

MEDICINAL PLANTS

(Indigenous and Exotic) Used in Ceylon

PART V

RUTACEAE-ZYGOPHYLLACEAE
with 76 illustrations including 12 colour plates

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INTRODUCTION

Part Five of the Medicinal Plants used in Ceylon contains 22 families from Rutaceae to Zygophyllaceae including 124 species. Seventy-six of the species are illustrated, of which twelve are in colour. Three endemic species, *Madhuca fulva* (Thw.) J.F. Macbr., *Madhuca nerifolia* (Thw.) H.J. Lam. and *Amomum masticatorium* Thw. are included for the first time as medicinal plants.

There are about ten species described in this volume which cannot be grown in Ceylon.

The bark of *Melaleuca leucadendra* Linn., Cajeput Tree, is used as a substitute for *Symplocos racemosa* Roxb., and seed of *Nigella sativa* Linn. for seed of *Carum carvi* Linn., the genuine "Kaluduru".

Acknowledgements: My grateful thanks are due to the National Science Council of Sri Lanka for financing the publication of the five volumes of this work. I wish to thank all officers of the Department of Agriculture who assisted me in the successful completion of this work and Dr. M. A. Chandraratne, the Director, in particular, who was of immense help in giving me every encouragement throughout and providing me with library and Herbarium facilities, including official transport.

I am grateful to Mrs. Nimala Amarasingh, Scientific Officer of the National Science Council for her valuable suggestions and editorial contributions and B. J. Premasuriya, Draughtman of the Department of Agriculture, for the text-figures and drawings.

D. M. A. JAYAWEERA

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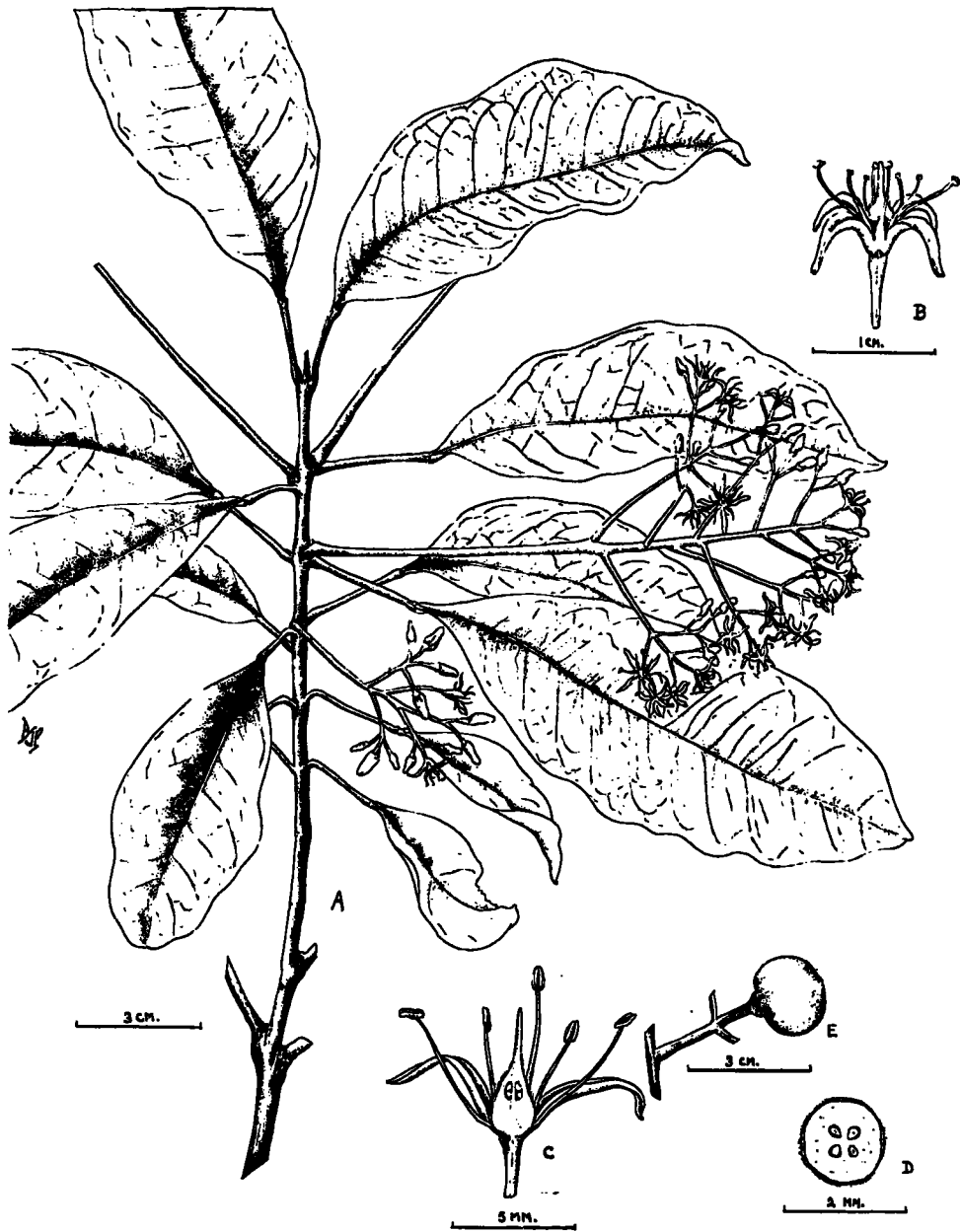


FIG. 456. *Acronychia pedunculata*. A, branch with leaves and inflorescences. B, flower lateral view. C, longitudinal section of flower. D, transverse section of ovary. E, fruit.

99. RUTACEAE

1. *Acronychia pedunculata* (Linn.) Miq. Fl. ind. Bat. Suppl. 542. 1860. (Fig. 456).

Acronychia laurifolia Bl.—*Cyminosma pedunculata* DC.—*Cyminosma ankenda* Gaertn.—*Clausena simplicifolia* Dalz.—*Jambolifera pedunculata* Linn.—*Gela lanceolata* Lour.—*Selas lanceolatum* Spreng.

Engl. Claw-flowered Laurel, Laka Wood; *Sinh.* Ankenda; *Tam.* Kattukanni, Muttainari.

A small tree with a pale smooth bark and glabrous young branches; leaves simple, opposite or some alternate, exstipulate, 7.5—12.5 cm long, oval or oblong, acute at base, usually shortly acuminate, obtuse, entire, glabrous and shining, dark green, petioles about 1.2 cm long; flowers regular, polygamous, pale yellowish green, 1.8 cm long on long pedicels, loosely arranged in pyramidal, divaricate, corymbose cymes on long straight axillary peduncles; sepals 4, fused into a 4-lobed calyx, lobes short and broad; petals 4, strap-shaped, 1.2 cm long, acute, inflexed at the tip, hairy within at base, subsistent; stamens 8, shorter than petals, 4 inner rather shorter, filaments slightly dilated at base, anthers versatile, disc large, tomentose; ovary superior, tomentose, sunk on top of the disc, 4-locular with 2 ovules in each loculus, style very short, stigma 4-lobed; fruit indehiscent, globular, 1.2—1.8 cm long, glabrous, rough with immersed glands, harder in the centre but with no distinct stone, 4-chambered.

Flowers from February to April.

Illustrations. Beddome, *Flor. Sylvat. Anal. Gen. pl. 6, fig. 4.* 1868—1873; Wight, III. *Ind. Bot. 1: pl. 65.* 1840; Gaertner, *Fruct. et Sem. Plant. 1: pl. 58, fig. 6.* 1788; Vahl, *Sym. Bot. 3: pl. 61.* 1790; Kirtikar and Basu, *Indian Med. Plants. pl. 190.* 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Malaya, Ceylon and Philippine Islands. It is common in Ceylon up to 5,000 feet elevation.

India. Sikkim: *T. Thomson*, 1857; Assam; *Jenkins*; East Bengal; *Griffith* 1190, *Kew Distribution* 1861—1862; Nilghiri & Kurg: *G. Thomson*; Pen. Ind. Or., *Wight* 309; *Wight* 362, *Kew Distribution* 1866—7. **Ceylon.** Central Prov., Kadugannawa, *Alwis*, Sept. 1922; Hunnasingiriya, *J. M. Silva* 55, June 1926. Uva Prov., Namunukula, *J. M. Silva*, March 1907; *J. C. Willis*, Oct. 1910. **Tenasserim and Andaman Islands.** *Helper* 1190, *Kew Distribution* 1861—2. **Philippine Islands.** Palawan: *Cenabre* 29991, July-Aug. 1925.

Composition. The leaves of this tree contain an aromatic oil.

Uses. The bark is used externally on swellings, fractures, sores and ulcers and taken internally as a purgative. In Indo-China, it is prescribed as a tonic for scabies.

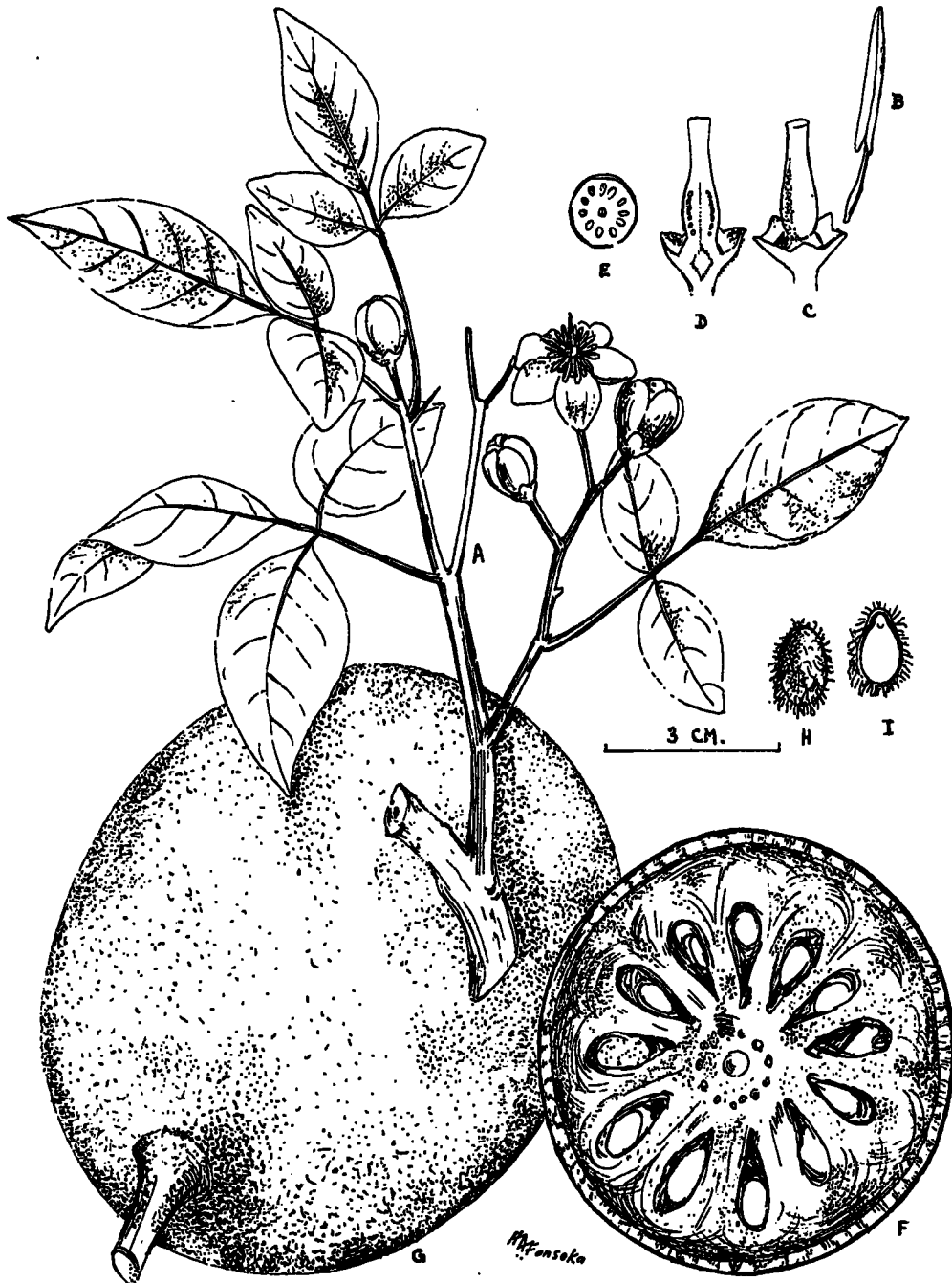


FIG. 457. *Aegle marmelos*. A, branch with leaves, open flower and flower buds. B, stamen. C, calyx and pistil. D, longitudinal section of pistil. E, transverse section of ovary. F, transverse section of fruit. G, mature fruit from outside. H, seed. I, longitudinal section of seed. B—E, enlarged.

2. *Aegle marmelos* Correa in Trans. Linn. Soc. 5: 223. 1800. (Fig. 457).

Feronia pellucida Roth.—*Crataeva marmelos* Linn.—*Crataeva religiosa* Ainslie non Vahl.

Engl. Bael Fruit Tree, Bilva; *Sinh.* Beli; *Tam.* Aluvigam, Iyalbudi, Kuvilam, Mavilangai, Vilvam, Villuvam; *Hindi* Bel; *Sans.* Adhararuha, Asholam, Atimangaliya, Bilva, Duraruha, Gandhapatra, Goharitaki, Hridayagandha, Kantakadhya, Kapitana, Karkatavha, Lakshmiphala, Mahakapithakhya, Mahaphala, Malura, Mangalya, Nilamallika, Patrashreshtha, Pitaphala, Putivata, Sadaphala, Samirasara, Sangrahi, Satyadhama, Satyaphala, Shailapatra, Shailusha, Shalatu, Shalya, Shandilya, Shivadruma, Shiveshtha, Shriphala, Sitanuna, Somaharitaki, Sunitika, Tripatra, Trishakhapatra, Trishika, Vilva.

A tree about 10—13 m in height with short, strong, sharp, spiny branches, 2.5 cm or more long in axils of leaves, bark bluish-grey with irregular furrows; leaves alternate, compound with one pair of shortly stalked opposite leaflets and a larger long-petioled terminal one, leaflets 2.5—5 cm long, ovate or oval-ovate, abrupt or tapering at base, somewhat attenuated towards the blunt apex, very shallowly serrato-crenate, smooth, thin, midrib prominent beneath; flowers regular, bisexual, pale greenish white, 1.8 cm wide, sweet-scented, stalked, solitary or in few-flowered, lax, erect, axillary or terminal cymes; calyx shallow, with 5 short, broad teeth, pubescent outside; petals 5, oblong-oval, blunt, thick, pale greenish white, dotted with glands, imbricate, spreading; stamens numerous, sometimes coherent in bundles, hypogynous, with short filaments half as long as the linear anthers; disc none or very small; ovary superior, oblong-ovoid, slightly tapering into the thick, short style which is again somewhat thickened upward, stigma capitate, axis of ovary wide, loculi numerous, 8—20, small, arranged in a circle with numerous ovules in each loculus; fruit globose, 5—12.5 cm diam., pericarp smooth, greenish-yellow, about 3 mm thick, hard, filled with soft mucilaginous tissue; seeds numerous, compressed, surrounded by slimy, transparent mucous, testa white, covered with woolly hairs, immersed in the mucous, exalbuminous.

Flowers in May.

Illustrations. Roxburgh, *Pl. Corom.* 2: *pl.* 142. 1798; Wight, *Ic. Pl. Ind. Or.*, *pl.* 16. 1838; Beddome, *Flor. Sylvat.* *pl.* 161. 1868—1873; Bentley and Trimen, *Med. Plants.* *pl.* 55. 1880; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 201. 1933.

Distribution. Occurs in dry hilly places throughout the warmer parts of India and Burma, and often cultivated in the mid and low-country in Ceylon.

India. Ranipur, *Singh* 6, May 1924; Dehra Dun, *Singh* 22, July 1924; Calcutta, Bot. Gard., *Wallich* 6379F. **Ceylon.** North Western Prov., Puttalam, cultivated, *Thwaites* C.P. 1206; Central Prov., Peradeniya, Bot. Gard., *Herb. Peradeniya*, 1878.

Composition. The leaves of this tree contain the alkaloids, aegelenine, aegelin, skimmianine. The wood contains dictamine and the bark-fagarine. The active principle in the fruit pulp is marmelosin. The fresh leaves on distillation yield a faint yellowish green volatile oil with a peculiar aromatic odour and slightly bitter taste.

Uses. The dried pulp of the unripe fruit is given along with other ingredients for dysentery, piles, dyspepsia, jaundice, scrofula, indigestion and chronic fever. The root bark is used in the form of a decoction for intermittent fever, hypochondria, melancholia and palpitation of the heart. It checks diarrhoea and gastric troubles in children. The fresh juice of the leaves is given for jaundice and anasarca. The ripe fruit is a laxative and prevents the growth of piles. In Cambodia, it is prescribed for tuberculosis and hepatitis. A decoction of the leaves is given for asthmatic complaints and the sweet-scented extract from flowers is used as an eye lotion.

A refreshing drink is prepared from the ripe fruits.

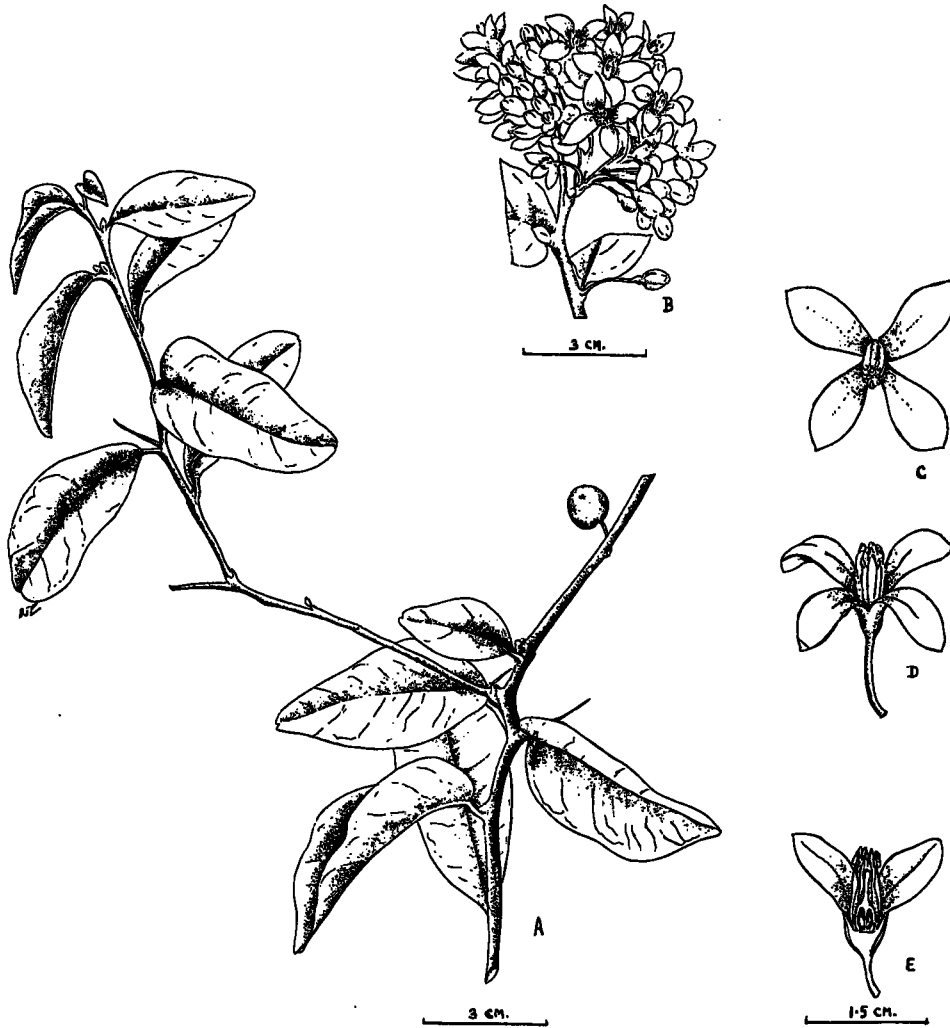


FIG. 458. *Atalantia ceylanica*. A, branch with leaves, spines and a fruit. B, inflorescence of flowers. C, flower dorsal view. D, flower lateral view. E, longitudinal section of flower.

3. *Atalantia ceylanica* (Arn.) Oliver in Journ. Linn. Soc. 5: (Suppl. 2) 25. 1861. (Fig. 458).

Rissoa zeylanica Arn.—*Sclerostylis zeylanica* Wight.—*Sclerostylis arnottiana* Wight.—*Limonia monophylla* Linn.

Sinh. Yaki-naran; *Tam.* Pey-kuruntu.

A much branched bush with very sharp, stout, axillary spines 0.6—2.5 cm long, smooth brown bark and glabrous young parts; leaves simple, alternate, exstipulate, very variable, 3—7.5 cm long, lanceolate or oval-oblong or somewhat ovate, rounded at base, emarginate or 2-lobed at apex, entire, coriaceous veiny, petioles short thick and glabrous; flowers regular, bisexual, white, fragrant, about 1.2 cm long, crowded in short, finely pubescent corymbose or racemose cymes shorter than leaves, pedicels slender and glabrous, bracts minute; sepals 4, fused into a 4-lobed calyx, lobes broad, shallow, finely ciliate, often obscure; petals 4, distinct, imbricate, oval with a broad claw, obtuse, thick, slightly concave, glandular; stamens 8, alternate ones larger, quite distinct, filaments flat, wider than anthers, anthers cordate-ovate, apiculate; ovary superior, sessile, smooth, 2-locular with 2 collateral ovules in each loculus, style short, stout, stigma clavate; fruit a globular-ovoid, 2—4 seeded berry, 1.2—1.8 cm long.

Flowers between March and August.

Illustrations. Beddome, *Flor. Sylvat. Anal. Gen. pl.* 46. 1868—73; Burmann, *Thes. Zeyl. pl.* 65, *fig.* 1. 1737; Herb. Peradeniya, drawing.

Distribution. Occurs in the warmer regions of India along the Western Ghats and Ceylon. It is rather common in the low-country in Ceylon. Colombo, Kalutara, Puttalam, Ratmale, Jaffna, Kekirawa, Bibile, etc.

Ceylon. Central Prov., Katugastota, *Lester-Smith* 9731, May 1932; Siyambalagastenne, *Alston*, Sept. 1926. Uva Prov., Bibile Dist., *J. M. de Silva*, Oct. 1925. without locality *Thwaites C.P.* 1196.

Uses. The juice of the leaves of this plant is used in the preparation of pills administered for catarrh, bronchitis and other chest complaints. The root is used in the treatment of ague.

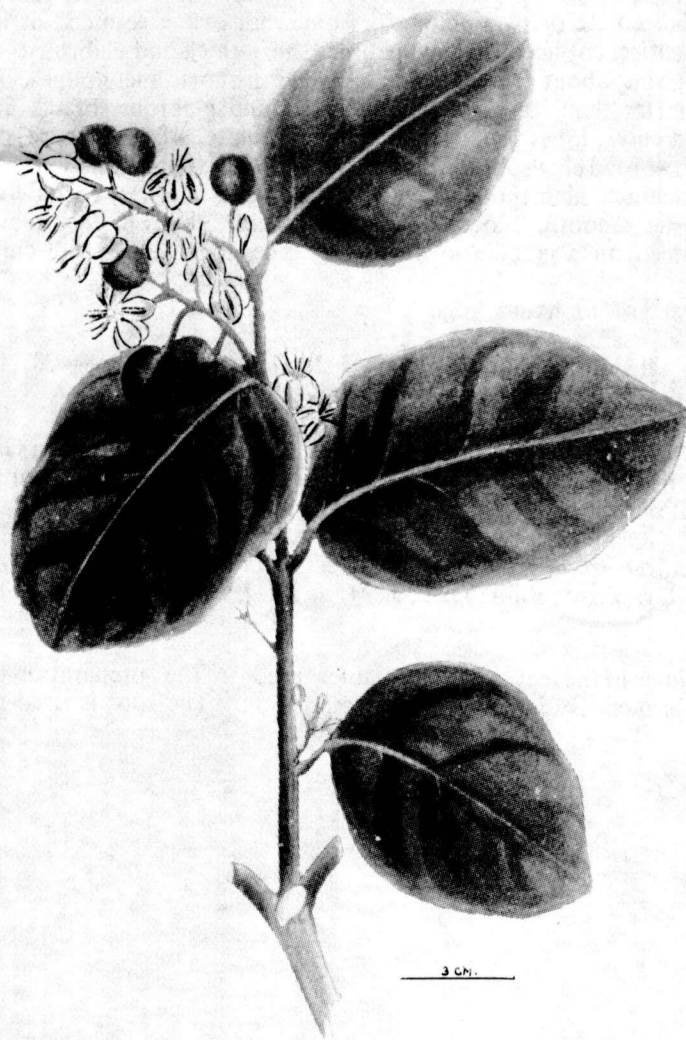
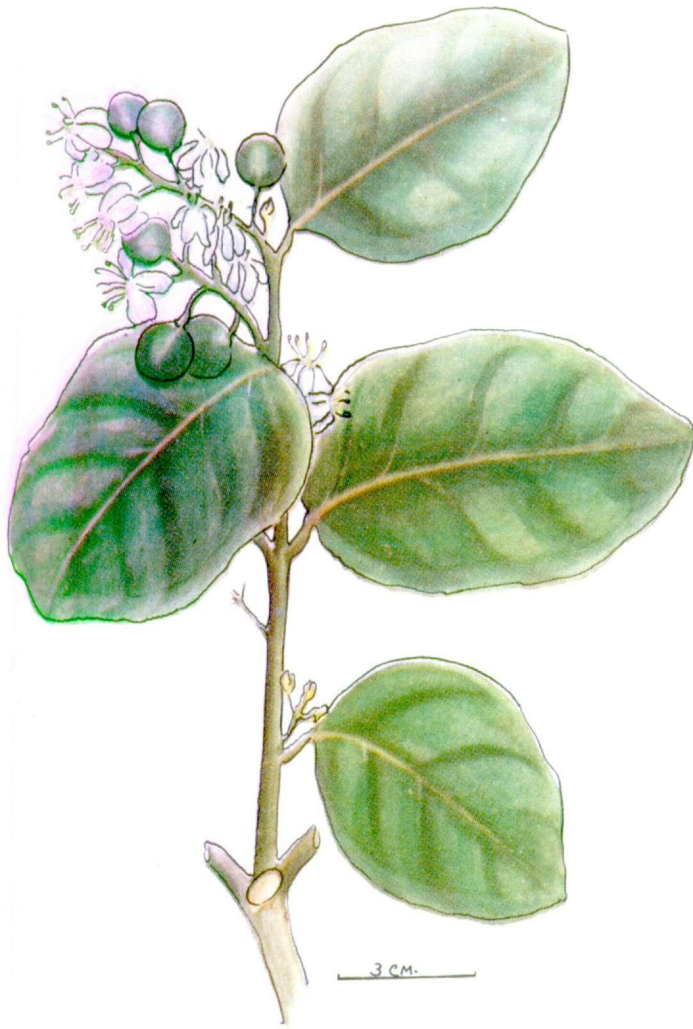


PLATE XXI. *Atalapha missionis* showing a branch with leaves, flowers and fruits.



H. Ponnaswariya

PLATE XXI. *Atalantia missionis* showing a branch with leaves, flowers and fruits.

4. *Atalantia missionis* Oliv. in Journ. Linn. Soc. 5 (Suppl.) 25. 1861. (Plate XXI).

Limonia missionis Wight.—*Chilocalyx ellipticus* Turcz.

Sinh. Pamburu; *Tam.* Kuruntu.

A much branched small tree with grey bark, rugged smooth branchlets armed with short, sharp spines 0.6—1.2 cm long; leaves simple, alternate, exstipulate, large, 6.3—10 cm long, broadly oblong or obovate-oval, somewhat tapering at base, obtuse or rounded at apex, entire or shallowly crenate, undulate, glabrous coriaceous, pellucid-punctate, veins very obscure; flowers regular, bisexual, white fragrant, numerous, 1.2 cm long in erect, glabrous, axillary panicles 2.5—6.3 cm long; sepals 4 or 5, fused into a 4 or 5-lobed small calyx, lobes acute; petals 4 or 5, distinct, imbricate, narrowly oval, spreading or recurved, soon falling; stamens 8 or 10, quite distinct, filaments slender, anthers narrowly oblong; ovary superior, small, glabrous on a short gynophore, 4 or 5-locular with 2 ovules in each loculus, style long stout, thickened upwards; fruit a 4 or 5-chambered, globular berry about 2.5 cm long with a thick rind, each chamber with one or two globose seeds embedded in a glutinous mucilage.

Flowers in April.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 175. 1839; Beddome, Flor. Sylvat. Anal. Gen. pl. 46. 1874; Herb. Peradeniya, drawing.

Distribution. Occurs in India specially in the Madras Presidency and Ceylon. It is rather common in the low-country dry regions in Ceylon. Batticaloa, Jaffna, Panadura, etc.

India. Pen. Ind. Or., Wight 323; Wallich 6358C. Ceylon. Without locality, Thwaites C.P. 1194.

Uses. The leaves of this tree are used on swellings, fractures, piles and fistula. Internally, a decoction of the leaves is given for phlegm and puerperal diseases.

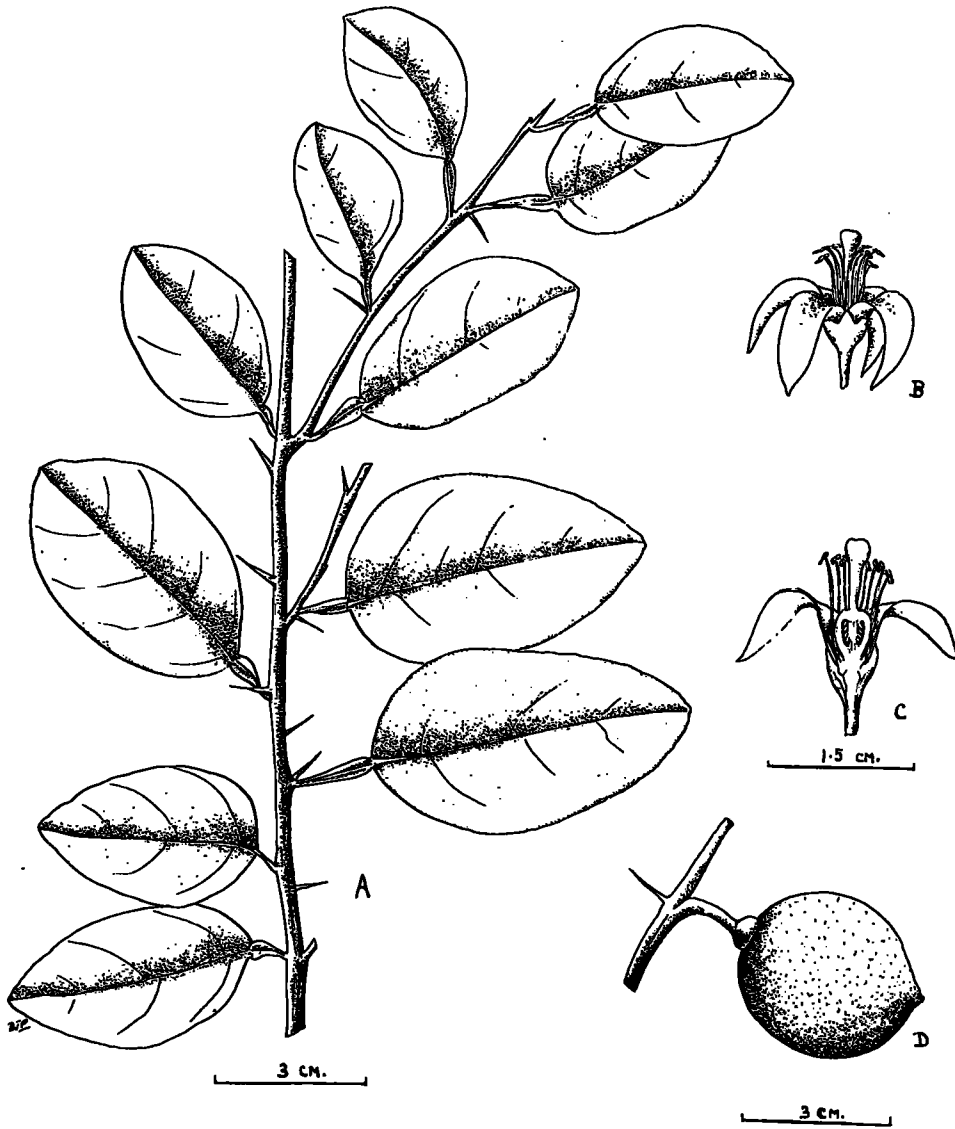


FIG. 459. *Citrus aurantifolia*. A, twig with leaves and spines. B, flowers, lateral view. C, longitudinal section of flower. D, fruit.

5. *Citrus aurantifolia* Swingle in Journ. Wash. Acad. Sc. 3: 465. 1913. (Fig. 459).

Limonia aurantifolia Christm.—*Limonia acidissima* Houtt.—*Limonia spinosum* Mill.—*Citrus acida* Moon.—*Citrus medica* var.—*acris* Martyn.—*Citrus medica* var.—*acida* Brandis.—*Citrus lima* Lunan—*Citrus javanica* Bl.—*Citrus notissima* Blanco—*Citrus limetta* var.—*aromatica* Wester—*Citrus excelsa* Wester.

Engl. Acid Lime, Sour Lime; *Sinh.* Dehi, Hindehi; *Tam.* Ambu, Ambuvagini, Arunam, Desikai, Elumichai, Eli-michumpallam, Iligusam, Murukku; *Hindi* Limee, Neembu; *Sans.* Amlajambir, Amlasara, Dantaghata, Jambira, Jantumari, Limpaka Nimbuka, Rochana, Shdhona, Vanhibija, Vanhidipya, Vijapura.

A small glabrous tree with stiff sharp spines which are simple by the side of buds: leaves simple, alternate, glandular dotted, elliptic-oblong, 5—7.5 cm long, blunt or sometimes rounded at apex, petioles short, narrowly winged, articulated at the top; flowers regular, bisexual, solitary or mostly clustered in the axils of leaves, usually about 1.2 cm long, white, fragrant throughout; sepals 5, fused into a 5-lobed calyx; petals 5, valvate, recurved; stamens 15 or more, arranged in a few bundles inserted at the base of a thick annular disc; ovary superior, abrupt at apex, 8—15-locular with large deciduous style, ovules many in each loculus; fruit round-oval to oval and small, 3.7—6.5 cm diam., exceedingly sour.

Illustration. Herb. Peradeniya, drawing.

Distribution. A native of Asia and much cultivated in India, Ceylon, Malaya, W. Indies, Florida, etc.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Feb. 1889; Uva Prov., Bibile, *Simpson* 9617, April 1932.

Composition. The juice of the lime contains citric acid, malic and tartaric acids in small quantities, pectin, sugar and traces of other salts.

Uses. The juice of the lime checks bilious vomiting and is an antiseptic particularly for cleaning wounds and is applied externally for snake bites. In Malaya, the root of the tree is given in the form of a decoction for dysentery, the pounded leaves are applied for headache and the juice of the fruit given for coughs and stomach-ache. In West Africa, lime juice is used as a leather dye. With oil it is used as a vermifuge in Senegal and Sierra Leone. The roasted fruit is applied to chronic sores and yaws.

Lime juice is extensively used for flavouring foods and as a chilled drink. The fruit is often salted, dried in the sun and preserved in its own juice as a pickle.

In Ceylon, it is an old custom to sprinkle juice of roasted lime on the body and bathing after attending funerals. Boiled lime is also used as a shampoo.

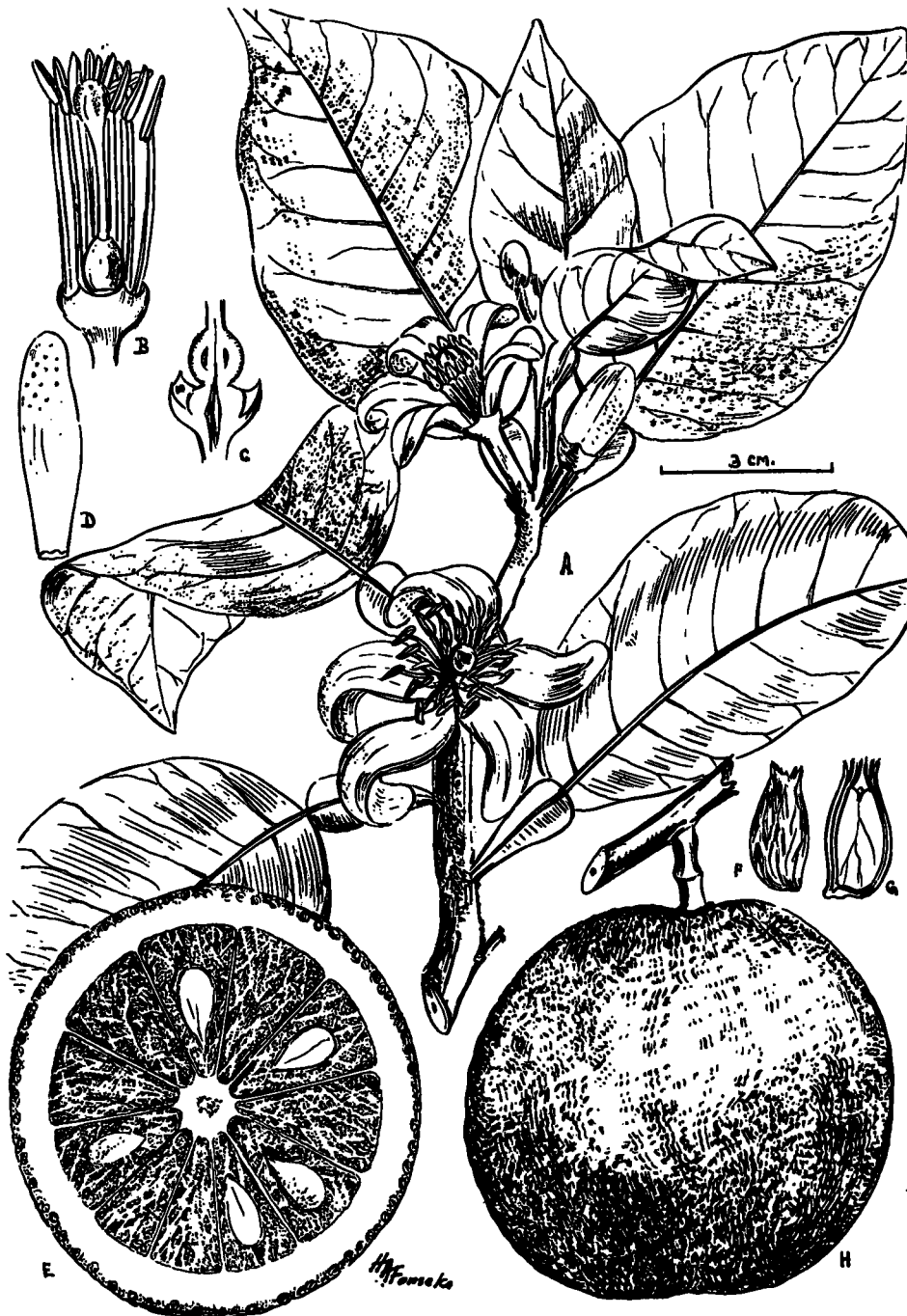


FIG. 460. *Citrus aurantium*. A, branch with leaves, flowers and flower buds. B, flower with petals and half the stamens removed to show the pistil. C, longitudinal section of ovary and calyx. D, petal. E, transverse section of fruit. F, seed. G, longitudinal section of seed showing the testa cotyledon and embryo. H, external view of fruit.

6. *Citrus aurantium* Linn. Sp. Pl. 783. 1753. (Fig. 460).

Citrus florida Salisb.—*Citrus buxifolia* Poir—*Citrus vulgaris* Risso—*Citrus aurantium* var.—*bigaradia* Brandis—*Citrus bigaradia* Loisel.

Engl. Seville or Sour orange; *Sinh.* Embul-dodan; *Tam.* Kadarai, Kadanarttai Nandam, Narangam, Narandam, Narattai *Sans.* Brihatjambhira, Nagaranga.

A glabrous tree of medium size, 7—10 m high with long but not very sharp spines; leaves of medium size, ovate-oblong, 7.5—10 cm long, shortly or bluntly acuminate, sinuate or crenate, petioles broadly winged; flowers of medium size, single or several in the axils of leaves, regular, bisexual, white and very fragrant; sepals 5, fused into a shallow calyx-tube, segments very short and pointed; petals 5, free, valvate, strap-shaped, recurved; stamens 20 or more, arranged in a few bundles round the pistil; ovary superior, globular, 10—12 locular with a large deciduous style; fruit globose or slightly flattened endwise, about 7.5 cm diam, rough, pulp acid and membranes bitter, core hollow at maturity, segments 10—12.

Illustrations. Wight, *Ic. Pl. Ind. Or., pl. 957. 1843—1845*; Bentley and Trimen, *Med. Plants, pl. 52. 1880*; Herb. Peradeniya, drawing.

Distribution. Probably a native of Cochin-China and cultivated in India, Ceylon, Africa and Philippine Islands.

Ceylon. Central Prov., Peradeniya, Bot. Gard., *Herb. Peradeniya, April 1889*. Uva Prov., Bibile, Exp. Station, *Simpson 9619, April 1932*. **Philippine Islands.** Mindanao. Davavo Prov., *Ramos and Edano 49220, March-April 1927*.

Composition. The oil distilled from the flowers of this tree contains d-limonene, geraniol and methyl anthranilate. The rind of the fruit yields a volatile oil, a gum-resin, a fixed oil δ -limonene and three glucosides hesperidin, isohesperidin, aurantiamarin, pentamethoxy flavone, auranetin and tannin. The juice of the fruit contains mucilage, sugar, citric acid and inorganic salts, while the leaf has ascorbic acid and l-stachydrine.

Uses. The mature fruit is used with pepper and rock salt as a throat swab on inflamed glands and tonsils to draw out phlegm. The juice mixed with sugar of *Borassus flabellifer* and sugarcane juice is given for chronic cough. In Vietnam, the fruit is used as a diaphoretic and purgative, while in the Philippines it is an ingredient in food given to invalids in febrile, inflammatory and scorbutic conditions.

The fruit is chiefly used in the manufacture of marmalade.

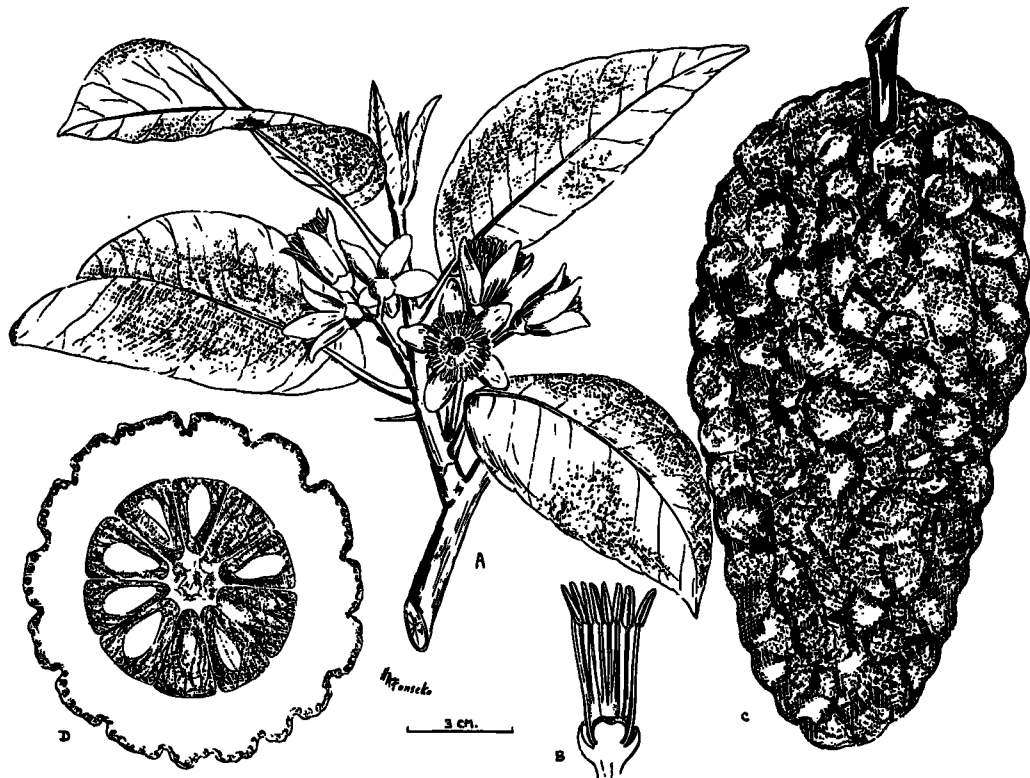


FIG. 461. *Citrus medica*. A, branch with leaves, spines and clusters of male flowers. B, longitudinal section of a male flower with corolla removed. C, fruit. D, transverse section of a fruit.

7. *Citrus medica* Linn. Sp. Pl. 782. 1753. (Fig. 461).

Citrus aurantium var.—*medica* W.&A.

Engl. Citron; *Sinh.* Lapnaran, Maha-ratadehi, Sideran; *Tam.* Kogilacham, Kommattimadalai, Maruchagam, Sidalai; *Hindi* Maphal; *Sans.* Amlakeshara, Begapura, Bijaka, Bijaphalaka, Bijapur, Bijapurna, Dantura chhada, Jantughna, Madhuramphala, Mahaphala, Matulunga, Phalapura, Rochanaphala, Ruchaka, Sukeshar, Supura, Vijapura.

A small tree or shrub about 3m high with irregular, straggling, short, thick branches, bark whitish grey, young shoots purplish to violet coloured; leaves simple, alternate, large, lamina 12.5—15 cm long, broadly oblong or oval-oblong, tapering to the base, bluntly crenate-serrate, stiff but not thick, gland-dotted, dark green above, pale beneath, petioles very short, not winged, axillary spines large; flowers unisexual, regular, usually in clusters (3—10), pink flowers, buds purplish; calyx shallow, persistent with 5 spreading teeth; petals 5, oblong, spreading, white above, strongly tinged with purplish pink externally; stamens 20—40, filaments nearly as long as petals, separate or more or less united into fours, hypogynous; ovary superior, supported on and surrounded at the base by a large, firm, rounded disc, 10-locular with several descending ovules in each loculus, fruit very large, oblong, blunt, not mammilate at apex, surface usually lobulated and rugged, pale or dark bright yellow, rind very thick and hard, pulp scanty and pale.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 53. 1880; Herb. Peradeniya, drawing.

Distribution. Occurs in India along the foot of the Himalayas, Western Ghats, Khasia mountains and Chittagong. It is cultivated in S. Europe, Mediterranean regions and in the hill-country gardens in Ceylon.

India. Sikkim: *J. D. Hooker*. Khasia: *J. D. Hooker & T. Thomson*. Silhet: *Wallich* 6385. Ceylon. Central Prov., Hakgala, Bot. Gard., *Simpson* 9024, Jan. 1932; Peradeniya, Bot. Gard., *F. W. de Silva*, June 1930.

Composition. The oil extracted from the rind of the fruit contains δ -limonene and citral while the pulp of the fruit contains the glucoside hesperidin.

Uses. The juice of the fruit with crude potassium carbonate ('yawakara-lunu') and bees' honey is given for pleurodynia, sciatica, lumbago and pain in the hip, joints, etc. The leaves, bark and fruit in combination with other drugs are prescribed for snakebite. The rind of the fruit is made into a preserve and used for treating dysentery.

The essence of citron is employed in perfumery.

8. *Citrus sinensis* Osbeck, Dagbok Ostind. Resa. 41. 1775.

Citrus aurantium var.—*sinensis* Linn.—*Citrus aurantium* Moon—*Citrus aurantium* Lush.—*Citrus longispina* Wester.

Engl. Orange, Sweet Orange: *Sinh.* Dodan, Peni-dodan; *Tam.* Narangam, Pattaviya, Pandil, Puttansini, Sadagadi, Sini; *Sans.* Airavata, Chakradivasi, Gandhadhya, Gandhapatra, Kirmira, Kirmirtvaka, Mahanarama, Mukhapriya, Nagar, Nagaranga, Nagruka, Naranga, Nariyanga, Suranga, Svadunaranga, Tvagagandha, Tvakasugandha, Vaktravasa, Varishtha, Yogaranga.

A small tree with an upright trunk, much branched above and spreading out to form a spherical head, bark greyish brown; leaves simple, alternate, often with short, solitary, sharp spines in the axils, oval or ovate-oblong, acute, 7.5—10 cm long, smooth and shining, dark green, paler beneath, entire or faintly serrate, articulated on the petiole, petioles 1.2—2.5 cm long, broadly or narrowly winged; flowers regular, bisexual, usually solitary, sometimes 2—6-flowered in axillary peduncles shorter than the petioles, white, fragrant; calyx cup-shaped with 5 short, broad, acute teeth, thick, pale green, persistent; petals 5, oblong, 2.5—3.1 cm long, thick and fleshy, blunt, white with yellowish sunken glands on the back, strongly recurved; stamens 20—25, hypogynous, filaments unequal, flattened, often united at the base in threes or fours, shorter than petals, anthers oblong-linear, versatile, bright yellow; ovary superior, cylindrical, striated longitudinally, with numerous oil glands below the epidermis, surrounded at the base by a swollen, prominent, rounded disk, 8 or more locular with several anatropous ovules in each loculus attached in two rows to the axile placentae, style thick, nearly as long as the stamens, stigma rounded and channeled; fruit a large rounded berry, 9—11 chambered, the loculi packed with soft tissue of large, irregular, fusiform, horizontal, loosely connected cells or vesicles, filled with sweet juice, the dissepiments very thin, membranous, the axis spongy, pericarp thin, spongy, externally smooth, slightly irregular due to the numerous projecting oil cysts below the epidermis, seeds several in each chamber, horizontal, oblong-ovoid, somewhat compressed with a blunt pointed apex and somewhat truncate at the hilum, testa soft, pale yellow, veiny and exalbuminous.

Flowers in April and May.

Illustration. Bentley and Trimen, *Med. Plants*, pl. 51. 1880.

Distribution. A native of China or Cochin-China and now cultivated in both hemispheres especially in the Mediterranean regions. It is a common tree in the village gardens in Ceylon.

Ceylon. Central Prov., Peradeniya, Bot. Gard., *Herb. Peradeniya*, Feb. 1889. Uva Prov., Bibile, Exp. Station, *Simpson* 9618, April 1932.

Composition. According to Nadkarni, the rind of the fruit contains a volatile oil, a gum resin, a fixed oil which consists of terpene, d-limonene, three glucosides namely herperidin, isohesperidin and aurantiamarin and tannin. The flowers and the fresh rind yield a volatile oil called oil of neroli used in perfumery. The leaves and unripe fruits possess a volatile oil which consists of limonene, nerolol, nerolyl-acetate and geraniol. The juice of the orange contains β -sitosteryl-d-glucoside, β -sitosterol, sugar, citric acid, inorganic salts, enzymes and vitamins A, B and C.

Uses. The juice of the orange is extremely beneficial to invalids suffering from coughs, bronchitis, diabetes and liver and heart ailments. It is a blood purifier and antiscorbutic. Orange peel is an ingredient in the preparation of various tinctures. The oil extracted from the rind is given internally as a stomachic and applied externally as a liniment on gout and rheumatism. In Vietnam, the plant is used as a diuretic and purgative. In Ecuador, an extract from the seed is used in the treatment of malaria which brings about a contraction of the enlarged spleen. In India, a poultice of the leaves is applied on certain skin conditions.



FIG. 462. *Clausena indica*. A, twig with leaves and a terminal panicle of flowers. B, flower lateral view. C, longitudinal section of pistil with calyx and corolla removed. D, stamen. E, fruits.

9. *Clausena indica* Oliv. in Journ. Linn. Soc. 5 (Suppl.): 36. 1861. (Fig. 462).

Piptostylis indica Dalz.—*Bergera nitida* Thw.

Sinh. Migon-karapincha; *Tam.* Pannai, Purankainari.

A small tree or shrub with pubescent young parts; leaves compound, alternate, exstipulate, imparipinnate, large, 15—30 cm long, rachis glabrous or puberulous, leaflets 7—13, distant, alternate, shortly stalked, 3.7—8.9 cm long, very unequal at base; ovate or lanceolate, obtusely acuminate, very faintly crenate, wavy, glabrous on both sides and shining; flowers regular, bisexual, small, greenish white, 6—8 mm long, shortly pedicellate in a short strictly terminal panicle; sepals 5, small, ovate-triangular, ciliate; petals 5, distinct, imbricate, oval-oblong; stamens 10, distinct, filaments slightly dilated in the middle; ovary superior, 2-locular, glabrous, glandular on a short broad gynophore, style short, stigma capitate; fruit a nearly globular, pink or cream-coloured smooth berry about 1.2 cm long, gland-dotted and with abundant pulp, seed solitary and green.

Illustrations. Beddome, Flor. Sylvat. Anal. Gen. *pl.* 44. 1874; Herb. Peradeniya drawing.

Distribution. Occurs in India and Ceylon. It is rather common in the low-country dry regions. Kurunegala, Jaffna, Anuradhapura, Mannar, etc.

India. Madras: *Beddome* 342. **Ceylon.** North-Western Prov., Mannar, *Crawford* 139. 1890; Central Prov., Kandy, *Herb. Wight* 1200; without locality, *Thwaites C. P.* 1203.

Uses. An infusion of the stem of this plant is given for colic and diarrhoea. The leaves and roots are used for indigestion and as a diuretic.

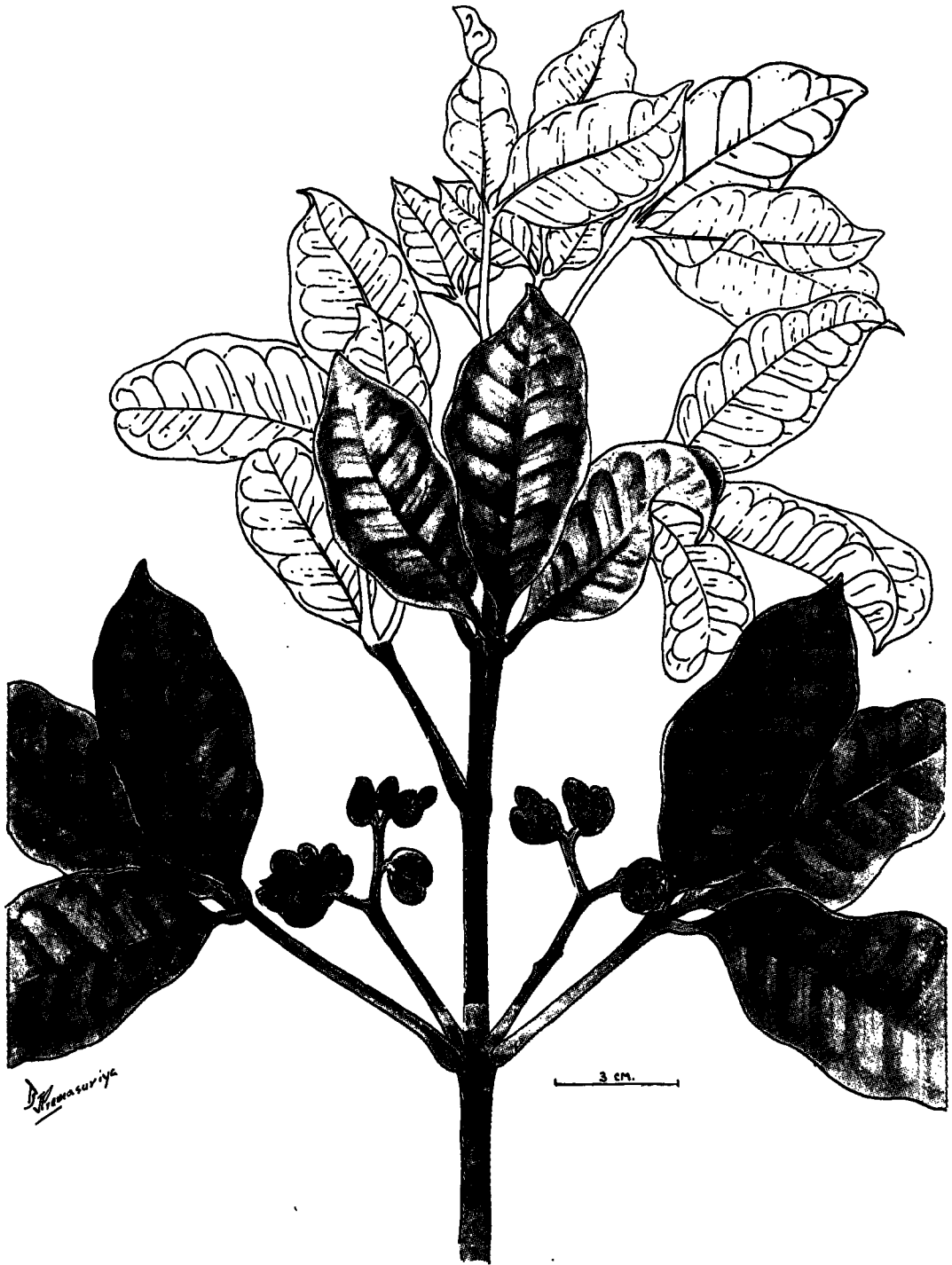


PLATE XXII. *Euodia lunu-ankenda*. Branch with leaves and fruits.

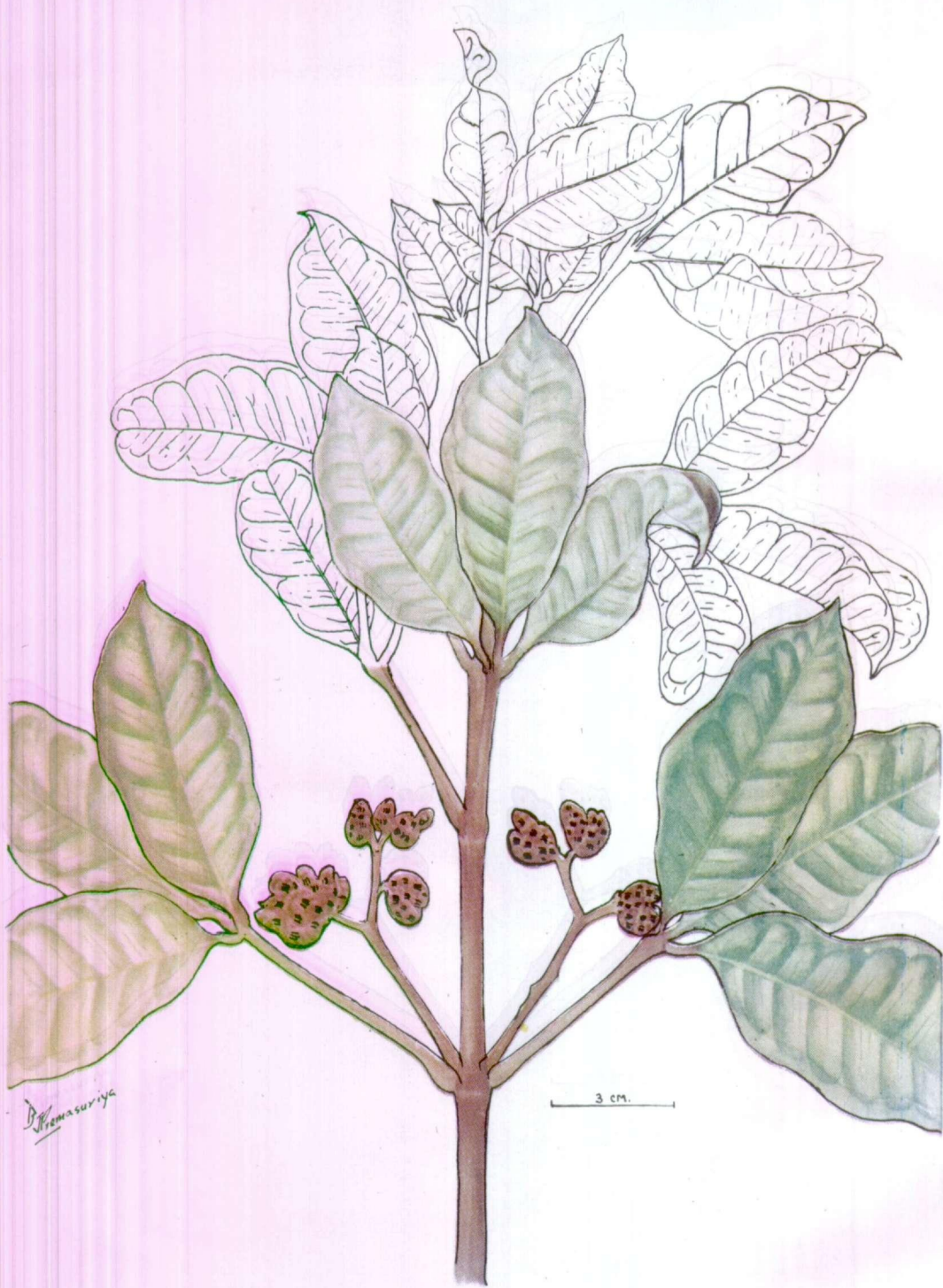


PLATE XXII. *Euodia lunu-ankenda*. Branch with leaves and fruits.

10. *Euodia lunu-ankenda* (Gaertn.) Merr. in Phil. Journ. Sci. 7: 378. 1913. (Plate XXII).*Euodia roxburghiana* Benth.—*Fagara lunu-ankenda* Gaertn.*Sinh.* Ankenda, Lunu-ankenda, Nebeda; *Sans.* Vanashampaga.

A small tree with opposite branches, bark grey, smooth, young parts finely tomentose; leaves opposite, 3-foliate, petioles as long as leaflets; leaflets 6—7.5 cm long, nearly sessile, oval or obovate-oval, tapering at base, shortly acuminate, entire, emarginate, glabrous when mature, pale beneath, lateral veins prominent, nearly horizontal; flowers unisexual, greenish-yellow on very short pedicels, densely crowded in small clusters at end of opposite branches of axillary pubescent panicles much shorter than leaves; sepals minute, 4 or 5, imbricate, rounded, pubescent; petals 4 or 5, valvate, ovate-oblong, acute; male flowers: stamens 4 or 5, rather exceeding petals, disc large, 4-lobed, prominent; female flowers: stamens shorter than petals; ovary superior, pubescent, 4-lobed, 4-locular with 2 ovules in each loculus, style much longer than petals; ripe carpels 1—4, globular-ovoid, 6 mm long, finely modulated, brown; seeds hemispherical, smooth and shining, blue-black in colour.

Flowers in April and May.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 204. 1839; Herb. Peradeniya, drawing.*Distribution.* Occurs in India, Ceylon, Malay Peninsula, Sumatra and Java. In Ceylon, it is common in lower elevations and rarer higher up between 2,000 and 6,000 feet altitude.

India. Mt. Khasia: *J. D. Hooker & T. Thomson.* Madras: *Beddome* 296. Pen. Ind. Or., *Herb. Wight* 534, Kew Distribution 1866—7. *Ceylon.* Without locality, *Thwaites C.P.* 538. Central Prov., Hakgala, *A. M. Silva*, April 1906; *A. M. Silva*, March 1906; *A. de Alwis*, March 1922; Wattakelle, *Herb. Peradeniya.*, April 1886; Magastota-Hakgala, *J. M. Silva*, May 1911; Nuwara Eliya, *Herb. Gardner* 163; Horton Plains, *Mueller-Dombois* 67070834, July 1967. *Malay Peninsula.* Perak, *King's Collector* 5269, Dec. 1883; *King's Collector* 7573, May 1885; *King's Collector* 5649, March 1884.

Uses. An infusion of the leaves and flowers of this tree is given as a tonic and emmenagogue. The juice of the leaves is administered for fever. A decoction of the root or root bark boiled in oil is taken for improving the complexion. In Indo-China, the plant is used as a bitter tonic and the bark and leaves are given for fever.

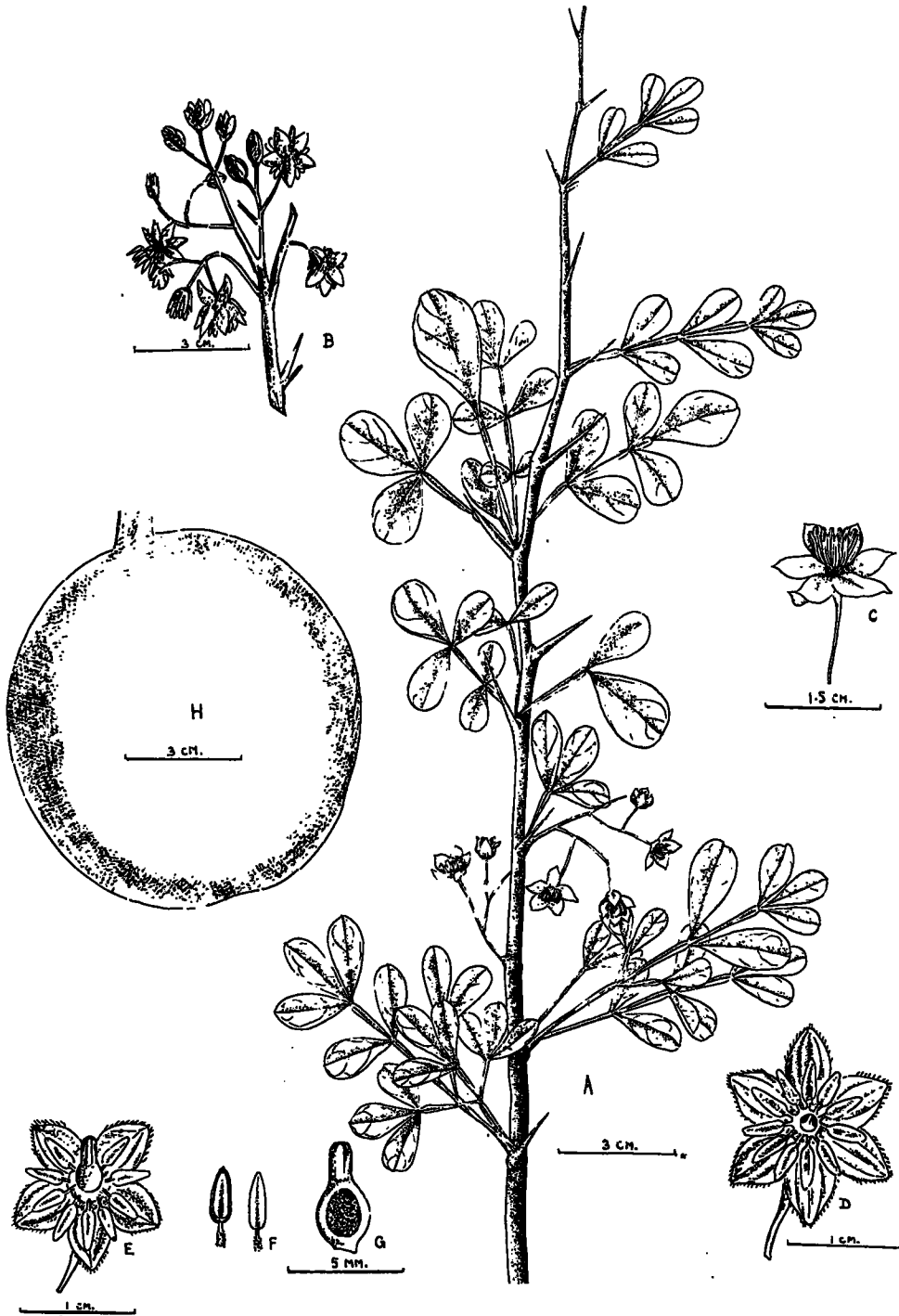


FIG. 463. *Feronia limonia*. A, branch with leaves, spines and panicles of flowers. B, panicle of flowers. C, male flower lateral view. D, male flower dorsal view. E, bisexual flower dorsal view. F, stamens. G, longitudinal section of ovary. H, fruit.

11. *Feronia limonia* (Linn.) Swingle in Journ. Wash. Acad. Sc. 4: 328. 1914. (Fig. 463).

Feronia elephantum Correa—*Limonia acidissima* Linn.—*Schinus limonia* Linn.—*Crataeva vallanga* Koenig mss.

Engl. Elephant Apple, Wood Apple; *Sinh.* Divul, Jool; *Tam.* Kabittam, Karuvila, Kuttvila, Mayladikkuruntu, Narivila, Pitavila, Savarilottiram, Silangam, Sirittam, Suppiyam, Suvarasam, Suvedegam, Tilavagam, Ubalottiram, Vellil, Vellilottiram, Vila, Vilakkabittam, Vilatti; *Hindi* Khaet; *Sans.* Akshasasya, Bhukapittha, Chirpaki, Dadhiphala, Dadhittha, Dantaphala, Dantashatha, Devapadadhya, Gandhaphala, Gopakarna, Grahi, Grahiphala, Granthiphala, Kagittha, Kapipriya, Kapisitha, Kapittha, Karanjaphalaka, Kasabhavallabha, Kathinyaphala, Kavittha, Kuchaphala, Malura, Mangalya, Manmatha, Nilamallika, Phala-sugandha, Pushpaphala.

A small tree with numerous branches, smooth whitish bark and sharp straight ascending spines 1.2—3.7 cm long; leaves compound, alternate, exstipulate, pinnate, 7.5—10 cm long, rachis and petiole flat, very narrowly winged, glabrous, leaflets opposite in 2 or 3 pairs and a terminal one, nearly sessile, 2.5—3.7 cm long, oval or obovate, obtuse, entire, glabrous, basal ones the largest; flowers regular, polygamous, pale green stained with red-purple and anthers dark red, small, numerous in small, paniculate, sessile cymes from axils of fallen leaves, pedicels slender and pubescent; sepals 5, fused into a 5-toothed small calyx; petals 5, distinct, imbricate, ovate, acute, spreading and smooth; stamens 7—12, equal, distinct, filaments very short; anthers very large, oblong; ovary superior on a short finely woolly disc, 5-locular with numerous ovules in each loculus, style very short, stigma fusiform; fruit large, 5—9 cm diam., globose, hard, pericarp woody, rough, whitish, 1-chambered with many seeds immersed in the pulp, seeds oblong, compressed.

Flowers in February and March.

Illustrations. Roxburgh, *Pl. Corom. 2: pl. 141.* 1798; Wight, *Pl. Ind. Or., pl. 15.* 1838; Beddome, *Flor. Sylvat. pl. 121.* 1868—1873; Kirtikar and Basu, *Indian Med. Plants, pl. 200.* 1933.

Distribution. Occurs throughout the dry regions in India and Ceylon. It is very common in the dry zone.

India. Mysore & Carnatic: *G. Thomson.* West Bengal: Calcutta, *Bot. Gard., Wallich 6380F.* Pen Ind. *Or., Herb. Wight 330.* Ceylon. Without locality, *Thwaites C.P. 1205.*

Uses. The fruit of this tree is an aromatic stimulant and a stomachic. The pulp of the unripe fruit along with other ingredients is used in chronic diarrhoea and dysentery. The ripe fruit is useful in hiccoughs, ailments of the gums and throat and applied externally on bites of venomous insects. The gummy exudation from the trunk with bees' honey also cures, diarrhoea and dysentery. The bruised leaves are used with great benefit in bowel complaints in children. The bark is prescribed for biliousness and all parts of the plant for snakebite.

The ripe fruit is eaten with sugar or honey as a custard.

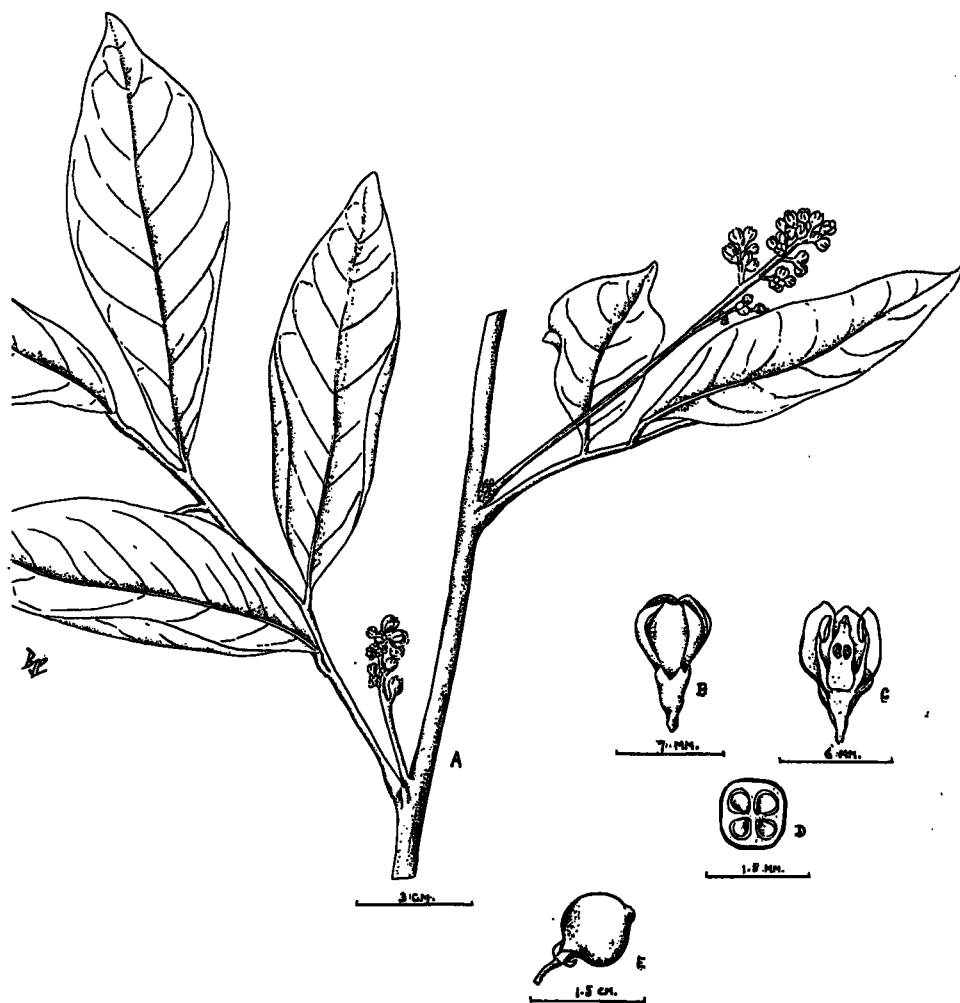


FIG. 464. *Glycosmis pentaphylla*. A, portion of a branch with leaves and panicles of flowers. B, flower lateral view. C, longitudinal section of flower. D, transverse section of ovary. E, fruit.

12. *Glycosmis pentaphylla* (Retz.) Correa in Ann. Mus. Hist. Nat. 6: 386. 1805. (Fig. 464).

Limonia pentaphylla Retz.—*Limonia arborea* Roxb.—*Toluiifera cochinchinensis* Lour.—*Glycosmis citrifolia* Lindl.—*Glycosmis angularis* Elm.—*Glycosmis cochinchinensis* Pierre ex Engler—*Glycosmis chilocarpa* W. & A.—*Glycosmis arborea* DC.—*Glycosmis retzil* Roem.—*Myrospermum chylocarpum* Roem.—*Murraya exotica* Blanco.

Sinh. Dodanpana; *Tam.* Anam, Kattukkonji, Konji, Kulapannai; *Sans.* Ashva-shakola.

A shrub or small tree without spines and the young parts scurfy-pubescent; leaves alternate or opposite, compound, exstipulate, imparipinnate, rachis flattened with sharp edges, leaflets 3—5, often reduced to one, rarely 7, nearly sessile, 5—12.5 cm long, oval, acute at base, shortly acuminate, obtuse, entire or faintly denticulate; flowers regular, bisexual, white, very sweet scented, small, less than 1.2 cm long, nearly sessile, crowded in small clusters arranged in erect, rusty pubescent, axillary panicles 2.5—10 cm long; sepals 5, distinct, imbricate, small, obtuse; petals 5, distinct, imbricate, lanceolate; stamens 10, distinct, alternate ones shorter, filaments flattened; ovary superior, on a short thick gynophore, broader than long, studded with large glands, 5-locular, style as wide as the ovary, stigma capitate; fruit a globose berry, 1 cm long, apiculate, smooth, pinkish white or cream coloured, seeds one or two, testa membranous, cotyledons green.

Flowers from January to April.

Illustrations. Beddome, *Flor. Sylvat. Anal. Gen. pl. 6, fig. 6.* 1874; Roxburgh, *Pl. Corom. 1: pls. 84 & pl. 85.* 1795; Curtis, *Bot. Mag. pl. 2074.* 1819; Herb. Peradeniya, drawing.

Distribution. Occurs in the tropical and sub-tropical regions of India, Ceylon, Malaya, China, Borneo and Australia. It is common as an undergrowth under the shade of trees in dry regions from sea level to 3,000 feet elevation in the low-country in Ceylon. Colombo, Kandy, Galagama, Kalutara, etc.

India. Malabar, Concan, etc. *Stocks, Law, etc.* Bengal: Shibpur, *Gammie*, July 1894; E. Bengal, *J. D. Hooker & T. Thomson*; Calcutta, cultivated, *Wall. Cat.* 63731. Pen. Ind. Or., *Herb. Wight* 363, Kew Distribution, 1866—7. Ceylon. Eastern Prov., Batticaloa, *Mueller-Dombois* 67081415, Aug. 1967. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya, Park*, April 1926. Western Prov., Kalutara, *J. M. Silva*, Feb. 1922. Southern Prov., Ruhuna National Park *Mueller-Dombois & Cooray* 68013105, Jan. 1968, without locality, *Thwaites C.P.* 180. Malaya. Chittagong, *King's Collector* 168, Sept. 1885. Tenasserim and Andamans. *Herb. Helfer* 541, Kew Distribution 1861—2. Cocos Island. *Prain*, 1889.

Composition. This plant contains the alkaloids glycosine, glycosmimine, skimminine and the leaves kokusagine and an unnamed alkaloid. In addition, the plant has an active principle glycosmine, a tannin, a phlobaphene, traces of salicin and sugars.

Uses. The juice of the leaves is used for fevers, liver complaints and for intestinal worms in children. The leaves are applied externally as a paste on eczema and other skin diseases.

13. *Micromelum ceylanicum* Swingle, Abeywick. Cey. Journ. Sci 2 (2): 178. 1959.

Micromelum compressum (Blanco) Merr.—*Micromelum minutum* W. & A.—*Micromelum pubescens* Bl.—*Micromelum glabrescens* Benth.—*Limonia minuta* Forst. f.—*Bergera integerrima* Roxb.

Sinh. Wal-karapincha; *Tam.* Kakaipalai.

A small tree with finely and densely pubescent shoots; leaves compound, alternate, exstipulate, imparipinnate, 20—25 cm long, rachis pubescent, leaflets 9—15, alternate or subopposite, shortly stalked, 3.7—7.5 cm long, ovate-lanceolate, very oblique at the base, attenuate, obtuse, irregularly finely crenate and wavy with very numerous, rather conspicuous glands above, slightly pubescent beneath; flowers regular, bisexual, white, strong-smelling, 0.6—1.2 cm long, very shortly stalked, arranged in terminal and axillary, spreading, pubescent, dichotomous, corymbose cymes, bracts small, opposite at the bifurcations; sepals 5, fused into a 5-lobed calyx, lobes broad, triangular and pubescent; petals 5, distinct, valvate, oblong-linear, spreading, pubescent; stamens 10, distinct, alternate ones shorter; ovary superior, on a short gynophore, 5-locular with 2 superposed ovules in each loculus, oblong, very hairy, style longer than ovary and very thick, stigma capitate; fruit an oblong-ovoid, 1-seeded berry, pointed, rough with glands, glabrous and yellow.

Flowers from October to February.

Illustrations. Beddome, Flor. Sylvat. Anal. Gen., pl. 7, fig. 1. 1874; Herb. Peradeniya, drawing.

Distribution. Occurs in the northern part of India, Ceylon, Burma, Malacca, Malaya, Java, China and in the Pacific Islands but not in South India. It is rather common in the low-country especially in the dry regions of Ceylon.

Ceylon. Central Prov., Kandy, Udawattekelle, *Senaratne* 10051. March 1953; *Meijer* 3, June 1970; Gannoruwa, *Alston*, Jan. 1926; *Wirawan* 611, Oct. 1968; Peradeniya, *Mueller-Dombois* 67110930, Nov. 1967; Murutalawa, *Appuhamy*, Oct. 1958. Sabaragamuwa Prov. Balangoda, *Thwaites C.P.* 188. Uva Prov., *Bibile, J. M. Silva*, July 1924. Samoa. *Horne* 91131, March 1879.

Composition. The leaves and stems of this tree contain an unnamed alkaloid.

Uses. This plant is used as a substitute for *Murraya koenigii* Spreng., medicinally. It is recommended for phthisis and chest troubles in Malaya and Indonesia. The root is chewed with betel leaves for coughs. The boiled roots are applied as a poultice for ague.

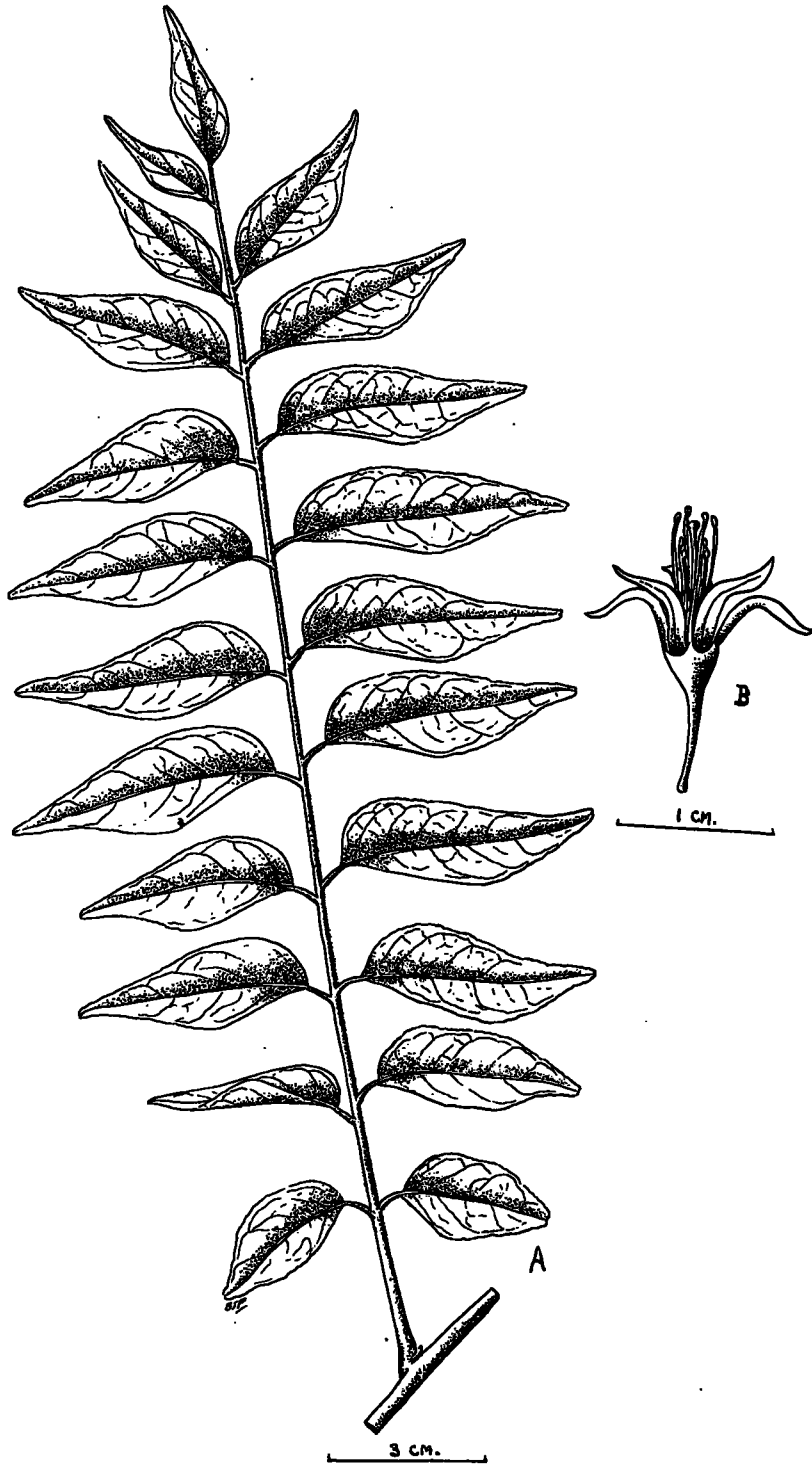


FIG. 465. *Murraya koenigii*. A, compound leaf. B, flower lateral view.

14. *Murraya koenigii* Spreng. Syst. Veg. 2: 315. 1825. (Fig. 465).

Bergera koenigii Linn.

Engl. Curry-leaf Tree; *Sinh.* Karapincha, Karrypincha; *Tam.* Karuvembu, Karuveppilai, Kattuveppilai; *Sans.* Alakavhaya, Chhardighna, Girinimba, Kadarya, Kalasaka, Krishnanimba, Mahanimba, Maharishtha, Nimbapatra, Priyasala, Raman, Sauranimba, Shuklasara, Surabhi, Surabnimba, Varatikta.

A small tree with dark grey bark and pubescent branchlets; leaves compound, alternate, exstipulate, imparipinnate, somewhat crowded, spreading, 15—25 cm long, rachis pubescent, leaflets 15—25, shortly stalked, 2.5—5 cm long, oval or oblong-lanceolate, very oblique at base, slightly caudate, obtuse or emarginate at apex, irregularly crenate, glabrous above, pubescent beneath, the lower ones smaller, and more rotundate; flowers regular, bisexual, white, fragrant, about 1.2 cm long on short pedicels and in much branched, flat-topped, corymbose terminal cymes, bracts minute; sepals 5, small, nearly distinct, triangular, subacute, pubescent; petals 5, linear, erect, glabrous, valvate gland-dotted; stamens 10, free, alternate ones shorter, inserted on a fleshy disc, filaments narrowed at the top; ovary superior, glabrous, without a gynophore, 2-locular with usually one ovule in each loculus, style long, stigma large, capitate; fruit a globular berry 0.6—1 cm long, apiculate, black, 2-seeded, rough with glands.

Flowers in December and August.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 13. 1838; Roxburgh, *Pl. Corom. 2: pl. 112. 1798*; Kirtikar and Basu, *Indian Med. Plants*, pl. 192. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India and Ceylon. It is very common in the low-country dry zone but rather rare in the hills of Anuradhapura, Polonnaruwa, Maturata, Badulla, etc.

India. N. Canara: Yellapore, *Talbot* 10/62, March 1882; Uttar Pradesh: Dehra Dun, *King. Bengal: Kurz*, March 1867; N. Bengal, *Kurz*, May 1867. *Pen. Ind. Or.*, *Wight* 327. **E. Pakistan.** Dacca, *Clarke* 20098. June 1873. **Ceylon.** Without locality, *Thwaites C.P.* 2547. **Maldive Islands.** Hikundi, *Didi* 100, 1896.

Composition. The fruit of this plant yields an oil and the leaves contain a glucoside called koenigin.

Uses. The leaves, bark and roots are tonic and stomachic. The leaves with other ingredients are roasted, made into a powder and given for constipation, abdominal colic and diarrhoea. The boiled leaves are given for hiccough and hoarseness. The juice of the fresh leaves is also given for diarrhoea and dysentery. The bruised leaves are applied externally on eruptions.

The leaf of this plant is the familiar "curry-leaf" used for flavouring soups, vegetables and meat dishes.



PLATE XXIII. *Paramignya monophylla*. A, branch with leaves and flowers. B, flower with corolla removed showing the calyx, gynophore and pistil. C, stamen with flattened hairy filament. D, fruit. B & C, slightly enlarged.

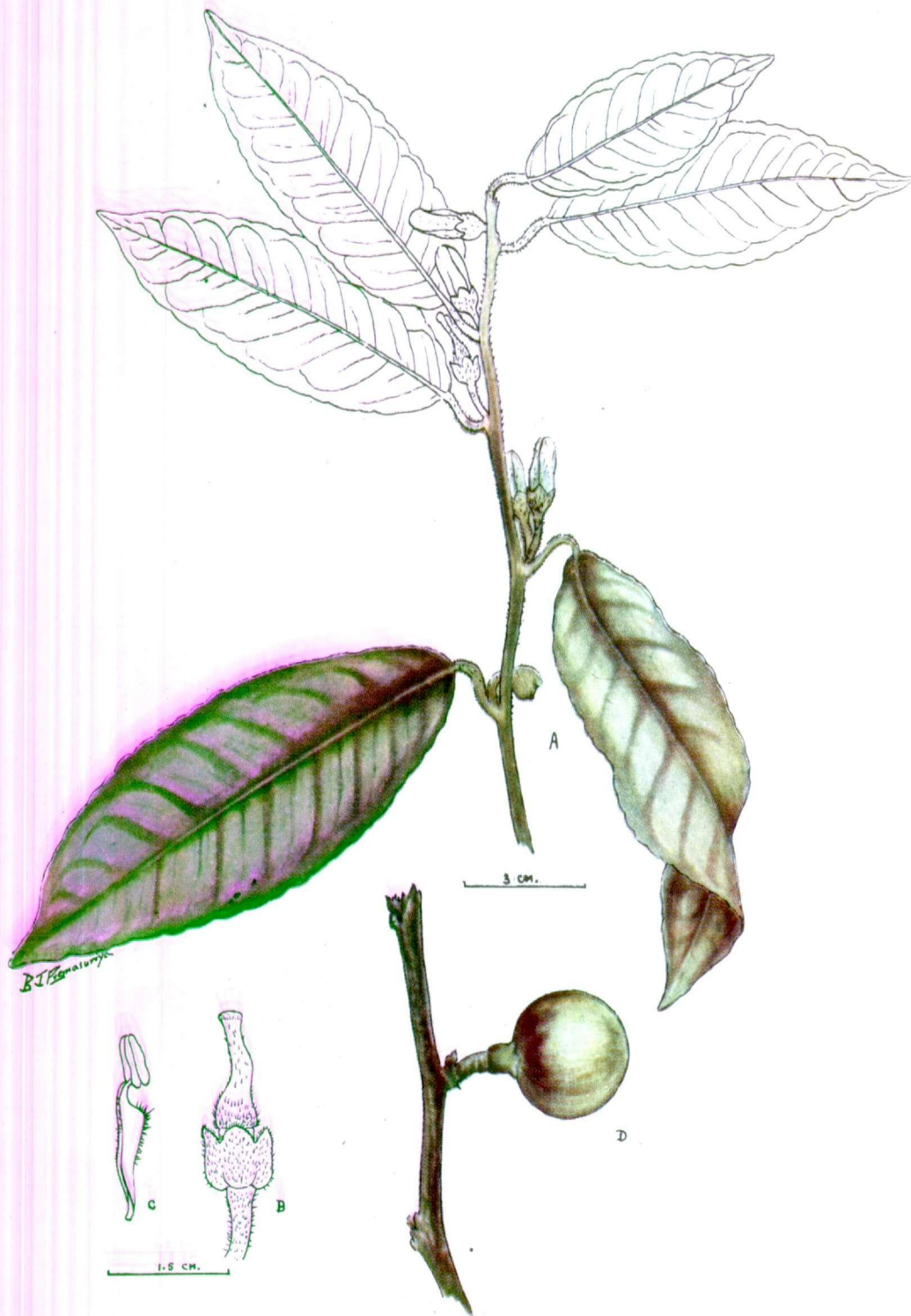


PLATE XXIII. *Paramignya monophylla*. A, branch with leaves and flowers. B, flower with corolla removed showing the calyx, gynophore and pistil. C, stamen with flattened hairy filament. D, fruit. B & C, slightly enlarged.

15. *Paramignya monophylla* Wight III. Ind. Bot. 1: 109, pl. 42. 1840. (Plate XXIII).

Sinh. Wellangiriya; *Tam.* Katillinsechan; *Sans.* Karuwageti.

A climbing shrub with densely pubescent shoots, the older branches provided with sharp, recurved, axillary spines 1.2 cm long; leaves unifoliate, alternate, exstipulate, numerous, 5—10 cm long, oval or oblong-oval or lanceolate, rounded at base, obtuse or acute at apex, entire or nearly so, glabrous except along the midrib on the lower surface, conspicuously gland-dotted, petioles 1.2 cm long and twisted; flowers regular, bisexual, white, 1.8 cm long, 1—3 together in axils of leaves, pedicels short, pubescent; sepals 5, fused into a 5-lobed, woolly pubescent calyx, lobes shallow, rounded; petals 5, oblong-linear, recurved; stamens 10, distinct, equal, filaments flat and hairy, anthers oblong; ovary superior, on a conspicuous gynophore, 5-locular with one or two ovules in each loculus, stigma large, capitate; fruit a globose-pyriform berry, over 2.5 cm long, smooth, seeds several, large and compressed.

Flowers in March and August.

Illustrations. Wight, III. Ind. Bot. 1: pl. 42. 1840; Kirtikar and Basu, Indian Med. Plants, pl. 195. 1933; Herb. Peradeniya., drawing.

Distribution. Occurs in India and Ceylon. It is rather common in the low-country dry regions in Ceylon. Dolosbage, Hunnasingiriya, Kurunegala, Haragama, Trincomalee, Minneriya, etc.

India. Sikkim: *J. D. Hooker*. Malabar, Concan, etc. *Stocks, Law*, etc. Ceylon Eastern Prov., Trincomalee, *J. M. Silva*, July 1921; Minneriya, *Thwaites C.P.* 1201; *Walker*.

Composition. The root of this plant contains calcium oxalate.

Uses The root is used as an alternative tonic. The bruised leaves are applied externally on snake-bite wounds. This plant is fed to cattle suffering from haematuria or flux of blood from the abdomen.

16. *Peganum harmala* Linn. Sp. Pl. 444. 1753.

Engl. Harmal, Syrian Rue; *Sinh.* Rata-aruda; *Tam.* Shimaiazha-vanai-virai, Simaiya-lavinai, Simaiyaravandi; *Sans.* Harmal.

A perennial herb 30—90 cm high, dichotomously and corymbosely branched; leaves simple, alternate, 5—7.5 cm long, multifold, segments narrow, linear, acute, stipules setaceous; flowers regular, bisexual, white, solitary, sessile or pedicelled 1.8—2.5 cm across on subterminal leaf-opposed pedicels; sepals 4 or 5, narrow, often foliaceous and pinnatifid, linear, acute, usually exceeding petals, persistent; petals 4 or 5, subequal, imbricate, white, elliptic-oblong, disc annular or cup-shaped; stamens 12—15, inserted at the base of the disc, some without anthers, filaments dilated below, anthers linear; ovary superior, globose, 2—3-lobed, 2—3-locular, ovules many in each loculus suspended by short funicles from the central angle, styles basal, twisted, 2—3-keeled above the middle, keels stigmatose; fruit a globose capsule, 4.5—8 mm diam., deeply lobed, veined, glabrous, dehiscent into 3 valves.

Flowers from October to December.

Illustration. Kirtikar and Basu, *Indian Med. Plants*, pl. 182. 1933.

Distribution. Grows in India, Persia, Mediterranean regions, Central Asia, Arabia, North Africa, Hungary and Spain.

India. Himal. Bor. Occ., *T. Thomson*. **Armenia.** *Du Pavillon*, June 1853. **Hungary.** *Lang*.

Composition. The root contains the alkaloids harmaline, harmalol, harmine, vasicine, while the seeds contain only the first three alkaloids.

Uses. The seeds of this plant are regarded as narcotic, anodyne, emetic and emmenagogue and act in large doses like ergot for which it is used as a substitute. They stimulate the sexual system in both males and females. A decoction of the leaves is given in rheumatism and used as a remedy for tapeworm in man and in malarial fevers.

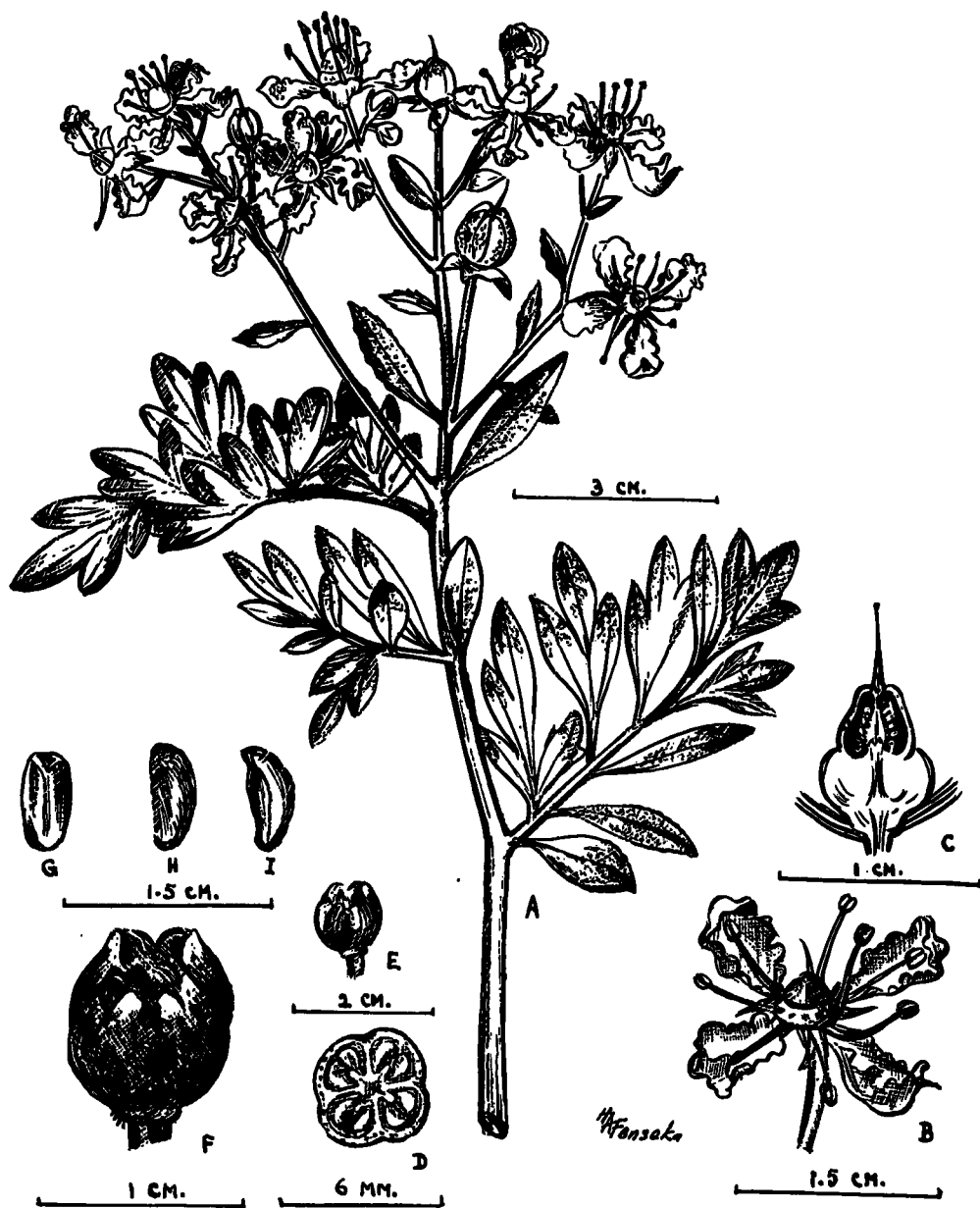


FIG. 466. *Ruta graveolens*. A, branch with leaves, flowers and fruits. B, flower. C, longitudinal section of pistil. D, transverse section of ovary. E & F, capsules. G—I, seed dorsal, lateral and longitudinal section.

17. *Ruta graveolens* Linn. Sp. Pl. ed. 2, 383. 1753. (Fig. 466).

Ruta graveolens var.—*angustifolia* Hook. f.—*Ruta angustifolia* Pers.—*Ruta chalepensis* Wall.

Engl. Garden Rue; *Sinh.* Aruda; *Tam.* Aruvadam, Arvada, Pambugolli; *Sans.* Guchhapatra, Pitapushpa, Sadapaha, Sarpadaushta, Somalatha, Vishapaha.

A perennial semi-shrubby plant 60—75 cm tall, stems cylindrical, slender, branched in the upper part, smooth, pale glaucous green; leaves compound, alternate, the lower ones tripinnate, the upper ones subpinnate or pinnate, the highest simple, leaflets linear-oval or oblong, the terminal ones obovate, all dotted with small pellucid glands, rather thick, bluish green; flowers regular, bisexual, yellow, long-stalked, erect, 2.5 cm across in terminal, corymbose, irregularly dichotomous cymes; sepals 4 or 5, narrow, acute, semipersistent, slightly connected; petals 4 or 5, much larger and alternating with the sepals, distant, widely spreading, greenish yellow, wide and hooded at top, suddenly contracted into a narrow claw below, margin wavy and sometimes toothed; stamens 8 or 10, inserted below the hypogynous disk, half opposite the sepals, half opposite petals in the concave limbs of which they are contained, filaments slender, glabrous, straight and exceeding the petals; ovary superior, surrounded at base and supported by a thick, fleshy, sticky, green disk, marked opposite each stamen with a deep nectariferous pore, large, 4 or 5 lobed, lobes (carpels) separate above, strongly dotted with sunk glands, 4-locular, ovules numerous on axile placentae, styles coming off from the inner sides of the carpels combined into a single body tapering to the apical stigma; fruit dry, hard, roundish, 4—5 lobed at top, greyish brown, rough, each carpel dehiscent from above ventrally and also some way down the dorsal suture; seeds ovoid, rounded at the back, flattish in front, angular, testa blackish, rough and albuminous.

Illustrations. Bentley and Trimen, *Med. Plants. pl.* 44. 1880; Kirtikar and Basu, *Indian Med. Plants, pl.* 181. 1933.

Distribution. Occurs in waste and stony ground throughout S. Europe extending from Spain and Portugal to Greece and Crimea. It is cultivated in India and in the up-country in Ceylon.

Ceylon. Central Prov., Hakgala, Bot. Gard., cultivated, *J. M. Silva*, Jan. 1928; Diyatalawa, *F. W. de Silva*, May 1929.

Composition. The whole plant contains the glucoside rutin, the fruits kokusaginine and skimmianine and the leaves an unnamed alkaloid. The oil of rue consists of two characteristic constituents namely methyl-n-heptyl ketone and methyl-n-nonyl ketone.

Uses. Rue is an acro-narcotic poison. It is given internally for hysteria, amenorrhoea epilepsy and flatulent colic while it is used externally as a rubefacient. This herb and its oil stimulate the uterine and nervous systems and considered injurious to pregnant women. It is a strong antispasmodic. A medicinal oil prepared with its juice is prescribed for convulsions in children and acute bronchitis and pneumonia. The seeds are considered a good ascaricide in Annam.

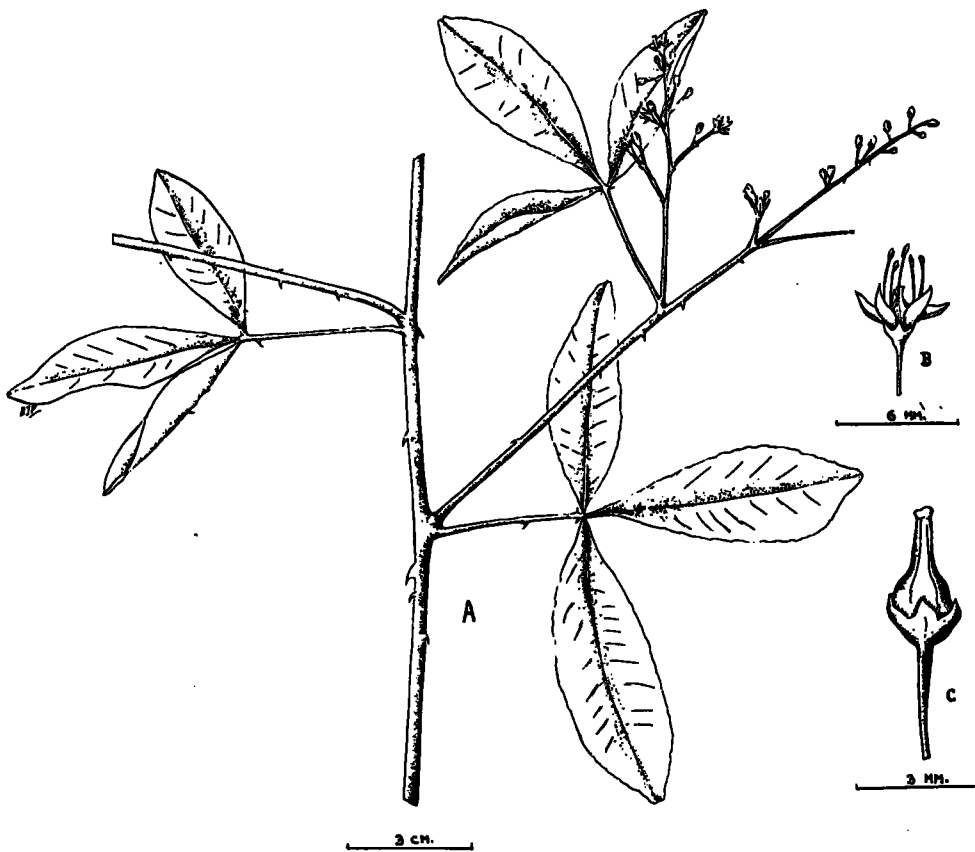


FIG. 467. *Toddalia asiatica*. A, branch with leaves and inflorescences of flowers. B, male or bisexual flower lateral view. C, female flower lateral view.

18. *Toddalia asiatica* Lamk. Ill. 2: 117. 1793. (Fig. 467).

Toddalia aculeata Pers.—*Toddalia nitida* Lamk.—*Toddalia angustifolia* Miq.—*Toddalia rubricaulis* Wall.—*Toddalia floribunda* Wall.—*Zanthoxylon floribundum*—*Scopolia aculeata* Sm.—*Limonia oligandra* Dalz.—*Paullinia asiatica* Linn.—*Paullinia aculeata* Linn.

Engl. Forest Pepper, Lopez-root; *Sinh.* Kudumiris; *Tam.* Kattumilagu, Kichili karanai, Milagaranai, Mullukkaranai; *Sans.* Dahana, Kanchana.

A small erect or scrambling or climbing shrub with cylindrical, glabrous or slightly tomentose stems set with recurved, compressed, sharp prickles; leaves alternate, exstipulate, 3-foliolate, petioles divaricate, often with prickles beneath, 1.2—1.8 cm long, leaflets sessile, articulated, 3.7—5 cm long, oval or oblong-lanceolate, acute at base, obtuse or bluntly acuminate at apex, very shallowly crenate-serrate, glabrous or with scattered stellate scales above, thick, gland-dotted, midrib often prickly beneath, lateral veins numerous; flowers regular, subunisexual, cream coloured, small, about 3 mm long on very short pedicels and in umbellate clusters of 6—12 at ends of branches of small axillary and terminal paniculate cymes; sepals 5, connate into a 5-lobed calyx, lobes very small, triangular; petals 5, distinct, valvate, oblong, thickened at tip, longer in female flowers; stamens 5, hypogynous, free in male flowers alternating with petals, anthers dorsifixed, reduced to 5 very short pointed filaments in female flowers, ovary superior, syncarpous, raised on a short gynophore, oblong, glabrous, 5-locular with 2 ovules in each loculus, stigma sessile; fruit fleshy, orange coloured, subglobose, apiculate with 3—5 grooves, set with large sunk glands, seeds smooth, subcompressed and rounded at the back, indehiscent, albuminous.

Flowers from January to April.

Illustrations. Wight, Ill. Ind. Bot., pl. 66. 1838; Beddome, Flor. Sylvat. Anal. Gen. 42, pl. 6, fig. 5. 1874; Burmann, Flor. Zeyl. pl. 24. 1765; Kirtikar and Basu, Indian Med. Plants, pl. 189. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Java, Sumatra, China, Philippine Islands and tropical Africa. It is very common in Ceylon from sea level to about 6,000 feet elevation.

India. Mt. Nilghiri and Kurg, *Hook. f. & T. Thomson.* Nilghiris, *Clarke* 10492B, March 1870; *Clarke* 11256A, March 1870. Khasia: *Clarke* 5725, Oct. 1867. Sikkim: *King* 96, Oct. 1871. Pen. Ind. Or *Wight* 360, Kew Distribution 1866—1867; *Wallich* 1206. Ceylon. Central Prov., Kandy, Udawattekelle, *Senaratne* 10050, March 1953. Uva Prov., Namunukula, *J. M. Silva*, March 1907. Without locality, *Thwaites C.P.* 2413; *Thwaites C.P.* 1250; *Walker.* Philippine Islands. Palawan: *McGregor* 45931, Sept. 1925. Mindanao: Dava Provo., *Ramos and Edano* 49031, March-April 1927.

Composition. The leaves of this plant yield a volatile oil with citronellal and linalool, while the root bark contains the alkaloids toddaline, toddalinine, lactone, resin, fixed oil and a glucoside, diosmin. The stem bark yields three coumarins, aculeatin and aculeatin hidiate.

Uses. The root bark is a reputed antimalarial remedy, though cligical tests with alcoholic extracts have not shown positive results. An infusion of it is a stimulating tonic, particularly after malaria. In the Philippines, a decoction of the root is used as an anti-pyretic and anti-diarrhoeic. The fruit and root are rubbed down with oil to make a stimulant liniment for rheumatism. In Africa the fruit is used as a cough remedy and the root in the treatment of indigestion and influenza. A decoction of the leaf is used in pneumonia and rheumatism, while that of the root is used on stomach-ache and as an anthelmintic. A poultice of the leaf is applied to carious teeth for relief from toothache. The root is also used for malaria, intermittent fever, diarrhoea, cholera, rheumatism and syphilis.



PLATE XXIV. *Zanthoxylum tetraspermum*. A, branch with leaves, spines and panicles of flowers. B, panicle of flowers. C, fruits.



PLATE XXIV. *Zanthoxylum tetraspermum*. A, branch with leaves, spines and panicles of flowers. B, panicle of flowers. C, fruits.

19. *Zanthoxylum tetraspermum* W. & A. Prodr. 148. 1834. (Plate XXIV).

Sinh. Katukeena.

A wide-climbing shrub with long rope-like stems set with large, woody, conical, spine tipped prickles 1.8 cm high, smaller branches glabrous with small, deflexed, hooked prickles; leaves alternate, compound, exstipulate, imparipinnate, 15—25 cm long, petioles and rachides cylindrical, armed beneath with numerous, large, hooked prickles, leaflets in 3 or 4 pairs and a terminal one, sessile, 6.4—8.9 cm long, oval or lanceolate, acute at base, suddenly attenuate, retuse, coarsely serrate, thick, smooth and glossy, lateral veins numerous; flowers regular, unisexual, yellowish pink, small on very short pedicels arranged in pyramidal, finely tomentose, axillary and terminal panicles 5—10 cm long; sepals 4 minute; petals 4, valvate, oblong, acute; stamens 4 in male flowers; ovary in female flowers superior, 4-carpellary, almost separated into unicarpellary units with 2 ovules in each, style capitate; fruit nearly globose consisting of 1—4 ripe carpels each dehiscent into two valves, 0.6 cm long, rugose, seed nearly globose hanging out of the carpel when ripe, polished and black.

Flowers in April and May.

Illustration. Herb. Peradeniya drawing.

Distribution. Occurs in India and Ceylon. It is rather common in the montane zone in Ceylon and much rarer at lower elevations, Maturata, Hakgala, Hewaheta, etc.

Ceylon. Central Prov., Hakgala, *A. M. Silva*, Oct. 1906. Without locality, *Thwaites C.P.* 386.

Uses. This species has the same properties as *Zanthoxylum budrunga* Wall., from India and *Zanthoxylum hamiltonianum* Wall., from Burma both of which can be cultivated in Ceylon. The fruit of this plant is a stimulant, astringent and digestive. It is prescribed for dyspepsia, some forms of diarrhoea and rheumatism. It resembles coriander, from which it is difficult to distinguish.

100. SALVADORACEAE

Salvadora persica Linn. Sp. Pl. 122. 1753.

Salvadora wightiana Planch—*Salvadora indica* Wight—*Cissus arborea* Forsk.—*Embellia grossularis* Retz.

Engl. Mustard Tree, Tooth-brush Tree; *Sinh.* Pilu; *Tam.* Kalarva, Kargol, Kargoli, Opa, Perungoli, Surugarva, Sittuvila, Uba, Uga, Uvay, Vijay; *Hindi* Badapilu, Chhotapilu, Jal, Pilu; *Sans.* Brihatpilu, Gauli, Langhupilu, Madhupilu, Mahaphala, Mahapilu, Mahavriksha, Pilu, Rajapilu.

A small, much branched, erect tree with long drooping slender branchlets, bark rough and furrowed and glabrous young parts; leaves simple, opposite, exstipulate, numerous 3.7—5 cm long, oblong-oval or ovate, tapering or rounded at base, obtuse or rounded, usually mucronate at apex, entire, glabrous and shining on both surfaces, thick, glaucous green, lateral veins oblique, obscure, petioles 0.6—1.2 cm long; flowers regular, bisexual, greenish white small, very numerous, on slender opposite, spreading pedicels, laxly arranged on branches of spreading, divaricate, glabrous racemes or panicles about as long as leaves, terminal and from axils of upper leaves; sepals 4, fused into a small, campanulate, glabrous calyx, segments broad and truncate; petals 4, fused, imbricate in bud, persistent, oval, acute, reflexed; stamens 4, inserted in corolla-tube, exerted; ovary superior, unilocular with one erect ovule, style absent; fruit a smooth, globose, red drupe about 3 mm long.

Flowers throughout the year.

Illustrations. Roxburgh, Pl. Corom. I: *pl.*26. 1795; Beddome, Flor. Sylvat. I: *pl.*247. 1868—1873; Wight, Ill. Ind. Bot. 2: *pl.*181. 1840; Kirtikar and Basu, Indian Med. Plants, *pl.*598. 1933.

Distribution. Occurs in the dry regions of India, Ceylon, Arabia, North Africa, Abyssinia, Syria, etc. It is common in dry and desert places, especially along the coast in Ceylon. Jaffna, Anuradhapura, Hambantota, etc.

India. Punjab: *T. Thomson*; Rajputana. *Duthrie*, Jan. 1886. Pen. Ind. Or., *Herb. Wight* 2465, Kew Distribution 1866—1867. Ceylon. North-Western Prov., Puttalam Lagoon *J. M. Silva* 40, March 1926. Eastern Prov., *Vincent* 22. Without locality, *Thwaites C. P.* 2267.

Composition. The leaves and bark of this tree contain the alkaloid trimethylamine, and the seed a volatile oil whose main constituent is benzyl mustard oil.

Uses. The bark of the stem is acrid and used in decoction for low fever and as a stimulant and tonic in amenorrhoea. In Punjab, the shoot and leaves are considered as antidotes for poisons and the juice of the leaves is given for scurvy. In Persia, the fruit is employed as a deobstruent, carminative and diuretic. In Africa, the root bark is used as a remedy for ankylostomiasis and the stem bark for gastritis and as an ascarifuge. The powdered root is applied like mustard plaster and a decoction of the root given for gonorrhoea and vesical catarrh. The leaf is a reputed diuretic.

MEDICINAL PLANTS

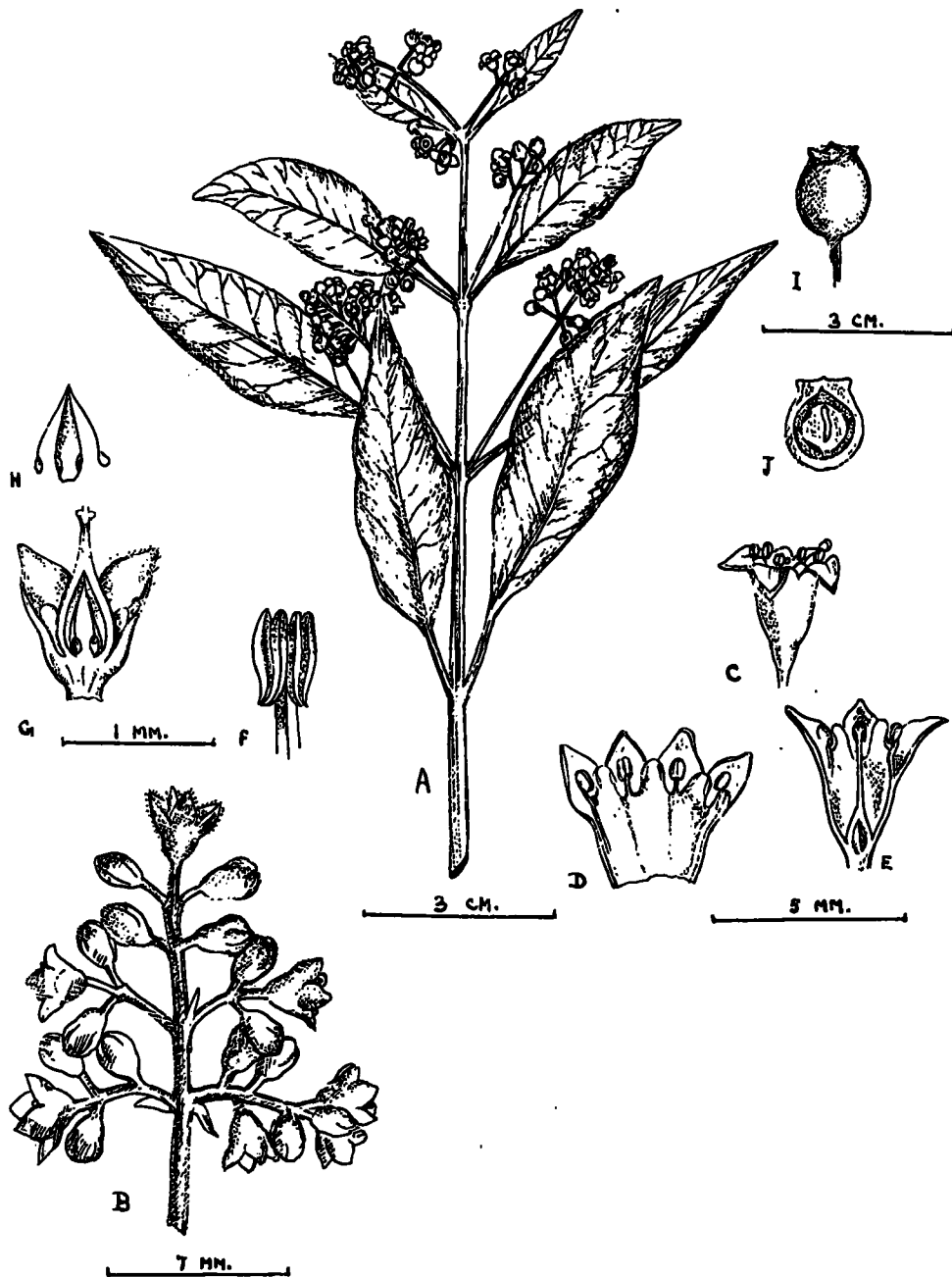


FIG. 468. *Santalum album*. A, branch with leaves and flowers. B, inflorescence of flowers. C, flower lateral view. D, perianth spread out showing the stamens and staminodes. E, longitudinal section of flower. F, stamen. G, longitudinal section of pistil. H, placenta showing the pendulous ovules. I, fruit. J, longitudinal section of fruit.

101. SANTALACEAE

Santalum album Linn. Sp. Pl. 349. 1753. (Fig. 468).

Santalum myrtifolium Roxb.—*Santalum verum* Linn.—*Santalum album* Rumph.—*Strium myrtifolium* Roxb.

Engl. Sandalwood, White Sandalwood; *Sinh.* Sudu-handun; *Tam.* Amukkam, Asam, Chandana kattai, Igam, Ingam, Kandam, Koravaram, Kulavuri, Malaivedbu, Malaiyaram, Malaiyasam, Padiram, Pidasaralam, Pidasaram, Saleyam, Sandanam, Sandani, Selegam, Selodam, Sisiram, Ulosidam; *Hindi* Chandal, Chandan, Chandoi, Safedchandan, Sandal; *Sans.* Annidita, Bhadrasara, Bhadrashraya, Bhadrashri, Bhadrashriya, Bogivallabha, Chandradyuti, Chandana, Chandrakanta, Dahasini, Ekangi, Gandhadhya, Gandhasara, Goshirsha, Gramya, Harichandana, Krishnachandana, Maharha, Malayaja, Malayodbhava, Mangalya, Panjasugandha, Patira, Pavana, Pitasara, Rajayoghya, Rauhina, Sarpavasa, Sarpeshta, Sevyā, Shrigandha, Shrikhanda, Situhima, Tailaparna, Tilaparna, Valgaka, Varnaka,

A small tree, 6—10 m high with numerous, opposite, slender, drooping branches, bark smooth, greyish brown, young twigs glabrous, leaves simple, opposite without stipules, petioles slender about 1.2 cm long, leaf blade 3.7—6.2 cm long, oval, ovate-oval or lanceolate, acute or obtuse at apex, tapering at the base into the petiole, entire, smooth on both sides, glaucous beneath; flowers regular, bisexual, small, numerous, shortly stalked in small, pyramidal, erect, terminal and axillary, trichotomous, paniculate cymes, panicle branches smooth, bracts small but passing into the leaves below; perianth campanulate, smooth, about 5 mm long, divided into 4 (rarely 5) triangular, acute, spreading segments, valvate in the bud, rather fleshy, at first straw-coloured, afterwards changing into deep reddish-purple, provided at the mouth with 4 erect, fleshy rounded lobes (staminodes); stamens 4, opposite the perianth segments, filaments very short, inserted in the mouth of the perianth and alternating with the erect lobes, anthers short, 2-celled, introrse; ovary half-inferior, tapering, unilocular with an erect central placenta rising from the base and not reaching the top, to the summit of which is attached 3 or 4 pendulous ovules without the usual coverings, style filiform, stigma small, 3 or 4-lobed on a level with the anthers; fruit about the size of a pea, spherical, crowned by the rim-like remains of the perianth-tube, smooth, somewhat fleshy, nearly black, epicarp thin, endocarp hard and bony with 3 equidistant ridges running half-way down the apex; seed solitary filling the endocarp and albuminous.

Flowers from March to May.

Illustrations. Beddome, *Flor. Sylvat.* pl.256. 1868—1873; Bentley and Trimen, *Med. Plants*, pl.292. 1880; Curtis, *Bot. Mag.*, pl.3235. 1833; Roxburgh, *pl. Corom. 1: pl.2.* 1795; Kirtikar and Basu, *Indian Med. Plants*, pl.844. 1933.

Distribution. Indigenous to Mysore in India, and occurs in E. Java, Timor and Islands of Malay Archipelago. It is cultivated in Ceylon.

India. Herb. Madras, *Wallich* 4034C. Pen. Ind. Or., *Herb. Wight* 2496, *Kew Distribution* 1866—1867. *Ceylon*, cultivated. North-Central Prov., Anuradhapura, *Herb. Peradeniya*, Jan. 1922. Central Prov., Peradeniya, Bot. Gard., *Herb. Peradeniya*, March 1888; *Thwaites C. P.* 2915; *Baker* 107. May 1907.

Composition. The heart wood of this tree contains a volatile oil, the chief constituent of which is the alcohol, santalol.

Uses. The heart wood is used alone or with other ingredients for fever, diarrhoea dysentery, gastric irritation, spermatorrhoea and gonorrhoea. The wood ground up with water into a paste is applied on local inflammations and skin diseases to allay heat and pruritus. It acts as a diaphoretic and checks haemoptysis. The seeds also contain an oil which is used in skin diseases. The wood is considered a diuretic and antipyretic in Cambodia. In Madagascar, the wood is mascerated with salt water and applied on wounds. The oil is recommended for gonorrhoea. It is often used in perfumery.

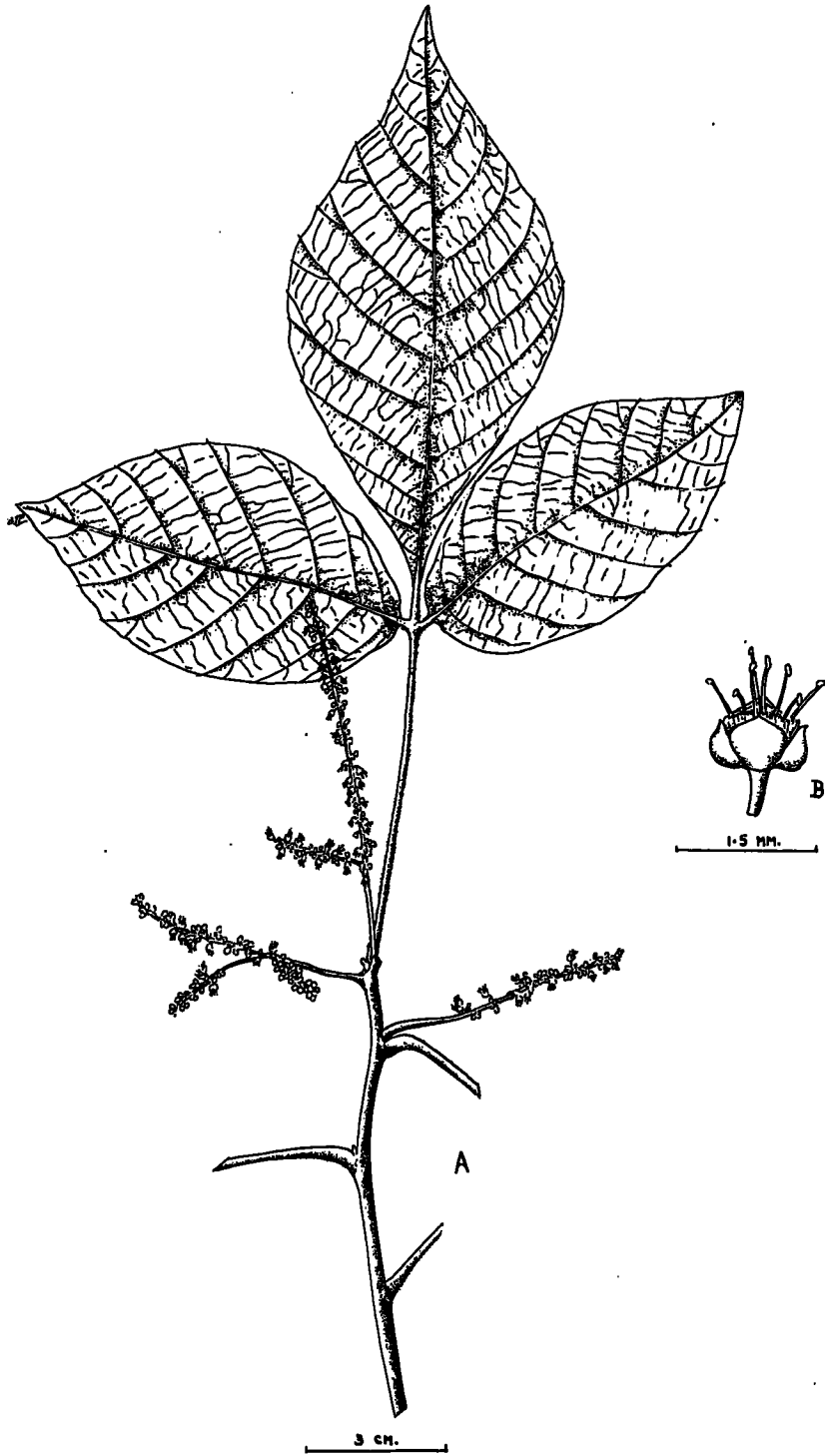


FIG. 469. *Allophylus cobbe*. A, branch with a leaf and panicles of flowers. B, flower lateral view.

102. SAPINDACEAE

1. *Allophylus cobbe* (Linn.) Blume, Rumph. 3: 131.1847. (Fig 469).

Allophylus serratus Radlk.—*Allophylus lanatus* Roxb.—*Rhus cobbe* Linn.—*Ornitrophe cobbe* Willd.—*Ornitrophe serrata* Roxb.—*Schmidelia cobbe* DC.

Sinh. Bu-kobbe, Kobbe, Kobo; *Tam.* Amlai; *Sans.* Kapolawattha.

A tall much branched shrub or small tree with pubescent branches and young parts; leaves alternate, exstipulate, 3-foliolate, spreading, petioles 7.5—10 cm long, cylindrical, very pubescent, leaflets on short stalks, the central leaflet longer, 10—15 cm long, all oval, the lateral ones rounded at base, the middle acute at base; sharply acuminate, acute, faintly serrate, softly pubescent on both sides, paler beneath with tufts of hair in the vein axils; flowers slightly irregular, polygamo-dioecious, very small, greenish, on very short pedicels, grouped in small fascicles on the slender branches of spicate, axillary panicles shorter than leaves; sepals 4 in pairs, imbricate, the outer ones smaller, glabrous; petals 4, cuneate with a scale half as long at the base, hairy; stamens 8, inserted inside the disc, filaments distinct; disc rather one-sided of 4 rounded glands opposite petals; ovary superior, didymous, 2-locular with one ovule in each loculus, finely hairy, style twice as long as the ovary, stigmas recurved; fruit indehiscent, globular-ovoid, 6 mm long, smooth, red, usually of a solitary carpel, pericarp fleshy, seed with a short aril, exalbuminous.

Flowers in October.

Illustrations. Burmann; *Fl. Ind. pl.32, fig.1, 1765*; Wight, *lc. Pl. Ind. Or., pl.964. 1843—1845*; Gaertner, *Fruct. et Sem. Plant. I: pl.44, fig.5. 1788*; Roxburgh, *Pl. Corom. I: pl.61. 1795*; *Herb. Peradeniya, drawing.*

Distribution. Occurs in India, Ceylon, N. Australia and Indian Archipelago. It is very common in the moist low-country in Ceylon.

India. Sikkim: *Clarke 9097. Sept. 1869. Khasia: J. D. Hooker & T. Thomson. Silhet: Wallich 8058 A & B. East Bengal: Herb. Griffith 974, Kew Distribution 1861—1862; Calcutta, Herb. Bot. N. Canara; Talbot, July 1882. Concan: Stocks; Nilghiri, King, July 1878. Madras: Beddome 322; Cleghorn 71. Pen Ind. Or., Herb. Wight 373 & 374, Kew Distribution 1866—1867. Ceylon. North Western Prov., Mannar, Crawford 48. Central Prov., Peradeniya, Bot. Gard., Alston, Nov. 1928; Nugatenne, Alston, Sept. 1926. Without locality, Thwaites C. P. 1156. Maldiv Islands. Gardiner 50, 1899. Andaman Islands. King's Collector, Oct. 1894; Prain's Collector 100, Oct. 1900.*

Composition. The seed of this plant contains an unidentified alkaloid.

Uses. This plant is an emenagogue. The astringent root is employed to check diarrhoea. All parts of the plant are used for preparation of medicinal oils for use on fractures.

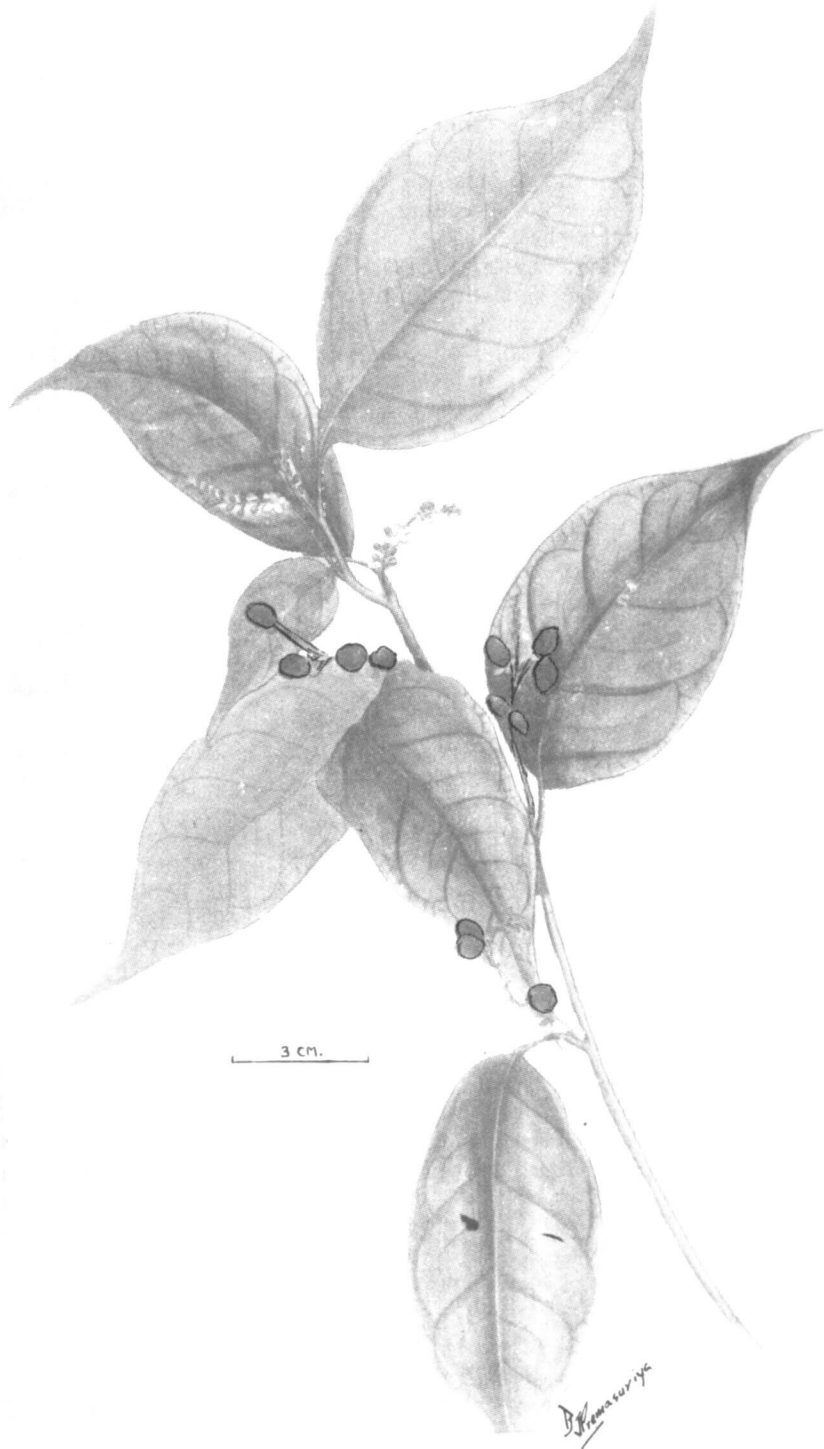


PLATE XXV. *Allophylus zeylanicus*, branch with leaves, flowering racemes and fruits.



PLATE XXV. *Allophylus zeylanicus*, branch with leaves, flowering racemes and fruits.

SAPINDACEAE

2. *Allophylus zeylanicus* Linn. Nov. Fl. Gen. in Amoen. Acad. 1 : 398. 1747. (Plate XXV).

Schmidelia allophylus DC.—*Schmidelia bidentata* Wall.—*Ornitrophe allophylus* Pers.

Sinh. Walkobo, Wel-kobbe.

A small tree with smooth, whitish bark and glabrous young parts; leaves simple, alternate, exstipulate, 12.5—22.5 cm long, lanceolate, acute at base, more or less acuminate, acute, entire or with a few very coarse teeth in the upper part, glabrous, petioles 1.2—1.8 cm long; flowers irregular, polygamo-dioecious, greenish white, in short pedicelled, hispid racemes; sepals 4, free, imbricate, in pairs, the outer smaller; petals 4, clawed, slightly longer than sepals, spatulate, hairy, the scale near the base of each petal very hairy; disc of 4 rounded glands opposite petals; stamens 8, inserted inside the disc, filaments distinct; ovary superior, 2-locular, 2-lobed with one ovule in each loculus; fruit carpels divaricate (often one abortive), each about 1.2 cm long, indehiscent, ovoid, smooth, white.

Flowers from March to May and in September and October.

Illustrations. Beddome, Ic. Pl. Ind., pl. 286; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon, It is rather common in the moist regions in Ceylon. Hunnagiriya, Hantane, Ambagamuwa, Haputale, Hakgala, Maturata, etc.

Ceylon. Central Prov., *J. M. Silva* 244, Dec. 1927; Knuckles, *J. M. Silva* 150, June 1926; Hakgala, *Smith*, Oct. 1906; *A. M. Silva*, Sept. 1906; *A. M. Silva*, April 1906; Haputale, *A. M. Silva*, May 1906; *Walker* 172; Madulkele, *Herb. Peradeniya*, Oct. 1887; Maturata, *A. M. Silva*, May 1906. Without locality, *Thwaites* C. P. 562.

Uses. All parts of this tree are used for preparation of medicinal oils applied on fractures. The leaves and bark are also applied as a poultice.



FIG. 470. *Cardiospermum microcarpum*. A, twig with leaves, flowers and fruits. B, flower dorsal view. C, flower lateral view with bud. D, dehiscent fruit with seeds attached to the axis.

3. *Cardiospermum microcarpum* H.B.K., Nov. Gen. & Sp. 5: 104. 1821. (Fig. 470).

Cardiospermum halicacabum Trim. non Linn.

Sinh. Penela-wel; *Tam.* Kottavan, Mudakattan, Mudakottan, Periyilai-mudakottan, Samuttiram, Samuttiradoyan, Siliyanai, Soliyan, Sugattan, Tiragamulagam; *Sans.* Jyotishati, Jyotir, Karavi, Karhasphota, Nagna, Paravatanghi, Sakralata.

An annual, subscandent climber with a slender, strongly furrowed, glabrous stem and puberulous young parts; leaves alternate, exstipulate, biternate, petioles 5—7.5 cm long, spreading or deflexed, furrowed, leaflets sessile or shortly stalked, ovate, tapering at base, acute, deeply incised-serrate, glabrous, thin and flaccid; flowers irregular, polygamo-dioecious, white, very small, 4 mm long on slender pedicels 7.5—17.5 cm long, a very small cyme terminating a stiff, slender, horizontal axillary peduncle 10 cm long, and provided beneath the cyme with 2 opposite reflexed circinate or hooked tendrils; sepals 4, persistent in pairs, rounded, outer pair very small; petals 4, rounded, the two upper each with a large emarginate scale near the base, the two lower distant, each with a small crested scale; disc unilateral of 2 glands opposite the lower petals; stamens 8, excentric, filaments connate at base; ovary superior 3-locular with one ascending ovule in each loculus, style very short, stigmas 3; fruit an inflated, 3-chambered, membranous, loculicidal capsule on a short, slender stalk, bladder-like, 1.2—1.8 cm wide, depressed-pyriform, trigonous, truncate at top, winged at the angles, valves papery, veiny, finely pubescent; seed 4—6 mm long, globular, glabrous, black, the aril heart-shaped and white.

Flowers all the year round.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 508. 1842—1843; Curtis, *Bot. Mag.* pl. 1049. 1807; Kirtikar and Basu, *Indian Med. Plants*, pl. 259. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Malacca in wet places. In Ceylon, it grows in the mid and low-country.

Ceylon. Northern Prov., Mullativu, Mukiyaivalai, *Alston* 1219. March 1927. Eastern Prov., Trincomalee, Mavadidichanai, *Alston* 552, May 1927. Central Prov., Haragama, *Herb. Peradeniya*, April 1926; Nigatenne, *Alston* 495, Oct. 1926. Southern Prov. Ranna, *Alston* 1220, March 1927.

Composition. This plant contains saponin and quebrachitol and an alkaloid, a glucoside, resins and tannins. The seeds possess an essential oil.

Uses. The whole plant is used both internally and externally in cases of rheumatism, nervous diseases, dropsy and orchitis. The juice of the plant is used as ear drops for earache and discharge from the meatus. It is also used for piles, bronchitis and phthisis. The root is an emetic and laxative and considered an aperient. The leaves are boiled in castor oil and applied externally on rheumatic pains, swellings and tumours. In China, the plant is considered an anthelmintic and anti-blenorrhagic. In Africa, an infusion of the leaf is given as an enema for dysenteries and diarrhoeas and taken internally for general outbreak of sores in the body. It is used as an anti-rheumatic and in digestive and pulmonary disorders. The root is a laxative, demulcent, diuretic and used in nervous diseases. In East Indies, the leaf and root are used as a diaphoretic, diuretic and as a remedy for dropsy, orchitis, amenorrhoea, rheumatism, nervous complaints and lung diseases.

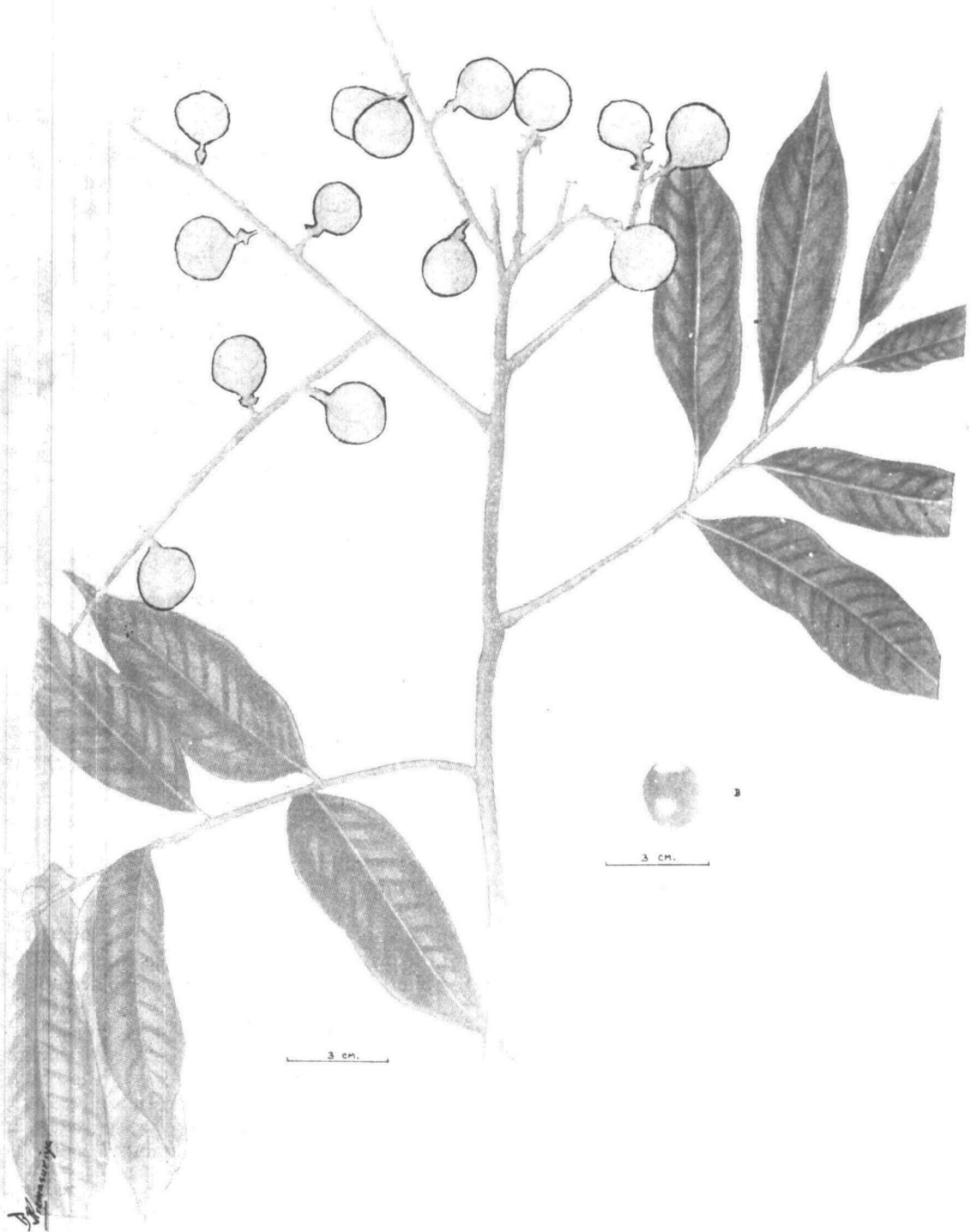


PLATE XXVI. *Euphoria longana*. A, branch with leaves and fruits. B, seed.



PLATE XXVI. *Euphoria longana*. A, branch with leaves and fruits. B, seed.

4. *Euphoria longana* Lamk. Dict. 3: 574. (Plate XXVI).

Nephelium longana Camb.—*Nephelium mora* Gard. ex Thw.—*Nephelium bengalense* G. Don—*Scytalia bengalensis* Roxb.—*Scytalia longan* Roxb.—*Dimocarpus longan* Lour.—*Dimocarpus pupilla* Moon—*Sapindus bengalensis* Roxb.—*Sapindus monogyna* Hb. Heyne—*Euphoria undulata* Hb. Heyne—*Euphoria pupillum* Steud.

Engl. Dragon's Eye, Logan; *Sinh.* Rasamora; *Tam.* Kattupuvam, Nurai, Pirappin, Puvam, Sembuvam, Varattarbuva; *Sans.* Pilu.

A large tree with smooth yellowish grey bark flaking off in small pieces and rufous stellate pubescent young parts; leaves compound, alternate, exstipulate, pinnate, rachis 10—15 cm long, cylindrical, rough with fine stellate pubescence, leaflets on very short tumid stalks, 7—11, oblong-lanceolate, acute and unequal at base, shortly acuminate, subobtuse, entire, rather undulate, glabrous, dark green and shining above, pale dull green often puberulous and minutely reticulate beneath, drying brown; flowers regular, polygamous, pale yellow, on pubescent pedicels, in clusters on branches of large, lax, pyramidal, pubescent, terminal panicles; sepals 5, fused into a 5-fid calyx, densely pubescent, lobes obtuse; petals 5, distinct about as long as calyx, linear-spathulate without scales; disc annular, fleshy, lobed, hairy; stamens in male flowers 10, in bisexual flowers 5 or 8, filaments hairy; ovary superior, didymous, 2-locular with one erect ovule in each loculus, very hairy, style long, stigmas 2, recurved; fruit supported on persistent calyx consisting of two or usually one by abortion, divaricate carpels, 1.2—1.5 cm long, globular ovoid, faintly tubercled with stellate hairs on the tubercles when young, afterwards glabrous. pericarp thin, brittle; seed completely covered with thin pulpy aril, black and shining.

Flowers from April to July.

Illustrations. Curtis, Bot. Mag. *pl.* 4096; Edward, Bot. Reg. *pl.* 1729. 1835; Beddome, Flor. Sylvat, *pl.* 156. 1868—1873; Kirtikar and Basu, Indian Med. Plants. *pl.* 266A. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and S. China. It is common in the low-country both in moist and dry regions up to an altitude of 2,000 feet in Ceylon.

India. Assam: *Chatterjee* 51/47, May 1902. Nilghiri and Kurg: *Hook f. and T. Thomson* Concan: *Stocks, Law*, etc. Ceylon. North-Central Prov., Ambepusse, *Senaratne*, June 1930. Uva Prov., Bibile, *J. M. Silva*, July 1924. Eastern Prov., Batticaloa, *Mueller-Dombois and Comanor* 67072704, July 1967. Without locality, *Thwaites* C.P. 1152. China. Kwangtung Prov., Taipo, *Tsiang Ying* 115, April 1928.

Uses. The bark of this tree is used for decoctions given for rheumatism, swellings and diseases of the lungs. It is applied externally as a poultice on fractures. The fruit is a nutrient stomachic and anthelmintic. In Indo-China, the seed is used as a tonic and brain stimulant.

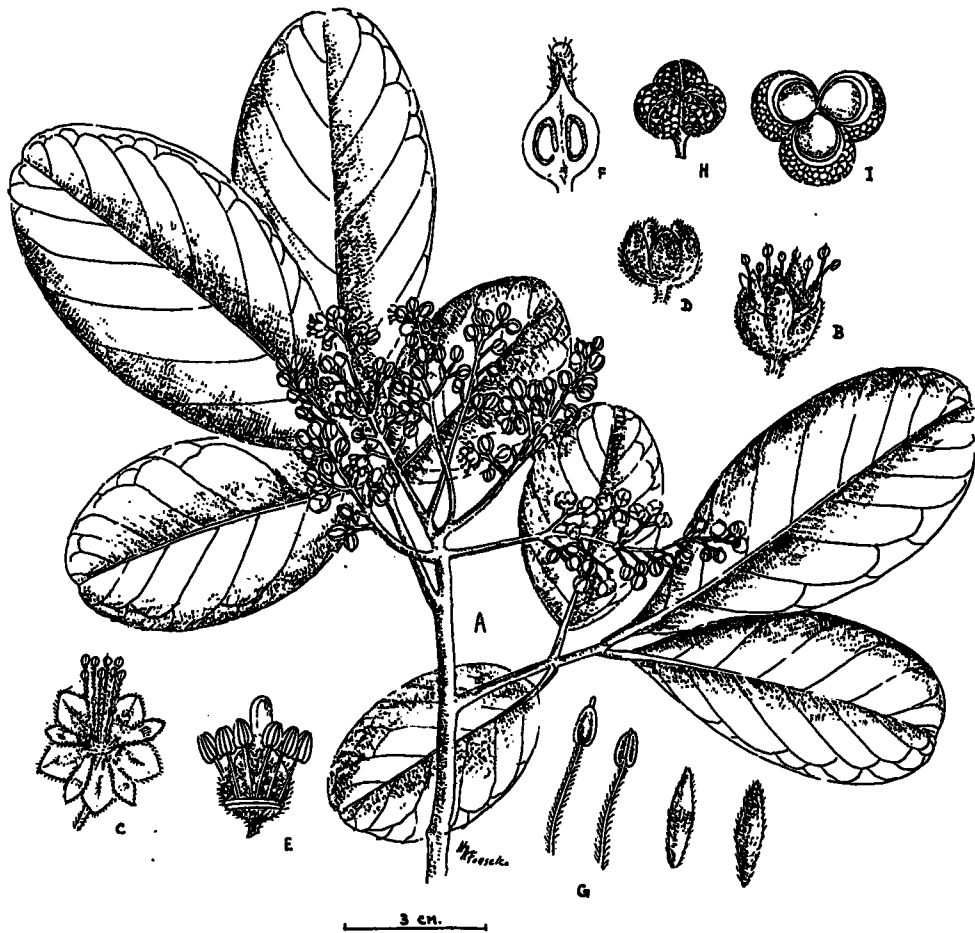


FIG. 471. *Sapindus emarginatus*. A, branch with leaves and inflorescence. B, male flower lateral view. C, male flower dorsal view. D, female flower lateral view. E, bisexual flower with calyx and corolla removed. F, longitudinal section of pistil. G, stamens and staminodes. H, fruit. I, dehiscent fruit. B—F, enlarged.

5. *Sapindus emarginatus* Vahl, Symb. Bot. 3: 54. 1794. (Fig. 471).

Sinh. Gas-penela, Penela; *Tam.* Nekkoyddan, Panalai, Pouanga.

A large tree with rough whitish bark and much branched spreading head and glabrous young parts; leaves compound, alternate, exstipulate, paripinnate, rachis 5—10 cm long, glabrous, leaflets 4—6, opposite or subopposite, 6.2—10 cm long, broadly oval or oval-oblong acute or rounded at base, rounded or emarginate at apex, glabrous above, glabrous or densely pubescent beneath, very stiff, convex above, greyish green with very prominent veins; flowers regular, polygamous, greenish white, very small, very shortly stalked, in large, much branched, spreading terminal spikes; sepals 5, imbricate, erect, obtuse; petals 5, distinct, erect, longer than sepals, oblong-linear, very silky with white down especially on margins and with a dense tuft in the centre but no scale; disc fleshy, annular, 5-lobed; stamens 8, as long as petals in male flowers and inserted within the disc, filaments hairy below; ovary superior, 2 or 3-locular with one erect ovule in each loculus; fruit 1.2 cm long, pericarp thick, fleshy, seed globular, black with a hard thick testa.

Flowers in March.

Illustrations. Beddome, *Flor. Sylvat.*, pl. 154. 1868—1873; Wight, *Ill. Ind. Bot.*, pl. 51. 1838.

Distribution. Occurs in India and Ceylon. It is common in the low-country in Ceylon.

India. Pen. Ind. Or., *Herb. Wight* 538, Kew Distribution 1866—7. Madras: *St. Thome; Beddome* 331. Mt. Nilghiri and Kurg: *Hooker f. and T. Thomson*. Mysore: Kumsi, *Meebold* 9648, Oct. 1908.

Ceylon. Eastern Prov., Trincomalee, *Thwaites* C.P. 1151. North Central Prov., Anuradhapura, *Herb. Peradeniya*, March 1883; Mahailuppallama, *Herb. Peradeniya*, March 1905. Southern Prov., Ruhuna National Park, Situlpahuwa, *Mueller-Dombois* 68022507, Feb. 1968; Ratanangala Beach, *Mueller-Dombois and Comanor* 67062221, June 1967; Batuwa Modera, *Fosberg* 50310, April 1968; Yala, *Cooray* 68052911R, May 1968; Komawa Wewa, *Comanor* 409, Aug. 1967. North-Western Prov., Wilpattu National Park, *Mueller-Dombois, Wirawan, Cooray and Bala-kishnan* 69043002, April 1969.

Composition. This tree contains the alkaloid, sanguinarine.

Uses. The fruit of this tree is the popular "soap nut" used as a substitute for soap. The pericarp of the fruit is applied as an ointment on swollen glands in the throat and tonsils. The seed along with other ingredients is given for fever in children.

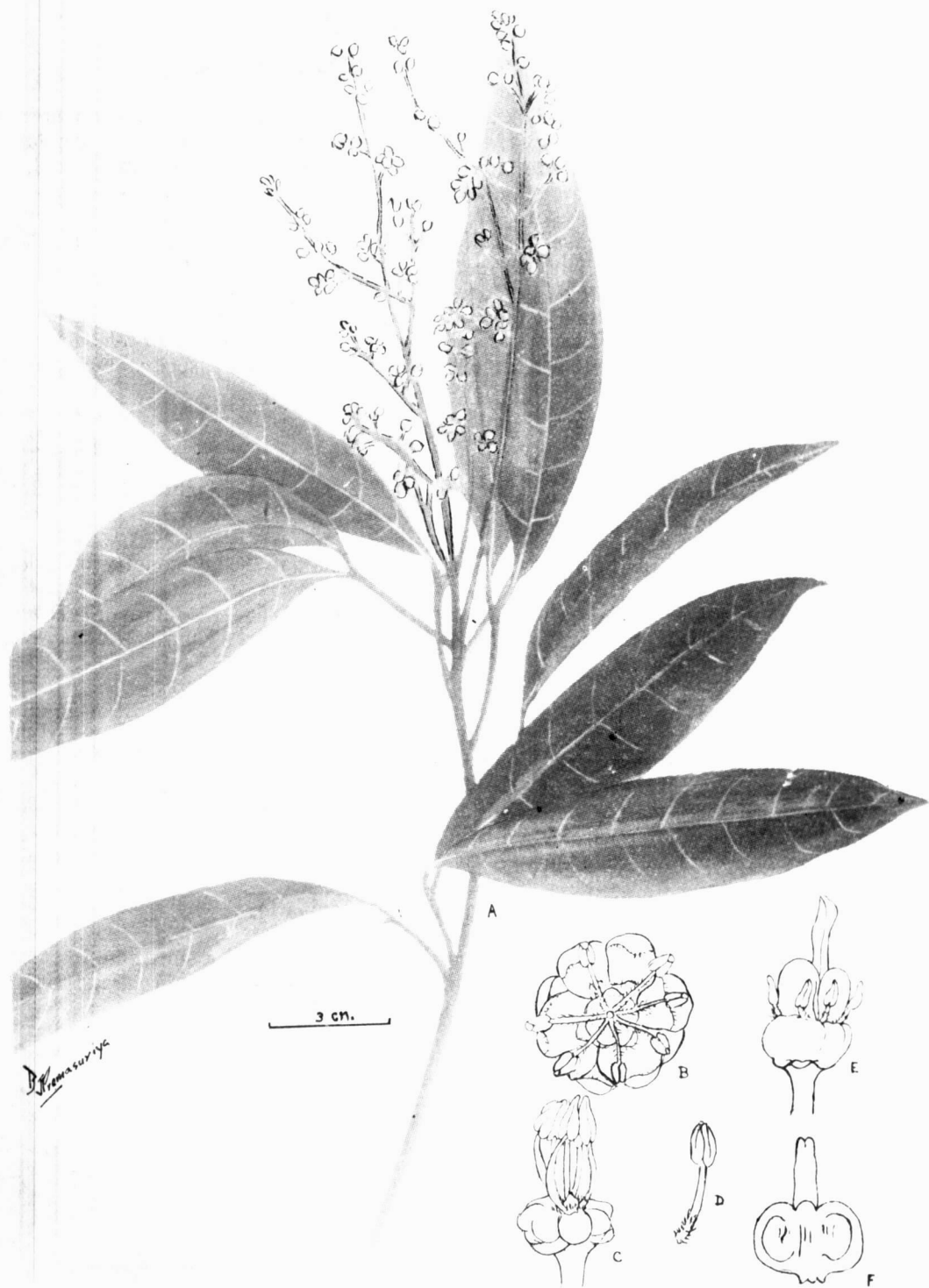


PLATE XXVII. *Sapindus trifoliatus*. A, twig with leaves and panicle of flowers. B, male flower dorsal view. C, male flower with perianth removed lateral view. D, stamen. E, bisexual flower with perianth removed lateral view. F, longitudinal section of pistil. B—F, enlarged.

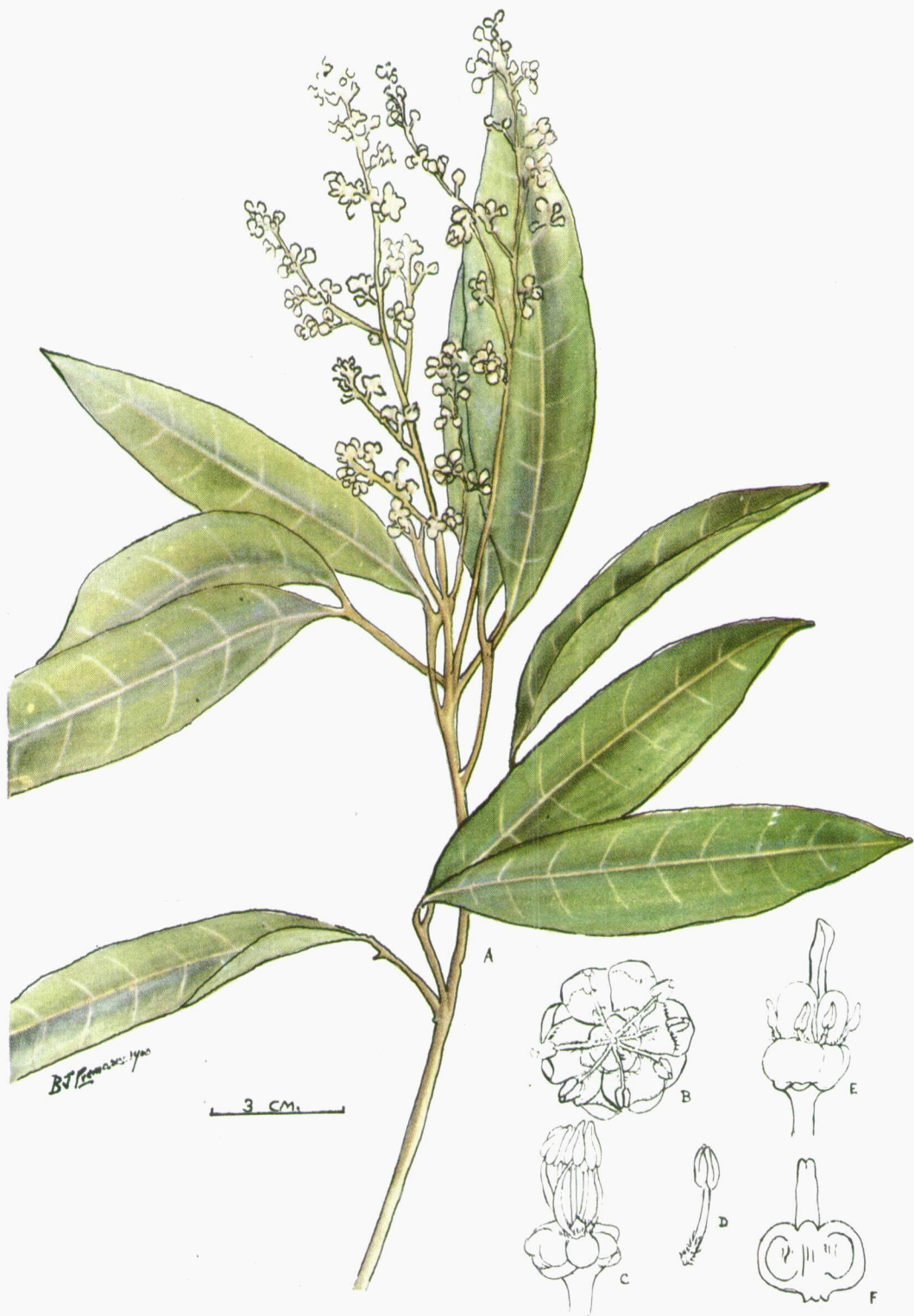


PLATE XXVII. *Sapindus trifoliatus*. A, twig with leaves and panicle of flowers. B, male flower dorsal view. C, male flower with perianth removed lateral view. D, stamen. E, bisexual flower with perianth removed lateral view. F, longitudinal section of pistil. B—F, enlarged.

6. *Sapindus trifoliatus* Linn. Sp. Pl. 367. 1753. (Plate XXVII).

Sapindus laurifolius Vahl—*Sapindus acutus* Roxb.—*Sapindus abstergens* Roxb.

Sinh. Kahapenela; *Tam.* Manippungu, Nittavanji, Neykottan, Puvand, Puchikottai, Punalai; *Sans.* Arishta, Arishtaka, Arthasadhana, Garbhapatana, Guchhaphala, Krishnavarna, Kumbhabijaka, Mangalya, Phenila, Pitaphena, Prakirya, Raktabija, Rishta, Somavalkala.

A medium-sized tree with pubescent young parts; leaves compound, alternate, exstipulate, pinnate, long-stalked, rachis 15—25 cm long, rigid, pubescent, leaflets 4—6 on very short, thick, pubescent petiolules, subopposite, 12.5—17.5 cm long, lanceolate or oval-lanceolate, acute at base, shortly acuminate, obtuse, entire, glabrous above, softly hairy beneath; flowers regular, polygamous, white, sweet-scented, small, numerous on short pedicels, in erect much branched, dense, pyramidal, terminal, more or less pubescent panicle; sepals 5, distinct, much imbricate, silky, obtuse, two outer much smaller; petals 5, distinct, linear-oblong, erect, longer than sepals; disc annular, fleshy; stamens 8 inserted within the disc, filaments hairy throughout; ovary superior, very hairy, 2 or 3-locular with one erect ovule in each loculus, fruit not seen.

Flowers in July and November.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 263. 1933; Herb. Peradeniya, drawing.

Distribution. Much cultivated in S. India and is rather common in the moist low-country in Ceylon.

India. Yellapore, *Talbot* 67, Sept. 1882. Concan: *Stocks*. Mysore: *Meebold* 9648, Oct. 1908. Madras: *Beddome*. Ceylon. Without locality, *Thwaites* C.P. 2545. Cuba. Harvard Trop. Gard., cultivated, *Jack* 4340, March 1926.

Composition. The oil extracted from the seeds of this tree contains n-eicosanic acid while the root bark contains saponin.

Uses. The fruit of this tree is given internally as an emetic nauseant and expectorant. It relieves asthma and certain types of colic. As an errhine it is employed in hemicrania, asthma, hysteria and epilepsy. The root is also a useful expectorant.

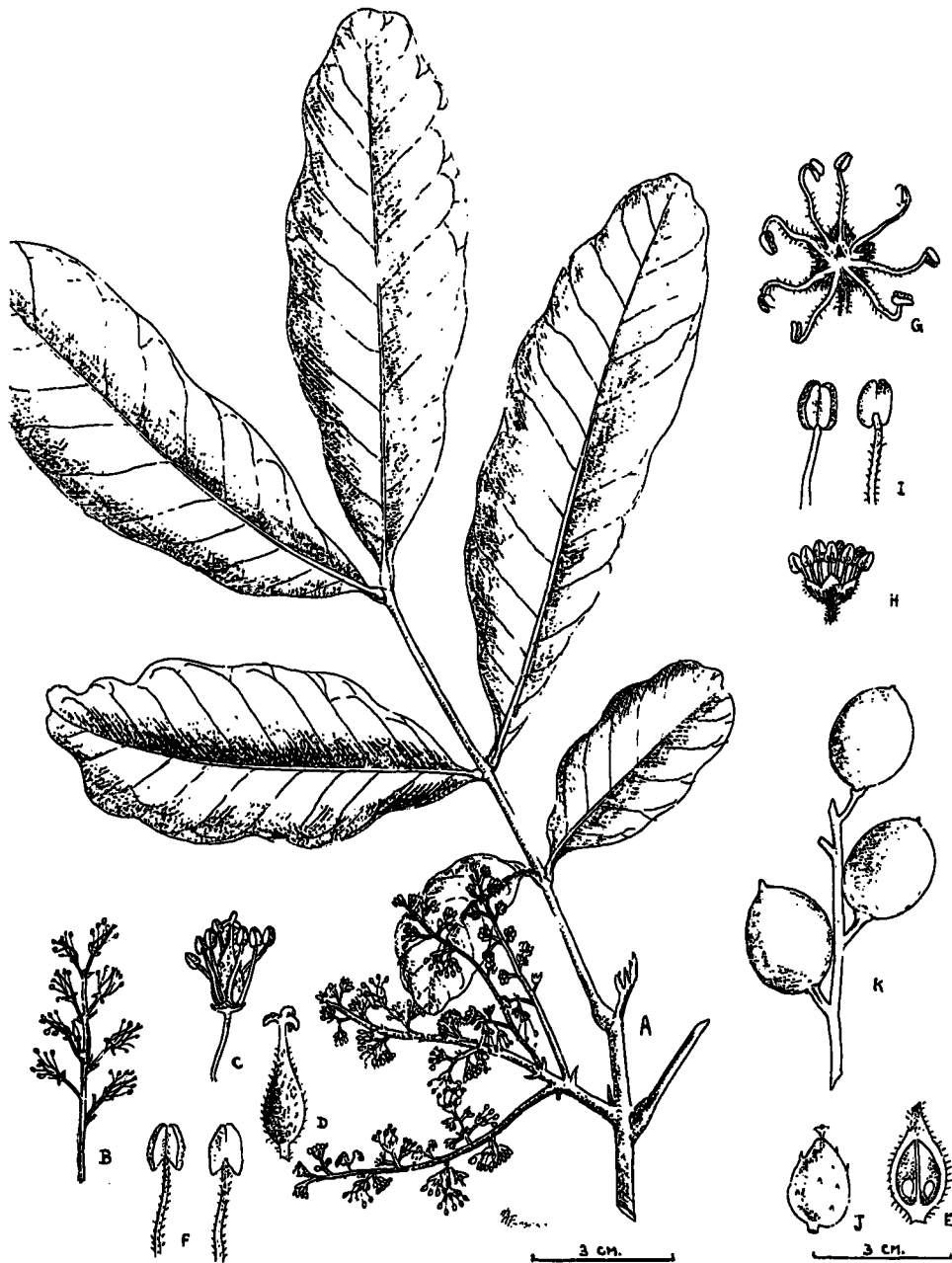


FIG. 472. *Schleicheria oleosa*. A, twig with a leaf and inflorescence. B, part of the inflorescence. C, bisexual flower lateral view. D, pistil. E, longitudinal section of a very young fruit. F, stamens from bisexual flowers. G, male flower from front. H, male flower lateral view. I, stamens from male flowers. J, young fruit. K, mature fruits. B—D, F, G—I, enlarged.

7. *Schleichera oleosa* Merr.: Interp. Rumph. 337. 1917. (Fig. 472).

Pistacia oleosa Lour.—*Schleichera trijuga* Willd.—*Schleichera pubescens* Roth—*Melicocca trijuga* Juss.—*Melicocca pubescens* DC.—*Scytalia trijuga* Roxb.—*Stadmania trijuga* Spreng.—*Cussambium spinosum* Ham.—*Cussambium pubescens* Ham.—*Cussambium glabrum* Ham.

Engl. Ceylon Oak; *Sinh.* Kon, Kon-gas; *Tam.* Kolama, Konji, Konjivanji, Kumbadiri, Mirugakkottai, Mudgottan, Pu, Pulichai, Puvam, Sakkattai; *Sans.* Ghanaskandha, Jantupadapa, Koshamra, Krimivriksha, Kshudramra, Lakshavriksha, Raktamra, Sukoshaka, Suraktaka, Vanamra.

A large tree with close branches and corrugated rough and cracked bark; leaves alternate, compound, paripinnate, rachis 7.5—18 cm long, bearing 4—6 leaflets, leaflets oblong, 7—18 cm long, 3.5—8 cm broad, opposite, coriaceous, truncate or emarginate at apex, dark green and shining on the upper surface, veins prominent beneath, margin recurved; flowers small, green, polygamo-dioecious, pedicellate, in lax, slightly branched, spicate panicles 5—12.5 cm long, from the young shoots below the new leaves; calyx 4—6 fid, segments acute, petals absent; disc flat, crenate at margin; stamens usually 7, inserted within the disc; ovary hairy, 3-locular with one erect ovule in each loculus, style long, stigma 3-lobed, capitate; fruits globular, apiculate, corky brown berries 1.7—2.2 cm diam. 1—2-chambered with a single seed in each chamber covered with an orange brown acid aril; seed exalbuminous, 1.3—1.4 cm long with a brittle brown testa.

Flowers in February.

Illustrations. Beddome *Flor. Sylvat. pl.* 119. 1868—1873; Brandis, *Ill. For. Fl. of North-West and Central India, pl.* 20; Kirtikar and Basu, *Indian Med. Plants, pl.* 262. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the dry forests of India, Burma and Ceylon.

India. Calcutta, *Wallich* 8080B ex Herb. Heyne, Mysore: *Clarke* 11304G, March 1870. Malabar, Concan, etc. *Stocks, Law, etc.* Pen. Ind. Or., *Herb. Wight* 534, Kew Distribution 1866—7. Ceylon. Without locality, *Thwaites C.P.* 1155. Eastern Prov., Inginiyagala, Senanayake Samudraya, *Mueller-Dombois and Comanor* 67072618, July 1967. Southern Prov., Ruhuna National Park, Rugantota, *Mueller-Dombois and Cooray* 67120612, Dec. 1967.

Uses. The bark of this tree is astringent. With oil it is used as a cure for itch and rubbed externally to relieve pain in the back and loins. The oil extracted from the seeds is applied on the head to promote the growth of hair. In different parts of India it is used for different purposes such as a purgative, prophylactic against cholera, rheumatism, headaches and on skin diseases. In Cambodia, the bark is prescribed for malarial fever.

103. SAPOTACEAE

1. *Madhuca fulva* (Thw.) J. F. Macbr. in Contr. Gray Herb. 53: 18. 1918.

Bassia fulva Bedd.—*Ficus mysorensis* Trim.—*Dasyaulus fulvus* Thw.

Sinh. Wana-mi.

A moderate sized tree with a brownish grey bark and the young shoots densely covered with copious orange tomentum; leaves simple, alternate, few on stout densely tomentose petioles about 1.8 cm long, broadly oval or oblong-oval, acute or subacute at base, shortly acuminate, glabrous above when mature and fulvous hairy on veins beneath, rather thick depressed above and venation prominent beneath; flowers regular, bisexual, numerous, in clusters of 4—8 from tomentose, prominent bosses in axils of fallen leaves, pedicels 3.7 cm long, glabrous; sepals 4 in two pairs, the outer pair enclosing the inner, persistent, outer segments oval, acute, glabrous, recurved, inner segments obtuse, densely fulvous tomentose, erect; petals not seen; ovary superior, not seen; fruit (immature) 3.7 cm long, ovoid, pointed and glabrous.

Flowers in April and August.

Illustration. Herb. Peradeniya, drawing.

Distribution. A rare endemic species growing in the moist low-country in Ceylon below 1,000 feet altitude. Hewesse, Ekneligoda, etc.

Ceylon. Ekneligoda, *Thwaites* C.P. 3446.

Uses. The leaves and bark of this tree are used on scalds and burns.

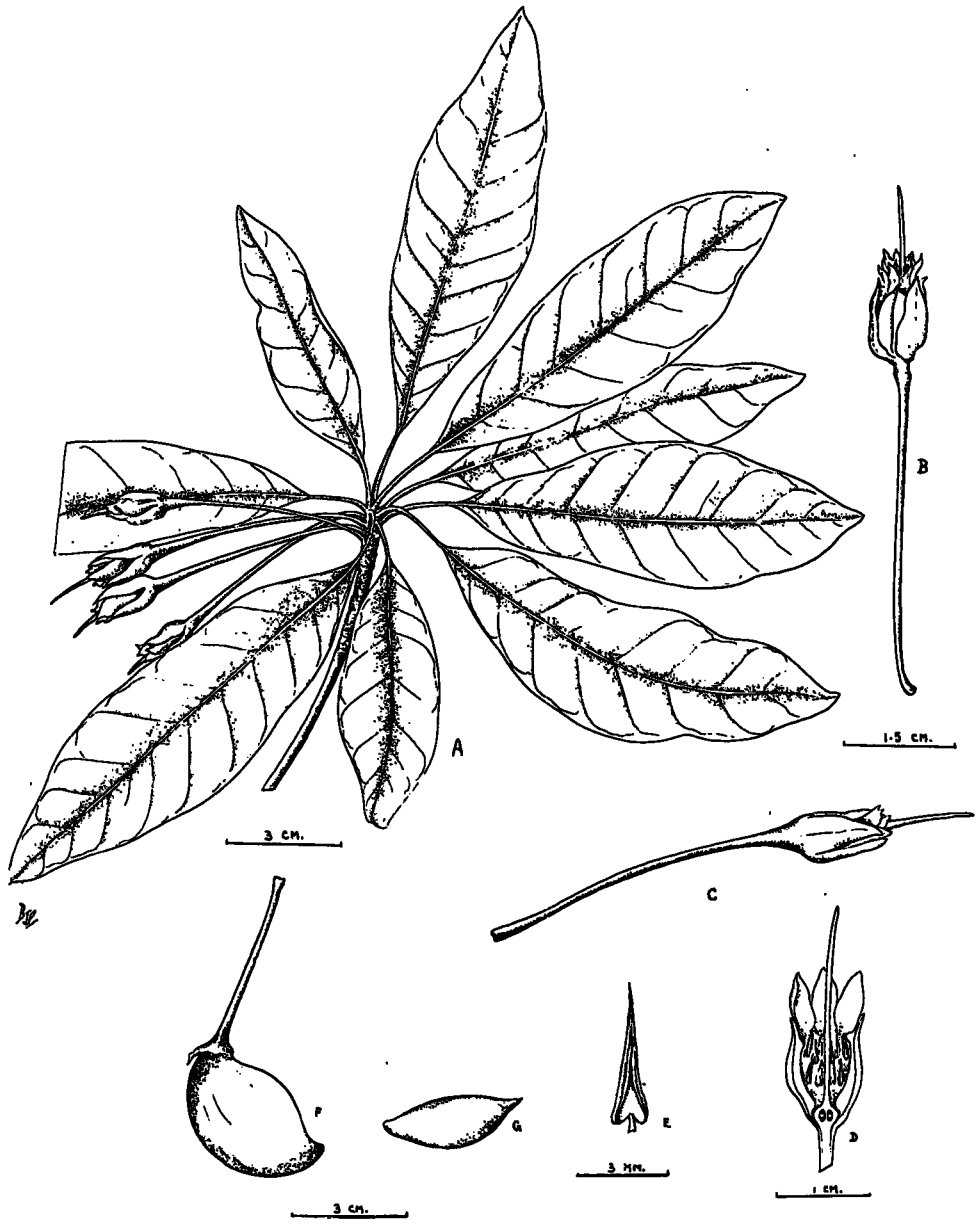


FIG. 473. *Madhuca longifolia*. A, twig with leaves and flowers. B,C, flowers lateral view. D, longitudinal section of flower. E, stamen. F, fruit. G, seed.

2. *Madhuca longifolia* (Linn.) J. F. Macbr. in Contr. Gray Herb. 58: 18. 1918. (Fig. 473).

Bassia longifolia Koen. ex Linn.—*Madhuca indica* Gmel.

Engl. Honey Tree; *Sinh. Mi*; *Tam.* Illuppai, Iruppai, Kuligam, Kulisam, Maduragam, Mavagam, Nattiluppai, Seyilam, Tittinam; *Hindi* Moha, Mohua; *Sans.* Madhuka.

A very large tree, much branched, bark thick, dark yellowish grey, slightly furrowed, young parts pinkish white, silky pubescent; leaves simple, alternate, stipulate, crowded at end of year's growth on slender petioles, 8.7—11.2 cm long, linear-lanceolate, tapering to both ends, slightly acuminate, quite glabrous when mature, thin, venation pellucid, petioles 1.2 cm long, stipules linear, very early caducous; flowers regular, bisexual, pale yellow, appearing with the young leaves and below them, solitary in axils of small deciduous bracts, pedicels 5—6.2 cm long, slender, rather thickened at the upper part, glabrous, erect, afterwards drooping; sepals 4 in two pairs, outer pair enclosing the inner, 1 cm long, ovate, acuminate, deciduous in fruits, outer pair nearly glabrous, inner pair finely tomentose; petals 8—12, fused into a fleshy inflated tube, lobes about as long as the tube, oblong, obtuse, erose, erect; stamens 16—24 in two tiers, upper tier quite sessile, lower with very short filaments, cordate at base, apiculate, 3-toothed at apex, hairy; ovary superior, 8-locular, ovules solitary in each loculus, hairy, style very long and much exerted; fruit obliquely ovoid, pointed, glabrous (tomentose when young), seed solitary (rarely 2), 3.7—4.2 cm long, ovoid, slightly compressed, straight on one edge and curved on the other with a stout curved beak, hilum linear extending the whole length of the straight edge, testa thin, hard, brittle, shining, ocre-yellow.

Flowers in February and May.

Illustrations. Wight, Ill. Ind. Bot. *pl.* 147. 1838; Beddome, Flor. Sylvat. *pl.* 42. 1868—1873; Kirtikar and Basu, Indian Med. Plants, *pl.* 581. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is common in the dry forest region in Ceylon but mostly planted in the moist low-country.

India. Malabar, Concan, etc., *Stocks, Law, etc.* Ceylon. Northern Prov., Jaffna, *Thwaites C.P.* 1797.

Composition. The seeds yield a fixed oil.

Uses. The bark is a good remedy for itch, swellings, fractures and snake-bite poisoning. The oil extracted from the seed is applied on swellings, rheumatism and other skin diseases. The heartwood made into a paste is applied on the throat for glandular swellings in the neck and throat.

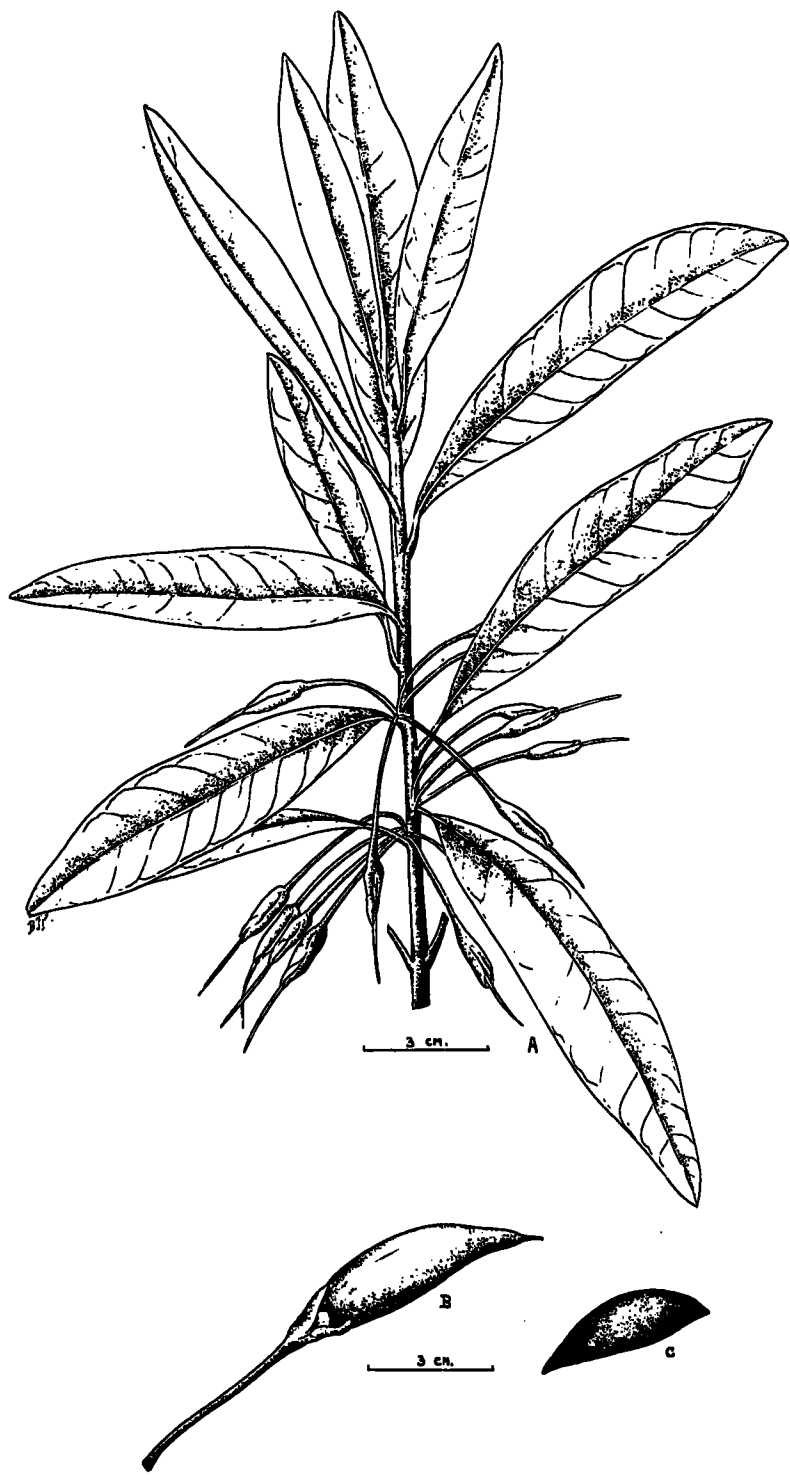


FIG. 474. *Madhuca neriifolia*. A, branch with flowers and leaves. B, fruit. C, seed.

3. *Madhuca neriifolia* (Thw.) H. J. Lam. in Bull. Jard. Buit. Ser' 3, 7: 182. 1925. (Fig. 474).

Bassia neriifolia Moon—*Dasyaulus neriifolius* Thw.

Sinh. Gan-mi.

A small tree with a dark brown bark and glabrous young parts; leaves simple, alternate, stipulate, numerous, scattered on short petioles, 10—17.5 cm long, oblong-linear, tapering to base, often apiculate, glabrous, rather thin, venation pellucid, stipules filiform, brown persistent; flowers regular, bisexual in clusters of about 6 from axils of leaves, pedicels about 2.5 cm long, erect or deflexed, glabrous; sepals 4 in two pairs, outer pair enclosing the inner, segments oval-lanceolate, acute, inner sepals silky hairy; petals 6, fused into a campanulate tube, lobes oblong, obtuse, silky outside, twisted; stamens 12 in one tier, sessile, very acute; ovary superior, 6-locular with a solitary ovule in each loculus, style much exerted and persistent; fruit a linear-ovoid, beaked berry 2.5—3.7 cm long; seed solitary, 2.5 cm long, linear-ovoid, compressed, acute at both ends, shining, pale brown, hilum along the whole length of one side.

Flowers in February and March.

Illustrations. Beddome, *Flor. Sylvat. pl.* 254. 1868—1873; Herb. Peradeniya, drawing.

Distribution. Endemic to Ceylon, it grows in the moist low-country by streams. Ambegamuwa, Ratnapura, Hantane, Trincomalee, etc.

Ceylon. Without locality, *Thwaites C.P.* 235.

Uses. The bark, root, heartwood and the oil extracted from the seeds of this tree are used for the same ailments as *Madhuca longifolia* is used. The oil is applied on wounds and sores caused by bears.

4. *Manilkara hexandra* (Roxb.) Dubard in Ann. Mus. Col. Mar. 23: 9. 1915.

Mimusops hexandra Roxb.—*Mimusops indica* A.DC.

Sinh. Palu; *Tam.* Pala, Palai, Sivandi, Sivani, Sukkilam, Ulakkaippalai; *Hindi* Khir Khirni, Kshiri, Ranjan; *Sans.* Dhupeshtha, Dridhaskandha, Guchhaphala; Kapisitha, Kshirashukla, Kshiravriksha, Kshiri, Kshirika, Kshiririni, Madhavodbhava, Madhuphala, Nimbabija, Nripadruma, Phaladhyaksha, Rajadana, Rajadani, Rajanya, Rajaphala, Rajavallabha, Shriphala.

A large tree with an unbranched main trunk and a few branches, bark blackish grey deeply furrowed vertically and young parts glabrous; leaves simple, alternate, exstipulate numerous, small, 3.7—7.5 cm long, broadly obovate, acute at base, truncate, emarginate or bilobed at apex, glabrous, subcoriaceous, venation pellucid, inconspicuous, petioles 1 cm long, channeled above; flowers small, regular, bisexual, pale yellow, numerous on slender curved rusty pedicels about 1 cm long, 1—3 together in axils of leaves; sepals 6 in two rows, outer valvate enclosing the inner, 0.6 cm long, lanceolate, subacute, puberulous; petals 18, six longer than the rest, linear-lanceolate, acuminate, in 3 series; stamens 6, filaments as long as anthers which are acute but not acuminate, staminodes 6 alternating with the stamens, deeply lacinate, glabrous; ovary superior, 12-locular with a single ovule in each loculus, style simple, exserted; fruit a small, ovoid, smooth, red berry about 1.2 cm long; seed solitary (rarely 2) ovoid, reddish brown and shining.

Flowers in February and March.

Illustrations. Roxburgh, Pl. Corom. 1: pl. 15. 1795; Wight, Ic. Pl. Ind. Or., pl. 1587. 1850; Kirtikar and Basu, Indian Med. Plants, pl. 584. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is very common in the forests of the dry zone in Ceylon.

Ceylon. North Central Prov., Anuradhapura and Kalawewa, *Herb. Peradeniya*, Feb. 1888. Central Prov., Dambulla, *Herb. Peradeniya*, July 1887. Without locality, *Thwaites C.P.* 1793.

Uses. The bark of this tree has astringent properties and the timber is used for building purposes. The fruit is edible.

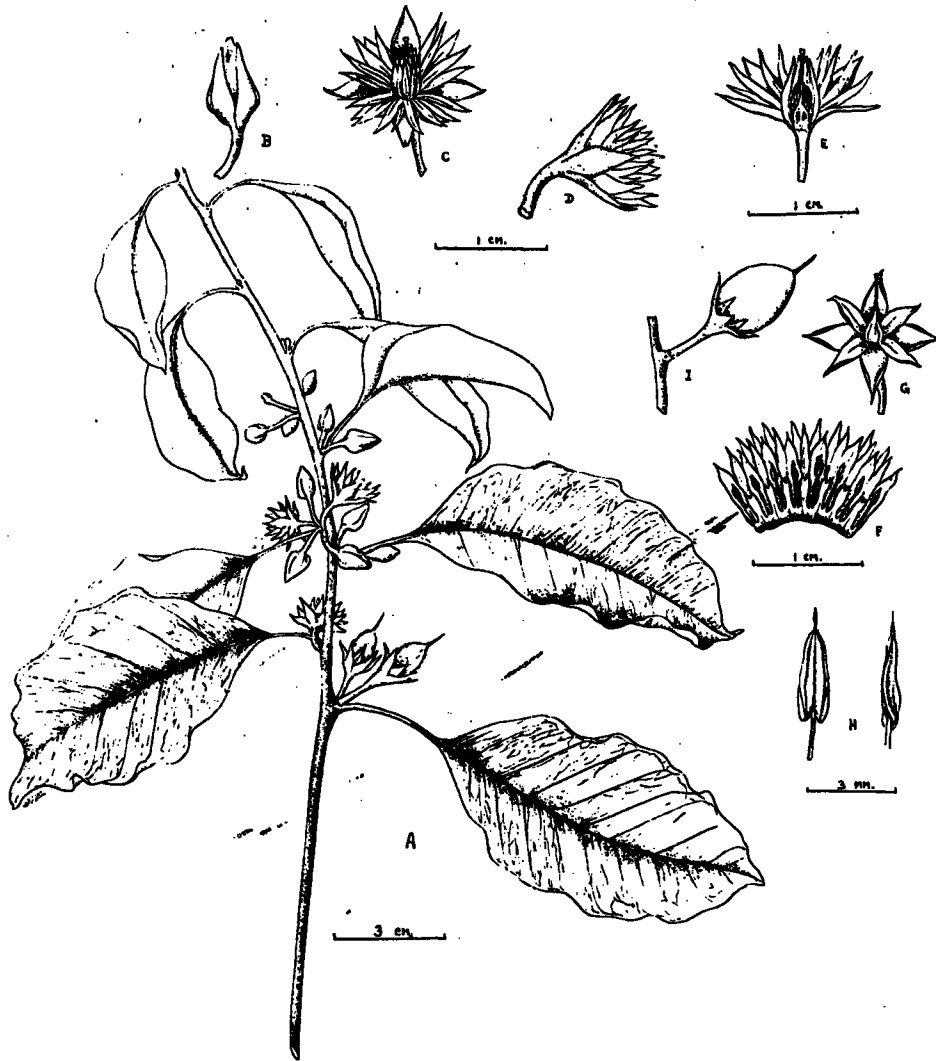


FIG. 475. *Mimusops elengi*. A, branch with leaves and flowers. B, partly opened flower bud. C, flower front view. D, flower lateral view. E, longitudinal section of flower. F, corolla opened out to show the stamens. G, flower with corolla removed showing pistil. H, stamens dorsal and lateral view. I, fruit

5. *Mimusops elengi* Linn. Sp. Pl. 349. 1753. (Fig. 475).

Sinh. Munamal; *Tam.* Alagu, Ijanji, Kesaram, Magil, Magilam, Makil, Mukalai, Vagalam, Vakudam, Vilva-pattiri; *Hindi* Bakul, Bolsari, Maulsarau, Maulser, Mulsari; *Sans.* Anangaka, Bakula, Chirapushpa, Dhanvi, Dohala, Gudhapushpaka, Kantha, Karuka, Keshara, Madhupanjara, Madhupushpa, Makula, Padyamoda, Sharadika, Sidhugandha, Sindhugandha, Sinhakeshara, Sthirakusuma, Shrimukhagandha, Shrimukhamadhu, Surabhi, Tailanga, Varalahdha, Visharada.

A large tree with an erect trunk and a compact leafy globular head, bark reddish brown, branchlets drooping, young parts silky with fine adpressed hair; leaves simple, alternate, stipulate, numerous, distant, large, 11.2—15 cm long, oval, subacute at base, acuminate, obtuse at apex, undulate, glabrous, dark green and shining on the upper surface, paler beneath, lateral veins very numerous and slender, petioles slender, cylindrical, 2.5 cm long, stipules minute, lanceolate quickly falling off; flowers small, regular, bisexual, white becoming cream coloured, sweet-scented, in axillary fascicles of 1—4, pedicels 0.6—0.8 cm long, adpressed pubescent, often deflexed; sepals 8 in two series, outer valvate enclosing the inner, lanceolate, subacute, outer ones pubescent; petals 24 in series of 8 each, corolla-tube short and fleshy, lobes linear-oblong, acute, often slightly lacerate; stamens 8, inserted at base of corolla-tube, anthers nearly sessile, sharply acuminate, cells divergent at base, staminodes 8, alternating with the stamens, oval, acuminate, hairy on outside; ovary superior, silky-pubescent, 8-locular with a solitary ovule in each loculus, style simple, tapering, exserted; fruit a fleshy berry, over 2.5 cm long, ovate-ovoid or ovoid, apiculate, pubescent when young, afterwards glabrous, orange-yellow; seed solitary, ovoid, compressed, brown and shining.

Flowers in March.

Illustrations. Roxburgh, Pl. Corom. 1: pl. 14. 1795; Gaertner, Fruct. et Sem. Plant. 1: pl. 42. 1788; Wight, Ic. Pl. Ind. Or., pl. 1586. 1850; Beddome, Flor. Sylvat. pl. 40. 1868—1873; Rumphius, Herb. Amb. 2: pl. 63. 1741; Kirtikar and Basu, Indian Med. Plants, pl. 583A. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malay Peninsula and Andaman Islands. It is rather common in the low-country in Ceylon, often cultivated.

India. Silhet: *Wallich* 41461. Ganget. Plain, *T. Thomson*. North Canara: *Talbot*, May 1882; *Wallich* 4146K. Malabar, Concan, etc. *Stocks, Law, etc.* Pen. Ind. Or., *Herb. Wight* 1739 Kew Distribution 1866—7. Ceylon. Kahaduwa, *King*, May 1927. Without locality, *Thwaites*, C.P. 1794. Maldiv Islands. *Didi* 116, 1896.

Composition. The bark and flowers of this tree contain an alkaloid, while the bark has in addition a tannin and a saponin. The seeds contain a toxic principle and a saponin, *mimusops-saponin*. The leaves do not contain saponin.

Uses. A decoction of the bark of this tree is used as a gargle for diseases of the gums and teeth and taken internally for discharges of the mucous membranes of the bladder and urethra. It is useful for treating fever and is supposed to increase fertility in women. Along with the flowers, it is given in diarrhoea. The young fruit in decoction is used as gargle for treating sprue and is chewed for strengthening gums. The pulp of the ripe fruit cures chronic dysentery.

The flowers serve as a cosmetic owing to their fragrance, while the ripe fruit is made into pickles and preserves. The bark is a source of tannin.

104. SCROPHULARIACEAE

1. *Adenosma capitatum* Benth. ex Fl. Brit. Ind. 4: 264, 1884.

Stemodia camphorata Moon.—*Pterostigma capitatum* Benth.

Sinh. Nil-gonakola.

An annual herb; stem 22.5—45 cm high, erect, very stout, cylindrical, densely villous, hairy, with numerous, slender, whorled ascending branches; leaves usually in whorls of 4, sessile, lanceolate-oblong, obtuse or subacute, crenate-serrate, villously hairy on both sides copiously gland-dotted beneath; flowers bilaterally symmetrical, bisexual, small, bluish purple, sessile, whorled in axils of leafy bracts, densely aggregated into short, round or ovoid terminal heads 1.2—1.8 cm long, bractlets filiform, as long as sepals; sepals 5, distinct, linear, equal in length, acute, very hairy; corolla 2-lipped, upper lip erect, lower spreading, 3-lobed; stamens 4, didynamous, included, anther cells distinct, stalked, one usually barren; ovary superior, style much exerted, much dilated and winged below stigma; capsule 4-valved, shorter than sepals, globose and acuminate.

Flowers in November.

Distribution. Occurs in India, Ceylon, Burma, Malaya and China. It is rather common in the moist low-country below 1,000 feet elevation in Ceylon. Colombo, Pasdunkorale, etc.

India. Bhutan: *Lister*, Oct. 1886 Assam: *Simons*. **Ceylon.** Without locality *Thwaites* C.P. 2880; *Walker*. Western Prov., Katunayake, *Alston* 2386, Aug. 1928.

Uses. A decoction of the roots is given for bowel complaints and rheumatism. The herb is applied as a poultice for pains in the abdomen. In Java, the leaves are cooked and eaten for fever and used externally for washing sick children.

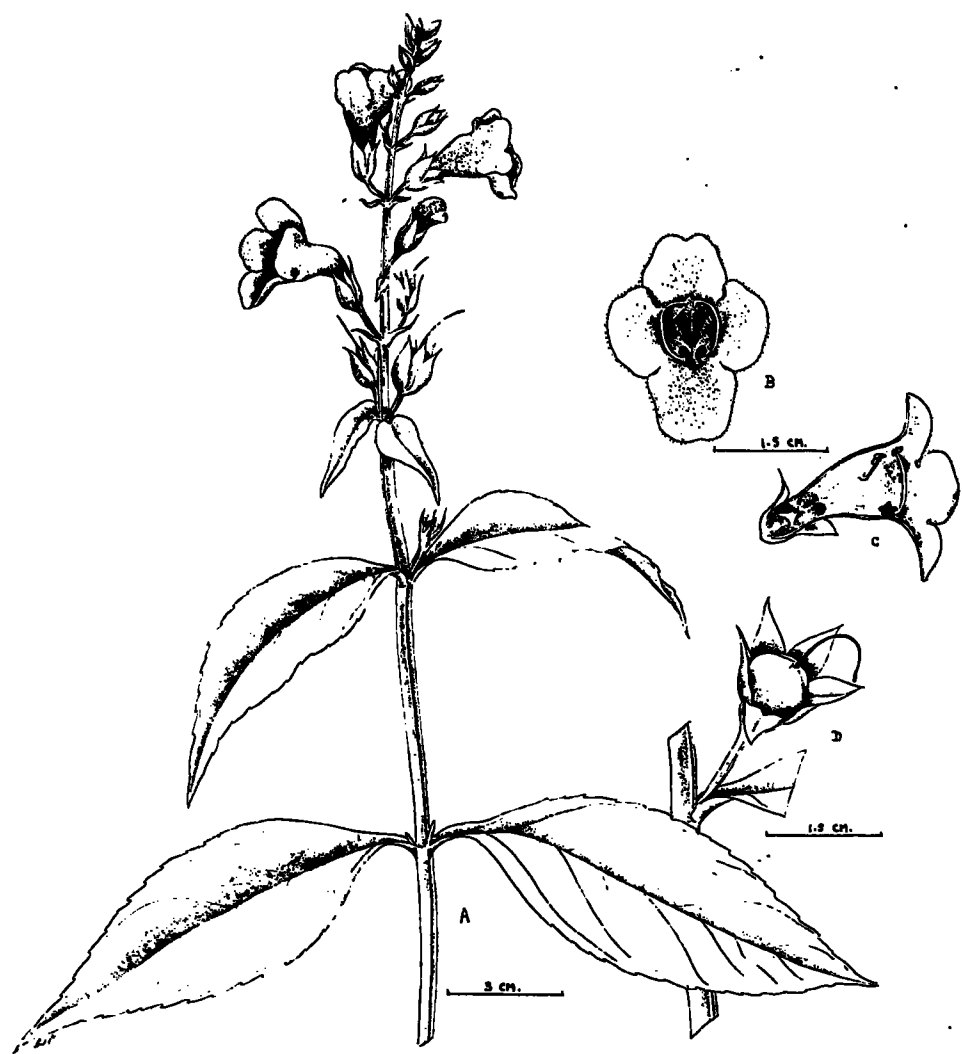


FIG. 476. *Artanema longifolium*. A, branch with leaves and flowers. B, flower dorsal view. C, longitudinal section of flower. D, fruit.

2. *Artanema longifolium* (Linn.) Vatke in *Linnea* 43: 307. (Fig. 476).

Columnella longifolia Linn.—*Achimenes sesamoides* Vahl.—*Artanema sesamoides* Benth.—*Diceros longifolius* Pers.

Sinh. Gaskotala; *Sans.* Kokilaksha.

A stout herb, stem 60—90 cm tall, erect, branched, quadrangular with very acute angles, glabrous, often purple; leaves simple, opposite, exstipulate, sessile, 6.2—12.5 cm long, narrowly ovate-lanceolate, tapering to base, acuminate, very acute at apex, serrate, harsh on both sides and at margin with fine asperities; flowers irregular, bisexual, large, rather dull violet-purple on short pedicels, in long, erect, lax, terminal racemes; sepals 5, strongly imbricate, ovate, acute, nearly glabrous; petals 5, fused into a funnel-shaped corolla, dilated at mouth, glandular pubescent inside, nearly 2.5 cm long, 2-lipped, upper lip erect, lower lip 3-lobed, lobes rounded, obtuse; stamens 4, didynamous, anthers coherent in pairs, cells confluent, filament of anterior ones long, curved round the mouth of corolla-tube, dilated at base with prominent knobs; ovary superior, 2-locular with numerous ovules in each loculus, style simple, stigma of two blades; fruit a globose capsule, seeds lobulated.

Flowers in July and August.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 1410. 1849; Curtis, *Bot. Mag.* pl. 8687. 1916; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, Ceylon, Malay Peninsula, Java, Sumatra, Philippine Islands and in tropical Africa. It is rather common in Ceylon in open and waste ground up to 4,000 feet altitude.

India. *Gibson ex Herb. Calc.* Ceylon. Sabaragamuwa Prov., between Delgoda and Karawita, *Herb. Peradeniya*, March 1919. Without locality, *Thwaites C.P.* 2024; *Walker.*

Uses. A decoction of the root is given for rheumatism, stones in the bladder, ophthalmia and diarrhoea. Seeds are used to improve vitality, favour conception and cure biliousness.

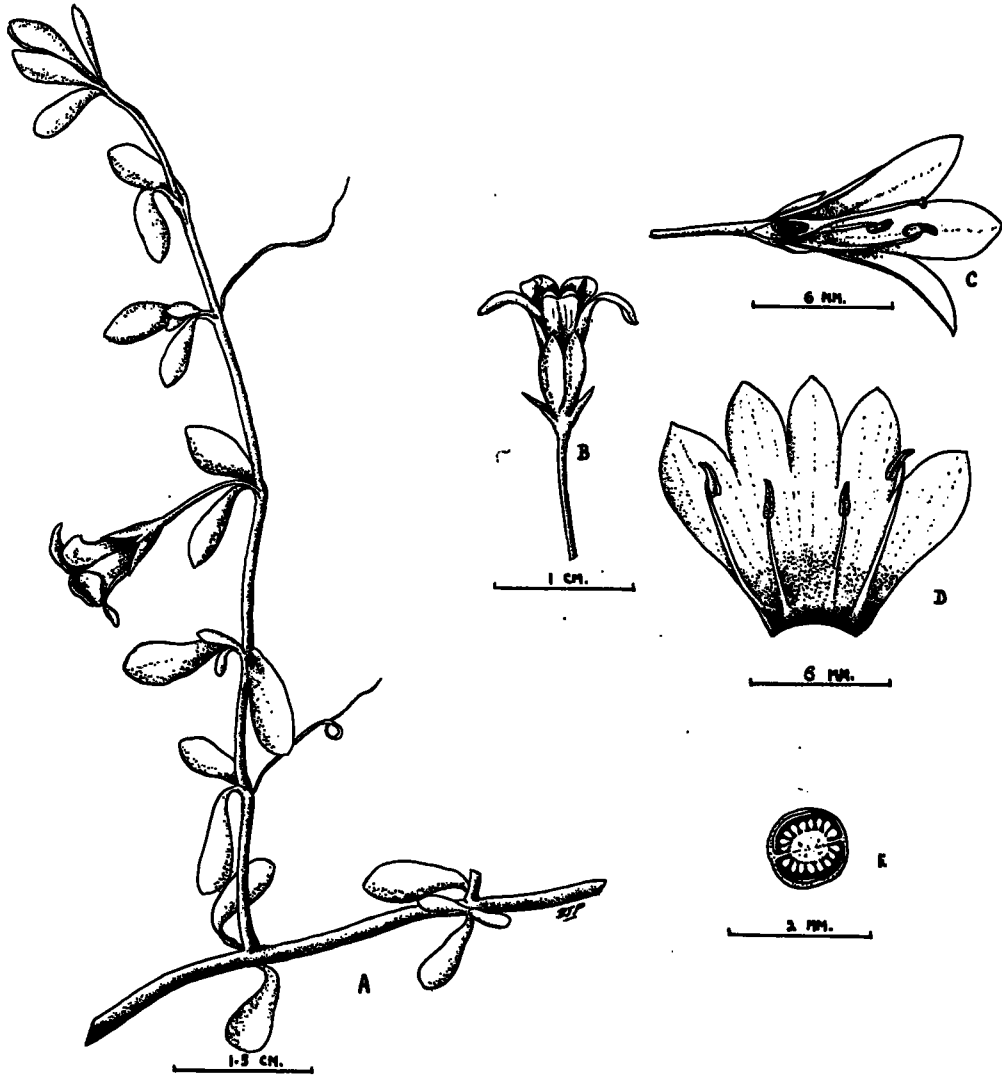


FIG. 477. *Bacopa monniera*. A, twig with leaves and a flower. B, flower lateral view. C, longitudinal section of flower. D, corolla opened out showing stamens. E, transverse section of ovary.

3. **Bacopa monniera** (Linn.) Wettst. in Engl. & Prantl. Nat. Pfl. 4 (3b): 77. 1891. (Fig. 477).

Gratiola monniera Linn.—*Bramia indica* Lamk.—*Monniera cuneifolia* Michx.—*Herpestis monniera* H.B. & K.—*Herpestis spathulata* Bl.—*Septis repens* Lour.—*Calyptriplex obovata* Blanco.

Sinh. Lunuwila; *Tam.* Brami, Nirbrami, Nirpirimi, *Hindi.* Barambhi, Jalneem, Safedchamni, Svetchamni; *Sans.* Bharati, Brahmi, Brmhacharini, Brmhakanyaka, Divya, Divyateja, Kopatavanka, Kopatavega, Mahaushadhi, Mandukamata, Manduki, Matsyakshi, Medhya, Parameshthini, Saraswati, Saumyalata, Sharada, Soma, Somavalli, Somya, Surasa, Surashreshtha, Sureshta, Survarchala, Swayambhuvi, Vaidhatri, Vallari, Vara, Vira, Vayastha

An annual herb with creeping stems rooting at nodes, rather succulent with numerous ascending branches; leaves simple, opposite, exstipulate, sessile, 1.2—1.8 cm long, spathulate very obtuse, entire, glabrous, rather fleshy; flowers irregular, bisexual, pale violet-blue, solitary, axillary, on glabrous pedicels much longer than leaves, bractlets linear-lanceolate, sepals 5, free, unequal, imbricate, outer sepals longer, oval-oblong, acute; petals 5, fused into a faintly 2-lipped corolla, nearly 1.2 cm long, rounded, lobes nearly equal; stamens 4 on corolla-tube, didynamous, included, anther cells distinct, both perfect; ovary superior, 2-locular, ovules numerous in each loculus, style simple, stigma usually 2-lobed; fruit a 2-valved, ovoid capsule, sharply pointed, enclosed in the calyx; seeds small, numerous with fleshy endosperm.

Flowers in December.

Illustrations. Curtis, Bot. Mag. pl. 2557. 1825; Roxburgh, Pl. Corom. 2: pl. 178. 1798; Kirtikar and Basu, Indian Med. Plants pl. 696C. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in marshy places in India, Ceylon, Malaya and Philippine Islands. It is very common in the low-country in Ceylon, especially in paddy fields near the sea coast.

India. Punjab: T. Thomson. Ceylon. Northern Prov., Talaimannar, J. M. Silva, July 1916. Without locality, Thwaites C.P. 2034. Maldive Islands. Gardiner, 1899—1900.

Composition. This herb contains the alkaloid, herpestine.

Uses. It is considered as a nervine tonic useful for insanity, epilepsy and loss of voice in phthisis. It is a diuretic, aperient and a mild purgative, especially given to children. The juice of the fresh stems and leaves is used as a snake-bite remedy. A special preparation of it with gold and other ingredients is given to increase strength, memory, voice, brain and sexual power.

4. *Centranthera indica* (Linn.) Gamble, Fl. Madras, 971. 1924.

Razumoria indica (Linn.) Als.—*Rhinacanthus indica* Linn.—*Centranthera procumbens* Benth.—*Centranthera brunoniana* Thw.

Sinh. Dutusatuta; *Sans.* Sudhatu.

An erect herb with thick, much branched, bright orange roots and numerous, obscurely quadrangular or compressed, hispid, often purple stems 7.5—45 cm long covered with spreading white hairs; leaves simple, alternate, exstipulate, sessile, oblong, 1.2—2.5 cm long, obtuse rather thick and stiff, sparsely bristly hairy and ciliate with large sunken glands, veinless; flowers irregular, bisexual, rather large, white usually with a large, brown-pink stain on the upper side of the throat, very shortly stalked, solitary, bractlets small, linear; sepals 5, fused and split down one side, nearly 1.2 cm long, spathaceous and flattened with 5, slightly winged angles, hispid-hairy, apex acute; petals 5, fused into a widely tubular, funnel-shaped corolla, 2.5 cm long, lobes spreading, rounded; stamens 4, didynamous, included, anthers not connate in pairs, cells spurred at base, one sometimes empty; ovary superior, 2-locular with numerous ovules in each loculus, style simple, stigma bilobed, dilated, acute; fruit capsule 1 cm long, ovoid, loculicidally 2-valved, valves often split into two, seeds numerous, yellow.

Flowers throughout the year.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is rather common in damp places in the low-country of the moist regions of Ceylon up to 3000 feet altitude, very rare in the dry regions. Batticaloa, Colombo, Galle, Galagedara, Gannoruwa, etc.

Ceylon. Central Prov., Galagedara, *Herb. Peradeniya.*, Oct. 1882; Gannoruwa, *Alston*, Nov. 1927; Balana, *Herb. Peradeniya*, June 1883; Kelebokke, *Herb. Peradeniya*, Aug. 1891. Sabaragamuwa Prov., Delgoda, *Lewis & J. M. Silva*, March 1919. Southern Prov., Opatha, *Herb. Peradeniya* March 1881. Without locality, *Thwaites C.P.* 2026; *Lewis*, Feb. 1915; *Walker*, *Herb. Wight* property.

Uses. All parts of this plant are considered diuretic and are used in decoctions along with other drugs for fever. It is used externally for sore eyes.

5. *Limnophila conferta* Benth. in DC. Prodr. 10: 387. 1846.

Limnophila serrata. Thw.—*Limnophila pulcherrima* Hook. f.—*Limnophila aromatica* Merr.

Sinh. Ambawila.

An aquatic annual with a stout stem, spongy, prostrate or floating below, with long roots from the nodes, cylindrical, glabrous or hairy; leaves sessile, opposite or whorled, 2—2.5 cm long with broad base, rhomboid-lanceolate, obtuse, crenate-serrate, rather thick, glabrous, dull pale green; flowers bilaterally symmetrical, bisexual, pale violet-pink, solitary or in very short leafy axillary spikes; bractlets minute, linear; sepals 5, equal, linear, very acute, usually hairy, tips spreading; corolla about 1 cm long, faintly bilobed, pubescent outside, corolla-tube wide, lower lip 3-lobed, lobes short and rounded; stamens 4, didynamous, included, anthers cohering in pairs, cells distinct, both perfect; ovary superior, style exerted, decurved at end, stigma of two blades; fruit capsule about 4 mm long, 2-valved, usually loculicidal, enclosed in the calyx, seeds bluntly angular and shining.

Flowers from January to March and in June.

Distribution. Occurs in India, Ceylon and Burma. It is common in wet places in the low-country in Ceylon.

India. Malabar, Concan, etc. *Stocks, Law, etc.* Bengal *J. D. Hooker and T. Thomson.* Chittagong: *J. D. Hooker and T. Thomson.* Ceylon. Without locality, *Thwaites C.P.* 2049. Central Prov., Peradeniya, Hakinda, *Herb. Peradeniya*, Dec. 1927. Pasdunkorale, Mimamalwatte, *Herb. Peradeniya*, March 1887.

Uses. This herb is chiefly used for poulticing sores on legs. A decoction of the roots and leaves is given for fever and acts as an aperient and expectorant.

6. *Picrorrhiza kurrooa* Benth. Scroph. Ind. 47.

Veronica lindleyana Wall.

Sinh. Katukarosana; *Tam.* Katukurogani; *Hindi* Karki, Kuru, Kutki; *Sans.* Anjani, Arishta, Ashoka, Asokarahini, Chakrangi, Chitangi, Dhanvantarigrantha, Dvijangi, Janani, Kanderuha, Katamvara, Katavi, Katuka, Katumbhara, Katurohini, Kedarakatuka, Krishna, Krishnabheda, Mahaushadhai, Malabhedini, Matsyapitta, Matsyashakala, Nakulasadani, Shakuladani, Shataparva, Tikta, Tiktarojanika, Vamaghni, Vantida.

A low, more or less hairy, perennial herb with a bitter rootstock with the thickness of the fifth finger, 15—25 cm long, clothed with withered leaf bases; leaves subradical, spatulate, serrate 5—10 cm long, rather coriaceous, tip rounded, base narrowed into a winged sheathing petiole; flowering scapes ascending, stout, longer than leaves, naked or with a few bracts below the inflorescence; spikes 5—10 cm long, subcylindric, spicate on leafy flowering stems, many-flowered, subhirsute, bracts oblong or lanceolate, as long as the calyx; flowers bilaterally symmetrical, bisexual; sepals 5, lanceolate, 6 mm long, ciliate, imbricate in bud; corolla of short-stamened form 6—8 mm long with longer filaments 8 mm long; of longer-stamened form 6 mm with filaments 1.8 cm long; stamens 4, filaments of the longer stamened form very slender, four times as long as the corolla, of the shorter-stamened form stout, two upper shorter than the upper lip of the corolla with the anthers under the hood, two lower exerted, anther-cells subdivergent and confluent at the top; ovary superior, 2-locular, many ovuled, style of the longer-stamened form long and slender, stigma simple, of the shorter-stamened form stouter and shorter, stigma capitate and exerted; fruit capsule ovoid, turgid, 1.2 cm long, septicidal and loculicidal, margins of the valves inflexed.

Illustration. Kirtikar and Basu, *Indian Med. Plants*, pl. 699. 1933.

Distribution. Occurs in the Alpine Himalayan regions, extending from Kashmir to Sikkim in India, but not in Ceylon.

India. Tihri-Garhwal, *Duthie* 229, June 1883.

Uses. This herb is a bitter stomachic and is useful in dyspepsia, fever and for many purgative preparations. It is also used as a vermifuge and for dysentery and asthma. In China and Malaya, the rhizome is used as a popular remedy for bilious dyspepsia with fever.

7. *Torenia travancorica* Gamble, Fl. Madras, 957. 1923.

Torenia leucosiphon Als.—*Torenia asiatica* var.—*parviflora* Hook. f.—*Torenia asiatica* Trim.

Sinh. Kothala-wel, Welkothala.

An annual herb with creeping, quadrangular stems rooting at nodes, glabrous with many, long, straggling, spreading or erect branches; leaves simple, opposite, exstipulate, 1.8—3.1 cm long, ovate-lanceolate, rounded at base but tapering to the petiole, acute, serrate, slightly rough with short hair on both sides, petioles 0.6—1.2 cm long; flowers irregular, bisexual, solitary, dark purple with pale yellow corolla-tube, pedicels erect or spreading, glabrous, 3.7—5 cm long, becoming thickened and deflexed in the fruit; sepals 5, completely connate with a 5-ribbed, slightly winged, glabrous calyx 1.8 cm long, cut half way down to two acute lips; petals 5, fused into a tubular 2-lipped corolla, dilated above, 2.5 cm long and 2.5 cm diam., upper lip arched, nearly entire, 3 lobes of the lower lip broader than long; stamens 4, didynamous, longer filaments arched, toothed at base, anthers coherent in pairs, perfect, cells of the upper pair divaricate, distinct, of the lower pair often confluent; ovary superior, 2-locular with numerous ovules in each loculus, style simple, stigma 2-lobed; fruit capsule 2-valved, included in calyx and about as long, linear-oblong, seeds numerous, small, excavated with endosperm.

Flowers from February to June.

Illustrations. Curtis, Bot. Mag. *pl.* 4249. 1846 and *pl.* 5167; Wight, Ic. Pl. Ind. Or., *pl.* 862. 1843—1845; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Java and China. It is common in damp places in the moist regions in Ceylon up to 4,000 feet altitude.

India. Assam: *Simons* ex Herb. Calc. Pen. Ind. Or., *Herb. Wight* 2397 in part, Kew Distribution 1866—68. **Ceylon.** Central Prov., *Thwaites C.P.* 2032 in part; Pasdun Korale, Bambara Botuwa, *Herb. Peradeniya.*, June 1883; Wellankande Forest, *Herb. Peradeniya.*, Dec. 1890. Southern Prov., Benelapanata, *Herb. Peradeniya.*, Feb. 1881.

Uses. The juice of the leaves is considered useful in the treatment of gonorrhoea.

105. SELAGINELLACEAE

Selaginella wightii Hieron in Hedw. 39: 319. 1900.

Lycopodium bryopteris Wall.—*Lycopodium rupestre* Hook. et Grev.—*Selaginella rupestris* Spreng.

Sinh. Sanjeeva.

A herb with densely tufted stems, decumbent or ascending, 5—15 cm long with pinnately arranged simple or slightly compound branches; leaves dense, many, ascending, uniform, densely imbricated, linear or linear-lanceolate, very small with a distinct transparent awn, pale green, convex and sulcate at the back, rigid and strongly ciliated; spikes square, sessile, 1—1.2 cm long; bracts rigid ovate-lanceolate, acute, much imbricated and acutely keeled.

Illustrations. Raddi, *Fil. Bras. pl. 4 bis, fig. 2*; Dillenius, *Musc. pl. 68, fig. 11*.

Distribution. Occurs in the north and south temperate zones of both hemispheres. It is found in Brazil, India and Ceylon. The author has come across it forming a carpet at the base of the Dambulla rock.

Uses. This plant is used in the preparation of medicinal oils for treatment of paralysis. In Africa, the plant is smoked with *Lycopodium clavatum* for relief of headache. The powdered rhizome is made into an ointment and rubbed on venereal sores in South Rhodesia.

106. SIMAROUBACEAE

1. *Ailanthus triphysa* (Dennst.) Als. in Trim. Fl. Ceyl. 6: 41. 1928.

Ailanthus malabarica DC.—*Adenanthera triphysa* Dennst.

Sinh. Kambalu, Kumbulu, Maha-kohomba, Wal-bilin; *Tam.* Mattipalai, Peru, Peru-maram, Peru vempu, Pongiliyam; *Sans.* Aralu, Atisarahita, Gugguladhupa, Mahanimba Mahanimbu.

A lofty tree with a straight trunk and rough bark, branchlets with very large, closely placed leafscars, young parts pubescent with fine simple or stellate hairs; leaves compound, alternate, exstipulate, very large, 45—60 cm long, pinnate, rachis cylindrical with a raised line along the upper side, very finely stellate pubescent, much thickened at base, leaflets 16—20, distant, opposite or subopposite, shortly stalked, 7.5—12.5 cm long, ovate-oblong, tapering, acute, unequal at base, upper half larger, rounded, lower half acute, entire, margin slightly reflexed, glabrous, glaucous beneath; flowers polygamous, small, numerous, white, the bisexual flowers rather larger than the males, shortly pedicellate in long, loose, axillary panicles; sepals 5, fused into a small, hairy calyx, segments acute; petals 5, valvate, oval-oblong, acute; stamens 10, exceeding the petals, fewer in bisexual flowers, disc 10-lobed; ovary superior, ovoid, glabrous, 3-locular with one ovule in each loculus; fruit a samara, indehiscent, 6.2—7.5 cm long, flat, oblong, obtuse at both ends, papery, glabrous with the seed about the middle, seed much compressed and circular.

Flowers in January.

Illustrations. Wight, Ic, Pl. Ind. Or., pl. 1604. 1850; Beddome, Flor. Sylvat. pl. 122. 1868—1873; Kirtikar and Basu, Indian Med. Plants, pl. 203. 1933.

Distribution. Occurs in India, Ceylon, Burma and Cochin-China. It is rather rare in the moist low-country in Ceylon. Seven Korales, Colombo, Gampaha, etc.

India. Canara: Talbot, Feb. 1882. *Ceylon.* Without locality, Thwaites C.P. 3456. *Cochin-China.* Pierre 1639, 1877.

Composition. The bark and leaves of this tree contain ailanthic acid.

Uses. The juice of the fresh bark and the gum resin which exudes from the injured bark are excellent remedies for dyspepsia, diarrhoea, dysentery and bronchitis. The leaves are recommended for cephalalgia and gastralgia. A decoction of the root bark given internally acts as an antidote against cobra-bite poisoning.

2. *Balanites aegyptiaca* Del. Ill. Fl. d'Eg. 263. 1813.

Ximenia aegyptiaca Linn.—*Ximenia agihalid* Mill.—*Ximenia ferox* Poir—*Balanites roxburghii* Planch.—*Balanites ferox* G. Don.—*Agialdia roxburghii* O. Ktze.

Sinh. Ingudi; *Tam.* Nanjundan, Nanjudi, Toruvattu; *Sans.* Angarvriksha, Angudidala, Anilantaka, Bhallakivriksha, Daruparuaphala, Gaurtvaka, Hinguputra, Inguda ingul, Inguni, Jalajanyu, Kantaka Krisharaka, Kroshtuphala, Munipadapa, Putigandha, Putripatra, Shulari, Tailabija, Tanupatra, Tapasamudrama, Tapasataru, Tiktaka, Tiktarnaja, Vinashaka, Vishakantaka.

A small spiny tree about 10 m high with pubescent or tomentose young parts, branches yellow-green, glabrous or pubescent, spines 2.5—3.7 cm long, axillary, straight, strong and very sharp; leaves alternate 2-foliolate, petioles 3—6 mm long, leaflets elliptic or obovate, obtuse or subacute, sometimes slightly mucronate, base usually acute, petiolules very short; flowers regular, bisexual, small, greenish-white, fragrant in axillary few or many-flowered, short peduncled cymes or fascicles; sepals 5, imbricate, ovate, concave, 3 mm long, pubescent outside, silky within; petals 5, imbricate, oblong-ovate, glabrous outside, silky villous within, a little longer than sepals; stamens 10, inserted in the furrows at the base of the disc, filaments glabrous, subulate, anthers attached at the back; disc cupular with a 10-lobed glandular margin; ovary superior, silky-villous, globose, 1/2-immersed in the disc, 5-locular with a single ovule in each loculus, linear, pendulous below the apex of the loculus, style short, conical; drupes large, ovoid woody, angular, 2.5—5 cm long, 5-grooved, seed pendulous, ovoid, exalbuminous.

Flowers from March to May.

Illustrations. Delile, Ill. Fl. d'Eg. pl. 28, fig. 1. 1813; Wight, Ic. Pl. Ind. Or., pl. 274. 1840; Kirtikar and Basu, Indian Med. Plants, pl. 207. 1933.

Distribution. Occurs in the drier parts of India, Burma, Arabia, Egypt, Eritrea and tropical Africa. It is not grown in Ceylon, but the dried fruits are imported from India.

India. Pen. Ind. Or., *Herb. Wight* 387 and 357 Kew Distribution 1866—7. *Burma and Malay Peninsula.* *Herb. Griffith* 1172, Kew Distribution 1861—2.

Uses. The bark, unripe fruits and leaves possess purgative and anthelmintic properties. The seeds are beneficial for colic and coughs. An oil prepared from the seeds is used in medicine as an application for ocline. The African Arabs use the pulp of the fruits as a detergent and the bark for poisoning fish.

3. *Brucea javanica* (Linn.) Merr. in Journ. Arni Arb. 9: 3. 1928.

Brucea amarissima Desv.—*Brucea sumatrana* Roxb.—*Gonus amarissima* Lour.

Sinh. Kaputugedi, Tittakohomba.

A shrub 1.3—2 m tall, densely yellow pubescent; leaves pinnate, alternate, often more than 30 cm long, leaflets 9, subopposite, ovate, 11 cm long, 5 cm broad, acuminate, rounded at base, coarsely crenate-dentate, shortly petioled; flowers regular, bisexual minute, purple, pedicelate in very small cymes collected into axillary, pubescent panicles shorter than leaves; calyx minute, deeply 4-lobed, imbricate, disc 4-lobed; petals linear, spatulate, larger than calyx segments; stamens 4, inserted below the disc, not exceeding the petals, filaments glabrous; ovary superior, 4-locular with pendulous ovules in each loculus; fruit globose, of 4 ovoid, 1-seeded drupes, 4 mm long, glabrous and black.

Flowers in March.

Distribution. A native of East Indies and Indo-Malaya. It is common in the low country in Ceylon, though not native. Kandy, Kegalle District, Negombo, etc.

India. Batu Gaja Jungles, *Deschamps*, Nov. 1900. **Ceylon.** Central Prov., Hantane, *Mueller-Dombois and Cooray* 67111330, Nov. 1967. **Indo-China.** Hue and vicinity, *Squires* 135, Jan.—May 1927. **Cochin-China.** *Pierre* 213, April 1866. **Malaya.** Perak: *Curtis* 1321, Dec. 1887; *Scortechini*.

Uses. The entire plant is bitter and the seeds are much used in Java as a cure for dysentery. It has anti-periodic and anti-dysenteric properties. In Indo-China, the seeds are well known for their anthelmintic and anti-dysenteric properties and they are believed to have also some anti-pyretic value. They are toxic.

MEDICINAL PLANTS

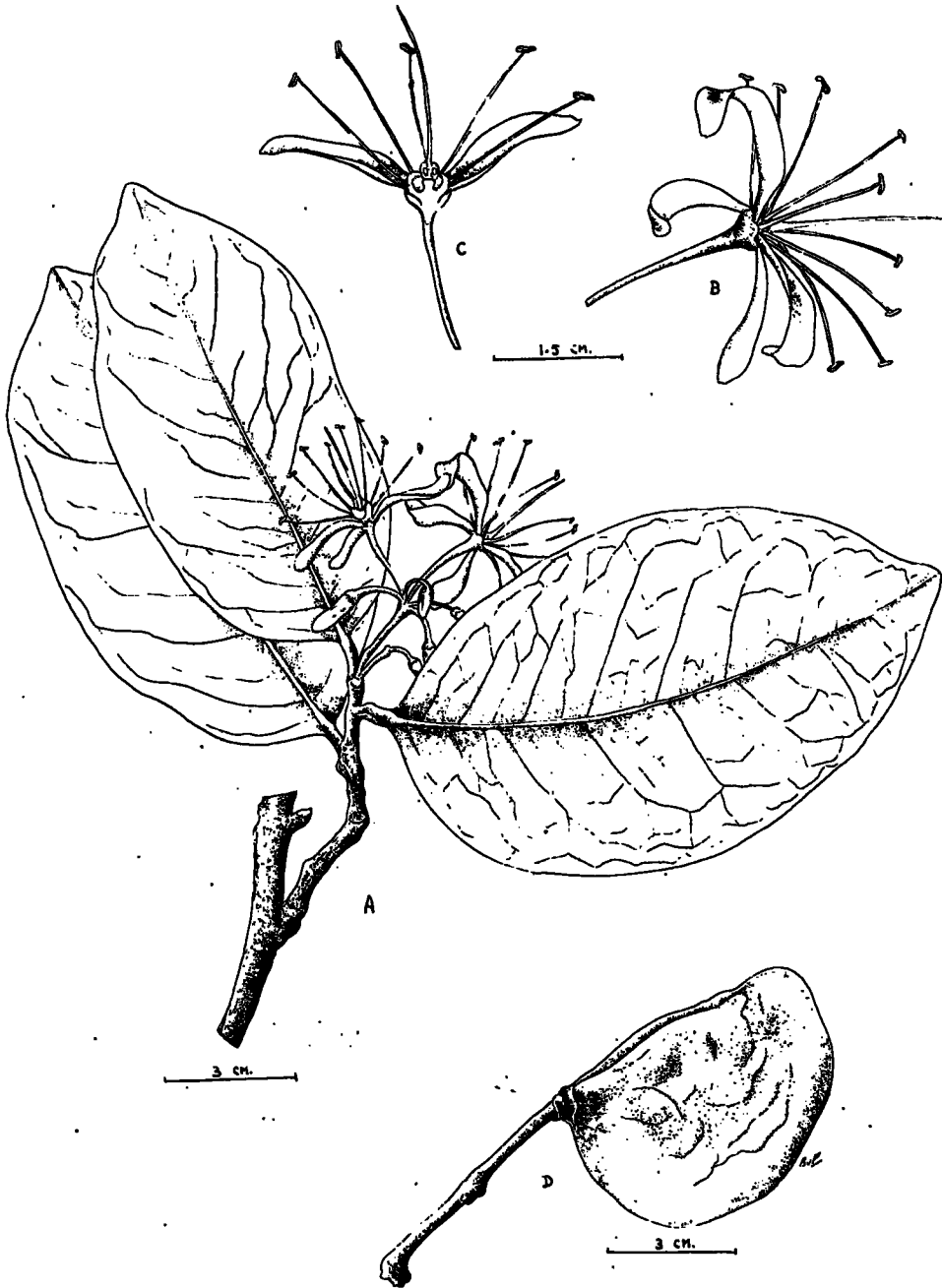


FIG. 478. *Samadera indica*. A, twig with leaves and flowers. B, flower lateral view. C, longitudinal section of flower. D, fruit carpel.

4. *Samadera indica* Gaertn. Fruct. 2: 352. 1791. (Fig. 478).

Niota pentaphylla Poir.—*Niota tetrapetala* Lamk.—*Niota lamarckiana* Bl.—*Vittmannia elliptica* Vahl—*Manungala pendula* Blanco.

Sinh. Samadara; *Tam.* Nibam, Niepa; *Sans.* Lokhandi.

A small tree 10—12 m high with glabrous young parts and transversely cracked bark; leaves simple, alternate, exstipulate, large, 17.5—25 cm long, oblong or oval-oblong, obtuse at base, shortly acuminate, entire, glabrous and shining on both sides, paler and veiny beneath, petioles 1.2—1.8 cm long, very thick, usually curved; flowers regular, bisexual, large, pinkish-yellow in few or many-flowered umbels, peduncle axillary, glabrous, pedicels 1.2—1.6 cm long, glabrous, red; sepals 4, fused into a 4-lobed calyx, lobes broad, subacute, glabrous; petals 4, distinct, convolute-imbricate, 2.5 cm long, linear-oblong, obtuse; stamens 8, filaments with a small, hairy, basal scale; ovary superior, shortly stalked, glabrous, deeply 4-lobed, 4-locular with one pendulous ovule in each loculus, style filiform a little longer than stamens; fruit 1—4, distinct, 1-seeded, indehiscent, compressed, semi-circular carpels with a straight inner edge, hard-leathery, smooth, reticulate, outer edge blunt, seed large.

Flowers in March.

Illustrations. Gaertner, Fruct. et Sem. Plant. 2: pl. 156. 1791; Vahl, Symb. Bot. 3: pl. 62. 1790; Kirtikar and Basu, Indian Med. Plants, pl. 204. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Philippine Islands. It is rather common in the moist low-country forests. Galle, Kalutara, Chilaw, Hewesse, etc.

India. Without locality, *Wallich* 6349; *Wallich* 1062. **Ceylon.** Central Prov., Peradeniya, Bot. Gard., cultivated, *F. W. de Silva* April 1928. Without locality, *Thwaites* C.P. 2766; *Walker*. **Philippine Islands.** Mindoro: *Ramos* 46447, Nov.—Dec. 1925.

Composition. The seeds of this tree contain a fatty oil consisting of triolein, tripalmitin and tristearin, an alkaloid, inositol, a bitter principle, sucrose and a glucoside, samaderin. The bark contains a bitter principle, phloroglucotannin, ellagotannic acid and tannic acid.

Uses. The bark is used as a febrifuge, while the bruised leaves are applied externally for erysipelas. An infusion of the leaf is a good insecticide especially against white ants. The oil extracted from the seeds is a useful application for rheumatism. In the Philippines, the juice of the pounded bark is considered a cure for skin diseases.

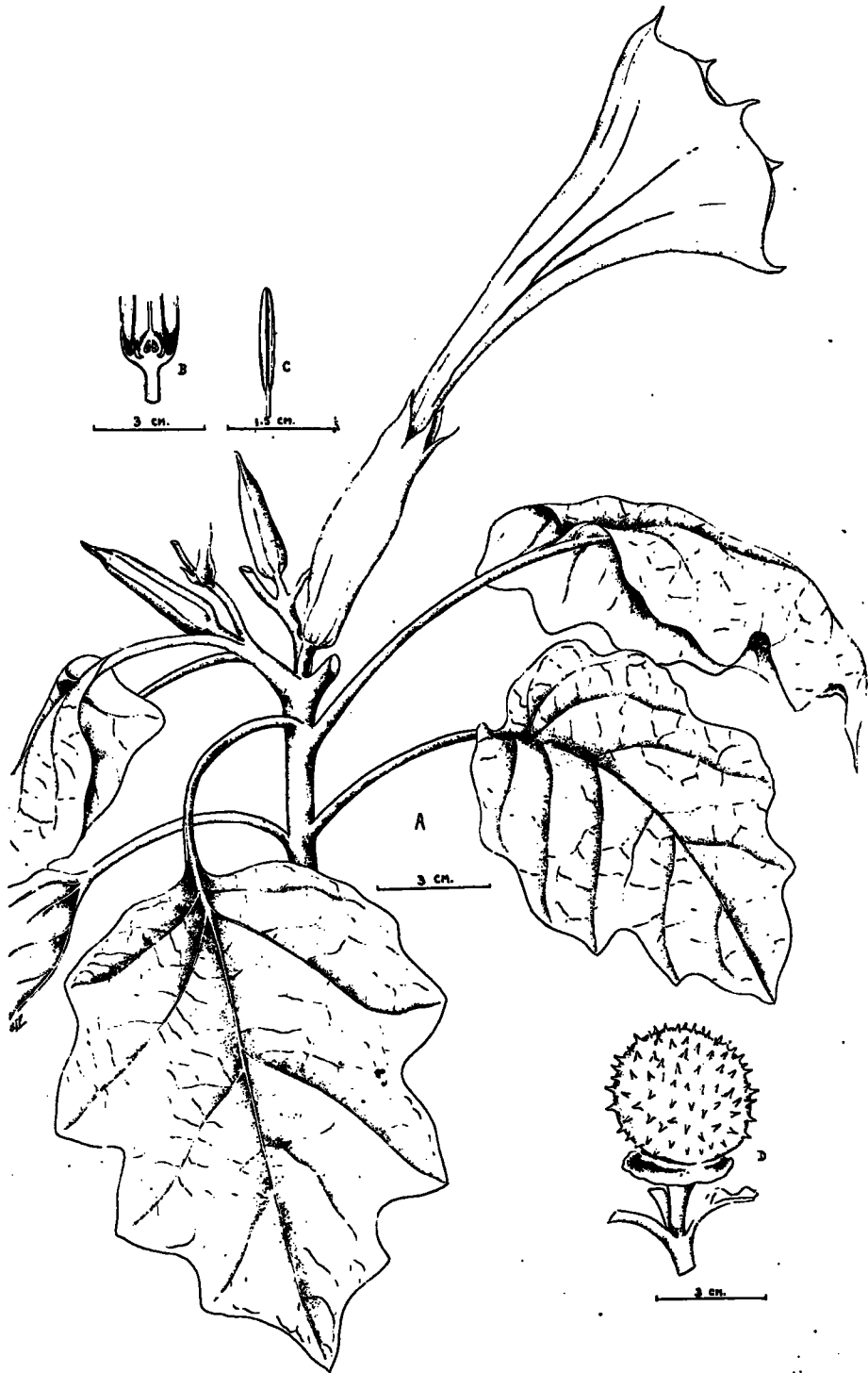


FIG. 479. *Datura metel*. A, branch with leaves, a flower and flower buds. B, longitudinal section of pistil. C, stamen. D, fruit.

107. SOLANACEAE

1. *Datura metel* Linn. Sp. Pl. 179. 1753. (Fig. 479).

Datura alba Nees—*Datura fastuosa* Linn.—*Datura fastuosa* var.—*alba* C.B. Clarke—*Datura hummatu* Bernh.

Engl. Black or Purple Datura, Downy Datura, White Datura; *Sinh.* Ela-attana, Kalu-attana, Sudu-attana; *Tam.* Ayigam, Emanamam, Karuvumattai, Madumattai, Maiyal, Mattadi, Mattai, Mattam, Ponnumattai, Samadu, Turam, Umattai, Udavumattai, Vellaiyu mattai, Vellumattai, (Purple-flowered form); Vellaiyumattai, Vellumattai (White-flowered form); Adukkumattai, Madulam, Vellaiyumattai, Vellumattai (Downy-flowered form); *Hindi* Kaladhatura (purple), Sadahadhatura, Safeddhatura (white); *Sans.* Bhranta, Dhurta-Kalahemaka, Kanaka. Kanakakhanthphala, Kanakapushpa, Kanakonmatta, Kitava, Krishna, dhatura. Krishnapushpa, Krishnoomatta, Kruradhatura, Kruradhurta, Madana, Mahasatha Matula, Mohana, Rajadhatura, Rajadhurta. Sashiva, Satha, Shiva, Shivapriya, Shivashekkara, Shyama, Snigda, Unmatta; Unmohin, Visharati (purple-flowered); Dhatura. Dhurta, Kanaka, Kanakauthphala. Kanakapushpa, Kanakonmatta. Kitava, Madana, Matula, Mohana; Shatha, Shivapriya, Shivashekkara, Shyana. Svetadhatura, Unmatta, Unmohin (white-flowered); Dhustura (downy-flowered).

An annual herb with stems 30—60 cm high, stout, somewhat zigzag, rather succulent, polished and shining but slightly rough with very minute scattered hairs, divaricately branched, marked with scars of fallen leaves; leaves simple, alternate, 7.5—15 cm long, triangular ovate, rounded and generally unequal-sided at base, acute, entire or more often with a few large coarse acute teeth or lobes, apparently glabrous but with very minute mealy pubescence on both sides, dull glaucous green above, paler beneath, veins pellucid, petioles 2.5—5 cm long; flowers regular, bisexual, very large, white or purple, on very short stout pedicels from the nodes but not axillary, erect and solitary; sepals 5, fused into a tubular calyx 7.5 cm long, very minutely adpressed-pubescent, segments 1.2 cm long, triangular, acuminate acute; petals 5, fused into a tubular funnel-shaped corolla, tube over 17.5 cm long, gradually widening upwards, limb 10 cm diam., lobes with the plait or midrib terminating in a short linear, acute tail, pubescent on the back, plicate and contorted in bud; stamens 5, filaments adnate to corolla-tube from base half way up, anther linear, dehiscing vertically; ovary superior, 2-locular, papillose, style over 15 cm long, stigma 2-lobed; fruit a fleshy, prickly, nodding capsule on curved pedicel, 3.7 cm long, supported at base on reflexed base of calyx, spines sharp; seeds very numerous, closely packed, nearly smooth and pale brown.

Flowers from January to March.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 1396. 1848; Curtis, *Bot. Mag.* pl. 1440. 1812; Kirtikar and Basu, *Indian Med. Plants*, pl. 685 and pl. 686. 1933; Herb. Peradeniya, drawing.

Distribution. A native of tropical Asia and now pantropic in distribution. It occurs in India, Ceylon, China, Philippine Islands and in the tropics generally. It is a common weed in waste and cultivated land in Ceylon.

India. Mysore and Carnatic: *G. Thomson.* Mont. Nilghiri and Kurg: *G. Thomson.* Madras: Coimbatore *Narayana*, Feb.—March 1929. Ceylon. Without locality, *Thwaites C.P.* 1897. North Central Prov., Periyakulama *Herb. Peradeniya.*, March 1927. Central Prov., Peradeniya, *Bot. Gard.*, *Appuhamy RN* 18, May 1949; *J. M. Silva.* Nov. 1925; *Herb. Peradeniya.*, Sept. 1888. Southern Prov., Ruhuna National Park, Patanagala, *Cooray* 68052403R. May 1968; Paranatotupola, *Cooray* 69111815R. Nov. 1969. Maldive Islands. Minikoi, *Gardiner* 36, 1899; Veimandu, *Didi*, 1896. Burma. *Mokin* 1196. Jan. 1903; Upper Burma: *Kyoukse. King's Collector* 35, 1893. China Kwangtung *Neu Yeung Fe.* Indo-China. Hue and vicinity. *Squires* 292 Jan.—May 1927. Philippine Islands. Luzon: San Mariano, Isabela Prov., *Ramos and Edano* 47019, Feb.—March 1926.

Composition. The leaves, flowers, fruits and seeds of this plant contain atropine, hyoscine, hyocyamine, cuscohygrine, norhyocyamine and metaloidine, while the fruits contain scopolamine and the seeds, a fatty oil.

Uses. The plant is a narcotic, anodyne and antispasmodic. When applied locally in aqueous masceration, it causes dilatation of the pupil of the eyes similar to belladonna. The leaves are used as poultices on inflamed breasts to check excessive secretion of milk, rheumatic swelling of joints, lumbago and painful tumours. It is a suitable substitute for belladonna for treatment of cataract and other diseases of the eye. The dried leaves made into cigarettes are smoked for bronchial asthma at the onset of the attacks, with beneficial results. The powdered root is rubbed on the gums for toothache. It is also used for curing rabid-dog bites and insanity. Internally, it is given as a remedy for preventing hydrophobia. The powdered seed is given in the form of pills for severe colds. It may be stuffed into cavities of teeth for toothache. In Tanganyika, the seed and roots are used as intoxicants. The dried root is smoked by the Swahili tribes for tuberculosis and the seed used for homicidal purposes. In East Africa the leaves are smoked for relief from asthma.

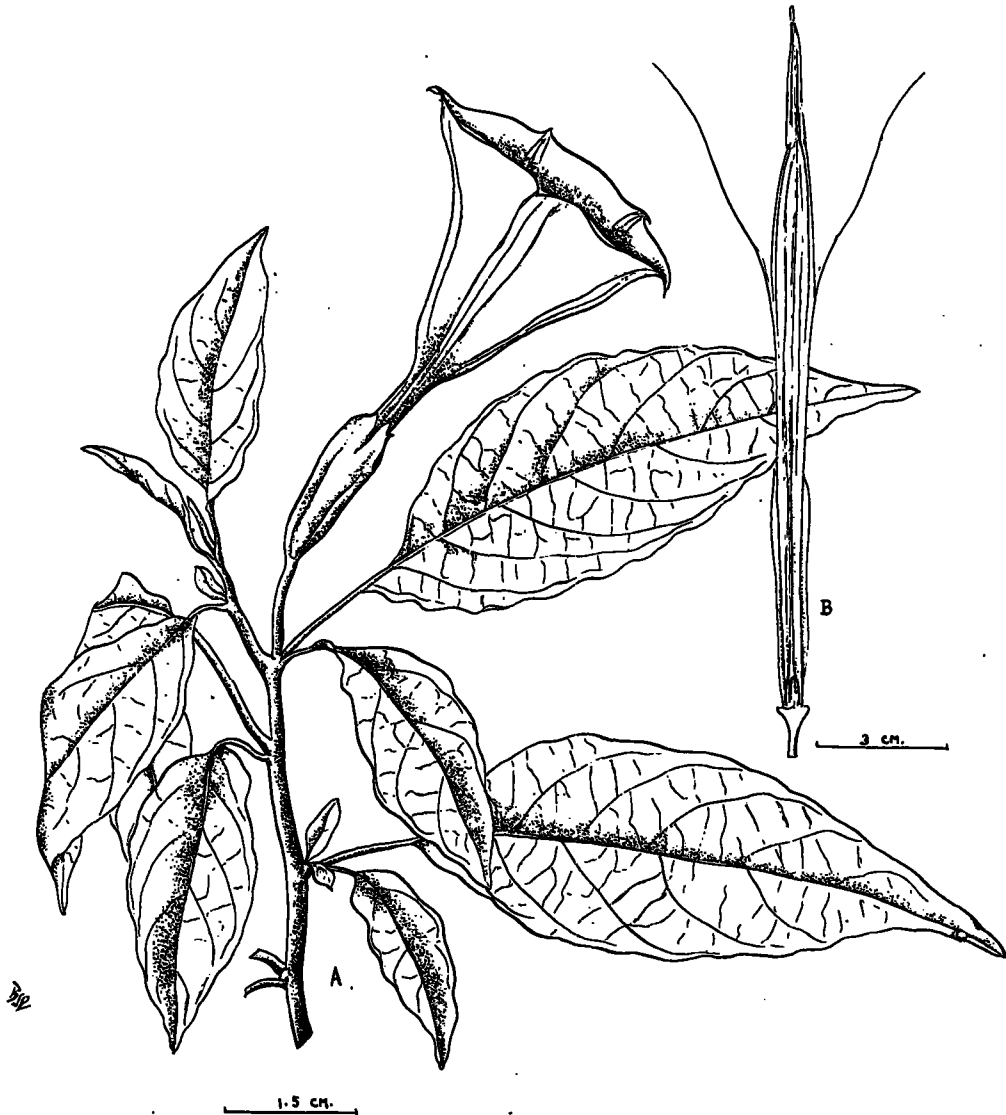


FIG. 480. *Datura suaveolens*. A, branch with leaves and a flower. B, longitudinal section of the lower part of the flower.

2. *Datura suaveolens* Humb. and Bonpl. ex Willd. Enum. Hort. Berol. 227. (Fig. 480).

Sinh. Thunbo-attana.

A large shrub 3—5 m tall with long, lanceolate, acuminate, undulate leaves; flowers regular, bisexual, white, large, 20—30 cm long, sweet-scented, drooping, frilled at the mouth.

Flowers all the year round.

Distribution. A garden plant of Mexican origin and grown in Ceylon as an ornamental plant.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Oct. 1888.

Composition. The leaves of this plant contain the alkaloids, hyoscine, hyocyamine, scopolamine and daturine which is a mixture of atropine and hyocyamine.

Uses. This plant is used as a narcotic. The Indians of the upper and northern Amazon drink it and the intoxicating effect lasts three days.

3. *Hyoscyamus niger* Linn. Sp. Pl. 179. 1753.

Hyoscyamus agrestis Kitaibel.—*Hyoscyamus persicus* Buhs—*Hyoscyamus lethalis* Salisb.

Engl. Henbane; *Sinh.* Korasani; *Tam.* Kurasaniyamam; *Hindi* Khurasaniajvayam, Khusanijamani. Khurosaniyamani; *Sans.* Dipya, Kuberakya, Madaka, Madakarini, Mani, Parasikaya. Shyama, Tivra, Turushka. Yavani.

An erect coarse herb with sinuate, subpinnatifid, alternate leaves, cauline leaves sessile, ovate or oblong, 12.5 cm long, 5 cm broad; flowers regular, bisexual, unilateral, subsessile, lower flowers axillary, solitary, upper ones forming a dense racemose or subscorpioid cyme, upper leaves bract-like; calyx urn-shaped, shortly 5-lobed, about 1.5 cm long, teeth shortly triangular, enlarged in fruit, corolla funnel-shaped, limb oblique 5-fid, lobes unequal, imbricate in bud, purple in the base, limb lurid green, purple-veined; stamens 5, attached to about the middle of the corolla-tube, anthers exserted; ovary superior, 2-locular, with numerous axile ovules, style filiform, stigma subcapitate; fruit capsule completely 2-chambered, 1.2 cm diam. circumscissile near the apex, seeds many, compressed.

Illustrations. Curtis, Bot. Mag., pl. 2394. 1823: Bentley and Trimen, Medicinal Plants, pl. 196. 1880.

Distribution. Occurs in the temperate Western Himalaya from Kashmir to Garhwal, Europe and W. & N. Asia. It is not grown in Ceylon but it is imported from India.

India. Himal. Bor. Occ., *T. Thomson*. Hungary. *Lang*.

Composition. The principal alkaloid in the leaves of this herb is hyoscyamine accompanied by small proportions of atropine and scopolamine.

Uses. Henbane is used as a cerebral and spinal sedative for insomnia and also to relieve griping caused by drastic purgatives. The leaves of this plant are expectorant; they are used as a gargle for toothache, bleeding from gums; a useful application for pain in the liver, gouty swellings, inflammation of the breasts and testes. The seeds are aphrodisiac, depilatory, astringent to the bowels; useful in nasal troubles, ophthalmia, earaches, fevers, headaches and pain in the joints. The leaves are principally employed in irritable conditions and nervous ailments. They are also used for asthma and whooping cough.

4. *Solanum ferox* Linn. Sp. Pl. ed. 2, 267. 1762.

Solanum lasiocarpum Dunal—*Solanum zeylanicum* Blanco—*Solanum hirsutum* Roxb.—*Solanum stramonifolium* Dunal.

Sinh. Malabatu; *Tam.* Anaichundai; *Sans.* Chandrapushpa, Chandri, Chandrika Garbhada Gardabhi, Kshetraduti, Lakshmana, Mahaushadi, Nakuli, Nishnehapushpa, Rama, Sitakanta, Svetakantakari.

A large herb, stem stout, very densely covered with long, coarse, stalked, stellate hairs and armed with numerous, straight, slender prickles; leaves simple, exstipulate, 2 at a node and unequal, large, 15—25 cm long broadly oval in outline, pinnately cut into few large acutely triangular lobes, softly stellate hairy on both sides and with long erect yellow prickles on the veins; flowers regular, bisexual, large, white, on short stellate tomentose pedicels, 2—6 in leaf opposed cymes, peduncle very short with few prickles; sepals 5, fused into a shaggy stellate hairy calyx, segments ovate, acute; petals 5, fused into a rotate corolla 3.1 cm diam. with a very short tube very hairy outside, lobes lanceolate, acute; stamens 5, inserted in the corolla throat, filaments very short, anthers large, connivent (but not connate) into an exerted cone, opening by two apical pores; ovary superior, 2-locular, style simple, long, often slightly curved, stigma small; fruit a globose berry surrounded at base by calyx, 1.8 cm long, very densely clothed with long yellow bristly hairs, seeds very numerous embedded in the pulp.

Flowers in January.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 1399. 1848, excl. var. *minus*; Kirtikar and Basu, Indian Med. Plants, pl. 674. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Malaya, S. China and Philippine Islands. It is rather common in the low-country up to 4,000 feet altitude.

India. Pen. Ind. Or. *Herb. Wight* 2019, Kew Distribution 1866—7. Ceylon. Central Prov. Hantane, *Thwaites* C.P. 2868; between Gadaladeniya and Lankatilleke, *J. M. Silva*, June 1927. **Philippine Islands.** Luzon: Rizal Prov., *Ahern's Collector* 2436, Jan.—March 1905.

Uses. The root of this herb is used as a remedy for cutaneous diseases. The seeds are burned and the fumes inhaled for toothache. In the Philippines, the leaves are used as poultices for swellings and in Malaysia, a decoction of the root is given for syphilis and for severe body pains and discomfort after meals.

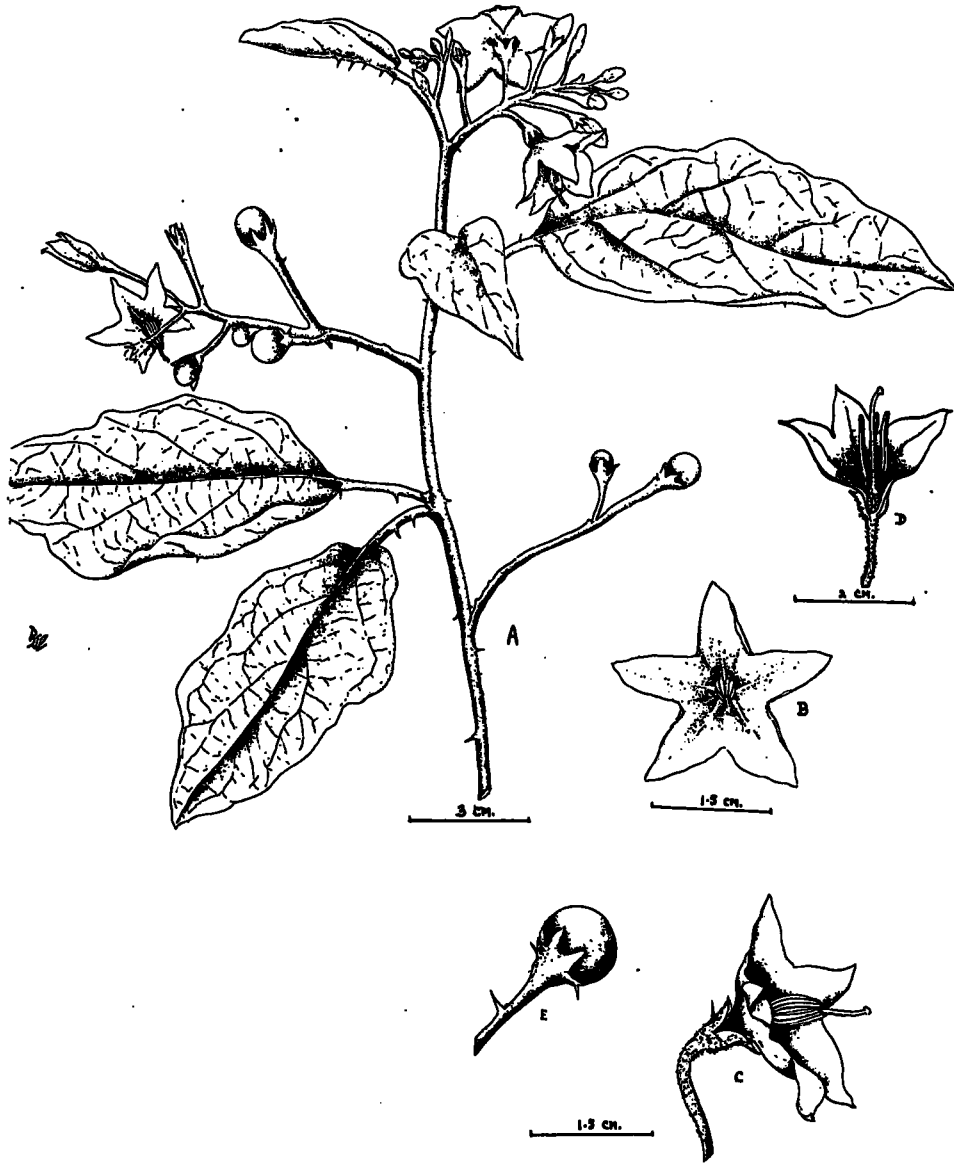


FIG.481. *Solanum indicum*. A, twig with leaves, flowers and fruits. B, flower dorsal view. C, flower lateral view. D, longitudinal section of flower. E, fruit.

5. *Solanum indicum* Linn. Sp. Pl. 187. 1753. (Fig. 481).

Solanum violaceum Jacq.—*Solanum cuneatum* Moench—*Solanum canescens* Bl.—*Solanum pinnatifidum* Roth—*Solanum agreste* Roth—*Solanum heynei* Roem. & Sch.—*Solanum anguini* Bojer—*Solanum himalense* Dunal—*Solanum junghuhnii* Miq.

Sinh. Tibbatu; **Tam.** Kandal, Karimullu Kuttuchadikkandangattaraimulli, Munda-gam, Naymulli, Papparamulli, Siruvaludadai, Siruvaludunai, Valudalai, Varttagi, Vattu, Uruvi; **Hindi** Barhanta, Barhata, Bhatakataiya, Bhutkataiya, Birhatta, Kattarha, Vadikadheri; **Sans.** Akranta, Alphaphala, Asprasi, Bahupatri, Bhantaki, Brahati, Brihatika, Dovadi, Dusparsa, Hinguli, Kantakarika, Kantakini, Kanthalu, Kanthathanu, Katphala, Kranta, Kshudrabhanta, Kshudrabhantaki, Kshudravartaki, Kuli, Lata, Mahati, Mahatkranta, Mahotika, Paravedi, Prasaha, Raktapaki, Rashtrika, Sinhi, Sinhika, Shtulabhandaki, Sthulakantha, Torani, Vanavrintaki, Vartaki, Vyaghri.

A semishrubby perennial with stout, much branched, often purple stems with many scattered, large, slightly curved, sharp prickles with long compressed base, covered (including prickles) with a scurfy coating of minute white stellate hair, denser on the young parts; leaves simple, alternate, 10—15 cm long, ovate in outline, caudate or rounded, often unequal sided at base, acute, with a few, large, oval-triangular, subacute lobes, rough above with stalked stellate hair, white-tomentose beneath with the same, veins with a few, large, straight spines on both sides, petioles 1.2—5 cm long, armed with prickles; flowers regular, bisexual, violet or purple, large, numerous, on short stellate-hairy and prickly pedicels 1.2 cm long, cymes racemose extra-axillary, peduncle short; sepals 5, fused into a small, stellate-hairy calyx, segments oblong-lanceolate, subacute; petals 5, fused into a rotate corolla 2.5—3.7 cm diam., stellate-hairy outside, lobes ovate-oblong, acute, somewhat crumpled at margins; stamens 5, inserted on corolla, filaments very short, anthers large, connivent (but not connate) into an exerted cone, opening by two apical pores; ovary superior, 2-locular, style simple, long, slightly curved, stigma small; fruit a berry 1 cm long, surrounded at base by the large spreading calyx, smooth but with a few stellate hairs on the summit, dark yellow.

Flowers in April and May.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 346. 1840—1843; Burman, Thes. Zeyl. pl. 102. 1737; Kirtikar and Basu, Indian Med. Plants, pl. 675. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in tropical India, Ceylon, Malaya, China, Philippine Islands and Africa. It is a weed in waste ground and roadsides in Ceylon, up to 6,000 feet altitude.

India. N. W. Himalaya: *Griffith*. E. Bengal: East India Co. *Herb. Griffith* 5912, Kew Distribution 1863—4. Mysor and Carnatic: *G. Thomson*; East India Co., *Herb. Falconer*, Kew Distribution 1869. Pen. Ind. Or., *Herb. Wight* 2015, Kew Distribution 1866—8. Ceylon. Central Prov., Peradeniya, *Thwaites C.P.* 1904; Ramboda, *Alston* 448, May 1928. Sabaragamuwa Prov. Hanwella, *Alston* 882, Aug. 1927; Middeniya, *Alston* 1307, March 1927; Nugatenne, *Alston* 1308, June 1926. Western Prov., Mirigama, *Alston* 682, June 1927.

Composition. According to Chopra, the fruit of this plant contains solanine and solanidine. The oil extracted from the seeds consists of glycerides of lauric, palmitic, stearic, arachidic, oleic, linoleic acids together with phytosterols, sitosterol and carpesterol. The fruit contains carbohydrates which hydrolyze into maltose, melibiose, sucrose, raffinose, etc.

Use. This plant is an astringent, resolvent and aphrodisiac. It is used in dysuria, colic, coughs and asthma. The root is a diuretic and useful for dropsy, coughs and catarrhal ailments. The vapour of burning seeds is a remedy for toothache. The half ripe berries are cooked and eaten as a vegetable in Ceylon and Malaya. In Java, a decoction of the plant is taken as a diuretic. It is used externally for itch and ringworm in Africa.

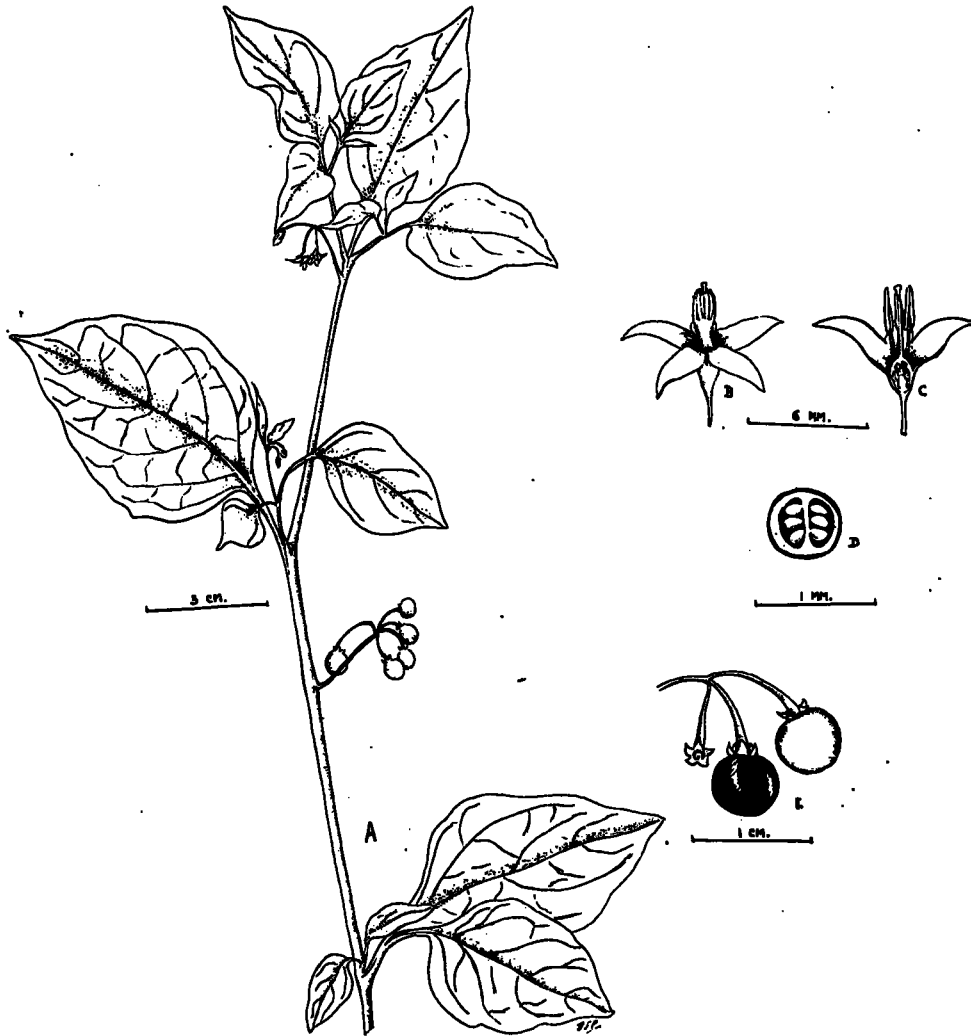


FIG. 482. *Solanum nigrum*. A, twig with leaves, flowers and fruits. B, flower lateral view. C, longitudinal section of flower. D, transverse section of ovary. E, fruits.

6. *Solanum nigrum* Linn. Sp. Pl. 186. 1753. (Fig. 482).

Solanum rubrum Mill.—*Solanum triangulare* Lamk.—*Solanum villosum* Lamk.—*Solanum nodiflorum* Jacq.—*Solanum uliginosum* Bl.—*Solanum roxburghii* Dunal—*Solanum miniatum* Bernh.—*Solanum rubrum* Nees.

Engl. Black Nightshade, Hound's Berry, Morelle; *Sinh.* Kalukanweriya; *Tam.* Manattakkali; *Hindi* Gurkamai, Kabeiya, Makoi; *Sans.* Bahuphala, Bahutikta, Dhvankshamachi, Ghanaghana, Guchhaphala, Jaghenephala, Kaka, Kakamachi, Kakamata, Kakini, Katuphala, Kushthagani, Rasayani, Sarvatika, Sundari, Svadupaka, Tiktika, Vayasavha, Vayasi.

An erect annual, 60—90 cm high, stem cylindrical, thickened at nodes, glabrous or more or less hispid-pubescent, much divaricately branched; leaves simple, alternate, numerous, ovate-lanceolate, tapering into obscure petiole, acuminate, subacute, usually entire, sometimes sinuate dentate, glabrous, thin and flaccid; flowers regular, bisexual, white, small on slender glabrous pedicels, cymes extra-axillary, 3—7 flowered, umbellate, peduncle 1.2—1.8 cm long, slender divaricate; sepals 5, fused into a very small, glabrous calyx, segments linear-oblong, reflexed and not enlarged in fruit; petals 5, fused into a rotate corolla under 0.6 cm lobes very deep, lanceolate-linear, acute; stamens 5, inserted in the throat of the corolla, filaments very short, anthers connivent but not connate into an exerted cone opening by 2 apical pores; ovary superior, 2-locular, style simple, long, often slightly curved, stigma small; fruit a globose berry 0.6 cm diam., shining, purplish black, seeds minute in watery pulp, finely shagreened.

Flowers all the year round.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 344. 843; Kirtikar and Basu, Indian Med. Plants, pl. 670. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and in all tropical and temperate regions of the world. It is a common weed in cultivated ground, especially in the montane zone in Ceylon.

India. Tibet: Sangpo, *Watson*, July 1904. Afghanistan: East India Co., *Herb. Griffith* 5901/1, Kew Distribution 1863—4. Punjab: *T. Thomson*. Ceylon. Central Prov., Hakgala, *Herb. Peradeniya*, May 1888. Uva Prov., Namunukula, *Willis*, April 1907. North Western Prov., Negombo South, *Simpson* 8865, Nov. 1931. Without locality, *Thwaites C.P.* 2865. Andaman Islands. *King's Collector* Dec. 1892. *China.* Kwangtung Prov., Canton. *Ying* 423, May 1928; Peiyunshan, *Ying* 1054, Sept. 1928; Fukian Prov., Hinghwa and vicinity, *Lin Pi* 6232, Aug. 1926. *Philippine Islands.* Luzon: Benguet Prov., Mt. St. Tomas, *Ramos and Edano* 45123, Feb. 1925; Cagayan Prov., Gattaran, *Clemens* 17568, April 1927.

Composition. The fruit of this plant contains solamargine, solanidine and solasodine, while the plant itself contains solanine and a tropeine alkaloid. The fruit is an excellent source of calcium, phosphorus and iron. The leaf and seed contain vitamin C and carotene.

Uses. The leaf is applied as a poultice on gouty joints and rheumatism. A fluid extract of the leaves and stems is used on piles, gonorrhoea, dropsy and enlargements of the liver and spleen. A decoction of the plant is used as fomentation for sore eyes and various skin diseases. In Rhodesia, the plant is used in the treatment of malaria, black-water fever and dysentery and in Mexico the fruit is a popular remedy for erysipelas. In the Philippines, the fruit is a reputed cure for diabetes, and in Bengal the berries are used for fever, diarrhoea, eye diseases and hydrophobia. The unripe fruit is ground into a paste and applied on ringworm. In Mauritius a poultice of the plant is applied for relief of abdominal pain and inflammation of the bladder. In Europe, it is used in the treatment of headaches, ulcers, wounds and as a diuretic and emetic. Italians use it as an antispasmodic, diaphoretic, emollient and sedative.

In Africa, the young shoots are eaten as a vegetable. The ripe fruits are made into jam and used as a substitute for raisins in plum pudding.

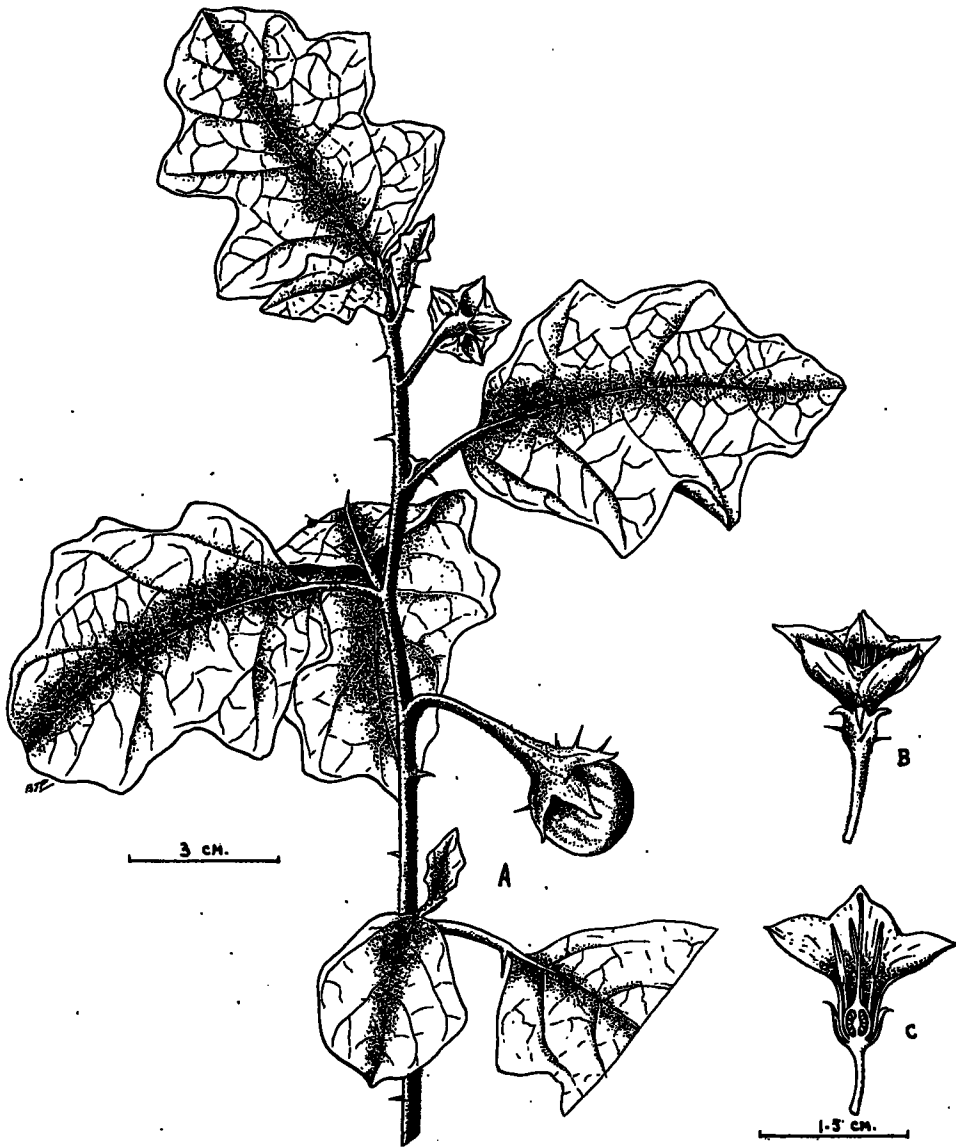


FIG. 483. *Solanum surattense*. A, twig with leaves, flower and fruit. B, flower lateral view. C, longitudinal section of flower.

7. *Solanum surattense* Burm. f., Fl. Ind. 57. 1768. (Fig. 483).

Solanum sodomaicum Linn.

Sinh. Ela-batu; *Tam.* Vaddu; *Sans.* Dhavani.

A perennial herb, often semi-woody at base and erect, 30—90 cm high with numerous divaricately spreading branches set with scattered straight, compressed, yellow prickles, younger parts covered with dense stellate tomentum; leaves simple, alternate, exstipulate, 6.2—10 cm long, oblong-oval, rounded and usually unequal sided at base, obtuse or subacute, shallowly pinnately lobed, stellate hairy on both sides, especially beneath with a few straight erect prickles on midrib above and beneath, petioles 1.2—1.8 cm long, stellate-tomentose and prickly; flowers regular bisexual, bright mauve purple, large, on short curved stellate-hairy pedicels, cymes usually 1-flowered, extra-axillary, peduncle very short or absent; sepals 5, fused into a stellate-hairy calyx with long prickles, segments linear-lanceolate, acute; petals 5, fused into a rotate corolla 2.5 cm diam., stellate-pubescent outside, lobes very broad, acute; stamens 5, inserted in corolla throat, filaments very short, anthers large, connivent (but not connate) into an exerted cone, each opening by two apical pores; ovary superior, 2-locular, style simple, long, often slightly curved, stigma small; fruit a globose berry, 2.5 cm long, surrounded by the much enlarged calyx, glabrous and shining, yellow or whitish with green veins, pedicel thickened upwards, channeled, seeds numerous.

Flowers all the year round.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, tropical Asia, Australia and Polynesian Islands. It is a very common roadside weed up to 6,000 feet altitude in Ceylon.

Ceylon. Without locality, *Thwaites C.P.* 1907. Central Prov., Nugatenne, *Alston*. Southern Prov., Ruhuna National Park, Patanagala, *Mueller-Dombois* 67083113. Aug. 1967.

Uses. The root of this plant is used for various lung ailments, diarrhoea, cough and rheumatism. The leaves and stems made into a congee is given to convalescing patients. The mature fruit is cooked and eaten as a vegetable.

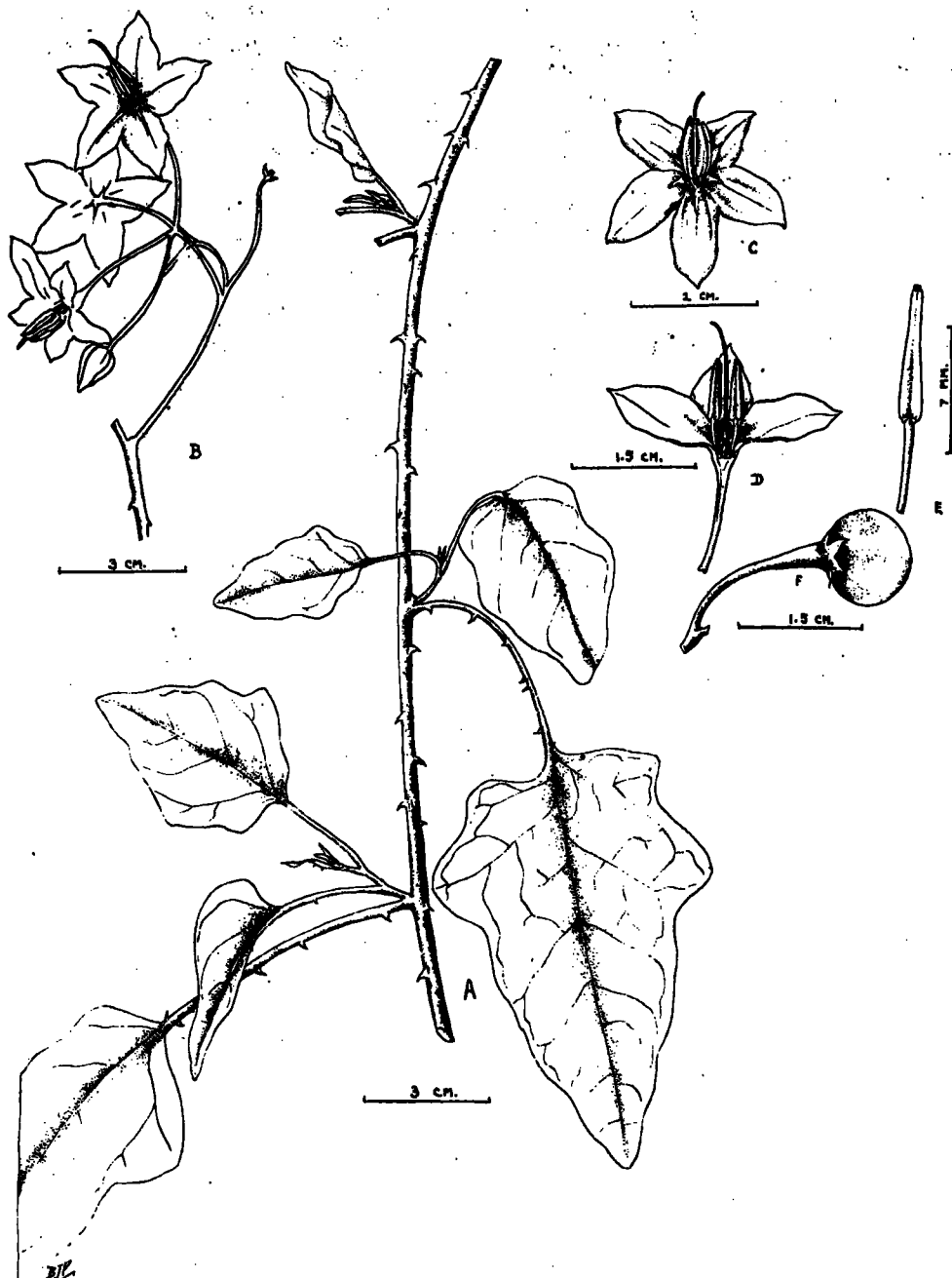


FIG. 484. *Solanum trilobatum*. A, branch with leaves and prickles. B, inflorescence. C, flower dorsal view. D, longitudinal section of flower. E, stamen. F, fruit.

8. *Solanum trilobatum* Linn. Sp. Pl. 188. 1753. (Fig. 484).

Solanum acetosaefolium Lamk.—*Solanum canararum* Miq.

Sinh. Wel-tibbatu; *Tam.* Kudalam, Nittidam, Sandunayattan, Surai, Tudi, Todulai, Tuduvilai; *Sans.* Achuda, Alarka.

A small subsucculent undershrub with numerous hooked prickles, stems slender with long divaricate branches with a few stellate hairs on the young shoots, otherwise glabrous, provided with many flattened, hooked, decurved very sharp prickles; leaves simple, alternate, small, 1.8—3.7 cm long, rotund-ovate in outline; obtuse, irregularly 3 or 5-lobed, glabrous often with 2 or 3 small curved prickles on midrib, petioles as long as leaves and prickly; flowers regular, bisexual, rich violet-purple, large on long divaricate or reflexed glabrous pedicels, cymes extra-axillary, short racemose, 3—9-flowered, nearly sessile; sepals 5, fused into a small, slightly stellate-hairy calyx, segments lanceolate, acute; petals 5, fused into a rotate corolla, 3.1—3.7 cm diam., stellate pubescent outside, lobes very deep, oblong-oval, obtuse, usually reflexed; stamens 5, inserted in corolla throat, filaments very short, anther large, connivent (but not connate) into an exerted cone, opening by two apical pores; ovary superior, 2-locular, style simple, long, often slightly curved, stigma small; fruit a globose berry, 0.8 cm long, smooth and scarlet in colour.

Flowers from December to February.

Illustrations. Curtis, Bot. Mag. *pl.* 6866. 1886; Wight, Ic. Pl. Ind. Or., *pl.* 854. 1843 1845; Kirtikar and Basu, Indian Med. Plants, *pl.* 678. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Malay Peninsula. It is very common in waste ground in the dry regions of Ceylon.

India. Bengal: *Herb. Calc.*; Mysor and Carnatic: *G. Thomson*. Ceylon. Northern Prov., Jaffna, *Thwaites C.P.* 1906; *Herb. Peradeniya*, Feb. 1890; Murunkan, *J. M. Silva*, July 1917. Southern Prov., Hambantota, *Herb. Peradeniya*, Dec. 1882; Tissamaharama, *Simpson* 9920. Aug. 1932.

Uses. The roots and leaves of this plant are given in the form of a decoction to consumptive patients. The berries and flowers are used for coughs. The leaves are a common pot herb given to children suffering from prolonged cough.

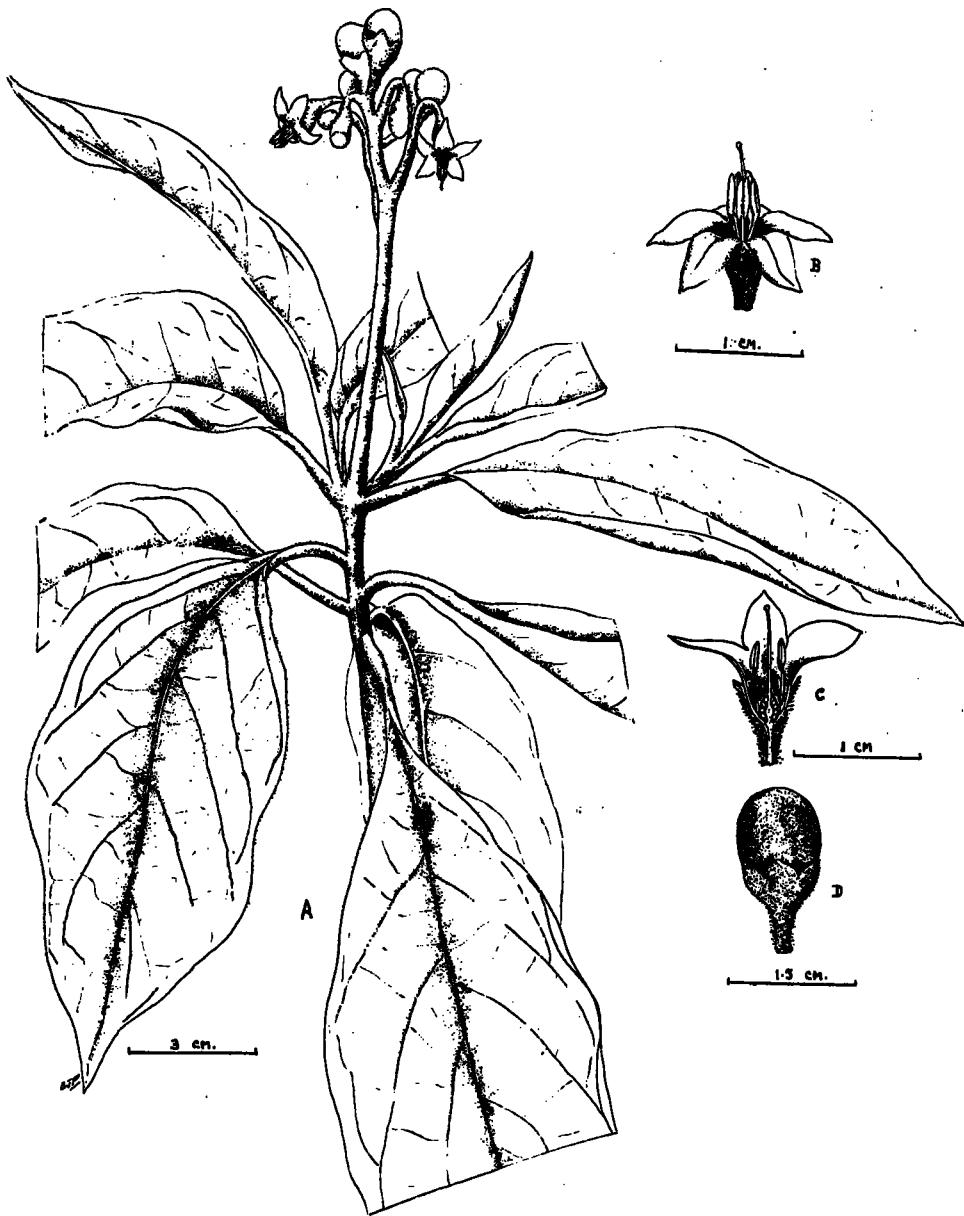


FIG. 485. *Solanum verbascifolium*. A, branch with leaves and flowers. B, flower lateral view. C, longitudinal section of flower. D, fruit.

9. *Solanum verbascifolium* Linn. Sp. Pl. 184. 1753. (Fig. 485).

Solanum pubescens Roxb.—*Solanum erianthum* Don.—*Solanum mauritianum* Blanco—*Solanum urticulatum* Ait.

Sinh. Hekarilla; *Tam.* Anaichundai, Malaichundai, Sundai; *Sans.* Gandira, Pathi, Priyamkari, Vidari.

A large shrub 2—3.3 m tall; the whole plant covered with a dense yellowish-grey tomentum of scurfy-stellate hair; leaves simple, alternate, large, 12.5—22.5 cm long, lanceolate-oval, rounded or acute at base, acuminate, subacute, tomentum velvety above, very woolly beneath, petioles 1.8—2.5 cm long and stout; flowers regular, bisexual, numerous, dull white on short, nodding very woolly pedicels, cymes terminal becoming lateral, dichotomous, dense, corymbose, peduncle 5—10 cm long, stout, erect; sepals 5, fused into a cup-shaped very woolly calyx, segments short, broadly triangular, acute; petals 5, fused into a rotate corolla, 1.2 cm diam., woolly or pubescent outside, lobes deep, oval-oblong, subacute; stamens 5, anthers connivent into an exerted cone each opening by two apical pores, filaments very short, inserted in the corolla throat; ovary superior, 2-locular, style simple, long, slightly curved, stigma small; fruit a globose berry 0.8 cm long, covered with small, scattered stellate hairs, yellow in colour, seeds minutely shagreened.

Flowers in June, July, etc.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 1398. 1848; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 673. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in tropical and subtropical parts of India, Ceylon, Malaya, China, Australia and tropical America. It is common in the moist regions from 1,000 to 6,000 feet altitude in Ceylon.

India. Sikkim and Bengal: *J. D. Hooker*; E. Bengal: East India Co. *Herb. Griffith* 5905, Kew Distribution 1863—4. Him. Bor. Occ., *T. Thomson*. Assam: *Chatterjee*, April 1902; *Simons*. Pen. Ind. Or., *Herb.* Wight 2014, Kew Distribution 1866—7, Ceylon. Central Prov., Rikillagaskade, *Thwaites C.P.* 1902; Mangala, *Alston* 1657, March 1928. Upper Burma. *Khan* 70, June 1888. Burma *Mokin* 276, Oct. 1902. China. Canton, *Herb. Hance* 1419, Dec. 1809.

Composition. This plant contains solanidine, mallic acid and saponin.

Uses. The leaves are used as an abortifacient and for expelling toxic substances from the body. In the Philippines, the roots are given in the form of a decoction for dysentery and diarrhoea. In Mexico, the leaves are applied as poultices on boils and ulcers and a decoction of the root given for fever.

10. *Solanum xanthocarpum* Schrad. and Wendl. var. *Jacquini* Thw.

Solanum jacquini Willd.

Sinh. Katuwel-batu; *Tam.* Kandangattari. Sutturam. Udaravani, Udavani; *Hindi* Katai, Kataikkuadda, Kateli, Ringni, Satyanasi; *Sans.* Anakranta, Bahukanta, Bahukantaka, Bahuphala, Bhantaki, Brihati, Chitraphala, Dhavani, Dhavanika, Dushpradharshini, Dusparsha, Katakari, Kantakarika, Katakini, Kantalika, Kantashreni, Kasaghi, Kshetraja, Kshudra, Kshudra-kantika, Kshudraphala, Kshurika, Kuli, Nidigdhika, Pitatandula, Prachodini, Putrapada, Rashtrika, Sarpatanu, Sinhi, Sprihi, Vyaghri.

An annual prostrate herb, stems somewhat zigzag, nearly glabrous with numerous yellow long prickles; leaves simple, alternate, oblong-oval, rounded or unequal sided at base, obtuse or subacute, pinnately deeply lobed, nearly glabrous with very numerous and long sharp bright yellow prickles, petioles prickly; flowers regular, bisexual, bright mauve purple, rather large on short curved pedicels, cymes usually 1-flowered, extra-axillary, peduncle very short or absent; sepals 5, fused into a prickly calyx, segments linear-lanceolate, acute; petals 5, fused into a rotate corolla about 2.5 cm diam., lobes very broad, acute; stamens 5, inserted in corolla throat, filaments very short, anthers large, connivent (but not connate) into an exserted cone, each opening by two apical pores; ovary superior, 2-locular, style simple, long, often slightly curved, stigma small; fruit a glabrous yellow berry with numerous seeds.

Flowers throughout the year.

Illustrations. Wight, *Ic. Pl. Ind. Or. pl. 1401. 1848*; Kirtikar and Basu, *Indian Med. Plants, pl. 677A. 1933.*

Distribution. Occurs throughout India and in the dry and sandy places in Ceylon. It is much cultivated for medicinal purposes.

India. Mysore and Carnatic: *G. Thomson. Pen. Ind. Or., Herb. Wight 2013, Kew Distribution 1866—8.* Ceylon. Without locality, *Thwaites C.P. 1905.*

Composition. This plant contains the alkaloid, solasodine, an unidentified alkaloid is found in leaves, stems and roots.

Uses. The root is valued as an expectorant and used in coughs, asthma, colic fever, loss of appetite and pains in the chest. The fumes of the burning seed cures toothache. In Bengal, this plant is used as a diuretic in dropsy, while in Punjab a decoction of the plant is given for gonorrhoea.

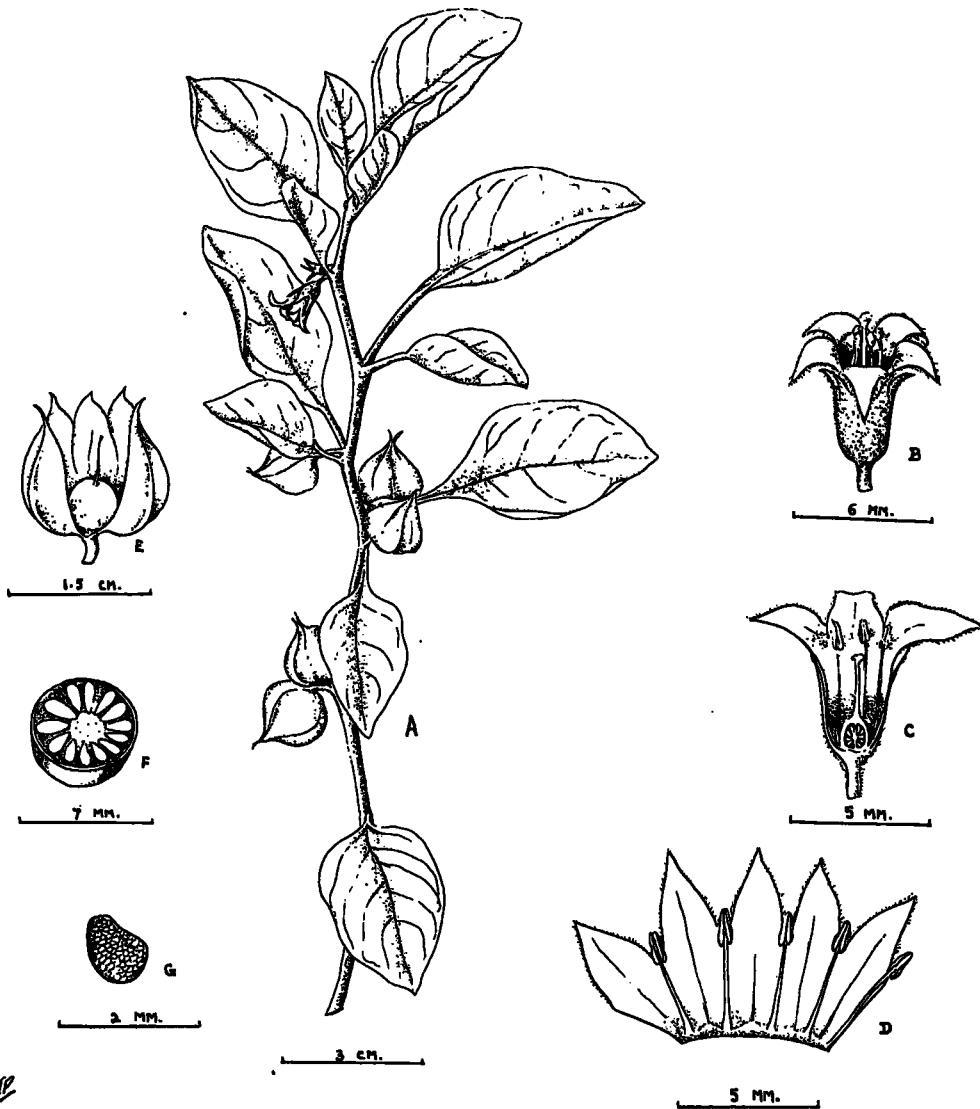


FIG. 486. *Withania somnifera*. A, branch with leaves, a flower and fruits. B, flower lateral view. C, longitudinal section of flower. D, corolla opened out showing stamens. E, fruit with persistent calyx. F, transverse section of fruit. G, seed.

1. *Withania somnifera* (Linn.) Dunal in DC. Prodr. 13 (1): 453. 1852. (Fig. 486).

Physalis somnifera Linn.—*Physalis flexuosa* Linn.—*Physalis arborescens* Thunb.—*Physalis omentosa* Thunb.

Sinh. Amukkara, Asgondu; *Tam.* Amukkiray, Asubam, Asuvagandi, Achmaganda; *Hindi.* Asgand, Punir; *Sans.* Ashvagandha, Ashvakandika, Balada, Balaja, Gandhapatri, Haya, Hayapriya, Kala, Kambuka, Kanrupini, Kushthagandha, Kushthagandhini, Palashaparni, Priyakari, Punya, Pushtida, Pushtipavira, Shyamala, Turagagandha, Turagi, Vajigandha, Vajikari, Vajini, Varada, Varagatrakari, Varahakarni, Varahapatri, Vataghni.

A small, semi-shrubby perennial herb with long tapering roots and branched stems covered with fine mealy-stellate pubescence; leaves simple, alternate, often in unequal pairs, 5—8.7 cm long, ovate, suddenly tapering to base, subacute, entire, shining and apparently glabrous but really covered with minute, stellate or scaly hair, rather thick, veins pellucid; flowers regular, bisexual, small, pale green on short pubescent pedicels, usually about 5 in umbellate cymes; sepals 5, fused into a campanulate, stellate-pubescent calyx, much enlarged and inflated in the fruit, segments linear-triangular, recurved at apex; petals 5, fused into a campanulate corolla 1.2 cm long, lobes lanceolate, erect but recurved in upper part, pubescent outside; stamens 5, inserted at base of corolla-tube, exerted; ovary superior, 2-locular, glabrous, style as long as stamens, stigma globose; fruit a small berry, 0.6 cm diam., enclosed in the loose, inflated fruiting calyx over 1.2 cm long, globose, slightly 5-angled pointed by connivent segments, scurfy pubescent, 1-chambered, seeds numerous.

Flowers throughout the year.

Illustrations. Gaertner, *Fruct. et Sem. Pl.* 2: *pl.* 131. 1791; Wight, *Ic. Ind. Or.*, *pl.* 853. 1843—45; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 681. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Mediterranean regions, Cape of Good Hope and temperate and South Africa. It is a common weed in cultivated ground in Ceylon.

India. Punjab: *T. Thomson*. Ceylon. Eastern Prov., Trincomalee, *Thwaites C.P.* 3651. **Egypt.** *Boissier*, Feb. 1846.

Composition. This plant contains the alkaloids nicotine, somniferine, somniferinine, somnine, withananine, withanine, Ψ -withanine and trace of vitamin C. The roots contain a volatile oil, sugar, mixture of fatty acids, withaniol and an alkaloid principle. The leaves and stems contain in addition tannin, potassium nitrate, somnirol, somnitol and withanic acid.

Uses. The root of this plant is a tonic, alterative, aphrodisiac and used in consumption, emaciation, debility due to old age, rheumatism, etc. It has also narcotic, diuretic and deobstruent properties. In Sind, it is used to cause abortion. The root ground into a paste is applied on ulcers, carbuncles and painful swellings with beneficial results. The Zulus use an infusion of the root as an enema for gangrenous rectitis and the whole plant for treating syphilis. The green berries are rubbed on ringworm with beneficial effect. A decoction of the leaf is used externally and internally in the treatment of haemorrhoids. A paste of the leaf is applied on syphilitic sores. In Tanganyika, the root of the plant is used as a sexual stimulant and also as an abortifacient, while in southern and eastern Africa it is given for diarrhoea and proctitis and the leaf for nausea and rheumatism.

In Ceylon, the powdered root is taken as an aphrodisiac and for consumption. A special preparation is made along with other drugs for treating insanity, apoplexy and nervous diseases.

The plant has milk-coagulating properties and can be used for cheese-making. It is also an insecticide.

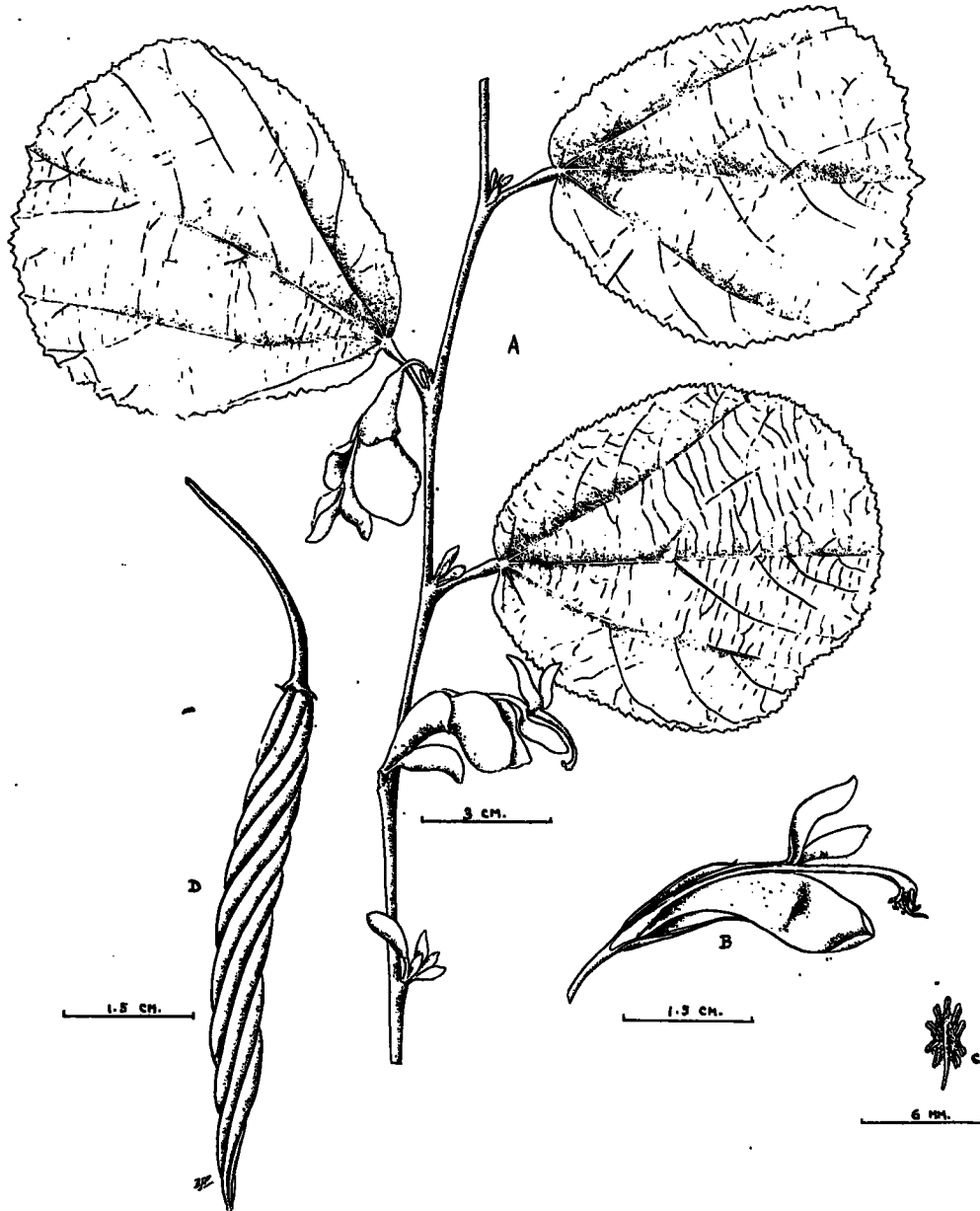


FIG. 487. *Helecteres isora*. A, branch with leaves and flower. B, longitudinal section of flower. C, ring of anthers round ovary, dorsal view. D, fruit.

108. STERCULIACEAE

1. *Helecteres isora* Linn. Sp. Pl. 963. 1753. (Fig. 487).

Helecteres chrysocalyx Miq.—*Helecteres roxburghii* G. Don.

Sinh. Liniya, Zimia; *Tam.* Vadampiri, Valamburi, Valumberi, Valumpuri; *Sans.* Avartani, Mrigashinga.

A shrub or small tree with finely wrinkled bark and stellate hairy rough twigs; leaves simple, alternate, stipulate, distichous, 6.3—8.9 cm long, rounded or cordate and oblique at base, suddenly caudate-acuminate at apex, serrate, sometimes 3-lobed in upper part, slightly hairy on both sides, rough beneath, petioles 0.6 cm long, stellate pubescent, stipules setaceous as long as petioles; flowers irregular, bisexual, crimson fading into a yellowish gray colour, in axillary clusters of 4—8 together, 3.7 cm long, on short stellate-tomentose pedicels, bracts 0.6 cm long, setaceous, hairy, buds curved and sharp pointed; sepals 5, fused into a 5-fid, 2-lipped, tubular calyx 1.9 cm long, curved, laterally compressed, segments triangular, acute, unequal, rough with stellate hairs; petals 5, unequal, long-clawed, more or less connate at base, obtuse, upper half ultimately reflexed, two lower petals wing-like, broad, oval-oblong, auricled on one side above, 3 upper petals oblong-linear; stamens 10, fused into a column which is adnate to the gynophore, very much exserted, suddenly turned downwards at the end, anthers in a ring round the ovary; ovary superior, conical at the end of a curved gynophore which is 3.7 cm long, 5-locular, style as long as the ovary, deflexed; fruit 5—7.5 cm long, consisting of 5 linear follicles, stellate-scurfy and tapering to a point; seeds numerous with loose wrinkled testa.

Flowers in July and August.

Illustrations. Beddome, *Flor. Sylvat. Anal. Gen. pl.* 5. 1874; Wight, *Ic. Pl. Ind. Or.*, *pl.* 180. 1839; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 148. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Malaya, Java, Australia and West Indies. It is rather common in the low-country in Ceylon up to 2,000 feet altitude. Matara, Colombo, Kurunegala, Yatiyantota, etc.

India. West Bengal: Calcutta, *Bot. Gard.*, cultivated; Nadia, *Clarke* 34231B, Nov. 1883; Bangladesh, Dacca, *Clarke* 20140C, Aug. 1873. Concan; *Law.* Nilghiris, *Schmid.* Pen. Ind. Or., *Wight* 224; *Wallich* 1179. Ceylon Mirigama, *de Silva*, Aug. 1923; Yatiyantota, Bulathkohupitiya Road, *Simpson* 9986, Aug. 1932; Without locality, *Thwaites* C.P. 1137. Upper Burma. Kachin Hills, *Mokin* 11, June 1899. Sumatra. *Yates* 1909.

Uses. The juice of the roots and fruits is administered internally for stomach ailments such as colic, griping and flatulence. The bark is used in diarrhoea and dysentery. In Jamaica, a decoction of the leaves is given for clysters.

2. *Pentapetes phoenicea* Linn. Sp. Pl. 698. 1753.

Dombeya phoenicea Cass.

Sinh. Bandu-vada; *Tam.* Nagappu; *Sans.* Arkavallabha, Bandhujiva, Bandhujivaka, Bandhuka, Bandhula, Bandhura, Haripriya, Jvraghna, Madhyadina, Madhyanika, Osthapushpa, Pushparakta, Rakta, Raktaka, Raktapushpa, Sharatapushpa, Supushpa, Suryabhakta.

A slightly branched annual herb, 60—150 cm tall with a glabrous stem; leaves simple, alternate, stipulate, very variable, 2.5—12.5 cm long, linear to oblong-deltoid, strongly crenate-errate, glabrous above, stellate hairy on veins beneath, petioles short, stipules linear as long as petioles; flowers regular, bisexual, large, bright red, 2.5-3.7 cm long, solitary or 2 together, axillary, pedicels jointed near the top, scabrid with few stellate hairs, bracteoles 3—5, filiform, early caducous; sepals 5, slightly connate at base, narrow-lanceolate, very acute, caudate, scabrous with few stellate hairs; petals 5, somewhat connate at base, obovate; stamens 20, connate at base, five staminodes linear, 3 times as long as fertile ones; ovary superior, 5-carpellary, 5-locular with numerous ovules in each loculus; fruit capsule subglobose, 1.2 cm long, shorter than persistent sepals, densely stellate-hairy, seeds angular, rough.

Flowers in February.

Illustration. Kirtikar and Basu, *Indian Med. Plants*, pl. 152. 1933.

Distribution. Occurs in India, Ceylon and Burma. It grows in the dry regions in Ceylon.

India. Bengal: *Wallich* 1157. Concan: *Stocks*. Ceylon. Northern Prov., Mannar District Giant's Tank, *Sayaneris*, Feb. 1890. Central Prov., Peradeniya, Bot. Gard., cultivated, *de Silva* 747, July 1938.

Uses. This herb is used as an emollient. The fruit is mucilaginous. The root is used medicinally as it is considered astringent, anti-bilious and anti-phlegmonous. In Celebes, the leaves are used as a substitute for tea.

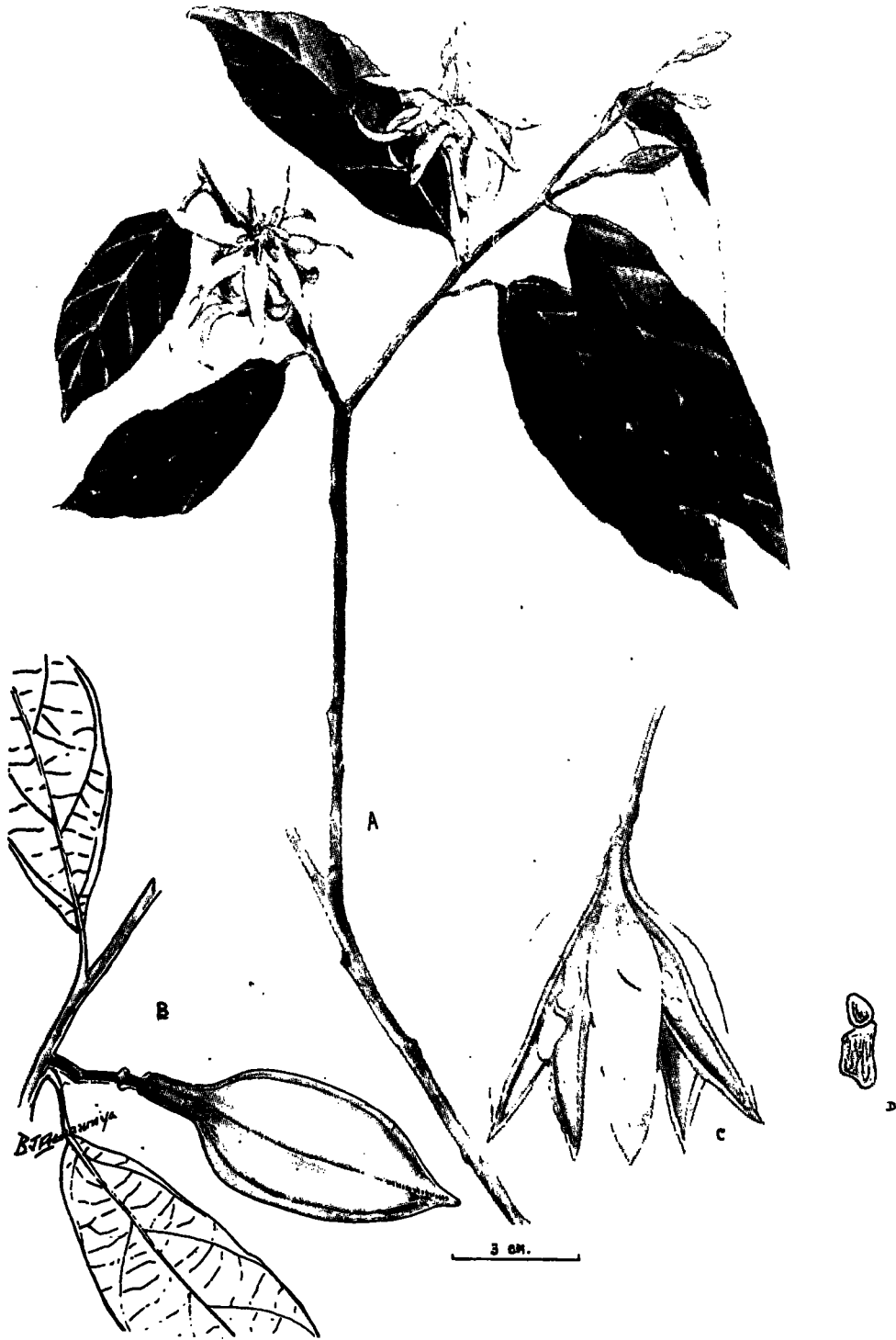


PLATE XXXVIII. *Pterospermum canescens*. A, branch with leaves and flowers. B, fruit external view. C, dehiscent fruit. D, winged seed.

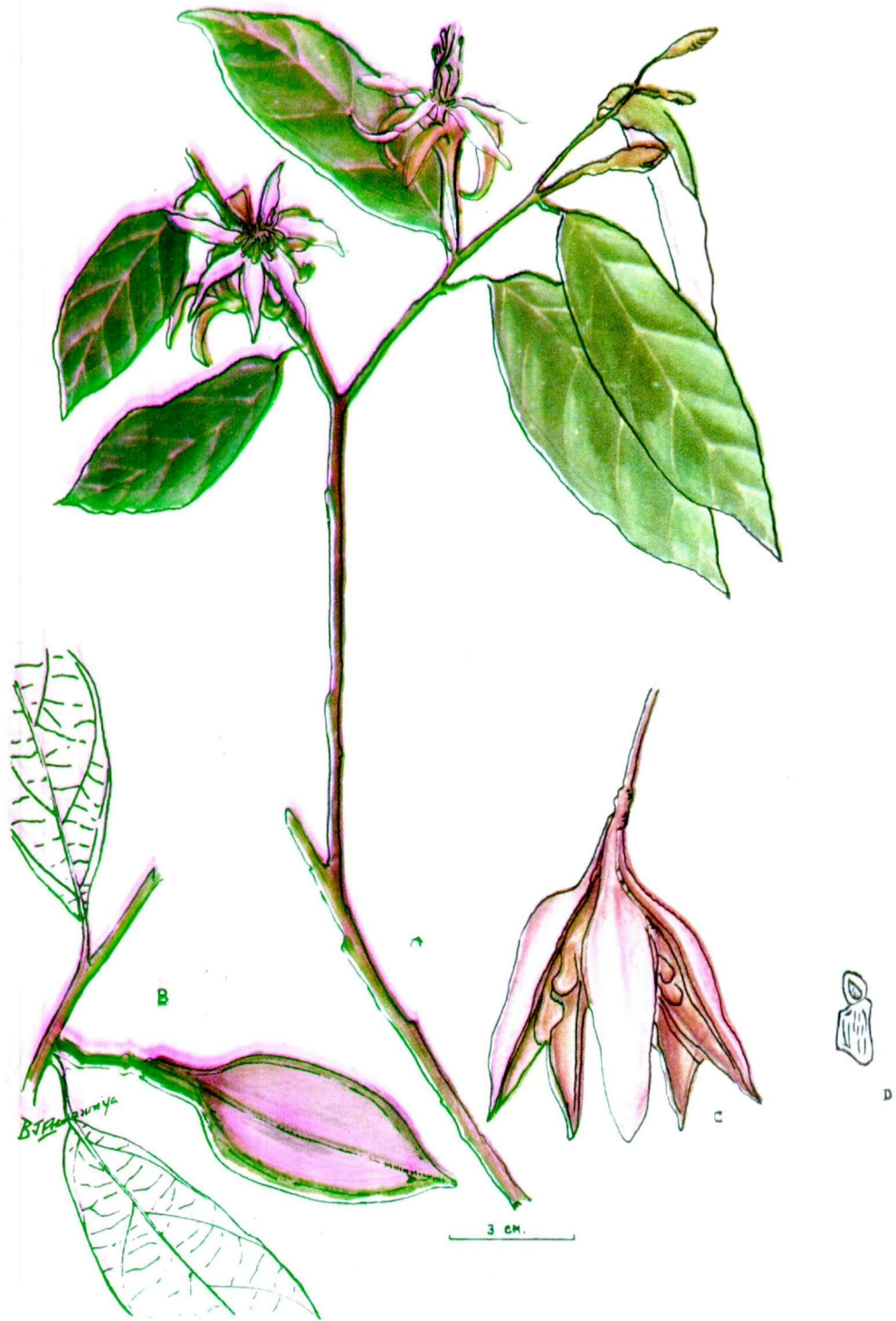


PLATE XXVIII. *Pterospermum canescens*. A, branch with leaves and flowers. B, fruit external view. C, dehiscent fruit. D, winged seed.

3. *Pterospermum canescens* Roxb. Hort. Beng. 50. 1814. (Plate XXVIII).

Pentapetes suberifolia Linn.—*Pterospermum suberifolium* Lamk.—*Pentapetes lamarckianus* Hochr.—*Pterospermum oblongum* Wall.—*Sterculia burmannianum* Hochr.

Sinh. Velanga; *Tam.* Sembolava, Sittilaipolavu, Todai, Vennagu; *Hindi* Much kand; *Sans.* Arghyarhalakshanaka, Bahupatra, Chitraka, Dirghapushpa, Harivallabha, Kshatra vriksha, Muchukunda, Mundivrikshanukaraka, Prativishnuka, Raktaprasava, Sudola, Supushpa.

A small tree with longitudinally cracked bark and finely tomentose young parts: leaves simple, alternate, stipulate, distichous, 5—10 cm long, obovate-oblong, rounded at base, bluntly acuminate, often irregularly lobed or jagged in the upper part, often unequal sided, glabrous above, white or yellowish beneath with fine tomentum, petioles short, tomentose, stipules small, caducous; flowers regular, bisexual, large, yellowish-white, sweet-scented, 2.5—3 cm diam., axillary, usually solitary on thick, tomentose, jointed pedicels with several caducous bractlets; sepals 5, slightly connate at base, 1.8 cm long, linear, obtuse, reflexed, thick, densely stellate-tomentose outside, pubescent and with a central line of long hairs within, caducous; petals 5, connate at base, shorter than sepals, linear-lanceolate; stamens 20, connate into a short tube at base, anthers linear; ovary superior, shortly stalked, 5-locular; fruit a loculicidal, 5-valved woody capsule, 5-7.5 cm long, oblong, attenuate at base tapering to a point covered with fine white tomentum; seeds winged, wing broad, terminal, twice the length of the seed.

Flowers in May.

Illustrations. Wight in Hook. Bot. Misc. 3: *pl.* 26; Kirtikar and Basu, Indian Med. Plants, *pl.* 129. 1933; Worthington, Ceyl. Trees, *pl.* 86. 1959; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is common in the low-country, especially in the dry regions in Ceylon. Jaffna, Hanguranketa, Batticaloa, etc.

India. Assam: *Jenkins*. Pen. Ind. Or., *Wight* 239; *Wallich* 1166. Ceylon. Northern Prov. Jaffna, Iranamaduwa, *Bamber*, June 1923. Central Prov., Hantane, *Gardner* 74; Peradeniya, Bot. Gard. *Silva*, July 1923; *Pierre* 3774, June 1862.

Uses. The flower of this tree mascerated with conjee water is applied for hemicrania. In Concan, the flowers and bark are charred and applied on suppurating smallpox ulcers.

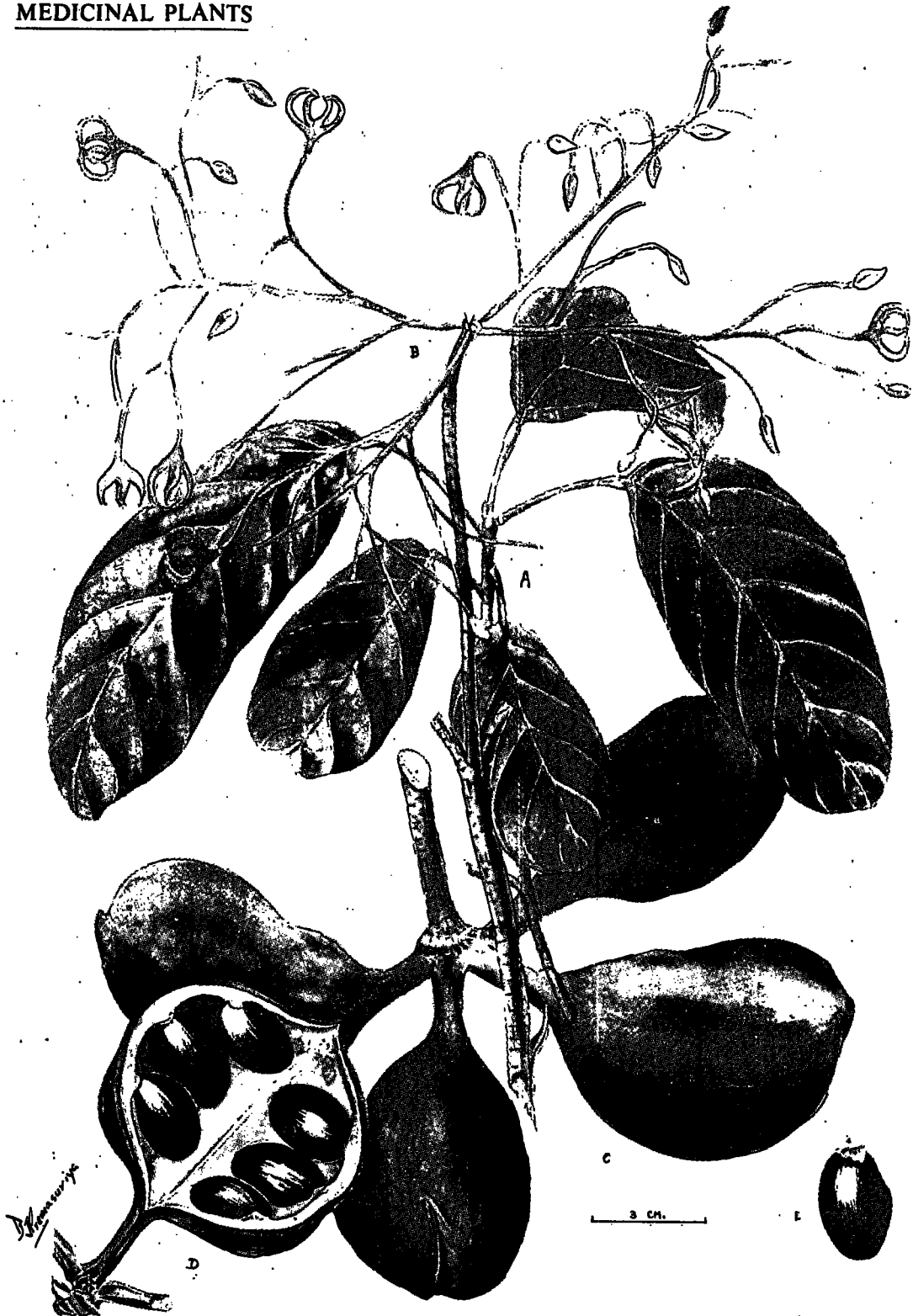


PLATE XXIX. *Sterculia balanghas*. A, twig with leaves. B, panicle of flowers. C, fruit with horizontal follicles. D, dehiscent follicle exposing the seeds. E, seed with yellow caruncle.

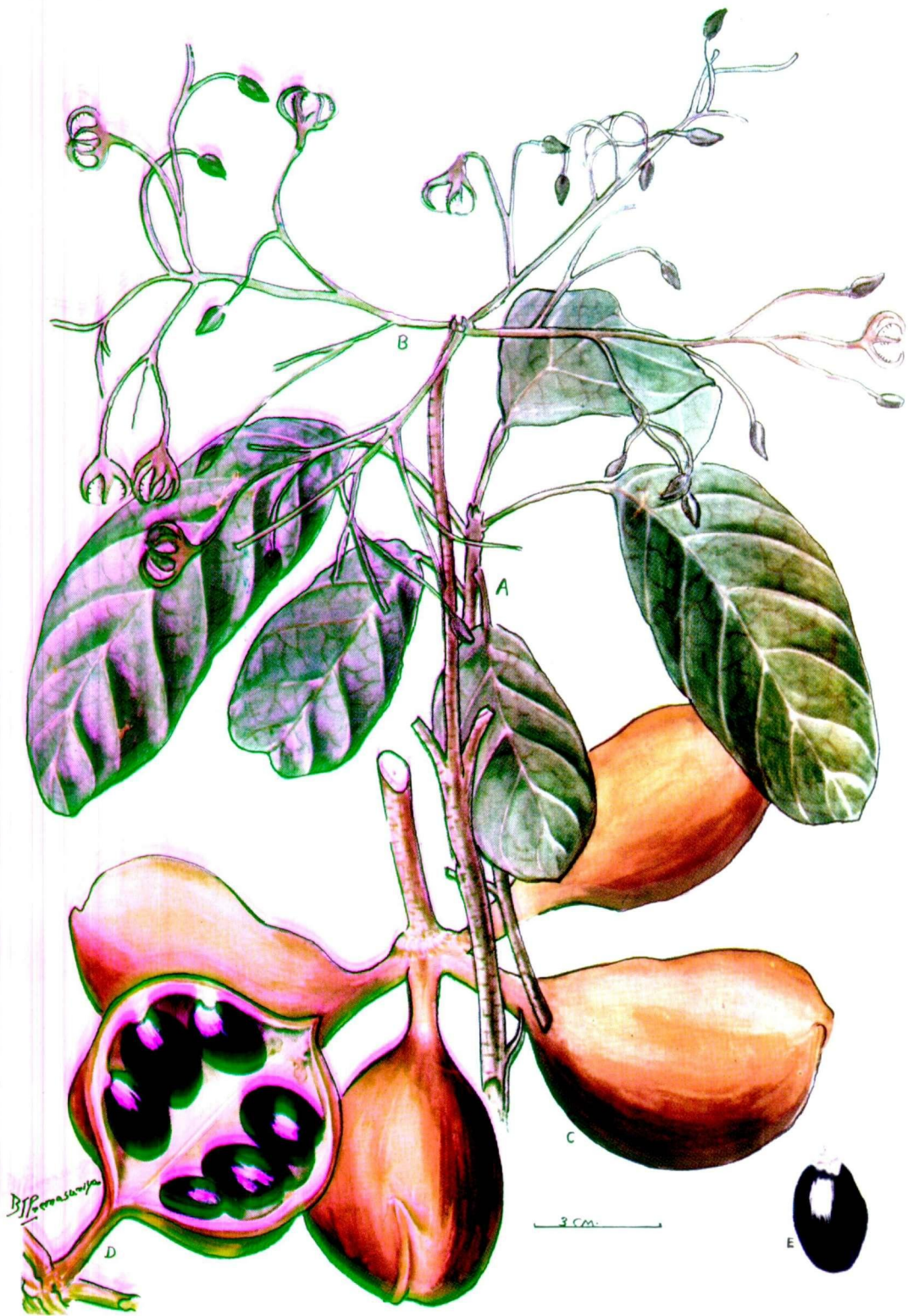


PLATE XXIX. *Sterculia balanghas*. A, twig with leaves. B, panicle of flowers. C, fruit with horizontal follicles. D, dehiscent follicle exposing the seeds. E, seed with yellow caruncle.

4. *Sterculia balanghas* Linn. Sp. Pl. 1007. 1753. (Plate XXIX).

Sinh. Nava.

A wide spreading tree about 13 m high with a whitish grey bark and pubescent young parts; leaves simple, alternate, stipulate, 7.5—12.5 cm long, ovate-oval, rounded at base, shortly acuminate, obtuse, recurved, entire, glabrous and shining above, paler and slightly stellate pubescent beneath, petioles 1.2—1.8 cm long, rough, stipules small, acute, hairy, deciduous; flowers regular, unisexual, small, green with crimson hairs, sweet-scented, 1 cm diam., on long pedicels and in stellate hairy panicles 10—12.5 cm long and slightly drooping from ends of branches; sepals 5, fused into a campanulate, 5-lobed calyx, segments linear-lanceolate, remaining connected by their tips, pubescent outside, hairy inside; petals absent; stamens 15, sessile, combined into a central column; ovary superior, 4—5-carpellary, 4—5-locular on a short gynophore; fruit follicles 4 or 5, spreading horizontally, shortly stalked, 8.8 cm long, oblong-ovoid, acuminate, very minutely pubescent, brilliant orange scarlet, pericarp thick, leathery, smooth within, seeds few 2.2 cm long, ovoid, black, shining with a small yellow caruncle at base, albuminous.

Flowers in July and August.

Illustrations. Wight, *Ill. Ind. Bot.* pl. 30. 1838; Worthington, *Ceyl. Trees*, pl. 80. 1959; Macmillán, *Trop. Plant. and Gard.*, pl. 438. 1956; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Malay Peninsula. It is common in the low-country from seashore to 3,000 feet altitude in Ceylon.

India. Madras: *Herb. Beddome*. Ceylon. Central Prov., Kandy, *Alston* 1153, Oct. 1926; Haragama, *Silva*, Oct. 1920. Without locality, *Thwaites C.P.* 1142.

Uses. The fruit is considered cooling and laxative. The inner bark yields a strong fibre used for cordage.

5. *Sterculia urens* Roxb. Pl. Corom. 1: 25. 1795.*Cavallium urens* Schott and Endl.

Sinh. Dadiya; *Tam.* Kavalam, Puttali, Sendalai, Sendanakku, Singapputtanaku, Tanakku, Vellaipputtali.

A tree with a few spreading branches, a papery flaking off bark and pubescent young parts; leaves simple, alternate, stipulate, large, 20—30 cm long on tomentose petioles as long as leaves crowded at the ends of branches, rotundate, cordate at base, shallowly palmately cut into 5, caudate-acuminate lobes, slightly pubescent above, velvety beneath; flowers regular, male and bisexual, greenish with purple centre, pedicellate in much branched, glandular pubescent panicles appearing before the leaves at the ends of branches; sepals 5, fused into a 5-lobed, campanulate calyx, pubescent on both sides, segments ovate-oblong, acute; petals absent; stamens about 20 in the male flower, sessile, staminal column short; bisexual flowers few, ovary superior, 5-carpellary on a short gynophore; fruit follicles 4—6, spreading, 2.5 cm long, oblong-ovoid, densely pubescent and also set with red, stiff, stinging bristles.

Flowers in April.

Illustrations. Roxburgh, Pl. Corom 1: *pl.* 24. 1795; Kirtikar and Basu, Indian Med. Plants, *pl.* 146. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma and Philippine Islands. It is rather rare in the dry low-country in Ceylon. Haragama, Bintenne, Uma-oya, etc.

India. Concan: *Stocks and Law*. Madras: *Cleghorn* 34. Ceylon. Uva Prov., Bintenne, Sorabora Wewa, *Silva*, April 1923; Lower Badulla Road, Uma-oya, *Thwaites C.P.* 2858. Southern Prov., Tissamaharama, *Simpson* 9960, Aug. 1932.

Uses. The gum exuded from the bark of this tree is a useful medicine for throat ailments. The leaves and tender branches are used for treating cattle suffering from pleuro-pneumonia. In the Philippines, the root bark is used as a poultice on wounds and fractures.

109. SYMPLOCACEAE

1. *Symplocos loha* Buch.—Ham. ex G. Don Prodr. 144.

Symplocos spicata Roxb.—*Symplocos polycarpa* Wall.—*Myrtus laurinus* Retz.—*Eugenia laurina* Willd.—*Bobua laurina* DC.

Sinh. Bombu, Wal-bombu; *Tam.* Elumunukkai.

A small tree with prominent leaf scars on the twigs and glabrous young parts; leaves simple, alternate, exstipulate, 7.5—15 cm long, oval or oval-lanceolate, acute at base, acuminate, acute at apex, shallowly crenate-serrate, glabrous and shining, coriaceous, veins slender, pellucid petioles 0.6—1.2 cm long, stout, flat or furrowed above; flowers regular, bisexual, white, slightly scented, small, numerous, sessile or nearly so with 3 small bracts at base rather laxly arranged in simple or more usually branched, erect, glabrous or puberulous inflorescences 5—7.5 cm long; sepals 5, fused into a tube adnate to ovary, segments imbricate, obtuse or rounded; petals 5, fused into a short tube 0.6 cm long, segments almost distinct, imbricate, rounded, concave; stamens 30—40 in several rows adnate to base of the corolla, filaments unequal, anthers short; ovary inferior, 3-locular with 3 pendulous ovules in each loculus, style simple, stigma 3-lobed; fruit a globose drupe 0.6 cm long, narrowed above into a cylindrical neck, glabrous, purple, faintly ribbed when dry, stone thin 3-seeded.

Flowers from February to May.

Illustrations. Burmann, *Thes. Zeyl. pl.* 62. 1737; Herb. Peradeniya drawing.

Distribution. Occurs in India, Ceylon, Malaya, China and Japan. It is a very common tree from sea level to 7,000 feet altitude in Ceylon.

India. Sikkim: *J. D. Hooker*. Khasia: *Clarke* 6169, Oct. 1867. Sylhet: *Clarke* 17975B, Nov. 1872; *Clarke* 14353B, Dec. 1871. Assam: Sibsagar, *Peal* 73. S. India: Kodaikanal, *Fischer* 2867, Aug. 1911. Pen. Ind. Or., *Herb. Wight* 1691, Kew Distribution 1866—7. Ceylon. Central Prov., Hunnasgiriya, *J. M. Silva* 54, June 1926; Madugoda, *Alston* 1962, Feb. 1926; Nuwara Eliya, Horton Plains, *Thwaites C.P.* 473; Sitaeliya, *A.M. Silva*, May 1906. Fiji Islands. *Horne* 1108, 1877—8.

Uses. This tree is used in the treatment of phlegm. The bark is used externally for poulticing fractures, as it promotes the healing of bones.

2. *Symplocos racemosa* Roxb. Hort. Beng. 40. 1814.

Symplocos hamiltoniana Wall.—*Symplocos rigida* Wall.—*Symplocos nervosa* A. DC.—*Symplocos propinqua* Hance.

Engl. Lodh Tree; *Sinh.* Lothsumbula; *Hindi* Lodh; *Sans.* Balabadhra, Balipriya, Bhillataru, Bhilli, Galava, Hastilodhraka, Hemapushpaka, Kandakilaka, Kandaniya, Laktakarma, Lodhra, Lodhraka, Lodhravriksha, Mahalodhra, Marjana, Rodhra, Shahara, Shaharalodhra, Shambara, Shavaraka, Shukla, Tilaka, Tririta, Tritaka, Vanarajhata.

A small tree or a large shrub, branchlets glabrous; leaves simple, alternate, oblong and sometimes almost orbicular, cuneate at both ends, obscurely crenate, obtuse, coriaceous, nerves distant, not conspicuous, petioles 8 mm long; flowers regular, bisexual, white, in racemes 5—10 cm long; bracts 4 mm long, ovate, hairy, deciduous, bracteoles 2 mm long, ovate, lower pedicels often distant 1—6 mm long; calyx-tube usually glabrous, 5-lobed, imbricate, lobes 2.5 mm long, ovate, minutely pubescent; corolla 4 mm long, petals 5, imbricate, free or obscurely connate; stamens numerous, adnate to corolla-tube usually throughout its length, anthers shortly oblong dehiscing longitudinally; ovary inferior, 3-locular with 2—4 anatropous pendulous ovules on an axile placenta, style filiform, stigma small, capitate; fruit a subcylindric smooth ellipsoid drupe nearly 1.2 cm long, 6 mm broad, 1—3-seeded with a woody endocarp.

Illustration. Kirtikar and Basu, Indian Med. Plants. *pl.* 587B. 1933.

Distribution. Occurs throughout North East India and Assam and Pegu. It is not found in Ceylon nor is it cultivated here.

India. Sikkim: *J. D. Hooker*; Manipore, *Watt* 6617, 1881—2. Khasia: *J. D. Hooker* and *T. Thomson*. Chota Nagpore, Parasnath, *Clarke* 24839B, Nov. 1874; *Clarke* 24990D, Nov. 1874; *Clarke* 20982F, Oct. 1873. Penang, *Curtis* 717, March 1880.

Composition. This plant contains the alkaloids, lotuirine and loturudine.

Uses. The bark is cooling, astringent and is used for bowel complaints, eye diseases, ulcers, etc. A decoction of it is used as a mouth wash to give firmness to bleeding and spongy gums and taken internally as a snake-bite cure. In Ceylon, the papery outer bark of *Melaleuca leucadendra* Linn. is used as a substitute as the genuine drug is not available.

110. THYMELAEACEAE

1. *Aquilaria agallocha* Roxb. Fl. Ind. 2: 422. 1832.

Engl. Aloes Wood, Lignum Aloes; *Sinh.* Agarū, Agil; *Tam.* Agar, Aggalichandana; *Hindi* Agar; *Sans.* Agarū, Agnikashtha, Anaryaka, Asara, Bhringaja, Jonk, Kashthaka, Krimigandha, Krimija, Krishna, Laghu, Loha, Lohakhya, Pataka, Pichhila, Pravara, Rajarha, Vanshika, Varnaprasadana, Yogaja.

A large evergreen tree, branches glabrous except for the silky shoots; leaves simple, alternate, linear-oblong, lanceolate or oblanceolate, 5—8.5 cm long, caudate acuminate, thinly coriaceous, shining, sometimes subsilky on the nerves beneath, nerves very many, slender, parallel and faint, petioles 2.5 mm long; flowers regular, bisexual, white in axillary or terminal peduncled or subsessile umbellules gathered into sessile or short-peduncled, silky umbels; perianth campanulate, lobes 5, broad, rounded, ovate, hairy, connate at base, spreading, scales above the stamens 5; stamens 10, anthers subsessile, oblong; disc absent; ovary superior, subsessile, villous, 2-locular, stigma large and subsessile; fruit a compressed, oblanceolate or obovate, loculicidal capsule with a coriaceous or hard and woody pericarp.

Illustrations. Roxburgh and Colabrooke, Trans. Linn. Soc. 21: *pl.* 21; Kirtikar and Basu, Indian Med. Plants, *pl.* 836B. 1933.

Distribution. Occurs in India towards East Himalaya, Assam and Martaban Hills, but not in Ceylon. The wood and resin of this tree are imported from India.

India. Silhet: *Wallich* 7250A. Assam: *Masters*.

Uses. The bark and wood of this tree are stimulant and used in gout, rheumatism and paralysis. They are astringent and given for diarrhoea and vomiting. In Ceylon, the wood is used for fever, rheumatism and bronchial diseases. In China, aphrodisiacal properties are attributed to it, while in Cambodia it is administered for malarial fevers. The resin is used in the perfumery industry in India.

2. *Gnidia eriocephala* Meissn. in Regensb. Denkschr. 3: 292. 1841.

Lasiosiphon eriocephalus Decaisne—*Lasiosiphon speciosus* Dcne.—*Lasiosiphon sisparensis* Dcne.—*Lasiosiphon insularis* Meissn.—*Lasiosiphon metzianus* Miq.—*Gnidia sisparensis* Gardn.—*Gnidia insularis* Gardn.—*Gnidia monticola* Miq.

Engl. Woolly-headed *Gnidia*: *Sinh.* Naha; *Tam.* Malaiviralan, Nachannar.

A much branched bush 2—3.3 m high, twigs slender, erect, glabrous; leaves simple alternate, exstipulate, 5—7.5 cm long, linear or lanceolate-oblong, acute at base, acute or obtuse at apex and apiculate, entire, glabrous, thin, petioles very short; flowers regular bisexual, bright yellow, nearly sessile in erect, dense, terminal heads 2.5—3.7 cm wide surrounded at base by an involucre of large, imbricate, oval, acute, silky bracts; perianth tubular with 5 spreading segments and alternating with them at the mouth 5 small scales (petals?) perianth tube 1 cm long, silky pubescent outside and with long white hair at the lower part, segments oblong, obtuse, flat, scales ovate, obtuse; stamens 10, in two rows inserted in top of tube, anthers almost sessile, included; ovary superior, with a single pendulous ovule, style long stigma globose; fruit small, dry, included in perianth-tube.

Flowers almost throughout the year.

Illustrations. Beddome, *For. Man. pl. 25, fig. 2*; Decaisne in *Jacq. Voy. Bot pl. 150. 1844*; Wight, *Ic. Pl. Ind. Or., pl. 1859 and 1860. 1852*; Kirtikar and Basu, *Indian Med. Plants, pl. 837. 1933.*

Distribution. Occurs in India and Ceylon. It is rather common in open rocky places especially in the Uva Province in Ceylon.

India. North Canara: *Talbot, Dec. 1880*; Nilghiris, *Wallich 1051. Pen. Ind. Or., Herb. Wight 2492, Kew Distribution 1866—8. Ceylon.* Central Prov, Talathuoya-Galaha Road, *Simpson 9152, Jan. 1932*; Madugoda, *Simpson 8804, Nov. 1931*; Urugoda Road, *Simpson 8822, Nov. 1931*; Fort Macdonald Valley, *Willis, March 1906. Without locality, Thwaites C.P. 469.*

Uses. The leaves of this plant are mascerated and applied on contusions, swellings, etc. The bark is used as a fish poison.

3. *Gyrinops walla* Gaertn. Fruct. 2: 276. 1791.

Cameraria zeylanica Moon.

Sinh. Patta-walla, Walla.

A small tree with a slender erect trunk and a small rounded head, branchlets numerous, slender, erect, bark thin, smooth, reddish brown, buds silky; leaves simple, alternate, exstipulate, 3.7—10 cm long, oblong-lanceolate, acute at base, shortly acuminate, obtuse or subacute, entire with a very narrow hyaline edge, quite glabrous, slightly shining, lateral veins very fine and numerous, midrib prominent beneath, petioles very short; flowers regular, bisexual, small, yellowish white on slender pubescent pedicels, 3—5 in shortly stalked umbels from axils of present or fallen leaves, bracts small, hairy, caducous; perianth tubular, slender with a ring of short hairs and scales above stamens, pubescent, segments 5, oval, subacute, spreading; stamens 5 in one row, inserted in mouth of perianth-tube opposite segments, anthers sessile; ovary superior, on a rather long stalk, 2-locular with a pendulous ovule in each loculus, style long, stigma capitate; fruit capsule 1.8 cm long, obovate, compressed, pointed, coriaceous, reddish brown, dehiscing loculicidally into 2 valves; seeds covered with brown hair, pointed, produced into a long tail-like process at base.

Flowers in December.

Illustrations. Gaertner, Fruct. et Sem. Plant. 2: *pl.* 140. 1791; Wight, Ic. Pl. Ind. Or., *pl.* 1850. 1852; Beddome, Flor. Sylvat. *pl.* 304. 1868—1873.

Distribution. Occurs in India and Ceylon. It is rather common in the moist regions up to 4,000 feet altitude in Ceylon.

Ceylon. Western Prov., Mirigama, *Alston* 675, June 1927; Hunuwala, *J. M. Silva*, April 1928. Southern Prov., Galle, *Thwaites C.P.* 1828.

Uses. The tender leaves of this tree are used as a vermifuge. They are applied as a poultice on boils, fistula in ano and snakebites with beneficial results. The mascerated leaves when placed in tooth-cavities loosen the teeth. The plant is also used for preparation of medicinal oils. The bark of the tree is tough and is used for making ropes.

111. TILIACEAE

1. *Corchorus capsularis* Linn. Sp. Pl. 529. 1753.

Engl. Jute; *Sinh.* Jaladara; *Tam.* Piratti-kirai; *Sans.* Nadika patta.

An annual, erect, glabrous herb, 0.6—1.2 m tall; leaves 5—10 cm long, narrowly ovate-lanceolate, rounded at base, acuminate, acute, serrate, the two lowest serratures produced into filiform appendages 5—10 cm long, glabrous, 3—5-veined at base, stipules filiform, as long as petioles; flowers regular, bisexual, yellow, in axillary clusters 1—3 together, each 1.2 cm diam., pedicellate; sepals 5, distinct; petals 5, distinct; stamens numerous, free on a short torus; ovary superior, 2—5-locular with numerous ovules; fruit capsule 2—5-valved, depressed, 1.2 cm diam., ridged and muricated, valves woody without transverse partitions inside; seeds wedge-shaped, smooth, brown.

Illustration. Wight, *lc. Pl. Ind. Or.*, pl. 311. 1840.

Distribution. Occurs in India, Ceylon and Malaya. It is found as a weed in the low-country in Ceylon.

India. Chota Nagpore: *Clarke* 21372, Oct. 1817. Upper Assam: *Jenkins* 5371, 1841. Pen. Ind. Or., *Herb. Wight* 278. 1840. **Ceylon.** Without locality, *Thwaites C.P.* 1105. Southern Prov., Ruhuna National Park, Patanagala, *Cooray* 69111411R, Nov. 1969. **Maldive Islands.** *Didi* 150. 1896. **Cuba.** Santiago de las Vegas, *Baker* 83, Aug. 1907.

Composition. The seeds of this plant contain raffinose and the glucoside, corchorin, while the leaves contain another glucoside, capsularin.

Uses The leaves are demulcent, bitter, tonic, stomachic, laxative, carminative, refrigerant and diuretic. An infusion of the plant is given for fever. An infusion of the leaves with coriander is a popular domestic remedy for colic.

The fibre of the stem is used for manufacture of sacking, paper-making and carpet-making.

2. *Corchorus olitorius* Linn. Sp. Pl. 746. 1753.

Sinh. Wanuk; *Sans.* Singirikka.

A shrubby annual or perennial, much branched, glabrous herb 1—1.3 m tall; leaves simple, alternate, 7.5—12.5 cm long, ovate-lanceolate, rounded at base, acuminate, acute, serrate, the two lowest serrations prolonged into deflexed, filiform tails 1.2 cm long, glabrous on both sides, 3—5 veined at base, veins conspicuous beneath, petioles 2.5—3.7 cm long, slightly pilose above, stipules 1.5 cm long and setaceous; flowers regular, bisexual, yellow, on very short pedicels, 1.2 cm diam., buds obovate, angled, cuspidate; sepals 5, distinct, linear, acuminate, cuspidate; petals 5, distinct, longer than sepals; stamens numerous, distinct; free on a short torus; ovary superior, 2—5-locular with numerous ovules, style papillose; fruit a glabrous, 5-valved capsule with transverse partitions between seeds, 4.2—6 cm long, linear, cylindrical, tapering with five short points at apex, seeds triangular and black.

Flowers in July

Distribution. Occurs in India, Ceylon and Malaya.

India. Chota Nagpore: *Clarke* 20679F, Oct. 1873. N. Canara: Yellapore, *Talbot*, Oct. 1887. Pen. Ind. Or., *Herb. Wight* 277. **Ceylon.** *Thwaites* C.P. 1107. Western Prov., Colombo, *Agri. Sch. C. Drieberg*, May 1894. **Cuba.** Santiago de las Vegas, *Baker* 31, Sept. 1906.

Uses. An infusion of the leaves is given for fever and colic.

3. *Grewia polygama* Roxb. Hort. Beng. 1814.

Grewia helicterifolia Thw.

Sinh. Boradamaniya; *Tam.* Thaviddai.

A much branched tree with smooth, whitish bark, twigs slender, young parts pubescent; leaves simple, alternate, distichous, 3.7—7.5 cm long, oblong-lanceolate, unequal at base, acuminate, acute, finely serrate in the upper parts, 3-nerved at base, nearly glabrous above, white with stellate pubescence beneath; petioles short; stipules longer, linear, very acute; flowers regular, polygamous, small, under 1.2 cm diam., in pedunculate umbels, 1—4 together from axils of leaves, bracts linear; sepals 5, distinct, linear, pubescent on both sides; petals 5, smaller than sepals with a glandular scale within at the base; stamens and ovary on a raised torus or gynophore, stamens numerous, distinct; ovary superior, 2—4-locular with 2 ovules in each loculus; fruit globular, 6 mm long, not lobed, hairy, stones 4, 1-seeded.

Flowers from July to October.

Distribution. Occurs in India, Ceylon, Burma and tropical Australia. It is rather common in the dry low-country in Ceylon. Dambulla, Hanguranketa, Anuradhapura, Vavuniya, Karativu, etc.

Ceylon. Eastern Prov., Batticaloa, Unichchai, *Mueller-Dombois* 67081411, Aug. 1969; *Alston*. A37; *Thwaites* C.P. 1113. North Central Prov., Anuradhapura, *Herb. Peradeniya.*, Oct. 1883; Mihintale, *Simpson* 8524, Sept. 1931.

Uses. The powdered root of this plant is given for diarrhoea and dysentery and also applied externally to hasten suppuration and as a dressing for wounds. The fruits, too, are used for the same ailments.

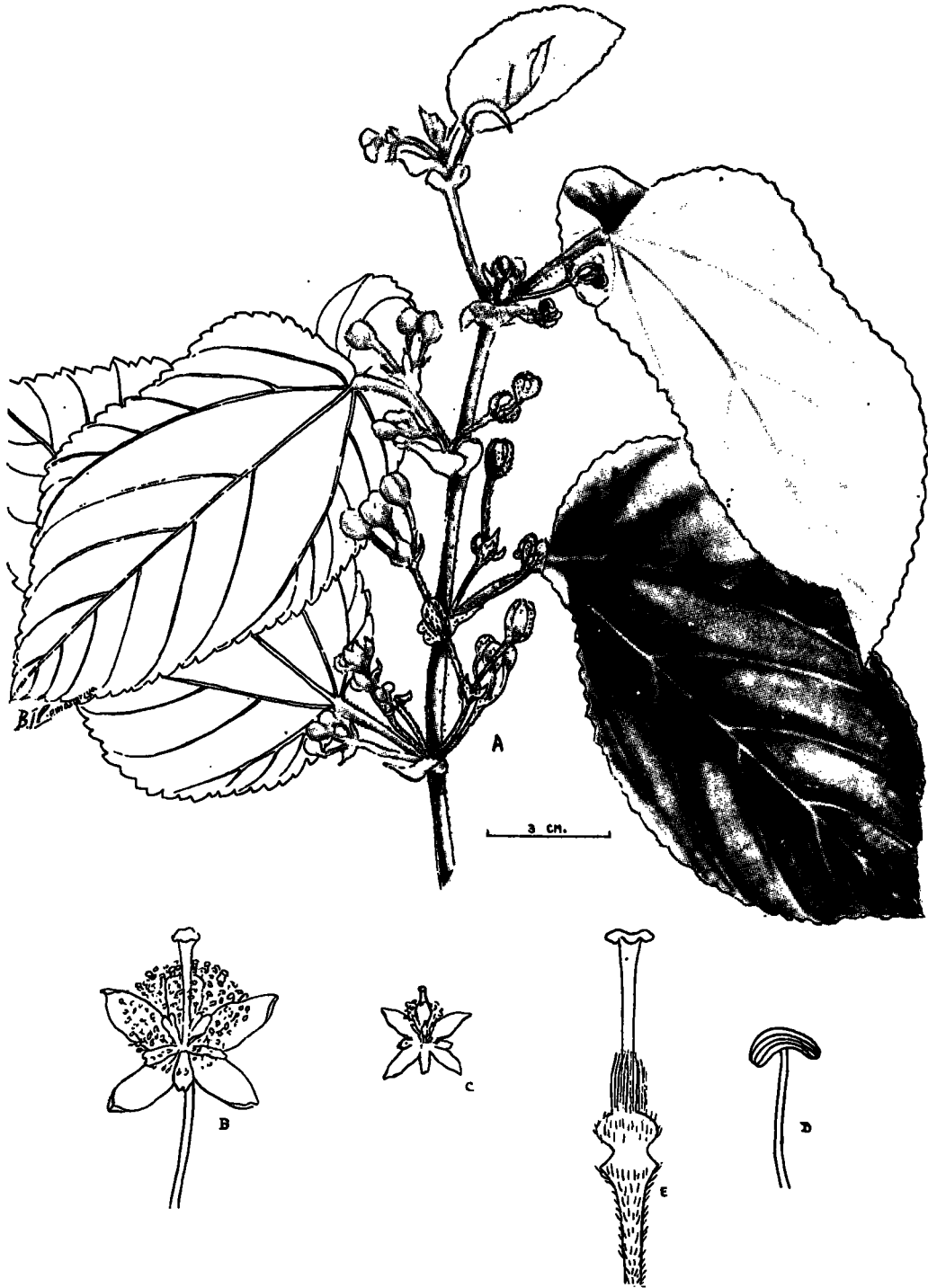


PLATE XXX. *Grewia tiliifolia*. A, branch with leaves and flowers in umbels. B, male flower dorsal view C, bisexual flower dorsal view D, stamen. E, flower with the stamens removed showing the torus and pistil.

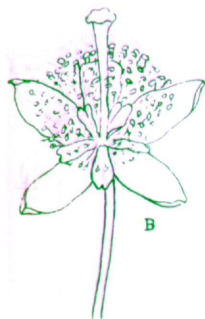


PLATE XXX. *Grewia tiliifolia*. A, branch with leaves and flowers in umbels. B, male flower dorsal view. C, bisexual flower dorsal view. D, stamen. E, flower with the stamens removed showing the torus and pistil.

4. *Grewia tiliifolia* Vahl. Symb. 35. 1790. (Plate XXX).

Sinh. Damaniya, Hamaniya; *Tam.* Chadachi; *Sans.* Dharmana, Dhamni.

A tree with brownish pale bark, young parts pubescent; leaves simple, alternate, 6.2—12.5 cm long, ovate-orbicular, more or less cordate and oblique at base, obtuse, serrate, glabrous on both sides, 3—5-nerved at base, petioles 1.8—2.5 cm long; stipules nearly 1.2 cm long, slightly falcate, auriculate, acuminate, veiny; flowers regular, polygamous, small, pale yellow slender-pedicelled, in stalked umbellate clusters of 3, several together from the axils about equalling the petioles; sepals 5, distinct, linear-oblong, stellate tomentose outside; petals 5, distinct, about half as long as sepals with a glandular scale within at the base; stamens numerous, distinct together with the ovary on a raised torus; ovary superior, 2—4-locular with 2 ovules in each loculus; fruit 2 cm long, 4-lobed, slightly stellate hairy, stones 3 or 6-celled.

Flowers from April to July.

Illustrations. Beddome, *Flor. Sylvat. pl.* 108. 1868—1873; *Herb. Peradeniya.*, drawing.

Distribution. Occurs in India, Ceylon, Burma and East tropical Africa. It is common in the low-country in Ceylon, extending into the lower montane zone.

India. Bengal: *Clarke* 11726F, May 1870; *Wallich* 1094E. Pen. Ind. Or., *Herb. Wight* 254, Kew Distribution 1866—7. Ceylon. Eastern Prov., Batticaloa, Unichchai, *Mueller Dombois* 67081408, Aug. 1967; *Thwaites C.P.* 621, upper specimen; Uma Oya, Kuruminiya Kandura, *J. M. Silva* 262, Dec. 1927. North Central Prov., Kekirawa, *Herb. Peradeniya.*, July 1887; Dambulla, *Simpson* 9825, June 1932; Damaniya, *Simpson* 8113, May 1931. Uva Prov., Bibile, *J. M. Silva* Dec. 1924.

Uses. This plant is astringent and cooling. It is prescribed for dysentery.

112. ULMACEAE

1. *Celtis cinnamomea* Lindl. ex Planch. in Ann. Sc. Nat. Ser' 2, 10: 303. 1848.

Celtis dysodoxylon Thw.—*Celtis waizii* Bl.—*Celtis orientalis* Moon—*Celtis roxburghii* Planch.—*Celtis reticulosa* Miq.

Sinh. Gurenda; *Tam.* Pinari.

An evergreen tree 10—13 m tall with tomentose branchlets; leaves simple, alternate, 7.5—10 cm long, obliquely ovate, long acuminate, entire, crenate or serrate, glabrous, coriaceous, dark green, 3-veined up to below the tip, penninerved and reticulate with transverse veinules, base acute or rounded, petioles 0.6—0.8 cm long, stipules free; flowers polygamous, (unisexual and bisexual) greenish in racemose or terminal cymes, female flowers in the upper axils, male and bisexual flowers in the lower axils; male flowers: puberulous, racemose cymes with slender branches, sepals 5, imbricate, stamens 5, filaments erect in bud, anthers small, disc villous; female and bisexual flowers: ovary superior, unilocular with a single pendulous ovule, stigmas 2 linear, deciduous; fruit a piciform drupe, narrowed to the obliquely beaked tip.

Flowers in February and March.

Illustrations. * Trimen, Handb. Fl. Ceyl. pl. 86. 1895; Herb. Peradeniya., drawing.

Distribution. Occurs in India, Ceylon, Burma and Malay Islands. It is rather common in the moist regions in Ceylon, from 2,000 to 5,000 feet altitude.

India. Assam: *Jenkins*. Ceylon. Central Prov., Hakinda, *F. W. de Silva* 99, April 1928; Rangala, Elephant Plains, *Herb. Peradeniya.*, April 1859; Nuwara Eliya, *A. M. Silva*, March 1906; Hakgala, *A. M. Silva*, May 1906. Southern Prov., Morawaka, *Herb. Peradeniya.*, March 1882. Without locality, *Thwaites C.P.* 2563.

Uses. The wood of this tree is given internally in the form of a powder with lemon juice to purify the blood for itch and other cutaneous eruptions. At the same time, it is used externally to anoint the body.

2. *Gironniera cuspidata* (Bl.) Kurz, For. Fl. 2: 470. 1877.

Cyclostemon cuspidatus Bl.—*Gironniera reticulata* Thw.—*Gironniera currani* Planch.—*Sponia subserrata* Kurz.—*Aphananthe cuspidata* Planch.—*Galupita cuspidata* Bl.—*Helminthosperma glabrescens* Thw.—*Celtis reticulata* Hook.f.

Sinh. Wal-munamal: *Tam.* Kodaittani.

An unarmed evergreen tree, 10—13 m tall with glabrous, lenticellate branchlets and glabrous or sparsely addressed hairy young parts; leaves simple, alternate, stipulate, 7.5—12.5 cm long, oblong to ovate-lanceolate, acuminate or caudate, base rounded or acute, smooth, glabrous, shining, finely reticulated above, scaberulous beneath, veins 10—12 pairs, spreading, petioles 0.6—1.2 cm long, stipules connate sheathing the buds, lanceolate, hairy, caducous; flowers regular, unisexual, dioecious, apetalous, males in shortly peduncled cymes and females solitary and axillary; male flowers: minute, globose, sepals 5, obtuse, imbricate; stamens 5, filaments suberect in bud, pistillode woolly; female flowers: sepals narrower than in males, acute, ovary superior, unilocular with a single ovule, glabrous, style central, stigmas 2, filiform, spreading, ovule pendulous; fruit an ovoid drupe, 1.2—1.8 cm long, shortly beaked, glabrous and hardly compressed.

Flowers in February and March.

Illustrations. Beddome, *Flor. Sylvat. p.* 313, *fig.* 1. 1868—1873; Kirtikar and Basu, *Indian Med. Plants, pl.* 887B. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, Ceylon, Java, Celebes and Philippine Islands. It is rather rare in the low-country in Ceylon between 1,000 and 3,000 feet altitude. Between Kurungala and Matale, Gannoruwa, Deltota and Badulla.

Ceylon. Central Prov., Peradeniya, *Herb. Peradeniya.*, Sept. 1901. Without locality, *Thwaites C.P.* 2565.

Uses. The bark is given internally for cutaneous diseases as it purifies the blood.

3. *Holoptelea integrifolia* (Roxb.) Planch. in Ann. Sc. Nat. Ser, 3, 10: 266. 1848.*Ulmus integrifolia* Roxb.

Engl. Indian Elm; *Sinh.* Dadakirilla, Godakirilla; *Tam.* Avari, Aya, Kanji, Tabasi, Vellaya; *Hindi* Banchilla, Begana, Bisenda, Chilbil, Chilla, Chllil, Chilmil, Chirbil, Chirmil, Dhamna, Kandru, Kanju, Karanji, Kumba, Kunj, Kunjanali, Papar, Papri; *Sans.* Chirabilva.

A deciduous tree, 17—20 m high, with ash-grey pustular bark and glabrous shoots; leaves simple, ternate, 5—12.5 cm long, oval to obovate-oblong, cuspidately acuminate or apiculate, entire (serrate when young), glabrous, base rounded or cordate, veins 5—7 pairs, petioles 0.6—0.8 cm long and puberulous; flowers regular, unisexual and perfect, greenish, mixed in short racemes or fascicles at the scars of fallen leaves about 0.4 cm diam; sepals 4, imbricate, pubescent, deciduous; stamens 4—8, filaments glabrous, anthers pubescent; ovary superior, stipitate, unilocular with one ovule, stigmas 2, subulate, ovule pendulous, anatropous; fruit a dry winged samara, orbicular in puberulous racemes, 1.6—2.5 cm broad, notched at the top with two usually incurved teeth, pedicel 0.6—1.2 cm long, very slender, jointed in the middle, nucleus in the centre, broadly oval, flat, reticulate, wings beautifully veined.

Flowers in July.

Illustrations. Wight, *Ic. Pl. Ind. Or., pl.* 1968. 1853; Roxburgh, *Pl. Corom. 1: pl.* 78. 1795; Beddome, *Flor. Sylvat. pl.* 310. 1868—1873. Kirtikar and Basu, *Indian Med. Plants, pl.* 885. 1933; Herb. Peradeniya., drawing.

Distribution. Occurs in India, Ceylon, Burma and Cochin-China. It is common in the dry regions of Ceylon.

India. Bihar: *J. D. Hooker. W. Bengal: Calcutta, Hort. Bot., Wallich 3547A. Pen. Ind. Or., Herb. Wight 2678, Kew Distribution 1866—8 Ceylon. North Central Prov., Anuradhapura, Herb. Peradeniya., Oct. 1883; Uma Oya, Thwaites C.P. 2381. Upper Burma. Ruby Huk, Feb. 1892.*

Uses. The mucilaginous bark is boiled and the juice applied on rheumatic swellings. The bark is powdered and tied as a poultice.

113. UMBELLIFERAE

1. *Apium graveolens* Linn. Sp. Pl. 264 1753.

Engl. Wild Celery, Marsh Parsley, Smallage; *Sinh.* Asamodagam; *Sans.* Ajamoda, Andhapatrika, Brahmakashi, Brahmamusha, Dipyaka, Gandhadala, Hastikavari, Hayagandha, Karavi, Kharashva, Kharavha, Lochamastaka, Markati, Mayura, Moda, Modadhya, Modini, Phalamukhya, Shikkimoda, Uragandha, Uragandhika, Vanhidipika, Vastamoda, Vishali.

A biennial glabrous herb, with erect branched stems, 0.3—2.6 m tall; leaves pinnate, radical leaves with large, deeply lobed segments, cauline leaves 3-partite, segments once or twice trifid, coarsely toothed; flowers regular, bisexual or polygamous, in leaf-opposed compound umbels, rays of the umbel 5—10, pedicels 6—16, 1—3 mm long; calyx-tube adnate to ovary, teeth absent; petals 5, epigynous, ovate, acute, tip inflexed; stamens 5, epigynous; ovary inferior, 2-locular, disc 2-lobed, styles 2, stigmas capitate, ovules one in each loculus, pendulous; fruit of two indehiscent, elliptic, subcompressed carpels, 2-2.5 mm long, ridges narrow, vittae broad.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 478. 1933; Bailey, *Manual of cultivated Plants*, fig. 153A. 1957.

Distribution. Occurs in India especially in the N. W. Himalaya and Punjab where it is frequently cultivated. It also occurs in W. Asia, Europe and N. Africa.

Composition. According to Wehmer, the plant contains a glucoside, apiin, a volatile oil, mannite and inosite in addition to vitamins A₂, B₁, and C₂. The bulb yields a volatile oil, glutamine, mannite, asparagine, tyrosine, etc., while the fruit also contains a volatile oil, apigenine, protein, choline, etc.

Uses. The root of this plant is considered an alterative and diuretic and given for anasarca and colic. The fruits are used in bronchitis, asthma, diseases of the chest, indigestion in children, rheumatic complaints, liver and spleen diseases and itch. All parts of the plant have aphrodisiacal properties. According to Nadkarni, the plant is a reputed preventive of rheumatism and gout and a useful carminative. In Africa, a decoction of the fruit is given for lumbago and rheumatism and the plant is used as an abortifacient and emmenagogue.

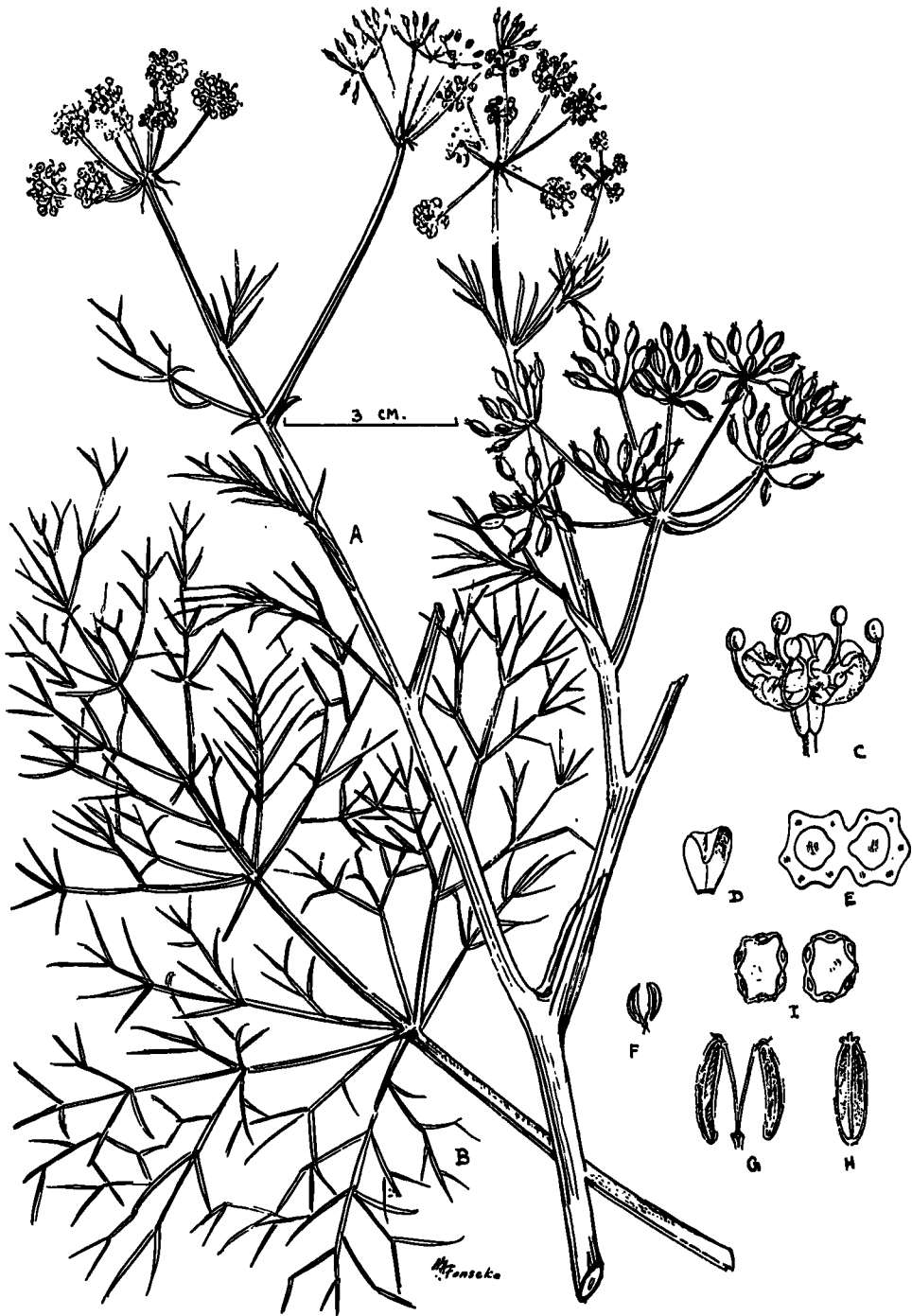


FIG. 488. *Carum carvi*. A, portion of a plant showing leaves, umbels of flowers and fruits. B, root-leaf. C, flower lateral view D, petal. E, transverse section of ovary. F, G, fruits. H, commissural view of mericarp. I, transverse section of fruit. C—E and G—I, enlarged.

2. *Carum carvi* Linn. Sp. Pl. 263. 1753. (Fig. 488).

Bunium carui Bieb.

Engl. Black Cumin, Caraway; *Sinh.* Kalu-duru; *Tam.* Kekkuvirai, Simaishembu; *Sans.* Bahugandha, Bhedanika, Bhedini, Hridya, Jarana, Kalajiraka, Kalameshi, Kashmirajiraka, Krishna, Krishnajaji, Krishnajiraka, Nila, Nilakana, Patu, Ruchya, Sugandha, Sushavi, Udgarashodini, Vantishodini, Varshakali.

A biennial (or annual) herb with a brown tapering root, often branched below and an erect, slender, cylindrical, hollow, faintly striate, smooth, much branched stem, branches ascending; root-leaves several, 15—22.5 cm long, on rather long petioles, narrowly triangular in outline, bi or tri-pinnate, primary pinnae sessile, opposite, closely placed so as to overlap at the base, broadly triangular in outline, ultimate divisions linear, acuminate, glabrous, pale green; stem-leaves alternate, small with large sheathing scarious brown petioles, pinnate or bipinnate, the ultimate segments very narrow and pointed; at the base of the sheathing petiole on either side is a sessile pinnate stipule with filiform segments; umbels numerous long-stalked often irregular of about 8—10 slender rays, involucre of one or few filiform bracts, or wanting, partial involucre absent or a single small bract; flowers small, about 2.5 mm across, the central ones usually barren; calyx-tube obsolete; petals 5, broadly oval, notched with an entire inflexed apex, white; stamens 5, alternating with petals; fruit about 4 mm long, oblong-ovoid, slightly compressed laterally, capped by the short spreading styles, smooth, scarcely constricted at the commissure which is flat, primary ridges prominent, narrow, blunt, pale, equal, vittae large, one in each furrow, and two on the commissural face, dark brown, unicarps somewhat curved, readily separating from the bifid carpophore, and remaining suspended by their apex.

Flowers in June.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 121. 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 479A. 1933.

Distribution. Common in Northern Europe and extends to Lapland, Finland, Siberia and Iceland. It is cultivated in the northern parts of India at very high elevations.

India. Tibet Occ. *T. Thomson*. Himal. Bor. Occ. *T. Thomson*.

Composition. Caraway fruits contain a volatile oil which is a mixture of two liquid oils, carvol and carvene. Carvene is a hydrocarbon, while carvol is an oxidised oil.

Uses. The fruit of this herb is a carminative and stimulant, usually given in children's ailments for flatulence and stomach ailments. An eyewash prepared from it is supposed to strengthen the sight. The seeds are pectoral and considered to be a diuretic and anthelmintic. A carum bath is recommended for painful swellings of the womb and a poultice of it is used, for protruding piles.

Carum is used in perfumery, especially in soaps and as a spice in cakes, bread, pastries, confectionery, sauces, cheese, etc. The oil is added to alcoholic liquors.

European caraway (seeds of *Nigella sativa* L.) is used as a substitute for the genuine drug in Ceylon.

3. *Carum copticum* Benth. and Hook. f., Gen. Pl. 1: 891. 1862.

Ammi copticum Boiss.—*Ammi glaucifolium* Blanco.—*Ligusticum ajawain* Flem.—*Ligusticum ajowan* Roxb.—*Athamantha ajowan* Wall—*Ptychotis coptica* DC.—*Bunium aromaticum* Linn.—*Seseli ammoides* Jacq.—*Daucus anisodorus* Blanco—*Trachyspermum ammi* Sprague.

Engl. Lovage; *Sinh.* Asamodagam, Yamani; *Tam.* Amam, Omam; *Sans.* Agnivardhini, Ajamoda, Ajamodika, Bhukadambala, Bhumikadambaka, Bhutika, Brahmadarbha, Dipani, Dipya, Dipyaka, Hridya, Kshetrayavanika, Shulahantri, Tikshnagandha, Tivragadha, Ugra, Ugragandha, Vatari, Yamanika, Yavagraja, Yavajadipaniya, Yavani, Yavasavha, Yavavha.

A minutely pubescent herb with a fusiform root; stem 30—90 cm tall, erect, branched, leafy; leaves pinnate, ultimate segments of all leaves linear, bracts several linear, bracteoles 3—5 small, linear; flowers white, polygamous in compound umbels, sterile flowers often with enlarged or irregular petals; calyx-tube adnate to ovary, calyx teeth small; petals 5, emarginate; stamens 5, epigynous; ovary inferior, 2-locular, disc 2-lobed, styles 2, stigmas capitate, ovules one in each loculus, pendulous; fruit ovoid, 2 mm long, carpels subpentagonous, dorsally compressed, ridges distinct, vittae solitary, small.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 566. 1840—1843; Kirtikar and Basu, Indian Med. Plants, pl. 477B. 1933.

Distribution. Occurs in Europe, Persia, Egypt and Afghanistan. It is extensively cultivated in India.

India. Punjab: cultivated, *T. Thomson*. Ceylon. Central Prov., Peradeniya, Exp. Station, cultivated, *Herb. Peradeniya.*, Oct. 1916.

Composition. The fresh plant yields a volatile oil, phellandrene and thymol, while the fruits contain p-cymol, in addition.

Uses. The root of this herb is a diuretic and carminative and the whole plant, a stomachic. The fruits are administered in flatulence, atonic dyspepsia and diarrhoea. It is often used as an ingredient in cough mixtures. The oil extracted from the fruits is effective for hookworm infection.



FIG. 489. *Centella asiatica*. A, portion of stem with leaves and fruit. B, flower lateral view. C, fruit.

4. *Centella asiatica* Urb. in Mart. Fl. Bras. 11: 287. 1979. (Fig. 489).

Hydrocotyle asiatica Linn.—*Hydrocotyle wightiana* Wall.—*Hydrocotyle lurida* Hance.—*Hydrocotyle nummularioides* Rich.—*Hydrocotyle pallida* DC.

Engl. Indian Pennywort; *Sinh.* Hin-gotukola, *Tam.* Babassa, Orila tamarai, Vallarai, Vallari; *Hindi* Vallari; *Sans.* Bhekaparni, Bheki, Brahmamanduki, Darduchhada, Divya, Mahaushadi, Mandukaparni, Mandukaparnika, Manduki, Supriya, Tvashti.

A prostrate perennial herb with a short vertical rootstock and glabrous axillary stems with long internodes; leaves simple, alternate, stipulate, several from the rootstock and 1 to 2 from each node of the runners, petioles 7.5—15 cm long, erect, glabrous, furrowed above, stipules short, adnate to petiole and forming a sheathing base, leaf blade horizontal, more or less cupped, 3.7—5 cm long, reniform, rather broader than long, the rounded basal lobes often overlapping, shallowly dentate-crenate, glabrous and shining on both sides; flowers irregular, bisexual, dark pink, nearly sessile, usually 3 together at ends of short, erect, pubescent peduncles, 1—3 from the nodes opposite the leaves, bracts 2, close beneath the umbel, ovate, obtuse; sepals absent or closely united with ovary; petals 5, minute, ovate, acute, slightly imbricate or valvate; stamens 5, alternating with petals, epigynous, filaments very short, flattened, anthers roundish; ovary inferior, crowned with a large epigynous disc, 2-locular with one pendulous ovule in each loculus, very much compressed, slightly hairy, styles 2, very short, erect; fruit about 0.3—0.4 cm long, ovoid, hard, consisting of 2 mericarps attached to a slender, central axis, indehiscent, pericarp thickened, mericarps with the primary and secondary ribs very obscure or vein-like, seed solitary in each mericarp, pendulous, albuminous.

Flowers from May to October.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 565. 1840—1843; Kirtikar and Basu, *Indian Med. Plants. pl.* 476. 1933; Herb. Peradeniya., drawing.

Distribution. Occurs in India, Ceylon and other tropical and subtropical countries. It is a very common weed in Ceylon growing in waste grassy places from sea level to the highest elevations.

India. Punjab: *T. Thomson*. Bengal: *J. D. Hooker and T. Thomson*. Mysore and Carnatic: *G. Thomson*. Madras: No. 220, 1853 without Collector's name. Pen. Ind. Or., *Herb. Wight* 1157, Kew Distribution 1866—7. Ceylon. Central Prov., Alagalle and Haputale, *Thwaites C.P.* 2810; Hakgala, *A. M. Silva*, Feb. 1906. New Caledonia. *Franc* 866. Philippine Islands. Luzon: Prov. of Union, Bauang, *Elmer* 5691, Feb. 1904.

Composition. This herb contains the alkaloid, hydrocotyline and a volatile oil, vellarine obtained principally from the roots. It is a good source of phosphorus, iron, calcium and other mineral constituents. It has a high percentage of vitamin B. A yellow neutral gum, centello-side has been isolated from local material. This resembles asiaticoside.

Uses. This herb is said to have a direct action on lowering the blood pressure and is often referred to as a rejuvenating medicament. The leaves are eaten raw or finely cut and roasted with scraped coconut. They are believed to purify the blood and cure indigestion, nervousness and dysentery. In some parts of India, the leaves are dried, powdered and taken with milk, to improve the memory.

The plant is useful both internally and externally for skin diseases, chronic and obstinate eczema, secondary and tertiary syphilis with ulceration, enlargement of glands, leprosy, abscesses and chronic rheumatism. It has a special influence on the urino-genital tract and set up urinary and ovarian irritation. It has been employed as a diuretic in several diseases.

An ointment prepared from the liquid extract of the plant with ghee is used as an external application on elephantiasis, enlarged scrotum, while the liquid extract is given internally. The expressed juice of the leaves with cow's milk and powdered root of *Glycyrrhiza glabra* L. is given as an alterative tonic.

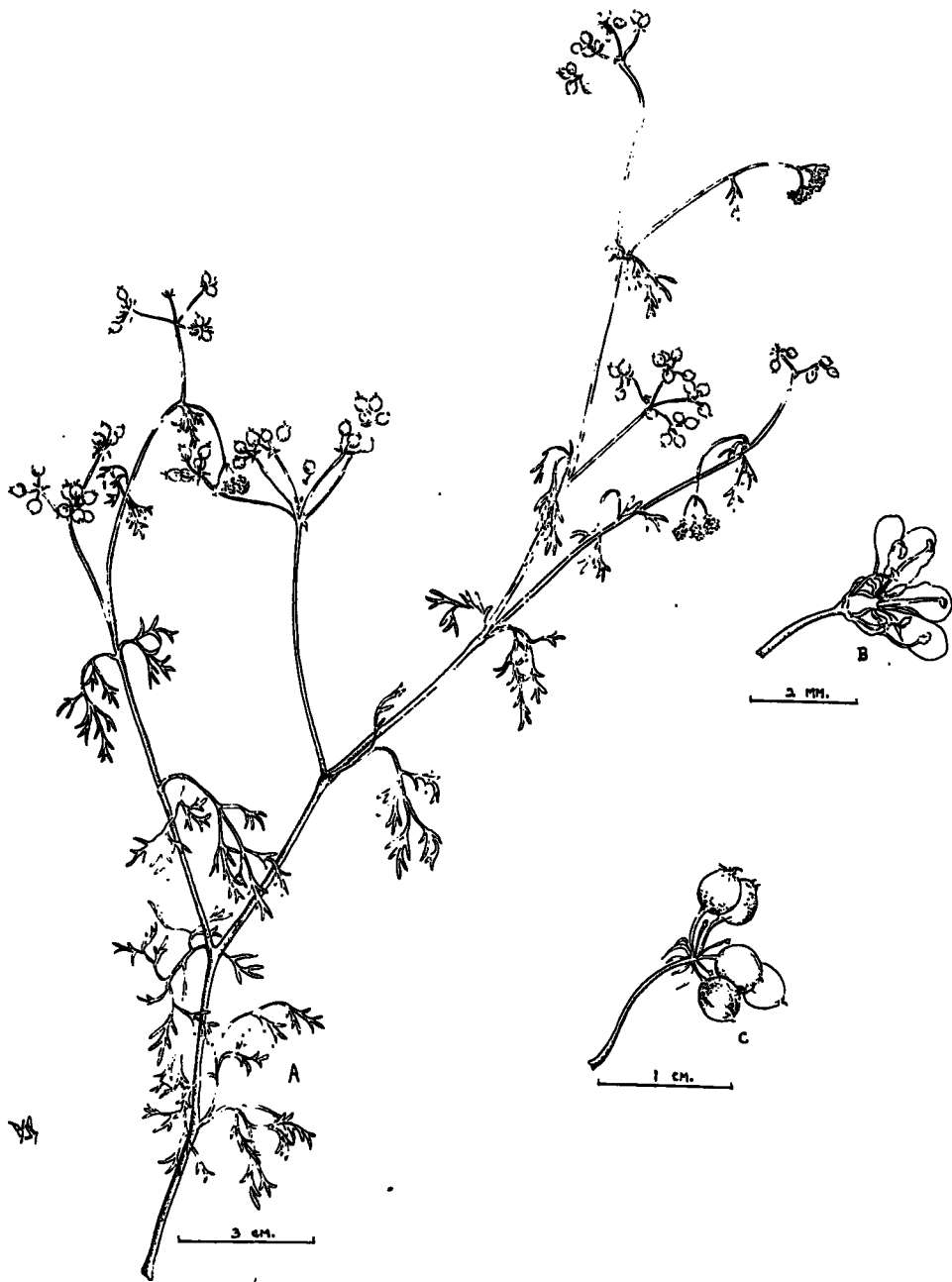


FIG. 490. *Coriandrum sativum*. A, branch with leaves, flowers and fruits. B, flower lateral view C, fruits.

5. *Coriandrum sativum* Linn. Sp. Pl. 256. 1753. (Fig. 490).

Cuminum cyminum Wall.

Engl. Coriander; *Sinh.* Kottamalli; *Tam.* Kotamalli; *Sans.* Ababika, Allaka, Chhatra, Dhana, Dhaneyaka, Dhanita, Dhanika, Dhaniyaka, Dhanya, Dhanyabija, Dhanyaka, Dhennika, Hridyagandha, Janapriya, Kunati, Kustumburi, Nisara, Shakayogya, Sukshmapatra, Sugandhi, Tumberu, Vedhaka, Veshana, Vitunnaka.

A glabrous herb 15—45 cm high emitting a very disagreeable odour when rubbed; leaves pinnately divided, segments of the lower leaves broadly ovate or cuneate, lobed and toothed; of the upper finely dissected into narrow linear thread-like segments; flowers regular, bisexual, small, white in compound umbels, the outer flowers of the umbellets with enlarged ray-like petals; calyx-tube adnate to ovary, teeth unequal, acute; petals 5, inserted on the margin of the calyx, equal, tip usually acute and abruptly inflexed; stamens 5, anthers versatile; ovary inferior, 2-locular, crowned with a fleshy, 2-lobed disc, styles 2, stigmas terminal, small; fruit small, ovoid or subglobose, ribbed, less than 5 mm long.

Flowers in July.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 516. 1840—1843; Kirtikar and Basu, *Indian Med. Plants*, pl. 485A. 1933.

Distribution. A native of Palestine, Syria, Mesopotamia and Greece but it is now cultivated throughout India and Ceylon.

India. Assam: *Chatterjee*, March 1902. Bengal: cultivated, *J. D. Hooker and T. Thomson*. **Ceylon.** North Central Prov., Anuradhapura, *A. M. Silva*, Dec. 1893. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya.*, Feb. 1898; *Livera*, Feb. 1926; *F. W. de Silva* 268, Nov. 1932. Indo-China. Hue and Vicinity, *Squires* 59, Jan.—May 1927.

Composition. The fresh plant contains volatile oil which consists of coriandrol, d-ilinalool, licariol, d-d-pinene, p-cymol, trepinene, dipentene, geraniol, l-borneol, β -phellandrene, terpinolene, n-de-cylaldehyde, acetic acid and decyl acid. The fruit contains volatile oil, pentosan, furfural, pectin, vitamin C, fat, protein, starch and potassium malate.

Uses. The fruit of this herb is universally used with dry ginger as decoction for colds, influenza, fever, etc. It is a flavouring agent for curries in the East. It is a refrigerant, diuretic, tonic and aphrodisiac. An infusion of the fruit is given for dyspepsia, sore throat, catarrh and bilious complaints. The oil is useful for flatulent colic, rheumatism, neuralgia, etc. According to Stuart, this plant is recommended for ptomaine poisoning.

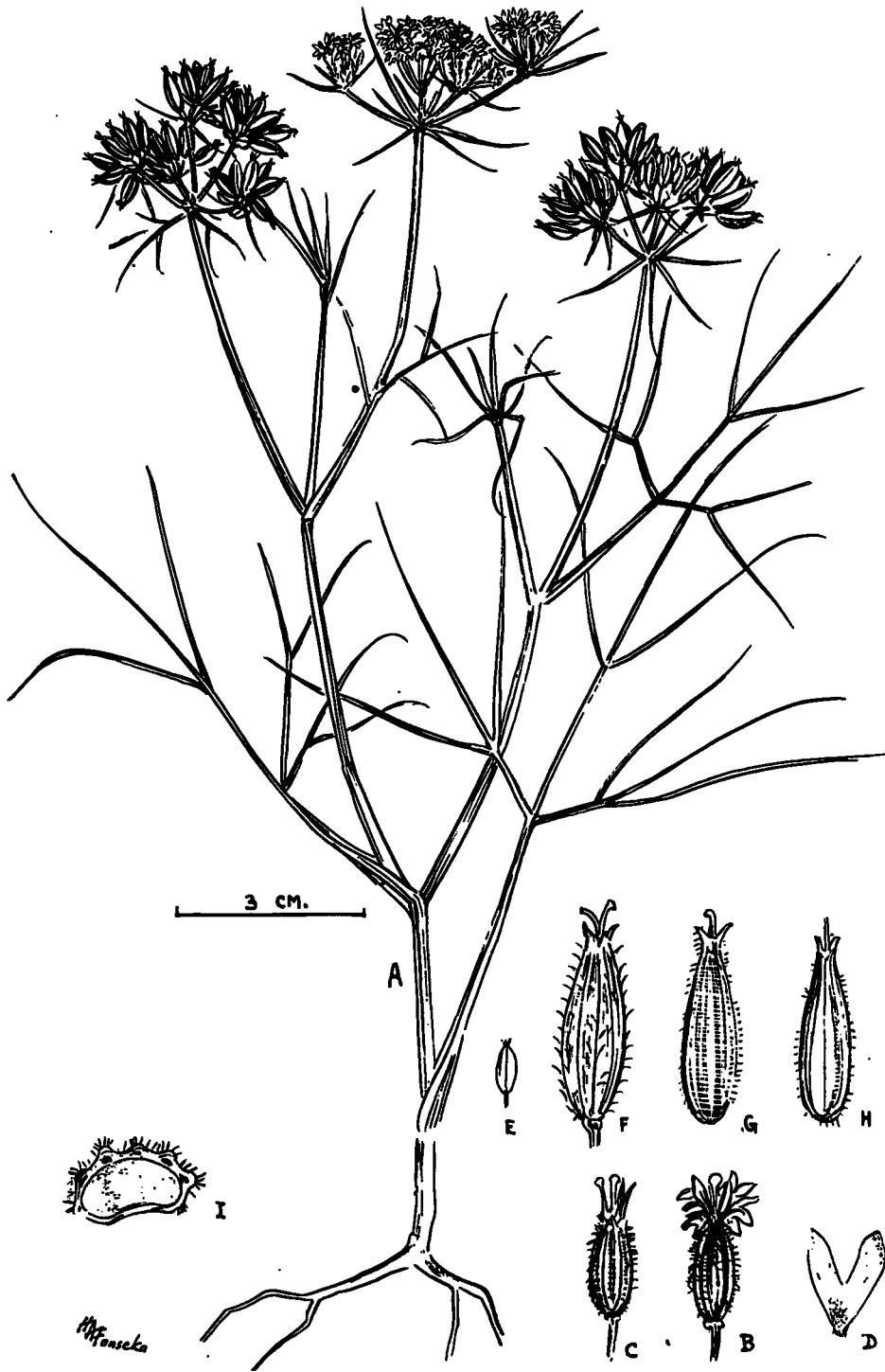


FIG. 491. *Cuminum cyminum*. A, plant with leaves, flowers and fruits. B, flower lateral view. C, flower with petals and stamens removed. D, petal. E, F, fruits. G, dorsal view of mericarp. H, commissural view of mericarp. I, transverse section of mericarp. B—D, F—I, enlarged.

6. *Cuminum cyminum* Linn. Sp. Pl. 254. 1753. (Fig. 491).

Cuminum odorum Salisb.—*Cuminum hispanicum* Merat.

Engl. Cumin; *Sinh.* Sudu-duru, Suduru; *Tam.* Seerugam, Shiragam; *Sans.* Ajaji, Ajajika, Dipaka, Dipya, Dipyaka, Dirghaka, Dirghakana, Gaurajaji, Gaurajiraka, Jarana, Jira, Jiraka, Jirana, Jirna, Kana, Kanajira, Kanavha, Magadha, Mitadipya, Mitajaji, Shuklajaji, Vahmisakha.

An annual herb with a much branched, cylindrical, striate or angular, solid, smooth stem about 30 cm high, branches spreading; leaves nearly sessile, the lower ones with longer stalks, petioles dilating and stem-clasping, blade ternately divided once or twice into long, slender, setaceo-linear, entire, acute segments, smooth and pale green; umbels stalked, rather irregular with few (4—7) rays; general involucre of a few, long, spreading or reflexed, linear-setaceous, rigid, trifid or entire bracts, partial ones of 2—4 similar but smaller bracts on the outside of the umbels, at first erect and exceeding the flowers, afterwards deflexed; flowers few, regular, bisexual, crowded on short pedicels; calyx teeth setaceous, persistent, unequal, the two outer usually the longest; petals nearly equal, deeply divided into two lobes, rose-coloured or white; stamens 5, alternating with petals inserted around an epigynous disc; ovary inferior, 2-locular, with a single ovule in each loculus, styles 2, short, erect; fruit about 6 mm long, ovaloblong, slightly narrowed at both ends, very little laterally compressed, crowned by the persistent calyx teeth, greyish-brown, mericarps not readily separating at the concave commissure, primary ridges slightly developed, secondary one more prominent, both or the latter only finely hispid with papillose hairs; vittae small, solitary beneath the secondary ridges, and two in the commissure.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 134. 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 485A. 1933.

Distribution. A native of the Mediterranean regions, now widely cultivated in India, China, U.S.A., Malta and Sicily.

Composition. Cumin seeds contain a volatile oil which is composed of the hydrocarbon cymol, an oxygenated oil called cuminal, acymene and other terpenes. Cymol has a lemon-like odour, while cuminal is typical of cumin.

Uses. Cumin seed is much used for flavouring curries in India and Ceylon. Medicinally, it is a stomachic, carminative and astringent. It is useful for dyspepsia, chronic diarrhoea and bilious nausea in pregnant women. It increases the secretion of milk when taken soon after childbirth.



FIG. 492. *Ferula asafoetida*. A, basal portion of a plant with the tuberous root, radical leaves and base of the flowering stalk. B, compound umbel. C, male umbel. D, female umbel. E, male flower lateral view F, male flower showing the stylopod lateral view. G, female flower. H, female flower with petals removed. I, mericarp, dorsal view. J, mericarp, ventral view. K, transverse section of fruit. L, umbels of fruits.

7. *Ferula asafoetida* Karst. Deutsche Fl. 845. 1880—1883. (Fig. 492).

Narthrex asafoetida Falconer.—*Ferula narthrex* Boiss.

Engl. Asafoetida; *Sinh.* Perunkayam; *Tam.* Perungayam; *Sans.* Agudagandha, Balhika, Bhedana, Bhutari, Dipta, Grihini, Hingu, Hinguka, Jantughna, Jantunashana, Jarana, Jatu, Jatuka, Kesara, Madhura, Pinyaka, Rakshoghna, Ramatha, Ramathadhvani, Sahasravedhi, Shuladvit, Shulahrita, Shulanashaka, Supadhupana, Uragandha, Ugravirya.

A very large herb, persisting for a number of years, but perishing after it has flowered; roots tuberous, 45 cm long, 10—15 cm diam., tapering, branched, dark brown externally, white within; leaves radical, spreading, large, 75—90 cm wide, stalked, compound; petioles about 22.5 cm long, triangular-cylindrical, solid, prominent in the middle line above, not sheathing or stipulate but with a short, membranous, intrapetiolar ligule at the base; rachis laterally compressed, double winged along the top with the narrow decurrent bases of the leaflets; primary divisions 3, the centre rather the longest, the two laterals ascending and curved horizontally outwards, each division pinnate, leaflets opposite, ovate or oblong-attenuate in outline but cut to the base into a few large linear-oblong, subacute ascending lobes, often again cut in a similar manner and much attenuated and tapering below into the narrow wings along the rachis, margin entire, much incurved, quite glabrous, thick, shining, somewhat bullate beneath, pale glaucous apple-green on both surfaces; flowering stem erect, stout, straight, reaching about 2.5 m or more in height, cylindrical, solid, strongly furrowed, smooth, pale green, tapering, giving off many regular, simple, lateral branches from each leaf axil except the few lowest; stem leaves numerous, alternate, stalked, the lowest ones with bipinnate lamina and a short, wide, slightly inflated sheath nearly surrounding the stem; proceeding up the stem the laminae gradually decrease in size and at length entirely disappear while the sheaths become much larger and more inflated, the largest ones about the middle of the stem, very much inflated, smooth, pale yellowish-green and completely enclosing and concealing the stem; above this they become smaller, those near the top reduced to membranous scales and disappearing before reaching the summit; flowers polygamous, the fertile umbels large, solitary, terminating the lateral branches, the male much smaller, very dense, globular, clustered at ends of long peduncles coming off lower down; fertile umbels 12—15 cm across, involucre absent; calyx teeth very slightly marked; petals 5, free, oblong-ovate, acute, entire and not incurved at apex, pale yellow, often unequal in the male flower; stamens 5, filaments about as long as petals; stylopod prominent, cupped with a sinous or lobed margin; ovary inferior, 2-locular, styles long, spreading or deflexed, deciduous; fruit 1—1.2 cm long, oval, often slightly pointed at apex, quite smooth, pale greenish yellow, the vittae purplish-brown, mericarp thin, much dorsally flattened, the 3 dorsal ridges filiform, very slender, the lateral expanded into a broad wing 1/4 width of the mericarp, dorsal vittae broad, solitary in each groove, commissural ones irregular, narrow, 4 or 6 sometimes divided.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 126. 1880; Curtis, *Bot. Mag.* pl. 5168. 1860; Kirtikar and Basu, *Indian Med. Plants*, pl. 483. 1933.

Distribution. Occurs in India and Western Tibet. It is not cultivated in Ceylon.

India. Kashmir: Aster Godai, *Rustun*, July 1884. When the plant is about 4—8 years old and the leaves are drying off, the upper part of the root is bared and the crown cut off with a special knife. The exudation from this cut surface accumulates as a white milk which later turns brown on hardening. This surface is protected by a dome-like structure of stones. A few weeks later the hardened plastic gum is scraped off and a new slice of the root 1—2 cm in thickness is cut off again and the milk allowed to accumulate as earlier and scraped off. This process is repeated several times in fortnightly intervals. This gum is mixed with sand and small stones of the same colour to make asafoetida.

UMBELLIFERAE

Composition. Asafoetida is composed of a volatile oil, resin and gum together with traces of malic acid, etc. The volatile oil is a mixture of sulphur compounds of the hydrocarbon C_8H_{12} , the resin containing ferulaic acid and umbelliferone. The resin and volatile oil are the active constituents of the drug.

Uses. The gum-resin is used extensively in India as a condiment. It is effective in flatulent colic and is used externally on ringworm. It is a powerful antispasmodic, expectorant, anthelmintic and a nervine stimulant. It is useful for asthma, dysentery, catarrh, hernia, whooping cough and angina pectoris. Its effect is remarkable in advanced stages of pneumonia and bronchitis in children. It is also used as a snake-bite cure.

In certain parts of Baluchistan, the leaves are given for rheumatism and the seeds to expel worms in children. The seeds and leaves possess sudorific and carminative properties.

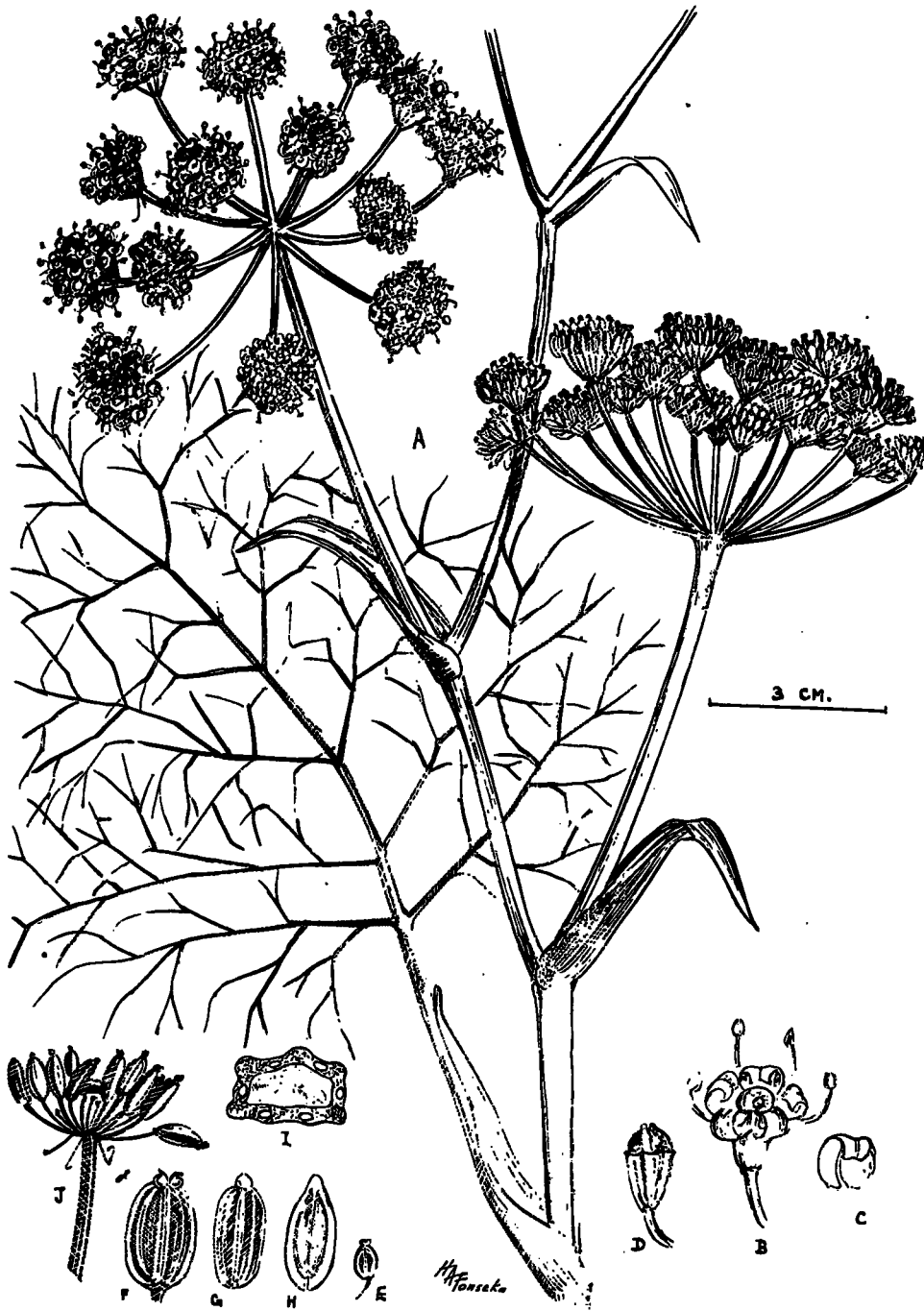


FIG. 493. *Foeniculum vulgare*. A, branch with a leaf and flowering and fruiting umbels. B, flower lateral view C, petal. D, pistil. E, F, fruits. G, dorsal view of mericarp. H, ventral view of mericarp. I, transverse section of mericarp. J, umbel of fruits. B--D and F--I, enlarged.

8. *Foeniculum vulgare* Gaertn. Fruct. 1: 105. 1788. (Fig. 493).

Foeniculum officinale Allion.—*Foeniculum dulce* C. Bauh.—*Foeniculum panmorium* DC.—*Foeniculum sativum* Berol.—*Foeniculum foeniculum* Karst.—*Anethum foeniculum* Linn.—*Meum foeniculum* Spreng.

Engl. Fennel; *Sinh.* Maduru, Maha-duru; *Tam.* Perunjiragam, Sohikirai; *Sans.* Ahichhatra, Avakapushpi, Bhuripushpa, Chhatra, Gandhadhika, Ghosha, Ghoshawati, Karavi, Madhavi, Madhura, Madhuri, Madhurika, Mangalya, Mishreya, Misi, Potika, Pushpavha, Sanghatapatrika, Shaleya, Shalina, Shatapatrika, Shataprasuna, Shatapushpa, Shitashiva. Sugandha, Supushpika, Talaparni, Tapasapriya, Trishahara, Vanapushpa.

A large perennial herb cultivated as an annual or biennial with a thick rootstock and stout, erect, cylindrical, bright green, smooth, polished, much branched stems 60—120 cm high; leaves pinnately decomposed, petioles very long, dilated for the greater part of its length into an open flattened sheath with an amplexicaul base, membranous margins, and at the top of a prominent, oblong, obtuse ligule, blade much divided, of the lower leavestripinnate or more, somewhat triangular in outline but the divisions not in one plane, ultimate segments numerous, linear, setaceous, acute, glabrous and shining, dark dull green, usually long, flexible and rather drooping, but often short spreading and divaricate, of the upper leaves smaller and much less divided, the uppermost leaves reduced nearly or quite to the dilated sheathing petioles; flowers regular, bisexual, yellow in compound umbels, umbels long stalked, large, lax with usually 15—20 flowers, spreading, curved without involucre; calyx teeth absent; petals 5, roundish, entire but with a strongly involute tongue; stamens 5, with long spreading filaments, bright yellow, disc large; ovary inferior, 2-locular, styles very short; fruit about 5 mm long, oblong-ovoid, capped with the conspicuous stylopod and short styles, smooth, greenish grey, commissure broad, flat, mericarps not compressed, primary ribs prominent, blunt, the marginal ones broader and somewhat thickened, vittae solitary in the grooves and two in the commissures.

Flowers in July and August.

Illustrations. Gaertner, Fruct. et Sem. Plant. 1: pl. 23, fig. 5. 1788; Wight, Ic. Pl. Ind. Or., pls. 515 and 570. 1840—1843; Kirtikar and Basu, Indian Med. Plants, pl. 477 D. 1933.

Distribution. A native of Europe commonly found in the Mediterranean regions extending to southern Russia, Asia Minor, Persia and India. It is extensively cultivated in India.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *F. W. de Silva* 263, Dec. 1932; *Senaratne*, Oct. 1929; *F. W. de Silva* 271, June 1933.

Composition. The leaves, stems and seeds of this plant contain an alkaloid. The fruit yields a volatile oil which contains anethol, fixed oil, pectin and pentosan. The plant also contains urease, cyanarin, a compound found in artichoke.

Uses. The seed is considered a stimulant, carminative and stomachic relieving flatulence, griping of the bowels and stomachache. The leaves are diuretic and the young shoots carminative and respiratory. The root is regarded as a purgative. The seeds are used extensively for flavouring curries.

In Madras, the fruits are used for venereal diseases and the oil extracted from them as a vermicide. In southern Europe, the root is used as a diuretic and the whole plant as a poultice for mammary inflammation. It is also a remedy for jaundice and menstrual troubles. In Italy, the fruit is used as an aromatic emmenagogue, galactagogue, carminative, stomachic and the root as a diuretic. In Africa, the plant is used for treating diarrhoea, cramp and stomachache.

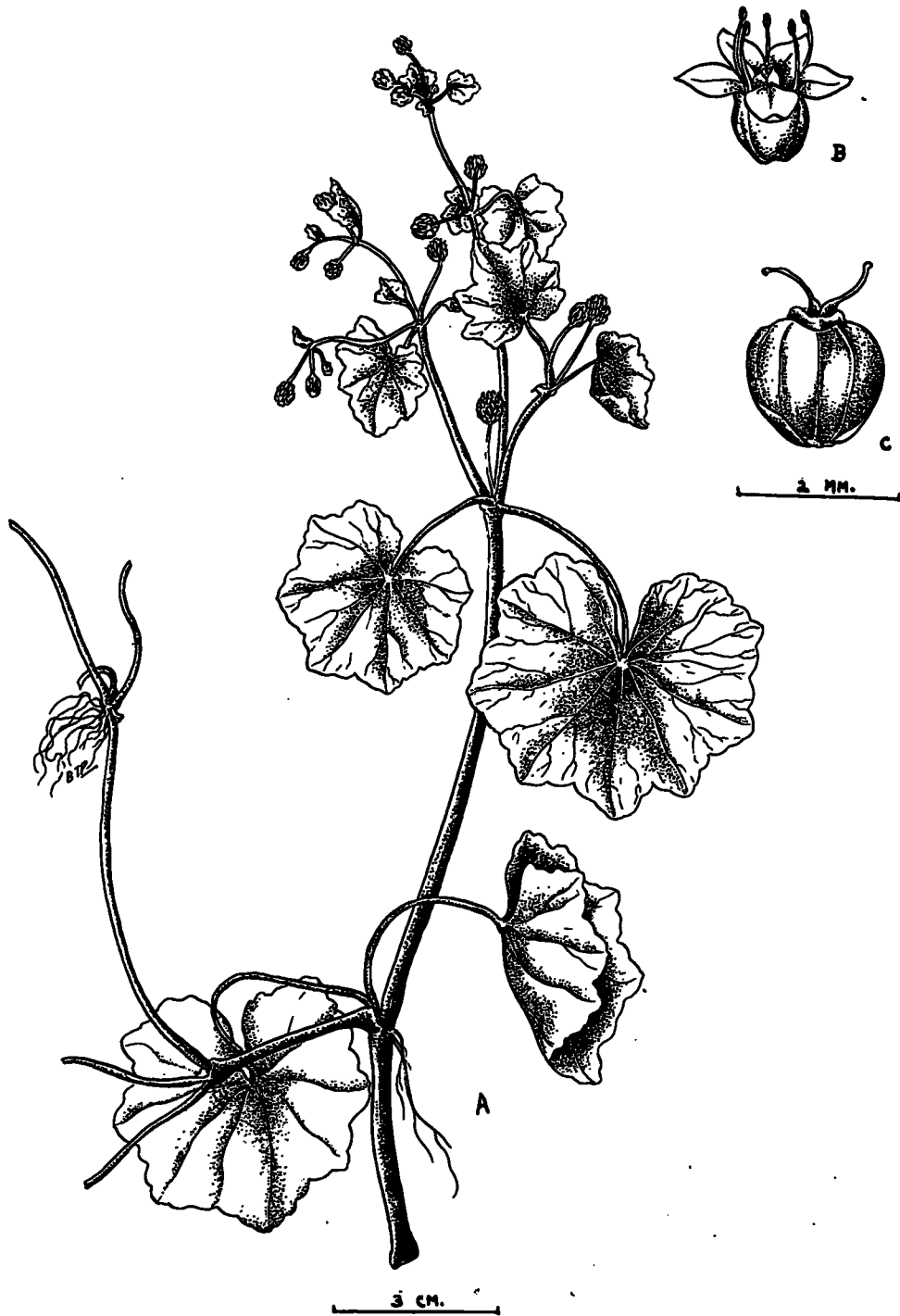


FIG. 494. *Hydrocotyle javanica*. A, portion of stem with leaves and umbels of flowers. B, flower lateral view. C, fruit with persistent styles.

9. *Hydrocotyle javanica* Thunb. Dissert. 2: 415. t3. (Fig. 494).

Hydrocotyle hispida Don.—*Hydrocotyle nepalensis* Hook.—*Hydrocotyle zeylanica* DC.—*Hydrocotyle hirsuta* Bl.—*Hydrocotyle polycephala* W. & A.—*Hydrocotyle heyneana* Wall.—*Hydrocotyle strigosa* Ham.

Sinh. Maha-gotukola; *Tam.* Vallari; *Sans.* Brahmi, Mandukparni.

A prostrate perennial herb with very long succulent, slightly pubescent (especially beneath the nodes) stems sending up erect, stout, flexuose branches to about 30 cm high; leaves simple, alternate, stipulate, 7.5—10 cm long, orbicular in outline, rather broader than long, very deeply cordate, palmately lobed less than half way down, very coarsely crenate, thin, shining on both sides with a few weak bristly hairs on veins, petioles of leaves from prostrate stems erect, 15—20 cm long, of those of upright branches much shorter, cylindrical, pubescent, stipules large, cauline, rounded, membranous; flowers irregular, bisexual, very small, pale green, sessile, 20 or more crowded in globular heads on short hairy peduncles 2—6 together from nodes of upright branches; sepals absent; petals 5, distinct, lanceolate, acute, valvate; stamens 5, epigynous; ovary inferior, crowned with a large epigynous disc, 2-locular with one pendulous ovule in each loculus, much compressed, glabrous, styles 2, spreading; fruit of two separate mericarps attached at summit to slender, central axis, indehiscent, much compressed, smooth, mericarps with primary ridges.

Flowers from May to October

Illustrations. Wight, Ic. Pl. Ind. Or., *pl.* 1003. 1843—1845; Bond, Wild Flowers of Ceylon Hills, *pl.* 35. 1953; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Malaya, Sumatra and tropical Australia. It is very common in moist places in the hill-country in Ceylon up to 7,000 feet altitude.

India. Nepal: *Wallich* 561, 1831. Sikkim: *Clarke* 25363, Oct. 1875; *Clarke* 25388, Oct. 1875; *Clarke* 13120, Oct. 1870; *J. D. Hooker*. West Bengal: Darjeeling, *Clarke* 8556, Aug. 1869; *Clarke* 12619A, Oct. 1870. Himal. Bor. Occ., *T. Thomson*. Khasia: *Clarke* 5623, Oct. 1867; *Clarke* 5383, Sept. 1867; *J. D. Hooker and T. Thomson*. Madras: Nilghiris, *Clarke* 10989C, March 1871; *Clarke* 11032, March 1870. Pen. Ind. Or., *Herb. Wight* 1159, Kew Distribution 1866—7. Ceylon. Central Prov., Nuwara Eliya, *Thwaites C.P.* 1634; Hakgala, *A. M. Silva*, Feb. 1906. Uva Prov., Namunukula, *Willis*, April 1907. Malay Peninsula. Perak, *King's Collector* 8197, Sept. 1883. Sumatra. East Coast, *Yates* 2092.

Composition. This plant contains an oily non-volatile liquid called vellarin.

Uses. This herb is an alterative, tonic, diuretic and local stimulant, especially of the cutaneous system. The leaves are used for indigestion, nervousness and dysentery.



FIG. 495. *Peucedanum graveolens*. A, branch with leaves, flowers and fruits. B, flower lateral view C, petal. D, pistil. E, fruit. F, fruit with mericarps attached. G, H, dorsal and ventral views of mericarp. I, transverse section of mericarp. B—D, F—I, enlarged.

10. *Peucedanum graveolens* Hiern. in Oliv. Fl. Trop. Afr. 3: 19. 1877. (Fig. 495).

Peucedanum sowa Kurz.—*Anethum graveolens* Linn.—*Anethum sowa* Roxb.—*Pastinacea anethum* Spreng.

Engl. Anet, Dill; *Sinh.* Satakuppa; *Tam.* Satakuppi-virai; *Sans.* Ahichhatra, Achichhatra, Avakpushpi, Bahala, Chhatra, Ghosha, Karavi, Madhavi, Misi, Poti, Pushpavha, Sanghatapatrika, Shaleyā, Shalina, Shatakshi, Shatapatrika, Shatapasana, Shatapushpa, Shatapushpika, Shatavha, Shipha, Shitashivha, Shophaka, Supushpika, Talaparni, Vajana, Vajrapushpi.

An annual or biennial herb with erect, cylindrical, slightly branched, smooth, pale green, finely striated stems 30—90 cm high; leaves alternate, stalked with the petioles flattened and dilated and with a white membranous margin, narrowly oval-triangular in outline, tripinnate or even more compound with ultimate segments setaceo-linear, sometimes curled, bright green, smooth; umbels 5—10 cm wide on long stalks, usually with about 12 rays, but sometimes with many more and no involucre; flowers regular, bisexual, small, yellow, numerous on longish slender pedicels; calyx teeth absent; petals 5, roundish, entire with an involute obtuse apex, shining; stamens 5, filaments short, incurved, stylopod flat, overlapping the bases of petals, somewhat lobed, styles very short; fruit about 5 mm long, broadly oval in outline, rounded at both ends, smooth, tipped with the small stylopod, mericarps readily separable, much dorsally compressed, three dorsal ribs prominent, filiform, two lateral ones expanded into a flat, thin wing surrounding the mericarp, greyish brown, the wing yellow; vittae solitary in each groove, broad and two in the commissures.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 572. 1840—1843; Kirtikar and Basu, Indian Med. Plants, pl. 484. 1933.

Distribution. Occurs wild among corn and other crops throughout southern Europe extending from Spain to Caucasus and Persia and southwards from Egypt to Abyssinia. It also occurs in northern Europe as a cornfield weed and in India.

Ceylon. Central Prov., Peradeniya, Expt. Station, *Herb. Peradeniya.*, Oct. 1916; Getambe, *Alston* 1687, Nov. 1927; Haputale, *Simpson* 8341, June 1931.

Composition. The principal constituent of oil distilled from the seed is a fluid hydrocarbon with a lemon-like odour. It also contains an oxygenated oil, identical to carvol.

Uses. The dried ripe fruits are carminative and stomachic. An infusion of it is given as a drink to women after confinement. Dill water is administered to children for flatulence, indigestion with griping, etc. It promotes the secretion of milk in women. The seed is employed as a condiment in India.

11. *Pimpinella anisum* Linn.

Engl. Aniseed; *Sinh.* Maha-duru.

An annual pubescent herb about 75 cm high with hollow stems; leaves alternate, petioles sheathing the base, basal leaves long-petiolate, 2.5—5 cm long, simple with coarse irregular teeth, stem-leaves 1-pinnate or ternate, lobes narrow, cuneate, entire or toothed; flowers small, yellowish white, regular, bisexual in compound umbels, involucre bracts lacking, involucral of few small bractlets; sepals minute or wanting; petals 5, incurved in bud; stamens 5, alternating with the petals, inserted around an epigynous disc; ovary inferior, 2-locular with a single seed in each loculus, styles 2; fruit ovate, greyish—brown, about 5 mm long, slightly compressed laterally consisting of 2 dry, 1-seeded indehiscent carpels (mericarp) which are attached to a pedicel longer than the fruit, each mericarp possessing 5, distinct primary ridges which are slightly wavy, depressions between them more or less bristly from the presence of short, stout hairs.⁶

Illustration. Greenish, Henry G., Text-Book of Pharmacognosy, Figs. 87 and 88. 1933 (fruit only).

Distribution. Indigenous to Greece, Egypt and Asia Minor but cultivated largely in southern Russia, Spain and Bulgaria.

Composition. The fruits of this plant contain a volatile oil consisting of anethol and methyl chavicol and p-methoxyphenyl-acetone. Pimpinellin is the bitter principle in the root.

Uses. The seed of this herb is employed as an aromatic and carminative.

12. *Trachyspermum roxburghianum* (DC.) Craib, Fl. Siam. Enum. 1: 788. 1931.

Carum roxburghianum Benth and Hook. f.—*Apium involucreatum* Roxb.—*Athamantha roxburghiana* Wall.—*Ptychotis roxburghiana* DC.—*Ptychotis ajowan* DC.

Sinh. Asamodagam; *Tam.* Ashamtagam, Ashamtavomam, Omam; *Sans.* Ugragandha, Yavanika.

As annual 5—12.5 cm high, much branched, stem glabrous; lower leaves pinnate or bipinnate, leaflets deeply cut into linear, lanceolate, apiculate segments, glabrous petioles with broad ciliate sheaths; umbels compound, primary umbels with 3—5 rays, involucre of three setaceous bracts, partial umbels of 6—10 flowers, involucre of 3—6 lanceolate-linear bracts with broad white margins; flowers white, polygamous, sterile flowers often with enlarged or irregular petals; calyx-teeth small or absent; petals 5, epigynous, broad, obtuse and emarginate; stamens 5, epigynous; ovary inferior, 2-locular, styles 2, stigmas capitate; fruit very small of 2 indehiscent carpels, hispid, 2—2.5 mm long, brown, not compressed, ridges slender, filiform.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 335. 1840—1843; Kirtikar and Basu, Indian Med. Plants, pl. 480. 1933.

Distribution. Cultivated in India, Ceylon and Malaya.

India. Plan. Ganget. Sup., cultivated, *T. Thomson*. Malabar, Concan, etc. *Stocks, law, etc.*

Uses. The seeds are useful for flatulence, hiccough colic, atonic dyspepsia, spasmodic ailments of the bowels, vomiting and pain in the bladder. A popular remedy for diarrhoea in children is an infusion of the powder made by roasting these seeds with seeds of *Holarrhena antidysenterica* (S. Kelinda). The root is regarded as a diuretic and prescribed for anasarca.

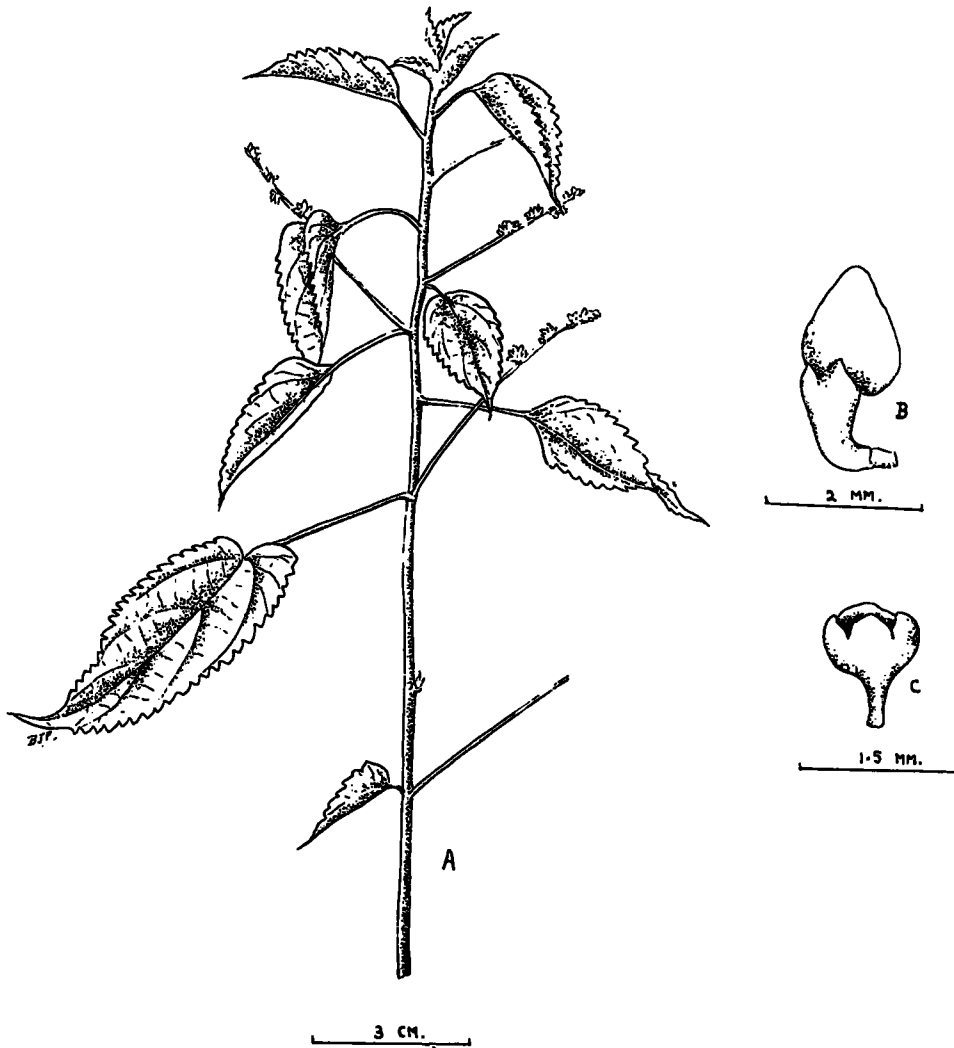


FIG. 496. *Girardenia zeylanica*. A, branch with leaves and inflorescences of flowers. B, female flower lateral view C, fruit with persistent perianth.

114. URTICACEAE

Girardenia zeylanica Decne in Jacq. Voy. 152. 1844. (Fig. 496).

Girardenia heterophylla Decne, sensu Trim.—*Urtica heterophylla* Vahl.—*Urtica diversifolia* Link.—*Urtica horrida* Link.—*Urtica palmata* Forsk.

Engl. Nilghiri Nettle; *Sinh.* Gas-kahambiliya; *Hind.* Alla, Awa, Bichna, Chichr.

A tall perennial, robust herb about 2 m tall with stinging hairs which are rigid, stout or slender and closely placed, stem and branches furrowed; leaves simple, alternate, 10—30 cm long and often as broad, cordate, base 3-veined, the upper leaves variously lobed, often palmately or pinnatifidly, coarsely toothed, more or less pubescent, petioles up to 17.5 cm long, stipules 2-fid, connate, foliaceous; flowers unisexual, monoecious, green, in peduncled cymes, males interrupted, subcylindrical, females in upper axils, bearing heads of flowers clothed with stinging hairs; male flowers: sepals 4—5, subequal, valvate; stamens 4—5, filaments inflexed in bud, pistillode short; female flowers: perianth subcampanulate, 2—3-toothed, persistent; ovary superior, unilocular with one erect ovule, stigma subulate, achene broadly ovate or subcordate, punctate.

Flowers in February.

Illustrations. Decaisne in Jacq. Voy. Bot. *pl.* 153. 1844; Wight, *Ic. pl. Ind. Or., pl.* 687 1840—1843; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma and Java. It is common in waste ground in the low-country in Ceylon up to 3,000 feet altitude. Maturata, Kandy, Haragama, etc.

India. Sikkim: *J. D. Hooker.* Ceylon. without locality, *Thwaites C.P.* 2193.

Uses. The leaves of this herb are used for headaches and on swollen joints. A decoction of the plant is given for fever.

115. VALERIANACEAE

1. *Nardostachys jatamansi* DC. Mem: Valer. 7. t. 1; Prodr. 4: 624.

Nardostachys grandiflora DC.—*Patrinia jatamansi* Don—*Valeriana jatamansi* Wall.—*Fedia grandiflora* Wall.

Engl. Spikenard; *Sinh.* Jatamansa; *Tam.* Jatamashi; *Hindi* Balchhar, Balchir, Baluchar, Jatalasi, Jatamansi, Kanuchara; *Sans.* Akashamansi, Amritajata, Bhutajata, Bhutakeshi, Chakravartini, Gandhamansi, Gauri, Hinsra, Jadamansi, Janani, Jatala, Jatamansi, Jatavali, Jati, Jatila, Keshi, Khasambhava, Kiratini, Kravjadi, Krishnajata, Laghumansi, Limasha, Mansi, Mansini, Mata, Mishika, Misi, Mrigabhaksha, Nalada, Nirlamba, Parvatavasini, Peshi, Peshini, Pishachi, Pishita, Putena, Sevali, Shvetakeshi, Sukshmajatamansi, Sukshmapatri, Tamasi, Tapasvini, Vahnini.

Erect perennial herb with a long, stout, woody rootstock covered with fibres from the petioles of withered scapes; stem 10—60 cm long, more or less pubescent upwards, often glabrate below, subscapose; leaves opposite, entire, radical, elongate, spatulate, cauline leaves few; radical leaves 15—20 cm long, 2.5 cm broad, longitudinally nerved, glabrous or slightly pubescent, narrowed into the petiole; cauline leaves 1 or 2 pairs, 2.5—7.5 cm long, sessile, oblong or subovate; flowers capitate, heads in cymes usually 1, 3 or 5, bracts usually pubescent; calyx-tube adnate to ovary, limb 5-lobed; corolla tubular-campanulate, 6 mm long, superior, lobes 5, spreading, somewhat hairy within; stamens 4, on the corolla-tube; ovary inferior, 3-locular with one ovule and 2 barren loculi; fruit 4 mm long, obovate, crowned by the dentate calyx teeth, covered with ascending white hairs, 1-seeded, seeds obovate, compressed.

Illustrations. Royle, Ill. Bot. Him. pl. 54. 1834; De Candolle, Mem. Valer, pls. 1 & 2 Kirtikar and Basu, Indian Med. Plants, pl. 509B. 1933.

Distribution. Occurs in the Alpine regions of Himalaya, extending eastwards to Sikkim ascending up to 17,000 feet altitude. It does not grow in Ceylon.

India. Himalaya, Garhwal, *Duthrie* 1175 (a), Aug. 1883. Sikkim: *J. D. Hooker*.

Uses: The roots of this plant are aromatic and bitter and they are supposed to possess stimulant and anti-spasmodic properties. They are used in the treatment of epilepsy, hysteria, convulsive ailments, palpitation of the heart, consumption, diseases of the eye, itch, boils, swellings, diseases of the head, hiccough, etc.

The roots are also used for improving the complexion, increasing the lustre of the eye and promoting the growth and increasing the blackness of the hair.

2. *Valeriana wallichii* DC. Mem. Valer, 15. t. 4.

Valeriana villosa Wall.—*Valeriana jatamansi* Jones.—*Valeriana spica* Vahl.

Engl. Indian Valerian; *Sinh.* Kattakumanjal, Thuwarda; *Sans.* Barhena, Chakra, Danda, Dandahasta, Dipana, Hasti, Jimha, Kalanusakara, Kalanusariva, Kalanusarya Kshatra Kunchina, Kutil, Laghusha, Mahoraga, Nahushakhya, Nata, Padika, Parthiva, Pindatagara, Rajaharshana, Shatha, Tagara, Vakra, Vinamra.

A perennial erect pubescent herb with a thick horizontal rootstock, stems usually tufted, 15—45 cm high, radical; leaves persistent, stalked, cordate-ovate, 2.5—7.5 cm long, 2.5—6.2 cm broad, toothed or sinuate, acute, stem-leaves shortly stalked, smaller, flowers numerous, unisexual, on different plants, white or tinged with pink in terminal corymbs 2.5—7.5 cm across; calyx-tube adnate to ovary, limb at flowering time scarcely perceptible, unrolling afterwards in 12 hairy lobes; corolla funnel-shaped, limb 5-lobed, spreading; stamens 3, inserted on the corolla-tube, protruding; ovary inferior, 3-locular, only one loculus containing a solitary, pendulous ovule, others empty, style slender, undivided, stigma terminal; fruit small, 1-seeded, crowned with the pappus-like calyx limb.

Flowers from March to May.

Illustrations. De Candolle, Mem. Valer. pl. 4; Kirtikar and Basu, Indian Med. Plants, pl. 511A. 1933.

Distribution. Occurs in Kashmir and Bhutan extending to Khasia Hills in India. It does not grow in Ceylon but is imported from India.

India. Nepal: *Wallich* 433/1; Himalaya, Garhwal, *Duthrie* 1173, June 1883; Him. Bor. Occ., *T. Thomson*; Kashmir, *Clarke* 28441, July 1876.

Composition. The root of this plant contains valerianic acid.

Uses. The root has an offensive smell and is used as one of the ingredients in the preparation of snake-bite cures. It is also used for ailments of the eye and hair and for liver, kidney and spleen diseases.

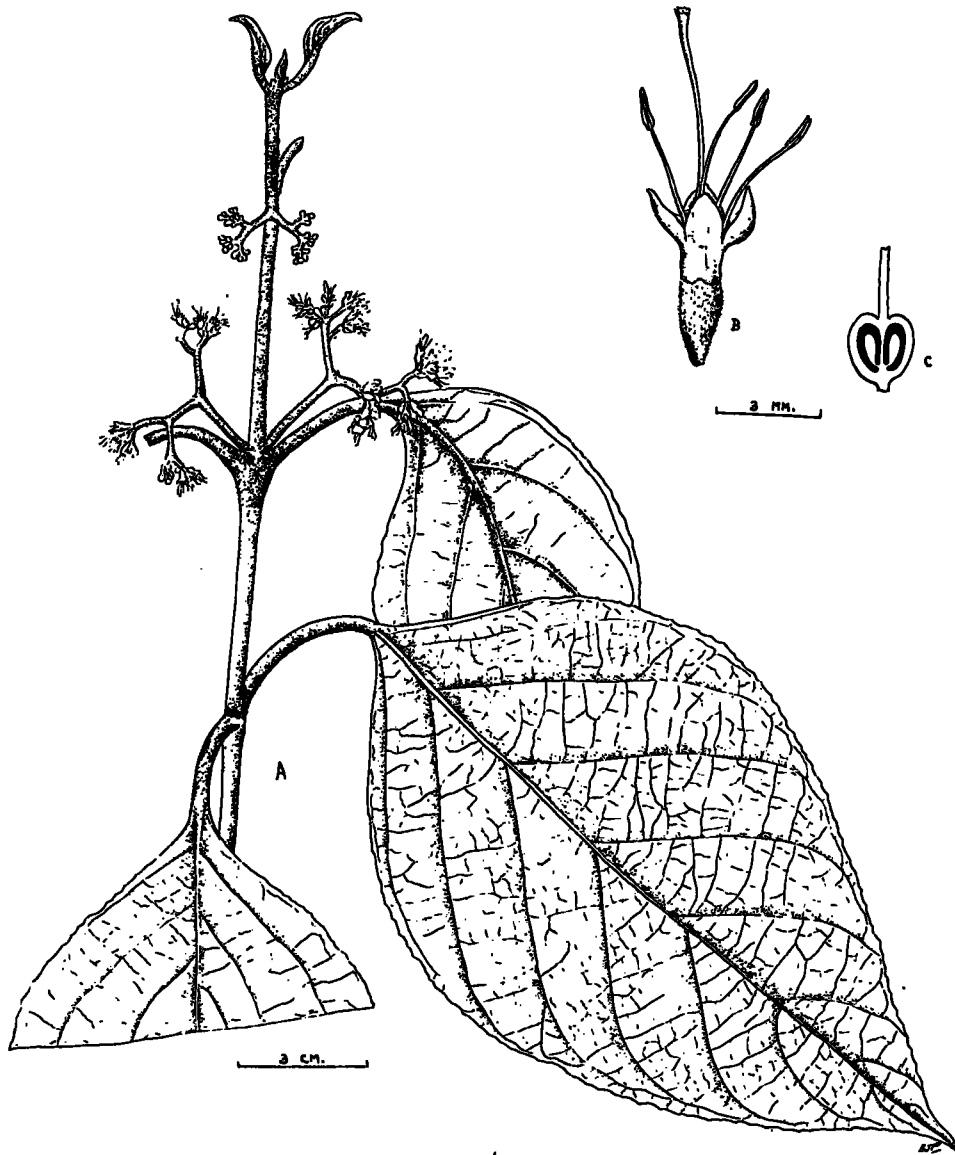


FIG. 497. *Callicarpa tomentosa*. A, branch with leaves and flowers. B, flower, lateral view C, longitudinal section of ovary.

116. VERBENACEAE

1. *Callicarpa tomentosa* (Linn.) Murr.; Abeywick. Ceyl. Journ. Sci. 2(2): 217. 1959. (Fig. 497).

Callicarpa lanata Linn.—*Callicarpa tomex* Poir.—*Callicarpa cana* Dalz. and Gibs.—*Callicarpa wallichiana* Walp.—*Callicarpa arborea* Miq.—*Tomex tomentosa* Linn.—*Cornutia corymbosa* Lamk.

Sinh. Illa; *Tam.* Kattukkumil, Vettilaippattai; *Hindi* Bastra.

A moderate sized bushy tree with stout, cylindrical branchlets closely covered with a thick felt of stellate hairs, young parts very densely stellate-tomentose; leaves simple, opposite, large, 15—22.5 cm long, ovate, rounded or obtuse at base, slightly acuminate, acute, entire glabrous when mature, rugose and bright green above, densely covered with a close felt of white or yellowish stellate hair beneath, petioles 1.8—5 cm long, stout, very tomentose; flowers regular, bisexual, pale pinkish lilac, sessile in clusters of 3, cymes shortly pedunculate, divaricately branched, densely stellate-tomentose, bracts linear; sepals 4, fused into a cup-shaped, nearly truncate, membranous, stellate-tomentose calyx, very faintly 4-lobed; petals 5, fused into a tubular corolla, glabrous, tube short, 0.3 cm long, lobes oblong, obtuse, recurved; stamens 4, much exserted, anthers cream-coloured; ovary superior, 2-locular, with 2 ovules in each loculus, stigma dilated, faintly bilobed; fruit a drupe under 0.6 cm long, black, juicy and shining.

Flowers in March and September.

Illustrations. Wight, Ic. Pl. Ind. Or., *pl.* 1480. 1849; Kirtikar and Basu, Indian Med. Plants, *pl.* 733. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Malaya. It is very common in the moist regions up to 4,000 feet altitude in Ceylon.

India. Sikkim: *T. Thomson*, 1857. Malabar, Concan, etc. *Stocks, Law, etc.* Canara: *Talbot*. Nilghiri and Kurg: *G. Thomson*. Pen. Ind. Or., *Herb. Wight* 2314, Kew Distribution 1866—7. *Ceylon.* Central Prov., Hantane, *J. M. Silva*, May 1924; Ambagamuwa, *Thwaites C.P.* 722. Western Prov., Mirigama, *Alston* 680, June 1927; Without locality, *Walker* 37, Herb. Wight property.

Uses. The bark and root of this tree are given in decoction to remove hepatic obstructions. The root is used for cutaneous ailments. In Malaya, this plant is considered a diuretic.

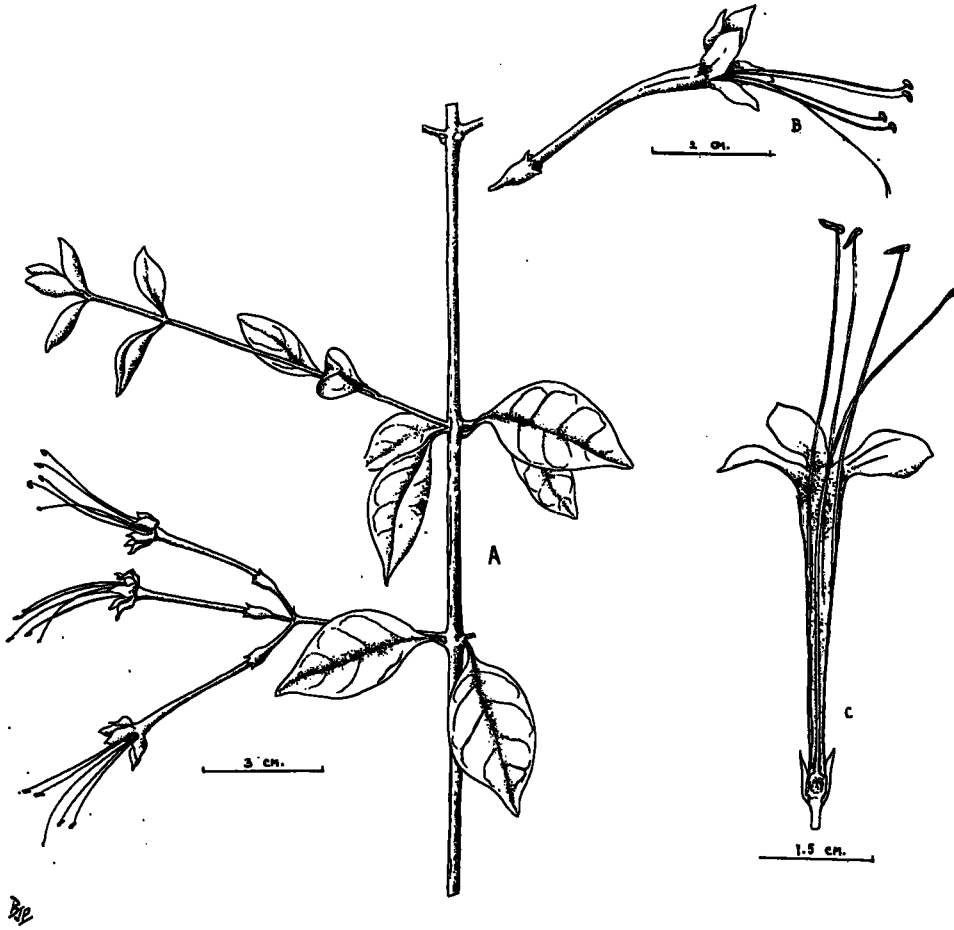


FIG. 498. *Clerodendrum inerme*. A, branch with leaves and flowers. B, flower lateral view. C, longitudinal section of flower.

2. Clerodendrum inerme (Linn.) Gaertn. Fruct. 1: 271. 1788. (Fig. 496).

Clerodendrum nerifolium Wall.—*Clerodendrum commersonii* Spreng.—*Clerodendrum capsulare* Blanco—*Volkameria commersonii* Poir.—*Volkameria inermis* Linn.—*Volkameria nereifolia* Roxb.

Sinh. Walgurenda; *Tam.* Anjali, Nirnochi, Pinarichanganguppi, Pinchal, Pinari, Pinarichangu, Sanganguppi, Sarapparachi; *Hindi* Lanjai, Sangkupi; *Sans.* Kundali, Samudrayuthika, Vanajai, Vanayuthika.

A much branched shrub, 1—1.6 m high, with virgate, glabrous twigs and pale brown bark; leaves simple, opposite, small, 2.5—3.7 cm long, oval or oblong-oval, acute at base, obtuse, entire, quite glabrous, rather thick, copiously gland-dotted beneath, petioles 0.6 cm long; flowers irregular, bisexual, moderate-sized, white tinged externally with pink, on rather long pedicels, cymes 3-flowered, axillary, peduncles shorter than leaves; sepals 5, fused into a campanulate calyx, glabrous, segments triangular, acute, rather spreading; petals 5, fused into a glabrous, tubular, 2-lipped corolla, tube very slender, 2.5—3.1 cm long, hairy within, slightly split down the back, lobes nearly equal about 1 cm long, oblong, obtuse or subacute, spreading or reflexed; stamens 4, didynamous, much exerted, filaments purplish; ovary superior, 2-locular, with 2 ovules in each loculus, style purplish and bifid; fruit a pyriform drupe 1.8 cm long, very blunt, dry, smooth, brown, splitting into 4 woody pyrenes.

Flowers from July to December.

Illustrations. Gaertner, *Fruct. et Sem. Plant. 1: pl. 57, fig. 1. 1788*; Kirtikar and Basu, *Indian Med. Plants, pl. 743. 1933*; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Malaya, tropical Australia, Polynesia and Philippine Islands. It is very common along the seashore in Ceylon. Jaffna, Negombo, Galle, etc.

Ceylon. Without locality, *Thwaites C.P. 1949. Maldive Islands. Minikoi, Gardiner 21, 1899*; Dugeli, *Didi 118, 1896. Malaya. Penang: Wallich 1788, 1882. Andaman Islands. King's Collector, June 1890. Thailand. Schromburgh 242, 1859. Indo-China. Hue and vicinity, Squires 371, Jan.—May 1927.*

Composition. The leaves of this plant contain a bitter principle very similar to that found in *Swertia chirata*, a fragrant stearoptin, resin, gum and a brown colouring matter.

Uses. A liniment prepared by boiling the root with oil is applied on parts affected by rheumatism. The leaves applied as a poultice on swellings prevent suppuration. A bath made of the leaves relieves itching. A decoction of the leaves, stems and roots is a remedy for intermittent fevers. The juice of the leaves is an alterative in scrophulous and venereal diseases. The pounded seeds, or a decoction of them, counteract poisonous effects of eating certain types of fish, including shellfish.



FIG. 499. *Clerodendrum infortunatum*. A, twig with leaves B, inflorescence of flowers. C, flower lateral view. D, longitudinal section of flower.

3. • *Clerodendrum infortunatum* Linn. Sp. Pl. 637. 1753. (Fig. 499).

Clerodendrum viscosum Vent.—*Clerodendrum cordatum* Don.—*Clerodendrum castanaefolium* Klotsch—*Clerodendrum calycinum* Turcz.—*Volkameria infortunata* Roxb.

Sinh. Gaspinna; *Tam.* Karukanni, Perugilai, Vellaikkanni; *Hindi* Bhand, Ghano, Thunera; *Sans.* Barhibarha, Barhichuda, Bhandira, Bhantaka, Bhanti, Harita, Kiravarnaka, Kukkura, Mayurachuda, Shirnaroma, Shirnaromaka, Shukabarha, Shukachhada, Shukapachhaka, Sthauneyaka, Vikacha, Vikirnaroma, Vikirnasanjna.

A shrub or small slender tree, 1.3—3.3 m high, with very bluntly quadrangular branchlets which are yellowish silky-pubescent; leaves simple, opposite, large, 10—15 cm long, ovate, cordate or rounded at base, acuminate, acute or subacute, entire, thinly hairy on both sides, especially on veins beneath, somewhat 3-nerved at base, venation prominent beneath, petioles 3.7—7.5 cm long, cylindrical, pubescent; flowers irregular, bisexual, white, large on rather long pubescent pedicels, cymes stalked in large, lax, pyramidal, pubescent panicles, bracts leafy, deciduous; sepals 5, fused into a campanulate calyx 1.2 cm long, silky-pubescent, very much enlarged in fruit, segments deep, lanceolate, very acute; petals 5, fused into a slender, long tube about 2.5 cm long, lobes large, 1.2 cm long, oblong, obtuse; stamens 4, didynamous, much exserted; ovary superior, 2-locular with 2 ovules in each loculus, style bifid; fruit a drupe 0.8 cm long, nearly globose, succulent, purplish black, shining, seated in centre of the very much spreading, succulent, bright pink calyx 3.7 cm diam., pyrenes usually solitary, brittle.

Flowers from April to August.

Illustrations. Gaertner, *Fruct. et Sem. Plant.* 1: *pl.* 57, *fig.* 1. 1788; Wight, *Ic. Pl. Ind. Or.*, *pl.* 1471. 1849; Curtis, *Bot. Mag. pl.* 1805. 1816; Edward, *Bot. Reg. pl.* 629. 1822; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 746. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Malaya. It is common in the moist regions of Ceylon up to 4,000 feet altitude Negombo, Galle, Kalutara, Bibile, etc.

India. Khasia Hills, *J. D. Hooker and T. Thomson. Ganget. Plan.*, *T. Thomson. Malabar, Concan, etc., Stocks, Law, etc. Mysor and Carnatic, G. Thomson. E. Bengal. Herb. Griffith* 6053, *Kew Distribution* 1863—4. *Pen. Ind. Or.*, *Herb. Wight* 2316, *Kew Distribution* 1866—8. *Ceylon.* Central Prov., Galagedara, Morakande Estate, *Alston* 1319, Dec. 1926. Uva Prov., Bibile, *J. M. Silva*, July 1924. Without locality, *Thwaites C.P.* 2894.

Uses. The leaves and roots of this plant are used externally for tumours and certain skin diseases. The fresh juice is given internally as a vermifuge and febrifuge in malarial fevers, especially in children.

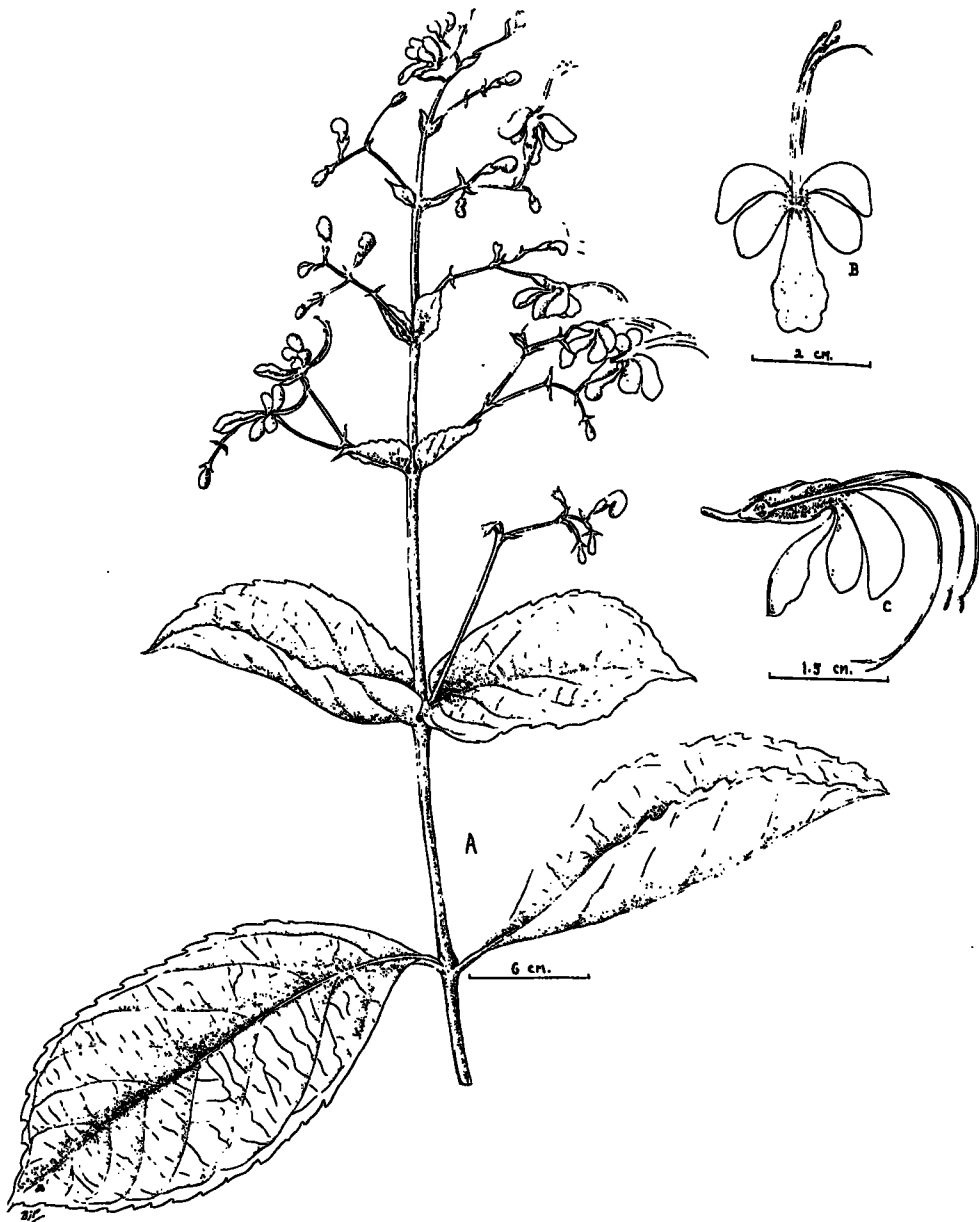


FIG. 500. *Clerodendrum serratum*. A, terminal branch with leaves and flower inflorescence. B, flower dorsal view C, longitudinal section of flower.

4. *Clerodendrum serratum* (Linn.) Moon, Cat. Pl. Ceyl. 46. 1824. (Fig. 500).

Clerodendrum ternifolium Don.—*Clerodendrum ornatum* Wall.—*Clerodendrum herbaceum* Wall.—*Clerodendrum cuneatum* Turcz.—*Volkameria serrata* Linn.

Sinh. Kenhenda; *Tam.* Angaravalli, Kandubarangi, Situdekku, Vadamadakki; *Hindi* Barangi; *Sans.* Angaravallari, Angaravalli, Baleya, Barbara, Bharangi, Bhargavi, Bhargi, Bhramareshta, Bhrigubhava, Bhriguja, Bhringaja, Bramhanayashtika, Bramhani, Bramhi, Bramhika, Durva, Dvidandi, Gardabhashaka, Hanjika, Kalingavalli, Kasaghi, Kasajita, Kharashaka, Mukhadanta, Padma, Phanji, Phanjika, Shakramata, Svarupa, Valeyashaka, Vantari, Vardhaka, Varvara, Vatari, Yashti.

A shrub with a stem 1.3—2.6 m high, slightly branched, bluntly quadrangular bark, yellow, smooth, young parts glabrous; leaves simple, opposite, large, 10—20 cm long passing into bracts above, oval or ovate-oval, acute at both ends, very coarsely and sharply serrate glabrous, petioles very short, stout; flowers irregular, bisexual, large on short, stout, compressed, pubescent, deflexed pedicels, cymes numerous, lax, pubescent, dichotomous with a pair of acute bracts at each branching and a flower in the fork, each in axil of a large leafy bract, and collectively forming a long, lax, terminal, erect panicle; sepals 5, fused into a campanulate calyx, puberulous, segments very short, broadly triangular, ciliolate; petals 5, fused into a short, 2-lipped corolla-tube 0.6—1 cm long, somewhat inflated, oblique at mouth, upper and lateral lobes pale blue, 1.2 cm long, broadly oval, flat, spreading, lowest one (lip) bluish-purple 1.8 cm long, oblong, very concave, deflexed; stamens 4, didynamous, filaments exerted, much curved, hairy at base; ovary superior, 2-locular with 2 ovules in each loculus, style bifid; fruit depressed, somewhat succulent, 4-lobed with a pyrene in each lobe (1—3 often suppressed).

Flowers from June to September.

Illustrations. Curtis, Bot. Mag. pl. 2536. 1825; Wight, Ic. Pl. Ind. Or., pl. 1472. 1849; Kirtikar and Basu, Indian Med. Plants, pl. 745. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Malay Peninsula and Java. It is common in the moist low-country up to 2,000 feet altitude in Ceylon.

India. N.W. India: Tihri-Garhwal, *Duthrie* 244, June 1883. Nepal: *Wallich* 1809. Khasia: *J. D. Hooker and T. Thomson; Brandis; Herb. Falconer* 743, Kew Distribution 1865. Sikkim: *J. D. Hooker.* Assam: *Simons.* N. Canara, *Talbot.* Pen. Ind. Or., *Herb. wight* 2319, Kew Distribution 1866—8. Ceylon. Central Prov., Kadugannawa, *Thwaites C.P.* 1951. Java. *Kooders Herb. Dwer Bot.* 38027B.

Uses. The root of this shrub is used for catarrhal ailments. In certain parts of India it is believed to be very effective for malarial fevers. The seeds bruised and boiled in butter milk are given as aperient and for dropsy.



FIG. 501. *Gmelina arborea*. A, twig with leaves. B, part of inflorescence. C, longitudinal section of flower.

5. *Gmelina arborea* Roxb. Hort. Beng. 46. 1814. (Fig. 501).

Gmelina rheedii Hook.—*Premna arborea* Roth.—*Premna tomentosa* Miq.

Engl. Candahar Tree, Coomb Teak; *Sinh.* Et-demata; *Tam.* Arisa, Goomadee, Gumudu-takku, Kalarbadi, Kattanam, Kumil, Kumbal, Perungumil, Pulirgumil, Umitekku; *Hindi* Gamari, Gambari, Gambhar, Gamhar, Gumbhar, Kambar, Kambhar, Khambhari, Khammara, Kumar, Kumbhar, Sewan, Shewan, Shiwan; *Sans.* Ashveta, Bhadra, Bhadraparni, Gambhari, Gandhari, Gandharya, Gopabhadrika, Grishri, Hira, Kakodumbhari, Kambharika, Kashmari, Kashmaryya, Kataphala, Krishna, Krishnaphala, Krishnavrintika, Kshirini, Kumuda, Madhubhadra, Madhumati, Madhuparnika, Madhurasa, Mahabhadra, Mahakumuda, Modini, Pitaphala, Pitarchini, Rohini, Sadabhadra, Sarvatobhadra, Sarvatobhadrika, Shriparni, Snigdhaparni, Sthulatvacha, Subhadra, Sudridhatvacha, Suphala, Svarubhadra, Vataha, Vidari, Vidarini.

A large spreading deciduous tree with greyish-yellow bark, rather rough, branchlets and young parts covered with a very fine white mealy pubescence; leaves simple, opposite, entire, articulated, 7.5—17.5 cm long, broadly ovate, rounded or cordate at base, acuminate, acute, entire, glabrous above when mature, densely woolly pubescent beneath with pale yellowish stellate hair, veins prominent beneath with a pair of large glands or pits below the lowest pair of veins, petioles 7.5—12.5 cm long, cylindrical, puberulous; flowers, irregular, bisexual, large, numerous, on short hairy pedicels in small stalked cymes of 3, arranged in a narrowly pyramidal, hairy, terminal panicle, bracts linear, buds clavate, angular; sepals 5, fused into a densely tomentose calyx, segments small; petals 5, fused into a funnel-shaped corolla, ventricose in the upper part, 3.7 cm long, densely hairy outside, lobes recurved or spreading, 4 upper lobes dull orange pink, the lower one being the longest, lemon yellow, projecting forwards, ovate, obtuse; stamens 4, didynamous, epipetalous, slightly exserted, anther-cells distinct, pendulous; ovary superior, 4-locular with one ovule in each loculus, style slender, stigma bifid; fruit a succulent drupe, about 2.5 cm long, ovoid or pyriform, smooth, orange-yellow, stone bony, ovate-ovoid.

Flowers in March.

Illustrations. Roxburgh, Pl. Corom. 3: pl. 246. 1820; Wight, Ic. Pl. Ind. Or., pl. 1479. 1849; Beddome, Flor. Sylvat. pl. 253. 1868—1873; Hooker in Curtis, Bot. Mag. pl. 4395. 1848; Kirtikar and Basu, Indian Med. Plants, pl. 739. 1933; Worthington, Ceylon Trees, pl. 345. 1959; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma and Philippine Islands. It is rather common but often cultivated in the moist regions of Ceylon up to 5000 feet altitude.

Ceylon. Central Prov., Ramboda, *Thwaites C.P.* 128.

Uses. The juice of the leaves of this tree is used to remove foetid discharges and worms from ulcers. A decoction of the roots and bark is given for fever and thirst and to increase the secretion of milk in women.

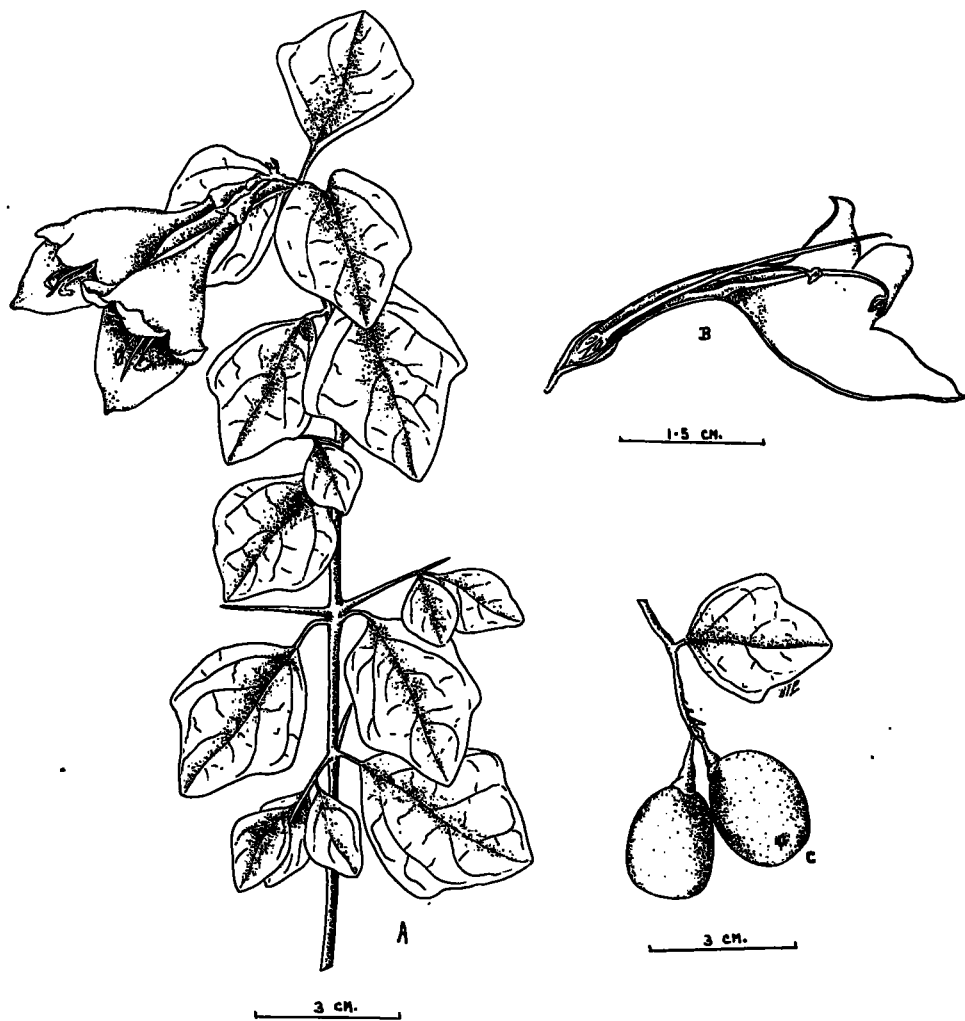


FIG. 502. *Gmelina asiatica*. A, portion of a branch with leaves and flowers. B, longitudinal section of flower. C, fruits.

6. *Gmelina asiatica* Linn. Sp. Pl. 626. 1753. (Fig. 502).

Gmelina coromandeliana Burm.—*Gmelina lobata* Gaertn.—*Gmelina parvifolia* Roxb.—*Michelia spinosa* Ammam.

Sinh. Demata; *Tam.* Arusavira, Kadambal, Kadukkumil, Kumirgodi, Nilakkumil; *Hindi* Badhara; *Sans.* Gopabhadra, Vikarini.

A much branched bush with a smooth yellowish white bark, branchlets horizontal, rigid, often compressed, puberulous, frequently much shortened and spinous at the end; leaves simple, opposite, small, 1.8—4.3 cm long, oval, acute or rounded at base, obtuse, entire, glabrous on both sides, paler and dotted with minute white glands beneath, petioles 0.6—1.2 cm long; flowers irregular, bisexual, large, bright sulphur-yellow, nodding on short pubescent pedicels, in terminal racemes or panicles, bracts small, deciduous; sepals 4, fused into a cup shaped calyx, somewhat contracted at mouth, pubescent with several large flattened oval glands on the upper part, segments very short acute; petals 4, fused into a funnel-shaped corolla 5 cm long, finely pubescent outside, tube curved, lobes ovate, subacute, lowest one largest; stamens 4, didynamous, epipetalous, anther cells distinct, pendulous; ovary superior, 4-locular with a single ovule in each loculus, style slender, stigma bifid; fruit a succulent drupe 1.8 cm long, obovate-ovoid, yellow, stone 1 or 2-chambered.

Flowers in September.

Illustrations. Gaertner, *Fruct. et Sem. Plant.* 1: *pl.* 56. 1788; Roxburgh, *Pl. Corom* 2: *pl.* 162. 1798; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 738B. 1933; Herb. Peradeniya. drawing.

Distribution. Occurs in India, Ceylon and Burma. It is common in open places in the low-country up to 2,000 feet altitude in Ceylon. Galle, Jaffna, etc.

Ceylon. Without locality, *Thwaites C.P.* 1952.

Uses. An infusion of the bark of this tree is used for washing sores and ulcers. The juice of the fruit is one of the constituents for the preparation of medicines for treatment of bronchitis, pneumonia and asthma. The leaves and young shoots contain a mucilage which mixed with water is employed to allay *ardor urinae* in gonorrhoea. The root is used for rheumatism in the loins and syphilitic diseases.

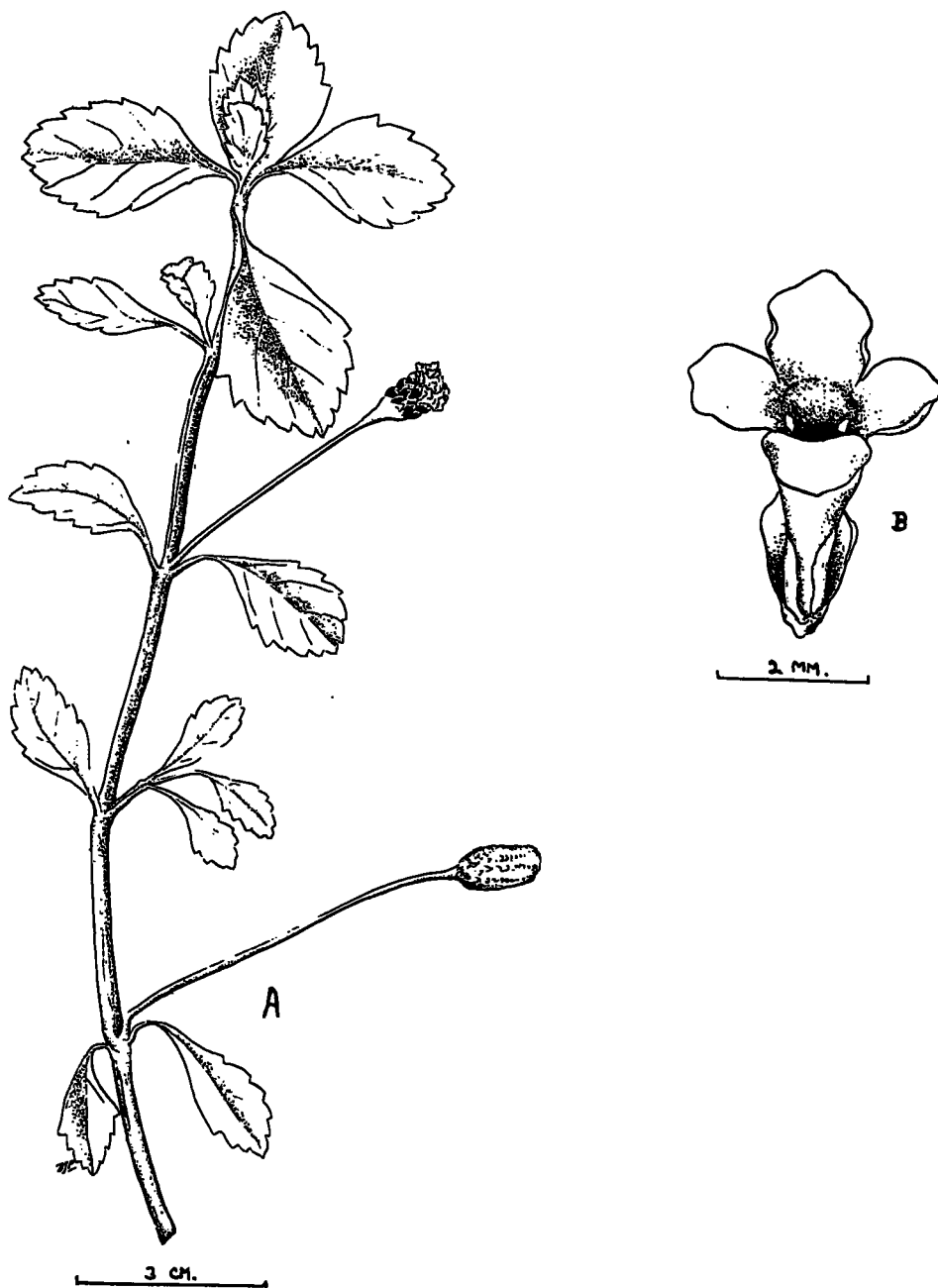


FIG. 503. *Phyla nodiflora*. A, portion of the stem with leaves and spikes of flowers. B, flower dorsal view.

7. *Phyla nodiflora* (Linn.) Greene; Abeywick. Ceyl. Journ. Sc. 2(2): 217. 1959. (Fig. 503).

Lippia nodiflora Rich.—*Lippia repens* Bert.—*Verbena nodiflora* Linn.—*Verbena capitata* Forsk.—*Blairia nodiflora* Gaertn.—*Zapania nodiflora* Lamk.—*Lantana sarmentosa* Spreng.—*Lantana repens* Spreng.—*Phyla chinensis* Lour.

Sinh. Hiramana-detta; *Tam.* Podutalei; *Hindi* Bhuiokra, Jalapapili, Ludra; *Sans;* Agnijvala, Bahushika, Chitrapatri, Jalapippali, Langali, Maharashtri, Matsyagandha, Pranada. Shakuladani, Sharadi, Toyavallari, Trinashita, Vashira.

A prostrate herb rooting at nodes, stems much branched, subquadrangular, glabrous; leaves simple, opposite, small, 1.8—3.7 cm long, spatulate, cuneate at base, obtuse, deeply and sharply serrate in upper part, rather thick, glabrous, minutely punctate, petioles short, obscure; flowers irregular, bisexual, very pale violet-pink, sessile, densely packed, heads at first nearly globose but becoming spicate and oblong in fruit, peduncles 2.7—7.5 cm long, from axil of one only of each pair of leaves, bracts ovate, acute or subacute; sepals 2, almost distinct; petals 5, fused into a 2-lipped corolla, corolla limb scarcely 2.5 mm diam. lobes spreading, rounded, upper lip 2 and lower lip 3-lobed with the middle lobe the largest segment; stamens 4, didynamous, filaments very short; ovary superior, 2-locular with two-ovules in each loculus, style very short; fruit dry, minute, about 1.5 mm long, splitting into 2, one seeded pyrenes.

Flowers throughout the year.

Illustrations. Burmann, Fl. Ind., pl. 6, fig. 1. 1765; Wight, Ic. Pl. Ind. Or., pl. 1463. 1849; Gaertner, Fruct. et Sem. Plant. 1: pl. 56. 1788; Kirtikar and Basu, Indian Med. Plants, pl. 731. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Philippine Islands. It is very common on the sands of the sea coast and on bunds of tanks in the dry regions of Ceylon.

India. Assam: *Simons*. Mysore and Carnatic: *T. Thomson*. Ceylon. Northern Prov., Talaimannar, *J. M. Silva*, July 1916. North Western Prov., Kalpitiya, *Herb. Peradeniya*, Aug. 1883; Chilaw, *Simpson* 8170, May 1931. North Central Prov., Minneriya, *Herb. Peradeniya*, Sept. 1885. Southern Prov., Tissamaharama, *Simpson* 9931, Aug. 1932. Without locality, *Thwaites C.P.* 1947. Maldive Islands. *Didi* 162, 1896; Minikoi, Vaimandu, *Gardiner* 12, 1899. Formosa. *Oldham* 381, 1864. Philippine Islands. Luzon: La Union Prov., *Lete* 53, 1927.

Uses. The tender leaves and stalks of this plant are given in the form of an infusion to children suffering from indigestion and to women after childbirth. A poultice of the fresh plant is applied to boils for early maturation. In the Philippines, an infusion of the leaves is drunk instead of tea as it is supposed to possess diuretic and carminative properties. In Bombay it is used as a demulcent for gonorrhoea. According to Nadkarni, a poultice of the plant is applied on swollen cervical glands, for erysipelas and chronic indolent ulcers.

8. *Premna herbacea* Roxb. Hot. Beng. 46. 1814.

Premna timoriana H. Lam.—*Pygmaeopremna humilis* Merr.

Sinh. Siritekku; *Tam.* Bumisamba, Sirudekku; *Hindi* Bharanig; *Sans.* Bhumjambu.

A small undershrub; leaves opposite, 10 cm long, 5—7.5 cm broad, obovate, obtuse, coarsely serrate, pubescent on nerves, microscopically dotted above, nerves 5 pairs; flowers often polygamous, small, in small corymbs 3.7 cm diam., pubescent somewhat dense, peduncle short; calyx small, cup-shaped, subequally 5-toothed, about 2.5 mm long, closely pubescent lobes ovate, obtuse; corolla tubular, 4-lobed, 4 mm long, greenish white, obscurely 2-lipped-hairy in the throat; stamens 4, didynamous; ovary superior, 2 or 4-locular with 4 ovules, style linear, shortly bifid; fruit a drupe 6 mm diam., globose, small, surrounded below by the calyx, 1—4-seeded.

Illustration. Kirtikar and Basu, Indian Med. Plants, *pl.* 738A. 1933.

Distribution. Occurs in India, Thailand, China and Philippine Islands. It is cultivated in Ceylon.

Ceylon. Cultivated, *W. Ferguson.*

Composition. The roots of this plant contain traces of an alkaloid and an orange brown acid resin.

Uses. A preparation from the root is given internally for rheumatism and dropsy. The juice of the root with juice of ginger and water is given for asthma, according to Hoatson. A medicinal oil prepared from the various parts of the plant is given for fever and body pains in pregnant women.

9. *Premna latifolia* Roxb. Hort. Beng. 46. 1814.

Sinh. Mahamidi; *Tam.* Erumaimunnai, Munnai, Pasumunnai, Pachumullai; *Hindi* Agniun, Bakar, Bakarcha, Basot, Jhatela, Tumari; *Sans.* Harimantha.

A small tree with a smooth white bark; leaves simple, opposite, 3.7—7.5 cm long, broadly oval or subrotundate, rounded or subcordate at base, shortly acuminate, acute, entire, hairy when young but glabrous when mature except for a few hairs on veins beneath, petioles 0.6—2.5 cm long, slender; flowers irregular, bisexual, yellowish or white, on short pedicels, cymes rather small, generally terminating short lateral branchlets, bracts caducous; sepals 5, fused into a cup-shaped, 2-lipped calyx, pubescent, much enlarged in fruit, segments shallow, acute; petals 4, fused into a short broad tube, hairy or woolly in the throat, lobes oblong, one lobe larger and broader than others to give a 2-lipped appearance; stamens 4, epipetalous, didynamous or equal; ovary superior, 2-locular with two ovules in each loculus; fruit a drupe 0.6 cm long, globose smooth, black, juicy, surrounded by enlarged calyx, stone 4-chambered.

Flowers in February, and July to October.

Illustrations. Wight, *IC. Pl. Ind. Or.*, pl. 869. 1843—1845; Kirtikar and Basu, *Indian Med. Plants*, pl. 737B. 1933.

Distribution. Occurs in India, Ceylon and Burma. It is rather common in the dry regions of Ceylon. Trincomalee, Mannar, Sigiriya, Uma Oya, etc.

Ceylon. Northern Prov., Talaimannar, *J. M. Silva*, July 1916; Jaffna, *Herb. Peradeniya*, Feb. 1890; Vaddukoddai, *Koshy*, Aug. 1955. Eastern Prov., Trincomalee, Sober Island, *Nevill*, March 1892; Uma Oya, *Herb. Peradeniya*, 1880. Central Prov., Bot. Gard., cultivated, *Herb. Peradeniya*, July 1889. Without locality, *Thwaites C.P.* 2893.

Uses. The leaves of this plant are diuretic and given internally as a decoction in dropsy and also applied externally. An infusion of the leaves with coriander is a popular remedy for acute dropsy. The latex of the plant is applied on boils.

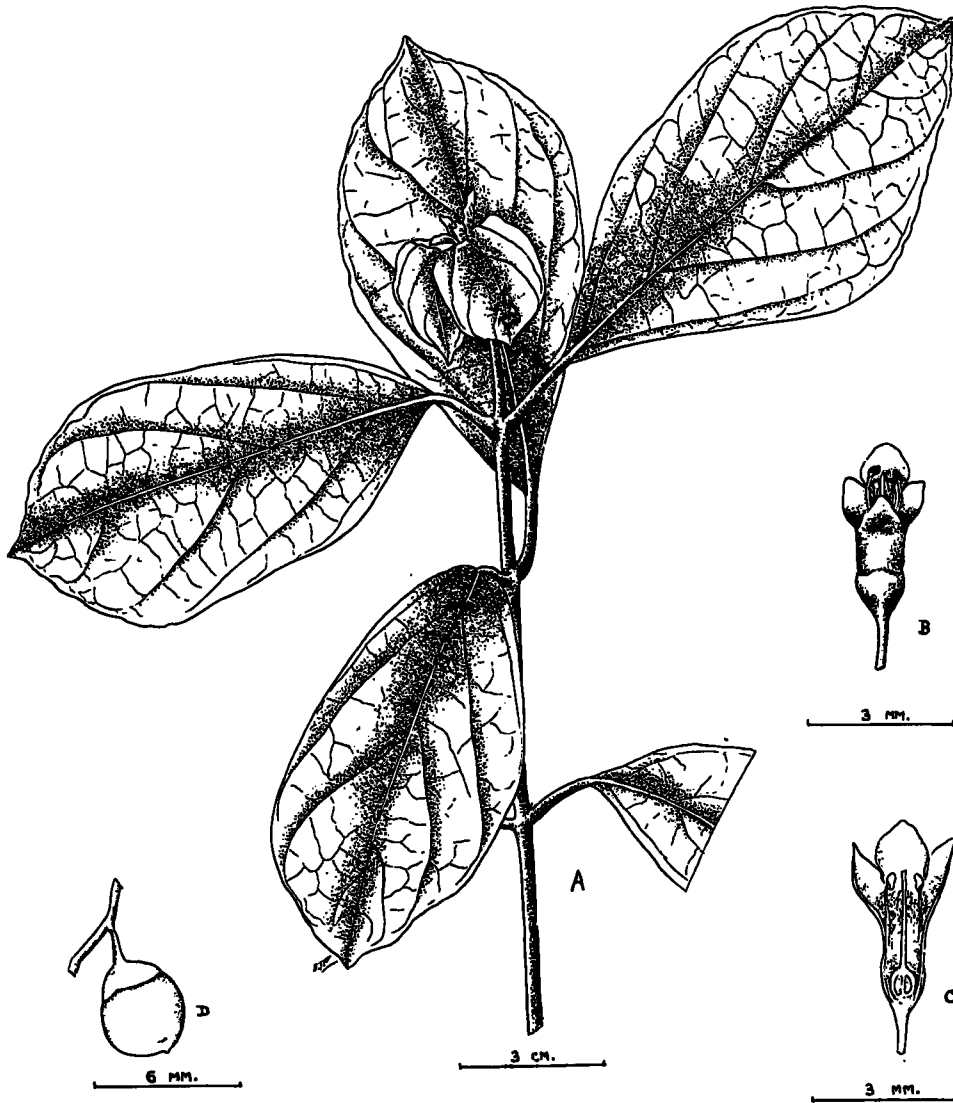


FIG. 504. *Premna serratifolia*. A, twig with leaves. B, flower lateral view. C, longitudinal section of flower. D, fruit.

10. *Premna serratifolia* Linn. Mant. 2: 253. 1771. (Fig. 504).

Premna integrifolia Linn.—*Premna spinosa* Roxb.—*Premna sambucina* Wall.—*Premna subcordata* Turez.—*Premna ovalifolia* Wall.—*Gumira integrifolia* Hassk.—*Cornutia corymbosa* Burm. f.

Sinh. Midi; *Tam.* Munnai, Pasumunnai; *Hindi* Agetha, Arni, Ustabunda; *Sans.* Agnibijaka, Agnimantha, Ananta, Arani, Araniketu, Ganakusika, Girikarnika, Havitmantha, Jaya, Jayanti, Jyotishka, Kanika, Karnika, Mathana, Madeyi, Nadija, Pavaka, Pavakarini, Pittamatha, Shriparna, Tanutvaka, Tarkari, Tejomantha, Vajjayantika, Vanhimantha Vanhimula, Vijaya, Vijayantika.

A small tree or shrub with a thin lenticellate yellowish bark and glabrous or slightly pubescent young parts; leaves simple, opposite, exstipulate, 5—7.5 cm long, broadly oval, acute or rounded at base, acute or subacute at apex, entire or faintly crenate-serrate in upper part, always quite glabrous; flowers irregular, bisexual, pale yellowish green, on short pubescent pedicels, cymes corymbosely paniculate, dense, pubescent, terminal; sepals fused into a 2-lipped calyx, one lip entire, the other 2-lobed so that the calyx appears 3-lobed, segments obtuse; corolla with a short broad tube, hairy or woolly in the throat, lobes 4, rounded, the lower ones somewhat longer so as to give a 2-lipped appearance; stamens 4, slightly exerted, didynamous or equal; ovary superior, 2-locular with two ovules in each loculus; fruit a small, globose drupe surrounded at base by the enlarged calyx, 0.4 cm long, stone hard, normally 4-chambered and 4-seeded.

Flowers in March and September.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 1469. 1849; Burmann f. *Fl. Ind.* pl. 41, fig. 1. 1765; Kirtikar and Basu, *Indian Med. Plants*, pl. 736. 1933.

Distribution. Occurs along the coasts of India, Ceylon, Malaya, Andaman and Nicobar Islands. It is common in the dry regions of Ceylon.

Ceylon. Northern Prov., Pothuvil, *Alston*, March 1928. Western Prov., Negombo, *F. W. de Silva*, July 1930; Batalagoda, *Alston*, Sept. 1927. Without locality, *Thwaites C.P.* 1953.

Composition. The bark of this plant contains the alkaloids; ganiarine and premnine.

Uses. This plant is used in the form of a decoction for rheumatism and neuralgia. A decoction of the leaves is given for flatulence. The root is an ingredient of drugs administered for fever.

11. *Premna tomentosa* Willd. Sp. Pl. 3: 314. 1804.

Premna flavescens Juss.— *Cornutia corymbosa* Lamk.

Sinh. Bu-seru, Gul-seru; *Tam.* Kollikkattaittekku, Kolukkutti, Pinari, Podaganari, Podanganari.

A tree with a yellowish fibrous bark shredding off in longitudinal flakes, branchlets covered with dense yellow woolly stellate hair; leaves simple, opposite, 10—15 cm long, ovate, rounded or subacute at base, acuminate, acute, entire, densely woolly with stellate hair when young, becoming glabrous above when mature, petioles 2.5—5 cm long woolly pubescent; flowers irregular, bisexual, dirty yellow, on very short pubescent pedicels, numerous, cymes rather close, stellate pubescent, terminal bracts linear; sepals 5, fused into a stellate hairy, cup-shaped calyx, lobes equal; petals 5, fused into a short broad tube, hairy or woolly in the throat, lobes rounded, one considerably longer; stamens 4, didynamous or equal, slightly exerted; ovary superior, 2-locular, with two ovules in each loculus; fruit a drupe 0.6 cm long, broadly ovoid, sparsely stellate hairy, stone hard, 4-chambered and 4-seeded pyrene.

Flowers in September, January and February.

Illustrations. Wight, Ic. Pl. Ind. Or., *pl.* 1468. 1849; Beddome, Flor. Sylvat. *pl.* 251. 1868—1873.

Distribution. Occurs in India and Ceylon. It is common in the low-country up to 4000 feet altitude in Ceylon. Matale, Hantane, Deltota, Bibile, etc.

Ceylon. Central Prov., Dambulla, *Simpson* 8110. May 1931; Ambepussa Farm, *Alston* 1326, Nov. 1926. Uva Prov., Bibile Dist., *J. M. Silva*, Oct. 1928. Without locality, *Thwaites C.P.* 747.

Uses. An aromatic oil extracted from the roots of this tree is used for stomach disorders.

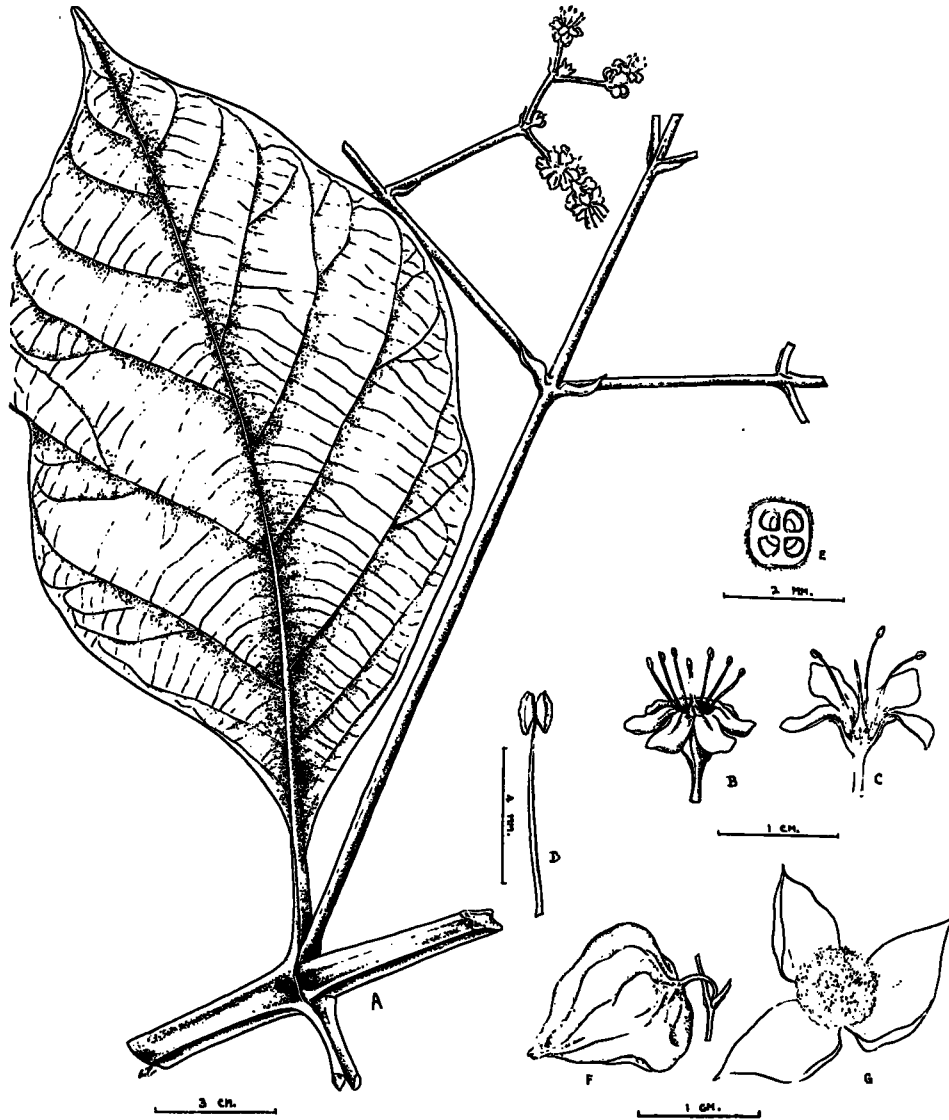


FIG. 505. *Tectona grandis*. A, portion of stem with leaf and inflorescence. B, flower lateral view. C, longitudinal section of flower. D, stamen. E, transverse section of ovary. F, fruit enclosed by calyx. G, fruit with hairy pericarp and expanded calyx.

12. *Tectona grandis* Linn. f. Suppl. 151. 1781. (Fig. 505).

Engl. Teak; *Sinh.* Thekka; *Tam.* Kalindi, Kumidigam, Sadi, Sagam, Sarasam, Tekku; *Hindi* Sagon, Sagun, Sagwan, Sakhu, Segun; *Sans.* Anila, Arjunopama, Arna, Atipatraka, Bhumisuha, Dhruvasadhana, Dirghachhada, Dvaradaru, Gandhasara, Grihadruma, Halimaka, Kharachhada, Kharapatra, Kolaphala, Krakachapatra, Mahapatra, Mahiruha, Nau, Sabarasara, Saka, Shaka, Shakakhya, Shakataru, Sharapatra, Shreshthakashtha, Sthirasara, Tailapila, Teka, Yogi.

A large deciduous tree with quadrangular, channeled, stellate tomentose branchlets; leaves simple, exstipulate, large, opposite or whorled, 30—60 cm long, 15—30 cm broad, elliptic or obovate, acute or acuminate, upper surface rough but usually glabrous, the lower clothed with dense stellate grey or tawny tomentose, entire, base usually cuneate, nerves 8—10 pairs with 2 or 3 large branches near the edge of the leaf, joined by numerous parallel transverse veins; flowers irregular, bisexual, white, shortly pedicellate in large, erect, terminal, branched, tomentose, cymose panicles 30—90 cm long with lanceolate bracts at the forks, bracts beneath calyx 2.5 mm long and linear-lanceolate; calyx gamosepalous, 0.3 cm long, stellately tomentose, semiglobose-campanulate, shortly 5 or 6-lobed, lobes spreading, subequal, about 1.2 mm long, enlarged in fruit to 2.5 cm or more and bladder-like enclosing the fruit, ovoid, more or less crumpled or irregularly plaited, reticulately veined; corolla gamopetalous, white, glabrous, 5 or 6-lobed, tube about 2 mm long, limb 0.6 cm across with spreading subequal imbricate lobes; stamens 5 or 6, inserted near the base of the corolla, equal, exserted, anthers ovate, with parallel cells; ovary superior, sessile, fleshy, 4-locular with a solitary ovule in each loculus, style linear, stigma shortly 2-fid; fruit a drupe enclosed in enlarged calyx, 1.2 cm diam., subglobose, somewhat 4-lobed, the pericarp soft with dense felted stellate hairs, endocarp bony.

Flowers from June to September.

Illustrations. Gaertner, *Fruct. et Sem. Plant.* 1: *pl.* 57. 1788; Roxburgh, *Pl. Corom.* 1: *pl.* 6. 1795; Beddome, *Flor. Sylvat.* *pl.* 250. 1868—1873; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 735. 1933; Worthington, *Ceylon Trees*, *pl.* 344. 1959.

Distribution. Occurs in India, Malay Peninsula and Burma. It is cultivated in Ceylon for timber.

India. Pen. Ind. Or., *Herb. Wight* 2306, *Kew Distribution* 1866—8; *Herb. Inp. For. Inst.*, Chand Bagh Road, *Razdan* 20, 1925.

Ceylon. Central Prov., Peradeniya, cultivated, *Baker* 126, May 1907. *Java.* *Herb. Div. Bot.*, *Kooders* 29621b; *Kooders* 20640b. *Sumatra.* (East): Asahan, Boenoet, *Yates* 1863, 1927.

Composition. The leaves of this tree contain tannin, the heart-wood a resin, tecto-quinone, calcium carbonate, tricalcic orthophosphate, quartz, etc.

Uses. A decoction of the leaves is a remedy for haemoptysis and used as a gargle for sore throat. The powdered heartwood is beneficial for dyspepsia, acute dermatitis and as a vermifuge. The bark is astringent and the flowers and seeds diuretic. The oil extracted from the fruits is used to promote the growth of hair. It also soothes itching skin.

13. *Vitex leucoxylo* Linn. f. Suppl. 293. 1781 non Kurz.

Vitex saligna Roxb.—*Wallrothia leucoxylo* Roth.

Sinh. Nebedda; *Tam.* Kaddu-nochchi, Kattunochi, Nirnochi.

A large tree with a smooth, thin, white bark and a large spreading head, young parts slightly pubescent; leaves opposite, compound, petioles 3.7—7.5 cm long, glabrous, leaflets usually 5 (or 3), stalked, unequal, the terminal one 7.5—8.7 cm long, twice as large as the basal pair, oblong-oval, acute at base, obtuse, entire, glabrous or very slightly pubescent beneath, rather thick, venation pellucid, finely reticulate; flowers irregular, bisexual, white with purplish hair, moderate sized, on short pubescent pedicels, cymes axillary, long stalked, dichotomous, lax, spreading, bracts long, linear; sepals 5, fused into a campanulate calyx, pubescent, segments shallowly triangular, acute; petals 5, fused into a 2-lipped corolla, densely pubescent outside, the four upper lobes oval-oblong, obtuse, the lowest lobe larger, crisped, hairy in the centre; stamens 4, didynamous, somewhat exserted; ovary superior, 4-locular with 4 ovules, stigma bifid; fruit a drupe supported on enlarged flattened calyx, about 1.8 cm long, broadly oblong-ovoid, very blunt, smooth, dark purple, stone large, 4-chambered and 4-seeded.

Flowers in July and August.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 1467. 1849; Worthington, Ceylon Trees, pl. 346. 1959; Herb. Peradeniya, drawing.

Distribution. Occurs in Madras in India and in Ceylon. It is common near tanks in the dry zone in Ceylon.

Ceylon. North Central Prov., Anuradhapura, *Alston* 1050, March 1927. Eastern Prov., Batticaloa, *Walker* 180, Sept. 1885; *Vincent*, 1882. Without locality, *Thwaites C.P.* 1957.

Uses. The leaves of this tree are smoked for catarrh and headache. The roots are used for intermittent fevers and the fruit as an anthelmintic.

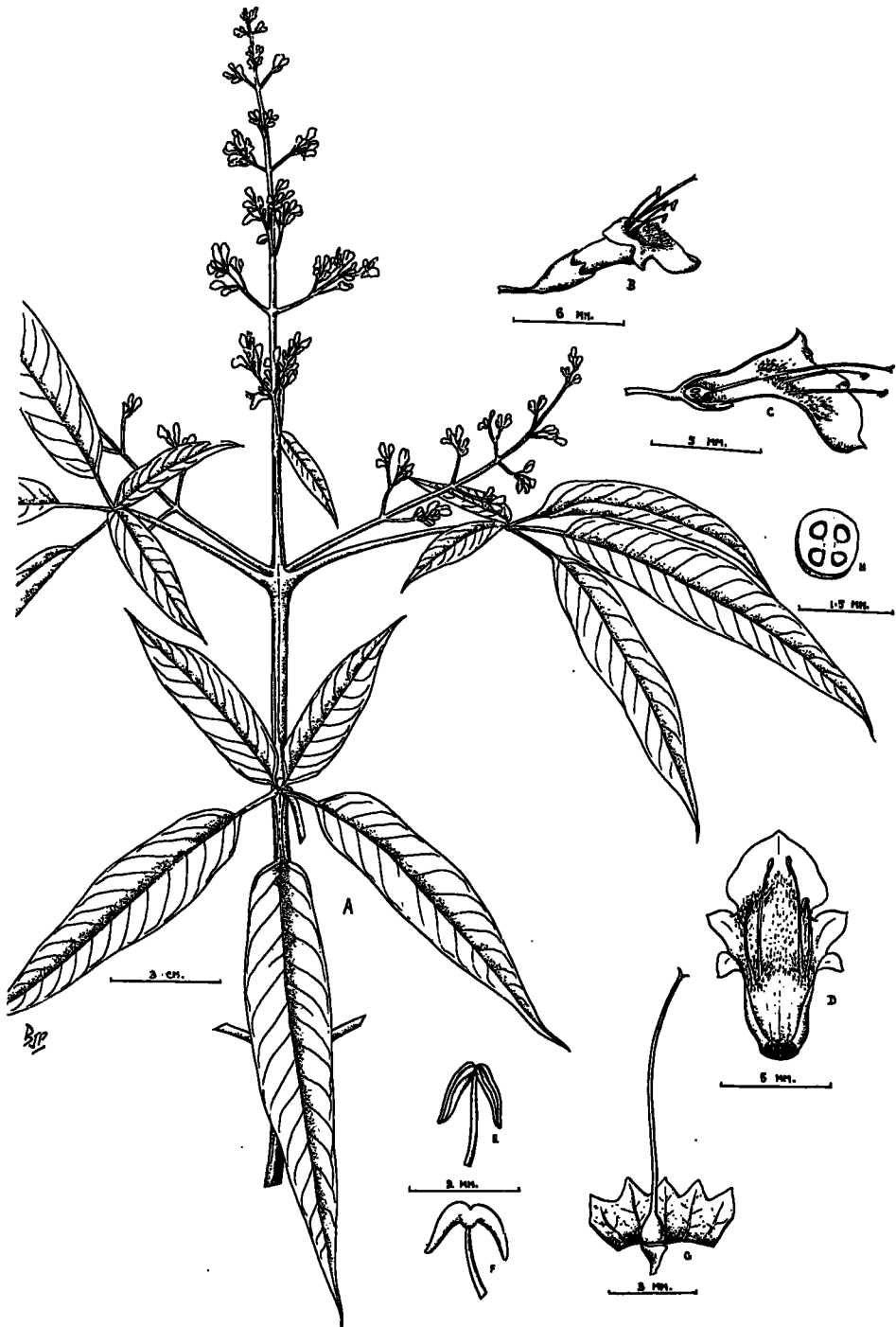


FIG. 506. *vitex negundo*. A, twig with leaves and flower panicle. B, flower lateral view. C, longitudinal section of flower. D, corolla opened out showing stamens. E, dehiscing stamen. F, dorsal view of stamen. G, pistil with calyx opened out. H, transverse section of ovary.

14. *Vitex negundo* Linn. Sp. Pl. 638. 1753. (Fig. 506).

Vitex bicolor Willd.—*Vitex arborea* Desf.—*Vitex paniculata* Lamk.

Engl. Indian Privet; *Sinh.* Nika, Nil-nika; *Tam.* Nirkkundi, Nochi, Sinduvaram, Tiriburamerittan, Vennochchi; *Hindi* Mewri, Nengar, Ningori, Nirgandi, Nirgunda, Nisinda Paniki-sambhalu, Sambhal, Sambhalu, Sanbhalu, Shawali, Shiwali, Shiwari, Sindhuca, Sinduari; *Sans.* Indrani, Nilapushpa, Nilanirgundi, Nirgundi, Shephali, Sinduvara, Surasa, Suvaha Svetasurasa.

A small slender tree or shrub, branchlets quadrangular, finely pubescent; leaves opposite, compound palmate, petioles 3.7—6.2 cm long, slender, pubescent, leaflets 3 or 5, the two lowest smaller, nearly sessile, the others long stalked, 7.5—10 cm long, linear-lanceolate acute and often unequal at the base, tapering to very acute apex, nearly glabrous above, densely covered with fine white pubescence beneath; flowers irregular, bisexual, numerous, bright lilac blue, on very short pubescent pedicels, cymes small, stalked, opposite, on erect branches of erect pyramidal terminal panicle, bracts caducous; sepals 5, fused into a campanulate calyx pubescent, segments short triangular; petals 5, fused into a 2-lipped corolla, pubescent outside tube hairy within, 4 upper lobes short, triangular, lowest one large, rounded, forming the lower lip; stamens 4, didynamous, epipetalous, somewhat exserted; ovary superior, 2 or 4-locular ovules 4, stigma bifid; drupe invested at the base by enlarged calyx, under 0.6 cm in length, nearly globose, black.

Flowers throughout the year.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 509. 1840—1843; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 740 *A.* 1933; Worthington, *Ceylon Trees*, *pl.* 347. 1959; Herb. Peradeniya, drawing.

Distribution. Occurs in tropical East Africa, Madagascar, India, Ceylon, Malaya, Polynesia, and Philippine Islands. It is common by the edge of streams especially in the dry regions of the low-country in Ceylon.

Ceylon. Northern Prov., *Thwaites C.P.* 1956.

Composition. The leaves of this tree contain the alkaloid, nishindine, an essential oil and a resin, while the fruit contains an acid resin, an astringent organic acid and mallic acid.

Uses. The leaves are used as a vulnerary. An oil prepared with the juice of the leaves is applied to sinuses and scrofulous sores with beneficial results. A decoction of the leaves is taken internally for flatulence. Externally, the leaves reduce inflammatory and rheumatic swellings in joints and swellings in the testes due to gonorrhoea. A pillow stuffed with the leaves is said to cure headache and catarrh. The leaves, roots and bark are used in snake-bite cures. The expressed fresh juice is given internally and poured into the nostrils for cases of stupor or coma. The bruised bark and leaves are applied on tarantula bites. The roots are used for many ailments such as coughs, asthma, fever, etc., and on scrofulous ulcers. A tincture of the root is administered for irritation of the bladder and rheumatism.

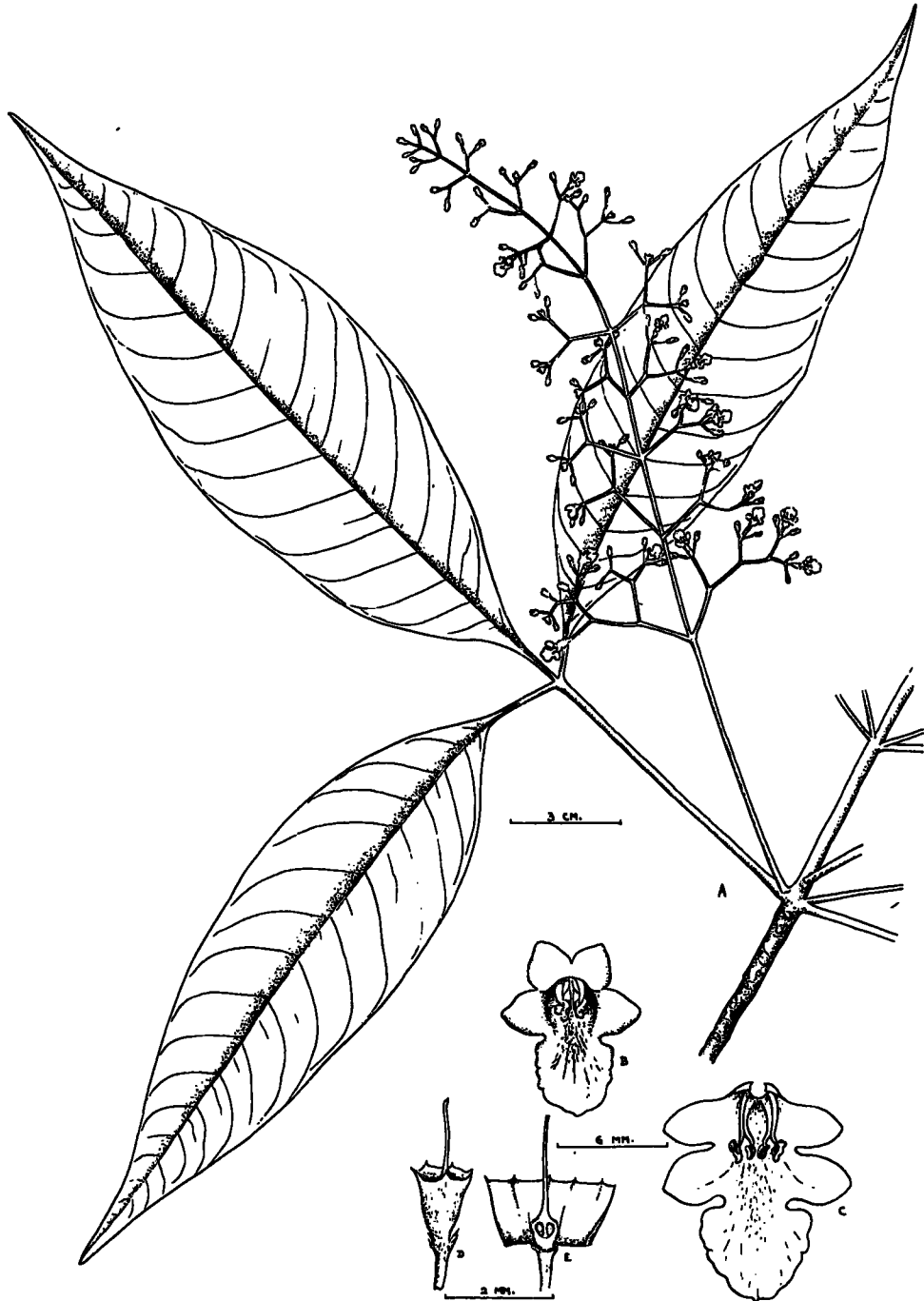


FIG. 507. *Vitex peduncularis*. A, portion of a twig with a leaf and inflorescence of flowers. B, flower dorsal view. C, corolla opened out showing the stamens. D, calyx and style lateral view. E, longitudinal section of pistil with the calyx opened and spread out.

15. *Vitex peduncularis* Wall. Cat. 1753. 1829. (Fig. 507).

Hindi Charaigorwa, Chhagriaruba, Minjurgorwa, Nagbail.

A moderate-sized tall tree; leaves opposite, compound, trifoliate, petioles 7.5—8.5 cm long, leaflets 15—18.5 cm long, 3.5—5 cm broad, lanceolate, acuminate, undulate, petiolules 1.7—2 cm long, lamina smooth on both sides, main vein prominent beneath; flowers bilaterally symmetrical, bisexual, small in axillary, racemose and tomentose panicles 22—27 cm long, branchlets cymose, flowers 7 mm across, creamish white with a pinkish white lower lip, blotched with yellow in the throat; sepals 5, fused into a campanulate calyx-tube 2 mm long, tomentose outside, lobes inconspicuous; petals 5, fused into a corolla-tube 3 mm long, lobes distinct, unequal, the ventral lobe the largest, 5 mm across, crescent-shaped and pubescent inside, lateral lobes oblong, 2 mm long and the dorsal lobes as long and ovate; stamens 4, epipetalous, filaments incurved and pubescent at base; ovary superior, 2-carpellary, 2-locular with 2 ovules in each loculus, 0.5 mm high, style 3 mm long, stigma bifid at the tip, fruit globular, 7 mm long, smooth with a stony endocarp.

Flowers during March and April.

Illustration. Kirtikar and Basu, *Indian Med. Plants*, pl. 741. 1933.

Distribution. Occurs in India and can be cultivated in Ceylon.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *F. W. de Silva* 1002, March 1946.

Composition. The leaves of this tree contain an alkaloid.

Uses. An infusion or decoction of the leaves and bark is given as a cure for blackwater fever. Externally, the bark is used as an application for chest pain.



FIG. 508. *Vitex trifolia*. A, branch with leaves and flowers. B, flower lateral view. C, longitudinal section of flower.

16. *Vitex trifolia* Linn. Sp. Pl. 638. 1753. (Fig. 508).

Vitex ovata Thunb.—*Vitex incisa* Wall.—*Vitex repens* Blanco—*Vitex agnus-castus* Kurz.

Sinh. Sudunika; *Tam.* Karunochi, Nirnochi, Nochi, Sirunochi; *Hindi* Pakinisan bhalu, Sufedsanbhalu; *Sans.* Indranika, Indrasurasa, Jalanirgundi, Kashanashini, Krishnanirgundi, Nilanirgundi, Nilika, Sephalika, Shakrani, Shuklaprishthaka, Sindhuka, Sinduvara, Surasa, Svetapushpa, Svetasurasa, Visugandhaka.

A bush with a smooth pale grey bark; leaves palmately compound, opposite, variable, some simple and some 3-foliolate with the lateral leaflets smaller; simple leaves 3.1—6.2 cm long, obtuse at both ends, leaflets sessile tapering to base, obtuse, all entire, glabrous above, very finely and closely white pubescent beneath, petioles 1.2 cm long, pubescent; flowers irregular, bisexual, bright pale purple, on short pedicels, cymes paniculate, 2.5—5 cm long, pubescent, bracts minute; sepals fused into a campanulate, white-pubescent calyx, enlarged in the fruit; petals 5, fused into a 2-lipped corolla, pubescent outside, tube cylindrical, funnel shaped, 0.6 cm long, mouth oblique, upper lip with two obtuse lobes, lower lip 3-lobed, the middle one much the longest; stamens 4, didynamous, epipetalous, much exerted; ovary superior, 2 or 4-locular with 4 ovules, stigma bifid; fruit a globose drupe about 0.6 cm long, the lower half more or less closely invested by the enlarged calyx, slightly scurfy, purplish-black, stone usually 1-chambered by abortion.

Flowers in August and September.

Illustrations. Curtis, Bot. Mag., pl. 21 87. 1820; Kirtikar and Basu, Indian Med. Plants, pl. 740B. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs along the seashore in India, Ceylon, Malaya, Australia, Polynesia and Philippine Islands. It is rather common in the dry low-country by the sea coast in Ceylon.

Ceylon. Northern Prov., Kankesanthurai, *Herb. Peradeniya*, Feb. 1890; Foul Point, *Simpson* 9688, May 1932. Eastern Prov., Mullativu, *Alston* 1327, March 1927. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Oct. 1914. Without locality, *Thwaites C.P.* 1955.

Composition. The leaves of this plant contain an alkaloid, an essential oil and a resin, while the fruit contains an acid resin, an astringent organic acid and malic acid in addition to the alkaloid. The essential oil consists of 1-d-pinene, camphene, terpinyl acetate and diterpene alcohol.

Uses. The leaves are used as dry fomentation for sprains, contusions and rheumatism. An infusion of the leaves is given for intermittent fevers, rheumatism and enlargement of the spleen. The leaves are also used for treating cancer in the breast. The fruit is said to be nervine, cephalic and an emmenagogue.

117. VITACEAE

1. *Ampelocissus indica* Planch. in Journ. Vigne Am. 373.

Vitis indica Linn.—*Vitis erioclada* W. & A.—*Ampelocissus erioclada* Planch.

Engl. Indian Grape Vine; *Sinh.* Rata-bulath-wel, To-wel; *Tam.* Sambaravalli.

A semi-woody perennial climber with stout, cylindrical, floccose-woolly stems and simple woolly tendrils about 15 cm long; leaves simple, alternate, stipulate, 10—15 cm long, broadly cordate-ovate with a rather narrow sinus and rounded lobes, very acute, very coarsely granular-dentate, glabrous above, woolly with rufous or grey tomentum on the prominent veins beneath, margin slightly reflexed, cottony beneath, petioles 7.5 cm long, densely floccose-woolly; flowers regular, polygamo-monoecious, sessile in dense clusters surrounded with rufous wool on the thick, very woolly branches of a paniculate cyme 7.5—10 cm long, on a peduncle of 5—7.5 cm in length, usually with a simple tendril below the cyme, buds broadly oblong-ovoid; sepals 5, fused into a cup-shaped calyx; petals 5, distinct, valvate, soon falling; stamens 5, inserted outside the disc, opposite petals, twice as long as the ovary; disc large, lobed; ovary superior, adnate to the base of the disc, flat on top, 10-grooved; fruit an oblong-ovoid berry 1.8 cm long, smooth, purple, resembling grapes.

Flowers in December.

Illustrations. Rheed, Hort. Mal. 7: pl. 6. 1688; Kirtikar and Basu, Indian Med. Plants, pl. 250. 1933.

Distribution. Occurs along the west coast of India and Ceylon. It is common in the moist low-country up to 2500 feet altitude in Ceylon.

India. Assam: *Jenkins*. Ceylon without locality, *Thwaites* C.P. 484; *Walker*; Central Prov., Kulugamma, *J. M. de Silva*, Feb. 1929; Kitulgala, Dambatenne, *J. M. Silva*, March 1928.

Uses. This plant purifies the blood and act as a diuretic when taken in the form of a decoction. In Cambodia, the roots are considered pectoral and diuretic. They are used for bronchitis and gonorrhoea.



PLATE XXXI. *Cayratia pedata*. A, portion of a twig with leaves and flowering inflorescence. B, fruits.



PLATE XXXI. *Cayratia pedata*. A, portion of a twig with leaves and flowering inflorescence. B, fruits.

2. *Cayratia pedata* (Lam.) Juss. ex Gagnep 4: 136. 1823. (Plate XXXI).

Columella pedata Lour.—*Cissus pedata* Lamk.—*Cissus heptaphylla* Retz.—*Vitis pedata* Vahl ex Wall.

Sinh. Mediya-wel; *Tam.* Kattuppirandai, Naralai; *Sans.* Godhapadi, Suvaha.

A weak tendril climber with a cylindrical, striate stem covered with short and long hairs, tendrils very slender, long, forked, young parts tomentose; leaves compound, alternate, stipulate, large, 3-foliate, the lateral leaflets usually pedately compound, petioles 5—7.5 cm long, pubescent, hairy, central leaflet long-stalked, lateral leaflets short-stalked, rarely simple, usually divided into 2, 3, or 4 leaflets which are unequal, nearly sessile or shortly stalked, all leaflets acute and often oblique at the base, shortly acuminate, acute, coarsely and shallowly repand-dentate, more or less pubescent on both sides, especially beneath; flowers regular, bisexual, white, on short pubescent pedicels, cymes corymbose, shortly pedunculate, dichotomous, lax, spreading, axillary; sepals 4, fused into a very shallow calyx; petals 4 (rarely 5), distinct at base, valvate, soon falling, hooded and slightly coherent at top, pubescent outside; stamens 4, inserted outside the disc opposite petals, disc large, lobed; ovary superior, adnate to base of disc, 2-locular with 2 collateral ovules in each loculus; fruit a depressed-globose, cream-coloured berry, 2—4-seeded, seeds semi-globose, smooth.

Flowers in July.

Illustrations. Rheedee, Hort. Mal. 7: *pl.* 10. 1688; Kirtikar and Basu, Indian Med. Plants, *pl.* 253. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Malaya. It is very common in the low-country in Ceylon.

India. Madras: Cleghorn 82. Pen Ind. Or., *Herb. Wight* 428; Wallich 6027C ex Herb. Wight. Khasia and Sylhet: J. D. Hooker and T. Thomson. Ceylon. Northern Prov., Jaffna, *Herb. Peradeniya*, Feb. 1890; Mullativu, Alston 647, March 1927. Eastern Prov., Trincomalee, Koddigar, *Herb. Peradeniya*, Aug. 1882. North Central Prov., Ritigala, Willis, March 1905. Central Prov., Dambulla, *Herb. Peradeniya*, July 1887. Without locality, Thwaites C.P. 1175.

Uses. This plant has astringent properties and a decoction of the leaves checks uterine reflexes.

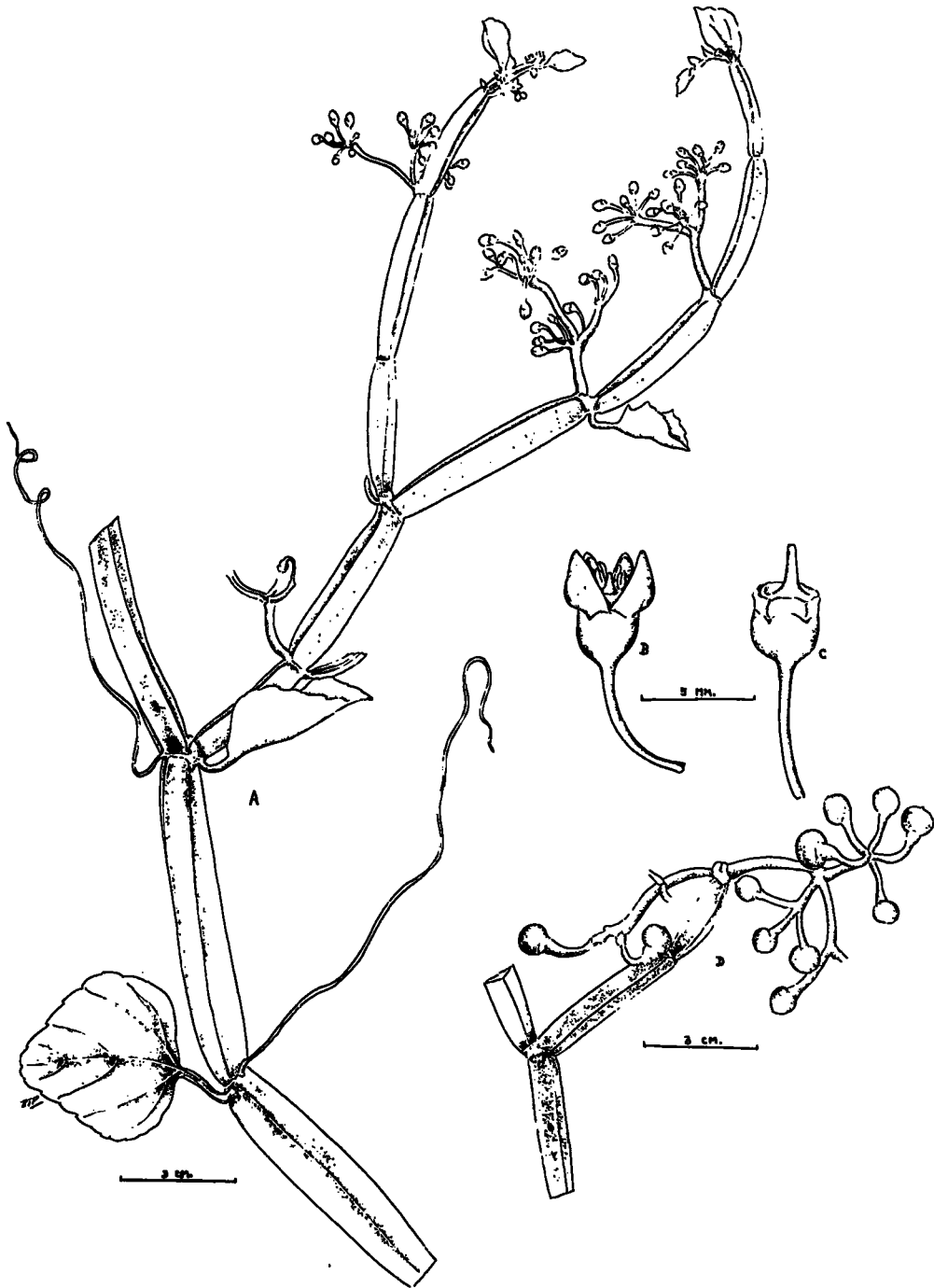


FIG. 509. *Cissus quadrangularis*. A, branch with leaves, tendrils and flower inflorescences. B, flower lateral view. C, pistil with disc and style. D, fruits.

3. *Cissus quadrangularis* Linn. Mant. 2. 39. 1771. (Fig. 509).

Vitis quadrangularis Wall · *Cissus edulis* Dalz.—*Saelanthus quadragonus* Forsk.

Engl. Adamant Creeper, Bone-setter; *Sinh.* Hiressa; *Tam.* Arugani, Indiravalli, Kiritti, Pirandai, Purandai, Uchiradam, Uttanasanjivi, Vachiravalli; *Sans.* Amara, Asthisamhara, Asthisandana, Asthisanmaraka, Asthisanhari, Asthishrinkala, Asthirinkhala, Granthiman, Kandalata, Kroshtughantika, Kulisha, Shiralaka, Vajrakanta, Vajravalli.

A tendril climber with a very long, thick, quadrangular, jointed, glabrous, green, fleshy stem and long, slender, simple stem tendrils; leaves simple, alternate, stipulate, distant, few, 2.5—5 cm long, broadly ovate or rotundate-deltoid, truncate at base, very obtuse, distantly spinous-crenate, glabrous, thick, petioles 0.6—1.2 cm long, subquadrangular, stipules small, broadly oval, obtuse; flowers regular, bisexual, small, pedicellate in small umbels on branches of a short, paniculate cyme; sepals fused into a cup-shaped calyx, scarcely lobed; petals 4, distinct, valvate, ovate, acute, soon falling; stamens 4 inserted outside the disc and opposite petals; disc large, cupular or annular, lobed; ovary superior adnate to base of the disc, 2-locular with 2 collateral ovules in each loculus, style short, blunt; fruit a globose, red, apiculate berry.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 51. 1838; Rheede, *Hort. Mal.* 7: *pl.* 41. 1688; Herb. Peradeniya, drawing.

Distribution. This climber occurs in India, Ceylon, Malacca, Philippine Islands, Java and E. Africa.

Ceylon. Northern Prov., Jaffna, *Thwaites C.P.* 1174.

Composition. The roots and leaves of this plant contain tannin.

Uses. The leaves and young shoots are powerful alteratives. The juice of the stem is a reputed cure for scurvy and irregular menstruation. The juice is dropped into the ear for otorrhoea and into the nose for epistaxis. The root is used as a specific for fractures of bones. In Tanganyika, the leaf is used for treating ulcers and wounds, the root for myalgia and the juice of the stem for earache. In central Africa, a decoction of the stem is given for blenorhagia, palpitation of the heart and as an anthelmintic. Externally, a poultice of the plant is applied for muscular pains. This plant is also used as a fish poison.

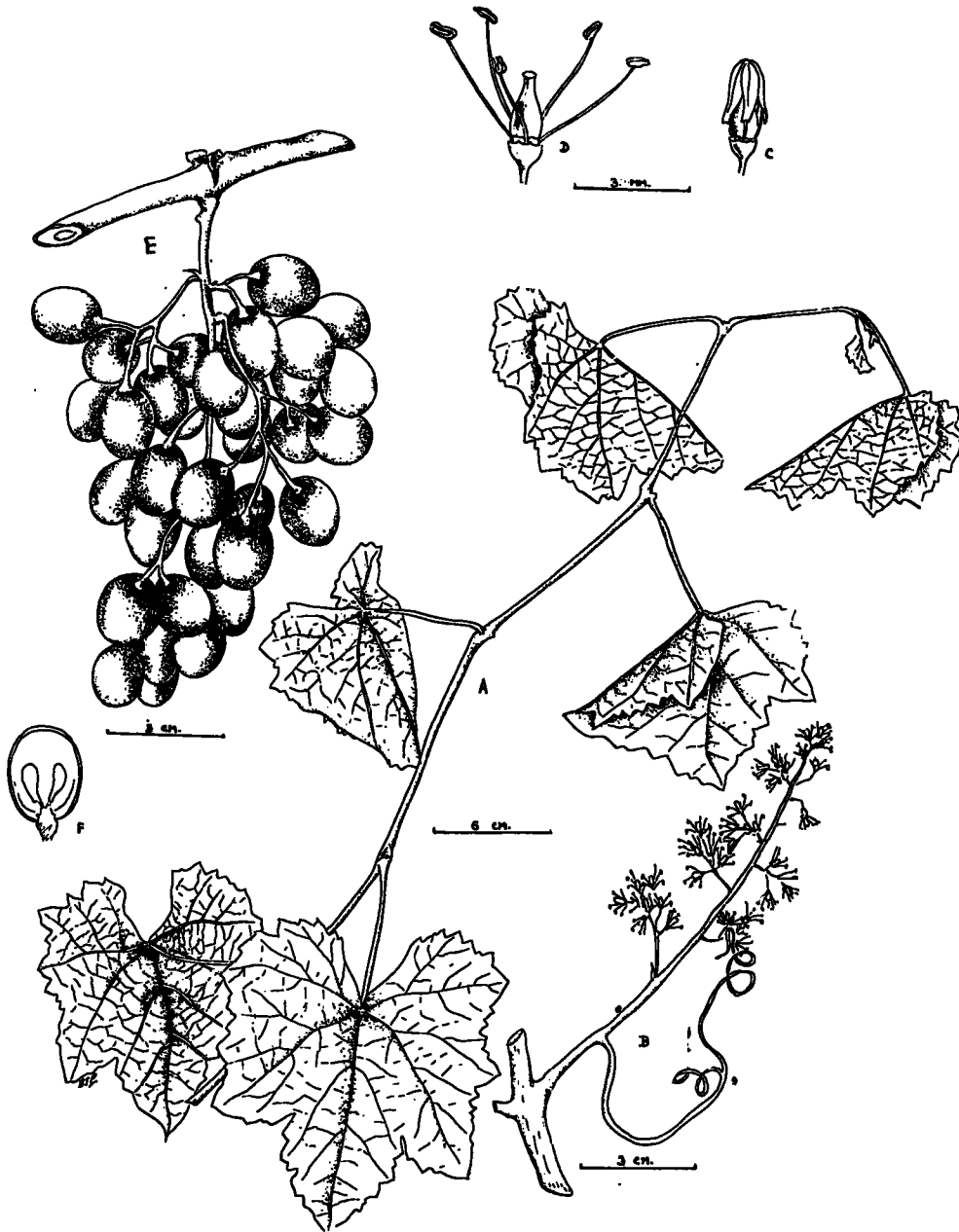


FIG. 510. *Vitis vinifera*. A, portion of a twig with leaves. B, inflorescence and tendril. C, flower lateral view with dehiscing corolla. D, pistil and stamens. E, bunch of fruits. F, longitudinal section of fruit showing the seeds embedded in gelatinous pulp.

4. *Vitis vinifera* Linn. Sp. Pl. 202. 1753. (Fig. 510).

Engl. Grape Vine; *Sinh.* Muddraspalam; *Tam.* Kodimundingai, Gostanidraksha, Kottani, Kottanigai, Maduram, Madurasam, Mundirigai, Simudai, Tiracham; *Sans.* Amrutaphala, Charuphala, Draksha, Gostani, Guchhaphala, Harahura, Krishna, Madhuras, Mridvika, Phatotama, Priyala, Rasa, Rasala, Suphala, Svadi, Svadvi, Swaduphala, Tapasapriya, Yakshmaghni.

A climbing shrub with numerous, long, tortuous, irregular, straggling branches somewhat thickened at nodes, bark brown, furrowed, flaking; leaves alternate on long, spreading, smooth petioles, stipules small, nearly lanceolate, thin, soon falling, leaf blade 5—10 cm long, cordate, at base, palmately veined and more or less deeply divided into 5 acute lobes, with the margin irregularly cut into large acute teeth, glabrous on both sides or somewhat pubescent beneath, tendrils (abortive inflorescences) coming off opposite leaves, horizontally spreading, long, smooth, slightly branched, tapering; flowers irregular, bisexual, green, very small, on rather long, slender, smooth, pale green pedicels greatly dilated at the summit, 10—20 of which compose small umbellato-racemose stalked clusters, which are themselves arranged irregularly to form oblong-ovoid, blunt, somewhat tapering, rather dense branched panicles 5—10 cm long, supported on smooth peduncles opposite leaves, cirrhiferous in the lower portion, bractlets lanceolate, acute, at base of clusters; calyx of 5 minute teeth at the margin of dilated receptacle; petals 5 (rarely 4), valvate, remaining united by their apices, but separating at once from the receptacle on the expansion of the flowers and coming off in one star-like piece, smooth, green; stamens 5 (rarely 4), hypogynous, opposite petals, often with 5 small staminodes alternating with them, filaments slender, erect-spreading, straight, white, anthers squarish, introrse, afterwards versatile; ovary superior, flask-shaped, 2-locular with 2 ovules in each loculus, style very short, stigma capitate; fruit an ovoid globular berry, 1.2—2.5 cm diam., pendulous, pericarp thin, green, yellow or blood-red, covered when ripe with scanty bluish-white bloom, filled with solid, gelatinous, very juicy greenish pulp, seeds 0.6—1.8 cm long, somewhat pear-shaped, flattened on the ventral surface and albuminous.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 66. 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 249A. 1933.

Distribution. Probably a native of S. E. Europe and W. India. It is now widely cultivated in Europe, India, Australia, California and other parts of North America. It is also cultivated in Ceylon.

Composition. The principal constituents of ripe grapes are grape sugar or glucose and acid tartarate of potash. On fermentation, the grape juice yields wine and brandy and from the tartar deposited the commercial acid tartarate of potash and tartaric acid are obtained. The seeds contain an oil which consists of stearic, palmitic and melissic acids and tannin.

Uses. The dried fruits are demulcent, laxative and sweet to the taste. They are useful for cough, thirst, hoarseness and consumption. The sap of the young branches is a popular remedy for skin diseases in Europe. The juice of the unripe grapes is astringent and useful for ailments of the throat.

Raisins constitute an essential ingredient in the preparation of 'aristas'. The grape cure is a popular remedy for pulmonary diseases and other ailments in Switzerland and other continental countries. The leaves and tendrils possess astringent properties and employed in diarrhoea and other bowel complaints. The grape seed oil is also a remedy for diarrhoea.



FIG. 511. *Xyris indica*. A, plant with leaves and flower spikes. B, flower spike.

118. XYRIDACEAE

Xyris indica Linn. Sp. Pl. 42. 1753. (Fig. 511).

Sinh. Ranmota; *Tam.* Kochilitti-pillu; *Hindi* Dabiduba; *Sans.* Dadanari, Dadumari.

An annual rush-like marshy herb, 30—60 cm high; leaves simple, radical, elongate, 0.6—0.8 cm broad, bifarious, narrowly loriform or ensiform, spongy, narrowed to an obtuse apex; scape robust, grooved, angles acute, spike 1.2—3.1 cm long, cylindric, ovoid or globose; bracts many, broader than long, orbicular or cuneately obovoid, tumid, dark red brown, shining, very coriaceous, margins scarious, lateral bracteoles dorsally winged, wing serrulate; flowers small, regular, bisexual, yellow, solitary, sessile in the axils of rigid imbricating bracts of a terminal spike, bracteoles deciduous considered by some as sepals; petals 3, long-clawed as long as sepals, limb orbicular, erose; stamens 3, filaments short and broad, inserted on petals, anthers oblong, 2-celled, dorsifixed, dehiscent dorsally, anther cells obtuse, acute at base, staminodes 2—3-fid, arms penicillate, ovary superior, unilocular, style short, 3-fid, arms long, stigmas terminal, truncate, ovules many on 3 parietal placentas, orthotropous; fruit a 1-chambered, loculicidally 3-valved capsule, seeds minute.

Flowers in December.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 980. 1933; Herb, Peradeniya, drawing.

Distribution. Occurs in low marshes in India, Ceylon, Malacca and Malay Islands. It is common in marshy ground in the moist low-country, in Ceylon.

India. Mysore, N. Canara, *Talbot* 246, Dec. 1882. Malabar, Concan, etc. *Stocks, Law, etc.* Ceylon. Southern Prov., Baddegama, *Alston* 1066, Jan. 1927. Without locality, *Thwaites C.P.* 3028.

Uses. This herb is applied on ringworm, itch and leprosy.

119. ZINGIBERACEAE

1. *Amomum masticatorium* Thwaites, Enum. 317. 1861.

A biennial herb with a slender, creeping rootstock; leafing stem 0.6—2.6 m high, distinct from the flowering stem, leaves simple, 12.5—35.5 cm long, sessile, linear-lanceolate, caudate-acuminate, glabrous on both surfaces, subcoriaceous, sheath glabrous, ligule 3.7 cm long, oblong-lanceolate, obtuse or acute, white, scarious; flowering stem 5—7.5 cm long, procumbent flexuous, loosely clothed with short, tomentose sheaths; spike globose, 3.7 cm diam., bracts less than 2.5 cm long, obovate, obtuse, hairy and ciliate; flowers irregular, bisexual, yellow with the lip dotted red, 3.7 cm broad; calyx-tube membranous, glabrous as long as the corolla-tube, 3-fid, tips of lobes bearded; corolla-tube 1.2—2.5 cm long, loosely villous, outer segments oblong, obtuse, dorsal twice as broad; lip orbicular, 3-lobed, side lobes large, broad, mid-lobe smaller bifid, lobules rounded, base 2-toothed; stamen 1, anther-cells glabrous, narrow, divergent from the middle upwards, crest semilunar, crenate; fruit globose, echinate about 1.8 cm diameter.

Distribution. A rare endemic species occurring in the forests of the lower montane zone.

Ceylon. Without locality, *Thwaites C.P.* 3701.

Uses. The rhizome of this plant is aromatic and carminative. It is chewed with betel leaves.

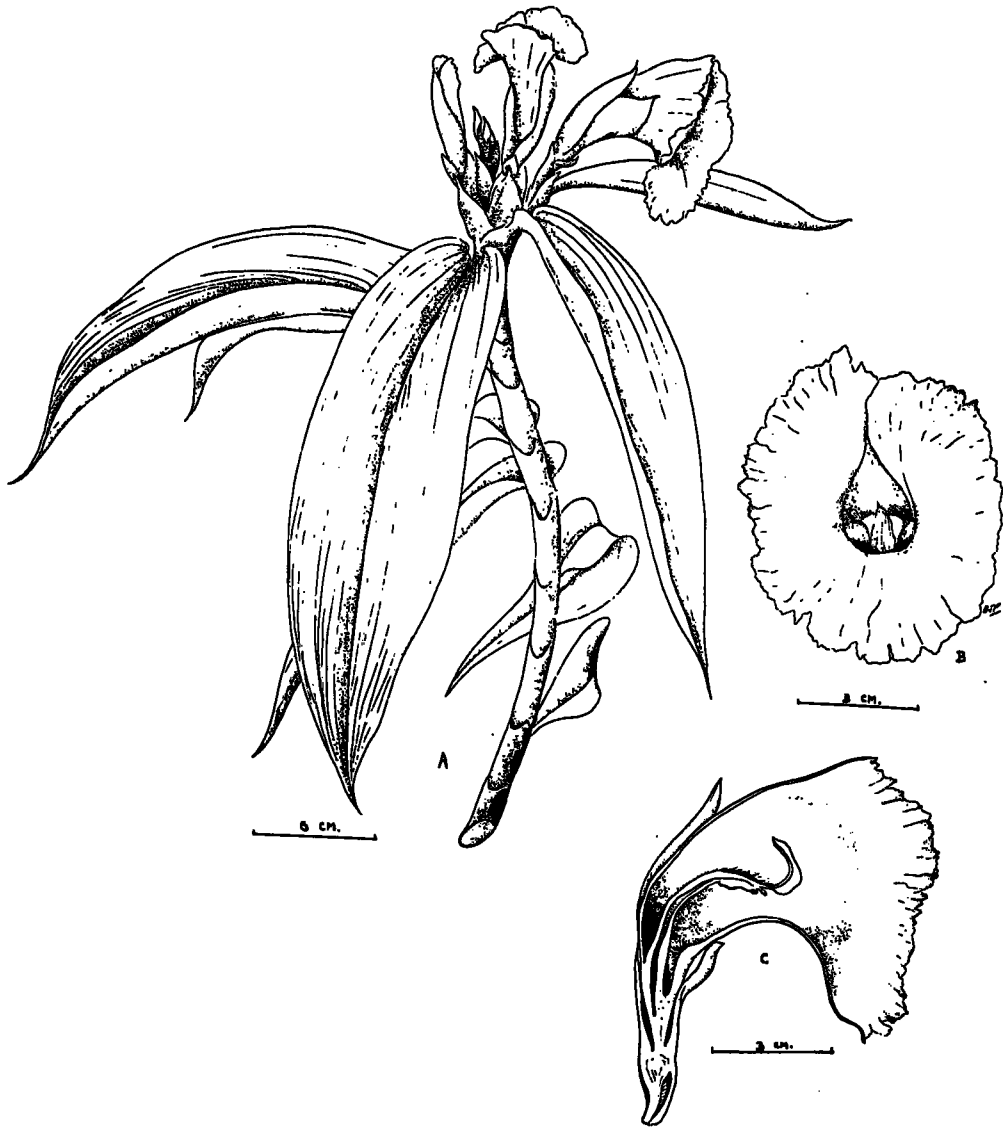


FIG. 512. *Costus speciosus*. A, apical portion of stem with leaves and flower spike. B, flower dorsal view. C, longitudinal section of flower.

2. *Costus speciosus* (Koen.) Smith in Trans. Linn. Soc. 1: 249. 1791. (Fig. 512).

Costus arabicus Jacq.—*Hellenia grandiflora* Retz.—*Banksia speciosa* Koenig.

Sinh. Thebu; *Tam.* Kottam, Kudavam, Kuravam, Kuttam, Kuttaiyidukki, Kugai-manjal, Malaivasambu, Ubariyavi, Vengottam; *Hindi* Keu, Kust; *Sans.* Brahmatirihā, Kashmira, Kemuka, Kushtha, Kushthabheda, Padmakarna, Padmapatra, Padmapatramula, Padmapunya, Padmavarnaka, Paushkara, Pushkarajata, Pushkaramula, Sagara, Shulaghna, Shura, Shvasari, Subandhu, Vira, Virapushkaravhaya, Vriksharuha.

Tall herbaceous biennial with a stout, tuberous, insipid rootstock, stem 2—3 m tall, stout, erect; leaves simple, spirally arranged, 15—30 cm or more long, sessile, oblong, acute, acuminate or cuspidate, silky beneath, sheath coriaceous, ligule absent; flower spike terminal, sessile, many flowered, 5—10 cm diam; bracts 2.5—3.7 cm long, ovate, acuminate, bright red, as long as the corolla-tube; calyx-tube 2.5 cm long, infundibular, 3-lobed, lobes ovate, cuspidate; corolla-tube as long as the calyx, segments longer than the tube, acute, lip suborbicular, white with yellow centre, 5—7.5 cm diam., concave, plicate and crisped, margins sometimes meeting in the middle disc pubescent and with a tuft of hairs at the base; stamens linear, 3.7—5 cm long with a tuft of hairs at the base of the filament which is confluent with an oblong, petaloid limb, pubescent on the sides, produced into a recurved, lanceolate, glabrous appendage as long as the linear anther cells, staminodes absent; ovary inferior, subglobose, pubescent, 3-locular with many ovules, style filiform, stigma clavate, mouth semi-lunar, ciliate; fruit globose trigonous red capsule, 2.5 cm diam., dehiscent, seeds arilled.

Flowers from January to March and in June.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 2014. 1853; Rheede, *Hort. Mal.* 11: pl. 8. 1692; Kirtikar and Basu, *Indian Med. Plants*, pl. 947. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, Ceylon, Malaya, China and Philippine Islands. It is rather rare in Ceylon found in shady places in the low-country. Morawak Korale, Ambagamuwa, Kadugannawa, Nilgala, etc.

India. Pen. Ind. Or., Coimbatore, *Herb. Wight 2797*, Kew Distribution 1866—8. Ceylon. North Western Prov., Madampe, *Simpson 9969*, Aug. 1932. Central Prov., Ambagamuwa, *Thwaites C.P. 3082*; Ginigathhena, *Simpson 8553*, Sept. 1931. Southern Prov., Morawak Korale, *Herb. Peradeniya*, March 1881. Andaman Islands *King's Collector*, Dec. 1892.

Uses. The root is useful for catarrhal fevers, coughs, dyspepsia, worms and skin diseases. In Bengal, it is used as a depurative and aphrodisiac. In Malaya, the juice of the fresh rhizome is given as a purgative. In Java it is administered for dysentery and syphilis.

3. *Curcuma aromatica* Salisb. Perad. Lond. t. 96. 1808.

Curcuma zedoaria Roxb.

Engl. Cochin Turmeric, Wild Turmeric, Yellow Zedoary; *Sinh.* Dadakaha, Walkaha; *Tam.* Kasturi-manjal, Kattu-mannal; *Hindi* Banhaldi, Banharidra, Janglihaldi; *Sans.* Aranyaharidra, Sholi, Sholika, Vanahaladi, Vanaharidra, Vanarishta.

A biennial herb with a large rootstock of palmately branched, sessile, annulate, biennial tubers, yellow and aromatic within; leaves simple, 22.5—30 cm long, oblong, caudate-acuminate, base deltoid, green, often variegated above, pubescent beneath, petioles 60—90 cm long, green; flowering stem appearing before or with the leafing stem, as thick as the forefinger, sheathed; flowers somewhat irregular, bisexual, in spikes 15—30 cm long and about 2.5 cm diam.; flower bracts 3.7—5 cm long, recurved, ovate, cymbiform, tip rounded, pale green connate below forming pouches for the flowers, empty bracts 5—7.5 cm long, red or pink, flowers shorter than bracts; calyx tubular; corolla pinkish-white with a yellow fragrant lip, tube 2.5 cm long, limb 3-partite, upper half funnel-shaped, lateral segments oblong, upper longer, ovate, concave, overarching the anther; staminodes obtuse as long as corolla segments, lip deflexed, orbicular, obscurely 3-lobed; stamen 1, filament short, adnate to the lateral staminodes, anther not crested, bases of cells spurred, incurved; ovary inferior, 3-locular, many-ovuled, style filiform, stigma 2-lipped, lips ciliate; fruit globose, pericarp membranous at length 3-valved.

Flowers in January and February.

Illustrations. Salisbury, Peradeniya. Lond. *Pl.* 96. 1808; Curtis, Bot. Mag. *pl.* 1546. 1813; Wight, Ic. Pl. Ind. Or., *pl.* 2005. 1853; Kirtikar and Basu, Indian Med. Plants, *pl.* 935. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is rather rare and is found growing in damp shady places in the low-country in Ceylon. Pussellawa, Gampola, etc., often cultivated.

Ceylon. Central Prov., Gampola, *Thwaites* C. P. 3705, Feb. 1862.

Uses. The rhizome of this plant is considered a tonic and carminative. Combined with other astringents it is applied on bruises and sprains.

4. *Curcuma domestica* Valet. in Bull. Jard. Ser' 2, 27; 31 & 153. 1917—1918.

Curcuma longa Trim. non Linn.

Engl. Turmeric; *Sinh.* Ath-kaha, Kaha; *Tam.* Manjal; *Hindi* Haldi; *Sans.* Aneshta, Bahula, Bhadra, Dirgharaga, Gandhapala-shirka, Gauri, Gharshani, Haladi, Haridra, Harita, Hemaragi, Hemaragini, Hridvilasini, Jayanti, Jvarantika, Kanchani, Kaveri, Krimighni, Kshanada, Kshapa, Lakshmi, Mangalaprada, Mangalaya, Mehaghni, Nisha, Nishakhya, Nishavha, Pavitra, Pinga, Pinja, Pita, Pitavaluka, Pitika, Rabhangavasa, Ranjani, Ratrinamika, Shifa, Shiva, Shobhana, Shyma, Subhagavhaya, Suvarna, Suvarnavarna, Tamasini, Uma, Vara, Varangi, Varavarnini, Varnadatri, Varnavati, Varnini, Vishaghni, Yamini, Yashitapriya, Yuvati.

A biennial herb, 1—1.5 m tall with a tuberous rootstock provided with tuberiferous root fibres; rootstock and rhizomes orange-yellow, annular, cylindrical, rhizomes distichous, placed fan-wise on rootstock, 3—4 on each side, 5—7.5 cm long, obfuciform each terminating in a bud with several lateral branchlets; leaves large, lamina 28—60 cm long, 9—15 cm broad oblong, acuminate, aristate, tapering to the petiole, glabrous on both sides, bright green on the upper surface, paler below, undulate, petioles 11—22 cm long, channelled on the upper surface continued into sheaths which are 12—29 cm long and equitant; flowers bilaterally symmetrical, bisexual, yellowish-green, 5 cm long, 1.5 cm broad, 2 or 3 at various stages of growth at the axil of each bract together forming a strobilus-like pedunculate spike at the top of the rootstock, peduncle 10 cm long, spike 10—14 cm long, 3—4 lowest bracts sterile and sheathing the lower end of the strobilus, spical bracts also sterile, white, oblong to obovate, 5 cm long, 2.5 cm broad, light green to white, obtuse and recurved at the middle, all bracts fused to axis at the base and lower half of the margin, bracts of individual flowers white, linear to oblong, 2.9—3.5 cm long, 1.2—1.7 cm broad; flowers sessile, calyx-tube membranous, 1.2 cm long, segments 3, inconspicuous; corolla-tube funnel-shaped, limbs 3, oblong, 1.5 cm long, 0.9—1 cm broad, dorsal limb clawed, petaloid staminodes 3 fused to corolla-tube together forming a tube 3.7 cm long, segments free, 2-lipped, lower lip recurved and yellow in colour, upper lip of 2 segments carrying the fertile stamen with membranous filament in between, anther not crested, forming a pocket for the stigma, bases of cells spurred and incurved; stamens 3, two at the base sterile, 4 mm long, filament inconspicuous and the fertile one adnate to the staminode-tube and carried up; ovary inferior, hairy, 3-carpellary, 3-locular with many axile ovules in each loculus, style 4.3 cm long, stigma 2-lipped; fruit not seen.

Flowers in October.

Illustration. Herb. Peradeniya, drawing.

Distribution. A native of Southern Asia and now largely cultivated in India, Ceylon, China, Java and other tropical countries. It is grown in the mid and moist low-country in Ceylon.

Ceylon. Central Prov., Peradeniya, *Herb. Peradeniya*, Sept. 1919; Gannoruwa, *Herb. Peradeniya*, July 1924; Beddewela, School Garden, *Herb. Peradeniya*, Nov. 1919.

Composition. The rhizomes of this herb contain fat, starch, camphor, resin, curcumin, a volatile oil, d- α phellandrene, carvone and cucumone.

Uses. The dried rhizome is much used as a condiment and a yellow dye is made from it for dyeing robes of Buddhist priests. The fresh rhizome is crushed and applied externally on bruises, sprains, wounds and leech-bites. Internally, it is given as an anthelmintic and in disorders of the blood. It is administered for diarrhoea, dysentery, flatulence, dyspepsia, colic jaundice and amenorrhoea. Inhalation of the fumes of burning dry turmeric relieves colds in the head and catarrh. In Ceylon, a paste of it is applied on prurigo, urticaria, boils, sprains and bruises, and given internally for rheumatism, bronchial ailments and snake-bites. The rhizomes are roasted with *Vernonia zeylanica* and applied on eczema of the legs with beneficial results.

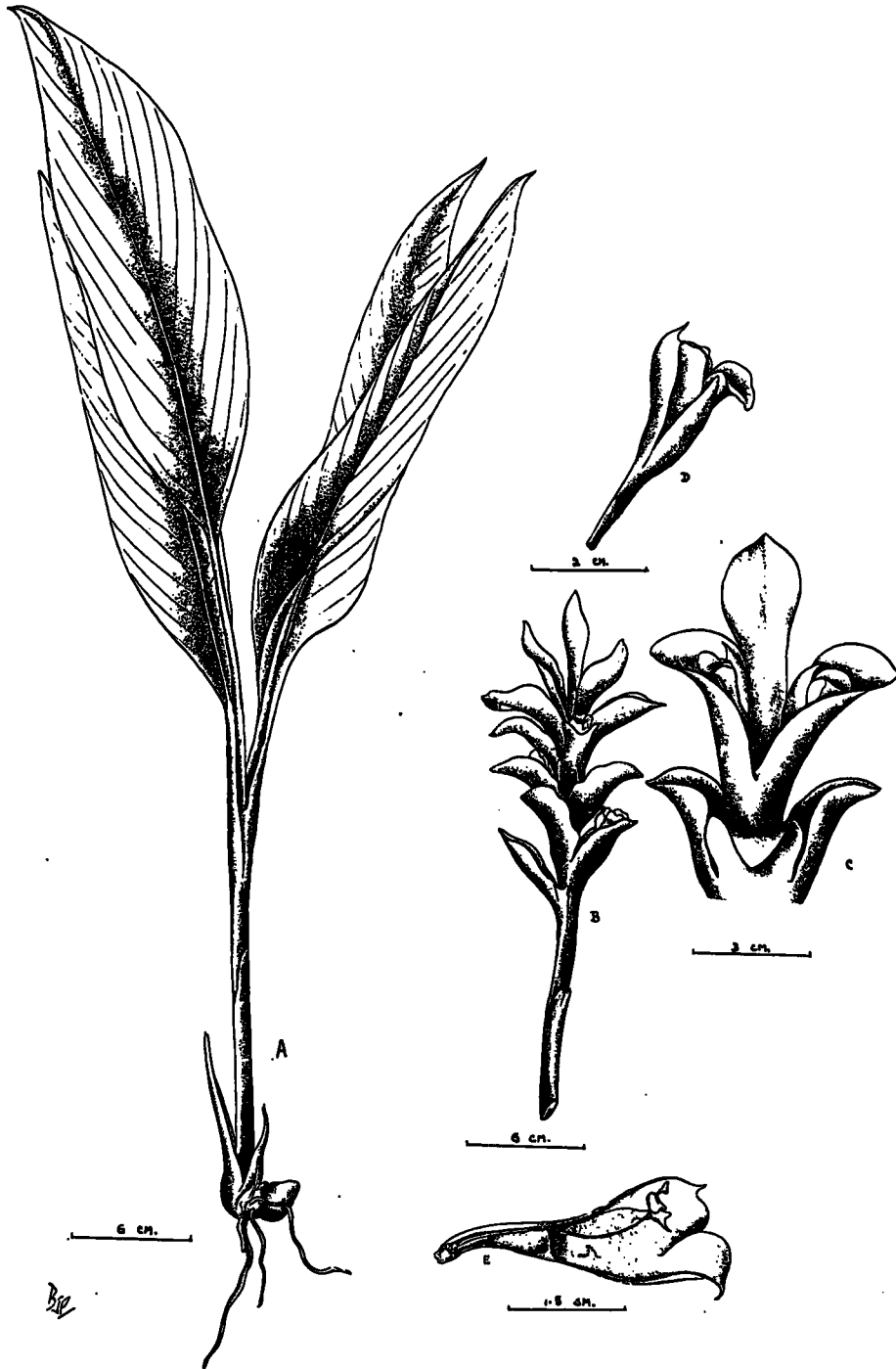


FIG. 513. *Curcuma zedoaria*. A, plant with leaves and tuber. B, flower spike. C, part of spike showing bracts and flowers. D, flower lateral view. E, longitudinal section of flower. D and E, without the ovary.

5. *Curcuma zedoaria* (Berg.) Roscoe Monandr. Pl. 109. 1828. non Roxb. (Fig. 513).

Curcuma zerumbet Roxb.—*Curcuma officinalis* Salisb.—*Curcuma speciosa* Link.—*Amomum zedoaria* Berg.—*Amomum zerumbeth* Koen.—*Amomum latifolium* Lamk.—*Roscoea nigrociliata* Hassk.—*Roscoea lutea* Hassk.—*Costus nigricans* Blanco—*Costus luteus* Blanco.

Engl. Zedoary; *Sinh.* Harankaha; *Tam.* Kichilikilhangu, Pulankilhangu; *Hindi* Kachura, Kalihaladi; *Sans.* Dravida, Duriabha, Gandhamulaka, Gandhasara, Jatala, Kalpaka, Karchura. *Karshya*, *Mukhya*, *Shathi*, *Vedhya*.

A biennial herb with a very stout rootstock and many sessile, cylindrical, oblong and palmately branched annulate tubers, pale yellow or white inside with a camphoraceous smell and bitter spicy taste, also bearing fleshy fibres that terminate in smaller oblong, less fragrant tubers; leaves simple, 4—6 subfarious, 30—60 cm long, oblong-lanceolate, finely acuminate, glabrous on both sides, clouded with purple down the middle, petioles long, narrowly winged; flowers somewhat irregular, bisexual, pale yellow, flowering stem 20—25 cm long, appearing before the leaves, stout, clothed with obtuse sheaths; spike 10—12.5 cm long, 7.5 cm diam., flower bracts 3.7 cm long, ovate, recurved, cymbiform, green tinged with red, empty bracts 5 cm long, crimson or purple; calyx tubular, obtusely toothed; corolla-tube twice as long as the calyx-tube, funnel-shaped, limb 3-partite, lateral segments oblong, dorsal segment longer overarched the anther; stamen 1, filament short, adnate to lateral staminodes which are short broadly oblong and petaloid, anther not crested, bases of cells spurred and incurved; lip 1.2 cm broad, orbicula, deflexed, obscurely 3-lobed; ovary inferior, 3-locular, many ovuled, style filiform, stigma 2-lipped, lips ciliate; fruit ovoid, trigonous, thin, smooth, bursting irregularly. seeds oblong, aril lacerate, white.

Flowers from January to March.

Illustrations. Roxburgh, *Corom. 2: pl.* 101. 1798; Rheede, *Hort. Mal. 11: pl.* 7. 1692; Kirtikar and Basu, *Indian Med. Plants, pl.* 934B. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, Ceylon, Malaya, and cultivated elsewhere. It is generally grown in damp shady places in the moist low-country in Ceylon.

India. Assam: Dalgaon, *Chatterjee* 170/9, April 1902. *Ceylon.* Central Prov., Peradeniya, *Bot. Gard., Herb. Peradeniya*, Feb. 1918. Without locality, *Thwaites C. P.* 3373.

Composition. The rhizomes of this plant yield a volatile oil (zedoary oil) with cineol, camphene, zingiberine, borneol, camphor, curcumin, zedoarin, gum, starch and resin.

Uses. The rhizomes possess aromatic, stimulant and carminative properties. Externally, they are applied on wounds, ulcers, sprains and certain types of dermatitis. In Ceylon they are used as tonic and carminative, while in Java and India a decoction of it is given at child-birth. The rhizome is supposed to check leucorrhoeal and gonorrhoeal discharges and act as a purifier of blood. In Cambodia, mothers chew the rhizomes and apply the saliva on the head and body of children suffering from convulsions.

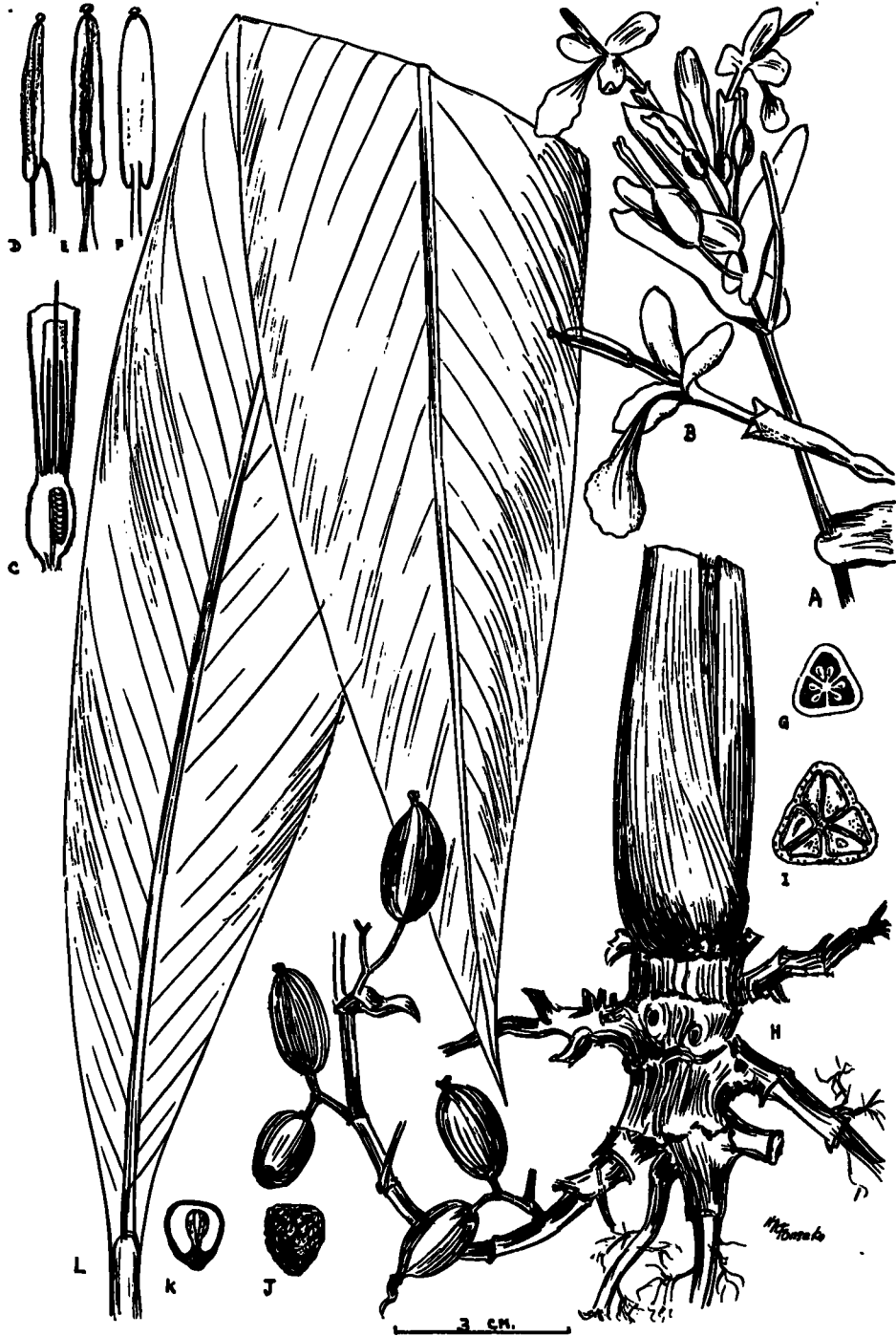


FIG. 514. *Elettaria repens*. A, small racemose portion of a flowering branch arising from the axil of a large bract. Similar small bracts located opposite the base of each pedicel. B, open flower lateral view. C, longitudinal section of the base of the flower showing two acicular staminodes. D, lateral view of anther and style. E, dorsal view. F, ventral view. G, transverse section of ovary. H, base of the stem with a fruit-bearing branch. I, transverse section of fruit. J, seed. K, longitudinal section of seed. L, leaf.

6. *Elettaria repens* (Sonner.) Baill., Abeywick. Ceyl. Journ Sci. 2 (2): 145. 1959. (Fig. 514).

Elettaria cardamomum Maton.—*Alpinia cardamomum* Roxb.—*Amomum cardamomum* White non Linn.—*Amomum repens* Sonnerat.—*Amomum racemosum* Lamk.—*Cardamomum officinale* Salisb.—*Alpinia granum-paradisi* Moon.—*Matonia cardamomum* Smith.

Engl. Malabar Cardamom; *Sinh.* Ensal; *Tam.* Anji, Elam, Ilangi, Irvadi, Kalindam, Korangi, Sukkumam, Sittelam, Taduvairi, Tiraladi, Tudi, Turutti, Vedi; *Hindi* Chhotielachi, Chhotiilayetchi, Ilayechi; *Sans.* Bahula, Bhringaparnika, Chandrabala, Chandrasambhava, Chandrika, Chhardikaghna, Chhardikaripu, Divodbhava, Dravidi, Ela, Gandhakuti, Gundhaphalika, Garbhara, Gaurangi, Kapotavarni, Korangi, Kshudraila, Kunati, Nishkuti, Prithvika, Putika, Shoetaila, Sugandhi, Sukshmaila, Tikshnagandha, Triputa, Truti, Tuttha, Tvachisugandha, Upakunchika, Vayastha.

A perennial herb with a fleshy, branching, annulate rootstock, stem 2—3 m tall, clothed below with spongy sheaths; leaves simple, subsessile, distichous, 30—90 cm long, 7.5—15 cm broad, caudate-acuminate, glabrous or more or less pubescent above, puberulous beneath, acute, sheaths very long, half surrounding the stem and overlapped by those below, sparsely villous at the top, ligule short and broad; flowering stems several from the rootstock, branches long up to 60—90 cm bracts at the internodes, linear-oblong, 3.7—5 cm long, membranous, persistent; flowers irregular, bisexual, in short 3—4-flowered racemes, shortly pedicelled, bracteolate; calyx-tube about 1.2 cm long, membranous, glabrous, 3-lobed or toothed; corolla-tube cylindrical, as long as the calyx, segments 3, linear-oblong, 1.2 cm long, pale green, tips rounded; androecium of 6 parts in two rows, the outer row consisting of three unequal staminodes inserted at the mouth of the corolla-tube, two being small, horizontal, horn-like, somewhat twisted opposite bodies, and the third large, petaloid (labellum), rhomboidal spatulate from a narrow base, obscurely 3-lobed and with the margin undulated, white with pink or purple veins, the inner row also of 3 unequal parts, two being small, barren, acicular staminodes inserted on the top of the ovary (epigynous), and the third a fertile stamen inserted at the mouth of the corolla between the horn-like staminodes of the outer row, filament rather short, connective thick and fleshy, anther 2-celled, adnate, introrse, the cells contiguous but separated by the style which passes up between them; ovary inferior, smooth, ovoid, 3-locular, style very slender and thread-like, thickened above, stigma capitate, small, hairy, occupying the space between the summits of the two anther cells; fruit oblong-ovoid, 1.2—1.8 cm long, bluntly triangular, smooth, striate, pale yellowish-grey, pointed, tipped with the withered perianth, pericarp thin, dehiscing loculicidally into 3 valves, seeds several in each chamber, closely packed, angular, obtusely wedge-shaped, dark brown, axile, endosperm farinaceous.

Flowers in April and May.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 267. 1880; Roxburgh, *Pl. Corom.* 3: pl. 226. 1820; Rheede, *Hort. Mal.* 11: pl. 4—5. 1672; Kirtikar and Basu, *Indian Med. Plants*, pl. 948. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in southern India especially near the Malabar coast and frequently cultivated in Ceylon.

Ceylon. Central Prov., Peradeniya, Bot. Gard., *Herb., Peradeniya*, Jan. 1883; *Baker* 128 May 1907; Muruthalawa, Dehigama, *Appuhamy*, 1951; Hantane, *Thwaites C. P.* 2431; Panwila, Gavatenne, *Webber*, June 1884; Urugala, *Anderson*, March 1883.

Composition. The seeds of this plant contain a volatile oil and starch.

Uses. The fruit is an aromatic carminative, stimulant, stomachic, and emmenagogue. It is given internally for diseases of the liver and uterus and applied externally on tumours of the uterus. The seed is diuretic and used to relieve the retention of urine. It is administered to children to prevent excessive vomiting. In Cambodia, the root is used as a laxative and tonic.

The seed of *Elettaria ensal* (Gaertn.) Abeywick., a common species growing in the forests of the moist regions of Ceylon, is also used medicinally for the same ailments.

7. *Globba bulbifera* Roxb. in *Asiat. Res.* 11: 358. 1810.

Globba marantinoides Trim.

Sinh. Hingum-piyali; *Tam.* Kachula-kelangu; *Sans.* Chandramulika.

Tufted, erect perennial herb, stem 60—75 cm high, slender, erect or somewhat drooping arising from a tufted rootstock, roots of fleshy fibres; leaves simple, few, distichous, 12.5—17.5 cm long, 3—4 cm broad, shortly petioled, oval to oblong-lanceolate, acuminate, midrib stout, green, paler beneath, sheath long, ligule very short, ciliate; spike or raceme 5—7.5 cm long, bracts loose, broadly oval-oblong, lower bract spreading or deflexed, green and persistent; flowers irregular, bisexual, lemon-yellow, very shortly pedicelled, lower flowers replaced by ovoid yellow bulbils 4—6 mm diam.; calyx-tube short, cylindric, obscurely 3-lobed; corolla-tube very slender, 8 mm long, segments subequal, oblong, shorter than the tube, lateral staminodes petaloid contiguous to the corolla lobes, lip deeply bifid, deflexed; stamen 1, filament long, slender, incurved, anther 2-celled, oblong, cells parallel, narrow, winged on both sides, wings spreading, deeply 2-fid; ovary inferior, unilocular, with 3 parietal placentas, style filiform, upper part placed in a groove in the filament, stigma turbinate; fruit oblong, terete, smooth, 6 mm long, at length dehiscent, seeds small, lacerate.

Flowers in January, February and June.

Illustration. Wight, *lc. Pl. Ind. Or., pl.* 2001. 1853.

Distribution. Occurs in India, Ceylon and Malaya. It is rare in shady places in dry low-country in Ceylon. Batticaloa, Nilgala, etc.

Ceylon. Without locality, *Thwaites C.P.* 3563. Uva Prov., Nilgala, *Herb. Peradeniya*, Jan. 1888.

Uses. The rhizome of this plant is used for the same ailments as *Kaempferia galanga* L. is employed.

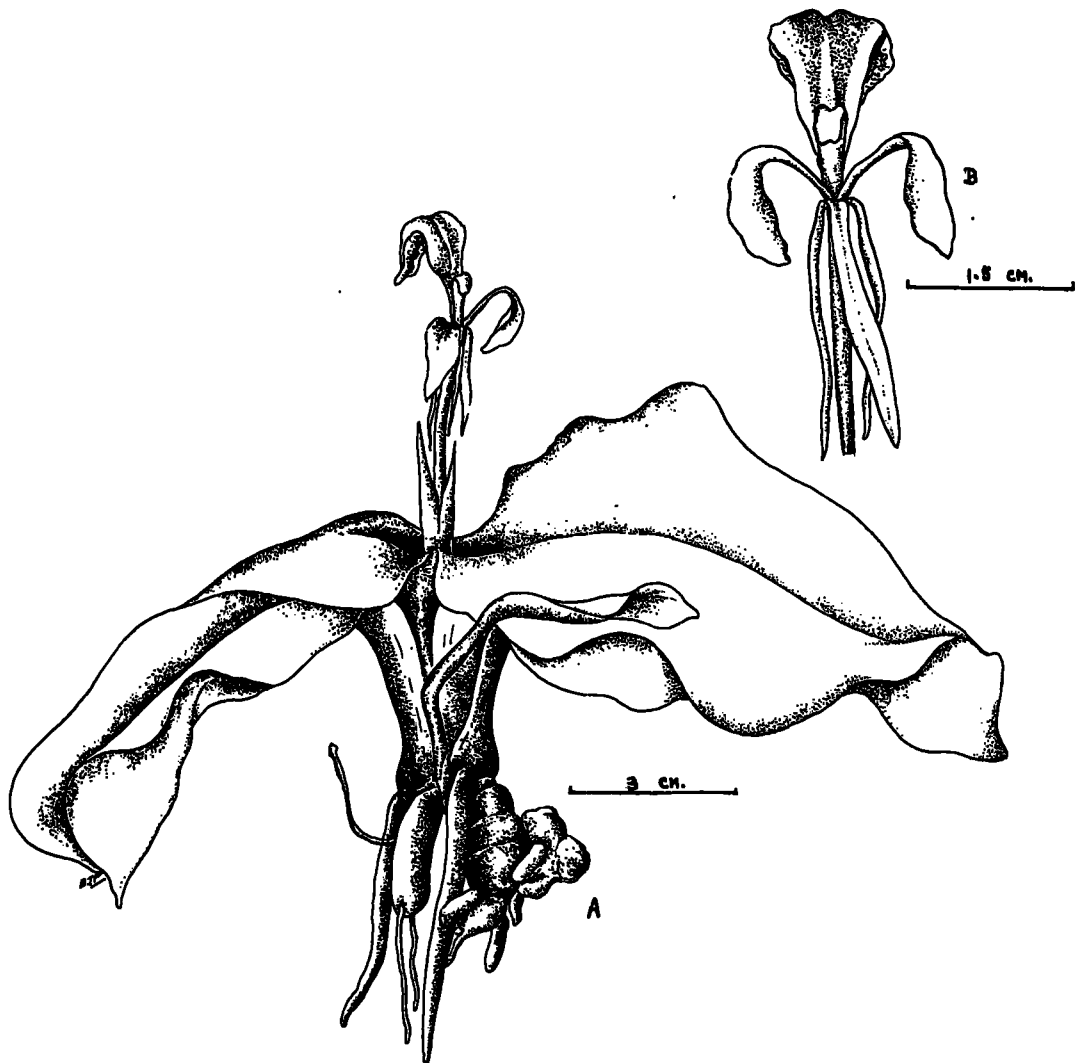


FIG. 515. *Kaempferia galanga*. A, full grown plant with tubers, leaves and flower: B, flower dorsal view.

8. *Kaempferia galanga* Linn. Sp. Pl. 3. 1753. (Fig. 515).

Kaempferia sessilis Koenig.—*Kaempferia humilis* Salisb.—*Kaempferia rotunda* Blanco—*Kaempferia plantaginifolia* Salisb.—*Kaempferia latifolia* Hornem.—*Alpinia sessilis* Koenig.

Sinh. Hinguru-piyali; *Tam.* Kachula-kelangu, Kacholam; *Hindi* Chandramula; *Sans.* Chandramulika, Sugandha-wacha.

A small herb with an aromatic, tuberous rootstock and fleshy, cylindrical root fibres which are not aromatic; leaves few, 2 spreading horizontally, lying flat on the surface of the ground 6.2—12.5 cm long, 4.3—8.7 cm broad, rotund-ovate, deltoid-acuminate, thin deep green, 10—12—ribbed, margins not thickened nor coloured, petioles short channelled; flowers irregular, bisexual, white, 6—12 from the centre of the plant between the leaves, fugaceous, fragrant, opening successively, bracts lanceolate, green, short; calyx as long as the outer bracts, short, cylindrical, splitting spathaceously; petals 3, gamopetalous, corolla-tube 2.5 cm long, lobes equal, usually spreading, lanceolate, pure white, a little shorter than the tube; lip more than 2.5 cm long and nearly as broad, deeply 2-lobed, lobes with a lilac spot at the base; stamen 1, perfect, filament short, arcuate, anther 2-celled, cells discrete, on a wide connective which is produced above into a petaloid crest, lip a quadrate, 2-lobed appendage, lateral staminodes 1-1.8 cm long, cuneate-obovate, white; ovary inferior, 3-locular, ovules on three axile placentas, style long, filiform, stigma turbinate; fruit an oblong capsule with a thin pericarp, seeds subglobose with a lacerate aril.

Flowers during June and July.

Illustrations. Wight, *Ic. Pl. Ind. Or., pl.* 899. 1843—1845; Rheede, *Hort. Mal.* 11: *pl.* 41. 1692; Kirtikar and Basu, *Indian Med. Plants, pl.* 938. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Malaya, Moluccas and Philippine Islands. It is frequently cultivated in village gardens in Ceylon.

Composition. The rhizome contains a volatile oil which consists of cinnamic acid ethyl ester, borneol, camphene, cineol, paraeumarin, cinnamic acid and anisic acid. It also contains traces of an alkaloid, starch, gum and minerals.

Uses. The rhizome of this plant mixed with oil is used externally for healing of wounds and applied warm on rheumatic regions. The sliced rhizome tied as a poultice hastens suppuration of boils (furuncles). A lotion prepared with the rhizome is used to remove dandruff or scales from the head. It is a stimulant, carminative and diuretic. The powdered rhizome mixed with bees' honey is given for coughs and pectoral ailments. The tubers are much used in perfumery and as a masticatory. In the Philippines, a decoction of the rhizome is taken as a tonic and for dyspepsia, headache and malarial chills. It is also used as a gargle.

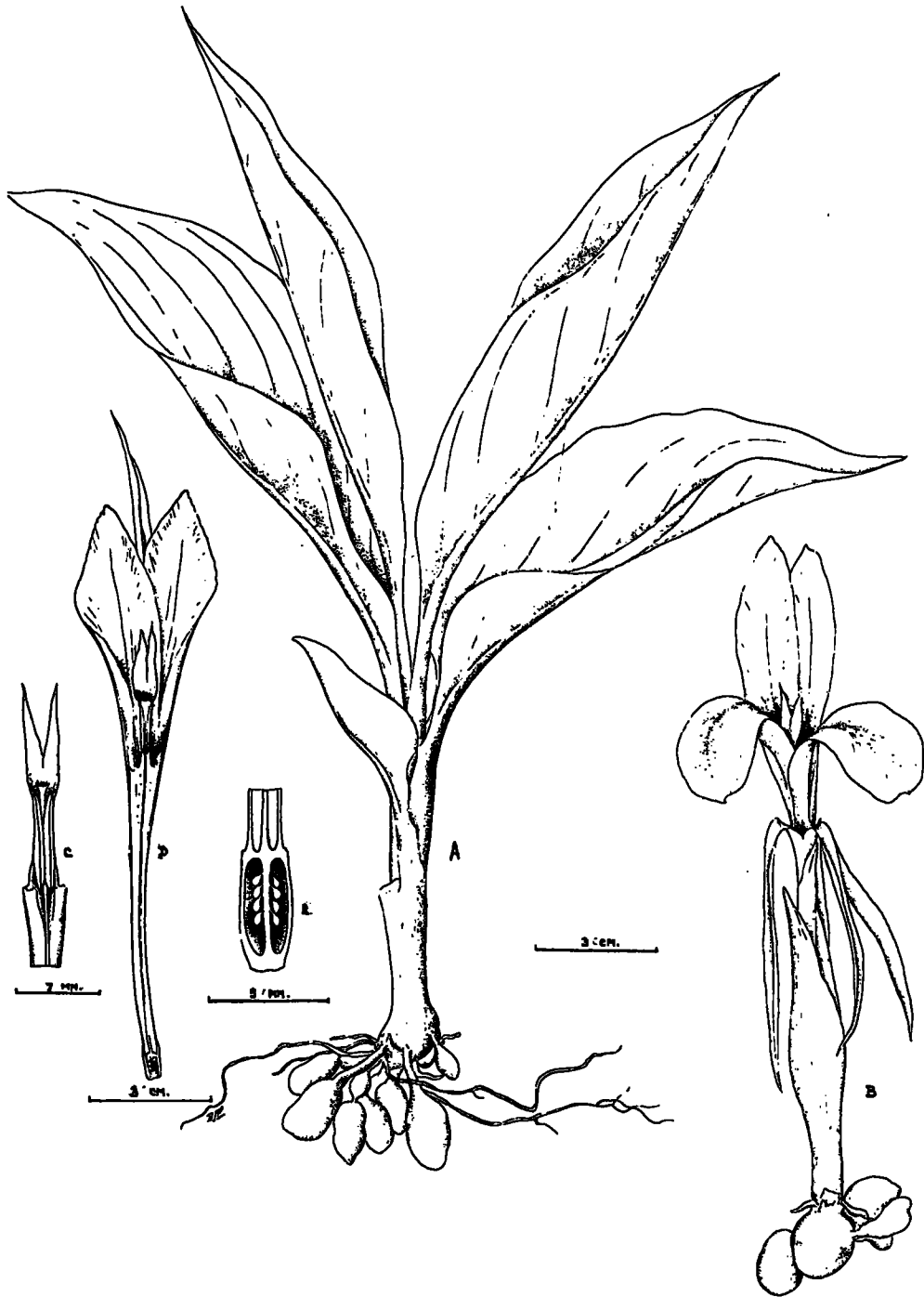


FIG. 516. *Kaempferia rotunda*. A, plant with leaves and tubers. B, flowering spike with tubers, C, stamen with appendage and style. D, longitudinal section of flower. E, longitudinal section of ovary.

9. *Kaempferia rotunda* Linn. Sp. Pl. 3. 1753. (Fig. 516).

Kaempferia longa Jacq.—*Kaempferia versicolor* Salisb.

Sinh. Ankenda, Saukenda, Yawakenda; *Hindi* Bhuichampa; *Sans.* Bhuchampaka, Bhumichampa.

A biennial herb with a tuberous rootstock and many, thick, fascicled, succulent root fibres bearing oblong tubers 2.5—5 cm long; leaves simple, few, erect, 30 cm long, 7.5—10 cm broad, oblong, acuminate, mottled green above, beneath pale red purple, base contracted into a long, cylindric, purple-brown sheath; flowers irregular, bisexual, sweet-scented, in oblong, sessile, 4—6 flowered spikes produced before the leaves, clothed with large purple imbricating bracts; flowers very large, 5 cm broad, bracts oblong, acute, inner 5—7.5 cm long, outer shorter; calyx tubular, nearly as long as the corolla-tube, minutely toothed, spathaceous, slit on one side; corolla-tube 5—7.5 cm long, segments white, 5—6.2 cm long, narrowly linear-lanceolate, acuminate, widely spreading, margins involute; stamen 1, anther erect opposite the lip, cells linear on the margins of a broad connective which is produced into an appendage divided to the base into 2, erect, lanceolate or subulate segments, lateral staminodes white, 3.7—5 cm long, erect, oblong, obtuse, petaloid, lip deflexed, darker green bright violet-purple, deeply cleft into 2, suborbicular, coloured lobes as long as the staminodes and broader; ovary inferior, 3-locular with axile placentation, style long, filiform, stigma globose or turbinate, mouth ciliate; fruit oblong, or ovoid, pericarp thin, seeds subglobose, aril lacerate.

Flowers in March and April.

Illustrations. Curtis, Bot. Mag. pls. 920 and 6054; Wight, Ic. Pl. Ind. Or., pl. 2029. 1853; Rheede, Hort. Mal. 11: pl. 9. 1692; Kirtikar and Basu, Indian Med. Plants, pl. 940. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malay Peninsula and cultivated elsewhere. It is not uncommon in the low-country but does not grow wild in Ceylon.

Ceylon. Without locality, *Thwaites C.P.* 3175. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, March 1889.

Composition. The rhizome yields an essential oil of a light yellow colour containing cineol.

Uses. The rhizomes and leaves ground into an ointment with oil is effective in healing fresh wounds and reducing swellings. Taken internally it removes blood clots from the blood stream. According to Chopra, the rhizomes are used for mumps with good results. In Java, the rhizomes and leaves are added for flavouring foods, while in Malaya they are used for making cosmetics.



FIG. 517. *Languas calcarata*. A, apical portion of a stem with leaves and flower panicle. B, longitudinal section of a flower.

10. *Languas calcarata* Merr. in Lingnan Sc. Journ. 1927, 5: 51. 1928. (Fig. 517).

Alpinia calcarata Rosc.—*Alpinia erecta* Lodd. & Steud.—*Alpinia bracteata* Rosc.—*Alpinia cernua* Sims.—*Renealmia calcarata* Haw.—*Globba erecta* Retz.

Sinh. Heen-araththa.

Rhizomatous perennial herb with a non-tuberous rootstock, stems slender, about 75 cm tall; leaves simple, alternate, 25—32 cm long, 2.5—5 cm broad, lanceolate, acuminate, long-pointed, glabrous on both surfaces and shining on the upper surface, scantily hairy along the margin, petioles sheathing, sheaths varying in length from 10—44 cm, ligule prominent, about 1 cm long and membranous; flowers irregular, bisexual, in pedunculate, terminal, dense-flowered panicles 8.5 cm long, two flowers together at each node, one opening earlier than the other, each bearing a pair of bracteoles, the inner one smaller than the outer, bracteoles oblong, papery white, 1—1.5 cm long, 0.6—1 cm broad; flowers irregular, bisexual, about 4 cm long, pedicels short, hairy; sepals 3, fused into a campanulate tube 1 cm long, pubescent outside, glabrous inside, apices rounded; petals 3, fused at base but segments free tinged with pink, segments oblong-spathulate, pubescent outside, dorsal segment 2 cm by 0.9 cm, lateral narrow; staminodes 3, fused at base with the stamen into a tube adnate to corolla, two basal staminodes reduced to minute filaments, the larger one petaloid, 3 cm by 2.3 cm ovate, yellow with vinous red streaks, emarginate, apex frilled and darker, glabrous and shining on both surfaces; stamen 1, anther tubular, style passing through, filament flat, 1.5 cm long, anther 0.8 cm long, style 3.5 cm in length, tinged pink, hairy towards the apex and stigma swollen; ovary inferior, 3 mm long, strongly pubescent, 3-locular, with many ovules in each loculus on a central axis, capsule not seen.

Illustrations. Wight, Ic. Pl. Ind. Or., *pl.* 2028. 1853; Edward, Bot Reg. *pl.* 141. 1816.

Distribution. Occurs in the southern Malay Peninsula, Concan and Ceylon. It is common, usually cultivated for medicinal purposes, in village gardens in Ceylon.

Ceylon. Central Prov., Peradeniya, Bot. Gard., *Herb. Peradeniya.*, Sept. 1896; *Senaratne* 42, July 1928.

Uses. A decoction of the rhizome of this plant is given for rheumatism. It is also used as a fomentation on rheumatic joints.

11. *Languas chinensis* Koenig in Retz. Obs. 3: 65. 1783.

Heritiera allughas Retz.—*Alpinia allughas* Rosc.—*Hellenia allughas* Willd.—*Zingiber nigrum* Gaertn.

Sinh. Alan, Alu, Alugas, Kelaniya; *Tam.* Shitta-rattai; *Sans.* Taraka.

A perennial herb with a stout, tuberous, aromatic rootstock and tall, stout stems 1—2 cm high; leaves simple, very shortly petioled, 30—45 cm long, 7.5—15 cm broad, linear-oblong or oblong-lanceolate, acuminate with usually a twisted cusp, glabrous, base acute, sheath compressed, ligule rounded; flowers irregular, bisexual, pink, in erect, decompound terminal panicles 15—30 cm long, pubescent, tomentose, lax or dense-flowered, branches short, ascending, with linear, deciduous bracts 10—15 cm long at the lower forks, shortly pedicelled; calyx-tube 0.8—1.2 cm long, subcampanulate, obtusely 2—3-toothed; corolla-tube as long as the calyx, segments longer than the tube, linear oblong, cymbiform, dorsally pubescent, shortly spurred below the hood tip; tip 2.5 cm long including the slender claw, cuneiform or nearly orbicular, bifid, margin waved and erose, claw as long as the limb, base with two fleshy teeth; stamen 1, filament broad, concave, nearly as long as the anther, cells distant, linear, glabrous, connective produced into a small-lobed crest; ovary inferior, 3-locular, style filiform, glabrous, stigma subglobose, small; fruit globose, 1.6 cm diam., pericarp black, fragile, seeds small, black with a spongy or fleshy aril.

Flowers from January to March.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 2026. 1853; Rheedee, *Hort. Mal.* 11: *pl.* 14. 1692; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 950. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, Ceylon, China and Malay Islands. It is rather common in wet places in the low-country in Ceylon.

China. Lantao Island. Hongkong, *Tsiang Ying* 674, June 1928; Canton, Kwangtung, *Wan Tong Shan* 339, June 1902.

Uses. The rhizome of this plant is used in the form of an infusion in fever, rheumatism and catarrhal ailments. It is also used for bronchitis, dyspepsia, and bronchial catarrh.

12. *Languas galanga* (Linn.) Stuntz in U.S. Dept. Agri. Bur. Pl. Ind. Bull. No. 261. 21. 1912.

Maranta galanga Linn.—*Languas vulgare* Koenig.—*Alpinia galanga* Sw.—*Alpinia viridiflora* Griff.—*Alpinia rheedii* Wight.

Engl. Greater Galangal, Java Galangal; *Sinh.* Aratta, Kaluwala; *Tam.* Anāndam, Arattai, Ardubam, Attumam, Kandanaguliyam, Ormarundu, Perarattai, Sattiratji, Sugandam, Tittiram, Tumberattagam; *Hindi* Barakalijan, Barakulanjan, Kulanjan, Kulinjan; *Sans.* Aruna, Dhumala, Elaparni, Gandhamula, Gandha-varuni, Kapidruma, Koraja, Kulanja, Kulanjana, Mahabharavacha, Nakuli, Patala, Purusha, Raktarenu, Raktapushpa, Rasna, Sugandha, Sugandhavacha, Sugandhayoga, Tikshnamula.

A perennial tuberous herb with elongate leafy stems and slightly aromatic rootstock; leaves cauline, 22.5—45 cm long, 3.7—11.2 cm broad, oblong-lanceolate, acute, glabrous, green above, paler beneath with slightly callous white margins, sheaths long, glabrous, ligule about 1 cm long and rounded; flowers irregular, bisexual, greenish white in dense-flowered panicles 15—30 cm long, branches short, rachis pubescent, pedicels 0.3—0.4 cm long, bracts 1 cm long, ovate-lanceolate; calyx 1 cm long, tubular, irregularly 3-toothed; corolla gamopetalous, 3 cm long, tube 1.2 cm long, lobes oblong, obtuse, subequal, 0.6 cm broad, lip 2.1 cm long, claw green, 6 mm long, 2.5 mm broad, blade white striated with red, about 1.2 cm long, broadly elliptic, shortly 2-lobed at apex with a pair of subulate glands at the base of the claw; stamen 1, perfect, 1.8 cm long, filament flattened, anther cells diverging at the top occasionally with an orbicular crest, lateral staminodes minute or obsolete; ovary inferior, 3-locular, ovules few on an axile placenta, style filiform, stigma subglobose; fruit orange red, indehiscent.

Flowers in May.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 949. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs throughout India, Ceylon, China and Malay Islands. It is commonly cultivated in the mid and low-country in Ceylon.

India. Malabar, Concan, etc. *Stocks, Law, etc.* Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Alston* 2107, June 1927. Without locality, *Thwaites C.P.* 3729.

Uses. An infusion of the rhizome of this herb is given for rheumatism, fever, impotency, bronchitis, dyspepsia and diabetes. The juice of the rhizome is given with human urine for cobra-bite poisoning. In Mysore, it is used for bronchial catarrh and in China, the seeds are used for colic, diarrhoea and vomiting.



FIG. 518. *Zingiber officinale*. A, underground rhizome with a young shoot, leaf shoot cut half-way and a flowering shoot. B, leaf. C, flower dorsal view. D, longitudinal section of flower. E, fertile stamen with connective wrapped round the style, enlarged.

13. *Zingiber officinale* Roscoe in Trans. Linn. Soc. 8: 348. 1807. (Fig. 518).

Anomum zingiber Linn.—*Zingiber blancoi* Hassk.

Engl. Ginger; *Sinh.* Inguru, Sidhinguru; *Tam.* Allān, Arttiragam, Attiragam, Inji, Kulumamulam, Kodataram, Maruppu, Sangai, Sigaram, Singaveram, Singiveram, Sukku, Sundi, Ubugallam; *Hindi* Ada, Adrak, Sonth; *Sans.* Anupama, Apakrishnaka, Ardraka, Ardrashaka, Chandrakhya, Gulmamula, Kandara, Katbhadra, Katukkata, Manchhaka, Mahija, Mulaja, Rahuchhana, Saikateshtha, Sharnga, Shringahera, Sushakaka, Sunti, Vara.

A perennial herb with a large, solid, tough, horizontal rhizome, consisting of a series of many persistent roundish joints, pale yellow within, covered with pale silvery brown skin, ringed with leaf scars, and each marked at the summit by a large, circular, flat scar, much branched, the new joints coming off below the terminal scars; roots numerous, large, cylindrical, fleshy, thick, brittle, semi-transparent, yellow; barren leafy stems erect, 90—120 cm high, entirely covered by leaf sheaths; leaves simple, alternate, distichous, sheaths long, lax, standing away from the stem, terminating in two small, rounded auricles, smooth, pale green, blade absent or nearly so in the lower leaves, in the upper about 20—30 cm long, spreading lanceolate-linear, tapering at both ends often much so at the apex, very shortly petiolate, smooth, bright green, paler and with a prominent midrib beneath; flowers stems shorter than the leafy ones, 15—30 cm high, erect, slender, surrounded with a few loose, blunt leafsheaths, the upper ones sometimes with a short blade; flowers few, rather small, sessile, soon withering, each surrounded by a smooth, thin, convolute bract, and placed in the axils of large, concave, smooth, striate, greenish-yellow obtuse bracts with membranous margins, which are closely placed at the summit of the flowering stem, strongly imbricated and collectively form an ovate oblong, blunt, dense, cone-like terminal spike 5—7.5 cm long; calyx tubular, split half-way down one side, membranous, superior; corolla orange-yellow, speckled, the tube much exceeding the calyx, divided above into 3 nearly equal, spreading or reflexed, linear-oblong, blunt segments, the posterior one rather the largest; staminodes 6, in two rows, the outer row of 3 inserted at the mouth of the corolla, the posterior 2 small and horn-like, the anterior (labellum) petaloid, rather shorter than the corolla lobes, purple with paler spots, divided into 3 blunt, rounded lobes, the central one much the largest; the inner row of staminodes represented by two elongated filiform bodies on top of the ovary, and a fertile stamen inserted at the mouth of the corolla, filament very short, connective prolonged above the anther into an entire horn-like process wrapped round the end of style, anther cells in contact, oblong-linear; ovary inferior, 3-locular with numerous ovules, style passing up behind and between the anther cells and extending beyond them, stigma tufted, fruit not seen.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 270. 1880; Rheede, *Hort. Mal.* 11: pl. 12. 1692; Kirtikar and Basu, *Indian Med. Plants*, pl. 944. 1933; *Herb. Peradeniya*, drawing.

Distribution. Widely cultivated in tropical countries and is probably a native of the Pacific Islands. It is commonly grown in all vegetable gardens in Ceylon.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Cuba. Santiago de las Vegas, *Baker* 101, Nov. 1935.

Composition. The rhizome of this herb contains a pungent principle, mainly zingerone and shogaol, while the aroma is due to a volatile oil containing camphene, phellandrene, zingiberene, cineol and borneol. It also contains gingerol, a yellow pungent body, an oleo-resin, gingerin, the active principle, and other resins and starch. Read adds the following constituents: zingerone, zingiberol, citral, linalool, geraniol, chavicol, vanillyl alcohol, caprylic acid, methyl heptenon, pelargon-aldehyde and malate.

ZINGIBERACEAE

Uses. Ginger rhizomes are used both in the fresh and dry forms. They are stomachic, carminative, stimulant, diaphoretic, sialagogue and digestive. They are extremely valuable for dyspepsia, flatulence, colic, vomiting and other pains in the stomach and bowels. They are effective for colds, coughs and fevers. Dry ginger and coriander boiled in water is a universal remedy for colds and fevers. With black and long pepper, it is a specific for diarrhoea given with bees' honey. The expressed juice of the fresh rhizome given gradually in increasing doses is regarded as a diuretic for general dropsy. The juice with garlic and bees' honey is a favourite remedy for coughs and asthma.

It is often used in the fresh form for flavouring curries, in sauces and cool drinks. Ginger preserve is an ingredient in cakes and other confectioneries.



FIG. 519. *Zingiber zerumbet*. A, portion of the leafing stem with leaves. B, flowering stem with spike. C, flower lateral view. D, corolla of flower opened out showing the stamen and style. E, pistil. F, longitudinal section of ovary.

14. *Zingiber zerumbet* (Linn.) Smith, Exot. Bot. 2: 105. 1805. (Fig. 519).

Zingiber spurium Koenig.—*Zingiber cassumunar* Naves.—*Amomum zerumbet* Linn.—*Amomum spurium* Gmel.—*Amomum sylvestre* Poir.—*Zerumbet zingiber* Lestib.

Sinh. Walinguru; *Hindi* Mahabaribach, Narkachur; *Sans.* Ahava, Avanti, Karpuraharidra, Kolanjana, Kumbhika, Sthulagranthi, Viranam.

A perennial herb with a very large but not much branched rootstock, hard, tuberculous, root fibres vermiform; leafing stem 1.6—2 m tall, about 1.2 cm diam., cylindrical, glabrous; leaves dichotomous, 25—30 cm long, 5—7.5 cm broad, sessile, oblong-lanceolate or oblanceolate, acuminate, glabrous, base narrowed, ligule 1.2—1.8 cm long, truncate, membranous; flowering stem 30—45 cm long, stout, usually flexuous, clothed with long appressed obtuse sheaths with sometimes rudimentary blades; flowers irregular, bisexual, in spikes 7.5—10 cm long, 5 cm diam., conico-oblong; bracts 2.5—3.7 cm long, closely imbricate, ovateoblong, tip rounded, glabrous, green, bright red in fruit, margins membranous; calyx-tube cylindric, 2.5 cm long, appressed to corolla-tube, 3-toothed, glabrous; corolla-tube 3.1 cm long, segments very pale yellow, ovate-lanceolate, acuminate, dorsal hooded, lateral segments smaller, adnate to the base of the lip; lip shorter than corolla segments, sessile, dark yellow, 3-lobed, lobes obtuse, median lobe the longest; stamen 1, filament short, anther glabrous, anther cells contiguous, parallel, connective ending in a long erect incurved slender beak as long as the cells, grooved in front and embracing the top of the style, style glabrous, stigma minute, funnel-shaped, mouth ciliate; ovary inferior, 3-locular, many ovuled; fruit 2.5 cm long, oblong, at length dehiscent, seeds 4 mm long, oblong, black, arillate.

Flowers in June.

Illustrations. Smith, Exot. Bot. 2: pl. 112. 1805; Wight, Ic. Pl. Ind. Or., pl. 2003. 1853; Curtis, Bot. Mag. pl. 2000. 1818; Rheede, Hort. Mal. 11: pl. 13. 1692; Kirtikar and Basu, Indian Med. Plants, pl. 945. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya, Java, Philippine Islands and other tropical countries. It is cultivated in the low-country in Ceylon up to 2000 feet altitude.

Ceylon. Central Prov., Kandy, *Alston* 2223, Oct. 1927; Without locality, *Thwaites* C. P. 3699.

Uses. The powdered rhizome is given as an anti-diarrhoeic. In India, it is used as a hot remedy for coughs, asthma, worms, leprosy and other skin diseases. In the Philippines, a decoction of the rhizome is prescribed for asthma and as a topical in rheumatism. In Madagascar, the boiled rhizome is given for pulmonary ailments.



PLATE XXXII. *Tribulus terrestris*, plant with leaves, flowers and fruits.



PLATE XXXII. *Tribulus terrestris*, plant with leaves, flowers and fruits.

120. ZYGOPHYLLACEAE

1. *Tribulus terrestris* Linn. Sp. Pl. 387. 1753. (Plate XXXII).

Tribulus lanuginosus Linn.

Engl. Calthrops; *Sinh.* Gokatu, Heengokatu, Nerenchi, Sembunerenchi; *Tam.* Nerunji, Sirunerinji; *Hindi* Gokhru; *Sans.* Bahukantaka, Bhakshataka, Chanadruma, Gokantaka, Gokhura, Gokshura, Gokshuri, Ikshugandha, Kanta, Kantaphala, Kshudragokshura, Kshudrakshura, Kshura, Laghugokshura, Palankasha, Shadanga, Shvadanshtra, Sthalashringataka, Sudumstra, Trikantaka, Vanshringataka.

An annual herb with numerous, long, prostrate, more or less hairy or hispid branches; leaves opposite, pair usually unequal, pinnate with 3—6 pairs of opposite, nearly sessile leaflets which are 0.3—1.2 cm long, oblong, apiculate, white and silky beneath, slightly silky above, stipules lanceolate, acute; flowers regular bisexual, bright yellow, 1.2—1.8 cm diam., solitary, axillary or leaf-opposed, pedicels slender, and shorter than leaves; sepals 5, distinct, linear, acute, imbricate; petals 5, distinct, imbricate, rounded, longer than sepals, fugaceous; stamens 10, distinct, alternate ones opposite petals longer, disc annular, 10-lobed; ovary superior, 5, locular with several superposed ovules in each loculus, bristly, style short, stout; fruit spherical, spiny, consisting of 5 distinct, indehiscent, glabrous or hairy cocci each with two pairs of sharp spines, one pair longer than the other, often muricate, seeds several in each coccus with transverse partitions between them, exalbuminous.

Flowers throughout the year.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 98. 1838; Kirtikar and Basu, *Indian Med. Plants*, pl. 168. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and other tropical countries. It is very common in sandy ground especially in the dry low-country in Ceylon. Trincomalee, Jaffna, Batticaloa, etc.

India. Tibet. Occ., *T. Thomson*; Gyantse, *Walton*, 1904. Mysore & Carnatic: *G. Thomson*. N. W. India: Etawak, *Clarke* 21957B. Ceylon. Northern Prov., Talaimannar, *Silva*, July 1916. Southern Prov., Hambantota, *Alston* 766, Dec. 1926. Without locality *Thwaites* C. P. 1252. Maldiv Islands. Male, *Gardiner*, 1899—1900. Ecuador. *Spruce*.

Composition. The entire plant contains alkaloids, glucosides and saponins, while the fruits contain fixed oil, unsaturated acids, essential oil, resins and a small amount of nitrates. The oil contains peroxidase, diastase, trace of glucosides and protein.

Uses. Water rendered mucilaginous by this plant is drunk as a remedy for impotency. A decoction or infusion of the stem is given for gonorrhoea. The fruit is valued as a diuretic, aphrodisiac and for stones in the bladder. In China, it is used for coughs, spermatorrhoea, scabies and ophthalmia. Both the fruit and seeds are used as a gargle for ulcers and inflammations in the mouth. In Africa, it is used as a tonic, an astringent in diarrhoea, galactagogue, diuretic, gonorrhoea and for diseases of the throat and eye. The leaf is cooked and eaten in West Africa.