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 fields in the University Campus.


Sivarajan 588.


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.


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, whereby he 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

**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.


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.

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.)

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. Brenan (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


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 under the ssp.octovalvis.


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.
   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.


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,

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;

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.


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.

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, palmined; 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:

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.
Ind. 17(1):44. 1959; Sant. 102. 1967. Modecca
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.


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.


Tendrils 2-3-fid; leaves orbicular or broadly ovate, 5-7-lobed; flowers white; males racemed; females
solitary in the axils; fruits up to 1 metre long, often twisted, white striped.


Sivarajan 1813.


Tendrils usually 2-fid; leaves ovate-lanceolate, cordate at base, margins distantly denticulate; flowers white; fruit ovoid-oblong, 8-10 cm long.


Sivarajan 454.

*Lagenaria* Ser.


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.


Sivarajan 1461.

_Coccinia_ Wt. & Arn.

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.


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.

*Benincasa* 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.


Sivarajan 1390.

Luffa Mill.


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.


Sivarajan 856.
Diplocyclos (Endl.) Von Post & Kuntze


_B. laciniosa_ Linn. Sp. Pl. 1013. 1753, in part; FBI.


Nat. (Ser.4) 12:141. 1859, pro mojore 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.)


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;
Densely pubescent climbers; leaves large, orbicular, entire or emarginate; flowers large, fleshy, yellow; fruits large; seeds ellipsoid.


Sivarajan 1378.

Cucumis Linn.


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.


Sivarajan 580.

Solena Lour.

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-thecouous and the other 1-thecuous.

Mukia Arn.


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


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.


Sivarajan 1418.


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.


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.
Berol. ex Foerster Handb. Cactkde 398. 1846.

Arborescent, much branched plants; stems jointed; branches with 4–7 wing like ribs; aerieoles 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.

1960; Gamb. 387.
Shrubs; branched flattened, jointed, obovate; leaves scale-like and deciduous; aeroioles 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_


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.


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.
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.


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
   2. Stems leafy

1. Radical leaves absent:
   3. Seeds tuberculate
   3. Seeds papillose

---


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.


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.

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, verticellate 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.
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.


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 836, 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.


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 836, 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.


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.


Sivarajan 206, 762.
ALANGIACEAE DC.

Alangium Lamk. (nom. cons.)


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 ..................... Xeromphes

1. Plants unarmed:

3. Flowers in globose heads:
   4. Bracteoles 0 ......................... Anthocepalus
   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

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**


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.

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*

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.


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.


_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.


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.


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

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.


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. 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.


Sivarajan 295.
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.


*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 ... *articulare*

*B. malabarica* Sivarajan, Sp. nov.

Herba erecta, ramosa; caulis acute quadrangul- laris, 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 temporo 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 muriatus; stigma capitatum; fructus ellipsoidales, 5 mm longi, supra basin hispide, 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).
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. articulata 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 \textit{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 \textit{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.

\textit{B. stricta} (Linn. f.) Schum. in Engl. & Pr. Pfam.


\textit{Spermacoce stricta} Linn. f. Suppl. 120. 1781;


Key to the varieties

1. Capsules densely hairy outside ........... var. \textit{stricta}
1. Capsules sparsely hairy or glabrescent .. var. \textit{rosea}

\textit{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 linearlanceolata, 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, fauci 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)

The author is thankful to Dr. C. Vaczy (Cluj, Romania) for kindly rendering the Latin diagnosis.

_of_ _Barreria 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, sparcely 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, sparcely 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:

<table>
<thead>
<tr>
<th></th>
<th><em>B. stricta</em> var.<em>rosea</em></th>
<th><em>B. stricta</em> var.<em>stricta</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Habit</td>
<td>Slender, rarely branched.</td>
<td>Stout, subshrubby, often branched.</td>
</tr>
</tbody>
</table>
Leaves Linear-lanceolate, narrowly elliptic or lanceolate, lateral veins obscure, margins distinctly incurved.

Flowers Pink. White.

Fruits Glabrescent or sparsely hairy above the base.

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.


Sivarajan 169, 320.


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.


Sivarajan 464.

**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 prostate, 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 articulare*, - "Caulis herbaceus, ruber teres, undique cauliculatus 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 – articulare complex' subsequent workers amalgamated them into a single species.

Schumann (op.cit. 1891) restricted the generic name *Spermacoce* to plants of American origin and transferred 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 "articulalis", the binomial being *B. articulalis* (Linn.f.) F.N. Williams.

**Argostemma Wall.**


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.


Sivarajan 1747.
Dentella J.R. & G. Forst.


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 hairiness 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

However, recent studies by Fosberg (J. Sci. 2:106-111. 1941 & Castanea 19:25-37. 1954), Shinners (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 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**


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.


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.


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.


Sivarajan 675.


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*.


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.

Erect or diffuse, glabrous or scaberulous annuals; leaves linear; flowers 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.


Sivarajan 491, 505, 1022, 1695.


Diffuse herbs; leaves linear, glabrous or scaberulous, lateral veins absent; peduncle from the upper axils, many flowered; flowers umbel late, white or pale pink, subsessile; calyx teeth slightly shorter than the corolla; capsules didymous, opening at the tip.
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 grasslands.


Sivarajan 48, 172, 560.

**Neanotis** W.H. Lewis


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.


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.**


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


Climbing shrubs; stem slender, terete; leaves elliptic-oblung or oblanceolate, caudate-acuminate; flowers white in umbellate heads; umbels pedunculate, terminal or in the upper axils; drupes lobed.

Flowers: Jan. – Mar.

Sivarajan 57.

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


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


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.

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.


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.)

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;

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. frondosa 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 sub-
globose or ovoid, about 1 cm long.
Flowers: Aug. - Nov.
Sivarajan 460.

Pavetta Linn.

Key to the species

1. Leaves dense-tomentose beneath ............ \textit{tomentosa}
1. Leaves glabrous ......................... \textit{indica}

\textit{P. tomentosa} Roxb. ex Smith in Rees, Cyclop. 26 n. 2.

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


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.


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;


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 subsessile or short peduncled .... Blainvillea
         4. Heads long-peduncled ........ Spilanthes
      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 .................... *Epilates*

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.


*Verbesina acmella* Linn. Sp. Pl. 901. 1753.


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.


Erect, scarcely branched herbs; leaves ovate-acute, entire; heads ovoid, long-pedunculate, heterogamous and rayed; flowers white; outer ray-florets female and disk-florets bisexual; achenes triquetrous, oblong; pappus of 2-3 bristles.


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.


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.


Sivarajan 547.
Cosmos Cav.

Key to the species

1. Leaf segments linear ....................... bipinnatus
1. Leaf segments ovate or elliptic ........ sulphureus


Glabrous herbs; leaves bipinnate, segments linear-filiform; heads large and showy, rayed; ray-florets neuter; disk-florets bisexual; achenes linear, beaked, glabrous.


Sivarajan 1132.

*C.sulphureus* Cav. *Jc.* 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.


Branched shrubs; leaves digitately 3-5-lobed; heads large, showy, bright yellow on long peduncles, dialated at the top, rayed and heterogamous.


Sivarajan 741.

Tridax Linn.


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.
Launaea sarmentosa (Willd.) Alston, growing on the sandy beach, in association with Spinifex littoreus (Burm.f.) Merr.
Launaea Cass.


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.

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, hissute 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.


Sivarajan 705.
Sphaeranthus Linn.


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 Composite 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 capitulum 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.


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