

FLORA OF INDIA  
Series 4



# FLORA OF TAROBA NATIONAL PARK

S.K. MALHOTRA  
&  
S. MOORTHY



BOTANICAL SURVEY OF INDIA

# **FLORA OF TAROBA NATIONAL PARK**

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Series 4

A FLORISTIC ACCOUNT OF  
**TAROBA NATIONAL PARK AND ITS ENVIRONS,**  
CHANDRAPUR DISTRICT, MAHARASHTRA STATE

S. K. MALHOTRA  
&  
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**BOTANICAL SURVEY OF INDIA**

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**Cover Photos :** *Top : Careya arborea* in full bloom.  
*Bottom : A flowering twig of Calycopteris floribunda.*

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## CONTENTS

<b>Foreword</b>		
<b>Introduction</b>	...	1
<b>Key to Angiospermic Plant Families</b>	...	7
<b>Key to Pteridophytic Plant Families</b>	...	18
<b>Systematic Treatment</b>	...	19
<b>References</b>	...	173
<b>Alphabetical Index to Families</b>	...	175
<b>Index to Genera and Species</b>	...	177
<b>Index to Local Names</b>	...	191

## FOREWORD

The Botanical Survey of India has been entrusted with the major task of undertaking detailed floristic surveys and inventorisation of the rich plant-wealth of our country. During the course of the years since its reorganisation in 1954, the Survey has done commendable work in the fields of floristics, plant taxonomy, ecology, endemism and conservation of rare and threatened plants of the vegetation of India. The results are being published under the categories : Flora of India (Series 1), State Floras (Series 2), District Floras (Series 3) and Special Publications, Monographs pertaining to ecology, conservation, etc. (Series 4).

With the setting up of several biologically rich areas as National Parks, Biosphere Reserves, and Wildlife Sanctuaries of utmost Conservation concern by the Government of India, the Botanical Survey thought it prudent to diversify its research into the realms of conservation and bring out special publications on such areas documenting the floral wealth which forms the basic requirement for scientific management and conservation.

The present publication on the Flora of Taroba National Park is one such endeavour by the scientists of the Survey, based on detailed field work in the area. This provides details on the location, approach, historical and environmental aspects of the area followed by a graphic account on the vegetation. The flora enumerates 667 species under 393 genera belonging to 110 families of flowering plants and ferns, easily identifiable by means of taxonomic keys to the families, genera and species. For each species, upto-date nomenclature, short description with flowering and fruiting periods and habitat notes are provided. At the end an index to scientific names is given for easy reference.

It is hoped that this synoptic flora of the Park area would be useful for biologists, teachers, students of botany, nature lovers and Park management authorities in getting to know of the plants of the area and in undertaking researches on plant-animal co-existence and better management of the Park.

I congratulate the authors for completing the assigned work and the Publication Section for processing its publication.

*Botanical Survey of India*  
*Calcutta*  
November, 9, 1992.

B. D. SHARMA  
Director



PLATE 1.: Photograph of Taroba National Park forest area with thick forest cover of vegetation representing tall trees like *Tectona grandis*, *Terminalia* spp. ; *Lagerstroemia* spp. etc. In the foreground *Costus speciosus* is present.



PLATE 2 : Thick ground vegetation dominated by *Costus speciosus*, along with other herbs, climbers, grasses and sedges like *Triumfetta rhomboidea*, *Sida* spp., *Ampelocissus latifolia*, *Paspalidium flavidum*, *Scleria* spp. etc.





PLATE 3 : General vegetation of dense forest with common tall trees like *Anogeissus latifolia*, *Terminalia crenulata*, *T. chebula*, *Tectona grandis*, *Dalbergia latifolia*, etc. In the foreground are *Costus speciosus*, *Triumfetta rhomboidea*, *Paspalidium flavidum*, etc.

## INTRODUCTION

Taroba National Park situated at a distance of about 45 km from Chandrapur City is the most attractive spot in the heart of the reserve forests of West Chandrapur forest division. There is a motorable road, leading from Chandrapur City to the Taroba National Park. After covering about 12 km from Chandrapur, the road plunges into the forests making a zig-zag path. The protected boundary of the National Park begins after 10 km from Khatoda village. From Khatoda the forests of Taroba begin and at some places they are very dense. After crossing the 'Kumbhi nala' the road climbs up a hillock unfolding a beautiful view of a big lake with forested hills providing an excellent background. The lake is called the 'Taroba lake' and a few forest rest houses have been recently constructed by the forest department on the hillocks nearby, formed by a bunding up a stream and joining three hillocks which surround it. There is also a shrine of Taroba where on every Sunday of the Pausa (December-January) month a festival is held and many Adivasis visit the temple. There is also a shrine of Maruti. People still believe in the sanctity of the lake water and take it to sprinkle their crops with the belief that it would keep the crop pests away.

In 1905 the area surrounding the Taroba lake was restricted for entry and later in 1935 it was made a sanctuary. In 1955, it was declared a National Park and 116.5 sq. km belt with an additional buffer zone of 57 sq km was created around the park where shooting is also prohibited. Visitors are not allowed to carry fire-arms inside and a mobile squad is posted to check any pilferage. Due to the various protective measures adopted by the forest department, the wildlife of both the animals and plants has increased much. Herds of cheetal, bison etc. are a common sight in the early mornings and evenings around the lake.

The lake itself contains a few crocodiles and a variety of fishes. In order to enlighten the tourists about the animals and plants of the area a net work of 88 km of fair weather roads have been constructed recently in the park leading to different points, of these the most important is the circular road around the lake at whose vantage points 'machans' or towers have been erected from where tourists can observe the animals approaching the lake, drinking water and relaxing.

### Materials and methods

The area was frequently visited to record in detail seasonal variations to collect plants in their different developmental stages. Special attention was paid to collect the ephemerals which complete the life cycle in a few days and vanish.

The specimens were identified with the help of available literature, proper dissections of the materials and finally comparing with the authentic herbarium sheets.

### Geology

The greater part of the area surveyed is undulating. Geologically the area has varied rocks ranging from granite, quartz and quartzite on the upper and steeper slopes of the hills. The rocks are generally exposed resulting in denudated and shallow soils.

### Climate

Weatherwise it is quite pleasant for the greater part of the year with only a short span of hot weather from April to May. The southwest monsoon is active from June to September. October and November constitute the post-monsoon season.

The air is generally dry except during monsoon when the humidity exceeds 70%, the summer months are the driest when the relative humidity in the afternoon is 20° to 25°.

### Past work

Haines (1916) has mentioned a few plants from Taroba. There is no other published work except those of Malhotra and Moorthy (1972, 1973, 1974, 1977). In the present work, the authors have attempted to consolidate the vegetation of the area briefly in a floristic form in order to be of help to the National Park lovers, forest officers, research workers and general public.

### VEGETATION

The vegetation of the area is of mixed deciduous type. In the forests of Taroba lake vicinity at Pandarpani, Khantundi, Ramdegi, Kantejhari, Khatoda etc., the prominent tree species occurring frequently are *Albizia lebbeck*, *Anogeissus latifolia*, *Bauhinia racemosa*, *Dalbergia latifolia*, *Diospyros melanoxylon*, *Haldina cordifolia*, *Mitragyna parvifolia*, *Sterculia urens*, *Tectona grandis*, *Terminalia bellirica*, *T. chebula*, *T. crenulata*. The other small trees and shrubs are often represented by *Acacia chundra*, *Bridelia retusa*, *Cleistanthus collinus*, *Semecarpus*

*anacardium*, *Xeromphis spinosa*, etc. The lianas and slender climbers like *Cissampelos pareira* var. *hirsuta*, *Cryptolepis buchananii*, *Mucuna pruriens*, *Pergularia daemia* etc. are often noticed. Several trees are infested by stem parasites like *Dendrophthoe falcata*, *Viscum nepalense* etc., while on a few others orchids like *Vanda tessellata* occur as epiphytes.

The undergrowth is generally rich after the monsoon. In the deep interiors of the forests, herbs, grasses and a few under-shrubs like *Abutilon indicum*, *Alternanthera sessilis*, *Andrographis paniculata*, *Barleria cristata*, *Biophytum sensitivum*, *Canscora diffusa*, *Cassia absus*, *Chrysopogon fulvus*, *Coldenia procumbens*, *Corchorus aestuans*, *Costus speciosus*, *Cyperus cyperoides*, *C. iria*, *Dactyloctenium aegyptium*, *Desmodium triflorum*, *Eclipta prostrata*, *Goniogyna hirta*, *Heteropogon contortus*, *Hibiscus lobatus*, *Launaea fallax*, *Paspalidium flavidum*, *Peristrophe paniculata*, *Phyllanthus maderaspatensis*, *Pupalia lappacea*, *Scleria* spp., *Sida* spp., *Triumfetta rhomboidea* etc. are frequently met with.

On the hillocks a distinctive vegetation can be noticed along the base, slopes and the top. Amongst the plants at the base of hillocks are trees like *Aegle marmelos*, *Melia azadirach*, *Tamarindus indica* and shrubs like *Adhatoda zeylanica*, *Calotropis procera*, *Dodonaea viscosa* etc. Amongst the herbs like *Cassia tora*, *Peristylis plantagineus*, *Sida acuta*, *Sphaeranthus indicus*, *Triumfetta rhomboidea* are common.

The slopes of the hillocks harbour trees like *Anogeissus latifolia*, *Buchanania lanzan*, *Mitragyna parvifolia*; shrubs like *Balanites aegyptiaca*, *Cleistanthus collinus*, *Ehretia laevis*, *Gardenia resinifera*, *Holarrhena antidysenterica*, *Woodfordia fruticosa*, and herbs like *Curculigo orchioides*, *Desmodium velutinum*, *Indigofera astragalina*, *Smithia conferta* etc. The plants on the top of the hillocks are represented by trees like *Bridelia retusa*, *Lannea coromandelica*, *Soymida febrifuga* etc., shrubs like *Clerodendrum multiflorum*, *Grewia hirsuta*, *G. rothii*, *Lagerstroemia indica* etc., and herbs like *Acrocephalus hispidus*, *Anisomeles heyneana*, *Cassia pumila*, *Dipteracanthus prostratus*, *Trichodesma sedgwickianum*, *Turnera ulmifolia*, *Waltheria indica* etc. Besides, Bamboos are also of not an uncommon occurrence in the area.

There are also ponds and ditches, at places stagnant waters where there is a distinct aquatic vegetation. The plant species frequently noticed are *Blyxa octandra*, *Ludwigia hyssopifolia*, *Nymphaea nouchali*, *Ottelia alismoides*, *Pistia stratiotes* etc. Roadside and avenue trees include *Albizia lebbek*, *Mangifera indica*, *Tamarindus indica*, *Tectona grandis* etc.

At certain seasons when the green herbage is low, various domestic or wild animals such as buffalos, goats, deers, bisons, blue bulls etc.

browse and graze down any green tree seedlings that may be available. In the shrub stratum grazing is concentrated on the palatable species which may be destroyed unless they are sufficiently thorny as in the case of *Zizyphus* and *Acacia* spp.

Most of the tree species in the area are used for shelter purposes. Bisons generally prefer a tree with a thick canopy of branches over it while a deer can avail even the tall gasses as its source of shelter. Some of the plants used as shelter by animals are *Aegle marmelos*, *Albizia odoratissima*, *Bauhinia racemosa*, *Bridelia retusa*, *Cleistanthus collinus*, *Dalbergia latifolia*, *Diospyros melanoxylon*, *Mangifera indica*, *Sterculia urens*, *Tamarindus indica* etc.

#### UTILITY OF THE MAJOR COMPONENTS

There are many plants which are used as forest products and also timber and are used by the residents of the area as follows :

##### (a) *Timbers used for carpentary and cabinet work :*

Some of the trees and shrubs which are used for carpentary and cabinet works are *Albizia lebbek*, *Anogeissus latifolia*, *Boswellia serrata*, *Gardenia latifolia*, *Lagerstroemia parviflora*, *Mangifera indica*, *Mitragyna parvifolia*, *Pterocarpus marsupium*, *Tectona grandis*, *Terminalia bellirica* etc.

##### (b) *Plants used in the manufacture of Bidis, Match boxes and in paper industry :*

The leaves of *Diospyros melanoxylon* are extensively used for wrapping the Bidis. The collection of 'tendu' leaves as it is commercially known, is quite common and is a big trade in the area. The plants such as *Bombax ceiba*, *Buchanania lanzan* etc. are used in the manufacture of match boxes. *Dendrocalamus strictus* is extensively used in the manufacture of paper. The collection and sale of this bamboo also is a big trade in the area.

##### (c) *Plants used for agricultural implements :*

Trees such as *Anogeissus latifolia*, *Bridelia retusa*, *Embllica officinalis*, *Lagerstroemia parviflora*, *Mitragyna parvifolia*, *Pterocarpus marsupium* etc., are used for agricultural implements.

##### (d) *Plants used for tanning :*

*Terminalia chebula* is the main source for tanning purposes. However, the bark of the tree species such as *Acacia chundra*, *Anogeissus latifolia*, *Boswellia serrata*, *Bridelia retusa*, *Cassia fistula*, *Cleistanthus collinus* and *Embllica officinalis* is also used for such purposes.

(e) *Gum and resin yielding plants :*

*Anogeissus latifolia*, *Bauhinia racemosa*, *Butea monosperma*, *Gardenia gummifera*, *Sterculia urens* are some of the gum yielding plants. Resin is obtained from the trees of *Boswellia serrata* and *Mitragyna parvifolia*.

(f) *Plants used for medicinal purposes :*

Many plants in the area are used for medicinal purposes in one way or the other. Such important species are : *Aegle marmelos*, *Cassia fistula*, *Embllica officinalis*, *Helicteres isora*, *Holarrhena antidysenterica*, *Mitragyna parvifolia*, *Tamarindus indica*, *Terminalia bellirica* and *Vitex negundo*.

#### ANTHROPOGENIC EFFECT ON THE VEGETATION

Fire and grazing have played an extremely influential part in determining the forest type occupying the land. These practices invariably have the effect of rendering the site less favourable to tree growth through a reduction of moisture levels in air and soil and often through erosion of the top soil. Grazing has an indirect effect on the standing trees in that associated with it are the practices of lopping for fodder and burning both to reduce the density of the canopy cover and to induce grass growth. The vital direct effect is in the inhibition of regeneration.

The tree felling has become more significant as the human population pressures have increased and the demand for fuel and timber augmented correspondingly. Due to the road building and mining activities the vegetation is not just damaged in the direct vicinity but much additional damage is done in the hilly areas because of the necessary incision and soil accumulation.

In short, excessive felling of forests has a serious effect on the development of soil and regeneration in the area.

#### PRESENT WORK

**Floristic analysis :**

The following enumeration includes both Angiosperms and Pteridophytes comprising 667 species, 393 genera and 110 families. Keys to the families/genera/species are given. The correct binomial is followed by local names if any. Brief notes have been provided. Phenological data covering only the flowering, fruiting period has also been mostly followed by frequency of their occurrence within the area and the habitat. The specimens are deposited in the herbarium of the Botanical Survey of India, Pune (BSI). The ten dominant families in the area in the order of their highest representation of species are Fabaceae, Poaceae, Cyperaceae, Euphorbiaceae, Asteraceae, Acanthaceae, Rubiaceae, Scrophulari-

aceae, Lamiaceae and Amaranthaceae. The genera and species representation of the same is as follows :

Sl. No.	Name of the family	Genera	Species
1.	Fabaceae	32	77
2.	Poaceae	45	76
3.	Cyperaceae	11	37
4.	Euphorbiaceae	15	35
5.	Asteraceae	22	26
6.	Acanthaceae	16	26
7.	Rubiaceae	13	21
8.	Scrophulariaceae	12	19
9.	Lamiaceae	8	14
10.	Amaranthaceae	9	12

Fabaceae is represented by 77 species and is thereby the dominant family in the area and Amaranthaceae with only 12 species is less represented. The genera within the family and the species within the genus are arranged alphabetically.

#### ACKNOWLEDGEMENTS

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## KEY TO ANGIOSPERMIC PLANT FAMILIES

1. Plants 2-cotyledonous, rarely one by reduction ; vascular bundles usually arranged in a single ring ; cambium present ; leaves usually reticulately veined :
  2. Perianth distinguishable into sepals and petals :
    3. Petals free :
      4. Sepals usually free :
        5. Torus small or elongated but not expanded :
          6. Flowers trimerous **ANNONACEAE**
          6. Flowers not trimerous, usually 4-5-merous :
            7. Stamens few, usually not more than 10 :
              8. Twining or sarmentose, rarely trailing herbs or shrubs ; carpels free **MENISPERMACEAE**
              8. Herbs, shrubs or trees ; carpels united :
                9. Flowers actinomorphic :
                  10. Placentation free-central **CARYOPHYLLACEAE**
                  10. Placentation parietal :
                    11. Petals cruciform ; stamens 6, tetradynamous ; disc in the form of 4 glands opposite sepals **BRASSICACEAE**
                    11. Petals not cruciform ; stamens often indefinite and if 6, not tetradynamous ; disc never in the form of glands **CAPPARACEAE**
        9. Flowers zygomorphic :
          12. Inner 2 sepals enlarged, petaloid, stamens 8, filaments united at the lower half ; placentation axile **POLYGALACEAE**



## BOTANICAL SURVEY OF INDIA

- |  |                |
|--|----------------|
| 12. Sepals 5, none specially enlarged but all are well developed ; stamens 5, free or in two bundles ; placentation parietal | VIOLACEAE      |
| 7. Stamens numerous, often more than 15 :  |                |
| 13. Carpels 2 or more syncarpous :   |                |
| 14. Placentation parietal :  |                |
| 15. Plants without sap ; petals absent   | FLACOURTIACEAE |
| 15. Plants with yellow sap ; petals bright yellow with maroon centre   | PAPAVERACEAE   |
| 14. Placentation not parietal :  |                |
| 16. Placentation free-central or basal-central   | PORTULACACEAE  |
| 16. Placentation usually axile, sometimes basal :  |                |
| 17. Stamens distinct   | TILIACEAE      |
| 17. Stamens monadelphous :   |                |
| 18. Anthers 1-celled   | MALVACEAE      |
| 18. Anthers 2-celled   | STERCULIACEAE  |
| 13. Carpels usually many (but sometimes reduced to one), apocarpous :  |                |
| 19. Terrestrial (plants) trees ; leaves distinctly longer than broad   | DILLENIACEAE   |
| 19. Aquatic plants ; leaves more or less orbicular :   |                |
| 20. Leaves floating ; ovules parietal ; endosperm and perisperm present and sometimes arillate                               | NYMPHAEACEAE   |
| 20. Leaves above water ; ovule pendulous ; no endosperm or perisperm   | NELUMBONACEAE  |
| 5. Torus expanded or thickened into a fleshy disc :  |                |
| 21. Flowers zygomorphic  | SAPINDACEAE    |

21. Flowers actinomorphic :

22. Styles 5, free or if solitary, with 5 linear stigmatose branches :

23. Plants usually woody, twining or sarmentose ; fruits winged

MALPIGHIACEAE

23. Plants neither twining nor sarmentose ; fruits not winged

OXALIDACEAE

22. Styles more or less connate or solitary :

24. Plants usually climbing or twining

VITACEAE

24. Plants not climbing, if climbing, armed or unarmed erect herbs, shrubs or trees :

25. Leaves gland-dotted, aromatic

RUTACEAE

25. Leaves not as above :

26. Stamens monadelphous

MELIACEAE

26. Stamens free :

27. Plants usually with acrid resinous juice ; stamens bearing resinous passages

ANACARDIACEAE

27. Plants not as above :

28. Inflorescence leaf-opposed

LEEACEAE

28. Inflorescence not leaf-opposed :

29. Leaves simple :

30. Flowers in axillary fascicles ; ovule one in each locule :

31. Stamens 3

HIPPOCRATEACEAE

31. Stamens 4-5

RHAMNACEAE

30. Flowers cymose ; ovules 2 or more in each locule :

32. Calyx accrescent ; stamens 3

OLACACEAE

32. Calyx not accrescent ; stamens 4-5

CELASTRACEAE

## 29. Leaves compound :

33. Herbs or under-  
shrubs; ovules 2 in  
each locule

ZYGOPHYLLACEAE

33. Trees ; ovules soli-  
tary in each locule

SIMAROUBACEAE

## 4. Calyx of united sepals :

## 34. Leaves usually simple :

35. Plants tendril bearing climbers

CUCURBITACEAE

35. Plants not bearing tendrils :

## 36. Plants aquatic :

37. Styles solitary ; fruits indehis-  
cent spinous

TRAPACEAE

37. Styles 2 or 4 ; fruits 4-fur-  
rowed or separating into 4  
cocci, not spinous

HALORAGACEAE

## 36. Plants terrestrial :

38. Stamens usually definite,  
often not more than 12 :

39. Ovary either inferior or  
at the most half-sup-  
erior :

40. Calyx lobes imbricate

MELASTOMATACEAE

40. Calyx lobes valvate  
atleast in buds :

41. Fruit a capsule,  
not winged

ONAGRACEAE

41. Fruit usually an  
indehiscent cori-  
aceous or drupa-  
ceous and frequ-  
ently winged

COMBRETACEAE

## 39. Ovary superior :

42. Soft wooded trees  
with latex ; leaves  
palmately fid to par-  
tite with long, hollow  
petioles

CARICACEAE

42. Herbs or shrubs and if trees, not with latex ; leaves and petioles not as above :
  43. Placentation parietal :
    44. Herbs ; flowers white or pink, never yellow, plants insectivorous **DROSERACEAE**
    44. Shrubs ; flowers usually yellow ; plants not insectivorous **TURNERACEAE**
  43. Placentation axile or basal :
    45. Petals usually present, though minute, (rarely absent) ; seeds not reniform, smooth **LYTHRACEAE**
    45. Petals absent ; seeds reniform, variously striate, rugulose or muriculate **MOLLUGINACEAE**
38. Stamens usually indefinite :
  46. Leaves opposite, glandular-punctate with intra-marginal nerves **MYRTACEAE**
  46. Leaves alternate, neither glandular-punctate nor with intra-marginal nerves :
    47. Ovary 1-celled **ALANGIACEAE**
    47. Ovary more than 1-celled :
      48. Locules of the ovary suppressed ; flowers red or orange ; fruit a berry with hard woody rind **PUNICACEAE**
      48. Ovary 4-loculed ; flowers white ; fruit a fibrous drupe **LECYTHIDACEAE**
34. Leaves mostly compound, rarely simple :
  49. Flowers actinomorphic **MIMOSACEAE**
  49. Flowers zygomorphic :
    50. Flowers with typical papilionaceous corolla **FABACEAE**

50. Flowers not with papilionaceous corolla CAESALPINIACEAE
3. Petals usually united :
51. Flowers epi or perigynous :
52. Inflorescence an involucrate head ; calyx absent or variously modified pappus ; ovary 1-celled ASTERACEAE
52. Inflorescence not as above ; calyx present ; ovary 2 or more celled :
53. Leaves opposite ; stipules inter or intra-petiole RUBIACEAE
53. Leaves alternate ; exstipulate :
54. Corolla equal or subequal ; anthers free CAMPANULACEAE
54. Corolla distinctly 2-lipped ; anthers connivent into a ring LOBELIACEAE
51. Flowers hypogynous :
55. Parasitic or insectivorous plants :
56. Parasitic plants CUSCUTACEAE
56. Insectivorous plants LENTIBULARIACEAE
55. Neither parasitic nor insectivorous plants :
57. Carpels 2, if more than 2, then plants aquatic :
58. Plants with milky latex or greenish-yellow sap :
59. Anthers sagittate, pollen not formed into pollinia APOCYNACEAE
59. Anthers not as above ; pollen formed into pollinia :
60. Filaments free ; anthers without horny wings PERIPLOCACEAE
60. Filaments united ; anthers with horny wings ASCLEPIADACEAE
58. Plants without any latex or greenish-yellow sap :
61. Flowers actinomorphic :

62. Floating herbs with flowers  
terminating on apparent petioles **MENYANTHACEAE**
62. Plants not as above :
63. Inflorescences one sided  
cymes (secund) :
64. Ovules indefinite in each  
locule ; fruit a capsule **HYDROPHYLLACEAE**
64. Ovules definite in each  
locule ; fruit a drupe or of  
four nutlets :
65. Ovary deeply 4-lob-  
bed ; style gynobasic  
(except in *Tricho-*  
*desma* L.) **BORAGINACEAE**
65. Ovary entire or  
slightly 4-lobed ;  
style terminal :
66. Style solitary **HELIOTROPIACEAE**
66. Styles 2-4 :
67. Styles 2 **EHRETIACEAE**
67. Styles 4 **CORDIACEAE**
63. Inflorescences not as above :
68. All or atleast lower leaves  
opposite :
69. Stamens 2 **OLEACEAE**
69. Stamens 4-5 :
70. Ovary 1-celled ;  
placentation  
parietal or free-  
central **GENTIANACEAE**
70. Ovary 2-celled ;  
placentation  
axile :
71. Stipules  
absent **SCROPHULARIACEAE**
71. Stipules  
present or re-  
presented by  
a raised line  
joining the  
bases or  
petioles **LOGANIACEAE**

68. Leaves usually alternate :

72. Plants erect or diffuse but not twining ; ovary 2-celled, ovules many in each locule

SOLANACEAE

72. Plants chiefly twining, at times trailing, diffuse or erect ; ovary 2-celled ; ovules 2 in each locule or 4-celled with one ovule in each locule

CONVOLVULACEAE

61. Flowers zygomorphic :

73. Fruits opening elastically from the apex of 2 loculicidal valves ; seeds usually supported on upcurved process from the placentas

ACANTHACEAE

73. Fruits not opening elastically, rarely indehiscent :

74. Leaves usually compound, if simple, seeds winged ; fruits much elongated

BIGNONIACEAE

74. Leaves usually simple ; seeds not winged ; fruits not as above :

75. Flowers with extra floral glands at the base of the pedicels :

76. Placentation axile ; fruit a capsule or indehiscent and spinous

PEDALIACEAE

76. Placentation parietal ; fruits with hooked prongs

MARTYNIACEAE

75. Flowers without extra floral glands at the base of the pedicels :

77. Plants often aromatic ; inflorescence a verticillaster ; style gynobasic

LAMIACEAE

77. Plants usually non-aromatic ; inflorescence not as above ; style terminal

VERBENACEAE

57. Carpels more than 2 :
- 78. Flowers usually unisexual ; stamens inserted on the receptacle (not epipetalous) EBENACEAE
  - 78. Flowers bisexual ; stamens epipetalous :
    - 79. Calyx often with stipitate glands ; styles 5 or if one, then with 5 terminal stigmatose branches PLUMBAGINACEAE
    - 79. Calyx without stipitate glands ; style 1 SAPOTACEAE
2. Perianth not distinguishable into sepals and petals :
- 80. Flowers epigynous :
    - 81. Parasitic plants ; flowers actinomorphic ; fruits drupes or berries LORANTHACEAE
    - 81. Non-parasitic plants ; flowers zygomorphic ; fruits capsules ARISTOLOCHACEAE
  - 80. Flowers hypogynous :
    - 82. Flowers unisexual or polygamous :
      - 83. Ovary 3-celled EUPHORBIACEAE
      - 83. Ovary 1-celled :
        - 84. Filaments not inflexed ULMACEAE
        - 84. Filaments inflexed (in bud) :
          - 85. Style undivided URTICACEAE
          - 85. Style branches 2 MORACEAE
    - 82. Flowers usually bisexual :
      - 86. Parasitic or non-parasitic plants ; anthers with valvular dehiscence :
        - 87. Parasitic twining herbs ; often leafless or with minute scales CASSYTHACEAE
        - 87. Non-parasitic trees or shrubs ; leaves well developed LAURACEAE
      - 86. Non-parasitic plants ; dehiscence of anthers not so :
        - 88. Leaves stipulate, stipules ochreate POLYGONACEAE
        - 88. Leaves exstipulate :
          - 89. Perianth petaloid NYCTAGINACEAE
          - 89. Perianth not petaloid ; if petaloid, bracts and bracteoles scarious AMARANTHACEAE



1. Plants 1-cotyledonous ; vascular bundles scattered, not in a ring ; cambium absent ; leaves mostly parallel veined :
  90. Perianth absent ; flowers subtended, dry, chaffy, usually inflorescence various of spikelets, imbricating glumes (bracts) :
    91. Stems mostly hollow, cylindrical or flattened ; leaves ligulate, leaf sheaths split ; fruit a caryopsis POACEAE
    91. Stems obtusely to distinctly trigonous, usually solid ; leaves not ligulate, sheaths not split ; fruit a compressed or trigonous nut CYPERACEAE
  90. Perianth present ; inflorescence not of spikelets ; flowers not subtended as above :
    92. Perianth represented only by scales or bristles :
      93. Flowers and fruits (inflorescence) densely pappose and drying TYPHACEAE
      93. Flowers and fruits (inflorescence) glabrous and fleshy ARACEAE
    92. Perianth present but not as above :
      94. Perianth uniseriate APONOGETONACEAE
      94. Perianth biseriate :
        95. Only outer perianth corolline :
          96. Ovary inferior HYDROCHARITACEAE
          96. Ovary superior ALISMATACEAE
        95. Both series of perianth corolline :
          97. Flowers epigynous :
            98. Flowers usually actinomorphic ; stamens 3 or more, petaloid, staminodes absent :
              99. Twining or climbing plants ; leaves simple or compound but reticulately veined ; flowers unisexual ; capsules winged or not but seeds winged DIOSCOREACEAE
              99. Plants not as above ; leaves parallel veined ; if reticulate, leaves much lobed ; flowers bisexual ; fruits and seeds not winged :
                100. Leaves reticulately veined, variously lobed ; placentation parietal TACCACEAE

- 100. Leaves parallel  
veined, entire ; pla-  
centation axile **HYPOXIDACEAE**
- 98. Flowers strongly zygomor-  
phic ; fertile stamens 1-2, at  
times only 1/2 stamens  
(anther lobe) fertile, the other  
being transformed into  
petaloid staminodes :
  - 101. Stems spirally twisted **COSTACEAE**
  - 101. Stems not so :
    - 102. Corolla spurred ;  
pollen often agglu-  
tinated into pol-  
linia ; gyno-  
stegium typical ;  
ovary spirally  
twisted **ORCHIDACEAE**
    - 102. Corolla not spur-  
red ; pollinia and  
gynostegium  
absent ; ovary not  
as above :
      - 103. Sepals free ;  
only 1/2 sta-  
men (anther  
lobe) fertile **CANNACEAE**
      - 103. Sepals con-  
nate ; 1 sta-  
men fertile **ZINGIBERACEAE**
- 97. Flowers hypogynous :
  - 104. Leaves reduced to cladodes **ASPARAGACEAE**
  - 104. Leaves well developed :
    - 105. Plants climbing or  
twining **LILIACEAE**
    - 105. Plants not as above ;
      - 106. Plants radical ;  
flowers in ter-  
minal, compact,  
solitary heads **ERIOCAULACEAE**
      - 106. Leaves and flowers  
not as above **COMMELINACEAE**

## KEY TO PTERIDOPHYTIC PLANT FAMILIES

1. Sporangia in sporocarps born at the bases of leaves MARSILEACEAE
1. Sporangia not in sporocarps :
  2. Sporangia are sunk in leaf-bases ; outer leaves have megasporangia and the inner microsporangia ISOETACEAE
  2. Sporangia are not sunk in leaf-bases and they are otherwise :
    3. Sporangia initiating from a group of cells ; sporangial walls more than 1-cell thick ; annulus absent, dehiscing by a slit into 2 valves OPHIOGLOSSACEAE
    3. Sporangia initiating from a single cell ; sporangial walls 1-cell thick ; annulate ; dehiscence irregular ADIANTACEAE

## DILLENACEAE

### DILLENIA L.

**Dillenia pentagyna** Roxb. *Kankera*.

Trees. Flowers yellow. Fruits pendulous.

*Fl. & Fr.* : March May. Infrequent in dense forests.

## ANNONACEAE

### ANNONA L.

**Annona squamosa** L. *Sitaphal*. Custard Apple.

Shrubs. Flowers cream coloured. Fruits green.

*Fl. & Fr.* : June December. Infrequent as an escape in open forests. Also planted.

## MENISPERMACEAE

- |   |             |
|---|-------------|
| 1. Inflorescence supported by foliar bracts ; carpels solitary        | CISSAMPELOS |
| 1. Inflorescence not supported by foliar bracts ; carpels 3 or more : |             |
| 2. Leaves glabrous ; seeds oblong or globose                          | TINOSPORA   |
| 2. Leaves densely pubescent ; seeds horse-shoe shaped                 | COCCULUS    |

### CISSAMPELOS L.

**Cissampelos pareira** L. var. **hirsuta** (Buch.-Ham. ex DC.) Forman  
*Pahadmul*. False Pareira Brava.

Climbing shrubs. Flowers pale white. Drupes scarlet.

*Fl. & Fr.* : Greater part of the year. Frequent in open forests.

### COCCULUS A.P.DC. *nom. cons.*

**Cocculus hirsutus** (L.) Diels, *Vasanvel*.

Climbing undershrubs. Flowers dirty white. Fruits black.

*Fl. & Fr.* : Greater part of the year. Frequent in open forests.

## TINOSPORA Miers

**Tinospora cordifolia** (Willd.) Miers ex Hook. f. & Thoms. *Gulancha tinospora*.

Climbing shrubs. Flowers yellow. Drupes red.

*Fl. & Fr.* : August November. Infrequent in open forests.

## NYMPHAEACEAE

## NYMPHAEA L.

1. Leaves sharply toothed ; anthers without appendages *N. nouchali*

1. Leaves entire or wavy ; anthers with long appendages *N. stellata*

**Nymphaea nouchali** Burm. f. *Kamal*. Indian red water-lily.

Aquatic herbs. Flowers blue or violet. Berries globose.

*Fl. & Fr.* : Greater part of the year. Frequent in ponds.

**N. stellata** Willd. *Lahan kamal*. Indian blue water lily.

Floating aquatic herbs. Flowers light blue, purple or violet. Fruits globular.

*Fl. & Fr.* : August November. Frequent in ponds.

## NELUMBONACEAE

## NELUMBO Adans.

**Nelumbo nucifera** Gaertn. *Suryakamal*. Sacred lotus.

Aquatic herbs. Flowers pink. Fruits ovoid.

*Fl. & Fr.* : August November. Frequent in ponds and pools.

## PAPAVERACEAE

## ARGEMONE L.

**Argemone mexicana** L. Prickly Poppy.

Prickly herbs. Flowers yellow. Capsules oblong-ellipsoid.

*Fl. & Fr.* : Greater part of the year. Frequent weed in wastelands.

## BRASSICACEAE

(nom. alter. CRUCIFERAE)

- |                     |          |
|---------------------|----------|
| 1. Pods dehiscent   | BRASSICA |
| 1. Pods indehiscent | RAPHANUS |

## BRASSICA L.

**Brassica nigra** Koch. *Mohri*. Black mustard.

Annuals. Flowers yellow. Pods subulate, torulose.

*Fl. & Fr.* : September February. Infrequent as an escape.

## RAPHANUS L.

**Raphanus sativus** L. *Moola*. Radish.

Herbs. Flowers lilac. Pods terete, torulose.

*Fl. & Fr.* : September December. Infrequent as an escape.

## CAPPARACEAE

- |                    |                |
|--------------------|----------------|
| 1. Shrubs or trees | <i>Crateva</i> |
| 1. Herbs           | <i>Cleome</i>  |

## CLEOME L.

- |   |                    |
|---|--------------------|
| 1. Flowers white ; andro and gynophores present | <i>C. gynandra</i> |
| 1. Flowers yellow ; andro and gynophores absent | <i>C. viscosa</i>  |

**Cleome gynandra** L.

Hispid herbs. Flowers pale. Capsules striate.

*Fl. & Fr.* : Greater part of the year. Frequent weed in cultivated fields and wastelands.**C. viscosa** L.

Annual herbs. Flowers yellow. Capsules rigid.

*Fl. & Fr.* : Greater part of the year. Frequent weed in cultivated fields.

## CRATEVA L.

**Crateva nurvala** Buch.-Ham.

Trees. Flowers yellow or white. Berries papillate.

*Fl. & Fr.* : March June. Infrequent in open forests. Also planted.

## VIOLACEAE

HYBANTHUS Jacq. *nom. cons.*

**Hybanthus enneaspermus** (L.) F.v. Muell. *Rathanparas.*

Herbs. Flowers red. Capsules yellow.

*Fl. & Fr.* : Greater part of the year. Frequent as forest undergrowth.

## FLACOURTIACEAE

FLACOURTIA L. Herit.

**Flacourtia indica** (Burm. f.) Merr. *Kutian.*

Trees. Flowers white. Berries red.

*Fl. & Fr.* : March - June. Infrequent in open forests.

## POLYGALACEAE

POLYGALA L.

1. Racemes 0.5-1.5 cm long ; capsules densely ciliate *P. arvensis*

1. Racemes 5-15 cm long ; capsules ciliate *P. elongata*

**Polygala arvensis** Willd. *auct. non. L. Bijnori.*

Herbs. Flowers yellow. Capsules didymous.

*Fl. & Fr.* : May - November. Frequent in moist habitats.

**P. elongata** Klein ex Willd.

Herbs. Flowers yellow. Capsules oblique.

*Fl. & Fr.* : July November. Frequent in moist habitats.

## CARYOPHYLLACEAE

## POLYCARPÆA Lam.

**Polycarpaea corymbosa** (L.) Lam. *Bhiska*.

Herbs. Flowers white. Capsules 3-nerved.

*Fl. & Fr.* : August December. Frequent in open forests.

## PORTULACACEAE

## PORTULACA L.

**Portulaca oleracea** L. *Pasalei*. Common Purslane.

Herbs. Flowers yellow. Capsules ovoid.

*Fl. & Fr.* Greater part of the year. Frequent weed in cultivated fields and moist situations.

## MALVACEAE

1. Fruits dehiscent capsules :
  2. Calyx spathaceous, deciduous ABELMOSCHUS
  2. Calyx not spathaceous :
    3. Style branches 5 HIBISCUS
    3. Style not branched THESPESIA
1. Fruits indehiscent or schizocarps of 5 or more cocci separating from the central axis :
  4. Epicalyx present :
    5. Epicalyx foliaceous ; flowers in capitate inflorescence MALACHRA
    5. Epicalyx not foliaceous ; flowers not in capitate inflorescence :
      6. Epicalyx 5 ; fruits glochidiate URENA
      6. Epicalyx more than 5 ; fruits not glochidiate PAVONIA
  4. Epicalyx absent :
    7. Carpels 1-seeded SIDA
    7. Carpels 2 or more seeded ABUTILON



**ABELMOSCHUS Medic.**

- |  |                     |
|--|---------------------|
| 1. Stems hispid ; epicalyx segments 6-16                 | <i>A. moschatus</i> |
| 1. Stems not hispid ; epicalyx segments 4-8 :            |                     |
| 2. Epicalyx segments small, linear-lanceolate, deciduous | <i>A. ficulneus</i> |
| 2. Epicalyx segments large, ovate, persistent            | <i>A. manihot</i>   |

**Abelmoschus ficulneus (L.) Wight & Arn. ex Wight**

Annuals. Flowers light purple. Capsules oblong, 5-angled.

*Fl. & Fr.* : September - December. Frequent weed in cultivated fields.

**A. manihot (L.) Medic.**

Herbs or undershrubs. Flowers yellow or purple. Capsules hispid, 5-angled.

*Fl. & Fr.* : September - December. Frequent in wastelands.

**A. moschatus (L.) Medic. Kapuskanda.**

Herbs. Flowers yellow. Capsules globose, hispid.

*Fl. & Fr.* : September - November. Infrequent in open forests.

**ABUTILON Mill.**

- |  |                    |
|--|--------------------|
| 1. Ripe carpels obtuse, awned or mucronate | <i>A. pannosum</i> |
| 1. Ripe carpels awned or mucronate         | <i>A. indicum</i>  |

**Abutilon indicum (L.) Sweet, Karkoti. Country Mallow.**

Undershrubs. Flowers yellow. Fruits (carpels) awned.

*Fl. & Fr.* : Greater part of the year. Infrequent in open forests.

**A. pannosum (Forst. f.) Schlect.**

Undershrubs. Flowers yellow. Fruits globose.

*Fl. & Fr.* : August - December. Frequent in open forests.

## HIBISCUS L.

- 1 Flowers yellow with deep purple or chocolate brown at the centre *H. vitifolius*
1. Flowers white or pale to deep pink *H. lobatus*

**Hibiscus lobatus** (J.A. Murr.) Kuntze

Herbs. Flowers white. Capsules slightly longer than calyx.

*Fl. & Fr.* : August - December. Frequent as forest undergrowth.

**H. vitifolius** L.

Herbs. Flowers yellow. Capsules winged, hairy.

*Fl. & Fr.* : March November. Frequent along water courses.

## MALACHRA L.

**Malachra capitata** (L.) L.

Herbs. Flowers yellow. Fruits subglobose.

*Fl. & Fr.* : August December. Frequent in open forests.

PAVONIA Cav. *nom. cons.*

1. Capsules slightly winged ; cocci glabrous *P. zeylanica*
1. Capsules not winged ; cocci hairy *P. odorata*

**Pavonia odorata** Willd.

Herbs. Flowers light pink. Capsules subglobose.

*Fl. & Fr.* : Greater part of the year. Frequent in open forests.

**P. zeylanica** (L.) Cav.

Suffruticose herbs. Flowers white to light pink. Fruits globose.

*Fl. & Fr.* : November. Frequent in open forests.

**SIDA L.**

- 1. Cocci aristate *S. cordifolia*
- 1. Cocci not aristate, merely acute :
  - 2. Pedicels jointed below the middle *S. rhombifolia*
  - 2. Pedicels jointed above the middle :
    - 3. Pedicels longer than the leaves *S. cordata*
    - 3. Pedicels shorter than the leaves :
      - 4. Flowers solitary, axillary *S. acuta*
      - 4. Flowers in axillary panicles *S. mysorensis*

**Sida acuta** Burm. f.

Suffruticose herbs. Flowers yellow. Fruits awned.

*Fl. & Fr.* : Greater part of the year. Frequent along roadsides of the forests.

**S. cordata** (Burm. f.) Boiss.

Suffruticose herbs. Flowers yellow. Fruits globose.

*Fl. & Fr.* : Greater part of the year. Frequent as forest undergrowth.

**S. cordifolia** L. *Chikna*.

Herbs. Flowers yellow. Fruits aristate.

*Fl. & Fr.* : Greater part of the year. Frequent in open forests.

**S. mysorensis** Wight & Arn.

Viscid herbs. Flowers yellow. Mericarps not curved.

*Fl. & Fr.* : Greater part of the year. Frequent in open forests.

**S. rhombifolia** L. *Guleatada*.

Erect herbs. Flowers yellow. Fruits awned.

*Fl. & Fr.* : August April. Frequent as forest undergrowth.

**THESPESIA** Soland. ex Corr. *nom. cons.***Thespesia lampas** (Cav.) Dalz. & Gibs.

Undershrubs. Flowers yellow. Capsules ovoid.

*Fl. & Fr.* : August April. Frequent in open forests.

**URENA L.****Urena lobata L.**

Undershrubs. Flowers pink. Carpels glochidiate.

*Fl. & Fr.* : September May. Frequent in wastelands and also as forest undergrowth.

**STERCULIACEAE**

- |   |            |
|---|------------|
| 1. Flowers unisexual ; petals absent                                  | STERCULIA  |
| 1. Flowers bisexual ; petals present :                                |            |
| 2. Ovary raised on a gynophore ; follicles spirally twisted           | HELICTERES |
| 2. Ovary not raised on a gynophore ; follicles not spirally twisted : |            |
| 3. Petals deciduous, appendaged                                       | BYTTNERIA  |
| 3 Petals persistent, not appendaged :                                 |            |
| 4. Flowers yellow, ovary 1-celled                                     | WALTHERIA  |
| 4. Flowers rosy, ovary 5-celled                                       | MELOCHIA   |

**BYTTNERIA Loebl. nom. cons.****Byttneria herbacea Roxb.**

Trailing herbs. Flowers purplish. Fruits globose, glochidiate.

*Fl. & Fr.* : July - December. Frequent in gravelly soils of hillocks.

**HELICTERES L.**

**Helicteres isora L.** *Murudphal, Murudseng.* East Indian Screw Tree.

Shrubs. Flowers red. Fruits of twisted follicles.

*Fl. & Fr.* : July December. Frequent in open forests.

**MELOCHIA L.****Melochia corchorifolia L.**

Erect herbs. Flowers white or pink. Capsules globose.

*Fl. & Fr.* : Greater part of the year. Frequent near marshy places.

**STERCULIA L.**

- 1. Leaves entire, not lobed *S. guttata*
- 1. Leaves palmately lobed :
  - 2. Panicles erect ; follicles with irritant hairs *S. urens*
  - 2. Panicles drooping ; follicle hairs not irritant *S. villosa*

***Sterculia guttata* Roxb.**

Trees. Flowers pale brown. Follicles woody.

*Fl. & Fr.* : January June. Infrequent in dense forests.

***S. urens* Roxb. Karu.**

Trees. Flowers yellowish. Follicles ovoid.

*Fl. & Fr.* : November - March. Infrequent in open forests.

***S. villosa* Roxb.**

Trees. Flowers pinkish. Follicles oblong.

*Fl. & Fr.* : December March. Infrequent in open forests.

**WALTHERIA L.*****Waltheria indica* L.**

Herbs. Flowers yellow. Capsules membranous.

*Fl. & Fr.* : Greater part of the year. Frequent in open forests.

**TILIACEAE**

- 1. Fruits echinate or bristly *Triumfetta*
- 1. Fruits not echinate, not bristly :
  - 2. Petals glandular at base ; fruits drupaceous, often 2-4-lobed *Grewia*
  - 2. Petals eglandular at base ; fruits capsular, elongate or globose *Corchorus*

**CORCHORUS L.**

- |  |                        |
|--|------------------------|
| 1. Capsules globose                                    | <i>C. capsularis</i>   |
| 1. Capsules elongate :                                 |                        |
| 2. Capsules 3-winged                                   | <i>C. aestuans</i>     |
| 2. Capsules not winged :                               |                        |
| 3. Beak of capsules 3-fid, spreading                   | <i>C. tridens</i>      |
| 3. Beak of capsules entire :                           |                        |
| 4. Capsules scabrous or aculeate, 3 winged, beak short | <i>C. trilocularis</i> |
| 4. Capsules glabrous, 10-ribbed, beak long             | <i>C. olitorius</i>    |

**Corchorus aestuans L.**

Herbs. Flowers yellow. Capsules winged.

*Fl. & Fr.* : September March. Frequent in moist or marshy places.

**C. capsularis L.**

Herbs. Flowers yellow. Capsules subglobose.

*Fl. & Fr.* : September December. Frequent weed in wastelands.

**C. olitorius L.**

Herbs. Flowers yellow. Capsules linear-cylindric.

*Fl. & Fr.* : July December. Frequent weed in cultivated fields.

**C. tridens L.**

Herbs. Flowers yellow. Capsules subcylindric.

*Fl. & Fr.* : August October. Infrequent weed in cultivated fields.

**C. trilocularis L.**

Herbs. Flowers yellow. Capsules hairy.

*Fl. & Fr.* : August - October. Frequent in moist places.

## GREWIA L.

- |   |                        |
|---|------------------------|
| 1. Subscandent shrubs ; leaves 3-ribbed | <i>G. flavescens</i>   |
| 1. Erect shrubs ; leaves 3-5-ribbed :   |                        |
| 2. Peduncles shorter than petioles      | <i>G. abutilifolia</i> |
| 2. Peduncles longer than petioles :     |                        |
| 3. Flowers white                        | <i>G. hirsuta</i>      |
| 3. Flowers pale yellow                  | <i>G. rothii</i>       |

**Grewia abutilifolia Vent. ex Juss.**

Shrubs. Flowers whitish-green. Drupes fleshy.

*Fl. & Fr.* : August    December. Frequent in open forests.

**G. flavescens A. Juss.**

Subscandent shrubs. Flowers yellow. Drupes 1    4-lobed.

*Fl. & Fr.* : June    October. Infrequent in open forests.

**G. hirsuta Vahl, Chatrani.**

Shrubs. Flowers whitish. Drupes wrinkled.

*Fl. & Fr.* : July    November. Frequent in open as well as dense forests.

**G. rothii DC.**

Shrubs. Flowers light yellow. Fruits hoary.

*Fl. & Fr.* : May - October. Frequent in open forests.

## TRIUMFETTA L.

- |  |                        |
|--|------------------------|
| 1. Leaves 3-5-lobed ; bristles of capsules short, glabrous | <i>T. rhomboidea</i>   |
| 1. Leaves orbicular ; bristles of capsules puberulous      | <i>T. rotundifolia</i> |

**Triumfetta rhomboidea Jacq. Bur Bush.**

Undershrubs. Flowers yellow. Fruits globose.

*Fl. & Fr.* : Greater part of the year. Frequent as forest undergrowth.

**Triumfetta rotundifolia** Lam.

Undershrubs. Flowers yellow. Capsules globose.

*Fl. & Fr.* : Greater part of the year. Frequent as forest undergrowth.

## MALPIGHIACEAE

## ASPIDOPTERIS A. Juss.

**Aspidopteris cordata** (Heyne ex Wall.) A. Juss.

Woody climbers. Flowers white. Fruits of oblong samaras.

*Fl. & Fr.* : August December. Frequent in open forests.

## ZYGOPHYLLACEAE

## TRIBULUS L.

**Tribulus terrestris** L. *Gokhru*. Puncture Vine.

Trailing herbs. Flowers yellow. Fruits globose.

*Fl. & Fr.* : August March. Frequent weed in cultivated fields.

## OXALIDACEAE

## BIOPHYTUM DC.

1. Pedicels as long as or longer than calyx ; seeds spirally warty

*B. candolleanum*

1. Pedicels much shorter than calyx ; seeds transversely ridged or striate

*B. sensitivum*

**Biophytum candolleanum** Wight

Herbs. Flowers yellow. Capsules ovoid.

*Fl. & Fr.* : August December. Infrequent weed in wastelands.

**B. sensitivum** (L.) DC.

Herbs. Flowers yellow. Capsules ovoid.

*Fl. & Fr.* : September December. Frequent weed in cultivated fields and wastelands.



## RUTACEAE

- |   |         |
|---|---------|
| 1. Leaflets 3, rachis not winged ; stamens numerous           | AEGLE   |
| 1. Leaflets more than 3, rachis winged ; stamens less than 15 | LIMONIA |

**AEGLE** *Corr. nom. cons.*

**Aegle marmelos** (L.) *Corr. Bel.* The Bael Tree.

Trees. Flowers greenish-white. Fruits globose.

*Fl. & Fr.* : April October. Frequent in outskirts of villages, usually planted.

**LIMONIA** L.

**Limonia acidissima** L. *Kawit.*

Trees. Flowers greenish yellow. Fruits ovoid or globose.

*Fl. & Fr.* : May December. Frequent in wastelands, especially in the village outskirts.

## SIMAROUBACEAE

**BALANITES** *Delile nom. cons.*

**Balanites aegyptiaca** (L.) *Delile, Hingan.*

Trees. Flowers yellow. Fruits oblong-ovoid.

*Fl. & Fr.* : February June. Frequent along water courses.

## MELIACEAE

- |                                 |             |
|---------------------------------|-------------|
| 1. Seeds not winged :           |             |
| 2. Leaves 2 or 3 pinnate        | MELIA       |
| 2. Leaves once pinnate          | AZADIRACHTA |
| 1. Seeds winged :               |             |
| 3. Filaments united into a tube | SOYMIDA     |
| 3. Filaments distinct           | CHLOROXYLON |

**AZADIRACHTA A. Juss.**

**Azadirachta indica** A. Juss. *Nim.* Margosa Tree.

Trees. Flowers white. Fruits greenish.

*Fl. & Fr.* : January - June. Frequent along the fields as well as roadsides in the villages.

**CHLOROXYLON A.P. DC. *nom. cons.***

**Chloroxylon swietenia** DC. *Bhirra.* East Indian Satin Wood.

Trees. Flowers white. Capsules ovoid.

*Fl. & Fr.* : March June. Frequent in open forests.

**MELIA L.**

**Melia azadirach** L. Bead Tree.

Trees. Flowers white. Fruits fleshy.

*Fl. & Fr.* : March June. Frequent near habitations.

**SOYMIDA A. Juss.**

**Soymida febrifuga** A. Juss. *Rohan.*

Small trees. Flowers greenish-white. Fruits woody when ripe.

*Fl. & Fr.* : Greater part of the year. Frequent in open and dense forests.

**OLACACEAE****OLAX L.**

- |   |                     |
|---|---------------------|
| 1. Armed shrubs, drupes <i>ca</i> 1 cm long   | <i>O. scandens</i>  |
| 1. Unarmed shrubs, drupes <i>ca</i> 2 cm long | <i>O. imbricata</i> |

**Olax imbricata** Roxb.

Scandent shrubs. Flowers white. Fruits ovate-oblong.

*Fl. & Fr.* : February June. Infrequent in open and dense forests.

***Olex scandens* Roxb.**

Scandent shrubs. Flowers white. Fruits ovate-oblong.

*Fl. & Fr.* : February June. Frequent in open forests.

**CELASTRACEAE**

## 1. Leaves alternate :

2. Unarmed, shrubby climbers, ovary free from disc **CELASTRUS**

2. Armed erect shrubs, ovary embedded in disc **MAYTENUS**

1. Leaves opposite **CASSINE**

**CASSINE L.**

***Cassine glauca* (Rottb.) Kuntze, *Arar.***

Trees. Flowers greenish-yellow. Fruits ovoid.

*Fl. & Fr.* : September February. Frequent in dense forests.

**CELASTRUS L.**

***Celastrus paniculata* Willd. *Dhimarbel.***

Stragglng shrubs. Flowers yellow. Fruits subglobose.

*Fl. & Fr.* : April November. Frequent in open as well as dense forests.

**MAYTENUS Molina *emend.* Bose**

1. Scandent, evergreen shrubs ; flowers sessile and fascicled *M. rothiana*

1. Erect, deciduous shrubs ; flowers peduncled in cymes *M. emarginata*

***Maytenus emarginata* (Willd.) Ding Hou**

Armed shrubs. Flowers white. Capsules purple when ripe.

*Fl. & Fr.* : September December. Frequent in open forests.

***M. rothiana* (Walp.) Lobreau-Callen**

Unarmed scandent shrubs. Flowers white. Fruits bright red.

*Fl. & Fr.* : March June. Frequent in open forests.

## HIPPOCRATEACEAE

## REISSANTIA Halle

**Reissantia indica** (Willd.) Halle

Climbing shrubs. Flowers yellow. Carpels ellipsoid.

*Fl. & Fr.* : April June. Infrequent in open forests.

## RHAMNACEAE

1. Unarmed climbers ; fruits samaroid

VENTILAGO

1. Armed erect or scandent shrubs ; fruits drupaceous

ZIZIPHUS

## VENTILAGO Gaertn.

**Ventilago denticulata** Willd.

Extensive climbers. Flowers greenish. Fruits winged.

*Fl. & Fr.* : October February. Frequent in dense forests.

## ZIZIPHUS Tourn. ex Mill.

1. Styles distinct or nearly so

*Z. xylopyra*

1. Styles connate to the middle :

2. Fruits more than 1 cm across

*Z. mauritiana*

2. Fruits less than 1 cm across

*Z. oenoplia*

**Ziziphus mauritiana** Lam. *Ber.* Indian Jujube.

Armed trees. Flowers greenish-white. Fruits brownish.

*Fl. & Fr.* : September December. Frequent in open forests.

**Z. oenoplia** (L.) Mill.

Straggling shrubs. Flowers greenish yellow. Fruits ovoid.

*Fl. & Fr.* : August December. Frequent in open as well as dense forests.

**Z. xylopyra** (Retz.) Willd. *Ghat Bor.*

Trees. Flowers greenish. Fruits woody.

*Fl. & Fr.* : May October. Frequent in open as well as dense forests.

## VITACEAE

- |  |              |
|--|--------------|
| 1. Inflorescence tendril-bearing                   | AMPELOCISSUS |
| 1. Inflorescence not tendril-bearing :             |              |
| 2. Leaves not lobed ; berry 1-seeded               | CISSUS       |
| 2. Leaves pedately 3-many lobed ; berry 2-4-seeded | CAYRATIA     |

AMPELOCISSUS Planch. *nom. cons.*

**Ampelocissus latifolia** (Roxb.) Planch. *Gelinda*.

Climbers. Flowers brownish-red. Berries black.

*Fl. & Fr.* : July October. Frequent in open forests.

CAYRATIA A. Juss. *nom. cons.*

**Cayratia trifolia** (L.) Domin. Foxgrape.

Climbers. Flowers greenish-white. Berries globose.

*Fl. & Fr.* : May October. Frequent on thorny bushes in open forests.

## CISSUS L.

- |  |                     |
|--|---------------------|
| 1. Erect shrubs ; tendrils 0                 | <i>C. woodrowii</i> |
| 1. Scandent shrubs ; tendrils leaf opposed : |                     |
| 2. Leaves palmately 3-5-lobed                | <i>C. vitigenia</i> |
| 2. Leaves ovate or orbicular not lobed       | <i>C. pallida</i>   |

**Cissus pallida** (Wall. ex Wight & Arn.) Steud.

Straggling shrubs. Flowers reddish. Berries pyriform.

*Fl. & Fr.* : March June. Frequent in open forests.

**C. vitigenia** L.

Scandent undershrubs. Flowers greenish. Berries pyriform.

*Fl. & Fr.* : May October. Frequent on hedges.

**Cissus woodrowii** (Stapf ex Cooke) Sant.

Shrubs. Flowers green with red tinge at apex. Berries globose.

*Fl. & Fr.* : July September. Frequent in open forests.

## LEEACEAE

### LEEA L.

**Leea asiatica** (L.) Ridsd.

Undershrubs. Flowers white or greenish-white. Berries green.

*Fl. & Fr.* : July October. Frequent as forest undergrowth.

## SAPINDACEAE

1. Climbing herbs ; fruits inflated

CARDIOSPERMUM

1 Shrubs or trees ; fruits not inflated

DODONAEA

### CARDIOSPERMUM L.

**Cardiospermum halicacabum** L. *Kanphuti*. Balloon Vine Hearted.

Climbers. Flowers white. Fruits inflated, pyriform.

*Fl. & Fr.* : Greater part of the year. Frequent in open forests.

### DODONAEA L.

**Dodonaea viscosa** (L.) Jacq. *Kharata*.

Shrubs. Flowers pale white. Fruits winged.

*Fl. & Fr.* : Greater part of the year. Frequent in open forests.

## ANACARDIACEAE

1. Leaves compound

LANNEA

1. Leaves simple :

2. Styles 3 or more :

3. Flowers unisexual, stamens as many as petals

SEMECARPUS

3. Flowers bisexual, stamens twice as many as petals

BUCHANANIA

2. Styles 1 :

4. Stamens twice as many as petals, all fertile

ANACARDIUM

4. Stamens rarely 4. one fertile others sterile

MANGIFERA

## ANACARDIUM L.

**Anacardium occidentale** L. *Kaju*. Cashewnut Tree.

Trees. Flowers yellow. Nuts reniform.

*Fl. & Fr.* : February May. Infrequent as an escape, planted.

## BUCHANANIA Spreng.

**Buchanania lanzan** Spreng. *Charoli*.

Trees. Flowers white. Fruits green turning brownish-red.

*Fl. & Fr.* : January June. Frequent in open forests.

## LANNEA A. Rich.

**Lannea coromandelica** (Houtt.) Merr. *Mowai*.

Trees. Flowers pale white. Fruits oblong.

*Fl. & Fr.* : February June. Frequent in open and dense forests.

## MANGIFERA L.

**Mangifera indica** L. *Amba*. Mango.

Trees. Flowers white. Fruits green.

*Fl. & Fr.* : February July. Infrequent as an escape, planted.

## SEMECARPUS L. f.

**Semecarpus anacardium** L. f. *Bibba*. Oriental Cashew.

Trees. Flowers pale white. Fruits black when ripe.

*Fl. & Fr.* : May - October. Frequent in open as well as dense forests.

## FABACEAE

1. Flowers white, yellow or blue :

2. Trees or shrubs :

3. Leaflets opposite, 22-30

SESBANIA

3. Leaflets alternate, 3-7 :

- 4. Leaflets 3-5 ; pods strap shaped DALBERGIA
- 4. Leaflets 5-7 ; pods orbicular, winged PTEROCARPUS
- 2. Herbs or climbers :
  - 5. Marshy herbs AESCHYNOMENE
  - 5. Terrestrial plants :
    - 6. Erect trees PONGAMIA
    - 6. Plants not erect :
      - 7. Climbing or twining herbs or shrubs :
        - 8. Leaflets 9-13 ; pods flat, narrowly winged DERRIS
        - 8. Leaflets 3-7 ; pods linear, not winged :
          - 9. Stamens monadelphous :
            - 10. Anthers alternately fertile ; pods beak narrowly incurved TERAMNUS
            - 10. Anthers all fertile ; pods beak if present, not so CANAVALLIA
          - 9. Stamens diadelphous :
            - 11. Leaves not gland dotted :
              - 12. Calyx teeth not distinct ; pods flattened GALACTIA
              - 12. Calyx teeth distinct ; pods subterete VIGNA
            - 11. Leaves gland dotted :
              - 13. Ovules 1-2 ATYLOSIA
              - 13. Ovules 3 or more :
                - 14. Leaflets modified into tendrils LATHYRUS
                - 14. Leaflets not modified into tendrils :
                  - 15. Calyx teeth accrescent PARACALYX
                  - 15. Calyx teeth not accrescent :
                    - 16. Leaves pinnate ; pods compressed RHYNCHOSIA



- 16. Leaves digitate ; pods turgid FLEMINGIA
- 7. Erect or prostrate herbs or shrubs :
  - 17. Leaves pinnately compound ; leaflets 2-8 pairs SMITHIA
  - 17. Leaves simple, bifoliate or 3-7-foliately compound, but not pinnately compound :
    - 18. Leaves bi-or trifoliately compound :
      - 19. Leaves bifoliately compound ZORNIA
      - 19. Leaves trifoliately compound CAJANUS
    - 18. Leaves simple or 3-7-foliately compound :
      - 20. Leaves either simple or 3-7-foliately compound CROTALARIA
      - 20. Leaves simple :
        - 21. Flowers solitary, axillary GONIOGYNA
        - 21. Flowers in subcapitate heads PSORALEA
- 1. Flowers orange, pink, purple, violet or lilac (rarely white in *Desmodium* and *Tephrosia*) :
  - 22. Leaves 1-3-foliate (except in *Clitoria*) :
    - 23. Trees BUTEA
    - 23. Herbs, shrubs or climbers :
      - 24. Climbing shrubs :
        - 25. Leaflets 3, pods 'S' shaped with irritant bristles MUCUNA
        - 25. Leaflets 5-7, pods nearly straight, sparsely hairy CLITORIA
      - 24. Erect or prostrate herbs, undershrubs or shrubs :
        - 26. Herbs :
          - 27. Pods linear, jointed, turgid ALYSICARPUS
          - 27. Pods boat-shaped, flat FLEIOTIS

26. Undershrubs or shrubs (except *Desmodium trifolium* DC.) :

28. Pods not jointed, viscid PSEUDARTHRIA

28. Pods jointed, not viscid :

29. Loments of the pod not folded on one another but separating into one seeded bits at maturity DESMODIUM

29. Loments of the pod folding on one another, included in the calyx even at maturity URARIA

21. Leaves 3-13-foliate or more :

30. Climbing herbs ABRUS

30. Erect herbs or undershrubs :

31. Hairs on leaves medifixed ; anthers apiculate INDIGOFERA

31. Hairs on leaves basifixed ; anthers obtuse TEPHROSIA

**ABRUS Adans.**

***Abrus precatorius* L. Gunj. Indian Liquorice.**

**Climbers. Flowers white. Fruits oblong, turgid.**

***Fl. & Fr.* : August March. Frequent in open forests.**

**AESCHYNOMENE L.**

1. Stems spongy ; calyx hispid *A. aspera*

1. Stems woody ; calyx glabrous *A. indica*

***Aeschynomene aspera* L. The Sola Pith Plant.**

**Marshy herbs. Flowers yellow. Fruits jointed, asperulate.**

***Fl. & Fr.* : January May. Infrequent in moist shady places.**

***A. indica* L.**

**Procumbent herbs. Flowers yellow. Fruits curved.**

***Fl. & Fr.* : August January. Frequent in moist shady places.**