

# **Flora of Calicut**

Thesis  
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## INTRODUCTION

Plants of Kerala have been studied for a long time, mainly from the medicinal point of view. However, systematic studies of the plants of this area were undertaken only after the publication of "Species Plantarum" by Linnaeus (1753). It is interesting to note that Linnaeus, in his "Species Plantarum" mainly based the nomenclature of Indian plants on van Rheedee's "Hortus Indicus Malabaricus" (1678-1703), thus giving prominence to the plants of this locality (cf. Santapau, 1958a). Later, Hooker and Thomson (1855) in their "Flora Indica" wrote: "A careful comparison of much of the materials comprised in these different collections from all parts of the chain assures us that Malabar is comparatively well explored botanically and that there are not many more phanerogamic plants to reward the labours of future investigators". This outlook was, however, proved wrong by subsequent works. In the "Flora of the Madras Presidency", Gamble (1918-1924) and Fischer (1936) described several additional plants occurring in this region. Calder, Narayanaswami and Ramaswami (1926) published a long list of plants which were not included in Hooker's "Flora of British India" (1872-1897). The presence of many more additional plants in this area have since been recorded by many subsequent workers,



like Razi (1959), Srinivasan and Agarwal (1964), Sebastine (1962), Sebastine and Ramamurty (1966) and others.

#### Previous work done

Apart from a few fragmentary works by Sebastine and Ramamurty (1966) and Vajravelu, Joseph and Chandrasekharan (1968) in which the vegetation of the hills in the nearby Palghat district is described on the basis of occasional collections and that by Ellis, Swamination and Chandrabose (1968) on the vegetation of Sultan's Battery and Chedaletth forest ranges in the Calicut district, about 80 kms away from the area under the present study, there is no work hitherto on the flora of this locality. The most popular reference book for the identification of plants in this region is the "Flora of Madras Presidency" by Gamble. The plants described from Kerala, by Gamble were mainly collected from the Western Ghats and the plains immediately below. Due to the wide differences between those areas and the one chosen for the present study in their altitudinal, climatic, edaphic and biotic factors, an intensive investigation of this region becomes necessary for a full and clear understanding of the local flora.

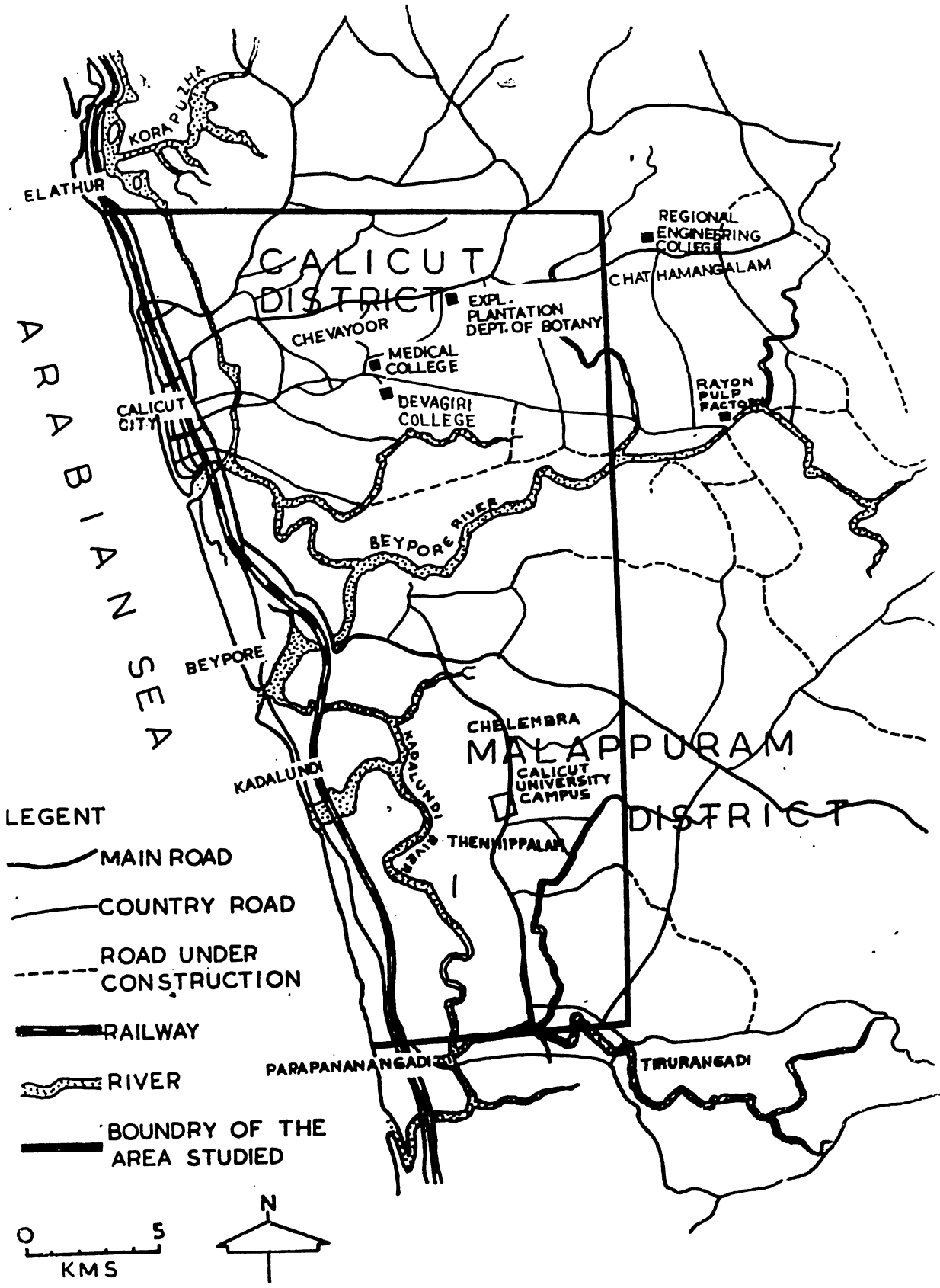
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PLATE 1

Map of the western sectors of Calicut and Malappuram Districts, Kerala, showing the area studied.



General features of the area

Geographical position: The area under study falls within latitude  $11^{\circ}30'-45'$  and longitude  $75^{\circ}40'-50'$  (Plate.1.).

Topography: Topographically this area can be divided into two regions. (1) the sandy low land adjoining the coast and (2) the undulating region behind it. The highest elevation is about 170 m at the Experimental Plantation area at Kottaparamba. The entire region is heavily populated and three main rivers, Kallai river, Beypore river and Kadalundi river traverse through this.

The geology of Malabar have been studied by Krishnan (1956), Narayanaswamy (1967), Balasundaram (1972), Krishnaswamy (1972) and others.

The recent and sub-recent formations met with in Calicut and adjoining area are mainly of soil, alluvium, clay, laterite, etc. The archaean formations are mainly gneisses with bands of granulites. Tertiary rocks are absent in this area.

Archaean crystallines: The archaean crystallines occurring around Calicut are hornblende-biotite gneisses and hornblende hypersthene gneisses with lenses and bands of hornblende granulite. Magnetite-quartz rocks are seen associated with these rocks in certain regions. Dykes of gabbro and dolerite are seen traversing the country/rocks in the N.E.- S.W. direction. The regional trend of foliation varies from N.E.- S.W. to N.N.E.-S.S.W. and E.-W. and from E.- W. to E.N.E.- W.S.W. The rocks in this area have been folded along E.- W. axis and later cross folded along N.E.- S.W., and N.N.W.- S.S.E. axis.

Recent and sub-recent formations: These formation concealing the archaean rocks are mostly developed towards the southern parts of Calicut. They include soil, alluvium, clays, carbonaceous clays, laterite etc.

Lateritic soil: The laterite cappings of hills are usually devoid of any appreciable soil cover. The slope of hills and plains in this area are generally covered by lateritic soil or red loam, varying in thickness from less than 1 m to over 2 m. A large part of the area studied is covered by lateritic soil.

They contain a high percentage of alumina and iron oxides and they are notably deficient in phosphorous, lime and magnesium and are lacking in alkalies and humus content.

In a lateritic profile the top soils may be usually deep and gravelly, but the laterite proper would be immature. But, some<sup>i</sup>times, the top soils may be eroded, leaving behind a slag-like mass of laterite. The profile of a typical laterite soil in this area as given by Krishnaswami (1972) is as noted below:

<u>Depth</u>	
(in feet) 0-1 (0-30 cm)	Yellowish brown clay loam soil with pebbles about 2 cm in size.
1-6 (30-183 cm)	Hard lateritic layer, top portion being crumbly, breaks into irregular shaped pieces, cellular and porous below, colours varying from red, reddish brown to yellow, irregularly mottled, small bits and grains of quartz are embedded in iron matrix.

6-18  
(183-550 cm) Reddish yellow, virmacular structures, §  
structural cavity filled with yellow and  
white clay matter; quartz grains occur  
throughout the depth, either in the iron  
matrix or in the clay matter. In the  
lower depths the laterite becomes soft  
and unsuitable for quarrying.

18-22  
(550-672 cm) Weathered boulders, hornblende - pyroxene  
granulite which retain rock structure  
and colour, but lighter in weight,  
embedded in clay matter. Clay is light  
yellowish grey and soft.

Below 22. Hard bed-rock; hornblende granulite.  
(Below 672 cm)

### Climate

Temperature and rainfall have a major role in  
determining the climate of a locality. Differences in  
floristic and vegetational distribution is predominantly  
latitudinal but that in vegetation type is mainly of  
precipitation (Good, 1953). The climatic data has been  
provided from this view point.



Temperature: The highest temperature recorded during the period under study (1970-1974) was 34.6°C in April 1973, and the lowest temperature was 17.6°C in January 1972 (Table I). The differences between the maximum and minimum temperature is least in July and August. The monthly mean maximum and mean minimum temperatures are recorded in Table 2. The fluctuation in temperature during the different months of a year is not very high.

Rain fall: The vegetation of this area is influenced by the heavy rain fall, during both the South-West and North-East monsoons. During June-August the South-West monsoon expends its full fury and "wild avalanches of water recurrently descent in thunderous cloud-bursts and the atmosphere is charged with moisture". In 1970 there was only one completely dry month, February. In 1971 and 1972, January and March were dry, while there was 0.35 cm and 0.2 cm rain in February of 1971 and 1972 respectively. In 1973 all the three months, January, February and March were dry. The highest monthly rain fall ~~fall~~ recorded was 103.05 cm in June 1971. Maximum annual rain fall

during the period under study was 342.91 cm in 1971 and the minimum was 302.16 cm in 1972 (Table 3).

Relative humidity: The highest relative humidity occurs in July-August, ranging between 81% and 95%. The relative humidity was never lower than 60%, recorded in December 1972. The highest relative humidity of 95% was recorded in July and August of 1970. Thus the humidity is found to be high the year round (Table 4).

Wind: Wind is not an important factor in this area. Usually it is at the maximum velocity during July-August, and is gentle and mild during December-January.

Table I

Monthly highest & lowest temperatures in degree centigrade during 1970, 1971, 1972 & 1973.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1970	Highest	34.2	33.5	34.0	34.5	34.4	31.7	30.8	30.0	30.7	32.2	32.8	32.8
	Lowest	20.1	20.5	21.8	22.3	23.1	21.9	21.6	22.0	22.0	22.6	21.6	18.4
1971	Highest	32.4	33.8	33.5	33.7	33.1	33.9	30.5	30.1	30.7	31.9	33.3	31.8
	Lowest	18.7	21.5	21.5	21.5	22.3	21.3	22.1	21.9	23.1	22.2	20.9	18.9
1972	Highest	32.5	32.1	32.9	34.2	33.9	33.3	30.7	30.8	31.5	32.9	32.4	32.9
	Lowest	17.6	19.2	22.1	21.6	21.8	22.0	21.6	21.6	22.6	22.4	20.0	20.6
1973	Highest	32.5	33.8	33.8	34.6	34.4	32.4	30.4	29.7	32.1	31.6	33.3	32.4
	Lowest	20.5	20.6	21.8	22.2	22.4	22.6	21.7	22.2	22.4	21.6	20.4	19.3

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1970	Mean Max.	32.6	32.7	33.1	33.9	32.2	29.8	28.2	27.6	29.7	30.1	31.9	32.1
	Mean Min.	23.1	23.1	24.6	25.6	25.7	24.3	23.3	23.3	23.8	23.8	23.8	21.1
1971	Mean Max.	31.6	32.2	32.3	32.9	31.7	28.5	27.9	27.8	29.2	29.7	31.5	30.6
	Mean Min.	22.5	23.0	24.3	25.4	25.0	23.0	23.1	23.2	24.1	23.3	23.1	21.6
1972	Mean Max.	31.1	31.3	32.2	33.8	31.1	30.6	28.6	28.7	30.5	31.0	31.4	31.6
	Mean Min.	19.9	22.2	24.1	26.1	24.7	24.9	23.4	23.5	24.5	24.2	23.9	22.9
1973	Mean Max.	31.7	32.6	33.0	33.9	33.2	29.6	28.4	27.2	29.7	30.7	31.4	31.4
	Mean Min.	21.7	23.6	24.9	26.5	26.0	24.2	23.5	23.1	24.1	24.0	23.2	22.5

Table 3

Monthly rain fall during 1970, 1971, 1972 and 1973 in Cm.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1970	1.38	0.0	5.0	13.13	43.72	69.46	80.37	76.49	22.48	27.69	0.58	0.35
1971	0.0	0.35	0.0	7.66	56.11	103.05	80.53	48.13	30.22	16.36	0.08	0.42
1972	0.0	0.2	0.0	3.42	50.86	53.81	88.07	32.7	13.9	26.6	22.39	10.48
1973	0.0	0.0	0.0	6.26	8.28	74.46	58.51	50.13	2.52	13.2	7.32	1.48

Table 4

Monthly mean relative humidity (%) during 1970, 1971, 1972 and 1973

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1970	R.H.at 8.30 IST.	74	68	70	73	81	92	95	95	90	86	76	66
	R.H.at 17.30 IST.	64	63	69	71	77	87	91	81	85	81	68	60
1971	R.H.at 8.30 IST.	76	73	74	75	83	92	94	92	88	87	79	78
	R.H.at 17.30 IST	66	65	68	72	79	90	91	88	86	81	64	67
1972	R.H.at 8.30 IST.	71	78	79	76	85	83	92	90	84	85	81	75
	R.H.at 17.30 IST	62	80	82	76	83	82	87	82	80	79	71	63
1973	R.H.at 8.30 IST.	75	73	75	76	77	89	92	94	86	84	79	76
	R.H.at 17.30 IST	73	64	70	70	75	84	86	88	81	76	67	64

## Present study

The present work is based on intensive explorations of the Greater Calicut area, covering about 600 sq. kms of the western section of the Calicut and Malappuram districts of Kerala, for its angiospermic flora.

Field work was conducted on the lines suggested by Santapau (1955). Excursions were undertaken 6-8 times a month, for more than 4 years, from November 1969 to January 1974, in different areas of the region so that plants could be collected in flowering and fruiting stages. Every type of plant collected was given a field number and observations were noted in the field note book. Observations included information on habitat, habit, subterranean organs, size of plant, leaf variations, size, colour and odour of flowers and common associates. Special care was taken to note the details of flower colour on the bases of corolla tube, throat and limb.

Considering the importance of ecological factors in floristic studies (Santapau, 1958b) care was taken to collect as much details about the habitat of the species as possible. Although all the species

occurring in a particular habitat are recorded, only those which are of some significance as indicators of habitat are quoted when enumerating the flora of selected habitats. The Biological Spectrum of the flora was also studied.

Specimens were identified in the laboratory. Sketches were made for several specimens when fresh. Later, specimens were poisoned with mercuric chloride solution in denatured spirit and pressed. Poisoning with the above solution were done a few times to avoid fungal and insect attacks. Such specimens which could not be identified here, were studied and identified at the Botanical Survey of India, Coimbatore. All the specimens were checked with the herbarium collections at the Botanical Survey of India, Coimbatore and the Forest College Herbarium at Coimbatore. Those which remained doubtful were sent to the Central National Herbarium, Calcutta, Herbarium of the Botanical Survey of India, Western Circle, Poona, Kew Herbarium, Rijksherbarium, Leiden, and to the specialists in the particular taxa for determinations and confirmations.

The herbarium specimens are deposited in the Herbarium of the Department of Botany, Calicut University.



Plan of preparation of the Flora.

According to Davis and Heywood (1963) a Flora is not a place to propose a new classification, "but it should follow an established system with slight modifications to incorporate the more accepted trends". Turril (1964) has pointed out that "it is generally best for the families and genera to be arranged according to a widely accepted system". The system adopted here, in general, is that of Bentham and Hooker (1862-1883). However, several newly created families which are considered worth recognition have been introduced.

Keys: This Flora is provided with dichotomous keys, for families, genera and species. These "keys are always artificial, although the choice of sequence of characters may contain some natural features" (Lam, 1959). Walters (1964) has pointed out the usefulness of purely artificial grouping for purposes of utilitarian classification.

Descriptions: Characters of diagnostic importance are given in detail based on the specimens collected.

Flower colours and flowering period which are mostly not mentioned in the South Indian Floras are given here.

Citation and nomenclature: While giving citations no attempt has been made to give complete synonymy, but the important and relevant ones alone are given. There have been many changes in the nomenclature of the plants of this area which have been creating a lot of confusion. Effort has been made to make the nomenclature up-to-date, according to the provisions of the International Code of Botanical Nomenclature (1972).

Measurements: Measurements are given in metric system. The measurements of leaves are of mature ones and do not include petioles. In Cyperaceae and Gramineae the measurements of glumes do not include awns, unless specified.

Abbreviations: The standard abbreviations for publications and authors' names have been adopted, except in a few cases which are cited very frequently. Such abbreviations and their full references are given below. Where the reprinted or revised editions are consulted, the original date is given, preceding the year of reprinting.

Bailey - Bailey, L.H. Manual of cultivated plants, 1924.  
(Rev. ed. 1949)

- Cooke - Cooke, T. Flora of the Presidency of Bombay,  
1901-1908 (Rep. ed. 1958)
- FBI. - Flora of British India by Hooker, J.D.  
et al, 1872-'97.
- Gamb. - Gamble, J.S. Flora of the presidency of  
Madras, 1915-'36. (Rep. ed. 1967)
- Mahes.- Maheshwari, J.K. Flora of Delhi, 1963.
- Pfam. - Die natuerlichen Pflanzenfamilien by Engler,  
A. & K.Prantl, 1887-1915.
- Pfreich.- Das Pflanzenreich. by Engler, A. 1900-1937.
- Rang. & Tad.- Rangachariar, K. & C. Tadulinga Mudaliyar.  
A Handbook of South Indian Grasses, 1921.
- Sant. - Santapau, H. Flora of Khandala on the  
Western Ghats of India, 1953. (2nd ed.1960;  
3rd ed. 1967)
- Bor - Bor, N.L. The Grasses of Burma, Ceylon,  
India and Pakistan (excluding Bambuseae)  
1960.

Vegetation of special habitats

Plant species which are considered to denote the character of the habitat are called plant indicators. In general, the communities are better indicators of habitats than individual species, (Balandin, 1936; Braun-Blanquet, 1932; Tansley and Chipp, 1926). Following this concept, common species from communities of selected habitats which are of special importance as indicators of the nature of the habitat have been listed.

- 1) Moist, shaded habitats: Many species are characteristic to shaded, moist places.

Sonerila rheedii Wt. & Arn.

Begonia canarana Miq.

Kalanchoe pinnata (Lamk.) Pers.

Ophiorrhiza prostrata D. Don

Ariopsis peltata Nimmo ex Graham

Caladium bicolor (W. Ait.) Vent., and

Curculigo orchioides Gaertn., are a few examples of such plants.

- 2) River banks: Some characteristic species are seen growing on the river banks. The most prominent among them are-

Crataeva nurvala Buch.-Ham.

Hiptage benghalensis (Linn.) Kurz

Anthocephalus chinensis (Lamk.) A. Rich.ex Walp.

Lindernia tenuifolia (Colsm.) Alston

Vitex leucoxydon Linn. f.

Clerodendrum inerme (Linn.) Gaertn.

Trewia nudiflora Linn.,

3) Back waters and salt marshes: The narrow belt of back waters and salt marshes at Beypore, Kadalundi, Feroke and Kallai support small populations of mangroves composed principally of-

Kandelia candel (Linn.) Druce

Cerbera manghas Linn.

Acanthus ilicifolius Linn.

Avicennia marina (Forsk.) Vierh.

A.officianalis Linn., and

Excoecaria agallocha Linn.

Some of these salt marsh areas are now being reclaimed and this vegetation is fast disappearing.

4) Ponds, streams and water-logged fields: These are populated by aquatic species like-

Nymphaea stellata Willd.

N.nouchali Burm. f.

Nymphoides indicum (Linn.) Kuntze

N.cristatum (Roxb.) Kuntze

N.parvifolium (Griseb.) Kuntze

Limnophila aquatica (Roxb.) Alston

L.heterophylla (Roxb.) Benth.

Utricularia uliginosa Vahl

U.inflexa Forsk.

U.gibba, ssp.exoleta (R.Br.) P.Taylor

Ottelia alismoides (Linn.) Pers.

Blyxa octandra (Roxb.) Planch. ex Th.

B.echinosperma (Clarke) Hook. f.

Hydrilla verticillata (Linn.f.) Royle

Najas graminea Del.

Aponogeton natans (Linn.) Engl. & Kr.

Pistia stratioides Linn. and

Eriocaulon setaceum Linn.

Besides these, there are also a few semi-aquatic species. Most common of them are-

Bergia capensis Linn.

Rotala indica (Willd.) Koehne

R. macrandra Koehne

R. occultiflora Koehne

Ammania baccifera Linn.

Sphenoclea zeylanica Gaertn.

Lobelia alsinoides Lamk.

Hydrolea zeylanica (Linn.) Vahl

Ipomoea aquatica Forsk.

Dopatrium junceum (Roxb.) Buch.-Ham. ex Benth.

D. lobelioides Benth.

Angelonia salicariaefolia Humb. & Bonpl.

Bacopa monnieri (Linn.) Pennell

Polygonum glabrum Willd.

P. barbatum Linn.

Monochoria vaginalis (Burm.f.) Presl. ex Kunth

Eichhornia crassipes (Mart.) Solms.

Eriocaulon cuspidatum Dalz.

Cyperus rotundus Linn.

C. castaneus Willd.

C. tenuispica Steud.

C. flavidus Retz.

C. iria Linn.

Fimbristylis dichotoma (Linn.) Vahl

F.bis-umbellata (Forsk.) Bubani

Scirpus supinus Linn.

S.articulatus Linn.

Eleocharis dulcis (Burm.f.) Trin. ex Henschel.

E.acutangula (Roxb.) Schult.

Coix gigantea Koenig ex Roxb.

Sacciolepis indica (Linn.) A.Chase, and

S.interrupta (Willd.) Stapf

Some other hydrophilic species which usually grow near streams on the hill-slopes are-

Mitragyna parvifolia (Roxb.) Korth.

M.tubulosa (Arn.) Kuntze

Xeromphis uliginosa (Retz.) Mahes. and

Glochidion zeylanicum (Gaertn.) A.Juss.

5) Sea-coast: The coast, being sandy has a very scanty vegetation, composed mainly of-

Indigofera uniflora Buch.-Ham. ex Roxb.

I.pulchella Roxb.

Tephrosia maxima (Linn.) Pers.

T.hirta (Buch.-Ham.) Gamb.

T.purpurea (Linn.) Pers.



Opuntia elatior Mill.

Mollugo cerviana (Linn.) Ser.

M.nudicaulis Lamk.

Launea sarmentosa (Willd.) Merr.

Ipomoea pes-caprae (Linn.) Sw.

Vitex trifolia Linn.

Phyla nodiflora (Linn.) Greene, and

Spinifex littoreus (Burm.f.) Merr.

6) Grassy slopes: The slopes have a predominantly /  
grass flora. The most conspicuously represented grass  
species are-

Heteropogon contortus (Linn.)P.Beauv.ex Roem.& Schult.

Apocopis mangalorensis (Hochst.) Henr.

Chloris barbata Sw.

Setaria pallide-fusca (Schum.) Stapf & Hubb.

Pennisetum polystachyon (Linn.) Schult.

Panicum brevifolium Linn.

Perotis indica (Linn.) Kuntze

Alloteropsis cimicina (Linn.) Stapf

Arundinella leptochloa (Nees ex Steud.) Hook.f.

A.metzii Hochst. ex Miq.

A.mesophylla Nees ex Steud.

Brachiaria setigera (Retz.) Hubb.  
B.paspaloides (Presl) Hubb.  
B.ramosa (Linn.) Stapf  
Oplismenus burmannii (Retz.) P.Beauv.  
O.compositus (Linn.) P.Beauv.  
Paspalum scrobiculatum Linn.  
P.conjugatum Berg.  
Paspalidium flavidum (Retz.) A. Camus  
Digitaria bicornis (Lamk.) Roem. & Schult. ex Loud.  
D.longiflora (Retz.) Pers.  
D.ciliaris (Retz.) Koeler  
Rottboellia exaltata Linn. f.  
Eulalia trispicata (Schult.) Henr.  
Dimeria hohenackeri Hochst. ex Miq.  
D.kanjirapalliana Jacob  
D.acutipes Bor  
Ischaemum mangaluricum (Hack.) Stapf ex Fischer  
I.tumidum Stapf ex Bor  
I.goebelii Hack. and  
I.semisagittatum Roxb.

Some of the tree forms present in such slopes are-

Bombax ceiba Linn.  
Ceiba pentandra (Linn.) Gaertn.  
Hopea wightiana Wall. ex Wt.

Ailanthus triphysa (Dennst.) Alston

Mitragyna parvifolia (Roxb.) Korth.

M. tubulosa (Arn.) Kuntze

Alstonia scholaris (Linn.) R.Br.

Macaranga peltata (Roxb.) Muell.-Arg.

Mallotus philippensis (Lamk.) Muell.-Arg.

Ficus callosa Willd.

F. tjakela Burm. f. and

F. benghalensis Linn. etc.

The herbaceous species are rather few as compared to other habitats. During the rainy season, however, the wet rocks support a few of them, as —

Polycarpaea corymbosa (Linn.) Lamk.

P. aurea Wt. & Arn.

Geissaspis tenella Benth.

Hedyotis caerulea Wt. & Arn.

Neanotis foetida (Hook.f.) Lewis, and

Dysophylla quadrifolia Benth., in the exposed habitats, and

Begonia canarana Miq.

Argostemma courtallense Arn. and

Ariopsis peltata Nimmo ex Graham etc. in the shaded places.

Cultivated plants.

Crop plants: The undulating region just behind the coast, with the hills and their valleys include large areas of cultivated land. The most important crop is Oryza sativa Linn. Eleusine corocana (Linn.) Gaertn. also is sometimes cultivated on the terraced hill slopes. Vegetables such as

Abelmoschus esculentus (Linn.) Moench.

Lablab purpureus (Linn.) Sweet

Vigna unguiculata (Linn.) Walp.

Carica papaya Linn.

Trichosanthes anguina Linn.

Lagenaria siceraria (Molina) Standley<sup>le</sup>

Momordica charantia Linn.

Benincasa hispida (Thunb.) Cogn.

Cucurbita maxima Duch.

Cucumis sativus Linn.

Ipomoea batatas (Linn.) Lamk.

Manihot esculenta Crantz.

Musa paradisiaca Linn. (Several varieties)

Dioscorea bulbifera Linn., and

Colocasia esculenta (Linn.) Schott. are cultivated in this area.

The common fruit trees seen here under cultivation are-

Annona squamosa Linn.

A. reticulata Linn.

Mangifera indica Linn.

Manilkara achras (Mill.) Fosberg

Artocarpus communis Forst., and

A. heterophyllus Lamk.

The main cash crops are listed below, in order of their relative importance.

Cocos nucifera Linn.

Anacardium occidentale Linn.

Hevia brasiliensis Muell. Arg.

Areca catechu Linn.

Ornamentals: The most common species of this group are-

Hibiscus rosa-sinensis Linn.

H. schizopetalus (Mast.) Hook. f.

Malvaviscus arboreus Cav.

Murraya paniculata (Linn.) Jack.

Bauhinia tomentosa Linn.

B. purpurea Linn.

B. acuminata Linn.

Gardenia resinifera Roth  
G. jasminoides Ellis  
Hamelia patens Jacq.  
Jasminum sambac (Linn.) Ait.  
J. angustifolium Vahl  
J. calophyllum Wall. ex DC.  
Nyctanthes arbor-tristis Linn.  
Asclepias curassavica Linn.  
Ipomoea nil (Linn.) Roth  
Torenia fournerii Linden ex Fourn.  
Pyrostegia venusta (Ker-Gawl) Presl  
Tecoma stans (Linn.) H.B. & K.  
Crossandra infundibuliformis (Linn.) Nees  
Clerodendrum indicum (Linn.) Kuntze  
C. thomsonae Balf.  
Ocimum sanctum Linn.  
Bougainvillea spectabilis Willd.  
Mirabilis jalapa Linn.  
Euphorbia pulcherrima Willd. ex Klotzsch  
Sauropus androgynus (Linn.) Merr.  
Acalypha hispida Burm. f.  
A. wilkesiana Muell.-Arg.  
Spathoglottis plicata Blume, and  
Crinum asiaticum Linn.

Recently introduced plants.

These include many ornamental plants as well as weeds. Common among them are-

Muntingia calabura Linn.

Gliricidia maculata H.B.& K.

Mimosa invisa Mark.

Kalanchoe pinnata (Lamk.) Pers.

K.verticillata Elliot

Piptanthocereus forbesii (Hort.Berol ex Foerster)  
Riccob.

Eupatorium odoratum Linn.

Acanthospermum hispidum DC.

Clerodendrum paniculatum Linn.

Anisomeles indica var.albiflora (Hassk.) Back.

Sauropus androgynus (Linn.) Merr. and

Croton bonplandianum Baill.

Weeds.

Weeds in gardens and cultivated fields: The most common species found in gardens are-

Cleome viscosa Linn.

Mollugo pentaphylla Linn.

Borreria ocymoides (Burm.f.) DC.

Mitracarpus verticillatus (Schum.& Thonn.)Vatke

Lindernia crustacea (Linn.) F. Muell.

L.ciliata (Colsm.) Pennell

Peperomia pellucida (Linn.) H.B.& K.

Pilea microphylla (Linn.) Liebm.

Pouzolzia zeylanica (Linn.) Benn.

Eragrostis unioloides (Retz.) Nees ex Steud.

E.ciliaris (Linn.) R. Br.

E.tenella (Linn.) Beauv. ex Roem. & Schult. and

Sporobolus tenuissimus (Schrank) Kuntze

Among cultivated fields, the low-lying wet or moist fields have a much more diverse weed flora than the cultivated up-lands. The more common weeds found in the low lands are-

Bergia capensis Linn.

Cleome viscosa Linn.

Geissaspis cristata Wt. & Arn.

Rotala indica (Willd.) Koehne

Ludwigia perennis Linn.

Fissendocarpa linifolia (Vahl) Bennet

Lindernia anagallis (Burm.f.) Pennell

L.crustacea (Linn.) F. Muell.

L.pusilla (Willd.) Boldingh.



Lindernia oppositifolia (Linn.) Mukh.

L.antipoda (Linn.) Alston

Utricularia reticulata Smith

U.inflexa Forsk.

Blyxa echinosperma (Clarke) Hook.f.

B.octandra (Roxb.) Planch. ex Th.

Murdannia ochracea (Dalz.) Bruckn.

Eriocaulon quinquangulare Linn.

E.sexangulare Linn., etc.

The weeds in the terraced, cultivated hill slopes are fewer in number. The most common of them are-

Cleome monophylla Linn.

Borreria stricta (Linn.f.) Schum.

B.articularis (Linn.f.) F.N.Will.

Mitracarpus verticillatus (Schum. & Thonn.) Vatke

Catharanthus pusillus (Murr.) G.Don

Allmannia nodiflora R. Br. ex Wt.

Celosia argentea Linn.

Aerva lanata (Linn.) Juss.

Paspalum scrobiculatum Linn.

Paspalidium flavidum (Retz.) A. Camus, and

Rottboellia exaltata Linn.f.

Specialised angiosperms.

Epiphytes: The most common epiphytes and their hosts are-

Dendrobium macrostachyum Lindl.

on Mangifera indica Linn.

Rh<sup>n</sup>chostylis retusa (Sw.) Blume

on Ficus benghalensis Linn.

Acampe praem<sup>x</sup>rosa (Roxb.) Blatt. & McC.

on a variety of hosts

Luisia teretifolia Guad.

on Artocarpus heterophyllus Lamk.

Parasites: The parasitic angiosperms represented here belong to two groups.

1) Root-parasites: The important representatives are

Striga gesneroides (Willd.) Vatke

on the rootstock of Dysophylla stellata

S.angustifolia (Don) Saldanha, on grass roots

S.lutea Lour. on grass roots

Sopubia delphinifolia (Roxb.) G.Don, on grass roots, and

Santalum album Linn. on grass roots

2) Stem-parasites: This group is represented by  
Dendrophthoe falcata (Linn.f.) Etting.

on Artocarpus heterophyllus and many  
other trees.

Helixanthera wallichiana (Schult.) Danser

on Memecylon umbellatum Burm. f.

Macrosolen capitellatus (Wt.& Arn.) Danser

on Artocarpus heterophyllus Lamk.

Helicanthes elastica (Desr.) Danser

on Mangifera indica Linn.

Viscum capitellatum Smith

on Dendrophthoe falcata (Linn.f.) Etting.

Cassytha filiformis Linn.

on bushes and grasses on the hill slopes.

Carnivores: This group is represented by—

Drosera burmanni Vahl

D.indica Linn.

Utricularia reticulata Smith

U.gibba ssp.exoleta (R.Br.) P.Taylor

U.inflexa var.stellaris (Linn.f.) P.Taylor

U.aurea Lour.

U.graminifolia Vahl, and

U.uliginosa Vahl

Endemic genera

A few South Indian endemic genera are represented in this region. They are—

Wagatea Dalz.

Hoppea Willd.

Hemidesmus R. Br.

Helicanthes Danser, and

Theriophonum Blume

Rao (1972) has described the monotypic genus Ariopsis J. Grah. as endemic to the Himalayas in India. However, this species has been collected locally, where it grows in the crevices of moist, shaded rocks, and is also represented in the Madras Herbarium with 4 sheets (Barber 6483, from Taliparamba; Vajravelu 32048, from Palghat; Joseph 17222, from Palghat and Sn. 52835 without locality and collector) Gamble (Fl. Madr. 1102) has described this species from the West Coast.

Biotic factors.

The vegetation in the whole region under study is subjected to anthropogenic influence. Trees in the wood-lands are felled and large areas are cleared for quarrying of granite to be used as road metal, country bricks for constructing buildings and walls, and clay for manufacturing roof tiles. This practice has helped in increasing the soil erosion. Large marshy areas near Puthiyara and Beypore are reclaimed for construction purposes, destroying the mangrooves. Trees are cut and used as building materials and fire wood. For the preparation of medicines in the Ayurvedic system of medicine, which is very popular in Kerala, numerous indigenous plants are collected in large quantities. This has resulted in many species like Rauvolfia serpentina, Tylophora indica, etc. becoming extremely rare in this area.

Biological spectrum of the angiospermic flora of Calicut

The vegetation form, which is an expression of the plant produced as a result of the interaction between the life-processes and the environment, is variously designated as "life-form" (Raunkiaer, 1905),

"growth-form" (Warming, 1909) or as the "vegetation form" (Clements, 1920). The organisms which have similar morphological adjustments to the environmental complex are considered to belong to the same life-form.

"Life-form" is distinct from "growth-form". Growth-forms are aspects of plant morphology significantly related to the environment, while life-forms are distinguished by an ideal of single factor-classification, with its primary classes defined on the basis of the location and protection of the perennating organs during the unfavourable period. Life-forms are not a direct answer of living things to the environment, but they represent a phylogenetic basis of response to a particular habitat (Braun-Blanquet, 1932). Raunkiaer's (1905, 1934) system of classification based on the "life-forms" is widely accepted due to its simplicity, clarity and compactness.

In Raunkiaer's system, the adaptation of the plant is considered only in relation to the climate. But the system is preferred (Gimingham, 1951) as it would be impossible to **take** into account the total adaptation and the entire habitat complex for **classifying** life-forms.

In India the biological spectra of different regions have mainly been studied by Borgesen (1930), Bharucha and Ferreira (1941), Srivastava (1944), Mehr-Homji (1962,1964) and Rao (1965).

The phytoclimate can be characterised by the life-forms in the biological spectrum of an area, which exceed those of the normal spectrum, (Raunkiaer, 1934). From a comparative study of the biological spectra of the Indian desert, Andhra, semi-arid zones of North India and semi-arid zones of South India, Mehr-Homji (1964) concluded that regions with less than 25 cm annual rainfall and 11-12 dry months are therophytic and semi-arid zones with 25-75 cm rainfall and 8-10 dry months are thero-chamaephytic, and that there is a gradual evolution of spectra from thero-phytic in arid regions to phanerophytic in humid regions.

Calicut with about 350 cm rainfall and 2-3 dry months give the spectrum as therophytic (cf. Table 5). The high incidence of annuals in the flora of this locality may be due to the interference of man with the natural vegetation, resulting in the creation of unnatural habitats by deforestation, cultivation and drainage. Under these conditions alien weeds find ideal place for colonising without competing with the indigenous vegetation. Warming (1909) has emphasised the role of man in changing the flora of a country.

Table 5

Comparison of Biological spectrum of Calicut with those of other regions and the

Normal spectrum (%)

Region	No. of dry months	Ph.	N.	Ch.	H.	G.	HH.	Th.	L.	P.	E.	Plant climate.
Normal spectrum (Raunkiaer, 1905)	--	28.0	15.0	9.0	26.0	4.0	2.0	13.0	--	--	3.0	--
Rajasthan desert (Das & Sarup, 1951)	11-12	9.7	4.6	18.9	15.5	--	3.4	40.0	7.8	--	--	Therophytic
Semi-arid zone of North India (Mehr-Homji, 1962)	9-10	11.0	12.3	18.3	10.4	5.2	3.0	33.0	6.0	1.0	--	Thero-chamae- phytic.
Semi-arid zone of South India (Mehr-Jomji, 1962)	8	15.0	15.3	12.4	11.0	6.0	4.0	28.0	7.0	1.0	--	Thero-chamae- phytic.
Saugar, Madhya Pradesh. (Rao, 1965)	8-9	11.8	5.0	4.3	13.4	1.7	4.4	49.0	9.4	0.9	0.1	Therophytic
Allahabad, Uttar Pradesh. (Srivastava, 1944)	8-9	20.6	11.6	9.2	3.4	--	7.8	41.6	3.1	--	2.7	Therophytic
Calicut (Present study)	2-3	18.0	15.1	7.0	4.5	5.4	2.5	32.1	13.6	1.0	0.8	Therophytic

Life-forms based mainly on the position of highest perennating buds in relation to the surface soil.

\* See the following page.



- \*  
Ph. = Phanerophytes (Perennating organs more than 2 metres above the soil)  
N. = Nano $\square$ phanerophytes (Perennating organs less than 2 metres above the soil)  
Ch. = Chamaephytes (Perennating organs 20-30 cm high above the soil)  
H. = Hemicryptophytes (Perennating organs at ground level)  
G. = Geophytes (Perennating organs subterranean)  
HH. = Hydrophytes (Aquatic plants with perennating buds under water)  
Th. = Therophytes (Annuals.)  
L. = Lianas (Climbing plants)  
P. = Parasites  
E. = Epiphytes.

Statistical analysis

The relative importance of families in a flora is usually expressed by tabulating the largest ten families in the order of their number of species and comparing it with those of the adjacent regions, or of the country as a whole (Good, 1953). On account of greater ecological diversity, larger areas have more heterogenous flora while smaller areas have homogenous flora (Good, 1953). It is probably on account of this that Calicut shows greater correlation with the Madras Presidency rather than India as a whole, as may be seen from Table 6.

Leguminosae and Gramineae occupy the first two ranks, as they are outstanding in their Geographical distribution. These are followed by Euphorbiaceae and Cyperaceae. Although rich in number of species Cyperaceae is confined to restricted habitats, mostly to the wet or marshy low lands. Good (1953) has stated "Almost every where Compositae, Gramineae, Leguminosae (in the wide sense) and Cyperaceae are among the first six, but thereafter much depends on whether the area concerned is temperate in which case such families as Caryophyllaceae, Cruciferae, Ranunculaceae, Rosaceae and Scrophulariaceae rank high,

or whether it is tropical, in which case such families as Orchidaceae, Euphorbiaceae and Rubiaceae take their places". The consequent preponderance of Euphorbiaceae and Rubiaceae is apparent in this area also. The human interference with the natural vegetation and creation of artificial habitats might have given a relatively greater advantage to the predominantly herbaceous Scrophulariaceae. The predominantly tropical families Convolvulaceae and Verbenaceae have better representation in this area whereas Acanthaceae and Compositae have fewer representation probably due to the dominance of Gramineae.

Table 6.

Comparison of the first 10 largest families of India, Madras Presidency, Western peninsula and Calicut.

India (Hooker, 1904)	Madras Pre- sidency (Fischer, 1935)	Western peninsula (Hooker, 1904)	Calicut (present study)
1. Orchidaceae	Leguminosae	Gramineae	Leguminosae
2. Leguminosae	Gramineae	Leguminosae	Gramineae
3. Gramineae	Rubiaceae	Acanthaceae	Euphorbiaceae
4. Rubiaceae	Acanthaceae	Orchidaceae	Cyperaceae
5. Euphorbiaceae	Euphorbiaceae	Cyperaceae	Rubiaceae
6. Acanthaceae	Orchidaceae	Euphorbiaceae	Scrophulariaceae
7. Compositae	Compositae	Rubiaceae	Acanthaceae
8. Cyperaceae	Cyperaceae	Compositae	Convolvulaceae
9. Labiatae	Labiatae	Labiatae	Compositae
10. Urticaceae	Asclepiadaceae	Asclepiadaceae	Verbenaceae

Statistics of the flora of Calicut:

	Dicotyledons	Monocotyledons	Total
Families	117	27	144
Genera	435	103	538
Species	725	211	936

Ratio between genera and species = 1:1.72

Ratio between dicotyledons & monocotyledons  
= 3.4:1

Lemee (1929-1943) has suggested that a method of statistical approach to a flora for a comparative study is to calculate the number of species per genus. According to Lemee (1929) there are about 2,25,000 species and the average number of species per genus is 18. In India there are about 7 species per genus (Hooker, 1872-'97) and in "Madras Presidency" the ratio of the number of genus to species is 1:3.4 (Gamble, 1915-'36), while in Calicut it is 1:1.72. This shows that the larger the area, the greater is the proportion of species to a genus.

\*KEY TO FAMILIES

DICOTYLEDONS

Polypetalae.

1. Flowers 3-merous:
  2. Carpels numerous ..... ANNONACEAE
  2. Carpels few ..... MENISPERMACEAE
1. Flowers not trimerous:
  3. Flowers bisexual or polygamous:
    4. Stamens more than 10:
      5. Flowers hypogynous:
        6. Sepals free:
          7. Sepals persistent:
            8. Leaves opposite ..... GUTTIFERAE
            8. Leaves alternate ..... DILLENiaceAE
          7. Sepals not persistent:
            9. Plants climbing ..... RANUNCULACEAE
            9. Plants not climbing:
              10. Fruits berries:
                11. Carpels distinct... NYMPHAEACEAE
                11. Carpels not  
distinct:
                  12. Ovary stalked... CAPPARACEAE
                  12. Ovary sessile... ELEOCARPACEAE

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\*The key is made in four steps - Polypetalae, Gamopetalae, Monochlamydeae and Monocotyledons, for convenience.

- 10. Fruits drupaceous or capsular:
  - 13. Leaves digitately lobed ... COCHLOSPERMACEAE
  - 13. Leaves simple:
    - 14. Fruits bristly ..... BIXACEAE
    - 14. Fruits not bristly:
      - 15. Ovary 1-loculed ..... FLACOURTIACEAE
      - 15. Ovary 2-many loculed.. TILIACEAE
- 6. Sepals connate:
  - 16. Stamens connate:
    - 17. Stamens monadelphous ..... MALVACEAE
    - 17. Stamens polyadelphous ..... BOMBACACEAE
  - 16. Stamens free:
    - 18. Fruit a berry ..... ALANGIACEAE
    - 18. Fruit not berry ..... DIPTEROCARPACEAE
- 5. Flowers perigynous or epigynous:
  - 19. Plants leafless ..... CACTACEAE
  - 19. Plants leafy:
    - 20. Leaves opposite:
      - 21. Ovary 1-loculed ..... RHIZOPHORACEAE
      - 21. Ovary 2-many loculed ..... MYRTACEAE
    - 20. Leaves alternate ..... BARRINGTONIACEAE
- 4. Stamens 3-10 (rarely more):
  - 22. Flowers hypogynous:
    - 23. Sepals free:

24. Plants covered with glandular hairs ... DROSERACEAE

24. Plants not covered with glandular

hairs:

25. Plants climbing:

26. Stamens 10 ..... LINACEAE

26. Stamens only 5 ..... PASSIFLORACEAE

25. Plants not climbing:

27. Leaves inciso-crenate or

lacerate ..... BRASSICACEAE

27. Leaves not as above:

28. Style basal ..... OCHNACEAE

28. Style terminal:

29. Ovary 1-loculed:

30. Capsules operculate .... PORTULACACEAE

30. Capsules not operculate:

31. Style short or 0 .... CLEOMACEAE

31. Style conspicuous:

32. Flowers regular... CARYOPHYLLACEAE

32. Flowers

irregular .... VIOLACEAE

29. Ovary 2-more loculed

(except in Gisekia of

Molluginaceae):

33. Style single:

- 34. Flowers spurred ..... BALSAMINACEAE
- 34. Flowers not spurred:
  - 35. Petals 3 ..... POLYGALACEAE
  - 35. Petals 4-5:
    - 36. Fruits circumcissile ..... AIZOACEAE
    - 36. Fruits not circumcissile ... SAPINDACEAE
- 33. Styles 2-5:
  - 37. Leaves simple:
    - 38. Leaves entire ..... MOLLUGINACEAE
    - 38. Leaves serrate ..... ELATINACEAE
  - 37. Leaves compound ..... OXALIDACEAE
- 23. Sepals connate at base:
  - 39. Leaves gland-dotted ..... RUTACEAE
  - 39. Leaves not gland-dotted:
    - 40. Carpels distinct (except a few members of Sterculiaceae)
      - 41. Leaves bearing bulbils ..... CRASSULACEAE
      - 41. Leaves without bulbils:
        - 42. Fruits winged ..... SIMAROUBACEAE
        - 42. Fruits not winged:
          - 43. Leaves simple ..... STERCULIACEAE
          - 43. Leaves compound ..... CONNARACEAE
    - 40. Carpels not distinct:
      - 44. Leaves opposite ..... MALPIGHIACEAE



44. Leaves alternate:

45. Perianth urceolate ..... OPILIACEAE

45. Perianth not as above:

46. Seeds winged ..... MORINGACEAE

46. Seeds not winged:

47. Stamens more than 5:

48. Filaments connate..... MELIACEAE

48. Filaments free:

49. Styles 2-5 (when 1,  
lateral)..... ANACARDIACEAE

49. Style single,  
terminal..... BURSERACEAE

47. Stamens 5 or less:

50. Ovary 1-loculed:

51. Flowers solitary,  
axillary..... TURNERACEAE

51. Flowers in  
panicles .... ICACINACEAE

50. Ovary 3-5-loculed:

52. Stamens 3 ..... HIPPOCRATEACEAE

52. Stamens 4-5:

53. Plants spinous... RHAMNACEAE

53. Plants spineless:

54. Climbers ..... VITACEAE

54. Erect shrubs.. LEEACEAE

22. Flowers perigynous or epigynous:

55. Carpel 1:

56. Flowers regular ..... MIMOSACEAE

56. Flowers irregular:

57. Stamens free ..... CAESALPINIACEAE

57. Stamens connate ..... PAPILIONACEAE

55. Carpels more than 1:

58. Carpels separating into 2

mericarps .... UMBELLIFERAE

58. Carpels connate throughout:

59. Fruits 1-seeded:

60. Connectives spurred.... MEMECYLACEAE

60. Connectives not

spurred.... COMBRETACEAE

59. Fruits many seeded:

61. Anthers opening by

pores ..... MELASTOMATACEAE

61. Anthers not opening

by pores:

62. Fruits elongated.... ONAGRACEAE

62. Fruits ovoid or

subglobose ..... LYTHRACEAE

3. Flowers unisexual:

63. Stigma fimbriate ..... CARICACEAE

63. Stigmas not fimbriate:

64. Plants tendrill-bearing ..... CUCURBITACEAE

64. Plants not tendrill-bearing.... BEGONIACEAE

Gamopetalae

1. Flowers epigynous or perigynous:
  2. Stipules conspicuous ..... RUBIACEAE
  2. Stipules absent:
    3. Anthers connate:
      4. Flowers aggregated in heads .... COMPOSITAE
      4. Flowers solitary or in racemes.. LOBELIACEAE
    3. Anthers free:
      5. Flowers sessile ..... SPHENOCLEACEAE
      5. Flowers pedicellate ..... GOODENIACEAE
1. Flowers hypogynous:
  6. Carpels free:
    7. Pollen carriers present:
      8. Pollen waxy ..... ASCLEPIADACEAE
      8. Pollen granular ..... PERIPLOCACEAE
    7. Pollen carriers absent ..... APOCYNACEAE
  6. Carpels connate:
    9. Ovary 1-loculed:
      10. Flowers spurred ..... LENTIBULARIACEAE
    10. Flowers not spurred:
      11. Leaves opposite ..... GENTIANACEAE
      11. Leaves alternate:
        12. Calyx glandular ..... PLUMBAGINACEAE
        12. Calyx eglandular ..... MENYANTHACEAE

9. Ovary 2 or more loculed:

13. Locules of ovary 3-8:

14. Stamens free from corolla .....EBENACEAE

14. Stamens inserted on corolla .... SAPOTACEAE

13. Locules of ovary 2:

15. Stamens only 2:

16. Branches sharply 4-angled ... NYCTANTHACEAE

16. Branches not angular ..... OLEACEAE

15. Stamens 4 or more (if less,  
staminodes present):

17. Leaves opposite:

18. Fruit capsular:

19. Corolla campanulate .... SPIGELIACEAE

19. Corolla bilabiate:

20. Calyx annular or

many toothed ..... THUNBERGIACEAE

20. Calyx of 4-5

segments .... ACANTHACEAE

18. Fruit a berry:

21. Leaves basally 3-5-

ribbed ..... STRYCHNACEAE

21. Leaves penninerved ..... POTALIACEAE

17. Leaves alternate:

22. Seeds numerous:

23. Style single:

24. Fruit berry ..... SOLANACEAE

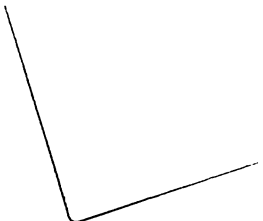
- 24. Fruit capsular:
  - 25. Seeds winged ..... BIGNONIACEAE
  - 25. Seeds not winged ..... SCROPHULARIACEAE
- 23. Styles 2 ..... HYDROPHYLLACEAE
- 22. Seeds few:
  - 26. Plants usually climbing ..... CONVOLVULACEAE
  - 26. Plants not climbing:
    - 27. Flowers in spicate, scorpioid
      - cymes ..... BORAGINACEAE
    - 27. Flowers not as above:
      - 28. Flowers regular ..... CORDIACEAE
      - 28. Flowers irregular:
        - 29. Leaves inequilateral
          - at base ..... GESNERIACEAE
        - 29. Leaves not inequilateral:
          - 30. Flowers solitary in
            - axils .... PEDALIACEAE
          - 30. Flowers not solitary:
            - 31. Fruits with 2
              - anterior hooks .. MARTYNIACEAE
            - 31. Fruits without hooks:
              - 32. Corolla campanulate, regular.. AVICENNIACEAE
              - 32. Corolla bilabiate:
                - 33. Fruits of 4
                  - nutlets ... LABIATAE
                - 33. Fruits drupaceous or of 1-4 pyrenes.. VERBENACEAE

## Monochlamydeae

1. Flowers bisexual (except in a few members of Lauraceae):
  2. Ovary superior:
    3. Perianth and bracts scarious ..... AMARANTHACEAE
    3. Perianth and bracts not scarious:
      4. Stipules present ..... POLYGONACEAE
      4. Stipules absent:
        5. Anthers opercular ..... LAURACEAE
        5. Anthers not opercular:
          6. Plants scaly ..... ELAEAGNACEAE
          6. Plants glabrous:
            7. Climbers ..... BASELLACEAE
            7. Plants not climbing:
              8. Flowers in slender spikes ... PEPEROMIACEAE
              8. Flowers in cymes or panicles.. NYCTAGINACEAE
    2. Ovary inferior or semi-inferior:
      9. Fruits many-seeded ..... ARISTOLOCHIACEAE
      9. Fruits 1-seeded:
        10. Trees, terrestrial ..... SANTALACEAE
        10. Shrubs, parasitic on branches of trees ..... LORANTHACEAE

- 1. Flowers unisexual:
  - 11. Ovary inferior ..... VISCACEAE
  - 11. Ovary superior:
    - 12. Ovary 1-celled:
      - 13. Plants climbing ..... PIPERACEAE
      - 13. Plants not climbing:
        - 14. Filaments inflexed in bud:
          - 15. Style undivided ..... URTICACEAE
          - 15. Stylar branches 2 ..... MORACEAE
        - 14. Filaments not inflexed.... ULMACEAE
      - 12. Ovary 2-3-loculed:
        - 16. Plants leafy ..... EUPHORBIACEAE
        - 16. Plants leafless ..... CASUARINACEAE

MONOCOTYLEDONS

- 
1. Perianth 2-seriate:
    2. Outer perianth calycine:
      3. Ovary inferior:
        4. Flowers enclosed in a spathe .... HYDROCHARITACEAE
        4. Flowers not enclosed in spathe:... BROMELIACEAE
      3. Ovary superior:
        5. Flowers in dense heads ..... XYRIDACEAE
        5. Flowers not in heads:
          6. Trees ..... PALMACEAE
          6. Herbs ..... COMMELINACEAE
    2. Both series of perianth corolline:
      7. Ovary 1-loculed ..... ORCHIDACEAE
      7. Ovary 3-loculed:
        8. Ovary 3-winged ..... BURMANNIACEAE
        8. Ovary not winged:
          9. Leaves spinous:..... AGAVACEAE
          9. Leaves not spinous:
            10. Ovary superior:
              11. Flowers in umbels ..... SMILACACEAE
              11. Flowers not in umbels:
                12. Plants spinous ..... ASPARAGACEAE



12. Plants unarmed:

13. Plants scapigerous ..... PONTEDERIACEAE

13. Plants not scapigerous ..... LILIACEAE

10. Ovary inferior:

14. Flowers irregular:

15. Stem spirally twisted ..... COSTACEAE

15. Stem not spirally twisted:

16. Ovary 1-loculed ..... MARANTACEAE

16. Ovary 3-loculed:

17. Fruit capsular:

18. Sepals free ..... CANNACEAE

18. Sepals connate ..... ZINGIBERACEAE

17. Fruit not capsular ..... MUSACEAE

14. Flowers regular:

19. Flowers terminating a scape:

20. Scape hidden in the leaf

axils..... HYPOXIDACEAE

20. Scape very long ..... AMARYLLIDACEAE

19. Flowers not on scapes ..... DIOSCOREACEAE

1. Perianth reduced or 0:

21. Inflorescence of spadices:

22. Spadices branched ..... PANDANACEAE

22. Spadices not branched ..... ARACEAE

21. Inflorescence not of spadices:

23. Flowers in spikes ..... APONOGETONACEAE

23. Flowers not in spikes:

24. Leaves spinulose on the

margins ..... NAJADACEAE

24. Leaves entire:

25. Flowers in heads ..... ERIOCAULACEAE

25. Flowers in spikelets with

imbricating glumes:

26. Leaves 3-ranked ..... CYPERACEAE

26. Leaves 2-ranked ..... GRAMINEAE

ENUMERATION

RANUNCULACEAE Juss.

Naravelia Adans.(nom.cons.)

N.zeylanica DC. Syst. 1:167. 1818; FBI. 1:19. 1872;  
Gamb. 3.

Climbing shrubs; leaves 2-foliolate, terminating in a 3-fid tendril; leaflets broadly ovate or elliptic, shortly acuminate, entire or dentate, basally veined; flowers green in axillary panicles; petals 8-12, linear, clavate, longer than sepals; stamens many, connective produced above the anthers; achenes short-stalked with long, feathery tails.

Flowers: Dec. - Jan.

Sivarajan 1477.

DILLENiaceae Salisb.

Key to the genera

- 1. Trees ..... Dillenia
- 1. Climbers ..... Tetracera

Dillenia Linn.

D.pentagyna Roxb. Pl. Corom. 1:21, t. 20. 1795; FBI. 1:38.  
1872; Gamb. 6.

Trees; leaves elliptic to oblanceolate, dentate, silky tomentose, reaching 30 x 12.5 cm in size, lateral veins many and parallel.

Extremely rare. The author could come across only a single tree in the whole area, and that too does not set flower.

Sivarajan 1610.

Tetracera Linn.

T.indica (Houtt. ex Christm. & Panz.) Merr. Int. Rumph. 367. 1917 & in J. Arn. Arb. 19:354. 1938; Hoogland in Fl. Males. 4(3):146. 1951. Assa indica Houtt. ex Christm. & Panz. Pfl. Syst. 4:40, t. 26, f. 1. 1779. Tetracera laevis Vahl, Symb. Bot. 3:71. 1794; FBI. 1:31, 1872; Gamb. 5.

Climbing shrubs; leaves elliptic-oblong, obtusely acuminate, up to 12.5 x 6 cm; flowers white in terminal or lateral panicles; sepals 4-5, spreading, concave, persistent; petals as many as sepals, white; stamens many; follicles ovoid, usually 4; seeds few, arillate.

Flowers: Mar. - May

Sivarajan 188.

ANNONACEAE Juss.

Key to the genera

1. Climbing shrubs:
  2. Berries many, long-stalked ..... Uvaria
  2. Berries few, sessile ..... Artabotrys
1. Erect shrubs or trees:
  3. Ripe carpels confluent ..... Annona
  3. Ripe carpels not confluent:
    4. Petals 5-6 cm long ..... Cananga
    4. Petals up to 2.5 cm long ..... Polyalthia

Uvaria Linn.

U.narum (Dunal) Blume, Fl. Java 5. 1828, in part; Hook.f.

& Thoms. Fl. Ind. 1:102. 1855; FBI. 1:50. 1872, in part;  
King in Ann. Roy. Bot. Gard. Calc. 4:27. 1893; D. Das  
in Bull. Bot. Sur. Ind. 5:39. 1963; Gamb. 9.

Unona narum Dunal, Anon. 99. 1817, in part.

Climbing shrubs; leaves oblong, obtusely acuminate  
or acute, glabrous; flowers brownish, 3-4 cm across;  
sepals 3; petals 6; connate at base, tips incurved; stamens  
many, anther cells concealed by the projecting connective;  
berries long-stalked, many, oblong, 1-2 seeded.

Common on hedges and <sup>in</sup> waste places. Usually branches help in climbing by twining around supports.

Flowers: Oct. - Nov.

Sivarajan 543.

Artabotrys R. Br.

A. zeylanicus Hook. f. & Thoms. in Hook. f. Fl. Ind. 128.

1855 & FBI. 1:54. 1872; King in Ann. Roy. Bot. Gard.

Calc. 4:43. 1893; D. Das in Bull. Bot. Sur. Ind. 5:40.

1963; Gamb. 10.

Woody, climbing shrub; leaves oblong-lanceolate, acute or shortly acuminate, glabrous; flowers brownish, solitary or fascicled on woody, hooked, flattened, leaf-opposed peduncles; sepals 3, ovate-acute; petals 6, oblong-lanceolate, rusty tomentose; anthers sessile; berries ovoid, mucronate, sessile.

Flowers: Mar. - Apr.

Sivarajan 1111.

Annona Linn.

Key to the species

- 1. Fruits spinous ..... muricata
- 1. Fruits not spinous:
  - 2. Leaves obtuse ..... squamosa
  - 2. Leaves acute ..... reticulata

A.muricata Linn. Sp. Pl. 536. 1753; Blatt. in J. Bombay nat. Hist. Soc. 34:292. 1930; Bailey 419.

Trees; leaves obovate-oblong or elliptic, obtuse or apiculate, shining green above; flowers creamy yellow on short peduncles; sepals 3, small; outer petals ovate-acute, thick, inner petals smaller and thin; fruits 15-20 cm long, ovoid, spinous.

Flowers: Mar. - May

Sivarajan 207.

A.squamosa Linn. Sp. Pl. 537. 1753; FBI. 1:78. 1872; Blatt. in J. Bombay nat. Hist. Soc. 34:292. 1930; Bailey 419; Gamb. 14.

Small trees; leaves elliptic-oblong, obtuse; flowers greenish yellow, axillary, solitary or clustered; sepals small; outer petals oblong, thick,

inner petals very small; fruits ovoid or subglobose with projecting areoles.

Flowers: Apr. - June

Sivarajan 1144.

A. reticulata Linn. Sp. Pl. 537. 1753; FBI. 1:78. 1872;

Blatt. in J. Bombay nat. Hist. Soc. 34:292. 1930;

Bailey 419; Gamb. 49.

Small trees; leaves oblong-lanceolate, acute; flowers greenish white; areoles of the fruit not tubercular.

Flowers: Apr. - June

Sivarajan 1143.

Cananga Hook.f. & Thoms.(nom.cons.)

C. odorata (Lamk.) Hook. f. & Thoms. Fl. Ind. 130.

1855 & FBI. 1:56. 1872; Sinclair in Sarawak. Mus.

Jour. 5(3):598. 1951; D.Das in Bull. Bot. Sur.

Ind. 5:40. 1963; Hutch. Gen. Fl. Pl. 1:102. 1964.

Uvaria odorata Lamk. Encycl. Meth. Bot. 1:595.

1785.



Trees with drooping or horizontal branches; leaves broadly ovate-lanceolate, acuminate; flowers yellow in few-flowered, axillary clusters; sepals ovate; petals lanceolate, 5-7 cm long; connective of the stamens produced; berries many-seeded.

Flowers: Dec. - Mar.

Sivarajan 1620.

Polyalthia Blume

Key to the species

- 1. Flowers fascicled on the old wood ..... longifolia
- 1. Flowers axillary, solitary ..... korintii

P. longifolia (Sonnerat) Th. En. 398. 1864; FBI. 1:62.

1872; King in Ann. Roy. Bot. Gard. Calc. 4:72. 1893;

D. Das in Bull. Bot. Sur. Ind. 5:42. 1963; Gamb. 11.

Uraria longifolia Sonnerat, Voy. Ind. 2:233, t. 131.

1782. Guatteria longifolia (Sonnerat) Wall. (Cat. 6442.

1832, nom. nud.) ex Wt. & Arn. Prod. 10. 1834; Hook.f.

& Thoms. Fl. Ind. 139. 1855.

Trees; leaves narrowly lanceolate, acuminate, margins undulate; flowers greenish white, fascicled on

the older parts of branches; sepals free; petals lanceolate; berries one-seeded.

Flowers: Mar. - June

Sivarajan 1004.

P.korintii (Dunal) Benth. & Hook. f. ex Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1:64. 1872; King in Ann. Roy. Bot. Gard. Calc. 4:79, Pl. 110A. 1893; Gamb. 11. Guatteria korintii Dunal, Anon. 134. 1817; DC. Prod. 1:94. 1824.

Shrubs; leaves ovate or elliptic, acuminate, glabrous on both surfaces, prominently reticulate; flowers green; sepals minute; petals 2-seriate, elliptic-acute, the outer spreading, inner erect; berries 1-seeded, ovoid, hirsute, long-stalked.

Flowers: Sept. - Oct.

Sivarajan 163, 410.

MENISPERMACEAE Juss.

Key to the genera

Male specimens

- 1. Stamens connate:
  - 2. Anthers capitate at the top of  
a column ..... Anamirta
  - 2. Anthers on the rim of a flat-  
topped column ... Cyclea
- 1. Stamens free:
  - 3. Pistillode absent ..... Tinospora
  - 3. Pistillode present ..... Tiliacora

Female specimens

- 1. Gynophore present ..... Anamirta
- 1. Gynophore absent:
  - 2. Ovary solitary ..... Cyclea
  - 2. Ovary 3-many:
    - 3. Stigma forked ..... Tinospora
    - 3. Stigma subulate ..... Tiliacora

Anamirta Colebr.

A.cocculus (Linn.) Wt. & Arn. Prod. 1:446. 1834; FBI.  
1:98. 1872; Diels in Pfreich. 4(94):108. 1910;  
Back. & Bakh. f. Fl. Java 1:156. 1963; Gamb. 19.  
Menispermum cocculus Linn. Sp. Pl. 340. 1753.

Anamirta paniculata Colebr. in Trans. Linn. Soc.  
13:66. 1822.

Woody, dioecious climbers; leaves large, ovate-acute, leathery; flowers small, white, paniculate on the old wood; sepals 6; petals 0; anthers in male flowers capitate at the top of a column; staminodes in female flowers 9, clavate; carpels 3 on a short gynophore; drupes purple, ovoid.

Commonly seen in undisturbed wood lands.

Flowers: Aug. - Oct.

Sivarajan 225, 468, 1525.

Cyclea Arn. ex Wt.

C. peltata (Lamk.) Hook. f. & Thoms. Fl. Ind. 201.  
1855, quoad basionym; Diels in Pfreich. 46:302.  
1910. Menispermum peltatum Lamk. Encycl. Meth.  
Bot. 4:96. 1797. Cocculus burmanni DC. Syst.  
1:517. 1818 & Prod. 1:96. 1824. Cyclea burmanni (DC.)  
Hook. f. & Thoms. Fl. Ind. 201. 1855 & FBI. 1:104.  
1872; Sant. 5. 1967.

Dioecious climbers; stem hispid; leaves ovate-lanceolate, peltate; flowers in axillary, hispid panicles; stamens in male flowers 4-6, connate round

the rim of a flat-topped column; in female flowers ovary one; drupes ovoid, or subglobose, small.

A slender climber, commonly seen on bushes and hedges.

Flowers: Oct. - Dec.

Sivarajan 802A, 802B.

Note: The nomenclature of this species has been controversial. Diels (loc.cit.) has shown that Menispermum peltatum Lamk. (1797) is conspecific with Cocculus burmanni DC. (1818). He transferred Menispermum peltatum to the genus Cyclea, but the new combination Cyclea peltata (Lamk.) Diels, becomes superfluous, since Hooker and Thomson had earlier applied the same combination to an entirely different species, C.arnotti Miers. But according to Art. 55 of Int. Code of Bot. Nom. the epithet 'peltata' must be retained for Menispermum peltatum to which it is originally attached.

Tinospora Miers.

Key to the species

- 1. Leaves glabrous ..... cordifolia
- 1. Leaves tomentose ..... sinensis

T. cordifolia (Willd.) Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1:97. 1872; Gamb. 19.; Sant. & Janardhanan in Bull. Bot. Sur. Ind. 10:368. 1968. Menispermum cordifolium Willd. Sp. Pl. 4:826. 1806.

Climbing shrubs; leaves simple, ovate-acuminate, deeply cordate at base, glabrous; flowers greenish yellow in dioecious racemes in the axils of fallen leaves; drupes ovoid.

Very common on hedges and bushes; and produce flowers after leaves.

Flowers: Jan. - Feb.

Sivarajan 878A, 878B.

T. sinensis (Lour.) Merr. in Sunyatsenia 1:193. 1934 & Trans. Am. Phil. Soc. Philad. 24:158. 1935; Sant. & Janardhanan in Bull. Bot. Sur. Ind. 10:368. 1968; Campylus sinensis Lour. Fl. Cochinch. 113. 1790. Menispermum malabaricum Lamk. Encycl. Meth. Bot. 4:96. 1797. Tinospora malabarica (Lamk.) Miers. in Ann. Hist. Nat. Ser. 2(7):38. 1851 & Contr. Bot. 3:32. 1871; FBI. 1:96. 1872; Subba Rao & Kumari in Bull. Bot. Sur. Ind. 9:186. 1967. T. tomentosa (Colebr.) Miers. in Ann. Hist. Nat. Ser. 3(13):319. 1864 & in Contr. Bot. 3:33. 1871.

Tomentose, climbing shrubs; leaves entire or 3-5-lobed, densely hairy on both surfaces; flowers greenish yellow in dioecious racemes, in the axils of fallen leaves.

Flowers: Jan. - Feb.

Sivarajan 63, 939.

Note: This plant goes under the name Tinospora malabarica in many of the Indian Floras, based on Menispermum malabaricum Lamk. Since the earliest name available for this species is Campylus sinensis, the correct name of the species should be T. sinensis.

Tiliacora Colebr.

T. acuminata (Lamk.) Miers. in Ann. & Mag. Nat. Hist. Ser. 2(7):39. 1851; Diels in Pflanzl. 46:61. 1910; Mahes. 53; Gamb. 20. Menispermum acuminatum Lamk. Encycl. Meth. Bot. 4:101. 1797. Tiliacora racemosa Colebr. in Trans. Linn. Soc. 5(13):67. 1821.

Slender climbers; leaves ovate-lanceolate, deltoid; flowers yellow in axillary pendulous racemes or panicles; sepals 6 in 2 series, the outer much smaller than the inner; petals 6, minute; stamens in

male flowers 6, rudimentary carpels 3; ovaries in female flowers 3-9; drupes obovoid, subcompressed.

Common on bushes and hedges, on the grassy slopes.

Flowers: Jan. - Mar.

Sivarajan 851, 974.

NYMPHAEACEAE Salisb.

Nymphaea Linn. (nom.cons.)

Key to the species

1. Leaves glabrous on both surfaces ..... stellata

1. Leaves dense-pubescent beneath ..... nouchali

N.stellata Willd. Sp. Pl. 5(2):1153. 1797; FBI. 1:114.

1872; Gamb. 24; Rao in Bull. Bot. Sur. Ind.(Suppl.2)

10:8. 1968.

Rhizomatous **perennials**; **leaves floating**, large, orbicular, entire or irregularly toothed, 8-15 cm across, glabrous on both surfaces; flowers white, 4-7 cm across.

Common in water-logged fields. This species displays considerable variation in the size of the leaves



and flowers, corresponding to the depth of water in which it lives.

Flowers: Aug. - Dec.

Sivarajan 681, 691, 1473.

N.nouchali Burm. f. Fl. Ind. 120. 1798; Rao in Bull.

Bot. Sur. Ind. (Suppl.2) 10:8. 1968. N.pubescens

Willd. Sp. Pl. 2:1154. 1930; Gamb. 24. N.rubra Roxb.  
ex Salisb. Parad. Lond. 1. Sub. t. 14. 1805.

N.lotus Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind.  
1:114. 1872, non Linn.

Rhizomatous perennials; leaves large, orbicular, regularly, sinuately, toothed, dense-tomentose beneath, up to 30 cm across; flowers red, about 10 cm across.

Common in the ponds and water-logged fields, and very often seen in association with N.stellata.

Flowers: Aug. - Dec.

Sivarajan 1489.

BRASSICACEAE Burnett

(Cruciferae Juss., nom. alt.)

Key to the genera

1. Pod not constricted between seeds ..... Rorippa  
1. Pod constricted between seeds ..... Brassica

Rorippa Scop.

R.indica (Linn.) Hiern. Cat. Afr. Pl. Welw. 1:26, add.  
& Corr. 1896; Bailey in Rhodora 18:155. 1916;  
Hochreut. in Candollea 2:370. 1925. Sisymbrium  
indicum Linn. Mant. 1:93. 1767. Nasturtium indicum  
(Linn.) DC. Syst. 2:199. 1818; FBI. 1:133. 1872;  
Gamb. 27.

Annual, erect herbs, about 60 cm tall; leaves  
pinnately lobed or lacerate, up to 10 x 4 cm; flowers  
yellow in terminal and axillary corymbose racemes;  
pod linear, 1 cm long.

A comparatively rare species, collected from  
the wet fields in Puthiyara, and noticed no where else  
in this area.

Flowers: Mar. - May

Sivarajan 196.

Note: This plant goes under the name Nasturtium indicum in most of the Indian Floras. The generic name Nasturtium is conserved, but only in a restricted sense, for a monotypic genus based on the type N.officianale R. Br. The correct name for the cited specimen is Rorippa indica.

Brassica Linn.

B.nigra Koch. in Roehl. Deutschl. Fl. (ed.3) 4:713.

†833; FBI. 1:156. 1872; Mahes. 62.

Annual herbs, 1-1.5 metres tall; basal leaves in a rosette, large, lyrate; cauline leaves oblanceolate, lyrate or dentate; flowers yellow; pods 4-5 cm long.

Not cultivated, but seen as a weed near habitations.

Flowers: Aug. - Dec.

Sivarajan 529.

CAPPARACEAE Juss.

Crataeva Linn.

Key to the species

1. Leaflets lanceolate, sessile ..... nurvala
1. Leaflets elliptic-acuminate, petiolulate ... adansonii

C.nurvala Buch.-Ham. in Trans. Linn. Soc. 15:121. 1827;  
Mahes. 65. 1963; Jacobs in Blumea 12:194. 1964.

C.religiosa var.nurvala (Buch.-Ham.) Hook. f. & Thoms.  
in Hook. f. Fl. Brit. Ind. 1:172. 1872.

Deciduous trees; leaves trifoliolate; leaflets narrow, lanceolate, glabrous, glaucous beneath, up to 15 x 4.2 cm; flowers white in terminal panicles; pedicels long; sepals deciduous; petals obovate-obtuse, long-clawed; berries ovoid.

Along the banks of rivers or streams, rather rare.

Flowers: Feb. - Mar.

Sivarajan 641, 958.

C.adansonii DC. Prod. 1:243. 1824, ssp.odora (Buch.-Ham.)

Jacobs in Blumea 12:198. 1964. C.odora Buch.-Ham. in Trans. Linn. Soc. 15:118. 1827. C.roxburghii R.Br. in Denh. & Clapp. Travels, App. 224. 1826. C.religiosa, var.roxburghii (R.Br.) Hook. f. & Thoms. in Hook. f. Fl. Brit. Ind. 1:172. 1872.

Deciduous trees; leaves trifoliolate; leaflets elliptic, abruptly acuminate, glabrous; flowers white turning yellowish in terminal racemes; pedicels long; sepals deciduous; petals obovoid-obtuse, long-clawed.

It is a beautiful sight to see this tree in full bloom. Seen usually near wet fields or some waterways.

Flowers: Mar. - Apr.

Sivarajan 1025.

CLEOMACEAE (Pax) Airy Shaw

Cleome (Linn.) DC. (sensu lato)

Note: The delimitation of this genus has been disputed very often. de Candolle (Prod. 1:237. 1824) was the first to segregate Gynandropsis from Cleome. Robert Brown (Denh. & Clapp. Narr. Trav. and discov. N. and Centr. Afr. 222. 1826, Lond.) and Schulteses (Syst. Veg. 7:23-51. 1829) rejected this segregation, on the grounds that Gynandropsis gynandra (Linn.) Briq. was the earliest known species of Cleome on which the genus was mainly constituted. This was followed by Jacobs (Fl. Males. 6:101. 1960), Iltis (Brittonia 12:279-294. 1960) and Ernst (J. Arn. Arb. 44:88. 1963). The main diagnostic characters of Gynandropsis were the stalked ovary and the stamens inserted on the gynophore. It has been emphasised (Iltis, loc.cit.) that these characters are quantitative, displaying considerable variation and hence do not form reasonable basis for generic separation. The author has shared this view in this work, and has treated all the available species

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Key to the species

1. Ovary long-stalked:
  2. Flowers white ..... gynandra
  2. Flowers pink ..... speciosa
1. Ovary sessile:
  3. Leaves unifoliolate ..... monophylla
  3. Leaves 3-5-foliolate:
    4. Flowers yellow:
      5. Plants viscid pubescent ..... viscosa
      5. Plants not viscid pubescent ..... aspera
    4. Flowers purplish ..... burmanni

C.gynandra Linn. Sp. Pl. 671. 1753; Jacobs in Fl. Males.

6:101. 1960. Gynandropsis pentaphylla (Linn.) DC.

Prod. 1:238. 1824, nom. illeg.; FBI. 1:171. 1872;

Gamb. 29. G.gynandra (Linn.) Briq. Ann. Cons. Jar.

Bot. Geneve 17:382. 1914; Sant. 9. 1960.

Low, branched, viscid annuals; leaves digitately 5-foliolate; leaflets oblanceolate or elliptic, pubescent on both surfaces; flowers white in terminal bracteate racemes; calyx glandular hairy; petals obovate, clawed; stamens inserted on the gynophore; capsules linear, 3-4 cm long, viscid; seeds muriccate.

Common on the sea-coast, railway<sup>embankments</sup> banks, roadsides  
and elsewhere.

Flowers: July - Dec.

Sivarajan 641.

C. speciosa H.B. & K. Nov. Gen. et Sp. 5:84, t. 436. 1821.

Gynandropsis speciosa (H.B. & K.) DC. Prod. 1:238.

1824; Cooke 1:43.

Tall, pubescent herbs; hairs not glandular;  
leaves digitately 5-7-foliolate; leaflets lanceolate-  
acuminate, pubescent on both surfaces; flowers large,  
pink in long, terminal, bracteate racemes; capsules  
linear, striate.

Mostly cultivated in gardens, rarely seen as  
an escape.

Flowers: Aug. - Dec.

Sivarajan 1383.

C. monophylla Linn. Sp. Pl. 672. 1753; FBI. 1:168. 1872;

Blatt. in J. Bombay nat. Hist. Soc. 31:898. 1927;

Gamb. 29.



Erect or diffuse, densely pubescent herbs; leaves unifoliolate, oblong-lanceolate, pubescent on both surfaces; flowers pink in terminal, bracteate racemes; bracts ovate-cordate; sepals pubescent; petals oblong-obtuse; capsules linear, striate, 7-9 cm long; seeds many, rugose.

A very common weed in upland cultivations.

Flowers: July - Nov.

Sivarajan 293.

C.viscosa Linn. Sp. Pl. 672. 1753; FBI. 1:170. 1872;

Blatt. in J. Bombay nat. Hist. Soc. 31:899. 1927;

Sant. 8. 1960; Gamb. 29.

Erect, viscid-pubescent annuals; leaves digitately 3-5-foliolate; leaflets obovate to lanceolate, obtuse, pubescent; flowers yellow, solitary in the axils and also in terminal, bracteate racemes; sepals viscid-hairy; petals oblanceolate, obtuse; stamens many; capsules linear, striate; seeds striate.

A common weed in sandy fields, road sides and the sea coast.

Flowers: Jan. - Sept.

Sivarajan 22, 168.

C. aspera Koenig ex DC. Prod. 5:241. 1824; FBI. 1:169.  
1872; Blatt. in J. Bombay nat. Hist. Soc. 31:899  
1927; Gamb. 29.

Diffuse herbs much branched from the base;  
leaves trifoliolate; leaflets oblong-obtuse, prickly;  
flowers small, yellow, solitary in the axils; capsules  
linear, **striate**, up to 2 cm long; seeds transversely  
ridged.

Common along the railway <sup>embankments</sup> ~~bank~~ and also on the  
sea-coast.

Flowers: Mar. - Sept.

Sivarajan 239.

C. burmanni Wt. & Arn. Prod. 1:22. 1834; Blatt. in J.  
Bombay nat. Hist. Soc. 31:899. 1927; Shah in J.  
Bombay nat. Hist. Soc. 60:481. 1963; Gamb. 29.

Diffuse or suberect herbs; stem angled with  
minute prickles; leaves trifoliolate; leaflets elliptic  
to obovate, glabrous; flowers purple, solitary in the  
axils; capsules linear, **striate**; seeds ridged.

Flowers: Aug. - Dec.

Sivarajan 411.

VIOLACEAE Batsch

Hybanthus Jacq. (nom.cons.)

H. enneaspermus (Linn.) Muell.-Arg. Fragn. 10:81. 1876;  
Tennant in Kew Bull. 16(3):431. 1963. Viola enneasperma Linn. Sp. Pl. 937. 1753. Ionidium suffruticosum (Linn.) Roem. & Schult. Syst. Veg. 5:394. 1819; FBI. 1:185. 1872; Gamb. 35.

Diffuse or erect herbs; leaves elliptic to oblanceolate, entire or toothed; flowers red, axillary, solitary; sepals acute, keeled; petals unequal, the lower petal large and clawed, saccate at base; stamens 5, some of them spurred; style slender, clavate; capsules subglobose; seeds striate.

Common on the grassy slopes and roadsides; much variable.

Flowers: Mar. - Nov.

Sivarajan 177, 563, 1198, 1277.

Note: Of the varieties distinguished by Tennant (loc.cit.), this specimen conforms to the var. enneaspermus. For a detailed discussion and synonymy Tennant (loc.cit.) may be referred.

BIXACEAE Link

Bixa Linn.

B.orellana Linn. Sp. Pl. 512. 1753; Burm. f. Fl. Ind.  
120. 1968; FBI. 1:252. 1922; Back. in Fl. Males.  
4(3):239. 1951; Blatt. in J. Bombay nat. Hist. Soc.  
31:909 1927; Gamb. 37.

Small trees with tomentose branches; leaves  
alternate, ovate-lanceolate; flowers white in terminal  
panicles; capsules ovoid, densely bristly outside;  
seeds with red, pulpy testa.

Flowers: Sept. - Oct.

Sivarajan 1502.

FLACOURTIACEAE DC.

Hydnocarpus Gaertn.

H.alpina Wt. Ic. t. 942.1845; FBI. 1:197. 1872; Gamb.37.

Trees; leaves oblong-acuminate, serrate, up to  
25 x 8 cm; flowers green, unisexual; males in axillary  
cymes; females usually solitary; petals each with a  
scale within; stamens in male flowers 10-15; ovary in  
female flowers 1-celled; stigmas sessile, radiating;

fruits large with a woody pericarp; seeds embedded in a pulp.

Flowers: most part of the year.

Sivarajan 164, 1042, 1207.

COCHLOSPERMACEAE Planch.

Cochlospermum Kunth (nom.cons.)

C.religiosum (Linn.) Alston, Handb. Fl. Ceyl. 6:14.

1931; Steenis in Fl. Males. 4(2):62. 1949. Bombax religiosum Linn. Sp. Pl. 512. 1753. B.gossypium Cav. Diss. Bot. 5:297, t. 156. 1785, non Linn.

Cochlospermum gossypium DC. Prod. 1:527. 1824;

FBI. 1:190. 1872; Gamb. 36.

Small, deciduous trees; leaves digitately 5-lobed; flowers bright yellow in terminal, clustered panicles; capsules 3-5-valved, inflated and leathery; seeds numerous, testa with woolly hairs.

Very rare. Collected from St. Joseph's College premises, Davagiri. These beautiful trees blossom when they are completely devoid of leaves.

Flowers: Jan. - Feb.

Sivarajan 32.

POLYGALACEAE R. Br.

1. Stamens 8 ..... Polygala  
1. Stamens only 4 ..... Salomonina

Polygala Linn.

Key to the species

1. Flowers pink ..... siberica  
1. Flowers not pink:  
    2. Capsules glabrous on the margins .... elongata  
    2. Capsules ciliate on the margins:  
        3. Leaves obovate ..... bolbothrix  
        3. Leaves oblong-obtuse ..... rosmarinifolia

P.siberica Linn. Sp. Pl. 702. 1753; FBI. 1:205. 1872;

Gamb. 42.

Diffuse or erect herbs; leaves ovate or elliptic, puberulous on both surfaces, up to 3.5 x 1.5 cm; flowers pink, in short, lateral, 2-3-flowered racemes; 2 lateral sepals much larger than the others; keel petal crested with a fimbriate appendage; stamens monadelphous; capsules compressed, broader than long, cells unequal, margins ciliate; seeds hairy with 3-fid caruncle.

Flowers: Aug. - Dec.

Sivarajan 214, 437.

POLYGALACEAE R. Br.

1. Stamens 8 ..... Polygala  
1. Stamens only 4 ..... Salomonina

Polygala Linn.

Key to the species

1. Flowers pink ..... siberica  
1. Flowers not pink:  
    2. Capsules glabrous on the margins .... elongata  
    2. Capsules ciliate on the margins:  
        3. Leaves obovate ..... bolbothrix  
        3. Leaves oblong-obtuse ..... rosmarinifolia

P.siberica Linn. Sp. Pl. 702. 1753; FBI. 1:205. 1872;

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Diffuse or erect herbs; leaves ovate or elliptic, puberulous on both surfaces, up to 3.5 x 1.5 cm; flowers pink, in short, lateral, 2-3-flowered racemes; 2 lateral sepals much larger than the others; keel petal crested with a fimbriate appendage; stamens monadelphous; capsules compressed, broader than long, cells unequal, margins ciliate; seeds hairy with 3-fid caruncle.

Flowers: Aug. - Dec.

Sivarajan 214, 437.

POLYGALACEAE R. Br.

- 1. Stamens 8 ..... Polygala
- 1. Stamens only 4 ..... Salomonina

Polygala Linn.

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- 1. Flowers not pink:
  - 2. Capsules glabrous on the margins .... elongata
  - 2. Capsules ciliate on the margins:
    - 3. Leaves obovate ..... bolbothrix
    - 3. Leaves oblong-obtuse ..... rosmarinifolia

P.siberica Linn. Sp. Pl. 702. 1753; FBI. 1:205. 1872;

Gamb. 42.

Diffuse or erect herbs; leaves ovate or elliptic, puberulous on both surfaces, up to 3.5 x 1.5 cm; flowers pink, in short, lateral, 2-3-flowered racemes; 2 lateral sepals much larger than the others; keel petal crested with a fimbriate appendage; stamens monadelphous; capsules compressed, broader than long, cells unequal, margins ciliate; seeds hairy with 3-fid caruncle.

Flowers: Aug. - Dec.

Sivarajan 214, 437.



P.elongata Klein ex Willd. Sp. Pl. 3:879. 1803; FBI.  
1:204. 1872 (excl. syn. P.wightiana); Mukh. in  
Bull. Bot. Soc. Beng. 12:36. 1958; Adema in Blumea  
14:273. 1966; Gamb. 42.

Erect or diffusely branched, pubescent herbs;  
leaves linear-oblong, 2 mm broad, glabrous; racemes  
lateral, 4-5 cm long, many-flowered; flowers bright  
yellow; sepals, petals and stamens as in other species;  
capsules compressed, 2-celled, cells unequal, glabrous;  
seeds ovoid, white villous; caruncle 3-fid below

Common among grasses on the rocky, lateritic  
slopes during the rainy season. Collected from the  
University campus.

Flowers: Sept. - Nov.

Sivarajan 260.

P.bolbothrix Dunn in Kew Bull. 1916:63. 1916; Rang. &  
Tad. in J. Ind. bot. Soc. 1:47-48. 1921; Mukh. in  
Bull. Bot. Soc. Beng. 12:37. 1958; Gamb. 42.

P.ciliata Wt. & Arn. Prod. 1:38. 1834, non Linn.

Herbs; branches diffuse or prostrate, patent hairy;  
leaves obovate-obtuse, ciliate on the margins, up to

2.5 x 1.5 cm; flowers pale yellow in lateral racemes; floral characters as in other species; the cells of the capsule unequal, strongly margined; margins ciliate; seeds hairy with a 3-fid caruncle.

Collected from the rocky lateritic slopes in the University Campus. Very often it is seen to grow in the small crevices of wet rocks during the rainy season.

Flowers: July - Sept.

Sivarajan 261.

P. rosmarinifolia Wt. & Arn. Prod. 1:37. 1834; FBI. 1:204. 1872; Mukh. in Bull. Bot. Soc. Beng. 12:38. 1958; Gamb. 42.

Erect, unbranched, hispid herbs, about 15 cm tall; leaves oblong-obtuse or apiculate, 2-2.5 x 0.5 cm; puberulous on both surfaces; racemes lateral; peduncles few-flowered; flowers pale yellow; capsules strongly margined; margins ciliate; seeds hairy with a 3-fid caruncle.

Flowers: July - Sept.

Sivarajan 1276.

This species is rare in this area.

Salomonina Lour. (nom.cons.)

S.ciliata (Linn.) DC. Prod. 1:334. 1824; FBI. 1:206.

1872; Trim. Fl. Ceyl. 1:83. 1893. Polygala ciliata

Linn. Sp. Pl. 705. 1753. Salomonina oblongifolia DC.

Prod. 1:334. 1824; FBI. 1:206. 1872; Gamb. 41.

Erect, branched herbs; stem angular; leaves ovate or elliptic, 3-nerved from base, sessile, up to 10 x 8 mm; flowers blue in terminal spikate racemes; sepals more or less equal; lower petal not crested; stamens 4, connate throughout; capsules compressed, broader than long, cells equal, margins spinous-toothed; seeds strophiolate, black.

A common annual on the grassy hill slopes, during the rainy season.

Flowers: July - Oct.

Sivarajan 263, 760.

CARYOPHYLLACEAE Juss.

Key to the genera

- 1. Erect herbs ..... Polycarpaea
- 1. Prostrate herbs ..... Polycarpon

Polycarpaea Lamk. (nom.cons.)

Key to the species

1. Sepals silvery white ..... corymbosa  
1. Sepals reddish-brown ..... aurea

P.corymbosa (Linn.) Lamk. Tabl. Encycl. 2:129. 1791;

FBI. 1:245. 1874; Blatt. in Rec. Bot. Sur. Ind. 9:28.

1921; Mahes. 70; Gamb. 46. Achyranthes corymbosa Linn.

Sp. Pl. 205. 1753.

Erect, much branched annuals; stem pubescent; leaves linear, apparently verticillate due to axillary clusters; stipules scarious, fimbriate; flowers in dense terminal cymes; bracts acute, white; sepals silvery white, lanceolate, acute, longer than the petals; stamens 5; capsules very small, 3-valved.

Very common on the coast and on the rocky hill slopes.

Flowers: Aug. - Jan.

Sivarajan 951.

P.aurea Wt. & Arn. in Ann. Nat. Hist. Ser. 1:91. 1839;  
Gamb. 47. P.corymbosa var. aurea (Wt. & Arn.) Wt. Ill.  
2:44, t. 110. 1850; FBI. 1:245. 1874.

Erect, branched annuals; stem pubescent; leaves as in the other species; flowers in dense, branched, terminal cymes; sepals shining red, acute; petals smaller; capsules very small.

This species is much more common than P.corymbosa on the rocky hill slopes.

Flowers: Aug. - Jan.

Sivarajan 768.

Polycarpon Loefl. ex Linn.

P.prostratum (Forsk.) Aschers & Sch. Weinf. in Oster. Bot. Zeitscher. 36:128. 1889. Obs.; Pax in Pfam. 3(1b):87. 1889; Sant. 12. 1960. Alsine prostrata Forsk. Fl. Aeg.-Ar. 207. 1775. P.loeflingiae Benth. & Hook. Gen. Pl. 1:153. 1862; Gamb. 46.

Prostrate, much branched herbs; leaves obovate-spathulate, seemingly whorled due to axillary clusters; flowers pink in axillary and terminal cymes; bracts ovate-acute, hairy at the tip; sepals ovate-acute, prominently keeled on the back; petals smaller than the sepals, toothed



Diffuse, succulent herbs with fusiform, tuberous roots; leaves linear, acute; flowers yellow, terminal and solitary, with an involucre of brownish hairs; capsules ovoid, circumscissile; seeds black.

Seen on moist rocks and hard laterite during the rainy season.

Flowers: May - Oct.

Sivarajan 1169, 1170.

Note: Geesink (loc.cit.) has remarked that "this is the most variable subspecies of the "pilosa complex" and has recognised seven races in it.

P.pilosa Linn. Sp. Pl. 445. 1753, ssp.grandiflora (Hook.f.)

Geesink in Blumea 17(2):297. 1969. P.grandiflora Hook. f. in Bot. Mag. t. 2885. 1829; Bailey 365; Mahes. 71.

Prostrate, succulent herbs, densely woolly at the nodes; leaves linear; flowers red or purple.

Commonly cultivated in gardens but, sometimes seen as an escape also.

Flowers: throughout the year.

Sivarajan 1725.

P.oleracea Linn. Sp. Pl. 445. 1753; FBI. 1:246. 1874;  
Blatt. in Rec. Bot. Sur. Ind. 9(1):28. 1921; Sant. 13.  
1960; Gamb. 47.

Erect, succulent herbs; leaves obovate, obtuse  
or retuse; flowers bright yellow, clustered at the tips  
of branches; fruits slightly compressed.

Flowers: Aug. - Nov.

Sivarajan 633, 1309.

Talinum Adans.

T.portulacifolium (Forsk.) Aschers & Sch. Weinf. in  
Bull. Herb. Boiss. 4. App. 172. 1896. Orygia portu-  
lacifolia Forsk. Fl. Aeg.-Ar. 103. 1775. Portulaca  
cuneifolia Vahl, Syn. Bot. 1:33. 1790. Talinum  
cuneifolium (Vahl) Willd. Sp. Pl. 2:864. 1799;  
FBI. 1:247. 1874; Gamb. 48.

Succulent herbs or under shrubs; leaves obovate  
or oblanceolate; flowers red in terminal panicles;  
sepals 2, ovate, deciduous; petals 5; stamens 5-many;  
capsules ovoid, 2-3-valved; seeds subglobose or reniform.

Flowers: most part of the year.

Sivarajan 797.



ELATINACEAE Dumort.

Bergia Linn.

B. capensis Linn. Mant. 2:241. 1771; D'Almeida in J. Bombay nat. Hist. Soc. 43:93, Pl. 1-3. 1943; Milne-Redhead in Kew Bull. 1948:450. 1949; Back. in Fl. Males. 4(3):203. 1951; Gamb. 49. B. verticillata Willd. Sp. Pl. (ed.4) 2:770. 1799, nom. illeg.; FBI. 1:252. 1874.

Annual, erect, fleshy herbs; leaves elliptic to oblanceolate, finely serrate; flowers minute, in dense, axillary clusters; sepals 5, acute; petals 5; stamens 10; capsules 3-5-celled; seeds many, minute.

Aquatic or semi-aquatic herbs, growing in flooded fields and on the margins of shallow ponds. The stem is fleshy and translucent with plenty of air-spaces within.

Flowers: July - Oct.

Sivarajan 449.

GUTTIFERAE Juss.

(Clusiaceae Lindl., nom. alt.)

Key to the genera

1. Flowers pedicellate ..... Calophyllum  
1. Flowers sessile or subsessile ..... Mesua

Calophyllum Linn.

C.inophyllum Linn. Sp. Pl. 513. 1753; FBI. 1:273. 1874;  
Brand. Ind.Tr. 54. 1907; Mahes. in Bull. Bot. Sur.  
Ind. 2:145. 1960; Gamb. 55.

Trees; leaves coriaceous, elliptic or obovate, obtuse, lateral veins very close and parellel; flowers white in axillary racemes or panicles; sepals and petals 4 each; stamens numerous, polyadelphous; ovary 1-celled, 1-ovuled; drupes about 3 cm across.

Flowers: Oct. - Dec.

Sivarajan 782.

Mesua Linn.

M.ferrea Linn. Sp. Pl. 515. 1753, ssp. thwaitesii

(Planch. & Triana) Vesque in DC. Mon. Phan. 8:632.  
1893; Mahes. in Bull. Bot. Sur. Ind. 5:339. 1963.

M.thwaitesii Planch. & Triana in Ann. Sci. Nat. Ser.

Tall trees; leaves oblong-lanceolate, glaucous beneath, up to 16 x 4 cm in size; flowers rose coloured, large and showy, axillary, solitary, subsessile; sepals orbicular; petals large, obovate; stamens numerous; ovary 2-celled; stigma peltate; fruits ovoid, 1-4 seeded with a woody pericarp.

Flowers: Apr. - May

Sivarajan 248.

Note: The extensive polymorphism, exhibited by the Linnean species M.ferrea has led many earlier workers to distinguish several species within the 'M.ferrea complex'. Vesque (loc.cit.) monographed this genus and united the whole complex into a single species M.ferrea, with 4 infraspecific categories, of which the author's specimen belongs to the ssp.thwaitesii. Maheshwari (loc.cit.) has accredited this subspecies to Vesque. Since Vesque's name is based on M.thwaitesii Planch. & Triana, the correct citation should be M.ferrea Linn. ssp.thwaitesii (Planch. & Triana) Vesque.

DIPTEROCARPACEAE Blume

Key to the genera

1. Fruits winged ..... Hopea
- ~~2.~~ Fruits not winged ..... Vatica

Hopea Roxb. (nom.cons.)

H.wightiana Wall. [Cat. 6295. 1832, nom. nud.] ex Wt.

Ill. t. 37. 1840; FBI. 1:309. 1874; Brand. in J.

Linn. Soc. 31:58. 1895; Gamb. 59.

Tall trees; leaves broad, oblong-obtuse, leathery, glabrous, up to 25 x 8 cm; petiole short and pubescent; flowers white, in terminal or axillary paniculate, secund racemes; calyx campanulate, 5-lobed, tube 2 mm long; petals oblong-obtuse, adpressed hairy outside; stamens 15 with produced awn-like connective; fruits with 2, oblong-obtuse wings.

Flowers: Apr. - May

Sivarajan 238, 244.

Vatica Linn.

V.chinensis Linn. Mant. 242. 1771; Smith, Pl. Ic. t.

36. 1789; Brand. in J. Linn. Soc. 31:119. 1895.

Vateria roxburghiana Wt. ill. 1:88. 1840. Vatica

roxburghiana (Wt.) Blume, Mus. Bot. Lugd. Bat.

2:31; t. 1849.

Large trees; leaves oblong-obtuse or lanceolate, leathery, glabrous, up to 15 x 8 cm; flowers white in short, axillary, pubescent panicles; calyx tomentose,

lobes obtuse; petals tomentose outside; stamens 15, connective produced; fruits dipressed globose, not winged.

Flowers: Mar. - May

Sivarajan 1091.

MALVACEAE Juss.

Key to the genera

1. Involucral bracts 0:
  2. Carpels 5-10 ..... Sida
  2. Carpels 15-20 ..... Abutilon
1. Involucral bracts 5 or more:
  3. Petals auricled near the base ..... Malvaviscus
  3. Petals not auricled:
    4. Fruits with glochidiate bristles .. Urena
    4. Fruits without glochidiate  
bristles:
      5. Stylar branches 5:
        6. Calyx 5-toothed ..... Hibiscus
        6. Calyx spathaceous ..... Abelmoschus
      5. Style not branched ..... Thespesia

Sida Linn.

Key to the species and subspecies

1. Leaves ovate-cordate:
  2. Plants trailing ..... cordata
  2. Plants erect ..... cordifolia
1. Leaves not ovate-cordate:
  3. Pedicels much longer than the  
petiole ..... rhombifolia  
ssp. rhombifolia
  3. Pedicels as long or slightly  
longer than the petiole:
    4. Leaves obtuse or retuse ..... rhombifolia  
ssp. retusa
    4. Leaves not as above:
      5. Leaves hairy ..... ovata
      5. Leaves glabrous ..... acuta

S. cordata (Burm.f.) Borss. in Blumea 14(1):182. 1966.

Melochia cordata Burm. f. Fl. Ind. 143. 1768.

S. veronicaefolia Lamk. Encycl. Meth. Bot. 1:5. 1783;

Gamb. 64. S. humilis var. veronicaefolia (Lamk.) Mast.  
in Hook. f. Fl. Brit. Ind. 1:322. 1875.

Trailing, hispid herbs; leaves ovate-cordate,  
acute or acuminate at tip, crenate-serrate; flowers

axillary, solitary, yellow; pedicels jointed in the middle; calyx 5-angled, hairy; corolla slightly longer than the calyx; carpels in fruits 5, muticous or with a 2-lipped beak, not reticulate, 2.5 cm long.

Common along the coast and in other sandy areas.

Flowers: Aug. - Jan.

Sivarajan 714.

S.cordifolia Linn. Sp. Pl. 684. 1753; FBI. 1:324. 1874;

Borss. in Blumea 14(1):200. 1966; Gamb. 64.

Erect, bushy plants, dense-pubescent all over; leaves orbicular or ovate-cordate, obtuse, margins crenate; flowers pale yellow, solitary or in few-flowered clusters in the axils; pedicels short; calyx lobes ovate-acute; corolla slightly exceeding the calyx; carpels 8-10, strongly reticulate, each with 2 retrorsely scabrous awns, almost as long as the carpel.

A very profuse weed on roadsides and in waste places.

Flowers: Aug. - Dec.

Sivarajan 753.

S.rhombifolia Linn. Sp. Pl. 684. 1753, emend. Mast.

in Hook. f. Fl. Brit. Ind. 1:323. 1875, ssp.rhombifolia: King in J. As. Soc. Beng. n.s. 60:41. 1891; Merr. En. 374. 1921; Borss. in Blumea 14:193. 1966.

S.rhomboidea Roxb. ex Flem. in As. Res. 11:178. 1810; Gamb. 65. S.rhombifolia var.rhomboidea (Roxb. ex Flem.) Mast. in Hook. f. Fl. Brit. Ind. 1:323-24. 1875.

Woody, hoary-pubescent herbs; leaves rhomboid or elliptic-oblong, crenate; flowers yellow, axillary, solitary; peduncles much longer than the petiole, jointed in the middle; carpels 10, muticous and reticulate, 3 mm long.

Not common, collected from near the waste dump at Kundayithodu.

Flowers: Oct. - Dec.

Sivarajan 1482.

S.rhombifolia Linn. emend. Mast., ssp.retusa (Linn.)

Borss. in Blumea 14(1):198. 1966. S.retusa Linn. Sp. Pl. (ed.2) 961. 1763. S.rhombifolia var.retusa (Linn.) Mast. in Hook. f. Fl. Brit. Ind. 1:324. 1874.

Stellate-tomentose herbs; leaves rhomboid or obovate, obtuse or retuse, coarsely toothed, stellate-



hairy beneath; flowers pale yellow; pedicels jointed, clustered in the upper axils; calyx angular, lobes acute; corolla twice as long as the calyx; carpels usually 10, reticulate, awans 2, short.

A weed in the grassy slopes and on roadsides. Used in medicinal preparations.

Flowers: Oct. - Dec.

Sivarajan 1509.

Note: Masters (loc.cit.) has described two varieties under S.rhombifolia. Borssum's studies (loc.cit.) have shown that these two are reproductively isolated populations, of which the anthesis do not overlap, and consequently no intermediate forms develop. He has raised them to the rank of subspecies.

S.ovata Forsk. Fl. Aeg.-Ar. 124. 1775; Sant. Fl. Saur. 1:36. 1962; Thoth. in curr. Sci. 33(19):593-594. 1964. S.grewioides Guill. & Perr. in Guill., Perr. & Rich. Fl. Senegamb. Tent. 1:71. 1831; FBI. 1:323. 1874.

Stellate-hairy herbs; leaves elliptic or oblong, obtuse or subacute, crenate, hairy on both surfaces; petioles very short; flowers 1-few in the axils; pedicels

jointed at the tip; calyx angular, lobes acute;  
corolla longer than the calyx; carpels 7-8, reticulate  
with 2 short awns.

Seen along the roadsides and grassy slopes.

Flowers: Oct. - Dec.

Sivarajan 1559.

Note: This species, frequently referred to  
as S.grewioides, is first reported from South India  
in 1964, by Thothathri, (loc.cit.), and was collected  
from Andhra Pradesh. There is no earlier record of  
this species in Kerala.

S.acuta Burm. f. Fl. Ind. 147. 1768, emend. K. Schum.

in Fl. Bras. 12(3):326. 1891, ssp.acuta: Borss.

in Blumea 14(1): 186. 1966.

Much branched, shrubby plants with stellate-  
tomentose branches; leaves lanceolate-acute, serrate;  
glabrous; petiole very short; flowers yellow, 1-2 in  
the axils; pedicels jointed at the middle; calyx  
angular, lobes acute; corolla longer than the calyx;  
carpels 5-8, reticulate, each with 2 retrorsely scabrous  
awns; awns shorter than the carpels.



jointed at the tip; calyx angular, lobes acute; corolla longer than the calyx; carpels 7-8, reticulate with 2 short awns.

Seen along the roadsides and grassy slopes.

Flowers: Oct. - Dec.

Sivarajan 1559.

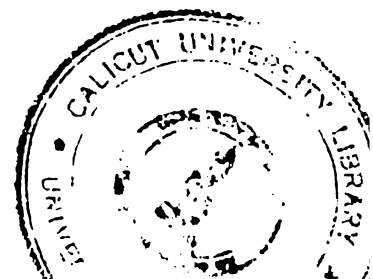
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in Fl. Bras. 12(3):326. 1891; ssp.acuta: Borss.

in Blumea 14(1): 186. 1966.

Much branched, shrubby plants with stellate-tomentose branches; leaves lanceolate-acute, serrate; glabrous; petiole very short; flowers yellow, 1-2 in the axils; pedicels jointed at the middle; calyx angular, lobes acute; corolla longer than the calyx; carpels 5-8, reticulate, each with 2 retrorsely scabrous awns; awns shorter than the carpels.



A profuse weed on roadsides and waste places.

Flowers: Aug. - Dec.

Sivarajan 734.

Note: S.acuta Burm. f. and S.carpinifolia Mast. are very often treated as conspecific. Actually, these two names refer to two distinct forms, which are treated as two subspecies by Borssum (loc.cit.), of which the author's specimen is ssp.acuta.

Abutilon Mill.

A.indicum (Linn.) Sweet, Hort. Brit. 54. 1826; FBI.

1:326. 1874; Chavan & Oza, Fl. Pavagadh 45. 1966;

Borss. in Blumea 14(1):171. 1966. Sida indica Linn.

Cent. Pl. 2:26. 1756. & Sp. Pl. (ed.2) 964. 1763.

S.asiatica Linn. Cent. Pl. 2:26. 1756 & Sp. Pl.

(ed.2) 964. 1763. Abutilon asiaticum (Linn.) Sweet,

Hort. Brit. 53. 1826; FBI. 1:326. 1874.

Soft-pubescent shrubs; leaves ovate-cordate, acuminate; petiole long, tomentose; flowers yellow; pedicels 4-7 cm long, axillary, jointed at the top; calyx about 1 cm long, lobes ovate-apiculate; corolla 2-3 cm across; carpels 15-20, much longer than the

calyx with acute tips, densely hispid hairy.

Flowers: Oct. - Dec.

Sivarajan 643, 1506.

Note: Borssum (loc.cit.) recognised three subspecies, based on the relative length of the calyx and the fruit. The author's specimen fits into ssp.indicum.

Malvaviscus Cav.

Note: Linnaeus and his contemporary workers were of the opinion that "the Hibiscus complex" included many distinct genera, like Ketmia Tourn. , Malvaviscus Dill., Trionum Linn., Hibiscus Linn., and Bammia Rupp. Of them, Hibiscus Linn. included two different elements, one that is presently known as Hibiscus, and the other as Malvaviscus Cav.

Miller (Gard. Dict. ed.4. 1754) typified Hibiscus Linn., but restricted it to a single species, H.malvaviscus Linn. (now, Malvaviscus arboreus Cav.) and assigned all the other species to a distinct genus Ketmia Tourn.

Fabricius (En. Meth. Pl. (ed.1) 152. 1759) validated the pre-Linnean name Malvaviscus Dill., but

calyx with acute tips, densely hispid hairy.

Flowers: Oct. - Dec.

Sivarajan 643, 1506.

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Malvaviscus Cav.

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Fabricius (En. Meth. Pl. (ed.1) 152. 1759) validated the pre-Linnean name Malvaviscus Dill.,, but

meant it to be a substitute name for the combined taxon of Hibiscus Linn. and Ketmia Tourn. (Fabr. En. Meth. Pl. (ed.2) 279. 1763). According to the rules he should have retained the name Hibiscus Linn. (sensu Mill.), instead of reviving the Dillenian name Malvaviscus. So his name became illegitimate and must be rejected.

Later Cavanilles (Diss. 3. 1787) resurrected Malvaviscus as a new generic name to include Hibiscus malvaviscus as separated from Hibiscus. Bakhuizen<sup>u</sup> van den Brink (Taxon 15:43. 1966 & 17:44-47. 1968) has discussed this problem in detail and has proposed the conservation of the name Malvaviscus Cav.

M. arboreus Cav. Diss. 3, t. 48, f. 1. 1787, var. penduliflorus (DC.) Schery in Ann. Mo. Bot. Gard. 29. 223. 1942; Bailey 657; Borss. in Blumea 14:133. 1966.  
M. penduliflorus DC. Prod. 1:445. 1824.

Shrubs; branches pubescent; leaves ovate-lanceolate, crenate-serrate, stellate-tomentose; flowers axillary, red or its various shades; bracts narrow, equalling the calyx; petals not spreading, but held erect by basal auricles; ovary 5-loculed; ovule

solitary in each cell.

Flowers: throughout the year.

Sivarajan 1504.

Urena Linn.

U.lobata Linn. Sp. Pl. 692. 1753; FBI. 1:329. 1875;

King in J. As. Soc. Beng. n.s. 60 (2):43. 1891; Merr.

En. 3:36. 1923; Gamb. 66., ssp. sinuata (Linn.) Borss.

in Blumea 14:142. 1966. U.sinuata Linn. Sp. Pl. 692. 1753;

FBI. 1:329. 1874; Gamb. 66.

Woody undershrubs, stellate hairy all over; leaves digitately lobed, lobes again pinnately incised or toothed; flowers pink, axillary, solitary; fruits pubescent and covered with glochidiate bristles.

Flowers: Sept. - Dec.

Sivarajan 754, 871.

**Note:** In almost all the Indian Floras U.lobata and U.sinuata are treated as two distinct species, principally based on the lobation of leaves. However Borssum (loc.cit.) has amalgamated both into a single species under the name U.lobata, but distinguished two subspecies,



ssp.lobata with cupular, and ssp.sinuata with spreading epicalyx. **U**nder the ssp.sinuata he has distinguished two varieties, of which the cited specimen is var.sinuata.

Hibiscus Linn.

Key to the species

1. Flowers yellow:

2. Plants armed with prickles:

3. Stipules lanceolate ..... furcatus

3. Stipules ear-shaped ..... surattensis

2. Plants unarmed:

4. Bracteoles free:

5. Capsules winged ..... vitifolius

5. Capsules not winged ..... sabdariffa

4. Bracteoles connate above the

middle..... tiliaceus

1. Flowers red:

6. Petals entire ..... rosa-sinensis

6. Petals very much dissected ..... schizopetalus

H.furcatus Willd. En. Hort. Berol. 736. 1800; FBI. 1:335.

1874; Woodr. in J. Bombay nat. Hist. Soc. 11:127.

1897; Gamb. 70; Rakshit & Kundu in Bull. Bot. Sur.

Ind. 12:161. 1970 (1972).

Rambling shrubs with recurved prickles; leaves entire or digitately 3-5-lobed, crenate-serrate, prickly on the midveins beneath; stipules lanceolate; flower bright yellow with a dark purple eye; involucral bracts forked; capsular valves reticulate; seeds minutely hairy.

Flowers: Nov. - Dec.

Sivarajan 767

H. surattensis Linn. Sp. Pl. 696. 1753; Cav. Diss. 3:149. 1787; FBI. 1:334. 1874; K. Schum. in Pfam. 3(6):48. 1895; Borss. in Blumea 14(1):57. 1966; Gamb. 70; Rakshit & Kundu in Bull. Bot. Sur. Ind. 12:160-61. 1970 (1972).

Erect or trailing plants with recurved prickles; leaves orbicular or ovate, 3-5-angled or lobed, crenate-serrate; stipules broad, ear-shaped, toothed and ciliate on the margins; flowers pale yellow; involucral bracts forked; capsules ovoid, hairy; seeds smooth.

Flowers: Nov. - Dec.

Sivarajan 1553.

H. vitifolius Linn. Sp. Pl. 696. 1753; FBI. 1:338. 1874;  
Borss. in Blumea 14(1):82. 1966; Gamb. 70; Rakshit &  
Kundu in Bull. Bot. Sur. Ind. 12:166. 1970 (1972).

Woody herbs, soft-tomentose all over; leaves cordate at base, 3-5-angled or lobed, crenate-serrate, tomentose beneath; flowers sulphur-yellow with a deep purple eye; bracteoles 8-12, linear, not forked; capsules apiculate, winged and hairy; seeds minutely tuberculate.

Flowers: Oct. - Mar.

Sivarajan 752.

Note: The leaves are highly variable in their depth of incision, shape of lobes and in their hairiness and hence Rakshit & Kundu (loc.cit.) have rejected the various 'formae' distinguished under this species, based on those features.

H. sabdariffa Linn. Sp. Pl. 695. 1753; FBI. 1:340. 1874;  
Borss. in Blumea 14:64. 1966; Gamb. 69; Rakshit &  
Kundu in Bull. Bot. Sur. Ind. 12:162. 1970 (1972).

Erect, purplish herbs; stem bristleless; leaves variable, 1-7-lobed, lobes deep, oblong or lanceolate;

flowers axillary, solitary; pedicels very short and stout; calyx enlarged and fleshy in fruits; capsules hispid.

Flowers: Oct. - Dec.

Sivarajan 783.

Note: Rakshit and Kundu (loc.cit.) has recognised two varieties in India, under this species. The cited specimen belongs to var. sabdariffa and is distinguished from the var. altissima by its bristleless stem and enlarged, fleshy fruiting calyx.

H. tiliaceus Linn. Sp. Pl. 694. 1753; Cav. Diss. 3:151. 1787; FBI. 1:343. 1874; Borss. in Blumea 14(1):29. 1966; Rakshit & Kundu in Bull. Bot. Sur. Ind. 12:157. 1970 (1972).

Small trees; branches dense-tomentose; leaves simple, orbicular-cordate, acuminate at apex, crenulate; flowers yellow; bracteoles connate into a 7-10-toothed cup; calyx lobes narrowly lanceolate, pubescent outside; capsule globose, tomentose; seeds subreniform.

Found along the banks of rivers and back waters.

Flowers: Nov. - Mar.

Sivarajan 1568.

Note: Rakshit and Kundu (loc.cit.) in their "Revision of the Indian species of Hibiscus" have recorded two varieties of this species based on the nature of leaves and the author's specimen with its invariably unlobed leaves, fits into the var. tiliaceus

H.rosa-sinensis Linn. Sp. Pl. 694. 1753; FBI. 1:334.

1874; Borss. in Blumea 14:72-73. 1966; Rakshit & Kundu in Bull. Bot. Sur. Ind. 12:165. 1970 (1972).

Shrubs; leaves ovate-acuminate, crenate-serrate up to 12 x 7 cm; flowers axillary, solitary; bracteoles free, linear, half as long as the calyx; calyx divided almost to the middle.

Commonly cultivated in gardens, usually does not set fruits. Propagation is mainly by stem-cuttings.

Flowers: throughout the year.

Sivarajan 612.

Note: Davis and Ghoshal (J. Bombay nat. Hist. Soc. 45:30-43. 1966) have presented a detailed account of the floral variations in H.rosa-sinensis. Borssum (loc.cit.) recognised two varieties of which the specimen cited with its serrate-dentate leaves belongs to the var. rosa-sinensis.

H. schizopetalus (Mast.) Hook. f. in Bot. Mag. 106. t. 6524. 1880; Sant. 18. 1960; Borss. in Blumea 14:73. 1966; Rakshit & Kundu in Bull. Bot. Sur. Ind. 12:166. 1970 (1972). H. rosa-sinensis var. schizopetalus Mast. in Gard. Chron. n.s. 12:272, f. 45. 1879.

Shrubs; leaves ovate or elliptic, crenate-serrate, up to 12 x 8 cm; flowers red, axillary, solitary; bracteoles linear; petals much dissected and reflexed.

Commonly cultivated in gardens and on hedges.

Flowers: throughout the year.

Sivarajan 611.

#### Abelmoschus Medicus

Note: Medicus (Malv. 46. 1787) first separated Abelmoschus from Hibiscus, based on its deciduous calyx. But most of the Indian workers continued to retain it as a section under the genus Hibiscus. Recently, Hochreutiner's view that Abelmoschus, due to the connation of calyx, corolla and stamens, and its deciduous nature, deserves a generic rank, (Candollea 2:81. 1914, Nova Guinea 14:163. 1924) has gained good support, and is widely accepted.

Key to the species

1. Fruits densely bristly ..... angulosus  
1. Fruits not bristly ..... esculentus

A.angulosus Wall. ex Wt. & Arn. Prod. 53. 1834; Back.  
& Bakh. f. Fl. Java 1:434. 1963; Borss. in Blumea  
14(1):104. 1966. Hibiscus angulosus (Wall. ex Wt.  
& Arn.) Steud. Nomencl. (ed.2) 1:758. 1840; FBI.  
1:341. 1875; Gamb. 70.

Annual herbs; leaves simple or 3-5-angled or  
lobed, crenate-serrate; flowers yellow in terminal  
racemes; bracts ovate-obtuse, connate at first, later  
separating; calyx spathaceous; capsules slightly  
longer than the bracts, covered with dense bristles.

A weed on hill slopes and also in upland  
cultivations.

Flowers: Oct. - Dec.

Sivarajan 495.

Key to the species

1. Fruits densely bristly ..... angulosus  
1. Fruits not bristly ..... esculentus

A.angulosus Wall. ex Wt. & Arn. Prod. 53. 1834; Back.  
& Bakh. f. Fl. Java 1:434. 1963; Borss. in Blumea  
14(1):104. 1966. Hibiscus angulosus (Wall. ex Wt.  
& Arn.) Steud. Nomencl. (ed.2) 1:758. 1840; FBI.  
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lobed, crenate-serrate; flowers yellow in terminal  
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separating; calyx spathaceous; capsules slightly  
longer than the bracts, covered with dense bristles.

A weed on hill slopes and also in upland  
cultivations.

Flowers: Oct. - Dec.

Sivarajan 495.

A.esculentus (Linn.) Moench. Meth. 617. 1764; Sant. 18.  
1960; Back. & Bakh. f. Fl. Java 1:435. 1963; Borss.  
in Blumea 14(1):100. 1966. Hibiscus esculentus Linn.  
Sp. Pl. 696. 1753; FBI. 1:341. 1874.



Stout, erect annuals; leaves large, orbicular, 5-7-lobed; flowers yellow with a purple base, short-pedicelled; capsules long, fusiform, angled, 10 cm or more long, bristleless.

Very common under cultivation as a vegetable.

Flowers: throughout the year.

Sivarajan 1836.

Thespesia Soland. ex Correa (nom.cons.)

T. populnea (Linn.) Soland. ex Correa in Ann. Mus. Par.

9:290. 1807; FBI. 1:345. 1874; Sant. 18. 1960; Borss. in Blumea 14(1):106. 1966; Fosberg & Sachet in Smith. Contr. Bot. 7:8-10. 1972; Gamb. 72. Hibiscus populneus Linn. Sp. Pl. 694. 1753.

Trees; leaves ovate-cordate, acuminate, entire; flowers yellow, axillary, solitary; involucral bracts caducous; calyx cupular, truncate; style club-shaped at the apex; capsules subglobose.

Flowers: May - July

Sivarajan 1835.

Note: Fosberg and Sachet (loc.cit. 1-13) have made an excellent study of the pantropical T.populnea complex and ha<sup>ve</sup>~~s~~ recognised two distinct species in it. T.populnea, with deeply cordate, green leaves, short peduncles articulate near the base and without bracts near the articulation, indehiscent fruits and matted, long seed-hairs, is pantropical on the sea shores and rarely inland, and T.populneoides (Roxb.) Kostel. with coppery or bronzed leaves with a very wide sinus, long peduncles articulate at base, drooping flowers, dehiscent pericarp with a very tough indehiscent endocarp and short, erect, club-shaped, or bulbous based seed-hairs is essentially an Indian Ocean plant, but reported from other areas of the tropics. The author could however come across <sup>only</sup> the former in this area.

BOMBACACEAE Kunth

Key to the genera

1. Staminal bundles 5 ..... Ceiba
- 1~~2~~. Staminal bundles many ..... Bombax

Ceiba Mill.

C.pentandra (Linn.) Gaertn. Fruct. 2:244, t. 133.  
1791; Hutch. Gen. Fl. Pl. 2:535. 1967. Bombax  
pentandrum Linn. Sp. Pl. 511. 1753. Eriodendron  
anfractuosum DC. Prod. 1:479. 1824; FBI. 1:350.  
1874. E.pentandrum Kurz in J. As. Soc. Beng.  
43:113. 1874.

Deciduous trees, prickly when young; branches  
in apparent whorls, horizontal; leaves digitately  
5-7-foliolate; flowers greenish, fascicled at the  
tips of branchlets; capsules fusiform, up to 20 cm long.

This is commonly cultivated for the "silk  
cotton". The wood is extensively used in match  
industry.

Flowers: Feb. - Mar.

Sivarajan 1072.

Bombax Linn.

B.ceiba Linn. Sp. Pl. 511. 1753, in part; Robins in  
Taxon 10:6 & 160. 1961; Sant. 20. 1967; Rao in Bull.  
Bot. Sur. Ind. (Suppl.2) 10:15. 1968. Bombax malaba-  
ricum DC. Prod. 1:479. 1824; FBI. 1:349. 1874; Gamb.71.  
Salmalia malabarica (DC.) Schott. & Endl. Melet. Bot.  
35. 1832.

Large, profusely spinous trees; leaves digitately 5-7-foliolate; flowers large, red and fleshy, solitary or 1-3 together; calyx densely villous within; capsules ellipsoid.

This deciduous tree is also commonly cultivated for "silk cotton". Often seen as an escape, this tree bears flowers after shedding the foliage and put on fresh foliage during April-May.

Flowers: Feb. - Mar.

Sivarajan 959.

#### STERCULIACEAE Bartling

##### Key to the genera

- 1. Flowers apetalous ..... Sterculia
- 1. Flowers with petals:
  - 2. Ovary on a gynophore ..... Helicteres
  - 2. Ovary not on a gynophore:
    - 3. Styles 5 ..... Melochia
    - 3. Style 1 ..... Waltheria

Sterculia Linn.

Key to the species

1. Leaves digitately 5-lobed ..... urens  
1. Leaves entire ..... guttata

S.urens Roxb. Pl. Corom. 1:25, t. 24. 1795; FBI. 1:355.  
1874; Sant. 20. 1960; Mahes. 84; Gamb. 75.

Deciduous trees; leaves clustered towards the tips of branches, long-petioled, lamina 5-lobed, lobes acuminate, pubescent on both surfaces; flowers small in glandular-pubescent, clustered panicles at the tips of branches, polygamous; calyx campanulate, lobes reflexed, pubescent outside; petals 0; stamens usually 10, connate in a column; follicles 3-5, oblong, covered with dense, sharp, shining bristles.

Flowers: Feb. - Mar.

Sivarajan 82.

S.guttata Roxb. [Hort. Beng. 50. 1814, nom. nud.] Fl.  
Ind. 3:148. 1832; FBI. 1:355. 1874; Sant. 20. 1960;  
Gamb. 76.

Trees; young branches stellate-tomentose; leaves short-petioled, simple, broadly ovate-oblong, acuminate,

stellate-tomentose beneath; flowers fascicled on axillary, pubescent racemes, polygamous; calyx campanulate, stellate-pubescent outside, lobes oblong, reflexed; follicles ovoid to obovoid, covered with dense reddish soft tomentum.

Flowers: Nov. - Feb.

Sivarajan 766.

Helicteres Linn.

H. isora Linn. Sp. Pl. 963. 1753; FBI. 1:365. 1874;  
Parke in Ind. For. 46:23. 1920; Sant. 21. 1960;  
Gamb. 70.

Stellate-tomentose shrubs; leaves obovate, abruptly acuminate, crenate-serrate, tomentose on both surfaces; flowers red, zygomorphic, bisexual in axillary clusters; calyx 2-lipped; petals oblong, reflexed; staminal column adnate with the gynophore; linear, follicles 5, spirally twisted, stellate-tomentose.

Flowers: Oct. - Mar.

Sivarajan 899.

Melochia Linn.

M. corchorifolia Linn. Sp. Pl. 675. 1753; FBI. 1:374.  
1874; Mahes. 86; Gamb. 79.

Erect or diffusè herbs; leaves variable in shape, up to 5 x 4 cm; flowers rose-pink, capitate at the tips of branches; sepals ciliate; petals obovate; stamens 5; capsules subglobose, 5-valved, hispid outside.

Common in wet sandy fields, and in other moist places.

Flowers: Aug. - Nov.

Sivarajan 606.

Waltheria Linn.

W. indica Linn. Sp. Pl. 673. 1753; FBI. 1:374. 1874;  
Sant. 22. 1960; Gamb. 79.

Woody, dense-tomentose herbs; leaves ovate-oblong; flowers yellow, in dense, axillary clusters; stamens 5, basally connate; capsules 1-celled, 2-valved, 1-seeded.

Common among grasses on the grassy slopes.

Flowers: Oct. - Mar.

Sivarajan 119, 605.

TILIACEAE Juss.

Key to the genera

- 1. Fruits with hooked bristles ..... Triumfetta
- 1. Fruits without bristles:
  - <sup>fruit?</sup> 2. Stigma lobed ..... Grewia
  - 2. Stigma not lobed ..... Corchorus

Triumfetta Linn.

Key to the species

- 1. Capsular valves pubescent ..... annua
- 1. Capsular valves glabrous ..... rhomboidea

T. annua Linn. Mant. 1:73. 1767; FBI. 1:396. 1874;  
Sant. 26. 1967; Gamb. 86.

Branched undershrubs; leaves ovate-lanceolate, serrate, hispid on both surfaces, 5-nerved from base, up to 8 x 5 cm; flowers yellow in axillary clusters;



sepals with mucronate tips; capsules pubescent with spiny bristles; seeds ovoid, smooth.

Flowers: Oct. - Dec.

Sivarajan 1527.

T. rhomboide<sup>a</sup> Jacq. En. Pl. Caraib. 22. 1760; FBI.

1:395. 1874; Sant. in Bull. Bot. Sur. Ind. 3:21.

1962 & Fl. Khand. 26. 1967. Bartramia indica Linn.

Sp. Pl. 389. 1753. Triumfetta bartramia Linn.

Syst. (ed.10) 2:1044. 1759 (nom. illeg.)

Woody, much branched undershrubs; leaves broadly ovate or rhomboid, 3-5-lobed or entire, serrate, pubescent on both surfaces; flowers yellow in dense cymes in the upper axils; capsules pubescent, bristles glabrous.

A common weed on the grassy slopes and often troublesome since the fruits adhere to the body of the cattle and the clothes of the passers by.

Flowers: Oct. - Mar.

Sivarajan 711.

Note: The nomenclature of this species presents a good deal of complications. For a detailed account see Santapau (loc.cit. 1962) and Raizada (Ind. For. 92:325. 1966)

Grewia Linn.

Key to the species

- 1. Leaves stellate-tomentose ..... lawsoniana
- 1. Leaves not as above:
  - 2. Flowers in umbels ..... umbellifera
  - 2. Flowers in terminal panicles ..... microcos

G.lawsoniana Drummond in Gamb. Fl. Pres. Madr.

f:115, 117. 1915.

Straggling shrubs; branches densely hispid; leaves elliptic-lanceolate, acuminate, serrulate, stellate-tomentose on both surfaces; flowers in clustered umbels; peduncles pubescent; sepals ribbed and tomentose; drupes 4-lobed.

Collected from the banks of Feroke river.

Flowers: Mar. - May,

Sivarajan 247.

G.umbellifera Bedd.For. Man. Bot. 37. 1871; FBI.

1:393. 1874; Narayanaswamy & Rao in J. Ind.bot.  
Soc. 29:179. 1950; Gamb. 84.

Climbing shrubs, younger portions hispid;  
leaves elliptic or oblong, abruptly acuminate,  
serrulate, basally 3-nerved, sparsely hairy or  
glabrescent; flowers in fascicled umbels; pedicels  
long, hispid; sepals ribbed, hispid; fruits deeply  
lobed.

Flowers: Aug. - Dec.

Sivarajan 1596.

G.microcos Linn. Syst. (ed.12) 602. 1753; Wt. Ill.

t. 33. 1840; FBI. 1:392.1874; Gamb. 83. Microcos  
paniculata Linn. Sp. Pl. 514. 1753.

Shrubs or small trees; leaves oblong or  
lanceolate, acuminate, glabrous, up to 25 x 7 cm;  
panicles terminal, lax, grey-pubescent; flowers 2-3,  
enclosed in an involucre of bracts, yellow; drupes  
ovoid or subglobose.

Flowers: Aug. - Dec.

Sivarajan 1457.

Corchorus Linn.

Key to the species

1. Capsules oblong, winged ..... aestuans  
1. Capsules subglobose, not winged ..... capsularis

C.aestuans Linn.Syst. (ed.10) 1079. 1759; Mahes. 89;  
Sant. 27. 1967. C.acutangulus Lamk. Encycl. Meth.  
Bot. 2:104. 1786; FBI. 1:398. 1874; Gamb. 86.

Much branched, diffuse herbs; leaves ovate to lanceolate, crenate-serrate, basally 3-5 nerved; stipules lanceolate; flowers yellow, 1-3 in the axils; peduncles short; fruits 2-3 cm long; linear, 6-angled and 3-winged.

Common weed on roadsides and railway embankments.

Flowers: July - Dec.

Sivarajan 471, 502.

C.capsularis Linn. Sp. Pl. 529. 1753; FBI. 1:397.  
1874; Mahes. 89; Sant. 26. 1967; Gamb. 87.

Erect, woody herbs; leaves ovate-lanceolate, acuminate, serrate, basally 3-5 ribbed; stipules

lanceolate; flowers yellow in leaf-opposed, short-peduncled clusters; capsules depressed-globose, prominently echinate, 2-2.5 cm across.

Annual weeds in wet places on roadsides.

Flowers: July - Oct.

Sivarajan 459.

ELAEOCARPACEAE DC.

Muntingia Linn.

M. calabura Linn. Sp. Pl. 509. 1753; Hutch. Gen. Fl.

Pl. 2:485. 1967.

Small trees; leaves distichous, elliptic to lanceolate, acute or acuminate, oblique at base, serrate, viscid pubescent on both surfaces; flowers white, axillary, solitary; calyx pubescent; petals obovate; stamens many; stigma sessile; berries subglobose, 1 cm across; seed many.

A species growing very quick, sometimes grown in gardens. The edible berries attract birds.

Flowers: throughout the year.

Sivarajan 900.

LINACEAE Gray

Hugonia Linn.

H. mystax Linn. Sp. Pl. 675. 1753; FBI. 1:413. 1874;  
Gamb. 90.

Hook-climbers with divericate branchlets;  
leaves obovate or elliptic-obtuse; flowers yellow,  
pentamerous; stamens 10, filaments connate at base;  
styles 5, distinct; fruits drupaceous, subglobose.

Flowers: Mar. - May

Sivarajan 190.

MALPIGHIACEAE Juss.

Key to the genera

1. Leaves entire ..... Hiptage  
1. Leaves spinous-toothed ..... Malpighia

Hiptage Gaertn.

H. benghalensis (Linn.) Kurz in J. As. Soc. Beng.

43:136. 1874; Jacobs in Fl. Males. 5(2):132. 1955.

Banisteria benghalensis Linn. Sp. Pl. 437. 1753.

H. madablota Gaertn. Fruct. 2:169, t. 116. 1791;

FBI. 1:418. 1874; Gamb. 91.

Large, woody, climbing shrubs; leaves elliptic-oblong, acuminate; flowers white in axillary or terminal racemes; calyx lobes oblong-obtuse; petals orbicular, fringed on the margins, silky tomentose outside, unequal; stamens 10, one much larger than the others; samaras 2-3 winged; seeds subglobose, solitary.

Collected from the banks of Feroke River.

Flowers: Nov. - Jan.

Sivarajan 865.

Malpighia Plumier ex Linn.

M. coccigera Linn. Sp. Pl. 426. 1753; Jacobs in Fl.

Males. 5(2):144. 1955; Bailey 614.

Woody shrubs; leaves ovate or obovate, spinous-toothed; flowers small, white, solitary or in axillary cymes; petals unequal, small, clawed and fimbriate.

Flowers: May - June

Sivarajan 1727.

OXALIDACEAE R. Br.

Key to the genera

- 1. Herbs:
  - ✓ 2. Leaves trifoliolate ..... Oxalis
  - ✓ 2. Leaves many-foliolate<sup>2</sup> ..... Biophytum
- 1. Small trees ..... Averrhoa

Oxalis Linn.

O. corniculata Linn. Sp. Pl. 435. 1753; FBI. 1:436.

1874; Calder in Rec. Bot. Sur. Ind. 6(8):331. 1919;

Kunth in Pfreich. 95:146. 1930; Symon in Trans.

Roy.Soc. S. Austr. 84:74. 1961; Gamb. 94.

Creeping, pubescent herbs; leaflets 3, at the tip of a long petiole; flowers yellow on slender, pubescent peduncles, bisexual; stamens usually 10, filaments sometimes connate at base; styles 5, distinct; capsules 2-2.5 cm long, 5-angled, villous; seeds bed-bug shaped.

A very common weed in gardens and in other moist, shady places.

Flowers: Oct. - May

Sivarajan 72, 623.



Biophytum DC.

B.reinwardtii Klotzsch. in Peters. Reise Mossamb.

Bot. 85. 1861; FBI. 1:437. 1874; Barnes in J. Ind.  
bot. Soc. 18:97. 1939; Gamb. 95.

Erect herbs, up to 15 cm tall; leaflets 8-10  
pairs; peduncles many; flowers yellow, umbelled;  
corolla salver-shaped; stamens 10, free, the inner  
longer; styles 5, distinct; capsules subglobose,  
glandular hairy with tubercular seeds.

A common weed on roadsides and in moist  
shady places.

Flowers: July - Dec.

Sivarajan 618.

Averrhoa Linn.

Key to the species

1. Leaflets 25-39 ..... bilimbi  
1. Leaflets 7-11 ..... carambola

A.bilimbi Linn. Sp. Pl. 428. 1753; DC. Prod. 1:689.  
1824; FBI. 1:439. 1874; Cooke 1:179.

Small, cauliflorous trees; leaves impari-pinnate; leaflets elliptic-lanceolate, base oblique or not, pubescent on both surfaces; flowers purple, peduncles pubescent; petals oblong; stamens shortly connate at base; styles distinct; fruits oblong, obtusely angled, 3-8 cm long.

Flowers: ~~May~~<sup>x</sup> - May

Sivarajan 1116, 1592.

A. carambola Linn. Sp. Pl. 428. 1753; FBI. 1:439.

1874; Mahes. 92.

Small trees; leaflets few, ovate or elliptic acuminate; flowers in axillary, glabrous panicles; petals obovate; the 5 shorter stamens non-antheriferous; fruit oblong, acutely angled.

Flowers: Mar. - May

Sivarajan 1097.

BALSAMINACEAE A.Rich.

Impatiens Linn.

Key to the species

1. Capsules linear ..... lucida
1. Capsules ovoid:
  2. Leaves broadly ovate or elliptic .. flaccida
  2. Leaves lanceolate ..... balsamina

I. lucida Heyne [ in Wall. Cat. 4738. 1831, nom. nud. ]  
ex Hook. f. in Fl. Brit. Ind. 1:451. 1874 & in  
Rec. Bot. Sur. Ind. 4:47. 1906; Barnes in J. Ind.  
bot. Soc. 18:101. 1939.

Small, erect, glabrous herbs; stem translu-  
scent; leaves opposite, ovate or elliptic, serrate,  
sparsely hairy or glabrescent, up to 4 x 2 cm,  
lamina with 1-2 pairs of glands above its base;  
flowers 1-3, fascicled in the axils, white or blue;  
pedicels up to 1 cm; spur slender, curved, almost  
as long as the pedicel; capsules linear, 1-1.5 cm  
long; seeds globose, black and smooth.

A monsoon herb common in the shady places on the slopes and in the immediate plains.

Flowers: Aug. - Oct.

Sivarajan 1257, 1259.

I. flaccida Arn. in Hook. Comp. Bot. Mag. 1:322.

1835; FBI. 1:457. 1874; Hook. f. in Rec. Bot. Sur. Ind. 4:52. 1906; Gamb. 101.

Erect annuals; leaves ovate or broadly elliptic-acuminate, crenate, glabrous, up to 10 x 5 cm; petioles 3-5 cm long with 2-3 pairs of glands; flowers blue, 1-3 in the axils; spur curved, as long as the pedicel; capsules ovoid, glabrous; seeds ovoid, minutely papillose.

Common in moist shady localities on the slopes during the rainy season.

Flowers: Aug. - Nov.

Sivarajan 482.

PLATE 2

Impatiens balsamina Linn. growing in  
exposed, rocky, lateritic slopes.





I. balsamina Linn. Sp. Pl. 938. 1753; FBI. 1:453.

1874; Hook. f. in Rec. Bot. Sur. Ind. 4:7. 1904

& 4:47. 1906; Gamb. 101.

Much branched, annual herbs; leaves alternate, narrowly lanceolate, serrate, glabrous; petiole short with 1-2 pairs of glands; flowers pink, 2-3 in the axils; spur long, curved; pedicels tomentose; fruits ovoid, densely adpressed pilose; seeds globose, brownish, minutely hirtillous. (Plate 2).

A very common weed in the rocky laterite areas in the University campus, during rainy season.

Flowers: Sept. - Dec.

Sivarajan 616.

RUTACEAE Juss.

Key to the genera

1. Plants armed:

2. Spines only at nodes:

3. Leaves simple ..... Citrus

3. Leaves pinnate:



- 4. Rachis broadly winged ..... Hesperethusa
- 4. Rachis not winged ..... Aegle
- 2. Spines scattered all over:
  - 5. Panicles terminal ..... Fagara
  - 5. Panicles axillary ..... Toddalia
- 1. Plants unarmed:
  - 6. Ovules 1-2 in each cell:
    - 7. Style persistent ..... Glycosmis
    - 7. Style deciduous ..... Murraya
  - 6. Ovules more than 2 in each cell... Ruta

Citrus Linn.

Key to the species

- 1. Rind of the fruit smooth ..... limon
- 1. Rind of the fruit with echinate  
warts ..... medica

C.limon (Linn.) Burm. f. Fl. Ind. 173. 1768; Lushington  
in Ind. For. 28:347. 1910; "limonum"; Bailey 609;  
Mahes. 95. C.medica Linn. var. limonum Linn. Sp. Pl.  
2:782. 1753; FBI. 1:515. 1875.

Shrubs or small trees; leaves unifoliolate;  
elliptic-oblong, obtuse, crenate; petiole narrowly

winged; flowers white in axillary cymes; stamens many; fruits subglobose, or ovoid.

Flowers: Apr. - May

Sivarajan 1112.

C. medica Linn. Sp.Pl. 782. 1753; FBI. 1:515. 1875; Lushington in Ind. For. 28:352. 1910; Tanaka in J. Bot. 68:234. 1930 & J. Ind. bot. Soc. 16:238. 1937; Sant. 32. 1960; Gamb. 115.

Shrubs or small trees; leaves unifoliolate, broadly oblong-obtuse, finely serrate; petioles not winged; fruits ovoid-oblong, conspicuously warted.

Often cultivated. Fruits used to prepare pickles and medicines.

Flowers: Apr. - May

Sivarajan 156, 1460.

Hesperethusa M.Roem.

H. crenulata (Roxb.) Roem. Syn. Hesper. 31:38. 1846; Tanaka in J. Bot. 68:230. 1930 & in J. Ind. bot. Soc. 16:232. 1937. Limonia crenulata Roxb. Pl. Corom. 1:60. t. 86. 1798; Gamb. 112.

Shrubs or small trees; leaves 3-5-foliolate; leaflets sessile; petiole broadly winged; flowers small, umbellate, clustered on axillary peduncles.

Flowers: Mar. - Apr.

Sivarajan 1108.

Aegle Correa (nom.cons.)

A.marmelos Correa in Trans. Linn. Soc. 5:223. 1800;  
FBI. 1:516. 1875; Gamb. 115.

Small, spinous trees; leaves 3-foliolate; leaflets lanceolate or elliptic-lanceolate, the terminal leaflet long-petioluled, lateral subsessile; flowers greenish white in axillary panicles; fruit large, rind woody; seeds embedded in a pulp.

This species is seen often cultivated, for the medicinal fruits.

Flowers: Apr. - May

Sivarajan 1829.

Fagara Linn. (nom.cons.)

Note: The generic limits of Zanthoxylum has been controversial. The separation of Fagara

from Zanthoxylum, as a distinct genus (Engl. in Pfam. 3(4):115-119. 1896) was based on the differences in views as to the morphological nature of the perianth of Zanthoxylum. Engler and his supporters thought that Zanthoxylum has apetalous flowers, whereas the flowers of Fagara have both petals and sepals, and hence they cannot be kept under the same generic name.

Brizicky (J. Arn. Arb. 43:82-83. 1962) is of the view that the "simple" perianth of Zanthoxylum is most likely a secondary condition derived by reduction from that of "Fagara type", by abortion of some or all the sepals". The occurrence of species of Zanthoxylum which are transitional in their perianth structure, not only supported this view, but also provided ample reason to regard Fagara as a subgenus of Zanthoxylum". Hartley (47:171-221. 1966) has also followed this view. However since the name Fagara Linn. is conserved over Zanthoxylum Linn., the author retains the species under Fagara.

F.rhetsa Roxb. Fl. Ind. 1:438. 1820. Tipalia limonella Dennst. Schulss. Hort. Malab. 31. 1818, nom. nud.  
Fagara budrunga Roxb. Fl. Ind. 1:437. 1820; Sant. 32. 1967. Zanthoxylum rhetsa (Roxb.) DC. Prod. 1:728.

1824; FBI. 1:495. 1875; Gamb. 107; Hartley in J.  
Arn. Arb. 51:425. 1970. Z.budrunga (Roxb.) DC.  
Prod. 1:728. 1824.

Trees with large, conical spines all over the  
trunk and branches; leaves crowded towards the tips of  
branches; leaflets 5-7 pairs, inequilateral; flowers  
small, greenish in dense, terminal panicles; fruits  
small, subglobose.

Flowers: Mar. - Apr.

Sivarajan 1166, 1168.

Toddalia Juss. (nom.cons.)

T.asiatica (Linn.) Lamk. Ill. 2:116. 1793; Gamb. 107;  
Sant. 32. 1967. Paullinia asiatica Linn. Sp. Pl.  
365. 1753. Toddalia aculeata Pers. Syn.1:249. 1805;  
FBI. 1:497. 1875.

Straggling, spinous shrubs; leaves trifoliolate;  
leaflets elliptic-obtuse, finely serrate or entire;  
petioles spinous; flowers small, white in axillary panicles.

Flowers: Nov. - Dec.

Sivarajan 696.

Glycosmis Correa

G.pentaphylla (Retz.) DC. Prod. 1:538. 1824, quoad  
basionym; Tanaka in J. Ind. bot. Soc. 16:229. 1937;  
Mitra & Subr. in J. Arn. Arb. 50:155. 1969.  
Limonia pentaphylla Retz. Obs. 5:24. 1789.  
L.arborea Roxb. Pl. Corom. 1:60. t. 85. 1798.  
Glycosmis arborea (Roxb.) DC. Prod. 1:538. 1824;  
Narayans in Rec. Bot. Sur. Ind. 14(2):20. 1941;  
Brizicky in J. Arn. Arb. 43:90. 1962. G.cochin-  
chinensis sensu Gamb. Fl. Pres. Madr. 153. 1915.

Unarmed shrubs; leaves 3-5-foliolate; leaflets  
ovate or elliptic, obtuse or subacute; flowers white,  
sessile in axillary, panicles; berries white,  
subglobose, pulpy.

Very common along the road sides and in waste  
places.

Flowers: Dec. - Mar.

Sivarajan 859.

Murraya Koenig ex Linn. (nom.cons.)

Key to the species

1. Leaflets 5-7 ..... paniculata  
1. Leaflets 11-15 ..... koenigii

M. paniculata (Linn.) Jack. in Malay. Misc. 1:31.  
1830; Tanaka in J. Ind. bot. Soc. 16:231. 1937;  
Mahes. 97; Sant. 33. 1967. Chalcas paniculata Linn.  
Mant. 1:68. 1767. Murraya exotica Linn. Mant.  
2:563. 1771; FBI. 1:502. 1875; Gamb. 111.

Small trees; leaflets glabrous, entire,  
ovate or elliptic, obtuse, up to 6 x 3 cm; flowers  
large, white in axillary, corymbose cymes; berries  
ovoid-oblong, 2-seeded.

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Flowers: June - Sept.

Sivarajan 1741.

M. koenigii (Linn.) Spreng. Syst. 2:315. 1826; FBI.  
1:503. 1875; Tanaka in J. Ind. bot. Soc. 16:231.  
1937; Mahes. 97; Sant. 33. 1967; Gamb. 111.  
Bergera koenigii Linn. Mant. 1:565. 1767.

Small trees; branchlets and leaves tomentose;  
leaflets distinctly unequal-sided, elliptic, acute  
or acuminate, finely serrate; flowers small, white  
in dense, terminal, corymbose panicles.

Usually cultivated for the aromatic leaves.

Flowers: Apr. - May

Sivarajan 232.

Ruta Linn.

R. graveolens Linn. Sp. Pl. 383. 1753; FBI. 1:485.

1875; Woodr. in J. Bombay nat. Hist. Soc. 11:267.

1897; Cooke 1:187; Brizicky in J. Arn. Arb.

43:5-6. 1962.

Erect, pungent smelling herbs; leaves  
decompound; leaflets small, rounded or obtuse;  
flowers small, yellowish in terminal corymbs;  
fruits capsular.

Flowers: Nov. - Dec.

Sivarajan 1828.

SIMAROUBACEAE DC.

Key to the genera

1. Leaves imparipinnate ..... Ailanthus  
1. Leaves simple ..... Quassia



Ailanthus Desf. (nom.cons.)

A.triphysa (Dennst.) Alston in Trim. Handb. Fl. Ceyl.  
6:41. 1931; Sant. 35. 1967. Adenanthera triphysa  
Dennst. Schluess. Hort. Malab. 32. 1818. Ailanthus  
malabarica DC. Prod. 2:89. 1825; FBI. 1:518. 1875;  
Sant. 32. 1960; Gamb. 116.

Trees; leaves 13-19-foliolate; leaflets  
lanceolate, acute or acuminate, entire, unequal-sided,  
glabrous; flowers polygamous, small in lax, axillary  
panicles; pedicels short; calyx minute, 5-toothed;  
petals oblong; disk 10-lobed; fruits of 1-5, oblong,  
1-seeded samaras with large, oblong-obtuse wings.

Flowers: Dec. - Jan.

Sivarajan 837, 941.

Quassia Linn.

Q.indica (Gaertn.) Nootboom in Blumea 11(2):517.  
1962. Samadera indica Gaertn. Fruct. 2:352, t.  
156, f. 3. 1791; FBI. 1:519. 1875; Gamb. 117.

Trees; leaves simple, elliptic-oblong,  
shining, coriaceous, about 25 x 8 cm; flowers large,

greenish yellow, <sup>m</sup>un~~l~~belled on a long, pendulous peduncle; fruits of 1-5, distinct, compressed, and narrowly winged drupes.

Flowers: Nov. - Jan.

Sivarajan 832.

Note: This plant is treated under the genus Samadera Gaertn. in most of the Indian Floras. Recently, Nooteboom (loc.cit.), after a careful synthesis of the different genera of Simaroubaceae, has agreed with Pierre (Bull. mens. Soc. Linn. Paris, n. 156. 1896) in considering Samadera as a section under Quassia.

OCHNACEAE DC.

Gomphia Schreb.

G.serrata (Gaertn.) Kanis in Taxon 16:422. 1967 & in Blumea 16:53. 1968. Meesia serrata Gaertn. Fruct. 1:344, t. 70, f. 6. 1788. Gomphia angustifolia Vahl, Symb. Bot. 2:49. 1791; FBI. 1:525. 1875. Quratea angustifolia (Vahl.) Baill. ex Laness. Fl. Util. Col. Fr. 607. 1886; Gilg. in Pfam. (ed.2) 21:74. 1925; Gamb. 119. O.serrata (Gaertn.) Robson in Taxon 11:51. 1962.

Woody shrubs or small trees; leaves oblong-acute, finely serrate, glabrous and shiny, lateral veins many, close, united in an intramarginal vein; stipules 2, lanceolate, incised; flowers yellow in axillary racemes or panicles; sepals 5, persistent; petals elliptic; stamens 10, anthers dehiscent by apical pores; ovary deeply 5-lobed; style basal; fruits of 4-5, 1-seeded drupes.

Flowers: Sept. - Dec.

Sivarajan 721.

Note: Previously the generic names Gomphia Schreb. and Ouratea Aubl. were considered synonymous, and the latter was used for both the Old World and the New World species, though their distinction was recognised at the subgeneric level. Recently Farron (Bull. Soc. Bot. Suisse, 73:196-217. 1963) after studying the African specimens has reserved the name Ouratea Aubl., exclusively for the American plants. Consequently Kanis (loc.cit.) 1967) has proposed the **resurrection** of the name Gomphia Schreb. for the majority of the Old World species.

Gomphia Schreb. differs from the American

Ouratea Aubl. in its curved ovule, the connate, incised stipules, and the persistent sepals. The name Ouratea Aubl. is conserved, but only in a restricted sense.

BURSERACEAE Kunth

Commiphora Jacq. (nom.cons.)

C.caudata (Wt. & Arn.) Engl. in DC. Mon. Phan.

4:27. 1883; Gamb. 122. Protium caudatum Wt. & Arn. Prod. 176. 1834; FBI. 1:530. 1875. Balsamodendrum caudatum (Wt. & Arn.) March. in Adansonia 7:266. 1866-67. Balsamea caudata (Wt. & Arn.) Engl. in Bot. Jahrb. 1:42. 1881.

Deciduous trees or shrubs; leaves alternate, 3-foliolate; leaflets elliptic-acuminate, glabrous, 4 x 3 cm; flowers polygamous in short panicles, tetramerous; pedicels short; stamens 8, dimorphic; ovary 2-4 celled, style short.

Flowers: Dec. - Jan.

Sivarajan 924.

MELIACEAE Juss.

Key to the genera

1. Flowers polygamo-dioecious ..... Aphanamixis
1. Flowers bisexual:
  2. Leaves trifoliolate ..... Naregamia
  2. Leaves with more than three  
leaflets:
    3. Fruits ribbed ..... Cipadessa
    3. Fruits not ribbed ..... Azadirachta

Aphanamixis Blume

A. polystachya (Wall.) Parker in Ind. For. 57:486.  
1931; Sant. 37. 1967. Aglaia polystachya Wall.  
in Roxb. Fl. Ind. 2:429. 1824. Andersonia  
rohituka (Roxb.) Fl. Ind. 2:213. 1832. Amoora  
rohituka (Roxb.) Wt. & Arn. Prod. 119. 1834;  
FBI. 1:559. 1875; Sant. 34. 1960; Gamb. 130.

Trees; leaves 7-17-foliolate; leaflets broadly  
elliptic or ovate-acuminate, oblique at base, up to  
20 x 10 cm; flowers polygamo-dioecious, female flowers  
in solitary spikes; fruits globose.

Found along the coast; only female specimens have been collected.

Flowers: Apr. - May

Sivarajan 1164.

Naregamia Wt. & Arn. (nom. cons.)

N. alata Wt. & Arn. Prod. 117. 1834; FBI. 1:542. 1875;

Gamb. 125.

Small, woody herbs; leaves trifoliolate; petiole winged; leaflets elliptic or ovate-obtuse; flowers white, solitary or in pairs in the axils; calyx shortly 5-toothed; petals 5, oblanceolate-spathulate; staminal column club-shaped, anthers 10; capsules ovoid, trigonous, 3-valved, valves separating from a central axis.

Flowers: Apr. - May

Sivarajan 215.

Cipadessa Blume

C. baccifera (Roth) Miq. in Ann. Mus. Ludy.-Bat. 4:6.

1868-69; Sant. 33. 1960; Gamb. 126. Melia baccifera

Roth, Nov. Pl. Sp. 215. 1821. C. fruticosa Blume

Bijdr. 162. 1825; FBI. 1:545. 1875.

Shrubs; leaves 11-13-foliolate; leaflets ovate or elliptic, acuminate; flowers greenish in axillary, corymbose panicles; calyx lobes and petals 5; staminal filaments connate below, forked at the tips; anthers sessile in between the teeth; fruit indehiscent, 5-ribbed, depressed globose, 6-8 mm across.

Flowers: Jan. - May

Sivarajan 116.

Azadirachta Juss.

A.indica A. Juss. in Mem. Mus. Par. 19:221. 1830; Mahes. 99. 1963; Chavan & Oza, Fl. Pavagadh, 59. 1966; Gamb. 127. Melia azadirachta Linn. Sp. Pl. 385. 1753; FBI. 1:544. 1875.

Trees; leaves pinnate, 7-13-foliolate; leaflets falcate, acuminate, serrate; flowers greenish in axillary panicles; calyx lobes short; petals oblong, spreading; staminal tube cylindrical, 8-10 lobed, lobes slightly toothed at the tip; drupes

ellipsoid, fleshy, yellow when mature.

Flowers: Dec. - Feb.

Sivarajan 836, 880.

OPILIACEAE Valetton

Cansjera Juss. (nom.cons.)

C.rheedii Gmel. Syst. 2:280. 1791; Wt. Ic. 1861.  
1852; FBI. 1:582. 1875; Sant. 39. 1967; Gamb.  
138.

Climbing shrubs; branches divaricate,  
pubescent; leaves ovate to oblong-lanceolate,  
glabrous; flowers small in axillary, pubescent,  
solitary or fascicled spikes; perianth urceolate,  
4-toothed, stamens as many as the perianth lobes;  
fruits orange-red, ovoid, glabrous with a single  
seed.

On hedges and in undisturbed wood lands.

Flowers: Dec. - Mar.

Sivarajan 889, 1560.



ICACINACEAE Miers.

Key to the species

- 1. Flowers in panicles ..... nothapodytes
- 1. Flowers in pendulous spikes ..... sarcostigma

Nathapodytes Blume

N.foetida (Wt.) Sleum. Notizbl. Berol.-Dahl. 15:247.  
1940; Howard in J. Arn. Arb. 23:70. 1942; Sant. 40.  
1967; Sleum. in Blumea 17(1):232-33. 1969.  
Stemonurus foetidus Wt. Ic. 3, t. 955. 1845.  
Mappia foetida (Wt.) Miers. in Ann. Mag. Nat.  
Hist. 2(9):395. 1852; FBI. 1:589. 1875; Gamb. 141.  
Mappia ovata Miers. in Ann. Mag. Nat. Hist.  
2(9):396. 1852; Gamb. 141.

Shrubs; leaves alternate, ovate or elliptic,  
acute or acuminate, glabrous or puberulous beneath,  
up to 16.5 x 7.5 cm; flowers greenish white, bisexual  
in terminal corymbose cymes, pentamerous; petals  
villous within; ovary 1-celled, 2-ovuled; drupes more  
or less flattened, 1-seeded.

Flowers: June - Sept.

Sivarajan 1161, 1292, 1374.

Note: This species, in almost all the Indian Floras is listed under the generic name Mappia Jacq. Sleumer (loc.cit. 1940) has shown that the plants hitherto known as Mappia from the Old World, are not actually Mappia, but a distinct genus, Nothapodytes, and has retained the name Mappia Jacq. for plants of American origin.

Sarcostigma Wt. & Arn.

S.kleinii Wt. & Arn. in Eding. New Phil. J. 14:299. 1833; FBI. 1:594. 1875; Gamb. 142; Sleum. in Blumea 17(1):254. 1969.

Huge climbing shrubs; leaves oblong-lanceolate, leathery, prominently reticulate, up to 25.6 x 9.8 cm; flowers unisexual, fascicled on long pendulous spikes from the old wood, 4-6-merous; ovary in female flowers 1-celled; ovules 2, pendulous; drupes oblong, sub-compressed.

Flowers: Jan. - Feb.

Sivarajan 1600.

HIPPOCRATEACEAE Juss.

Key to the genera

- 1. Petals shortly clawed ..... Loesneriella
- 1. Petals not clawed ..... Salacia

Loesneriella A.C.Smith

L.arnottiana (Wt.) A.C.Smith in J. Arn. Arb. 26:174.

1945. Hippocratea arnottiana Wt. Ill. Ind. Bot.

1:133, Pl. 46, 47A. 1839; FBI. 1:624. 1875; Gamb.

153.

Woody climbers; leaves opposite, ovate-oblong or elliptic; flowers green in axillary or terminal panicles, calyx 5-lobed, small; petals 5, obovate-obtuse, concave; disc cup-shaped; stamens 3, inserted within the disc; ovary sunk in the disc; style short; fruits samaras, oblanceolate-obtuse.

Flowers: Dec. - Jan.

Sivarajan 33, 922.

Note: In the Indian Floras, this plant is listed under the genus Hippocratea. Hippocratea Linn. (sensu lato) originally included all the species of Hippocrateaceae. A.C.Smith (Brittonia 3:391-396. 1940)

restricted this generic name to the type species,  
which is exclusively tropical American and transferred  
all the Old World species to the genus Loesneriella  
A.C.Smith.

Salacia Linn.

S.fruticosa Heyne [in Wall. Cat. 4223. 1831, nom.nud.]  
ex Lawson in Hook. f. Fl. Brit. Ind. 1:628. 1875;  
Gamb. 155.

Woody climbers; leaves elliptic or ovate,  
caudate-acuminate, glabrous; flowers green in forked,  
axillary cymes; calyx lobes minutely ciliate; petals  
orbicular, spreading, not concave; disc almost flat,  
dipressed above; stamens 3, inserted within the disc;  
ovary sunken; berries 1-3 celled, leathery.

Flowers: Jan. - May

Sivarajan 182, 969.

RHAMNACEAE Juss.

Ziziphus Adans.

Key to the species

1. Trees ..... mauritiana

1. Straggling shrubs:

2. Flowers in axillary fascicles ..... oenoplia

2. Flowers in terminal panicles ..... rugosa

Z.mauritiana Lamk. Encycl. Meth. Bot. 3:319. 1789;

Sant. in J. Bombay nat. Hist. Soc. 51:802. 1953 &

Fl. Khand. 39. 1960; Fosberg in Phytologia (15(7):

502. 1968. Z.jujuba Lamk. Encycl. Meth. Bot. 3:318.

1789 (non Miller, 1768); FBI. 1:632. 1875; Gamb. 157.

Trees with curved prickles; branches white-tomentose; leaves ovate or elliptic-obtuse, 3-nerved from base, densely silky villous beneath; flowers in axillary fascicles; calyx pubescent outside; petals minute, cucullate; stamens 5, opposite to and deflexed with the petals; styles 2; drupes subglobose.

Flowers: Mar. - May

Sivarajan 167, 227.

Z.oenoplia Mill. Gard. Dict. (ed.8) no. 3. 1768; FBI.

1:634. 1875; Sant. 40. 1960; Gamb. 158.

Rambling shrubs with rusty-tomentose, spinous branches; leaves ovate-lanceolate, oblique at base, basally 3-5-veined, rusty tomentose on both surfaces;

flowers greenish; calyx hairy; petals small, obovate; styles 2; drupes purple.

Flowers: Oct. - Nov.

Sivarajan 532.

Z. rugosa Lamk. Encycl. Meth. Bot. 3:319. 1789; FBI.

1:636. 1875; Sant. 40. 1960; Gamb. 158.

Rambling, armed shrubs; leaves broadly ovate or elliptic, obtuse, crenate-serrate, 3-5-veined, glabrous above, tomentose beneath; panicles densely grey-tomentose; flowers 4 mm across; petals 0; styles 2.

Flowers: Feb. - Mar.

Sivarajan 165, 988.

VITACEAE Juss.

Key to the genera

- 1. Leaves simple ..... Cissus
- 1. Leaves not simple:
  - 2. Tendrils on the peduncle ..... Ampelocissus
  - 2. Tendrils not as above:
    - 3. Flowers polygamous ..... Tetrastigma
    - 3. Flowers hermaphrodite ..... Cayratia

Cissus Linn.

Key to the species

1. Pedicels deflexed in fruit ..... repens  
1. Pedicels erect in fruit ..... glauca

C.repens Lamk. Encycl. Meth. Bot. 31. 1783; Gamb.

167. Vitis repens (Lamk.) Wt. & Arn. Prod. 125.  
1834; FBI. 1:646. 1875.

Tendrils climbers; stem glaucous; leaves alternate, ovate-lanceolate, acuminate, cordate at base, serrate, basally 5-nerved, up to 12 x 7 cm; cymes leaf-opposed; flowers in umbels, greenish white, small, tetramerous; calyx campanulate, truncate; pedicels deflexed in fruits.

Flowers: July - Sept.

Sivarajan 1385.

C.glauca Roxb. [Hort. Beng. 11. 1814, nom. nud.]

Fl. Ind. 1:425. 1820; Gamb. 168. Vitis glauca  
(Roxb.) Wt. & Arn. Prod. 126. 1834; FBI.1:647.  
1875. C.repens sensu Planch. in DC. Mon. Phan.  
5:504. 1887.

Tendrils climbers; tendrils usually forked; stem glaucous; leaves orbicular, acuminate, deeply cordate at base, serrate; flowers green in leaf-opposed cymes, tetramerous; pedicels erect in fruit.

Flowers: Sept. - Nov.

Sivarajan 724.

Ampelocissus Planch.

Key to the species

- 1. Flowers in cylindric spikes ..... arnottiana
- 1. Flowers in paniculate spikes ..... latifolia

A.arnottiana Planch. in DC. Mon. Phan. 5:379. 1887; Gamb. 165; Vitis indica Wt. & Arn. Prod. 1:131. 1834, ~~nom~~ Linn.; FBI. 1:653. 1875. Ampelocissus indica (Wt. & Arn.) Planch. in J. La Vigne. Amer. Dec. 375. 1884.

Tendrils climbers, covered with yellowish tawny wool; leaves simple, ovate-cordate, acuminate, sharply serrate, wooly on both surfaces; peduncles



tendrill-bearing; spikes cylindrical; flowers  
fascicled, 5-merous.

Flowers: Mar. - May

Sivarajan 189.

A. latifolia (Roxb.) Planch. in J. <sup>La</sup> Vigne. Amer.

Dec. 374. 1884 & in DC. Mon. Phan 5:370. 1887;  
Sant. 41. 1960; Gamb. 165. Vitis latifolia Roxb.  
[Hort. Beng. 18. 1814, nom. nud.] Fl. Ind.  
1:661. 1820; FBI. 1:652. 1875.

Climbing shrubs; stem glaucous; leaves  
entire or digitately lobed, serrate, glabrous;  
peduncles leaf-opposed, tendrill-bearing; tendrills  
forked; panicles dense; flowers pentamerous.

Flowers: Mar. - May

Sivarajan 160, 1028.

Tetrastigma Planch.

T. muricatum (Wt. & Arn.) Gamb. Fl. Pres. Madr.  
2:229. 1918. Vitis muricata Wt. & Arn. Prod.  
1:660. 1834.

Tendrill climbers; leaves 1-5-foliolate;

leaflets elliptic-oblong, acute or acuminate, sharply serrate, glabrous, the laterals unequal sided; flowers in short, axillary cymes; white, tetramerous; fruits ovoid or subglobose, 1 cm across.

Flowers: Jan. - Mar.

Sivarajan 940

Cayratia Juss. (nom.cons.)

Key to the species

- 1. Plants glabrous ..... trifolia
- 1. Plants fulvous tomentose ..... pedata

C.trifolia (Linn.) Domin in Biblioth. Bot. 89:370.  
1927. Vitis trifolia Linn. Sp. Pl. 203. 1753.  
Cissus carnosa Lamk. Encycl. Meth. Bot. 1:31.  
1783; Vahl, Symb. 3:19. 1794; Planch. in DC.  
Mon. Phan. 5:570-71. 1887. Vitis carnosa (Lamk.)  
Wall. ex Wt. & Arn. Prod. 127. 1834; FBI. 1:654.  
1875. Cayratia carnosa (Lamk.) Gagnep. in Nat.  
Syst. 1:347. 1911; Mahes. 102; Gamb. 169.

Tendrils climbers; leaves trifoliolate, long-petioled; leaflets ovate or elliptic, serrate,

glabrous, laterals unequal sided and smaller, up to 10 x 5 cm; flowers green in corymbose panicles, tetramerous.

Flowers: July - Sept.

Sivarajan 1459.

C. pedata (Lamk.) Gagnep. in Lecomte Not. Syst. 1:346. 1911; Gamb. 169. Cissus pedata Lamk. Encycl. Meth. Bot. 1:31. n. 1628. 1783; Willd. Sp. Pl. 1:658. 1798; DC. Prod. 1:632. 1824; Planch. in DC. Mon. Phan. 5:559. 1887. Vitis pedata (Lamk.) Wall. ex Wt. & Arn. Prod. 1:128. 1834; FBI. 1:661. 1875.

Tomentose climbers; tendrils usually forked; leaves 5-7-foliolate; petiole long, tomentose; leaflets ovate or elliptic, acuminate, crenate, laterals unequal sided; flowers greenish white in corymbose panicles; tetramerous; berries ovoid, 8 mm across.

Flowers: July - Sept.

Sivarajan 1305.

LEEACEAE Dumort.

Leea Royen ex Linn.(nom.cons.)

Key to the species

1. Leaves hirsute ..... robusta  
1. Leaves glabrous ..... indica

L.robusta Roxb. [Hort. Beng. 18. 1814, nom. nud.]

Fl. Ind. 1:655. 1832; Sant. 43. 1960; Gamb. 171.

L.diffusa Lawson in Hook. f. Fl. Brit. Ind. 1:662.  
1875.

Woody shrubs; stem often hollow; leaves  
2-3-pinnate; leaflets elliptic-oblong, acuminate,  
serrate, pubescent on both surfaces; stipules  
sheathing; flowers greenish white in large terminal  
panicles; calyx 5-toothed; petals connate at base,  
lobes revolute; disc lobes truncate; stamen 5,  
inserted between the disc lobes; berries dipressed  
globose, black when ripe.

Flowers: June - Sept.

Sivarajan 477, 1375.

L.indica (Burm.f.) Merr. in Philip. J. Sci. Bot.

14:245. 1919. Staphylea indica Burm. f. Fl. Ind.  
75. t. 24, f. 2. 1768. Aquilicia sambucina Linn.  
Mant. 2:211. 1771. Leea sambucina (Linn.) Willd.  
Sp. Pl. 1:1177. 1797; FBI. 1:666. 1785, in part;  
Gamb. 172.

Large shrubs; stem often hollow; leaves 2-3-  
pinnate; leaflets glabrous, oblong or elliptic-oblong,  
acuminate at apex, crenate; stipules fleshy, sheathing;  
flowers greenish white in corymbose cymes; disc lobes  
notched at the tip; berries purplish black, dipressed  
globose.

Flowers: Dec. - Apr.

Sivarajan 40, 66, 1032.

SAPINDACEAE Juss.

Key to the genera

1. Climbers ..... Cardiospermum
1. Trees or shrubs:
  2. Leaflets serrate ..... Allophylus
  2. Leaflets entire:
    3. Flowers in panicles ..... Sapindus
    3. Flowers in pendulous racemes .... Schleichera

Cardiospermum Linn.

C. halicacabum Linn. Sp. Pl. 366. 1753; FBI. 1:670.  
1875; Mahes. 103; Gamb. 175.

Tendrill-climbers; leaves bi-ternate;  
leaflets lobed or dentate; flowers white, polygamous,  
tetramerous; two of the petals with basal, scaly  
appendages; stamens 8, unequal; disc unilateral;  
ovary 3-celled; capsules inflated, trigonous,  
3-valved; valves reticulate.

Flowers: Jan. - Mar.

Sivarajan 52, 864.

Allophylus Linn.

A. serratus (Roxb.) Kurz in J. As. Soc. Beng. 44:185.  
1875, quoad basionym; Radlk. in Pfreich. 98:562.  
1932; Gamb. 175; Leenhouts in Blumea 15:351. 1967;  
Mukh. in Ind. For. 98:494. 1972. Ornitrophe  
serrata Roxb. Pl. Corom. 1:44, t. 61. 1796.

Shrubs; leaves trifoliolate; leaflets  
elliptic-acuminate, serrate and hairy on both surfaces;  
flowers white, small, irregular, polygamous,  
tetramerous in axillary racemes; petals with reflexed,

shaggy scales; disc unilateral; stamens usually 8;  
ovary 2-celled; fruits 2-lobed.

Flowers: Aug. - Nov.

Sivarajan 386, 1433.

Note: Radlkofer (loc.cit.) transferred Ornitrophe serrata Roxb. to the genus Allophylus and accredited the new combination to him. But this became superfluous since Kurz (loc.cit.) had already made the combination earlier, but applied to a different species, A.villosus. According to Art. 55 of the International Code, the combination A.serratus must be retained for O.serrata Roxb. to which the epithet "serrata" was originally attached.

Sapindus Linn.

S.laurifolius Vahl, Symb. 3:54. 1794; Sant. 45. 1960;  
Gamb. 178.

Trees; leaves with 2-3 pairs of leaflets;  
leaflets entire, elliptic to oblong, acuminate, up  
to 20 x 8.5 cm; flowers white, in terminal or axillary,  
tomentose panicles; petals wooly; drupes 3-lobed.

A common tree, sometimes cultivated for its fruits, which are used as substitute for soap.

Flowers: Oct. - Jan

Sivaraman 684.

Schleichera Willd. (nom. cons.)

S. oleosa (Lour.) Oken, Allg. Naturgesch. (3)2:1341.

1841; Sant. 44. 1960. Pistacia oleosa Lour. Fl.

Cochinch. 2:615. 1790. Schleichera trijuga Willd.

Sp. Pl. 4(2):1396. 1805; Fl. 1:681. 1875; Camb. 177.

Large trees; leaves usually 6-foliate;  
leaflets opposite, large, elliptic-oblong or oblan-  
ceolate, obtuse, shortly petioluled; flowers small,  
polygamo-dioecious, fascicled in slender, pendulous,  
interrupted racemes, apetalous; fruits indehiscent,  
ovoid.

Flowers: Mar. - Apr.

Sivaraman 155.



A common tree, sometimes cultivated for its fruits, which are used as substitute for soap.

Flowers: Oct. - Jan

Sivarajan 684.

Schleichera Willd.(nom.cons.)

S.oleosa (Lour.) Oken, Allg. Naturgesch. (3)2:1341.

1841; Sant. 44. 1960. Pistacia oleosa Lour. Fl.

Cochinch. 2:615. 1790. Schleichera trijuga Willd.

Sp. Pl. 4(2):1396. 1805; FBI. 1:681. 1875; Gamb. 177.

Large trees; leaves usually 6-foliolate; leaflets opposite, large, elliptic-oblong or oblanceolate, obtuse, shortly petioluled; flowers small, polygamo-dioecious, fascicled in slender, pendulous, interrupted racemes, apetalous; fruits indehiscent, ovoid.

Flowers: Mar. - Apr.

Sivarajan 155.

ANACARDIACEAE Lind.

Key to the genera

- 1. Leaves pinnate:
  - 2. Flowers white ..... Spondias
  - 2. Flowers green ..... Lanea
- 1. Leaves simple:
  - 3. Petioles with spur-like  
appendages ..... Holigarna
  - 3. Petioles without appendages:
    - 4. Fruit a nut ..... Anacardium
    - 4. Fruit drupaceous ..... Mangifera

Spondias Linn.

S.pinnata (Linn. f.) Kurz in Prel. Rep. For. & Veg. Pegu. App. A.44, App. B.42. 1875; Back. & Bakh. f. Fl. Java 2:151. 1965; Airy Shaw & Forman in Kew Bull. 22(1):8. 1967. Mangifera pinnata Linn. f. Suppl. Pl. 156. 1781. Spondias mangifera Willd. Sp. Pl. 2:751. 1799; FBI. 2:42. 1876; Gamb. 186.

Small, trees; leaves imparipinnate, clustered towards the tips of branches; leaflets 11-15, unequal sided; flowers small, white, polygamous in terminal clustered panicles; fruits drupaceous.

Deciduous trees, sometimes cultivated for the edible fruits.

Flowers: Mar. - Apr.

Sivarajan 1047.

Lannea A. Rich. (nom.cons.)

L.coromandelica (Houtt.) Merr. in J. Arn. Arb. 19:353. 1938; Sant. 47. 1960. Dialium coromandelicum Houtt. Nat. Hist. 2(2):39, t. 5, f. 2. 1774. Odina wodier Roxb. [Hort. Beng. 29. 1814, nom. nud.] Fl. Ind. 2:293. 1832; FBI. 2:29. 1876; Gamb. 187.

Small, deciduous trees; leaves imparipinnate; leaflets 7-9, ovate-acuminate; flowers green, polygamous in terminal or subterminal panicles; drupes small, oblong.

Flowers: Feb. - Apr.

Sivarajan 166, 1026, 1053.

Holigarna Buch.-Ham. ex Roxb.(nom.cons.)

H.arnottiana Hook. f. Fl. Brit. Ind. 2:36, 1876; Kurz in J. As. Soc. Beng. 45(2):208. 1876; Gamb. 191.

Trees with an acrid juice; leaves simple, obovate to oblanceolate-obtuse; petioles with 1-2 spurlike appendages; flowers green in terminal, tomentose panicles; drupes ovoid.

Flowers: Dec. - Mar.

Sivarajan 826, 972, 1611.

Anacardium Linn.

A. occidentale Linn. Sp. Pl. 583. 1753; FBI. 2:20. 1876;

Cooke, 1:274; Sant. 47. 1960; Gamb. 185.

Trees; leaves obovate-obtuse; flowers polygamous in terminal and sub-terminal compound panicles; nuts reniform on enlarged, juicy, edible thalamus.

Very commonly cultivated on the rocky hill slopes. The edible nuts are in high demand and are expensive. A kind of liquor is distilled from the juicy "cashew apples". The nut-shell oil also has many uses.

Flowers: Dec. - May

Sivarajan 1823.

Mangifera Linn.

M.indica Linn. Sp. Pl. 200. 1753; FBI. 2:13. 1876;  
Sant. 46. 1960; Gamb. 185.

Trees; leaves oblong, acute or acuminate;  
flowers polygamous in terminal panicles; fruits  
drupaceous.

Several wild and improved varieties are common  
under cultivation.

Flowers: Dec. - Feb.

Sivarajan 1824.

MORINGACEAE Dumort.

Moringa Adans.

M.oleifera Lamk. Encycl. Meth. Bot. 1:398. 1785; Gamb.  
192. M.pterygosperma Gaertn. Fruct. 2:314. 1791;  
FBI. 2:45. 1876.

Small trees; leaves usually 3-pinnate, leaflets  
elliptic to obovate, small; flowers white in terminal  
panicles; calyx lobes linear; petals spathulate; fertile  
stamens 5; staminodes 5-6; fruits linear-oblong, ribbed,  
35-50 cm long; seeds trigonous, winged on the angles.

Cultivated for its fruits popularly called "drum sticks". The leaves and fruits are used as vegetables.

Flowers: Jan. - Apr.

Sivarajan 1155.

CONNARACEAE R. Br.

Key to the genera

- 1. Follicle stalked ..... Connarus
- 1. Follicle sessile ..... Rourea

Connarus Linn.

C.monocarpus Linn. Sp. Pl. 675. 1753; FBI. 2:50. 1876;  
Leenhouts in Fl. Males. 5(4):538. 1958; Gamb. 194.

Erect shrubs; leaves 3-5-foliolate; leaflets elliptic-oblong, acuminate, up to 12 x 5 cm; flowers white in terminal and subterminal panicles; sepals dense-tomentose outside; petals oblong; stamens 10, dimorphic; follicles stipitate, inflated, glabrous, yellow, up to 4.5 cm long; seeds black, arillate; aril large, lobed, fleshy and yellow.

Flowers: Oct. - Mar.

Sivarajan 145, 620, 1066.

Rourea Aubl. (nom.cons.)

R.minor (Gaertn.) Leenhouts in Fl. Males. 5(4):514.

1958. Aegiceras minus Gaertn. Fruct. 1:216. 1788,  
excl. syn. Umbraculum maris Rumph., non Willd.  
et auct. R.santaloides Wt. & Arn. Prod. 144.  
1834; FBI. 2:47. 1876; Gamb. 193.

Climbing shrubs; leaves 3-5-foliolate;  
leaflets ovate-acuminate, up to 9 x 5.5 cm;  
flowers white, in short, axillary panicles;  
stamens connate at base; follicles ellipsoid,  
up to 2 cm long; seeds arillate.

Flowers: Dec. - May

Sivarajan 841, 1139.

PAPILIONACEAE Giseke

(Fabaceae Lindl., nom.alt.)

Key to the genera

1. Stamens monadelphous:
  2. Leaves simple or digitate:
    3. Pods compressed:
      4. Leaves 2-foliolate ..... Zornia
      4. Leaves 3-foliolate:
        5. Climbing shrubs ..... Canavalia
        5. Diffuse herbs ..... Rothia
      3. Pods not compressed ..... Crotalaria
    2. Leaves pinnate:
      6. Trees or woody climbers:
        7. Pod woody ..... Pongamia
        7. Pod not woody:
          8. Pods winged on both margins.. Aganope
          8. Pods not as above:
            9. Leaves 3-5-foliolate ..... Derris
            9. Leaves many-foliolate ..... Dalbergia

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6. Herbs:

10. Bracts large, persistent ..... Geissaspis

<sup>2a</sup> 10. Bracts minute, deciduous ..... Abrus

1. Stamens diadelphous:

11. Stamens in bundles of 5 each:

12. Leaflets 4-8 pairs ..... Smithia

12. Leaflets many ..... Aeschynomene

11. Stamens usually (9)+1:

13. Pods jointed:

14. Pods flat ..... Desmodium

14. Pods not flat ..... Alysicarpus

13. Pods not jointed:

15. Leaves many-foliolate (except  
in Indigofera trifoliata):

16. Plants not climbing:

17. Leaflets parallel-

veined ..... Tephrosia

17. Leaflets not as above:

18. Leaflets obtuse:

19. Flowers yellow ... Sesbania

19. Flowers not

yellow: ... Indigofera

18. Leaflets acute ..... Gliricidia

16. Plants climbing ..... Clitoria

15. Leaves trifoliolate:

20. Calyx spurred ..... Centrosema

20. Calyx not spurred:

21. Seed only one in a pod ..... Butea

21. Seeds more than one in a pod:

22. Plants armed ..... Erythrina

22. Plants unarmed:

23. Erect shrubs:

24. Peduncles filiform .... Rhynchosia

24. Peduncles not filiform:

25. Flowers yellow ..... Cajanus

25. Flowers pink or  
purplish ... Flemingia

23. Climbers:

26. Pods bristly ..... Mucuna

26. Pods not bristly:

27. Pod few seeded ..... Atylosia

27. Pod many seeded:

28. Pods flat ..... Lablab

28. Pods subterete .. Vigna

Zornia J.F.Gmel.

Z.gibbosa Span. in Linnaea 15:192. 1841; Mohlenbrock  
in Webbia 16:112, tt. 44 & 76. 1961; Wagh in J.  
Bombay nat. Hist. Soc. 61:214. 1964. Z.diphylla auct.  
Plur.(non Pers. 1807); FBI. 2:147. 1876; Gamb. 229.

Trailing herbs; leaves 2-foliolate; leaflets lanceolate, acute, punctulate; stipules and bracts peltate; flowers pale yellow, sessile, exerted from the bracts; lomentum with retrorsely scabrous, glochidiate bristles, not reticulate.

Common on the grassy slopes during the rainy season.

Flowers: Aug. - Nov.

Sivarajan 624.

Canavalia Adans. (nom.cons.)

C. gladiata (Jacq.) DC. Prod. 2:404. 1825; Chatterjee in J. Ind. bot. Soc. 28:86. 1947; Sant. 67. 1967. Dolichos gladiatus Jacq. Coll. Bot. 2:276. 1788. Canavalia ensiformis sensu Baker in Hook. f. Fl. Brit. Ind. 2:195. 1876; Gamb. 253. (non DC. nec. Dolichos ensiformis Linn.)

Climbing shrubs; leaflets large, obovate or ovate, obtuse, the laterals unequal sided; flowers pink, fascicled on axillary, long-peduncled racemes; calyx bilabiate; anthers uniform; pods compressed, up to 40 x 3 cm; seeds compressed.

Flowers: Aug. - Nov.

Sivarajan 1785.

Rothia Pers. (nom.cons.)

R.indica (Linn.) Druce in Rep. Bot. Exch. Brit. Isles

3:423. 1914. Trigonella indica Linn. Sp. Pl. 778.1753.

Rothia trifoliata<sup>a</sup> Pers. Syn. 2:302 & 659. 1807; FBI.

2:63. 1876; Gamb. 199.

Densely hispid herbs; leaves trifoliolate; leaflets elliptic or obovate, hairy on both surfaces; flowers reddish brown; calyx lobes subequal; anthers uniform; pods flat, up to 4 x 0.3 cm; densely adpressed hairy; seeds reniform.

Flowers: July - Dec.

Sivarajan 440.

Crotalaria Linn.

Key to the species

1. Leaves simple:

2. Plants diffuse or trailing:

3. Flowers in racemes ..... linifolia

3. Flowers not in racemes:

4. Pods hairy ..... biflora

- 4. Pods glabrous:
  - 5. Peduncles few-flowered ..... prostrata
  - 5. Peduncles many-flowered ..... nana
- 2. Plants erect:
  - 6. Plants densely silky hairy ..... juncea
  - 6. Plants not as above:
    - 7. Stipules lanceolate, small .. retusa
    - 7. Stipules ovate-acuminate,  
large ..... verrucosa
- 1. Leaves digitate:
  - 8. Leaflets three:
    - 9. Erect under shrubs ..... pallida
    - 9. Creeping herbs ..... laevigata
  - 8. Leaflets five ..... quinquifolia

C.linifolia Linn. f. Suppl. 322. 1718; FBI. 2:72.

1876; Sant. 49. 1960; de Munk in Reinwardtia  
6:207. 1962; Gamb. 208.

Diffuse herbs; leaves oblanceolate-obtuse,  
adpressed hairy; flowers pale yellow, in terminal  
racemes; upper calyx lobes connate; corolla slightly

longer than the calyx; pods oblong, glabrous, a little longer than the calyx; seeds 6-8.

Flowers: Sept. - Jan.

Sivarajan 654.

C. biflora (Linn.) Linn. Mant. 570. 1771; Wt. & Arn. Prod. 190. 1834; FBI. 2:66. 1876; de Munk in Reinwardtia 6:201. 1962; Gamb. 206. Astragalus biflorus Linn. Mant. 273. 1771.

Densely tomentose, diffuse herbs; leaves ovate or orbicular, up to 1.5 x 1 cm; flowers yellow, 1-2 on lateral peduncles; pods 8-10 mm long, hairy, 10-15 seeded.

Flowers: Oct. - Mar.

Sivarajan 1076.

C. prostrata Rottl. ex Willd. En. Hort. Berol. 2:747. 1809; FBI. 2:67. 1876; de Munk in Reinwardtia 6:211. 1962; Gamb. 206.

Trailing, densely hispid herbs; leaves small, ovate-acute, 1 x 0.5 cm; flowers yellow, few on short,

axillary peduncles; pods oblong, glabrous, 15-20 seeded.

Flowers: Oct. - Mar.

Sivarajan 176.

C. nana Burm. f. Fl. Ind. 156, t. 48, f. 2. 1758;  
FBI. 2:71. 1876; Sant. 49. 1960; de Munk in  
Reinwardtia 6:210. 1962; Gamb. 208.

Erect, much branched, hispid herbs; leaves elliptic-oblong or oblanceolate, adpressed hairy; flowers small, yellow in terminal or subterminal umbels; pods almost as long as the calyx, glabrous, 8-10 seeded.

Common on the lateritic slopes among grasses and also on the sandy sea-coast.

Flowers: Sept. - Nov.

Sivarajan 1071, 1585.

C. juncea Linn. Sp. Pl. 714. 1753; FBI. 2:79. 1876;  
Sant. 50. 1960; de Munk in Reinwardtia 6:206.  
1962. Gamb. 210.

Erect, densely hispid herbs; leaves oblong-obtuse, mucronate, adpressed hairy; flowers large and showy, bright yellow in terminal, hispid racemes; pods hairy.

Flowers: Sept. - Nov.

Sivarajan 1406.

C. retusa Linn. Sp. Pl. 715. 1653; FBI. 2:75. (excl. Syn. D. & G.) 1876; Sant. 49. 1960; de Munk in Reinwardtia 6:212. 1962; Gamb. 207; Polhill in Kew Bull. 22:310-'11. 1968.

Much branched herbs; leaves elliptic-oblong or oblanceolate, obtuse, glabrous; flowers bright yellow in terminal racemes; pods 3-4 cm long, with a hooked tip.

Flowers: Dec. - Mar.

Sivarajan 12.

C. verrucosa Linn. Sp. Pl. 715. 1753 & (ed. 2) 1005. 1763; Willd. Sp. Pl. 3:977. 1802; FBI. 2:77. 1876; de Munk in Reinwardtia 6:217. 1962; Gamb. 210.



Branched, woody herbs; stem angled; leaves ovate-obtuse; stipules large, ovate-acuminate; flowers blue, large, showy in terminal racemes; pods long; seeds many.

A beautiful plant growing on the sandy sea-coast.

Flowers: Sept. - Jan.

Sivarajan 566.

C.pallida Ait. Hort. Kew 3:20. 1789; Polhill in Kew Bull. 22:262. 1968. C.mucronata Desv. in J. Bot. 3:76. 1814 & in Ann. Sc. Nat. 9:407. 1826; de Munk in Reinwardtia 6:209. 1962. C.striata DC. Prod. 2:131. 1825; FBI.2:84. 1876; Gamb. 212.

Erect undershrubs; leaves long-petioled, trifoliolate; leaflets obovate, rounded at tip; flowers yellow in terminal racemes; corolla with prominent reddish veins; pods oblong, falcate, minutely hairy; seeds many.

Fairly common on roadsides and waste places.

Flowers: July - Mar.

Sivarajan 1197.

C. laevigata Lamk. Encycl. Meth. Bot. 2:198. 1786;

FBI. 2:83. 1876; Gamb. 212.

Trailing herbs with divaricate branches;  
leaves 3-foliolate; leaflets obovate-obtuse, middle  
one larger, densely hispid beneath; flowers yellow  
in terminal racemes; pods oblong, minutely puberulous;  
seeds oblong.

Flowers: Sept. - Nov.

Sivarajan 1081, 1775.

C. quinquifolia Linn. Sp. Pl. 716. 1753 & (ed.2) 1006.

1763; Burm. f. Fl. Ind. 157. 1768; Willd. Sp. Pl.

3:988. 1802; FBI. 2:84. 1876; de Munk in Reinwardtia

6:212. 1962.

Woody undershrubs; stem angular; leaves  
digitately 5-foliolate; leaflets narrowly oblong;  
flowers bright yellow in terminal racemes; pods large,

clavate or oblong-acute, beaked at the tip, up to 5 cm long; seeds many.

Usually growing in the wet fields or near some ponds.

Flowers: July - Nov.

Sivarajan 451.

Pongamia Vent. (nom.cons.)

P.pinnata (Linn.) Pierre Fl. For. Coch. Sub. t. 385. 1899; Sant. 68. 1960; Thoth. in Bull. Bot. Sur. Ind. 3:417-23. 1960; Chavan & Oza, Fl. Pavagadh, 87. 1966. Cytisus pinnatus Linn. Sp. Pl. 743. 1753. Galedupa indica Lamk. Encycl. Meth. Bot. 2:594. 1788-89. Pongamia glabra Vent. Jard. Malm. t. 28. 1803; FBI. 2:240. 1876; Gamb. 272. Derris indica (Lamk.) Bennet in J. Bombay nat. Hist. Soc. 68:303. 1971.

Trees; leaves 5-9-foliolate; leaflets ovate-acuminate, glabrous; flowers pinkish-white, fascicled on axillary, racemose axes, shortly pedicelled; calyx campanulate, truncate or obscurely toothed; anthers uniform; pod compressed, obliquely oblong, not winged; seed solitary.

A common tree on the road sides, very often displaying ovarian galls.

Flowers: Jan. - Mar.

Sivarajan 888.

Note: Pongamia Vent. is usually treated as a distinct genus from Derris Lour., mainly based on its woody pods without wings. Recently Bennet (loc.cit.) has found that the winged fruits of the species of Derris and the wingless fruits of Pongamia, show all intermediary forms, and this character is inadequate to keep the two genera distinct. His view is that the characters which kept Pongamia and Derris separate, no longer hold good any<sup>d</sup> hence he has reduced Pongamia as a section under Derris - Derris sect. Pongam (Adans.) Bennet. In this work the author prefers to keep it as a distinct genus, since the name Pongamia is conserved with P.pinnata as its type species.

Aganope Miq.

Note: Miquel (Fl. Ind. Bat. 1:151. 1855) established the genus with a clear circumscription and was based on A.floribunda Miq., a synonym of Derris thyrsiflora (Benth.) Benth. Later Bentham (Jour. Linn.

Soc. Bot. 4 Suppl. 103. 1860) reduced it into a section under Derris and was followed by many subsequent workers. Recently Polhill (Kew Bull. 25(2):265-66. 1971) working on the "generic limits of Dalbergiae" found sufficient reasons for the re-segregation of Aganope as a distinct genus. The wing petals are not obviously adherent to the keel in the lower half as in Derris, although they may be slightly so at the tips. The hilum of the seed is markedly eccentric with a spreading radicle. In Derris the hilum is in a sub-median sinus and the radicle incurved.

A.thyrsiflora (Benth.) Polhill in Kew Bull. 25:270.

1971. Milletia thyrsiflora Benth. in Miq. Pl.

Jungh. 1:249. 1852, in adnot. Derris eualata Bedd.

Ic. Pl. Ind. Or. 1:42. 1851. Derris thyrsiflora

(Benth.) Benth. in J. Linn. Soc. Bot. 4. Suppl.

114. 1860. D.thyrsiflora (Benth.) Benth., var. eualata

(Bedd.) Thoth. in Bull. Bot. Sur. Ind. 3:195. 1961.

A robust, climbing shrub; leaves impari-pinnate; leaflets 7-9, ovate or ovate-lanceolate, glabrous, reticulate; flowers greenish yellow, in large, terminal and axillary, silky tomentose panicles up to 1.5 metres long; pods flat, thin, reticulate,

prominently winged on both sutures, 8-10 x 4-6 cm.

Flowers: Jan. - Mar.

Sivarajan 971, 1579.

Derris Lour (nom.cons.)

Key to the species

1. Pods orbicular, 2-3 cm long ..... trifoliata
1. Pods narrowly elliptic, much longer ... scandens

D.trifoliata Lour. Fl. Cochinch. 433. 1790; Thoth.

in Bull. Bot. Sur. Ind. 3:181. 1961; Hutch. Gen.

Fl. Pl. 1:384. 1964. Galedupa uliginosa Roxb.

[Hort. Beng. 53. 1814, nom. nud.] Fl. Ind. 3:243.

1832. Derris uliginosa (Roxb.) Benth. in Miq. Pl.

Jungh. 1:252. 1852; FBI. 2:241. 1878; Gamb. 273.

Climbing shrubs; leaves 5-7-foliolate, glabrous; leaflets ovate-acuminate, up to 12 x 6 cm; flowers white in lateral racemes or panicles; pods orbicular, flat, beaked at the tip, prominently reticulate, very narrowly winged on the dorsal suture; seeds 1-2, compressed, reniform.

Found commonly along the river banks and back waters.

Flowers: Jan. - May

Sivarajan 56, 193.

D.scandens (Roxb.) Benth. in J. Linn. Soc. 4 (Suppl.) 103. 1860; FBI. 2:240. 1876; Thoth. in Bull. Bot. Sur. Ind. 3:177. 1961 & ibid. 13:164. 1971 (1973); Gamb. 272, non D.scandens (Aubl.) Pittier, 1917. Dalbergia scandens Roxb. Pl. Corom. 2:29. t. 192. 1805. D.timoriensis DC. Prod. 2:417. 1825. Derris timoriensis (DC.) Pittier in Contr. U.S. Nat. Herb. 20:41. 1917; Thoth. in Bull. Bot. Sur. Ind. 12:105. 1970, nom. illeg.

Climbing shrubs; leaves 7-9-foliolate, leaflets oblong-obtuse or elliptic, up to 8 x 3 cm; flowers white, fascicled on solitary or paniculate racemes; peduncles and pedicels tomentose; pods narrowly elliptic, acute at both ends, compressed, 4-5 seeded.

Common on the banks of rivers and back waters.

Flowers: Jan. - Mar.

Sivarajan 107, 1074, .

in Ann. Roy. Bot. Gard. Calc. 10. t. 18. 1899;  
Gamb. 269.

Large, woody climbers; branches twisted; leaves  
13-21-foliolate; leaflets oblong, retuse or emarginate,  
adpressed silky hairy; flowers white, in axillary,  
cymose panicles; calyx teeth small, distinct; anthers  
uniform; pods samaroid, thin, flat; seed usually 1,  
rarely 2.

Flowers: Dec. - Jan.

Sivarajan 39, 147.

Geissaspis Wt. & Arn.

- 1. Pods longer than the bracts ..... tenella
- 1. Pods shorter than the bracts ..... crinata

G. tenella Benth. in Flora 32:559. 1849; FBI. 2:141.  
1876; Sant. 52. 1960; Gamb. 229.

Small, trailing herbs; leaves with 4 obovate-  
retuse leaflets; stipules bristly on the margins,  
spurred; bracts ovate-dentate; flowers exerted from  
the bracts; calyx distinctly 2-lipped; anthers uniform;  
pods usually 2-seeded.

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The author is thankful to Dr. R.M. Polhill, Royal  
Botanic Gardens, Kew, for his valuable comments on the  
identity of the Geissaspis specimens.



Common, on the moist rocky slopes, during the rainy season.

Flowers: Aug. - Oct.

Sivarajan 400, 500.

Note: Two distinct forms of this species are represented in the author's collections, (1) the typical form with bright yellow flowers, collected from the neighbouring Cannanore district, and (2) another with bright crimson-red flowers, collected from the area of the present study. Regarding this species, in a personal communication, Dr. Polhill (Royal Botanic Gardens, Kew) writes "I do not find any exception to the general statement that the corolla is yellow. It is common for the yellow-flowered species in the Papilionoideae to have fine red veins or markings, and if so then a red flush is quite often seen either on older flowers or as variations between plants or populations. If the Calicut plants have no yellow at all, then this must be a striking difference". The specimen in question, invariably has deep crimson-red flowers without yellow. However Dr. Polhill has reported that the specimen agrees well with the type of G.tenella. So the author tentatively keeps it under the same.

G.cristata Wt. & Arn. Prod. 218. 1834; FBI. 2:141.

1876; Sant. 52. 1960; Gamb. 229.

Trailing herbs; leaves 4-foliolate; leaflets obovate-obtuse; stipules bristly on the margins, long-spurred; bracts orbicular with long bristles on the margins, closely imbricating; flowers pale yellow, much shorter than the bracts; calyx 2-lipped; anthers uniform; pods usually one seeded.

Very common in moist or wet, cultivated fields.

Flowers: Aug. - Dec.

Sivarajan 644.

Abrus Adans.

A.pulchellus Watt ex Th. En. 91. 1859; FBI. 2:175.

1876; Gamb. 247; Verdcourt in Kew Bull. 24:245.

1970. A.fruticulosus sensu Breteler in Blumea 10:612. 1960, in part.

Slender climbers; leaves pinnate, 14-18-foliolate; leaflets oblong, obtuse or retuse; flowers yellowish, fascicled on axillary racemose axes;

bracts minute, deciduous; pods oblong, flat, tip beaked, adpressed tomentose.

Flowers: Oct. - Nov.

Sivarajan 1497.

Note: Breteler (loc.cit.) has treated A.fruticulosus as a very variable species, consisting of prostrate herbs and erect woody shrubs, plants with smooth as well as tuberculate pods, and those with compressed, unicolourous seeds and those having spherical, red seeds with a black eye. A.pulchellus according to him is conspecific with A.fruticulosus.

Breteler's treatment of this species obviously involved a mixture of more than one species. Verdcourt (loc.cit.) has analysed this 'complex', and segregated A.pulchellus as a distinct species based mainly on the leaflets. Of the subspecies recognised by Verdcourt (loc.cit.) the cited specimen belongs to the ssp. pulchellus.

Smithia Ait. (nom.cons.)

S.sensitiva Ait. Hort. Kew 3:496. 1789; FBI. 2:148. 1876; Sant. 53. 1960; Gamb. 232; Verdcourt in Kew Bull. 24:16. 1970.

Trailing herbs; leaflets 4-6 pairs, oblong-obtuse, hairy on the margins and on the midrib beneath; flowers yellow in axillary racemes; calyx equally 2-lipped; standard petal auricled at base; stamens diadelphous (5+5); fruit a lomentum, joints papillose.

A profuse weed in the harvested fields, especially in sandy areas.

Flowers: Aug. - Nov.

Sivarajan 638.

Aeschynomene Linn.

A. indica Linn. Sp. Pl. 711. 1753; FBI. 2:151. 1876;  
Gamb. 234.

Diffusely branched, woody undershrubs; leaflets many, small, oblong-obtuse and sensitive; flowers pale yellow in axillary racemes; calyx deeply 2-lipped; stamens in 2 bundles of 5 each; lomentum long-stalked, flattened.

Flowers: Sept. - Dec.

Sivarajan 516.

Desmodium Desv. (nom.cons.)

Key to the species

- 1. Trailing herbs:
  - 2. Pods hirsute ..... heterophyllum
  - 2. Pods glabrous ..... triflorum
- 1. Erect plants:
  - 3. Pods with out hooked hairs:
    - 4. Petioles winged ..... triquetrum
    - 4. Petioles not winged ..... motorium
  - 3. Pods with hooked hairs ..... laxiflorum

D.heterophyllum (Willd.) DC. Prod. 2:334. 1825; FBI. 2:173. 1876; Meeuwen in Reinwardtia 6:251. 1962; Gamb. 245. Hedysarum heterophyllum Willd. Sp. Pl. 3:1201. 1802. D.triflorum Wt. & Arn. Prod. 229. 1834, in part.

A hispid, trailing herb; leaves trifoliolate; leaflets elliptic-oblong, obtuse or retuse, up to 1.2 x 1 cm; flowers purple, solitary or in axillary racemes; peduncles filiform and long; lomentum up to 2.4 cm long, 4-5-jointed, dorsal suture straight; seeds compressed.

Flowers: July - Mar.

Sivarajan 613.

Note: Very often confused with D.triflorum but can be distinguished by its densely hispid, oblong-obtuse, larger leaves, and larger, hirsute pods.

D.triflorum (Linn.) DC. Prod. 2:334. 1825; Wt. & Arn. Prod. 229. 1834, in part; FBI. 2:173. 1876; Meeuwen in Reinwardtia 6:261. 1962; Gamb. 245. Hedysarum triflorum Linn. Sp. Pl. 749. 1753.

Creeping herbs, more or less glabrous; leaves trifoliolate; leaflets obovate, retuse or emarginate at apex, 5-6 mm long; flowers small, purple, solitary or racemed in the axils; lomentum 3-5-seeded, 1-1.5 cm long, straight on the dorsal suture, reticulate and glabrous.

Flowers: July - Mar.

Sivarajan 613.

D.triquetrum (Linn.) DC. Prod. 2:326. 1825, ssp.triquetrum: Sant. 57. 1960; Meeuwen in Reinwardtia 6:292. 1962; Gamb. 244. Hedysarum triquetrum Linn. Sp. Pl. 746.1753.

Shrubs with 3-angular, adpressed hairy branches; leaves unifoliolate, ovate-oblong or lanceolate, acute; petiole winged; flowers purple, fascicled in terminal

racemes or panicles; pods adpressed tomentose,  
6-8-seeded.

Flowers: Sept. - Nov.

Sivarajan 658.

D. motorium (Houtt.) Merr. in J. Arn. Arb. 19:345.

1938; Meeuwen in Reinwardtia 6:24. 1962. Hedysarum  
motorium Houtt. Nat. Hist. 2:246. 1779. H. gyrans  
Linn. f. Suppl. 332. 1781. Desmodium gyrans (Linn.f.)  
DC. Prod. 2:326. 1825; FBI. 2:174. 1876.

Shrubs; leaves 1-3-foliolate; leaflets oblong-  
obtuse, laterals very small as compared to the odd  
leaflet; flowers yellowish white in axillary or terminal,  
bracteate racemes; pods minutely pubescent.

Flowers: Dec. - Jan.

Sivarajan 890.

D. laxiflorum DC. in Ann. Sc. Nat. Paris 4:100. 1825 &

Prod. 2:335. 1825; FBI. 2:164. 1876; King in J.  
As. Soc. Beng. 66(2):141. 1897; de Munk in Reinwardtia  
6:252. 1962. D. diffusum DC. in Ann. Sc. Nat. Paris  
4:100. 1825 & Prod. 2:335. 1825, non (Willd.) DC.  
quae est D. dichotomum.

Branched, woody herbs; stem obscurely angular, glabrous; leaves 3-foliolate; stipules broad, auricled; leaflets obovate or elliptic, obtuse, pubescent; flowers small, purple in terminal, simple or paniculate racemes; pedicels filiform; pods straight on the ventral suture and intended on the other, covered with dense, hooked bristles.

Flowers: Sept. - Mar.

Sivarajan 636.

Alysicarpus Neck. ex Desv. (nom.cons.)

Key to the species

- 1. Pod hairy ..... monilifer
- 1. Pod not hairy:
  - 2. Racemes short and dense ..... vaginalis
  - 2. Racemes long and lax ..... bupleurifolius

A.monilifer (Linn.) DC. Prod. 2:353. 1825; FBI. 2:157.  
1876; Gamb. 238. Hedysarum moniliferum Linn. Mant.  
1:102. 1767.

Prostrate herbs; leaves broadly oblong-obtuse, cordate; flowers pink, in dense, axillary racemes;



calyx longer than the first joint of the pod, deeply divided; anthers uniform; pods moniliform, joints with hooked bristles.

Flowers: Jan. - Apr.

Sivarajan 178, 1064.

A.vaginalis (Linn.) DC. Prod. 2:353. 1825; FBI.

2:158. 1876; Sant. 55. 1960; Steenis in Reinwardtia  
6:86. 1961; Gamb. 238. Hedysarum vaginalis Linn.  
Sp. Pl. 746. 1753.

Diffuse herbs; leaves elliptic or narrowly oblong; flowers in short, terminal racemes; calyx shorter than the first joint of pod, deeply lobed; anthers uniform; pods reticulate, glabrous.

Flowers: Sept. - Dec.

Sivarajan 764.

A.bupleurifolius (Linn.) DC. Prod.2:352. 1825; FBI.

2:158. 1876; Sant. 55. 1960; Steenis in Reinwardtia  
6:88. 1961; Gamb. 239. Hedysarum bupleurifolium  
Linn. Sp. Pl. 745. 1753.

Diffuse herbs; leaves elliptic to narrowly oblong, obtuse; flower reddish in long, terminal racemes; calyx much longer than the first joint of the pod; pods moniliform, joints glabrous.

Flowers: Sept. - Dec.

Sivarajan 655.

Tephrosia Pers. (nom.cons.)

Key to the species

- 1. Leaves silky villous beneath ..... tinctoria
- 1. Leaves not silky villous:
  - 2. Pods densely villous ..... hirta
  - 2. Pods minutely scabrous:
    - 3. Flowers 1.5 cm across ..... maxima
    - 3. Flowers much smaller ..... purpurea

T.tinctoria (Linn.) Pers. Syn. 2:329. 1807; FBI.

2:111. 1876; Sant. 51. 1960; Gamb. 225. Galega

tinctoria Linn. Syst. (ed.10) 1172. 1759.

Woody, tomentose undershrubs; leaves 3-9-foliolate, the odd leaflet much larger than the laterals, elliptic-oblong, acute, densely adpressed silky-hairy beneath; flowers red in axillary racemes; calyx lobes

subequal; anthers uniform; pods flat, minutely scabrous, up to 5.5 cm long.

Rare; collected from the lateritic grassy slopes at Devagiri.

Flowers: Mar. - June

Sivarajan 892.

T.hirta (Buch.-Ham.) Gamb. Fl. Madr. 1:318. 1918.

Galega hirta Buch.-Ham. in Trans. Linn. Soc. 13:546. 1822.

Diffusely branched undershrubs; leaves 13-15-foliolate; leaflets elliptic or oblanceolate; flowers pink, racemed; calyx densely silky hairy; pods covered with dense, villous hairs.

Common on the sandy sea coast and nearby areas.

Flowers: Aug. - Dec.

Sivarajan 670, 1480.

T.maxima (Linn.) Pers. Syn. 2:329. 1807; Gamb. 225.

Galega maxima Linn.Syst. (ed.10) 1172. 1759.

T.purpurea var.maxima (Linn.) Baker in Hook. f.

Fl. Brit. Ind. 2:113. 1876.

Much branched undershrubs; leaflets oblanceolate, obtuse or retuse; flowers pink, large, solitary in the axils or in racemes; pods scabrous, 5-6 cm long.

Very commonly seen on the sandy coast and in its neighbourhood.

Flowers: Aug. - Dec.

Sivarajan 554, 1287.

T. purpurea (Linn.) Pers. Syn. 2:329. 1807; FBI. 2:112.

1876, in part; Mahes. 121; Gamb. 226. Galega

purpurea Linn. Sp. Pl. 1172. 1753.

Much branched undershrubs; leaflets elliptic or oblanceolate; flowers small, red in axillary or terminal racemes; pods compressed, minutely scabrous.

Common on the sea coast, and in the neighbouring areas.

Flowers: Aug. - Dec.

Sivarajan 452, 553, 1289.

Sesbania Scopoli (nom.cons.)

S.sesban (Linn.) Merr. in Philip. J. Sc. Bot. 7:235.  
1912; Gillet in Kew Bull. 17(1):112. 1963; Hutch.  
Gen. Fl. Pl. 1:402. 1964. Aeschynomene sesban Linn.  
Sp. Pl. 714. 1753. Sesbania aegyptiaca Poir. Encycl.  
7:128. 1806; Pers. Syn. 2:316. 1807; FBI. 2:114.  
1876; Gamb. 228.

Shrubs; leaflets many, oblong-retuse; flowers  
bright yellow in axillary racemes; pods linear,  
pendulous, up to 25 cm long, septate between the seeds;  
seeds oblong.

Flowers: Aug. - Dec.

Sivarajan 1361.

Note: Gillet (loc.cit.) has recognised two  
subspecies of which ssp.punctata (DC.) Gillet is  
known only from Africa. The ssp.sesban includes two  
varieties of which the author's specimen belongs to  
the var.sesban. This can be distinguished from the  
var.bicolor by its yellow standard, speckled with  
purple as against the purple standard in the latter.

Indigofera Linn.

Key to the species

- 1. Pods 2-seeded ..... enneaphylla
- 1. Pods more than 2-seeded:
  - 2. Leaves trifoliolate ..... trifoliata
  - 2. Leaves imparipinnate:
    - 3. Flowers solitary, axillary ..... uniflora
    - 3. Flowers in axillary racemes:
      - 4. Leaves rounded at tip:
        - 5. Pods hairy ..... hirsuta
        - 5. Pods glabrous ..... pulchella
      - 4. Leaves acute or subacute  
at apex ..... teysmannii

I.enneaphylla Linn. Mant. 2:272. 1771, append. 571.

1771; FBI. 2:94. 1876; Gillet in Kew Bull. (Add. Ser.1) 35. 1958; Mahes. 117; Gamb. 218.

Trailing herbs; leaves 5-7-foliolate; leaflets obovate-obtuse, adpressed hairy; flowers greenish yellow in short, dense, axillary, racemes; pods minutely hairy, 2-seeded.

Common along the railway lines and roadsides in sandy areas.

Flowers: Sept. - Nov.

Sivarajan 551.

I. trifoliata Linn. Cent. Pl. 2:29. 1756 & Amoen. Acad.  
4:327. 1759; FBI. 2:96. 1876, in part; Gamb. 219.

Diffuse herbs; leaves trifoliolate; leaflets oblong-obtuse; flowers reddish-purple in short, axillary clusters; pods 1-1.5 cm long, 4-5-seeded, strongly keeled on both the sutures.

Common on the grassy slopes.

Flowers: Aug. - Oct.

Sivarajan 770.

I. uniflora Buch.-Ham. ex Roxb. Hort. Beng. 57. 1814,  
nom. nud. Fl. Ind. 3:374. 1832; FBI. 2:94. 1876;  
Gamb. 218.

Prostrate or diffuse herbs; leaves 5-foliolate; leaflets small; flowers reddish-purple, usually solitary in the axils; pod linear, glabrous, 1 cm long; seeds 3-5.

Common on the sandy sea-coast.

Flowers: July - Nov.

Sivarajan 442.

I.hirsuta Linn. Sp. Pl. 751. 1753; FBI. 2:98. 1876,  
in part; Verdcourt in Kew Bull. 24(3):500-501. 1970.

Branched, hirsute undershrubs; leaves obovate  
or elliptic-obtuse; flowers in long, dense, axillary  
racemes; standard brick-red; pod 2 cm long, slender.

Flowers: Sept. - Oct.

Sivarajan 630.

Note: Verdcourt (loc.cit.) has discussed the  
identity of both I.astragalina and I.hirsuta and has  
kept them distinct, based on the following characters:

Standard brick red or rose-red,  
the same colour as the wing,  
except for a white spot at its  
base ..... I.hirsuta

Standard white or pale pink,  
paler than or sometimes the  
same colour as the wings ..... I.astragalina

I.pulchella Roxb. [Hort. Beng. 57. 1814, nom. nud.]  
Fl. Ind. 3:382. 1832; FBI. 2:101. 1876; Cooke. 1:341;  
Gamb. 221.



Small undershrubs; stem minutely pubescent; leaves 9-13-foliolate; leaflets obovate, rounded or retuse at apex, puberulous on both surfaces, up to 3 x 1.5 cm; flowers reddish purple in pubescent, axillary racemes; pods turgid, cylindrical, glabrous.

Collected from the sandy coast at Beypore.

Flowers: Oct. - Jan.

Sivarajan 1297.

I. teysmannii Miq. Fl. Ind. Bat. 1:1083. 1858.

Small trees; branches spreading, angular; leaves 13-17-foliolate, leaflets elliptic-lanceolate, glaucous beneath, up to 8 x 3 cm; stipules small, lanceolate; flowers in long, axillary, erect racemes, red, peduncles 12-18 cm long; pods deflexed.

Found on hedges and some times in waste places. It is not mentioned in any of the Indian Floras, and seems that this is the first report of this plant from South India.

Flowers: Aug. - Nov.

Sivarajan 1767.

Gliricidia Kunth

G. maculata H.B. & K. Nov. Gen. et Sp. 6:393. 1824;

Blatt. & Millard in J. Bombay nat. Hist. Soc. 36:139,  
t. 18, 19. 1932.

Deciduous shrubs or small trees; leaves  
15-19-foliolate; leaflets ovate-lanceolate; flowers  
rose-coloured in dense, clustered racemes in the axils  
of fallen leaves; pods compressed, up to 12 x 1.5 cm.

Common; cultivated for green manure, on hedges  
and near cultivated lands.

Flowers: Jan. - Mar.

Sivarajan 30.

Clitoria Linn.

C. terneata Linn. Sp. Pl. 753. 1753; FBI. 2:208. 1876;

Mahes. 131; Gamb. 258.

Climbers; leaves with 5-7, ovate-obtuse or  
rounded leaflets; flowers of various colours, most  
commonly purple; pods flat, oblong up to 11 x 1 cm.

Commonly grown as an ornamental.

Flowers: throughout the year

Sivarajan 77, 1403.

Centrosema (DC.) Benth.(nom.cons.)

C.virginianum (Linn.) Benth. in Ann. Wien. Mus. 2:120.

1838; Subramanian in Bull. Bot. Sur. Ind. 3:201.

1961; Thoth. & Prasad in Curr.Sci. 39:353. 1970.

Clitoria virginiana Linn. Sp. Pl. 753. 1753.

Climbing shrubs, pubescent throughout; leaves trifoliolate; leaflets elliptic or ovate, acute; flowers rose-pink; calyx spurred; standard petal pubescent; pods compressed, up to 12 x 0.6 cm.

This plant with its flowers closely resembling those of Clitoria terneata are wild on the grassy slopes.

Flowers: Oct. - Dec.

Sivarajan 645,

Butea Roxb. ex Willd.(nom.cons.)

Key to the species

1. Flowers large, red ..... monosperma

1. Flowers small, yellowish white ..... parviflora

B.monosperma (Lamk.) Taub. in Engl. & Pr. Pfam. 3(3):366.

1894; Blatt. in J. Ind. bot. Soc. 8:134. 1910; Sant.

66. 1967. Erythrina monosperma Lamk. Encycl. Meth.

Bot. 1:391. 1783. Butea frondosa Koenig ex Roxb. As.

Res. 3:469. 1792 & Pl. Corom. 1:21, t. 21. 1795;  
FBI. 2:194. 1876; Gamb. 252.

Trees; leaves trifoliolate; leaflets large, obovate, rounded at apex, laterals inequilateral; flowers large, bright red, usually borne on the trunk and older branches; pods flat, thin.

Flowers: Jan. - Mar.

Sivarajan 121.

B. parviflora Roxb. [Hort. Beng. 53. 1814, nom. nud.]  
Fl. Ind. 3:248. 1832; Blatt. in J. Ind. bot. Soc. 8:137. 1910; Sant. 60. 1960. Spatholobus roxburghii Benth. Pl. Jungh. 238. 1851-52; FBI. 2:193. 1876; Gamb. 253.

Extensive climbers; leaves trifoliolate; leaflets large, elliptic-acute, laterals inequilateral; flowers fragrant, small, aggregated in large panicles.

Flowers: Sept. - Oct.

Sivarajan 660.

Erythrina Linn.

E. variegata Linn. in Stickm. Herb. Amb. 10. 1754 & Amoen. Acad. 4:122. 1759, var. orientalis (Linn.) Merr. Inter. Herb. Amb. 276. 1917; Mahes. in Bull. Bot. Sur. Ind. 3:45-48. 1962; Bullock in Kew Bull. 20:294. 1966. E. corollodendron Linn., var. orientalis Linn. Sp. Pl. 706. 1753. E. indica Lamk. Encycl. Meth. Bot. 2:391. 1786; FBI. 2:188. 1876; Sant. 64-65. 1967.

Tall, deciduous trees; profusely prickly on the stem and branches; leaves trifoliolate; leaflets large, ovate, acute or subacute; flowers bright red in clustered racemes at the tips of branches; pods large, curved, constricted between seeds.

Cultivated on hedges and as props for Betel plant, pepper etc., as it regenerates quickly.

Flowers: Mar. - Apr.

Sivarajan 1046.

Rhynchosia Lour. (nom. cons.)

R. rufescens DC. Prod. 2:387. 1825; FBI. 2:220. 1876; Gamb. 263.

Erect, dense-tomentose shrubs; leaves trifoliate; leaflets elliptic, obtuse or acute, laterals unequal sided; flowers yellow in lax, axillary racemes; peduncles filiform; pod enclosed in the calyx, 1-seeded, tomentose.

Flowers: Dec. - Mar.

Sivarajan 148.

Cajanus DC. (nom.cons.)

C.cajan (Linn.) Druce in Rep. Bot. Exch. Cl. Brit. Isles 1916:611. 1917; Sant. 76. 1967. Cytisus cajan Linn. Sp. Pl. 739. 1753. Cajanus indicus Spreng. Syst. 3:248. 1826; FBI. 2:217. 1876.

Adpressed tomentose shrubs; leaves trifoliolate; leaflets elliptic-oblong, acute, soft tomentose; flowers yellow in axillary racemes; pods densely adpressed tomentose, constricted between seeds.

Flowers: Dec. - Mar.

Sivarajan 884.

Flemingia Roxb. ex Ait. (nom.cons.)

F. macrophylla (Willd.) Kuntze ex Prain in J. As. Soc.  
Beng. 66(2):440. 1897. Crotalaria macrophylla Willd.  
Sp. Pl. 3:982. 1802. Moghania macrophylla (Willd.)  
Kuntze, Rev. Gen. 199. 1891. Flemingia congesta Roxb.  
ex Ait. Hort. Kew (ed.2) 4:349. 1812; FBI. 2:228.  
1876, in part.

Woody shrubs; stem trigonous, adpressed tomentose;  
leaves 3-foliolate, glabrous except on the veins beneath;  
flowers in dense, axillary, clustered racemes; pods  
small.

Flowers: Sept. - Dec.

Sivarajan 1826.

Mucuna Adans. (nom.cons.)

Key to the species

1. Pods flat ..... gigantea  
1. Pods not flat ..... prurita

M. gigantea (Willd.) DC. Prod. 2:405. 1825; FBI. 2:186.  
1876; Merr. interp. Herb. Amb. 277. 1917; Gamb. 251.

Dolichos giganteus Willd. Sp. Pl. 3:1041. 1800.

Zoophthalmum giganteum (Willd.) Prain in J. As. Soc.  
Beng. 66(2):68. 1897.

Climbing shrubs; leaves trifoliolate; leaflets ovate-acute, large; flowers greenish white in axillary, pendulous cymes; pods flat, adpressed-hairy, about 12 x 4 cm in size.

This, rather rare species was collected from the banks of the back waters at Beypore.

Flowers: Aug. - Sept.

Sivarajan 466.

M. prurita Hook. in Bot. Misc. 2:348. 1830-31; Sant. .  
59. 1960; Gamb. 356. M. pruriens Baker in Hook. f.  
Fl. Brit. Ind. 2:187. 1876 (non DC. 1825).

Climbing shrubs; leaves trifoliolate, pubescent; flowers greenish purple in axillary, pendulous cymes; pods terete, curved and covered with irritant bristles.

Common on hedges and in waste places.

Flowers: Aug. - Dec.

Sivarajan 1825.



Atylosia Wt. & Arn.

A. scarabaeoides Benth. in Miq. Pl. Jungh. 242. 1851-55;  
FBI. 2:215. 1876; Gamb. 261; Gupta, Fl. Nainit. 95.  
1968.

Dense-pubescent, climbing herbs; leaves trifoliate; leaflets elliptic-obtuse, basally 3 veined; flowers bright yellow; pods 4-5-seeded, hairy.

Common on the grassy slopes, twining on bushes or grasses.

Flowers: Sept. - Nov.

Sivarajan 657.

Lablab Adans.

L. purpureus (Linn.) Sweet, Hort. Brit. ed. 1:481. 1827;  
Verdcourt in Kew Bull. 24(3):410. 1970. Dolichos  
purpureus Linn. Sp. Pl. (ed.2) 1021. 1763.  
D. lablab Linn. Sp. Pl. 725. 1753; FBI. 2:209. 1876;  
Sant. 66. 1960.

Climbing shrubs; leaves trifoliolate; leaflets large ovate-acuminate, 3-ribbed, glabrous; flowers pink; pods broad, long-beaked.

Cultivated as a vegetable.

Flowers: Aug. - Dec.

Sivarajan 1494.

Vigna Savi.

Note: The problem of the generic distinction of Phaseolus Linn. and Vigna Savi. has been discussed at length by Verdcourt (Kew Bull. 24(3):507-570. 1970) and the author has followed him in classifying the specimens collected here.

Key to the species

- 1. Leaflets entire:
  - 2. Flowers yellow ..... radiata
  - 2. Flowers pink ..... unguiculata
- 1. Leaflets lobed ..... trilobata

V. radiata (Linn.) Wilczek. in Fl. Congo. Belg. 6:386.  
1954, var. sublobata (Roxb.) Verdcourt in Kew Bull.  
24(3):559. 1970. Phaseolus radiatus Linn. Sp. Pl.  
725. 1753; Sant. 62. 1953. P. sublobatus Roxb.  
[Hort. Beng. 54. 1814, nom. nud.] Fl. Ind. 3:288.  
1832; Gamb. 256.

Erect herbs, later twining; leaves trifoliolate; leaflets ovate-acute, laterals inequilateral, sometimes lobed; flowers yellowish; pods cylindric, hairy; seeds green.

Flowers: Aug. - Nov.

Sivarajan 672, 1428.

V. unguiculata (Linn.) Walp. Repert. 1:779. 1892; Andrews, Pl. Ango-Egypt-Sudan 2:246. 1952; Verdcourt in Kew Bull. 24(3):543-44. 1970. Dolichos unguiculatus Linn. Sp. Pl. 725. 1753. D. sinensis Linn. Cent. Pl. 2:28. 1758. Vigna sinensis (Linn.) Savi. ex Hassk. Cat. Hort. Bogor. 279. 1844; Bailey 576.

Erect or climbing herbs; leaves trifoliolate; leaflets large, ovate; flowers pinkish; pods cylindric, 15-20 cm long.

Flowers: Aug. - Nov.

Sivarajan 1392, 1657.

V. trilobata (Linn.) Verdcourt in Taxon 17:172. 1968 & in Kew Bull. 24(3):560. 1970. Dolichos trilobatus Linn. Mant. 1:101. 1767. Phaseolus trilobatus (Linn.) Schreb. in Nov. Acta Akad. Caes. Leop. Carol. Nat.

Curios. 4:132. 1770; Leese in Amer. Midl. Nat. 60:144.  
1958. P.trilobus sensu Ait. auctt. mult; non Dolichos  
trilobus Linn.

Climbing or twining, hispid herbs; leaves 3-  
foliolate; leaflets mostly lobed again, ovate-acute;  
flowers yellow in axillary, long-peduncled, dense clusters.

Flowers: July - Dec.

Sivarajan 311, 444, 1445.

CAESALPINIACEAE R. Br.

Key to the genera

1. Leaves 2-foliolate, leaflets connate  
half the way ..... Bauhinia
1. Leaves not as above:
  2. Leaves simple pinnate:
    3. Stamens 3 ..... Tamarindus
    3. Stamens more than 3:
      4. Petal 0 ..... Saraca
      4. Petals present ..... Cassia
  2. Leaves bipinnate:
    5. Pods winged ..... Peltophorum
    5. Pods not winged:
      6. Flowers spicate ..... Wagatea
      6. Flowers not spicate:
        7. Flowers yellow ..... Caesalpinia
        7. Flowers red ..... Delonix

Bauhinia Linn.

Key to the species

- 1. Flowers white ..... acuminata
- 1. Flowers not white:
  - 2. Stamens 10 ..... tomentosa
  - 2. Stamens only 3 ..... purpurea

B.acuminata Linn. Sp. Pl. 376. 1753; Burm. f. Fl. Ind. 94. 1768; DC. Prod. 2:513. 1825; FBI. 2:276. 1878; Bor & Raizada in J. Bombay nat. Hist. Soc. 42:5. 1940; de Wit in Reinwardtia 3:394. 1956; Gamb. 289.

Shrubs; leaves tomentose beneath, glabrous above, lobes subacute; flowers large, showy, white; pods oblan- ceolate, acuminate, ridged on both sutures, compressed; seeds few, compressed.

Flowers: Aug. - Dec.

Sivarajan 1157.

B.tomentosa Linn. Sp. Pl. 375. 1753; FBI. 2:275. 1878; Bor & Raizada in J. Bombay nat. Hist. Soc. 42:4. 1940; de Wit in Reinwardtia 3:410. 1956; Mahes. 137; Gamb. 288.

Shrubs or small trees with slender branches; leaves dense-tomentose beneath, lobes rounded at tip;

flowers yellow; calyx spathaceous, 5-toothed at the tip; stamens 10; pods oblong, 10-15 cm long, not ridged on the upper suture; seeds 10-12.

Flowers: Aug. - Dec.

Sivarajan 1401.

B.purpurea Linn. Sp. Pl. 375. 1753; FBI. 2:284. 1878;  
de Wit in Reinwardtia 3:406. 1956; Sant. 74. 1960;  
Gamb. 288. Phanera purpurea (Linn.) Benth. in Pl.  
Jungh. 1:262. 1852.

Large trees; leaves large, coriaceous, glabrous, lobes obtuse or subacute; flowers large in terminal, dense-tomentose, paniculate racemes, purple; calyx pubescent, splitting into 2 leathery, toothed segments; stamens 3-4; pods very long; seeds more than 10.

Flowers: Sept. - Nov.

Sivarajan 1479.

Tamarindus Linn.

T.indica Linn. Sp. Pl. 34. 1753; FBI. 2:273. 1878;  
Mahes. 139; Gamb. 290.

Trees; leaves 28-32-foliolate; leaflets oblong-obtuse; flowers in axillary racemes; petals 3 with purplish stripes; stamens 3, filaments connate half the way up and then free; pod thick, curved and compressed; seeds brown.

Flowers: Apr. - May

Sivarajan 1151.

Saraca Linn.

S.asoka (Roxb.) de Wilde in Blumea 15:393. 1967; Zuijdr. in Blumea 15:422. 1967. Jonesia asoka Roxb. in Res. 4:355. 1799. S.indica sensu Baker in Hook. f. Fl. Brit. Ind. 2:271. 1878; Gamb. 289.

Tall trees; leaves 8-10-foliolate; leaflets 4-6 pairs, oblong, up to 20 x 6 cm, short-petioled; flowers reddish yellow, apetalous in dense, axillary, corymbose cymes; bracteoles erect, persistent; calyx segment 4; petals 0; stamens usually 8.

Flowers: Dec. - May

Sivarajan 1073.

Note: de Wilde (loc.cit.) has segregated 2 distinct species from the original S.indica complex and has excluded S.indica from India.

Cassia Linn.

Key to the species

1. Trailing herbs:

2. Leaflets 20-24 ..... kleinii

2. Leaflets more than 40 ..... mimosoides

1. Shrubs or trees:

3. Pods winged ..... alata

3. Pods not winged:

4. Leaflets 2-3 pairs:

5. Flowers in panicles ..... bacillaris

5. Flowers 1-2 in the axils ..... tora

4. Leaflets 4 or more pairs:

6. Leaflets acute or acuminate:

7. Racemes large and

pendulous ..... fistula

7. Racemes short, not

pendulous:

8. Plants densely hirsute.. hirsuta

8. Plants glabrous ..... occidentalis

6. Leaflets obtuse:

9. Pubescent undershrubs ..... nigricans

9. Glabrous trees ..... siamea



C.kleinii Wt. & Arn. Prod. 293. 1834; Benth. in Trans.

Linn. Soc. 27:581. 1871; FBI. 2:266. 1878; Woodr.

in J. Bombay nat. 11:427. 1898; Cooke 1:452; Gamb.285.

Diffuse, woody herbs; leaves 20-24-foliolate;  
leaflets oblong-mucronate, inequilateral, 2 mm broad;  
flowers bright yellow in extra-axillary, short racemes;  
pods flat, 2-4 cm long; pubescent.

Seen along the grassy slopes during the rainy  
season.

Flowers: Aug. - Nov.

Sivarajan 656.

C.mimosoides Linn. Sp. Pl. 1753; FBI. 2:266. 1878;

de Wit in Webbia 11:283. 1956; Sant. 72. 1960; Symon  
in Trans. Roy. Soc. S. Austr. 90:133. 1966; Gamb.285.

Diffuse, woody herbs; leaflets many, oblong-  
acute, 5 x 1.5 mm, unequal sided; flowers bright yellow;  
pods flat, up to 4 cm long, dipressed between the seeds;  
seeds compressed, brown.

Common along the grassy slopes during the monsoon.

Flowers: Aug. - Dec.

Sivarajan. 457.

C.alata Linn. Sp. Pl. 378. 1753; FBI. 2:264. 1878;  
de Wit in Webbia 11:231. 1956; Symon in Trans.  
Roy. Soc. S. Austr. 90:94-95. 1966; Gamb. 286.

Shrubs or small trees; leaves 12-18-foliolate;  
leaflets large, oblong or obovate, obtuse; flowers  
bright yellow in long, dense, speciform racemes; bracts  
and calyx reddish; pods winged, 10-15 cm long.

Common near wet fields or near ponds or  
streams.

Flowers: Dec. - Mar.

Sivarajan 120.

C.bacillaris Linn. f. Suppl. 231. 1781.

Shrubs with scandent branches; leaves usually  
4-foliolate, the terminal pair larger; leaflets  
elliptic or ovate, acute, all inequilateral, up to  
10 x 5 cm, the lower pair with a prominent gland at  
the junction of petiolules; flowers bright yellow in  
terminal, pubescent panicles.

A very rare species, seemingly a recent  
introduction to India.

Flowers: Sept. - Dec.

Sivarajan 1519.

C.tora Linn. Sp. Pl. 376. 1753; FBI. 2:263. 1878, in part; de Wit in Webbia 11:276. 1956; Sant. 71. 1960; Symon in Trans. Roy. Soc. S. Austr. 90:92. 1966; Gamb. 284.

Woody annuals; leaves usually 6-foliolate; leaflets obovate-obtuse; flowers bright yellow in axillary, few-flowered clusters; pods linear; seeds oblong, truncate at tips, many.

A common weed during monsoon. Leaves sometimes used as a vegetable.

Flowers: Sept. - Nov.

Sivarajan 1263.

C.fistula Linn. Sp. Pl. 377. 1753; FBI. 2:261. 1878; de Wit in Webbia 11:207. 1956; Sant. 71. 1960; Gamb. 281.

Deciduous trees; leaves 8-12-foliolate; leaflets large, ovate-lanceolate; flowers bright yellow in long, pendulous racemes; pedicels very long; pods cylindrical, pendulous; seeds immersed in a pulp.

Flowers: Apr. - May

Sivarajan 1158.

C.hirsuta Linn. Sp. Pl. 378. 1753; de Wit in Webbia  
11:250. 1956; Symon in Trans. Roy. Soc. S. Austr.  
90:88-89. 1966; Gamb. 284.

Densely hirsute shrubs; leaflets 3-4 pairs,  
ovate lanceolate, densely hirsute on both surfaces;  
flowers yellow; pods linear, densely villous.

On roadsides and waste places on the slopes.

Rare.

Flowers: Sept. - Nov.

Sivarajan 1528.

C.occidentalis Linn. Sp. Pl. 377. 1753; FBI. 2:262.

1878; de Wit in Webbia 11:256. 1956; Symon in Trans.  
Roy. Soc. S. Austr. 90:87-88. 1966; Gamb. 284.

Branched, glabrous shrubs; leaflets 14-20,  
lanceolate; flowers in terminal racemes, yellow; pods  
narrowly oblong, flat; seeds ovoid, compressed, acute  
at one end.

Common on road sides and waste places.

Flowers: Oct. - Mar.

Sivarajan 715.

C.nigricans Vahl, Symb. Bot. 1:30. 1790; Benth. in  
Trans.Linn. Soc. 27:577. 1871; Prain in J. As. Soc.  
Beng. 66:477. 1898; Cooke 1:446; Gamb. 286.

Pubescent undershrubs; leaves 16-20-foliolate;  
leaflets oblong-obtuse, apiculate, pubescent on both  
surfaces, up to 1 x 0.4 cm; flowers small, yellow in  
supra-axillary fascicles; pods 3-4 x 0.5 cm; compressed,  
puberulous.

Common on the grassy, lateritic slopes at  
Devagiri.

Flowers: Nov. - Mar.

Sivarajan 1618.

C.siamea Lamk. Encycl. Meth. Bot. 1:648. 1785; FBI.  
2:264. 1878; de Wit in Webbia 11:263. 1956; Gamb.  
285.

Tall trees with tomentose branches; leaflets  
16-20, elliptic-obtuse, mucronate; flowers yellow in  
terminal, paniculate corymbs; pods linear, long  
pendulous.

Flowers: Mar. - July

Sivarajan 1137.

Peltophorum (Vogel) Walp.(nom.cons.)

P. pterocarpum (DC.) Backer ex K. Heyne, Nutt. Pl. Ned. Ind. (ed.2) 2:755. 1927; Blake in Austr. J. Bot. 2:112. 1954. Inga pterocarpa DC. Prod. 2:441. 1825. Caesalpinia inermis Roxb. Hort. Beng. 90. 1814, nom. nud. Fl. Ind. 2:367. 1832. P. ferrugineum Benth. Fl. Austr. 2:279. 1864; FBI. 2:257. 1878. P. inermis (Roxb.) Naves in Blanco Fl. Fil. (ed.3) t. 355. ex F. Vill. Nov. Append. 69. 1880; Sant. 70. 1960.

Trees with rusty tomentose branches; leaves bipinnate; leaflets oblong-obtuse, up to 2 x 1 cm; flowers bright yellow in dense, axillary or terminal, paniculate racemes; pods thin, oblong, up to 10 cm long.

Commonly cultivated as avenue trees.

Flowers: July - Mar.

Sivarajan 392.

Wagatea Dalz.

W. spicata Dalz. in Kew J. Bot. 3:89. 1851; FBI. 2:261. 1878; Sant. 71. 1960; Gamb. 281.

Woody, prickly climbers; leaves bipinnate; rachis prickly; leaflets oblong-obtuse, glabrous;

flowers red in long, terminal, simple or paniculate spikes; pods linear-oblong, constricted between seeds.

An endemic species of South-West India, clad with stout prickles on the stem, branches and the rachis, collected from the hill-slopes near Tiruvangad temple.

Flowers: Nov. - Jan.

Sivarajan 811.

Caesalpinia Linn.

Key to the species

1. Plants armed:

2. Straggling shrubs ..... mimosoides

2. Small trees ..... sappan

1. Plants unarmed:

3. Leaflets 8-10 mm broad ..... pulcherrima

3. Leaflets 2 mm broad ..... coriaria

C. mimosoides Lamk. Encycl. Meth. Bot. 1:452. 1783;

FBI. 2:256. 1878; Cooke 1:440; Gamb. 279.

Stragglers; branches and petioles profusely prickly; leaflets 16-20, oblong-mucronate, 5 x 2 mm; flowers bright yellow in terminal and leaf-opposed

racemes; pods linear-oblong, long-beaked, dipressed between the seeds.

Usually seen on the grassy slopes.

Flowers: Oct. - Jan.

Sivarajan 1838.

C.sappan Linn. Sp. Pl. 381. 1753; FBI. 2:255. 1878;  
Cooke 1:438; Gamb. 279.

Small trees; trunk prickly; leaflets oblong-obtuse, up to 1 x 0.5 cm; rachis tomentose; flowers bright yellow in terminal, paniced racemes; pods compressed; woody, 5-7 x 3-4 cm.

Flowers: Sept. - Dec.

Sivarajan 1379.

C.pulcherrima (Linn.) Swartz, Obs. 166. 1791; FBI.  
2:288. 1878; Gamb. 279. Poinciana pulcherrima Linn.  
Sp. Pl. 380. 1753; Mahes. 144.

Shrubs; leaflets 6-8 pairs on each pinna; oblong-obtuse, glabrous; flowers in terminal corymbs, yellow, red or orange; stamens much exerted.



A common ornamental.

Flowers: throughout the year

Sivarajan 945.

C.coriaria Willd. Sp. Pl. 2:532. 1799; Cooke 1:440,  
Gamb. 279.

Trees with tomentose branches; pinnae 50-56-  
foliolate; leaflets very narrow, oblong; flowers small,  
greenish white, in dense, axillary racemes; pods curved.

Collected from the premises of St. Joseph's  
College, Devagiri.

Flowers: Dec. - Jan.

Sivarajan 945.

Delonix Rafin.

D.regia (Boj. ex Hook.) Rafin. Fl. Tell. 2:92. 1836;  
Sant. 71. 1960; Gamb. 280. Poinciana regia Boj.  
ex Hook. Bot. Mag. 2884. 1829; FBI. 2:260. 1878.

Large, deciduous trees; leaves bipinnate,  
with 15-17 pairs of pinnae; leaflets many, oblong-  
obtusate; flowers scarlet red with a mottled odd petal,

in terminal and axillary, lax corymbs; pods very long, woody and pendulous.

Commonly cultivated as an avenue tree. During the flowering season, the trees are without leaves.

Flowers: Apr. - May

Sivarajan 1098.

MIMOSACEAE R. Br.

Key to the genera

1. Leaflets 2 to each pinnae ..... Pithecellobium
1. Leaflets more than 2:
  2. Flowers capitate:
    3. Heads in panicles:
      4. Plants armed ..... Acacia
      4. Plants unarmed:
        5. Stipules large ..... ~~Al~~<sup>b</sup>gizia
        5. Stipules not as above ... Abarema
    3. Heads not in panicles:
      6. Plants prickly ..... Mimosa
      6. Plants not prickly:
        7. Leaflets acute ..... Leucaena

- 7. Leaflets obtuse:
  - 8. Heads globose ..... Xylia
  - 8. Heads not globose ..... Samanea
- 2. Flowers in racemes ..... Adenanthera

Pithecellobium Mart.(nom.cons.)

P.dulce (Roxb.) Benth. in Hook. Lond. J. Bot. 3:199.  
1844; FBI. 2:302. 1878; Sant. 78. 1960; Gamb. 308;  
Isely in Madrono 21:283. 1972. Mimosa dulcis Roxb.  
Pl. Corom. 1:67. t. 99. 1798.

Trees with spinose stipules; pinnae in pairs;  
leaflets 2 at the tips of the rachis; heads in terminal  
panicles; flowers small; pods coriaceous, twisted;  
seeds arillate.

Flowers: Jan. - Mar.

Sivarajan 187.

Acacia Mill.

A.pennata (Linn.) Willd. Sp. Pl. 4:1090. 1805; Merr.  
in J. Arn. Arb. 23:396. 1942; Sant. 76. 1960;  
Gamb. 304. Mimosa pennata Linn. Sp. Pl. 522. 1753.

Prickly, straggling shrubs; pinnae many-  
foliolate; leaflets oblong-obtuse, about 5 x 1.5 mm;

flower-heads fascicled in terminal panicles, yellowish white; pods flat, thin and dry; seeds ovoid-oblong, compressed.

Flowers: July - Sept.

Sivarajan 393.

Albizia Durazz.

A. chinensis (Osbeck.) Merr. in Amer. J. Bot. 3:575.

1916; Sant. 77. 1960. Mimosa chinensis Osbeck. Dag.

Ostind. Resa 233. 1757. Albizia stipulata Boiv.

in Encycl. 19. Seicl. 2:33. 1833; FBI. 2:300. 1878.

Small trees with densely rusty-tomentose branches; stipules large, deciduous; pinnae with 80-90, falcate leaflets; flower-heads fascicled on axillary or terminal panicles; pods thin, flat, reticulate; seeds ovate, compressed.

Flowers: Mar. - Apr.

Sivarajan 179.

Abarema Pittier

A. bigemina (Linn.) Kosterm. in Bull. Org. Sci. Res.

Indonesia 20:51. 1954. Mimosa bigemina L'

Pl. 517. 1753. Pithecellobium bigeminum (Linn.)  
Mart. in Herb. Fl. Bras. 115. 1837; Benth. in Hook.  
Lond. J. Bot. 3:206. 1844, 'Pithecolobium'; FBI.  
2:303. 1878; Gamb. 308.

Small trees; leaves bipinnate; leaflets 2-3  
pairs to each pinna, elliptic-lanceolate; heads few-  
flowered, clustered in panicles, pubescent; flowers  
small, subsessile, greenish yellow; pods spiral,  
compressed, valves bright red within.

Flowers: Jan. - Mar.

Sivarajan 180.

Mimosa Linn.

Key to the species

1. Pinnae 1-2 pairs ..... pudica  
1. Pinnae 3-4 pairs ..... invisa

M. pudica Linn. Sp. Pl. 518. 1753; FBI. 2:291. 1878;  
Sant. 75. 1960; Gamb. 298.

Diffuse herbs; stem terete with recurved  
prickles; leaves very sensitive; pinnae 1-2 pairs,  
digitate; leaflets 10-18 pairs, linear-oblong; heads

globose; flowers 4-merous, pink, polygamous; pods flat, bristly, slightly curved, with 3-5, 1-seeded joints.

Flowers: Sept. - Mar.

Sivarajan 1834.

M.invisa Mart. Herb. Fl. Bras. 121. 1837; Nair in J. Bombay nat. Hist. Soc. 61:469-71. t. 1. 1964 ('65); Fosberg in Phytologia 15:499. 1968.

Diffuse shrubs; stem angular, prickly; leaves sensitive; pinnae 3-5 pairs; leaflets small, linear; heads pink, small.

Collected from the waste places near Cheruvannoo

Flowers: Sept. - Dec.

Sivarajan 1587.

Leucaena Benth.

L.leucocephala (Lamk.) de Wit in Taxon 10:53. 1961.

Mimosa leucocephala Lamk. Encycl. Meth. Bot. 1:12.

1783. Acacia glauca Willd. Sp. Pl. 4:1075. 1805.

Leucaena glauca (Willd.) Benth. in Hook. J. Bot.

4:416. 1842; FBI. 2:290. 1878.

Small trees; leaves bipinnate, pubescent; leaflets 12-16 pairs to each pinna, linear-oblong, acute, inequilateral, 2.5 mm broad; flowers in axillary,

According to Gillis (op.cit.) the correct name of the species is Leucaena latisiliqua (Linn.) Gillis (in Taxon 23: 190. 1974), based on Mimosa latisiliqua Linn., all the other names being synonyms.

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Xylia Benth.

X.xylocarpa (DC.) Taub. in Bot. Centralbl. 47:395.

1891; Gamb. 295. Inga xylocarpa DC. Prod. 2:439.

1825. Xylia dolabriformis Benth. in Hook. J. Bot. 4:417. 1842; FBI. 2:286. 1878; Cooke 1:465.

Trees with tomentose branches; leaves bipinnate; leaflets opposite, oblong or ovate, up to 9 x 5.5 cm; flowers in axillary, long-pedunculate, globose heads; pods oblong, flat, rusty-tomentose; seeds ellipsoid, compressed.

Flowers: Mar. - Apr.

Sivarajan 173.

Samanea (Benth.) Merr.

S. saman (Jacq.) Merr. in J. Wash. Acad. Sc. 6:47. 1916;  
Britton & Rose in N. Amer. Fl. 23:34. 1928; Hutch.  
Gen. Pl. 1:294. 1964. Mimosa saman Jacq. Fragm. 15.  
t. 9. 1800. Pithecolobium saman (Jacq.) Benth. in  
Hook. Lond. J. Bot. 3:216. 1844.

Large trees; branchlets tomentose; leaves  
bipinnate; leaflets ovate or obovate-obtuse; flowers  
in fascicled, axillary heads; peduncles 5-8 cm long;  
pods indehiscent, compressed, strongly margined; seeds  
many, embed<sup>d</sup> in a pulp.

Common on the banks of Feroke River and  
Kallai River, occasionally cultivated as an avenue tree  
on the roadsides.

Flowers: Mar. - May

Sivarajan 1040.

Adenanthera Linn.

A. pavonina Linn. Sp. Pl. 384. 1753; FBI. 2:287. 1878;  
Cooke 1:466; Gamb. 296.



Trees; leaves bipinnate, pinnae 17-19-foliolate; leaflets alternate, elliptic-obtuse; flowers in axillary sp<sup>i</sup>ciform racemes; pods oblong, compressed; seeds blood-red, discoid.

Flowers: Mar. - June

Sivarajan 882, 935.

CRASSULACEAE DC.

Kalanchoe Adans.

Key to the species

- 1. Leaves with bulbils at the crenatures .... pinnata
- 1. Leaves with bulbils at the tips ..... verticilla

K.pinnata (Lamk.) Pers. Syn. 446. 1805; Back. in Fl.

Males. 4:199. 1951. Cotyledon pinnata Lamk. Dict.

2:141. 1786. Bryophyllum calycinum Salisb. Parad.

Lond. t. 3. 1805; FBI. 2:413. 1878. B.pinnatum (Lamk.

Oken, Allg. Natur. 3:1966. 1841; Gamb. 319.

Succulent herbs; leaves 1-7-foliolate; leaflets broadly elliptic, crenate, thick and fleshy; flowers red pendent in long-peduncled, large panicles; calyx inflat

cylindric, 4-lobed; corolla longer, cylindric, 4 lobed; stamens 8; carpels 4, connate at base; follicles enclosed in the persistent calyx and corolla, many seeded.

This tropical African plant, now naturalised in India is common in shaded, hard laterite soils, and is propagated by the bulbils formed in the crenature of leaves.

Flowers: Dec. - Jan.

Sivarajan 879.

K. verticillata Elliot in J. Linn. Soc. 29:14. 1891;

Bailey, 467. 1891.

Erect, succulent herbs; leaves verticillate, subcylindric, linear, and mottled; bulbils clustered at the tips of leaves; flowers red, pendent in terminal panicles.

This tropical African plant is common in gardens, but seen as an escape also.

Flowers: Dec. - Jan.

Sivarajan 1642.

DROSERACEAE Salisb.

Drosera Linn.

Key to the species

1. Leaves spathulate ..... burmanni  
1. Leaves linear ..... indica

D. burmanni Vahl, Symb. 3:50. 1794; King in J. As. Soc. Beng. 66:306. 1897; Steen in J. Arn. Arb. 28:421. 1947; Steenis in Fl. Males. 4(4):378. 1953; Gamb. 320.

Scapigerous herbs; leaves radical, rosulate, spathulate, covered with glandular hairs; scapes one or more, leafless, filiform; flowers white in secund racemes towards the tips of the scapes; calyx lobes linear; petals spathulate; stamens as many as petals; styles 5; capsules 5-valved; seeds many, minute, reticulate.

Flowers: Mar. - Apr.

Sivarajan 1082, 1660.

Caulescent herbs; leaves linear with dense, gland-tipped hairs; racemes leaf-opposed; flowers deep-purple, rarely white; calyx lobes glandular; petals obovate; stamens as many as petals; styles 3, bifid; capsules 3-valved; seeds many, reticulate.

Common on the wet, grassy hill slopes during monsoon.

Flowers: Aug. - Nov.

Sivarajan. 591.

#### RHIZOPHORACEAE R. Br.

##### Key to the genera

- 1. Fruits viviparous ..... Kandelia
- 1. Fruits not viviparous ..... Carallia

##### Kandelia (DC.) Wt. & Arn.

K.candel (Linn.) Druce, Rep. Bot. Exch. Cl. Br. Isl. 1913:4210. 1914; Ding Hou in Fl. Males. 5(4):473. 1958. Rhizophora candel Linn. Sp. Pl. 443. 1753. Kandelia rheedii Wt. & Arn. Prod. 311. 1834; FBI. 2:437. 1878; Gamb. 324.

Small trees; leaves oblong-obtuse to oblanceolate, up to 16 x 4 cm; flowers white in axillary cymes; fruits long, spindle shaped, viviparous.

Common along the back waters and in salt marshes at Feroke. Now this area is being reclaimed and these plants are disappearing.

Flowers: Jan. - Aug.

Sivarajan 1059.

Carallia Roxb. (nom. cons.)

C. brachiata (Lour.) Merr. Philip. J. Sci. 15:249. 1919;

Ding Hou in Fl. Males. 5(4):485. 1958. Diatoma

brachiata Lour. Fl. Cochinch. 296. 1790. Carallia

integerrima DC. Prod. 3:33. 1828; FBI. 2:439. 1878;

Gamb. 325.

Tall trees with horizontal branches; leaves obovate, obtuse or retuse at tip; flowers in forked, capitate cymes, greenish white; fruits small, 1-loculed subglobose.

Flowers: June - July

Sivarajan 1177.

COMBRETACEAE R. Br.

Key to the genera

- 1. Trees ..... Terminalia
- 1. Climbing shrubs:
  - 2. Petals 0 ..... Calycopteris
  - 2. Petals as many as calyx lobes:
    - 3. Flowers 8-10 cm long ..... Quisqualis
    - 3. Flowers 1-1.5 cm long ..... Combretum

Terminalia Linn. (nom. cons.)

Key to the species

- 1. Fruits winged; leaves acute or  
acuminate at apex ..... paniculata
- 1. Fruits not winged; leaves obtuse at apex:
  - 2. Fruits compressed ..... catappa
  - 2. Fruits not compressed ..... bellirica

T. paniculata Roth, Nov. Pl. Sp. 383. 1821; Wt. & Arn.  
Prod. 315. 1834; FBI. 2:448. 1878; Gamb. Ind. Timb.  
344. 1902; Brand. Ind. Tr. 311. 1911; Blatt. in J.  
Ind. Bot. Soc. 8:250. 1929; Gamb. 329.

Trees; branches tomentose; leaves ovate or  
elliptic-oblong, acute or acuminate at apex, 15-20 x  
8-10 cm; petiole very short; flowers greenish, minute,

spikate in terminal or subterminal panicles; calyx cup shaped, teeth triangular; petals 0; fruits tomentose, with 3 unequal wings.

Flowers: Jan. - Feb.

Sivarajan 1.

T. catappa Linn. Syst. Nat (ed.12) 2:674. 1767 (err. 638)

& Mant. 1:128. 1767; FBI. 2:444. 1878; Blatt. in J.

Ind. bot. Soc. 8:250. <sup>1929,</sup> Exell in Fl. Males. 4(5):566.

1954; Gamb. 328.

Tall trees; branches usually spreading and horizontal; leaves large, obovate or oblanceolate, obtuse, cordate at base; petioles very short; flowers greenish white in slender, axillary spikes; fruits ovoid, compressed, winged; seeds elliptic.

Flowers: Nov. - Dec.

Sivarajan 901.

T. bellirica (Gaertn.) Roxb. Pl. Corom. 2:54, t. 198.

1805; FBI. 2:445. 1878; Blatt. in J. Bombay nat.

Hist. Soc. 8:250. 1929; Exell in Fl. Males. 4(5):569.

1954; Gamb. 328. Myrobalanus bellirica Gaertn. Fruct.

2:90. t. 97. 1791.

Tall, deciduous trees; leaves broadly elliptic to obovate, glabrous; petioles long; flowers greenish white in axillary spikes, pubescent; drupes subglobose, tomentose, faintly ridged.

Flowers: Jan. - Feb.

Sivarajan 1681.

Calycopteris Lamk.

C.floribunda (Roxb.) Lamk. Encycl. Meth. Bot. Supply.

2:41. 1811 & Tabl. Encycl.2:485. 1819; FBI. 2:449.

1878. Exell in Fl. Males. 4(5):584. 1954; Gamb. 331.

Getonia floribunda Roxb. Pl. Corom. t. 87. 1820.

Climbing, woody shrubs; leaves elliptic to oblong, acute or acuminate; tomentose on both surface; flowers sessile in dense, terminal, pubescent panicles; calyx accrescent, tube longer than the ovary, lobes reflexed; petals 0; stamens 10; fruits oblong, 5-ridged, pubescent with a crown of the calyx lobes.



Common in the exposed hard laterite of  
the hill slopes.

Flowers: Feb. - May

Sivarajan 69.

Quisqualis Linn.

Q. indica Linn. Sp. Pl. (ed.2) 1:556. 1762; FBI.  
2:459. 1878; ~~Expell~~ in Fl. Males. 4:547. 1954;  
Gamb. 332.

Climbing shrubs; leaves elliptic or oblong,  
acuminate; flowers white, changing to red in  
axillary or terminal spikes; calyx tube much longer  
than the ovary, 5-7 cm long, limb 5-lobed; petals 5,  
elliptic-obtuse; stamens 10; ovary 1-celled; ovules  
few.

Flowers: throughout the year.

Sivarajan 1065.

Combretum Loefl. (nom.cons.)

C.latifolium Blume, Bijdr. 641. 1825; Exell in Fl.

Males. 4(5):542. 1954. C.extensum Roxb. [ Hort. Beng.

28. 1814, nom. nud.] ex Don in Trans. Linn. Soc.

Lond. 15:414, 422. 1827; FBI. 2:458. 1878; Gamb. 332.

Climbing, woody shrubs; leaves ovate or elliptic, acute or shortly acuminate; flowers greenish white in simple or paniculate spikes, usually on older branches; calyx pubescent, lobes 4, triangular-acute; petals 4, emarginate at apex; fruits with 4 papery, striate wings.

Extensive climbers in the undisturbed wood lands.

Flowers: Dec. - Jan.

Sivarajan 1597.

MYRTACEAE Juss.

Key to the genera

1. Flowers pedicellate:

2. Ovary usually 2-celled ..... Syzygium

2. Ovary many-celled ..... Psidium

1. Flowers sessile ..... Callistemon

Syzygium Gaertn. (nom.cons.)

Note: The segregation of Syzygium from the genus Eugenia has been a matter of discord, and still continues to be so. The immensely wide variations displayed by the complex, together with the want of a comprehensive monographic work has contributed much to the confusion. Merrill and Perry (J. Arn. Arb. 29:99-100. 1938) favoured the separation, mainly based on seed characters. According to their generic concept Syzygium possesses "naked embryo" with two distinct cotyledons and the seed-coat remains loosely attached to the pericarp; whereas the embryo of Eugenia is "not naked" but with a definite seed-coat and is "Pseudomonocotyledonous". Moreover they have geographically delimited the two genera, Syzygium to include most of the Old World species and Eugenia characteristically confined to tropical America.

Many botanists like Henderson (Gard. Bull. Singapore. 12:1-293. 1949) did not favour this segregation and preferred to adhere to Bentham and Hooker's concept of the genus Eugenia to include "everything". Henderson (loc.cit.) and Wilson (Pacific. Sc. 11:161-180. 1957) found that the degree of fusion of cotyledons and the extend of the adherance of the testa to the pericarp is quite variable. Several

intermediate forms in the inflorescence, perianth and floral features were also met with.

However, evidences have been accumulating in recent times, in favour of the splitting. Many of the organographic characters of pubescens, bracteoles and pseudo-pedicels have been emphasised. Rudolf Schmid (Am. J. Bot. 59:423-436. 1972) has presented the totality of the differences between the two genera and has concluded - "on the basis of the facts from both vegetative and especially reproductive anatomy, it is difficult to escape the conclusion that there are at least two largely allopatric, co-ordinate groups embraced by Eugenia (sensu lato); the strictly Old World genus Syzygium (sensu lato) and the mainly New World genus Eugenia (sensu strico)".

#### Key to the species

- 1. Leaves obovate, obtuse at apex ..... caryophyllatum
- 1. Leaves lanceolate, acuminate:
  - 2. Flowers in 2-5-flowered cymes ..... jambos
  - 2. Flowers in many-flowered panicles:
    - 3. Branches of panicles at right
      - angles .... cumini
    - 3. Branches of panicles ascending ... zeylanicum

S. caryophyllatum (Linn.) Alston in Trim. Handb. Fl. Ceyl. 6:116. 1931; Sant. 92. 1967. Myrtus caryophyllatus Linn. Sp. Pl. 472. 1753. Eugenia caryophyllaea Wt. ill. 2:15. 1850; FBI. 2:490. 1878.

Shrubs or small trees; leaves obovate, obtuse or emarginate at apex, up to 11 x 5.2 cm; flowers white, small, paniculate in the subterminal axils; berries purple, ovoid.

Common among the bushes on the grassy slopes.

Flowers: Feb. - Mar.

Sivarajan 977, 1002.

S. jambos (Linn.) Alston in Trim. Handb. Fl. Ceyl. 6:115. 1931; Merr. & Perry in J. Arn. Arb. 19:114 & 217. 1938; Sant. 93. 1967. Eugenia jambos Linn. Sp. Pl. 470. 1753; FBI. 1:474. 1878. Jambosa vulgaris DC. Prod. 3:286. 1828; Gamb. 336.

Small trees; leaves narrowly lanceolate, acuminate, base acute, intramarginal vein conspicuous; flowers greenish white large in terminal cymes; berries globose.

Very commonly cultivated for the edible fruits,  
but also wild.

Flowers: May - Aug.

Sivarajan 1505.

S. cumini (Linn.) Skeels in U.S. Dept. Agr. Bur. Pl. Ind.  
Bull. 248:2. 1912; Alston in Trim. Fl. Ceyl. 6:116.  
1931; Merr. & Perry in J. Arn. Arb. 19:108 & 230.  
1938; Sant. 92. 1967. Myrtus cumini Linn. Sp. Pl. 471.  
1753. Eugenia jambolana Lamk. Encycl. Meth. Bot.  
3:198. 1789; FBI. 2:499. 1879. Syzygium jambolanum DC.  
Prod. 3:259. 1828; Gamb. 340.

Trees; leaves elliptic-lanceolate, often  
abruptly acuminate, lateral veins prominent, close,  
uniting in an intramarginal nerve, 4-5 cm broad; flowers  
greenish, paniced often in the axils of fallen leaves;  
berries globose, purple.

Flowers: Mar. - Apr.

Sivarajan 1029.

S. zeylanicum (Linn.) DC. Prod. 3:260. 1828; Merr. & Perry in J. Arn. Arb. 19:101, 224. 1938; Gamb. 338. Myrtus zeylanica Linn. Sp. Pl. 472. 1753. Eugenia zeylanica (Linn.) Wt. ill. 2:15. 1841; FBI. 2:485. 1878.

Much branched, woody shrubs; leaves ovate or lanceolate, acuminate, coriaceous, short-petioled; flowers greenish white in terminal and axillary panicles.

Very common ~~on~~ the hill slopes, among bushes.

Flowers: Feb. - Mar.

Sivarajan 100.

Psidium Linn.

P. guajava Linn. Sp. Pl. 470. 1753; FBI. 2:468. 1878; Merr. & Perry in J. Arn. Arb. 19:198. 1938; Sant. 85. 1960; Gamb. 334.

Small trees; trunk usually without bark; leaves elliptic-oblong, obtuse, pubescent; flowers white on axillary peduncles; berries ovoid or globose with a crown of persistent calyx limb; seeds many.

Flowers: June - July

Sivarajan 1175.

Callistemon R. Br.

C.citrinus (Curt.) Stapf in Bot. Mag. 150, t. 9050.

1925. Domin in Biblioth. Bot. 89:454. 1928; Bailey  
725; Mathew in Rec. Bot. Sur. Ind. 20(1):104. 1969.

Metrosideros citrina Curt. in Bot. Mag. 8, t. 260.

1794. Callistemon lanceolatus DC. Prod. 3:223. 1828.

Trees; leaves narrowly lanceolate-acute, up to  
8 x 1 cm; flowers red, sessile towards the tips of  
branches, forming a spike.

A rare species, collected from the St. Joseph's  
College Campus, Devagiri.

Flowers: Dec. - Mar.

Sivarajan 905.

BARRINGTONIACEAE Rudolphi

Key to the genera

- 1. Fruits globular ..... Careya
- 1. Fruits angular ..... Barringtonia



Careya Roxb. (nom.cons.)

C.arborea Roxb. Pl. Corom. 3:14, t. 218. 1829 & Fl.

Ind. 2:636. 1832; FBI. 2:511. 1879; Sant. 84. 1960;  
Gamb. 345.

Deciduous trees; leaves large, obovate, obtuse or retuse at apex, serrulate, coriaceous; flowers reddish, sessile; calyx lobes acute; petals oblong-obtuse; stamens many, reddish; fruits large, 7-10 cm across; glabrous.

Flowers: Mar. - Apr.

Sivarajan 1833.

Barringtonia J.R. & G.Forst.(nom.cons.)

B.acutangula (Linn.) Gaertn. Fruct. 2:97, t. 101. 1791;

FBI. 2:508. 1879; Gamb. 344; Payens in Bluméea 15(2):

226. 1967. Eugenia acutangula Linn. Sp. Pl. 471.

1753.

Trees; leaves elliptic to obovate, serrate, leathery; flowers red in long, pendulous racemes; calyx angular, lobes 4; fruits angular, truncate at tip.

Seen along the banks of rivers and streams  
and also near wet fields.

Flowers: Mar. - Apr.

Sivarajan 135, 983.

Note: Of the two subspecies that Payens (loc. cit.) distinguished, the author's specimens fit into the ssp. acutangula, since they are having distinctly pedicellate flowers and acutely angled fruits.

#### MELASTOMATACEAE Juss.

##### Key to the genera

- 1. Flowers trimerous ..... Sonerila
- 1. Flowers 4-5 merous:
  - 2. Calyx with stalked bristles ..... Osbeckia
  - 2. Calyx without stalked bristles ..... Melastoma

##### Sonerila Roxb. (nom. cons.)

S. rheedii Wall. (Cat. 4096. 1831, nom. nud.) ex Wt.

& Arn. Prod. 1:321. 1834; Stapf in Ann. Bot. 6:307.  
1892; Gamb. 353; Nair in J. Bombay nat. Hist. Soc.  
48:324. 1969.

Annual herbs; stem short, translucent; leaves elliptic-acute or obtuse, bristly hairy on both surfaces, penninerved; flowers rose-purple, trimerous, shortly pedicelled, on terminal, secund racemes; capsules many-seeded, opening by apical valves.

A pretty herb in moist shady places, on the hill slopes. Very often the plant is purple.

Flowers: Aug. - Nov.

Sivarajan 487, 1420, 1421.

Osbeckia Linn.

- 1. Annual herbs ..... truncata
- 1. Perennial shrubs ..... octandra

O. truncata D. Don, in Wt. & Arn. Prod. 322. 1834; FBI.

2:514. 1879; Sant. 85. 1960; Gamb. 349.

Annual, densely hispid herbs; leaves ovate or elliptic-acute, up to 3 x 1.5 cm, 3-5 nerved from base; flowers 4-merous, deep purple, 1 cm across; calyx lobes and the intermediate appendages crowned with tufts of stalked bristles; capsules open by apical pores.

Common on the grassy slopes and also as a weed  
in cultivated fields.

Flowers: Jan. - Mar.

Sivarajan 51.

O. octandra (Linn.) DC. Prod. 3:142. 1828; Cogn. in DC.

Mon. Phan. 7:320. 1891; FBI. 2:521. 1879; Gamb. 348.

Melastoma octandra Linn. Sp. Pl. 560. 1753.

Woody, much branched shrubs or undershrubs;  
leaves elliptic-acute, adpressed hairy, basally veined;  
flowers pale purple, 2.5 cm across; capsules dehiscing  
by apical pores.

Collected from the slopes near Experimental  
Plantation, Kottamparamba.

Flowers: Jan. - Mar.

Sivarajan 67.

Melastoma Linn.

M. malabathricum Linn. Sp. Pl. 390. 1753; FBI. 2:523.

1879; Gamb. 350.

Much branched shrubs covered with adpressed scales; leaves elliptic-acute, basally veined, up to 8 x 4 cm; flowers large, purple, 5 cm across in terminal cymes; fruits irregularly dehiscent.

Along the banks of streams or ponds.

Flowers: Mar. - July

Sivarajan 186.

MEMECYLACEAE DC.

Memecylon Linn.

Key to the species

- 1. Leaves petioled ..... umbellatum
- 1. Leaves sessile or subsessile ..... depressum

M.umbellatum Burm. f. Fl. Ind. 87. 1768; Cooke 1:503; Sant. 86. 1960; Gamb. 355. M.edule Roxb. Pl. Corom. 1:59, t. 82. 1795; FBI. 2:563. 1879; Gamb. 356.

Shrubs or small trees; leaves petioled, broadly elliptic-acute, leathery, glabrous; flowers deep-violet in paniculate umbels, usually on the old wood; calyx campanulate, minutely 4-toothed; petals ovate-acute;

stamens 8, connective spurred behind the anthers;  
berries ovoid, yellowish.

Common on the grassy slopes. It is a beautiful  
sight to see this plant in full bloom.

Flowers: Jan. - Mar.

Sivarajan 156, 183.

M. depressum Benth. [in Wall. Cat. 4101. 1831, nom. nud.]  
ex Triana in Trans. Linn. Soc. 28:158. 1872; Gamb.  
357. M. amplexicaule Roxb. var. malabarica Clarke in  
Hook. f. Fl. Brit. Ind. 2:559. 1879, in part.

Woody shrubs; leaves sessile, oblong-lanceolate,  
cordate at base, glabrous and leathery; flowers blue  
5-10, fascicled on short, axillary tubercles, tetramerous;  
stamens with spurred connectives.

Common along the bushes on the grassy slopes.

Flowers: Mar. - May

Sivarajan 1080.

LYTHRACEAE Jaume St. Hil.

Key to the genera

1. Herbs:

2. Flowers in dense, axillary clusters .... Ammannia

2. Flowers in spikes or solitary in axils.. Rotala

1. Shrubs or trees:

3. Stamens numerous ..... Lagerstroemia

3. Stamens 8 ..... Lawsonia

Ammannia Linn.

Note: The species of Ammannia and Rotala are very often confused, but can be promptly distinguished by the fruits. van Leeuwen (Blumea 19(1):53-56. 1971) made a distinction of these two genera as follows: The pericarp of both the genera are having two layers of parenchyma. In Rotala the inner layer is of transversely elongated, strongly lignified cells, while Ammannia has both the layers almost similar.

The author's collection of Ammannia includes only one species, A.baccifera. For the subspecific classification the author has followed Koehne (Op.cit.) and two subspecies are distinguished as given below.

Key to the subspecies

1. Leaves lanceolate-acute ..... ssp. baccifera

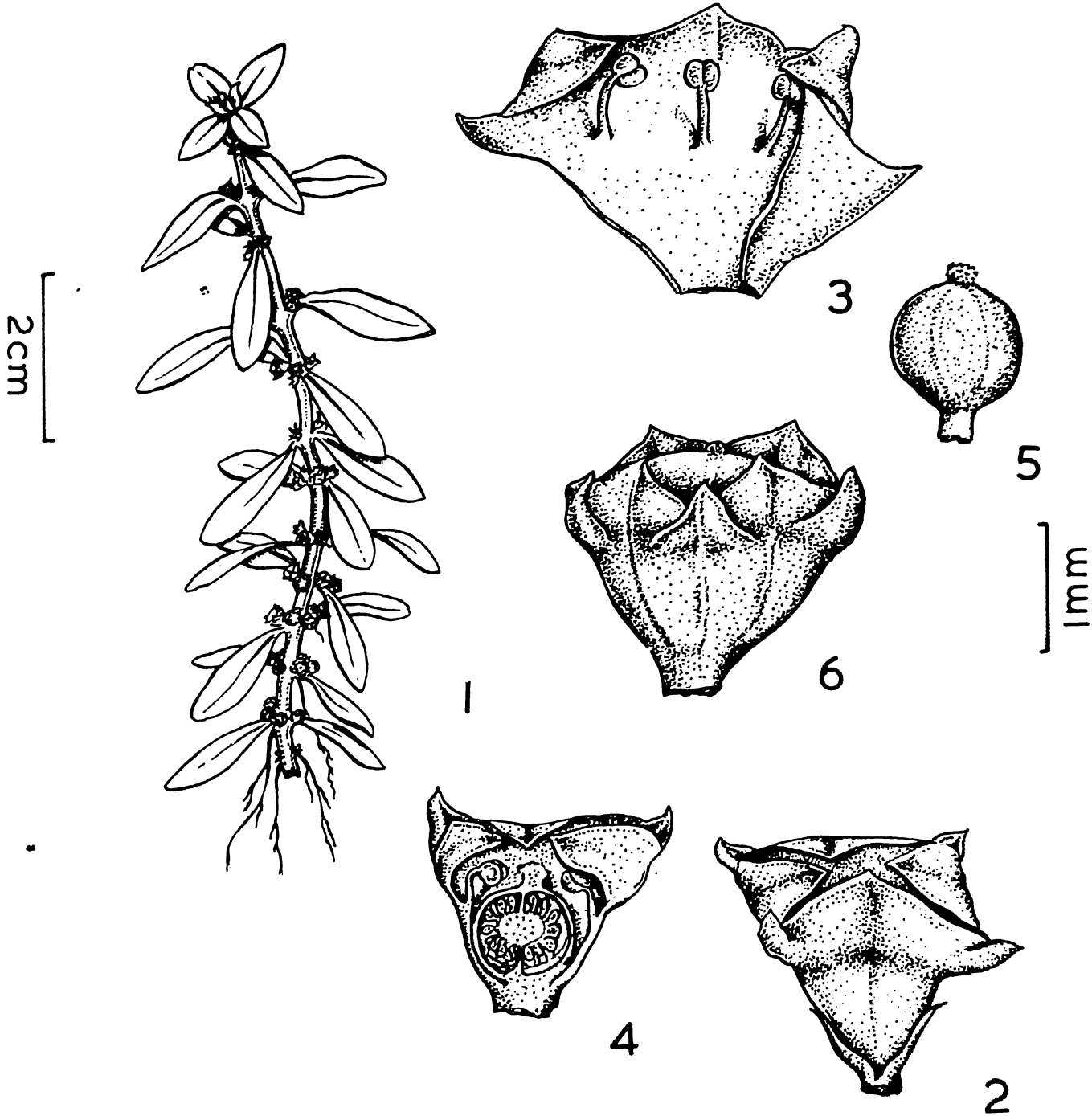
1. Leaves elliptic-obtuse ..... ssp. aegyptiaca

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The author is thankful to Dr. (Miss.) B.L.J. van Leeuwen, Rijksherbarium, Leiden, for confirming the identification of A.baccifera ssp. aegyptiaca and to Mr. Vasudevan Nair of Govt. Victoria College, Palghat for his critical comments on the Rotala specimens.

PLATE 3

Ammannia baccifera Linn., ssp.aegyptiaca  
(Willd.) Koehne. Fig. 1. A branch. Fig.2.  
Flower. Fig.3. Calyx split open revealing  
the stamens. Fig.4. L.S. of flower.  
Fig.5. Pistil. Fig.6. Capsule with the  
persistent calyx.





AMMANNIA BACCIFERA LINN.

ssp. AEGYPTIACA (WILLD.) KOEHNE

A. baccifera Linn. Sp. Pl. (ed.2) 175. 1762, ssp. baccifera:  
Koehne in Engl. Bot. Jahrb. 1:260. 1880 & Pfreich.  
4(216):54-55. 1903; FBI. 2:569. 1879; Blatt. & Hallb.  
in J. Bombay nat. Hist. Soc. 26:215. 1919; Sant. 87.  
1960; Gamb. 360.

Much branched herbs; leaves linear-lanceolate,  
acute at apex, up to 2.5 x 0.5 cm, glabrous; flowers  
minute in dense, axillary clusters; fruits irregularly  
dehiscing; seeds many.

Common in marshy fields or on the banks of  
shallow ponds.

Flowers: Sept. - Dec.

Sivarajan 564.

A. baccifera Linn., ssp. aegyptiaca (Willd.) Koehne in  
Engl. Bot. Jahrb. 1:260. 1880 & Pfreich. 4(216):55.  
1903. A. aegyptiaca Willd. En. Hort. Berol. 1:167,  
t. 6. 1809. A. salicifolia Hiern in Oliv. Fl. Trop.  
Afr. 2:478. 1874, excl. Syn; non Monti; FBI. 2:569.  
1879.

Erect or diffuse, fleshy herbs; leaves elliptic-  
oblong, obtuse, cordate at base; flowers green, much larger

and fewer than in the previous subspecies, clustered in the axils; calyx campanulate, teeth triangular; capsules irregularly rupturing (Plate 3).

A semi-aquatic or marshy herb; collected from the cultivated fields.

Flowers: Sept. - Dec.

Sivarajan 450, 578.

Rotala Linn.

Key to the species

1. Leaves dimorphic:

2. Leaves on the main stem orbicular .. indica

2. Leaves on the main stem elliptic,

acute .... densiflora

1. Leaves not dimorphic:

3. Flowers in terminal spikes ..... macrandra

3. Flowers axillary, solitary:

4. Leaves verticillate ..... occultiflora

4. Leaves opposite ..... pentandra

R.indica (Willd.) Koehne in Engl. Bot. Jahrb. 1:172.

1880 & Pfreich. 4(216):40. 1903; Back. & Bakh. f.

Fl. Java 1:252. 1963; Gamb. 359; van Leeuwen in  
Blumea 19:54. 1971. Peplis indica Willd. Sp. Pl.  
2:244. 1799.

Aquatic or marshy annuals; leaves up to 1.8 cm  
across, those on the floriferous branches bract-like,  
lanceolate, acute; flowers minute; capsules 2-valved.

A common weed in wet or marshy fields, during  
the rainy season.

Flowers: Nov. - Mar.

Sivarajan 68.

R.densiflora (Roth ex Roem. & Schult.) Koehne in Engl.

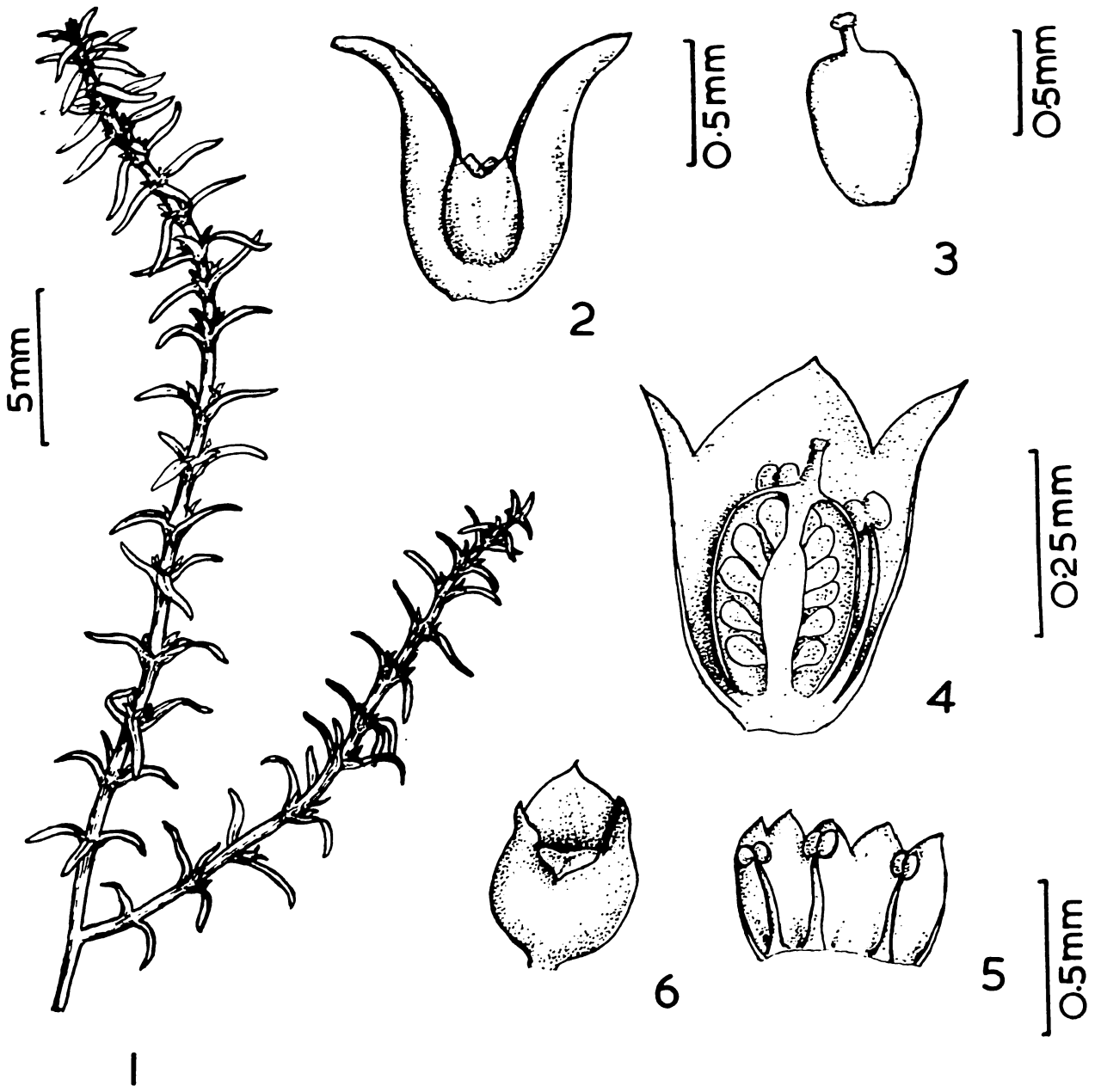
Bot. Jahrb. 1:164. 1880 & 4:388. 1883 & Pfreich.  
4(216):35. 1903; Back. & Bakh. f. Fl. Java 1:253.  
1963; Gamb. 359; van Leeuwen in Blumea 19:55. 1971.  
Ammannia densiflora Roth ex Roem. & Schult. Syst.  
3:304. 1818; DC. Prod. 3:79. 1828.

Annual herbs, rooting at lower nodes; leaves  
up to 1 x 0.4 cm, those on the flowering branches much  
smaller; flowers pink, 2 mm across; capsules 3-valved.

PLATE 4

Rotala occultiflora Koehne,

Fig. 1. A branch. Fig. 2. Flower with  
bracteoles. Fig. 3. Pistil. Fig. 4. L.S.  
of flower. Fig. 5. Calyx split open  
displaying stamens. Fig. 6. Capsule with  
the persistent calyx.



1  
*ROOTALA OCCULTIFLORA* KOEHNE

In wet or moist sandy fields, during the rainy season.

Flowers: Aug. - Nov.

Sivarajan 646.

R. macrandra Koehne in Engl. Bot. Jahrb. 1:176. 1881 & in Pfreich. 4(216):42. 1903; Gamb. 359. Ammannia rotundifolia Buch.-Ham. in D. Don, Prod. Fl. Nep. 220. 1825; FBI. 2:566. 1879, in part.

Diffuse or erect herbs, rooting at the lower nodes; leaves orbicular; flowers small, rose-coloured in terminal, solitary or branched, bracteate spikes; stamens much exerted.

Common in wet or marshy low lands.

Flowers: Sept. - Dec.

Sivarajan 71, 846.

R. occultiflora Koehne in Engl. Bot. Jahrb. 1:152. 1880 & in Pfreich. 4(216):30. 1903; Sant. 89. 1960; Gamb. 358.

Small, branched annuals; leaves verticillate, linear, broadened at base; flowers solitary, axillary,

sessile, minute; bracteoles 2, linear, longer than the flowers; calyx lobes usually 4; stamens 3 or rarely 2; capsules 2-3 valved (Plate 4).

A rare species collected from the water-logged<sup>g</sup> fields in the University Campus.

Flowers: Aug. - Dec.

Sivarajan 588.

R.pentandra (Roxb.) Blatt. & Hallb. in J. Bombay nat.

Hist. Soc. 25:707. 1918, in part, pro basion. et syn.

R.leptopetala; van Leeuwen in Blumea 19:55. 1971.

Ammannia pentandra Roxb. Fl. Ind. 1:448. 1820.

A.leptopetala Blume, Mus. Bot. Lugd. Bat. 2:134.

1856. R.leptopetala (Blume) Koehne in Engl. Bot.

Jahrb. 1:162. 1880 & Pfreich. 4(216):34. 1903; Back.

& Bakh. f. 1:253. 1963; Gamb. 358.

Slender herbs; leaves linear or narrowly elliptic, about 15 x 4 mm, those on the flowering branches similar; flowers minute, axillary, solitary; calyx lobes minute; petals very small; capsules subglobose.



sessile, minute; bracteoles 2, linear, longer than the flowers; calyx lobes usually 4; stamens 3 or rarely 2; capsules 2-3 valved (Plate 4).

A rare species collected from the water-logged<sup>g</sup>~~k~~ fields in the University Campus.

Flowers: Aug. - Dec.

Sivarajan 588.

R.pentandra (Roxb.) Blatt. & Hallb. in J. Bombay nat.

Hist. Soc. 25:707. 1918, in part, pro basion. et syn.

R.leptopetala; van Leeuwen in Blumea 19:55. 1971.

Ammannia pentandra Roxb. Fl. Ind. 1:448. 1820.

A.leptopetala Blume, Mus. Bot. Lugd. Bat. 2:134.

1856. R.leptopetala (Blume) Koehne in Engl. Bot.

Jahrb. 1:162. 1880 & Pfreich. 4(216):34. 1903; Back.

& Bakh. f. 1:253. 1963; Gamb. 358.

Slender herbs; leaves linear or narrowly elliptic, about 15 x 4 mm, those on the flowering branches similar; flowers minute, axillary, solitary; calyx lobes minute; petals very small; capsules subglobose.

Common in wet or moist fields and seen as a weed in low-land cultivations.

Flowers: Oct. - Mar.

Sivarajan 43, 46.

Note: Wight (IC. t. 217. 1839) recognised Rotala and Ammannia as distinct genera and suggested that A.pentandra should be placed under Rotala, but did not make the actual combination. Blatter and Hallberg (loc.cit.) made the formal combination, but merged it with R.densiflora. Recently van Leeuwen (loc.cit.) has correctly delimited and segregated the two species, wherebyshe expelled R.densiflora from the synonymy of the species and kept the combination R.pentandra binding.

Lagerstroemia Linn.

Key to the species

- 1. Petals erect ..... speciosa
- 1. Petals pendulous ..... indica

L.speciosa (Linn.) Pers. Syn. 2:72. 1806; Koehne in Pfreich. 17:261. 1903; Mahes. 162. Munchansia speciosa Linn. in Muench. Housv. 1:357, t. 2. 1770.

Lagerstroemia flos-reginae Retz. obs. 5:25. 1778;  
FBI. 2:577. 1879; Gamb. 362.

Trees; leaves ovate or elliptic, coriaceous,  
20-25 x 8-10 cm; flowers blue, showy, 6-7 cm across,  
in terminal panicles; capsules woody, 3-6 valved;  
seeds compressed, winged.

Flowers: Aug. - Nov.

Sivarajan 736.

L.indica Linn. Sp. Pl. (ed.2) 734. 1762; FBI. 2:575.  
1879; Gamb. 362; Mathew in Rec. Bot. Sur. Ind.  
20:117. 1969.

Shrubs; leaves elliptic to obovate, obtuse  
at apex, up to 7 x 4 cm; flowers blue in terminal  
panicles; petals crisped with a long claw; stamens  
numerous.

Flowers: Mar. - July

Sivarajan 1152.

Lawsonia Linn.

L.inermis Linn. Sp. Pl. 349. 1753; Koehne in Engl.  
Bot. Jahrb. 4:36. 1883; Sant.89. 1960; Gamb. 363.

L.alba Lamk. Encycl. Meth. Bot. 3:106. 1789; FBI.  
2:573. 1879.

Spinous shrubs; leaves small, elliptic-acute;  
flowers greenish white in dense, terminal panicles;  
calyx lobes 4, spreading; petals wrinkled; stamens 8,  
in antisepalous pairs; capsules breaking up irregularly.

Flowers: Mar. - May

Sivarajan 1100.

ONAGRACEAE Juss.

Key to the genera

- 1. Seeds dimorphic ..... Fissendocarpa
- 1. Seeds monomorphic ..... Ludwigia

Fissendocarpa (Haines) Bennet

(Jussiaea Sect. Fissendocarpa Haines.)

Note: Fissendocarpa Haines is one of the  
seventeen sections recognised by Raven (Op.cit.) under  
the genus Ludwigia, and was rather anomalous in its  
position with dimorphous seeds, without any relative.  
So, the section Fissendocarpa Haines, which spoiled  
the homogeneity of the genus Ludwigia is raised to  
generic status by Bennet (Op.cit.)

F.linifolia (Vahl) Bennet in J. Bombay nat. Hist. Soc.  
67(1):126. 1970. Jussiaea linifolia Vahl, Ecolog.  
Arn. 2:32. 1798. J.hyssopifolia G. Don, Gen. Syst.  
2:693. 1832. Ludwigia hyssopifolia (G. Don) Exell  
in Garcia de Orta 5:471. 1957; Raven in Reinwardtia  
6:385. 1963; Sreem. in Bull. Bot. Sur. Ind. 8:79.  
1966.

Much branched herbs; stem angled or winged;  
leaves elliptic to lanceolate, acute; flowers axillary,  
solitary, sessile, yellow; capsules linear, terete,  
not inflated, up to 2.5 cm long; seeds uniseriate and  
dimorphic, the lower larger ones embedded in the  
mesocarp and the upper smaller ones free.

Common in marshy fields and on the banks of  
fresh water ponds.

Flowers: July - Dec.

Sivarajan 14.

Ludwigia Linn.

Note: Ludwigia Linn. and Jussiaea Linn. have  
been very often treated as two distinct genera and  
this separation was primarily based on the number of

stamens. It has been shown by several workers that this is a very inconsistent character for generic distinction, to depend upon. Brennan (Kew Bull. 8:163-172. 1953) amalgamated the two taxa under a single generic name Jussiaea. Hara (J. Jap. Bot. 28:289-294. 1953) later pointed out that this merger had already been done by Baillon (Hist. Pl. 6:463. 1877) under the name Ludwigia, which should be accepted according to rules. Raven (op.cit. 1963) also shared the view of Hara.

Key to the species

- 1. Plants densely adpressed tomentose ..... octovalvis
- 1. Plants glabrous ..... perennis

L. octovalvis (Jacq.) Raven in Kew Bull. 15:476. 1962 & Reinwardtia 6:356. 1963; Sreem. in Bull. Bot. Sur. Ind. 8:79. 1966. Oenothera octovalvis Jacq. Enum. Syst. Pl. 19. 1760. Jussiaea suffruticosa Linn. Sp. Pl. 1:388. 1753; FBI. 2:587. 1879.

Dense-tomentose, woody herbs; leaves elliptic to lanceolate, adpressed pubescent; flowers large, yellow; pedicels very short; calyx lobes ovate-acute; petals deciduous, obovate; capsules, 8-ridged, adpressed

tomentose, about 4 cm long; seeds free.

Flowers: Mar. - May

Sivarajan 130.

Note: Of the 3 subspecies recognised by Raven (loc.cit.), ssp.sessiliflora and ssp.octovalvis are reported to occur in India. Sreemadhavan (loc.cit.) has found that there are many intermediate forms in between these two, and due to the high variability, he has recommended the treatment of all the Indian materials <sup>under</sup> the ssp.octovalvis.

L.perennis Linn. Sp. Pl. 1:119. 1753; Raven in Reinwardtia 6:367. 1963; Sreem. in Bull. Bot. Sur. Ind. 8:80. 1966. L.parviflora Roxb. [ Hort. Beng. 11. 1814, nom. nud.] Fl. Ind. 1:440. 1820; FBI. 2:558. 1879; Gamb. 365.

Erect, glabrous herbs; leaves elliptic to lanceolate; flowers small, yellow; capsules inflated 4-angled up to 1 cm long; seeds free and in many rows.

A common weed in cultivated fields, on road sides and in other moist low lands.

Flowers: July - Dec.

Sivarajan 409.

TURNERACEAE DC.

Turnera Linn.

Key to the species

1. Flowers bright yellow ..... ulmifolia  
1. Flowers pale yellow with a purple base.. subulata

T.ulmifolia Linn. Sp. Pl. 271. 1753; Back. in Fl. Males.  
4(3):237. 1951; Brizicky in J. Arn. Arb. 42:208. 1961.  
T.ulmifolia, var. angustifolia Willd. ex Urb. Mon.  
Turn. 141. 1883; Gamb. 369.

Much branched, woody herbs; leaves lanceolate-acute, serrate, glabrous above, pubescent below; petioles with a pair of glands towards the tip; flowers bright yellow; pedicels adnate to the petiole at base, later free; bracteoles lanceolate; calyx lobes acuminate; petals retuse, oblanceolate, yellow.

Flowers: Sept. - Dec.

Sivarajan 1847.

T.subulata J.E. Smith in Rees, Cyclop. 36. 1819; Back.  
in Fl. Males. 1(4):236-37, f. 1. 1951; Sharma  
Vuppuluri in Ind. For. 95(5):313. 1969. T.trioniflora  
Sims. in Bot. Mag. 2106. 1820. T.elegans Otto in Nees,



Hort. Phys. Berol. 36. 1820. T.ulmifolia var.  
elegans (Otto) Urb. Mon. Turn. 139. 1893; Mudaliar  
& Rao in Madr. Agr. J. 38:1-2. 1951.

Much branched, woody herbs; leaves ovate or  
elliptic, serrate, pubescent; flowers pale yellow  
with a deep-purple base; pedicels adnate to the  
petiole; bracteoles linear, 1-nerved.

Flowers: Sept. - May

Sivarajan 380.

Note: Urban (loc.cit.) has **included** both  
these under the polymorphic T.ulmifolia. However,  
Backer's (loc.cit.) observations on their ~~inter-~~  
sterility, differences in morphology and physiology  
are convincing enough to accept them as two distinct  
species.

PASSIFLORACEAE Juss.

Passiflora Linn.

- 1. Leaves simple, entire ..... quadrangularis
- 1. Leaves 3-angled or lobed:
  - 2. Bracteoles multifid ..... foetida
  - 2. Bracteoles entire ..... incarnata

P. quadrangularis Linn. Syst. Nat. (ed.10) 1248. 1759;  
F.M.Bailey in Queensl. Fl. 688. 1900; Chakr. in  
Bull. Bot. Soc. Beng.3:64. 1949; Green in Kew  
Bull. 26(3):557. 1972.

Climbers; stem sharply 4-angled; leaves entire;  
broadly ovate or elliptic, acuminate, glabrous; petiole  
with 5-6 glands; stipules large, ovate-acute; flowers  
large, purple; sepals oblong-obtuse, green outside,  
pink within; corona filaments striped with purple and  
white; fruits large, ellipsoid or ovoid.

Flowers: Mar. - May

Sivarajan 1085.

P. foetida Linn. Sp. Pl. 959. 1753; Chakr. in Bull. Bot.  
Soc. Beng. 3:57. 1949; Bor & Raizada, Beaut. Ind.  
Climb. & Shr. 258, f. 151. 1954; Gamb. 370; Green  
in Kew Bull. 26(3):555. 1972.

Foetid, slender climbers; stem terete; leaves  
3-angled or lobed, lobes lanceolate or elliptic, pubescent;  
flowers white; bracteoles pectinate, viscid tomentose;  
berries about 2 cm across.

Flowers: Dec. - May

Sivarajan 872.

P. incarnata Linn. Sp. Pl. 959. 1753; Guill. Fl. Caled.  
224. 1948 & Mem. Mus. Hist. Nat. N.S. Bot. 8:148.  
1959; Green in Kew Bull. 26:555. 1972.

Climbers; stem terete; leaves cordate at base;  
deeply 3-lobed, lobes elliptic or lanceolate, serrate;  
flowers large and showy; corona filaments striped with  
white and purple; berries globose, about 5 cm across.

Flowers: Mar. - June

Sivarajan 558.

CARICACEAE Dum.

Carica Linn.

C. papaya Linn. Sp. Pl. 1036. 1753; FBI. 2:599. 1879;  
Gamb. 371.

Small, usually dioecious trees; trunk with  
prominent leaf scars; leaves large, digitately lobed,  
palminerved; petiole very long, hollow inside; flowers  
pale yellow, subsessile or in long, drooping panicles;  
fruits large.

Usually cultivated for its edible fruits.

Flowers: most part of the year

Sivarajan 1846.

CUCURBITACEAE Juss.

Key to the genera

1. Flowers white:
  2. Petals fimbriate ..... Trichosanthes
  2. Petals not fimbriate:
    3. Fruits large, bottle shaped ..... Lagenaria
    3. Fruits small, oblong ..... Coccinia
1. Flowers yellow:
  4. Fruits echinate ..... Momordica
  4. Fruits not echinate:
    5. Fruits densely hispid and white  
waxy outside .... Benincasa
    5. Fruits not as above:
      6. Stamens 5 ..... Luffa
      6. Stamens 3:
        7. Seeds with a transverse  
ridge ..... Diplocyclos
        7. Seeds without transverse  
ridge :..
        8. Seed black ..... Citrullus
        8. Seeds not black:
          9. Male flowers solitary.. Cucurbita

9. Male flowers not solitary:

10. Fruits large ..... Cucumis

10. Fruits small:

11. Calyx glabrous ..... Solena

11. Calyx hairy ..... Mukia

Trichosanthes Linn.

Key to the species

1. Leaves lobed:

X 2. Flowers yellow ..... bracteata

2. Flowers not yellow:

3. Fruits ellipsoid, 5-7 cm long ..... cucumerina

3. Fruits fusiform, upto 1 metre

long ..... anguina

1. Leaves not lobed ..... nervifolia

T.bracteata (Lamk.) Voigt, Hort. Sub. Calc. 58. 1845;

Cogn. in DC. Mon. Phan. 3:375. 1881; Merr. En.

Philip. Fl. Pl. 3:584. 1923; Kundu in J. Bombay nat.

Hist. Soc. 43:379. 1942; Chakr. in Rec. Bot. Sur.

Ind. 17(1):44. 1959; Sant. 102. 1967. Modecca

bracteata Lamk. Encycl. Meth. Bot. 4:210. 1797.

Trichosanthes palmata Roxb. Fl. Ind. 3:704. 1832;

FBI. 6:606. 1879; Gamb. 374.

Tomentose climbers; leaves 3-5-lobed or angled, scabrous, up to 15 cm across; flowers yellow; males in axillary, bracteate racemes; bracts laciniate; female flowers usually solitary; fruits globose, 8-10 cm across.

Flowers: Sept. - Nov.

Sivarajan 1495.

T. cucumerina Linn. Sp. Pl. 1008. 1753; FBI. 2:609. 1879;

Kundu in J. Bombay nat. Hist. Soc. 43:372. 1942; Chakr. in Rec. Bot. Sur. Ind. 17:31. 1959; Gamb. 373.

Tomentose climbers; tendrils 2-3-fid; leaves 3-5-lobed, lobes obtuse; flowers white; males in racemes; females solitary in the axils; fruits ellipsoid, beaked, white striped when young, yellow when ripe with a long beak.

Flowers: Sept. - Nov.

Sivarajan 755.

T. anguina Linn. Sp. Pl. 1008. 1753; FBI. 2:610. 1879;

Kundu in J. Bombay nat. Hist. Soc. 43:374. 1942;  
Chakr. in Rec. Bot. Sur. Ind. 17:35. 1959; Gamb. 374.

Tendrils 2-3-fid; leaves orbicular or broadly ovate, 5-7-lobed; flowers white; males racemed; females<sup>2</sup>

solitary in the axils; fruits up to 1 metre long, often twisted, white striped.

Flowers: Aug. - Oct.

Sivarajan 1813.

T.nervifolia Linn. Sp. Pl. 1008. 1753; FBI. 2:609. 1879, in part; Kundu in J. Bombay nat. Hist. Soc. 43:371. 1942; Chakr. in Ind. J. Agr. Sci. 16(1):15. 1946 & in Rec. Bot. Sur. Ind. 17:30. 1959; Gamb. 373.

Tendrils usually 2-fid; leaves ovate-lanceolate, cordate at base, margins distantly denticulate; flowers white; fruit ovoid-oblong, 8-10 cm long.

Flowers: Aug. - Oct.

Sivarajan 454.

Lagenaria Ser.

L.siceraria (Molina) Standley in Publ. Field Mus. Nat. Hist. Chicago, Bot. Ser. 3:435. 1930. Cucurbita siceraria Molina, Sagg. Chile. 133. 1782. Cucurbita leucantha Duch. in Lamk. Encycl. Meth. Bot. 2:150. 1786. Lagenaria vulgaris Seringe, Mem. Soc. Phys. Hist. Nat. Gen. 3:25, t. 2. 1825; FBI. 3:613. 1879.

L.leucantha (Duch.) Rusby in Mem. Torr. Bot. Club  
6:43. 1896; Chakr. in Rec. Bot. Sur. Ind. 17:66.  
1959.

Climbers; tendrils 2-fid; leaves orbicular,  
3-5-angled or lobed, cordate; flowers white, solitary  
in the axils; fruits bottle-shaped with a shell like  
pericarp.

Usually seen under cultivation. Tender fruits  
are used as a vegetable. The dry "shells" of the mature  
fruits are used to store toddy.

Flowers: Aug. - Oct.

Sivarajan 1461.

Coccinia Wt. & Arn.

C.grandis (Linn.) Voigt. Hort. Suburb. Calc. 59. 1845.

Bryonia grandis Linn. Mant. 1:126. 1767. Coccinia  
indica Wt. & Arn. Prod. 347. 1834; Gamb. 379.

Cephalandra indica (Wt. & Arn.) Naud. in Ann. Sc.  
Nat. Ser. 5(5):16. 1866; FBI. 2:621. 1879 (excl.

syn.) Coccinia cordifolia (Linn.) Cogn. in DC. Mon.  
Phan. 3:529. 1881; Chakr. in Rec. Bot. Sur. Ind.

17:117. 1959. Cephalandra grandis (Linn.) Kurz in  
J. As. Soc. Beng. 46(2):103. 1877.



Slender, dioecious climbers; tendrils simple or bifid; leaves entire or digitately 3-5-lobed, cordate; flowers white, usually solitary, axillary; fruits oblong-obtuse, 5-6 cm long, green, striped with white when young.

Flowers: Nov. - Mar.

Sivarajan 112, 680.

Momordica Linn.

M.charantia Linn. Sp. Pl. 1009. 1753; FBI. 2:616. 1879;

Cogn. in DC. Mon. 3:436. 1881; Chakr. in Rec. Bot.

Sur. Ind. 17:88. 1959; Gamb. 375.

Slender climbers; tendrils simple; leaves 5-7-lobed, cordate; flowers yellow, solitary in the axils; fruits oblong, 20-30 cm long, tuberculate.

Flowers: throughout the year.

Sivarajan 1708.

Benincasa Savi.

B.hispida (Thunb.) Cogn. in DC. Mon. Phan.3:513. 1881;

Chakr. in Rec. Bot. Sur. Ind. 17:84. 1959; Mahes.

168. Cucurbita hispida Thunb. Fl. Jap. 322. 1784.

Benincasa cerifera Savi. in Bibl. Ital. 9:158. 1818;

FBI. 2:616. 1879; Gamb. 383.

Hispid climbers; tendrils 2-3-fid; leaves large, orbicular-cordate, scabrous; flowers yellow, axillary, solitary; fruits large, succulent, densely hairy when young and with a thick, waxy deposit when mature.

Flowers: Aug. - Oct.

Sivarajan 1390.

Luffa Mill.

L.cylindrica (Linn.) Roem. Fam. 2:64. 1846; Cogn. in DC. Mon. Phan. 3:456. 1881; Chakr. in Rec. Bot. Sur. Ind. 17:75. 1959; Jeffrey in Kew Bull. 15:355. 1962; Mahes. 168. Momordica cylindrica Linn. Sp. Pl. 1009. 1753. Luffa aegyptiaca Mill. Dict. (ed.4) 500. 1785; FBI. 2:614. 1879; Gamb. 376.

Extensive, scabrous climbers; leaves scabrous with 5 triangular lobes; flowers yellow; males in many-flowered, axillary racemes, females on 1-3-flowered peduncles; fruits ovoid, minutely tubercular.

Flowers: Oct. - Feb.

Sivarajan 856.

Diplocyclos (Endl.) Von Post & Kuntze

D. palmatus (Linn.) Jeffrey in Kew Bull. 15:352. 1962.

Bryonia palmata Linn. Sp. Pl. 1012. 1753, excl. Syn.

B. laciniosa Linn. Sp. Pl. 1013. 1753, in part; FBI.

2:622. 1879. Bryonopsis laciniosa Naud. in Ann. Sc.

Nat. (Ser.4) 12:141. 1859, pro majore parte, et.

sensu auct. mult., non (Linn.) Naud. loc. cit.,

(sensu stricto); Chakr. in Rec. Bot. Sur. Ind.

17:135. 1959.

Slender, delicate climbers; leaves deeply 3-7-lobed, cordate, denticulate; flowers yellow; fruits globose, striped, 1.5 cm across; seeds with a crenulate, transverse ridge.

Flowers: Sept. - Nov.

Sivarajan 479.

Note: The Linnean epithet "laciniosa" has long been erroneously applied to the widely distributed plant of the Old World tropics, in the combination Bryonopsis laciniosa (Linn.) Naud. Actually this is an American plant of which the correct name is Cayaponia laciniosa (Linn.) Jeffrey and that of the Old World species is Diplocyclos palmatus (Linn.) Jeffrey.

Citrullus Schrad. ex Eckl. & Zeyh.

(nom.cons.)

C.lanatus (Thunb.) Matsumara & Nakai in Cat. Sem. Hort.

Bot. Univ. Tokyo 1920:38. 1920; Back. & Bakh. f. Fl.

Java 1:300. 1963; Hara in Taxon 18:346-347. 1969;

Shah in J. Bombay nat. Hist. Soc. 69:446. 1972.

Momordica lanata Thunb. Prod. Fl. Cap. 13. 1794.

C.vulgaris Schrad. Ind. Sem. Gotting. 2. 1833 & in

Eckl. & Zeyh. En. 2:280. 1836; Chakr. in Rec. Bot.

Sur. Ind. 17:113. 1959.

Slender climbers; tendrils 2-3-fid; leaves deeply 3-5-lobed, villous; flowers yellow, usually solitary, axillary; fruits subglobose, 6-8 cm across.

Flowers: Mar. - July

Sivarajan 1203.

Cucurbita Linn.

C.maxima Duch. in Lamk. Encycl. Meth. Bot. 2:151. 1786;

Cogn. in DC. Mon. 3:544. 1881; FBI. 3:622. 1879; Chakr.

in Ind. J. Agr. Sci. 16:6. 1946 & in Rec. Bot. Sur.

Ind. 17(1):123. 1959.

Densely pubescent climbers; leaves large, orbicular, entire or emarginate; flowers large, fleshy, yellow; fruits large; seeds ellipsoid.

Flowers: Aug. - Dec.

Sivarajan 1378.

Cucumis Linn.

C. sativus Linn. Sp. Pl. 1012. 1753; FBI. 2:620. 1879;

Chakr. in Rec. Bot. Sur. Ind. 17:105. 1959; Gamb. 378.

Annual, hirsute plants; leaves broadly orbicular or ovate-cordate, palmately 3-5-lobed; flowers yellow, fascicled or solitary in the axils; fruits oblong, orange striped.

Flowers: Aug. - Dec.

Sivarajan 580.

Solena Lour.

S. heterophylla Lour. Fl. Cochinch. 1:514. 1790; Sant.

104. 1967. Zehneria umbellata (Klein) Th. En. 125.

1858; FBI. 2:625. 1879, in part. Melothria heterophylla

(Lour.) Cogn. in DC. Mon. Phan. 3:618. 1881; Chakr. in

Rec. Bot. Sur. Ind. 17:159. 1959; Sant. 94. 1960;

Gamb. 380.

Slender climbers; leaves ovate or oblong-lanceolate cordate, denticulate; flowers pale yellow, males sub-umbellate; females solitary in the axils; fruits 4-5 cm long, oblong.

Flowers: Apr. - June

Sivarajan 175, 286.

Note: This plant is listed under the name Melothria heterophylla Cogn. in most of the Indian Floras. However, Jeffrey (Kew Bull. 15(3):343. 1961) has re-established the genus Solena Lour. by its peculiar, obliquely triplicate anther-thecae and Mukia Arn., by its tumid seeds and clustered flowers, as distinct from Melothria Linn., into which they were sunk by Cogniaux (loc.cit.). Melothria is now an entirely New World genus comprised of plants with long-stalked fruits and male racemes, compressed seeds, 3 stamens two of which are 2-thealous and the other 1-thealous.

Mukia Arn.

M. maderaspatana (Linn.) M. Roem. Syn. Pep. 47. 1846;

Sant. 104. 1967; Jeffrey in Hook. Ic. Pl. 7(3):5. 1969.

Cucumis maderaspatanus Linn. Sp. Pl. 1912. 1753.

Mukia scabrella Arn. in Hook. J. Bot. 3:276. 1841.

Melothria maderaspatana (Linn.) Cogn. in DC. Mon. Phan. 3:623. 1881; Chakr. in Rec. Bot. Sur. Ind. 17:141. 1959; Gamb. 381.

Slender, hispid climbers; leaves 3-5-angled; flowers small, bright yellow; berries subglobose, hispid when young.

Flowers: Sept. - Mar.

Sivarajan 152, 592, 1365.

BEGONIACEAE C.A.Agardh.

Begonia Linn.

Key to the species

- 1. Stigmas reniform ..... crenata
- 1. Stigmas 3-5 lobed ..... canarana

B.crenata Dryand. in Trans. Linn. Soc. Lond. 1:164, t.

14. 1791; FBI. 2:651. 1879; Sant. 95. 1960; Gamb. 385.

Annual herbs, up to 20 cm tall; leaves 3-4, long-petioled, ovate or suborbicular, crenate-serrate, at times lobed, cordate at base; flowers unisexual, white or pale pink; sepals 4, outer larger; stamens in male flowers many; capsules 2-celled, wings subequal and triangular.

Collected from the shaded wet banks of streams,  
near Devagiri.

Flowers: Aug. - Sept.

Sivarajan 1418.

B. canarana Miq. Anal. Bot. Ind. 3:18. 1852; FBI. 1:2652.  
1879; Gamb. 385.

Small, delicate herbs; leaves orbicular, crenate-  
serrate, cordate at base, glabrous; flowers white in  
terminal panicles; sepals 4, outer larger; stamens in  
male flowers many; capsules 2-celled, wings narrow, one  
much larger than the others.

In the crevices of moist rocks in shady  
localities.

Flowers: Aug. - Oct.

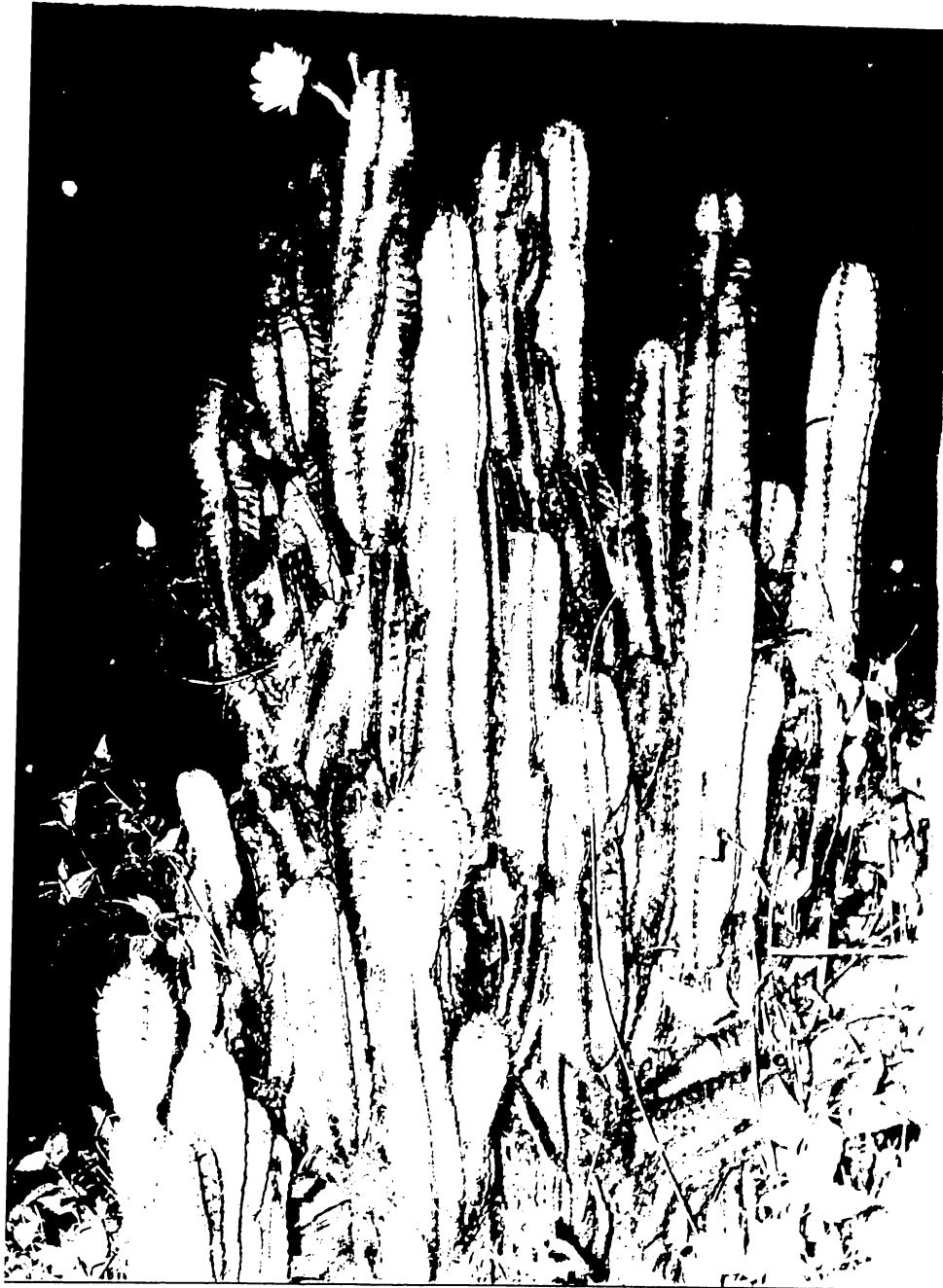
Sivarajan 481.

CACTACEAE Juss.

Key to the genera

- 1. Branches ribbed ..... Piptanthocereus
- 1. Branches not ribbed ..... Opuntia





Piptanthocereus Riccob.

P.forbesii (Hort. Berol ex Foerster) Riccob. in Boll.

Ort. Bot. Palermo 8:223. 1909. Cereus forbesii Hort.  
Berol. ex Foerster Handb. Cactkde 398. 1846.

Arborescent, much branched plants; stems jointed;  
branches with 4-7 wing like ribs; areioles large, with  
6-10 straight spines; flowers white, long and funnel-  
shaped; perianth lobes many, outer greenish, inner white;  
stamens many; ovary unilocular; ovules numerous; style  
single, long; stigmatic lobes many, linear, radiating.  
(Plate 5.)

A New World species introduced and naturalised  
in this area. Seen on hedges and in waste places; it  
blooms in the night.

Flowers: Apr. - May

Sivarajan 1126.

Opuntia Mill.

O.elatior Mill. Gard. Dict. (ed.8) no.4. 1768; Burkill  
in Rec. Bot. Sur. Ind. 4(6):287. 1911; Sant. 96.  
1960; Gamb. 387.

Shrubs; branched flattened, jointed, obovate; leaves scale-like and deciduous; aeriocles with several straight spines; flowers orange-yellow at opening; calyx tube short, adnate to the ovary; petals spreading; stamens many, included; carpels many, connate; style short; stigmatic lobes many; berries with compressed seeds.

Flowers: Aug. - Nov.

Sivarajan 1555.

AIZOACEAE Rudolphi (sensu stricto)

Trianthema Linn.

Key to the species

1. Leaves broad, obovate ..... portulacastrum  
1. Leaves narrow, linear ..... triquetra

T.portulacastrum Linn. Sp. Pl. 223. 1753; Back. in

Fl. Males. 4(3):274. 1951; Gamb. 389; Bogle in J.

Arn. Arb. 51:455, f. 3. 1970. T.monogyna Linn.

Mant. 1:69. 1767; FBI. 2:660. 1879.

Prostrate, succulent herbs; leaves obovate, obtuse or retuse, up to 2.5 x 2 cm; flowers sessile,

white or rose-coloured, solitary, enclosed in the petiolar base; stamens 10-15; capsules opercular, operculum 1-2-seeded, the chamber 4-5-seeded.

Flowers: Mar. - May

Sivarajan 210.

T. triquetra Rottl. ex Willd. Neueschr. Naturfr. Berlin 4:181. 1803; DC. Prod. 3:352. 1828; Back. in Fl. Males. 4:273. 1951; Steenis in Blumea 12:320. 1964; Gamb. 389. T. crystallina Wt. & Arn. Prod. 355. 1834. (non Vahl); FBI. 2:660. 1879.

Prostrate herbs; leaves linear-acute, 1 x 0.3 cm; flowers sessile, clustered in the axils, not concealed in the petiolar bases; stamens only 5; capsules opercular; the operculum and the chamber one-seeded.

Flowers: Mar. - Apr.

Sivarajan 241.

MOLLUGINACEAE Hutch.

Key to the genera

- 1. Carpels connate:
  - 2. Seeds appendaged at the hilum ..... Glinus
  - 2. Seeds not appendaged ..... Mollugo
- 1. Carpels free ..... Gisekia

Glinus Linn.

G. oppositifolius (Linn.) A. DC. in Bull. Herb. Boiss. 2:552. 1901; Merr. & Perry in J. Arn. Arb. 23:38, 60. 1942; Back. in Fl. Males. 4:270. 1951. Mollugo oppositifolia Linn. Sp. Pl. 89. 1753; Burm. f. Fl. Ind. 31. 1768; Gamb. 390. Glinus spergula (Linn.) Fenzl. in Spreng. Nom. Bot. (ed.2) 1:688. 1840; FBI. 2:662. 1879.

Prostrate or diffuse herbs, rooting at nodes; stem villous; leaves in apparent whorls, oblanceolate or elliptic, obtuse, up to 2.5 x 0.5 cm; flowers white, fascicled in the axils; pedicels 1-1.5 cm long; capsules 3-valved, 3 mm long; seeds many, reniform, smooth, with a pair of filiform appendages at the hilum, one very short, the other long and encircling the seed.

Very common in the moist, sandy fields, especially in shaded habitats.

Flowers: Dec. - June

Sivarajan 88, 1013, 1101.

Mollugo Linn.

Key to the species

- 1. Radical leaves rosulate:
  - 2. Stems naked ..... nudicaulis
  - 2. Stems leafy ..... cerviana
- 1. Radical leaves absent:
  - 3. Seeds tuberculate ..... pentaphylla
  - 3. Seeds papillose ..... disticha

M.nudicaulis Lamk. Encycl. Meth. Bot. 4:234. 1767; Ser. in DC. Prod. 1:391. 1824; FBI. 2:664. 1879; Shah in J. Bombay nat. Hist. Soc. 59:319. 1962; Gamb. 390.

Erect, annual herbs; leaves radical, rosulate, obovate to oblanceolate, obtuse, up to 2.5 x 1 cm; peduncles many, erect, and branched; pedicels slender; flowers white; sepals 5, green with white margins; petals absent; stamens usually 5; ovary 3-5-loculed;

styles 3-5; capsules 3-valved; seeds many, tuberculate, appendage 0.

Common on the sandy sea-coast.

Flowers: May - July

Sivarajan 1232, 1273.

M.cerviana (Linn.) Ser. in DC. Prod. 1:392. 1824; Benth. Fl. Austr. 3:334. 1866; FBI. 2:663. 1879; Gamb. 390. Pharnaceum cerviana Linn. Sp. Pl. 272. 1753; Burm. f. Fl. Ind. 76. 1768.

Small, erect herbs; stems many, slender; leaves both radical and cauline, radical ones rosulate, obovate-spathulate, cauline leaves linear; flowers white in terminal cymes; capsules 3-valved; seeds brown, reticulate, appendages 0.

Common annual on the sandy sea coast.

Flowers: May - July

Sivarajan 891, 1282.

M.pentaphylla Linn. Sp. Pl. 89. 1753; Burm. f. Fl. Ind. 31. 1768; Ridl. Fl. Mal. Penins. 1:867. 1922; Merr. & Perry in J. Arn. Arb. 23:386. 1942; Back. in Fl.

Males. 4(3):268. 1951; Gamb. 390. M.stricta Linn.  
Sp. Pl. (ed.2) 131. 1762. Pharnaceum pentaphyllum  
(Linn.) Spreng. Syst. Veg. 1:949. 1824.

Prostrate or diffuse herbs, sometimes rooting at nodes; leaves whorled, elliptic to lanceolate, obtuse or acute; flowers white in leaf-opposed, usually corymbose cymes; peduncles and pedicels filiform; capsules subglobose, 3-valved; seeds reniform, black, tuberculate.

The author's collection of this taxon has revealed that it is a polymorphic species comprised of many ecological variants, differing in their habit, and leaves. Those collected from the sea-shore are diffuse herbs, sometimes rooting at nodes with lanceolate leaves, about 3.5 x 1 cm in size. The panicles or racemes are large, and many flowered. Those on the moist, grassy, hill-slopes are erect or diffuse, with a few, linear, verticillate leaves and few-flowered axillary racemes.

Flowers: May - Dec.

Sivarajan 1218, 1247, 1275.

M.disticha (Linn.) Ser. in DC. Prod. 1:392. 1824; FBI.  
2:663. 1879; Gamb. 390. Pharnaceum distichum Linn.  
Mant. 2:221. 1767. Mollugo racemosa Lamk. Tabl. Encycl.  
1:218. 1792.



Erect or diffuse herbs; stem angular; leaves lanceolate, acute, glabrous; flowers in cymes; branches of cymes racemosa; pedicels short, filiform; sepals elliptic, white; seeds papillose, brown.

Flowers: Mar. - Sept.

Sivarajan 138.

Gisekia Linn.

G. pharnaceoides Linn. Mant. 2:562. 1767; FBI. 2:664.

1879; Gamb. 391; Linn Bogle in J. Arn. Arb. 51:435.

1970. Koelreutera molluginoides Murr. in Nov. Comm.

Gotting 3:67, t. 2, f. 1. 1773. Gisekia molluginoides

(Murr.) Wt. in Calc. J. Nat. Hist. 7:162. 1847.

Prostrate herbs; rooting at nodes; leaves opposite or whorled, obovate-spathulate; flowers white in axillary fascicles; pedicels filiform; petals 0; stamens 5 or 10; carpels 5, distinct, each with a solitary ovule, papillose in fruits; seeds reniform, minutely pitted, and compressed.

Common on the sandy coast.

Flowers: Mar. - Sept.

Sivarajan 886, 1300.

Erect or diffuse herbs; stem angular; leaves lanceolate, acute, glabrous; flowers in cymes; branches of cymes **racemosa**; pedicels short, filiform; sepals elliptic, white; seeds papillose, brown.

Flowers: Mar. - Sept.

Sivarajan 138.

Gisekia Linn.

G. pharnaceoides Linn. Mant. 2:562. 1767; FBI. 2:664.

1879; Gamb. 391; Linn Bogle in J. Arn. Arb. 51:435.

1970. Koelreutera molluginoides Murr. in Nov. Comm.

Gotting 3:67, t. 2, f. 1. 1773. Gisekia molluginoides

(Murr.) Wt. in Calc. J. Nat. Hist. 7:162. 1847.

Prostrate herbs; rooting at nodes; leaves opposite or whorled, obovate-spathulate; flowers white in axillary fascicles; pedicels filiform; petals 0; stamens 5 or 10; carpels 5, distinct, each with a solitary ovule, papillose in fruits; seeds reniform, minutely pitted, and compressed.

Common on the sandy coast.

Flowers: Mar. - Sept.

Sivarajan 886, 1300.

Note: The systematic position of this genus has been a matter of dispute. It has been assigned to Phytolaccaceae by de Candolle (Prod. 13:26-28. 1849), Portulacaceae by Gagnepain (Bull. Soc. Bot. Fr. 65:7-10. 1918) and to Aizoaceae by Bentham and Hooker (Gen. Pl. 1:859. 1867). Most recently this genus has been segregated into Molluginaceae by Hutchinson (Fam. Fl. Pl. 1:128-129. 1926) and others, where Gisekia comprises a monotypic tribe Gisekieae Endl. with its free carpels and solitary seeds. The author has subscribed to Hutchinson's view, in this work.

UMBELLIFERAE Juss.

(Apiaceae Lindl., nom. alt.)

Key to the genera

- 1. Creeping herbs ..... Centella
- 1. Erect herbs ..... Coriandrum

Centella Linn.

C. asiatica (Linn.) Urb. in Mart. Fl. Braz. 11:287. t.

78, f. 1. 1879; Buwalda in Blumea 2:134. 1936 & in Fl.

Males. 4:117. 1953; Gamb. 392. Hydrocotyle asiatica

Linn. Sp. Pl. 234. 1753; FBI. 2:669. 1881.

Creeping herbs, rooting at nodes; leaves simple, reniform, crenate, basally 5-7 nerved, cordate at base;

petioles long, fascicled at the nodes; flowers brown in axillary umbels; calyx truncate; petals ovate-acute; stamens 5; fruit of 2, compressed, prominently ridged mericarps.

Flowers: Oct. - May

Sivarajan 194, 688, 936.

Coriandrum Linn.

C. sativum Linn. Sp. Pl. 256. 1753; Bailey 753;  
Gamb. 399.

Erect herbs; leaves pinnatisect, segments of the upper leaves filiform; flowers white in compound umbels; calyx lobes 5; petals unequal, obcordate; stamens 5; mericarps compressed on the inner surface.

Seen as an escape, especially near habitations.

Flowers: Oct. - Mar.

Sivarajan 206, 762.

ALANGIACEAE DC.

Alangium Lamk. (nom. cons.)

A. salvifolium (Linn.f.) Wangerin in Engl. Pflanz.

4(220b):9. 1910, ssp. hexapetalum (Lamk.) Wangerin  
in Engl. Pflanz. 4(220b):9. 1910; Mukh. in Bull.  
Bot. Sur. Ind. 10:331. 1968. Grewia salvifolia  
Linn. f. Suppl. 409. 1781. A. hexapetalum Lamk.  
Encycl. Meth. Bot. 1:175. 1783.

Woody shrubs; leaves elliptic to oblanceolate,  
acuminate, 3-5 veined from base; flowers in axillary  
clusters, pubescent outside; petals deflexed; stamens  
many; fruits ovoid, 2-2.5 cm long, rusty tomentose.

Flowers: Feb. - May

Sivarajan 154, 960, 1146.

RUBIACEAE Juss.

Key to the genera

1. Plants armed:
  2. Fruits 1-2 seeded ..... Canthium
  2. Fruits many seeded ..... Xeromphis
1. Plants unarmed:
  3. Flowers in globose heads:
    4. Bracteoles 0 ..... Anthocephalus
    4. Bracteoles present ..... Mitragyna
  3. Flowers not in globose heads:
    5. Fruits capsular:
      6. Capsules compressed ..... Ophiorrhiza
      6. Capsules not compressed:
        7. Seed one in each cell:
          8. Capsule circumscissile ... Mitracarpus
          8. Capsule not as above ..... Borreria
        7. Seeds many in each cell:
          9. Anthers connate ..... Argostemma

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The author is thankful to Dr. C.E. Ridsdale, Rijksherbarium, Leiden, for his valuable comments with regard to the identify and nomenclature of the Rubiaceae specimens.

9. Anthers free:

10. Capsules indehiscent ..... Dentella

10. Capsules dehiscent (except in  
Hedyotis auricularia):

11. Corolla not more than 5 mm  
long :...

12. Seeds without a ventral  
cavity ..... Hedyotis

12. Seeds with a ventral  
cavity ..... Neanotis

11. Corolla much longer ..... Pentas

5. Fruits fleshy berries or drupes:

13. Fruit forming a syncarpium ..... Morinda

13. Fruit not a syncarpium:

14. Ovary 1-celled ..... Gardenia

14. Ovary more than one celled:

15. Flowers in helicoid cymes ..... Hamelia

15. Flowers not as above:

16. Corolla tube longer than  
the lobes:

17. Corolla tube curved ..... Psychotria

17. Corolla tube straight:

18. One calyx lobe usually  
enlarged and

foliaceous ..... Mussaenda

18. Calyx lobe not as above:
- 19. Style entire ..... Pavetta
  - 19. Style 2-fid ..... Ixora
16. Corolla tube shorter than lobes .... Coffea

Canthium Lamk.

Key to the species

- 1. Flowers 5-merous ..... leschenaultii
- 1. Flowers 4-merous ..... parviflorum

C.leschenaultii (DC.) Wt. & Arn. Prod. 426. 1834; Wt. Ic. 826. 1845; Blatt. in J. Bombay nat. Hist. Soc. 36:790. 1933. Dondisia leschenaultii DC. Prod. 4:469. 1830. Canthium rheedii DC. Prod. 4:474. 1830; FBI. 3:134. 1880. Plectronia rheedii (DC.) Bedd. For. Man. Fl. Sylv. 134-35. 1874. Gamb. 441.

Spinous, woody shrubs; leaves ovate or elliptic-lanceolate, about 7 x 3.5 cm in size, rusty tomentose on the lower surface; flowers green in axillary clusters; corolla tube very short, lobes linear, reflexed; anthers with glandular hairs; drupes obovoid, compressed, 1 cm across.

Flowers: Jan. - May

Sivarajan 58, 686, 1719.



C. parviflorum Lamk. Encycl. Meth. Bot. 1:602. 1785;  
Roxb. Pl. Corom. t. 51. 1796; FBI. 3:136. 1881;  
Blatt. in J. Bombay nat. Hist. Soc. 36:790. 1933.  
Plectronia parviflora (Lamk.) Bedd. For. Man. Bot.  
134-35. 1874; Gamb. 441.

Deciduous shrubs or small trees, usually the flowering branches unarmed, spines on the young shoots long, and very stout; leaves ovate, obtusely acuminate, base subcordate, glabrous, up to 8 x 6 cm; flowers 4-6 mm across, greenish yellow, campanulate in axillary, solitary or fascicled cymes; corolla lobes triangular, as long, or shorter than the tube; drupes obovoid, compressed; 1-1.5 cm long.

Flowers: Apr. - May

Sivarajan 195, 1088, 1089.

Xeromphis Rafin

Key to the species

1. Flowers in axillary cymes ..... malabarica
1. Flowers solitary or fascicled in axils:.
  2. Corolla glabrous ..... uliginosa
  2. Corolla hairy outside ..... spinosa

X.malabarica (Lamk.) Raju in Excurs. Fl. Sinhachalam Hill. Calc. 13. 1966. Randia malabarica Lamk. Encycl. Meth. Bot. 3:25. 1789, FBI. 3:111. 1880; Gamb. 435.

Erect, woody shrubs; spines in axillary pairs; leaves ovate to elliptic, acute or obtuse, glabrous; flowers white in axillary cymes; bracteoles many, triangular; corolla lobes reflexed, acute, glabrous; berries small, many seeded; seeds free.

Flowers: June - Sept.

Sivarajan 289, 1128.

X.uliginosa (Retz.) Maheswari in Bull. Bot. Sur. Ind. 3:92. 1961 & in Bull. Bot. Soc. Uni. Saugar 10:39. 1961; Kar & Panigrahi in Bull. Bot. Sur. Ind. 5:237. 1963. Gardenia uliginosa Retz. Obs. 2:14. 1781; Roxb. Pl. Corom. t. 135. 1798. Randia uliginosa (Retz.) Poir. in Lamk. Encycl. Suppl. 2:829. 1811; DC. Prod. 4:386. 1830; FBI. 3:110. 1880; Gamb. 434.

Shrubs; spines very short; branches 4-angled; leaves elliptic or oblanceolate, obtuse, glabrous, up to 12 x 7 cm; flowers solitary, white, 3-4 cm across; corolla lobes broadly orbicular, glabrous; berries

many seeded; seeds embedded in a pulp.

An extremely rare species. A few plants are seen growing in the wet fields in the University Campus.

Flowers: Mar. - Apr.

Sivarajan 1160.

X.spinosa (Thunb.) Keay in Bull. Jard. Bot. Brux.

28:37. 1958; Mahes. in Bull. Bot. Soc. Uni. Saugar  
10:40. 1961 & in Bull. Bot. Sur. Ind. 3:91. 1961;  
Kar & Panigrahi in Bull. Bot. Sur. Ind. 5:237.  
1963. Gardenia spinosa Thunb. Diss. Gard. no. 7.  
1780. G.dumetorum Retz. Obs. 2:14. 1781. Randia  
dumetorum (Retz.) Poir. in Lamk. Encycl. Suppl.  
2:829. 1811; FBI. 3:110. 1880. R.spinosa (Thunb.)  
Poir. in Lamk. Encycl. Suppl. 2:829. 1811; FBI.  
3:110. 1880. R.longispina DC. Prod. 4:386. 1830;  
Wt. & Arn. Prod. 398. 1834; Gamb. 434. R.brandisii  
Gamb. Fl. Pres. Madr. 616. 1921.

Much branched, spinous shrubs; spines  
axillary, stout; leaves elliptic to obovate, hairy  
on the veins beneath, up to 5 x 2.8 cm; flowers  
white turning yellowish, solitary or fascicled in  
the axils; corolla lobes obtuse, reflexed, hairy

outside; seeds embedded in a pulp.

Flowers: Apr. - May

Sivarajan 234.

Note: This species has been very often included under 'Randia dumetorum complex'. Gamble in his "Flora of Presidency of Madras" split this complex into several species. But now it is accepted that the group contains only a single species. Keay (loc.cit.) has transferred it to the genus Xeromphis under the name X.spinosa (Thunb.) Keay.

Anthocephalus A. Rich.

A.chinensis (Lamk.) A. Rich. ex Walp. Rep. 2:491.

1843; Ridsdale in Gard. Bull. 25:252. 1970. Bakh. f. in Taxon 19:469. 1970. Cephalanthus chinensis Lamk. Encycl. Meth. Bot. 1:678. 1785. Nauclea cadamba Roxb. [Hort. Beng. 14. 1814, nom. nud.] Fl. Ind. 512. 1820. Anthocephalus indicus A. Rich. in Mem. Soc. Hist. Nat. Par. 5:238. 1834., nom. illeg. A.cadamba (Roxb.) Miq. Fl. Ind. Bat. 2:135. 1856.

Large, deciduous trees; leaves elliptic, acute or obtuse, shining green above, pubescent beneath;

heads solitary in the axils, 4-5 cm across; peduncles 4-5 cm long; calyx lobes linear-clavate, 6-8 mm long; corolla greenish yellow, 8-10 mm.

Common along the wet, swampy banks of Kunnamangalam River.

Flowers: Jan. - Mar.

Sivarajan 1614.

Note: The identity of this genus and its type species has been very much confused. Walpers (Rep. 2:491. 1843) first named this plant as Anthocephalus chinensis based on Cephalanthus chinensis Lamk. But most of the Indian workers have kept it under Richard's A.indicus, which is entirely based on C.chinensis Lamk. According to Art. 55 of the Code the correct name should be A.chinensis and A.indicus should be rejected as an illegitimate name.

Mitragyna Korth.(nom.cons.)

Key to the species

1. Leaves rounded at apex ..... parvifolia
1. Leaves acuminate at apex ..... tubulosa

M. parvifolia (Roxb.) Korth. Obs. Naocl. Ind. 19. 1839;  
Bakh. f. in Taxon 19:472. 1970. Nauclea parvifolia  
Roxb. Pl. Corom. 1:40, t. 52. 1795. Stephegyne  
parvifolia (Roxb.) Korth. Verh. Nat. Gesch. Bot.  
161. 1840; FBI. 3:24. 1880.

Trees; leaves obovate or orbicular, rounded at apex, up to 14 x 9 cm; stipules large, obovate-obtuse, caducous; flowers greenish yellow turning reddish purple; heads solitary, axillary; calyx limb minute.

A rare species, collected from the University Campus, growing near streams or wet fields.

Flowers: Mar. - Apr.

Sivarajan 1099.

M. tubulosa (Arn.) Kuntze, Rev. Gen. 228. 1891; Gamb.  
413. Nauclea tubulosa Arn. in Th. En. 137. 1859.  
Stephegyne tubulosa (Arn.) Benth. & Hook. f., Gen.  
Pl. 2:31. 1873.

Trees; leaves oblong or oblanceolate, acuminate, subcordate at base, 25 x 12 cm; stipules large, caducous; heads solitary; flowers greenish yellow

turning purple; calyx limb truncate, longer than the fruit.

A rare species near water ways, collected from the University campus.

Flowers: July - Aug.

Sivarajan 292.

Ophiorrhiza Linn.

O. prostrata D. Don, Prod. Fl. Nep. 136. 1825; Sant. & Merch. in Bull. Bot. Sur. Ind. 3:109. 1961; Kar & Panigrahi in Bull. Bot. Sur. Ind. 5:234. 1963.

O. harrisiana Heyne ex Hook. f. in Fl. Brit. Ind. 3:78. 1880; Gamb. 428.

Small herbs; leaves elliptic-acute, up to 10 x 5 cm; flowers white in terminal, dichotomous, secund cymes; capsules compressed, broader than long, opening at the apex; seeds many.

Common along the banks of fresh water streams or ponds in shaded places.

Flowers: Aug. - Dec.

Sivarajan 295.

PLATE 6

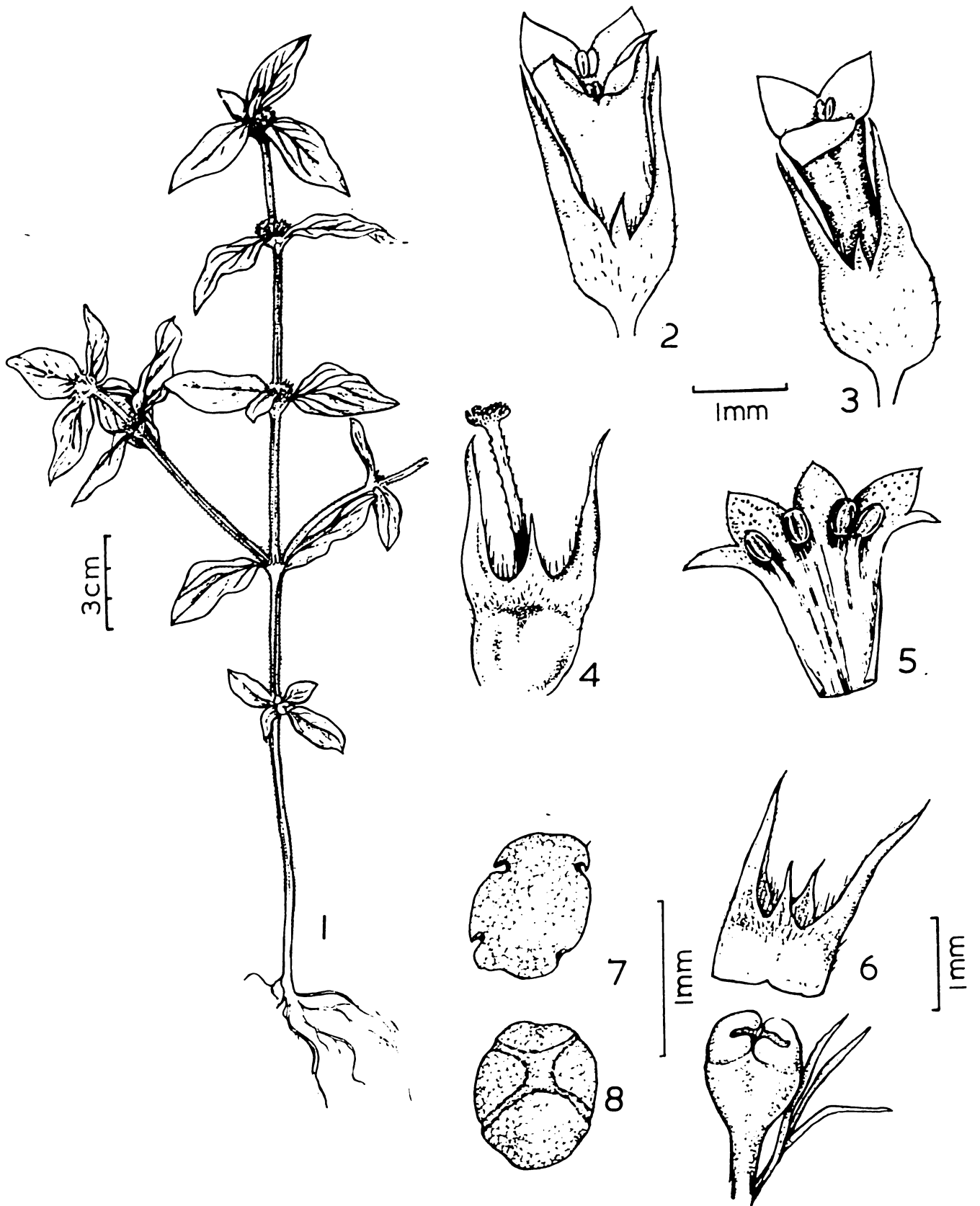
Mitracarpus verticillatus (Schum. & Thonn.)

Vatke. Fig.1. Entire plant. Figs.2-3.

Flowers. Fig.4. A flower with corolla removed to show the calyx teeth, style and stigma. Fig.5. Corolla tube split open showing the insertion of stamens. Fig.6.

Circumscissile capsule. Figs. 7-8. Dorsal and ventral views of the seed.





MITRACARPUS VERTICILLATUS (SCHUM. & THONN.) VATKE

Mitracarpus Zucc.

M. verticillatus (Schum. & Thonn.) Vatke in Linnaea  
40:196. 1876; Sebastine & Ramamurt~~y~~ in Bull. Bot.  
Sur. Ind. 9:291. 1963. Staurospermum verticillatum  
Schum. & Thonn. Berskr. Guin. Pl. '73. 1827.  
Mitracarpum senegalense DC. Prod. 4:572. 1830.  
Oldenlandia verticillata (Schum. & Thonn.) Bacl.  
ex DC. Prod. 4:572. 1830.

Erect, usually branched herbs; stem 4-angular,  
hispid; leaves sessile, ovate or elliptic, basally  
veined, veins usually impressed; flowers white, minute  
in dense, axillary and terminal clusters; capsules  
circumscissile; seed solitary in each cell. (Plate 6.)

Profuse weed on road sides and in waste places.

Flowers: Aug. - Nov.

Sivarajan 325.

Borreria G.F.W.Meyer (nom.cons.)

Key to the species

1. Leaves linear-lanceolate:
  2. Septum persistent in fruits ..... malabarica
  2. Septum not persistent in fruits .... stricta

1. Leaves elliptic to obovate:

3. Flowers minute, many in each cluster ... ocymoides

3. Flowers large, few in each cluster:

4. Stipules with glandular papillae ... eradii

4. Stipules without glandular

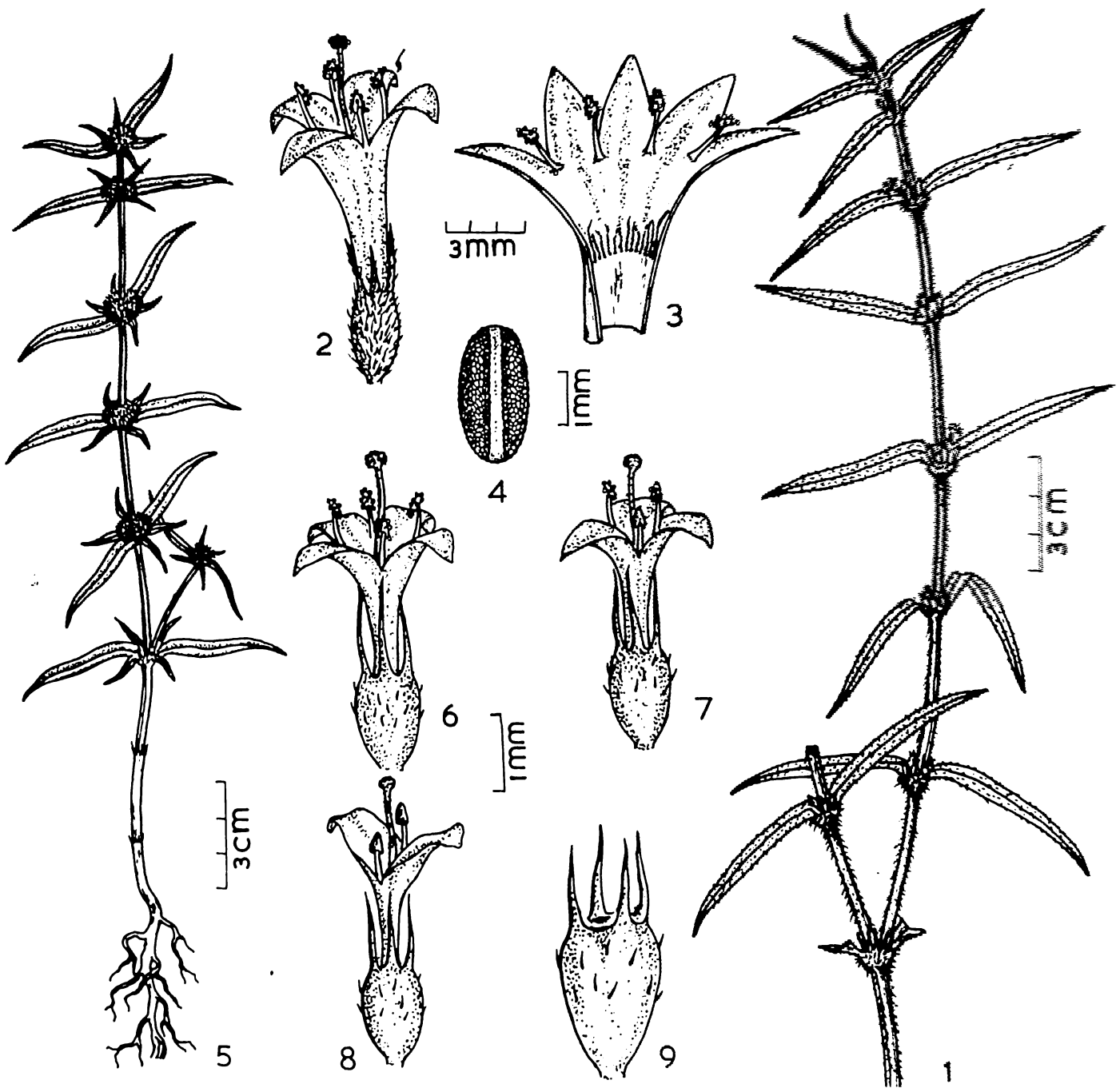
papillae ... articularis

B. malabarica Sivaraman, Sp. nov.

Herba erecta, ramosa; caulis acute quadrangularis, angulis hispidis; folia lineari-lanceolata, acuta, utrinque scabra, usque ad 6 x 0.8 cm, marginibus recurvis et nervis lateralibus obscuris; stipulae vaginantes, basi foliorum connatae, extus dense-pilosae, apice cum 5-7 setis glabris praeditae; flores axillares, rosei, pauci, sessiles, fasciculati; lobi calycis 4 lineari, margine ciliati, fructificationis tempore 2-3 mm longi; tubus corollae 5-7 mm longus, intus annulo piloso moniliforme obtectus; lobi corollae 4, ovato-acuti, usque ad 3 x 2 mm; stamina 4, file inserta; ovarium biloculare, ovulis solitariis; stylus filiformis, 6-7 mm longus, apicem versus muricatus; stigma capitatum; fructus ellipsoidales, 5 mm longi, supra basin hispidi, lobis calycinalibus erectis in corona persistente, septo remanenti instructis; semina oblonga, 3 x 1.5 mm, ventraliter sulcata, testa reticulata (Plate 7. Fig.1-4).

PLATE 7

Figs. 1-4. Borreria malabarica Sivarajan &  
Manilal. Fig.1. A branch. Fig. 2. Flower.  
Fig.3. Corolla tube split open. Fig.4. Seed.  
Figs. 5-9. Borreria stricta (Linn.f.)  
Schum. var.rosea Sivarajan & Manilal.  
Fig. 5. Entire plant. Figs. 6-8. Flowers.  
Fig.9. Capsule.



B.stricta et B.articulari affinis, sed habitu erecto-ramoso, foliis lineari-lanceolatis, fasciculis axillaribus paucifloribus atque septo persistenti differt.

Holotypus Sivarajan 374 in Herbario Sectionis Botanici Universitatis Calicutensis conservatur.

B.malabarica Sivarajan Sp. nov.

Erect, branched herbs; stem sharply 4-angled, angles hispid hairy; leaves linear-lanceolate, acute, scabrous on both surfaces, about 6 x 0.8 cm, margins recurved, lateral veins obscure; stipules sheathing, connate with leaf-bases, densely hispid outside with 5-7 glabrous bristles at the tip; flowers pink, in axillary, few-flowered, sessile clusters; calyx lobes 4, linear, ciliate on the margins, 3 mm long in fruits; corolla tube 5-7 mm long with a ring of moniliform hairs within; corolla lobes 4, ovate-acute, up to 3 x 2 mm in size; stamens 4, inserted at the throat; ovary 2-celled with a solitary ovule in each; style filiform, 6 mm long, muricate towards the tip; stigma capitate; fruits ellipsoid, 5 mm long, hispid above the base with the persistent crown of erect calyx lobes; septum persistent; seeds oblong, 3 x 1.5 mm in size, ventrally grooved, testa reticulate. (Plate 7. Fig. 1-4).

This species can be easily distinguished from B.stricta (Linn.f.) K.Schum. by its few-flowered axillary cymes, large, pink flowers and the persistent septa in the fruits. It differs from B.articularis (Linn.f.) F.N.Will. in its much branched, erect habit and in its linear-lanceolate leaves.

Holotype Sivarajan 374 is deposited in the Botany Department Herbarium of the Calicut University.

B.stricta (Linn.f.) Schum. in Engl. & Pr. Pfam.

4(4):143. 1891; Sant. 108. 1960; Kar & Panigrahi

in Bull. Bot. Sur. Ind. 5:228. 1963; Gamb. 461.

Spermacoce stricta Linn. f. Suppl. 120. 1781;

FBI. 3:200. 1881.

#### Key to the varieties

1. Capsules densely hairy outside ..... var.stricta

1. Capsules sparsely hairy or glabrescent .. var.rosea

var.stricta.

Erect, branched, subshrubby plants; stem sharply 4-angular, angles hispid; leaves narrowly elliptic or lanceolate, sessile, up to 5 x 0.8 cm, margins not prominently incurved, lateral veins obvious, 2-3 pairs; flowers white; capsules obovoid

or ellipsoid, densely hairy outside, 3 mm long.

Common annuals, on the grassy hill-slopes.

Flowers: Oct. - Nov.

Sivarajan ~~398~~, 625.

B. stricta (Linn.f.) K.Schum. var. rosea Sivarajan var.nov.

Planta erecta, gracilis, 10-20 cm alta; caulis quadrangularis, in angulis scaber; folia linearo-lanceolata, acuta, circa 4 x 0.4 cm, superne atque inferne (in nervo medio) hispida, nervis secundariis obscuris, marginibus prominenter recurvatis; flores parvi, rosei, in capitulis axillaribus densis, terminalibus globososque dispositi; bracteae et bracteolae filiformes, hyalinae; calycis lobi 4, lineares, erecti, persistentes, 1 mm longi; tubus corollae brevior vel calycis lobos aequans; lobi 4-(3-2); stamina tot quot corollae lobi, faucibus inserta; ovarium biloculare, loculi ovulis solitariis praediti; stylus 2-2.5 mm longus, corollam superans; stigma capitatum; capsula ellipsoidea, inferne glabra, superne sparse pilosa usque glabriuscula, 2-2.5 mm longa; semina oblonga, ventraliter sulcata, 1.5 mm longa. (Plate 7. Fig. 5-9)

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The author is thankful to Dr. C. Vaczy (Cluj, Romania) for kindly rendering the latin diagnosis.

of Borreria malabarica and B. stricta var. rosea



A specie B.stricta habitu minore, foliis minoribus sine nervis lateralibus, floribus roseis, capsulis sparse pilosis vel glabrescentibus, nec non seminibus minoribus differt.

Holotypus Sivarajan 291 in Herbario Sectionis Universitatis Calicutensis reperitur.

B.stricta (Linn.f.) K.Schum., var. rosea Sivarajan var.nov.

Erect, slender herbs, 10-20 cm tall; stem 4-angled, scabrous on the angles; leaves linear-lanceolate, acute, about 4 x 0.4 cm in size, hispid on the upper surface and on the mid-vein beneath, lateral veins obscure, margins prominently recurved; flowers minute, pink, in dense, axillary and terminal globose heads; bracts and bracteoles filiform, hyaline; calyx lobes 4, linear, erect, persistent, 1 mm long; corolla tube shorter or almost as long as the calyx lobes, lobes 4-(3-2); stamens as many as corolla lobes, inserted at the throat; ovary 2-celled, ovules solitary in each cell; style longer than the corolla, 2-2.5 mm long; stigma capitate; capsule ellipsoid, glabrous below, sparsely hairy to glabrescent above, 2-2.5 mm long; seeds oblong, ventrally grooved, 1.5 mm long.

(Plate 7. Fig. 5-9)

Distinguished from B.stricta var.stricta by its smaller size, smaller leaves without lateral veins, pink flowers, sparsely hairy or glabrescent capsules and smaller seeds.

Holotype Sivarajan 291 is deposited in the Botany Department Herbarium of the Calicut University.

Both the varieties occur as profuse weeds in this area. They exhibit conspicuous differences in their morphology and the flowering and fruiting periods. By the time var.stricta starts flowering, var.rosea would have already shed their seeds. Out crossing is prevented due to this separation in flowering time and, therefore, intermediate forms do not occur.

The main differences between the two varieties are tabulated below:

|       | <u>B.stricta</u> var. <u>rosea</u> | <u>B.stricta</u> var. <u>stricta</u> |
|-------|------------------------------------|--------------------------------------|
| Habit | Slender, rarely branched.          | Stout, subshrubby, often branched.   |

|                |   |   |
|----------------|---|---|
| Leaves         | Linear-lanceolate,<br>lateral veins obs-<br>cure, margins dis-<br>tinctly incurved. | Narrowly elliptic<br>or lanceolate,<br>lateral veins<br>distinct, margins<br>slightly or not<br>incurved. |
| Flowers        | Pink.   | White.  |
| Fruits         | Glabrescent or<br>sparcely hairy<br>above the base.                                 | Densly hispid<br>above the base.  |
| Flowering time | August-September  | <b><u>November- December</u></b>  |

B. ocymoides (Burm.f.) DC. Prod. 4:544. 1830; Kar. and  
Panigrahi in Bull. Bot. Sur. Ind. 5:228. 1963; Gamb.  
461. Spermacoce ocymoides Burm. f. Fl. Ind. 34, t.  
13, f. 1. 1768; FBI. 3:200. 1881.

Diffuse herbs; stem narrowly winged and ciliate;  
leaves ovate or elliptic, acute, sessile, glabrous, up  
to 2.5 x 1.5 cm; flowers white, minute in dense,  
axillary and terminal clusters; calyx lobes very unequal;  
capsules glabrous.

A common weed in gardens and on the grassy slopes.

Flowers: Sept. - Dec.

Sivarajan 169, 320.

B.eradii Ravi in J. Bombay nat. Hist. Soc. 66:539-41, ff. 1-10. 1970.

Diffuse herbs; stem sharply 4-angled, villous; leaves ovate or elliptic, attenuate at base, scabrid on both surfaces, lateral veins close, 6-7 pairs up to 4 x 2 cm; flowers pink in axillary, sessile clusters, campanulate; calyx densely villous; corolla 5 mm long.

Collected from sandy fields near Meenchanda and Feroke.

Flowers: Aug. - Dec.

Sivarajan 464.

B.articularis (Linn.f.) F.N.Will. in Bull. Herb.

Boiss. 2. Ser. 5:956. 1905; Merr. in Trans. Am. Phil. Soc. ns. 24:374. 1935; Sant. & Merch. in Bull. Bot. Sur. Ind. 3:107. 1961; Kar & Panigrahi in Bull. Bot. Sur. Ind. 5:228. 1963. Spermacoce articularis Linn. f. Suppl. 119. 1781 (excl. Syn. Rumph.). S.hispida Linn. Sp. Pl. 102. 1753; Roxb.

Fl. Ind. 3:124. 1832. Borreria hispida (Linn.)  
Schum. in Engl. & Pr. Pfam. 4(4):144. 1891,  
(non Spruce ex K.Schum.)

Erect or diffuse herbs; stem subterete or 4-angled, scabrid or pilose; leaves elliptic to obovate, obtuse or acute; flowers pink, in axillary, sessile clusters; calyx hairy, lobes spreading; corolla campanulate or funnel shaped, lobes as long as or much shorter than the tube; capsules 2-celled, 2-seeded; septa persistent.

Flowers: July - Dec.

Sivarajan 288, 318, 423, 1283, 1293, 1484.

Note: B.articularis (Linn.f.) F.N.Will., as understood today is much variable. The author's collections of this species include at least two, easily distinguishable, extreme forms, which were originally described as two different species. The one with prostrate, or diffuse, sharply 4-angled, scabrous stems, non-flexuous leaves and funnel shaped flowers with corolla tube four or more times longer than the lobes, is very common along the grassy slopes and on the sandy coast and displays much variation

in the leaf shape and size. Linnaeus filius (loc.cit.) described this plant under the name Spermacoce articu-  
laris, - "Caulis herbaceus, ruber teres, undique cauali-  
culatus ramosus. Rami Virgati procumbentes. Folia  
opposita ..... obtusiascula scabra. Flores albi,  
angusti .....". The other form with erect or  
suberect, terete or subterete, pilose stem, flexuous  
leaves, and turbinato-campanulate flowers with corolla  
tube almost as long as the lobes is mostly found on  
the rocky, lateritic slopes, and was originally described  
under the name Spermacoce hispida by Linnaeus - "Caulis  
herbaceus, erectus, obsolete tetragonous, piloso -  
hispidulous, rami inferi oppositi. Folia .....  
utrimque scabra, crassiascula, flexuosa ..... corolla  
violacea, turbinato campanulata, semiquadrifida, erecta  
....." -. However realising the continuous range  
of variation displayed by this 'S.hispida - articularis  
complex' subsequent workers amalgamated them into a  
single species.

Schumann (op.cit. 1891) restricted the generic  
name Spermacoce to plants of American origin and trans-  
ferred the Indian species to another genus, Borreria.  
Consequently, S.hispida Linn. was also transferred to  
the genus Borreria under the name B.hispida (Linn.)

Schum. (1891). But this combination is illegitimate, since it is a later homonym of B.hispida Spruce ex K. Schum., a Brazilian species, and hence this plant is treated under the next available epithet "articularis", the binomial being B.articularis (Linn.f.) F.N.Williams.

Argostemma Wall.

A.courtallense Arn. in Ann. Nat. Hist. 3:22. 1839; Wt.

Ic. 1160. 1846; FBI. 3:42. 1880; Blatt. in J. Bombay nat. Hist. Soc. 36:783. 1933; Gamb. 417.

Small, delicate herbs, about 2-5 cm tall; leaves whorled, elliptic-acute, variable in size; flowers white in terminal, 2-3-flowered umbels, 4-merous; calyx lobes triangular-acute; anthers connivent at first, opening by apical pores; capsules many seeded, opening at the apex.

On wet rocks on the shaded bank of a stream near the University campus. Very rare.

Flowers: Aug. - Sept.

Sivarajan 1747.

Dentella J.R. & G.Forst.

D.repens (Linn.) Forst. Char. Gen. Pl. Ins. Mar. Austr. 25, t. 13. 1776; FBI. 3:42. 1880; Airy Shaw in Kew Bull. 1934:291. 1934; Subram. & Sharma in Bull. Bot. Sur. Ind. 10:386. 1968; Reed in Phytologia 19:311. 1970. Oldenlandia repens Linn. Mant. 1:40. 1:40. 1767. (non Burm.f.)

Prostrate, delicate herbs, rooting at the nodes; leaves elliptic-acute, 5 mm long, glabrous or ciliate on the margins; flowers white, sessile, axillary and at the forks of the stem; fruits dry, indehiscent, densely hairy outside, many seeded.

Very common in the moist sandy fields and display much variation in its hairyness<sup>i</sup> and size of the flowers.

Flowers: May - Dec.

Sivarajan 151, 222, 1019.

Hedyotis Linn.

Note: There have been much controversy over the circumscription of the genus Hedyotis and the generic status of Oldenlandia and Exallage. Linnaeus (Sp. Pl. 101. 1753) originally included only three



species under Hedyotis, namely H.fruticosa, H.auricularia and H.herbacea and separated Oldenlandia based on the wholly inferior ovary and the numerous minute, angled seeds with fleshy endosperm. Later Bremekamp (Verh. Kon. Ned..Akad. Wet. 2, 48(2):142. 1952) removed Hedyotis auricularia to a new genus, Exallage, based on its indehiscent fruits.

However, recent studies by Fosberg (J. Sci. 2:106-111. 1941 & Castanea 19:25-37. 1954), Shinnars (Field and Lab. 17:136-169. 1949), Lewis (Rhodora 63:216-223. 1961) and Bakhuizen. f. (Fl. Java 2:284-288. 1965) have shown that the major characteristics of the taxa now treated under Hedyotis exhibit continuous ranges, and that Bremekamp's (loc.cit.)-127) generic realignments would not stand. Working on the genus Hedyotis in Maharashtra State, Rolla Rao and Hemadri (Ind. For. 99(6):372-379. 1973) have found that the number, size and shape of seeds, the position of ovary, nature of endosperm and the length of corolla displayed a continuous range of variation and that the merger of the genera Oldenlandia and Exallage under Hedyotis was justifiable. The author <sup>h</sup>was followed this broad concept of the genus Hedyotis, and has treated all species of Oldenlandia and Exallage under Hedyotis.

Key to the species

1. Capsules indehiscent ..... auricularia
1. Capsules dehiscent:
  2. Leaves ovate or orbicular ..... trinervia
  2. Leaves linear:
    3. Flowers capitate ..... caerulea
    3. Flowers not capitate:
      4. Plants erect, much branched ... herbacea
      4. Plants usually diffuse or  
prostrate:
        5. Peduncle very short or 0 .. diffusa
        5. Peduncle long:
          6. Flowers few ..... corymbosa
          6. Flowers many ..... umbellata

H.auricularia Linn. Sp. Pl. 101. 1753; FBI. 3:58.

1880; Back. & Bakh. f. Fl. Java 2:287. 1965; Rolla

Rao & Hemadri in Ind. For. 99:375. 1973. Oldenlandia

auricularia (Linn.) K.Schum. in Engl. & Pr. Pfam.

4(4):25. 1891; Gamb. 421. Exallage auricularia (Linn.)

Bremek. Verh. Kon. Ned. Akad. Wet. 2, 48(2):142.

1952; Sant. & Merch. in Bull. Bot. Sur. Ind. 3:108.

1962.

Diffuse herbs; leaves ovate to elliptic, acute or acuminate, basally nerved, veins usually impressed; flowers white, sessile, clustered in the axils; capsules pubescent, dry and indehiscent, cells few-seeded.

Flowers: June - Dec.

Sivarajan 294, 1349, 1694.

H. trinervia (Retz.) Roem. & Schult. Syst. 3:197. 1819; Wt. & Arn. Prod. 414. 1834; Back. & Bakh. f. Fl. Java 2:286. 1965; Rolla Rao & Hemadri in Ind. For. 99:378. 1973. Oldenlandia trinervia Retz. Obs. 4:23. 1786; FBI. 3:66. 1880; Gamb. 421.

Prostrate herbs, rooting at nodes, usually hairy; leaves ovate to orbicular subsessile, up to 1 x 0.8 cm, basally 3-nerved; flowers minute, white, sessile or subsessile in the axils; capsules didymous.

Common in wet or moist cultivated fields.

Flowers: Mar. - Sept.

Sivarajan 45.

H. caerulea Wt. & Arn. Prod. 412. 1834; FBI. 3:60. 1880; Rolla Rao & Hemadri in Ind. For. 99:375. 1973.

Oldenlandia caerulea (Wt. & Arn.) Gamb. Fl. Pres.  
Madr. 597. 1921.

Erect, scabrous herbs, 8-12 cm tall; leaves linear-acute, 1-nerved, 1-2 cm long, 2 mm broad; flowers capitate, blue; calyx teeth triangular, with a filiform point.

An annual on the rocks and grassy hill-slopes, during rainy season.

Flowers: Sept. - Oct.

Sivarajan 675.

H. herbacea Linn. Sp. Pl. 102. 1753; Back. & Bakh. f.

Fl. Java 2:286. 1965; Rolla Rao & Hemadri in Ind.

For. 99:376. 1973. H. heynii R. Br. [in Wall. Cat. n. 867. 1829, nom. nud.] ex Wt. & Arn. Prod. 416. 1834;

Oldenlandia herbacea (Linn.) Roxb. Fl. Ind. 1:424.

1820; Bremek. in Verh. Kon. Neder. Akad. Wet. Natur.

48(2):244. 1952. O. heynii (R.Br.) G. Don, Gen. Syst.

3:531. 1834; FBI. 3:65. 1880.

Much branched, erect, glabrous annuals; leaves linear or linear-lanceolate; peduncles filiform, solitary; flowers white; corolla tube much longer than the calyx teeth; capsules didymous, opening at the top.

A profuse weed on the road-sides and in the up-land cultivations.

Flowers: July - Dec.

Sivarajan 614, 897, 1696.

Note: A polymorphic species of which Bremekamp (loc.cit.) has distinguished about 9 varieties. The author's specimen belongs to the var. herbacea.

H. diffusa Willd. Sp. Pl. 1:566. 1798. Oldenlandia diffusa (Willd.) Roxb. Hort. Beng. 11. 1814, nom. nud. Fl. Ind. 1:423. 1820; DC. Prod. 4:426. 1830; FBI. 3:65. 1880; Gamb. 423.

Diffuse, glabrous annuals; leaves linear-acute, lateral veins 0; flowers solitary, sessile or short-pedicelled, white; calyx teeth acute, glabrous, shorter than the corolla tube; capsule didymous, opening at the apex.

Common annual in the wet or moist, sandy fields.

Flowers: Aug. - Nov.

Sivarajan 19, 25, 1023, 1048, 1693.

H. corymbosa (Linn.) Lamk. Tabl. Encycl. 1:272. 1791;  
Mold. in Phytologia 19(5):312. 1970; Rolla Rao &  
Hemadri in Ind. For. 99:375. 1973. Oldenlandia  
corymbosa Linn. Sp. Pl. 119. 1753; FBI. 3:64. 1880;  
Bremek. in Verh. Kon. Neder. Akad. Wet. Natur.  
48(2):254. 1952; Sant. 103. 1960; Gamb. 423.

Erect or diffuse, glabrous or scaberulous  
annuals; leaves linear; flower<sup>s</sup> white or pale pink,  
2-5 on axillary, filiform peduncles; pedicels also  
filiform; calyx teeth shorter than corolla tube;  
capsules didymous, opening at the apex.

Flowers: Aug. - Oct.

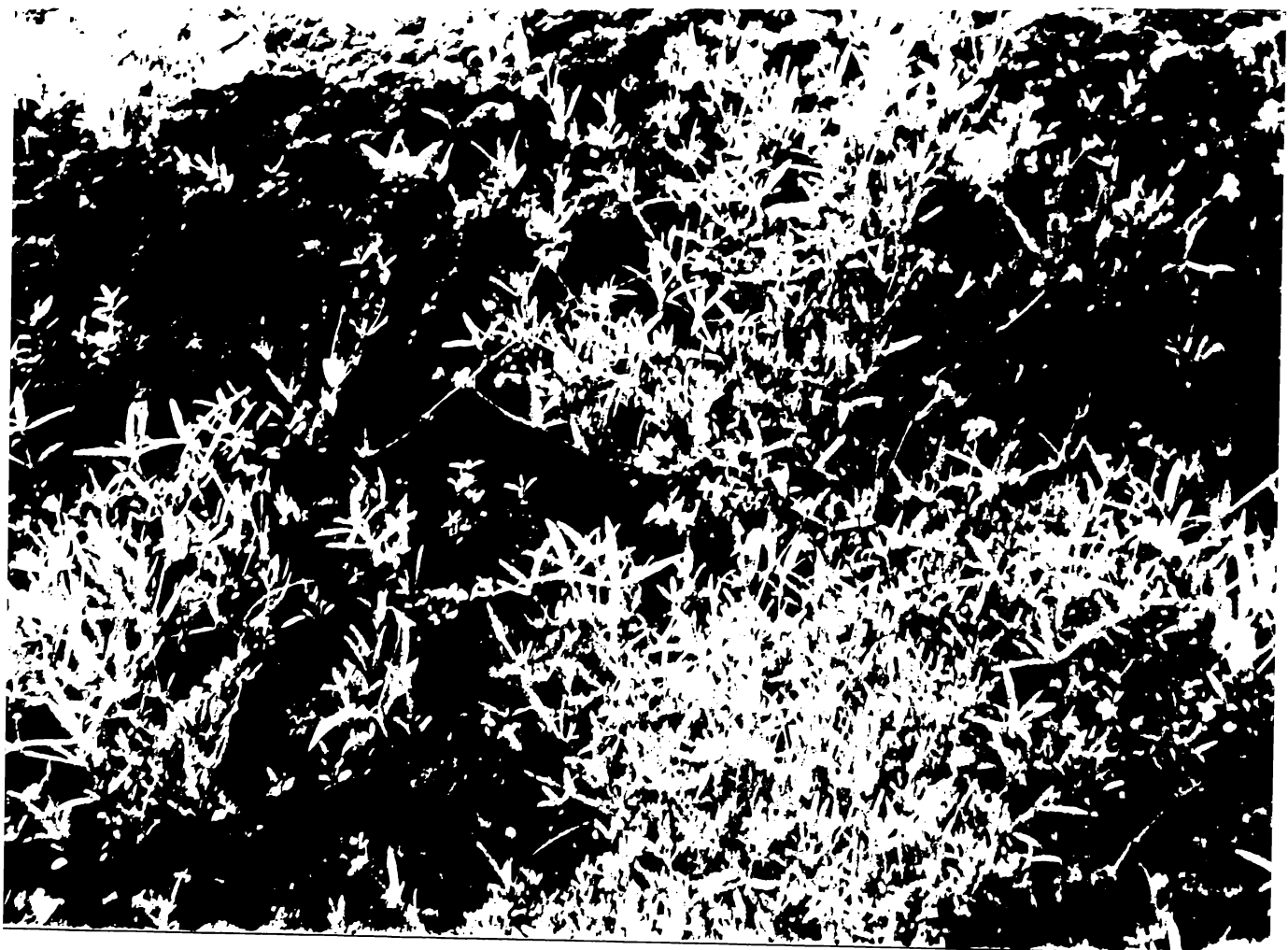
Sivarajan 491, 505, 1022, 1695.

H. umbellata (Linn.) Lamk. Tabl. Encycl. 1:272. 1792.  
Oldenlandia umbellata Linn. Sp. Pl. 119. 1753;  
DC. Prod. 4:425. 1830; FBI. 3:66. 1880; Bremek.  
in Verh. Kon. Ned. Akad. Wet. 48(2):251. 1952;  
Gamb. 424.

Diffuse herbs; leaves linear, glabrous or  
scaberulous, lateral veins absent; peduncle from the  
upper axils, many flowered; flowers umbellate, white  
or pale pink, subsessile; calyx teeth slightly shorter  
than the corolla; capsules didymous, opening at the tip.

PLATE 8

Neanotis foetida (Hook.f.) Lewis, in  
flowers and fruits growing in the crevices  
of rocks.





Note: Bremekamp (loc.cit.) describes this species as being cultivated in India for ~~the~~ alizarin content of its roots. There is no cultivation of this species in this region. They are wild and very common along the railway embankments and in grass-lands.

Flowers: Aug. - Dec.

Sivarajan 48, 172, 560.

Neanotis W.H. Lewis

N.foetida (Hook.f.) Lewis in Ann. Miss. Bot. Gard. 53:38.

1966. Anotis foetida Hook. f. Fl. Brit. Ind. 3:74.

1880; Gamb. 427. Hedyotis foetida Dalz. in Hook. J.

Bot. 2:134. 1850, non (Forst.) J.E.Smith in Rees

Cyclop. 17. 1811.

A diffuse annual, glabrous; leaves linear or narrowly lanceolate; stipules minute, bristly; flowers white or purple, capitate on slender subterminal peduncles; corolla funnel-shaped; capsules didymous, crown prominent; seeds few in each cell, compressed, black. (Plate 8)

A monsoon herb in the crevices of rocks and in hard rocky laterite. Very common in the University campus.

Flowers: Aug. - Oct.

Sivarajan 270.

Note: This plant has been generally treated under the genus Anotis till very recently. Lewis (loc. cit. 32-33) has shown that Anotis is entirely a New World genus and that the Old World species, usually kept under this genus should be transferred to the new genus, Neanotis.

Pentas Benth.

P.lanceolata (Forsk.) Deflers, Voyage on Yemen, 142.

1889; K.Schum. in Engl. & Pr. Pfam. 4(4):29. 1891; Bailey 931; Sant. & Merch. in Bull. Bot. Sur. Ind. 3:110. 1961; Mahes. 182. Ophiorrhiza lanceolata Forsk. Fl. Aeg.-Ar. 42. 1775.

Erect, densely hispid herbs; leaves ovate-lanceolate or elliptic-acute, up to 14 x 5 cm, base narrowed into a short petiole; flowers pale pink in terminal bracteate corymbose cymes; calyx lobes unequal; corolla tube long, slender and cylindric, lobes acute; capsules 2-celled; seeds many.

Flowers: Oct. - July

Sivarajan 829, 1135.

Morinda Linn.

Key to the species

- 1. Climbing shrubs ..... umbellata
- 1. Shrubs or small trees:
  - 2. Leaves acute or obtuse ..... citrifolia
  - 2. Leaves acuminate ..... coreia

M.umbellata Linn. Sp. Pl. 176. 1753; DC. Prod. 4:449.  
1830; Wt. & Arn. Prod. 420. 1834; FBI. 3:157. 1880;  
Kar & Panigrahi in Bull. Bot. Sur. Ind. 5:230.  
1963; Gamb. 460. M.scandens Roxb. Fl. Ind. 1:548.  
1820; DC. Prod. 4:449. 1830.

Climbing shrubs; stem slender, terete; leaves elliptic-oblong or oblanceolate, caudate-acuminate; flowers white in umbellate heads; umbels pedunculate, terminal or in the upper axils; drupes lobed.

Flowers: Jan. - Mar.

Sivarajan 57.

M.citrifolia Linn. Sp. Pl. 176. 1753; Roxb. Fl. Ind.

1:541. 1820; Buch.-Ham. in Trans. Linn. Soc. 13:533.  
1822; Wt. & Arn. Prod. 419. 1834; FBI. 3:155. 1880;  
Blatt. in J. Bombay nat. Hist. Soc. 36:793. 1933;  
Gamb. 459.

Shrubs or small trees; branches angular; leaves very broadly ovate, acute or obtuse; flowers in leaf-opposed solitary heads; calyx limb truncate; corolla white, tube 1 cm long, throat hairy; the syncarpium ovoid, large.

Flowers: Jan. - May

Sivarajan 944

M.coreia Buch.-Ham. in Trans. Linn. Soc. 13:537. 1822;  
DC. Prod. 4:448. 1830. M.tinctoria Roxb. /Hort. Beng.  
15. 1814, nom. nud.] ex DC. Prod. 4:447. 1830; Roxb.  
Fl. Ind. (ed. Carey) 1:543. 1832; Wt. & Arn. Prod.  
419. 1834; FBI. 3:156. 1880; Gamb. 459.

Trees; leaves elliptic to oblanceolate, acuminate up to 15 x 7 cm; heads usually solitary, leaf-opposed; flowers white, 5-merous; syncarpia ovoid.

Flowers: Jan. - Mar.

Sivarajan 1676.

Gardenia Ellis (nom.cons.)

Key to the species

1. Leaves obtuse or subacute ..... resinifera  
1. Leaves acuminate ..... jasminoides

G.resinifera Roth, Nov. Pl. Sp. 150. 1821; Sant. 105.

1960. G.lucida Roxb. [ Hort. Beng. 15. 1814, nom.  
nud.] Fl. Ind. (ed. Carey) 1:707. 1832; FBI. 3:115.  
1880; Gamb. 436.

Trees or shrubs; leaves broadly elliptic,  
obtuse or subacute, up to 12 x 5 cm; the terminal bud  
filled with a viscous, yellowish, aromatic substance;  
flowers white, turning yellow, axillary, solitary,  
short-peduncled; calyx teeth linear; corolla tube  
4-5 cm long; lobes 5, spreading, oblong.

Flowers: Mar. - May

Sivarajan 1478.

G.jasminoides Ellis in Phil. Trans. 51:935. 1761;

Blatt. in J. Bombay nat. Hist. Soc. 36:789. 1933;

Gamb. 437. G.florida Linn. Sp. Pl. (ed.2) 2:305.

1762.

Much branched shrubs; leaves elliptic to oblanceolate, acuminate at apex, up to 9 x 4 cm; flowers white, axillary, solitary, short-peduncled, usually double.

Flowers: Mar. - Sept.

Sivarajan 903.

Hamelia Jacq.

H. patens Jacq. Enum. Pl. Car. 16. 1760; Sant. 108.  
1960.

Much branched shrubs; leaves opposite or whorled, elliptic-acute, or shortly acuminate, up to 6 x 2.5 cm; flowers red in terminal, paniculate, helicoid cymes, tubular; corolla lobes very small, erect; ovary 5-celled; berries deep red.

Flowers: most part of the year

Sivarajan 381.

Psychotria Linn. (nom.cons.)

P. curviflora Wall. in Roxb. Fl. Ind. 2:167. 1824; Back.  
& Bakh. f. Fl. Java 2:329. 1965. P. ophioxyloides  
Wall. in Roxb. Fl. Ind. 2:168. 1824. Chasalia

curviflora (Wall.) Th. En. Pl. Zeyl. 150. 1859;  
FBI. 3:176. 1880; Gamb. 453. C.ophioxyloides (Wall.)  
Craib. in Gard. Bull. Straits. Settl. 6:474. 1930;  
Sant. & Merch. in Bull. Bot. Sur. Ind. 3:108. 1961.

Woody much branched shrubs; leaves elliptic-oblong or oblanceolate, obtuse or shortly acuminate, up to 18 x 7 cm; flowers deep purple in terminal, paniculate cymes; calyx minute; corolla tube curved, throat yellowish; drupes subglobose, sometimes 2-lobed, purple when mature.

Flowers: Mar. - Sept.

Sivarajan 208, 1364, 1436.

Mussaenda Linn.

M.froncosa Linn. Syst. Nat. (ed.10) 2:931. 1759; FBI.  
3:89. 1880; Jayaweera in J. Arn. Arb. 44:114, f. 1,  
236. 1963; Gamb. 430.

Straggling shrubs; leaves ovate or elliptic, acuminate, hirsute, up to 12 x 6 cm; flowers ~~orange-~~ red in densely hirsute, lax, terminal cymes; one of the calyx lobes enlarged to form an ovate or elliptic-acuminate, white, foliaceous structure; berries subglobose or ovoid, about 1 cm long.

Flowers: Aug. - Nov.

Sivarajan 460.

Pavetta Linn.

Key to the species

1. Leaves dense-tomentose beneath ..... tomentosa  
1. Leaves glabrous ..... indica

P.tomentosa Roxb. ex Smith in Rees, Cyclop. 26 n. 2.

1813; Sant. 120. 1967. P.indica var. tomentosa (Roxb. ex Smith) Hook. f. Fl. Brit. Ind. 3:150. 1880; Kar & Panigrahi in Bull. Bot. Sur. Ind. 5:234. 1963; Gamb. 446.

Much branched shrubs; branches 4-angular; leaves elliptic, obtuse or acute, glabrescent above, dense-tomentose beneath; flowers white in terminal, tomentose panicles; calyx teeth minute; corolla tube slender, 2-3 cm long; stigma entire; berries subglobose.

Flowers: May - June

Sivarajan 1179.



P.indica Linn. Sp. Pl. 110. 1753; FBI. 3:150. 1880;  
Sant. 107. 1960; Gamb. 446.

Much branched shrubs; branches angular,  
glabrous; leaves elliptic-acute, glabrous; flowers  
white in large terminal, glabrous panicles.

Flowers: May - June

Sivarajan 1550.

Ixora Linn.

Key to the species

- 1. Flowers white:
  - 2. Leaves oblanceolate, mucronate ..... acuminata
  - 2. Leaves oblong-acuminate ..... lanceolaria
- 1. Flowers red ..... coccinea

I.acuminata Roxb. [Hort. Beng. 10. 1814, nom.nud.] Fl.  
Ind. 1:383. 1820; DC. Prod. 4:488. 1830; FBI. 3:137.  
1880; Kar & Panigrahi in Bull. Bot. Sur. Ind. 5:230.  
1963.

Small trees; leaves oblanceolate, shortly  
mucronate at tip, leathery, glabrous, up to 14 x 5 cm;  
flowers white, in terminal, corymbose cymes; calyx lobes

lanceolate, much longer than the ovary; fruits ellipsoid or oblong.

Flowers: most part of the year.

Sivarajan 245.

I.lanceolaria Colebr. in Roxb. Fl. Ind. 1:397. 1820;  
FBI. 3:138. 1881.

Small, woody shrubs; leaves elliptic-ovate or oblong, acuminate, up to 12 x 3.4 cm; flowers white in terminal, lax panicles.

Flowers: June - July

Sivarajan 860, 1745.

I.coccinea Linn. Sp. Pl. 110. 1753; FBI. 3:145. 1880;  
Bremek. in Bull. Jard. Bot. 3(14):351. 1937; Gamb.  
445.

Woody, erect or straggling shrubs; leaves sessile or subsessile, oblong or ovate, acute or obtuse, leathery; flowers red in terminal corymbose panicles; calyx teeth minute; corolla tube slender; fruits subglobose, purple when mature.

Common on the grassy slopes, with flowers in various shades of red. This is one of the few species that thrive underneath the cashew trees. Many ornamental varieties are seen under cultivation also.

Flowers: Dec. - May

Sivarajan 835, 1517.

Coffea Linn.

C.arabica Linn. Sp. Pl. 172. 1753; FBI. 3:153. 1880;

Mathew in Rec. Bot. Sur. Ind. 20:133. 1969.

Shrubs; leaves large, elliptic or oblanceolate, acuminate, glabrous; flowers white, fragrant, in axillary, dense clusters; berries 2-seeded, ellipsoid.

Flowers: Jan. - Feb.

Sivarajan 1612.

COMPOSITAE Giseke

(Asteraceae Dumort. nom. alt.)

Key to the genera

1. Heads solitary:
  2. Leaves simple:
    3. Heads not yellow:
      4. Heads usually sessile or  
short peduncled .... Blainvillea
      4. Heads long-peduncled ..... Spilanthus
    3. Heads yellow:
      5. Leaves petiolate ..... Synedrella
      5. Leaves sessile ..... Vicoa
  2. Leaves not simple:
    6. Ligulate flowers present:
      7. Erect plants:
        8. Leaves pinnately compound .. Cosmos
        8. Leaves digitately lobed .... Tithonia
      7. Trailing plants:
        9. Only the outer flowers  
ligulate .... Tridax
        9. All the flowers ligulate ... Launaea
    6. Ligulate flowers absent ..... Grangea

1. Heads variously clustered:
  10. Heads compound:
    11. Plants scapigerous ..... Elephantopus
    11. Plants not scapigerous:
      12. Stem winged ..... Sphaeranthus
      12. Stem not winged ..... Acanthospermum
  10. Heads simple:
    13. Heads dioecious ..... Xanthium
    13. Heads monoecious:
      14. Leaves opposite:
        15. Leaves narrowly elliptic  
or lanceolate ..... Eclipta
        15. Leaves ovate:
          16. Flowers pink ..... Ageratum
          16. Flowers white ..... Eupatorium
      14. Leaves alternate:
        17. Stem winged ..... Epaltes
        17. Stem not winged:
          18. Heads rayed ..... Erigeron
          18. Heads not rayed:
            19. Flowers orange-red:
              20. Heads 4-5 mm  
long ..... Blumea
              20. Heads 1.5 cm  
long ..... Crassocephalum

19. Flowers not orange-red:

21. Basal leaves lacerate ..... Emilia

21. Leaves not as above ..... Vernonia

Blainvillea Cass.

B. acmella (Linn.) Philipson in Blumea 6:350. 1950.

Verbesina acmella Linn. Sp. Pl. 901. 1753.

Blainvillea rhomboidea Cass. in Dict. Sc. Nat.

29:493. 1823; Gamb. 496. B. latifolia DC. in Wt.

Contr. Bot. Ind. Or. 71. 1834; FBI. 3:305. 1881;

Cl. Comp. Ind. 135. 1876.

Erect, branched, hispid herbs; leaves ovate-lanceolate, crenate-serrate, 3 nerved from base; heads small, subsessile or short-peduncled, heterogamous, the outer 1-2 series of flowers being female and the others bisexual; corolla of the female flowers ligulate, those of bisexual tubular; pappus usually 0; achenes trigonous.

Flowers: Sept. - Nov.

Sivarajan 494.

Spilanthes Jacq.

S. paniculata Wall. ex DC. Prod. 5:625. 1836; Koster  
& Philipson in Blumea 6:350. 1950. S. acmella auct.  
(non Murr. 1774); Cl. Comp. Ind. 138. 1876; FBI.  
3:307. 1881; Gamb. 498.

Erect, scarcely branched herbs; leaves ovate-  
acute, entire; heads ovoid, long-pedunculate, hetero-  
gamous and rayed; flowers white; outer ray-florets  
female and disk-florets bisexual; achenes triquetrous,  
oblong; pappus of 2-3 bristles.

Flowers: Aug. - Dec.

Sivarajan 170.

Synedrella Gaertn. (nom. cons.)

S. nodiflora Gaertn. in DC. Prod. 5:629. 1836; Cl.  
Comp. Ind. 139. 1876; FBI. 3:308. 1881; Gamb. 498.

Erect, woody, scabrous herbs; leaves ovate-  
lanceolate, acute, entire, scabrous above; heads yellow,  
sessile, heterogamous and rayed; outer ligulate flowers  
female, inner tubular ones bisexual; achenes dimorphous,  
those of the ray-florets elliptic, compressed with

spinous margins and those of the disc florets  
trigonous.

Flowers: Nov. - Mar.

Sivarajan 414.

Vicoa Cass.

V.indica (Linn.) DC. in Wt. Contr. Bot. Ind. Or. 10.  
1834 & Prod. 5:474. 1836; Cl. Comp. Ind. 127.  
1876; Sant. 117. 1960; Gamb. 493; Kitamura in  
Acta Phytotax. Geobot. 24:17. 1969. Inula indica  
Linn. Sp. Pl. (ed.2) 1236. 1762. Vicoa auriculata  
Cass. in Ann. Sc. Nat. (ser.1) 17:418. 1829; FBI.  
3:297. 1881.

Erect herbs, scarcely branched; leaves sessile,  
oblong-lanceolate, cordate at base; heads heterogamous,  
rayed; ray-florets female, disk-florets bisexual;  
achenes small, terete; pappus in ray-florets 0, and  
of a few bristles in disk-florets.

Common on grassy slopes, and also as a weed  
in upland cultivations.

Flowers: Aug. - Dec.

Sivarajan 547.



Cosmos Cav.

Key to the species

1. Leaf segments linear ..... bipinnatus  
1. Leaf segments ovate or elliptic ..... sulphureus

C.bipinnatus Cav. Ic. 5(1):10. t. 14. 1791; Woodr. in  
J. Bombay nat. Hist. Soc. 5:650. 1898; Bailey 999.

Glabrous herbs; leaves bipinnate, segments  
linear-filiform; heads large and showy, rayed; ray-  
florets neuter; disk-florets bisexual; achenes linear,  
beaked, glabrous.

Flowers: Aug. - Dec.

Sivarajan 1132.

C.sulphureus Cav. Ic. 1:56. t. 79. 1791; Bailey 999.

Erect, pubescent annuals; leaves 2-3-pinnate;  
leaflets elliptic or lanceolate; heads large, bright  
yellow, heterogamous, rayed; achenes beaked, hispid.

A weed in upland cultivations and also grown  
in gardens.

Flowers: Mar. - May

Sivarajan 211.

Tithonia Desf. ex Juss.

T. diversifolia (Hemsl.) A. Gray in Proc. Amer. Acad.  
19:5. 1883; Bailey 997; Sant. 139. 1967. Mirasolia  
diversifolia Hemsl. Biol. Centr. Am. Bot. 2:168.  
1881.

Branched shrubs; leaves digitately 3-5-lobed;  
heads large, showy, bright yellow on long peduncles,  
dialated at the top, rayed and heterogamous.

Flowers: Sept. - Dec.

Sivarajan 741.

Tridax Linn.

T. procumbens Linn. Sp. Pl. 900. 1753; FBI. 3:311.  
1881; Cl. Comp. Ind. 142. 1876; Sant. 119. 1960;  
Gamb. 500.

Trailing, hispid herbs; leaves inciso-dentate  
or pinnately lobed, hispid on both surfaces; heads  
rayed, heterogamous; ray-florets female; disc-florets  
bisexual; achenes oblong, silky hairy; pappus of  
feathery bristles.

Flowers: July - Mar.

Sivarajan 108.

PLATE 9

Launaea sarmentosa (Willd.) Alston,  
growing on the sandy beach, in  
association with Spinifex littoreus  
(Burm.f.) Merr.



Launaea Cass.

L. sarmentosa (Willd.) Alston in Trim. Handb. Fl. Ceyl. 6. Suppl. 173. 1931; Merr. in Sunyatsenia 2:328. 1935. Prenanthes sarmentosa Willd. Phyt. 10, t. 6, f. 2, 1794 & Sp. Pl. 3:1540. 1803. Launaea pinna-tifida Cass. in Ann. Sc. Natur. (Ser.1) 23:85. 1831; FBI. 3:416. 1881; Gamb. 515.

Creeping herbs rooting at the nodes; leaves, sinuate-lobed, oblong-obtuse; heads peduncled, yellow, solitary or fascicled; flowers all ligulate; ligules 5-toothed at the tip; achenes 4-angled; pappus of many-seriate silky hairs. (Plate 9)

Common along the sea coast, most frequently in association with Spinifex littoreus.

Flowers: Sept. - Nov.

Sivarajan 562.

Grangea Adans.

G. maderaspatana (Linn.) Poir. Encycl. Suppl. 2:825. 1811; Cl. Comp. Ind. 37. 1876; FBI. 3:247. 1881; Sant. 112. 1960; Gamb. 478. Artemisia maderaspatana Linn. Sp. Pl. 849. 1753.

Diffuse, densely pubescent herbs; leaves alternate, pinnatisect; heads subglobose, heterogamous, not rayed; flowers yellow, outer female and inner bisexual; achenes flattened, glandular with a persistent pappus tube, the mouth of the pappus tube fimbriate.

Flowers: Mar. - May

Sivarajan 1000.

Elephantopus Linn.

E. scaber Linn. Sp. Pl. 814. 1753; Cl. Comp. Ind. 28.

1876; FBI. 3:242. 1881; Sant. 110. 1960; Gamb. 476.

Scapigerous, his<sup>n</sup>ute herbs; leaves mainly radical, oblong-spathulate, cauline ones narrower; heads compound, homogamous, few-flowered, sessile and enclosed in an involucre of 3 leafy bracts; corolla blue, tubular; achenes 10-ribbed, truncate at apex; pappus bristles 4-6.

Flowers: Dec. - Feb.

Sivarajan 705.

Sphaeranthus Linn.

S.indicus Linn. Sp. Pl. 927. 1753; FBI. 3:275. 1881;  
Sant. 116. 1960; Gamb. 487. S.hirtus Willd. Sp. Pl.  
3:2395. 1804; Cl. Comp. Ind. 97. 1876.

Erect or diffuse, much branched herbs; stem winged; leaves oblong or oblanceolate, lacerate or dentate, hispid; heads small, heterogamous, not rayed; outer flowers in each capitulum female, inner bisexual; corolla tubular; achenes angular, glabrescent.

Common in wet fields, near salt-marshes or river banks.

Flowers: Nov. - Mar.

Sivarajan 104.

Acanthospermum Schrank.

A.hispidum DC. Prod. 5:522. 1836; Sant. 123. 1960;  
Gamb. 495.

Densely hairy herbs; branches forking; leaves ovate or elliptic, hairy on both surfaces; heads yellow, heterogamous, rayed, sessile at the forks of branches; outer ligulate florets female; achenes with 2 sharp horns at the tip, compressed and hairy.

A recently introduced weed, now very common on road sides and in waste places.

Flowers: July - Nov.

Sivarajan 290.

Note: Good (1956) has given a list of 46 genera of ~~C~~<sup>a</sup>omposite having compound capitula, but has not included Acanthospermum. Detailed floral morphological studies by Tiagi and Manilal (Proc. Nat. Acad. Sc. B. 34(3):291-305.1964) has established beyond doubt that the ~~C~~apitulum of this genus is compound, each having an involucre of its own. There are 5-9 Peripheral capitula, each with a single, ligulate, female floret, and a central capitulum of about 7 tubular male florets.

Xanthium Linn.

X. strumarium Linn. Sp. Pl. 987. 1753; Cl. Comp. Ind.

132. 1876; FBI. 3:303. 1881; Sant. 118. 1960; Gamb.

494. X. indicum Koen. ex Roxb. [ Hort. Beng. 67. 1814, nom. nud.] Fl. Ind. 3:601. 1832.

Scabrous plants; leaves alternate, lobed, irregularly toothed; heads racemed, lower female, upper bisexual; female heads 2-flowered, apetalous; bracts connate to form a 2-horned utricle, covered with



hooked bristles; bisexual heads many flowered, bracts small; corolla tubular.

Flowers: Aug. - Nov.

Sivarajan 733.

Eclipta Linn. (nom.cons.)

E.prostrata (Linn.) Linn. Mant. 2:286. 1771; Sant. in J. Bombay nat. Hist. Soc. 54:475-476. 1957 & Fl. Khand. 133. 1967. Verbesina prostrata Linn. Sp. Pl. 902. 1753. V.alba Linn. Sp. Pl. 902. 1753. Eclipta alba (Linn.) Hassk. Pl. Jav. Rar. 528. 1848; Cl. Comp. Ind. 134. 1876; FBI. 3:304. 1881; Gamb. 495.

Diffuse annuals, strigosely hairy; leaves opposite, oblong-lanceolate, acute; heads heterogamous, rayed; outer ray-florets female, white, inner bisexual and tubular; achenes obovoid, subcompressed; pappus 0.

Flowers: Nov. - Mar.

Sivarajan 89, 1571.

Ageratum Linn.

A.conyzoides Linn. Sp. Pl. 839. 1753; Cl. Comp. Ind. 30. 1876; FBI. 3:243. 1883; Sant. 110. 1960; Gamb. 476.

Rarely branched annuals; leaves ovate-acute, crenate, long-petioled; heads homogamous, not rayed; corolla tubular, 5-toothed, pale blue; achenes glabrous; 5-angled; pappus of 5 scales, lacerate at base.

A very common weed on grassy slopes. Very often the plants display variegated leaves.

Flowers: Aug. - Dec.

Sivarajan 361.

Eupatorium Linn.

E.odoratum Linn. Syst. Nat. (ed.10) 1205. 1759, in part & Sp. Pl. (ed.2) 1174. 1763; DC. Prod. 5:153. 1836; Koster in Pulle, Fl. Sur. 4:113. 1938 & in Blumea 7:290. 1952.

Much branched, scandent shrubs; leaves ovate-lanceolate, crenate-serrate; heads white, homogamous, not rayed, 1.5 cm long; achenes 5-angled.

A profuse, exotic weed, now naturalised and spreading throughout India.

Flowers: Mar. - May

Sivarajan 1043.

Epaltes Cass.

E.divaricata Cass. in Bull. Soc. Phil. 139. 1818; Cl.  
Comp. Ind. 96. (excl. syn. E.pygmaea) 1876; FBI.  
3:274. 1881; Sant. 116. 1960; Gamb. 486.

An erect or diffuse herb; stem winged; leaves narrow, oblanceolate, shortly dentate; heads: pink or rose, subglobose, not rayed, heterogamous; outer flowers female, fertile, inner bisexual, sterile; anthers shortly tailed at base; achenes obovoid, ribbed.

Flowers: Sept. - Nov.

Sivarajan 512, 586.

Erigeron Linn.

Key to the species

- 1. Heads in corymbs ..... asteroides
- 1. Heads in panicles ..... canadensis

E.asteroides Roxb. [Hort. Beng. 61. 1814, nom. nud.]  
Fl. Ind. 2:432. 1824; Cl. Comp. Ind. 55. 1876; FBI.  
3:254. 1881; Gamb. 479.

Tall, villous herbs; leaves lanceolate or oblanceolate, entire or toothed; heads in corymbose

panicles, rayed, heterogamous; the outer flowers female, inner hermaphrodite; achenes compressed, minutely villous; pappus feathery.

Flowers: Dec. - Mar.

Sivarajan 947.

E.canadensis Linn. Sp. Pl. 863. 1753; Cl. Comp. Ind. 51. 1876; FBI. 3:254. 1881; Gamb. 479; Mathew in Rec. Bot. Sur. Ind.20:146. 1969.

Woody herbs; leaves lanceolate, dentate, villous on both surfaces; heads in large panicles, heterogamous and rayed; achenes compressed and margined.

Flowers: Dec. - Mar.

Sivarajan 862.

Blumea DC. (nom.cons.)

Key to the species

1. Prostrate herbs ..... oxyodonta  
1. Erect herbs ..... mollis

B.oxyodonta DC. in Wt. Contr. Bot. Ind. Or. 15. 1834;  
Cl. Comp. Ind. 85. 1876; FBI. 3:266. 1881; Sant.  
114. 1960; Randeria in Blumea 10:280. 1960; Gamb.482.

Prostrate, scabrid herbs; radical leaves oblong-ovate, serrate, cauline ones much smaller; flowering stems creeping; heads orange-yellow, not rayed, heterogamous; outer flowers female, inner hermaphrodite; achenes 4-angled; pappus hairs uniseriate, caducous.

Flowers: Dec. - May

Sivarajan 3.

B. mollis (Don) Merr. in Phil. J. Sc. Bot. 5:256. 1910;

Sant. 113. 1960; Randeria in Blumea 10:261. 1960.

Erigeron molle Don, Prod. 172. 1825. Blumea

wightiana DC. in Wt. Contr. Bot. Ind. Or. 14. 1834;

Cl. Comp. Ind. 74. 1876; FBI. 3:261. 1881.

Erect, villous herbs; leaves ovate-dentate; heads in panicles or racemes, not rayed, heterogamous; achenes hairy.

Flowers: Dec. - Mar.

Sivarajan 1041.

Crassocephalum Moench.

C. crepiodes (Benth.) Moore in J. Bot. 50:211. 1912;  
Steenis in J. Ind. bot. Soc. 46:463. 1967. Gynura  
crepioides Benth. in Hook. f. Niger. Fl. 458. 1849.

Erect, fleshy herbs; leaves large, ovate-acuminate, simple or 2-3-lobed, serrate; heads cylindric, orange-yellow, not rayed; achenes cylindric, faintly ribbed.

Flowers: Mar. - July

Sivarajan 162.

Note: van Steenis (loc.cit.) has given a critical account and bibliography on the introduction of this weed into S.E.Asia, Malesia and Australia. As pointed out by Raju (Trop. Ecol. 7:171. 1966) this is very often confused with Erichthites valerianifolia (Wolf.) DC. However the uniformly cylindric, weakly ribbed achene is characteristic of C. crepioides, and this differs from Gynura by the quite different stylar arms and the scarcely widened corolla tube.

Emilia Cass.

E. sonchifolia (Linn.) DC. in Wt. Contr. Bot. Ind. Or.  
24. 1834 & Prod. 6:302. 1838; Cl. Comp. Ind. 174.  
1876; FBI. 3:336. 1881; Sant. 120. 1960; Gamb. 503.  
Cacalia sonchifolia Linn. Sp. Pl. 835. 1753.

Annual, hispid herbs; leaves mainly radical,  
oblanceolate-obtuse, lyrate towards the base, glaucous,  
cauline ones amplexicaule, lanceolate; heads oblong,  
few-flowered, homogamous and not rayed; corolla tubular;  
achenes 5-ribbed, villous on the angles.

Flowers: July - Mar.

Sivarajan 21.

Vernonia Schreb. (nom.cons.)

1. Climbers ..... eleagnifolia  
1. Erect herbs ..... cinerea

V. eleagnifolia DC. Prod. 5:22. 1836; Cl. Comp. Ind.  
24. 1876.

Climbing shrubs with divaricate branches;  
leaves oblong-obtuse, minutely silky pubescent below;  
heads white in terminal panicles, not rayed, homogamous;  
achenes angled; pappus 2-seriate.

Commonly called the "Curtain plant", this is often cultivated in gardens. Seen as escape also.

Flowers: Jan. - Mar.

Sivarajan 933.

V. cinerea (Linn.) Less. in Linnaea 4:291. 1829; Cl.

Comp. Ind. 20. 1876; Koster in Blumea 1:410. 1935;

Gamb. 475. Conyza cinerea Linn. Sp. Pl. 862. 1753.

Erect herbs; leaves ovate or elliptic, entire or irregularly toothed; heads in terminal panicles; homogamous, not rayed; flowers blue; achenes 5-angled with adpressed hairs; pappus 2-seriate, the outer much longer and feathery.

Flowers: July - Mar.

Sivarajan 1219.

#### GOODENIACEAE R. Br.

##### Scaevola Linn. (nom. cons.)

S. taccada (Gaertn.) Roxb. Hort. Beng. 15. 1814, nom.

nud. Fl. Ind. 1:527. 1820; Back. & Bakh. f. Fl.

Java 2:453. 1965. Lobelia taccada Gaertn. Fruct.

1:119, t. 25. 1788. Scaevola sericea Vahl, Symb.



Bot. 2:37. 1791; Leenhouts in Fl. Males. 5(3):339-41.  
1957. S.koenigii Vahl, Symb. Bot. 3:36. 1794.  
S.frutescens (Mill.) Krause in Engl. Pflanzg.  
Gooden.- Brun. 133. 1912; Gamb. 516.

Branched shrubs; branches thick; leaves  
alternate, entire, oblanceolate-spathulate, up to  
13 x 6 cm, fleshy; flowers in axillary cymes; pedicels  
short; calyx lobes distant; corolla rose-pink or white,  
split on one side, tube about 2 cm long, lobes fim-  
briate; stamens free; drupes with solitary seeds.

Flowers: Sept. - Dec.

Sivarajan 1521.

LOBELIACEAE R.Br.

Lobelia Linn.

L.alsinoides Lamk. Encycl. Meth. Bot. 3:588. 1791;  
Sant. 124. 1960. L.trigona Roxb. Hort. Beng. 85.  
1814, nom. nud. Fl. Ind. 2:111. 1824; FBI. 3:423.  
1881; Gamb. 518.

Diffuse herbs; stem angled; leaves ovate-acute or obtuse, entire or serrate, basally 3-5-nerved, up to 2 x 1.5 cm; flowers violet, long-pedicelled; calyx tube campanulate, lobes lanceolate, distant; corolla 2-lipped; stamens connate in a column, anthers bristled; capsules many-seeded; seeds lenticular, smooth.

In wet or moist fields, also as a weed in wet land cultivations.

Flowers: Sept. - Nov.

Sivarajan 492.

#### SPHENOCLEACEAE DC.

Sphenoclea Gaertn. (nom.cons.)

S. zeylanica Gaertn. Fruct. 1:113, t. 24, f. 5. 1788;

Blume Bijdr. 16:1138. 1826; Moritzi Syst. Verz. 66.

1845-46; Merr. Fl. Man. 462. 1912; Airy Shaw in Fl.

Males. 1:27. 1954; Gamb. 520.

Erect, branched herbs; leaves petioled, elliptic or lanceolate, acute, penninerved, up to 8 x 2.5 cm; flowers white in oblong, terminal spikes; calyx lobes ovate-obtuse; corolla campanulate; stamens as many as

corolla lobes, free; capsules circumscissile; seeds oblong, tuberculate.

Flowers: Nov. - Mar.

Sivarajan 103.

PLUMBAGINACEAE Juss.

Plumbago Linn.

P. zeylanica Linn. Sp. Pl. 151. 1753; FBI. 3:480.

1882; Steenis in Fl. Males. 4(2):109. 1949;

Sant. 124. 1960; Gamb. 524.

Woody herbs; leaves ovate or elliptic, acute or obtuse, sessile; flowers in terminal spikes; calyx long, tubular, shortly 5-toothed and 5-ridged, glandular bristly outside; corolla white, tube slender, up to 2 cm long, lobes obovate, spreading; stamens 5; capsules oblong.

Flowers: Jan. - May

Sivarajan 115, 453, 496.

SAPOTACEAE Juss.

Key to the genera

1. Leaves golden silky-pubescent beneath .... Chrysophyllum
1. Leaves glabrous:
  2. Fruits large, subglobose ..... Manilkara
  2. Fruits small, ovoid ..... Mimusops

Chrysophyllum Linn.

C.cainito Linn. Sp. Pl. 192. 1753; Vink in Blumea 9:26.  
1958; Gamb. 533.

Small trees; leaves elliptic, abruptly acuminate at apex, glabrous above, lateral veins close and parallel; flowers greenish yellow, campanulate in axillary fascicles; calyx lobes 5; corolla 5-lobed; stamens 5; staminodes 0, fruits globose.

Flowers: Aug. - Sept.

Sivarajan 1354.

Manilkara Adans.(nom.cons.)

M.achras (Mill.) Fosberg in Taxon 13:255. 1964. Sapota achras Mill. Gard. Dict. ed.8. 1768. Achras sapota Linn. Sp. Pl. (ed.2)469. 1762; FBI.3:534. 1882; Gamb. 533.

Trees; leaves elliptic-lanceolate, acute or shortly acuminate; flowers white, solitary in the axils; calyx pubescent; corolla campanulate; staminodes 6, petalloid, alternating with the stamens; berries sub-globose.

Flowers: Sept. - Nov. †

Sivarajan 1850.

Mimusops Linn.

M. elengi Linn. Sp. Pl. 349. 1753; FBI. 3:548. 1882;  
van Royen in Blumea 6(3):594. 1952; Sant. 126. 1960;  
Gamb. 538.

Trees; leaves elliptic, acute or acuminate, coriaceous; flowers white, fragrant; calyx deeply 8-lobed, pubescent; corolla rotate, lobes many, acute at tips; stamens 8, filaments connate at the base with the staminodes, forming a tube; berries 1-seeded.

Flowers: Jan.- Mar.

Sivarajan 146, 1054.

EBENACEAE Gurke

Diospyros Linn.

Key to the species

1. Flowers pedicellate ..... peregrina  
1. Flowers sessile ..... candolleana

D.peregrina (Gaertn.) Gurke in Engl.& Pr. Pfam. 4(1):164.

1891; Mahes. 206; Gamb. 546. Embryopteris peregrina  
Gaertn. Fruct. 1:145. 1788. Diospyros embryopteris  
Pers. Syn. 2:624. 1807; FBI. 3:556. 1882.

Trees; branches spreading; leaves distichous,  
broadly oblong-obtuse, leathery, prominently reticulate,  
up to 20 x 10 cm; petiole short; flowers unisexual in  
axillary cymes; calyx much enlarged in fruits; corolla  
urceolate, stamens many; ovary 8-loculed; styles 4;  
fruits large, subglobose.

Flowers: Jan. - Mar.

Sivarajan 1671.

D.candolleana Wt. Ic. t. 1221. 1848; FBI. 3:566. 1882;

Sant. 127. 1960; Gamb. 543.

Trees with spreading branches; leaves distichous, oblong, acute or obtusely acuminate, up to 15 x 5 cm, reticulation not prominent; petiole short; flowers unisexual, sessile, clustered in the axils, adpressed pubescent; corolla slender, longer than the calyx; stamens 10, paired; fruit globose or ellipsoid; fruiting calyx lobes with reflexed margins.

Flowers: Jan. - Mar.

Sivarajan 149.

OLEACEAE Hoffm. & Link.

Key to the genera

- 1. Corolla tube not distinct ..... Linociera
- 1. Corolla tube distinct:
  - 2. Corolla lobes minute, erect ..... Olea
  - 2. Corolla lobes large, spreading ..... Jasminum

Linociera Sw. ex Schreb.

L. malabarica Wall. [Cat. 2828. 1831, nom.nud.] ex  
Don, Syst. 4:53. 1838; FBI. 3:607. 1882; Gamb. 558.

Trees; leaves elliptic-oblong, coriaceous, up to 11 x 5 cm; flowers yellowish white, capitate on short,

axillary peduncles; calyx minute; corolla cohering at base, lobes linear-lanceolate; anthers sessile, one at the base of each pair of petals; drupes ellipsoid.

Collected from the banks of Kunnamangalam river.

Flowers: Jan. - Mar.

Sivarajan 970.

Olea Linn.

O.dioica Roxb. [Hort. Beng. 3. 1814, nom. nud.] Fl.

Ind. 1:106. 1832; FBI. 3:612. 1882; Sant. 128. 1960;

Gamb. 559.

Trees; leaves elliptic-oblong, acuminate, entire or serrate; flowers small, greenish white in axillary panicles; drupes ellipsoid.

Flowers: Jan. - Feb.

Sivarajan 70.

Jasminum Linn.



- 2. Leaflets usually 3:
  - 3. Leaflets acuminate ..... flexile
  - 3. Leaflets obtuse or subacute ..... calophyllum
- 1. Leaves simple:
  - 4. Calyx glabrous ..... angustifolium
  - 4. Calyx pubescent:
    - 5. Bracts ovate-lanceolate, green ... multiflorum
    - 5. Bracts linear:
      - 6. Calyx lobes as long as the  
tube .... arborescens
      - 6. Calyx lobes much longer than  
the tube:
        - 7. Plants glabrous ..... malabaricum
        - 7. Plants pubescent ..... sambac

J. grandiflorum Linn. Sp. Pl. 8. 1753; FBI. 3:603. 1882;  
Bailey 795; Mahes. 209; Green in Bailey 13:146.  
1965; Gamb. 556. J. officianale Linn. var. grandiflorum  
(Linn.) Stokes, Bot. Comment. 1:21. 1830.  
J. officianale f. grandiflorum (Linn.) Kobuski in  
J. Arn. Arb. 13:161. 1932.

Scandent shrubs; leaves imparipinnate, 7-9-  
foliolate; flowers white in lax, terminal cymes; calyx

lobes linear; corolla lobes spreading lanceolate-acute, reddish beneath.

Flowers: most part of the year.

Sivarajan 1759.

Note: Kobuski (loc.cit.) has reduced this as a form of J. officianale Linn., since he found "no character or group of characters consistent enough for specific separation". However Green (loc.cit.) has found that this could clearly be separated into a distinct species based on the following key.

Inflorescence subumbellate,

corolla tube 15-17 mm long,

lobes 9-12 mm long and

5-8 mm broad ..... J. officianale

Inflorescence cymose with

stalks of lateral flowers

exceeding that of the

central ones, corolla

tube 15-23 mm long, lobes

15-20 mm long, 8-14 mm broad ..... J. grandiflorum

J. flexile Vahl, Symb. Bot. 5(3):1. 1794; FBI. 3:601.

1882; Cooke 175; Gamb. 556.

Woody climbers; leaves trifoliolate; leaflets elliptic to lanceolate; flowers white in lax, axillary, clustered cymes; fruits ellipsoid.

Flowers: Dec. - Mar.

Sivarajan 54, 943.

Note: Inamdar and Suryanarayana [Bull. Bot. Sur. Ind. 9:299. 1967 ('68)] have investigated the floral variations of the species and have recorded up to 6 petals and 9 sepals in its flowers.

J. calophyllum Wall. [Cat. 2889. 1831, nom. nud.] ex DC.

Prod. 8:310. 1834; FBI. 3:602. 1882; Gamb. 556.

Climbing shrubs; leaves 3-foliolate; leaflets ovate-lanceolate, up to 7 x 3 cm; flowers white in axillary or terminal trichotomous cymes; berries, subglobose.

Flowers: throughout the year.

Sivarajan 911.

J.angustifolium Vahl, En. 1:29. 1804; Roxb. Fl. Ind.

1:95. 1820; FBI. 3:598. 1882; Gamb. 555.

Pubescent climbers; leaves simple, ovate to lanceolate, acute at apex, glabrous, up to 3 x 2 cm; flowers white in terminal 1-3-flowered cymes; calyx lobes 3-4 mm long; corolla tube 2-2.5 cm long, lobes lanceolate-acuminate; berries ellipsoid.

Flowers: throughout the year.

Sivarajan 1118.

J.multiflorum (Burm. f.) Andr. Bot. Rep. t. 496.

1801; Kobuski in J. Arn. Arb. 13:172. 1932; Green in Bailey 13:151-152. 1965. Nyctanthes multiflora Burm. f. Fl. Ind. 5, t. 3, f. 1. 1768. Jasminum pubescens (Retz.) Willd. Sp. Pl. 1:37. 1797; FBI. 3:592. 1882; Gamb. 554.

Climbing shrubs; leaves simple, ovate to elliptic, acute or acuminate, pubescent; flowers white in sub-capitate, terminal cymes; bracts green, up to 18 x 8 mm; calyx lobes linear, 6-8 mm long; corolla lobes elliptic-oblong, acute; berries ellipsoid.

Flowers: Apr. - May

Sivarajan 1153, 1649, 1778.

J. arborescens Roxb. [Hort. Beng. 3. 1814, nom. nud.]

Fl. Ind. 1:95. 1820; FBI. 3:594. 1882; Gamb. 554.

Glabrous shrubs, sometimes climbing; leaves ovate-acuminate; flowers white in terminal, trichotomous, pubescent cymes; pedicels long, slender; calyx lobes about 2 mm long, erect; corolla lobes oblong-acute; berries ellipsoid.

Flowers: Jan. - May

Sivarajan 1201, 1607.

J. malabaricum Wt. Ic. t. 1250. 1850; FBI. 3:554. 1882;

Sant. 127. 1960.

Climbing shrubs; leaves simple, ovate-acuminate; flowers white in lax, terminal, trichotomous, tomentose cymes; calyx lobes linear, 5 mm long, reflexed later; berries ellipsoid.

Flowers: Mar. - May

Sivarajan 999.

J. sambac (Linn.) Ait. Hort. Kew 1:8, 1789; FBI. 3:591.

1882; Bailey 798; Mahes. 208; Green in Bailey

13:157-158. 1965; Gamb. 554. Nyctanthes sambac Linn.

Sp. Pl. 6. 1753.

Climbing shrubs; leaves ovate-elliptic, obtuse or sub-acute; cymes terminal, few-flowered; corolla tube short, lobes orbicular, white.

Flowers: throughout the year.

Sivarajan 1777.

Note: Green (loc.cit.) has reported 3 cultivars of this species throughout the tropics, (1) Double (2) Semi-double and (3) Single flowered forms and all these are cultivated in this locality.

NYCTANTHACEAE J.G. Agardh.

Nyctanthes Linn.

N.arbor-tristis Linn. Sp. Pl. 6. 1753; FBI. 3:603.

1882; Sant. 128. 1960; Gamb. 556.

Small trees; branches angled; leaves ovate, acute or acuminate, entire or deeply serrate, scabrid on both surfaces; flowers in capitate clusters on axillary peduncles; calyx truncate or minutely toothed; corolla white, lobes 5, slightly obcordate; stamens 2, inserted at the middle of the tube.

Flowers: Sept. - Mar.

Sivarajan 1405.

1. Plants climbing:
  2. Flowers large and showy:
    3. Flowers yellow ..... Allamanda
    3. Flowers white ..... Chonemorpha
  2. Flowers small:
    4. Corolla tube about 1 cm long ..... Ellertonia
    4. Corolla tube much shorter:
      5. Corolla lobes orbicular ..... Vallaris
      5. Corolla lobes lanceolate ..... Ichnocarpus
1. Plants not climbing:
  6. Leaves alternate:
    7. Flowers yellow ..... Thevetia
    7. Flowers white:
      8. Calyx lobes 1 cm long ..... Cerbera
      8. Calyx lobes minute ..... Plumeria
  6. Leaves opposite or whorled:
    9. Lateral veins almost vertical  
to the mid vein:
      10. Leaves obtuse at tip ..... Alstonia
      10. Leaves acute at tip ..... Nerium
    9. Lateral veins arched or ascending:
      11. Fruits drupaceous ..... Rauvolfia

11. Fruits follicular:

12. Follicles linear:

13. Seeds with a tuft of silky

hairs at the top ..... Holarrhena

13. Seeds without silky hairs ... Catharanthus

12. Follicles obliquely ovoid ..... Tabernaemontana

Allamanda Linn.

A.cathartica Linn.Mant. 2:214. 1771; Sant. 133. 1960;

Gamb. 577; Markgraf, Fl. Illustr. Catar. 1:38. 1968.

Straggling shrubs; leaves opposite or whorled, oblanceolate or elliptic-oblong, acuminate, up to 12 x 5.5 cm; flowers bright yellow in axillary racemes; corolla tube inflated above the base.

Common on hedges and usually cultivated in gardens.

Flowers: throughout the year.

Sivarajan 1154, 1182.

Chonemorpha G. Don (nom.cons.)

C.fragrans (Moon) Alston in Ann. Roy. Bot. Gard. Perad.

11:203. 1929; Chatterjee in Kew Bull. 1948:68. 1948;

Rolla Rao in J. Ind. bot. Soc. 32:36. 1953; Sant.



132. 1960. Echites fragrans Moon Cat. 20. 1821.  
E. macrophylla Roxb. Hort. Beng. 20. 1814, nom.  
nud. Fl. Ind. 2:13. 1832 (non H.B.K. 1819)  
Chonemorpha macrophylla (Roxb.) G. Don in Gen.  
Syst. 4:76. 1837; FBI. 3:661. 1882; Gamb. 575;  
Chatterjee in Kew Bull. 1947:49-50. 1947, nom.  
illeg.

Climbing shrubs, covered with dense, rusty  
tomentum; leaves large, ovate, acute or subacute at  
apex, subcordate at base, tomentose, more densely  
beneath; flowers large, white, fragrant; follicles  
about 25 cm long.

Flowers: Mar. - May

Sivarajan 150, 1181.

slopes.

Flowers: July - Aug.

Sivarajan 404.

Vallaris Burm. f.

V. solanacea (Roth) Kuntze, Rev. Gen. 2:417. 1891;

Mahes. 212; Gamb. 573. Peltanthera solanacea Roth,

Nov. Pl. Sp. 132. 1821.

Climbing shrubs; leaves opposite, elliptic-oblong or lanceolate, acuminate; flowers yellowish white in axillary cymes; calyx 5-lobed; corolla rotate, tube very short; stamens inserted at the top of the tube; anthers connate by their connectives around the stigma; follicles about 12 cm long.

Flowers: Jan. - May

Sivarajan 158.

Ichnocarpus R. Br. (nom. cons.)

I. frutescens (Linn.) Ait. & Ait. f. Hort. Kew 2:69;

1811; FBI. 3:669. 1882; Mahes. 213; Gamb. 577.

Apocynum frutescens Linn. Sp. Pl. 213. 1753.

Slender climbers; leaves ovate or elliptic, obtuse or acute; flowers small, white in terminal or axillary, paniculate cymes; calyx 5-lobed; corolla tube constricted below the mouth, lobes lanceolate; stamens connivent around the stigma, included; follicles linear.

Flowers: Nov. - Feb.

Sivarajan 41, 539.

Thevetia Linn. (nom.cons.)

T.peruviana (Pers.) Merr. in Philip. J. Sci. Bot.

9:130. 1914; Shah in J. Bombay nat. Hist. Soc.

59:321. 1962. Cerbera peruviana Pers. Syn. 1:267.

1805. Thevetia neriifolia Juss. ex Steud. Nom. Bot. (ed.2) 2:680. 1841.

Small trees; leaves alternate, linear-lanceolate, glabrous, up to 14 x 1 cm; flowers large, bright yellow in terminal, peduncled cymes; corolla tube much inflated above the base; stamens included; fruits drupaceous, slightly compressed, about 3 cm across.

A native of south America, this plant is naturalized in India; seen wild and also cultivated

in gardens and on hedges.

Flowers: May - Dec.

Sivarajan 1205.

Cerbera Linn.

C.manghas Linn. Sp. Pl. 208. 1753; Gamb. 566.

C.odollam Gaertn. Fruct. 2:193. 1791; FBI. 3:638.  
1882.

Small trees with an acrid, milky latex; leaves alternate, oblanceolate, abruptly acuminate; flowers white in terminal or subterminal, paniculate cymes; calyx 5-partite; corolla tube short, lobes spreading; stamens included; drupes usually globose, large.

This species is characteristic of salt-marshes and back waters. But a few trees are seen along the road sides near Ramanattukara, in the fresh water areas. Fruits are highly poisonous.

Flowers: June - Dec.

Sivarajan 1205.

Plumeria Linn.

P.rubra Linn. Sp. Pl. 209. 1753; Markgraf, Fl. Illustr.  
Catar. 1:34. 1968; Mathew in Rec. Bot. Sur. Ind.  
20:154. 1969. P.rubra Linn. forma acutifolia (Poir.)  
Woods. in Poir. Encycl. Suppl. 2:667. 1812; FBI.  
3:641. 1882; Gamb. 577. P.acuminata Ait. Hort. Kew  
2:70. 1789.

Deciduous trees; bark grey; leaves elliptic to  
oblanceolate, acute, up to 30 x 10 cm, lateral veins  
many, parallel, joined in a submarginal vein; flowers  
white with a yellow centre, borne in terminal panicles;  
calyx minute; corolla tube short, slender, green,  
lobes obovate, rounded at apex; stamens included.

This is usually seen on hedges and in the  
premises of temples, does not set fruits, and the  
propagation is by vegetative methods.

Flowers: Feb. - Mar.

Sivarajan 877.

Trees; leaves in whorls of 7 or less, oblanceolate-obtuse; flowers fragrant in sub-terminal, corymbose cymes; greenish yellow; follicles linear, up to 25 cm long.

Flowers: Oct. - Dec.

Sivarajan 735.

Nerium Linn.

N.indicum Mill. Gard. Dict. (ed.8) no.2. 1786; Merr. En. 3:336. 1923; Sant. 133. 1960. N.odorum Ait. Hort. Kew 1:297. 1789; FBI. 3:655. 1882; Gamb. 577.

Shrubs; leaves whorled, leathery, elliptic-oblong, up to 15 x 2.5 cm; flowers red, single or double in terminal cymes.

Flowers: throughout the year.

Sivarajan 1518.

Rauvolfia Linn.

Key to the species

- 1. Plants glabrous ..... serpentina
- 1. Plants dense-tomentose ..... tetraphylla

R. serpentina (Linn.) Benth. ex Kurz For. Fl. Burm.

2:171. 1877; FBI. 3:632. 1882; Sulochana in J. Ind. bot. Soc. 38:578. 1959; Sant. 130. 1960; Gamb. 567.

Ophioxylon serpentinum Linn. Sp. Pl. 1043. 1753.

Woody herbs or undershrubs; leaves elliptic-oblong, acuminate, glabrous, up to 13.5 x 6.2 cm; flowers white or pinkish in terminal or axillary sub-umbellate cymes; pedicels and calyx red; corolla tube 1.5 cm long, slender, lobes spreading; stamens included; drupes 2, distinct, purplish black.

Seen on the grassy slopes among bushes.

Cultivated for medicine.

Flowers: Mar. - May

Sivarajan 378.

R. tetraphylla Linn. Sp. Pl. 208. 1753; Rao in Ann. Miss.

Bot. Gard. 43:285. 1956; Sulochana in J. Ind. bot.

Soc. 38:586. 1959. R. canescens Linn. Sp. Pl. (ed.2)

303. 1762; Gamb. 568.

Pubescent shrubs; leaves in whorls of 4, unequal, elliptic, pubescent on both surfaces; flowers white, about 5 mm long in tomentose, terminal cymes;

corolla tube 2-2.5 mm long, lobes rounded; drupes purple when ripe, almost completely connate.

Seen along the rocky coast at Kadalundi.

Flowers: throughout the year.

Sivarajan 1069.

Holarrhena R. Br.

H. antidysenterica (Linn.) Wall. [Cat. 1672. 1829, nom. nud.] ex DC. Prod. 8:413. 1844; FBI. 3:644. 1882; Sant. 131. 1960; Gamb. 570. Nerium antidysentericum Linn. Sp. Pl. 209. 1753.

Shrubs or small trees; leaves ovate-oblong or elliptic, pubescent; flowers white in axillary cymes; corolla tube long, narrow, cylindrical, lobes obovate, rounded at apex; follicles linear, pendulous.

Flowers: Dec. - May

Sivarajan 133.

Catharanthus G. Don

Note: The names Catharanthus, Lochnera and Vinca are very often used as synonyms. In 1828, Reichenbach (consp. Reg. Veg. 134) Split the genus



Vinca into Vinca proper and Lochnera, but did not give a description to Lochnera. In 1838, Endlicher (Gen. Pl. 583) gave a description, and validated Lochnera, an otherwise nomen nudum. But by this time, the name Lochnera became superfluous, since the genus has been properly and validly published by G. Don (Gen. Syst. Gard. Bot. 4:95. 1837) under the name Catharanthus.

Key to the species

- 1. Leaves elliptic-lanceolate, acute at apex .. pusillus
- 1. Leaves obovate, rounded at apex ..... roseus

C. pusillus (Murr.) G. Don, Gen. Syst. 4:95. 1836.

Vinca pusilla Murr. in Comm. Gotting 3:66, t. 2, f.

1. 1773; FBI. 3:640. 1882. Lochnera pusilla (Murr.)

K. Schum. in Engl. & Pr. Pfam. 4(2):145. 1895;

Gamb. 568.

Herbs, 20-25 cm tall; leaves elliptic-lanceolate, acuminate, membranous; flowers 1-3 in the axils, white; calyx 5-lobed; corolla tube cylindrical, slender, constricted at mouth, lobes spreading, 3 mm long; stamens included; follicles linear, about 5 cm long.

Flowers: Sept. - Nov.

Sivarajan 321.

C.roseus (Linn.) G. Don, Gen. Syst. 4:95. 1837; Sant.  
in Bull. Bot. Sur. Ind. 3:15. 1961; Markgraf, Fl.  
Illustr. Catar. 1:29, fig. 8. 1968. Vinca rosea Linn.  
Syst. (ed.10) 944. 1759; FBI. 3:640. 1882. Lochnera  
rosea (Linn.) Reichb. Consp. Reg. Veg. 134. 1828;  
Dwyer in Lloydia 27(4):285. 1964.

Branched undershrubs; leaves obovate, rounded  
at apex, up to 5 x 3 cm, lateral veins whitish; flowers  
white, pink or blue, 1-2 in the axils; calyx 5-lobed;  
corolla tube narrowly cylindrical, 2-2.5 cm long, lobes  
spreading, obovate, obtuse or retuse, about 2 cm long;  
follicles linear.

Common on the sandy coast near West Hill and  
also cultivated in gardens:

Flowers: Mar. - Dec.

Sivarajan 98, 223.

Tabernaemontana Linn.

Note: Stapf (in Dyer, Fl. Trop. Afr. 4:25. 1902)  
has split the genus Tabernaemontana into several new  
genera, and the genus Tabernaemontana proper has been

practically excluded from the Old World. Subsequently all species of Tabernaemontana in India were transferred to the new genus Ervatamia Stapf. But Merrill (Contr. Arn. Arb. 8:140. 1934) has established that the generic distinction of Ervatamia was not on sound basis. In this work, the author has followed Merrill in keeping the available species under the generic name Tabernaemontana Linn.

Key to the species

- 1. Corolla lobes overlapping to right ..... heyneana
- 1. Corolla lobes overlapping to left ..... divaricata

T.heyneana Wall. in Bot. Reg. Sub. t. 1273. 1829;

FBI. 3:572. 1882. Ervatamia heyneana Cooke, Fl.

Bomb. 2:134. 1904; Gamb. 572.

Small trees with grey bark; leaves elliptic-oblong, acuminate, glabrous; flowers white in corymbose cymes; calyx lobes 5; corolla tube cylindric, about 2.5 cm long, lobes spreading; stamens included; follicles orange-yellow, divaricate, angled, tips recurved; seed-arils red.

Flowers: Feb. - Mar.

Sivarajan 95.

T.divaricata (Linn.) R. Br. in Roem. & Schult. Syst.  
4:427. 1819; Merr. in Contr. Arn. Arb. 8:140, 1934;  
Sant. 131. 1960. Nerium divaricatum Linn. Sp. Pl.  
209. 1753. Ervatamia coronaria Stapf, in Dyer, Fl.  
Trop. Afr.4:127. 1902; Gamb. 571.

Shrubs; leaves elliptic-oblong, acuminate;  
flowers white in axillary cymes; calyx lobes 5;  
corolla tube thick, 2-2.5 cm long, lobes spreading;  
stamens included; usually does not produce fruits.

Very often cultivated in gardens. Propaga-  
tion is by stem-cuttings. Both single-flowered  
and double flowered forms are cultivated.

Flowers: throughout the year.

Sivarajan 908.

#### ASCLEPIADACEAE R.Br.

##### Key to the genera

1. Plants climbing:
2. Leaves deeply cordate:
3. Leaves oblong to lanceolate ..... Holostemma

- 3. Leaves ovate-orbicular, acuminate:
  - 4. Peduncles longer than the leaves .. Pergularia
  - 4. Peduncles shorter than leaves ..... Telosma
- 2. Leaves not cordate:
  - 5. Flowers in racemes ..... Cosmostigma
  - 5. Flowers in umbels:
    - 6. Corolla lobes connate by their  
tips ..... Ceropegia
    - 6. Corolla lobes not as above:
      - 7. Pedicels capillary ..... Tylophora
      - 7. Pedicels not capillary:
        - 8. Plants dense-tomentose ..... Gymnema
        - 8. Plants glabrous ..... Dregea
- 1. Plants erect:
  - 9. Flowers red-orange ..... Asclepias
  - 9. Flowers purplish ..... Calotropis

Holostemma R. Br.

H.annulare (Roxb.) K.Schum. in Engl. & Pr. Pfam. 4(2):

250. 1895; Blatt. & McC. in J. Bombay nat. Hist. Soc.

36:529. 1922; Sant. 135. 1960; Gamb. 586. Asclepias

annularis Roxb. [Hort. Beng. 20. 1814, nom. nud.]

Fl. Ind. 2:37. 1832. H.rheedii Wall. Pl. As. Rar.

2:51. 1831; FBI. 4:21. 1883.

Large climbers; leaves ovate-oblong, lanceolate, acute or obtuse, deeply cordate at base; flowers large, purple in axillary cymes; calyx eglandular; corolla deeply 5-lobed; corona annular, adnate with the base of the winged staminal column; anthers with a membraneous appendage at tip; pollinia solitary in each cell, clavate; caudicle slender; follicles lanceolate.

Flowers: July - Aug.

Sivarajan 401, 1402.

Pergularia Linn.

P.daemia (Forsk.) Choiv. Result. Sc. Miss. Stefan.

Paoli Somal. Ital. 1:115. 1916; Blatt. & McC. in J. Bombay nat. Hist. Soc. 36(3):528. 1933; Sant. & Irani Bot. Mem. Uni. Bomb. 4:74. 1962. Asclepias daemia Forsk. Fl. Aeg. -Arab. 51. 1775. Daemia extensa R. Br. in Mem. Wern. Soc. 1:50. 1810; FBI. 4:20. 1883. Pergularia extensa (R.Br.) N.E. Brown in Dyer, Fl. Cap. 4:758. 1908; Gamb. 588.

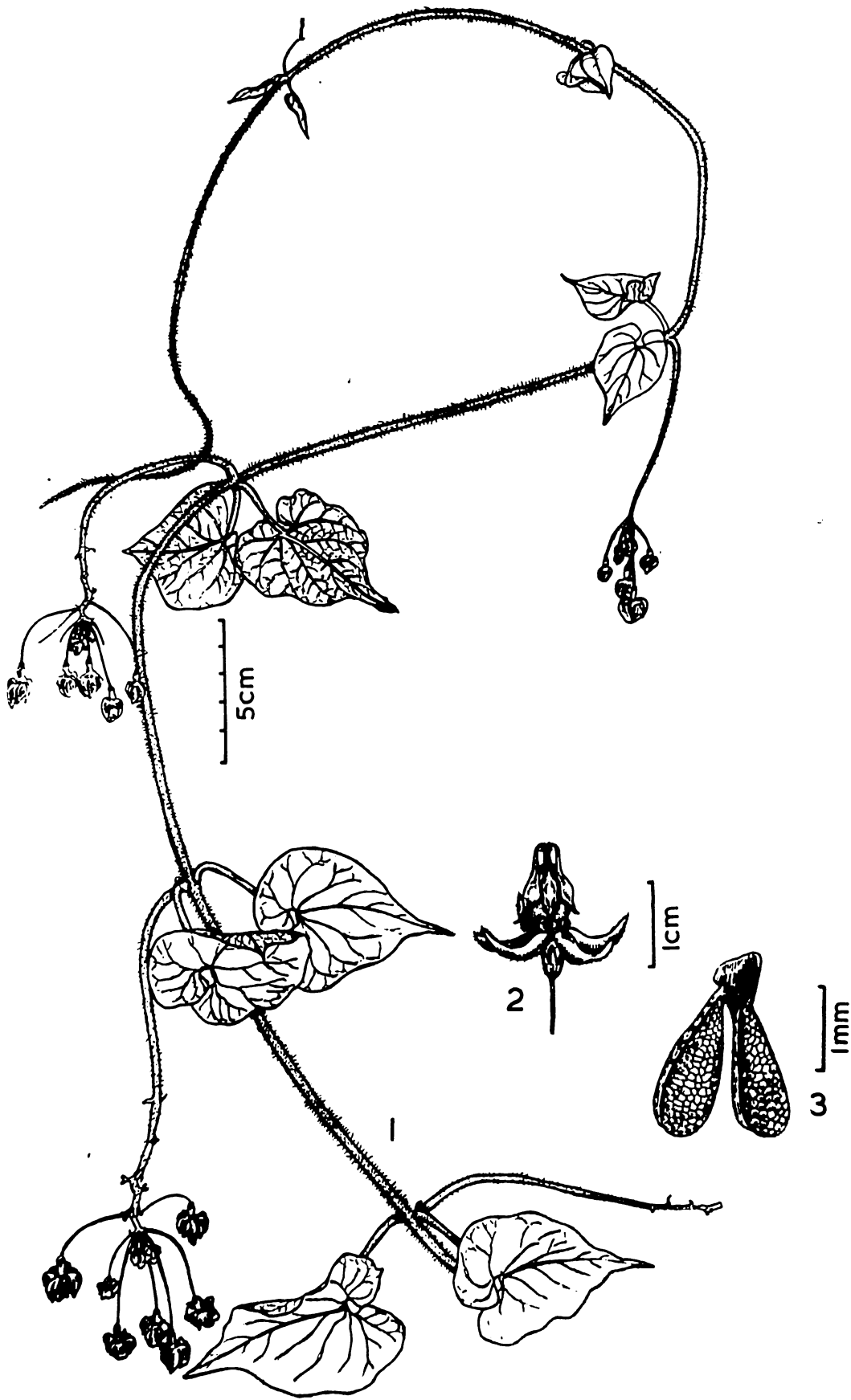
Hispid climbers; leaves broadly orbicular, acuminate, deeply cordate at base; flowers greenish

PLATE 10

Pergularia daemia (Forsk.) Choiv.

Fig.1. Flowering branch. Fig.2. Flower

Fig.3. Pollinia.



PERGULARIA DAEMIA (FORSK.) CHOIV.



white in axillary racemes or corymbs; pedicels long; calyx 5-lobed, glandular within; corolla tube short, lobes lanceolate-acute; corona double, the outer 5 lobes entire and the inner spurred; filaments connate; anthers with a membranous appendage at the tip; pollinium one in each cell; follicles 2, lanceolate, echinate. (Plate 10)

Flowers: Dec. - Jan.

Sivarajan 1580.

Telosma Coville

T. pallida (Roxb.) Craib. in Kew Bull. 1911:418. 1911; Blatt. & McC. in J. Bombay nat. Hist. Soc. 36:531. 1933; Gamb. 593. Asclepias pallida Roxb. Hort. Beng. 20. 1814, nom. nud. Fl. Ind. 2:48. 1832. Pergularia pallida Wt. & Arn. in Wt. Contr. Bot. Ind. or 42. 1834; Wt. Ic. t. 585. 1842; FBI. 4:38. 1883.

Climbers; leaves ovate or sub-orbicular, acuminate, deeply cordate at base; flowers greenish in lateral, umbellate cymes; pedicels and calyx pubescent; corolla tube constricted at the throat; lobes oblong, spreading; corona single, adnate to the staminal column, lobes linear; anthers with membranous tips; pollinium solitary in each cell, oblong; follicle lanceolate, terete;

seeds with a silky coma.

Flowers: Apr. - May

Sivarajan 255.

Cosmostigma Wt.

C. racemosa Wt. Contr. Bot. Ind. or. 42. 1834; FBI.

4:46. 1883; Sant. 155. 1967; Gamb. 595.

Glabrous climbers; leaves ovate-acuminate, truncate or rounded at base; flowers in lateral corymbs; calyx lobes with pairs of glands in between them; corolla lobes acute, blotched with brown within; corona scales notched at the tips, adnate with the base of the staminal column; anthers with membranous tips; follicles large, oblong; seeds flat, with a tuft of silky hairs at the tip.

Flowers: Aug. - Oct.

Sivarajan 313.

Ceropegia Linn.

C. candelabrum Linn. Sp. Pl. 211. 1753; FBI. 4:70.

1883; Gamb. 603.

PLATE 11

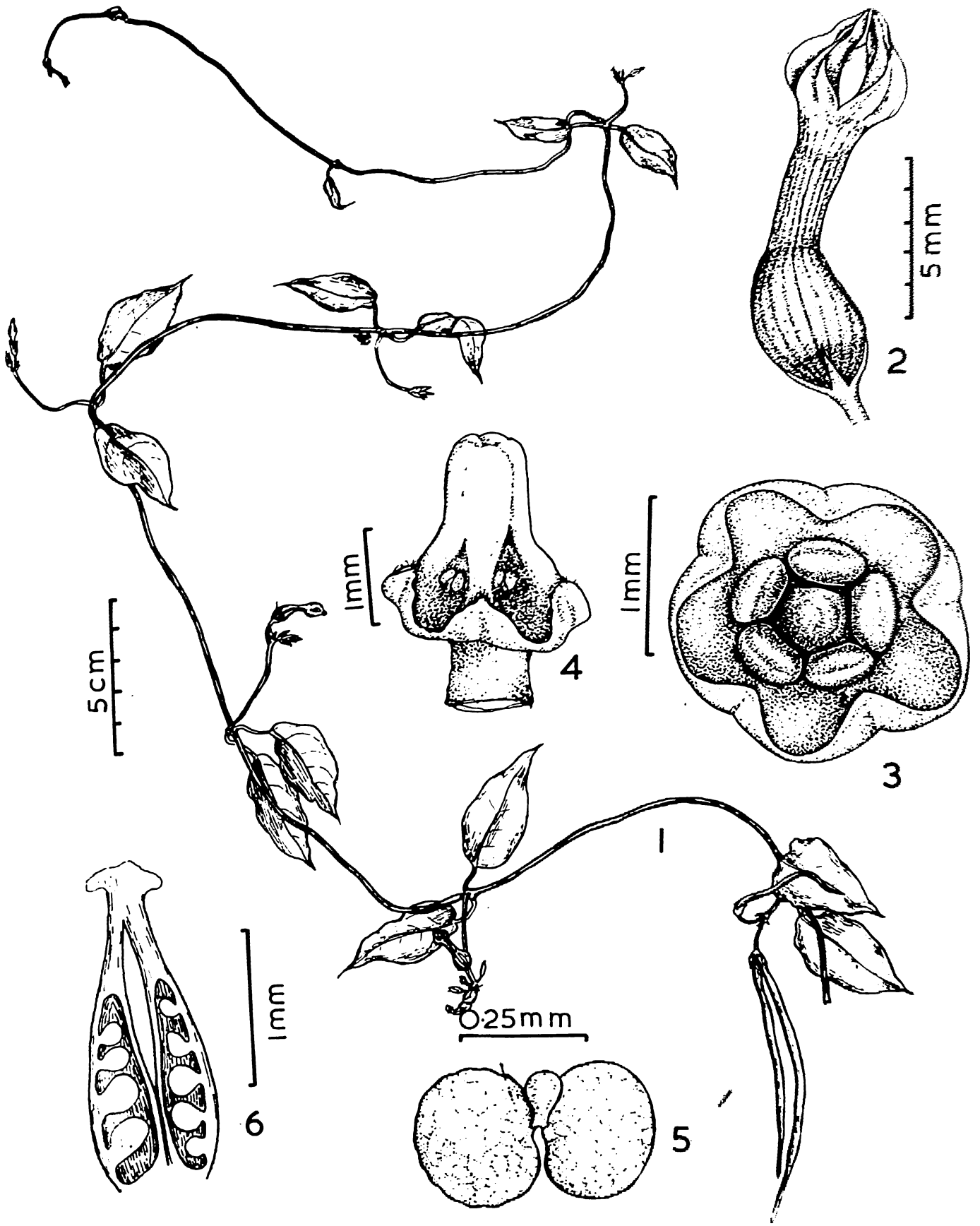
Ceropegia candelabrum Linn.

Fig.1. A flowering branch. Fig.2 Flower.

Fig.3. Top-view of the staminal column,  
after the removal of the inner corona.

Fig.4. Staminal column with both the  
whorls of corona. Fig.5. Pollinia.

Fig.6. L.S. of pistil.



CEROPEGIA CANDELABRUM LINN.

Slender climbers; leaves ovate to elliptic, acute; flowers umbellate on slender peduncles; calyx deeply lobed, lobes minute, linear; corolla tube inflated below, prominently veined, lobes lanceolate, connate by their ciliate tips, margins reflexed; corona double, outer with minute, triangular lobes, inner spatulate; staminal column short; anthers without membranous appendages; follicles linear; seeds with a tuft of hairs at the tips. (Plate 11).

Flowers: Aug. - Sept.

Sivarajan 375, 1768

Tylophora R. Br.

Key to the species

- 1. Plants glabrous ..... pauciflora
- 1. Plants tomentose ..... indica

T. pauciflora Wt. & Arn. in Wt. Contr. Bot. Ind. Or.  
49. 1834; FBI. 4:41. 1883; Wt. Ic. 1274. 1848;  
Gamb. 592.

Trailing or climbing herbs; leaves ovate-lanceolate, acute or acuminate; flowers greenish,

umbellate on short peduncles; pedicels filiform; calyx 5-partite, glandular; corolla purplish, deeply 5-lobed; corona of 5 fleshy lobes; anthers with membranous tips; follicles, lanceolate; seeds flat, ending in a tuft of hairs.

Flowers: Sept. - Nov.

Sivarajan 600.

T.indica (Burm. f.) Merr. in Philip. J. Sci. 19:373.

1921; Sant. 154. 1967. Cynanchum indicum Burm. f.

Fl. Ind. 70. 1768. Asclepias asthmatica Linn. f.

Suppl. 171. 1781. Tylophora asthmatica (Linn. f.)

Wt. & Arn. in Wt. Contr. Bot. Ind. Or. 51. 1834;

FBI. 4:44. 1883; Gamb. 593.

Slender, pubescent climbers; leaves ovate to oblong, acute or acuminate, pubescent, up to 5.8 x 2.6 cm; flowers greenish purple in umbellate-cymes; calyx deeply 5-partite, pubescent; corolla lobes oblong-acute; corona single, lobes acuminate at tip; follicles tapering.

Flowers: Nov. - Dec.

Sivarajan 821.

Gymnema R. Br.

G. sylvestre (Retz.) R. Br. in Mem. Wern. Soc. 1:33. 1809;  
Schult. in Roem. & Schult. Syst. Veg. 6:57. 1819; Wt.  
Ic. 349. 1840; FBI. 4:29. 1883; Gamb. 590; Sant. 152.  
1967. Periploca sylvestris Retz. Obs. 2:15. 1781.

Tomentose climbers; leaves ovate, shortly  
acuminate, densely tomentose; flowers in lateral short-  
peduncled umbels, greenish yellow; calyx lobes ovate;  
corona of 5 fleshy lobes, corolline; anthers with  
membraneous appendages; pollen mass solitary in each  
cell; follicles slender; seeds ovate, ending in a coma,  
strongly margined.

Flowers: July - Aug.

Sivarajan 1742.

Dregea E. Mey. (nom.cons.)

D. volubilis (Linn.f.) Benth. ex Hook. f. Fl. Brit. Ind.  
4:46. 1883; Sant. & Irani in Bot. Mem. Uni. Bomb.  
4:42. 1962; Sant. 154. 1967. Asclepias volubilis Linn.  
f. Suppl. 170. 1781. Marsdenia volubilis (Linn.f.)  
Cooke, Fl. Pres. Bomb. 2:166. 1904; Sant. 137. 1960;  
Gamb. 595.

Glabrous climbers; leaves broadly ovate-acuminate, rounded or subcordate at base; flowers greenish yellow in axillary, pendulous umbels; peduncles and pedicels long; calyx 5-partite; corolla rotate, lobes obtuse; corona of 5 rounded, fleshy lobes; anthers with membranous tips; follicles lanceolate, seeds flattened, ending in a coma.

Flowers: Mar. - April

Sivarajan 1105.

Asclepias Linn.

A. curassavica Linn. Sp. Pl. 215. 1753; FBI. 4:18. 1883;  
Sant. 158. 1967; Gamb. 585.

Erect herbs; leaves narrowly oblong or lanceolate, acuminate, up to 12.5 x 2.6 cm; flowers orange-red in terminal or axillary umbels; calyx small; corolla deeply 5-lobed, red, lobes acute; corona of 5 erect, horned lobes; anthers with membranous tips; follicles lanceolate.

Flowers: Aug. - Mar.

Sivarajan 820.



Calotropis R. Br.

C. gigantea (Linn.) R. Br. in Ait. Hort. Kew (ed.2)  
2:78. 1811; FBI. 4:17. 1883; Blatt. & McC. in J.  
Bombay nat. Hist. Soc. 36:526. 1922; Sant. 151.  
1967; Gamb. 585. Asclepias gigantea Linn. Sp. Pl.  
214. 1753.

Much branched, succulent shrubs covered with  
a cottony pubescens; leaves large, fleshy, obovate-  
obtuse, subsessile; flowers large, purplish; calyx  
lobes ovate; corolla campanulate; corona lobes 5,  
laterally compressed, adnate with the staminal column;  
follicles large, inflated; seeds flat, ending in coma.

Flowers: throughout the year.

Sivarajan 609.

PERIPLOCACEAE Schlter.

Note: In most of the Indian Floras this family  
is treated as a tribe under the family Asclepiadaceae.  
Rudolf Schlechter (Notizbl. Bot. Gart. Berlin 9:23. 1924)  
proposed the separation of this tribe into a distinct  
family periplocaceae, based on their free filaments,  
form of the anthers, spoon or bag-shaped pollen-carriers,

Pollen tetrads and stigmas which are much different from those of the remainder of Asclepiadaceae, which treatment is followed by all the modern workers.

Key to the genera

1. Lateral veins close and parellel ..... Cryptolepis
1. Lateral veins distant and arched ..... Hemidesmus

Cryptolepis R. Br.

C.buchanani Roem. & Schult. Syst. Veg. 4:409. 1819;  
FBI. 4:5. 1883; Sant. & Irani in Bot. Mem. Univ.  
Bomb. 4:91. 1962; Gamb. 580; Sant. 151. 1967.

Climbing shrubs; leaves elliptic-oblong, shortly acuminate, up to 18 x 6 cm; lateral veins close and parellel; flowers small, greenish yellow in axillary cymes; calyx with 5 scales at base within; corolla campanulate; corona scales 5, clavate; stamens attached to the base of the corolla tube; pollen masses in pairs, granular; styles distinct; follicles 2, narrowed to the tip, divaricate; seeds flat with a tuft of hairs at the tip.

Flowers: Mar. - Apr.

Sivarajan 1109.

Hemidesmus R. Br.

H. indicus (Linn.) R. Br. in Mem. Wern. Soc. 1:56. 1809;

FBI. 4:5. 1883; Sant. & Irani in Bot. Mem. Uni.

Bomb. 4:96. 1962; Sant. 150. 1967; Gamb. 580.

Periploca indica Linn. Sp. Pl. 211. 1753.

Climbers with tuberous roots; leaves narrowly lanceolate to elliptic; flowers subcapitate in the axils; calyx lobes acuminate with 5-scales at base within; corolla rotate, lobes ovate-subacute; corona scales fleshy; stamens 5; pollen masses in pairs, granular; follicles cylindrical, tapered at the tip; seeds flattened, ovate, with a tuft of silvery white hairs.

Common on the grassy slopes, twining on bushes. The roots are aromatic and are used in the preparation of some beverages. This endemic species of South India exhibits much variation in the size and shape of leaves.

Flowers: Oct. - Jan.

Sivarajan 593, 659, 949.

STRYCHNACEAE Link.

Strychnos Linn.

Key to the species

- 1. Trees ..... nux-vomica
- 1. Climbers:
  - 2. Tendrils simple ..... cinnamamifolia
  - 2. Tendrils bifid ..... aenea

S.nux-vomica Linn. Sp. Pl. 189. 1753; FBI. 4:90. 1883;  
Hill in Bull. Misc. Inf. Kew 1917:183. 1917; Gamb.610.

Trees; leaves opposite, ovate or elliptic, coriaceous, glabrous, basally 5-nerved; flowers greenish yellow in dense, terminal, cymes; calyx shortly toothed; corolla tube cylindrical, much longer than the lobes; stamens short; berries globose; seeds many, discoid.

Flowers: Jan. - Feb.

Sivarajan 134, 1598, 1603.

C.cinnamamifolia Th. En. 201. 1860, var.wightii Hill  
in Bull. Misc. Inf. Kew 1917:194. 1917; Gamb. 611.  
S.colubrina Wall. [Cat. 4455. 1831, nom. nud.] ex  
Wt. Ic. t. 434. 1841, (non Linn. 1753). S.cinnamami-  
folia sensu Cl. in Hook.f. Fl. Brit. Ind.4:89. 1883,  
in part.

Climbing shrubs; tendrils not forked; leaves elliptic or ovate acuminate, coriaceous, 3-ribbed; flowers greenish yellow in terminal, dense cymes; calyx shortly toothed; corolla tube much longer than the lobes; berries large; seeds discoid.

Flowers: Dec. - Feb.

Sivarajan 246, 1601, 1604.

S.aenea Hill in Bull. Misc. Inf. Kew 1917:138. 1917;  
Gamb. 610.

Climbing shrubs; tendrils bifid; leaves ovate to elliptic, acuminate, leathery, 3-ribbed from base; cymes axillary; flowers greenish yellow, small; corolla lobes slightly shorter than the tube; berries spherical; seeds compressed.

Flowers: Jan. - Feb.

Sivarajan 1593.

PLATE 12

Fig.1. Mitrasacme polymorpha R. Br.

Fig.2. M.alsinoides R. Br.



Fig. 1



Fig. 2

SPIGELIACEAE Mart.

Mitrasacme Labill.

Key to the species

1. Leaves elliptic-acute ..... polymorpha  
1. Leaves linear-lanceolate ..... alsinoides

M. polymorpha R. Br. Prod. 452. 1810; FBI. 4:80. 1883;  
Gamb. 608.

Small, hirsute herbs, 5-8 cm tall; leaves few, opposite, ovate or elliptic, subsessile, up to 1.5 x 0.8 cm; flowers white, campanulate in long-pedunculate umbels, tetramerous; styles 2, connate above the middle; capsules laterally compressed, 2-celled, many seeded. (Plate 12. Fig. 1).

Common in the grassy hill-slopes during the rainy season.

Flowers: Aug. - Nov.

Sivarajan 305.

M. alsinoides R. Br. Prod. 453. 1810; FBI. 4:80. 1883;  
Cooke 247; Gamb. 607. M. pusilla Dalz. in Kew J. Bot.  
5(2):136. 1850.



PLATE 13

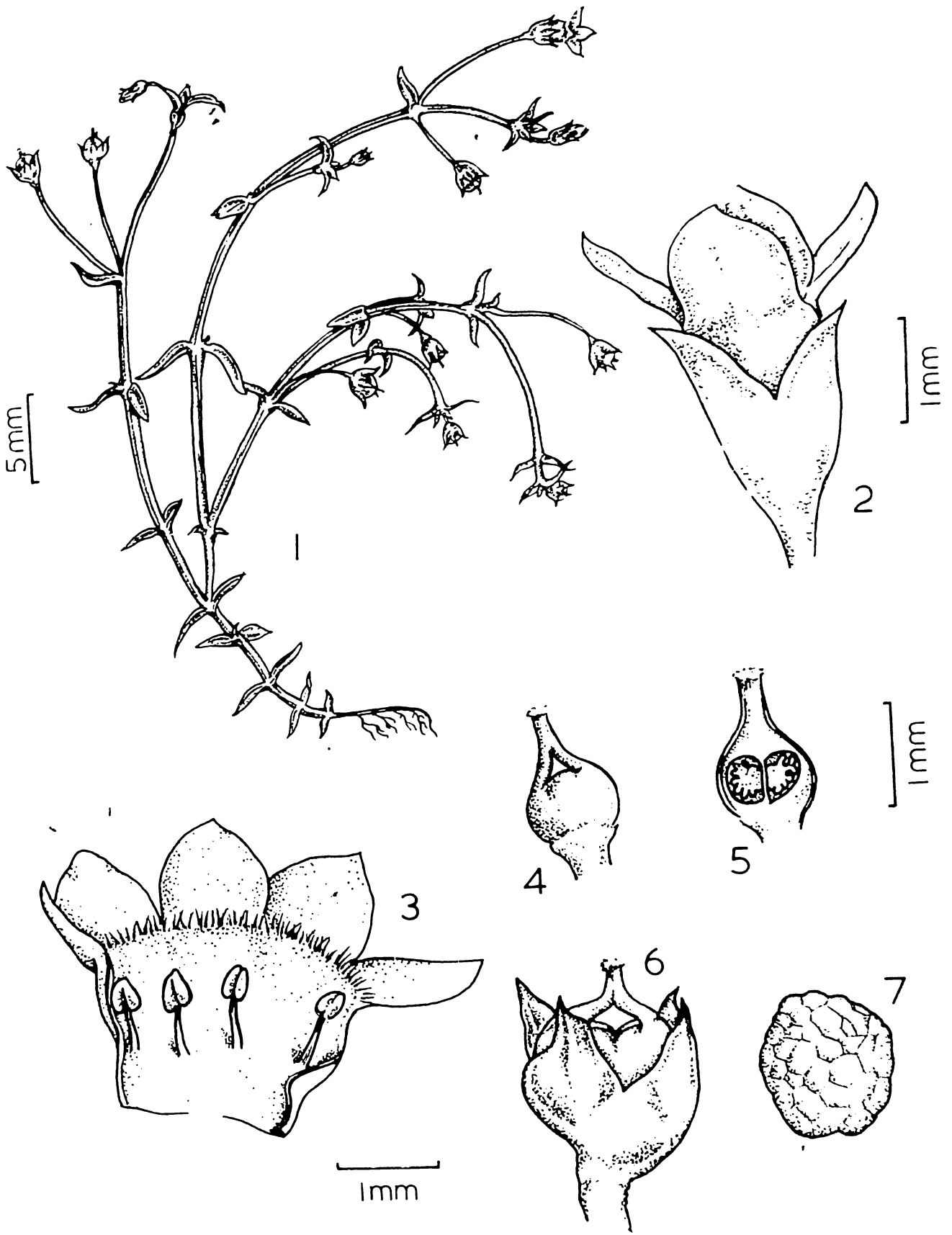
Mitrasacme alsinoides R. Br.

Fig.1. Entire plant. Fig.2. Flower.

Fig.3. Corolla tube split open.

Fig.4. Pistil. Fig.5. L.S. of ovary.

Fig.6. Capsule with the persistent  
calyx and style. Fig.7. Seed.



MITRASACME ALSINOIDES R. BR.

Glabrous annuals; leaves opposite, linear-lanceolate, sessile, up to 1 x 0.3 cm; flowers white, solitary or 2-3 clustered in the axils; pedicels filiform, short; capsules laterally compressed; seeds reticulate. (Plate 12, Fig. 2 & Plate 13.)

Common on the hill slopes among grasses.

Flowers: Aug. - Nov.

Sivarajan 75, 281.

POTALIACEAE Mart.

Fagraea Thunb.

F. ceilanica Thunb. in Vet. Acad. Handl. Stockh. 3:132, t. 4. 1782; FBI. 4:83. 1883; Leenhouts in Fl. Males. 6(2):315. 1962 & in Bull. Jard. Bot. Brux. 32(4): 420-21. 1962; Gamb. 608. "zeylanica". F. obovata Wall. in Roxb. Fl. Ind. 2:33. 1824; FBI. 4:83. 1883; Gamb. 608.

Scandent, woody shrubs; leaves opposite, obovate-spathulate, glabrous, up to 20 x 8 cm; petioles auricled at base; flowers pale yellow, large, funnel-shaped in terminal or axillary cymes; calyx lobes 5;

corolla tube about 6-8 cm long, lobes obtuse; fruit a 1-2-loculed berry; seeds embedded in a pulp.

A rare species, on a shaded rock at West Hill.

Flowers: Apr.- May

Sivarajan 1163.

GENTIANACEAE Juss.

Key to the genera

- 1. Fruits cylindric ..... Canscora
- 1. Fruits subglobose or ovoid:
  - 2. Perfect stamens 4-5 ..... Exacum
  - 2. Perfect stamens 1-2 ..... Hoppea

Canscora Lamk.

Key to the species

- 1. Stem not winged ..... diffusa
- 1. Stem narrowly winged:
  - 2. All flowers pedicellate ..... pauciflora
  - 2. Central flowers of each cyme  
sessile ..... heteroclita

C.diffusa R. Br. Prod. 451. 1810, in Obs; FBI. 4:103.

1883; Sant. 143. 1960; Gamb. 617.

Slender annuals; stem 4-angled; leaves ovate or elliptic, the lower shortly petioled, upper sessile; flowers pink in lax, terminal, dichasial cymes; bracts at the forks leaf-like; pedicels filiform; calyx tube cylindrical, keeled, 4-toothed; corolla lobes unequal; perfect stamens 1-2, longer than the others; ovary 1-celled; capsules 2-valved; seed minute.

Common on lateritic slopes.

Flowers: July - Oct.

Sivarajan 775.

C. pauciflora Dalz. in Hook. Kew J. Bot. 2:136. 1850;  
FBI. 4:103. 1883; Sant. 143. 1960; Gamb. 617.

Slender annuals; stem narrowly 4-winged; leaves ovate, obtuse or acute, sessile; panicles few-flowered; flowers pink, pedicellate; pedicels slightly enlarged towards the tip; calyx keeled, other features as in C. diffusa.

Common on lateritic slopes.

Flowers: Aug. - Nov.

Sivarajan 844.

C.heteroclita (Linn.) Gilg. in Engl. & Pr. Pfam.

4(2):76. 1895. Gentiana heteroclita Linn. Mant.

2:560. 1770. Canscora sessiliflora Roem. & Schult.

Syst. 3:230. 1827; FBI. 4:104. 1883; Gamb. 617.

Erect, slender annuals; stem narrowly 4-winged; leaves ovate-obtuse or subacute, sessile; cymes few-flowered; flowers rose-coloured, the central flower of each cyme sessile, the laterals pedicellate. Other characters as in other species.

Common on moist rocky slopes.

Flowers: Aug. - Nov.

Sivarajan 510.

Exacum Linn.

Key to the species

- 1. Calyx lobes winged ..... bicolor
- 1. Calyx lobes not winged ..... sessile

E.bicolor Roxb. [ Hort. Beng. 83. 1814, nom. nud. ] Fl.

Ind. 1:413. 1820; Cl. in J. Linn. Soc. Bot. 14:425.

1875; FBI. 4:96. 1883; Sant. 141. 1960; Gamb. 613.

Erect annuals, 20-50 cm tall; stem sharply 4-angled; leaves variable in size, oblong-lanceolate, acuminate, 5-ribbed from base; flowers in axillary and terminal dichasial cymes, tetramerous; corolla lobes white with rose or pink tips; stamens yellow, lanceolate, erect; ovary 2-celled; capsules 2-valved; seeds minute.

A monsoon herb on the grassy slopes producing dense, beautiful bunches of flowers.

Flowers: Aug. - Oct.

Sivarajan 608, 635.

E. sessile Linn. Sp. Pl. 112. 1753; Wt. Ic. 1324. 1848;  
Cl. in J. Linn. Soc. Bot. 4:427. 1875; FBI. 4:98.  
1883; Gamb. 614.

Small, annual herbs, 10-15 cm tall; stem 4-angled; leaves small, ovate, acute or subacute, sessile; flowers blue, subsessile small; calyx lobes ovate, not winged; anthers very small; capsules globose.

A rare species in the grassy hill slopes. Seen near the University Campus.

Flowers: Aug. - Sept.

Sivarajan 340.

Hoppea Willd.

H. fastigata Cl. in Hook. f. Fl. Brit. Ind. 4:100. 1883;  
Gamb. 616.

Small, annual herbs; stem 3-8 cm tall, narrowly 4-winged; leaves opposite, sessile, ovate, obtuse or acute, glabrous; flowers pale yellow, small in capitate clusters; calyx 4-angled, lobes acute, with marginal nerves; perfect stamens 1-2, larger than the sterile staminodes.

A common, but inconspicuous herb among grasses on the lateric slopes during the rainy season.

Flowers: July - Oct.

Sivarajan 129.

MENYANTHACEAE Dumort.

Nymphoides Seguiet.

Key to the species

- 1. Radical leaves present ..... parvifolium
- 1. Radical leaves absent:
  - 2. Corolla lobes not fimbriate ..... cristatum
  - 2. Corolla lobes fimbriate ..... indicum



N. parvifolium (Griseb.) Kuntze, Rev. Gen. Pl. 2:429.

1891; Subr. Aquat. Ang. 26. 1962. Limnanthemum  
parvifolium Griseb. in DC. Prod. 9:141. 1845; FBI.  
4:132. 1883; Gamb. 621.

Annual, aquatic herbs; radical leaves spatulate-  
rounded at apex, 2 cm long; branches few, terminating  
in a single, floating, ovate-obtuse, deeply cordate leaf,  
up to 3 cm across; flowers pale yellow, small; pedicels  
short, fascicled at the nodes; capsules 5 mm long; seeds  
few, subglobose.

A rare species. Collected from the shallow ponds  
in the University campus.

Flowers: Aug. - Nov.

Sivarajan 431.

N. cristatum (Roxb.) Kuntze, Rev. Gen. Pl. 42. 1891;

Subr. Aquat. Ang. 25. 1962. Menyanthes cristata Roxb.  
Pl. Corom. 2:3, t. 105. 1798. Limnanthemum cristatum  
(Roxb.) Griseb. Gen. & Sp. Gent. 342. 1839; Gamb. 620.

Aquatic herbs; leaves all floating, ovate-  
orbicular, deeply cordate at base, about 10 cm across;  
flowers white, yellow at base within; pedicels 5-8 cm  
long; calyx lobes deep, 5 mm long; capsules many seeded.  
(Plate 14. Fig. 1).

PLATE 14

Fig.1. Nymphoides cristatum (Roxb.)

Kuntze, growing in shallow ponds, along  
with Eichhornia crassipes (Mart.) Solms.  
and Nymphaea stellata Willd.

Fig.2. N.indicum (Linn.) Kuntze

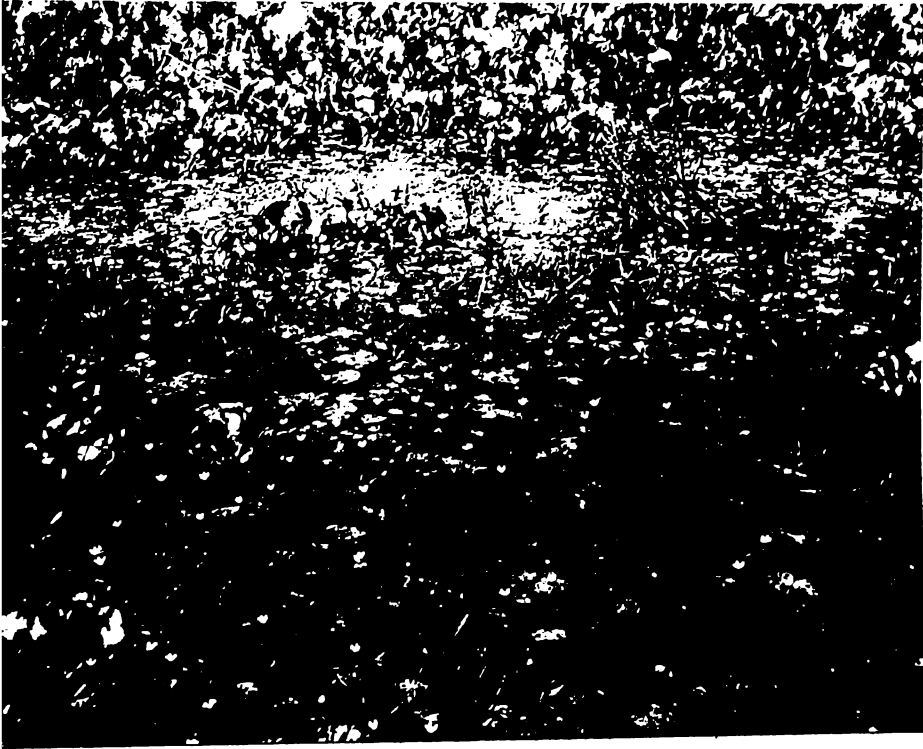


Fig. 1



Fig. 2

Very common in water-logged fields.

Flowers: Aug. - Nov.

Sivarajan 980, 1470.

N.indicum (Linn.) Kuntze, Rev. Gen. Pl. 429. 1891; Subr.  
Aquat. Ang. 25. 1962. Menyanthes indica Linn. Sp.  
Pl. 145. 1751. Limnanthemum indicum (Linn.) Griseb.  
emend. Th. En. 205. 1860; FBI. 4:131. 1883; Gamb. 621.

Aquatic herbs; leaves large, orbicular, deeply  
cordate at base, up to 25 cm across; flowers white;  
pedicels long, fascicled at the nodes; calyx lobes  
1 cm long; capsules many seeded. (Plate 14. Fig. 2).

Large plants in ponds and water-logged fields.

Flowers: Aug. - Dec.

Sivarajan 866.

#### HYDROPHYLLACEAE R.Br.ex Edwards.

##### Hydrolea Linn. (nom.cons.)

H.zeylanica (Linn.) Vahl, Symb. Bot. 2:46. 1791; FBI.  
4:133. 1883; Back. in Fl. Males. 4(3):207. 1951;  
Gamb. 621. Nama zeylanica Linn. Sp. Pl. 226. 1753.

Diffuse, flaccid annuals; leaves alternate, elliptic to lanceolate, acute, short-petioled; flowers deep blue in axillary or terminal racemes; calyx glandular-pubescent; corolla campanulate, 5-lobed; stamens 5, filaments dilated at base; ovary 2-celled, ovules many; styles 2, distinct; stigmas capitate; capsules thin, ovoid; seeds minute, many.

Common in moist or wet fields, especially in shaded places.

Flowers: Aug. - Dec.

Sivarajan 818, 1569.

BORAGINACEAE Juss.

Heliotropium Linn.

Key to the species

1. Flowers pale violet or pink ..... indicum
1. Flowers white:
  2. Leaves large, up to 10 x 6 cm ..... keralense
  2. Leaves much smaller, 1.5 x 0.5 cm .... scabrum

H. indicum Linn. Sp. Pl. 130. 1753; FBI. 4:152. 1883;  
Johnston in J. Arn. Arb. 32:111. 1951; Gamb. 630.

Branched, woody herbs; leaves ovate, emarginate, base narrowed; flowers pale violet or pink in terminal, long, spicate, scorpioid cymes; nutlets united in pairs, separating later, ribbed prominently.

A common weed in sandy fields and waste places, easily distinguished from H.keralense by their pale-violet or pink flowers.

Flowers: Mar. - May

Sivarajan 192, 1033.

H.keralense Sivarajan & Manilal in J. Ind. bot. Soc.

51:348-350. 1972.

Erect, fleshy herbs, profusely hairy all over; leaves ovate, obtuse or acute, decurrent on the petiole at base; flowers white in terminal, spicate, scorpioid cymes; corolla tube as long or slightly longer than the calyx, broadest at base, tapering towards the tip with long, setose, bulbous-based hairs outside; fruits ribbed, beaked, 2-partite at the tip.

A very common weed in the paddy fields and other sandy places during the monsoon period.

Flowers: Dec. - June

Sivarajan 6, 191, 997.

H. scabrum Retz. Obs. 2:8. 1781; FBI. 4:152. 1883;

Gamb. 630.

Small, diffuse or erect densely rusty tomentose herbs; leaves elliptic-acute, adpressed hairy on both surfaces; flowers white in terminal, interrupted spikes.

Annuals on the wet grassy hill-slopes, road sides, and in moist, harvested fields.

Flowers: Mar. - May

Sivarajan 220, 221..

CORDIACEAE R.Br. ex Dumort.

Key to the genera

- 1. Trees ..... Cordia
- 1. Prostrate herbs ..... Coldenia

Cordia Linn.

C. obliqua Willd. Phytogr. 1(4):t. 4, f. 1. 1794; FBI. 4:137. 1883; Kazmi in J. Arn. Arb. 51:142-143. 1970.

Small trees; leaves obovate, repand-crenate, up to 10 x 6 cm; flowers white, polygamous in terminal cymes; drupes ovoid, pink, pulpy.

Flowers: May - June

Sivarajan 1384.

Note: Of the two varieties recognised by Kazmi (loc.cit.) the cited specimen belongs to var.obliqua.

Coldenia Linn.

C.procumbens Linn. Sp. Pl. 125. 1753; FBI. 4:144. 1883;  
Johnston in J. Arn. Arb. 32:13. 1951; Sant. 146.  
1960; Gamb. 627; Kazmi in J. Arn. Arb. 51:148. 1970.

Prostrate, densely white villous herbs; leaves silky villous on both surfaces, inciso-crenate; flowers axillary, white, solitary, minute; drupes beaked at tip.

A common weed, in the fields during the summer season.

Flowers : Mar. - Aug.

Sivarajan 38.



CONVOLVULACEAE Juss.

Key to the genera

1. Corolla lobes deeply obcordate ..... Ericybe
1. Corolla lobes not obcordate:
  2. Style only one:
    3. Stigmatic lobes ovate-oblong ..... Hewittia
    3. Stigmatic lobes subglobose:
      4. Leaves densely velvety beneath ..... Argyreia
      4. Leaves not velvety:
        5. Pollen spinulose ..... Ipomoea
        5. Pollen not spinulose:
          6. Outer sepals much larger  
than the inner ..... Aniseia
          6. All sepals almost equal:
            7. Seeds 4 in each capsule ... Merremia
            7. Seed solitary in each  
capsule ... Porana
    2. Styles usually 2:
      8. Climbing shrubs ..... Bonamia
      8. Prostrate or diffuse herbs ..... Evolvulus

Erycibe Roxb.

E. paniculata Roxb. Pl. Corom. 2:31, t. 159. 1789; FBI. 4:180. (excl. syn. E. rheedii Bl.) 1883; Hoogland in Blumea 7:352. 1953; Sant. 167. 1967. E. wightiana Grah. Cat. 13:1839; Sant. 149. 1960.

Climbing shrubs; leaves ovate or elliptic; flowers yellowish white in axillary, rusty tomentose panicles; calyx lobes orbicular; corolla lobes obcordate, tube villous outside; stamens inserted at the throat of the corolla; ovary 1-celled, 4-ovuled; fruit a berry with a single seed.

Flowers: Dec. - Jan.

Sivarajan 34.

Hewittia Wt. & Arn.

H. sublobata (Linn.f.) Kuntze, Rev. Gen. Pl. 441. 1891; Oost. in Fl. Males. 4(4):438. 1953. Convolvulus sublobatus Linn. f. Suppl. 135. 1781. Hewittia bicolor Wt. & Arn. in Madr. J. Sci. 1(5):22. 1837; FBI. 4:216. 1883; Gamb. 649.

Twining, hispid herbs; leaves ovate-cordate, up to 9.5 x 7 cm; flowers axillary, solitary or in few-flowered cymes; sepals very unequal, outer larger, ovate, inner lanceolate; corolla pale yellow with a purple base; capsule 1-celled, 3-4 seeded.

Flowers: Aug. - Nov.

Sivarajan 727.

Argyreia Lour.

Key to the species

- 1. Bracts much longer than the calyx ..... nervosa
- 1. Bracts shorter than the calyx ..... imbricata

A.nervosa (Burm.f.) Boj. Hort. Maurit. 224. 1837; Sant. in J. Bombay nat. Hist. Soc. 47:351. 1947; Oest. in Blumea 5:364. 1943 & 6:338. 1950; Hoogland in Blumea 7:181. 1952. Convolvulus nervosus Burm. f. Pl. Ind. 48, t. 20, f. 1. 1768. Argyreia speciosa Sweet. Hort. Brit. 289. 1827; FBI. 4:185. 1883; Camb. 6377.

Silky pubescent climbers; leaves large, ovate-cordate, apiculate at tip, glabrous above, densely white, silky tomentose beneath; peduncles longer than petioles; bracts ovate-lanceolate, acuminate, 3-4 cm

long; flowers rose-purple, silky tomentose outside.

Flowers: June - July

Sivarajan 1542.

A, imbricata (Roth) Sant. & Patel in Trans. Bose Res.

Inst. Calc. 22:40. 1958. Ipomoea imbricata Roth,

Nov. Pl. Sp. 112. 1821. Lettsomia aggregata Roxb.

[Hort. Beng. 13. 1814, nom. nud.] Fl. Ind. 2:76.

1824; FBI. 4:191. 1883; Gamb. 639. Argyreia aggregata

(Roxb.) Choisy in Mem. Soc. Phys. Geneve 6:427. 1833;

Oost. in Blumea 5:380. 1943; Sant. in J. Bombay nat.

Hist. Soc. 47:351. 1947.

Dense-tomentose, subshrubby or climbing plants;  
leaves ovate-obtuse, pubescent beneath, up to 10 x 6.5  
cm; flowers rose-purple, 3 cm long; peduncles as long  
as the petiole; bracts obtuse, small.

Flowers: Sept. - Oct.

Sivarajan 1528.

Ipomoea Linn.

Key to the species

- 3. Flowers pedicellate:
  - 4. Shrubs or twiners:
    - 5. Corolla glabrous outside:
      - 6. Flowers in panicles ..... staphylina
      - 6. Flowers in cymes ..... sepiaria
    - 5. Corolla tomentose outside .... fistulosa
  - 4. Herbs, usually creeping:
    - 7. Leaves oblong-lanceolate ..... aquatica
    - 7. Leaves orbicular ..... repens
- 2. Leaves lobed:
  - 8. Leaf-lobes obtuse ..... pes-caprae
  - 8. Leaf-lobes acute or acuminate:
    - 9. Calyx densely hispid ..... nil
    - 9. Calyx glabrous:
      - 10. Flowers axillary, solitary .. cairica
      - 10. Flowers in axillary cymes:
        - 11. Calyx lobes obovate-
          - obtuse ..... mauritiana
        - 11. Calyx lobes lanceolate ... batatas
- 1. Flowers not pink or purple:
  - 12. Leaves simple:
    - 13. Corolla about 3 cm long ..... obscura
    - 13. Corolla 10-12 cm long ..... macrantha
  - 12. Leaves lobed:
    - 14. Flowers white ..... pes-tigridis

14. Flowers red:

15. Leaf-lobes pinnate ..... quamoclit

15. Leaf-lobes digitate ..... hederifolia

I.pileata Roxb. Fl. Ind. 2:94. 1824; FBI. 4:203. 1883;

Oost. in Blumea 3:507. 1940 & in Fl. Males. 4(4):467.

1953; Sant. in J. Bombay nat. Hist. Soc. 47:346.

1947; Gamb. 643.


A slender, pubescent climber; leaves ovate-cordate, acuminate at apex; flowers pink, capitate, enclosed in boat-shaped bract; sepals unequal, obtuse, hispid; corolla about 3 cm long; capsules 2-celled, usually 4-seeded.

Flowers: Nov. - Dec.

Sivarajan 780.

I.staphylina Roem. & Schult. Syst. 4:249. 1819; Choisy

in Mem. Soc. Phys. Hist. Nat. Geneve 9:460. 1841;



purple within at base, aggregated in lax, axillary panicles.

Flowers: Feb. - Mar.

Sivarajan 1646.

I. sepiaria Roxb. [Hort. Beng. 14. 1814, nom. nud.]

Fl. Ind. 2:90. 1824; FBI. 4:209. 1883; Verdcourt in Fl. Trop. E. Afr. 117. 1963. I. maxima sensu auct. mult. [non (Linn.f.) Sw.]; Oost. in Blumea 3:525. 1940 & in Fl. Males. 4:472, t. 45. 1953; Sant. in J. Bombay nat. Hist. Soc. 47:346. 1947.

Slender climbers; leaves ovate-oblong, acute, cordate at base up to 5 x 3 cm; flowers pink, few at the tips of long, axillary peduncles; pedicels short, sub-umbelled; capsules 2-celled, 4-2-seeded; seeds hairy.

Flowers: Oct. - Mar.

Sivarajan 874.

Note: Verdcourt (Kew Bull. 15:7. 1961) has shown that I. sepiaria Roxb. is not conspecific with I. maxima (Linn.f.) Sw. as has been considered by Ooststroom (loc.cit.).

I. fistulosa Mart. ex Choisy in DC. Prod. 9:349. 1845;  
Raizada in Ind. For. 92(5):313. 1966. Batatas  
crassicaulis Benth. Voy. Sulph. 134. 1845. I. crassi-  
caulis (Benth.) Robinson in Proc. Amer. Acad.  
51:530. 1916; Oost. in Blumea 3:569. 1940 & in Fl.  
Males. 4(4):485. 1953. Ipomoea carnea auct. non Jacq.

Shrubs, sometimes slightly twining; leaves  
ovate-lanceolate cordate at base, up to 15 x 9.5 cm;  
flowers pink to white, up to 8 cm long, in axillary,  
corymbose cymes; corolla densely tomentose outside.

In exposed situations the plant is shrubby  
and in shaded conditions it <sup>e</sup>twins<sub>k</sub> up. It is seen wild  
and also cultivated in gardens.

Flowers: throughout the year.

Sivarajan 857, 1136.

I. aquatica Forsk. Fl. Aeg.- Ar. 44. 1775; FBI. 4:210.  
1883; Oost. in Blumea 3:528. 1940 & in Fl. Males.  
4(4):473. 1953; Sant. in J. Bombay nat. Hist. Soc.  
47:346. 1947. Gamb. 643. I. reptans Poir. in Lamk.  
Encycl. Suppl. 3:460. 1814. (non Convolvulus reptans  
Linn. 1753) I. repens Roth, Nov. Pl. Sp. 110. 1821,  
(non Convolvulus repens Linn. 1753).



Creeping herbs rooting at nodes; leaves oblong-lanceolate, hastate at base; flowers large, pink in 1-3-flowered, axillary cymes.

In water-logged fields and marshes.

Flowers: July - Nov.

Sivarajan 91, 122, 1124.

I. repens Lamk. Ill. 1:467. n. 2134. 1793 & Encycl.

Meth. Bot. 6:18. 1804; Gamb. 643. Ipomoea beladamboe  
Roem. & Schult. Syst. Veg. 4:233. 1819; FBI. 4:209.  
1883.

Creeping herbs; leaves ovate-lanceolate, cordate at base, up to 6 cm across; flowers rose-purple in axillary, short, few-flowered cymes.

A pretty plant resembling I. pes-caprae, but for its entire leaves.

Flowers: Oct. - Dec.

Sivarajan 1572.

I. pes-caprae (Linn.) Sweet, Hort. Suburb. Londin. 35.

1818; Roth, Nov. Pl. Sp. 109. 1827; Oost. in Blumea 3:532. 1940 & in Fl. Males. 4(4):475. 1953; Sant.

in J. Bombay nat. Hist. Soc. 47:347. 1947; Gamb.  
644. Convolvulus pes-caprae Linn. Sp. Pl. 159.  
1753. Ipomoea biloba Forsk. Fl. Aeg.-Ar. 44. 1775;  
FBI. 4:212. 1883.

Creeping herbs; leaves apically 2-lobed,  
base cuneate, lobes rounded; flowers large, rose-purple,  
about 6-7 cm long; seeds villous.

Common along sandy coast and railway embank-  
ments.

Flowers: Aug. - Dec.

Sivarajan 480, 571.

Note: Ooststroom (ll.cc.) recognised two sub-  
species under I.pes-caprae, of which the cited specimen  
fits into the ssp.pes-caprae and can be distinguished  
from the ssp.braziliensis (Linn.) Oost. by its deeply  
2-lobed leaves with rounded lobes and cuneate or  
attenuate base and corolla of about 6 cm length.

I.nil (Linn.) Roth, Cat.Bot. 1:36. 1797; Oost. in  
Blumea 3:497. 1940 & in Fl. Males. 4(4):465. 1953;  
Sant. in J. Bombay nat. Hist. Soc. 47:348. 1947.  
Convolvulus nil Linn. Sp. Pl. (ed.2) 1:219. 1752.  
Ipomoea hederacea suet. Plur., non Jacq.; FBI.  
4:199. 1883; Gamb. 644.

Hispid climbers; leaves ovate-cordate, shallowly 3-lobed, lobes acuminate; flowers in axillary few-flowered cymes; calyx lobes linear, hirsute; corolla 5-7 cm long, deep purple on the limb, greenish below; capsules subglobose; seeds glabrous.

Flowers: Mar. - June

Sivarajan 416.

I. cairica (Linn.) Sweet, Hort. Brit. 287. 1827; Oost. in Blumea 3:542. 1940 & in Fl. Males. 4(4):478. 1953; Sant. in J. Bombay nat. Hist. Soc. 47:348. 1947; Gamb. 645. Convolvulus cairicus Linn. Syst. (ed.10) 922. 1759. Ipomoea palmata Forsk. Fl. Aeg.-Ar. 43. 1775; FBI. 4:214. 1883.

Slender climbers; leaves deeply 5-lobed, lobes elliptic-mucronate, glabrous; flowers rose-purple, up to 5 cm long; peduncles 1-3-flowered; capsules glabrous, usually 4-seeded.

Flowers: throughout the year.

Sivarajan 1380.

FBI. 4:202. 1883; Oost. in Blumea 3:558. 1940 & in  
Fl. Males. 4:483, t. 55. 1953.

Climbers with large, tuberous roots; leaves  
5-7 lobed, 12-15 cm across; flowers rose-purple in  
long-pedunculate, axillary cymes; capsules ovoid,  
4-celled, 4-seeded; seeds woolly.

This pretty plant with its large tuberous  
roots are used ~~in~~ medicine, and are commonly seen on  
hedges and bushes.

Flowers: July - Dec.

Sivarajan 478.

Note: This plant goes under the name I. digitata  
Linn. in the Indian Floras. The name I. digitata Linn.,  
actually applies to a rare endemic Haitian species, the  
correct name of the Indian specimen being I. mauritiana  
Jacq. (Verdcourt. loc. cit.)

I. batatas (Linn.) Lamk. Encycl. Meth. Bot. 1:465. 1791;

FBI. 4:202. 1883; Oost. in Blumea 3:512. 1940; Sant.  
in J. Bombay nat. Hist. Soc. 47:348. 1947.

Convolvulus batatus Linn. Sp. Pl. 154. 1753.

Creeping herbs with tuberous roots; lamina deeply 5-7 lobed, lobes narrowly oblong, acute; flowers rose-purple in axillary cymes; sepals acuminate.

Flowers: May - June

Sivarajan 1221.

I. obscura (Linn.) Ker-Gawl. in Bot. Reg. 3, t. 239.

1817; FBI. 4:207. 1883; Oost. in Blumea 3:519. 1940 & in Fl. Males. 4(4):471. 1953; Sant. in J. Bombay nat. Hist. Soc. 47:347. 1947; Gamb. 643. Convolvulus obscurus Linn. Sp. Pl. (ed.2) 220. 1762.

Slender climbers, hairy or glabrous; leaves ovate-cordate, acuminate at tip, basally 7-9 nerved; flowers creamy yellow, on 1-2 flowered, slender, axillary peduncles.

Flowers: May - Sept.

Sivarajan 493, 1127, 1424.

I. macrantha Roem. & Schult. Syst. 4:251. 1819; Gunn. in Brittonia 24:158-161. 1972. I. longiflora R. Br. Prod. 1:484. 1810, non Willd. 1809. I. tuba (Schlech.) G. Don, Gen. Syst. 4:271. 1838; Oost. in Blumea 3:575. 1940 & in Fl. Males. 4(4):487. 1953.

Glabrous, climbing shrubs; leaves simple, broadly ovate-acuminate, deeply cordate at base, up to 15 x 7.5 cm; flowers greenish-white, large, 1-3 on long, axillary peduncles; capsules about 2 cm across; seeds 4, covered with pale hairs; hairs on the margins much longer.

A rare species, collected from the salt marshes on Kadalundi river bank.

Flowers: Sept. - Mar.

Sivarajan 1554.

I. pes-tigridis Linn. Sp. Pl. 162. 1753; FBI. 4:204.

1883; Oost. in Blumea 3:504. 1940 & in Fl. Males. 4(4):467. 1953; Sant. in J. Bombay nat. Hist. Soc. 47:348. 1947; Gamb. 644. Convolvulus pes-tigridis (Linn.) Spreng. Syst. 1:502. 1824.

Densely hispid climbers; leaves digitately 5-7 lobed, lobes ovate or broadly elliptic; flowers small, white, in long-pedunculate, bracteate heads; bracts and sepals bristly at base; capsules ovoid; seeds hairy.

Flowers: Sept. - Nov.

Sivarajan 640.

I. quamoclit Linn. Sp. Pl. 159. 1753; FBI. 4:199. 1883;  
Oost. in Blumea 3:555. 1940 & in Fl. Males. 4(4):482.  
1953; Sant. in J. Bombay nat. Hist. Soc. 47:349. 1947.  
Quamoclit vulgaris Choisy in Mem. Soc. Phys. Geneve  
6:434. 1833. Q. pinnata Boj. Hort. Maurit. 224. 1837;  
Gamb. 645.

Slender, glabrous climbers; leaves deeply  
pinnatifid, lobes linear; flowers red in axillary long-  
peduncled 1-3 flowered cymes; capsules 4-celled, 4 seeded,  
seeds glabrous.

Flowers: May - Sept.

Sivarajan 1372.

I. hederifolia Linn. Syst. Nat. (ed.10) 925. 1759; Verd-  
court in Fl. Trop. E. Afr. 132. 1963. I. angulata Lamk.  
Encycl. Meth. Bot. 1:464. 1791; Oost. in Blumea 3:553.  
1940 & in Fl. Males. 4:481, t. 54. 1953; Sant. in J.  
Bombay nat. Hist. Soc. 47:349. 1947. Quamoclit  
hederifolia (Linn.) G. Don, Gen. Syst. 4:259. 1837.  
Quamoclit phoenicea Choisy in Mem. Soc. Phys. Geneve  
6:433. 1883; Gamb. 645.

Climbers; leaves ovate-cordate, 3-5 angled or  
shallowly lobed; flowers red in long-pedunculate,

forked, axillary cymes; corolla tube 3.5 cm long, slender; capsules ovoid; seeds 4, pubescent.

Flowers: Nov. - Jan.

Sivarajan 853.

Aniseia Choisy

A. martinicensis (Jacq.) Choisy in Mem. Soc. Phys.

Geneve 8:66. 1838; Oost. in Blumea 3:279. 1939 & in Fl. Males. 4(4):435. 1953; Sant. in J. Bombay nat. Hist. Soc. 47:341. 1947. Convolvulus martinicensis Jacq. Sel. Stirp. Amer. 26, t. 17. 1763.

Aniseia uniflora Choisy in Mem. Soc. Phys. Geneve 6:483, t. 2. f. 9. 1833; Gamb. 649.

Glabrous climbers; leaves simple, oblong or elliptic, obtuse, up to 7.2 x 2 cm; flowers white, solitary in the axils; sepals very unequal, outer 2 much larger than the inner, ovate, acute; capsules 2-celled; seeds 4.

Flowers: Sept. - Oct.

Sivarajan 683.



Merremia Endl. (nom.cons.)

Key to the species

1. Flowers purple at base ..... tridentata
1. Flowers without a purple base:
  2. Flowers bright yellow:
    3. Leaves simple:
      4. Leaves orbicular-reniform ..... gangetica
      4. Leaves ovate-acuminate ..... hederacea
    3. Leaves digitately lobed ..... vitifolia
  2. Flowers white or pinkish ..... umbellata

M.tridentata (Linn.) Hall. f. in Engl. Bot. Jahrb.

16:552. 1893; Prain in J. As. Soc. Beng. 74:304.

1906; Oost. in Blumea 3:315. 1939 & Fl. Males.

4(4):445. 1953. Convolvulus tridentatus Linn. Sp.

Pl. 157. 1753. Ipomoea tridentata (Linn.) Roth in

Roem. Arch. Bot. 1:38. 1798; FBI. 4:205. 1883.

Key to the subspecies

1. Leaves oblanceolate, obtuse ..... ssp.tridentata
1. Leaves lanceolate, acute ..... ssp.hastata

M. tridentata (Linn.) Hall. f., ssp. tridentata:

Slender, twining or trailing plants; leaves oblanceolate-obtuse, dentate at base; flowers pale yellow on axillary, 1-3 flowered, slender peduncles; capsules 2-celled; seeds glabrous.

Flowers: Sept. - Mar.

Sivarajan 893.

M. tridentata (Linn.) Hall. f., ssp. hastata (Desr.)

Oost. in Blumea 3:317, f. 2. 1939 & in Fl. Males. 4(4):445, f. 27a. 1953. Convolvulus hastatus Desr. in Lamk. Encycl. Meth. Bot. 3:542. 1789. (non Forsk. 1775). Merremia hastata (Desr.) Hall. f. in Engl. Bot. Jahrb. 16:552. 1893; Gamb. 652. I. angustifolia sensu Clarke in Hook. f. Fl. Brit. Ind. 4:205. 1883, in part.

Slender twiners; leaves lanceolate, acute, hastate at base; flowers creamy-yellow in axillary, 1-3 flowered cymes; capsules ovoid, 2-celled; seeds glabrous.

Flowers: Sept. - Mar.

Sivarajan 722.

M. gangetica (Linn.) ~~C~~<sup>u</sup>odont. Bull. Jard. Bot. Etab.  
Brux. Suppl. 31:743. 1961; Mahes. in Bull. Bot. Sur.  
Ind. 5:133. 1963. Evolvulus gangeticus Linn. Sp. Pl.  
2:391. 1762. E. emarginatus Burm. f. Fl. Ind. 77, t.  
30, f. 1. 1768. Ipomoea reniformis Choisy in Mem.  
Soc. Phys. Geneve 6:446. 1883; FBI. 4:206. 1883.  
Merremia emarginata (Burm.f.) Hall. f. in Engl. Bot.  
Jahrb. 16:552. 1893; Oost. in Blumea 3:312. 1939;  
Gamb. 652.

Glabrous climbers; leaves ovate-cordate up to  
4 x 3 cm; flowers small, bright yellow in axillary,  
3-7-flowered cymes; sepals cucullate; capsules 2-celled;  
seeds puberulous.

Flowers: Dec. - Jan.

Sivarajan 772

M. hederacea (Burm.f.) Hall. f. in Engl. Bot. Jahrb.  
18:118. 1894; FBI. 4:206. 1883; Oost. in Blumea  
3:302. 1939 & in Fl. Males. 4(4):441. 1953; Sant.  
in J. Bombay nat. Hist. Soc. 47:345. 1947.  
Evolvulus hederaceus Burm. f. Fl. Ind. 77, t. 30,  
f. 2. 1768. Merremia chryseides Hall. f. in Engl.  
Bot. Jahrb. 16:552. 1893; Gamb. 652.

Glabrous climbers; leaves ovate-cordate up to 4 x 3 cm; flowers small, bright yellow in axillary 3-7-flowered cymes; sepals cucullate; capsules 2-celled; seeds puberulous.

Flowers: Dec. - Jan.

Sivarajan 845.

M. vitifolia (Burm.f.) Hall. f. in Engl. Bot. Jahrb.

16:552. 1893; Oost. in Blumea 3:329. 1939 & Fl.

Males. 4(4):448. 1953; Sant. in J. Bombay nat. Hist.

Soc. 47:345. 1947; Gamb. 651. Convolvulus vitifolius

Burm. f. Fl. Ind. 45, t. 18, 1. 1768. Ipomoea

vitifolia Sweet, Hort. Brit. ed. 1. 289. 1827.

Extensive climbers; leaves shallowly 5-7-lobed, about 15 cm across, lobes dentate; flowers in long-peduncled, axillary, 2-3 flowered cymes; calyx hispid outside; corolla yellow; capsules globose, large; seeds glabrous.

Flowers: Mar.- May

Sivarajan 894.

M. umbellata (Linn.) Hall. f. in Engl. Bot. Jahrb. 16:552.

1893; Oost. in Blumea 3:33. 1939 & Fl. Males. 4(4):449.

1953; Gamb. 651. Convolvulus umbellatus Linn. Sp. Pl.

155. 1753. Ipomoea cymosa (Desr.) Roem. & Schult.  
Syst. 4:241. 1819; FBI. 4:211. 1883.

Slender climbers; leaves elliptic or oblong-acute, up to 7 x 3 cm; flowers in axillary, pedunculate cymes, white or pale pink; capsules subglobose; seeds patently hairy.

Flowers: Jan. - Mar.

Sivarajan 27, 938.

Note: This species display considerable variation in its hairiness. The author's collections include completely glabrous plants and also those which are densely hairy on stems and leaves.

Porana Bubm. f.

P. volubilis Burm. f. Fl. Ind. 51, t. 21, f. 1. 1768;  
FBI. 4:222. 1883; Oost. in Blumea 3:87. 1938 & in  
Fl. Males. 4(4):402. 1953; Gamb. 647.

Straggling shrubs; leaves ovate-cordate, acuminate at apex, about 4.8 x 3.2 cm in size, glabrous; flowers white in axillary panicles; capsules globose; seed one.

Flowers: Dec. - Jan.

Sivarajan 35.

PLATE 15

Bonamia semidigyna (Roxb.) Hall. f.

Fig.1. A flowering branch. Fig.2. Calyx

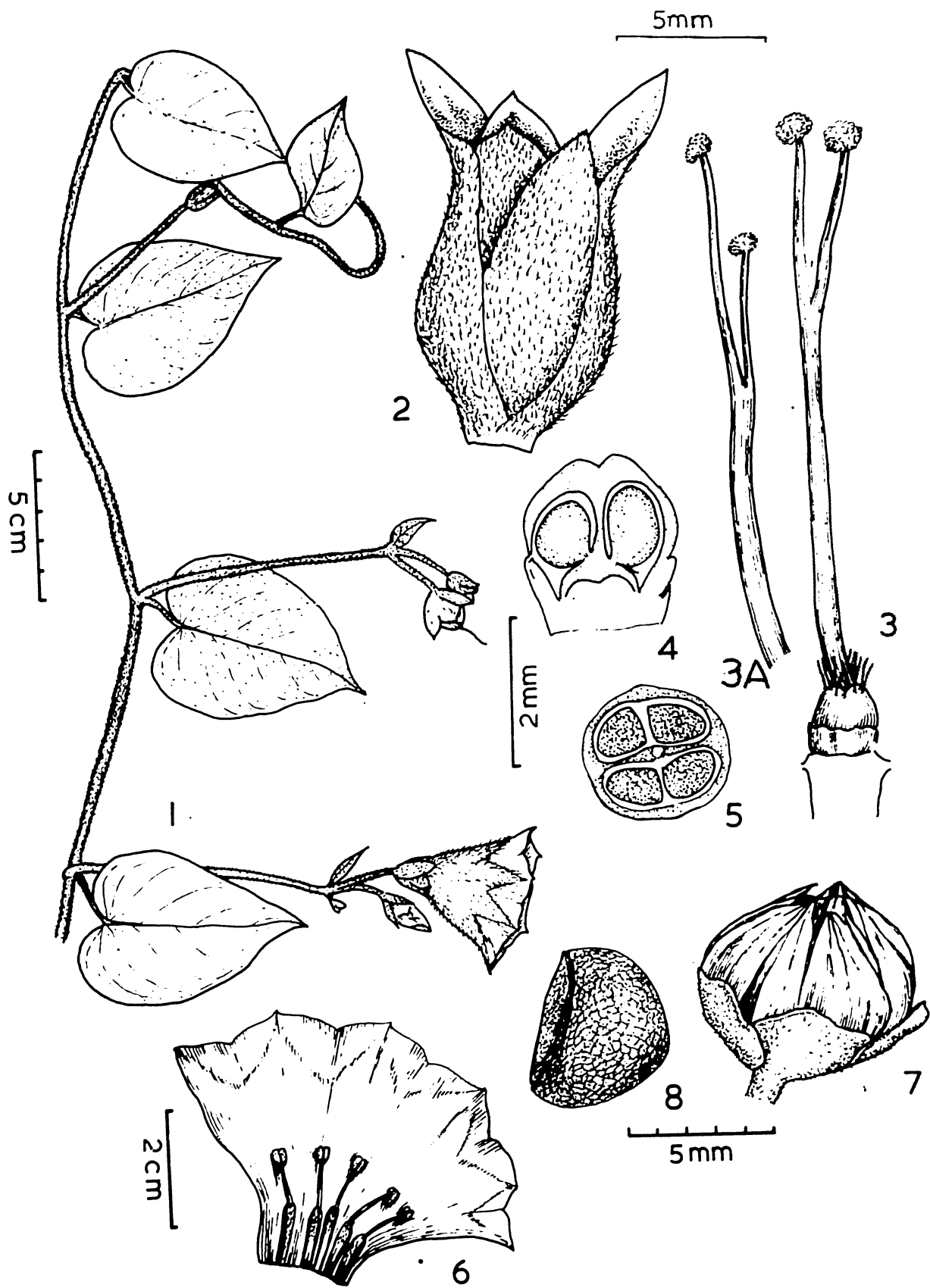
Fig.3. Pistil. Fig.3A. A style with

unequal arms. Fig.4. L.S. of ovary.

Fig.5. T.S. of ovary. Fig.6. Corolla

split open, displaying stamens.

Fig.7. Capsule. Fig.8. Seed.



BONAMIA SEMIDIGYNA (ROXB) HALL. F.

Bonamia Thou. (nom.cons.)

B.semidi-gyna (Roxb.) Hall. f. in Engl. Bot. Jahrb.

16:528. 1893; Oost. in Blumea 3:76. 1938 & in Fl.

Males. 4(4):398. 1953. Convolvulus semidi-gynus Roxb.

[Hort. Beng. 13. 1814, nom. nud.] Fl. Ind. 2:47.

1824. Breweria cordata Blume Bijdr. 722. 1825; FBI.

4:223. 1883; Gamb. 648. B.semidi-gyna (Roxb.) Kuntze,

Rev. Gen. Pl. 440. 1891.

Densely soft, rusty-tomentose climbers; leaves ovate-cordate, acuminate at apex, up to 8 x 6.2 cm; flowers white in few-flowered, axillary, long-peduncled cymes; calyx tomentose; corolla white, rusty villous on the plaits outside; styles connate below, equally or unequally divided above; stigma capitate; capsules ovoid; seeds 4, black, glabrous. (Plate 15).

Flowers: Sept. - Oct.

Sivarajan 799, 854.

Note: Ooststroom (loc.cit. 1938) distinguished 2 varieties under this species, of which the cited specimen belongs to var.semidi-gyna. The other variety - var.farinacea- can be distinguished by its narrower leaves, and distinctly nerved sepals.



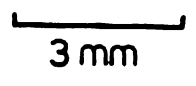
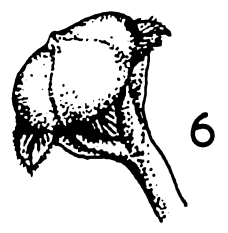
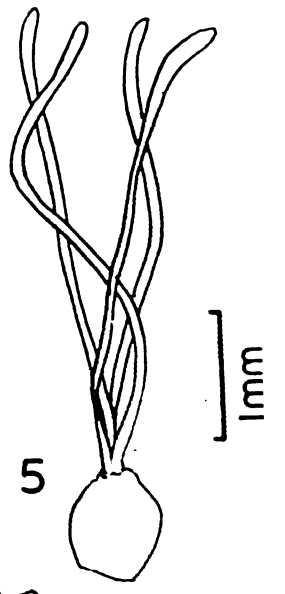
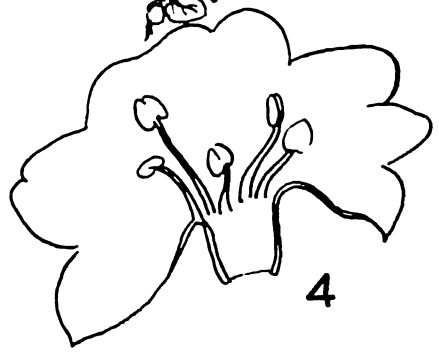
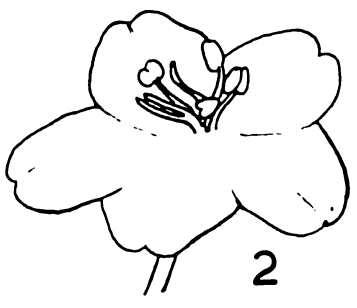
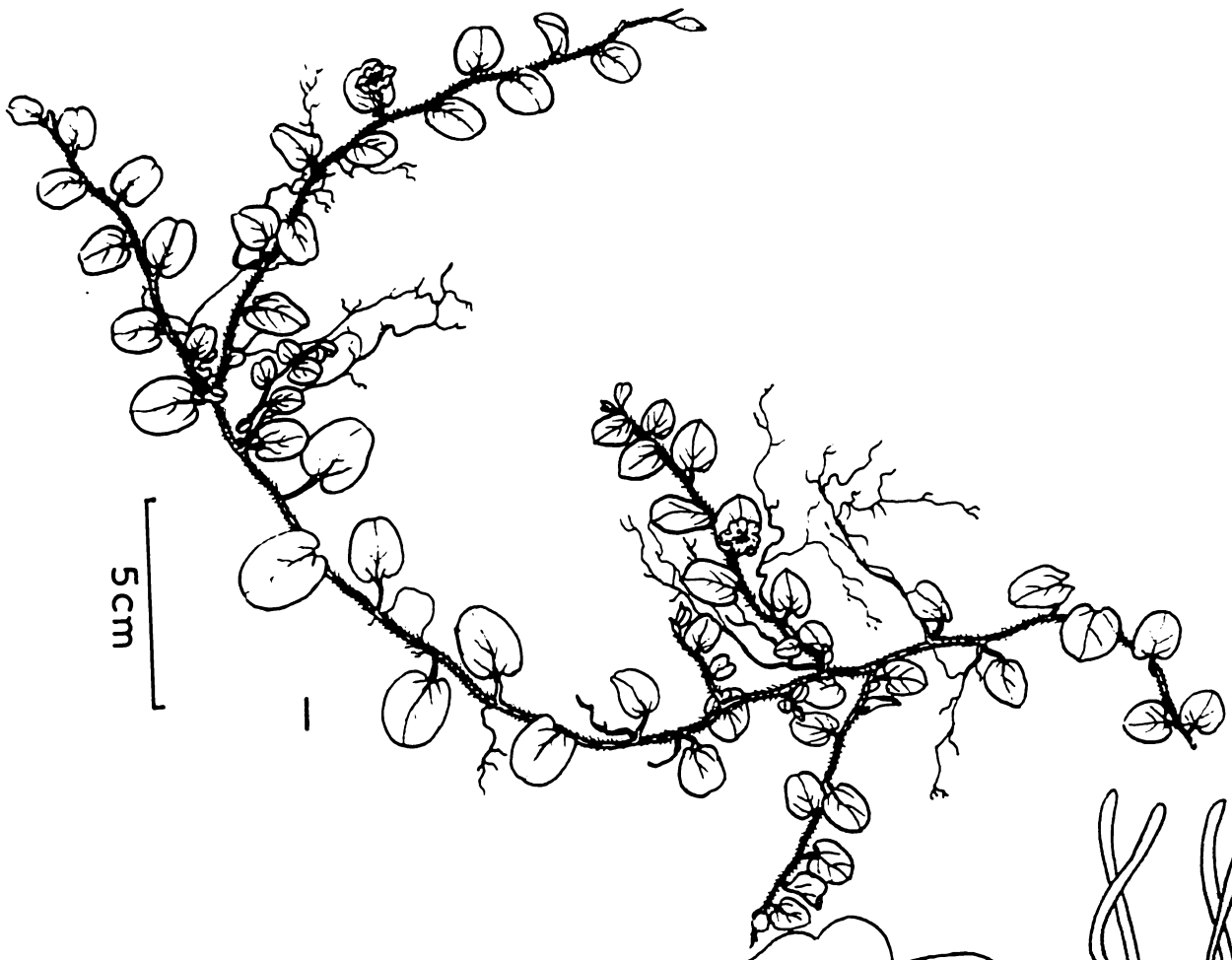
PLATE 16

Evolvulus nummularius (Linn.) Linn.

Fig.1. Creeping branch. Figs.2-3. Flowers.

Fig.4. Corolla split open. Fig.5. Pistil.

Fig.6. Capsule.



EVOLVULUS NUMMULARIUS (LINN.) LINN.

Evolvulus Linn.

Key to the species

1. Flowers white ..... nummularius  
1. Flowers purple ..... alsinoides

E.nummularius (Linn.) Linn. Sp. Pl. (ed.2) 391. 1762;  
Oost. in Medd. Bot. Mus. Utrecht 14:114. 1934;  
Sivarajan & Manilal in Bull. Bot. Surv. Ind. 12:279.  
1970 (1972); Stearn in Taxon 21:649. 1972. Convolvulus  
nummularius Linn. Sp. Pl. 157. 1753. Volvulopsis  
nummularia (Linn.) Roberty in Candollea 14:28. 1952.

Much branched, prostrate herbs; leaves rounded  
or orbicular, 1-2.5 cm across; flowers white, axillary;  
peduncles shorter than the leaves; corolla white,  
glabrous; styles 2, each again forked. (Plate 16).

Flowers: May - Nov.

Sivarajan 202, 243.

E.alsinoides (Linn.) Linn. Sp. Pl. (ed.2) 392. 1762;  
Oost. in Medd. Bot. Mus. Utrecht 14:26. 1934 & Blumea  
3:74. 1938 & Fl. Males. 4(4):395. 1953; Stearn in  
Taxon 21:649. 1972. Convolvulus alsinoides Linn. Sp.  
Pl. 157. 1753.

Diffuse, densely hispid herbs; leaves elliptic-acute, hairy on both surfaces; flowers in axillary cymes; peduncles much longer than the leaves; corolla violet; styles 2, each again forking.

Flowers: May - Dec.

Sivarajan 203, 1248.

SOLANACEAE Juss.

Key to the genera

1. Fruits spinous ..... Datura
1. Fruits not spinous:
  2. Berries enclosed in the inflated calyx..Physalis
  2. Berries not enclosed in calyx:
    3. Fruits globose or dipressed globose:
      4. Leaves simple or lobed ..... Solanum
      4. Leaves pinnate ..... Lycopersicon
    3. Fruits elongate, tapering ..... Capsicum

Datura Linn.

D.metel Linn. Sp. Pl. 179. 1753; Roxb. Fl. Ind. 1:561. 1832; Sant. in J. Bombay nat. Hist. Soc. 47:657. 1947 & Fl. Khand. 174. 1967. D.fastuosa Linn. Syst. Nat. (ed.10) 2:932. 1759; FBI. 4:242. 1883; Gamb. 660.

Low, branched shrubs; leaves broadly ovate-acuminate, entire or pinnately lobed, base very unequal; flowers large, white on short peduncles; calyx about 6-9 cm long, lobes short; corolla large, funnel-shaped, lobes caudate-acuminate; stamens inserted near the base of the corolla tube; fruits globose, covered with short spines; dehiscence irregular; seeds compressed, smooth.

Flowers: Sept. - Dec.

Sivarajan 1474.

Physalis Linn.

P. minima Linn. Sp. Pl. 183. 1753; FBI. 4:238. 1883;  
Sant. 174. 1967; Gamb. 659.

Fleshy annuals; leaves ovate to ovate-lanceolate, entire or dentate; flowers greenish yellow; pedicels short, nodding; calyx campanulate, lobes short, accrescent in fruits; corolla with a purple base, campanulate, lobes short; stamens inserted at the base of the corolla; berries fleshy, globose, enclosed in the prominently veined calyx; seeds many, minute, discoid.

Flowers: Aug. - Dec.

Sivarajan 639.

Solanum Linn.

Key to the species

- 1. Plants unarmed ..... nigrum
- 1. Plants armed:
  - 2. Flowers white ..... torvum
  - 2. Flowers purple:
    - 3. Berries subglobose:
      - 4. Leaves glabrous ..... surattense
      - 4. Leaves stellate-tomentose ..... indicum
    - 3. Berries oblong-ovoid ..... melongena

S.nigrum Linn.Sp. Pl. 186. 1753; FBI. 4:229. 1883;

Sant. 172. 1967; Gamb. 657.

Branched, glabrous herbs; leaves ovate to lanceolate; flowers small, white in lateral cymes; calyx lobes obtuse; corolla lobes longer than the tube, subacute; staminal filaments flat, hairy at the base; berries globose, 4-6 mm across, purple when mature.

. Flowers: Aug. - Nov.

Sivarajan 439.

S.torvum Sw. Prod. Descr. Veg. Ind. Occ. 47. 1788; FBI.

4:234. 1883; Sant. in J. Bombay nat. Hist. Soc. 47:654.  
1948; Gamb. 658.

Stellate-tomentose shrubs with scattered prickles on the stem and petiole; leaves ovate-oblong, sinuate or lobed, stellate-tomentose; flowers white in pubescent, lateral cymes; berries subglobose or obovoid, 1-1.2 cm across, red when mature.

Flowers: Mar. - Sept.

Sivarajan 1005.

S.surattense Burm. f. Fl. Ind. 57. 1768 (excl. Syn.

pluk. et. Raj.); Sant. 173. 1967. S.xanthocarpum  
Schrad. & Wendl. Sert. 1:8, t. 2. 1795; FBI. 4:236.  
1883; Gamb. 658.

Diffuse, prickly herbs; leaves pinnately 7-11 lobed, unequal sided at base, prickly on the midribs; flowers purple; berries 1.5 cm across.

Flowers: Aug. - Nov.

Sivarajan 1188.

S.indicum Linn. Sp. Pl. 187. 1753; FBI. 4:234. 1883;

Sant. in J. Bombay nat. Hist. Soc. 47:653. 1948 &  
Fl. Khand. 173. 1967; Gamb. 658.

Prickly undershrubs, minutely stellate-tomentose;  
leaves sinuately toothed; flowers purple in lateral cymes;  
berries white-striped when young and yellow when ripe,  
1.5 cm across.

Flowers: Sept. - Oct.

Sivarajan 524.

S.melongena Linn. Sp. Pl. 185. 1753; FBI. 4:229. 1883;

Sant. 173. 1967.

Armed shrubs; leaves ovate, sinuately toothed,  
unequal sided at base; flowers blue; fruits variable in  
size, purple or greenish.

Many cultivars of this species are used as  
vegetable.

Flowers: Aug.- Dec.

Sivarajan 1885



Lycopersicon Mill.

L. lycopersicum (Linn.) Karsten. Dentsch. Fl. 966.

1880-85; Sant. & Janardh. in Bull. Bot. Sur. Ind.  
8 (Suppl.1):35. 1967; Raizada in Ind. For. 94:445.  
1968; Shah in J. Bombay nat. Hist. Soc. 69:446.  
1972. Solanum lycopersicum Linn. Sp. Pl. 185. 1753.  
Lycopersicon esculentum Mill. Gard. Dict. (ed.8)  
n. 2, 1768; Sant. 175. 1967; Gamb. 661.

Fleshy, branched annuals; leaves pinnate;  
leaflets pinnatisect; flowers yellow in lateral cymes;  
fruits large dipressed globose.

Flowers: Aug. - Nov.

Sivarajan 619.

Capsicum Linn.

1. Fruits 5-7 cm long ..... annum  
1. Fruits 2-3 cm long ..... frutescens

C. annum Linn. Sp. Pl. 188. 1753., var. acuminata Fingerh.

in Mon. Gen. Caps. 13, t. 2, f. c. 1832; Sant. 175.

1967; Gamb. 661. C.frutescens Roxb. Fl. Ind.  
1:574. 1832; FBI. 4:239. 1883, (non Linn.).

Shrubby annuals; leaves sometimes fascicled in  
the axils, ovate-lanceolate; flowers white, fruits  
red-orange, pendulous, very often curved.

Flowers: Sept. - Dec.

Sivarajan 1513.

C.frutescens Linn. Hort. Cliff. 60. 1737 & Sp. Pl.  
159. 1753; Fingerh. in Mon. Gen. Caps. 17, t.  
4, f. c. 1832. C.minimum Mill. Gard. Dict. (ed.6)  
n. 10. 1752.

Shrubby perenniels; leaves ovate-lanceolate;  
flowers white; fruits green or white, erect, not  
curved.

Flowers: throughout the year.

Sivarajan 1462.

SCROPHULARIACEAE Juss.

Key to the genera

1. Perfect stamens 2:
  2. Prostrate herbs ..... Microcarpaea
  2. Erect herbs ..... Dopatrium
1. Perfect stamens 4 (except in a few species of Lindernia)
  3. Anthers with one locule imperfect:
    4. Flowers capitate ..... Adenosma
    4. Flowers solitary in the axils:
      5. Calyx 5-lobed ..... Sopubia
      5. Calyx spathaceous ..... Centranthera
  3. Anthers with both the locules perfect:
    6. Anthers meeting in pairs:
      7. Calyx winged or keeled ..... Torenia
      7. Calyx neither winged <sup>r</sup> or keeled ..... Lindernia
    6. Anthers not meeting in pairs:
      8. Capsules heart-shaped ..... Rhamphicarpa
      8. Capsules not heart-shaped:
        9. Corolla tube cylindrical:
          10. Corolla tube bent near the top.. Striga
          10. Corolla tube straight.. Ruellia

9. Corolla tube not cylindric:

11. Flowers regular ..... Scoparia

11. Flowers irregular:

12. Stamens inserted at the base

of the tube ..... Angelonia

12. Stamens inserted at the

middle of the tube :

13. Calyx lobes very unequal... Bacopa

13. Calyx lobes almost equal... Limnophila

Microcarpaea R. Br.

M.muscosa R. Br. Prod. 436. 1810; Benth. in DC. Prod.

10:433. 1846; FBI. 4:286. 1884; Sant. in J. Bombay

nat. Hist. Soc. 46:381. 1946 & 49:48. 1952; Gamb.677.

Small, prostrate herbs, rooting at nodes;  
leaves small, subsessile, 4-6 mm long, elliptic-acute;  
flowers minute, sessile, solitary in the axils; stamens  
only 2; anthers 1-loculed; capsules enclosed in the  
enlarged calyx.

Common in moist fields, very often so thickly  
growing that it forms a "carpet".

Flowers: June - Dec.

Sivarajan 1491.

Dopatrium Buch.-Ham. ex Benth.

Key to the species

1. Fruiting pedicels 5-7 mm long ..... lobelioides  
1. Fruiting pedicels 0 ..... junceum

D.lobelioides Benth. Scroph. Ind. 31. 1835; FBI. 4:274.  
1884; Gamb. 670.

Erect herbs, 20-25 cm tall; stem fleshy, rarely branched; lower leaves obovate-oblong or spatulate, 2-3 x 1-1.2 cm, the upper ones much smaller; flowers small, blue; capsules globose, fruiting pedicels filiform, 1.5-2 cm long.

Usually seen as a weed in water-logged fields and in shallow ponds.

Flowers: Aug. - Dec.

Sivarajan 587.

D.junceum (Roxb.) Buch.-Ham. ex Benth. Scroph. Ind.  
31. 1835; FBI. 4:274. 1884; Sant. 159. 1960; Gamb.  
670. Gratiola juncea Roxb. Pl. Corom. 2:16, t. 129.  
1798.

Erect herbs; stem fleshy, usually branched; basal leaves obovate-oblong or elliptic, 2-2.5 x 1 cm,

the upper much smaller and distant; flowers small, solitary in the axils; corolla blue; capsules globose, sessile.

In shallow ponds and in marshes on the hills.  
Collected from the University campus.

Flowers: Aug. - Dec.

Sivarajan 408.

Adenosma R. Br.

A. bilabiatum (Roxb.) Merr. En. Philip. Pl. 3:434. 1923;  
Back. & Bakh. f. Fl. Java 2:507. 1965. Erinus  
bilabiatum Roxb. [Hort. Beng. 47. 1814, nom. nud.]  
Fl. Ind. (ed. Carey) 3:92. 1832. Adenosma capitatum  
Benth. Gen. Pl. 2:949. 1876; FBI. 4:264. 1885;  
Gamb. 666.

Erect, woody annuals; leaves opposite or whorled, ovate-oblong, crenate, hairy on both surfaces; flowers blue in dense, terminal heads; calyx lobes lanceolate, one of them being larger, ciliate; capsules ovoid; seeds scabrous.

A common weed on the grassy slopes and in upland cultivations.

Flowers: Aug. - Oct.

Sivarajan 707.

Sopubia Buch.-Ham.

S.delphinifolia (Roxb.) G. Don, Gen. Syst. 4:560. 1837;

FBI. 4:302. 1884; Sant. 164. 1960; Gamb. 682.

Gerardia delphinifolia Roxb. Pl. Corom. 1:7. t. 90.

1795.

Erect annuals; leaves pinnatisect, lobes filiform; flowers axillary, solitary, white with purplish blotches; calyx 5-lobed, lobes longer than the tube; corolla pubescent outside; stamens 4, didynamous, anthers meeting in pairs, one of the anther cells imperfect; capsules oblong, about 6 mm long; seeds striate.

A monsoon herb on the grassy slopes. An abnormal specimen collected from the University campus showed fasciated stem.

Flowers: Sept. - Dec.

Sivarajan 499, 531, 676.

Centranthera R. Br.

- 1. Flowers white ..... indica
- 1. Flowers purple:
  - 2. Plants densely hispid ..... nepalensis
  - 2. Plants glabrescent or glabrous ..... tranquebarica

C.indica (Linn.) Gamb. Fl. Madr. 971. 1924. Rhinanthus  
indica Linn. Sp. Pl. 603. 1753. C.procumbens Benth.  
in DC. Prod. 10:525. 1846; FBI. 4:301. 1884.

Diffuse, densely hispid herbs; roots bright yellow; leaves oblong-obtuse, up to 3 cm long; with tubercular based hairs on both surfaces; flowers white, funnel-shaped; calyx spathaceous, ribbed, hairy; stamens 4, anthers meeting in pairs, one cell often imperfect, filaments hairy; capsules about 8 mm long.

A rare species in wet, sandy fields, collected from Nallalam and Kadalundi.

Flowers: Sept. - Nov.

Sivarajan 649, 650, 743, 747.

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The author is thankful to Prof. HuiLin Li, Morris Arboretum, University of Pennsylvania, for the generous helps rendered in confirming the identifications of the Centranthera specimens and for his critical comments on them.



Note: Hooker (Fl. Brit. Ind. 4:301. 1884) has expressed doubt over the specific status of this plant and has remarked that it might be "possibly a variety of C.hispida. Santapau (Fl. Khand. (ed.3.) 184. 1967) has treated C.indica, as conspecific with C.hispida R.Br. and C.nepalensis Don. But it is now accepted that C.hispida is restricted to Australia and New Guinea. Regarding the other two species Prof. Hui Lin Li (in a personal communication to the author) states that "C.indica and C.nepalensis are separable as two distinct taxa - either as species or varieties-". The author feels that Gamble's (loc.cit.) treatment is on amply justifiable grounds, since the two specimens are so strikingly distinct in their growth form, flower colour, capsules, seed size and in their characteristic habitats.

C.nepalensis D. Don, Prod. Fl. Nep. 88. 1825; Pennell, Scroph. W. Himal. 93. 1943; Sant. in J. Bombay nat. Hist. Soc. 49:46. 1950; Hui Lin Li in Bot. Bull. Acad. Sinica 2:75. 1961. C.cochinchinensis var. nepalensis (D. Don) Merr. in 150th An. Vol. Roy. Bot. Gard. Calc. 56. 1942. C.hispida sensu Hook. f. Fl. Brit. Ind. 4:301. 1884; Gamb. 683; non R. Br.

Erect, densely hispid herbs; leaves oblong-obtuse with tubercular based hairs on both surfaces;

flowers rose-purple, funnel shaped; calyx 5-6 mm long; lower pair of staminal filaments hairy, anther cells as in C.indica; capsules 5 mm long.

On grassy slopes in rocky areas. Usually this plant is unbranched. Sometimes 2 opposite branches develop from the axils of some upper pair of leaves with very long internodes.

Flowers: Aug. - Oct.

Sivarajan 341, 534, 651.

Note: This plant is listed under the name C.hispida in many Indian Floras. C.hispida, C.nepalensis and C.cochinchinensis are very often considered conspecific. But Hui Lin Li (loc.cit.) has maintained the three as different species. C.hispida is limited in its range to Northern Australia and New Guinea. C.nepalensis is confined to the Himalayas and Western China to as far east as Western Hupeh. C.cochinchinensis has a more eastern range. C.nepalensis differs from the other two species, in having purple flowers, smaller corolla (1.5 cm) and spirally ridged seeds.

C. tranquebarica (Spreng.) Merr. in 150th Ann. Vol.

Roy. Bot. Gard. Calc. 55. 1942; Hui Lin Li in Bot.

Bull. Acad. Sinica 2:77. 1961. Razumovia tranquebarica

Spreng. Fl. Hal. Mant. 45. 1807 & Syst. 2:812. 1825.

C. humifusa Wall. [Cat. 3883. 1830, nom. nud.] ex

Benth. Scroph. Ind. 50. 1835 & in DC. Prod. 10:535.

1846; FBI. 4:301. 1884; Gamb. 972.

Erect or diffuse, branched herbs; leaves linear-oblong with sparse tubercular based hairs, up to 2 x 0.5 cm; flowers purple; calyx 4-5 mm long; corolla tubular, 8-10 mm long; filaments glabrous; capsules 4 mm long.

An annual in wet sandy fields, during the rainy season.

Flowers: Sept. - Nov.

Sivarajan 473, 506, 748.

Torenia Linn.

Note: The delimitation of Torenia and Lindernia has been a difficult task. Pennell (J. Arn. Arb. 24:254. 1943) distinguished the two genera as follows. "In Lindernia the sepals whether distinct or joined, do not invest the capsule, but have their tips some what spreading, whereas in Torenia the sepals invest the capsules, being curved above it with their connivent tips projecting above it". Keeled or winged calyx in Torenia has been another feature as contrasted with the wingless or not keeled calyx of Lindernia. In this treatment, the author has followed Pennell's generic concept.

Key to the species

- 1. Calyx broadly winged ..... fournieri
- 1. Calyx keeled or narrowly winged:
  - 2. Capsules 1 cm long ..... bicolor
  - 2. Capsules 0.5 cm long ..... lindernioides

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The author is thankful to Rev. Fr. (Dr.) Cecil J. Saldanha, St. Joseph's College, Bangalore for his critical comments and determinations of the Torenia and Lindernia specimens.

T.fournieri Linden ex Fourn. Ill. Hort. 13:129, t. 249.

1876; Bailey 897; Saldanha in Bull. Bot. Sur. Ind.  
8:126. 1966; Gamb. 672.

Diffuse herbs; leaves ovate-lanceolate, serrate, up to 4 x 2 cm; flowers deep purple with a yellow throat, solitary in the upper axils or in terminal few-flowered racemes; calyx ovoid; stamens 4, didynamous, anthers meeting in pairs, longer pair of filaments appendaged.

Seen cultivated as an ornamental.

Flowers: Aug. - Dec.

Sivarajan 1131.

T.bicolor Dalz. in Hook. Kew J. Bot. 3:38. 1851; FBI.

4:278. 1884; Sant. in J. Bombay nat. Hist. Soc. 49:36.  
1950; Saldanha in Bull. Bot. Sur. Ind. 8(2):129. 1966.

Diffuse annuals; leaves ovate or triangular, crenate-serrate, 3.5 x 2.2 cm; flowers deep purple, solitary in the axils; pedicels long, deflexed in fruits; calyx tubular, 1.2-1.8 cm long; appendages of filaments short, subulate; capsules included in the calyx.

Common in wet low lands during the rainy season.

Flowers: Sept. - Dec.

Sivarajan 60.

T. lindernioides Saldanha in Bull. Bot. Sur. Ind. 8:129.  
1966.

Prostrate herbs, rooting at nodes; leaves ovate, crenate-serrate, up to 1.5 cm long; flowers blue, axillary, solitary, small; calyx distinctly winged; capsules ellipsoid, narrowed at the top, included in the calyx; seeds numerous, foveolate.

This plant, closely resembling Lindernia crustacea (Linn.) F. Muell. is common in the wet fields during monsoon.

Flowers: July - Dec.

Sivarajan 1012, 1780.

Note: Saldanha (loc.cit.) has remarked that this is an enigmatic little plant which has often been included under Lindernia crustacea (Linn.) F. Muell. But it differs from the latter in the structure of the calyx and of the capsule.

Lindernia All.

Key to the species

1. Perfect stamens 4:
  2. Capsules much longer than the calyx .... anagallis
  2. Capsules as long as the calyx:
    3. Flowers in terminal racemes:
      4. Plants prominently hirsute ..... ovata
      4. Plants almost glabrous ..... crustacea
    3. Flowers not racemed ..... pusilla
1. Perfect stamens 2:
  5. Capsules linear:
    6. Leaves spinous-toothed ..... ciliata
    6. Leaves not spinous-toothed:
      7. Capsules 1 cm or more long:
        8. Leaves oblong, up to  
5.5 x 0.8 cm ..... oppositifolia
        8. Leaves elliptic, up to  
2 x 0.7 cm ..... antipoda
      7. Capsules less than 1 cm long ..... tenuifolia

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The author is thankful to Mr. D. Philcox, Royal Botanic Gardens, Kew for his helps in the determinations of Lindernia and Limnophila species.

5. Capsules not linear:

9. Leaves oblong-lanceolate to linear .... hyssopioides

9. Leaves ovate or orbicular:

10. Capsules ovoid ..... parviflora

10. Capsules rounded or subglobose .... rotundifolia

L.anagallis (Burm.f.) Pennell in J. Arn. Arb. 24:252.

1943; Mukh. in J. Ind. bot. Soc. 24:133. 1945; Philcox  
in Kew Bull. 17:484. 1964 & 22:45. 1968. Ruellia  
anagallis Burm. f. Fl. Ind. 135. 1798. Vandellia  
pedunculata Benth. Scroph. Ind. 37. 1835; FBI. 4:282.  
1884. Lindernia cordifolia (Colsm.) Merr. En. Philip.  
Pl. 3:437. 1923. L.angustifolia (Benth.) Wettst. in  
Engl. & Pr. Pfam. 4(3B):79. 1891; Mukh. in J. Ind.  
bot. Soc. 24:132. 1945.

An erect or diffuse herb; leaves linear to  
ovate-obtuse, serrate, up to 1.2 x 0.8 cm; flowers  
white or blue, solitary in the axils; perfect stamens 4;  
capsules linear, about 1 cm long.

Flowers: Aug. - Nov.

Sivarajan 1664, 1665.

Note: The author's collections of this taxon  
include two apparently distinct forms. The diffuse form  
rooting at the nodes with triangular- ovate leaves is



treated under Vandellia pedunculata in the Indian Floras, and the other with linear-lanceolate leaves is kept under the name V.angustifolia. Apart from the leaf shape, Hooker (loc.cit.) considered the inflorescence of these taxa to be quite different, V.pedunculata with terminal racemes and V.angustifolia with axillary, solitary flowers. Mukherjee (ll.cc.) in his revision of Indian Lindernia also held them as two distinct species.

But Philcox (loc.cit.) has extended the limits of Lindernia anagallis as to include L.angustifolia also. According to him, the leaves of this species exhibited a continuous range of variation and cannot be depended for segregation of species. Regarding the type of inflorescence, (in a personal communication to the author), he says "In this I consider there to be only one common type of inflorescence in which all flowers are solitary in the leaf axils and never racemose. This is because I consider every flower to be subtended either by normal or reduced leaves, never by bracts."

Following Philcox, the author has treated both the specimens under L.anagallis.

L.ovata Schlecht. in Engl. Bot. Jahrb. 59:107. 1924.

Vandellia hirsuta Buch.-Ham. ex Benth. Scroph. Ind. 36. 1835; FBI. 4:279. 1884; Gamb. 673.

Diffuse herbs, hirsute all over; leaves ovate or elliptic, up to 3.5 x 2 cm; flowers white with a yellow throat in terminal racemes; pedicels long; capsules ovoid, as long as the calyx.

In moist grass fields, and as a weed in gardens.

Flowers: Aug. - Dec.

Sivarajan 343.

L.crustacea (Linn.) F. Muell. Syst. Cens. Austral. Pl.

1:97. 1882; Hochr. in Candollea 5:205. 1934; Pennell in Brittonia 2:181. 1936 & in J. Arn. Arb. 20:79. 1939; Mukh. in J. Ind. bot. Soc. 24:130. 1945; Philcox in Kew Bull. 22:17. 1968. Capraria crustacea Linn. Mant. 1:87. 1767. Vandellia crustacea (Linn.) Benth. Scroph. Ind. 35. 1835; FBI. 4:279. 1884; Gamb. 673.

Diffuse herbs, sometimes rooting at nodes; leaves ovate, triangular, serrate-dentate, rounded, cordate or attenuate at base; lower flowers solitary in the axils, upper in apparent racemes; pedicels up to 1.5 cm; capsules oblong-ovoid; seeds foveolate.

L.ciliata (Colsm.) Pennell in Brittonia 2:182. 1936 & in J. Arn. Arb. 24:253. 1943; Hara in J. Jap. Bot. 19:209. 1943; Mukh. in J. Ind. bot. Soc. 24:133. 1945; Philcox in Kew Bull. 22:51. 1968. Gratiola ciliata Colsm. Prod. Desc. Grat. 14. 1793. Ilysanthes serrata (Roxb.) Urban in Ber. Deutsch. Bot. Ges. 2:436. 1884; Gamb. 675.

Small, erect annuals, 5-12 cm tall; leaves elliptic-oblong, sharply dentate; flowers purple in terminal racemes; fertile stamens 2; capsules linear, 1.4 cm long.

Common in moist, rocky places, and on grassy slopes.

Flowers: July - Nov.

Sivarajan 283.

L.oppositifolia (Linn.) Mukh. in J. Ind. bot. Soc. 24:134. 1945. Gratiola oppositifolia Linn. Sp. Pl. 1:105. 1753. Ilysanthes oppositifolia (Linn.) Urb. in Berl. Deutsch. Bot. Ges. 2:435. 1884; Gamb. 676.

Erect or diffuse annuals; leaves narrowly oblong entire or toothed, about 5.5 x 0.8 cm; flowers blue in apparent, terminal racemes; capsules linear, 1-1.2 cm long.

A variable species in moist grassy slopes and also seen as a weed on old walls and in gardens.

Flowers: July - Dec.

Sivarajan 322, 1369.

L.pusilla (Willd.) Boldingh. Zakfl. Landbouwstr. Java 165. 1916; Pennell in Brittonia 2:182. 1936 & J. Arn. Arb. 20:81. 1939; Philcox in Kew Bull. 22:41. 1968. Gratiola pusilla Willd. Sp. Pl. 1:105. 1797. Vandellia scabra Benth. Scroph. Ind. 36. 1835; FBI. 4:281. 1884; Gamb. 673. Lindernia hirta (Cham. & Schlech.) Pennell in J. Arn. Arb. 24:250. 1943; Mukh. in J. Ind. bot. Soc. 24:131. 1945.

Diffuse or prostrate herbs; leaves rounded or ovate, serrate, basally 3-5-veined, up to 1.5 x 1 cm; flowers white, axillary, solitary or in pairs; appendages on the longer pair of staminal filaments rounded; capsules subglobose.

A weed in wet-land cultivations and also in other moist or marshy low-lands.

Flowers: May - Dec.

Sivarajan 44, 436.

L.ciliata (Colsm.) Pennell in Brittonia 2:182. 1936 & in J. Arn. Arb. 24:253. 1943; Hara in J. Jap. Bot. 19:209. 1943; Mukh. in J. Ind. bot. Soc. 24:133. 1945; Philcox in Kew Bull. 22:51. 1968. Gratiola ciliata Colsm. Prod. Desc. Grat. 14. 1793. Ilysanthes serrata (Roxb.) Urban in Ber. Deutsch. Bot. Ges. 2:436. 1884; Gamb. 675.

Small, erect annuals, 5-12 cm tall; leaves elliptic-oblong, sharply dentate; flowers purple in terminal racemes; fertile stamens 2; capsules linear, 1.4 cm long.

Common in moist, rocky places, and on grassy slopes.

Flowers: July - Nov.

Sivarajan 283.

L.oppositifolia (Linn.) Mukh. in J. Ind. bot. Soc. 24:134. 1945. Gratiola oppositifolia Linn. Sp. Pl. 1:105. 1753. Ilysanthes oppositifolia (Linn.) Urb. in Berl. Deutsch. Bot. Ges. 2:435. 1884; Gamb. 676.

Erect or diffuse annuals; leaves narrowly oblong entire or toothed, about 5.5 x 0.8 cm; flowers blue in apparent, terminal racemes; capsules linear, 1-1.2 cm long.

Seen in marshes and along the wet river banks.  
Collected from the banks of Kallai River.

Flowers: Aug. - Sept.

Sivarajan 317, 518.

L. antipoda (Linn.) Alston, Trim. Fl. ceyl. 6, Suppl. 214.  
1931; Pennell in J. Arn. Arb. 20:81. 1939 & 24:253.  
1943, in part; Philcox in Kew Bull. 17:484. 1964 &  
22:57. 1968. Ruellia antipoda Linn. Sp. Pl. 635. 1753.  
Ilysanthes veronicifolia (Retz.) Urb. in Berl. Deutsch.  
Bot. Ges. 2:436. 1884; Gamb. 657. Lindernia anagallis  
(Burm.f.) Pennell, var. grandiflora (Retz.) Mukh. in  
J. Ind. bot. Soc. 24:133. 1945.

Diffuse herbs, rooting at the lower nodes;  
leaves ovate-elliptic, serrate, glabrous, up to  
3.5 x 1.6 cm; flowers purple in apparent, terminal  
racemes; capsules 1.5 cm long, linear.

In moist or wet places, also seen as a weed in  
wet cultivated fields.

Flowers: July - Dec.

Sivarajan 280, 389, 1014.

L.tenuifolia (Colsm.) Alston, Trim. Fl. ceyl. 6 (Suppl.)  
214. 1931; Mukh. in J. Ind. bot. Soc. 24:134. 1945;  
Philcox in Kew Bull. 22:62. 1968. Gratiola tenuifolia  
Colsm. Prod. Desc. Grat. 8. 1793. Ilysanthes tenuifolia  
(Colsm.) Haines, Bot. Bih. & Or. 634. 1922.

Tufted, erect or diffuse herbs; leaves linear,  
fleshy, up to 1.5 cm long; flowers pale blue or white,  
minute; fruiting pedicels up to 7 mm long; capsules  
linear, 6 mm long.

Very common on the Kallai river bank.

Flowers: June - Dec.

Sivarajan 432, 1368.

L.hyssopioides (Linn.) Haines, Bot. Bih. & Or. 635. 1922;  
Philcox in Kew Bull. 22:50. 1968. Gratiola hyssopioides  
Linn. Mant. 174. 1767. Ilysanthes hyssopioides (Linn.)  
Benth. in DC. Prod. 10:419. 1846; FBI. 4:283. 1884;  
Gamb. 675.

Erect, slender herbs; leaves elliptic-acute, up  
to 7 x 4 mm; flowers white with purplish blotches; pedicels  
filiform, 2 cm long in fruits; capsules ovoid, 6 mm long.

Flowers: Oct. - Dec.

Sivarajan 1549.

L. parviflora (Roxb.) Haines, Bot. Bih. & Or. 635. 1922;  
Pennell in Acad. Nat. Sci. Phil. Mon. 5:29. 1943;  
Mukh. in J. Ind. bot. Soc. 24:132. 1945. Gratiola  
parviflora Roxb. Pl. Corom. 3:3. 1811. Ilysanthes  
parviflora (Roxb.) Benth. in DC. Prod. 10:420. 1846;  
FBI. 4:283. 1884; Gamb. 675.

Erect, slender herbs, up to 15 cm tall; leaves ovate or lanceolate, about 2 x 0.5 cm; flowers purplish; pedicels filiform, about 1.5 cm long; capsules ovoid, twice longer than the calyx.

Flowers: July - Dec.

Sivarajan 1658.

L. rotundifolia (Linn.) Mukh. in J. Ind. bot. Soc. 24:132.  
1945. Gratiola rotundifolia Linn. Mant. 274. 1767.  
Ilysanthes rotundifolia (Linn.) Benth. in DC. Prod.  
10:420. 1846; FBI. 4:284. 1884; Gamb. 675.

Diffuse herbs, rooting at lower nodes; leaves ovate-orbicular; flowers white, blotched with purple, solitary in the axils; capsules subglobose.

In marshy fields, and also seen as a weed in wet land cultivations.

Flowers: Aug. - Nov.

Sivarajan 433, 1343.



Rhamphicarpa Benth.

R. longiflora (Arn.) Benth. Comp. Bot. Mag. 1:368. 1836;  
FBI. 4:300. 1884; Sant. 164. 1960; Gamb. 681. Buchnera  
longiflora Arn. Nov. Act. Nat. Cur. 18:356. 1836.

Annual herbs, 5-10 cm tall; leaves once or twice  
pinnatisect, lobes linear; flowers white, sessile,  
solitary in the axils; corolla tube 2.5-4 cm long, narrow,  
cylindric; capsules heart-shaped; seeds many.

Plants bloom at night and shed the flowers early  
morning. Common on wet rocky slopes.

Flowers: Aug. - Dec.

Sivarajan 300.

Striga Lour.

Key to the species

1. Leaves scale-like ..... gesneroides
1. Leaves not scale-like:
  2. Flowers yellow ..... lutea
  2. Flowers white ..... angustifolia

S.gesneroides (Willd.) Vatke in Oest. Bot. Zeitschr.

25:11. 1875; Sant. in J. Bombay nat. Hist. Soc. 49:42.

1950; Saldanha in Bull. Bot. Sur. Ind. 5:68. 1963.

Buchnera gesneroides Willd. Sp. Pl. 3:338. 1800.

Striga orobanchoides (R. Br. ex Endl.) Benth. in Hook.

Comp. Bot. Mag. 1:361, t. 19. 1836; FBI. 4:299. 1884;

Gamb. 680.

Erect, branched herbs, 10-15 cm tall; stem purple; leaves reduced to scales; flowers purple in the axils of scaly leaves; calyx 5-ribbed; capsules ellipsoid.

Characteristically restricted to rocky laterite, and parasitic on the roots of Dysophylla quadrifolia. Of the varieties recognised by Saldanha (loc. cit. 68-69.) the cited specimen belongs to the var. gesneroides.

Flowers: Aug. - Dec.

Sivarajan 514.

S.lutea Lour. Fl. Cochinch. 22. 1790; FBI. 4:299. 1884;

Pennell in Acad. Nat. Sc. Phil. Mon. 5:96. 1943;

Saldanha in Bull. Bot. Sur. Ind. 5:69. 1963; Gamb.680.

Buchnera asiatica Linn. Sp. Pl. 630. 1753 (nom.rej.).

Striga asiatica (Linn.) Kuntze, Rev. Gen. Pl. 466.

1891, nom. rej.; Sant. 163. 1960.

Erect, hispid herbs; leaves narrowly oblong; flowers solitary in the axils, yellow; calyx 10-ribbed with one rib terminating each lobe, pubescent; corolla tube slender, pubescent outside; capsules ellipsoid.

Usually seen on grassy slopes, parasitising on grass roots.

Flowers: June - Sept.

Sivarajan 1229.

Note: Saldanha (loc.cit.) recognised three varieties under this species, primarily based on flower colour. The cited specimen belongs to the var. lutea.

S.angustifolia (Don) Saldanha in Bull. Bot. Sur. Ind.

5:70. 1963. Buchnera angustifolia Don, Prod. Fl.

Nep. 91. 1825. B.euphrasioides Benth. Scroph. Ind.

41. 1835, (non Vahl, 1794). Striga euphrasioides

(Benth.) Benth. in Hook. Comp. Bot. Mag. 1:364. 1836;

FBI. 4:299. 1884; Sant. in J. Bombay nat. Hist. Soc.

49:44. 1950; Gamb. 680.

Erect herbs; leaves narrowly oblong to lanceolate, up to 2.5 x 0.5 cm; flowers white in terminal spikes; calyx 10-ribbed, each lobe terminated with 3 ribs; capsules oblong.

In grassy slopes, among grasses.

Flowers: July - Aug.

Sivarajan 276, 298.

Note: This plant is very often treated under the name S.euphrasioides (Benth.) Benth. Pennell (Acad. Nat. Sc. Phil. Mon. 5:96. 1943) has held that S.asiatica (Linn.) Kuntze, is the correct name for this species. But the lack of an authentic type together with the ambiguous diagnosis by Linnaeus has caused a great deal of confusion. (Saldanha l.c.67.). According to Merrill (Trans. Amer. Phil. Soc. n.s. 24:353. 1935) S.asiatica is the correct name for S.lutea Lour. and according to Hochreutiner (Candollea 5:210. 1934), it applies to S.densiflora Benth. Thus, since the name is used in different senses it is proposed (Saldanha, loc. cit. 67-68) that the name may be kept as a nominum rejiciendum (Art. 69).

Bentham's name Striga euphrasioides and its basionym Buchnera euphrasioides Vahl, are based on two very distinct types. So the name S.euphrasioides (Vahl) Benth. must be restricted to Vahl's specimen and that of Bentham should be renamed. Saldanha (loc.cit.), hence, has made the combination S.angustifolia, based on Buchnera angustifolia Don.

Russelia Jacq.

R. equisetiformis Schlech. & Cham. in Linnaea 6:377. 1831;

Sant. in J. Bombay nat. Hist. Soc. 49:47. 1950.

R. juncea Zucc. Flora 15(2) Beibl. 99. 1832.

Much branched herbs; stem angular; leaves ovate-lanceolate, often reduced to scales; flowers red, tubular in dichotomous cymes; capsules subglobose.

Flowers: July - Aug.

Sivarajan 1361.

Scoparia Linn.

S. dulcis Linn. Sp. Pl. 116. 1753; FBI. 4:289. 1884;

Sant. 165. 1960; Gamb. 678.

Erect, woody herbs; leaves elliptic to obovate, serrate; flowers white, 1-3 in each axil, corolla throat densely bearded; capsules ovoid.

A weed on road sides and in cultivated fields.

Flowers: Aug. - Dec.

Sivarajan 701.

Angelonia Humb. & Bonpl.

A. salicariaefolia Humb. & Bonpl. Pl. Aequin. 2:92, t.  
108. 1812; Bailey 900.

Erect, ~~viscid~~-tomentose herbs; leaves narrowly lanceolate, distantly serrate, up to 10 x 1 cm; flowers purple, 1-3 in each axil; capsules subglobose, minutely hairy.

Seen growing wild in wet fields, sometimes grown in gardens.

Flowers: Mar. - Dec.

Sivarajan 544.

Bacopa Aubl. (nom.cons.)

Key to the species

- 1. Flowers sessile ..... hamiltoniana
- 1. Flowers pedicellate:
  - 2. Pedicels fascicled in the axils .. floribunda
  - 2. Pedicels solitary in the axils ... monnieri

B. hamiltoniana (Benth.) Wettst. in Engl. & Pr. Pfam.

4(3b):77. 1895; Pennell in Proc. Acad. Nat. Sc.

Philad. 98:92. 1946; Sant. in J. Bombay nat. Hist.

Soc. 49:30. 1950. Herpestis hamiltoniana Benth.

Scroph. Ind. 30. 1835; FBI. 4:272. 1884. Moniera  
hamiltoniana (Benth.) Cooke, Fl. Bomb. 2:357. 1905.

Small, erect herbs; leaves narrowly lanceolate-acute, entire or serrate, up to 2.5 x 0.5 cm; flowers axillary, solitary, sessile; 2 of the calyx lobes larger, ovate, others lanceolate; corolla pink; capsules subglobose.

A weed in moist fields, among grasses.

Flowers: Aug. - Mar.

Sivarajan 64, 540.

Note: For a detailed account of the nomenclature of the genus refer Santapau (loc.cit.).

B.floribunda (R. Br.) Wettst. in Engl. & Pr. Pfam.

4(3b):77. 1895; Pennell in Proc. Acad. Nat. Sc.

Philad. 98:92. 1946; Sant. in J. Bombay nat. Hist.

Soc. 49:31. 1950. Herpestis floribunda R. Br. Prod.

442. 1810; FBI. 4:273. 1884. Moniera floribunda

(R. Br.) Cooke, Fl. Bomb. 2:357. 1905.

Erect herbs; stem subquadrangular; leaves lanceolate-acute; flowers white, 1-3 in each axil; pedicels 4-5 mm long; calyx as in the earlier species; capsules oblong.

In moist sandy fields, near the coast. Collected from Kadalundi.

Flowers: Sept. - Dec.

Sivarajan 1536.

B.monneri (Linn.) Pennell in Proc. Acad. Nat. Sci. Philad. 98:94. 1946; Sant. 158. 1960. Lysimachia monneri Linn. Cent. Plant. 2:9. 1756. Herpestis monneria (Linn.) Benth. Scroph. Ind. 30. 1835; FBI. 4:276. 1884. Moniera cuneifolia Cooke, Fl. Bomb. 2:285. 1905; Gamb. 669.

Creeping herbs, rooting at nodes; leaves obovate-oblong or spatulate; flowers white, axillary, solitary; pedicels up to 2.5 cm; capsules ovoid.

Common on the river banks and in saline marshes.

Flowers: July - Dec.

Sivarajan 87.

Limnophila R. Br. (nom. cons.)

Key to the species

1. Flowers distinctly pedicellate:
  2. Leaves all verticillate ..... indica
  2. Aerial leaves opposite ..... aquatica



1. Flowers sessile or subsessile:

3. Leaves basally nerved ..... heterophylla

3. Leaves penninerved ..... repens

L.indica (Linn.) Druce, Rep. Bot. Exch. Club. Brit.

Isles. 3:420. 1913 (1914); Sant. in J. Bombay nat.

Hist. Soc. 49:34. 1950 & Fl. Purandh. 91. 1957, excl.

syn. L.racemosa; Philcox in Kew Bull. 24:115. 1970.

Hottonia indica Linn. Sp. Pl. (ed.2) 208. 1762.

L.gratioloides R. Br. Prod. 442. 1810; FBI. 4:271.

1884; Gamb. 668.

Small herbs, about 8-15 cm tall; leaves all verticillate, variously lobed; flowers pale yellow, solitary in the upper axils; pedicels 7 mm long; capsules subglobose.

In moist or marshy fields, near the coast.

Flowers: Sept. - Oct.

Sivarajan 628.

Note: Santapau (loc.cit.) has extended the limits of this species to include both L.racemosa Benth. and L.gratioloides R. Br., since "these two are connected by many intermediate forms". However, Philcox (loc.cit.) has separated them into two distinct species.

The author has collected both these plants from Calicut. They are conspicuously different in their habit, the shape, size, insertion and venation of leaves, in the inflorescence, pedicel length etc. and hence the author feels that Philcox's separation of these two species is on ample grounds.

L.aquatica (Roxb.) Alston in Ann. Roy. Bot. Gard.

Perad. 11:205. 1929; Philcox in Kew Bull. 24(1):129.

1970. Cyrilla aquatica Roxb. Pl. Corom. 2:47, t.

189. 1798. Limnophila racemosa Benth. Scroph. Ind.

26. 1835; FBI. 4:271. 1884; Gamb. 668., nom. illegit.

Annual, hirsute herbs; submerged leaves with capillary lobes; aerial leaves elliptic-lanceolate, serrate, basally 3-veined; flowers white with purple blotches forming terminal racemes; capsules subglobose.

Aquatic herbs in water-logged fields and ponds.

Flowers: Aug. - Dec.

Sivarajan 446, 629.

Note: A probable interspecific hybrid of

Limnophila aquatica and L.indica.

The author has collected a specimen of Limnophila which does not exactly correspond to any of the published descriptions.

The plant grows tufted on the wet banks of a river at Kunnamangalam and are extremely hirsute. The lower leaves and those on the young stems are verticillate and toothed or pinnately lobed. The upper leaves are opposite, elliptic-acute, serrate, 3-5-nerved from the base, up to 1.8 x 0.7 cm. The pale yellow flowers are solitary in the axils.

Subsequent collections have revealed that, in spite of its normal, healthy growth and flowering, the population is unable to produce ~~fertile fruits and~~ viable seeds. The availability of Limnophila indica and L.aquatica in the vicinity, the intermediate characters exhibited and the failure to produce **viable seeds** indicate a possible hybrid nature. These plants are under further study by the author.

Flowers: Sept. - Mar.

Sivarajan 993.

L.heterophylla (Roxb.) Benth. Scroph. Ind. 25. 1835;  
FBI. 4:270. 1884; Gamb. 668; Philcox in Kew Bull.  
24:124. 1970. Columna heterophylla Roxb. Fl. Ind.  
(ed.carey) 3:97. 1832.

Aquatic, hirsute herbs; submerged leaves with capillary lobes; aerial ones opposite, narrowly lanceolate,

serrate, up to 1.5 x 0.3 cm, basally 3-veined; flowers subsessile, pale pink; capsules subglobose.

In water-logged fields and in shallow ponds.

Flowers: Aug. - Dec.

Sivarajan 1548.

L.repens (Benth.) Benth. in DC. Prod. 10:387. 1846;  
Philcox in Kew Bull. 24:154. 1970. Stemodia repens  
Benth. in Lindl. Bot. Reg. 17, t. 1470, Sp. 11. 1832  
& Scroph. Ind. 24. 1835. Limnophila conferta Benth.  
in DC. Prod. 10:387. 1846; FBI. 4:266. 1884; Sant.  
in J. Bombay nat. Hist. Soc. 49:33. 1950; Gamb. 667.  
L.sessilis (Benth.) Fischer in Bull. Mis. Inf. Kew.  
1932:62. 1932.

Diffuse herbs; leaves monomorphous, elliptic to lanceolate, crenate-serrate, up to 2.5 x 1 cm; flowers axillary, solitary or in racemes; capsules ovoid.

In marshy fields and in wet grassy slopes.

Flowers: July - Dec.

Sivarajan 742.

LENTIBULARIACEAE L.C.Rich.

Utricularia Linn.

Key to the species

1. Aquatic herbs:

2. Floats present ..... inflexa  
var. stellaris

2. Floats absent:

3. Racemes 1-3 flowered ..... gibba  
ssp. exoleta

3. Racemes 4-6 flowered ..... aurea

1. Terrestrial herbs:

4. Scapes twining ..... reticulata

4. Scapes not twining:

5. Sepals flat, spreading in  
fruits ... graminifolia

5. Sepals clasping the fruits ..... uliginosa

U.inflexa Forsk. Fl. Aeg.-Ar. 9. 1775, var. stellaris

(Linn.f.) Taylor in Mitt. Bot. Staass. Munchen. 4:96.

1961. U.stellaris Linn. f. Suppl. 86. 1781; FBI.4:328.

1884; Sant. in J. Bombay nat. Hist. Soc. 49:217. 1950;

Gamb. 689.

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Floating herbs with submerged stolon; leaves whorled, capillaceo-multifid with interspersed bladders; flowers yellow, racemed; peduncle with a whorl of spongy floats at base; pedicels short; fruiting calyx lobes reflexed, exposing the capsules.

Very common in water-logged fields and ponds.

Flowers: Oct. - Jan.

Sivarajan 758.

U.gibba Linn. Sp. Pl. 18. 1753, ssp.exoleta (R. Br.)

Taylor in Mitt. Bot. Staatss. Munchen 4:101. 1961 & in Hutch. & Dalz. Fl. W. Trop. Afr. (ed.2) 2:381.

1961 & in Kew Bull. 18:204. 1964. U.exoleta R. Br.

Prod. 430. 1810; FBI. 4:329. 1884; Sant. in J.

Bombay nat. Hist. Soc. 49:218. 1950; Gamb. 689.

Small floating or rooting herbs; stolons filiform; leaves multifid, lobes capillary; peduncles and pedicels filiform; flowers yellow; spur slightly longer than the lower lip, straight; seeds lenticular, winged.

Flowers: Sept. - Mar.

Sivarajan 777.

U.aurea Lour. Fl. Cochinch. 26. 1790; Back. & Bakh. f.

Fl. Java 2:517. 1965. U.flexuosa Vahl, En. 198. 1805;  
FBI. 4:329. 1884; Sant. in J. Bombay nat. Hist. Soc.  
49:218. 1950; Gamb. 689.

Aquatic herbs with submerged stolons; leaves whorled, segments capillary with bladders; flowers yellow in simple racemes; peduncles without spongy floats; pedicels deflexed in fruits; seeds many, angled with narrowly winged margins.

Floating herbs in stagnant pools or water-logged fields.

Flowers: Oct. - Jan.

Sivarajan 909.

U.reticulata Sm. Exot. Bot. 2. t. 119. 1805; FBI. 4:331.

1884; Sant. in J. Bombay nat. Hist. Soc. 49:219. 1950  
& Fl. Khand. 188. 1967; Gamb. 690.

Terrestrial plants; scapes twining, with a few scales; flowers blue-violet; the palate of the corolla reticulate with purple; spur short, slightly curved; seeds reticulate.

Common in paddy fields, twining around paddy plants.

Flowers: Dec. - Jan.

Sivarajan 929, 1492.

U.graminifolia Vahl, En. 1:195, no. 3. 1805; Sant. in.  
J. Bombay nat. Hist. Soc. 49:219. 1950; Gamb. 690.  
U.caerulea Clarke in Hook. f. Fl. Brit. Ind. 4:331.  
1884, non Linn.

Slender, terrestrial herbs; stolon ~~leaves~~ fili-  
form; leaves small, spathulate with bladders beneath;  
scape usually erect, 5-10 cm tall; flowers blue or  
purple; pedicels not recurved; calyx lobes ovate-  
acuminate green; palate of the corolla reticulate with  
purple veins; spur conical; seeds reticulate.

A common monsoon herb on the wet or moist hard  
lateritic slopes, in the University campus.

Flowers: Aug. - Nov.

Sivarajan 1316.

U.uliginosa Vahl, En. 1:203, no 25. 1804; Sant.in J.  
Bomb<sup>ay</sup> nat. Hist. Soc. 49:218 & Fl. Khand. 188. 1967;  
Gamb. 689.

A slender, terrestrial herb, 4-8 cm tall; leaves  
oblong-spathulate; scape slender, 2-4 flowered; flowers  
bluish purple, pedicelled; pedicels not recurved; ~~sepals~~  
ovate-acute purple; spur slightly curved; seeds ~~subglobose,~~  
reticulate.



In the swamps near the University Campus, often seen closely associated with U.graminifolia.

Flowers: Aug. - Nov.

Sivarajan 272.

GESNERIACEAE Dumort.

Rhynchoglossum Blume

R.notonianum (Wall.) Burt. in Not. Roy. Bot. Gard.

Edinb. 24:170. 1962. Wulfenia notoniana Wall. Tent.

Fl. Nep. 46. 1826. Klugia notoniana (Wall.) DC.

Prod. 9:276. 1845; FBI. 4:366. 1884; Sant. 169.

1960; Gamb. 696.

Fleshy annuals; leaves ovate-lanceolate, acute or acuminate, unequal sided at base; lateral veins many, arched, parallel; flowers bright blue; calyx 5-winged, lobes 5, unequal; corolla tube short, white; perfect stamens 4; capsules ovoid, 2-valved.

Common in damp, shaded places.

Flowers: July - Dec.

Sivarajan 438, 577, 1355.

Note: Burt. (loc.cit.) has treated Rhynchoglossum Blume and Klugia Schlecht. as congeneric.

BIGNONIACEAE Juss.

Key to the genera

1. Trees or shrubs:
  2. Calyx spathaceous:
    3. Flowers white ..... Dolichandrone
    3. Flowers crimson-red ..... Spathodea
  2. Calyx not spathaceous:
    4. Flowers dull white:
      5. Leaves decomposed ..... Oroxylum
      5. Leaves simply pinnate ..... Pajanelia
    4. Flowers not white:
      6. Leaflets lanceolate, acuminate, 10-15 cm long.. Tecoma
      6. Leaflets elliptic, up to 2 m long ..... Tecomaria
1. Climbing shrubs:
  7. Leaves 2-3-foliolate ..... Pyrostegia
  7. Leaflets many ..... Pandorea

Dolichandrone (Fenzl.) Seem. (nom. cons.)

D. spathacea (Linn.) K. Schum. Fl. Kais. Wilh. Land.

123. 1889; Sprague in Kew Bull. 1919:304. 1919;

Gamb. 700. Bignonia spathacea Linn. Suppl. 283.

1781, (non Roxb.). Spathodea rheedii Spreng. Syst. Veg. 2:835. 1825; DC. Prod. 9:206. 1845. D.rheedii (Spreng.) Seem. in J. Bot. 8:380. 1870; FBI. 4:379. 1884.

Trees; leaves 5-7-foliolate; leaflets ovate-lanceolate, acuminate; flowers large, white, short-pedicelled; calyx spathaceous; corolla funnel-shaped, 10-15 cm long; stamens 4, didynamous; anthers with 2, divaricate cells; capsules very long; seeds compressed with membranous wings.

Flowers: June - July

Sivarajan 1171.

Spathodea Beauv.

S.campanulata Beauv. Fl. Owar. 1:47. tt. 27-28. 1805; Bailey 907; Gamb. 703.

Trees; leaves 15-19-foliolate, tomentose; leaflets ovate to lanceolate, acuminate, pubescent beneath; flowers large, showy in many-flowered, dense racemes, scarlet; buds filled with a watery sap; calyx spathaceous, densely pubescent, red; corolla large; capsules oblong-lanceolate, flattened.

A plant of New World tropics, now naturalized in India also.

Flowers: Sept. - Oct.

Sivarajan 536.

Oroxylum Vent.

O.indicum (Linn.) Vent. Dec. Gen. Nov. 9. 1808; FBI. 4:378. 1884; Sant. 169. 1960; Gamb. 698. Bignonia indica Linn. Sp. Pl. 625. 1753.

Trees; leaves bipinnate; leaflets elliptic-acute or acuminate; racemes terminal, dense; flowers dull white; calyx campanulate; corolla lobes subequal, toothed; capsules large, compressed; seeds thin, flat and hyaline winged.

Flowers: June - July

Sivarajan 1313.

Pajanelia DC.

P.longifolia (Willd.) K. Schum. in Engl. & Pr. Pfam. 4(3b):244. 1895. Bignonia longifolia Willd. Sp. Pl. 3:306. 1800. Pajanelia multijuga (Wall.) DC. Prod. 9:227. 1845. P.rheedii Wt. Ic. t. 1343-44. 1850; Gamb. 702.

Trees with warted trunk; leaves pinnate, clustered towards the tips of branches; leaflets broadly ovate or elliptic, acuminate, oblique at the base; flowers reddish outside, dull-white within, fleshy, in terminal racemes; fruits compressed, winged; seeds compressed with hyaline wings.

Flowers: Mar. - Apr.

Sivarajan 217.

Tecoma Juss.

T. stans (Linn.) H.B. & K. Nov. Gen. & Spec. 3:144.

1819; Sant. 171. 1960. Bignonia stans Linn. Sp. Pl.

(ed.2) 871. 1763. Stenolobium stans (Linn.) Seem.

in J. Bot. 1:88. 1863.

Shrubs or small trees; leaves 3-7-foliolate; leaflets lanceolate-acuminate, serrate; flowers bright yellow; large and showy; capsules linear; seeds compressed, winged.

Flowers: Oct. - May

Sivarajan 567.

Tecomaria Spach.

T. capensis (Thunb.) Spach. Hist. Nat. Veg. 9:137. 1840;  
Schum. in Pfam. 4(3b):230. 1894; Mathew in Rec. Bot.  
Sur. Ind. 20:175. 1969. Bignonia capensis Thunb.  
Prod. Pl. Cap. 105. 1800.

Low undershrubs; leaves imparipinnate, about  
10-15 cm long; leaflets few, small, elliptic-acute,  
serrate; flowers red in terminal racemes; calyx campan-  
ulate, 5-toothed; corolla 4-lobed; capsules linear,  
compressed.

Flowers: Nov. - Dec.

Sivarajan 906.

Pyrostegia Presl.

P. venusta (Ker-Gawl.) Presl. Bot. Bemerk. 93. 1845;  
Miers. in Proc. Roy. Hort. Soc. 3:188. 1863; Mathew  
in Rec. Bot. Sur. Ind. 20:177. 1969. Bignonia  
venusta Ker-Gawl. in Bot. Reg. 3, t. 249. 1818.  
Pyrostegia ignea (Vell.) Presl. Bot. Bemerk. 93.  
1845; Bailey 903.

Tendrill-climbers; leaves 2-3-foliolate; leaf-  
lets elliptic-acute; flowers crimson red, in pendulous,

axillary panicles; calyx glandular hairy; corolla tube funnel-form, curved, lobes oblong-obtuse, reflexed; capsules linear.

Flowers: most part of the year.

Sivarajan 1630.

Pandorea Spach.

P. jasminoides (Lindl.) Schum. in Engl. & Pr. Pfam.

4(3b):230. 1894; Bailey, Cycl. Hort. 2452. 1916;

Mathew in Rec. Bot. Sur. Ind. 20:178. 1969. Tecoma

jasminoides Lindl. Bot. Reg. 23, t. 2002. 1837.

Climbing shrubs; tendrils 0; leaves bipinnate; leaflets lanceolate, acuminate; flowers pink, sprinkled with purple in terminal panicles; calyx campanulate, 5-toothed; corolla limb large, spreading, lobes crenate; capsules oblong 5-8 cm long; seeds elliptic, winged.

Flowers: July - Dec.

Sivarajan 1467.

PEDALIACEAE R. Br.

Key to the genera

- 1. Fruits with spines near the base ..... Pedaliium
- 1. Fruits without spines ..... Sesamum

Pedaliium Roy. ex Linn.

P. murex Linn. Syst. 1123. 1759; FBI. 4:386. 1884; Mahes.  
262; Gamb. 704.

Fleshy annuals; leaves ovate-obtuse, dentate;  
flowers yellow, solitary in the axils, 4-5 cm long;  
peduncle short; fruits indehiscent, obtuse at tip with  
4 spines at 4 angles near the base.

This mucilagenous herb is common on the sea  
coast and along the road sides.

Flowers: May - June

Sivarajan 1174.

Sesamum Linn.

- 1. Prostrate herbs ..... laciniatum
- 1. Erect herbs ..... indicum



S. laciniatum Klein. ex Willd. Sp. Pl. 3:359. 1800; Wt.  
Ic. t. 1345. 1848; FBI. 4:387. 1884; Woodr. in J.  
Bombay nat. Hist. Soc. 12:354. 1899; Gamb. 704.

Prostrate, densely hispid herbs; leaves variously  
dentate or lobed, up to 4 x 3 cm; flowers reddish purple,  
pubescent outside; capsules ovoid, slightly compressed,  
1 cm long, hispid.

On the grassy slopes, road sides and waste  
places on hills.

Flowers: July - Nov.

Sivarajan 267.

S. indicum Linn. Sp. Pl. 634. 1753; FBI. 4:387. 1884;  
Back. in <sup>Fl.</sup> Males. 4(3):217. 1951; Sant. 172. 1960;  
Gamb. 704.

Tomentose, erect herbs; lower leaves digitately  
lobed, up to 15 x 10 cm, upper entire; flowers rose-  
pink, solitary in the axils; corolla pubescent outside;  
capsules 2 cm long, silky tomentose.

Common under cultivation. Occasionally found  
as a weed in waste places.

Flowers: July - Oct.

Sivarajan 486, 1334.

MARTYNIACEAE Stapf

Martynia Linn.

M.annua Linn. Sp. Pl. 618. 1753; Back. in Fl. Males.

4(3):221. 1951; Gamb. 705. M.diandra Gloxin Obs.

14, t. 1. 1785; FBI. 4:386. 1884.

Coarsely pubescent, succulent herbs; leaves large, ovate-orbicular, subcordate at base; flowers showy, rose-coloured with yellow and purplish blotches in terminal and axillary racemes; fruits with 2 anterior hooks.

Common on the sandy sea coast during the rainy season.

Flowers: July - Dec.

Sivarajan 1165, 1308.

ACANTHACEAE Juss.

Key to the genera

1. Perfect stamens 2:

2. Calyx 5-partite:

3. Flowers in racemes or panicles:

4. Capsules linear-oblong ..... Andrographis

4. Capsules elliptic ..... Indoneesiella

- 3. Flowers not in racemes or panicles:
  - 5. Bracts dimorphic ..... Rungia
  - 5. Bracts not dimorphic:
    - 6. Spikes glandular hairy ..... Eranthemum
    - 6. Spikes not glandular hairy:
      - 7. Bracts linear,  
                    inconspicuous:
        - 8. Flowers in cymes or  
                    panicles ..... Rhinacanthus
        - 8. Flowers in spikes ..... Gendarussa
      - 7. Bracts ovate, imbricate:
        - 9. Anther cells not  
                    spurred:
          - 10. Flowers white ..... Adhatoda
          - 10. Flowers greenish ... Ecbolium
        - 9. Lower anther cell  
                    spurred ... Justicia
- 2. Calyx 4-partite:
  - 11. Corolla distinctly 2-lipped ..... Rostellularia
  - 11. Corolla of 5 subequal lobes ..... Barleria
- 1. Perfect stamens 4:
  - 12. Seeds 4 or less:
    - 13. Plants spinous ..... Acanthus
    - 13. Plants not spinous:
      - 14. Bracts very small ..... Asystasia



A. paniculata (Burm.f.) Wall. ex Nees in Wall. Pl. As.  
Rar. 3:116. 1832; FBI. 4:502. 1884; Sant. in Bot.  
Mem. Uni. Bomb. 2:50. 1952 & J. Bombay nat. Hist.  
Soc. 51:359. 1953; Gamb. 734. Justicia paniculata  
Burm. f. Fl. Ind. 9. 1768. Andrographis subspathulata  
Clarke in Hook. f. Fl. Brit. Ind. 4:501. 1885.

Much branched herb; leaves elliptic to lanceo-  
late; flowers blue or purplish in terminal and axillary  
panicles; stamens 2, filaments hirsute, anthers 2-  
celled, bearded at the base; capsules linear-oblong,  
compressed; seeds 8-10, on acute retinacula

This medicinal herb is seen wild along the  
road sides and in waste places.

Flowers: Sept. - Nov.

Sivarajan 626.

A. ceylanica Nees in Hook. Comp. Bot. Mag. 2:313.

1836 & in DC. Prod. 11:518. 1847, non sensu Wt.  
Ic. t. 1560. 1850. A. macrobotrys Nees in DC. Prod.  
11:516. 1847, var. parviflora Clarke in Hook. f.  
Fl. Brit. Ind. 4:503. 1884.

Scarcely branched herbs; leaves oblong-  
lanceolate, up to 6 x 2' cm; racemes axillary, much

longer than the leaves; flowers pink with purple blotches; staminal filaments hirsute, anthers bearded; capsules linear, glabrous; retinacula acute.

This plant with its hardly branched stem and racemes is collected from the premises of Thiruvangad temple.

Flowers: Aug. - Nov.

Sivarajan 601.

Indoneesiella Sreem.

I.echioides (Linn.) Sreem. in Phytologia 16:466. 1968.

Justicia echioides Linn. Sp. Pl. 16. 1753.

Andrographis echioides (Linn.) Nees in Wall. Pl. As. Rar. 3:117. 1831; FBI. 4:505. 1885; Sant. in Bot. Mem. Uni. Bomb. 2:51. 1951; Gamb. 736.

Neesiella echioides (Linn.) Sreem. in Phytologia 15:271. 1967.

Rarely branched, erect, villous herbs; leaves oblong-obtuse, sessile, up to 10.5 x 3 cm; racemes axillary, 1-sided, usually unbranched; flowers erect, white with purple blotches; capsules elliptic, villous, slightly shorter or as long as the sepals; seeds 4.

Common on the sandy sea coast, and also on the lateritic slopes.

Flowers: Aug. - Nov.

Sivarajan 632, 1281.

Note: This plant, described under the name Andrographis echioides in most of the Indian Floras, was segregated into a new genus Neesiella by Sreemadhavan (loc.cit. 1967). Since this happened to be a later homonym of Neesiella Schiffn. (Engl. & Pr. Pfam. 1, 3(1):32. 1893) a genus of Hepaticae, Sreemadhavan (loc.cit. 1968) has renamed the genus as Indoneesiella Sreem.

Rungia Nees

R.pectinata (Linn.) Nees in DC. Prod. 11:469. 1847; Wt. Ic. t. 1547. 1850; Sant. 206. 1967. Justicia pectinata Linn. Amoen. Acad. 4:299. 1759. Rungia parviflora Nees var.pectinata (Linn.) Clarke in Hook. f. Fl. Brit. Ind. 4:550. 1885; Gamb. 750.

Erect or diffuse, branched herbs; leaves elliptic to oblanceolate, up to 2.5 x 1 cm; flowers minute in short, one-sided spikes; bracts dimorphic, the barren bracts elliptic-acute and the flowering

bracts orbicular, with conspicuous hyaline, ciliate margins; stamens 2, anther cells superposed, the lower cell with a basal appendage, capsules with 4, compressed seeds.

Flowers: Sept. - May

Sivarajan 216, 1663.

Eranthemum Linn.

E. capense Linn. Sp. Pl. 9. 1753; Bremek. in Verh. Nedere. Akad. Wet. II. 45(1):34. 1948; Sant. in Bot. Mem. Uni. Bomb. 2:33. 1952. Justicia montana Roxb. Pl. Corom. 2:41. 1805. Eranthemum montanum (Roxb.) Roxb. [Hort. Beng. 80. 1814, nom. nud.] Fl. Ind. 1:100. 1824. Gamb. 720. Daedalacanthus montanus (Roxb.) T. Anders. in Th. En. 229. 1869.

Woody shrubs; leaves elliptic-acuminate; spikes terminal and axillary, simple or paniculate, glandular-hairy; bracts long-acuminate; flowers pinkish; calyx 5-partite, lobes linear, viscid hairy; corolla tube slender, 2-5 cm long; perfect stamens 2, staminodes linear; capsules clavate; seeds 4, discoid; retinacula sharp.



Collected from the rocky lateritic slopes near Thiruvangad temple.

Flowers: Dec. - Jan.

Sivarajan 28.

Rhinacanthus Nees

R.nasuta (Linn.) Kurz in J. As. Soc. Beng. 39:79. 1870; Sant. in Bot. Mem. Uni. Bomb. 2:92. 1952 & Fl. Khand. 210. 1967. Justicia nasuta Linn. Sp. Pl. 16. 1753. Rhinacanthus communis Nees in Wall. Pl. As. Rar. 3:109. 1832; FBI. 4:541. 1881; Gamb. 758-59.

Diffusely branched undershrubs; leaves elliptic-lanceolate; flowers white in axillary and terminal, lax, paniculate cymes; corolla tube slender, long; stamens 2, anther cells superposed, muticous; capsules clavate, seeds 2-3, compressed.

Common on hedges, road sides and waste places.

Flowers: Jan. - Mar.

Sivarajan 96, 852.

Gendarussa Nees

G.vulgaris Nees in Wall. Pl. As. Rar. 3:104. 1832 & in DC. Prod. 11:410. 1847; Sreen. & Agar. in Bull. Bot. Sur. Ind. 5:83. 1963. Justicia gendarussa Burm. f. Fl. Ind. 10. 1768; FBI. 4:532. 1885; Sant. in Bot. Mem. Uni. Bomb. 2:91. 1952; Gamb. 755.

Much branched undershrubs; leaves narrowly lanceolate, up to 12 x 3 cm; spikes terminal, at times paniculate; bracts linear; flowers white with purple spots; lower anther cell~~s~~ spurred; capsules clavate, glabrous.

Usually seen on hedges and also in waste places.

Flowers: Dec. - Jan.

Sivarajan 26, 1039.

Adhatoda Mill.

A.vasica Nees in Wall. Pl. As. Rar. 3:103. 1832; FBI. 4:540. 1885; Sant. in Bot. Mem. Uni. Bomb. 2:92. 1952 & Fl. Khand. 210. 1967; Gamb. 758. Justicia adhatoda Linn. Sp. Pl. 15. 1753.

Shrubs; leaves elliptic-lanceolate, acuminate; flowers white in axillary bracteate spikes; bracts large, ovate; stamens 2, anther cells apiculate; capsules ovate, compressed; seeds 1-2, orbicular, compressed.

Common on hedges. Sometimes cultivated for medicine.

Flowers: Dec. - Mar.

Sivarajan 867, 998.

Ecbolium Kurz

E. viride (Forsk.) Alston in Trim. Fl. Ceyl. 6:229.

1931; Sant. 208. 1967; Sreen. & Agarw. in Bull Bot. Sur. Ind. 5:82. 1963. Justicia viridis Forsk. Fl. Aeg.-Ar. 5. 1775. Ecbolium linneanum Kurz in J. As. Soc. Beng. 2:75. 1871; FBI. 4:544. 1885; Gamb. 752.

Key to the varieties

1. Leaves ovate-obtuse ..... var. rotundifolia
1. Leaves lanceolate-acuminate ..... var. laetevirens

var. rotundifolia (Nees) Raizada in Ind. For. Rec.

5(1):16. 1958. E. rotundifolia Nees in Wall. Pl. As.

Rar. 3:108. 1832. E. linneanum Kurz, var. rotundifolia  
(Nees) Clarke in Hook. f. Fl. Brit. Ind. 4:545. 1885.

Woody undershrubs; leaves ovate-obtuse; spikes dense; bracts broadly ovate, minutely dentate, shortly acuminate, up to 2 x 1.5 cm; stamens 2, anther cells parallel; capsules ovoid compressed with a distinct stalk; seeds compressed; retinacula curved.

Flowers: Jan. - Sept.

Sivarajan 114.

var. laetevirens (Clarke) Raizada in Ind. For. Rec.

5(1):16. 1958. E. linneanum Kurz, var. laetevirens

Clarke in Hook. f. Fl. Brit. Ind. 4:545. 1885;

Sant. 208. 1967.

Woody herbs; leaves broadly lanceolate, acute or acuminate; spikes long; bracts lanceolate-acuminate entire up to 2.5 x 1 cm; pubescent; stamens and capsules as in the previous variety.

Flowers: Jan. - Sept.

Sivarajan 1499.

Justicia Linn.

Note: When Linnaeus first proposed the name Justicia (Gen. Pl. 4 No.12. 1737), his generic description was based on the Asiatic species Justicia adhatoda. In the "Species Plantarum" he included 10 more species in the genus Justicia, without altering the circumscription of the genus. However since it was found that they form a heterogenous group, later workers were inclined to segregate them into different genera.

Justicia (sensu lato) included about 300 species distributed both in the New World and Old World, with immense variation in their vegetative and floral features. This lead many subsequent authors to divide the genus into many genera as Adhatoda, Gendarussa, Rostellularia etc. Recently Bremekamp (Verh. Nederl. Akad. Wet. 45(2):1-78. 1948), supporting Nees (op.cit.), has resurrected many of the genera segregated by the later<sup>t</sup>, which had been subsequently merged by others with Justicia.

Still, this is not without objections. Stearn (J. Arn. Arb. 52:636-637. 1971) kept Justicia as a large genus to include "everything", but recognised "the possibility of its later dismemberment and the revival of names now buried in its synonymy". However considering

the merits of the dilimitation of genera by Bremekamp, the author has followed him in this work.

J.betonica Linn. Sp. Pl. 15. 1753; FBI. 4:525. 1885;  
Sant. in Bot. Mem Uni. Bomb. 2:85. 1952 & Fl. Khand.  
208. 1967; Gamb. 755. Adhatoda betonica (Linn.) Nees  
in Wall. Pl. As. Rar. 3:103. 1832 & in DC. Prod.  
11:385. 1847.

Shrubs; leaves broadly lanceolate acuminate;  
flowers white, speckled with pink in long, terminal  
spikes; bracts white with green nerves, ovate, acute;  
bracteoles more or less similar; corolla white, spotted;  
capsules clavate, 1.5 cm long.

Flowers: July - Nov.

Sivarajan 1476.

Rostellularia Reichb.

Note: Nees in 1832 (Wall. Pl. As. Rar. 3:76-100)  
proposed the genus Rostellaria in Acanthaceae. Since  
this is a later homonym of Rostellaria Gaertn., a  
Sapotaceous genus, Reichenbach (Handb. 190. 1837) emended  
the name as Rostellularia. The diagnostic characters of  
this genus are the cystoliths, terminal spikes with

decussate bracts, each subtending a single flower;  
4-5-partite calyx; glabrous and flattened staminal  
filaments, spurred lower cell of the anthers, the  
four seeded capsules and short retinacula

Key to the species

- 1. Spikes cylindric ..... serpyllifolia
- 1. Spikes linear ..... prostrata

R. serpyllifolia (Benth. ex Clarke) Bremek. in Verh.

Nederl. Akad. Wet. 45(2):62. 1948; Sreen. & Agarw.  
in Bull. Bot. Sur. Ind. 5:85. 1963. Justicia simplex  
var. serpyllifolia Benth. ex Clarke in Hook. f. Fl.  
Brit. Ind. 4:539. 1885. J. serpyllifolia (Benth. ex  
Clarke) Gamb. Fl. Pres. Madr. 1080. 1924.

Diffuse or Prostrate herbs, rooting at lower  
nodes; stem 4-angled, villous, zig zag; leaves ovate  
or rounded; spikes cylindric, 2-4 cm long; bracts and  
bracteoles linear, ciliate; calyx lobes 4; stamens 2,  
anther cells superposed, lower cell spurred; capsules  
4-seeded.

A very common weed on the grassy slopes.

Flowers: Aug. - Dec.

Sivarajan 284.

R. prostrata (Clarke) Majumdar in Bull. Bot. Soc. Beng.  
25:75. 1971. Justicia diffusa var. prostrata Clarke  
in Hook. f. Fl. Brit. Ind. 4:538. 1885. J. prostrata  
(Clarke) Gamb. Fl. Pres. Madr. 1081. 1924.

Prostrate or diffuse herbs, rooting at lower  
nodes; leaves orbicular or ovate, small; spikes linear,  
2-4 cm long; bracts and bracteoles shorter than the  
calyx lobes; flowers pink; capsules short.

Common along the railway embankments. Collected  
from Calicut city.

Flowers: Aug. - Dec.

Sivarajan 550, 1347.

Barleria Linn.

Key to the species

1. Plants armed with prickles:
  2. Leaves obovate, up to 2 cm long ..... mysorensis
  2. Leaves elliptic, much larger ..... prionites
1. Plants without prickles:
  3. Outer sepals spinous toothed ..... cristata



3. Sepals not spinous toothed:

4. Bracts linear, reflexed ..... involucrata

4. Bracts ovate, not reflexed ..... strigosa

B.mysorensis Heyne in Roth, Nov. Sp. Pl. 313. 1821; FBI.  
4:484. 1884; Gamb. 742. B.bispinosa Nees in Wall. Pl.  
As. Rar. 3:94. 1832 & in DC. Prod. 11:241. 1847,  
(non Vahl).

Tomentose shrubs with long, intrapetiolar spines;  
leaves ovate-mucronate; flowers large, pink; 2 outer  
sepals much larger, ovate, spinous-denticulate; corolla  
lobes 5, subequal; perfect stamens 2; capsules oblong,  
4 seeded.

A common plant on the road sides and waste  
places.

Flowers: Sept. - Mar.

Sivarajan 808.

B.prionites Linn. Sp. Pl. 636. 1753; FBI. 4:482; 1884;  
Sant. in Bot. Mem. Uni. Bomb. 2:57. 1952 & Fl. Khand.  
201. 1967; Gamb. 741.

Spinous undershrubs; leaves elliptic-acute, up  
to 10.5 x 5 cm; flowers yellow, solitary in the lower

axils and spikate above; sepals entire, spinous-tipped; capsules ovoid, 2-seeded.

Common on hedges and road sides. Collected from Feroke.

Flowers: Sept. - Dec.

Sivarajan 732.

B.cristata Linn. Sp. Pl. 636. 1753; FBI. 4:488. 1884;  
Sant. in Bot. Mem. Uni. Bomb. 2:60. 1952 & Fl.  
Khand. 201. 1967; Gamb. 743.

Tomentose, woody plants; leaves dense tomentose, elliptic-oblong, up to 6.5 x 2.4 cm; flowers pink, in axillary cymes; bracts and sepals spinous-denticulate; capsules 4-seeded.

Flowers: Sept. - Mar.

Sivarajan 1799.

B.involucrata Nees in Wall. Pl. As. Rar. 3:92. 1832 &  
in DC. Prod. 11:232. 1847; FBI. 4:485. 1884; Sant.  
in Bot. Mem. Uni. Bomb. 2:60. 1952; Gamb. 742.

Undershrubs; leaves elliptic-lanceolate, flowers purple in axillary cymes; calyx lobes acute, outer larger, ovate; capsules 4-seeded.

Flowers: Sept. - Mar.

Sivarajan 1469.

B. strigosa Willd. Sp. Pl. 3:379. 1800; FBI. 4:489. 1884; Gamb. 743. B. caerulea Roxb. [ Hort. Beng. 45. 1814, nom. nud. ] Fl. Ind. 3:39. 1832; Nees in Wall. Pl. As. Rar. 3:91. 1832 & in DC. Prod. 11:26. 1847.

Woody shrubs; leaves ovate-lanceolate, up to 15 x 6.2 cm; flowers deep blue in axillary, dense, one-sided spikes; bracts large, imbricate, ovate-oblong; outer sepals ovate, denticulate; capsules 4-seeded.

Flowers: Aug. - Dec.

Sivarajan 1503.

Acanthus Linn.

A. ilicifolius Linn. Sp. Pl. 639. 1753; FBI. 4:481. 1884; Sant. in Bot. Mem. Uni. Bomb. 2:16. 1952; Gamb. 712. Dilivaria ilicifolia (Linn.) Juss. Gen. 103. 1789.

Armed shrubs; leaves pinnately lobed, lobes ending in spines; flowers blue in dense, terminal spikes; capsules ovoid; seeds spongy.

Common on the river banks and in salt marshes of Kallai, Feroke and Beypore.

Flowers: Mar. - June

Sivarajan 1055.

Asystasia Blume

Key to the species

- 1. Bases of leaves rounded or subcordate .... gangetica
- 1. Bases of leaves narrowed:
  - 2. Leaves glabrous ..... chelenoides
  - 2. Leaves pubescent ..... dalzelliana

A.gangetica (Linn.) Anders. in Th. En. 235. 1860; Sant. in Bot. Mem. Uni. Bomb. 2:68. 1952; Gamb. 744.

Justicia gangetica Linn. Amoen. Acad. 4:299. 1759.

Asystasia coromandelina Wt. ex Nees in Wall. Pl. As. Rar. 3:89. 1832; FBI. 4:493. 1884. A.violacea Dalz. in Kew J. Bot. 2:139. 1850 (non Dalz. ex Clarke).

Diffuse, pubescent herbs; leaves ovate-acute or shortly acuminate; flowers purple, in terminal,

1-sided racemes; sepals linear-lanceolate; stamens 4, both the anther cells perfect; capsules elliptic, stalked, 4-seeded; seeds compressed.

Flowers: Aug. - Dec.

Sivarajan 1442.

A.chelenoides Nees in Wall. Pl. As. Rar. 3:89. 1832;

FBI. 4:493. 1884; Gamb. 744.

A straggling herb; leaves elliptic or ovate-lanceolate, base narrowed, glabrous; flowers pale purple in terminal, secund, paniculate racemes; capsules 4-seeded.

Flowers: Aug. - Dec.

Sivarajan 497, 1393.

A.dalzelliana Sant. in Kew Bull. 1948:276. 1948 & Fl.

Khand. 204. 1967; Sreen. & Agarw. in Bull. Bot. Sur.

Ind. 5:82. 1963. A.violacea Dalz. ex Clarke in Hook.

f. Fl. Brit. Ind. 4:494. 1884 (non Dalz. 1850);

Gamb. 745.

Erect or diffuse, tomentose herbs; leaves elliptic-acute, pubescent; flowers lilac in terminal,

secund racemes; calyx segments linear; capsules 2-2.5 cm long.

Flowers: Aug. - Dec.

Sivarajan 316.

Crossandra Salisb.

C. infundibuliformis (Linn.) Nees in Wall. Pl. As. Rar.

3:98. 1832; Sant. in Bot. Mem. Uni. Bomb. 2:55. 1951;

Napper in Kew Bull. 24:336. 1970. Justicia infundi-

buliformis Linn. Sp. Pl. 21. 1753. Crossandra

undulaefolia Salisb. Parad. Lond. t. 12. 1805; FBI.

4:492. 1884; Gamb. 739.

Woody shrubs; leaves ovate-lanceolate; flowers orange-yellow in dense, bracteate, terminal spikes; bracts closely imbricating, ciliate; sepals 5, the outer larger, ovate; corolla limb unilateral, subequally 5-lobed; stamens 4; anthers 1-celled; capsules oblong-acute; seeds 4, compressed.

Flowers: Jan. - Sept.

Sivarajan 839.

Note: Napper (loc.cit.) has recognised 3 subspecies based mainly on the bracts and bracteoles.

The author's specimen with its elliptic-acute bracts and bracteoles as long as the bracts, falls under the ssp. infundibuliformis.

Phaulopsis Willd.(nom.cons.)

P.dorsiflora (Retz.) Sant. in Kew Bull. 1948:276. 1948  
& in Bot. Mem. Uni. Bomb. 2:30. 1951 & Fl. Khand.  
197. 1967. Ruellia dorsiflora Retz. Obs. 6:31. 1791.  
Micranthus oppositifolia Wendl. Bot. Beobacht. 39.  
1788. Gamb. 718. Phaulopsis imbricata (Forsk.)  
Cordem. Fl. Reun. 496. 1895 (non Sweet, 1827).  
Micranthus dorsiflorus (Retz.) Fischer in Kew Bull.  
1932:63. 1932.

Pubescent, woody herbs; leaves very variable in unequal pairs; flowers white, small in dense, bracteate, 1-sided spikes at the tips of branches; bracts orbicular, closely imbricating; calyx 5-partite, one ovate, others linear-subulate; stamens 4, anthers 2-celled; capsules clavate, compressed; seeds 4, compressed.

Flowers: Aug. - Dec.

Sivarajan 55, 804.

The author's specimen with its elliptic-acute bracts and bracteoles as long as the bracts, falls under the ssp. infundibuliformis.

Phaulopsis Willd. (nom. cons.)

P. dorsiflora (Retz.) Sant. in Kew Bull. 1948:276. 1948  
& in Bot. Mem. Uni. Bomb. 2:30. 1951 & Fl. Khand.  
197. 1967. Ruellia dorsiflora Retz. Obs. 6:31. 1791.  
Micranthus oppositifolia Wendl. Bot. Beobacht. 39.  
1788. Gamb. 718. Phaulopsis imbricata (Forsk.)  
Cordem. Fl. Reun. 496. 1895 (non Sweet, 1827).  
Micranthus dorsiflorus (Retz.) Fischer in Kew Bull.  
1932:63. 1932.

Pubescent, woody herbs; leaves very variable in unequal pairs; flowers white, small in dense, bracteate, 1-sided spikes at the tips of branches; bracts orbicular, closely imbricating; calyx 5-partite, one ovate, others linear-subulate; stamens 4, anthers 2-celled; capsules clavate, compressed; seeds 4, compressed.

Flowers: Aug. - Dec.

Sivarajan 55, 804.



Note: The earliest name for this genus is Micranthus Wendl. (1798). Willdenow (Sp. Pl. 3:342. 1801) replaced the name by Phayloopsis without giving any reason, and this was later corrected by Sprengel (Anliet. ed.2. 2:422. 1817) as Phaulopsis. Later, Ecklon (Top Verz. 43. 1827) gave the name Micranthus to a genus of Iridaceae, and is conserved. Hence Micranthus Wendl. became a nomenclatural synonym of Phaulopsis.

Lepidagathis Willd.

L.incurva Buch.-Ham. ex D. Don, Prod. Fl. Nep. 119. 1825; Sreen. & Agarw. in Bull. Bot. Sur. Ind. 5:83. 1963. L.hyalina Nees in Wall. Pl. As. Rar. 3:95. 1832; FBI. 4:521. 1885; Gamb. 748.

Diffuse or prostrate herbs; leaves elliptic-acute, up to 2.5 x 1.5 cm; flowers white, small in terminal or axillary, clustered, pubescent heads; bracts hyaline, ciliate; calyx lobes 5, unequal; stamens 4; capsules compressed; seeds flattened.

Flowers: Oct. - May

Sivarajan 198.

Staurogyne Wall.

Key to the species

1. Branches trailing ..... zeylanica  
1. Branches not trailing ..... glauca

S.zeylanica (Nees) Kuntze, Rev. Gen. Pl. 497. 1891;  
Sant. in Bot. Mem. Uni. Bomb. 2:13. 1952; Gamb. 710.  
Ebermaiera zeylanica Nees in DC. Prod. 11:74. 1847;  
FBI. 4:397. 1884.

Herbaceous plants with trailing branches; leaves  
all opposite, elliptic-obtuse; flowers purplish in  
terminal or axillary spikes; bracts obovate; bracteoles  
linear; calyx lobes 5, subequal; stamens 4; capsules  
oblong; seeds many, globose, pitted.

Flowers: Oct. - Jan.

Sivarajan 910.

S.glauca (Nees) Kuntze, Rev. Gen. Pl. 497. 1891; Sant.  
in Bot. Mem. Uni. Bomb. 2:13. 1952; Gamb. 710.  
Ebermaiera glauca Nees in Hook. Comp. Bot. Mag.  
2:310. 1836; FBI. 4:395. 1884.

Erect, viscid-pubescent herbs; branches not trailing; leaves alternate, oblanceolate-spathulate; flowers purplish in axillary or terminal spikes; bracts spathulate; bracteoles linear; seeds globose, not pitted.

Flowers: Oct. - Jan.

Sivarajan 37.

Hygrophila R. Br.

Note: This pantropical genus was divided into two subgenera, namely Euhygrophila and Asteracantha by C.B. Clarke (Hook.f. Fl. Brit. Ind. 4:406-408. 1884) based on the spines, calyx morphology and the number of seeds per capsule. Nees (Wall. Pl. As. Rar. 3:75. 1832) treated Asteracantha as a separate genus, and this was followed by many subsequent workers. Recently Heine (Kew Bull. 16:173. 1962) has discussed at length the taxonomic position of Asteracantha and has reverted it again as a subgeneric taxa under Hygrophila, because of the inadequacy of these characters for generic separation.

Key to the species

- 1. Plants armed with spines ..... auriculata
- 1. Plants not armed:
  - 2. Leaves lanceolate-acute ..... angustifolia
  - 2. Leaves elliptic or oblanceolate-  
obtuse ..... erecta

H.auriculata (Schum.) Heine in Kew Bull. 16:173. 1962;  
Sreeniv. & Agarw. in Bull. Bot. Sur. Ind. 5:83. 1963;  
Chavan & Oza, Fl. Pavagadh 175. 1966; Sant. 194-95.  
1967. Barleria auriculata Schum. in Schum. & Thonn.  
Besker Guin. Pl. 285. 1827. B.longifolia Linn. Cent.  
Pl. 2:22. 1756. Asteracantha longifolia (Linn.)  
Nees in Wall. Pl. As. Rar. 3:90. 1832; Sant. 173.  
1960; Gamb. 712. A.auriculata (Schum.) Nees in DC.  
Prod. 11:248. 1847. Hygrophila spinosa Anders. in  
Th. En. 225. 1860; FBI. 4:408. 1884.

Hispid herbs; leaves narrowly lanceolate, in  
whorls of 6, with axillary spines; flowers blue, clus-  
tered in the axils; calyx lobes 4, unequal; stamens 4,  
anthers 2-celled; capsules linear-oblong; seeds 4-8.

Common in marshy fields and on the banks of ponds.

Flowers: Aug. - Dec.

Sivarajan 557.

H.angustifolia R. Br. Prod. 479. 1810; Gamb. 713.

H.salicifolia Nees in Wall. Pl. As. Rar. 3:81.

1832; FBI. 4:407. 1884.

Herbs; leaves narrowly lanceolate-acute, glabrous, about 8.5 x 1 cm in size; flowers purplish, clustered in the axils; bracteoles lanceolate-acute, ciliate; capsules linear, longer than the calyx; seeds 10-15.

Common in wet fields or on the banks of streams and ponds in low lands.

Flowers: Sept. - Dec.

Sivarajan 469.

H.erecta (Burm.f.) Hochr. in Candollea 5:230. 1934;

Sreen. & Agarw. in Bull. Bot. Sur. Ind. 5:83. 1963;

Back & Bakh. f. Fl. Java 2:270. 1965. Ruellia erecta

Burm. f. Fl. Ind. 135. 1784. H.quadrivalvis Nees in

Wall. Pl. As. Rar. 3:80. 1832; FBI. 4:408. 1885;

Gamb. 714.

Woody herbs; leaves elliptic to oblanceolate, obtuse; flowers purplish in axillary clusters; bracteoles oblong-obtuse; capsules almost twice as long as the calyx; seeds many, retinacula hooked.

In marshy fields and on the banks of ponds  
and streams.

Flowers: Aug. - Dec.

Sivarajan 726.

Ruellia Linn. (emend. Bremek.)

R. tuberosa Linn. Sp. Pl. 635. 1753; Bremek. in Verh.  
Ned. Akad. Wet. (2) 45 (1):11. 1948; Sant. in Bot.  
Mem. Uni. Bomb. 2:23. 1952; Gamb. 714.

Small, erect herbs; leaves ovate or elliptic,  
obtuse, up to 12 x 5 cm; flowers deep blue, large,  
showy in axillary cymes; capsules 2.5 cm long.

Flowers: Mar. - July

Sivarajan 1149.

Dipteracanthus Nees (emend. Bremek.)

Key to the species

1. Leaves obtuse ..... patulus  
1. Leaves acute ..... prostratus

D.patulus (Jacq.) Nees in Wall. Pl. As. Rar. 3:81.

1832; Bremek. in Verh. Ned. Akad. Wet. (2) 45  
(1):16. 1948; Sant. in Bot. Mem. Uni. Bomb. 2:24.  
1952; Mahes. 273. Ruellia patula Jacq. Misc. Bot.  
2:358. 1781; FBI. 4:412. 1884; Gamb. 714.

Tomentose herbs; leaves ovate-obtuse, pubescent; flowers rose-pink, 1-3 in the axils; calyx lobes lanceolate, acute with setose margins; stamens 4, anthers 2-celled; capsules clavate; seeds discoid, margined and hygroscopically hairy on hooked retinacula.

Flowers: Aug. - Dec.

Sivarajan 1816.

D.prostratus (Poir.) Nees in Wall. Pl. As. Rar. 3:81.

1832; Bremek. in Verh. Ned. Akad. Wet. (2) 45  
(1):16. 1948; Sant. in Bot. Mem. Uni. Bomb. 2:24  
1952 & Fl. Khand. 196. 1967. Ruellia prostrata Poir.  
in Lamk. Encycl. Meth. Bot. 6:349. 1804; FBI. 4:411.  
1884; Gamb. 714.

Diffuse herbs, sometimes rooting at the lower nodes; leaves ovate-acute; flowers rose-pink, solitary in the axils; calyx lobes linear, ciliate; capsules

slightly pubescent.

Flowers: Aug. - Dec.

Sivarajan 556.

THUNBERGIACEAE van Tiegh.

Thunbergia Retz. (nom. cons.).

Key to the species

1. Climbers ..... grandiflora  
1. Erect shrubs ..... erecta

T. grandiflora (Roxb. ex Rottl.) Roxb. ∩ Hort. Beng.  
45. 1814, nom. nud. ∩ in Lodd. Bot. Cab. t. 324.  
1819 & Fl. Ind. 3:34. 1832; FBI. 4:392. 1884;  
Bremek. in Verh. Neder. Akad. Wet. 50(4):45-46.  
1955; Sant. 194. 1967; Gamb. 708. Flemingia  
grandiflora Roxb. ex Rottl. in Nov. Act. Nat.  
Cur. 4:202. 1803.

Climbing shrubs; leaves ovate-cordate,  
distantly dentate; flowers large, blue or white in



axillary racemes; bracts spathaceous, dense-tomentose; bracteoles falcate; stamens 4, anthers 2-celled; capsules globose, beaked; seeds 4, globose; retinacula absent.

Flowers: Aug. - Jan.

Sivarajan 833, 1443.

T. erecta (Benth.) T. Anders. in J. Linn. Soc. 7:18. 1864; Bremek. in Verh. Neder. Akad. Wet. 50(4):37. 1955; Mahes. 265; Gamb. 708. Meyenia erecta Benth. in Hook. Niger. Fl. 476. 1846.

Woody shrubs; leaves elliptic to ovate-lanceolate; flowers deep purple, showy, solitary in the axils; bracts ovate; calyx annular, many toothed.

Flowers: most part of the year.

Sivarajan 1408.

VERBENACEAE Jaume St. Hil.

Key to the genera

1. Flowers purplish or blue:
  2. Plants densely stellate-tomentose ... Callicarpa
  2. Plants not stellate-tomentose:
    3. Flowers in spikes ..... Stachytarpheta
    3. Flowers not in spikes:
      4. Calyx purple ..... Petrea
      4. Calyx not purple:
        5. Leaves simple ..... Duranta
        5. Leaves digitately 1-7-foliolate .... Vitex
  1. Flowers not purplish or blue:
    6. Stamens included:
      7. Flowers in pendulous racemes ..... Citharexylum
      7. Flowers not in racemes:
        8. Shrubs:
          9. Flowers capitate ..... Lantana
          9. Flowers in corymbose cymes.. Premna
        8. Creeping herbs ..... Phyla

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The author is thankful to Prof. Harold N. Moldenke, Honorary Curator, New York Botanic Gardens, for the identification and critical comments on the Verbenaceae and Avicenniaceae specimens and also for his encouragements.

VERBENACEAE Jaume St. Hil.

Key to the genera

1. Flowers purplish or blue:
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    3. Flowers in spikes ..... Stachytarpheta
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      4. Calyx purple ..... Petrea
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foliolate .... Vitex
1. Flowers not purplish or blue:
  6. Stamens included:
    7. Flowers in pendulous racemes ..... Citharexylum
    7. Flowers not in racemes:
      8. Shrubs:
        9. Flowers capitate ..... Lantana
        9. Flowers in corymbose cymes.. Premna
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6. Stamens exerted:

10. Drupe enclosed in the enlarged calyx.. Tectona

10. Drupe not enclosed in calyx ..... Clerodendrum

Callicarpa Linn.

C.tomentosa (Linn.) Murray, Syst. Veg. (ed.13) 130.

1774; Mold. in Feddes Repert. 40:106. 1936; Meeuse

in Blumea 5:71. 1942; Mold. in Phytologia 22:281.

1972. Tomex tomentosa Linn. Sp. Pl. 118. 1753.

Callicarpa lanata Linn. Mant. 2:331. 1771; FBI.

4:567. 1885; non sensu Gamb. 1878.

Densely tomentose shrubs; leaves broadly elliptic, acute or acuminate, glabrescent above, densely stellate-tomentose beneath; flowers rose-purple in axillary, corymbose cymes; peduncle and calyx stellate-hairy; fruits small, purple or black, 2-4-seeded.

Usually found along the banks of streams or waterways on the hill slopes.

Flowers: Nov. - Mar.

Sivarajan 809.

Stachytarpheta Vahl (nom.cons.)

Key to the species

1. Leaves ovate-acute ..... mutabilis  
1. Leaves elliptic-obtuse ..... jamaicensis

S.mutabilis (Jacq.) Vahl, En. 1:208. 1805; Bor and  
Raizada in J. Bombay nat. Hist. Soc. 43:294. 1942;  
Cooke<sup>2</sup> 501; Gamb. 763. Verbena mutabilis Jacq.  
Collect. 5(2):334. 1788.

Much branched shrubs; leaves ovate-acute,  
serrate, scabrous; flowers in the excavations of the  
terminal spikes, deep purple; bracts linear; calyx  
4-5-toothed; corolla tube slender, 1-1.5 cm long;  
perfect stamens 2; fruits enclosed in the calyx,  
separating into 2; 1-seeded pyrenes.

Common on hedges on grassy slopes.

Flowers: May - Dec.

Sivarajan 1475.

S.jamaicensis (Linn.) Vahl, En. 1:206. 1804; Meeuse  
in Blumea 5(1):70. 1942; Mahes. 285. Verbena  
jamaicensis Linn. Sp. Pl. 19. 1753.

Much branched shrubs; leaves elliptic, crenate-serrate, glabrous; flowers in the excavations of the terminal spikes as in the previous species, blue.

Common weed on road sides and waste places along the hills and slopes.

Flowers: Aug. - Dec.

Sivarajan 498.

Petrea Linn.

P. volubilis Linn. Sp. Pl. 626. 1753; Cooke<sup>2</sup> 518; Gamb.

774.

Climbing shrubs; leaves oblong or elliptic, scabrid, prominently reticulate; flowers in pendulous racemes; calyx purple, persistent, lobes oblong, spreading; corolla tube short, cylindrical; stamens 4; drupe 2-seeded and enclosed in the calyx.

Flowers: Dec. - Jan.

Sivarajan 838.

Duranta Linn.

D.repens Linn. Sp. Pl. 673. 1753; Sant. 191. 1960 &  
215. 1967. D.plumieri Jacq. Select. Stirp. Arn.  
186. 1763; FBI. 4:560. 1885; Cooke 2518; Gamb. 774.

Shrubs; branches often spiny; leaves ovate or elliptic, obtuse, serrate; flowers in simple or panicled racemes, blue; calyx persistent; corolla tube longer than the calyx; drupes yellow.

A common shrub, grown on hedges and cultivated in gardens.

Flowers: May - Sept.

Sivarajan 1176, 1204.

Vitex Linn.

Key to the species

1. Petiole winged ..... altissima
1. Petiole not winged:
  2. Leaflets lanceolate-acuminate:
    3. Plants glabrous ..... leucoxyton
    3. Plants densely tomentose ..... nigundo
  2. Leaflets elliptic or oblanceolate,  
obtuse ..... trifolia

V. altissima Linn. f. Suppl. 294. 1781; FBI. 4:584.

1885; Gamb. 772; Mold. in Phytologia 15:226. 1967  
& 16:495. 1968, forma alata (Willd.) Mold. in  
Phytol. 22:126. 1971. V. alata Willd. in Ges. Naturf.  
Fr. New Schr. 4:203. 1803; FBI. 4:584. 1885.

Trees; leaves 3-5-foliolate; leaflets lanceo-  
late-acuminate, sessile, glabrous; petioles broadly  
winged; cordate at base; flowers pale blue in large,  
terminal panicles; calyx villous; drupe subglobose,  
1 cm across, purple when ripe.

Flowers: Mar. - May

Sivarajan 1855.

V. leucoxydon Linn. f. Suppl. 293. 1781; FBI. 4:587.

1885; Sant. 189. 1960; Sen & Naskar in Bull. Bot.  
Sur. Ind. 7:60. 1965; Sebastine & Ramamurty in  
Bull. Bot. Sur. Ind. 8:180. 1966; Mold. in Phyto-  
logia 15:253, 316. 1967 & 16:500-501. 1968 &  
17(1):8-9. 1968.

Small trees; leaves digitately 3-5-foliolate;  
leaflets lanceolate-acute, glabrous above, downy  
beneath, up to 15 x 5 cm; flowers white in lax, axillary,  
dichasial cymes; calyx 5-toothed; corolla with purplish



hairs; drupes 2.5-3 cm across, subglobose or obovoid.

A rare species found along the river banks.  
Collected from Kunnamangalam.

Flowers: Mar. - May

Sivarajan 962.

V.nigundo Linn. Sp. Pl. 638. 1753; FBI. 4:583. 1885;

Sant. 189. 1960; Mold. in Phytologia 15:304-11.

1967; & 16:493-95, 500-501 & 17:12-13. 1968.

V.trifolia Grah. Cat. 155. 1839, (non Linn.).

Shrubs or small trees leaves 3-5-foliolate;  
leaflets lanceolate, 12 x 4 cm, pubescent beneath;  
flowers blue in terminal, thyrsoid panicles; drupes  
ovoid, 1 cm long, black when ripe.

A common aromatic plant.

Flowers: Mar. - Nov.

Sivarajan 142, 252, 1183, 1206, 1327.

Note: The author's collections of this species  
include two distinct forms. One of them, the typical  
of the species, is grey-pubescent on the branches, under  
surface of leaves, panicles and flowers. The flowers  
are light purple with a pinkish tube. The throat of the

corolla and the staminal filaments at base are grey hairy. The other form displays deep purple pubescence and deep purple flowers. The throat of the corolla has a mixed pubescence of both grey and purple. Staminal filaments are purple hairy at base.

No Indian Flora has given any reference to the latter. Prof. H.N. Moldenke in a personal communication to the author has confirmed that no such form has been named so far. It might be that it is very difficult to distinguish them in the Herbarium. where Of late, Dr. Harold N. Moldenke has published this purple-pubescent specimen as a new variety with the name Vitex negundo, var. purpurascens Moldenke (Phytologia 28: 404. 1974).

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V. trifolia Linn. Sp. Pl. 638. 1753; FBI. 4:583. 1885; Gamb. 771; Mold. in Phytologia 8:87-88. 1961; 15:78, 267. 1967; 16:495. & 17:47-49. 1968.

Key to the varieties

- 1. Leaves usually 3-foliolate ..... var. subtrisecta
- 1. Leaves invariably 1-foliolate ..... var. simplicifolia

V. trifolia, var. subtrisecta (Kuntze) Mold. in Phytologia 8:88. 1961. Vitex agnus-castus var. subtrisecta Kuntze,

Rev. Gen. Pl. 2:510 & 511. 1891. V.trifolia Linn..

FBI. 4:583. 1885; Gamb. 771., in part.

Shrubs; leaves usually 3-(2-1)-foliolate; leaflets elliptic or obovate-oblongate, obtuse, glabrous above, dense-tomentose beneath, the middle leaflet much exceeding the laterals; flowers pale-purple in terminal panicles; drupes subglobose, purplish when ripe.

Flowers: May - Dec.

Sivarajan 1199, 1298, 1299.

V.trifolia var. simplicifolia Cham. in Linnaea 7:107.

(as V.trifolia  $\beta$  simplicifolia) 1832. V.trifolia Linn., FBI. 4:583. 1885; Gamb. 771, in part.

Shrubs; leaves much smaller than in the earlier variety, elliptic to ovate-orbicular, dense-tomentose beneath; flowers pale purple in terminal panicles.

Flowers: May - Dec.

Sivarajan 485, 1301.

Citharexylum Mill.

C.spinosum Linn. Sp. Pl. 2:625. 1753. C.subserratum

auct. non Sw.

Shrubs or small trees; leaves elliptic-oblong, acute or obtuse, entire or minutely dentate; flowers small, white in pendulous racemes; short-pedicelled; calyx small, minutely toothed; corolla throat villous; fruits not seen.

Commonly cultivated on hedges and at times in gardens, never set fruits.

Flowers: July - Sept.

Sivarajan 1084.

Note: This genus is represented in India by a single cultivated species, very often erroneously treated under C.subserratum Sw., now known as C.fruticosum var. subserratum (Sw.) Moldenke. However regarding the identity of the Indian material, Prof. Moldenke, in a personal communication to the author has written: "I have never come across this species from India. All the numerous specimens I have seen from India, which are originally labelled C.subserratum have proved to be nothing more than the commonly cultivated C.spinosum Linn."

Lantana Linn.

L.camara Linn. Sp. Pl. 627. 1753, var. aculeata (Linn.)

Mold. in Torreyia 9:34. 1934. Sant. 211. 1967;

Mathew in Rec. Bot. Sur. Ind. 20:180. 1969.

L.aculeata Linn. Sp. Pl. 627. 1753; Gamb. 761.

L.camara auct., non Linn., FBI. 4:562. 1885.

Straggling, prickly shrubs; leaves ovate-acute, serrate, scabrous; flowers orange-red in pedunculate heads; bracts lanceolate; calyx small; corolla tube cylindric, curved, pubescent outside; drupes subglobose, 2.5 mm across.

A very common weed on hedges and on the grassy slopes. Several chimeral varieties with variously coloured flowers are available.

Flowers: Dec. - July

Sivarajan 1062.

Premna Linn.(nom.cons.)

1. Shrubs or small trees ..... latifolia

1. Woody herbs ..... obtusifolia

P.latifolia Roxb. [Hort. Beng. 46. 1814, nom. nud.]

Fl. Ind. 3:76. 1832, var.viburnoides Clarke in Hook.

f. Fl. Brit. Ind. 4:758. 1885; Lamk. in Bull. Jard.

Bot. Buitenz. (Ser.3) 3:44. 1921; Gamb. 767.

Shrubs or small trees; leaves ovate or elliptic, shortly obtusely acuminate at apex, entire or obscurely dentate, glabrescent; corymbs terminal on the branchlets; flowers greenish white; drupes subglobose.

Flowers: May - Sept.

Sivarajan 1173, 1720.

P.obtusifolia R. Br. Prod. 512. 1810; Mold. in Phytologia 23(5):423. 1972.

Diffusely branched or erect herbs; leaves ovate to obovate, serrate, glabrous; flowers greenish white in terminal corymbs; drupes purple when mature.

Common on the hard rocky hill-slopes, among bushes.

Flowers: Dec. - Jan.

Sivarajan 950.

Phyla Lour.

P.nodiflora (Linn.) Greene in Pittonia 4:46. 1899; Chavan & Oza, Fl. Pavagadh 185. 1966; Sant. 211. 1967. Verbena nodiflora Linn. Sp. Pl. 20. 1753.

Lippia nodiflora (Linn.) A. Rich. in Michx. Fl.

Bor. Amer. 2:15. 1803; FBI. 4:563. 1885; Gamb. 762.

Creeping herbs, rooting at the nodes; leaves obovate or spatulate, narrowed at base, serrate; flowers minute, pale pink or white, sessile in long-peduncled heads; fruits globose, dry, splitting into 2, 1-seeded pyrenes, 1-1.5 mm across.

Common in wet or marshy fields, on the river banks, and also in sandy beach.

Flowers: Aug. - Mar.

Sivarajan 113, 443.

Tectona Linn. (nom.cons.)

T. grandis Linn. f. Suppl. 151. 1781; FBI. 4:570. 1885;

Cooke 2:424.

Tall trees; leaves large, obovate, acute or acuminate; flowers greenish yellow in large, terminal panicles; calyx stellate-tomentose; corolla white; fruits globose, with dense, stellate pubescens outside.

Flowers: Aug. - Sept.

Sivarajan 1827.

A.indica (Linn.) Kuntze, var.albiflora (Hassk.) Back.

in Back. & Bakh. f. Fl. Java 2:624. 1965; Sivaraman & Manilal in Proc. Natl. Acad. Sc. Ind. II. 42(B):225-26. 1972.

An aromatic undershrub, rather indistinguishable from the var.indica in the vegetative condition, but recognised by the uniformly greenish white flowers. (Plate 19.)

Backer (loc.cit.) has reported this variety from Djakarta, Indonesia. First reported from India by Sivaraman and Manilal (loc.cit.). This <sup>is</sup> common in this region.

Flowers: Oct. - Jan.

Sivaraman 1576.

NYCTAGINACEAE Juss.

Key to the genera

1. Flowers with petaloid bracts ..... Bougainvillea
1. Flowers without petaloid bracts:
  2. Fruits ovoid, rugose ..... Mirabilis
  2. Fruits clavate, not rugose ..... Boerhaavia



Bougainvillea Comm. ex Juss. (nom.cons.)

B.spectabilis Willd. Sp. Pl. 2:348. 1799; Sant. 196.

1960; Chavan & Oza, Fl. Pavagadh 193. 1966; Gamb. 815.

Armed, straggling shrubs; leaves ovate-acuminate; flowers in triads, aggregated in axillary cymes, each subtended by an ovate-acute, petaloid bract.

Many horticultural varieties are common under cultivation.

Flowers: Dec. - Mar.

Sivarajan 1831.

Mirabilis Linn.

M.jalapa Linn. Sp. Pl. 177. 1753; Sant. 196. 1960.

Herbs with tuberous rootstocks; leaves ovate-lanceolate, glabrous; flowers deep crimson, funnel like in terminal cymes; perianth tube long and cylindrical, limb spreading; fruits black, ovoid, rugose.

Flowers: throughout the year.

Sivarajan 1832.

Boerhaavia Linn.

Key to the species

1. Flowers white ..... erecta  
1. Flowers pink ..... diffusa

B. erecta Linn. Sp. Pl. 3. 1753; Nair in Bull. Bot. Sur.

Ind. 9:283. 1967. B. punarnava Saha & Krishnamurthy  
in J. Bombay nat. Hist. Soc. 61:217-18. 1964; Nair  
& Nair in J. Bombay nat. Hist. Soc. 61:216-17. 1964.

Erect or suberect herbs; leaves ovate or  
lanceolate in unequal pairs; flowers white; fruits  
clavate, truncate at the tip, eglandular.

Common along the railway embankments. Collected  
from West Hill.

Flowers: Aug. - Dec.

Sivarajan 582.

B. diffusa Linn. Sp. Pl. 3. 1753; FBI. 4:709. 1885; Sant.  
196. 1960; Gamb. 814.

Diffuse herbs; leaves ovate-obtuse in unequal  
pairs; flowers pink; fruits clavate, obtuse and glandular.

This medicinal herb is common in moist shaded areas.

Flowers: Sept. - Mar.

Sivarajan 106.

AMARANTHACEAE Juss.

Key to the genera

1. Flowers unisexual:
  2. Leaves alternate ..... Amaranthus
  2. Leaves opposite ..... Iresine
1. Flowers bisexual:
  3. Flowers dimorphic:
    4. Staminodes present ..... Cyathula
    4. Staminodes absent ..... Pupalia
  3. Flowers monomorphic:
    5. Staminodes present:
      6. Sepals not spinous-tipped ... Aerva
      6. Sepals spinous-tipped ..... Achyranthes
    5. Staminodes absent:
      7. Leaves opposite:
        8. Stigma capitate ..... Alternanthera
        8. Stigma 2-lobed ..... Gomphrena

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The author is thankful to Dr. Mohinder Pal, National Botanic Gardens, Lucknow, for his kind helps in confirming the identification of the Amaranthaceae specimens.

7. Leaves alternate:

9. Seed 1 in each utricle ..... Allmania

9. Seeds 2 or more in each utricle ..... Celosia

Amaranthus Linn.

Key to the species

1. Plants armed with spines ..... spinosus

1. Plants unarmed:

2. Flowers in terminal spikes ..... viridis

2. Flowers in sessile, axillary  
clusters ..... tricolor

A. spinosus Linn. Sp. Pl. 991. 1753; Burm. f. Fl. Ind.  
200. 1768; FBI. 4:718. 1885; Ridl. Fl. Mal. Pen.  
3:6. 1924; Back. in Fl. Males. 4(2):78. 1949; Duke  
in Ann. Miss. Bot. Gard. 4:18. 1961.

Much branched herbs, armed with axillary spines;  
leaves ovate-lanceolate, acute or obtuse; flowers green  
in axillary clusters or in terminal, paniculate spikes;  
utricle circumscissile, rugose, as long as the sepals;  
seeds shining black, 1 mm across.

Flowers: Sept. - Nov.

Sivarajan 738.

A.viridis Linn. Sp. Pl. (ed.2) 1405. 1763; Benth. Fl. Austr. 5:215. 1870; FBI. 4:720. 1885; Merr. in Am. J. Bot. 23:611. 1936; Steenis in Fl. Males. 4:594. 1954; Sant. 222. 1967. A.gracilis Desf. Tabl. Ec. Bot. 43. 1804; Back. in Fl. Males. 4(2):76. 1949.

Erect or diffuse herbs; leaves ovate to lanceolate; flowers green in slender, terminal or axillary, paniculate spikes; stamens 2-3, utricle indehiscent; seeds black, 1 mm across.

Flowers: Aug. - Dec.

Sivarajan 679.

A.tricolor Linn. Sp. Pl. 989. 1753; Merr. & Chum. in Sunyatsenia 5:51. 1940; Back. in Fl. Males. 4(2):77. 1949. A.mangostanus Linn. Cent. Pl. 1:32. 1755; FBI. 4:720. 1885; Ridl. Fl. Mal. Pen. 3:6. 1924.  
A.polygamus Linn. Cent. Pl. 1. t. 32. 1755.  
A.gangeticus Linn. Syst. (ed.10) 2:1268. 1759; FBI. 4:719. 1885.

Erect or diffuse, much branched herbs; leaves ovate-acute; flowers green in capitate, axillary clusters,

~~forming~~<sup>and</sup> large, terminal spikes.

Flowers: Aug. - Dec.

Sivarajan 1567.

Iresine P.Browne (nom.cons.)

I.herbstii Hook. f. in Gard. Chron. 654:1206. 1864;

Back. in Fl. Males. 4(2):97. 1949.

Erect herbs; leaves ovate or orbicular, obtuse and emarginate at apex; flowers greenish, minute, in terminal, dioecious panicles.

Flowers: Dec. - Jan.

Sivarajan 1588.

Note: Backer (loc.cit.) after examining a good collection of this species from Malesia could find no male flowers and fruits. The specimens at the author's disposal are also exclusively female, and no male flowers could be noticed.

Cyathula Blume (nom.cons.)

C.prostrata (Linn.) Blume, Bijdr. 549. 1825; FBI. 4:723.

1885; Ridl. Fl. Mal. Pen. 3:7. 1924; Back. in Fl.

Males. 4(2):82. 1949; Gamb. 820. Achyranthes prostrata  
Linn. Sp. Pl. (ed.2) 296. 1762; Burm. f. Fl. Ind. 64.  
1768. Pupalia prostrata (Linn.) Mart. Beitr. Amar.  
113. 1825.

Diffuse herbs; leaves **small**, broadly elliptic-  
acute; flowers in clusters of 2-4 in interrupted spikes,  
1-2 of each cluster perfect, the imperfect ones with  
hooked awns; perfect stamens 5, filaments connate at  
base with the staminodes forming a cup; utricle indehiscent.

Flowers: Aug. - Dec.

Sivarajan 570.

Note: Backer (loc.cit.) has distinguished two  
varieties primarily based on the leaves, and the cited  
specimen fits into the var.prostrata.

Pupalia Juss. (nom cons.)

P.lappacea (Linn.) Juss. in Ann. Mus. 2:132. 1803; FBI.

4:724. 1885; Back. in Fl. Males. 4(2):83. 1949.

Achyranthes lappacea Linn. Sp. Pl. 204. 1753.

A.atropurpurea Lamk. Encycl. Meth. Bot. 1:346. 1785.

Pupalia atropurpurea (Lamk.) Moq. in DC. Prod.

13(2):331. 1849; FBI. 4:723. 1885.

Diffuse, hispid herbs; leaves ovate-lanceolate; flowers dimorphic; perfect flowers very few; imperfect ones reduced to awns with long, hooked bristles; utricle compressed, indehiscent.

Flowers: Nov. - Feb.

Sivarajan 858.

Aerva Forsk. (nom.cons.)

Key to the species

- 1. Plants green ..... lanata
- 1. Plants purplish ..... sanguinolenta

A.lanata (Linn.) Juss. in Ann. Mus. 11:131. 1808; Blume, Bijdr. 547. 1825; FBI. 4:728. 1884; Back. in Fl. Males. 4(2):84. 1949; Gamb. 825. Achyranthes lanata Linn. Sp. Pl. 204. 1753.

Erect, dense-tomentose herbs; leaves very variable in shape; flowers white in dense, fascicled, axillary spikes.

A medicinal herb, growing wild and displaying much variability.

Flowers: throughout the year.

Sivarajan 212, 697, 1058, 1295.



A. sanguinolenta (Linn.) Blume, Bijdr. 547. 1825; Back.  
in Fl. Males. 4(2):85. 1949; Chavan & Oza, Fl.  
Pavagadh 197. 1966. Achyranthes sanguinolenta Linn.  
Sp. Pl. (ed.2) 294. 1762. Aerva scandens (Roxb.)  
Wall. [Cat. 6911. 1829, nom. nud.] ex Moq. in DC.  
Prod. 13(2):302. 1849; FBI. 4:727. 1884; Gamb. 825.

A purplish, diffuse or sub-erect plant; leaves  
elliptic-lanceolate, pubescent; flowers in clustered,  
axillary spikes.

Flowers: Sept. - May

Sivarajan 1817.

Achyranthes Linn.

A. aspera Linn. Sp. Pl. 204. 1753; FBI. 4:730. 1885;  
Back. in Fl. Males. 4(2):88. 1949; Gamb. 823.

Erect or diffuse, pubescent herbs; leaves  
obovate to oblanceolate, apiculate; flowers greenish,  
deflexed and distant on terminal spikes with spinous-  
tipped perianth lobes; stamens 2-5, filaments comate  
with the staminodes at the base forming a tube; ~~stamens~~  
indehiscent.

Flowers: Aug. - May

Sivarajan 209, 702.

Alternanthera Forsk.

Key to the species

1. Prostrate or diffuse herbs ..... sessilis  
1. Erect herbs ..... versicolor

A. sessilis (Linn.) DC. Cat. Hort. Monsp. Lond. 77.

1813; R. Br. ex Sweet, Hort, Suburb. Lond. 48. 1818;

Roth. in Roem. & Schult. Syst. 5:554. 1819; FBI.

4:731. 1885; Back. in Fl. Males. 4(5):594. 1954.

Duke in Ann. Miss. Bot. Gard. 48:391. 1961. Gomphrena

sessilis Linn. Sp. Pl. 225. 1753. Alternanthera

triandra Lamk. Encycl. Meth. Bot. 1:95. 1783; Gamb.

825.

Diffuse or prostrate herbs; leaves ovate or elliptic; flowers white in axillary heads; sepals unequal; stamens 2-3; utricle obcordate; seed one, lenticular.

Flowers: throughout the year.

Sivarajan 20, 463.

Note: Backer (loc.cit.) has distinguished 2 varieties, of which var. tenuissima (Suess.) Back. has linear to filiform leaves. The cited specimen belongs to var. sessilis.

A.versicolor (Regel) Hort. ex Regel, Gartenfl. 108.

1869; Bailey 357. Telanthera versicolor Regel, Ind.  
Sem. Hort. Petrop. 83. 1868.

Erect, tufted herbs; leaves crimson-red,  
obovate-spathulate; flowers white in fascicled heads  
in the axils of leaves and in the forks of the stem.

Flowers: May - Dec.

Sivarajan 1798.

Gomphrena Linn.

Key to the species

- 1. Heads subglobose ..... globosa
- 1. Heads oblong ..... celosioides

G.globosa Linn. Sp. Pl. 224. 1753; Burm. f. Fl. Ind. 72.

1768; FBI. 4:732. 1885; Ridl. Fl. Mal. Pen. 3:10. 1924;  
Back. in Fl. Males. 4(2):95. 1949; Duke in Ann. Miss.  
Bot. Gard. 48:49. 1961; Gamb. 825.

Erect, villous annuals; leaves elliptic-oblong,  
up to 9.5 x 4.2 cm; flowers white or purple in terminal,  
subglobose heads.

Flowers: throughout the year.

Sivarajan 1463.

G.celosioides Mart. in Beitr. Amar. 93. 1825; Back. in Fl. Males. 4(2):96. 1949; Chavan & Oza, Fl. Pavagadh 200. 1966.

Diffuse herbs; leaves elliptic-acute or oblanceolate, pubescent; heads oblong acute; flowers white.

Flowers: July - Nov.

Sivarajan 264.

Allmania R. Br. ex Wt.

A.nodiflora (Linn.) R. Br.  $\int$  in Wall. Cat. 6890. 1832, nom. nud.  $\int$  ex Hook. f. Fl. Brit. Ind. 4:716. 1885; Back. in Fl. Males. 4(2):74. 1949 & 4(5):593. 1954. Celosia nodiflora Linn. Sp. Pl. 205. 1753. Allmania albida (Mart.) R. Br.  $\int$  in Wall. Cat. 6981. 1832, nom. nud.  $\int$  ex Hook. f. Fl. Brit. Ind. 4:717. 1885. A.pyramidalis (Burm.f.) Koord. Exk. Fl. 2:195. 1912.

Key to the varieties

1. Plants pubescent ..... var. roxburghii  
1. Plants glabrous ..... var. dichotoma

A.nodiflora R. Br. ex Hook. f., var. roxburghii Hook. f.  
Fl. Brit. Ind. 4:717. 1885.

Erect or diffuse herbs; leaves obovate-spathulate, up to 5.2 x 2.5 cm; heads short-peduncled, globose, mostly terminal.

Flowers: Aug. - Dec.

Sivarajan 259, 297.

A.nodiflora R. Br. ex Hook. f. var. dichotoma (Heyne)

Hook. f. Fl. Brit. Ind. 4:717. 1885. Celosia

dichotoma Heyne in Roth, Nov. Sp. 172. 1827.

Prostrate, glabrous herbs; leaves ovate or elliptic, up to 5 x 2.8 cm; heads sessile, axillary.

Flowers: Aug. - Dec.

Sivarajan 377, 1185.

Celosia Linn.

C.argentea Linn. Sp. Pl. 205. 1753; Blume, Bijdr. 543.

1825; FBI. 4:714. 1885; Back. in Fl. Males.4(2):73.

1949; Duke in Ann. Miss. Bot. Gard. 48:12. 1961.

An erect herb; leaves linear or lanceolate; flowers pinkish white; seeds black, shining.

Flowers: Sept. - Dec.

Sivarajan 394.

BASELLACEAE Moq.

Basella Linn.

B.alba Linn. Sp. Pl. 272. 1753; Wt. Ic. t. 896. 1844-45.

B.rubra Linn. Sp. Pl. 272. 1753; Lamk. Tabl. Encycl.  
t. 215, f. 1. 1792; FBI. 5:20. 1886; Gamb. 830.

Succulent, climbing shrubs; leaves alternate, ovate-acute or acuminate, cordate at base, glabrous; flowers small, pinkish in short, axillary spikes; bracteoles 2, connate to form a cup; perianth 2-3 mm long, shortly 5-lobed; stamens inserted at the mouth of the perianth; fruits subglobose, purple when mature.

Flowers: Dec. - Mar.

Sivarajan 990.

POLYGONACEAE Juss.

Key to the genera

1. Tendril climbers ..... Antigonon
1. Erect herbs ..... Polygonum

Antigonon Endl.

A.leptopus Hook. & Arn. Bot. Beech. Voy. 308. t. 69.

1841; Cooke 2:519; Sant. 203. 1960.

Extensive, robust climbers; leaves ovate-lanceolate, cordate at base, up to 10.5 x 6.5 cm; flowers pink or white in axillary racemes.

Flowers: Dec. - July

Sivarajan 256.

Polygonum Linn.

Key to the species

- 1. Flowers white ..... barbatum
- 1. Flowers pink ..... glabrum

P. barbatum Linn. Sp. Pl. 362. 1753; FBI. 5:37. 1885;

Gage in Rec. Bot. Sur. Ind. 2:397. 1903; Steward in Contr. Gray Herb. 88:52. 1930; Gamb. 833.

Erect herbs, leaves lanceolate, adpressed hairy, up to 12.5 x 2.2 cm; stipules densely adpressed hairy; bristles longer than the stipular tube; spikes paniculate; bracts with paniculate margins.

In marshy fields and river banks. Collected from the banks of Kunnamangalam river.

Flowers: Sept. - Mar.

Sivarajan 953.

P.glabrum Willd. Sp. Pl. 2:447. 1799; FBI. 5:34. 1885;  
Gage in Rec. Bot. Sur. Ind. 2:393. 1903; Cooke 2:514;  
Sant. 201. 1960.

Glabrous herbs; leaves lanceolate, up to 18 x 3.5  
cm; stipular sheath glabrous, truncate without bristles  
at the margins; flowers pink, in paniculate spikes;  
bracts glabrous.

In marshy and water-logged fields.

Flowers: Sept. - Mar.

Sivarajan 102.

ARISTOLOCHIACEAE Juss.

Arstolochia Linn.

A.indica Linn. Sp. Pl. 960. 1753; FBI. 5:75. 1886;  
Schmidt, in Pfam. (d.2) 16b:241. 1935; Gamb. 841.

Twiners; stem angled; leaves ovate-oblong to lan-  
ceolate, obtuse or acute, up to 12 x 5 cm, glabrous; flo-  
wers deep purple in axillary corymbs; perianth tube inflated  
below; stamens 6, adnate with the stylar column; style with  
3-6-lobed stigma; capsules oblong, 6-valved, 5-6 cm long,  
truncate at the lower part; seeds many, flattened and winged.



P.glabrum Willd. Sp. Pl. 2:447. 1799; FBI. 5:34. 1885;  
Gage in Rec. Bot. Sur. Ind. 2:393. 1903; Cooke 2:514;  
Sant. 201. 1960.

Glabrous herbs; leaves lanceolate, up to 18 x 3.5  
cm; stipular sheath glabrous, truncate without bristles  
at the margins; flowers pink, in paniculate spikes;  
bracts glabrous.

In marshy and water-logged fields.

Flowers: Sept. - Mar.

Sivaraajan 102.

ARISTOLOCHIACEAE Juss.

Aristolochia Linn.

A.indica Linn. Sp. Pl. 960. 1753; FBI. 5:75. 1886;

Schmidt, in Pfam. (ed.2) 16b:241. 1935; Gamb. 841.

Twiners; stem angled; leaves ovate-oblong to lan-  
ceolate, obtuse or acute, up to 12 x 5 cm, glabrous; flo-  
wers deep purple in axillary corymbs; perianth tube inflated  
below; stamens 6, adnate with the stylar column; style with  
3-6-lobed stigma; capsules oblong, 6-valved, 5-6 cm long,  
truncate at the lower tip; seeds many, flattened and winged.

Flowers: Sept. - Nov.

Sivarajan 483, 781.

PIPERACEAE C.A. Agardh.

Piper Linn.

1. Spikes erect ..... longum  
1. Spikes pendulous ..... nigrum

P.longum Linn. Sp. Pl. 29. 1753; FBI. 5:83. 1886;  
Gamb. 844.

Plants creeping and rooting at the lower nodes; leaves ovate or ovate-lanceolate, acuminate, deeply cordate at base, glabrous above; spikes yellow, 1-2 cm long; bracts peltate, orbicular; flowers unisexual; perianth 0; stamens 2-3; ovary 1-celled with a solitary ovule.

Flowers: July - Sept.

Sivarajan 1468.

P.nigrum Linn. Sp. Pl. 28. 1753; FBI. 5:90. 1886;  
Yuncker in Lilloa 26:243. 1953; Gamb. 845.

Climbing shrubs, rooting at nodes; leaves ovate or elliptic, acute or acuminate, base rounded, never cordate, glabrous, basally 5-9-veined; spikes dioecious, pendulous and slender; bracts not peltate; berries subglobose.

Flowers: Nov. - Jan.

Sivarajan 1837.

PEPEROMIACEAE (Miq.) Wettst.

Peperomia Ruiz. & Pav.

P.pellucida (Linn.) H. B. & K. Nov. Gen. 1:64. 1815;

Sant. 203. 1960; Gamb. 847. Piper pellucidum Linn.

Sp. Pl. 30. 1753.

Small, erect, flaccid herbs; stem translucent; leaves ovate-cordate, acute or acuminate, basally 5-7-nerved, glabrous; spikes slender, erect; flowers bisexual; stamens 2; fruits ribbed.

Flowers: July - Dec.

Sivarajan 920.

LAURACEAE Juss.

Key to the genera

1. Plants parasitic ..... Cassytha
1. Plants non-parasitic:
  2. Leaves basally nerved ..... Cinnamomum
  2. Leaves penninerved:
    3. Flowers in panicles ..... Alseodaphne
    3. Flowers in pedunculate umbels .. Litsea

Cassytha Linn.

C. filiformis Linn. Sp. Pl. 35. 1753; Wt. Ic. t. 1847.  
1852; FBI. 5:188. 1886; Gamb. 868.

Leafless, parasitic herbs; stem filiform;  
flowers white on short, few-flowered branches; sessile;  
bracteoles 3; perianth lobes 6, outer 3 smaller; perfect  
stamens 6-9, operculate, the third row, with a  
pair of glands on the filaments; staminodes 3, stipitate;  
fruits white, subglobose.

Common on bushes on the grassy slopes.

Flowers: Aug. - Dec.

Sivarajan 538, 1432.

Cinnamomum Schaeffer. (nom.cons.)

C.verum J. S. Presl, Rostl. 2:36. 1825; Sweet, Hort.  
Brit. (ed.1) 344. 1827. C.zeylanicum Blume, Bijdr.  
568. 1825; Nees in Wall. Pl. As. Rar. 2:74. 1831 &  
3:32. 1832; FBI. 5:131. 1886; Gamb. 857.

Trees; leaves elliptic-oblong, acute or shortly  
acuminate, coriaceous, basally 3-5-veined; flowers  
small, greenish white in axillary panicles; perianth  
lobes 6; perfect stamens 9, anthers 4-celled, operculate,  
the 4th row staminodal; berry ovoid, purple.

Flowers: Mar. - May

Sivarajan 1801.

Alseodaphne Nees

A.semicarpifolia Nees in Wall. Pl. As. Rar. 2:72. 1829;  
FBI. 5:144. 1886; Cooke 2:526; Sant.205. 1960; ~~Gamb.~~<sup>b</sup>  
858.

Trees; leaves obovate-obtuse, narrowed to the  
base, penninerved; flowers small, hermaphrodite in  
axillary panicles; perianth lobes 6, subequal; perfect  
stamens 9, anthers 4-celled; staminodes cordate; berries  
subglobose, fleshy.

Flowers: Mar. - Apr.

Sivarajan 133.

Note: Gamble (loc.cit.) has reported 2 varieties mainly based on the leaf shape, of which the cited specimen belongs to the var. parvifolia Hook.f.

Litsea Lamk. (nom.cons.)

Key to the species

1. Umbellules pedicellate:
  2. Leaves elliptic-lanceolate up to  
25 cm long ... glutinosa
  2. Leaves elliptic-acute, up to  
12 cm long ... deccanensis
1. Umbellules sessile or sub-sessile ..... coriacea

L. glutinosa (Lour.) C.B.Robinson in Philip. Jour. Sc.  
Bot. 6:321. 1911; Rao in Bull. Bot. Sur. Ind.  
(Suppl.2) 10:68. 1968. Sebifera glutinosa Lour.  
Fl. Cochinch. 638. 1790.

Small trees with pubescent branchlets; leaves elliptic-oblong, acute, pubescent on the veins, on

both surfaces; umbellules pedunculate, greenish-yellow, dioecious; bracts concave; perianth lobes 6, sometimes 0; perfect stamens 9 to 12; berries ovoid.

Flowers: July - Aug.

Sivarajan 1732.

L.deccanensis Gamble, Fl. Pres. Madr. 1235. 1925;  
Kosterm. in Reinwardtia 7:502. 1969. L.tomentosa  
Heyne ex Hook. f. Fl. Br. Ind. 5:157. 1886 (non  
Blume 1826).

Small trees; branches densely tomentose;  
leaves elliptic-acute, dense-tomentose beneath;  
umbellules peduncled, axillary; bracts concave,  
deflexed; flowers unisexual, greenish-yellow; perianth  
lobes very small; berries dipressed-globose, black.

Flowers: June - Aug.

Sivarajan 1119, 1230.

L.coriacea (Heyne ex Meissn.) Hook.f. Fl. Brit. Ind.  
5:166. 1886; Gamb. 865. Tetranthera coriacea Heyne  
ex Meissn. in DC. Prod. 15:186. 1864.

Small trees; leaves elliptic-acute, up to 15 x 5.5 cm, glabrous; umbellules white, sessile or subsessile, mainly on the older branches; perianth lobes 6; berries ovoid.

Flowers: Jan. - Feb.

Sivarajan 2.

ELAEAGNACEAE Juss.

Eleagnus<sup>A</sup> Linn.

E.conferta Roxb. Fl. Ind. 1:440. 1832; Schlecht. in DC. Prod. 14:612. 1857; Sant. 207. 1960; Gamb. 872.

E.latifolia Linn. Sp. Pl. 121. 1753; FBI. 5:202. 1886, in part.

Climbing shrubs; leaves ovate or elliptic up to 12 x 7.5 cm, with dense, silvery scales beneath; flowers in axillary, few-flowered cymes, bisexual; perianth urceolate, lobes 4, triangular-acute, spreading; stamens 4, inserted at the mouth of the perianth tube; ovary 1-celled; style with lateral stigmatic surface; drupes oblong.

Flowers: Sept. - Nov.

Sivarajan 1613.



LORANTHACEAE Juss.

Key to the genera

1. Flowers pedicellate:
  2. Flowers 4-5 cm long ..... Dendrophthoe
  2. Flowers 1-1.2 cm long ..... Helixanthera
1. Flowers sessile:
  3. Leaves penninerved ..... Macrosolen
  3. Leaves basally nerved ..... Helicanthes

Dendrophthoe Mart.

D.falcata (Linn.f.) Etting. in Denkschr. Akad. Wissen.  
Math.-Naturw. Cl. 32:52, 53, 58, t. 13, f. 14. 1872;  
Danser in Bull. Jard. Bot. Buitenz (Ser.3) 11:403.1931;  
Merr. in Contr. Arn. Arb. 8:53. 1934. Loranthus  
falcatus Linn. f. Suppl. 211. 1781. L.longiflorus  
Desr. in Lamk. Encycl. Meth. Bot. 3:598. 1789; FBI.  
5:214. 1886; Gamb. 877.

Shrubby parasites; branches usually pendulous;  
leaves oblong-lanceolate, subsessile, coriaceous, gla-  
brous, up to 15.5 x 5.5 cm; flowers in dense, axillary  
racemes; calyx short, minutely toothed; corolla tube  
usually pink, curved; lobes scarlet red, connivent at  
first; berry ovoid or oblong, crowned by the cup-shaped  
calyx.

This is a common parasite, living usually on a variety of hosts like Mangifera indica, Artocarpus heterophyllus etc.

Flowers: Feb. - Mar.

Sivarajan 814, 965.

Helixanthera Lour.<sup>x</sup>

H.wallichiana (Schult.) Danser in Verhand. K. Akad.

Wetensch. Amsterd. (Sect.2) 29 (6):60. 1933.

Loranthus wallichianus Schult. Syst. 7 (1):100.

1829; FBI. 5:205. 1886; Gamb. 876.

Shrubby parasites; leaves ovate-elliptic, glabrous, coriaceous, penninerved; flowers in axillary, fascicled racemes; calyx subglobose, minute, limb obsolete; corolla red, 4-lobed at apex; fruits ovoid, rugose.

Collected from near the University campus.

This species was seen parasitising on Memecylon umbellatum.

Flowers: May - June

Sivarajan 1818.

Macrosolen Blume

M.capitellatus (Wt. & Arn.) Danser in Blumea 2:36.

1936. Loranthus capitellatus Wt. & Arn. Prod. 382.

1834; FBI. 5:221. 1886. Elytranthe capitellata

(Wt. & Arn.) Engl. in Engl. & Pr. Pfam. 3(1):189.

1886; Danser in Bull. Jard. Bot. Buitenz (Ser.3)

10:313. 1929.

Shrubs; leaves elliptic to lanceolate, coriaceous, up to 10 x 4.8 cm; flowers 4-5, capitate at the tips of short peduncles in the axils; calyx limb cylindric, truncate; corolla greenish-yellow, lobes as long as the tube; berry ellipsoid, crowned with the calyx limb.

A common parasite on Artocarpus heterophyllus.

Flowers: Mar. - Apr.

Sivarajan 778, 1107.

Helicanthes Danser

H.elastica (Desr.) Danser in Verhand. K. Akad. Wetensch.

Amsterd. (Sect.2) 29(6):55. 1933; Sant. 209. 1960.

Loranthus elasticus Desr. in Lamk. Encycl. Meth. Bot.

3:599. 1789; FBI. 5:216. 1886; Gamb. 878.

PLATE 20

Helicanthes elastica (Desr.) Danser,  
growing on Mangifera indica Linn.



Dichotomously branched, shrubby parasites; leaves ovate or elliptic, obtuse, 3-5-nerved; flowers sessile, clustered at the nodes; calyx tube ellipsoid, limb cylindrical; corolla about 3 cm long, lobes 5; berry subglobose or ovoid.

A very common parasite on Mangifera indica. The infection is so acute that several trees are getting dried up and decayed. (Plate 20).

Flowers: Sept. - Jan.

Sivarajan 598.

VISCACEAE Miq.

Viscum Linn.

V. capitellatum Smith in Rees, Cyclop. 37. Viscum no. 18. 1817; FBI. 5:225. 1886; Danser in Blumea 4:309. 1941; Gamb. 881.

Dwarf shrubs; branches terete; leaves obovate-spathulate, fleshy, deciduous; flowers 2-4, small, sessile at the tips of short peduncles; calyx limb annular; corolla lobes 3, triangular, subacute; berry ovoid-oblong.

PLATE 21

Viscum capitellatum Smith, Parasitising  
on Dendrophthoe falcata (Linn. f.)  
Etting.





The author found this parasite on Dendrophthoe falcata which was in turn parasitising a Mango Tree. (Plate 21).

Flowers: Mar. - May

Sivarajan 1115.

SANTALACEAE R. Br.

Santalum Linn.

S. album Linn. Sp. Pl. 349. 1753; FBI. 5:231. 1886;

Chavan & Oza, Fl. Pavagadh 204. 1966; Gamb. 883.

Small trees; leaves elliptic-acute, glabrous, up to 7 x 3 cm; flowers greenish yellow turning reddish purple, in terminal paniculate cymes, hermaphrodite; perianth campanulate, lobes 4-5, later reflexed; disc lobes fleshy; ovary 1-celled; ovules 2-3, pendulous; drupes ovoid.

A semiparasitic tree with fragrant wood.

Common on the grassy hill slopes.

Flowers: Sept. - Dec.

Sivarajan 537.

EUPHORBIACEAE Juss.

Key to the genera

1. Flowers in cyathia:
  2. Cyathia regular ..... Euphorbia
  2. Cyathia bilateral ..... Pedilanthus
1. Flowers not in cyathia:
  3. Fruits dry, capsular (except in  
Phyllanthus reticulatus &  
P.acida):
    4. Leaves digitately lobed:
      5. Staminal filaments branched .... Ricinus
      5. Staminal filaments not branched:
        6. Petals present ..... Jatropha
        6. Petals absent:
          7. Seeds carunculate ..... Manihot
          7. Seeds not carunculate .... Hevia
    4. Leaves simple:
      8. Trees:
        9. Leaves peltate ..... Macaranga
        9. Leaves not peltate:
          10. Flowers in terminal  
spikes ..... Mallotus

10. Flowers not as above:

11. Ovary dense-tomentose outside ... Aporusa

11. Ovary glabrous ..... Glochidion

8. Herbs or Shrubs:

12. Branching phyllanthoid:

13. Staminal column triradiate ..... Sauropus

13. Staminal column not triradiate:

14. Stamens 5, filaments

partially connate ..... Meineckia

14. Stamens 3 (when 5, the inner

connate and outer

free) ..... Phyllanthus

12. Branching not phyllanthoid:

15. Capsules smooth:

16. Plants climbing ..... Tragia

16. Plants erect:

17. Male flowers with disc

glands ..... Micrococca

17. Male flowers without disc

glands:

18. Stamens many in male

flowers ..... Acalypha

18. Stamens only 3 in male

flowers ..... Excoecaria

- 15. Capsules not smooth:
  - 19. Plants stellate-tomentose:
    - 20. Seeds carunculate ..... Croton
    - 20. Seeds not carunculate ..... Chrozophora
  - 19. Plants without stellate hairs ..... Sebastiana
- 3. Fruits not capsular:
  - 21. Petals present ..... Bridelia
  - 21. Petals absent:
    - 22. Stamens 2 in male flowers ..... Sapium
    - 22. Stamens 3 or more in male flowers:
      - 23. Calyx truncate ..... Breynia
      - 23. Calyx not truncate:
        - 24. Styles long and plumose ..... Trewia
        - 24. Styles not plumose:
          - 25. Leaves entire ..... Securinega
          - 25. Leaves sharply dentate .... Suregada

Euphorbia Linn.

Key to the species

- 1. Plants leafy:
  - 2. Plants armed with stipular spines:
    - 3. Spines 2-3 mm long ..... neriifolia
    - 3. Spines 10-15 mm long ..... milii

2. Plants unarmed:

4. Shrubs ..... pulcherrima

4. Herbs:

5. Cyathia in terminal cymes .... heterophylla

5. Cyathia axillary:

6. Cymes sessile ..... thymifolia

6. Cymes pedunculate ..... hirta

1. Plants not leafy ..... tirucalli

E.neriifolia Linn. Sp. Pl. 451. 1753; Boiss. in DC.

Prod. 79. 1892; Rao in (Suppl.2) Bull. Bot. Sur.

Ind. 10:71. 1968. E.nivulia Buch.-Ham. in Trans.

Linn. Soc. 14:286. 1825; FBI. 5:255. 1887; Gamb.

893.

Large, spinous shrubs; stem terete; spines arising from conical cushions; leaves oblanceolate-spathulate, fleshy and deciduous, up to 12.5 x 5.2 cm; cyathia in solidary or in twin cymes.

Often grown on hedges.

Flowers: Mar. - Apr.

Sivarajan 1121.

Note: E.ligularia Roxb. and E.neriifolia Linn. are two very similar species which are often confused.

However, E.neriifolia Linn. can be distinguished from the other by its terete stems and obtuse leaves. Gamble has erroneously identified E.neriifolia Linn. (Fl. Madr. Pres. 890. 1967), since his specimen actually is not the Linnean species, but of Boisser (DC. Prod. 79. 1862) which is a later homonym of the Linnean species, valid name of the species being E.ligularia Roxb.

E.milii Desmoul. in Bull. Hist. Nat. Soc. Linn. Bordeaux. 1:27. 1826; Bailey 617; Mathew in Rec. Bot. Sur. Ind. 20(1):195. 1969; Airy Shaw in Kew Bull. 26(2):266. 1972. E.splendens Boj. ex Hook. in Bot. Mag. 56, t. 2902. 1829; Gamb. 894. E.bojeri Hook. Bot. Mag. 63, t. 3527. 1836; Boiss. in DC. Prod. 78. 1862.

Trailing, spinous shrubs; leaves deciduous, oblanceolate or elliptic-obtuse; cyathia in axillary, dichotomous cymes with 2, red, orbicular-mucronate bracts.

Flowers: Oct. - Dec.

Sivarajan 710.

E. pulcherrima Willd. ex Klotzsch. in Otto & Dietr.

Allg. Gartenz. 2:27. 1834; FBI. 5:239. 1887; Sant.  
216. 1960; Gamb. 894. Poinsettia pulcherrima (Willd.  
ex Klotzsch.) R. Grah. in Edinburgh New Phil. Jour.  
20:412. 1836.

Shrubs with woody branches; leaves broadly  
elliptic or panduriform, the upper ones usually shining  
crimson-red or orange-yellow; cyathia in terminal cymes;  
glands on the involucre conspicuous, orange yellow.

Flowers: throughout the year.

Sivarajan 1839.

E. heterophylla Linn. Sp. Pl. 453. 1753; Merr. En. Philip.

Fl. Pl. 2:462. 1923; Back. & Bakh. f. Fl. Java 1:502.  
1963; Airy Shaw in Kew Bull. 26(2):264. 1972.

E. geniculata Ort. Hort. Matr. Dec. 18. 1797.

Poinsettia heterophylla (Linn.) Klotzsch. & Garcke  
ex Klotzsch. in Monatsber. Akad. Berl. 253. 1859;  
Dressler in Ann. Miss. Bot. Gard. 48:329. 1961.

Herbs; stem ribbed or smooth, leaves entire or  
panduriform, mottled or not; cyathia in terminal dense  
cymes; glands on the involucre greyish or red.

Flowers: throughout the year.

Sivarajan 798.

E.thymifolia Linn. Sp. Pl. 454. 1753; FBI. 5:252. 1887;  
Sant. 215. 1960; Gamb. 893; Airy Shaw in Kew Bull.  
26(2):267. 1972. E.prostrata Grah. Cat. 179. 1839,  
(non Ait.).

Prostrate or diffuse, hispidly hairy annuals;  
leaves obliquely oblong, obtuse, finely serrate, about  
1 cm long; cyathia in axillary clusters, minute;  
capsules pubescent, ripen within the involucre and  
splits open on one side.

A common weed. Very often the plant is rose-  
coloured.

Flowers: July - Mar.

Sivaraajan 93, 1011, 1274.

E.hirta Linn. Sp. Pl. 454. 1753; Merr. En. 462. 1923;  
Henderson in J. Malay. Br. Roy. As. Soc. 17:70.  
1939; Sant. 214. 1960; Back. & Bakh. f. Fl. Java  
504. 1963; Airy Shaw in Kew Bull. 26(2):264. 1972.  
E.pilulifera Linn. Sp. Pl. 454. 1753; Boiss. in DC.  
Prod. 21. 1862; FBI. 5:250. 1887.

Erect or diffuse, hispid herbs; leaves elliptic  
or obliquely ovate, serrate; cyathia green, capitate on



axillary peduncles; capsules adpressed pubescent.

Flowers: July - Mar.

Sivarajan 109.

E.tirucalli Linn. Sp. Pl. 452. 1753; Boiss. in DC.

Prod. 15(2):96. 1862; FBI. 5:254. 1887; Merr. in  
Trans. Amer. Phil. Soc. n.s. 24(2):242. 1935; Back.  
& Bakh. f. Fl. Java 502. 1963; Airy Shaw in Kew  
Bull. 26:267-68. 1972.

Erect, leafless, succulent shrubs with terete  
branches, commonly cultivated in gardens.

Flowers: not seen.

Sivarajan 1840.

Pedilanthus Poit. (nom.cons.)

P.tithymaloides (Linn.) Poit. in Ann. Mus. Hist. Nat.

Paris 19:390, t. 19. 1812; FBI. 5:239. 1887; Sant.  
224. 1960; Webster in J. Arn. Arb. 48:428. 1967;  
Gamb. 942. Euphorbia tithymaloides Linn. Sp. Pl.  
453. 1753.

Succulent herbs; stem zig zag; leaves ovate-  
acute, deciduous; cyathia bilaterally symmetrical in  
lateral cymes; involucral tube produced into a posterior  
spur.

Usually grown on hedges. A variety with variegated leaves is commonly cultivated in gardens.

Flowers: Mar. - Apr.

Sivarajan 1068.

Ricinus Linn.

R. communis Linn. Sp. Pl. 1007. 1753; FBI. 5:457. 1887;

Merr. En. 447. 1923; Sant. 225. 1960; Gamb. 933. Airy

Shaw in Kew Bull. 26(2):328. 1972.

Glaucous shrubs; leaves large, digitately lobed, serrate, acuminate; flowers pale yellow in terminal monoecious panicles; stamens branched, fasciculate in male flowers, anthers many; capsules spinous; seeds mottled and carunculate.

Flowers: June - Sept.

Sivarajan 424.

Jatropha Linn.

Key to the species

1. Plants glandular hairy ..... glandulifera
1. Plants glabrous ..... curcas

J. glandulifera Roxb. [ Hort. Beng. 104. 1814, nom. nud. ]

Fl. Ind. 3:688. 1832; FBI. 5:382. 1887; Gamb. 937.

Much branched shrubs; leaves purplish, digitately 3-5-lobed, margins with gland-tipped hairs; flowers monoecious in terminal cymes, greenish purple; bracts lanceolate or elliptic, glandular; calyx glandular; capsules ellipsoid or oblong, 1 cm long; seed 1 in each cell.

Flowers: Aug. - Nov.

Sivarajan 876.

J. curcas Linn. Sp. Pl. 1006. 1753; FBI. 5:383. 1887; Merr.

En. 449. 1923; Sant. 220. 1960; Bäck. & Bakh. f. Fl.

Java 1:494. 1963; Gamb. 937; Airy Shaw in Kew Bull.

26:283. 1972. .

Glabrous shrubs with an acrid latex; leaves orbicular, subcordate, 3-5-lobed, lobes serrate, acuminate; flowers yellowish green in axillary cymes; petals connate to half its length, lobes reflexed; capsules ellipsoid, obtuse.

Flowers: Mar. - May

Sivarajan 1030.

Manihot Mill.

Key to the species

1. Trees ..... glaziovii  
1. Shrubs ..... esculenta

M. glaziovii Muell. Arg. in Mart. Fl. Bras. 11(2):471.

1874; Gamb. 942; Webster in J. Arn. Arb. 48:347. 1967.

Trees; leaves long-petioled, orbicular-cordate, digitately 5-lobed, lobes large, obtuse; flowers greenish yellow in monoecious panicles; calyx campanulate, deeply lobed; stamens 10 in male flowers; capsules of 3, 2-valved cocci.

Flowers: July - Sept.

Sivarajan 1387.

M. esculenta Crantz. Inst. Rei. Herb. 1:167. 1766; Merr.

in Trans. Amer. Phil. Soc. n.s. 24(2):240. 1935; Back. & Bakh. f. Fl. Java, 496. 1963; Airy Shaw in Kew Bull. 26(2):308. 1972. Jatropha manihot Linn. Sp. Pl. 1007. 1753. Manihot utilissima Pohl. Pl. Bras. Ic. 1:32. 1827; FBI. 5:239. 1887; Gamb. 942.

Shrubs with prominent leaf-scars and tuberous roots; leaves digitately 5-7-lobed, lobes lanceolate-

acute or acuminate; flowers in axillary, monoecious panicles; calyx campanulate, deeply lobed; capsules prominently 6-ridged.

Very common under cultivation, for the starch-rich tuberous roots, "tapioca".

Flowers: Feb. - Mar.

Sivarajan 50.

Hevea Aubl.

H. brasiliensis Muell. Arg. in Linnaea 34:204. 1865-'66; Bailey, 621; Webster in Brittonia 48:322. 1967.

Trees; leaves digitately 3-foliolate; leaflets elliptic to lanceolate, acuminate; flowers small, pale-yellow in axillary panicles; capsules 3-lobed; large.

Flowers: Mar. - Apr.

Sivarajan 1096.

Macaranga Thon.

M. peltata (Roxb.) Muell. Arg. in DC. Prod. 15(2):1010. 1866; FBI. 5:448. 1887; Sant. 222. 1960; Gamb. 928. Osyris peltata Roxb. Fl. Ind. 3:755. 1832.

Trees; branches glaucous; leaves large, ovate, or orbicular, acuminate, peltate, many-ribbed from base; flowers minute, in racemes or panicles; racemes straight; bracts obtuse, tomentose, concealing the flowers; stamens usually 3; capsules globose, glandular, 6 mm across.

Flowers: Dec. - Jan.

Sivarajan 29.

Mallotus Lour.

Key to the species

- 1. Leaves 3-nerved from base ..... philippensis
- 1. Leaves penninerved ..... atrovirens

M. philippensis (Lamk.) Muell. Arg. in Linnaea 34:196.

1865; FBI. 5:442. 1887; Back. & Bakh. f. Fl. Java

483. 1963; Gamb. 924. Airy Shaw in Kew Bull. 21:392.

1968 & 26:300. 1972. Croton philippense Lamk. Encycl.

Meth. Bot. 2:206. 1786. Mallotus reticulatus Dunn,

in J. Linn. Soc. Lond. 38:365. 1908.

Trees; branched rusty tomentose; leaves ovate-lanceolate, deltoid, up to 20 x 10 cm, 3-veined from base; flowers in dioecious, terminal, paniculate spikes;

capsules brown, stellate-tomentose and red-glandular.

Flowers: Dec. - Jan.

Sivarajan 861, 1608, 1628.

M.atrovirens Muell. Arg. in Linnaea 34:195. 1865-'66;

FBI. 5:440. 1887; Gamb. 925.

Shrubs; branches pubescent; leaves elliptic-acuminate or obtuse, apiculate, penninerved, cross veins very prominent; spikes slender, usually simple, dense-pubescent; capsules scaly, pubescent.

Flowers: Dec. - Jan.

Sivarajan 885.

Aporusa Blume

A.lindleyana (Wt.) Baill. Etud. Gen. Euph. 654. 1858;

FBI. 5:349. 1887; Gamb. 916. Scepa lindleyana Wt.

Ic. t. 361. 1840.

Small, dioecious trees; leaves elliptic-oblong, acuminate; female flowers small in short, axillary spikes; capsules globose, short-pedicelled, dense-tomentose outside.

A rare species of which the author could see only one female plant in the St. Joseph's College Campus, Devagiri.

Flowers: Dec. - Jan.

Sivarajan 946.

Glochidion J. R. & G. Forst.(nom.cons.)

Note: This genus is the closest relative of Phyllanthus. But the absence of disc, the characteristic androecium and the plurilocular ovary make this a very distinctive group. Bentham in his "Genera Plantarum" (3:272. 1880) has followed Mueller Argoviensis (DC. Prod. 15(2):275. 1865-66) in merging this with Phyllanthus. Later Hooker in his "Flora of British India" (1890) resurrected the genus Glochidion, and its generic status is now accepted by all the modern workers.

G. zeylanicum (Gaertn.) A. Juss. Tent. Euphorb. 107. 1824; Th. En. 285. 1861; Bedd. For. Fl. 1921. 1873; FBI. 5:310. 1890; Pearson in J. Linn. Soc. Bot. 33:355. 1900; Alston in Ann. Roy. Bot. Gard. Perad. 11:2-3. 1928; Gamb. 914. Bradleia zeylanica Gaertn. Fruct. 2:128. 1791. Phyllanthus zeylanicus Muell. Arg. in DC. Prod. 15(2):281. 1866.



Small trees; leaves ovate to lanceolate, about 18.5 x 8.5 cm; flowers green in small, axillary, monoecious clusters; stamens 6-8, connate by their projecting connectives; ovary 4-6-celled with a stout, undivided style; capsules of 3, 2-valved cocci, subglobose with the persistent, enlarged style.

Commonly seen along the banks of streams or other waterways on the hill slopes.

Flowers: July - Nov.

Sivarajan 470, 484.

Sauropus Blume

Key to the species

1. Leaves ovate to rounded ..... quadrangularis
1. Leaves lanceolate ..... androgynus

S. quadrangularis (Willd.) Muell. Arg. in *Linnaea* 32:73.

1863 & in DC. *Prod.* 15(2):242. 1866; *FBI.* 5:335. 1887; *Gamb.* 911; Airy Shaw in *Kew Bull.* 26:337. 1972.

Phyllanthus quadrangularis Willd. *Sp. Pl.* 4:585. 1805.

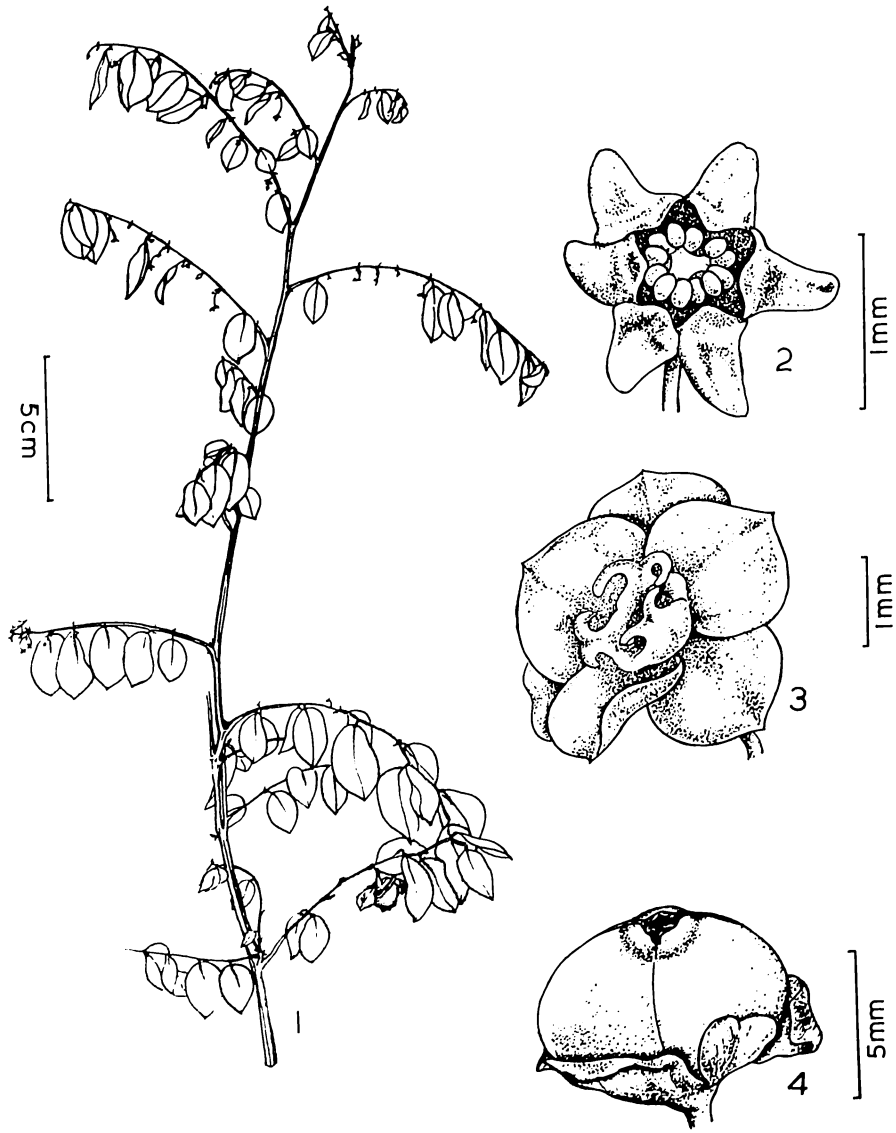
Herbs with twiggy branches; leaves ovate or elliptic, greyish above; flowers in monoecious, axillary clusters; male flowers: minute; stamens 3, anthers on

PLATE 22

Sauropus quadrangularis (Willd.) Muell.

Arg. Fig.1. A twig. Fig.2. Male flower.

Fig.3. Female flower. Fig.4. Capsule.



SAUROPUS QUADRANGULARIS (WILLD.) MUELL. ARG.

the angles of a trigonous column; female flowers: much larger, apex of the ovary broad, bearing the styles on the projecting angles; capsules globose, white. (Plate 22)

This plant is seen restricted to the rocky lateritic slopes and is common in the University campus.

Flowers: July - Mar.

Sivarajan 810.

S.androgynus (Linn.) Merr. in Philip. For. Bull. 1:30. 1903; Pax & Hoff.in Pfreich. 81:217. 1922; Gamb. 911. Airy Shaw in Kew Bull. 26(2):333. 1972. Clutia androgyna Linn. Mant.1:128. 1767. S.albicans Blume, Bijdr. 596. 1825; FBI. 5:332. 1887.

Shrubs; leaves elliptic to lanceolate, male flowers: discoid, 8-12 mm across; staminal column triradiate at the tip, bearing the anthers on the angles; female flowers: larger, perianth lobes obovate, ovary with produced, style-bearing angles; capsules globose, crustaceous, white or pinkish.

Flowers: July - Mar.

Sivarajan 1510.

Meineckia Baill.

M. parvifolia (Wt.) Webster in Acta Bot. Neerl. 14:342.  
1965. Peltandra parvifolia Wt. Ic. Pl. Ind. Or. 5.  
t. 1892. 1852. Phyllanthus peltandrus Muell. Arg.  
in Linnaea 32:11. 1863. P. thwaitesianus Muell. Arg.  
in Linnaea 32:11. 1863; FBI. 5:287. 1887. Neopeltandra  
parvifolia (Wt.) Alston, Handb. Fl. Ceyl. 6:256. 1931.

Branched herbs; leaves ovate-obtuse or subacute,  
membraneous and glabrous; petiole filiform; cymules  
axillary, monoecious; stamens 5 in male flowers,  
partially connate; capsules glabrous, subglobose with  
a filiform pedicel.

A very rare species, seen growing on the moist  
mud walls, at Kunnamangalam.

Flowers: July - Sept.

Sivarajan 1415.

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The author is thankful to Prof. G.L. Webster, University  
of California, for checking up the specimens of Meineckia  
and Phyllanthus and for his critical comments on them.

Note: The taxonomic history of this genus has been very confusing, and this has been placed under many generic names like Peltandra, Phyllanthus, Securinega and Neopeltandra. G.L.Webster (loc.cit.) has however established the distinctness of this genus.

Webster<sup>(loc.cit.)</sup> has reported this species from Andhra Pradesh and Palni Hills in India. This is a new report of this plant from Kerala.

Phyllanthus Linn.

Key to the species

1. Shrubs or trees:

2. Stamens 5 ..... reticulatus

2. Stamens less than 5:

3. Fruits dehiscent ..... emblica

3. Fruits indehiscent ..... acidus

1. Herbs:

4. Capsules smooth:

5. Filaments connate:

6. Cymules dioecious ..... debilis

6. Cymules monoecious ..... amarus

5. Filaments distinct ..... virgatus

4. Capsules not smooth:

7. Fruiting pedicels 2-2.5 cm long .. gardnerianus

7. Fruiting pedicels very short ..... urinaria

P. reticulatus Poir. in Lamk. Encycl. Meth. Bot. 5:298.

1804; FBI. 5:288. 1887; Webster in J. Arn. Arb. 38:57.  
1957; Airy Shaw in Kew Bull. 26:322-323. 1972.

Kirganelia reticulata (Poir.) Baill. Eteud. Gen. Euph.  
613. 1858; Gamb. 905.

Pubescent shrubs; leaves ovate or obovate,  
obtuse; perianth lobes 6, the inner 3 slightly larger;  
stamens usually 5, the inner 2-3 connate, and the outer  
free; carpels 6 or more; fruits baccate, 6 or more  
loculed, purple when ripe.

Flowers: Mar. - May

Sivarajan 1035

Note: de Jussieu (Tent. Euphorb. 19, t. 4. 1789)  
established the genus Kirganelia mainly based on its  
baccate fruits and peculiar fusion of the stamens.  
Recent workers have come to a consensus that the fruit  
nature is not a reliable character, and that Kirganelia  
should be treated as a subgenus under Phyllanthus.

P. emblica Linn. Sp. Pl. 982. 1753; FBI. 5:289. 1887;

Webster in J. Arn. Arb. 38:76. 1957; Airy Shaw in Kew  
Bull. 26:319. 1972. Emblica officianalis Gaertn.  
Fruct. 2:122. 1791; Gamb. 906.

Deciduous trees; leaves small, linear-oblong, up to 15 x 3 mm; cymules monoecious; fruits fleshy at first, later open into three cocci.

Flowers: Jan. - Feb.

Sivarajan 823, 923.

Note: Webster (loc.cit.) has provisionally included this species under the subgenus Cicca. It resembles P.acidus in its arboreal habit and fleshy fruits, but this is only superficial. In P.emblica the fruit is fundamentally capsular and breaks up into three cocci, whereas in P.acidus the fruits are drupaceous.

P.acidus (Linn.) Skeels in U.S. Dept. Agric. Bur. Pl. Ind. Bull. 148:17. 1909; Webster in J. Arn. Arb. 38:66. 1957; Airy Shaw in Kew Bull. 26:315. 1972. Averrhoa acida Linn. Sp. Pl. 428. 1753. Cicca disticha Linn. Mant. 124. 1767. Phyllanthus distichus (Linn.) Muell. Arg. in DC. Prod. 15:413. 1866; FBI. 5:304. 1887. Cicca acida (Linn.) Merr. Interpr. Rumph. Herb. Amboin. 314. 1917.

Small trees; leaves ovate-lanceolate on deciduous branchlets; flowers mostly on short, leafless



branchlets on the old wood, tetramerous; fruits a 6-8-ribbed, depressed-globose drupe, 2-3 cm across.

Flowers: Dec. - May

Sivarajan 1802.

Note: Robinson in his monograph of Philippine Phyllanthinae (Phil. J. Sci. Bot. 4:87. 1909 & 6:323. 1911) assigned a distinct generic status for Cicca, based on its drupaceous fruits and has been followed by many workers. Though the fruit and the tetramerous flowers formed good distinguishing characters, Webster (J. Arn. Arb. 37:97-98. 1956), found that the pollen grains, seeds and growth-form are all quite typical of Phyllanthus and has retained Cicca as a subgenus under Phyllanthus - a view which is shared by Airy Shaw (loc.cit.). It has already been pointed out by earlier workers that the freshness of the fruit is not a dependable character, since there is a gradual transition from capsule to drupaceous fruits in the genus Phyllanthus.

The resemblance of this species with Averrhoa bilimbi is to be noted. Walt. Ann. Bot. (1793) listed it under that name.

P.debilis Klein ex Willd. Sp. Pl. 4:582-83. 1804; FBI.  
5:299. 1887; Webster in J. Arn. Arb. 38:307. 1957;  
Gamb. 903; Webster & Airy Shaw in Kew Bull. 26:92.  
1971.

Erect annuals; branchlets deciduous, compressed;  
leaves elliptic-acute; stipules lanceolate-acuminate;  
cymules dioecious; bracteoles scarious; capsules subglo-  
bose, 2-2.5 mm across; seeds trigonous with longitudinal  
and fine cross striae, and hyaline hygroscopic 'setae'.

Common in moist, grassy places and also in  
gardens as a weed.

Flowers: Aug. - Mar.

Sivarajan 1761.

P.amarus Schum. & Thonn. Kongl. Danske Vidensk. Selsk.  
Skr. 4:195-96. 1829; Webster in J. Arn. Arb. 37:6.  
1956 & 38:313. 1957 & in Brittonia 22:69. 1970; Airy  
Shaw in Kew Bull. 26:317. 1972. P.niruri auct. in  
part; non Linn. P.nanus Hook. f. Fl. Brit. Ind.  
5:298. 1887.

branchlets on the old wood, tetramerous; fruits a 6-8-ribbed, depressed-globose drupe, 2-3 cm across.

Flowers: Dec. - May

Sivarajan 1802.

Note: Robinson in his monograph of Philippine Phyllanthinae (Phil. J. Sci. Bot. 4:87. 1909 & 6:323. 1911) assigned a distinct generic status for Cicca, based on its drupaceous fruits and has been followed by many workers. Though the fruit and the tetramerous flowers formed good distinguishing characters, Webster (J. Arn. Arb. 37:97-98. 1956) found that the pollen grains, seeds and growth-form are all quite typical of Phyllanthus and has retained Cicca as a subgenus under Phyllanthus - a view which is shared by Airy Shaw (loc.cit.) . . It has already been pointed out by earlier workers that the fleshiness of the fruit is not a dependable character, since there is a gradual transition from capsules to drupaceous fruits in the genus Phyllanthus.

The resemblance of this species with Averrhoa bilimbi is so striking that Linnaeus (loc.cit. 1753) listed it under that genus.

P.debilis Klein ex Willd. Sp. Pl. 4:582-83. 1804; FBI.  
5:299. 1887; Webster in J. Arn. Arb. 38:307. 1957;  
Gamb. 903; Webster & Airy Shaw in Kew Bull. 26:92.  
1971.

Erect annuals; branchlets deciduous, compressed;  
leaves elliptic-acute; stipules lanceolate-acuminate;  
cymules dioecious; bracteoles scarious; capsules subglo-  
bose, 2-2.5 mm across; seeds trigonous with longitudinal  
and fine cross striae, and hyaline hygroscopic 'setae'.

Common in moist, grassy places and also in  
gardens as a weed.

Flowers: Aug. - Mar.

Sivarajan 1761.

P.amarus Schum. & Thonn. Kongl. Danske Vidensk. Selsk.  
Skr. 4:195-96. 1829; Webster in J. Arn. Arb. 37:6.  
1956 & 38:313. 1957 & in Brittonia 22:69. 1970; Airy  
Shaw in Kew Bull. 26:317. 1972. P.niruri auct. in  
part; non Linn. P.nanus Hook. f. Fl. Brit. Ind.  
5:298. 1887.

Erect annuals; branchlets compressed, deciduous; leaves oblong to obovate, obtuse; stipules lanceolate-acuminate; cymules monoecious, except for a few proximal ones; capsules subglobose, 1.5-2 mm across; seeds trigonous with longitudinal and cross striae and hyaline, hygroscopic 'setae'.

This species is a common weed in moist localities.

Flowers: Aug. - Mar.

Sivarajan 1763.

P. virgatus ("virgata") Forst. f. Fl. Ins. Austr. Prod. 65. 1786; Back. & Bakh. f. Fl. Java 469. 1963; Airy Shaw in Kew Bull. 26:325. 1972. P. simplex var. virgatus (Forst.f.) Muell. Arg. in Linnaea 32:32. 1893. P. simplex Retz. Obs. Bot. 5:29. 1789; FBI. 5:295. 1887; Gamb. 902.

Erect or diffuse herbs; leaves on the main stem distichous, narrowly oblong-obtuse; male flowers minute, sessile, clustered in the axils; female flowers on long, filiform pedicels; capsules depressed globose, smooth; seeds minutely tubercled.

Commonly seen in the rocky laterite. Collected from Devagiri and the University campus.

Flowers: July - Mar.

Sivarajan 73, 171, 1222.

P.gardnerianus (Wt.) Baill. Eteud. Gen. Euph. 628. 1858; Gamb. 902. Macraea gardneriana Wt. Ic. t. 1902, f. 3. 1852. P.simplex var. gardneriana (Wt.) Muell. Arg. in Linnaea 32:32. 1863; FBI. 5:295. 1887.

Undershrubs with a thick rootstock; branches leafy throughout; leaves elliptic or oblong, obtuse, glabrous; male flowers fascicled in the axils; females solitary, on long, filiform pedicels; capsules depressed globose, minutely verrucose; seeds minutely tubercled.

Common in the hard rocky laterite, especially in the crevices of shaded rocks.

Flowers: July - Mar.

Sivarajan 308.

P.urinaria Linn. Sp. Pl. 982. 1753; FBI. 5:293. 1887; Gamb. 902; Webster in J. Arn. Arb. 38:194, f. 9. 1957 & Brittonia 22:65. 1970; Airy Shaw in Kew Bull. 26:325. 1972.

Erect or diffuse annuals; branchlets compressed, deciduous; leaves oblong or obovate, obtuse or acute; stipules of each pair unequal, lanceolate, those of cataphylls auricled at base; cymules usually dioecious; capsules prominently tuberculate, 2-2.5 mm across; seeds trigonous, prominently transversely ridged.

Common in the grassy slopes. Also seen as a weed in gardens.

Flowers: July - Dec.

Sivarajan 1189, 1223, 1278.

Note: This species exhibits a reverse order in the distribution of sex on the branchlets, the pistillate flowers being proximal and the staminate ones being distal, whereas other species of Phyllanthus have the reverse order.

Tragia Linn.

T. involucreta Linn. Sp. Pl. 980. 1753; FBI. 5:465. 1887;

Cooke, 3:120; Gamb. 931.

A slender, twining herb with stinging hairs; leaves ovate-lanceolate, acuminate, coarsely serrate, hispid on both surfaces; flowers in monoecious racemes;

capsules of 3, 2-valved cocci; seeds globose.

Flowers: Nov. - Dec.

Sivarajan 545.

Micrococca Benth.

M. mercurialis (Linn.) Benth. in Hook. Niger. Fl. 503.

1849; Prain in Ann. Bot. 15:631. 1911; Pax in  
Pfreich. 4:133. 1914; Gamb. 929. Tragia mercurialis  
Linn. Sp. Pl. 680. 1753. Claoxylon mercurialis (Linn.)  
Th. En. Pl. Zeyl. 271. 1861; FBI. 5:413. 1887.

Erect annuals; leaves ovate, acute or acuminate,  
crenate-serrate; flowers minute in monoecious fascicles  
on axillary racemes; male flowers with ciliate disc  
glands; capsules deeply 3-lobed; seeds globose, foveolate.

Flowers: June - Dec.

Sivarajan 876, 1180, 1307.

Acalypha Linn.

Key to the species

1. Styles very prominent and coloured:

2. Leaves pubescent ..... Micrococca

2. Leaves glabrous ..... Acalypha



1. Styles not prominent or coloured:
  3. Bracts longer than the capsules:
    4. Bracts without glandular hairs:
      5. Leaves tomentose ..... alnifolia
      5. Leaves glabrous ..... indica
    4. Bracts with glandular hairs ..... malabarica
  3. Bracts shorter than the capsules:
    6. Leaves deltoid:
      7. Bracts with sessile glands ..... fruticosa
      7. Bracts without glands ..... lanceolata
    6. Leaves not deltoid ..... racemosa

A. hispida Burm. f. Fl. Ind. 303. 1768; Muell. Arg. in DC. Prod. 815. 1866; FBI. 5:417. 1887; Back. & Bakh. f. Fl. Java 1:489. 1963; Airy Shaw in Kew Bull. 26:206. 1972.

Much branched, dioecious shrubs; leaves broadly ovate-acuminate, dentate, pubescent on both surfaces, up to 20.5 x 9.8 cm; female spikes drooping, cylindrical, very long; styles crimson red, branched; ovary villous.

Flowers: throughout the year.

Sivarajan 824.

A. wilkesiana Muell. Arg. in DC. Prod. 15:817. 1866;  
Bailey, 622; Gamb. 931; Mathew in Rec. Bot. Sur. Ind.  
20:197. 1969; Airy Shaw in Kew Bull. 26:208. 1972.

Monoecious shrubs; leaves ovate or elliptic,  
coarsely dentate, almost glabrous, sometimes mottled;  
spikes short, dioecious, erect and interrupted.

Flowers: throughout the year.

Sivarajan 1520.

A. alnifolia Klein ex Willd. Sp. Pl. 4:525. 1805; FBI.  
5:415. 1887; Gamb. 930.

Grey-pubescent herbs; leaves ovate-cordate,  
crenate-serrate, about 2.5 x 1.8 cm; spikes dioecious;  
male spikes up to 4 cm long; female flowers subcapitate;  
bracts dentate, enclosing the capsules; capsules of 3,  
2-valved cocci; seeds subglobose.

Flowers: Sept. - Dec.

Sivarajan 1721.

A. indica Linn. Sp. Pl. 1003. 1753; Muell. Arg. in DC.  
Prod. 868. 1866; FBI. 5:416. 1887; Back. & Bakh. f.  
Fl. Java 1:490. 1963; Gamb. 930; Airy Shaw in Kew Bull.  
26:206. 1972.

Annual herbs; leaves long-petioled, ovate-deltoid, serrate, up to 4 x 2.8 cm; spikes monoecious with a triradiate hood at the tip; female flowers lower and the males upper; bracts large, orbicular, dentate; capsules hispid, often concealed by the bracts.

Flowers: July - Dec.

Sivarajan 822, 1362.

A. malabarica Muell. Arg. in Linnaea 34:42. 1865-66;

FBI. 5:416. 1887; Gamb. 930; Chandra Bose in Bull.

Bot. Sur. Ind. 10:244. 1969.

Annual, tomentose herbs; leaves long-petioled, ovate-deltoid, crenate-serrate, up to 10 x 5.6 cm; flowers in androgynous spikes, about 5 cm long; male flowers few, terminal; bracts longer than the capsules, shortly dentate, teeth with gland-tipped hairs; capsules glabrous.

Flowers: Aug. - Dec.

Sivarajan 1514.

A. fruticosa Forsk. Fl. Aeg.-Ar. 161. 1775; FBI. 5:415.

1887; Gamb. 931.

Woody undershrubs; leaves ovate-acuminate, crenate-serrate; spikes axillary, solitary, short, androgynous; bracts with sessile glands; capsules tomentose, glandular.

Flowers: Mar. - July

Sivarajan 896.

A.lanceolata Willd. Sp. Pl. 4:524. 1805; Merr. & Chun in Sunyatsenia 5:92. 1940; Gamb. 931; Airy Shaw in Kew Bull. 26:206. 1972. A.boehmerioides Miq. Fl. Ind. Bat. Suppl. 459. 1860; Muell.-Arg. in DC. Prod. 15(2):871. 1866; Merr. in Trans. Phil. Soc. n.s. 24(2):238. 1935; Back. & Bakh. f. Fl. Java 1:490. 1963. A.fallax Muell. Arg. in Linnaea 34:43. 1865 & in DC. Prod. 872. 1866; FBI. 5:416. 1887.

Dense-tomentose, annual herbs; leaves ovate-deltoid, crenate, about 6 x 3.5 cm; spikes densely hispid, androgynous, short, sessile; bracts dentate, hispid, shorter than the capsules; capsules hairy.

Flowers: July - Dec.

Sivarajan 85.

A. racemosa Wall. ex Baill. Eteud. Euph. 443. 1858;  
Raizada in Ind. For. 92:300. 1966. A. paniculata Miq.  
Fl. Ind. Bat. 1:406. 1859; FBI. 5:415. 1887;  
Gamb. 930.

Erect herbs; leaves ovate-acuminate, crenate-  
serrate, up to 12.5 x 8.2 cm; spikes dioecious; male  
spikes axillary, solitary; female flowers in axillary  
or terminal, lax panicles; bracts minute.

Flowers: Aug. - Dec.

Sivarajan 1766.

Excoecaria Linn.

E. agallocha Linn. Sp. Pl. (ed.2) 1451. 1763; FBI.5:472.  
1888; Back. & Bakh. f. Fl. Java 499. 1963; Gamb. 941;  
Airy Shaw in Kew Bull. 26:269. 1972. Stillingia  
agallocha (Linn.) Baill. Eteud. Gen. Euph. 518. 1858.

Trees or shrubs; leaves alternate, ovate or  
elliptic, acute, entire or finely crenulate, glabrous;  
spikes dioecious, 3-6 cm long; stamens 3; ovary 3-celled;  
styles 3; capsules glabrous, 3-lobed, cocci separating  
from a central columella; seeds subglobose.

Common in salt marshes and along back waters  
at Beypore and Kadalundi.

Flowers: Mar. - Sept.

Sivarajan 708.

Croton Linn.

Key to the species

1. Herbs ..... bonplandianum  
1. Shrubs ..... lacciferus

C.bonplandianum Baill. in Adansonia 4:339. 1864; Cro-  
ziat in J. Bombay nat. Hist. Soc. 41:573. 1940;  
Mahes. 316. C.sparciflorum (C.sparciflorus, sphalm.)  
Morong. Ann. N.Y. Acad. Sci. 7:221. 1893; Gamb. 920.

Much branched, erect, stellate-tomentose, herbs;  
leaves lanceolate, crenate-serrate, acuminate; flowers  
greenish white in monoecious spikes; disc annular;  
calyx lobes 5; petals 5; stamens many, free; capsules  
oblong, depressed at the tip, sparsely stellate-hairy  
when young; seeds carunculate.

An introduced weed, now naturalized in India.  
It runs wild on the road sides and waste places and  
even on the sea coast.

Flowers: June - Sept.

Sivarajan 728.

C.lacciferus Linn. Sp. Pl. 1005. 1753; Gamb. 920.

C.aromaticus sensu Hook. f. Fl. Brit. Ind. 5:388.  
1887, in part.

Shrubs; branches stellate-tomentose; leaves ovate-lanceolate, acute or obtuse, stellate-tomentose beneath; spikes dioecious, dense-tomentose; capsules densely stellate-hairy; seeds carunculate.

Flowers: Mar. - May

Sivarajan 1106.

Chrozophora Juss. (nom.cons.)

C.rotteri (Geisel.) A. Juss. ex Spreng. Syst. Veg.

3:850. 1826; Prain in Bull. Misc. Inf. Kew 1918: 95. 1918; Steenis in Bull. Jard. Bot. Buit. Ser. 3, 13:399. 1948; Sant.221. 1960; Back. & Bakh. f. Fl. Java 477. 1963; Gamb. 921; Airy Shaw in Kew Bull. 25:463. 1971 & 26:232. 1972. Croton rotteri Geisel. in Crot. Monogr. 54. 1807; A. Juss. Tent. Euphorb. 28. 1824. Chrozophora plicata var.rotteri (Geisel.) Muell. Arg. in DC. Prod. 15(2):747. 1866.

Erect, branched herbs, densely stellate-tomentose; leaves ovate or orbicular, sometimes 3-lobed, stellate-hairy on both surfaces; flowers in axillary or

terminal, monoecious racemes; disc of 5 glands; calyx lobes 5; petals 5, yellow; stamens 5-10, filaments partially connate; capsules covered with stellate tomentum; seeds globose, not carunculate.

This is a common weed in the harvested fields and was collected from Feroke.

Flowers: June - Nov.

Sivarajan 254.

Sebastiana Spreng.

S. chamaelea (Linn.) Muell. Arg. in DC. Prod. 15:1175.

1866; FBI. 5:475. 1888; Back. & Bakh. f. Fl. Java 498. 1963; Gamb. 940; Airy Shaw in Kew Bull. 26:339.

1972. Tragia chamaelea Linn. Sp. Pl. 981. 1753.

Microstachys chamaelea (Linn.) Juss. Tent. Euphorb.

49. 1824. Stillingia chamaelea (Linn.) Baill. Eteud.

Gen. Euph. 516. 1858. Excoecaria chamaelea (Linn.)

Baill. in Adansonia 6:323. 1867.

Branched, woody herbs; leaves oblong-obtuse, up to 5 x 1.2 cm; flowers minute in axillary, monoecious spikes, up to 2-3 cm long; petals and disc absent; capsules of 3 cocci, each with two dorsal rows of short



spines; seeds subglobose, carunculate.

Flowers: July - Dec.

Sivarajan 61.

Bridelia Willd.

Key to the species

1. Flowers in axillary clusters;
  2. Trees ..... roxburghiana
  2. Rambling shrubs ..... scandens
1. Flowers in terminal spikes ..... retusa

B.roxburghiana (Muell. Arg.) Gehrm. in Engl. Bot.

Jahrb. 41. Beibl. 95:30. 1908; Gamb. 896. B.retusa,  
var.roxburghiana Muell. Arg. in DC. Prod. 15(2):70.  
1866; FBI. 5:268. 1887.

Trees with stout, sharp spines; leaves oblong-elliptic, obtuse, up to 15 x 7.5 cm; flowers sessile in axillary clusters; sepals 5; petals 5; stamens 5 in male flowers; ovary in female flowers 2-celled; drupe black, dipressed globose.

Flowers: Sept. - Dec.

Sivarajan 1434.

B.scandens (Roxb.) Willd. Sp. Pl. 4:979. 1805, in part;  
Gehrm. in Engl. Bot. Jahrb. 41. Beibl. 95:29. 1908;  
Sant. in J. Bombay nat. Hist. Soc. 50:307. 1952.  
Clutia scandens Roxb. Pl. Corom. 2:39, t. 173. 1798.  
Bridelia stipularis Muell. Arg. in DC. Prod. 15:499.  
1866, in part.

Climbing shrubs with spines when young; leaves elliptic-oblong or obovate, up to 10 x 4.5 cm, those on the flowering branches much smaller; flowers in sessile, monoecious, axillary clusters, densely hairy outside and glabrous within; drupes black.

Flowers: Oct. - Dec.

Sivarajan 704.

B.retusa (Linn.) Spreng. Syst. Veg. 3:48. 1826; Muell.  
Arg. in DC. Prod. 15(2):493. 1866; FBI. 5:268. 1887;  
Jablonski in Pfreich. 8:69. 1915; Gamb. 896; Airy  
Shaw in Kew Bull. 26:230. 1972. Clutia retusa Linn.  
Sp. Pl. 1042. 1753. C.spinosa Roxb. Corom. Pl. 2:38.  
1798. Bridelia spinosa (Roxb.) Willd. Sp. Pl. 4:979.  
1805.

Small trees; leaves broadly oblong-obtuse,  
leathery, lateral veins many; flowers in usually terminal

and subterminal spikes; drupes subglobose, black when ripe.

Flowers: Aug. - Oct.

Sivarajan 1841.

Sapium P. Br.

S. insigne (Royle) Benth. in Benth. & Hook. f. Gen. Pl. 3:335. 1880; FBI. 5:471. 1888; Gamb. 941; Airy Shaw in Kew Bull. 26:330. 1972. Falconeria insignis Royle Ill. Bot. Himal. 354. t. 98 (84a), Fig.2. 1839. Excoecaria insignis (Royle) Muell. Arg. in DC. Prod. 15(2):212. 1866.

Deciduous trees; leaves elliptic-acuminate, crenate-serrate; spikes unisexual or bisexual, erect; male flowers in rounded clusters and the females usually solitary; fruits fleshy.(Plate 23).

Flowers: Feb. - Mar.

Sivarajan 1024, 1595, 1647.

Note: The flowering spikes and fruits of this species are described variously by various authors. A careful screening of the local population of this species in this area has revealed interesting variations

PLATE 23

Sapium insigne (Royle) Benth. in flowers.

Fig.1. Male tree bearing spikes.

Fig.2. Female tree with fruiting spikes.

Fig. 1



Fig. 2

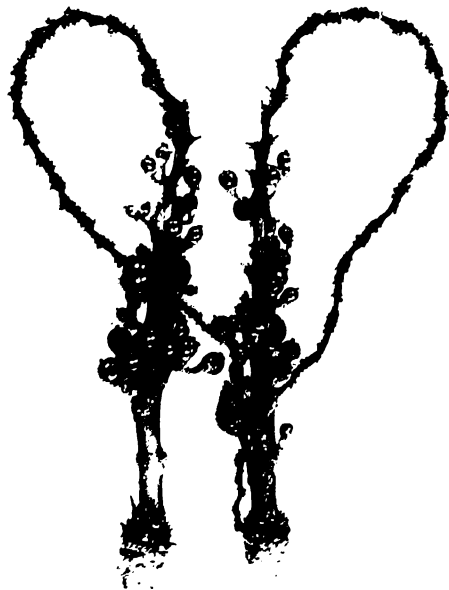
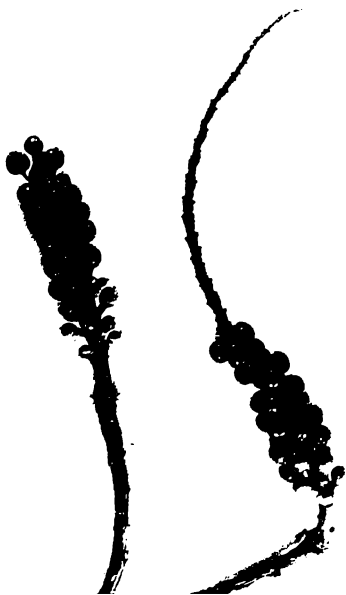
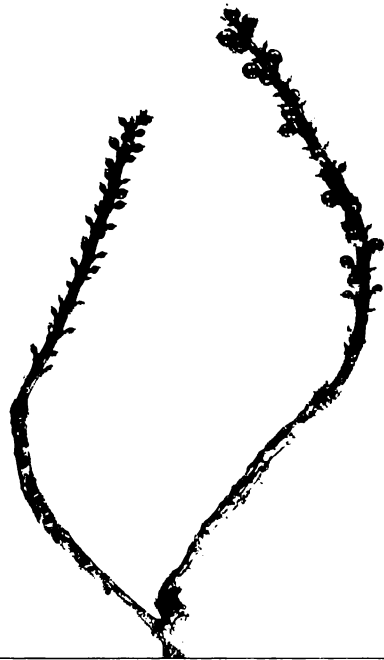
PLATE 24

Sapium insigne (Royle) Benth. Different types of sex distribution. Fig. 1. Male spikes. Fig. 2. Female spikes. Figs. 3-4. Bisexual spikes.

Fig. 1



Fig. 2



mainly in their reproductive phase.

These deciduous trees with their acrid milky juice shed their leaves before flowering (January-March) and put on juvenile leaves during April-May. Rarely, plants in foliage are also seen to bear spikes. They are most commonly dioecious (Plate 23, Figs. 1-2 & Pl. 24, Figs. 1-2) Monoecious plants with bisexual spikes are also seen. In these bisexual spikes, the basal part is exclusively female and the upper part male. Solitary female flowers in the axil of each bract (Plate 24. fig.3) is the most common type, while a few trees showed 2-5 female flowers in each <sup>c</sup>~~axil~~ axil (Plate 24. fig. 4). However, monoecious plants with unisexual spikes were not seen.

The short-pedicellate female flowers have 2-3-carpellate ovary with 2-3 styles connate at base. Fruits are 2-3-seeded fleshy berries, falling off leaving a central columella, which are 2-3 fid at tips. Shape of fruits are also variable from subglobose to ovoid.

Breynia, J.R. & G.Forst (nom.cons.)

B.vitis-idaea (Burm.f.) C.E.C.Fischer in Bull. Misc.

Inf. Kew 1932:65. 1932; Airy Shaw in Kew Bull. 26:227.

1972. Rhamnus vitis-idaea Burm. f. Fl. Ind. 61. 1768.



Phyllanthus rhamnoides Willd. Sp. Pl. 4:580. 1805.

Breynia rhamnoides (Willd.) Muell. Arg. in DC.

Prod. 15(2):440. 1866; FBI. 5:330. 1887; Gamb. 912.

Shrubs; leaves ovate-obtuse or orbicular, glaucous beneath, up to 4.5 x 2 cm; flowers in axillary monoecious fascicles, greenish white, campanulate; pedicels short; petals and disc absent; stamens 3, connate in a column; drupes subglobose, black when ripe.

Flowers: Mar. - May

Sivarajan 1031.

Trewia Linn.

T. nudiflora Linn. Sp. Pl. 1193. 1753; FBI. 5:423. 1887;

Gamb. 922; Airy Shaw in Kew Bull. 20:405. 1966 & 23:79. 1969 & 26:343. 1972.

Dioecious, deciduous trees; leaves broadly ovate-acuminate, rounded or cordate at base, ~~glabrous,~~ up to 15 x 8 cm; male flowers in pendulous, ~~many-flowered~~ racemes; female flowers 1-3 on long peduncles; ~~petals~~ and disc absent; drupes oblong.

Common along the banks of rivers and streams.  
There are a few trees along the road sides near  
Ramanattukara.

Flowers: Dec. - Jan.

Sivarajan 921, 1653.

Securinega Commers. ex Juss. (nom.cons.)

Key to the species

1. Plants usually spinous ..... leucopyrus  
1. Plants not spinous ..... virosa

S.leucopyrus (Willd.) Muell. Arg. in DC. Prod. 15(2):

451. 1866; Pax. & Hoffm. in Pfam. (ed.2) 19C:60. 1931;

Airy Shaw in Kew. Bull. 25:493. 1971 & 26:340. 1972.

Fluggea leucopyrus Willd. Sp. Pl. 4:757. 1805; FBI.

5:328. 1887; Gamb. 907. F.xerocarpa A. Juss. Tent.

Euphorb. 106, 5. 2, f. 7B. 1824. Phyllanthus leucopyrus

(Willd.) Koenig ex Roxb. Fl. Ind. 3:658. 1832. Cicca

leucopyrus (Willd.) Kurz For. Fl. Brit. Burma 2:353.

1877.

Straggling shrubs; branches often ending in spines  
leaves obovate or oblanceolate, obtuse, glabrous, up to  
4 x 1.5 cm; flowers greenish yellow, clustered in the axils,

short-pedicellate; calyx lobes 5; petals 0; stamens 5;  
fruits dry, globose, black when ripe.

Flowers: July - Sept.

Sivarajan 723, 1736.

S.virosa (Roxb. ex Willd.) Baill. in Adansonia 6:334.

1866, quoad synonym tantum, emend Pax. & Hoffm. in  
Pfam. (ed.2) 190:60. 1931; Back. & Bakh. f. Fl.  
Java 466. 1963; Airy Shaw in Kew Bull. 26:340. 1972.  
Phyllanthus virosus Roxb. ex Willd. Sp. Pl. 4:578.  
1805. Fluggea microcarpa Blume, Bijdr. 580. 1825;  
FBI. 5:329. 1887. Fluggea virosa (Roxb. ex Willd.)  
Baill. Etud. Gen. Euphorb. 593. 1858; Gage in J.  
As. Soc. Beng. 75(5):525. 1936.

Unarmed shrubs; leaves obovate-obtuse; flowers  
minute in axillary clusters, short pedicelled; male  
flowers numerous; females few; fruits globose, dry,  
black when mature.

Flowers: Mar. - May

Sivarajan 237.

Suregada Roxb. ex Rottl.

S.angustifolia (Muell. Arg.) Airy Shaw in Kew Bull.

23:128-29. 1969. Gelonium angustifolium Muell.-Arg.  
in DC. Prod. 15(2):1128. 1866 (tantum quoad vars.  
ellipticum et lanceolatum, excl. var.spathulato)  
G. lanceolatum sensu Th. En. 274. 1861; FBI. 5:459.  
1887, in part.

Dioecious shrubs or small trees; leaves  
elliptic-acute or acuminate, pellucid-punctate, spinulose-  
dentate; inflorescence leaf-opposed; male flowers many  
in short, bracteolate racemes; female flowers few,  
fascicled; capsules deeply lobed.

Flowers: Jan. - May

Sivarajan 59, 181.

Note: This South Indian species can very well be  
distinguished from its close allies by its sharply acu-  
minate leaves and its sharply spinulose margins and the  
tight bracteolate male racemes.

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The author is thankful to Dr. H.K.Airy Shaw, Royal  
Botanic Gardens, Kew, for the identification of the  
Suregada specimen and for his valuable comments on that.

STILAGINACEAE C.A.Agardh.

Antidesma Linn.

Key to the species

1. Leaves obtuse at the tip ..... ghaesembilla
1. Leaves acuminate at tip:
  2. Branches glabrous ..... bunius
  2. Branches hispid ..... menasu

A.ghaesembilla Gaertn. Funct. 1:189. 1788; Muell.Arg.  
in DC. Prod. 15(2):251. 1866; FBI. 5:357. 1887;  
Airy Shaw in Kew Bull. 26:353. 1972. A.pubescens  
Roxb. Pl. Corom. 2:35, t. 167. 1798. A.frutescens  
Jack. in Mal. Misc. 2:91. 1822; Pax and Hoffm. in  
Pfreich. 4:157. 1922.

Small, dioecious trees with hispid branches;  
leaves ovate to obovate; obtuse; flowers green in  
paniculate spikes; stamens in male flowers 4-5; fruits  
ellipsoid, slightly compressed.

Flowers: May - July

Sivarajan 231.

A. bunius (Linn.) Spreng. Syst. Veg. 1:826. 1825; Muell.  
Arg. in DC. Prod. 15(2):262. 1866; FBI. 5:358. 1887;  
Back. & Bakh. f. Fl. Java 458, 460. 1963; Airy Shaw  
in Kew Bull. 26:353. 1972. Stilago bunius Linn. Mant.  
122. 1767.

Shrubs or small trees; leaves elliptic or  
lanceolate, coriaceous, glabrous, up to 10 x 3.5 cm;  
flowers green in simple or rarely branched spikes;  
fruits ovoid, compressed.

Flowers: May - June

Sivarajan 230, 1319.

A. menasu Miq. ex Tul. in Ann. Sc. Nat. Ser. III.  
15:215. 1815; Muell. Arg. in DC. Prod. 15(2):257.  
1866; FBI. 5:364. 1887; Gamb. 908.

Shrubs; leaves elliptic or oblanceolate,  
caudate-acuminate; flowers green in branched or  
unbranched spikes; fruits compressed.

Flowers: Mar. - July

Sivarajan 226, 249, 1684.

ULMACEAE Mirbel

Trema Lour.

T.orientalis (Linn.) Blume, Mus. Bot. Lugd. Bat. 2:62.  
1856; FBI. 5:484. 1888; Polhill in Kew Bull. 19:143.  
1964; Gamb. 945. Celtis orientalis Linn. Sp. Pl.  
1044. 1753.

Small trees with spreading branches; leaves  
obliquely ovate-acuminate, serrate, 3-ribbed at base;  
flowers in short, axillary cymes; perianth 4-5-partite;  
stamens as many as perianth lobes; drupes subglobose.

Flowers: Feb. - Mar.

Sivarajan 1001.

MORACEAE Link.

Key to the genera

1. Female flowers 1-2 in the axils ..... Streblus
1. Female flowers many:
  2. Flowers enclosed in receptacles ..... Ficus
  2. Flowers not enclosed in receptacles:
    3. Fruits multiple ..... Artocarpus
    3. Fruits of individual drupelets ..... Morus

Streblus Lour.

S. asper Lour. Fl. Cochinch. 615. 1790; FBI. 5:489.

1888; Gamb. 947.

Small, robust trees with tomentose branches;  
leaves obovate or oblanceolate, serrate, scabrid;  
male flowers in dense, capitate clusters; female flowers  
1-2 in the axils, pedicellate.

Flowers: Mar. - May

Sivarajan 1061.

Ficus Linn.

Key to the species

1. Fruits on the old wood or on special  
creeping branches:
  2. Leaves glabrous ..... racemosa
  2. Leaves scabrous ..... hispida
1. Fruits axillary:
  3. Fruits peduncled:
    4. Leaves scabrid ..... asperrima
    4. Leaves not scabrid:
      5. Fruits about 2 cm across ..... callosa
      5. Fruits 1 cm across ..... tinctoria



3. Fruits sessile:

6. Branches and leaves densely woolly ... drupacea

6. Branches and leaves not woolly:

7. Leaves obtuse:

8. Fruits 1 cm across ..... microcarpa

8. Fruits much larger ..... benghalensis

7. Leaves caudate-acuminate:

9. Receptacles 3-7 in axillary

clusters .... tjakela

9. Receptacles in axillary pairs:

10. Leaves long cuspidate ..... religiosa

10. Leaves shortly cuspidate ... talboti

F. racemosa Linn. Sp. Pl. 1060. 1753; Corner in Dansk.

Bot. Arkiv. 23:28. 1963; Sant. 259. 1967. F. glomerata

Roxb. Pl. Corom. 2:13. t. 123. 1798; King in Ann.

Roy. Bot. Gard. Calc. 1:173. 1888; FBI. 5:535. 1888;

Sant. 230. 1960.

Evergreen trees; leaves elliptic-oblong, glabrous, 3-ribbed from base; fruits dense-tomentose, 1.5 cm across on bracteolate, tubercled and warted branchlets, clustered on the trunk and older branches.

Flowers: Jan. - May

Sivaraajan 966.

F.hispida Linn. f. Suppl. 442. 1783; King in Ann. Roy.  
Bot. Gard. Calc. 1:80. 1880 & FBI. 5:522. 1888;  
Corner in Gard. Bull. Sing. 18:40. 1960; Gamb. 955;  
Sant. 258. 1967.

Small trees; leaves entire or lobed, ovate or  
elliptic, scabrid; fruits golden yellow, hispid,  
solitary in the axils of fallen leaves or fascicled on  
leafless branches, often reaching and penetrating the  
soil.

Flowers: Jan. - Mar.

Sivarajan 1104

F.asperrima Roxb. Fl. Ind. 3:554. 1832; FBI. 5:522; 1888,  
Cooke, 2:536; Sant. 258. 1967.

Small trees; leaves alternate, oblong-  
lanceolate or elliptic, scabrid on both surfaces;  
fruits axillary, solitary, pedunculate, tomentose.

Flowers: Jan. - Mar.

Sivarajan 987.

F.callosa Willd. in Mem. Acad. Berl. 102. 1798; King  
in Ann. Roy. Bot. Gard. Calc. 1:64. 1888 & FBI.  
5:516. 1888; Gamb. 954.

Evergreen trees; leaves broad, oblong-obtuse, coriaceous, glabrous; receptacles axillary, solitary, subglobose with a long peduncle.

Flowers: Jan. - Mar.

Sivarajan 1522.

F.tinctoria Forst. f. Prod. Fl. Austr. 76. 1786,  
ssp.parasitica (Willd.) Corner in Gard. Bull. Sing.  
17:477. 1960; Sant. 256. 1967. F.parasitica Willd.  
Mem. Acad. R. Sc. Bell. Lett. Fr. Guill. 2:102. t. 3.  
1798. F.gibbosa Blume, var.parasitica (Willd.) King.  
in Ann. Roy. Bot. Gard. Calc. 1:6. Pl. 2 a-b. 1888;  
Sant. 227. 1960.

Trees, often epiphytic; leaves ovate or elliptic-acute, glabrous, usually unequal sided; receptacles small, 1-5 in the axils, pedunculate.

Often growing epiphytically on F.benghalensis.

Flowers: Jan. - Mar.

Sivarajan 1162.

E.drupacea Thunb. Diss. Ficus 6:11. 1786, var. pubescens  
(Roth) Corner in Gard. Bull. Sing. 17:380-381. 1959;  
Sant. 256. 1967. E.mysorensis Heyne ex Roth  
var. pubescens Roth in Roem. & Schult. Syst. Veg.  
1:508. 1817; King in Ann. Roy. Bot. Gard. 1:20. 1888.

Evergreen trees; branches and leaves densely  
woolly; leaves broadly elliptic, short-acuminate,  
leathery; receptacles sessile, axillary to the leaves  
near the tips of branches.

Collected from the premises of Varakkal temple  
at West Hill.

Flowers: Sept. - Jan.

Sivarajan 475.

F.microcarpa Linn. f. Suppl. 442. 1781; Corner in Gard.  
Bull. Sing. 17:397. 1959; Sant. 257. 1967. F.retusa  
auct. non Linn; FBI. 5:511. 1888.

Trees with very slender aerial roots; leaves  
elliptic or obovate-obtuse, basally 3-nerved; receptacles  
sessile, usually in axillary pairs towards the tips of  
branches.

Flowers: Dec. - Jan.

Sivarajan 807.

Note: This plant has been erroneously described as F. retusa Linn. in many of the Indian Floras. Linnaeus described his species F. retusa based on specimens from Java. Corner (loc.cit.) has found that F. retusa Linn. does not actually occur in India and that the correct identity of the Indian specimen is as cited above.

F. benghalensis Linn. Sp. Pl. 1059. 1753; King in Ann. Roy. Bot. Gard. Calc. 1:18, t. 13, 81, f. c. 1888; FBI. 5:499. 1888; Corner in Gard. Bull. Sing. 17:381. 1959; Gamb. 952; Sant. 256. 1967.

Large trees with many, large, aerial roots; leaves ovate-oblong; obtuse, large, coriaceous; receptacles large, hispid, sessile in axillary pairs.

Common on road sides. Usually cultivated near temples.

Flowers: Jan. - May.

Sivarajan 1804.

F. tjakela Burm. f. Fl. Ind. 227. 1768; King in Ann. Roy. Bot. Gard. Calc. 1:57. 1888; FBI. 5:514. 1888; Gamb. 953.

Trees; leaves broadly oblong, cuspidate, long-  
petioled; receptacles <sup>↑</sup>small, sessile, in clusters of  
<sub>^</sub>2-6 in the axils or on the older branches.

Flowers: Jan. - Apr.

Sivarajan 1820.

F. religiosa Linn. Sp. Pl. 1059. 1753; FBI. 5:513. 1888;  
Gamb. 953; Sant. 257. 1967.

Large trees; leaves ovate, with a long, lan-  
ceolate, cuspidate tip; receptacles small in axillary  
pairs, sessile, smooth, depressed globose.

Flowers: Jan. - Mar.

Sivarajan 1130.

F. talboti King, in Ann. Roy. Bot. Gard. Calc. 1:51. 1888;  
FBI. 5:512. 1888; Gamb. 953.

Deciduous trees; leaves oblong, caudate-  
acuminate, glabrous, penninerved; receptacles in  
sessile pairs in the axils of fallen leaves.

Flowers: Dec. - Mar.

Sivarajan 1609.

Artocarpus J.R. & G.Forst. (nom.cons.)

Key to the species

1. Leaves pinnately lobed ..... communis
1. Leaves not pinnately lobed:
  2. Male spikes up to 15 cm long ..... hirsutus
  2. Male spikes not more than 5 cm long.. heterophyllus

A.communis Forst. Char. Gen. 103. 1776; Merr. En. 2:40.

1923; Jarret in J. Arn. Arb. 40:307. 1959.

Radermachia incisa Thunb. in Vet. Akad. Handl. Stockt.

254. 1776. Artocarpus incisa (Thunb.) Linn. f. Suppl.

411. 1781; FBI. 5:539. 1888. A.altilis (Parkinson)

Fosberg in J. Wash. Acad. Sci. 31:95. 1941.

Trees; leaves large, leathery, pinnately lobed;  
25-50 cm long; male spikes up to 25 cm long; female  
spikes ovoid; fruits small, echinate.

Usually cultivated for the edible fruits.

Popularly known as "Bread-fruit tree".

Flowers: Nov. - Jan.

Sivarajan 1819.

A.hirsutus Lamk. Encycl. Meth. Bot. 3:210. 1789,

"hirsuta"; FBI. 5:541. 1888; King in Ann. Roy.  
Bot. Gard. Calc. 2:9, t. 5. 1889; Jarret in J.  
Arn. Arb. 40:358. 1959; Gamb. 957.

Large trees; leaves elliptic-obtuse, strigose-hairy on the veins; flowers on axillary, pedunculate, narrowly cylindrical receptacles; fruits small, echinate, spines straight.

Flowers: Jan. - Feb.

Sivarajan 1678.

A.heterophyllus Lamk. Encycl. Meth. Bot. 3:210. 1789,

"heterophylla"; Jarret in J. Arn. Arb. 40:334. 1959.  
A.integrifolia Linn. f. B.heterophylla (Lamk.) Pers.  
Syn. Pl. 2:531. 1807.

Tree; leaves obovate-oblong or elliptic, obtuse; male and female spikes ellipsoid-oblong, usually from the old wood; fruits large, echinate; spines short.

Popularly known as "Jack-fruit tree", this is very common under cultivation for the edible fruits. The timber is also valuable.

Flowers: Dec. - Mar.

Sivarajan 1093.



Morus Linn.

M.alba Linn. Sp. Pl. 986. 1753; FBI. 5:492. 1888;

Woodr. in J. Bombay nat. Hist. Soc. 12:515. 1899;

Cooke 3:159.

Shrubs or small trees; leaves ovate, crenate-serrate, basally 3-nerved; flowers greenish in axillary, clustered spikes.

Flowers: Feb. - June

Sivarajan 1344.

URTICACEAE Juss.

Key to the genera

1. Leaves opposite:
  2. Leaves large, toothed ..... Lecanthus
  2. Leaves small, entire ..... Pilea
1. Leaves alternate:
  3. Plants with stinging hairs:
    4. Leaves not lobed ..... Laportea
    4. Leaves 3-7-lobed ..... Girardinia
  3. Plants without stinging hairs:
    5. Leaves entire ..... Pouzolzia
    5. Leaves dentate ..... Boehmeria

Lecanthus Wedd.

L.wallichii Wedd. in Ann. Sc. Nat. Ser. 4(1):187. 1854;  
Wright in J. Linn. Soc. 26:480. 1899; Cooke 3:133;  
L.wightii sensu Hook. f. Fl. Brit. Ind. 5:559. 1888,  
in part.

Fleshy herbs; leaves obliquely ovate, acuminate,  
dentate; flowers white in axillary, dioecious, short-  
peduncled heads; sepals 4-5 in males; stamens inflexed;  
perianth of female flowers 3-partite, lobes unequal;  
achenes minute, compressed.

Flowers: July - Dec.

Sivarajan 1821.

Pilea Lindl. (**nom.cons.**)

P.microphylla (Linn.) Liebm. in Vidensk. Selsk. Skr.  
5(2):296. 1851; Cooke 3:659, Gamb. 965. Parietaria  
microphylla Linn. Syst. (ed.10) 1308. 1759.

Small, delicate herbs; leaves small, elliptic  
to spatulate, up to 5 mm long; male and female flowers  
in axillary, pedunculate cymes, minute; perianth of  
male flowers of 2-4 segments; stamens 2-4; perianth of  
females of 3 segments; achene ovoid, compressed.

A weed on old, moist walls and in gardens.

Flowers: July - Dec.

Sivarajan 709.

Laportea Gaud. (nom.cons.)

L.interrupta (Linn.) Chew in Gard. Bull. Sing. 19:200.  
1965 & 25:145, f. 15. 1969. Urtica interrupta Linn.  
Sp. Pl. 985. 1753. Fleurya interrupta (Linn.) Wt.  
Ic. Pl. Ind. Or. 6:10, t. 1975. 1853; FBI. 5:548.  
1888; Gamb. 959.

Erect herbs covered with stinging hairs; leaves  
ovate-acuminate, crenate-serrate; flowers capitate on  
interrupted, axillary spikes; achenes compressed,  
marginated.

Flowers: July - Dec.

Sivarajan 323.

Girardinia <sup>a</sup>Gaud.

G.zeylanica Decne. in Jacq. Voy. 152. 1844; Sant. 255.  
1960; Gamb. 960. G.heterophylla Decne, var.zeylanica  
(Decne) Hook. f. Fl. Brit. Ind. 5:550. 1888.

Herbs with stinging hairs; leaves 3-7-lobed,  
crenate-serrate, 3-ribbed from base; flowers clustered

in short, axillary spikes, armed with stinging hairs; achenes compressed.

A weed on road sides at Beypore, with very virulent stinging hairs.

Flowers: July - Dec.

Sivarajan 1792.

Pouzolzia Gaud.

P.zeylanica (Linn.) Benn. Pl. Jav. Rar. 67. 1838; Merr. in Trans. Am. Phil. Soc. 24(2):140. 1935; Back. & Bakh. f. Fl. Java 2:47. 1965. Parietaria zeylanica Linn. Sp. Pl. 1052. 1753. P.indica Linn. Mant. 1:128. 1767. Pouzolzia indica (Linn.) Gaud. Freyc. Voy. Bot. 503. 1826; FBI. 5:581. 1888.

Erect or diffuse herbs; lower leaves ovate-lanceolate, basally 3-nerved, upper leaves much smaller; flowers in monoecious, axillary clusters; achenes with scarious wings.

Flowers: June - Dec.

Sivarajan 24, 1465.

Boehmeria Jacq.

B. malabarica Wedd. in Arch. Mus. Hist. Nat. Paris 8:355.  
1855-56; FBI. 5:575. 1888; Gamb. 970.

Shrubs; leaves ovate-lanceolate or elliptic,  
crenate-serrate, scabrid; flowers minute in axillary  
clusters; achenes minute, ovoid.

A rare species collected from the banks of  
Kunnamangalam River.

Flowers: Nov. - Mar.

Sivarajan 1615.

CASUARINACEAE R.Br.

Casuarina Adans.

C. equisetifolia Linn. Amoen. Acad. 4:143. 1759; Sant.  
232. 1960; Gamb. 972.

Tall trees with cylindric, jointed branchlets;  
leaves reduced to scales; male flowers in terminal spikes  
perianth of 1-2 sepals; stamen only one; female flowers  
in ovoid or ellipsoid heads, bracteate and bracteolate;  
achenes enclosed in the hardened, enlarged bracteoles.

Flowers: Aug. - Sept.

Sivarajan 355.

PLATE 25

Hydrilla verticillata (Linn.f.) Royle  
in flowers, growing submerged in  
shallow ponds.



HYDROCHARITACEAE Juss.

Key to the genera

1. Leaves whorled on the stem ..... Hydrilla
1. Leaves all radical:
  2. Spathes broadly winged ..... Ottelia
  2. Spathes never winged ..... Blyxa

Hydrilla L.C.Rich.

H. verticillata (Linn.f.) Royle Ill. Bot. Himal. t. 376.  
1839; FBI. 5:659. 1888; Den Hartog in Fl. Males.  
5(4):385. 1957; Subram. Aquat. Ang. 55. 1962; Gamb.  
977; Rao & Verma in Bull. Bot. Sur. Ind. 12:140.  
1970. Serpicula verticillata Linn. f. Suppl. 416.  
1781; Roxb. Pl. Corom. 2:33. 1802.

Submerged herbs with branched stem; leaves whorled, linear; flowers unisexual; male flowers shortly pedicellate, solitary; spathe subglobose; sepals and petals 3 each; stamens 3; female flowers solitary, sessile; spathe cylindric, toothed at tip; sepals and petals as in male flowers; ovary 1-celled; fruits subulate; seeds minute, few. (Plate 25)

Common in fresh-water ponds and fields.

Flowers: Oct. - Jan.

Sivarajan 843.



Ottelia Pers.

O. alismoides (Linn.) Pers. Syn. Pl. 1:400. 1805; FBI.

5:662. 1888; Subram. Aquat. Ang. 61. 1962; Gamb.

978; Rao & Verma in Bull. Bot. Sur. Ind. 12:141. 1970.

Stratiotes alismoides Linn. Sp. Pl. 535. 1753.

~~Fleshy~~, **S**ubmerged herbs; leaves radical, dimorphic, the upper ones ovate to orbicular, basal ones linear; flowers white, solitary, axillary, bisexual; spathe 5-6-toothed; wings crisped; petals obovate; stamens 6 or more; fruit 6-valved, concealed in the spathe.

Common in fresh water ponds, slow streams, and in water-logged fields.

Flowers: Aug. - Nov.

Sivarajan 627.

Blyxa Norontia ex Thouras.

Key to the species

1. Seeds tailed ..... echinosperma

1. Seeds not tailed ..... octandra

B. echinosperma (Clarke) Hook. f. in Fl. Brit. Ind. 5:661.

1888; Den Hartog in Fl. Males. 5(4):391. 1957; Subr.

Aquat. Ang. 59. 1962; Gamb. 978; Rao & Verma in Bull.

Bot.Sur. Ind. 12:140. 1970. Hydrotrophus echinospermus  
Clarke in J. Linn. Soc. Bot. 14:8, t. 1. 1875.

Submerged herbs; leaves all radical, linear;  
flowers on slender scapes, bisexual; sepals, petals and  
stamens 3 each; spathe narrow, ribbed; fruits linear;  
seeds many-seriate, spinous, tailed at both ends.

Common in fresh water ponds and streams.

Flowers: Sept. - Jan.

Sivarajan 1606.

B.octandra (Roxb.) Planch. ex Th. En. 332. 1864, excl.  
specimina; Den Hartog in Fl. Males. 5(4):392. 1957;  
Subram. Aquat. Ang. 60. 1962; Gamb. 978. Vallisneria  
octandra Roxb. Pl. Corom. 2:34, t, 165. 1802.  
B.roxburghii Rich. Mem. Inst. Paris 12(2):23-24, 77,  
t. 5. 1812; FBI. 5:660. 1888.

Submerged herbs; leaves linear; scapes slender;  
flowers unisexual; male spathes enclosing several,  
pedicellate male flowers; female flowers solitary; seeds  
spinous, tailless.

In shallow ponds and streams.

Flowers: Aug. - Dec.

Sivarajan 309, 425.

BURMANNIACEAE Blume

Burmannia Linn.

B.pusilla (Miers.) Th. En. 325. 1864; FBI. 5:665. 1888;  
Sant. 234. 1960. Goyananthus pusillus Miers. in  
Trans. Linn. Soc. 5, 18:537, t. 38, f. 3. 1841.  
Burmannia coelestis, var. pusilla (Miers.) Trim. Handb.  
Fl. Ceyl. 4:131. 1898. B.coelestis Fischer in Gamb.  
Fl. Pres. Madr. 1399. 1928 (non Don).

Erect, slender herbs; stems filiform, 10-15 cm tall; leaves reduced to scales; flowers blue or purple, 1-4; calyx tube broadly 3-winged, wings petalloid; anthers sessile; ovary 1-celled; capsules many seeded; testa reticulate.

A common annual on the grassy hill-slopes during the monsoon period.

Flowers: Aug. - Dec.

Sivarajan 430.

ORCHIDACEAE Juss.

Key to the genera

- 1. Terrestrial:
  - 2. Lip: 3-lobed, 1-spurred ..... Habenaria
  - 2. Lip: 2-lobed, 2-spurred ..... Zeuxine
- 1. Epiphytic:
  - 3. Leaves terete ..... Luisia
  - 3. Leaves flat:
    - 4. Sepals and petals striped ..... Acampe
    - 4. Sepals and petals not striped:
      - 5. Lip spurred ..... Rhynchostylis
      - 5. Lip not spurred ..... Dendrobium

Habenaria Willd.

Key to the species

- 1. Leaves broad, ovate or orbicular ..... diphylla
- 1. Leaves narrow, lanceolate ..... viridiflora

H.diphylla Dalz. in Hook. Kew J. Bot. 2:262. 1850; FBI.  
6:151. 1890; Sant. & Kapad. Orch. Bomb. 21. 1966;  
Gamb. 1028.

Tuberous herbs; leaves 1-2, fleshy and flat on the soil; flowers greenish white in many-flowered racemes; lateral sepals ovate-acute, prominently nerved, dorsal one

obscurely veined; lateral petals linear; lip 3-partite, laterals much longer than the mid-lobe; spur as long as the ovary.

Common on the grassy hill-slopes during the rainy season.

Flowers: Aug. - Sept.

Sivarajan 306.

H. viridiflora (Sw.) R. Br. Prod. 312. 1810; Wt. Ic. 1705. 1851; FBI. 6:150. 1890; Sant. & Kapad. Orch. Bomb. 35. 1966; Gamb. 1028. Orchis viridiflora Sw. in Act. Holm. 706. 1800.

Tuberous herbs; leaves 2-4, basal, lanceolate-acute; scapes long; flowers green; sepals and petals as in other species; lip lobes linear, almost equal; spur as long or slightly longer than the ovary.

Common on the grassy-slopes.

Flowers: Aug. - Dec.

Sivarajan 274, 275.

Zeuxine Lindl. (nom.cons.)

Z.longilabris (Lindl.) Benth. ex Hook. f. Fl. Brit. Ind.  
6:107. 1890; Sant. & Kapad. in J. Bombay nat. Hist.  
Soc. 59(1):193. 1962 & Orch. Bomb. 169. 1966; Gamb.  
1018. Monochilus longilabris Lindl. Gen. Sp. Orch.  
487. 1840 & in J. Linn. Soc. 1:187. 1857.

Stem creeping, tuberous, short; leaves 2-3,  
ovate or ovate-oblong; acute; scapes long, glandular  
pubescent; flowers white; sepals subequal; lip much  
longer, 2-spurred at base, limb of 2, obovate, sharply  
toothed lobes.

Rare. The author could collect only one  
specimen from the lateritic slopes at Devagiri.

Flowers: Dec. - Jan.

Sivarajan 917.

Luisia Gaud.

L.teretifolia Gaud.in Freyc. Voy. Bot.426, t. 37. 1829;  
FBI. 6:22. 1890; Sant. & Kapad. 213-14. 1966; Gamb.  
1005. Cymbidium tenuifolium Wt. Ic. 1689. 1851.

Epiphytic herbs; leaves fleshy, terete, linear;  
flowers yellowish; lip subsaccate at base; petals as  
long as the sepals; spur 0.

Acampe Lindl.

A.praemorsa (Roxb.) Blatt. & McC. in J. Bombay nat. Hist. Soc. 6:94, t. 54. 1932; Sant. & Kapad. in J. Bombay nat. Hist. Soc. 60:94. 1963 & in Orch. Bomb. 233. 1966.  
Epidendrum praemorsum Roxb. Pl. Corom. 1:34, t. 43. 1795. A.wightiana Lindl. Fol. Orch. Acampe 2. 1853.

Epiphytic herbs; leaves narrowly oblong, coriaceous, keeled; flowers in short, lateral, paniced or simple corymbs; sepals and petals with cross stripes; spur short, saccate.

Flowers: Feb. - Mar.

Sivarajan 1038.

Rhynchosyilis Blume

R.retusa (Sw.) Blume, Bijdr. 286, t. 49. 1825; FBI. 6:32. 1890; Sant. & Kapad. 211. 1966; Gamb. 1007.  
Aerides retusum Sw. in Schrad. Jour. 2:233. 1799.

Epiphytic herbs; leaves narrowly oblong, coriaceous, channeled, bluntly 2-toothed at tip; flowers in long, cylindric spikes, pink with darker blotches; lip clawed with a saccate, laterally flattened spur.

Seen growing on Ficus benghalensis

Flowers: May - June

Sivarajan 1264.

Dendrobium Sw.(nom.cons.)

D. macrostachyum Lindl. Gen.Sp. Orch. 78. 1830; & Bot.

Reg. t. 1865. Misc. 60. 1844; FBI. 6:735. 1890;

Kranzlin in Pfreich. 45:59. 1910; Sant. & Kapad.

Orch. Bomb. 96, Pl. 23. 1966; Gamb. 990.

Epiphytes; stem nodose; leaves ovate or elliptic, acute, sessile; flowers in lateral racemes, greenish yellow; pedicels slender; sepals and petals lanceolate; lip ovate-oblong, long-clawed and pubescent, side lobes smaller, not spurred.

Growing epiphytically on the branches of Mangifera indica, and many other species.

Flowers: Mar. - May

Sivarajan 201.



ZINGIBERACEAE Lindl.

Key to the genera

1. Connective of anthers spurred at base ..... Curcuma
1. Connective not spurred:
  2. Flowering spikes lateral ..... Zingiber
  2. Flowering spikes from between the leaves:
    3. Leafy stem 0 ..... Kaempferia
    3. Leafy stem tall ..... Hedychium

Curcuma Linn.

Note: The taxonomic delimitation of species of the genus Curcuma, based on the position of spikes and the colour characters have been subjected to much controversy.

The spikes of the species of Curcuma may either be terminal on the leafy shoot or lateral, arising directly from the rootstock, and this positional difference was one of the major characters, used in species delimitation. But, Roxburgh (As. Res. 11:336. 1810), based on his studies of C. rubescens, reported that this difference was nothing but seasonal, the early spikes being lateral and the later ones central, ie. terminal on the leafy shoot. Subsequent works on this genus by

Santapau (J. Bombay nat. Hist. Soc. 45:618-24. 1945 & 51:135-39. 1952) and Chavan and Oza (Fl. Pavagadh 222. 1966) have also endorsed Roxburgh's view. Santapau (Fl. Purandhar 128-29. 1958) has made the following observations with regard to C.pseudomontana "..... at the beginning of the rainy season the plant has a large spike coming out from the side of the leaves. Gradually by the beginning of August this lateral spike decays and a central one appears surrounded by leaves. One and the same plant shows the two types of spikes." However, the author could not come across such a phenomenon in the local population of Curcuma, and the key to the species furnished below is strictly based on the local collections.

Roxburgh (loc.cit.) and Valetton (Bull. Jard. Bot. Buitenz. 2. Ser. 27:1-81. 1918) also hold the view that the colour characters displayed by this genus, can ~~also~~ be used in species delimitation. However, Santapau (Fl. Purandhar 129. 1958) has reported that it shows much variations within the species, and that in C.pseudomontana the colour of the bracts of the coma, is "green, pink or rose, purple or pure white". Hence both these characters, have now become undependable for the delimitation of species in this genus. Recently Bakhuizen

(Back. & Bakh. f. Fl. Java, 3:69. 1968) based on his "collective species concept" has amalgamated the different species, segregated mainly on these characters, bringing them under "a collective head". (For details refer Burttt and Smith, 1972)

Key to the species

1. Spikes usually lateral ..... aromatica
1. Spikes from the centre of the leaves ..... pseudomontana

C. aromatica Salisb. Parad. Lond. t. 96. 1805; FBI.

6:210. 1890; Gamb. 1036; Burttt & Smith, in Notes, Roy. Bot. Gard. Edinb. 31(2):226. 1972.

Acaulescent herbs; rootstock branched; root-fibres slender; leaves elliptic-oblong, acuminate, large; spikes produced laterally on the rootstock; fertile bracts pouched, green, upper sterile ones larger, pink; flowers pink with yellow lip; fertile stamen single; capsules globose.

Grows near streams and in wet shady areas.

Flowers: July - Aug.

Sivaraajan 881, 1117.

C.pseudomontana Grah. Cat. 210. 1839; Lisboa in J.  
Bombay nat. Hist. Soc. 2:144. 1887; Sant. in J.  
Bombay nat. Hist. Soc. 45:618-623. 1945; Gamb. 1035.  
C.montana sensu Baker in Hook. f. Fl. Brit. Ind.  
6:214. 1890, in part.

Rootstock small; tubers many at the tips of  
fleshy fibres; leaves oblong-lanceolate, acuminate,  
up to 50 x 20 cm; flowering spikes usually arising  
from the centre of leaves, strobiliform, as in the  
previous species; flowers yellow; capsules subglobose,  
3-valved.

A monsoon herb, common in shaded, moist  
habitats.

Flowers: July - Aug.

Sivarajan 1431.

Zingiber Boehmer (nom.cons.)

Key to the species

1. Peduncle 20 or more cm long ..... serumbet  
1. Peduncle very short or 0 ..... wightianum

Z. zerumbet (Linn.) Smith, Exot. Bot. 2:105, 112. 1805;  
FBI. 6:247. 1892; Schum. in Pfreich. 4(46):172. 1904;  
Cooke<sup>3</sup>/241; Gamb. 1040; Burt & Smith in Notes. Roy.  
Bot. Gard. Edinb. 31(2):182. 1972. Amomum zerumbet  
Linn. Sp. Pl. 1. 1753.

Rootstock large; leafy stem tall; leaves oblanceolate-acuminate, glabrous; flowering stem lateral, clothed with appressed, obtuse sheaths; spikes ovoid, bracts closely imbricating, obovate-orbicular; flowers pale yellow; capsules ellipsoid.

Seen in moist, shaded habitats. The spikes have abundant mucilage in them.

Flowers: July - Aug.

Sivarajan 350.

Z. wightianum Th. En. 315. 1861; FBI. 6:244. 1892; Schum. in Pfreich. 4(46):186. 1904; Gamb. 1040.

Rootstock usually branched; stem leafy; leaves oblong-lanceolate, acuminate, pubescent beneath; flowers pale yellow in ovoid, sessile or short-peduncled spikes, produced directly from the rootstock; lip 3-lobed, middle lobe obovate, emarginate; capsules ellipsoid, 3-valved, valves fleshy, red within.

Common in moist shaded habitats.

Flowers: July - Aug.

Sivarajan 474.

Kaempferia Linn.

K.galanga Linn. Sp. Pl. 2. 1753; FBI. 6:219. 1890;  
Schum. in Pfreich. 4 (46):77. 1904; Gamb. 1037;  
Burt & Smith in Notes. Roy. Bot. Gard. Edinb.  
31(2):185. 1972.

Herbs; stem absent; leaves usually 2, radical,  
spread on the soil, orbicular to rotund, up to 15 x 10  
cm; flowers few, spicate, on a very short scape; bracts  
lanceolate; lip deeply 2-lobed; connective of the  
anther produced, 2-lobed at tip; capsules oblong.

Flowers: Aug. - Sept.

Sivarajan 1740.

Hedychium Koenig

H.flavescens Carey ex Rosc. Manandr. Pl. t. 50. 1828;  
Schum. in Pfreich. 4(46):44. 1904; Turriel in Kew  
Bull. 1915:369, f. 5. 1914. H.coronarium Koenig,  
var.flavescens (Carey ex Rosc.) Baker in Fl. Brit.  
Ind. 6:226. 1892.

Herbs; rootstock branched; leaves lanceolate, acuminate, glabrous, up to 10 cm broad; flowers in terminal strobiliform spikes; bracts oblong-obtusate; flowers sulphur-yellow; corolla tube slender, long; capsules globose, 3-valved.

Flowers: Aug. - Dec.

Sivarajan 898.

COSTACEAE (Schum.) Nak.

Costus Linn.

C. speciosus (Koenig) Smith in Trans. Linn. Soc. 1:249.

1791; FBI. 6:249. 1892; Sant. 247. 1960; Gamb. 1038;

Burt & Smith in Notes; Roy. Bot. Gard. Edinb.

31(2):200. 1972. Banksea speciosa Koenig in Retz.

Obs. 3:75. 1783.

Succulent herbs; stem spirally twisted; leaves spiral, oblong to oblanceolate, caudate-acuminate; flowers white in dense, terminal spikes; bracts ovate, bright red; capsules ovoid, 3-valved.

Flowers: July - Aug.

Sivarajan 403, 549, 1426.

MARANTACEAE Petersen

Maranta Linn.

M.arundinacea Linn. Sp. Pl. 2. 1753; Gamb. 1045.

Stem branched; tubers oblong; leaves oblong-lanceolate, acuminate, petiole long; flowers white in pairs on long, axillary peduncles.

Usually cultivated for the medicinal tuberous rhizomes.

Flowers: Sept. - Oct.

Sivarajan 503.

CANNACEAE Juss.

Canna Linn.

C.indica Linn. Sp. Pl. 1. 1753; FBI. 6:260. 1890; Sant. 247. 1960; Gamb. 1045.

Plants slender; leaves elliptic-lanceolate, acuminate; racemes many-flowered; petals yellow; staminodes bright red, oblanceolate, entire; lip entire, orange coloured, spotted with red.

Flowers: most part of the year.

Sivarajan 1854.



MUSACEAE Juss.

Musa Linn.

M. paradisiaca Linn. Sp. Pl. 1043. 1753; Gamb. 1046.

Herbs; rootstock large; leaves large, the sheaths convolute; flowers on terminal, monoecious, bracteate spikes; sepals and petals connate; lip free, transparent; stamens 5-6; fruits large oblong.

Several varieties of bananas and plantains are cultivated. They flower only once in their life.

Flowers: Once in its life.

Sivarajan 1853.

BROMELIACEAE Juss.

Ananas Mill.

A. comosus (Linn.) Merr. Interpr. Herb. Amb. 133. 1917; Sant. 248. 1960. Bromelia comosa Linn. In Stickman, Herb. Amb. 21. 1754. Ananas sativus Schult. f. Syst. 7:1283. 1830; Gamb. 1046.

Leaves in rosettes, long, spiny and serrate; scape short; flowers blue, small, sessile, bisexual; fruit a syncarpium with bulbils at its tip.

Naturalized in this region. Sometimes cultivated for the "pine apple".

Flowers: Aug. - Sept.

Sivarajan 1877.

AMARYLLIDACEAE Jaume St.-Hil.

Key to the genera

1. Staminal corona present:
  2. Ovules many in each cell ..... Pancratium
  2. Ovules only 2 in each cell ..... Hymenocallis
1. Staminal corona absent ..... Crinum

Pancratium Linn.

P. triflorum Roxb. [Hort. Beng. 23. 1814, nom. nud.] Fl. Ind. 2:126. 1824; Baker, Handb. Amar. 118. 1888; FBI. 6:285. 1892; Gamb. 1051.

Bulbous herbs; bulbs globose; leaves thin, linear to lanceolate; flowers white, umbelled on scapes; umbels few-flowered; spathes 2, membranous; pedicels short; perianth funnel-like, lobes linear; staminal corona of bifid lobes between and connate with the filaments forming a cup; capsules trigonous.

Common; set flowers soon after the first rains.

Flowers: **June - July.**

Sivarajan 992.

Hymenocallis Salisb.

H. littoralis (Jacq.) Salisb. in Trans. Hort. Soc. 1:338.

1812; Baker. Handb. Amar. 123. 1888. Pancratium

littorale Jacq. Hort. Vind. 3:41. t. 750. 1776.

Leaves radical, oblong to lanceolate, many-veined; flowers white, sessile, umbelled on a compressed scape; spathes membranous, large; perianth tube long, lobes linear; staminal cup campanulate, dentate.

Flowers: most part of the year.

Sivarajan 1191.

Crinum Linn.

1. Leaves large, up to 10 cm broad ..... asiaticum

1. Leaves up to 3 cm broad ..... defixum

C. asiaticum Linn. Sp. Pl. 292. 1753; FBI. 6:280. 1890;

Baker, Handb. Amar. 75. 1888; Sant. 249. 1960;

Gamb. 1051.

Bulbs large; leaves many, up to 1 metre long, slightly narrowed at both ends, acuminate at tip; scape long, axillary; flowers white, umbelled, short-pedicelled; perianth lobes linear, about as long as the tube; fruit subglobose.

Commonly cultivated on hedges and in gardens.

Flowers: April - May

Sivarajan 1122.

C.defixum Ker-Gawl. in J. Sci. & Arts 3:105. 1817; Baker, Handb. Amar. 76.1888; FBI. 6:280. 1892; Gamb. 1051.

Bulbs ovoid; leaves linear-oblong, radical; scapes axillary, cylindric; bracts 2, oblong-lanceolate; flowers white, umbelled, short-pedicelled; perianth lobes linear, as long as the tube; fruits subglobose.

Collected from the sandy sea coast at West Hill.

Flowers: Aug. - Sept.

Sivarajan 1190.

HYPOXIDACEAE R. Br.

Curculigo Gaertn.

C.orchiodes Gaertn. Fruct. 1:63. t. 13. 1788; FBI.

6:279. 1890; Sant. 248. 1960; Gamb. 1050. C.malabarica

Wt. Ic. 6:22, t. 2043, f. 1. 1853.

Herbs with tuberous rootstocks; leaves usually sessile, linear or lanceolate, plicate; scapes very short, hidden among the leaf-sheaths; flowers yellow; perianth tube slender, segments ovate-acute; capsules 1-4-seeded.

A monsoon herb in grasslands and in shaded rocky places.

Flowers: Aug. - Dec.

Sivarajan 1172.

AGAVACEAE Endl.

Agave Linn.

A.wightii Drumm. & Prain in Dept. Land Rec. and Agric.

Beng. Bull. 8:11. 1906; Mahes. 334; Gamb. 1052.

Trunk short, stout; leaves in compact rosette, oblong-acute, broadest at the middle, fibrous, margins with small prickles, tip with a stout sharp spine; scape very long, sometimes branched; flowers green, funnel-form in dense, terminal panicles.

Naturalised in this region, found on hedges and in waste places.

Flowers: Mar. - July

Sivarajan 1340.

DIOSCOREACEAE R. Br.

Dioscorea Linn.

Key to the species

1. Stem spinous:

2. Leaves penninerved ..... pentaphylla

2. Leaves basally veined ..... tomentosa

1. Stem not spinous ..... bulbifera

D.pentaphylla Linn. Sp. Pl. 1032. 1753; FBI. 6:289. 1892;

Burkill in J. Proc. As. Soc. Beng. 10:23. 1914; Prain

& Burkill in Ann. Roy. Bot. Gard. Calc. 14:160, Pl.

66, 67. 1936 & Pl. 422. 1938; Burkill in Fl. Males.

4(3):315. 1951; Gamb. 1056.

Tuberous climbers; stem terete with scattered spines; leaves 3-5-foliolate; petioles 5-6 cm long with bulbils in the axils; leaflets elliptic acute or acuminate, up to 10 x 3.5 cm, puberulous on both surfaces, laterals inequi-lateral; male flowers in fascicled racemes on long, pubescent, pendulous panicles.

Flowers: Sept. - Oct.

Sivarajan 542, 1512.

D.tomentosa Spreng. Pugill. 2:92. 1815; FBI. 6:289.

1892; Gamb. 1055.

Pubescent twiners; stem terete; leaves 3-foliolate (rarely 2-1-foliolate), leaflets ovate or elliptic, acute, basally 5-nerved, up to 8 x 5 cm, pubescent on both surfaces; male flowers in axillary, fascicled, dense racemes or in terminal panicles.

Flowers: July - Sept.

Sivarajan 1236.

D.bulbifera Linn. Sp. Pl. 1033. 1753; Burkill in Fl.

Males. 4(3):311. 1951.

Stem terete; leaves simple, long-petioled, ovate-acuminate, cordate at base, glabrous, 9-11-nerved from

base; male and female flowers in short, slender, fascicled spikes, greenish white.

Flowers: Aug. - Oct.

Sivarajan 519, 718, 1320.

LILIACEAE Juss.

Key to the genera

- 1. Leaf ending in a tendril ..... Gloriosa
- 1. Leaf not ending in a tendril ..... Chlorophytum

Gloriosa Linn.

G.superba Linn. Sp. Pl. 305. 1753; FBI. 6:358. 1892;  
Sant. 252. 1960; Gamb. 1061.

Climbing herbs; rootstock tuberous; leaves ovate-lanceolate, tip elongating into a tendril; flowers large; perianth segments linear, flexuous, and deflexed; capsules septicidal; seeds subglobose.

Common on the grassy slopes. The rootstock is used in medicine.

Flowers: Dec. - Jan.

Sivarajan 546, 703.



Chlorophytum Ker-Gawl.

C. laxum R. Br. Prod. 277. 1810; FBI. 6:336.1892; Gamb. 1066.

Small herbs; stem 0; leaves distichous, radical, plicate, linear-lanceolate; scape filiform, few flowered; flowers distant, greenish; pedicels jointed, short; capsules 3-lobed, cells 1-3-seeded; seeds angled.

A monsoon herb in rocky lateritic hill-slopes.

Flowers: Aug. - Sept.

Sivarajan 266, 279.

SMILACACEAE Vent.

Smilax Linn.

S. zeylanica Linn. Sp. Pl. 1029. 1753; FBI. 6:309. 1892;

Koyama in Adv. Front. Pl. Sc. 4:50. 1963; Gamb. 1061.

S. macrophylla Roxb. Fl. Ind. 3:793. 1832; FBI. 6:310.

1892, (non Willd. 1805) S. wightii DC. Mon. Phan.

1:174. 1878; FBI. 6:310. 1892.

Woody, climbing prickly shrubs; leaves very variable, oblong-lanceolate to ovate or orbicular, acute or shortly cuspidate, 3-7-nerved from base; flowers in axillary, peduncled umbels, unisexual; berry globose.

Flowers: July - Sept.

Sivarajan 467, 1237, 1736.

ASPARAGACEAE Juss.

Asparagus Linn.

A. racemosus Willd. Sp. Pl. 2:152. 1799; FBI. 6:316.

1892; Gamb. 1060.

Scandent shrubs, short-spinous; cladodes slightly compressed, acicular; flowers racemed; racemes solitary or fascicled in the axils, many-flowered; pedicels slender; fruits globose berries.

Flowers: Oct. - Nov.

Sivarajan 1524.

PONTEDERIACEAE Kunth

Key to the genera

- 1. Petioles inflated ..... Eichhornia
- 1. Petioles not inflated ..... Monochoria

Eichhornia Kunth

E. crassipes (Mart.) Solms. in DC. Mon. Phan. 4:527. ~~1843~~

Gamb. 1069. Pontederia crassipes Mart. Nov. Gen. ~~82~~

9, t. 4. 1823. Eichhornia speciosa Kunth, En.  
4:131. 1843.

Floating or rooted water plants; leaves floating,  
ovate or obovate; flowers violet, in dense racemes;  
perianth funnel-like; capsules ovoid or oblong; seeds  
ribbed.

A profuse weed in ponds and in other stagnant  
waters; introduced from America. It has now become a  
menace in lakes and ponds.

Flowers: Aug. - Dec.

Sivarajan 907.

Monochoria Presl.

M.vaginalis (Burm.f.) Presl. ex Kunth, En. 4:134. 1843;  
FBI. 6:363. 1892; Back. in Fl. Males. 4(3):256. 1951;  
Gamb. 1068. Pontederia vaginalis Burm. f. Fl. Ind.  
80. 1768.

Herbs; leaves petioled, ovate-acuminate, cordate  
or rounded at base, shining green above; flowers blue in  
axillary racemes; perianth segments obovate; capsules  
oblong; seeds ribbed.

In marshes or on the banks of ponds or streams.

Flowers: July - Nov.

Sivarajan 749, 751.

XYRIDACEAE C.A.Agardh.

Xyris Linn.

Key to the species

1. Plants robust, up to 30-40 cm tall ..... indica
1. Plants much smaller 8-10 cm tall ..... pauciflora

X.indica Linn. Sp. Pl. 42. 1753; emend. J.E.Smith in

Rees, cyclop. 30. n. 11. 1819; FBI. 6:364. 1892;

Van Royen in Fl. Males. 4(4):373. 1953; Gamb. 1070.

Scapigerous herbs; leaves flat, 10-30 cm long; scapes longer, terete, strongly ribbed; heads subglobose or ovoid; bracts orbicular or obovate, glabrous; flowers orange-yellow.

In marshy fields.

Flowers; Aug. - Nov.

Sivarajan 849.

X. pauciflora Willd. Phytogr. 1:2, t. 1., f. 1. 1794;  
Malm. in Pfam. (ed.2) 15a:389. 1929; van Royen in  
Fl. Males. 4(4):371. 1953; Gamb. 1070.

Scapigerous herbs; leaves up to 6 cm long,  
acuminate; scape as long or little longer, finely  
striate; heads globose or ovoid; bracts orbicular,  
flowers yellow.

A common monsoon herb in the crevices of rocks.

Flowers: Aug. - Oct.

Sivaraajan 421, 520.

COMMELINACEAE R. Br.

Key to the genera

1. Flowers in open panicles ..... Murdannia
1. Flowers not in panicles:
  2. Posticous cells of the capsules  
indehiscent ..... Commelina

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The author is thankful to Dr. R.V. Kammathy, Botanical  
Survey of India, Calcutta, for confirming the identity  
of the Commelinaceae specimens and for his comments on  
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them.

2. All cells of the capsules dehiscent:
3. Cymes much exerted from the leaf-sheath .... Cyanotis
4. Cymes enclosed in the leaf-sheath .. Amischophacelus

Murdannia Royle (nom.cons.)

Key to the species

1. Flowers dull yellow:
  2. Seeds uniseriate in each cell ..... wightii
  2. Seeds biseriate in each cell ..... ochracea
1. Flowers purple or blue:
  3. Seeds 1-seriate in each cell:
    4. Capsules 7-9 mm long ..... dimorpha
    4. Capsules 4-5 mm long ..... spirata
  3. Seeds not 1-seriate in each cell:
    5. Leaves linear-subterete ..... semiteres
    5. Leaves not as above:
      6. Seed 1 in each capsule ..... vaginata
      6. Seed 2-seriate in each capsule .. nudiflora

M. wightii Roll<sup>a</sup> Rao & Kammathy in Notes Roy. Bot. Gard. Edin. 25(2):184. 1965. Aneilema pauciflorum Wt. Ic. 2077. 1853 (non Dalz. 1851); FBI. 7:378. 1894; Gamb. 1078. Murdannia pauciflora (Wt.) Bruckn. in Engl. & Pr. Pfam. (ed.2) 173. 1930; Fernand. & Sant. in J. Bombay nat. Hist. Soc. 52. 137. 1954.

Diffuse, slender herbs, rooting at lower nodes; leaves ovate or elliptic, obtuse or subacute at apex, rounded or cordate at base, up to 4 x 2.5 cm, sheath hairy; flowers in axillary, 2-4-flowered cymes; pedicels up to 1 cm long, usually deflexed in fruits; seeds black, smooth.

Flowers: Aug. - Nov.

Sivarajan 1451.

Note: Murdannia pauciflora (Wt.) Bruckner, based on Aneilema pauciflorum Wt., is a species distributed in different parts of India. Aneilema pauciflorum Wt. is a later homonym of A. pauciflorum Dalz. [ in Hook. J. Bot. 136. 1851 ] which is a synonym of Murdannia vaginata (Linn.) Bruckner, and hence illegitimate.

M. ochracea (Dalz.) Bruckn. in Engl. & Pr. Pfam. (ed.2) 137. 1930. Aneilema ochraceum Dalz. in Hook. Kew J. Bot. 3:135. 1851; FBI. 6:380. 1894; Gamb. 1079.

Erect herbs; leaves broadly lanceolate-acute, sessile, glabrous, up to 10 x 1.5 cm; flowers blue in terminal, dichotomous panicles; bracts minute, ovate;



capsules oblong, glabrous; seeds dark brown, striate.

Flowers: Aug. - Sept.

Sivarajan 1659

M. dimorpha (Dalz.) Bruckn. in Engl. & Pr. Pfam. (ed.2)

173. 1930; Sant. 286. 1967. Aneilema dimorphum Dalz.  
in Kew J. Bot. 3:138. 1851.

Glabrous herbs; leaves linear-lanceolate;  
panicles sparingly branched; flowers blue; capsules  
oblong, trigonous; seeds 3-5, uniseriate in each cell,  
minutely striate.

Flowers: Aug. - Nov.

Sivarajan 412, 456, 1338.

M. spirata (Linn.) Bruckn. in Engl. & Pr. Pfam. (ed.2)

15A:173. 1930; Fernand. & Sant. in J. Bombay nat.  
Hist. Soc. 52:137. 1954; Sant. 254. 1960; Panigrahi  
& Kammathy in Proc. Natl. Acad. Sci. Ind. 33:495.  
1963. Commelina spirata Linn. Mant. 176. 1767.  
Aneilema spiratum (Linn.) R. Br. Prod. 271. 1810;  
FBI. 6:377. 1894; Gamb. 1078.

Erect or diffuse, slender herbs; leaves ovate  
to oblong, subacute, up to 3 x 1 cm, sessile; flowers

pale blue in terminal and subterminal panicles; bracts minute, ovate, persistent; pedicels up to 5 mm long; capsules ellipsoid, 4 mm long; seeds minute, straw-coloured.

Flowers: Aug. - Nov.

Sivarajan 488, 744, 1370, 4454, 1558.

M. semiteres (Dalz.) Santapau in Poona Agr. coll. Magaz. 41:284. 1951, in part; Brenan in Kew Bull. 1952:184. 1952 in part; Rao & Kammathy in Bull. Bot. Sur. Ind. 6:3. 1964. Aneilema semiteres Dalz. in Hook. Kew J. Bot. 3:138. 1851. A. paniculatum Wall. ex Clarke in DC. Mon. Phan. 3:215. 1881, (non Wt. 1853); FBI. 6:381. 1894; Gamb. 1079.

Small, erect or diffuse herbs; roots fibrous; leaves linear-filiform, fleshy, subterete; flowers in terminal panicles; bracts minute, persistent; pedicels filiform, up to 7 mm long; capsule ellipsoid, small; seeds few, smooth.

This plant is seen as a gregarious annual on rocky hill-tops during the monsoon period.

Flowers: Sept. - Nov.

Sivarajan 269.

M.vaginata (Linn.) Bruckn. in Engl. & Pr. Pfam. (ed.2) 15A:137. 1930; Fernand. & Sant. in J. Bombay nat. Hist. Soc. 52:137. 1954; Panigrahi & Kammathy in Proc. Natl. Acad. Sci. Ind. 33:499. 1963. Commelina vaginata Linn. Mant. 177. 1767. Aneilema vaginatum (Linn.) R. Br. Prod. 271. 1810; FBI. 6:381. 1894; Gamb. 1079.

Stems tufted; leaves linear-lanceolate, acute or obtuse, up to 10 x 0.8 cm; flowers 1-6, fascicled in the axils of bracts; bracts narrowly oblong-obtuse, truncate, sheathing; pedicels slender; capsules globose; seeds hemispheric, rugose.

Flowers: Aug. - Nov.

Sivarajan 746, 1449.

M.nudiflora (Linn.) Brenan in Kew Bull. 1952:189. 1952; Rolla Rao in Bull. Bot. Sur. Ind. 3:393. 1961; Panigrahi & Kammathy in Proc. Natl. Acad. Sci. Ind. 33:495. 1963. Commelina nudiflora Linn. Sp. Pl. 4. 1753, in part, vide Merrill in J. Arn. Arb. 18:64-66. 1937. Aneilema nudiflorum (Linn.) R. Br. Prod. 271. 1810; FBI. 6:378. 1894. Gamb. 1545. Murdannia malabarica (Linn.) Bruckn. in Engl. & Pr. Pfam. (ed.2) 15A:173. 1930; Sant. in J. Bombay nat. Hist. Soc. 52:658. 1955.

Diffuse, delicate herbs, often rooting at the nodes; leaves linear-lanceolate, acute or acuminate, up to 10 cm long; flowers in terminal, subcorymbose, panicles; pedicels 5-7 mm long; bracts caducous; capsules subglobose, 3-4 mm across.

Flowers: Sept. - Nov.

Sivarajan 334, 1366.

Commelina Linn.

Key to the species

1. Spathe auricled ..... benghalensis
1. Spathe not auricled:
  2. Cymes clustered at the tips of  
branches .... erecta
  2. Cymes not clustered:
    3. Seeds reticulately pitted ..... diffusa
    3. Seeds smooth ..... attenuata

C. benghalensis Linn. Sp. Pl. 41. 1753; FBI. 6:370. 1894;

Barnes in J. Bombay nat. Hist. Soc. 46:71. 1946;

Panigrahi & Kammathy in J. Ind. bot. Soc. 43:302.

1964; Gamb. 1075.

Diffuse or creeping herbs, rooting at nodes; stem hairy; leaves ovate-acute, densely hispid, sheath pubescent; flowers blue; spathe axillary, funnel-shaped, auricled, short-petioled; capsules pyriform, usually 2-celled, posticous cell only rarely present; seeds closely pitted.

The normal flowers usually do not set viable, healthy seeds. Instead, the white, cleistogamous flowers produce large viable seeds. Self-fertilization in this species is effected by the coiling of the staminal filaments together with the style, whereas the staminodes remain uncoiled (Barnes in J. Bombay nat. Hist. Soc. 46:70-89. 1946)

Flowers: During most part of the year.

Sivarajan 1238, 1337.

C. erecta Linn. Sp. Pl. 41. 1753. C. undulata R. Br. Prod. 270. 1810; Clarke in DC. Mon. 3:179. 1881, excl. var. setosa. C. obliqua Buch.-Ham., var. mathewii Clarke in DC. Mon. Phan. 3:178. 1881. C. Kurzii Clarke in J. Linn. Soc. 11:44. 1871 & DC. Mon. 3:185. 1881. C. livingstonii Clarke in DC. Mon. Phan. 3:199. 1881. C. sphaerosperma Clarke in Dyer, Fl. Trop. Afr. 8:58. 1901. C. paludosa, var. mathewii (Clarke) Rolla Rao & Kammathy in Bull. Bot. Sur. Ind. 3:168. 1961.

Diffuse or erect herbs; stem pubescent; leaves broad, lanceolate-acuminate, short-petioled; cymes clustered at the tips of branches; bracts ovate-acuminate; sessile; flowers blue; capsules 3-celled, the posticous cell indehiscent, deciduous and scabrid with a hemispheric seed; seeds in the lateral cells ellipsoid, compressed.

Flowers: Aug. - Dec.

Sivarajan 1326.

C.diffusa Burm. f. Fl. Ind. 18, t. 7, f. 2. 1768; Merr. in J. Arn. Arb. 18:64. 1937; Panigrahi & Kammathy in J. Ind. bot. Soc. 43:299. 1964; Rolla Rao in Notes Roy. Bot. Gard. Edin. 15(2):179. 1964; Sant. 284. C.nudiflora auct. Plur. non Linn.; FBI. 6:369. 1894; Barnes in J. Bombay nat. Hist. Soc. 46:70. 1946; Sant. 253. 1960; Gamb. 1074.

Diffuse herbs, rooting at lower nodes; leaves ovate-lanceolate, acute; cymes axillary; peduncles 1-1.5 cm long; bracts ovate, 1.5-2 cm; capsules ovoid-oblong, posticous cell indehiscent, 1-seeded, the others 2-seeded, dehiscent; seeds reticulately pitted, truncate at the adjescent tips.

Flowers: July - Nov.

Sivarajan 53, 413, 731, 1367.

C.attenuata Koen. ex Vahl, En. 2:168. 1806; Barnes in  
J. Bombay nat.Hist. Soc. 46:80-81. 1949.

Diffuse herbs, rooting at lower nodes; leaves  
linear or lanceolate, acute, base subcordate; flowers  
purple, 1-2 in each cyme; spathes peduncled; capsules  
5-seeded, posticous cell indehiscent; seeds smooth,  
truncate at one end.

Flowers: July - Dec.

Sivarajan 552, 1265.

Cyanotis D.Don (nom.cons.)

Key to the species

1. Bracts much longer than the cymes ..... cristata
1. Bracts as long or only slightly longer  
than the cymes ..... burmanniana

C.cristata (Linn.) Schult. f. Syst. 7:1150. 1830; D.  
Don, Prod.46. 1836; FBI. 6:385. 1894; Gamb. 1081.  
Commelina cristata Linn. Sp. Pl. 42. 1753.

Diffuse herbs, rooting at lower nodes; leaves  
elliptic-oblong, obtuse, glabrous or densely hispid on  
both surfaces; cymes terminal and in the upper axils;  
bracteoles many, falcate; flowers purple; filaments of

stamens purple-bearded; capsules glabrous; seeds black, striate, with 2 large pits on 2 of their faces.

Flowers: July - Nov.

Sivarajan 336, 356, 1067, 1217, 1224.

C.burmanniana Wt. Ic. 2089. 1853; Rolla Rao in Blumea 14:348. 1966.

Diffuse or creeping herbs, rooting at lower nodes, densely hispid; leaves ovate to lanceolate, hairy on both surfaces, up to 5 x 0.8 cm; flowers blue; bracts ovate; cymes short; bracteoles short, ovate-acute, slightly hairy; filaments of stamens bearded.

On the moist rocks and also in the coastal sand.

Flowers: July - Nov.

Sivarajan 265, 1266.

Amischophacelus Rolla Rao & Kammathy

A.axillaris (Linn.) Rolla Rao & Kammathy in J. Linn. Soc. (Bot.) 59:306. 1966. Commelina axillaris Linn. Sp. Pl. 42. 1753. Cyanotis axillaris (Linn.) J. A.



& J. H. Schult. Syst. Veg. 7(2):1154. 1830; FBI.  
5:388. 1894; Gamb. 1082.

Diffuse, fleshy herbs, rooting at lower nodes; leaves linear, usually glabrous, sheath short; flowers in sessile cymes enclosed in the leaf-sheaths; bracteoles linear-lanceolate, minutely ciliate; filaments purple-bearded, inflated at tips; capsules glabrous; seeds cylindric, pitted.

Flowers: July - Dec.

Sivarajan 1417, 1450.

Note: This species is listed under the genus Cyanotis in almost all the Floras. Though closely related, it differs from Cyanotis in the sessile cymes enclosed in the leaf sheaths, linear-lanceolate, more or less hyaline bracteoles and a different capsule with 3 projections at the tip. Significantly it differs from species of Cyanotis in its chromosome number being  $2n = 20$ , whereas Cyanotis have  $2n = 24$  (Rolla Rao & Kammathy loc.cit.).

PALMAE Juss.

Key to the genera

- 1. Leaves fan-like ..... Borassus
- 1. Leaves not fan-like:
  - 2. Leaves bipinnate ..... Caryota
  - 2. Leaves simple pinnate:
    - 3. Spathe separating into 2 flaps ... Phoenix
    - 3. Spathe not as above:
      - 4. Endocarp bony ..... Cocos
      - 4. Endocarp membranous ..... Areca

Borassus Linn.

B. flabellifer Linn. Sp. Pl. 1187. 1753; FBI. 6:482.  
1893; Brand. Ind. Tr. 657. 1906.

Tall palms; trunk annulate, cylindrical; leaves large, fan-shaped; leaflets linear lanceolate, plicate; petioles subterete, spinous on the margins; spadix large, branched; fruits large, subglobose, brown; seeds oblong.

Common. The leaves are used for thatching  
~~h~~uts and to write on. Fruits are edible.

Flowers: Mar. - Apr.

Sivarajan 1852.

Caryota Linn.

C.urens Linn. Sp. Pl. 1189. 1753; FBI. 6:422. 1893;  
Sant. 256. 1960; Gamb. 1089.

Palms about 30 metres tall; trunk annulate; leaves large, about 5 metres long; leaflets retuse at tip, irregularly toothed; spadices monoecious, much branched, 3-4 metres long, pendulous; spathes 3-5; fruits globose, about 2 cm across; seed 1-2.

This common palm is sometimes tapped for toddy. The leaf is a favourite fodder for elephants. The rachis is used as fishing rod.

Flowers: Mar. - May

Sivarajan 1851.

Phoenix Linn.

P.sylvestris (Linn.) Roxb. Hort. Beng. 73. 1814, nom. nud. Fl. Ind. 3:787. 1832; FBI. 6:425. 1893. Elate sylvestris Linn. Sp. Pl. 1189. 1753, in part.

Tall palms; trunk with persistent bases of petioles; leaves large; leaflets many, linear, plicate; spadix about 1 metre long, erect, branched; spathe separating

into two boat-shaped bracts; fruits ellipsoid.

Flowers: Jan. - Feb.

Sivaraajan 1876.

Cocos Linn.

C.nucifera Linn. Sp. Pl. 1188. 1753; FBI. 6:482. 1893;  
Gamb. 1086.

Trunk tall, annulate; leaves pinnate; leaflets linear-lanceolate, folded along the mid rib; spathe 2 or more, upper woody; spadix much branched, monoecious; female flowers few; fruits large, about 30 cm long, ovoid, trigonous.

Extensively cultivated along the West Coast of India. In **Sanskrit** this plant is called 'Kera Vriksha' after which this land, "Kerala" - "the land of Kera<sup>रा</sup>" - is named. At times it is also referred to as "Kalpa Vriksha", since the uses of this are so numerous. Coconut kernels are edible and <sup>are</sup> also crushed for extracting oil. Coconut water is a very refreshing and nutritive drink. Shells are used as fuel and also <sup>to</sup> ~~on~~ handicrafts. The husk is a very good source of fibre and is largely used in coir industry, which is a major cottage industry in Kerala. The leaves are used for

thatching huts, and the stem used for temporary construction. The palms are tapped for coconut-toddy, a favourite local drink.

Flowers: Most part of the year.

Sivarajan 1857.

Areca Linn.

A.catechu Linn. Sp. Pl. 1189. 1753; FBI. 6:405. 1893;

Gamb. 1085.

Slender trees, up to 30 metres tall; stem annulate; leaves pinnate; spathe not woody; spadix much branched, monoecious; flowers minute, female flowers few; fruits ovoid or ellipsoid, 3-5 cm long; seed solitary.

Extensively cultivated. This is the "betel-nut palm". Seeds are used to chew with lime, betel leaf etc.

Flowers: most part of the year.

Sivarajan 1858.

PLATE 26

Pandanus odoratissimum Linn.f.



PANDANACEAE R. Br.

Pandanus Linn. f.

Key to the species

1. Ovary many-celled ..... odoratissimum  
1. Ovary 1-celled ..... canaranus

P.odoratissimum Linn. f. Suppl. Pl. 64. 1781; St.-John  
in Taxon 12:201-204. 1963; Stone in Gard. Bull. Sing.  
22:236. 1967. P.tectorius Soland. ex Parkinson in J.  
Voy. H. M.S.End. 46. 1774; Warburger in Pfreich.  
3:46. 1900. P.fascicularis Lamk. Encycl. Meth. Bot.  
1:372. 1783; FBI. 6:485. 1893.

Branched shrubs with stout, long stilt roots;  
leaves ensiform, caudate-acuminate, the margins and  
keel spinulose; male spadices many, cylindric, racemed  
with lanceolate spathes; female spadices solitary;  
carpels confluent in groups of 5-8. (Plate 26)

Collected from the banks of a pond on the  
lateritic slopes near Thiruvangad temple.

Flowers: Mar. - Apr.

Sivarajan 1110.



P.canaranus Warb. in Engl. Pfreich. 4(9):75, f. 21E.  
1900; Martelli in Webbia 4(1):9, 44, 96. 1913 &  
4(2) t. 29, f. 31-35. 1914; St.-John in Bot. Mag.  
Tokyo 85:242. 1972.

Branched shrubs; leaves ensiform, margins and  
keels spinulose; spathes lanceolate; male spadices  
cylindric, racemed; drupes club-shaped.

Common along the railway embankments, road sides  
and the banks of streams.

Flowers: Dec. - Jan.

Sivarajan 1578.

ARACEAE Juss.

Key to the genera

1. Flowers hermaphrodite ..... Pothos
1. Flowers not hermaphrodite:
  2. Plants aquatic, floating ..... Pistia
  2. Plants terrestrial:
    3. Rootstock creeping:
      4. Leaves linear, 1-1.5 cm broad .. Cryptocoryne
      4. Leaves elliptic, 15-20 cm  
broad ..... Lagenandra

3. Rootstock not creeping:

5. Leaves peltate:

6. Placenta central ..... Caladium

6. Placenta parietal:

7. Neuters present ..... Colocasia

7. Neuters absent ..... Ariopsis

5. Leaves not peltate:

8. Spadix much longer than the

spathe .... Typhonium

8. Spadix not or slightly longer

than spathe:

9. Leaves simple ..... Theriophonum

9. Leaves 3-partite ..... Amorphophallus

Pothos Linn.

P.scandens Linn. Sp. Pl. 968. 1753; FBI. 6:551. 1893;

Sant. 261. 1960; Gamb. 1110.

Climbing shrubs, rooting at nodes; leaves ovate to lanceolate, acute or acuminate, coriaceous, up to 8 x 3.5 cm; petiole winged; spadix obovoid or subglobose, on short, axillary peduncles; spathe small; perianth segments and stamens 6 each; berries ellipsoid; seeds 1-3, compressed.

Flowers: Dec. - Jan.

Sivarajan 36, 1464.

Pistia Linn.

P.stratiotes Linn. Sp. Pl. 963. 1753; FBI. 6:495; 1893;  
Gamb. 1097.

Stoloniferous, floating herbs; leaves sessile, obovate-cuneate, obtuse or retuse at tip, pubescent on both surfaces; spathe about 1 cm long, short-peduncled, enclosing the spadix; perianth 0; female flowers solitary; neuters few above the female flowers; male inflorescence in a ring of connate stamens; berries ovoid.

In shallow ponds, and water-logged cultivated fields.

Flowers: Dec. - Jan.

Sivarajan 1570.

Cryptocoryne Fisch. ex Wycl.

C.spiralis (Retz.) Fisch. ex Wycler in Linnaea 5:428.

1830; FBI. 6:494. 1983; Sant. 258. 1960; Gamb. 1097.

Arum spirale Retz. Obs. 1:30. 1779.

Tufted herbs; leaves radical, linear, acute or obtuse at tip, narrowed to base, up to 25 x 1.5 cm; spathe with a transverse septum enclosing the spadix, limb linear-lanceolate; peduncle short; male flowers forming a cylinder;

stamens 1-2, anthers sessile; female flowers in a single whorl below the neuter region; berries fleshy.

Abundant in moist or marshy fields with their spadices usually below the soil level.

Flowers: Dec. - Jan.

Sivarajan 928.

Lagenandra Dalz.

L. ovata (Linn.) Th. En. 334. 1864; Engl. in Engl. & Pr. Pfam. 73:228. 1920; Sant. in J. Bombay nat. Hist. Soc. 54:967. 1957; Gamb. 1099. Arum ovatum Linn. Sp. Pl. 967. 1753. Lagenandra toxicaria Dalz. in Hook. J. Bot. 4:289. 1852; FBI. 6:495. 1893.

Herbs; leaves petiolate, elliptic, thick, up to 35 x 20 cm; spathe greenish purple outside, deep purple within, limb much longer than the tube, caudate-acuminate; spadix enclosed in a chamber formed by a transverse septum; female flowers in many whorls; male flowers many, forming a cylinder above the neuter region, stamens 1-2, anthers sessile.

Collected from the premises of Thiruvangad temple.

Flowers: Mar. - Apr.

Sivarajan 1087.

Caladium Vent.

C. bicolor (Ait.) Vent. Descr. Pl. Nouv. t. 30. 1801 & in Arch. Bot. 2(3):348. 1801; Bakl. & Koster in Blumea 12(1):66. 1963. Arum bicolor Ait. Hort. Kew 3:316. 1789.

Tuberous herbs; leaves petioled, ovate or orbicular, acute or acuminate, deeply cordate at base, up to 20 cm across; spathe greenish outside, the limb cuspidate, longer than spadix.

This species, though often found cultivated as an ornamental, is very common along the road sides and waste places and includes many forms with variously mottled leaves.

Flowers: May - July

Sivarajan 1140.

Colocasia Schott.(nom.cons.)

C. esculenta (Linn.) Schott. Melet. 1:18. 1832; Sant. 261. 1960. Arum esculentum Linn. Sp. Pl. 965. 1753. Colocasia antiquorum Schott. Melet 1:18. 1832; FBI. 6:523. 1893; Gamb. 1102.

Tuberous herbs; leaves long-petioled, ovate or suborbicular, peltate, deeply cordate at base; spathes yellow, limb lanceolate, caudate-acuminate; peduncles short, solitary or clustered; spadix shorter than spathe; male and female flowers separated by flat neuters; stamens in male flowers connate forming synandria.

Common on the road sides and waste places in wet or moist areas.

Flowers: July - Nov.

Sivarajan 1325, 1508.

Ariopsis J. Grah.

A.peltata Nimmo in Graham cat. 252. 1839; FBI. 6:519.

1893; Sant. 260. 1960; Gamb. 1102. A.protanthera  
N.E. Brown in Rep. Roy. Bot. Gard. Kew 51. 1877.

Tuberous herbs; leaves 1-2, peltate, ovate or suborbicular; petiole 10-15 cm long; spathe 2-3 cm long, open, short-peduncled; male flowers immersed in the spadix, anthers 3 in each; neuters 0; female flowers on one side of the spadix, few; berries angled.

Flowers: June - Aug.

Sivarajan 1202.

Typhonium Schott.

Key to the species

1. Leaves 3-lobed ..... trilobatum  
1. Leaves not lobed ..... flagelliforme

T. trilobatum (Linn.) Schott. in Wein. Zeit Scher 3:72.

1829; FBI. 6:509. 1893; Blatt. in J. Bombay nat. Hist.

Soc. 35:22. 1931; Gamb. 1100. Arum trilobatum Linn.

Sp. Pl. 965. 1753.

Tuberous herbs; leaves few, digitately 3-lobed, lobes caudate-acuminate, basal veins many; spathe with a short, convolute tube below and a narrow, lanceolate, deciduous limb; spadix usually longer than spathe, with a linear, barren appendage above the male flowers; neuters many, filiform; stamens in male flowers 1-3; berries ovoid.

Flowers: Mar. - Dec.

Sivarajan 233.

T. flagelliforme (Roxb. ex Lodd.) Blume in Rumphia 1:134.

1835; Calder et al in Rec. Bot. Sur. Ind. 11:152.

1926; Gamb. 1100. Arum flagelliforme Roxb. J-Hort.

Beng. 65. 1814, nom. nud., J ex Lodd. Bot. Cab. 396.

1819; Roxb. Fl. Ind. 3:627. 1832. T. cuspidatum (Blume)  
Dcne. l in Nouv. Ann. Mus. Par. 3:367. 1834 l ex  
Blume in Rumphia 1:134. 1835.

Tuberous herbs; leaves ovate-oblong, acute or acuminate, cordate at base, basal lobes hastate or rounded, green above, glaucous below, basal veins few; neuters dimorphic, basal ones clavate, and upper ones subulate.

Flowers: Mar. - Dec.

Sivarajan 277.

Theriophonum Blume

T. infaustum N.E. Brown in J. Linn. Soc. 18:260. 1880;  
FBI. 6:513. 1893; Gamb. 1102.

Tuberous herbs; leaves many, elliptic or oblong, obtuse, mucronate, hastately cordate at base, basal lobes rounded, minutely hairy on both surfaces; petiole short; spathe green with a subcylindric tube at base, limb lanceolate, acute; spadix shorter than the spathe; neuters filiform or subulate; stamens in male flowers 1-2, anthers not beaked; berries ovoid.

This genus has 6 of its species endemic to peninsular India. This species is a common tufted herb,



growing in moist shady places on the rocky, laterite areas.

Flowers: Aug. - Oct.

Sivarajan 338.

Amorphophallus Blume ex Decn.

(nom. cons.)

A. hohenackeri (Schott.) Engl. & Gehrm. in Pfreich.

4(230) 103-105. 1911; Calder et al, in Rec. Bot.

Sur. Ind. 11:9. 1926; Gamb. 1107. Rhuphiophallus

hohenackeri Schott. Gen. Aroid. t. 27. 1858.

Tuberous herbs; leaves usually 3-partite, segments pinnatisect, lobes oblong or elliptic, acuminate; petiole mottled; spadices produced after leaves; spathe ovate-obtuse or acute, greenish yellow, speckled with red; spadix a little shorter than the spathe, shortly stipitate; neuters few; berries subglobose, fleshy, orange-yellow.

In shaded rocky places among bushes. The spadix has a characteristic smell and the shape resembles the hood of snakes. The leaves are produced after flowers.

Flowers: Mar. - Apr.

Sivarajan 1027.




PLATE 27

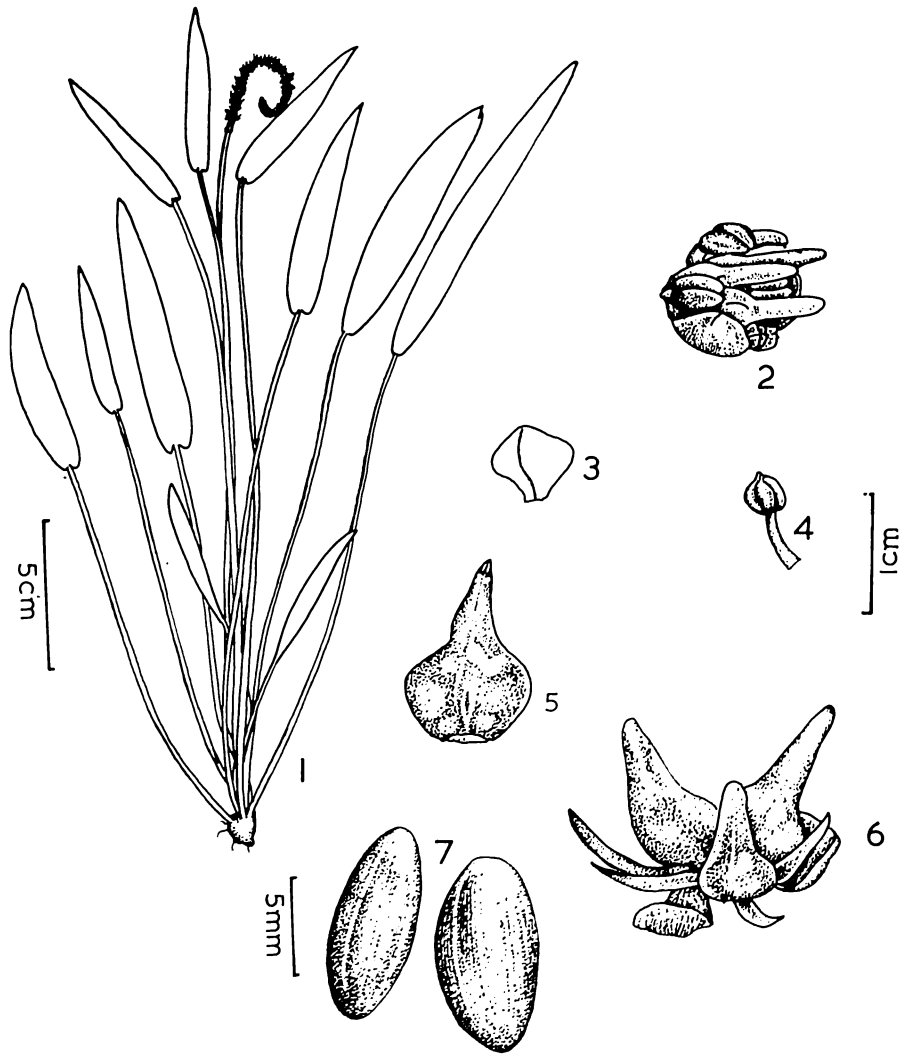
Annonogiton natans (Linn.) Engl. & Kr.

Fig. 1. A plant. Fig. 2. Flower. Fig. 3.

Perianth segment. Fig. 4. Stamen. Fig. 5.

Carpel. Fig. 6. Fruits with the persistent  
perianth and staminal filaments.

Fig. 7. seeds.



APONOGETON NATANS (LINN) ENGL. & KR.

APONOGETONACEAE J.G.Agardh

Aponogeton Linn.f.(nom.cons.)

Kv.

A.natans (Linn.) Engl. & in Engl. ~~Krause~~, Pfreich.

Heft. 24:11. 1906; Gamb. 1114; Bruggen in Blumea

18(2):477. 1970. Saururus natans Linn. Mant. 2:227.

1771.

Aquatic herbs; rhizome tuberous; submerged leaves cuneate at both ends; floating leaves cordate at base; peduncles long; spathe caducous; spike 4-7 cm long; flowers blue, closely arranged on the spike; tepals 2, spatulate; fruits beaked at the tip. (Plate 27)

This is a monsoon herb growing in water-logged fields and is rare in this area.

Flowers: Aug. - Sept.

Sivarajan 1728.

NAJADACEAE Juss.

Najas Linn.

N.graminea Del. Descr. Egypte. Hist. nat. 2:282, t. 50.

1813; Blatt. in Rec. Bot. Sur. Ind. 8:473. 1919;

Gamb. 1118.

Submerged herbs; stem slender, branched; leaves linear, serrulate at margins, sheath auricled; flowers minute, axillary, 1-3 in the axils; perianth hyaline; stamen 1, adnate to the perianth; achenes ellipsoid, up to 2 mm long.

Seen in fresh water ponds and lakes.

Flowers: Aug. - Sept.

Sivarajan 663.

ERIOCAULACEAE Desv.

Eriocaulon Linn.

Key to the species

1. Sepals in male flowers 3:
  2. Aquatic herbs ..... setaceum
  2. Terrestrial herbs:
    3. Involucral bracts exceeding the floral bracts:
      4. Peduncle up to 15 cm long ..... dianae, var.  
longibractesum
      4. Peduncle 4-5 cm long ..... acanthum

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The author is thankful to Dr. Harold N. Moldenke, Hon. Curator, New York Botanical Gardens for the confirmations and his critical comments on the specimens of Eriocaulon.

3. Involucral bracts not as above:
- 5. Involucral bracts lanceolate ..... elenorae
  - 5. Involucral bracts obovate or  
ob lanceolate:
    - 6. Heads conical ..... conicum
    - 6. Heads subglobose ..... quinquangulare
1. Sepals in male flowers 2:
- 7. Leaves obtuse, cuspidate at tip ..... cuspidatum
  - 7. Leaves not as above:
    - 8. Sepals in female flowers 3 ..... sexangulare
    - 8. Sepals in female flowers 2 ..... truncatum

E. setaceum Linn. Sp. Pl. 87. 1753; FBI. 6:572. 1893;  
Gamb. 1126.

Stem submerged, spongy, very long; leaves capillary, flexuous and 1-nerved; peduncles many, umbellate at the tips of the stem, up to 8 cm long; heads subglobose; male calyx spathaceous, split down in front; sepals in female flowers 3, obovate; petals linear.

A submerged herb with only the inflorescence above the water.

Flowers: July - Nov.

Sivarajan 385.

E. dianae Fyson in J. Ind. Bot. 1:50. 1919, synonym & 2:259, Pl. 12. 1921., var. longibracteatum Fyson in J. Ind. Bot. 2:259-60, Pl. 13. 1921, 'longi bracteata'; Sant. 262. 1960; Gamb. 1128; Sant. & Shah in J. Bombay nat. Hist. Soc. 66:440. 1969; Mold. in Phytologia 21:272. & 428. 1971 & Fifth Summ. 1:274, 280 & 295. 1971 & 2:499 & 934. 1971.

Leaves linear-lanceolate; acute, 6-10 cm long; peduncles many, striate, up to 15 cm long; sheaths half as long as the leaves; heads subglobose, up to 5 mm across; involucral bracts much longer, lanceolate; calyx in male flowers spathaceous, split down on one side; corolla lobes 3 with black glands at the tips; sepals in female flowers 3, free, 2 of them boat-shaped, third one flat; petals 3, free, eglandular.

Common in wet or marshy fields, easily recognisable by its involucral bracts.

Flowers: July - Dec.

Sivarajan 10, 296.

E. xeranthemum Mart. in Wall. Pl. As. Rar. 3:29. 1832; FBI. 6:584. 1893; Fyson in J. Ind. Bot. 2:200. 1921; Gamb. 1127.

PLATE 28

Fig.1. Eriocaulon elenorae Fyson in Wet  
fields. Fig.2. E.cuspidatum Dalz.  
growing in shallow ponds.



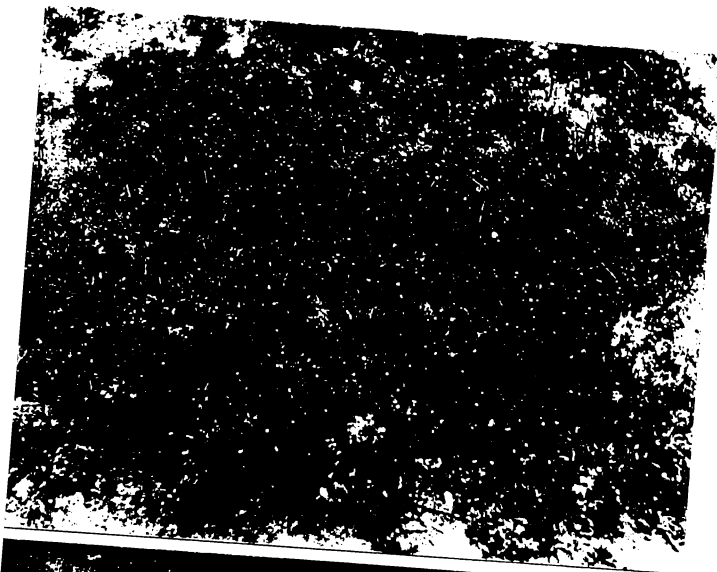


Fig. 1

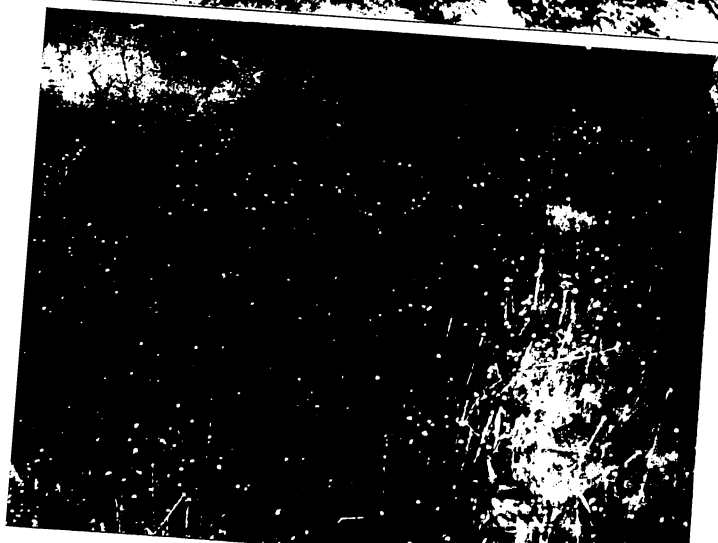


Fig. 2

Leaves linear-lanceolate, acute, up to 5 cm long; peduncles striate, 2-5 cm long; sheaths lax, 2-2.5 cm long; heads hemispheric; involucre bracts scarious, glistening; sepals in male flowers 3, free or connate and split down on one side; corolla lobes glandular at tip; sepals in female flowers 2-3; petals 3, glandular at tip.

Common on wet rocks and on lateritic grassy slopes during rainy season.

Flowers: July - Nov.

Sivarajan 303.

E.eleanorae Fyson in J. Ind. Bot. 2:316, t. 35. 1921; Razi in Rec. Bot. Sur. Ind. 18:19. 1959; Shah in Bull. Bot. Sur. Ind. 4:237. 1962; Gamb. 1127; Sant. & Shah in J. Bombay nat. Hist. Soc. 66:440. 1969; Mold. in Phytologia 19:335-336. 1970 & 21:273. 1971.

Leaves narrowly linear; peduncles many, slender, striate, up to 10 cm long; sheaths shorter than leaves, split on one side; heads subglobose;

involucral bracts lanceolate; floral bracts obovate-cuspidate; calyx spathaceous in male flowers, in female flowers sepals free, ciliate, 2 of them winged; petals eglandular. (Plate 28. Fig. 1).

Common in wet or marshy places on grassy slopes. Sometimes it is found living submerged in shallow ponds.

Flowers: July - Sept.

Sivarajan 302, 1488.

E.conicum (Fyson) C.E.C.Fischer in Gamb. Fl. Madr. 9:1916-17. 1931; Mold. in Phytologia 20:347-48. 1970 & 24:352. 1972 & Fifth Summ. 1:274. 1971 & 2:467, 499 & 934. 1971. E.dianae var. conica Fyson in J. Ind. Bot. 2:260. 1921.

Leaves linear-acuminate; peduncles many, 5-ribbed; sheaths shorter than the leaves; bracts obovate; heads distinctly conical; sepals in male flowers connate, spathaceous; corolla lobes with or without glands; sepals in female flowers 3, free, spatulate; petals 3, usually glandular at tip.

Collected from the marshy fields at Feroke.

Flowers: Sept. - Jan.

Sivarajan 914.

E. quinquangulare Linn. Sp. Pl. 1:129. 1753; Willd. Sp. Pl. 1:485. 1797; FBI. 6:582. 1894; Ruhl. in Pfreich. 4(30):85. 1903; Mahes. in Bull. Bot. Sur. Ind. 5:138. 1963; J. Joseph in Bull. Bot. Sur. Ind. 5:297. 1963; Subr. & Henry in Bull. Bot. Sur. Ind. 8:214. 1966; Gamb. 1125; Mold. in Phytologia 18:428-35, 451. 1969 & 19:25, 26 & 38. 1969.

Leaves linear-lanceolate, acute; peduncles numerous, 5-ribbed, up to 20 cm long; sheath shorter than leaves; heads ovoid; bracts obovate or oblanceolate; male calyx spathaceous, 3-lobed; corolla lobes linear; sepals in female flowers 3, free; petals glandular.

Common in wet, cultivated fields as a weed, and also on wet rocks during rainy season.

Flowers: Sept. - Jan.

Sivarajan 648.

E.cuspidatum Dalz. in Hook. Kew J. Bot. 3:281. 1851;  
FBI. 6:581. 1893; Fyson in J. Ind. Bot. 1:150. 1919;  
Gamb. 1126; Arora in Bull. Bot. Sur. Ind. 10:65. 1968;  
Mold. in Phytologia 20:348. 1970 & 24:353. 1972; Fifth  
Summ. 1:274, 280. 1971 & 2:934. 1971.

Leaves linear, obtuse, shortly cuspidate at tip,  
up to 10 x 0.5 cm; peduncles few, 7-ribbed; sheaths gla-  
brous, mouth oblique; heads subglobose; bracts obovate-  
cuneate; sepals in male flowers 2, free, narrowly winged;  
corolla lobes unequal; sepals in female flowers 2;  
petals 3, gland-tipped. (Plate 28, Fig. 2)

This is seen in marshes and also in shallow  
water. The length of the peduncle is much variable  
corresponding to the depth of water.

Flowers: Sept. - Jan.

Sivarajan 913, 1332, 1333.

E.sexangulare Linn. Sp. Pl. 87. 1753; FBI. 6:580. 1893;  
Fyson in J. Ind. Bot. 2:318, tt. 39, 40. 1921; Gamb.  
1126.

Leaves linear-lanceolate, up to 25 x 2 cm;  
peduncles many, 4-5-ribbed, up to 40 cm long; sheaths  
oblique at mouth, long acuminate; involucre bracts

orbicular or obovate; floral bracts obovate; sepals in male flowers 2, connate and winged; sepals in female flowers 3, eglandular.

Common in sandy fields near the sea coast.  
The long, dried peduncles are locally used to make brooms.

Flowers: Nov. - Mar.

Sivarajan 1556.

E. truncatum Buch.-Ham. ex Mart. in Wall. Pl. As. Rar.

3:29. 1831; FBI. 6:578. 1893; Ruhl. in Pfreich.  
13(4-30):13, 103, 107 & 287. 1903; Gamb. 1127; Arora  
in Bull. Bot. Sur. Ind. 10:65. 1968; Mold. in  
Phytologia 17:461. 1968 & 19:414, 424. 1970.

Leaves ensiform, linear; peduncles many, 5-7-  
ribbed; sheath shorter than leaves; bracts obovate,  
rounded or subacute at tips; heads hemispheric; sepals  
in male flowers 2, partly connate; corolla lobes glandu-  
lar or not; sepals in female flowers 2; petals 3, with  
or without glands.

Collected from the wet fields during the monsoon.

Flowers: July - Sept.

Sivarajan 271.

CYPERACEAE Juss.

Key to the genera

- 1. Glumes distichous ..... Cyperus
- 1. Glumes spiral:
  - 2. Hypogynous bristles absent:
    - 3. Glumes 2-sexual:
      - 4. Spikelets lateral on the stem ... Scirpus
      - 4. Spikelets not lateral ..... Fimbristylis
    - 3. Glumes 1-sexual ..... Scleria
  - 2. Hypogynous bristles present:
    - 5. Bristles only 2 ..... Lipocarpa
    - 5. Bristles 3-6:
      - 6. Leaves 0 ..... Eleocharis
      - 6. Leaves linear-lanceolate ..... Fuirena

Cyperus Linn.

Key to the species

- 1. Rachilla deciduous:
  - 2. Glumes 4-5 ..... kyllingia
  - 2. Glumes many ..... javanicus
- 1. Rachilla persistent:
  - 3. Stylar arms:
    - 4. Stamen usually 1:
      - 5. Spikelets more than 1 cm long ... pumilus
      - 5. Spikelets less than 1 cm long ... flavidus

4. Stamens 2:

6. Glumes acute at apex ..... malabaricus

6. Glumes truncate at apex ..... macrostachyos

3. Stylar arms 3:

7. Rhizomatous herbs:

8. Glumes 1-3-veined:

9. Glumes closely imbricating ..... haspan

9. Glumes distant, not or slightly  
imbricating ..... distans

8. Glumes with more than 3 veins:

10. Spikelets 1 cm or more long:

11. Rachilla winged:

12. Glumes 5-nerved ..... rotundus

12. Glumes 7-9-nerved ..... bulbosus

11. Rachilla not winged ..... pilosus

10. Spikelets less than 1 cm long:

13. Glumes orbicular ..... pangorei

13. Glumes ovate ..... exaltatus

7. Non-rhizomatous herbs:

14. Glumes recurved-mucronate:

15. Nerves on the glumes 7-9 ..... uncinatus

15. Nerves on the glumes 1-3 ..... squarrosus

14. Glumes not recurved-mucronate:

16. Stamen usually 1:

17. Spikelets 1 cm or more long ..... castaneus

17. Spikelets much shorter ..... diformis



16. Stamens usually 2-3:

18. Glumes shortly mucronate or cuspidate

at tip:

19. Spikelets about 2 cm long ..... imbricatus

19. Spikelets 1 cm long ..... compressus

18. Glumes not mucronate at tip:

20. Nuts almost as long as the glumes .. iria

20. Nuts shorter than the glumes ..... tenuispica

C. kyllingia Endl. Cat. Hort. Acad. Vindob. 1:94. 1842;

Kern in Reinwardtia 6:67. 1961. Kyllinga monocephala

Rottb. Descr. and Ic. 13. t. 4, f. 4. 1773; FBI.

6:588. 1893; Gamb. 1130.

Small herbs; rhizome creeping; spikelets compressed, white or green in subglobose, sessile heads; glumes 4-5; stamens 3; nuts trigonous, acute.

Flowers: July - Dec.

Sivarajan 769.

C. javanicus Houtt. Nat. Hist. 2:13. Pl. 1, t. 88, f.

1. 1782; Merr. in J. Arn. Arb. 19:321. 1938; Blake

in J. Arn. Arb. 28:222. 1947 (non Kukenth. in Pfreich.

101 (IV.20):476, f. 53 A-G. 1936); Mariscus albescens

Gaud. in Freyc. Voy. Bot. 415. 1826; FBI. 6:623. 1893.

Tufted herbs; leaves scabridulous; umbels compound; spikelets spicate, linear-lanceolate, 7 mm long; glumes ovate-obtuse; nuts ellipsoid, apiculate.

Flowers: Sept. - Mar.

Sivarajan 1147, 1962.

C. pumilus Linn. Cent. Pl. 2:6. 1756 & Amoen. Acad. 4:302. 1788; Cl. in J. Linn. Soc. 21:43. 1884; Sant. 300. 1967. C. pygmaeus Retz. Obs. 4:9. 1786, (non Rottb.) C. hyalinus Vahl, En. 5:329. 1806. C. nitens Vahl, En. 2:331. 1806. Pycreus nitens (Vahl) Nees in Nov. Act. Acad. Cur. 19. Suppl. 53. 1843; FBI. 6:591. 1893. P. pumilus (Linn.) Dom. in Bibl. Bot. 85:417. 1916; Blatt. in J. Bombay nat. Hist. Soc. 37:31. 1934.

Erect herbs; umbels compound; spikelets 1.8-2 cm long; rachilla zig zag, 25-30-flowered; glumes oblong-obtuse, cuspidate, 2 mm long, plicate, 1-veined; stamen 1; styles 2-fid; nuts planoconvex, oblong, 1 mm long.

Common in moist and marshy fields.

Flowers: July - Sept.

Sivarajan 1807.

C. flavidus Retz. Obs. 5:13. 1789, non sensu Cl. in J. Linn. Soc. 20:287. 1883 & FBI. 6:600. 1893; quae est C. tenuispica Steud; Korlahalli in Bull. Bot. Sur. Ind. 9:236. 1967. C. globosus All. Auctur. Fl. Pedem. 49. 1789, (non Forsk. 1775); Kukenth. in Pfreich. 101 (IV. 20):352. 1936; Blake in J. Arn. Arb. 28:220. 1947. C. capillaris Koenig ex Roxb. Fl. Ind. 1:198. 1820. Pycreus globosus (All.) Reichb. Fl. Germ. Exc. 2:140. 1830; Blatt. & McC. in J. Bombay nat. Hist. Soc. 37:29. 1935. P. capillaris (Koenig ex Roxb. ) Nees in Linnaea 9:283. 1834; FBI. 6:591. 1893.

Herbs about 50 cm tall; rhizome 0; umbels compound; spikelets stellately spreading, oblong with parellel sides, 5 mm long; rachilla wavy; flowers 15-20; glumes oblong-obtuse, closely imbricating, plicate, 1.5 mm long; stamen only 1; style 2-fid; nut planoconvex, tuberculate.

Flowers: July - Nov.

Sivarajan 1051.

C. malabaricus (Clarke) Cooke, Fl. Pres. Bomb. 2:856. 1908; Kükenth. in Pflanz. 101:278, f. 31, A, D. 1936; Sant. 299. 1967. Pycneus malabaricus Clarke in J. Linn. Soc. 34:12. 1898; Blatt. in J. Bombay nat. Hist. Soc. 37:28. 1934.

Caespitose herbs, 10-25 cm tall; spikelets spicate, sessile, oblong-sub<sup>b</sup>acute, 1.5-1.8 cm long; glumes broadly ovate-acute with hyaline margins, 2.5 mm long; stamens 2; styles 2-fid; nuts ovoid, compressed, transversely muricate.

A slimy plant, commonly seen in marshy fields, and on the grassy slopes.

Flowers: July - Nov.

Sivarajan 357.

C. macrostachyos Lamk. Ill. Gen. 1:147. 1791. C. albomarginatus Mart. & Schrad. ex Nees in Mart. Fl. Bras. 2(1):9. 1842; Kükenth. in Pflanz. 101:359, f. 42, E-H. 1936; Sant. 267. 1967. Pycneus albomarginatus Nees in Mart. Fl. Bras. 2(1):9. 1842; FBI. 6:594. 1893; Gamb. 1133. P. macrostachyos (Lamk.) Raynal in Kew Bull. 23:314. 1969.

Herbs about 30-50 cm tall; leaves few, basal, shorter than the trigonous stem; spikelets in compound umbels, oblong-obtuse, 2 cm long; glumes ovate-truncate with a conspicuous white margin, 3 mm long; stamens 2; nut obovoid, rounded at tip.

Collected from the marshy fields at Cheruvannoor. Commonly seen as a weed in paddy fields.

Flowers: Sept. - Dec.

Sivarajan 730.

C. haspan Linn. Sp. Pl. 1:45. 1753; Ridley in Trans.

Linn. Soc. II. Bot. 9:241. 1916; ~~Ku~~kenth. in Pfreich. 101 (IV.20):247. 1936; Blake in J. Arn. Arb. 28:219. 1947; Mitra, ~~in~~ Monoc. E. Ind. 97. 1958; Kern in Reinwardtia 6:58. 1961 & 6:150. 1962; Gamb. 1139.

Herbs; rhizome creeping; inflorescence of compound umbels; spikelets 6-8 mm long; glumes oblong-obtuse with hyaline margins, 1-veined, 2 mm long; rachilla zigzag; stamens 3-2; styles 3-fid; nuts triquetrous, much smaller than the glumes.

Collected from the marshy fields at Kunnamangalam.

Flowers: July - Nov.

Sivarajan 956, 1809

C. distans Linn. f. Suppl. 103. 1781; FBI. 6:607. 1893;

Kukenth. in Pfreich. 101 (IV.20):137. 1935; Ohwi in Bot. Mag. Tokyo 56:199. 1942; Blake in J. Arn. Arb. 28:214. 1947; Kern. in Reinwardtia 6:53. 1961 & 6:149. 1962; Gamb. 1140.

Erect, stoloniferous herbs; 30-50 cm tall; inflorescence of compound umbels; spikelets linear, 1.8 cm long; glumes oblong-obtuse, distant; rachilla wavy, glabrous; stamens 3; styles 3-fid; nuts triquetrous, minutely tuberculate, 1.5 mm long.

Collected from the wet fields. Common as a weed in paddy fields.

Flowers: Aug. - Nov.

Sivarajan 372, 954, 1285.

C. rotundus Linn. Sp. Pl. 45. 1753; FBI. 6:614. 1893;

Sant. 268. 1960; Kern in Reinwardtia 6:53. 1961; Chavan & Oza, Fl. Pavagadh 229. 1966; Gamb. 1140.

Rhizomatous, tufted, herbs, about 10-15 cm tall; leaves few, linear-lanceolate; spikelets distichous, 10-15-flowered, 1-1.2 cm long, aggregated in umbellate spikes; glumes ovate-acute, 5-nerved, 3 mm long;

stamens 3; styles 3-fid; nuts trigonous.

Flowers: Sept. - Dec.

Sivarajan 1196.

C. bulbosus Vahl, En. 2:342. 1805; FBI. 6:611. 1893;

Chavan & Oza, Fl. Pavagadh 229. 1966; Gamb. 1140.

Stoloniferous herbs; stolons ending in small ovate or elliptic bulbils; leaves few; spikelets up to 2 cm long, 13-19-flowered, aggregated in umbellate spikes; glumes elliptic-subacute, 7-9-nerved, 2 mm long; rachilla winged; stamens 3; styles 3-fid, nut triquetrous.

Flowers: Sept. - Dec.

Sivarajan 1315.

C. pilosus Vahl, En. 2:354. 1806; FBI. 6:609. 1893; Kern

in Reinwardtia 6:54. 1961; Gamb. 1140.

Stoloniferous, erect herbs; leaves 4-5, lanceolate, plicate, up to 1 cm broad; spikes in umbels, rachis of the spikes hispidulous; spikelets oblong-acute; glumes ovate-obtuse, striate with hyaline margins, 2.5 mm long; stamens 2-3; nut triquetrous, half as long as the glume.

A common weed in low land cultivations.

Flowers: Nov. - Jan.

Sivarajan 11.

C. pangorei Rottb. Descr. & Ic. 31. t. 7, f. 3. 1773;  
Sant. 300. 1967; Gamb. 1140. C. tegetum Roxb. Fl. Ind.  
1:208. 1832; Cl. in J. Linn. Soc. 21:160. 1884; FBI.  
6:613. 1893.

Rhizomatous herbs, 25-50 cm tall; leaves very  
few; inflorescence of compound umbels, rays many;  
spikelets short, 5 mm long; glumes orbicular-mucronate,  
striate, margins hyaline, 2 mm long; stamens 3; style  
3-fid; nuts triquetrous, 1 mm long.

Collected from wet or marshy fields. Very  
often as a weed in low land cultivations.

Flowers: Sept. - Nov.

Sivarajan 669.

C. exaltatus Retz. Obs. 5:11. 1789; Vahl, En. 2:366,  
1805. 1789; FBI. 6:617. 1893; Sant. 266. 1960;  
Koyama in Quart. J. Taiwan Mus. 14:167. 1961; Kern  
in Reinwardtia 6:148. 1962; Gamb. 1141.



Herbs, up to 1 metre tall; leaves few, lanceolate, 5-7 mm broad; umbels compound; spikelets each 15-20-flowered, 6-8 mm long; glumes ovate, concavely mucronate at tip, 5-7-nerved, margins hyaline, 2 mm long; rachilla zigzag, persistent; stamens 3; 3-merous; nut trigonous, half as long as the glume.

Seen growing as a weed in the paddy fields.

Flowers: Sept. - Dec.

Sivarajan 1535.

C. uncinatus Poir. Encycl. 7:247. 1806; Cl. in Dyer's Fl. Trop. Afr. 5:328. 1902; Blatt. in J. Bombay Hist. Soc. 37:258. 1934; Gamb. 1139. C. cuspidatus H. B. & K. Nov. Gen. & Sp. 5:204. 1815; Cl. in J. Linn. Soc. 5(21):88. 1884; FBI. 6:598. 1893.

Tufted annuals; rhizome absent; stem 5-8 cm; leaves linear; spikelets in dense, pedunculate heads to 1 cm long; flowers 8-15; glumes 2.5 mm long, ovate-obovate with a recurved mucro at the tip, 7-9-nerved; stamen 1; nut obovoid, triquetrous, minutely tuberculate, 1 mm long.

Flowers: July - Sept.

Sivarajan 365, 420.

Herbs, up to 1 metre tall; leaves few, lanceolate, plicate, 5-7 mm broad; umbels compound; spikelets spicate, each 15-20-flowered, 6-8 mm long; glumes ovate, conspicuously mucronate at tip, 5-7-nerved, margins hyaline, 2 mm long; rachilla zigzag, persistent; stamens 3; styles 3-fid; nut trigonous, half as long as the glume.

Seen growing as a weed in the paddy fields.

Flowers: Sept. - Dec.

Sivarajan 1535.

C. uncinatus Poir. Encycl. 7:247. 1806; Cl. in Dyer's Fl. Trop. Afr. 5:328. 1902; Blatt. in J. Bombay nat. Hist. Soc. 37:258. 1934; Gamb. 1139. C. cuspidatus H. B. & K. Nov. Gen. & Sp. 5:204. 1815; Cl. in J. Linn. Soc. 5(21):88. 1884; FBI. 6:598. 1893.

Tufted annuals; rhizome absent; stem 5-8 cm tall; leaves linear; spikelets in dense, pedunculate heads, up to 1 cm long; flowers 8-15; glumes 2.5 mm long, ovate to obovate with a recurved mucro at the tip, 7-9-nerved, stamen 1; nut obovoid, triquetrous, minutely tuberculate, 1 mm long.

Flowers: July - Sept.

Sivarajan 365, 420.

C. squarrosus Linn. Cent. Pl. 2:6. 1756; Kern in Reinwardtia 6:60. 1961; Sant. 300-301. 1967. C. aristatus Rottb. Progr. 22. 1772; FBI. 6:606. 1893; Sant. 265. 1960; Gamb. 1140.

A tufted, diffuse herb, about 10-15 cm tall; leaves few; spikelets in heads or spikes, 8-12-flowered, 5-6 mm long; glumes with a recurved arista at the tip and hyaline margins, 1-3-veined; stamen usually 1; styles 3-fid; nut trigonous, 1.5 mm long.

This small herb is common in wet fields.

Flowers: July - Sept.

Sivarajan 326.

C. castaneus Willd. Sp. Pl. 1:278. 1797; Roxb. Fl. Ind. 1:199. 1820; FBI. 6:598. 1893; Kern in Reinwardtia 2:117. 1952; Gamb. 1139.

Non<sup>r</sup>rhizomatous, tufted herbs, 3-5 cm tall; spikelets 1 cm long, 8-12-flowered, grouped in umbellate spikes; glumes ovate-oblong, shortly mucronate, 3-ribbed, 3 mm long; rachilla zigzag; stamen usually 1; style 3-fid; nut oblong, triquetrous, 1.5 mm long.

Flowers: Sept. - Dec.

Sivarajan 299.

C. difformis Linn. Cent. Pl. 2:6. 1756 & Amoen. Acad.

3:302. 1760; FBI. 6:599. 1893; Sant. 266. 1960; Kern  
in Reinwardtia 6:58. 1961 & 6:150. 1962; Gamb. 1139.

Nonrhizomatous herbs about 40 cm tall; spikelets  
in umbelled, dense heads, short; rachilla persistent;  
glumes obovate-obtuse with a short mucro at the tip,  
margins hyaline; stamen only one; styles 3-fid; nuts  
triquetrous, as long as the glumes.

Common in wet or marshy fields.

Flowers: July - Nov.

Sivarajan 667, 750.

C. imbricatus Retz. Obs. 5:12. 1789; Koyama in Quart. J.

Taiwan Mus. 14:166. 1961; Gamb. 1141. C. radiatus Vahl,  
En. 2:369. 1806; FBI. 6:617. 1893.

Erect herbs; rhizome 0; spikelets digitate in  
umbelled spikes, lanceolate, acute, about 1.8 cm long;  
rachilla zigzag, persistent; glumes about 15-20, ovate-  
obtuse, cuspidate, 5-7-ribbed, 2.5 mm long; nuts trique-  
trous, obovoid, shorter than the glume.

Commonly seen as a weed in paddy fields.

Flowers: Sept. - Dec.

Sivarajan 1430, 1690.

C.compressus Linn. Sp. Pl. 46. 1753; FBI. 6:605. 1893;  
Mitra, Monoc. E. Ind. 98. 1958; Sant. 265. 1960; Kern  
in Reinwardtia 6:150. 1962; Gamb. 1140.

Tufted herbs, about 25 cm tall; spikelets in  
umbellate spikes, elliptic-acute, 1 cm long; rachilla  
zigzag, persistent, not winged; glumes ovate-mucronate,  
striate, 4 mm long; stamens 3; styles 3-fid; nut obovoid-  
obtuse, shorter than the glume.

Collected from the sandy sea coast and also  
from moist fields.

Flowers: Sept. - Nov.

Sivarajan 590, 1357.

C.iria Linn. Sp. Pl. 45. 1753 (excl. Tab. Rheed.); FBI.  
6:606. 1893; Kukenth. in Pfreich. 101 (IV.20):150.  
1935; Sant. 266. 1960; Kern in Reinwardtia 6:55. 1961;  
Gamb. 1140.

Tufted, nonrhizomatous herbs, 20-25 cm tall; spikelets  
in umbellate spikes; glumes obovate-orbicular, plicate,

3-veined, 1.5 mm long; stamens 2-3; nut obovoid, triquetrous, as long as the glume.

Common in marshes; very often <sup>Seen</sup> as a weed in paddy fields.

Flowers: July - Nov.

Sivarajan 595, 1050.

C. tenuispica Steud. Syn. Pl. Cyp. 11. 1855; Kern in Reinwardtia 2:116. 1952 & 3:38. 1954 & 6:59. 1961; Gamb. 1139. C. flavidus auct. (non Retz.); FBI. 6:600. 1893.

Tufted herbs, 20-30 cm tall; rhizome 0; spikelets stellately arranged in umbels, 8-10 mm long, 25-30-flowered; glumes oblong-obtuse, 1.5 mm long; rachilla zigzag, persistent; stamens 1-2; styles 3-fid; nut subglobose, not trigonous, shorter than the glume.

Common in marshy fields and also in shallow ponds.

Flowers: July - Nov.

Sivarajan 527, 756, 1531.

Scirpus Linn.

Key to the species

1. Stem filiform ..... squarrosus
1. Stem not filiform:
  2. Spikelets borne below the middle  
of the stem ..... articulatus
  2. Spikelets borne above the middle  
of the stem ..... supinus

S. squarrosus Linn. Mant. 2:181. 1771; FBI. 6:663. 1893;  
Kern in Reinwardtia 4:93. 1956 & 6:146. 1962; Gamb.  
1156.

A tufted, nonrhizomatous herb; stem 8-15 cm long; spikelets in lateral heads just below the tips of the stem; bracts much longer than the heads; glumes obovate-oblong, acuminate, 1.25 mm long; stamens 2-3; nuts trigonous, minutely tuberculate, 1 mm long.

Flowers: Oct. - Mar.

Sivarajan 666, 1312.

S. articulatus Linn. Sp. Pl. 47. 1753; FBI. 6:655. 1893;  
Sant. 269. 1960; Kern in Reinwardtia 6:34. 1961;  
Gamb. 1156.

Aquatic or marshy, tufted herbs; leaves reduced to sheaths; stem spongy, transversely septate; spikelets in sessile, stellate, lateral clusters just above the sheath; glumes ovate-apiculate, 6 mm long; stamens 3; nuts obovoid, sharply trigonous, smooth, 2 mm long.

Common in water-logged fields.

Flowers: Sept. - Dec.

Sivarajan 572, 739.

S. supinus Linn. Sp. Pl. 49. 1753; FBI. 6:655. 1893;  
Boeck. in Linnaea 36:699. 1870; Gamb. 1156.

Tufted annuals; stem 10-20 cm long; spikelets in stellate, sessile, lateral clusters, oblong, 6 mm long; glumes ovate-apiculate, 2.5 mm long; stamens 3; nut obovoid, trigonous, straw-coloured and transversely rugose.

Seen in water-logged or marshy fields.

Collected from the grassy slopes in the University campus.

Flowers: Sept. - Nov.

Sivarajan 932.



Fimbristylis Vahl (nom.cons.)

Key to the species

1. Spikelets solitary or 2-3:
  2. Glumes distichous ..... ovata
  2. Glumes not distichous:
    3. Glumes 4 mm long:
      4. Spikelets acute ..... schoenoides
      4. Spikelets obtuse ..... tetragona
    3. Glumes much smaller ..... polytrichoides
1. Spikelets many:
  5. Spikelets 1-1.5 cm long:
    6. Stamens usually 2 ..... ferruginea
    6. Stamens 3 ..... complanata
  5. Spikelets less than 1 cm long:
    7. Glumes obtuse at apex:
      8. Spikelets subglobose ..... littoralis
      8. Spikelets not subglobose:
        9. Glumes 2-2.5 mm long:
          10. Nuts smooth ..... bis-umbellata
          10. Nuts tuberculate ..... tenera
        9. Glumes much smaller ..... capillaris
      7. Glumes acute at tip:
        11. Spikelets subglobose ..... miliacea
        11. Spikelets not subglobose:
          12. Spikelets umbelled ..... dichotoma

12. Spikelets capitate:

13. Glumes ovate ..... argentea

13. Glumes lanceolate ..... barbata

F.ovata (Burm.f.) Kern in Blumea 15:126. 1967; Shah in J. Bombay nat. Hist. Soc. 66:233. 1969. Carex ovata Burm. f. Fl. Ind. 194. 1768. Cyperus monostachyos Linn. Mant. 2:180. 1771. Fimbristylis monostachyos (Linn.) Hassk. Pl. Java Rar. 61. 1848; FBI. 6:649. 1893; Gamb. 1152, 'monostachya'.

Tufted herbs; leaves short; spikelets solitary, ovate-acute, compressed; glumes ovate-oblong, mucronate, keeled, 5 mm long; rachilla persistent, pouched; style hairy; nut planoconvex, obovoid, tuberculate, 2 mm long.

Common in moist or wet fields.

Flowers: July - Sept.

Sivarajan 671, 1574.

F.schoenoides (Retz.) Vahl, En. 2:286. 1806; FBI. 6:634. 1893; Sant. 269. 1960; Koyama in J. Fac. Sc. Uni. Tokyo 3(8):115. 1961; Kern in Reinwardtia 6:147. 1962; Gamb. 1150. Scirpus schoenoides Retz. Obs. Pl. 5:14. 1789.

Tufted, slender herb; leaves linear, shorter than the stem; spikelets 1-3, ovate-acute, up to 1 cm long; glumes orbicular or ovate, obtuse, striate, 4 mm long; stamens 2-3; style villous; nut planconvex, obovate, umbonate at tip and reticulate, 2 mm long.

Collected from moist fields.

Flowers: Aug. - Nov.

Sivarajan 509.

F.tetragona R. Br. Prod. 226. 1810; FBI. 6:631. 1893;  
Blake in J. Arn. Arb. 35:208. 1954; Sant. 269. 1960;  
Koyama in J. Fac. Sc. Uni. Tokyo 3(8):118. 1961;  
Kern in Reinwardtia 6:148. 1962; Gamb. 1150.  
F.cylindrocarpa Kunth, En. 2:222. 1837. F.arnotti Th.  
En. 348. 1864. Scirpus tetragonus (R. Br.) Poir.  
Encycl. Meth. Suppl. 5:98. 1817.

Tufted herbs; leaves few, shorter than the stem; spikelet solitary, ovoid or subglobose, obtuse, 6-10 mm long; glumes oblong or obovate, obtuse, 4 mm long; stamens 2-3; styles 2-fid; nut oblong, straw-coloured, reticulate.

Collected from the grassy slopes in the University campus.

Flowers: Aug. - Nov.

Sivarajan 405.

F. polytrichoides (Retz.) Vahl, En. 2:248. 1806; FBI. 6:632. 1834; Koyama in J. Fac. Sc. Uni. Tokyo 3(8):110. 1961; Kern in Reinwardtia 6:148. 1962. Scirpus polytrichoides Retz. Obs. 4:11. 1786.

Tufted herbs; stems slender; leaves much shorter than the stem; spikelets solitary, ellipsoid, acute, 5 mm long; glumes oblong-obtuse, glabrous, 1.5 mm long; stamens 3; nut brownish black; obovoid, planoconvex.

Collected from the marshy fields at West Hill.

Flowers: Sept. - Nov.

Sivarajan 576.

F. ferruginea (Linn.) Vahl, En. 2:291. 1806; FBI. 6:638. 1893; Kukenth. in Engl. Bot. Jahrb. 59:48. 1924 & 69:258. 1938; Sant. 268. 1960; Kern in Reinwardtia 6:45. 1961 & 6:147. 1962; Gamb. 1151. Scirpus ferrugineus Linn. Sp. Pl. 74. 1753. Fimbristylis brevifolia R. Br. Prod. 228. 1810. Scirpus brevifolius (R. Br.) Poir. Encycl. Suppl. 5:99. 1817.

Tufted herb; leaves linear, much shorter than the stem; spikelets umbelled, ovate-lanceolate, pedicelled, 1-1.5 cm long; glumes ovate-oblong, keeled, 5 mm long;

stamens 2; style densely villous; nuts obovoid, short-stalked, 1 mm long.

Flowers: July - Nov.

Sivarajan 1150.

F.complanata (Retz.) Link. Hort. Berol. 1:292. 1827;  
FBI. 6:646. 1893; Blake in J. Arn. Arb. 35:215. 1954;  
Kern in Reinwardtia 6:38. 1961; Gamb. 1151. Scirpus  
complanata Retz. Obs. Bot. 5:14. 1789. Fimbristylis  
autumnalis (Linn.) Roem. & Schult., var. complanata  
(Retz.) Kükenth. in Engl. Bot. Jahrb. 59:50. 1924.

Rhizomatous herbs; leaves basal; bracts shorter than the compound umbels; spikelets peduncled, cylindric, 1-1.2 cm long; glumes ovate-acute, keeled, 3 mm long; stamens 3; nuts trigonous, straw-coloured and tubercled.

Flowers: Aug. - Oct.

Sivarajan 1533.

F.littoralis Gaudich. in Frey. Voy. Bot. 413. 1826;  
Blake in J. Arn. Arb. 35:217. 1954; Koyama in J.  
Fac. Sc. Uni. Tokyo 3(8):107. 1961. Scirpus  
tetragonus Poir. Encycl. 6:767. 1804, nec. (R. Br.)  
Poir. Encycl. Suppl. 5:98. 1817, nec. Fimbristylis  
tetragona R. Br. 1810.

Tufted herbs; very often confused with F.miliacea, but distinguished by the almost globular spikelets and the striate, distichous, flabellate tufts of leaves.

Flowers: Sept. - Dec.

Sivarajan 1686.

F.bis-umbellata (Forsk.) Bubani, Dedecanth. 30. 1850;

Fischer in Kew Bull. 1935:145. 1935; Koyama in J.

Fac. Sc. Uni. Tokyo 3(8):113. 1961; Kern in Reinwardtia

6:47. 1961 & 6:147. 1962; Gamb. 1151. Scirpus

bis-umbellatus Forsk. Fl. Aeg.-Ar. 1:15. 1775.

Tufted herbs; leaves much shorter than the stem; umbels compound; spikelets pedicelled, ovoid or oblong, 4 mm long; rachilla persistent, pouched; glumes ovate-obtuse, 2.5 mm long; stamens 3; nuts obovate, triquetrous, smooth, shorter than the glume.

Flowers: Aug. - Nov.

Sivarajan 301, 330.

F.tenera Roem. & Schult. Syst. 2. Mant. 57. 1824; FBI.

6:642. 1893; Sant. 269. 1960; Gamb. 1152.

Tufted herb; leaves basal, linear-oblong, obtuse; bracts much shorter than the umbels; spikelets 9-15,

ellipsoid, 4 mm long; glumes oblong-obtuse, 2 mm long; stamens 3; style 3-fid, hairy; nut obovate, tubercled, 1 mm long.

Flowers: Aug. - Dec.

Sivarajan 717, 1532.

F. capillaris (Linn.) A. Gray, Man. Bot. (ed.5) 5:567.

1872, comb. seminud. emend. hoc. loco, Koyama in J.

Fac. Sc. Uni. Tokyo 3(8):102. 1961. Scirpus capillaris

Linn. Sp. Pl. 45. 1753. Bulbostylis capillaris (Linn.)

Cl. in Hook. f. Fl. Brit. Ind. 6:651. 1894.

Erect, tufted herbs; leaves filiform; spikelets pedunculate, ovate-acute, 4 mm long; glumes ovate-obtuse; stamens 2; nuts ovoid, trigonous, faintly reticulate, 1 mm long.

Flowers: July - Sept.

Sivarajan 333.

F. miliacea (Linn.) Vahl, En. 2:287. 1806, quoad basionym;

Blake in J. Arn. Arb. 35:216. 1954; Koyama in J. Fac.

Sc. Uni. Tokyo 3(8):108. 1961; Kern in Reinwardtia

6:147. 1962. Scirpus miliaceus Linn. Syst. Veg. 10:558.

1759. S. quinquangularis (Vahl) Kunth, En. 2:229. 1837;

Gamb. 1151.

Tufted herbs; inflorescence compound umbels; spikelets pedicelled, subglobose, 3 mm across; glumes ovate-acute, keeled, 1.5 mm long; stamens 2-3; nut obovoid, striolulate and tubercled.

Flowers: Aug. - Dec.

Sivaraajan 9.

F.dichotoma (Linn.) Vahl, En. 2:287. 1806; FBI. 6:637.

1893; Fischer in Kew Bull. 1935:150. 1935; Blake in J. Arn. Arb. 35:213. 1954; Sant. 268. 1960; Koyama in J. Fac. Sc. Uni. Tokyo 3(8):111. 1961; Kern in Reinwardtia 6:147. 1962; Gamb. 1151. Scirpus dichotomus Linn. Sp. Pl. 50. 1753. Fimbristylis diphylla (Retz.) Vahl, En. 2:289. 1806; FBI. 6:636. 1893.

Herbs, up to 40 cm tall; leaves obtuse, shorter than the stem; spikelets in umbels, ovate-acute, 6-7 mm long; glumes ovate-acute, boat-shaped, 2 mm long; stamens 2; style villous, arms 2; nut planoconvex, reticulate, marble-white, 1.5 mm long.

Collected from moist or wet fields in the University campus.

Flowers: Aug. - Nov.

Sivaraajan 329, 720, 1534.



F. argentea (Rottb.) Vahl, *En.* 2:294. 1805; *FBI.* 6:640.

1893; Kern in *Reinwardtia* 6:49. 1961; *Gamb.* 1151.

Scirpus argenteus Rottb. *Progr.* 27. 1772.

Tufted herbs, 5-8 cm tall; leaves shorter than the stem; spikelets cylindric-obtuse, 1 cm long; rachilla persistent; glumes ovate-acute, keeled; stamen usually 1; nut planoconvex, obovate, striate.

Common in moist fields.

Flowers: May - July

Sivarajan 1272.

F. barbata (Rottb.) Benth. *Fl. Austral.* 7:321. 1878.

Scirpus barbatus Rottb. *Descr. and Ic.* 52. t. 17, f. 4. 1773. Bulbostylis barbata (Rottb.) Cl. in Hook. f. *Fl. Brit. Ind.* 6:651. 1893; Blake in *J. Arn. Arb.* 28:228. 1947; Kern in *Reinwardtia* 6:51. 1961 & 6:148. 1962; *Mahes.* 361.

Tufted herb; stems filiform; leaves linear; spikelets in terminal heads, hardly compressed, 5 mm long; glumes oblong, cuspidate, plicate, puberulous outside; stamens 2; nuts obovoid, triquetrous, faintly reticulate.

Flowers: July - Sept.

Sivarajan 805, 1246.

Scleria Bergius.

Key to the species

1. Nuts longitudinally reticulate ..... parvula  
1. Nuts smooth ..... levis

S. parvula Steud. Syn. Pl. Glum. 2:174. 1855; Kern in  
Blumea 11:202. 1961. S. tesellata sensu Boeck. in  
Linnaea 38:470. 1874, in part, (non Willd.); FBI.  
6:686. 1894.

Annuals, tufted herbs; leaves linear-lanceolate,  
up to 20 x 0.5 cm; spikelets unisexual in <sup>a</sup>springly  
branched panicles; male spikelets longer or as long as  
the peduncles; stamens 3; nuts white, bony, subglobose,  
reticulate.

Flowers: Sept. - Dec.

Sivarajan 1810.

S. levis Retz. Obs. 4:13. 1786; FBI. 6:689. 1894; Blake  
in J. Arn. Arb. 35:226. 1954; Kern in Blumea 11:164.  
1961; Koyama in J. Fac. Sci. Uni. Tokyo 3(8):139.  
1961. Gamb. 1163. S. hebecarpa Nees in Wt. Contr.  
117. 1834; FBI. 6:689. 1894; Gamb. 1163.

Perennial, rhizomatous herbs; leaves lanceolate, 3-5-ribbed, 1 cm broad; panicles with many filiform bracteoles; spikelets unisexual, oblong, apiculate, 4 mm long; female flowers solitary; nut subglobose and bony.

Flowers: Sept. - Dec.

Sivarajan 1147, 1692.

Lipocarpha R. Br. (nom.cons.)

L. chinensis (Osb.) Kern in Blumea Suppl. IV. (Lamk. Jubilee Vol.) 167. 1958 & in Reinwardtia 6:146. 1962. Scirpus chinensis Osb. Dagb. Oostind. Resa:220. 1757. Lipocarpha argentea (Vahl) R. Br. ex Nees in Linnaea 9:287. 1835; Kükenth. in Engl. Bot. Jahrb. 59:51. 1925 & 69:259. 1938. L. senegalensis (Lamk.) Dandy in J. Bot. 70:331. 1932; Ohwi in Bot. Mag. Tokyo 56:204. 1942; Blake in J. Arn. Arb. 28:229. 1947.

Tufted herbs; spikelets aggregated in terminal heads; glumes obovate-acute, deciduous, white; hypogynous bristles 2; nut oblong, triquetrous, brownish, 1 mm long, much shorter than the hypogynous bristles.

Flowers: Aug. - Nov.

Sivarajan 1016.

Eleocharis R. Br.

Key to the species

1. Plants stoloniferous:
  2. Stem terete, transversely septate  
within .... dulcis
  2. Stem triangular, not septate within.. acutangula
1. Plants not stoloniferous:
  3. Nuts biconvex ..... geniculata
  3. Nuts trigonous ..... retroflexa

E.dulcis (Burm.f.) Trin. ex Henschel. Vita Rumph. 186.  
1833; Svenson in Rhodora 41:11. 1939; Blake in J.  
Arn. Arb. 28:227. 1947. Andropogon dulce Burm. f.  
Fl. Ind. 219. 1768. Eleocharis plantaginea (Retz.)  
Roem. & Schult. Syst. 2:150. 1817; K. Schum. in  
Notizbl. Bot. Gart. Mus. Berlin 2:97. 1898,  
("Heleocharis plantaginea R. Br.").

A tufted herb with elongate stolon; leaves 0,  
except for the basal sheaths; stem terete, transversely  
septate within; spikelets terminal, cylindrical; glumes  
oblong-obtuse, 6 mm long; hypogynous bristles 6-8;  
stamens 2-3; nuts obovoid; smooth.

Flowers: Sept. - Dec.

Sivarajan 50<sup>7</sup>~~2~~.

E. acutangula (Roxb.) Schult. in Roem. & Schult. Syst. Veg. Mant. 2:91. 1824; Andrews Fl. Pl. Sudan 3:359. 1960; Kern in Reinwardtia 6:35. 1961. Scirpus acutangulus Roxb. Fl. Ind. 1:213. 1820. S. fistulosus Poir. Encycl. 6:749. 1806 (non Forsk. 1775). Eleocharis fistulosus (Poir.) Link. ex Spreng. Jahrb. Gewach. 3:78. 1820, nom. illeg.; Blake in J. Arn. Arb. 28:226. 1947.

Tufted herbs with elongate stolons; stem sub-triquetrous, not septate within; spikelets acute, 3-4 cm long; glumes ovate-subacute, 5 mm long; hypogynous bristles as long as the nut, scabrous; nut top-shaped, with the persistent, swollen base of the style.

Common in water-logged fields.

Flowers: Sept, - Dec.

Sivaraajan 863, 1544.

E. geniculata (Linn.) Roem. & Schult. Syst. Veg. Mant. 2:150. 1817; Kern in Reinwardtia 6:37. 1961. Scirpus geniculata Linn. Sp. Pl. 1:48. 1753. Eleocharis capitata R. Br. Prod. 225. 1810; FBI. 6:627. 1893; Gamb. 1145.

Tufted herbs, 8-15 cm tall; stolon 0; stem many; spikelets subglobose or ovoid, obtuse; fertile glumes obovate-obtuse, 2 mm long; hypogynous bristles 5-7, scabrous, as long as the nut; stamens 3; nut obovoid, brown with the persistent, swollen styler base.

Flowers: Aug. - Sept.

Sivarajan 476.

E.retroflexa (Poir.) Urb. Symb. Ant. 2:165. 1900; Kern in Reinwardtia 6:35. 1961. Scirpus retroflexus Poir. in Lamk. Encycl. 6:753. 1804. Eleocharis chaetaria Roem. & Schult. Syst. Veg. Mant. 2:154. 1817; FBI. 6:629. 1893; Gamb. 1145.

Small, diffuse herbs; stolon 0; stem slender; spikelets ovoid, 3-4 mm long; glumes ovate-obtuse, 2.5 mm long; hypogynous scales 6, filiform, longer than the nut; stamens 3; nut trigonous, straw-coloured, 1.5 mm long.

Flowers: Jan. - Mar.

Sivarajan 1020.

Fuirena Rottb.

Key to the species

1. Glumes 3-nerved:
  2. Rhizome absent ..... ciliaris
  2. Rhizome creeping ..... umbellata
1. Glumes 7-nerved ..... uncinata

F.ciliaris (Linn.) Roxb. Fl. Ind. 1:184. 1820; Kern in Reinwardtia 6:31. 1961. Scirpus ciliaris Linn. Mant. 2:182. 1771. Fuirena glomerata Lamk. Encycl. Meth. Bot. 1:151. 1791; FBI. 6:666. 1893. F.wallichiana Camus in Lecomte Fl. Gen. Indo-Ch. 7:141. 1912,(non Kunth).

Herbs without rhizomes; leaves lanceolate; spikelets in capitate clusters, oblong; fertile glumes oblong to obovate, obtuse with a villous awn, 3 mm long; hypogynous bristles in 2 unequal series; nuts obovoid, triquetrous, 1.5 mm long.

Collected from the marshy fields at Feroke.

Flowers: Oct. - Dec.

Sivarajan 49, 1017.

F.umbellata Rottb. Progr. 27. 1772; FBI. 6:666. 1893;  
Kukenth. in Engl. Bot. Jahrb. 59:52. 1924; Blake in  
J. Arn. Arb. 28:228. 1947; Kern in Reinwardtia 6:31.  
1961. F.uncinata Camus in Lecomte Fl. Gen. Indo-Ch.  
7:141. 1912, (non Kunth).

Herbs; **rhizome** creeping; leaves shorter than the  
stem; spikelets in capitate clusters, oblong, 5-8 mm  
long; fertile glumes awned near the tip, 3-nerved;  
hypogynous bristles in 2 series, the inner being larger;  
nut obovoid, sharply trigonous, apiculate at tip.

Flowers: Oct. - Dec.

Sivarajan 508.

F.uncinata Kunth, En. 2:184. 1837; FBI. 6:666. 1893;  
Boeck. in Linnaea 37:108. 1871; Cooke 3:413; Gamb. 1158.

Tufted, low herbs; rhizome 0; leaves lanceolate;  
spikelets ovoid, 4 mm long; glumes few, 7-nerved, awned  
at the tip; hypogynous bristles 6, inner larger; stamens 2;  
nut triquetrous.

Flowers: Oct. - Dec.

Sivarajan 1485.



GRAMINEAE Juss.

Key to the genera

1. Stamens 1-3:
  2. Lodicules 0:
    3. Spikelets dioecious ..... Coix
    3. Spikelets monoecious ..... Apocopis
  2. Lodicules 2:
    4. Spikelets 2-3-nate, one sessile,  
others pedicellate:
      5. Sessile spikelets enclosed in  
a cavity ..... Rottboellia
      5. Sessile spikelets not as above:
        6. Racemes solitary ..... Heteropogon
        6. Racemes 2 or more:
          7. Lower glumes noduled on  
the margins .... Ischaemum
          7. Lower glumes not noduled:
            8. Upper lemma awned:
              9. Glumes subequal .... Eulalia
              9. Glumes equal ..... Arthraxon
            8. Upper lemma not awned.. Digitaria

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The author is thankful to Dr. R.S.Raghavan, Botanical Survey of India, Poona, for his kind helps in confirming the identifications of the grasses.

4. Spikelets all alike:

10. Plants dioecious ..... Spinifex

10. Plants monoecious:

11. Spikelets not paniced:

12. Raceme solitary ..... Perotis

12. Racemes 2-many:

13. Raceme subtended by a spathe:

14. Involucral spikelets

present ... Themeda

14. Involucral spikelets

absent .... Pseudanthi-  
stiria

13. Raceme not subtended by

spathe:

15. Lower glume absent ..... Paspalum

15. Lower glume well

developed:

16. Rachis produced beyond

the raceme ... Dactyloctenium

16. Rachis not as above:

17. Spikelets awned:

18. Racemes many .... Chloris

18. Racemes 2-3 ..... Dimeria

17. Spikelets not awned:

19. Glumes ciliate

on the margins.. Alloteropsis

- 19. Glumes not ciliate:
  - 20. Spikelets 1-flowered ..... Cynodon
  - 20. Spikelets 2-4-flowered ..... Eleusine
- 11. Spikelets panicled:
  - 21. Panicles spiciform, cylindrical:
    - 22. Spikelets with involucre bristles:
      - 23. Upper lemma smooth ..... Pennisetum
      - 23. Upper lemma transversely rugose ..... Setaria
    - 22. Spikelets without involucre bristles ..... Sacciolepis
  - 21. Panicles not as above:
    - 24. Branches of panicles spiciform:
      - 25. Spikelets awned ..... Oplismenus
      - 25. Spikelets not awned:
        - 26. Spikelets pedicelled:
          - 27. Racemes secund ..... Echinochloa
          - 27. Racemes not secund ..... Brachiaria
        - 26. Spikelets sessile ..... Paspalidium
    - 24. Branches of panicles effuse, (spiciform in Sporobolus piliferus):
      - 28. Spikelets 2-3-nate, one sessile, others pedicellate:
        - 29. Spikelets awned:
          - 30. Racemes whorled ..... Vetiveria

- 30. Racemes not whorled:
  - 31. Racemes with involucre spikelets .. ~~Iselema~~<sup>i</sup>
  - 31. Racemes not as above:
    - 32. Racemes supported by spathes:
      - 33. Spikelets in threes ..... Apluda
      - 33. Spikelets 2-nate ..... Cymbopogon
      - 32. Racemes without spathe ..... Spodiopogon
    - 29. Spikelets not awned ..... Sachharum
- 28. Spikelets all alike:
  - 34. Tall grasses:
    - 35. Lemmas silky hairy ..... Neyraudia
    - 35. Lemmas glabrous ..... Phragmites
  - 34. Small herbaceous grasses:
    - 36. Spikelets awned ..... Arundinella
    - 36. Spikelets not awned:
      - 37. Spikelets laterally compressed:
        - 38. Glumes keeled ..... Eragrostis
        - 38. Glumes not keeled ..... Cyrtococcum
      - 37. Spikelets not compressed:
        - 39. Florets 2 ..... Panicum
        - 39. Floret only 1 ..... Sporobolus
- 1. Stamens 6:
  - 40. Spikelets capitate:
    - 41. Lodicules 0 ..... Dendrocalamus
    - 41. Lodicules three ..... Bambusa
  - 40. Spikelets pedicellate ..... Oryza

Coix Linn.

Key to the species

1. Leaves 3-4 cm broad ..... lacryma-jobi  
1. Leaves about 1 cm broad ..... gigantea

C. lacryma-jobi Linn. Sp. Pl. 972. 1753; FBI. 7:100. 1896;  
Rang. & Thad. 141; Bor 264; Sant. 273. 1960; Gamb. 1182.  
C. arundinacea Lamk. Encycl. Meth. Bot. 3:422. 1791.

Tall grass; leaves lanceolate, cordate at base, about 3-4 cm broad; racemes 4-5 cm long with a solitary, basal, female flower, enclosed in a polished, ovoid shell; male spikelets many, compressed; lower glume prominently winged; lemmas similar; stamens 3.

Flowers: July - Nov.

Sivarajan 461.

Note: Bor (loc.cit.) recognised 4 varieties under this species, of which the cited specimen belongs to the var. lacryma-jobi.

C. gigantea Koenig ex Roxb.  $\sqrt{\quad}$  Hort. Beng. 66. 1814, nom. nud.  $\sqrt{\quad}$  Fl. Ind. (ed.2) 2:570. 1832; Bor 264; Gamb. 1182. C. lacryma-jobi Linn., var. gigantea (Koenig ex Roxb.) Stapf ex Hook. f. Fl. Brit. Ind. 7:100. 1896.

Erect, perennial grass, up to 3-4 metres tall; leaves linear, glabrous; racemes spiciform; 'involucre' of the female flower ovoid; the lower glume of the male spikelets narrowly winged.

This species is rather rare in this area and is collected from the wet road sides of Ramanattukara.

Flowers: July - Nov.

Sivarajan 694.

Note: This species is so closely similar to C.aquatica Roxb. that the latter was considered for long, to be a variety of C.gigantea. But the chromosome number and the habits are different, and hence Boh (loc.cit.) has segregated it as a distinct species.

#### Apocopis Nees

A.mangalorensis (Hochst.) Henr. in Blumea 4:523. 1941;  
Bor 96. Amblyachyrum mangalorensis Hochst. in Flora  
39:26. 1856.

Tufted annuals; leaves lanceolate-acute, up to 3 x 0.4 cm, with bulbous based hairs on both surfaces; racemes solitary or in pairs, 3-4 cm long, hairy; spikelets in pairs, the pedicellate one often represented by pedicel alone, compressed; lower glume obovate-truncate,

3 mm long, veins not reaching the margins; stamens 2-3;  
grains linear.

Flowers: Oct. - Dec.

Sivarajan 789.

Rottboellia Linn. f. (nom.cons.)

R.exaltata Linn. f. Nov. Gram. Gen. 40, t. 1. 1779 &  
Suppl. Pl. 114. 1781; FBI. 7:156. 1896; Rang. & Thad.  
175; Bor 206; Gamb. 1219. R.denudata Steud. Syn. Pl.  
Glum. 1:362. 1854.

Annual grass; leaves linear, very long, 5-8 mm  
broad, sheaths with tubercular based hairs; racemes  
slender, solitary and spiciform, 5-8 cm long; spikelets  
in opposite pairs of dissimilar spikelets, the sessile  
one enclosed in a concave recess.

Collected from the fresh-water ponds on the  
grassy slopes in the University campus, where it grows  
abundantly during the rainy season.

Flowers: Aug. - Oct.

Sivarajan 677.

Heteropogon Pers.

H. contortus (Linn.) P. Beauv. ex Roem. & Schult. Syst.

Veg. 2:836. 1817; Bor 163; Gamb. 1208. Andropogon  
contortus Linn. Sp. Pl. 1045. 1753.

Perennial grass; leaves mainly basal, distichous, linear; racemes solitary, terminating the culms; spikelets in pairs, one sessile and the other pedicellate, terete; glumes more or less equal, covered with tubercle-based hairs; lemmas hyaline, the lower geniculately awned; awn long and sharp; stamens 3.

This grass is gregarious on the hill-slopes. The spikelets with their barbed callus and the sharp, hygroscopic awns adhere to the clothes. In north Malabar, besides being used as a fodder, the culms are used for thatching huts.

Flowers: Sept. - Nov.

Sivarajan 716.



Ischaemum Linn.

Key to the species

1. Lower glumes of pedicelled spikelets  
    winged at apex:
  2. Leaves rounded to cordate at base:
    3. Leaves up to 3 cm long ..... mangaluricum
    3. Leaves much longer ..... semisagittatum
  2. Leaves tapering at base ..... goebelii
1. Lower glumes of pedicelled spikelets  
    not winged ..... tumidum

I. mangaluricum (Hack.) Stapf ex Fischer in Gamb. Fl. Madr.

1723. 1934; Bor 182. I. aristatum Hack. (non Linn.),  
subsp. imberbe, var. mangaluricum Hack. in DC. Mon. Phan.  
6:204. 1889.

Culms long, diffuse; leaves lanceolate, up to  
3 x 1 cm; hispid on both surfaces, cordate at base;  
racemes spiciform; spikelets in pairs, one pedicellate  
and the other sessile; rachis densely bristly; lower  
glumes with nodules on the margins, tips winged on one  
side; upper lemma of sessile spikelets awned at tip;  
paleas hyaline; stamens 3; styles 2, free.

Flowers: Oct. - Dec.

Sivarajan 737.

I. semisagittatum Roxb. [Hort. Beng. 8. 1814, nom. nud.]

Fl. Ind. 1:320. 1832; FBI. 7:130. 1897; Bor 185;

Gamb. 1194. Andropogon semisagittatus (Roxb.) Steud.

Syn. Fl. Glum. 1:376. 1854.

Culms slender; leaves lanceolate, rounded or subcordate at base; lower leaves long-petioled; racemes spiciform; rachis densely hispid; lower glumes with lateral nodules connected by transverse ridges, those of the pedicelled spikelets broadly and obliquely winged.

Flowers: Oct. - Dec.

Sivarajan 868.

I. goebelii Hack. in Ost. Bot. Z. 51:149. 1901; Bor 179.

I. aristatum Hack. (non Linn.), subsp. imberbe Hack.,

var. imbricatum Hack. in DC. Mon. Phan. 6:203. 1889.

I. imbricatum (Hack.) Stapf ex Ridl. Fl. Mal. Pen.

5:200. 1925.

Diffusely branched herbs; culms slender; leaves linear-lanceolate; racemes 7-8 cm long; spikelets glabrous; lower glume of sessile spikelets with lateral nodules, that of the pedicelled spikelets more or less smooth; tips of the lower glume obliquely winged; joints of the rachis hispid.

Flowers: Oct. - Dec.

Sivarajan 677.

I.tumidum Stapf ex Bor in Kew Bull. 1951:450. 1952; Bor  
186; Sant. 316. 1967.

Culms slender; leaves ovate-lanceolate, cordate  
at base, up to 4 x 2 cm; racemes 2, densely bristly hairy  
all over; spikelets as in the above species; lower glumes  
noduled, that of the pedicelled spikelets not winged;  
spikelets awned or not.

Flowers: Oct. - Dec.

Sivarajan 790.

Eulalia Kunth

E.trispicata (Schult.) Henr. in Blumea 3:453. 1940; Sant.  
277. 1960; Bor 157. Andropogon trispicatus Schult.  
Mant. 2:452. 1824. A.tristachyus Roxb. [ Hort. Beng.  
6. 1814, nom. nud. ] Fl. Ind. 1:261. 1820, non H. B.  
K. 1816. Eulalia argentea Brongn. in Duperr. Voy.  
Coquille Bot. 2(2):92. 1830. Pollinia argentea (Brongn.)  
Trin. in Bull. Acad. Sci. Petersb. 1:71. 1836; FBI.  
7:111. 1896. E.tristachya (Roxb.) Kuntze, Rev. Gen.  
Pl. 2:775. 1891; Gamb. 1189.

Culms glabrous, slender; leaves linear-lanceolate  
up to 25 x 0.5 cm, basal sheath glabrous; spikes 3-10,  
8-10 cm long; rachis and pedicels covered with whitish hairs;

spikelets in pairs; sessile spikelet 3 mm long, awned;  
glumes and lemmas dissimilar.

Flowers: Nov. - Mar.

Sivaraajan 768, 786, 883, 985, 1006.

Arthraxon Beauv.

Key to the species

1. Pedicellate spikelets present ..... lancifolius  
1. Pedicellate spikelets absent ..... quartinianus

A.lancifolius (Trin.) Hochst. in Flora 39:188. 1856; Bor  
100; Gamb. 1198; Jain in J. Ind. bot. Soc. 51:176.  
1972. Andropogon lancifolius Trin. Mem. Acad. Sci.  
Petersb. 6:271. 1832; Jain in Ind. For. 97:220-22.1971.  
Arthraxon microphyllus (Trin.) Hochst. in Flora 39:188.  
1856; FBI. 7:147. 1896.

Erect herbs; culms slender, glabrous; leaves  
elliptic-lanceolate, cordate at base, villous on both  
surfaces; racemes in pairs, 2-4 cm long, silvery-silky;  
spikelets 2-nate, one sessile and the other pedicellate,  
compressed, 2.5-3 mm long; glumes equal, lower glume of  
sessile spikelet 2-cuspidate; upper lemma awned; stamens  
usually 2.

Very common on old walls and other wet places,  
even on wet roofs.

Flowers: July - Dec.

Sivarajan 1410.

A. quartinianus (A. Rich.) Nash in N. Am. Fl. 17:99. 1912;  
Blatt. & McC. Bomb. Grass. 78. 1934, in part; Bor 97,  
102; Gamb. 1198; Jain in J. Ind. bot. Soc. 51:179. 1972.

Annual grass; culm slender, 20-30 cm tall; leaves  
lanceolate-acuminate, up to 5 x 1 cm; racemes 2-3,  
digitate; joints of the rachis ciliate; spikelets solitary,  
sessile, laterally compressed; lower glume 7-9 nerved;  
upper lemma awned; stamens 2.

Flowers: July - Dec.

Sivarajan 1843.

Digitaria Heist.. ex Fabr.

Key to the species

1. Pedicelled spikelets with spreading hairs .. bicornis
1. Pedicellate spikelets glabrous:
  2. Upper glume as long as the lower lemma .. longiflora
  2. Upper glume half as long as the lower  
lemma ... ciliaris

D.bicornis (Lamk.) Roem. & Schult. ex Loud. Hort.

Brit. 24, n. 1578. 1830; Bor 299; Veldkamp in Blumea  
21(1):30-32. 1973. Paspalum bicornis Lamk. Tab. Encycl.  
1:176. 1791. Digitaria biformis Willd. En. Pl. Berol.  
92. 1809; Bor 299.

Culms rooting at lower nodes, glabrous; leaves  
linear, flat, 5-8 x 0.5 cm, margins scabrous; racemes 2  
or more, 6-10 cm long; spikelets in dimorphic pairs,  
lanceolate, 3-3.5 mm long, pedicellate one with long  
spreading hairs, sessile one glabrous.

Flowers: Mar. - Dec.

Sivarajan 1075, 1252, 1256.

Note: This species in the author's collection  
shows much variation as to the hairiness of the spikelet.  
Not all the pedicellate spikelets are hairy. In some  
cases very few of the pairs have hairy spikelets. Other  
pairs have both the pedicellate and sessile spikelets  
glabrous.

D.longiflora (Retz.) Pers. Syn. 1:85. 1805; Rang. &  
Tad. 59; Bor 302; Sant. 308. 1967; Gamb. 1223;  
Veldkamp in Blumea 21(1):66-69. 1973. Paspalum  
longiflorum Retz. Obs. 4:15. 1786.

Culms creeping and rooting at nodes; leaves lanceolate, 1-2 cm x 0.5 cm; racemes 2-3, 4-5 cm long; spikelets in pairs, monomorphic, elliptic-acute, 2 mm long, pubescent; upper glume as long as the prominently nerved, lower lemma.

Flowers: Mar. - Sept.

Sivarajan 794, 795, 1009, 1249.

D.ciliaris (Retz.) Koeler, Deser. Gram. 27. 1802; Bor, Fl. Iraq 9:478. 1968; Jain & Doli Das in Ind. For. 99:571-72. 1973; Veldkamp in Blumea 21(1):32-35. 1973. Panicum ciliare Retz. Obs. Bot. 4:16. 1786. P.adscendens H. B. & K. Nov. Gen. et Sp. 1:97. 1816. Digitaria adscendens (H.B. & K.) Henr. in Blumea 1:92. 1934.

Annual herbs; culms slender; leaves lanceolate, long, flat; racemes digitate, long; spikelets not dimorphic, elliptic, not compressed; pedicelled spikelets without spreading hairs; lower lemma 5-7 nerves<sup>4</sup>, upper glume half as long as the lower lemma.

Flowers: Oct. - Mar.

Sivarajan 1214.





PLATE 29

Spinifex littoreus (Burm.f.) Merr.  
growing in close association with  
Opuntia elatior Mill. on the beach  
at Chaliyam.



Spinifex Linn.

S. littoreus (Burm. f.) Merr. in Philip. J. Sci. Bot.  
7:229. 1912; Bor 366; Gamb. 1183. Stipa littorea  
Burm. f. Fl. Ind. 29. 1768. Spinifex squarrosus  
Mant. 2:300. 1771; FBI. 7:63. 1897.

Much branched, bushy grasses; leaves rigid,  
spiny, involute, grey-glaucous; inflorescence dioec  
spiciform racemes grouped in capitate clusters; mal  
spikelets many on each racemes; female solitary; gl  
unequal, the upper longer; lemmas subequal, paleate  
stamens 3; styles 2, connate below. (Plate 29)

This grass grows in vast expanses on the co  
sand. ~~dunes~~. The spines are very stout and sharp.

Flowers: Oct. - Dec.

Sivarajan 831.

Perotis Ait.

P. indica (Linn.) Kuntze, Rev. Gen. Pl. 787. 1891; M  
in J. Arn. Arb. 19:320. 1938; Bor 611; Gamb. 125  
Anthoxanthum indicum Linn. Sp. Pl. 28. 1753. Per  
latifolia Ait. Hort. Kew 1:85. 1789; FBI. 7:98.  
Rang. & Thad. 137. P. perottetii Gandg. in Bull.  
Bot. France 66:301. 1920.

Spinifex Linn.

S. littoreus (Burm.f.) Merr. in Philip. J. Sci.  
7:229. 1912; Bor 366; Gamb. 1183. Stipa liti  
Burm. f. Fl. Ind. 29. 1768. Spinifex squarroc  
Mant. 2:300. 1771; FBI. 7:63. 1897.

Much branched, bushy grasses; leaves ri  
spiny, involute, grey-glaucous; inflorescence c  
spiciform racemes grouped in capitata clusters;  
spikelets many on each racemes; female solitary  
unequal, the upper longer; lemmas subequal, pal  
stamens 3; styles 2, connate below. (Plate 29)

This grass grows in vast expanses on th  
sand, ~~dunes~~. The spines are very stout and shar

Flowers: Oct. - Dec.

Sivarajan 831.

Perotis Ait.

P. indica (Linn.) Kuntze, Rev. Gen. Pl. 787. 189  
in J. Arn. Arb. 19:320. 1938; Bor 611; Gamb.  
Anthoxanthum indicum Linn. Sp. Pl. 28. 1753.  
latifolia Ait. Hort. Kew 1:85. 1789; FBI. 7:  
Rang. & Thad. 137. P. perottetii Gandg. in Bu  
Bot. France 66:301. 1920.

Spinifex Linn.

S. littoreus (Burm. f.) Merr. in Philip. J. Sci. Bot.  
7:229. 1912; Bor 366; Gamb. 1183. Stipa littorea  
Burm. f. Fl. Ind. 29. 1768. Spinifex squarrosus Linn.  
Mant. 2:300. 1771; FBI. 7:63. 1897.

Much branched, bushy grasses; leaves rigid,  
spiny, involute, grey-glaucous; inflorescence dioecious,  
spiciform racemes grouped in capitate clusters; male  
spikelets many on each racemes; female solitary; glumes  
unequal, the upper longer; lemmas subequal, paleate;  
stamens 3; styles 2, connate below. (Plate 29)

This grass grows in vast expanses on the coastal  
sand, dunes. The spines are very stout and sharp.

Flowers: Oct. - Dec.

Sivarajan 831.

Perotis Ait.

P. indica (Linn.) Kuntze, Rev. Gen. Pl. 787. 1891; Merr.  
in J. Arn. Arb. 19:320. 1938; Bor 611; Gamb. 1256.  
Anthoxanthum indicum Linn. Sp. Pl. 28. 1753. Perotis  
latifolia Ait. Hort. Kew 1:85. 1789; FBI. 7:98. 1896;  
Rang. & Thad. 137. P. perottetii Gandg. in Bull. Soc.  
Bot. France 66:301. 1920.

Spinifex Linn.

S. littoreus (Burm.f.) Merr. in Philip. J. Sci. Bot.  
7:229. 1912; Bor 366; Gamb. 1183. Stipa littorea  
Burm. f. Fl. Ind. 29. 1768. Spinifex squarrosus Linn.  
Mant. 2:300. 1771; FBI. 7:63. 1897.

Much branched, bushy grasses; leaves rigid,  
spiny, involute, grey-glaucous; inflorescence dioecious,  
spiciform racemes grouped in capitate clusters; male  
spikelets many on each racemes; female solitary; glumes  
unequal, the upper longer; lemmas subequal, paleate;  
stamens 3; styles 2, connate below. (Plate 29)

This grass grows in vast expanses on the coastal  
sand, dunes. The spines are very stout and sharp.

Flowers: Oct. - Dec.

Sivarajan 831.

Perotis Ait.

P. indica (Linn.) Kuntze, Rev. Gen. Pl. 787. 1891; Merr.  
in J. Arn. Arb. 19:320. 1938; Bor 611; Gamb. 1256.  
Anthoxanthum indicum Linn. Sp. Pl. 28. 1753. Perotis  
latifolia Ait. Hort. Kew 1:85. 1789; FBI. 7:98. 1896;  
Rang. & Thad. 137. P. perottetii Gand. in Bull. Soc.  
Bot. France 66:301. 1920.

Spinifex Linn.

S. littoreus (Burm.f.) Merr. in Philip. J. Sci. Bot.

7:229. 1912; Bor 366; Gamb. 1183. Stipa littorea

Burm. f. Fl. Ind. 29. 1768. Spinifex squarrosus Linn.

Mant. 2:300. 1771; FBI. 7:63. 1897.

Much branched, bushy grasses; leaves rigid, spiny, involute, grey-glaucous; inflorescence dioecious, spiciform racemes grouped in capitate clusters; male spikelets many on each racemes; female solitary; glumes unequal, the upper longer; lemmas subequal, paleate; stamens 3; styles 2, connate below. (Plate 29)

This grass grows in vast expanses on the coastal sand dunes. The spines are very stout and sharp.

Flowers: Oct. - Dec.

Sivarajan 831.

Perotis Ait.

P. indica (Linn.) Kuntze, Rev. Gen. Pl. 787. 1891; Merr.

in J. Arn. Arb. 19:320. 1938; Bor 611; Gamb. 1256.

Anthoxanthum indicum Linn. Sp. Pl. 28. 1753. Perotis

latifolia Ait. Hort. Kew 1:85. 1789; FBI. 7:98. 1896;

Rang. & Thad. 137. P. perottetii Gandg. in Bull. Soc.

Bot. France 66:301. 1920.

Culms slender; leaves ovate-lanceolate, cordate, up to 4.5 x 1 cm, glabrous; racemes spiciform, simple; spikelets linear, 2 mm long, deciduous; glumes subequal, awned; lemmas shorter than the glumes.

Flowers: July - Dec.

Sivara Jan 1348.

Themeda Forsk.

T. triandra Forsk. Fl. Aeg.-Ar. CXXIII: 178. 1775; Bor 254, f. 27; Gamb. 1209. Anthistiria imberbis Retz. Obs. Bot. 3:11. 1783; FBI. 7:211. 1896. Themeda imberbis (Retz.) Cooke, Fl. Pres. Bomb. 2:992. 1908.

Tufted grass; culms glabrous; leaves linear up to 25 x 1 cm; racemes subtended by spathes; spikelets 2-nate, the terminal group 3-nate, the two lowest pairs persistent forming male or neuter involucreal spikelets.

Flowers: Oct. - Dec.

Sivara Jan 1546.

Pseudanthistiria (Hack.) Hook.f.

P. umbellata (Hack.) Hook. f. Fl. Brit. Ind. 7:220. 1896; Bor 204; Gamb. 1212. Andropogon umbellatus Hack. in DC. Mon. Phan 6:401. 1889.



Culms slender; leaves ovate-lanceolate, cordate, up to 4.5 x 1 cm, glabrous; racemes spiciform, simple; spikelets linear, 2 mm long, deciduous; glumes subequal, awned; lemmas shorter than the glumes.

Flowers: July - Dec.

Sivarajan 1348.

Themeda Forsk.

T. triandra Forsk. Fl. Aeg.-Ar. CXXIII: 178. 1775; Bor 254, f. 27; Gamb. 1209. Anthistiria imberbis Retz. Obs. Bot. 3:11. 1783; FBI. 7:211. 1896. Themeda imberbis (Retz.) Cooke, Fl. Pres. Bomb. 2:992. 1908.

Tufted grass; culms glabrous; leaves linear up to 25 x 1 cm; racemes subtended by spathes; spikelets 2-nate, the terminal group 3-nate, the two lowest pairs persistent forming male or neuter involucreal spikelets.

Flowers: Oct. - Dec.

Sivarajan 1546.

Pseudanthistiria (Hack.) Hook.f.

P. umbellata (Hack.) Hook. f. Fl. Brit. Ind. 7:220. 1830. Bor 204; Gamb. 1212. Andropogon umbellatus Hack. DC. Mon. Phan 6:401. 1889.

Culms slender; leaves ovate-lanceolate, cordate, up to 4.5 x 1 cm, glabrous; racemes spiciform, simple; spikelets linear, 2 mm long, deciduous; glumes subequal, awned; lemmas shorter than the glumes.

Flowers: July - Dec.

Sivarajan 1348.

Themeda Forsk.

T. triandra Forsk. Fl. Aeg.-Ar. CXXIII: 178. 1775; Bor 254, f. 27; Gamb. 1209. Anthistiria imberbis Retz. Obs. Bot. 3:11. 1783; FBI. 7:211. 1896. Themeda imberbis (Retz.) Cooke, Fl. Pres. Bomb. 2:992. 1908.

Tufted grass; culms glabrous; leaves linear up to 25 x 1 cm; racemes subtended by spathes; spikelets 2-nate, the terminal group 3-nate, the two lowest pairs persistent forming male or neuter involucreal spikelets.

Flowers: Oct. - Dec.

Sivarajan 1546.

Pseudanthistiria (Hack.) Hook.f.

P. umbellata (Hack.) Hook. f. Fl. Brit. Ind. 7:220. 1896; Bor 204; Gamb. 1212. Andropogon umbellatus Hack. in DC. Mon. Phan 6:401. 1889.

Culms slender; leaves ovate-lanceolate, cordate, up to 4.5 x 1 cm, glabrous; racemes spiciform, simple; spikelets linear, 2 mm long, deciduous; glumes subequal, awned; lemmas shorter than the glumes.

Flowers: July - Dec.

Sivarajan 1348.

Themeda Forsk.

T. triandra Forsk. Fl. Aeg.-Ar. CXXIII: 178. 1775; Bor 254, f. 27; Gamb. 1209. Anthistiria imberbis Retz. Obs. Bot. 3:11. 1783; FBI. 7:211. 1896. Themeda imberbis (Retz.) Cooke, Fl. Pres. Bomb. 2:992. 1908.

Tufted grass; culms glabrous; leaves linear up to 25 x 1 cm; racemes subtended by spathes; spikelets 2-nate, the terminal group 3-nate, the two lowest pairs persistent forming male or neuter involucreal spikelets.

Flowers: Oct. - Dec.

Sivarajan 1546.

Pseudanthistiria (Hack.) Hook.f.

P. umbellata (Hack.) Hook. f. Fl. Brit. Ind. 7:220. 1896; Bor 204; Gamb. 1212. Andropogon umbellatus Hack. in DC. Mon. Phan 6:401. 1889.

Diffuse annuals, rooted at lower nodes; leaves broadest at the middle, glabrous, up to 4 x 0.8 cm; racemes spiciform, solitary in the axils of boat-shaped bracts, each with one pair of sessile, bisexual and one pair of pedicellate and one sessile male spikelets; glumes subequal; lemmas awned, awns 20-25 mm long; stamens 3.

Collected from the Kadalundi River bank.

Flowers: Oct. - Dec.

Sivarajan 788, 791.

Paspalum Linn.

Key to the species

- 1. Spikelets orbicular ..... scrobiculatum
- 1. Spikelets not orbicular:
  - 2. Racemes 4-6 cm long ..... paspaloides
  - 2. Racemes much longer ..... conjugatum

P.scrobiculatum Linn. Mant. 1:29. 1767; FBI. 7:10. 1896, (excl. syn. P.orbiculare Forst.); Bor 340; Gamb. 1227.

Annual grass; culms erect; leaves lanceolate, glabrescent, 10-20 cm long; racemes secund, 2-4, 2-10 cm long; rachis pubescent; spikelets in 2 rows, orbicular

or ovate-orbicular, 2-2.5 mm across; glume usually 1, as long as the spikelet; lemmas dissimilar.

A weed in cultivated uplands; grains contain a poisonous ingredient.

Flowers: Oct. - Mar.

Sivarajan 1077, 1250, 1253.

P. paspaloides (Michaux) Scribner in Mem. Torr. Bot.

Club 5:29. 1894; Jain & Doli Das in Ind. For. 99:575.

1973. Digitaria paspaloides Michaux, Fl. Bor. Am.

1:46. 1803. P. distichum auct. Fl; Bor 338; (non Linn.)

Stolons creeping; culms slender; leaves linear, flat, 4-7 x 0.5 cm; racemes 2-3, 4-6 cm long; spikelets, in 2 rows, secund, elliptic-subacute, 2 mm long; glume pubescent.

Flowers: May - Dec.

Sivarajan 1254, 1441.

P. conjugatum Berg. in Act. Helv. Phys. Math. 7:129, t.

8. 1772; FBI. 7:11. 1896; Bor 336; Gamb. 1228.

P. longissimum Hochst. ex Steud. Syn. Pl. Glum. 1:19. 1854.

Stoloniferous grass; culms erect; leaves lanceolate, hispidulous on the upper surface, up to 20 x 1 cm; racemes 2, 10-12 cm long; spikelets broadly ovate, 1.5-2 mm long; glume ciliate on the margins.

Flowers: July - Dec.

Sivarajan 1791.

Dactyloctenium Willd.

D.aegyptium (Linn.) Beauv. Ess. Agrost. Expl. Pl. 15.

1812; Sant. 274. 1960; Bor 489; Gamb. 1273.

Cynosurus aegyptius Linn. Sp. Pl. 72. 1753.

Eleusine aegyptia (Linn.) Desf. Fl. Atlant. 1:85.

1798. Dactyloctenium aegyptiacum Willd. En. Pl.

Hort. Berol. 1029. 1809.

Stoloniferous grass; leaves linear-lanceolate, margins ciliolate, up to 10 x 0.8 cm; spikes digitate, 2.5-3.5 cm long, rachis shortly produced above; spikelets 2-2.5 mm long; glumes subequal; lemmas 1-keeled and 3-nerved.

Flowers: Sept. - Dec.

Sivarajan 1842.

Chloris Sw.

C. barbata Sw. Fl. Ind. Occ. 1:200. 1797; Rang. & Tad. 276; Blatt. & McCann, Bomb. Gras. 256. 1935; Bor 465; Shah in J. Bombay nat. Hist. Soc. 59:322. 1962; Gamb. 1272.

Annual grass; culm creeping below, glabrous; leaves lanceolate, up to 25 x 0.5 cm; spiciform racemes one sided, digitate; spikelets pink, with 1-2 upper florets imperfect; glumes 2, keeled, as long as the lemma; lemma 3-nerved, 2.5 mm long, margins ciliate, awned at the tip, awns 4-5 mm long.

Flowers: July - Nov.

Sivarajan 426.

Dimeria R. Br.

Key to the species

- 1. Rachis trigonous ..... hohenackeri
- 1. Rachis not trigonous:
  - 2. Racemes 3-4.5 cm long ..... kanhirapalliana
  - 2. Racemes 8-10 cm long ..... acutipes

D.hohenackeri Hochst. ex Miq. in Verh. Nederl. Inst.

3:35. 1851; FBI. 7:103. 1896; Bor 142; Gamb. 1187.

Psilostachys hohenackeri (Hochst. ex Miq.) Steud.

Syn. Pl. Glum. 1:413. 1855. Arthraxon hohenackeri

(Hochst. ex Miq.) Steud. Syn. Pl. Glum. 1:413. 1855.

Annuals; leaves linear, sparsely hispid, up to 10 x 0.3 cm; racemes spiciform, 2-3, digitate, 6-8 cm long; spikelets biseriate, secund, 3 mm long; glumes rigid, not winged; lemmas shorter than glumes, upper lemma awned.

Flowers: Nov. - Mar.

Sivarajan 1545.

D.kanhirapalliana Jacob in J. Bombay nat. Hist. Soc.

47:48-49. 1947.

Short, erect annuals; culms very slender; leaves linear; racemes in pairs; spikelets 3 mm long; glumes subequal, densely hairy; upper lemma awned from the sinus ; awns scaberulous.

Flowers: Nov. - Mar.

Sivarajan 926.



Note: This is closely allied to D.ornithopoda, but differs in its 2 divaricate racemes and the leaves with sparse, bulbous-based hairs.

D.acutipes Bor in Kew Bull. 1952:560. 1953; Bor 137-'38.

Culms tufted; leaves linear, up to 8 x 0.3 cm, hairy; racemes 2-3, digitate, spiciform, 8-10 cm long; rachis flat, ciliate on the margins; spikelets secund, solitary, hairy; upper glume awned; awn 2.5-3 mm long, not winged.

A species thought to be endemic to Madras State. Bor has reported it from the cultivated fields in the outskirts of Madras.

Flowers: Nov. - Mar.

Sivarajan 787.

Alloteropsis Presl.

A.cimicina (Linn.) Stapf in Prain, Fl. Trop. Afr. 9:487. 1919; Bor 276; Rajgopal and Panigrahi in Proc. Nat. Acad. Sc. Ind. 37:23. 1967; Gamb. 1223. Milium cimicinum Linn. Mant. Pl. 184. 1771. Axonopus cimicina (Linn.) Beauv. Ess. Agrost. 12. 1812; FBI. 7:64. 1896.

Culms many, slender; leaves flat, lanceolate, acute, cordate at base, 10 x 2 cm; racemes spiciform, digitate; spikelets ovoid, 3 mm long; glumes dissimilar, upper as long as the lower lemma, ciliate on the margins; lemmas dissimilar, upper with a 2 mm long arista at the tip.

Flowers: Oct. - July

Sivarajan 1216, 1226, 1242.

Cynodon Rich. (nom. cons.)

C.dactylon (Linn.) Pers. Syn. Pl. 1:85. 1805; FBI.

7:288. 1896; Bor 469; Gamb. 1270. Panicum dactylon

Linn. Sp. Pl. 58. 1753. Digitaria dactylon (Linn.)

Scop. Fl. Carn. (ed.2) 1:53. 1772. Paspalum

dactylon (Linn.) Lamk. Tab. Encycl. 1:176. 1791.

Culms creeping and rooting below, slender; leaves linear, up to 8 x 0.3 cm; spikes 3-6, umbellate; spikelets 2-seriate, laterally compressed; glumes shorter than the lemmas; lemmas 3-nerved.

Flowers: Nov. - Mar.

Sivarajan 1009.

Eleusine Gaertn.

Key to the species

1. Spikes 1-1.5 cm broad ..... corocana  
1. Spikes 5 mm broad ..... indica

E.corocana (Linn.) Gaertn. Fruct. 1:8, t. 1. 1788;  
FBI. 7:294. 1897; Bor 492; Gamb. 1273. Cynosurus  
corocanus Linn. Syst. Nat. (ed.10) 2:875. 1759.

Annuals; culms stout, 40-60 cm tall; leaves long, lanceolate, up to 1 cm broad; spikes many, digitate, 6-8 cm long; spikelets densely imbricating and laterally compressed; glumes subequal, keeled; lemmas almost similar; paleas winged on the keels; stamens 3; styles 2, free; seeds globose.

Flowers: Sept. - Nov.

Sivarajan 521.

E.indica (Linn.) Gaertn. Fruct. 1:8. 1789; FBI. 7:263.  
1897; Bor 493; Sant. 310. 1967; Gamb. 1273.  
Cynosurus indicus Linn. Sp. Pl. 72. 1753.

Annual grass; leaves distichous, linear, up to 5 mm broad; spikes secund, digitate, terminating the culms; spikelets densely imbricating; paleas not winged on the keels; grains oblong, obtusely 3-gonous.

Flowers: Sept. - Dec.

Sivarajan 806.

Pennisetum Rich.

P. polystachyon (Linn.) Schult. Syst. Veg. Mant. 2:146.

1824; Bor 346; Gamb. 1241. Panicum polystachyon Linn. Syst. Nat. (ed.10) 2:870. 1759.

Tall, robust grass; leaves lanceolate; panicles spiciform, 15-25 cm long; rachis angled, flexuous; spikelets sessile, solitary in a plumose-bristly involucre; florets 2, upper bisexual and the lower male or reduced to lemmas; glumes and lemmas unequal; stamens 3.

Flowers: July - Dec. )

Sivarajan 873.

Setaria P. Beauv. (nom. cons.)

S. pallide-fusca (Schum.) Stapf & Hubb. in Kew Bull. 1930; 259. 1930; Bor 363; Sant. & Shah in J. Bombay nat. Hist. Soc. 60:138. 1963; Gamb. 1239. Panicum pallide-fuscum Schum. Beskr. Guin. Pl. 58. 1827. P. glaucum Nees in Act. Nat. Cur. 19, Suppl. 1:173. 1843, (non Linn. 1753) Setaria glauca Hack. in Bol. Soc. Brot. 3:135. 1884 (non P. Beauv. 1812); FBI. 7:78. 1896 in part; Rang. & Tad. 110.

Annual grass; culms many; leaves flat, glabrous, up to 40 x 1 cm; panicles spiciform, dense; spikelets ovoid, 2.5-3 mm long; involucrel bristles 6-9, longer than the spikelets; lower glume much shorter than the lemma; upper lemma transversely rugulose; stamens 3; grains ellipsoid.

Flowers: July - Nov.

Sivarajan 719, 1322, 1324, 1435.

Sacciolepis Nash

Key to the species

- 1. Spikes 10-25 cm long ..... interrupta
- 1. Spikes 3-4 cm long ..... indica

S. interrupta (Willd.) Stapf in Prain, Fl. Trop. Afr.

9:757. 1920; Bor 358; Gamb. 1238; Symon in Kew Bull.  
27(3):403. 1972. Panicum interruptum Willd. Sp. Pl.  
1:341. 1798; FBI. 7:40. 1896.

Tall grass with spongy, delicate culms rooting below; leaves lanceolate, up to 45 cm long, glabrous; spikelets green or purplish, lanceolate, 3-4 mm long, glabrous; glumes and lemmas unequal, many-nerved, lower glume 1.5-2 mm long, obtuse; stamens 3.

A very common weed in paddy fields in water-logged lowlands. Occasionally the whole plant is purple.

Flowers: July - Sept.

Sivarajan 126, 1455.

S. indica (Linn.) A. Chase in Proc. Biol. Soc. Wash.

21:8. 1908; Bor 357; Gamb. 1238. Aira indica Linn.  
Sp. Pl. (ed.1) in 'errata', 1753. Panicum indicum  
Linn. Mant. Pl. 2:184. 1771, non Mill. 1768.

Sacciolepis spicata (Linn.) Honda in Tokyo Uni.  
J. Fac. Sci. Bot. 3:261. 1930.

Culms tufted, never spongy, 10-20 cm tall;  
leaves lanceolate 5-8 x 0.5 cm; spikes 2-4 cm long;

spikelets 2 mm long, ovoid; glumes and lemmas unequal, many nerved; stamens 3.

Flowers: Sept. - Dec.

Sivarajan 1539, 1573, 1656.

Oplismenus P. Beauv.

Key to the species

1. Racemes 1-2 cm long ..... burmannii  
1. Racemes 4-5 cm long ..... compositus

O. burmannii (Retz.) P. Beauv. Ess. Agrost. 54:168-69.

1812; FBI. 7:68. 1896; Bor 317; Gamb. 1232. Panicum burmannii Retz. Obs. 3:10. 1783. Orthopogon albus Nees ex Steud. Syn. Pl. Glum. 1:44. 1854. Oplismenus indicus Duthie, List Grass. N.W. Ind. 8. 1888, non Roem. & Schult. 1817.

Annual grass; culms creeping below; leaves elliptic-acute, up to 4 x 1.5 cm, minutely hispid on both surfaces; racemes spiciform, secund, distant on the panicles; spikelets 2-2.5 mm long; glumes subequal, shorter than the dissimilar lemmas, both awned; awns longer than the glumes, scaberulous.

Flowers: Aug. - Dec.

Sivarajan 1078, 1481.

O.compositus (Linn.) P. Beauv. Ess. Agrost. 54:168-69.  
1812; FBI. 7:66. 1896; Bor 317; Gamb. 1231. Panicum  
compositum Linn. Sp. Pl. 57. 1753.

Culms creeping below; leaves broadly elliptic  
to lanceolate, acuminate, up to 7 x 2 cm; panicles very  
long; spikelets distant, 4 mm long, both the glumes  
awned; awns much longer than the spikelets, smooth.

Flowers: Aug. - Dec.

Sivarajan 1786.

Echinochloa Beauv.

E.colonum (Linn.) Link, Hort. Berol. 2:209. 1833; Sant.  
275. 1960; Bor 308; Gamb. 1230; Gould et al in Amer.  
Midl. Natur. 87:56. 1972. Panicum colonum Linn. Syst.  
(ed.10) 870. 1759. E.crusgalli, ssp.colonum (Linn.)  
Honda in Bot. Mag. Tokyo 37:122. 1923.

Culms 50-100 cm tall; leaves lanceolate, reaching  
25 x 0.8 cm; racemes spiciform, 1-2.5 cm long, fascicled  
on a racemose axis; spikelets ovoid-acute, hispid; lower  
glume apiculate, lemmas dissimilar, the lower almost  
equalling the upper glume.



Common in moist sandy fields, and also as a weed in paddy fields.

Flowers: July - Nov.

Sivarajan 371, 406.

Brachiaria Griseb.

Key to the species

1. Rachis not triquetrous ..... setigera
1. Rachis triquetrous:
  2. Lower glume more than half as long  
as the spikelets ..... paspaloides
  2. Lower glume shorter:
    3. Spikelets 3-3.5 cm long ..... ramosa
    3. Spikelets 4-4.5 mm long ..... brizantha

B.setigera (Retz.) Hubb. in Hook. Ic. Pl. 34:2, t. 3363.

1938; Bor 286. Panicum setigerum Retz. Obs. 4:15.

1786. Urochloa setigera (Retz.) Stapf in Prain, Fl.

Trop. Afr. 9:598. 1920. Panicum affine Poir. in Lamk.

Encycl. Suppl. 4:15. 1786.

Diffuse grass; culms glabrous; leaves broadly elliptic-acuminate, up to 12 x 3 cm; panicles lax; racemes 6-8 cm long; spikelets solitary or paired, ovate,

hispidulous; lower glume very short; lemmas dissimilar.

Flowers: July - Dec.

Sivarajan 1730.

B.paspaloides (Presl) Hubb. in Hook. Ic. Pl. t. 3363.

1938; Bor 284. Urochloa paspaloides J.S. Presl ex  
C.B. Presl, Rel. Haenk. 1:318. 1830. Panicum  
ambiguum Trin. in Mem. Acad. Sci. Petersb. Ser.  
3:243. 1835.

Culms slender, rooting at the lower nodes;  
leaves lanceolate, about 10 x 1.5 cm, sheaths ciliate  
towards the mouth; panicles of short racemes; spikelets  
elliptic-acute, 4 mm long; lower glume acute, striate;  
lemmas smooth.

Flowers: July - Mar.

Sivarajan 1411.

B.ramosa (Linn.) Stapf in Prain Fl. Trop. Afr. 9:542.

1919; Sant. 272. 1960; Bor 284; Gamb. 1226; Panicum  
ramosum Linn. Mant. 29. 1767; FBI. 7:36. 1896, in  
part; Rang. & Tad. 88.

Culms many, glabrous; leaves lanceolate, acuminate,  
minute hairy, hairs not bulbous-based; panicles

3-6-racemed; racemes 4-5 cm long; spikelets elliptic-apiculate, hispidulous, solitary or binate, 3-3.5 mm long; lower glume almost half as long as the spikelet.

Flowers: Mar. - Dec.

Sivarajan 236, 1211, 1251.

B.brizantha (Hochst. ex A. Rich.) Stapf in Prain Fl.

Trop. Afr. 9:531. 1919; Bor 281. Panicum brizanthum  
Hochst. ex A. Rich. Tent. Fl. Abyss. 2:363. 1851.

Culms slender, rooting at lower nodes; leaves lanceolate, up to 15 x 1 cm with tubercular-based hairs on both surfaces; panicles with 2-5 racemes; spikelets elliptic-acute, 4-4.5 mm long; lower glume about 1/4th of the spikelet, 5-7 nerved.

Flowers: May - Dec.

Sivarajan 664, 1212.

Paspalidium Stapf

P.flavidum (Retz.) A. Camus in Lecomte, Fl. Gen. Indo-Ch.

7:419. 1922; Bor 333; Sant. 318. 1967; Gamb. 1229.

Panicum flavidum Retz. Obs. 4:15. 1786; FBI. 7:28.

1896; Rang. & Tad. 69. P.floridum Royle, Ill. Bot.

Himal. 410. 1840. P.granulare Lamk. Encycl. Meth. Bot.

1:170. 1791.

Annual grass; stem spongy and creeping below; leaves lanceolate-acute, 8-20 cm long, flat; racemes spiciform, 5-12 on a long triquetrous common rachis, lower ones shorter than the internodes; spikelets 2-seriate and secund on the rachis, ovate-acute, 3 mm long; lower glume much smaller than the spikelets, orbicular; lemmas prominently nerved.

Flowers: Aug. - Dec.

Sivarajan 574.

Vetiveria Lem.-Lisanc.

V. zizanoides (Linn.) Nash in Small, Fl. South-East U.S.

67. 1903; Bor 258; Gamb. 1201. Phalaris zizanoides

Linn. Mant. Pl. 2:183. 1771. Andropogon zizanoides

(Linn.) Urban, Symb. Antill. 4:79. 1903.

Perennial, rhizomatous grass; culms tufted, stout; leaves linear, often conduplicate; panicles large with whorls of racemes; spikelets 2-nate, one sessile and bisexual, the other pedicellate and male; glumes equal, lower rounded on the back, upper keeled, both muricate; lemmas hyaline; stamens 3; styles 2.

Flowers: Sept. - Nov.

Sivarajan 1414.

Iseilema Anders.

I.laxum Hack. in DC. Mon. Phan. 6:682. 1889; FBI. 7:218.  
1897; Rang. & Tad. 233; Bor 188; Gamb. 1211.

Culms 40-50 cm tall, compressed; leaves linear-lanceolate, keeled; racemes panicled each with a scarious spathe; spikelets lanceolate; the basal 4 involucrel pedicelled; rachis short with 2 pedicelled and one sessile spikelets; pedicelled spikelets male; glumes membranous, subequal, 2-keeled; lemmas hyaline, often the upper absent; palea 0; sessile spikelets bisexual; lower glumes truncate, 2-toothed, upper boat-shaped; lemmas dissimilar, lower short, upper geniculately awned; stamens 3.

Flowers: Nov. - Dec.

Sivarajan 1859.

Apluda Linn.

A.mutica Linn. Sp. Pl. 82. 1753; Bor 93; Sant. 303.  
1967; Gamb. 1212.

Culms branched, diffuse, rooting at the lower nodes; leaves linear-lanceolate, acuminate, up to 20 x 0.5 cm; panicles compound; spikelets 3, at the

tips of each branchlet; bract aristate, boat-shaped, striate with hyaline margins, 8 mm long; glumes equal; upper lemma 2-lobed.

Flowers: Sept. - Mar.

Sivarajan 955.

Cymbopogon Spreng.

C.citratus (DC.) Stapf in Kew Bull. 1906:357. 1906;  
Prain, Fl. Trop. Afr. 9:282. 1919; Sant. 273. 1960;  
Bor 126; Gamb. 1216. Andropogon citratus DC. Cat.  
Hort. Monsp. 78. 1813.

Perennials; culms many; leaves flat, linear, very long, scaberulous along the margins; racemes paired, panicled; one pair of spikelet in each raceme homogamous and all the others heterogamous; sessile spikelet linear, 5-6 mm long; upper lemma 2-fid at tip, not awned.

Flowers: Dec. - Mar.

Sivarajan 930.

Spodiopogon Trin.

S. rhizophorus (Steud.) Pilger in Engl. & Pr. Pfam. Aufl. 2, 14E:119. 1940; Bor 246. Andropogon rhizophorus Steud. Syn. Pl. <sup>G</sup>Plum. 1:381. 1854. Spodiopogon albidus (Wall.) Benth. in J. Linn. Soc. (Bot.) 19:66. 1881; Gamb. 1186.

Culms diffusely branched, glabrous; leaves elliptic-oblong, acuminate, 18 x 2.5 cm, petioled; racemes 5-10 in panicles, 3-6 cm long; spikelets 2-3-nate with one of them sessile and the others pedicellate; glumes subequal; upper lemma awned; the rachis and the pedicels densely silky hairy.

Flowers: Sept. - Dec.

Sivarajan 1790.

Saccharum Linn.

S. spontaneum Linn. Mant. Alt. 183. 1771; FBI, 7:118. 1897; Bor 214; Gamb. 1185. Imperata spontanea (Linn.) P. Beauv. Ess. Agrost. 8. 1812.

Perennials; culms solid; leaves long, scabrid, up to 1 cm broad, flat; panicles large, terminal, silky-hairy; rachis of racemes articulate; spikelets 2-nate,

ome sessile and the other pedicellate; florets 2;  
glumes 2, coriaceous, equal; lemmas hyaline; stamens 3;  
styles 2.

Flowers: Oct. - Dec.

Sivarajan 1561.

Neyraudia Hook. f.

N. arundinacea (Linn.) Henr. in Meded. Herb. Leid. no. 58,  
8. 1929; Bor 518; Gamb. 1250-51; Aristida arundinacea  
Linn. Mant. 186. 1771. Arundo madagascariensis Kunth,  
Rev. Gram. 1:273, t. 48. 1830; FBI. 7:305. 1897.

Perennials; leaves flat, scabrid, up to 50 x 1 cm;  
panicles large, compound; spikelets 4-6-flowered, laterally  
compressed; rachilla bearded; glumes 2, subequal, keeled;  
lemmas long-subulate, acuminate, silky hairy; paleas  
2-keeled; keels puberulous; flowers all bisexual; stamens  
3; styles 2.

Flowers: Oct. - Dec.

Sivarajan 1562.



Phragmites Trin.

P.karka (Retz.) Trin. ex Steud. Nom. Bot. (ed.2) 2:324.  
1841; Bor 416; Gamb. 1251. Arundo karka Retz. Obs.  
4:21. 1786. Phragmites nepalensis Nees ex Steud. Syn.  
Pl. Glum. 1:196. 1854.

Tall, perennial, rhizomatous grass; culms stout;  
leaves flat, up to 50 x 4 cm; panicles large, decompound;  
spikelets 5-7-flowered, linear, 1.2 cm; rachilla silky  
hairy; glumes unequal, lanceolate; lemmas 3-veined, much  
longer than the glumes; paleas much smaller, 2-keeled,  
each enclosing a bisexual floret; stamens 1-3; styles 2.

Flowers: Oct. - Dec.

Sivarajan 1962.

Arundinella Raddi

Key to the species

- 1. Upper lemma awned ..... mesophylla
- 1. Upper lemma not awned:
  - 2. Spikes 5-7 cm long ..... leptochloa
  - 2. Spikes shorter ..... metzii

A.mesophylla Nees ex Steud. Syn. Pl. Glum. 1:115. 1854;

Bor 423.

Perennial grass; culms slender; leaves linear, 8-12 x 0.5 cm, with bulbous-based hairs beneath; panicles 8-15 cm long, purplish; spikelets binate, the lower male or barren, upper bisexual; lower glume shorter, the upper acuminate, scabrous-nerved, 3-5 mm long with a few bristles; upper lemma awned with one shorter bristle on either side of the awn.

Flowers: Aug. - Dec.

Sivarajan 759.

A.leptochloa (Nees ex Steud.) Hook. f. Fl. Brit. Ind.

7:76. 1896; Bor 423; Gamb. 1247. Panicum leptochloa  
Nees ex Steud. Syn. Pl. Glum. 1:62. 1854. P.zeylanicum  
Arn. ex Hook. f. Fl. Brit. Ind. 7:76. 1896.

Arundinella lawsonii Hook. f. Fl. Brit. Ind. 7:76.  
1896; Gamb. 1247.

Culms glabrous; leaves lanceolate-acuminate, 20-25 x 1 cm cordate or rounded at base with bulbous-based hairs on both surfaces; panicles lax, purplish; spikelets binate, lanceolate, 2-2.5 cm long; upper glume shorter than the lower lemma, glabrous, prominently nerved, without awn or setae.

Flowers: Sept. - Dec.

Sivarajan 573.

A. metzii Hochst. ex Miq. in Verh. Konink. Nederl. Inst.  
3, Pl. 4, 31. 1851; FBL. 7:72. 1896; Bor 423; Sant.  
305. 1967; Gamb. 1247. A. pygmaea Hook. f. Fl. Brit.  
Ind. 7:72. 1896.

Culms many with bulbous-based hairs; leaves lanceolate, cordate or rounded at base, 8-10 x 0.5-0.8 cm hairy on both surfaces; panicles lax, branches 4-5 cm long; spikelets 2-2.5 cm, glabrous; glumes prominently nerved, nerves scaberulous; upper lemma 2 mm long, without awn or setae.

Flowers: Sept. - Dec.

Sivarajan 774, 784.

Eragrostis Beauv.

Key to the species

1. Spikelets many-flowered:
  2. Keels of the palea ciliate ..... riparia
  2. Keels of the palea not ciliate:
    3. Spikelets 2.5-3 mm broad ..... unioloides
    3. Spikelets 1-1.5 mm broad ..... tremula
1. Spikelets few-flowered:
  4. Rachilla articulate:
    5. Paleas ciliate on the keels ..... ciliaris
    5. Paleas not ciliate on the keels ... japonica

4. Rachilla not articulate:

6. Paleas ciliate on the keels ..... tenella

6. Paleas not ciliate on the keels ..... pilosa

E.riparia (Willd.) Nees, Agrost. Bras. 512. 1829; Bor  
513; Gamb. 1263. Panicum riparia Willd. in Ges.

Natur. Freunde Berlin Neue Schrift 4:185. 1803.

Eragrostis tenella (Linn.) Beauv., var. riparia (Willd.)

Stapf in Hook. f. Fl. Brit. Ind. 7:315. 1896.

Perennials; culms slender; leaves often involute,  
acute, sheath bristly at the mouth; spikelets 5-6 mm  
long, 1 mm broad, many-flowered; glumes shorter than  
the lemma, 1-keeled, scaberulous on the keel; lemma  
3-veined; palea 2-keeled, keels ciliate.

Flowers: Aug. - Dec.

Sivarajan 573, 870.

E.unioides (Retz.) Nees ex Steud. Syn. Pl. Glum. 264.

1855; Bor 515; Gamb. 1264. Poa unioides Retz. Obs.

5:19. 1789. Eragrostis amabilis Hook. f. Fl. Brit.

Ind. 7:317. 1896; non Linn.

Culms slender, 25-40 cm tall; leaves linear-  
lanceolate, 8-10 x 0.5 cm, sheath bearded at the mouth;  
panicles large; spikelets purplish; glumes shorter than

the lemmas; lemmas acute, glabrous, 3-nerved, 1.5 mm long; palea 2-keeled, keels scaberulous.

Flowers: Oct. - July

Sivarajan 13, 1120, 1243, 1685.

E.tremula (Lamk.) Hochst. ex Steud. Syn. Pl. Glum. 1:269.

1854; FBI. 7:320. 1896; Bor 514; Gamb. 1264. Poa

tremula Lamk. Tab. Encycl. 1:185. 1791.

Culms slender; leaves linear-lanceolate, acuminate; panicles lax; spikelets 5-6 mm long; glumes as long as the lemmas, 1-nerved; lemmas 3-nerved, glabrous, acute; palea 2-keeled, scaberulous.

Flowers: July - Mar.

Sivarajan 541, 925.

E.ciliaris (Linn.) R. Br. in Tuckey. Narr. Exp. Congo. App.

478. 1818; FBI. 7:314. 1896; Bor 506; Gamb. 1263. Poa

ciliaris Linn. Syst. Nat. 2:875. 1759.

Culms slender; leaves often convolute, acute, sheath hairy at mouth; panicles spiciform; spikelets few-flowered, 2 mm long; glumes 1-keeled, shorter than lemmas; lemmas 3-nerved, lateral nerves close to the margins; palea ciliate on the keels.

Flowers: July - Mar.

Sivarajan 427.

E. japonica (Thunb.) Trin. in Mem. Acad. Sci. Petersb.  
(Ser.6) 1:405. 1831; Bor 509; Gamb. 1264. Poa  
japonica Thunb. Fl. Jap. 51. 1784. Eragrostis  
tenuissima Schrad. ex Nees, Fl. Afr. Austr. 409.  
1841. E. interrupta var. tenuissima (Schrad. ex Nees)  
Stapf ex Hook. f. Fl. Brit. Ind. 7:316. 1896.

Perennials; culms up to 150 cm tall; leaves usually flat, lanceolate-acuminate; panicles slender, branches whorled, 3-5 cm long; rachilla articulate; spikelets few-flowered; glumes shorter than lemmas, 1-nerved; paleas glabrous on the keels.

Flowers: Dec. - Mar.

Sivarajan 1049.

E. tenella (Linn.) P. Beauv. ex Roem. & Schult. Syst.  
2:576. 1817; Bor 513; Fosberg in Phytologia 15:501.  
1968. Poa tenella Linn. Sp. Pl. 69. 1753. Eragrostis  
amabilis (Linn.) Wt. & Arn. ex Hook. & Arn. Bot.  
Beechey Voy. 251. 1838.

Culms slender; leaves linear-lanceolate, acuminate, sheath bristly; spikelets 1.5-2 mm long; glumes 1-keeled, obtuse; paleas ciliate on the keels.

Flowers: Oct. - July

Sivarajan 668, 1213.

E.pilosa (Linn.) Beauv. Ess. Agrost. 71:162, 175.

1812; FBI. 7:323. 1896; Rang. & Tad. 305; Bor 512;

Gamb. 1265. Poa pilosa Linn. Sp. Pl. 68. 1753.

Slender annuals; culms filiform; leaves linear; panicle lax; rachilla persistent; glumes unequal, shorter than the lemmas; lemmas ovate-obtuse, 1-keeled, scabrous; palea scaberulous on the keels.

Flowers: Dec. - Mar.

Sivarajan 1079.

#### Cyrtococcum Stapf

C.trigonum (Retz.) A. Camus in Bull. Mus. Hist. Nat.

Paris 27:118. 1921; Jansen in Reinwardtia 2:257.

1953; Bor 292; Gamb. 1237. Panicum trigonum Retz.

Obs. 3:9. 1783; FBI. 7:56. 1896.

Diffuse, glabrous, annual grass; culms rooting at basal nodes; leaves elliptic or lanceolate, acute, mid-vein indistinct, up to 3 x 0.7 cm; spikelets in effuse panicles, ellipsoid, 1.5 mm long; pedicels filiform, short; glumes and lemmas dissimilar, upper glume as long as the lower lemma; stamens 3.

Flowers: July - Nov.

Sivarajan 1439.

Panicum Linn.

Key to the species

- 1. Leaves ovate-acuminate ..... brevifolium
- 1. Leaves linear-lanceolate:
  - 2. Plants rhizomatous ..... repens
  - 2. Plants not rhizomatous:
    - 3. Lower glume orbicular ..... paludosum
    - 3. Lower glume apiculate ..... psilopodium

P. brevifolium Linn. Sp. Pl. 59. 1753; Bor 324; Gamb.

1235. P. arborescens Linn. Sp. Pl. 59. 1753, in part.

P. ovalifolium Poir. in Lamk. Encycl. Suppl. 4:279.  
1816; FBI. 7:44. 1896.



Diffuse, annual grass; culms slender, rooting at the lower nodes; leaves ovate-acuminate, many-veined, up to 4 x 1.5 cm; panicles effuse; pedicels capillary, longer than spikelets; spikelets ovoid, 1.5 mm long, hispidulous; lemmas dissimilar, the lower equalling the upper glume; stamens 3.

Flowers: Aug. - Dec.

Sivarajan 713.

P. repens Linn. Sp. Pl. (ed.2) 87. 1762; FBI. 7:49.

1896; Rang. & Tad. 99; Bor 330; Gamb. 1235.

Rhizomatous, tufted grass; culms erect; leaves linear-lanceolate, rigid and convolute, 25-30 x 0.5 cm; spikelets in terminal panicles, lanceolate, acute, 4 mm long; lower glume orbicular, 0.75 mm long; lemmas ribbed.

Flowers: Aug. - Dec.

Sivarajan 548.

P. paludosum Roxb. Fl. Ind. 1:310. 1820; Bor 329.

Culms creeping or floating, spongy at base; leaves always flat, 8-10 x 0.8 cm; spikelets lanceolate, 3 mm long; lower glume orbicular, obtuse, lemmas ribbed.

Flowers: Dec. - Mar.

Sivarajan 1052.

P. psilopodium Trin. Gram. Panic. 217. 1826; FBI. 7:46.

1896; Bor 329; Sant. 317. 1967; Gamb. 1234.

P. flexuosum Retz. Obs. Bot. 3:9. 1783.

Erect, annuals; leaves linear-lanceolate, flat, up to 20 x 0.6 cm; panicles effuse; spikelets elliptic-acute, 3-4 mm long; lower glume ovate-apiculate, 1 mm long; lemmas almost similar, acute, many veined.

Flowers: July - Sept.

Sivarajan 1323, 1346.

Sporobolus R. Br.

Key to the species

- 1. Panicles spiciform ..... piliferus
- 1. Panicles effuse ..... tenuissimus

S. piliferus (Trin.) Kunth, En. 1:211. 1823; Bor 632;

Gamb. 1258. Vilfa pilifera Trin. Diss. Bot. 157. 1824.

Sporobolus stachyanthus A. Rich. Tent. Fl. Abyss.

2:394. 1851. S. ciliatus Munro ex Hook. f. Fl. Brit.

Ind. 7:251. 1896.

Non-stoloniferous annuals; culms tufted; leaves lanceolate, acute, pilose and serrulate on the margins, 2.5 x 0.5 cm; panicles spiciform; spikelets about 1.5 mm long; glumes 2, unequal; lemma 1-nerved; stamens 2.

Flowers: July - Oct.

Sivarajan 310.

S.tenuissimus (Schrank) Kuntze, Rev. Gen. Pl. 3:369.

1893; Bor 633. Panicum tenuissimum Schrank in Denkschr. Bot. Ges. Regensb. 2:26. 1822. Vilfa minutiflora Trin. Diss. Bot. 158. 1824. Sporobolus minutiflorus (Trin.) Link, Hort. Berol. 1:88. 1827; FBI. 7:248. 1896; Gamb. 1258.

A delicate annual, 30-50 cm tall; leaves glabrous; panicles effuse; spikelets oblong, 2 mm long; pedicels filiform; glumes shorter than the lemma; stamens 3.

Flowers: July - Dec.

Sivarajan 1726.

Dend<sup>2</sup>ocalamus Nees

D.strictus (Roxb.) Nees in Linnaea 9:476. 1834; FBI.

7:404. 1897; Gamb. in Ann. Roy. Bot. Gard. Calc.

7:78. 1896. & Fl. Madr. 1286. Bambos stricta Roxb.  
Pl. Corom. 1:58, t. 80. 1798.

Trees; leaves lanceolate, up to 20 x 1 cm;  
panicles large, compound; spikelets capitate, ovate;  
florets usually hermaphrodite; glumes ovate-acute,  
many nerved; lemmas similar; paleas ovate, the lower  
with 2 ciliate keels; stamens 6; style long, hairy.

Flowers: Flowers only once in its life. (Jan.- Mar.)

Sivarajan 144.

Bambusa Schreb. (~~nom. cons.~~)

B. arundinacea (Retz.) Willd. Sp. Pl. 2:245. 1799; Blatt.  
in Ind. For. 55:556. 1929; Holttum in Taxon 5:67.  
1956; Gamb. in Ann. Roy. Bot. Gard. Calc. 7:11. 1896  
& Fl. Madr. 1286. Bambos arundinacea Retz. Obs.  
5:24. 1786.

Trees; branches armed with stout spines; leaves  
lanceolate, up to 20 x 3 cm; panicles usually large, leaf  
less, with spike branches; spikelets up to 2 cm long,  
many-flowered; floral glumes 3-6, upper most few male or  
neuter; palea 2-keeled, keels ciliate; stamens 6.

Flowers: once in its life (Jan. - Mar.)

Sivarajan 964.

Oryza Linn.

O. sativa Linn. Sp. Pl. 333. 1753; Bor 605; Gamb. 1276.

Annuals; leaves linear-lanceolate, usually flat; panicles compound; spikelets laterally compressed, 1-flowered; glumes 2, very short; lemma coriaceous, strongly nerved, hispidulous; awns long and barbellate or absent; palea as long as the lemma; stamens 6; styles 2, free.

There are several varieties, both improved and local, under cultivation.

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Sivarajan 931.

SUMMARY

The angiosperm flora of the greater Calicut area, covering about 600 sq. kms. of the Western section of Calicut and Malappuram Districts of Kerala is studied exhaustively.

Important aspects of morphology, nomenclature, ecology and taxonomy are noted. Vegetations of special habitats are described briefly.

A brief statistical analysis of the flora is given. The Biological spectrum of the area is studied on the basis of life-forms of the plants and it is found to be essentially therophytic.

936 species belonging to 538 genera of 144 families are collected and identified. Two new species, Heliotropium keralense and Borreria malabarica, a new variety, Borreria stricta var. rosea and several new records from India are reported. A few endemic species and many rare species are also collected.

Dichotomous keys for the families, genera and species are provided.

The nomenclature is made up-to-date.

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OF THE NATIONAL ACADEMY OF SCIENCES, INDIA  
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*SOMELES INDICA* VAR. *ALBIFLORA* (HASSK.) BAGK.  
A NEW RECORD FROM INDIA

V. V. SIVARAJAN AND K. S. MANILAL



NATIONAL ACADEMY OF SCIENCES, INDIA  
ALLAHABAD

## SHORT NOTES

ANISOMELES INDICA VAR. ALBIFLORA (HASSK.) BACK.  
A NEW RECORD FROM INDIA

During systematic studies on the flora of Calicut, Kerala, the authors came across an interesting specimen of *Anisomeles indica* (Labiatae) with prominently pinkish white flowers, which turned out to be *A. indica* var. *albiflora*. Backer (1965) has reported this from Djakarta. So far as the authors know, this is the first report of this variety from India. Since no description of this is available in the common Indian Flora for ready consultation, a detailed description of the variety is given below.

*Anisomeles indica* (L.) O. Kze. var. *albiflora* (Hassk.) Backer in Fl. Java, 2 : 1965.

Much branched aromatic undershrubs, about 1-1.5 m tall, densely greyish tomentose throughout, hairs multicellular, intermixed with shorter glandular hairs; stem 4-angular. Leaves decussate, up to 12 x 8 cm. sparingly hairy above, densely grey tomentose beneath, petiole soft tomentose, up to 4 cm long; lamina ovate to lanceolate, acute or shortly acuminate at tip, subcordate or slightly cuneate at base; margins crenate; lateral veins 4-5 pairs, the lowest pair arising acutely from the base. Inflorescence densely axillary sessile cymes, those below are distant and those above form an interrupted terminal spike with much smaller obovate to ovate leaves subtending the cymes. Flowers sessile, bracteate; bracts linear to lanceolate, 8 mm long; calyx hispid hairy, tube 6 mm long; densely woolly within, lobes 5, lobes acute, about half as long as the tube, reticulate within. Corolla greenish to yellowish, tube 7 mm long annulate within below the stamens; upper lip entire, 4 mm long, lower lip 7 mm long, 3-lobed; lobes rounded, middle lobe retuse, lower lip with a dense tuft of erect white hairs on the median field; stamens didynamous, filaments incurved and bearded along its inner surface, anthers of the upper pair 2-lobed and of the lower pair 1-celled, cells compressed; style filiform, up to 1.5 cm long; stigmatic lobes 2, equal, linear. Nutlets black, smooth, slightly flattened, rounded, slightly angular on the inner surface (Figs. 1-6).

This variety can be distinguished from *A. indica* proper by its shorter calyx, the dense tuft of hairs within the calyx tube and by its invariably greenish to yellowish flowers. In the vegetative condition it is hardly distinct.

This is a common weed on road sides and waste places in Calicut and suburbs. It plants flowers during October-January.

## ACKNOWLEDGEMENT

Thanks are due to Prof. Tseng-Chieng Huang, National Taiwan University, Taipei, for his critical comments on the specimen and to Prof. B. K. Nayar for his cooperation.

## REFERENCE

BACKER, C. A. (1965). Flora of Java, 2 : 624.

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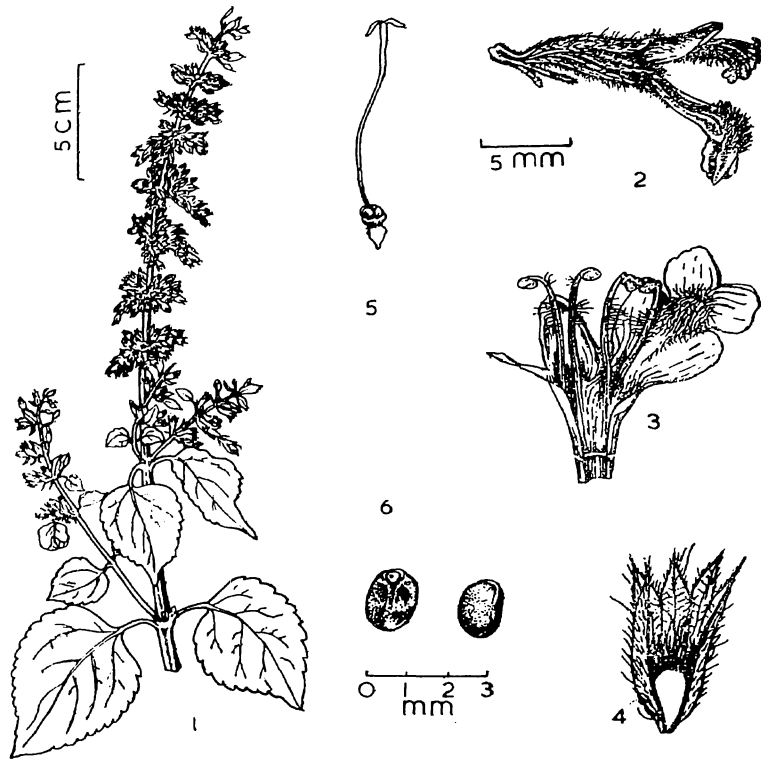


Fig. 1-6 *A. indica* var. *albiflora*. Fig. 1. A twig. Fig. 2. A flower. Fig. 3. Corolla split open. Fig. 4. Calyx split open. Fig. 5. Pistil. Fig. 6. Seeds—ventral and dorsal views.

## A NEW SPECIES OF *HELIOTROPIUM* L. FROM SOUTH INDIA<sup>1</sup>

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### ABSTRACT

The authors during their exploration in and around Calicut have observed this weed in moist fields during the rainy season, growing both isolated and also in close association with *Heliotropium indicum* L. The plant appears to be new and a description of it based on fresh specimens is given.

#### *Heliotropium keralense* SIVARAJAN ET MANILAL. SP. NOV.

Herba erecta et carnosa usque 30 cm alta, per totum corpus villosus; folia alternata vel sub-opposita; petiole usque 9 cm; lamina ovata, obtusa vel acuta, in petiola ad basim decurrentia, usque 10 × 6 cm; flores albae in terminos spicatae, cymes scorpioides; flores longae usque 3 vel 4 mm, et latae 2.5 mm quattuor vel quinque lobae calycis, fere aequales, longae setosae villosae; villi ad basim bulbosi; fistula corollae aequalis vel aliquot longior quam calycem, ad basim latissima sursum contrahens, longa 2 mm, cum villi longi setosi bulbosi ad basim ad extra, quinque lobae plicatae triangulares; quinque stamen, infra medium fistulae corollae inserta, antheres ovatae-obtusae, filamenta minuta,

grana pollen prolata vel sub-prolata (41 μ × 30.5 μ), 3-zonicolporata; ovarium habens quattuor loba, quattuor cellae et quattuor ovulae; ovulae sunt pendulosae, stylus parvus et grossus; stigma lobolosa et hemispherica ad basim segmentata; fructus quattuor parvae nuce. pericarpae segmentatae; semina minuta membrana co-operta.

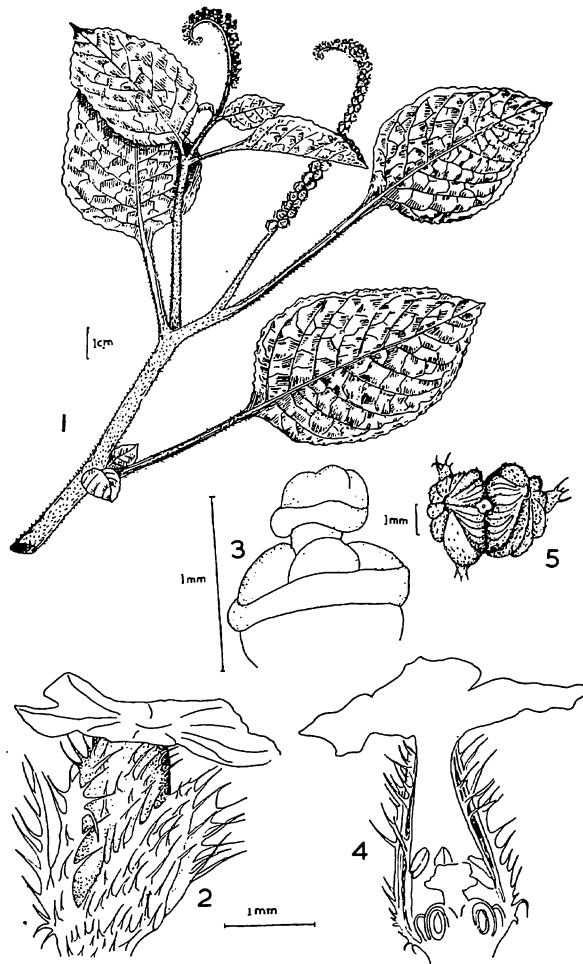
Holotypus Sivarajan 191 (Calicut, 16.4.1970) et paratypus Sivarajan 997 (Calicut, 7.7.71) Positi in Herbario regionis australis Bot. Sur. Ind. ad Coimbatore.

#### *Heliotropium keralense* SIVARAJAN ET MANILAL SP. NOV.

Erect fleshy herbs up to 30 cm tall, profusely hairy throughout. Leaves up to 10 × 6 cm, alternate or subopposite, ovate, obtuse or acute at apex, abruptly narrowed and decurrent on petiole at base, sparsely strigose beneath on veins, glabrous above; lateral veins 4-6 pairs, forking near margins; petioles up to 9 cm long. Flowers white in simple, terminal, spicate scorpioid cymes up to 18 cm long; peduncles strigose hairy. Calyx lobes 4-5, subequal, persistent, slightly enlarged in fruit;

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FIGS. 1-5. *Heliotropium keralense* Sivarajan et Manilal. Fig. 1. twig. Fig. 2. flower. Fig. 3. pistil. Fig. 4. L.s. flower. Fig. 5. fruit.

including calyx lobes 2.5 × 1 mm long bulbous-based hairy without. Corolla 3-4 mm long; 2.5 mm across; tube as long as or slightly longer than calyx, broadest at base tapering upwards, long, setose bulbous-based hairy without; lobes 5, triangular, plicate. Stamens 5, inserted below the middle of corolla tube; filaments minute; anthers ovate-obovate. Pollen grains prolate to subprolate (4.1 × 3.0-5 μ), 3-zonocolporate; ectocolpium elongate, tenuimarginate, broadest at middle, with acute tips; endocolpium circular to longitudinal. Ovary 4-lobed, 4-loculed. Ovules one per locule; pediculus; style short, thick; stigma lobed, hemispherical, frilled at base. Fruit 4 × 4 mm, nuclei 4, two, perite and

beaked, sparsely hairy on surface, ribbed without, mesocarp fleshy; seeds small, testa membranous.

*Holotype* Sivazajan 191 (Calicut, 16.4.1970) and *paratype* Sivazajan 997 (Calicut 7.3.1971) are deposited in the Herbarium of the Southern Circle of Botanical Survey of India, Coimbatore.

The plant is closely allied to *Heliotropium indicum* L. in its general habit, but differs in its prominently white smaller flowers, much shorter and differently shaped corolla tube, the profuse, long setose, bulbous-based hairs on the calyx and corolla tube, smaller pollen grains and shorter style.

fruiting calyx lobes  $2.5 \times 1$  mm long bulbous-based hairy without. Corolla 3–4 mm long; 2.5 mm across; tube as long as or slightly longer than calyx, broadest at base tapering upwards, long, setose bulbous-based hairy without; lobes 5, triangular, plicate. Stamens 5, inserted below the middle of corolla tube; filaments minute; anthers ovate-obtuse. Pollen grains prolate to subprolate ( $41\mu \times 30.5\mu$ ). 3-zonicolporate; ectocolpium elongate, tenuimarginate, broadest at middle, with acute tips; endocolpium circular to lalongate. Ovary 4-lobed, 4-loculed. Ovules one per locule, pendulous; style short, thick; stigma lobed, hemispheric, frilled at base. Fruit  $4 \times 4$  mm, nutlets 4, two, partite and

beaked, sparsely hairy on surface, ribbed without, mesocarp stony; seeds small, testa membranous.

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