *Ternstroemia* Mutis ex L.f., *nom. cons.*

Trees or shrubs. Leaves pseudo-verticillate or subopposite, coriaceous. Flowers axillary, solitary or in fascicles, unisexual, sometimes bisexual. Sepals 5, unequal, persistent. Petals 5, connate at base. Stamens many, epipetalous; anthers glabrous. Ovules 2-3 loculed, usually 2 ovules in each locule, pendulous; styles often absent; stigmas 2-3 lobed or subentire. Berries fleshy or woody, indehiscent. Seeds 1-2 or more, oblong.

About 160 species in C. America, C. and S.E. Asia; 1 in A. & N. Islands.

*Ternstroemia wallichiana* (Griffith) Ridley in Fl. Malay Penin. 1: 198. 1922; Chauhan & Paul in Fl. India 3: 193. 1993. *Erythrochiton wallichianum* Griffith, Not. Pl. Asiat. 4: 565, 1854 & Icon. Pl. Asiat. 4: t. 585A, f. 7. 1854. *T. penangiana* auct. non Choisy, 1855 & Dyer in Fl. Brit. India 1: 281. 1874.

Evergreen trees, up to 10 m high. Leaves oblong, obovate or broadly oblanceolate, cuneate or decurrent at base, shortly acuminate at apex, 5-17 x 4-7 cm, entire; petiole channelled above. Flowers white, axillary, solitary or in fascicles, ca 3 cm across. Sepals orbicular, wrinkled, persistent. Petals ca 2 cm long, obovate, leathery, denticulate. Stamens many in several rows. Ovary conical, 2-loculed; stigma 2-lobed, dentate. Berries ca 2 cm across, globose, fleshy, orange, 4-seeded. Seeds brown, ca 1.5 cm, long, embedded in reddish pulp.

*Fl.*: Nov.-Feb; *Fr.*: March-April.

*Distr.*: Dhanikhari in S. Andaman and Lakmipur in N. Andaman.

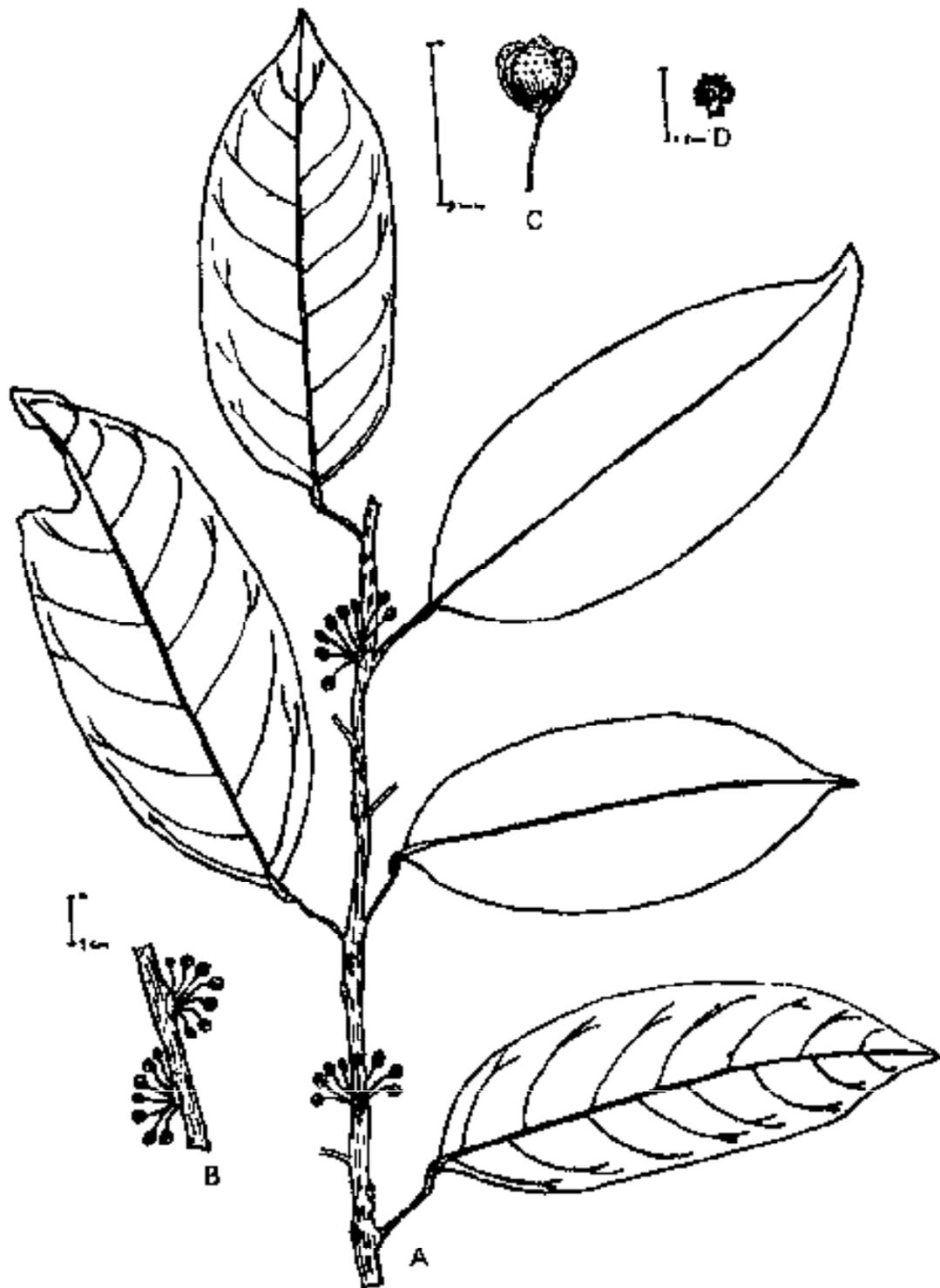
**ACTINIDIACEAE (SAURAUACEAE)**

(H.S. Debnath)

A monogeneric family confined to tropical and subtropical America, Asia and a few in Australia; ca 300 species; 1 species in A. & N. Islands.

**Saurauia Willd.**

Shrubs or trees. Leaves simple, alternate, serrate with prominent parallel veins diverging from midrib, with hairs and scales, exstipulate. Flowers axillary, solitary or in cymes or lateral panicles, bisexual,



**Fig.1:** *Pycnarrhena longifolia*. (Decne ex Miq.) Becc. A. Twig; B. Axillary fasciculate inflorescence; C. Male flower; D. Stamen.

hypogynous, bracteate; sepals free, imbricate, persistent; petals free or connate at base, imbricate; stamens many; ovary superior, 3-5 locular, ovules numerous in axile placentation; styles 4-5, free or variously united, stigma simple. Fruit a berry. Seeds small, numerous, albuminous.

**Saurauia bracteosa** DC., in Mem. Soc. Phys. Genev. 1: 422. 1822; Back & Bakh. f., Fl. Java 1: 326. 1963; Yoganarasimhan, Chelladurai, Togunashi, Govindaiah & Keshav Murthy in Curr. Sci. 51, 4: 198-199. 1982.

Evergreen trees, up to 7m high. Leaves 15-35x7-8 cm, elliptic-oblong-obovate, cordate at base, shortly acuminate at apex, coriaceous, dentate-serrate, scaly on the upper surface in juvenile leaves, glabrous in mature leaves, lower surface very densely clothed with a fine, grey or brown tomentum. Petiole about 5 cm long. Cymes in corymbs, densely pubescent and scaly; bracts foliaceous, oblong, caudate at apex; sepals 5, outer 2 densely scaly, much shorter than petals, united at base, ovate to lanceolate; petals 5, white, obovate, imbricate, notched at apex, connate at base; stamens many, connate at base only; filaments united at base, anthers versatile, yellow; ovary densely tomentose, 5-loculed; styles 4-5, united at base, persistent. Berries globose, densely white tomentose. Seeds pyramidal, reticulate, pitted.

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

In tropical evergreen forests.

*Distr.*: Laful, East-West Road.

Leaves of this species are reported to be used as fodder, in the preparation of hair-pomade and bark in medicine and wood as building material and for packing cases.

### DIPTEROCARPACEAE

About 15 genera and 580 species confined to Asian tropics except for a few species in Tropical Africa; 2 genera and 7 species in A. & N. Islands.

- 1 a. Leaves plicately folded in bud; stipules amplexicaule; stipular scars prominent & encircling twigs; fruit calyx lobes valvate..... 1. *Dipterocarpus*

- b. Leaves not folded in bud; stipules not amplexicaule; stipular scars inconspicuous; fruit calyx lobes imbricate.....2. *Hopea*

### 1. *Dipterocarpus* Gaertn.

Medium to large sized trees with buttressed bases; bark more or less prominently, densely verrucose-lenticellate. Leaves coriaceous, margin usually sinuate towards apex; petioles distinctly geniculate; stipules large, hastate to lorate, obtuse more or less succulent. Inflorescences somewhat irregularly, sparingly branched racemose, few flowered. Flowers white or pink; calyx 5 lobed, lobes valvate, two longer ones oblong to spatulate,  $\pm$  distinctly 3-nerved, other three lobes remaining short and forming a crown round apex of the nut; corolla lobes large, narrowly oblong, white or cream coloured with a prominent pink stripe down the centre; stamens 15-many, persisting in a ring around ovary after petals fall off; filaments of variable length, broad, compressed, connate at base, tapering gradually and filiform below the anther; anthers linear, tapering apically with 4 pollen sacs; ovary enclosed in calyx tube, the apex ovoid to conical, densely puberulent; stylopodium cylindrical to filiform, densely puberulent, narrowing into filiform style. Fruit large, nut-like, enclosed in calyx tube.

About 80 species in Sri Lanka, India, eastwards to Indo-China, Sumbawa, Borneo and the Philippines; 5 in A. & N. Islands.

- 1 a. Mature fruiting calyx tube angled, ribbed and winged .....2  
 b. Mature fruiting calyx tube not angled, ribbed and winged .....4
- 2 a. Calyx tube with angles widely winged .....1. *D. alatus*  
 b. Calyx tube with angles very narrowly winged .....3
- 3 a. Leaves glabrous on both surfaces; flowers 5-6.3 cm in diameter; fruit calyx tube at least one and half times as long as broad, distinctly ellipsoid .....  
 .....4. *D. grandiflorus*  
 b. Leaves pilose on both surfaces; flowers 1.8 cm in diameter; fruit calyx tube less than one and half times as long as broad, broadly ellipsoid to globose .....2. *D. costatus*
- 4 a. Branchlets pubescent, tomentose or pilose.....3. *D. gracilis*  
 b. Branchlets glabrous .....5. *D. kerrii*

1. *D. alatus* Roxb (Hort. Beng. 42. 1814 *nom. nud.*) ex G. Don, Gen. Hist. 1: 813. 1831; Dyer in Hook. f., Fl. Brit. India 1: 298. 1874, p.p. *D. incanus* Roxb., (Hort. Beng. 42. 1814, non. nud). Fl. Ind. 2: 614. 1832.

Trees up to 60 m high. Leaves 10-20 x 5.6-11.2 cm, ovate or elliptic-ovate, apex acute, cuneate or broadly rounded at base, nearly glabrous above except on veins, pubescent beneath; petioles 2.5-3.8 cm long, softly pubescent; stipules 5-8.5 cm long, stellate tomentose to pilose. Flowers in axillary, simple or branched, 3-7 flowered racemes; calyx tube 1-1.5 cm long, obconic with 5 wings; corolla lobes ca 3 cm long, white or yellowish-white; stamens 30-32; filaments flattened; anthers 4-5 mm long; ovary densely tomentose; styles pilose at base, glabrous towards apex. Fruits 1.7-2.5 cm long, globose, usually 5-winged to the base, wings glaucous, sparsely stellate-hairy; larger wings 10-12.5 cm long, linear-ovate or spatulate, obtuse, smaller wings 5-12 mm long, orbicular or ovate.

*Fl.*: Jan.-March; *Fr.*: April-June.

*Distrib.*: Andaman Islands.

2. *D. costatus* Gaertn. f., Suppl. Carp. 3: 50, t. 187. 1805; Parkinson, For. Fl. Andaman Islands. 93. 1923.

Trees, 20-30 m high. Leaves 5-15 x 2.5-7 cm, ovate or elliptic, coriaceous, apex acute to shortly acuminate, obtuse or broadly cuneate at base, pilose on both surfaces; petioles 1.5-4 cm long, softly pubescent; stipules ca 5 cm long, shaggy yellow tomentose. Flowers in axillary or terminal, 3-9 flowered, branched or unbranched spikes; calyx campanulate, 5 ribs starting from between lobes and running down to the base, 2-3 mm long, rounded, tube and lobes densely stellate pilose; corolla lobes 1.7-2.5 cm long, tomentose outside; stamens 18-20; filaments short, lorate; anthers short, linear-lorate; ovary ovoid, densely pubescent, tapering into the columnar style. Fruit berry, ca 1.8 cm in diameter; calyx tube subglobose, persistently pubescent, with 5 continuous, coriaceous wings, longer lobes 2, linear-oblong narrowly obtuse, shorter lobes 3, sub-orbicular, revolute, prominent.

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

3. ***D. gracilis*** Blume, *Bijdr.* 224. 1825. *D. pilosus* Roxb. (*Hort. Beng.* 93. 1814, *nom. nud.*) *Fl. Ind.* 2: 615. 1832; Dyer in *Hook. f. Fl. Brit. India* 1: 296. 1874. *D. turbinatus* Buch.-Ham. in *Mem. Wern. Soc.* 6: 300. 1832, non Gaertn. f. 1805. *D. turbinatus* Gaertn. f. var. *andamanica* King in *J. Asiat. Soc. Beng.* 62: 92. 1893. *D. andamanicus* (King) Tewary & Sarkar in *Ind. J. For.* 10: 63. 1987.

Trees, up to 40 m high; branchlets, leaf buds, outside of stipules, undersurface of leaves, midrib above and petioles densely rufous tomentose. Leaves 6-20 x 3-12 cm, ovate, elliptic-oblong, apex shortly acuminate, obtuse to rounded at base, margin distantly crenate, with fascicled cilia. Flowers in axillary or terminal racemes; calyx tube 1-1.5 cm long, ovoid, obovoid to funnel-shaped; corolla lobes 2.5-4 cm long, stellate-tomentose outside; stamens ca 30; filaments short; anthers linear; ovary ovoid-conical; styles slender, filiform. Fruits globose or broadly ovoid-conical, two longer lobes of fruiting calyx narrowly spatulate, three shorter lobes of fruiting calyx ovate to orbicular.

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

4. ***D. grandiflorus*** (Blanco) Blanco, *Fl. Filip.* ed. 21: 314. 1845. *Mocanera grandiflorus* Blanco, *Fl. Filip.* ed. 1: 451. 1837. *Dipterocarpus griffithii* Miq., *Ann. Mus. Lugd.-bat.* 1: 213. 1864; Dyer in *Fl. Brit. India* 1: 299. 1874.

Trees, up to 40 m high; branchlets, leaf bud, outside of stipule, parts of petals exposed in bud, ovary apex densely pale pubescent. Leaves 10-18 x 5-12 cm, ovate, apex shortly acuminate obtuse or subcordate at base; petioles 3-9 cm long; stipules oblong-lanceolate. Flowers in axillary, 2-4 flowered, usually simple, sometimes branched racemes; calyx tube 1.5-2.2 cm long, more or less 5-winged, 3 longer lobes linear-spathulate, obtuse, 2 smaller lobes oblong to deltoid; petals 3.7-5 cm long; stamens 27-30; filaments compressed; ovary tapering into a short, stout, columnar style, densely tomentose. Fruits ca 6 x 2.5 cm, oblong or ellipsoid, usually with 5 wings.

*Fl.*: Jan.-Feb.; *Fr.*: April-June.

5. *D. kerrii* King in J. Asiat. Soc. Beng. 62. 2: 93. 1893.

Trees, ca 40 m high; parts of petals exposed in bud, inside of stipules and ovary apex densely silky pubescent. Leaves 7-13 x 3-7 cm, apex linear-lanceolate, acute or very shortly bluntly acuminate, cuneate at base; petioles 2-3 cm long; stipules silky pubescent inside, glabrous outside; Flowers 2-5 in axillary, simple or branched spikes; calyx tube 1.2 cm long, three smaller lobes rounded, two larger lobes linear-oblong, petals ca 2.5 cm long, linear-oblong, obtuse; stamens 33, filaments flattened at base; ovary ovoid, small. Fruits 2.5-3 cm in diameter, two longer lobes linear-oblong or oblong-lanceolate, obtuse, three shorter lobes sub-orbicular, subrevolute.

*Fl.*: Jan.-Feb.; *Fr.*: April-July.

*Distrib.*: Andaman Islands.

2. *Hopea* Roxb.

Trees with buttressed trunk. Leaves narrowly oblong with oblique base, coriaceous; stipules small, linear, fugaceous, stipular scars inconspicuous. Inflorescences lax panicles of unilateral racemes. Flowers sessile or shortly pedicelled, ebracteate; calyx tube very short, lobes stellate-tomentose outside, two outer ones longer, ovate, three inner sub-orbicular, often mucronate; petals imbricate, fleshy, densely stellate-tomentose outside; stamens 10 or 15, rarely numerous connate at base, falling with the petals; filaments subulate, outermost longer, innermost shorter, sterile, anthers short, medifixed; ovary 3-locular, ovules many in 2-rows in axile placentation; styles short, cylindrical; stigmas thick. Fruit globose, fibrous, nut-like, 1-seeded, tightly enveloped by the base of accrescent calyx lobes, 2 of which develop into linear wings.

About 110 species in tropical Asia from India and Sri Lanka eastwards to New Guinea and the Lousiade archipelago; 2 in A. & N. Islands.

- 1 a. Leaves glabrous above, pale yellow or silvery lepidote beneath; corolla lobes fimbriate at apex ..... 1. *H. helferi*  
 b. Leaves glabrous on both surfaces; corolla lobes not fimbriate at apex ...  
 ..... 2 *H. odorata*

1. **H. helferi** (Dyer) Brandis in J. Linn. Soc. Bot. 31: 62. 1895. *Vatica helferi* Dyer in Hook. f., Fl. Brit. India 1: 302. 1874.

Trees, up to 40 m high; young shoots, buds, petioles, leaf venation beneath, stipules, panicles, outside of perianth densely buff-puberulent. Leaves 6-20 x 2-7 cm, oblong-lanceolate, apex broadly short acuminate or obtuse, cuneate to occasionally cordate, subequal base; petioles 5-10 mm long, rugose; stipule scars obscure. Panicles terminal, subterminal or axillary, becoming lax; 2 outer calyx lobes ovate-oblong or lanceolate, subacute; tomentose except basal portion, 3 inner lobes shorter ovate, tomentose outside; petals pale yellow, elliptic-oblong; stamens 15, filaments broadly compressed at base; ovary and stylopodium cylindrical, subtruncate; styles shorter than ovary and stylopodium. Fruit berry, 10 x 7 mm, ovoid, apiculate, striate; fruiting calyx appressed to the base of nutlet, 2 longer lobes narrowly oblong or oblanceolate, 3 shorter lobes ovate.

*Fl.*: Oct.-Feb.; *Fr.*: Nov.-April.

*Distrib.*: Andaman Islands.

2. **H. odorata** Roxb., Pl. Corom. 3: 7, t. 210. 1811; Dyer in Hook. f. Fl. Brit. India 1: 308. 1874.

Trees, 30-40 m high; branchlets, panicles, vegetative buds, outside of sepals, petals densely puberulent. Leaves 5-14 x 3-5 cm, ovate-lanceolate, apex acute or obtusely acuminate, broadly cuneate at base, margin entire or undulate; petioles 1-2 cm long; stipules minute, fugaceous. Flowers sweet-scented, very short pedicelled, in branched panicles; calyx lobes unequal, slightly pubescent, outer 2 lobes lanceolate, obtuse or sub-acuminate, inner 3 broadly ovate, acute, petals pale creamy yellow, ca 4 mm long, pubescent outside; stamens 15, filaments slender, compressed at base; ovary ovoid, punctate or glabrous, gradually narrowed into a conical stylopodium and a long, cylindrical style. Fruits 3-6 x 5-8 mm, ovoid; the two enlarged wings ca 3.8 cm long, oblong or oblanceolate or broadly spatulate, obtuse at both ends, 3 smaller lobes ovate, subacuminate.

*Fl.*: Feb.-April; *Fr.*: May-June.

*Distrib.*: Andaman Islands.

**ANCISTROCLADACEAE**

A monogeneric family confined to tropical West Africa, South East Asia and South China; *ca* 12 species; 3 species in A. & N. Islands.

**Ancistrocladus Wallich *nom. cons.***

Liana often shrubs with short, circinate woody hooks. Leaves usually in terminal tufts, alternate, simple, oblanceolate, entire, with scattered minute glandular pits. Inflorescences dichotomously branched, terminal or lateral panicles. Flowers regular, bisexual, bracteate; calyx 5-lobed, imbricate, tube short, persistent; petals 5, free, alternate with sepals, imbricate, white or pink; stamens 5 or 10; filaments dilated, connate at base, anthers 2-loculed, basifixed, introrse; ovary half inferior, unilocular with a basal, erect ovule; styles 3, free; stigmas flattened. Fruit a nut. Seeds large with ruminant endosperm.

About 12 species in tropical West Africa, South East Asia and South China; 2 in A. & N. Islands.

- 1 a. Leaves more than five times as long as wide .....2
- b. Leaves not more than three times as long as wide .....2. *A. tectorius*
- 2 a. Leaves not more than 30 cm long. Panicles terminal or on short slender lateral branchlets 2-3 times dichotomous .....3. *A. wallichii*
- b. Leaves 30-38 cm long. Panicles terminal repeatedly dichotomous with stout divaricate divisions, the ultimate ones recurved .....1. *A. attenuatus*

1. **Ancistrocladus attenuatus** Dyer in Hook.f., Fl. Brit. Ind. 1: 300. 1874; Parkinson, For Fl. Andaman Islands 95. 1923.

Liana. Stem twisted, dark coloured; branchlets with circinate hooks. Leaves tufted, 30-38 x 3.5-4.5 cm, cuneate linear, sessile, gradually acuminate. Panicle terminal repeatedly dichotomous. Flowers crowded at the tip; bracts solitary, deltoid, acute; calyx lobes 5, unequal, imbricate, 2 lobes enlarged, narrowly elliptic, obtuse; calyx tube in fruit furrowed; petals 5, united at the base; stamens 10, alternately unequal; ovary 1-celled, inferior; carpels 3; ovule 1, basal, ascending with 2 integuments. Nut with spreading calyx wings.

2. ***Ancistrocladus tectorius*** (Lour.) Merr. *Linga. Sc. J.* 6: 329. 1930. *Bembix tectoria* Lour. *Fl. Coch.* 282. 1790. *Ancistrocladus extensus* (Wall. cat. 1052, nomen) Planch. *Ann. Sc. Nat.* 3, 13: 318. 1849; Dyer in Hook. f., *Fl. Brit. Ind.* 1: 300. 1874; Parkinson For. *Fl. Andaman Islands* 95. 1923.

Liana, often shrubs; branches sympodial with a series of circinate woody hooks. Leaves crowded, sessile, 9-30 x 3-10 cm, variable in size and shape, usually obovate-oblong, tapering towards base, apex obtuse, acute or even acuminate. Flowers crowded at the tips; calyx lobes 5, unequal imbricate, oval, thin margined, provided with 1-3 conspicuous prominent glands; petals 5, united at the base, oblique-oval, margin often involute, acute; stamens 10, alternately unequal; filament broadened at the base, cells free, acute, more or less latrorse; ovary consisting of 3 carpels, 1-celled; ovule 1, basal, ascending with 2 integuments. Nut with spreading unequal calyx wings, oblong-cuneate to spatulate, often oblique, apex blunt to rounded. Seed obconical.

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

*Distr.*: S. Andaman.

3. ***Ancistrocladus wallichii*** Planch. in *Ann. Sc. Nat. Ser.* 3, 13: 319. 1849; Dyer in Hook. f. *Fl. Brit. Ind.* 1: 300. 1874.

Liana with tortuous branches. Leaves 22-30 x 3-4 cm, sessile, linear or linear-elliptic, obtusely acuminate or acute, gradually narrowed to the sub-auricled base. Panicle terminal or on short, slender, lateral branchlets. Bracts solitary, ovate, denticulate; enlarged calyx lobes in fruit subequal, oblong-ovate, obtuse, spreading; petals united at the base; ovary 1-celled; carpels 3; ovule 1, basal. Nut with spreading calyx wings.

## MALVACEAE

About 88 genera and 2300 species in the tropical, subtropical and temperate regions; 5 genera and 6 species in A. & N. Islands.

- 1 a. Styles as many as carpels or style undivided and stigmas entire .....2  
 b. Styles twice as many as carpels .....5. *Urena*

- 2 a. Fruit a capsule; staminal column 5-toothed or armed at apex, antheriferous throughout or a major portion of it or tipped with clusters of anthers .....3.  
 b. Fruit a schizocarp, breaking into mericarp at maturity; staminal column without teeth, apex slit up into numerous filaments .....3. *Sida*
- 3 a. Style distally 5-branched, with branches spreading at maturity, stigmas more or less capitate or globose .....4  
 b. Styles unbranched; stigmas ribbed or lobed ... .....4. *Thespesia*
- 4 a. Calyx regularly 5-lobed, not spathaceous, persistent .....2. *Hibiscus*  
 b. Calyx regularly 2-3 lobed, spathaceous, deciduous .....1. *Abelmoschus*

### 1. *Abelmoschus* Medikus

Herbs, undershrubs or trees, hirsute. Leaves palmilobed to palmiparted. Flowers solitary, axillary or in terminal racemes by reduction of upper leaves; pedicels inarticulate. Epicalyx segments 4-16, usually free, calyx spathaceous, lobed or toothed at tip, split to the base on one side, adnate and falling with corolla. Corolla large. Staminal column included. Ovary 5-locular, many ovuled; style-1, distally 5-branched; stigmas discoid. Capsule ovoid to oblong or cylindric, loculicidally dehiscent with longitudinal slits towards base. Seeds many in each locule.

About 15 species, throughout tropical, subtropical and temperate regions of the old world; 1 in A. & N. Islands.

***Abelmoschus moschatus* Medic.** Malv. 46. 1787; *Hibiscus abelmoschus* Linn. Sp. Pl. 696. 1753; Mast. in Hook. f., Fl. Brit. Ind. 1: 342. 1874. Parkinson, For. Fl. Andaman Islands. 96. 1923.

Herbs or undershrubs, up to 3 m high, hirsute. Leaves 4-15 x 3-18 cm, angular or 3-7 palmilobed to palmiparted; petioles 2-15 cm long. Stipules 5-10 mm. Epicalyx 6-10 segments; segments linear, 10-15 x 1-2 mm. Calyx spathaceous, 1.5-3.0 cm high. Corolla large yellow with dark purple centre. Staminal column included, antheriferous throughout. Ovary 5-locular, many ovuled; style-1, distally 5-armed; stigma discoid. Capsules 4-8 x 2-3 cm, with a rostrum. Seeds 3-4 mm, concentrically ribbed.

*Fl.*: July-Oct.; *Fr.*: Oct.-Dec.

2. *Hibiscus* Linn. *nom. cons.*

Annual or perennial herbs, undershrubs, woody climbers, shrubs or trees; branchlets glabrate or sparsely to densely pubescent or tomentose with simple hairs. Leaves simple, palmilobed to palmiparted, often with obscure nectaries or nectariferous zone on midrib beneath; stipules subulate to linear, ovate or foliaceous. Flowers axillary, solitary or in terminal, lax racemes or panicles by reduction of upper leaves. Epicalyx segments 3-many. Calyx 5-lobed or 5-parted, distinctly nerved, persistent. Corolla generally large and showy, rotate, campanulate or cylindrical, variously coloured. Staminal column shorter or as long as petals, truncate or 5-toothed at apex, antheriferous throughout or only in the upper half. Ovary 5-locular or 10-locular by 5 false septa, ovules 3 or more in each locule; style 1, distally 5-branched; stigmas usually discoid, sometimes capitate, capsules loculicidally dehiscent, usually 5-loculed or 10-loculed. Seeds 3-many in each locule, subglobose or obovoid, reniform.

About 250 species throughout tropics and subtropics of the world; 2 in A. & N. Islands.

- 1 a. Woody climbers. Stipules linear-lanceolate. Epicalyx segments 5. Capsule exceeding the calyx ..... *H. scandens*
- b. Trees. Stipules oblong. Epicalyx segments 7-10. Capsule not exceeding the calyx ..... *H. tiliaceous*
1. ***Hibiscus scandens*** Roxb. (Hort. Beng. 51. 1814 *nom. nud.*) Fl. Ind. ed Carey 3: 200. 1832 *non* Wall.; Mast. in Hook. f., Fl. Brit. Ind. 1: 337. 1874; Parkinson, For. Fl. Andaman Islands 96. 1923.

Woody climbers over lofty trees. Young stems, petioles and pedicels with stellate hairs. Leaves 4-12 x 3-11 cm, ovate cordate, 3-lobed, lobes deltoid, apex acute or acuminate both surfaces with stellate pilose. Flowers solitary in terminal cymes. Epicalyx segments lanceolate. Calyx connate below middle, equal or shorter than the epicalyx, persistent. Corolla white or yellow with crimson centre. Capsule ovoid-cylindric, densely covered with stellate hairs. Seeds reniform, densely covered with brownish white hairs.

*Fl. & Frt.* : Oct.-March.

2. *Hibiscus tiliaceus* Linn., Sp. Pl. 694. 1753.

Trees up to 15 m high, Leaves 3-18 x 1.5-18 cm, orbicular, unlobed or 3-5 lobed, apex acute to acuminate, base deeply cordate. Flowers solitary, axillary or in terminal raceme by reduction of upper leaves. Epicalyx cupular, segments deltoid. Calyx campanulate, lobes with 3 prominent veins and a nectary on the midvein outside. Corolla campanulate, petals obovate, yellow with dark purple base, finally turning red. Staminal column shorter than the petals. Capsule 1-2 cm in diameter, globose to ovoid with a short beak. Seeds reniform, 5-8 per locule, blackish brown, papillose.

- 1 a. Leaves unlobed, base cordate ..... *ssp. tiliaceus*  
 b. Leaves 3-5 lobed, base rounded or truncate ..... *ssp. hastatus*

*ssp. tiliaceus* Linn., Sp. Pl. 694. 1753; Mast. in Hook. f., Fl. Brit. India 1: 343. 1874; Parkinson, For. Fl. Andaman Island 96. 1923.

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

*ssp. hastatus* (Linn.f.) Borss. in Blumea 14: 36.1966. *Hibiscus hastatus* Linn. f. Suppl. 310. 1781. *non* Cav. 1787.

3. *Sida* L.

Annual or perennial herbs or undershrubs. Leaves ovate, rhomboid, obovoid, retuse or lanceolate, entire, rarely lobed or divided. Flowers axillary, solitary or in clusters or in racemes or panicles by reduction of leaves. Epicalyx absent. Calyx 5-lobed, campanulate. Corolla rotate, connate at base and adnate to the staminal column, yellow or yellowish white. Staminal column shorter than petals, hairy or glabrous. Carpels 5-14, uniovulate; styles as many as carpels; stigma capitate. Schizocarps globular to oblate; mericarps more or less trigonous. Seeds ovoid-oblong to reniform, glabrous or hairy.

About 200 species in tropics and subtropics of the world; 1 in A. & N. Islands.

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

Annual undershrubs or herbs. 0.5-2 m high. Leaves 1-9 x 0.5-2.5 cm, lanceolate to linear, elliptic-lanceolate or ovate-oblong, apex acute, base mostly acute, margin serrate, both the surfaces sparsely hairy. Stipules 6-12 x 1.0-1.5 mm, each pair different. Flowers solitary, axillary or in clusters of 2-3. Epicalyx absent. Calyx campanulate, 5-lobed. Corolla rotate, light yellow; petals as long as calyx lobes or slightly exceeding. Staminal column *ca* 4 mm long with simple or glandular hairs. Ovary ovoid, *ca* 1.5 mm long. Mericarps 6-10, tetrahedral, birostate, one seeded. Seeds *ca* 2 mm long, triangularly ovoid, dark brown.

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

*Distr.* : L. Andaman & Nicobar.

#### 4. *Thespesia* Sol. ex Correa *nom. cons.*

Trees or shrubs; branchlets with an indumentum of scales or stellate hairs. Leaves simple, entire or palmilobed; stipules early caducous. Flowers solitary, axillary or in racemes by reduction of upper leaves. Epicalyx segments 3 or 6, free, caducous. Calyx cyathiform, nearly truncate, persistent. Corolla large, showy, mostly yellow with a dark purple centre. Staminal column shorter than petals, cylindric, antheriferous throughout. Ovary 5-loculed; style unbranched; stigma clavate, 5-sulcate or rarely 5-lobed. Capsules globose or pyriform, indehiscent or partly dehiscent or loculicidal; pericarp woody. Seeds 3-many in each locule, obovoid, glabrous, pubescent or tomentose.

About 18 species in tropical and subtropical regions of the world; 1 in A. & N. Islands.

***Thespesia populnea*** (Linn.) Sol. ex. Corr. in Arn. Mus. Herb. Paris 9: 290, t. 8. f. 1. 1807; Mast. in Hook. f., Fl. Brit. India 1: 345. 1874; Parkinson, For. Fl. Andaman Islands 97. 1923.

Trees, 5-10 m high, twigs densely covered with minute scales. Leaves 5-20 x 5-15 cm, orbicular, deltoid, ovate or oblong, apex acute to acuminate, base deeply cordate. Stipules 4-10 mm long, lanceolate to linear. Flowers solitary, axillary. Epicalyx segments 3, free, oblong to oblanceolate, caducous. Calyx 8-12 x 18 mm, campanulate with 5 teeth, outside densely scaly, inside densely hirsute. Corolla light yellow with

dark purple centre, petals obliquely obovate, apex rounded. Staminal column shorter than the petals, antheriferous throughout. Ovary 6-8 mm in diameter, globose to ovoid; style *ca* 3 cm long; stigmas clavate, coherent. Capsule 2.0-3.5 cm in diameter, globose, 4 or 5 loculed, indehiscent. Seeds 6-10 x 5-8 mm, obovoid, angular, densely covered with yellowish brown long simple hairs.

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

### 5. *Urena* L.

Annual or perennial undershrubs or shrubs. Young parts densely minute stellate hairy. Leaves palmilobed to parted or in clusters. Epicalyx campanulate, 5-lobed, lobes connate at base. Calyx campanulate, 5-lobed. Corolla rotate, stellate pilose outside; petals 5. Staminal column as long as petals, truncate or denticulate at apex; antheriferous towards tip; anthers subsessile. Ovary depressed globose, 5-loculed, locules uniloculate; style divided from about middle into 10 arms, reflexed; stigmas discoid or capitate, papillose. Schizocarp subglobose; mericarps 5, separating at maturity, triangularly obovoid. Seeds obovoid trigonous, glabrous, ascending.

Monotypic, pantropical.

*Urena lobata* Linn., Sp. Pl. 692. 1753 *sens. lat.*; Mast. in Hook. f., Fl. Brit. India 1: 329. 1874.

Undershrubs, 0.5-2.0 m high. Leaves 1-12 x 0.5-12.5 cm, ovate to orbicular, unlobed, apex obtuse to acute or rounded, base shallowly cordate, rounded, obtuse to acute, margin serrate to crenate or entire, both surfaces densely stellate hairy, stipules 2-4 mm long, linear to lanceolate. Flowers axillary, solitary or in clusters of 2-3. Epicalyx segments 5, 3-10 x 1-3 mm, linear to lanceolate. Calyx 5 parted, tubular to campanulate, free at the base; lobes ovate to deltoid. Corolla 2-3 cm in diameter, pink with a purple centre; stellate pilose outside; petals 5, obovate. Ovary depressed globose, 5-loculed, one ovule in each locule; style above the middle divided into 10 arms, reflexed; stigmas discoid, papillose. Schizocarp 5-8 mm in diameter, globular; mericarps 5, 4-5 mm high, indehiscent, covered with glochidiate spines. Seeds 2-3 mm in diameter, reniform.

- 1 a. Leaves angled or shallowly lobed. Epicalyx cupular in fruit, appressed to the mericarps, segments long triangular.....1. ssp. *lobata*  
 b. Leaves palmatilobed or-fid. Epicalyx spreading or reflexed in fruit, segments linear to lanceolate. ....2. ssp. *sinuata*

1. ***Urena lobata* ssp. *lobata*** Linn., Sp. Pl. 692. 1753; Mast. in Hook. f., Fl. Brit. India 1: 329. 1874.

*Distrib.*: Andaman and Nicobar Islands.

2. ***Urena lobata* ssp. *sinuata*** (Linn.) Borss. in Blumea 14: 142. 1966. *U. sinuata* Linn. Sp. Pl. 692. 1753; Mast. in Hook. f. Fl. Brit. India 1: 329. 1874.

*Distrib.*: Andaman Islands.

## BOMBACACEAE

Pantropical, predominantly in tropical America, about 26 genera and 225 species; 2 genera and 3 species in A. & N. Islands.

- 1 a. Stems armed; flowers large, peduncles thick, 1-2 cm long; stamens numerous, anthers hippocrepiform .....1. *Bombax*  
 b. Stems smooth; flowers small, peduncles up to 5 cm long; staminal tube divided into 5-filaments, each with 2-3 anfractose anthers ... .....2. *Ceiba*

### 1. *Bombax* L., *nom. cons.*

Trees, deciduous; trunk buttressed. Leaves alternate, petiolate, stipulate digitately compound, 5-9 foliolate; leaflets articulate, sessile or petiolulate, glabrous or tufted hairy. Flowers solitary or in clusters, axillary or subterminal; bracteoles 3, fugacious; Calyx campanulate to fusiform, truncate, or irregularly 3-7 lobed at apex. Petals 5, linear to obovate or oblong, adnate to the base of staminal tube. Stamens numerous in 2 whorls of 5-6 bundles, cornate at base, divided above into numerous 10 long filaments; anthers medifixed, unilocular, dehiscing longitudinally, extrorse; Ovary 5-locular, ovules many in each locule; styles filiform or clavate, divided into 5 spreading stigmatic branches at the tip. Capsules cylindrically oblong, appressed hairy outside, dehiscing longitudinally into 5-valves, valves densely covered with silky fibres inside. Seeds numerous, pyriform to globose, glabrous, exarillate, embedded in silky fibres.

About 8 species in tropical America, Africa and Asia; 2 in A. & N. Islands.

- 1 a. Trees, 30-40 m high. Flowers 10-12 x 12 cm. Stamens generally 65 in 6 bundles, middle bundle with 15 stamens and 5 bundles in the outer series each with 10 stamens. Capsule 11-12 cm long. Seed dark brown ..... *B. ceiba*
- b. Trees, up to 15 m high Flowers 12-17 x 22 cm. Stamens numerous in 5 bundles. Capsule 18-22 cm long. Seed black ... ..... *B. insigne*

1. **Bombax ceiba** Linn. Sp. Pl. 511. 1753, pro-parte quoid Plantas Asiaticus exclux. *B. malabaricum* DC. Prodr. 1: 479. 1824; Mast. in Hook. f. Fl. Brit. Ind. 1: 349. 1874; Parkinson; For. Fl. Andaman Islands 898. 1923.

Trees, 30-40 m high. Trunk straight, covered with short, sharp, conical woody prickles. Leaves digitate, spreading; leaflets 5-7, lanceolate, 12-24 x 7-10 cm, glabrous, apex denticulate, entire, petioled. Stipules small, caducous. Flowers bright red coloured, pedicels thick, singly or in clusters towards the end of the branchlets. Calyx cup-shaped, 3-4 cm, oblong, recurved, imbricate; filaments pinkish, flat, angular; anthers reniform; Ovary conical, glabrous; style  $\pm$  6 cm long; stigma 5-fid, subulate, recurved. Capsule oblong, tapering at both ends. 11-12 cm long, 5-valved. Seeds numerous obovate, smooth, brown, embedded in dense creamy white wool.

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

2. **Bombax insigne** Wall. Pl. Asiat. Rar. 1: 71. 1830; Mast. in Hook. f. Fl. Brit. Ind. 1: 349. 1874; Parkinson For. Fl. Andaman Islands 898. 1923. *B. insigne* Wall. var. *wightii* Prain in Journ. As. Soc. Beng. 5: 62. 1893 *B. insigne* var. *andamanica* Prain l.c. *B. insigne* Wall var. *polystemon* Prain l.c.

Trees, up to 15 m high. Leaves digitate, glabrous deciduous; leaflets 7-9, sessile, obovate, cuspidate-acuminate, glaucous beneath. Flowers 12-17 x 22 cm, solitary, on leafless branches; peduncles stout, 1.5 cm long, curved; calyx 3-5 cm long, cup-shaped, truncate or bilobed, coriaceous, inside sticky hairy petals 5, 13-15 cm long, scarlet linear-oblong, narrowed at the base, curved at the apex, with stellate hairs outside; stamens

numerous; filaments filiform, 8-10 cm long, unequal; ovary ovoid, tomentose; stigma 5-fid. Capsule large, oblong, glabrous, 18-22 x 4-6 cm, 5-valved, woody, curved downwards at the apex. Seeds obovate, smooth, black, embedded in densely wool.

*Fl.*: Feb.-March; *Fr.*: April-May.

## 2. *Ceiba* Mill. emend Gaertn.

Trees, deciduous. Leaves digitate, petiolate, 5-9 foliolate; leaflets articulate. Flowers solitary or clustered in axils of leaves or appear before them, actinomorphic, rarely zygomorphic, pedicellate, bracteolate; bracteoles tufted hairy fugaceous. Calyx campanulate to fusiform, truncate or irregularly 3-12 lobed, lobes valvate, persistent. Petals usually 5, sometimes 6, adnate to the base of staminal tube, pubescent or glabrous inside. Staminal tube cylindrical, short; anthers dehiscing longitudinally. Ovary superior or half inferior; styles dilated into 5-lobed stigma. Capsules oblong, ends pointed, coriaceous or woody, 5 valved, leaves densely silky inside; central column winged and persistent. Seeds numerous, ovoid or globose, exarillate, embedded in white silky fibrous cotton.

A genus of *ca* 3 species in America and tropical Africa; 1 in A. & N. Islands.

*Ceiba pentandra* (Linn.) Gaertn. *Fruct. Sem.* 2: 244. t. 133. 1791.  
*Bombax pentandra* Linn. *Sp. Pl.* 511. 1753.

Trees; trunk smooth with prickles and green when young. Leaves digitately compound, deciduous; leaflets 5-7, 10-12 x 4 cm, base and apex acute; petiole *ca* 14 cm long. Inflorescences solitary or in cluster of maximum 10 flowers, axillary or at the end of the branchlets, blooms after complete leaf fall. Calyx cup-shaped, persistent, coriaceous, apex irregularly 3-5 lobed; petals usually 5, sometimes 6, white, contorted, oblanceolate, 4 cm long, imbricate. Staminal tube divided above into 5 stamens; each stamen again split above into usually 3 filiform branches or filaments, each bearing 1-2 celled twisted anther; filament 3.5 cm long, with petaloid stamen. Ovary ovoid, 5-loculed, ovules many in each locule; style filiform, dilated, 4 cm long; stigma 5-lobed. Capsule oblong, coriaceous, 12 x 3.5 cm, 5-valved. Seeds many, globose, black with woolly cotton.

*Fl.*: Dec.-Feb.; *Fr.*: Feb.-April.

*Distrib.*: A. & N. Islands.

**STERCULIACEAE**

About 68 genera and 1100 species almost exclusively in tropics and subtropics, rarely in temperate regions; 11 genera and 17 species in A. & N. Islands.

- 1 a. Flowers unisexual or polygamous; petals absent .....2
- b. Flowers bisexual; petals present .....6
- 2 a. Leaves scaly beneath; fruits samaras .....5. *Heritiera*
- b. Leaves without scales beneath; fruits follicular .....3
- 3 a. Follicles opening long before maturity .....4
- b. Follicles not opening before maturity .....5
- 4 a. Androgynophore exerted after anthesis .....3. *Firmiana*
- b. Androgynophore remaining within flower after anthesis ...8. *Pterocymbium*
- 5 a. Seeds winged .....10. *Pterygota*
- b. Seeds without wings .....11. *Sterculia*
- 6 a. Staminodes present .....7
- b. Staminodes absent .....7. *Melochia*
- 7 a. Staminal column adnate to gynophore forming stalk, dilated above into a cup; fertile anthers alternating with staminodes towards margin .....8
- b. Staminal column free from carpels; anthers alternating with staminodes along the margin of the cupular column at its apex .....9
- 8 a. Flowers actinomorphic; staminal tube narrow, straight; seeds winged ...  
.....9. *Pterospermum*
- b. Flowers zygomorphic; staminal tube dilated; seeds not winged .....  
.....4. *Helicteres*
- 9 a. Staminodes emarginate; capsules 5-winged .....1. *Abroma*
- b. Staminodes acute; capsules not winged .....10

- 10 a. Fertile stamens 5; capsules covered with stiff spines and barbs .....2. *Byttneria*  
 b. Fertile stamens 10; capsules downy .....6. *Leptomychia*

### 1. *Abroma* Jacq.

Trees or shrubs, stellate hairy. Leaves simple, alternate, cordate, ovate-oblong, serrulate. Peduncle axillary or leaf opposed or terminal, few flowered. Flowers bisexual; sepals 5, connate near the base; petals 5, claw concave, broadly glandular at base, lamina large spatulate; staminal cup bears 5 groups of fertile anthers in sinuses; staminodes longer than the fertile filaments, obtuse; ovary sessile, 5-locular, ovules many in each locule; styles 5, connivent. Capsules membranous, 5-angled, 5-winged, septically 5-valved, valves villous at the edges. Seeds numerous.

2 Species in tropical Asia and Polynesia; 1 in A. & N. Islands.

*Abroma angusta* Linn. f. Suppl. 341.1781; Masters in Hook. f. Fl. Brit. Ind. 1: 375. 1874.

Shrubs. Leaves cordate, ovate-oblong, 10-15 x 10-12 cm, repand-denticulate, glabrescent above, tomentose below; petiole 1-2 cm long. Stipules linear. Peduncle axillary, opposite the leaves, few-flowered. Flowers ca 5 cm in diameter; sepals 5, lanceolate, free nearly to the base; petals 5, purplish, concave below; staminal cup of 5 fertile and as many sterile divisions, 3 antheriferous; anthers 2-lobed, lobes divergent; staminodes longer than the fertile filaments, obtuse; ovary sessile, pyramidal, 5-lobed; styles 5. Capsule membranous, 5-angled, 5-winged, truncate at the apex. Seeds numerous.

*Fl.*: Aug.-Sep.; *Fr.*: Oct.-Feb.

### 2. *Byttneria* Loefl., *nom. cons.*

Herbs, shrubs or trees, often climbers, usually prickly. Leaves simple, alternate, lobed or entire, petiolate. Flowers in much branched axillary or terminal umbellate cymes, bisexual; sepals 5, connate at base; petals 5, with a hooded limb which usually enter the staminal cup and cover the anther lobes, sometimes with two strap-shaped appendages on both sides of the hood, claw narrow; staminal cup with an inner series of 5 stamens

and an outer series of 5 staminodes alternating with stamens; anther lobes reniform, divergent staminodes ovate, acute; ovary small, 5-loculed; ovules 2 in each locule; styles entire or 5-fid. Capsules globose, spiny or prickly, septicidally 5-valved. Seed 1 in each locule.

About 50 species in tropical America, Africa, Mascarene Islands, tropical Asia and West Polynesia; 2 in A. & N. Islands.

- 1 a. Leaves palmately 3-5 lobed .....1. *B. andamanensis*  
 b. Leaves entire .....2. *B. grandifolia*

1. **Byttneria andamanensis** Kurz in Journ. As. Soc. 2: 47. 1871; Masters in Hook. f. Fl. Brit. Ind. 1: 377. 1874; Parkinson, For. Fl. Andaman Islands 102. 1923.

Climbing shrub. Leaves 10-12 x 10 cm, glabrescent, thinly stellate hairy, ovate, palmately lobed, lobes acute or acuminate; petiole 10-20 cm long; stipules subulate, deciduous. Cymes di or trichotomous. Flowers minute, bisexual; sepals 5, connate at the base; petals 5, with a concave claw and with two lateral lobes; stamens 10, 5 fertile stamens opposite the petals, 5 staminodes opposite the sepals; anthers 2-lobed; ovary sessile, 5-loculed. Capsule globose, glabrous, covered with short subulate spines, septicidally 5-valved, cells 1-seeded.

*Fl.*: May-Aug.; *Fr.*: Oct.

*Distrib.*: Andaman Islands.

2. **Byttneria grandifolia** DC., Prodr. 1: 486. 1824. *B. aspera* Colebr. ex Wall. in Roxb., Fl. Ind. 2: 383. 1824; Masters in Hook. f., Fl. Brit. Ind. 1: 377. 1874 "Byttneria"; Parkinson, For. Fl. Andaman Islands. 102. 1923.

Woody climbers; young parts stellate pubescent. Leaves 10-20 cm across, orbicular, cordate, acuminate, chartaceous, entire, glabrous, shining above; petiole 5-12 cm long; stipules linear-lanceolate. Flowers in much branched umbellate cymes, small, hisexual, pale brown; pedicels slender, jointed in the middle; sepals, with a concave claw and with two lateral lobes; stamens 10, below into a membranous tube, 5-fertile stamens opposite the petals, 5-staminodes opposite the sepals; ovary 5-loculed, with 2-ovules in each. Capsule 2.5-4 cm in diameter, globose, septical, woody,

5-valved, with one seed in each, armed with stout sharp rather distant conical prickles. Seeds ovate-oblong.

*Fl.* : Apr.-May.

### 3. *Firmiana Marsili*

Trees. Leaves simple, entire or shallow to deeply incised, cordate, acute or shortly acuminate at apex, glabrous or stellate hairy on the upper surface, often pubescent beneath; petioles long. Flowers unisexual in coralliform panicles, stellate pubescent; calyx tubular, 5-lobed, toothed; corolla absent; androgynophore exerted after anthesis; stamens 10, filaments attached to the sunken top of androgynophore; ovaries 5, conglutinate; ovules 2-4 per ovary; style short; stigmas curved outside. Fruit membranous follicles. Seeds 2-4, ovoid, smooth, wrinkled when dry.

About 8 species in tropical Asia and Pacific islands; 1 in A. & N. Islands.

*Firmiana colorata* (Roxb.) R.Br. in Benn., Pl. Jav. Rar. 235. 1844. *Sterculia colorata* Roxb., Pl. Coast Corom. 1: 26. t. 25. 1795; Masters in Hook. f., Fl. Brit. Ind. 1: 359. 1871; Parkinson, For. Fl. Andaman Islands 101. 1923.

Trees. Leaves palmately 3-5 lobed, cordate, 10-20 x 12-25 cm. Crowded towards the end of the branches; petiole 7-25 cm long; stipules lanceolate. Panicles short, terminal. Flowers covered with red or orange red coral like pubescence; calyx broadly tubular or funnel-shaped, 2-3 cm long, lobes 5, 2-3 mm long; petals absent; staminal column red in colour, with 10-30 sessile, yellow anthers; styles short, recurved. Follicles lanceolate-elliptic to oblong, 4-7 cm long, reticulate, 2-seeded. Seeds yellow, ovoid, 1 cm long.

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

*Distr.*: Andaman Islands.

### 4. *Helicteres* L.

Shrubs or small trees, more or less stellate pubescent. Leaves simple, alternate. Flowers bisexual, axillary or in fascicles or in long or short

spikes; calyx 5-fid, tubular; petals 5, entire or somewhat 2-lipped with long claw; staminal column adnate to gynophore, slightly curved towards apex, exerted, dilated above into 3-lobes, each lobe again bifurcated bearing an anther on each tooth; anthers 2-celled; staminodes arising from staminal column alternately between fertile lobes; ovary at the top of the gynophore, 5-lobed, 5-locular; styles awl-shaped, more or less united, slightly thickened and stigmatose at the tips. Follicles straight or spirally twisted. Seeds tubercled.

About 60 species in tropics of both the hemispheres, predominantly in America; 2 in A. and N. Islands.

- 1 a. Pedicels 2 mm at most. Follicles densely covered with flexuous, stellate pubescent bristles .....1. *H. angustifolia* var. *obtusifolia*  
 b. Pedicels 5-10 mm Follicles not bristly .....2. *H. isora*

1. ***Helicteres angustifolia*** Linn. var. *obtusifolia* (Wall ex Kurz) King, J. As. Soc. Beng. 62. 2 1893.

Shrubs or trees. Leaves oblong-lanceolate, with suboblique rounded base, hardly acuminate, acute, 2-12 x 0.25-4.5 cm; petiole 2-6 mm long; stipules lanceolate-linear. Inflorescences spicate. Flowers mostly in pairs, combined into small racemes, glandular at base, pale purple; bracts lanceolate-linear; calyx 5-7 mm long; petals 5, clawed, inside red-glandular, unequal 1-1.2 cm long, claw of the 2 broader ones winged or widened towards apex, the 3 other petals narrower, auricled near apex; disc absent; gynandrophore  $\pm$  7 mm, pubescent at base; staminal tube short, terminated by 10 stamens and 5 staminodes; filaments short; anther cells 2; ovary 5-celled; styles 5. Follicles 1.5-2 cm long. Seeds many, exalate, glabrous, dark brown.

*Fl.*: March-May; *Fr.*: May-June.

*Distr.*: A. & N. Islands.

2. ***Helicteres isora*** Linn., Sp. Pl. 963. 1753; Masters in Hook. f., Fl. Brit. Ind. 1: 365. 1874.

Large shrubs or small trees. Leaves oblong, obovate or orbicular, 5-10 x 4-8 cm, irregularly toothed, often triangular towards apex, oblique

and cordate or rounded at the base, shortly acuminate; petiole 3-8 mm long, tomentose; stipules linear, 3-7 mm long, tomentose. Inflorescences 2-6 flowered, axillary cyme. Flowers 3-3.5 cm long; bracts linear, 3-5 mm long, tomentose; calyx bilabiate, 5-lobed, laterally pubescent; petals 5, red in colour, unequal, 2-3.5 cm long, upper 3 longer and narrower than the lower 2, claw auriculate; stamens 15, exerted, 3-4 cm long; anthers ovate, arranged in a ring around ovary; ovary ovoid or conical, 5-grooved, tomentose; style curved, 5-grooved, tomentose; style curved, 5-grooved at the base. Fruit cylindrical, 4-6 x 0.3-0.7 cm. Seeds angular.

*Fl.*: July-Dec.

### 5. *Heritiera* Aiton

Trees with buttresses; branches lepidote. Leaves alternate, unifoliolate or digitate, chartaceous or coriaceous, adpressed fimbriate scaly beneath, pseudopeltate; petioles thickened at both ends. Flowers unisexual, in axillary panicles; peduncles and branches adpressed lepidote; pedicels articulate; calyx campanulate or urceolate, 4-6 toothed, stellate pubescent; petals absent; male flowers with 8-10 anther locules clustered, regularly or irregularly arranged in a ring at the top of the gynophore with a minute sterile ovary in the centre; androgynophore granular papillose at base; female flowers with 4 or 5 (6), sessile, laterally compressed conglutinate, almost free ovaries encircled by sterile anthers at base; style short, spreading or incurved with minute stigmas. Samaras with an ellipsoid or globose nut, woody epicarp winged or keeled.

About 31 species in tropical Asia from India through Myanmar, Thailand, Vietnam to Malesia, tropical Australia, Pacific regions and Africa; 1 in A. and N. Islands.

*Heritiera littoralis* Dryand. in Ait. Hort. Kew 3: 546. 1789; Masters in Hook. f., Fl. Brit. Ind. 1: 363. 1874; Parkinson, For. Fl. Andaman Islands 102. 1923.

Trees, upto 20 m high, buttressed. Leaves elliptic to oblong, acute or acuminate at apex, obliquely cordate at base, upper surface green, lower surface pale, covered with fimbriate scales. Flowers axillary, in much branched small panicles, golden yellow, tinged with red inside, stellate pubescent, unisexual; calyx connate, 4-6 toothed; androgynophore white,

ringed by the anther lobes; female flowers with sterile anthers at the base of the ovary. Fruits ellipsoid, woody, smooth, shining brown, inside densely short hairy, outside with a short radder-like apical crest.

*Fl.*: Nov.-Jan.; *Fr.*: Feb.-June.

A littoral tree conspicuous with its huge buttresses.

### 6. *Leptonychia* Turcz.

Shrubs or treelets. Leaves simple, alternate, entire, glabrous, petiolate, stipulate. Flowers bisexual, axillary cymes, shortly pedicelled, bracteate; sepals 5, velvet in bud, stellate hairy outside, velvety inside; petals 5, imbricate in bud, orbicular, concave, densely villous; stamens 10; staminal tube short, embracing the base of the ovary; filaments 3-seriate, outer series of 10-15 ligulate staminodes, middle of 10 fertile stamens, inner- most 5 very short fleshy staminodes; anthers linear-oblong, introrse, dehiscent longitudinally at the sides; ovary sessile, obscurely obovoid, verrucose, densely downy, 2-3 loculed or unilocular by abortion, locules 1-seeded. Seeds black with orange coloured fleshy aril.

About 45 species mostly in tropical Africa and a few in South East Asia; 1 in A. & N. Islands.

*Leptonychia caudata* (Wall. ex G. Don) Burret Notizblatt Bot. Gart. Berlin-Dahlem 9: 729. 1926. *Grewia caudata* Wall. [Cat. (1829) no. 1099, nomen] ex G. Don, Gen. Hist. Dichl. Pl. 1: 547. 1831. *Leptonychia heteroclita* (Roxb. ex G. Don) Kurz, J. As. Soc. Beng. 39, 2: 67. 1870. *L. glabra* Turcz. Bull. Soc. Imp. Nat. Moscou 31: 223. 1838; Parkinson, For. Fl. Andaman Islands 103. 1923. *L. acuminata* Masters in Hook. f., Fl. Brit. Ind. 1: 379. 1874.

Shrubs or treelets, 6 to 11 m high. Leaves ovate or obovate to ovate or obovate-lanceolate, 4.5-20 x 1.5-7 cm, base acuminate to cuneate to obtuse, margin obscurely undulate, apex acute to caudate, glabrous; stipules lanceolate, broadly sessile, apex acute, outside velutinous, inside glabrous; petioles pulvinate in upper half. Cymes axillary, solitary, 1-7 flowered; bracts ovate to triangular-oblong, 1.2-3.0 x 0.5-1 mm; sepals 5, ovate to oblong, shortly connate at base, 4-9 x 1-2.5 mm; petals 5, shortly clawed, 1.0-2.25 x 0.8-2.0 mm; outer staminodes 2-5 together; stamens

10; anthers ovoid to sagittiform; inner staminodes 5, apex triangular; ovary 2-5 locular,  $\pm$  globose, 0.7-1.8 mm in diam.; stigma indistinctly 2-3 lobed. Capsule 2-5 valvate, shortly acuminate, 10-22 x 10-18 mm diameter. Seeds 1-3 per fruit, ellipsoid to obovoid, shining black.

### 7. *Melochia* L.

Herbs, shrubs or trees, more or less pubescent. Leaves simple, alternate, serrate, petiolate. Flowers small in axillary or terminal clusters or umbellate corymbs; sepals 5, connate at base, tube cup-shaped or funnel-shaped with 2 fine teeth; petals 5, free, spathulate, marcescent; stamens 5; filaments connate forming a spindle-shaped staminal cup or tube; anthers extrorse; staminodes absent; ovary sessile, 5-loculed, ovules 2 in each locule; styles 5, free or connate at base. Capsules globose or subglobose, loculicidally 5-valved. Seeds 1 in each locule, brown or black.

About 60 species in tropics of both hemispheres; 1 in A. & N. Islands.

*Melochia umbellata* (Houtt.) Stapf. in Kew Bull. 317. 1913. *Visenia umbellata* Houtt., Handl. 8: 309, t. 46, f. 3. 1777. *Melochia velutina* Wall. ex Bedd. For. Man. Bot. 35, Anal. Gen. t. 53. 1871; Masters in Hook. f., Fl. Brit. Ind. 1: 374. 1874.

Shrubs or trees. Leaves 10-12 x 7-9 cm, cordate, suborbicular, serrate, apex 6-8 mm long. Panicles many flowered, lax, terminal and axillary. Flowers 6 cm across; calyx 5-lobed, campanulate, deltoid-ovoid; petals 5, oblong, spathulate, macrescent; stamens 5, opposite the petals, connate below into a tube; anthers extrorse, 2-lobed, lobes parallel; filaments flat; ovary sessile, 5-celled, 2-ovuled; styles 5, opposite the petals; Capsule 10-14 mm long, 5-lobed, bristly. Seeds winged, black.

Fl.: Nov.-March.

### 8. *Pterocymbium* R.Br.

Trees. Leaves simple; stipules lateral, subulate, caducous. Flowers in large branched panicles, polygamo-monoecious; calyx 5-lobed, divided nearly to the middle, turbinate; petals absent; male flowers with stamens on a staminal column; anthers 10 or 8 in a single whorl, annulately coherent, covering the abortive ovaries; female flowers with carpels 3-6,

free. Follicles 1-6, stipitate, membranous, dehiscing long before maturity. Seed 1, basal.

About 5 species in South East Asia, New Guinea to Fiji Islands; 1 in A. & N. Islands.

**Pterocymbium tinctorium** (Blanco) Merrill in Govt. Lab. Publ. Philip. 27: 24. 1905 & Enum. 3: 57. 1923. *Heritiera tinctoria* Blanco, Fl. Filip. 653. 1837. *Sterculia campanulata* Wall. ex Masters in Hook. f., Fl. Brit. Ind. 1: 362. 1874. excl. syn. *Pterocymbium javanicum* Br.; Parkinson. For. Fl. Andaman Islands 100. 1923.

Trees. Leaves cordate, ovate, 10-12 x 8-10 cm, glabrous above, pubescent beneath; petiole as long as the lamina; stipules subulate, caducous, 5-nerved. Panicles terminal, ascending; calyx turbinate, campanulate, divided half way down, coriaceous, lobes lanceolate; petals absent; staminal column pubescent below; stamens 10; anthers 2-celled; ovaries 5, sessile; styles short, connate at the base, coherent; stigmas as many as the carpels, free, filiform, recurved; ovules 2, collateral, erect. Follicles 5-6 or fewer by abortion, 10-15 cm long, stipitate, glabrous. Seeds spherical, solitary, wrinkled.

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

### 9. *Pterospermum* Schreb. *nom. cons.*

Trees or shrubs. Leaves simple or lobed coriaceous, oblong, oblong-lanceolate or obovate, rounded, cordate, entire or serrate; petioles long or short; stipules pinnate to palmately lacinate or absent. Flowers bisexual, regular, 1-3 in axillary and terminal peduncles; sepals 5, deciduous; Petals 5, deciduous with the calyx; staminal column adnate to gynophore; fertile stamens 15 in 5 groups of 3 between the staminodes and opposite sepals; anthers linear erect, apiculate; ovary inserted on the top of the staminal column, 5-locular; ovules many; styles entire with furrowed stigmas. Capsules woody or coriaceous, terete or angled, loculicidally 5-valved. Seeds winged above.

About 40 species in E. Himalayas, S.E. Asia and W. Malesia; 1 in A. and N. Islands.

***Pterospermum acerifolium*** (Linn.) Willd., Sp. Pl. 3: 729. 1801; Masters in Hook.f., Fl. Brit. Ind. 1: 368. 1874. *Pentapetes acerifolia* Linn., Sp. Pl. 698. 1753. *Pterospermum aceroides* Wall. Cat. n. 1171; Parkinson, For. Fl. Andaman Islands 102. 1923.

A large tree, up to 30 m high. Leaves oblong, broadly obovate to ovate, orbicular or rectangular, 10-40 x 8-35 cm, cordate, often peltate, margin wavy to distantly coarse toothed or irregularly lobed, silvery to rusty beneath, glabrescent and dark green above; petiole 5-15 cm long, densely tomentose at the base; stipules pinnatifid, caducous. Flowers mostly solitary, 10-15 cm across, white, fragrant; sepals 5, united at the base into a short tube, 8-12 x 1 cm, obtuse, rusty pubescent outside, thick, reflexed, deciduous; petals 5, linear-oblong or obovate, 6-12 x 1 cm, reflexed, obtuse. Stamens 5-9 cm long, staminodes equalling the petals; anthers 1-1.5 cm long. Carpels 5; ovary oblong, pentagonal, 5-loculed, densely rusty tomentose. Capsule 5-10 cm long, 5-valved, rusty brown-glabrescent. Seeds compressed obliquely oval, wings brown, membranous.

*Fl.*: Nov.-Jan.

*Fr.*: March-June.

#### 10. *Pterygota* Schott. & Endl.

Trees. Leaves entire or irregularly lobed. Flowers unisexual to polygamous in panicles in the axils of fallen leaves; calyx deeply 5-partite; corolla absent; staminal column cylindric, bearing 4-5 groups of about 5 anthers in each male flower; ovaries 5, sessile; ovules many; style short; stigma 2-lobed. Follicles 5, hard woody. Seeds many winged at apex.

About 5 species in India, Sri Lanka, Myanmar, Malesia, S. China, New Guinea, Tropical Africa and Madagascar; 1 in A. and N. Islands.

***Pterygota alata*** (Roxb.) R.Br. in Benn., Pl. Jav. Rar. 234. 1844. *Sterculia alata* Roxb., Pl. Coast Coromandal 3: 48. t. 287. 1820; Masters in Hook.f., Fl. Brit. Ind. 1: 360. 1874; Parkinson, For. Fl. Andaman Islands. 99. 1923.

A tall tree, young parts with ferruginous pubescence. Leaves broadly ovate-cordate, 10-25 x 7-15 cm, undulate, glabrous, acute or shortly

acuminate, crowded towards the ends of branches. Raceme small, few flowered. Flowers unisexual and bisexual, 1.0-1.5 cm across; sepals 5, linear-lanceolate or elliptic, 1.2-1.5 x 0.3-0.4 cm. densely ferruginous pubescent outside; petals absent; anthers in male flowers united into 1-2 mm broad head on 4-6 mm long staminal column; in bisexual flowers sessile anthers are arranged in clusters of 4 or 5 in the sinuses formed by the carpels; carpels 5; ovary sessile, 2-3 mm long, pubescent; style recurved. Follicles large, woody, 7-12 cm in diameter, obliquely globose. Seeds oblong, compressed, winged.

*Fl.*: Feb.-March; *Fr.*: May-June.

### 11. *Sterculia* L.

Trees. Leaves simple, digitate or palmately lobed, elliptic-lanceolate, oblong or obovate, tapering, acute, rounded, subcordate or cordate at base, acute, acuminate at apex; stipules often caducous. Flowers unisexual, in axillary to terminal, erect or drooping panicles or racemes; calyx 5-lobed, usually stellate hairy outside, densely so inside; corolla absent; stamens 10-30, monadelphous; ovaries on long or short gynophore bearing sterile anthers in 5 groups at the base of ovary in female flowers; styles long, connate; stigmas as many as carpels. Fruit coriaceous or woody follicles, 1-many seeded. Seeds sometimes arillate.

About 300 species in tropics of both the hemispheres, predominantly in tropical Asia; 5 in A. & N. Islands.

- 1 a. Leaves simple, not lobed.....2
- b. Leaves palmately lobed.....5. *S. villosa*
- 2 a. Calyx lobes broad, spreading .....3
- b. Calyx lobes narrow incurved, frequently coherent at the tips, gaping at the sides.....4
- 3 a. Leaves ovate, apex acute, base rounded to cordate.....1. *S. guttata*
- b. Leaves broadly ovate-orbicular (obovate) ovate, apex obtusely or rather acutely acuminate, base fairly deeply cordate.....2. *S. macrophylla*
- 4 a. Calyx widely campanulate .....4. *S. rubiginosa* var. *glabrescens*
- b. Calyx globular.....3. *S. parviflora*

1. ***Sterculia guttata*** Roxb., Hort. Beng. 50, 1814 & ex DC., Prodr. 1: 482. 1824; Masters in Hook. f., Fl. Brit. Ind. 355. 1874.

Young twigs rusty-tomentose. Leaves simple *ca.* 25 x 12 cm, ovate, entire, acute at apex, rounded to cordate at base, palmately 3-5 nerved, softly tomentose beneath. Panicles terminal; calyx 5-lobed; lobes acute, reflexed, rusty pubescent beneath, pubescent within; petals absent, androphore elongate; staminal column glabrous-recurved; anthers 10; staminodes absent; pistils 3-6, often coherent. Follicles 5 cm long, obovoid, rugose, with brownish hairs. Seeds many, arillate, on short, stout funicles with spreading bristles.

*Fl.*: May-July; *Fr.*: Aug.-Sept.

2. ***Sterculia macrophylla*** Vent. Jard. Malm. 2. n. 91. 1805; Masters in Hook. f., Fl. Brit. Ind. 1: 356. 1874.

Large tree. Leaves simple, entire, 9-32 x 8-27 cm, broadly oval-orbicular-(obovate)-ovate, obtusely or rather acutely acuminate, palmately nerved, base fairly deeply cordate, opaque above, moderately to rather densely covered with stellate hairs; petioles 3-12 cm long. Panicles deflexed, much branched, hispid; calyx 5-lobed, inside with sugar secreting hairs, 5-6 mm long, lobes short, acute; petals absent; carpels 5; style short, thick; stigma 5-lobed. Follicles 1-5, 3.0-5.5 cm long, 1-2 seeded.

*Fl.*: May-Oct.

3. ***Sterculia parviflora*** Roxb. (Hort. Beng. 50. 1814) Fl. Ind. 3: 147. 1832; Masters in Hook. f., Fl. Brit. Ind. 1: 356. 1874; Parkinson, For. Fl. Andaman Islands 100. 1923.

Tree. Leaves 12-20 x 5-10 cm, oblong to elliptic, glabrous, apex blunt, base rounded; petiole *ca.* 5 cm long, thickened at the top. Racemes axillary. Flowers small, yellowish brown; calyx globular. Follicles 5 cm long, coriaceous.

*Fl.*: Jan.-Feb.

4. ***Sterculia rubiginosa*** Vent. Jard. Malm. 2. n. 91. 1805; Parkinson, For. Fl. Andaman Islands. 100. 1923. var. *glabroescens*.

Tree. Leaves 15-30 x 5-10 cm, elliptic to ovate or obovate, acuminate, somewhat narrowed to the rounded base, glabrous above, pubescent beneath; petiole 2.5-5 cm long, thickened at top. Flowers reddish brown in rufus-tomentose lax panicles; calyx campanulate; lobes lanceolate. Follicles 5 cm long, coriaceous, pubescent outside, glabrous within.

*Fl.*: Dec.-Feb.; *Fr.*: Mar.-May.

*Distrib.*: Endemic to Andaman Islands.

5. *Sterculia villosa* Roxb. (Hort. Beng. 50. 1814, *nom. nud.*) Fl. Ind. ed. Carey 3: 153. 1832; Masters in Hook. f., Fl. Brit. Ind. 1: 355. 1874; Parkinson, For. Fl. Andaman Islands. 101. 1923.

A medium sized tree. Leaves palmately 5-7 lobed, 20-40 cm long, glabrescent above, tomentose below, cordate at base, lobes somewhat oblong or obovate, entire or 3 fid, acuminate-cuspidate; petioles 25-40 cm long. Panicles 15-30 cm long, rusty pubescent, pendulous. Flowers unisexual; bracteole filiform, caducous; calyx 5-partite, campanulate, 6-10 x 10-15 mm, yellow with pinkish throat; lobes lanceolate; staminal column 4-5 mm long, recurved, glabrous; anthers 10; carpels 5; ovary globose, strigose, 5-loculed, many ovuled; gynophore 2-3 mm long; style recurved. Follicles 5, sessile, 4-6 cm long, coriaceous, rusty pubescent. Many seeded, red when ripe. Seeds oblong, smooth, black.

*Fl.*: Jan.-Feb.; *Fr.*: Mar.-Apr.

### TILIACEAE

About 50 genera and over 450 species in the tropical and temperate regions; 5 genera and 11 species in A. and N. Islands.

- |   |                                   |                      |
|---|-----------------------------------|----------------------|
| 1 | a. Fruit a drupe .....            | 3. <i>Grewia</i>     |
|   | b. Fruit a capsule .....          | 2                    |
| 2 | a. Capsule echinate .....         | 5. <i>Triumfetta</i> |
|   | b. Capsule not echinate .....     | 3                    |
| 3 | a. Capsule cocci winged .....     | 1. <i>Berrya</i>     |
|   | b. Capsule cocci not winged ..... | 4                    |

- 4 a. Leaves palmately nerved; capsules orbicular-reniform; seeds pilose .....  
 .....4. *Trichospermum*
- b. Leaves pinnately nerved; capsules pyriform; seeds not pilose .....  
 .....2. *Brownlowia*

### 1. *Berrya* Roxb.

Trees. Leaves alternate, cordate, 5-7 nerved. Inflorescences axillary or terminal panicles, leafy at base; calyx 3-5 lobed, campanulate; petals 5; stamens numerous; ovary 3-4 lobed; style subulate; stigma lobed. Capsule with persistent calyx. Seeds 1-2 in each locule, endosperm fleshy.

About 8 species in Indo-Malaya, Philippine islands and Tahiti; 1 in A. and N. Islands.

*Berrya cordifolia* (Willd.) Burret in Notizbl. Bot. Gart. Berlin-Dahlem 9: 606. 1926. *Espera cordifolia* Willd. in Ges. Naturf. Freunde Berlin New Schriften 3: 450. 1801. *Berrya ammonilla* Roxb. [Hort. Beng. 42. 1814, *nom. nud.*] Pl. Corom. 3: 60, t. 264. 1819 et Fl. Ind. 1: 639. 1832; Masters in Fl. Brit. India 1: 383. 1874; Parkinson, For. Fl. Andaman Islands. 103. 1923.

Trees, up to 30 m high. Leaves simple, ovate-oblong, 10-20 x 3-12 cm, apex acuminate, cordate at base, undulate, stellate-pubescent when young, glabrous when mature; petioles 3-5 cm long; stipules linear-setaceous, 1-1.5 cm long, caducous. Flowers numerous, lax; pedicels pubescent; calyx 3-5 lobed, lobes 3-5 mm long, obtuse, pubescent; petals 5, 6-8 mm long, white or pink, oblong, obtuse; stamens inserted on a short receptacle; filaments 4-5 mm long; anthers didymous; ovary 3 (-4)-loculed; locules 4-ovuled; style ca 2.5 mm long; stigma peltate, 3-lobed. Capsules with persistent calyx, globose, 1-1.3 cm in diameter, with 6-8 wings, wings horizontal spreading blunt, stellate pubescent. Seeds 1-4 in each locule, 6 x 3 mm, clothed with brown to yellow bristles.

*Fl.*: March-April; *Fr.*: Sept.-Nov.

### 2. *Brownlowia* Roxb. *nom. cons.*

Trees, covered with lepidote or stellate hairs. Leaves alternate, pinnate; stipules sometimes large, foliaceous. Flowers in terminal panicles

or in axils of upper leaves; calyx 3-5 fid, campanulate; petals 5; stamens numerous; anthers subglobose; staminodes 5, within stamens opposite petals, linear; ovary 5-loculed; locules 2-ovuled; carpels 2-valved, 1-seeded. Seeds non-endospermous.

About 30 species in S.E. Asia through Malaysia and the Philippine Islands to New Guinea and the East Pacific Islands; 1 in A. & N. Islands.

**Brownlowia tersa** (Linn.) Kosterm. in Council Sci. Indonesia Bull. 1: 73. 1959 et in Reinw. 4: 536. 1959. *Glabrawia tersa* Linn. Mant. 2: 276. 1771. *Brownlowia lanceolata* Benth, in Journ. Linn. Soc. 5, Suppl. 2: 57. 1861; Parkinson, For. Fl. Andaman Islands. 105. 1923.

Shrubs, 2-3 m high. Leaves lanceolate, 12-15 x 3-4.5 cm, apex acuminate, rounded at base, entire, dark green and glossy above, densely dull silvery scaly beneath; petioles up to 8 mm long. Flowers in axillary or terminal cymes; calyx 4-5 lobed, campanulate, connate below; lobes ca 3 mm long, acute, lepidote; petals 5, white, free, narrowly obovate, ca 5 mm long; stamens many, alternating with 5 petaloid staminodes opposite the petals; staminodes linear-lanceolate; anthers didymous; ovary 4-lobed; locules 2-ovuled; style simple; stigma 4-lobed, capsules pyriform, ca 1.5 cm long, woody with a line separating the 2-valved carpels, brownish, scaly.

*Fl.*: May-June; *Fr.*: Aug.-Sept.

Rarely distributed along the creeks in the back mangrove areas of tidal forests. It often grows along the banks and almost submerged during the high tides.

### 3. *Grewia* L.

Small trees, shrubs or climbers with stellate hairs. Leaves alternate, petiolate, stipulate, entire or serrate, rarely lobed, coriaceous. Inflorescences axillary or leaf opposed, solitary or clustered, pedunculate, umbellate cymes or panicles. Flowers bisexual, pedicellate, yellow, orange, pink or white, pentamerous, bracteate; sepals 5, free, usually coloured, mostly glabrous within; petals 5, rarely absent, free, clawed, claw pitted or glandular inside; stamens numerous, free, inserted on the more or less elevated torus or androphore; anthers dorsifixed, dorsally curved, dehiscent

longitudinally; ovary superior, 2-4 loculed, each locule with 2 or more superposed ovules; style subulate; stigma 2-4 lobed, containing 1-4 pyrenes, each stone 1 or 2 seeded, seeds suberect or horizontal, endospermous.

About 150 species in the tropics and subtropics, rare in temperate regions; 6 in A. & N. Islands.

- 1 a. Flowers solitary .....4. *G. indandamanica*  
 b. Flowers many in panicles or cymes .....2
  - 2 a. Inflorescences paniculate, terminal and/or axillary .....3  
 b. Inflorescences cymose, axillary or leaf opposed .....4
  - 3 a. Leaves subentire or serrulate; petals white or yellow; drupes globose, 8-10 mm in diameter, purple .....5. *G. nervosa*  
 b. Leaves entire; petals pink; drupes obovoid, 1.3-2.3 cm in diameter, orange yellow .....2. *G. calophylla*
  - 4 a. Leaves glabrous or glabrescent .....5  
 b. Leaves scabrid on both surfaces, sometimes harshly tomentose beneath .....3. *G. heterotricha*
  - 5 a. Leaves crenate-serrate; drupes 4-lobed .....1. *G. acuminata*  
 b. Leaves sharply serrate; drupes 2-lobed .....6. *G. serrulata*
1. *Grewia acuminata* A.L. Juss. in Ann. Mus. Natl. Hist. Nat. 4: 91. t. 48. 1804. *G. scabrida* Wallich ex Kurz in J. Asiat. Soc. Beng. 42: 63. 1873; Masters in Fl. Brit. India 1: 389. 1874.

Climbing shrubs. Leaves elliptic, elliptic-oblong or ovate-lanceolate, 10-15 x 5-7 cm, apex acuminate, rounded at base, crenate-serrate, glabrescent. Flowers in axillary cymes; peduncles 1-2.5 cm long; pedicels 5-10 mm long; sepals oblong-lanceolate, pilose; petals white or yellow, entire or erose; receptacle angular, sulcate, villous; androgynophore ca 4 mm long, tomentose; stamens many; filaments glabrous; ovary globose, ca 2.5 mm in diameter, pilose; stigma bilobed. Drupes subglobose, ca 1.5 cm in diameter, 4-lobed, glabrescent.

*Fl.*: May-Sept.; *Fr.*: Aug.-Dec.

2. *Grewia calophylla* Kurz ex Masters in Fl. Brit. India 1: 392. 1874; Parkinson, For. Fl. Andaman Islands. 104. 1923.

Trees, 6-10 m high. Leaves ovate-lanceolate, ovate-elliptic or oblong-elliptic, 12-18 x 3-8 cm, apex acuminate, rounded or subacute at base, entire, coriaceous, glabrous. Flowers in terminal panicles; pedicels up to 1.2 cm long; sepals linear-oblong or linear-spathulate; petals pink, linear-oblong; androgynophore *ca* 1.2 mm long, glabrous in lower, tomentose in upper; stamens many; filaments glabrous; ovary subglobose; *ca* 2 mm in diameter, puberulous; stigma bilobed. Drupes obovoid, tapering at base, glabrous, orange-yellow.

*Fl.*: April-July; *Fr.*: Aug.-Dec.

3. *Grewia heterotricha* Masters in Fl. Brit. India 1: 389. 1874. *G. umbellata* auct. non Roxb. 1832; Masters in Fl. Brit. India 1: 385. 1874, p.p.

Scandent shrubs. Leaves elliptic, elliptic-ovate, elliptic-oblong, ovate-lanceolate or ovate-oblong, 5-12 x 2-7 cm, apex acute-acuminate, obtuse or rounded at base, crenate-serrate, scabrid on both surfaces. Flowers in axillary or leaf-opposed, umbellate cymes; peduncles 2.5-10 cm long; pedicels 1-2.5 cm long sepals linear-oblong, densely pubescent; petals white, oblong-lanceolate; receptacle villous; androgynophore up to 1.2 cm long; ovary subglobose, *ca* 1.5 mm in diameter, pilose; stigma obscurely 4-5 lobed. Drupes 4-lobed, 1-2 cm in diameter, fleshy, glabrescent.

*Fl.*: April-Jan.; *Fr.*: Dec.-March.

4. *Grewia indandamanica* J.L. Ellis & L.N. Ray in Candollea 46: 341, f. 1. 1991.

Shrubs or undershrubs. Leaves ovate-elliptic, up to 7 x 2.8 cm, apex acuminate, rounded or cordate at base, crenate-serrate, chartaceous to slightly coriaceous; stipules *ca* 1 mm long. Flowers axillary, solitary; peduncles up to 1 cm long, jointed in the middle and slightly thickened; pedicels up to 9 mm long, sparsely puberulous; sepals linear-ovate, spatulate, cucullate, puberulous outside, glabrous inside; petals ovate-oblong, entire, glabrous outside; receptacle *ca* 2 mm long, glabrous in lower, stellate pubescent in upper; stamens numerous; filaments filiform,

glabrous; anthers innate, reniform; ovary globose, densely pubescent, 4-loculed with 1 ovule in each; style slender, 4-angled. Drupes globose or slightly flattened or angled, *ca* 1 cm in diameter, wrinkled, sparsely hairy. Seed 1 in each locule, glabrous.

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

5. ***Grewia nervosa*** (Lour.) Panigr. in Taxon 34: 702. 1985. *Fallopia nervosa* Lour. Fl. Cochinch. 336. 1790. *Grewia microcos* L., Syst. Nat. ed. 12, 2: 602. 1767, nom. illeg.; Masters in Fl. Brit. India 1: 392. 1872; Parkinson, For. Fl. Andaman Islands. 105. 1923.

Small trees or shrubs. Leaves elliptic-oblong, lanceolate or ovate-lanceolate, 9-20 x 4-10 cm, apex acute or acuminate, rounded or cordate at base, subentire or serrulate, glabrous or pubescent beneath. Flowers in axillary or terminal panicles; pedicels *ca* 1 mm long; sepals oblong-obovate, tomentose; petals white or yellow, ovate, acute, pubescent at base; receptacle *ca* 1 mm long, ciliate at apex; stamens many; filaments hairy at base; ovary globose, *ca* 1 mm in diameter, glabrous; stigma 2-fid. Drupes globose or subglobose, 8-10 mm in diameter, glabrous, wrinkled.

*Fl.*: March-Dec.; *Fr.*: June-March.

6. ***Grewia serrulata*** DC., Prodr. 1: 510. 1824; *G. laevigata* auct. non Vahl 1790; Masters in Fl. Brit. India 1: 381. 1874; Parkinson, For. Fl. Andaman Islands. 104. 1923.

Trees or shrubs. Leaves lanceolate, ovate-lanceolate, elliptic-ovate or obovate, 1-15 x 1.5-5 cm, apex acute or acuminate, rounded or narrowed at base, sharply serrate, glabrous or glabrescent. Flowers in axillary, umbellate cymes; peduncles 1-2 together, 1.5-2.5 cm long; pedicels up to 2.5 cm long; sepals oblong or lanceolate, tomentose; petals greenish white, ovate or obovate, usually notched; receptacle 2-3 mm long, pubescent in upper half; stamens numerous; filaments glabrous; ovary ovoid, 1.5 mm in diameter, pilose; stigma 5-lobed; lobes laciniate. Drupes globose, 2-lobed, 5-15 mm in diameter, glabrous.

*Fl.*: April-Dec.; *Fr.*: June-March.

#### 4. *Trichospermum* Bl.

Trees, stellate hairy. Leaves simple, alternate, crenate-serrate; stipules caducous. Flowers in axillary and terminal 2- or 3-chotomous cymes, bisexual and unisexual; pedicels involucrate with small bracts; sepals 5, free; petals 5, free; stamens numerous, free, on a crenate disc; anthers suborbicular or oblong, versatile; ovary 1-2-loculed, pilose, ovules 2-seriate, many in each locule. Capsules acute or mucronate at tip, dehiscing longitudinally. Seeds oblong, densely pilose on margins.

About 25 species in tropical America and Asia; 1 in A. & N. Islands.

*Trichospermum javanicum* Blume, Bijdr. 57. 1825. *Colona javanica* auct. non (Blume) Burnett 1926; Balakr. & M.K.V. Rao in Jain & R.R. Rao, Assessm. Threat. Pl. India 200. 1983.

Trees, up to 20 m high. Leaves ovate to ovate-oblong, 5-20 x 2.5-10 cm, apex acute, rounded at base, glabrescent above, sparsely and minutely stellate-puberulous beneath; petioles 1-2.5 cm long. Flowers in axillary, many flowered cymes; peduncles 1-7.5 cm long; pedicels up to 1 cm long; sepals oblong, 1-1.5 cm long, stellate-pubescent on both surfaces; petals pale-green, ca 1 cm long, oblong-spathulate, pubescent on both surfaces; ovary globose, hairy. Capsules orbicular-reniform, 1-2 x 2.5-3 cm, glabrescent. Seeds oblong, pilose.

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

#### 5. *Triumfetta* L.

Shrubs, undershrubs or herbs. Leaves simple, alternate, petiolate, entire or 3-5 lobed, serrate; stipules persistent, rarely fugaceous. Inflorescence axillary or leaf-opposed, dense fascicles of 3-flowered dichasia; flowers bisexual or female, 5-merous, pedicellate; sepals free, 5, hooded valvate; petals 5, free, rarely absent; stamens many or rarely twice as many as sepals, free, inserted above 5-angular receptacle; anther dehiscing lengthwise; carpels 2-5, syncarpous; ovary with uncinata hairs, 2-5 loculed; locules 2-ovuled; style filiform; stigma 2-5 lobed. Capsules indehiscent or separating into cocci, echinate setose, 2-5 loculed; locules 1 or 2-seeded. Seeds ovoid to obovoid.

About 160 species in tropical and subtropical regions of the world; 2 in A. & N. Islands.

- 1 a. Herbs ..... 1. *T. annua*  
 b. Woody creepers ..... 2. *T. repens*

1. **Triumfetta annua** Linn., Mant. Pl. 73. 1767; Masters in Fl. Brit. India 1: 396. 1874.

Erect herbs, up to 1 m high. Leaves ovate-lanceolate, 5-10 x 2-5 cm, apex acute to acuminate, cuneate at base, irregularly serrate, sparsely hairy on both surfaces; stipules subulate, ca 5 mm long, hairy. Flowers in 3-flowered, leaf-opposed pedunculate cymes, ca 8 mm in diameter; pedicels ca 2 mm long; sepals lorate, ca 4 mm long, cucullate, awned; petals orange, spatulate, obtuse, as long as sepals; stamens 10; carpels 4; ovary globose, 4-loculed; style as long as stamens; stigma 4-lobed. Capsules globose, 5-8 mm in diameter, glabrous, covered with uncinat spines.

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

2. **Triumfetta repens** (Blume) Merr. & Rolfe in Philipp. J. Sci. 3: 111. 1908; Dagar & T. Chakrab. in Ind. J. For. 10: 68. 1987. *Porpa repens* Blume, Bijdr. 118. 1825.

Woody creepers. Leaves elliptic to ovate-orbicular, apex rounded-obtuse, broadly rounded to acute at base, shallowly dentate-serrate; larger leaves 3-5 lobed. Flowers in 2-3-flowered, leaf-opposed cymes; peduncles 5-10 mm long, stellate hairy; pedicels stellate hairy; sepals linear, 8-10 mm long; petals yellow, 6-7 mm long, spatulate-oblongate; stamens many; ovary ca 1.5 mm in diameter; style filiform, ca 7 mm long, 3-4 fid. Capsules 1-1.5 cm in diameter, globose, densely echinate, 3-4 loculed, black or dark brown.

*Fl.*: April-May; *Fr.*: Oct.-Nov.

## ELAEOCARPACEAE

About 9 genera and 400 species in tropics and subtropics of the world; 1 genus and 8 species in A. & N. Islands.

**Elaeocarpus L.**

Large to medium sized trees. Leaves alternate, often crowded at ends of branchlets, entire or crenate-serrate. Flowers in few to many-flowered racemes, pediceiled; sepals usually 5, rarely 4 or 6, valvate, inserted on annular disc, deciduous; petals 5, rarely 4 or 6, valvate fimbriate or toothed with 10-60 more or less linear divisions; stamens many, filament long or short, anthers innate, linear or oblong, comose, awned or not; disc flat, cushion-shaped, thickened, often pitted, glabrous or villous, often 5-lobed; ovary superior, sessile, 2-5 locular, rarely 1-locular or more; ovules pendulous; styles long or short, subulate; stigma entire. Drupes with a woody, rugose or tubercled pyrene; pyrenes 1-5, or rarely more-loculed, locules usually 1-seeded.

About 200 species in Asia, Australia and Pacific regions; 8 species in A. & N. Islands.

- 1 a. Anthers awned .....2
- b. Anthers not awned.....6
- 2 a. Petals broader towards base, narrowed towards apex..... 5. *E. petiolatus*
- b. Petals narrowed towards base, broader toward apex.....3
- 3 a. Awns shorter than anthers.....6. *E. rugosus*
- b. Awns as long as or longer than anthers.....4
- 4 a. Leaves 24-40 cm long, pyrenes compressed, strongly rugose ..... 1. *E. aristatus*
- b. Leaves up to 20 cm long; pyrenes terete, tubercled.....5
- 5 a. Petioles and midrib glabrous; pedicels glabrous or puberulous, straight..... 4. *E. macrocerus*
- b. Petioles and midrib rufous hairy; pedicels softly tomentose, recurved..... 8. *E. tuberculatus*
- 6 a. Anthers bearded with tufts of hairs at apex .....7
- b. Anthers not bearded at apx .....7. *E. tectorius*
- 7 a. Leaves pustulate when dry; flower buds ellipsoid; pyrenes faintly rugose..... 2. *E. floribundus*
- b. Leaves not pustulate when dry; flower buds broadly ovoid or oblong-ovoid; pyrenes strongly rugose..... 3. *E. helferi*

1. ***Elaeocarpus aristatus*** Roxb., [Hort. Beng. 43: 1814, *nom nud.*] Fl. Ind. 2: 599. 1832; Masters in Hook. f. Fl. Brit. India 1: 405. 1874.

Trees, 15-30 m high. Leaves simple, alternate, obovate, elliptic or oblanceolate, 20-40 x 6-10 cm, apex rounded or subacute, cuneate or acute at base, margins distantly serrulate or subentire; petioles 1.5-4.5 cm long. Flowers in rusty villous racemes, 1.8-2 cm in diameter, fragrant; pedicels rusty-villous, 1-2 cm long; sepals lanceolate, narrowly triangular or oblong, ca 1.5 cm long, deciduous; petals triangular, laciniate, white, densely silky hairy outside; stamens 40-60, anthers with 4-5 mm long erect awns; ovary ovoid, 2-loculed; styles subulate, longer than anthers. Drupes 3-3.5 cm long, ellipsoid; pyrenes oblong, pointed at both ends, compressed, rugose.

*Fl.*: April-Sept.; *Fr.*: June-Oct.

2. ***E. floribundus*** Blume, Bijdr. 120. 1825; Masters in Hook. f. Fl. Brit. India 1: 401. 1874.

Trees, 15-25 m tall. Leaves simple, crowded near ends of branchlets, 5-20 x 2-8 cm, broadly ovate or elliptic-ovate, apex bluntly acute or cuneate to rarely rounded at base, margins coarsely repand-serrate; petioles 3-5 cm long. Flowers in axillary racemes, 6-7 mm in diameter; pedicels puberulous or glabrous, 8-10 mm long; sepals lanceolate, 5-7 mm long; petals obtriangular laciniate, 5-7 mm long, white; stamens 25-30, anthers bearded, not awned; ovary silky villous; 3-loculed. Drupes 2.5-4 cm long, oblong-ovoid; pyrenes narrowed at both ends, shallowly rugose, 3-grooved.

*Fl.*: March-August; *Fr.*: Oct.-Dec.

3. ***E. helferi*** Kurz ex Masters in Hook. f. Fl. Brit. India 1: 402. 1874.

Trees, 15-20 m high. Leaves simple, alternate, 5-20 x 2-6 cm, oblong-lanceolate or elliptic, apex acute to cuspidate or shortly acuminate, rounded at base, margins crenate-serrate; petioles 2-2.5 cm long. Flowers in axillary racemes 5-10 mm in diameter; pedicels puberulous, 4-6 mm long; sepals ovate-lanceolate, 2-4 mm long, acute apex, hairy; petals laciniate half way down, apex broader, cuneate at base, margins ciliate; stamens 35-45, anthers bearded at tip; ovary globose, hairy, 3-loculed. Drupes oblong-ovoid, 2-3 cm long; pyrenes oblong-ovoid, rugose.

*Fl.*: April-June; *Fr.*: Aug.-Oct.

4. **E. macrocerus** (Turcz.) Merr. in J. Arn. Arb. 32: 183. 1951. *Monocera macrocera* Turcz. in Bull. Soc. Imp. Nat. Moscou 19 (2): 494. 1846.

Trees, 10-20 m high. Leaves simple, alternate, 6-20 x 3-12 cm, obovate-oblong, oblanceolate-spathulate, apex obtuse or subacute, cuneate at base, margins distantly crenate-serrate. Flowers in axillary, corymbose racemes, 2-2.5 cm in diameter; pedicels 2-3 cm long; sepals linear-lanceolate, ovate-lanceolate or oblong, 1.5-2 cm long, greyish hairy outside, glabrous within; petals oblong-cuneate, 2-2.5 cm long, dull white, lacinate, pilose outside, canescent within; stamens 30-60; anthers with 3-4 mm long, erect awns; ovary ovoid. Pyrenes terete, unilocular 1-seeded.

*Fl.*: Feb.-March; *Fr.*: May-June.

5. **E. petiolatus** (Jack) Wallich ex Steudel, Nom. Bot. ed. 1: 545. 1840. *Monocera petiolata* Jack in Malay. Misc. 1 (5): 43. 1820.

Trees, 20-30 m high. Leaves simple, alternate, 7-20 x 4-9 cm, elliptic-lanceolate or oblong-elliptic, apex bluntly acuminate or acute, narrowed at base, margins distantly serrulate or subentire; petioles 2-6.5 cm long. Flowers in axillary racemes, ca 1.5 cm in diameter; pedicels 5-12 mm long; sepals lanceolate, 6-8 mm long, glabrous outside, puberulous and keeled inside, margins villous; petals oblong, 7-9 mm long, lacinate, white; stamens 20-30; anthers with short, reflexed awns; ovary oblong, glabrous. Drupes 1.5-2 cm long, oblong-ovoid; pyrenes rugose, unilocular, 1-seeded.

*Fl.*: Dec.-March; *Fr.*: July-Sept.

6. **E. rugosus** Roxb. (Hort. Beng. 42. 1814, *nom. nud.*) ex G. Don, Gen. Hist. 1: 559. 1831; Masters in Hook. f. Fl. Brit. India 1: 405. 1874.

Trees, 25-35 m high. Leaves simple, usually crowded at ends of branchlets, 16-35 x 7-15 cm, obovate, oblong or oblanceolate, apex bluntly apiculate, obtuse or subacute, narrowed and obtuse at base, margins distantly minute serrate or subentire; petioles 1.5-2 cm long. Flowers in axillary racemes, 1-1.5 cm in diameter; pedicels 2-2.5 cm long, tomentose; bracts leafy, 2-3 cm long, oblanceolate, serrate; sepals linear-lanceolate, 1-1.5 cm long, acuminate, buff tomentose outside; petals oblong-cuneate, 1-1.8 cm long, glabrous inside, tomentose or silky hairy outside; stamens 30-60, anthers with erect or reflexed awns; ovary oblong-ovoid, silky

villous. Drupes 3-3.5 cm long, obovoid or oblong; pyrenes compressed, strongly rugose, 1-seeded.

*Fl.*: Feb.-April; *Fr.*: July-Oct.

7. *E. tectorius* (Lour.) Poiret in Lam., *Encycl. Suppl.* 2: 704. 1812. *Craspedum tectorium* Lour., *Fl. Cochinch.* 336. 1790. *E. robustus* Roxb., (*Hort. Beng.* 42. 1814, *nom. nud.*) *Fl. Ind.* 2: 597. 1832; Masters in Hook. f. *Fl. Brit. India* 1: 402. 1874, p.p.

Trees, 15-30 m high. Leaves simple, alternate, 6-24 x 3-8 cm, elliptic-oblong to ovate-oblong, apex acute to acuminate, broadly cuneate to rounded at base, margins repand-serrate; petioles 1-5 cm long; flowers in axillary, pubescent racemes, 1-1.2 cm in diameter; pedicels 5-7 mm long, grey puberulous; sepals lanceolate or ovate, 5-6 mm long, densely villous along margins; petals cuneate-oblong, 5-7 mm long, lacinate at apex, ciliate along margins; stamens 40-50, anthers oblong, puberulous, rarely with a few bristles at apex; ovary oblong-ovoid, 3-loculed. Drupes 2-3.5 cm long, ellipsoid or oblong-ovoid; pyrenes rugose, locules 1-seeded.

*Fl.*: Mar.-June; *Fr.*: July-Oct.

8. *E. tuberculatus* Roxb. (*Hort. Beng.* 93. 1814, *nom. nud.*) *Fl. Ind.* 2: 594. 1832; Masters in Hook. f. *Fl. Brit. India* 1: 404. 1874.

Trees, 60-80 m high. Leaves simple, crowded at ends of branchlets, 6-20 x 4-12.5 cm, obovate, apex rounded to obtuse, rounded or truncate at base, margins obscurely crenate-dentate; petioles 1.5-4 cm long; flowers in axillary, rufous hairy racemes 2-2.5 cm in diameter, pedicels 1.5-2.5 cm long; sepals linear-lanceolate or oblong, 1-1.5 cm long; petals oblong-cuneate, 1.5-2 cm long; stamens 40-70; anthers with awns; ovary oblong, silky tomentose. Drupes ovoid, 2-4 cm long; pyrenes terete, tubercled.

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

## LINACEAE

Cosmopolitan, ca 12 genera and 290 species; 1 genus and 1 species in A. & N. Islands.

**Indorouchera** Hall. f. (*Roucheria* Hill.)

Trees, erect or scandent shrubs or woody climbers. Leaves entire or glandular-serrate, coriaceous; stipules minute, caducous. Flowers in axillary fascicles, or in short fascicled spikes, yellow, subtended by bracteoles; sepals 5, subequal; petals 5, hypogynous, contorted; stamens 10, alternately long and short; filaments connate into a short tube; ovary 3-5-locular; ovules 2; styles 3-5, filiform; stigmas cuneate, bilobed. Drupes subglobose, stone 3-6 angled, locules 1-2 seeded. Seeds compressed, pendulous.

About 4 species in Malaysia, Indonesia and India; 1 species in A. & N. Islands.

**Indorouchera griffithiana** (Planch.) Hall. f. in Meded. Rijksherb. Leiden No. 35: 50. 1918; Vasudeva Rao, M.K. & Chakraborty, T. in J. Econ. Tax. Bot. 5(4): 931-932. 1984. *Roucheria griffithiana* Planch. in Hook. f. J. Bot. 6: 143. 1847; Hook. f. Fl. Brit. Ind. 1: 414. 1874.

Scandent shrubs or woody climbers, entirely glabrous. Branchlets 1-2 hooked at base; hooks  $\pm$  2 cm long. Leaves lanceolate-oblong-obovate, 7-14 x 2-4.5 cm caudate-acuminate at apex, shallowly to rather coarsely serrate-dentate, thinly coriaceous, shining above; lateral nerves 7-10 pairs, slender; petioles 7-20 mm long. Inflorescences axillary, fasciculate; bracteoles triangular or deltoid. Flowers 6-12 together, sessile, fragrant; sepals broadly ovate to suborbicular, 2-3 x 1.2-2.3 mm, obtuse to acute; petals 5, narrowly oblong to spatulate-oblong, 7-8 x 2-3 mm, yellow, caducous; stamens 10, unequal, alternately longer and shorter, connate below; ovary ellipsoid-obovoid,  $\pm$  1 mm diam., trilocular; styles 3, free; stigma bilobed. Drupes ellipsoid, 7-8 x 5-6 mm orange red; pyrene 1-seeded.

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

*Distr.*: Great Nicobar Island.

**ERYTHROXYLACEAE**

About 3 genera and 250 species in tropics and subtropics of the world; 1 genus and 1 species in A. & N. Islands.

**Erythroxyllum P. Br.**

Trees or shrubs. Leaves simple, alternate, entire, distichous; stipules intrapetiolar, entirely connate, rarely bifid, often bicarinate. Flowers small, solitary or fasciculate in leaf axils or on short branches, actinomorphic, bisexual; pedicels bracteolate; calyx 5-6 lobed, free or connate at base, imbricate; petals 5-6, free, deciduous, appendaged, alternating with calyx lobes; filaments connate at base into a staminal tube, margin toothed; anthers ellipsoid, basifixed, 2-loculed, dehiscence longitudinal; ovary 1-3 loculed; ovules pendulous, 1-2 in each locule; style 3, erect, free or sometimes connate at base; stigma flattened or clavate. Fruit a drupe. Seed 1 with thin testa.

About 200 species in tropical and subtropical regions of the world, chiefly in America and Madagascar; 1 in A. & N. Islands.

**Erythroxyllum cuneatum** (Miq.) Kurz, J. As. Soc. Beng. 43, 2: 135. 1847. *Ficus cuneata* Wall. Cat. No. 4534. 1828, *nom. nud.* *Urostigma cuneatum* Miq. in Hook. Lond. J. Bot. 6: 585. 1847. *Erythroxyllum burmanicum* Griff. Posth. Papers, Not. Pl. As. 4: 468, t. 581, Fig. 3. 1854.

Tree, 8-40 m high. Leaves mostly obovate, elliptic or oblong, 4-15 x 2-6 cm, shortly acuminate or rounded, base attenuate or cuneate, petiole 2-8 mm. Stipules triangular to lanceolate. Flowers in clusters of 1-8, dimorphous. Bracteoles deltoid, scarious. Calyx lobes triangular, acuminate with a bluntish tip. Petals white, whitish green to light green and yellow, oblong or oblong-elliptic, convex; ligule 3-lobed. Stamens equal or unequal. Ovary ellipsoid, ovoid or subglobular, somewhat longer than the staminal tube; styles connate or connate only at the base; stigmas capitate, often flattened, broader than the style. Drupe oblong-ovoid, red, distinctly furrowed, top pointed. Seed flattened, often somewhat curved, with distinct furrows.

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

**MALPIGHIACEAE**

About 60 genera and 800 species, mainly in tropical South America, tropical Africa, Asia; 2 genera and 4 species in A. & N. Islands.

- 1 a. Leaf base mostly acute and with 2 glands beneath. Flowers zygomorphic; style-1 ..... 2. *Hiptage*  
 b. Leaf base rounded, truncate or cordate, glandless. Flowers actinomorphic; styles-3 ..... 1. *Aspidopterys*

### 1. *Aspidopterys* Jussieu

Lianas. Leaves simple, entire, opposite, glandless; stipules very small, caducous or absent. Inflorescence axillary, rarely terminal, panicle like; flowers bisexual, actinomorphic, crowded at the top of the opposite lateral branches, bracteate; sepals 5, free; petals 5, free, imbricate, oblong, somewhat cucullate at the top; stamens 10; filaments thin, sometimes connate at the base, glabrous; ovary superior; carpels 3; styles 3, free, diverging terete, persistent; stigmas capitate; disc inconspicuous. Samaras often attached to a longer or shorter carpophore, sustained by the disc lobes at its base. Seeds straight and linear.

About 20 species in India, Yunnan, S. China and Hainan and Malaysia; 2 species in A. & N. Islands.

- 1 a. Petiole glabrous or thinly pale and appressed hairy. Inflorescence glabrous ..... 1. *A. elliptica*  
 b. Petiole densely set with often dark coloured hairs. Inflorescence hairy ...  
 ..... 1. *A. tomentosa* var. *tomentosa*

1. *Aspidopterys elliptica* (Blume) Jussieu, Ann. Sc. Nat. 2, 13: 266. 1840. *Hiraea elliptica* Blume, Bijdr. 225. 1825. *Aspidopterys andamanica* Hutchinson, Kew Bull. 99. 1917; Parkinson, For. Fl. Andaman Islands. 107. 1923.

Climber, up to 10 m high. Leaves ovate or ovate-elliptic to obovate-oblong, base rounded or slightly cordate, apex acuminate. Sepals 5, thin oblong. Petals 5, white, sometimes yellow-green, oblong with top rounded. Carpophore pyramidal wing suborbicular, mostly emarginate, approximately flat, pale translucent to shiny brown and coriaceous; dorsal wing distinct but narrow. Seed in the centre of the wing, linear.

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

*Distrib.*: Andaman Islands.

2. **A. tomentosa** (Blume) Jussieu, Ann. Sc. Nat. 2, 13: 267. 1840. var. **tomentosa**. *Hiraca tomentosa* Blume, Bijdr. 225. 1825.

Liana, about 10 m long. Twigs with long persistent, ferruginous to dark red-brown hairs. Leaves opposite, seldom subopposite or in whorls of 3, elliptic-obovate, apex shortly narrowed to rounded, abruptly acuminate cuspidate, upper surface glabrous, glaucous when dry, lower surface dark ferruginous to fulvous-haired. Inflorescences many flowered. Bract acute. Pedicels terete, thin, glabrous above the bracteoles. Bracteoles inserted below the articulation. Sepals 5, glabrous, sometimes ciliate. Petals 5, white, obovate, glabrous, top rounded. Filaments terete, sometimes connate at the base, glabrous. Ovary glabrous. Carpophore acute, wing ovate, pale green and translucent, glabrescent.

## 2. **Hiptage** Gaertner

Climbing shrubs. Leaves elliptic-oblong, subcoriaceous, base generally with 2 glands beneath; stipules minute, gland-like, sometimes absent. Inflorescence terminal or axillary, raceme like; flowers zygomorphic, bracteate; pedicels jointed, 2-bracteolate; calyx deeply incised, one or more sepals with a large gland on the outside; petals 5; stamens 10, unequal, the anterior one much longer than the others; ovary 3-lobed; styles 1, filiform; stigma acute. Samaras consisting of a globular mericarp; mericarp 1-3. Seeds subglobose.

About 30 species mostly in South America, Mauritius, Celebes, Fiji, W. Malaysia, Formosa, Indochina, Myanmar, Sri Lanka, China to W. Himalayas; 2 species in A. & N. Islands.

- 1 a. Gland distinctly inserted on the surface of the calyx and eventually on the pedicel. Youngest parts appressedly haired ..... 1. *H. benghalensis*  
 b. Gland sunken in the tissue of the apex of the pedicel. Youngest parts densely tomentose ..... 2. *H. thothathri*

1. **Hiptage benghalensis** (L.) Kurz, J. As. Soc. Beng. 43, 2: 136. 1874. *Banisteria benghalensis* Linn., Sp. Pl. 1: 437. *Hiptage madablot* Gaertn. Fruct. 2: 169, t. 116. 1791; Parkinson, For. Fl. Andaman Islands. 106. 1923. *Gaertnera obtusifolia* Roxb. Hort. Beng. 32. 1814, *num. nud.* *Hiptage obtusifolia* (Roxb.) DC. Prod. 1: 583. 1824.

Lianas. Leaves oblong, ovate-lanceolate, 9-15 x 4-8 cm, acute or acuminate, subcoriaceous, glabrous. Racemes longer than leaves, fulvous-sericeous haired. Flowers very fragrant, varying in colour between pink to white. Sepals ovate to elliptic, calycinal glands oblong-elliptic to lanceolate, half decurrent on pedicels. Petals orbicular to elliptic, more or less clawed, inside glabrous, outside haired, margins fimbriate. Anthers ovoid *ca* 2 mm long; filaments 6 mm long, acute, curved. Ovary pubescent; style terete with acute top. Samaras variable in size and shape, middle wing oblanceolate, acute and narrow at apex, lateral wings lanceolate, oblong, dorsal crista sometimes present.

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

*Distrib.*: Andaman Islands.

2. **H. thothathri** Balakr. et Srivastava in J. Econ. Tax. Bot. 4(3): 985-986. 1983.

Woody climbers, glabrous; branches with distinct scars on nodes. Leaves elliptic, 4.5-5.5 x 2.5-3.5 cm, acute at apices, obtuse at bases; petioles 5-6 mm long. Inflorescences appressed pubescent; pedicels 14-20 mm long, articulated at middle; bracts *c.* 2 mm long, pubescent; bracteoles abortive or very minute. Sepals ovate, red, glabrous, round apices, calycinal glands *ca* 4 x 1 mm; petals suborbicular, white tomentose dorsally, margins fimbriate. Anthers ovoid, 1-1.5 mm long; short filaments *ca* 6 mm long, filaments 10-11 mm long. Ovary sericeous; styles *ca* 10 mm long. Fruit not known.

*Fl.*: March.

*Distrib.*: Endemic to North Andaman Islands. Known only from type locality.

*Note*: Description based upon protologue.

## RUTACEAE

About 150 genera and 1600 species in warm tropical to subtropical or warm temperate regions of the world; 13 genera and 22 species in A. & N. Islands.

- 1 a. Woody climbing shrubs .....10. *Paramignya*  
 b. Erect trees or shrubs, never climbing .....2
- 2 a. Leaves pinnate with 1-17 leaflets. Fruit capsular, usually 1-follicular ...  
 .....13. *Xanthoxylum*  
 b. Not as above .....3
- 3 a. Innovations and inflorescences puberulent with minute rusty coloured  
 septate hairs .....6. *Glycosmis*  
 b. innovations glabrous or if pubescent the hairs white, grey, tawny,  
 stamineous, rather coarse, never rusty red .....4
- 4 a. Leaves simple or unifoliolate, never pinnate .....5  
 b. Leaves never simple, either pinnate or trifoliolate .....7
- 5 a. Unarmed trees. Ovary densely puberulent. Fruit a small drupe .....  
 .....1. *Acromychia*  
 b. Usually spiny trees. Ovary glabrous or fine puberulent. Fruit a hyperidium  
 .....6
- 6 a. Stamens 8 or 10; ovary 3-5 celled; ovules 1 or 2 in each cell .....3. *Atalantia*  
 b. Stamens 4 (or more) times as many as the petals; ovary mostly 5-18 celled,  
 the cells usually with 4 or more ovules .....4. *Citrus*
- 7 a. Petiole winged .....8  
 b. Petiole not winged .....9
- 8 a. Leaflets usually 3, coriaceous. Fruit about 25 mm in diameter; pericarp  
 leathery .....11. *Pleiospermum*  
 b. Leaflets 3-7, chartaceous. Fruit 50 mm or more in diameter; pericarp woody  
 .....7. *Limonia*
- 9 a. Branches unarmed, spineless. Leaves with up to 15 leaflets .....10  
 b. Branches spiny. Leaves trifoliolate .....12
- 10 a. Leaves strictly opposite, always trifoliolate. Fruit a small, follicular  
*dehiscent capsules* .....5. *Euodia*  
 b. Leaves alternate or spiralled, usually with 2-9 (sometimes more) leaflets.  
 Fruit a berry .....11
- 11a. Petals valvate. Flowers in mostly flattopped corymbose cymes .....  
 .....6. *Micromelum*

- b. Petals imbricate. Flowers in cymose or racemose panicles .....9. *Murraya*
- 12 a. Evergreen shrubs. Flowers trimerous with 6 stamens. Fruits a small fleshy red berry .....12. *Triphasia*
- b. Deciduous trees. Flowers 4-5 merous with numerous stamens. Fruit a large globose woody berry .....2. *Aegle*

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

Trees or shrubs. Leaves simple or trifoliate, opposite, gland dotted. Inflorescences axillary, paniculate, subcorymbose or reduced to a few flowers or one flower; flowers bisexual, 4-merous; sepals usually imbricate; petals valvate; stamens 8; filaments tapered, usually ciliate at base and pilose at the middle; anthers ovoid or ellipsoid, basifixed; disc shallowly 8-lobed; ovary 4-celled, each cell 2-ovulate; style twisted; stigma shallowly 4-lobed. Fruit a 4-locular drupe; epicarp thin fleshy to crustaceous and somewhat woody when dry. Seeds ellipsoid to subpyriform, carunculate, smooth or rough.

About 42 species occurring from India to South-Western China, Taiwan, throughout Malesia to South Eastern Australia, New Caledonia; 1 species in A. & N. Islands.

*Acronychia pedunculata* (Linn.) Miq., Fl. Ind. Bat. Suppl. 532. 1861. *Jambolifera pedunculata* Linn., Sp. Pl. 349. 1753. *Acronychia laurifolia* Blume, Bijdr. 245. 1825 et auct. plur.; Hook. f., Fl. Brit. Ind. 1: 498. 1875; Parkinson, For. Fl. Andaman Islands. 108. 1923.

Small trees. Leaves simple, elliptic to suboblong or slightly obovate, base cuneate, apex obtusely acuminate. Inflorescence axillary, paniculate, subcorymbose or reduced to a few flowers or one flower. Flowers bisexual, 4-merous, greenish white, 8-11 mm long; sepals deltoid; petals usually pubescent within, ovary densely pubescent, 4-celled; style twisted; stigma shallowly 4-lobed. Fruit a 4-locular drupe, subglobose to angularly sub-conic. Seeds 3-7 mm long.

*Fl.*: Feb.-July.

*Distr.*: S. Andaman (Jirkatang).

## 2. *Aegle* Correa

Deciduous, spiny tree. Leaves alternate, trifoliolate or with only 1 or 2-leaflets. Inflorescences axillary, paniculate, few flowered; flowers 4-5 merous; calyx with 4 or 5 short, obtuse sepals, caducous; petals imbricate in bud, white, ovate-oblong, apex rounded; stamens numerous; filaments free, subulate; anthers linear; disc small, annular; ovary cylindric, 8-20 celled; each cell 5-many ovulate in 2-series; stigma longitudinally furrowed, subcylindric to bluntly conical. Fruit subglobose; of 8-20 segments; pericarp hard, woody-seeds subcompressed.

A monotypic genus of India, Sri Lanka, Myanmar and Indochina.

*Aegle marmelos* (Linn.) Correa, Trans. Linn. Soc. London 5: 223. 1800; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 516. 1875; Parkinson, For. Andaman Islands. 111. 1923. *Crataeva marmelos* Linn., Sp. Pl. 444. 1753.

Trees, up to 10 m high. Leaves alternate, trifoliolate or a very few with only 1 or 2 leaflets; leaflets ovate to elliptic, 7-7.5 x 4.2-4.8 cm, densely minutely glandular-punctate, when crushed spicy fragrant with a fragrance unlike limonene. Inflorescences axillary, 4-5 cm long, clustered. Flowers in racemes or racemes of cymes, white; sepals broadly deltoid, minutely puberulent; petals oblong-obovate, densely glandular; stamens numerous (35-45) in an irregular double or triple series, rather unequal; filaments glandular, narrowed at apex; anthers linear lanceolate; ovary lageniform, 8 x 4 mm., glabrous; style stout; stigma oblong-cylindric, truncate; ovary about 12 celled; ovules 5 or more per cell. Fruit subglobose, of 8-16 segments. Seeds woolly pubescent.

*Fl.*: March-May; *Fr.*: May-Aug.

*Distr.*: South and Middle Andaman.

## 3. *Atalantia* Correa

Small trees or shrubs, armed with single, straight spines or unarmed. Leaves alternate, unifoliolate or simple, coriaceous. Inflorescences axillary or pseudoterminal, fascicled, racemose to paniculate, subcorymbose; calyx of 3-5 sepals or spathiform bilobate or irregularly lobed; petals usually 4 or 5, imbricate; stamens 6-10, free or variously connate in a tube by the

filament bases; anthers short, ovate; disc annular, short; ovary ovoid-subglobose, 3-5-celled; each cell 1-2 ovulate. Fruit a hesperidium, globose or subglobose, green or yellow when ripe. Seeds few, oblong.

About 11 species occurring in India, Sri Lanka, South-West Asia, eastward to southern China, throughout Indochina and western Malesia; 2 species in A. & N. Islands.

- 1 a. Calyx irregularly lobed .....1. *A. monophylla*  
 b. Calyx regularly or subregularly 4-5 lobed .....2. *A. simplicifolia*

1. ***Atalantia monophylla*** (Roxb.) DC., Prodr. 1: 535. 1824; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 511. 1875; Parkinson, For. Fl. Andaman Islands. 108. 1923. *Limonia monophylla* Roxb. (non L.), Pl. Corom. 1: 59. 1795. *Trichilia spinosa* Willd., Sp. Pl. 2: 554. 1799. *Atalantia spinosa* (Willd.) Koorders, Exkursion fl. Java. 2: 427. 1912.

Trees. Leaves ovate or elliptic, 3-15 x 2-4.5(-6) cm, base broadly cuneate, apex obtuse, margins entire to obscurely undulate. Inflorescences racemose, fascicled, axillary; calyx splitting irregularly into 2 segments, glabrous or puberulent; petals 4 or 5, white, glabrous, blunt; stamens 8 or 10, at base connate and forming a tube; ovary 6-7 mm long; stigma sessile, irregularly 3-4 lobed. Fruit globose, yellowish green, up to 2 cm in diameter. Seeds few.

*Fl.*: Sept.-March; *Fr.*: Jan.-July.

*Distrib.*: Andaman and Nicobar Islands.

2. ***Atalantia simplicifolia*** (Roxb.) Tanaka, J. Bot. 68: 232. 1930. *Amyres simplicifolia* Roxb. Fl. Ind. ed. 2, 2: 244. 1832.

Shrubs. Leaves elliptic-lanceolate, caudate-acuminate with a broad 2-lobed tip, 7-10 cm long, margin entire, inflorescences racemose. Flowers white, fragrant, usually 4-merous; calyx 4-5 lobed; petals obovate-oblong; stamens free; anthers ovoid; ovary 2-celled, ovules 2 collateral; stigma subcapitate.

*Fl.*: Nov.-March; *Fr.*: March-June.

*Distr.*: S. Nicobar.

4. *Citrus* L.

Trees, armed with axillary spines, all parts aromatic when bruised. Leaves alternate, unifoliolate or simple, chartaceous or coriaceous, entire or crenulate; petiole often winged or marginate. Inflorescences racemose-corymbose, axillary or as single flowers; flowers bisexual or functionally staminate; sepals 4 or 5; petals 4-8, commonly 5; stamens about 4 times as many as petals or upto 6-10 times as many, mostly free; disc short, annular; ovary subglobose, mostly 8-10 celled; each cell with 2 collateral ovules; style cylindrical; stigma globose-capitate. Fruit a hesperidium, pericarp leathery. Seeds angular-obovoid.

About 12 species in southern China, South-east Asia and Indomalayan region; 3 species in A. & N. Islands.

- 1 a. Pulp vesicles of fruit containing numerous droplets of acrid oil. Petiole long, broadly winged, the wing as long as broad as the leaf blade, but not cordate. Stamens usually free .....2. *C. hystrix*
- b. Pulp vesicles of fruit never containing acrid oils, mostly free entirely of droplets. Petiole wingless or merely marginate or if winged never more than 75% as wide as the leafblade. Stamens mostly imperfectly coherent-adsinate in several bundles.....2
- 2 a. Petioles wingless, not or imperfectly articulated with the leafblade. Flowers perfect or staminate. Pericarp often very thick .....3. *C. medica*
- b. Petioles winged, articulated with the leaf blades. Flowers all perfect. Pericarp often rather thin ..... 1. *C. grandis*
1. *Citrus grandis* (Linn.) Osbeck, Dagh. Ostind. Resa 98. 1757. *C. aurantium* var. *grandis* Linn., Sp. Pl. 2: 783. 1753. *C. decumna* Linn., Syst. Veg. ed. 2: 508. 1767; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 516. 1875; Parkinson, For. Fl. Andaman Islands. 111. 1923. *C. maxima* Merr., Interp. Rumph. Herb. Amboin. 296. 1918.

Trees. Leaves ovate to elliptic, apex obtusely acute, base rounded or sub-cordate; petiole broad, obcordately winged, the wing about one fourth to one third as long as the blade; margins subentire to shallowly crenulate. Inflorescence a single flower or a cluster of few flowers, axillary. Flowers, pentamerous, puberulous; petals white; stamens 20-25 with large linear anthers; ovary large, globose; style caducous; ovary cells rather numerous, more than 10. Fruit 10-15 cm or more in diameter, subglobose to pyriform; pericarp firmly adherent. Seeds large, wrinkled.

*Fl.*: March-April.

*Distr.*: N. Nicobar.

2. **Citrus hystrix** DC., Cat. Pl. Hort. Bot. Monp. 97. 1813; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 515. 1875.

Shrubs or trees, up to 12 m high. Leaves broadly ovate to ovate-oblong, apex obtuse to obtusely acuminate or slightly emarginate, base rounded, margins serrate-crenate; petiole broadly winged, the wing about the same size as the blade. Inflorescences axillary, glabrous, 1-5 flowered. Flowers 4-5 merous; calyx usually 4 sepals; petals white, cream or pinkish; stamens 24-30, free, ovary glabrous, ovate, globose, rugulose; style short. Fruit subglobose or ovate-globose, or ellipsoid, base abruptly contracted, up to 7 cm in diameter. Seeds ovoid-oblong.

*Fl. & Fr.*: Not known.

3. **Citrus medica** Linn., Sp. Pl. 2: 782. 1753; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 515. 1875; Parkinson, For. Fl. Andaman Islands. 111. 1923.

Shrubs or small trees. Leaves elliptic-ovate to ovate lanceolate, apex obtuse to rounded, at base rounded or cuneate, margins serrate-crenate; petiole wingless or nearly so. Inflorescences short racemose, axillary, few flowered. Flowers perfect or staminate; petals 5, pinkish or purplish externally; stamens 30-40 or more; ovary large, cylindrical, 10-13 celled. Fruit ovoid to oblong. Seeds numerous, 9-10 mm long.

*Fl.*: Jan.-Aug.; *Fr.*: Feb.-Aug.

*Distr.*: Cultivated in Andaman Islands and scarcely grown in N. Nicobar.

#### 5. **Euodia** J.R. & G. Forst.

Shrubs, or trees, unarmed, evergreen or deciduous, monoecious or dioecious, aromatic. Leaves opposite, simple or trifoliolate or pinnate; leaflets usually entire. Inflorescences axillary, paniculate to corymbose-cymose; flowers 4-5 merous, white, green, yellowish or pink; sepals

imbricate; petals sessile, valvate; disc sinuately 4-5 lobed; stamens 4 or 5; filaments subulate; stamens 4 or 5; filaments subulate; anthers ovate, versatile; ovary 4-5 celled; each cell 2-ovulate; stigma obscurely 4-5 lobed. In staminate flowers carpels empty. Fruits follicular, each follicle 2-valved, coriaceous. Seeds ovoid.

About 100 species occurring from Madagascar through Indo-Malesia to Japan and eastward to Polynesia. 2 species in A. & N. Islands.

- 1 a. Leaflet blades predominantly wide obovate with rounded apex; secondary nerves strong, dividing dichotomously near margin and interacting with adjacent dichotomous to form distinct intramarginal loop ..... 1. *E. glabra*
- b. Leaflet blades ovate, elliptic-oblong or lanceolate grading to obovate with acuminate apex; secondary nerves slender, ending indistinctly at margins ..... 2. *E. lunu-ankenda*

1. ***Euodia glabra*** Bl. Bijdr. 245. 1825; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 489. 1875; Parkinson, For. Fl. Andaman Islands. 109. 1923.

Small trees, 5-15 m high. Leaves digitatively trifoliolate, 13-28 cm long; leaflet widely obovate or obovate-elliptic, 7.5-18 x 7.0-9.5 cm, often rounded or rarely abruptly acuminate at apex, margins entire, coriaceous. Flowers in dense, subumbellate clusters, 4-5 mm long; bracts minute. Male flowers: sepals 4, free at the base, ovate to suborbicular, obtuse or shortly acuminate, pubescent; petals 4, 2.5-3.0 mm long, oblong, obtusely acuminate, acumen deflexed, glabrous; disc pulvinate; stamens 4, exerted, inserted at base of disc; filaments glabrous; anthers oblong; pistillodes 3-4, minute. Female flowers: sepals, petals and disc as in male flowers; ovary 4-lobed, 4-loculed, globose; style short; stigma capitate. Follicles 3-4, 10-12 mm long, punctate, coriaceous. Seeds broadly elliptic, black.

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

*Distr.*: S. Andaman and Nicobar islands.

2. ***Euodia lunu-ankenda*** (Gaertn.) Merril in Philip. J. Sci. Bot. 1: 378. 1912. *Fagara lunu-ankenda* Gaertn., Eruct. Sem. Pl. 334. t. 68. f 9. 1778.

Small trees, up to 20 m long. Leaves digitatively trifoliolate, 13.5-23 cm long; leaflet blades ovate, elliptic-oblong-lanceolate, 9.5-14 x 3.5-6.5

cm, obtuse or shortly acuminate or rarely apiculate at apex, margins entire. Flowers in short subumbellate cymes, abortively unisexual; bracts minute, ovate, pubescent. Male flowers: sepals 4, green, connate at below, ovate-suborbicular, obtuse, pubescent; petals 4, white, 2-3 mm long, ovate, acuminate, acumen deflexed; stamens 4; filaments glabrous; anthers oblong, obtuse, dorsifixed; disc annular, densely pubescent; pistillodes of 4 rudimentary carpels. Female flowers: sepals; petals as in male flowers; staminodes 4 with effete anthers; ovary 4-lobed, 4-loculed, subglobose, pubescent; style short; stigma capitate, 4-grooved. Follicles 2-4, 5-8 mm long, globose, pale greenish. Seed one per follicle, globose, black.

*Fl.*: Jan.-Aug.; *Fr.*: Oct.-Dec.

### 6. *Glycosmis* Correa

Unarmed shrubs or trees. Innovations and young inflorescences puberulent. Leaves alternate, rarely opposite, imparipinnate with 1-15, usually 1-5 leaflets. Inflorescences axillary or pseudoterminal, racemose or cymose; flowers mostly 4-5 merous; sepals imbricate, usually glandular; petals imbricate, greenish to cream white; stamens 8 or 10, unequal; filaments subulate or somewhat fleshy; anthers ovate to elliptic; disc annular, lobulate; ovary clavate to subconic to lageniform, often raised on a stout gynophore, 2-5-celled; each cell 1-2 ovulate; style persistent; stigma discoid-truncate. Fruit a globose to oblong ellipsoid berry, usually 1-2 seeded; pericarp globular. Seeds round to plano convex.

About 40 species occurring in India, Sri Lanka eastward throughout S.E. Asia to southern China and Taiwan, throughout Malesia and south to Queensland and New Guinea; 2 species in A. and N. Islands.

- 1 a. Leaflets mostly 3-7 per leaf; leaf blade narrowly elliptic to oblong-elliptic, often pale to whitish-silvery beneath; anthers dilated .....2. *G. pentaphylla*
- b. Leaflets usually 3, but sometimes 1-5 or 7 per leaf; leaf blade elliptic to ovate; paler brownly or greenish beneath; anthers subulate .....2
- 2 a. Ovary glabrous .....1. *G. mauritiana*
- b. Ovary pilosa .....3. *G. pilosa*

1. ***Glycosmis mauritiana*** (Lam.) Tanaka Bot. Not. 159. 1928, *Limonia mauritiana* Lam., Enc. 3: 517. 1789, *Glycosmis pentaphylla* Roxb., Pl. Corom. 1: 60, t. 84. 1795, non Retz. 1788.

Shrubs, up to 3 m high. Leaves usually with 3-5 leaflets, rarely with 1-2 or 6-7 leaflets; leaflets thin, coriaceous, paler beneath, 4-10 x 1.5-4 cm, elliptic to somewhat ovate or obovate, acuminate to subcordate. Inflorescences axillary, bi-pinnate; bracteoles minute, deltoid, puberulent. Flowers in cymules, 4-5 merous, sepals ovate-deltoid, concavo-convex, ciliolate, obscurely few glandular; petals elliptic or subovate, sparsely glandular, 4-6 x 1.8-2 mm; stamens with few hairs near apex of anther; filaments subulate; anthers ovate-elliptic to oblong-elliptic; ovary clavoid, 2 x 1 mm, truncate. Fruit subglobose, 10 mm in diameter, 1-seeded.

- 1 a. Leaves oblong or elliptic lanceolate or oblanceolate. Panicles upto 5 cm long .....2  
 b. Leaves ovate or obovate. Panicles more than 5 cm long .....3
- 2 a. Leaves pinnately 5-3-1 foliolate.....1. var. *andamanensis*  
 b. Leaves pinnately 5-3 foliolate.....3. var. *insularis*
- 3 a. Leaves pinnately 3-1 foliolate.....4. var. *latifolia*  
 b. Leaves pinnately 3-4 foliolate.....2. var. *fuscescens*

1. var. *andamanensis* (Narayanaswami) Mitra & Subramanyam, J. Arnold Arbor. 50: 156. 1969. *G. pentaphylla* var. *andamanensis* Narayanaswami Rec. Bot. Surv. India 14. 2: 16. 1961.

Small trees. Leaves pinnately 5-3 foliolate; leaflets elliptic-lanceolate, 9-20 x 4.2-8.0 cm. Inflorescences axillary short panicle, 3-4 cm long.

*Fl.*: Sept.-Feb.; *Fr.*: April-Oct.

*Note*: Endemic to Andaman and Nicobar Islands.

2. var. *fuscescens* (Kurz) Mitra & Subramanyam, J. Arnold Arbor. 50: 156. 1969. *G. trifoliata* var. *fuscescens* Kurz Narayanaswami, Rec. Bot. Surv. India 14. 2: 20. 1941.

Small trees. Leaves pinnately 3-4 foliolate; leaflets ovate or obovate. Inflorescences axillary panicle, 6-7 cm long.

3. var. *insularis* (Kurz) Tanaka. Journ. Indian Bot. Soc. 16: 229. 1937. *G. arborea* var. *insularis* Kurz, Journ. Bot. 14: 38. 1876, pro parte. *G. pentaphylla* var. *insularis* (Kurz) Narayanaswami, Rec. Bot. Surv. India 14. 1: 20. 1941.

Trees. Leaves pinnately 5-3 foliolate; leaflets oblong or elliptic lanceolate or oblanceolate, 9-20 x 4.5-7 cm. Inflorescences axillary panicle, up to 5 cm long.

*Fl.*: Oct.-Jan.; *Fr.*: Jan.-May.

*Distr.*: S. Nicobar.

4. var. *latifolia* (Kurz) Balakr. in Bull. Bot. Surv. Ind. 22: 173. 1980. *G. trifoliata* Spreng. var. *latifolia* Kurz in Journ. Bot. 14: 37. 1876. *G. pentaphylla* Correa var. *latifolia* (Kurz) Narayanaswami in Rec. Bot. Surv. Ind. 14. 2: 20. 1941.

Shrubs or small trees. Leaves pinnately 3-1 foliolate; leaflets 14-21 x 7.5-10.2 cm. Inflorescences axillary panicle, 5-9 cm long.

*Note*: Endemic to Nicobar Islands.

2. *Glycosmis pentaphylla* (Retz.) A. DC., Prodr. 1: 538. 1824. *Limonia pentaphylla* Retz., Obs. Bot. 5: 24. 1788. *L. arborea* Roxb., Pl. Corom. 1: 60. t. 85. 1798. *Glycosmis arborea* (Roxb.) A. DC. l.c.

Shrubs or small trees, up to 3 m high. Leaves alternate; leaflets usually 3 or 5, rarely 7, very rarely 2 or 1; 6-24 x 7 cm, elliptic or oblong-elliptic, acuminate at both ends, usually paler and often almost whitish beneath, entire to minutely or sometimes rather distinctly crenulate-serrate on the margins. Inflorescences axillary, paniculate, tripinnate. Flowers mostly pentamerous, sepals broadly ovate-rotund, 1.2-1.5 mm long, margins scarious, ciliolate; petals obovate-elliptic, 5 x 2.5 mm; stamens glabrous; filaments broadest at middle; anthers broadly ovate to ovate-elliptic; disc obscurely lobulate; ovary ovoid to ovoid-cylindric; stigma flat, obscurely lobed or angled. Fruit globose, 10-13.5 mm in diameter, usually 1, sometimes 2-3 seeded. Seeds round to plano-convex, suboblong.

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

*Distr.*: Nicobar islands and L. Andaman.

3. *Glycosmis pilosa* Narayanaswami, Rec. Bot. Surv. Ind. 14. 2: 36. 1941.

Shrubs or small trees, 7-10 m high. Leaflets 3-5-7 foliolate, subopposite or alternate, ovate or oblong elliptic, lanceolate, 6-18 x 2.5-7 cm. Inflorescences axillary, densely rusty, 1.5-5 cm long. Flowers 4-5 mm long; sepals 1 mm or less, ovate; petals oblong or obovate; stamens 10, alternately shorter; filaments narrow subulate; ovary elliptic terete, densely rusty pilose in the middle, 5-celled with one pendulous ovule in each cell; style 3 mm long; stigma semidisciform. Fruits globose 1.5 cm in diameter, rugose, pitted glandular or scurfy, 1-seeded.

*Fl.*: Jan.-April.

*Distr.*: Interview Island.

### 7. *Limonia* L.

Trees, armed with straight axillary spines. Leaves alternate, imparipinnate, with opposite lateral leaflets; petiole and rachis marginate or narrowly winged. Inflorescences axillary, paniculate; flowers perfect, but polygamous by abortion; calyx 5-toothed; petals 5, imbricate; stamens 7-12; filaments dilated; anthers linear-oblong, basifixed; disc short; ovary globose, incompletely 4-6-celled; each cell numerous ovulate. Fruit large, globose, indehiscent, woody, with muciliginous pulp. Seeds numerous, oblong, compressed.

A monotypic genus, native of India, Myanmar, Indochina & in Sri Lanka.

*Limonia acidissima* Linn., Sp. Pl. ed. 2. 1: 554. 1762; Hook. f. in Hook. f. Fl. Brit. Ind. 1: 509. 1875.

Small trees, up to 7 m high. Leaves alternate, imparipinnate, glabrate with opposite lateral obovate leaflets. Inflorescences axillary, cymose-paniculate, puberulent. Flowers perfect but polygamous by abortion, white, green or reddish purple; calyx 5-toothed, deltoid, minutely puberulent; petals 5, glabrous, 4-6 mm long; stamens 7-12; filaments excavate, woolly inside at base; anthers oblong; disc thin; ovary glabrous, rotund, incompletely 4-6 celled; style short, stout; stigma oblong-fusiform, 5-angulate-lobulate. Fruits woody; globose indehiscent. Seeds numerous, oblong.

*Fl.*: March-April; *Fr.*: Aug.-Dec.

### 8. *Micromelum* Bl.

Unarmed, scented trees or shrubs. Leaves alternate, imparipinnate, up to 23 leaflets; leaflets subchartaceous to thin coriaceous. Inflorescences paniculate, corymbose, terminal; flowers 5-merous; sepals deltoid; petals valvate; stamens 10, alternating larger and shorter; ovary 2-6 celled; each cell 2-ovulate; ovules superposed; style slender, caducous; stigma capitate; disc annular. Fruit a subglobose or broadly ellipsoid berry; pericarp thin glandular. Seeds 1 or 2, oblong.

About 9 species in India, S.E. Asia, Sri Lanka throughout Malesia and Melanesia, eastward to Fiji, Tonga and Samoa; 1 species in A. & N. Islands.

***Micromelum minutum*** (Forst. f.) Wight & Arn., Prodr. 1: 448. 1834. *Limonia minuta* Forst. f., Fl. Ins. Austr. Prodr. 33. 1786. *Micromelum pubescens* Blume, Bijdr. 1: 137. 1825; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 501. 1875; Parkinson, For. Fl. Andaman Islands. 110. 1923.

Small trees, up to 9 m high. Leaves alternate, imparipinnate with 9-15 leaflets; leaflets 1-4 cm, ovate, lanceolate, attenuate-acuminate, margins irregularly undulate-crenate. Inflorescences terminal, cymose paniculate. Flowers pentamerous; calyx cupular, shallowly 5-toothed; sepals acute, puberulent; petals white, linear oblong, 7 x 1.5 mm, glandular punctate; stamens 10; anthers oblong-orbicular; ovary cylindrical, 5-celled; densely puberulent; style slender; stigma capitate. Fruit ovoid-oblong berry. Seeds 1 or 2, oblong.

*Fl.*: Nov.-Feb.; *Fr.*: Feb.-June.

*Distr.*: Andaman islands.

### 9. *Murraya* Koenig ex L.

Unarmed trees or shrubs. Leaves alternate, imparipinnate (very rarely unifoliolate in *M. paniculata*) with alternate leaflets. Inflorescences paniculate, axillary or terminal; flowers 5-merous; sepals ovate or lanceolate; petals imbricate, linear to ovate-lanceolate or oblanceolate; stamens 10, alternating longer and shorter; filaments sometimes compressed; anthers ovate or elliptic; disc annular to short cylindrical; ovary

ovoid, often on distinct gynophore, 2-5 celled; each cell 2 or rarely 1-ovulate; style caducous; stigma capitate. Fruit ovoid to globose, baccate; pericarp thin. Seeds 1 or few.

About 11 species from India through southern China and S.E. Asia to Malasia, Taiwan east to New Guinea, N.E. Australia and New Caledonia; 3 in A. & N. Islands.

- 1 a. Leaf rachis glabrate. Fruits usually 1-celled, ellipsoid-subglobose, red when ripe .....2
- b. Leaf rachis pubescent. Fruits 2-5 celled, if 5 celled then angled or lobed, if 2 celled subglobose, blackish when ripe .....2. *M. koenigii*
- 2 a. Leaflets obovate, rather obtuse. Petals oblong-spathulate. Fruits ellipsoid-subglobose, not or obscurely acuminoid .....1. *M. exotica*
- b. Leaflets ovate-elliptic or ovate, acuminate. Petals oblong-subelliptic, less spathulate. Fruits ellipsoid acuminoid .....3. *M. paniculata*

1. ***Murraya exotica*** Linn., Mant. 2: 563. 1771; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 502. 1875; Parkinson, For. Fl. Andaman Islands. 110. 1923.

Erect shrubs, up to 3 m high. Leaves 9 cm long; leaflets mostly 3-7, alternate or the lowest pair opposite; blades obovate to subelliptic, obtuse to bluntly acuminate with the apex minutely notched, base cuneate, 1-3.5 x 0.9-1.8 cm, sub-entire or obscurely crenate. Inflorescences terminal, paniculate, 3-6 flowered. Flowers pentamerous; calyx lobes 1.5-1.9 mm long, deltoid, glandular; petals 5 or 6, white, oblong-subspathulate, 21 x 6 mm; stamens 10; filaments thick subulate; anthers rounded; gynophore torulose; ovary 2 mm long, slightly 2-(3-) angled, 2-3 celled; style cylindrical; stigma flattened, capitate, obscurely 2-3 lobed. Fruit ellipsoid-subglobose. Seeds 1-3, ellipsoid-obovoid.

*Fl.*: Feb.-May; *Fr.*: May-June.

2. ***Murraya koenigii*** (Linn.) Spreng., Syst. Veg. 2: 315. 1825; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 503. 1875. *Bergera koenigii* Linn., Mant. 2: 563. 1771.

Shrubs or small trees, up to 5 m high. Leaves spiralled-alternate, pinnate, crowded at twig ends; leaflets 15-25, dark green above, paler

beneath, obliquely oblong-lanceolate; blades 1-4 x 0.8-1.5 cm. Inflorescences dense, corymbose paniculate. Flowers pentamerous, numerous, cymosely arranged, white, fragrant; sepals 1 x 1 mm; petals valvate, linear, 8 x 1.7 mm; stamens 10, 5 longer; filaments attenuate from a slender base; anthers short, oblong; ovary bulbous, 2-celled, 1 mm long; style pale green; stigma capitate, discoid; disc obscurely 5-angled. Fruit a subglobose berry, up to 11 mm diameter. Seeds 1 or 2, globular-ovoid.

*Fl.*: May-June.

Cultivated.

3. ***Murraya paniculata*** (Linn.) Jack, Malay. Misc. 1: 31. 1820. *Chalcas paniculata* Linn., Mant. 1: 68. 1767.

Shrubs or small trees. Leaves alternate imparipinnate, with usually 3-5 (rarely 7) leaflets, rarely unifoliate; leaflets petiolate, ovate or ovate-elliptic, acuminate, base cuneate to rounded, margins entire or obscurely crenate. Inflorescences axillary, paniculate, few flowered; calyx usually 5 lobed (rarely 4); sepals narrowly deltoid; minutely puberulent; petals 5 (rarely 4), elliptic to ovate-elliptic or slightly obovate, 15-21 x 4-6 mm, white; stamens 10, alternately longer; filaments dilated slightly downward; anthers short oblong; disc glabrous; ovary ovoid-ellipsoid; style columnar, capitate; stigma bilobed. Fruit an ovoid, 1-2 seeded berry. Seed *ca* 1 cm long.

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

*Distr.*: Baratang, Little Andaman.

#### 10. ***Paramignya*** Wight

Woody climbing shrubs with recurved spines. Leaves unifoliate, alternate. Inflorescences axillary; flowers clustered or solitary, 4-5 merous; calyx cupular; petals linear or oblong, white; stamens 8 or 10; filaments free, filiform to subulate or thickened at base; anthers oblong, narrow; ovary on a distinct gynophore, 3-5 celled; each cell 1-2 ovulate. Fruit globose, ellipsoid, ovoid or obovoid, angled or furrowed; pericarp rather thick and firm. Seeds one or a few compressed, ovoid or oblong.

About 12 species in India and Sri Lanka, Myanmar, southern China and Indochina, Malay Peninsula, throughout Indonesia to Philippines, Timor, Queensland, Australia; 1 species in A. & N. Islands.

**Paramignya armata** (Thw.) Beddome ex Oliv., J. Linn. Soc. Bot. 5 Suppl. 2: 43. 1861; Hook. f. in Hook. f., Fl. Brit. Ind. 1: 511. 1875; Parkinson, For. Fl. Andaman Islands, 108. 1923. *Arthromischus armatus* Thw., Enum. Pl. Zeyl. 47. 1858.

Shrubby, much branched climbers, with many axillary spines. Leaves 3.7-7.6 x 1.6-3.5 cm, ovate-lanceolate or oblong-lanceolate, acute or obtuse at apex, base round, entire. Inflorescences axillary. Flowers 3-7 together, tetramerous; calyx glabrous, teeth 4, minute; petals 4, oblong, greenish white; stamens 8, equal, filaments linear-subulate, pilose; anthers linear-oblong; gynophore narrow; ovary 3-4 celled, pilose, each cell 1-ovulate; stigma capitate. Fruit globose-ovoid, 8-18 mm in diameter, yellow, 1-4 seeded.

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

*Distr.*: Dhanikhari in S. Andaman, Lamia Bay to Kalipur in N. Andaman, Kimus in N. Nicobar.

### 11. **Pleiospermium** (Engler) Swingle

Trees, armed with axillary spines or not. Leaves alternate, 1-3 foliolate, entire. Inflorescences axillary or pseudoterminal; flowers 4-5 merous; calyx with deltoid to lanceolate sepals; petals linear-oblong; stamens 8 or 10, free; filaments glabrous, anthers oblong; disc cupulate; ovary sessile or on short gynophore, 4-5-celled; each cell 2-ovulate; stigma subcapitate with 4 or 5 stylar canals, each pair of canals with a pair of oil glands. Fruit globose-oblong; pericarp glandular. Seeds compressed, subovate.

About 5 species in India, Sri Lanka, Sumatra, Java and Borneo. 1 species in A. & N. Islands.

**Pleiospermium alatum** (Wight & Arn.) Swingle, J. Wash. Acad. Sci. 6: 428. 1916. *Limonia alata* Wight & Arn. Prodr. 92. 1834; Hook. f. in Hook. f. Fl. Brit. Ind. 1: 508. 1875; Parkinson, For. Fl. Andaman Islands. 109. 1923.

Small trees with single axillary spine or not. Leaves trifoliate or sometimes only with 1 or 2 leaflets; leaflets obovate-oblongate, apex broadly rounded, base cuneate, margins entire. Inflorescences axillary, clustered. Flowers rather small, 4-5 merous; calyx finely pubescent; sepals deltoid; petals ovate-oblong, dorsally finely pubescent; stamens 8 or 10, free; anthers linear-oblong; disc campanulate; ovary obovoid, glabrous 3.5-4.2 x 1.6-1.8 mm, 4-5 celled; style slender; stigma subglobose; ovary cells biovulate. Fruit globose, 2.3-2.5 cm in diameter, cells 1-2 seeded. Seeds ovoid, compressed, up to 1 cm long.

*Fl.*: March-May.; *Fr.*: May-June.

## 12. *Triphasia* Lour.

Shrubs with spines. Leaves alternate, sessile, trifoliate. Inflorescences axillary, cymes; flowers solitary or in 3-flowered, sweet scented, 3-merous; calyx 3-lobed; petals 3, imbricate, free; stamens 6; filaments free, subequal, dilated at the base; anther linear; ovary 3-celled; each cell 1-ovulate; style slender, deciduous; stigma obtuse or capitate. Fruit a small berry. Seeds oblong, 1-3.

About 3 species in tropical Asia and Philippines. 1 species in A. & N. Islands.

*Triphasia trifolia* (Burm. f.) Wilson in *Torreya* 9: 33, 1909. *Limonia trifolia* Burm. f., *Fl. Ind.* 103. t. 35, f. 1, 1768.

Shrubs with spines generally in pairs, sometimes solitary. Leaves alternate, sessile, 3-foliate; leaflets elliptic to ovate, terminal one larger, apex retuse, margin crenate. Flowers solitary or in 3-flowered cymes, axillary, sweet-scented; Calyx 3-lobed; petals 3, free, imbricate, linear-oblong; stamens 6, inserted round a fleshy disc; filaments free subequal, dilated at the base; anthers linear; ovary ovoid, 3-celled, narrowed into a slender deciduous style; stigma obtuse, 3-lobed; ovules solitary in each cell. Berry small, ovoid, 1-3 seeded, seeds oblong.

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

*Distr.*: N. Nicobar.

13. *Zanthoxylum* L.

Evergreen or deciduous trees, shrubs or woody climbers, usually armed with prickles, aromatic. Leaves alternate, pinnate, up to 15 pairs of leaflets or trifoliolate, rarely unifoliolate, rarely paripinnate. Inflorescences axillary or terminal, cymose, racemose or paniculate; flowers 4-5-merous; stamens usually 4-6; disc flat; ovary 1-5 celled, rudimentary in staminate flowers; carpels free or united, biovulate; the ovules collateral or superposed; style coherent or with divergent tips; stigma capitate. Fruit of 1-5, free or more or less basally united follicles; pericarp glandular. Seeds ovoid-subglobose.

About 275 species in tropical and subtropical regions of the world; 2 species in A. & N. Islands.

- 1 a. Leaves digitately 3-foliolate. Carpels solitary .....1. *Z. ovalifolium*  
 b. Leaves imparipinnate or paripinnate, if 3-foliolate, then the carpels are more than one .....2. *Z. rhetsa*

1. *Zanthoxylum ovalifolium* Wt. *Illust. Ind. Bot.* 1: 169. 1839; Hook. f. in Hook. f., *Fl. Brit. Ind.* 1: 492. 1875; Parkinson, *For. Fl. Andaman Islands.* 109. 1923.

Shrubs or small trees, up to 8 m high, usually unarmed or rarely armed. Leaves digitately 3-foliolate or occasionally 1-2 foliolate or rarely pinnate, 8-30 cm long; leaflets 1-3 or rarely 5, elliptic-oblong or obovate, abruptly acuminate with short, retuse acumen or retusely subobtuse at apex. Male flowers: in clusters or in cymose umbellules, 0.2-0.3 cm long; sepals 4 or rarely 3, free to the base, ovate-triangular, acute; petals 4 or rarely 3, lanceolate to oblong or elliptic, subobtuse, whitish, with prominent midrib; stamens 4 or rarely 3; pistillode of 1 carpel, disc pulvinate, lobulate; female flowers: sepals and petals as in males; staminodes 4, filiform; carpel solitary, ovoid, glandular punctate; styles eccentric; stigmas globose; follicles subglobose, apiculate with persistent style. Seeds black, smooth.

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

2. *Zanthoxylum rhetsa* (Roxb.) DC., *Prodr.* 1: 728. 1824; Hook. f. in Hook. f., *Fl. Brit. Ind.* 1: 495. 1875. *Fagara rhetsa*. Hort. Beng. 11. 1814, nomen; Roxb., *Fl. Ind.* 1: 417. 1820. *Zanthoxylum budrunga* (Roxb.) DC., *l.c.* 1824; Hook. f. in Hook. f., *Fl. Brit. Ind.* 1: 475. 1875; Parkinson, *For. Fl. Andaman Island.* 110. 1923.

Tree, up to 30 m high. Leaves alternate, pinnate, or 10-17 leaflets; ovate or elliptic, acuminate, at base asymmetric, margins entire to wavy. Inflorescences axillary or terminal, paniculate. Flowers 4-merous, yellowish; pistillate ones smaller; stamens usually 4-6; disc flat; ovary usually one carpel; stigma capitate. Fruit about 6 mm wide, 1 or 2 seeded. Seed ovoid-subglobose.

*Fl.*: March-June; *Fr.*: Sept.-Nov.

### SIMAROUBACEAE

About 30 genera and 200 species in tropical and subtropical regions of both the hemispheres; 6 genera and 8 species in A. & N. Islands.

- 1 a. Leaves simple .....2
- b. Leaves compound .....3
- 2 a. Leaves distinctly petioled, subelliptic to lanceolate, with scattered concave glands usually on undersurface. Flowers in pendulous, pseudo-umbels; filaments with basal scales; ovule solitary in each cell .....5. *Samadera*
- b. Leaves sessile or nearly so, linear spatulate, without any glands. Flowers in corymb-like cymes; filaments without basal scales; ovules 2 in each cell ..... 6. *Suriana*
- 3 a. Branches armed. Leaves ternate or pinnate with winged rachis. Flowers bisexual .....3. *Harrisonia*
- b. Branches unarmed. Leaves pinnate. Flowers unisexual or both unisexual and bisexual .....4
- 4 a. Stipules absent. Sepals and petals not persistent in fruits. Stamens glabrous .....5
- b. Stipules caducous. Sepals and petals persistent in fruits. Stamens pilose at base ... .....4. *Picrasma*
- 5 a. Stamens as many as petals. Disc 4-lobed. Fruits not winged .....2. *Brucea*
- b. Stamens twice as many as petals. Disc 10-lobed. Fruits winged .....1. *Ailanthus*

#### 1. *Ailanthus* Desf.

Trees. Leaves tufted at the ends of branches, pari- or imparipinnate, long petioled; leaflets opposite to subopposite, acuminate, entire or toothed.

Flowers in dense axillary, terminal panicles, unisexual; male flowers foetid during anthesis; calyx 5-lobed, connate; petals 5, induplicate valvate in bud; disc flat, 10-lobed; stamens 10 in male flowers, barren and reduced or absent in female flowers; filaments subulate; carpels 2-5, free, laterally compressed, rudimentary or absent in male flowers; styles free or connate; stigmas peltate; ovule 1, anatropous. Fruits 1-5, linear or oblong lanceolate, 1-seeded samaras, with membranous wing. Seeds lenticular.

About 5 species in tropical and subtropical areas; 2 species in A. & N. Islands.

- 1 a. Leaflets coarsely toothed. Samaras once or twice twisted at base.....1. *A. excelsa*  
 b. Leaflets entire. Samaras not twisted .....2. *A. triphysa*

1. ***Ailanthus excelsa*** Roxb. Pl. Corom. 1: 24, t. 23. 1795; A.W. Bennett in Hook. f. Fl. Brit. Ind. 1: 518. 1875.

Trees, 8-20 m high, deciduous, large leaf-scars present. Petioles tomentose. Leaflets alternate or subopposite, unequal at base, acute or acuminate; petiolules with two hairy glands near the base. Flowers in much branched, lax panicles; calyx 5-lobed, lobes triangular; petals 5, ovate-lanceolate, reflexed; filaments subulate, glabrous; ovary sparsely hairy, laterally compressed; styles free or connate, stigmas curling. Samaras linear-oblong to lanceolate; seeds reticulated above, red in colour.

*Fl.*: Dec.-May; *Fr.*: Feb.-July.

2. ***A. triphysa*** (Dennst.) Alston, Handb. Fl. Ceylon VI (Suppl.): 41. 1931; Nootboom in Fl. Mal. I. 6: 219. 1962. *Adenanthera triphysa* Dennst. Schliiss. Hort. Malab. 32. 1818. *Ailanthus malabarica* DC. Prodr. 2: 89. 1825, *nom. illeg.*; A.W. Bennett in Hook. f. Fl. Brit. Ind. 1: 518. 1875.

Trees, 30-40 m high. Leaves mostly paripinnate; leaflets opposite, obliquely ovate-lanceolate to oblong-lanceolate, unequal at base, acute or acuminate, coriaceous, glabrous. Flowers white, in dense panicles; bracts small, caducous; calyx 5 lobed, lobes triangular; petals 5, oblong-lanceolate; vary glabrous; styles free or united at the base, connate above; stigmas 3-4 lobed, peltate. Samaras oblong, reddish brown, rounded at both ends.

*Fl.*: Jan.-April.; *Fr.*: Jan.-May.

## 2. *Brucea* J.F. Miller

Shrubs or small trees. Leaves imparipinnate; leaflets 3-15, opposite, ovate to lanceolate, slightly oblique, acuminate, entire or coarsely toothed with scattered, spot-like glands along the margin on the undersurface. Flowers 4-merous, in long narrow axillary panicles, uni- or bisexual; sepals 4, connate at base, ovate-elongate or triangular; petals 4, free, ovate-oblong or linear; disc cupular, glabrous; stamens 4, rudimentary or absent in female flowers; filaments short; anthers cordate ovate; carpels 4, free, ovoid; styles free or coherent at the base; stigmas thickened or club-shaped. Fruits 1-4, dried nuts, ellipsoidal. Seeds ovoid.

About 6 species in old world tropics; 1 species in A. & N. Islands.

*Brucea javanica* (L.) Merr. in J. Ard. Arb. 9: 3. 1928; Nooteboom in Fl. Mal. I. 6: 211. 1962.

Evergreen shrubs or small trees. Leaves 20-50 cm long; leaflets 3-15, ovate-oblong to ovate-lanceolate, base acute or obtuse, apex acuminate, sparsely hairy above, more or less yellowish pubescent beneath, sometimes completely glabrous, petiolules slender. Flowers reddish to various coloured, in axillary pubescent paniculate cymes; bracts deltoid, small; male flowers: sepals 4, connate at base, pubescent, sometimes toothed; petals 4, free, linear spathulate, sparsely pubescent to nearly glabrous, sometimes toothed; filaments subulate; female flowers: sepals and petals as in female flowers; stigmas free, stamens absent or vestigial. Nuts ovoid, glabrous.

*Fl.*: Mar.-July; *Fr.*: May-Jan.

## 3. *Harrisonia* R. Brown ex A.H.L. Juss.

Shrubs with straggling prickly branches; prickles caducous. Leaves spirally arranged; leaflets rhomboid to ovate lanceolate, subentire to coarsely crenate or serrate, obtuse. Flowers in axillary or terminal cymes, bisexual, 4-5-merous, bracteate; calyx 4-5 lobed; lobes acute-triangular, persistent; petals 4-5, glabrous; disc hemispherical; stamens 8-10; filaments free, with hairy, concave scales at base; anthers latrorse; ovary 4-5 celled,

connate, globose or lobed; styles 4-5, connate or distinct at base; stigma 4-5 lobed; ovule solitary, pendulous, amphitropous. Fruits globose, entire or lobed drupes.

About 4 species in the tropics; 2 species in A. & N. Islands.

- 1 a. Leaves ternate. Flowers usually 4-merous, ca 4 mm long, whitish; cymes 3-5-flowered. Fruits 4-5 x 5-7 mm .....1. *H. brownii*
- b. Leaves imparipinnate. Flowers usually 5-merous, 6-10 mm long, pinkish; cymes 8-30 flowered. Fruits 4-9 x 11-15 mm .....2. *H. perforata*

1. **Harrisonia brownii** A.H.L. Juss. in Mem. Mus. Hist. Nat. Paris 12: 540. t. 28. no. 47. 1825; Kurz, Rep. Veg. Andaman (app. A.) 33. 1870; A.W. Bennett in Hook. f. Fl. Brit. Ind. 1: 519. 1875; Parkinson, For. Fl. Andaman Islands. 112. 1923. Nootboom in Fl. Mal. I. 6: 207. 1962.

Scandent shrubs, about 5 m high; branches prickly. Leaves ternate; apical leaflets largest and gradually narrowing into the petiolule, ovate rhomboid, acuminate; lateral leaflets usually oblique, cuneate towards the rachis, petiolules slender, channelled. Flowers few; bracts ca 1.5 mm long, persistent; calyx lobes ca. 1 mm long, glabrous; petals white, lanceolate to oblong, acute and inflexed at apex; disk short, cylindrical, slightly 8-lobed; stamens 8; filaments 2.5 mm long; ovary 1 mm long; styles 4, connate, twisted, glabrous. Drupes glabrous,  $\pm$  0.5 cm across, green, entire.

*Fl.*: June-Oct. *Fr.*: July-Nov.

*Distr.*: S. Andaman : Baratang, Chiriatapu; M. Andaman: Bakultala.

*Note*: King (in J. Asiat. Soc. Beng. 42: 227. 1893) and Parkinson (l.c.) record its distribution in Andaman as fairly common. According to Nootboom the distribution of this species in Andaman Island. is a "marked and unexpected extension of the range towards the west". Andaman specimens possess globose, entire fruits and a few flowers.

2. **H. perforata** (Blanco) Merr. in Philip. J. Sc. Bot. 7: 236. 1912; Nootboom in Fl. Mal. I. 6. 208. 1962. *Pallurus perforatus* Blanco, Fl. Filip. 174. 1837. *Harrisonia hennettii* (Planchon) A.W. Bennett in Hook. f. Fl. Br. Ind. 1: 519. 1875; Parkinson, For. Fl. Andaman Islands. 113. 1923. *Limonia pubescens* Wall. ex Hook. f. l.c. 507. 1875.

Scandent shrubs, *ca* 8 m high. Leaves 8-16 cm long, leaflets ovate, glabrous, crenate. Flowers with pubescent pedicels; calyx lobes persistent; petals lanceolate, rarely oblong, pubescent on both sides, inserted below the disk; stamens 10; filaments 7-10 mm long. Disk cup-shaped, fleshy. Ovary glabrous, slightly lobed; styles connate, pubescent. Drupes slightly lobed.

*Fl.*: Dec.-May. *Fr.*: Feb.-Aug.

*Distr.*: S. Andaman: Havelock, Rangat Bay; N. Andaman: Aerial Bay.

#### 4. *Picrasma* Bl.

Trees or large shrubs. Leaves imparipinnate; leaflets opposite or subopposite. Flowers 4-5 merous, in axillary, long peduncled corymbose compound cymes, unisexual, or both unisexual and bisexual; sepals 4-5, free or connate; petals 4-5, valvate; stamens 4-5, alternate with petals; anthers emarginate, latrorse; disc entire or lobed, pubescent; carpels 4-5, free, pubescent; styles connate above; stigmas free, filiform; ovule solitary, erect, basal. Fruits 1-5, drupaceous, subglobose.

About 8 species in tropics; 1 species in A. & N. Islands.

*Picrasma javanica* Blume, Bijdr. 5: 248. 1825; A.W. Bennett in Hook. f. Fl. Brit. Ind. 1: 520. 1875; Parkinson, For. Fl. Andaman Islands. 113. 1923. *P. andamanica* Kurz ex A.W. Bennett in Hook. f. Fl. Brit. Ind. 1: 520. 1875.

Trees, 10-15 m high. Leaves imparipinnate, 1-3-jugate; leaflets opposite, 3-7, oblong-ovate, or elliptic, margins sometimes wavy or wrinkled, cuneate at base, abruptly acuminate at apex, glabrous; stipules broadly ovate-orbicular. Flowers 4-merous, in axillary, paniculate cymes; pedicels villous, elongating in fruits; sepals 4, triangular to ovate, persistent; petals 4, white, valvate, accrescent in fruits, ovate-oblong or oblong; stamens 4, alternate with petals, inserted at the narrow base of the disk; anthers emarginate, latrorse. Disk 4-lobed, hairy. Drupes 1-4, on cushion-like disk, ovoid, white, black when ripe, enclosed in persistent calyx.

*Fl.*: Jan.-May; *Fr.*: Mar.-Oct.

*Distr.*: S. Andaman: Havelock, Namunaghar, Bedonabad, Herbertabad; N. Andaman: Lamia Bay to Ramnagar, Lakhimpur, Saddle Peak; L. Andaman.

### 5. *Samadera* J. Gaertn.

Small trees. Leaves alternate, entire. Flowers in axillary or terminal pseudo-umbels, bisexual; calyx 3-5 lobed; lobes imbricate, with a concave gland outside; petals 3-5, free; disk obconic, glabrous; stamens with basal scales, twice the number of petals, epipetalous ones smaller than episepalous ones; filaments slender, twisted; anthers lanceolate; carpels 4-5, on columnar disk; styles free at base, connate above; stigmas acute; ovule solitary, pendulous. Fruits semiorbicular, woody, laterally compressed drupes, with a narrow wing at the apex.

About 2 species in the tropics; 1 species in A. & N. Islands.

*Samadera indica* J. Gaertn., *Fruet. Sem.* 2: 352. t. 156, f. 3. 1791; A.W. Bennett in Hook. f., *Fl. Brit. Ind.* 1: 519. 1875; *S. lucida* (Wall.) Planchon in Hook. Lond. *J. Bot.* 5: 562. 1846; A.W. Bennett l.c. 519. 1875; Parkinson, *For. Fl. Andaman Islands.* 112. 1923. *Quassia indica* (Gaertn.) Nootboom in Steenis, *Fl. Mal.* 1. 6: 199. 1962.

Evergreen shrubs or small trees, 6-10 m high. Leaves alternate, entire, acute at base, coriaceous and glossy; flowers bisexual, 4-merous, many; bracts minute; calyx lobes imbricate, obtuse with a concave gland outside, semiorbicular, pubescent on the back, thick persistent in fruit; petals 4, oblanceolate, white or pale yellow, hairy on the back; stamens 8, Lepipetalous ones smaller than episepalous ones, pubescent; filaments slender, twisted; anthers medifixed, lanceolate. Ovary free, puberulous, distinct, on columnar disk; disc obconic, glabrous; styles free at base, connate above; stigma acute; ovule solitary, pendulous. Drupes semiorbicular, flattened, keeled with glands on pericarp, surface reticulate. Seeds solitary.

*Fl.*: Jan.-June; *Fr.*: Feb.-July.

### 6. *Suriana* L.

Shrubs or small trees; branches and leaves with dense glandular hairs. Leaves simple, crowded at the ends of the branchlets, sessile. Flowers 2-4

in axillary or terminal cymes or solitary, bisexual, 5-merous; bracts foliaceous, persistent; sepals lanceolate, imbricate connate at base; petals clawed, obovate or elliptical, imbricate; stamens 10, obdiplostemonous, 5 antipetalous stamens sterile; filaments subulate, hairy below; anthers 2-locular, latrorse; disc inconspicuous; carpels 5, free; styles filiform, basal; stigmas capitellate; ovules 2 in each locule, amphitropous. Fruits 5 or fewer, 1-seeded achene-like drupelets enclosed by the calyx, subspherical.

A monotypic pantropical genus.

*Suriana maritima* Linn. Sp. Pl. 284. 1753; A.W. Bennett in Hook. f. Fl. Brit. Ind. 1: 522. 1875; Parkinson, For. Fl. Andaman Islands. 112. 1923; Nooteboom, in Fl. Mal. I. 6: 196. 1962.

Shrubs or small tree, branches and leaves with dense, simple, glandular hairs. Leaves simple, sessile, entire, crowded at the end of the branchlets; scars tuberculate. Flowers bisexual, 5-merous, perfect, 2-4 in axillary or terminal cymes or solitary; pedicels articulated at the base; bracts foliaceous, persistent, lanceolate sepals lanceolate, imbricate, connate at base, persistent petals bright yellow, as long as sepals, clawed, obovate or elliptical, imbricate; stamens 10, distinct, obdiplostemonous, 5 antipetalous, stamens barren; filaments subulate, hairy below; anthers 2-locular, emarginate, latrorse, versatile; carpels 5, free; styles filiform, basal, glabrous except at the base; stigmas capitellate; ovules 2-in each locule, amphitropous; disk inconspicuous. Fruits 1-seeded achene-like drupelets enclosed by the calyx, subspherical, pubescent.

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

*Notes*: The genus *Suriana* is a monotypic pantropical genus; widely distributed on the sea shores of the new and old world. This *S. maritima* is a littoral species, found along sea coast in islands or small islets.

#### Excluded species:

*Eurycoma longifolia* Jack in Mal. Misc. 2: 45. 1822; A.W. Bennett in Hook. f. Fl. Brit. Ind. 1: 521. 1875.

## OCHNACEAE

About 30 genera and 250 species in tropical, rarely subtropical countries, chiefly in S. America and Africa; 2 genera and 2 species in A. & N. Islands.

- 1 a. Stipules intrapetiolar, united. Anthers opening with 2 apical pores .....2. *Ochna*  
 b. Stipules free. Anthers opening with 2 cylindrical slits .....1. *Brackenridgea*

1. *Brackenridgea* A. Gray

Trees or treelets. Leaves simple, distichous glossy above, chartaceous; stipules small, free, often laciniate, caducous. Inflorescences thyrsoid, but of umbelloid appearance; flowers actinomorphic, bisexual, with hemispherical torus; bracts small, broadly linguiform to triangular, laciniate, caducous; pedicels filiform, accrescent and turning red in fruit, articulate base; sepals 5, accrescent, fleshy, red in fruit; petals 5 (-10), white or yellow; stamens 10; filaments subterete; anthers dehiscing from the apex downwards by longitudinal slits; ovaries 5 (-10), obovoid; ovule campotropous, epitropous; style united; stigma small. Fruits 1-2 (-5), greenish, 1-seeded drupe on a swollen torus; turning black or almost so when ripe.

About 5 species in tropical eastern Africa and Madagascar; 1 species in A. & N. Islands.

*Brackenridgea hookeri* (Planch.) A. Gray, New Gen. Pl. 6. 1853. *Gomphia hookeri* Planch. in Hook., Lond. J. Bot. 6: 3. 1877; Parkinson, For. Fl. Andaman Islands. 114. 1923.

Trees, up to 30 cm high. Stipules small, free, laciniate. Leaves oblong to oblanceolate, 7-20 x 2-6 cm, obtuse to acute, margin entire, chartaceous, glossy above. Inflorescences terminal, many-flowered, sessile cymes; bracts small, triangular, caducous; torus distinctly tumid, red in fruit; sepals 5, ovate-obovate, enlarged, fleshy and red in fruit; petals obovate; filaments subterete; anthers dehiscing from the apex downwards by longitudinal slits. Ovaries obovoid; ovule campotropous, epitropous; stigma small. Fruit reddish, turning black when ripe.

*Fls.*: Jan.-April.

*Distr.*: Andaman Islands.

## 2. *Ochna* L.

Shrubs or treelets. Leaves simple, distichous, glabrous, chartaceous or subcoriaceous; stipules intrapetiolarly united, caducous. Inflorescences lateral or terminal thyrus with a terminal flower; flowers actinomorphic, bisexual, with hemispherical torus; peduncle with many, small, distichously caducous bracts at base; pedicels filiform, articulate; sepals 5, greenish, accrescent and turning red in fruit; petals 5-10, in 2 whorls, yellow; stamens many in 2 or more whorls; filaments subterete; anthers opening with 2-apical pores; ovaries 5-10 (-15), ovoid; ovule atropous; styles fused; stigmas as many as ovaries, free or  $\pm$  united. Fruit 1-3 (-5), greenish, 1-seeded drupe on a swollen torus, turning black when ripe.

About 85 species in tropical and South Africa and tropical Asia; 1 species in A. & N. Islands.

*Ochna integerrima* (Lour.) Merr., Trans. Am. Phil. Soc. N.S. 24, 2: 265. 1935, emend. *Elaeocarpus integerrimus* Lour., Fl. Cochinch. 338. 1790. *Ochna wallichii* Planch. in Hook., Lond. J. Bot. 5: 650. 1846; Parkinson, For. Fl. Andaman Islands. 114. 1923. *O. squarrosa* (non L.) Kurz, Rep. Andaman Island. 74. 1870. *O. andamanica* Kurz, Rep. Andaman Island. 33. 1870. *nom. nud.*

Shrubs or treelets, 4-12 m high, deciduous; branchlets slender. Stipules small, intrapetiolarly united, caducous. Leaves obovate-oblong or obovate-lanceolate, 6-20 x 2-6 cm, acuminate, sometimes acute or obtuse at apex, margin finely denticulate. Inflorescences many flowered; branches 1-3 flowered, monochasial. Torus distinctly tumid and turning red in fruit; sepals 5, ovate to ovate-oblong; petals 5-6 (10), obovate, tapering at base or subunguiculate; filaments unequal, outermost the longest. Ovaries 6-10, obovoid; ovule atropous; stigmas as many as ovaries. Fruits greenish, turning black when ripe.

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

*Distr.*: Sitanagar, Saddle Peak, Myo Myo, Baratang, Wright Myo, Ferrargung in Andaman islands; Nancowry, Kamorta in Nicobar.

**BURSERACEAE**

A family of 16 genera and 600 species occurring throughout the tropics; 3 genera and 5 species in A. & N. Islands.

- 1 a. Flowers bisexual, 5-merous .....3. *Guruga*  
 b. Flowers unisexual, 3-merous .....2
- 2 a. Leaves often stipulate. Disc and pistil often pilose. Pyrene thick walled, bony, 3-1 seeded .....1. *Canarium*  
 b. Leaves exstipulate. Disc always, pistil nearly always glabrous. Pyrene thin walled, papyraceous to crustaceous, 1-seeded .....2. *Dacryodes*

**1. *Canarium* Stickman**

Trees or shrubs, evergreen or deciduous. Leaves mostly compound, spirally arranged, pinnate, very rarely unifoliolate, usually stipulate. Inflorescence an axillary or terminal panicle, cyme, raceme or spike; flowers 3-merous; sepals usually fused basally; petals free, usually imbricate; stamens 6, free or connate, sometimes epipetalous, sometimes adnate to disc, sterile and reduced in female flowers; disc intrastaminal, usually 6-lobed, strongly developed in male flowers; pistil usually very reduced to absent in male flowers. Drupe usually 3-locular stony pyrene.

A genus of 100 species in tropical and subtropical regions from Africa through Asia to the Pacific Islands; 3 species in A. & N. Islands.

- 1 a. Stipules present .....2  
 b. Stipules absent .....2. *C. euphyllum*
- 2 a. Stipules deeply incised, pectinate to dendriform .....1. *C. denticulatum*  
 b. Stipules entire .....3. *C. manii*

1. ***Canarium denticulatum*** Bl., Bijdr. 1162. 1826. ssp. *denticulatum* Leenhouts in Blumea 9. 2: 367. 1959. *C. coccineobracteatum* Kurz in Journ. As. Soc. Beng. 41. 2: 296. 1872; Bennett in Hook. f. Fl. Brit. Ind. 1: 536. 1875; Parkinson, For. Fl. Andaman Islands. 116. 1923.

Trees, 15 (-50) m high, rarely a shrub. Leaves 2-6-jugate. Stipules persistent (to caducous), inserted on the petiole from the base, pectinate

to dendriform, minutely tomentose. Leaflets inequilateral, ovate to lanceolate, 5-20 x 2-15 cm, glabrous, cuneate to rounded or cordate base, apex acuminate, margin entire to dentate or serrate; nerves 9-21 pairs. Inflorescences axillary, together pseudo-terminal, laxly thyrsoid; bracts lanceolate. Flowers unisexual, dioecious, densely pubescent; calyx cupular, in fruit broadly funnel-shaped, triangular, 12-14 mm in diam.; petals 3, free; stamens 6, glabrous; disc glabrous, 6-lobed; pistil glabrous, more or less stalked. Infructescences densely tomentose, with up to 10 fruits. Fruits ellipsoid to ovoid or obvoid, 2.5-3 x 1.2-1.5 cm, glabrous; pyrene smooth. Seeds (3-)1.

- 1 a. Habit coarse. Leaves 4-6-jugate. Lobes of the stipules broad. Nerves (14-) 16-17 (-21) pairs .....f.a. *denticulatum*  
 b. Habit more slender. Leaves 2-4-jugate. Lobes of the stipules subulate. Nerves (9-) 11-12 (-14) pairs .....f. b. *fissistipulum*

a. forma *denticulatum* Leenhouts in *Blumea* 9. 2: 368. 1959.

Trees, 20-30 (-50) m high. Leaves 4-6-jugate. Stipules pectinate, the lobes broad, laciniate. Leaflets rather dull; nerves (14-) 16-17 (-21) pairs, moderately prominent beneath.

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

*Distrib.*: Andaman Islands.

b. forma *fissistipulum* Leenhouts in *Blumea* 9. 2: 368. 1959.

Trees, 15-25 (-32) m high, sometimes shrubs. Leaves 2-4-jugate. Stipules dendriform, the lobes subulate. Leaflets shining; nerves (9-) 11-12 (-14) pairs, rather prominent beneath.

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

*Distrib.*: Andaman Islands.

2. **Canarium euphyllum** Kurz (Rep. Veg. And. Islands 33 & 61. 1870) Journ. As Soc. Beng. 41. 2: 295. 1872; Bennett in Hook. f. Fl. Brit. Ind. 1: 535. 1875; Parkinson, For. Fl. Andaman Islands 115. 1923.

Trees, up to 30 m high. Leaves 4-6 (-8)-jugate, glabrous. Stipules absent; leaflets ovate to oblong, 10-25 (-35) x 5-9 cm, chartaceous, base oblique, rounded to subcordate, apex abruptly acuminate, margin coarsely serrate or dentate; nerves 12-19 (ca 30) pairs. Inflorescences axillary, thyrsoid, 20-45 cm long, glabrous; bracts subulate. Flowers unisexual, dioecious, minutely tomentose; petals 3, free; stamens 6, glabrous, the filaments about halfway connate; disc annular, 1-2 mm high, fleshy, glabrous; pistil minute or none, glabrous. Infructescences racemose, rather coarse with 3-5 fruits. Fruits ovoid-ellipsoid, rounded triangular in cross section, smooth. Seed 1.

*Fl.*: May-June; *Fr.*: Jan.-May.

3. **Canarium manii** King in Journ. As. Soc. Beng. 62. 2: 247. 1894; Parkinson, For Fl. Andaman Islands 116. 1923.

Large trees, branchlets scabrous, lenticellate, leaf scars prominent. Leaves 2-4-jugate; stipules very caducous, orbicular, leaving a distinct, drop-shaped scar; leaflets ovate-lanceolate, the terminal ones elliptic, 8-14 x 3.5-7 cm, thin coriaceous, cuneate to cordate base, apex rather abruptly acuminate, margin entire; nerves 9-12 pairs. Inflorescences terminal, thinly minutely pubescent, male one thyrsoid, female ones subracemose; bracts orbicular to lanceolate. Flowers unisexual, dioecious, densely pubescent; calyx in male flowers c 1 mm, in female flowers 5-6 mm; petals 3, free; stamens 6, glabrous, disc glabrous; pistil glabrous, distinctly stalked, in male flowers absent. Infructescences with 1-2 fruits. Fruits ovate to obovate, 27-30 x 14-16 mm, papillose. Seed 1.

*Fl.*: Feb.-April; *Fr.*: April-July.

*Distr.*: Endemic to Andaman Islands.

## 2. **Dacryodes** Vahl

Trees or large shrubs, deciduous. Leaves exstipulate; leaflets entire. Flowers 3-merous, in axillary and/or terminal panicles; sepals free or connate; petals with thickened, inflexed apex; stamens 6, glabrous; filaments free or their base to various degree connate with the disc; disc intrastaminal, glabrous; pistil 3-(-2)-celled, usually glabrous, reduced in the male flowers; stigma sessile. Drupe oblong or ellipsoid, 1-seeded, pyrene containing 1 fertile and 2-reduced cells.

About 40 species in tropical America, tropical Africa and in tropical Asia: 1 species in A. & N. Islands.

**Dacryodes rugosa** (Blume) H.J. Lam. in Ann. Jard. Bot. Buitenz. 42: 203. 1932. *Santiria rugosa* Blume, Mus. Bot. Lugd. Bat. 1: 212. 1850.

Trees or large shrubs. Young branchlets pubescent. Leaves exstipulate; leaflets 5-7, 5-23 x 2-10 cm, ovate-oblong, acuminate, brittle, on the upper surface shining and subulate, glabrous, lower surface sparingly hairy. Panicles axillary, crowded at the top of the branchlets, combined into a terminal inflorescence, more or less pubescent. Flowers 3-merous, small, unisexual, 2-3 mm long, yellowish; calyx cupular, shortly dentate; petals slightly thickened at the top; in male flowers stamens 6, around or on the margin of the cupular, disc glabrous; ovary rudimentary, minute; staminodes 6 in female flowers, ovary minute, 3-celled; stigma sessile, 3-lobed. Drupe ovoid, slightly oblique, 16-25 x 9-15 mm. Seed 1.

*Fl.*: Oct.-Dec.; *Fz.*: Feb.-May.

*Distr.*: Katchal, Malacca in N. Nicobar and East-West road in S. Nicobar.

### 3. **Garuga** Roxb.

Trees or shrubs, deciduous. Leaves compound, stipulate; leaflets crenate-serrate; often with stipellae. Panicles axillary, crowded at the end of the branchlets, appearing before the leaves; flowers bisexual, 5-merous, perigynous, with hypanthium; sepals free; stamens 10, free, with a disc lobe between each filament; ovary on short gynophore; carpels 5, fused. Drupes of 1-5, small, furrowed pyrenes.

4 species distributed from South eastern Asia to Melanesia; 1 species in A. & N. Islands.

**Garuga pinnata** Roxb., Pl. Corom. 3. 5. t. 208. 1811; Bennett in Hook. f. Fl. Brit. Ind. 1: 528. 1875.

Trees, up to 15 m high. Leaves exstipulate, alternate, imparipinnately compound, with 5-10 pairs of leaflets; leaflets opposite, subsessile, 10 x 4 cm, oblong-lanceolate, crenate, oblique, acuminate. Inflorescence an

axillary and terminal much branched panicle; bracts deciduous. Flowers bisexual or unisexual, shortly pedicellate, yellow; calyx 5, toothed, campanulate, teeth triangular, valvate; petals 5, inserted on the hypanthium beneath margin of the disc, valvate, linear-oblong; stamens 10, free, inserted in the notches of the disc; anthers oblong-ovate, dorsifixed, filaments dilated at the base; disc crenate, thin, with 10 notches; ovary ovoid; hairy, locules 4-5; style hairy. Fruit fleshy, 1.2-1.8 cm in diameter, fleshy, globose.

*Fl.*: April-May.

### MELIACEAE

About 51 genera and 550 species in the tropics and subtropics of both hemispheres; 11 genera and 39 species in A. & N. Islands.

- |   |   |                        |
|---|---|------------------------|
| 1 | a. Loculi 1 or 2 ovulate .....  | 2                      |
|   | b. Loculi multiovulate .....  | 10                     |
| 2 | a. Fruit dehiscent .....  | 3                      |
|   | b. Fruit indehiscent .....  | 7                      |
| 3 | a. Disc free, cyathiform or tubular .....   | 4                      |
|   | b. Disc narrowly or broadly stipitate, annular, patelliform or absent .....               | 5                      |
| 4 | a. Anthers inserted apically on the filaments or on the margin of the staminal tube ..... | 9. <i>Trichilia</i>    |
|   | b. Anthers inserted within the throat of the staminal tube .....                          | 6. <i>Disoxylum</i>    |
| 5 | a. Anthers in 2 alternating whorls within the staminal tube .....                         | 8. <i>Sphaerosacme</i> |
|   | b. Anthers in a single whorl .....  | 6                      |
| 6 | a. Leaves with a dormant apical bud; staminal tube cylindrical .....                      | 4. <i>Chisocheton</i>  |
|   | b. Leaves without a dormant apical bud; staminal tube cyathiform or globular .....        | 2. <i>Aphanamixis</i>  |
| 7 | a. Disc tubular .....   | 7. <i>Sandoricum</i>   |
|   | b. Disc annular, patelliform, stipitate or absent .....                                   | 8                      |
| 8 | a. Indumentum of stellate hairs or peltate scales .....                                   | 1. <i>Aglaia</i>       |
|   | b. Indumentum of simple hairs .....   | 9                      |

- 9 a. Fruit a berry .....10. *Walsura*
- b. Fruit a drupe .....3. *Azadirachta*
- 10 a. Seeds without a wing .....11. *Xylocarpus*
- b. Seeds winged .....5. *Chukrasia*

1. *Aglaia* Lour.

Usually trees, rarely bushes; dioecious; trunk often with buttresses; indumentum of stellate hairs or peltate scales on young parts. Latex often present. Leaves usually imparipinnate, occasionally simple or trifoliate; leaflets (1-) 3-25, lanceolate; oblanceolate, ovate, obovate; elliptical or oblong, margin entire, apex acuminate to caudate with the acumen obtuse or acute, base rounded, subcordate, cuneate or attenuate. Inflorescences usually axillary or supra axillary, occasionally ramiflorous or cauliflorous; male inflorescences large, much divaricately branched, with smaller, triangular or linear, bracts; female inflorescences similar to the male, usually smaller and less branched, sometimes a narrow spike-like raceme with few flowers. Flowers unisexual, solitary or in sessile clusters, subglobose, ellipsoid or obovoid; calyx cup-shaped, often thickened at the base, shallowly or deeply 3-5 (or 6) lobed; lobes unequal; petals 3-5 (or 6), free or united at the base, usually yellow, sometimes pink or white, subrotund, elliptical or obovate, unequal, occasionally with stellate hairs or peltate scales on the outside; stamens united, more or less truncate at the base, usually subglobose, obovoid, cup-shaped; anthers in the female flowers similar but sterile; ovary 1-3 (-10) locular; superior depressed globose or ovoid, with dense stellate hairs or peltate scales; locule with 1 or 2-collateral or superposed ovule; style short or absent; stigma ovoid, more or less cylindrical or depressed globose. Fruit subglobose, obovoid or ellipsoid. Seeds large.

About 100 species in the Indo-Malesian region, Australia, Melanesia and Polynesia. 11 species in A. & N. Islands.

- 1 a. Leaflets with few or no hairs or scales on the lower surface, the reticulation continuous and subprominent on one or both surfaces ..... 8. *A. oligophylla*
- b. Leaflets with at least some scales or hairs on the lower surface, the reticulation not continuous and sub-prominent on either surface, or if sub-prominent, than with indumentum on lower surface of leaflet..... 2

- 2 a. Indumentum dense, of white or pale brown hairs or scales which totally conceal the lower surface of leaflet ..... 1. *A. argentea*  
 b. Indumentum reddish-brown or, if pale not totally concealing the lower surface of leaflet ..... 3
- 3 a. Indumentum of peltate scales, sometimes with stellate scales, interspersed ..... 4  
 b. Indumentum of stellate hairs or scales: peltate scales absent ..... 11. *A. spectabilis*
- 4 a. Scales densely covering lower surface of leaflet ..... 2. *A. crassinervia*  
 b. Scales = absent to numerous on lower surface of leaflet ..... 5
- 5 a. Scales few to numerous on lower surface of leaflet ..... 6  
 b. Scales ± absent from lower surface of leaflet but may densely cover the midrib below and immediately adjacent to it and occasionally on the lateral veins ..... 7. *A. odoratissimus*
- 6 a. Scales orange-brown, pale brown or almost white throughout ..... 7  
 b. Scales at least partly reddish brown ..... 8
- 7 a. Peltate scales evenly distributed on the lower surface of leaflet and visible to the naked eye as tiny dots ..... 3. *A. cucullata*  
 b. Peltate scales not evenly distributed on the lower surface of leaflet or if they are then not visible to the naked eye ..... 9
- 8 a. Staminal tube with a narrow pin-prick aperture *ca.* 0.3 mm in diameter, with an entire margin, anthers included ..... 10. *A. silvestris*  
 b. Staminal tube with the aperture wider than 0.3 mm, the margin shallowly lobed, anthers protruding through the aperture ..... 10
- 9 a. Fruit dehiscent ..... 6. *A. lawii*  
 b. Fruit indehiscent ..... 4. *A. edulis*
- 10 a. Leaflets usually markedly ovate, scales almost absent from the lower surface, veins often black or red when dry; fruits asymmetrical ellipsoid with one locule ..... 9. *A. perviridis*  
 b. Leaflets elliptical, ovate or obovate, scales few to numerous on the lower leaflet surface, veins neither black nor red when dry; fruits asymmetrical with 2 or 3 loculi ..... 5. *A. korthalsii*

1. ***Aglaia argentea*** Blume, Bijdr.: 170. 1825; King in J. As. Soc. Beng. 64: 70. 1895; Parkinson, For. Fl. Andaman Islands. 121. 1923.

Trees, up to 30 m high. Leaves imparipinnate; leaflets 9-19, laterals subopposite, 4.5-30 x 1.5-11 cm, elliptic or oblong, apex acuminate with the acute acumen upto 10 mm long, rounded to an asymmetrical subcordate base; petiolules 5-10 mm on lateral leaflets, 10-120 mm on terminal leaflets; petiole 4-41 cm. Flowers ellipsoid, sessile or occasionally with pedicels up to 2.5 mm long; calyx deeply divided into 5 rounded lobes; petals 5, white or yellow, elliptical; staminal tube obovoid, anthers 5, ovoid; ovary ellipsoid or ovoid; stigma subglobose or ovoid. Fruits ovoid or obovoid.

*Fl.*: June-July.

2. *Aglaia crassinervia* Kurz ex Hiern. in Hook. f., Fl. Brit. India 1: 556, 1875. *A. cinerea* King in J. As. Soc. Beng. 64: 66, 1895.

Trees, up to 22 m high with white latex. Leaves imparipinnate; leaflets 11-15, laterals alternate or subopposite, 7-35 x 4-12 cm, elliptical, apex acuminate-caudate with the acute acumen up to 15 mm long, rounded or cuneate base, upper surface with numerous almost white scales when young; petiolules up to 1.5 cm long; petioles up to 20 cm long. Flowers subglobose ca 1.5 mm in diameter; pedicels up to 1.5 mm long; calyx deeply divided into 5 rounded lobes; petals 5, obovate or elliptical; staminal tube subglobose; anthers 5, ovoid, ovary depressed-globose; stigma ovoid. Fruits subglobose or pyriform.

*Fl.*: April-June.

3. *Aglaia cucullata* (Roxb.) Pellegrin in Lecomte, Fl. Gen. Indo-China, 1: 771, 1911. *Amoora cucullata* Roxb., Pl. Coromandel 3: 54, t. 258, 1820; Hiern. in Hook. f., Fl. Brit. India 1: 560, 1875. *Andersonia cucullata* Roxb., Hort. Beng. 87, 1814, *nom. nud.*

Trees, up to 15 m high. Leaves imparipinnate; leaflets 5-9, laterals subopposite, 4-20 x 1.5-6 cm, ovate, asymmetrical, curved, apex acuminate with obtuse acumen up to 5 mm, rounded base, lower surface rugulose, faintly pitted; petiolules up to 10 mm in lateral leaflets, up to 15 mm in terminal leaflets. Flowers subglobose, up to 3.5 x 3.5 mm, pedicels up to 3 mm; calyx divided up to half way into 3-4 obtuse lobes; petals 3, yellow, 2.5-3 x 1-1.5 mm, obovate; staminal tube obovoid; anthers 6, ellipsoid; ovary depressed-globose; stigma ellipsoid. Fruits obovoid, trilocular capsules.

*Fl.*: Throughout the year.

*Notes*: Rarely distributed in the mangrove areas. Reported for Andaman by Hook. f. (l.c.). No further collections are available.

4. ***Aglaia edulis*** (Roxb.) Wall., Calc. Gard. Rep. 26. 1840; Hiern. in Hook. f., Fl. Brit. India 1: 556. 1875. *Milnea edulis* Roxb., Hort. Beng. 18. 1814, *nom. nud.*

Trees, up to 20 m high with white latex. Leaves imparipinnate; leaflets 5-9 (-11), the laterals subopposite or alternate, 5-20 x 2-8 cm, usually elliptical, sometimes ovate, often coriaceous, acuminate at apex, with the obtuse acumen up to 1.5 cm, rounded or cuneate at the slightly asymmetrical base; petiolules 5-12 mm on lateral leaflets, up to 20 mm on terminal leaflets; petioles 4-9 cm. Male flowers 1-7 x 1-7 cm, fragrant; pedicels 0.5-1.5 mm; calyx cup-shaped, with (4 or) 5 rounded lobes; lobes with ciliate margin; petals (4 or) 5, yellow or orange; staminal tube cup-shaped, yellow; anthers 5(-6), ovoid, ovary depressed globose; stigma either ovoid or depressed globose; female flowers 2-4 x 2-5 cm; pedicels nearly 2 mm; calyx with 5 ovate lobes; petals 5(-7); staminal tube cup-shaped; anthers 5, 0.5-1.5 x 0.4-1.2 mm; ovary 0.3-1 x 0.9-1 mm; stigma 0.4-0.8 x 0.8-1.3 mm; ovoid or depressed globose. Fruits subglobose with a central depression at the apex.

*Fl.*: June-July.

*Distr.*: East-West Road in S. Nicobar.

5. ***Aglaia korthalsii*** Miq., Ann. Mus. Bot. Lugd. Bat. 4: 42. 1868; Pannell in Kew Bull. Addl. series 16: 125. 1992.

Trees up to 26 m high with white latex. Leaves obovate in outline; leaflets (3-) 5 (-7), the laterals subopposite, 8-27 x 3-8 cm, elliptical, ovate or sometimes obovate, apex acuminate with the usually obtuse but sometimes acute acumen up to 10 mm long; petiolules 5-10 mm; petioles 7-12 cm. Flowers 1.5-2 x 1.6-2.5 mm, subglobose or depressed globose, sweetly fragrant; pedicels 0.8-3 mm; calyx divided into 5 rounded lobes, lobes with fimbriate margins; petals 5, white or yellow, obovate; staminal tube obovoid or cup-shaped, shallowly 5-lobed; anthers 5, ovoid; ovary depressed globose; stigma depressed globose or obovoid. Fruits ellipsoid or subglobose.

*Fl.*: March-April.

*Notes*: The distribution of this species in Andaman & Nicobar Islands was recorded by Pannell (l.c.).

6. *Aglaia lawii* (Wight) Saldanha ex Ramamoorthy in Saldanha & Nicolson, Flora of Hassan District 392, pl. 76. 1976. *Nimmonia lawii* Wight in Calc. Journ. Nat. Hist. 7: 13. *nom. nov. pro. Epichuris exarillata* J. Graham, non Arn. *Aglaia andamanica* Hiern. in Hook. f., Fl. Brit. India 1: 555. 1875; King in J. As. Soc. Beng. 64: 79. 1895; Parkinson, For. Fl. Andaman Islands. 121, 1923.

Trees up to 30 m high with white latex. Leaves imparipinnate, ovate or obovate in outline, leaflets (1 or) 2-7(-11), the laterals alternate or subopposite, 4-30 x 1.5-11.5 cm, asymmetrical elliptical, ovate or obovate, acuminate or acuminate-caudate at apex with the obtuse acumen 5-15 mm long, usually broadly cuneate but occasionally rounded, attenuate or cordate at the asymmetrical base, sessile or with petiolules up to 20 mm; petioles 1.5-16 cm. Flowers 1.5-4.5 x 1.5-5 mm, obovoid or subglobose; pedicels 0.5-5 mm; calyx cup-shaped, shallowly divided into 3 or 4 (-6) obtuse lobes; corolla a short tube connate with the base of the staminal tube; 0.5-3.5 x 1-3.5 mm; anthers (5 or) 6-10, ovoid; ovary subglobose or ovoid, 0.25-0.8 (-1.2) x 0.3-1 mm; stigma ovoid. Fruits subglobose, ovoid, ellipsoid or pear-shaped.

*Fl.*: Oct.-Jan.

*Fr.*: Jan.-March.

*Distr.*: Baratang, Bakultala, Ramnagar, Harmander Bay in Andaman.

7. *Aglaia odoratissima* Blume, Bidjr. 171. 1825; King in J. As. Soc. Beng. 64: 67. 1895; Pannell in Kew Bull. Addl. Series 16: 237. 1992.

Trees, up to 12 m high occasionally with some white latex. Leaves imparipinnate, ovate or obovate in outline; leaflets (1-) 3-5 (-7), the laterals subopposite or opposite, 4-20 x 2-7 cm, usually elliptical sometimes asymmetrical, sometimes ovate or obovate, acuminate caudate at apex with the obtuse acumen, up to 20 mm long, rounded or cuneate at the asymmetrical base; petiolules up to 2 cm long; petioles 2-6 cm long. Male

flowers up to 1.5 mm in diameter, depressed globose, very fragrant of citronella; pedicels ca 1 mm; calyx divided almost to the base into 5 (or 6) subrotund lobes; petals 5, lemon yellow, elliptical or obovate-rotund; staminal tube shallowly cup-shaped with the apical margin incurved and shallowly 5-lobed; anthers ovoid; ovary subglobose, densely covered with stellate hairs; stigma ovoid with two small apical lobes; female flowers up to 2 mm in diameter, ovoid; loculi 1 or 2, each containing 1 ovule. Fruits ellipsoid or obovoid, rounded at apex and tapering at base, yellow, orange or orange-red.

*Fl.*: April-May.

8. *Aglaia oligophylla* Miq., Fl. Ind. Bat. Suppl. 1: 507. 1861. *A. pedicellaris* C. de Candolle in A. & C. de Candolle, Monogr. Phan. 1: 607. 1878. *A. glaucescens* King in J. As. Soc. Beng. 64: 64. 1895; Parkinson, For. Fl. Andaman Islands. 121. 1923. *A. fusca* King in J. As. Soc. Beng. 64: 62. 1895; Parkinson, For. Fl. Andaman Islands. 121. 1923.

Trees, up to 20 m high. Leaves imparipinnate, obovate in outline; leaflets 3-11, the laterals opposite or subopposite, 4-20 x 2-8 cm, subcoriaceous, obovate or elliptical, acuminate-caudate at apex with the obtuse acumen up to 10 mm long, cuneate or rounded at the symmetrical base; petiolules up to 1.2 cm on lateral leaflets, up to 2 cm in terminal leaflets; petioles up to 9 cm. Flowers up to 2 x 2.5 mm, depressed globose; pedicels up to 1.5 mm; calyx divided into 5 blunt lobes, lobes with ciliate margin; petals 5, yellow, obovate; staminal tube 1.3 mm in diameter, depressed globose; anthers 5, obovoid; ovary depressed globose; stigma nearly ovoid. Fruits 1-3 cm in diameter, subglobose.

*Fl.*: Dec.-Feb.

*Fr.*: Feb.-March.

9. *Aglaia perviridis* Hiern. in Hook. f., Fl. Brit. India 1: 556. 1875.

Trees, up to 12 m high. Leaves up to 54 cm long; leaflets 11-13, the laterals subopposite, 7-20 x 2-5 cm, lanceolate or narrowly elliptical, caudal apex with the obtuse acumen up to 2 cm long, rounded on one side and cuneate on the other at the asymmetrical base; petiolules up to 1 cm on lateral leaflets up to 2 cm on the terminal leaflets; petiole up to 10 cm

long. Flowers ellipsoid; pedicels 0.5-1 mm; calyx cup-shaped, divided into 5 broad ovate lobes, lobes with fimbriate margin; petals 5, elliptical, yellow; staminal tube 1-2 x 0.8-1.8 mm; anthers 5, 0.4-0.8 x 0.2-0.5 mm; ovary depressed globose; stigma ovoid. Fruit few, asymmetrical, ellipsoid with one side flat.

*Fl.*: June-July.

*Fr.*: July-Aug.

*Distr.*: Laful, East-West Road in S. Nicobar.

10. *Aglaia silvestris* (R. Roemer) Merrill, Interpr. Rumph. Herb. Amboin. 210. 1917. *Lansium silvestre* M. Roemer, Fam. Nat. Syn. Monogr. 1: 99. 1846. *Aglaia gangoo* Miq., Fl. Ind. Bat. Suppl. 1: 506. 1861; King in J. As. Soc. Bengal 64: 65. 1895; Parkinson, For. Fl. Andaman Islands. 121. 1923. *Amoora gangoo* (Miq.) Kurz. in J. As. Soc. Beng. 45: 123. 1876. *Amoora manni* King ex Brandis, Indian Trees 142. 1906; Parkinson, For. Fl. Andaman Islands. 123. 1923. *Aglaia manni* (King ex Brandis) Jain & Gaur, J. Econ. Tax. Bot. 7: 466. 1986.

Trees, up to 30 m high with white latex. Leaves imparipinnate, broadly oblong in outline; leaflets (5-) 13-19, the laterals alternate, 8-20 x 1.5-6.5 cm, subcoriaceous, usually oblong, sometimes lanceolate or elliptical, acuminate at apex with the obtuse acumen up to 18 mm long, rounded or shortly cuneate at the asymmetrical base; petiolules 5-15 mm; petioles 10-20 cm. Flowers obovoid, fragrant; pedicels up to 2 mm long; calyx cup-shaped, deeply divided into 5 broadly ovate lobes, lobes with ciliate margins; petals 5 (or 6), yellow, elliptical or ovate; staminal tube obovoid; anthers 5, ovoid; ovary depressed globose; stigma ovoid, with two small lobes. Fruits usually obreniform in outline, indehiscent.

*Fl.*: June-Oct.; *Fr.*: Jan.-March.

*Distr.*: Katchal in N. Nicobar; S. Nicobar islands.

11. *Aglaia spectabilis* (Miq.) Jain & Bennett, Indian J. Forestry 1984, 9 (3): 271. 1987. *Amoora spectabilis* Miq., in Ann. Mus. Bot. Lugd. Bat. 4: 37. 1868. Hiern. in Hook. f., Fl. Brit. India 1: 561. 1875. *Amoora wallichii* King in J. As. Soc. Beng 64: 56. 1895; Parkinson,

For. Fl. Andaman Islands. 123. 1923. *Aglaia hiernii* Viswanathan & Ramachandran in Bull. Bot. Surv. India 24: 212. 1983. *Aphanomixis wallichii* (King) Haridasan & R.R. Rao, For. Fl. Meghalaya 206. 1985.

Trees, up to 40 m high with white latex. Leaves imparipinnate in dense spirals, obovate in outline; leaflets (3-) 11-21, the laterals subopposites, 8-40 x 2.5-12.5 cm, coriaceous, lanceolate, oblong or elliptical, acuminate at apex with the acute-acumen up to 1.5 (-4) cm, rounded at the asymmetrical base; petiolules 8-20 mm; petioles 14-25 cm. Flowers fragrant. Male flowers 2-5 x 2-3 mm; female flowers up to 7 x 6 mm; pedicels up to 3 mm; calyx cup-shaped, divided into 3 obtuse lobes; petals 3, up to 4 x 2.5 mm, pinkish yellow or white, elliptical; staminal tube cup-shaped; anthers 6; ovary subglobose; stigma ellipsoid with 3 apical lobes and 6 longitudinal ridges. Fruits 6-9 x 5.5-9 cm, subglobose or obovoid.

Fl.: Aug.-Sept.

## 2. *Aphanamixis* Bl.

Trees; indumentum of simple hairs. Leaves pinnate; leaflets entire. Dioecious; male panicles large with spicate branches; female inflorescences spicate; male flowers smaller than female; calyx 5-lobed; petals 3, free, fused in lower half to staminal tube; staminal tube short, globose; anthers 6; antheroids without pollen; disc absent; ovary 3-celled, each cell 2-ovulate; style very short; stigma conical, 3-angular, pistillodes rudimentary. Fruit 2-3-valved. Seeds 1 or 2 per cell.

About four species from the Indo-Malayan region to New Guinea and the Solomon Islands. 1 species in A. & N. Islands.

*Aphanamixis polystachya* (Wall.) Parker in Ind. For. 57: 486. 1931. *Aglaia polystachya* Wall. in Roxb., Fl. Ind. ed. Carey and Wall. 2: 429. 1824. *Andersonia rohituka* Roxb. [Hort. Beng.: 87. 1814, *nom. nud.*] Fl. Ind. ed. 2, 2: 213. 1832. *Amoora rohituka* (Roxb.) Wight & Arn. in Wight Cat. No. 24. 1833 et Prodr.: 119. 1834; Hiern. in Hook. f. Fl. Brit. India 1: 559. 1875; Parkinson, For. Fl. Andaman Islands. 123. 1923.

Trees, 6-10 m high. Leaves 60-75 cm long; leaflets 6-7 pairs, 13-20 x 6-7 cm, ovate, apex acute, obliquely rounded at base, glabrous. Male

panicles 15-30 cm; female inflorescences as long as leaves. Fruit obovoid, 3 x 2.5 cm, glabrous. Seeds ellipsoid, brown.

Grow along water courses in evergreen forests.

*Fl.*: Aug.-Sept.; *Fr.*: May-June.

*Distr.*: M. Andaman.

### 3. *Azadirachta* A. Juss.

Trees. Leaves pinnate; leaflets serrate, oblique. Panicles axillary. Flowers 5-merous; staminal tube 10-fid at tip, disc annular. Ovary 3-celled. Drupe pulpy, cylindrical. Seeds solitary ex-arillate.

2 species in Indo-Malayan region; 1 species in A. & N. Islands.

*Azadirachta indica* A. Juss. in Mem. Mus. Hist. Nat. Paris 19: 221. t. 2. f. 5. 1830. *Melia azadirachta* Linn. Sp. Pl. 385. 1753; Hiern. in Hook. f. Fl. Brit. India 1: 544. 1875; Parkinson, For. Fl. Andaman Islands. 129. 1923.

Trees. Leaves up to 30 cm long; leaflets 5-13, obliquely lanceolate, 3-7 x 1-3 cm, apex acuminate, cuneate at base, margin dentate. Panicles up to 30 cm long. Flowers white, ca 10 mm in diameter; calyx 5-fid, lobes ovate; petals oblanceolate, ca 5 mm in diameter; staminal tube dilated above. Fruits baccate, 1-seeded, pulpy, green when young, yellow when ripe.

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

### 4. *Chisocheton* Bl.

Trees. Leaves pinnate, pseudogemmate or sometimes imparipinnate, very rarely paripinnate; leaflets 2-28 pairs, usually opposite, rarely subalternate near leaf base. Inflorescences paniculate, sometimes thyrsoid or sub-racemose, axillary or supra-axillary. Flowers unisexual, usually bracteolate; calyx obscurely 3-6 lobed, more or less cupuliform; petals (3-) 4-6 (-14), in 1(-2) whorls, free, imbricate, quincuncial or alternative, rarely united at the base, white or pink; staminal tube cylindrical, sometimes weakly expanded or contracted at the mouth, with an entire to

crenate margin or topped by 4-10 (-30) emarginate, truncate or narrowly lanceolate 2 (-3)-fid appendages; anthers (3-) 4-10 (-30), usually attached within the tube when completely included or partly exerted, hairy or glabrous, usually loculate, alternating with lobes or appendages; anther very slender, indehiscent; disk usually absent, if present narrowly or broadly stipitate, occasionally lobed; ovary 2-8 locular, loculi with 1(-2) collateral or superposed orthotropous ovules; style capitate, clavate or discoid; pistillode slender, ovules minute or wanting. Fruit a 2-5 (-8)-valved loculicidal capsule, often stipitate, sometimes rostrate, the valves 1 (-2)-seeded; pericarp usually leathery. Seeds obovoid-spheroid to scutelliform.

About 51 species distributed from eastern India to southern China, throughout the islands of the China Sea to northern Australia, and eastwards to the New Hebrides; 4 in A. & N. Islands.

- 1 a. One or more petals narrower than and enclosed by the others.....2. *C. grandiflorus*  
 b. Petals ± same width .....2
- 2 a. Hairs stellate, pericarp spongy .....3. *C. longistipitatus*  
 b. Hairs simple, pericarp not spongy .....3
- 3 a. Ovary 4-locular. Seeds 3(-4) .....1. *C. cumingianus*  
 b. Ovary 2-locular. Seeds 2 .....4. *C. nicobariamus*

1. ***Chisocheton cumingianus*** (C. DC.) Harms s.sp. ***balansae*** (C.DC.)  
 Mabberley in *Taxon* 26: 528. 1977. *C. balansae* C. DC. in *Bull. Herb. Boiss.* 2: 578. 1894. *C. paniculatus* Hiern. in *Hook. f., Fl. Brit. India* 1: 552. 1875. *nom. illeg.*

Trees. Leaves crowded in dense terminal spirals, up to 120 cm long, pseudogemmate; petiole terete or weakly flattened adaxially; leaflets in upto 15 pairs, opposite or subopposite proximally, petiolules (4)-6-12 mm long, glabrescent to tawny tomentose, ovate to elliptic, shortly cuspidate apex, base unequally acute. Inflorescences axillary, supra-axillary or borne on short-shoots on defoliated twigs; pedicel with bracteoles; calyx 1-3 mm long, campanulate, margin more or less entire; petals (3-) 4(-5), 12-20 mm long, spatulate, acute; staminal tube up to 18 mm long; anthers 6-9, loculate, elliptic-oblong, glabrous or villous; disc annular, glabrous; ovary in female flowers 3-4 locular, each cell 1(-2) ovulate; style disciform

or capitate. Infructescence a pendulous raceme, globose glabrous to velutinous, dehiscent. Seeds 3-4, arillate.

*Fl.*: June-July.

2. **Chisocheton grandiflorus** (Kurz) Hiern. in Hook. f., Fl. Brit. India 1: 552. 1875; Andaman & Nicobar Gaz. April 1900 (1900); Kloss, Andamans and Nicobars: 336. 1903; Parkinson, For. Fl. Andaman Islands: 119. 1923. *Schizochiton grandiflorum* Kurz in J. As. Soc. Bengal 41: 296. 1872.

Trees. Leaves up to 55 cm long, pseudogemmate; leaflets up to 6 pairs, narrowly oblong-elliptical, apex acute to subacuminate, weakly asymmetrical at base, arcuate, ascending. Inflorescences sparsely branched, pendent, supra-axillary. Flowers crowded at apex, pedicels absent; calyx 5-6.5 mm long, cupuliform, 4-5 toothed or entire, margin ciliate; petals 5-6, 12-14 mm long, linear spatulate, alternative, all densely pubescent; staminal tube crenulate or weakly 6-7 lobed; lobes truncate; anthers 6-8, 3-4 mm long loculate, disc cupuliform, adnate to ovary; style adpressed pubescent, subcapitate. Fruit large apple-like, 3-lobed pyriform, 3-valved.

*Fl.*: Oct.-Jan.

*Distr.*: S. Nicobar (East-West Road), Katchal island in N. Nicobar.

3. **Chisocheton longistipitatus** (F.M. Bailey) L.S. Smith in Proc. R. Soc. Queensl. 70: 29. 1959. *Castanospora longistipitata* F.M. Bailey, Queensl. Fl. 1: 288. 1899.

Trees, 15-20 m high. Leaves 40-80 cm long; rachis 2-4.5 mm in diameter, channelled with short; claw-like pseudogemmula; leaflets 2-6 pairs, 5-25 x 4-10 cm, elliptic-oblong, sparsely stellate pubescent, midrib sunken. Inflorescences 30-40 cm long, 3-6 branched; calyx subsessile, 1-3 mm long; petals 4-5, 5.5-6.5 x 0.5-0.8 mm; staminal tube 5-lobed, pubescent in the middle; anthers 5, ca 1 mm long; disk cupular; ovary 2-3 locular; style stellate pubescent below. Fruit spherical, 3-3.5 cm long, stipe 1-3 cm long, pericarp spongy. Seeds 2-3, discoid.

*Fl.*: Aug.-Dec.

*Distr.*: S. Nicobar.

4. **Chisocheton nicobarianus** H.S. Debnath & P.V. Sreekumar in J. Eco. Tax. Bot. 16. 3: 553-555. 1992.

Trees, 15-30 m high. Leaves 20-60 cm long, pseudogeminate; leaflets 3-8 pairs, opposite or sub-opposite, ovate-oblong or elliptic, 4-20 x 1.5-8 cm, apex acuminate, glaucous and sparsely pubescent adaxially, subcoriaceous; nerves 8-14 pairs; petiolules 4-8 mm long, hispid. Inflorescences axillary or supra axillary, loosely panicate, 30-60 cm long; branches 8-20, each one 3-15 cm long with clustered side branches. Flowers oblong, 8-14 mm long, white, fragrant; pedicels 1-1.5 mm long, hispid; calyx cupular, 1.5-2.5 mm long, with 4 obscure lobes, coriaceous, hispid; petals 4, spatulate, 8-12 mm long, coriaceous, sparsely hirtellous; disc absent; staminal tube 6-10 mm long, 8-lobed; lobes bidentate at apex, villous on both sides except at apex; stamens 8, anthers 1-2 mm long, densely hirsute on dorsal side; pistil 8-10 mm long; ovary oblong, 1.0-1.5 mm long, hirsute, tapering to style, hirsute; stigma capitate with an annular rim, truncate at apex. Fruits spherical *ca* 3.5 cm in diameter; stipe *ca* 5 mm long. Seeds 2, discoid, 1.5-2.0 cm in diameter.

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

#### 5. **Chukrasia** Jussieu

Trees, deciduous. Leaves odd-pinnate; leaflets entire, glabrous or with simple hairs. Flowers 4-5 merous, functionally unisexual, but appearing bisexual; calyx 4-5 lobed; petals 4-5, free, staminal tube broadly cylindrical, narrowed at apex; anthers or antherodes attached to margin; disc scarcely developed in functionally male flowers, cushion-like in functionally female flowers; ovary 3-celled, each cell with numerous ovules; style slender; stigma capitate; style & stigma more slender in pistillode. Capsule woody, ellipsoid, 3-5-valved. Seeds with terminal wing, 80-100 per cell.

About 2 species in China to Indo-malesia; 1 species in A. & N. Islands.

**Chukrasia tubularis** A.H.L. Jussieu in Mirbel & Cass. apud. Guill in Bull. Sci. Nat. Paris 23: 239. 1830. et Mus. Hist. Nat. 19: 251, t. 22, f. 27. 1832; Parkinson, For. Fl. Andaman Islands. 119. 1923; Ahmed, Ind. For. 72: 27. 1946.

Trees, ca 20 m high. Leaves 40-75 cm long; leaflets 6-8 pairs, ovate or oblong, 9-12 x 4-6 cm, apex acuminate, obliquely rounded at base. Panicles terminal; calyx 2-3 mm; petals yellow, oblong, 12 x 3 mm; staminal tube 10 x 5 mm. Ovary flask-shaped, tapering into style. Capsule ovoid-ellipsoid, 5 x 2.75 cm. Seeds 2 x 1.2 cm.

*Fl.*: May.

## 6. *Disoxylum* Bl.

Trees, indumentum of simple hairs. Leaves pinnate; leaflets entire. Dioecious, flowers in axillary thyrses; calyx 3-5 lobed; petals 3-6, free or fused to staminal tube; staminal tube cylindrical; disc tubular; ovary 2-5 celled, each cell 1-2-ovulate; stigma discoid or capitate. Fruit a 2-5 valved capsule. Seeds partly or completely surrounded by arillode.

About 60 species from the Indo-Malayan region eastwards to Australia, New Guinea and Polynesia; nine species in A. & N. Islands.

- |   |  |                             |
|---|--|-----------------------------|
| 1 | a. Calyx cup-shaped, sub entire, about half the length of the flower .....   | 3. <i>D. binectariferum</i> |
|   | b. Calyx 4-5 fid or partite or sepalous.....                                 | 2                           |
| 2 | a. Flowers paniced .....   | 3                           |
|   | b. Flowers racemose or spicate .....   | 7                           |
| 3 | a. Ovary glabrous .....  | 4                           |
|   | b. Ovary hairy .....   | 5                           |
| 4 | a. Leaves imparipinnate .....  | 2. <i>D. arborescences</i>  |
|   | b. Leaves paripinnate .....  | 6. <i>D. macrocarpum</i>    |
| 5 | a. Disk hairy .....  | 6                           |
|   | b. Disk glabrous .....   | 7. <i>D. maingyi</i>        |
| 6 | a. Leaves paripinnate .....  | 5. <i>D. gobara</i>         |
|   | b. Leaves imparipinnate .....  | 8. <i>D. thyrsoides</i>     |
| 7 | a. Leaflets suddenly acuminate, glabrous. Fruits depressed globular.....     | 1. <i>D. andamanica</i>     |
|   | b. Leaflets acute, short hairy on the nerves. Fruits ellipsoid-obovoid ..... | 4. <i>D. densiflorum</i>    |

1. **Disoxylum andamanicum** King in J. As. Soc. Beng. 64: 49. 1895; Parkinson, For. Fl. Andaman Islands. 120. 1923.

Trees, 5-7 m high. Leaves imparipinnate, ca 30 cm long; leaflets 12-24 x 10-15 cm, ovate to oblong or elliptic, suddenly acuminate, unequal at the base. Flowers in short axillary racemes, ca 1.5 cm long; petals pale yellow or cream, ca 1 cm long, reflexed; stamens 8. Fruit depressed globular, ca 4 cm in diameter.

*Fl.*: Oct.-Jan.

2. **Disoxylum arborescences** (Bl.) Miq. in Ann. Mus. Bot. Lugd. Bat. 4: 24. 1869; King in J. As. Soc. Beng. 64: 38. 1895; Parkinson, For. Fl. Andaman Islands. 120. 1923; Merrill & Perry in J. Arn. Arb. 21: 302. 1940. *Goniocheton arborescens* Bl. Rijdr. 177. 1825.

Tall shrubs or trees. Leaves imparipinnate 4-29 cm long; leaflets 5-9, 2-25 x 1.5-9 cm, oval to obovate-lanceolate, caudate, obtuse, acute base; petioles 1-8 mm. Panicles glabrous or short hairy; 2-11 cm; flowers pentamerous; pedicels 3-7 mm long; calyx ciliate, short hairy within; petals ca 7 mm long; staminal tube incised, ca 5 mm; disk outside glabrous, inside short-hairy, ovary 5-celled. Fruit 1.5-2 x 2.5-3 cm, globose-ellipsoid, 2-4 celled.

*Fl.*: Sept.-Jan.

*Distr.*: L. Andaman and Nicobar islands.

3. **Disoxylum binectariferum** Hook. f. ex Bedd. in Trans. Linn. Soc. 25: 212. 1865.

Trees, 12-15 m high. Leaves 50-75 cm long; leaflets 5-pairs, 15-30 x 7-13 cm, ovate or oblanceolate, apex acuminate, rounded at base, entire, glabrous. Thyrses up to 7 cm; flowers 4-merous; calyx subentire, 2-3 mm long; petals white, oblong, ca 7.5 mm long, pubescent; staminal tube ca 6 mm long. Capsule globose, 5-6 cm, orange-yellow, 4-5 celled. Seeds blackish red, glossy.

*Fl.*: Sept.-Dec.

4. ***Disoxylum densiflorum*** Miq. Ann. Mus. Lugd. Bat. 4: 9. 1868; Balak. in Bull. Bot. Surv. Ind. 24: 59. 1982.

Trees. Leaves imparipinnate, densely short-hairy to subglabrous, 14-65 cm; leaflets 9-21, 2.5-32 x 1.5-10 cm, oval-lanceolate, glabrous or short hairy on the nerves; petioles 1-12 mm long, densely pubescent to glabrous. Inflorescences spiciform-racemiform, 2.5-10 cm long, short hairy; flowers solitary or often fascicled, 4-5 merous; calyx ciliolate, ca 3 mm long; petals 6-10 mm; staminal tube pilose on both surfaces; style hairy. Fruit 3-6.5 cm long, ellipsoid-obovoid, 1-4 celled.

*Fl.*: May-July.

5. ***Disoxylum gobara*** (Buch.-Ham.) Marr. in Journ. Arn. Arb. 23: 173. 1942; Balakrishnan in Jour. Bomb. Nat. Hist. Soc. 67: 57. 1970; Debnath & Sreekumar in J. Eco. Tax. Bot. 16. 1: 219. 1992.

Trees, up to 15 m high. Leaves 20-40 cm long, paripinnate; rachis terete; leaflets 5-8, opposite or alternate, 6-20 x 3-8 cm, elliptic or elliptic-oblong, acuminate at apex, coriaceous, glabrous. Flowers on axillary panicles, 0.5-1 cm long, white, fragrant; pedicels short, bracteolate; bracts subulate; sepals acute, pubescent; petals 4, oblong; anthers 8, subsessile; ovary 3-4 celled, hairy; disk hairy. Capsule globose, 6 cm long. Seeds arillate.

*Fl.*: Nov.-Jan.

6. ***Disoxylum macrocarpum*** Bl., Bijdr. 175. 1825.

Trees. Leaves paripinnate, 14-49 cm long, varying from ovate-oval-oblong to obovate-oblong-lanceolate, glabrous; leaflets 6-13, 5-27 x 3-11.5 cm, apex acuminate, acute-rounded base; petiolules 3-12 mm. Panicles up to 18 cm long; flowers 4-merous; pedicels 2.5-4.5 cm long; panicles and pedicels powdery pubescent; calyx shortly ciliolate, inside glabrous; petals ca 7 mm long, inside glabrous; staminal tube ca 6 mm; disc outside glabrous, inside finely hairy; ovary 4-celled. Fruit subglobose-ellipsoid, 4.5-7 cm in diameter, with deep longitudinal grooves, scarlet orange-red, 1-4 celled.

*Fl.*: Dec.-Feb.

7. *Disoxylum maingyi* Hiern. in Hook. f. Fl. Brit. Ind. 1: 547. 1875.

Trees. Leaves 15-25 cm long; leaflets 5-7, opposite or subopposite, elliptic, apex obtusely acuminate, cuneate at base, 4.5-13 x 2.5-5 cm; petioles ca 1.5 cm. Panicles 3.5-4 cm long; flowers 5-merous, ca 4 cm long; calyx short, toothed; petals ca 6 mm long, adnate in bud with the glabrous staminal tube, hairy outside; staminal tube obtusely crenate; anthers 10; disc 5-toothed, hirsute inside, glabrous outside; ovary 4-celled; style 5-celled each cell opposite to calyx lobe with 2 collateral ovules.

*Fl.*: Nov.-Jan.

8. *Disoxylum thyrsoïdes* Griff. var. *andamanica* King in J. As. Soc. Beng. 64: 43. 1895; Parkinson, For. Fl. Andaman Islands. 120. 1923.

Trees, 15-20 m high. Leaves imparipinnate, 30-40 cm long; leaflets 6-9, 10-20 x 4-7.5 cm, ovate to ovate-oblong, apex shortly acuminate, oblique at base. Flowers with an unpleasant smell, 5-7 mm in diameter; petals white, tinged with purplish pink, reflexed. Fruit obovoid, 2-3 lobed, ca 2.5 cm long.

*Fl.*: Dec.-Feb.

Doubtful species:

*Disoxylum racemosum* King in J. As. Soc. Beng. 64: 47. 1895.

7. *Sandoricum* Cav.

Trees. Leaves spirally arranged, 3-foliolate; leaflets entire or rarely shallowly serrate, apex acuminate. Flowers in axillary panicles; calyx cupular-campanulate, shallowly 5-lobed; petals 5, free, expanded-reflexed, oblong-linear; stamens 10; filaments connate into a 10-fid tube; segments shortly 2-lobed to deeply bifid; anthers basifixed, oval, minutely apiculate; disc tubular, dentate; ovary at the base adnate to the calyx; cells 5, 2-ovuled; style not exerted; stigma 5 lobed half way down. Drupe depressed globose, 2-5 pyrenous, pyrenes 1-2 seeded.

About 10 species in Mauritius, Indomalasia; 1 species in A. & N. Islands.

*Sandoricum koetjapa* (Burm. f.) Merrill in Philipp. J. Sci. 7: 237. 1912. *Melia koetjapa* Burm. f., Fl. Ind. 101. 1768. *Sandoricum indicum* Cav. Diss. 7: 359. t. 202 & 203. 1789; Hiern. in Hook. f. Fl. Brit. India 1: 553. 1875; Parkinson, For. Fl. Andaman Islands. 117. 1923.

Trees. Leaves spirally arranged; petiole 2-18 cm; leaflets 4-25 x 2-15 cm, ovate-oval-oblong, acute, obtuse or rounded at base, entire or occasionally serrate; petiolules 2-12 cm. Panicles 6-24 cm long, densely pubescent to glabrous; calyx inside thinly short hairy to glabrous; petals short hairy or glabrous, yellow or tinged with red; staminal tube outside hairy or glabrous; ovary and style glabrous. Fruit yellow, velutinous, 5-6 mm in diameter.

Fl.: Feb.

#### 8. *Sphaerosacme* Wall. ex M.J. Roem.

Trees. Indumentum of simple hairs. Leaves imparipinnate; leaflets 7-13, opposite, 3.5-20 x 1.5-5 cm, oblong, apex acuminate, cuneate or nearly rounded at base, glabrescent. Inflorescences axillary or supra-axillary; flowers unisexual; calyx deeply 4- or 5-lobed; petals 5, free, imbricate; staminal tube ca 0.2 cm long, almost globose, margin undulate; anthers 10, glabrous, in 2 whorls of 5, upper partly exerted, the lower alternating with the upper and completely included; disc absent; ovary with 5 uniovulate loculi; style absent; style head broad, pileate, 5-lobed. Fruit 2-5 valved capsule.

One species in Sikkim, Bhutan, Nepal and A. & N. Islands.

*Sphaerosacme decandra* (Wall.) Pennington in Blumea, 22. 3. 488. 1975. *Aglaia decandra* Wall in Roxb., Fl. Ind. (ed. Carey) 2. 427. 1824. *Amoora decandra* Hiern. in Hook. f. Fl. Brit. Ind. 1: 562. 1875.

Description as for *Sphaerosacme*

Fl.: June-August.

#### 9. *Trichllia* P. Br.

Trees or shrubs. Leaves pinnate; leaflets alternate, entire. Inflorescence a corymbose panicle. Flowers 4-5 merous; stamens united half way with

anthers at the notches; disc fleshy, cupular; ovary 2-3 celled; immersed in disc. Capsules 2-valved, 1-seeded.

About 300 species in Mexico to tropical South America, West Indies and tropical Africa; 1 species in A. & N. Islands.

**Trichilia connaroides** (W. & A.) Benthelzen in Acta Bot. Neerl. 11: 13. 1962; Debnath & Sreekumar in J. Eco. Tax. Bot. 16. 1: 219. 1992.  
*Xanthoxylum connaroides* W. & A., Prodr. 148. 1834.

Trees, 10-15 m high; young branches pubescent, vertically furrowed. Leaves alternate, imparipinnate, 15-30 cm long, 5-11 foliolate; leaflets 2-10 x 1-3 cm, ovate-oblong or lanceolate, acuminate, base obtuse, dark green glossy above, glaucous beneath; petiolules 0.5-1 cm long. Panicles axillary, corymbose, 20-30 cm long; calyx 5-fid; petals 5, white; staminal tube 8-10 lobed; anthers apiculate; disc annular, fleshy; ovary 2-3 celled; ovules 2 in each cell; style dilated; stigma bifid. Capsule globose, 1-celled, 2-valved, 1-seeded, glabrous, pale green when young, glossy when ripe. Seed with a thin, white aril.

*Fl.*: Nov.-Jan.

*Fr.*: Jan.-April.

## 10. *Walsura* Roxb.

Trees, indumentum of simple and/or bifid hairs. Leaves trifoliolate or odd pinnate; leaflets entire. Flowers in axillary thyrses, bisexual or unisexual; calyx 5-lobed; petals 5, free, valvate to imbricate; stamens 10; filaments connate below and often with a pair of lanceolate apical appendages; antheroides smaller, without pollen; disc annular; ovary usually 2-celled; stigma capitate; pistillode flattened; stigma broader than in female and bisexual flowers. Fruit a berry, 1-2 seeded.

About 30-40 species in Himalaya and Sri Lanka to S. China, Indochina, W. Himalaya, Celebes, W. Malaysia; 5 species in A. & N. Islands.

- |  |   |
|--|---|
| 1 a. Leaves less than 30 cm long ..... | 2 |
| b. Leaves more than 30 cm long .....   | 3 |

- 2 a. Leaflets finely papery with long acuminate tip .....5. *W. oxycarpa*  
 b. Leaflets not papery, apex acute .....1. *W. candollei*
- 3 a. Filaments bidentate at apex .....3. *W. pinnata*  
 b. Filaments not bidentate at apex .....4
- 4 a. Filaments subulate .....4. *W. robusta*  
 b. Filaments not subulate .....2. *W. hypoleuca*

1. **Walsura candollei** King in J. As. Soc. Beng. 64: 85. 1895; Brandis, Ind. Trees 136. 1906; Parkinson, For. Fl. Andaman Islands. 122. 1923.

Trees. Leaves imparipinnate, 10-17 cm long; leaflets-5, 5-10 cm long, lanceolate, apex acute, rounded at the base, pale beneath. Flowers in corymbose panicles, small; sepals & petals 5; stamens 10, yellow; filaments connate one third of their length. Berry ca 2 cm long, ovoid-globose, densely and minutely rusty puberulous.

Endemic to Andaman islands.

*Fl.*: April-June; *Fr.*: June-July.

*Distr.*: Baratang (Bamboo nallah side) in S. Andaman.

2. **Walsura hypoleuca** Kurz, Rep. Veg. Andam. ed. 2: 33. 1870; Parkinson, For. Fl. Andaman Islands. 122. 1923.

Trees. Leaves 20-40 cm long; leaflets 5, 10-15 x 4-7.5 cm, elliptic to oblong-lanceolate, apex acuminate, quite glabrous, chartaceous, glaucous beneath. Panicles puberulent, shorter than leaves; calyx 5-partite; petals 5, occasionally 8, white; stamens 10 (sometimes 15); filaments linear, densely pubescent on both sides; connate on one third way or less, equal; ovary densely tawny tomentose. Berry ca 1.5 cm long, oblong, acuminate.

*Fl.*: Jan.-Feb.

*Distr.*: Rutland and Barakhari in S. Andaman.

3. **Walsura pinnata** Hassk., Retzia, 1: 147. 1963; P.S.N. Rao & S.P. Mathew in Journ. Bomb. Nat. Hist. Soc. 89. 3: 392. 1992.

Trees, 10-12 m high. Leaves *ca* 30 cm long, imparipinnate; petiole up to 8 cm long; leaflets subopposite, 3-5, 12-15 x 3.0-4.5 cm, ovate-oblong, entire, retuse or shortly acuminate. Flowers in axillary and terminal panicles or corymbs, peduncle and pedicel finely hairy; sepals 5, triangular, connate, puberulous; petals 5, white, erect-upcurved, ovate-oblong, puberulous; stamens 10, hairy around the disc; filaments free or shortly connate, flattened, bidentate at apex; anthers basifixed, ovoid; disc annular, puberulous; ovary 2-celled, each cell 2-ovulate; style short; stigma broad.

*Fl.*: Jan.-Feb.

*Distr.*: North and South Andaman.

4. **Walsura robusta** Roxb., Hort. Beng. 32: 1814; Parkinson, For. Fl. Andaman Islands. 122. 1923.

Trees, up to 30 m high. Leaves *ca* 30 cm; leaflets 5 or sometimes 3, 5-15 x 2.5-8 cm, apex acuminate, rounded at base, glossy above. Thyrses almost as long as leaves, densely almost as long as leaves, densely pubescent. Flowers *ca* 4 mm across. Staminal tube white, pubescent below. Fruit subglobose, 12-16 mm in diameter.

*Fl.*: Jan.-April.

*Distr.*: Rutland in S. Andaman.

5. **Walsura oxycarpa** Kurz in J. As. Soc. Beng. 44: 200. 1875; Naithani in Fl. Plants of India, Nepal & Bhutan 89. 1990.

Trees. Leaves imparipinnate, 12-18 cm long; leaflets 5, 7-11 cm long, finely papery, long acuminate, rounded at base, glaucescent beneath, lanceolate-oblong lanceolate. Panicles and peduncle sparingly branched. Flowers in axillary thyrses. Berry ovate-oblong, acuminate, about 2 cm long, densely covered with fine, short, erect hairs.

*Fl.*: Dec.-Feb.

### 11. **Xylocarpus** Koen.

Trees or shrubs. Leaves paripinnate; leaflets (1) 2 or 3 (4) pairs, entire, glabrous. Flowers unisexual, but with well developed vestiges of the

opposite sex present, borne in short, little branched, axillary thyrses; calyx 4-lobed to about the middle, valvate; petals 4, free, patent-reflexed; stamens 8, around the disc; filaments connate, shortly 8-fid; anthers medifixed, oval; ovary 4-locular, each locule with 3 or 4(-6) ovules; disc large, red, cushion-shaped, situated beneath or surrounding and fused to the ovary and free from the staminal tube; style short; stigma peltate, orbicular. Capsule globose-ovoid, fleshy. Seeds 8-20, pyramidal or tetrahedral.

An old world genus in mangrove swamps or coastal scrub forests; four species in A. & N. Islands.

- 1 a. Buttresses present. Staminal teeth prominent .....2
- b. Buttresses absent. Staminal teeth obscure .....3
- 2 a. Stem smooth. Leaflets obovate. Fruits 20-35 cm in diameter .....  
.....2. *X. granatum*
- b. Stem rough and fissured. Leaflets elliptic-oblong. Fruits 7-13 cm in diameter .....1. *X. gangeticus*
- 3 a. Leaflets ovate. Stigma cupular. Fruits 5-7 cm in diameter .....  
.....4. *X. moluccensis*
- b. Leaflets elliptic-oblong. Stigma discoid. Fruits 8-15 cm in diameter.....  
.....3. *X. mekongensis*

1. **Xylocarpus gangeticus** (Prain) C.E. Parkinson, Ind. For. 60. 2: 140. 1934. *Carapa moluccensis* Lamk. var. *gangetica* Prain, Rec. Bot. Surv. Ind. 2: 292. 1903. *Carapa* sp. No. 116, Parkinson, For. Fl. Andaman Islands. 118. 1923.

Trees, 10-15 m high with small buttresses. Stem base with pointed pneumatophores. Leaves with two pairs of leaflets; leaflets elliptic-oblong, apex rounded. Flowers in axillary thyrses, white with reddish gland inside; calyx 4-lobed; petals 4, free. Fruits globose, obscurely 4-lobed.

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

Grows in tidal forests.

2. **Xylocarpus granatum** Koenig, in Natur. f. 20: 2. 1784. *Carapa obovata* Blume Bijdr. 179. 1825; Parkinson, For. Fl. Andaman Islands. 118. 1923.

Trees, 5-12 m high, buttressed. Leaves unijugate or bijugate; leaflets obovate or obovate-oblong, entire, rounded at apex, base narrowed. Flowers in axillary thyrses, white with a reddish gland inside; calyx 4-lobed; petals 4, free. Fruits globose, splitting tardily into 4-valves. Seeds pyramid-shaped.

Found in association with *Rhizophora* sp., *Kandelia candel* and *Sonneratia alba*. Common on sheltered banks in the mangrove forests and forms one of the important constituents of the mangrove forests.

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

3. **Xylocarpus mekongensis** Pierre, Fl. Cochinch. t. 359. B. 1897; Banerjee *et al.* in Mangrove in India Identification Manual, Calcutta 60. 1989.

Trees up to 15 m high, trunk ca 50 cm in diameter at base; bark reddish brown, peeling off into thick flakes, stem base with woody pneumatophore or blind root, suckers. Leaves paripinnate, mostly bijugate; leaflets 2-4 paired, each 9-18 x 4-7 cm, elliptic-oblong, obtuse at both ends. Flowers white, in axillary panicles. Fruits 8-12 cm across, brown, globose, capsular. Seeds tetrahedral.

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

Distribution of this species in Andaman and Nicobar Islands was recorded by Banerjee *et al.* (l.c.). No further collections are available.

4. **Xylocarpus moluccensis** (Lamk.) Roem. Sym. Hesper 1: 124. 1846. *Carapa moluccensis* Lamk. Encyl. 1: 621. 1785; Parkinson, For. Fl. Andaman Islands. 118. 1923.

Small trees, 5-8 m high. Stem base with pneumatophores. Leaves with 2 or 3 pairs of leaflets; leaflets ovate, acute at apex, oblique at base, dark green above, coriaceous. Flowers white with red gland inside. Fruits globose.

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

Common along beaches and apparently favouring open coast.

**DICHAPETALACEAE**

(P. Lakshminarasimhan)

4 genera and ca 220 species occurring in tropics; 1 genus & 3 species in A. & N. Islands.

**Dichapetalum Thou.**

Monoecious or dioecious trees, shrubs or lianas. Leaves spiral, but usually pseudo-distichous, short-petioled, pinnatinerved, orbicular flat glands nearly always present on leaf surface mostly beneath in basal part. Inflorescences axillary, dichotomously branched or glomerulous. Flowers 5-merous. Stamens episepalous. Disc consisting of 5 intrastaminal, epipetalous lobes. Pistil 2 or 3-merous. Drupes usually tomentose, more or less lobed.

About 200 species, most of them local endemics in Africa; 2 species and 1 subspecies from A. & N. Islands.

- 1 a. Leaves more or less densely pubescent beneath; fruits 1-7, entire or 2-lobed, pericarp without sutures .....3. *D. timoriense*
- b. Leaves glabrous or subglabrous beneath; fruits 1-4, distinctly 2, 3-lobed, pericarp with distinct sutures .....2
- 2 a. Leaves with a few glands, usually only beneath near the base; fruits usually 1,2-lobed .....1. *D. gelonioides* ssp. *andamanicum*
- b. Leaves with a few glands, scattered beneath, especially on the nerves and midrib; fruits up to 4,3-lobed .....2. *D. platyphyllum*

1. ***Dichapetalum gelonioides* (Roxb.) Engl. ssp. *andamanicum* (King)** Lecnh. in Reinwardtia 4: 83. 1956 & in Steenis, Fl. Males. 1, 5: 312. 1957. *Chailletia andamanica* King in J. As. Soc. Beng. 64 (2): 93. 1895; Parkinson, For. Fl. Andaman Islands. 124. 1923. *Dichapetalum andamanicum* (King) Engl. in Engl. & Prantl, Pflanzenfam 3,4: 348. 1896.

Trees or shrubs, 3-8 m high; branchlets blackish when dry, finely puberulous and angled in young, glabrous, lenticellate and terete in old. Leaves coriaceous, yellowish-green when dry, elliptic-obovate, obovate or oblanceolate, rarely elliptic up to 13 x 5.5 cm, shortly and bluntly acuminate at apex, cuneate at base, entire; lateral nerves 3-7 pairs. Flowers white or greenish-white, ca 4 mm across. Calyx puberulous to pubescent.

Ovary covered with soft white hairs. Drupes ovoid, faintly compressed or globose, up to 10 x 8 mm, usually bilobed, each with a groove on either side; stone tuberculate.

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

*Distr.*: North, Middle and South Andaman-Endemic.

Endemic to the islands and occurring in the inland forests.

2. ***Dichapetalum platyphyllum*** Merr. in Philipp. J. Sci. 30: 401. 1926; Leenh. in Reinwardtia 4: 81. 1956 & in Steenis, Fl. Males. 1, 5: 310. 1957; Lakshminarasimhan & Srivastava in Indian J. For. 15: 83. 1992.

Lianas or a tree ca 5m high; branchlets terete, early glabrescent, dark brown, faintly ribbed, gland-dotted. Leaves coriaceous, glabrous above, puberulous beneath, elliptic, oblong-elliptic or rarely obovate, up to 20 x 9.2 cm, acuminate or rarely obtuse at apex, cuneate or slightly oblique at base, entire; lateral nerves 5-9 pairs. Infructescences distinctly stalked. Drupes 1-4, globose, ca 3 cm across, 3-lobed with a distinct suture on each lobe, lobes obovoid; seeds 3, 1 per locule, ca 15 x 8 mm, pear-shaped, violet-brown when dry.

*Fr.*: September-November.

*Distr.*: North & South Nicobar.

Rare in the inland forests.

3. ***Dichapetalum timoriense*** (DC.) Boerl., Handl. 1: 199. 1890; Leenh. in Reinwardtia 6: 78. 1954 & in Steenis, Fl. Males. 1, 5: 307. 1957. *Chailletia timoriensis* DC., Prodr. 2:57. 1825. *C. deflexifolia* Turcz. in Bull. Soc. Nat. Mosc. 36 (1): 611. 1863; Hook. f., Fl. Brit. India 1: 571. 1875 incl. var. *tomentosa*. *Dichapetalum deflexifolium* Boerl., *op. cit.*

Lianas, young branchlets densely pubescent, terete, older branchlets glabrous, purplish-brown to greyish with prominently protuberant lenticels. Leaves glabrous above, densely pubescent beneath, oblong, elliptic-ovate to obovate or rarely orbicular, up to 20 x 12 cm, abruptly acuminate at apex, cuneate or rounded at base, entire; lateral nerves 5-8 pairs. Flowers

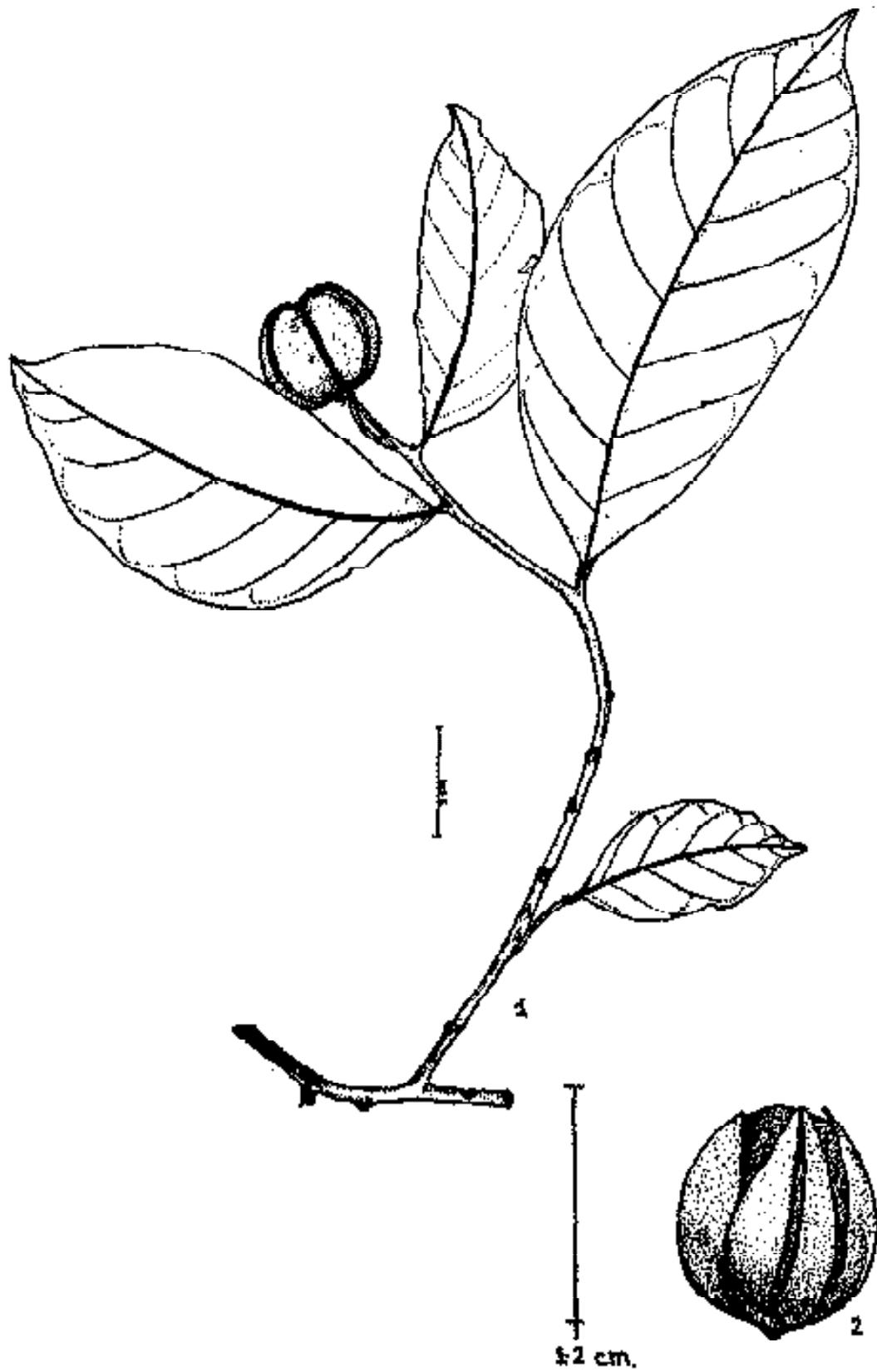


Fig. 2: *Dichapetalum platyphyllum* Merr.  
 1. Twig 2. Fruit

white, ca 3 mm long. Drupes 1-7, up to 3.8 cm in diam., ovoid more or less pear shaped or cordate, entire or 2-lobed, densely fulvous velvety pubescent, golden-brown when fresh; seeds 1-2.

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

*Distr.*: South Nicobar.

A few in the inland forests associated with *Ficus*, *Leea* and *Mussaenda*.

### OLACACEAE

About 25 genera and 250 species distributed in tropics; 5 genera and 5 species in A. & N. Islands.

- 1 a. Fertile stamens isomerous with and opposite petals .....2
- b. Fertile stamens anisomerous or twice or thrice the number of petals.....3
- 2 a. Lianas; young branchlets provided with shortly bifid tendrils; leaves palmatinerved at base, higher up with several pinnate nerves; leaf-base subpeltate; calyx adherent to fruit .....2. *Erythropalum*
- b. Erect trees or shrubs; tendrils absent; leaves penninerved; leaf-base and calyx not as above .....1. *Anacolosa*
- 3 a. Staminodes present; fruiting calyx much enlarged, enclosing lower 2/3 of fruit. ....4. *Olax*
- b. Staminodes absent; fruiting calyx not as above .....4
- 4 a. Branches spiny; stamens 8 or 10, half of them epipetalous, the other columnar; stigma simple. ....5. *Ximentia*
- b. Branches unarmed; stamens 12-15, all epipetalous; stigma capitate, obscurely 3-lobed .....3. *Ochanostachys*

#### 1. *Anacolosa* Bl.

Shrubs or trees. Leaves petiolate, 1-nerved. Inflorescences cymose, axillary. Calyx cup-shaped, 5-7 toothed. Petals 5-7, free. Stamens concealed in cavity of petals and slightly adnate to their base. Ovary imperfectly 2-3 celled below, 1-celled above; style simple, stigma shortly lobed. Drupes surrounded by accrescent disc; stone crustaceous, 1-seeded.

ca 15 species in the old world tropics, of which 1 species in Central Africa, 2 in Madagascar, the rest in S. India to Assam, Myanmar, Andaman & Nicobar Islands, Indochina, Thailand, Malesia and the Pacific; 1 species in A. & N. Islands.

1. *Anacolosia frutescens* (Bl.) Bl., Mus. Lugd.-Bat. 1: 251, f. 46. 1850; Sleum. In Blumea 26: 150. 1980 & in Steenis & de Wilde, Fl. Males. 1, 10: 25. 1984 *Stemonurus frutescens* Bl., Bijdr. 649. 1826. *Anacolosia puberula* Kurz in J. As. Soc. Bengal 41 (2): 297. 1872; Mast. in Hook. f., Fl. Brit. India 1: 581. 1875. 5. *A. heptandra* Maing. ex Mast. in Hook. f., *op. cit.* *A. puberula* var. *andamanica* King in J. As. Soc. Bengal 64 (2): 110. 1895; Parkinson, For. Fl. Andaman Island. 125. 1923.

Large shrubs or small trees, 3-8 m high; branchlets flattened in young portions, terete in older portions, pale brown to black. Leaves coriaceous, pale brown to dark brown when dry, elliptic, ovate-elliptic, ovate-lanceolate or rarely obovate, up to 16 x 5.5 cm, acuminate, acute or rarely obtuse at apex, cuneate or rounded at base, entire; lateral nerves 3-8 pairs. Flowers yellow, pale cream or green, ca 3 mm long. Drupes obovoid or ovoid, up to 1.2 cm long, deep yellow, minutely velvety.

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

*Distr.*: Middle & South Andaman. North & South Nicobar.

Common.

*Notes*: According to A. Chakrabarty in Bull. Bot. Surv. India 14: 171-172. (1972) 1975, the occurrence of *A. griffithii* Mast. as mentioned in Hook. f., Fl. Brit. India 1: 580 1875 was based on the misidentification and the genus *Anacolosia* Bl. is represented in these islands only by the two taxa, viz., *A. puberula* Kurz and *A. puberula* var. *andamanica* King. Kurz's collection at CAL. (acc. No. 182964) labelled as *A. griffithii* Mast. matches exactly with King's material 64: 101. 1895) stated that he had not found any materials which can be called *A. griffithii* Mast. from Andaman and all materials he found were *A. puberula* var. *andamanica* Sleumer (*op. cit.*) merged *A. puberula* and *A. puberula* var. *andamanica* under *Anacolosia frutescens* (Bl.) Bl.

## 2. *Erythropalum* Bl.

Climbing cirrhose shrubs. Leaves petiolate. Flowers hermaphrodite. Calyx limb 4-5 parted. Corolla rotate-campanulate, deeply 5-lobed. Stamines 5, alternate with lobes of calyx. Ovary tapering at apex into a short style, 1-celled, stigma minute, 3-lobed. Fruits fleshy, indehiscent; seed 1, pendulous.

Monotypic. Widely spread in S. India, and from the E. Himalaya to Assam, Bengal, Myanmar and the Andaman Islands, Indochina and Malesia.

1. *Erythropalum scandens* Bl. Bijdr. 922. 1826; Mast. in Hook. f., Fl. Brit. India 1: 578. 1875; Sleumer in Blumea 26: 151. 1980 & in Steenis & de Wilde, Fl. Males. 1, 10: 17. 1984. *E. populifolium* Mast. in Hook. f., *op. cit.* *E. vagum* Mast. in Hook. f., *op. cit.*

Undershrubs or large lianas; bark yellowish-brown; branchlets puberulous or large lianas; bark yellowish-brown; branchlets puberulous, striate. Leaves membranous, elliptic to elliptic-oblong or lanceolate-oblong, up to 16 x 7.1 cm, acuminate at apex, broadly rounded at base, entire; lateral nerves 4-7 pairs. Flowers pale yellow, ca 3 mm across, on slender pedicels, forming slender long-peduncled, 2-cleft cymes up to 13 cm long, in leaf axils. Drupes ellipsoid-oblong, up to 2.5 x 1.2 cm, crustaceous, yellow, crowned by the scars of calyx-limb, stalked.

*Fl.*: March-April.

*Distr.*: Andaman Islands (Sleumer.)

## 3. *Ochanosiachys* Mast.

A tree or shrub. Leaves petiolate, 1-nerved. Flowers numerous, on long, slender, branching axillary spikes. Calyx cup-shaped, 4-5 toothed. Petals 4-5, free, hairy within. Disc hypogynous, fleshy. Ovary free, incompletely 3-celled beneath, 1-celled above.

Monotypic, endemic in Malesia, its occurrence in A. & N. Islands scarcely doubtful.

1. **Ochanostachys amentacea** Mast. in Hook. f., Fl. Brit. India 1: 577. 1875; Sleum. in Bleumea 26: 153. 1980 & in Steenis & de Wilde, Fl. Males. 1, 10: 14. 1984; Vasud in J. Econ. Tax. Bot. 8: 118. 1986.

Trees, 10-30 m high; branchlets terete, glabrous or puberulous. Leaves coriaceous, oblong, ovate to elliptic or elliptic-oblong, up to 15 x 7 cm, shortly acuminate at apex, broadly cuneate to rounded at base, entire; lateral nerves *ca* 5 pairs, distinct, arching. Flowers green to whitish-yellow, *ca* 2.5 mm long. Drupes subglobose, *ca* 2.5 cm across, green, ripens yellow; seed 1, subglobose.

*Distr.*: Andaman & Nicobar Islands (Vasud.)

#### 4. **Olax** L.

Trees or shrubs, often scandent. Leaves petioled. Racemes axillary, simple or branched. Calyx minute. Petals hypogynous. Staminalodes 5-6, bifid. Ovary free, surrounded by a shallow, cup-shaped, hypogynous disc, 3-celled below, 1-celled above, style simple, stigma 3-lobed. Stone crustaceous, 1-celled, 1-seeded.

*ca* 40 species; in the old world tropics, subdivided by Engler into African sections, and a fifth sect. *Triandrae* Engl. which comprises both African species and all those found in Asia, Malesia (2 spp.), Australia and the Pacific.; 1 species in A. & N. Islands.

1. **Olax imbricata** Roxb., Fl. Ind. 1: 169. 1820; Mast. in Hook. f., Fl. Brit. India 1: 575. 1875; Parkinson, For. Fl. Andaman Island. 125. 1923; Sleum. in Steenis & de Wilde, Fl. Males, 1,10: 8. 1984; Nayar & Giri in Bull. Bot. Surv. India 27: 258. (1985) 1987. *O. imbricata* var. *membranifolia* Kurz in J. As. Soc. Bengal 45 (2): 123. 1876.

Climbers or scandant shrubs; branchlets terete, greyish, lenticellate. Leaves coriaceous, ovate-oblong, oblong-lanceolate, oblong, lanceolate or elliptic, up to 15 x 5.8 cm, acute or acuminate at apex, rounded at base, entire; lateral nerves 4-7 pairs. Flowers white or greenish, *ca* 1.2 cm long. Drupes globose, *ca* 1.2 cm across, orange, enveloped by accrescent calyx.

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

*Distr.*: Middle & South Andaman; North & South Nicobar.

*Notes*: Nayar & Giri (*op. cit.* 257) do not agree with Sleumer (Blumea 26: 156. 1980) who merged *O. wightiana* Wall. ex Wight & Arn. with *O. imbricata* Roxb. According to them these are two distinct species, and they give a comparative study of the two taxa in respect of their taxonomic characters.

### 5. *Ximenia* L.

A shrub or low tree. Leaves shortly petioled, 1-nerved. Flowers racemose, usually hermaphrodite. Calyx cupular, 4-5 toothed, persistent. Petals 4-5, revolute, hairy within. Stamens hypogynous. Ovary sessile, 4-celled. Drupes 1-celled; stone solitary.

8 species; in the (sub) tropics, 1 of them (*X. americana*) pan tropical; 1 in A. & N. Islands.

1. *Ximenia americana* L. Sp. Pl. 1193. 1753; Mast. in Hook. f., Fl. Brit. India 1: 574. 1875; Parkinson, For. Fl. Andaman Islands. 124. 1923; Sleum. in Blumea 26: 166. 1980 in Steenis & de Wilde, Fl. Males. 1, 10: 11. 1984.

Staragglng shrubs or small trees, 4-5 m high; branchlets straight, stiff, angled and armed with straight spines, blackish-brown to grey, ribbed, lenticellate. Leaves coriaceous, pinkish-brown to black when dry, ovate to broadly elliptic or obovate, up to 6 x 3.5 cm, emarginate or obtuse with a short mucro at apex, cuneate or rounded at base, entire; lateral nerves 4-8 pairs. Flowers yellowish-white or white, ca 1.2 cm across. Drupes globose, ca 2 cm across, ripens yellow.

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

*Distr.*: North & South Andaman. North Nicobar.

Occasional in littoral forests.

### ICACINACEAE

About 58 genera with 400 species, predominantly in tropics; 5 genera and 6 species in A. & N. Islands.

- 1 a. Climbing shrubs or lianas .....2  
 b. Erect trees or shrubs .....3
- 2 a. Branchlets usually bearing bifid tendrils; leaves opposite decussate, reticulations a little raised beneath; flowers in lax cymes; filaments shorter than anthers; exocarp of fruits redish, rufous tomentose .....3. *Iodes*  
 b. Branchlets without tendrils; leaves spiral, reticulations prominent on both sides; flowers in interrupted spikes; filaments longer than anthers; exocarp of fruits bright orange-red or yellow, soft velvety tomentose.....  
 .....4. *Sarcostigma*
- 3 a. Anther filaments glabrous; drupes with a thick fleshy laterally borne adnate appendage and longitudinal median furrow on ventral side.....  
 .....1. *Codiocarpus*  
 b. Anther filaments bearded below cells, on back or on connectives; drupes not as above .....4
- 4 a. Flowers bisexual; disc prominent; drupes large, 3.5-5.5 cm long .....  
 .....5. *Stemonurus*  
 b. Flowers unisexual; disc absent or obscure; drupes small, 1-2.8 cm long ...  
 .....2. *Gomphandra*

### 1. *Codiocarpus* Howard

Dioecious trees. Leaves spirally arranged, entire, penninerved. Calyx cup-shaped. Petals minutely inflexed at apex. Male flowers: stamens exerted, rudiment of ovary present. Female flowers: staminodes present; ovary with a lateral oblong swelling, stigma obscurely 3-lobed. Drupes oblong, flattened; seed 1 with copious endosperm.

2 closely related species, 1 in A. & N. Islands, the other in Philippines.

1. *Codiocarpus andamanica* (Kurz) Howard in Brittonia 5: 57. 1943. *Apodytes andamanicus* Kurz, Andam. Rep. 35: 33. 1870 & in J. As. Soc. Bengal 41 (2): 298. 1872; Mast. in Hook. f. Fl. Brit. India 1: 588. 1875. *Gomphandra andamanica* (Kurz) King in J. As. Soc. Bengal 64 (2): 115. 1875; Parkinson, For. Fl. Andaman Islands. 126. 1923.

Trees, 3-30 m high; branchlets yellow-puberulous, terete, with striations in younger portions. Leaves coriaceous, dark green and glossy above, pale beneath, oblong to elliptic-lanceolate, elliptic to elliptic-oblong

or obovate to obovate-oblong, up to 24 x 10.5 cm, acuminate at apex, rounded, truncate or cuneate at base; lateral nerves 3-12 pairs. Inflorescences cymose, axillary or on leafless branches up to 3 cm long. Flowers white or whitish-yellow, *ca* 4 mm across. Drupes with *ca* 7 longitudinal ridges on dorsal side and a single furrow on ventral side, white; seed *ca* 14 x 4 mm, with 6-7 veins, anastomosing on dorsal side and a single longitudinal median furrow on ventral side.

*Fl. & Fr.*: December-May or almost throughout the year.

*Distr.*: Andaman islands.

Common in tropical forests.

## 2. *Gomphandra* Wall. ex Lindl.

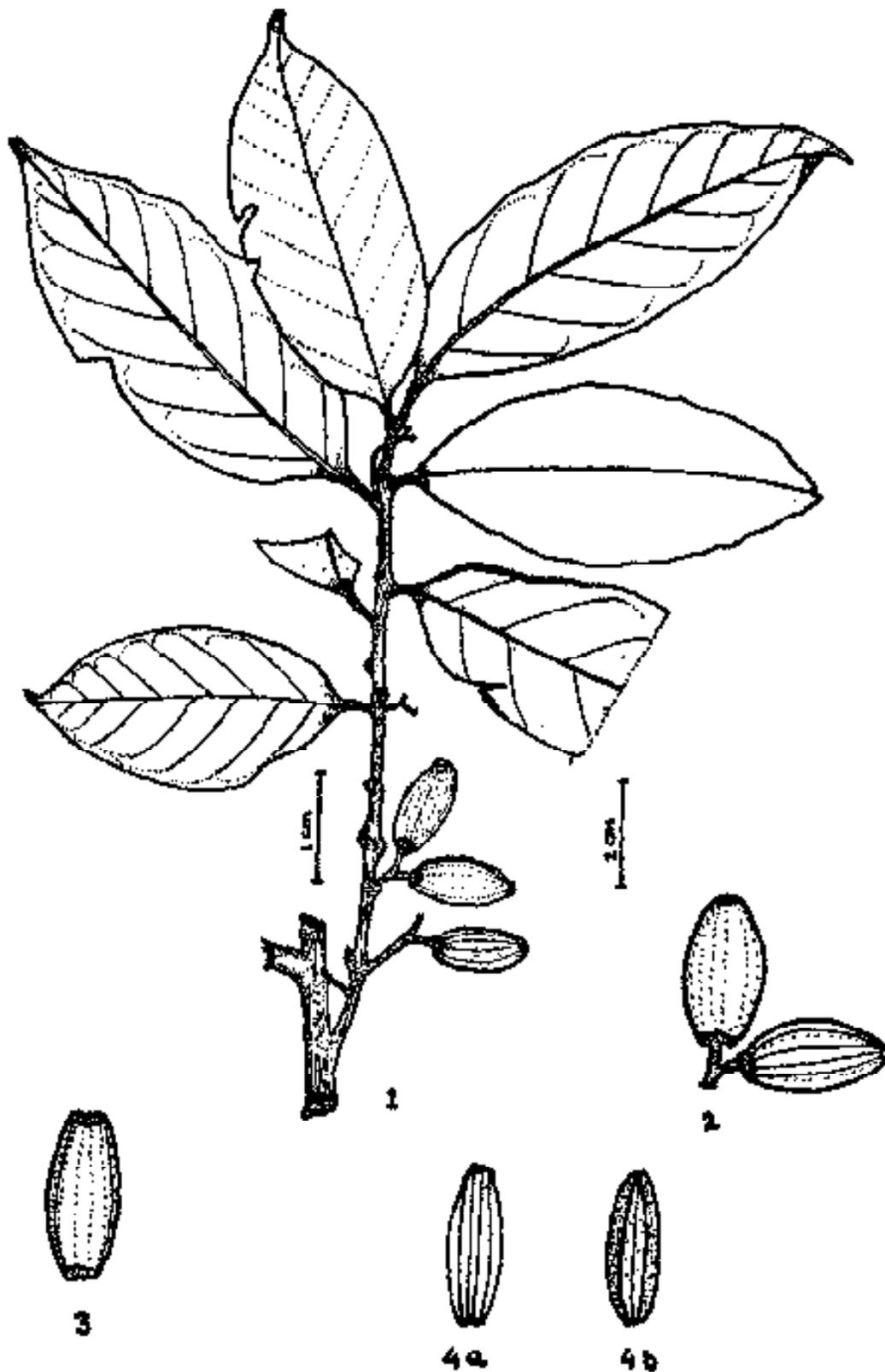
Dioecious trees, rarely shrubs. Leaves spirally arranged, entire. Flowers in cymes, loose to subcapitate. Calyx cupular, minute, subsistent. Petals inflexed at tips. Male flowers: stamens free, rudiment of ovary conspicuous. Female flowers: stigma large, thick-discoid; Drupes crowned by large persistent stigma; seed 1.

About 33 species distributed from S.E. Asia to Solmon Island; 2 species in A. & N. Islands.

- 1 a. Leaves thinly coriaceous; inflorescences compact, umbelliform; corolla lobes broadly oblong, obtuse; drupes narrowly ellipsoid ..... 1. *G. comosa*
- b. Leaves membranous to chartaceous; inflorescences with more laxly arranged and divergent branches; corolla lobes ovate, acuminate; drupes oblong. .... 2. *G. tetrandra*

1. ***Gomphandra comosa*** King in J. As. Soc. Bengal 64 (2): 112. 1895; Parkinson, For. Fl. Andaman Islands. 126. 1923; Sleum. in Blumea 17: 199. 1969.

Shrubs or trees, 3-8 m high; branchlets greyish to blackish or pinkish. Leaves dark green above, pale beneath, oblong to elliptic-oblong or elliptic, rarely obovate-elliptic or lanceolate, up to 17.5 x 9.8 cm, shortly acuminate at apex, attenuate, cuneate or oblique at base; lateral nerves 5-8 pairs. Inflorescences up to 1.4 cm long. Flowers greenish or whitish, *ca* 2.5 mm across. Drupes up to 2.8 x 1 cm, with *ca* 10 irregular longitudinal ridges



**Fig. 3: Gomphandra comosa king**  
 1. Habit, 2. Drupes 3. Single drupe 4a. Endocarp of fruit with ribs & 4b. Seed ventral side with a furrow

on dorsal side and a single longitudinal ridge on ventral side, white or dark brown when dry; seed ellipsoid, *ca* 22 x 4 mm, dorsal side smooth, ventral side slightly wrinkled with a pair of lateral veins.

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

*Distr.*: South Andaman. North & South Nicobar.  
Endemic.

2. **Gomphandra tetrandra** (Wall. ex Roxb.) Sleum. in Notizbl. Berl.-Dahl. 15: 238, 1940 & in Blumea 17: 204, 1969; Lakshminarasimhan *et al.* in J. Bombay Nat. Hist. Soc. 88: 310, (1991) 1992. *Lusianthera tetrandra* Wall. ex Bedd., Fl. Sylv. 3: t. 61. descr. 1871; *p.p.*; Mast. in Hook. f., *op. cit* incl. all vars. *p.p.*

Trees, 15-18 m high; branchlets greyish, terete, pubescent when young, later glabrous. Leaves greyish to black when dry, elliptic to oblanceolate, up to 15.8 x 6.3 cm, acuminate at apex, cuneate at base; lateral nerves 5-8 pairs. Cymes axillary, puberulous, dichotomously branched, up to 2.5 cm long. Flowers *ca* 3 mm long. Drupes smooth; seed large, integument striated.

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

*Distr.*: South Nicobar.

Frequently in hill forests near ditches.

### 3. **Iodes** Bl.

Dioecious climbing shrubs or lianas. Leaves entire, penninerved. Inflorescences cymose. Calyx minute, cup-shaped, persistent in female. Petals generally connate at base only, persistent in female. Male flowers: stamens equal in number to and opposite lobes of corolla; ovary rudimentary. Female flowers: ovary sessile, stigma sessile, dissoid, 5-lobed. Drupes surrounded at base by persistent calyx; seed 1.

About 14 species in tropical Africa, Madagascar and Indo-malayan regions; 1 species in A. & N. Islands.

1. ***Iodes cirrhosa*** Turcz. in Bull. Soc. Nat. Moscou 27 (2): 281. 1854; Sleum. in Blumea 17: 221. 1969 & in Steenis, Fl. Males. 1, 7: 70. 1971; T. Chakrab. & Vasud. in J. Econ. Tax. Bot. 6: 455. 1985. *I. ovalis* sensu Mast. in Hook. f. Fl. Brit. India 1: 596. 1875 non Bl. 1828. *I. brandisii* Kurz in J.As. Soc. Bengal 41 (2): 298. 1872; Mast. in Hook. f., *op. cit.*

Climbers, ochraceous-pubescent; branchlets terete. Leaves thinly coriaceous, glabrescent above (except for midrib), densely pilose beneath, broadly ovate to elliptic (often suborbicular) or oblong-elliptic to lanceolate, up to 15 x 8 cm, mucronate or acute at apex, rounded, subcordate or rarely cuneate at base; lateral nerves 3-5 pairs. Male inflorescences in much branched, and many flowered, rather lax cymes, up to 35 cm long. Female inflorescences few-flowered, up to 6 cm long. Drupes oblong-ellipsoid or ovoid, up to 2 x 1.5 cm, laterally compressed and crested; seed oblong, ca 6 x 3 mm, pubescent towards distal end.

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

*Distr.*: South Nicobar.

Rare in the littoral forests or edges of evergreen forests on rocky loam to an altitude of ca 20 m.

#### 4. ***Sarcostigma*** Wight & Arn.

Dioecious climbers. Leaves entire, penninerved. Flowers minute, arranged in tufts along pendulous rachis. Calyx cupular. Petals shortly connate at base. Male flowers: stamens alternate with petals, exserted; rudiment of ovary hirsute. Female flowers ovary sessile, hirsute, stigma subsessile, umbonate. Drupes surrounded at base by persistent calyx and corolla, exocarp coriaceous, endocarp woody, lined with a thin white membrane; seed 1, testa thin.

2 species distributed in tropical Asia; 1 species in A. & N. Islands.

1. ***Sarcostigma kleinii*** Wight & Arn. in Edinb. New Phil. J. 14: 299. 1833; Mast. in Hook. f., Fl. Brit. India 1: 594. 1875; Sleum. in Blumea 17: 254. 1969 & in Steenis, Fl. Males 1, 7: 74. 1971. *S. wallichii* Baill. in Adansonia 10: 282. 1872; Mast. in Hook. f., *op. cit.*;

Parkinson, For. Fl. Andaman Islands. 126. 1923, *S. edule* Kurz in J. As. Soc. Bengal 41 (2): 298. 1872; Mast. in Hook. f., *op. cit.*

Lianas; branchlets grey to black. Leaves coriaceous, dark green above, pale beneath, elliptic-oblong or obovate-oblong, rarely ovate, up to 20 x 11.5 cm, shortly acuminate at apex, cuneate or rounded at base; lateral nerves 4-8 pairs. Spikes up to 13 cm long, 1-3 fascicled. Flowers brownish-green or yellowish-brown, *ca* 3.5 mm long. Drupes unequally subovoid-ellipsoid or oblong; seed *ca* 15 x 9 mm.

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

*Distr.*: Andaman islands.

Common in the inland forests.

#### 5. *Stemonurus* Bl.

Trees. Leaves spiral, entire. Umbels axillary and generally solitary. Calyx cup-shaped, persistent. Petal connate at base, inflexed at apex, caducous. Filaments shortly bearded below anther on ventral side and long penicillate distally on back side. Ovary unilocular with 2 pendant ovules; stigma punctiform. Drupes with outer fibrous endocarp; seed 1.

About 12 species distributed in Indomalayan region; 1 species in A. & N. Islands.

1. *Stemonurus secundiflorus* Bl., Bijdr. 649. 1826; Sleum. in Blumea 17: 258. 1969 & in Steenis, Fl. Males. 1, 7: 59. 1971. *Lasianthera secundiflora* (Bl.) Miq., Fl. Ind. Bot. 1: 792. 1856; Thoth. & Banerjee in Indian Forester 103: 708. 1877.

Trees, medium sized; branchlets grey-black, slightly rugose. Leaves coriaceous, oblong, elliptic or broadly elliptic-oblong, up to 20 x 9 cm, acuminate or acute at apex, cuneate at base; lateral nerves 7-10 pairs. Inflorescences up to 6.5 cm long, axillary. Flowers yellowish-green or white, *ca* 4 mm long. Drupes ellipsoid, oblong or ovoid-oblong, *ca* 2 cm broad with ridges, woody, narrowed and pointed at apex, orange-yellow, greenish to pinkish at base; seed ellipsoid, *ca* 2.6 x 0.8 cm.

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

*Distr.*: Little Andaman. North & South Nicobar.

Frequent.

### Oplliaceae

About 8 genera and 60 species distributed in the tropics, especially in Asia; 2 genera & 2 species in A. & N. Islands.

- 1 a. Branchlets glabrous; inflorescence of panicles, in axils of leaves, often also on older branches or on main trunk; drupes shortly pedicelled, pedicels 1-4 mm long..... 2. *Champereia*
- b. Branchlets pubescent when young, glabrous at maturity and provided with lenticels; inflorescence of spikes, in axils of leaves, rarely on older branches or on trunk; drupes sessile. .... 1. *Cansjera*

#### 1. *Cansjera* A.L. Juss. (*nom. cons.*)

Climbing shrubs. Leaves shortly petioled. Flowers monochlamydeous, hermaphrodite. Perianth regular, 4-5 parted. Stamens as many as lobes of perianth, and opposite to them, staminodes hypogynous, alternate with stamens. Ovary 1-celled, stigma capitate, 4-lobed. Fruits drupaceous, surrounded at base by marcescent perianth, stone bony; seed 1, erect.

3 species from India and Sri Lanka to S. China, Malesia and N. Australia; 1 species in A. & N. Islands.

1. *Cansjera rheedii* J.F. Gmel., Syst. Nat. 2: 280. 1791 ('*Cansiera*'); Mast. in Hook. f., Fl. Brit. India 1: 582. 1875; Parkinson, For. Fl. Andaman Islands. 125. 1923; Hiepko in Willdenowia 9: 45. 1979 & in Steenis, Fl. Males. 1, 10: 50. 1984.

Lianas; branchlets terete, greenish when fresh, brownish-grey to yellow. Leaves coriaceous, puberulous when young, later becoming glabrous, lanceolate to oblong-lanceolate, elliptic or ovate, up to 12.5 x 5 cm, acuminate at apex, cuneate or slightly rounded at base, entire; lateral nerves 4-7 pairs. Spikes ca 5 cm long. Flowers greenish-yellow, ca 4 mm long. Drupes oblong, up to 12 x 8 mm, orange-red; seed oblong, ca 7 x 5 mm, hilum basal, deeply sunk.

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

*Distr.*: Throughout Andaman and Nicobar islands.

## 2. *Champercia* Griff.

Shrubs or small trees. Flowers minute, bisexual. Perianth inferior. Filaments longer than perianth. Disc shortly 5-lobed, between stamens. Ovary half immersed in disc, stigma sessile, broad. Drupes oblong-ellipsoid.

1 variable species: Myanmar, Thailand, Vietnam, Taiwan, Malasia and A. & N. Islands.

1. ***Champercia manillana*** (Bl.) Merr. in Philipp. J. Sci. Bot. 7: 233. 1912; Heipko in Willdenowia 9: 16. 1979 & in Steenis & de Wilde, Fl. Males. 1, 10: 35. 1984. *Cansjera manillana* Bl., Mus. Bot. Lugd.-Bat. 1: 246. 1851 *Champercia gnetocarpa* Kurz in J. Bot. 13: 325. 1875 & in J. As. Soc. Bengal 45 (2): 123. 1876. *C. griffithiana* Planch. ex Kurz in J. As. Soc. Bengal 44 (2): 154. 1875; Hook. f., Fl. Brit. India 5: 236. 1886 ('*Champercia*' sub Santalaceae); Parkinson, For. Fl. Andaman Islands. 231. 1922.

Trees or shrubs, 2-10 m high; branchlets terete, yellowish-brown when young, greyish to pale brown at maturity, smooth, flexuous. Leaves subcoriaceous, granulate, elliptic to elliptic-oblong, ovate-oblong or lanceolate, up to 21 x 8.7 cm, acuminate or acute at apex, cuneate, attenuate, rounded or rarely oblique at base, entire; lateral nerves 5-8 pairs. Panicles up to 10 cm long. Drupes up to 1.7 x 1 cm, ripens orange-red; seed 1, oblong, ca 10 x 5 mm, white or yellow, grooved at base.

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

*Distr.*: Andaman islands and North Nicobar.

Common in the inland and littoral forests.

The variation of the size of the fruits is considerable. The fruit size generally varies from 1 to 1.2 cm in length (Heipko) but relatively large fruits are seen in Andaman and Nicobar specimens (up to 1.7 cm long).

**CELASTRACEAE**

About 90 genera and over 1000 species in both hemispheres except the Arctic regions, predominantly occurring in the tropics and subtropics; 9 genera, 22 species in A. & N. Islands.

- 1 a. Leaves spiral, alternate or distichous .....2
- b. Leaves opposite .....5
- 2 a. Leaves distichous; stamens 2 .....7. *Nichobariodendron*
- b. Leaves spiral or alternate; stamens 4-5 .....3
- 3 a. Leaves entire .....1. *Bhesa*
- b. Leaves crenate-serrate .....4
- 4 a. Scandent shrubs; inflorescences paniculate fruits capsular, dehiscent .....3. *Celastrus*
- b. Erect trees; inflorescences umbelliform fruits drupaceous, indehiscent ....9. *Siphonodon*
- 5 a. Lianas or scandent shrubs, rarely erect trees or shrubs; stamens 3 .....6
- b. Erect shrubs or small trees; stamens 4-5 .....7
- 6 a. Fruits drupaceous, indehiscent .....8. *Salacia*
- b. Fruits capsular, dehiscent .....6. *Hippocratea*
- 7 a. Inflorescences larger, up to 11 cm long; ovary 2-celled; fruits drupaceous, indehiscent .....2. *Cassine*
- b. Inflorescences shorter, up to 6 cm long; ovary 4-5 celled; fruits capsular, dehiscent .....8
- 8 a. Ovules 2 in each cell; fruits obovoid .....4. *Euonymus*
- b. Ovule 1 in each cell; fruits globose or transverse or tricoccus.....5. *Glyptopetalum*

1. **Bhesa** Buch.-Ham. ex. Arn.

Buttressed evergreen trees. Leaves spiral, coriaceous; stipules finely veined. Racemes solitary or paired. Panicles axillary. Flowers 5-merous. Calyx deeply lobed. Petals contorted. Stamens inserted on the disc or just beneath the outer margin. Disc fleshy. Ovary free, 2-celled; styles 2,

filiform; stigma small. Capsules entire or 2-lobed, mostly 1-2 seeded; seeds completely or partly covered by fleshy axil.

5 species; 1 in A. & N. Islands.

**Bhesa robusta** (Roxb.) Ding Hou in *Blumea Suppl.* 4: 152. 1958 & in Steenis, *Fl. Males.* 1, 6: 283. 1962; T. Chakrab. & Gang. in *J. Econ. Tax. Bot.* 14: 116. 1990. *Celastrus robustus* Roxb., *Fl. Ind.* 2: 395. 1824 & ed. Carey 1: 626. 1832. *Kurrimia pulcherrima* Wall. ex Laws. in Hook. *f. Fl. Brit. India* 1: 622. 1875 *nom. illeg. pro cit. prior*; Parkinson, *For. Fl. Andaman Islands.* 129. 1923. *K. maingayi* Laws, in Hook. *f., op. cit.* 622.

Trees, 12-30 m high; bark rough, brown; branchlets terete, brown. Leaves often glossy above, pale below, dark brown when dry, oblong to oblong-elliptic, up to 21 x 8.5 cm, shortly acuminate to acute at apex, rounded to cuneate at base; lateral nerves 9-15 pairs, curved. Capsules cylindric-oblong or ellipsoid, up to 3.7 x 1.4 cm, with 2 vertical grooves, ripens black.

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

*Distr.*: S. Andaman.

Rare in the inland forests at low altitudes.

## 2. *Cassine* L.

Shrubs or trees. Leaves decussate, cymes axillary or extra axillary, distinctly peduncled. Flowers bisexual, 4-5 numerous. Calyx lobes imbricate. Petals imbricate, spreading. Stamens inserted on or slightly under the outer margin of the disc. Disc fleshy, flat. Pistil conical or flask-shaped, base slightly united with disc or partly immersed in it. Fruits indehiscent, 1-2 celled; seeds 1-2, albuminous.

About 80 species, cosmopolitan in the tropics of both hemispheres but a majority in Africa; 1 species in A. & N-Islands.

***Cassine viburnifolia*** (Juss.) Ding Hou in Steenis, *Males.* 1, 6: 286. 1962; T. Chakrab. & Gang. in *J. Econ. Tax. Bot.* 14: 116. 1990. *Aegiphila*

*viburnifolia* Juss., Ann. Mus. Hist. Nat. Paris 7:76. 1806. *Flaeodendron subrotundum* King in J. As. Soc. Beng. 65 (2): 356. 1896; Parkinson, For. Fl. Andaman Islands. 127.1923.

Small trees or shrubs, up to 10 m high. Leaves chartaceous to subcoriaceous, obovate, obovate-oblong, rarely broad-elliptic to suborbicular, up to 10.5 x 6 cm, acute, obtuse or rarely acuminate at apex, cuneate at base, remotely crenulate or subentire; lateral nerves 4-7 pairs. Flowers white, ca 6 mm across. Drupes obovoid-oblong, ca 12 x 6 mm, dark coloured; seeds obovoid-oblong, ca 6 x 3 mm.

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

This species is included on the basis of literature (South Andamans-Parkinson, *op. cit.*).

### 3. *Celastrus* L.

Scandent shrubs; branchlets lenticellate. Leaves spiral, petioled. Inflorescences paniced. Flowers 5-merous, unisexual. Calyx campanulate, persistent, fertile stamens inserted on the margin of disc or under the outer margin. Ovary completely or incompletely 3-celled; style usually columnar; stigma usually 3-lobed. Capsules tipped by persistent style, loculicidally 3-valved; seeds 1-6 enveloped by a fleshy crimson aril.

About 31 species largely in the tropical and subtropical zones; 1 species in A. & N. Islands.

*Celastrus paniculatus* Willd., Sp. Pl: 1125. 1797; Laws. in Hook. f. Fl. Brit India 1: 617. 1875; Parkinson, For. Fl. Andaman Islands. 128. 1923; Ding Hou in Steenis, Fl. Males. 1,6: 235. 1962; T. Chakrab. & Gang. in J. Econ. Tax. Bot. 14: 116. 1990.

Scandent shrubs; branches terete, brown, glabrescent. Leaves chartaceous to thinly coriaceous, dark brown when dry, broadly elliptic to oblong-elliptic or ovate to obovate, up to 18 x 9.5 cm, shortly acuminate at apex, cuneate or rounded at base, crenulate; lateral nerves 4-8 pairs. Flowers yellowish. Capsules subglobose, up to 10 x 8 mm, stalk up to 7 mm long; seeds ellipsoid or subglobose, ca 5 x 3 mm.

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

*Distr.*: Middle & South Andaman.

Rare in the hill forests at low altitudes.

*Notes*: In Andaman this plant was first collected in 1891 from North Bay (King, *s.n.* CAL.). Subsequently it was collected from South Andaman in 1900 & 1901 (*Prain's collector*). Parkinson (*op. cit.* p. 129) reported it from Middle & South Andaman. Since then this plant was not collected from Andaman until recently on 9-12-92 (*B.K. Sinha 16305, PBL*) from Karmatang.

#### 4. *Euonymus* Tournf. ex L.

Usually shrubs or small trees. Leaves opposite, usually decussate. Inflorescences axillary, cymose, rarely flowers in fascicles (*E. javanicus*). Flowers 5 or 4 merous. Calyx deeply lobed. Petals spreading or reflexed. Disc distinct. Stamens inserted on disc, at margin or half way. Ovary partly or wholly immersed in disc. Fruit a loculicidal capsule, often coloured; seeds usually black, with mostly orange aril at base or enveloped by it.

About 175 species, chiefly distributed in tropical and subtropical Asia; 2 in A. & N. Islands.

Zijlstra and Tolsma (in *Taxon* 40: 137-139, 1991) put up a proposal to conserve the spelling of *Euonymus* against *Evonymus* as the former spelling is followed in a number of floras etc. and remains universally accepted in comparison to the latter. The proposal has been recommended by votes 10: 0 (Brummitt in *Taxon* 43: 115, 1994 under Report of the Committee for Spermatophyta: 40). Linnaeus used the spelling *Evonymus* in his *Species Plantarum* and *Euonymus* in his *Genera Plantarum* and both have been used subsequently. Prior to the 1981 Sydney Congress, *Euonymus* was stated in Article 74.1(b) to be more philologically correct spelling and therefore accepted. At Sydney, however, the whole of Article 74 was deleted and under Article 13.4 of the present code *Euonymus* became the accepted spelling. In Asia the spelling of *Evonymus* has virtually never been accepted. The genus is also well known in horticulture as *Euonymus*.

- 1 a. Peduncles distinct, 1.25-8 cm long; flowers in dichotomously branched cymes; pediscels 3-5 mm long; fruits small, 1-1.2 cm long ..... 1. *E. cochinchinensis*
- b. Peduncles obscure or short, rarely up to 2 cm long; flowers solitary or in fascicles; pedicels 1-2 cm long; fruits larger, 1.5-2.8 cm long ..... 2. *E. javanicus*

1. ***Euonymus cochinchinensis*** Pierre, Fl. For. Coch. 4: t. 309 A. 1894; Ding Hou in Steenis, Fl. Males. 1,6: 248. 1962; Vasud. & T. Chakrab. in J. Econ. Tax. Bot. 6: 266. 1985; T. Chakrab. & Gang. *Ibid.* 14: 117. 1990.

Trees, 5-6 m high; branchlets terete, brown. Leaves chartaceous, elliptic to oblong-elliptic or ovate-elliptic, up to 11 x 5 cm, shortly acuminate at apex, cuneate or rounded at base, entire; lateral nerves 5-7 pairs. Flowers white, ca 9 mm across; bracts fimbriate. Fruits broadly obovoid, strongly and unequally 5-lobed, ca 1.5 cm across, greenish-yellow.

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

*Distr.*: Little Andaman.

Common in the mangrove forests or rare in the inland forests on sandy loam at sea level.

2. ***Euonymus javanicus*** Bl., Bijdr. 1:46. 1827; Laws. in Hook. f., Fl. Brit. India 1: 607. 1875; Ding Hou in Steenis, Fl. Males 1, 6: 248. 1962; T. Chakrab. & Gang. in J. Econ. Tax. Bot. 14: 117. 1990.

Trees, 6-23 m high; bark reddish; branchlets terete, brown. Leaves chartaceous to subcoriaceous, broadly elliptic to oblong-elliptic or obovate to obovate-oblong, up to 20 x 9 cm, acute to acuminate or subobtuse at apex, cuneate or yellowish, ca 5 mm long. Fruits obovoid, ca 1.5 cm across with 1 or 2 seeds in each cell, apiculate at apex, stalk up to 3 cm long.

*Fl. & Fr.*: September-April.

Common in the inland forests or along river banks at sea level.

*Distr.*: Andaman (Ding in Steenis, *op. cit.* 249). North & South Nicobar.

### 5. *Glyptopetalum* Thw.

Shrubs or small trees; branchlets terete. Leaves decussate or opposite. Cymes simple or 2-3 times forked, axillary or extra-axillary. Flowers bisexual, 4-merous. Calyx lobes spreading, the inner pair larger than the outer one. Petals fleshy, smooth. Disk fleshy, flat. Stamens inserted on the disk or on the united body of disc and pistil. Ovary immersed in the disc; style obscure; stigma obscure or obtuse. Capsules loculicidal; seeds with incomplete fleshy aril covering the lower side.

About 20 species in Sri Lanka, India, Myanmar, Indo-China, China and Malaysia; 1 species in A. & N. Islands.

***Glyptopetalum calocarpus* (Kurz) Prain** in J. As. Soc. Bengal 60 (2): 209. 1891; Parkinson, For. Fl. Andaman Islands. 127. 1923; T. Chakrab. & Gang. in J. Econ. tax. Bot. 14: 118. 1990. *Euonymus calocarpus* Kurz in J. As. Soc. Bengal 41 (2): 299. 1872; Laws. in Hook. f., Fl. Brit. India 1: 609. 1875.

Shrubs or small trees, 1-2 m high. Leaves coriaceous, elliptic to oblong or oblong-lanceolate, up to 16 x 8 cm, shortly and bluntly acuminate to subacuminate at apex, cuneate at base, entire and slightly incurved. Flowers greenish-white, ca 3 mm long. Capsules ca 1.5 cm across, 1-4 loculed, dark brown; seed 1 in each cell, globose, red.

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

*Distr.*: North & South Andaman. North Nicobar.

Scarce in the littoral or hill forests at low altitudes, ascending to 650 m in subtropical forests on Saddle Peak.

*Notes*: It is endemic to Andaman and Nicobar Islands. Ding Hou (in Steenis, Fl. Males. 1, 6: 256. 1962) feels that *Fuonymus fengii* Chun. & How. in a *Glyptopetalum* in floral characters, it is closely allied to *G. zeylanicum* from Sri Lanka, *G. calocarpum* from Andaman and Nicobar Islands and *G. calyptrum* from Indo-China by the pyramidal pistil but differs in other characters like obovate-entire leaves, introse anthers and

round cushion-like thickening of the connective filaments and proposed a new combination, *Glyptopetalum fengii* (Chun. & How.) Ding Hou, which is new to China.

### 6. *Hippocratea* L. *sens. lat.*

Lianas or scandent shrubs, rarely erect trees. Leaves decussate. Inflorescences axillary, dichotomously cymose, or rarely paniculate, sometimes with supplementary branchlets in dichotomies or in axils of branchlets. Flowers pentamerous, white or greenish. Disc extrastaminal. Calyx 5-parted. Petals spreading. Stamens 3, inserted at base of free part of pistil. Ovary 3-celled; style distinct, slender or short; stigmas 1-3. Fruits capsular, of 3 divergent, separate follicles, usually dehiscent; seeds compressed, with a basal, membranous wing. About 60 species, natives of tropics of both hemispheres; 5 species in A. & N. Islands.

The earlier workers like Miers, Smith, Ding Hou, Halle, Wilczek, and others divided *Hippocratea* L. into several genera. Robson (Bot. Soc. Broteriana, 2nd Ser., 39: 46-49. 1965) reviewed the whole concept of *Hippocratea*. He is of the opinion that it seems preferable to take a broad view in classifying those plants rather than to split them up into 16 genera of which several are not or only incompletely separable from their closest relatives. (e.g. *Prionostemma-Semirestis-Pristimera* and *Simirestis-Loeseneriella* and others (e.g. *Helictonema*), although technically separable, are merely specialised offshoots from the central complex. It would be possible to include all genera under *Hippocratea* L.

- |   |    |  |                         |
|---|----|--|-------------------------|
| 1 | a. | Inflorescences paniculate, or thyrsiform; bracts often with small supernumerary branchlets .....   | 2. <i>H. grahamii</i>   |
|   | b. | Inflorescences dichotomously cymose; bracts without supernumerary branchlets.....  | 2                       |
| 2 | a. | Leaves entire .....  | 5. <i>H. pauciflora</i> |
|   | b. | Leaves shallowly crenulate or crenate-serrate (with glands) to subentire .....   | 3                       |
| 3 | a. | Leaves narrowly oblong; inner surface of petals and disc glabrous .....  | 4. <i>H. majumdarii</i> |
|   | b. | Leaves broadly elliptic to oblong-elliptic or oblong-obovate, rarely round or ovate; inner surface of petals towards upper portion and disc at top distinctly pilose ..... | 4                       |

- 4 a. Leaves obtuse or rarely subacute to emarginate at apex; petioles 4-6 mm long; pericarp woody; seed proper broadly ellipsoid .....1. *H. cumingii*  
 b. Leaves shortly and bluntly acuminate at apex; petioles ca 1 cm long; pericarp thin leathery; seed narrowly oblong-ellipsoid.....3. *H. macrantha*
1. **Hippocratea cumingii** Laws. in Hook. f., Fl. Brit. India 1: 624. 1875; T. Chakrab. & Gang. in J. Econ. Tax. Bot. 14: 743. 1990. *H. dinghoui* T. Chakrab. & Gang. *Ibid.* 14: 119. 1990. *Loeseneriella cumingii* (Laws.) Ding Hou in Blumea 12: 32. 1963 & in Steenis, Fl. Males. 1, 6: 399. 1964; Vasud. in J. Econ. Tax. Bot. 13: 41. 1989.

Scandent shrubs; branchlets terete, dark brown to black. Leaves coriaceous, up to 11.5 x 6.5 cm, attenuate or rarely rounded at base; lateral nerves 5-8 pairs. Inflorescences in axillary and terminal, 2-4 times dichotomously branched cymes, up to 12 cm long, puberulous. Flower buds yellowish, ca 3.5 mm long, densely puberulous.

Scarce in the littoral forests especially on rocks at sea level.

*Fl.*: February-April.

*Distr.*: North Nicobar.

*Notes*: Vasudeva Rao (*op. cit.* 41-42) reported it as a new record for India based on the collections *P. Chakrabarty* 1158 and 5280 (*PBL & CAL*) from Katchal Island. The supposed new species, *H. dinghoui* T. Chakrab. & Gang. is conspecific with *H. cumingii*. The material of the former differs from the type specimen of the latter only in having leaves with obtuse or often subacute species and green on drying (Chakrabarty & Gangopadhyay in J. Econ. Tax. Bot. 14: 743. 1990).

2. **Hippocratea grahamii** Wight, Ill. Ind. Bot. 134. 1839; Laws. in Hook. f., Fl. Brit. India 1: 624. 1875. *H. andamanica* King in J. As. Soc. Bengal 65 : 359. 1896; Parkinson, For. Fl. Andaman Islands 128. 1923; T. Chakrab. & Gang. in J. Econ. Tax. Bot. 14: 119. 1990. *Pristimera grahamii* (Weight) A. C. Sm. in J. Arnold Arbor. 26: 178. 1945. *Reis-santia grahamii* (Weight) Ding Hou in Blumea 12: 33. 1963 & in Steenis, Fl. Males 1, 6: 402. 1964; Raju in J. Biol. Sci. 8: 57. 1965. *Arnicratea grahamii* (Weight) N. Halle in Bull. Mus. Natn. Hist. Nat. Paris 4c ser. 6, section B, Adansonia 1: 14. 1984. *Loeseneriella*



**Fig. 4: *Hippocratea grahamii* wight**  
 1. Fruiting twig 2. Seed with a basal wing.

*andamanica* (King) Naithani & Sas. Biswas in Naithani, Fl. Pl. India, Nepal & Bhutan 95. 1990. *Hippocratea parkinsonii* T. Chakrab. & Gang., *op. cit.* p. 124. *syn. nov.*

Lianas or rarely trees *ca* 15 m high; branchlets terete, blackish, greyish or pinkish-brown, smooth or sometimes fissured. Leaves subcoriaceous to coriaceous, greyish-green or blackish-brown above and coppery brown beneath when dry, broadly elliptic to elliptic, oblong to oblong-elliptic, ovate-oblong to ovate-elliptic or rarely oblanceolate, 5-16 x 2-9 cm, shortly acuminate, obtuse or acute at apex, cuneate, rounded or rarely oblique at base, entire and slightly incurved; lateral nerves 5-9 pairs, midrib slightly raised but flattened near to base above and prominently raised beneath. Flowers pale greenish-white or yellowish-green, *ca* 2 mm across. Infructescences 8-20 cm long. Ripe carpels oblong or obovoid-oblong, 5.5-10.5 x 2.5-4 cm, obtuse or truncate at apex, narrowed towards base, brown when dry, pericarp woody, striate; seeds (including wing) oblong-lanceolate or obovoid-oblong with a beak at distal end, 3-8 x 1-2.5 cm, seed proper ellipsoid or ovoid-oblong, *ca* 2 x 1 cm, wings pale to pinkish-brown when dry.

*Fl. & Fr.*: January-September (fruiting also in October, January-February).

*Distr.*: South Andaman.

Rare scattered in the inland/littoral forests.

*Notes:* *Hippocratea andamanica* King was first collected from *Port Blair* by King's collector on 21-3-1884. Some more collections were made from the South Andaman by King and his collectors in 1891, 1893 and 1894 which have all been deposited at *CAL*. This plant has been collected recently from South Creek Nala, Baratang island on 30-1-1978 (*P. Basu* 6871), Shoal Bay on 31-1-1989 (*L.N. Ray* 13548) and Wright Myo on 19-3-1991 (*Sam P. Mathew* 20804)-*PBL*.

Ding Hou (in Steenis, Fl. Males. 1, 6: 402-404. 1964) transferred *Hippocratea grahamii* to *Reissantia* Halle and giving distributional data as Konkan, Sylhet and S. Andaman. He makes no mention of *H. andamanica*. Raju (*op. cit.* p. 57) treated *H. andamanica* under *Reissantia grahamii*. Halle (*op. cit.* pp. 12-16. 1984) erected a new genus *Arnicratea*

which differs from *Reissantia* by a larger disc, ovary immersed, narrowly inserted below the stamens and petals being superposed on it and ovules 4-7 in each locule. While treating *Reissantia grahamii* under *Arnicratea* Halle gives distributional data of the species as Bombay, Malabar, and Andamans without making any reference to *H. andamanica*. Naithani & Sas. Biswas (*op. cit.* p. 95) have transferred *Hippocratea* to *Loeseneriella* A.C. Sm.

Although Chakrabarty and Gangopadhyay (*op. cit.* p. 119) considered *H. grahamii* as distinct from *H. andamanica*, it is interesting that both species agree in almost all characters and hence have been considered as conspecific (Raju, *op. cit.* p. 57).

Even though Ding Hou and N. Halle in their treatment have not mentioned *H. andamanica* it is probable they were referring to the same plant while giving the distribution in Andaman.

Chakrabarty & Gangopadhyay (*op. cit.* pp. 124-126) described a new species *H. parkinsonii* differing from *H. andamanica* in the leaves being smaller, acute at apex, the lateral nerves slightly impressed above, the nervules being obscure above, the ripe carpels smaller and the seeds much larger. All these quantitative characters fall within the ambit of *H. grahamii* and hence both are treated as conspecific.

3. *Hippocratea macrantha* Korth., Verh. Nat. Ges. Ned. Bezitt. Bot. 187, t. 39. 1841-2; Parkinson, For. Fl. Andaman Islands. 128. 1923; T. Chakrab. & Gang. in J. Econ. Tax. Bot. 14: 121. 1990. *Loeseneriella macrantha* (Korth.) A. C. Sm. in Am. J. Bot. 28: 439. 1941; Ding Hou in Steenis, Fl. Males. 1, 6: 398. 1964.

Lianas; branchlets terete, blackish. Leaves coriaceous, dull brown when dry, up to 11 x 6.5 cm, rounded at base; lateral nerves 5-6 pairs. Infructescences up to 25 cm long, pedunculate. Fruits 2-3-parted; ripe carpels oblong to oblong-ellipsoid, up to 10 x 3.5 cm, obtuse at apex, striate, blackish-brown when dry.

*Fr.*: April-May.

*Distr.*: Andaman (Parkinson, *op. cit.* p. 128). North Nicobar.

Scarce near streams at sea level.

4. **Hippocratea majumdarii** T. Chakrab. & Gang. in *J. Econ. Tax. Bot.* 14: 122. 1990.

Climbers; branchlets quadrangular when young and terete when old, black. Leaves coriaceous, pale brown when dry, up to 12.5 x 4.5 cm, subacuminate to subacute at apex, rounded to cuneate at base; lateral nerves 5-7 pairs, faint above, prominent beneath. Inflorescences axillary and terminal, up to 5 cm long, few flowered glabrescent. Flowers 5-7 mm in diam.

*Distr.*: Andaman Islands.

5. **Hippocratea pauciflora** DC., *Prodr.* 1: 569. 1824; Lakshminarasimhan *et al.* in *Rheedea* 3: 121. 1993. *Loesenleriella pauciflora* (DC.) A. C. Sm. in *Am. J. Bot.* 28: 440. 1941; Ding Hou in Steenis, *Fl. Males.* 1, 6: 400. 1964; Raju in *J. Biol. Sci.* 8: 56. 1965.

Lianas; branchlets pinkish-brown or pinkish-black, granulate, terete. Leaves coriaceous, pale brown when dry, oblong or oblong-elliptic, up to 10.7 x 3.6 cm, acuminate or obtuse at apex, cuneate at base; midrib slightly below. Infructescences axillary. Follicles ellipsoid or obovoid, ca 4.5 x 2.5 cm, obtuse at apex, pericarp pale brownish with longitudinal veins on outer surface, dehiscing through middle, rather woody; seeds 1.5 x 0.8 cm (incl. wing) with a terminal beak, wing membranous, broadly ovoid, dark brown when dry with a median vein.

*Fr.*: August-September.

*Distr.*: South Andaman.

Rare in the inland forests.

#### 7. **Nicobariodendron** Vasud. & T. Chakrab.

Dioecious trees. Leaves distichous. Inflorescences axillary, racimiform, simple or compound. Male flowers: Calyx 4-5 segmented, imbricate; petals 4-5, free, imbricate, inserted on edge of disc alternating with calyx segments; stamens 2, free, inserted near base of petals, exserted; anthers dorsifixed, 2-celled, longitudinally dehiscent; pistillode somewhat sunken in receptacle. Fruits drupeaceous, unilocular, 1-seeded, subtended by persistent calyx.

1 species occurring in Nicobar Islands.

**Nicobariodendron sleumeri** Vasud. & T. Chakrab. in J. Econ. Tax. Bot. 7: 514. (1985) 1986; T. Chakrab. & Gang. *Ibid.* 14: 126. 1990.

Trees, 8-55 m high, dioecious; branchlets terete, greyish, brownish or blackish, lenticellate. Leaves coriaceous, glossy and reddish brown to blackish above when dry, pale beneath, oblong-elliptic to obovate-elliptic, up to 10 x 4 cm, shortly acuminate at apex, cuneate at base; lateral nerves 5-9 pairs, faint above, somewhat prominent beneath. Male inflorescences axillary, racemiform, often compound, up to 11 cm long. Drupes oblong-ellipsoid or narrowly obovoid, up to 2 x 1 cm, unilocular, 1-seeded, dark brown, thin walled.

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

*Distr.*: North & South Nicobar. Endemic.

Fairly common in the inland forests or dense forests at hill top or mixed forests near coast up to 100 m.

### 8. *Salacia* L.

Lianas, scandent shrubs, rarely erect trees; branchlets usually terete and greyish. Flowers axillary, fascicled, or in cymes, thyrsoid or paniced. Calyx deeply 5-lobed. Petals 5. Disc intrastaminal, fleshy. Stamens inserted at base of free part of pistil. Ovary partly or completely immersed in the disc, narrowing into a distinct or obscure style. Fruits drupaceous, 1-3 celled; seeds 1 to several, embedded in mucilaginous, 1-3 celled; seeds 1 to several, embedded in mucilaginous pulp.

About 200 species having pantropical distribution; 9 in A. & N. Islands.

- 1 a. Flowers in distinctly peduncled cymes or panicles .....2
- b. Flowers in fascicles with pedicels arising directly from a tubercle or wart.
- 2 a. Leaves entire; bracts, bracteoles and calyx lobes fimbriate ....8. *S. tortuosa*
- b. Leaves serrate-crenate to subentire; bracts, bracteoles and calyx lobes not as above .....3

- 3 a. Flowers in cymes ..... 3. *S. korthalsiana*  
 b. Flowers in panicles ..... 5. *S. nicobarica*
- 4 a. Fruits rugose ..... 5  
 b. Fruits not as above ..... 6
- 5 a. Leaves coriaceous; fruits broadly obovoid, stalk-like, contracted at base  
 ..... 2. *S. exsculpta*  
 b. Leaves chartaceous; fruits subglobose ..... 9. *S. verrucosa*
- 6 a. Calyx lobes glabrous ..... 7  
 b. Calyx lobes puberulous or pubescent, fringed ..... 8
- 7 a. Petals ovate; fruits tuberculate ..... 6. *S. reticulata*  
 b. Petals roundly obovate; fruits smooth ..... 7. *S. salacioides*
- 8 a. Fruits large, ca 2.8 cm across ..... 4. *S. macrosperma*  
 b. Fruits smaller, 6-25 mm across ..... 1. *S. chinensis*

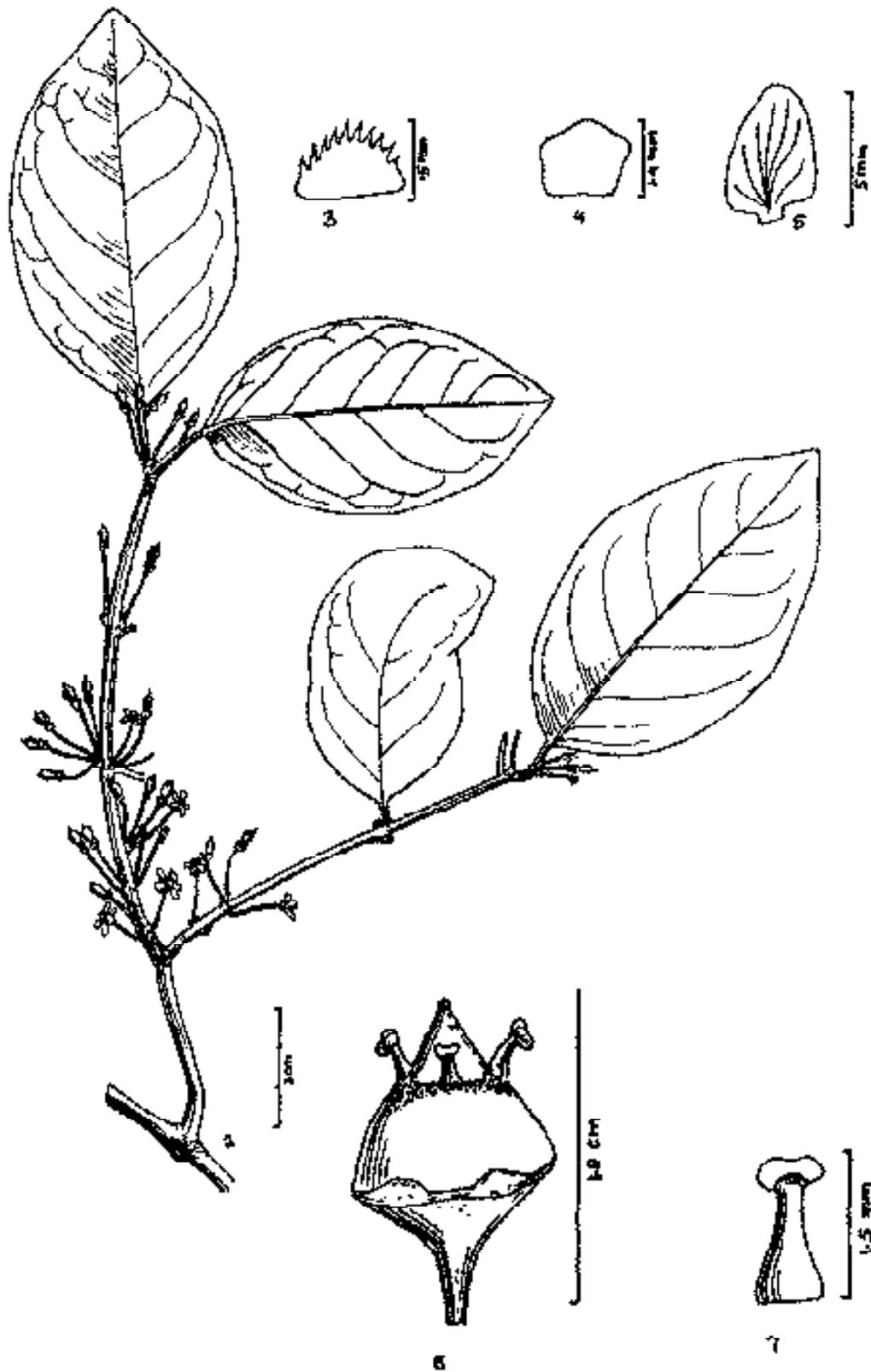
1. ***Salacia chinensis*** L., Mant. 2: 293. 1767; Ding Hou in Steenis, Fl. Males. 1, 6: 419. 1964; Raju in J. Biol. Sci. 8: 57. 1965. *S. prinoides* DC., Prodr. 1: 571. 1824; Laws. in Hook. f., Fl. Brit. India 1: 626. 1875; Parkinson, For. Fl. Andaman Islands 127. 1923. *S. latifolia* Wall. ex Laws. in Hook. f. *op. cit.* 626; Parkinson, *op. cit.* 128. *S. chinensis* var. *latifolia* (Wall. ex Laws.) T. Chakrab. & Gang. in J. Econ. Tax. Bot. 14: 127. 1990, *syn. nov.*

Scandent shrubs or lianas (rarely trees ca 4 m high); branchlets terete, sometimes slightly flattened at nodes and younger portions, pinkish-brown or pinkish-black, lenticellate. Leaves subcoriaceous to coriaceous, blackish or greenish-brown or olive green above and coppery brown to greyish beneath when dry, oblong, broadly elliptic to elliptic-oblong, elliptic-lanceolate, ovate, obovate, rarely suborbicular or obovate-oblong, up to 16 x 9 cm, acuminate or occasionally acute to obtuse at apex, cuneate, rounded or rarely attenuate at base, shallowly serrate, undulate to entire; lateral nerves 3-10 pairs. Flowers pale green or greenish-yellow, up to 5 mm long. Fruits globose, sometimes ellipsoid, ripens orange-red, unilocular, 1-2 seeded; seed globose, ca 1.5 cm across.

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



**Fig. 5:** *Salacia chinensis* L.  
1. Fruiting twig.



**Fig. 6: *Salacia chinensis* L.**  
 2. Flowering twig 3. Bract 4. Calyx 5. Petal,  
 6. Flower with petals removed 7. Stamen.

*Distr.:* Common in Middle, South & Little Andaman. North & South Nicobar.

2. **Salacia exculpta** Korth., *Kruidk.* 183. 1842; Ding Hou in Steenis, *Fl. Males.* 1, 6: 4171. 1964. *S. rubra* Laws. in Hook. f., *Fl. Brit. India* 1: 627. 1875; King in *J. As. Soc. Bengal* 65: 370. 1896; Ridl., *Fl. Mal. Pen.* 1: 460. 1922. *S. wrayi* King, *op. cit.* 367; Ridl., *op. cit.*

Lianas; stems ca 2 cm thick; branchlets blackish or coppery-brown to greyish-brown, terete, lenticelled or not. Leaves glossy green above and pale beneath when fresh, coppery-brown to brownish on both sides or blackish above and brownish below when dry, elliptic and slightly decurrent or rounded at base, undulate to slightly crenate; lateral nerves 7-10 pairs. Fruits axillary, 2.5-5 x 1.6-4 cm; pericarp coriaceous when dry, green when young, ripens orange to red; seeds 2-4, embedded in mucilaginous pulp, oblong to ellipsoid, up to 2 x 1 cm.

*Fr.:* November-January.

*Distr.:* North & South Andaman.

Dr. Ding Hou to whom a photograph of the fruiting liana had been referred to for confirmation of its identity says (pers. comm. July, 1993) "As you have identified, this plant comes nearest to *S. exculpta* Korth., especially by the fruiting characters. However, judging by the twig colour, leaf margin, rugose fruit, etc., it is also closely allied to *S. verrucosa* Wight. It may be possible belonging to a new species" It is rather surprising that though the Andaman Island have been almost thoroughly explored, this plant has not been collected until recently and that too only in fruits. The plant is rare, flowers may be small and flowering period short, and this could be the reason for its not being collected in flowers. Even in the fruiting stage the plant is quite distinct. It matches well with *S. exculpta* hitherto not known from India except in having larger, coriaceous, undulate to slightly crenate leaves. The exact identity can be confirmed only if flowers are collected.

3. **Salacia korthalsiana** Miq. in *Ann. Mus. Bot. Lugd.-Bat.* 4 : 152. 1869; Ding Hou in Steenis, *Fl. Males.* 1, 6: 406. 1964; Lakshminarasimhan & Srivastava in *Indian J. For.* 16: 77. 1993.

Lianas; branchlets flattened in younger portions, later terete, dark brownish to black, lenticellate. Leaves chartaceous, brownish-to black when dry, elliptic to elliptic-oblong or ovate to ovate-oblong, up to 15 x 7.1 cm, acuminate at apex, cuneate, or rounded at base; lateral nerves 5-8 pairs. Flowers yellowish-green, *ca* 1.5 mm long. Fruits subglobose, up to 2.6 x 2.1 cm, red, becoming black when dry, slightly contracted at base, stalked; seed 1, subglobose.

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

*Distr.*: North Nicobar.

Rare in forest edges at an altitude of *ca* 20 m.

4. **Salacia macrosperma** Wight, Ic. t. 926. 1845; Laws. in Hook. f., Fl. Brit. India 1: 628. 1875; Raju in J. Biol. Sci. 8: 58. 1965; Lakshminarasimhan & Srivastava in Indian Forester 119: 414. 1993.

Scandent shrubs; branchlets terete, pinkish-brown, lenticellate. Leaves coriaceous, pinkish-brown above and greyish to olive green below when dry, elliptic to elliptic-oblong or ovate-oblong, up to 12.5 x 7.1 cm, obtusely acuminate at apex, rounded or rarely cuneate at base, entire; lateral nerves 4-5 pairs. Fruits globose, smooth, ripens red, becoming black when dry, stalk *ca* 4 mm long.

*Fr.*: August.

*Distr.*: South Nicobar.

Scarce in the littoral forests.

5. **Salacia nicobarica** (Kurz) Raju in J. Biol. Sci. 8: 58. 1965. *Hippocratea nicobarica* Kurz in J. As. Soc. Bengal 44 (2): 203. 1875; T. Chakrab. & Gang. in J. Econ. Tax. Bot. 14: 124. 1990. *Loeseneriella nicobarica* (Kurz) Naithani & Sas. Biswas in Naithani, Fl. Pl. India, Nepal & Bhutan 95. 1990.

Lianas; branchlets terete, blackish, sparsely or minutely lenticellate. Leaves coriaceous, elliptic to elliptic-oblong or elliptic-lanceolate, up to 18.5 x 8.1 cm, shortly and bluntly acuminate at apex, cuneate or rounded

at base; lateral nerves 4-10 pairs. Inflorescences up to 4 x 5 cm. Flowers greenish or yellowish, *ca* 4 mm long. Fruits globose, *ca* 1.2 cm in diam., black, stalked.

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

*Distr.*: Endemic to North Nicobar.

Rare in the inland forests.

6. ***Salacia reticulata*** Wight, Ill. 1: 134. 1840; Laws. in Hook. f., Fl. Brit. India 1: 627. 1875; Raju in J. Biol. Sci. 8:59. 1965; Lakshminarasimhan & Srivastava in Indian Forester 119: 415. 1993.

Climbers; branchlets flattened to angular in young portions, terete in old portions, pinkish-brown. Leaves black above and coppery brown below when dry, lanceolate, elliptic or rarely elliptic-oblong, up to 11.8 x 6.7 cm, acuminate or acute at apex, cuneate or rounded at base, entire; lateral nerves 5-6 pairs. Flowers *ca* 1 mm long, 3-6 in each axil.

*Fl.*: September.

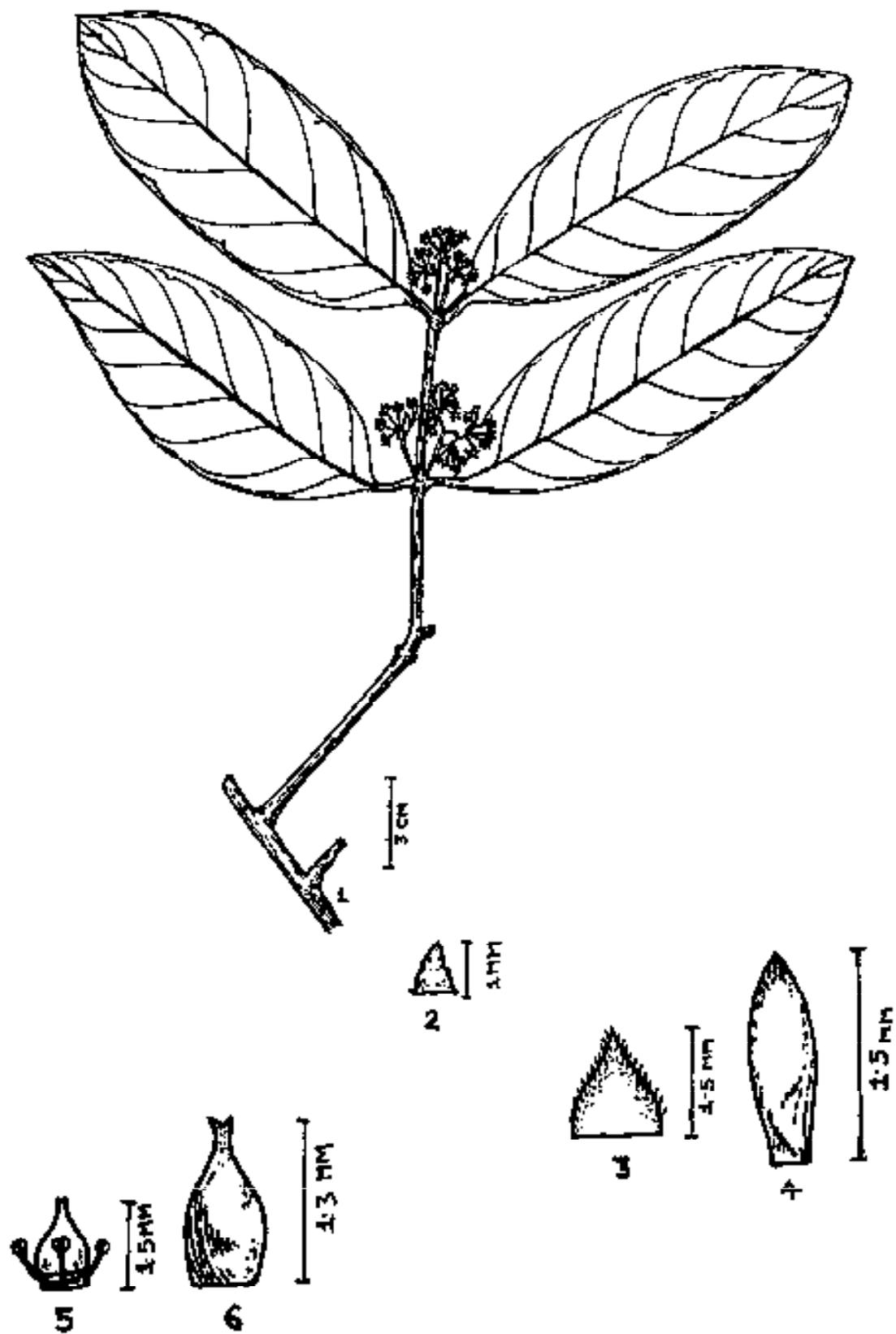
*Distr.*: South Andaman.

A few along the littoral forests.

7. ***Salacia salacioides*** (Roxb.) Rolla Rao & Hemadri in J. Bombay nat. Hist. Soc. 67. 358. 1970; Lakshminarasimhan & Srivastava in Indian Forester 119: 415. 1993. *Johnia salacioides* Roxb., Fl. Ind. 1: 172. 1820 & 1: 168. 1832. *Salacia roxburghii* Wall. ex Wight & Arn., Prodr. 105. 1834; Laws. in Hook. f., Fl. Brit. India 1: 627. 1875; Raju in J. Biol. Sci. 8: 59. 1965.

Climbers; branchlets terete, pinkish to brown. Leaves olive green above and greyish beneath when dry, elliptic or rarely obovate-oblong, up to 14.5 x 6.7 cm, shortly acuminate or obtuse at apex, cuneate or rounded at base, entire; lateral nerves 4-6 pairs. Flowers green, *ca* 1.5 mm long, on axils of fallen leaves.

*Fl.*: January.



**Fig. 7 : *Salacia tortuosa* Griff.**

1. Flowering twig 2. Bract 3. Sepal 4. Petal 5. Stamens inserted at base of ovary and within disc 6. Pistil enlarged.

*Distr.*: South Andaman.

Occasional in the littoral forests.

8. **Salacia tortuosa** Griff. Not. Pl. Asiat. 4: 471. 1854 & Ic. Pl. Asiat. t. 581, f. 2. 1854; Kurz, For. Fl. Brit. Burma 1: 258. 1877; Lakshminarasimhan & Ray in Indian Forester 120: 67. 1994.

Lianas ca 15 m long; branchlets greyish to pinkish, fissured, lenticellate, flattened when young, later terete. Leaves coriaceous, dark blackish-brown above and pale coppery brown beneath when dry, elliptic to elliptic-oblong, up to 21 x 7.8 cm, shortly acuminate at apex, cuneate, rounded, slightly decurrent, rarely oblique at base; midrib prominent, lateral nerves 6-12 pairs, prominent, flattened above, raised beneath. Inflorescences axillary or extra-axillary, up to 2 cm long. Flowers yellow.

*Fl.*: February-March.

*Distr.*: North Andaman.

Rare in the tropical inland forests on *Aporosa* and *Morinda* species.

9. **Salacia verrucosa** Wight, Ill. Ind. Bot. 1: 134. 1834; Laws. in Hook. f., Fl. Brit. India 1: 628. 1875; Ding Hou in Steenis, Fl. Males. 1, 6: 414. 1964; Lakshminarasimhan *et al.* in J. Bombay nat. Hist. Soc. 88: 311. (1991) 1992.

Scandent shrubs, 2-3 m high; branchlets terete, blackish, sparsely lenticellate. Leaves pinkish-brown to blackish above and pale brown below when dry, elliptic to ovate-elliptic, up to 8.5 x 4.5 cm, acuminate or rarely cuspidate at apex, cuneate or rounded at base, crenulate or subentire; lateral nerves 6-8 pairs. Flowers green, ca 2 mm long.

*Fl.*: August.

*Distr.*: North Nicobar.

Common in the littoral forests.

### 9. *Siphonodon* Griff.

Trees. Leaves spiral or alternate. Inflorescence axillary, cymose. Flowers 5-merous. Calyx lobes imbricate. Petals imbricate. Stamens 5. Pistil half immersed, adnate to disc. Ovary many-celled. Fruits drupaceous, hard, with numerous bony, 1-seeded stones; seeds flat, testa membranous. About 7 species distributed from S.E. Asia through Malesia to Australia; 1 in A. & N. Islands.

*Siphonodon celastrineus* Griff. in Calc. J. Nat. Hist. 4: 247, t. 14. 1844; Laws. in Hook. f., Fl. Brit. India 1: 629. 1875; Ding Hou in Steenis, Fl. Males. 1, 6: 394. 1964; T. Chakrab. & Gang. in J. Econ. Tax. Bot. 14: 128. 199<sup>Q</sup>; Vasud. in Nord. J. Bot. 14: 304. 1994. *Hydnocarpus sharmae* Rao & Sreek. in Nord. J. Bot. 12: 225. 1992.

Trees, 6-16 m high; branchlets brown, smooth, terete. Leaves coriaceous, green or brown when dry, elliptic or oblong, up to 23 x 7 cm, acuminate at apex, cuneate at base; lateral nerves 8-10 pairs. Flowers white mottled with pink striations. Fruits globose or ovoid, ca 4 x 4.5 cm, green, ripens orange, stalked; seeds deltoid, ca 1.5 x 1 cm.

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

*Distr.*: North & South Andaman.

Uncommon in the inland and littoral forests.

*Notes*: Vasudeva Rao (1986) listed this species on the basis of literature. Chakrabarty & Gangopadhyay (*op. cit.*) included it based on collections from Little Coco Island and Great Coco Island which now come under Myanmar. Rao & Sreekumar (*op. cit.* p. 225-226) published a new species viz., *Hydnocarpus sharmae* which is conspecific with *Siphonodon celastrineus* (cf. Mitra in Sharma & Balakrishnan, Fl. India 2: 424. 1993; Vasud. in Nord. J. Bot. 14: 303-305. 1994).

## RHAMNACEAE

70 genera and ca. 1500 species, rather extensively represented throughout the temperate and tropical regions of the world; 6 genera, 18 species in A. & N. Islands.

- 1 a. Branches often with tendrils; disc with an appendage opposite each calyx-segment; fruits usually 3-winged .....2. *Gouania*
- b. Branches without tendrils; disc without an appendage opposite the calyx-segments, fruits wingless or with a single apical wing.....2
- 2 a. Leaves palminerved .....3
- b. Leaves penninerved .....4
- 3 a. Branchlets armed with recurved sharp stipular prickles; flowers perigynous; calyx-tube broadly obconical; drupes containing a solid 1-3 celled stone ..... 6. *Ziziphus*
- b. Branchlets unarmed; flowers epigynous; calyx-tube hemispherical; capsules dry or drupaceous, slightly 3 lobed, dehiscent septocidally into 3 cocci ..... 1. *Colubrina*
- 4 a. Erect shrubs; leaves opposite or subopposite; flowers hypogynous.....3. *Sageretia*
- b. Scandent shrubs or lianas; leaves alternate; flowers perigynous or epigynous .....5
- 5 a. Fruits dehiscent; seed chamber elongated, continued in the compressed upper appendage .....4. *Smythea*
- b. Fruits indehiscent; seed chamber globose, not as above .....5. *Ventilago*

1. *Colubrina* L.C. Rich. ex T. Brongn. (*nom. cons.*)

Scandent or erect shrubs or trees. Leaves alternate or opposite, basally 3-5 nerved or penninerved, petiolate. Inflorescence axillary, thyrsoid or cymose fascicles. Flowers protandrous, 5-merous, calyx, corolla and androecium attached to the rim of hemispheric or shallow floral cup. Calyx lobes not pubescent. Petals cucullate, convolute, clawed at base. Disc fleshy, annular, flat. Ovary 3-loculed; style 3-cleft; stigmas truncate or obtuse. Capsules globose; seeds compressed, 3-gonous; albumen fleshy.

31 species (21 in the warmer parts of America, 1 in Hawaii, 4 in Madagascar, 5 in S.E. Asia); 1 in A & N Islands.

*Colubrina asiatica* (L.) Brongn. in Mem. Fam. Rham. 62. 1826 & in Ann. Sci. Nat. 1, 10 : 369. 1827; Laws. in Hook. f., Fl. Brit. India 1 : 642. 1875; Parkinson, For. Fl. Andaman Islands. 131. 1923; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 32. 1990. *Ceanothus asiaticus* L., Sp. Pl. 196. 1753.

Straggling shrubs or trees, 1.5-5 m high, often scandent; branchlets greyish to pinkish-brown, slightly ribbed. Leaves membranous ovate or ovate-lanceolate, up to 8.5 x 6 cm, acuminate at apex, broadly rounded or slightly oblique at base, crenate; lateral nerves 2-3 pairs; stipules deltoid, ca 1 mm long. Flowers yellowish-green, ca 6 mm across. Capsules ca. 1.2 cm across, green or yellow, slightly depressed at top, tardily dehiscent, supported by the persistent calyx-tube at base; seeds 3, ca 4 mm across, brownish, slightly emarginate at base.

*Fl. & Fr.* : November - March or almost throughout the year.

*Distr.* : South & Little Andaman; North & South Nicobar.

Common in littoral forests. Also seen in mangrove and inland forests.

## 2. *Gouania* N.J. Jacq.

Climbing shrubs; branches circinate-tendrilar. Leaves alternate, petiolate. Inflorescence terminal or axillary racemes or panicles. Flowers epigynous, pentamerous, rachis often cirrhose. Calyx lobes valvate. Petals cucullate, clawed at base, inserted below the margin of disc. Stamens enclosed in petals; anthers dehisce longitudinally. Disc massive. Ovary connate to bottom of calyx tube, 3-carpellary, 3-loculed, immersed in disc; style 3-cleft; stigma papillose. Schizocarpic capsules woody; seeds with horny testa.

70 species (35 in America, 14 in Asia, 15 in Madagascar & other Islands of Indian Ocean, 2 in Australia and 2 in Africa); 2 species & 1 variety in A. & N. Islands.

- 1 a. Leaves penninerved, usually with entire margins; fruits rusty tomentose ...  
..... 1. *G. andamanica*
- b. Leaves palminerved, with crenate - serrate margins; fruits glabrous.....  
..... 2 *G. leptostachys*

1. ***Gouania andamanica*** King in J. As. Soc. Beng. 65 : 382, 1897; Parkinson, For. Fl. Andaman Islands. 131, 1923; Bhandari & Bhansali in Nayar *et al.* Fasc. Fl. India 20 : 37, 1990.

- 1 a. Leaves sparsely pubescent above, lateral nerves inconspicuous; fruits wingless.....*var. andamanica*

- b. Leaves glabrous above, lateral nerves conspicuously impressed; fruits somewhat winged .....var. *brevialata*

**var. andamanica.**

Climbing shrubs; branchlets flattened towards younger portions, later terete, blackish; ribbed. Leaves sparsely pubescent on both sides, densely on nerves, elliptic to elliptic-oblong or ovate to ovate-oblong, up to 9.7 x 6.7 cm, subacute or shortly acuminate at apex, rounded or cuneate at base, entire or rarely serrulate, lateral nerves 6-9 pairs; petioles pubescent; stipules subulate, pubescent. Flowers greenish, pale white or pale yellow, ca 3 mm long. Capsules ellipsoid, up to 12 x 6 mm, triquetrous, rusty tomentose, crowned with persistent calyx, tardily dehiscent; seeds ca 6 x 3 mm.

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

*Distr.* : Andaman islands. Endemic.

Common in the inland forests on the rocky places near streams.

var. *brevialata* Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 27, 1990.

Leaves glabrous above, pubescent below; lateral nerves depressed above. Fruits up to 2 x 1.7 cm, wings slightly developed.

This species is included on the authority of Bhandari & Bhansali, *op. cit.*

2. ***Gouania leptostachya*** DC., Prodr. 2 : 40. 1825; Laws. in Hook.f., Fl. Brit. India 1 : 643. 1875; Parkinson, For. Fl. Andaman Islands. 131. 1923; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 38. 1990. *G. tiliaefolia* Roxb., Pl. Cor. 67, t. 98. 1798 & Fl. Ind. 2 : 417. 1824 non Lam. 1789, nec. Rottb. ex DC. 1825.

Climbing shrubs or lianas; branchlets greyish - olive green or pinkish-brown; tendrils axillary or extra - axillary. Leaves glabrous above, antrose hairy on veins beneath, ovate, up to 9.7 x 7.5 cm, acute to acuminate at apex, rounded or slightly cordate and 3-nerved at base, crenate-serrate; lateral nerves 3-5 pairs. Flowers greenish white, ca 0.3 mm long. Capsules

green, obconical, up to 9 x 13 mm 3-valved, crowned by persistent calyx; seeds 3, up to 5 x 3 mm.

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

*Distr.* Andaman group of islands; North & South Nicobar

Common.

### 3. *Sageretia* Brongn.

Armed or unarmed shrubs or trees. Leaves opposite or subopposite. Inflorescence terminal or axillary panicles. Flowers pentamerous. Calyx urceolate; persistent. Petals cucullate, clawed. Stamens enclosed in petals. Disc saucer-shaped, fleshy, nectariferous, filling the calyx tube. Ovary tricarpeal, 3-loculed; style short, thick. Drupes 3-loculed, globose or obovoid with 3-coriaceous indehiscent kernels; seeds 3, testa crustaceous.

40 species; 1 in A. & N. Islands.

*Sageretia parviflora* (R. & S.) G. Don., Gen. Syst. 2 : 29. 1832; Bhandari & Bhansali in Nayar *et al.*, Fasc. F. India 20 : 66. 1990; Lakshminarasimhan *et al.* in Bull. Bot. Surv. India 33 : 282. (1991) 1994. *Rhamnus parviflora* R. & S., Syst. Veg. 5 : 295. 1819. *Sageretia oppositifolia* Brongn., Mem. Fam. Rham. 53. 1826 & in Ann. Sci. Nat. 1, 10 : 360. 1827, Laws in Hook. f., Fl. Brit. India 1 : 611. 1855.

Shrubs, 2-3 m high; branches often climbing, armed with thorns, greyish-brown to slightly pinkish, softly tomentose in young portions. Leaves subcoriaceous, blackish-brown above and pale brown beneath when dry, ovate-elliptic, up to 4.5 x 2.5 cm, acute or acuminate at apex, rounded at base, serrulate; lateral nerves 3-5 pairs; petioles softly pubescent. Flowers yellow, ca. 3 mm across. Drupes up to 10 x 5 mm, ripens black, pointed with permanent style. Sparse.

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

*Distr.* : North Andaman

*Notes* : This species was treated under *S. filiformis* (Schultes) G. Don. in some floras (Matthew, Fl. Tamilnadu Carnatic 3 : 267. 1983) and was

based on *Rhamnus filiformis* Roth ex Schultes (1820). Although Bhandari & Bhansali (*op. cit.*) do not mention *S. filiformis*, their treatment has been followed here as they have revised the family Rhamnaceae of India.

#### 4. *Smythea* B.C. Seem. ex A. Gray

Scandent woody shrubs or climbers. Leaves alternate, coriaceous to chartaceous. Inflorescence of axillary fascicles or rarely paniced. Flowers pentamerous. Calyx lobes puberulous outside. Petals alternate with sepals, cucullate. Stamens opposite the petals; filaments basally attached to petals. Disc filling the calyx tube. Ovary bicarpellary, bilocular; style with two slightly divergent, stigmatic arms. Fruits capsular, 1-celled, dehiscing vertically into valves, supported by persistent calyx at base; seeds 1, exalbuminous.

7 species in the world; 2 in A. & N. Islands.

- 1 a. Leaves entire to distantly denticulate; stamens longer than petals; fruits cinereous tomentose, attenuate above .....1. *S. lanceata*  
 b. Leaves crenate serrate; stamens equal to petals; fruits brown woolly tomentose, oblique above .....2. *S. calpicarpa*

1. ***Smythea calpicarpa*** Kurz. in J. As. Soc. Beng. 41 (2) : 301. 1872; Laws. in Hook. f., Fl. Brit. India 1 : 632. 1875; Parkinson, For. Fl. Andaman Islands. 130. 1923; Banerjee & Mukherjee in Indian Forester 96 : 214. 1970; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 77. 1990. *Ventilago calpicarpa* (Kurz) Oza in Indian Forester 94 : 267. 1968 & *Ibid.* 99 : 516. 1973.

Scandent shrubs; young branches fulvous pubescent. Leaves lanceolate to elliptic-lanceolate or ovate-elliptic, up to 10 x 4 cm, acute at apex, oblique at base, crenate-serrate; lateral nerves 6-8 pairs. Flowers green, ca 6.5 mm across. Capsules oblong, up to 3 x 1.2 cm, samaroid, covered with brown silky hairs.

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

*Distr.* : A few in South Andaman.

2. ***Smythea lanceata*** (Tul.) Summerh. in Kew Bull. 1928 : 389. 1928; Oza in Indian Forester 94 : 403. 1968; Banerjee & Mukherjee, *Ibid.*

96 : 212. 1970; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 77. 1990. *Ventilago lanceata* Tul. in Ann. Sci. Nat. 8, 4 : 121 1857. *Smythea reticulata* King in J. As. Soc. Beng. 65 : 318. 1896.

Scandent shrubs; branchlets pale brown to pinkish-brown. Leaves greyish when dry, elliptic to elliptic-oblong or elliptic-lanceolate, ovate to ovate-oblong, up to 13 x 5 cm, acuminate at apex, oblique, rounded or cuneate at base, entire to distantly denticulate; lateral nerves 3-6 pairs. Flowers greenish-white, ca 1.5 x 3 mm. Capsules greyish when dry, ovoid - lanceolate, up to 8 x 3 cm, compressed; seed broadly orbicular - obovoid, compressed.

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

*Distr.* South & Little Andaman; South Nicobar.

A few in the littoral forests.

*Notes* : It is endemic to A. & N. Islands. Oza (1968) during the course of the taxonomic revision of the Indian species of the Rhamnaceae came to the conclusion that Parkinson 1031 (*CAL*) from Havelock Islands labelled as *Smyhea calpicarpa* Kurz is *S. pacifica* Seem. *S. pacifica* was one of the plants collected by Seemann from the Vitian or Fijian Islands. As Gray in Bonplandia 10 : 35. 1862, remarked on the Seemann's collection and pointed out that *S. pacifica* had its fruits separately like *Ventilago lanceata* Tul., with which it ought to be compared. Later on, Summerhayes (1928) observed that *Ventilago lanceata* is identical with *S. dupontii* Hemsl. and *S. pacifica* Seem. He transferred *V. lanceata* to the genus *Smythea* and hence the correct name becomes *S. lanceata* (Tul.) Summerh. Oza reported it for the first time as an addition to the Indian Flora.

Bhandari & Bhansali (*op. cit.*) also feel that Parkinson's collection identified as *S. calpicarpa* from Andaman Islands is *Smythea lanceata*.

### 5. *Ventilago* J. Gaertn.

Scandent or climbing shrubs. Leaves alternate, simple, coriaceous; stipules minute. Inflorescence axillary or terminal, umbellate cymes, fascicles or panicles. Flowers pentamerous. Calyx lobes keeled with a hard

incurved point at apex within, puberulous outside. Petals cucullate, membranous, clawed at base. Stamens opposite to and enclosed by petals, adnate to their bases. Disc filling the calyx tube, adnate to the lower half of ovary. Ovary 2-celled; style hairy at base, with two short stigmatic lobes. Samara 1-seeded, indehiscent, winged; seeds globose to subglobose, testa membranaceous, exalbuminous.

About 70 species occurring in Indo-Malayan region, Polynesian Islands, Australia and Madagascar; 2 in A. & N. Islands.

- 1 a. Calyx tube saucer-like, adnate only to the base of fruit.....2. *V. madraspatana*  
 b. Calyx tube cup-like, adnate to the lower part of fruit .....1. *V. denticulata*

1. ***Ventilago denticulata*** Willd. in Ges. Naturf. Fr. Neue. Schr. 3 : 417. 1801; Banerjee & Mukherjee in Indian Forester 96 : 209. 1970; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20: 82. 1990. *V. calyculata* Tul. in Ann. Sci. Nat. 8, 4 : 124. 1857; Laws in Hook. f. Fl. Brit. India 1 : 631. 1875.

Large woody, climbing shrubs; branchlets green when fresh, blackish-brown when dry, pubescent. Leaves pubescent, ovate to ovate-elliptic, up to 16 x 7.5 cm, obtuse or subacute at apex, oblique and rounded at base, crenate-serrate; petioles channelled. Flowers ca 2 mm across, Samara globose, ca 3 mm across, wing brownish-golden to grey-pubescent, oblong, up to 5.5 x 2 cm, median line single or double; seeds black.

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

*Distr.* : South Andaman.

Bhandari & Bhansali (*op. cit.* 84) have given the distribution as Andaman & Nicobar Islands.

2. ***Ventilago madraspatana*** Gaertn., Fruct. 1 : 223, t. 49, f. 2. 1788; Laws. in Hook. f., Fl. Brit. India 1 : 631. 1875; Parkinson, For. Fl. Andaman Islands. 129. 1923; Banerjee & Mukherjee in Indian Forester 96 : 207. 1970; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 85. 1990.

Large woody climbers; branchlets greyish to pale brown, pubescent when young, older branches ribbed. Leaves oblong - lanceolate to elliptic-ovate, up to 10 x 5 cm, acuminate at apex, rounded or cuneate to oblique at base, entire or crenate; lateral nerves 4-9 pairs. Flowers yellowish-green, ca 6 mm across. Samara globose, ca 2.5 mm in diam., median line single, fruit wing elliptic-oblong, up to 4.5 x 0.8 cm.

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

*Distr.* : North, South & Little Andaman.

A few along inland and littoral forests.

### 6. *Ziziphus* Tourn. ex P. Mill.

Shrubs or trees, rarely decumbent or creeping. Leaves alternate or opposite, coriaceous, 3-5 nerved from base, petiolate; stipules either single or rarely both spinose. Inflorescence in axillary or terminal cymes or thyrses. Flowers pentamerous. Petals cucullate. Stamens inserted below disc. Disc flat or pitted. Ovary immersed in the disc and adnate to its base, 2-4 loculed, style 2-4, stigma papillose. Putamen woody or horny; seeds 1-3, with thin testa.

About 135 species in temperate and tropical parts of the world chiefly in Asia and America, a few extending to the Pacific Islands and Australia; 8 species & 1 variety in A. & N. Islands.

- |   |  |                          |
|---|--|--------------------------|
| 1 | a. Leaves glabrous or pubescent on the main nerves.....                                    | 2                        |
|   | b. Leaves tomentose beneath .....  | 4                        |
| 2 | a. Branches patently shortly pubescent .....   | 4. <i>Z. horsfieldii</i> |
|   | b. Branchlets glabrous .....   | 3                        |
| 3 | a. Flowers in pedunculate cymes, peduncles above 8 mm long .....                           | 1. <i>Z. andamanica</i>  |
|   | b. Flowers in almost sessile cymose fascicles, peduncles 2-3 mm long.....                  | 3. <i>Z. glabrata</i>    |
| 4 | a. Cymes terminal or flowers in lateral panicles, distinctly pedunculate; petals absent .. | 8. <i>Z. rugosa</i>      |
|   | b. Cymes axillary, sessile or shortly pedunculate ; petals present .....                   | 5                        |

- 5 a. Large climbers ..... 6  
 b. Erect trees or shrubs ..... 7
- 6 a. Leaves distantly serrulate along margins, transverse at right angles to midrib  
 ..... 2. *Z. brunoniana*  
 b. Leaves minutely denticulate or almost entire along margins, transverse  
 nerves not as above ..... 7. *Z. oenoplia*
- 7 a. Small trees ; leaves fuscous - tomentose beneath; disc grooved .....  
 ..... 5. *Z. mauritiana*  
 b. Low much-branched shrubs; leaves grey-tomentose beneath; disc pitted ...  
 ..... 6. *Z. nummularia*
1. ***Ziziphus andamanica*** Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20: 89. 1990. *Z. glabra* King in J. Asiat. Soc. Bengal 65 : 376. 1897 non Roxb. 1824; Parkinson, For. Fl. Andaman Islands. 130. 1923.

Trees or scandent shrubs, armed with recurved prickles; branchlets blackish, young branchlets puberulous. Leaves glabrous and glossy except the pubescent midrib, ovate to ovate-oblong, rarely ovate-lanceolate, up to 11.2 x 5 cm, obtusely caudate-acuminate at apex, slightly cuneate, oblique at base, crenate-serrulate. Flowers greenish-white, ca 4 mm long. Drupes bluntly ellipsoid or almost globose, up to 1.8 x 1.5 cm, ripens yellow; seed compressed, brown.

A few in the inland forests.

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

*Distr.* North, Middle & South Andaman; North Nicobar.

2. ***Ziziphus brunoniana*** Brandis, Ind. Trees 169. 1971 (Repr. ed.); Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 93. 1990.

Climbing shrubs, armed with spines; branchlets strigose. Leaves glabrous above, adpressed fulvous hairy beneath, up to 4.5 x 2.7 cm, acute to subacuminate at apex, oblique at base, distantly serrulate; petioles rusty tomentose. Drupes obovoid, ca 8 mm long; seeds black, compressed.

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

*Distr.* : South Andaman.

3. **Ziziphus glabrata** Heyne ex Roth, Nov. Pl. Sp. 159. 1821 ; Laws, in Hook. f., Fl. Brit. India 1 : 633. 1875; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 96. 1990.

Unarmed trees, 6-12 m high; branchlets greyish-brown, lenticellate. Leaves lanceolate or ovate-oblong, up to 10.3 x 5.2 cm, acute at apex, rounded or subcordate at base, crenulate. Flowers yellowish-green or orange-yellow, *ca* 6 mm across. Drupes globose or obovoid, *ca* 1 cm in diam., flattened, pulp gelatinous; seeds brownish.

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

*Distr.* : North Nicobar.

Scattered in the inland forests.

Bhandari & Bhansali (*op. cit.*) have given Andamans as distribution.

4. **Ziziphus horsfieldii** Miq., Fl. Ind. Bot. 1 : 643. 1855; King in J. As. Soc. Beng. 65 : 376. 1896 ; Brandis, Ind. Trees 171. 1906; Backer & Bakh. f., Fl. Java 2 : 82. 1965.

Scandent shrubs, armed with stipular prickles; branchlets blackish with a few greyish-brown lenticels. Leaves ovate-oblong or ovate, up to 7.5 x 4.5 cm, obtusely acuminate at apex, oblique and rounded at base, crenate-serrate ; petioles pubescent. Flowers yellowish. Drupes globose-obovoid, up to 1.5 x 1.5 cm, warty, green when young, ripens yellow.

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

*Distr.* : South Andaman; North & South Nicobar.

A few in the Inland forests.

Bhandari & Bhansali (*op. cit.*) have not included the above species although they considered it as a distinct species from *Z. rugosa*.

5. **Ziziphus mauritiana** Lam., Encycl. 3 : 319. 1789 ; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 99. 1990. *Z. jujuba* (L.) Gaertn. Fruct. 1 : 203. 1788 *non* Mill. 1768 ; Laws. in Hook. f. Fl.

Brit. India 1 : 632. 1875; Parkinson, For. Fl. Andaman Islands. 131. 1923.

Trees, 3-10 m high, armed with stipular spines; branchlets blackish-brown to greyish, petioles, underside of leaves and inflorescence clothed with a white or brown tomentum. Leaves pinkish-brown above and white beneath when dry, variable, elliptic to elliptic-oblong, or suborbicular, obtuse or acute at apex, obliquely rounded at base, entire or serrulate. Flowers greenish-yellow, pale yellow or greenish-white, *ca* 2.5 mm long. Drupes globose or ellipsoid up to 1.3 x 1.2 cm, incipient fruits green, ripens orange or red; stone 2-celled, tubercled.

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

*Distr.* : North, Middle & South Andaman.

Parkinson (*op. cit.*) gives it as planted at Port Blair. Vasudeva Rao (in J. Econ. Tax. Bot. 8 : 162. 1986) includes it under Non-indigenous species. They have become naturalised in Andamans.

6. **Ziziphus nummularia** (Burm. f.) Wight & Arn., Prodr. 162. 1834; Laws. in Hook. f., Fl. Brit. India 1 : 633. 1875; Bhandari & Bhansali, in Nayar *et al.*, Fasc. Fl. India 20 : 102. 1990. *Rhamnus nummularia* Burm, f., Fl. Ind. 61. 1768.

Straggling shrubs, 2-3.5 m high, armed with spines, young branches tomentose. Leaves tomentose on both surfaces, ovate, elliptic or orbicular, up to 2.5 x 1.8 cm, obtuse at apex, oblique at base, serrate; petioles tomentose. Flowers *ca* 5 mm across. Drupes globose, *ca* 8 mm in diam., ripens black-red; seeds compressed black.

*Fl.* : March - June; *Fr.* : November - January.

This species is included on the basis of literature (Bhandari & Bhansali, *op. cit.* 103). No specimen of this species is available in PBL.

7. **Ziziphus oenoplia** (L.) Mill., Gard. Dict. ed. 8 : No. 3. 1768; Laws in Hook. f., Fl. Brit. India 1 : 634. 1875; Parkinson, For. Fl. Andaman Islands. 130. 1923 ; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 103. 1990. *Rhamnus oenoplia* L., Sp. Pl. 194. 1753.

- 1 a. Leaves fulvous - tomentose above .....var. *oenoplia*  
 b. Leaves glabrous above .....var. *pallens*

**var. *oenoplia*.**

A straggling shrub, 3-8 m high, often climbing, usually armed with solitary stipular prickles; branchlets, underside of leaves and inflorescence clothed with ferrugineous hairs. Leaves ovate, ovate-oblong or ovate-lanceolate, up to 7.5 x 4.2 cm, acute or acuminate at apex, oblique at base, minutely denticulate or almost entire; petioles tomentose. Flowers greenish-white, pale yellow or greenish-yellow, *ca* 1 mm long. Drupes ellipsoid or almost globose, up to 9 x 6 mm, yellow, ripens black; stones tuberculate.

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

*Distr.* : Middle & South Andaman.

var. *pallens* Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 106. 1990.

Large climbers, armed with stipular prickles; branchlets blackish to pinkish-brown, rusty pubescent, lenticellate. Leaves glabrous above, slightly hairy beneath only on nerves, ovate or elliptic, acuminate at apex, oblique at base; petioles pubescent. Flowers *ca* 2 mm across.

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

*Distr.* : Common in Middle & South Andaman.

8. *Ziziphus rugosa* Lam., Encycl. 3 : 319. 1789; Laws. in Hook. f., Fl. Brit. India 1 : 636. 1875; Bhandari & Bhansali in Nayar *et al.*, Fasc. Fl. India 20 : 108. 1990.

A straggling shrub or tree, often climbing, armed with short stipular prickles. Leaves glabrous above, densely tomentose beneath when young, elliptic, up to 15 cm long. Flowers greenish, densely pubescent. Drupes *ca* 7.5 mm long, yellow; stone 1-celled, 1-seeded.

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

This species is included on the basis of literature (Vasud. in J. Econ. Tax. Bot. 8 : 119. 1986). No specimens of this species are available in *PBL*.

**VITACEAE**

12 genera and 700 species distributed in tropical and subtropical regions; 4 genera and 16 species in A. & N. Islands.

- 1 a. Tendrils inflorescence - borne .....1. *Ampelocissus*
- b. Tendrils leaf-opposed .....2
- 2 a. Flowers unisexual ; stigma usually 4-lobed, at times obscurely so.....4. *Tetrastigma*
- b. Flowers bisexual ; stigma entire .....3
- 3 a. Leaves simple or digitately 5-foliolate; berries 1-2 seeded .....3. *Cissus*
- b. Leaves palmately compound; berries 2-4 seeded .....2. *Cayratia*

**1. *Ampelocissus* Planch. (*nom. cons.*)**

Cirriforous lianas. Leaves thinly coriaceous. Cymes leaf-opposed. Flowers 4 or 5-merous, polygamo-monoecious. Calyx cupular, obscurely lobed. Petals spreading or recurved. Disc annular, often 5-10 furrowed. Stamens inserted around disc. Ovary 2-celled, ovules 2 per cell, style short, thick, stigma discoid. Berries fleshy with 2 or 4 dorsally compressed seeds.

About 95 species in tropics ; 3 species in A. & N. Islands.

- 1 a. Branchlets, peduncles and usually petioles woolly tomentose intermixed with bristles ; leaves simple ; flowers pedicelled .....1. *A. barbata*
- b. Branchlets, peduncles and petioles rusty-tomentose or glabrous ; leaves compound; flowers sessile .....2
- 2 a. Branchlets, peduncles and petioles rusty-tomentose; leaves pedately 5-foliolate; leaflets oblong-lanceolate or broadly oblanceolate; berries oblong-ovoid .....2. *A. helferi*
- b. Branchlets, peduncles and petioles glabrous; leaves digitately 5-9 foliolate; leaflets elliptic-oblong; berries globose-oblong .....3. *A. polystachya*

1. **Ampelocissus barbata** (Wall.) Planch. in DC., Monogr. Phan. 5 : 375. 1887. *Vitis barbata* Wall. in Roxb., Fl. Ind. 2: 478. 1824; Laws in Hook. f., Fl. Brit. India 1 : 651. 1875; Parkinson, For. Fl. Andaman Islands. 134. 1923.

Lianas; branchlets terete, slightly flattened at nodes, hollow, ribbed. Leaves ovate, up to 27 x 24 cm, acuminate at apex, cordate at base, unequally wavy dentate; lateral nerves 6-7 pairs. Panicked cymes up to 12 cm long. Flowers yellow or yellowish-green, ca 2 mm long. Berries globose, ca 7 mm across, ripening brownish-green, red or dark purple.

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

*Distr.* : Middle, South & Little Andaman; North Nicobar.

Common along edges and roadsides of inland forests. Also seen occasionally in tidal forests.

2. **Ampelocissus helferi** (Laws.) Planch. in DC., Monogr. Phan. 411. 1887. *Vitis helferi* Laws. in Hook. f., Fl. Brit. India 1 : 662. 1875; Shetty & P. Singh in Nayar & Sastry, Red Data Book Ind. Pl. 3 : 260. 1990.

Scandent shrubs or climbers; branchlets terete, somewhat flattened at nodes, hollow, striated, lenticellate, bark greyish-black to rusty-brown. Leaves ca 26 cm long; leaflets glabrous above, tomentose beneath, up to 16.5 x 6.5 cm, acuminate at apex, cuneate to attenuate or oblique at base, serrate; lateral nerves 6-11 pairs. Berries oblong-ovoid, ca 1.5 x 1 cm, dull green.

*Fr.* : April.

*Distr.* : South Andaman.

Rare in the inland forests at an altitude of ca 100 m.

*Notes* : After the type collection of Helfer, it has been collected only once from Mount Harriet (N.G. Nair 3666) on 21.4.1976.

Doubtful Species

3. **Ampelocissus polystachya** (Wall.) Planch. in DC., Monogr. Phan. 5: 411. 1887. *Vitis polystachya* Wall., Cat. 6028. 1831-32, *p.p.*; Laws. in Hook. f., Fl. Brit. India 1 : 662. 1875.

Climbers; stems cylindrical, coarse and thick; bark thick, corky. Leaflets up to 30 x 10 cm, cuspidate at apex, distantly serrate. Flowers black when dry. Berries globose, ca 2 cm across, succulent.

*Distr.* : Tanasserim/Andaman Islands (Lawson).

2. **Cayratia** A. L. Juss. (*nom. cons.*)

Vines or lianas. Stipules 2, distinct. Cymes corymbose. Flowers 4-merous. Calyx subtruncate, obscurely lobed. Petals coriaceous, cucullate within. Disc cupular, adnate to base of ovary. Stamens inserted around disc. Ovary 2-celled, ovules 2 per cell, style subulate. Seeds pitted.

About 45 species distributed in Africa, Madagascar, Indo-Malaysia, Australia, New Caledonia and the Pacific ; 3 species in A. & N. Islands.

- 1 a. Leaves all digitately 3-foliolate .....3. *C. trifolia*  
 b. Leaves pedately 3-5 foliolate, rarely up to 11-foliolate .....2
- 2 a. Branchlets glabrous; leaflets ovate or oblanceolate; peduncles not articulate; cymes usually leaf-opposed; seeds pyriform .....  
 .....1. *C. japonica*  
 b. Branchlets pilose when young, later becoming glabrous; leaflets oblong-lanceolate, ovate-oblong or rarely obovate; peduncles mostly articulate; cymes axillary; seeds hemispheric .....2. *C. pedata*

1. **Cayratia japonica** (Thunb.) Gagnep. in Lecomte, Notul. Syst. (Paris) 1 : 349. 1911 ; Backer & Bakh. f., Fl. Java 2 : 93. 1965. *Vitis japonica* Thunb., Fl. Jap. 104. 1784; Parkinson, For. Fl. Andaman Islands. 134. 1923. *V. tenuifolia* auct. non Wight & Arn. 1834; Laws. in Hook. f., Fl. Brit. India 1 : 600. 1875 *p.p.*

Climbers; stems greyish to whitish, slender, branchlets slightly swollen at nodes, terete, hollow, finely ribbed. Leaves 3-5 foliolate; leaflets ovate or oblanceolate, upto 12 x 6.3 cm, acuminate or rarely acute at apex,

cuneate, oblique or attenuate at base, serrate. Panicked cymes up to 13 cm across, puberulous. Flowers white on greenish, *ca* 1.2 mm long. Berries globose, *ca* 1.2 cm across.

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

*Distr.* : Middle & South Andaman; North Nicobar.

Common.

2. ***Cayratia pedata*** (Lam.) Juss. ex Gagnep. in Not. Syst. (Paris) 1: 346. 1911; Shetty & P. Singh in Kew Bull. 42: 935. 1987 & in Taxon 37: 171. 1988. *Cissus pedata* Lam. Encycl. 1: 31. 1783. *Vitis pedata* (Lam.) Wall. ex Wight, Cat. 26. 1833; Laws. in Hook. f., Fl. Brit. India 1: 661. 1875; Kurz in J. As. Soc. Bengal 45(3): 124. 1876.

Lianas; branchlets terete, hollow, ribbed, greyish to pale pinkish-brown. Leaves pedately 5, rarely 3-11 foliolate; leaflets membranous, oblong-lanceolate, ovate-oblong or rarely obovate, up to 15 x 8 cm, acuminate at apex, oblique and unequal at base, remotely serrate-toothed. Corymbose cymes up to 10 cm long. Berries depressed-globose, obscurely 4-lobed, *ca* 1 cm across, smooth, ripening violet.

*Fl.* : March-June; *Fr.* : January-November.

*Distr.* : Andaman group of islands; North Nicobar.

Common in the inland forests and rare in the littoral forests.

3. ***Cayratia trifolia*** (L.) Domin in Biblioth. Bot. 89: 370. 1927; Shetty & P. Singh in Taxon 37: 171. 1988. *Vitis trifolia* L., Sp. Pl. 203. 1753. *V. carnosia* (Lam.) Wall. Num. List. 206, No. 6018. 1831-32; Laws. in Hook. f., Fl. Brit. India 1: 654. 1875.

Climbers; branchlets terete to angled, greyish-black, faintly ribbed. Leaves up to 22.5 cm long; leaflets ovate to elliptic on rarely rhomboid to almost orbicular, up to 13.5 x 5.2, obtuse or acute, rarely acuminate at apex, cuneate, rounded or slightly oblique at base, serrate or dentate. Cymes *ca*. 4 cm long. Flowers greenish-white, *ca* 5 mm across. Berries turbinate or globose, up to 1.1 cm across, ripening black or violet; seeds *ca* 6 x 4 mm.

*Fl.* : March - November; *Fr.* : July - May.

*Distr.* : Common both in A. & N. groups of islands.

### 3. *Cissus* L.

Climbing shrubs or sometimes creeping herbs. Cymes leaf-opposed or placed next the leaves, umbellate. Flowers 4-merous, bisexual. Calyx-tube cupular, entire or obscurely 4-lobed. Petals ovate, calyptrate at first, afterwards separating. Disc cupular, basally enveloping ovary. Ovary 2-celled, ovules 2 per cell, style subulate, stigma small. Berries fleshy.

About 350 species, tropical, rarely subtropical; 8 species in A. & N. Islands.

- 1 a. Leaves compound, digitately 5-foliolate .....3. *C. elongata*
- b. Leaves simple .....2
- 2 a. Stem and branches acutely angled or winged .....3
- b. Stem and branches terete or obscurely angled .....4
- 3 a. Stem 4-winged, thick, fleshy, greatly contracted at nodes.....6. *C. quadrangularis*
- b. Stem 5-angled, woody, not as above .....5. *C. pentagona*
- 4 a. Leaves pubescent or tomentose beneath .....5
- b. Leaves completely glabrous .....6
- 5 a. Young parts covered with a fugaceous tawny or rusty-coloured wool or tomentum; flowers scarlet red; seeds smooth .....7. *C. repanda*
- b. Young parts densely red-brown malpighiaceus hairy; flowers white; seeds with angular facets .....1. *C. aristata*
- 6 a. Leaves membranous, variegated; calyx with unequal sides; seeds with angular facets .....2. *C. discolor*
- b. Leaves chartaceous to coriaceous, not variegated; calyx with equal sides; seeds smooth .....7
- 7 a. Tendrils simple .....4. *C. nodosa*
- b. Tendrils bifid .....8. *C. repens*

1. **Cissus aristata** Bl., Bijdr. 183. 1825 ; Backer & Bakh. f., Fl. Java 2 : 91. 1965; Balakr. in Bull. Bot. Surv. India 24 : 59. (1982) 1983.

Climbers, slender, spreading; stem grooved. Leaves ovate, up to 15 x 10 cm, acuminate at apex, cordata at base, bristly serrate ; basal nerves 5, palmate, lateral nerves 5 pairs from midrib. Inflorescences umbellately branched, ultimate cymes subcorymbose. Berries ovoid or subglobose, up to 6 mm across, nodding, dark purple when ripe.

*Fl. & Fr.* : July - March

*Distr.* : South Andaman ; North & South Nicobar.

Common in shady places, along roadsides and edges of inland forests.

2. **Cissus discolor** Bl., Cat. Gew. Buitenz. 39. 1823 & Bijdr. 181. 1825; Latiff in Malay. Nat. J. 35. 205. 1982. *Vitis discolor* Dalz. in Hook. J. Bot. Kew Gard. Misc. 2 : 38. 1850; Laws, in Hook. f., Fl., Brit. India 1 : 647. 1875; Parkinson, For. Fl. Andaman Islands. 133. 1923.

Climbing shrubs; stems woody at base, red when young, branchlets pinkish-brown or pale yellowish. Leaves ovate-lanceolate to lanceolate or ovate-oblong, up to 20 x 6.5 cm, acuminate at apex, cuneate, rounded or truncate/cordate at base, bristly serrate; lateral nerves 5-7 pairs. Cymes up to 6 cm long. Flowers *ca* 3 mm long. Calyx purple. Petals yellow. Berries globose, *ca* 6.3 mm across, ripens red.

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

*Distr.* : Middle, South & Little Andaman.

Sparse in the inland forests.

3. **Cissus elongata** Roxb., Fl. Ind. 1 : 429. 1820 ; P. Singh & Shetty in Taxon 35 : 596. 1986. *Vitis elongata* (Roxb.) Wall., Num. List. No. 6016. 1831-32; Laws, in Hook. f., Fl. Brit. India 1 : 658. 1875.

Climbers; branchlets terete, hollow, striate, dull greyish-white or greyish-black. Leaves *ca* 9 cm long; leaflets membranous, oblanceolate or rarely obliquely lanceolate, up to 9.5 x 4 cm, acuminate at apex, cuneate

or slightly attenuate at base, broadly serrate. Flowers greenish-purple. Infructescences *ca.* 12 cm long. Berries globose, *ca.* 2.3 cm across; seeds *ca.* 1.3 cm across, stony with a beak at one end.

*Fl.* : March - June & *Fr.* : November.

*Distr.* : North Andaman.

Sparse along sides of jungle path.

*Notes* : Suessenguth (in Mitt. Bot. Staatssamml. 1 : 352. 1953) transferred *C. elongata* to *Cayratia*. P. Singh & Shetty (in Taxon 35 : 596. 1986) are convinced that the species rightly belongs to the genus *Cissus sensu stricto* and not to *Cayratia*. Moreover, the chromosome number  $2n=24$  reported by Patil *et al.* (Curr. Sci. 49 : 38. 1980) also supports this view.

4. ***Cissus nodosa*** Bl., Catalogus 39. 1823 & Bijdr. 182. 1825 ; Backer & Bakh. f., Fl. Java 2 : 92. 1965. *Vitis nodosa* (Bl.) Miq. Ann. Mus. Bot. Lugd. Bat. 1 : 87. 1863.

Climbers; branchlets pale brownish to slightly pinkish-brown, ribbed, slightly rugose. Leaves ovate-lanceolate, up to 13 x 5 cm, acuminate at apex, rounded, truncate or sometimes cuneate at base, entire; lateral nerves 5-7 pairs, thin. Petals reddish-violet with a green top. Infructescences *ca.* 8 cm long. Berries globose, *ca.* 1.3 cm across, green to black to dark purple.

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

*Distr.* : South & Little Andaman.

Sparse in the inland forests from sea level to an altitude of *ca.* 50 m.

5. ***Cissus pentagona*** Roxb. Fl. Ind. 1 : 408. 1820. *Vitis pentagona* Voigt, Hort. Suburb. Calc. 28. 1845; Laws. in Hook. f., Fl. Brit. India 1 : 646. 1875; Kurz, For. Fl. Brit. Burma 1 : 275. 1877.

Climbers; branches pale yellowish, brownish to brownish-green, thick, succulent, glossy. Leaves ovate or ovate-oblong, up to 10 x 6 cm, acuminate at apex, truncate or slightly sinuate to rounded at base, subentire to

remotely bristly toothed; lateral nerves 4-5 pairs. Panicked cymes up to 6 cm long. Flowers yellowish or pinkish-brown, *ca* 2 mm long. Berries globose or obovoid, up to 6 x 5 mm, glossy black when mature.

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

*Distr.* : North & South Andaman.

A few along roadsides, forest edges in the inland forests and also in littoral forests.

6. ***Cissus quadrangularis*** L., Syst. Nat. ed. 12, 2: 124, 1767 et Mant. Pl. 39. 1767; Shetty & P. Singh in Taxon 37 : 172. 1988. *Vitis quadrangularis* (L.) Wall. ex Wight, Cat. 26. 1833; Laws. in Hook. f., Fl. Brit. India 1 : 645. 1875.

Rambling; stems *ca* 1 cm across, succulent, constricted and jointed at nodes. Leaves succulent, ovate, up to 4 x 4.5 cm, obtuse at apex, truncate to cordate at base, subentire. Flowers scarlet red, *ca* 4 mm long. Berries globose, *ca* 5 mm across.

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

*Distr.* : South Andaman.

Usually cultivated. Also seen as an escape along forests edges and roads.

7. ***Cissus repanda*** Vahl, Symb. 3 : 18. 1794; S.M. Almeida, Fl. Savantwadi 1 : 103. 1990. *Vitis repanda* (Vahl) Wight & Arn., Prodr. 125. 1834; Laws. in Hook. f., Fl. Brit. India 1 : 648. 1875.

Large climbers; stem compressed, curly, deeply and longitudinally cracked, blackish. Leaves ovate, broadly cordate, usually somewhat angular or obsolete lobed, 5-nerved at base, up to 15 x 15 cm, shortly and bluntly acuminate at apex, remotely and bristly repand-serrate. Cymes up to 6.2 cm long. Flowers reddish, *ca* 2 mm across. Berries drooping, obovoid, *ca* 9 x 6 mm, purplish-black.

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

*Distr.* : South Andaman; Nicobar Islands (Kurz in J. As. Soc. Bengal 45 (3) : 124. 1876).

*Notes* : Kurz described *Vitis linnaei* (in J. As. Soc. Bengal 44(2) : 176. 1875), based on *Vitis reparia* Wall. Cat. No. 6038. 1831-32 and in For. Fl. Brit. Burma 1 : 275. 1877 considered *V. repanda* (Vahl) Wight & Arn. as synonymous to it.

8. **Cissus repens** Lam., Encycl. 1 : 31. 1783; Shetty & P. Singh in Taxon 37 : 173. 1988. *Vitis repens* (Lam.) Wight & Arn. in Wight, Cat. 58. 1833 & Prodr. 125. 1834; Laws. in Hook. f., Fl. Brit. India 1 : 646. 1875; Parkinson, For. Fl. Andaman Islands. 134. 1923.

Large climbers; branchlets greyish to pale yellow, ribbed. Leaves ovate, up to 13 x 9 cm, acuminate at apex, cordate or truncate to rounded at base, distantly wavy dentate. Cymes up to 4 cm long. Flowers greenish-white, reddish-green or purple, ca 4 mm long. Berries globose or ovoid, ca 6 x 4 mm, purple or whitish-red.

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

*Distr.* : North & South Andaman; North & South Nicobar.

Common in the inland forests. Occasionally seen in littoral forests.

#### 4. **Tetrastigma** Planch.

Climbing shrubs. Leaves palmately 1-3 foliolate or pedately 4-6 foliolate; tendrils entire on bifid. Inflorescences axillary or leaf-opposed cymes. Flowers 4-merous. Calyx lobed, dentate or truncate. Petals free. Disc thick, persistent in fruit. Stamens inserted under disc, staminodes minute. Ovary embedded in disc, 2-celled, cells 2-ovuled, styles short. Berries 1-4 seeded.

About 90 species, distributed in S.E. Asia, Indo-Malaya and Australia; 2 species in A. & N. Islands.

- 1 a. Branchlets lenticellate; petals rusty-puberulous outside ..... 1. *T. andamanicum*  
 b. Branchlets smooth; petals glabrous outside ..... 2. *T. campylocarpum*

1. **Tetrastigma andamanicum** (King) Suesseng. in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, 20 d : 319. 1953. *Vitis andamanicum* King in J. As. Bengal 65 : 393. 1896 ; Brandis, Ind. Trees 705. 1906; Parkinson, For. Fl. Andaman Islands. 134. 1923.

Lianas; mature branches woody, young branches striate, terete, black or dark. Leaves mostly 3-foliolate or pedately 4-5 foliolate; leaflets thinly coriaceous, oblong to elliptic or ovate, up to 19 x 10 cm, shortly cuspidate or acuminate at apex, cuneate or rarely slightly oblique at base, broadly serrate; lateral nerves 6-12 pairs. Cymes axillary, ca 3.5 x 4.6 cm, many-flowered, much branched, spreading, puberulous, pedunculate. Flowers ca 2 mm long. Berries globular-ovoid, ca 2 x 2 cm, green with a scanty pulp; seed 1, ovoid, ca 10 x 7 mm, subcompressed, grooved on one face and 3-ridged on the other.

*Fl.* : January-May & *Fr.* : July-May.

*Distr.* : Middle, South & Little Andaman; North & South Nicobar. Endemic.

*Notes* : *Vitis andamanica* King was originally described in 1896 from Andaman on the basis of some collections made by Dr. King's collectors. Although Brandis (*op. cit.* 705), and later Parkinson (*op. cit.* 134) included this species, it has never been collected after the type collections until recently from Rangachang area in South Andaman Island on 17.2.1973 (*N.P. Balakrishnan* 30). This specimen had been put under *T. lanceolarium* (Roxb.) Planch. and subsequently as *T. andamanicum* (King) Suesseng. by Shetty (*op. cit.*). Now there are quite a few collections of this plant at PBL & CAL.

2. **Tetrastigma campylocarpum** (Kurz) Planch. in DC., Mon. Phan. 5 : 437. 1887; Raiz., Suppl. UGP. & Sub. Himal. Tract. 44. 1976. *Vitis campylocarpa* Kurz in J. As Soc. Bengal 41 (2) : 302. 1872 & For. Fl. Brit. Burma 1 : 274. 1877; Laws. in Hook. f., Fl. Brit. India 1 : 657. 1875.

Climbers; stem terete with slightly swollen nodes, pale brownish. Leaves 3-foliolate; leaflets drying greyish-black above and pinkish-brown beneath, elliptic or obovate, up to 14 x 7 cm, acuminate at apex, rarely oblique, cuneate at base, remotely and slightly crenate-toothed; lateral nerves ca 11 pairs. Panicked cymes ca 8 cm long. Flowers ca 3 mm long.

*Fl.* : November - December.

*Distr.* : South Nicobar.

Common along roadsides.

**LEEACEAE**

1 genus and 34 species having paleotropical distribution (32 of which occur in the Indo-Malesian area and 2 are restricted to the Afro-Madagascar area); 1 genus and 7 species in A. & N. Islands.

1. *Leea* van Royen ex L. (*nom. cons.*)

Small trees, shrubs or herbs. Leaves usually very large, distichous, unifoliolate, trifoliolate or 1-4 pinnate. Peduncles opposite leaves. Inflorescence corymbosely-cymose. Flowers bisexual, actinomorphic, 4 or 5-merous. Petals and stamens connate with disc. Ovary inserted on disc, 3-6 celled, style short, stigma swollen, ovules solitary in each cell. Berries depressed-globose, 3-6 celled, 3-6 seeded; seed wedge-shaped.

34 species having palaeotropical distribution; 7 species in A. & N. Islands.

- 1 a. Petiolar stipule a narrow wing; up to 10 mm broad, somewhat persistent, scar usually narrow .....2
- b. Petiolar stipule obovate, over 10 mm broad, early caducous, scar broad.....3
- 2 a. Stems and branches unarmed; stems often fluted and crispately winged, petiolules often winged, peduncles often fluted or crispately winged; berries purple-black .....3. *L. asiatica*
- b. Stems and branches spinescent; stems, petiolules and peduncles not as above; berries orange to lead-grey .....2. *L. angulata*
- 3 a. Calyx and petals mealy pubescent; petals thick-fleshy; anthers with thick orange-brown walls .....7. *L. macrophylla*
- b. Calyx and petals glabrous; petals and anther walls thin .....4
- 4 a. Inflorescence and leaflets with large discoidal brown pearl glands. ....1. *L. aequata*
- b. Pearl glands inconspicuous or absent .....5

- 5 a. Flowers red, purplish-red to orange-yellow .....5. *L. guineensis*  
 b. Flowers greenish-white .....6
- 6 a. Leaves 3-foliolate or 1-pinnate; corolla tube and anther lobes above 4 mm long, staminal tube 2.3 mm long or more .....4. *L. grandifolia*  
 b. Leaves 1-3-pinnate; corolla tube and anther lobes below 4 mm long; staminal tube below 2.2 mm long .....6. *L. indica*

1. ***Leea aequata*** L., Syst. Nat. ed. 12, 2 : 627. 1767 & Mant. 1 : 124. 1767; Parkinson, For. Fl. Andaman Islands. 133. 1923; Ridsd. in Blumea 22: 90. 1974. *L. hirta* Roxb. ex Hornem., Hort. Hafn. 1 : 231. 1813; Laws. in Hook. f., Fl. Brit. India 1 : 668. 1875.

Shrubs, 1-4 m high; young branches hispid pubescent. Leaves 2-3 pinnate, up to 40 cm long, rachis hirsute; leaflets membranous to coriaceous, hispid, lanceolate, oblong-lanceolate, elliptic or ovate-lanceolate, up to 25 x 10 cm, acuminate at apex, rounded or cuneate at base, serrate; lateral nerves 7-18 pairs. Inflorescences subterminal to leaf-opposite, up to 8 cm long, pubescent. Flowers white, ca 4 mm long, sessile or subsessile. Berries ca 1 cm across, ripens red to black.

*Fl.* : May - July & *Fr.* : July - April.

*Distr.* : North, Middle & South Andaman.

2. ***Leea angulata*** Korth. ex. Miq. in Ann. Mus. Bot.-Lugd.-Bat. 1:97. 1863; Ridsd. in Blumea 22: 84. 1974; N.G. Nair in Sci. & Cult. 41 : 544. 1975.

Shrubs or small trees, 3-5 m high. Leaves 2-3 pinnate, up to 35 cm long, rachis winged at base; leaflets numerous, hairy at nerve axils beneath, ovate-elliptic, up to 12 x 15 cm, acuminate at apex, cuneate to oblique at base, coarsely serrate; lateral nerves 4-10 pairs. Inflorescences solitary or geminate, 5-10 cm long. Berries ca 1.5 cm across; seeds ca 4 x 3 mm.

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

*Distr.* : North Andaman. North & South Nicobar.

*Notes* : Parkinson (For. Fl. Andaman Islands. 133. 1923) makes a mention of a species of *Leea*, the stems of which are armed with prickles

and which is occurring in Middle Andaman, on the east-coast, North of Betapur and on Havelock Island. This species may be probably *Leea angulata*.

3. *Leea asiatica* (L.) Ridsd. in Manilal, Bot-Hist. Hort. Malab. 189. 1980. *Phytolacca asiatica* L., Sp. Pl. 474. 1753. *Leea crispa* van. Royen ex L., Syst. Nat. ed. 12, 2 : 627. 1767 & Mant. 124. 1767; Laws. in Hook. f., Fl. Brit. India 1 : 665. 1875; Ridsd. in Blumea 22 : 88. 1974. *L. aspera* Edgew. in Trans. Linn. Soc. 20 : 36. 1846 non Wall. ex G. Don 1831; Laws. in Hook. f., *op. cit.* *L. pumila* Kurz in J. As. Soc. Bengal 41 (2) : 302. 1872; Laws. in Hook. f., *op. cit.* 666.

Semi-herbaceous shrubs or trees, up to 8 m high; branchlets pinkish-brown to blackish-brown. Leaves 3-foliolate or 1-pinnate; leaflets 7, elliptic or ovate to ovate-oblong, up to 15 x 8 cm, acuminate at apex, rounded or cordate at base, crenate to serrate; lateral nerves 10-15 pairs. Inflorescences up to 12 cm long. Flowers greenish-white, *ca* 2 mm across. Berries *ca* 1.5 mm across; seed *ca* 5 x 3 mm.

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

*Distr.* : Andaman group of islands.

4. *Leea grandifolia* Kurz in J. Bot. 13 : 325. 1875; Ridsd. in Blumea 22 : 87. 1974.

Shrubs or trees, 2-7 m high; branchlets brown, grey to black, lenticellate. Leaves up to 42 cm long; leaflets 3-7, pinkish-brown above, coppery brown beneath when dry, ovate or elliptic, up to 39 x 25 cm, acute to acuminate at apex, rounded at base, shallowly serrate; lateral nerves 8-15 pairs. Inflorescences up to 8 cm long. Flowers *ca* 5 mm long. Berries *ca* 1.2 cm across, ripens black; seeds *ca* 4 x 3 mm, greyish-black.

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

*Distr.* : North & South Nicobar. Endemic.

Rare.

5. *Leea guineensis* G. Don., Gen. Hist. 1 : 712. 1831; Ridsd. in Blumea 22 : 92. 1974. *L. acuminata* Wall. ex C.B. Cl. in Bot. Lond. 19 : 141. 1881; Parkinson, For. Fl. Andaman Island. 133. 1923.

Herbs, 30-100 cm high or small shrubs or trees *ca* 5 m high; stem reddish-brown, woody at base, often with aerial roots at nodes, young parts of stem striated, flattened, later becoming terete. Leaves 1-3 pinnate, up to 23 cm long; leaflets 5-11, dark brown to greyish-brown above and coppery brown to olive green-brown beneath when dry, oblong-lanceolate or elliptic to ovate, up to 25 x 8.8 cm, acuminate at apex, rounded or broadly cuneate at base, serrate or subentire; lateral nerves 4-13 pairs. Inflorescences pseudo-terminal, up to 7 cm long. Flowers *ca* 3 mm across, sessile. Berries *ca* 6 mm across, ripens black.

*Fl. & Fr.* : January-July

*Distr.* : Middle, South & Little Andaman.

6. ***Leea indica*** (Burm. f.) Merr. in Philipp. J. Sci. 14 : 245. 1919; Ridsd. in Blumea 22 : 95. 1974. *Staphylea indica* Burm. f., Fl. Ind. 75, t. 23, f. 2. 1768. *Leea sambucina* Willd., Sp. Pl. 1 : 1117. 1798 *nom. illeg.*; Laws. in Hook. f., Fl. Brit. India 1 : 666. 1876; Parkinson, For. Fl. Andaman Islands. 132. 1923.

Undershrubs, shrubs or small trees, 1.2-10 m high; branchlets whitish-green when fresh, drying pinkish-brown to black, sparsely lenticelled, striated. Leaves up to 50 cm long; leaflets coriaceous, pinkish-brown above and coppery-brown below when dry, oblong, elliptic, ovate-lanceolate or lanceolate, up to 23.5 x 10 cm, sharply acuminate at apex, cuneate at base, coarsely crenate-serrate. Inflorescences up to 25 cm long. Flowers *ca* 3 mm long. Berries *ca* 1.2 cm across, ripens greenish-brown, orange or bluish-black.

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

*Distr.* : Both in Andaman and Nicobar groups of islands.

Common up to 200 m above msl.

7. ***Leea macrophylla*** Roxb. ex Hornem., Hort. Hafn. 1 : 231. 1813; Laws. in Hook. f., Fl. Brit. India 1 : 664. 1875; Ridsd. in Blumea 22 : 85. 1974. *L. integrifolia* Roxb., Fl. Ind. 2 : 472. 1824; Laws. in Hook. f., *op. cit.* 667. *L. robusta* Roxb., *op. cit.* 468; Laws. in Hook. f., *op. cit.* *pp.* *L. cinerea* Laws. in Hook. f., *op. cit.* 665. *L. coriacea* Laws. in

Hook. f., *op. cit.* *L. diffusa* Laws. in Hook. f., *op. cit.* 667. *L. angustifolia* Laws. in Hook. f., *op. cit.* 665. *L. parallela* Wall. ex Laws. in Hook. f., *op. cit.* 666. *L. latifolia* Wall. ex Kurz. in J. As. Soc. Bengal 4 (2) : 411. 1896; Parkinson, For. Fl. Andaman Islands. 132. 1923.

Shrubs or trees, 1-5 m high; young branches pubescent, often appearing mealy, striated. Leaves unifoliolate or trifoliolate to 1-3 pinnate, up to 1.5 m long, rachis robust, striated, sparsely or densely hairy; leaflets 5-21 or more, glabrous to sparsely hairy above, glabrous to puberulous along midrib, veins and veinlets, elliptic to oblong or ovate or elliptic - lanceolate, up to 30 x 14 cm, acuminate at apex, cuneate, rounded to subcordate at base, serrate; lateral nerves 6-18 pairs. Inflorescences terminal, up to 45 cm long, pubescent. Flowers greenish-white, ca 5 mm across, sessile to subsessile. Berries ca 7 mm across.

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

*Distr.* : Middle & South Andaman.

### SAPINDACEAE

About 150 genera and 2000 species in the tropics and subtropics; 13 genera, 19 species and 2 formas in A. & N. Islands.

- 1 a. Climbing herbs; inflorescences with a pair of tendrils..... 3. *Cardiospermum*
- b. Erect trees or shrubs (rarely subscandent shrubs as in *Allophylus*);  
      inflorescences without tendrils .....2
- 2 a. Fruits winged ..... 3
- b. Fruits wingless ..... 4
- 3 a. Leaves simple; capsules reniform .....5. *Dodonaea*
- b. Leaves compound; capsules obovoid .....8. *Lepidopetalum*
- 4 a. Leaves 1 or 3 foliolate .....1. *Allophylus*
- b. Leaves simple or pinnate .....5
- 5 a. Seed naked .....6
- b. Seed with sarcotesta and/or arilloid or with thickened cup-shaped placenta  
      below seed ..... 7

- 6 a. Leaves and twigs covered with glandular scales; petals absent .....6. *Ganophyllum*  
 b. Leaves and twigs without glandular scales; petals present .....9. *Lepisanthes*
- 7 a. Indumentum of stellate hair tufts besides solitary hairs .....8  
 b. Indumentum of solitary hairs or plants glabrous .....9
- 8 a. Petals 5; ovules attached apically to about half-way; fruit lobes loculicidally  
 dehiscent into valves; hairy region covering less than 1/6 of seed  
 .....7. *Harpullia*  
 b. Petals 0-5; ovules attached nearly to base; fruits entire, breaking up  
 irregularly; hilar region covering up to 1/2 of seed .....4. *Dimocarpus*
- 9 a. Fruits spiny .....11. *Nephelium*  
 b. Fruits smooth to wrinkled when dry .....10
- 10 a. Pseudostipules present; fruits indehiscent .....12. *Pometia*  
 b. Pseudostipules absent; fruits dehiscent .....11
- 11 a. Pistil lobed; fruits entire, obovoid; aril with 2 spurs at base .....10. *Mischocarpus*  
 b. Pistil entire; fruits lobed, obcordate; aril not as above .....2. *Arytera*

### 1. *Allophylus* L.

Small trees or shrubs. Leaves 1 or 3 foliolate. Racemes or spikes simple or branched, axillary. Flowers polygamo-dioecious, white or yellowish. Sepals 4, in opposite pairs, hooded, membranous, the 2 outer smaller. Petals 4. Disc usually with 4 glands opposite petals. Stamens 8, inserted on receptacle inside disc. Ovary usually 2-lobed and 2-celled, ovules in cells solitary. Schizocarp indehiscent, usually 1-2 lobed, juicy, bright red; seeds usually with a short fleshy axil.

About 190 tropical and subtropical species; 4 species in A. & N. Islands.

According to Leenhouts the genus may probably encompasses a number of diploids and polyploids, partly infertile. There will be some genetically well delimited species, but without knowledge of chromosomes it is impossible to say what are good taxa, what are not. So in his opinion (Blumea 15 : 301-358. 1967), the genus contains but 1 polymorphic species, viz., *A. cobbe* (L.) Reausch.

- 1 a. Leaflets subcoriaceous to coriaceous .....2  
 b. Leaflets membranous .....3
- 2 a. Leaflets coarsely serrate or crenulate along margins, subcoriaceous  
 puberulous or glabrescent along midrib and petiolules; fruits globose .....  
 .....1. *A. cobbe*  
 b. Leaflets serrate along margins in upper half and entire in lower half,  
 coriaceous, glabrous; fruits obovoid to subglobose .....2. *A. dimorphus*
- 3 a. Leaflets gradually narrowed into somewhat long acumen, equally acutely  
 serrate along margins; fruit cocci larger, ca. 8 x 7 mm .....  
 .....3. *A. subfalcatus* var. *acutissimus*  
 b. Leaflets all somewhat obtuse to acute, rarely shortly acuminate, obtusely  
 few dentate or serrulate, somewhat subentire along margins; fruit cocci  
 medium sized .....4. *A. urphyllus*

1. ***Allophylus cobbe*** (L.) Reusch., Nomencl. ed. 3 : 108. 1797; Hiern  
 in Hook. f., Fl. Brit. India 1 : 673. 1875; Parkinson, For. Fl. Andaman  
 Islands. 136. 1923; Leenh. in Blumea 15 : 322. 1967. *Rhus cobbe* L.,  
 Sp. Pl. 267. 1753.

Small trees or shrubs, 1-5 m high; branchlets greyish or dark brown,  
 terete, lenticellate. Leaves 3-foliolate, up to 20 cm long; leaflets blackish  
 above and coppery-brown or greyish-green beneath when dry, ovate,  
 elliptic, lanceolate or oblanceolate up to 25 x 9 cm, acuminate or acute at  
 apex, attenuate or often oblique at base; lateral nerves 6-12 pairs. Flowers  
 ca 1 mm across, fascicled in clusters of 3-4 on inflorescence axis. Fruits  
 globose, ca 8 mm across, ripens orange-red.

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

*Distr.* : Andaman & Nicobar groups of islands.

Common along littoral forests, also seen in edges of inland forests.

2. ***Allophylus dimorphus*** Radlk. Sapind. Hol. - Ind. 17 : 56. 1879;  
 Leenh. in Blumea 15 : 325. 1967.

Shrubs, ca 2 m high; branchlets terete, blackish-brown, lenticellate.  
 Leaves 3-foliolate; leaflets elliptic or rhomboid, up to 10.5 x 4.8 cm,

acuminate at apex, cuneate and oblique at base. Inflorescences ca 3.5 cm long. Flowers ca 1 mm long.

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

*Distr.* : Common in South Nicobar.

3. *Allophylus subfalcatus* Radlk. var. *acutissimus* (Radlk.) Mukherjee in Indian Forester 98 : 493. 1972. *A. glaber* (Roxb.) Radlk. var. *acutissimus* Radlk. in Engler, Pflanzenr. 98b : 567. 1932.

Undershrubs or trees, 7-12 m high; branchlets whitish-green when fresh, greyish to greyish-brown upon drying, terete, lenticellate. Leaves 3-foliolate; leaflets glossy, drying blackish above and coppery-brown beneath, elliptic to elliptic-lanceolate or ovate-lanceolate, up to 15.5 x 8.5 cm, cuneate to cuneate-oblique at base; lateral nerves 9-14 pairs. Spikes ca 20 cm long. Flowers ca 5 mm long, in clusters. Fruit cocci globose to obovoid.

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

*Distr.* : North & South Andaman; North Nicobars.

Endemic. Common in the inland forests up to 250 m above msl.

4. *Allophylus triphyllus* (Burm. f.) Merr. in Philip. J. Sci. 19 : 363. 1921; Leenh. in Blumea 15 : 329. 1967. *Usubris triphyllus* Burm. f., Fl. Ind. 89, t. 32, f. 1. 1768. *Allophylus glaber* (Roxb.) Boerl., Hand. 1 : 284. 1890 *nom. illeg.*; Radlk. in Engler, Pflanzenr. 98b : 566. 1932.

A tall shrub; branchlets dark brown to black, lenticellate, glabrescent. Leaves 3-foliolate; leaflets ovate to elliptic, rarely oblong-lanceolate, up to 16.5 x 6.3 cm, cuneate or rounded, slightly oblique at base; lateral nerves 4-8 pairs. Inflorescences up to 12 cm long, densely-flowered, glabrescent. Flowers ca 2 across. Fruits cocci globose, ripens red or dark purple.

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

*Distr.* : South Andaman; North Nicobar.

## 2. *Arytera* Bl.

Trees or tall shrubs. Leaves paripinnate; leaflets entire. Inflorescences paniced. Flowers polygamo-dioecious, regular. Calyx deeply 5 (-6) parted. Petals 5 (-6). Disc annular. Stamens 8 (-9), filaments pilose. Ovary at first entire, 2-celled, cells 1-ovuled, style robust, persistent, stigma shortly 2-dentate. Capsules deeply 2 (-1) lobed, mericarps 2-valved; seed with a saccate aril.

About 32 species distributed in China, Australia, Indo-Malayan and the Pacific regions; 1 species in A. & N. Islands.

1. *Arytera littoralis* Bl. in Rumphia 3 : 170. 1849; Parkinson, For. Fl. Andaman Islands. 137. 1923; Turner in Blumea 38 : 144. 1993 & in Adema *et al.* Fl. Males. 1, 11 : 473. 1994. *Euphoria xerocarpa* Bl. Bijdr. 234. 1825 *pp.* (excl. fruits), *comb. illeg.* *Arytera xerocarpa* (Bl.) Adelb. in Blumea 6 : 324. 1948. *Cupania adenophylla* Planch. ex Hiern in Hook. f., Fl. Brit. India 1 : 677. 1865.

Trees, 2-10 m high; branchlets lenticellate with prominent scars of fallen leaves, reddish in young parts when fresh, greenish-brown, pinkish-brown to blackish upon drying. Leaves (2) 4-6 foliolate; leaflets subopposite, coriaceous, glabrous above, glabrous to hairy especially on major nerves, elliptic, elliptic-oblong to oblong-lanceolate or ovate, up to 19.5 x 5.2 cm, acuminate at apex, cuneate and slightly attenuate at base; lateral nerves 5-11 pairs. Inflorescences axillary to pseudoterminal, up to 6 cm long, pubescent. Flowers yellowish, *ca* 2.5 cm across. Capsules with 1 or 2 well developed lobes, *ca* 2.2 x 0.8 cm, stalked; seeds ellipsoid to orbicular.

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

*Distr.* : North, Middle & South Andaman; North Nicobar.

Scattered in the littoral forests.

*Notes* : Balakrishnan & Rao (1983) included this species under the list of endangered plants as far as Indian territory is concerned. Rao (1986) listed this species from Andaman based on literature. It is noticed that this plant was first collected from Andaman in 1884 by Dr. King's collector.

and then by Parkinson in 1916 from Middle Andaman. Recent collections are after nearly six decades from Car Nicobar in 1975 by Nair and Interview Island in 1991 by Lakshminarasimhan.

For a discussion of the nomenclatural problems regarding *A. litoralis*, see H. Turner (1993).

### 3. *Cardiospermum* L.

Climbing herbs; stems and branches wiry. Leaves biternate, coarsely dentate. Inflorescences of axillary racemes, lowest pair of pedicels developed into spiral tendrils. Flowers irregular, polygamo-dioecious. Sepals 4, the 2 outer ones small. Petals 4, in pairs. Disc unilateral composed of 2 glands. Stamens 8, excentric, filaments pilose. Ovary 3-celled, style short, stigma 3-lobed. Capsules 3-lobed, inflated, loculicidal; seeds globose, black usually arillate at base, testa crustaceous.

12 species mostly occurring in tropical America; 1 species in A. & N. Islands.

1. *Cardiospermum halicacabum* L., Sp. Pl. 366. 1753; Hiern in Hook. f. Fl. Brit. India 1 : 697. 1875.

Climbing herbs; branches pinkish-brown to yellowish, ribbed. Leaves ca. 10 cm long; leaflets chartaceous, lanceolate or ovate, up to 5 x 2.8 cm, acuminate at apex, attenuate at base. Flowers white, ca 3 mm across. Capsules broadly pyriform, ca 3.5 cm across, reddish-green or greenish-brown; seeds ca. 4 mm across.

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

*Distr.* : Andaman group of islands; North Nicobar.

Common along road sides, edges of forests and also introduced.

### 4. *Dimocarpus* Lour.

Trees or shrubs. Leaves paripinnate, rarely unifoliolate; leaflets opposite. Flowers unisexual. Calyx and petals 5 (exceptionally 6). Disc complete, slightly 5-lobed. Stamens (-6) 8 (-10). Pistil 2- (exceptionally 3-) merous, ovary sessile, style apical, stigma spreading. Pistillode small,

densely pilose. Fruits usually with 1 developed lobe, globose to broadly ellipsoid, indehiscent, calyx persistent; seed globose.

5 species in S. and S.E. Asia; 1 species in A. & N. Islands.

1. **Dimocarpus longan** Lour., Fl. Cochinch. 233. 1790; Leenh. in Blumea 19 : 122. 1971. *Nephelium longana* Cambess., Mem. Mus. Hist. Nat. Paris 18 : 30. 1829; Hiern in Hook. f., Fl. Brit. India 1 : 688. 1875.

Trees, 4-16 m high; branchlets terete, dark brown to greyish-brown, warty, lenticellate. Leaves up to 19 cm long; leaflets 2-8 pairs, coriaceous, drying dark brownish above and glaucous beneath, lanceolate to oblong-lanceolate, oblong-elliptic, elliptic or oblanceolate, up to 17.5 x 8 cm, acute or acuminate at apex, cuneate or often oblique at base, entire; lateral nerves 10-18 pairs. Inflorescences of axillary or terminal paniced cymes, up to 20 cm long. Flowers white, ca 4 mm long. Fruits subglobose or ellipsoid, ca 1.2 cm across, granulate to nearly smooth, brownish.

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

*Distr.* : North & Middle Andaman; North Nicobar.

Scattered in the inland and tropical forests, but rarely cultivated.

### 5. **Dodonaea** Mill.

Shrubs or rarely arborescent. Inflorescences lateral and terminal. Flowers polygamous. Sepals 5-2. Petals absent. Stamens 10-5, usually 8, inserted on outer side of disc. Disc obsolete in males small in females. Ovary 3-6 sided and celled, style 3-6-sided, 3-6 cleft at apex. Capsules 2-6 sided, septicidally 2-6 valved, cells 1-2 seeded.

About 60 tropical and subtropical species, mostly occurring in Australia; 1 species in A. & N. Islands.

1. **Dodonaea viscosa** Jacq., Enum. Syst. Pl. 19. 1760; Hiern in Hook. f., Fl. Brit. India 1 : 697. 1875; Parkinson, For. Fl. Andaman Islands. 135. 1923; Leenh. in Blumea 28 : 285. 1983.

Shrubs or treelets, 1-4 m high; branchlets angled or more or less terete, brownish to blackish-brown, slightly ribbed in younger parts. Leaves



**Fig. 8: *Dimocarpus longan* Lour.**  
1. Flowering twig.

obovate to oblanceolate or rarely broadly elliptic, up to 11.2 x 3.5 cm, acute or cuspidate at apex, attenuate at base, recurved; lateral nerves up to 35 and looping. Inflorescences of paniced cymes, ca 7 cm long. Flowers pale green or yellowish-green, ca. 3 mm long. Capsules ca 1.7 x 1.8 cm, compressed, winged, straw coloured.

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

*Distr.* : North, Middle & South Andaman; North Nicobar.

Scattered at low altitudes in littoral forests.

### 6. *Ganophyllum* Bl.

Trees. Leaves paripinnate; leaflets entire. Inflorescences paniced. Flowers pentamerous, polygamodioecious, regular. Calyx persistent. Corolla absent. Disc hairy. Stamens inserted between lobes of disc. Ovary 2-celled, cells 2-ovuled, style short, thick, stigma 2-lobed. Drupes acute, 1-celled, 1-seeded.

1 species in tropical W. Africa, 1 in Philippines, Sumatra, Java, New Guinea and N.E. Australia; 1 species in A. & N. Islands.

1. *Ganophyllum falcatum* Bl., Mus. Bot. 1 : 230. 1850; Parkinson, For. Fl. Andaman Islands. 116. 1923; Baker & Bakh. f., Fl. Java 2 : 142. 1965.

Trees, 8-21 m high; bark rough, reddish-brown, branchlets greyish-white to greyish-brown, lenticellate. Leaves up to 60 cm long; leaflets 7-21, coriaceous, lanceolate to oblong-lanceolate or ovate, up to 10 x 3.7 cm, acuminate at apex, oblique at base; lateral nerves 6-11 pairs, looping far from margins. Inflorescences axillary or pseudo-terminal, ca 20 cm long, tomentose to pubescent. Flowers yellow, ca 2 mm long. Fruits ellipsoid to ovoid, ca 1.5 x 1 cm, slightly pointed, glossy green to yellowish-orange.

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

*Distr.* : North, Middle & South Andaman; North Nicobar.

Frequent in the littoral forests.

### 7. *Harpullia* Roxb.

Shrubs to medium sized trees. Leaves paripinnate; leaflets usually alternate, entire. Flowers dioecious, regular, pentamerous. Sepals hairy. Petals longer than calyx. Stamens 5-8. Ovary 2 or 3-celled with 1 or 2 ovules per locule. Fruits usually short-stipitate, 2 or 3-lobed.

26 species, occurring in S.E. China, Bangladesh, India, Sri Lanka, Myanmar, Thailand, Vietnam, throughout Malesia, Australia, from the Solomon Island to Samoa and Tonga, New Caledonia; 1 species in A. & N. Islands.

1. *Harpullia cupanioides* Roxb., Fl. Ind. 2 : 442. 1824; Hiern in Hook. f., Fl. Brit. India 1 : 692. 1875 *p.p.*; Parkinson, For. Fl. Andaman Islands. 136. 1923; Leenh. & Vente in Blumea 28 : 26. 1982.

Trees, 6-18 m high; branchlets whitish-green when fresh, greyish to brownish or pinkish-brown when dry. Leaflets 3-6 pairs, chartaceous, oblong to elliptic-lanceolate, oblong-lanceolate to ovate-lanceolate or rarely elliptic, up to 20 x 7 cm, acuminate at apex, obliquely cuneate or rarely rounded at base; lateral nerves 8-15 pairs. Inflorescences of axillary or pseudo-terminal panicles, ca 25 cm long. Flowers pale whitish, greenish-white or yellow, ca 8 mm across. Petals slightly reniform, transversely ellipsoid, up to 5 x 2.5 cm, truncate at base, ripens yellowish-orange to red, 2-seeded.

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

*Distr.* : Middle, South & Little Andaman; South Nicobar.

### 8. *Lepidopetalum* Bl.

Trees. Leaves paripinnate, pulvinate at base; leaflets subopposite to opposite, entire. Inflorescence ramiflorous to axillary to pseudoterminal. Flowers actinomorphic. Sepals 5 (or 6), basally united. Petals 5 (to 7). Disc circular. Stamens (7-) 8 (-10). Ovary 2 or rarely 3-locular, ovule 1 per locule, style and stigma united. Fruit an obovoid capsule, regularly dehiscent, usually with one developed seed; seed ellipsoid.

6 species distributed in Malesia, N.E. Australia; 1 species in A. & N. Islands.

1. **Lepidopetalum montanum** (Bl.) Redlk., Sap. Holl.-Ind. 14. 1879; Van Welzen *et al.* in *Blumea* 36 : 457. 1992. *Arytera montana* Bl. in *Rumphia* 3 : 171. 1847. *Cupania jackiana* Hiern in Hook. f., *Fl. Brit. India* 1 : 68. 1875. *Lepidopetalum jackianum* Radlk., *op. cit.* 45.

Trees or shrubs, 3-10 m high; branchlets blackish to pinkish-brown. Leaves up to 30 cm long; leaflets 2-10, elliptic, oblong or ovate-oblong, up to 17 x 7.5 cm, shortly and obtusely acuminate at apex, rounded or cuncate to oblique at base; lateral nerves 7-10 pairs. Racemes up to 5 cm long. Flowers white, *ca* 1.2 mm long. Capsules *ca* 3.7 x 2 cm, compressed, apex truncate with a mucro, reddish-brown outside, hirsute and scarlet within; seed *ca* 2 x 1.2 cm, black, arillate at base.

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

*Distr.* : South Andaman; North Nicobar.

Scattered along roadsides and in scrub jungles from sea level to an altitude of *ca* 20 m above msl. Rarely also cultivated near villages.

*Notes* : *Lepidopetalum jackianum* was known only from Nicobar Islands, while *L. montanum* was only recorded from Sumatra. van Welzen *et al.* (*op. cit.* p. 458) united both the species as they only differ marginally, the Sumatran leaflets tend to be somewhat more slender and have a more acute apex, while the rachis and petiolules are more hairy than those of the Nicobar Islands. The disc of the Nicobar specimens is usually not revolute as on Sumatra. Typical for *L. jackianum* are the usually few domatia, the small petals, the high and slender disc, the subglabrous pistil, and the large, stiped fruits.

### 9. **Lepisanthes** Bl.

Trees or shrubs; indumentum consisting of solitary, simple hairs. Leaves pari or imparipinnate, sometimes simple; leaflets opposite or alternate, entire. Inflorescences remi - or cauliflorous. Flowers unisexual. Petals mostly distinctly clawed. Fruits sessile or sometimes shortly stipitate, drupaceous; seeds with a shining brown to black testa, hilum basal.

About 40 species distributed in Old World tropics from W. Africa via Madagascar, S. and S.E. Asia and Malesia to New Guinea; 4 species in A & N Islands.

- 1 a. Leaves usually simple, rarely compound; petals as long as sepals .....3. *L. senegalensis*
- b. Leaves always compound; petals longer than sepals .....2
- 2 a. Fruits parted, (sub) glabrous .....2. *L. rubiginosa*
- b. Fruits either lobed or tomentose .....3
- 3 a. Petioles distinctly developed, exstipulate .....4. *L. tetraphylla*
- b. Petioles absent, basal pair of leaflets simulating stipules ... 1. *L. andamanica*

1. ***Lepisanthes andamanica*** King in J. As. Soc. Bengal 65 (2) : 428. 1896; Parkinson, For. Fl. Andaman Islands. 137. 1923; Leenh. in Blumea 17 : 62. 1969.

Trees, 5-6 m high, bark pale purplish-brown to greyish, branchlets terete. Leaves paripinnate, rarely 1-foliolate, up to 30 cm long; leaflets usually 4, chartaceous, bluntly acute or acuminate at apex, upper pair elliptic or sometimes lanceolate to oblanceolate, up to 21 x 9.5 cm, slightly oblique-cuneate at base, lower pair ovate, obovate or elliptic, up to 10 x 5.3 cm, rounded at base; lateral nerves 7-10 pairs. Inflorescences of compound, densely fulvous to greyish-puberulous panicles. Flowers white, ca. 6 mm across. Drupes globose, ca 2 x 1.5 cm, 3-lobed, smooth, densely appressed short-hairy, ripens yellow.

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

*Distr.* : South Andaman; North Nicobar. Endemic.

A few in the inland and littoral forests.

2. ***Lepisanthes rubiginosa*** (Roxb.) Leenh. in Blumea 17 : 82. 1969. *Sapindus rubiginosa* Roxb., Pl. Cor. 1 : 44, t. 62. 1796. *Erioglossum edule* Bl., Bijdr. 229. 1825; Hiern in Hook. f., Fl. Brit. India 1 : 672. 1875. *E. rubiginosa* Bl. in Rumphia 3 : 118. 1849; Parkinson, For. Fl. Andaman Islands. 137. 1923.

Trees, 2-18 m high; bark brownish; branchlets usually terete but flattened or laterally compressed in younger portions, tomentose when young, later glabrous. Leaves usually imparipinnate, up to 60 mm long; leaflets (2) 5-13, coriaceous, puberulous when young, later glabrous, broadly ovate to ovate-oblong, elliptic to elliptic-oblong, oblong-lanceolate, oblanceolate or oblong, rarely suborbicular, up to 19 x 9 cm, acuminate or acute or obtuse at apex, oblique or rarely cuneate at base; lateral nerves 9-12. Pairs up to 27 cm long, pubescent or puberulous. Flowers white, ca 3 mm across. Drupes ovoid-ellipsoid or globose, up to 2 x 1.2 cm, ripens dark purple or scarlet.

*Fl. & Fr.*: December-June

*Distr.*: Andaman & Nicobar groups of islands common in the inland deciduous or mixed forests up to 25 m above msl.

3. ***Lepisanthes senegalensis*** (Juss. ex Poir.) Leenh. in *Blumea* 17 : 85. 1969 & *Ibid.* 18 : 429. 1970. *Sapindus senegalensis* Juss. ex Poir., *Encycl.* 6 : 666. 1805. *Aphania montana* Bl., *Bijdr.* 236. 1825; Parkinson, *For. Fl. Andaman Islands*, 135. 1923. *Sapindus danura* Voigt, *Hort. Suburb. Calcutta* 94. 1845; Hiern in Hook. f., *Fl. Brit. India* 1 : 684. 1875. *Aphania danura* (Roxb.) Radlk., *Sitz. Ber. K. Beyer. Ak. Wiss. M.-Ph. Kl. Muench.* 8 : 238. 1878; Parkinson, *op. cit.* *Sapindus bifoliolata* Hiern in Hook. f., *op. cit.* *S. attenuata* Wall. ex Hiern in Hook. f., *op. cit. nom. illeg.* *Aphania nicobarica* Radlk. in Feddes *Repert.* 18 : 332. 1922.

Shrubs or small trees, 2-3 m high; branchlets terete, brownish, lenticellate. Leaves often crowded together in tufts on branches and simple, coriaceous, glossy, elliptic to lanceolate or obovate, up to 30 x 10.2 cm, acuminate or acute at apex, cuneate or cordate at base, lateral nerves 15-19 pairs; rarely paripinnate then leaflets 1-2 pairs, elliptic to oblong, up to 15 cm long, subacute to shortly acuminate at apex, tapering and rounded at base. Panicles ca half as long as leaves. Flowers whitish or pinkish-white, ca 6 mm across. Drupes often in pairs, ellipsoid, ca 1.2 cm long reddish.

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

*Distr.* : North Andaman; Nicobar Islands (Leenhouts).

Scarce in the inland and littoral forests.

4. *Lepisanthes tetraphylla* (Vahl) Radlik., Sitz. Ber. K. Bayer. Ak. Wiss. M. Ph. Kl. Muench. 8 : 276. 1876; Leenh. in *Blumea* 17 : 63. 1969 & *Ibid.* 18 : 430. 1970. *Sapindus tetraphylla* Vahl., *Symb.* 3 : 54. 1794. *Hemigyrosa canescens* Bl. in *Rumphia* 3 : 166. 1849; Hiern in Hook. f., *Fl. Brit. India* 1 : 671. 1875. *Lepisanthes montana* Bl., *Bijdr.* 238. 1825; Hiern in Hook. f., *op. cit.* 679. *Hemigyrosa deficiens* Bedd., *Fl. Sylv.* t. 231. 1872; Hiern in Hook. f., *op. cit.* 671. *H. longifolia* Hiern in Hook. f., *op. cit.* *Lepisanthes browniana* Hiern in Hook. f., *op. cit.* 680. *L. cuneata* Hiern in Hook. f., *op. cit.* *Ostodes appendiculata* Hook. f., *op. cit.* 5 : 401. 1887.

Trees, 5-10 m high; branchlets grey with white spots. Leaves 1-9 jugate; leaflets elliptic to elliptic-oblong, ovate to ovate-lanceolate or obovate, up to 23 x 9 cm, acuminate to obtuse or rarely emarginate at apex, oblique, cuneate, rounded or sometimes subcordate at base; lateral nerves 6-11 pairs. Flowers whitish, sometimes greenish-white or cream coloured, ca 3 mm long. Drupes subglobose, ca 1.5 cm across, yellowish, grey or greyish-pink; seeds brown.

*Fl. & Fr.* : February - June

*Distr.* : North Nicobar.

A few in the inland and littoral forests.

#### 10. *Mischocarpus* Bl. (*nom. cons.*)

Shrubs or sometimes large trees. Leaves spirally arranged, paripinnate; leaflets alternate to subopposite, mostly greyish-green when dry above. Flowers unisexual. Calyx spreading or cup-shaped, 5-merous. Petals 0-5, variably hairy. Stamens mostly 8. Pistils 3-celled. Pistillode small. Fruits distinctly stiped, loculicidal, ripens red.

11 species from S.E. Asia to Australia; 2 species in A. & N. Islands.

- 1 a. Leaflets with midrib above mostly angular, reticulation mostly coarse; calyx puberulous outside; anther filaments puberulous at least at base; suture between cotyledons curved. .... 1. *M. pentapetalus*

- b. Leaflets with midrib above mostly rounded, reticulation mostly fine and dense; calyx glabrous in upper half; anther filaments glabrous; suture between cotyledons straight .....2. *M. sundaicus*

1. ***Mischocarpus pentapetalus*** (Roxb.) Radlk., Sapind. Holl. Ind. 43. 1879; van der Ham in Blumea 23 : 271. 1977; Vasud. in J. Econ. Tax. Bot. 8 : 168. 1986; Lakshminarasimhan *et al.* in Bull. Bot. Surv. India 33 : 282. (1991) 1994. *Schleichera pentaphylla* Roxb., Fl. Ind. 2 : 275. 1832. *Cupania pentaphylla* Hiern in Hook. f., Fl. Brit. India 1 : 678. 1875. *C. sumatrana* Miq., Fl. Ind. Bot. 1, 2 : 566. 1859; Hiern in Hook. f., *op. cit.* *C. helferi* Hiern in Hook f., *op. cit.*

Shrubs or trees, 3-5 m high; branchlets pinkish-brown. Leaves up to 11 cm long; leaflets (1-) 2-4 pairs, coriaceous, lanceolate to elliptic-oblong or rarely ovate, up to 13 x 4.8 cm, obtusely acuminate at apex, cuneate or almost oblique at base, entire; lateral nerves 9-14 pairs. Inflorescences of axillary or subterminal cymes, up to 15 cm long. Flowers yellowish-green, ca 4 mm long. Fruits globose, subglobose or ellipsoid, ca 1.2 cm long with a persistent calyx, stipe ca 5 mm long; seed 1, globose, ca 5 mm across.

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

*Distr.* : South Andaman.

Rare in the mangrove forests and along streams of Mount Harriet hill ranges.

2. ***Mischocarpus sundaicus*** Bl., Bijdr. 238. 1825; Parkinson, For. Fl. Andaman Islands. 137. 1923; van der Ham in Blumea 23 : 281. 1977. *Cupania lassertiana* Cambes. Mem. Mus. Hist. Nat. Paris 18 : 28, 46, t. 3. 1829 *comb. illeg.*; Hiern in Hook. f., Fl. Brit. India 1: 678. 1875.

Shrubs or trees, up to 10 m high; branchlets blackish or reddish-brown, striate. Leaflets 1-3 (4) pairs, coriaceous, elliptic, ovate or ovate-oblong to ovate-lanceolate or lanceolate, up to 17 x 7 cm, acuminate at apex, cuneate and slightly decurrent at base, entire; lateral nerves 8-15 pairs. Flowers ca 3 mm across, in simple or branched puberulous racemes, ca 6 cm long, often collected into larger terminal panicles ca. 14 cm long. Capsules pear-shaped, up to 1.7 x 0.4 cm, sharply 3-cornered, much

tapering at base, sprinkled with minute hairs when young; Seeds globose to ellipsoid, *ca* 7 cm lng, 3-lobed.

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

*Distr.* : South Andaman.

Infrequent in occurrence.

### 11. *Nephelium* L.

Medium sized to tall trees or rarely shrubs. Leaves spirally arranged, paripinnate; leaflets mostly with domatia. Flowers actinomorphic, polygamous. Calyx (4-or) 5- (or 6-) merous usually cup-shaped. Petals small, as many as or fewer than calyx-lobes or wanting. Stamens 4-10, filament rather densely long hairy at least in basal part. Pistil densely hairy, ovary warty, 2 or rarely 1-loculed. Fruits 1, exceptionally 2-lobed, warty to spiny, exceptionally nearly smooth.

22 species in S.E. Asia and Malesia, from Yunan and Assam to Hainan and the Moluccas; 1 species in A. & N. Islands.

1. *Nephelium uncinatum* Radlk. ex Leenh. in *Blumea* 31 : 421. 1986; Lakshminarasimhan *et al.* in *Bull. Bot. Surv. India* 33 : 317 (1991) 1994.

Trees *ca* 60 m high; bark whitish, branchlets rusty tomentose and longitudinally grooved when young, later glabrous and terete. Leaves 4-8 jugate; leaflets glabrous on upper side, sparsely hairy on midrib and veins on lower side and minutely sericeous in between, coppery, brown to blackish-brown above and grey to greyish-brown below when dry; lateral nerves 9-20 pairs. Fruits solitary or with an undeveloped one, up to 3.5 x 2.5 cm, epicarp set with thick warts tapering to filiform appendages, mesocarp thin, endocarp stony, 1-seeded.

*Fr.* : June

*Distr.* : South Nicobar

Rare in tropical forests.

12. *Pometia* J.R. & G. Forst.

Trees, often with prominent buttresses; bark peeling off in flakes. Leaves paripinnate; leaflets 4-13 pairs. Inflorescence a terminal or rarely axillary thyrse. Flowers regular, pentamerous. Calyx dish-shaped to shallowly cup-shaped. Petals wanting. Disc annular with 5 pits for stamens. Stamens 5, anthers minutely papillose. Ovary 2-lobed, densely brown-pubescent, locules 2 with 1 ovule in each. Fruits simple with scar of style at base; seed covered by an arillode.

2 species & 7 formas distributed in Sri Lanka, Andaman, throughout Malaysia to Samoa, a few are scattered in N. Siam, S. Yunnan, Indo-China and Formosa; 2 formae in A. & N. Islands.

*Pometia pinnata* J. R. & G. Forst., Cher. Gen. 110, t. 55. 1776; Parkinson, For. Fl. Andaman Islands. 136. 1923; Jacobs in Reinwardtia 6 : 120. 1962.

- 1 a. Upper surface of leaflets hairy on midrib .....2. *f. tomentosa*  
b. Upper surface of leaflets glabrous on midrib .....1. *f. glabra*

1. *f. glabra* (Bl.) Jacobs in Reinwardtia 6 : 125. 1962. *Irina glabra* Bl., Bijdr. 230. 1825.

Trees, 8-30 m high; bark purple-brownish or blackish-grey; branchlets brown-puberulous when young. Leaves up to 90 cm long; leaflets basal pair like auricles, suborbicular to elliptic, up to 4 cm long, upper ones suborbicular, elliptic to elliptic-oblong or lanceolate, rarely ovate, up to 33.5 x 11 cm, acuminate or acute at apex, subcordate, rounded, cuneate or oblique at base, broadly dentate; lateral nerves 8-25 pairs. Inflorescences up to 60 cm long. Flowers pale red or yellow, ca 2 mm across. Fruits oblong, up to 3.5 x 3 cm, ripens brownish-black; seed 1, oblong with an oblique and truncate apex, ca 2.5 x 1 cm.

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

*Distr.* : North, South & Little Andaman; South Nicobar.

Common in low moist places along streams.

2. *f. tomentosa* (Bl.) Jacobs in Reinwardtia 6 : 130. 1962. *Irina tomentosa* Bl., Bijdr. 230. 1825. *Pometia tomentosa* T. & B., Gat. Hort.

Bog. 214. 1866; Hiern in Hook. f., Fl. Brit. India I : 691. 1875. *P. tomentosa* var. *ferruginea* Hiern in Hook. f., *op. cit.*

Trees, up to 47 m high; branchlets densely rusty-brown pubescent. Leaf rachis densely pubescent; leaflets brownish when dry, basal pair falcate, ca 2 x 1 cm, often caducous or reduced to a hairy appendage, the others slightly overlapping, up to 30 x 8 cm, acute at apex, rounded at base, dentate; lateral nerves 18-22 pairs. Inflorescences up to 40 cm long, somewhat hanging, repeatedly branched, lax, densely, rusty-brown pubescent. Fruits ca 3.3 x 2 cm.

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

*Distr.* : South Andaman; North Nicobar.

*Cultivated species*

### 13. *Litchi* Sonn.

Trees. Leaves paripinnate; leaflets entire, coriaceous, dull glaucous beneath by presence of small papillae. Inflorescences terminal and in upper leaf axils. Flowers regular. Calyx shallowly 4-5-lobed. Corolla absent. Disc annular. Stamens 6-10, filaments short hairy. Ovary deeply 2-lobed, cells 1-ovuled, style 2-branched. Schizocarp covered with angular-contiguous, flat, mucronate tubercules.

About 12 species distributed in India, S. China, S.E. Asia and W. Malaysia; 1 species in A. & N. Islands.

1. *Litchi chinensis* Sonn., Voy. Ind. 2 : 230, t. 129. 1782; Backer & Bakh. f., Fl. Java 2 : 137. 1965. *Nephelium litchi* Camb. in Mem. Mus. Hist. Nat. 18 : 30. 1829; Hiern in Hook. f., Fl. Brit. India I : 687. 1875; Parkinson, For. Fl. Andaman Islands. 138. 1923.

Trees; branches spreading. Leaves up to 22.5 cm long; leaflets 2-8, oblong-lanceolate or ovate, up to 15 x 4.5 cm, acuminate at apex, cuneate at base; lateral nerves obsolete. Panicles tawny pubescent. Flowers greenish-white, ca 3 mm across. Fruits globose, ca 2.5 cm across, 2-1 lobed, with fleshy aril.

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

Introduced for its edible fruits in Andaman but has not done well (C.E. Parkinson).

### SABIACEAE

4 genera and *ca* 46 species distributed in South East Asia, China, Japan and Mexico to Brazil; 1 genus, 1 species in A. & N. Islands.

#### *Meliosma* Bl.

Trees. Leaves alternate, simple or imparipinnate; leaflets subopposite. Inflorescence in terminal, sometime axillary panicles. Flowers numerous, small, bisexual, irregular. Sepals distinct, 5-13. Petals 5, outer 3 larger, inner 2 smaller. Disc smaller, annular, irregularly 5-dentate. Stamens 5; 3 staminodial, 2 fertile. Ovary 2-locular, each locule with 2 superposed ovules; styles and stigmas simple. Fruits drupaceous, oblong to globose, 1-loculed, 1-seeded; seeds exalbuminous.

About 25 species, *ca* 15 of which in South East Asia and *ca* 10 in Central South America; 1 in A. & N. Islands.

*Meliosma lanceolata* Bl., Cat-Gew. Buitenz. 32. 1823; Hook. f., Fl. Brit. India 2: 7. 1876; Beus. in Blumea 19: 489. 1971; T. Chakrab. & Vasud. in J. Econ. Tax. Bot. 6: 453. 1985; Beus. & Water in de Wilde, Fl. Males. 1, 10: 704. 1989; T. Chakrab. & Gang. in J. Econ. Tax. Bot. 15: 47. 1991. *M. Sumatrana* sec. M.P. Nayar & S.C. Majumdar in Nayar *et al.* Fasc. Fl. India 20: 126. 1990, *p.p. excl. descr. non* (Jack) Walp. 1848.

Trees, 5-10 m high; branchlets terete, pinkish-brown, striate, sparsely lenticellate. Leaflets 7-12 per leaf, coriaceous, glabrous above, glabrous to sparsely rufous or greyish-pubescent on nerves beneath, elliptic to oblong-elliptic or rarely oblanceolate, up to 21 x 7 cm, caudate-acuminate at apex, cuneate at base, entire; lateral nerves 5-10 pairs. Inflorescence axis greyish. Panicles up to 120 cm long, pendulous, scattered rufous-pubescent.

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

*Distr.*: S. Nicobar.

Rare in dense evergreen forests or near stream up to ca 75 m altitude.

*Notes*: This is a Malesian species and has been reported as a new record for India by Chakrabarty & Vasudeva Rao (*l.c.*). However, Nayar & Majumdar (*op. cit.* 127) pointed out the material cited by Chakrabarty & Vasudeva Rao (1985) actually represents *M. sumatrana* (Jack) Walp., another Malesian species hitherto unrecorded for India. They elucidated that the characters of the material, *D.K. Hore* 7209 agree well with those of *M. sumatrana* and differ from *M. lanceolata* in having glabrous ovary, rounded inner petals and obscurely veined leaves.

Critical studies made by Chakrabarty & Gangopadhyay (1991) revealed that *M. lanceolata* and *M. sumatrana* are closely allied and variable species but can be distinguished from one another as given below:

- 1 a. Midrib of leaflets flat or sunken on the upper surface; inflorescences elongate and pendulous (up to 150 cm long); inner petals up to 1 mm (rarely up to 1.5 mm) long, always deeply bifid; endocarp up to 1 cm across ...  
.....*M. lanceolata*
- b. Midrib of leaflets prominent on the upper surface, inflorescences 7-50 (-75) cm long; inner petals 1.5-2 (-3) mm long, entire to retuse or occasionally slightly bifid at apex; endocarp 0.8-2 cm across .....*M. sumatrana*

The Great Nicobar materials are referable to *M. lanceolata* instead of *M. sumatrana*.

## ANACARDIACEAE

About 73 genera & 850 species, in tropics, subtropics, Mediterranean regions, and in temperate North America; 13 genera and 26 species (of which the occurrence of 7 species is doubtful) in A. & N. Islands.

- 1 a. Carpels free or only one; leaves simple .....2
- b. Carpels united (rarely 1); leaves rarely simple .....6
- 2 a. Leaves decussate .....1. *Bouea*
- b. Leaves spiral or alternate .....3

- 3 a. Carpels 4-6 .....2. *Buchanania*
- b. Carpels 1 .....4
- 4 a. Petals accrescent, enlarged in fruits .....12. *Swintonia*
- b. Petals deciduous, not enlarged in fruits .....5
- 5 a. Calyx spathaceous; stamens all fertile .....5. *Gluta*
- b. Calyx 4-5 lobed; usually 1 stamen fertile, rest sterile .....8. *Mangifera*
- 6 a. Carpels usually 5, ovary 5-(rarely 1) celled .....7
- b. Carpels 3, ovary 1-celled .....8
- 7 a. Leaflets with a distinct, continuous, intra-marginal vein; styles free above  
..... 11. *Spondias*
- b. Leaflets without intra-marginal vein; styles connate at tip .....  
.....3. *Dracontomelon*
- 8 a. Ovary superior; fruit without fleshy peduncle; leaves both simple and  
compound .....9
- b. Ovary inferior or semi-inferior; fruit sunken in a cupular or tubular hollow  
receptacle; leaves simple .....10
- 9 a. Calyx accrescent; drupes globose .....9. *Parishia*
- b. Calyx not accrescent; drupes laterally compressed .....7. *Lannea*
- 10 a. Drupes set on a much enlarged apex of peduncle .....10. *Semecarpus*
- b. Drupes enclosed within enlarged fleshy peduncle .....11
- 11 a. Petals valvate; styles 3 .....6. *Holigarna*
- b. Petals imbricate; styles 1 .....4. *Drimycarpus*

**1. Bouea Meisn.**

Trees. Leaves thickly coriaceous, entire. Inflorescences of axillary and terminal panicles. Flowers polygamous, (3-) 4 (-5)-merous. Sepals deciduous, valvate. Petals imbricate. Disc short. Stamens as many as petals, inserted on disc. Ovary sessile, 1-celled, 1-ovuled, style short, terminal, stigma obscurely unequally 3-lobed. Drupes fleshy, pyrene fibrous, 1-seeded.

3 species distributed in tropical S.E. Asia and Malesia; 1 species in A. & N. Islands.

1. ***Bouea oppositifolia*** (Roxb.) Meisn., Pl. Vasc. Gen. Pars. Prior (Tab. Diagn.): 75, Pars. alt. (Comment.): 55. 1837; Ding Hou in Steenis, Fl. Males. 1, 8: 466. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 53. (1983) 1985. *Mangifera oppositifolia* Roxb., Fl. Ind. 2: 434. 1834. *Bouea burmanica* Griff., Pl. Cantor. 14. 1841; Hook. f., Fl. Brit. India 2: 21. 1876; Parkinson, For. Fl. Andaman Islands. 141. 1973.

Trees, 6-11 m high; branchlets greyish-brown. Leaves Dark brownish upon drying, lanceolate to oblong-lanceolate, up to 30 x 6.2 cm, acuminate at apex, cuneate and slightly decurrent at base; lateral nerves 16-20 pairs. Flowers greenish-yellow, ca 2.5 mm across. Drupes ellipsoid, up to 3.7 cm long, ripens yellow.

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

*Distr.*: Middle & South Andaman.

Scarce in the evergreen forests at an altitude of ca 50 m.

## 2. ***Buchanania*** Spreng.

Trees. Leaves coriaceous, entire. Inflorescence of terminal and axillary panicles. Flowers bisexual. Calyx 3-5 toothed or lobed, persistent. Petals 4-5, recurved. Disc 5-lobed. Stamens 8-10, inserted at base of disc. Carpels free, seated in the cavity of disc, one fertile, 1-celled, 1-ovuled, appressed-hairy, the rest of them empty, style columnar, stigma obliquely truncate. Drupes tipped by style base; seed gibbous.

About 25 species distributed in tropical Asia, Malesia, Australia, Micronesia, Melanesia and Polynesia; 4 species in A. & N. Islands.

- 1 a. Fruits obliquely oblong or subobcordate .....2  
 b. Fruits sublentiform .....3  
 2 a. Panicles shorter than leaves; calyx glabrous; fruits obliquely oblong .....  
 .....2. *B. lancifolia*  
 b. Panicles as long as or longer than leaves; calyx hairy without, glabrous within; fruits obliquely subobcordate .....3. *B. sessifolia*  
 3 a. Leaf apex usually obtuse or rounded; pedicels usually not articulated; anthers versatile, sagittate .....1. *B. arborescens*

- b. Leaf apex acuminate or acute; pedicels articulated; anthers basifixed, not as above .....4. *B. splendens*

1. ***Buchananla arborescens*** (Bl.) Mus., Bot. 1: 183. 1850; Ding Hou in Steenis, Fl. Males. 1, 8: 415. 1978. *Conigeton arborescens* Bl., Bijdr. 1156. 1826. *Buchanania lucida* Bl., Mus. Bot. 1: 184. 1850; Hook. f. Fl. Brit. India 2: 23. 1876.

Trees, 3.5-4 m high. Leaves hairy beneath especially on midrib when young, glabrescent, obovate to oblanceolate or elliptic-oblong, up to 26 x 7 cm, cuneate to attenuate at base; lateral nerves 7-18 pairs. Panicles up to 22 cm long, hairy, glabrescent. Flowers white. Drupes ca 1 cm across.

*Distr.*: Andaman Islands. (Ding Hou in Steenis, *op. cit.* 417).

2. ***Buchanania lancifolia*** Roxb., Fl. Ind. 2: 386. 1832; Hook. f., Fl. Br. India 2: 24. 1876; Kurz, For. Fl. Brit. Burma 1: 309. 1877; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 53. (1983) 1985.

Trees, large; young shoots tawny villous. Leaves lanceolate or oblong-lanceolate, up to 20 cm long, tapering at base; lateral nerves 15-20 pairs. Panicles lax, up to 6.8 cm long. Drupes somewhat compressed, obliquely oblong.

*Distr.*: Andaman (Kurz, *op. cit.* 309; Mukherjee & D. Chandra, *op. cit.*).

3. ***Buchanania sessifolia*** Bl., Mus. Bot. 1: 184. 1850 ('sessilifolia'); Ding Hou in Steenis, Fl. Males. 1, 8: 418. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 53. (1983) 1985. *B. acuminata* Turcz. in Bull. Soc. Nat. Mosc. 31, 1: 472. 1858; Hook. f., Fl. Brit. India 2: 24. 1876.

Trees, 5-10 m high; bark fissured; branchlets pale brownish. Leaves blackish-brown above and coppery brown below upon drying, oblong-lanceolate to elliptic-lanceolate, oblanceolate or obovate-oblong, up to 27 x 9 cm, acuminate at apex, cuneate or attenuate at base; lateral nerves 14-25 pairs. Panicles lax. Flowers whitish-green or yellowish-green, ca 5 mm long.

*Fl.*: August.

*Distr.*: North Nicobar.

Scattered in open places and along roadsides at low altitudes.

4. ***Buchanania splendens*** Miq., Fl. Ind. Bot. Suppl. 1: 524. 1861; Ding Hou in Steenis, Fl. Males. 1, 8: 413. 1978. *B. platyneura* Kurz in J. As. Soc. Bengal 46 (2): 125. 1876; Parkinson, For. Fl. Andaman Islands. 139. 1923; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 53. (1983) 1985.

Trees, 4-30 m high; bark of branches greenish-white when fresh, pale grey or brownish-grey when dry, branches striated. Leaves slightly hairy on both sides when young, later glabrous, elliptic-lanceolate, ovate-oblong or oblanceolate, up to 30 x 8 cm; lateral nerves 7-20 pairs; petioles stout. Panicles ca 18 cm long, puberulous or glabrous, rarely glabrescent. Flowers pale yellow, green or white, ca 2 mm long. Drupes ca 1.2 cm across, with a lateral median ridge on pericarp, woody when dry, ripens purple-black; seed 1, ca 5 mm long.

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

*Distr.*: Middle & South Andaman; North & South Nicobar.

Common in the inland forests up to 30 m altitude.

### 3. ***Dracontomelon*** Bl.

Trees. Leaves spirally arranged, imparipinnate; leaflets opposite or alternate, entire. Panicles axillary and subterminal. Flowers bisexual, pentamerous. Sepals free. Petals free. Disc cup-shaped, crenulate. Stamens inserted at base of disc. Ovaries sessile, densely short-hairy, 1-ovuled, styles connate by their obtuse, stigmatiferous tips. Drupes depressed globose, pyrenes flattened, bullate; seeds compressed, testa membranous.

About 8 species distributed from continental Asia throughout Malesia to W. Polynesia (Fiji); 1 species in A. & N. Islands.

1. ***Dracontomelon dao*** (Blanco) Merr. & Rolfo in Philipp. J. Sci. 3: 108. 1908 (*'Dracontomelum'*); Ding Hou in Steenis, Fl. Males. 1, 8:

470. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 53. (1983) 1985. *Paliurus dao* Blanco, Fl. Filip. 174. 1837. *Dracontomelon mangifera* (Bl.) Bl., Mus. Bot. 1: 231, f. 42. 1850 *nom. illeg.*; Hook. f., Fl. Brit. India 2: 43. 1876; Parkinson, For. Fl. Andaman Islands. 142. 1923.

Trees, 10-30 m high; bark green when fresh, drying brownish-grey; young shoots tawny-pubescent. Leaves up to 45 cm long; leaflets 12-20, glabrous above, slightly hairy below, elliptic-oblong, oblong, ovate-oblong to lanceolate, up to 20 x 8.5 cm, acuminate at apex, obliquely rounded at base; lateral nerves 10-17 pairs. Panicles up to 27 cm long, pubescent. Flowers pale white or greenish-white, ca 8 mm across. Drupes up to 3.1 cm across, with persistent calyx, ripens yellow.

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

*Distr.*: North & South Andaman; Nicobar islands.

A few in the inland forests along the streams and forest edges.

#### 4. *Drimycarpus* Hook. f.

Lofty trees. Leaves entire. Inflorescences racemose or paniced. Flowers pentamerous, polygamous. Calyx superior, lobes rounded. Petals erect, orbicular. Disc broad, annular. Stamens inserted at base of disc. Style 1, short, stigma capitate. Drupes transversely obliquely ovoid; seed attached to wall of cell, testa membranous.

2 or more species distributed in India, Bhutan, Myanmar, Thailand, Vietnam and Malesia; 1 species in A. & N. Islands.

1. *Drimycarpus racemosus* (Roxb.) Hook. f., Fl. Brit. India 2: 36. 1876; Parkinson, For. Fl. Andaman Islands. 140. 1923; Ding Hou in Steenis, Fl. Males. 1, 8: 520. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 54. (1983) 1985, *Holigarna racemosa* Roxb., Fl. Ind. 2: 82. 1820.

Trees, 12-15 m high; bark smooth; green when fresh, drying greyish-yellow; branchlets greyish-brown, ribbed, lenticellate. Leaves drying brownish-green, lanceolate to oblong or oblanceolate, up to 23 x 8 cm,

shortly acuminate at apex, cuneate, rounded or rarely oblique at base; lateral nerves 14-24 pairs. Panicles axillary or from leaf scars. Flowers greenish-yellow or white, *ca* 2 mm across. Drupes *ca* 2.5 cm across, yellowish-green, ripens red.

A few along forest edges.

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

*Distr.*: Middle & South Andamans.

### 5. *Gluta* L.

Trees, rarely shrubs. Leaves coriaceous, entire. Inflorescences paniculate. Flowers bisexual. Calyx circumscissile or bursting irregularly, caducous. Petals adnate to disc. Stamens inserted on disc, filaments filiform. Ovary 1-celled, style distinct, filiform, stigma simple. Drupes 1-celled, dry; seed with a testa adherent to endocarp.

About 30 species distributed in Madagascar and Indo-Malesian region; 1 species dubitfully occurring in A. & N. Islands.

1. *Gluta tavoyana* Wall. ex Hook. f., *Fl. Brit. India* 2: 22. 1876; Ding Hou in Steenis, *Fl. Males* 1, 8: 59. 1978. *G. elegans* (Wall.) Hook. f. var. *helferi* Hook. f., *l.c.*.

Trees, up to 30 m high. Leaves obovate-oblong, elliptic-oblong or lanceolate, up to 16 x 5.5 cm, obtuse, acute or rarely acuminate at apex, cuneate at base; lateral nerves 7-20 pairs. Panicles up to 15.5 cm long, puberulous. Drupes globose, *ca* 3.5 cm across, brown, scurfy, stalked.

*Fl.*: February; *Fr.*: October.

*Distr.*: Andaman/Tenasserim (Hook. f. *l.c.*).

In lowland and littoral forests up to 300 m altitude.

### 6. *Holigarna* Buch.-Ham. ex Roxb. (*nom. cons.*)

*Lofty trees*. Leaves entire, coriaceous; petioles furnished with 2 or 4 spur-like deciduous appendages. Racemes or panicles axillary and

terminal. Flowers pentamerous, polygamous. Calyx superior, tube cup-shaped. Petals densely villous in front, persistent. Stamens inserted on edge of disc, coherent at base with petals. Styles 3-5, terminal, stigmas capitate or clavate. Drupes compressed, resinous; testa membranous.

8 species distributed in Indo-Malayan region; 3 species of doubtful occurrence in A. & N. Islands.

*H. ferruginea*, *H. grahamii* and *H. kurzii* are reported from Andaman (D. Chandra, 1985). There are no specimens of these species from Andamans either at CAL or PBL. The occurrence of these species in these Islands appear to be doubtful unless fresh collections are made.

- 1 a. Leaves obtuse at apex .....1. *H. ferruginea*
- b. Leaves acute or acuminate at apex .....2
- 2 a. Leaves oblanceolate .....2. *H. grahamii*
- b. Leaves obovate to lanceolate and almost oblong .....3. *H. kurzii*

1. **Holigarna ferruginea** March., Rev. Anacard. 171. 1869; Hook. f., Fl. Brit. India 2: 37. 1876; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 54. (1983) 1985.

Trees. Leaves obovate. Racemes robust, clothed with dark rusty tomentum.

*Distr.*: Andaman (Mukherjee & D. Chandra, *op. cit.*).

2. **Holigarna grahamii** (Wight) Kurz in J. As. Soc. Bengal 42 (2): 305. 1872; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 54. (1983) 1985. *Semecarpus grahamii* Wight, Ic. t. 235. 1839 & Illus. Ind. Bot. 1: 185. 1839.

Trees, 10-15 m high. Leaves up to 30 x 15 cm. Panicles ferruginous. Flowers white or yellowish-green, ca 7 mm across. Drupes ovoid, ca 2.8 x 1.6 cm, basal 3/4 portion enclosed in calyx.

*Distr.*: Andaman (Mukherjee & D. Chandra, *op. cit.*).

3. **Holigarna kurzii** King in J. As. Soc. Bengal 65: 512. 1896; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 54. (1983) 1985.

Trees, 15-18 m high; branchlets and younger parts all velvety pubescent. Leaves up to 30 cm long; lateral nerves 12-18 pairs. Panicles shorter than leaves. Fruits broader than long, only the top exerted from the fleshy yellowish-orange veined minutely puberulous hypocarp.

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

*Distr.*: Andaman (Mukherjee & D. Chandra, *op. cit.*).

#### 7. *Lannea* A. Rich. (*nom. cons.*)

Trees. Leaves few at ends of branches, spirally arranged, imparipinnate; leaflets opposite, entire. Spikes crowded on twig-apices or on short axillary shoots, in axils of fallen leaves. Flowers 4(-5) merous, unisexual. Calyx deeply divided, persistent, petals imbricate. Disc annular. Stamens attached at outer base of disc. Ovary sessile, styles 3-4, short, truncate. Drupes flattened laterally, 1-seeded.

About 10 species chiefly distributed in tropical and South Africa, 1 in tropical Asia and Malesia; 1 species in A. & N. Islands.

1. *Lannea coromandelica* (Houtt.) Merr. in J. Arnold. Arbor. 19: 353. 1938; Ding Hou in Steenis, Fl. Males. 1. 8: 478. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 54. (1983) 1985. *Dialium coromandelicum* Houtt., Nat. Hist. 2, 2: 39, t. 5, f. 2. 1774. *Odina wodier* Roxb., Fl. Ind. 2: 293. 1832; Hook. f., Fl. Brit. India 2: 29. 1876; Parkinson, For. Fl. Andaman Islands. 141. 1923.

Trees, 5-18 m high; bark dark brownish-grey with longitudinal furrows; branchlets greyish-black, lenticellate. Leaves up to 45 cm long; leaflets 7-11, ovate, elliptic or oblong-lanceolate; up to 15 x 6.2 cm, acuminate at apex, rounded to cuneate at base; lateral nerves 5-11 pairs. Flowers greenish-yellow, ca 3 mm across. Drupes broadly ellipsoid, up to 1.2 cm long, ripens red; seeds reniform.

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

*Distr.*: North, South & Little Andaman; North & South Nicobar.

8. *Mangifera* L.

Trees. Leaves often crowded at tops of branchlets, coriaceous, entire. Panicles terminal and in upper leaf axils, many-flowered. Flowers 4-6 merous, polygamous, pedicels articulate. Sepals free. Petals much larger than calyx with 3-5 ridges -like, basally connate nerves. Disc lobed, tuberculate. Fertile stamens 1(-2) and often 2-5 staminodes within disc or on it. Ovary sessile, 1-celled, 1-ovuled, style lateral. Drupes large, fleshy, pyrene compressed, fibrous, 1-seeded; testa papery.

About 69 species in Sri Lanka, India, Myanmar, Thailand, Indo-China and China, throughout Malesia to the Solomons; 5 species in A. & N. Islands.

- |   |  |                           |
|---|--|---------------------------|
| 1 | a. Sepals pubescent outside .....  | 2                         |
|   | b. Sepals glabrous outside .....   | 3                         |
| 2 | a. Stamens 4-5, 1-fertile; ovary globose; drupes ellipsoid, blunt.....   | 2. <i>M. camptosperma</i> |
|   | b. Stamens 1; ovary obliquely and broadly ovoid; drupes ovoid; acuminate .....                                 | 4. <i>M. sylvatica</i>    |
| 3 | a. Sepals lanceolate; petals yellowish, broadly ovate-lanceolate; ovary silky-pubescent; stigma subulate ..... | 1. <i>M. andamanica</i>   |
|   | b. Sepals ovate; petals white, ovate-oblong; stigma capitate .....   | 3. <i>M. nicobarica</i>   |

1. *Mangifera andamanica* King in J. As. Soc. Bengal 65: 470. 1896; Parkinson, For. Fl. Andaman Islands, 139. 1923; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 54. (1983) 1985.

Trees, 9-25 m high; bark dark brown; branchlets quadrangular when young, later terete. Leaves elliptic to broadly oblanceolate or obovate, up to 23 x 7 cm, acute, obtuse or acuminate at apex, cuneate at base; lateral nerves 4-20 pairs. Panicles up to 6 cm long. Flowers yellowish, ca 6 mm across. Drupes oblong, ellipsoid to ovoid-ellipsoid, up to 4 x 2 cm; seeds ellipsoid, ca 2.3 x 1.3 cm.

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

*Distr.:* South Andaman.

Rare at low altitudes.

2. **Mangifera camptosperma** Pierre, Fl. Forest Cochinch. t. 363 A. 1897; Thoth. & Balakr. in Bull. Bot. Surv. India 24: 175. (1982) 1983. *M. sylvatica sensu* Parkinson, For. Fl. Andaman Islands. 139. 1923 *non* Roxb. 1824.

Trees, 5-40 m high; bark greyish; branchlets pale yellowish-brown. Leaves oblong, oblanceolate or elliptic-lanceolate, up to 45 x 8 cm, acuminate to caudate at apex, cuneate at base; lateral nerves 15-25 pairs. Panicles up to 30 cm long, densely pubescent. Drupes up to 9 x 8 cm, ripens yellow; seeds reniform, up to 5.8 x 3.5 cm.

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

*Distr.*: South Andaman; South Nicobar.

Scattered in the inland forests.

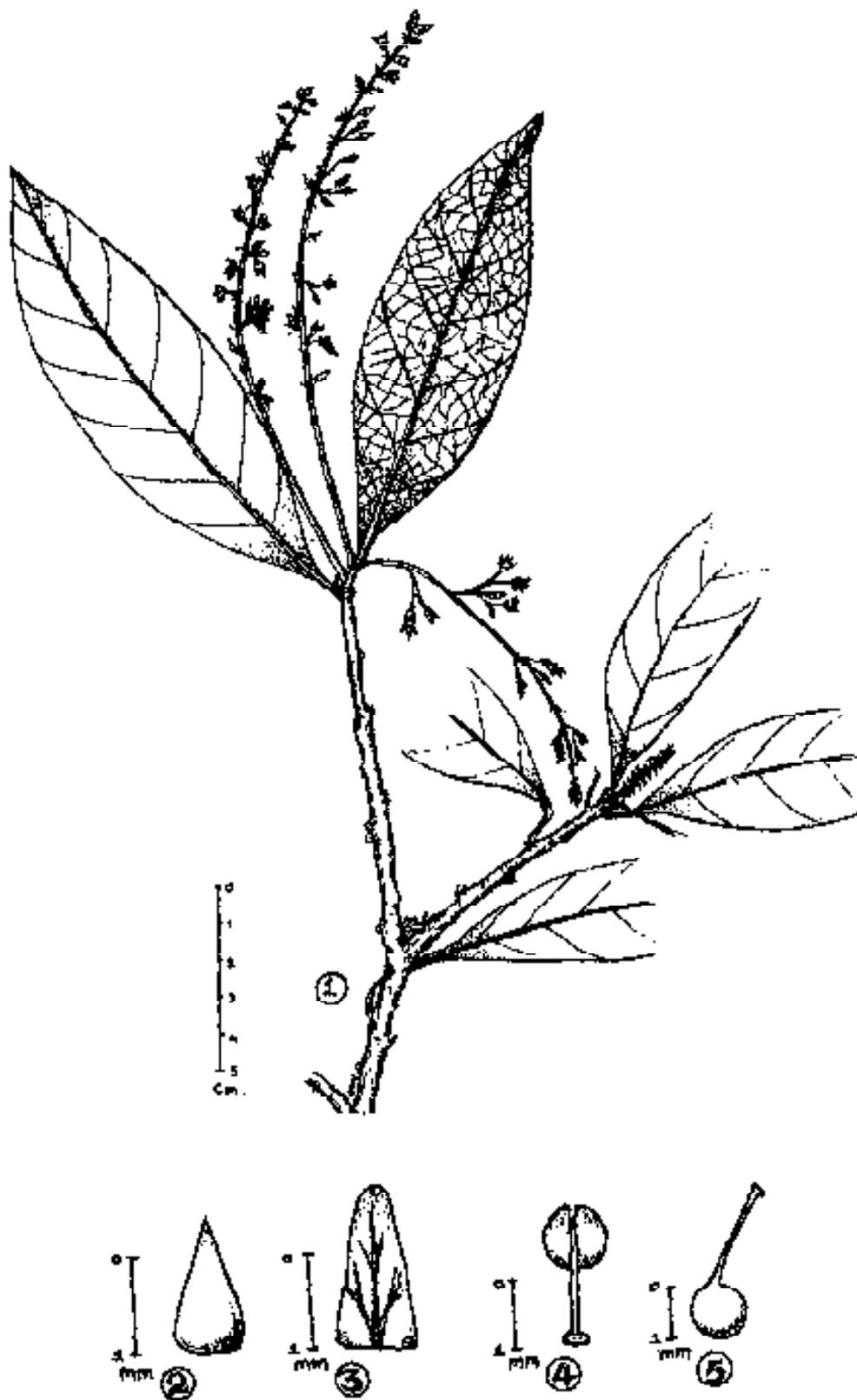
3. **Mangifera nicobarica** Kosterm. in Kosterm. & Bompard. The Mangoes 52. 1993.

Trees, ca 20 m high; twigs reddish-brown. Leaves scattered, elliptic to oblanceolate or oblong, up to 15 x 5 cm, acute to shortly acuminate at apex, gradually tapered and slightly decurrent at base; lateral nerves 8-12 pairs. Panicles pseudo-terminal, fascicled, the peduncles slender, pseudo-racemiform up to 15 cm long. Flowers white to yellow, 4-merous. Fruits unknown.

*Distr.*: South Nicobar. Endemic.

Scarce in lowland mixed dense tropical rain forest.

*Notes*: This species is closely related to *M. quadrifida* from which it differs in having leaf shape different, reticulation on upper leaf surface more pronounced, the flowers much larger, the ridges of petals only for a short part connate at base, hardly prominulous. It is also close to *M. andamanica*, but the leaves differ.



**Fig. 9: *Mangifera nicobarica* Kosterm.**  
 1. Flowering twig 2. Sepal 3. Petal 4. Fertile stamen attached to disc  
 5. Ovary.

4. **Mangifera sylvatica** Roxb., Fl. Ind. 2: 438. 1824; Hook. f., Fl. Brit. India 2: 15. 1876; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 54. (1983) 1985.

Trees, ca 4.5 m high; bark flaky; branchlets terete, pinkish-brown. Leaves elliptic or elliptic-lanceolate, up to 36 x 12.5 cm, acuminate at apex, cuneate at base; lateral nerves 13-30 pairs. Panicles ca 9 cm long. Flowers white or yellow, ca 2.5 mm across. Drupes ca 10 cm long, ripens yellow.

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

*Distr.*: South Andaman; South Nicobar.

Rare in the inland forests.

*Cultivated species:*

5. **Mangifera indica** L., Sp. Pl. 200. 1753; Hook. f., Fl. Brit. India 2: 13. 1876; Parkinson, For. Fl. Andaman Island. 139. 1923; Ding Hou in Steenis, Fl. Males. 1, 8: 427. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 54. (1983) 1985.

Trees, 6-30 m high; bark greyish-brown; branchlets blackish, ribbed. Leaves lanceolate, elliptic, up to 30 x 9.5 cm, acute or acuminate at apex, cuneate at base; lateral nerves 17-30 pairs. Flowers greenish-yellow or pale creamish, ca 2.5 mm across. Drupes ovoid-oblong, up to 25 x 10 cm, ripens yellowish-green, yellow or red.

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

*Distr.*: Andaman & Nicobar groups of islands.

Cultivated for its edible fruits. Probably a native of Indo-Myanmar.

#### 9. **Parishia** Hook. f.

Trees. Leaves imparipinnate; leaflets entire, coriaceous. Panicles ample, nodding. Flowers 4-merous, dioecious. Male flowers: calyx cupular, sepals ovate; petals oblong; disc short, annular, obscurely 4-lobed; stamens

inserted below margin of disc. Female flowers: ovary sessile, style terminal, unequally 3-fid, stigma capitate. Drupes pubescent, pointed by style base, pericarp thin; testa membranous.

5 species in India, Myanmar, Thailand and Malesia; 1 species in A. & N. Islands.

1. *Parishla insignis* Hook. f. in Trans. Linn. Soc. London 23: 170, t. 26. 1860 & Fl. Brit. India 2: 30. 1876, *incl. var. andamanensis* Engl.; King in J. As. Soc. Bengal 65 (2): 492. 1896, *incl. var. pubescens* King & var. *tomentosa* King; Parkinson, For. Fl. Andaman Islands. 142. 1923; Ding Hou in Steenis, Fl. Males. 1, 8: 545. 1978; Mukherjee & D. Chandra in Bull. Surv. India 25: 55. (1983) 1985.

Trees, 20-40 m high; bark of branches greyish-blue to greyish, flaky, branchlets terete. Leaves up to 60 cm long; leaflets 13-19, glabrous above, pubescent beneath, ovate to ovate-lanceolate or oblong to lanceolate or elliptic, up to 20 x 6.2 cm, acute to acuminate at apex, oblique or rounded at base; lateral nerves 4-15 pairs. Panicles up to 35 cm long, pubescent. Flowers greenish-red or yellow, ca 6 mm across. Drupes ca 1.2 cm across, calyx lobes ca 10 cm long.

*Fl. & Fr.*: November-April.

*Distr.*: North & South Andaman.

A few in the inland forests.

#### 10. *Semecarpus* L.f.

Trees. Leaves spirally arranged, simple, coriaceous, entire. Panicles in upper leaf-axils and terminal, often combined into a terminal panicle. Flowers 5-6 merous, polygamous or dioecious. Sepals deciduous. Petals free. Disc broad, annular, densely hairy. Stamens inserted at base of disc. Styles 3, stigmas large, lobed. Drupes fleshy, compressed, 1-seeded, testa coriaceous.

About 60 species chiefly in Indo-Malesia, distributed in India, Sri Lanka, Myanmar, Thailand, Indo-China, Formosa, Micronesia, Solomon Islands, throughout Malesia, to Australia, New Caledonia and Fiji; 4 species in A. & N. Islands of which the occurrence of 2 is doubtful.

- 1 a. Ovary tomentose or pubescent .....2  
 b. Ovary glabrous .....3
- 2 a. Inflorescences tawny-velvety; pedicels less than 2 mm long, velvety; petals imbricate; hypocarp discoid .....3. *S. heterophyllus*  
 b. Young parts of inflorescences puberulous, glabrescent; pedicels absent; petals only imbricate at apex; hypocarp obconical stalk-like..... 2. *S. prainii*
- 3 a. Panicles longer than leaves .....1. *S. kurzii*  
 b. Panicles shorter than leaves .....4. *S. subpanduriformis*
1. ***Semecarpus kurzii*** Engl. in DC., Mon. Phan. 4: 478. 1883; Parkinson, For. Fl. Andaman Islands 140. 1923; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 56. (1983) 1985.

Trees, 5-21 m high; bark light grey, smooth; branchlets greyish-brown, clothed with deciduous rusty tomentum. Leaves glabrous above, lower surface with stiff deciduous hairs, blackish above and pale brownish below on drying, oblong-lanceolate, elliptic-lanceolate, oblanceolate or obovate, up to 60 x 13 cm, shortly acuminate or rarely emarginate at apex, cuneate at base; lateral nerves 11-30 pairs. Flowers greenish to pale yellowish, ca 1.2 mm across. Drupes obliquely ovoid or obovoid, up to 4.5 x 3 cm, ripens orange, with a deep furrow on one side and a ridge on the other, hypocarp obconical when young, ca 1 cm across, slightly discoid when mature, ca 2 mm across.

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

*Distr.*: South Andaman; North & South Nicobar. Endemic.

Common.

2. ***Semecarpus prainii*** King in J. As. Soc. Bengal 65 (2): 511. 1896; Parkinson, For. Fl. Andaman Islands. 140. 1923; Ding Hou in Steenis, Fl. Males. 1, 8: 509. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 56. (1983) 1985.

Trees, 5-25 m high; bark greyish or pale brownish, lenticellate or not; branchlets terete. Leaves pale brown or coppery brown beneath when dry, lanceolate to oblanceolate or obovate-oblong, up to 30 x 9 cm, abruptly

acuminate, acute or rarely obtuse at apex, cuneate at base; lateral nerves 18-26 pairs. Panicles up to 40 cm long, lateral branches up to 18 cm long. Flowers white, *ca* 1 mm across. Drupes obliquely and broadly obovoid, up to 2.2 x 1.4 cm, greenish, yellow to scarlet, hypocarp obconical.

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

*Distr.*: Andaman group of islands; North Nicobar.

Scattered in low altitudes.

#### Doubtful Species

3. ***Semecarpus heterophyllus*** Bl., Mus. Bot. 1: 187. 1850; Hook. f., Fl. Brit. India 2: 35. 1876; Kurz, For. Fl. Brit. Burma 1: 312. 1877; Ding Hou in Steenis, Fl. Males. 1, 8: 512. 1978.

Trees, 9-12 m high; branches stout and puberulous when young. Leaves elongate-oblong to oblong-obovate, up to 30 cm long, shortly and abruptly acuminate at apex, cuneate at base; lateral nerves 12-15. Nuts obliquely ovoid, up to 3.7 cm long.

*Distr.*: Andaman (Kurz, *op. cit.* 313) or Tenasserim/Andaman (Hook. f., *op. cit.*).

Rare in the littoral forests.

4. ***Semecarpus subpanduriformis*** Wall. ex Hook. f., Fl. Brit. India 2: 35. 1876; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 56. (1983) 1985.

Trees, 12-18 m high. Leaves glaucous beneath, cuneately obovate to oblong, *ca* 30 x 10 cm, acuminate at apex, rounded or acuminate at the narrowed base; lateral nerves 16-30. Flowers greenish. Drupes obliquely orbicular.

*Distr.*: Andaman & Nicobar Islands (Mukherjee & D. Chandra, *op. cit.*).

11. *Spondias* L.

Deciduous trees. Leaves usually crowded at tips of branches, imparipinnate; leaflets subopposite. Panicles in axils of leaves or fallen leaves and terminal, often combined into a large terminal panicle. Flowers bisexual or polygamous, 4-5 merous. Calyx deciduous. Petals spreading. Disc cupular, crenate. Stamens inserted below disc. Ovary sessile, styles 4-5, stigmas divergent. Drupes fleshy, pyrene woody with longitudinal ridges; testa membranous.

10 species in the Indo-Malesian and American tropics; 2 species in A. & N. Islands.

- 1 a. Flowers distinctly pedicelled; flanges of the hard part of endocarp often indirectly connected with peripheral layer of meshes by numerous spinose and fibrous processes .....1. *S. cytherea*  
 b. Flowers sessile or subsessile; flanges of the hard part of endocarp partly or wholly and directly connected with peripheral layer of meshes .....  
 .....2. *S. pinnata*

1. ***Spondias cytherea*** Sonn., Voy. Ind. Or. & China 3: 242, t. 123. 1782; Ding Hou in Steenis, Fl. Males. 1, 8: 481. 1978; P.S.N. Rao & Sreek. in J. Econ. Tax. Bot. 14: 717. 1990. *S. dulcis* Soland. ex Forst. f., Pl. Escul. 33. 1786; Hook. f., Fl. Brit. India 2: 42. 1876.

Erect spreading trees, ca 18 m high. Leaves up to 30 cm long; leaflets 13-15, elliptic to ovate-oblong. Panicles up to 30 cm long. Flowers white. Drupes ovoid, ca 8 cm long; seed usually 1, rarely 2, remaining abortive.

*Fl.*: March-April & *Fr.*: August-September.

*Distr.*: South Andaman.

*Notes*: It occurs as wild and mostly cultivated.

2. ***Spondias pinnata*** (L.f.) Kurz, Prelim. Rep. For. & Pegu, Append. A 44: A PP. B. 42. 1875; Ding Hou in Steenis, Fl. Males. 1, 8: 483. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 56. (1983) 1985. *Mangifera pinnata* L.f., Suppl. 156. 1781. *Spondias mangifera* Willd., Sp. Pl. 2: 751. 1799; Hook. f., Fl. Brit. India 2: 42. 1876; Parkinson, For. Fl. Andaman Islands. 141. 1923.

Trees, 5-8 m high; bark light grey; branchlets greyish to brownish, lenticellate. Leaves up to 60 cm long; leaflets 3-6 pairs, elliptic-oblong or rarely elliptic-lanceolate, up to 15 x 5 cm, abruptly acuminate at apex, cuneate or slightly oblique at base, lateral nerves 15-25 pairs. Flowers white or yellowish. Drupes ellipsoid or ellipsoid-oblong, up to 4 x 2.5 cm, ripens yellow.

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

*Distr.*: Middle & South Andaman; North Nicobar.

Few in scrub forests.

## 12. *Swintonia* Griff.

Tall trees. Leaves entire. Panicles terminal and axillary, large and broad. Flowers bisexual or unisexual, 5-merous. Calyx small. Petals adnate to middle of disc. Stamens inserted on top of disc, free. Ovary sessile, narrowed into the slender style, stigma capitate. Drupes subtended by the reflexed enlarged petals; testa thin.

About 12 species distributed in India, Myanmar, Thailand, Cambodia, Laos, Vietnam and Malesia; 1 species which is of doubtful occurrence in A. & N. Islands.

### Doubtful Species

1. *Swintonia floribunda* Griff., Proc. Linn. Soc. London 1: 283. 1849; Ding Hou in Steenis, Fl. Males. 1, 8: 445. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 56. (1983) 1985. *S. helferi* Hook. f., Fl. Brit. India 2: 26. 1876.

Trees, ca 30 m high. Leaves lanceolate, elliptic to narrowly elliptic, oblong or obovate-oblong, up to 30 x 3.7 cm, obtusely acuminate at apex, cuneate at base; lateral nerves 25-30 pairs. Panicles lax, longer than leaves. Drupes globose or subglobose to obovoid, ca 1.7 cm across.

*Distr.*: Andaman Island (Ding Hou in Steenis, *op. cit.*).

*Cultivated species :*

### 13. *Anacardium* L.

Trees. Leaves spirally arranged, simple, coriaceous, entire. Panicles or corymbs terminal and in upper axils, combined into a large terminal corymb. Flowers polygamous, 5-merous. Sepals deciduous. Petals recurved, densely short hairy on both surfaces. Disc minute. Stamens 7-10, basally connate into a tube, all or some fertile. Ovary 1-celled, 1-ovuled, style lateral, subulate, stigma minute. Nuts indehiscent, reniform, seated on a large pyriform fleshy body formed of enlarged disc and top of peduncle; testa membranous.

About 8 Species distributed in tropical America, some cultivated in the tropics; 1 species in A. & N. Islands.

1. *Anacardium occidentale* L., Sp. Pl. 383. 1753; Hook. f., Fl. Brit. India 2: 20. 1876; Parkinson, For. Fl. Andaman Island. 140. 1923; Ding Hou in Steenis, Fl. Males 1, 8: 421. 1978; Mukherjee & D. Chandra in Bull. Bot. Surv. India 25: 53. (1983) 1985.

Trees, 6-15 m high; branchlets blackish to greyish. Leaves obovate, up to 17.5 x 10 cm, obtuse or slightly emarginate at apex, cuneate or rounded at base; lateral nerves 8-20 pairs. Panicles up to 25 cm long. Flowers yellow streaked with red, ca 4 mm across. Drupes up to 3.5 x 2 cm, orange or crimson with a kidney-shaped nut seated on it.

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

*Distr.:* South Andaman; North Nicobar.

Cultivated along roadsides.

## MORINGACEAE

1 genus and 14 species, distributed from Africa to India; 1 genus and 1 species in A. & N. Islands.

### 1. *Moringa* Adans.

Deciduous trees. Leaves alternate; leaflets opposite, entire. Panicles axillary. Flowers irregular, bisexual. Calyx capular, 5-cleft; segments unequal, petaloid. Petals 5, unequal. Stamens inserted on edge of disk. Disc lining calyx-tube. Ovary stipitate, 1-celled; style tubular, stigma perforated. Capsules elongate, beaked, loculicidally 3-valved; seeds many.

14 species distributed in arid area stretching from southern Angola and South western Africa across to Rajasthan with the addition of Madagascar; 1 species in A. & N. Islands.

1. *Moringa oleifera* Lam., *Encycl.* 1: 398. 1785 & *Ill. Gen.* 2, t. 337. 1823; Steenis & Buitenzorg in Steenis, *Fl. Males.* 1, 4: 45. 1949; Verdc. in *Kew Bull.* 40: 7. 1985. *M. pterygasperma* Gaertn., *Fruct.* 2: 314. 1791; Hook. f., *Fl. Brit. India* 2: 45. 1876; Parkinson, *For. Fl. Andaman Islands.* 142. 1923.

Trees, 4-8 m high; branchlets pinkish-brown, lenticellate. Leaves 2-4 pinnate, up to 60 cm long, imparipinnate; leaflets 8-10 pairs, ovate, obovate or oblong, up to 2.7 x 1.4 cm, obtuse or slightly emarginate at apex, rounded or cuneate at base; nerves obscure. Panicles up to 30 cm long. Flowers white with greenish base. Capsules up to 45 x 0.8 cm, pendulous, 9-ribbed; seeds up to 1 cm in diam, 3-gonous, winged at angles.

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

*Distr.*: South & Little Andaman.

Introduced and cultivated for its fruits. It is naturalised in some parts of Andaman.

### CONNARACEAE

About 16 genera and 300-350 species, having circumtropical distribution, but predominantly developed in Africa; 4 genera and 11 species in A. & N. Islands.

- 1 a. Calyx valvate .....2  
 b. Calyx imbricate .....3

- 2 a. Leaves unifoliolate; stamens connate at base; pistil 1; calyx persistent, not accrescent in fruits .....3. *Ellipanthus*  
 b. Leaves plurifoliolate; stamens free; pistils 5; calyx usually accrescent in fruits .....1. *Cnestis*
- 3 a. Petals glabrous; stamens glabrous; pistils 5, heterotristylous; ovary oblique-ovoid; calyx accrescent in fruits; seed ellipsoid to subglobose ....4. *Rourea*  
 b. Petals glandular-ciliate along margin below middle, mostly hairy at apex; pistil 1, heterodistylous; ovary globose; calyx persistent, not accrescent in fruits; seed more or less bean-shaped .....2. *Connarus*

### 1. *Cnestis* A. L. Juss.

Lianas or scandent shrubs. Leaves imparipinnate. Inflorescences solitary or consisting of fascicled branches inserted on knobs. Flowers 5-merous. Sepals slightly confluent at base, acute. Petals with indented and incurved at tip. Stamens 10, all fertile. Ovary pubescent. Fruits up to 5 per flower, pear-shaped; seed 1, flattened bean-shaped.

About 40 species mainly in tropical Africa and Madagascar; 1 species in A. & N. Islands.

1. *Cnestis palala* (Lour.) Merr. in J. Straits Brch. R. Asiat. Soc. 85: 201. 1922; Leenh. in Steenis, Fl. Males. 1, 5: 499. 1958. *Thysanus palala* Lour., Fl. Cochinch. 284. 1790. *Cnestis ramiflora* Griff., Notul. 4: 432. 1854; Hook. f., Fl. Brit. India 2: 54. 1876 *p.p.*; Parkinson, For. Fl. Andaman Islands 143. 1923. *C. palala* ssp. *palala* var. *brevistylis* Mondal in J. Econ. Tax. Bot. 15: 493. 1991 *syn. nov.*

Scandent shrubs or lianas, bark blackish or blackish-brown; branchlets densely buff-tomentose when young, glabrous when old. Leaves up to 33 cm long; leaflets 9-20 pairs, opposite or subopposite, subcoriaceous or thinly coriaceous, puberulous or glabrous above, softly pubescent beneath, oblong to linear-oblong, elliptic or lanceolate, up to 11 x 4 cm, obtuse to acuminate or rarely acute at apex, cordate, rounded or often oblique-cordate at base, entire; midrib sunken and narrowly grooved above, raised beneath, lateral nerves 3-10 pairs. Inflorescences ca 8 cm long. Flowers white, yellow or pink, ca 3 mm across. Fruits up to 3.2 x 1 cm, straight, distinctly beaked, yellow or red, densely rusty tomentose with longitudinal ridges and furrows; seeds black with red arillode.

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

*Distr.*: South & Little Andaman.

Common along roadsides and edges of forests.

## 2. *Connarus* L.

Lianas, shrubs or small trees. Leaves imparipinnate, sometimes trifoliolate, rarely unifoliolate, leaflets pellucid-glandular punctate. Inflorescences terminal and often in upper leaf-axils, paniculate. Flowers bisexual, fragrant, 5-merous; sepals, petals and stamens glandular punctate. Sepals slightly confluent at base. Petals free. Stamens connate at base. Ovary and basal part of style densely pilose, upper part of style glandular-pubescent. Fruits somewhat compressed, pericarp dry.

About 100 species, pantropical; 6 species in A. & N. Islands.

- |   |   |  |
|---|---|--|
| 1 | a. Petals glabrous outside .....  | 2  |
|   | b. Petals pubescent outside .....   | 4  |
| 2 | a. Fruits 1.5-3.8 x 1-2 cm, pericarp thin .....   | 6. <i>C. semidecandrus</i>                     |
|   | b. Fruits 3.5-7 x 2-4 cm, pericarp thick-woody .....  | 3  |
| 3 | a. Leaflets thickly coriaceous, veins dense and conspicuous; fruits ca 2.2 cm broad .....         | 5. <i>C. planchonianus</i>                     |
|   | b. Leaflets rigid-chartaceous or thinly coriaceous, veins not as above; fruits more broader ..... | 1. <i>C. kingii</i>                            |
| 4 | a. Fruits sessile .....   | 3. <i>C. nicobaricus</i>                       |
|   | b. Fruits short to long stipitate .....   | 5  |
| 5 | a. Sepals blunt; fruits semi-obovoid, beak lateral .....  | 4. <i>C. paniculatus</i>                       |
|   | b. Sepals acute; fruits usually spindle-shaped, beak about terminal .....                         | 2. <i>C. monocarpus</i> ssp. <i>malayensis</i> |

1. *Connarus kingii* Schellenb. in *Candollea* 2: 96. 1925; Vasud. in *J. Econ. Tax. Bot.* 8: 121. 1986.

Small trees ca 4 m high or semi-scandent shrubs; bark pale brown to greyish; branchlets glabrous or young parts densely ferruginously

pubescent or tomentose, later verrucose-lenticellate. Leaves 1-2 jugate, up to 26 cm long; leaflets oblong to oblong-lanceolate or elliptic to elliptic-oblong, up to 20 x 1 cm, acuminate at apex, cuneate or rounded at base, entire; midrib grooved above, raised beneath, lateral nerves 4-9 pairs. Inflorescences up to 20 cm long, densely ferruginous-rusty tomentose. Flowers reddish, *ca* 7 mm long. Follicles broadly ellipsoid, turgid, laterally compressed; seeds broadly oblong, *ca* 2 x 1.5 cm.

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

*Distr.*: South Andaman; Nicobar Islands (Vasud., *op. cit.*).

Scattered in the inland forests.

2. **Connarus monocarpus** L. ssp. **malayensis** Leenh. in Steenis, Fl. Males. 1, 5: 538. 1958. *C. oligophyllus* Wall. ex. Planch. in Linnæa 23: 427. 1850; Hook. f., Fl. Brit. India 2: 53. 1876. *C. maingayi* Hook. f., *op. cit.*

Lianas, sometimes a shrub or small tree; branchlets often lenticellate. Leaves usually 2-4 jugate; leaflets ovate-elliptic to lanceolate, up to 14 x 7 cm, base cuneate or rounded to subcordate, sometimes subpeltate, at times slightly oblique in lateral ones; lateral nerves 3-8 pairs. Inflorescences up to 15 cm long, widely and laxly branched with many flowers, shortly and densely tomentose. Fruits obliquely spindle-shaped to ellipsoid, up to 5 x 2 cm, ripens yellow to orange.

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

*Distr.*: Nicobar (Leenhouts).

3. **Connarus nicobaricus** King in J. As. Soc. Bengal 66 (1): 6. 1897; Brandis, Ind. Trees 212. 1906.

Scandent shrubs. Leaves up to 25 cm long; leaflets 3-5, lateral up to 11.3 cm long, terminal larger, broadly ovate, apex with a short blunt point, base broad and rounded; lateral nerves 6 or 7 pairs. Panicles as long as leaves, rusty-pubescent. Flowers *ca* 3.5 mm long, crowded near ends of branchlets. Follicles up to 3.7 x 2.5 cm, subcompressed, obtuse, faintly striate longitudinally, pubescent inside.

*Distr.*: Nicobar Islands (King, *l.c.*). Endemic.

4. ***Connarus paniculatus*** Roxb., Fl. Ind. 3: 139. 1832; Hook. f., Fl. Brit. India 2: 52. 1876; Leenh. in Steenis, Fl. Males. 1, 5: 533. 1958. *C. wightii* Hook. f., *op. cit.* 51. *C. andamanicus* Mondal in J. Econ. Tax. Bot. 15: 459. 1991 *syn. nov.*

Lianas or trees, 4-10 m high; branchlets pinkish-brown to greyish-brown, minutely ferruginous-tomentose at tip, early glabrescent, sometimes lenticellate. Leaves 2-3 jugate or trifoliolate; leaflets elliptic or ovate, rarely obovate, up to 17 x 9.5 cm, blunt to shortly and broadly acuminate at apex, rounded at base; lateral nerves 4-8 pairs. Flowers light brown, *ca* 6 mm long. Fruits up to 3 x 2.2 cm, green, ripens orange or yellowish.

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

*Distr.*: South & Little Andaman; North & South Nicobar.

Common.

*Notes*: Mondal (*op. cit.* 459-460) described a new species *C. andamanicus* based on a collection from Koshin Don, Great Nicobar Island, R.P. Dwivedi 7822. He considered it to be allied with *C. paniculatus* and *C. nicobaricus*, it differs from the former in having 3-5 pairs of main nerves in leaflets, smaller flowers, sepals orbicular-obtuse, keeled, shorter, petals fleshy, both sides of sepals and petals densely appressed tomentose and from the latter in having all the characters, mentioned above except in *C. nicobaricus* sepals are hairy outside only.

Critical study of herbarium specimens at PBL revealed that the lateral nerves in leaflets are 4-8 pairs, sepals elliptic or ovate, densely ferruginous-pubescent without, glabrous or subglabrous within, petals shortly densely pubescent within. All those quantitative characters fall within the ambit of *C. paniculatus* and hence both are treated as conspecific.

5. ***Connarus planchonlanus*** Schellenb. in Kew Bull. 1927: 375. 1927; Leenh. in Steenis, Fl. Males. 1, 5: 528. 1958; Hore in Bull. Bot. Surv. India 26: 21. (1984) 1985. *C. grandis* Hook. f., Fl. Brit. India 2: 53. 1876 *non* Jack. 1822.

Large lianas, shrubs or small trees, 2-5 m high; branchlets brown, minutely tomentose when young, soon glabrous. Leaves 1-2 jugate, usually 5-foliolate; leaflets oblong to lanceolate or elliptic, up to 16 cm long, obtusely acuminate at apex, cuneate or rounded at base, entire; lateral nerves 4-8 pairs. Flowers white, *ca* 2 mm long. Follicles slightly compressed, ellipsoid to obovoid, green, turning yellowish-orange and ultimately brownish when dry.

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

*Distr.*: South Nicobar.

Infrequent in the littoral forests and also along roadsides, rocky hill slopes of the inland forests.

6. **Connarus semidecandrus** Jack. Mal. Misc. 2 (7): 39. 1822; Hook. f. Fl. Brit. India 2: 52. 1876; Leenh. in Steenis, Fl. Males. 1, 5: 534. 1958. *C. gibbosus* Wall. ex Hook. f., *op. cit.*; Parkinson, For. Fl. Andaman Islands. 143. 1923. *C. griffithii* Hook. f., *op. cit.*.

Large scandent shrubs or small trees, *ca* 5 m high; branchlets greyish to brownish, glabrous or the young parts densely ferruginously pubescent, later becoming verrucose-lenticellate. Leaves up to 22.5 cm long, 3-5 foliolate; leaflets elliptic to lanceolate or elliptic-oblong; up to 20 x 8 cm, blunt to acuminate at apex, cuneate at base; lateral nerves 5-12 pairs. Flowers white or yellowish, *ca* 3 mm long. Fruits ovoid-oblong, compressed, pointed, striate; seeds glossy, black.

*Fl. & Fr.*: April-September.

*Distr.*: South Andaman; North Nicobar.

Sparse in the inland scrub forests.

### 3. **Ellipanthus** Hook. f.

Shrubs or small trees. Inflorescences axillary. Flowers 4-5 merous. Sepals densely pubescent without. Petals free, white. Stamens twice as much as petals; tube pilose within, glabrous without. Pistil pilose, somewhat laterally inserted; ovary oblique. Fruits densely tomentose,

ripens yellowish to brownish; seed 1, ellipsoid, shining black, basal parts covered with a yellowish to orange arillode.

About 10 species; 2 species in A. & N. Islands.

- 1 a. Leaves and petioles glabrous; fruits velvety-tomentose .....1. *E. calophyllus*  
 b. At least midrib beneath and petioles puberulous; fruits pale rusty-tomentose  
 .....2. *E. tomentosus* var. *gibbosus*

1. ***Ellipanthus calophyllus*** Kurz in J. As. Soc. Bengal 41: 305. 1872; Hook. f., Fl. Brit. India 2: 35. 1876; Parkinson, For. Fl. Andaman Islands. 144. 1923.

Trees, 4.5-9 m high. Leaflets subcoriaceous, elliptic, ovate-oblong, oblong or lanceolate, up to 17.5 x 6.2 cm, shortly and obtusely acuminate at apex, rounded at base, entire; lateral nerves reddish beneath and inter-arching. Flowers in cymes. Fruits oblong or ellipsoid, ca 2.5 cm long.

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

*Distr.*: Andaman (Kurz, *op. cit.*; Parkinson, *op. cit.*)

2. ***Ellipanthus tomentosus*** Kurz var. ***gibbosus*** (King) Leenh. in Steenis, Fl. Males 1, 5: 523. 1958. *E. gibbosus* King in J. As. Soc. Bengal 66 (2): 10. 1897. *E. helferi* Hook. f., Fl. Brit. India 2: 55. 1876.

Shrubs or small trees, ca 10 m high. Leaflets glabrous above sparsely adpressed-pubescent below, ovate-lanceolate to lanceolate and linear-lanceolate, up to 22 x 8 cm, shortly and abruptly caudate-acuminate at apex, rounded at base, entire; lateral nerves 7 or 8 pairs. Flowers ca 3.8 mm long, in dense many-flowered capitate cymes. Fruits narrowly oblong, ca 2 cm long, compressed, beaked, stipitate.

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

*Distr.*: Andaman (Leenhouts).

#### 4. ***Rourea*** Aubl. (*nom. cons.*)

Lianas or erect shrubs. Leaves imparipinnate. Inflorescences paniculate. Flowers bisexual, 5-merous. Sepals ovate, usually minutely

pubescent without, ciliate along margins, barbulate at apex, glabrous within. Petals lanceolate, 2-3 times as long as sepals. Stamens 10, confluent at base. Fruits 1 per flower.

About 90-100 species; 2 in A. & N. Islands.

- 1 a. Leaflets numerous, 0.5-3.5 cm long, sessile ..... 1. *R. mimosoides*  
 b. Leaflets few, in 1-6 pairs, 5-20 cm long, petiolate ..... 2. *R. minor*

1. ***Rourea mimosoides*** (Vahl) Planch. in *Linnaea* 23: 420. 1850; Leenh. in Steenis, *Fl. Males.* 1, 5: 517. 1958. *Connarus mimosoides* Vahl, *Symb.* 2: 87. 1794. *Rourea wallichiana* Planch. ex Bl., *Mus. Bot.* 1: 263. 1850; Hook. f., *Fl. Brit. India* 2: 49. 1876. *R. villosa* Planch., *op. cit.* 422; Hook. f., *op. cit.* 48. *R. concolor* Bl., *op. cit.*; Hook. f., *op. cit.* 49. *R. similis* Bl., *op. cit.*; Hook. f., *op. cit.*

Large lianas, sometimes shrubs with drooping branches; branchlets minutely fulvous-tomentose, becoming glabrescent. Leaves up to 51-foliolate, rachis pubescent; leaflets ovate or elliptic to oblong, *ca* 1.5 cm broad, apex emarginate or obtuse, base slightly cordate or truncate, in lateral leaflets base slightly oblique; lateral nerves 2-10 pairs. Inflorescences *ca* 12 cm long. Fruits narrowly ellipsoid, up to 15 x 5 mm, curved, dehiscing by ventral slit.

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

*Distr.*: Andaman and Nicobar Islands (Leenhouts).

2. ***Rourea minor*** (Gaertn.) Leenh. in Steenis, *Fl. Males.* 1, 5: 514. 1958. *Aegiceras minus* Gaertn., *Fruct.* 1: 216, t. 46. 1788. *Rourea santaloides* (Vahl) Wight & Arn., *Prodr.* 144. 1834; Hook. f., *Fl. Brit. India* 2: 47. 1876. *R. caudata* Planch. in *Linnaea* 23: 419. 1850; Hook. f.; *op. cit.* 48. *R. pulchella* Planch., *op. cit.* 419; Hook. f., *op. cit.* 48. *R. commutata* Planch., *op. cit.* 420 *nom. illeg.*; Hook. f., *op. cit.* 47; Parkinson, *For. Fl. Andaman Islands.* 143. 1923. *R. humilis* Bl., *Mus. Bot.* 1: 262. 1850; Brandis, *Ind. Trees* 211. 1906. *R. acuminata* Hook. f., *op. cit.* 48.

Lianas; bark of branchlets striated, sometimes granulate, greenish-black when fresh, greyish-white or pinkish-brown upon drying, glabrous

or young parts minutely tomentose. Leaves up to 26 cm long; leaflets chartaceous to coriaceous, glossy dark green when fresh, greyish or blackish brown when dry; sub-orbicular, ovate to lanceolate, oblong or elliptic, up to 6.5 cm broad, acuminate to caudate at apex, cuneate, rounded or oblique at base, entire; lateral nerves 2-8 pairs. Inflorescences up to 15 cm long. Flowers white, *ca* 5 mm across. Fruits obliquely ellipsoid to ovoid, up to 25 x 7 mm, curved; seed 1, *ca* 9 x 4 mm.

*Fl.*: June-December; *Fr.*: September-February.

*Distr.*: Middle & South Andaman; North & South Nicobar.

Scattered in the inland forests.

### FABACEAE (= PAPILIONACEAE)

About 437 genera and 11300 species, cosmopolitan in distribution; 43 genera, 96 species, 2 varieties and 1 forma in A. & N. Islands.

- 1 a. Stamens free or obscurely connate at base ..... 2
- b. Stamens joined to a considerable degree ..... 3
- 2 a. Calyx with well developed and distinct imbricate lobes; ovary sessile; stigma oblique; pods coriaceous, rigid or fleshy, dehiscent ..... 23. *Ormosia*
- b. Calyx shortly lobed subtruncate, valvate to slightly imbricate; ovary stalked; stigma terminal; pods sublignose or membranous, usually indehiscent ...  
..... 31. *Saphora*
- 3 a. Anthers dimorphous; leaves simple or digitately 3-foliolate, rarely imparipinnate, if compound leaves never glandular-punctate and fruits never jointed ..... 9. *Crotalaria*
- b. Anthers uniform, sometimes aborted, or if dimorphic then leaves pinnate or glandular-punctate ..... 4
- 4 a. Leaves paripinnate; stamens 9; pods elastically dehiscent, with brown to bright coloured seeds ..... 1. *Abrus*
- b. Leaves imparipinnate or pinnately or digitately 2-4 foliolate or unifoliolate or simple, rarely paripinnate (*Sesbania*, *Smithia*); stamens 10; pods and seeds not as above ..... 5
- 5 a. Anthers apiculate or appendaged; petals caducous ..... 18. *Indigofera*
- b. Anthers not appendaged if petals falling early ..... 6

- 6 a. Pods transversely jointed; seeds asymmetrical ..... 7  
 b. Pods not jointed or if so then seeds more symmetrical ..... 13
- 7 a. Calyx glumaceous, striate ..... 4. *Alysicarpus*  
 b. Calyx not as above ..... 8
- 8 a. Pedicels long, becoming looped ..... 20. *Mecopus*  
 b. Pedicels not as above ..... 9
- 9 a. Pods persistently folded up within calyx ..... 35. *Uraria*  
 b. Pods not as above ..... 10
- 10 a. Pods inflated, many seeded ..... 28. *Pycnospora*  
 b. Pods not as above ..... 11
- 11 a. Flowers 1 per bract, crowded in short racemes or heads; bracts all similar; bracteoles well developed ..... 11. *Dendrolobium*  
 b. Flowers 2-several per primary bract, each usually subtended by a secondary bract; bracts dimorphic; bracteoles small or absent ..... 12
- 12a. Petioles winged; leaves 1-foliolate ..... 34. *Tadehagi*  
 b. Petioles wingless, or if slightly so then leaves 3-foliolate ... 13. *Desmodium*
- 13 a. Hypanthium usually present; intrastaminal disc absent ..... 14  
 b. Hypanthium usually absent; intrastaminal disc present ..... 21
- 14 a. Pods neither jointed nor buried by hypanthium ..... 15  
 b. Pods jointed unless geocarpic ..... 17
- 15 a. Ovules numerous ..... 29. *Sesbania*  
 b. Ovules 1-4 ..... 16
- 16a. Wing petals broadly expanded, crimped, bright yellow or orange .....  
 ..... 26. *Pterocarpus*  
 b. Wing petals not much broader than keel, not crimped, white, cream or reddish to bluish ..... 10. *Dalbergia*
- 17a. Pods with strong longitudinal nerves ..... 22. *Ormocarpum*  
 b. Pods or joints of pods reticulately veined ..... 18.

- 18a. Conspicuous pellucid or pustular glands on leaves, calyx, etc.; pedicel without joints or bracteoles ..... 37. *Zornia*
- b. Pellucid or pustular glands lacking; pedicels almost always articulate and or bracteolate ..... 19.
  
- 19a. Bracts much enlarged, usually completely enveloping the flowers and fruits; joint 1-2 ..... 17. *Geissaspis*
- b. Bracts not completely enveloping the flowers and fruits; joints 1-many ..... 20.
  
- 20a. Inflorescences mostly lax; pods straight to coiled, with 1-many joints, exerted from calyx ..... 2. *Aeschynomene*
- b. Inflorescences mostly dense and scorpioid, often strobilate; pods not visible, plicate ..... 30. *Smithia*
  
- 21a. Leaves 5-many foliolate, rarely 3-foliolate; inflorescences aggregated towards branch ends; seeds with rudimentary plumules ..... 22
- b. Leaves pinnately 3 - foliolate or simple (some species of *Flemingia*) rarely 5-9 foliolate (*Centrosema & Clitoria*); inflorescences often in many axils; seeds with well developed plumules ..... 24
  
- 22 a. Valves of fruits wingless ..... 25. *Pongamia*
- b. Valves of fruits winged down one or both sutures ..... 23
  
- 23 a. Vexillary stamen free only at base; pods membranous to subcoriaceous ..... 12. *Derris*
- b. Vexillary stamen free; pods coriaceous ..... 3. *Aganope*
  
- 24 a. Leaflets and calyx with yellowish gland dots ..... 25
- b. Leaflets and calyx eglandular ..... 26
  
- 25a. Ovules 3 or more; arils often prominent ..... 5. *Cajanus*
- b. Ovules 2 (-3); arils inconspicuous ..... 16. *Flemingia*
  
- 26 a. Style bearded below stigma ..... 27
- b. Style beardless ..... 30
  
- 27 a. Stigma oblique ..... 28
- b. Stigma terminal ..... 29
  
- 28 a. Style flat upward ..... 24. *Pachyrhizus*
- b. Style filiform ..... 36. *Vigna*

- 29 a. Petals unequal ..... 8. *Clitoria*  
 b. Petals equal ..... 19. *Lablab*
- 30 a. Stamens monadelphous ..... 31  
 b. Stamens diadelphous ..... 34
- 31 a. Petals unequal ..... 15. *Erythrina*  
 b. Petals equal ..... 32
- 32 a. Upper lip of calyx projecting ..... 6. *Canavalia*  
 b. Upper lip of calyx not as above ..... 33
- 33 a. Pods oblong, turgid, 1-2 seeded ..... 14. *Dioclea*  
 b. Pods linear, flat, many-seeded (more than 2 up to 15) ..... 27. *Pueraria*
- 34 a. Flowers resupinate; standard petal appendaged on back ..... 7. *Centrosema*  
 b. Flowers not as above; standard petal unappendaged ..... 35
- 35 a. Wing petals glabrous ..... 33. *Strongyloдон*  
 b. Wing petals hairy ..... 36
- 36 a. Pods with stinging hairs and many seeded, if single seeded then face of valve raised by plates running towards centre ..... 21. *Mucuna*  
 b. Pods glabrous and 1-seeded at apex ..... 32. *Spatholobus*

#### 1. *Abrus* Adans.

Woody climbers. Leaves multijugate; leaflets opposite, mucronate, entire; stipules persistent. Inflorescences terminating leafy or leafless branches. Flowers sessile. Calyx campanulate or funnel-shaped, lobed or shortly toothed. Corolla much longer than calyx. Stamens monadelphous. Ovary multiovulate, pubescent, style curved, stigma penicillate. Pods septate, beaked, pubescent; seeds arillate.

17 species, pantropical; 2 species in A. & N. Islands.

- 1 a. Leaflets 0.6-2.5 cm long; pods turgid; seeds scarlet with a black spot around hilum ..... 1. *A. precatorius*  
 b. Leaflets 1-1.5 cm long; pods flat; seeds entirely brownish-black ..... 2. *A. pulchellus*

1. *Abrus precatorius* L., Syst. Nat. ed. 2, 2 : 472. 1767; Baker in Hook. f., Fl. Brit. India 2: 175. 1876; Parkinson, For. Fl. Andaman Islands. 150. 1923; Breteler in Blumea 10: 617. 1960; Sanj., Legumes of India 74. 1992.

Climbers; branchlets greyish to brownish, sometimes striate. Leaves up to 13.5 cm long; leaflets 10-20 pairs; membranous, linear-oblong, up to 8 mm broad, obtuse at apex, rounded at base. Racemes up to 10 cm long. Flowers white, pink or lilac, ca 7 mm long. Pods oblong, up to 5 x 1.3 cm, beaked at tips, pubescent when young, later glabrous, 3-5-seeded.

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

*Distr.*: Andaman group of islands; North Nicobar.

Common up to 270 m above m.s.l.

2. *Abrus pulchellus* Wall. ex Thw., Enum. Pl. Zeyl., 91. 1859; Baker in Hook. f., Fl. Brit. India 2: 175. 1876; Parkinson, For. Fl. Andaman Islands. 150. 1923; Sanj., Legumes of India 74. 1992. *A. fruticulosus* auct. non Wall. ex Wight & Arn, 1840; Breteler in Blumea 10: 612. 1960.

Climbers; branchlets pinkish to pinkish-brown, lenticellate. Leaves up to 16 cm long; leaflets 6-12 pairs, oblong, up to 2 cm broad, obtuse at apex, rounded to oblique at base. Racemes up to 13 cm long, dense. Flowers pink or pale blue, ca 1.1 cm long. Pods oblong, up to 7 x 1 cm, beaked at tips, 8-13 seeded.

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

*Distr.*: North and South Andamans.

A few in the inland forests, up to 500 m above m.s.l.

## 2. *Aeschynomene* L.

Erect or decumbent herbs, shrubs or small trees. Leaves 5-100 foliolate; leaflets sessile, entire. Inflorescences racemose, sometimes paniculate. Flowers pentamerous. Petals yellowish to red or purplish. Fruit a loment, 2-18 articulate; seeds small, reniform.

About 150 species, chiefly distributed in the tropics, with some extension into warm temperate areas, in America, Asia, Australia and the Pacific Islands; 2 species in A. & N. Islands.

- 1 a. Leaflets 1-costate ..... 2. *A. indica*  
 b. Leaflets 2-many costate ..... 1. *A. americana*

1. ***Aeschynomene americana*** L., Sp. Pl. 713. 1753; Rudd in Reinwardtia 5: 25. 1959; D. Chatterjee in Sci. & Cult. 25: 488. 1960; Sanj., Legumes of India 75. 1992.

Herbs upto 50 cm high; stems erect or decumbent, pale brownish; glandular-hispid to subglabrous. Leaves up to 7 cm long, 20-60 foliolate; leaflets linear, up to 6 x 1 mm, aristate at apex, rounded to cuneate at base. Racemes ca 2.5 cm long. Flowers ca 7 mm long. Lomentum linear, up to 3 x 0.5 cm; seeds reniform, ca 3 x 2 mm, dark brown.

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

*Distr.*: North Nicobars.

A few along roadsides.

2. ***Aeschynomene indica*** L., Sp. Pl. 713. 1753; Baker in Hook. f., Fl. Brit. India 2: 151. 1876; Rudd in Reinwardtia 5: 30. 1959; Sanj., Legumes of India 75. 1992.

Herbs, 0.3-2 m high; stems erect, pale to dark brownish. Leaves ca 6.7 cm long, 50-70-foliolate; leaflets elliptic-oblong, up to 4.5 x 1.3 mm, obtuse at apex, rounded at base. Racemes ca 2.5 cm long. Flowers ca 8 mm long. Lomentum linear-oblong, up to 3.5 x 0.3 cm; seeds reniform, ca 4 x 3 mm, dark brown.

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

*Distr.*: North, South and Little Andaman.

A few near cultivated fields or fresh water swamps.

### 3. *Aganope* Miq.

Woody climbers or semi-scandent trees. Leaves alternate; lateral leaflets opposite or subopposite, somewhat coriaceous, glossy above, entire. Panicles thyrsoid. Calyx campanulate. Corolla creamy-white. Stamens diadelphous. Ovary with up to 10 ovules, style tapering, stigma minute. Fruits indehiscent, flattened, valves coherent between seeds.

About 6 species in the forests of West and Central Africa and in Asia from India to China south to the Philippines and New Guinea; 2 species in A. & N. Islands.

- i a. Pedicels as long as calyx; pods large, up to 19.5 cm long, deeply indented between seeds, narrowly winged down upper suture ..... 1. *A. heptaphylla*
- b. Pedicels shorter than calyx; pods small, up to 13 cm long, not indented between seeds, distinctly winged down both sutures ..... 2. *A. thyrsoiflora*

1. ***Aganope heptaphylla*** (L.) Polhill in Kew Bull. 25: 268. 1971; Sanj., Legumes of India 75. 1992. *Sophora heptaphylla* L., Sp. Pl. 373. 1753. *Derris sinuata* Bth. ex. Thw., Enum. Pl. Zeyl. 93. 1859; Baker in Hook. f., Fl. Brit. India 2: 246. 1878; Thoth. in Bull. Bot. Surv. India 3: 195. (1961) 1962.

Scandent shrubs or lianas up to 15 m long; branchlets pinkish or pinkish-brown, striate, lenticellate. Leaves up to 34 cm long; leaflets ovate to elliptic or suborbicular, up to 15 x 12 cm, obtuse or acute to shortly acuminate, rarely emarginate at apex, rounded to cuneate at base; lateral nerves 5-7 pairs. Panicles up to 35 cm long. Flowers greenish or white, ca 1.3 cm long. Pods oblong, up to 3 cm broad.

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

*Distr.*: Middle and Little Andaman; North and South Nicobar.

Common in the inland forests, also seen rarely in littoral forests.

2. ***Aganope thyrsoiflora*** (Bth.) Polhill in Kew Bull. 25: 268. 1971; Sanj., Legumes of India 76. 1992. *Millettia thyrsoiflora* Bth. in Miq., Pl. Jungh-249. 1852. *Derris thyrsoiflora* (Bth.) Bth. in J. Linn. Soc. 4 (Suppl.): 114. 1860; Baker in Hook. f., Fl. Brit. India 2: 246. 1878. *D. wallichii* Prain in J. As. Soc. Bengal 66: 99. 1897; Parkinson, For. Fl. Andaman Islands. 148. 1923.

Climbers or trees up to 3 m high; branchlets pale brownish to greyish, striate, lenticellate. Leaves up to 45.5 cm long; leaflets elliptic to elliptic-oblong or ovate to ovate-lanceolate, up to 16 x 8 cm, acute to acuminate at apex, cuneate to rounded or slightly cordate at base; lateral nerves 4-8 pairs. Panicles finely silky, up to 45 cm long. Flowers white, ca 1.1 cm long. Pods ellipsoid to oblong, up to 3.8 cm broad, acute at apex and narrowing towards base, 1-4 seeded.

*Fl. & Fr.*: February-August/ July-January.

*Distr.*: Middle and South Andaman; North Nicobar.

Scattered.

#### 4. *Alysicarpus* Neck. ex Desv. (*nom. cons.*)

Diffuse annuals or biennials. Leaves simple, rarely 3-foliolate. Inflorescences of axillary racemes. Calyx teeth deep, the two upper connate. Stamens diadelphous. Ovary many-ovuled, style incurved, stigma capitate. Pods terete or turgid.

About 25 species occurring in Old World tropics; 1 species in A. & N. Islands.

1. *Alysicarpus vaginalis* (L.) DC., Prodr. 2: 353. 1825; Baker in Hook. f., Fl. Brit. India 2: 158. 1876; Steenis in Reinwardtia 6: 87. 1961; Sanj., Legumes of India 81. 1992. *Hedysarum vaginale* L., Sp. Pl. 746. 1753.

Perennial decumbent herbs; branches pale brownish, articulated, glabrescent. Leaves elliptic to elliptic-oblong, rarely orbicular, up to 4 x 1.4 cm, obtuse at apex with a mucro, rounded or cuneate at base, entire. Racemes up to 8 cm long. Flowers pink, blue or violet-red, ca 4 cm long. Lomentum linear, up to 1.7 x 0.5 cm, ca 6-jointed, slightly rugose, faintly pubescent; seeds orbicular.

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

*Distr.*: Middle, South and Little Andaman; North Nicobar.

Common as a weed in wastelands, grassy slopes and forest edges.

5. *Cajanus* DC. (*nom. cons.*)

Herbs or shrubs, erect, creeping or climbing. Leaflets entire. Inflorescences racemose; bracts caducous. Calyx-tube campanulate, the lowest the larger, the two upper ones more or less connate. Corolla more or less exerted, marcescent or fugaceous. Stamens diadelphous (9+1). Ovary subsessile, style thickened above the middle, upcurved. Pods compressed, bivalved, more or less septate within, depressed between seeds; seeds shiny.

About 32 species distributed in Africa, S.E. Asia, from India to Australia; 3 species in A. & N. Islands.

- 1 a. Erect shrubs; ripe seeds without strophiole or with small vestigial strophiole ..... 1. *C. cajan*
- b. Climbing or creeping plants; ripe seeds with conspicuous strophiole ... 2.
- 2 a. Leaflets larger, 3.5-10 cm long, acuminate at apex, glabrous above, sparsely pubescent below; corolla marcescent ..... 2. *C. crassus*
- b. Leaflets smaller, 1-4.5 cm long, obtuse or acute at apex, silky-pubescent on both sides; corolla fugaceous ..... 3. *C. scarabaeoides*

1. *Cajanus cajan* (L.) Millsp., Field. Columb. Mus. Bot. 2, 1: 53. 1900; van der Maesen in Agric. Univ. Wageningen Pap. 85 (4): 65. (1985) 1986; Sanj., Legumes of India 100. 1992. *Cystisus cajan* L., Sp. Pl. 739. 1753. *Cajanus indicus* Spreng., Syst. Veg. 3: 248. 1826; Baker in Hook. f., Fl. Brit. India 2: 217. 1876.

Shrubs, 1-4 m high; branches greyish-brown to pale brownish, striate. Leaves up to 14.3 cm long; leaflets elliptic to elliptic-lanceolate, rarely obovate-elliptic, up to 8.2 x 2.6 cm, acuminate or acute at apex with a mucro, cuneate at base. Racemes axillary, up to 11 cm long. Flowers yellow, up to 2.2 cm long. Pods oblong, up to 6.2 x 0.7 cm, 2-4 seeded; seeds globose or ellipsoid.

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

*Distr.*: South and Little Andaman; North and South Nicobar.

Usually cultivated but also found as an escape (naturalised).

2. **Cajanus crassus** (Prain & King) van der Maesen in Agric. Univ. Wageningen Pap. 85 (4): 105. (1985) 1986; Sanj., Legumes of India 100. 1992. *Atylosia crassus* Prain & King in J. As. Soc. Bengal 66: 45. 1897. *A. mollis* Bth. in Miq., Pl. Jungh. 243. 1852 p.p.; Baker in Hook. f., Fl. Brit. India 2: 213. 1876.

Climbing shrubs; branches brownish, ribbed, pubescent. Leaves up to 12 cm long; leaflets coriaceous, up to 9.5 cm broad, terminal rhomboid, rounded or slightly cordate at base, lateral ovate, obliquely rounded at base. Racemes up to 8 cm long. Flowers yellow, ca 2 cm long. Pods oblong, up to 4.2 x 1.2 cm, softly brownish-tomentose, 3-6 seeded; seeds orbicular, black.

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

*Distr.*: Middle and South Andaman.

Rare in the inland forests.

It resembles *C. mollis* (Bth.) van der Maesen quite closely. It differs from the former in having 1) leaves more sparsely brown-pubescent and reticulate beneath 2) terminal leaflet almost as long as broad 3) pods 3-6 seeded and 4) Seeds parallel to sutures.

3. **Cajanus scarabaeoides** (L.) du Petit-Thou., Dict. Sci. Nat. 6: 617. 1817 ('*Cajan scarabaeoide*'); van der Maesen in Agric. Univ. Wageningen Pap. 85 (4): 183, 189. (1985) 1986; Sanj., Legumes of India 103. 1992. *Dolichos scarabaeoides* L., Sp. Pl. 726. 1753. Baker in Hook. f., Fl. Brit. India 2: 215. 1876.

Slender twiners; branches brownish, striate, tomentose. Leaves up to 4 cm long; leaflets coriaceous, up to 2.7 cm broad, terminal oblanceolate or elliptic, cuneate to rounded at base, lateral elliptic to oblong, obliquely cuneate at base. Racemes axillary, up to 2 cm long. Flowers yellow, ca 1 cm long. Pods oblong, up to 2 x 0.5 cm, densely covered with dull or golden-brown long and short hairs, 3-7 seeded.

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

*Distr.*: North Nicobar.

A few in grasslands.

6. *Canavalia* DC. (*nom. cons.*)

Slender vines to stout lianas. Leaves alternate; leaflets entire, generally with appressed or ascending hairs. Thyrses axillary. Flowers commonly resupinate. Calyx tubular at base, bilabiate, with appressed or ascending hairs, lower lip with 3 small teeth, upper with 2 larger lobes. Petals showy. Ovary puberulent or pubescent, stigma capitate. Pods usually with 4-15 seeds.

51 species distributed in the tropics and subtropics; 4 species in A. & N. Islands.

- 1 a. Upper calyx lobes 6 mm or more long, more or less equal to length of tube ..... 1. *C. africana*
- b. Upper calyx lobes up to 4 mm long, much shorter than tube ..... 2
- 2 a. Petioles shorter than leaflets; leaflets membranous; petiolules glabrous; calyx glabrescent or thinly puberulous; pods 4-5 cm wide, turgid, dorsal and ventral sutures not parallel, indehiscent or if tardily dehiscent valves not twisting; hilum of seeds 11.5-14 mm long ..... 2. *C. cathartica*
- b. Petioles usually as long as leaflets or longer; leaflets subcoriaceous to coriaceous; petiolules strigose or pubescent; calyx pubescent; pods 2-2.5 cm wide, compressed, dorsal and ventral sutures more or less parallel, dehiscent, valves twisting after dehiscence; hilum of seeds ca 7 mm long ..... 3. *C. rosea*

1. ***Canavalia africana*** Dunn in Piper & Dunn, Bull. Misc. Inf. Kew 1922: 135. 1922; Sanj., Legumes of India 107. 1992. *C. virosa* (Roxb.) Wight & Arn., Prodr. 253. 1834 *p.p.* *C. ensiformis* DC. var *virosa* (Roxb.) Baker in Hook. f., Fl. Brit. India 2: 196. 1976.

Climbers, biennial. Leaflets membranous, ovate or broadly ovate, sometimes orbicular, up to 14 x 9 cm, subacute or obtuse at apex with a short mucro, cuneate or subtruncate at base. Racemes 10-20 flowered; up to 40 cm long. Flowers rose-purple or lilac. Pods ellipsoid-elongate, compressed, up to 14 x 2.5 cm, sparsely hairy or glabrous, shortly beaked; seeds ovoid or ellipsoid, up to 2 x 1.1 cm.

*Fl.*: October-February/ June-September; *Fr.*: January-December.

*Distr.*: Nicobar.

2. **Canavalia cathartica** Thou. in Desv., J. Bot. 1: 81. 1813 ("catharticus"); Sauer in Brittonia 16: 158. 1964; Sanj., Legumes of India 107. 1992. *C. turgida* Grah. ex A. Gray, Bot. U.S. Expl. Exped. 1: 440. 1854; Parkinson, For. Fl. Andaman Islands. 153. 1923. *C. ensiformis* (L.) DC., Prodr. 2: 404. 1825; Baker in Hook. f., Fl. Brit. India 2: 195. 1876. *C. ensiformis* var. *turgida* (Grah. ex A. Gray) Baker in Hook. f., *op. cit.* 196. 1876.

Climbers, biennial; branches pale brownish to yellowish. Leaves up to 28 cm long; leaflets ovate or orbicular to obovate, up to 15 x 12 cm, shortly acuminate or rarely rounded with a mucro or retuse at apex, cuneate or rounded at base. Racemes 10-16 flowered, up to 18 cm long. Flowers pink or pale purple, up to 3 cm long. Pods oblong, up to 18 cm long, beak lateral, incurved; seeds ovoid, ca 2 x 1.3 cm.

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

*Distr.*: Andaman group of Islands. North and South Nicobar.

Common in the inland forests.

*Notes*: This species is closely allied to *C. maritima* (Aubl.) Thou. but differs in having 1) Larger leaflets, 2) glabrous petiolules, 3) Larger and more turgid pod with a separating woolly endocarp.

3. **Canavalia rosea** (Swartz) DC., Prodr. 2: 404. 1825. *Dolichos roseus* Swartz, Fl. Ind. Occ. 1243. 1806. *C. obtusifolia* (Lam.) DC., Prodr. 2: 404. 1825; Baker in Hook. f., Fl. Brit. India 2: 196. 1876.

Creeping perennials, rooting at nodes; branches pale greyish, ribbed. Leaves up to 37 cm long; leaflets ovate to obovate, up to 13.2 x 9.2 cm, acuminate or obtuse at apex with a mucro, cuneate or rounded at base. Racemes 4-8 flowered, up to 21.5 cm long. Flowers red or pink, up to 3.5 cm long. Pods up to 12.5 cm long, beak incurved; seeds ovoid to subglobose, up to 1.6 x 1 cm.

A few in the littoral forests.

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

*Distr.*: South Andaman; South Nicobar.

*Cultivated Species:*

4. **Canavalia gladiata** (Jacq.) DC., Prodr. 2: 404. 1825; D. Chatterjee in J. Indian Bot. Soc. 28: 86. 1949; Sanj., Legumes of India 107. 1992. *Dolichos gladiatus* Jacq., Coli. Bot. 2: 276. 1788.

Climbers, annual or biennial. Leaflets ovate or broadly ovate, up to 18 x 12 cm acute, subacute or shortly acuminate at apex, subtruncate at base. Racemes 12-16 flowered, up to 25 cm long. Flowers usually lilac or pale pink, up to 2.5 cm long. Pods linear-oblong, up to 35 x 4 cm compressed, slightly curved, beaked; seeds ellipsoid, up to 3.5 x 2 cm.

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

*Distr.:* Cultivated in Andaman islands.

*Notes:* According to Chatterjee (*op. cit.* pp. 85-86), the Indian specimens wrongly called *C. ensiformis* (L.) DC., are really *C. gladiata* and it is doubtful if true *C. ensiformis* is found in India at all. Its presence in cultivation in India, however cannot be ruled out. In 1876, Baker quite wrongly used the name *C. ensiformis* (Hook. f., Fl. Brit. India 2: 195) for the Indian plant with red beans. Most of the later authors on Indian Botany followed Baker, and now the truly Old World plant is widely known in India by the name *C. ensiformis*- a name rightly belonging to an American plant. The name should be restricted to the America Plant (which has white seeds) and the Old World plant should be known as *C. gladiata* (Jacq.) DC.

### 7. **Centrosema** (DC.) Bth. (*nom. cons.*)

Herbs or shrubs, twining or creeping at base. Stipules long persistent; leaflets stipellate, entire. Inflorescences of axillary racemes. Calyx with 2 striate, basal bracteoles, tube campanulate, teeth unequal. Standard much longer than other petals. Ovary sessile, many ovuled, style dorsally flattened. Pods linear, long beaked, 2 valved, 10-20 seeded, septate between seeds.

About 45 species, distributed in America; 1 species in A. & N. Islands.

1. **Centrosema pubescens** Bth., Comm. Legum. Gen. 55. 1837; Steenis & Jacobs in Fl. Mal. Bull. 18: 1089. 1963; Sanj., Legumes of India 111. 1992.

Climbing shrubs; branchlets pale brownish to brownish, pubescent. Leaves up to 13 cm long; leaflets pubescent, elliptic, up to 7.2 x 5 cm, acute to shortly acuminate at apex, rounded or slightly cordate at base. Racemes up to 7 cm long. Flowers pink or white, *ca* 1.6 cm long. Pods up to 13 x 0.7 cm, glabrescent.

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

*Distr.*: North Nicobar.

A few in scrub forests or near rubber plantations.

### 8. *Clitoria* L.

Scandent or suberect undershrubs. Leaves 3-7 foliolate, stipules persistent, small; leaflets entire, stipellate. Bracts and bracteoles persistent. Calyx membranous, tubular. Corolla much exserted. Ovary stalked, many ovuled, style incurved, flattened. Pods linear.

About 70 species, distributed in the tropics, especially in America; 1 species in A. & N. Islands.

1. *Clitoria ternata* L., Sp. Pl. 753. 1753; Baker in Hook. f., Fl. Brit. India 2: 208. 1876; Parkinson, For. Fl. Andaman Islands. 153. 1923; Sanj., Legumes of India 114. 1992.

Climbers; stem pale greyish to yellowish. Leaves up to 11 cm long; leaflets elliptic or ovate, up to 5.7 x 4.1 cm, obtuse or retuse at apex, cuneate or rounded at base. Flowers deep blue or white, up to 4 cm long, solitary. Pods beaked, hairy, 6-10 seeded; seeds *ca* 3 x 2 mm, yellowish-brown.

Cultivated but becoming naturalised (common).

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

*Distr.*: Middle, South and Little Andaman; North Nicobar.

### 9. *Crotalaria* L.

Herbs or shrubs. Leaves simple or digitately compound; leaflets 3-5. Inflorescences of bracteate, terminal or leaf opposed racemes. Bracteoles 2. Calyx 5-lobed, half way or more deeply incised. Corolla various in

colour, often yellow, as long as calyx or emergent. Stamens 10. Ovary with 1-many ovules, style top barbate, stigma small. Pods mostly inflated, 2 valved; seeds kidney-shaped, albuminous.

About 600 species distributed in the tropical and subtropical regions (Africa & Madagascar with 511 species); 9 species in A. & N. Islands, of which the occurrence of 1 species is doubtful.

- 1 a. Leaves 3-foliolate, petioles articulated ..... 2
- b. Leaves simple, the petioles not as above ..... 3
- 2 a. Seeds 2 ..... 8. *C. willdenowiana* ssp. *glabrifoliolata*
- b. Seeds many ..... 5. *C. pallida*
- 3 a. Pods distinctly stalked ..... 4
- b. Pods sessile ..... 5
- 4 a. Leaves puberulent below; stipules and bracts subulate; calyx hairy ..... 6. *C. reusa*
- b. Leaves finely silky below; stipules and bracts ovate, foliaceous; calyx glabrous ..... 7. *C. spectabilis*
- 5 a. Pods ovoid to ovoid-oblong ..... 6
- b. Pods linear-oblong ..... 7
- 6 a. Racemes capitate, 6-12 flowered; calyx densely silky; pods ovoid, slightly exerted ..... 4. *C. nana*
- b. Racemes elongated, laxly 6-20 flowered; calyx shortly silky; pods ovoid-oblong, as long as calyx ..... 3. *C. linifolia*
- 7 a. Racemes terminal ..... 2. *C. calycina*
- b. Racemes lateral ..... 8
- 8 a. Plants subglabrous; leaves equally narrowed or both sides at base; stipules deciduous; bracts subulate; corolla slightly exerted ..... 9. *C. stocksii*
- b. Plants finely silky; leaves oblique; stipules persistent; bracts lanceolate; corolla not exerted ..... 1. *C. acicularis*

1. ***Crotalaria acicularis*** Buch.-Ham. ex Bth. in Hook., London J. Bot. 2: 476. 1843; Baker in Hook. f., Fl. Brit. India 2: 68. 1876; Sanj., Legumes of India 115, 1992.

Herbs. Leaves almost sessile, membranous, elliptic, up to 2.2 x 0.9 cm, obtuse and mucronulate at apex, cuneate at base, entire. Racemes densely 12-20 flowered. Pods *ca* 15-20 seeded.

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

*Distr.*: Andaman islands.

Rare.

2. ***Crotalaria calycina*** Schrank., *Pl. Rar. Hort. Monac.* t. 12. 1819; Baker in Hook. f., *Fl. Brit. India* 2: 72. 1876; Sanj., *Legumes of India* 118. 1992.

Annual herbs; stems 30-60 cm high; branches clothed with short adpressed silky hairs. Leaves glabrous above, obscurely silky below, linear or lanceolate, up to 15 cm long, acute or obtuse at apex. Racemes lax, 2-12 flowered (flowers if solitary from leafy nodes). Pods 1.2-2 cm long, 20-30 seeded.

*Distr.*: Nicobar Islands.

3. ***Crotalaria linifolia*** L. f., *Suppl.* 322. 1781; Baker in Hook. f., *Fl. Brit. India* 2: 72. 1876; Sanj., *Legumes of India* 123. 1992.

Shrubs, 50-75 cm high; branchlets golden-brownish, clothed with short adpressed hairs. Leaves glabrescent above and with adpressed golden-brown pubescence beneath, oblanceolate, up to 3.1 x 0.9 cm, mucronate at apex, cuneate at base, entire. Racemes up to 18 cm long. Pods up to 6 x 4 mm, ripens black, 8-10 seeded.

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

*Distr.*: North Nicobar.

Rare in grasslands.

4. ***Crotalaria nana*** Burm. f., *Fl. Ind.* 156, t. 48, f. 2. 1768; Baker in Hook. f., *Fl. Brit. India* 2: 71. 1876; Sanj., *Legumes of India* 125. 1992;

Annuals, profusely branched, with dense silky hairy herbs. Leaves thinly silky above, densely so below, oblanceolate, up to 2.5 cm long, obtuse

at apex, subcuneate at base. Flowers ca 6 mm long. Pods ca 6mm long, 10-12 seeded.

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

*Distr.*: South Nicobar.

Rare in open dry places.

5. ***Crotalaria pallida*** Ail., Hort. Kew 2: 20. 1789; Polhill in Kew Bull. 22: 262. 1968; Sanj., Legumes of India 126. 1992. *C. striata* DC., Prodr. 2: 131. 1825; Baker in Hook. f., Fl. Brit. India 2: 84. 1876.

Shrubs, 0.7-1 m high; branchlets pale brownish to yellowish, sparsely tomentose. Leaves up to 10.5 cm long; leaflets membranous, glabrous above, obscurely pubescent beneath, elliptic to obovate, up to 7.5 x 4.5 cm, obtuse at apex, cuncate at base, entire. Racemes terminal and lateral, up to 30 cm long, 20-50 flowered. Flowers ca 1.3 cm long. Pods oblong, up to 4.2 x 0.6 cm, with a lateral recurved beak, 20-30 seeded.

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

*Distr.*: North and South Andaman; North Nicobar.

Scattered along roadsides.

6. ***Crotalaria retusa*** L., Sp. Pl. 715. 1753; Baker in Hook. f., Fl. Brit. India 2: 75. 1876; Sanj., Legumes of India 128. 1992.

Herbs or undershrubs, 0.2-1 m high; branchlets blackish-brown, ribbed. Leaves oblanceolate, rarely oblanceolate-oblong, up to 8.5 x 3 cm, retuse or rarely obtuse at apex, cuneate at base, entire. Racemes lax, 12-20 flowered. Flowers up to 1.8 cm long. Pods oblong, up to 5.2 x 1.8 cm, with a lateral beak, 15-20 seeded.

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

*Distr.*: South Andaman.

Scattered along roadsides and open places as weeds.

7. ***Crotalaria spectabilis*** Roth, Nov. Pl. 341. 1821; Sanj., Legumes of India 130. 1992. *C. sericea* Retz., Obs. Bot. 5: 26. 1789 *non* Burm. f., 1768; Baker in Hook. f., Fl. Brit. India 2: 75. 1876; De Munk in Reinwardtia 6: 214. 1962.

Undershrubs, 0.9-1.2 m high; branches striate. Leaves subcoriaceous, oblanceolate-oblong, up to 15 cm long, subacute or obtuse at apex, cuneate at base. Racemes 20-40 flowered, up to 30 cm long. Pods linear-oblong, up to 5 x 2.2 cm.

*Distr.*: Nicobar Islands.

8. ***Crotalaria willdenowiana*** DC. *ssp. glabrifoliolata* Ellis in Bull. Bot. Surv. India 6:97. (1964) 1965; Sanj., Legumes of India 132. 1991; K. Kumar & Sinha in J. Bombay Nat. Hist. Soc. 91: 341. 1994.

Herba, suffruticose, up to 30 cm high. Petioles and petiolules pubescent; leaflets glabrous above, adpressedly tomentose beneath, oblanceolate, up to 2 x 1 cm, emarginate, apiculate; Racemes 2-10 flowered. Legumes obliquely subglobose, ca 5 x 4 mm, strongly beaked, tomentose; seeds reniform, grey, shiny.

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

*Distr.*: North Andaman.

Rare in dried, sunny places in the crevices of boulders.

#### Doubtful Species

9. ***Crotalaria stocksii*** Bth. ex. Baker in Hook. f., Fl. Brit. India 2: 67. 1876; Sanj., Legumes of India 130. 1992.

Diffuse herbs; stems 30-45 cm long. Leaves membranous, linear-oblong, up to 3.1 cm long, obtuse at apex, cuneate at base. Pods up to 7.5 mm long, sessile, black, 12-16 seeded.

*Distr.*: Tenasserim/Andamans (Bth. ex Baker in Hook. f., *l.c.*).

10. *Dalbergia* L. f. (*nom. cons.*)

Trees or climbing or straggling shrubs. Leaves alternate; leaflets 3 to many, rarely unifoliolate, entire. Inflorescences of racemes or panicles or cymes. Calyx campanulate, teeth varying, the lowest one longest. Corolla papilionaceous. Ovary stipitate, ovules 1- few, style incurved, stigma minute. Pods samaroid, indehiscent.

About 100 species, pantropic (tropical Asia, Africa, America & Australia); 5 species in A. & N. Islands.

- 1 a. Stamens diadelphous ..... 5. *D. volubilis*
- b. Stamens monadelphous ..... 2
- 2 a. Pods smooth ..... 1. *D. candenatensis*
- b. Pods veined ..... 3
- 3 a. Leaflets 3-7, usually 5, larger, 3.4-13 x 3.3-10.5 cm; inflorescence rachis, calyx and ovary glabrous ..... 3. *D. lutifolia*
- b. Leaflets 9-41, smaller, 1-5.3 x 0.4-3 cm; inflorescence rachis and branches of panicles rusty-tomentose or densely puberulous; calyx puberulous or without pubescence; ovary glabrous except the puberulous suture ..... 4
- 4 a. Leaflets 9-15, larger, 3-5.3 x 1.8-3 cm, glabrous above, puberulous to glabrescent below; petiolules glabrous; inflorescence rachis and branches of panicles rusty-tomentose ..... 2. *D. confertifolia*
- b. Leaflets 20-41, smaller, 1-2.5 x 0.4-1.1 cm, puberulous above, pubescent below; petiolules pubescent; inflorescence rachis and branches of panicles densely puberulous ..... 4. *D. pinnata*

1. *Dalbergia candenatensis* (Dennst.) Prain in J. As. Soc. Bengal 70 (2): 49, 1901; Sanj., Legumes of India 134, 1992. *Cassia candenatensis* Dennst., Schl. Hort. Ind. Malab. 12, 1818. *Dalbergia monosperma* Dalz. in Hook. f., J. Bot. Kew Gard. Misc. 2: 36, 1850; Baker in Hook. f., Fl. Brit. India 2: 237, 1876; Parkinson, For. Fl. Andaman Islands. 149, 1923.

Climbers; branches blackish-brown, lenticellate, twining, often twisted into spiral hooks. Leaves up to 12.5 cm long; leaflets usually 5, subcoriaceous, glabrous above, puberulous beneath, obovate, up to 5 x 2.6 cm, obtuse or rarely retuse at apex, cuneate at base. Panicles axillary.

Flowers white, up to 6 mm long. Pods *ca* 2.7 x 1.2 cm, falcately recurved along dorsal sutures, brown, shortly stalked, mucronate at apex, 1-seeded; seed reniform, compressed.

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

*Distr.*: North & South Andaman.

A few in the littoral forests, often found in tidal forests/mangrove forests.

2. ***Dalbergia confertiflora*** Bth. in Miq., Pl. Jungh. 1: 255. 1852; Baker in Hook. f., Fl. Brit. India 2: 2133. 1876; Parkinson, For. Fl. Andaman Islands. 149. 1923; Sanj., Legumes of India 135. 1992.

Climbers, extensive, woody; branches blackish-brown, lenticelled. Leaves up to 18 cm long; leaflets elliptic-oblong or obovate, obtuse to retuse at apex, rounded to cuneate at base; lateral nerves 6-9 pairs, indistinct. Panicles axillary and terminal, up to 32.5 cm long. Flowers yellow or white, *ca* 7 mm long. Pods oblong, up to 14 x 2.5 cm, acute at apex, rounded at base, shortly stalked, 1-3 seeded; seeds reniform, *ca* 7 x 4 mm, compressed.

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

*Distr.*: Middle and South Andaman.

A few in the littoral forests.

3. ***Dalbergia latifolia*** Roxb., Pl. Cor. 2: 7, t. 113. 1798; Baker in Hook. f., Fl. Brit. India 2: 231. 1876; Sanj., Legumes of India 137. 1992. *D. emarginata* Roxb., Fl. Ind. 3: 224. 1832; Brandis, Ind. Trees 233. 1906.

Trees, 10-40 m high; bark smooth. Leaves up to 30 cm long; leaflets coriaceous, orbicular to broadly obovate, obtuse to acuminate at apex, shortly cuneate at base; lateral nerves 6-7 pairs, ascending. Inflorescences axillary, up to 11.3 cm long. Flowers white, *ca* 6 mm long. Pods lanceolate or oblong-lanceolate up to 10.2 x 2.6 cm acuminate at both ends, tapering

into a slender stalk, flat, 1-3 seeded; seed ovoid to slightly reniform, ca 6.5 x 4.5 mm, compressed, brown to black.

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

*Distr.*: Andaman group of islands.

4. ***Dalbergia pinnata*** (Lour.) Prain in Ann. Roy. Bot. Gard., Calcutta 10: 48. 1904; Sanj., Legumes of India 138. 1992. *Derris pinnata* Lour., Fl. Cochinch. 432. 1790. *Dalbergia tamarindifolia* Roxb., Fl. Ind. 3: 233. 1832; Baker in Hook. f., Fl. Brit. India 2: 234. 1876; Parkinson, For. Fl. Andaman Islands. 149. 1923.

Small trees; branchlets blackish to brownish, rusty tomentose when young. Leaves up to 17 cm long; leaflets subcoriaceous, oblong, retuse to obtuse at apex, obliquely cuneate at base. Panicles axillary, up to 8 cm long. Flowers white, up to 7 mm long. Pods narrowly oblong, up to 8.5 x 1.4 cm, stalked, rounded to subacute at apex and base, finely reticulate, 1-3 seeded; seed up to 1.8 x 0.4 cm.

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

*Distr.*: Middle and South Andaman.

Rare or scattered.

5. ***Dalbergia volubilis*** Roxb., Pl. Cor. 2: 48, t. 191. 1805 & Fl. Ind. 3: 231. 1832; Baker in Hook. f., Fl. Brit. India 2: 235. 1876; Parkinson, For. Fl. Andaman Islands. 149. 1923; Sanj., Legumes of India 142. 1992.

Climbers or scandent shrubs; branchlets blackish to pale brownish, lenticellate, striate or not. Leaves up to 22 cm long; leaflets 9-13, obovate to elliptic, up to 7 x 3 cm, obtuse and mucronate at apex, cuneate at base; lateral nerves 8-10 pairs, faint. Panicles usually terminal, rarely axillary, up to 30 cm long. Pods oblong, up to 7.5 x 2 cm, stalked, obtuse to mucronate at apex, narrowed at base, reticulated; seeds reniform, ca 7 x 5 mm, compressed.

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

*Distr.*: Middle and South Andaman.

Scattered in the littoral forests.

### 11. *Dendrolobium* (Wight & Arn.) Bth.

Shrubs or trees. Leaves 3-foliolate or rarely 1-foliolate, stipulate; leaflets: terminal leaflets larger than lateral ones, 2-stipellate at pulvinous base, lateral leaflets usually conspicuously oblique at base, 1-stipellate at pulvinous base of leaflet. Inflorescences axillary, shortly pedunculate. Calyx deeply 4-lobed, upper lobe entire or minutely 2-toothed at apex, lower longer than the other one. Corolla white or pale yellow. Stamens monadelphous. Ovary 2-8 ovuled, stigma capitate. Pods indehiscent 1-8 jointed; seeds rim-arillate.

12 species, distributed in tropical Asia, Indian Ocean region and Australia; 1 species in A. & N. Islands.

1. *Dendrolobium umbellatum* (L.) Bth. in Miq., Pl. Jungh. 216, 218. 1852; Ohashi in Ginkgoana 1: 82. 1973. *Hedysarum umbellatum* L., Sp. Pl. 747. 1753. *Desmodium umbellatum* (L.) DC., Prodr. 2: 325. 1825; Baker in Hook. f., Fl. Brit. India 2: 161. 1876 *p.p.*; Parkinson, For. Fl. Andaman Islands. 151. 1923; Sanj., Legumes of India 165. 1992.

Shrubs or small trees, 3-15 m high; branchlets whitish-green when fresh, later dark brownish, lenticellate, glabrescent. Leaves up to 17.5 cm long; leaflets pale brown to dark brown above and pale whitish beneath when dry, sometimes appressed-sericeous on both sides when young, soon becoming glabrescent above, finely appressed hairy beneath, elliptic or ovate, up to 11.7 x 6.7 cm, obtuse to acute at apex, rounded to cuneate at base, entire; lateral nerves 7-12 pairs. Flowers *ca* 1.2 cm long. Pods narrowly oblong, up to 3.5 x 0.6 cm, pale brownish, straight or curved, 1-5 seeded; seeds ellipsoid, up to 3.1 x 4.2 cm.

Common.

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

*Distr.* Andaman islands; North and South Nicobar.

12. **Derris** Lour. (*nom. cons.*)

Woody climbers, scandent shrubs, rarely erect trees. Leaves alternate; leaflets opposite, entire. Inflorescences of axillary or terminal racemes or panicles. Calyx campanulate. Corolla exerted. Stamens monadelphous. Ovary 2-more ovuled, style filiform, incurved, stigma terminal. Pods mostly indehiscent, flat, rarely turgid, distinctly winged on dorsal or less prominently on ventral suture; seeds compressed.

About 120 species, chiefly in Tropical Asia, few in Africa and America; 5 species and 1 forma in A. & N. Islands.

- 1 a. Standard petal with two callosities at base of limb .....3. *D. elliptica*
- b. Standard petal without callosities at base of limb .....2
- 2 a. Pods winged along both sutures .....1. *D. andamanica*
- b. Pods winged along upper suture .....3
- 3 a. Pods narrow, thin, strap-shaped, much longer than broad ..... 4. *D. scandens*
- b. Pods much broader, thick, turgid against seeds at times .....4
- 4 a. Pods glabrous .....5. *D. trifoliata*
- b. Pods clothed with fine silky hairs .....2. *D. elegans*

1. **Derris andamanica** Prain in J. As. Soc. Bengal 66 (2): 104. 1897; Parkinson, For. Fl. Andaman Islands. 148. 1923; Thoth. in Fasc. Fl. India 8: 7. 1982; Sanj., Legumes of India 143. 1992.

Lianas; branchlets blackish, lenticellate, rusty tomentose when young. Leaves up to 35 cm long; leaflets coriaceous, elliptic to elliptic-oblong or rarely obovate, up to 12.5 x 7 cm, obtuse or rarely acute to emarginate at apex, rounded or cuneate at base; lateral nerves 5-10 pairs. Panicles up to 60 cm long. Flowers yellowish-white, up to 1.5 cm long. Pods oblong, up to 11 x 2.5 cm, beak recurved at apex, reticulately veined, appressed rusty pubescent, 2-3 seeded.

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

*Distr.*: Andaman & Nicobar Islands.

Scattered in the inland forests.

2. **Derris elegans** Bth. in Miq., Pl. Jungh. 1: 252. 1852; Baker in Hook. f., Fl. Brit. India 2: 242. 1878; Parkinson, For. Fl. Andaman Islands. 148. 1923; Thoth. in Fasc., Fl. India 8: 15. 1982; Sanj., Legumes of India 145. 1982.

- 1 a. Racemes 6-13 cm long, shorter than leaves ..... *f. elegans*  
 b. Racemes 16.5-20 cm long, longer than leaves ..... *f. andamanensis*

***f. elegans.***

Lianas; branchlets blackish to pinkish-brown, lenticellate, young parts covered with brown pubescence. Leaves up to 20.5 cm long; leaflets elliptic to elliptic-lanceolate or obovate, up to 16 x 6 cm, acuminate or obtuse at apex, cuneate to rounded at base; lateral nerves 6-8 pairs. Racemes up to 6.2 cm long. Flowers white, ca 1 cm long. Pods obliquely rounded to oblong, up to 5 x 2.5 cm, reticulately veined, 1-2 seeded.

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

*Distr.*: Middle and South Andaman; North and South Nicobar.

A few in the inland forests.

***f. andamanensis*** Thoth in Bull. Bot. Surv. India 3: 184. (1961) 1982; Sanj., Legumes of India 145. 1992.

Lianas; branchlets pale brownish, rusty tomentose when young. Leaves ca 20 cm long; leaflets pubescent along veins beneath, elliptic to lanceolate, up to 14 x 5.6 cm, shortly acuminate at apex, cuneate to rounded at base; lateral nerves 11-13 pairs. Racemes lax. Pods oblong, ca 5 x 1.8 cm, reticulately veined.

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

*Distr.*: North and South Andaman.

Endemic.

3. **Derris elliptica** (Wall.) Bth. in J. Linn. Soc. 4 (Suppl.): 111. 1860; Baker in Hook. f., Fl. Brit. India 2: 243. 1878; Thoth. in Fasc. Fl. India 8: 16. 1982; Sanj., Legumes of India 145. 1992. *Pongamia elliptica* Wall., Pl. Asiat. Rar. 3: 20, t. 237. 1832.

Large climbing shrubs; young parts rusty-tomentose. Leaves up to 40 cm long; leaflets submembranous to coriaceous, sparsely puberulous above, brown silky below especially on nerves, obovate to obovate-oblong, up to 16 x 6 cm, shortly acuminate at apex, cuneate at base. Racemes up to 26 cm long, densely ferruginous. Flowers whitish-pink to red, up to 1.8 cm long. Pods oblong or rarely ellipsoid, up to 13 x 3.3 cm, faintly reticulated, minutely puberulous, 1-2 seeded.

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

*Distr.*: Andaman & Nicobar Islands.

4. **Derris scandens** (Roxb.) Bth. in J. Linn. Soc. 4 (Suppl.): 103. 1860; Baker in Hook. f., Fl. Brit. India 2: 240. 1876; Parkinson, For. Fl. Andaman Island. 148. 1923; Thoth in Fasc., Fl. India 8: 27. 1982; Sanj. Legumes of India 148. 1992. *Dalbergia scandens* Roxb., Pl. Cor. 2: 29, t. 192. 1805.

Lianas; branchlets blackish to pinkish-brown, lenticellate. Leaves up to 18.5 cm long leaflets subcoriaceous, elliptic to elliptic-lanceolate or ovate or oblanceolate, up to 8.5 x 3.5 cm, retuse or acute to shortly acuminate at apex, rounded or cuneate at base; lateral nerves 8-10 pairs. Racemes up to 41 cm long. Flowers white to pale pink, ca 1 cm long. Pods broadly ellipsoid to oblong, up to 12 x 1.6 cm, tapering at both ends, reticulately veined, adpressed silky-hairy, 1-4 seeded; seed up to 8 x 5 mm, reddish-brown.

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

*Distr.* Andaman islands; North and South Nicobar.

Common.

5. **Derris trifoliata** Lour., Fl. Cochinch. 2: 433. 1790; Thoth. in Fasc., Fl. India 8: 30. 1982; Sanj., Legumes of India 148. 1992. *D. uliginosa*

(Willd.) Bth. in Miq., Pl. Jungh. 1: 252. 1852; Baker in Hook. f., Fl. Brit. India 2: 241. 1878; Parkinson, Flor Fl. Andaman Islands. 147. 1923.

Scandent shrubs to lianas; branchlets blackish to greyish-black. Leaves up to 25 cm long; leaflets subcoriaceous, ovate to ovate-lanceolate, up to 13 x 6.4 cm, acuminate or retuse at apex, rounded at base; lateral nerves 8-9 pairs. Racemes up to 24 cm long. Flowers white or rose-pink, up to 1.2 cm long. Pods broadly oblong, up to 5.2 x 3.8 cm, with a recurved beak at apex, reticulately veined, 1-2 seeded; seed ovoid orbicular, ca 1.2 x 1.5 cm, reddish-brown to black.

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

*Distr.*: South and Little Andaman. North and South Nicobar.

Common.

### 13. *Desmodium* Desv. (*nom. cons.*)

Shrubs or undershrubs, often herbs or rarely trees. Leaves mostly pinnately 3-foliolate but occasionally 1-foliolate or often 1-and 3-foliolate and rarely 5-7 foliolate, distinctly pulvinate, stipulate; leaflets entire, variously shaped, with 2 stipels at base of pulvini of terminal leaflets and 1 stipel at base of pulvini of lateral leaflets. Inflorescences mostly racemose or paniculate, rarely fasciculate. Calyx usually broadly campanulate. Corolla variously coloured, mostly pink to pale purple. Ovary usually many-ovuled, mostly puberulent, style inflexed or incurved, stigma terminal or slightly lateral, capitate or minute. Pods exerted from calyx, compressed, jointed, flat or rarely turgid.

About 300 species distributed in the warmer regions especially in E. Asia, Brazil and Mexico; 7 species & 1 variety in A. & N. Islands.

- 1 a. Trailing herbs, with small (1-5 cm long) 3-foliolate leaves .....2
- b. Erect herbs or undershrubs (rarely prostrate as in *D. laxiflorum*) with larger (5-15 cm long) 1-3 foliolate leaves .....3
- 2 a. Flowers all 1-3 together in axils of leaves; lower suture of pod slightly indented ..... *S. D. triflorum*

- b. Flowers solitary or geminate in leaf axils and up to 6 in racemes; lower suture of pod considerably indented ..... 3. *D. heterophyllum*
- 3 a. Joints of pod 3-5 times as long as broad ..... 4  
 b. Joints of pod as long as broad or 1-2 times as long as broad ..... 5
- 4 a. Leaves 3-foliolate; calyx teeth lanceolate, larger than tube; pods not or slightly constricted at joints ..... 4. *D. laxiflorum*  
 b. Leaves 1-foliolate; calyx teeth deltoid, shorter than tube; pods distinctly constricted at both sutures ..... 6. *D. zonatum*
- 5 a. Primary bracts narrowly triangular, globose inside, densely and minutely hairy outside; joints of pod once or twice as long as broad .....  
 ..... 1. *D. gangeticum*  
 b. Primary bracts ovate, glabrous on both sides; secondary bracts absent; joints of pod as long as broad ..... 2. *D. heterocarpon*
1. ***Desmodium gangeticum* (L.) DC., Prodr. 2: 327. 1825; Baker in Hook. f., Fl. Brit. India 2: 168. 1876; Sanj., Legumes of India 183. 1992. *Hedysarum gangeticum* L., Sp. Pl. 746. 1753. *Desmodium gangeticum* var. *maculatum* (L.) Baker in Hook. f., l.c.**

Shrubs, 1-2 m high, subscentent; branchlets brownish, ribbed, glabrescent. Leaves unifoliolate, chartaceous, puberulous above, pubescent beneath, ovate to ovate-lanceolate or elliptic, ca 6.5 cm broad, acuminate at apex, rounded at base; lateral nerves 6-12 pairs. Racemes terminal, up to 30 cm long. Pods linear, up to 2.5 x 0.2 cm, incurved, 6-8 jointed, constricted along upper suture; seeds depressed obovoid or ellipsoid, up to 1.8 x 2.5 mm.

*Fl. & Fr.*: November-February (fruiting also in October).

*Distr.*: South Andaman; North Nicobar.

Scarce in the inland forests.

2. ***Desmodium heterocarpon* (L.) DC., Prodr. 2: 377. 1825; Sanj., Legumes of India 154. 1992. *Hedysarum heterocarpon* L., Sp. Pl. 747. 1753. *Desmodium polycarpum* (Poir.) DC., *op. cit.* 334; Baker in Hook. f. Fl. Brit. India 2: 171. 1876 *p.p.***

- 1 a. Inflorescence-rachides covered with spreading hooked hairs .....  
 .....var. *heterocarpon*  
 b. Inflorescence-rachides densely covered with appressed straight hairs .....  
 .....var. *strigosum*

**var. heterocarpon.**

Undershrubs, up to 60 cm high, ascending or often creeping; branchlets yellowish-brown, pubescent. Leaves 3-foliolate; leaflets sparsely appressed white-hairy above, sparsely appressed sericeous beneath, elliptic to elliptic-oblong, rarely obovate, up to 8.5 x 4.5 cm, obtuse at apex, cuneate to rounded at base; lateral nerves 5-10 pairs. Racemes axillary, ca 7 cm long. Pods narrowly oblong, up to 2.5 x 0.3 cm, 3-7 jointed, sessile.

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

*Distr.*: South Andaman; North Nicobar.

Common.

var. **strigosum** van Meeuwen in *Reinwardtia* 6 : 95, 1961; Ohashi in *Ginkgoana* 1: 215, 1973; Sanj., *Legumes of India* 155, 1992.

Shrubs, ca 1 m high; branchlets greenish-brown to pinkish-brown, lenticellate, appressed pubescent when young. Leaves 1 or 3-foliolate; leaflets pubescent, elliptic to orbicular or obovate, up to 6.5 x 3.5 cm, obtuse to retuse at apex, rounded to slightly cordate at base; lateral nerves 5-10 pairs. Racemes terminal and axillary, up to 15 cm long. Flowers up to 5 mm long. Pods linear-oblong, up to 2.5 x 0.3 cm, 4-8 jointed, constricted along upper suture, woolly pubescent; seeds ellipsoid, ca 1.6 x 2.5 cm.

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

*Distr.*: North and South Andaman; North Nicobar.

It was introduced in Andamans between 1866 and 1890 and is now found scattered as a weed.

3. **Desmodium heterophyllum** (Willd.) DC., *Prodr.* 2: 334., 1825; Baker in Hook. f., *Fl. Brit. India* 2: 173, 1876; Sanj., *Legumes of India* 155, 1992. *Hedysarum heterophyllum* Willd., *Sp. Pl.* 3(2): 1201, 1802.

Trailing herbs; stem pale yellowish to pinkish-brown, pubescent. Leaflets glabrous above, sparsely pilose below, broadly obovate or elliptic, up to 2.5 x 0.8 cm, obtuse or acute at apex, rounded to cuneate at base; lateral nerves 4-5 pairs, inconspicuous. Flowers *ca* 9 mm long. Pods narrowly oblong, up to 2 x 0.4 cm, hairy; seeds ellipsoid, up to 1.5 x 2 mm.

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

*Distr.*: South Andaman; North Nicobar.

A few in open places or mixed forests.

4. **Desmodium laxiflorum** DC. in Ann., Sci. Nat. Paris 4: 100. Jan. 1825; Baker in Hook. f. Fl. Brit. India 2: 164. 1876; Sanj., Legumes of India 156. 1992.

Undershrubs, 0.3-1.5 m high; branchlets pinkish-brown, densely covered with white hairs when young. Leaflets pubescent, ovate to ovate-lanceolate or elliptic, up to 7.5 x 4.2 cm, acuminate at apex, cuneate at base; lateral nerves 7-12 pairs. Racemes terminal or axillary, up to 50 cm long. Pods linear-oblong, up to 3 x 0.2 cm, 6-8 jointed, softly tomentose; seeds ellipsoid, up to 1.1 x 2.3 mm.

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

*Distr.*: South Nicobar.

Scattered along roadsides or hill slopes up to 400 m. above msl.

5. **Desmodium triflorum** (L.) DC., Prodr. 2: 334. 1825; Baker in Hook. f., Fl. Brit. India 2: 173. 1876; Sanj., Legumes of India 163. 1992. *Hedysarum triflorum* L., Sp. Pl. 749. 1753.

Trailing herbs; stems 5-25 cm long; branches pale brownish, pubescent when young. Leaflets glabrous above, adpressed-pubescent below, obovate, up to 1.5 x 0.9 cm, retuse at apex, rounded at base; lateral nerves 4-5 pairs. Pods oblong, up to 1.7 x 0.3 cm, 3-5 jointed, hairy; seeds broadly oblong, up to 1.3 x 2 mm.

Introduced prior to 1866, common in cleared lands around Port Blair. It has since become naturalised in grasslands, coconut plantations, etc.

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

*Distr.*: North, South and Little Andaman; North Nicobar.

6. **Desmodium zonatum** Miq., Fl. Ind. Bot. 1 (1): 250. 1855; Sanj., Legumes of India 166. 1992. *D. ormocarpoides* auct. non DC. 1825; Baker in Hook. f., Fl. Brit. India 2: 164. 1976.

Undershrubs or shrubs, 0.3-1 m high; branchlets pale to pinkish-brown, pubescent when young. Leaves glabrous above, softly tomentose below, ovate to ovate-lanceolate or elliptic, ca 6 cm broad, acuminate at apex, rounded to cordate at base; lateral nerves 7-10 pairs. Racemes terminal or terminal and axillary, up to 22 cm long. Pods linear, 6-8 jointed, hairy; seeds oblong, up to 2 x 5 mm.

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

*Distr.*: South Andaman; South Nicobar.

A few in the inland forests.

*Cultivated/non-indigenous species;*

7. **Desmodium auricomum** Grah. ex Bth. in Miq., Pl. Jungh. 223. 1852; Baker in Hook. f. Fl. Brit. India 2: 172. 1876. Prain in J. As. Soc. Bengal 59: 251. 1890.

Annual herbs, 30-50 cm long; stem caespitose and diffuse. Leaves 3-foliolate; leaflets chartaceous, sparsely pubescent, elliptic, obovate or almost orbicular, obtuse or retuse at apex, rounded to slightly oblique at base; lateral nerves 4-6 pairs, inconspicuous. Racemes lax, terminal, up to 7 cm long. Pods narrowly oblong, up to 1.8 x 0.8 cm, 3-5 jointed; seeds broadly obovoid, ca 1 x 1.5 mm.

*Distr.*: Introduced as a weed in Andaman between 1866 and 1890 and found with *D. triflorum* and *Smithia* spp. (Prain l.c.)

14. *Dioclea* Kunth.

Climbing shrubs. Leaves stipellate. Inflorescences of elongated racemes with thickened nodes. Calyx tube campanulate, teeth as long as tube, two upper connate. Corolla slightly exerted. Ovary sessile, few ovuled, style incurved, stigma capitate. Pods flattened along the upper suture.

About 30 species in tropical America, a few in Old World tropics; 1 species in A. & N. Islands.

1. *Dioclea hexandra* (Ralph) Mabberley in Manilal, Bot. Hist. Hort. Malab. 98. 1980; Sanj., Legumes of India 166. 1992. *Mucuna hexandra* Ralph, Ic. Carp. 30, t. 34.f. 5. March 1849. *Dioclea reflexa* Hook. f., Niger Fl. 306. Nov.-Dec. 1849; Baker in Hook. f., Fl. Brit. India 2 : 196. 1876; Parkinson, For. Fl. Andaman Islands. 147. 1923.

Lianas, 6-9 m long; branches pinkish-brown to blackish, lenticellate, striate, sparsely setose when young, later become glabrescent. Leaves up to 36 cm long, petioles densely golden-brown appressed pubescent when young; leaflets subcoriaceous, appressed pubescent on both sides, ovate to elliptic, up to 16 x 10 cm, shortly acuminate at apex, rounded to cuneate at base, entire; lateral nerves 7-9 pairs, lateral petiolules rusty pubescent. Racemes ca 15 cm long, dense. Flowers pale pink, ca 2.3 cm long. Pods up to 10 x 5 cm, golden-brown appressed pubescent when young, later glabrescent, 1-2 seeded; seed discoid, ca 3 cm across, dark brown.

*Fl. & Fr.*: December-February/ May-January.

*Distr.*: North, South and Little Andaman; South Nicobar.

Common in the inland forests.

15. *Erythrina* L.

Trees with prickly branches. Inflorescences of dense racemes. Calyx oblique, spathaceous, finally slitting down to base or campanulate-bilabiate. Ovary stalked, many ovuled, style incurved, stigma capitate. Pods linear, turgid, torulose.

About 108 species distributed in the warmer regions; 2 species in A. & N. Islands.

- 1 a. Stems, leaves, inflorescences and calyx densely stellate hairy when young; calyx lobes prominent; keel petals free; pods leathery; seeds scarlet-red or brownish-red ..... 2. *E. variegata*  
 b. Stems, leaves, inflorescences and calyx not as above; calyx lobes inconspicuous; keel petals adherent; pods woody; seeds purplish-black but never red ..... 1. *E. fusca*

1. ***Erythrina fusca*** Lour., Fl. Cochinch. 427. 1790; Sanj., Legumes of India 172. 1992. *E. ovalifolia* Roxb., Fl. Ind. 3: 254. 1832; Baker in Hook. f., Fl. Brit. India 2: 189. 1976.

Trees, 12-15 m high; branchlets pale yellowish or whitish. Leaves ca 30 cm long; leaflets chartaceous, up to 17 x 15 cm, terminal deltoid, bluntly acute at apex, truncate to broadly cuneate at base, entire, lateral obliquely ovate; lateral nerves 4-7 pairs. Racemes robust, tawny or greyish tomentose. Flowers pale purple with keel and wing bases greenish-yellow. Pods up to 25 x 2.2 cm, stalked, puberulous, ripens black, 6-8 seeded; seeds oblong.

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

A few in the littoral forests.

2. ***Erythrina variegata*** L. in Stickman, Herb. Amboin. 10. 1754 & Amoen. Acad. 4: 122. 1759; Sanj., Legumes of India 173. 1992. *E. indica* Lam., Encycl. 2: 391. 1788; Baker in Hook. f., Fl. Brit. India 2: 188. 1876; Parkinson, For. Fl. Andaman Islands. 152. 1923.

Trees, 3-10 m high; branchlets pale yellowish. Leaves up to 48 cm long; leaflets deltoid, up to 20 x 18 cm, acuminate at apex, truncate to broadly cuneate at base, entire. Racemes dense, ca 25 cm long. Flowers bright scarlet, up to 6.5 cm long. Pods up to 30 x 3 cm, 6-8 seeded.

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

*Distr.*: South and Little Andaman; North Nicobar.

A few in the littoral forests and roadsides of inland forests.

16. *Flemingia* Roxb. ex Ait & Ait.f. (*nom. cons.*)

Shrubs or rarely herbs. Inflorescences various. Calyx-tube short, teeth narrow, the lowest often the longest. Petals equal. Stamens diadelphous. Ovary sessile, style filiform, beardless, stigma capitate. Pods oblong, turgid, usually 2-seeded.

About 30 species distributed in Old World tropics; 3 species in A. & N. Islands, of which the occurrence of 1 is doubtful.

- 1 a. Leaves 3-foliolate ..... 1. *F. macrophylla*  
 b. Leaves simple ..... 2  
 2 a. Bracts large, folded, concealing the flowers ..... 2. *F. strobilifera*  
 b. Bracts minute, not folded, not concealing the flowers ..... 3. *F. paniculata*

1. ***Flemingia macrophylla*** (Willd.) O. Ktze. ex Merr. in Philipp. J. Sci. Bot. 5: 130. 1910; Sanj., Legumes of India 176. 1992. *Crotalaria macrophylla* Willd., Sp. Pl. 3: 982. 1802. *Flemingia congesta* Roxb. ex Ait. f., Hort. Kew ed. 2,4: 349. 1812; Baker in Hook. f., Fl. Brit. India 2: 228. 1876; Parkinson, For. Fl. Andaman Islands. 150. 1923.

Shrubs, 1.2-1.8 m high; branchlets pinkish-brown to yellowish-brown, pubescent. Leaves up to 22.5 cm long, petioles puberulous; leaflets subcoriaceous, ovate or elliptic, up to 16 x 7.5 cm, acute to acuminate at apex, lateral leaflets oblique; lateral nerves with brownish silky hairs beneath. Inflorescences of dense subspicate, axillary racemes, ca 3 cm long. Flowers pink and purple streaked, up to 1.2 cm long. Pods ca 1.2 cm long.

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

*Distr.*: Middle and South Andaman.

Common in stream beds.

2. ***Flemingia strobilifera*** (L.) Ait. & Ait. f. in Hort. Kew ed. 2, 4: 350. 1812; Baker in Hook. f., Fl. Brit. India 2: 227. 1876; Parkinson, For. Fl. Andaman Islands. 150. 1923; Sanj., Legumes of India 178. 1992.

*Moghania strobilifera* (L.) St. Hil. ex Jacks., Ind. Kew. 2: 252. 1894; S.K. Mukherjee in Bull. Bot. Soc. Bengal 6: 10. 1952.

Shrubs, 0.6-4 m high; branchlets blackish-brown. Leaves subcoriaceous, dark green above and dull below, silky pubescent on nerves beneath when young, ovate to ovate-lanceolate, up to 19 x 8 cm, obtuse or shortly acuminate at apex, rounded or slightly cuncate at base, entire; lateral nerves 5-11 pairs. Inflorescences of axillary and terminal racemes up to 12 cm long. Flowers greenish-white, ca 5 mm long. Pods up to 1.2 cm long; seeds orbicular.

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

*Distr.*: North, Middle and South Andaman; North Nicobar.

#### Doubtful Species

3. *Flemingia paniculata* Wall. ex Bth. in Miq., Pl. Jungh. 245. 1852; Baker in Hook. f., Fl. Brit. India 2: 227. 1876; Sanj., Legumes of India. 177. 1992. *Moghania paniculata* (Wall. ex Bth.) H. Li in Amer. J. Bot. 31: 277. 1944; S.K. Mukherjee in Bull. Bot. Soc. Bengal 6: 14. 1952.

Erect shrubs, 1.5-3 m high; branches thinly pubescent or downy. Leaves membranous or subcoriaceous, ovate or ovate-lanceolate, acute, acuminate or cuspidate at apex, cordate at base, entire; veins prominent. Inflorescence of terminal or axillary panicles or fascicled racemes. Flowers pink. Pods ca 14 cm long, densely pubescent; seeds oblong, black.

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

*Distr.*: Tenascrrim/Andaman (S.K. Mukherjee, *l.c.*; Sanj., *l.c.*)

#### 17. *Geissaspis* Wight & Arn.

Annuals. Leaves with 2 pairs of leaflets. Inflorescences of racemes. Calyx deeply 2-lipped, upper entire, lower obscurely toothed. Corolla 2-3 times calyx. Stamens monadelphous. Ovary shortly stalked, 2-ovuled, style incurved, stigma minute, capitate. Joints of pods turgid in middle, with a distinct, flat, reticulately veined, 1-seeded, indehiscent.

3 species distributed in warmer Asia; 1 species in A. & N. Islands.

1. **Geissaspis cristata** Wight & Arn., Prodr. 218, 1834; Baker in Hook. f., Fl. Brit. India 2: 141, 1876; Sanj., Legumes of India 181, 1992.

Trailing herbs; stems up to 10 cm long, pale brownish. Leaves ca 1 cm long; leaflets sessile, obovate, ca 5 x 2.5 mm, obtuse at apex, cuneate at base, entire. Racemes ca 9 cm long. Flowers purplish or orange-yellowish. Pods somewhat semi-orbicular, up to 5 mm long.

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

*Distr.*: South Andaman.

Scattered.

### 18. *Indigofera* L.

Annual or perennial herbs or shrubs, rarely small trees or treelets. Leaves alternate. Inflorescences usually of axillary racemes, sometimes of pseudopanicles or rarely of solitary flowers. Calyx campanulate, pubescent outside, usually glabrous inside. Corolla caducous. Stamens diadelphous (9+1). Ovary 1 to many-ovuled, style curved upwards, stigma capitate. Pods beaked at apex, endocarp septate between seeds.

About 700 species occurring throughout the tropical and subtropical regions of the world; 6 species in A. & N. Islands.

- 1 a. Leaves trifoliolate ..... 3. *I. glandulosa*  
 b. Leaves multifoliolate ..... 2.
- 2 a. Leaflets glabrous adaxially; pods 1-4 seeded, torulose ..... 2. *I. coerulea*  
 b. Leaflets pubescent on both surfaces; pods 3 or more seeded ..... 3
- 3 a. Pods straight ..... 1. *I. arrecta*  
 b. Pods curved ..... 4
- 4 a. Pods 1-2 cm long, distinctly curved, 5-8 seeded ..... 4. *I. suffruticosa*  
 b. Pods 2-3.5 cm long, slightly curved, 8-12 seeded ..... 5. *I. tinctoria*

1. **Indigofera arrecta** Hochst. ex A. Rich., Tent. Fl. Abyss. 1: 184, 1847; Sanj., Legumes of India 185, 1992 & in Hajra *et al.* Fasc. Fl. India 21: 15, 1995.

Stout, woody herbs or undershrubs, 1-2m high; stems and branches ridged, striate, sparsely strigulose. Leaves up to 12 cm long; leaflets 7-17, drying blackish, oblong to obovate-oblong, up to 3 x 1.3 cm, rounded and apiculate at apex, cuneate to rounded at base. Racemes up to 7.5 cm long, axillary, many-flowered. Flowers pale pink to scarlet red, ca 6 mm long. Pods subcylindric to somewhat tetragonal, obscurely torulose, up to 2.3 x 0.4 cm, thinly adpressed pubescent, endocarp red-spotted; seeds oblong, cylindrical, smooth.

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

*Distr.*: Andaman & Nicobar Islands (Sanj., *op. cit.*)

2. **Indigofera coerulea** Roxb., Fl. Ind. 3: 377, 1832; Sanj., Legumes of India 186, 187, 1992 & in Hajra *et al.* Fasc. Fl. India 21: 34, 37, 1995.

Shrubs, 90-150 cm high; stems and branches woody, angular. Leaves up to 7.5 cm long; leaflets 5-11, rarely 3, opposite, obovate or obcordate, up to 2.7 x 2.5 cm, obtuse to retuse and mucronate at apex, cuneate at base. Racemes up to 8 cm long, axillary. Flowers reddish-yellow, ca 4 mm long. Pods divaricate, falcate, torulose, up to 1.5 x 0.25 cm, adpressed canescent, endocarp reddish-brown; seeds smooth, truncate at both ends, reddish-brown.

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

*Distr.*: Andaman & Nicobar Islands (Sanj., *op. cit.*)

3. **Indigofera glandulosa** Wendl., Bot. Beob. 55, 1798; Sanj. in Bull Bot. Surv. India 26: 40, (1984) 1985, Legumes of India 189, 1992 & in Hajra *et al.* Fasc. Fl. India 21: 66, 67, 1995. *I. glandulosa* Roxb. ex Willd., Sp. Pl. 3: 1227, 1803; Baker in Hook. f., Fl. Brit. India 2: 94, 1876.

Erect shrubs, up to 1 m high; branches pale brownish, pubescent. Leaves up to 3.5 cm long; leaflets pubescent on both surfaces, glandular beneath, obovate to oblanceolate, up to 3.5 x 0.9 cm, rounded with a mucro

or slightly retuse at apex, cuneate at base; lateral nerves 3-4 pairs. Racemes up to 1.2 cm long. Flowers up to 3.5 mm long. Pods oblong, up to 6 x 3 mm, descending, dehiscent; seeds dark brown.

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

*Distr.*: South Andaman.

A few.

4. ***Indigofera suffruticosa*** Mill., Gard. Dict. ed. 8, no. 2. 1768; Sanj., Legumes of India 195. 1992 & in Hajra *et al.* Fasc. Fl. India 21; 130. 1995. *I. anil* L., Mant. 2: 272. 1771.

Erect shrubs, 1-3 m high; branches pale brownish to greyish, striate, pubescent. Leaves up to 11.5 cm long; leaflets 9-15, narrowly elliptic to elliptic-oblong or obovate to oblanceolate, up to 3.8 x 1.5 cm, obtuse with a mucro at apex, cuneate at base; lateral nerves indistinct. Racemes up to 6 cm long. Flowers pink to reddish, *ca* 5 mm long. Pods linear, up to 2 mm broad, hairy; seeds 4-6.

*Fl. & Fr.*: May-June / November-December.

*Distr.*: South Andaman; North Nicobar.

A few in grasslands or in open places.

5. ***Indigofera tinctoria*** L., Sp. Pl. 751. 1753; Baker in Hook. f., Fl. Brit. India 2: 99. 1876; Sanj., Legumes of India 195. 1992 & in Hajra *et al.*, Fasc. Fl. India 21: 133. 1995.

Undershrubs or shrubs, 30-150 cm high. Leaflets 7-13, opposite, elliptic to obovate or obovate-oblong, up to 2.1 x 1.2 cm, obtuse to rounded or emarginate and mucronate at apex, cuneate to rounded at base. Racemes up to 5 cm long. Flowers pink or brick-red, *ca* 5 mm long. Pods *ca* 2 mm broad, 6-12 seeded, endocarp red-spotted; seeds finely pitted, shiny.

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

*Distr.*: North Nicobar.

Rare in forest clearings.

*Cultivated species*:

6. ***Indigofera zollingeriana*** Miq., Fl. Ind. Bot. 1, 1: 310. 1855; Sanj., Legumes of India 148. 1992 & in Hajra *et al.* Fasc. Fl. India 21: 159.1995.

Trees, 5-8 m high. Leaves up to 30 cm long; leaflets 1-19, opposite, sparsely adpressed pubescent on both surfaces, elliptic, rarely ovate, up to 6.5 x 2.8 cm, acute and mucronate at apex, rounded at base. Racemes up to 20 cm long. Flowers deep violet-purple, up to 8 mm long. Pods cylindrical, up to 4 x 0.5 cm, sparsely adpressed pubescent, up to 16-seeded; seeds discoid, shallowly foveolate, brown.

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

*Distr.*: Andaman & Nicobar Islands (Sanj., *op. cit.*).

### 19. **Lablab** Adans.

Suberect or climbing herbs. Stipules mostly reflexed and persistent; stipels lanceolate. Inflorescences falsely racemose. Calyx 2-lipped, tube campanulate, upper lip entire or emarginate, lower lip 3-lobed. Corolla rather small. Anthers uniform. Ovary with several ovules, style laterally flattened, slightly curved at apex. Pods tipped by persistent style, septa spongy. Seeds ovoid, compressed, hilum linear, with a whitish linear or hemispherical aril.

1 species (probably), distributed in tropical Africa and widely cultivated; 1 species in A. & N. Islands.

1. ***Lablab purpureus*** (L.) Sweet, Hort. Brit. ed. 1: 481. 1827; Sanj., Legumes of India 199. 1992. *Dolichos purpureus* L. Sp. Pl. ed. 2: 1021. 1763. *D. lablab* L. Sp. Pl. 725. 1753; Baker in Hook. f., Fl. Brit. India 2: 209. 1876.

Twining herbs; branches pale brown to pale yellowish, striate. Leaves up to 20 cm long; leaflets membranous, deltoid or broadly ovate to obliquely ovate, up to 10.5 x 8.2 cm, acute or acuminate at apex, broadly cuneate or truncate at base, entire. Inflorescences ca 20 cm long. Flowers bluish-purple or purple-white, up to 2 cm long. Pods oblong, up to 6.5 x 1.2 cm, recurved, beaked, 2-4 seeded.

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

*Distr.*: North and South Andaman; North Nicobar.

Usually cultivated, also found as an escape in wastelands or scrub forests.

## 20. *Mecopus* Bennett

Annual herbs. Leaves biserrate, 1-foliolate, stipellate. Inflorescences of dense head like racemes; bracts filiform-subulate, persistent. Calyx tube campanulate, the two upper connate. Standard petal broad, keel incurved. Stamens diadelphous. Ovary stipitate, 2-ovuled, style inflexed, stigma minute, capitate. Pods above the insertion of calyx on a long stalk.

1 species in Indo-Malesian regions; 1 species doubtfully occurring in the Andaman Islands.

1. *Mecopus nidulans* Bennett in Bennett & R. Br., Pl. Jav. Rar. 154, t. 32. 1840; Baker in Hook. f., Fl. Brit. India 2: 160. 1876; Sanj., Legumes of India 209. 1992.

Herbs up to 30 cm high; branches slender, spreading. Leaflets membranous, broader than long, truncate or faintly emarginate at apex, subcordate at base. Inflorescences ca 2.5 cm long. Pods with a stalk 3-4 times as long as itself.

*Distr.*: Andaman Islands (Vasud. in J. Econ. Tax. Bot. 8: 122. 1986).

*Notes*: There are no specimens of this species from Andaman and Nicobar Islands either at PBL or CAL.

21. **Mucuna** Adans. (*nom. cons.*)

Herbs, lianas or rarely erect shrubs. Leaves ample, stipellate; lateral leaflets asymmetrical. Inflorescences subumbellate, condensed-paniculate or falsely racemose through reduction of lateral branches. Flowers showy. Calyx tube campanulate, two upper teeth quite connate, lowest longer than middle ones. Corolla much exerted. Ovary sessile, few to many-ovuled, style long, filiform, stigma capitate. Pods septate or apparently so between seeds, mostly dehiscent, margins often winged.

About 100 species distributed in tropics; 4 species A. & N. Islands.

- 1 a. Annuals; strophiole present ..... 4. *M. pruriens*
- b. Woody perennials; strophiole absent ..... 2
- 2 a. Pods without longitudinally running lamellae on face of valves ..... 1. *M. gigantea*
- b. Pods having longitudinally running lamellae raised on face of valves ..... 3
- 3 a. Lamellae on face of valves converging towards centre of pod, pods 1-seeded ..... 2. *M. monosperma*
- b. Lamellae on face of valves obliquely running across the face, pods 3 (-4) seeded ..... 3. *M. nigricans*

1. **Mucuna gigantea** (Willd.) DC., Prodr. 2: 405. 1825; Baker in Hook. f., Fl. Brit. India 2: 186. 1876; Parkinson, For. Fl. Andaman Islands. 145. 1923; Sanj., Legumes of India 216. 1992. *Dolichos gigantea* Willd., Sp. Pl. 3: 1041. 1802.

Lianas; branchlets pale brownish to blackish, striate. Leaves up to 22.5 cm long; leaflets: terminal glabrous above, puberulous beneath, elliptic or rarely orbicular, up to 15 x 8 cm, shortly acuminate at apex, rounded or cuneate at base, entire, lateral nerves 5-6 pairs; lateral leaflets obliquely ovate to lanceolate or rarely obliquely orbicular, up to 14 x 8.2 cm, acuminate at apex. Inflorescences up to 5.5 cm long. Flowers greenish, yellowish or whitish, up to 5.5 cm long. Pods ellipsoid-oblong, up to 18 x 4.5 cm, 2-6 seeded; seeds dark brown or blackish.

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

*Distr.*: Andaman islands; North and South Nicobar.

2. **Mucuna monosperma** DC. ex Wight in Hook. Bot. Misc. 2: 346. 1831; Baker in Hook. f., Fl. Brit. India 2: 185. 1876; Parkinson, For. Fl. Andaman Islands. 146. 1923; Sanj., Legumes of India 216. 1992.

Lianas; branchlets pale greyish to blackish, lenticellate, striate, glabrescent. Leaves up to 22.5 cm long; leaflets obliquely ovate-lanceolate or sometimes elliptic, rarely oblanceolate, up to 17 x 8 cm, acute to shortly acuminate at apex, rounded, cuneate or slightly cordate at base. Inflorescences up to 18 cm long. Flowers purple, up to 5 cm long. Pods ellipsoid-oblong, up to 10 x 7.5 cm.

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

*Dist.*: Middle, South and Little Andaman.

Common.

3. **Mucuna nigricans** (Lour.) Steud., Nom. Bot. ed. 2, 2: 163. 1841. *Citta nigricans* Lour., Fl. Cochinch. 456. 1790. *Mucuna imbricata* DC. ex Baker in Hook. f., Fl. Brit. India 2: 185. 1876 p.p.; Parkinson, For. Fl. Andaman Islands. 146. 1923; Sanj., Legumes of India 216. 1992.

Lianas; branchlets blackish, lenticellate, striate. Leaves up to 37.5 cm long; leaflets obovate or obliquely elliptic, up to 17.5 x 7.8 cm, cuspidate at apex, cuneate or rounded at base, entire; lateral nerves ca 6 pairs. Inflorescences up to 15 cm long. Flowers dull purple or white with purple dots, up to 5 cm long. Pods up to 15 cm long, wings ca 1.2 cm wide along edges.

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

*Distr.*: South Andaman.

A few in the inland forests.

4. **Mucuna pruriens** (L.) DC., Prodr. 2: 405. 1825; Baker in Hook. f., Fl. Brit. India 2: 187. 1876; Parkinson, For. Fl. Andaman Islands. 146. 1923; Sanj., Legumes of India 217. 1992. *Dolichos pruriens* L. in Stickman, Diss. Herb. Amb. 23. 1754.

Annual climbers; stem pale brownish to blackish, striate, pubescent. Leaves up to 38 cm long; leaflets: terminal rhomboid, up to 13 x 8.6 cm, mucronate at apex, cuneate at base; lateral obliquely ovate, up to 13 x 10 cm. Inflorescences up to 30 cm long. Flowers dark purple, up to 4 cm long. Pods turgid, up to 7.5 cm long.

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

*Distr.*: Andaman (C.E. Parkinson, *l.c.*); North Nicobar.

A few found along creeks or streams or in the inland forests.

## 22. *Ormocarpum* P. Beauv. (*nom. cons.*)

Erect shrubs or small trees. Leaves distichous or fascicled, stipules subpersistent; leaflets entire, mucronate. Inflorescences of fasciculiform racemes each in axil of bract. Calyx tube campanulate, 2 upper segments connate at base. Corolla pale yellow, mostly violet-veined. Ovary stalked, 5-many ovuled, style strongly curved, stigma terminal. Pods constricted between 1-seeded joints.

20 species; occurring in the tropics and warm old world; 1 species in A. & N. Islands.

1. *Ormocarpum orientale* (Spreng.) Merr., *Interp. Rumph. Herb. Amboin.* 266. 1917; Sanj., *Legumes of India* 222. 1992. *Parkinsonia orientalis* Spreng., *Syst. Vcg.* 1: 76. 1826. *Ormocarpum glabrum* Teijsm. & Binnend., *Nat. Tijds. Ned. Indies* 27: 56. 1864; Prain in *J. As. Soc. Bengal* 66: 379. 1897.

Shrubs, 1-1.5 m high; branchlets pale yellowish to brownish, striate. Leaves up to 8 cm long, 9-20 foliolate; leaflets oblong to obovate, up to 2.5 x 1.1 cm, obtuse to retuse at apex, cuneate at base. Flowers 1-4 per raceme. Pods linear, up to 8 x 0.4 cm, curved, joints 1-4.

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

*Distr.*: South Andaman.

A few in the edges of forests.

23. *Ormosia* Jacks. (*nom. cons.*)

Erect trees. Leaves imparipinnate. Inflorescence of racemes or panicles. Calyx campanulate, the upper teeth the shortest. Petals with short claws, equal. Stamens much incurved. Ovary 2-3-ovuled, style long, filiform, circinate at end, stigma oblique. Pods turgid, 2-valved, continuous within; seeds with a bright scarlet aril or testa.

About 100 species distributed in East South America, E. Asia to N.E. Australia; 1 species in A. & N. Islands.

1. *Ormosia travancorica* Bedd., Fl. Sylv. t. 45. 1870; Baker in Hook.f., Fl. Brit. India 2: 253. 1878; P.S.N. Rao & S.K. Srivastava in Indian J. Forestry 14: 74. 1991; Sanj., Legumes of India 223. 1992.

Trees, 25-30 m high; young parts tomentose. Leaves up to 35 x 18 cm; leaflets 5-6 pairs, oblong to elliptic, up to 15 x 5 cm, acute or obtuse at apex. Panicles shorter than leaves; bracteoles and calyx fulvo tomentose. Pods up to 6 x 4.5 cm; seeds 1-2.

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

*Distr.*: North Andaman.

Rare in the protected hill forests of Kalpong at an altitude of ca. 100 m above msl.

24. *Pachyrhizus* L.C. Rich. ex DC. (*nom. cons.*)

Twining or rarely semi erect perennial herbs to somewhat woody vines with tuberous roots. Leaves with linear stipules; leaflets with linear, caducous stipels. Inflorescences dibotryoid. Calyx tubular, 2-lipped, upper lip emarginate, lower deeply 3-toothed. Corolla much exserted. Stamens diadelphous (9+1). Ovary sessile, many-ovuled, style recurved, distal part of stigma subglobose on the vertical surface, widening at apex. Pods linear-oblong, deeply depressed between seeds.

5 species distributed in the New world tropics; 1 species in A. & N. Islands.

1. **Pachyrhizus erosus** (L.) Urban, Symb. Antill. 4: 311. 1905; Sanj., Legumes of India 227. 1992. *Dolichos erosus* L., Sp. Pl. 726. 1753. *Pachyrhizus angulatus* L.C. Rich. ex DC., Prodr. 2: 402. 1825; Baker in Hook.f., Fl. Brit. India 2: 207. 1876.

Climbing herbs; stems pale greyish to brownish, striated or not, smooth with soft hairs when young. Leaves up to 20 cm long; leaflets membranous, thinly pubescent on both sides, up to 12.5 x 12.5 cm, terminal rhomboid, palmately lobed, acuminate at apex, cuneate and 5-nerved at base, lateral obliquely rhomboid, entire, dentate or slightly to deeply palmately lobed, acuminate at apex, cuneate and 3-nerved at base. Racemes up to 33 cm long, lax, rusty pubescent. Flowers bluish-violet or reddish, ca. 2 cm long. Pods up to 10 x 1.2 cm, terminately beaked; seeds 8-10, rounded or squarish.

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

*Distr.*: South Andaman.

A few in the inland forests.

## 25. **Pongamia** Vent. (*nom. cons.*)

Trees, erect. Leaflets opposite, entire, exstipellate. Inflorescences of flowers in lax, axillary racemes, arranged in fascicles of 2-4 on rachis. Calyx campanulate, truncate, teeth obsolete. Corolla exserted. Stamens monadelphous. Ovary sessile, ovules 2, style incurved, stigma minute. Pods woody, flattened, indehiscent; seed 1, reniform.

2-4 species, distributed in tropical Asia and Australia; 1 species in A. & N. Islands.

1. **Pongamia pinnata** (L.) Pierre, For. Fl. Cochinch. t. 385. 1899; Thoth. in Bull. Bot. Surv. India 3: 418 (1961) 1962 & Taxon 30: 44. 1981; Sanj., Legumes of India 230. 1992. *Cytisus pinnatus* L., Sp. Pl. 741. 1753. *Pongamia glabra* Vent., Jard. Malm. 1: 28, t. 28. 1803; Baker in Hook.f., Fl. Brit. India 2: 240. 1876; Parkinson, For. Fl. Andaman Islands 152. 1923.

Trees, 10-20 m high; branchlets blackish to pale greyish, lenticellate, striate. Leaves up to 37 cm long; leaflets ovate to elliptic, up to 16.2 x 9.5

cm, acute to shortly acuminate at apex, cuneate or rounded at base; lateral nerves 6-8 pairs. Racemes up to 26 cm long. Flowers white, tinged with pink or violet, up to 1.5 cm long. Pods ellipsoid to oblong, up to 7.4 x 3.2 cm, shortly beaked at apex; seed reddish-brown.

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

*Distr.*: Andaman islands; North and South Nicobar.

Common.

## 26. *Pterocarpus* Jacq. (*nom. cons.*)

Tall trees. Leaves alternate; leaflets 5 or more, rarely 3, entire, coriaceous. Inflorescence a simple raceme to lax, terminal or axillary panicle. Flowers yellow. Calyx turbinate, often incurved, upper 2 teeth more or less connate. Corolla papilionaceous. Ovary shortly stipitate, style incurved, stigma terminal, 2-6 ovuled. Pods indehiscent, winged around seed, 1-2 seeded.

About 20 species, spread in the tropics of both the hemispheres; 1 species in A. & N. Islands.

1. *Pterocarpus dalbergioides* Roxb. ex DC., Prodr. 2: 418. 1825; C.E. Parkinson, For. Fl. Andaman Is. 152. 1923; Thoth., Tax. Rev. Tribe Dalbergieae Ind. Subcont. 210. 1987; Sanj., Legumes of India 231. 1992. *P. indicus* auct. non Willd. 1802; Baker in Hook.f., Fl. Brit. India 2: 238. 1876 p.p., C.E. Parkinson, *op. cit.* 153.

Trees, 25-40 m high, often with large buttresses; branchlets pale yellowish to greyish, lenticellate, striate. Leaves up to 31 cm long, 5-9-foliolate; leaflets ovate, ovate-oblong to ovate-lanceolate or ovate-elliptic, up to 11 x 6 cm, acuminate at apex, rounded to slightly cuneate at base; lateral nerves 5-11 pairs. Panicles up to 19.5 cm long. Flowers yellow, up to 1.5 cm long. Pods suborbicular to orbicular, up to 7.5 x 7 cm, flat, stalked; seed reniform.

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

*Distr.*: North, Middle and South Andaman, cultivated in Nicobar Islands.

Endemic.

*Uses:* It is the well known 'Padauk' of the Andaman Islands and is one of the most important timber yielding species. It is also known as the Andaman Red Wood tree.

### 27. *Pueraria* DC.

Twining herbs or shrubs. Leaves stipellate; leaflets entire or lobed. Inflorescences of axillary racemes with flowers fasciated on tubercles of rachis. Calyx-tube campanulate. Corolla distinctly exserted. Ovary sessile or nearly so, many-ovuled, style filiform, much incurved, stigma capitate. Pods linear, flat.

About 20 species, distributed in the tropics and E. Asia; 2 species & 1 variety in A. & N. Islands, out of which the occurrence of 1 species is doubtful.

- 1 a. Plants leafless in flowering season; calyx subglabrous, teeth acute, as long as tube; pods 6.3-7.3 broad .....2. *P. candollei*  
 b. Leaves and flowers contemporary; calyx densely clothed with adpressed bristly hairs, lowest tooth as long as tube, others shorter, all setaceous at tip; pods 3-5 mm broad .....1. *P. phaseoloides*

1. ***Pueraria phaseoloides* (Roxb.) Bth.** in J. Linn. Soc. Bot. 9: 125. 1867; Baker in Hook. f., Fl. Brit. India 2: 199. 1876; Sanj., Legumes of India 234. 1992. *Dolichos phaseoloides* Roxb., Fl. Ind. 3: 316. 1832.

- 1 a. Standard 1-1.3 cm long; pods 4-7 (8.5) cm long .....var. *phaseoloides*  
 b. Standard 1.5-2.1 cm long; pods (7.5) 8.5-12 cm long .....var. *javanicus*

Twining herbs; stem brownish to pale yellowish or greyish, densely clothed with soft golden brown hairs. Leaves up to 22.5 cm long, petioles clothed with woolly hairs; leaflets sparsely adpressed-puberulous to pubescent above, adpressed densely silky pubescent below, rotund, broadly ovate or rhomboid, entire or 3-lobed, up to 12 x 11.2 cm, obtuse to acute at apex, cuneate to rounded at base; lateral nerves 4-6 pairs, petiolules densely pubescent. Racemes up to 55 cm long, pubescent. Flowers pink or bluish-pink or white tinged with blue, ca 2 mm long, pedicels pubescent. Pods 10-15 seeded, sparsely adpressed-pubescent.

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

*Distr.*: South and Little Andaman; North Nicobar.

A few in the inland forests and tidal forests.

var. *javanicus* (Bth.) Baker in Hook.f., Fl. Brit. India 2: 199. 1876; van der Maesen in Agric. Univ. Wageningen Papers 85 (1): 75. 1985; Sanj., Legumes of India 234. 1992. *Neustanthus javanicus* Bth. in Miq., Pl. Jungh. 2: 235. 1852.

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

*Distr.*: South Andaman.

#### *Doubtful species*

2. ***Pueraria candollei*** Grah. ex. Bth. in Miq., Pl. Jungh. 235. 1852 (as *P. candollei* Wall.); Baker in Hook.f., Fl. Brit. India 2: 197. 1876; Prain in J. As. Soc. Bengal 66: 419. 1897; Sanj., Legumes of India 233. 1992.

Shrubs; branches slender, terete. Leaflets subcoriaceous, glabrescent on both sides, rotund, up to 22.5 cm long, acute at apex. Racemes ca 30 cm long. Pods ca 7.5 cm long, few-seeded.

*Distr.*: Andaman Islands (Brandis, Ind. Trees 228. 1908).

#### 28. ***Pycnospora*** R. Br. ex Wight & Arn.

Herbs or small shrubs. Leaves pinnately 3-foliolate, stipulate, entire. Inflorescences of terminal, many flowered racemes. Calyx deeply cleft, the upper teeth subconnate. Corolla much exserted. Stamens diadelphous. Ovary sessile, many-ovuled, style inflexed, filiform, stigma minute, capitate. Pods oblong, 2-valved, continuous within.

1 species, distributed in the old world tropics; 1 species in A. & N. Islands.

1. ***Pycnospora lutescens*** (Poir.) Schindler in J. Bot. 64: 145. 1926; van Meeuwen in Reinwardita 5: 437. 1961; Sanj., Legumes of India 236. 1992. *Hedysarum lutescens* Poir. in Lam., Encycl. 6: 417. 1806. *Pycnospora hedysaroides* R. Br. ex Wight & Arn., Prodr. 197. 1834; Baker in Hook.f., Fl. Brit. India 2: 153. 1876.

Perennial, trailing herbs; stems ca 50 cm long, pinkish-brown, pubescent when young. Leaves up to 2.5 cm long; leaflets subcoriaceous, glabrous above, finely pubescent below, obovate, suborbicular or oblong, up to 2.6 x 1.5 cm, acute or obtuse at apex with mucro, cuneate or rounded at base; lateral nerves 5-7 pairs. Racemes up to 7 cm long. Flowers whitish-purple, ca 8 mm long. Pods up to 1.2 cm long, apiculate, ripens black.

*Fl. & Fr.*: September-November.

*Distr.*: Andaman group of islands. North Nicobar.

A few in grasslands.

### 29. *Sesbania* Scop. (*nom. cons.*)

Herbs, erect shrubs or small trees. Leaves stipulate, paripinnate; leaflets deciduous, linear-oblong, mucronate. Inflorescences of axillary racemes. Calyx campanulate, shallowly 2-lipped or 5-toothed. Corolla much exerted. Stamens diadelphous. Ovary stipitate, style filiform, incurved, stigma capitate. Pods 2-valved, dehiscent, septate between seeds; seeds numerous.

About 50 species; distributed in the warm and usually wet regions; 3 species in A & N Islands.

- 1 a. Perennials; leaf-rachises unarmed; pods flexible, twisted and torulose ...  
.....2. *S. sesban*
- b. Annuals; leaf-rachises armed with prickles; pods firm and not as above ...  
.....1. *S. bispinosa*
1. ***Sesbania bispinosa*** (Jacq.) W.F. Wight in U.S. Dept. Agric. Bur. Pl. Ind. Bull. 137: 15. 1909; Gillet in Kew Bull. 17: 129. 1963; Sanj., Legumes of India 242. 1992. *Aeschynomene bispinosa* Jacq., Ic. Pl. Rar. 3: 13, t. 564. 1792. '*Sesban aculeata* nom. illeg.; Baker in Hook.f., Fl. Brit. India 2: 114. 1876.

Shrubs, 3-4 m high; branchlets pinkish-red to pale brownish. Leaves up to 25 cm long; leaflets 10-25 pairs, up to 1 x 0.25 cm, obtuse at apex, cuneate at base. Racemes up to 10 cm long. Flowers 4-10 mm long, limb of standard yellow with brown spots. Pods linear, up to 18 x 0.15 cm.

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

*Distr.*: Middle, South and Little Andaman.

A few in fresh water swamps.

2. **Sesbania sesban** (L.) Merr. in Philipp. J. Sci. Bot. 7: 235. 1912; Gillet in Kew Bull. 17: 112. 1963; Sanj., Legumes of India 243. 1992. *Aeschynomene sesban* L., Sp. Pl. 714. 1753. *Sesbania aegyptica* (Poir.) Pers., Syn. 2: 316. 1807; Baker in Hook.f., Fl. Brit. India 2: 114. 1876.

Shrubs, ca 1.5 m high; branchlets pinkish-brown, softly pubescent. Leaves up to 20 cm long; leaflets ca 18 pairs, pubescent on both sides, up to 2.6 x 0.6 cm, obtuse at apex, cuneate at base. Flowers yellow, ca 3 cm long. Pods ca 2.5 x 0.45 cm, pubescent, beak terminal.

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

*Distr.*: South Andaman; North and South Nicobar.

A few along roadsides, marshy places and in deciduous forests.

*Cultivated species:*

3. **Sesbania grandiflora** (L.) Poir. in Lam., Encycl. 7: 127. 1806; Baker in Hook.f., Fl. Brit. India 2: 115. 1876; Parkinson, For. Fl. Andaman Islands 153. 1923; Backer & Bakh. f., Fl. Java 1: 597. 1963; Sanj., Legumes of India 244. 1992. *Robinia grandiflora* L., Sp. Pl. 722. 1753.

Trees, 4.5-7.5 m high; branchlets yellowish, pubescent. Leaves up to 25 cm long; leaflets ca 16 pairs, membranous, up to 3.7 x 1 cm, emarginate at apex. Racemes up to 10 cm long. Flowers creamy-white, standard flushed with pink, ca 7 cm long. Pods up to 50 x 0.8 cm, beaked; seeds 15-50, pale coloured.

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

*Distr.:* South Andaman. Introduced and planted in the settlements for the leaves and fruits which are eaten.

### 30. *Smithia* Ait. (*nom. cons.*)

Herbs or under shrubs. Stipules scarious, with large auricles; leaflets opposite, sensitive, mucronate, leaf-rachis ending in a bristle. Calyx deeply 2-lipped, the lips usually entire. Corolla exserted. Stamens in two bundles of 5 each. Ovary many-ovuled, style incurved, filiform, stigma minute, capitate. Pods included within calyx, joints 2-7, folded together, warty.

About 30 species, distributed in the old world tropics, especially in Asia and Madagascar; 1 species in A. & N. Islands.

1. *Smithia sensitiva* Ait., Hort. Kew ed. 1, 3: 496. 1789; Baker in Hook.f., Fl. Brit. India 2: 148. 1876; Sanj., Legumes of India 248. 1992.

Spreading herbs; stems 20-60 cm long; branches greyish or pale yellowish. Leaves up to 3 cm long; leaflets 4-20, pubescent along midrib beneath, linear-oblong or obovate, up to 7.5 x 2.5 mm, obtuse at apex, cuneate or rounded at base, entire. Inflorescence up to 3 cm long. Flowers yellow, up to 6 mm long. Pods up to 6 mm long, joints suborbicular, papillose on faces.

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

*Distr.:* Throughout Andaman group of islands.

Common in grasslands and roadsides, etc.

### 31. *Sophora* L.

Trees or shrubs. Leaves imparipinnate. Inflorescences of racemes or panicles. Flowers showy. Calyx oblique, broadly campanulate, teeth short. Corolla much exserted. Ovary stalked, many-ovuled, style incurved, stigma capitate. Pods usually indehiscent.

About 52 species, distributed in the tropics and mostly N. temperate regions; 1 species in A. & N. Islands.

1. **Sophora tomentosa** L., Sp. Pl. 373. 1753; Baker in Hook.f., Fl. Brit. India 2: 249. 1878; Parkinson, For. Fl. Andaman Islands 151. 1923; Sanj., Legumes of India 250. 1992.

Shrubs or trees, 2-15 m high; branchlets greyish to pale yellowish, softly tomentose. Leaves up to 30 cm long; leaflets 11-12, broadly elliptic to elliptic-oblong or oblanceolate, up to 4.5 x 2.8 cm, obtuse to acute at apex, rounded, cuneate or sometimes oblique at base, entire. Racemes terminal, ca 2.5 cm long. Flowers yellow, up to 2 cm long. Pods oblong, up to 20 cm long, beaded, tomentose, 6-8 seeded.

*Fl.*: June-March, & *Fr.*: Almost throughout the year.

*Distr.*: South and Little Andaman; North and South Nicobar.

Common.

### 32. **Spatholobus** Hassk.

Lianas. Leaves pinnately 3-foliolate; stipules and stipels caducous. Inflorescences of ample terminal panicles extending into axils of upper leaves. Calyx campanulate, the upper two teeth connate. Corolla distinctly exserted, petals subequal. Ovary 2-ovuled, style incurved, stigma capitate. Pods flat, curved.

15 species, occurring in tropical Asia; 1 species in A. & N. Islands.

1. **Spatholobus acuminatus** Bth. in Miq., Pl. Jungh. 238. 1852; Baker in Hook.f., Fl. Brit. India 2: 194. 1876; Parkinson, For. Fl. Andaman Islands 146. 1923. Sanj., Legumes of India 251. 1992.

Lianas; branchlets blackish, lenticellate, striate. Leaves up to 25 cm long; leaflets glabrescent, elliptic to elliptic-lanceolate, up to 15 x 3 cm, acuminate at apex, rounded or cuneate at base, entire. Panicles up to 20 cm long. Flowers pink and white, ca 8 mm long. Pods up to 12.5 x 2 cm, samaroid, indehiscent, pale brown, pubescent.

*Fl. & Fr.*: November-April.

*Distr.*: Middle and South Andaman.

A few in the inland forests up to 350 m above msl.

### 33. *Strongylodon* Vogel

Twining herbs. Leaves stipellate. Inflorescences of lax racemes. Calyx campanulate, gibbous, teeth short. Corolla much exserted. Ovary stalked, few-ovuled, style filiform, stigma capitate. Pods oblong, turgid. Seeds with a hilum running more than half round.

About 20 species, distributed from Madagascar to Polynesia, especially Philippines; 1 species in A. & N. Islands.

1. *Strongylodon lucidus* (Forst.) Seemann, Fl. Vit. 61. 1865; Huang in Agric. Univ. Wageningen Papers 90 (8): 43. 1991. *Glycine lucida* G. Forst., Fl. Ins. Austral. 272. 1786. *Strongylodon pseudolucidus* Craib. in Curtis, Bot. Mag. 9: t. 8494. 1913; Sanj., Legumes of India 253. 1992. *S. ruber auct. non Vogel* 1836; Baker in Hook.f., Fl. Brit. India 2: 191. 1876; Parkinson, For. Fl. Andaman Islands. 147. 1923.

Twining herbs; stem pale greyish to pinkish-brown, striate. Leaves up to 30 cm long; leaflets membranous; terminal elliptic or ovate, up to 11.7 x 5.5 cm, acuminate at apex, rounded or cuneate at base, entire; lateral leaflets obliquely ovate, up to 11 x 6.7 cm. Racemes ca 40 cm long, pendulous. Flowers orange-red or brownish-red, ca 3 cm long. Pods up to 8 x 5 cm, distinctly stalked, 2-seeded, beak terminal ca 1 cm long.

*Fl. & Fr.*: September-April.

*Distr.*: North, South and Little Andaman.

Scattered in the inland forests.

### 34. Tadebagi Ohashi

Subshrubs of shrubs. Leaves stipulate, stipellate, petiolate and entire. Inflorescences racemose, terminal and axillary or only terminal. Calyx campanulate, 4-lobed. Petals with well developed nerves. Ovary pubescent, 5-8 ovuled, style glabrous, stigma capitate. Pods exserted, compressed, usually 5-8 jointed.

3 species distributed in Asia, Pacific Islands, New Caledonia and northern Australia; 1 species & 1 subspecies in A. & N. Islands.

1. **Tadehagi triquetrum** (L.) Ohashi in Ginkgoana 1: 290. 1973. *Hedysarum triquetrum* L., Sp. Pl. 746. 1753. *Desmodium triquetrum* (L.) DC., Prodr. 2: 326. 1825; Baker in Hook.f., Fl. Brit. India 2: 163. 1876 p.p.; Parkinson, For. Fl. Andaman Islands. 151. 1923; Sanj., Legumes of India 163. 1992.

- 1 a. Petiolar wings 0.6-2.5 x 0.1-0.5 cm on each side of petiole; stipules ca. 3 x 1 mm, early caducous; bracts early caducous; pods entirely glabrous when mature .....ssp. *auriculatum*  
 b. Petiolar wings 1.5-5.5 x 0.4-0.6 cm on each side of petiole; stipules ca. 1.8 x 0.4 cm, persistent; bracts persistent; pods pubescent .....  
 .....ssp. *triquetrum*.

ssp. *triquetrum*

Shrubs, ca 1 m high; branchlets pinkish-brown to blackish, triquetrous and puberulous when young, woody and lenticellate when old. Leaves chartaceous, glabrous above, pubescent beneath, ovate-lanceolate, oblong-elliptic to elliptic up to 20.5 x 6.5 cm, acute to acuminate at apex, rounded or slightly cordate at base; lateral nerves 16-19 pairs. Racemes up to 37 cm long. Flowers purple or pink, ca 1 cm long. Pods oblong to linear, up to 7.5 x 0.7 cm, stalked, woolly pubescent, with a straight prolongation at apex up to 7 mm long; seeds transversely ellipsoid, up to 2.5 x 1.3 mm.

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

*Distr.*: Middle and South Andaman.

Scattered in the inland forests up to 700 m above msl.

ssp. *auriculatum* (Dc.) Ohashi in Ginkgoana 1: 293. 1973. *Desmodium auriculatum* DC., Prodr. 2: 326. 1825. *D. triquetrum* ssp. *auriculatum* (DC.) Prain in J. As. Soc. Bengal 66: 390. 1897; van Meeuwen in Reinwardtia 6: 262. 1962; Sanj., Legumes of India 164. 1992. *Tadehagi triquetrum* ssp. *andamanicum* Balakr. & N.G. Nair in Bull. Bot. Surv. India 24: 29. (1982) 1983. *T. andamanicum* (Balakr. & N.G. Nair) S.P. Mathew in J. Econ. Tax. Bot. 14: 236. 1990.

Erect shrubs, 1-3 m high; branches pinkish-brown to greyish-black. Leaves sparsely puberulous and scattered long hairy on nerves beneath and sparsely hairy along margins, oblong-elliptic or rarely ovate-lanceolate, up to 20 x 4.2 cm, acute-acuminate or mucronate at apex, rounded to subcordate at base; lateral nerves 9-18 pairs. Inflorescences up to 18 cm long. Flowers reddish-purple tinged with blue, ca 6 mm long. Pods oblong or obovoid, up to 6.2 x 0.7 cm, stalked, slightly hairy, finely reticulate, with a curved acicular prolongation at apex up to 9 mm long.

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

*Distr.*: North and South Andaman.

A few in the scrub forests of Saddle Peak in N. Andaman at an altitude of ca 600 m above msl.

### 35. *Uraria* Desv.

Herbs or erect shrubs. Leaves pinnately 1-9 foliolate, stipellate. Inflorescence of racemes or panicles. Flowers borne along rachis. Calyx deeply partite, tube short, two upper teeth short, three lower usually elongated, setaceous, standard broad, wings adhering to keel. Stamens diadelphous. Ovary few-ovuled, style inflexed, filiform, stigma terminal. Pods of 2-6, small turgid, 1-seeded, indehiscent, joints often placed face to face.

About 20 species, distributed in tropical Africa, S.E. Asia, Formosa, Indo-Malesia, N. Australia and Pacific region; 2 species in A. & N. Islands.

- 1 a. Erect suffruticose perennials; upper leaves 5-9 foliolate; leaflets linear-oblong; bracts deciduous, glabrous; corolla slightly exserted; pod joints 3-6, glabrescent, often whitish .....2. *U. picta*
- b. Trailing suffruticose perennials; leaves 1- and 3-foliolate intermixed; leaflets elliptic to oblong or almost orbicular; bracts subpersistent, distinctly ciliated; corolla scarcely exserted; pod joints 1-2, finely pubescent, brownish.....1. *U. lagopodioides*

1. *Uraria lagopodioides* (L.) Desv., Mem. Soc. Linn. Paris 4: 309. 1826; van Meeuwen in Reinwardtia 5: 451. 1961; Sanj., Legumes of India 268. 1992. *Hedysarum lagopodioides* L., Sp. Pl. 1198. 1753. *Uraria lagopoides* (Burm.f.) DC., Prodr. 2: 324. 1825; Baker in Hook.f., Fl. Brit. India 2: 156. 1876.

Trailing herbs; stem yellowish to pale greyish. Leaves ca 3.5 cm long; leaflets glabrous above, finely pubescent beneath, up to 3.1 x 2.7 cm, obtuse at apex, rounded or slightly cordate at base, entire. Inflorescences up to 7.3 cm long. Flowers pinkish-red, blue or purple. Pods oblong.

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

*Distr.*: North Nicobar.

A few along open places and grasslands.

2. *Uraria picta* (Jacq.) Desv. ex DC., Prodr. 2: 324. 1825; Baker in Hook.f., Fl. Brit. India 2: 155. 1876; van Meeuwen in Reinwardtia 5: 452. 1961; Sanj., Legumes of India 268. 1992. *Hedysarum pictum* Jacq., Coll. Bot. 2: 262. 1788.

Herbs, up to 1 m high; branches pale yellowish to pale greyish, striate, faintly puberulous. Leaves 16 cm long; leaflets glabrous above, puberulous below, up to 9.5 x 1.5 cm, obtuse at apex with a mucro, rounded at base, entire; lateral nerves 7-8 pairs. Inflorescences up to 10 cm long. Flowers pinkish-blue.

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

*Distr.*: North Nicobar.

A few in grasslands.

### 36. *Vigna* Savi

Twining or erect herbs. Leaves stipellate; stipules mostly produced below the point of attachment, often peltate and persistent. Racemes peduncled, axillary, tubercled. Calyx campanulate, the upper teeth often connate. Corolla much exserted. Stamens diadelphous. Ovary sessile, many ovuled, style long, filiform, stigma oblique or introrsely lateral. Pods straight or slightly incurved.

About 150-200 species distributed mostly in tropical Africa and Asia; 7 species in A. & N. Islands.

- 1 a. Keel prolonged into a beak .....2  
 b. Keel not as above .....3
- 2 a. Pods glabrous .....*V. adenantha*  
 b. Pods densely pubescent .....*A. V. pilosa*
- 3 a. Stipules ovate-lanceolate, attached above base; thickened part of style variously incurved; pods ca. 14.5 cm long, 9-10 seeded .....5. *V. unguiculata* ssp. *cylindrica*  
 b. Stipules lanceolate; thickened part of style scarcely incurved; pods 5-7 cm long, few-seeded (3-12 seeded) .....4
- 4 a. Leaflets membranous, acuminate at apex; pedicels 2-3 mm long .....2. *V. luteola*  
 b. Leaflets fleshy, obtuse at apex; pedicels 3-6 mm long .....3. *V. marina*

1. ***Vigna adenantha*** (G.F. Meyer) Marechal & Stainier in *Taxon* 27: 202. 1978; Sanj., *Legumes of India* 272. 1992. *Phaseolus adenanthus* G.F. Meyer, *Prim. Fl. Esseq.* 239. 1818; Baker in Hook.f., *Fl. Brit. India* 2: 200. 1876.

Twining or trailing herbs; stems pale greyish, glabrescent. Leaves ca. 9 cm long; leaflets ovate, up to 9 x 5 cm, acuminate at apex, rounded or obliquely truncate at base, entire. Racemes up to 15 cm long. Flowers yellowish, ca 1 cm long. Pods linear, up to 12.5 x 1 cm, laterally compressed, beaked; seeds ca 14, oblong, black.

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

*Distr.*: North and South Andaman.

Rare in the tropical evergreen forests.

2. ***Vigna luteola*** (Jacq.) Bth. in *Mart., Fl. Bras.* 15: 194, t. 50, f. 2. 1859; Baker in Hook.f., *Fl. Brit. India* 2: 205. 1876; Sanj., *Legumes of India* 274. 1992. *Dolichos luteolus* Jacq., *Hort. Vindob.* 1: 39, t. 90. 1770.

Twining or creeping herbs. Leaflets often faintly lobed, glabrescent, ovate, up to 5 x 2 cm, acuminate at apex, subtruncate-cuneate at base, entire. Racemes up to 20 cm long. Flowers yellow. Pods stalked, appressed hairy; seeds up to 4 x 0.3 cm, blackish.

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

*Distr.*: Andaman Islands.

3. **Vigna marina** (Burm.f.) Merr. in Inter. Rumph. Herb. Amb. 285. 1917; Sanj., Legumes of India 274. 1992. *Phaseolus marinus* Burm.f., Ind. Alter. Univ. Amb. 18. 1769. *Vigna lutea* (Swartz) A. Gray, Bot. U.S. Expl. Exped. 452. 1854; Baker in Hook.f., Fl. Brit. India 2: 205. 1876.

Climbing herbs; stems pale yellowish, striate, glabrescent. Leaves ca. 30 cm long; leaflets ovate, elliptic or orbicular, up to 12 x 9 cm, obtuse at apex, cuneate or rounded at base, entire; lateral nerves 4-5 pairs. Racemes up to 30 cm long. Flowers pale yellow, ca 1.2 cm long. Pods linear, ca 6 mm broad, subcompressed, with a lateral beak at apex, ripens black, glabrous or thinly hairy; seeds ca 6 x 5 mm, greyish, greyish-brown or reddish.

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

*Distr.*: South and Little Andaman; North and South Nicobar.

Common in the littoral forests.

4. **Vigna pilosa** (Willd.) Baker in Hook.f., Fl. Brit. India 2: 207. 1876; Sanj., Legumes of India 275. 1992. *Dolichos pilosa* Willd., Sp. Pl. 3: 1043. 1800.

Twining or creeping herbs; stems glabrescent to densely pubescent. Leaflets ovoid-deltoid, up to 13 x 5.2 cm, acuminate at apex, lateral ones subtruncate-rounded at base, terminal ones cuneate at base. Racemes up to 12 cm long. Flowers pale bluish-violet, limb of standard pale lilac with darker centre on inner side. Pods up to 13 x 0.7 cm, subcompressed, densely pubescent, 8-12 seeded; seeds oblong, shining black.

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

*Distr.*: North and South Andaman.

5. **Vigna unguiculata** (L.) Walp. ssp. **cylindrica** (L.) van Eseltine in Hedrick, Veg. New York 1 (2): 11. 1931; Sanj., Legumes of India 277.

1992. *Phaseolus cylindricus* L. in Stickman, Herb. Amb. 23. 1754 & in Amoen. Acad. 4: 132. 1759. *Vigna catjang* (Burm.f.) Walp. in Linnaea 13: 533. 1839 *nom. illeg.*: Baker in Hook.f., Fl. Brit. India 2: 205. 1876; Prain in J. As. Soc. Bengal 59: 239. 1891.

Twining herbs; stems pale yellowish to pale pinkish, striate. Leaves up to 25 cm long; leaflets up to 14.5 x 8.6 cm, terminal: ovate-deltoid or rarely rhomboid, shortly acuminate at apex, cuneate at base, entire or faintly lobed at base, lateral nerves 4-6 pairs, lateral leaflets oblong to ovoid-deltoid. Racemes up to 18 cm long. Flowers pinkish-blue or yellowish, ca 2.7 cm long. Pods linear, ca 7 mm broad, patent; seeds ca 6.5 x 0.45 cm, brownish-white.

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

*Distr.*: North, Middle and South Andaman.

Usually cultivated but found scattered as an escape along forest edges and tidal forests.

*Non-Indigenous species* :

6. ***Vigna mungo* (L.) Hepper** in Kew Bull. 11: 128. 1956; Sanj., Legumes of India 275. 1992. *Phaseolus mungo* L., Mant. 1: 101. 1767; Baker in Hook.f., Fl. Brit. India 2: 203. 1876; Prain in J. As. Soc. Bengal 59: 239. 1891.

Annual, much branched herbs; stems densely pubescent; branches prostrate, twining or erect-ascending. Leaflets ovate deltoid to ovate-rhomboid, up to 9 x 6 cm, acuminate at apex, entire or faintly lobed. Racemes up to 4 cm long. Flowers yellowish, up to 1.5 cm long. Pods up to 6 x 0.5 cm, subcompressed, densely brown hairy; seeds 6-12, black.

*Distr.*: Cultivated in grasslands of Andaman Islands (Prain, *l.c.*).

7. ***Vigna trilobata* (L.) Verdc.** in Taxon 17: 172. 1968 & in Kew Bull. 24: 560. 1970; Sanj., Legumes of India 276. 1992. *Dolichos trilobatus* L., Mant. 1: 101. 1767. *Phaseolus trilobus* auct. *multo non Dolichos trilobus* L.; Baker in Hook.f., Fl. Brit. India 2: 201. 1876; Prain in J. As. Soc. Bengal 59: 244. 1891.

Trailing or twining, straggling or suberect, annual-perennial herbs; stems glabrescent. Leaflets *ca* 3 x 2 cm, variable, lateral ones obliquely cuneate at base, all leaflets palmately 3-lobed to partite. Racemes up to 30 cm long. Pods *ca* 4 x 0.3 cm, terete, patent, 6-16 seeded; seeds black or greenish.

Cultivated but also common in waste places as a weed (Prain, *l.c.*).

### 37. *Zornia* J.F. Gmel.

Herbs. Leaves distichous, 2-4 foliolate, stipules large. Inflorescences of 2-seriate spikes; bracts large, germinate. Calyx: upper teeth short, connate, lowest shorter than two middle ones. Corolla much exerted. Stamens monadelphous. Ovary sessile, many -ovuled, style filiform, incurved, stigma minute, capitate. Pods compressed upper suture almost straight, lower suture sinuate, joints indehiscent.

About 75 species, distributed in the warmer regions; 1 species in A. & N. Islands.

1. *Zornia gibbosa* Span in *Linnaea* 15: 192. 1841; Sanj., *Legumes of India* 280. 1992.

Prostrate or diffuse herbs; stems *ca* 25 cm long. Leaves *ca* 3 cm long; leaflets rigidly coriaceous, lanceolate, up to 1.8 x 0.4 cm, acute at apex, rounded or cuneate at base. Racemes up to 7.5 cm long. Flowers pale yellow, *ca* 5 mm long. Pods *ca* 8 x 3 mm, joints 2-6, spinous; seeds rekniform.

*Distr.*: South Andaman.

*Non-Indigenous Species* :

### 38. *Calpogonium* Desv.

Twining or partly creeping herbs. Leaves pinnately 3-foliolate, stipellate. Inflorescences partly sessile, fascicled, 2-4 flowered and partly peduncled, racemose. Calyx long-hairy. Corolla bluish-violet, glabrous. Pods brown-hairy, 4-8 seeded.

8 species, distributed in NW tropics; 1 species in A. & N. Islands.

1. **Calpogonium mucunoides** Desv., Ann. Sci. Nat. Paris 1, 8: 423. 1826; Sanj., Legumes of India 104. 1992.

Twining herbs; branches brownish, pubescent. Leaflets pubescent, ovate to elliptic-ovate, usually asymmetrical, up to 8 x 6 cm, acute at apex with a mucro, rounded or broadly cuneate at base, entire. Inflorescences ca 14 cm long. Pods linear-oblong, up to 4 x 5 mm, shortly beaked at apex, septate inside; seeds oblong, chocolate-brown.

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

*Distr.*: South Andaman (at Corbyn's Cove).

Common.

### 39. **Cicer** L.

Annual herbs. Leaves pinnate, rigid; leaflets and stipules strongly veined and deeply toothed. Inflorescences of axillary, solitary or few-flowered racemes. Calyx tube oblique, teeth subequal. Corolla exerted. Stamens diadelphous. Ovary sessile, 2-many ovuled, upper half of style glabrous, stigma capitate. Pods much turgid, 2-valved, narrowed into persistent style, seeds 1 or more, thick.

About 40 species, distributed in N. Africa, Abyssinica, E. Mediterranean to C. Asian regions; 1 species in A. & N. Islands.

1. **Cicer arietinum** L., Sp. Pl. 738. 1753; Baker in Hook.f., Fl. Brit. India 2: 176. 1876; Prain in J. As. Soc. Bengal 59: 238. 1891; Sanj., Legumes of India 113. 1992.

Spreading much-branched, viscous herbs. Leaves up to 5 cm long, usually imparipinnate; leaflets pubescent, oblanceolate, oblong or ovate-elliptic, up to 1 x 0.5 cm, mucronate at apex, cuneate at base, sharply dentate. Flowers yellow. Pods ovoid-oblong, up to 1.5 x 1 cm, glandular-pubescent.

*Distr.*: Planted in 1866 in Andaman Islands (Prain, *l.c.*).

40. *Cyamopsis* DC.

Annual, erect herbs. Leaves imparipinnate, 3-7 foliolate, rarely 1-foliolate; leaflets opposite. Inflorescences of axillary racemes. Calyx oblique, 5-toothed, ventral tooth the longest. Petals caducous, standard distinctly veined, keel shortly spurred on side. Stamens 10, monadelphous. Ovary sessile, many-ovuled, style incurved at apex, stigma capitate. Pods flat, longitudinally ridged, beaked, 2-valved, septate between seeds, somewhat compressed, minutely tuberculate.

3 species distributed in Arabia, India and drier parts of Africa; 1 species in A. & N. Islands.

1. *Cyamopsis tetragonoloba* (L.) Tunib. in Engler & Prantl, Nat. Pflanzenfam. 3 (3): 259. 1894; Sanj., Legumes of India 133. 1992 & in Hajra *et al.*, Fasc. Fl. India 21: 2. 1995. *Psovalea tetragonoloba* L., Mant. 1: 104. 1767. *Cyamopsis psoralioides* (Lam.) DC., Prodr. 2: 216. 1825; Baker in Hook.f., Fl. Brit. India 2: 92. 1876.

Erect annual herbs, ca. 1 m high; branches pale brownish, ribbed. Leaves up to 11.5 cm long; leaflets elliptic or rarely oblanceolate, up to 7.3 x 3 cm, acute at apex with a mucro, cuneate at base, dentate. Flowers rose, ca 2 mm long. Pods linear, up to 7 x 0.3 cm, straight, 3-10 seeded.

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

*Distr.*: North Nicobar.

Cultivated in Agricultural farm at Car Nicobar.

41. *Gliricidia* Kunth

Trees or erect shrubs. Leaves imparipinnate; leaflets opposite or lower alternate, entire. Inflorescences of axillary racemes with solitary flower along rachis. Calyx widely campanulate, truncate or shortly dentate, limb of standard with minute basal auricles. Anthers uniform. Ovary stipitate, many-ovuled, style short, stigma small, capitate. Pods flat, 2-valved; seeds 2-many.

4 species, distributed in tropical America; 1 species in A. & N. Islands.

1. ***Gliricidia sepium*** (Jacq.) Kunth ex Walp., 1: 679. 1842; Sanj., Legumes of India 181. 1992. *Robinia sepium* Jacq., Enum. Pl. Carib. 28. 1760. *Gliricidia maculata* H.B.K., Nov. Gen. Sp. 6: 393. 1824 in note, Benth., Trees Calc. 146. 1900.

Shrubs or small trees, 2-8 m high; branchlets greyish-black to pale greyish, lenticellate. Leaves up to 20 cm long; leaflets 7-17, ciliptic or ovate-lanceolate, up to 7.2 x 3.2 cm, acute to acuminate at apex, cuneate to rounded, sometimes slightly oblique at base. Racemes up to 15 cm long. Flowers pink, *ca* 2.5 cm long. Pods broadly linear, up to 15 x 2 cm.

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

*Distr.*: North and South Andaman.

Cultivated as a fencing plant.

#### 42. *Phaseolus* L.

Erect, suberect or twining herbs. Leaves pinnately 3-foliolate or rarely 1-foliolate; stipules basifixed, persistent. Racemes axillary, shortly peduncled. Calyx campanulate. Corolla much exserted, keels with spirally twisted beak. Stamens diadelphous. Ovary sessile, many-ovuled, style filiform, twisted round with keel, bearded down side below oblique stigma. Pods compressed.

About 50 species distributed in tropical and warm America; 2 species in A. & N. Islands.

1. ***Phaseolus lanatus*** L., Sp., Pl. 724. 1753; Baker in Hook.f., Fl. Brit. India 2: 200. 1876; Prain in J. As. Soc. Bengal 59: 239. 1891; Babu *et al.* in Bull. Bot. Surv. India 27: 7. (1985) 1987; Sanj., Legumes of India 228. 1992.

Suberect or twining herbs, glabrescent or pubescent. Leaflets ovate-triangular to deltoid, up to 11 x 9 cm, narrowed or acuminate at apex, often obtuse and mucronate, lateral ones oblique. Pods sword-shaped, up to 12 x 2.5 cm, yellowish-brown, beaked; seeds 2-6 per pod, *ca* 2.5 cm long, red, brown, black or white.

*Fl. & Fr.*: April and December-January.

*Distr.:* Cultivated in gardens of South Andaman.

2. **Phaseolus vulgaris** L., Sp. Pl. 723. 1753; Baker in Hook.f., Fl. Brit. India 2: 200. 1876; Prain in J. As. Soc. Bengal 59: 239. 1891; Sanj., Legumes of India 228. 1992.

Twining annual herbs, hairy; branches brown. Leaflets pubescent, ovate-deltoid, up to 10 x 10.5 cm, acuminate or obtuse and mucronate at apex, rounded to truncate-subcuneate at base. Racemes up to 10 cm long. Flowers white, pink or blue, up to 1.5 cm long. Pods linear, up to 4 x 1.5 cm, beaked, laterally compressed; seeds 1-12.

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

*Distr.:* Little Andaman; North Nicobar.

Cultivated only in gardens of Andaman (Prain, *l.c.*).

#### 43. **Pisum** L.

Climbing herbs. Leaves paripinnate, rachis terminated by a branched tendril, stipules large. Inflorescences axillary, peduncled, 1-5 flowered racemes. Calyx-tube campanulate, 2 upper segments broadest. Anthers uniform. Ovary sessile, many-ovuled, style curved, hard, margins reflexed, vexillary side longitudinally bearded, stigma terminal, oblique. Pods acuminate, 2-valved; seeds with incomplete aril.

6 species, occurring in Mediterranean, W.Asian regions; 2 species in A. & N. Islands.

1. **Pisum arvense** L., Sp. Pl. 727. 1753; Baker in Hook.f., Fl. Brit. India 2: 181. 1876; Sanj., Legumes of India 229. 1992.

Suberect or climbing annuals. Leaflets 4, up to 1.4 x 0.7 cm, cuneate at base, serrate along margins in upper half. Seeds compressed.

*Fr.:* February.

*Distr.:* Cultivated in North Nicobar.

2. *Pisum sativum* L., Sp. Pl. 727. 1753; Baker in Hook.f., Fl. Brit. India 2: 181. 1876; Prain in J. As. Soc. Bengal 59: 238. 1891; Sanj., Legumes of India 229. 1992.

Suberect or climbing annuals. Leaflets 4-6, ovate to oblong. Flowers usually white. Pods broad; seeds roundish, whitish.

Planted in Andaman in 1866 (Prain, l.c.).

### CAESALPINIACEAE

About 162 genera & 2000 species occurring in the tropical and subtropical regions; 12 genera & 30 species in A. & N. Islands.

- 1 a. Leaves simple, mostly deeply bilobed, rarely entire or fully divided into 2 leaflets ..... 1. *Bauhinia*  
 b. Leaves compound (paripinnate or bipinnate) ..... 2
- 2 a. Leaves paripinnate ..... 3  
 b. Leaves bipinnate ..... 5
- 3 a. Petiolules twisted; disc at top of a prolonged calyx-tube; petal 1 ..... 5. *Intsia*  
 b. Petiolules straight; disc sub-basal; petals 5 ..... 4
- 4 a. Anthers dehiscing by pores or by a short slit; ovary with numerous ovules; pods variable, terete or flat; seeds albuminous ..... 3. *Cassia*  
 b. Anthers dehiscing lengthwise by slits; ovary 1-2 ovulate; pods turgid, obliquely oblong; seeds exalbuminous ..... 4. *Cynometra*
- 5 a. Sepals and petals subequal; stigma broadly peltate ..... 6. *Peltophorum*  
 b. Sepals and petals unequal; stigma terminal, funnel-shaped or bilobed ..... 6
- 6 a. Fruits laterally winged along one margin or wingless ..... 2. *Caesalpinia*  
 b. Fruits with a terminal oblique wing above the seed bearing part ..... 7. *Pterolobium*

#### 1. *Bauhinia* L.

Unarmed erect shrubs or small trees or tendrilled climbers. Leaves palmately nerved. Inflorescences of simple or paniced often corymbose racemes. Calyx tube lined by disc, limb entire and spathaceous or cleft

into 2 or 5 teeth. Petals 5, subequal, clawed. Stamens 1-10 perfect, filaments free or shortly connate. Ovary stipitate, many-ovuled. Pods flat, continuous within.

About 250 species, distributed in tropical America, Africa and in continental Asia; 5 species in A. & N. Islands.

- 1 a. Climbers or stragglers with tendrils; sepals free to receptacle, some connate or all free; fertile stamens 3 (rarely 2); ovarial stipe connate with wall of receptacle .....2. *B. stipularis*
- b. Trees or shrubs without tendrils; calyx spathaceous; fertile stamens 10-1; ovarial stipe free or partly so .....2
- 2 a. Lower surface of leaves grey pubescent, later becoming glabrescent; flowers white; receptacle turbinate; pods with sharp-rimmed raised sutures .....1. *B. acuminata*
- b. Lower surface of leaves rusty pubescent; flowers yellow; receptacle campanulate; 3 pods not as above .....3. *B. tomentosa*

- 1. **Bauhinia acuminata** L., Sp. Pl. 375. 1753; Baker in Hook. f. Fl. Brit. India 2: 276. 1875; de Wit in Reinwardtia 3: 393. 1956; Sanj., Legumes of India 2. 1992.

Erect shrubs, ca 3 m high; branchlets brownish to blackish. Leaves coriaceous, pale brownish to greyish when dry, orbicular to broadly ovate, up 12.5 x 12 cm, rounded or cordate at base, palmately 9-11 nerved, lobes triangular-acute. Racemes lateral and terminal, ca 7 cm long. Anther connectives and filaments hairy. Style sparsely pubescent, stout. Pods linear-oblong, brownish when dry, up to 11 x 1.5 cm, beaked at apex; seeds 3-11, ca 8 x 3.5 mm, flat.

Scarce in shady places of wastelands and near fresh water streams. Also cultivated.

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

*Distr.* : Middle & South Andaman.

- 2. **Bauhinia stipularis** Korth. in Kruidk. 92. 1841; Sanj., Legumes of India 6. 1992; K. & S.S. Larsen in Nord. J. Bot. 13 : 659. 1993. *Phanera stipularia* (Korth.) Bth. in Miq., Pl. Jungh. 263. 1852; de

Wit in *Reinwardtia* 3 : 469. 1956. *P. nicobarica* Balakr. & Thoth in *Bull. Bot. Surv. India* 17 : 201. (1975) 1978. *Bauhinia albolutea* (Miq.) Prain in *J. As. Soc. Bengal* 66 : 181. 1897. *B. nicobarica* (Balakr. & Thoth.) Bennet in *Indian J. For.* 5 : 326. 1982; Sanj., *op. cit.* 4.

Large climbing shrubs; young shoots densely brownish-hirsute. Leaves ovate, up to 14 x 12 cm, shallowly cordate at base, palmately 9-13 nerved, lobes acute to subacute; nerves ridged and sparsely grey puberulous beneath; stipules pubescent outside, almost glabrous inside. Corymbose racemes lateral or terminal, up to 10 cm long. Sepals densely and minutely puberulous outside. Filaments of fertile stamens minutely and sparsely puberulous, staminodes minutely puberulous at base. Ovary densely brown silky-tomentose, style minutely puberulous, stigma swollen, peltate. Pods linear, woody, brown.

*Fl. & Fr.* : July - May

Common in dense mixed and littoral forests.

*Notes* : *Bauhinia* L. *sensu lato* was split by de Wit (*Reinwardtia* 3 : 381-539. 1956) in his revision of Malaysian Bauhineae and this taxonomic treatment was followed by Thothathri (*Bull. Bot. Soc. Bengal* 10 : 130-134. 1965). As the characters used for treating the segregate genera viz., *Phanera* Lour., *Lasiobema* (Korth.) Miq. and *Piliostigma* Hochst. are not good enough for generic separation, Cusset (*Adansonia* n. s. 6 : 361-362. 1976) and K. Larsen & S.S. Larsen (*Taxon* 28 : 591-592. 1979) treated *Bauhinia* in the broader sense including all the above genera. Bennet (*l.c.*) effected a new combination and the same has been followed by Sanjappa (*l.c.*).

A species of *Bauhinia*, collected from Car Nicobar Island by Jetineck of Hochstetter's Australian expedition was named by Prain (1897) as *B. albolutea*. According to de Wit (1956) the correct name of this species is *Phanera stipularis* (Korth.) Bth. But here it has been treated under *Bauhinia sensu lato*.

3. ***Bauhinia tomentosa*** L., *Sp. Pl.* 375. 1753; Baker in *Hook.f., Fl. Brit. India* 2: 275. 1878; de Wit in *Reinwardtia* 3: 409. 1956; Sanj., *Legumes of India* 6. 1992.

Erect shrubs, ca 4 m high; branchlets lenticellate, pale brownish to pale greyish. Leaves coriaceous, broadly ovate to orbicular, up to 3 x 4.5 cm, truncate to broadly cuneate at base, palmately 7-9 nerved, lobes rounded at apex. Panicles terminal, ca 12 cm long. Flowers ca 4.5 cm across. Calyx densely silky-tomentose. Anther filaments woolly pubescent at base. Ovary densely tomentose, style sparsely pubescent towards lower half. Pods linear-oblong, up to 13 x 1.5 cm, beaked, brownish to blackish when dry; seeds ca 5, laterally compressed, brown.

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

*Distr.:* South Andaman.

Rare.

*Cultivated species :*

4. **Bauhinia purpurea** L., Sp. Pl. 375. 1753; Baker in Hook.f., Fl. Brit. India 2: 284. 1878; de Wit in Reinwardtia 3: 406. 1956; Sanj., Legumes of India 5. 1992.

Trees, ca 8m high; branchlets sparsely lenticellate, pale whitish to brownish. Leaves coriaceous, broadly ovate to orbicular, up to 11 x 12 cm, cordate or rarely truncate at base, palmately 11 - nerved, lobes rounded to acute at apex. Panicles terminal or lateral ca 10 cm long. Flowers white, ca 5 cm across. Calyx densely silky tomentose. Anther filaments appressed puberulous at base. Ovary, style and stigma densely silky pubescent. Pods linear, up to 25 x 2.5 cm; seeds ca 10, orbicular, flat.

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

*Distr.:* South Andaman.

Rare in waysides and under cultivation.

5. **Bauhinia variegata** L., Sp. Pl. 375. 1753; Baker in Hook. f., Fl. Brit. India 2: 284. 1878; de wit in Reinwardtia 3: 411. 1956; Sanj., Legumes of India 6. 1992.

Trees, ca. 8 m high; branchlets lenticellate, brownish to blackish. Leaves coriaceous, broadly ovate to elliptic or orbicular, up to 10 x 11

cm, cordate or rounded at base, palmately 11-13 nerved, lobes rounded at apex. Panicles terminal, ca 7 cm long, tomentose. Flowers white with a pinkish tinge, ca 4 cm across. Calyx silky tomentose. Ovary, style and stigma silky pubescent. Pods linear-oblong, up to 20 x 2 cm, beak ca. 2.5 cm long, brownish to blackish when dry; seeds 12 - 26, flat, orbicular, brown.

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

*Distr.*: South & Little Andaman.

Scattered along roadsides or cultivated.

## 2. *Caesalpinia* L.

Climbers or shrubs or small trees, usually armed with recurved prickles. Leaves alternate; leaflets opposite or alternate, jointed at base, entire, base usually oblique. Inflorescences racemes. Flowers mostly bisexual, pentamerous. Sepals connate into a campanulate calyx tube. Petals inserted on receptacle. Stamens inserted on receptacle, free, in 2 whorls which alternate with petals. Ovary oblique at base, style slender, curved upwards, often funnel-shaped at top; stigma terminal, oblique. Pods 1-5 times as long as wide, paricarp usually swollen on each seed; seeds 1-10.

About 100 species, pantropical in distribution; 7 species in A. & N. Islands, of which the occurrence of 1 species is doubtful.

*Mezoneuron* Desf. is now included in *Caesalpinia* due to similarities in floral and vegetative features (Hattink, 1974; Vidal & Hul Thol, 1976; Polhill & Vidal, 1981). New combinations in *Caesalpinia* have been published for the Asiatic species of *Mezoneuron* (Hattink, 1974; Vidal & Hul Thol, 1976). Vidal & Hul Thol (1976) regarded *Mezoneuron* as subgenus of *Caesalpinia*; however the subgeneric name was not validly published by these authors. Herendeen Zarucchi (1990) validated the name and is now known as subgenus *Mezoneuron* (Desf.) Vidal ex Herendeen & Zarucchi.

Taking into consideration the prominent winged nature of the fruits in the indigenous *Mezoneuron* species, Subramanian *et al.*, (1989) feel that

the 4 Indian species viz., *Caesalpinia andamanica*, *C. cucullata*, *C. enneaphylla* and *C. hymenocarpa*, should be treated under the genus *Mezoneuron* Desf.

However, *Caesalpinia decapetala* (Roth) Alston often bears a narrow dorsal wing on the pod. Hence Hattink (1974) refrained from subdividing *Caesalpinia* and treated *Mezoneuron* under it in a broad sense.

- 1 a. Leaflets with stipels; pedicels 3.5 cm or longer; anther filaments 3 cm or longer .....6. *C. pulcherrima*
  - b. Leaflets without stipels; pedicels 3.5 cm or shorter; anther filaments 3 cm or shorter .....2
  - 2 a. Flowers unisexual; pods armed with rigid spines .....2. *C. bonduc*
  - b. Flowers bisexual; pods unarmed .....3
  - 3 a. Ovules 1-2, rarely 3; pinna 2-5 pairs; leaflets 2-4 pairs per pinna; pods 1-2 times as long as wide, 4-7 cm long, wingless .....3. *C. crista*
  - b. Ovules 4-6, rarely 1-2 but then either 10 or more pairs of pinna and more than 16 leaflets per pinna or a calyx tube present; pods 2½ - 5 times as long as wide, 6-15 cm long; petiolules 0.5 -1 mm long .....5
  - 4 a. Leaflets 5-12 pairs per pinna, less than 2 cm long; petiolules 0.5 - 1 mm long .....5
  - b. Leaflets 3-6 pairs per pinna, more than 2 cm long; petiolules 2-4 mm long .....6
  - 5 a. Flower buds hairy; pedicel of fruit 0.8 - 1.5 cm long; tip of fruit usually hooked .....5. *C. hymenocarpa*
  - b. Flower buds glabrous; pedicel of fruit 1.5-2 cm long; tip of fruit acute .....7. *C. enneaphylla*
  - 6 a. Leaflets opposite, acuminate at apex, coriaceous; standard petal bilobed; seed 1, rarely 2 per fruit .....4. *C. cucullata*
  - b. Leaflets alternate, obtuse or reflex at apex, membranous; standard petal rounded at top; seeds 3-4 per fruit .....1. *C. andamanica*
1. ***Caesalpinia andamanica*** (Prain) Hattink in Reinwardtia 9:15. 1974; Sanj., Legumes of India 9. 1992. *Mezoneuron andamanicum* Prain in J.As. Soc. Bengal 61 (2): 13. 1892 & *Ibid.* 66 (2): 234. 1897; Parkinson, For. Fl. Andaman Islands. 156. 1923.

Large climbers; branchlets glossy. Prickles in pairs at base of pinnac and scattered in between, leaflets obovate, up to 6 x 3.5 cm, cuneate at base. Petals yellow, reddish at base and on nerves, gland - dotted outside. Anther filaments hairy. Pods ellipsoid-oblong, up to 4 cm broad, 3-7 jointed below top, stalked, receptacle persistent, laterally flattened, dorsal and ventral edges recurved; seeds ovoid, brown.

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

*Distr.*: South Andaman

A few in the inland forests.

2. **Caesalpinia bonduc** (L.) Roxb., *Fl. Ind.* 2: 362. 1832 *p.p.* excl. pl. descr. *emend.* Dandy & Exell, *J. Bot.* 76: 179. 1938; Baker in Hook. f., *Fl. Brit. India* 2: 255. 1878; Hattink in *Reinwardtia* 9: 17. 1974; Sanj., *Legumes of India* 9. 1992. *Guilandina bonduc* L., *Sp. Pl.* 381. 1753. *Caesalpinia bonducella* (L.) Fleming in *As. Res.* 11: 159. 1810 *nom. illegit.*; Baker in Hook.f., *op.cit.* 254; Parkinson, *For. Fl. Andaman Islands.* 157. 1923.

Large, climbing shrubs; branchlets pale yellowish or pinkish - brown. Rachis armed with recurved, prickles at base of pinnae and often scattered in between in basal part, often also with straight prickles, pinnae 6-11 pairs; leaflets 5-14 pairs, opposite or subopposite, chartaceous, glabrous above, puberulous beneath, elliptic to oblong or rarely obovate, up to 5.5 x 3 cm, acute or obtuse and mucronulate at apex, rounded or truncate, rarely cuneate at base; lateral nerves 5-10 pairs. Racemes axillary, up to 30 cm long, silky tomentose, armed. Flowers yellowish, ca 1.2 cm across. Calyx densely brownish or rusty tomentose. Pods ellipsoid or oblong, up to 15 x 7 cm, stalked; seeds 1-2, subglobose or ellipsoid-oblong, ca 2.5 (4) x 1.8 cm, greyish.

Common in the littoral forests on sandy soil. *Fl. & Fr.*: April February.

*Distr.*: Middle, South & Little Andaman; North & South Nicobar.

3. **Caesalpinia crista** L. *Sp. Pl.* 380. 1753 *p.p.* excl. *syn. pluk.* & Breyn. *emend.* Dandy & Exell, *J. Bot.* 76: 179. 1938; Hattink in *Reinwardtia*

9: 20. 1974; Sanj., Legumes of India 10. 1992. *C. nuga* (L.) Ait., Hort. Kew ed. 2, 3: 32. 1811; Baker in Hook. f., Fl. Brit. India 2: 255. 1878; Parkinson, For. Fl. Andaman Islands. 157. 1923.

Climbing shrubs; branchlets blackish. Rachis usually armed with recurved prickles at base of pinnae and scattered in between; leaflets coriaceous, pale greyish beneath and blackish - brown above upon drying, ovate to elliptic or rarely oblong, up to 7 x 3.5 cm, acute to obtuse, sometimes acuminate at apex, rounded to cuneate at base; lateral nerves 6-11 pairs. Inflorescences up to 17 cm long. Anther-filaments densely pubescent at base. Style densely pubescent. Pods ellipsoid or rarely obliquely ellipsoid, up to 4.4 cm broad, beaked, blackish upon drying; seed 1, orbicular to ovoid or reniform, blackish.

*Fl.*: December - November; *Fr.*: July - March.

*Distr.*: Throughout A & N islands.

Common along the tidal and mangrove forests, also in littoral forests.

4. ***Caesalpinia cucullata*** Roxb., Fl. Ind. 2: 358. 1832; Hattink in Reinwardtia 9 : 22. 1974; Sanj., Legumes of India 10. 1992. *Mezoneuron cucullatum* (Roxb.) Wight & Arn., Prodr., 283. 1834; Baker in Hook.f., Fl. Brit. India 2: 258. 1878; Parkinson, For. Fl. Andaman Islands. 156. 1923. *M. cucullatum* var. *grandis* Heyne ex Baker in Hook.f., *op.cit.* 258.

Lianas; branchlets pale brownish to blackish or greyish, sparsely ribbed. Rachis unarmed or armed with recurved prickles at base of pinnae or scattered in between, pinnae 2-6 pairs; leaflets elliptic to ovate-lanceolate, up to 12 x 6.5 cm, cuneate to rounded, rarely oblique at base. Inflorescences ca 30 cm long, often from old stem. Flowers yellow, ca 2 cm across. Pods broadly ellipsoid, ca 3 cm broad, ripen reddish, coppery brown when dry; seed 1, rarely 2, orbicular, brownish.

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

*Distr.*: North, Middle & South Andaman; North Nicobar.

Scattered in the dry deciduous inland forests.

5. **Caesalpinia hymenocarpa** (Prain) Hattink in Reinwardtia 9: 35. 1974; Sanj., Legumes of India 11. 1992. *Mezoneuron hymenocarpum* Prain in J.As.Soc. Bengal 66: 233, 472. 1897; Parkinson, For. Fl. Andaman Islands. 156. 1923. *M. pubescens* auct. non Desf.; Baker in Hook.f., Fl. Brit. India 2: 259. 1878.

Climbing shrubs; branchlets pinkish - brown or pale brownish, finely puberulous. Rachis armed with prickles at the interim of each pinna and often scattered in between, pinnae 1-5 pairs; leaflets chartaceous, glabrous above, tomentose beneath, obovate or obliquely oblong, up to 2.5 x 1 cm, obtuse or rounded at apex, cuneate at base; lateral nerves obscure. Inflorescences ca 35 cm long. Flowers pale yellow, ca 1 cm across. Calyx rusty-tomentose. Anther filaments hairy. Pods ellipsoid, ca 3.5 cm broad, stalked, pale brownish to greenish upon drying; seeds 3-5, ellipsoid.

*Fl. & Fr.*: October - March

Scattered in the evergreen forests.

*Distr.*: North & South Andaman.

*Notes*: Sastry & Kale (1983) noted that *Caesalpinia hymenocarpa* (Prain) Hattink is a superfluous name as there is already *C. hymenocarpa* Wall. ex. Baker. But the same authors (1984) held that the combination novum proposed by Hattink is valid. It resembles *C. andamanica* but can easily be distinguished by its leaves and its calyx being pubescent; by its pedicels being shorter and by its pods being smaller and not so distinctly reticulated.

6. **Caesalpinia pulcherrima** (L.) Swartz, Obs. Bot. Pl. Ind. Occ. 166. 1791; Baker in Hook.f., Fl. Brit. India 2: 255. 1878; Parkinson, For. Fl. Andaman Islands. 157. 1923; Hattink in Reinwardtia 9: 50. 1974; Sanj., Legumes of India 14. 1992. *Poinciana pulcherria* L., Sp. Pl. 380. 1753.

Shrubs or small trees, 1-3 m high; branchlets pinkish-brown to blackish. Pinnae 5-9 pairs; leaflets 4-12 pairs, chartaceous, drying pale brownish beneath and coppery brown above, oblong, obovate, rarely elliptic, up to 2.7 x 1.1 cm, retuse at apex with a mucro, cuneate at base;

lateral nerves 5-9 pairs, obscure. Racemes up to 50 cm long. Flowers yellowish to dark red. Anther filaments red, hairy in the basal part. Pods broadly linear-oblong, up to 10 x 1.5 cm, beaked, stalked, blackish upon drying.

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

*Distr.*: South Andaman & North Nicobar.

A native of S. America, introduced in gardens as an ornamental plant. But it is often met as an escape in open places or near villages.

*Doubtful species*

7. **Caesalpinia enneaphylla** Roxb., Fl. Ind. 2: 363. 1832; Hattink in Reinwardtia 9: 30. 1974; Sanj., Legumes of India 11. 1992. *Mezoneuron enneaphyllum* (Roxb.) Wight & Arn. ex Bth. in Miq., Pl. Jungh. 258. 1852; Baker in Hook.f., Fl. Brit. India 2: 258. 1878; Brandis, Ind. Trees 248. 1906; Parkinson, For. Fl. Andaman Islands. 156. 1923.

Climbers. Rachis armed with recurved prickles at insertion of pinnae and in between; leaflets 9-11 pairs, membranous, elliptic-oblong, ca 1.2 x 0.5 cm, obtuse at apex, rounded at base. Flowers greenish-yellow, ca 1.2 cm long. Anther filaments hairy. Pods ellipsoid-oblong, up to 20 x 5 cm, reddish when young, stalked; seeds 4-6, ellipsoid.

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

*Distr.*: Andaman islands (Brandis, l.c.)

*Notes*: Parkinson (l.c.) has included this species based on the authority of Brandis. He also mentions that the specimens of this species at CAL were from Coco Islands which now come under Myanmar. Subsequent workers have included this species from Andaman based on literature (Vasud. in *J. Econ. Tax. Bot.* 8: 123. 1986 & Sanj., Legumes of India 12. 1992). There are no recent collections of this species from Andaman-Nicobar Islands and therefore the occurrence of this species from these islands appear to be doubtful unless fresh collections are made.

3. *Cassia* L.

Erect shrubs or trees, rarely herbs. Leaflets opposite, entire, often with glands on rachis or petiole. Inflorescences of axillary racemes and terminal panicles, rarely cymes. Calyx - tube short, deeply lobed. Petals subequal, usually broad. Stamens usually 10, rarely all perfect, 3-5 often reduced to staminodes or absent. Style incurved, stigma terminal. Seeds usually compressed.

About 535 species occurring in the tropical and warm temperate regions excluding Europe; 8 species in A. & N. Islands.

- |   |   |                           |
|---|---|---------------------------|
| 1 | a. Foliar glands present .....  | 2                         |
|   | b. Foliar glands absent .....   | 5                         |
| 2 | a. Leaflets 20-80 pairs, narrow, 0.5-1 mm broad; sepals acuminate ...   | 3. <i>C. mimasoides</i>   |
|   | b. Leaflets 3-8 pairs, broader, 0.5-3.5 cm broad; sepals obtuse or acute .....  | 3                         |
| 3 | a. Rachis usually with several glands between leaflets .....  | 8. <i>C. tora</i>         |
|   | b. Rachis with a single gland at base .....   | 4                         |
| 4 | a. Stipules linear; leaflets acuminate at apex, glands ovoid; bracts linear; sepals broadly oblong to obovate, acute; seeds orbicular ..... | 5. <i>C. occidentalis</i> |
|   | b. Stipules ovate; leaflets acute at apex; glands subulate; bracts ovate; sepals ovate, rounded; seeds ovoid .....                          | 7. <i>C. sophera</i>      |
| 5 | a. Shrubs .....   | 1. <i>C. alata</i>        |
|   | b. Trees .....  | 6                         |
| 6 | a. Pods dehiscent .....   | 6. <i>C. siamea</i>       |
|   | b. Pods indehiscent .....   | 7                         |
| 7 | a. Flowers bright yellow, in lax pendulous racemes .....  | 2. <i>C. fistula</i>      |
|   | b. Flowers pink, fading to dull white in corymbose racemes .....  | 4. <i>C. nodosa</i>       |
1. *Cassia alata* L., Sp. Pl. 378. 1753; Baker in Hook.f., Fl. Brit. India 2: 264. 1878; Parkinson, For. Fl. Andaman Islands. 155. 1923; de Wit in Webbia 11: 231. 1955; Pandey in J. Bombay Nat. Hist. Soc. 68: 314. 1971; Sanj., Legumes of India 14. 1992.

Shrubs, up to 4m high; branchlets ribbed, blackish. Leaflets 8-20 pairs, chartaceous, oblong or obovate, up to 12 x 8 cm, rounded-mucronate at apex, obliquely truncate to broadly cuneate at base; lateral nerves 5-16 pairs. Racemes ca 60 cm long. Flowers yellow, ca 2.2 cm across; bracts brownish-orange. Pods linear-oblong, up to 18 x 1.3 cm, beaked, blackish.

*Fl. & Fr.*: November - April.

*Distr.*: North, Middle & South Andaman; North Nicobar.

Mostly cultivated. It is often found scattered in forest edges, waysides and open places as a weed.

2. ***Cassia fistula* L.**, Sp. Pl. 377. 1753; Baker in Hook.f., Fl. Brit. India 2: 261. 1878; Parkinson, For. Fl. Andaman Islands. 155. 1923; de Wit in *Webbia* 11: 207. 1955; Pandey in J.Bombay Nat. Hist. Soc. 68: 313. 1971; Sanj., Legumes of India 15. 1992.

Trees, up to 8 m high; branchlets greyish. Leaflets 4-8 pairs, chartaceous, ovate-lanceolate, up to 18 x 8 cm, bluntly acute at apex, rounded to cuneate and slightly decurrent at base; lateral nerves 12-18 pairs. Racemes ca 50 cm long. Flowers ca 5 cm across. Sepals velutinous outside. Pods cylindrical, up to 50x 2 cm, dark brown or black when ripe.

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

*Distr.*: South Andaman

Introduced. Also occurring in wild condition.

3. ***Cassia mimosoides* L.**, Sp. Pl. 379. 1753; Baker in Hook.f., fl. Brit. India 2: 266. 1878; de Wit in *Webbia* 11: 283. 1955; Pandey in J.Bombay Nat. Hist. Soc. 68: 317. 1971; Sanj., Legumes of India 17. 1992.

Undershrubs up to 1 m high; branchlets pinkish, pubescent to glabrescent. Rachis puberulous with a small sessile gland below the lowest pair of leaflets; leaflets coriaceous, linear-oblong, up to 2 mm long, acute and mucronate at apex, broadly cuneate at base; lateral nerves obscure. Flowers yellow, ca 8 mm across, solitary or 2-3 together. Pods linear-

oblong, ca 6 x 0.5 cm, shortly beaked, brownish to blackish; seeds 20-25, brown, flat.

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

*Distr.*: North Nicobar.

Scattered.

4. ***Cassia nodosa*** Buch - Ham. ex Roxb., *Fl. Ind.* 2: 336. 1832; Baker in Hook.f., *Fl. Brit. India* 2: 261. 1878, Parkinson, *For. Fl. Andaman Islands* 154. 1923; de Wit in *Webbia* 11: 223. 1955; Pandey in *J. Bombay Nat. Hist. Soc.* 68: 313. 1971; Sanj., *Legumes of India* 16. 1992.

Trees, 9-15m high; bark grey. Leaflets 6-12 pairs, elliptic to elliptic-oblong or ovate to ovate-oblong, up to 10 x 4 cm, acute to shortly acuminate at apex, rounded or sometimes oblique at base. Flowers ca 3.7 cm across on slender stalks from scars of fallen leaves. Pods cylindrical, up to 50 x 2 cm.

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

*Distr.*: Middle Andman.

Rare.

5. ***Cassia occidentalis*** L., *Sp. Pl.* 377. 1753; Baker in Hook.f., *Fl. Brit. India* 2: 262. 1878; de Wit in *Webbia* 11: 256. 1955; Pandey in *J. Bombay Nat. Hist. Soc.* 68: 316. 1971; Sanj., *Legumes of India* 19. 1992.

Undershrubs, up to 2 m high; branchlets pale yellowish to brownish, finely ribbed. Leaflets chartaceous, elliptic to elliptic-lanceolate, up to 9.5 cm long, cuneate to obliquely broadly rounded at base; lateral nerves 5-12 pairs. Flowers yellowish, ca 1.8 cm across. Pods linear, up to 11.5 x 0.5 cm, transversely partitioned acute, dark brownish with pale yellowish edges upon drying; seeds 15-30, pale brown.

*Fl. & Fr.*: March - September (rarely fruiting in February also).

Scattered along edges of forests as secondary vegetation or in cleared lands.

*Dist.*: Middle & South Andaman; North Nicobar.

6. *Cassia slamea* Lam., *Encycl.* 1: 648. 1785; Baker in Hook.f., *Fl. Brit. India* 2: 264. 1878; Parkinson, *For. Fl. Andaman Islands*, 155. 1923; de Wit in *Webbia* 11: 263. 1955; Pandey in *J. Bombay Nat. Hist. Soc.* 68: 312. 1971; Sanj., *Legumes of India* 20. 1992.

Trees, up to 15 m high; branchlets sparsely lenticellate, pinkish-brown to blackish or greyish. Leaflets 4-15 pairs, coriaceous, coppery brown upon drying, elliptic to elliptic-oblong, obtuse and mucronate at apex, cuneate at base; lateral nerves 7-15 pairs. Panicles ca 2.5 cm long, silky-pubescent. Pods linear-oblong, up to 22.5 x 1.5 cm, slightly curved at posterior end, flat, with thickened sutures, shortly beaked, blackish upon drying; seeds 20 - 30, flat, ovoid, light brown.

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

*Distr.*: South Andaman

Scattered along roadsides, wastelands and open places. Introduced.

7. *Cassia sophera* L., *Sp. Pl.* 379. 1753; Baker in Hook.f., *Fl. Brit. India* 2: 262. 1878; de Wit in *Webbia* 11: 265. 1955; Pandey in *J. Bombay Nat. Hist. Soc.* 68: 317. 1971; Sanj., *Legumes of India* 21. 1992.

Shrubs up to 3 m high; branchlets pale greyish-white, striate. Leaflets chartaceous, drying olive green, elliptic or lanceolate, up to 5 cm long, cuneate to rounded at base; lateral nerves 6-11 pairs. Cymes ca 5 cm long. Pods linear-oblong, up to 10x 0.6 cm, shortly beaked, straight or curved, transversely septate, greyish-black upon drying; seeds 30-40.

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

*Distr.*: South Andaman.

A few as a weed in secluded places.

8. *Cassia tora* L., Sp. Pl. 376. 1753; Baker in Hook.f., Fl. Brit. India 2: 263. 1878 *p.p.*; de Wit in Webbia 11: 276. 1955; Pandey in J. Bombay Nat. Hist. Soc. 68: 316. 1971; Sanj., Legumes of India 22. 1992.

Undershrubs, up to 1 m high; branchlets finely ribbed, pale greyish to pale brownish. Leaflets chartaceous, obovate or broadly elliptic, up to 6 cm long, obtuse with a short mucro at apex, obliquely cuneate at base; lateral nerves 6-12 pairs. Racemes ca 4 cm long, Flowers yellow, ca 1.5 cm across. Ovary densely pubescent. Pods linear, up to 13 x 0.3 cm, beaked, obliquely septate; seeds 20-30, glossy, rhomboidal.

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

*Distr.*: North, South & Little Andaman.

Scattered as a weed in wastelands, waysides, open places and edges of beach forests on sandy soil.

#### 4. *Cynometra* L.

Erect unarmed trees. Leaflets coriaceous, entire. inflorescences of axillary corymbs or racemes. Calyx-tube short. Petals equal. Filaments exerted. Style filiform, stigma capitate. Pods with thick, indehiscent, usually rugose tough, somewhat fleshy valves.

About 70 species occurring in the tropics; 1 species in A. & N. Islands.

1. *Cynometra iripa* Kostel., Allg. Med. Pharm. Fl. 4: 1348. 1835; van Meeuwen in Blumea 18: 21. 1970; Kosterm. in Reinwardtia 10: 66. 1982; Sanj., Legumes of India 26. 1992. *C. ramiflora* L. var. *heterophylla* Thw., Enum. Pl. Zeyl. 97. 1859; Baker in Hook.f., Fl. Brit. India 2: 267. 1878 (as a syn. of *C. ramiflora*); Parkinson, For. Fl. Andaman Islands. 154. 1923; van Meeuwen, *op.cit* 23 (as a syn. of *C. ramiflora*); Sanj., *op.cit* 26 (as a syn. of *C. ramiflora*) *C. ramiflora* ssp. *bijuga* var. *heterophylla* Prain in J. As. Soc. Bengal 66(2): 198, 478. 1897; van Meeuwen, *op.cit*. 23; Sanj., *op.cit*. 27. *C. ramiflora* var. *mimosoides* Baker in Hook.f., *op.cit*. 267; Parkinson, *op.cit*. 154. *C. ramiflora* ssp. *bijuga* var. *mimosoides* Prain, *op.cit*. 478.

Trees, 5-12 m high branchlets sparsely lenticellate, striate, blackish or pale greyish. Leaflets usually 4, opposite, obliquely obovate to elliptic,

up to 13 x 6 cm, retuse or obtuse to acute at apex, cuneate to broadly rounded and decurrent at base; lateral nerves 5-15 pairs, thin, obscure. Inflorescence of pubescent racemes, ca 2 cm long, arising from leaf axils or leaf scars. Ovary and style rusty pubescent. Pods ca 3 x 3 cm, laterally flattened, rusty brownish, beak lateral and subterminal.

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

*Distr.*: North, Middle & South Andaman; North & South Nicobar.

Prain correctly observed that *C. ramiflora* L. did not occur in India and Sri Lanka. *C. ramiflora* ssp. *genuina* Prain is strictly a Malesian species. Prain's second subspecies, although wrongly under the specific name *C. bijuga* Span is with its two varieties, correctly disposed off and represents *C. iripa* Kostel (Kostermans, *op.cit.* pp., 64 -66.).

### 5. *Intsia* Du Petit -Thou.

Trees. Leaves 2-5 jugate, stipules, more or less connate at base, leaflets opposite (-subopposite), entire. Inflorescences of terminal or lateral racemes or panicles. Sepals 4. Stamens 3 fertile, filaments connate at base with 4-7 staminodes. Ovary stipitate, style terminal, stigma small. Pods flat, thin, 2-valved, seeds few, flat.

3 species in tropical Asia, coasts of Indian & Pacific Oceans; 2 species in A. & N. Islands.

- 1 a. Leaves with 2 pairs of leaflets; sepals 8-10 mm long; petals 1.5-2 cm long; fertile stamens 3 cm long; style 4 cm long .....1. *I. bijuga*
- b. Leaves with 4 pairs of leaflets; sepals 4-8 mm long; petals 6-9 mm long; fertile stamens 2 cm long; style 2 cm long .....2. *I. palembanica*

1. *Intsia bijuga* (Colebr.) O.Ktze., Rev. Gen. Pl. 1: 191. 1991; K.Larsen & S.S. Larsen in Smitinand & K. Larsen, Fl. Thailand 4: 125. 1984. *Macrolobium bijugum* Colebr. Ivans. Linn. Soc. 12: 359. 1818. *Azefia bijuga* (Colebr.) A.Gray, U.S. Explor. Exped. Bot. 467. 1854; Baker in Hook. f. Fl. Brit. India 2: 274. 1878; Parkinson, For. Fl. Andaman Islands. 154. 1923. *A. retusa* Kurz in J.As.Soc. Bengal 42(2): 73. 1873, Baker in Hook.f., *op.cit.* 274. *Intsia bijuga* var. *retusa* (Kurz.) Sanj., Legumes of India 31. 1992.

Trees, 10-21 m high; branchlets sparsely lenticillate, pale brownish to greyish or rarely pinkish brown. Leaflets coriaceous, glossy dark green above and pale beneath in fresh condition, drying pale brownish to pale greyish, elliptic to obliquely elliptic, broadly orbicular to ovate or obliquely obovate, up to 12 x 10 cm, obtuse or rarely emarginate at apex, rounded or broadly cuneate at base; lateral nerves 5-9 pairs. Inflorescences ca 10 cm long. Flowers white to pink, ca 2 cm long. Pods broadly oblong to linear, up to 22.5 x 6.5 cm, woody, beaked, green, ripens black, drying pale brownish; seeds up to 8, orbicular, ca 2.5 cm across.

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

*Distr.*: Andaman islands; North & South Nicobar.

Common in the littoral forests on sandy beaches.

2. *Intsia palembanica* Miq., Fl. Ind. Bot. Suppl. 1: 107, 289. 1860; Sanj., Legumes of India 32. 1992. *Afzelia palembanica* (Miq.) Baker in Hook.f., Fl. Brit. India 2: 275. 1878; Parkinson, For. fl. Andaman Islands. 154. 1923. *A. bakeri* Prain in J.As.Soc. Bengal 66: 209. 1897. *Intsia bakeri* (Prain) Prain, Sci.Mem. Med. Off. Ind. Army 12:13. 1901.

Trees, up to 50 m high. Leaflets subcoriaceous, ovate, oblong or elliptic, ca 8.5 x 5.5 cm, obtuse and emarginate at apex, rounded at base. Panicles up to 10 cm long, pubescent. Flowers green. Pods oblong, up to 30 x 8.5 cm, woody, straight or curved; seeds broadly oblong.

*Fl. & Fr.*: Not known.

*Distr.*: South Andaman.

*Notes*: The Maraban tree of Malacca, it has been introduced from the straits settlements and Sri Lanka and was planted in the Brigade creek valley in 1907. It is said to be "the best known Malacca timber tree."

#### 6. *Peltophorum* (Vogel) Bth. (*nom. cons.*)

Tall unarmed trees. Inflorescences of axillary and paniced terminal racemes. Calyx with disc at base. Petals spreading. Stamens 10, free, declinate, filaments with a dense tuft of hairs at base. Ovary free, style

long, filiform, incurved. Pods flat, hard, indehiscent, with a firm, broad wing on each suture.

ca 8 species distributed in tropics; 1 species in A. & N. Islands.

1. **Peltophorum pterocarpum** (D.C.) Back. ex. K. Heyne, Nutt. Pl. ed. 2,2: 755. 1927; Sanj., Legumes of India 33. 1992. *Inga pterocarpa* DC., Prodr. 2: 441. 1825. *Peltophorum ferrugineum* (Decne.) Bth. Fl. Austral 2: 279. 1864; Baker in Hook.f., Fl. Brit. India 2: 257. 1878; Parkinson, For. Fl. Andaman Islands. 157. 1923.

Trees, 10-21 m high; branchlets lenticellate, greyish to blackish-brown, ferruginous pubescent. Rachis ferruginous pubescent; leaflets 10-22 pairs, sessile or subsessile, opposite, coriaceous, blackish-brown above and pale brownish beneath when dry, oblong, up to 1.5 x 0.6 cm, retuse at apex, obliquely rounded at base, entire lateral nerves 4-8 pairs. Panicles ca 30 cm long, rusty. Calyx rusty pubescent. Ovary hairy. Pods ellipsoid, up to 10 x 2.5 cm, slightly woody, reddish to blackish when dry; seeds 1-4, flat, oblong.

*Fl. & Fr.*: January - July, August-December.

Scattered in roadsides and littoral forests.

*Dist.*: Middle & South Andaman; North & South Nicobar.

#### 7. **Pterolobium** R. Br. ex Wight & Arn.(*nom.cons.*)

Lianas. Calyx deeply cleft, with disc near base. Petals spreading, clawed, equalling calyx. Stamens 10, free, declinate. Ovary sessile, 1-ovuled, style filiform. Pods indehiscent, samaroid.

1 species in tropical Africa, 10 in tropical and subtropical Asia and Australia; 1 species in A. & N. Islands.

1. **Pterolobium macropterum** Kurz in J.As. Soc. Bengal 42(2): 71. 1873; Parkinson, For. Fl. Andaman Islands. 155. 1923; Vidal & Thol. Bull. Mus. Nation Hist. Nat. 3, 15: 22. 1974; Sanj., Legumes of India 35. 1992. *P. indicum* A. Rich var. *macropterum* (Kurz) Baker in Hook. f., Fl. Brit. India 2: 259. 1878.

Large climbers; branchlets sparingly armed with small prickles, sparsely ribbed, blackish. Rachis armed with prickles at nodes, pinnae 7-10 pairs; leaflets 7-10 pairs, opposite, chartaceous, elliptic - oblong, oblong to obovate, up to 1.2 x 0.6 cm, retuse at apex, cuneate at base; lateral nerves obscure. Inflorescences of lax, axillary or terminal panicles, *ca* 15 cm long. Flowers white with pale yellow throat, *ca* 9 mm across. Anther filaments brownish - pubescent in the lower half. Ovary pubescent. Pods ellipsoid, up to 6.2 x 1.3 cm, wing scarlet.

*Fl.*: April -May (rarely December) & *Fr.*: April - December.

*Distr.*: Middle & South Andaman.

Scarce in the inland forests in sandy and rocky loam.

*Cultivated species.*

### 8. *Amherstia* Wall.

Erect trees. Leaves abruptly pinnate. Inflorescences of racemes. Calyx-tube long, cylindrical, disciferous, sepals 4, the two lowest connate. Petals only 3 developed. Stamens diadelphous. Ovary stalked beyond disc, many-ovuled, style long, filiform, capitate. Pods flat, almost woody, dehiscent; seeds large, compressed.

1 species in Myanmar which has been introduced in Andaman Islands.

1. *Amherstia nobilis* Wall., Pl. Asiat. Rar. 1: t. 1-2. 1830; Baker in Hook.f., Fl. Brit. India 2: 272. 1878; Parkinson, For. Fl. Andaman Is. 155. 1923; Sanj., Legumes of India 1. 1992.

Trees, 9-12 m high. Leaves paripinnate, up to 45 cm long; leaflets 6-8 pairs, oblong to ovate-oblong, up to 12.5 cm long, acuminate at apex, rounded at base, entire. Racemes lax. Flowers large, showy. Calyx crimson. Petals yellow. Pods oblong, up to 17.5 cm long; seeds 4-6, transversely ovoid or orbicular.

Planted as an ornamental tree in South Andaman and it thrives well.

9. *Brownea* Jacq. ('*Brownaea*') *nom. et. orth. cons.*

Small trees. Leaves paripinnate; leaflets long-acuminate with gland at base of midrib beneath. Inflorescence of head-like racemes. Calyx deeply 4-partite. Petals erect-patent, clawed. Stamens 10-14, connate. Ovary many-ovuled, style long, stigma terminal. Pods woody, 2-valved.

About 30 species occurring in tropical America; 1 species in A. & N. Islands.

1. *Brownea ariza* Bth., Pl. Hartw. 171. 1845; Parkinson, For. Fl. Andaman Islands. 155. 1923; Sanj. Legumes of India. 8. 1992.

Trees, up to 5 m high; branchlets pinkish-brown, smooth. Leaflets 8-14, alternate, rarely opposite, coriaceous, up to 13 x 4 cm, basal leaflets ovate, upper obliquely elliptic to elliptic to elliptic-oblong, acuminate at apex, cordate or obliquely cordate at base; lateral nerves 7-18 pairs, thin, obscure. Inflorescences ca 15 x 14 cm, terminal. Flowers scarlet pink, ca 3 cm across. Ovary, style and stigma silky - pubescent.

*Fl.*: March - April.

*Distr.*: South Andaman

Introduced as an ornamental plant in Haddo Garden, Viper Island.

10. *Delonix* Rafin

Unarmed trees. Leaves bipinnate. Inflorescences of corymbose racemes. Calyx persistent. Petals clawed, subequal. Stamens free, declinate, exerted, filaments villous at base. Ovary (sub) sessile, ovules numerous, style filiform, stigma truncate. Pods flattened, woody, dehiscent; seeds numerous.

10 species occurring in tropical Africa, mostly Madagascar and India 1 in A. & N. Islands.

*Delonix regia* (Boj. ex Hook.) Rafin, Fl. Tedd. 2: 92. 1837; Sanj., Legumes of India 27. 1992. *Poinciana regia* Boj. ex Hook. in Bot. Mag. 56: 5, t. 2884. 1829; Baker in Hook.f., Fl. Brit. India 2: 260. 1878; Parkinson, For. Fl. Andaman Islands 158. 1923.

Trees, up to 10 m high; branchlets lenticellate, greyish brown. Leaflets 15-20 pairs, opposite, sessile to subsessile, chartaceous, oblong, up to 1 x 0.4 cm, rounded and shortly mucronate at apex, broadly rounded to cuneate at base; lateral nerves obscure. Corymbs ca 2.5 cm long. Flowers scarlet-orange. Pods oblong, up to 60 x 5 cm long, shortly beaked at apex, brownish to blackish upon drying; seeds compressed, oblong ellipsoid.

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

*Distr.*: Middle, South & Little Andaman; North Nicobar.

Introduced and planted in edges of forests, waysides and open places on sandy loam.

### 11. *Saraca* L.

Erect trees. Leaves abruptly pinnate, rigidly coriaceous. Inflorescences of axillary corymbose panicles, bracteoles subpetaloid, reddish. Calyx with disc at apex of a cylindrical tube. Corolla absent. Stamens exserted. Ovary many-ovuled, stipitate, style long, filiform, stigma minute capitate. Pods flat, dehiscent, rigidly coriaceous.

11 Species occurring in Indo-Malesian region; 1 in A. & N. Island.

1. *Saraca asoca* (Roxb.) de Wilde in *Blumea* 15: 393. 1967; Zuij. *Ibid.* 422; Sanj., *Legumes of India* 35. 1992. *Jonesia asoca* Roxb., *Asiat. Res.* 4: 355, f. 252-3. 1799. *Saraca indica auct. non L.* 1767; Baker in Hook.f., *Fl. Brit. India* 2: 271. 1878; Parkinson, *For. Fl. Andaman Islands* 155. 1923.

Trees. Leaflets 4-6 pairs, oblong-lanceolate, up to 22.5 x 4.5 cm, acute at apex, cuneate at base, entire. Flowers orange coloured changing red. Pods ovoid to oblong, up to 22.5 x 3.5 cm, shortly beaked at apex.

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

*Distr.*: South Andaman.

Planted for its beautiful flowers.

There has been a considerable confusion in literature about the name of this plant which was almost always referred to as *S.indica* L. It appeared, however, that the type specimen of *S.indica* L. collected by Kleynhoff in Java, belongs to a different species. The present species, in its original area confined to India and Myanmar west of the Irrawaddy River, is typified by a plant described by Roxburgh in 1799 from the botanical garden at Calcutta. In a note he observed that this plant has been introduced here from the interior. The holotype specimen, the description, and the accompanying figure leave no doubt about its proper identity. (Zuijderhoudt, *op.cit* p. 423).

## 12. *Tamarindus* L.

Trees, Leaves abruptly pinnate. Inflorescences racemes. Calyx tube turbinate, the two lowest teeth connate. Petals only the three upper developed and hooded, the two lower reduced to scales. Stamens monadelphous, only 3 developed, the others reduced to bristles. Ovary many-ovuled, style filiform, stigma capitate. Pods many-seeded, epicarp thin, crustaceous, mesocarp thick, pulpy.

1 species in tropical Africa (?), *T. indica* largely cultivated in the tropics for its edible fruit also occurs in A. & N. Islands.

1. ***Tamarindus Indica*** L., Sp. Pl. 34. 1753; Baker in Hook.f., Fl. Brit. 2: 273. 1878; Parkinson, For. Fl. Andaman Islands 155. 1923; Sanj., Legumes of India 36. 1992.

Trees, up to 10 m high; branchlets lenticellate, striate, greyish. Leaves paripinnate; leaflets 10-15 pairs, opposite, chartaceous, oblong, up to 2 x 0.5 cm, oblong, obtuse and mucronate at apex, obliquely rounded to cuneate at base, entire; lateral nerves 4-8 pairs. Inflorescences *ca* 15 cm long, axillary or terminal. Flowers yellow, streaked with red, *ca* 1.3 cm across. ovary and style pubescent. Pods oblong, up to 15 x 2 cm, shortly beaked at apex, constricted, brownish upon drying; seeds compressed, obovoid-orbicular, shining.

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

*Distr.*: Middle & South Andaman; North Nicobar.

Cultivated in sandy loam.

## MIMOSACEAE

About 58 genera & 3100 species mainly in tropics and sub-tropics, often in dry regions; 10 genera and 26 species in A. & N. Islands.

- |   |  |                         |
|---|--|-------------------------|
| 1 | a. Stamens definite, up to 10 per flower .....   | 2                       |
|   | b. Stamens indefinite, more than 15 per flower .....   | 4                       |
| 2 | a. Plants armed with prickles on internodes; leaves sensitive; inflorescences heads; sepals often 4-toothed; petals 4-lobed; stamens 4-8, anther without gland .....             | 6. <i>Mimosa</i>        |
|   | b. Plants unarmed; leaves not sensitive; inflorescences of spikeform racemes or spikes; sepals 5-toothed; petals 5; stamens 10, anthers with a gland on apex of connective ..... | 3                       |
| 3 | a. Erect trees without tendrils; leaflets alternate .....  | 2 <i>Adenanthera</i>    |
|   | b. Lianas or scandent shrubs with tendrils; leaflets opposite .....  | 5 <i>Entada</i>         |
| 4 | a. Stamens free .....  | 1 <i>Acacia</i>         |
|   | b. Stamens monadelphous .....  | 5                       |
| 5 | a. Flowers heteromorphic; pods straight .....  | 3 <i>Albizia</i>        |
|   | b. Flowers uniform; pods twisted .....   | 6                       |
| 6 | a. Stipules spinescent; seeds with an aril .....   | 7 <i>Pithecellobium</i> |
|   | b. Stipules unarmed; seeds without an aril .....   | 4 <i>Archidendron</i>   |

1. *Acacia* Mill.

Erect or scandent, usually armed shrubs or trees. Leaves bipinnate, rarely modified into phyllodes; leaflets paripinnate, opposite, entire. Inflorescences of globose heads or cylindrical spikes. Flowers usually 5-merous, bisexual or polygamous. Calyx campanulate or funnel shaped, shortly toothed. Petals exserted, united in the lower half. Stamens much exserted. Ovary stipitate or sessile, many ovuled, style filiform, stigma capitate. Pods ligulate or oblong, usually compressed and dry.

More than 1200 species occurring in tropical and subtropical regions; 7 species in A. & N. Islands.

- 1 a. Erect shrubs; stipules spinescent; internodes unarmed .....3. *A.farnesiana*
- b. Woody climbers or scandent shrubs; stipules unarmed; internodes armed with prickles .....2
- 2 a. Lateral veins of leaflets forming a reticulate pattern beneath .....3
- b. Lateral veins of leaflets not as above .....4
- 3 a. Leaflets rounded and mucronate-apiculate at apex, membranaceous; pods fleshy, wrinkled upon drying, venation inconspicuous .....2. *A.concinna*
- b. Leaflets rounded (rarely broadly acute) at apex, chartaceous; pods rigidly chartaceous, smooth, venation prominent .....1. *A. andamanica*
- 4 a. Petiolar gland at or above the middle of the petiole (flowering specimens); leaflets obtuse, straight .....4. *A. megaladena*
- b. Petiolar gland below the middle of the petiole, usually just above the basal pulvinous; leaflets sharply acute, apex often bent forwards.....5. *A.pennata*

1. *Acacia andamanica* Nielsen in *Adansonia* 2, 19: 354. 1980 & in Smitinand & Larsen, *Fl. Thailand* 4(2): 172. 1985; Sanj., *Legumes of India* 37. 1992. *A pseudo-intsia auct. non* Miq. 1855; Parkinson, *For. Fl. Andaman Islands* 159. 1923. *A. pseudo-intsia* Miq. var. *ambigua* Prain in *J.As.Soc. Bengal* 66(2): 249 & 511. 1897 non *A. ambigua* Hoffm.

Large scandent shrubs; branchlets pinkish - brown to blackish, finely ribbed, armed with sharp recurved, glossy and dark-coloured prickles. Leaf rachis armed with prickles below; leaflets 30-35 pairs, sessile, obliquely oblong, up to 1.8 x 0.5 cm, truncate at base; midrib shifted to one side giving an asymmetrical shape, lateral nerves 3-4 pairs. Panicles heads ca 30 cm long, heads ca 1 cm across, peduncles rusty-pubescent, armed with prickles. Flowers yellowish-white, creamy or yellow. Pods ca 16 x 2.5 cm, beaked, brown; seeds broadly ellipsoid.

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

*Distr.*: South & Little Andaman.

Rare in the inland forests along waysides and edges on sandy loam.

*Notes*: It differs from *A. pseudo-intsia* in having half hastate to half cordate stipules, petiolar gland in the lower half of petiole and concave, calyx tube glabrous and pods narrower.

2. **Acacia concinna** (Willd.) A.DC., Prodr. 2: 464. 1825; Baker in Hook.f., Fl. Brit. India 2: 296. 1878; Kurz, For. Fl. Brit. Burma 1: 423. 1877; Nielsen in Adansonia 2, 19: 348. 1980 & in Opera Bot. 81: 12. 1985; Sanj., Legumes of India 38. 1992. *Mimosa concinna* Willd., Sp. Pl. 4: 1039. 1806. *Acacia concinna* var. *rugata* (Buch Ham. ex Bth.) Baker in Hook.f., *op.cit.* 297.

Large scandent shrubs; stems and branches armed with numerous recurved prickles, young shoots shortly pubescent. Leaf-rachis armed or back with recurved prickles; leaflets 10-20 pairs, sessile, linear-oblong, up to 1.2 x 0.35 cm, asymmetrically rounded at apex, truncate at base. Heads *ca* 7.5 mm across, peduncles sparingly pubescent or densely pubescent, arising solitary, or 2-3 from axils of leaves or from above scars of fallen leaves. Flowers yellowish. Pods up to 10 x 2 cm, blunt with a thick point towards apex, tapering at base, slightly torose; seeds rather compressed, black.

*Fl.*: March - April & *Fr.*: November - January.

*Distr.*: North & South Andaman.

A few in the tropical and moist upper mixed forests.

3. **Acacia farnesiana** (L.) Willd., Sp. Pl. 4: 1083. 1806; Baker in Hook. f., Fl. Brit. India 2: 292. 1878; Parkinson, For. Fl. Andaman Islands 159. 1923; Sanj., Legumes of India 39. 1992. *Mimosa farnesiana* L., Sp. Pl. 521. 1753. *Vachellia farnesiana* (L.) Wight & Arn., Prodr. 272. 1834; Vasud. in J.Econ. Tax. Bot. 8: 163. 1986.

Shrubs or small trees, up to 4 m high; branchlets lenticellate, greyish to rarely blackish. Stipular spines *ca* 3 cm long, straight. Leaf-rachis sparsely armed with spines, pubescent to glabrescent; leaflets 10-20 pairs, sessile, chartaceous, linear boat shaped, up to 5 x 2 mm, acute at apex, broadly truncate at base; lateral nerves obscure. Panicked heads *ca* 7 mm long silky pubescent peduncles. Flowers whitish. Pods up to 7.5 x 2 cm, pointed at both ends; seeds ellipsoid.

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

*Distr.*: South Andaman.

Cultivated. Also seen as an escape in edges of forests on rocky loam.

4. *Acacia megaladena* Desv. in J. Bot. 1: 69. 1814, Brenan & Exell, Bol. Soc. Brot. 2, 31: 102. 1957; Nielsen in Adansonia 2, 19: 350. 1980 & in Opera Bot. 81: 25. 1985, Sanj., Legumes of India 41. 1992. *A. pennata* var. *arrophula* (D. Don) Baker in Hook. f., Fl. Brit. India 2: 298. 1878.

Lianas. Stipules puberulous to woolly. Leaflets 19-81 pairs, ciliate, asymmetrically oblong, up to 7.5 x 1.5 mm, truncate at base. Heads ca 7 mm across in panicles. Pods up to 15 x 2.5 cm, acuminate at both ends, dark reddish-brown, dehiscing along both sutures; seeds ovoid-ellipsoid to ellipsoid, flat, brown.

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

*Distr.*: South Andaman.

Scattered.

*Notes*: This species is often merged with *A. pennata* by many authors but according to Brenan & Exell (1957) and Nielsen (1980), the differences in leaflet shape and the position of the petiolar gland are so distinctive that *A. megaladena* is to be regarded as distinct species. The leaves have a shorter rachis in fruiting specimens than in flowering ones.

5. *Acacia pennata* (L.) Willd., Sp. Pl. 4: 1090. 1806; Baker in Hook. f., Fl. Brit. India 2: 297. 1878; Parkinson, For. Fl. Andaman Islands, 159. 1923; Nielsen in Adansonia 2, 19: 352. 1980 & in Opera Bot. 81: 18. 1985 (as subsp. *pennata*); Sanj., Legumes of India 42. 1992 (as subsp. *pennata* var. *pennata*). *Mimosa pennata* L., Sp. Pl. 522. 1753.

Scandent shrubs; branchlets pale whitish, armed with many sharp slightly recurved prickles. Leaf-rachis silky-pubescent, armed with prickles; leaflets 35-40 pairs, sessile, chartaceous, linear, obliquely truncate at base; lateral nerves 4-5 pairs, obscure. Panicked heads ca 20 cm long, heads cream-coloured or yellowish, ca 1 cm across borne on ca 1.5 cm long silky pubescent peduncles. Pods up to 15 x 2 cm, shortly beaked at apex, brownish to blackish.

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

*Distr.:* North & South Andaman.

Rare in the inland forests near nallahs and streams.

*Cultivated species:*

6. ***Acacia auriculiformis*** A. Cunn. ex Bth. in Hook., London J. Bot. 1: 377. 1842; Sen & Naskar in Bull. Bot. Surv. India 7: 31. 1968; Sanj., Legumes of India 45. 1992.

Trees, up to 10 m high; branchlets angular, brownish or blackish. Leaves apparently simple modified to phyllodes, phyllodes subcoriaceous to coriaceous, falcate, up to 18 x 3 cm, bluntly acute at apex, cuneate and decurrent at base. Spikes axillary, ca 5 cm long. Flowers yellowish. Pods ca 8 x 0.5 cm, irregularly twisted in shape.

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

*Distr.:* South Andaman; South Nicobar.

Introduced by social forestry along way sides and forest edges.

7. ***Acacia nilotica*** (L.) Delile ssp. ***indica*** (Bth.) Brenan in Kew Bull. 12: 84. 1957; Sanj., Legumes of India 42. 1992. *A. arabica* (Lam.) Willd. var. *indica* Bth. in Hook., London J. Bot. 1: 500. 1842. *A. arabia auct. non* (Lam.) Willd. 1805; Baker in Hook.f., Fl. Brit. India 2: 293. 1878.

Trees, up to 3 m high; branchlets straight, finely grey - downy. Spines up to 5 cm long, white. Leaf-rachis downy with many glands; Leaflets 20-40, membranous, glabrous or rather downy, up to 6 mm long. Heads yellow ca 1.2 cm across, axillary. Pods ca 19 x 1.5 cm, rigidly coriaceous, densely persistently grey-downy, 8-12-seeded, distinctly stalked.

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

*Distr.:* South Andaman.

Planted in Ross Island.

## 2. *Adenanthera* L.

Trees; young branches and inflorescence axes mostly puberulous, or tomentose with simple hairs. Leaves bipinnate, distichous; leaflets distichous, chartaceous, often asymmetric, slightly unequal sided, entire. Inflorescences many-flowered, found at end of young branches. Calyx connate and minute. Petals shortly united at base. Stamens free. Ovary inconspicuously stalked, style terminal, often curved, stigma porate. Epicarp of fruit with 2 longitudinal fissures at dehiscence; seeds bright red monochrome or dichrome with a black apical spot.

12 species restricted to tropical Asia, Australia and Melanesia; 2 species in A. & N. Islands.

- 1 a. Calyx 0.8 -1 mm long; petals 3-5 mm long; ovary glabrous or with a few scattered hairs only; style *ca.* as long as ovary; pods straight prior to dehiscence; seeds 8-9.5 x 7-9.5 mm .....2. *A. pavonina*
- b. Calyx 0.5 - 0.75 mm long; petals 2.5 -3.5 mm long; ovary densely sericeous; style shorter than ovary; pods densely spirally contorted before dehiscence; seeds 5.5 - 7 x 4.5 - 7 .....1. *A. microsperma*

1. *Adenanthera microsperma* Teijsm. & Binn., Nat. Tijdschr N.I. 27 58. 1864, Nielsen & Guinet in Nord. J. Bot. 12: 112. 1992. *A. pavonina* var. *microsperma* (Teijsm. & Binn.) Nielsen in Adansonia 2, 19: 341. 1980; Sanj., Legumes of India 54. 1992.

Trees, up to 10 m high; branchlets blackish or pinkish-brown, sometimes striate. Leaflets 3-8 pairs, chartaceous, drying blackish-brown above and light green to greyish beneath, oblong to elliptic-oblong, up to 2 x 1.5 cm, rounded at apex, often mucronulate, cuneate at base; lateral nerves 4-7 pairs. Inflorescences up to 30 cm long (incl. peduncle). Flowers yellowish-white, *ca* 4 mm across. Pods linear, *ca* 10 x 1 cm, brownish, 6-10 seeded.

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

*Distr.*: North & South Nicobar.

Scarce in scrub and evergreen forests.

*Notes:* Nielsen (*l.c.*) included it in *A. pavonina* as a variety. Sanjappa (*l.c.*) followed this treatment. Nielsen's change in his concept of this species is due to the fact that he had the opportunity to study all the species of the genus. Indumentum, flower, pod and seed characters are different in *A. microsperma* (Nielsen & Guinet, *l.c.*).

Trees, 15-24 m high; branchlets blackish, leaflets 4-9 pairs, oblong, up to 3 x 1.5 cm, obtuse at apex, often mucronulate, broadly cuneate at base; lateral nerves 4-9 pairs, obscure. Inflorescences *ca* 20 cm long (incl. peduncle). Flowers yellow to yellowish-orange, *ca* 4 mm across. Pods linear-falcate, up to 20 x 1.5 cm, curved and twisted upon drying with up to 25 seeds.

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

*Distr.:* South Andaman; North Nicobar.

Rare in the inland/scrub forests.

### 3. *Alhizia Durazz.*

Large trees. Leaves bipinnate; leaflets paripinnate, opposite, entire. Flowers in globose heads, usually pentamerous, bisexual. Calyx campanulate or funnel shaped, distinctly toothed. Corolla funnel shaped, petals firmly united below middle. Ovary sessile or subsessile, style filiform, stigma capitate. Pods flat, compressed, continuous within.

About 100-150 species, pantropical in distribution; 6 species in A. & N. Islands of which 1 species may be of doubtful occurring.

- |   |   |                     |
|---|---|---------------------|
| 1 | a. Flowers pedicellate .....  | 2                   |
|   | b. Flowers sessile .....  | 3                   |
| 2 | a. Leaves with a gland <i>ca.</i> 1.5 cm above the base of the main petiole; peduncles 2 or more together in the axils of terminal leaves but not collected in panicles; calyx funnel shaped, puberulous; ovary sessile; pods dehiscent ..... | <i>2.A. lebbeck</i> |
|   | b. Leaves with a gland <i>ca.</i> 5 mm above the base of the main petiole; peduncles 2-5 together in fascicles and collected in terminal panicles; calyx tubular, glabrous; ovary shortly stipitate; pods indehiscent .....                   | <i>5.A. retusa</i>  |

- 3 a. Stipules auriculate; leaflets sessile, acute at apex; ovary sessile; pods indehiscent .....1 *A. chinensis*  
 b. Stipules inconspicuous or filiform; leaflets shortly petiolulate, obtuse, rounded, often mucronate at apex; ovary shortly stipitate; pods dehiscent .....4
- 4 a. Pods collected in terminal panicles; heads with dimorphic flower, staminal tube as long as corolla tube; ovary puberulous to tomentose .....3 *A. odoratissima*  
 b. Peduncles collected in axillary panicles; heads with uniform flowers; staminal tube longer than corolla-tube; ovary glabrous .....4 *A. procera*

1. ***Albizia chinensis*** (Osb.) Merr. in Amer. J. Bot. 3: 575. 1916; Nielsen in *Adansonia* 2, 19: 221. 1979 & in *Opera Bot.* 81: 40. 1985; Sanj., *Legumes of India* 54. 1992 (as var. *chinensis*). *Mimosa chinensis* Osb., *Dagbok Ostind. Rasa* 233. 1757. *Albizia stipulata* (Roxb.) Boiv., *Encycl.* 19, siecle 2: 33. 1838; Baker in Hook.f., *Fl. Brit. India* 2: 300. 1878; Parkinson, *For. Fl. Andaman Islands* 160. 1923.

Trees, 6-30 m high; branchlets lenticellate, coppery brown to greyish-brown. Leaf-rachis pubescent; leaflets 25-45 pairs, chartaceous, linear-oblong, up to 1.5 x 0.4 cm, obliquely cuneate at base; lateral nerves 5-6, obscure. Heads ca 4.5 cm across borne on ca 1.5 cm long peduncles. Flowers white or creamy, ca 5 mm across. Pods linear-oblong, up to 1.5 x 2 cm chartaceous, shortly beaked, dull pale-brown, seeds ellipsoid, flat.

*Fl. & Fr.*: February-July (also fruiting December-February).

*Distr.*: Middle & South Andaman; North Nicobar.

Common along forest edges and along streams.

2. ***Albizia lebbeck*** (L.) Bth. in Hook., *London J. Bot.* 3: 81. 1844 *p.p.* ('*lebbeck*') & *Trans. Linn. Soc.* 30: 562. 1875 *p.p.*; Baker in Hook.f., *Fl. Brit. India* 2: 298. 1878; Parkinson, *Flor. Fl. Andaman Islands* 160. 1923; Nielsen in *Adansonia* 2, 19: 220. 1974 & in *Opera Bot.* 81: 30. 1985; Sanj., *Legumes of India* 56. 1992 *Mimosa lebbeck* L., *Sp. Pl.* 516. 1753.

Trees, 8-30 m high, bark white; branchlets lenticellate, greyish. Leaflets 5-9 pairs, chartaceous, obliquely obovate or elliptic-oblong, up

to 4.5 x 3 cm, obtuse or emarginate at apex, cuneate or rounded at base; lateral nerves 5-7 pairs. Flowers silky-white turning pale yellow. Pods linear-oblong, up to 30 x 5.2 cm, straw-coloured; seeds ellipsoid, flat.

*Fl. & Fr.*: February-May (also fruiting August-September/November-February).

*Distr.*: Andaman islands.

Common in the deciduous forests.

3. *Albizia procera* (Roxb.) Bth. in Hook., London J.Bot. 3: 89. 1844; Baker in Hook.f., Fl. Brit. India 2: 299. 1878; Brandis, Ind. Trees 271., 1906; Parkinson, For.Fl. Andaman Islands 161. 1923; Nielsen in Adansonia 2, 19: 223. 1979 & in Opera Bot. 81: 38. 1985; Sanj., Legumes of India 58. 1982. *Mimosa procera* Roxb., Pl. Corom. 2: 12, t. 121. 1799. *Albizia procera* var. *elata* (Roxb.) Baker in Hook.f., *op.cit.* 299.

Large trees; bark pale-brown, smooth; branchlets pinkish-brown, lenticellate. Leaflets 6-12 pairs, chartaceous, dark green and glabrous above, pale with scattered hairs beneath, obliquely ovate to ovate-oblong, up to 4.5 x 2.5 cm, rounded to cuneate at base. Heads ca 2 cm across. Flowers yellowish-white. Pods linear-oblong, up to 20 x 2 cm, bright reddish-brown glossy; seeds 6-12, obovoid-ellipsoid.

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

*Distr.*: North Andaman (Parkinson, *l.c.*)

Found growing near river-sides and in moist places.

4. *Albizia retusa* Bth. in Hook., London J.Bot. 3: 90. 1844; Nielsen in Adansonia 2, 19: 221. 1979 & in Opera Bot. 81: 30. 1985; Sanj., Legumes of India 58. 1992. *A. littoralis* Teijsm & Binn., Natuurk. Tijdsch. Ned. India 29: 259. 1866; Prain in J.As. Soc. Bengal 66: 257. 1898.

Small trees; branchlets terete. Leaflets 4-6 pairs, chartaceous, sparsely puberulous on both sides, obovate or oblong, up to 3.7 x 2 cm, obtuse at

apex, cuneate at base. Inflorescences ca 12 cm long; heads white, ca 1.2 cm long. Flowers ca 4 mm across.

*Fl.*: March-April.

*Distr.*: North Nicobar.

Rare.

There are two sheets at CAL from Nancowry hill jungle, collected on 28.3.1894 by *Dr. King's collector* in flowers. D. Prain's comments 'The leaves are narrower than that of *A. lebeck*. Jelinck previously collected this in the Nicobar and Kurz says it is *A. littoralis* Teijsm. & Binn. Kurz did not find it himself.'

#### Doubtful species

5. ***Albizia odoratissima*** (L.f.) Bth. in Hook, London J. Bot. 3: 88. 1844; Baker in Hook.f., Fl. Brit. India 2: 299. 1878; Nielsen in Adansonia 2, 19: 225. 1979 & in Opera Bot. 81: 48., 1985; Sanj., Legumes of India 57. 1992. *Mimosa odoratissima* L.f., Suppl. Pl. 437. 1781. *Albizia odoratissima* var. *mollis* Bth. ex Baker in Hook. f., Fl. Brit. India 2: 299. 1878.

Trees, up to 40 m high. Leaflets 10-16 pairs, up to 3.5 x 1.2 cm, broadly oblong, oblique at base; lateral nerves prominent. Peduncles collected in puberulous to tomentose terminal panicles. Pods up to 22 x 3.5 cm, chartaceous, with distinct marks over seeds; seeds ovoid, flat.

*Distr.*: Andaman Islands (Vasud. in J. Econ. Tax. Bot. 8: 124. 1986; Sanj., *op.cit*)

There are no collections of this species from Andaman at PBL & CAL. The occurrence of this species will be confirmed from these islands only if fresh collections are made.

#### *Cultivated species :*

6. ***Albizia falcataria*** (L.) Fosberg in Reinwardtia 7: 88. 1965 *excl. A falcata* (L.) Backer; Sanj., Legumes of India 59. 1992. *Adenanthera*

*falcataria* L., Sp. Pl. ed. 2. 550. 1762 based on *Clypearia rubra* Rump. Herb. Arb. 3: 176, t. 111. 1743.

*Distr.*: Andaman & Nicobar Islands (Vasud. in J.Econ. Tax. Bot. 8: 163. 1986).

#### 4. *Archidendron* F. Muell

Unarmed trees or shrubs. Leaves bipinnate, often with glands on petiole, rachis and pinnae; leaflets opposite, entire. Flowers collected in heads, umbels, corymbs or racemes, the heads may be arranged in panicles; flowers bisexual or unisexual, (3)-5 merous. Calyx gamosepalous. Corolla gamopetalous. Stamens united into a tube at the base. Ovaries 1-: several per flower. Pods dehiscent, most often reddish outside and orange-reddish inside; seeds flattened with a black or bluish-black testa.

The genus *Archidendron* is extended to comprise all the species formerly included in *Pithecellobium* sect *Clypearia* and *Abarema* sensu Kosterm, *Cylindrokelupha* Kosterm, *Paralbizia* Kosterm. and *Zygia* sensu Kosterm. (Nielsen, 1979).

About 100 species distributed from India to New Guinea and N.Australia; 4 species in A. & N. Islands.

- 1 a. Branchlets distinctly angular to winged, puberulous to tomentose; upper leaflets faintly puberulous above, faintly puberulous to tomentose below; pods puberulous to tomentose .....2*A. clypearia*
- b. Branchlets terete, glabrous; leaflets glabrous on both sides; pods glabrous .....2
- 2 a. Pinnae mostly 1 pair; leaflets unequal at base; flowers white; calyx minutely puberulous; corolla lobes subpuberulous to glabrous outside; ovary pilose; pods black or reddish-brown when dry .....1*A. bigeminum*
- b. Pinnae 2 pairs with the proximal pair much abbreviated; leaflets mostly symmetric at base; flowers pale yellow or creamy; calyx faintly sericeous; corolla lobes sericeous; ovary glabrous; pods yellowish when dry .....3*A. elliptica*

1. ***Archidendron bigeminum* (L.) Nielsen** in Opera Bot. 76: 73. (1984) 1985; Gang. & T. Chakrab. in J.Econ. Tax. Bot. 17: 684. 1993. *Mimosa bigemina* L., Sp. Pl. 1: 517. 1753. *Pithecellobium* (as

'*Pithecolobium* ') *bigeminum* (L.) Mast. in Flora 20 (2): Beibl. 8: 115. 1837 in Obs. ex Bth. in Hook., London J.Bot. 30: 206. 1844; Baker in Hook. f., Fl. Brit. India 2: 303. 1878. *P. oppositum* Kurz in J.As. Soc. Bengal 45(3): 129. 1876, non Miq. 1861; Prain in J.As. Soc. Bengal 66(2): 515. 1897. *P. nicobaricum* Prain, *op.cit.* 66(2): 267, 516. 1897. *P. monadelphum* (Roxb.) Kosterm. in Reinwardtia 3: 11. 1954. *Abarema monadelpha* (Roxb.) Kosterm. *emend.* Natuurw. Onderz Indonesie 20: 54. *A. bigemina* (L.) Kosterm, *op.cit.* 51, f. 34-35. 1954. *Archidendron monadelphum* (Roxb.) Nielsen in Adansonia 2, 19(1): 21. 1979.

Trees, up to 6 m high; branchlets lenticellate, striate or finely ribbed, greyish-brown; leaflets 2 pairs, chartaceous to sub-coriaceous, elliptic to elliptic-lanceolate or broadly ovate-lanceolate, up to 13 x 3 cm, acuminate at apex, cuneate to broadly rounded at base; lateral nerves 7-14 pairs. Panicles axillary, ca 10 cm long. Flowers ca 5 mm across. Pods up to 9 x 1.5 cm, curved into a spiral in one plane, flattened, 5-4 seeded.

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

*Distr.*: North Nicobar.

Rare in the inland forests on loamy soil at low altitudes.

2. ***Archidendron clypearia*** (Jack) Nielsen in Adansonia 2, 19: 15. 1979; Nielsen *et al.* in Opera Bot. 76: 52. 1984; Sanj., Legumes of India 60. 1992; Gang, & T. Chakrab. in J.Econ. Tax. Bot. 17. 686. 1993. *Inga clypearia* Jack in Malay Misc. 2 (7): 78. 1822. *Pithecellobium clypearia* (Jack) Bth. in Hook., London J.Bot. 3: 209. 1844; Baker in Hook.f., Fl. Brit. India 2: 305. 1878. *Abarema clypearia* (Jack) Kosterm. in Bull. Org. Natuurw. Onderz Indonesie 20: 42. 1954 *p.p. ex cl. syn. Mimosa nodosa* Lowr. non L. *Pithecellobium angulatum* Bth., *op.cit.* 208, Baker in Hook. f., *op.cit.* 2: 305. 1878; Parkinson, For Fl. Andaman Islands 161. 1923. *Abarema angulata* (Bth.) Kosterm., *op. cit.* 20: 47. 1954. *A. clypearia* var. *angulata* (Bth.) Kosterm. in Adansonia 2, 6: 353. 1966.

Trees, up to 10 m high; branchlets blackish to pale brownish or brownish. Leaflets 2-10 pairs, coriaceous, elliptic, ovate or ovate-lanceolate, up to 14 x 6.5 cm, acuminate at apex, asymmetrically cuneate

or rounded-truncate at base; lateral nerves 5-13 pairs. Panicles terminal, up to 30 cm long, pubescent. Flowers creamy or yellowish-white, white or greenish, 3-5 mm across. Pods up to 12 x 2 cm, compressed, spirally twisted, coriaceous; seeds ellipsoid to globose, up to 1.2 cm across.

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

*Distr.*: Middle & South Andaman; North & South Nicobar.

Common in the inland forests or edges of forests (usually in damp and open places along stream sides) on clayey loam up to 100 m altitude and also along road sides in Great Nicobar.

3. *Archidendron ellipticum* (Bl.) Nielsen in *Adansonia* 2, 19: 21. 1979; Nielsen et al. in *Opera Bot.* 76: 68. 1984 (as subsp. *ellipticum*); Sanj., *Legumes of India* 60. 1992; Gang. & T. Chakrab. in *J. Econ. Tax. Bot.* 17: 689. 1993. *Inga elliptica* Bl., *Cat.* 88. 1823. *Pithecellobium fasciculatum* Bth. in Hook., *London J. Bot.* 3: 208. 1844; Baker in Hook. f., *Fl. Brit. India* 2: 304. 1878. *P. ellipticum* (Bl.) Hassk. *Retzia* 225, 236. 1855; Prain in *J. As. Soc. Bengal* 66(2): 270, 516. 1897. *Abarema elliptica* (Bl.) Kosterm. in *Bull. Org. Natuurw. Orderz Indonesie* 20: 53. 1954.

Trees, up to 8 m high; branchlets pale yellowish to greyish-brown, lenticellate. Leaflets 3-8 pairs, coriaceous, drying blackish-brown above and olive green below, variable, oblong, obovate, oblanceolate, broadly ovate to ovate-lanceolate or elliptic-oblong, up to 25 x 9 cm, shortly acuminate to acute at apex, rounded to broadly or obliquely cuneate at base; lateral nerves 5-8 pairs. Panicles terminal, up to 40 cm long, rusty-pubescent. Pods up to 9 cm across, spirally twisted, forming a complete ring, valves dehiscing along both sutures; seeds ellipsoid, ca 2 x 1.5 cm.

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

*Distr.*: North & South Nicobar.

Common in the inland forests on hill slopes or disturbed forest edges at low altitudes.

*Cultivated species :*

4. **Archidendron bubalinum** (Jack) Nielsen in *Adansonia* 2, 19(1): 16. 1979; Nielsen *et al.* in *Opera Bot.* 76: 50. 1984; Gang. & T. Chakrab. in *J. Econ. Tax. Bot.* 17: 691. 1993. *Inga bubalina* Jack, *Malay Misc.* 2: 771. 1822.

Trees, up to 8 m high, lenticelled, ribbed, greyish-brown. Leaflets 2 pairs, coriaceous, elliptic to broadly obovate, up to 10 x 4.5 cm, shortly acuminate or acute at apex, cuneate at base; lateral nerves 7-11 pairs. Panicles terminal, ca 7 cm long. Flowers white or pale yellow, ca 3 mm across. Pods (immature) curved, flattened, thin, black outside.

*Fl.*: January-February.

*Distr.*: South Andaman.

Cultivated in Port Blair. Perhaps introduced from Malaysia during pre independence period.

### 5. **Entada** Adans. (*nom. cons.*)

Lianas or scandent shrubs. Leaves bipinnate; leaflets paripinnate, entire. Flowers polygamous. Calyx minute, campanulate. Stamens free. Ovary sessile many ovuled, style filiform, stigma concave terminal. Pods flat, woody with many 1-seeded joints; seeds orbicular.

30 species distributed in tropical America and Africa to Australia; 1 species in A & N Islands.

1. **Entada rheedel** Spr., *Syst. Veg.* 2: 325. 1825; *Panigr.* in *Taxon* 34: 714. 1985 (as *ssp. rheedel*); Sanj., *Legumes of India* 66. 1992 (as *ssp. rheedel*). *E. pursaetha* DC., *Prodr.* 2: 425. 1825; Brenan in *Kew Bull.* 1955: 164. 1955. *E. monostachya* DC., *Prodr.* 2: 425. 1825 & *Mem. Leg.* 421. 1826 *nom. superfl.*; Subhedar in *J. Bombay Nat. Hist. Soc.* 82: 234. 1985. *E. scandens auct. non* Bth. 1841; Baker in *Hook f., Fl. Brit. India* 2: 287. 1878 *p.p.*; Parkinson, *For. Fl. Andaman Islands* 158. 1923. *E. phascoloides* (L.) Merr., *Philipp. J. Sci. Bot.* 9: 86. 1914; Brenan, *op. cit.* 164.

Lianas; branchlets lenticellate or not, ribbed, pinkish-brown or greyish-brown. Leaflets 2-8 pairs, subcoriaceous to coriaceous, elliptic, up to 9 x 3.5 cm refuse or rounded to rarely acuminate at apex, broadly cuneate at base; lateral nerves 4-15 pairs. Spikes axillary up to 25 cm long. Flowers pale yellow or yellowish-white, ca 4.5 mm across. Pods oblong, up to 120 x 10 cm, thickened along edges, depressed and constricted between seeds; seeds up to 5 cm across, chocolate red.

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

*Distr.*: North, Middle & South Andaman; North Nicobar.

Abundant in the islands and is found in nearly all localities both in the interior and sea shores.

## 6. *Mimosa* L.

Shrubs or herbs. Leaves bipinnate; leaflets paripinnate, opposite, entire. Flowers sessile, polygamous. Calyx campanulate, shortly toothed. Petals connate towards base. Filament much exerted, free. Ovary stipitate, many-ovuled, style filiform, stigma minute, terminal. Pods stipitate, oblong, flat, thin, made up 1-seeded joints that separate when mature from sutures.

About 450-500 species in tropical and subtropical America, few in Africa & Asia; 2 species in A. & N. Islands.

- 1 a. Leaves pinnately compound; pinnae 4-1 pairs; leaflets with scattered hairs on both surfaces; ovary inconspicuously puberulous ..... *M. invisa*  
 b. Leaves subdigitately compound; pinnae 1-2 pairs; upper surface of leaflets glabrous, lower surface and margins faintly hispid; ovary glabrous .....  
 ..... *M. pudica*

1. *Mimosa invisa* Mart. ex Colla, Herb. Pedom 2: 255. 1834; Sanj., Legumes of India 68. 1992

Scandent or prostrate shrubs, up to 1 m high; branchlets broadly quadrangular, pubescent, pinkish-brown, armed with 4 rows or recurved prickles. Leaf-rachis hirsute, armed with 4 rows of recurved prickles on internodes and stipellate thorns at bases of pinnae; leaflets 12-21 pairs, chartaceous, oblong, up to 5 x 1.5 mm, broadly rounded or acute at apex,

broadly rounded at base; midrib and lateral nerves inconspicuous. Heads ca 8 mm across. Flowers pinkish.

*Fl.*: March-April.

*Distr.*: Middle & South Andaman.

Common in wastelands, waysides along with secondary vegetation.

2. **Mimosa pudica** L., Sp. Pl. 518. 1753; Baker in Hook.f., Fl. Brit India 2: 291. 1878; Sanj., Legumes of India 69. 1992.

Prostrate herbs up to 60 cm high; branches pale brownish, armed with prickles. Leaflets 12-25 pairs, chartaceous, linear-oblong, up to 7 x 2 mm, acute at apex, slightly obliquely rounded at base. Heads ca 1 cm across. Flowers pinkish. Pods several, ca 1.5 x 0.4 cm, straight with setose margins, brownish.

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

*Distr.*: Andaman; North Nicobar.

Common weed in wastelands, waysides, grasslands, etc.

It is a native of tropical America.

### 7. *Pithecellobium* Mart. (*nom. cons.*)

Trees or shrubs. Leaves bipinnate, mostly with glands on petiole, rachis and pinnae; leaflets opposite, entire. Inflorescences of flowers in pedunculate heads or spikes, axillary or arranged in terminal or axillary panicles. Flowers bisexual. Calyx gamosepalous. Corolla gamopetalous. Filaments united into a tube. Ovary 1, stalked. Pods irregularly or regularly dehiscent.

About 15 species in Sri Lanka, Thailand, S. Vietnam and C. & S. America; 1 species in A. & N. Islands.

1. **Pithecellobium dulce** (Roxb.) Benth. in Hook., London J. Bot. 3: 213. 1844 (*Pithecolobium*); Baker in Hook, f., Fl. Brit. India 2: 302. 1878; Parkinson, For. Fl. Andaman Islands 161. 1923; Kosterm. in Bull. Org.

Natuurw. Orderz. Indonesie 20: 8. 1954; Nielsen in *Adansonia* 2, 19: 34. 1979. *Mimosa dulcis* Roxb., *Pl. Corom.* 1: 67, t. 99. 1798.

Trees, up to 10 m high; branchlets minutely lenticellate, ribbed, greyish. Leaflets 1 pair, coriaceous, elliptic to broadly obovate, up to 3.5 x 1.8 cm, rounded at apex, obliquely cuneate at base; lateral nerves 6-10 pairs. Panicles up to 25 cm long, pubescent. Flowers white, ca 4 mm across. Pods ca 4 cm across, rusty pubescent when young; seeds black.

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

*Distr.*: North & South Andaman; North Nicobar.

Cultivated in Port Blair as a shade tree and also trimmed as a hedge plant along roadsides and may also be seen as an escape.

*Cultivated species* :

### 8. *Leucaena* Benth.

Unarmed erect trees. Leaves bipinnate; leaflets opposite. Inflorescences of dense globose heads. Flowers sessile, 5-merous. Calyx cylindrical-campanulate, shortly toothed. Petals free. Stamens free, much exerted. Ovary stipitate, many-ovuled, style filiform, stigma minute, terminal. Pods flat, strap-shaped, dehiscent.

About 50 species in tropical America, 1 pantropical, 1 in Polynesia; 1 species in A. & N. Islands.

1. *Leucaena latisiliqua* (L.) Gillis in *Taxon* 23: 190. 1974; Sanj., *Legumes of India* 67. 1992. *Mimosa latisiliqua* L., *Sp. Pl.* 519. 1753. *Leucaena leucocephala* (Lam.) de Wit in *Taxon* 10: 54. 1961; Polhill & Stearn in *Taxon* 25: 323. 1976. *L. glauca* (Willd.) Bth. in *Hook.*, *London J. Bot* 4: 416. 1842; Baker in *Hook. f.*, *Fl. Brit. India* 2: 290. 1878.

Trees, up to 3 m high; branchlets minutely lenticellate, blackish or greyish. Leaflets ca 20 pairs, chartaceous, linear-oblong, up to 1.2 x 0.3 cm, acute at apex, obliquely cuneate at base; lateral nerves obscure. Heads terminal, paniced, puberulous. Flowers pale yellow, ca 2 mm across. Pods up to 15 x 1.2 cm, membranous; seeds narrowly ovoid.

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

*Distr.*: South Andaman; North Nicobar.

Cultivated in gardens, waysides.

### 9. *Prosopis* L.

Armed trees or shrubs with scattered prickles. Leaves bipinnate; leaflets opposite, entire. Inflorescences of narrow spikes or subspicate racemes. Flowers minute, polygamous, 5-merous. Calyx campanulate, subentire or faintly 5-toothed. Petals ligulate, subcoherent at base. Stamens free, anthers crowned with gland. Ovary stipitate, many-ovuled, style filiform, stigma minute, terminal. Pods turgid septate mesocarp spongy.

About 44 species cosmopolitan in the tropics; 1 species in A. & N. Islands.

1. *Prosopis julifera* (Swartz) DC., Prodr. 2: 447. 1825; Burket in J. Arnold Arbor. 57: 499. 1976; Sanj., Legumes of India 72. 1992. *Mimosa julifera* Swartz, Prodr. 85. 1788.

Small trees or shrubs, up to 5 m high; branchlets lenticellate, striate, greyish. Leaflets many, sessile to subsessile, chartaceous, linear-oblong, up to 2 x 0.5 cm, mucronate at apex, rounded at base; lateral nerves 3-5 pairs. Spikes ca 10 cm long, fascicled. Flowers yellowish-green, ca 2.5 mm across.

*Fl.*: September - October.

*Distr.*: South Andaman; North Nicobar.

Cultivated along roadsides, and in rural areas.

### 10. *Samanea* (DC.) Merr.

Trees. Leaves bipinnate; leaflets opposite, entire. Flower heads in terminal or axillary corymbose racemes. Calyx-tube elongate. Petals basally united. Stamens numerous, monadelphous. Ovary stipitate. Pods slightly twisted, woody, indehiscent; seeds 2-seriate.

About 20 species distributed from Mexico to tropical S. America to Africa; 1 species in A. & N. Islands.

1. *Samanea saman* (Jacq.) Merr. in Wash. Acad. Sci. 6: 47, 1916; Sanj., Legumes of India 72, 1992. *Mimosa saman* Jacq. Fragn. Bot. 15, t. 9, 1800-1809. *Pithecellobium saman* (Willd.) Bth. in Hook., London J. Bot. 3: 216, 1844. *Enterolobium saman* (Jacq.) Prain in J.As. Soc. Bengal 66(2): 252, 1897; Parkinson, For. Fl. Andaman Islands 161, 1923.

Trees, up to 30 m high; branchlets lenticellate, striate, blackish, golden-pubescent when young, later glabrous. Leaf-rachis golden-pubescent when young, later glabrous; leaflets 5-6 pairs, sessile, coriaceous, golden-pubescent when young, obliquely obovate to broadly oblong, up to 5.5 x 3 cm, obtuse and mucronate at apex, broadly to obliquely cuneate at base; lateral nerves 5-9 pairs. Heads ca. 4 cm across. Flowers white tinged with pink. Pods linear-oblong, up to 16 x 0.5 cm, blackish, slightly constricted between seeds with woody lateral margin; seeds ellipsoid, ca 9 x 5 cm.

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

*Distr.*: South Andaman; North Nicobar.

Planted along roadsides, edges of scrub forests and else where.

## ROSACEAE

(L.N. Ray)

About 100 genera and 2000 species, cosmopolitan in distribution; 3 species in A. & N. Islands.

- 1 a. Fruit oblong, but not a drupe, coriaceous, 1-seeded ..... 1. *Parastemon*
- b. Fruit globose, drupe-like with 1-several stones ..... 2
- 2 a. Branches with straight or hooked prickles, drupelets many, 1-seeded .....  
..... 2. *Rubus*
- b. Branches without prickles; drupe 1, with one stone, hard, bony ... 3. *Prunus*

### 1. *Parastemon* DC.

Shrubs or small trees. Leaves simple, alternate, evergreen, entire. Flowers polygamo-dioecious, racemose, spicate. Calyx tube shortly campanulate, lobes 5, imbricate. Petals 5, oblong, deciduous. Stamens 2, perfect, unilateral. Carpels 1, adnate to one side of the calyx tube. Fruit oblong, coriaceous, 1-seeded indehiscent.

Species 2, Indo-Malayan; 1 in A. & N. Islands.

*Parastemon urophyllus* DC. in Ann. Sci. Nat. Ser. 2, Bot. 18. 208. 1842; Hook.f., Fl. Brit. Ind. 2: 312. 1878; Ridley, Fl. Mal. Pen. 1: 672. 1922.

Small evergreen trees. Leaves simple, alternate, entire, coriaceous, elliptic-lanceolate, 5-8 x 2.5 - 4 cm, base acute, apex obtusely acuminate, glabrous, shining, narrowed at the base into very short petiole; nerves 4-6 pairs, faint; petiole 6 mm long. Racemes slender, axillary, 5-8 cm long, glabrous; bracts concave at the base of the pedicel. Flowers minute, shortly pedicelled, polygamous. Fruit yellowish, ellipsoid-oblong, ca 12 x 6 mm, quite smooth and glabrous. Seed one.

*Fl. & Fr.*: Fruits in December.

*Distr.*: Nicobar Islands.

In mixed forest or near the sea coast.

### 2. *Rubus* L.

Creeping herbs or erect or sarmentose shrubs, almost always prickly. Leaves alternate, simple or compound, stipules free or adnate to the petiole. Flowers in terminal and axillary corymbose, white or red. Calyx tube broad, lobes 5, persistent in fruit. Petals 5. Stamens many. Ripe carpels numerous, usually fleshy, one seeded, on a conical dry or spongy receptacle.

Species 250, cosmopolitan, 1 in A. & N. Islands.

*Rubus moluccanus* Linn. var. *angulosus* Kalkman, in Blumea 29 (2): 364. 1984. *R. angulosus* Focke, Bibliotheca Bot. 72: 90. t. 35. 1910. non illeg., non Greml, 1871.

Straggling shrubs, up to 6 m long or high, branches grey tomentose, covered with minute, hooked prickles, young twigs, nerves and veins on the lower surface with semi-appressed to patent, long, straight hairs. Leaves simple, margin serrate, distinctly 3-5 lobed with the main lobe usually shallowly lobed again; apical lobe large; base cordate, margin of the basal lobes distinctly overlapping or at least touching each other; petiole 3-6 cm, rarely longer. Inflorescence in terminal and axillary panicles. Flowers 1.5 cm across. Calyx campanulate, hirsute; lobes acuminate, incised. Petals sub-orbicular to elliptic, white, glabrous or with some hairs outside. Stamens numerous. Pistil glabrous, stigma bilobed. Fruit scarlet red, globose.

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

*Distr.*: Andaman & Nicobar Islands.

Inland forest in shaded places.

### 3. *Prunus* L.

Shrubs or trees. Leaves alternate, simple, entire or serrate or crenate or glandular-serrulate; petiole often 2-glandular. Calyx deciduous in fruits, lobes 5. Stamens 15-50, inserted at the mouth of calyx tube, filaments free. Carpels 1, ovules 2, colateral, pendulous. Fruit fleshy, endocarp an indehiscent or 2 valved, 1 seeded, smooth or rugged stone.

Species 80 distributed in North temperate regions; 2 in A. & N. Islands.

- 1 a. Leaves entire, densely black-dotted beneath ..... 2
- b. Leaves entire, not densely black-dotted beneath ..... 3
- 2 a. Basal glands absent, fruit ovoid ..... 2. *P. javanica*
- 3. Basal glands present fruit transversely ellipsoid or didynamous .....  
..... 1. *P. ceylanica*

- 1. *Prunus ceylanica* (Wt.) Miq. Fl. Ind. Bat. 1, 1: 366, 1855; Kalkman in *Blumea* 13 (1): 52, 1955. *Polydontia ceylanica* Wt. 111. Ind. Bot. 1: 203, 1840 (*Polydontia*). *Pygeum acuminatum* Colebr. Trans. Linn. Soc. 12: 360, t. 18, 1818; Hook.f. Fl. Brit. Ind. 2: 318, 1878; Parkinson, For. Fl. Andaman Islands 162, 1923.

Tall trees, young branchlets ash grey. Leaves elliptic-oblong or ovate lanceolate, 6-18 x 4-7 cm, base acute or rounded, apex acuminate, entire, coriaceous, glabrous above, ± pubescent beneath when young; petiole 1-2 cm long, basal glands 2, flat. Racemes axillary, solitary, 3-10 cm long. Flowers white. Calyx tube pubescent outside, glabrous inside, except bottom; lobes triangular, minute. Petals 6, woolly outside, glabrous inside, elliptic to orbicular, minute. Stamens 20-40. Ovary with a ring of hairs around base. Drupe didymous or bilobed, 14-25 x 9-19 mm.

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

*Distr.*: Andaman islands.

Tropical rain forests, rare.

2. *Prunus javanica* (T. & B.) Miq., Fl. Ind. Bot. 1, 1: 365 & 1085. 1855; Kalkman in Blumea 13: 47. 1965. *Cerasus javanica* T. & B. Nat. Tijds. Ned. Indie 2: 309. 1851. *P. martabanica* Kurz, Hook.f. Fl. Brit. Ind. 2: 316. 1878; Parkinson, For. Fl. Andaman Islands 162. 1923.

Trees up to 30 m high; bark chocolate brown. Leaves oblong-ovate, 10-15 x 4-6 cm, bases rounded to acute, apex acuminate, margin entire, membranous, glabrous, densely black dotted beneath, lateral nerves faint; petiole 6-12 cm long; stipules linear, deciduous. Racemes axillary, usually solitary, 6-10 cm long, glabrous or sparsely pubescent. Flowers 8 mm across, hypanthia 2 mm long, pubescent. Calyx tube pubescent outside, glabrous inside; calyx lobes minutely obtuse. Petals white, broad, ovate or orbicular. Stamens 25-50. Ovary glabrous. Drupe ovoid to ellipsoid, acute, ca 20 x 8 mm, stone thin, smooth.

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

*Distr.*: Andaman islands.

Inland forest, rare.

## ESCALONIACEAE

### *Polyosma* Bl.

Evergreen trees, branchlets, petioles and inflorescence pubescent. Leaves opposite or subopposite, acuminate. Flowers in terminal racemes.

Calyx-tube entirely adnate to the ovary; lobes 4, small, persistent. Petals 4, epigynous, linear, valvate, very hairy. Ovary inferior 1-celled, style columnar, stigma simple. Fruit sub-baccate, 1-seeded.

Species 8, Indo-Malayan region to tropical Australia; 1 in A. & N. Islands.

***Polyosma integrifolia*** Blume, Bijdr. 659. 1825; C.B. Clarke in Hook.f. Fl. Brit. Ind. 2: 409. 1878; Parkinson, For. Fl. Andaman Is. 163. 1923.

An evergreen small tree, 8-10 m high, with a pale bark, the youngest shoots tawny pubescent. Leaves nearly opposite, 9-15 x 3.5-5.5 cm, oblanceolate, shortly caudate-acuminate, distantly toothed, glabrous, with 8-12 pairs of lateral nerves, depressed on the upper surface and interarching. petiole upto 2.5 cm long. Flowers white with pleasant smell, 8 mm long, on greyish puberulous bracteate peduncles, forming slender pubescent terminal racemes. Calyx teeth ovate, acute. Petals 4, puberulous, linear, valvate. Stamens 4, with hairy filaments. Berry ovoid, tapering, crowned by the persistent calyx limb.

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

*Distr.*: Andaman Islands.

In tropical hill jungle, scarce.

## CRASSULACEAE

About 35 genera and 1,500 species, cosmopolitan in distribution; 1 genus and 1 species in A. & N. islands.

### ***Kalanchoe*** Adans.

An erect or ascending, succulent perennial herb, sometimes woody. Leaves, trifoliate or pinnately 5 foliolate. Flowers terminal in corymbose or paniculate cymes. Calyx more or less deeply 5-lobed or 4-fid. Corolla gamophyllous, 4-lobed, lobed erect or recurved. Stamens 8, biseriate, inserted on the corolla tube; hypogynous scales 4. Carpels 4, attenuated into long subulate styles; ovules many. Follicles 4, membranous. Seeds oblong-ellipsoid with 8-15 longitudinal ribs.

About 200 species, mainly in tropics of S. Africa to China and Java; 1 species in A. & N. islands.

**Kalanchoe pinnata** (Lam.) Pers. Syn. pl. 1: 446. 1805; Backer in Steenis, Fl. Males. 4: 199. 1951. *Coryledon pinnata* Lam. Encycl. 2: 141. 1786. *Bryophyllum calycinum* Salisb. Parad. Lond. t. 3. 1805; Clarke in Hook.f. Fl. Brit. Ind. 2: 413. 1878. *B. pinnatum* (Lam) Oken. Allg. Naturgesch. 3: 1966. 1841.

Semisucculent herbs up to 1 m long; branchlets glabrous, swollen at nodes. Leaves decussate, crowded in young shoots, distant in adult ones, often 3-5 foliate; oblong or ovate-elliptic, 7.5-15 x 4-6.5 cm, thick-coriaceous, glabrous, greenish, base oblique, obtuse round, margins crenate, apex obtuse-subacute; petiole up to 5 cm, greenish with violet blotches; petiolule up to 1 cm. Cymes paniced, bracts foliar, bracteoles linear, pedicel nodose. Flowers 2-3 cm across. Calyx tube lobed above middle, terete, 2.5-3 x 1.5 cm, green with reddish blotches, puberulous, lobes 4, triangular, 1 x 0.8 cm, acuminate. Corolla up to 5 cm, base greenish, 8 folded, glandular within, apex reddish, constricted above carpels; lobes 4, ovate, 1 x 0.6 cm, acuminate. Stamens 8, inserted above the constriction of the corolla; filaments upto 3.5 cm, slightly exerted; hypogynous scales 4, adnate to carpels, 2.5 mm long. Carpels 4, up to 1 cm, ovules numerous; style up to 3 cm. Follicles up to 1.5 cm. Seeds numerous up to 1.5 mm, striate.

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

*Distr.*: Occasional; in rocky areas in moist deciduous forests of Andaman islands.

### RIHIZOPHORACEAE

16 genera and 120 species; tropical, mostly old world; 6 genera and 11 species in A. & N. Islands.

- 1 a. Littoral, seeds germinating on the tree ..... 2
- b. Inland, seeds, not germinating on the tree ..... 5
- 2 a. Leaves more or less elliptic, acute at both ends ..... 3
- b. Leaves more or less oblong or obovate, rounded or notched at the top, sepals and petals 5-6 ..... 4

- 3 a. Sepals and petals 4; stilt roots present ..... 6. *Rhizophora*  
 b. Sepals and petals 8-14, petals bilobed or emarginate; knee roots present  
 ..... 1. *Bruguiera*
- 4 a. Shrubs, stamens many ..... 4. *Kandelia*  
 b. Small trees. Stamens 10-12 ..... 3. *Ceriops*
- 5 a. Branchlets solid; flowers in pedunculate cymes ..... 2. *Carallia*  
 b. Branchlets hollow; flowers in fascicles ..... 5. *Gynotroches*

### 1. *Bruguiera* Lam.

Buttressed trees with knee-like pneumatophores. Leaves entire, leaf-scars with three vascular bundles. Flowers generally nodding, solitary or 2-5 flowered. Pedunculate cymes. Calyx accrescent, 8-14 lobed, lobes subulate-lanceolate. Petals as many as calyx lobes, each embracing a pair of stamens, caducous. Stamens twice, as many as the petals; anthers dehiscing lengthwise, introrse. Ovary inferior, 2-4 celled, each cell 2-ovuled. Seed usually solitary, viviparous, hypocotyl terete or obscurely ribbed.

6 species, widely distributed from tropical eastern Africa to Asia, throughout Malesia to northern Australia and Polynesia. 3 in A. & N. Islands.

- 1 a. Flowers larger, solitary; calyx tube almost bell-shaped, the limb 8-14 lobes, petals 8-14 ..... 2. *B. gymnorrhiza*  
 b. Flowers rather small in pedunculate cyme, 2-5 flowered; calyx tube almost club-shaped, the limb 8-cleft, petals 8 ..... 2
- 2 a. Calyx tube cylindric, tapering at base, ribbed, the lobes very short and rigid  
 ..... 3. *B. parviflora*  
 b. Calyx tube obtuse at base, not ribbed, the lobes nearly as long as the tube, reflexed in fruit ..... 1. *B. cylindrica*

1. ***Bruguiera cylindrica*** (L.) Bl. En. Pl. Jav. 1: 93. 1827, quoad basionym. *Rhizophora cylindrica* Linn. Sp. Pl. 443. 1753. *B. caryophylloides* (Burm. f.) Bl. Brit. Ind. 2: 438. 1978.

Evergreen trees, up to 23 m high, all parts quite glabrous. Bark grey, with a few small corky lenticels. Leaves thin, elliptic, 7-17 x 2-8 cm, acute, at apex, base cuncate; petiole 1-4.5 cm; stipules 2.5-3.5 cm long. Flowers greenish, 10-12 mm long; pedicels 1-4 cm. Calyx tube smooth, 4-6 x 2 mm, lobes 8, about as long as the tube. Petals 3-4 mm long outer margin usually fringed with white hairs in the lower parts. Stamens 1.5-2.5 mm long. Calyx tube in fruit 10-12 mm long, the lobes reflexed, not accrescent, hypocotyl cylindric, often curved, 8-15 x 0.5 cm.

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

*Distr.*: Andaman islands.

Mangrove forests.

2. **Bruguiera gymnorrhiza** (L.) Lamk. Encycl. Meth. Bot. 4: 696. 1798; Henslow in Hook.f. Fl. Brit. Ind. 2: 437. 1878. *Rhizophora gymnorrhiza* Linn. Sp. Pl. 443. 1753. *B. conjugata* (non *Rhizophora conjugata* Linn) Merr., Philipp. J. Sci. 9 (Bot.): 118. 1914. Parkinson, For. Fl. Andaman Islands 164. 1923.

Buttressed trees, upto 36 m high. Branching mostly sympodial. Bark grey to almost black, roughly fissured, usually with large corky lenticels on buttresses and base of stems. Leaves elliptic-oblong, coriaceous, 8.5-22 x 5-7 cm, acute, base cuneate, rarely obtuse; petiole 2-4.5 cm long; stipules often reddish, ca 4 cm long. Flowers 3-3.5 cm long; solitary. pedicels 1-2.5 cm. Calyx red to pink red, lobes 12-14, usually 0.6 the length of the calyx. Petals 13-15 mm long, outer margin fringed with white silky hairs. Stamens 8-11 mm long, anthers linear 4-5 mm. Style ca 1.5 cm, angular towards the base; hypocotyl cigar-shaped, slightly angular, with a blunt narrowed, apex, 15-25 x 1.5-2 cm.

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

*Distr.*: Andaman & Nicobar islands.

Mangrove forests.

3. **Bruguiera parviflora** (Roxb.) W. & A. ex Griff., Trans. Med. Phys. Soc. Calcutta 8: 10. 1836; Henslow in Hook.f. Fl. Brit. Ind. 2: 438.

1878; Parkinson, For. Fl. Andaman Is. 165. 1923. *Rhizophora parviflora* Roxb. Fl. Ind. ed. Carey 2: 461. 1832.

Evergreen trees up to 24 m high, all parts quite glabrous; bark smooth, grey with a few small, obscure lenticels. Leaves elliptic, 7.5-13 x 2.5-4 cm, coriaceous, glossy above, apex acute, base cuneate; petiole 1.5-2 cm; stipules ca 4.5 cm long. Flowers yellowish-green on slender pedicels; pedicels 6-13 mm. Calyx tube cylindrical, ridged, 7-9 mm long, lobes 8, ca 0.2-0.25 as long as the tube. Petals 1.5-2 mm long, white, hairy at the lower margin. Stamens 1.5 mm. Style 1.2-1.5 mm; hypocotyl cylindrical, 7.5-13 x 0.5 cm, smooth.

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

*Distr.*: Andaman & Nicobar islands.

Mangrove forests.

## 2. *Carallia* Roxb.

Shrubs or trees. Leaves decussate with large interpetiolar stipules, entire to dentate or serrate, papyraceous to thinly coriaceous. Flowers small, sessile in short trichotomous axillary cymes. Calyx produced into a short tube beyond the ovary, teeth 5-8. Petals inserted with stamens on the edge of a crenulated disk lining the calyx tube, unguiculate, blade deeply serrate or lobed. Ovary inferior, usually 4-celled, ovules 2 in each cell. Fruit small, globose, coriaceous, seed 1, testa fibrous, embryo curved in copious albumen.

About 10 species distributed in Madagascar, throughout Indo-Malesia and N. Australia; 1 in A. & N. Islands.

1. *Carallia brachiata* (Lour.) Merr. Philipp. J. Sci. 15: 249. 1919; Ding Hou in Steenis Fl. Males. 1, 5: 485. 1958. *Diatoma brachiata* Lour. Fl. Cochinch. 296. 1790. *Carallia lucida* Roxb. Pl. Corom. 3: 8. 1811; Parkinson, For. Fl. Andaman Islands 165. 1923; Henslow in Hook.f. Fl. Brit. Ind. 2: 439. 1978.

Trees, up to 35 m high. Leaves papyraceous to thin coriaceous, elliptic, obovate to oblanceolate, 5-12 x 2.5-6.5 cm, entire, margins recurved, dark green or glossy above, pale with numerous black dots beneath, lateral nerves fine and inarching, apex acute to shortly acuminate, base cuneate;

petiole 1 cm. Stipules 1-2.5 cm long. Inflorescences solitary, di- or trichotomously branched, 1-6 cm long, usually shining by secreted resin. Flowers shortly pedicellate or sessile. Calyx lobes deltoid. Petals suborbicular, ca 1.5 mm long. Stamens ca 2 mm long. Fruit small, globose, ca 7 mm in diam.; seeds reniform.

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

*Distr.*: Andaman & Nicobar islands.

In inland forests, rare.

### 3. *Cerlops* Arn.

Small trees. Stem with stilt roots. Leaves entire, coriaceous. Stipules lanceolate. Inflorescence condensed cymes. Bracteoles 2, partly connate. Calyx deeply 5-6 lobed. Petals white, 5 or 6, each embracing 2-stamens, cohering at the base with uncinat-hairy margins. Ovary half inferior. 3-celled, 2 ovules in each cell. Fruit ovoid. Hypocotyl clavate, tapering to the apex, ridged and sulcate.

Species 2, tropical coast of India, West Pacific oceans and A. & N. Islands.

- 1 a. Petals with 3 clavate appendages at the apex; calyx lobed on the fruits reflexed; hypocotyl hanging vertically downwards on the tree ..... 2. *C. tagal*  
 b. Petals fringed at the apex; calyx lobes on the fruits erect or ascending; hypocotyl projecting in various directions on the tree ..... 1. *C. decandra*

1. *Cerlops decandra*(Griff.) Ding Hou, in Steenis Fl. Males. 5: 471. 1958. *Bruguiera decandra* Griff. Trans. Med. Phys. Soc. Calc. 8: 10. 1836. *C. roxburghiana* Arn. Ann. Mag. Nat. Hist. 1: 364. 1838; Henslow in Hook.f. Fl. Brit. Ind. 2: 436. 1878.

Small trees up to 15 m high. Leaves obovate or obovate to elliptic-oblong, 4.5-10 x 5-6 cm, apex obtuse or rounded, base cuneate; petiole 1-2.5 cm; stipules 1.5-2.5 cm. Inflorescences usually in the leaf axils of several nodes at the upper part of a branchlet, 3-5 flowered, head like, condensed. Calyx lobes erect, both in flower and in fruit, ovate, acute, 3-4

mm, tube ca 2 mm high. Petals slightly obovate-oblong, ca 2.5 mm long, fringed at the apex. Stamens  $\pm$  equal, ca 1 mm long; hypocotyl 9-15 cm long.

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

*Distr.*: Andaman islands.

Mangrove forests. (No specimen of this taxon are available in PBL).

2. *Ceriops tagal* (Perr.) C.B. Rob., Philipp. J. Sci. 3 (Bot.) 306. 1908. *Rhizophora tagal* Perr. Mem. Soc. Linn. Paris 3: 138. 1824. *C. candolliana* Arn., Ann. Mag. nat. Hist. 1: 364. 1838, nom. illeg.; Henslow in Hook.f. Fl. Brit. Ind. 2: 438. 1878; Parkinson, in For. Fl. Andaman Islands 165. 1823.

Small trees up to 15 m high often degenerating into a bushy shrub under unfavourable conditions; bark light grey, fairly smooth with fine lenticular fissures. Leaves obovate to obovate-oblong, rarely elliptic-oblong, 5-11 x 2-7.5 cm, obtuse or sometimes slightly emarginate, base cuncate, petiole 1.5-3.5 cm; stipules 1.2-2.5 cm long. Inflorescence often in the axils of the terminal nodes of a branchlet, usually resinous, 4-10 flowered. Calyx 6-7 mm long, lobes erect in flower, reflexed in fruit, ovate, acuminate. Petals oblong, c. 4 mm long, apex with 3 clavate appendages. Stamens 3-5 mm, alternately long or short. Fruit ovoid, 1.5-2.5 cm long, calyx lobes soon reflexed; hypocotyl club-shaped, sharply angular, 15-30 cm.

*Fl. & Fr.*: Various times of the year.

*Distr.*: Andaman Islands.

Mangrove forests.

#### 4. *Kandella* W. & A.

Small trees. Leaves entire. Stipules linear. Inflorescence axillary, pedunculate cymes, 4-9 flowered. Calyx deeply 5 (-6) lobed. Petals 5 (-6), bilobed, with a long stem in the sinus, each lobe multifid. Stamens many, free, unequal in length, exerted. Ovary inferior, 1-celled, 6 ovuled; hypocotyle cylindrical to spindle-shaped or clavate, pointed.

Monotypic, in tidal swamps of the Western Peninsula, Bengal, Myanmar and Andaman Islands.

1. ***Kandelia candel*** (Linn.) Druce, Rep. Bot. Exch. Club, Br. Is. 1913 (3): 420. 1914. *Rhizophora candel* Linn. Sp. Pl. 443. 1753. *K. rheedei* W.A., Prod. 311. 1834, nom. illeg.; Henslow in Hook.f. Fl. Brit. Ind. 2: 437. 1878; Parkinson, For. Fl. Andaman Islands 165. 1923.

Small trees upto ca 7 m high. Leaves elliptic-oblong or obovate-oblong, 6-13 x 2.5-5 cm, obtuse, base cuneate, margin usually reflexed; petiole 1-1.5 cm; stipules 2 cm long. Inflorescences dichotomously branched 4 (-6-9) flowered cymes; peduncle 1.5-5 cm. Pedicels 2-3 mm. Flowers white 1.5-2 cm long; bracteoles 2-4, connate. Calyx 1-1.5 cm long, lobes linear, reflexed after anthesis. Petals bifid, the lobes divided into numerous capillary segments. Stamens many. Ovary half-inferior, prolonged beyond the calyx into a fleshy cone, one-celled, ovules 6, stigma 3-lobed. Fruit ovoid, girt at the base by the reflexed calyx lobes; hypocotyl clavate, 15-40 cm long, terete.

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

*Distr.*: Andaman islands.

Mangrove forests. (No specimen of this taxon is available in PBL).

### 5. *Gynotroches* Bl.

Trees; branchlets hollow. Leaves entire. Stipules lanceolate. Flowers in axillary fascicles, bracteolate. Pedicels articulated. Calyx deeply 4-5 lobed. Petals 4-5, unguiculate. Stamens twice the number of the calyx lobes. Ovary superior, 4-6 celled, each cell 3-8 ovuled. Fruit a berry, few to many seeded, globose, sometimes oblong, much wrinkled when dry.

Monotypic, distributed in Myanmar, Siam, Malaysia to Micronesia and Nicobar islands (INDIA).

1. ***Gynotroches axillaris*** Blume, Bijdr.: 219. 1815; Henslow in Hook.f. Fl. Brit. Ind. 2: 440. 1878; Ding Hou in Steenis Fl. Males. 5: 488. 1938.

Small evergreen tree  $\pm$  20 m high; young branches hollow, brown coloured. Leaves oblong to elliptical, 8-24 x 3-8 cm, apex bluntly or shortly acuminate, coriaceous, glossy, strongly net-veined on the lower surface; petiole 0.5-1 cm; stipules 1.5 cm long. Flowers small, yellowish green, pedicelled, almost dioecious by abortion, crowded in the axils of the leaves. Calyx ovate, up to 2.5 cm long. The males with perfect stamens and petals, the ovary usually thin and abortive with the stigma not dilated. Female and hermaphrodites longer pedicelled, the petals and stamens usually smaller or the latter sometimes barren; stigma radiately lobed. Berry 3-4 mm diam., several seeded, almost globular, pulpy, scarlet to purplish red.

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

*Distr.*: Great Nicobar island.

Inland hill forests.

## 6. *Rhizophora* L.

Evergreen moderate sized trees sending down numerous aerial roots into the mud of the mangrove swamp. Leaves thick, stipules large, deciduous, enclosing the buds. Flowers on few-flowered cymes. Calyx divided into 4-segments, persistent and enlarged in fruits. Petals 4. Stamens 8-12, anthers nearly sessile. Ovary half inferior, 2-celled, with 2-ovules in each cell. Fruit conical, leathery, indehiscent, 1-celled, 1-seeded, the seed germinating on the tree, the large cylindrical radical perforating the apex of the fruit.

Species 7, along tropical coasts. 3 in A. & N. Islands.

- 1 a. Inflorescence 2-flowered, sessile, petals glabrous ..... 1. *R. apiculata*
- b. Inflorescence 2-5(12) flowered, pedicelled, petals hairy ..... 2
- 2 a. Style obscure or very short, up to 1.5 mm ..... 2. *R. mucronata*
- b. Style filiform, 4-6 mm ..... 3. *R. stylosa*

1. ***Rhizophora apiculata*** Bl., En. Pl. Jav. 1: 91. 1827; Ding hou in Steenis Fl. Males. 5: 452. 1958. *R. conjugata* auct. non. Linn., Henslow in Hook.f. Fl. Brit. Ind. 2: 436. 1878; Parkinson, in For. Fl. Andaman Islands 164. 1923.

Trees, up to 30 m or more high; branching primarily sympodial. Leaves elliptic-oblong to sublanceolate, 7-18 x 3-8 cm, apex acute to apiculate, base cuneate; midrib  $\pm$  tinged reddish beneath; petiole 1.5-3 cm. Stipules 4-8 cm long. Inflorescence 2-flowered. Flowers sessile, developing from the cupular involucre after falling of the sustaining leaf. Calyx lobes brownish yellow to reddish, ovate, concave, acute, 10-14 mm long. Petals lanceolate, 8-11 mm long, membranous, flat, glabrous. Stamens mostly 12, 4 epipetalous and 4 pairs episepalous, 6-7.5 mm long, superior part of the ovary 1.5-2.5 mm high, enclosed by the disk, hypocotyle cylindrical, clavate  $\pm$  blunt, up to 38 x 1.2 cm before falling.

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

*Distr.:* Mangrove forests of Andaman & Nicobar Islands.

2. **Rhizophora mucronata** Lamk., *Encycl.* 6: 189. 1804; Henslow in Hook.f. *Fl. Brit. Ind.* 2: 435. 1978; Parkinson, in *For. Fl. Andaman Islands* 164. 1923.

Trees up to 25 m high, rarely over 30 m, branching not distinctly sympodial. Leaves broad-elliptic to oblong, 11-18 x 5-10.5 cm, acute at both ends, shining, pale beneath and with black dots, mucronate by the excurrent midrib, coriaceous, glabrous, midrib green beneath; petiole 2.5-5.5 cm, green; stipules 5.5-8.5 cm long. Inflorescences 2-3 times forked, 2-5 (12) flowered. Peduncles 2.5-5 cm or more. Flowers pedicellate, pedicel 4-8 mm. Calyx lobes ovate, 13-15 mm long. Petals lanceolate, ca 9 mm long, fleshy; involute, margins villous. Stamens 8, 4 epipetalous, and 4-episepalous, 6-8 mm long. Free part of the ovary 2.5-3 mm high, in anthesis already emerging far beyond the disk. Style 0.5-1.5 mm, 2-lobed, hypocotyl cylindrical, strongly rugose, 36-64 x 1.8 cm.

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

*Distr.:* Andaman & Nicobar Islands.

Mangrove forests.

3. **Rhizophora stylosa** Griff., *Not. Pl. As.* 4: 665. 1854; Ding hou in Steenis *Fl. Males.* 5: 456. 1958; Banerjee & Rao in *J. Ind. Bot. Soc.* 57 (Suppl.): 57. 1978.

Small trees up to 10 m high, branching not primarily sympodial. Leaves broadly elliptic, 6.5-12.5 x 2.5-6.5 cm, apex blunt, base cuneate, midrib green; petiole 2.5-3.5 cm, green; stipules 4-6 cm long. Inflorescence 3-4 times forked, 5-8 flowered; peduncle 2.5-5 cm. Flowers pedicellate, 0.5-1 cm. Calyx in anthesis pale yellow, lobes 9-12 x 3-5 mm. Petals *ca* 8 mm long, densely villous along the margins, rarely also on the back, partly enclosing the epipetalous stamen with these margins, hairs 3-6 mm long. Stamens 8, 4 epipetalous, 4 episepalous. Superior part of the ovary depressed conical, in anthesis enclosed by the disk, hardly 1.5 mm high. Style filiform, 4-6 mm long, shortly or obscurely two teathed, hypocotyle cylindrical, up to 54 x 1.2-1.6 cm before falling.

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

*Distr.*: Andaman & Nicobar islands.

Mangrove swamps

### COMBRETACEAE

About 20 genera and over 600 species, throughout tropics and subtropics; 5 genera 14 species in A. & N. Islands.

- 1 a. Receptacle without adnate bracteoles. Leaves opposite verticillate or alternate ..... 2
- b. Receptacle with two adnate bracteoles. Leaves alternate ..... 3. *Lumnitzera*
- 2 a. Petals present ..... 3
- b. Petals absent ..... 4
- 3 a. Style not adnate to the inner wall of the upper receptacle ..... 2. *Combretum*
- b. Style adnate for part of its length to the inner wall of the upper receptacle ..... 4. *Quisqualis*
- 4 a. Calyx lobes not accrescent ..... 5. *Terminalia*
- b. Calyx lobes very conspicuous, accrescent, persistent at time of fruiting ..... 1. *Calycopteris*

1. **Calycopteris** Lam.

Scandent shrubs. Leaves opposite or subopposite. Flowers bisexual, 5-merous, shortly pedicelled or sessile in terminal leafy panicles. Calyx lobes 5, accrescent. Petals 0. Stamens 10, biseriate, inserted within the upper receptacle above the margin of the disk. Disc cupular without free margin. Style subulate. Fruit 5-gonous and 5-furrowed, crowned by the 5 spreading, accrescent calyx lobes. Seed solitary.

Monotypic. India, Assam, Myanmar, Indo-China, Siam, Malay peninsula and in A. & N. Islands.

1. **Calycopteris floribunda** (Roxb.) Lam, *Encycl. Suppl.* 2: 41. 1811; C.B. Clarke in Hook.f., *Fl. Brit. Ind.* 2: 449. 1878; Parkinson *For. Fl. Andaman Islands* 169. 1923.

Large scandent shrubs, young branchlets densely fulvous-tomentellous. Leaves chartaceous, densely fulvous-pubescent above when young, somewhat glabrescent when older, densely fulvous-tomentellous below, finely reticulate, ovate to narrowly elliptic, 6-15 x 2-7 cm, acuminate or acute at the apex, cuneate at the base; petiole 0.5-1 cm, fulvous-tomentellous. Panicles with reduced leaves at the point of branching and narrowly elliptical, tomentellous leaf like bracts, subtending the flowers. Flowers yellowish green, in tomentose axillary and terminal panicles. Calyx lobes 5, accrescent, narrowly elliptic or oblanceolate, tomentellous. Petals 0. Stamens 10, unequal. Fruit ellipsoid, densely villous, 7-8 x 2-3 mm, 5-angled, surrounded by the enlarged 1-1.5 cm calyx lobes.

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

*Distr.*: Andaman Islands.

2. **Combretum** Loefl.

Large shrubs with long pendent or scandent branches. Leaves petiolate, opposite, in some species whorled, rarely alternate. Flowers bisexual or polygamous. Calyx tube constricted above the ovary, shortly or long produced, urceolate, funnel shaped or tubular, limb 4-5 lobed, deciduous. Petals small, inserted between the calyx lobes. Stamens 8-10, generally biseriate, those of the lower series episepalous, filaments slender, usually

long, exserted, anthers didymous. Ovary inferior, 1-celled; style subulate, ovules 2-6, pendulous. Fruits with 4-5 wings, angles or ridges, dry, generally indehiscent. Seed - 1.

Species 250, common in tropical regions of America, Africa, and Asia but not in Australia and Polynesia. 4 species in A. & N. Islands.

- 1 a. Flowers 4-merous. Fruits broadly 4-winged. .... 2
- b. Flowers 5-merous. Fruits with 5-membranous wings ..... 3
- 2 a. Flowers in elongated spike. Leaves usually broadly elliptic .....  
..... 3. *C. punctatum* ssp. *squamosum*
- b. Flowers in sub capitate spikes. Leaves usually lanceolate or narrowly elliptic.  
..... 2. *C. porterianum*
- 3 a. Flowers in more or less elongated spikes. Leaves ovate-elliptic .....  
..... 1. *C. latifolium*
- b. Panicles terminal, young ovary densely villous ..... 4. *C. roxburghii*

- 1. **Combretum latifolium** Bl. Bijdr. 641. 1825. *C. extensum* Roxb. ex G. Don. in Trans. Linn. Soc. Lond. 15: 414, 1827; C.B. Clark in Hook.f. Fl. Brit. India 2: 458. 1878. Parkinson, For. Fl. Andaman Island 169. 1923.

An extensive woody climber, glabrous or nearly so. Leaves opposite, chartaceous or sub-coriaceous, usually broadly elliptic or ovate elliptic, 8-29 x 4-13 cm, acuminate at apex, cuneate or rounded at base; petiole 7-20 mm long. Inflorescence a terminal or axillary panicle or spikes; bracts very small and soon caducous. Flowers greenish-white, 4-merous, sub-sessile. Calyx with a ring of hairs at the base within but not entirely filled by long hairs. Petals narrow-obovate, slightly exceeding the calyx. Stamens 8, inserted at the margin of the disk. Disc narrowly infundibuliform, margin thickened. Fruit sub-orbicular, with 4 thin, flexible wings, puberulo-glandular or nearly glabrous.

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

*Distr.*: Andaman & Nicobar islands.

- 2. **Combretum porterianum** (Cl.) Wall. ex Craib., Fl. Siam. En. 1: 618. 1931; Excell. in Steenis Fl. Males. 1, 4: 540. 1954. *C. chinense* Roxb.

ex Don. trans. Linn. Soc. Lond. 15: 417, 432. 1827 Pro parte ? *C. chinense* var. *portertanum* C.B. Clark in Hook. f. Fl. Brit. India 2: 457. 1878.

A large woody climber; branchlets rounded. Leaves opposite, chartaceous, elliptic or obovate-elliptic, sparsely pubescent or glabrous, densely uniformly scaly, up to 14 x 7 cm, usually acuminate; petiole tomentellous or sparsely scaly, 0.5-1 cm. Inflorescence of axillary spikes or a terminal panicle of spikes; rachis tomentellous or densely puberulous; bracts 1.5 mm long. Flowers yellowish-white, sessile. Calyx tube distinctly constricted above the ovary then funnel-shaped. Petals 4, yellow, obovate, emarginate at apex, glabrous. Stamens 8, filaments 3 mm long. Disc infundibuliform; style 2 mm long. Fruit suborbicular in outline, shortly stipitate, densely scaly on the body and sparsely so on the 4, thin flexible wings.

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

*Distr.*: Andaman islands.

Inland forest.

3. *Combretum punctatum* Bl. ssp. *squamosum* (Roxb. ex G. Don.) Excell in Steenis Fl. Males. 4: 539. 1954. *C. squamosum* Roxb. ex Don., Trans. Linn. Soc. Lond. 15: 419. 1827; Clarke in Hook. f. Fl. Brit. Ind. 2: 456. 1878; Parkinson, For. Fl. Andaman Islands 170. 1923.

A large scandent shrub; young branchlets densely ferruginous or cinereous. Leaves opposite, subcoriaceous, densely scaly on both surfaces, broadly elliptic, occasionally narrowly elliptic, usually about 5-11 x 3-7 cm, abruptly acuminate at apex, rounded at base; petiole 7 to 12 mm. Inflorescence a terminal panicle of elongated spikes, rachis densely cinereous or ferruginous-scaly. Flowers yellowish white, fragrant, sessile, 4-merous. Calyx segments 4, broadly triangular, the mouth villous. Petals 4, narrowly elliptic or oblanceolate, unguiculate. Stamens 8. Disc infundibuliform. Fruits usually suborbicular, very variable in size and shape, sparsely scaly; with 4 thin flexible wings.

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

*Distr.*: Nicobar islands.

4. **Combretum roxburghii** Spreng. Syst. 2: 331. 1825. *C. decandrum* Roxb. Pl. Corom. t. 59. 1796 (non Jacq., 1760); Clarke in Hook.f. Fl. Brit. India 2: 452. 1878.

An exceedingly large climbing shrub with many branches pendent and subsucculent, conspicuous in flower by the floral leaves. Leaves opposite, 10-12.5 cm, somewhat hairy when young, when old glabrous or rarely with tufts of hairs in the axils of nerve beneath; petiole 0.8 cm long. Racemes numerous, very villous, in large terminal quasi-panicles, the leaves there on 5-7.5 cm long, becoming petaloid at the time of flowering; bracteoles linear, 6 mm, somewhat persistent. Calyx segments lanceolate-subulate, suberect. Petals oblong, glabrous, hardly exceeding the calyx or twice as long as calyx. Ovary sessile. Disc covered with short hairs. Fruit 2-3 cm, oblong or elliptic, subquadrate, nearly smooth.

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

*Distr.*: Andaman islands.

### 3. *Lumnitzera* Willd.

Evergreen shrubs or small trees. Leaves alternate, clustered towards the ends of branches, fleshy, spatulate or narrowly obovate. Flowers bisexual, pentamerous, shortly pedicellate, red, white, pink in short terminal or axillary spikes or racemes. Calyx tube with two adnate bracteoles near the base, oblong, narrowed at both ends, produced above the ovary, lobes 5, persistent. Petals 5, oblong. Stamens 10 in two series, or fewer. Ovary inferior, style subulate. Fruit woody, elliptic-oblong, obtusely angled, crowned by the persistent calyx.

Species 2, on the shores of the tropics of the old world and of Polynesia, and also in A. & N. Islands.

- 1 a. Flowers red in terminal racemes. Knee-shaped pneumatophores present..... 1. *L. littorea*  
 .....  
 b. Flowers white, in axillary racemes. Knee-shaped pneumatophores absent...  
 ..... 2. *L. racemosa*

1. **Lumnitzera littorea** (Jack.) Voigt. Hort. Suburb. Calc. 39. 1845. *L. coccinea* W. & A. Prod.: 316. 1834; Clarke in Hook.f. Fl. Brit. Ind. 2: 452. 1878; Parkinson, For. Fl. Andaman Islands 168. 1923.

Small trees with dark-coloured, rough, fissured bark, peeling in flakes and with slender knee-shaped pneumatophores; young branches reddish or grey, glabrous. Leaves dark green, usually crowded at the ends of the branchlets, narrowly obovate to oblanceolate, 2-8 x 1-2.5 cm, rounded or slightly retuse at apex and cuneate at the base. Racemes short, terminal, ca 1.5-3 cm long. Flowers handsome, bright scarlet, shortly pedicelled. Calyx lobes very broadly ovate, slightly imbricate, margin ciliolate. Petals red, glabrous, oblong-elliptic, 4.5 x 1.5-2 mm. Stamens 5-10, usually 7; style glabrous. Fruit glabrous, ca 10 x 4 mm, longitudinally ribbed, somewhat corky in texture.

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

*Distr.*: Andaman islands.

Back mangrove, sometimes also above the tide level.

2. *Lumnitzera racemosa* Willd. Neue. Schr. Ges. Naturf. Fr. Berl. 4: 187. 1803; Clarke in Hook. f. Fl. Brit. India 2: 452. 1878; Parkinson, For. Fl. Andaman Islands 168. 1923.

Small trees or shrubs, knee-shaped pneumatophores absent; bark rough, reddish-brown; young branchlets reddish grey, sometimes appressed-pubescent at first, soon glabrous. Leaves pubescent or glabrous, narrowly obovate or narrowly obovate-elliptic, 2-9 x 1-2.5 cm, blade cuneate to the sub-sessile base. Spike short axillary, ca 2 cm long. Flowers white, sessile. Calyx lobes 5, broadly obovate-acuminate. Petals white, glabrous, narrowly elliptic or oblanceolate. Stamens 10, equalling or slightly exceeding the petals; style glabrous. Fruit appressed-pubescent or glabrous, 10-12 x 3-5 mm.

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

*Distr.*: Andaman & Nicobar islands.

In mangrove swamps and other tidal forests.

#### 4. *Quisqualis* L.

Woody climbers. Leaves opposite or subopposite, entire; petiole base forming thorns after the fall of the leaf. Flowers 5-merous, bisexual, in

terminal or axillary bracteate spikes. Calyx tube divided into a lower part surrounding and adnate to ovary and a tubular upper part terminating in the calyx-lobes. Calyx lobes 5, triangular. Petals 5. Stamens 5 + 5, inserted inside and near the mouth of the upper part. Style adnate to the inner wall of the upper part. Ovules 2-4. Fruits dry, oblong, narrowed at both ends, 5-angled. Seed 1, longitudinally sulcate.

About 17 species mainly tropical; 1 planted in A. & N. islands.

**Quisqualis indica** L. Sp. Pl. ed. 2, 1: 556. 1762; Clarke in Hook.f. Fl. Brit. Ind. 2: 459. 1878; Parkinson For. Fl. Andaman Islands 170. 1923.

A large evergreen woody climber, all younger parts more or less pubescent or villous. Leaves opposite or subopposite, papyraceous, elliptic or elliptic-oblong, 5-18 x 2.5-9 cm, acuminate or sometimes subcaudate at the apex, rounded or subcordate at the base; petiole varying from tomentose to nearly glabrous, 0.5-2 cm long. Spikes terminal and axillary, 2-10 cm long, sometimes forming a leafy panicle; bracts lanceolate-acuminate or elliptic, 6-10 x 2-3 mm. Flowers pleasantly scented. Calyx narrowly tubular, slightly expanded at the apex, outside varying from tomentose to nearly glabrous, calyx lobes deltoid or shortly triangular. Petals oblong, white, finally turning of dark red, somewhat rounded and very shortly unguiculate at the base, imbricate in bud, sparsely pubescent. Fruit 2-3 cm long, glossy, deeply furrowed and sharply 5-angular, the angles coriaceous and wing-like.

*Fl.*: Feb.-July.

*Distr.*: Commonly grown in the gardens of A. & N. islands.

### 5. **Terminalia** L.

Large trees. Leaves alternate or nearly opposite. Flowers sessile, small, greenish or white, generally in long spikes. Calyx tube campanulate, constricted above the ovary as a rule densely woolly within, deciduous, limb 5-toothed. Petals 0. Stamens 10, in two rows. Seed included in a coriaceous or osseous endocarp. Cotyledon convolute.

Species about 250, throughout humid and semi-humid tropics; 7 in A. & N. Islands.

- 1 a. Fruits with 2 large wings.....1. *T. bialata*  
 b. Fruits not winged.....2
- 2 a. Inflorescences paniculate.....3  
 b. Inflorescences simple.....4
- 3 a. Inflorescences strictly terminal; fruits prominently 5-ridged ellipsoid or subglobose .....3. *T. citrina*  
 b. Inflorescences terminal and axillary, fruits obscurely 5-ridged oblong .....4. *T. mannii*
- 4 a. Leaves subopposite to alternate; branches slender (up to 5 mm thick), without prominent leaf-scars; fruits smaller (ca 1.8 x 1.5 mm), dark-red.....7. *T. vermae*  
 b. Leaves always alternate; branches thick (more than 5 mm), with prominent leaf-scars; fruits larger, not dark-red.....5
- 5 a. Petioles 2-3 cm long; leaves entire.....6. *T. sharmae*  
 b. Petioles shorter; leaves entire.....6
- 6 a. Leaves cuneate-attenuate at base; petioles eglandular.....5. *T. procera*  
 b. Leaves cordate at base; petioles with 2 glands.....2. *T. catappa*

1. ***Terminalia bialata*** Stuedel, Clarke in Hook.f. Fl. Brit. Ind. 2: 449. 1878; Brandis, Indian Trees: 310. 1906; Parkinson, For. Fl. Andaman Islands 167. 1923.

A tall tree, up to 30-40 m high, with large, thin, curved and often branched buttresses; bark light brown, smooth and finely fissured. Leaves crowded at the end of the branchlets, perfectly glabrous, chartaceous, obovate or oblanceolate, 10-15 x 2.5-10 cm, shortly acuminate, tapering at base; petiole slender, 5-8 cm long. Flowers small greenish-yellow, supported by minute deciduous bract, forming simple puberulous axillary spikes, usually as long as the leaves, the male flowers at the upper and hermaphrodite ones at the lower part of the spikes. Young ovary and calyx brown pubescent or tomentose. Fruit butterfly-shaped, about 5 cm long and 10 cm across, ellipsoid, with 2-broad, stiff, veined wings.

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

*Distr.*: Andaman Islands.

Inland forests.

2. ***Terminalia catappa*** L., Syst. Nat. ed. 12, 2: 674. 1707; Clarke in Hook.f. Fl. Brit. Ind. 2: 444. 1878; Parkinson in For. Fl. Andaman Islands 167. 1923.

A tall tree, 10-35 m high, with a long straight bole and a flat umbrella-shaped crown. Young shoots brown pubescent. Leaves chartaceous or papyraceous, spirally arranged and crowned at the ends of the branches, typically obovate, sometimes elliptic-obovate, rounded or shortly acuminate at apex and somewhat narrowed below the middle to a subcordate or auricled base, 8-30 x 5-17.5 cm; usually with *ca* 6-9 pairs of rather widely spaced nerves; petiole thick, usually sericeous-pubescent, 5-15 mm. Spike grey or rusty tomentose or pilose, the upper flowers male, the lower hermaphrodite; the bracts minute. Calyx lobes ovate-triangular, glabrous within and without. Young ovary glabrous or hairy. Fruits 2.5-5 cm long, compressed drupe and keeled all round.

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

*Distr.*: Andaman & Nicobar islands.

Frequently along the sea shores of all the islands.

3. ***Terminalia citrina*** (Gaertn.) Roxb. ex Flem. in As. Res. 11: 183, 1810; Clarke in Hook.f. Fl. Brit. Ind. 2: 446. 1878. *Myrobalanus citrina* Gaertn. Fruct. 2: 91. t. 97. 1791.

A tall tree, 20-30 m high, buttressed at base, all parts glabrous, the very young shoots rufous-villous. Leaves papyraceous or chartaceous, opposite or subopposite, elliptic-lanceolate, 10-16.5 x 4.5-7 cm, usually shortly acuminate at apex and rounded or broadly cuneate at base; petiole 2-3.5 cm long; nerves 9-12 pairs, usually rather closely spaced, and reticulations clear on both surfaces. Flowers small, dull yellow, sessile, all hermaphrodite, in terminal panicles, rachis rufous tomentose or pubescent; bracts filiform, 2 mm long, caducous. Calyx teeth glabrous outside, pubescent inside, the tube linear oblong. Drupe oblong-lanceolate, 20-30 x 8-20 mm, 5 cornered, dull orange yellow.

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

*Distr.*: Nicobar islands.

Beach forests.

4. ***Terminalia procera*** Roxb., [Hort. Beng. 33. 1814, nomen] Fl. Ind. 2: 429. 1832; C.B. Clarke in Fl. Brit. Ind. 2: 444. 1878; Parkinson, For. Fl. Andaman Islands 167. 1923.

A lofty tree, about 40 m high, with branches in horizontal whorls. Leaves 15-30 x 5-10 cm, obovate-lanceolate or obovate-oblong, usually tapering towards the petiole at base, the apex more or less rounded or shortly apiculate, coriaceous, glabrous when old, petiole 1.5 cm long, slender. Flowers white, star-shaped, woolly within, in slender racemes; the hermaphrodite ones situated near the base. Calyx limb salver-shaped. Drupe ellipsoidal, ca 3.75 cm long, obscurely angled but not compressed or keeled.

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

*Distr.*: Andaman & Nicobar islands.

Very common in the deciduous and semi-deciduous forests.

5. ***Terminalia manii*** King in J. As. Soc. Beng. 66: 329. 1897; Prain in Ann. Roy. Bot. Gard. Cal. 9: 41. 1901; Parkinson, For. Fl. Andaman Islands 168. 1923.

A tall tree, 40-60 m high with a straight clean bole; bark very smooth, whitish to yellowish-brown. Leaves 10-20 x 4-8 cm, scattered, ovate to elliptic-lanceolate, acuminate; petiole about 2.5 cm long, glandular near the insertion of the leaf blade. Flowers yellowish or greenish white. Fruit 1.6-1.8 cm long, ovoid and pointed, obscurely ridged.

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

*Distr.*: Andaman & Nicobar islands.

Inland forests.

6. *Terminalia sharmae* Gang. & T. Chakrab. in J. Econ. Tax. Bot. 16(1): 237, 1992.

Trees, 20 m high, branchlets brownish, terete, glabrous, with prominent leaf-scars. Leaves alternate, crowded towards tips of branchlets, obovate to elliptic, 15-22 x 7-8.5 cm, narrowly cuneate at base and slightly decurrent into petioles, crenulate along margins, rounded or shortly acuminate at apex, thinly coriaceous, glabrous, brown when dry; midrib flat above, raised beneath; lateral nerves 8-10 pairs, evenly spaced, straight, curved upwards and branching near margins; tertiary nerves prominent on both surfaces; petioles 2-3 cm long. Inflorescences axillary, simple, spicate, 5 cm long, rachis grey, puberulous to glabrous. Drupes ellipsoid, somewhat compressed, 2.5-3 x 2-2.5 cm, scarcely angled, brown, glabrous, sessile.

*Fr.*: January.

*Distr.*: Andaman islands.

Inland forests, rare, at  $\pm$  300 m above msl.

7. *Terminalia vermae* Gang. & T. Chakrab. in J. Econ. Tax. Bot. 16(1): 239, 1992.

Large trees; branchlets terete, brownish. Leaves subopposite to alternate, ovate-elliptic to oblong, 12-17 x 5-6.5 cm, acute to obtuse at base, entire along margins, acuminate at apex, acumen 10-15 mm long, coriaceous, glabrous, black-brown above when dry, paler beneath; midrib flat above, raised beneath; lateral nerves 8-12 pairs, prominent, evenly spaced, arcuate, vanishing near margins; tertiary nerves and nervules obscure; petiole 3-4.5 cm long. Inflorescences axillary, simple, spicate, about 5 cm long, glabrous. Drupes subglobose, dark crimson, glossy, glabrous, sessile.

*Fl. & Fr.*: October.

*Distr.*: Andaman islands.

Semi evergreen inland forests, rare.

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*Thespesia populnea* Correa

*Sterculia villosa* Roxb.

