

MEDICINAL PLANTS

(Indigenous and Exotic) Used in Ceylon

PART IV

MAGNOLIACEAE—RUBIACEAE

with 115 illustrations including eight colour plates

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INTRODUCTION

Part IV of the Medicinal Plants used in Ceylon deals with 37 families i.e. Magnoliaceae to Rubiaceae. This includes 158 species of plants which are described and 122 of these are illustrated. Out of these five species are endemics and they do not appear as medicinal plants in other publications. Four are exotics which are not grown in Ceylon. The island's requirements of the latter drugs are imported from India and the neighbouring countries. Exotics which are cultivated in Ceylon number 36. Coconut, Arecanut and Jak-fruit though common are exotics which are cultivated commercially and for food. The commonly used species such as cloves, nutmeg, pepper, etc. are also included.

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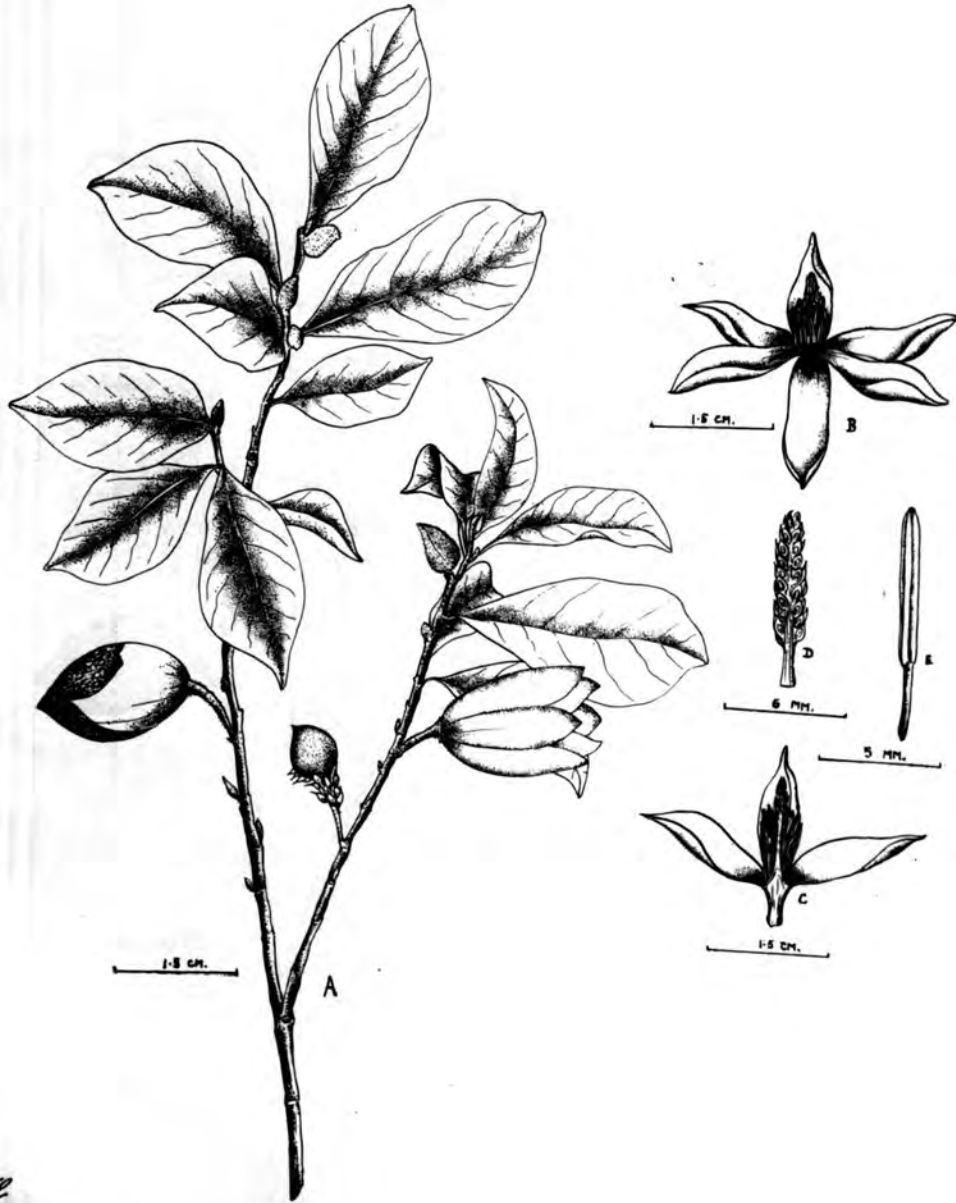


FIG. 349. *Magnolia fuscata*. A, twig with leaves and flower buds. B, flower, lateral view. C, longitudinal section of flower. D, longitudinal section of pistil. E, stamen.

62. MAGNOLIACEAE

1. *Magnolia fuscata* Andr. Bot. Rep. pl. 229. 1799—1811. (Fig. 349).

Michelia fuscata Blume.

Sinh. Madana-kama; *Tam.* Madanakam-poo.

A much-branched, evergreen spreading shrub, about 4 m high with ferruginous, tomentose twigs; leaves simple, alternate, 7—10.5 cm long, 0.2—4.5 cm broad, oblong-lanceolate, entire, shortly acuminate, acute at apex, tapering to a short, stout petiole, dark green and shining on the upper surface, pale green beneath, thick, coriaceous, pubescent along the prominent midrib beneath, petioles 3—5 mm long, ferruginous tomentose; stipules long, linear, fused enveloping the young leaf, soon falling off as the leaf expands; flowers regular, bisexual, solitary, axillary, erect, 4—5 cm across, purplish white, fragrant on stout, ferruginous tomentose peduncles 1—1.3 cm long; calyx fused covering the corolla, ferruginous tomentose outside, glabrous within, breaking off irregularly and falling off early as the flower opens; petals 6, free, thick, purplish white, overlapping each other, outer ones oblong-lanceolate, 2.5 cm long, 1.2 cm broad, inner ones lanceolate, 1.7 cm long, 0.6 cm broad; stamens numerous, round the base of the gynophore, filaments chocolate-brown, 3 mm long, anthers linear, 4 mm long; ovary superior, of many free and glabrous carpels arranged on a lax elongate spike, each carpel containing 2 basal ovules; fruit not seen.

Flowers throughout the year.

Illustrations. Andrews, Bot. Rep. pl. 229. 1799—1811; Herb. Peradeniya, drawing.

Distribution. Occurs in China and is now cultivated both in the hill-country and mid-country in Ceylon.

Ceylon. Central Prov., Hakgala, Bot. Gard., *Herb. Peradeniya*, 1887.

Composition. The leaves of this shrub contain the alkaloids, magnolamine, magnoline and tetrandrine.

Uses. The seeds and flowers are used for making preparations for strengthening sexual virility. The bark is a stimulant, expectorant and astringent, and the root a purgative.

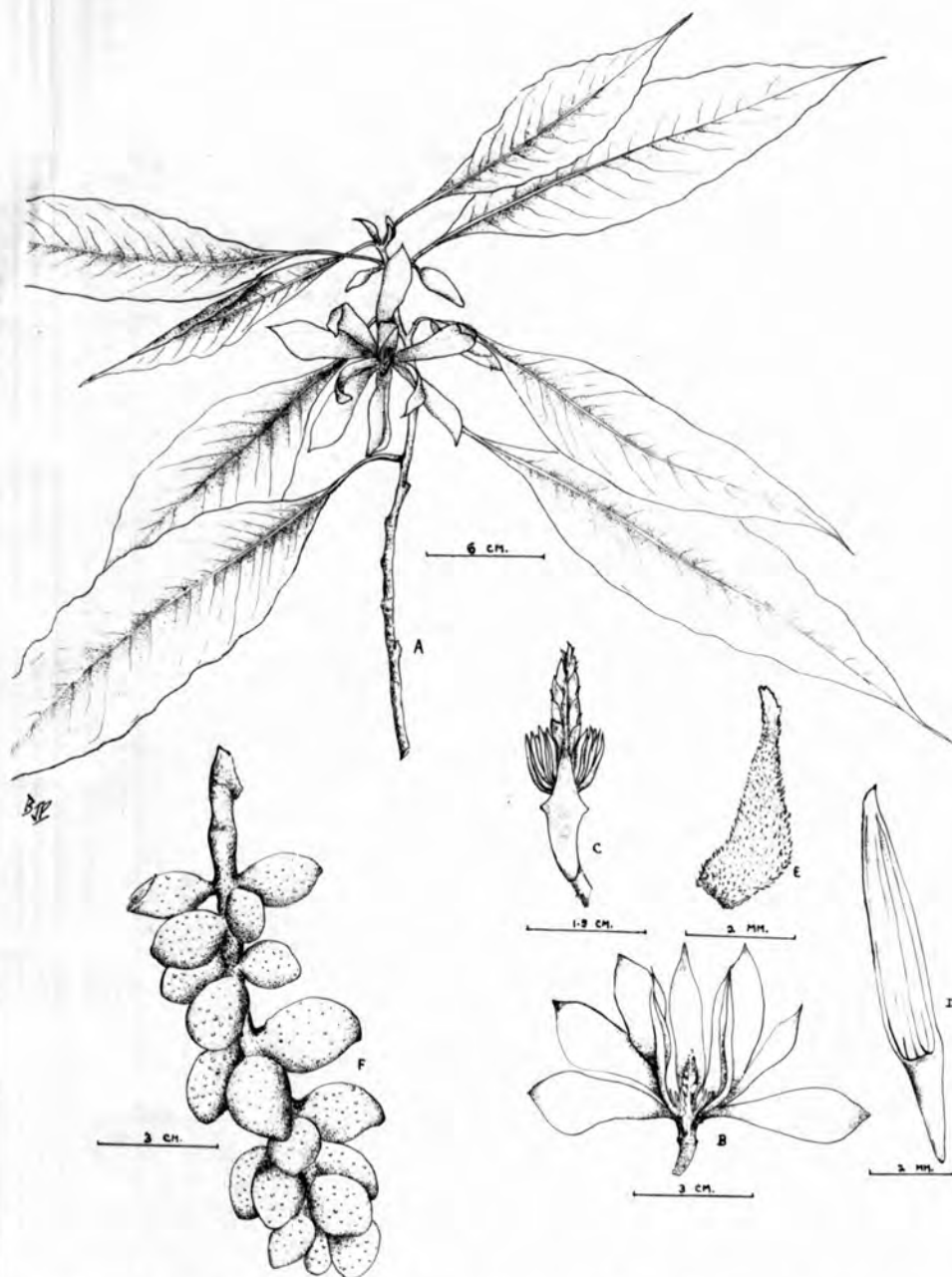


FIG. 350. *Michelia champaca*. A, branch with leaves and flowers. B, longitudinal section of a flower. C, longitudinal section of androecium, gynoecium and gynophore. D, stamen. E, carpel. F, fruits.

2. *Michelia champaca* Linn. Sp. Pl. 536. 1753. (Fig. 350).

Michelia rufinervis DC.—*Michelia doldsopa* Ham. ex DC.—*Michelia aurantiaca* Wall.—*Michelia rheedii* Wight.

Sinh. Hapu, Sapu, Gini-sapu; *Tam.* Amariyam, Sambagam, Sembagam, Shampagni, Vandumarmalar; *Sans.* Anjana, Atigandhaka, Bhramaratithi, Bringmohi, Chambunala, Champaka, Champeya, Deepapushpa, Gandhaphali, Hemanga, Hemapushpa, Hemapushpaka, Hemavha, Kamabana, Kanchana, Katu, Kumara, Kusuma, Kusumadhipa, Kusumadhirata, Nagapushpa, Patichampaka, Peetapushpa, Punyagandha, Rajachampaka, Shatapadatithi, Shitala, Shitalachhada, Sthiragandha, Sthirapushpa, Subhaga, Sukumara, Surabhi, Svarnachampaka, Svarnapushpa, Uragandha, Vanadapika, Vanadeepa, Vanamalika, Varalabha.

A tall, handsome, evergreen tree with a straight trunk and ascending and spreading branches forming a compact head; leaves simple, stipulate, 17.5—25 cm long, 5—8.7 cm broad, lanceolate, acute, acuminate, entire, glabrous above except when young, glabrous or pubescent beneath, petioles 1.8—2.5 cm long; stipules connate in pairs, enveloping the leaf buds, deciduous as they open; sepals and petals similar, 15 or more, deep yellow or orange, imbricate, the outer oblong, acute and the inner linear; stamens numerous, many-seriate, anthers linear, adnate, introrse; carpels many, persistent, 2-valved, arranged in a lax or elongate spike, gynophore stipitate, capsules 1.8 cm long, dark brown, opening on the back by two valves, valves woody, orbicular, covered with white warty excrescences; seeds 1—12, brown, polished, variously angled, rounded on the back, pendulous by a long funicle.

Flowers from April to September.

Illustrations. King, Ann. Bot. Gard. Calc. 3: pl. 64; Wallich, Pl. As. Rar. pl. 147. 1830; Kirtikar and Basu, Indian Med. Plants, pl. 26. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the forests of temperate Himalaya from Nepal eastwards and in Pegu, Tenasserim, Nilghiris and Travancore upto 3000 feet altitude. It also grows in Sumatra, Java and China. It is cultivated in the mid-country in Ceylon for its timber.

India. Nepal: Wallich 969; 971A, 1821. Uttar Pradesh: Dehra Dun, Aziz 1, May 1921. Bengal: Clarke 11721A, May 1870. Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, Alston 1650, May 1927; de Silva 17, June 1927; de Silva 33, Feb. 1928. Burma. Rangoon; Wallich 6492A. Thailand. Saigon, Bot. Gard., cultivated, Pierre 189, April 1876.

Composition. The leaves, stems, fruits and seeds of this tree contain an unnamed alkaloid. According to Nadkarni, the bark contains a volatile oil, fixed oil, resin, tannin, mucilage, starch and sugar. The volatile brown oil from the bark contains cineol, isoeugenol, benzoic acid, benzyl alcohol, benzaldehyde and p-cresol methyl ether. The flowers, seeds and bark contain a bitter aromatic principle.

Uses. The leaves are applied to indolent swellings and the leaf-juice is taken to relieve colic. The bark is used in the treatment of low intermittent fevers. The root bark is an emmenagogue and purgative. The flowers are a stimulant, carminative, demulcent and diuretic. An infusion of the flower is recommended for dyspepsia and fevers. The mascerated flowers are excellent for cephalalgia, ophthalmia, rheumatism, vertigo and gout. The oil from the seeds relieves flatulence when rubbed on the abdomen. The flower yields champaka oil which is used as a perfume.

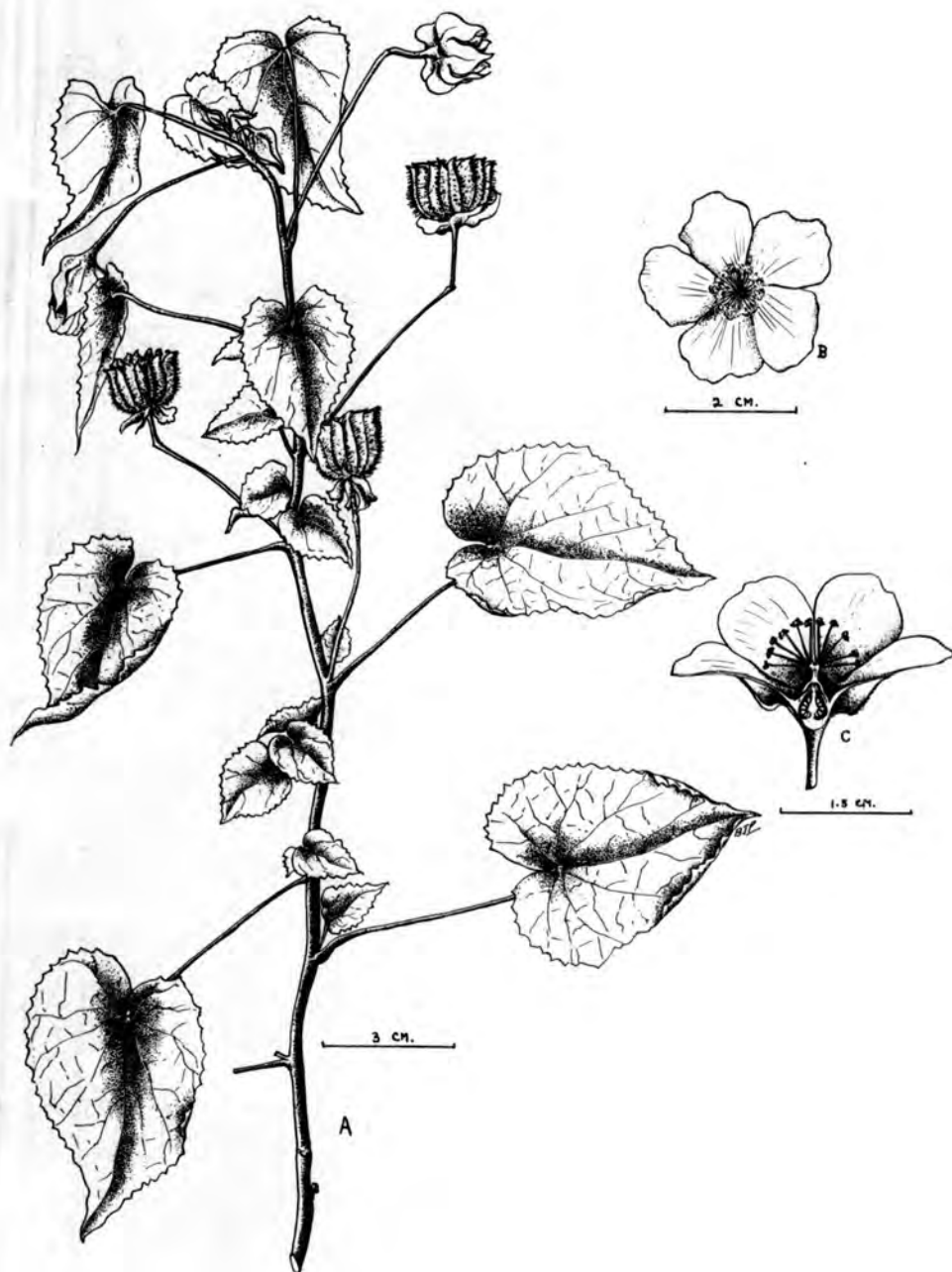


FIG. 351. *Abutilon asiaticum*. A, branch with leaves, flowers and fruits. B, flower, dorsal view. C, longitudinal section of flower.

63. MALVACEAE

1. *Abutilon asiaticum* D. Don, Gen. Syst. 1: 503. 1831. (Fig. 351).

Sida asiatica Linn.

Engl. Country Mallow; *Sinh.* Anoda, Maha-bevila; *Tam.* Perundutti, Tutti; *Sans.* Kalikhanghi.

A slightly branched, densely pubescent, erect shrub; leaves simple, alternate, stipulate, 3.5 cm long, ovate, deeply cordate at base, acute, dentate-serrate, slightly hairy and rugose on the upper surface, velvety beneath with prominent veins; petioles 3.2—3.8 cm long, tomentose; flowers regular, bisexual, yellow, solitary and axillary, large, 5 cm diam., pedicel 3.7—5 cm long, stout, jointed near the top, tomentose, bracteoles and epicalyx absent; sepals 5, fused about halfway, lobes oval, acuminate, 3-veined, ultimately deflexed, hairy outside and densely pubescent within; petals 5, convolute, adnate to stamen-tube at base; stamens numerous, filaments fused into a tube; ovary superior, many carpellary; fruit of about 20 ripe carpels, densely covered at the back with long white hair, pointed but not beaked, dehiscent along the back and at the top, seeds 3 to a carpel, smooth and kidney-shaped.

Flowers from July to September.

Illustrations. Cavanilles, Diss. 1: *pl.* 7, *fig.* 2. 1785; Cav. Diss. 5: *pl.* 128, *fig.* 1. 1788.

Distribution. Occurs along the east and west coasts of India and Ceylon. It is rather rare in Ceylon, growing in waste ground especially in the dry zone.

Ceylon. North - Central Prov., Anuradhapura, *Thwaites C.P.* 1135. Eastern Prov., Kottiyar, Allai Tank, *Nevill*, 1890.

Composition. The leaves of this shrub contain mucilage, tannin, organic acids and traces of asparagin.

Uses. Used for rheumatism and to allay thirst and vomiting. The leaves boiled in coconut milk and ground into a paste are applied on boils, sores, ulcers, etc., to draw out pus. They are used for piles. In Ghana, the leaves are mashed in water and the liquid taken with local peppers for gonorrhoea.

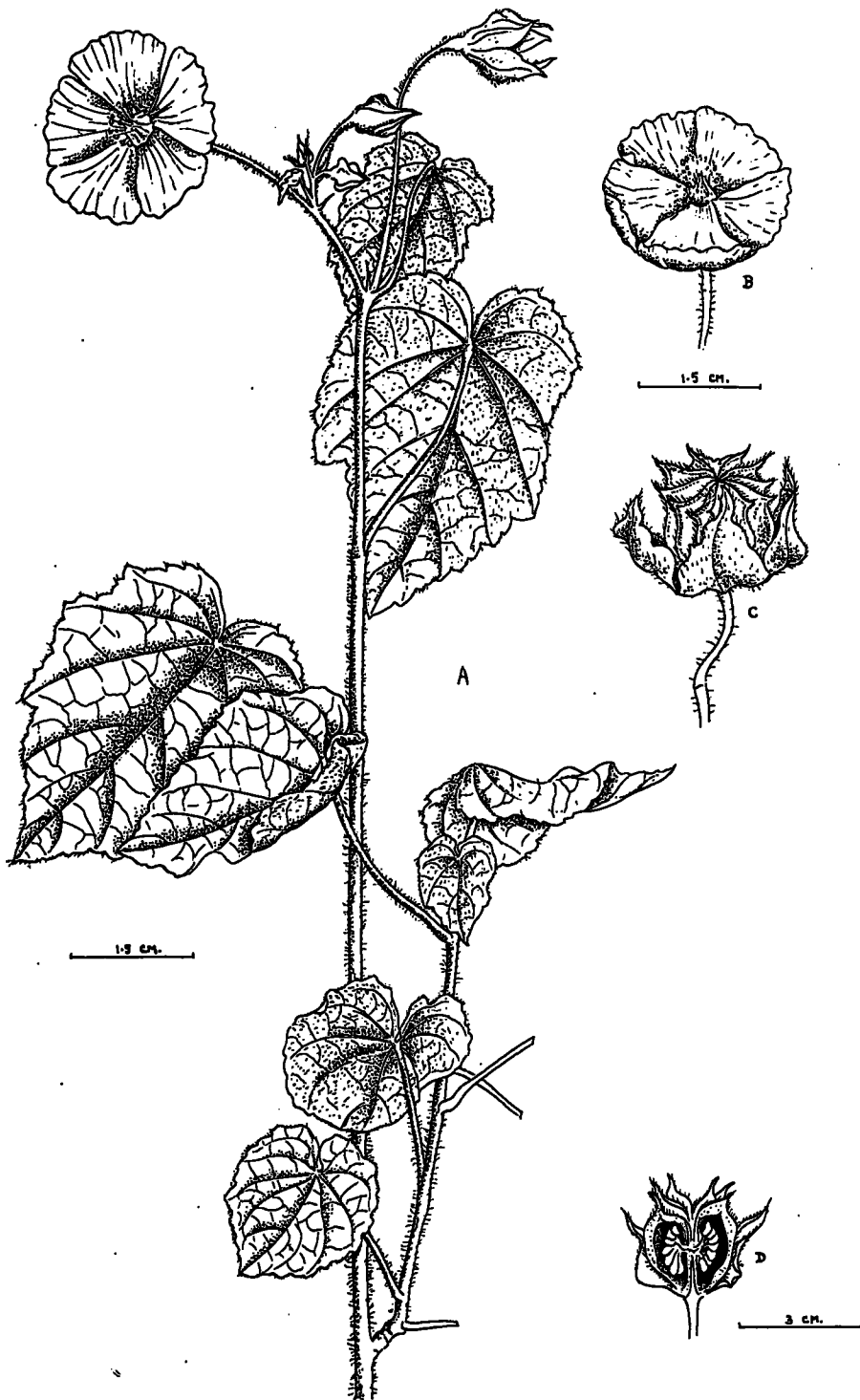


FIG. 352. *Abutilon indicum*. A, branch with leaves and flowers. B, flower, dorsal view. C, fruit with persistent calyx. D, longitudinal section of fruit showing seeds.

2. *Abutilon indicum* Sweet, Hort. Brit. 1: 54. 1827. (Fig. 352).

Abutilon asiaticum W.&A.—*Sida indica* Linn.

Sinh. Anoda; *Tam.* Nallattutti, Paniyarattutti, Perundutti, Tutti, Vaddattutti; *Sans.* Atibala, Balika, Balya, Bhuribala, Ghanta, Kankati, Rishiprokta, Shita, Shitapushpa, Vikantaka, Vatyapushpika, Vrishyagandha, Vrishyagandhika.

A semi-shrubby perennial with very finely downy branches; leaves simple, alternate, stipulate, 1.9—5 cm long, broadly ovate, very cordate at base, acute, irregularly and coarsely dentate, white with very fine dense pubescence on both sides, petioles very long, 2.5—7.5 cm long; flowers regular, bisexual, orange yellow, solitary and axillary, 2.5 cm diam., nodding, pedicels slender, jointed at the top, epicalyx absent; sepals 5, fused into a 5-lobed, cup-shaped calyx, lobes shallow, apiculate; petals 5, convolute, adnate to stamen-tube; stamens numerous, fused into a tube; ovary superior, 10-carpellary, style passing through the stamen-tube and dividing into five branches each terminating in a capitate stigma; ripe carpels 15—20, separating when ripe, hairy at the back, beak short and sharp, spreading horizontally, dehiscing along the back and at the top, seeds minutely dotted.

Flowers almost throughout the year.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 12. 1838; Cavanilles, Diss. 1: pl. 7, fig. 10. 1785; Kirtikar and Basu, Indian Med. Plants, pl. 123. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs throughout India, Ceylon and Philippine Islands. It is common towards the dry country in Ceylon.

India. Bengal: *J. D. Hooker and T. Thomson*; Calcutta, Bot. Gard., *Native Collector*. Assam: *Griffith; Jenkins*. Ceylon. Northern Prov., Jaffna, *Thwaites C.P.* 1133; North Central Prov., Anuradhapura, *Alston* 1130, March 1927. **Maldive Islands.** Horsburgh Atoll, *Gardiner*, 1899—1900; Male, *Christopher*, 1888; Hulule, *Gardiner* 16, 1899. **Seychelles Islands.** *Neville*, 1899. **Philippine Islands.** Luzon: Bataan Prov., Mt. Marivales, Lamao River, *Borden* 2038, 1904; Sulu Prov., Tawitawi, *Ramos and Edano* 44059, 1924.

Composition. The leaves contain mucilage, tannin, an organic acid and traces of asparagin.

Uses. The juice of the leaves prepared into an ointment is used for quick healing of ulcers. The root is a diuretic and taken for relief in strangury and haematuria. It is also effective in leprosy. In India, the leaves are cooked and eaten for bleeding piles. A decoction of it is used for bronchitis, bilious diarrhoea, gonorrhoea, inflammation of the bladder and in fevers. It is recommended as a mouthwash for toothache and tender gums. The seeds are a well-known aphrodisiac and used as a laxative for piles and in the treatment of coughs. The Chinese use the seeds for puerperal diseases, urinary disorders, chronic dysentery and fevers. In the Philippines, a decoction of the leaves is used for cleaning wounds and ulcers, vaginal infections and as enemas.

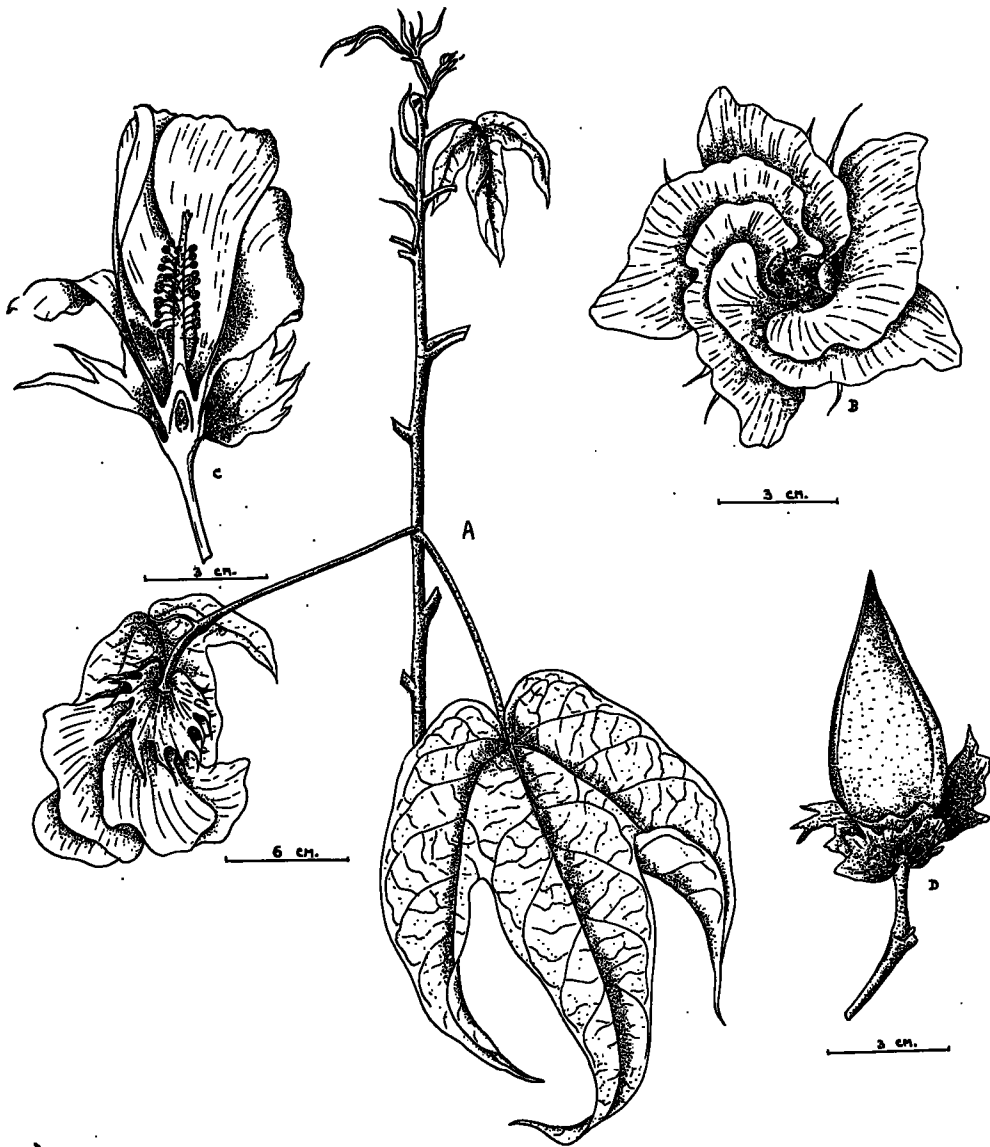


FIG. 353. *Gossypium herbaceum*. A, branch with leaf and flower. B, flower, dorsal view. C, longitudinal section of flower. D, fruit.

3. *Gossypium herbaceum* Linn. Sp. Pl. 693. 1753. (Fig. 353).*Gossypium obtusifolium* Roxb.—*Gossypium wightianum* Tod.

Engl. Cotton; Sinh. Kapu-pulun; Tam. Panchu.

Herbaceous annual forming a subshrub, 1.5 m tall with a few herbaceous branches, sparsely hairy or rarely becoming glabrous; leaves broadly ovate, coriaceous, reticulate, strongly cordate, short-acute, the 5–7 lobes extending less than half the depth of the blade, narrowed at base, glandular-dotted; flowers large, regular, bisexual, axillary, yellow with purple centre, bracteoles 3, rounded basally and broadly triangular, flaring widely from the flower, wider than long, cordate, margin with 6–8 teeth on each side; calyx entire or somewhat 5-lobed, reduced to a cup-shaped structure; petals 5, large and broad, convolute; stamens numerous, fused into a stamen-tube adnate to corolla at the base; ovary superior, 5-locular with 2–7 axile ovules in each loculus; fruit capsule about 2.5 cm long, rounded without prominent shoulder, beaked, 3–4-chambered, seeds large, angled with grey or white fuzzy lint.

Illustration. Wealth of India, 4: pl. 12.

Distribution. Probably a native of Arabia and Asia Minor. It is now cultivated in all tropical countries.

India. Mont. Nilghiri and Kurg: *Hooker f. and T. Thomson*. Maldive Islands. *Gardiner*, 1899–1900.

Composition. The lint of the fruit contains 94% cellulose. The cotton seed contains 92% dry matter, 16–20% protein, 18–24% oil, 30% carbohydrate and 22% crude fibre. The principal pigment in the seed is gossypol, a phenolic compound of which the kernels contain 0.4–2%. This is rendered harmless on crushing and heating. The seeds yield 13.1–24.5% oil and the kernel contains sugars, dextrans and soluble pectins, hemicellulose and pectin-like substances and cellulose. Starch is practically absent and raffinose is the principal sugar. Cotton seed is rich in vitamins of the B-complex group, A, D and E.

Uses. The roots of this plant are used for irregular and painful menstruation; seeds for rheumatism, convulsions in children; the juice of the leaves and roots for painful micturition and are also applied on diseases of the eye. Seeds are frequently used in the treatment of swelling and ulceration of female organs and urinary diseases. A poultice made of cotton seed, ginger and water is applied for orchitis.

Commercially produced cotton is consumed in the manufacture of woven goods such as clothing, cord, thread, etc. It is one of the basic raw materials for cellulose industries including plastics, rayon and for explosives. It is universally used in the medical profession. Cottonseed oil is primarily used for edible purposes, manufacture of soaps, lubricants, lard substitute, margarine, etc. The oil possesses emollient properties and is used in liniments and the root bark as an emmenagogue in dysmenorrhoea and as an abortifacient. A syrup of cotton flowers is given for hypochondria and a poultice made out of the flowers is applied on burns and scalds.

The cottonseed cake is extensively used as cattle feed with bran and pulses.

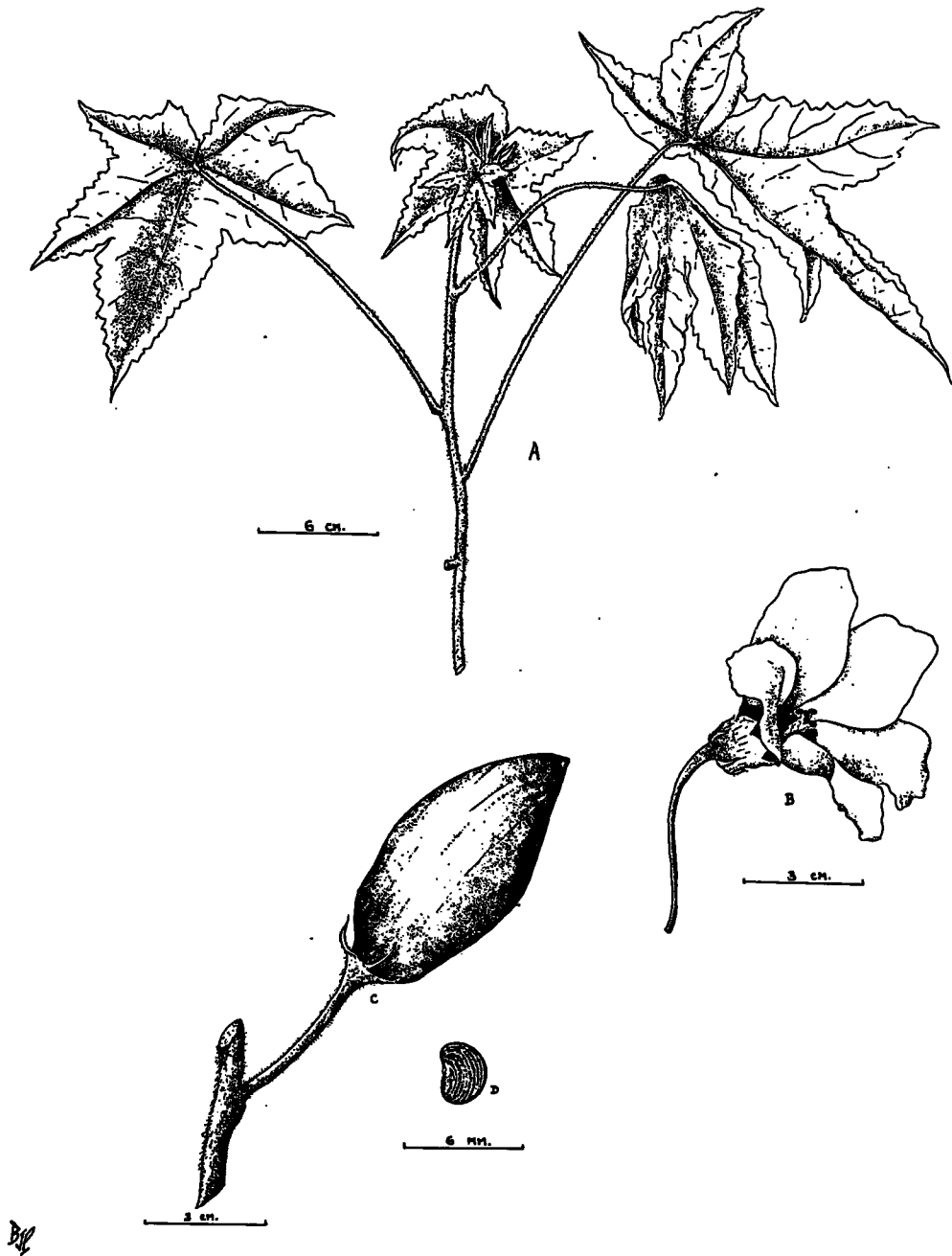


FIG. 354. *Hibiscus abelmoschus*. A, branch with leaves. B, flower, lateral view. C, fruit. D, seed.

4. *Hibiscus abelmoschus* Linn. Sp. Pl. 696. 1753. (Fig. 354).

Hibiscus flavescens Cav.—*Hibiscus spathaceus* Wall.—*Hibiscus ricinifolius* Wall.—*Hibiscus chinensis* Wall.—*Abelmoschus moschatus* Medik.—*Abelmoschus rugosus* W.&A.

Engl. Musk Mallow; *Sinh.* Kapukinissa; *Tam.* Kasturivendai, Kattukkasturi; *Sans.* Latakasturika.

A tall, slightly branched annual with stems hispid with long deflexed hair; leaves simple, alternate, stipulate, variable, ovate-cordate or palmately divided into 3—5 acute lobes, dentate-serrate, hairy on both sides, petioles longer than leaves also covered with long, deflexed hairs, stipules small, subulate; flowers regular, bisexual, large, bright yellow with a purple centre, 7.5—10 cm diam., solitary, often appearing terminal, pedicel stout, curved, much thickened beneath the flower, bracteoles 8, distinct, linear, hispid, much shorter than the calyx; sepals 5, completely fused except at the apices into a calyx-tube which splits along one side; petals 5, convolute, fused at the base to the stamen-tube; stamens numerous, monadelphous, filaments fused to form a tube adnate to corolla below; ovary superior, 5-carpellary, 5-locular and axile placentation; style long, passing through the stamen-tube and dividing into 5 branches each terminating in a capitate stigma; fruit a loculicidal, dehiscent, ovate-ovoid, acute, hispid capsule, 6.3—7.5 cm long, seeds kidney-shaped, striate.

Flowers in September.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 399. 1840—1843; Cavanilles, *Diss.* 3: *pl.* 70, *fig.* 2. 1786; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 131. 1933; Herb. Peradeniya, drawing.

Distribution. Cultivated in warmer parts of India and Ceylon and in most tropical countries. It is rather rare in Ceylon confined to the moist low-country. Colombo, Kandy, Badulla, Raigam Korale, etc.

India. Chittagong, *Clarke* 19639, Feb. 1873. *Ceylon.* Raigam Korale; *Thwaites C.P.* 726; Habarana, *de Silva* 30, Dec. 1927.

Composition. Wehmer records that the seeds yield an essential oil which contains farnesol, palmitic acid, furfural, acetic acid, ambrettol acid and lactose. Other workers have reported that seeds contain an edible oil, gossypetine, an anthocyanin glucoside, hibiscine, a quercetine and a pigment.

Uses. The leaves and roots are used for headaches, rheumatism, varicose veins, fever and gonorrhoea. An infusion, decoction or tincture of the seeds are demulcent, stomachic, antispasmodic, and useful for nervous debility and hysteria. Seeds are also used as a drink in fevers and gonorrhoea and as an inhalent for hoarseness and dryness of the throat. In Bombay, a paste of the seed in milk is applied to cure itch. In Guinea, the plant is regarded as a heart tonic and an excellent snakebite remedy. In America and the West Indies the seed is administered both internally and externally for snakebite.

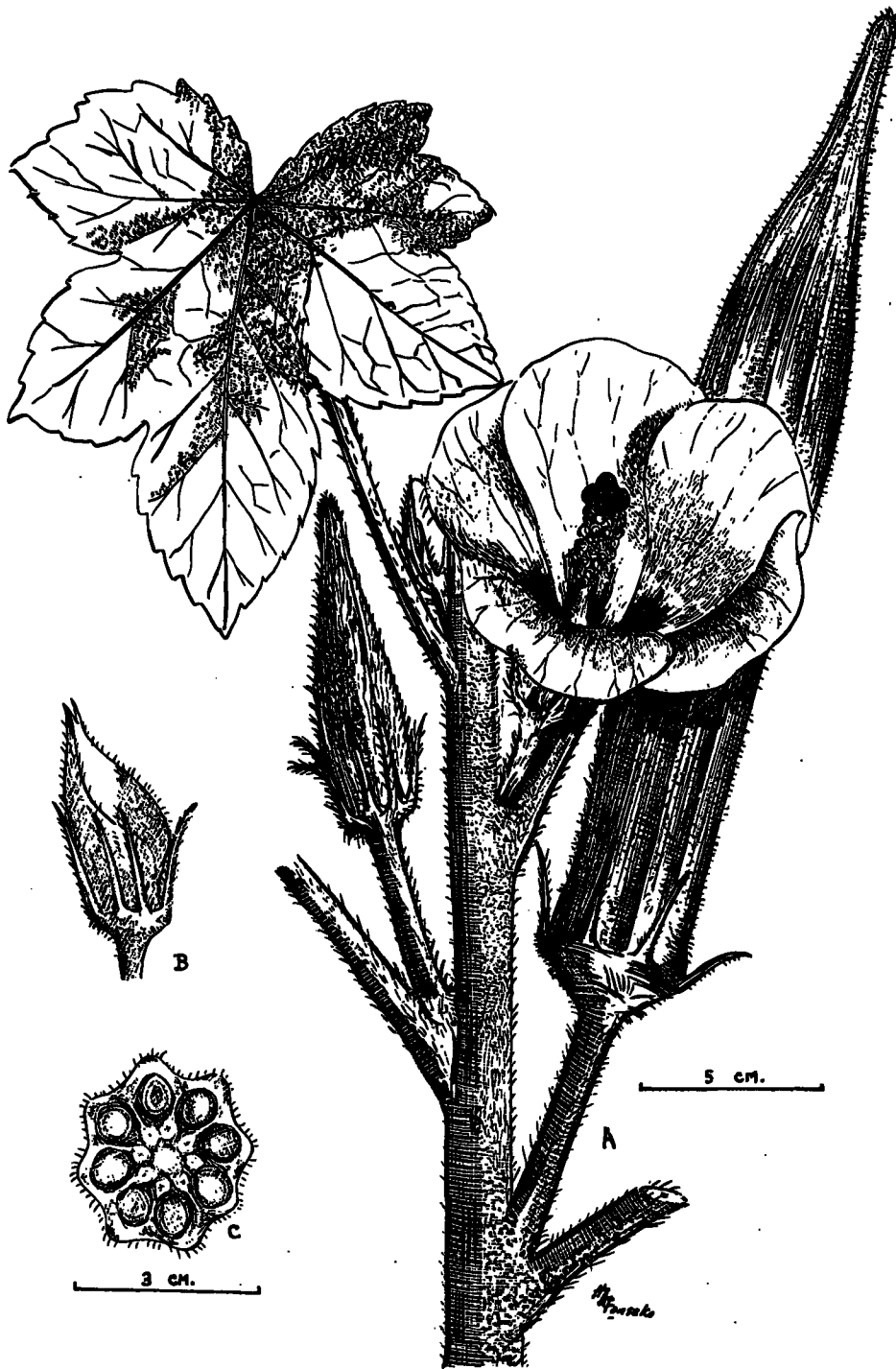


FIG. 355. *Hibiscus esculentus*. A, upper portion of a plant, the terminal portion removed, showing a leaf, an open flower, flower bud and fruits. B, bud showing the calyx and epicalyx. C, transverse section of fruit.

5. *Hibiscus esculentus* Linn. Sp. Pl. 696. 1753. (Fig. 355).

Hibiscus longifolius Roxb.—*Abelmoschus esculentus* W. & A.

Engl. Lady's Finger, Okra; *Sinh.* Bandakka; *Tam.* Vendai, Vendi; *Sans.* Asrapatraka, Bhenda, Bhinda, Bhindatika, Chatupunda, Chatushpada, Darivka, Gandhamula, Karaparna, Kshatrasanbhava, Pichhila, Sushaka, Tindisa, Vrittabija.

A large annual herb reaching a height of 1—2 m, stem thick, erect, stiff, cylindrical, rough with long spreading hairs, sparingly branched; leaves simple, alternate, on very long hispid petioles, stipules linear-subulate, hairy, deciduous, blade large, variable, often 20 cm or more long, palmately veined, deeply cut into 3—5 acute lobes which are broad and shallow in the lower ones and deep and narrow in the upper, cordate or rounded at the base, coarsely dentate-serrate, rough with short hairs on both surfaces; flowers large, regular, bisexual, solitary in axils of leaves, on short, thick, hispid peduncles much dilated at the summit; epicalyx 8—12, linear, acute, erect, strongly hairy segments which are quickly caducous, buds conical, apiculate; calyx pale green, soft, 5 fused, splitting completely down one side at expansion of flower and having the appearance of a small spathe, densely covered with short hairs, soon falling away; petals 5, large, strongly convolute in bud, much overlapping, slightly connected at base, pale yellow with a purple base within; stamens numerous, filaments combined into a short tube adherent to petals at the base, anthers covering the upper portion of the tube, crowded, 1-celled, yellow; ovary superior, ovate, conical, strongly hairy, 4—5-locular, style passing through the staminal tube, stigma capitate, large, deeply 4—5-lobed, deep crimson; fruit capsule 7.5—25 cm long, narrowly oblong or fusiform, tapering to a blunt point at apex, cylindrical with 4—10 blunt angles, rough with short scattered hairs, pericarp dry, chartaceous, dehiscing loculicidally into 8—10 valves with a single row of seeds in each chamber, seeds nearly round, large, smooth, brown, exalbuminous.

Flowers all the year round.

Illustrations. Cavanilles, Diss. 3: pl. 61, fig. 2. 1786; Bentley and Trimen, Med. Plants, pl. 36. 1880; Kirtikar and Basu, Indian Med. Plants, pl. 132. 1933; Herb. Peradeniya, drawing.

Distribution. Cultivated in India, Ceylon and other tropical countries. It is probably a native of Africa.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Sept. 1908.

Composition. The leaves, roots and fruits contain much mucilage. The green fruit abounds in mucilage, pectin and starch.

Uses. A valuable emollient and demulcent owing to its copious mucilage. The immature fruits are used as a vegetable and are supposed to possess cooling properties. They are boiled in milk and given for coughs. They are also useful in the form of a decoction for catarrhal ailments, gonorrhoea, painful micturition and dysuria. The oil extracted from the seeds is edible and the fibre of the plant is used for papermaking.

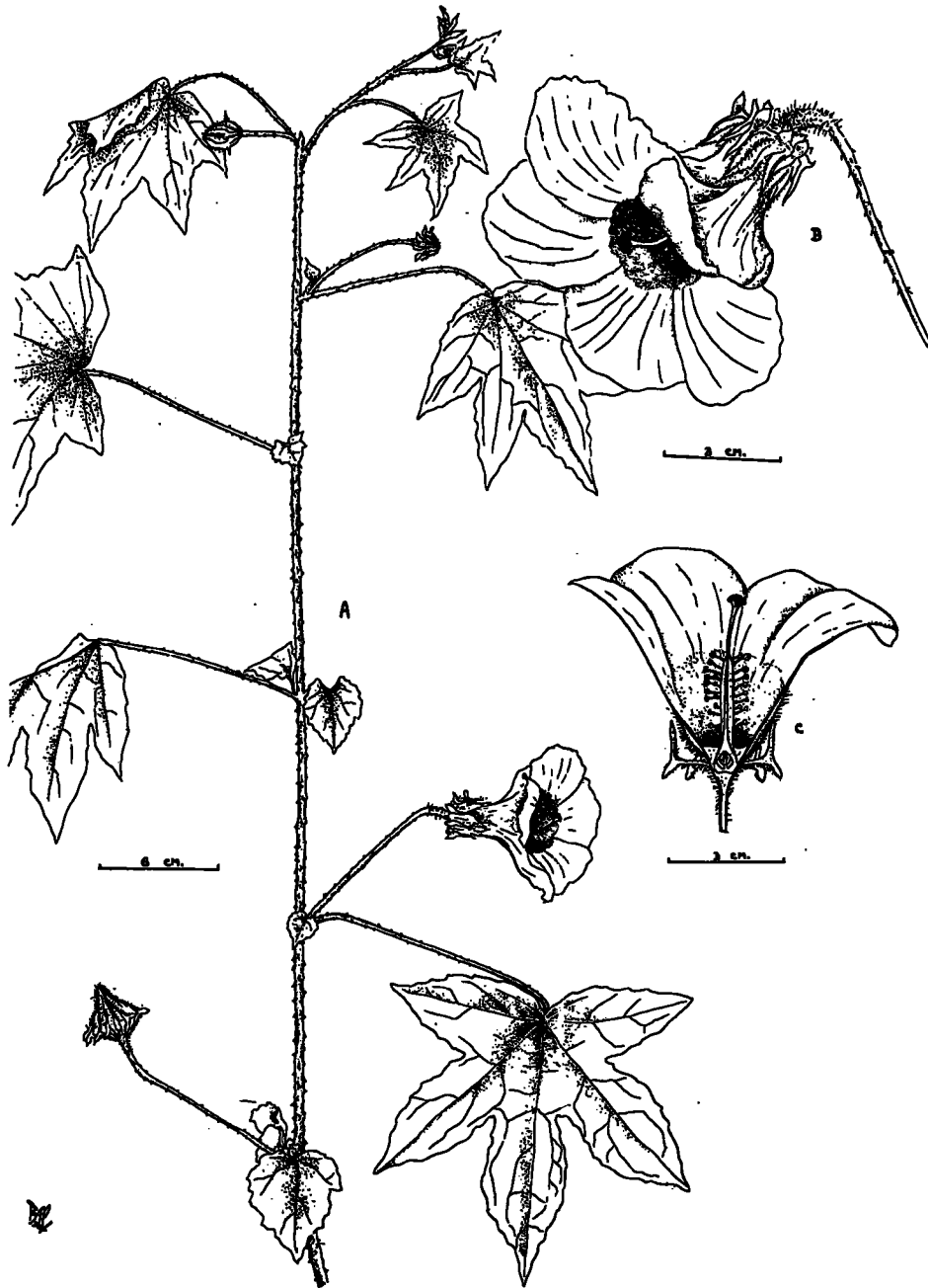


FIG. 356. *Hibiscus furcatus*. A, stem with leaves and flowers. B, flower, lateral view. C, longitudinal section of flower.

6. *Hibiscus furcatus* Willd. Enum. Hort. Berol. 736. 1809. (Fig. 356).

Hibiscus hispidissimus Griff.—*Hibiscus aculeatus* Roxb.—*Hibiscus bifurcatus* Roxb.

Sinh. Napiritta.

A large scrambling or climbing, semi-shrubby perennial with a tomentose or glabrous stem set with numerous, scattered, sharp, decurved, hooked prickles; leaves simple, alternate, stipulate, 5—7.5 cm long, roundish, deeply palmately cut into 3—5 lanceolate acute, strongly serrate segments, glabrous or pubescent, prickly on veins beneath, petioles as long or longer than leaves, stout, cylindrical, very prickly, stipules linear-lanceolate; flowers regular, bisexual, large, yellow with a dark crimson centre, 6.3—10 cm long, pedicels 2.5—7.5 cm long, very prickly, epicalyx 10—12, linear-setaceous, bristly, lower half spreading or reflexed, upper half erect with a small deflexed leafy appendage in the middle; sepals 5, connate halfway, ovate, acute, bristly, much enlarged in the fruit; petals 5, convolute, fused with the stamen-tube at the base; stamens numerous, filaments fused into a tube; ovary superior, 5-carpellary, 5-locular with axile ovules, style passing through the stamen-tube and dividing into 5 stigmas; fruit a conical-ovoid, loculicidally dehiscent capsule, 1.2 cm long, pointed, enclosed in a thickened, enlarged, connivent calyx which is covered with coarsely adpressed bristly hairs; seeds compressed, rough with scattered papillae, grey-brown.

Flowers from December to February.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 134B. 1933. Herb. Peradeniya, drawing.

Distribution. Grows in the warmer parts of India, Ceylon and in Asia and Europe. It is very common in Ceylon, climbing on trees and bushes in the low-country.

India. Silhet: *Hooker and Thomson*. Ceylon. Without locality, *Thwaites C.P. 727*. Central Prov., Gannoruwa, *Senaratne* 10032, April 1953.

Uses. An infusion of the roots of this plant in water is used as a cooling drink. The leaves are applied to promote the suppuration of boils.



FIG. 357. *Hibiscus rosa-sinensis*, branch with leaves, open flower and flower buds.

7. *Hibiscus rosa-sinensis* Linn. Sp. Pl. 694. 1753. (Fig. 357).

Hibiscus arnottii Griff. ex Maş. — *Hibiscus festalis* Salisb. — *Hibiscus rosiflorus* Stokes.

Engl. Shoe Flower; *Sinh.* Sapattu-mal, Wada-mal; *Tam.* Arattam, Irattaichegap, puchembarattam, Irattaimanjambarattam, Mandaram, Sapattuppu, Sembarattai, Sevarattai, Sivandavessai; *Sans.* Arkapriya, Aruna, Harivallabha, Japapushpa, Java, Joba, Odhrapushpa, Ondrakhya, Pratika, Raktapushpi, Rogapushpi, Rudrapushpa, Trisandhya.

A large spreading shrub with a brownish bark, young stems reddish brown, internodes 3.5—5.5 cm long; leaves simple, alternate, ovate or ovate-lanceolate, 7—17.5 cm long, 4.5—10 cm broad, acuminate, irregularly and coarsely serrate along the upper 2/3 of the blade, entire near the base, glabrous on both sides or with a few minute stellate hairs on nerves beneath, petioles 2—8.5 cm long, stipules subulate, 1 cm long; flowers regular, bisexual, solitary, axillary, bright red, 10 cm diam., pedicels 6 cm long, jointed above the middle, epicalyx 5—7, free, subulate, 1.2—1.5 cm long, glabrous; calyx 5, fused, segments almost divided to the middle, puberulous with very minute stellate hairs, lobes 1.8 cm long, lanceolate; petals 5, free, contorted, 7 cm long, 4.5 cm broad, fused to the stamen-tube at the base; stamens numerous, filaments fused to a tube adnate to corolla and exerted much beyond the flower; ovary superior, 5-carpellary, 5-locular with numerous axile ovules, style lying inside the stamen-tube and extending beyond, dividing into 5 lobes each terminating in a capitate stigma, fruit capsule not seen except in the horticultural varieties, seeds few, about the size of an okra seed.

Flowers throughout the year.

Distribution. Commonly cultivated in gardens throughout India and Ceylon. It thrives well anywhere from the sea coast to the hill country and in the dry zone in Ceylon. It is probably a native of China.

India. Calcutta, Bot. Gard., cultivated. **Ceylon,** cultivated everywhere as a hedge plant. **China.** Hongkong, cultivated, *Tsiang Ying* 355, April 1928.

Composition. The flowers contain a small amount of hibiscetin.

Uses The leaves and young flower buds are used as a poultice on boils and swellings. A decoction of the roots is given for fevers, coughs and venereal diseases. The flowers are used as an expectorant for bronchitis, paralysis, dysmenorrhoea and coughs. In the Dutch Indies, the flowers are eaten with papaya seeds to cause abortion. The Chinese use the flowers for blackening eye-brows.

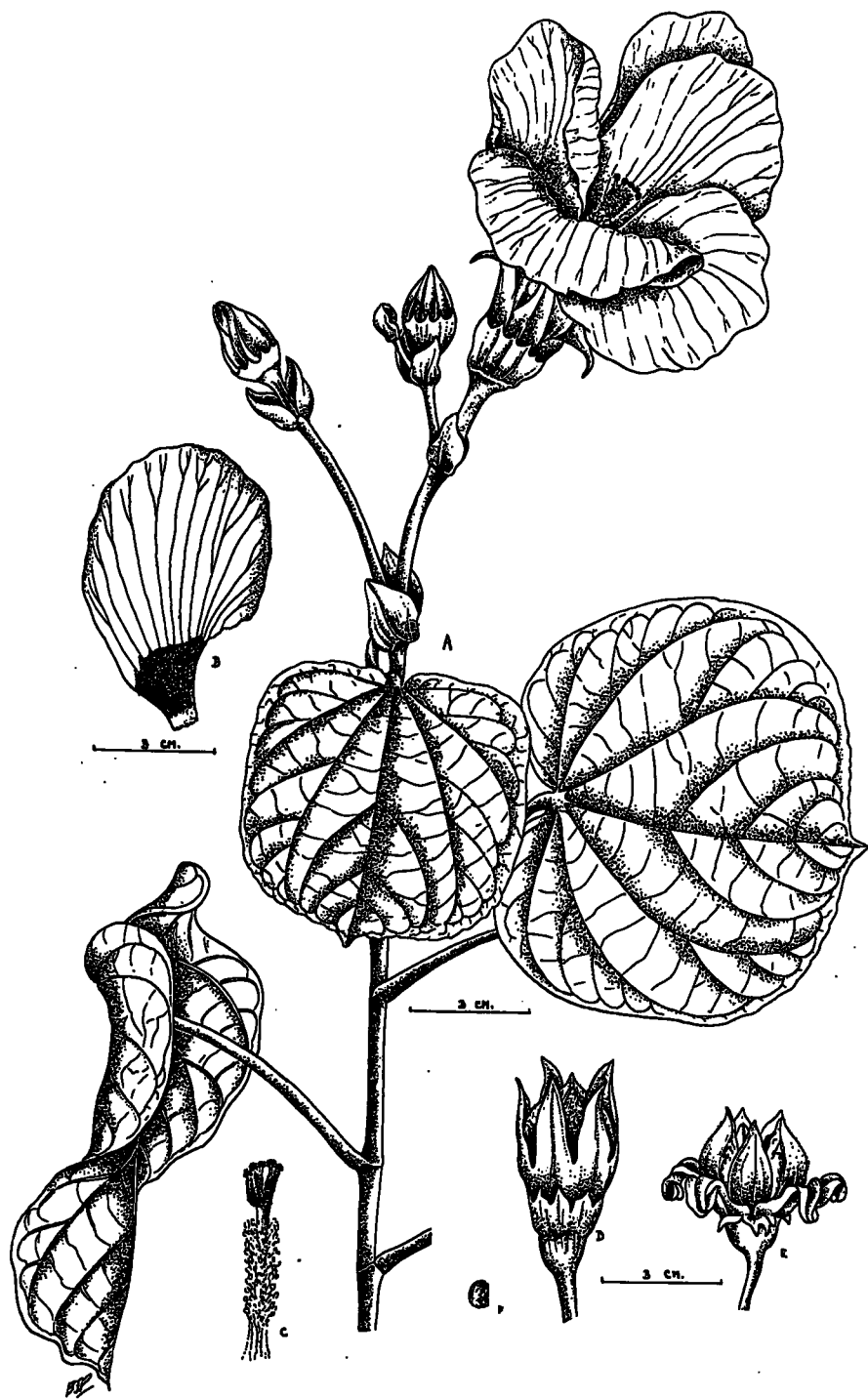


FIG. 358. *Hibiscus tiliaceus*. A, branch with leaves, an open flower and flower buds. B, petal. C, stamen-tube through which the style passes. D, fruit with persistent calyx and epicalyx. E, dehiscent fruit. F, seed.

8. *Hibiscus tiliaceus* Linn. Sp. Pl. 694. 1753. (Fig. 358).*Paritium tiliaceum* W. & A.—*Hibiscus tortuosus* Roxb.*Sinh.* Beli-patta; *Tam.* Nir-paratthi; *Sans.* Bala.

A large much branched shrub with pubescent young shoots; leaves simple, alternate, stipulate, 6.3—8.8 cm long, rotund, more or less cordate at base, abruptly acuminate, denticulate, glabrous above and finely pubescent and white beneath, petioles 2.5—3.8 cm or more long, pubescent, stipules large, 1.2 cm long, ovate, obtuse, pubescent; flowers regular, bisexual, terminal, 7.5 cm long, pedicel 1.2—2 cm long, stout, curved, pubescent, epicalyx 10, fused for about 3/4 the length to form a campanulate, persistent cup; sepals 5, fused for about 1/3 the length forming a 5-lobed calyx, much longer than the epicalyx, lanceolate, acute, persistent; petals 5, convolute, pale yellow with a crimson centre, fused at base with the stamens; stamens numerous, filaments fused into a tube round the style and adnate to corolla at the base; ovary superior, 5-carpellary, 5-locular and axile placentation, style long divided into five lobes at apex each terminating in a capitate stigma; fruit a 10-chambered capsule 1.2—2 cm long, shorter than the calyx, pointed, hairy, loculicidally dehiscent, seeds numerous.

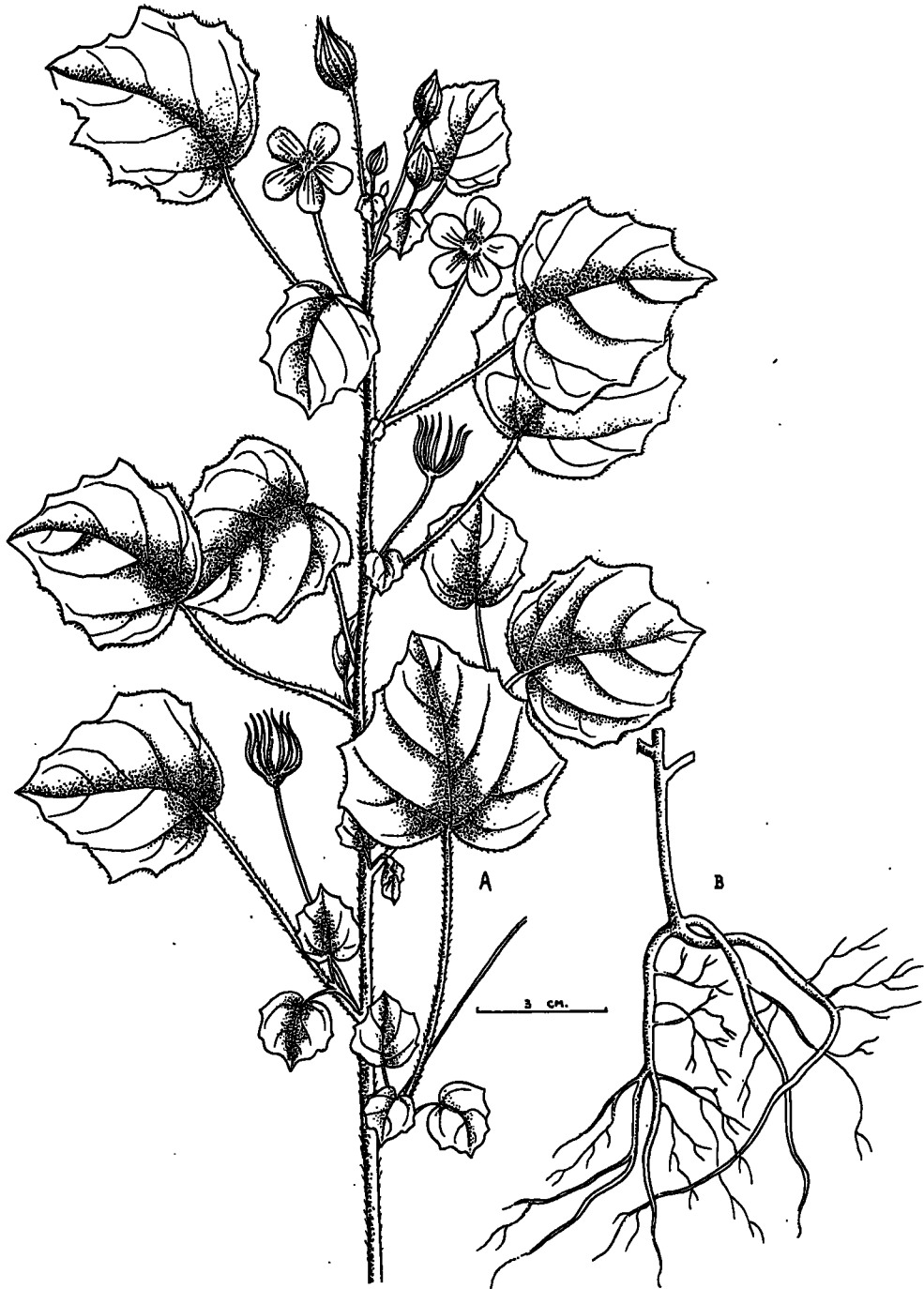
Flowers from December to March.

Illustrations. Beddome, *Flor. Sylvat. Anal. Gen. pl.* 4. 1868—1873; Wight *Ic. Pl. Ind. Or., pl.* 7. 1838; Kirtikar and Basu, *Indian Med. Plants, pl.* 133. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in all tropical countries especially near the sea coast. It is very common in the low-country in Ceylon, chiefly near the seashore and by rivers and streams, growing gregariously.

India. Bengal: *J. D. Hooker*; Calcutta, *Hort. Bot. Gard*; Chittagong: *Clarke* 19918, Feb. 1873. Ceylon. Trincomalee, *Thwaites C.P.* 1120. S. Andamans. *Heinig* 31/34, July 1897. Great Coco Island. *King's Collector*. 1890. Maldive Islands. *Didi* 131. 1896; Minikoi, *Gardiner* 37, 1899. British North Borneo. Janbongan Island: *Cabiling* 3777, Nov. 1927. Australia. Melbourne, *Govt. Botanist*.

Uses. The mucilaginous aqueous extract of the bark is prescribed for dysentery. The fibre is used for making cordage. In the Philippines, the powdered bark is used as an emetic and the flowers boiled in milk for earache. In Amboina, Java and Pahang, an infusion of the root is given for fevers, and as a diuretic and febrifuge. The young leaves are also boiled in sugar and used in coughs and bronchitis. In Africa, the plant is used as a laxative and for sore throat and congestive pulmonary conditions.



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FIG. 359. *Pavia odorata*. A, branch with leaves and flowers. B, root system.

9. *Pavonia odorata* Willd. Sp. Pl. 3: 837. 1800. (Fig. 359).

Hibiscus odoratus Roxb.—*Pavonia sidoides* Horn. in DC.—*Pavonia rosea* Wall.—*Pavonia romborna* Wall.

Sinh. Hribara, Pushpa-bevila; *Tam.* Avibattam, Peramutti, Suvesagam; *Hindi* Sugandha-vala; *Sans.* Ambunamaka, Bala, Barhishtha, Hribera, Hrivela, Kachamoda, Keshanama, Keshanamaka, Keshya, Kuntala, Kunthashira, Lalanapriya, Toya, Udichya, Vajra, Valaka, Varapinga, Vari, Varida, Varinamaka.

An erect, branched, annual herb, 45—90 cm tall, stems covered with a viscous pubescence; leaves simple, alternate, stipulate, 2.5—6.5 cm long, roundish ovate, cordate at base, shallowly 3—5 lobed, lobes acute, dentate, stellate-hairy on both sides, often felted and whitish beneath, petioles longer than leaves; flowers regular, bisexual, axillary, solitary, pale pink or white, crowded at the ends of branches, pedicels viscous and hispid, jointed near the top, bracteoles 11—14, setaceous with copious long spreading hairs; sepals 5, connate at base; petals 5, distinct, convolute, adnate at base to the stamen-tube; stamens numerous, filaments fused into a tube through which the style passes; ovary superior, 5-carpellary, 5-locular with one axile ovule in each loculus, styles 10 fused; fruit indehiscent, separating into 1-seeded unicarpellary sections, glabrous or hairy.

Flowers from December to April.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 128. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the north-west provinces and in the Western Peninsula of India, Ceylon, Burma and east tropical Africa. It is rather common in Ceylon, confined to the dry low-country. Batticaloa, Hambantota, Dambulla, Ekiriyankumbura, etc.

India. Pen. Ind. Or., *Wight* 175; Banda N.W.P., *Bell* 41, March 1901. Ceylon, without locality, *Thwaites C.P.* 1888; North-Eastern Prov., Puttalam, *Willis*, Dec. 1910; North-Central Prov., Mankulam, *Alston* 1131, March 1927; Eastern Prov., Batticaloa, *Thwaites C.P.* 1125; Southern Prov., Bata-ata, *Alston* 1473, March 1927.

Uses. The root of this plant is fragrant and aromatic, and used along with other drugs for treatment of typhoid fever, dysentery in children, and inflammation of, and haemorrhage from, internal organs. The entire plant is used as a cure for rheumatism.

Plectranthus zeylanicus (S. Iriveriya) is erroneously used instead of this plant in Ayurvedic practice owing to a wrong translation of its Sanskrit name.

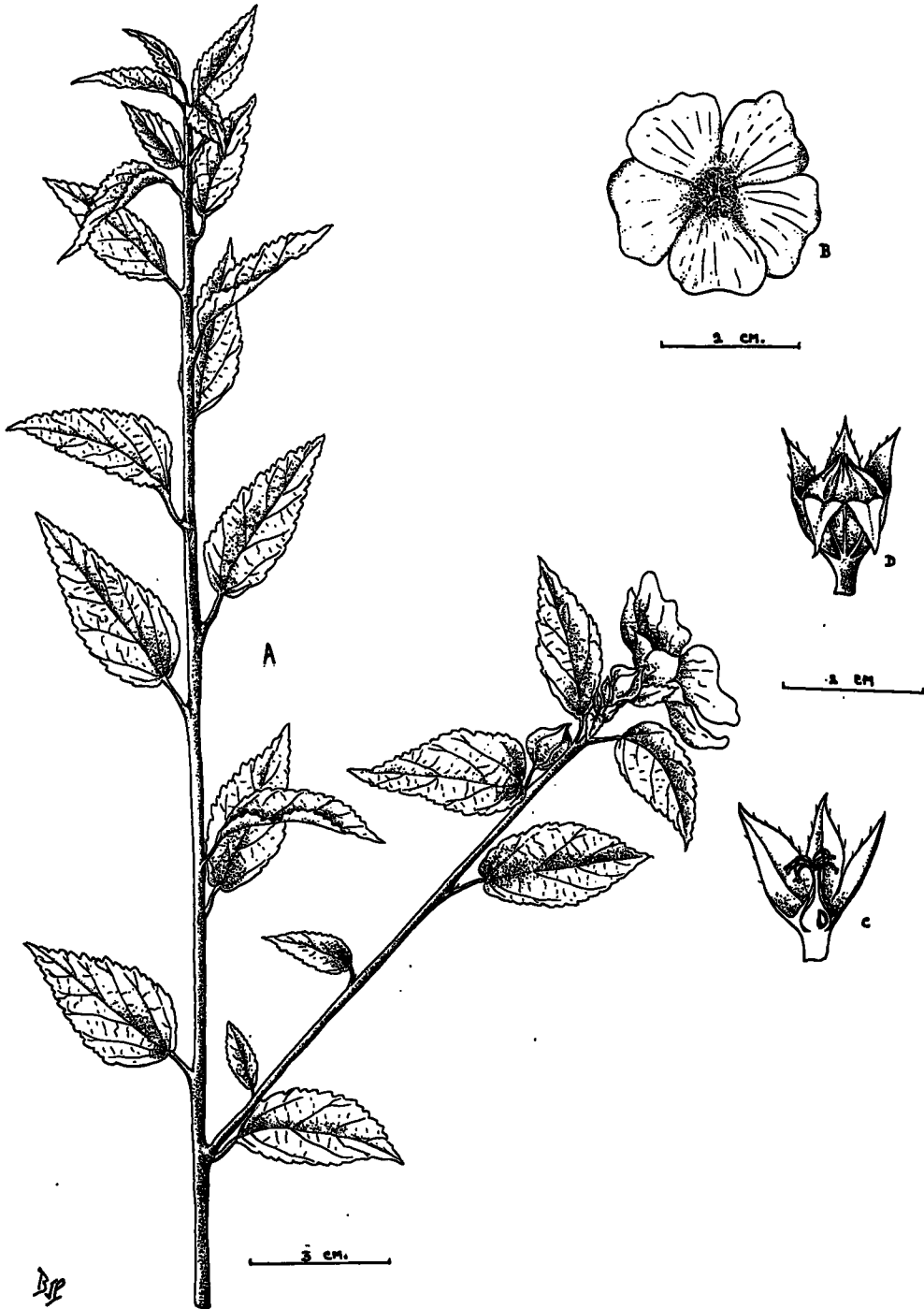


FIG. 360. *Sida acuta*. A, branch with leaves and flower. B, flower, dorsal view. C, longitudinal section of a flower with the corolla removed. D, fruit with persistent calyx.

10. *Sida acuta* Burm. f., Fl. Ind. 147. 1768. (Fig. 360).

Sida carpinifolia Linn. f.—*Sida lanceolata* Roxb.—*Sida stipulata* Cav.—*Sida stauntoniana* DC.—*Sida scoparia* Lour.—*Sida frutescens* Cav.

Sinh. Gas-bevila; *Tam.* Arivalmanaippundu, Arivalmukkan, Kayappundu, Malai-dangi, Malaikkurundali, Mayirmanikkam, Ponsusuttai, Vattatiruppi; *Sans.* Bala, Brihannagabala, Mahabala, Pata, Pila, Pitberela, Rajbala.

A much-branched, semi-shrubby, erect perennial, smooth or slightly rough with minute stellate hairs; leaves simple, alternate, stipulate, 1.2—6.3 cm long, lanceolate-oblong, rounded at base, acute or obtuse at apex, serrate or crenate-serrate, glabrous, pale beneath, petioles 6 mm long, thickened at the top, slightly stellate-hairy, stipules linear-subulate, exceeding petioles, veined and ciliate; flowers regular, bisexual, axillary, solitary, yellow, 1.6 cm long, pedicels 0.6—1.2 cm long, stellate pubescent, epicalyx absent; sepals 5, connate into a 5-lobed calyx, nearly glabrous, segments broadly triangular, acute or acuminate; petals 5, connate at base and adnate to the stamen-tube, twice as long as the calyx; stamens numerous, filaments fused into a stamen-tube; ovary superior, 5 or more carpellary with one ovule in each loculus, fruit irregularly dehiscent, 5—11 carpellary, rugose at the back, each carpel with two sharp erect beaks.

Flowers all the year round.

Illustrations. Cavanilles, Diss. 1: *pl.* 2, *fig.* 3 and *pl.* 3, *fig.* 10. 1785; Wight, Ic. Pl. Ind. Or., *pl.* 95. 1838; Kirtikar and Basu, Indian Med. Plants, *pl.* 121. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the warmer parts of India, Ceylon and in the tropics generally. It is common in waste ground in the low-country in Ceylon.

India. Sikkim: *Prain's Collector* 134, Dec. 1903; Bengal: *J. D. Hooker*; Pen. Ind. Or., *Wight* 199. Ceylon. Eastern Prov., Batticaloa, *Thwaites C.P.* 2760; Central Prov., Peradeniya, *de Silva*, Dec. 1928. Maldiv Islands. *Gardiner*, 1899—1900; *Didi* 138, 1896. China. Formosa, *Oldham*, 1864.

Composition. The leaves, stems and roots of this plant contain an unnamed alkaloid. Sanyal and Ghose state that the roots contain asparagin. According to Friese, the leaves contain saponin.

Uses. A decoction of the roots and leaves is given for haemorrhoids, fevers, impotency, gonorrhoea and rheumatism. The bruised leaves warmed with gingelly oil and applied to boils hasten suppuration. The expressed juice of the roots and leaves is employed for removal of intestinal worms. In the Punjab, the seeds are given for enlarged glands and inflammatory swellings.



PLATE XIII. *Sida alba*, showing a branch with leaves, flowers and fruits.



PLATE XIII. *Sida alba*, showing a branch with leaves, flowers and fruits.

11. *Sida alba* Linn. Amoen. Acad. 5: 380. 1760. (Plate XIII).

Sida spinosa Linn.—*Sida retusa* Wight.—*Sida alnifolia* Linn.—*Sida glandulosa* Roxb.—*Sida boriaria* Wall.

Sinh. Kotikan-bevila; *Tam.* Arivalmanaippundu, Mayirmanikkam; *Sans.* Avishta, Bhadrani, Chatupala, Devadanda, Gangeruki, Ghanta, Gorakshatandula, Hrisvagavedhuka, Jhasha, Kharagandha, Kharagandhini, Kharavallika, Kharyashthika, Mahagandha, Mahapatra, Mahaphala, Mahashaka, Mahodaya, Nagabala, Pila, Pitberela, Vishvadeva, Vishvadevi.

An erect much branched undershrub with slender stellate hairy stems and recurved prickles at the nodes below the petioles; leaves simple, alternate, stipulate, 2.5—3.7 cm long, oval or oblong, obtuse, coarsely crenate-serrate, glabrous above and finely stellate pubescent beneath, petioles 0.6—1 cm long, stellate pubescent; flowers regular, bisexual, axillary, solitary without bracteoles, 1.2 cm long, pedicels 1.2—1.8 cm long, slender; sepals 5, fused into a cup-shaped, 5-lobed, hairy calyx, segments short, triangular, acute; petals 5, convolute, adnate to the stamen-tube; stamens numerous, filaments fused into a tube through which the style passes; ovary superior, 5-carpellary, 5-locular with axile placentae; fruit irregularly dehiscent, carpels 1-seeded with 2 long, erect, rough beaks equalling the calyx.

Illustrations. Kirtikar and Basu, Indian Med. Plants, *pl.* 120. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the warmer north-west provinces of India, Ceylon and in the tropics generally. It is rather rare in Ceylon being confined to the dry low-country.

India. Concan: *Stocks*; Pen Ind. Or., *Wight* 196. Ceylon. Eastern Prov., Batticaloa, *Thwaites C.P.* 3553.

Composition. The entire plant contains alkaloids.

Uses. The leaves are beneficial in cases of gonorrhoea, gleet and scalding urine, while a decoction of the root is used as a demulcent for irritability of the bladder and for gonorrhoea. The root also acts as a diaphoretic and is used for mild cases of fever.

MEDICINAL PLANTS

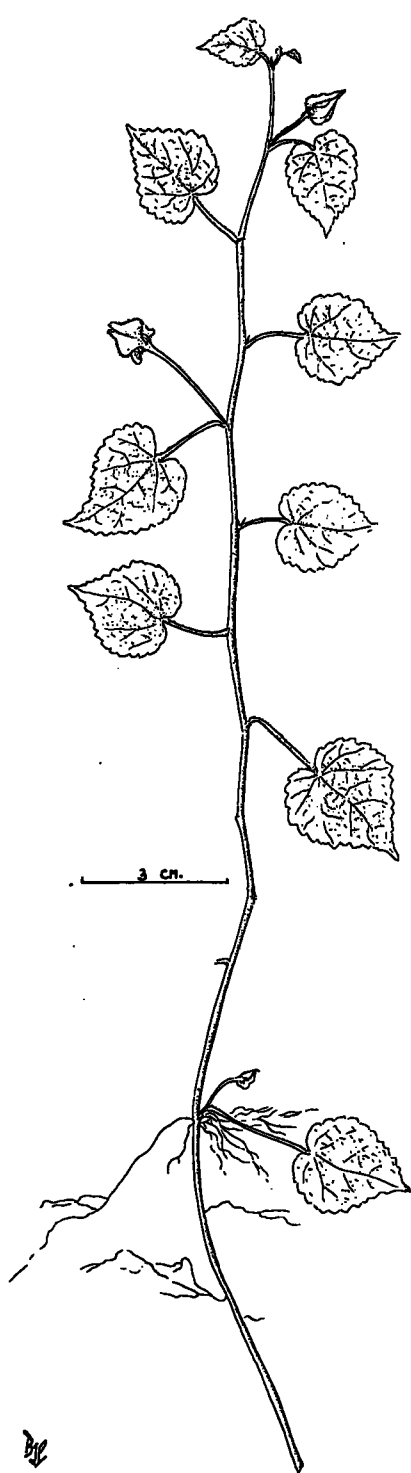


FIG. 361. *Sida cordifolia*, branch with leaves.

12. *Sida cordifolia* Linn. Sp. Pl. 684. 1753. (Fig. 361).

Sida herbacea Cav.—*Sida micans* Cav.—*Sida rotundifolia* Cav.—*Sida althaeifolia* Swartz.

Sinh. Hin-anoda, Sulu-bu-bebila, Wel-bevila; *Tam.* Arivalmandippundu, Chevakanpundu, Mayirmanikkam, Nilatutti; *Hindi* Kanghi; *Sans.* Badiyalaka, Bala, Baladhya, Balini, Bhadra, Bhadrabala, Bhadrodani, Brela, Jayanti, Kalyanini, Kanaka, Kathoravashtika, Kharakashtika, Krura, Motapati, Nilaya, Odanavha, Odani, Odanika, Phanijivaka, Prahasa, Raktatandula, Samanga, Samansha, Shitapaki, Suvarna, Svetherela, Variga, Vataghni, Vatyalaka, Vatyali, Vatyapushpi, Vilala.

An erect semi-shrubby perennial with numerous branches covered with soft silky spreading hair; leaves simple, alternate, stipulate, 1.9—5 cm long, ovate, cordate at base, obtuse at apex, strongly dentate-serrate, densely velvety on both surfaces, petioles 1.2—2.5 cm long with spreading hairs, stipules linear and caducous; flowers regular, bisexual, axillary, yellow, small, without bracteoles, pedicels 1 cm long, woolly; sepals 5, connate into a cup-shaped, 5-lobed calyx, very woolly, segments triangular, acute; petals 5, convolute, adnate to stamens at the base; stamens numerous, filaments fused into a tube through which the style passes; ovary superior, style dividing into 5 branches each terminating in a capitate stigma; ripe carpels 10, white with 2 long straight beaks set with reflexed hairs and exceeding the calyx.

Flowers all the year round.

Illustrations. Rheede, Hort. Mal. 10: pl. 54. 1678—1703; Kirtikar and Basu, Indian Med. Plants, pl. 119A. 1933.

Distribution. Occurs as a weed in tropical and sub-tropical regions of India, Africa and Ceylon. It is a common weed in waste ground in the low-country in Ceylon, especially in the dry districts. Kantalai, Polonnaruwa, Galagama, Minneriya, Adam's Peak, etc.

India. Punjab: Jullundur, Clarke 23433, Oct. 1874; Chota Nagpore, Clarke 20648, Sept. 1873; Clarke 20831, Nov. 1873. Mysore, Concan, etc. *Stocks.* Madras: Cleghorn 29. Pen. Ind. Or., Wight 194. Ceylon. Without locality, Thwaites C.P. 259; Maha Oya, Simpson 9720, May 1932; Negombo, de Silva, July 1930. **Seychelles Islands.** Neville, 1867. **China.** Formosa, Oldham 43, 1864. **Philippine Islands.** Luzon: Ramos and Edano 44642, 1924.

Composition. This plant contains ephedrine in addition to fatty oil, phytosterol, mucins, potassium nitrate and resin acids. The seed has a high alkaloid content, chiefly ephedrine.

Uses. The fresh leaves are bruised and applied on boils to promote suppuration. They are also cooked and eaten for bleeding piles. The juice of the entire plant is given with water for rheumatism, spermatorrhoea and gonorrhoea. It also has diuretic properties. An infusion of the roots is given for nervous and urinary diseases and for disorders in the blood and bile. It is also prescribed for asthma and as a cardiac tonic. The seeds are considered to possess aphrodisiacal properties and are given for colic, tenesmus, gonorrhoea and cystitis. In Africa, the plant is used as a remedy for children's diseases.

13. *Sida racemosa* Burm. f., Fl. Ind. 1: 48. 1788.

Sida mysorensis W. & A.—*Sida glutinosa* Cav.—*Sida hirta* Wall.—*Sida urticaefolia* W. & A.—*Sida nervosa* Wall.—*Sida olens* Ham.—*Sida tenax* Ham.—*Sida radicans* Cav.

Sinh. Siriwedi-bevila; *Sans.* Nagabala.

An erect perennial herb, 60—90 cm tall with a more or less hairy stem; leaves simple, alternate, stipulate, 2.5—5 cm long, ovate, cordate at base, acute, coarsely serrate-dentate, tendency to be 3-lobed, softly hairy on both sides, petioles 1.2—3.7 cm long, hairy; flowers regular, bisexual, axillary, solitary, small, yellow, less than 1.2 cm long, pedicels 0.6—1.2 cm long and hairy, bracteoles absent; sepals 5, fused into a cup-shaped, 5-lobed calyx, hairy, segments narrowly triangular, acuminate; petals 5, convolute, fused at base to a stamen-tube; stamens numerous, filaments fused into a tube through which the style passes; ovary superior, 5-carpellary, 5-locular with axile placenta; fruit irregularly dehiscent into 1-seeded, smooth, shortly bicuspidate carpels.

Flowers all the year round.

Distribution. Occurs in the warmer parts of India, Ceylon and Burma. It is rather common in the mid and low-country in Ceylon. Peradeniya, Haragama, Bibile, etc.

India. Kanara: *Talbot*, Nov. 1881; Mysore, Concan, etc. *Stocks and Law*. Ceylon. Without locality, *Thwaites C.P.* 1123; Uma Oya, Kumuniya Kandura, *Silva* 264, Dec. 1927; Bibile, *Silva*, Oct. 1925.

Uses. The roots and stems of this plant are considered cooling, astringent and tonic. A decoction of it is given for fevers, urinary disorders and to prevent miscarriages.

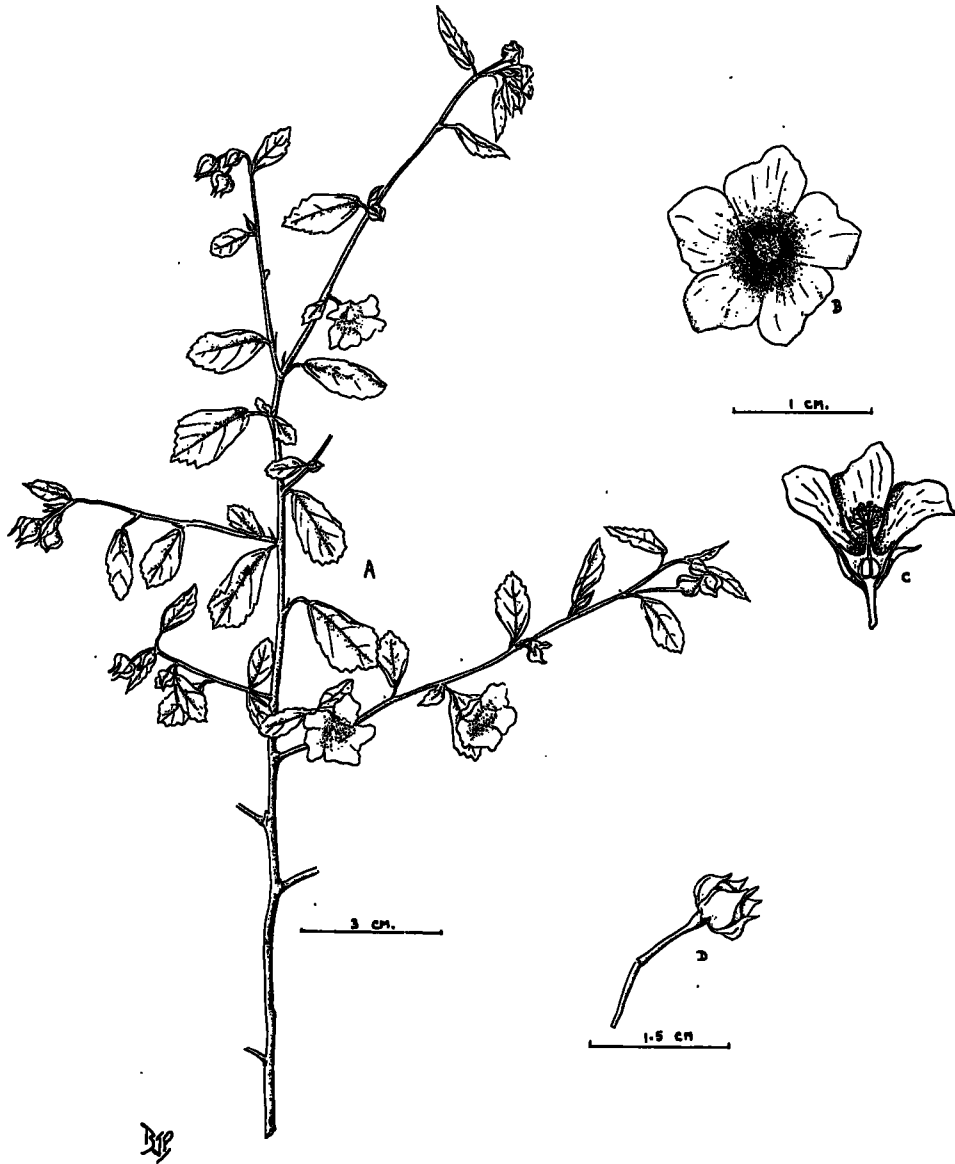


FIG. 362. *Sida rhombifolia*. A, branch with leaves and flowers. B, flower, dorsal view. C, longitudinal section of flower. D, fruit with persistent calyx.

14. *Sida rhombifolia* Linn. Sp. Pl. 684. 1753. (Fig. 362).

Sida canariensis Willd.—*Sida compressa* Wall.—*Sida semicranata* Link.—*Sida philippica* DC.

Sinh. Kotikan-bevila; *Tam.* Anaikurundotti, Kurundotti, Tenacham; *Sans.* Ahikhandha, Atibala, Bala, Barela, Brihadagala, Devaarha, Devabala, Devasaha, Gandha vallari, Gandhavalli, Jyeshthabala, Karambhara, Kesarika, Keshawardhini, Keshruha, Lalbarila, Mahabala, Mahagalarthaprasadini, Mahagandha, Mriga, Mrigadini, Mrigarasa, Pitapushpa, Pitapushpi, Prasadini, Sahadeva, Sahadevi, Samanga, Sarini, Varshapushpa, Varshapushpi, Vataghni, Vatyā, Vatyayani.

An erect, much branched undershrub with stellate hairy branches; leaves simple, alternate, stipulate, 2.5—5 cm long, rhomboid-lanceolate, acute, and dentate-serrate towards the apex, entire and obtuse at base, glabrous above, densely stellate hairy beneath, petioles 0.6 cm long, stellate hairy, stipules setaceous longer than petioles; flowers regular, bisexual, axillary, yellow, solitary, 1.8 cm long, pedicels 1.2—3.7 cm long also stellate hairy, bracteoles absent; sepals 5, connate into a cup-shaped, 5-lobed calyx, segments broadly triangular, acute or apiculate; petals 5, convolute, slightly connate at base and adnate to the stamen-tube; stamens numerous, filaments fused into a stamen-tube through which the style passes; ovary superior, fruit 9—10 carpellary, irregularly dehiscent, separating from the axis into unicarpellary 1-seeded segments.

Flowers all the year round.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 122. 1933; Herb. Peradeniya, drawing.

Distribution. A weed growing in waste ground throughout the tropics. It is a roadside weed in Ceylon growing upto the montane zone.

India. Him. Bor. Occ., Punjab, *T. Thomson*. Uttar Pradesh, Dehra Dun, *Singh* 67, 1928. Bengal: *Clarke* 26523, June 1875; *Wallich* 1863C. East Bengal: *Hook. f. and T. Thomson*; *Griffith* 506, Kew Distribution 1861—1862. Sikkim: *T. Thomson*, 1857. Khasia: *Clarke* 16662, Oct. 1871. *Ceylon.* North-Eastern Prov., Puttalam, *Thwaites C.P.* 3117; *Thwaites C.P.* 1131; *Thwaites C.P.* 3615. Central Prov., Katugastota, *Senaratne*, 10097, April 1952. *China.* *Tsiang Ying* 116, April 1928. *French Guiana.* *Sagot* 105. *Timor.* *Meyer*, 1884. *Fiji Islands.* *Horne* 400, March 1879.

Composition. This plant contains the alkaloid ephedrine which is absent in the Australian variety.

Uses. Used for poulticing ulcers, boils, fractures and as skin application for chickenpox and itches. In Europe, it is regarded as a valuable remedy for pulmonary tuberculosis and rheumatism. A decoction of the roots is used as a mouthwash for toothache and taken internally for high fever, abdominal ailments, irregular menses and rheumatism. In Borneo and Central Africa, it is used as an abortifacient. The leaf is also applied as a poultice on inflammations. In Vietnam, the plant is used as a purgative. It is also a source of fibre.

15. *Sida veronicaefolia* Lamk. Encycl. 1: 24. 1783.*Sida humilis*-Cav.*Sinh.* Bevila; *Tam.* Palampasi, Palampadu; *Sans.* Bhumiphala, Bala,

A perennial herb with long, prostrate, trailing branches rooting at nodes and with scattered stellate hairs; leaves simple, alternate, stipulate, variable in size, 1.2—5 cm long, broadly ovate, cordate at base, acute, coarsely crenate-serrate, sparsely covered with long hairs, petioles 0.6—1.9 cm long and hairy; flowers regular, bisexual, pale yellow, small, numerous, less than 1.2 cm diam., pedicels about 2.5 cm long, stiff, slender, slightly hairy; sepals 5, connate into a cup-shaped, 5-lobed calyx, segments triangular, very acute with stellate hairs on margins; petals 5, convolute, slightly connate at base and adnate to stamen-tube, broader than long, truncate; stamens numerous, filaments fused into a tube through which the style passes; ovary superior, 5-carpellary, 5-locular with axile placentae; fruit irregularly dehiscent, 1-seeded carpels, pointed, very slightly bicuspidate and smooth.

Flowers from January to March.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 119B. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the tropical and subtropical regions of both hemispheres, including the warmer parts of India and Ceylon. It is very common in waste ground in the low-country in Ceylon. Batticaloa, Haragama, Hanguranketa, etc.

India. Him. Bor. Occ., *T. Thomson*; Concan; *Stocks, Law, etc.* Chota Nagpore, *Clarke* 20743, Oct. 1873. Pen. Ind. Or., *Wight* 186. **Ceylon.** Without locality, *Thwaites C.P.* 1124. **Maldive Islands.** Addu Atoll, Minikoi, *Gardiner* 18, Feb. 1901; *Didi* 155, 1896.

Uses. The flowers and unripe fruits are given in decoction for burning sensation in micturition. The crushed leaves heal cuts and bruises. A decoction of the roots is given for fevers, urinary complaints, diarrhoea in pregnancy and as a preventive against miscarriages.

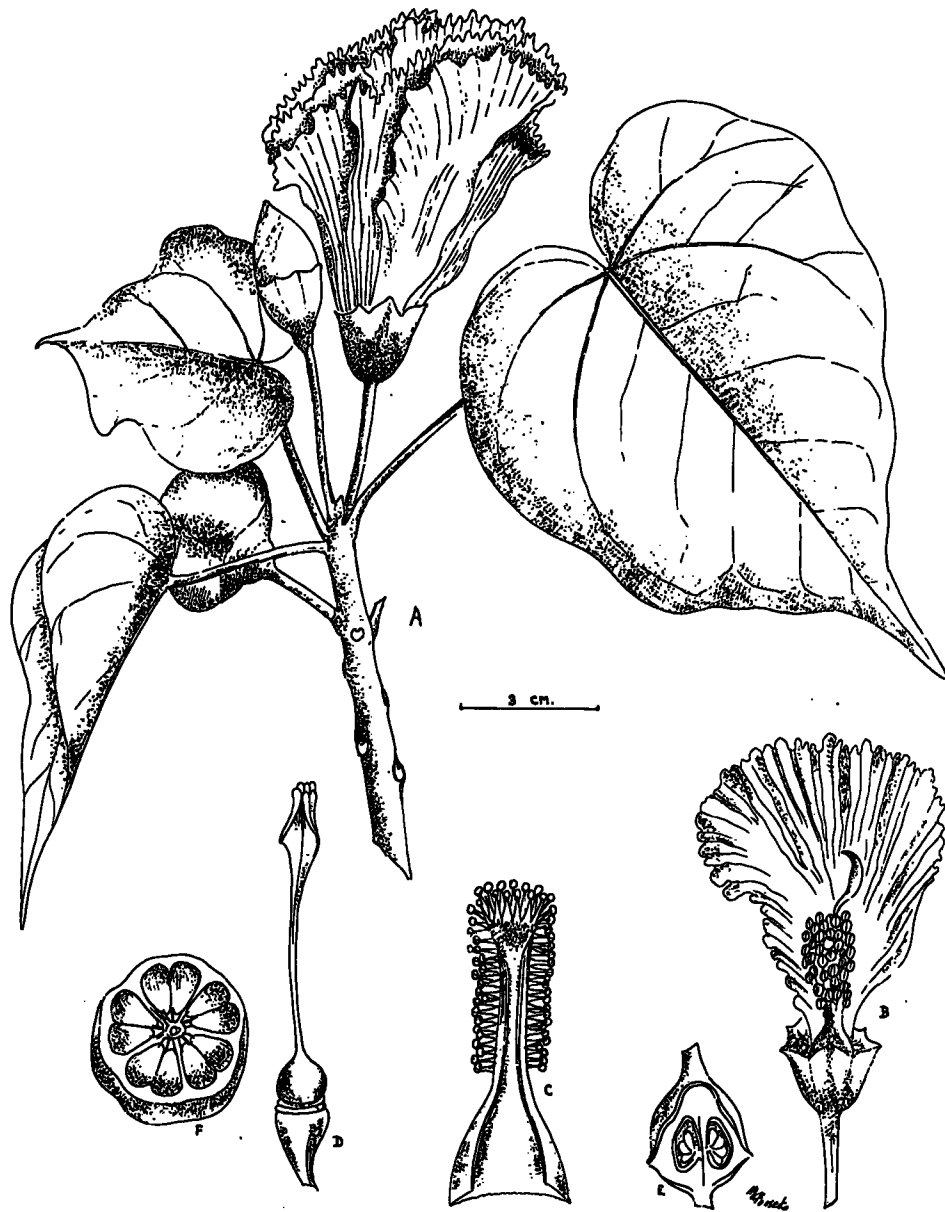


FIG. 363. *Thespesia populnea*. A, twig with leaves, flower, flower bud and fruit. B, flower with four petals removed. C, stamen-tube opened out. D, pistil. E, longitudinal section of ovary. F, transverse section of fruit.

16. *Thespesia populnea* Soland ex Corr. in Ann. Mus. 9: 290. 1807. (Fig. 363).

Hibiscus populneus Linn.—*Hibiscus bacciferus* Forst.—*Hibiscus populifolius* Salisb.—*Thespesia populneoides* Kostel.

Engl. Portia-tree, Tulip-tree; *Sinh.* Gan-suriya, Suriya; *Tam.* Kavarachu, Puvarathu; *Hindi* Bhendi; *Sans.* Parisa.

A small tree 10—15 m high with a rough lenticelled bark and a dense top, all parts covered with peltate scales; leaves simple, alternate, long-petioled, ovate-cordate, acuminate, 5—12.5 cm long, dark green, yellow when old; flowers regular, bisexual, yellow fading into purplish pink, solitary, axillary, 5—7.5 cm diam., bracts small, deciduous; sepals 5, fused into a cup-shaped, truncate, 5-toothed calyx; petals 5, convolute and adnate to stamen-tube at the base; stamens numerous, filaments fused into a stamen-tube through which the style passes; ovary superior, 5-carpellary, 5-locular with axile ovules; fruit a depressed-globose, woody, indehiscent capsule 2.5—3.7 cm diameter.

Flowers throughout the year.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 8. 1838; Worthington, Ceylon Trees, pl. 73. 1959.

Distribution. Occurs in the tropics of America, Africa, Asia and the Pacific Islands. It is very common along the seashore and in the dry zone in Ceylon up to 2,000 feet altitude.

North America: Florida, Miami, *Moldenke* 5635 (NY); *Caldwell* 8770 (US) *Central America:* British Honduras, *Donnell Smith* 16 (US); Honduras *Molina* 10431 (US); *South America:* British Guiana, *Jenman* 5853 (NY) *India:* Bangalore, *Saldanha C* 58874 (NY).

Ceylon. Southern Prov., Ruhuna National Park, Patanagala Ocean Beach, *Mueller-Dombois* 67082504, Aug. 1967; between Buttala and Yala, *Comanor* 400, June 1967; Patanagala, *Fosberg* 50352; April 1968; Kumana, *Cooray* 69073119R, July 1969.

Philippine Islands: Luzon, *Escritor* 20894 (US) *Maldiv Islands:* Male Atoll, *Fosberg* 36852 (US) *Australia:* Queensland, *White* 10092 (NY) *Fiji Islands:* Viti Levu, *Degener* 15106 (US, NY).

Uses. The leaves and bark are used as a blood purifier and for piles, and in the preparation of medicinal oils which are applied on fractures. The leaves are employed for poulticing ulcers and the bark on boils. A conjee prepared from the juice of the leaves and bark with grains of *Setaria italica* is given for injuries due to falls, flatulence and as a purgative. A decoction of the bark is given as an astringent, tonic and alterative.

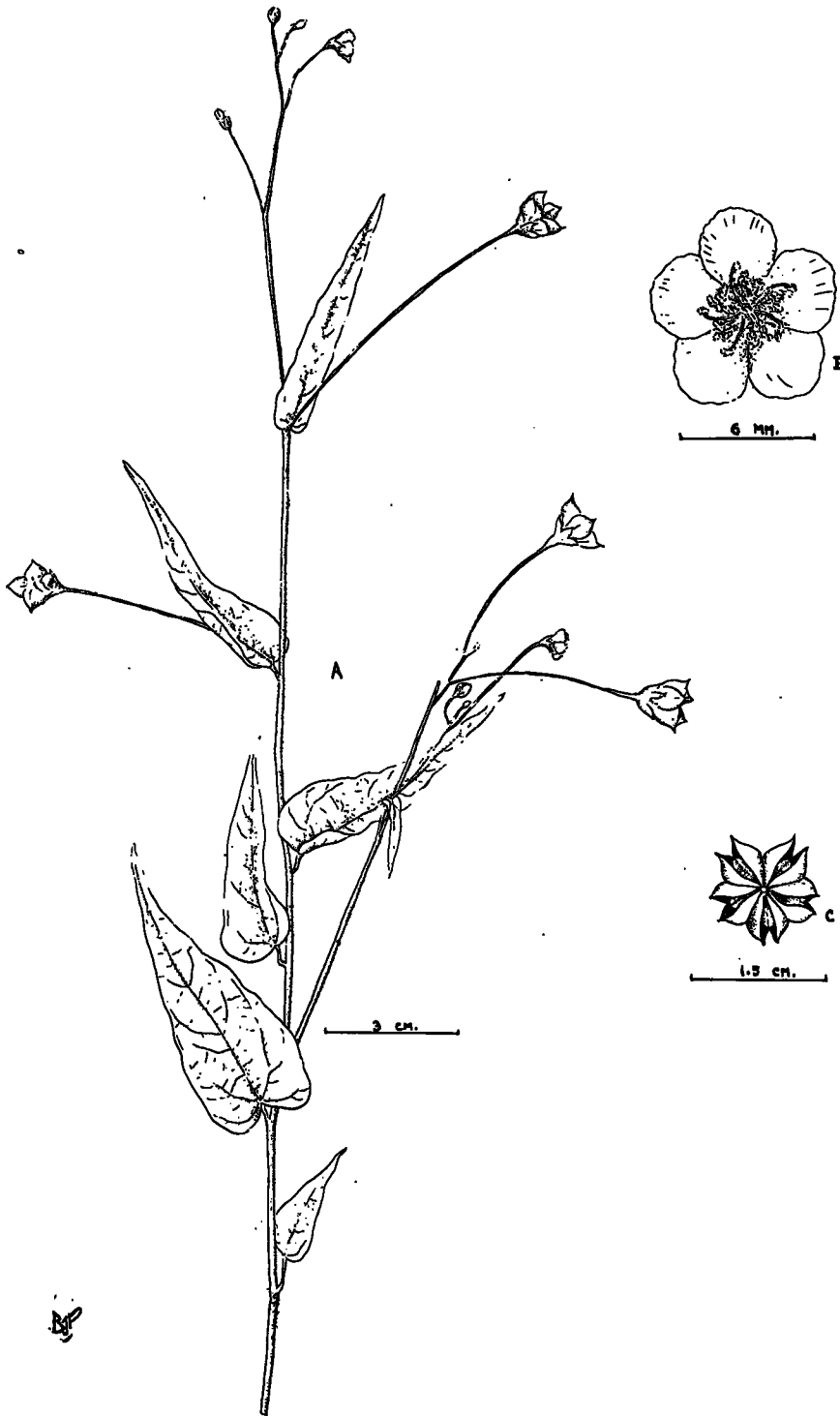


FIG. 364. *Wissadula periplocifolia*. A, twig with leaves, flowers and fruits. B, flower, dorsal view. C, dehiscent fruit.

17. *Wissadula periplocifolia* (Linn.) Presl. ex Thw. Enum. 1858. (Fig. 364).

Wissadula zeylanica Medik.—*Sida periplocifolia* Linn.—*Abutilon periplocifolium* Sweet.

Sinh. Kirikaju, Wisadooliya; *Tam.* Wisadooliya; *Sans.* Wisadooliya.

A semi-shrubby, erect, much branched perennial, 1—1.3 m in height, more or less covered with stellate tomentum; leaves simple, alternate, 6.2—8.7 cm long, deltoid ovate, cordate at base, much attenuated acute apex, entire, glabrous above, more or less densely clothed with white or brown stellate wool beneath, petioles 1.2—2.5 cm long, woolly; flowers regular, bisexual, small, pale yellow, about 1.2 cm long, on slender pubescent pedicels, jointed near the top, at first nodding, arranged in large, lax, erect, terminal panicles, bracteoles absent; sepals 5, connate below, puberulous, lobes ovoid, acute; petals 5, connate at base, adherent to stamens, stamen-tube divided at apex into numerous filaments; ovary superior, carpels 5, much exceeding calyx, smooth, truncate at top, spreading, pubescent, 6 mm long, awned, acutely pointed but not beaked, dehiscent along the top and outer side, seeds 2—3 in each loculus, pyriform, black, pubescent.

Flowers in November and February.

Distribution. Occurs in India, Ceylon, Thailand, Java and Sumatra. It is common in the moist low-country in Ceylon.

Ceylon. Without locality, *Thwaites C.P.* 1132; *Walker.* North-Western Prov., Kurunegala, *Herb. Peradeniya*, Sept. 1888. Uva Prov., Bibile, *Herb. Peradeniya*, Jan. 1888. Southern Prov., Ambalantota-Madampe Road, *Simpson* 8635, Sept. 1931.

Uses. Employed for snake-bite poisoning. For cobra-bite poisoning, the juice of this plant is applied with human urine on the body and for krait-bite poisoning the juice of the plant is taken internally with the juice of the leaves of *Clerodendrum infortunatum* and *Phyllanthus debilis*.

The stem yields an excellent fibre.

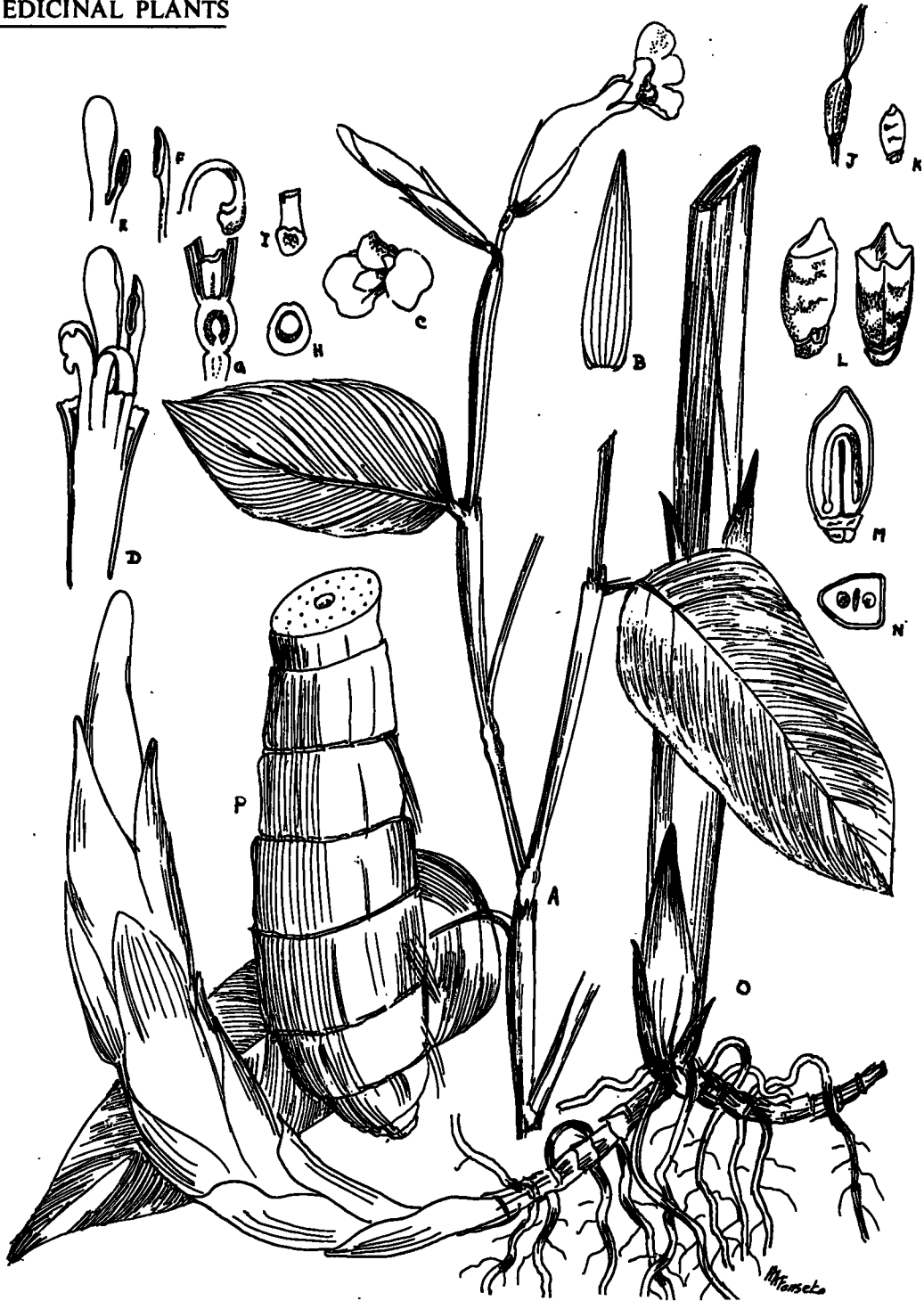


FIG. 365. *Miranta arundinacea*. A, top portion of a branch of flowering plant showing leaves with sheaths and a terminal pair of flowers. B, sepal. C, dorsal view of flower. D, portion of the corolla-tube showing the innermost staminodes. E, anther-bearing staminode. F, anther. G, longitudinal section of ovary showing the basal ovule. H, transverse section of ovary. I, stigma. J, fruit. K, L, seeds. M, longitudinal section of seed showing the horse shoe-shaped double embryo. N, transverse section of seed. O, base of flowering stem and rhizome branch. P, portion of mature rhizome.

64. MARANTACEAE

1. *Maranta arundinacea* Linn. Sp. Pl. 2. 1753. (Fig. 365).

Maranta romossima Wall.—*Maranta indica* Tussac.

Engl. Arrowroot Plant; *Sinh.* Aralukpiti, Hulankiriya; *Tam.* Arurutukkilangu.

A herbaceous perennial with a creeping, definite rootstock giving off (beneath the terminal buds) lateral, solid, fleshy, cylindrical thickened branches (tubers) curving upwards, covered with large, imbricated, thin, pale brown or white scales and afterwards ringed with their scars; flowering stem 1.6—2 m high, slender, much branched, smooth, compressed, swollen at nodes, mostly covered with the sheaths of leaves, branches wide spreading; leaves numerous with long sheaths split completely down one side, and either enveloping the stem or standing a little away from it, smooth, striate with somewhat membranous margins and terminating above in 2 prominent, blunt, purple auricles, blade spreading set on a short, thick, hard, rounded, finely pubescent petiole, ovate-oblong or ovate-lanceolate, the lower reaching 25 cm in length, the upper 5—10 cm acute or acuminate, entire, glabrous or nearly so on both surfaces with a prominent, thick midrib which ceases before the apex and very numerous, slender, curved, parallel lateral veins, pale green, somewhat glaucous beneath, convolute in veneration; flowers shortly stalked, slightly nodding, pedicels somewhat thickened beneath the flower, arranged in pairs at the ends of the rather long, slender, divaricate branches terminating in the long peduncles which are given off opposite the axils of upper leaves; bracts long, sheathing, blunt, at the base of branches; sepals 3, superior, equal, oval-oblong, subobtusate, membranous, delicately veined; petals and stamens combined below into a tube which is about half as long again as the sepals, curved and gibbous on the back, nearly straight in front, divided at the end into 3 equal, broadly oval-oblong, blunt outer segments (corolla) and 5 inner equal divisions (petaloid staminodes) exceeding the corolla and arranged in 2 whorls, the outer whorl of two nearly equal, large, labelliform bifid staminodes, the inner whorl of 3 much smaller, unequal ones of which the two smaller are partially united, recurved, and the longer one somewhat spatulate, erect, bearing on one side a free, erect, small, 1-celled anther; ovary inferior, very bluntly trigonous, smooth, unilocular with a single erect ovule seated on a thick stalklike placenta, style united with the upper surface of the flower-tube for nearly its whole length, the terminal part free, somewhat triangular, curved over into a hook, stigma truncate, slightly dilated, perforated in the centre, with a prominent lip round the mouth; fruit small, crowned with the remains of the sepals, smooth, oblong-ovoid, pericarp leathery, dehiscing from the top into 3 valves; seed solitary, erect, ovoid, irregularly pointed or shortly beaked at the top, testa very hard, smooth, mottled, a hollow canal runs up the centre of the seed from base for about 3/4 its length, endosperm abundant, horny.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 265. 1880; Macmillan, *Trop. Plant. and Gard.* ed. 5, p. 292. 1956; Wallich, *Plant. Asiat. Rar.* pl. 286. 1831; Curtis, *Bot. Mag.* pl. 2307. 1822; Roscoe, *Scitamineae*, pl. 25.

Distribution. A native of tropical America and now frequently cultivated in all tropical regions of the world including India, Ceylon, Java, Philippine Islands and the west coast of Africa. In Ceylon, it flourishes in the mid and low-country, mainly cultivated for food.

Ceylon. Peradeniya, Bot. Gard., *Herb. Peradeniya*, without collector's name and date of collection.

Composition. The tubers of this plant contain starch, fibre, fat, albumen, sugar and gum.

Uses. The boiled tubers are eaten as a source of food, while the starch extracted from them is given to convalescing patients. In the West Indies, they are often used for poulticing wounds. The starch is a nutrient, emollient and demulcent for bowel complaints and diseases of the urinary organs. The expressed juice of the rhizome is an antidote for food poisons and bites of venomous snakes.



FIG. 366. *Memecylon capitellatum*. A, branch with leaves and clusters of flowers. B, flower, lateral view. C, fruits.

65. MELASTOMACEAE

1. *Memecylon capitellatum* Linn. Sp. Pl. 349 1753. (Fig. 366).

Memecylon edule var. *capitellata* Clarke.

Sinh. Dodan-kaha, Weli-kaha; *Tam.* Kattikaya, Pavaddai-kaya, Venkali-kaya.

A shrub with a brown bark and cylindrical twigs; leaves simple, opposite, entire, glabrous, very shortly stalked, 5—6.5 cm long, oblong or slightly rhomboid-oval, acute at base, obtuse or slightly acuminate at apex, thick, shining on both surfaces, bright light green, paler beneath, lateral veins inconspicuous, the intramarginal vein joining the midrib at the base, making it distinctly 3-nerved; flowers regular, bisexual, violet-blue, rather large, sessile, few together in small heads at ends of stiff peduncles 0.6—3.7 cm long, from axils of present and fallen leaves; sepals 4, fused into a campanulate calyx-tube adnate to ovary, segments conspicuous, fleshy, erect, bluntly pointed; petals 4, distinct; stamens 8, equal, anthers short, opening by slits, connection produced into a large horn below; ovary inferior, unilocular, surmounted by a depressed epigynous disc marked with 8 strongly winged rays, ovules 6—8 on a free-central placenta; fruit a black purple 1-seeded berry 1 cm or more in length, crowned by the large calyx segments, seed large and cotyledons folded.

Flowers during May and June.

Illustrations. Beddome, *Flor. Sylvat. pl.* 206, *fig. A.* 1868—1873; Burmann, *Thes. Zeyl. pl.* 30. 1737; Trimen, *Flor. Ceyl. pl.* 41; Lamarck, *Ill. pl.* 284; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India and Ceylon. It is common in the low-country, upto an elevation of 1,000 feet in both moist and dry regions in Ceylon, especially in the northern forests. Galle, Ratnapura, Anuradhapura, etc.

Ceylon. North-Central Prov., Anuradhapura, *Herb. Peradeniya*, Oct. 1883; Eastern Prov., Muthur, Faul Point, *Simpson* 9653, May 1932; Batticaloa, *Walker* 174, Sept. 1885; *Thwaites C.P.* 1564.

Uses. The leaves and bark of this plant are used for the preparation of medicinal oils applied on ulcers and as a fomentation on swellings.

2. *Memecylon umbellatum* Burm. f., Fl. Ind. t. 31. 1765.

Memecylon edule Roxb.—*Memecylon edule* var. *typica* Clarke—*Memecylon edule* var. *Thw.*—*Memecylon tinctorium* Koer.—*Memecylon globiferum* Wall.—*Memecylon pyriformis* Naud.

Sinh. Dedi-kaha, Dodan-wenna; *Tam.* Alli, Anjani, Kasa, Kasai, Kashamaram, Kaya, Perungaya, Pungali, Puvai, Sirugasa; *Sans.* Anjani.

A small tree with terete young branches, glabrous; leaves simple, opposite, exstipulate, 3.7—7.5 cm long, 1.5—3.7 cm broad, elliptic or ovate, subacute or shortly and bluntly acuminate, attenuated but sometimes rounded at base, margins slightly revolute, midrib prominent, lateral veins obscure, petioles 2.5—5 mm long; flowers regular, bisexual, numerous, in umbellate cymes from the axils of fallen leaves of the old wood, peduncles several together, 3—10 mm long, elongating in the fruit, ultimate pedicels 2.5—10 mm long, very slender, buds pyriform; calyx 2.5 mm long, campanulate before expansion, saucer-shaped afterwards, 3 mm across the mouth when flowering, limb truncate, 4-toothed, teeth small, triangular; petals 4, broadly ovate or orbicular, obtuse or apiculate; stamens 8, equal, filaments filiform, anthers short, cells opening by slits, connective thickened at the back ending in an obtuse spur behind; disc without or with very faint rays; ovary inferior, unilocular, glabrous, apex convex, ovules whorled about a free-central placenta, style filiform; fruit a globose berry, 6 mm diam., purplish black, crowned though inconspicuously with a calyx limb, usually 1-seeded.

Flowers from January to March.

Illustrations. Roxburgh, Pl. Corom. 1: pl. 82. 1795; Burman f., Fl. Ind. pl. 31. 1765; Wight, Ill. Ind. Bot. pl. 93. 1838; Kirtikar and Basu, Indian Med. Plants, pl. 429. 1933.

Distribution. Occurs along the western coast of India and on the east in Assam and Sylhet, Ceylon and Malay Peninsula.

India. N. Canara: *Talbot*, Dec. 1880; Mt. Nilghiri and Kurg: *G. Thomson*. Ceylon. Sabaragamuwa Prov., Ratnapura, *Thwaites C.P.* 3442. Tenasserim and Andamans. *Herb. Helfer* 2326, Kew Distribution 1862—3. Malaya. Penang: *Curtis*, Oct. 1885. Philippine Islands. Luzon: Rizal Prov., *Ahern's Collector* 3070, June 1905; Bataan Prov., Mt. Marivales, Lamao River, *Borden* 820, June 1904.

Uses. A decoction of the roots of this tree is given for irregular menstruation and an infusion of the leaves used as an astringent for ophthalmia.

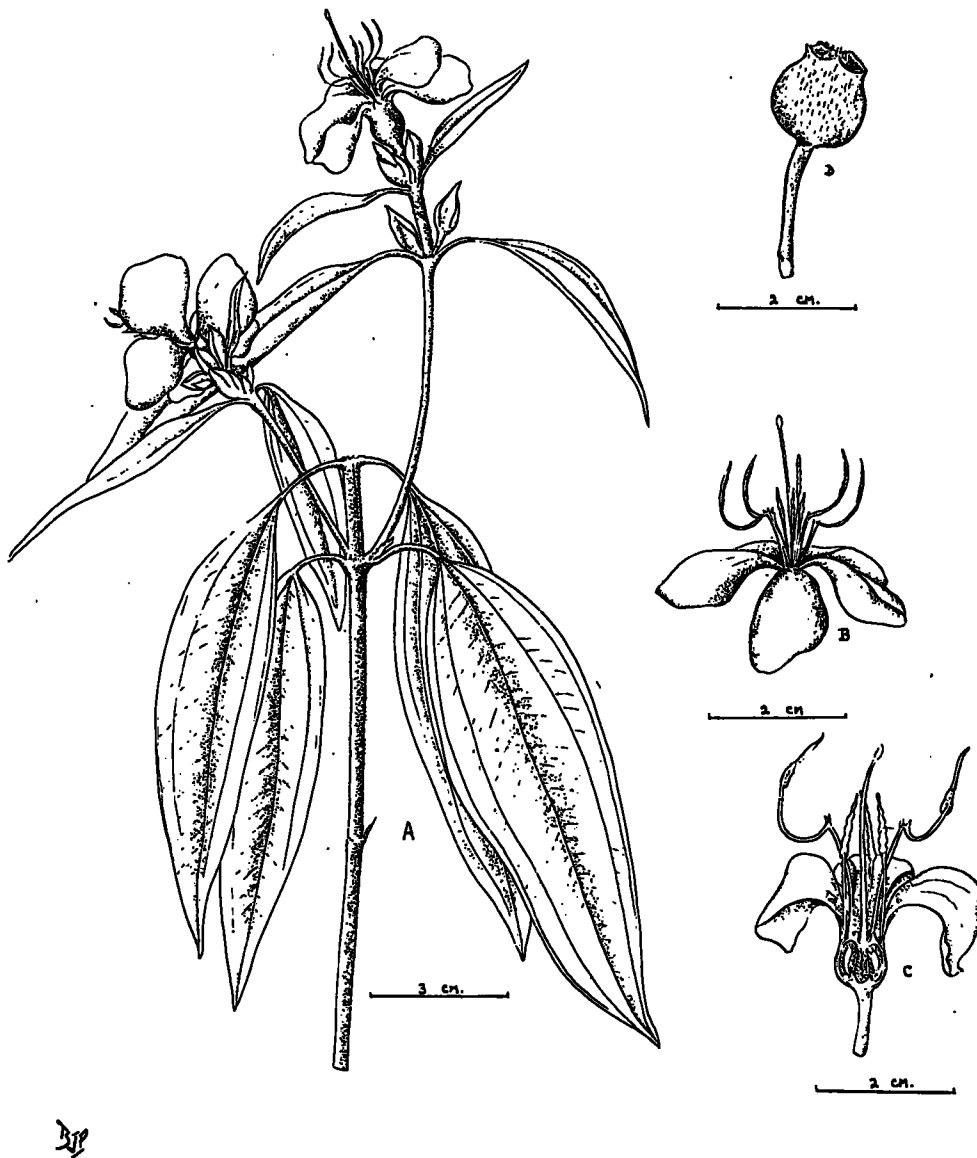


FIG. 367. *Osbeckia octandra*. A, branch with leaves and flowers. B, flower, lateral view. C, longitudinal section of flower. D, fruit.

3. *Osbeckia octandra* DC. Prodr. 3: 142. 1828. (Fig. 367).

Melastoma octandra Linn.—*Osbeckia polycephala* Naud.—*Osbeckia virgata* Don.

Sinh. Heen-bowitiya, Kuruvina; *Tam.* Katthoo mukhtohulai, Mahthulai.

A small erect shrub with many erect virgate branches, bark reddish brown, flaking off in fibrous pieces, young shoots quadrangular, hispid with adpressed bristly hairs; leaves opposite, narrowly lanceolate or oblong-lanceolate, shortly tapering to base, subacute, very faintly serrate, ciliate, almost entirely glabrous above, glaucous green with scattered long hairs beneath, 3-nerved, petiole 3 mm long, flat, hairy; flowers regular, bisexual, pale pink or nearly white, about 3 cm across, numerous in close corymbose or paniculate terminal cymes; calyx-tube long-companulate, faintly ribbed, perfectly glabrous or occasionally with few scattered simple or stellate bristly hairs, segments narrowly triangular, less than half the length of the tube, ciliate, tipped with a bristle or large stellate hair, intermediate teeth large; petals 5, rounded, ciliate; stamens 10, anthers attenuate; ovary half-inferior, 4-5 loculed with numerous ovules; fruit capsules enclosed in the calyx-tube and partially adnate to it below, loculicidally dehiscent, seeds numerous, kidney shaped.

Illustrations. Mrs. Dorothy Fernando, *Wild Flowers of Ceylon*, pl. 6, fig. 7. 1954; Herb. Peradeniya, drawing.

Distribution. Common in the moist mid and low-country upto 5,000 feet altitude in Ceylon. It also occurs in South India.

Ceylon. Central Prov., Rangala, *Alston* 1738, 1927; Hunnagiriya, *J. M. Silva* 63, 1926; between Ramboda and Nuwara Eliya, *Mueller-Dombois and Comanor* 67052819, 1967; Welimada, *Dombois* 67091517, 1967; Haputale, *Dombois* 68051904, 1968; Peradeniya, *Dombois* 67110922, 1967; Dambulla, *Thwaites C.P.* 507, 1852; between Ginigathena and Norton Bridge, *Robyns* 7230, 1971. Hantane, *Robyns* 7177, 1971; Peradeniya, Bot. Gard., *Robyns* 7100, 1971. Sabaragamuwa Prov., Ratnapura, *Robyns* 7253, 1971. Southern Prov., Hiniduma, *Robyns* 7346, 1971; Belihuloya, *Reed* 2251, 1969.

Uses. The tender leaves of this plant made into a curry and the mature leaves made into a salad taken plentifully with both meals for 5—7 days is known to cure diabetes. The leaves taken as a gruel early in the morning for a week, cures haemorrhoids. The leaves and roots are given in the form of a decoction for hepatitis.



FIG. 368. *Aglaia roxburghiana*. A, branch with leaves, fruits and flowers. B, male flower, lateral view. C, bisexual flower, lateral view. D, bisexual flower, lateral view showing the calyx and corolla. E, stamen-tube of male flower opened out showing the sessile anthers. F, stamen-tube of bisexual flower opened out. G, pistil with corolla and stamen-tube removed.

66. MELIACEAE

1. *Aglaiia roxburghiana* (Wight and Arn.) Miq., Ann. Mus. Lugd. Bot. 4: 41. 1868. (Fig. 368).

Aglaiia odoratissima Bl.—*Aglaiia lepidota* Miq.—*Aglaiia spanoghei* Bl.—*Aglaiia grata* Wall. ex Voight.—*Aglaiia midnaporensis* Carey ex Voight.—*Milonea roxburghiana* W. & A.—*Walsura lanceolata* Wall.—*Meliaceae singapuriana* Wall.

Sinh. Puwangu; *Tam.* Kannikkombu, Sokkalai, Priangu; *Hindi* Phula Phana; *Sans.* Anganapriya, Bhangura, Bhedini, Gandhaphala, Gauri, Gourvalli, Govandini, Govarna, Gundra, Kanguni, Kanta, Karambha, Katu, Krishangi, Krishnapushpi, Lata, Mahilavhaya, Mangalya, Mithavalli, Narivallabha, Parnabhendini, Phalapriya, Pholini, Pita, Preyasi, Priyaka, Priyangu, Shubha, Shyama, Subhanga, Vanita, Vishvaksena, Vritta.

A moderate-sized or large tree with a smooth, dull greyish orange bark and young parts covered with minute ferruginous scales; leaves compound, alternate, exstipulate, pinnate, rachis 5—10 cm long, cylindrical, smooth, leaflets 2 pairs and a terminal one, shortly stalked, 6.2—10 cm long, oval, acute or tapering to base, obtuse, entire, somewhat undulate, glabrous on both sides, paler beneath; flowers regular, small, yellow, polygamous, the males numerous in pyramidal spreading panicles exceeding the leaves, the bisexuals few in short racemes, peduncles slightly supra-axillary, lepidote; sepals 5, fused into a deeply 5-lobed, imbricate calyx; petals 5, distinct, imbricate, orbicular, very concave; stamens 5, fused into a truncate tube, thickened below each sessile anther, included; ovary superior, 2-locular; fruit an ovoid or pyriform berry, gibbous at base, 1.6—1.8 cm long, minutely rusty pilose, pale orange coloured with a thin pericarp, seeds 1 or 2, ovoid, testa white, thick, pulpy, embryo green, cotyledons very thick, not easily separable, externally lobulated.

Flowers during July.

Illustrations. Beddome, Flor. Sylvat. pl. 130. 1868—1873; Wight, Ic. Pl. Ind. Or., pl. 166. 1839; Kirtikar and Basu, Indian Med. Plants, pl. 222. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India along the Western Ghats, Ceylon, Burma, Malay Peninsula, Java and Sumatra. It is common in the low-country in Ceylon. Galle, Trincomalee, Minneriya, Hantane, etc.

Ceylon. North-Central Prov., Galkulam, *Herb. Peradeniya*, Aug. 1885. Eastern Prov., Batticaloa, *Walker* 168, Sept. 1885. Western Prov., Ambepussa, *Senaratne*, June 1930; between Nildandahena and Pantheru Kande, *J. M. Silva* 284, Dec. 1927. Without locality, *Thwaites C.P.* 1148.

Uses. The root and bark of this tree are useful for dysentery and fever. The leaves are emetic and given for abdominal pains. The fruits are used along with other ingredients for haemoptysis, diarrhoea with vomiting and externally on ulcers.



FIG. 369. *Amora rohituka*. A, portion of a leaf and stem, bearing panicles of flowers. B, flower bud. C, flower with corolla opened out showing stamen-tube. D, stamen-tube opened out showing the stamens and pistil. E, anthers.

2. *Amoora rohitaka* (Roxb.) Wight and Arn. Prodr. Fl. Pen. Ind. Or. 119. 1834. (Fig. 369).

Amoora polystachya Hook. f. and Jacks—*Amoora macrophylla* Nimmo—*Aglaia polystachya* Wall.—*Aphanamixis polystachya* Blatter.—*Andersonia rohituka* Roxb.—*Andersonia rohitoca* Griff.—*Sphaerosacme polystachya* Wall.—*Sphaerosacme spicata* Wall.—*Buchanania spicata* Hb. Roxb.—*Meliacea wightiana* Wall.

Sinh. Hingul; *Tam.* Sem, Surailachumaram, Vangul; *Sans.* Janavallabha, Ksharayogya, Lakshmi, Lakshmivana, Rohitaka, Saptavha, Sarvajanapriya, Sitanga, Sitapushpa, Sitavhaya, Shvetarohitaka, Shuklarohita.

A moderate sized tree with a straight trunk, drooping branches and finely silky young parts; leaves pinnate compound, alternate, exstipulate, large, spreading, rachis 30—70 cm long, cylindrical, thickened at base, leaflets 13—17 in 6—8 opposite pairs and a terminal one, stalked, 7.5—12.5 cm long, unequal at base, acuminate, obtuse, glabrous on both sides, the terminal one the smallest; flowers regular, polygamous, yellow, sessile, distant, the males numerous, small on the spicate branches of large, spreading, supra-axillary panicles, the female flowers twice as large and in long drooping spikes; sepals 5, imbricate, rotundate, downy, ciliate; petals 3, strongly imbricate, rotundate, very thick, concave; stamens 6, fused into a globose tube, nearly entire at the mouth; ovary superior, 3-locular with two superposed ovules in each loculus, pilose, stigma sessile, large, trigonous; fruit a globose or somewhat pyriform smooth red capsule about 2.5 cm long, valves thick, fleshy, spongy within, seeds about 2.5 cm long, broadly ovoid, apiculate, aril fleshy, yellow, testa smooth, shining, purplish-brown, marked along the ventral side with a raised raphe.

Flowers in July and August.

Illustrations. Beddome, *Flor. Sylvat. pl.* 132. 1868—1873; Griffith, *lc. Pl. Asiat.* 4: *pl.* 589, *fig.* 3. 1845; Roxburgh, drawings in *Herb. Kew, pls.* 934 and 1127; Kirtikar and Basu, *Indian Med. Plants, pl.* 223. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, along the Western Ghats, Assam, Ceylon, Tenasserim, Andaman Islands, Cambodia, Indo-China, Malaya and Philippine Islands. It is rather rare in Ceylon in the moist regions upto 3,000 feet altitude. Hantane, Maturata, Ekiriyan-kumbura, etc.

India. Bengal: *Hook. f. and Thomson.* Tinnevely, *Beddome* 289. Sylhet: *Wallich* 1277/1. Sikkim: *J. D. Hooker.* Chittagong: *King's Collector* 211., Jan. 1889. Ceylon. Without locality, *Thwaites C.P.* 558; *Senaratne*, Dec. 1930. Malaya. Perak: *Scortechini*; Larut: *King's Collector* 6163, May 1884.

Composition. The bark of this tree contains two yellow resins.

Uses. The bark is an astringent and used as a cure for enlarged liver and spleen. The oil extracted from the seeds is a stimulating liniment for rheumatism.



FIG. 370. *Azadirachta indica*. A, twig with leaf and flower panicles. B, flower, lateral view. C, flower with corolla removed. D, stamen-tube opened out with four of its anthers removed. E, longitudinal section of pistil. F, transverse section of ovary. G, fruit. H, transverse section of fruit.

3. *Azadirachta indica* A. Juss. in Mem' Mus. Par. 19: 221. 1830. (Fig. 370).

Melia azadirachta Linn.—*Melia parviflora* Moon.—*Melia indica* Brandis.

Engl. Margosa Tree, Neem Tree; *Sinh.* Kohomba, Nimbu-nimba-gaha; *Tam.* Arulundi, Kaduppagai, Kinji, Malugam, Niriyaam, Pisidam, Sengumaru, Ukkragadam, Varuttam, Venbu, Veppu; *Hindi* Nimb; *Sans.* Arishta, Arkapadapa, Chhardana, Chhardighna, Hingu, Kaitarya, Kakaphala, Kireshta, Kitaka, Maloka, Neta, Nimba, Nimbaka, Niryasa, Niyamana, Pakvakrita, Parbhadhraka, Pichumanda, Pitasara, Prabhadra, Pukamalaka, Puyari, Rajabhadhraka, Ravipriya, Sarvatobhadra, Satiktaka, Shirsharpana, Shita, Shukrapriya, Subhadra, Sumana, Varatvacha, Vishirnaparna, Vranasodhakari, Yavaneshta.

A tall tree with spreading branches, a straight brown-barked trunk and glabrous young parts; leaves alternate, imparipinnate compound, exstipulate, crowded, rachis 15—22.5 cm long, glabrous, leaflets 2—8 pairs and a terminal one, alternate, very shortly stalked, 5—10 cm long, lanceolate-falcate, very unequal-sided, oblique at base, coarsely dentate-serrate, glabrous; flowers regular, bisexual, white, sweet-scented in lax, narrow, axillary panicles 12.5—20 cm long; sepals 5, fused, deeply cleft, lobes imbricate, rounded, finely ciliate; petals 5, imbricate, spatulate-oblong, ciliate; stamens 10, filaments fused into a tube with the anthers between the teeth, dilated above, hairy within, teeth truncate and trifid, recurved, anthers small, erect; ovary superior, 3-locular, with 2 collateral ovules in each loculus, stigma 5-lobed; fruit an oblong-ovoid drupe 1.5—1.8 cm long, blunt, smooth, dark purple, 1-celled, endocarp bony, seed solitary.

Flowers between March and May.

Illustrations. Beddome, *Flor. Sylvat. pl.* 13. 1868—1873; A. Jussieu, *Mem. Mus. Par. 19: pl.* 13, *fig.* 5. 1830; Wight, *Ic. Pl. Ind. Or., pl.* 77. 1838; Kirtikar and Basu, *Indian Med. Plants, pl.* 218. 1933; Herb. Peradeniya, drawing.

Distribution. A common tree in the warmer parts of India, Ceylon, Burma, and Java. It is commonly grown in practically every village garden in the mid and low-country in Ceylon.

Ceylon. Northern Prov., Jaffna, *Thwaites C.P.* 1159.

Composition. The leaf of this tree contains the alkaloid parasine, the bark, margosine and the fruit azaridine. The oil extracted from the seed contains margosic acid and a bitter principle.

Uses. A strong decoction of the fresh leaves has antiseptic properties and is used for washing wounds, ulcers and as a bath for patients recovering from chickenpox and childbirth. It is a useful insecticide as well. The gummy exudation from the trunk is useful in catarrhal and other ailments. The sap of the tree has been recommended for chronic cases of leprosy and other skin diseases. A useful oil is extracted from the seed. It is a local remedy for chronic skin diseases and ulcers preventing the formation of maggots and dislodging them if they are already present. It is used externally for rheumatism and taken internally by pregnant women and patients suffering from syphilis, leprosy and chronic malarial fevers. A decoction of the root bark along with other ingredients is given for typhoid fever. In Ceylon, the juice of the fresh leaves is given with rock salt for intestinal worms and with honey for jaundice and skin diseases. The oil is given with garlic and ginger after childbirth.

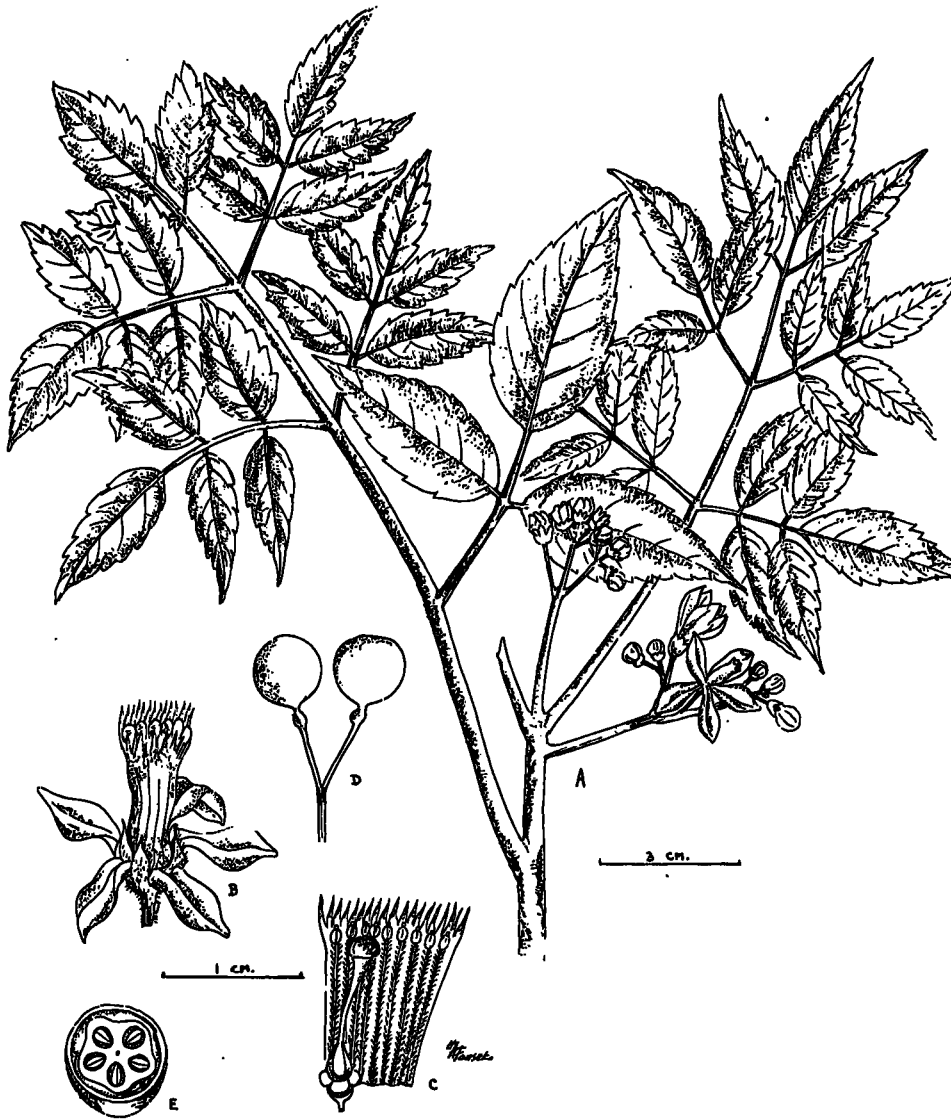


FIG. 371. *Melia azedarach*. A, branch with leaves and flower panicles. B, flower, lateral view C, stamen-tube opened and spread out showing anthers and pistil. D, fruits. E, transverse section of a fruit.

4. *Melia azedarach* Linn. Sp. Pl. 384. 1753. (Fig. 371).

Melia sempervirens Sw.—*Melia bukayun* Royle.

Engl. Bead Tree, Indian Lilac; *Sinh.* Mahanimba; *Tam.* Malaivenbu, Malaiveppam, Pisidam, Sigarinimbam, Tittam; *Sans.* Akshadru, Brihannimba, Dreka, Gairika, Giripatra, Himadruma, Kaitarya, Kakanda, Karmuka, Keshamushti, Kshira, Mahadroksha, Mahanimba, Mahatikta, Nimbaka, Parvata, Pavaneshtha, Ramyaka, Sakaleyaka, Shuklasharaka, Vishamushtika.

A tree reaching a height of about 13 m with a soft red cedar-like wood and alternate, imparipinnate, 2—3-pinnate compound leaves, pinnae opposite or alternate, ultimate leaflets 3—11, opposite or nearly so, 1.2—5 cm long, 0.6—2.5 cm broad, ovate or lanceolate, acuminate, obtusely serrate, sometimes lobes glabrous on both sides, slightly inequilateral at the base, petiolules short and slender; flowers regular, bisexual, fragrant, lilac, in many-flowered, long-peduncled, axillary panicles shorter than leaves, glabrous or puberulous, pedicels slender; calyx 5-lobed, imbricate, pubescent outside, divided nearly to the base, lobes ovate-oblong, acute, ciliolate; petals 5, free, much exceeding the calyx, 1.5 cm long, oblong-lanceolate; disc annular; staminal tube purple, 7.5 mm long, glabrous, slightly ribbed outside, faintly pubescent within, acutely 20-toothed, anthers 10, within the tube, sessile, glabrous, apiculate, one between each pair of teeth; ovary superior, glabrous, 5-locular, loculi opposite the sepals with 2 superposed ovules in each loculus, style cylindric, much exceeding the ovary, stigma capitate; fruit a sub-fleshy, ellipsoid-globose, 4-seeded drupe, seeds pendulous, elliptic, testa crustaceous.

Flowers in April and May.

Illustrations. Wight, *lc. Pl. Ind. Or.*, pl. 160. 1839; A Jussieu, *Mem. Mus.* Par. 19: pl. 13, fig. 4. 1830; Curtis, *Bot. Mag.* pl. 1066, 1808; Edward, *Bot. Reg.* pl. 643. 1822; Beddome, *Flor. Sylvat.* pl. 13. 1868—1873; Kirtikar and Basu, *Indian Med. Plants*, pl. 219. 1933; Herb, Peradeniya, drawing.

Distribution. Occurs in Persia and China but it is cultivated and naturalized throughout India. It can be grown in Ceylon.

India. Uttar Pradesh: Dehra Dun, *Gandhe* 30, March-April 1921. Bengal: *J. D. Hooker and T. Thomson*; Calcutta, *Herb. Bot. Wallich* 1250A. Madras: Nilghiris, *Schmid.* Pen Ind. Or., *Herb. Wight* 408, Kew Distribution 1866—7. Ceylon. Uva Prov., Attampitiya, cultivated, *Herb. Peradeniya*; Central Prov., *Herb. Peradeniya*, Eastern Prov., *Herb. Peradeniya*, Singapore. *Anderson* 28, Oct. 1861.

Composition. The bark of this tree contains the alkaloid paraisine. The fixed oil extracted from the seed contains butyric, valeric, stearic, palmitic, oleic, linoleic, arachidic, liquoceric and unsaturated resinous acids. The African plant contains a bitter principle mangrovin. The leaf yields meliatin, lipides and carotenoids. The fruit contains the alkaloid azaridine, a resin, meliotannic acid and benzoic acid, oil, glucose, hydrocarbons and proteins.

Uses. The root and the bark are used as an anthelmintic, vermifuge, cathartic, emetic and for intermittent fevers and dysentery. Poultices of the bark are used for leprosy and scrofulous ulcers. A decoction of the leaf is an anthelmintic, astringent and emetic and given to relieve hernia. A paste of the flowers is applied on the head to destroy lice. The oil contains sulphur in organic combination and is useful for all cutaneous ailments and rheumatism. It is also used in the treatment of chronic syphilitic sores and indolent ulcers. Internally, it is given for chronic malarial fever, syphilis and leprosy. In South Africa, an infusion of the leaf and fruit is used as a local application on eczema. An aqueous extract of the heartwood relieves asthmatic attacks. In North Carolina, U.S.A., the bark and fruit are regarded as a vermifuge, while in Mexico, the bark is used as a fish poison.

5. *Melia dubia* Cav. Diss. 7: 364. 1789.

Melia composita Willd.—*Melia robusta* Roxb.—*Melia australasica* A. Juss.—*Melia aethiopica* Welw.—*Melia azedarach* Moon non Linn.

Sinh. Lunumidella, Wal-koli-omba; *Tam.* Malaivembu, Rurukkuveppu, Turukku vembu; *Sans.* Arangaka.

A very large tree with a smooth, thin, purplish-brown bark and stellate mealy young parts; leaves alternate, exstipulate, crowded, very large, 30—90 cm long, bi or tri-pinnate, compound, pinnae distant, opposite, 3—6 pairs, leaflets 2—5 pairs in each pinna and a terminal one, stalked, oval or ovate, slightly oblique at base, acuminate, coarsely and shallowly crenate, the lowest often again pinnate, glabrous, rachis cylindrical, glabrous, dilate at base; flowers regular, bisexual, white, numerous in corymbose panicles 10—20 cm long, peduncle axillary, stellate scurfy; sepals 5, fused at base into a 5-lobed calyx, segments lanceolate, acute, stellate-mealy, imbricate; petals 5, distinct, imbricate, linear-oblong, obtuse, reflexed, stellate-mealy outside, pubescent within; stamens fused into a 20-toothed, tapering tube, hairy within, teeth spreading, filiform, anthers 10, nearly sessile, attenuate with pairs of teeth, style long, stigma clavate, 5-toothed; ovary superior, 5-locular, with two superposed ovules in each loculus; fruit an ovoid drupe 2.5—3.7 cm long, smooth, shining, yellowish, seeds solitary in each chamber, pointed, smooth, brown.

Flowers during February.

Illustrations. Beddome, *Flor. Sylvat. pl.* 12. 1868—1873; Kirtikar and Basu, *Indian Med. Plants, pl.* 220. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in E. Himalaya, Assam and the Western Ghats in India, Ceylon, Malay Peninsula, China, Java and Australia. It is rather common in the moist low-country in Ceylon.

India. W. Bengal: Calcutta, Hort. Bot., *Wallich* 1254/1. Pen. Ind. Or., *Herb. Wight* 409, Kew Distribution 1866—7. Without locality, *Beddome* 22. Ceylon. Central Prov., Peradeniya, Bot. Gard. *Herb. Peradeniya*, May 1900. Without locality, *Thwaites C.P.* 699. China. Kwangtung Prov., Taipo, *Tsiang Ying* 112, April 1928. Sumatra. East Coast: *Yates* 1259.

Composition. The fruit of this tree contains a white crystalline glucoside, malic acid, glucose, mucilage and pectin.

Uses. The fruit is a favourite remedy for colic, relieving pain immediately. The wood is used for making tea chests and outriggers of boats.

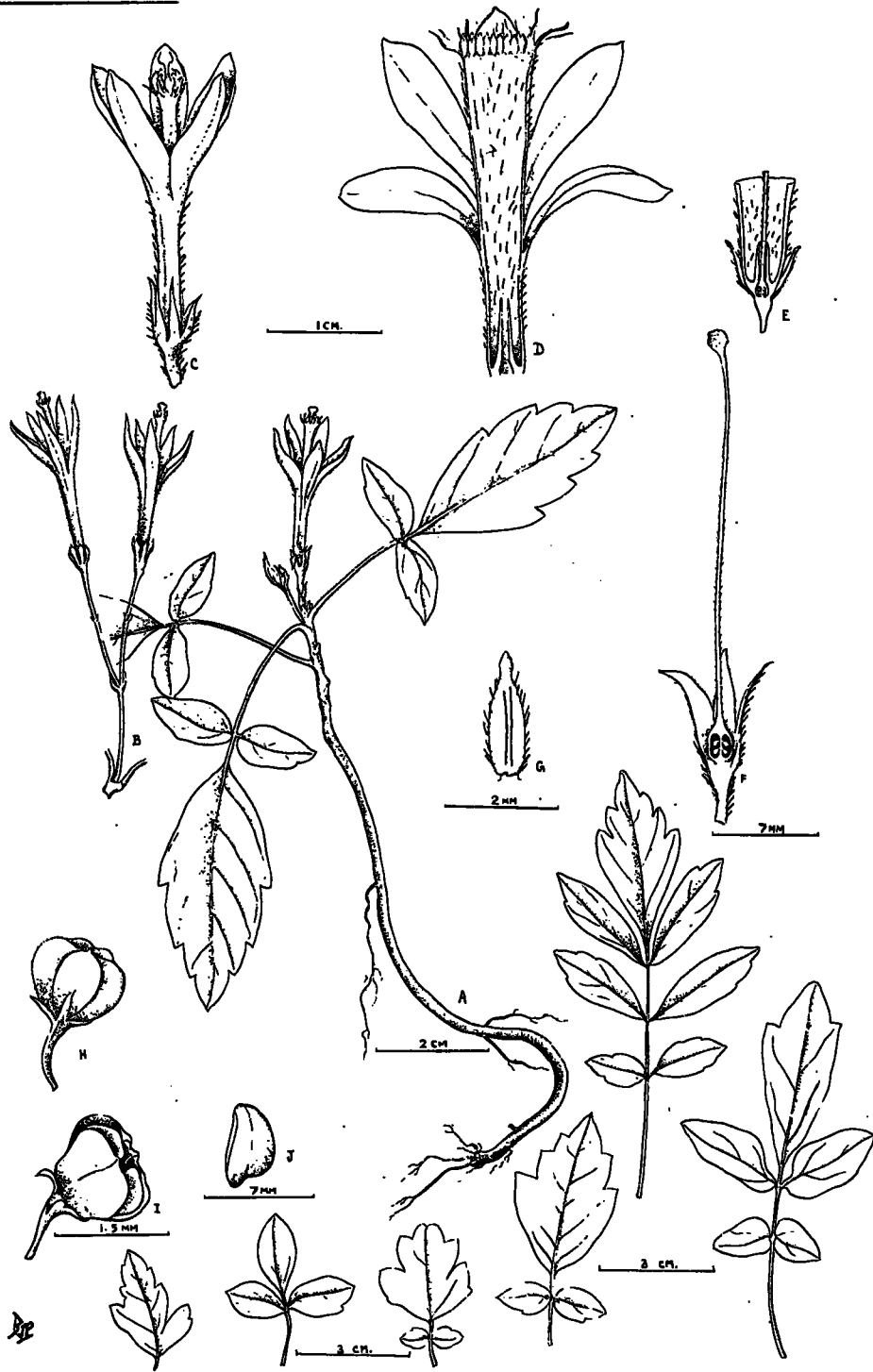


FIG. 372. *Munronia pumila*. A, plant with leaves, flower and forms of leaves. B, inflorescence. C, flower, lateral view. D, corolla and stamen-tube spread out. E, longitudinal section of lower part of flower through the corolla-tube. F, longitudinal section of pistil. G, stamen. H, fruit. I, dehiscent fruit. J, seed.

6. *Munronia pumila* Wight, Ic. Pl. Ind. Or., pl. 91. 1838. (Fig. 372).*Melia pumila* Moon.

Sinh. Binkohomba.

A very small hardy shrub with unbranched stems 5—15 cm long, a whitish bark and long woody roots; leaves rather crowded, pinnate, petioles 1—4.5 cm long, hairy; leaflets 1—3 pairs and a large terminal one, stalked, oval, acute, entire or coarsely lobed, the terminal leaflet 2—5 cm long, 1.5—3 cm broad, lateral leaflets 0.8—2.7 cm long, 1.5—3 cm broad, scantily pubescent above, densely hairy below; flowers regular, bisexual, white, scented, 2.5 cm long and as much across when open, bracts linear, 2.5 mm long, hairy, bracteoles smaller, paired and also hairy, pedicels 7 mm long, broader at the top, ridged and hairy; sepals 5, linear or linear-oblong, 4.5—5 mm long, acute or subacute, hairy on both surfaces; corolla 5, basal portion fused to the stamen-tube to a length of about 1 cm, ridged, hairy inside and outside, lobes broadly lanceolate, 1.5—1.6 cm long, 0.6—0.75 cm broad, subacute, hairy outside especially along the midrib, glabrous inside; stamens 10, filaments connate into a tube which adheres to corolla-tube at the base and terminating in 10 filiform teeth at the mouth, hairy on both surfaces, base recurved into a glabrous sheath round the ovary and part of the style, anthers almost sessile, erect, alternating with the teeth, 2 mm long, narrow, sterile at the top and hairy outside; ovary superior, pyramidal, 1.2 mm long, 5-locular with 2 superposed ovules in each loculus, style 2 cm long, hairy 3/4 way up from base, stigma capitate; fruit a depressed globose 5-lobed capsule, 1.2 cm diam., and hairy, seeds pyriform, narrowly winged, smooth, brown.

Flowers during July, August and April.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 91. 1838; Wight, Ill. Ind. Bot. 1: pl. 147. 1840; Herb. Peradeniya, drawing.

Distribution. An endemic species, common but not abundant, growing in rocky places in the low-country. Sigiriya, Ritigala, Maturata, Balangoda, Lunugala, Wellawaya, Botale, etc.

Ceylon. Central Prov., Muppane, *Alston* 2465, May 1928. North-Central Prov., Ritigala, *Willis*, March 1905. Southern Prov., Wellawaya, *Green*, Jan. 1906. Without locality, *Thwaites* C.P. 177.

Uses. A decoction of this plant is an excellent bitter tonic often used as a substitute for Chiretta (*Swertia chirata* Buch.). It is given for fever, dysentery and purification of blood.



FIG. 373. *Soymida febrifuga*. A, leaf and inflorescence. B, longitudinal section of flower. C, calyx. D, petals, front and lateral views. E, part of a staminal whorl, inner view. F, part of a staminal whorl, outer view. G, pistil. H, transverse section of ovary.

7. *Soymida febrifuga* A. Juss., Mem' Mus. Par. 19: 250. 1830. (Fig. 373).

Swietenia febrifuga Roxb.—*Swietenia soymida* Duncan.—*Swietenia rubra* Wall.—*Cedrela febrifuga* Roxb.

Engl. Red or Bastard Cedar; *Sinh.* Rohana; *Tam.* Sem, Somadanam, Sombu, Soni, Surakkali, Vandu; *Sans.* Agniruka, Atiruka, Chandravallabha, Charmakasha, Kashamansi, Lomakarani, Mahamansi, Mansarohi, Mansarohini, Patranga, Praharavalli, Rasayani, Rohini, Suloma, Vasa, Vikasha, Viravati, Vritta.

A very large tree 23—26 m high with a straight trunk and a dense, large, rounded head of numerous branches, bark very rough and brownish, wood bright red; leaves alternate, exstipulate, on very long stalks, pinnate compound, 30—45 cm long with about 12 shortly stalked leaflets either opposite in pairs or alternate, 5—10 cm long, the terminal ones smaller, ovate-oblong, obtuse, blunt at apex, base often unequal, entire, thick, glabrous, veined; flowers regular, bisexual, small, greenish white, shortly stalked in small lateral cymes on the divaricate branches of the large paniculate axillary or terminal inflorescences which are 20—30 cm long, bracts minute; sepals 5, small, orbicular, spreading, flat, imbricate; petals 5, larger than sepals, rounded with a longish claw, spreading, concave, veined, greenish white; stamens 10, filaments united for half their length into a fleshy, cup-shaped, hypogynous short tube, upper half free, broad, very thick and fleshy, each terminating in two divaricate pointed lobes, anthers placed between the lobes, introrse, short, 2-celled; ovary superior, smooth, ovoid, 5-locular with numerous pendulous ovules in each loculus, style short, broad, stigma large, flat on a level with the crown of stamens, 5-lobed; fruit a woody capsule, oblong-ovoid, 2.5 cm long, 5-chambered, dehiscing from apex septifragally into 5 valves each of which splits into 2 layers and also separate from the large, persistent, 5-angled axis; seeds imbricate in two rows, pendulous from the top of the axis, compressed, margined, produced at either end into a wing, the upper longer, exalbuminous.

Flowers in April and May.

Illustrations. A. Jussieu, Mem' Mus. Par. 19: *pl.* 22, *fig.* 6. 1830; Beddome, Flor. Sylvat. *pl.* 8. 1868—1873; Roxburgh, Pl. Corom. 1: *pl.* 17. 1795; Kirtikar and Basu, Indian Med. Plants, *pl.* 228. 1933.

Distribution. Occurs in the hilly dry districts of North, Western, Central and South India and in Ceylon.

India. Pen. Ind. Or., *Herb. Wight* 420, Kew Distribution 1866—7. Ceylon. Central Prov., Hakgala, Bot. Gard., *Alston*, Sept. 1926. Southern Prov., *Moon*, June 1921.

Composition. The bark of this tree contains tannic acid and a bitter principle.

Uses. The bark is used as an astringent in intermittent fevers and advanced stages of dysentery and diarrhoea. It is not as effective as cinchona for malarial fevers.

MEDICINAL PLANTS



PLATE XIV. *Walsura piscidia*. A, portion of the stem with leaves and inflorescences of flowers. B, flower, dorsal view. C, flower, lateral view. D, fruits.



PLATE XIV. *Walsura piscidia*. A, portion of the stem with leaves and inflorescences of flowers. B, flower, dorsal view. C, flower, lateral view. D, fruits.

8. *Walsura piscidia* Roxb., Hort. Beng. 32. 1814. (Plate XIV).
Heynea trifoliata A. Juss.—*Trichilia coriacea* Wall.—*Trichilia trifoliata* Wall.

Sinh. Kirikon, Malpetta; *Tam.* Cheddavakku, Kanjimarana, Malaivirali, Sattuvakku, Valsura; *Sans.* Walsura.

A small or moderate-sized tree with a light brown, vertically cracked bark and glabrous young parts; leaves compound, alternate, exstipulate, 3-foliolate, rachis stiff, glabrous, brown, leaflets 3.7—7.5 cm long, stalked, oblong-oval, acute at base, obtuse, entire, glabrous, pale and finely reticulate beneath; flowers regular, bisexual, pinkish white, 0.8 cm long, on short pedicels, in small, rather dense, long stalked, pubescent, axillary or terminal, paniculate cymes; sepals 5, fused into a 5-lobed calyx, lobes acute, pubescent; petals 5, free, nearly valvate, pubescent outside; stamens 10, filaments shortly connate at base, broad, flat, hairy inside, anthers terminal, apiculate; disc large, annular, tumid; ovary superior, sunk in the disc, 2-locular with 2 collateral ovules in each loculus, style very short, stigma large, turbinate capitate; fruit indehiscent, 1-seeded, 1—1.2 cm long, broadly ovoid, minutely apiculate, finely tomentose, bright orange yellow; seed completely enveloped in white, juicy aril, testa pale brown with prominent raphe down the ventral side.

Flowers in March.

Illustrations. Wight, Ill. Ind. Bot. 1: pl. 55. 1840; Beddome, Flor. Sylvat. Anal. Gen. pl. 8, fig. 6. 1874; Kirtikar and Basu, Indian Med. Plants, pl. 225. 1933; Herb. Peradeniya drawing.

Distribution. Occurs along the Western Ghats in India and Ceylon. It is a very common tree in the low-country dry regions in Ceylon. Jaffna, Kurunegala, Galle, Anuradhapura, Batticaloa, etc.

India. Madras: *G. Thomson*. Pen. Ind. Or., *Herb. Wight* 515, Kew Distribution 1866—7; *Wallich* 395; *Herb. Wight* 394. Ceylon. Northern Prov., Vavuniya, *Nevill*, July 1889. North-Central Prov., Anuradhapura, *Herb. Peradeniya*, March 1883; Mahailupalama, *Willis*, March 1905. Eastern Prov., Batticaloa, *Walker* 125. Sept. 1885, without locality, *Thwaites* C.P. 1162.

Uses. The bark of this tree is a powerful emmenagogue and acts as a violent emetic. An ointment is prepared from its fruits for application on itch. It is also a stimulant and expectorant.



FIG. 374. *Anamirta cocculus*. A, branch with leaves. B, lower surface of leaf. C, portion of the stem with male inflorescences. D, male flower, lateral view. E, longitudinal section of male flower. F, fruits.

67. MENISPERMACEAE

1. *Anamirta cocculus* (Linn.) Wight and Arn. Prodr. Fl. Pen. Ind. Or. 1: 446. 1834. (Fig. 374).

Anamirta paniculata Colebr.—*Anamirta flavescens* Miers.—*Anamirta toxifera* Miers.—*Menispermum cocculus* Linn.—*Menispermum heteroclitum* Roxb.—*Menispermum monodelphum* Roxb.—*Cocculus lacunosus* DC.—*Cocculus suberosus* DC.—*Cocculus populifolius* DC.—*Cocculus flavescens* DC.

Sinh. Pagan, Thiththawel; *Tam.* Kakkollivirai; *Sans.* Garalaphala, Kakahva, Kakamari, Kakanashika, Kakaphala.

A large, woody twiner with vertically furrowed or corrugated thick bark and glabrous young shoots; leaves simple, alternate, exstipulate, entire, 7.5—15 cm long, broadly ovate, acute or obtuse, rounded or subcordate at base, glabrous on the upper surface, paler and with very small tufts of hair in the axils of veins beneath, petioles 5—10 cm long, thickened at lower ends; flowers regular, unisexual, 6 mm diam., pale greenish-yellow, sweet-scented, on separate plants, in short, thick, divaricate pedicels arranged on horizontal branches of large, glabrous panicles 20—30 cm long arising from the old wood, bracts 2 or 3, small, at the base of each flower; sepals 6, equal, imbricate and ultimately reflexed; petals absent; male flower: stamens numerous, filaments fused to form a central column on which anthers form a globose head, anthers square, 4-celled; female flower: ovary superior, 5-carpellary on a short globose gynophore surrounded at the base by 10 very small, bifid, fleshy staminodes, stigmas terminal, reflexed, ripe carpels 1—3 (usually 2) on thickened branches of the enlarged gynophore, globose, 1.2 cm long, smooth, black drupe.

Flowers during May and June.

Illustrations. Roxburgh, Cat. Merc. Angl. Ind. Or., pl. 130; Bentley and Trimen, Med. Plants, pl. 36. 1880; Kirtikar and Basu, Indian Med. Plants, pl. 36. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malay Archipelago and New Guinea. It is rather common in the moist low-country upto 2,000 feet elevation in Ceylon.

India. Bengal: Calcutta, Hort. Bot., cultivated, *Wallich* 4954B. Pen. Ind. Or., *Herb. Wight* 41 and 46. Ceylon. Central Prov., Peradeniya, *Baker* 121, May 1907; Ambagamuwa, *Thwaites* C.P. 2722.

Composition. The fruit of this plant contains the alkaloids cocculine, menispermine and para-menispermine. According to Wehmer, it contains the bitter principles picrotoxin, picrotoxinin, picrotin and cocculin as well. It also contains fat of stearophanic or anamirtic acid constituent. According to Fluckiger and Hanbury, the poisonous property in the seeds is due to the presence of picrotoxin.

Uses. The bitter principle picrotoxin in the fruit is an antidote for morphia poisoning as it arrests the paralysis of the centre of respiration which causes death. In the Philippines, the seeds are used externally to destroy head lice. An ointment made from finely powdered seeds cures ringworm. The bruised fresh bark is applied on wounds caused by snakebite.

The primitive tribes of the Malay Peninsula use it as an arrow and fish poison.

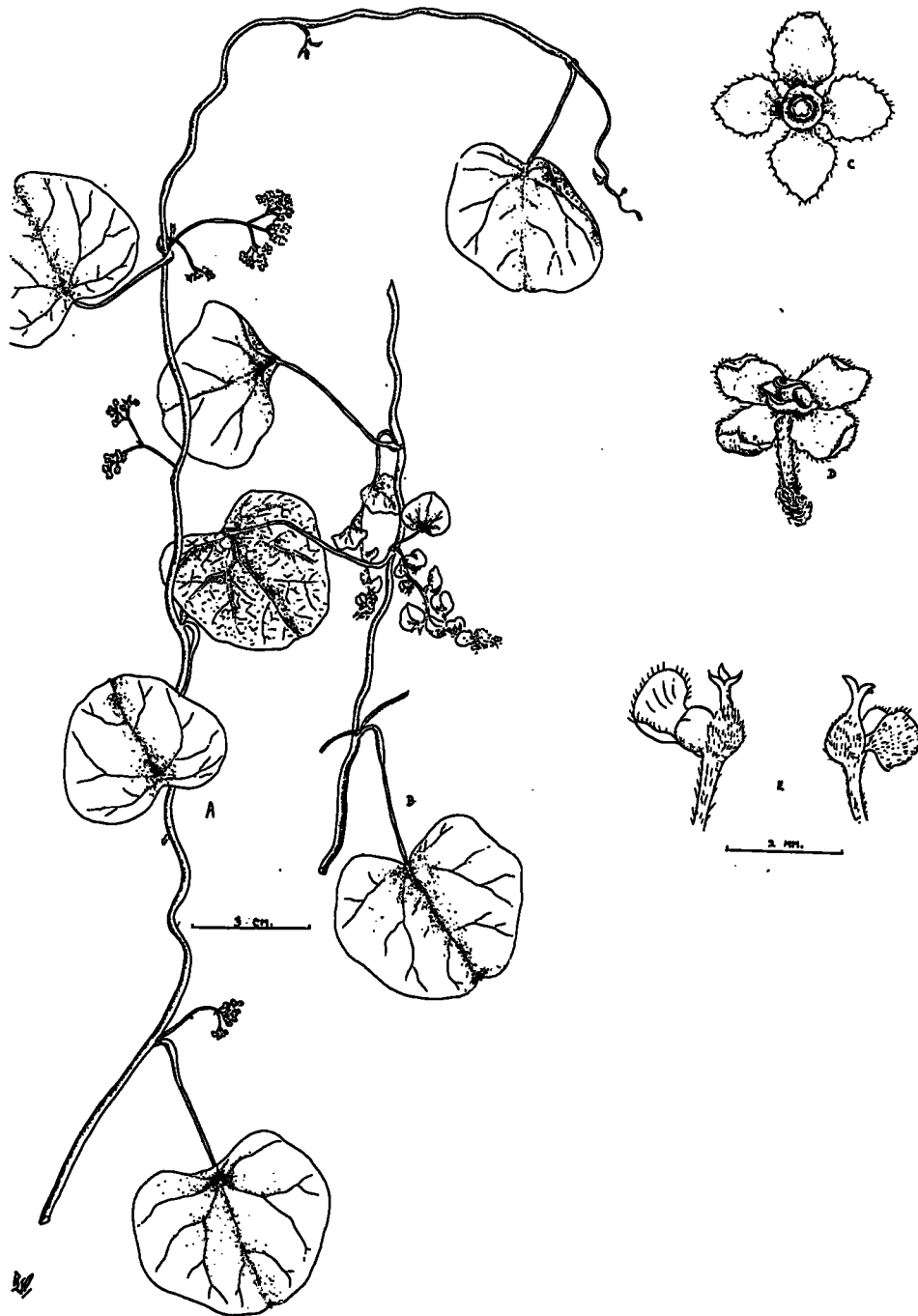


FIG. 375. *Cissampelos pareira*. A, portion of male plant with leaves and inflorescences. B, portion of female plant. C, male flower, dorsal view. D, male flower, lateral view. E, female flowers, lateral view.

2. *Cissampelos pareira* Linn. Sp. Pl. 1031. 1753. (Fig. 375).

Cissampelos caepeba Linn.—*Cissampelos convolvulacea* Willd.—*Cissampelos orbiculata* Buch.—*Cissampelos discolor* Buch.—*Cissampelos hirsuta* Buch.—*Cissampelos hernandifolia* Wall.—*Cissampelos obtecta* Wall.—*Cissampelos diversa* Miers.—*Cissampelos elata* Miers—*Cissampelos grallatoria* Miers—*Cissampelos eriantha* Miers—*Cissampelos delicatula* Miers—*Cissampelos subpeltata* Thw.—*Cissampelos triandra* Roxb.—*Menispermum orbiculatum* Linn.—*Cocculus orbiculatus* DC.—*Cocculus villosus* Wall.—*Cocculus membranaceus* Wall.—*Cissampelos microcarpa* DC.

Engl. False Pareira Brava, Velvet-leaf; *Sinh.* Diyamitta; *Tam.* Appatta, Punaïtitta, Puttutiruppi, Sina, Titta, Tuvan, Tuvigaba, Vattattiruppi; *Sans.* Ambashtahm, Ambashtika, Avidhakarni, Brihattikta, Chchinnaveshika, Devi, Ekashthila, Kuchela, Kucheli, Laghupatha, Mahanjasi, Malati, Malavi, Papacheli, Papehelika, Patha, Patika, Prachina, Prachinambastika, Pratanini, Rasa, Ruchishya, Shishira, Shreyasi, Sthapini, Susthira, Tiktapushpa, Trishira, Uthika, Vallika, Vara, Varatikta, Vastadini, Venivalli, Vidhakarni, Vridhakarnika, Vriki, Vrittaparni.

A small woody twiner with straggling branches, young shoots whip-like and pubescent; leaves simple, alternate, exstipulate, entire, small, 3.8—6.3 cm long, ovate-orbicular or reniform-orbicular, acute or obtuse, mucronate, more or less peltate, slightly cordate at base, glabrous on the upper surface, stellate-pubescent and pale and sometimes glabrous beneath, ciliate at margin, petioles 2.5—3.7 cm long, pubescent; flowers small, unisexual, greenish-yellow on separate plants; male flowers pedicellate in small, branched, lax, cymose clusters at the ends of filiform axillary peduncles shorter than leaves; sepals 4, ovate-spathulate; toothed; petals 4, coherent into a 4-lobed cup-shaped corolla, lobes half as long as the sepals; stamens 4, monadelphous, stamen column slender, anthers in a ring bursting transversely; female flowers in crowded umbels or short racemes in axils of large, leafy, reniform, hairy bracts, on racemose axillary panicles longer than leaf petioles; sepal 1, oval, hairy outside; petal 1, glabrous, broader and shorter than the sepal; ovary superior, unicarpellary, ovoid, gibbous, silky, unilocular with a suspended ovule, style 3-fid, branches spreading, stigmas 3, staminodes absent; ripe carpel a small, red, ovoid, somewhat compressed drupe about 4 mm long, style scar basal, endocarp transversely ridged and tuberculate, hollowed on sides, seed horse-shoe shaped.

Illustrations. Rheede, Hort. Malab. II: pl. 62. 1692; Bentley and Trimen, Med. Plants, pl. 15. 1880; Kirtikar and Basu, Indian Med. Plants, pl. 42. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in tropical and subtropical India, Ceylon, Singapore, Philippine Islands, East Africa and America. It is common in the mid and low-country in Ceylon. Peradeniya, Kurunegala, Dambulla, Jaffna, etc.

India. Khasia: *J. D. Hooker and T. Thomson.* Punjab: *T. Thomson.* Bengal: *Clarke* 11745A, May 1870. Gurhwal: *Falconer* 90, Kew Distribution 1864. Sylhet: *Wallich* 4981B. Assam: Brahmaputra Plains, *Kurz* 53; *Jenkins*, without locality. Courtalam: *Hooker f. and Thomson.* Decca: *Clarke* 20114B, Aug. 1873. Madras: Nilghiri, *Hooker f. and T. Thomson; Wight* 39F; *Wight* 40; *Wight* 39D; *Prome, Wallich* 4977G; *Wallich* 4979G. Tenasserim and Andamans. *Helper* 84, Kew Distribution 1861—2. Ceylon. Central Prov., Dambulla, *Alston* 999; *Alston* 1005, March 1927; Hakgala, *Alston* 457, May 1926. Without locality, *Thwaites C.P.* 168. *Philippine Islands.* Luzon: Isabella Prov., *Ramos and Edano* 46816; *Ramos and Edano* 46946; Bataan Prov., *Borden* 2015, Sept.—Dec. 1904.

Composition. The roots of this plant contain the alkaloids bebeerine, cissampeline, hyatine, hyatinine, isochondodendrine and sepeerine; quercitol, an acidic volatile oil, sterol, a yellow bitter principle and resin.

Uses. The leaves are used as an antiscabious remedy and in the treatment of abscesses, ulcers and wounds. A decoction of the roots is a febrifuge, diuretic, lithotriptic and a pectoral remedy. It is a good emetic and purgative. It is also used in the treatment of chronic cystitis, nephritic colic, nephritis, vesicular calculus, fever, diarrhoea and urinary and venereal diseases. It is used as a solvent of the stone in the bladder in Reunion and Madagascar. It is an antiseptic for the bladder and used for chronic inflammation of the urinary passage. The root is also used as a fish poison.

3. *Cocculus hirsutus* (Linn.) Diels, Menispermaceae in Engl. Pflanzenreich 236. 1910.

Menispermum hirsutum Linn.—*Cocculus villosus* DC.—*Cocculus sapium* Colebr.—*Cocculus hastatus* DC.—*Cocculus aristolochiae* DC.—*Menispermum villosus* Lamk.—*Menispermum mysotoides* Linn.—*Holopeira villosa* Miers.—*Holopeira laeviuscula* Miers.—*Holopeira auriculata* Miers.

Engl. Broom Creeper, Ink Berry; *Sinh.* Lunuketiya-wel; *Tam.* Kattukkodi; *Sans.* Chchilihinda, Dirghakanta, Dirghavalli, Dridhakanda, Dridhalata, Garudi, Mahahala, Mahamula, Mochakabhida, Palatagarudi, Sauparni, Somavalli, Tiktanga, Vanatiktika, Vasandi, Vasantiktika, Vastadani.

A small, much branched, straggling climber with long, slender, twining, striate, hairy pubescent branches; leaves simple, alternate, exstipulate, entire, 2.5—3.7 cm long, deltoid-ovate, obtuse, apiculate or mucronate at apex, tapering to or truncate at base, glabrous on the upper surface except when young, slightly hairy on veins beneath, ciliate at margin, 3-5 veined at base, petioles 6 mm long and hairy; flowers regular, unisexual, on separate plants, male flowers in small cymose panicles, on very slender axillary peduncles shorter than leaves, female flowers 2 or 3 together in axillary clusters, male bracts subulate and hairy; sepals 6, biseriate, inner ones larger, villous outside; petals 6, bifid, lobed at the sides; male flowers: stamens 6, filaments hairy at the base, anther cells bursting transversely; female flowers: ovary superior, 3-carpellary, smooth with 6 staminodes; ripe carpel small, 4 mm long, endocarp bony, horse-shoe shaped with centre perforated, sharply keeled along the back, the sides with strong transverse ridges, seed doubled into a hook.

Flowers in February and March.

Illustrations. Colebr. in Trans. Linn. Soc. 13: *pl.* 6, *fig.* 2. 1882; Kirtikar and Basu, Indian Med. Plants, *pl.* 38B. 1933.

Distribution. Occurs in tropical and subtropical parts of India, Ceylon, Burma, S. China, Arabia and tropical Africa. It is rare in Ceylon, growing in the dry country in Trincomalee and between Jaffna and Kankesanthurai.

India. Pen. Ind. Or., *Herb. Wight* 42, Kew Distribution 1866—7; *J. D. Hooker.* Bengal: Calcutta, Bot. Gard., cultivated, *Wallich* 49571. *Ceylon.* Without locality, *Thwaites C.P.* 1050.

Composition. This plant contains an alkaloid, β -sitosterol and two oils.

Uses. A decoction of the roots is used as an alterative in chronic rheumatism and venereal diseases. It is a laxative and sudorific. The juice of the leaves with water solidifies into a jelly which is given with sugar for gonorrhoea.



FIG. 376. *Coscinium fenestratum*. A, branch with leaves and male flower heads. B, female flower, dorsal view. C, female flower with calyx and corolla removed showing the carpels laterally. D, single carpel, lateral view. E, lateral view of stamens. B—F, enlarged.

4. *Coscinium fenestratum* Colebr. in Trans. Linn. Soc. 13: 65. 182. (Fig. 376).

Menispermum fenestratum Gaertn.—*Cocculus blumeanus* Wall.—*Pareira medica* Lindl.

Engl. Calumba Wood, Ceylon Calumba Root, False Calumba Root, Tree Turmeric; *Sinh.* Bangwel-geta, Veniwel; *Tam.* Atturam, Imalam, Kadari, Manjalkodi, Maramanjai, Pasamantram, Sanniyam, Seyebasam, Tiyyaram, Udaravi, Udubadi; *Sans.* Daru-haridra, Darvi.

A woody climber with a smooth bark, young shoots densely and finely yellow-tomentose; leaves simple, alternate, exstipulate, large, 10—20 cm long, broadly ovate or roundish, sharply acute at apex, rounded, subcordate or slightly peltate at base, entire, glabrous above, densely yellow-tomentose beneath, strongly 5—7-nerved, veinlets very prominent beneath, petioles 7.5—10 cm long; flowers very small, unisexual, male and female flowers on separate plants, sessile in small dense rounded heads which are stalked and umbellately or racemosely arranged in the axils of leaves, pedicel yellow-tomentose; bracts beneath the flower numerous, small and imbricated; sepals 6 in two rows, distinct, imbricate, rounded; petals 3, ovate, spreading; male flowers: stamens 6 in two rows, outer distinct, inner coherent half way up; female flowers: ovary superior, 6-carpellary, hairy, styles filiform, reflexed, staminodes 6; ripe carpels 1—3, globose, 2 cm long, brown, densely and finely tomentose, endocarp bony, very hard, deeply projected inwards on ventral face, seeds albuminous, cotyledons laciniate.

Flowers from January to March.

Illustrations. Kirtikar and Basu, Indian Med. Plants, *pl.* 37. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the jungles of S. India, Malacca, Singapore, Ceylon and Sumatra. It is common in the moist low-country forests in Ceylon. Ambagamuwa, Balangoda, Botale, Kurunegala, Puttalam, etc.

Ceylon. Without locality, *Thwaites C.P.* 1055.

Composition. The stem and roots of this climber contain the alkaloids, berberin, jatrorrhizine and palmatine.

Uses. The wood is a bitter tonic and a decoction of it is used as a remedy for, or to prevent, tetanus. The root has antiseptic properties and often is used for dressing wounds and ulcers.

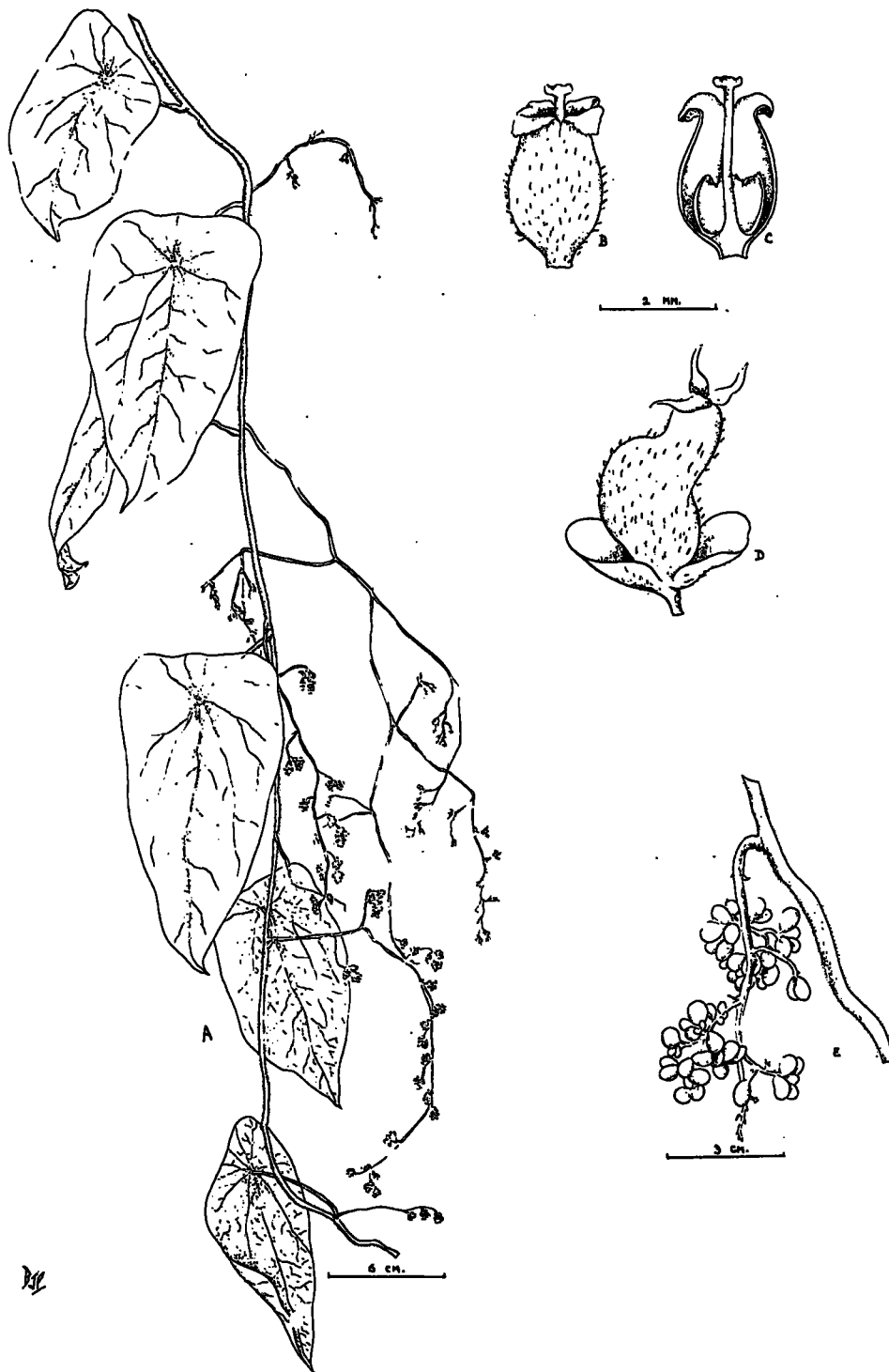


FIG. 377. *Cyclea burmanni*. A, portion of the stem of a male plant with leaves and inflorescences. B, male flower, lateral view. C, longitudinal section of male flower. D, female flower. E, cluster of fruits.

5. *Cyclea burmanni* Miers, Contrib. 3: 239. 1874. (Fig. 377).

Clypea burmanni Miers—*Rhaptomeris burmanni* W. & A.

.*Sinh.* Kesi-pissan; *Tam.* Vouth-vully-Kodi.

A small woody twiner with the young shoots, pubescent; leaves simple, alternate, exstipulate, entire, 7.5—10 cm long, peltate, elongate-deltoid, very acute, truncate or shallowly subcordate at base, margin undulate, smooth and shining on the upper surface, more or less pubescent beneath, reticulately veined; flowers regular, unisexual, green, pedicellate in small clusters on a long, branched, pubescent, axillary panicle, male and female flowers on separate plants; male flowers: sepals 4 or 5, coherent to form a campanulate inflated calyx; petals 4 or 5, coherent into a 4 or 5-lobed corolla, lobes inflexed, stamens 4, monadelphous, staminal column short, anthers bursting transversely; female flowers: sepal 1, hairy; petal 1, glabrous, truncate; ovary superior, monocarpellary, hairy, style 3-fid, staminodes absent; ripe carpel globular-ovoid, glabrous, white, style scar sub-basal, endocarp tubercled, muriculate in lines on back and convex on the sides, seeds horse-shoe shaped, cotyledons narrow.

Flowers in September.

Illustrations. Burmann, Fl. Zeyl. pl. 101; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is common in the moist low-country in Ceylon in waste and cultivated ground.

Ceylon. Without locality, *Thwaites C.P.* 1049. North-Central Prov., Ritigala. *Willis*; Arattana, *Senaratne* 10021, Feb. 1953. Central Prov., Ramboda-Nuwara Eliya, dry patana, *Mueller-Dombois and Comanor* 67052830, June 1967; Hantane, *Mueller-Dombois*, *Cooray and Herath* 68011802, June 1968.

Composition. The roots of this plant contain the alkaloids, burmannine and burmannaline.

Uses. The bruised leaf is used to stop bleeding from fresh wounds and as a healing agent. The plant has stimulating and expectorant properties and is used as a diuretic.

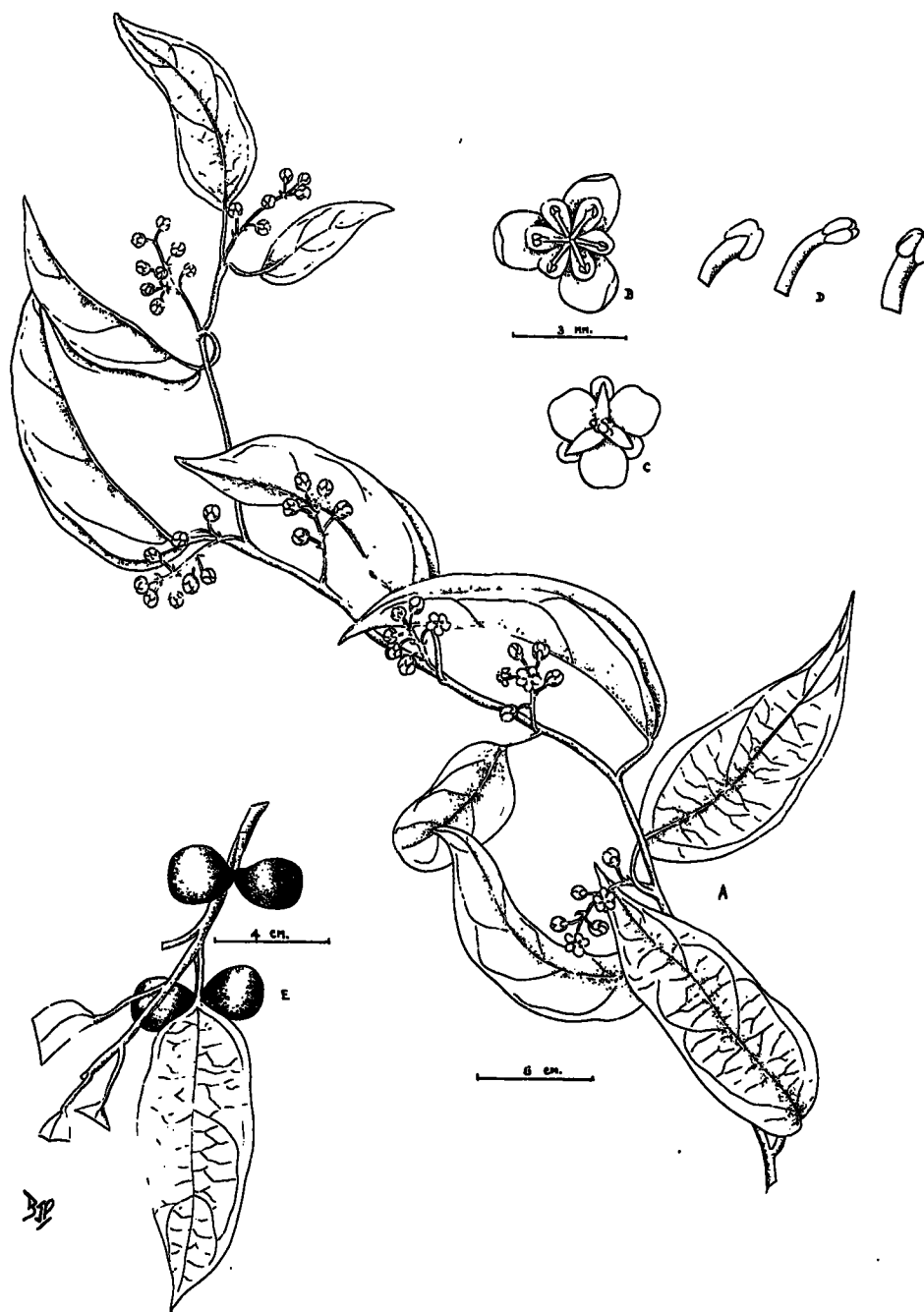


FIG. 378. *Hyserpa nitida*. A, portion of stem with leaves and male flowers in clusters. B, male flower, dorsal view. C, male flower, ventral view. D, stamens, enlarged. E, stem with fruits.

6. *Hyserpa nitida* Miers in Ann. Nat. Hist. Ser' 2, 7: 6. 1851. (Fig. 378).

Hyserpa cuspidata Miers—*Hyserpa praevaricata* Miers—*Hyserpa pauciflora* Miers—*Hyserpa uniflora* Miers—*Hyserpa triflora* Miers—*Cocculus cuspidatus* Wall.—*Cocculus triflorus* DC.—*Limacea cuspidata* Hook. f.

Sinh. Kiriwel, Niriwel.

A small twining shrub with slender, pubescent branches; leaves simple, alternate, exstipulate, entire, 3.7—5 cm long, ovate-lanceolate, acute, cuspidate, often twisted at apex, rounded or tapering at base, glabrous, thick, somewhat 3-nerved, finely reticulate, petioles slender, 1.2 cm long; flowers regular, unisexual, small, yellow, few, males and females on different plants in axillary racemose clusters shorter than leaves, bracts small subulate; sepals 6 in two rows, surrounded at the base by several small rounded bracts, inner row much larger, rotund, concave; petals 6, half the length of inner sepals, truncate; male flowers: stamens 6, adnate to and as long as the petals; female flowers: ovary superior, 3-carpellary, ripe carpels 1—3, usually 2, 1.6 cm long, ovoid-pyriform, dull reddish purple, sessile, smooth, endocarp hard with a large round intrusion, wrinkled, seeds curved into a circle round a central cavity.

Flowers from July to September.

Illustrations. Miers, Contrib. 3: pl. 108; Herb. Peradeniya, drawing.

Distribution. Occurs in East Bengal in India, Ceylon and Malay Archipelago. It is rather common in the low-country and lower zone in the hill country in Ceylon. Deltota, Dimbula, Pussellawa, Passara, Bintenne, etc.

India. Assam: *Masters*. Tenasserim and Andamans, *Helper* 94, Kew Distribution 1861—2; *Griffith* 139. Ceylon. Central Prov., Kandy, *Alston* 477, Nov. 1926. Without locality, *Thwaites C.P.* 1051; *Walker* 2/59. Uva Prov., between Passara and Lunugala, *Herb. Peradeniya*, Jan. 1888.

Composition. The leaves of this plant contain an alkaloid.

Uses. Used with other ingredients in the treatment of fever. It is also employed as a fomentation and for boils in children.

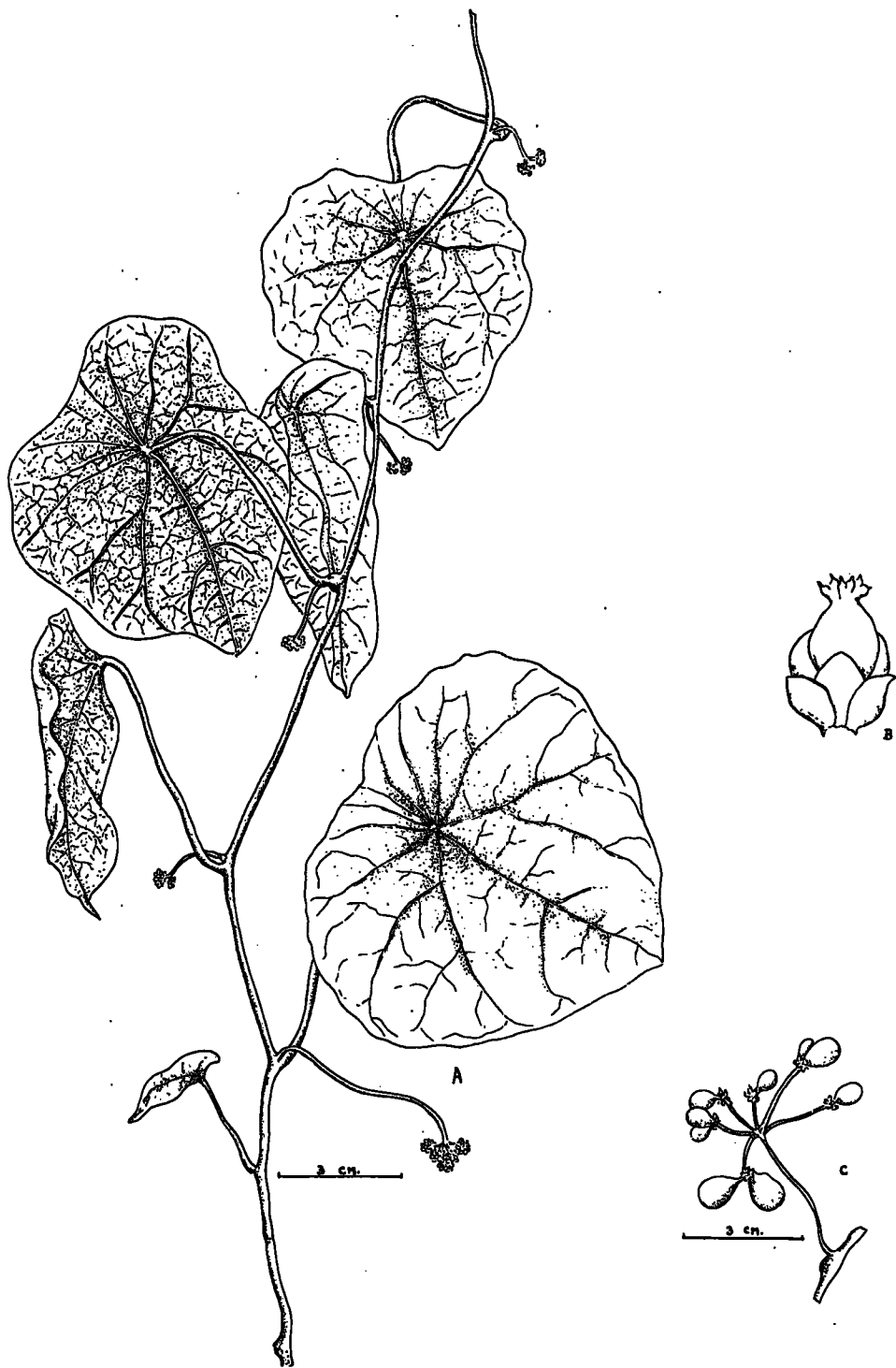


FIG. 379. *Stephania japonica*. A, portion of a female plant with leaves and inflorescences. B, female flower, lateral view, enlarged, C, fruits.

7. *Stephania japonica* (Thunb.) Miers in Ann. Nat. Hist. Ser'3, 18: 14. 1866. (Fig. 379).

Menispermum japonicum Thunb.—*Cissampelos psilophylla* Presl.—*Stephania corymbosa* Turz.—*Stephania hernandifolia* Trim.

Sinh. Lunuketiya-wel, Lupuketiya-wel; *Tam.* Kattukodi; *Sans.* Ambashtha, Patha, Vanatiktika, Vasadani.

A slender twining plant with glabrous shoots; leaves simple, alternate, exstipulate, entire, 5—10 cm long, round ovate, acute or obtuse, peltate-cordate or truncate at base, glabrous on the upper surface, glaucous beneath, petioles 2.5—5 cm long, slender, divaricate; flowers regular, small, unisexual, greenish white, male and female flowers on separate plants in small umbels at the ends of branches of long-stalked inflorescences, bracts subulate; male flowers: sepals 6, nearly equal, obovate, filaments fused into a short staminal column with the summit expanded, anthers in a ring bursting transversely; female flowers: sepals 3—5, acute; petals 6, shorter than sepals; ovary superior, unicarpellary, style 3-fid, branches subulate, staminodes absent, ripe carpel solitary, scarlet, sessile, small, compressed, about 9 mm long, glabrous, endocarp strongly tubercled on back and sides, seeds curved almost into a ring.

Flowers in July.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 939. 1843—1845; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya, tropical Australia and Africa. It is common in the moist regions in Ceylon. Nugatenne, Madugoda, Hewaheta, Bintenne, Horton Plains, etc.

India. Nepal: *Wallich* 4977i; Sikkim: *J. D. Hooker*. Khasia: *J. D. Hooker and T. Thomson*. Assam: *Masters*. E. Bengal: *Griffith* 87, Kew Distribution 1861—2; *Wight* 953. Ceylon. Central Prov., Horton Plains, *Willis*, May 1906; Madugoda, *Alston*, June 1926; *Walker* 2/126. Without locality, *Thwaites C.P.* 2757. Pegu. Irrawaddy and Sittang Valley: *Kurz* 1794, Jan. 1871. Australia. Queensland: *Mueller*; Melbourne: *Hort. Bot. Gard.* Japan. Nagasaki without name of collector.

Composition. The stem of this plant contains the alkaloids epistephanine, pseudo-epistephanine, hasubanonine, homostephanoline, hypoepistephanine, insularine, metaphanin, protostephanine, stephanine, stephanoline, steponine and its base viii.

Uses. The root is used in the composition of many Ayurvedic preparations as a substitute for *Cissampelos pareira* in the treatment of fevers and bowel ailments. Externally, it is used as a cure for itch and for the treatment of fractures.

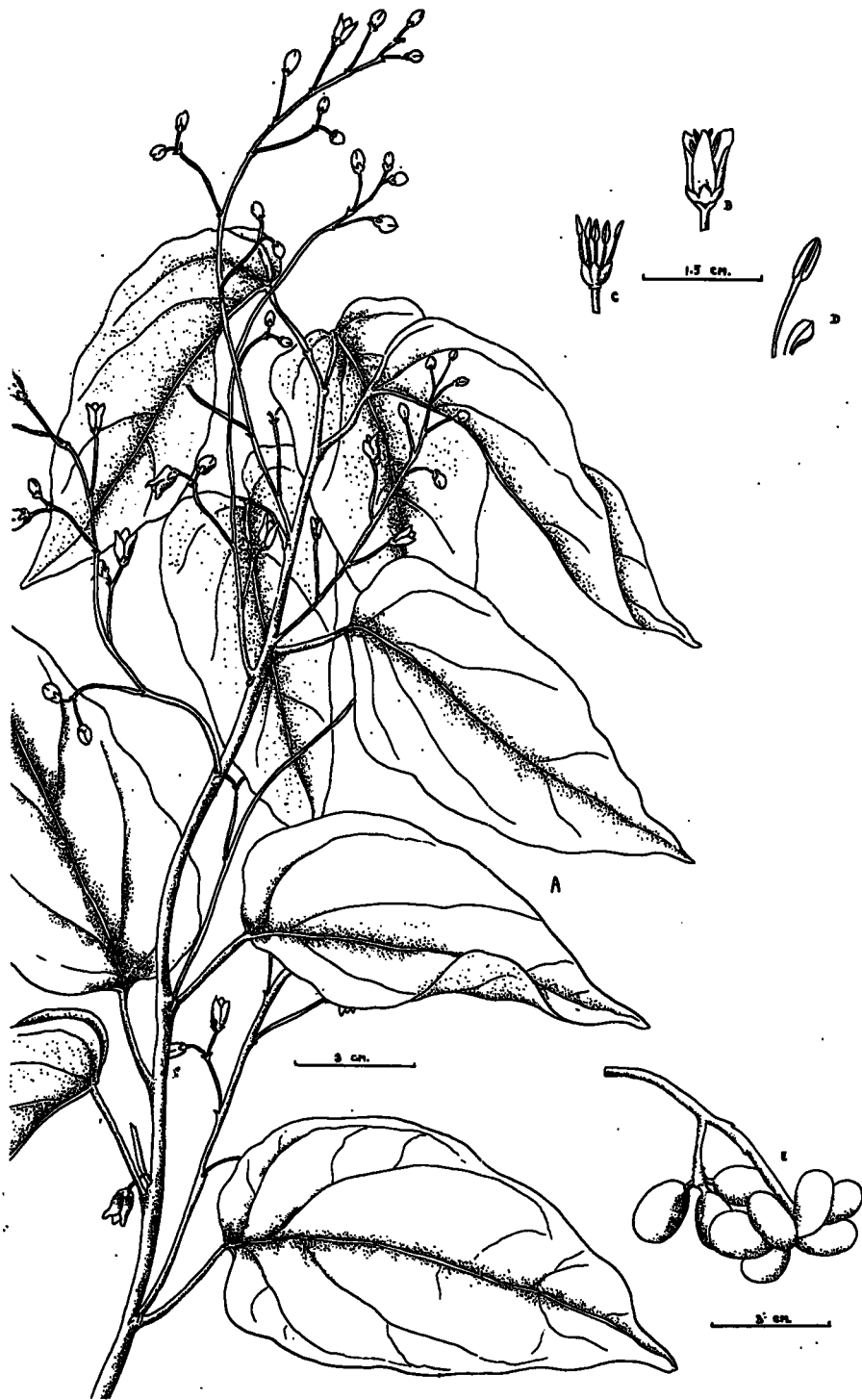


FIG. 380. *Tillacora acuminata*. A, portion of the male plant with leaves and panicles of flowers. B, male flower, lateral view. C, male flower with corolla removed. D, stamens. E, fruits.

8. *Tiliacora acuminata* (Lam.) Miers in Tayl. Ann. Hist. Nat. Ser'2, 7: 39. 1851. (Fig. 380).

Tiliacora racemosa Colebr.—*Tiliacora fratenaria* Miers—*Tiliacora cuspidiformis* Miers—*Tiliacora abnormalis* Miers—*Menispermum acuminatum* Lamk.—*Menispermum radiatum* Lamk.—*Menispermum polycarpum* Roxb.—*Cocculus acuminatus* DC.—*Cocculus radiatus* DC.—*Diploclisia polycarpus* Wall.

A woody climber with glabrous young shoots; leaves simple, alternate, exstipulate, entire, 10—12.5 cm long, ovate, attenuate acute, rounded at base, undulate, glabrous, somewhat 3-veined, petioles slender, 1.9—2.5 cm long; flowers regular, unisexual, yellow on separate plants, 6 mm across, stalked, laxly arranged in elongated axillary panicles, pedicels with 2 small bractlets at the base; sepals 6, erect, biseriata, inner ones longer and larger, lanceolate, acute; petals 6, minute, spatulate, obtuse; male flowers: stamens 6, anthers adnate in two rows opposite petals; female flowers: ovary superior, 3—12-carpellary, style short, subulate; ripe carpels 1—10, red or orange, ovoid, 1.2 cm long on short stalks, smooth, endocarp wrinkled, seeds strongly hooked and bent double.

Flowers in January and February.

Illustrations. Rheede, Hort. Mal. 7: pl. 3. 1688; Herb. Peradeniya, drawing.

Distribution. Occurs throughout tropical India, Ceylon, Singapore, Cochin-China and Java. It is rather common in the dry districts of Ceylon. Dambulla, Kantalai, Batticaloa, etc.

India. Bengal: *J. D. Hooker and T. Thomson*; Courtalam, *Hook. f. and Thomson*. Nilghiri: *Cleghorn* 14. Pen. Ind. Or., *Herb. Wight* 45; *Herb. Wight* 40, Kew Distribution 1866—8; *Wallich* 4958B. Ceylon. Nagolla, *de Silva*, Aug. 1929. Without locality, *Thwaites C.P.* 1056.

Composition. The bark and roots of this plant contain the alkaloid tiliacorine.

Uses. The root, mascerated with water, is drunk to counteract the poisonous effects of venomous snakebites.

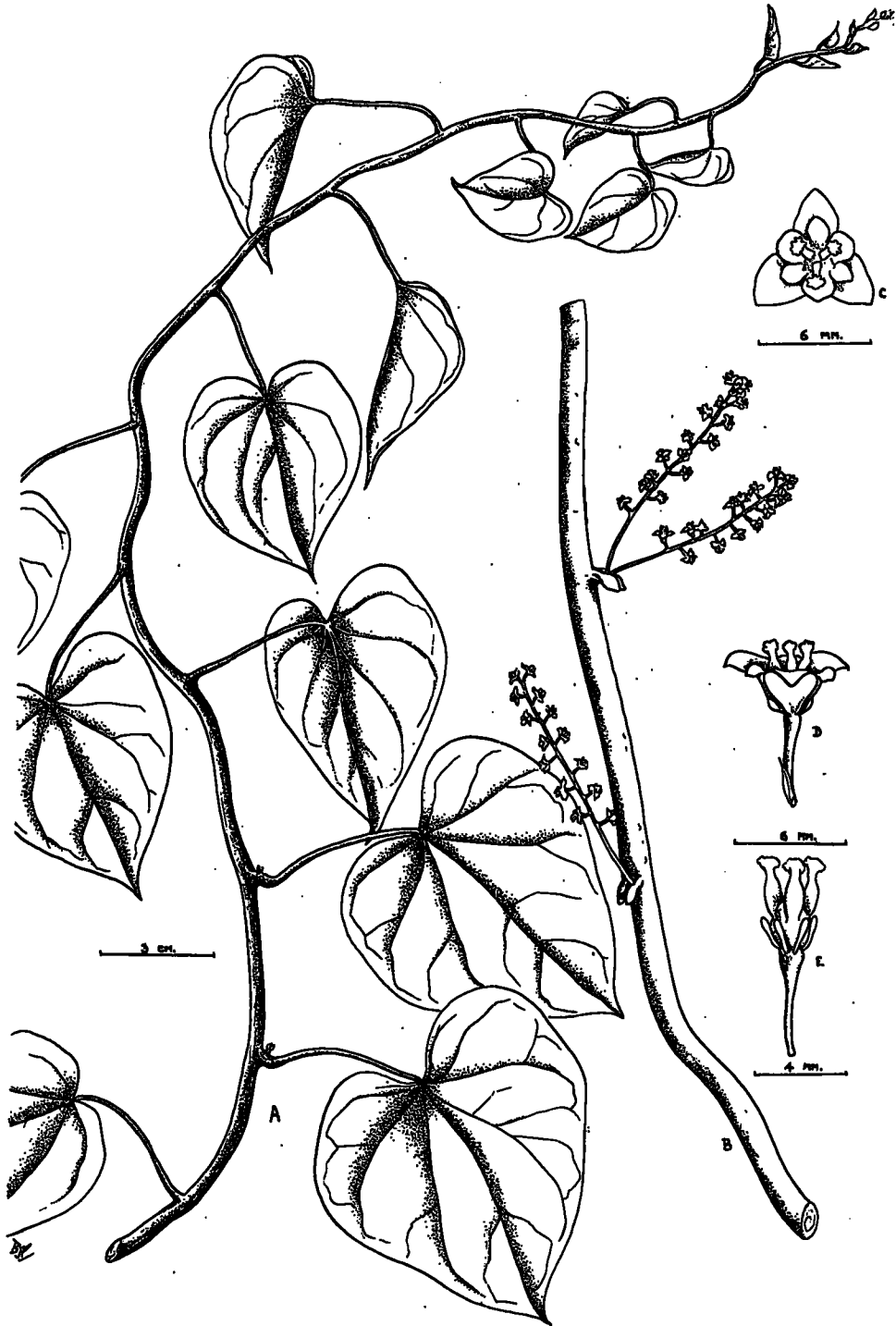


FIG. 381. *Tinospora cordifolia*. A, portion of the stem with leaves. B, portion of the stem with racemes of female flowers. C, female flower, dorsal view. D, female flower, lateral view. E, female flower with calyx and corolla removed showing staminodes and carpels.

9. *Tinospora cordifolia* Miers in Ann. Nat. Ser' 2, 7: 38. 1851. (Fig. 381).

Tinospora palminervis Miers—*Menispermum cordifolium* Willd.—*Cocculus cordifolius* DC.—*Cocculus convolvulaceus* DC.—*Cocculus verrucosus* Wall.

Sinh. Galuchi, Rasakinda; *Tam.* Amridavalli, Amudam, Asasi, Kaippuchildil, Kumali, Narsindil, Niraidarudian; Paganrai, Padalamulam, Parivai, Pattigai, Sadi, Sagadundam, Sagamuli, Silam, Sindil, Sivandi, Sivedai, Ubavam, Vallikkandam, Vayamadu; *Hindi* Gulancha; *Sans.* Amrita, Amritalata, Amritavallari, Amritavalli, Bhishakapriya, Chakralakshana, Chakrangi, Chandrasah, Chandrapasa, Chchinna, Chchinnaruha, Chchinnadbava, Chchinnodhana, Dhira, Goraksha, Guduchi, Guluchi, Jivanthika, Jivatiha, Jwaranashini, Jwarari, Kundalini, Kundalli, Madhuparni, Madhuparnika, Nagakumarika, Nirjara, Pamrodhara, Pittaghni, Rasayani, Shyama, Somalatika, Somavalli, Suvakrita, Tantri, Tantrika, Uddhara, Vara, Vataraktari, Vatsadani, Vayastha, Vishalya.

A perennial climbing plant growing very high on tops of trees sending down very long thread-like aerial roots; stems slender, closely worted, bark ash coloured peeling off in flakes, shoots glabrous; leaves simple, alternate, exstipulate, entire, 3.8—6.4 cm long, roundish ovate, broadly cordate at base, acute or acuminate, glabrous, thin, 5—7-nerved, petioles 2.5—5 cm long, slender, thickened and curved at the base; flowers unisexual, regular, greenish yellow, on separate plants, 1.9 cm diam., males in clusters of 1—6 or more on slender branches of a drooping panicle exceeding the leaves, females solitary in shorter racemes; sepals 6, in two rows, inner sepals much longer; petals 6, shorter than inner sepals; male flowers: stamens 6, distinct, filaments thickened upwards and adnate to base of petals and wrapped in them; female flowers: stamens reduced to small scales, ovary superior, 3-carpellary, carpels distinct on a thick gynophore, styles short, stigma dilated, tongue-shaped and lacinate; ripe carpels 1—3, ovoid, apiculate, smooth and red drupes.

Flowers in February.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 385 and pl. 486. 1840—43; Rheedee, Hort. Mal, 7: pl. 21. 1688; Kirtikar and Basu, Indian Med. Plants, pl. 35. 1933; Bentley and Trimen, Med. Plants, pl. 12. 1880; Herb. Peradeniya, drawing.

Distribution. Occurs throughout tropical South India, Ceylon, Burma and Andaman Islands. It is common in the dry districts in the low-country in Ceylon. Batticaloa, Kalpitiya, Jaffna, Mannar, Dambulla, etc.

India. Bengal: Clarke 21794A, June 1871. Siwalik and Jaunsar Divs., Dewar 3. Decca: Clarke 17222E, June 1872. Madras: Cleghorn 13. Pen Ind. Or., Herb. Wight 43 and 44. Ceylon. Murukkan, Giant's Tank, Simpson 9351, March 1932.

Uses. The stem of this plant is used for fever, skin diseases, jaundice and syphilis. The starch obtained from the roots is a remedial agent for chronic diarrhoea and dysentery. It relieves symptoms of rheumatism. An infusion of the stem is used as an alterative and tonic and is reputed to be a blood purifier and aphrodisiac. It is also useful in diabetes and secondary syphilitic ailments. In certain parts of India, the stem of the plant is considered a specific for bites of venomous snakes and insect stings.

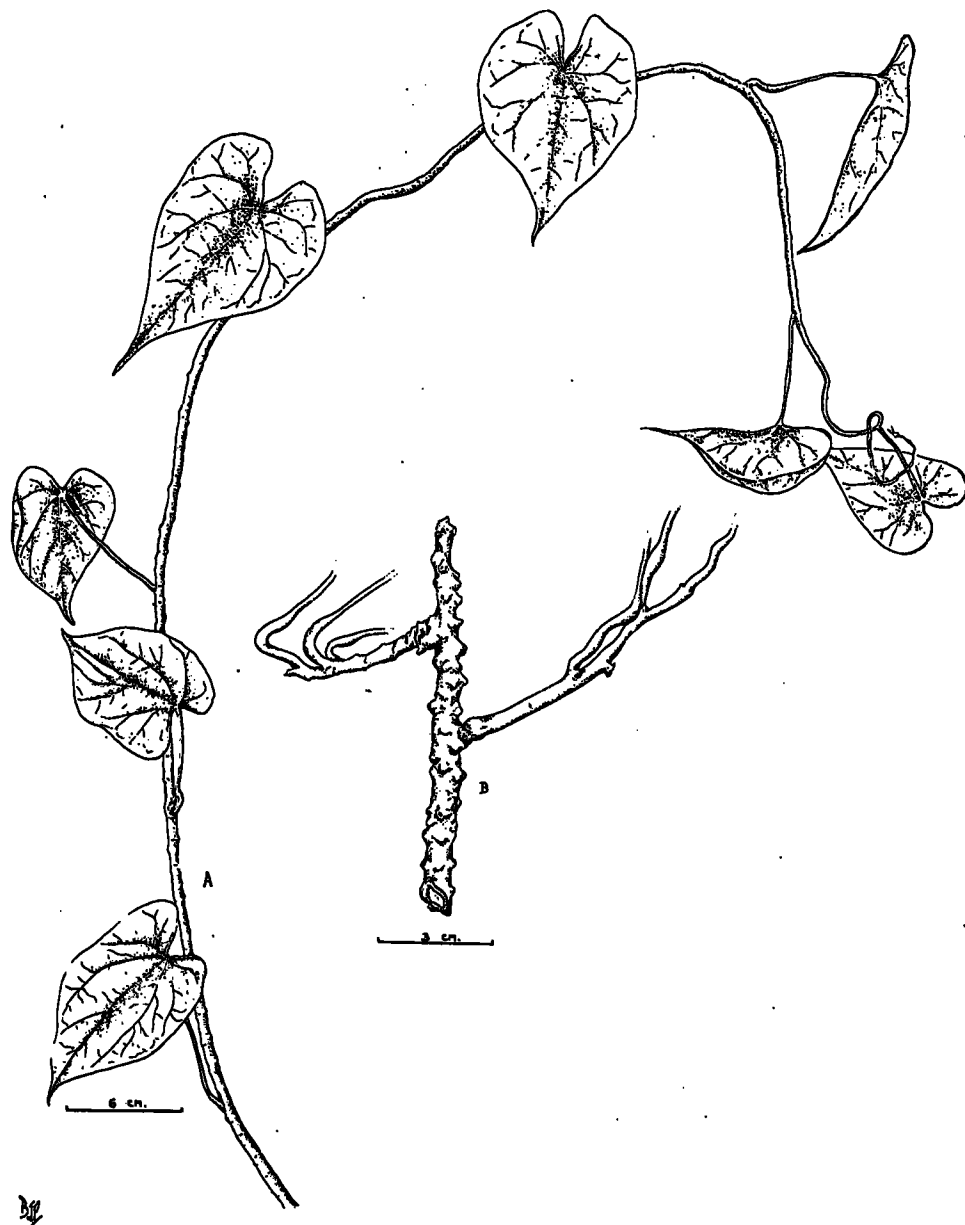


FIG. 382. *Tinospora glabra*. A, portion of the stem with leaves. B, outside view of a warted stem.

10. *Tinospora glabra* (Burm. f.) Merr. in Journ. Arn. Arb. 19: 340. 1938. (Fig. 382).

Tinospora crispa Miers—*Tinospora cordifolia* F. Vill.—*Menispermum crispum* Linn.—*Menispermum verrucosum* Roxb.—*Menispermum tuberculatum* Lamk.—*Menispermum rumosum* Blanco.—*Cocculus crispus* DC.—*Cocculus verrucosum* Wall.—*Cocculus cordifolius* Walp.

Sinh. Thiththa-kinda.

A twining and widely climbing plant with smooth, shining, much warted stems and white papery bark; leaves simple, alternate, exstipulate, entire, 10—12.5 cm long, broadly orbicular cordate, suddenly acuminate, 7-veined, glabrous on both sides, thin, petioles 7.5—10 cm long, thickened and twisted at base, smooth; flowers regular, unisexual, greenish-white, on separate plants, 1—3 together on very slender pedicels in the axils of small persistent bracts, rather distantly arranged in slender pendent spicate racemes or panicles 10—15 cm long from axils of old leaves; male flowers: sepals 6 in two rows, inner ones much longer; petals 6, shorter than inner sepals; stamens 6, distinct, adnate to base of petals and the filaments thickened upwards; female flowers and ripe carpels not seen.

Flowers in May.

Illustration. Rumphius, *Herb. Ambo. 5: pl. 44, fig. 1. 1741—1745.*

Distribution. Occurs in India from Sylhet, Assam to Pegu and Malacca. It is cultivated in Malay Peninsula and Ceylon. It grows in the moist low-country at Kaduwela and Heneratgoda in Ceylon.

Ceylon. Western Prov., Heneratgoda, *Herb. Peradeniya*, June 1884; *Herb. Peradeniya*, May 1885.

Composition. Wehmer records that the entire plant contains a bitter principle, colombine, picoretine and traces of berberine.

Uses. An aqueous extract of this plant is commonly used for stomach trouble, indigestion, diarrhoea and fever. The juice of the plant with coconut oil cures rheumatism and flatulence in children. Externally, it is an effective remedy for the treatment of ulcers and cancerous wounds.

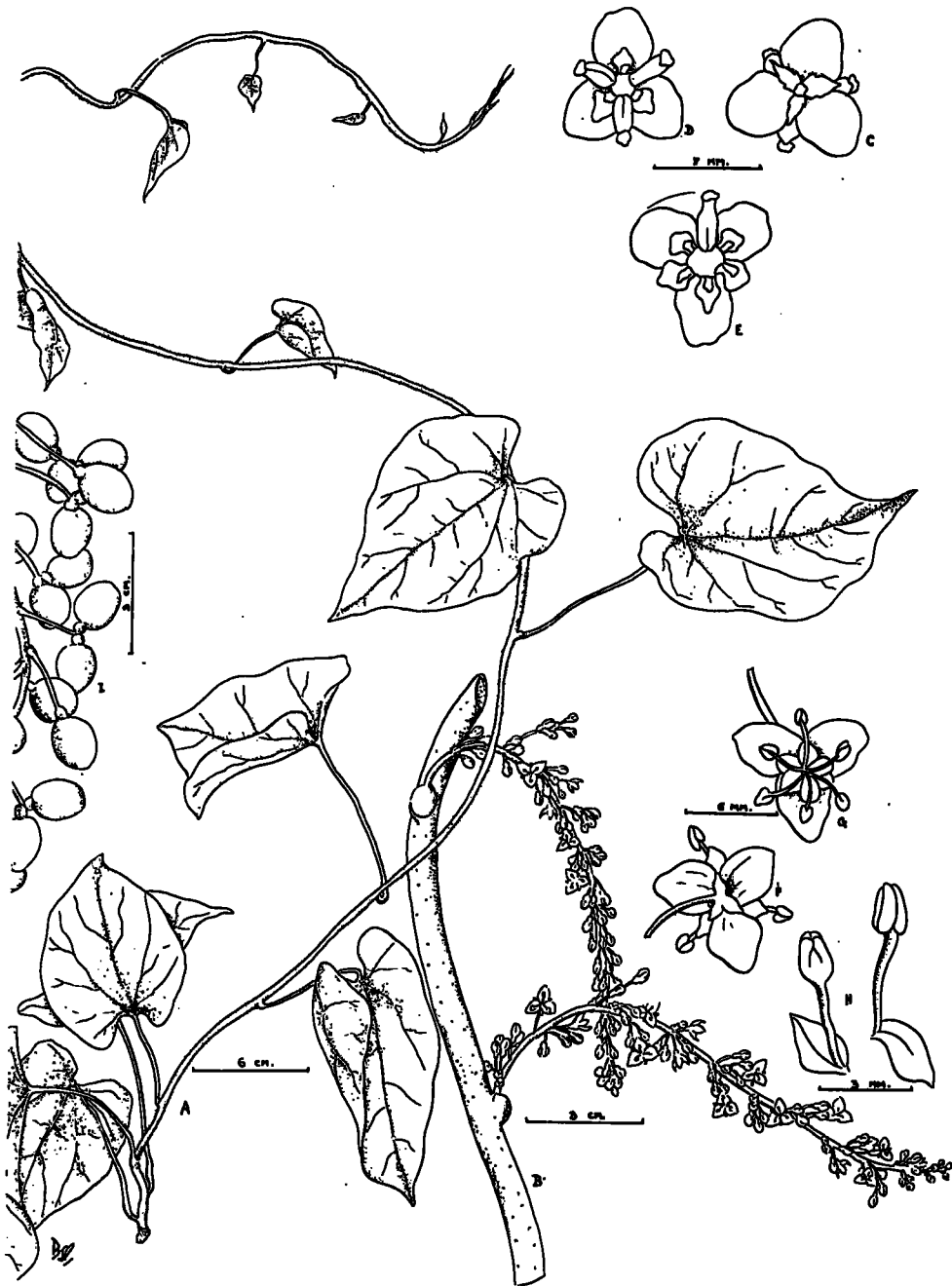


FIG. 383. *Tinospora malabarica*. A, shoot with leaves. B, stem bearing male inflorescences. C, female flower, ventral view. D, female flower, dorsal view. E, female flower with two carpels removed showing staminodes. F, male flower, ventral view. G, male flower, dorsal view. H, stamens adnate to petals. I, fruits.

11. *Tinospora malabarica* Miers, Contrib. Bot. 3: 32. 1874. (Fig. 383).

Menispermum malabaricum Lamk.—*Cocculus malabaricus* DC.—*Tinospora tomentosa* (Colebr.) Miers

Sinh. Bukinda, Walkinda; *Tam.* Potchindil.

A wide climbing plant with long warted internodes and smooth, shining stem about 1.2 cm diam., bark white or reddish, papery and young shoots pubescent; leaves simple, alternate, exstipulate, entire, 10—12.5 cm long, broadly cordate-ovate, acute, pubescent on the upper surface, finely tomentose and whitish beneath, petioles very long, twisted at the base, pubescent, leaving a very prominent scar after leaf fall; flowers small, regular, unisexual, pale greenish-yellow, on separate plants, slender pedicelled, in small clusters, arranged in slender drooping spicate panicles 10—12.5 cm long, arising from axils of fallen leaves; sepals 6 in two rows, inner ones much longer; petals 6, shorter than inner sepals; male flowers: stamens 6, filaments distinct, thickened upwards, adnate to base of petals; female flowers: ovary superior, 3-carpellary, styles short, stigmas capitate, staminodes 6, very small; ripe carpels 1—3, usually 2 on very short thick stalks, ovoid, smooth, 1.2 cm long, endocarp tubercled, seed ovoid, deeply hollowed on the ventral side.

Flowers in July.

Illustrations. Rheede, Hort. Mal. 7: pl. 19. 1688; Kirtikar and Basu, Indian Med. Plants, pl. 33. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is rather common in the low-country in Ceylon. Kurunegala, Gonagamuwa, Heneratogoda, etc.

Ceylon. Without locality, *Thwaites C.P.*, 2804.

Uses. This plant has tonic properties. In China, the leaves and stems are used in the treatment of chronic rheumatism, while in Cambodia the whole plant is used as fumigant for piles and ulcerated wounds. Medicated baths prepared with it are given to patients suffering from liver complaints.

68. MORACEAE

1. *Antiaris toxicaria* (Pers.) Leschen, in Ann. Mus Par. 16: 478. 1810.

Ipo toxicaria Pers.—*Antiaris innoxia* Bl.—*Antiaris saccidora* Dalz.—*Antiaris dubia* Spanog.—*Antiaris zeylanica* Seem.—*Lepurandra saccidora* Nimmo.

Engl. Upas Tree; *Sinh.* Riti; *Tam.* Ali, Arandali, Irainji, Maravuri, Nettavil, Pattai; *Hindi* Jungle-lakuch; *Sans.* Valkala.

A tall evergreen tree about 42 m tall with a straight trunk buttressed at the base and vertically panelled, mottled black and white bark; leaves simple, alternate, 10–20 cm long, oblong or oval-oblong, acuminate, mucronate, cuspidate, subcaudate, entire or serrulate, glossy on the upper surface, glabrous or tomentose beneath, base rounded or cordate, young leaves hirsute, veins 8–10 pairs, petioles very short; flowers monoecious, males crowded on the surface of an axillary peduncle, receptacle surrounded by confluent imbricate bracts, females minute, solitary in a pyriform involucre of many confluent bracts, male receptacles 3–4-nate, orbicular, 1.2 cm diam., velvety at length, convex, female receptacles axillary, subsessile, ovoid, 0.3 cm long, velvety; male flowers: sepals 3–4, narrowly spatulate, imbricate; stamens 3–8, filaments erect, pistillode absent; female flowers: perianth absent, ovary superior, adnate to the involucre, unilocular, with a single pendulous ovule, style arms 2, subulate, recurved; fruit globose, pyriform, 0.8–1.8 cm diam., narrowed into a short pedicel, red-purple, 1-seeded.

Flowers during August and September.

Illustrations. Trecul in Ann. Sc. Nat. Ser'3, 8: pl. 6. 1847; Wight, Ic, Pl. Ind. Or., pl. 1958. 1853; Beddome, Flor. Sylvat. pl. 307. 1868–1873; Kirtikar and Basu, Indian Med. Plants, pl. 908. 1933; Worthington, Cey. Trees, pl. 419. 1959; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Malay Peninsula, S. China, Java, Sumatra, Borneo and Philippine Islands. It is rather common in the low-country in Ceylon up to 2,000 feet altitude. Kurunegala, Gampaha, Kadugannawa, Badulla, etc.

India. N. & S. Concan; *Law.* Malabar, Concan, etc. *Stocks, Law,* etc. Nilghiri and Kurg; *G. Thomson.* Ceylon. Without locality, *Thwaites C.P.* 2231. **Borneo.** Perak, *Wray* 521, 1883.

Composition. The milky latex of this tree contains antiarol, potassium nitrate, a resin named antiarresin, a crystalline protein, an acid and 3 active glucosides α -antiarin, β -antiarin and rantiarin.

Uses. In small quantities, the juice of this tree is a mild cardiac and circulatory stimulant and in large doses it acts as a myocardial poison. It stimulates intestinal and uterine contractions. In India, the bitter seeds of this tree are used as a febrifuge and a remedy for dysentery. Various wild tribes of Malaya, Java, Borneo, etc. use the sap for preparing arrow poisons.

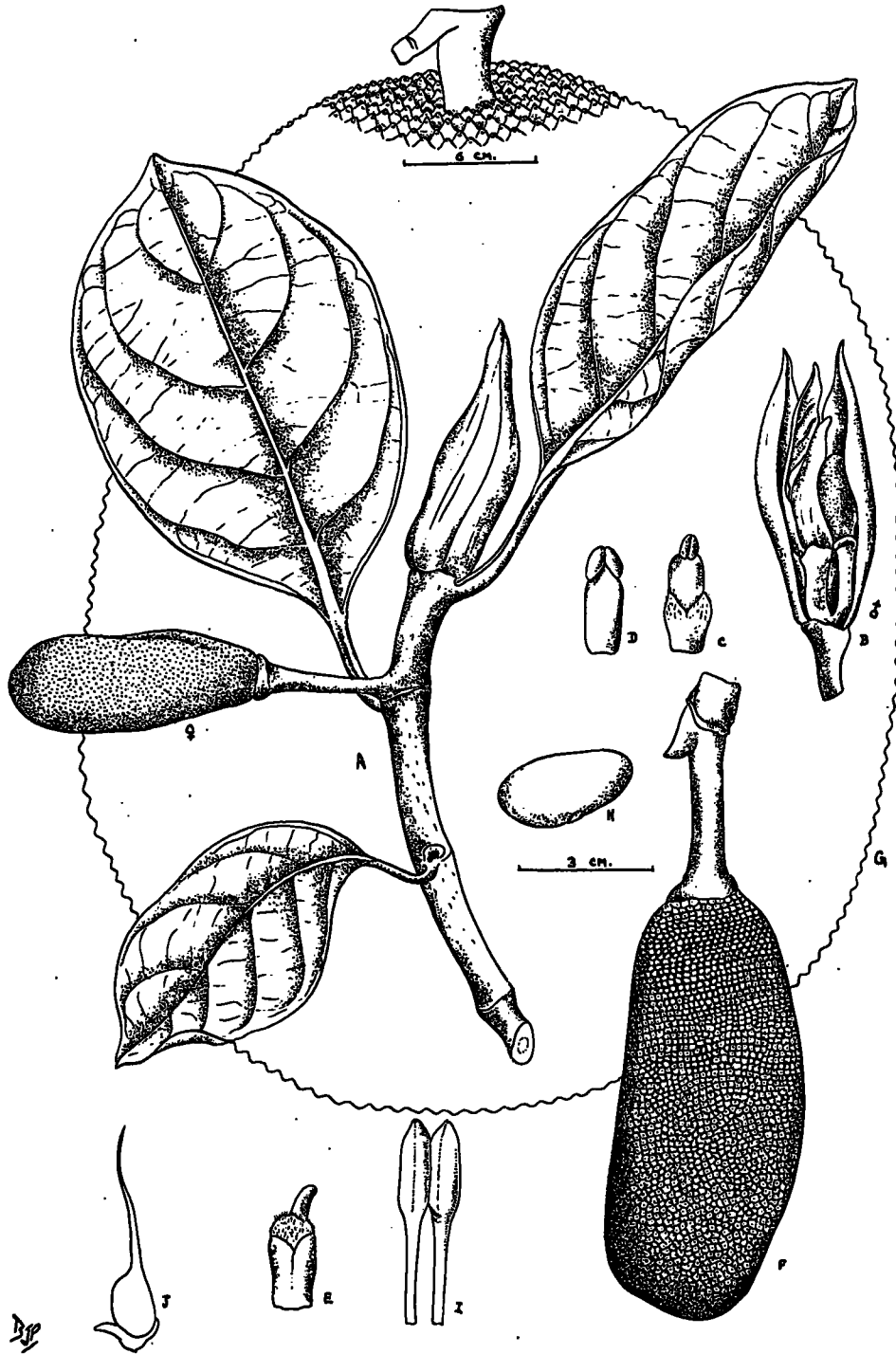


FIG. 384. *Artocarpus heterophyllus*. A, stem with leaves and female inflorescence. B, male inflorescence. C, male flower. D, male flower with perianth removed. E, female flower. F, young fruit. G, mature fruit. H, seed. I, infertile flowers. J, spinescent apex of ovary. C—E, I, J, enlarged.

2. *Artocarpus heterophyllus* Lam. Encycl. 3: 309. 1789. (Fig. 384).

Artocarpus integra Merr.—*Artocarpus integrifolia* Linn. fr.—*Artocarpus philippinensis* Lam.—*Artocarpus maxima* Blanco.—*Radermachera integra* Thunb.—*Polyphema jaca* Lour.—*Sitodium cauliflorum* Gaertn.

Engl. Jakfruit Tree; *Sinh.* Herali, Kos, Waraka, Wela; *Tam.* Murasabalam, Pagal, Pala, Palasu, Palavu, Panasam, Pila, Sira, Tagar, Vasukkai, Verphala; *Hindi* Chakki, Kanthal, Kathal, Katol, Panasa, Panas; *Sans.* Apushpa, Ashaya, Atibrihatphala, Champa, Champakalu, Kantakaphala, Kantakiphala, Kantaphala, Kantiphala, Kosha, Mahasarja, Mridagaphala, Mulaphalada, Murajaphala, Palasa, Panas, Panasa, Pashumusta, Phalada, Phalasa, Phala-vrikshaka, Phalina, Phanasa, Putaphala, Skandaphala, Sthula, Sthulakantaphala.

A large evergreen tree, glabrous except the young shoots, bark red-brown containing a milky latex inside; leaves simple, alternate, 10—20 cm long, elliptic or obovate, acuminate, entire or those of the young shoots sometimes lobed, dark green and shining on the upper surface, rather rough beneath, base narrowed, main nerves 7 or 8 pairs, petioles 1.2—2.5 cm long, stipules large, glabrous, soon caducous; flowers unisexual, monoecious, densely crowded on globose or oblong axillary receptacles often mixed with scales; male flowers: perianth 2—4-lobed or partite, lobes obtuse, valvate or slightly imbricate, stamen one, erect, pistillode absent; female flowers: perianth tubular, confluent below with the receptacle, mouth minute; ovary straight, ovule pendulous, style central or lateral, stigma entire; fruit large, globose or cylindrical, 30—75 cm long, 15—30 cm broad, hanging on short stalks from the trunk and larger branches, clothed with the greatly accrescent fleshy perianths and carpels (anthocarps) which have hardened spinescent apices; seeds pendulous, large, oblong, exalbuminous, testa membranous, cotyledons unequal.

Flowers from October to January.

Illustrations. Roxburgh, *Pl. Corom.*, pl. 250. 1820; Wight, *Ic. Pl. Ind. Or.*, pl. 678. 1840—1843; Curtis, *Bot. Mag.*, pls. 2833 and 2834. 1828; Gaertner, *Fruct. et Sem. Plant.*, pl. 71 and pl. 72. 1788; Worthington, *Cey. Trees*, pl. 422. 1959; Kirtikar and Basu, *Indian Med. Plants*, pl. 906. 1933; Macmillan, *Trop. Pl. and Gard.* p. 249. 1956; Herb. Peradeniya, drawing.

Distribution. A native of Western Ghats in India and now cultivated in most tropical countries including Ceylon, where it flourishes in the moist mid and low-country.

India. Plan. Ganget. Inf., *T. Thomson and J. D. Hooker.* Ceylon. Without locality, cultivated, *Thwaites C.P.* 2233; *Drieberg*, Aug. 1914. *Cuba.* Harv. *Trop. Gard.*, cultivated, *Jack* 4900. March 1927.

Composition. The fruit of this tree contains a high carbohydrate content but is deficient in calcium and iron. The seeds are rich in starch. The wood contains morin and a crystalline compound, cyanomaclurin which has been found to contain the phloroglucinol group probably isomeric with catechins and piperonal, an essential oil. The pulp of the fruit is rich in vitamin C.

Uses. The fruit is eaten in various forms. The rich yellow flesh (aril) surrounding the seeds is sweet and aromatic when ripe and eaten raw. Before the arils ripen, they are boiled with the seeds and eaten with scraped coconut as a meal. The seeds are roasted and made into sweetmeats. The latex makes an excellent cement for cracked pots especially those used for carrying water. The unripe fruit is minced, boiled with scraped coconut and eaten. The young fruits are curried or prepared into pickles. The tender leaves minced fine and roasted with scraped coconut is a specific for insomnia, while the juice of the tender fruit with coconut milk and jaggery is a miraculous antidote for narcotic poisoning. The leaves are used in skin diseases and the root for diarrhoea and fever. The roots are also used for skin diseases and as an antiasthmatic. The milky juice mixed with vinegar is applied on swellings and abscesses. The starch from the seeds is given in bilious colic and the roasted seeds have an aphrodisiacal action. The heartwood is an excellent timber and a dye extracted from it is used for dyeing robes of Buddhist priests. An infusion of the mature leaves and bark is given for stones in the bladder and for diabetes.

3. *Ficus benghalensis* Linn. Sp. Pl. 1059. 1753.

Urostigma benghalense Gasp.—*Ficus indica* Linn.

Engl. Banyan Tree; *Sinh.* Mahanuga, Nuga; *Tam.* Al, Ala, Alam, Eguvasam, Ka, Kadavam, Kagavasugam, Kan, Kavasugam, Koil, Pali, Palu, Peral, Pudam, Pudavam, Pudavirujam, Ton, Vadam, Vadavirukkam, Vekkurodam; *Hindi* Bar, Bargad, Bargat, Ber, Bor; *Sans.* Avaroha, Bahupada, Bahupadi, Bhandira, Bhringi, Chira, Dhruva, Jatala, Jatiljati, Karmaja, Kshiri, Mahachhaya, Mana, Madali, Nandi, Nila, Nyagrodha, Padarohana, Patanga, Raktaphala, Rolina, Shipharuha, Shungi, Skandhaja, Skandhajanya, Skandharuha, Vaishnavanas, Vaishnavanodaya, Vanaspati, Vata, Vitapi, Vrikshanath, Yakshataru, Yakshavas, Yamapriya.

A very large evergreen tree, 23—34 m tall, with huge spreading limbs supported by aerial roots which later form accessory trunks extending to a large area and stout, softly pubescent branchlets; leaves simple, alternate, 10—20 cm long, 5—12.5 cm broad, oval, ovate or orbicular-ovate to oblong, coriaceous, obtuse or obtusely cuspidate, quite entire, glabrous or pubescent beneath, base rounded, subcordate or acute, basal veins strong, lateral veins 7—8 pairs, finely reticulate beneath, petioles 1.2—5 cm long, stipules 1.8—2.5 cm long, coriaceous; flowers minute, unisexual, of 3 kinds, males, females and imperfect females (gall flowers) crowded along with bracteoles in the inner walls of fleshy receptacles which are sessile, globose, about 1.8 cm diam., puberulous, arising in axillary pairs; basal bracts 3, orbicular, spreading; male flowers: near the mouth of the receptacle, perianth 4, stamen 1, filament erect; female flowers: perianth as in the male but shorter, ovary superior, unilocular with a single pendulous ovule, straight or oblique, style excentric, stigma simple; fruit with fleshy pericarp and with achenes embedded in them, dark red in colour.

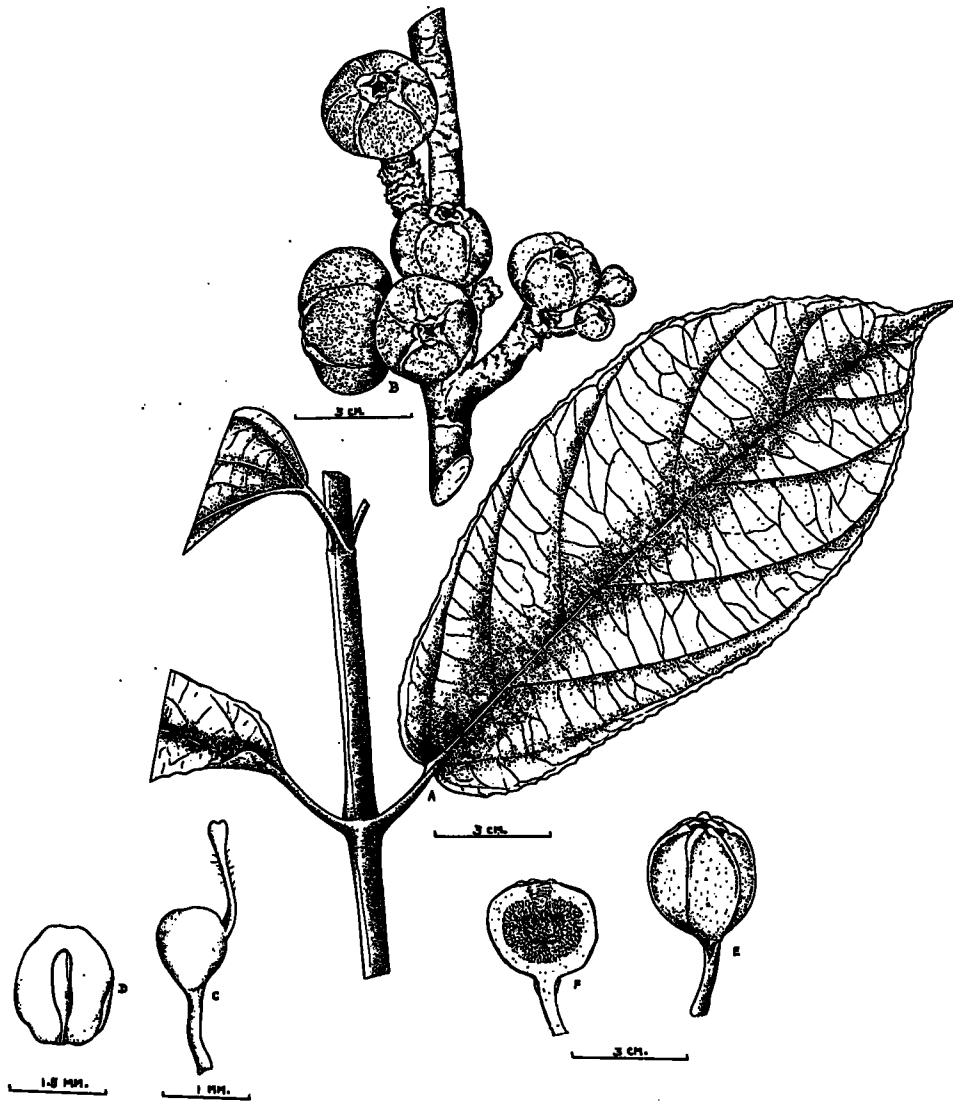
Flowers in December.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 1989. 1853; Champion in Hook. *Journ. Bot.* *pl.* 13 and *pl.* 14. 1841; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 893. 1933; Worthington, *Cey. Trees*, *pl.* 402. 1959; Herb. Peradeniya, drawing.

Distribution. Occurs in the sub-Himalayan forests and S. India and naturalized elsewhere. It is common in the low-country dry regions of Ceylon, upto an altitude of about 2,000 feet.

India. Calcutta, Bot. Gard., cultivated. *Ceylon.* Northern Prov. Jaffna, *Thwaites C.P.* 2225. Eastern Prov., Trincomalee, *Alston* 540, May 1927.

Uses. An infusion of the bark is considered a specific for diabetes. The milky juice is applied externally on pains, bruises, rheumatism, lumbago, and on cracked and inflamed soles of the feet. In the Punjab, the root fibres are given for gonorrhoea, an infusion of the small branches for haemoptysis and tips of the aerial roots for persistent vomiting and dysentery.



Rg

FIG. 385. *Ficus hispida*. A, twig with leaves. B, twig with fruits. C, female flower, lateral view. D, male flower, dorsal view. E, fruit receptacle. F, longitudinal section of fruit receptacle.

4. *Ficus hispida* Linn. f., Suppl. 442. 1781. (Fig. 385).

Ficus oppositifolia Willd.

Sinh. Kotadimbula; *Tam.* Ottamalam, Peyatti, Sonatti; *Hindi* Daduri, Dagurin, Gobla, Kagsha, Katgularia; *Sans.* Ajaji, Ajakshi, Asuma, Bhadro-dumbarika, Chitrathashaja, Jaghanaphala, Kakodumbara, Kakodumbarika, Kharadala, Kharapatrika, Kshiri, Kshudrodumbarika, Kushtharani, Phalguni, Phalguvatika, Phalu, Rajika, Udumbaraphala.

A hispidly pubescent shrub or small tree; leaves opposite, 10—30 cm long, oval-ovate or subovate, apiculate, cuspidate or caudate, entire or toothed above the middle, base rounded cuneate or cordate, veins 3—5 pairs, strong beneath and reticulate with cross venules, basal pair strong; petioles 1.2—3.7 cm long, densely hispid; stipules binate or 4-whorled on leafy branches, ovate-lanceolate, pubescent; flowers minute, unisexual of 3 kinds males, females and imperfect females crowded along with bracteoles on the inner walls of a fleshy receptacle, receptacles axillary, binate or fascicled on tubercles or shoots of mature wood, turbinate or subpyriform, 1.2—2.5 cm diam., hispid with sometimes adnate lateral bracts, umbilicus rather large; peduncles 5—16 mm long, basal bracts 3; male flowers: sepals 3, concave, hyaline, stamen 1, filament broad; gall and fertile female flowers pedicelled, naked; ovary straight or oblique, style excentric, long hairy, stigma cylindrical, tubular, achene ovoid, fruit yellowish.

Flowers in November, December and July.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 638. 1840—1843; King, *Fic. pls.* 154 and 155.

Distribution. Occurs in India, Ceylon, Malaya, China and Australia. It is common in the low-country in Ceylon up to 3,000 feet altitude.

Ceylon. Without locality, *Thwaites C.P.* 2230. Central Prov., Kandy, *Bamber*, Aug. 1922; *Comanor and Wirawan* 760, Dec. 1969; *Gampola-Nawalapitiya, Comanor* 525, Nov. 1967.

Composition. The bark of this tree contains tannin, wax and a glucosidic principle.

Uses. All parts are astringent to the bowels, antidyenteric and useful for ulcers, biliousness, psoriasis, anaemia, piles, jaundice, haemorrhage of the nose and mouth and diseases of the blood. The fruit is an aphrodisiac, tonic, lactagogue and emetic. The fruits, seeds and the bark possess valuable emetic properties.

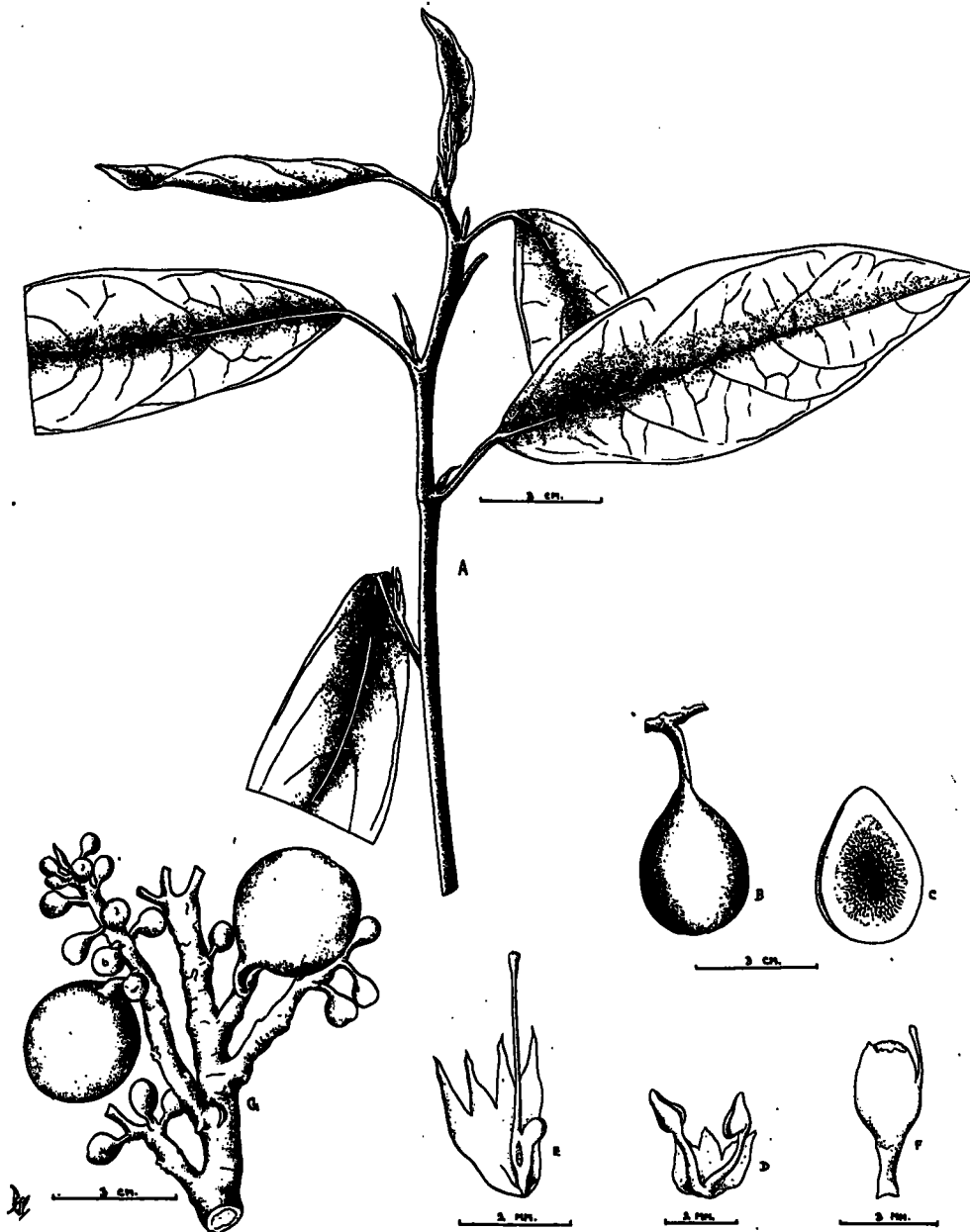


FIG. 386. *Ficus racemosa*. A, branch with leaves. B, receptacle. C, longitudinal section of receptacle showing the flowers. D, male flower. E, female flower. F, gall flower. G, branch containing fruits.

5. *Ficus racemosa* Linn. Sp. Pl. 1060. 1753. (Fig. 386).

Ficus glomerata Roxb.—*Ficus chittagonga* Miq.—*Ficus mollis* Miq.—*Ficus goolereea* Roxb.—*Cavellia glomerata* Miq.—*Cavellia mollis* Miq.

Sinh. Attikka; *Tam.* Adam, Adavam, Adavu, Anai, Anjiram, Asamarudam, Asuvattam, Atti, Koli, Malaiyinmunivan, Tumbaram, Tuniyangam, Udumbaram; *Hindi* Dimere, Gular, Lelka, Paroa, Umar, Umrai, Tue; *Sans.* Apushpaphalasambandha, Audumbaram, Brahmavriksha, Haritaksha, Hemadughda, Hemadugdhaka, Jadhanephala, Jantuphala, Kalaskandha, Krimikanta, Kshiravriksha, Kunjera, Panimukha, Pavitraka, Pushpahina, Sadaphala, Saumya, Shitaphala, Shitavalkala, Shvetavalkala, Suchakshu, Supratishthita, Udumbara, Yajana, Yajnanga, Yajnaphala, Yajnasara, Yajnayogga, Yajniya, Yana, Yanodumbara.

An evergreen tree 18—20 m high with glabrous, pubescent or scaberulous shoots; leaves simple, alternate, 10—17.5 cm long, oblong-ovate to obovate or lanceolate, tapering to an obtuse apex, entire, membranous, glabrous on both sides, shining above, base obtuse, rarely acute, veins 4—6 pairs, prominent beneath, petioles 1.8—5 cm long, stipules 1.2—1.8 cm long, linear-lanceolate, membranous; flowers unisexual, of 3 kinds, males, females and imperfect females or gall flowers crowded along with bracteoles on the inner walls of a fleshy, short peduncled, subglobose, pyriform or subturbinate receptacle 3.1 cm diam., glabrous or pubescent, umbilicus depressed, basal bracts 3, triangular-ovate; male flowers: sessile, sepals 3—4, membranous, inflated, enveloping the 2 elongate-ovate anthers, filaments connate; gall flowers pedicelled, perianth toothed, covering the base of the ovoid, rough ovule, style lateral, elongate, stigma clavate; fertile female flowers in a zone between the male and gall flowers, subsessile, perianth 4—5-toothed, teeth lanceolate, enveloping the small minutely tubercled achene, ovary superior, unilocular with a single pendulous ovule, style subterminal, much elongate, stigma clavate, fruit reddish about 3.5 cm long.

Flowers in November.

Illustrations. Roxburgh, Pl. Corom. 2: pl. 123. 1798; Wight, Ic. Pl. Ind. Or., pl. 667. 1840—1843; Kirtikar and Basu, Indian Med. Plants, pl. 904. 1933; Worthington, Cey. Trees, pl. 408. 1959.

Distribution. Occurs in India, Ceylon and Burma. It is common on banks of streams in the moist low-country in Ceylon up to an altitude of 2,000 feet.

Ceylon. Eastern Prov., Kantalai, *Alston* 519. May 1927. Central Prov., Peradeniya, *Thwaites C.P.* 3305.

Uses. An infusion of the bark or the expressed juice of the unripe fruits is given for menorrhagia, haemoptysis and urinary diseases. The milky juice is administered for piles and diarrhoea. The powdered leaves are used for bilious ailments. The root is useful for dysentery and the sap of the root for diabetes and haemorrhoids. The boiled fruits are given to prevent injury to the intestines as a result of swallowing injurious objects. The juice of the root is a tonic and given for gonorrhoea. The bark is also employed to extract poison from wounds caused by cats and is given to cattle suffering from rinderpest.

6. *Ficus religiosa* Linn. Sp. Pl. 1059. 1753.

Ficus affini Griff.—*Urostigma religiosum* Gasp.—*Urostigma affine* Miq.

Engl. Bo Tree, Peepul Tree, Pipal Tree; *Sinh.* Bo-gaha; *Tam.* Achuvattam, Arasu, Arayal, Asuvattam, Attiru, Attugamani, Ilanai, Kanavam, Kunjarasanam, Magadurumam, Mara, Narayanam, Padaroganam, Panai, Pittalam, Saladalam, Saranam, Suvalan, Tavanam, Tiru, Vanagandi; *Hindi* Pipal, Pipli; *Sans.* Achyutavas, Ashvatha, Bodhidru, Bodhidruma, Chaityadru, Chaityavriksha, Chaladala, Chalapatra, Devatma, Dhanuvriksha, Gajabhakshaka, Gajapatra, Gajashana, Guhyapushpa, Guru, Kapitana, Keshavalaya, Krishnavasa, Kshiradruma, Kunjarashana, Mahadruma, Mangalya, Nagabandhu, Pavitraka, Pippala, Sevyā, Shri, Shrimana, Shubhada, Shuchidruma, Shymala, Vipra, Vishala, Vriksharaja, Yajnika.

A large, glabrous, usually an epiphytic tree with spreading branches; leaves simple, alternate, entire, coriaceous, 10—17.5 cm long, 7.5—10 cm broad, ovate-rotund, narrowed upwards and the apex produced into a linear-lanceolate tail about half as long as the main portion of the blade, base broad, rounded, truncate or cordate in young leaves, 5—7-nerved, lateral main nerves about 8 pairs with finely reticulate venation in between, petioles 7.5—10 cm long, slender, stipules minute, ovate, acute; flowers minute, unisexual, monoecious on the inner walls of fleshy receptacles the mouth of which is closed by imbricate bracts; florets often mixed with bracteoles, of four forms, males, females, gall and neuter flowers; receptacles in pairs, axillary, sessile, smooth, depressed-globose, 1.2 cm diam., dark purple when ripe, basal bracts broad, spreading; male flowers: few only near the mouth of some receptacles, sessile, sepals 3, broadly ovate, stamen 1, anther single, ovate-rotund, filament short; gall and female flowers: sessile or pedicellate, gall flowers much more numerous than the fertile females, many of them without perianth; sepals 5, lanceolate; ovary superior, unilocular, ovule solitary, often containing the pupa of a hymenopterous insect, style short, lateral, stigma round; fruit an enlarged, hollow, cup-shaped, closed receptacle, the inner wall studded with achenes, seeds pendulous.

The fruits ripen from May to July.

Illustrations. Wight, *Ic. Pl. Ind. Or., pl.* 1967. 1853; Beddome, *Flor. Sylvat. pl.* 314. 1868—1873; Griffith, *Ic. Pl. Asiat. pl.* 553 1845; Miquel, *Fl. Nederl. Ind. 1 (2): pl.* 23. 1856—1859; Kirtikar and Basu, *Indian Med. Plants, pl.* 896A. 1933; Worthington, *Cey. Trees, pl.* 414. 1959; Herb. Peradeniya, drawing.

Distribution. Occurs in the sub-Himalayan forests in Bengal and Central India. It is cultivated in the mid and low-country in Ceylon. It is considered as a sacred tree and worshipped by Buddhists.

India. Sikkim Himalaya: *Treutler* 1244, March 1875. Punjab: *T. Thomson.* Maisor and Carnatic: *G. Thomson.* Ceylon. North-Central Prov., Anuradhapura, *Herb. Peradeniya,* Aug. 1885. Maldivé Islands. *Didi* 32, 1896.

Uses. The leaves and young shoots are used as a purgative and an infusion of the bark given for scabies. A paste of the bark is an absorbent for inflammatory swellings. The juice of the bark is used as mouthwash for toothache and strengthening of the gums. The powdered root bark rubbed with bees' honey promotes granulation in apthae and ulcers. A decoction of it is given for fever with diarrhoea and dysentery. Water in which freshly burnt bark has been steeped cures obstinate hiccup. The powder of the dried bark is used for fistula in ano. The fruit is a laxative. The powdered bark and fruits taken in water cures asthma and promotes fertility in women.

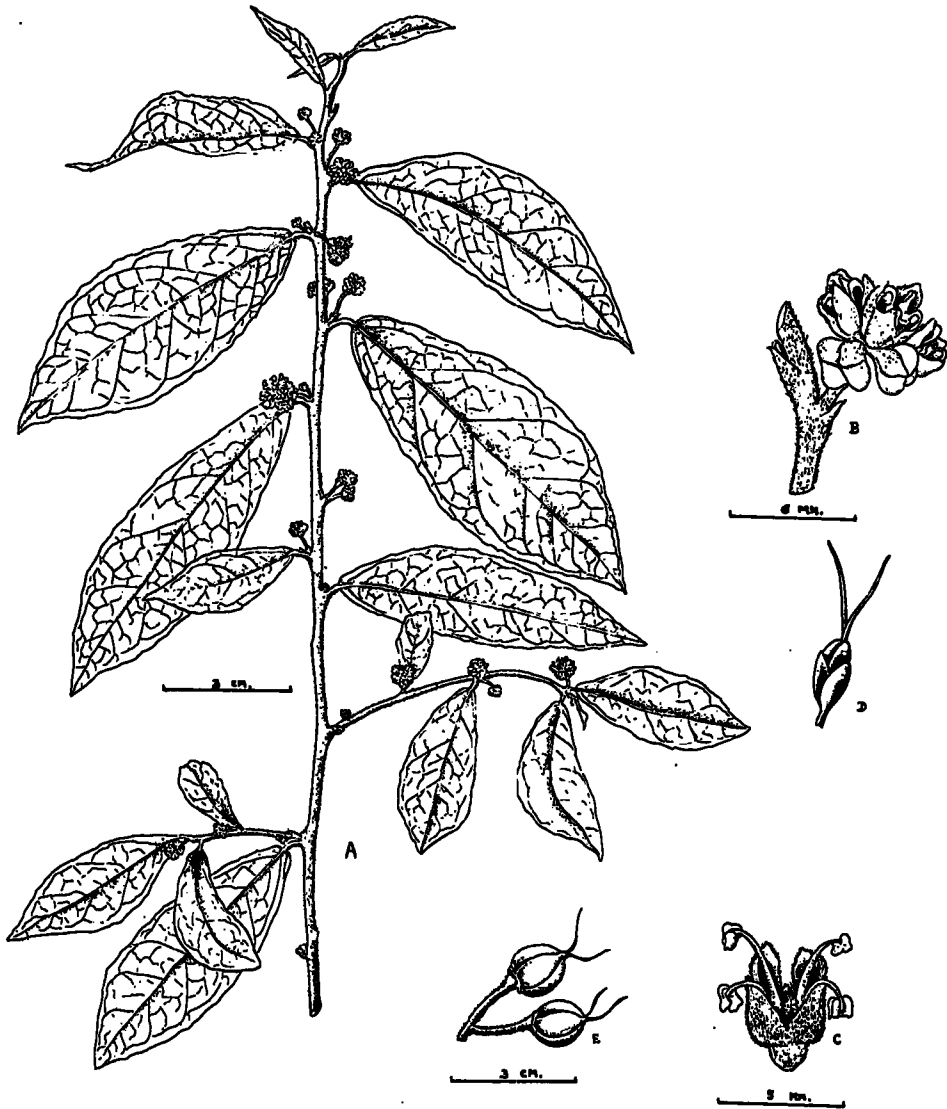


FIG. 387. *Strebilus asper*. A, branch with leaves and clusters of flowers. B, cluster of male flowers. C, male flower, lateral view. D, female flower. E, fruits.

7. *Streblus asper* (Retz.) Lour. Fl. Cochin-China, 2: 615. 1790 (Fig. 387).

Epicarpurus orientalis Bl.—*Epicarpurus asper* Steud.—*Trophis aspera* Retz.—*Trophis cochinchinensis* Poir.—*Trophis aculeata* Roth.—*Achymus patens* Soland.—*Calius lactescens* Blanco—*Streblus lactescens* Blanco

Sinh. Getanetul; **Tam.** Kurripila, Kuttippirai, Parayan, Pasuna, Patpiray, Pira, Pirasu, Piray, Pukki, Vittil; **Hindi** Daheya, Dahia, Karchanna, Rusa, Sahora, Siora; **Sans.** Akshadhara, Bhutavasa, Bhutavriksha, Dhukavasa, Gavakshi, Karkashachhada, Kaushikyoja, Kharachhada, Kshiraranasha, Pishachandru, Pitaphala, Pitaphalaka, Rukshapatra, Sakata, Shakhota, Shankhinivasa.

An unarmed shrub or a small gnarled tree about 10 m high with pubescent or tomentose branchlets, leaves simple, alternate, scabrid, 2.5–7.5 cm long, ovate, obovate or rhomboid, acute or acuminate, coarsely toothed from below the middle, base acute, scaberulous on both surfaces, especially beneath, veins 4–6 pairs, petioles 0.2–0.4 cm long; flowers unisexual, monoecious, yellow; male flowers: solitary or in binate heads, subsessile, 3-bracteate; sepals 4, imbricate; stamens 4, filaments inflexed in bud, pistillode short, top dilated; female flowers: on slender pedicels which are thickened upwards, sepals 4, unequal, broad, concave; ovary superior, unilocular with single pendulous ovule, style terminal, long and slender; fruit pisiform embraced by the persistent sepals, style persistent.

Flowers during March and April.

Illustrations. Beddome, For. Man. Bot. pl. 26, fig. 1; Wight, Ic. Pl. Ind. Or., pl. 1961. 1853; Wight in Hook. Journ. Bot. 1: pl. 121. 1834; Worthington, Cey. Trees, pl. 424. 1959.

Distribution. Occurs in the drier parts of India, Ceylon, Malaya, Andaman Islands, S. China and Philippine Islands. It is common in the dry low-country in Ceylon, upto an altitude of 2,000 feet.

India. Dharwar: Talbot, 1899. Plan. Ganget. Inf., T. Thomson. Pen. Ind. Or., Herb. Wight 2709, Kew Distribution 1866–8; Wallich 4640C. Ceylon. Central Prov., Haragama, Thwaites C.P. 2214. North-Central Prov., Deduru Oya, Simpson 8855, Nov. 1931; Uma Oya, Herb. Peradeniya, April 1883. Uva Prov., Bibile, J. M. Silva, July 1924. **Philippine Islands.** Luzon: Cagayan Prov., Alcala, Clemens 17529, April 1927.

Composition. The latex of this tree contains resin and a bitter substance, streblid, which is neither a glucoside nor an alkaloid.

Uses. A decoction of the bark is given for fever, dysentery and diarrhoea and used externally for disinfecting wounds. The powdered root is applied as a poultice on ulcers. The latex is painted on soles of feet and chapped hands and also on glandular swellings. The seeds are made into a paste and applied on leucoderma and piles.

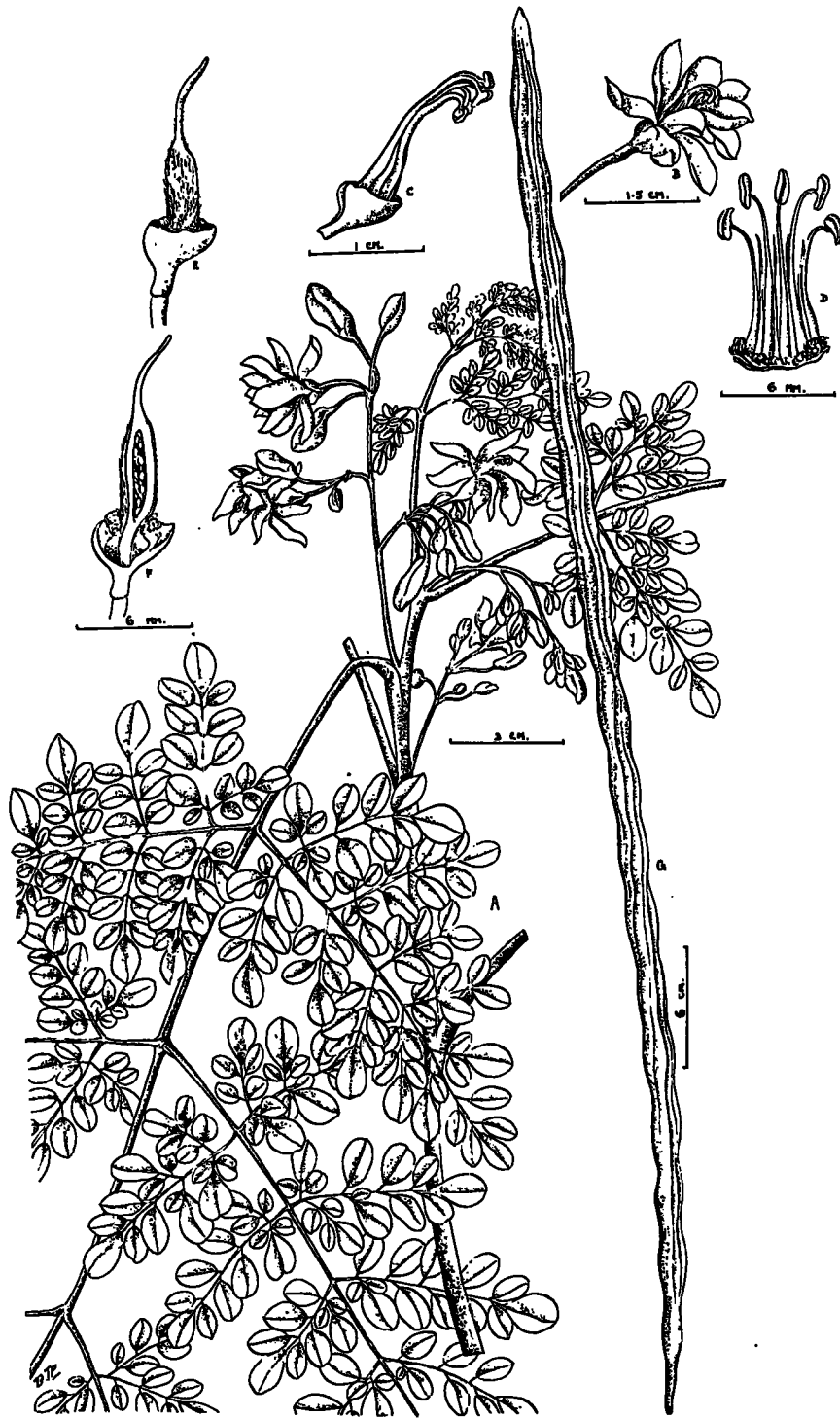


FIG. 388. *Moringa oleifera*. A, branch with leaves and inflorescences of flowers. B, flower, lateral view. C, flower with perianth removed. D, stamens spread out. E, pistil. F, longitudinal section of pistil. G, fruit.

69. MORINGACEAE

1. *Moringa oleifera* Lamk. Encycl. 1: 398. 1783. (Fig. 388).

Moringa pterygosperma Gaertn.—*Moringa zeylanica* DC.—*Moringa polygona* DC.—*Hyperanthera moringa* Vahl—*Hyperanthera decandra* Willd.—*Guilandinia moringa* Linn.—*Moringa nux-ben* Perr.

Engl. Drumstick Tree, Indian Horse radish; *Sinh.* Murunga; *Tam.* Achuram, Asusuram, Karunjanam, Kiranjanam, Kaykkirai, Kilavi, Murungai, Sikkura; *Hindi* Sohajana; *Sans.* Akshiba, Bahumula, Chaksushya, Chalusha, Damsamula, Danshamula, Dravinanashana, Dvisigru, Gandhaka, Haritapatra, Haritashaka, Jalaproya, Janapriya, Kakshivaka, Kalibaka, Kaminisha, Katukanda, Komalpatraka, Krishnagandha, Krishnashigru, Kshamadansha, Madhugunjana, Madushigruka, Mechaka, Mocha, Mochaka, Mukhabanga, Mukhamlda, Mulakaparni, Murangi, Rochana, Ruchiranjana, Sanamaka, Sanbhanjana, Shakapatra, Shigru, Shigruka, Shobhanjana, Shobhataka, Sitavhaya, Subhanjana, Sumula, Supatraka, Sutikshna, Strichittahari, Svetamaricha, Svetashigru, Tikshnamula, Tikshnandhaka, Tilashigru, Ugra, Ugragandhata, Upadansha, Vanapallava, Vidradhinashana.

A small tree with a corky bark and soft wood, young parts tomentose; leaves alternate, usually 3-pinnate, 45 cm long, rachis slender, thickened, articulated at the base, pinnae and pinnules opposite, deciduous, their rachides very slender, articulated and with a gland at the articulations, ultimate leaflets opposite, 1.2—1.8 cm long, 0.6—1 cm broad, the lateral elliptic, the terminal obovate and slightly larger than the lateral ones, nerves obscure, petiolules of the lateral leaflets 1.5—2.5 mm long, those of the terminal 0.3—0.6 cm long; flowers irregular bisexual, white in large puberulous panicles, calyx cup-shaped, 5-cleft, segments unequal, petaloid, deciduous from above the base, imbricate, lobes linear-lanceolate, reflexed, puberulous outside; petals 5, unequal, the upper smaller, the lateral ascending, the anterior the larger, spathulate, veined, disc lining the calyx-tube; stamens 5, inserted on the edge of the disc, fertile, alternating with 5—7 antherless ones, filaments villous at the base, anthers dorsifixed, 1-celled; ovary stipitate, oblong, villous, ovules numerous in two series on parietal placentas, style cylindrical, stigma perforated; fruit pods (capsules) 45 cm. long, 9-ribbed, 1-chambered, beaked, loculicidally 3-valved, seeds many, 3-angled, angles winged, exalbuminous.

Flowers between January and April.

Illustrations. Wight, Ill. Ind. Bot. 1: *pl.* 77. 1838; Beddome, Flor. Sylvat. *pl.* 80. 1868—1873; Griffith, Notul. Pl. As. 4: *pl.* 609. 1845; Kirtikar and Basu, Indian Med. Plants, *pl.* 283. 1933.

Distribution. Occurs in the forests of Western Himalaya and frequently cultivated in India, Ceylon, Burma, Malaya, Philippine Islands and East Africa. In Ceylon, it is often grown in the dry zone especially in Jaffna, Mannar and Puttalam.

India. Bengal: cultivated, *T. Thomson*. Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, March 1889. Maldive Islands. Hulule, *Gardiner*, 1899—1900; *Didi* 4, 1896; Minikoi, *Gardiner* 10, 1899.

Composition. The bark contains the alkaloids moringine and moringinine, two resins, mucilage and an inorganic acid. The root yields an essential oil and the seeds contain traces of an acrid acid, a pungent alkaloid and ben oil. The bark exudes a gum with the properties of tragacanth and used for tanning. The leaves and fruits are rich in calcium, iron and are good sources of phosphorus. The fruit is also rich in protein. Moringa gum contains arabinose, galactose, glycuronic acid and traces of rhamnose. The seeds yield a fixed oil and alkaloid nuclein. The active principle in the root is spirochin.

MORINGACEAE

Uses. A popular remedy for snake-bite poisoning in Ceylon. The leaves are used as a poultice to reduce glandular swellings. The juice of the leaves has purgative properties. The fresh root is regarded as a stimulant diuretic. In India and Indo-China, the roots are regarded antiscorbutic, rubefacient and counter irritant. The juice of the root is useful as a decoction for asthma, gout, rheumatism, enlarged spleen and liver, internal and deeply seated inflammations and calculus ailments. In Nicaragua, a decoction of the root is used for dropsy. The ben oil from seeds has no smell, no taste and no colour. It has the property of not undergoing oxidation for a long time when exposed and is hence valuable for ointments as an external application for rheumatism.

In Africa and Madagascar, the exudate from the tree is used as a diuretic, antifebrile and remedy for asthma, the resins as a rubefacient and antidiarrhoeic and the oil as a remedy for hysteria and scurvy. In India, the root, bark, leaf, flower, seed and gum are used in the treatment of enlarged spleen and liver, in acute and chronic rheumatism, fever, epilepsy, sores in the mouth and leprosy. In the Philippines, the oil is applied on goitre and acute rheumatism. In Mauritius, the expressed juice of the leaf is used as an irritant purgative and anthelmintic, the fruit for diseases of the liver and pancreas, and the root bark as a stimulant, diuretic, stomachic and abortifacient. The immature fruit is often used in Ceylon as a curry and the leaf for shell-fish preparations as it is supposed to counteract any poisonous effects.

70. MYRISTICACEAE

1. *Horsfieldia irya* (Gaertn.) Warb. in Ber. Deut. Bot. Ges. 13: 85. 1875.

Myristica irya Gaertn.—*Myristica javanica* Bl.—*Myristica sphaerocarpa* Wall.—*Myristica exaltata* Wall.

Sinh. Iriya.

A rather slender erect tree about 13 m high, branched at the top, bark purplish grey, smooth, marked with leaf scars, young parts slightly rusty-furfuraceous; leaves simple, alternate, numerous, 17.5—20 cm long, oblong or linear-lanceolate, acute at base, acuminate acute, glabrous, not coriaceous, curved, shining on the upper surface, slightly paler beneath, petioles, very short, flat on top; flowers regular, unisexual, pale yellow, dioecious, male flowers minute, very numerous on short pedicels, clustered in much branched rusty-pubescent thyrsoid panicles 7.5—10 cm long, from the axils of fallen leaves with numerous small linear-lanceolate bracts, female flowers larger, much fewer in short close panicles; perianth globose, segments 2, valvate; stamens 6—10, filaments combined into a turbinate column, anthers distinct, 2-celled; ovary superior, unilocular with a single basal erect ovule, style very short; fruit globose, nearly 2.5 cm long, pericarp leathery, rusty-tomentose outside, glabrous and bright pink within dehiscing into 2 valves; seed globose, completely covered by the entire scarlet aril.

Flowers in January and February.

Illustrations. Gaertner, *Fruct. et Sem. Plant.* 1: *pl.* 41. 1788; Wallich, *Pl. As. Rar.*, 1: *pl.* 89. 1830; Worthington, *Cey. Trees*, *pl.* 352. 1959; *Herb. Peradeniya*, drawing.

Distribution. Occurs in Ceylon, Burma, Malacca, Malay Islands, Andaman Islands, Java, Sumatra and Borneo but not in the Indian Peninsula. It is rather common in the moist low-country in Ceylon up to an altitude of 2,000 feet. *Peradeniya*, *Ambagamuwa*, *Hunnasgiriya*, etc.

Ceylon. Western Prov., Heneratgoda, *Herb. Peradeniya*, July 1890. Without locality, *Thwaites C.P.* 2620. Great Cocos Island. *Prain*, Dec. 1889.

Uses. The latex of this tree is used to clean ulcers and the root mascerated with lime juice is drunk for snakebite poisoning especially for that of the krait. The leaves are used to draw out pus from boils and sores.

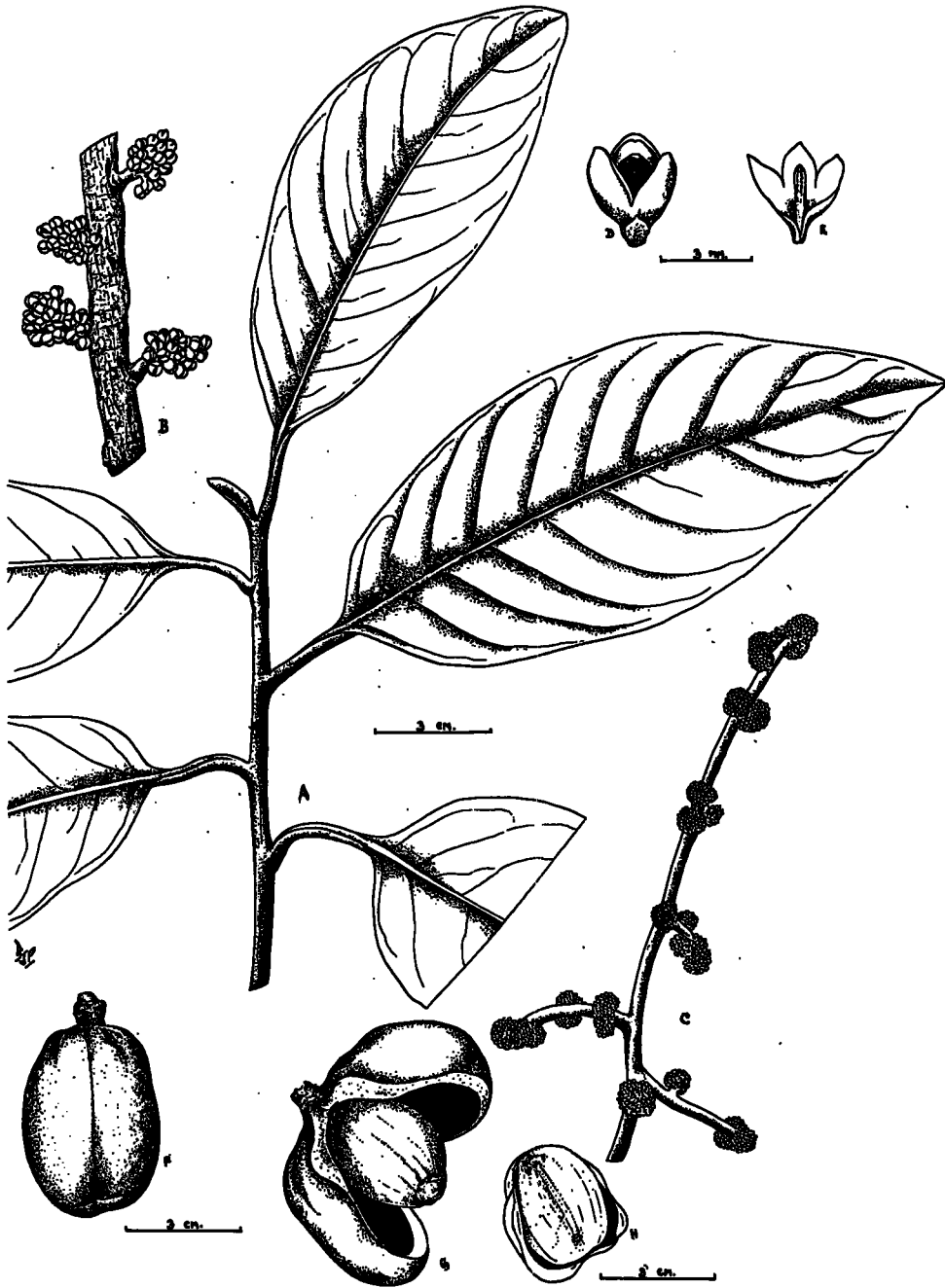


FIG. 389. *Horsfieldia iryagedhi*. A, twig with leaves. B, stem with clusters of female flowers. C, portion of stem with clusters of male flowers. D, female flower, lateral view. E, male flower with corolla partly opened. F, fruit. G, dehiscent fruit. H, seed showing the aril.

2. *Horsfieldia iryagedhi* (Gaertn.) Warb. in Nov. Act. Nat. Cur. 68: 288. 1897. (Fig. 389).

Myristica iryagedhi Gaertn.—*Myristica horsfieldia* Bl.—*Horsfieldia odorata* Willd.—*Pyrrhosa horsfieldia* Wight.

Sinh. Ruk-gaha, Thalan; *Sans.* Indura.

A large tree with a tall straight trunk and numerous long drooping branches, bark thin, brownish grey, slightly cracked, branchlets marked with leaf scars, young parts orange tomentose; leaves large, simple, alternate, spreading distichously, 17.5–30 cm long, oblong-lanceolate, acute or slightly rounded at base, acuminate, acute or obtuse, entire, glabrous, bright green and polished on the upper surface, glaucous and with more or less orange stellate tomentum beneath, petioles 2.5 cm long, very stout, rufous tomentose; flowers regular, unisexual, dioecious, male flowers very numerous, orange-yellow, fragrant, very small, sessile in many densely globose heads, sessile on branches of large spreading orange-tomentose panicles 10–15 cm long from axils of fallen leaves, female flowers fewer, much larger in short axillary panicles; perianth thick, segments 3, deep, valvate; stamens 6, wholly or the filaments only connate to form a central column, anther 2-celled; ovary superior, densely tomentose, unilocular with a single basal erect ovule, style very short; fruit about 5 cm long, broadly ovoid or nearly globose, rufous-tomentose, pericarp thick dehiscent into 2 valves; seed about 3.7 cm long, oblong-ovoid, aril scarcely lobed, completely covering the seed, dark orange-chrome coloured, testa thin, endosperm much ruminated.

Flowers from August to October.

Illustrations. Gaertner, *Fruct. et Sem. Plant.* 1: *pl.* 41, *fig.* 4. 1788; Wight, *Ic. Pl. Ind. Ind. Or.*, *pl.* 1857. 1852; Worthington, *Ceyl. Trees*, *pl.* 353, 1959; Herb. Peradeniya, drawing.

Distribution. Endemic to Ceylon often found commonly in the moist low-country up to 1,000 feet altitude.

Ceylon. Central Prov., Udugama, *King*, Feb. 1929; Ambagamuwa, *Trimen*. Sabaragamuwa Prov., Ratnapura, *Thwaites C.P.* 221. Western Prov., Heneratgoda, *Herb. Peradeniya*, Aug. 1890.

Uses. The flowers of the male tree are often used as temple offerings, while the wood is used for making boats. Medicinally the flowers and bark are used for dysentery, hiccough and wasting diseases.

MEDICINAL PLANTS

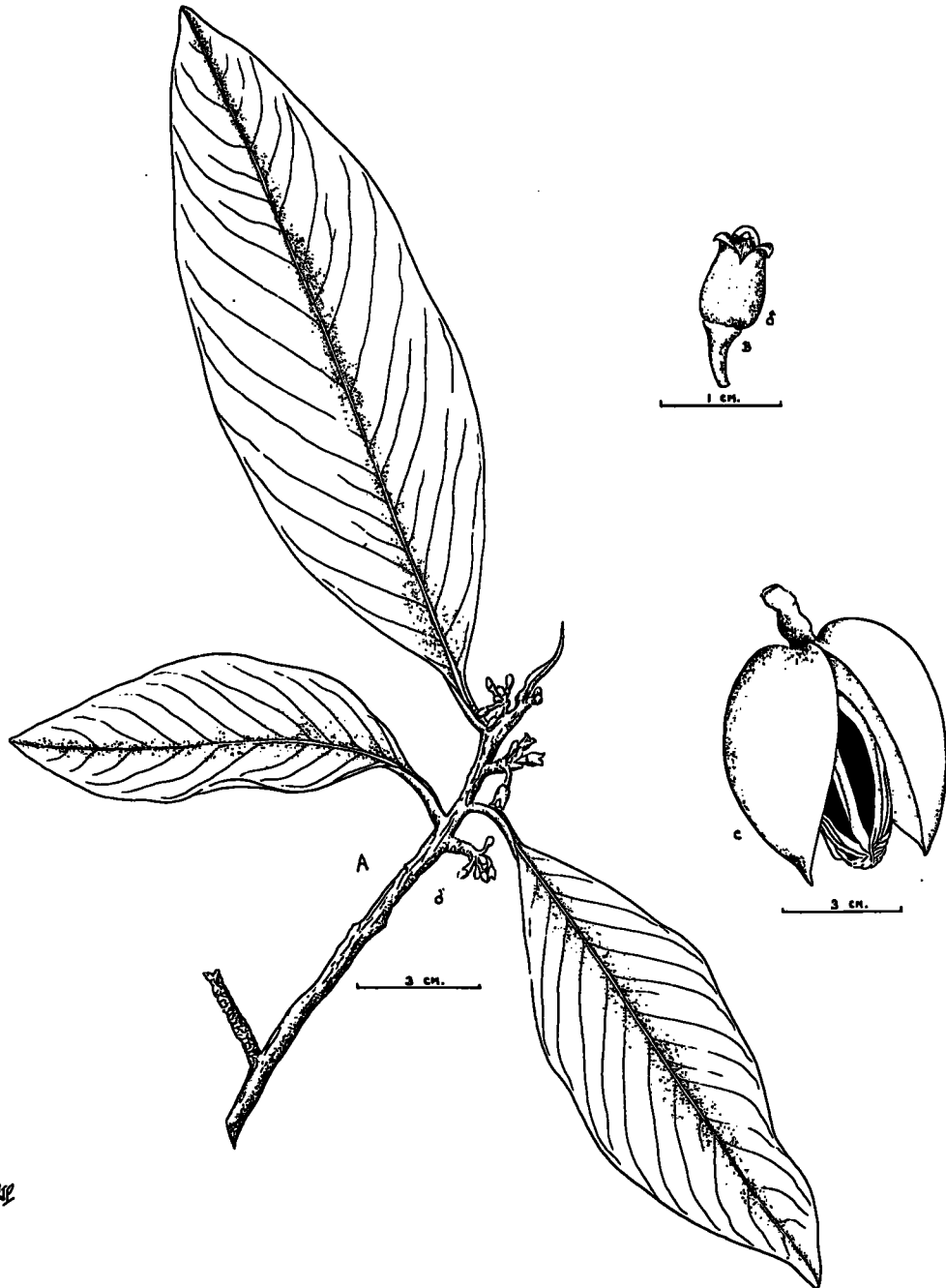


Fig. 390. *Myristica dactyloides*. A, male twig with leaves and clusters of flowers. B, male flower, lateral view. C, dehiscent fruit.

3. *Myristica dactyloides* Gaertn. Fruct. 1: 194. 1788. (Fig. 390).

Myristica laurifolia Hook. f. & Thom.—*Myristica diospyrifolia* A.D.C.—*Myristica tomentosa* Thw.

Sinh. Malaboda, Perimavara; *Tam.* Palmanikkam.

A large tree with spreading branches, bark orange-grey, rather smooth, young parts fulvous-puberulous; leaves simple, alternate, large, distichously spreading, exstipulate, 12.5—22.5 cm long, 4.5—6 cm broad, oval or lanceolate-oval, acute or slightly rounded at base, entire, quite glabrous, coriaceous, lateral veins numerous, parallel, translucent, petioles 2.5—3.7 cm long, very stout, channelled above enclosing the leaf buds acting like stipules or leaf scales; flowers regular, unisexual, orange-yellow, dioecious, on short, stout pedicels, in nearly sessile clusters in axils of fallen leaves, the male flowers more numerous, very shortly racemose, bract close beneath the flower and shorter than it, oval, obtuse, rufous-pubescent; perianth ovoid, or urceolate, 0.6 cm long, rufous-pubescent, segments 3, short, acute, recurved; stamens 10—14, wholly or the filaments only connate to form a central column, anther 2-celled; ovary superior, unilocular, with a single erect basal ovule, pubescent, style very short; fruit on a short, stout stalk, ovate-ovoid, about 5 cm long, blunt, densely covered with fine scurfy rusty-orange pubescence, pericarp very thick and fleshy, dehiscent into 2 valves; seed 3.7 cm long, testa thin, brittle, chocolate brown, shining, endosperm cheesy, moderately ruminant, aril closely and deeply cut into lacerate linear segments as long as, or longer than, the seed.

Flowers in June and October.

Illustrations. Beddome, *Flor. Sylvat. pl.* 267. 1868—1873; Worthington, *Cey. Trees, pl.* 350. 1959; Herb. Peradeniya, drawing.

Distribution. Grows in S. India and Ceylon. It is common in the forests of the moist regions below 4,000 feet altitude in Ceylon.

India. Malabar: *Beddome* 231; *Beddome* 113. Madras: *Beddome* 327. Pen. Ind. Or., *Herb. Wight* 2487, Kew Distribution 1866—8. Ceylon. Sabaragamuwa Prov., Wallandka Forest, *Herb. Peradeniya*, Dec. 1893. Without locality, *Thwaites C.P.* 416.

Uses. A decoction of the bark and leaves is used as a gargle for throat ailments.

MEDICINAL PLANTS



Fig. 391. *Myristica fragrans*. A, branch with leaves, half-opened fruit and 2 female flowers. B, longitudinal section of a male flower. C, column of stamens. D, longitudinal section of the column of stamens. E, female flower with perianth opened showing the pistil. F, fruit with one half of the pericarp removed showing the bright red aril (mace) and dark brown seed. G, seed with the testa removed. H, longitudinal section of the seed showing the whitish endosperm, embryo and cotyledons. B—E, enlarged.

4. *Myristica fragrans* Houttuyn, Hist. Nat. 2 (3): 233. 1774. (Fig. 391).

Myristica officinalis Linn. f.—*Myristica moschata* Thunb.—*Myristica aromatica* Lamk.

Engl. Nutmeg, Mace Tree; *Sinh.* Sadikka, Wasawasi (aril); *Tam.* Adipalam, Attigam, Kasam, Sadi, Sadikkay, Salugam, Samüttirandam, Sidam, Sinevam, Sirugaridam, Sivigara, Sivigaram; *Hindi* Jaiphal; *Sans.* Ghatastha, Jaiphala, Jati, Jatikoshā, Jatiphala, Jatishasga, Kosha, Koshaka, Madashaunda, Majjasara, Malatiphala, Phala, Puta, Rajabhogya, Shakula, Sumanaphala.

A moderate sized evergreen tree, 8—13 m high with numerous spreading branches covered with greyish-brown rather smooth bark, young branches green; leaves simple, alternate, shortly petiolate, exstipulate, somewhat convex above, 10—15 cm long, ovate or oblong-ovate, acute at both ends, entire, smooth, strongly veined, dark green and paler beneath; flowers regular, unisexual, yellowish, dioecious in small axillary racemes of 2—6 flowers, flowers sometimes solitary in the female tree, pedicels slender, drooping with a single, quickly deciduous, rounded bract just below the flower; perianth about 1 cm long, fleshy, bell-shaped or urceolate, nearly smooth, pale yellow, cut into 3 (rarely 4) spreading or erect, triangular, acute teeth, aestivation valvate; male flowers: stamens combined into a central fleshy column, about as long as the tube of the perianth, with about 6—10 linear, 2-celled anthers occupying its upper 2/3 and opening longitudinally; female flowers: ovary superior, unilocular with a single, erect, anatropous ovule, a little shorter than the perianth, broadly ovate, acute at apex and terminating in two persistent stigmas; fruit pendulous, about 7.5 cm by 5 cm, grooved by a longitudinal furrow which passes through the somewhat lateral apiculus marking the positions of the stigmas, smooth, yellow; pericarp nearly 1.2 cm thick, tough and fleshy, yellowish-white, dehiscing from above along the furrow into two equal halves and containing a single erect seed which completely fills the cavity, out of which it readily falls when ripe; seed about 3 cm long, broadly ovoid, blunt, closely enveloped and almost completely covered by an irregularly cut, fleshy arillus (mace) which is cup-shaped round the basal hilum and much folded over the top of the seed, brilliant scarlet when fresh, but yellow and brittle when dry, testa very hard and thick, dark brown, smooth and shining, marked with impressions from the tightly arillus, inner seed coat thin, membranous, pale brown, nucleus of the seed (nutmeg) wrinkled externally, mainly consisting of the abundant endosperm, which is rather soft but firm, whitish and marbled with numerous reddish-brown vein-like partitions into which the inner seedcoat penetrates (ruminated), embryo at base of the hilum, cotyledons foliaceous, lacinate.

Flowers almost throughout the year.

Illustrations. Bentley and Trimen, *Medicinal Plants*, pl. 218. 1880; Gaertner, *Fruct. et Sem. Plant.* 1: pl. 41. 1788; Curtis, *Bot. Mag. pls.* 2756 and 2757. 1827; Rumphius, *Herb. Ambo.* 2: pl. 4. 1741; Roxburgh, *Pl. Corom. pl.* 274. 1820; Worthington, *Cey. Trees*, pl. 351. 1959; Macmillan, *Trop. Plant. and Gard.*, p. 327. 1959.

Distribution. A native of E. Moluccas and other Indian Islands, Amboyna, Borneo, New Guinea, etc. It is now cultivated in Ceylon, Malaya, Philippines, W. Indies and South America.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *F. W. de Silva*, Aug. 1931; *Baker* 124, July 1907; *Appuhamy*, Feb. 1952; *Herb. Peradeniya*, Feb. 1888. **Malaya.** Singapore: *Anderson* 11, Oct. 1861. **Pegu.** Batjan, *Teysmann* 5891, without date of collection.

Composition. The principal constituents of nutmeg are fat, volatile oil, starch, albuminous matter, etc. The expressed oil of nutmeg containing myristicin is a useful stimulant in chronic rheumatism, paralysis and sprains, while the volatile oil obtained by distilling the powdered nutmeg with water is employed as a carminative and stimulant.

Uses. The seeds of this tree are mainly used as a flavouring agent for medical and culinary purposes. They have carminative and stomachic properties and beneficial for flatulency, nausea and vomiting. In Cambodia, the nut is used as a remedy for loose bowels. The mace is used medicinally and as a condiment.

71. MYRISINACEAE

1. *Embelia ribes* Burm. f., Fl. Ind. 62. 1768.

Embelia garcinaefolia Wall.—*Embelia glandulifera* Wight.—*Embelia paniculata* Moon.—*Calispermum scandens* Lour.—*Samara floribunda* Kurz—*Samara ribes* Kurz

Sinh. Walangasal, Wal-embilla; *Tam.* Kattukodi, Vayivilangam, Vellal, Vilangam; *Hindi* Baberang, Wanorung; *Sans.* Amogha, Bhasmaka, Bidanda, Chitra, Jantunashaka, Kairala, Kapali, Kevala, Krimighna, Krimiha, Krimikantaka, Krimiripu, Krimishetru, Mogha, Mrigagamani, Pavaka, Rasayana, Shudratandula, Suchitrabija, Tandula, Tundula, Tunduliyaka, Vara, Vatari, Vella, Vilanga, Vrishanashana.

A large, scandent shrub, old stems with thick brown bark set with conical mamilliform processes, climbing by means of reflexed lateral twigs which are deciduous except the basal part which remains as a woody reflexed spine, branches very long and slender and the bark of young branches nearly white, very smooth and shining with large lenticels; leaves simple, alternate, exstipulate, 10—12.5 cm long, on very short petioles usually bordered with prominent glands, lanceolate or oblong-lanceolate, acute or rounded at base, entire, glabrous and shining on both surfaces, paler and somewhat silvery beneath, lateral veins invisible, whole surface with scattered, minute, red, sunken glands; flowers regular, very small, pale greenish yellow or nearly white, often polygamous, 0.4 cm long, numerous on short divaricate pedicels, in lax, elongated, spreading, pubescent panicles 15—60 cm long, terminal or in axils of the upper leaves, bracts small, setaceous, deciduous; sepals 5, small, persistent, segments broadly ciliate; petals 5, fused but split into 5 distinct imbricate petals pubescent on both sides; stamens 5, inserted on petals, erect, filaments very short; ovary superior, unilocular with few ovules on a free central placenta, style simple, fruit a dry berry about 0.6 cm long, nearly globose, tipped with style, smooth, crimson, seed solitary.

Flowers between June and November.

Illustrations. Burmann f., Fl. Ind. pl. 23. 1768; Wight, Ic. Pl. Ind. Or., pl. 1207. 1848; Kirtikar and Basu, Indian Med. Plants, pl. 577. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs throughout India and is rather common in the lower montane moist regions up to 4,000 feet altitude in Ceylon. Hantane, Ramboda, Galle, Kurunegala, Ratnapura, etc.

India. Sikkim: *T. Thomson*, 1857. Assam: Sibsagar, Ligri Pukri, *Eco. Prod. India Collector* 10393, March 1895. Conor, *Clarke* 18705E, March 1870. Without locality, *Wallich* 2304D. **Ceylon.** Without locality, *Walker*, Herb. Wight property; *Champion* 2/49. Herb. Wight Property. North-Western Prov., Kurunegala, Doluwa Kande, *Herb. Peradeniya*, June 1886. Sabaragamuwa Prov., Karawila, *Herb. Peradeniya*, Dec. 1893; *Alston*, Dec. 1926. **Tenasserim.** *Gallatly* 794, April 1877. **China.** Kwangtung, Lantau Island, *Lignam University No.* 16509 (Tsang), Dec. 1927.

Composition. This plant contains embelin.

Uses. The fruit is a carminative, stomachic, anthelmintic and beneficial against intestinal worms, dyspepsia and skin diseases. It is specially effective against tapeworms. The dried berries are used along with other ingredients for treatment of tumours, calculi, fistula, piles, cough, enlarged spleen, abdominal dropsy and preventing effects of old age. A decoction of the roasted fruit is a household remedy for worms and gripe in children, while the powdered fruit with bees' honey is given to prevent worm trouble.

72. MYRTACEAE

1. *Eugenia bracteata* (Willd.) Roxb. Hort. Beng. 37. 1813.

Eugenia zeylanica Roxb. non Willd.—*Eugenia wildenovii* Wight.

Sinh. Kaya, Tembilya; *Tam.* Venkalikaya.

A much branched shrub or small tree with very smooth yellowish grey bark, young twigs cylindrical, densely covered with rusty pubescence; leaves simple, opposite, oblong-lanceolate or oval, aromatic when bruised, exstipulate, 4—7.5 cm long, tapering to base, obtuse at apex, often somewhat acuminate, glabrous, paler beneath, veins inconspicuous, petioles 3—9 mm long; flowers regular, bisexual, solitary, white, 2.5 cm diam., often 2—7 in corymbose cymes, peduncle rather long, stiff, rufous-pubescent with two small linear bracts at summit; sepals 4, calyx-tube campanulate, rufous-pubescent, segments oblong-ovate, obtuse; petals 4, large, ovate-oblong, pubescent outside, ciliate, somewhat reflexed; stamens numerous, bent inwards in the bud, distinct, in many rows, anthers small, versatile; ovary inferior, 2-locular with several ovules in each loculus, style simple; fruit 0.8—1.5 cm long, usually globose, sometimes pear-shaped, orange yellow or red, crowned with calyx segments.

Flowers from February to May.

Illustrations. Hooker, Journ. Bot. 1: *pl.* 124; Wight, Ic. Pl. Ind. Or., *pl.* 545. 1840—1843.

Distribution. Occurs in South India and Ceylon. It is very common in the dry regions, especially near the coast in Ceylon.

Ceylon. Without locality, *Thwaites C.P.* 1586. Eastern Prov., *Herb. Peradeniya*, Aug. 1885. Central Prov., Peradeniya, Bot. Gard., cultivated, *Thwaites C.P.* 1590; Nitre Cave, *Herb. Peradeniya*, Sept. 1888.

Uses. This plant is used medicinally.

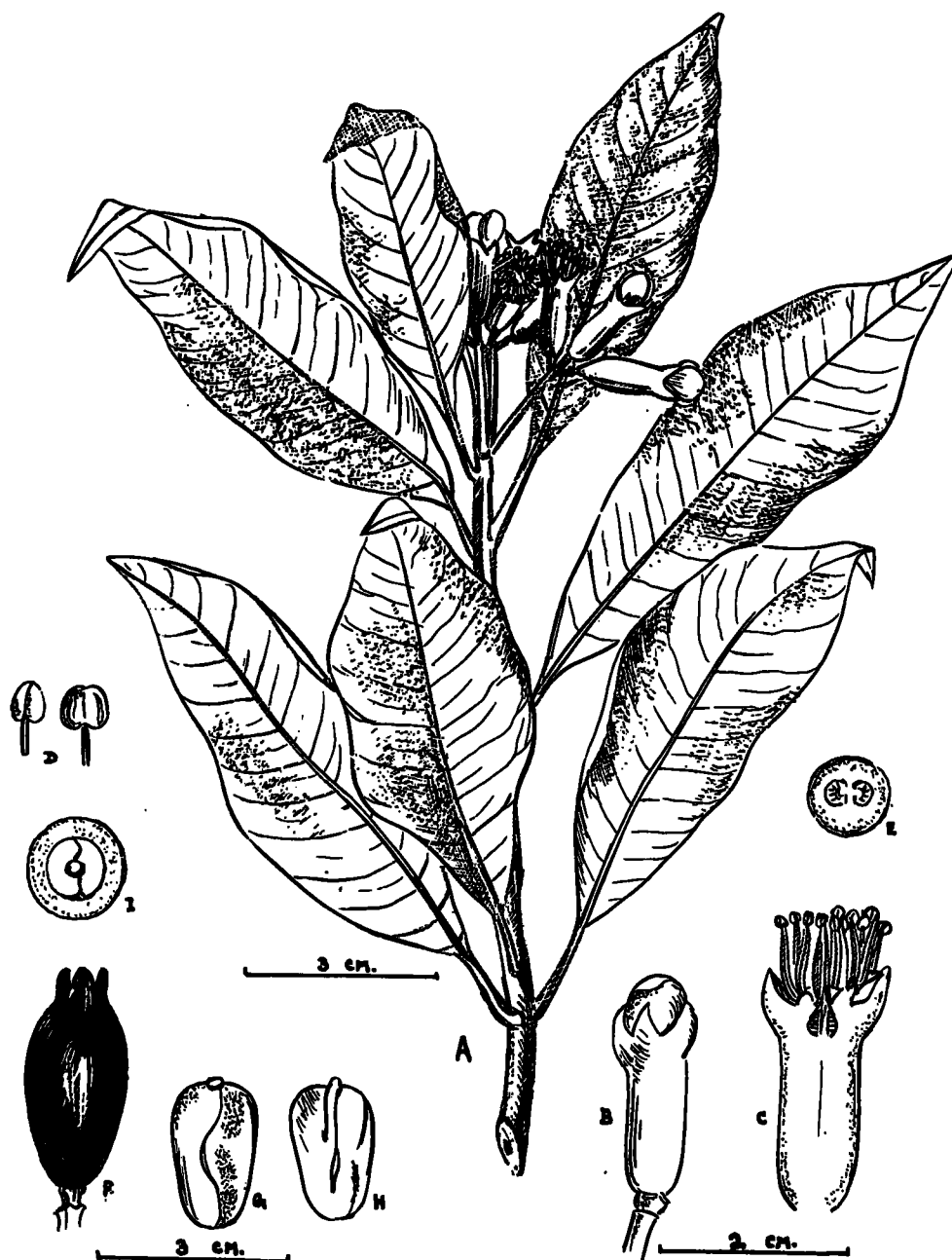


FIG. 392. *Eugenia caryophyllata*. A, branch with leaves, open flowers and flower buds B, flower bud. C, longitudinal section of flower after the petals have fallen. D, stamens. E, transverse section of ovary. F, fruit. G, seed with testa removed showing the cotyledons. H, seed with one cotyledon removed showing the embryo. I, transverse section of fruit. D, enlarged.

2. *Eugenia caryophyllata* Thunb. Diss. de Caryoph. Aromat. 1: 1788. (Fig. 392).

Caryophyllus aromaticus Linn.—*Eugenia aromatica* Willd.—*Myrtus caryophyllus* Spreng.

Engl. Clove Tree; *Sinh.* Karabu, Karabu-neti, Lamanga; *Tam.* Ilavangappu, Karuvappu, Kiramb; *Hindi* Loga; *Sans.* Lavanga.

A small tree about 10—13 m in height with numerous, horizontally spreading slender branches forming a dense pyramidal crown, bark pale yellowish grey, smooth with glabrous buds; leaves opposite, numerous, 7.5—15 cm long including the petioles which are 1.8—2.5 cm long, oval, acute or acuminate at apex, tapering into the petiole at base, entire, glabrous on both sides, thick, dotted with minute glands, dark green and shining on the upper surface, paler beneath with the midrib and parallel lateral veins prominent; flowers regular, bisexual, jointed to short stalks, arranged in groups of three at the extremities of the short articulated branches of small terminal paniculate cymes, bracts small, non-deciduous; calyx about 1.2 cm long, glabrous, somewhat rough with numerous immersed glands, whitish at first, then green and finally crimson, the lower part cylindrical-compressed, oblong, solid, fleshy (hypanthium), the upper part cut into four short triangular, fleshy, concave, spreading teeth; petals 4, strongly imbricated in the bud so as to form a little spherical head embraced by the calyx teeth, quickly falling, very concave, rounded, about 6 mm wide, beset with immersed oil glands and yellowish; stamens very numerous, inserted in several rows on the outside of an elevated, quadrilateral, epigynous disc, filaments about as long as petals and spreading after the fall of the latter, anthers small, roundish, versatile, dehiscing longitudinally; ovary completely immersed in the summit of the fleshy calyx, small, 2-locular with numerous axile ovules, style simple, shorter than the stamens, slender, tapering; fruit fleshy about 2.5 cm long, obovoid-oblong, crowned by the persistent inflexed calyx teeth and the style, smooth, purple, pericarp 3 mm thick, seed solitary, large, occupying the whole of the interior of the fruit, testa thin and membranous, cotyledon large, often unequal and fleshy, exalbuminous.

Flowers from January to March.

The cloves of commerce are the dried unexpanded flower buds which are picked green and spread out in the sun for a few days to dry, when they become dark brown.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 112. 1880; Curtis, *Bot. Mag.* pl. 2749 and pl. 2750. 1827; Macmillan, *Trop. Plant. & Gard.*, p. 324. 1959; Herb. Peradeniya, drawing.

Distribution. A native of Moluccas, five islets lying off the coast of the larger island of Dilolo, north-east of Celebes. It is no longer found there as the trees have been wilfully destroyed but it is now largely cultivated in the neighbouring islands of the Amboyna group. It is also grown in Sumatra, Malacca, Penang, Mauritius and Bourbon, Guiana, Brazil and in most West Indian Islands and Zanzibar. In Ceylon, it is grown in the mid-country, upto an elevation of 2,000 feet.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *F. W. de Silva*, Oct. 1929; *Appuhamy*, March 1927; *Herb. Peradeniya*, Feb. 1888; *Baker* 108, May 1907.

Composition. The principal constituent of cloves is the volatile oil, caryophyllin, a neutral tasteless substance and eugenin, a considerable proportion of gum, tannic acid and salicylic acid.

Uses. The clove is regarded as a carminative, stomachic and stimulant. It allays thirst and nausea in children suffering from worms and indigestion. Along with other ingredients, it cures colic, diseases of the chest and throat, cough, hiccough, asthma, diarrhoea and urinary diseases. Clove oil is used for toothache. Soap manufacturers and distillers use it for scenting their products, while the dried flower bud is used for culinary purposes.

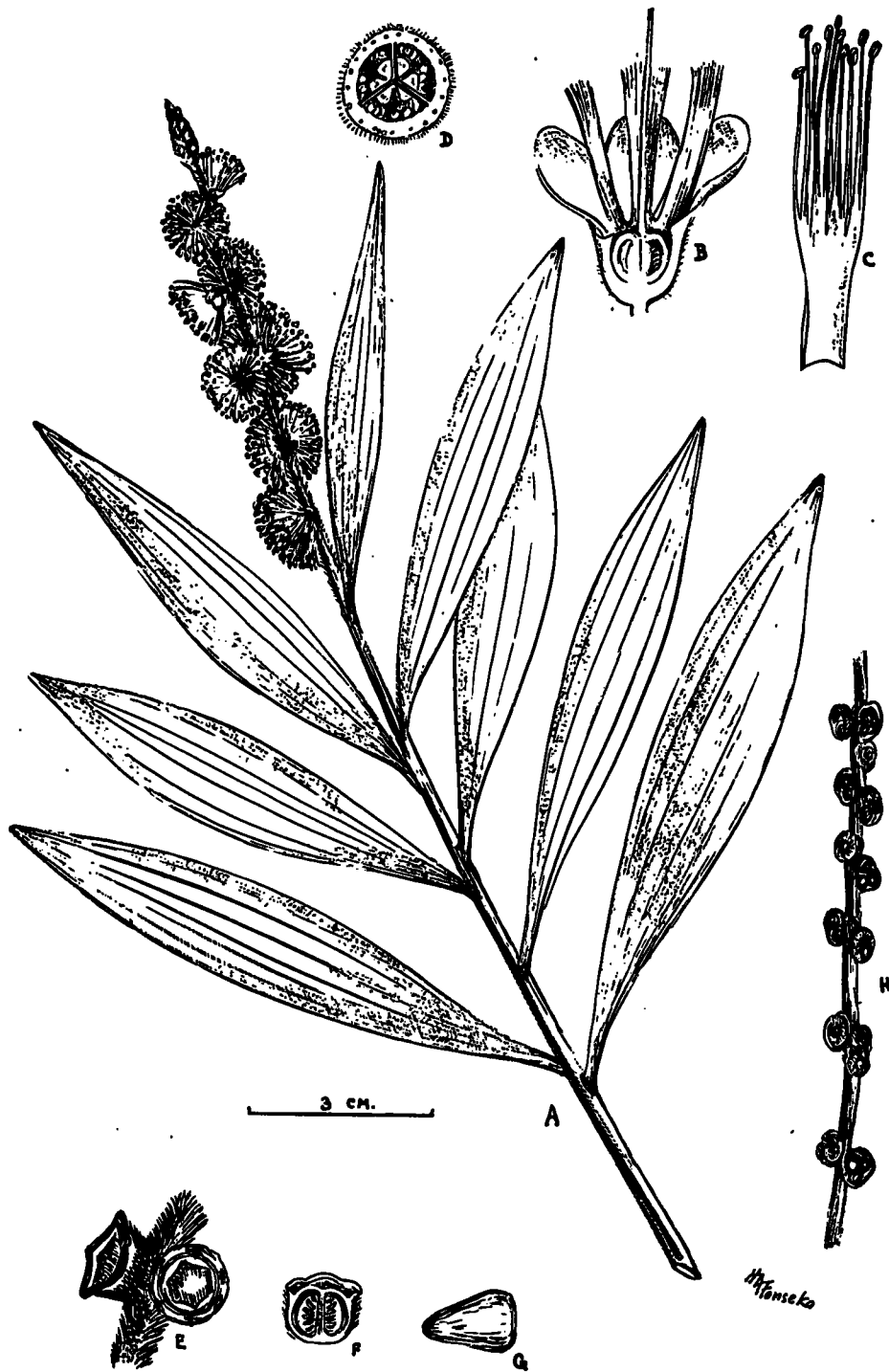


FIG. 393. *Melaleuca leucadendra*. A, twig with leaves and flower spike. B, longitudinal section of flower. C, stamen bundle. D, transverse section of ovary. E, fruits. F, vertical section of fruit. G, seed. H, mature fruits on a branch, B—G, enlarged.

3. *Melaleuca leucadendra* Linn. Mant. 1: 105. (Fig. 393).*Myrtus leucadendron* Linn.

Engl. Cajeput Tree; *Sinh.* Lothsumbul, Weradi-lothsumbul; *Tam.* Kaiyappudai, Kajaput.

A large tree with thick spongy bark coming off in flaky strands, branches puberulous; leaves somewhat opposite or alternate, simple, exstipulate, elliptic, oblong or lanceolate, 7—10 cm long, 1—2 cm broad, tapering at both ends with 3—7 parallel veins and numerous cross veinlets; flowers regular, bisexual, creamy white in terminal spikes 5—15 cm long, the axis growing into a leafy shoot after flowering; sepals 5, fused with the receptacle, the five lobes deciduous; petals 5, spreading, imbricate, deciduous; stamens numerous, filaments fused into 5 bundles opposite the petals, each bundle containing 5—10 filaments; ovary inferior, 3-locular with numerous axile ovules, fruit capsules nearly hemispherical about 3—5 mm across.

Illustrations. Rumphius, *Herb. Ambo.* 2: *pl.* 16 and *pl.* 17, *fig.* 1. 1741; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 420. 1933.

Distribution. Occurs in Malay Peninsula, Cambodia, Borneo, etc. It is cultivated in India and in the mid and up-country in Ceylon.

India. Saharampore: *T. Thomson.* Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Aug. 1884. Tenasserim and Andaman Islands. *Herb. Helfer* 2338, Kew Distribution 1861—2. Indo-China. Tourana and vicinity, *J. & M. S. Clemens* 3971, May-July 1927. **Australia.** Queensland: Gulf of Carpentaria and Edgcombe Bay, without name of collector.

Uses. The oil extracted from the leaves of this tree is used for rheumatism and as a mosquito repellent. The bark is a substitute for the genuine "Lothsumbul" *Symplocos racemosa*, which is a stimulant and tonic. Cajeput oil is used internally for hysteria, flatulence, colic, rheumatism and low fevers.

4. *Psidium guajava* Linn. Sp. Pl. 470. 1753.

Psidium guyava Trim.—*Psidium guava* Griseb.—*Psidium pomiferum* Linn.—*Psidium cujavus* Linn.—*Psidium aromaticum* Blanco—*Myrtus guajava* O. Ktze.

Engl. Guava Tree; *Sinh.* Pera, Peragaha; *Tam.* Koyya, Segappugoyya, Sengoyya, Sirugoyya, Vellaikoyya, Uyyskkondan; *Sans.* Aprithaktvacha, Dridhabija, Madhuramla, Mansala, Mridu, Perala, Peruka, Pita, Tuvara, Vastula.

A shrub or small tree 3—7 m high, the bark scaly and greenish brown, young branchlets 4-angled; leaves simple, opposite, oblong-elliptic to oval, 7.5—15 cm long, 3.5—5 cm broad, acute or rounded at apex, finely pubescent below, the veins conspicuously impressed on the upper surface and raised below, petioles 5—8 mm long; flowers regular, bisexual, white, about 2.5 cm across, solitary and axillary or 2—3 together on slender peduncles, pedicels 1.2—1.8 cm long and stout; the receptacle or calyx-tube campanulate or pyriform, lobes 5, often closed before flowering and splitting irregularly; petals 5, free, imbricate, spreading, oblong, concave, 2 cm long, 1.3 cm broad, soon deciduous; stamens numerous in many series, free, inserted on the disc about the length of petals, the outer stamens sometimes reduced to a whorl of 2—5 petaloid staminodes; ovary inferior, 5—6-locular, pubescent with many axile ovules in each loculus; fruit a globose, ovoid or pyriform berry 2.5—10 cm long commonly yellow with white, yellow or deep pink flesh, glabrous and crowned with the persistent calyx lobes.

Flowers and fruits almost throughout the year.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 421. 1933; Macmillan, *Trop. Plant. and Gard.* p. 263. 1959; Herb. Peradeniya, drawing.

Distribution. A native of Mexico but it is now often cultivated and naturalized in most tropical countries. It thrives in medium and high elevations up to 5,000 feet in Ceylon. A wild form of this variety occurs as a common weed in waste ground bearing small round berries which are pale yellow when ripe, used for making jelly.

India. Bengal: *J. D. Hooker & T. Thomson*. Ceylon. Central Prov., Iriyagama, *J. M. de Silva*, July 1928. Indo-China. Hue and vicinity *Squires* 321, Jan.—May 1927. China. Kwantung: Sun Yatsen University, *T. Ying* 0396.

Composition. Wehmer records that the leaves of this tree contain a fixed oil and a volatile oil. The fruit contains "glycosen", saccharose and protein. The bark and roots are rich in tannin and the fruit in vitamin C content, particularly in the skin and outer flesh. The leaf yields 3 antibacterial substances namely avicularin, guaijaverin and another. Various workers have isolated one or more of the following substances: a phytosterol, psidiolic acid, d- and dl-limonene, sesquiterpene, cadinylic sesquiterpene, cadinylic sesquiterpene alcohol, β -sitosterol, ursolic, aleanolic, crategolic and guaijavolic acids, carotene, niacin and vitamins β -complex and C.

Uses. The bark of this tree is used in the form of a decoction for diarrhoea and dysentery and also as a mouthwash for swollen gums. The leaves are chewed for toothache. An infusion of the leaves is recommended for cerebral ailments, nephritis and cachexia in West Indies, while the pounded leaves are applied to rheumatism and an extract used for epilepsy and cholera. The fruit is anthelmintic and a jelly prepared from it is tonic to the throat and beneficial for constipation. The water in which the fruit is soaked is beneficial for diabetes. The juice of the fruit and leaves is an antidote for manioc and cannabis poisoning. A paste of the leaves with turmeric is applied on leucoderma patches with good results. In Hawaii, the leaf is used as medicinal tea and as a remedy for deep cuts, sprains, diarrhoea and intestinal haemorrhage. The unripe fruit is astringent and antidiarrhoeic. In Egypt and Hong Kong, a decoction of the leaf is taken for relief of cough and pulmonary disorders. In Java, the leaf is used as a poultice, a styptic and a dressing for wounds, as a stomachic and a remedy for cholera. The tender leaves are chewed to remove the intoxicating effect of alcohol and other narcotics.

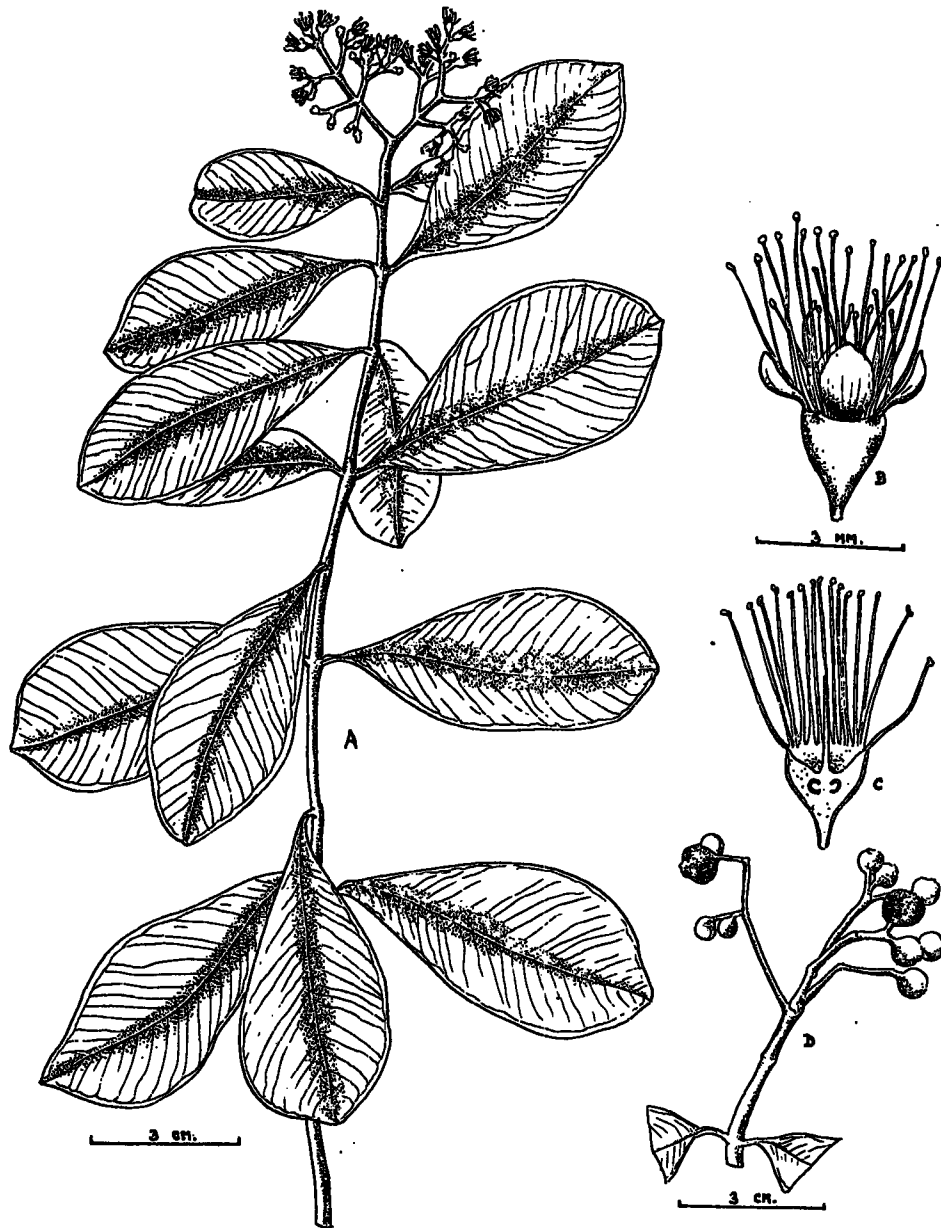


FIG. 394. *Syzygium caryophyllatum*. A, branch with leaves and flowers. B, flower, lateral view, C, longitudinal section of flower with the petals removed. D, twig bearing fruits.

5. *Syzygium caryophyllatum* (Linn.) Alston in Trim. Ceyl. 6: 116. 1931. (Fig. 394).

Myrtus caryophyllata Linn.—*Eugenia corymbosa* Lamk.—*Syzygium caryophyllaeum* Wight—*Myrtus caryophyllus* Spr.—*Calyptranthes caryophyllata* Pers.

Sinh. Dan, Heen-dan; *Tam.* Marungi; *Sans.* Svetha jambu.

A bush or shrubby tree with a smooth grey bark, slightly compressed young twigs scurfy and orange brown; leaves simple, opposite, exstipulate, 6.2—8.7 cm long, ovate-oval, acute at base, rounded, obtuse or very shortly and bluntly acuminate, glabrous, shining and bright apple green on the upper surface, rather pale beneath, lateral veins numerous, fine but rather conspicuous beneath, petioles 0.6 cm long; flowers regular, bisexual, white, small, numerous, nearly sessile, cymes terminal, corymbose, trichotomous, buds ovoid-globose; sepals 4, fused into a campanulate calyx-tube adnate to ovary and produced beyond, truncate, segments scarcely perceptible; petals 4, connate into a cap falling off as the flower opens; stamens indefinite, distinct, in many rows, anthers small, versatile; ovary inferior, 2-locular with many ovules in each loculus, style simple; fruit a depressed-globose, inky purple black berry, juicy, shining and 1—1.2 cm long.

Flowers from February to May.

Illustrations. Wight, Ic. Pl. Ind. Or., *pl.* 540. 1840—1843; Herb. Peradeniya, drawing.

Distribution. Occurs in South India, Ceylon and Borneo. It is very common especially in open sandy places in the low-country, both in the moist and dry regions in Ceylon. Colombo, Negombo, etc.

Ceylon. Central Prov., Peradeniya, School of Agriculture, *Alston*, Nov. 1925. Without locality, *Thwaites C.P.* 1582; *Walker*, Herb. Wight Property.

Uses. The leaves and bark of this tree are applied on burns, boils and ulcers and is given internally for diabetes. The seeds are used as a purgative.

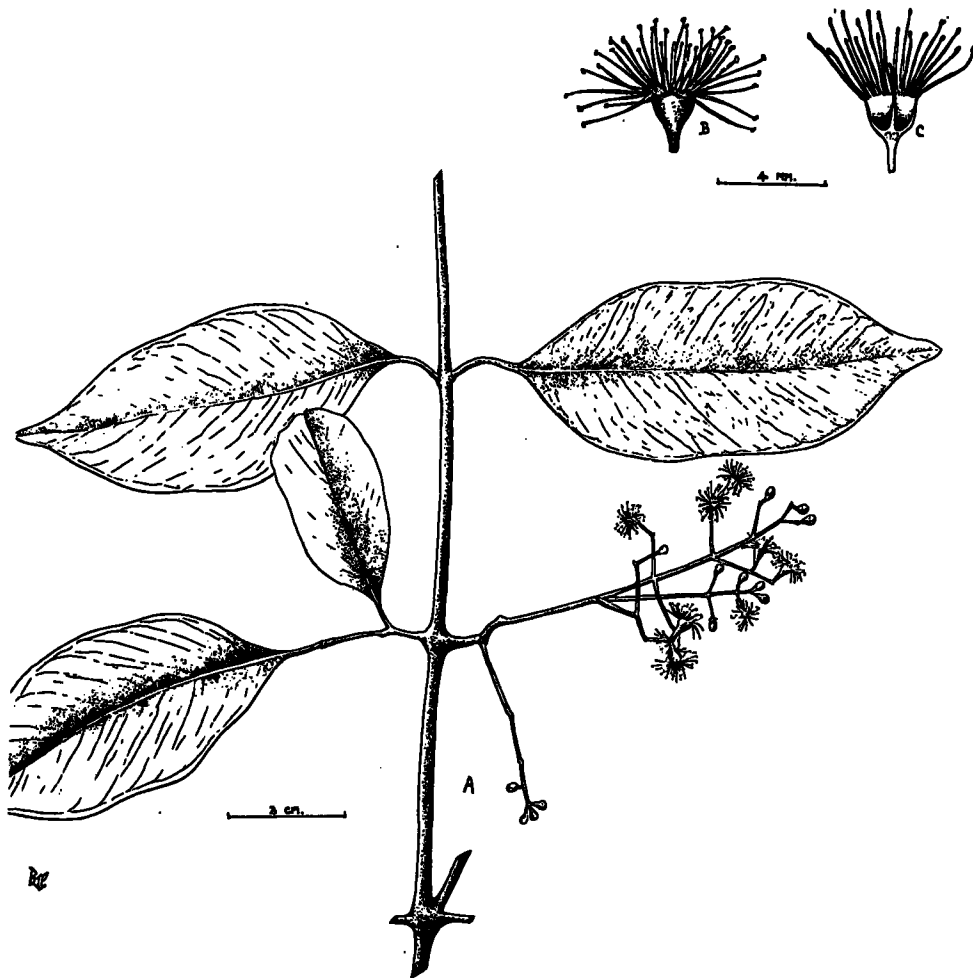


FIG. 395. *Syzygium cumini*. A, branch with leaves and inflorescence. B, flower, lateral view with the corolla fallen off. C, longitudinal section of flower.

6. *Syzygium cumini* Skeels in U.S. Dept. Agric. Bur. Pl. Ind. Bull. CCXLVIII: 25. 1912. (Fig. 395).

Myrtus cumini Linn.—*Eugenia cumini* Druce—*Eugenia jambolana* Lamk.—*Eugenia frondosa* Wall.—*Eugenia moorei* F. Muell.—*Eugenia djouat* Perr.—*Eugenia caryophyllifolia* Lam.—*Syzygium jambolanum* DC.—*Calyptranthes jambolana* Willd.—*Calyptranthes capitellata* Ham.

Engl. Black Plum, Jambol; *Sinh.* Madan, Maha-dan; *Tam.* Arugadam, Kottainagam, Kottainaval, Nagai, Naval, Neredam, Sambal, Sambari, Sambu, Takkolam; *Hindi* Jaman; *Sans.* Brahaspati, Jambavam, Jambu, Jambula, Kakajambu, Mahaskandha, Meghamodini, Meghavarna, Nilaphala, Rajajambu, Rajphala, Rajasha, Shukapriya, Shyamala, Surabhipriya, Svetsjambu.

A large tree with a thick rough grey bark and cylindrically compressed exfoliating twigs; leaves simple, opposite, exstipulate, 7.5—8.7 cm long, oval or oblong-oval, tapering to base, acute or subacute at apex, glabrous, not shining, rather thin, light bright green, lateral veins very numerous with a marginal vein, petioles 0.6—1.2 cm long; flowers regular, bisexual, white, honey-scented, small, on short pedicels, cymes about 7.5 cm long, lax, pedunculate with slender divaricate branches, coming off from axils of fallen leaves, often at some distance down the branches; sepals 4, fused into a turbinate calyx-tube adnate to ovary, limb cup-shaped, truncate or with very obscure segments; petals 4, connate into a cap which falls off as the flower opens, cap not pointed; stamens numerous, quite distinct, in many rows, anthers small, versatile; ovary inferior, 2-locular with many axile ovules in each loculus; fruit 1—1.2 cm long, ovoid, often lop-sided, crowned with the truncate calyx limb.

Flowers from May to August.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 535. 1840—1843; Beddome, *Flor. Sylvat.* 1: pl. 197. 1868—1873; Kirtikar and Basu, *Indian Med. Plants*, pl. 424. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya and Philippine Islands. It is common in both wet and dry regions up to 3,000 feet in Ceylon. Talaimannar, Jaffna, Maturata, Trincomalee, etc.

India. Assam: *Kurz* 103, April 1876; Naga Hill, *Prain's Collector* 100020, May 1899. Dehra Dun, *Carroll*, April-Sept. 1821. Nilghiri and Kurg: *G. Thomson*. Madras: *Cleghorn*. Pen. Ind. Or., *Herb. Wight* 1043, Kew Distribution 1866—7. Ceylon. Northern Prov. Talaimannar, *J. M. Silva*, July 1916. Eastern Prov., Trincomalee, *Thwaites C.P.* 3644; *Vincent* 18. Central Prov. Hantane, *Herb. Gardner*, Herb. Wight Property; Pussellawa, *W.F.*, May 1878. Without locality, *Thwaites C.P.* 1584. Maldiv Islands. Lami, *Didi* 19, 1896. Burma. Chittagong, *King's Collector* 63, Aug. 1885. Pegu. *Kurz* 1316. Malay Peninsula. *Herb. Griffith* 2414, Kew Distribution 1861—2. Tenasserim and Andamans. *Herb. Helfer* 2413, Kew Distribution 1862—3. S. Andamans: Dhani Khari, *King's Collector*, Dec. 1890. Thailand. *Shomburg* 128, 1859.

Composition. The bark contains tannin, gallic acid and a crystalline substance called jambosine.

Uses. A decoction of the bark is given internally for diarrhoea and dysentery. Externally, it is used for cleaning ulcers and as a mouthwash for spongy gums. A fine paste of the bark with cow's milk cures bloody discharge in dysentery. A syrup prepared from the juice of the ripe fruit is useful for enlarged spleen and chronic diarrhoea. The ripe fruit or the pulverised seed is taken as a remedy for diabetes as they check the conversion of starch into sugar.

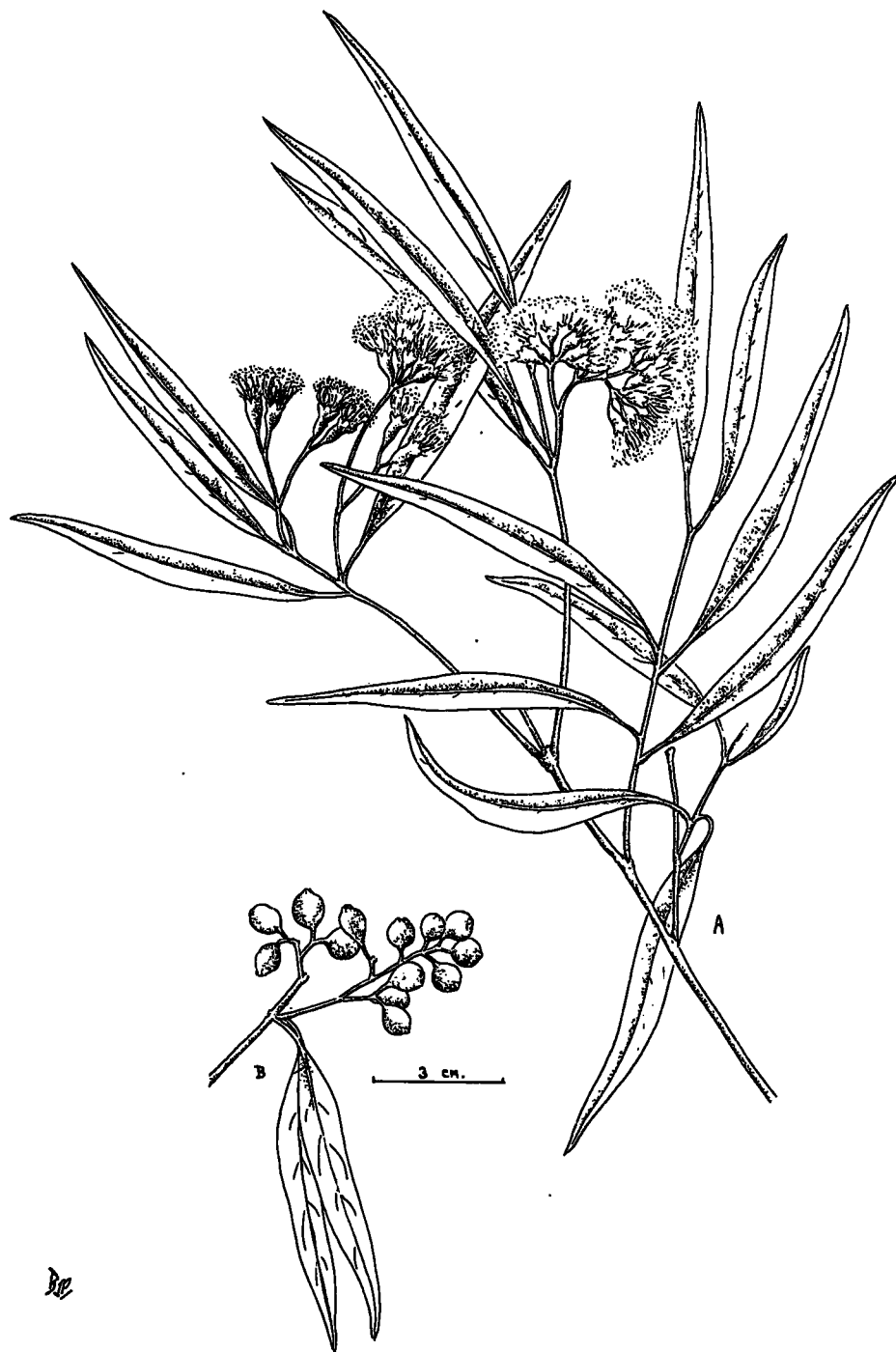


FIG. 396. *Syzygium zeylanicum*. A, twig with leaves and flower inflorescences. B, twig bearing fruits.

7. *Syzygium zeylanicum* DC. Prodr. 3: 260. 1828. (Fig. 396).

Myrtus zeylanica Linn.—*Eugenia spicata* Lamk.—*Eugenia zeylanica* Wight—*Eugenia glandulifera* Roxb.—*Syzygium politum* Wall.—*Syzygium belluta* DC.—*Syzygium corticatum* Wall.—*Acmena zeylanica* Thw.—*Acmena parviflora* DC.—*Jambusa bracteata* Miq.

Sinh. Maranda, Moran; *Tam.* Marungi.

A large shrub or tree with a pale brown bark and slender shining, purplish twigs; leaves simple, opposite, exstipulate, variable, 3.7—11.2 cm long, ovate-oval to lanceolate-linear, usually caudate-acuminate, obtuse, margin slightly revolute, smooth and shining on both surfaces, lateral veins numerous but inconspicuous, petioles about 0.6 cm long; flowers regular, bisexual, small, white, numerous, rather crowded in axillary and terminal cymes, pedicels very short and glandular; sepals 4, fused into a funnel-shaped calyx-tube adnate to ovary, densely glandular, segments rotundate, obtuse or subacute, erect; petals 4, connate into a cap, imperfectly calyptrate; stamens indefinite, distinct in many rows, anthers small and versatile; ovary inferior, 2-locular with several ovules in each loculus, style simple; fruit a globose pure white berry under 6 mm in length crowned with the persistent calyx limb.

Flowers in March and April.

Illustrations. Beddome, *Flor. Sylvat.* 1: *pl.* 202. 1868—1873; Rheedee, *Hort. Mal.* 5: *pl.* 20. 1678—1703; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malay Peninsula and Andaman Islands. It is very common in the dry and intermediate country in Ceylon up to 2,000 feet altitude. Batticaloa, Eravur, Palugama, Ritigala, Haragama, etc.

India. Malabar, Concan, etc. *Stocks, Law, etc.* Pen. Ind. Or., *Herb. Wight* 1037, Kew Distribution 1866—7. **Ceylon.** North-Central Prov., Ritigala, *Willis*, March 1905; *Herb. Peradeniya* July 1887. Central Prov., Haragama, *Alston* 833 and 864, April 1926; *Hakgala, J. M. Silva*, May 1911. Uva Prov., Palugama, *Thwaites C.P.* 380. Without locality, *Thwaites C.P.* 56; *Walker*, *Herb. Wight* property. **Malay Peninsula.** Penang: Govt. Hill, *Curtis*, Nov. 1885. Perak: *King's Collector* 7216, 1885. **Malacca.** *Harvey*, 1891. **Sumatra.** *Yates* 2011.

Uses. This tree has stimulant and anti-rheumatic properties. The leaves and roots are used as a vermifuge. The Malays apply the plant on elephants to make them docile. In Indo-China, parts of this tree are used as a stimulant, anti-rheumatic and anti-syphilitic.

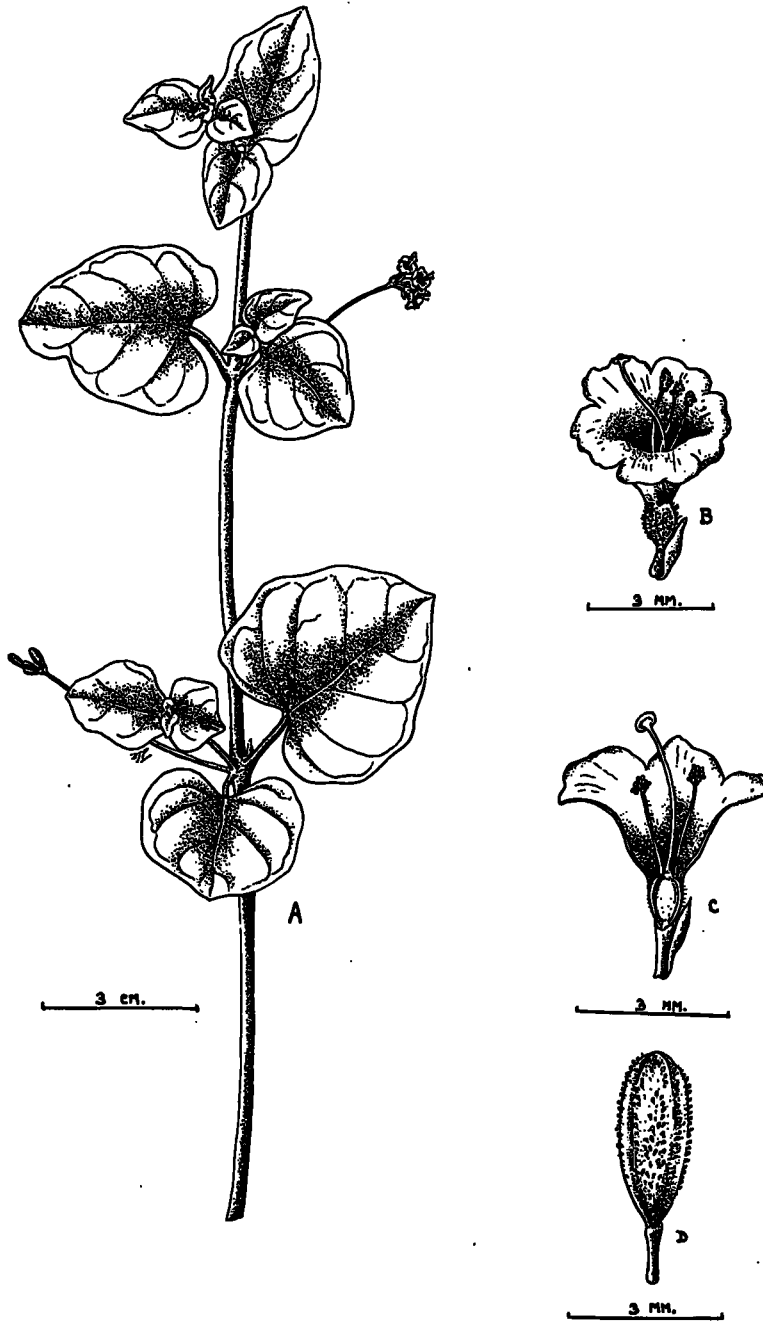


FIG. 397. *Boerhavia diffusa*. A, twig with leaves and umbels of flowers. B, flower, lateral view. C, longitudinal section of flower. D, fruit.

73. NYCTAGINACEAE

1. *Boerhavia diffusa* Linn. Sp. Pl. 3: 1753. (Fig. 397).

Boerhaavia repens Linn.—*Boerhaavia repanda* Wall.—*Boerhaavia procumbens* Roxb.—*Boerhaavia glutinosa* Moon.

Engl. Hogweed, Pigweed; *Sinh.* Pitasudupala, Pitasudu-sarana; *Tam.* Karich-charanai, Mukaratte, Mukurattai, Mukkaraichchi; *Hindi* Gadhapurana, Sant, Thikri; *Sans.* Bhauma, Kathillaka, Krishnakhya, Krura, Lohita, Mandalpatrika, Nava, Navya, Nila, Nilapunarnava, Nilavarshabhu, Nilini, Pravrishenya, Punarbhava, Punarnava, Raktakanda, Raktapatrika, Raktapunarnava, Raktapushpa, Raktapushpika, Raktavarshabu, Sarini, Shilatika, Shonapatra, Shophagni, Shothagni, Shyma, Swatapunarnava, Vaishakhi, Varshabhava, Varshabhu, Varshaketu, Vikasvara, Vishaghi, Vishakarpara.

A prostrate, perennial herb with a large fusiform root and slender, cylindrical, much branched, minutely pubescent, purplish branches thickened at nodes; leaves simple, opposite, unequal at each node; larger leaves 2.5—3.7 cm long, smaller ones 1.2—1.8 cm long, broadly oval or subrotundate, rounded or subcordate at base, rounded at apex, entire, somewhat undulate, glabrous and green on the upper surface, silvery white with a layer of minute scales beneath, petioles slender, as long as the leaves; flowers regular, bisexual, very small, bright purplish-pink, shortly stalked or nearly sessile, 4—10 in small umbels arranged in small slender long-stalked, corymbose, axillary and terminal panicles, viscous with white sessile glands, bracts very small, lanceolate, acute; perianth 5, fused, tube contracted above ovary, glandular-viscid, lobes bifid, each segment obtuse; stamens 2, exerted, anthers small; ovary superior, unilocular with a single erect ovule, stigma peltate; fruit 0.3 cm long, membranous, closely invested with persistent perianth-tube which is oblong-ovoid, broadly and bluntly 5-ribbed, very glandular, seed solitary.

Flowers all the year round.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 874. 1843—1845; Rheede, *Hort. Mal.* 7: pl. 56. 1688; Kirtikar and Basu, *Indian Med. Plants*, pl. 783A & B. 1933.

Distribution. Occurs in all tropical and subtropical regions of Asia, Africa and America. It is a very common weed in sandy waste ground, especially near the coast in Ceylon.

India. Bengal: *Wallich 6770B. Plan. Ganget. Sup. T. Thomson.* Maisor and Carnatic: *G. Thomson.* Ceylon. Southern Prov., Hambantota, *Alston 606*, Dec. 1926. Without locality, *Thwaites C.P. 1099.* Maldive Islands. Veimandu, Horsburgh Atoll, Minikoi and Heddufuri, *Gardiner*, 1899—1900; *Didi 20*, 1896.

Composition. This plant contains the alkaloid punarnavine, boerhaavic acid, potassium nitrate and phlobaphenes.

Uses. A liquid extract produces diuresis in cases of oedema and ascites, specially due to liver, peritoneal and kidney ailments. It is considered a specific for dropsy. The root is used along with other ingredients for the preparation of remedies for anaemia, jaundice, asthma, cough, colic, enlargement of liver, piles, abdominal worms, acute leprosy, heart disease, fistula, blood and skin diseases, anasarca, liver and spleen diseases, strangury, retention of urine, etc. In Ghana it is used in the treatment of yaws, while in Uruguay it is considered an anti-dysenteric and emetic. In the West Indies, it is a popular remedy for gonorrhoea.

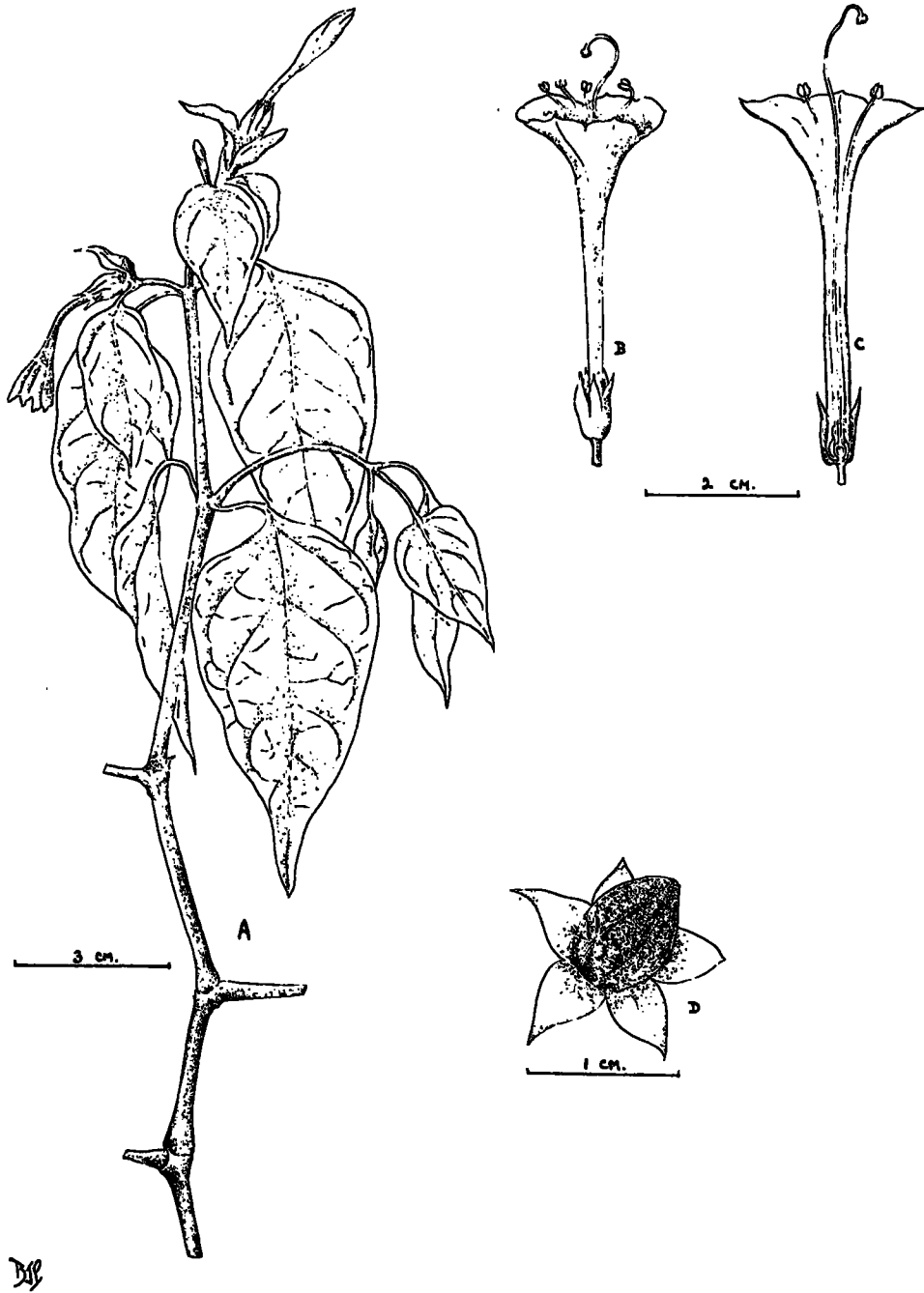


FIG. 398. *Mirabilis jalapa*. A, branch with leaves and flowers. B, flower, lateral view. C, longitudinal section of flower. D, fruit with persistent involucre of bracts.

2. *Mirabilis jalapa* Linn. Sp. Pl. 177. 1753. (Fig. 398).

Mirabilis longiflora Blanco

Engl. Four-o'clock flower, Marvel of Peru; *Sinh.* Hendirikka, Sendirikka; *Tam.* Antinarulu, Pattarachi, Pattarashu; *Hindi* Gulabbas, Gulabash, Guleaabbas; *Sans.* Krishna-keli, Sandhyakali.

A quick growing annual herb with erect much-branched stems 30—90 cm high, glabrous or slightly pubescent, root thickened and tuberous and stems swollen at the nodes; leaves simple, opposite, petioled, dark green, ovate, 5—15 cm long, 3—4 cm broad, acuminate, truncate or cordate at base; flowers regular, bisexual, about 3—5 cm long, 2.5 cm diam., white, red, yellow or striped, involucre calyx-like, 5-lobed, containing only one flower; calyx trumpet-shaped, various coloured, 5-lobed, lobes fused into a tube 2.5—5 cm long, constricted above ovary limb spreading, deciduous; petals absent; stamens 4, exserted, filaments united at the base; ovary superior, unilocular with a single ovule, style filiform with capitate stigma, fruit a leathery ribbed achene.

Flowers almost throughout the year, opening in the evenings.

Distribution. A native of tropical America and now cultivated in S. Africa, India, Ceylon, China and Philippine Islands.

Ceylon. Central Prov., Peradeniya, Bot. Gard., *Herb. Peradeniya*, Sept. 1887. **Maldive Islands.** Hulule, *Gardiner* 21, 1899—1900; *Didi* 119; *Didi* 71, 1896. **Formosa.** *Oldham* 441. April 1866.

Composition. The leaves, stems and flowers of this herb contain an alkaloid, while the roots contain the alkaloids trigonelline and oxymethylantraquinone. Wehmer records that the plant yields galactose and arabinose.

Uses. The tuberous root is a mild purgative and the fresh juice of the leaves is applied to the body to allay heat and itching urticaria arising from dyspepsia. An infusion of the leaves is prescribed as a diuretic for dropsy. The bruised leaves are used for poulticing boils and abscesses. In Malaya, juice of the leaves is given internally for gonorrhoea. In South Africa, the root is used as a purgative. In Japan and China, the seeds are used to make a cosmetic powder.

3. *Pisonia grandis* R. Br. Prodr. 422.

Pisonia morindaefolia R.Br.—*Pisonia alba* Spanogué—*Pisonia inermis* Vidal—*Cordia olitoria* Blanco

Engl. Lady-love, Lettuce-tree; *Sinh.* Wathabanga; *Tam.* Chandi, Ilachaikkettayilai, Lechchai-kottai, Muruval.

A tree 10—13 m in height, glabrous except the inflorescence, branches stout; leaves simple, opposite or alternate, 15—25 cm long, ovate or oblong, acute or acuminate; flowers small, dioecious, sessile or pedunculate in dense panicle, corymbose, terminal cymes, bracts and bracteoles small; male flowers: perianth campanulate, limb 5-lobed; lobes induplicate-valvate; stamens 8, exerted, filaments connate below in a tube or ring, anthers oblong, didynamous; female flowers much smaller, perianth tubular, usually enlarged at base; ovary superior, sessile, elongate, style included or exerted, stigma capitate, peltate or fimbriate; fruit 1.2—1.6 cm long, long-pedicelled enclosed in the coriaceous perianth base, 5-angled with one row of prickles, seed with a hyaline testa adnate to the pericarp.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 1765. 1852; Kirtikar and Basu, Indian Med. Plants, pl. 785. 1933; Worthington, Cey. Trees, pl. 349. 1959.

Distribution. Occurs in Andaman Islands, Malaysia, Polynesian Islands and cultivated in India and Ceylon. It is common along the coasts of Ceylon and inland up to the mid-country.

Ceylon. Western Prov., Colombo, cultivated, *W.F.*, Nov. 1881; *Mueller-Dombois* 68041101, April 1968; *Willis* 4548, Aug. 1908, female flowers; *Herb. Peradeniya*, March 1884, male flowers. North-Western Prov., Chilaw, *W. Ferguson*, Nov. 1881, female flowers. Maldivé Islands. *Didi* 7, 1896; *Veimandu, Gardiner*, 1899—1900.

Uses. The leaves of this tree are used for poulticing contusions, inflammations, fractures and on rheumatism and internally for dyspepsia. The fresh leaves are moistened with eau-de-Cologne and applied to reduce inflammations of an elephantoid nature in the legs and other parts of the body. The young leaves are often eaten as a vegetable.

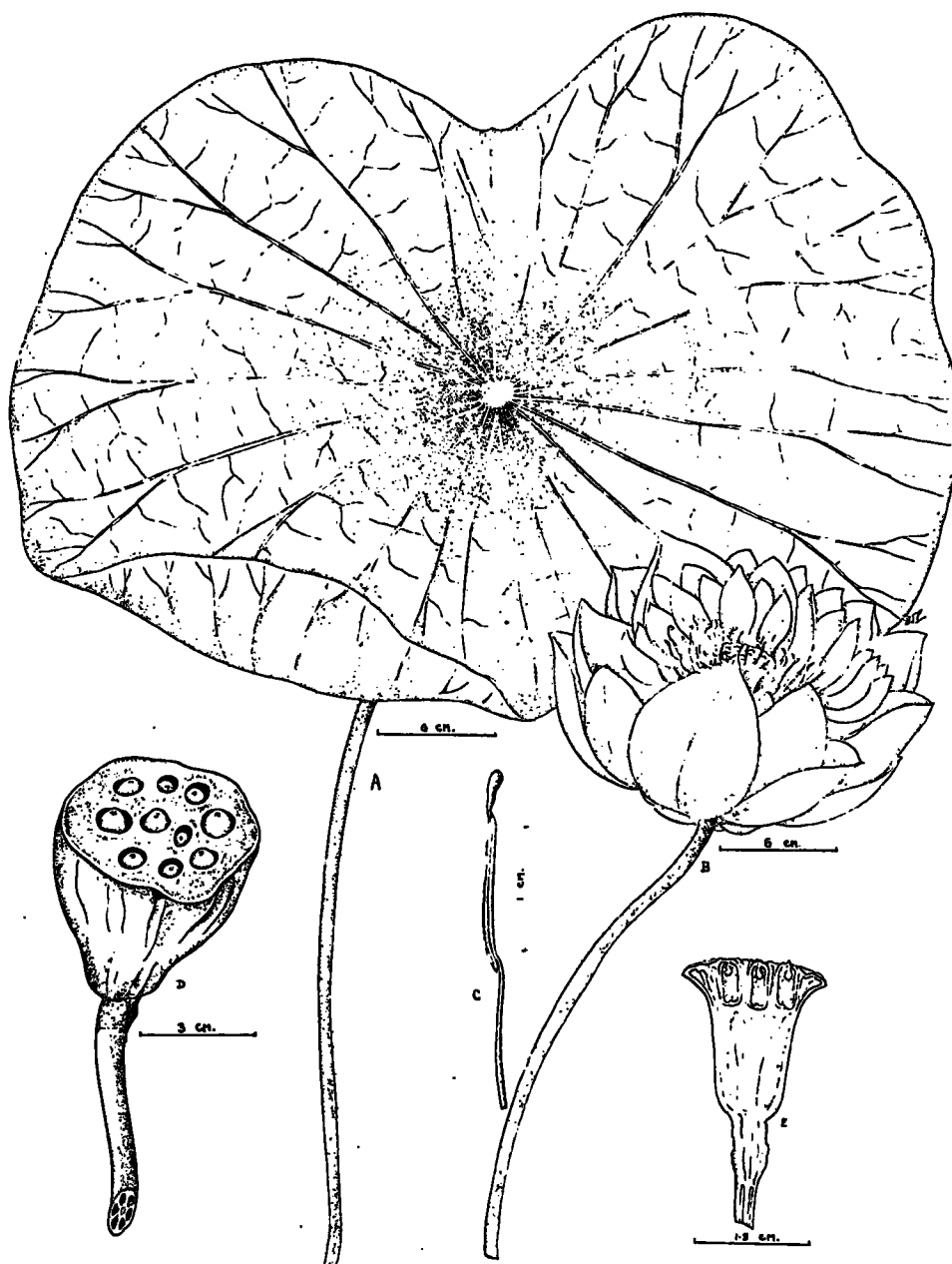


FIG. 399. *Nelumbo nucifera*. A, leaf with petiole. B, flower, lateral view. C, stamen with spatulate appendage. D, fruit with seeds. E, longitudinal section of fruit and seeds.

74. NYMPHAEACEAE

1. *Nelumbo nucifera* Gaertn., Abeywick., Ceyl. Journ. Sci. 2 (2) 160, 1959. (Fig. 399).

Nelumbium nuciferum Gaertn.—*Nelumbium speciosum* Willd.—*Nelumbium nelumbo* Druce—*Nelumbium asiaticum* Rich.—*Nymphaea nelumbo* Linn.—*Nelumbo indica* Poir.—*Cyamus nelumbo* Smith—*Cyamus mysticus* Salisb.

Engl. Chinese Water-lily, Indian Lotus, Sacred Lotus; *Sinh.* Nelun, Tamburu; *Tam.* Ambal, Sivapputamarai, Tamarai; *Hindi* Kanwal; *Sans.* Abja, Ambhoja, Bisakusuma, Bisaprasuna, Drishopadma, Harivetra, Indiralaya, Jalajanma, Kamala, Kavar, Kunja, Kusheshaya, Kutapa, Mahapadma, Mahotpala, Nala, Nalika, Nalina, Padma, Pankaja, Pankeruha, Pathoja, Pundarika, Pushkara, Putaka, Rajiva, Sahrapatra, Sarojanma, Saroruha, Sarsija, Sarsiruha, Sharada, Sharapadma, Shatapatra, Shri, Shriparna, Shrivasa, Shuklapadma, Sitambuja, Sujala, Tumarasa, Vanashobhana, Varisoha.

A large aquatic herb with a slender, elongated, branched, creeping stem with tufts of roots at nodes; leaves very large, some erect, others horizontal and floating at the ends of very long, rough, prickly petioles, blade peltate, 30—60 cm diam., concave or flat, rotundate, entire, radially veined, glabrous, and glaucous; flowers regular, bisexual, white or rose-coloured, sweet-scented, solitary, large, 10—25 cm diam., at the ends of very long, erect, asperous pedicels coming off from the nodes of the stem and sheathed at the base; sepals 4 or 5, caducous, small; petals 15 or more, soon falling, oval, 7.5—12.5 cm long, obtuse, concave, finely veined, at first erect, afterwards spreading; stamens numerous, outer ones petaloid with a spatulate appendage beyond the anther; ovary superior, carpels small, 10—20, separately sunk on top of a large, obconical, raised receptacle about 2 cm high and 2.5 cm wide at the flat top, ovules 1 or 2 pendulous, style short, exerted, stigma capitate; receptacle enlarges as much as 5—10 cm in width on maturity, ovoid, glabrous with ripe 1-seeded carpels, loose in cavities; seed exalbuminous.

Flowers from February to August.

Illustrations. Wight, *Ill. Ind. Bot.* 1: *pl.* 9. 1838; Smith *Exot. Bot.* 1: *pl.* 31 and *pl.* 32; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 51. 1933.

Distribution. Occurs in stagnant water throughout the warmer regions from Persia to Australia. It is common in tanks in the dry zone in Ceylon.

India. Pen. Ind. Or., *Herb. Wight* 52. Ceylon. Western Prov., Jaela, *Senaratne*, March 1952. Without locality, *Thwaites C.P.* 1022. Tenasserim and Andamans. *Helper* 136, Kew *Distribution* 1861—2.

Composition. The seeds of this plant contain the alkaloid, nelumbine, while the leaves have nuciferine and an alkaloid. Read reports that in addition to nelumbine the seeds contain protein, fat, carbohydrates, vitamin C₂ and copper oxide. The constituents of the rhizome are starch, vitamin C, asparagin, protein and fat.

Uses. The stamens of the flowers are used for bleeding piles and debility and weakness in children. An aqueous extract of the fresh rootstock of the white-flowered variety is given internally for snake-bite poisoning, especially that of the cobra. Nadkarni states that flowers with stamens and juice of the flower stalk are used for diarrhoea, cholera, fevers, liver complaints and as a cardiac tonic. The flower is also made into syrup and given for coughs, dysentery and to check haemorrhages from bleeding piles. Burkill reports that the ground petals are administered for syphilis in Malaya. The seeds are made into a paste and applied on leprosy and other skin diseases. The milky juice of the leaves and flower stalk is given for diarrhoea. In China and Malaya, the dried petals and stamens of the pink-flowered variety are used as a cosmetic to improve the complexion. The rhizome is frequently used as a vegetable and the seeds divested of their testa are roasted or ground into flour and eaten.

The fresh flowers are used as temple offerings.

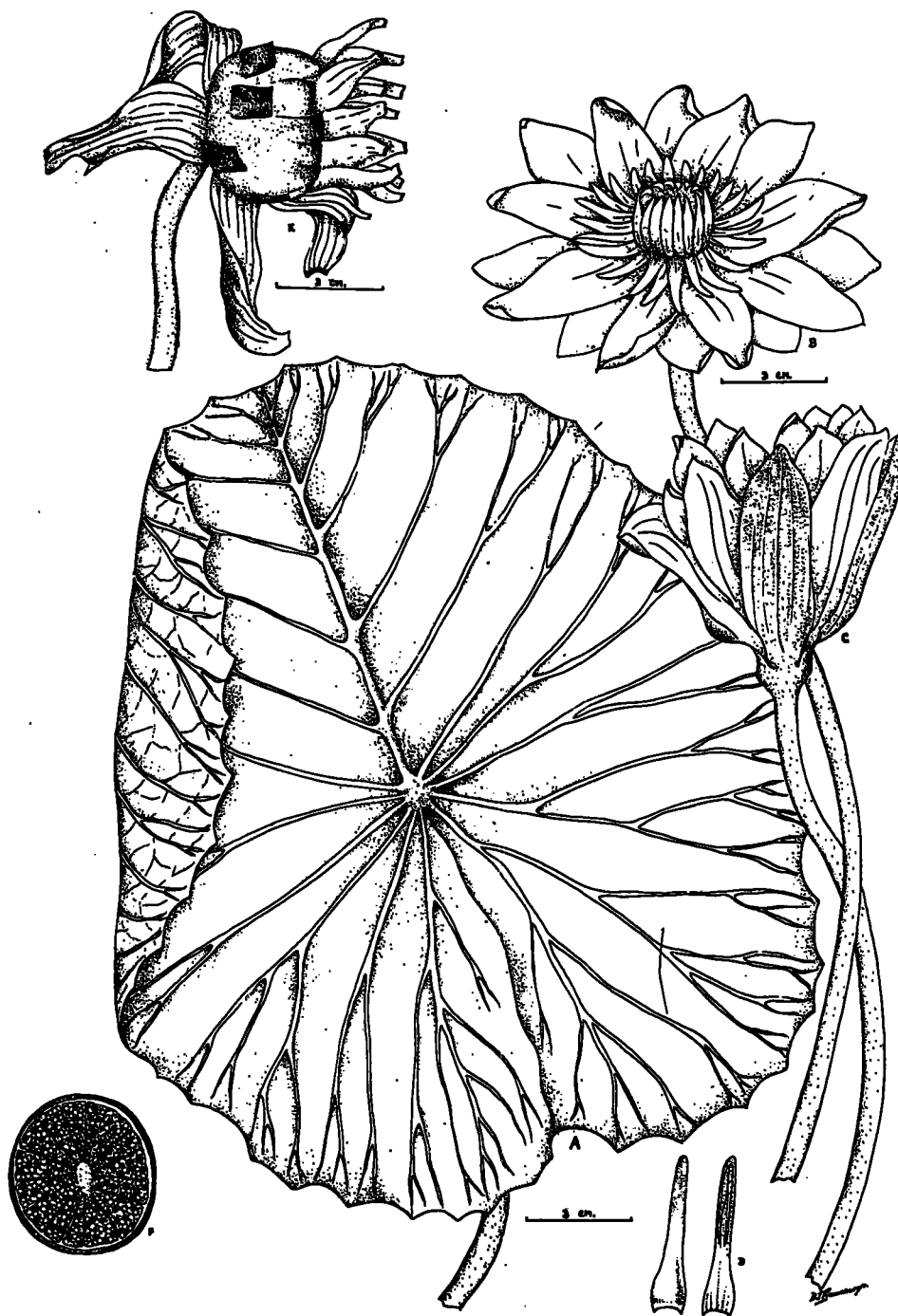


FIG. 400. *Nymphaea lotus*. A, leaf. B, flower, dorsal view C, flower, lateral view showing the sepals. D, stamens, dorsally and ventrally. E, fruit with persistent sepals. F, transverse section of fruit showing the loculi and seeds.

2. *Nymphaea lotus* Linn. Sp. Pl. 511. 1753. (Fig. 400).

Nymphaea nauchali Burm. f.—*Nymphaea pubescens* Willd.—*Nymphaea rubra* Roxb. ex Salisb.—*Castalia pubescens* Bl.

Sinh. Et-olu, Olu, Otu; *Tam.* Allitamarai, Ambal; *Sans.* Alagandha, Alipriya, Alohita, Alpapatra, Aruvinda, Arunakamala, Bhadra, Charunalaka, Hallaka, Indivara, Kalharamu, Kamala, Kokanada, Krishnakanda, Kumuda, Kunalaya, Nilotpala, Raktakairava, Raktakal-hara, Raktakamala, Raktakumuda, Raktambhoja, Raktasandhyaka, Raktasaroruha, Rakta-varija, Raktavarna, Raktotpala, Ravipriya, Rochana, Sandhyaka, Shonapadma, Somakhya.

An aquatic herb with a short, erect, roundish, tuberous rootstock; leaves on very long, cylindrical, submerged petioles, leaf blades horizontal, floating, peltate, 15—20 cm diam., sagittate-rotundate, obtuse with narrow or wide sinus 7.5 cm deep at base, coarsely sinuate-dentate, glabrous on the upper surface, finely velvety tomentose beneath, veins very prominent; flowers solitary, regular, bisexual, white, pale or dark rose-coloured, fragrant; open only in the morning, very large, 12.5—17.5 cm diam., on very long, usually pubescent peduncles; sepals 4, oblong, obtuse, ribbed, glabrous or pilose externally, petaloid; petals about 12, oblong or oval-oblong, obtuse, spreading, white or pink; stamens about 40, without appendages, filaments dilated at base, anthers adnate, linear, introrse; ovary superior, many-carpellary, sunk in and confluent with the fleshy receptacle to form a many-locular ovary with numerous ovules, stigma sessile, rays of the stigma terminating in fleshy club-shaped, incurved appendages; fruit globular, 3.2 cm diam., spongy berry, green, crowned with erect connivent stiff, persistent sepals, loculi about 15, closely crowded with numerous seeds; seeds ovoid-globular, ribbed with vertical lines of little tubercles and very minutely and transversely striate, aril white, transparent.

Flowers throughout the year. The mature flower sinks below the surface and the fruit matures and ripens under water.

Illustrations. Wight, Ill. Ind. Bot. 1: pl. 10. 1838; Roxburgh ex Salisb., Parad. Lond. 1: sub. pl. 14; Herb. Peradeniya, drawing.

Distribution. A common aquatic herb which occurs throughout tropical Asia, Africa, Java and Philippine Islands. It is very common in streams, ponds and tanks throughout the low-country upto 1,000 feet altitude. Jaffna, Anuradhapura, Matale, Galle, etc.

India. Chittagong: *J. D. Hooker & T. Thomson*. Pen. Ind. Or., *Herb. Wight* 54. Ceylon North-Central Prov., Nikawewa, *Simpson* 9413, April 1932; Rambewewa, *Alston* 1116, March 1927. Southern Prov., Galle, Akuruwella, *Simpson* 8411. July 1931; Tissamaharama, *Alston* 1117, Jan. 1926. Without locality, *Thwaites* C.P. 1019.

Composition. This plant contains an alkaloid and glucoside.

Uses. The powdered rootstock is given for dyspepsia, diarrhoea, piles and urinary ailments. A decoction of the flower is given for palpitation of the heart. It is also supposed to be a blood purifier and aphrodisiac. The seeds are eaten by diabetic patients. The juice of the fruits made into a conjee with grains of *Setaria italica* Beauv. (S. Thanahal) is given with salt for snake-bite poisoning followed by blood in the urine. The rhizome is prescribed for cystitis, nephritis, enteritis, fevers and insomnia. In Africa it is given for jaundice, urinary troubles and haemorrhoids. The seed converted into flour is used for making bread in China and East Indies while it is boiled and eaten in the Philippine Islands.

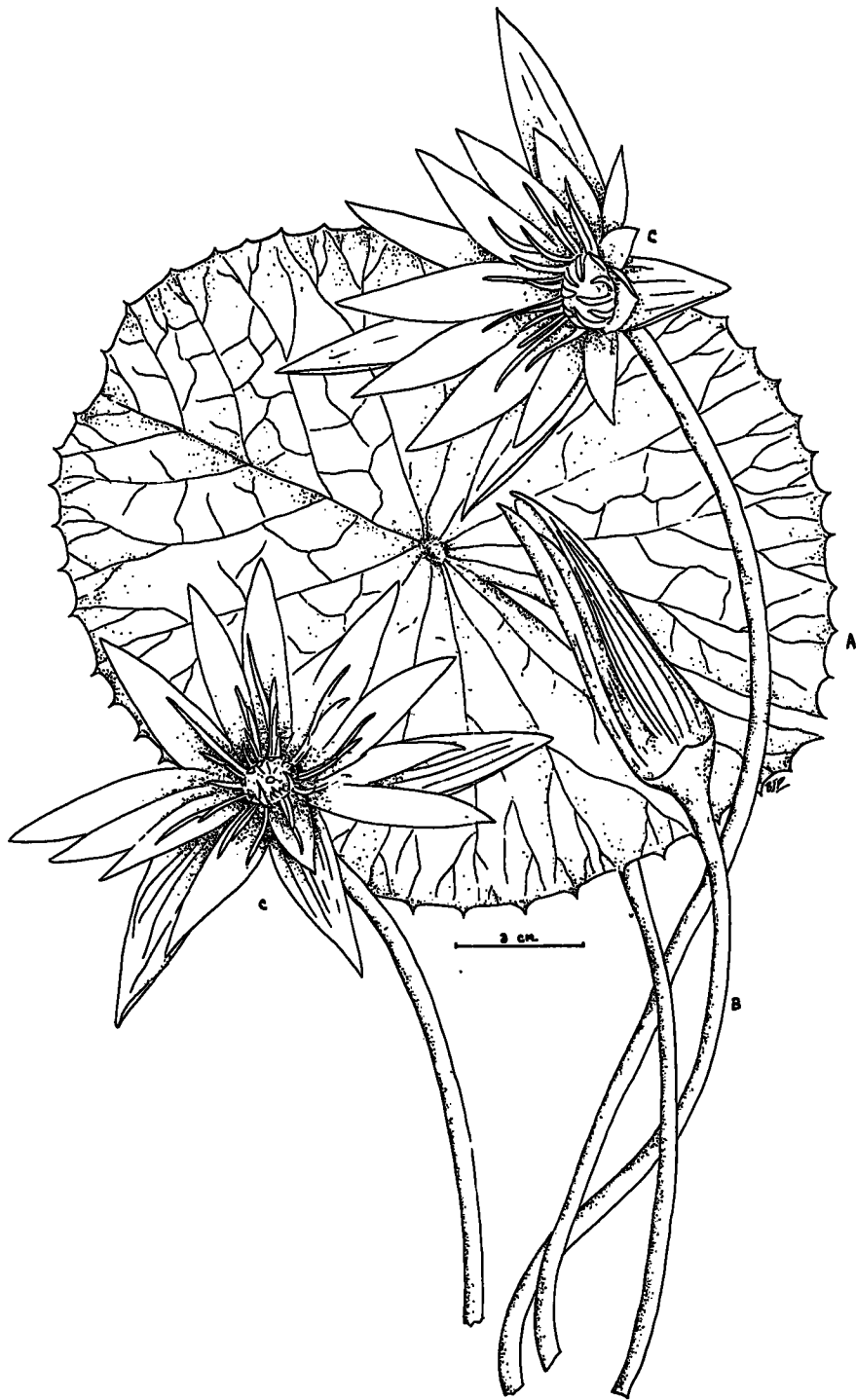


FIG. 401. *Nymphaea stellata*. A, leaf blade with petiole. B, flower bud. C, open flowers, lateral view.

3. *Nymphaea stellata* Willd., Sp. Pl. 2: 1153. 1799. (Fig. 401).

Nymphaea stellata var. *parviflora* Hook. f. & Thom.—*Castalia stellata* Bl.

Engl. Blue Water-lily; *Sinh.* Kumudu, Manel, Nilupul; *Sans.* Asitotpala, Indiwari, Kandota, Kandotha, Kumuda, Kuvalaya, Mridutpala, Nilakamala, Nilaliya, Nilambujanma, Nilapatra, Nilotpala, Nilpankaja, Nilpatraka, Saugandhika, Utpala, Utpalaka.

An aquatic herb with a short, erect, ovoid rootstock; leaves on long, slender, submerged petioles, blade floating, about 12.5–20 cm diam., sagittate-rotund, obtuse with a narrow sinus of 5–7.5 cm in depth at the base, margin entire or coarsely sinuate, glabrous on both surfaces; flowers regular, bisexual, solitary on long peduncles, 7.5–15 cm diam., pale blue or violet, open all day; sepals 4, petaloid, narrowly oblong-lanceolate, obtuse or subacute; petals numerous, linear or lanceolate, acute or subobtuse; stamens numerous, filaments broad, the outer ones petaloid, anther adnate, linear, introrse with a tongue-shaped appendage beyond; ovary superior, carpels numerous sunk in and confluent with the fleshy receptacle to form a many-locular ovary, ovules numerous, stigmas sessile, connate, stigmatic rays acute, curved upwards at the ends without appendages; fruit a soft, globular, spongy berry, bursting irregularly; seeds numerous small, albuminous, longitudinally striate, enveloped in a large aril.

Flowers all the year round.

Illustrations Wight, *lc. Ind. Or.*, pl. 178. 1839; Kirtikar and Basu, *Indian Med. Plants*, pl. 49. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in warmer parts of India, tropical Asia and Africa. In Ceylon, it is common in shallow streams, tanks and ponds throughout the low-country, especially in the dry zone. Jaffna, Galle, Anuradhapura, etc.

India. Pen. *Ind. Or.*, *Herb. Wight* 55. Malaya, Penang: *Curtis* 518, Dec. 1885. Ceylon. Western Prov., Bopitiya-Jaela, *Simpson* 8944, Nov. 1931; Delatura-Jaela, *Simpson* 8993, Nov. 1931. Without locality, *Thwaites C.P.* 1021. Indo-China. *Squires* 369, May 1927.

Uses. The stem of this herb is considered emollient and diuretic. It is given for diseases of the urinary tract. The starchy rhizomes are roasted and eaten.

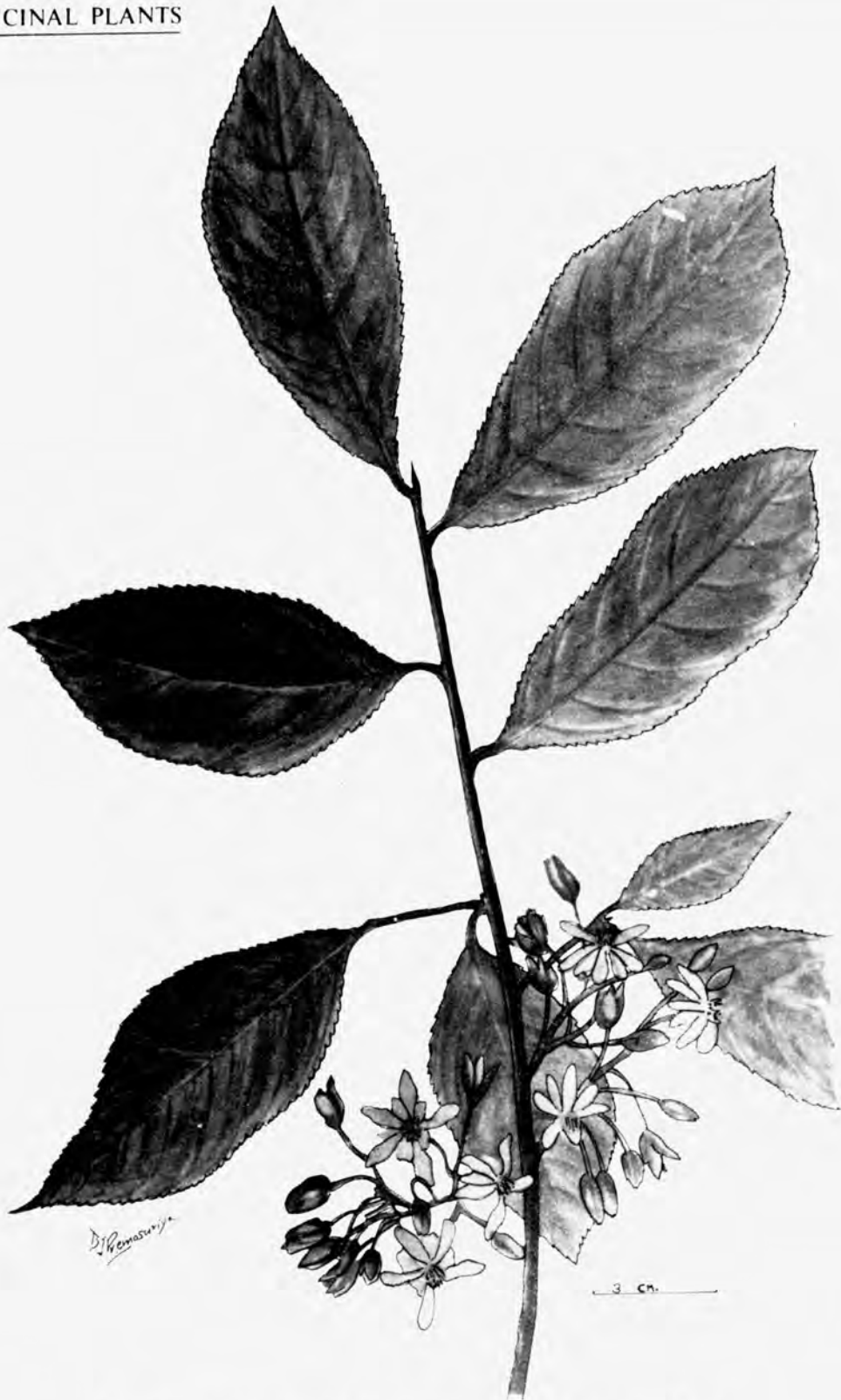


PLATE XV. *Ochna jabotapita*, branch showing leaves and umbels of flowers.

75. OCHNACEAE

1. *Ochna jabotapita* Linn. Sp. pl. 513. 1753. (Plate XV).

Ochna moonii Thw.—*Ochna wightiana* var. *moonii* Trim.—*Polythecium moonii* Trim.

Sinh. Bo-keera; *Tam.* Kat-takari.

A small, much branched tree with glabrous young parts; leaves simple, alternate, stipulate, 7.5—15 cm long, shortly stalked, lanceolate or rhomboid-lanceolate, subobtusate at base, acute, finely serrate, paler on the undersurface, veiny; flowers regular, bisexual, bright yellow, about 2.5 cm diam., 6—12 in umbellate panicles, pedicels jointed; sepals 5, distinct, imbricate, persistent, crimson on fruit, oblong-ovoid; petals 5, distinct, imbricate, about equalling the sepals; stamens indefinite, distinct, anthers as long as filaments dehiscing longitudinally, deciduous; ovary superior consisting of 3—10 distinct carpels, each carpel single-chambered with one ovule on a swollen gynophore, styles basal, connate; fruit of distinct 1-seeded fleshy carpels, 5—7 in number, 1.2 cm long, smooth and purplish black.

Flowers from November to February.

Illustrations. Worthington, Cey. Trees, *pl.* 110. 1959; Herb. Peradeniya., drawing.

Distribution. Endemic to Ceylon and found commonly growing in moist regions up to 2,000 feet altitude. Jaffna, Trincomalee, Haragama, etc.

Ceylon. Northern Prov., Jaffna, *Thwaites C.P.* 2554. Central Prov., Urugala, Siyambalgastenne, *Alston* 488, Sept. 1926; Peradeniya, Bot. Gard., *J. M. Silva*, March 1922; Katugasdigiliya, *Alston*, Aug. 1927; Hakinda, *F. W. de Silva* 100, April 1928; Beraliya, *Alston* 2380, May 1928. Sabaragamuwa Prov., Ratnapura, Karawita Kande, *Herb. Peradeniya.*, March 1919. Southern Prov., Okanda-Kumana Road, *Cooray* 69073021R, July 1969. Without locality, *Thwaites C.P.* 1221.

Uses. This plant is used medicinally.

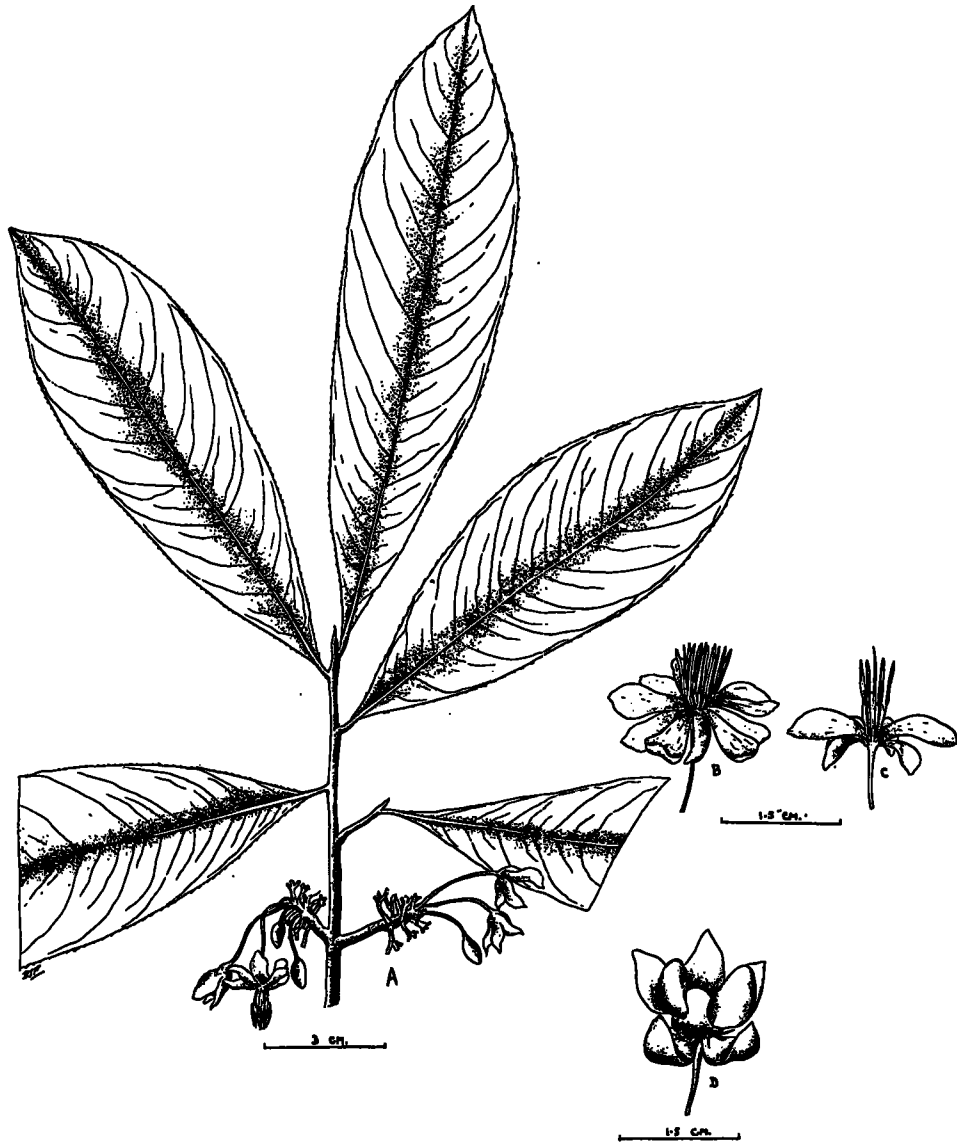


FIG. 402. *Ochna squarrosa*. A, branch with leaves and umbels of flowers. B, flower, lateral view. C, longitudinal section, of flower. D, fruit with persistent sepals and distinct 1-seeded carpels on a gynophore.

2. *Ochna squarrosa* Linn. Sp. Pl. ed. 2, 731. 1762. (Fig. 402).

Ochna lucida Thunb.—*Ochna rufescens* Thunb.—*Ochna obtusata* DC.

Sinh. Mal-keera; *Tam.* Chilanti, Panjaram, Shengodu, Sherundi, Shilandi; *Sans.* Kanakachampa.

A small tree with glabrous young parts, buds closely covered with numerous acute leaf scales; leaves simple, alternate, stipulate, 5—12.5 cm long, oval or lanceolate, acute at both ends, finely crenate-serrate, the teeth minutely spinous, glabrous on both sides, veiny, petioles 0.6 cm long, stipules lanceolate-subulate, deciduous; flowers regular, bisexual, yellow, fragrant, large, short umbellate panicles, pedicels slender, 2.5—3.7 cm long, glabrous, drooping, jointed near the base; sepals 5, distinct, imbricate, persistent, 1.2—1.8 cm long, broadly oval, obtuse, glabrous, many-veined; petals 5, distinct, imbricate, a little longer than sepals; stamens indefinite, distinct, anthers long, linear, deciduous, dehiscing longitudinally, filaments persistent; ovary superior, 3—10-carpellary, carpels distinct, 1-celled on a swollen gynophore with a solitary ovule, styles basal, connate, persistent, stigmas lobed; fruit of 3—6 distinct, ripe carpels on the enlarged gynophore, fleshy, surrounded by the enlarged sepals, ovoid, sessile, shining, black seeds with endosperm.

Flowers in June.

Illustrations. Roxburgh, Pl. Corom. 1: *pl.* 89. 1795; Wight, Ill. Ind. Bot. 1: *pl.* 69. 1838; Griffith, Not. Pl. As. 4: *pl.* 605. 1845; Herb. Peradeniya, drawing.

Distribution. Occurs in India along the Western Ghats and Assam and in Burma. It is rather rare in Ceylon, in the dry low-country. Jaffna, Trincomalee, Batticaloa, etc.

India. Canara: *Dalzell and Stocks.* Madras: *Cleghorn* 96. Pen. Ind. Or., *Herb. Wight* 392, Kew Distribution 1866—7; *Herb. Wight* 471; *Wallich* 472. Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya.* Without locality. *Thwaites C.P.* 1223.

Uses. The bark of this tree is used as a digestive tonic. Externally, it is used for poulticing fractures.



PLATE XVI. *Olax zeylanica*, branch showing leaves and fruits.



PLATE XVI. *Olax zeylanica*, branch showing leaves and fruits.

76. OLACACEAE

1. *Olax zeylanica* Linn. Sp. Pl. 34. 1753. (Plate XVI).

Sinh. Mella.

A small tree with the young branches acute angled, finely ridged transversely, glabrous and yellow; leaves simple, alternate, exstipulate, 5—7.5 cm long, ovate-oblong, acute at base, attenuate to acute or obtuse at apex, entire, rather thick, glabrous and shining, petioles very short; flowers regular, bisexual, 0.6 cm long, few, pedicellate in very small axillary racemes, buds slightly clavate and blunt; sepals minute, fused into a cup-shaped calyx, greatly enlarged in the fruit; petals 5 oblong, more or less coherent into a tube; stamens 3, inserted at the base of the petals, staminodes 5 inserted with the stamens, usually bifid; ovary superior, partly sunk in a small cup-shaped disc, unilocular above and 3-locular below, ovules 3, pendulous from top of a central placenta, style long; fruit a broadly ovoid drupe, 1 cm long, strongly apiculate, smooth, scarlet, less than half covered with the enlarged cup-shaped calyx.

Flowers in April.

Illustrations. Worthington, *Cey. Trees*, pl. 131. 1959; Herb. Peradeniya, drawing.

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

Ceylon. North-Central Prov., Ritigala, *Willis*, March 1905. Central Prov., Hewessa, *Herb. Peradeniya*, March 1887. Southern Prov. Galagama, *Thwaites C.P.* 1214.

Uses. The leaves of this tree, fried in cow ghee and red onions, are eaten for painful micturition with excellent results.

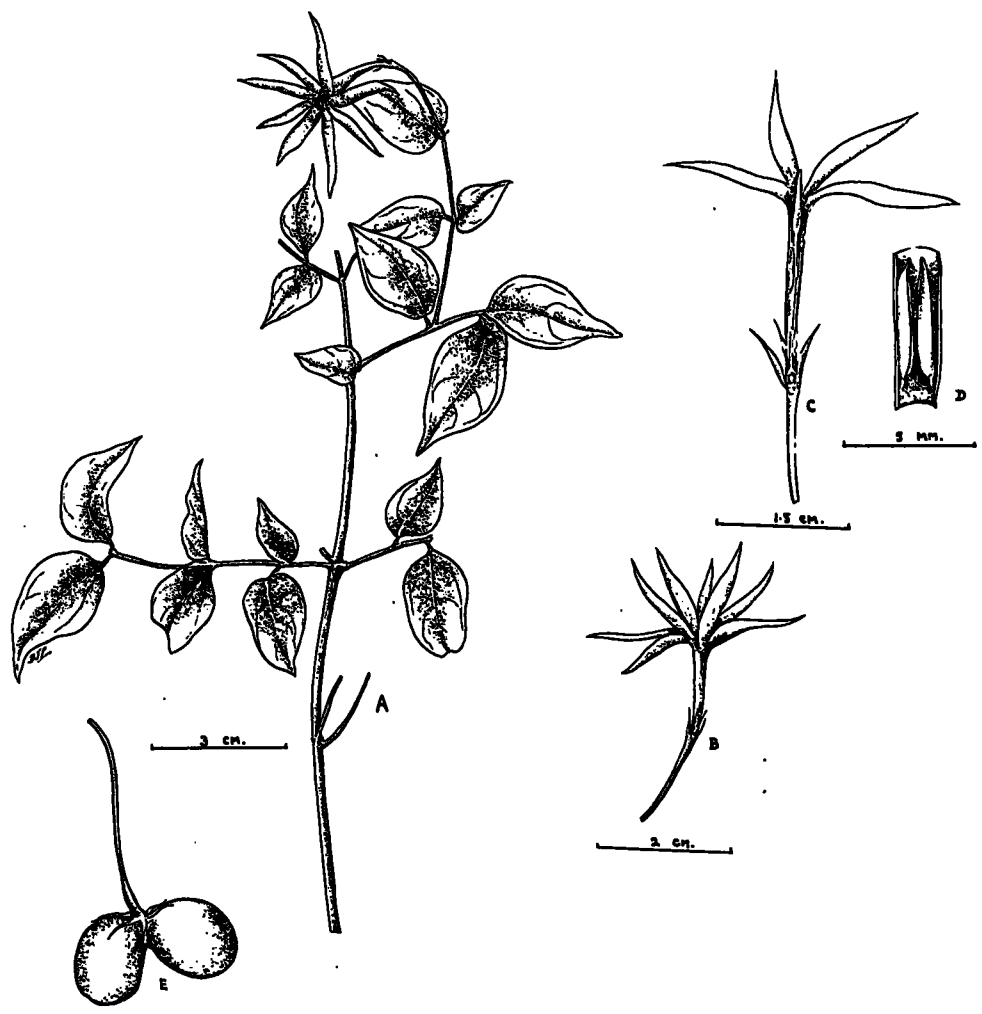


FIG. 403. *Jasminum angustifolium*. A, branch with leaves and flower. B, flower, lateral view. C, longitudinal section of flower. D, portion of corolla-tube showing the attachment of stamens. E, fruit.

77. OLEACEAE

1. *Jasminum angustifolium* (Linn.) Willd., Sp. Pl. 1: 36. 1797. (Fig. 403).

Jasminum vimineum Willd.—*Jasminum triflorum* Pers.—*Nyctanthes angustifolia* Linn.—*Nyctanthes viminea* Retz.—*Nyctanthes triflora* Burm.—*Monogorium vimineum* Lamk.—*Monogorium triflorum* Lamk.

Engl. Wild jasmine; *Sinh.* Wal-pichcha; *Tam.* Adachalam, Adigal, Kanmelaval, Kattumalligai, Kava, Kecham, Madali, Manval, Marugu, Mullai, Sirumalligai, Vanamalligai; *Hindi.* Banmallika, Mwari; *Sans.* Asphota, Kanamallika, Priya, Supuja, Vanamalli.

A scandent semi-shrubby climber with glabrous stems but the twigs pubescent; leaves simple, opposite, exstipulate, very variable on the same plant, small, 1.2—5 cm long, ovate-oval or oval-lanceolate, rounded at base, sometimes attenuate, obtuse or acute at apex, glabrous; flowers regular, bisexual, white, on slender pedicels, solitary or more usually in threes at ends of short, lateral, divaricate twigs; sepals 5, fused into a tubular or funnel-shaped calyx-tube, glabrous, segments distant, short, 3—4 mm long, filiform, acute; petals fused into a narrow corolla-tube about 1 cm long, lobes 7 or 8, equal, linear-oblong, very acute; stamens 2, inserted and included in the corolla-tube, filaments very short, anthers oblong; ovary superior, 2-locular with 1 or 2 ovules in each loculus, style simple, stigmas 2; fruit didynamous, of 2 berry-like carpels both usually developed, about 0.8 cm long and broadly ovoid.

Flowers in April and from July to September.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 698. 1840—1843: Burmann f., Fl. Ind., pl. 2. 1765; Kirtikar and Basu, Indian Med. Plants, pl. 591. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is common in the low-country in Ceylon especially in the dry regions up to 2,000 feet altitude. Jaffna, Trincomalee, Dambulla, Hantane, Haragama, etc.

India. Calcutta, Bot. Gard., cultivated; Pen. Ind. Or., *Herb. Wight* 1756, Kew Distribution 1866—7. *Ceylon.* Eastern Prov., Kantalai, *Herb. Peradeniya*, 1885. North-Western Prov., Puttalam, *Herb. Peradeniya*, 1883. Without locality, *Thwaites C.P.* 1807.

Uses. The root of this plant ground into a paste with the root of *Acorus calamus* L. (S. Wadakaha) and lime juice, is considered a valuable remedy for ringworm.

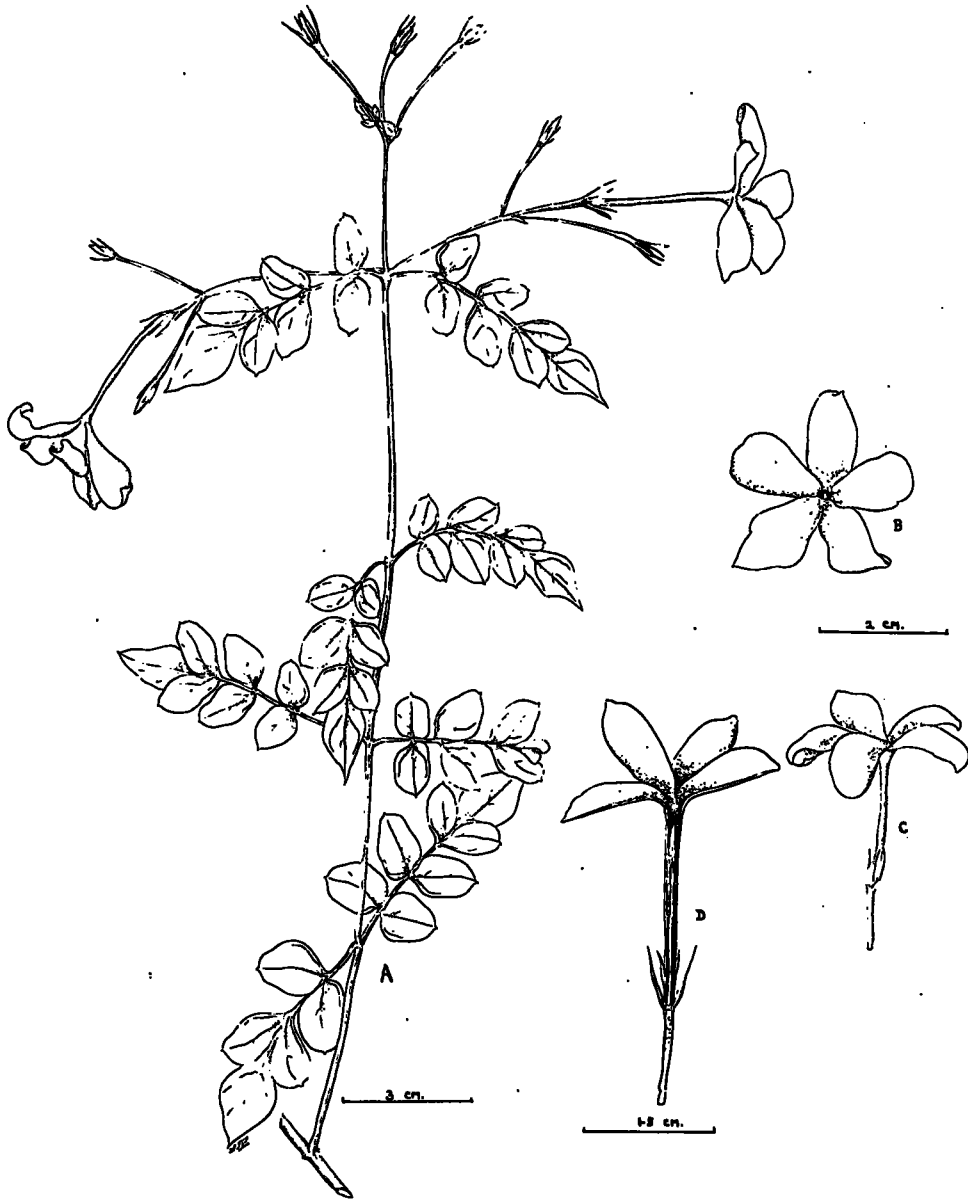


FIG. 404. *Jasminum grandiflorum*. A, branch with leaves and flowers. B, flower, dorsal view. C, flower, lateral view. D, longitudinal section of flower.

2. *Jasminum grandiflorum* Linn. Sp. Pl. ed. 2, 9. 1762. (Fig. 404).*Jasminum aureum* Don.

Engl. Jasmine; *Sinh.* Desaman, Saman-pichcha; *Tam.* Kodimalligai, Manmadabanam, Padarmalligai, Pichi, Sadimalligai; *Hindi* Chambeli, Chameli; *Sans.* Balihrasa, Chambeli, Chetaki, Hridayagandha, Janeshta, Jati, Malati, Malini, Mandana, Manchara, Nripatmaja, Prahasenti, Rajaputri, Sandhyapushpi, Shrimati, Sukumari, Sumana, Surabhigandha, Surapriya, Surupa, Suvarsha, Suvasanta, Svarnajatika, Tailamalini, Upajati, Varshabhava, Varshapushpa, Veshika.

A climbing shrub with green stems; leaves opposite, odd-pinnate, 7.5—10 cm long, leaflets opposite, nearly sessile, 7-11, ovate, the terminal one 1.2—2.5 cm long, often partially united with the upper pair; flowers regular, bisexual, white, often tinged with purple outside, very fragrant in terminal cymes; calyx-tube short, teeth 5, linear, about 6—7 mm long; corolla salver-shaped, tube cylindrical, about 1.8—2.2 cm long, 5-lobed, lobes 1.2 cm long, oblong or obovate-oblong; stamens 2, inserted on the corolla-tube, included, filaments very short, anthers 2-celled; ovary superior, 2-locular, with 2 anatropous ovules in each loculus, style simple, slender, stigma 2-lobed; fruit a deeply 2-lobed berry or globose through the suppression of one of the loculi, seed solitary in each loculus.

Flowers from May to September.

Illustrations. Edward, Bot. Reg. pl. 91. 1816; Wight, Ic. Pl. Ind. Or., pl. 1257. 1848; Kirtikar and Basu, Indian Med. Plants, pl. 393. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the subtropical region of North-West Himalaya in India and cultivated elsewhere. In Ceylon, it is a common garden plant especially grown for its flowers.

India. Nepal: *Wallich* 2885E, 1827. Malabar, Concan, etc. *Stocks, Law, etc.* Ceylon. Eastern Prov., Trincomalee, cultivated. Central Prov., Bot. Gard., cultivated, *Herb. Peradeniya*, May 1887. **Maldive Islands.** Veimandu, Horsburgh Atoll and Heddufuri, *Gardiner*, 1899—1900; Hulule, *Gardiner* 24, 1899—1900; *Didi* 80, 1896. **Tenasserim and Andamans.** *Herb. Helfer* 3718, Kew Distribution 1861—1862.

Composition. The flowers of this plant contain a volatile oil, jasminol and indol. The oil consists of benzyl-acetate, methyl anthranilate, linalol and a betone called jasmone. The leaves contain an alkaloid called jasminine, salicylic acid and an astringent principle.

Uses. The leaves are a remedy for skin diseases, ulcers in the mouth and toothache. The fresh juice of the leaves is applied to soften corns. The flowers mascerated in water and left overnight are used as an eye wash and an infusion of the flowers as a cosmetic. The flower buds are used for making garlands.

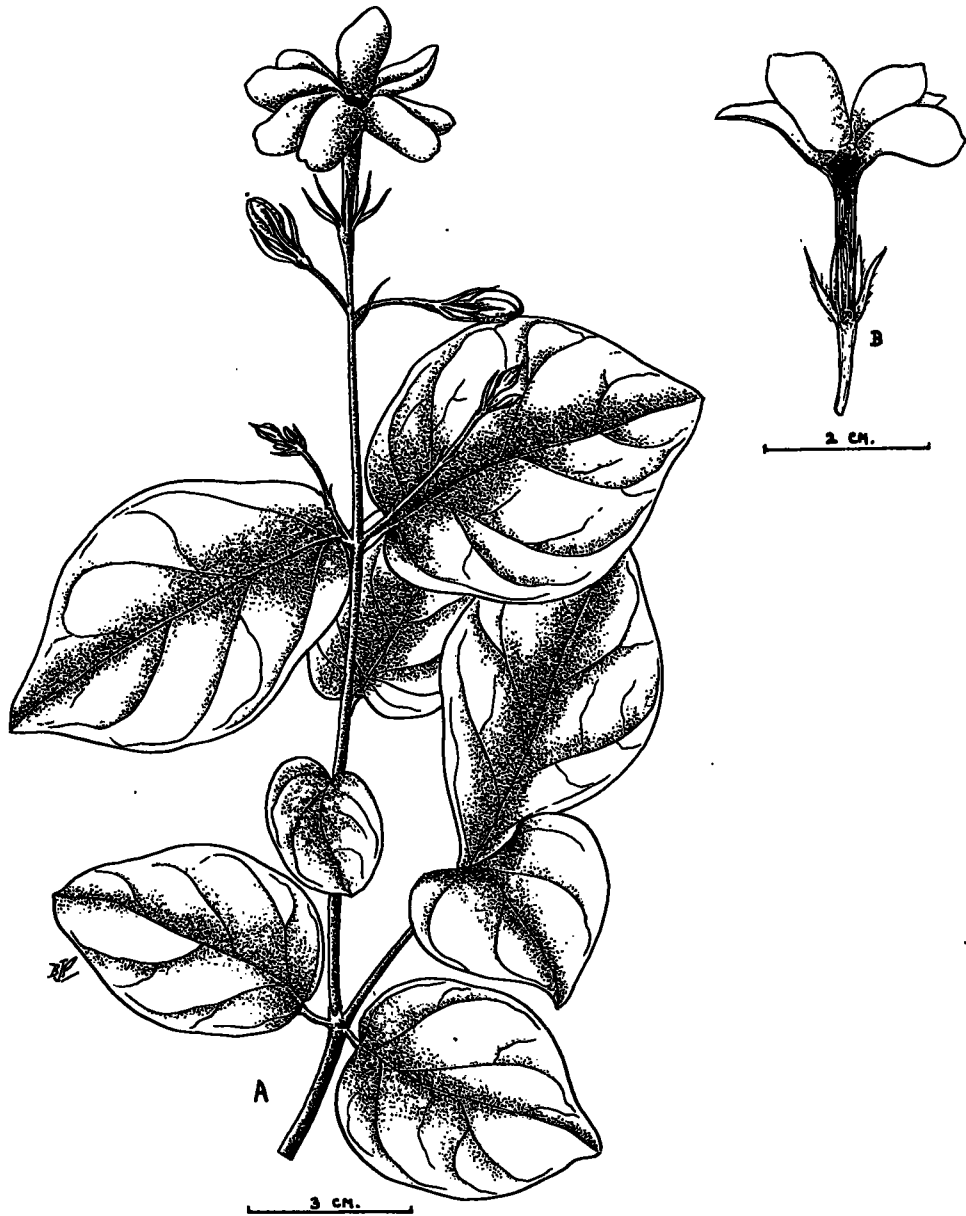


FIG. 405. *Jasminum sambac*. A, branch with leaves, open flower and flower buds. B, longitudinal section of flower.



PLATE XV. *Ochna jabotapita*, branch showing leaves and umbels of flowers.

3. *Jasminum sambac* (Linn.) Ait. Hort. Kew, ed. 1: 8. 1789. (Fig. 405).

Nyctanthes sambac Linn.—*Jasminum blancoi* Haask.—*Jasminum fragrans* Salisb.—*Jasminum undulatum* Willd.—*Jasminum zambac* Roxb.—*Jasminum quinqueflorum* Heyne—*Jasminum pubescens* Wall.—*Monogorium sambac* Lamk.—*Monogorium undulatum* Lamk.

Engl. Sambac Jasmine; *Sinh.* Geta-pichcha, Pichcha; *Tam.* Anangam, Iruvachi Iruvadi, Karumugai, Koguttam, Kudamalligai, Maladi, Malli, Malligai, Malligam, Mayilam, Mullaikkodi, Peramalli, Perumalligai, Pittigai, Sadaviru, Selugam, Sindu, Talavam, Talavu; *Hindi* Banmallika, Bel, Chamba, Mogra, Motia, Mugra; *Sans.* Ananga, Ashtapadi, Asphota, Atigandha, Bhadravalli, Bhupadi, Dalakoshaka, Dantapatra, Devalata, Gandharaja, Gandhasara, Gauri, Gavakshi, Gigija, Janeshta, Kamabana, Kausika, Madavanti, Malli, Mallika, Mrigeshta, Muktabandhana, Mudgara, Mudgaraka, Narishta, Navamallika, Pramodini, Priya, Rajaputri, Saptala, Saptapatra, Saumya, Shatapada, Shatpadananda, Shitabhiru, Shripadi, Sita, Sitabiru, Trinasakhya, Trinashunya, Vanachandrika, Varshiki, Vartula, Vitapriya.

A suberect shrub with pubescent young branches; leaves simple, opposite, membranous, 3.7—11.2 cm long, 2.1—3.7 cm broad, variable in shape, usually broadly ovate or elliptic, acute, obtuse or acuminate, entire, glabrous or nearly so, base rounded or subcordate, rarely acute, main nerves 4—6 pairs, petioles 3—6 mm long and hairy; flowers regular, bisexual, white, very fragrant, solitary or usually 3-flowered (many flowered in cultivation) cymes, bracts linear-subulate, pedicels 0.6—1 cm long, hairy; calyx 1—1.2 cm long, hairy, 5—9-lobed, teeth linear-subulate, 0.6—1 cm long; corolla 4—12-lobed, tube 1.2 cm long, lobes as long as the tube, narrowly oblong, acute or obtuse, spreading, imbricate in bud; stamens 2, included in the corolla-tube, filaments very short, anthers attached at the back near the base; ovary superior, 2-locular, ovules attached near the base, style cylindric, stigma at length 2-fid; ripe carpels 1—2, subglobose, 0.6 cm diam., black, surrounded by the suberect calyx teeth.

Flowers throughout the year.

Illustrations. Edward, Bot. Reg. *pl.* 1. 1815; Curtis, Bot. Mag. *pl.* 1785. 1816; Wight, Ic. Pl. Ind. Or., *pl.* 704. 1840—1843; Burmann, Thes. Zeyl. *pl.* 58. *fig.* 2. 1737; Kirtikar and Basu, Indian Med. Plants, *pl.* 588B, 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India from Bengal southwards, Malaya, Burma, China and Philippine Islands. It is commonly cultivated in Ceylon as a garden plant.

India. Dhaka: *Clarke* 17066C, May 1872; *Clarke* 17066D, May 1872; *Clarke* 17067C; *Clarke* 17067B, May 1872. Ceylon. Patebada, *Simpson* 9993, Aug. 1932. Without locality, *Thwaites C.P.* 1812. Maldive Islands. Addu, Haddumati, Horsburgh Atoll, Veimandu and Heddufuri, *Gardiner*, 1899—1900; Hulule, *Gardiner* 35, 1899—1900; *Didi* 89, 1896.

Composition. The roots of this plant contain an alkaloid, while the flowers yield an essential oil similar to that in the flowers of *Jasminum grandiflorum*.

Uses. The flowers and leaves are a valuable lactifuge being bruised and applied on breasts of women. When the leaves are boiled in water they exude a balsam which is used for anointing the head for eye complaints, strengthening the vision and in cases of insanity. The root is employed as an emmenagogue and used for bronchitis, pulmonary catarrh and asthma.

In the Philippines, the flower of this plant is adopted as the national flower. Women wear the flowers in their hair for their fragrance. In China, they are used for flavouring tea, while in Malaya, water in which flowers have been soaked is used for washing the face.

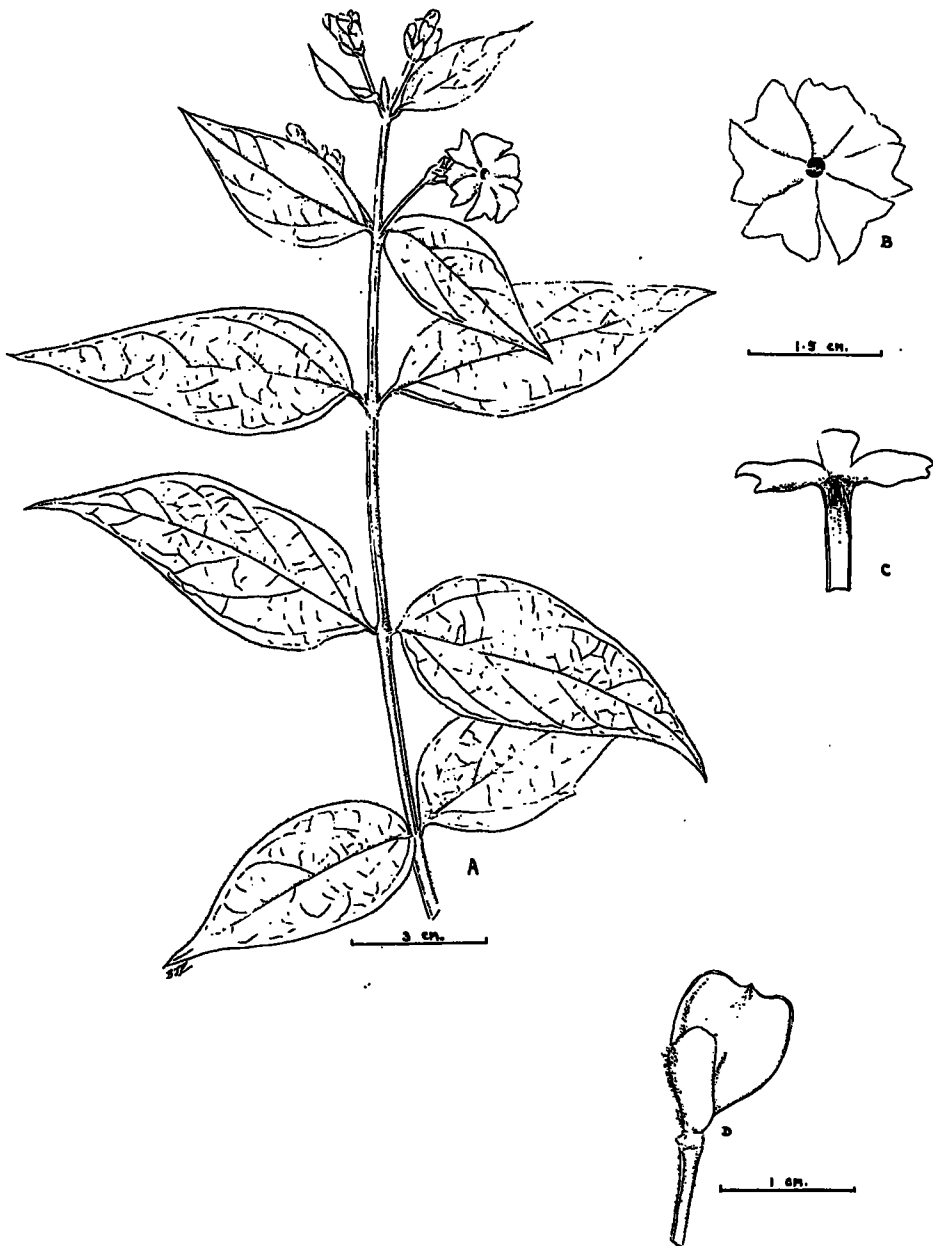


FIG. 406. *Nyctanthes arbor-tristis*. A, branch with leaves and flowers. B, flower, dorsal view. C, longitudinal section of corolla showing the insertion of stamens. D, fruit with persistent bract.

4. *Nyctanthes arbor-tristis* Linn. Sp. Pl. 6. 1753. (Fig. 406).

Parilium arbor-tristis Gaertn.—*Scabrita scabra* Linn.—*Scabrita triflora* Linn.

Engl. Coral Jasmine, Night-flowering Jasmine; *Sinh.* Sepalika; *Tam.* Manjatpu, Parisadam, Pavalamalligai, Sudam, Tira; *Hindi* Binari, Har, Harsingar, Karasli, Kuri, Saherva, Saihari, Seoli, Siharu; *Sans.* Atyuha, Harashingarpushpaka, Kharapatraka, Nalakunkuma, Parijata, Prajakta, Ragapushpi, Rajanihasa, Sepholi, Sephalika,

A small tree with sharply quadrangular branches covered with stiff whitish hairs; leaves simple, opposite, 5—10 cm long, 2.5—6.2 cm broad, ovate, acute or acuminate, rough and scabrous above with short bulbous hairs, densely pubescent beneath with appressed hairs, entire or with a few large distant teeth, base rounded or slightly cuneate, main nerves few, conspicuous beneath, petioles 6 mm long and hairy; flowers regular, bisexual, white and orange, fragrant, sessile in pedunculate, bracteate fascicles of 3—5, peduncles 4-angled, slender, hairy, axillary and solitary and in short trichotomous cymes, bracts broadly ovate or suborbicular, 0.6—1 cm long, apiculate, hairy on both sides; calyx 0.6—0.75 cm long, narrowly campanulate, hairy outside, glabrous inside, truncate or obscurely toothed or lobed, ciliate; corolla glabrous, about 1.2 cm long, tube 6—7.5 mm long, orange-coloured, about equalling the limb, 4—8-lobed, contorted in bud, spreading, lobes white, unequally obcordate, cuneate; stamens 2, subsessile, near the top of the corolla-tube; ovary superior, 2-locular with 1—2 ovules in each loculus, style short, stigma simple; fruit a chartaceous capsule, much compressed, 1.8 cm long and broad, obcordate or nearly orbicular, 2-chambered, separating into 2, flat, 1-seeded carpels, reticulately veined and glabrous.

Flowers all the year round.

Illustrations. Edward, *Bot. Reg. pl.* 399. 1819; Curtis, *Bot. Mag. pl.* 4900. 1856; Beddome, *Flor. Sylvat. pl.* 240. 1868—1873; Gaertner, *Fruct. et Sem. Plant. 1: pl.* 51. 1788; Gaertner, *Fruct. et Sem. Plant. 2: pl.* 138. 1791; Rheede, *Hort. Mal. 1: pl.* 21. 1678; Kirtikar and Basu, *Indian Med. Plants, pl.* 594. 1933.

Distribution. Occurs in Central India and now cultivated elsewhere including Ceylon.

India. Dehra Dun: *Abdul Hamid* 71; *Kapur* 70. Siwalik and Jaunsar Div., *Sen* 72, Sept. 1921. Bengal: *J. D. Hooker*. Misor and Carnatic: *G. Thomson*. East India Co., *Herb. Falconer*, Kew Distribution 1865. Ceylon. Northern Prov., Jaffna, cultivated, *Thwaites C.P.* 1808. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Feb. 1887; Gannoruwa, cultivated, *Alston* 1076, May 1927.

Composition. The leaves of this tree contain an alkaloid.

Uses. The leaves are used for fever and rheumatism. A decoction of the leaves is given for obstinate sciatica. The fresh juice of the leaves with honey is administered for malarial fevers. It is given with sugar to children as a remedy for intestinal worms. The flowers yield a yellow dye which is used for dyeing cotton cloth.

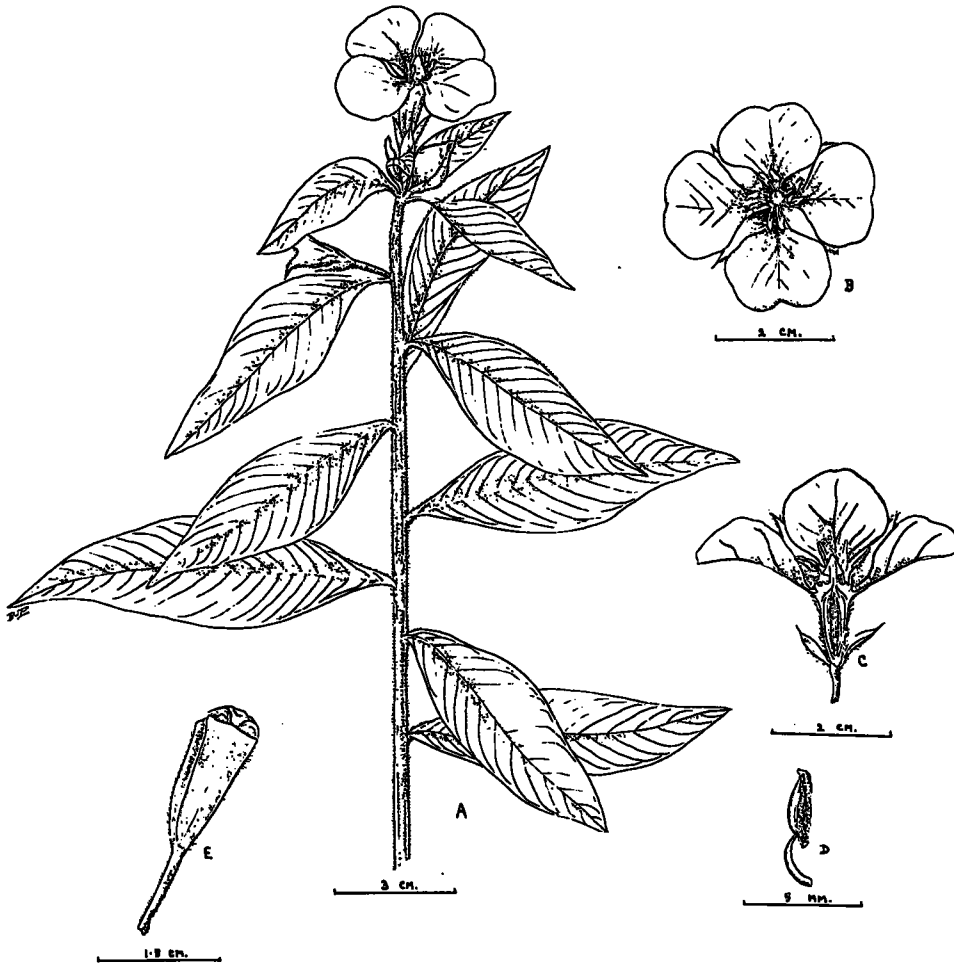


FIG. 407. *Jussiaea suffruticosa*. A, branch with leaves and flower. B, flower, dorsal view. C, longitudinal section of flower. D, stamen. E, fruit.

78. ONAGRACEAE

Jussiaea suffruticosa Linn. Sp. Pl. 388. 1753. (Fig. 407).

Jussiaea suffruticosa var. *subglabra* Trim.—*Jussiaea exaltata* Roxb.—*Jussiaea villosa* Lamk.—*Jussiaea fruticosa* DC.—*Jussiaea scabra* Willd.—*Jussiaea burmanni* DC.—*Jussiaea octophila* DC.—*Jussiaea longipes* Griff.—*Jussiaea decumbens* Wall.—*Jussiaea angustifolia* Lamk.—*Jussiaea erecta* Linn.—*Epilobium fruticosum* Lour.

Engl. Primrose Willow; *Sinh.* Bera-diyanilla; *Tam.* Kattukkrambu, Krambuppundu, Nir-kirambu; *Sans.* Bhallavi-anga, Bhulavanga.

A semi-shrubby perennial, 60—120 cm tall, woody below with stiff, erect, cylindrical branches clothed with short spreading hairs; leaves simple, alternate, entire, 5—10 cm long, lanceolate, glabrous or subglabrous tapering to base, acute, lateral veins numerous, prominent beneath; flowers regular, bisexual, chrome yellow, solitary, axillary, sessile, 1.8 cm across with lanceolate bracts; sepals 4, fused into a calyx-tube completely adnate to ovary, quadrangular, hairy, segments ovate, attenuate, acute, longer than the tube; petals 4, rotundate, emarginate, pinnately veined; stamens 8, epigynous, erect, filaments very short; ovary inferior, 4-locular with numerous ovules in each loculus, style very short, stigma large, quadrate, pyramidal; fruit capsule quadrangular, truncate, about 2.5 cm long, tapering downwards, hairy, 8-ribbed, irregularly dehiscent, seeds numerous, ovoid, brown, polished.

Flowers during February and from May to October.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 436. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya, Philippine Islands and S. America. It is found in the moist low-country in wet places in Ceylon up to an altitude of 3,000 feet.

India. Khasia: *J. D. Hooker and T. Thomson*. Bengal: *J. D. Hooker*; Calcutta, *Wallich* 6333A. Misor and Carnatic: *G. Thomson*. Malabar and Concan: *Stocks, Law, etc.*; Coimbatore, *Wallich* 6333B. Assam: *Prain's Collector* 8, Oct. 1898. Ceylon. Central Prov., Peradeniya Exp. Station, *Alston* 1252, Oct. 1926; Kandy, *Thwaites C.P.* 1540. Malaya. Singapore, *Anderson* 56, Oct. 1861. S. Andamans. *King*, April 1890. Philippine Islands. Luzon: Benquet Prov., *Baguio, Elmer* 5768, March 1904. Mexico. Morelos: *Pringle* 8250, Oct. 1899. Ecuador. *Fraser*.

Uses. A decoction of this plant is considered a vermifuge and purgative. The macerated plant given with butter-milk is beneficial for dysentery.

79. OPHIOGLOSSACEAE

1. *Helminthostachys zeylanica* (Linn.) Hook. and Bauer, Gen. Fil. t. 80 B.

Osmunda zeylanica Linn.

Sinh. Thaniwella.

A herb with thick, fleshy, creeping rhizomes; stipes 15—30 cm long, fronds growing singly from the underground rhizome, leaf-blade palmately pinnate in three divisions which are stalked, each dividing again into 2—5 segments, the ultimate divisions lanceolate or linear-oblong, 7—15 cm long, 2—4 cm broad, the apex acuminate, margin slightly toothed or entire; fertile spike solitary, arising from the base of the leaf blade, 7—20 cm long, 1.2 cm broad, the peduncle about as long as the upper fertile portion and firm; capsules in long crested clusters which form a long loose spike, veins forked, free; sterile segments foliaceous and digitate.

Illustrations. Hooker and Bauer, Gen. Fil. *pl.* 48*B*; Beddome, Ferns of South India, *pl.* 69; Beddome, Ferns of Brit. India, Ceylon and Malay Peninsula, *pl.* 292. 1883.

Distribution. Occurs in India, Ceylon, Malay Peninsula, Philippine Islands, tropical Australia and New Caledonia. It is common in swampy places in the Western and Southern Provinces in Ceylon. Heneratgoda, Kalutara, Wathupitiwela, etc.

Ceylon. Western Prov., Gampaha, *J. M. de Silva*, Aug. 1926; Heneratgoda, *Senaratne*, Dec. 1938; *Thwaites C.P.* 1411; Kelaniya, *J. M. Silva*, Aug. 1915; Hanwella, *Alston* 881, Aug. 1927; Kaduwela *Cooray* 125, June 1959. Southern Prov., Matara, *Cooray* 162, May 1962.

Composition. This plant is an excellent source of phosphorus, iron and a fair amount of calcium.

Uses. The rhizomes are used in the treatment of syphilis, dysentery, catarrh, whooping cough and phthisis. In Moluccas, they are employed as a mild aperient.

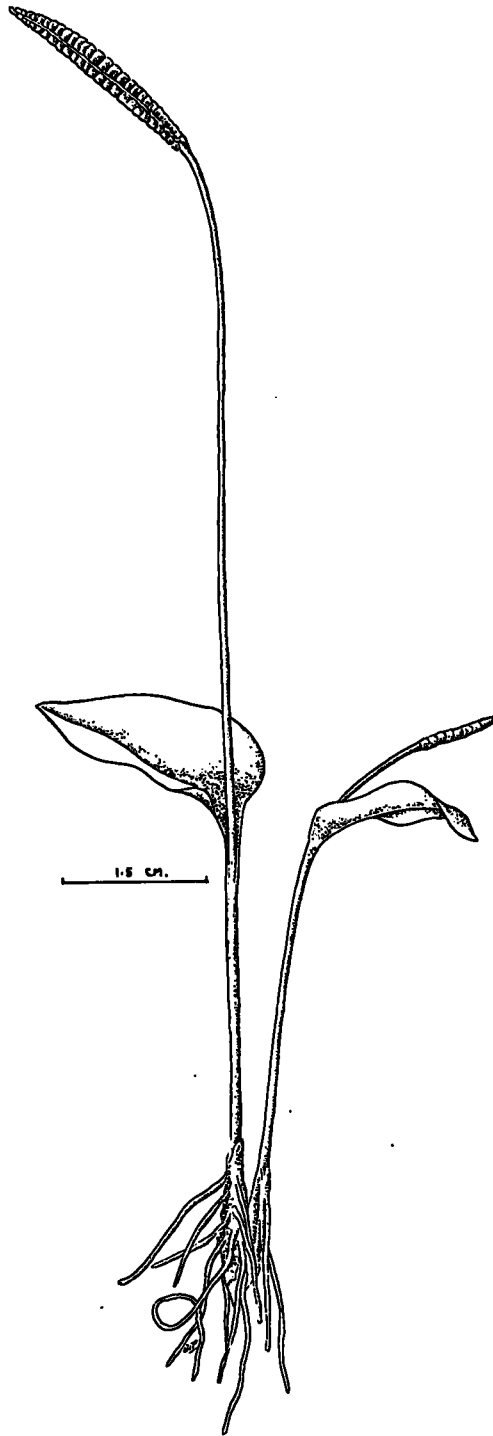


FIG. 408. *Ophioglossum pedunculatum*, entire plant with rhizome, frond and spike.

2. *Ophioglossum pedunculosum* Desv. (Fig. 408).

Ophioglossum reticulatum Linn.—*Ophioglossum cordifolium* (Roxb.) Wall.

Sinh. Ekapetipiyān.

A small terrestrial herb with an elongated underground rhizome provided with many fibrous rootlets; fronds large, sterile division placed a little below the middle, sterile frond or leafy portion 3.7—7.5 cm long, 2.5—5 cm broad, thin, ovate, apex blunt or acute, base cordate, veins prominent without a midrib, spike stalked, peduncle 5—10 cm long, fertile portion about 2.5 cm long; capsules sessile, arranged in two rows forming a narrow close spike which arises from the base of the barren segment, capsule deeply 2-valved, opening down the side nearly to the base without a ring, vernation erect.

Illustrations. Beddome, *Ferns of S. India*, pl. 70; Beddome, *Ferns of Brit. India, Ceylon and Malay Peninsula*, pl. 290. 1883.

Distribution. Occurs in South India, Ceylon, Malay Peninsula, tropical America and Africa, and Philippine Islands. It is rare in Ceylon, generally confined to Nuwara Eliya and the neighbourhood.

Ceylon. Central Prov., Ramboda, *Thwaites C.P.* 1408. Western Prov., Nugegoda, *Cooray* 130, June 1959.

Uses. This plant is used for treating wasting diseases, arresting sexual weakness and painful micturition. It is also employed for the treatment of insanity.

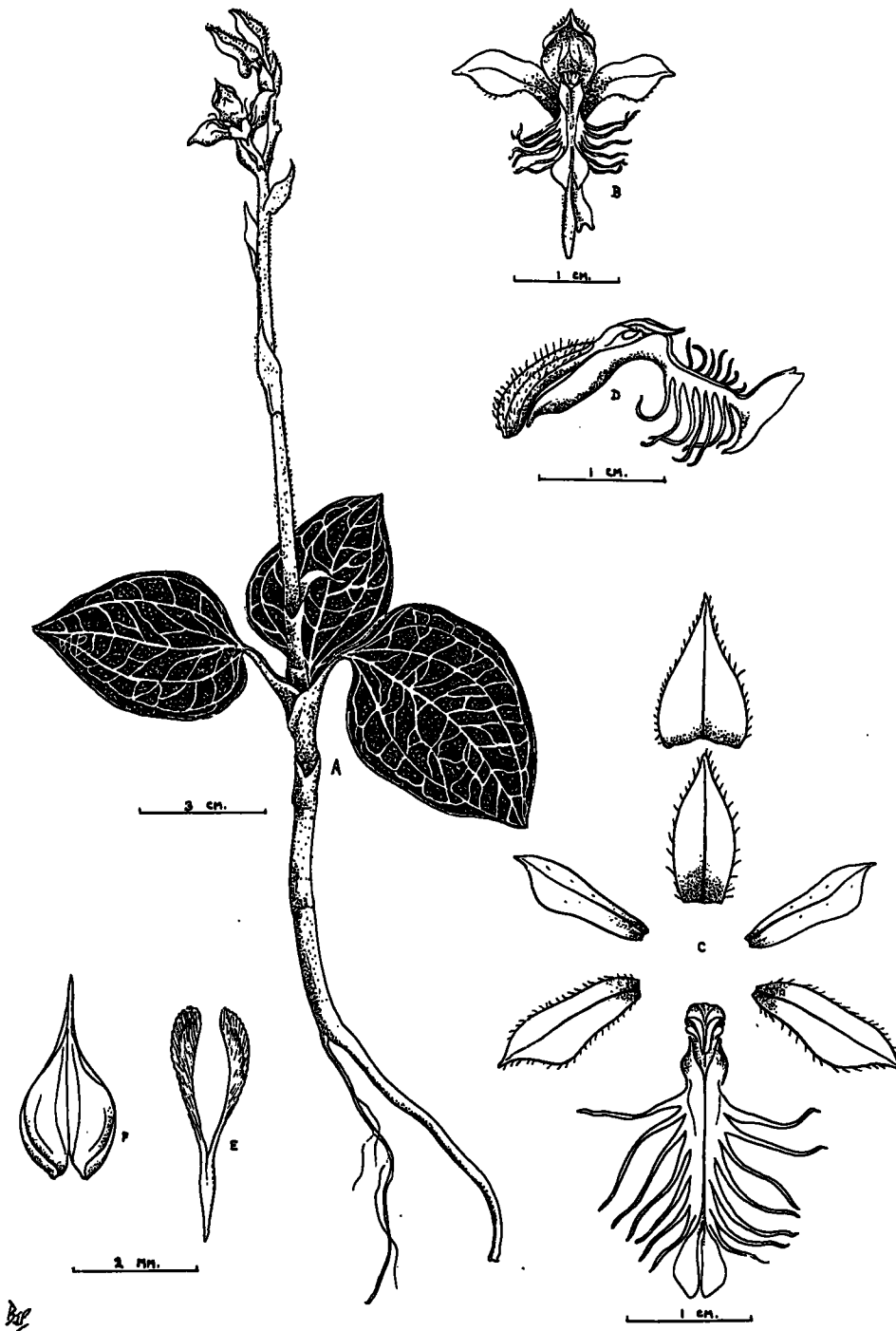


FIG. 409. *Anoectochilus setaceus*. A, whole plant with leaves and flower spike. B, flower, dorsal view. C, dissection of the flower showing the bract, sepals, petals and lip spread out. D, lip showing the spur and pistil, lateral view. E, pollinia. F, operculum of the anther.

80. ORCHIDACEAE

1. *Anoectochilus setaceus* Blume, Bidjr. Nederl. Ind. 412. 1825. (Fig. 409)

Chrysobaphus roxburghii Wall.—*Anoectochilus regale* Blume.—*Anoectochilus setaceus* var.—*inornatus* Hook.

Sinh. Wanaraja.

Terrestrial leafy herb with a creeping stem, the terminal end erect and above ground; leaves 3—5, spreading, 2.5—4 cm long, 1.7—2.5 cm broad, ovate, acute, glabrous, dark velvety green above with orange reticulations, paler beneath, petioles sheathing the stem; flowers bilaterally symmetrical, bisexual, white, 1.8 cm broad in glandular pubescent, terminal spikes, peduncle 6—8 cm long, glandular pubescent with 2 or 3 lanceolate, coloured, sterile bracts; floral bracts 0.9—1.1 cm long, 3.5—4 mm broad, lanceolate-ovate, acuminate acute, glandular pubescent, 1-veined; sepals 3, glandular-pubescent, dorsal sepal 9 mm long, 4.5 mm broad, oblong-ovate, acuminate, acute, lateral sepals slightly longer but narrower, obliquely obovate, oblong, acute, bases appressed on the spur; petals 2 lateral and a lip which is attached to the base of the column and spurred, clawed, margins of the claw crinite with 8 long flexuous, filiform lobes on each side, mid-lobe 2-winged, spur 8 mm long, inflated, base notched or bifid with 2 fimbriated calli inside; column 6 mm high, obconical with 2 parallel lamellae in front and lateral stigmatic lobes; anther dorsal on the column, pollinia 2, clavate narrowing to a single caudicle, attached to the rostellum by a small gland; ovary inferior, 1.2 cm long, 3-carpellary, unilocular with numerous parietal ovules.

Flowers in January, May to September and December.

Illustrations. Curtis, *Bot. Mag. pl.* 5208. 1860; Edward, *Bot. Reg. pl.* 2010. 1837; Blume, *Orch. Archip. Ind. pl.* 17B. 1858—1859 *Herb. Peradeniya*, drawing.

Distribution. Occurs in the shade of trees in forests of the mid and low-country in Ceylon, Nuwara Eliya, Ambagamuwa, Ratnapura, Adam's Peak, Ritigala, etc.

Ceylon. North-Central Prov., Ritigala, *Willis*, March 1905. Central Prov., Hantane, *Champion*; Dolosbage, *Herb. Peradeniya*, Sept. 1885; Hunnasgiriya, *Jayaweera* 46, April 1960. Without locality, *Macrae* 1; *Champion*; *Thwaites C.P.* 384. **British North Borneo.** Mt. Kinabalu. *Carr* 3084, March 1933.

Uses. This plant is used for treating snake-bite poisoning.

2. *Ephemerantha macraei* (Lindl.) Hunt and Summerhayes, *Taxon* 10 (4): 101. 1961.

Dendrobium macraei Lindl.—*Callista macraei* (Lindl.) O.Kuntze—*Desmotrichum fimbriatum* Blume.

Sinh. Jatamakuta: *Hindi* Jiban, Joivanti, Sag; *Sans.* Bhadra, Jiva, Jivabhadra, Jivada, Jivani, Jivaniya, Jivanti, Jivapatra, Jivapushpi, Jivavardhini, Jivavriksha, Jivdati, Jivya, Kanjika, Kshudrajiva, Madhushvasa, Madhusrava, Mangalya, Mrigaratika, Payaswini, Pranada, Putrabhadra, Raktangi, Shakashreshtha, Shashashimbika, Shrigati, Srava, Sukhankari, Supringala, Yashaskari, Yashasya.

Tufted epiphyte with a creeping annular rootstock and pendulous, sympodially branching stems, each branch terminating in a fusiform pseudobulb, pseudobulbs 2.5—5 cm long, rather flat, green, shining, grooved longitudinally, covered with papery scale leaves when young; leaves one to each pseudobulb, terminal, 4.5—14 cm long, 1.2—4.2 cm broad, sessile, linear-oblong or lanceolate, obtuse, dark green and shining above, paler beneath, many veined; flowers bilaterally symmetrical, bisexual, white with pale yellow lip, 1.7 cm across, 1—3 arising from the top of the pseudobulb at the base of the leaf, peduncles 5.4 mm long, enveloped by a number of small, greyish white, papery, acuminate, scaly leaves; floral bracts 1.8 mm long, broadly ovate, acuminate, acute, fleshy, 3-veined; sepals 3, dorsal sepal 10.5—11 mm long, oblong-lanceolate, acute, 5 or 7-veined, lateral sepals 10—11 mm long, obliquely oblong, lanceolate, acute or acuminate, 7-veined, adnate to the foot of the column; lateral petals 2, 9.5—10 mm long, lanceolate, lip 1.2 cm long, lateral lobes of lip oblong, midlobe recurved, crenulate, crisped, terminating in a subquadrate, 2-lobed limb with 2 fleshy crests; column 3.2 mm high, oblong, toothed at apex, foot short but broad, margin curved in with a well developed mentum; anther terminal, pollinia 4 in two pairs; ovary inferior, 3-carpellary, unilocular with numerous parietal ovules.

Flowers during March and August.

Illustrations. King and Prantling, *Ann. Bot. Gard. Calc.* 8: *pl.* 86. 1896; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 933. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Malay Peninsula and Philippine Islands. It is rather rare growing on branches or rocks in forests up to 2,500 feet altitude in Ceylon. Hunnasingiriya, Hantane, Dolukande, Ritigala, etc.

India. Sikkim: *Prantling* 266, May 1893. Khasia: *Hooker* 26. Bengal: *Biswas* 1938. Assam: *Rita*. Ceylon. North-Central Prov., Ritigala, *Willis*, March 1905. Central Prov., Hunnasingiriya, *Jayaweera* 1983, Without locality, *Macrae* 21.

Uses. This plant is used as a stimulant and tonic.

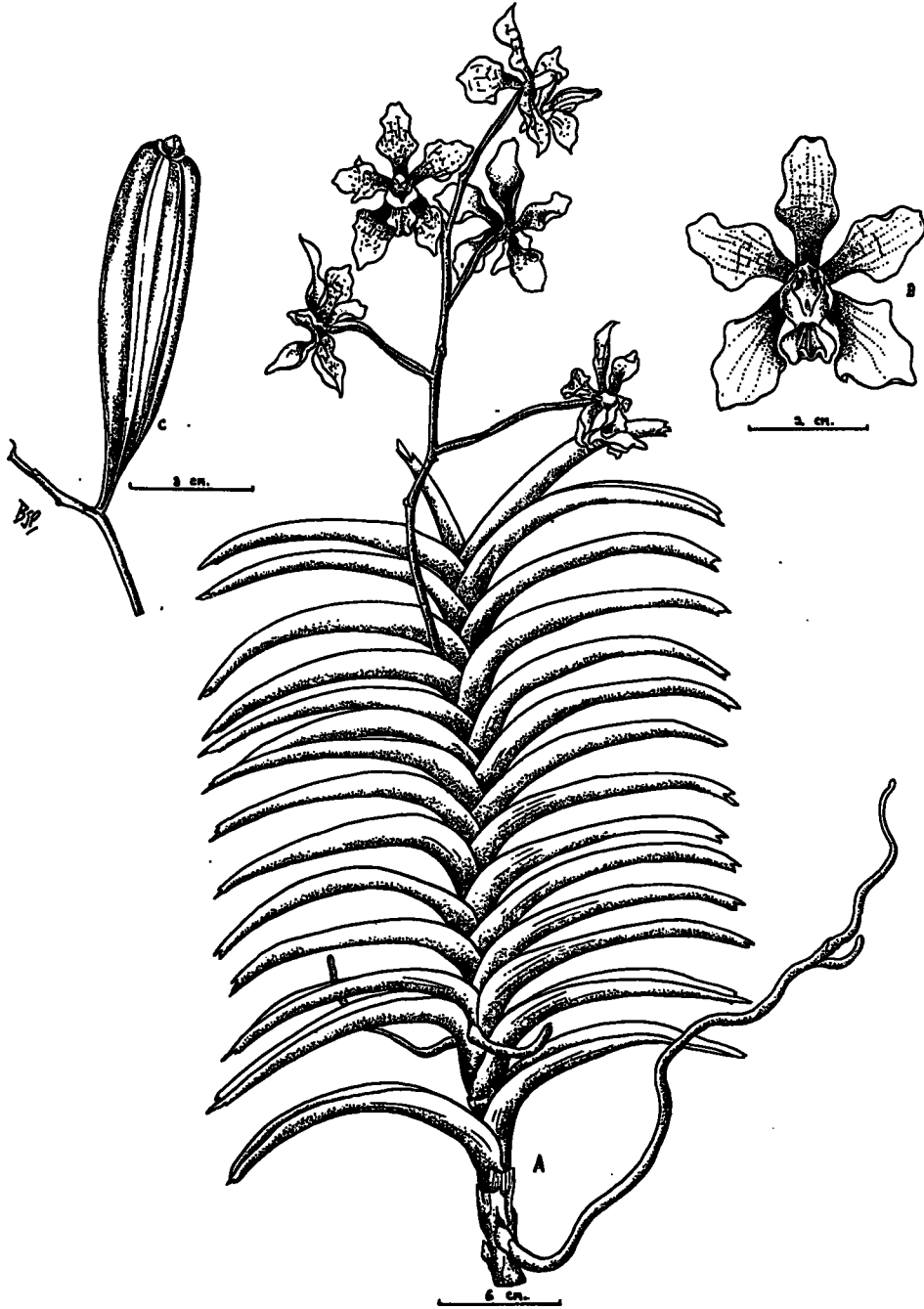


FIG. 410. *Vanda tessellata*. A, plant with a flower raceme. B, flower, dorsal view. C, fruit.

3. *Vanda tessellata* (Roxb.) Lodd. ex G. Don in Loud. Hort. Brit. 372. 1830. (Fig. 410).

Epidendrum tessellatum Roxb.—*Epidendrum tesselloides* Steud.—*Cymbidium tessellatum* Sw.—*Cymbidium tesselloides* Roxb.—*Cymbidium alagnata* Ham. ex Wall.—*Vanda roxburghii* R. Br.—*Vanda unicolor* Steud.—*Vanda tesselloides* Reichb.—*Aerides tessellatum* Wight.

Sinh. Rasni; *Hindi* Banda, Nai, Perasara, Persara, Rasna, Vanda; *Sans.* Atisara, Bhujangaksi, Chhatraki, Dronagandhika, Elaparni, Gandhanakuli, Muktarasa, Nakuleshta, Nakuli, Palankapa, Rasadhya, Rasana, Rasna, Rasya, Sarpagandha, Shreyasi, Sugandha, Sugandhimula, Surasa, Suvaha, Vandaka, Vriksharuha, Yuktarasa.

Stout epiphyte, 30—60 cm high, brown bases of the remnants of old leaves sheathing the internodes in the lower part of the stem; leaves simple, 15—20 cm long, strap-shaped, recurved, distichous, equitant, thick, coriaceous, obtusely keeled, praemorse with two unequal lobes and a short pointed one in between; flowers bilaterally symmetrical, bisexual, large, 5 cm across in various shades of grey, red or yellow in 4—10-flowered racemes measuring 15—20 cm in length, peduncle stout with 2 or more sterile bracts, floral bracts 2.7 mm long, broadly triangular ovate; sepals 3, dorsal sepal 2.4 cm long, obovate, faintly trifid, margin wavy, lateral sepals 2.5 cm long, obovate, obtuse, wavy and many-veined; petals 3, lateral petals 2.5 cm long, obovate, wavy, lip funnel-shaped, 3-lobed, lateral lobes erect, obliquely oblong, acute, midlobe panduriform, constricted below the bifid apex, disc swollen with fleshy curved ridges, spur conical, short, blunt, laterally compressed, column 9 mm high, fleshy, cylindrical; anther terminal, pollinia 2, globular, unequally bifid, attached to a large gland by a short and broad conical strap; ovary inferior, 3-carpellary, unilocular with numerous parietal ovules, fruit a clavate, ribbed capsule 7.5—9 cm long.

Flowers during January, March to August and in December.

Illustrations. R. Brown in Edward's Bot. Reg. *pl.* 506. 1820; Wight, *Ic. Pl. Ind. Or.*, *pl.* 916. 1843—1845; Roxburgh, *Pl. Corom.* 1: *pl.* 42. 1795; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 931. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, Ceylon, Burma and China. It is rather common on trees in the dry zone and east coast of Ceylon. Jaffna, Batticaloa, Puttalam, Anuradhapura, Polonnaruwa, etc.

India. Nepal: Khairbhati, *Inayat*, April 1900. Madhya Pradesh: Chota Nagpore, Palandu, *A. Coore* 148, 1898—1899. Bihar: *J. D. Hooker*. Andhra Pradesh: Nellore, *M. S. Ramaswami* 1337, July 1914. Mysore: South Canara, *Barber* 2531, Nov. 1900. Pen. Ind. Or., *Herb. Wight* 2976, Kew Distribution 1866—1868 Ceylon. North-Central Prov., Maradankadawala, *Herb. Peradeniya*, Aug. 1885. North-Western Prov., Puttalam, *Herb. Peradeniya*, July 1883. China. Yunnan: *Tsai* 56757, Jan. 1934. Hainan: Kachik and vicinity, *Lau* 1415, March 1933.

Uses. The root of this herb is used for rheumatism and other allied diseases. It is a constituent in the medicated preparations for external application for rheumatism and diseases of the nervous system.

4. *Zeuxine regia* (Lindl.) Trimen, Syst. Cat. Pl. Ceyl. 90. 1885.

Monochilus regium Lindl.

Sinh. Iru-raja.

A terrestrial leafy herb with a creeping stem rising above to 7—12 cm in height; leaves simple, few 4—6 to a plant, 3.5—6.5 cm long, rather distant, oblanceolate or oval-lanceolate, reddish brown with a silvery grey band in the middle on the upper surface, paler beneath, petioles short, membranous, sheathing the stem at the base; flowers bilaterally symmetrical, bisexual, greenish white in terminal, long-peduncled, glandular pubescent spikes, peduncle with 3—4 sterile bracts, floral bracts 4.6 mm long, broadly ovate, acuminate, glandular pubescent; sepals 3, dorsal sepal 3.5 mm long, ovate, acuminate, subacute, lateral sepals 3.7 mm long, oblong; petals 3, lateral petals 3.5 mm long, dimidiate-ovate, rounded or subacute, appressed on the dorsal sepal to form a hood over the column, lip 3.2 mm long, subquadrate, cymbiform, lateral lobes folding in and enclosing 2 stout linear recurved calli; column 1.7 mm high, ovate, acuminate, deeply bifid, stigmatic lobes along the margin; anther dorsal, pollinia 2, obovoid or pyriform, sessile on a linear strap, gland small, shield-shaped; ovary inferior, 3-carpellary unilocular with numerous parietal ovules, fruit a small, fusiform capsule, 7.5 mm long.

Flowers during December and January.

Illustration. Herb. Peradeniya, drawing.

Distribution. A rather common endemic species growing under shade of trees in forests of the mid-country. Ritigala, Adam's Peak, Kurunegala, Hantane, Rangala, Galaha, Nuwara Eliya, etc.

Ceylon. Central Prov., Hantane, *Schlechter*, Aug. 1905; Pitakande, *J. M. de Silva* Feb. 1927; Hunnasingiriya, *Jayaweera* 462, Jan. 1961. Without locality, *Macrae* 63, 1829; *Thwaites* C.P. 2643.

Uses. This plant is used for treating snake-bite poisoning.

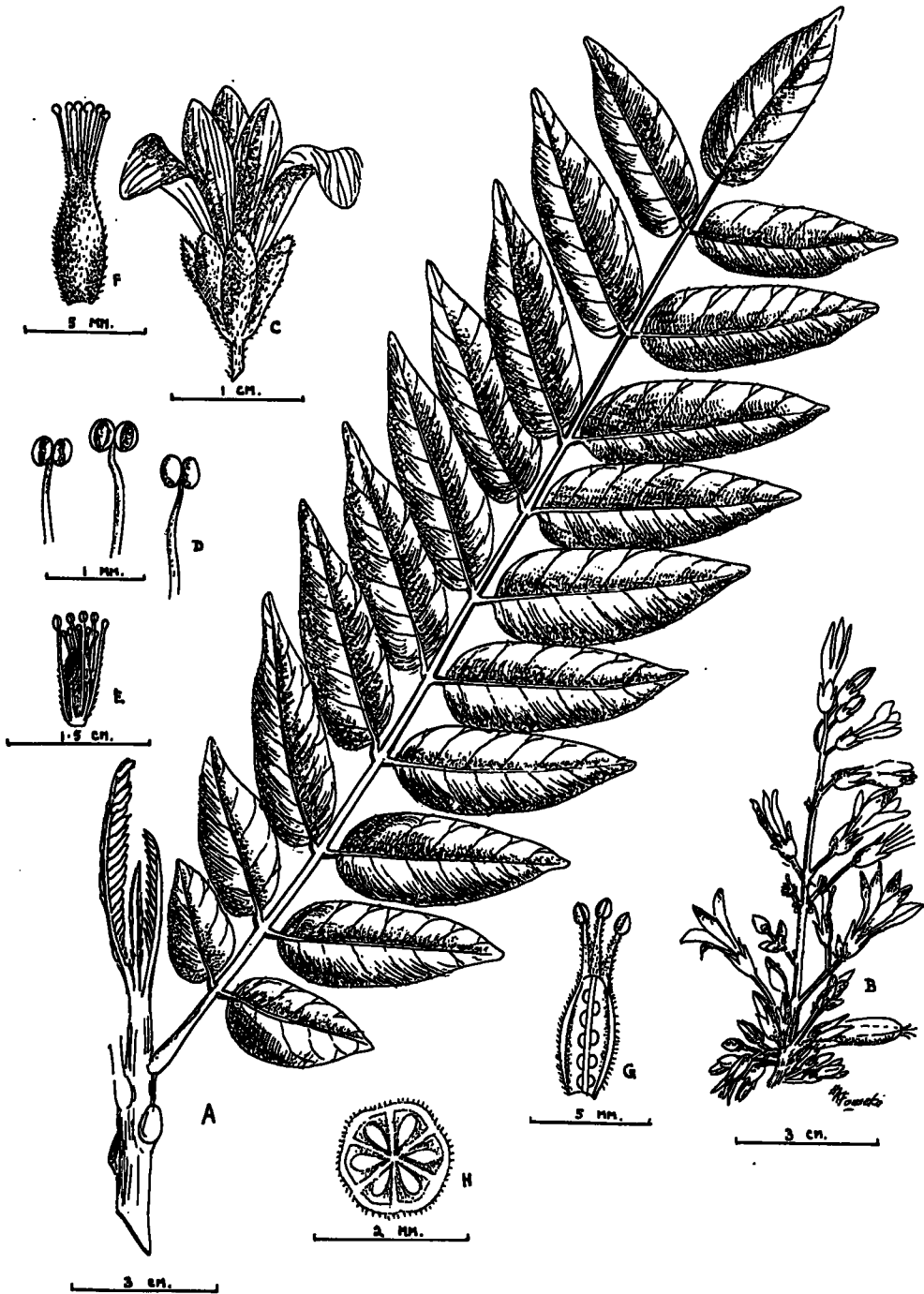


FIG. 411. *Averrhoa bilimbi*. A, twig with a compound leaf. B, inflorescence. C, flower, lateral view. D, stamens. E, shorter stamens and pistil, longer stamens removed. F, pistil. G, longitudinal section of pistil. H, transverse section of ovary.

81. OXALIDACEAE

1. *Averrhoa bilimbi* Linn. Sp. Pl. 428. 1753. (Fig. 411).

Engl. Bilimbi, Blimbing, Cucumber-Tree; *Sinh.* Bilin, Bimbiri; *Tam.* Kochittamarattai, Pilimbi, Pulichakkay, Pulima.

A small tree 5—7 m tall, rusty pubescent on young parts and petioles, bark reddish brown; leaves alternate, imparipinnate, exstipulate, each containing 11—35 leaflets, pinnae entire, 3.7—5 cm long, 1.8 cm broad, oblong, more or less pubescent on both surfaces, base usually rounded, somewhat oblique, petiolules 2—4 mm long and pubescent; flowers regular, bisexual, small, fragrant, arising from the trunk and branches in villous panicles; sepals 5, imbricate, outer ones shorter, 4 mm long, ovate-lanceolate, acute, pubescent outside; petals 5, red-purple, hypogynous, contorted, oblong-spathulate, more than twice as long as sepals, glands absent; stamens 10, very shortly connate at the base into a ring, all perfect, filaments of alternate stamens twice as long as the others; ovary superior, 5-carpellary, 5-locular, pubescent, 4 mm long, with numerous axile ovules, styles 5, distinct, 3 mm long, pubescent, persistent, stigmas capitate; fruit fleshy, large, drooping, oblong berry 5—10 cm long, furrowed lengthwise, indehiscent, seeds flat and exarillate.

Flowers from March to May and during November.

Illustrations. Beddome, *Flor. Sylvat. pl.* 117. 1868—1873; Kirtikar and Basu, *Indian Med. Plants, pl.* 179. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India and Malaya; known only as a cultivated and naturalized plant in tropical countries. It is a common garden plant in the mid and low-country in Ceylon.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Feb. 1888. **Maldives Islands.** *Didi* 92. 1896. **Malaya.** Singapore, *Anderson* 84, 1861.

Composition. The fruit of this plant contains potassium oxalate.

Uses. Heyne reports that a decoction of the leaves of this tree is given for inflammation of the rectum in Java. A paste of the leaves is applied for mumps, rheumatism and pimples. The fruit is used for piles and fevers. The juice of the fruit made into a syrup is used in cases of haemorrhage from bowels, stomach and internal haemorrhoids. The mature and dried fruits are used as a vegetable.

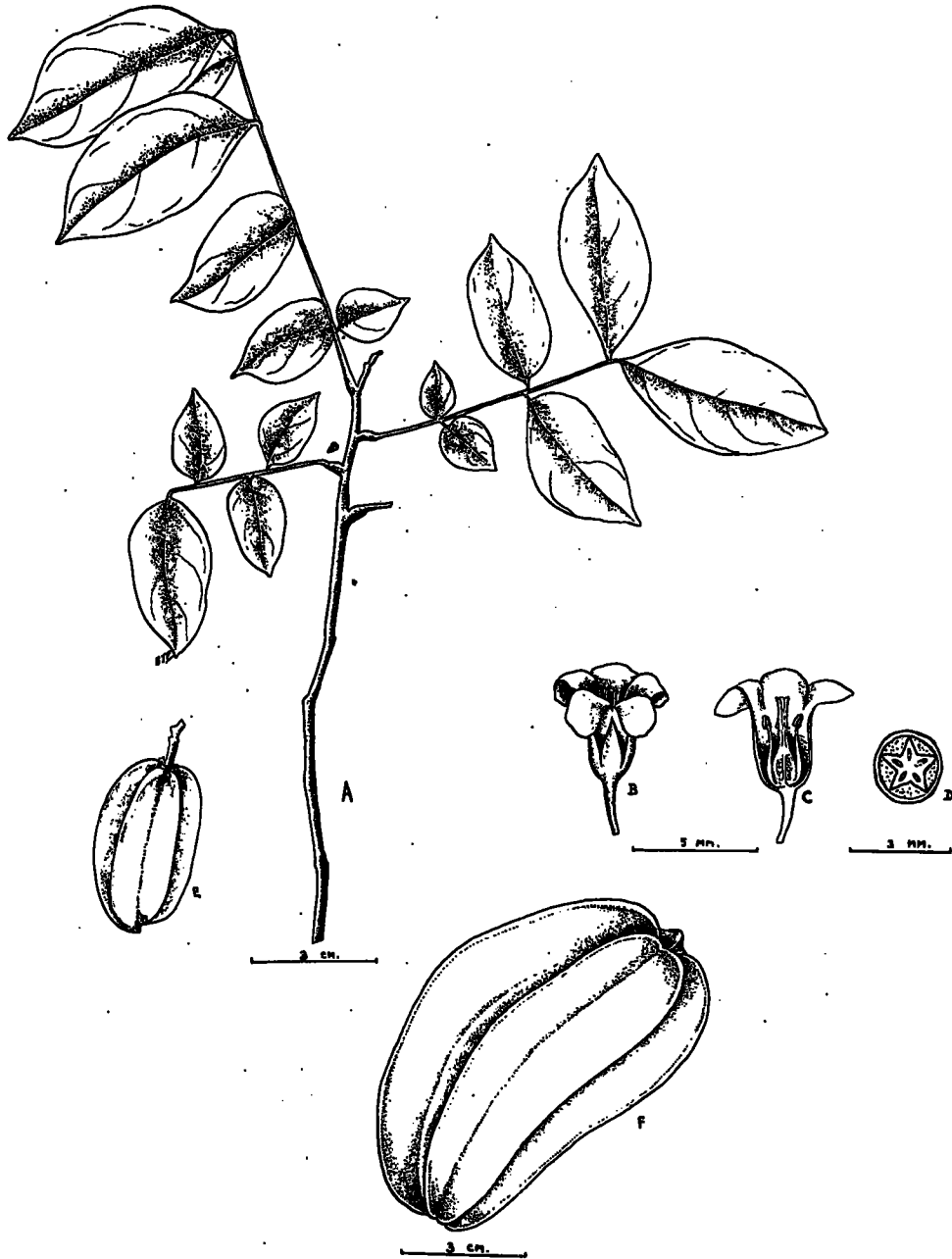


FIG. 412. *Averrhoa carambola*. A, twig with compound leaves. B, flower, lateral view. C, longitudinal section of flower. D, transverse section of ovary. E, young fruit. F, mature fruit with ribs.

2. *Averrhoa carambola* Linn. Sp. Pl. 428. 1753. (Fig. 412).

Averrhoa pentandra Blanco.

Engl. Carambola Apple, Chinese Gooseberry; *Sinh.* Kamaranga; *Tam.* Kandasagadam, Sagadam, Sigam, Sisam, Tamarattai; *Sans.* Brihaddala, Dharaphala, Karmar, Karmara, Kamaranga, Karuka, Mudgara, Pitaphala, Rujakara, Shiral, Shukapriya.

A small tree about 10 m tall, with close drooping branches, young parts finely pubescent or glabrate; leaves alternate, imparipinnate compound, exstipulate, leaflets 5—11, irritable to the touch, 3.7—6.2 cm long, 1.8—3 cm broad, ovate-oblong, acuminate, entire, glabrous or pubescent above, glaucous and glabrous underneath, base oblique, acute, petiolules short, stout, pubescent; flowers regular, bisexual, in short axillary racemes, sometimes springing from the bark; sepals 5, imbricate, 3—6 mm long, glabrous; petals 5, hypogynous, contorted, more than twice as long as sepals, oblong-ovate, variegated white and purple; stamens 10, of which 5 are shorter and without anthers, or sometimes 1 or 2 of these longer and antheriferous, filaments dilated at base; ovary superior, 5-carpellary, 5-locular with numerous axile ovules, styles 5, distinct, stigmas capitate; fruit 7.5—12.5 cm long, ovoid, ellipsoid or oblong, acute angled with 3—5 deep ribs, yellow, very pulpy, fragrant; seeds arillate.

Flowers from May to August and in November.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 178. 1933; Herb. Peradeniya drawing.

Distribution. Occurs in the Malayan region and widely cultivated in the tropics. It is somewhat common in Ceylon, often planted in the mid and low-country.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, May 1888. *Maldivé Islands.* *Didi* 68, 1896. *Indo-China.* *Squires* 403, May 1927. *British North Borneo.* Sandakan, *Castro* 3845, April 1927. *Brazil.* Bot. Gard., cultivated, *Baker* 60, June 1908.

Composition. The fruit of this tree is a good source of iron and contains vitamins B and C in addition to oxalic acid and potassium oxalate. The seeds contain an alkaloid harmaline.

Uses. A decoction of the leaves and fruits is given to arrest vomiting. The fruit is a good remedy for internal bleeding piles. It is laxative, antiscorbutic, sialogogue and antiphlogistic. The seed is regarded as a narcotic and a good anodyne for asthma, colic and jaundice. The Chinese use the flowers for treating skin diseases.

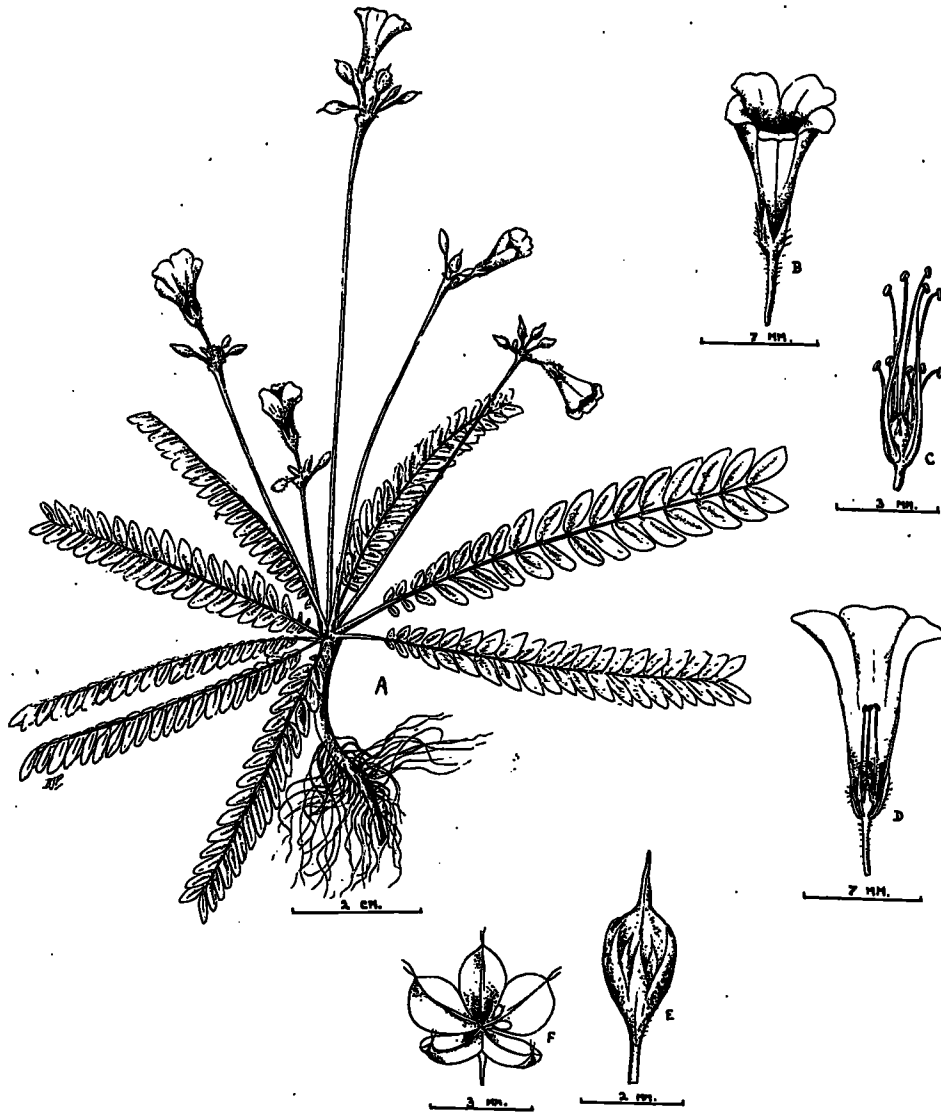


FIG. 413. *Biophytum reinwardtii*. A, whole plant with roots, leaves and umbels of flowers. B, flower, lateral view. C, flower with the perianth removed showing the stamens and pistil. D, longitudinal section of flower. E, fruit with persistent calyx. F, dehiscent capsule.

3. *Biophytum reinwardtii* Klotsch in Peters Moss. Reise, 85. 1861—63. (Fig. 413).

Oxalis sensitiva Linn.—*Oxalis reinwardtii* Zucc.—*Oxalis metziana* Miq.—*Oxalis gracilentia* Kurz—*Biophytum sensitivum* Trim.

Sinh. Gasnidikumba; *Sans.* Jalapushpa, Jhullapushpa, Jvalatpushpa, Krichhaha, Laghuvrikshaka, Lajjaluka, Panktipatra, Pitapushpa.

An annual herb with a short, erect, reddish stem 2.5—5 cm high; leaves paripinnate compound crowded into a rosette at the top of the stem, spreading, 3.7—7.5 cm long, petioles short, leaflets 10—16 pairs, sensitive, lower ones smaller, terminal pair the largest, 1 cm long, oblong, truncate or subcordate at base, apiculate, glabrous, paler beneath; flowers regular, bisexual, golden yellow with red veins, 0.8 cm long, numerous in axillary stalked umbels, peduncles erect, slightly exceeding the leaves, stiff, glandular pubescent, pedicels slender, spreading, bracts very small, numerous, crowded, longer than sepals; sepals 5, distinct, imbricate, linear-lanceolate, acute, 3—5-veined, glandular hairy; petals 5, contorted, connate into a salver-shaped corolla much exceeding the sepals, lobes rounded, spreading; stamens 10, distinct, inner 5 longer; ovary superior, 5-carpellary, 5-locular, styles 5, nearly glabrous; fruit a globular, ovoid, loculicidal capsule, apiculate, valves flat and spreading after dehiscence, seeds strongly tuberculate.

Flowers throughout the year.

Illustrations. Rheede, Hort. Mal. 9: pl. 19. 1689; Kirtikar and Basu, Indian Med. Plants, pl. 177. 1933; Herb. Peradeniya, drawing.

Distribution. Grows in the warmer parts of India and tropics including Java and China. It is a very common herb growing as a roadside weed in the low-country in Ceylon.

India. Sikkim: *T. Thomson*, 1857; *Wallich* 4343A; *Hance* 4834, July 1872. Ceylon. Central Prov., Hantane, *Thwaites* C.P. 1190. Uva Prov., Weragantota, *Alston* 1669, Feb. 1928; Lunugala, *Herb. Peradeniya*, Jan. 1888.

Uses. The leaves of this herb are diuretic and expectorant. The ground leaves are applied to wounds and bruises. A decoction of the herb is given for hypertension. In Java, a decoction of the leaves is given for asthma, phthisis and snake-bite poisoning, while a decoction of the root is drunk for gonorrhoea and stone in the bladder. The powdered seed mixed with cow ghee is applied on abscesses to promote suppuration.

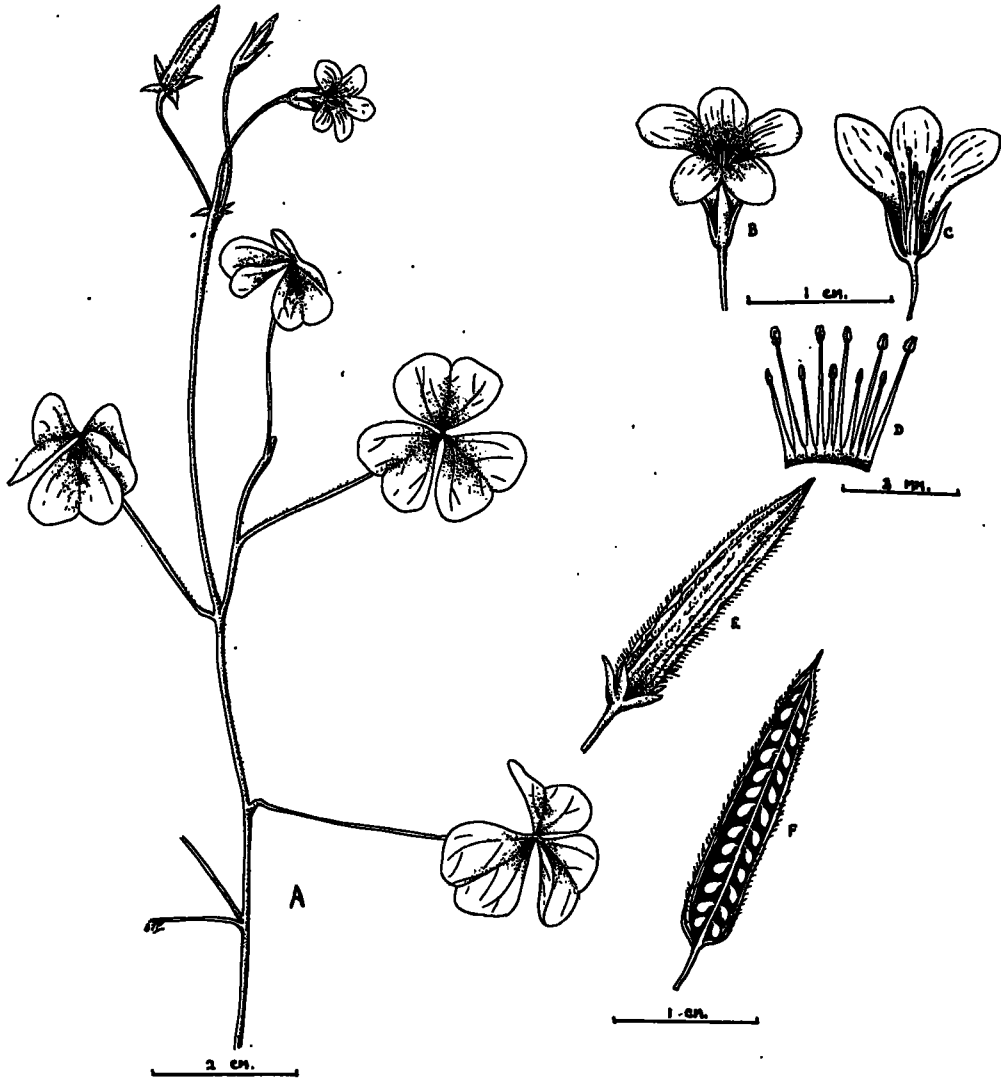


FIG. 414. *Oxalis corniculata*. A, branch with leaves, flower and fruit. B, flower, lateral view. C, longitudinal section of flower. D, stamens spread out. E, fruit. F, longitudinal section of fruit showing seeds.

4. *Oxalis corniculata* Linn. Sp. Pl. 435. 1753. (Fig. 414).*Oxalis repens* Salisb.

Engl. Indian Sorrel; *Sinh.* Embul-embiliya, Embulpala, Hinembulembiliya; *Tam.* Paliakiri, Puliyarai; *Hindi* Amrul; *Sans.* Ambashta, Amlalonika, Amlika, Amlotaja, Changeri, Chukrita, Shuklika.

A perennial herb with a long slender subterranean creeping stem rooting at nodes and giving off slender, ascending, much branched, pilose branches, roots tuberous; leaves alternate, trifoliate, stipulate, on very long slender, hairy petioles, leaflets sessile, over 1.2 cm long, broadly obcordate, glabrous, ciliate, stipules small adnate to petiole; flowers regular, bisexual, yellow, 1 cm long in little umbels of 1—3 on erect axillary peduncles greatly exceeding the leaves, pedicels slender, hairy, bracts setaceous in a ring below the pedicel; sepals 5, distinct, imbricate, lanceolate, obtuse, pilose; petals 5, contorted, slightly coherent at base, exceeding sepals, rounded, long-clawed; stamens 10, connate at base, five inner ones longer; ovary superior, 5-carpellary, 5-locular; oblong and pubescent with numerous axile ovules, styles 5, stigmas papillate; fruit a 5-chambered loculicidal capsule 1.8 cm long, linear-oblong, pubescent, 5-angled with a short beak; seeds surrounded by a white, fleshy aril, testa strongly transversely ridged, brown.

Flowers throughout the year.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 18. 1838; Kirtikar and Basu, *Indian Med. Plants*, pl. 176B. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs throughout the warmer regions of the world. It is a very common weed in Ceylon.

India. Him. Bor. Occ., *T. Thomson*. Naga Hills, *Prain's Collector*, 1886. *Pen Ind. Or.*, *Herb. Wight* 460. **Ceylon.** Nuwara Eliya, *Thwaites C.P.* 1189; Deltota, Bowalana Estate, *Herb. Peradeniya*, July 1924; Ambawela, *Silva*, March 1906. **Japan.** *Maximowicz*, 1861.

Composition. This plant contains acid oxalate of potassium.

Uses. It is a cure for scurvy. The juice of the leaves boiled in cow ghee and curd is given for piles, strangury, prolapse, etc. The juice is also used for cleaning wounds and applied on itch. It is an antidote for mercurial, arsenic and *Datura* poisoning. The bruised leaves applied as a poultice on inflamed parts relieves pain. In the Philippine Islands, a decoction of the leaves is prescribed for fevers and dysentery.

82. PALMAE

1. *Areca catechu* Linn. Sp. Pl. 1189. 1753.

Areca faufel Gaertn.—*Areca hortensis* Lour.—*Areca alba* Rumph.

Engl. Areca-Nut Palm, Betel-Nut Palm; *Sinh.* Puwak; *Tam.* Kamugu, Kandi, Kiramugam, Kugagam, Pakku, Pakkupanai, Pugam, Tuvarkkay; *Hindi* Supari, Suppari, Supyari; *Sans.* Akota, Chhataphala, Chikkana, Dirghapadapa, Dridhavalkala, Ghouta, Gopadala, Guvaka, Kapitana, Karamatta, Khapura, Kramuka, Puga, Pugi, Rajatala, Suranjana, Tambula, Tantusara, Valkataru.

An erect palm with a slender, annulate trunk, all parts glabrous; trunk 13—26 m tall, 20—40 cm diam., straight, cylindrical, of equal thickness throughout and grey; leaves pinnatisect, 1.3—2 m long, erecto-patent and recurved, leaflets (reduplicate-plicate) numerous, crowded, 30—60 cm long, linear to linear-lanceolate, many-veined, lower finely acuminate, upper praemorse or bifid, uppermost confluent, sheath long and smooth; spathes simple, compressed, glabrous; spadix infrafoliar, branched, monoecious, very shortly peduncled, 30—45 cm long or more, branched paniculately at the base, rachis short, stout, compressed, smooth, branches filiform terminating in pendulous male spikes; male flowers small, more or less distichous; calyx deeply cut into 3 minute triangular valvate segments; petals 3, much longer than sepals, oblong, rigid, striate, valvate; stamens 6, hypogynous, filaments very short, triangular, anthers sagittate, basifixed, pistillode 3-fid; female flowers 1—3 at the bases of the branches or at their axils, much larger than the males; sepals 3, imbricate, 8 mm long, ovate-cordate, obtuse; petals 3, longer than sepals, imbricate, staminodes forming a 6-toothed membrane; ovary superior, unilocular, stigmas 3, sessile, ovule basal, erect; fruit 3.2—5 cm long, ovoid, orange or scarlet; seed ovoidly hemispheric, about 1.8 cm diam., base truncate, endosperm ruminant, embryo basilar.

Flowers all the year round.

Illustrations. Roxburgh, Pl. Corom. 1: pl. 75. 1795; Gaertner, Fruct. et Sem. Plant. 1: pl. 7, fig. 2. 1788; Kirtikar and Basu, Indian Med. Plants, pl. 986. 1933; Bentley and Trimen, Med. Plants, pl. 296. 1880; Macmillan, Trop. Plant. and Gard., pl. 367. 1956; Herb. Peradeniya, drawing.

Distribution. Cultivated in Asia and Malayan Islands, possibly a native of Philippine Islands as it was found wild in the primary forests of Palawan. It is very commonly cultivated in the mid and low-country in Ceylon.

India. Calcutta, Bot. Gard., cultivated. Ceylon. Central Prov., Peradeniya, Bot. Gard. cultivated, *Baker* 136; *Herb. Peradeniya*, June 1916; *Herb. Peradeniya*, Feb. 1907.

Composition. The seed of this palm contains the alkaloids arecaidine, arecaine, arecolidine, arecoline, guvacine and isoguvacine. The leaves and stems also contain an alkaloid, while the entire plant has norarecaidine and norarecoline. Besides these, the nut contains tannin, gum and gallic acid.

Uses. The dried nut is stimulant, astringent and taenifuge. It is a powerful sialogogue and stimulates the secretion of sweat. It is used as a masticatory, dentifrice and vermifuge. Women in Malaya use the young shoots as an abortifacient in early pregnancy. The juice of the young leaves mixed with oil is used externally for lumbago in India. The powdered nut is effective in expelling tapeworms from human beings and also combating roundworms. In China, the bark is used for choleraic ailments and for flatulent and dropsical conditions. In Ceylon, the grated nut is applied externally on ulcers while the dried unripe nuts along with other ingredients are taken to destroy abdominal worms. In Cambodia, the juice of the leaves is used internally for bronchitis and externally on lumbago, the fruit with opium for diarrhoea and the root for diseases of the liver.

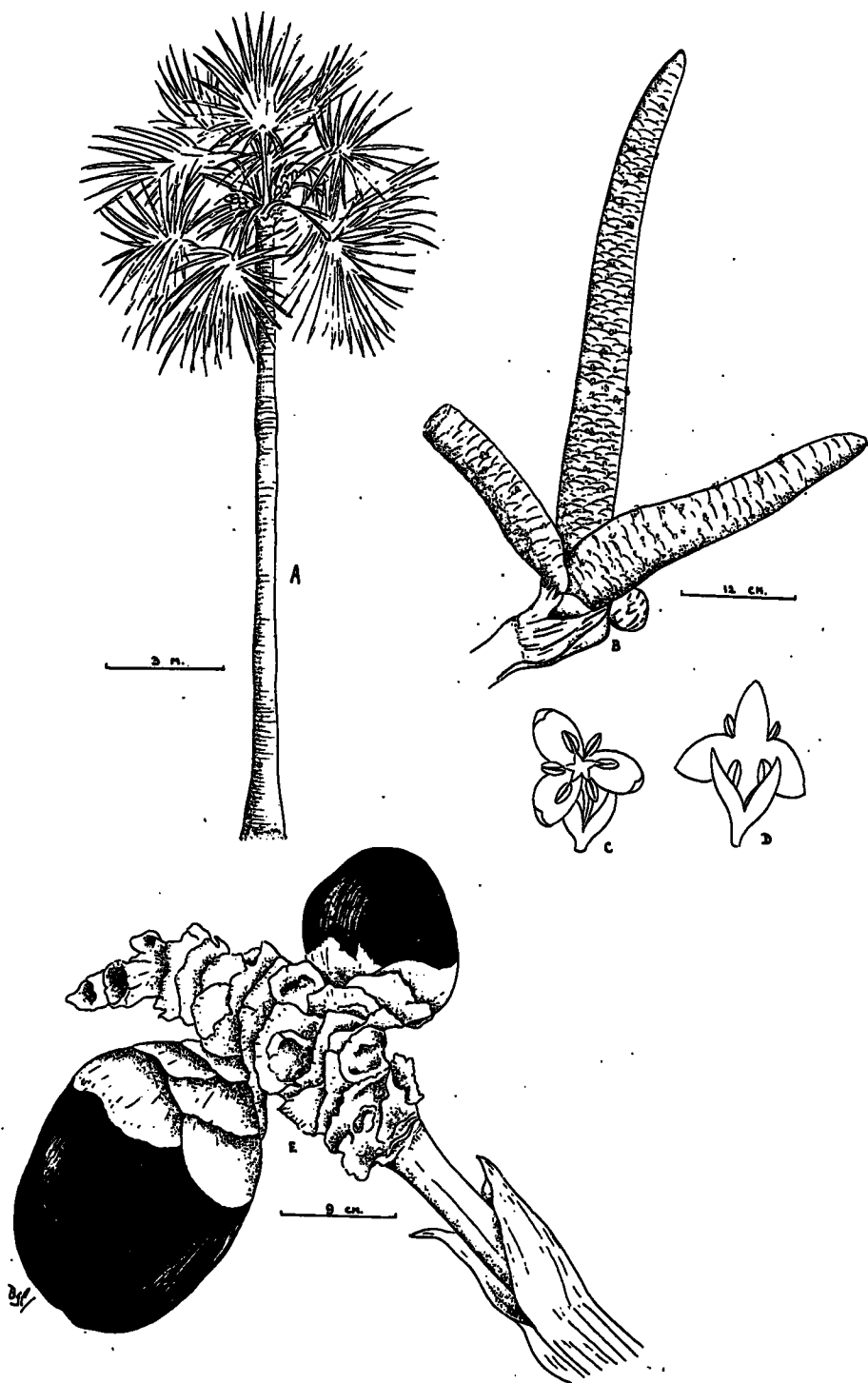


FIG. 415. *Borassus flabellifer*. A, full grown palm with straight trunk and crown of leaves. B, male spadix with spikes. C, male flower, dorsal view. D, male flower, ventral view. E, fruits. C & D, enlarged.

2. *Borassus flabellifer* Linn. Sp. Pl. 1187. 1753. (Fig. 415).

Borassus flabelliformis Murr.—*Borassus dichotomus* White—*Borassus aethiopum* Mart.—*Lantarus domestica* Rumph.

Engl. Palmyra Palm; *Sinh.* Tal, Talgaha; *Tam.* Anbanai, Edagam, Karadalam, Karambanai, Nilam, Nungu, Panai, Pondai, Ponda, Pul, Purbadi, Puttrani, Suttruppanai, Talai, Tali; *Hindi.* Tal, Tar, Tarkajhar; *Sans.* Asavardu, Bhumipishacha, Chiravu, Dhvajadruma, Dirghadru, Dirghapadapa, Dirghaskanda, Dirghataru, Drumashreshtha, Drumeshvara, Guchhapatra, Karapatravan, Lekhyapatra, Madadhya, Madhurasa, Mahonnata, Patri, Shataparva, Tala, Taladruma, Tamsi, Tantugarbha, Tantuniryasa, Taruraja.

A tall dioecious palm with a straight trunk 20—23 m tall and 60—90 cm diam., black, scarred above, swollen above the middle and again contracted upwards; leaves palmately fan-shaped, 2—3.3 m diam., rigidly coriaceous, many-cleft into lanceolate or linear 2-fid lobes 0.6—1.3 m long with spinulose margins, petioles stout with spinous margins, ligule short; spathe sheathing the peduncle, open; spadix interfoliar, branches cylindric; male flowers biseriate in small scorpioid spikelets, densely clothed with imbricating and mixed with scaly bracteoles, exerted seriatim from the bracts as the spikes lengthen; sepals 3, narrowly cuneate, tip truncate, inflexed; petals 3, shorter than sepals, imbricate, obovate-spathulate; stamens 6, anthers large, subsessile, oblong, pistillode of 3 bristles; female flowers large, globose, about 2.5 cm diam., perianth fleshy, sepals 3, imbricate, fleshy, reniform; petals 3, convolute, staminodes 6—9; ovary superior, subtrigonal, 3—4-locular, stigmas 3, sessile recurved, ovules basilar, erect; fruit a broadly obovoid drupe, 20 cm diam., seated on a greatly enlarged perianth, mesocarp fleshy and fibrous, pyrenes 1—3, 6.2 cm broad, obcordate, compressed, black, seeds compressed, testa adherent to the endocarp, embryo apical in the hollow endosperm.

Flowers in March and April.

Illustrations. Roxburgh, Pl. Corom., *pls.* 71 and 72, 1795; Gaertner, Fruct. et Sem. Plant. 1: *pl.* 8. 1788; Kirtikar and Basu, Indian Med. Plants, *pl.* 989. 1933; Macmillan; Trop. Plant. and Gard. *p.* 349. 1956. Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Burma. It is very common in the dry regions especially in the desert and sandy tracts near the coast in Ceylon.

Ceylon. Without locality, *Thwaites C.P.* 3743.

Composition. The sap of this palm contains sugar and ascorbic acid, while the pulp of the ripe fruit is rich in vitamins A and C.

Uses. This is a very useful palm as its timber is used for building purposes and the leaves for thatching and basket making. The inflorescences are tapped for toddy. The orange syrupy extract of the mesocarp of the fruit and the germinating seeds are sources of food. The toddy is beneficial for inflammatory ailments and dropsy. It is a diuretic and is prescribed for chronic gonorrhoea and amoebiasis. A toddy poultice prepared from fresh toddy and rice flour is a stimulant application on gangrenous ulcerations, carbuncles and indolent ulcers. An extract of the green leaves is used internally in secondary syphilis. The potash from the ash of the flower with sugar cane molasses is given for enlarged spleen. The jaggery turned out from the sweet toddy is used for making remedies for cough and phlegm in the chest and is an antidote for food poisoning. The tomentum from the bases of the fronds is used as a styptic to arrest bleeding from superficial wounds. The root is used for cholera and externally for exhaustion and difficult labour. In Cambodia, the root is considered a diuretic, anthelmintic and a cure for gonorrhoea. The young plant is considered antibilious and antidyenteric.

3. *Calamus rotang* Linn. Sp. Pl. 325. 1753.*Calamus roxburghii* Griff.

Sinh. Wewel ; Tam. Priampu

Perennial very slender scandent palm; stem simple, cylindrical, ringed at nodes, upper nodes clothed with spinous leaf sheaths; leaves 45—60 cm long; petioles very short, stout, margined with small straight recurved spines with conical laterally compressed bases, leaflets many, equidistant, lower 20—30 cm long, upper gradually smaller, linear-lanceolate, acuminate, 3-veined, veins naked above or bearing distant bristles, midrib alone, setose beneath, margins setulose; flowers small, polygamo-dioecious male spadix very long, decomposed, flagelliferous, sparingly spinous, spathes elongate, tubular, flower 15—25 cm long, sparingly armed with scattered recurved spines, upper unarmed, scurfy; spikes 2.5—3.7 cm long, recurved or revolute, bracteoles densely crowded, cymbiform; male flowers secund in 3—4 series, 3 mm long, calyx cupular, base thickened, striate, 3-lobed, lobes broad, acute; petals 3, sessile, smooth, acute; stamens 6, filaments very short, subulate, anthers dorsifixed, versatile; female flowers 2.5 mm long, scattered along the slender branches of the spadix; calyx conical, tubular, 3-toothed, base dilated, truncate; petals 3, sessile, valvate, tips only exerted; ovary superior, incompletely 3-locular, clothed with retrorse scales, stigmas 3, ovule basilar, erect; fruit seated on the minute perianth, subglobose, 1.2 cm diam., mucronate, scales in a vertical series, pale yellow.

Flowers during February and March.

Illustration. Griffith, Palms Brit. Ind. pl. 195A.

Distribution. Occurs in Peninsular India and is common in moist places in the dry regions of Ceylon.

Ceylon. Without locality, Thwaites C.P. 3388.

Uses. The rhizomes of this palm are used in decoction for diabetes and indolent ulcers. The cabbage is applied on boils in the form of a paste.

4. *Caryota urens* Linn. Sp. Pl. 1189. 1753.

Engl. Wine Palm; *Sinh.* Kitul; *Tam.* Tippilipana.

A tall unarmed palm, trunk 13—20 m tall and 0.3 m diam., cylindrical, annulate, not soboliferous, flowering when full grown from axils of leaves beginning with the upper and thence successively downward, a male and female spadix alternating and then dying; leaves large, bipinnatisect, 6—7 m long, 3—5 m broad, primary divisions 1.6—2 m, arched and drooping, leaflets 10—20 cm long, fascicled or alternate, cuneiform, sessile, obliquely truncate, irregularly serrate-toothed on the truncate margin, upper margin produced beyond the leaflets into a tail, quite glabrous, bright green, shining, margins at the base recurved, petioles very stout, sheath smooth with fibrous netted margins; spathes 3—5, incomplete, tubular, spadix interfoliar, shortly peduncled, 3—4 m long, the branches simple, forming a dense tassel drooping from the very stout short peduncle; spathes closely embracing the peduncle of the spadix; flowers crowded, males solitary or binate with an interposed female, cylindrical when closed, 1.2 cm long; sepals 3, orbicular imbricate; petals 3, linear-oblong, coriaceous, concave, connate at base, valvate; stamens many, filaments short, anthers acuminate with no pistillodes; female flower subglobose, sepals 3, orbicular imbricate; petals 3, short; staminodes 3 or 6; ovary superior, obovoid, trigonous, 3-locular, stigma 3-lobed, ovule erect; fruit 1.6—1.8 cm diam., globose, red or yellow, 1—2-seeded, pericarp acrid and full of raphides.

Illustrations. Gaertner, *Fruct. et Sem. Plant.* 1: *pl.* 7, *fig.* 3. 1788; Macmillan, *Trop. Plant. and Gard.* *p.* 154. 1956.

Distribution. Occurs in tropical Asia. It is common in the mid and low-country moist regions up to 3,000 feet altitude in Ceylon.

India. Khasia: *J. D. Hooker and T. Thomson.* *Pen. Ind. Or., Herb. Wight* 2765, *Kew Distribution* 1866—1868. Ceylon. North-Central Prov., Ritigala, *Willis*, March 1905. Southern Prov., Ruhuna National Park, Kumbukkan Oya, *Cooray* 69073109R, July 1969.

Uses. The root bark and cabbage of this palm are used for treatment of rheumatic swellings and snake-bite poisoning. The inflorescences are tapped for toddy and treacle and jaggery made from it. The wood is used for building purposes. The pith yields starch which is eaten. The leaves produce the kitul fibre of commerce. The cabbage of this palm before flowering is a favourite food of elephants. It is used medicinally for gastric ulcers. The root is employed for tooth ailments, the bark and seed on boils and the tender flowers for promoting growth of hair.

5. *Cocos nucifera* Linn. Sp. Pl. 1188. 1753.

Cocos nana Griff.—*Cocos mamillaris* Blanco.

Engl. Coconut Tree; *Sinh.* Gon-tembili, Nawasi-pol, Pol; Rantembili, Tembili; *Tam.* Egadam, Ilangali, Keli, Muppudaikay, Nadigelam, Naligelam, Naligerum, Naligelam, Papparatennai, Talai, Ten, Tengay, Tengu, Tennai; *Hindi* Naree, Naree, Nariyal, Nariyaekaper, Nariyel; *Sans.* Dakshinatriya, Dridhanira, Dridhaphala, Duraruha, Garikera, Jataphala, Junga, Karakamba, Kaushikaphala, Kurchashekkara, Kurchashirshaka, Langali, Mahaphala, Mangalya, Mriduphala, Mutkuna, Nadikeli, Narikari, Narikela, Nilataru, Payodhara, Phalakeshara, Phalamunda, Putodaka, Rasaphala, Sadaphala, Sadapushpa, Shiraphala, Skandhaphala, Subhanga, Sutanga, Toyagarbha, Trinaraja, Tryakshaphala, Tryambakaphala, Uchhataru, Varaphala, Vishvamitrapriya.

A tall erect, monoecious, unarmed palm, trunk 13—28 m tall, 30—60 cm diam., thickened and ascending at base, inclined, rarely forked; leaves compound, pinnate, 4—6 m long, leaflets 60—90 cm long, linear-lanceolate, acuminate, flaccid, bright green, petioles 1—1.6 m long, stout unarmed; spathe 60—90 cm long, narrowly oblong, tapering at both ends, glabrous or downy, splitting longitudinally; spadix at first erect, simply paniced, branches drooping, 1.3—2 m long, straw-coloured, upper parts of branches with numerous male flowers and the lower with 1 or 2 female flowers; male flowers small, yellowish; sepals 3, valvate, 0.2 cm long, ovate, acute; petals 3, valvate, 0.6 cm long, oblong-lanceolate; stamens 6, filaments subulate, anther linear, erect, pistillode minute; female flowers few, 2-bracteate; sepals 3, about 2.5 cm long, concave; petals 3, orbicular, convolute, smaller than sepals, staminodes reduced to an orange-coloured disc on which the ovary is seated; ovary superior, 3-carpellary, 3-locular of which two are empty and only one loculus provided with a solitary sub-basilar ovule, style very short, stigmas 3; fruit a large trigonously obovoid, oblong or subglobose drupe, 15—25 cm long, 1-seeded, pericarp thick, endocarp bony, endosperm forming a thick white layer of fleshy fibrous oily substance adherent to the membranous testa which again is adherent to the stony black endocarp.

Flowers throughout the year.

Illustrations. Roxburgh, Pl. Corom. 1: pl. 73. 1795; Hooker, Journ. Bot. 2: pl. 1. 1850. Kirtikar and Basu, Indian Med. Plants, pl. 999. 1933; Bailey, Man. Cult. Plants, pl. 27 in part. 1957; Macmillan, Trop. Plant. and Gard. p. 374. 1956; Herb. Peradeniya, drawing.

Distribution. A native of Polynesia, now cultivated in India, Ceylon, Burma, Pacific Islands and other tropical countries. It is universally cultivated in the mid and low-country in Ceylon, especially near or along the sea coast, but not wild.

Ceylon. Lunuwila, Bandirippuwa Estate, *Liyanage*, April 1960.

Composition. The coconut water contains traces of vitamin A, a small quantity of vitamin B and an appreciable amount of vitamin C. The exact composition of coconut oil is uncertain. It is made up largely of the glyceryl ester of lauric and myristic acids and other fats which are glyceryl esters of other fatty acids as caproic, capryllic, capric, oleic, etc.

Uses. This is a most useful palm. It yields timber, food, alcohol, vinegar, thatching material, fibre for making ropes, brushes, brooms, etc., fuel, bowls, spoons, oil for food, cooking, illumination, soap making, substitutes for butter and lard, ointments and oil cake for feeding livestock and for fertilizer.

Medicinally, coconut water is useful as a diuretic and anthelmintic and was used as a substitute for saline during the war. The pulp of the young fruit is given for sun-stroke. The coconut milk obtained from the grated kernel is an aperient, diuretic, anthelmintic and is used as a cure for diarrhoea, anaemia and for allaying urinary irritation. The flower of the coconut along with other ingredients is employed as a cure for dysentery. The oil is extensively used in the preparation of medicinal ointments and oils. It is applied on the head to promote the growth of hair. It is used in most food preparations in Ceylon. Many pharmaceutical products such as soaps, liniments, etc., are made from it. In Jamaica, the oil is given as a vermifuge. The roots are astringent and used for dysentery in Java and also for strengthening of the gums.

The inflorescence of the palm is tapped for toddy in East Africa, India, Ceylon and other countries. Treacle and jaggery are made from it, while the fermented toddy is drunk or used for distilling alcohol or making vinegar.

6. *Corypha umbraculifera* Linn. Sp. Pl. 1187. 1753.

Sinh. Tala-gas.

An unarmed annulate palm with a huge, erect, cylindrical, straight trunk 10—26 m high, 60—90 cm diam., dying after flowering and fruiting when about 40 years old; leaves very large borne at the crown, 2.6—5.3 m diam., plicate, palmately cleft to about the middle into 80—100 linear-lanceolate acute or bifid lobes, petioles 1.6—3.3 m long, very stout, margins armed with short compressed dark spines; spathes many, tubular, spadix pyramidal, 3.3—8 m high, decomposed, shortly and stoutly peduncled, branchlets forming pendulous spikes; flowers regular, bisexual, small; calyx cupular, 3-fid; petals 3, oblong, about 2 mm long, acute, imbricate; stamens 6, filaments subulate, anthers dorsifixed; ovary superior, deeply 3-lobed, 3-locular, style short, subulate, stigma minute, 3-fid, ovules erect; fruit a shortly stipitate, globose drupe, 3.7 cm diam. with two small arrested carpels at its base, greyish olive-coloured.

Flowers between November and January when it has reached full maturity.

Illustrations. Macmillan, *Trop. Plant. and Gard.* pgs. 156 and 160. 1956.

Distribution. Rather common in the moist regions in Ceylon below 2,000 feet altitude. It also occurs in Malabar.

Uses. The leaves of this palm are used for making ola leaves, umbrellas, fans, mats, etc., The young fruits are pounded and used for stupefying fish. The starch extracted from the pith is given as a gruel for stomach disorders. The root along with other ingredients is made into a paste and applied externally on the stomach to cause purging.

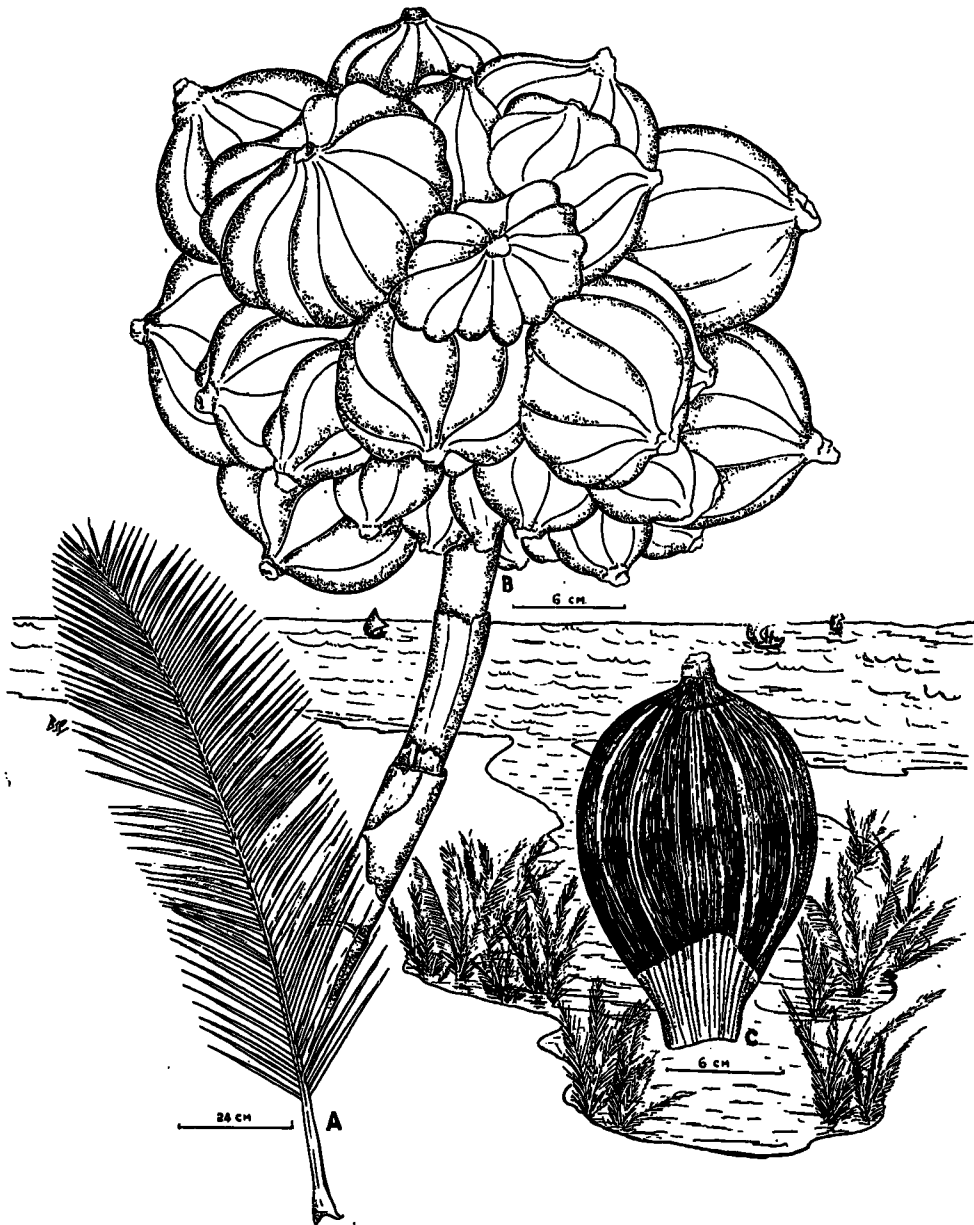


FIG. 416. *Nypa fruticans*. A, leaf. B, syncarp with 1-seeded carpels crowded together. C, single carpel.

7. *Nypa fruticans* Wurm. in Verh. Bot. Genuotsch 1: 349. 1779 (Fig. 416).

Nypa fruticans Thunb.—*Nypa littoralis* Blanco.

Engl. Nipa Palm, Water Coconut; *Sinh.* Ginpol; *Hindi* Gulga.

A brackish water palm with a prostrate, branched rootstock, about 45 cm diam., rooting along the lower surface, clothed with sheaths of old leaves, leafing and flowering at the ends of branches; leaves many, pinnatisect, erect and recurved, 5 m long and upwards, petioles 1.3—1.6 m long; very stout, sheath short, leaflets innumerable, linear-lanceolate, shortly decurrent on the rachis, 1.3—1.6 m long, bright green above, glaucous and 3-keeled beneath, sides reduplicate in vernation, tip subulate, midrib scurfy; flowers unisexual, monoecious, spadix 1.3—2.3 m long, peduncle 1.3—1.8 m long, males in catkin-like branches of the spadix, females crowded in a terminal head; male flowers small, surrounded by setaceous bracteoles; sepals linear with clavate inflexed tips, imbricate; petals similar but narrower; stamens 3, filaments connate to a very short column, anther elongate, basifixed, pistillode absent; female flowers much larger than the males, perianth segments 6, irregularly disposed, rudimentary; ovary superior, 3-carpellary, connate, tips free with an oblique stigmatic line, densely crowded, angled, ovules erect; fruit a large globose syncarp, about 30 cm diam., nodding, of many obovoid hexagonal 1-celled, 1-seeded carpels with pyramidal tips, pericarp fleshy and fibrous, endocarp spongy and floury, seed erect, as large as a hen's egg, grooved on one side, hilum broad, endosperm horny.

Flowers in October.

Illustrations. Martius, Hist. Nat. Palm. 3: *pl.* 208; La Billardiere, Mem. Mus. Par. 5: *pls.* 12 and 22; Griffith, Ic. Pl. Asiat. *pls.* 244 to 247.

Distribution. Occurs in Ceylon, Burma, Malaya to Queensland but not in India. It is rare being found in the mouths of rivers in the south-west coast of Ceylon. Kalutara, Koggala, Dikwella, etc.

Ceylon. Western Prov., Kalutara, *Thwaites C.P.* 3333.

Uses. This palm is much used in Malaya and Philippine Islands for thatching and making baskets. The inflorescence is tapped for toddy from which vinegar, sugar and alcohol are made. Medicinally, the juice of the young leaves with coconut milk is given for herpes. In Borneo, the ash of the roots is used for toothache and the fresh leaves in the treatment of ulcers and as a remedy for centipede bites.



FIG. 417. *Phoenix zeylanica*. A, male spadix. B, female spadix with spathe. C, male flower, unopened. D, male flower lateral view. E, male flower, dorsal view. F, female flower, lateral view. G, fruits.

8. *Phoenix zeylanica* Trimen in Journ. Bot. 267. 1885. (Fig. 417).*Phoenix sylvestris* Thw.—*Elate sylvestris* Linn.*Engl.* Wild Date Palm; *Sinh.* Indi, Wal-indi.

A dioecious palm with a trunk 2.6—7 m in height; leaves pinnatisect, sides of leaflets induplicate in vernation, leaflets many quadrifariously inserted, sub-equidistant, 17.5—20 cm long, linear-lanceolate, coriaceous, concave, spreading at right angles, bright green; spathe 20—35 cm long, keel furfuraceous; spadix about 30 cm long, peduncle stout, rachis flattened, branches of male 10—15 cm long, of female longer; male flowers: calyx cupular, 3-toothed; petals 3 much longer, obliquely ovate, valvate; stamens 6, anthers subsessile, linear; female flowers: spadix long-peduncled, peduncle 2.5 cm broad, flattened, branches 15—25 cm long and divergent in fruit; calyx cupular; petals 3, orbicular, imbricate; ovary superior, of 3 free, unilocular carpels, stigmas sessile, uncinata, ovules erect; fruit about 1.2 cm long, 6 mm diam., obovoid-oblong, apiculate, red, at length violet-blue, pericarp fleshy; seed nearly as long as the fruit, ventrally grooved.

Flowers during February.

Illustrations. Gaertner, *Fruct. et Sem. Plant.* 1: pl. 9. 1788; Herb. Peradeniya, drawing.**Distribution.** Very common in the moist low-country, especially along the southern coast of Ceylon. It is endemic and very similar to *Phoenix pusilla* Gaertn. which occurs in the dry regions.**Ceylon.** Southern Prov., *Thwaites C.P.* 3172. North-Western Prov., Kalpitiya, *Simpson* 9155, Feb. 1932.**Uses.** The cabbage of this palm is used for gonorrhoea and gleet and externally as a poultice along with other drugs on fractures. It is an antidote for poisons. The fruit is used as a vermifuge and the roots for toothache.*P. pusilla* is also used instead of this plant for treating the same ailments.



FIG. 418. *Pandanus ceylanicus*. A, branch showing the terminal leaves and male inflorescence. B, cluster of stamens. C, pedicels (confluent filaments). D, stamens, lateral view. E, stamen, ventral view.

83. PANDANACEAE

1. *Pandanus ceylanicus* Solms in *Linnaea* 42: 16. 1878. (Fig. 418).

Pandanus furcatus Thw. (non Roxb.)

Engl. Screw Pine; *Sinh.* O'keyiya.

A sparingly branched shrub with very slender, tall, tufted stems about 2.5 cm diam; leaves simple, very long, spirally arranged at the ends of branches, 90—120 cm long, 2.5 cm broad, lanceolate, caudate, margins and keel distantly spinulose, marginal spinules upcurved, spadices terminal, solitary, flowers dioecious without perianth; male inflorescence of a stout flexuous, pendulous rachis 15—25 cm long bearing spadices of flowers in axils of pale yellow spathiform bracts with green caudate tips; male spadices 7.5—10 cm long, cylindric consisting of a stout rachis clothed with short stout pedicels (confluent filaments) 1.2 cm long, terminated by a cluster of oblong, apiculate anthers 2.5 mm long; female spadix solitary, sessile consisting of unilocular, 1-ovuled carpels 1.6 cm long, clavate, angular, acute, stigma unguiculate, simple or 2-toothed; fruit a nearly globose syncarp 12.5—15 cm diam., green, drupes angular, crown rounded tipped by the large coriaceous incurved stigma; drupes deciduous singly or in masses, seed fusiform.

Flowers during February and March.

Illustration. Herb. Peradeniya, drawing.

Distribution. This species is endemic to Ceylon, usually found growing in running water, beds of streams or edge of paddy fields in the low-country.

Ceylon. Without locality, *Thwaites C.P.* 2734.

Uses. The juice of the roots is used for preparation of medicinal oils for application on the head and for diseases of the eyelids.

2. *Pandanus tectorius* Soland. ex Parkinson, Journ. Voy. H.M.S. Endeavour, 46. 1773.

Pandanus odoratissimus Linn. f.

Engl. Screw Pine; *Sinh.* Mudu-keyiya; *Tam.* Kaidai, Kandal, Kechiya, Kedagai, Madi, Muchali, Mudangal, Mundagam, Talhai; *Hindi* Gagandhul, Keora, Ketgi, Keura; *Sans.* Chamarapushpa, Dalapushpa, Dhulipushpika, Dirghapatra, Gandhapushpa, Halina, Indukalika, Jambuka, Kantadala, Ketaka, Krakachachhada, Medhya, Nripapriya, Panshula, Shivadvishtha, Sthiragandha, Suchikapushpa, Tikshnapushpa, Viphalā.

A shrubby plant 5—7 m high with stems rooting above ground and branches, 2.5 cm diam. upwards, spreading and supported by aerial roots; leaves simple, very long, spirally arranged at ends of branches, 1—1.6 m long, ensiform, caudate-acuminate, coriaceous, marginal spines pointing forward, those on the midrib beneath pointing forward or backwards, base sheathing; spadices solitary, terminal, flowers unisexual, dioecious without perianth; male inflorescence of a stout, elongate, pendulous, terminal rachis bearing spadices of flowers in the axis of large, white, lanceolate, coriaceous, spathiform bracts, 10—30 cm long; male spadices very fragrant, 7.5—10 cm long, 2.5—3.7 cm diam., sessile, cylindric, consisting of a very stout rachis giving off densely crowded short spiciform branches clothed with stamens, anthers longer than the slender filaments, sagittately lanceolate, caudate-acuminate, base of cells rounded; female spadix solitary, 5 cm diam., enclosed in spathiform yellow bracts like those of the male inflorescence, but stricter, carpels confluent in obpyramidal groups of 6—10 or fewer, green, unilocular, ovules one in each loculus ascending from the base of a parietal placenta, stigmas short, reniform, yellow; fruit an oblong or globose, orange or scarlet syncarp, 15—25 cm long and broad, carpels 5—7.5 cm long, thick-walled, turbinate, angular, confluent, crown smooth, convex, more or less depressed around the reniform stigmas, drupes deciduous, seeds fusiform.

Flowers during the rainy season.

Illustrations. Roxburgh, Pl. Corom. 1: pls. 94—96. 1795.

Distribution. Occurs along the coasts of tropical Asia, Andaman Islands, Polynesia and Mauritius. It is very common in Ceylon along the sea coast, usually forming a belt above the high water mark.

Ceylon. Western and Southern Provs., between Galle and Colombo, *Thwaites C.P.* 3739. **Philippine Islands.** Luzon: Zambales Prov. Anulin, *Ramos and Edano* 44663, Nov.—Dec. 1924; Tayabas Prov. Casiguran, *Ramos and Edano* 45375, May-June 1925.

Uses. The cabbage of this plant is used as a poultice for boils and the aerial roots as a diuretic. In Cambodia too, the roots are employed as a diuretic, depurative and tonic.

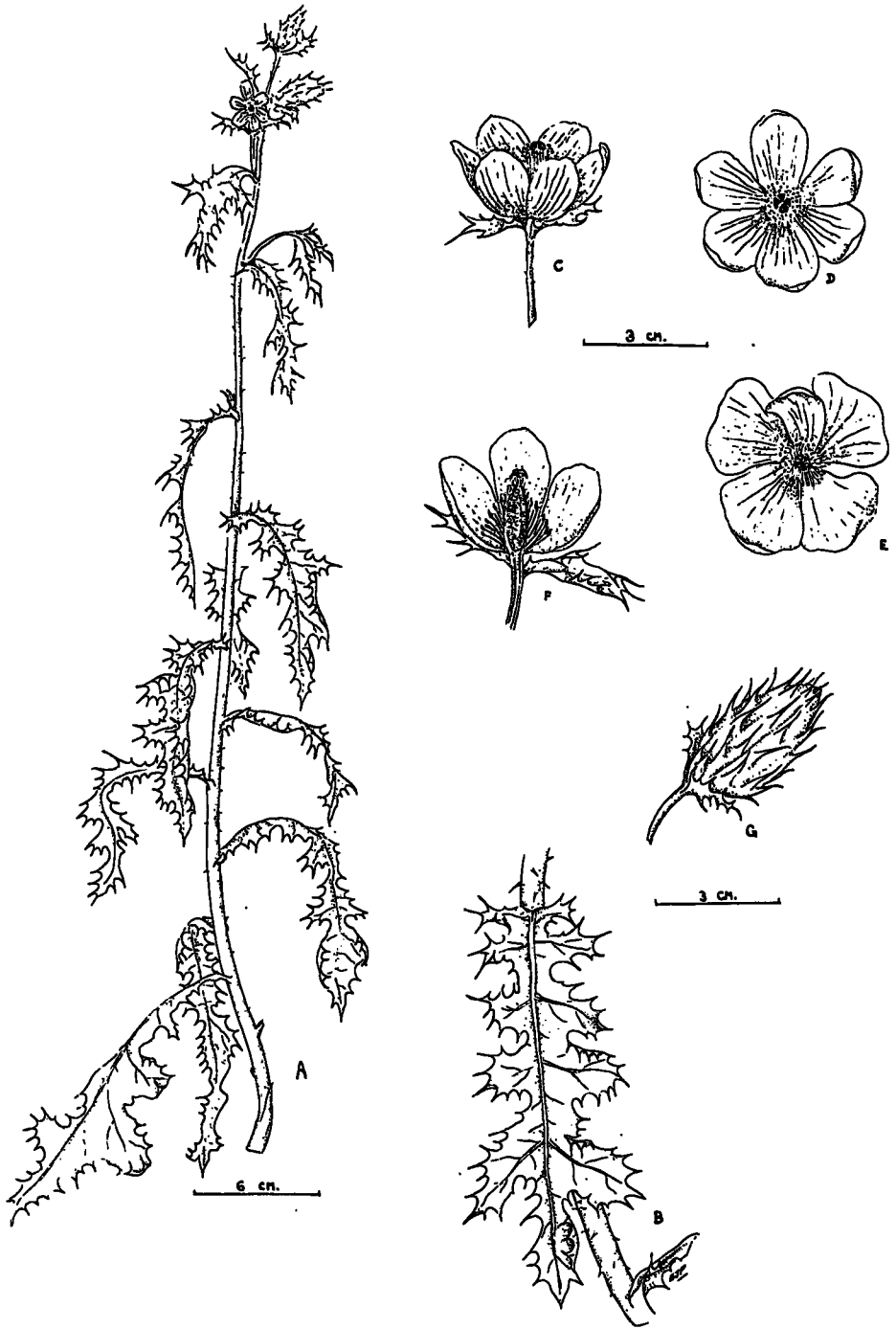


FIG. 419. *Argemone mexicana*. A, branch with leaves and flowers. B, leaf dorsal view. C, flower, lateral view. D, 6-petalled flower, dorsal view. E, 5-petalled flower, dorsal view. F, longitudinal section of flower. G, fruit.

84. PAPAVERACEAE

1. *Argemone mexicana* Linn. Sp. Pl. 508. 1753. (Fig. 419).

Engl. Mexican Poppy, Prickly Poppy; *Sinh.* Rankirigokatu; *Tam.* Bramadandu, Kurukkum; *Hindi* Kutaila, Kutila; *Sans.* Brahmadandi, Hemadugha, Hemashikka, Hemavati, Hemavha, Kanchanakehiri, Kanchani, Karhini, Katuparni, Kshirini, Patuparni, Pitapushpa, Rukmini, Srigalakanta, Suvarna, Svarnadagha, Svarnakshiri, Svarnavha, Tiktadugha, Yavachincha.

A prickly, branching, glaucescent herb, 60—120 cm tall, with yellow milky juice; leaves simple, sessile, 1/2-amplexicaul, 7.5—15 cm long, 2.5—6.2 cm broad, sinuato-pinnatifid, segments inciso-dentate, spiny on the margins, the midrib and the veins beneath, lower surface very pale, prickles sharp, yellow; flowers regular, bisexual, terminal, yellow, 2.5—7.5 cm across, peduncles prickly, buds usually erect, bracts foliaceous; sepals 2—3, concave, nearly valvate, prickly outside, horned at apex, caducous; petals 4—6, imbricate in two series. 2.5—3 cm long, more or less crumpled, obovate, cuneiform, yellow with darker parallel veins, deciduous; stamens indefinite; ovary superior, covered with soft spines, 4—6-carpellary, unilocular, ovules many on 4—7 parietal placentae, stigmas red divided into 4—7 lobes; fruit capsule 1.8—3.7 cm long, oblong or elliptic, prickly, dehiscing at the top by 3—6 short valves alternating with the stigmas and placentae, seeds blackish-brown, deeply reticulato-scrobiculate.

Flowers all the year round.

Illustrations. Watt and Breyer-Brandw., *Med. Plants of S. & E. Africa*, pl. 215; Curtis, *Bot. Mag.* pl. 243. 1794; Kirtikar and Basu, *Indian Med. Plants*, pl. 54. 1933.

Distribution. A native of tropical America and now naturalized in India, Africa and Ceylon. It is a common roadside weed growing up to 5,000 feet altitude in Ceylon.

Costa Rica. Alajeula: *Alfaro* 5705, May 1887. **Ceylon.** Central Prov., Peradeniya, *Thwaites*, May 1887. **Maldive Islands.** *Didi* 52, 1896; *Male*, *Gardiner*, 1899—1900; *Haly*, 1892.

Composition. The leaves, stems and roots of this herb contain berberine while the roots contain allocryptopine, argemonine, chelerythrine, codeine, coptisine, dihydrochelerythrine and sanguinarine in addition. The entire plant above the ground contains the alkaloids dihydrosanguinarine, morphine and protopine. The fruit has norargemonine and the seeds sanguinarine and volatile oil.

Uses. The root of this plant is used for skin and blood diseases. A paste of it is applied on scorpion stings. The milky yellow juice is used medicinally as a purgative and for jaundice and skin diseases. It is a diuretic and heals indolent ulcers. With cow ghee, it is given for gonorrhoea and as eye drops for leucoma, white spots, fleshy growths and cloudiness. The seeds and oil have beneficial effects on asthma. In Abyssinia, the herb is employed as a diuretic, the seed for its narcotic properties and the oil of the seed as a purgative. The entire herb and the flower are used as a diaphoretic, expectorant, diuretic, narcotic and in ophthalmia, gonorrhoea and snake-bite poisoning. In South Africa, a paste of it is applied on eczema. In Konkan, the juice is given with milk for leprosy. The seeds are laxative, emetic, nauseant, expectorant and demulcent. They are used in catarrhal infections of the throat, pulmonary mucous membrane, and in pertussis and asthma. In Mexico, the seeds are an antidote for snake venom. The smoke from the burning seeds is held as a fumigant for toothache and caries of the teeth. The oil extracted from the seeds is a purgative and used externally on chronic ulcers and eruptions. Both flowers and leaves are narcotics.

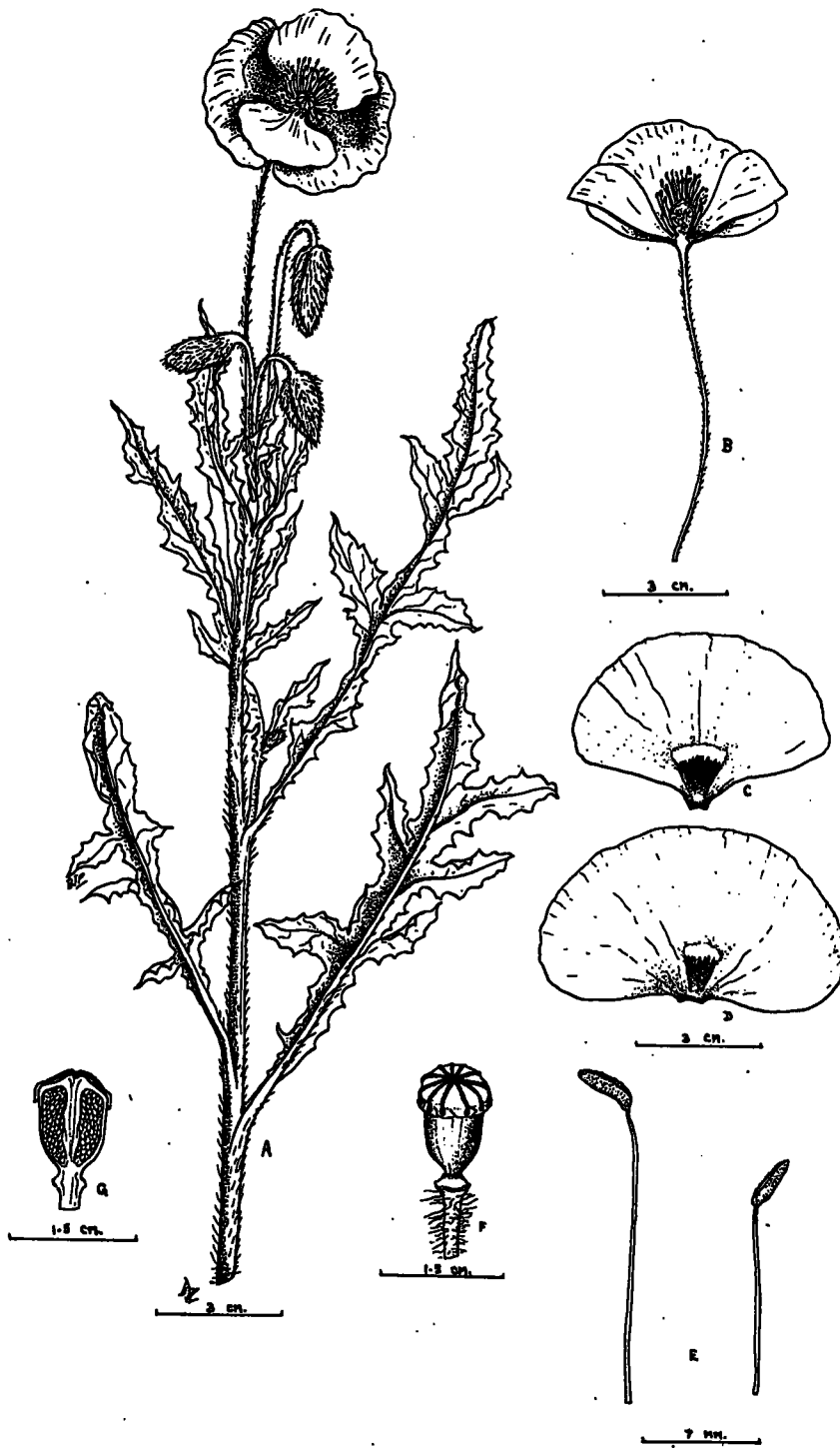


FIG. 420. *Papaver rhoeas*. A, branch with leaves, flower and flower buds. B, longitudinal section of flower. C, inner petal. D, outer petal. E, stamens. F, pistil. G, longitudinal section of pistil.

2. *Papaver rhoeas* Linn. Sp. Pl. 507. 1753. (Fig. 420).

Engl. Corn Poppy, Poison Poppy, Scarlet Poppy, Red Poppy; *Sinh.* Abin; *Tam.* Siguppuppostaka, Sivappugashagasha; *Sans.* Raktapostavrikshaha.

An erect annual herb, 30—90 cm high, with a slender, branched, round, hispid stem, bristles stiff and spreading, branches erect, root vertical, tapering slightly and branched; root leaves stalked, pinnatisect with lanceolate distant segments, 6.5—12.5 cm long, 5 cm broad, scantily hairy on the upper surface, hispid on the lower surface, irregularly cut into ascending lobes tipped with bristles, petioles 2.5—7 cm long; stem leaves 19.5—25 cm long, 6.5—7.5 cm broad, sessile, irregularly pinnatisect, segments narrow, bright green, hairy on the upper surface, less hispid below but concentrated along veins; flowers solitary at the ends of stems or branches on long stalks, hispid with hairs, 7.5 cm diam., bright red, stalks 19.5 cm long, flower buds drooping; sepals 2, overlapping in the bud, articulating with the receptacle, cast off at the top when the flower opens, pale green set with spreading bristly hairs; petals 4, large, brilliant red with a dark purple blotch fringed white on the outside at the base, two outer petals broader than long, 4.1 cm long, 7.3 cm broad, two inner ones erect 4 cm long, 6 cm broad, all early caducous; stamens numerous, inner ones longer than the outer, filaments 0.4—1.7 cm long, blackish purple, anther 2 mm long, basifixed, pollen green; ovary superior, top-shaped, 1 cm long, 0.7 cm broad, unilocular with 10 or more placentae projecting from the wall to the centre of the ovary, stigmas 10—13, radiating from the conical summit; capsule shortly stalked, half ovoid, truncate, smooth and faintly ribbed, seeds numerous, minute, reniform, testa reticulated.

Illustration. Bentley and Trimen, *Med. Plants*, pl. 19. 1880.

Distribution. A native of Sicily and it now occurs as a weed in England, Europe, Asia Minor, N. W. India and N. Africa. It is not grown in Ceylon, except as an ornamental plant in the hill-country.

India. Kashmir: Katmandu, without name of collector.

Composition. The leaves, stems and roots of this herb contain coptisine, protopine and another unnamed alkaloid, while the fruit contains morphine, narcotine, rhoeadine, rhoegenine and thebaine.

Uses. The latex extracted from the fruit is a narcotic and has slightly sedative properties. The petals of the flower are sudorific.

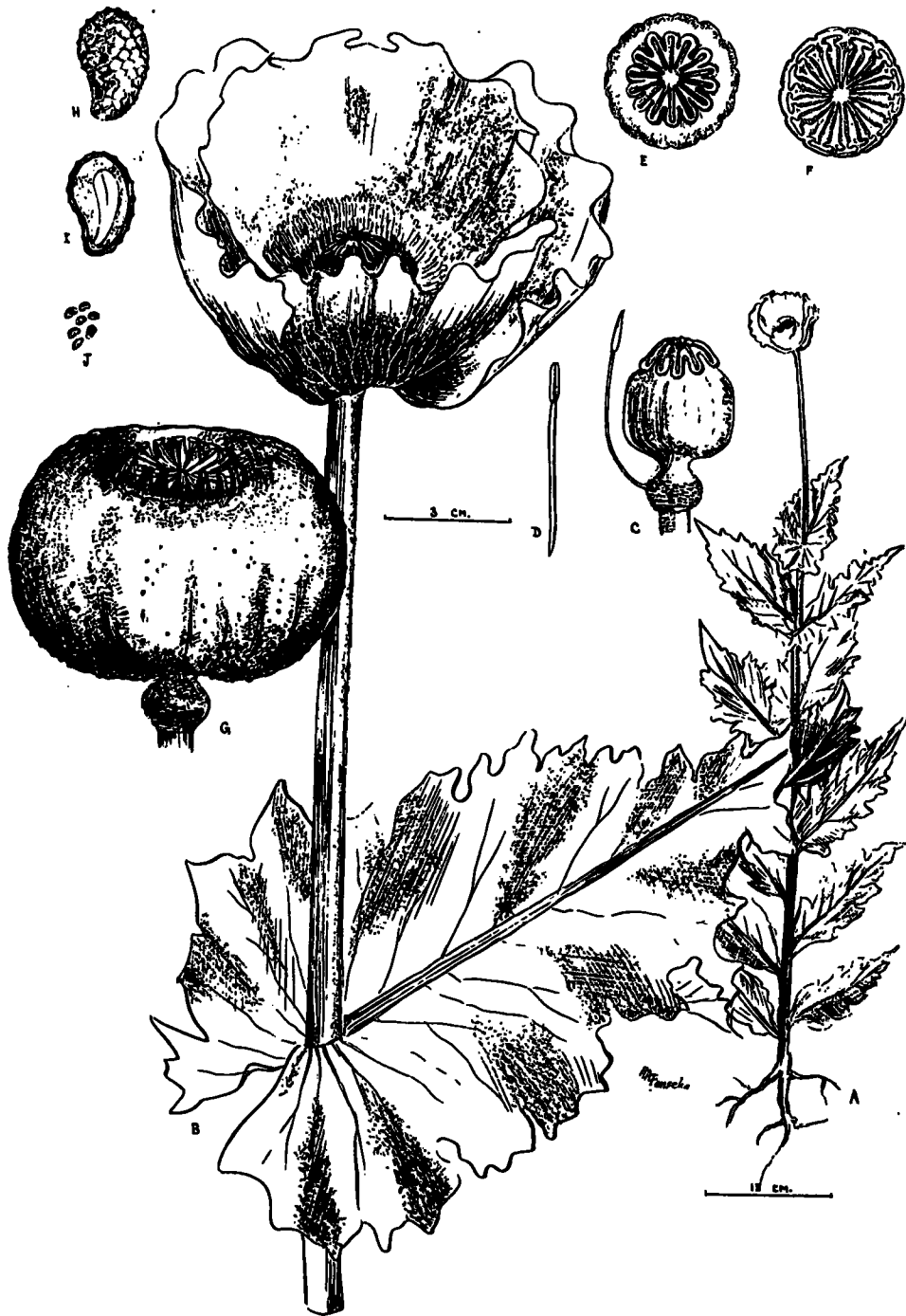


Fig. 421. *Papaver somniferum*. A, plant with roots, leaves and flower. B, flower with one of the upper leaves. C, pistil with one of the stamens indicating the position of attachment. D, stamen. E, stigma, dorsal view. F, transverse section of the ovary. G, fruit. H, seed. I, longitudinal section of seed. J, seeds. H, and I, enlarged.

3. *Papaver somniferum* Linn. Sp. Pl. 508. 1753. (Fig. 421).

Papaver amaenum Lindl.—*Papaver nigrum* Crantz—*Papaver amplexicaule* Stokes—*Papaver officinale* Gmel.—*Papaver hortense* Huss.—*Papaver setigerum* DC.

Engl. Opium Poppy; *Sinh.* Abin; *Tam.* Abini, Gashasha, Kasakasa, Postaka; *Sans.* Ahifen, Chosa, Khasa, Khasaka, Ullasata.

An annual herb with a thick, tapering, much branched, yellow root and an erect cylindrical stem about 90 cm high, pale green, covered with white bloom, glabrous or with a few bristly horizontal hairs; leaves many, alternate, sessile, spreading horizontally; lower ones 15 cm long, oval-oblong, tapering at base, deeply pinnatisect with acute segments and deeply and irregularly dentate, upper ones about 25 cm long gradually becoming wider with a more cordate base, uppermost ones broadly ovate with a deeply cordate amplexicul base, not pinnatisect but more strongly and deeply toothed, smooth and shining, rather thick, dull green covered with a glaucous white bloom which is readily removed, paler beneath with prominent veins, midrib very nearly white; flowers regular, bisexual, few, solitary, white, pink, purple or almost black, very large, 7.5—17.5 cm across, terminating the stem and branches; buds erect, ovate-ovoid, drooping; sepals 2, broad, blunt, smooth, glaucous green, disarticulating and pushed away as flowers expand; petals 4, very large, decussate, the two outer ones wider than long and much overlapping the narrower inner ones, concave, undulated, variable in size and colour; stamens very numerous, hypogynous, inserted in 5 or 6 rows on the undersurface of the dilated gynophore, erect, filaments narrow, linear, ribbon-shaped, anthers linear attached by a very narrow base to the filaments, cream-coloured, becoming pale brown and twisted after dehiscence; ovary superior, large, depressed globular about 2.5 cm diam., suddenly contracted below into a neck 0.6 cm wide which again dilates to form the receptacle which narrows off below into the peduncle, smooth, pale green, unilocular with large spongy parietal placentae, equal in number to and beneath the stigmatic rays passing nearly to the centre and bearing numerous scattered ovules; stigma sessile, peltate, spreading or curved over the top with 8—20 short, obtuse, oblong rays; fruit globular or ovoid, 3.7—7.5 cm diam., crowned by the persistent stigma, pericarp dry, hard, brittle, brownish yellow, indehiscent, seeds very numerous, very small, reniform, testa with reticulated network.

Flowers in July.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 18. 1880; Ames, *Eco. Ann. and Hum. Cult.*, p. 42. 1932; Kirtikar and Baśu, *Indian Med. Plants*, pl. 53. 1933; Herb. Peradeniya drawing.

Distribution. Cultivated in India and in the warm temperate regions of Europe, Asia and N. Africa, extending eastwards to China. Its cultivation is prohibited in Ceylon.

Ceylon. Cultivated, *de Silva* 729. May 1938.

Composition. The leaves of this plant contain codeine, morphine, narcotine and narcotoline, while the fruit has the following alkaloids: aporeine, codamine, codeine, cryptopine, gnoscopine, hydrocotarnine, lanthopine, laudanidine, laudanine, laudanosine, meconidine, morphine, narçine, narcotine, narcotoline, neopine, oxynarcotine, papaveramine, papaverine, porphyroxine, protopine, rhoeadine, thebaine and xanthaline.

Uses. The opium of commerce is obtained from the latex produced as a result of incisions made on the maturing fruit. It is used for dysentery with vomiting and ailments of the intestine and urinary system. It is a stimulant, soporific and used for peritonitis, pleurisy, pneumonia, fever, genito-urinary diseases, gallstones, rheumatism, neuralgic ailments, strangulated hernia etc., Externally, it allays pain in neuralgia, rheumatic ailments and diseases of the eye. In China, the fruit heads and seeds are ground together and used in diarrhoea and dysentery. The seeds have no narcotic effects but yield a fixed oil used for illuminations, cooking and painting.

85. PEDALIACEAE

1. *Pedaliium murex* Linn. Syst. Nat. ed. 10, 1123. 1759.

Sinh. Et-nerenchi; *Tam.* Anainerunji, Ananeringie, Perunerunji; *Hindi* Baragokhru, Faridbuti, Kadvagokhru; *Sans.* Gokshura, Tittagokshura.

An annual herb with stems 15—60 cm long, decumbent, much branched, thick, slightly rough with scaly glands or hairs; leaves simple, opposite, 1.5—4.5 cm long, 1.3—3.5 cm broad, obovate to elliptical in outline, acute at base, apex truncate or rounded, very coarsely crenate-serrate or lobed, glabrous on the upper surface, covered with minute scaly hairs beneath, rather fleshy, pale glaucous green, petioles 0.6—1.3 cm long; flowers irregular, bisexual, sulphur-yellow on very short curved pedicels, solitary, axillary; sepals 5, fused into a very short and wide calyx-tube, segments lanceolate-oblong, spreading; petals 5, fused into an obscurely 2-lipped, tubular, pale yellow corolla, limb nearly 2 cm long, glandular-pubescent within, lobes broad, the lowest lobe the largest, throat hairy; stamens 4, didynamous, anthers not connate filaments glandular hairy at base; ovary superior, 2-locular with 2 superposed ovules in each loculus, stigmas 2-lipped; fruit hard, indehiscent, glabrous or sparsely glandular, rugose or tuberculate, 1—1.8 cm long, narrowed below into a short thick stalk, broadly ovoid, bluntly 4-angled with spines from the angles, pericarp very tough, fibrous, woody, seeds pendulous.

Flowers from February to August.

Illustrations. Burmann f., *Fl. Ind. pl. 45, fig. 2.* 1765; Gaertner, *Fruct. et Sem. Plant. 1: pl. 58.* 1758; Wight, *Ic. Pl. Ind. Or., pl. 1615.* 1850; Kirtikar and Basu, *Indian Med. Plants, pl. 711.* 1933; Theobald and Grupe, *Revised Fl. Ceyl. 1 (1): pl. 86, fig. 2E.* 1972; Herb. Peradeniya drawing.

Distribution. Occurs in India, Ceylon, tropical Africa and extending eastwards as far as Indonesia. It is common in sandy places near the sea, especially in the dry regions of Ceylon.

Ceylon. Northern Prov., Jaffna, *Trimen*, Feb. 1890; Elephant Pass, *Theobald and Grupe* 2330, 1971. North-Central Prov., Anuradhapura, Nuwara Wewa, *Simpson* 8054, 1932. Eastern Prov., Batticaloa, *Thwaites C.P.* 1779; Trincomalee, *Theobald and Grupe* 2323, 1971; *Simpson* 8482, 1932. North-Western Prov., Chilaw, *Trimen*, July 1883.

Uses. The leaves and stems of this herb form a thick mucilage when whipped with water and this is used as a remedy for gonorrhoea and dysuria. The fruit is a demulcent, diuretic, antispasmodic and aphrodisiac. A decoction of the fruit is useful for irritation of the urinary organs, spermatorrhoea and impotence. The juice of the fruit is employed for puerperal diseases and promotes lochial discharge. The leaves are eaten as a vegetable for splenic enlargements.

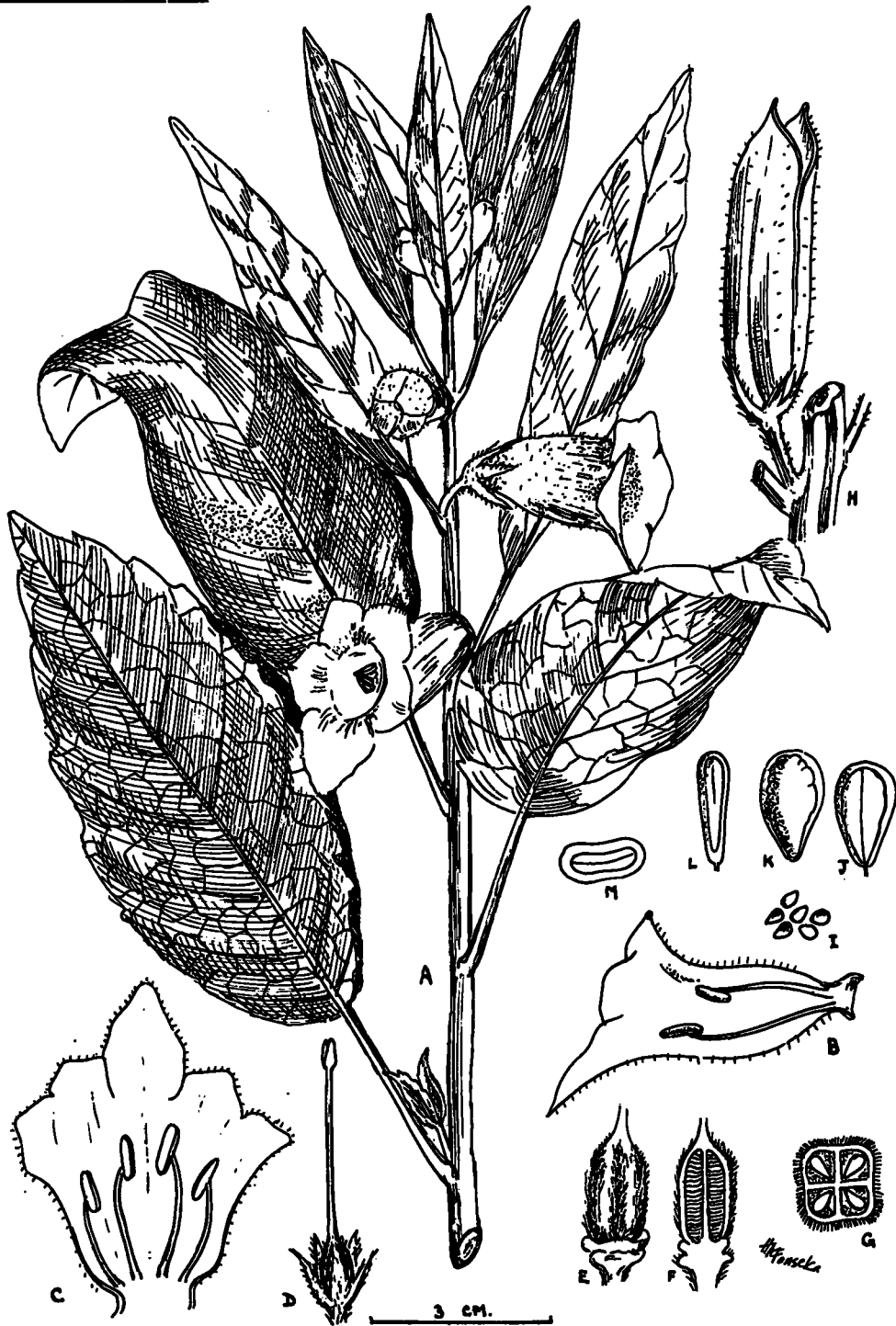


FIG. 422. *Sesamum indicum*. A, upper part of plant with leaves and flowers. B, longitudinal section of corolla showing epipetalous stamens. C, corolla laid open also showing stamens. D, calyx and pistil. E, ovary, densely hairy. F, longitudinal section of ovary. G, transverse section of ovary. H, fruit showing dehiscence. I, J, K, seeds. L, vertical section of seed through the cotyledons. M, transverse section of seed. E—G, J—M, enlarged.

2. *Sesamum indicum* Linn. Sp. Pl. 634. 1753. (Fig. 422).

Sesamum orientale Linn.—*Sesamum luteum* Retz.—*Sesamum occidentale* Heer and Regel.

Engl. Gingelly, Sesame; *Sinh.* Thala, Tel-thala; *Tam.* Ellu, Nuvvulu, Yelluchedi; *Hindi* Bariktel, Gingli, Krishnatel, Mithatel, Til, Tilkatel, Tir, Kash; *Sans.* Homadhanya, Jatila, Papaghna, Pavitra, Pitratarpana, Puraphala, Putadhanya, Snehaphala, Tailaphala, Tila, Vanodbhava.

An annual herb with erect stems 30—60 cm high, puberulous with long ascending branches from base, stems and branches obtusely quadrangular in the upper part, furrowed; leaves opposite below, the upper ones usually alternate, very variable, the upper lanceolate, entire, 3—6 cm long, short-petioled, the lower often deeply and palmately cut at the base into 2 or more serrate segments, glabrous above, puberulous beneath with minute scaly hairs, long-petioled; flowers irregular, bisexual, on very short erect puberulous pedicels, solitary and axillary: sepals 5, fused into a deeply cut calyx, pubescent, segments nearly distinct, 3—5 mm long; petals 5, fused into a tubular, ventricose, oblique-mouthed, obscurely 2-lipped, usually white corolla 2.5—3.5 cm long, lobes unequal, lowest the largest, pubescent outside, glabrous within; stamens 4, didynamous, included, anthers not connate, dorsifixed, 2-celled, filaments of one pair 8 mm long and the other 6 mm long; ovary superior, 2-locular with many superposed ovules in two rows in each loculus, densely hairy, surrounded by a small fleshy disc, style filiform, stigmas 2; fruit a loculicidally dehiscent 2-valved capsule 1.5—2.8 cm long, bluntly quadrangular, shortly beaked, densely villous-pubescent, valves separating for about half-way down, gaping, seeds about 2 mm long, slightly compressed, glabrous, pale yellow, brown or black, exalbuminous, testa smooth.

Flowers from May to August and sometimes throughout the year.

Illustrations. Wight, *Ill. Ind. Bot.*, pl. 163. 1840; Curtis, *Bot. Mag.*, pl. 1688. 1814. Bentley and Trimen, *Med. Plants*, pl. 198, 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 712; 1933; Theobald and Grupe, *Revised Fl. Ceyl.* 1 (1): p. 86, fig. 2A, B. 1972.

Distribution. Cultivated in all warmer parts of the world, including India and Ceylon. It is widely grown and naturalized in the dry zone, especially along roadsides, abandoned fields and waste areas in Ceylon.

India. Calcutta, *Bot. Gard.*, cultivated. *Ceylon.* Northern Prov., Jaffna, *Thwaites C.P.* 2023; Elephant Pass, *Theobald and Grupe* 2331. Eastern Prov., Trincomalee, *Thwaites C.P.* 3852. Central Prov., Dambulla, Pelwehera, *Alston* 2402, May 1928; Peradeniya, *Bot. Gard.*, cultivated, *Herb. Peradeniya.*, Jan. 1893. *Japan.* Yokohama, cultivated, *Maximowicz*, 1862. *Cuba.* Santiago de las Vegas, *Baker* 91, Aug. 1907.

Composition. The seeds of this herb contain a fixed oil, saccharose, pentosan, lecithin choline, phytine, conglutine, globuline, legumine, etc. The leaf has much gum, tannin and chlorogenic acid. The oil consists of sesamin, sesamol and sterols.

Uses. The leaves are used as a vermifuge and the stems for stomach ailments. The leaves mixed with water form a mucilage which is given for diarrhoea, dysentery, catarrh, bladder troubles, acute cystitis and strangury. The stalks are burnt and the ash used on haemorrhoids and purulent otorrhoea. The seeds are nourishing, diuretic and lactagogue and much used for making sweetmeats. A plaster made of the seeds is applied on burns and scaldings. The seeds are useful for piles and constipation. The oil is used for all purposes for which olive oil is used, such as lime liniments, oil-dressings of ulcers, suppurating wounds, etc. It is taken internally for gonorrhoea. A decoction of the seeds with linseed oil is given for coughs and as an aphrodisiac. In Europe, North America and India the oil is used for perfumery. It is also often used for culinary purposes and as margarine. In Sierra Leone, the mucilaginous juice of the plant is applied on the hair to destroy lice. The roots and leaves made into a lotion blackens and promotes the growth of hair. In other parts of Africa a decoction of the plant is drunk for malaria and the leaf chewed. The seed is also used as a purgative.

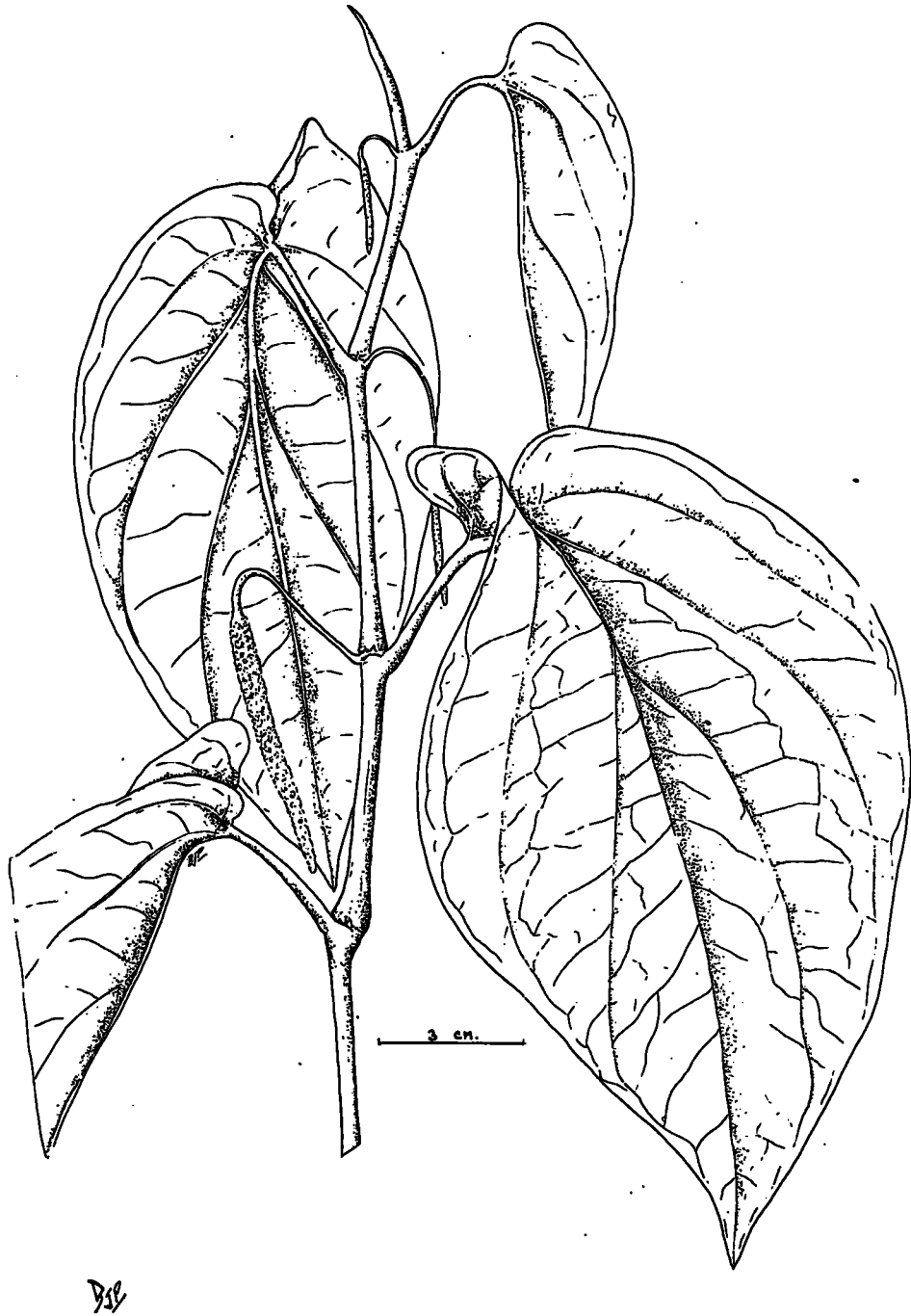


FIG. 423. *Piper betle*. Apical portion of a twig with leaves and drooping female spikes.

86. PIPERACEAE

1. *Piper betle* Linn. Sp. Pl. 28. 1753. (Fig. 423).

Chavica betle Miq.—*Piper siriboa* Linn.—*Piper betle* var. *siriboa* Cas. DC.—*Piper peepuloides* Wall.—*Piper amisumolens* Blanco.—*Piper anisudorum* Blanco—*Piper philippinense* Cas. DC.—*Piper blancoi* Merr.—*Piper bathycarpum* Cas. DC.—*Piper puberulinodum* Cas. DC.—*Piper carnistylum* Cas. DC.—*Chavica siriboa* Miq.

Engl. Betel Vine, Betel Pepper; *Sinh.* Bulath-wel; *Tam.* Ilaikkodi, Mellilai, Nirvalli, Pachadam, Sivanagini, Sukkuli, Sulini, Tambulam, Vellilai, Vettilai, Vettilaichurul; *Hindi* Pan, Tambuli; *Sans.* Bhakshyapatra, Bhujangalata, Bhujangavalli, Divabhishta, Kalaskanda, Nagavalli, Nagavallika, Nagini, Parna, Parnaguhashaya, Parnalata, Phanivalli, Saptalata, Saptashira, Tambulavallari, Tambuli, Tambulivalli, Vitika.

A perennial vine with semi-woody stems, climbing by many short adventitious rootlets, stems very stout, much thickened at nodes, young parts glabrous; leaves simple, alternate, large, 15—20 cm. long, some broadly ovate, cordate and symmetrical at base known as female leaves and others narrower and oblique called male leaves, thin, brittle, very acuminate, cordate at base, entire but margin often rather undulate, usually 7-veined, glabrous, thick, bright green and shining on both surfaces, petioles 1.8—2.5 cm long, stout, stipules membranous, enclosing the bud; flowers naked, unisexual, dioecious in dense cylindrical spikes, male spikes not seen, female spikes 2.5—5 cm long, pendulous, bracts triangular-rotundate, peltate, yellow, rachis pilose; ovary superior, unilocular with a solitary erect ovule, stigmas 5 or 6, spreading stellately; fruit sparingly produced, quite immersed in the fleshy spike forming nodosities and pendulous.

Illustrations. Curtis, Bot. Mag., pl. 3132. 1832; Kirtikar and Basu, Indian Med. Plants, pl. 834. 1933; Macmillan, Trop. Plant. and Gard., p. 368. 1956.

Distribution. Indigenous to and cultivated in India, Ceylon, Malay Peninsula, Philippine Islands and East Africa. It is commonly cultivated in gardens in the low-country in Ceylon.

Ceylon. Central Prov., Gannoruwa, *Herb. Peradeniya*, Nov. 1894. Western Prov., Colombo, *Thwaites C.P.* 3962. *Maldivé Islands.* *Didi III*, 1896. *Philippine Islands.* Mindanao, Davao Prov., Mati, *Ramos and Edano* 49239, March-April 1927; Sulu Prov., Tawitawi, *Ramos and Edano* 44114, July-Aug. 1924.

Composition. The chief constituent of the leaves of this plant is a volatile oil known as betel oil. It contains two phenols, betelphenol (chavibetol), chavicol and cadinene. According to Nadkarni, the leaves also contain an alkaloid, arakene, and terpene and sesquiterpene. Gildemeister mentions that the Java betel contains allylpyrocatechol, cineol, eugenol, methyl ether and caryophyllene, in addition to those mentioned by Nadkarni.

Uses. The fresh betel leaves are used extensively as a masticatory. They are stimulant, antiseptic, sialogogue, carminative, astringent and aphrodisiac. The bruised leaves are applied as an antiseptic on cuts and wounds and as a poultice on boils. The juice of the leaves is a stomachic and febrifuge. It is given to children for cough and administered into the eye for night blindness in adults. It is applied on the mammae for checking secretion of milk. Its roots with black pepper are given to women to bring about sterility. In Cambodia, the pounded leaves are used for preparation of lotions and baths for patients suffering from protracted fever, small pox, enlarged glands and lymphangitis. In the Philippines, the leaves are given for gastric and lung disorders in children. In East Africa, the juice of the leaves is given for catarrh and diphtheria. The leaves are applied to purulent ulcers.

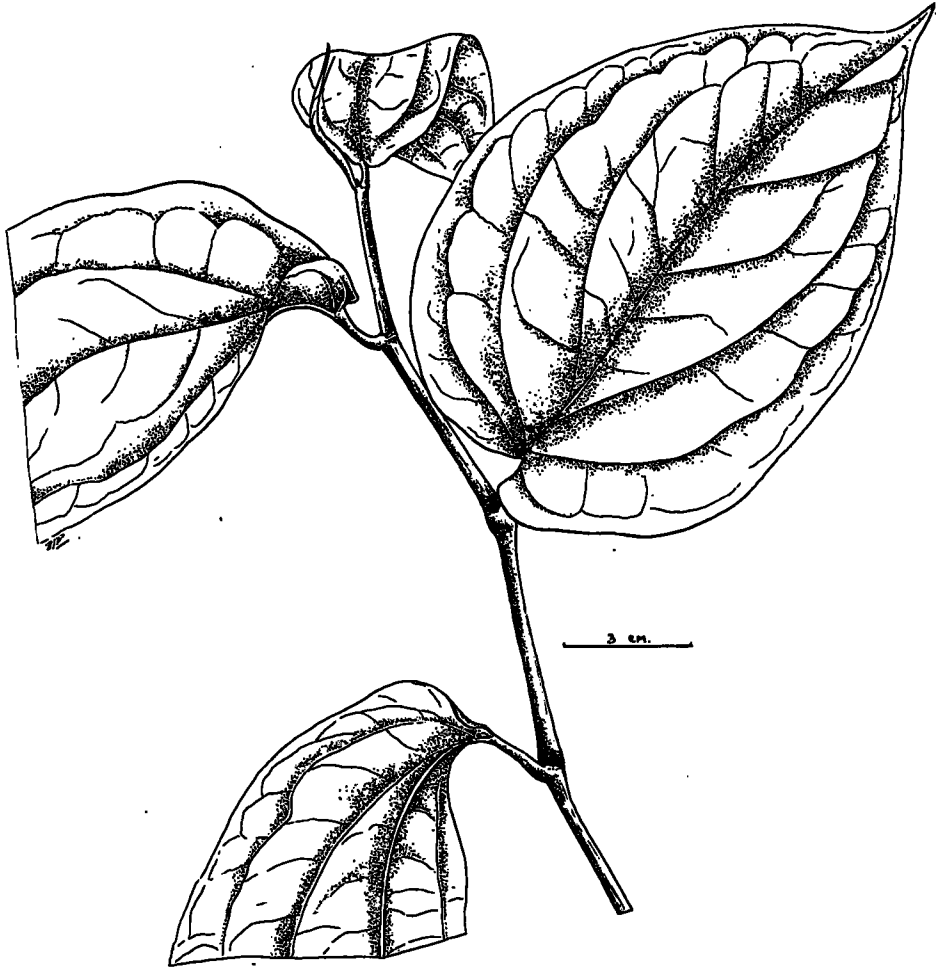


FIG. 424. *Piper chavya*. A twig with leaves.

2. *Piper chavya* Buch.—Ham. in Wall. Cat. 6650 C. 1829. (Fig. 424).

Piper chavya Miq.—*Piper chaba* Hunter (non Blume).

Sinh. Siviya-wel; *Hindi* Chab, Chavi; *Sans.* Chavika, Chavana, Chavi, Chavya, Gandhanakuli, Katuka, Katukapini, Kola, Kolavallika, Krikara, Kutilasaptaka, Nakuli, Purandara, Tejovati, Tikshnakarikanavali, Uchhista, Ushana, Vashira.

A climbing glabrous perennial vine with cylindrical dichotomously branched stems thickened at nodes; leaves simple, alternate, oblong, ovate or lanceolate, 12.5—17.5 cm long, 6.2—6.8 cm broad, acuminate, base rounded, unequal, cordate, nerves at base 3 with 2 pairs from the midrib, petioles 0.6—1.2 cm long; flowers bisexual, sessile in slender spikes peduncles 1.2—2.5 cm long; fruiting spikes cylindro-conical, widest at base, bright red, 2.5—7.5 cm long, 1.2 cm diam., drupes very small, globose and sunk.

Illustration. Kirtikar and Basu, *Indian Med. Plants*, pl. 822. 1933.

Distribution. This plant is cultivated in India, Ceylon and Malay Islands. It is a native of Java and Sumatra.

Ceylon. Central Prov., *Thwaites C.P.* 3691.

Uses. The root is used for asthma, bronchitis, fever, piles and pains in the abdomen. It is sometimes used as a substitute for roots of *Piper longum* L.

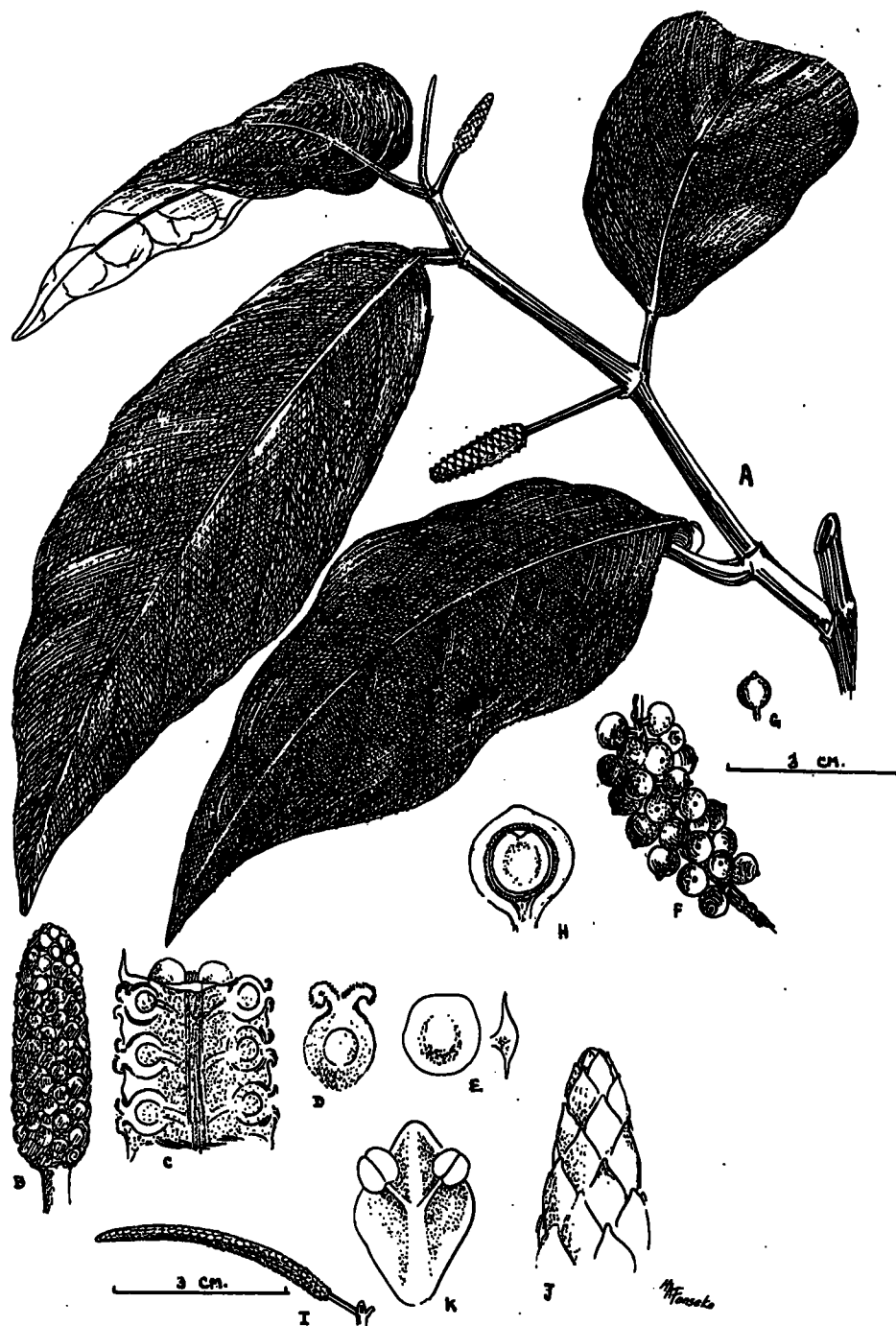


FIG. 425. *Piper cubeba*. A, branch of female plant with spikes. B, female spike. C, longitudinal section of a part of the female spike. D, longitudinal section of pistil. E, bracts, dorsal and lateral views. F, spike with fruits. G, fruit. H, longitudinal section of fruit. I, male spike. J, upper part of male spike. K, bract with stamens. C—E, H, J, K, enlarged.

3. *Piper cubeba* Linn. f. Suppl. 90. 1781. (Fig. 425).

Cubeba officinalis Miq.—*Piper caudatum* Houtt. non Vahl.

Engl. Cubeb; *Sinh.* Walga-miris; *Tam.* Val-milaku; *Sans.* Kankola.

A climbing shrub with smooth, cylindrical, zigzag striate stems somewhat thickened at nodes; leaves simple, alternate, on very short stout petioles, blade about 15 cm long, lanceolate or oval-oblong, tapering to an acute apex, usually somewhat unequal at the base, entire, slightly wavy, glabrous on both surfaces, somewhat coriaceous, dark green, rather paler with prominent veins beneath; flowers unisexual, dioecious, minute, sessile, each with a bract at the base, densely crowded in small, cylindrical, stalked, solid spikes coming off opposite leaves; male spikes slender, tapering, shortly stalked, about 2.5 cm long, the female spikes shorter, blunt, thick and fleshy, on longer stalks; bracts of male flowers crowded, imbricate, thin, rhomboidal, subacute, of female flowers peltate, nearly circular, slightly hairy, fleshy with a short stalk, perianth absent in both; male flowers: stamens 2 (or 3), anthers short, ovate, 2-celled; female flowers: ovary superior, sunk in the substance of the spadix, globular with a single erect ovule, style very short, stigmas 3 or 4, short, recurved, papillose; fruit globular smooth, about 6 mm long, with a blunt apiculus and tapering below into a stalk-like base which is a little longer than the rounded extremity, projecting horizontally from the axis and together forming a lax raceme about 5 cm long; seed completely filling the fruit, embryo minute in a cavity excavated at the summit of the copious mealy endosperm.

Illustrations. Bentley and Trimen, *Med. Plants*, pl. 243. 1880; Greenish, Henry G. *Text-Book of Pharmacognosy*, pl. 93. 1933; Macmillan, *Trop. Plant. and Gard.*, p. 359. 1956.

Distribution. A native of Java, Sumatra and Borneo and much cultivated in coffee plantations. It grows under similar conditions as pepper in Ceylon, requiring live or artificial supports and a fair amount of shade.

Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *J. M. Silva*, Dec. 1928. **Malaya.** Johore: *Ridley*, March 1889; Singapore: March 1891, without name of collector. **Java.** Bogor, cultivated, March 1891, without name of collector.

Composition. Cubebs yield a volatile oil, cubebin, resin and cubebic acid. The fruit is supposed to contain the alkaloid, piperine.

Uses. Cubebs have stimulant, carminative and diuretic properties. They are a valuable remedy for gonorrhoea, gleet and ailments of the bladder. They have an antiseptic action on the mucous membrane of the genito-urinary organs and also sometimes used for chronic bronchitis.

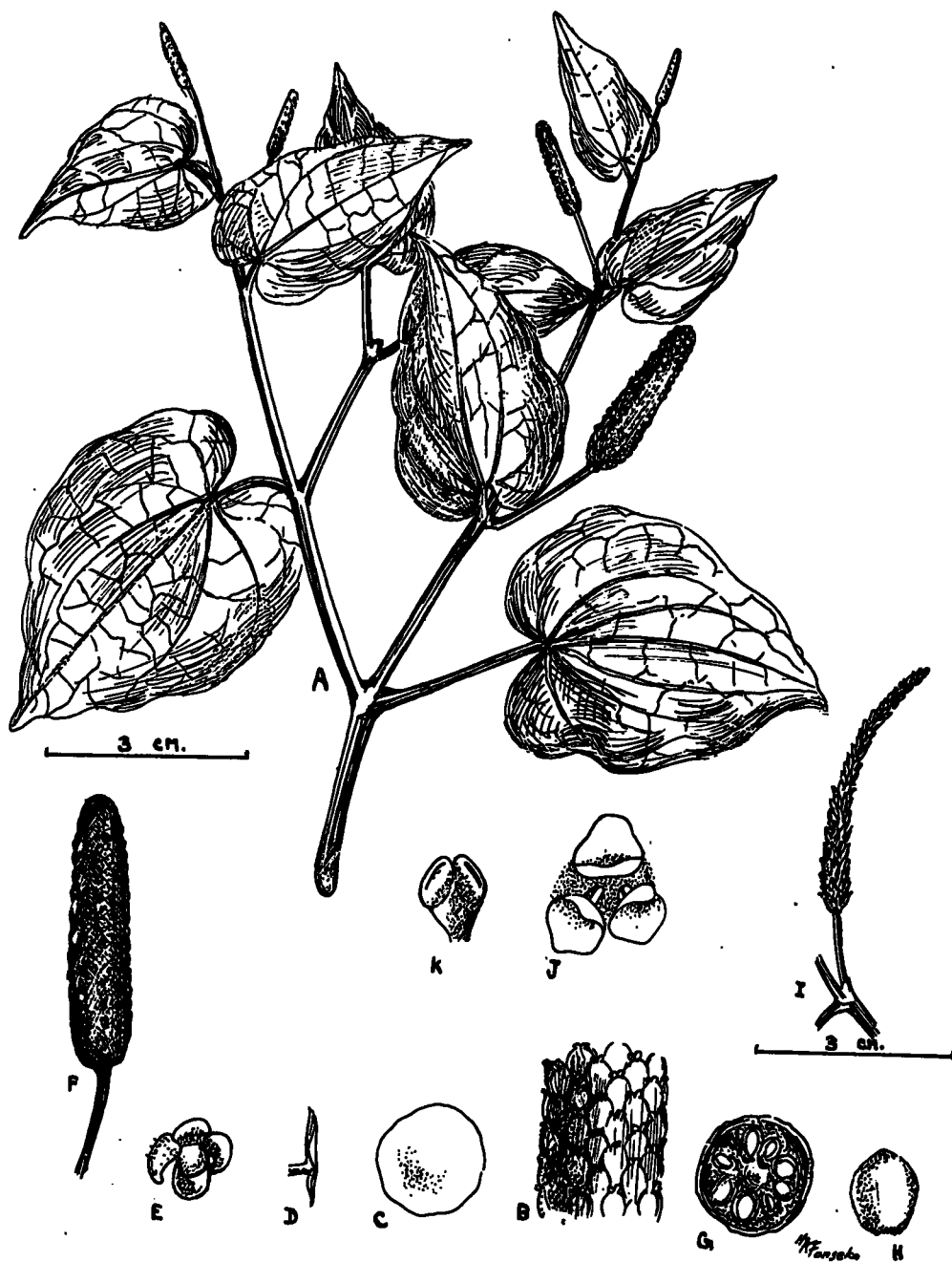


FIG. 426. *Piper longum*. A, twig from female plant with half-ripe fruit spikes. B, portion of female flower-spike. C, D, flower bract, dorsal and lateral views. E, female flower with the ovary, style divided into 4 recurved stigmas. F, ripe fruit-spike. G, transverse section of ripe fruit-spike. H, fruit. I, male flower-spike. J, male flower, dorsal view. K, stamen. B—E, G, H, J, K, enlarged.

4. *Piper longum* Linn. Sp. Pl. 29. 1753. (Fig. 426).

Piper sarmentosum Wall.—*Piper latifolium* Hunter—*Chavica roxburghii* Miq.—*Chavica sarmentosa* Miq.

Engl. Long Pepper; *Sinh.* Tippili, Wagapul; *Tam.* Argadi, Atti, Kalidi, Kalini Kaman, Kanna, Kattuttippilikkodi, Kindigam, Kirandigam, Kolagam, Magadai, Magad Pippili, Sabala, Sadi, Salani, Salini, Samilagi, Sanjalai, Savundi, Sayin, Sirumulagam Sirumulam, Tippili, Tirandigam, Tunavi, Ulagulam, Vayavetti; *Hindi* Gazpibal, Pipal, Pipar Piplamul, Pipli, Pipulmul; *Sans.* Chanchala, Chapala, Dantakapha, Eranda, Gonanika Granthika, Kagophale, Kana, Kati, Katubija, Kola, Kolya, Korangi, Krikala, Krishna, Krishnapippali, Magadha, Magadhi, Magadhodbhava, Pippali, Shaundi, Shyama, Sukshmatandula, Tiktatandula, Trikana, Upakulya, Ushana, Vaidehi.

A perennial herb with a thick, erect, jointed, branched rootstock, stems numerous 60—90 cm long, ascending or prostrate (not climbing), much branched, stout, cylindrical, thickened above nodes, finely pubescent; leaves simple, alternate, stout, cylindrical, thickened above nodes, finely pubescent; leaves simple, alternate, numerous, 3.7—8.7 cm long, lower ones broadly ovate, very cordate with broad rounded lobes at base, upper ones oblong-oval, cordate at base, all subacute, entire, glabrous, thin, bullate with reticulate venation sunk above and raised beneath, dark green and shining above, pale and dull beneath, petioles of lower leaves 5—7.5 cm long, stout, of upper ones very short or none, stipules about 1.2 cm long, membranous, lanceolate, obtuse, enclosing the bud but soon falling off; flowers naked, unisexual, dioecious, sessile in axils of fleshy bracts supported by two lateral bracts arranged in solitary, pedunculate spikes; male spikes slender, bracts narrow; female spikes 1.2—2.5 cm long, bracts circular, flat, peltate; perianth absent; stamens 2, anther 2-celled; ovary superior unilocular with a solitary erect ovule, stigmas 3 or 4, short, spreading, persistent; fruit very small ovoid, completely sunk in solid fleshy spike which is 2.5—3.7 cm long, ovoid-oblong, erect blunt, blackish green and shining.

Flowers all the year round.

Illustrations. Nees, *Med. Bot.*, pl. 23; Miquel, *Ill. Pip.*, pl. 30; Bentley and Trimen, *Med. Plants*, pl. 244. 1880; Wight, *lc. Pl. Ind. Or.*, pl. 1928. 1853; Kirtikar and Basu, *Indian Med. Plants*, pl. 821A. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the warmer parts of India, Ceylon, Malay Peninsula, Timor and Philippine Islands. It is often cultivated in the low-country in Ceylon, principally in the dry regions.

India. Sikkim: *J. D. Hooker*; Silhet: *Wallich* 6640F. *Ceylon.* Central Prov., Peradeniya, Bot. Gard., cultivated, *Baker* 134, June 1907; Muruthalawa, *Appuhamy*, Nov. 1952. Western Prov., Colombo, *Thwaites C.P.* 2953.

Composition. The fruit of this plant contains the alkaloid piperine, in addition to volatile oil and resin.

Uses. The dried immature fruit-spikes and roots are used in decoction for acute and chronic bronchitis, fever and cough. The fruit is also used with other ingredients for enlargements of the spleen and other abdominal viscera. It is a stimulant to the urethra and rectum. It increases the gastric secretion and improves the appetite. It is occasionally used for haemorrhoids, piles and dropsy. Externally, the fruit acts as a rubefacient anodyne and counter-irritant. The root has carminative, laxative and expectorant properties.

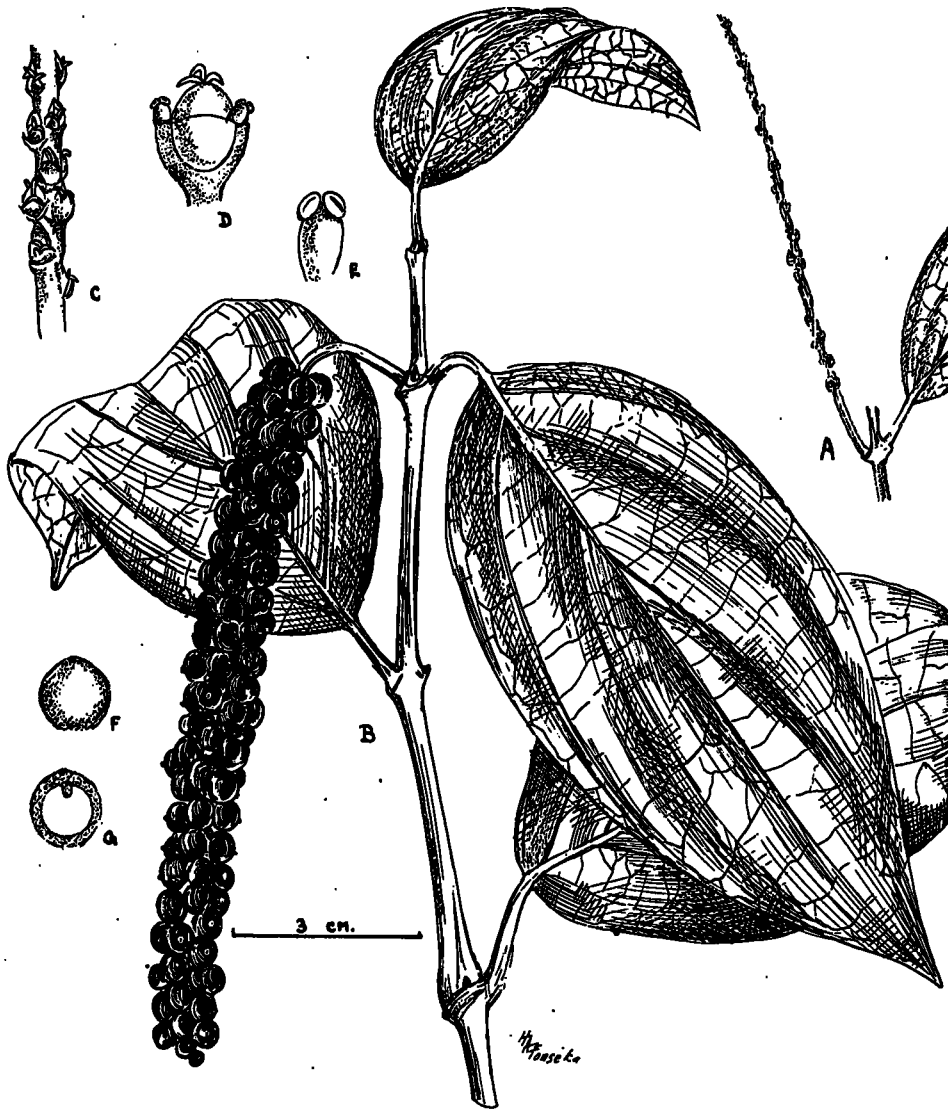


FIG. 427. *Piper nigrum*. A, flower-spike arising opposite a leaf. B, twig with leaves and pendulous fruit-spike. C, portion of the flower-spike showing the bracts and flowers. D, flower, lateral view. E, stamen. F, fruit. G, longitudinal section of fruit. D, E, enlarged.

5. *Piper nigrum* Linn. Sp. Pl. 28. 1753. (Fig. 427).

Piper trioicum Roxb.—*Piper nigrum* var.—*trioicum* Cas. DC.—*Piper baccatum* Cas. DC.—*Piper glabrispicum* Cas. DC.—*Muldera multinervis* Miq.—*Muldera wightiana* Cas. DC.

Engl. Black Pepper; *Sinh.* Gammiris; *Tam.* Aguttam, Arisu, Irambivam, Kallinai, Kandanaguli, Kari, Karyam, Kolagam, Malaiyinnunivan, Marisam, Milagu, Milaku, Milaguvalli, Sevviyam, Sur, Tirangal, Uchiram, Valliyam, Vellaimulagu; *Hindi* Chocamirch, Golmirch, Habush, Filfilgird, Kalimirch, Mirch, Safedmirch; *Sans.* Dharmapathana, Dharmavarttana, Kaphavirodhi, Katuka, Kola, Kolaka, Krishna, Krishnamushana, Malina, Maricha, Mrishta, Pavita, Ruksha, Sarvahita, Shakanga, Shirovritta, Shudha, Shyama, Tikshna, Ushana, Vallija, Vara, Varishtha, Vellija, Venuja, Venuka, Vrittaphala, Yavanapriya, Yavaneshta.

A climbing perennial with cylindrical, dichotomously branched stems much thickened at nodes, glabrous, rooting sparingly, shining; leaves simple, alternate, 12.7—17.5 cm long, ovate-oval, broadly-ovate or ovate-oblong to nearly orbicular, rounded or more or less cordate at base and oblique, acuminate acute, 5—9-veined (outer ones often faint), coriaceous, glabrous, paler beneath, petioles 2.5—3.7 cm long and stout; flowers bisexual, sessile in axils of fleshy bracts with 2 lateral bractlets arranged in leaf-opposed spikes 5 cm long, slender, bracts oblong, upper part free concave, very obtuse; perianth absent; stamens 2, anther 2-celled; ovary superior, unilocular with a solitary erect ovule, styles 2—4; fruit nearly globose, at first dark green about 6 mm long passing through orange-yellow to dull red when ripe in pendulous spikes 10—15 cm long, bractlets connate above forming the upper margin of a shallow nearly circular cup round the fruit, pulp scanty, seed ovoid-globose, pointed at base, testa thin, hard, smooth, yellow.

Flowers in September, and January,

Illustrations. Miquel, *Ill. Pip.*, pl. 50; Curtis, *Bot. Mag.* pl. 3139. 1832; Nees, *Med. Plants*, pl. 21; Bentley and Trimen, *Med. Plants*, pl. 245. 1880; Wight, *Ic. Pl. Ind. Or.*, pl. 1935. 1853; Kirtikar and Basu, *Indian Med. Plants*, pl. 821B. 1933; Herb. Peradeniya, drawing.

Distribution. Indigenous to South India but spread by cultivation over the islands of Malay Archipelago, West Indies and South America. It is now cultivated in Sumatra, Penang, Siam, Borneo and Philippine Islands and in Ceylon in the moist mid and low-country.

India. Mt. Khasia: *J. D. Hooker and T. Thomson*; S. India: *Barber* 7791 without locality. **Ceylon.** Central Prov., Matale, *Alston* 577 May 1927; Peradeniya, *Bot. Gard.*, *Baker* 103, June 1907; *F. W. de Silva*, Oct. 1939; Muruthalawa, *Appuhamy*, Dec. 1951. **Malaya.** Singapore, *Wallich* 6643F, 1822.

Composition. Black pepper contains an acrid resin, an oleoresin, a volatile oil, starch, gum, a fatty oil and inorganic matter besides the alkaloids, chavicine, β -methyl-pyrroline, piperidine and piperovatine.

Uses. Internally, pepper is a stomachic, carminative and induces secretion of bile. It is used in dyspepsia, flatulence, gonorrhoea, cough, haemorrhoids, intermittent fevers, piles and elephantiasis. It has been successfully used to stop vomiting in cases of cholera, and for paralytic and arthritic disorders. It is an antidote for shell-fish and mushroom poisoning. Externally, it is used as a rubefacient and counter-irritant. A liniment prepared with it is useful for chronic rheumatism. In Cambodia, it is used as a cure for dysentery and in East Africa it is given as an abortifacient. Black pepper is used extensively for culinary purposes.

87. PLANTAGINACEAE

1. *Plantago erosa* Wall. in Roxb. Fl. Ind. ed. Carey and Wall. 1: 423. 1832.

Plantago asiatica Linn.—*Plantago major* var. *asiatica* Trim.

Engl. Greater Plantain; *Sinh.* Isapagol; *Tam.* Ishappukol-virai; *Hindi* Luhuriya; *Sans.* Uthamu-jiran.

A perennial herb with an erect, stout rootstock; leaves simple, alternate, radical, 2.5—4.7 cm long, tapering into and decurrent on petiole, obtuse or subacute, entire or more or less coarsely dentate or lobed, nearly glabrous or with scattered short hairs on both sides, 5-nerved, petioles usually much longer than leaves, wide, sheathing at base; flowers small, regular, bisexual, nearly sessile in rather lax narrow spikes 2.5—12.5 cm long, peduncles (scapes) erect, slender, usually much exceeding the leaves, bracts shorter than calyx; sepals 4, imbricate, free, ovate, subacute with membranous margins, glabrous, persistent; petals 4, fused into a scarious corolla, tube oblong-ovoid, lobes lanceolate, acute, reflexed, imbricate; stamens 4 inserted on corolla-tube, much exerted; ovary superior, 2-locular with several ovules in each loculus, style filiform; fruit capsule dehiscent by a circular line at the base, ovate-ovoid, obtuse, apiculate, glabrous, seeds somewhat angled, dull black.

Illustration. Wight, Ill. Ind. Bot., pl. 177.

Distribution. Occurs in India, Ceylon, Malaya, Burma, China and Philippine Islands. It is common in the upper montane zone in Ceylon, as a roadside weed.

India. Sikkim: *T. Thomson*. Assam: *Jenkins*. Ceylon. Central Prov., Nuwara Eliya, *Thwaites C.P.* 2246; Ambawela Road, *Willis*, March 1906; Pidurutalagala, *Nock*, April 1893; Dimbula, *Smith*, 1890; Hakgala, *Herb. Peradeniya*, Jan. 1888; *A. M. Silva*, Oct. 1906.

Composition. This plant contains a large amount of potassium salts and citric acid. The leaves, roots and flower buds contain a glucoside, aucubin and enzymes invertin and emulsin. The seeds possess a fixed oil, aucubin, choline and organic acids succinic and platenollic acids.

Uses. Used as a diuretic and astringent. In Java it is given for stones in the bladder, diabetes, worms and haemorrhoids. The fresh juice of the leaves is known to be a remedy for malaria. A decoction of the leaves and roots is an antidiarrhetic and is given for coughs and consumption. The seed is used for dysentery, diarrhoea, whooping cough, wasting diseases and promotes fertility by increasing the secretion of semen in men. In Japan, a watery extract of the seed is given for whooping cough.

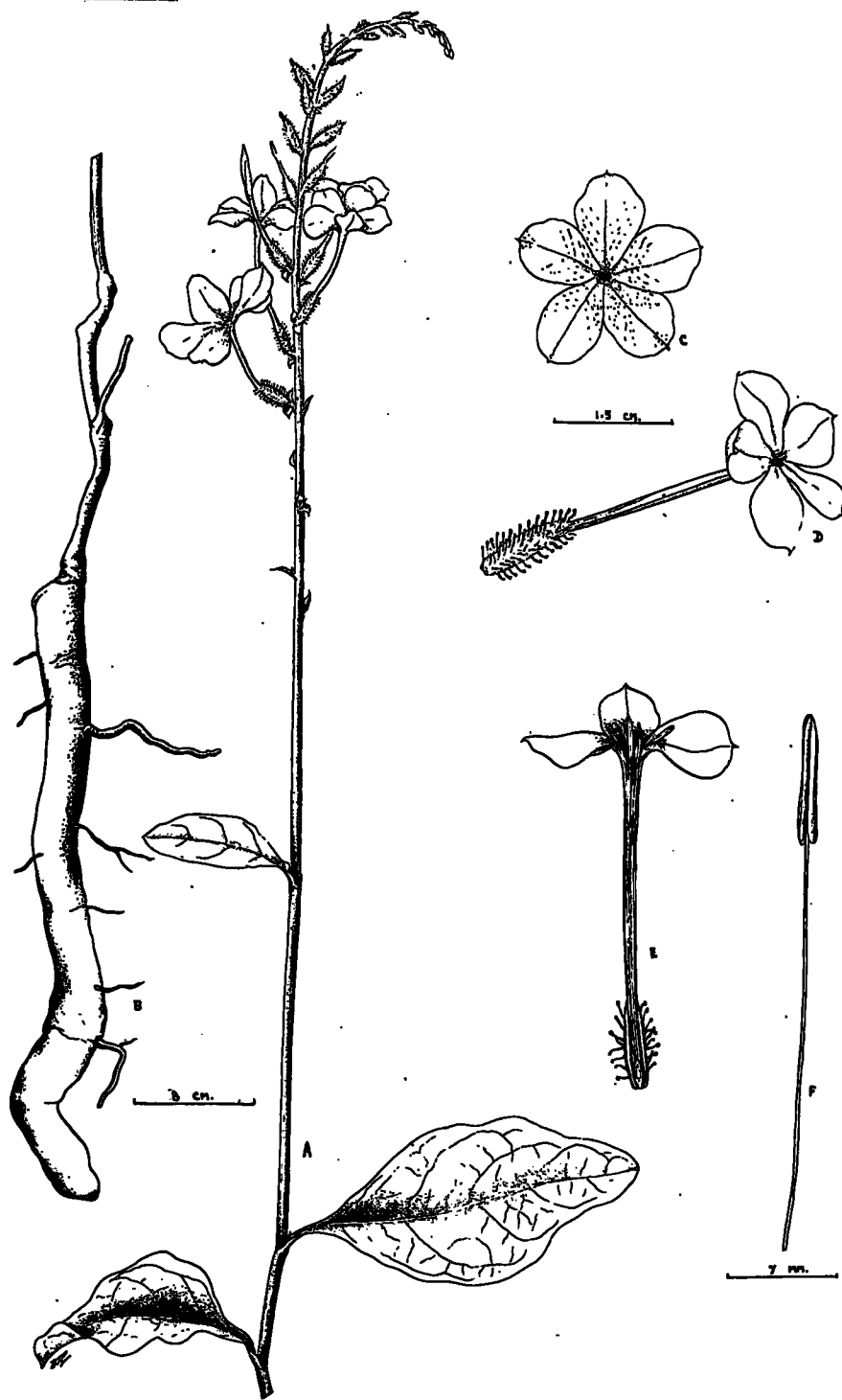


FIG. 428. *Plumbago indica*. A, apical portion of branch with leaves and flower raceme. B, tuberous root. C, flower, dorsal view. D, flower, lateral view. E, longitudinal section of flower. F, stamen.

88. PLUMBAGINACEAE

1. *Plumbago indica* Linn. in Stickm. Herb. Amb. 24. 1754. (Fig. 428).

Plumbago rosea Linn.—*Plumbago coccinea* Boiss.—*Thela coccinea* Lour.

Engl. Rosy-flowered Leadwort; *Sinh.* Ratnetol, Ratnitul; *Tam.* Akkini, Sengodiveli, Sengoduveli, Sengappugodiveli, Sittiramulam; *Hindi* Chitra, Lalchita, Lalchitarak, Lalchitra, Raktachitra; *Sans.* Agni, Atidipya, Chitraka, Chitranga, Chitravalli, Dahatea, Daruna, Dipika, Dvayagni, Hrasvagni, Kala, Kalamula, Mahanga, Marjana, Pathi, Pavaka, Raktachitra, Raktachitraka, Rakfasikha, Usharbudhavhaya, Vahnimula, Vyala.

A perennial glabrous herb, more or less climbing with striated stems and with long succulent roots; leaves simple, alternate, exstipulate, ovate-elliptic, about 10 cm long, tapering into a short somewhat clasping petiole, entire, undulate, glabrous, thin; flowers regular, bisexual in long purplish-red to scarlet racemes, bracts shorter than calyx; sepals 5, fused into a narrow, tubular, glandular calyx, pubescent with stalked glands; petals 5, fused into a tubular salverform corolla, tube about 2.5 cm long, segments obovate, spreading, apiculate; stamens 5, distinct, hypogynous, free from the corolla, filaments as long as the corolla-tube, anthers exserted just beyond the throat; ovary superior, 5-carpellary, unilocular with basal placenta and one anatropous ovule, style 2.2 cm long; stigmas 5; fruit a membranous circumscissile capsule, enclosed by persistent calyx, the deciduous part often splitting into 5 valves from below.

Illustrations. Curtis, Bot. Mag., pls. 230 and 5363; Kirtikar and Basu, Indian Med Plants, pl. 574B. 1933.

Distribution. Probably a native of South Asia and now cultivated throughout India and Ceylon.

India. Sikkim: *J. D. Hooker*. Madras: *Wallich*. Assam: *Jenkins*. Ceylon. Central Prov., Peradeniya, Bot. Gard., cultivated, *Herb. Peradeniya*, Aug. 1887.

Composition. The root bark of this plant contains plumbagin.

Uses. The juice of the root blisters the skin. The root is used to cause abortion. The juice of the leaves and roots mixed with oil is employed as an application for rheumatism, paralysis and leprosy. In South India, the dried root is valued as a remedy for secondary syphilis and leprosy. The vesicating properties of the milky juice is made use of on certain types of leucoderma and scabies.

2. *Plumbago zeylanica* Linn. Sp. Pl. 151. 1753.

Plumbago auriculata Bl.—*Plumbago viscosa* Blanco—*Thela alba* Lour.

Engl. Ceylon Leadwort, White-flowered Leadwort; *Sinh.* Elanetol, Sudunitul; *Tam.* Adigarradi, Akkini, Angodiveli, Kanilam, Kanilindiran, Karimai, Kodiveli, Koduveli, Sadaveda, Sittiragam, Sittiramulam, Tigana, Vanama, Vellaikkodivali, Vangodiveli; *Hindi* Chita, Chitarak, Chitawar, Chiti, Chitra; *Sans.* Agni, Agnimata, Agnisikha, Anala, Analanama, Barhi, Bhali, Brihadbhanu, Chitra, Chitraka, Chitranga, Dahaka, Dahana, Daruna, Dvipi, Himarati, Hiranyareta, Hutabhuk, Jataveda, Jyotishka, Krishnanu, Krishnavartma, Kuta, Lohitanga, Pachi, Palaka, Pali, Pathi, Pathina, Pavaka, Saptarshi, Shambara, Shardula, Shikhavana, Shikhi, Shuchi, Shura, Shushma, Shwetachitraka, Ushana, Vaishavanara, Vallari, Vanhi, Vanhinama, Vibhakara, Vibhasu, Vyala.

A perennial herb with long succulent roots and spreading, branched, cylindrical, glabrous stems 60—150 cm long; leaves simple, alternate, exstipulate, 3.7—8.7 cm long, sessile, oval or ovate-oval, much tapering towards the base but there dilated to form rounded amplexicaul stipule-like auricles, acute at apex, entire, undulate, glabrous, thin, somewhat glaucous and finely scurfy beneath; flowers regular, bisexual, white, on very short pedicels, in erect terminal spicate racemes, rachis and bracts glandular; sepals 5, fused into a narrowly tubular calyx about 1.2 cm long, persistent, segments with membranous margins, covered with large, stalked, spreading, globose, crimson glands; petals 5, fused into a long slender tube 2.5 cm long, lobes 1.2 cm long, oval, acute, twisted in bud; stamens 5, distinct, hypogynous, filaments as long as the corolla-tube, anthers exerted just beyond the throat; ovary superior, 5-carpellary, unilocular, with a single basal ovule, style simple, stigmas 5; fruit capsule included in the persistent calyx and corolla, oblong, sharply pointed, pericarp thin below, circular dehiscent near the base, thick and hard above, seed solitary.

Flowers from December to March.

Illustrations. Wight, *Ill. Ind. Bot.*, pl. 179. 1838; Kirtikar and Basu, *Indian Med. Plants*, pl. 574A. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in the tropics including India and Ceylon. It is common in the low-country in Ceylon in the dry districts.

India. Assam: *Simons*. Malabar, Concan, etc. *Stocks, Law, etc.* Ceylon. Without locality, *Thwaites C.P.* 2265. Formosa. Tamsuy, *Oldham* 413, 1864.

Composition. The roots of this herb contain plumbagin. The leaves and stems also possess a little plumbagin and a fixed and volatile oil.

Uses. The root increases the appetite and digestive power and useful for dyspepsia, flatulence, piles, anasarca, diarrhoea, skin diseases, etc. Externally, it is applied on chronic skin diseases and leprosy. It is an irritant causing blisters. However it has powerful germicidal action on bacteria and unicellular organisms. The root is largely used as an abortifacient both externally and internally. In Africa, the plant is employed as a remedy for leprosy. Owing to the irritant qualities, African girls use it in cosmetic tattooing. In Europe, a cold infusion of the root is employed for influenza and blackwater fever.

89. POLYGONACEAE

1. *Polygonum barbatum* Linn. Sp. Pl. 362. 1753.

Polygonum stoloniferum Blanco—*Polygonum persicaria* Walp.—*Polygonum fissum* Miers—*Polygonum erythroides* Miq.—*Polygonum stagninum* Meissn.—*Polygonum flaccidum* Roxb.—*Polygonum rivulare* Koen.—*Polygonum hornemanni* Meissn.

Sinh. Ratu-kimbulwenna; *Tam.* Atalari; *Sans.* Ola.

A perennial herb with erect, glabrous stems 40—90 cm tall; leaves simple, alternate, stipulate, numerous, 12.5—15 cm long, linear-lanceolate, nearly sessile, tapering to both ends, acute, finely hairy on both sides and at margin, stipules usually longer than the internodes, combined into a tubular membranous sheath 3.7 cm long, strigose with long hair, ciliate with strong coarse hair as long as the tube; flowers regular, bisexual, small, white, usually jointed on short slender pedicels, racemes 3.7—5 cm tall, erect, slender, rather lax, bracts strongly pectinate; perianth 4 or 5-lobed, lobes imbricate without glands; stamens 4, 5 or 8, inserted on the perianth (perigynous); ovary superior, unilocular with a solitary basal ovule, styles 3; fruit a small nut enclosed in persistent perianth, triangular, black and shining.

Flowers all the year round.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 1798. 1852; Kirtikar and Basu, Indian Med. Plants, pl. 808. 1933.

Distribution. Occurs in the warmer parts of India, Ceylon, Malaya, Philippine Islands and Africa. It is common in the low-country moist regions in wet places in Ceylon. Galle, Batticaloa, Peradeniya, etc.

India. N. W. India: *Royle*. E. Bengal: *Herb. Griffith* 4115, Kew Distribution 1863—4. Assam: *Masters; Jenkins*. Plan. Ganget. Inf. *T. Thomson*. Misor and Carnatic: *G. Thomson*. Pen. Ind. Or., *Herb. Wight* 2454, Kew Distribution 1866—8. Ceylon. Eastern Prov., Batticaloa, *Simpson* 8305, June 1931. Without locality, *Thwaites C.P.* 3000. Tenasserim and Andamans. *Herb. Helfer* 4115, Kew Distribution 1862—3. Malaya. Penang: *Wallich* 1708. Japan. Nagasaki: *Oldham* 688, 1862.

Uses. The pounded leaves of this plant applied to wounds is an effective cicatrizant. A decoction of the leaves is used to wash ulcers in China, while in Malabar and Canara the seeds are used to relieve colic. The roots are astringent. In Brazil, the juice of the plant is given for strangury and the fresh plant used in baths for gout and haemorrhoids. It is a fish poison. The seed is aromatic, purgative and emetic. The plant has antiseptic properties.

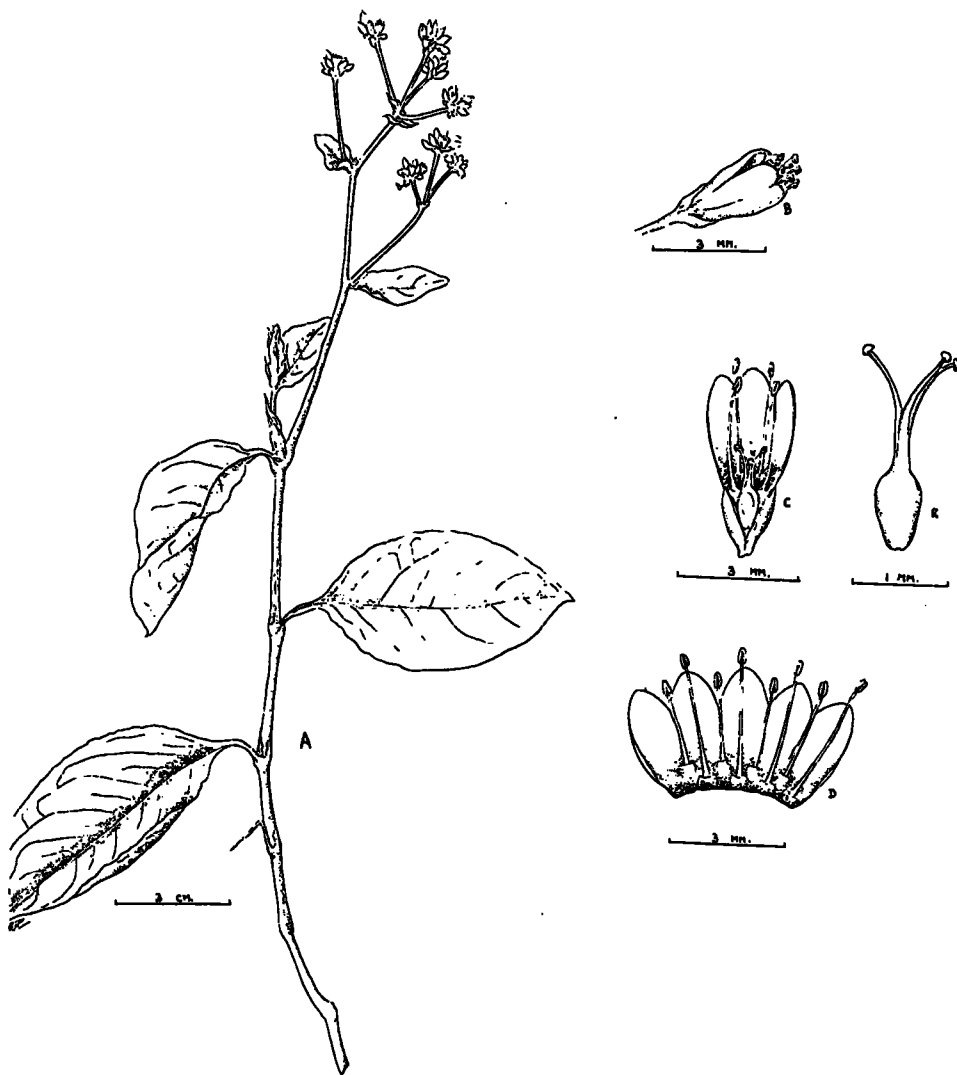


FIG. 429. *Polygonum chinense*. A, branch with leaves and inflorescence of flowers. B, flower, lateral view. C, longitudinal section of flower. D, perianth spread out showing the insertion of stamens. E, pistil.

2. *Polygonum chinense* Linn. Sp. Pl. 363. 1753. (Fig. 429).

Polygonum cymosum Roxb.—*Polygonum auriculatum* Meissn.—*Polygonum bracteatum* Poir.—*Polygonum patens* Don.—*Polygonum corymbosum* Willd.—*Polygonum ovatum* Heyne—*Ampelgoum chinense* Lindl.—*Coccoloba crispata* Ham.

Sinh. Miyandalu.

A large scrambling shrub, semiscandent over trees and bushes by its very long, divaricate branches which are cylindrical, swollen at nodes, glabrous and shining, young parts glabrous; leaves simple, alternate, stipulate, numerous, 6.2—11.2 cm long, oval or ovate-oval, shortly petioled, uppermost sessile, suddenly tapering to base, shortly acuminate, acute, entire, glabrous except on the prominent midrib which is hispid beneath, stipules very long (nearly 5 cm), membranous, very obliquely truncate, lanceolate, acute; flowers regular, bisexual, pinkish-white, small, sessile, crowded in small globose heads arranged in terminal corymbs, peduncles usually glandular pubescent, bracts small, acute; perianth deeply 5-lobed, lobes ovate, imbricate, subacute, erect; stamens 8, inserted on the perianth (perigynous); ovary superior, unilocular with a single basal ovule, styles 2 or 3; fruit a nut enclosed in fleshy persistent perianth, large, trigonous.

Flowers all the year round.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 1806. 1852; Herb. Peradeniya., drawing.

Distribution. Occurs in India, Ceylon, Malay Peninsula, Java, Sumatra, China and Philippine Islands. It is common in the moist montane zone in Ceylon, upto 7,000 feet altitude.

India. Sikkim: *T. Thomson*. Himal. Bor. Occ., *T. Thomson*. Assam and Khasia: *Simons*. Khasia: *Griffith* 562; *Parasnath*, *T. Thomson*; Mt. Khasia, *J. D. Hooker and T. Thomson*. Assam: *Prain's Collector* 429; *Watt* 11459, May 1895. Silhet: *Wallich* 1707. E. Bengal: *Herb. Griffith* 4126, Kew Distribution 1863—4. Pen. Ind. Or., *Herb. Wight* 2458, Kew Distribution 1866—8. **E. Pakistan.** Chittagong: *King's Collector* 243. Ceylon. Central Prov., Kandy, *Alston* 3141. March 1926; Peradeniya, *Thwaites C.P.* 2249; Hakgala, Patana, *A. M. Silva* Oct. 1906. **Burma.** Maymyo, *Robbins* 39354, July 1924. Upper Burma: Shan States, *Huk*, Nov. 1890. **Indo-China.** Hue and vicinity, *Squires* 231, Jan.—May 1927. **China.** Yunan Expedition, *Anderson*, 1875; Hongkong, *Herb. Hance* 759, Oct. 1889. **Java.** *Yates* 2748, March 1928. **Sumatra.** (W. coast). Mt. Singgalan, *Yates* 2417, 1927. **Japan.** Nagasaki, *Oldham* 693, 1862. **Philippine Islands.** Luzon: Banquet Prov., *Banguio*, *Elmer* 5852, March 1904. Mindanao: Davao Prov., Mt. Mayo, *Ramos and Edano* 49402, April—May 1927.

Uses. This plant has vulnerary and antiscorbutic properties. It is used on boils and also to draw out thorns and other foreign objects from the body.

3. *Polygonum pulchrum* Blume Bijdr. 2: 536. 1825.

Polygonum tomentosum Willd.—*Polygonum orientale* Wall.—*Polygonum ochreatum* Houtt.

Sinh. Sudu-kimbulwenna; *Sans.* Swastika, Sunnysanna.

An annual herb with prostrate stems below, rooting at nodes, stem above erect, stout, glabrous or pubescent; leaves simple, alternate, stipulate, rather large, 10—20 cm long, linear-lanceolate, the lowest ones somewhat ovate much tapering at both ends, very acute, entire, silky pubescent on both surfaces sometimes white and velvety, petioles very short (sometimes as long as the lower leaves), stipules 1.8—2.5 cm long, hairy, combined into a tubular membranous sheath, mouth truncate, ciliate with fine bristly hairs 0.6 cm long; flowers regular, bisexual, white, small, on short pedicels, racemes few, paniced, erect, 3.7—6.2 cm long, slender, bracts large, very truncate, hairy, ciliate; perianth 4 or 5-lobed, lobes imbricate; stamens 4, 5 or 8 inserted on perianth (perigynous); ovary superior, unilocular, with a solitary basal ovule, styles 2 or 3; fruit a small nut enclosed in persistent perianth, 3 mm long, orbicular, somewhat compressed, black and shining.

Flowers all the year round.

Illustrations. Houttuyn, Pfl. Syst. 6: pl. 49, fig. 1; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya, Java, Philippine Islands and tropical and S. Africa. It is common in ditches and bordering tanks in the low-country, especially in the dry regions in Ceylon. Batticaloa, Galle, Anuradhapura, etc.

India. Assam: *Jenkins*. N. Canara: *Talbot*, 1882. Plan. Ganget. Inf., *T. Thomson*. Maisor and Carnatic: *G. Thomson*. W. Bengal: Calcutta Bot. Gard., cultivated. CEYLON. North-Central Prov., Kekirawa Tank, *Herb. Peradeniya*, July 1887. Southern Prov., Ranna, *Alston* 1338, March 1927. Without locality, *Thwaites C.P.* 2248.

Composition. This plant contains an acrid resin.

Uses. The leaves are astringent and styptic. The plant is considered an excellent remedy for diarrhoea and fever.

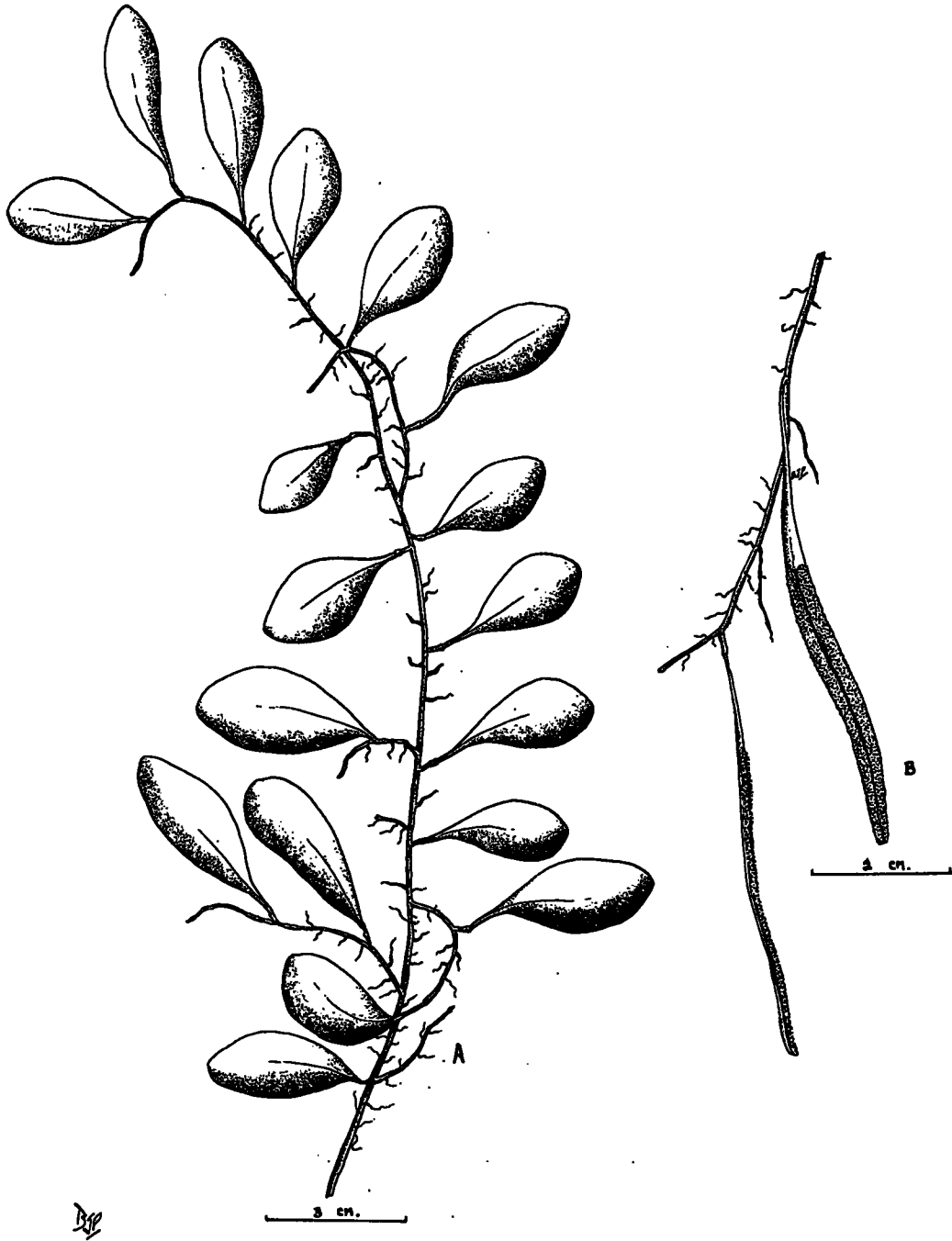


FIG. 430. *Drymoglossum heterophyllum*. A, portion of stem with sterile fronds. B, stem with fertile fronds.

90. POLYPODIACEAE

1. *Drymoglossum heterophyllum* (Linn.) Presl. Tent. Pterid. 227. (Fig. 430).

Drymoglossum piloselloides (Linn.) Presl.

Sinh. Panampethi, Salli-kola.

An epiphytic fern climbing on branches of trees and shrubs; rhizomes long, slender, covered with adpressed, peltate, lacinated scales which are sometimes hair-pointed; fronds of two kinds, sterile and fertile; sterile fronds vary in form rounded to elliptic, 1.2—5 cm long, 1.8 cm wide, thick, fleshy, covered with stellate hairs when young, stipes about 5 mm long; fertile fronds 5—10 cm long, 3—6 mm broad, veins immersed, areoles with copious free veinlets, stipes about 2.5 cm long; sori arranged in broad continuous marginal lines often confluent and covering the whole undersurface, capsules mixed with a few stellate paraphyses.

Illustrations. Presl, Tent. Pterid., *pl.* 10; Beddome, Ferns of Brit. India and Ceylon, *pl.* 244. 1883.

Distribution. This fern occurs in India, Ceylon, Burma, Malaya, Indo-China and Philippine Islands. It is common in Ceylon both in the hill-country and low-country, epiphytic on trees and shrubs.

India. Assam: *Masters*. Malaya. Penang: *Wallich* 139. Burma. Rangoon: *Scott*.

Uses. The leaves are used as a styptic to arrest capillary haemorrhages and on eczema.



FIG. 431. *Portulaca oleracea*. A, plant with leaves and roots. B, flower, dorsal view.

91. PORTULACACEAE

1. *Portulaca oleracea* Linn. Sp. Pl. 445. 1753. (Fig. 431).

Portulaca laevis Ham.—*Portulaca suffruticosa* Thw.

Engl. Garden Purslane; *Sinh.* Gendakola; *Tam.* Karikkirai, Parupukkirai, Passalakirai, Pulichchankirai, Pulikkirai; *Sans.* Brihalloni, Gholika, Lona, Lonamla, Loni, Lonika, Lunia.

A stout, glabrous, annual herb with numerous prostrate or ascending branches; leaves simple, alternate, oblong-spathulate, 1—2 cm long, very obtuse, thick, pale beneath, glabrous and shining, petioles very short without stipular appendages; flowers, regular, bisexual, yellow, sessile, inconspicuous in terminal clusters, a few flowers together; sepals 2, connate below and imbricate at the free ends, fleshy, very acute, persistent; petals 4 or 5 or absent, about the same size as the sepals, very delicate and soon falling off; stamens 8—12, perigynous, distinct; ovary half inferior, unilocular with numerous ovules on a basal placenta, stigmas 5 or 6, long; fruit capsule dehiscent transversely, the lid coming off with the free portions of the persistent calyx, seeds numerous, muriculate and dark brown.

Flowers all the year round.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 95. 1933; Herb. Peradeniya drawing.

Distribution. Occurs in all warmer parts of the world. It is a weed in cultivated ground throughout Ceylon.

Ceylon. Northern Prov., Jaffna, *Thwaites C.P.* 1103. Central Prov., Peradeniya, Bot. Gard., *Alston* 1128, April 1927; Haputale, *de Alwis* 8, Aug. 1927. Maldive Islands. *Didi* 133, 1896.

Composition. This herb contains an unnamed alkaloid, urea, vitamin C, fat, potassium salts and oxalates.

Uses. Used in all countries as a vulnerary, antiscorbutic, refrigerant and a mild diuretic. It is useful in catarrhal and urino-genital ailments. It is an article of diet recommended for scurvy and liver diseases. The leaves are used for poulticing boils, ulcers and wounds and to heal burns and cure skin diseases. In the form of an infusion or decoction, they are used as a gastric sedative, diuretic and in the treatment of dysentery. The seed is a stomachic, emollient and diuretic. It is employed for treating dysentery and internal ulcerations of the stomach. In Africa, the plant is used as a sudorific, antiscorbutic and for treatment of haemoptysis, pulmonary and skin diseases and as a snake-bite remedy. It is cooked and eaten as a vegetable.

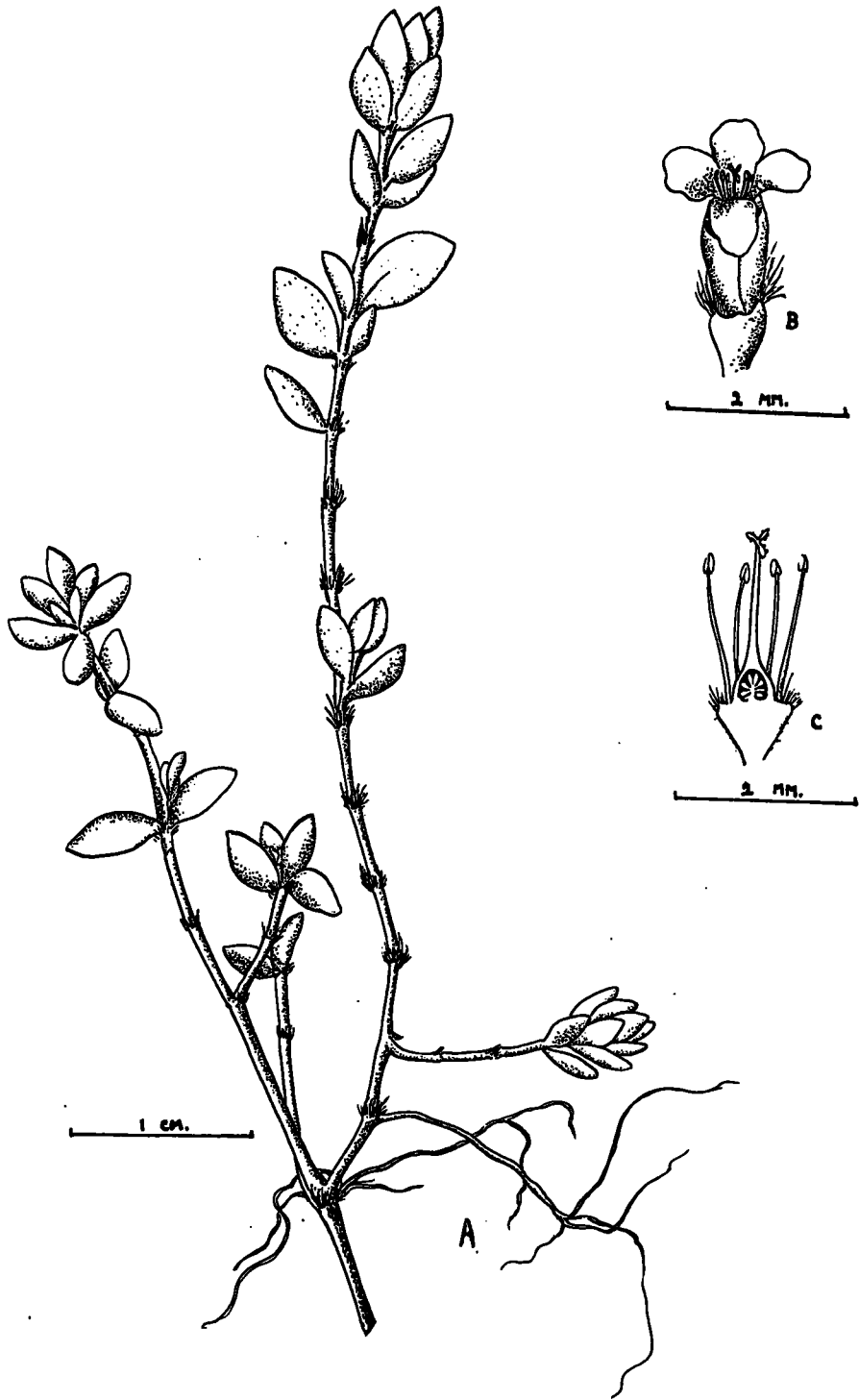


FIG. 432. *Portulaca quadrifida*. A, portion of the plant showing roots, leaves and stipular hairs. B, flower, lateral view with long white hairs surrounding it. C, longitudinal section of flower with the perianth removed.

2. *Portulaca quadrifida* Linn. Mant. 73. 1767. (Fig. 432).

Portulaca meridiana Linn. f.—*Portulaca geniculata* Royle.—*Illecebrum verticillatum* Burm.

Sinh. Hin-gendakola; *Tam.* Passalaikkirai, Passelikkirai, Sinnaparpukkirai, Sirup-passaraikkirai; *Sans.* Kshudragholika, Laghughonika, Laghulonika, Lamba, Upadyki.

A prostrate annual herb which is much branched, creeping and rooting at nodes with numerous slender stems; leaves simple, opposite, very nearly sessile, oval, 0.6 cm long, very fleshy, subobtusate at apex, stipular appendages a ring of white hairs round every node; flowers solitary, regular, bisexual, lemon yellow, open in the middle of the day only, terminal, sessile, surrounded by long white hairs and an involucre of 4 leaves; sepals 2, connate below and imbricate at the free ends, oblong-oval, obtuse and thin; petals 4, distinct, perigynous, oval, obtuse; stamens 8, distinct, perigynous; ovary half-inferior, unilocular with numerous ovules on a basal placenta, style filiform, 4-fid at apex; fruit a dehiscent capsule splitting transversely by a deciduous lid, acute, seeds numerous, muriculate and dark brown.

Flowers all the year round.

Illustrations. Wight, Ill. Ind. Bot. 2: pl. 109; Kirtikar and Basu, Indian Med. Plants, pl. 96A. 1933; Herb. Peradeniya drawing.

Distribution. Occurs in the warmer parts of tropical Asia, Africa, India and Ceylon. It is an extremely common weed in cultivated ground in the low-country in Ceylon, upto 3,000 feet altitude.

India. Him. Bor., T. Thomson. Ceylon. Eastern Prov., Thwaites C.P. 1100. Central Prov., Peradeniya, Bot. Gard., Alston 2008, Oct. 1927. Maldive Islands. Didi 129, 1896.

Composition. The leaves contain mucilage and acid potassium oxalate.

Uses. An infusion of this plant is an emetic and anthelmintic and given for stomach complaints and gonorrhoea. An aqueous extract of it is drunk to prevent threatened abortion. In India, Chopra reports that the plant is used for skin diseases and diseases of the kidneys, bladder and lungs. According to Ainslie, it is used as an external application on erysipelas and an infusion of it is taken internally as a diuretic for dysuria. In Africa, the plant is used as a cure for toothache.

92. PRIMULACEAE

1. *Cyclamen indicum* Linn.

Sinh. Urala.

This plant is mentioned by Linnaeus in his *Species Plantarum* but there are no corresponding specimens in the Herbarium, Peradeniya. Neither Hooker nor Trimen mention this in their works, the *Flora of British India* and *Handbook of the Flora of Ceylon*. It is only a name. Gabriel Goonewardena however, says that the drug referred to as "Urala" is the yam of *Dioscorea globosa* Roxb., a climber cultivated in India. I have not been able to fix its identity so far.

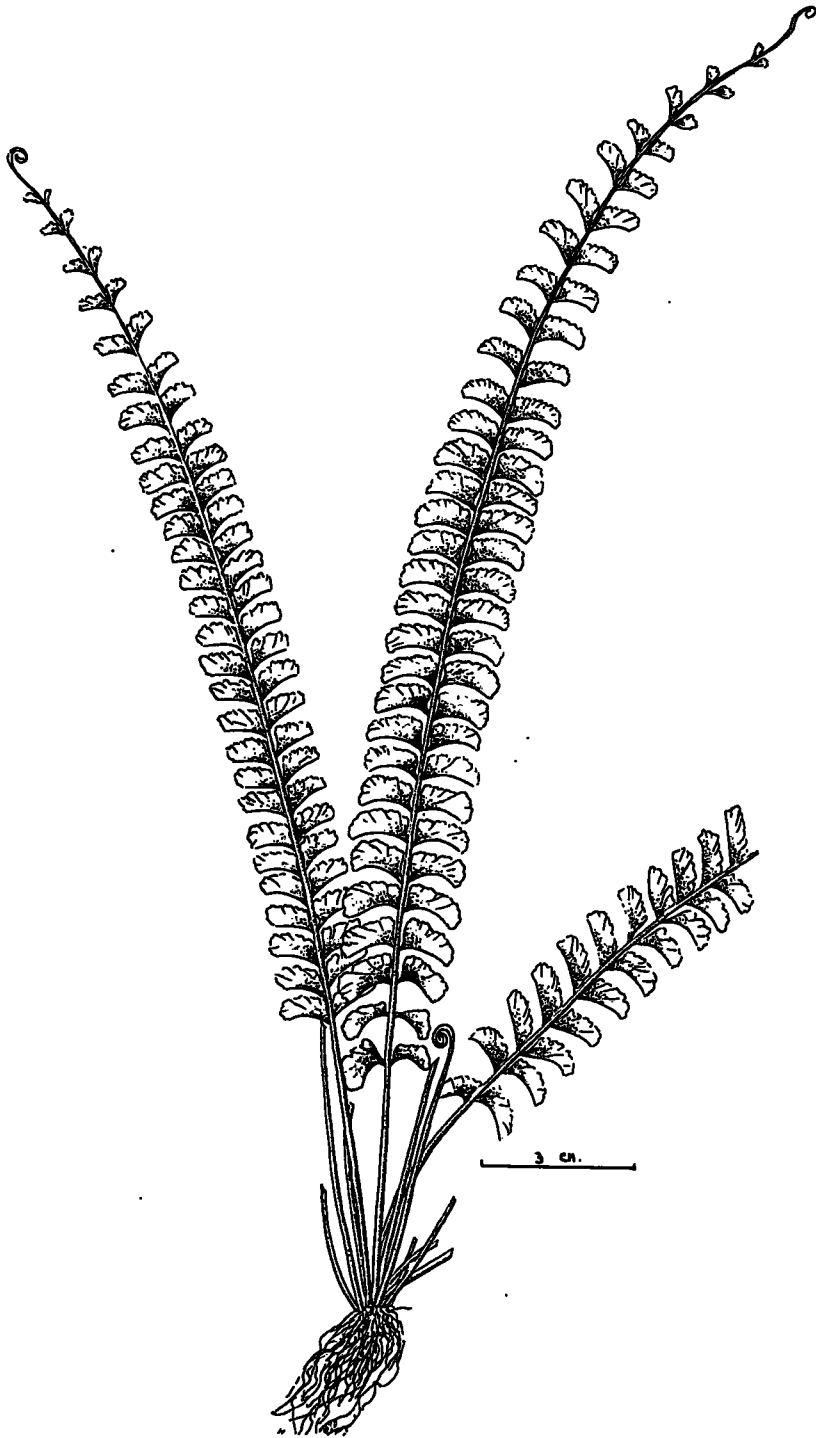


FIG. 433. *Adiantum caudatum*, plant with roots, stipes and fronds.

93. PTERIDACEAE

1. *Adiantum caudatum* Linn. Mant. 308. (Fig. 433).

Adiantum inoisum Forsk.—*Adiantum flagelliferum* Wall.—*Adiantum hirsutum* Bory.—*Adiantum capillus-gorgonis* Webb.

Sinh. Thuda-wediya; *Sans.* Mayurashikha.

An erect or spreading fern with tufted spikes 5—10 cm long, more or less covered with brown hairs; fronds linear in outline, 15—30 cm long, simply pinnate, often elongated (and rooting at the extremity), leaflets 1.2—1.8 cm long, nearly sessile, upper margin rounded and more or less cut, often deeply and repeatedly, the apex usually blunt, the lower line straight and horizontal, the lower leaflets slightly stalked, coriaceous, veins prominent, the rachis and both surfaces of the frond villose; sori marginal, roundish or transversely oblong on the edge of the lobes, indusium of the same shape as the sorus formed of the reflexed margin of the fronds bearing the capsules on its underside, veins free.

Illustrations. Beddome, *Ferns of British India*, pl. 44. 1883; Kirtikar and Basu, *Indian Med. Plants*, pl. 1029. 1933.

Distribution. Occurs throughout India, Ceylon, Malay Peninsula, S. China, tropical Africa, Java, Mauritius and Cape Verde Islands.

Uses. The leaves are used in diabetes and as a cure for coughs and fevers. Externally, they are applied on diseases of the skin.

2. *Adiantum philippense* Linn. Sp. Pl. 1094. 1753.

Adiantum lunulatum Burm.—*Pteris lunulata* Retz.

Sinh. Wala-wenna; *Hindi* Hansapadi, Hansapagi, Kalijhamp, Kalijhant, Paresiyavasan, Brahmadani, Chitrapada, Dharttarashtapadi, Ghritamandalika, Godhangri, Godhapadika, Hansaghri, Hansapadi, Hansavati, Karnati, Kiramata, Kirapadika, Kitamari, Madhusrava, Padang, Raktapadi, Sancharini, Shitangi, Sutapadika, Suvaka, Tamrapadi, Tridala, Tripadi, Triphala, Vikranta, Vishvagranti.

A tufted rhizomatous fern with naked wiry stipes 10—15 cm long, 7.5 cm broad, pinnae subdimidiate on slender leaf stalks, the lower edge nearly in a line or oblique with the petiole, the upper edge rounded and like the bluntly rounded sides usually more or less lobed; petioles of the lower pinnae spreading 6—12 mm long, herbaceous, the rachis and both surfaces naked; sori in continuous line along the edge, indumentum of the same shape as the sorus, formed of the reflexed margin of the frond bearing the capsules on the underside, veins free.

Illustrations. Beddome, *Ferns of South India*, pl. 1; Kirtikar and Basu, *Indian Med. Plants*, pl. 1031. 1933.

Distribution. Occurs in India, Ceylon, Burma and the tropics, generally in moist places and lower slopes of hills.

Uses. The leaves are used internally for febrile ailments and applied externally on erysipelatos inflammations. A plaster made from the rhizome is applied on chronic tumours. The ash of the plant mixed with gingelly oil and vinegar and applied on bald patches of the head caused by ringworm, makes the hair grow on the scalp. A paste of the rootstock prepared with cows' milk, bees' honey and sugar taken internally is effective on menorrhagia. The root of the plant is effective for strangury and fever due to elephantiasis. The plant is useful for dysentery, diseases of the blood, ulcers and epileptic fits.

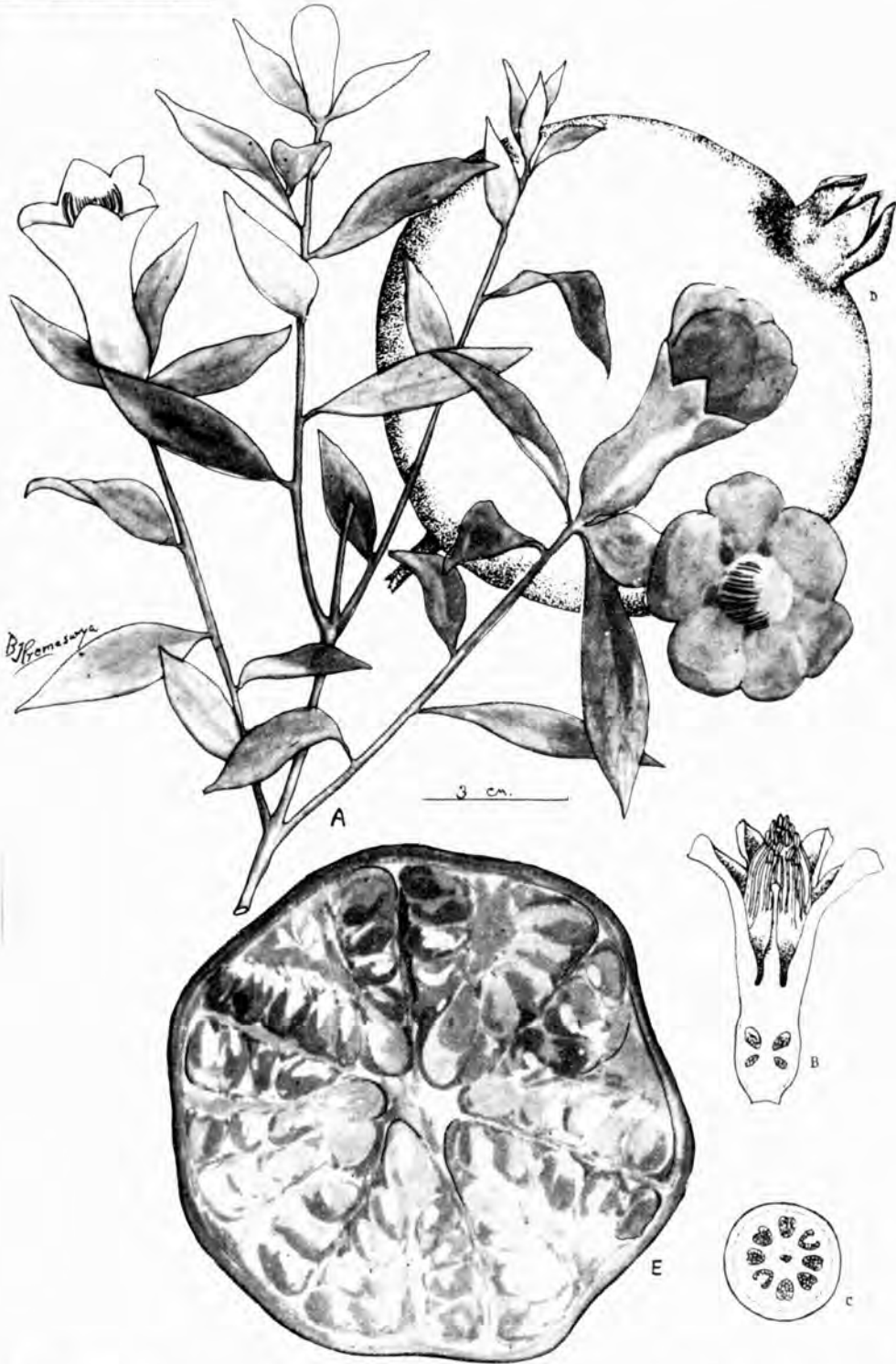


PLATE XVII. *Punica granatum*. A, branch with leaves and flowers. B, longitudinal section of flower. C, transverse section through the upper tier of cells of the ovary. D, fruit. E, transverse section of fruit showing seeds.

MEDICINAL PLANTS



PLATE XVII. *Punica granatum*. A, branch with leaves and flowers. B, longitudinal section of flower. C, transverse section through the upper tier of cells of the ovary. D, fruit. E, transverse section of fruit showing seeds.

94. PUNICACEAE

1. *Punica granatum* Linn. Sp. Pl. 472. 1753. (Plate XVII).

Punica grandifolia Hort.—*Punica nana* Linn.—*Punica spinosa* Lam.

Engl. Pomegrante Tree; *Sinh.* Delun, Delungaha; *Tam.* Kalumal, Madalai, Madulam, Madulungam, Pumadalai, Pulimadalai, Tadimadalai, Tadimam, Tusagam; *Sans.* Bijapura, Dadima, Dadimasara, Dadimba, Dalika, Dantabija, Dantabijaka, Karaka, Kuchaphala, Kuttima, Lohitapushpaka, Madhubija, Milapatra, Milapatraka, Mukhavallabha, Nagarata, Parvarut, Phalashadava, Pindapushpa, Pindira, Raktabija, Raktapushpa, Shukadana, Shukavallabha, Sunile, Suphala, Svadvamala, Valkaphala, Vrittaphala.

A large shrub or small tree 3.3—5 m tall with slender, somewhat angular branches often with spiny ends, bark pale brownish grey, furrowed longitudinally, the young parts and buds red in colour; leaves usually opposite, sometimes alternate, often fasciated on the older branches, shortly stalked, without stipules, 2.5—5 cm long, oblong-ovate or lanceolate, tapering at both ends, entire, rather thick and stiff, smooth and shining, often persistent; flowers regular, bisexual, large, solitary or 2 or 3 together in the axils of the leaves near the ends of branches, very shortly stalked; calyx large, broadly tubular, over 3.1 cm long, thick and leathery, adherent to the ovary below, cut into 5—7 thick, triangular, acute, valvate lobes above, smooth, shining and scarlet; petals 5—7, inserted in the throat of the calyx and alternating with its lobes, spreading, imbricate, crumpled, roundish, with a short broad claw, crimson; stamens very numerous, free, inserted in several rows on the calyx-tube below the petals, crowded, erect, anthers ovoid, dorsifixed, 2-celled, introrse, yellow, dehiscing longitudinally; ovary completely amalgamated with the lower part of the calyx-tube, thick and leathery, with 2 tiers of loculi, the lower tier of 3 loculi, the upper tier of 5—8 loculi, ovules very numerous, sessile, covering the whole surface of the placentae which in the loculi of the lower tier are axile and in those of upper tier parietal, style tapering, stigma simple, capitate; fruit as large as an orange, 6—7 cm or more diam., hard, depressed-globose, bluntly 5—8 angled, abruptly contracted at the top into a short neck terminated by the thick calyx lobes and containing the withered stamens; pericarp thin, very smooth, tough, yellow or reddish, cavity irregularly divided below the middle into two storeys by a thin somewhat conical diaphragm extending from the centre to the sides, upper storey divided into 5—8 irregular chambers by thin, tough, membranous, dissepiments, lower storey often also with one or more vertical partitions, seeds very numerous, entirely filling the fruit attached to the upper chambers on all sides of thick, strong, spongy placentae, which project from the wall but do not extend to the top or bottom of the chambers and in the lower chamber or chambers either all over the floor of the fruit or on several irregular projecting placentae, seed 1.2 cm long, polygonal, composed of a thick, translucent, pink, juicy coating, inner coat hard, white, cotyledons foliaceous, convolute, exalbuminous.

Illustrations. Griffith, *Ic. Pl. Asiat.*, pl. 634; Curtis, *Bot. Mag.*, pl. 1832. 1816; Wight, *Ill. Ind. Bot.* pl. 97; Bentley and Trimen, *Med. Plants*, pl. 113. 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 435. 1933; Herb. Peradeniya, drawing.

Distribution. A native of Kabul and Persia and is now cultivated in most tropical and temperate countries including Africa, India and Ceylon.

India. Himal. Bor. Occ., *T. Thomson*. Ceylon. Central Prov., Peradeniya, Bot. Gard. cultivated, *Herb. Peradeniya*, Aug. 1902. Maldive Islands. *Didi* 115, 1896; *Gardiner*, 1899—1900.

Composition. The bark of this plant contains the alkaloids pelletierine, isopelletierine, methyl-pelletierine and pseudopelletierine in addition to tannin, a glucoside, granatic and gallic acids. The fruit contains invert sugar, saccharose, the enzyme invertine and citric and malic acids. It is also rich in vitamin C and is a good source of iron.

Uses. The root bark is a specific for cases of tapeworm and tuberculous diseases in children. It is also used in diseases of the eye, painful micturition and catarrh. The rind of the fruit is excellent for diarrhoea and dysentery and the bark of the stems a good anthelmintic. In Africa, the different parts of the plant are used for the same diseases. The plant is used as a diuretic in Vietnam, while in Sumatra the root bark is employed as an abortifacient. In Java, the bark of the stem is used as a poison.



FIG. 434. *Aconitum ferox*. A, upper portion of the plant with a lower leaf, flowers and fruits. B, sepals dissected, dorsal view. C, D, posterior petal. D, enlarged.

95. RANUNCULACEAE

1. *Aconitum ferox* Wall. in Seringe Mus. Helvet. d'Hist. Nat. 1: 60. 1822. (Fig. 434).

Aconitum virosum Don.—*Aconitum napellus* var. *rigidum* Hook. f.—*Aconitum dissectum* Stein.

Engl. Bish, Nepal Aconite; *Sinh.* Vachanabhi; *Tam.* Vashanavi; *Sans.* Aheya, Amrita, Bhugara, Brahmaputra, Darada, Gara, Garada, Garala, Ghora, Halahala, Haridra, Jangala, Jangula, Jivanaghata, Kakola, Kalakuta, Kasakula, Kishala, Kshveda, Nila, Pradipana, Pranahara, Raktashringika, Rasa, Rasayana, Shanklakeya, Shringi, Sowrashtrika, Tikshana, Vatsanabha, Visha.

A perennial herb with a fleshy, fusiform, tuberous rootstock attenuated below into the root giving off laterally near the summit one or two similar tubers, stem about 2 m high, erect, stout, smooth below, finely hairy above, simple or branched; leaves alternate, the lower ones long-stalked, upper ones shorter, deeply and palmately cut into 5 acute, irregularly indented lobes, glabrous and dark green above, paler with prominent veins beneath, the upper ones passing insensibly into the bracts; flowers irregular, bisexual, pale dirty blue, large, pedicels long, glandular pubescent in erect racemes; sepals 5, petaloid, very unequal, deciduous, imbricate, all glandular hairy outside, lateral ones not hairy within, the upper ones arched, laterally compressed, two lateral ones broadly ovate, blunt, the two inner ones oblong or lanceolate, unequal; petals reduced; stamens numerous, hypogynous, filaments rather long, slightly hairy, outer ones drooping, anthers small, 2-celled, dull green; ovary superior, 5-carpellary, carpels distinct with numerous ovules; fruit of 5 follicles tipped with styles, erect, transversely wrinkled, strongly pubescent, seeds black with pitted or plaited testa.

Flowers in July and August.

Illustrations. Wallich in Seringe Mus. Helvet. 1: *pl.* 15, *figs.* 43 and 44. 1823; Edinburgh New Philosoph. Journ. 47, *pl.* 5.

Distribution. Occurs in India, in the temperate sub-alpine regions of Himalaya extending from Sikkim to Garhwal. It does not grow in Ceylon.

India. N. W. Himalaya: Gulmar Pass, *Duthie* 725, Aug. 1883. Sikkim: *Thomson*, Oct. 1857; *Tumboch*, *Clarke* 12742C, Oct. 1870; *J. D. Hooker*, all between 10,000—14,000 feet altitude.

Composition. The roots of this herb contain aconite and an unnamed alkaloid of the composition $C_{30}H_{47}NO_7$.

Uses. The root is used in the treatment of inflammatory conditions of the throat, lungs, intestines, joints, etc., leprosy, fever, cholera and rheumatism. Externally, a paste of it is applied in the form of a plaster on the skin for neuralgia, boils, etc.

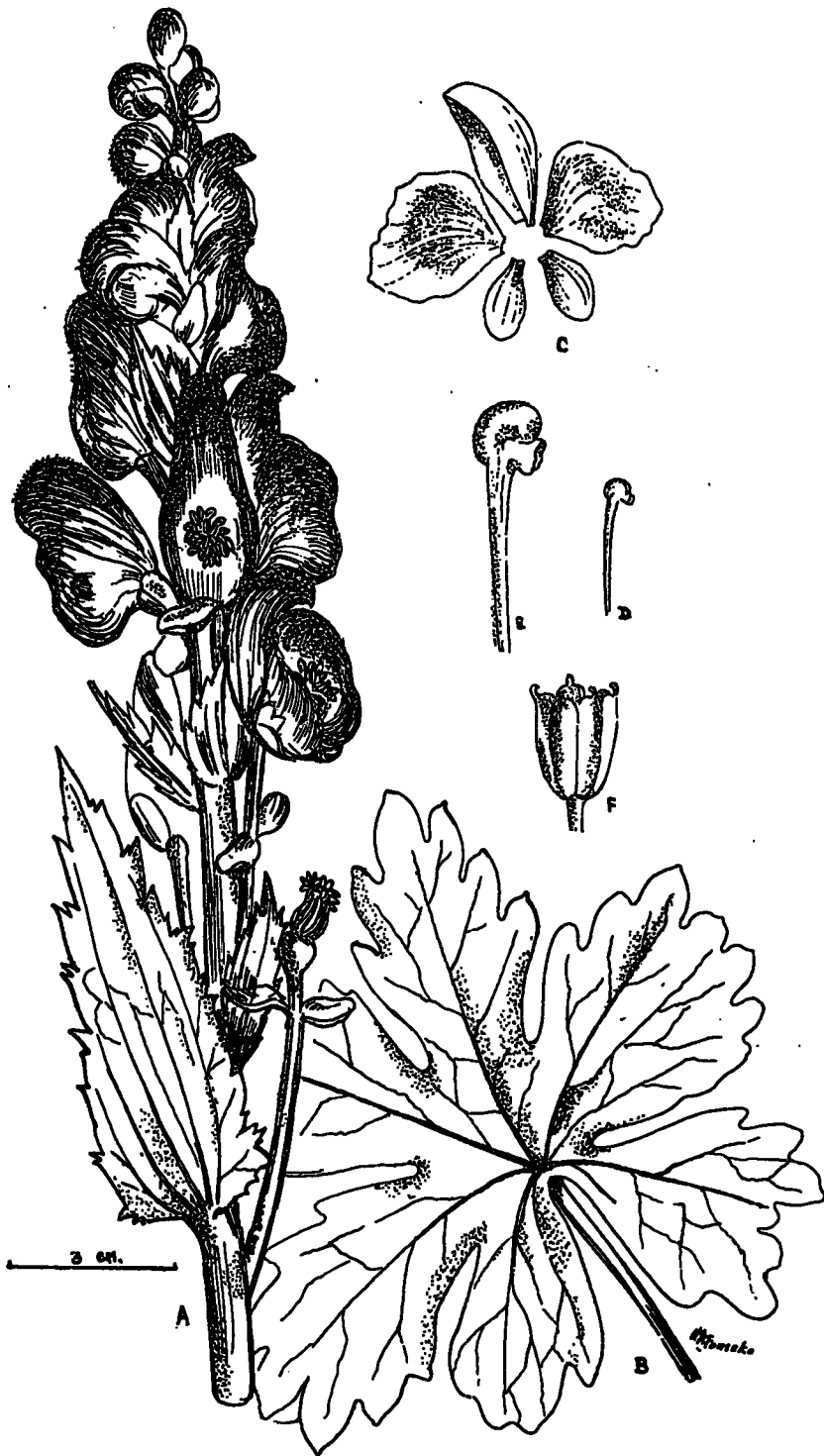


FIG. 435. *Aconitum heterophyllum*. A, raceme of flowers. B, lower leaf. C, sepals dissected and spread out. D, E, posterior petal. F, fruit. E, enlarged.

2. *Aconitum heterophyllum* Wall., List of E. Indian Plants No. 4772. 1828. (Fig.435).

Aconitum cordatum Royle.—*Aconitum atees* Royle.—*Aconitum ovatum* Lindl.

Sinh. Atiudayan, Atividayan; *Tam.* Atividayan; *Sans.* Amrita, Aruna, Ataicha, Atisaraghni, Atis, Ativisha, Bhangura, Bhringi, Ghunavallabha, Kashmira, Madri, Mahoshadha, Mridvi, Prativisha, Shishubhaishyajja, Shokapaha, Shringi, Shringhika, Shuklakanda, Shveta, Shvetakanda, Shvetavacha, Shyamkanda, Upvisha, Vira, Virupa, Visha, Visharupa, Vishva.

A perennial herb with an oblong-ovoid or fusiform perpendicular rootstock, pale grey externally, white within and with numerous spreading root fibres; stem erect, 30—90 cm high, simple or slightly branched, cylindrical and pubescent above, somewhat angled below; leaves variable, the lower ones long petioled, reniform, base cordate, deeply 5-lobed, the lobes deeply and irregularly inciso-crenate, upper ones very shortly stalked or sessile, amplexicaul, narrowly ovate with a cordate base and acuminate apex, strongly inciso-serrate, glabrous, bright green paler beneath; flowers irregular, bisexual, purplish-blue or yellowish-green, large on long rufous-pubescent pedicels closely appressed to the stem in racemes, bracts leaf-like, cordate, acuminate, bracteoles oblong, membranous, entire, sub-opposite; sepals 5, petaloid, very unequal, deciduous, imbricate, the upper one large, boat-shaped, laterally compressed, pointed, the lateral ones obliquely ovate and the anterior ones small, oval, pendulous, all pubescent on the exterior; petals 5, posterior petal with a thick dorsal, black, incurved knob with an inferior membranous appendage but no backward spur; stamens numerous, hypogynous, filaments long, slightly hairy, outer ones drooping, anthers small, 2-celled, dull green; ovary superior, 5-carpellary, carpels quite distinct, shorter than stamens, somewhat divergent, smooth with numerous ovules in two rows; fruit of 5 follicles, pericarp papery, slightly veined, minutely downy, seeds large, irregularly angled, bright brown.

Illustrations. Royle, Ill. Bot. Himal., *pl.* 13. 1834; Curtis, Bot. Mag., *pl.* 6092. 1874; Bentley and Trimen, Med. Plants, *pl.* 7. 1880.

Distribution. Occurs in India in the West temperate regions of the Himalaya. It does not grow in Ceylon.

India. Himalaya: *Herb. Munroanum* 290, Sept. 1844; Kashmir: Pharkian Pass, *Keshavanam* 476, Aug. 1906; Srikantha, Dudu Gadh, *Duthie* 723, Aug. 1883. Simla: *Thomson*, all between 8,000—15,000 feet altitude.

Composition. The roots of this plant contain the alkaloids atidine, atisine, heteratisine and hetisine.

Uses. The root is used as a cure for diarrhoea, dysentery, bilious complaints and vomiting in children. It is also given for intermittent and paroxysmal fevers and as a tonic in convalescence.

In Ceylon, *Cryptocorine* spp. are used as a substitute.



FIG. 436. *Clematis gouriana*. A, branch with leaves and inflorescences of flowers. B, flower, lateral view. C, longitudinal section of flower with perianth removed. D, fruit. E, achene.

3. *Clematis gouriana* Roxb. Fl. Ind. 2: 670. 1824. (Fig. 436).

Clematis cana Wall.—*Clematis javana* DC.

Engl. Indian Traveller's Joy; *Sinh.* Nara-wel.

A perennial woody climber with wide spreading branches, pubescent when young; leaves opposite, exstipulate, pinnate or bipinnate, petiole and rachis elongated, leaflets stalked, ovate, oblong or lanceolate-oblong, 2.5—12.5 cm long, 1.2—3.7 cm broad, caudate acuminate, serrate, glabrous on the upper surface, pubescent beneath; flowers regular, bisexual, yellowish or greenish-white, 1.9 cm diam., borne in large, axillary, compound inflorescences; sepals 4, petaloid, valvate, pubescent; petals absent; stamens numerous, free, filaments narrowly linear, glabrous, connective not produced; ovary superior, carpels numerous, distinct, each with a solitary pendulous ovule; fruit a head of achenes each with a hairy tail.

Flowers in October and November.

Illustrations. Wight, Ic. Pl. Ind. Or., pls. 933 and 934. 1843—1845; Kirtikar and Basu, Indian Med. Plants, pls. 3 and 3A. 1933.

Distribution. Occurs in India, Ceylon, Malay Peninsula, Java and Philippine Islands. It is rather rare in the montane zone between 3,000—6,000 feet altitude in Ceylon. Hakgala, Nuwara Eliya, Ramboda, Dimbula, etc.

India. Nepal: *Wallich* 4673H; N. W. Himalaya: *Griffith*; *Mussourie*, *King*, 1869; E. Himalaya: *Herb. Griffith* 5. Sikkim: *Thomson*, Nov. 1857. Khasia: *J. D. Hooker and T. Thomson*. Bombay, Yellapore, *Talbot*, Oct. 1880. Coonoor: Nilghiri, *Hook f. and T. Thomson*; *Clarke* 10348C, March 1870. Malabar, Concan, etc., *Stocks, Law, etc.*, Jullundur, *Clarke* 23367A; *Clarke* 23401C, Oct. 1874; *Prasnath, Clarke* 33771D, Oct. 1883. Pen. Ind. Or., *Herb. Wight* 1 and 2, Kew Distribution 1866—7. Ceylon. Central Prov., Hakgala, *Willis*, March 1906; without locality, *Thwaites* C.P. 680.

Uses. The fresh leaves of this plant, if bruised and applied on the skin, cause vesication. A decoction of the plant is given for puerperal fever.

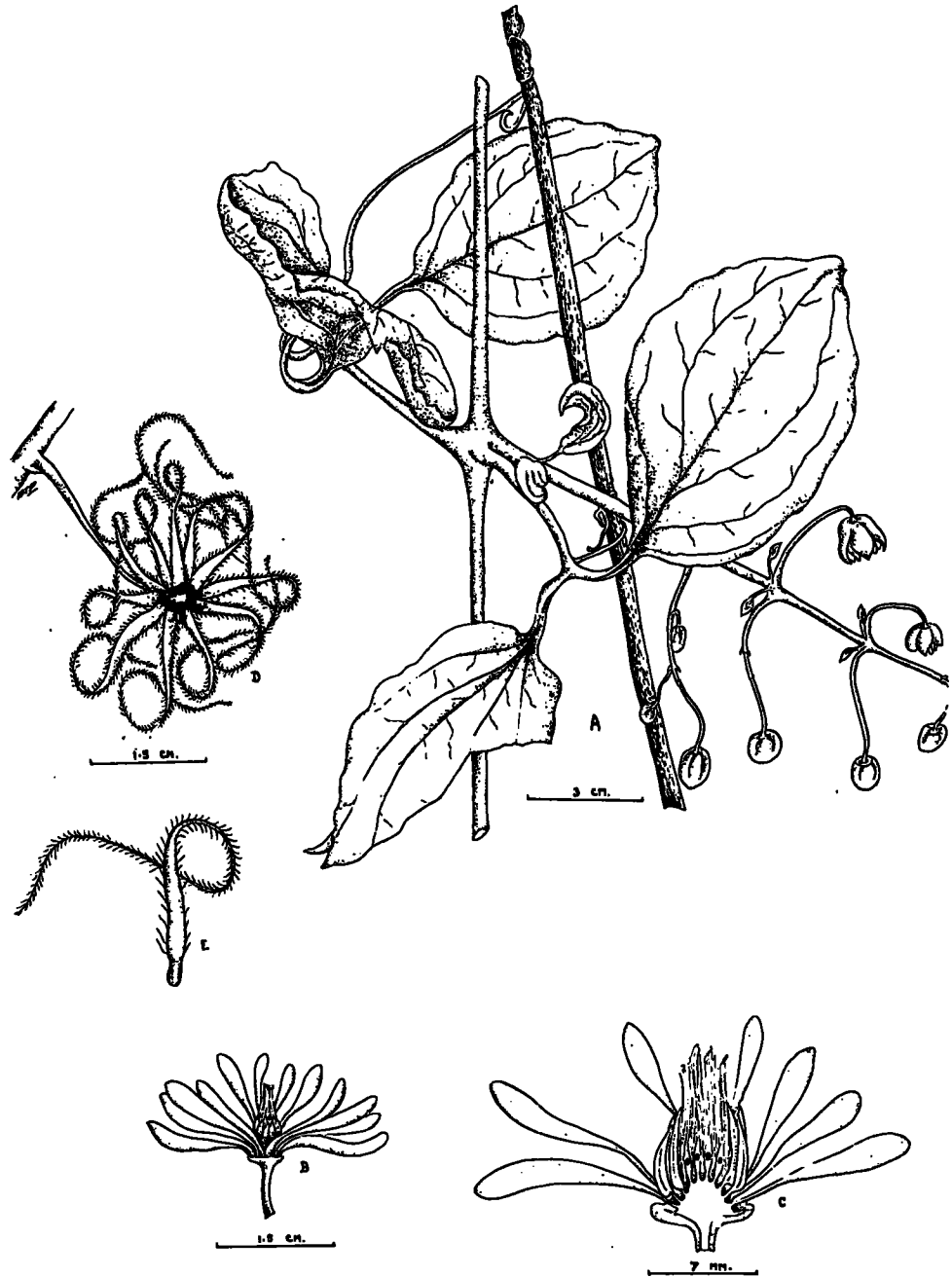


FIG. 437. *Naravelia zeylanica*. A, twig with leaflets, leaflet-tendrils and inflorescence of flowers. B, flower, lateral view with the sepals fallen off. C, longitudinal section of flower showing petals, stamens and carpels. D, fruit-head of achenes. E, achene.

4. *Naravelia zeylanica* (Linn.) DC. Syst. 1: 167. 1818. (Fig. 437).

Atragene zeylanica Linn.—*Clematis zeylanica* Herm.

Sinh. Narawel; *Sans.* Laghukarni, Murva.

A climbing shrub with pubescent branches; leaves opposite, exstipulate, long-petioled, 3-foliolate, the central leaflet modified into a tendril which is trifid at apex, leaflets broadly oval, acute, often unequal at base, entire or gashed, glabrous on the upper surface, more or less silky pubescent beneath, 5-nerved; inflorescence axillary, compound; flowers regular, bisexual green; sepals 4, valvate, ovate-lanceolate, subacute, pubescent, soon falling; petals 12, longer than sepals, linear-spathulate, 1.2—1.9 cm long, spreading; stamens indefinite, distinct, free; ovary superior of many free carpels with long styles and stigmas, each with a single ovule; fruit a head of achenes and shortly stalked, acuminate, whip-like and slightly hairy.

Flowers from September to February.

Illustrations. Roxburgh, *Pl. Corom.*, 2: pl. 188. 1798; Herb. Peradeniya, drawing.

Distribution. Occurs in India and is rather rare in the moist low-country in Ceylon. Hiniduma, Galle, Colombo, Lunugala, Kalutara, Kandy, etc.

India. Silhet: Gurhatty Hills, *Wallich 4787A, G, C & H.* Assam: Damra Plains, Goalpara District, *King's Collector.* Dec. 1890; *Jenkins; Simons 380.* Bombay: N. Canara, *Talbot,* Nov. 1880. Travancore: *Lawson 151,* Nov. 1893; Mt. Nilghiri, *Hooker f. and T. Thomson.* Pen. Ind. Or., *Herb. Wight 4,* Kew Distribution 1866—7. Ceylon. Western Prov., Colombo, *Herb. Peradeniya,* Sept. 1856. Uva Prov., *Trimen,* Jan. 1888. Southern Prov., Hiniduma, *Livera,* Feb. 1923; Galle, *Thwaites C.P. 1009,* Dec. 1853. Without locality, *Alston A16.*

Uses. This plant is used on itch, eczema, eruptions due to impure blood and for malaria.

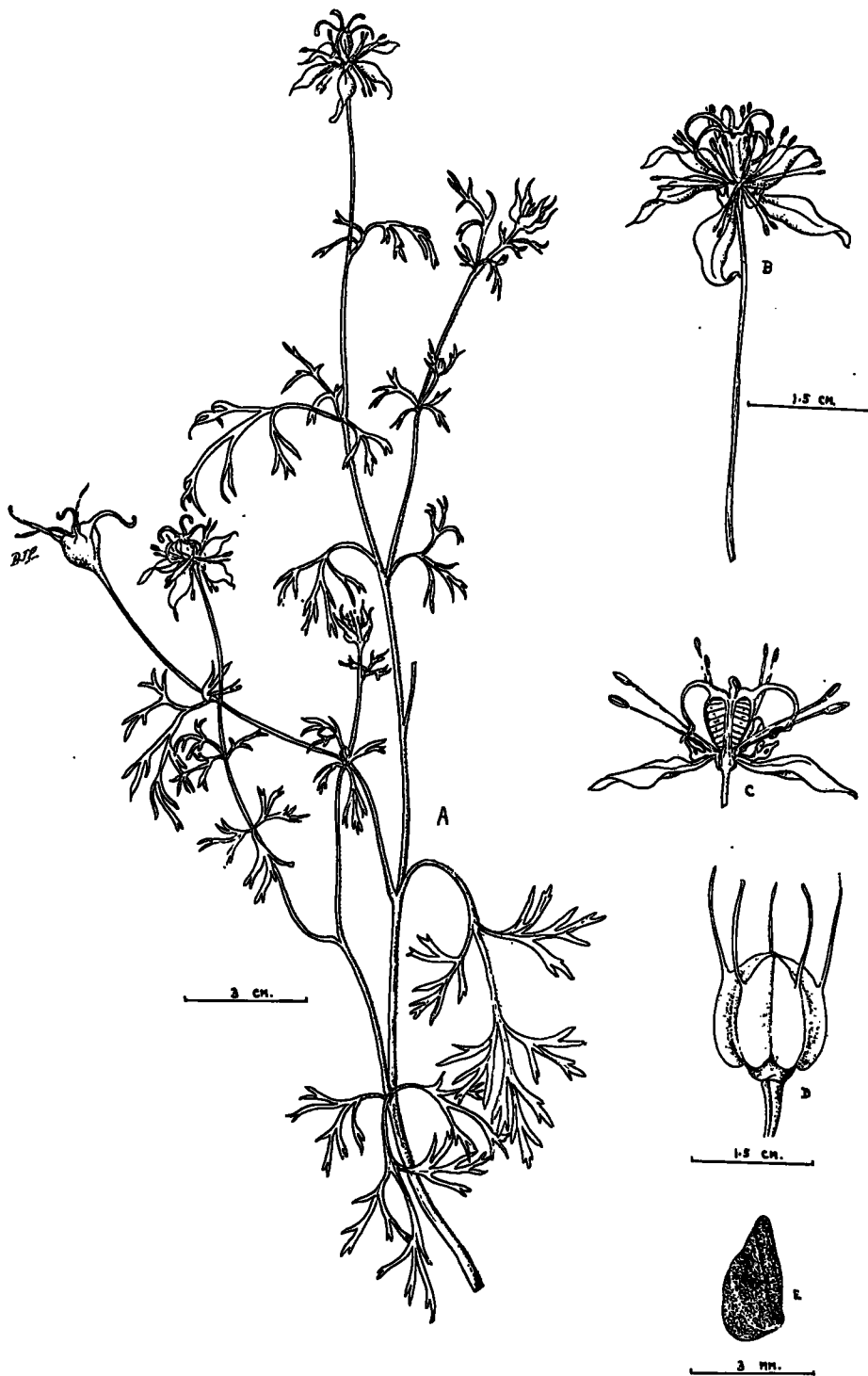


FIG. 438. *Nigella arvensis*. A, twig with leaves and flowers. B, flower, dorsal and lateral view. C, longitudinal section of flower showing perianth, honey-leaves, stamens and ovary. D, fruit, lateral view. E, seed.

5. *Nigella sativa* Linn. Sp. Pl. 753. 1753. (Fig. 438).

Nigella indica Roxb. ex Flem.

Engl. Black Cummin, Nutmeg Flower, Small Fennel; *Sinh.* Kaluduru; *Tam.* Karungiragam; *Sans.* Bashpika, Kalajaji, Karava, Karavi, Krishnajiraka, Kunchi, Kunchika, Kunjika, Musavi, Prathvika, Prithvi, Prithu, Prithuka, Sthulajiraka, Sushavi, Upakunchiraka.

An annual herb 35—50 cm tall, branching at the top, stem green, round, hairy, 2—5 mm diam., internodes 2—5 cm long; leaves alternate, pinnate, lower leaves small, petioled, upper leaves sessile, 6—10 cm long, pinnae irregularly lobed, glabrous on the upper surface, hairy beneath and on the rachis; flowers regular bisexual, terminal on branches, white or greenish white about 3 cm diam., long-stalked, pedicels 1.5—5.5 cm long becoming longer as the fruit matures; perianth 5, free, greenish white, lanceolate, 1.2—1.5 cm long, 0.4—0.5 cm broad, 3-veined, veins branching; honey leaves 8, 5 mm long, 2.5 mm broad, 3-lobed, anterior lobe, small ovate, acuminate, blue, flapped over the fused concave hairy base of the pair of posterior lobes, posterior lobes ovate, greenish white, apex blue with a blue line across the body, each carrying a shining green mass, scantily ciliated; stamens numerous, outer ones longer than the inner ones, basifixed, filaments 2.5—5.2 mm long, slender, anthers 1.5—2 mm long; ovary superior, .5 mm long, smooth, 5-carpellary, syncarpous, 5-locular, axile placentation, styles and stigmas about 7 mm long; fruit capsule with many black trigonal seeds.

Distribution. Though this herb is not a native of India, it is sometimes cultivated in Punjab and Bihar. It is not grown in Ceylon.

Afghanistan. *Herb. Griffith 38A*, Kew Distribution 1861—62.

Composition. The seeds of this herb contain the alkaloids, connigelline and nigelline.

Uses. The seeds are aromatic stimulant with a sharp taste having anthelmintic and carminative properties. They are used in lung complaints, coughs and jaundice, both internally and externally. They are also employed in the treatment of hydrophobia, tertiary fever, paralysis and eye sores. The powdered seed mixed with gingelly oil is applied on eruptions of the skin.

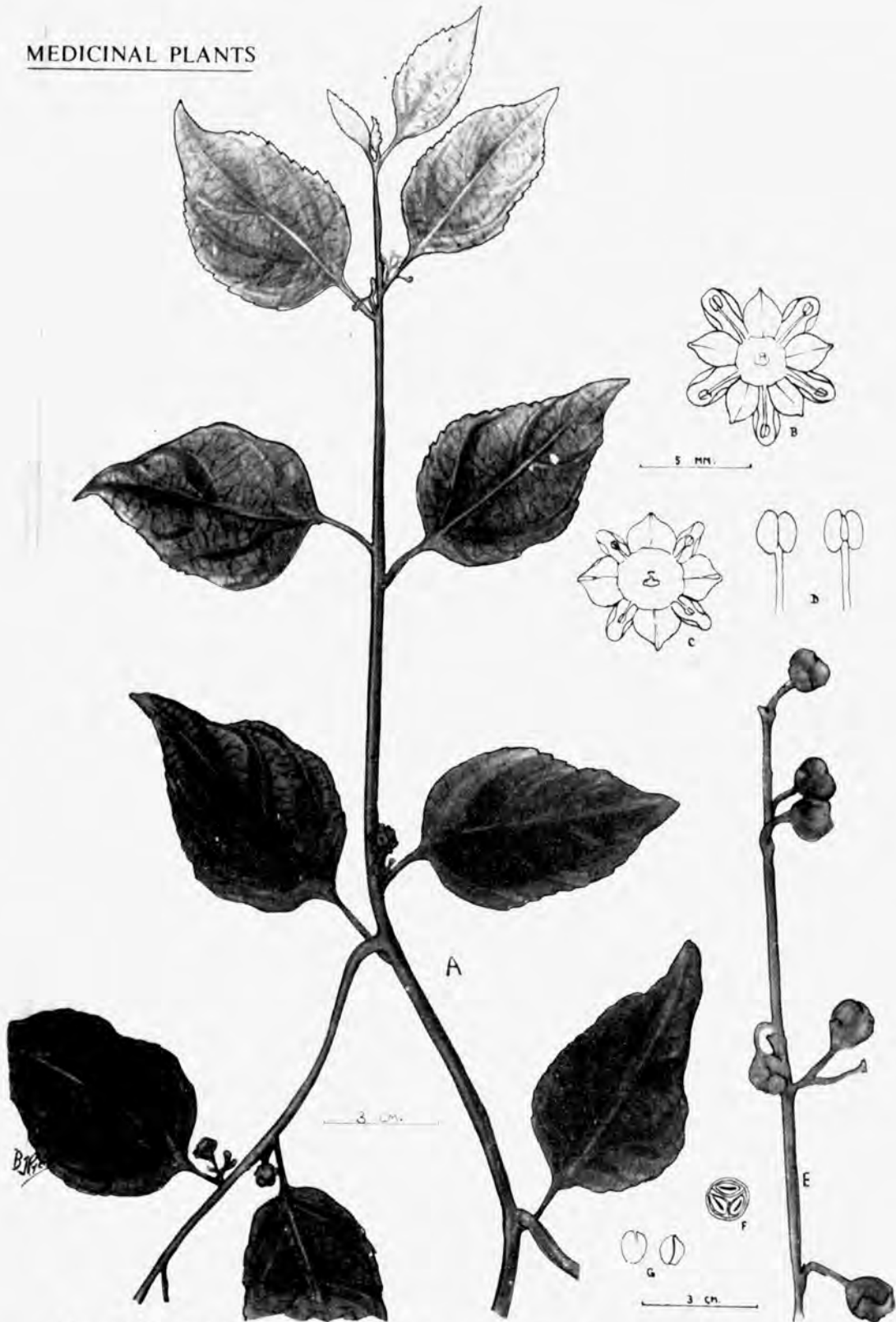


PLATE XVIII. *Colubrina asiatica*. A, branch with leaves and flower cymes. B, flower, dorsal view. C, 4-merous flowers, dorsal view. D, stamens. E, twig with fruits. F, transverse section of fruit. G, seeds. D, enlarged.

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PLATE XVIII. *Colubrina asiatica*. A, branch with leaves and flower cymes. B, flower, dorsal view. C, 4-merous flowers, dorsal view. D, stamens. E, twig with fruits. F, transverse section of fruit. G, seeds. D, enlarged.

96. RHAMNACEAE

1. *Colubrina asiatica* Brongn. in Ann. Sc. Nat. Ser'1, 10: 369. 1827. (Plate XVIII).

Colubrina javanica Miq.—*Ceanothus asiaticus* Lamk.—*Ceanothus capsularis* Forst.—*Pomaderris capsularis* G. Don—*Rhamnus acuminata* Colebr.

Sinh. Tel-heeriya, Wel-heeriya; *Tam.* Majir-manikkam.

A much branched shrub with glabrous young parts; leaves simple, alternate, 3.7—6.2 cm long, ovate, rounded or subcordate at base, acuminate, obtuse, crenate-serrate, glabrous, thin, somewhat 3-veined at base, petioles 1.2—1.8 cm long; flowers regular, bisexual, greenish—yellow, pedicellate in small axillary nearly sessile cymes; sepals 5, fused into a 5-lobed, hemispherical tube, slightly hairy, segments acute; petals 5, as long as sepals, clawed, involute; stamens 5, inserted outside the disc; disc fleshy filling the calyx-tube; ovary half inferior immersed in the disc, 3-locular, style 3-lobed; fruit a septicidally dehiscent, 3-valved, globose capsule, 1 cm long, smooth, valves cartilaginous, seeds dull brownish grey.

Illustrations. Wight, Ill. Ind. Bot., pl. 74. 1838; Burmann, Thes. Zeyl., pl. 48. 1737; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya, Java, Borneo, Australia and S. W. Africa. It is rather common in the dry regions in Ceylon. Trincomalee, Batticaloa, Kurunegala, etc.

India. Pen. Ind. Or., *Herb. Wight* 17. Ceylon. Northern Prov., Jaffna, *Herb. Peradeniya*, Feb. 1890; Karitivu, *Herb. Peradeniya*, Aug. 1883. Without locality, *Thwaites C. P.* 1239. Maldiva Islands. *Gardiner*, 1899-1900; Hulule, *Gardiner* 27, 1899-1900; *Didi* 122, 1896. Malaya. Penang: *Curtis* 235, Nov. 1885. Tenasserim and Andaman Islands. *Herb. Helfer* 2020/2, Kew Distribution 1861-2. New Caledonia. *Franc* 1704; *Deplanche* 321. Aldabra Island. *Abbott*.

Composition. The leaves, flowers, roots and bark of this plant contain an alkaloid.

Uses. This plant is used for the preparation of poultices and medicinal oils for treatment of rheumatism and inflammations caused by impure blood.



PLATE XIX. *Rhamnus wightii*. A, branch with leaves, flowers and fruits. B, flower, lateral view. C, petal and stamen. D, stamen. E, longitudinal section of pistil. F, G, transverse sections of 4 and 3-locular ovaries. H, seed. I, longitudinal section of seed showing cotyledons. B—I, enlarged.



PLATE XIX. *Rhamnus wightii*. A, branch with leaves, flowers and fruits. B, flower, lateral view. C, petal and stamen. D, stamen. E, longitudinal section of pistil. F, G, transverse sections of 4 and 3-locular ovaries. H, seed. I, longitudinal section of seed showing cotyledons. B—I, enlarged.

2. *Rhamnus wightii* Wight & Arn., Prodr. 164. 1834. (Plate XIX).*Ceanothus wightiana* Wall.

Eng. Indian Buckhora; Tam. Peyppula; Sans. Raktharohita.

A large shrub with puberulous young parts; leaves simple, alternate, stipulate, 5—8.5 cm long, ovate-oval or ovate, rounded or acute at base, acuminate, obtuse, apiculate, finely glandular-serrate, glabrous on both sides, petioles 1.2 cm long, stipules very early caducous; flowers regular, bisexual, small, yellowish-green, 1—5 in axillary clusters on glabrous pedicels; sepals 5, fused into a 5-lobed calyx, glabrous, segments triangular; petals 5, very small, spathulate; stamens 5, inserted in the mouth of the calyx-tube (perigynous), disc inconspicuous; ovary superior, 3—4-locular, styles 3 or 4 connate halfway up; fruit a globose berry, 0.5 cm long, supported on flat persistent calyx-tube tipped with persistent styles, smooth and reddish purple.

Flowers in September.

Illustrations. Wight, Ic. Pl. Ind. Or., *pl.* 159. 1839; Kirtikar and Basu, Indian Med Plants, *pl.* 244B, 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India and is common in the upper montane zone in Ceylon. Nuwara Eliya, Hakgala, Ambawela, etc.

India. South India: *Fischer* 2901, Sept. 1911. Pen. Ind. Or., *Herb. Wight* 484, Kew Distribution 1866-7. **Ceylon.** Central Prov., Nuwara Eliya, Elephant Plains, *Thwaites C. P.* 2535; Sita Eliya, *A. M. Silva*, April 1906; Hakgala, *de Alwis*, April 1920; *J. M. Silva*, May 1911; Ambawela, *Alston* 1038, Feb. 1927.

Uses. The bark of this plant is valuable owing to its tonic, astringent and deobstruent properties.

3. *Ventilago maderaspatana* Gaertn. Fruct. 1: 223. 1788.*Ventilago bracteata* Wall.

Engl. Red Creeper; *Sinh.* Kobowakka, Yakada-wel; *Tam.* Pappili, Surul, Surul-battaikkodi, Vembadam; *Sans.* Raktavalli.

A large woody climber with elongated slender branchlets and pubescent young parts; leaves simple, alternate, stipulate, 3.7—12.5 cm long, ovate or ovate-lanceolate, obtuse or rounded at base, acuminate, obtuse or rarely acute at apex, shallowly crenate-serrate or entire, glabrous and shining, lateral veins 6—12 on each side, fine but conspicuous, oblique, connected by very fine transverse reticulation, petioles 3—6 mm long, stipules very small, lanceolate, pubescent; flowers regular, bisexual, pale green, small, numerous, 4 mm long, on short pubescent pedicels, arranged in clusters on the branches of large, spreading and drooping, pubescent, elongated, terminal panicles; sepals 5, fused into a 5-lobed, obconical calyx-tube, pubescent, lobes erect, very acute; petals 5, small, shorter than calyx, 2-lobed; stamens 5, slightly adnate to base of petals and as long; disc broad, flat, slightly 5-lobed; ovary half-inferior, 2-locular, styles 2, short; fruit a small globular, 1-seeded, indehiscent nut supported by persistent calyx, wing 2.5—3.7 cm long, linear-oblong, leathery, pubescent, veined, slightly bifid at apex.

Flowers in June and July.

Illustrations. Gaertner, Fruct. et Sem. Plant., 1: *pl.* 49. *fig.* 2. 1788; Wight, Ic. Pl. Ind. Or., *pl.* 163. 1839; Kirtikar and Basu, Indian Med. Plants, *pl.* 238A. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India and in the hot dry places in Ceylon. It is very common in the low-country and rather rare in the moist regions. Heneratgoda, Pasdun Korale, Mirigama, Dambulla, Anuradhapura, etc.

India. Concan: *Stocks*. Pen Ind. Or., *Herb. Wight* 511; *Herb. Wight* 472, Kew Distribution 1866-7. **Ceylon.** North-Central Prov., Kekirawa, *Herb. Peradeniya*, Aug. 1885. Central Prov., Kandy, Lady Horton's, *F. W. de Silva*, May 1928; Siyambalagastenne, *Alston*, Sept. 1926. Uva Prov., Bibile, *J. M. Silva*, Oct. 1925; Uma Oya, *Herb. Peradeniya*, 1880. Without locality, *Thwaites C.P.* 1236.

Uses. The root bark of this plant is a tonic, carminative, stomachic and stimulant. It is useful for cases of low fever and for atonic dyspepsia. The powdered bark is applied externally on itch and other skin diseases with good results.

4. *Zizyphus jujuba* Lam. Enaf. 3: 319, 1789.

Zizyphus sativa Gaertn.—*Zizyphus vulgaris* Lamk.—*Zizyphus flexuosa* Wall.—*Zizyphus nitida* Roxb.—*Zizyphus sinensis* Lamk.

Engl. Common Jujube; *Sinh.* Masan; *Tam.* Ilantai.

A glabrous shrub or small tree about 10 m tall, thorny, spreading, branchlets often fascicled, slender and having frequently the appearance of pinnate leaves; leaves simple, alternate, petioled, oblong-ovate to ovate-lanceolate, 2.5—5 cm long, obtuse or sometimes emarginate, serrate, 3—5-nerved from base, glabrous underneath, stipules often transformed into spines; flowers regular, bisexual, small, yellowish in short, axillary cymes; sepals 5, fused into a 5-lobed calyx; petals 5; stamens 5, opposite petals and inserted with them at or below margins of fleshy disc which lines the calyx-tube, filaments free, slender; ovary immersed in the disc and adnate to it at base, 2-locular with 2-parted style; fruit a fleshy, subglobose to oblong, dark red or brown drupe, 1.2—2.5 cm long with whitish flesh and a hard 2-chambered stone.

Illustration. Kirtikar and Basu, *Indian Med. Plants*, pl. 241. 1933.

Distribution. Occurs in India, Southern Europe, and China.

India. Himal. Bor. Occ., *T. Thomson*. Calcutta, Bot. Gard., cultivated. **Japan.** Yokohama, *Maximowicz*, 1862.

Composition. The leaves of this plant contain an alkaloid.

Uses. A syrup of the dried fruit of this plant is given for bronchitis.

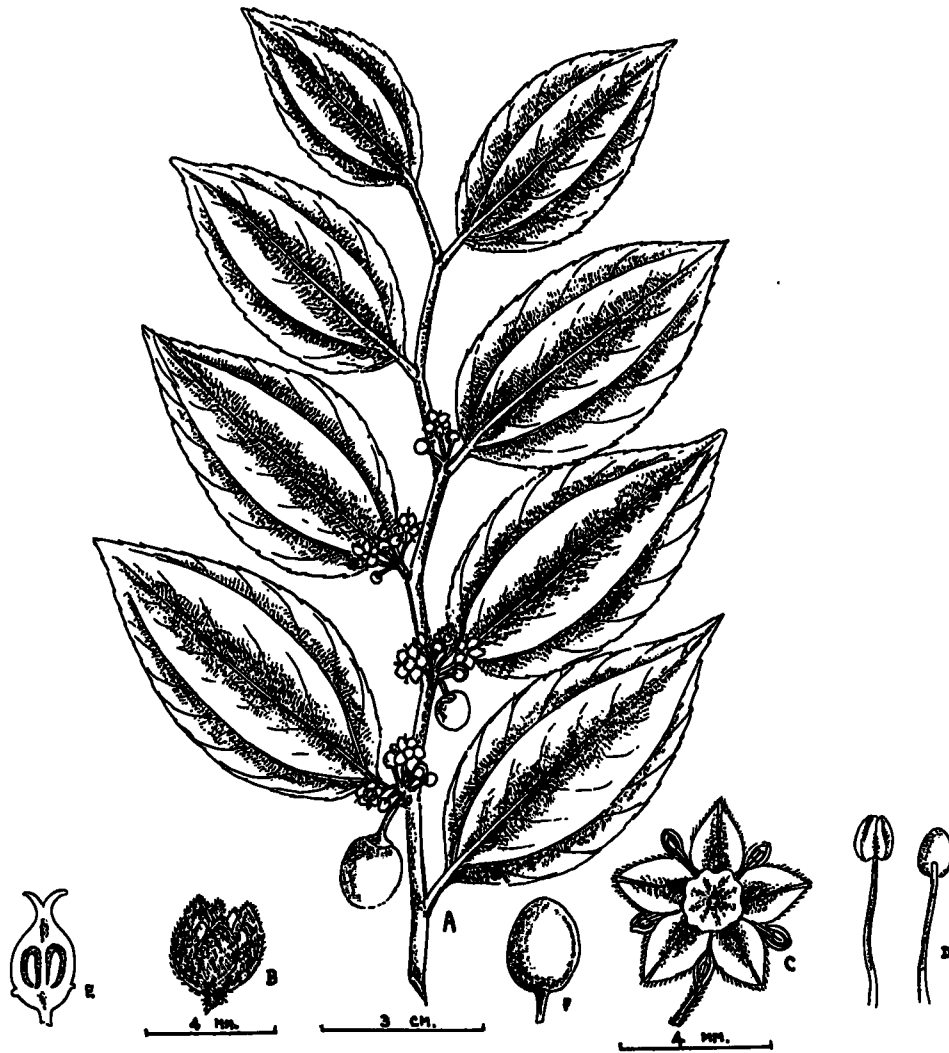


FIG. 439. *Zizyphus mauritiana*. A, twig with leaves, clusters of flowers and fruits. B, flower, lateral view. C, flower, dorsal view. D, stamens. E, longitudinal section of pistil F, fruit. D, E, enlarged.

5. *Zizyphus mauritiana* Lamk. in Wall. Cat. 4245. 1828. (Fig. 439).

Zizyphus jujuba Lamk.—*Zizyphus sororia* Schult.—*Zizyphus trinervius* Roth.—*Rhamnus jujuba* Linn.

Engl. Indian Cherry; *Sinh.* Ilanga, Debara, Masan; *Tam.* Adidaram, Attiram, Ilandai, Iradi, Iratti, Koli, Kondai, Kullari, Kulvali, Padari, Sivagam, Vadari, Vettiram, Veyam; *Sans.* Ajaproya, Badari, Balashta, Dridhabija, Dviparni, Ghonta, Gudaphala, Kantaki, Karkarmadhu, Koli, Kuvali, Madhuraphala, Mahadebara, Nakli, Nripabadari, Nripeshta, Prithukoli, Phalashayshira, Rajabadari, Rajakoli, Rajavallabha, Sukshmaphala, Sukshmapatrika, Srigalakoli, Svachha, Sukrapriya, Suphala, Tanubija, Ubhayakantaka.

A large shrub or a small much branched tree with dark grey longitudinally fissured bark and elongated, flexuose, woolly pubescent branchlets; leaves simple, alternate, 3-veined, with or without stipular spines, 2.5—3.7 cm long, broadly oblong-oval or rotundate, rounded at both ends, faintly and irregularly denticulate, glabrous on the upper surface, densely covered beneath with whitish or buff-coloured tomentum, petioles short, woolly, stipular spines short, very sharp, one usually curved and the other straight, often absent; flowers small, regular, bisexual, greenish white, on hairy pedicels in small axillary clusters or very shortly pedunculate cymes; sepals 5, fused into an obconical, 5-lobed tube, woolly outside, segments very acute; petals 5, very small, spathulate, recurved; disc 10-lobed, 10-grooved; stamens 5, slightly adnate to base of petals; ovary half-inferior, 2—4-locular, styles 3, connate, trifid; fruit a globose drupe, 1.2 cm long, fleshy, smooth, yellow, stone 2-celled, brown, excavated on the surface.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 99. 1838; Hooker, *Journ. Bot.* 1: *pl.* 140; Brandis *For. Flor.* *pl.* 17; Beddome, *Flor. Sylvat.* *pl.* 149. 1868—1873; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 239. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, China, Australia and Africa. It is rather common in the dry regions of Ceylon. Trincomalee, Anuradhapura, etc.

India. Uttar Pradesh: Dehra Dun, *Dimri* 26, March 1926; Asarori, *Abdul Hamid* 25, *Thano, Sewal* 6, Dec. 1921. Punjab: *T. Thomson.* Sylhet: *Wallich* 4244D. Concan: *Stocks.* Pen. Ind. Or., *Herb. Wight* 500; *Herb. Wight* 501. Ceylon. Without locality, *Thwaites C.P.* 1242. Southern Prov., Ruhuna National Park, Andunoruwa Wewa, *Fosberg and Mueller-Dombois* 50138, April 1968; *Fosberg* 50139, April 1968; Yala Road, *Comanor* 1163, March 1968; Tissakataragama, *Cooray* 69090415R, Sept. 1969. Maldive Islands. *Didi* 147, 1896; Horsburgh Atoll, *Gardiner*, 1899—1900. Burma and Malay Peninsula. Without locality, *Herb. Griffith* 2035, *Kew Distribution* 1861—62.

Composition. The root and bark of this plant contain tannin, the latter with ziziphic acid in addition. The leaves and bark contain an alkaloid. The fruit is rich in mucilage, sugar and other fruit acids.

Uses. A decoction of the leaves and bark is employed as an effective remedy for dysentery and diarrhoea. The root is a purgative and used for fevers. The powdered root is applied to ulcers and wounds. The ripe fruit purifies the blood and relieves coughs.



PLATE XX. *Zizyphus napeca*. A, branch with leaves, stipule spines and flowers in cymes. B, fruit. C, seed.

MEDICINAL PLANTS



PLATE XX. *Zizyphus napeca*. A, branch with leaves, stipule spines and flowers in cymes. B, fruit. C, seed.

6. *Zizyphus napeca* Willd. Sp. Pl. 1104. 1797. (Plate XX).

Rhamnus napeca Linn.

Sinh. Yak-eraminiya.

A shrub with very woolly, rufous tomentose young parts; leaves simple, alternate, oval, 3-nerved, slightly oblique at base, abruptly acuminate, obtuse, finely serrulate, glabrous on both surfaces, shortly petioled, stipular spines solitary or in pairs, both recurved, short, stout, hairy, purple; flowers small, regular, bisexual, pale greenish-yellow in rufous, hairy, axillary cymes; sepals 5, fused into a calyx-tube; petals 5, small, reflexed; stamens 5, slightly adnate to base of petals, disc with 5—10-lobed free margin; ovary half-inferior, 2—4-locular, styles 2, recurved; fruit globular, about 2 cm long with a single, rugose seed.

Flowers in July.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in South India, Ceylon and Malaya. It is rather rare in the low-country in Ceylon.

India. Madras: *Cleghorn* 105. **Ceylon.** Without locality, *Thwaites* C.P. 1241; *Walker*; *W. Ferguson*. **Malaya.** Penang: 1822 without name of collector.

Uses. A decoction of the bark of this plant is given for fever, dysentery and loss of appetite.

7. *Zizyphus oenoplia* Mill. Gard. Dict. ed. 8, No. 3. 1868.

Zizyphus albens Roxb.—*Zizyphus centidifolia* DC.—*Zizyphus ferruginea* Heyne—*Zizyphus rufula* Miq.—*Zizyphus scandens* Roxb.—*Rhamnus oenoplia* Linn.

Engl. Jackal Jujube; *Sinh.* Hin-eraminiya, Wel-masan; *Tam.* Ambulam, Amburi, Surai, Suraimullu, Suraiyilandi; *Sans.* Bahukantaka, Dusparsa, Karkhandu, Madhura, Srigalakoli.

A scrambling shrub, semi-scandent by its prickles, bark very rough, branchlets rufous pubescent becoming glabrous; leaves simple, alternate, stipulate, 3-veined, numerous, distichous, 3.2—4.5 cm long, lanceolate or oval, very unequal sided, acute and oblique at base, acute and rounded and apiculate at apex, entire or minutely denticulate, glabrous or closely pubescent above, silky with adpressed, fulvous hair beneath, petioles short and hairy, stipular spines strong, short, compressed, hooked, usually only one developed; flowers very small, regular, bisexual, crowded on shortly pedunculate cymes about 6 mm diam.; sepals 5, fused into an obconical, 5-lobed, very hairy calyx-tube; petals 5, very small, reflexed; stamens 5, disc flat with free margins ovary half-inferior, 2—4-locular; fruit a small drupe, 6 mm long, ovoid, apiculate, black and shining.

Flowers during March and April.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in tropical Asia, Australia, the warmer parts of India, Ceylon and Malacca. It is very common in the low-country, chiefly in the dry regions of Ceylon.

India. Siwalik and Jaunsar: *Sen* 34, 1921. East Bengal: *Herb. Griffith* 2037, Kew Distribution 1862—63. Pen. Ind. Or., *Herb. Wight* 499; *Herb. Wight* 476, Ceylon. North-Central Prov., Anuradhapura, *Herb. Peradeniya*, March 1883. Uva Prov., *Herb. Peradeniya*, Jan. 1888. Without locality, *Thwaites C.P.* 1240. Malaya. Perak: *Scortechini* 1541. Penang: *Wallich* 4246G.

Uses. A decoction of the bark is used to promote the healing of fresh wounds. A conjee prepared from the juice of the bark, leaves, flowers and roots is given to counteract wasp stings. In India, the fruit is used for the preparation of pills for pains in the stomach.

8. *Zizyphus rugosa* Lamk. Encycl. 3: 319. 1789.

Zizyphus glabra Roxb.—*Zizyphus latifolia* Roxb.—*Zizyphus obliqua* Heyne—*Zizyphus paniculata* Roth.

Sinh. Maha-eraminiya; *Tam.* Churai, Kattilandai, Todari.

A large straggling or climbing shrub, with long virgate branches, fulvous-tomentose when young; leaves simple, alternate, 3-veined, stipulate, 5—7.5 cm long, broadly oval or rotundate unequal sided, oblique at base, very shortly acuminate, denticulate, glabrous on the upper surface, densely fulvous-tomentose becoming glabrous beneath, petioles 1 cm long, tomentose, prickles usually solitary, strong, broad based, recurved or nearly straight, hairy; flowers small, regular, bisexual, greenish in tomentose, pedunculate cymes, about 2.5 cm long, arranged along one side of short, usually leafless, lateral branches; sepals 5, fused into an obconical, 5-lobed calyx, hairy outside; petals absent; stamens 5, disc 5-lobed; ovary half-inferior, 2—4-locular, styles 2, connate at base; fruit a pyriform-globose drupe, apiculate, smooth, stone very thin, 1-seeded.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 242. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs throughout India, Ceylon and Burma. It is common in the moist low-country in Ceylon up to an altitude of 2000 feet. Ratnapura, Hantane, Ambegamuwa, etc.

India. Uttar Pradesh: Dehra Dun, Lachiwala, *Sethi* 41, April 1921. Sikkim: *J. D. Hooker*. Ceylon. Western Prov., Colombo, *W.F.*; without locality, *Thwaites C.P.* 2719. Upper Burma. South Shan State: Laikaw, *Khalil*, 1894.

Uses. This plant is beneficial for menorrhagia along with other ingredients. It is an antidote for mercurial poisoning. The fresh parts of the plant are used for poulticing fractures, sores, boils and also to draw out thorns from the eye.

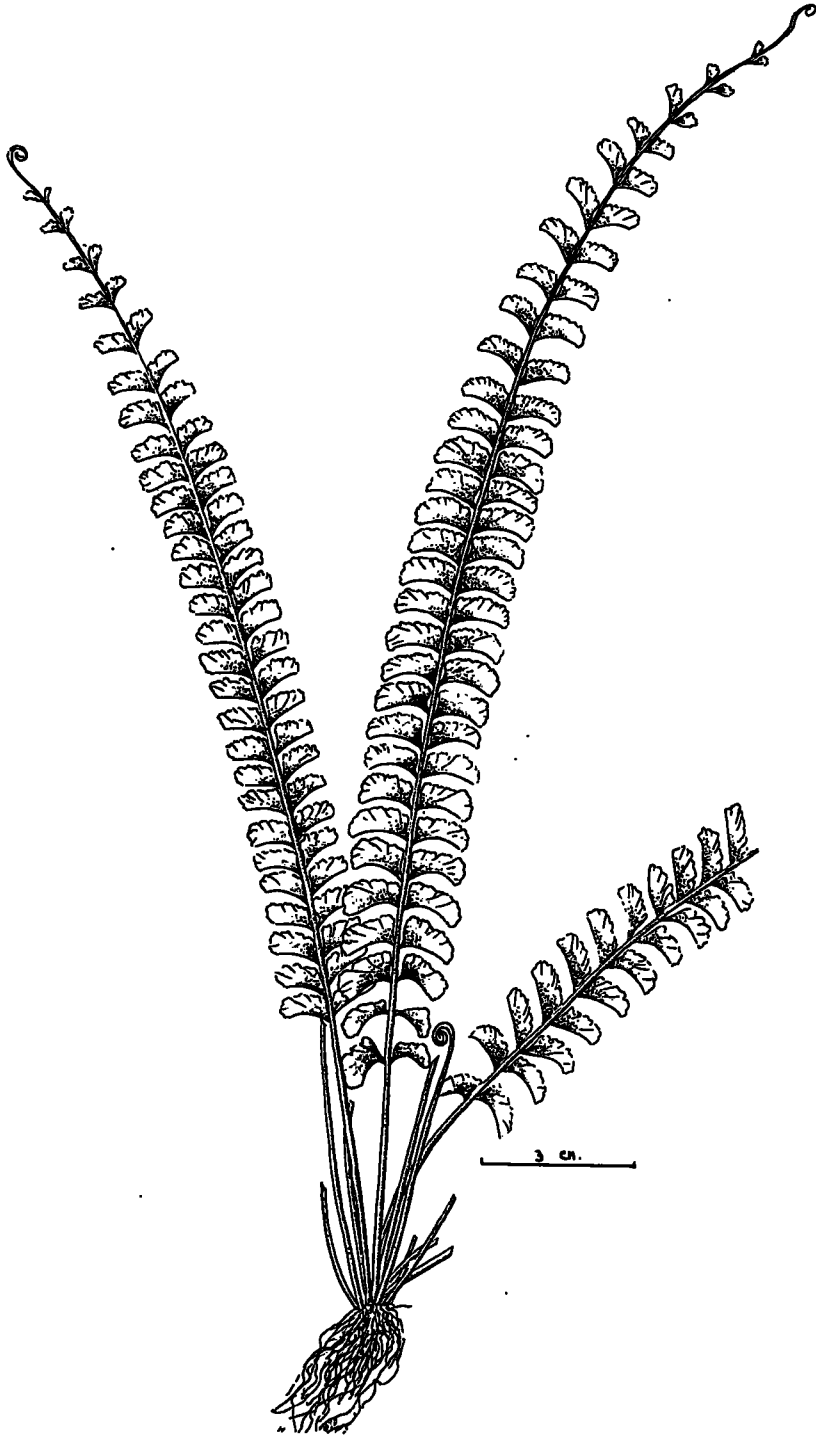


FIG. 433. *Adiantum caudatum*, plant with roots, stipes and fronds.

93. PTERIDACEAE

1. *Adiantum caudatum* Linn. Mant. 308. (Fig. 433).

Adiantum inoisum Forsk.—*Adiantum flagelliferum* Wall.—*Adiantum hirsutum* Bory.—*Adiantum capillus-gorgonis* Webb.

Sinh. Thuda-wediya; *Sans.* Mayurashikha.

An erect or spreading fern with tufted spikes 5—10 cm long, more or less covered with brown hairs; fronds linear in outline, 15—30 cm long, simply pinnate, often elongated (and rooting at the extremity), leaflets 1.2—1.8 cm long, nearly sessile, upper margin rounded and more or less cut, often deeply and repeatedly, the apex usually blunt, the lower line straight and horizontal, the lower leaflets slightly stalked, coriaceous, veins prominent, the rachis and both surfaces of the frond villose; sori marginal, roundish or transversely oblong on the edge of the lobes, indusium of the same shape as the sorus formed of the reflexed margin of the fronds bearing the capsules on its underside, veins free.

Illustrations. Beddome, *Ferns of British India*, pl. 44. 1883; Kirtikar and Basu, *Indian Med. Plants*, pl. 1029. 1933.

Distribution. Occurs throughout India, Ceylon, Malay Peninsula, S. China, tropical Africa, Java, Mauritius and Cape Verde Islands.

Uses. The leaves are used in diabetes and as a cure for coughs and fevers. Externally, they are applied on diseases of the skin.

2. *Adiantum philippense* Linn. Sp. Pl. 1094. 1753.

Adiantum lunulatum Burm.—*Pteris lunulata* Retz.

Sinh. Wala-wenna; *Hindi* Hansapadi, Hansapagi, Kalijhamp, Kalijhant, Paresiyavasan, Brahmadani, Chitrapada, Dharttarashtapadi, Ghritamandalika, Godhangri, Godhapadika, Hansaghri, Hansapadi, Hansavati, Karnati, Kiramata, Kirapadika, Kitamari, Madhusrava, Padangi, Raktapadi, Sancharini, Shitangi, Sutapadika, Suvaka, Tamrapadi, Tridala, Tripadi, Triphala, Vikranta, Vishvagranti.

A tufted rhizomatous fern with naked wiry stipes 10—15 cm long, 7.5 cm broad, pinnae subdimidiate on slender leaf stalks, the lower edge nearly in a line or oblique with the petiole, the upper edge rounded and like the bluntly rounded sides usually more or less lobed; petioles of the lower pinnae spreading 6—12 mm long, herbaceous, the rachis and both surfaces naked; sori in continuous line along the edge, indumentum of the same shape as the sorus, formed of the reflexed margin of the frond bearing the capsules on the underside, veins free.

Illustrations. Beddome, *Ferns of South India*, pl. 1; Kirtikar and Basu, *Indian Med. Plants*, pl. 1031. 1933.

Distribution. Occurs in India, Ceylon, Burma and the tropics, generally in moist places and lower slopes of hills.

Uses. The leaves are used internally for febrile ailments and applied externally on erysipelatous inflammations. A plaster made from the rhizome is applied on chronic tumours. The ash of the plant mixed with gingelly oil and vinegar and applied on bald patches of the head caused by ringworm, makes the hair grow on the scalp. A paste of the rootstock prepared with cows' milk, bees' honey and sugar taken internally is effective on menorrhagia. The root of the plant is effective for strangury and fever due to elephantiasis. The plant is useful for dysentery, diseases of the blood, ulcers and epileptic fits.

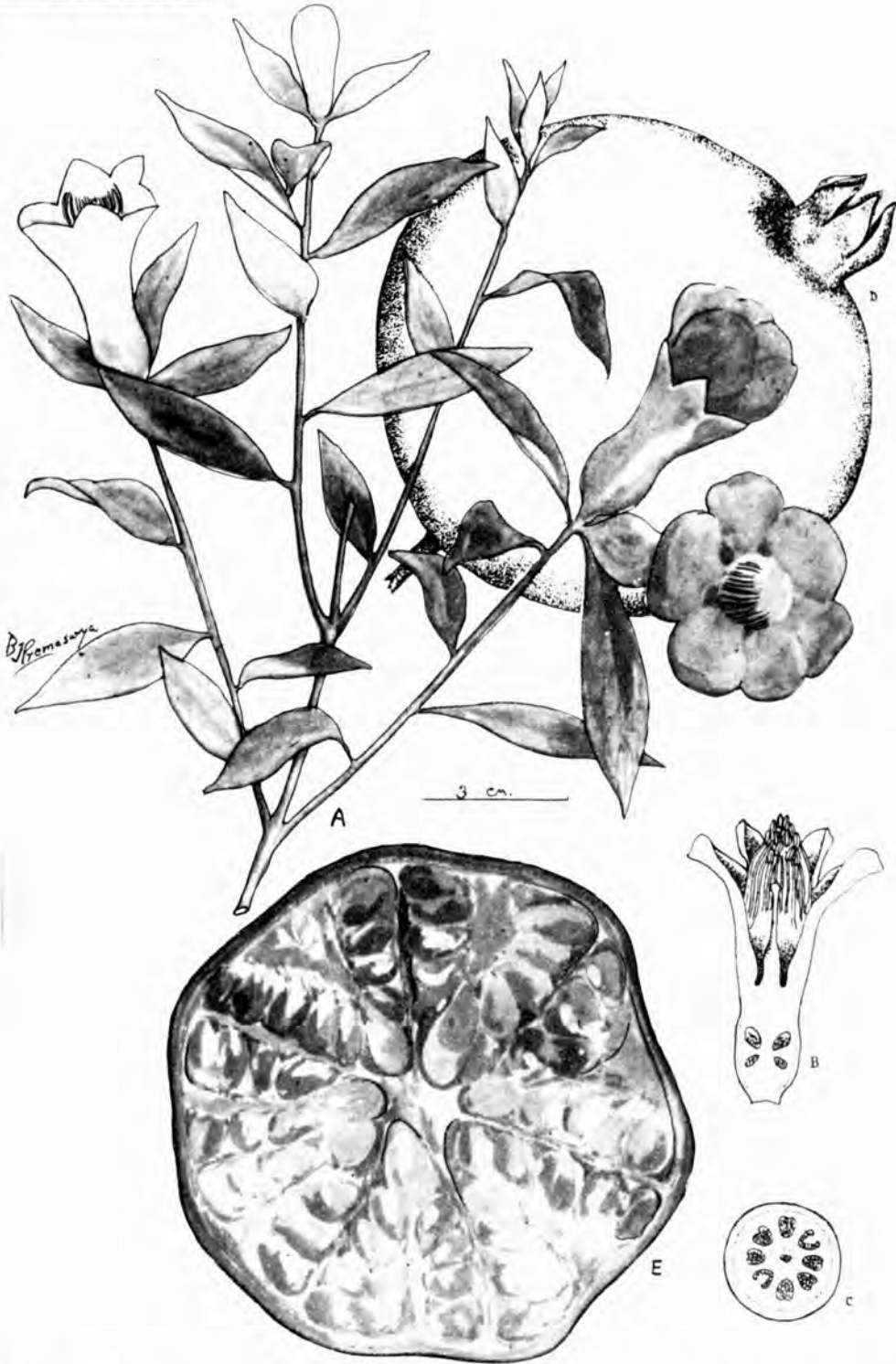


PLATE XVII. *Punica granatum*. A, branch with leaves and flowers. B, longitudinal section of flower. C, transverse section through the upper tier of cells of the ovary. D, fruit. E, transverse section of fruit showing seeds.

MEDICINAL PLANTS

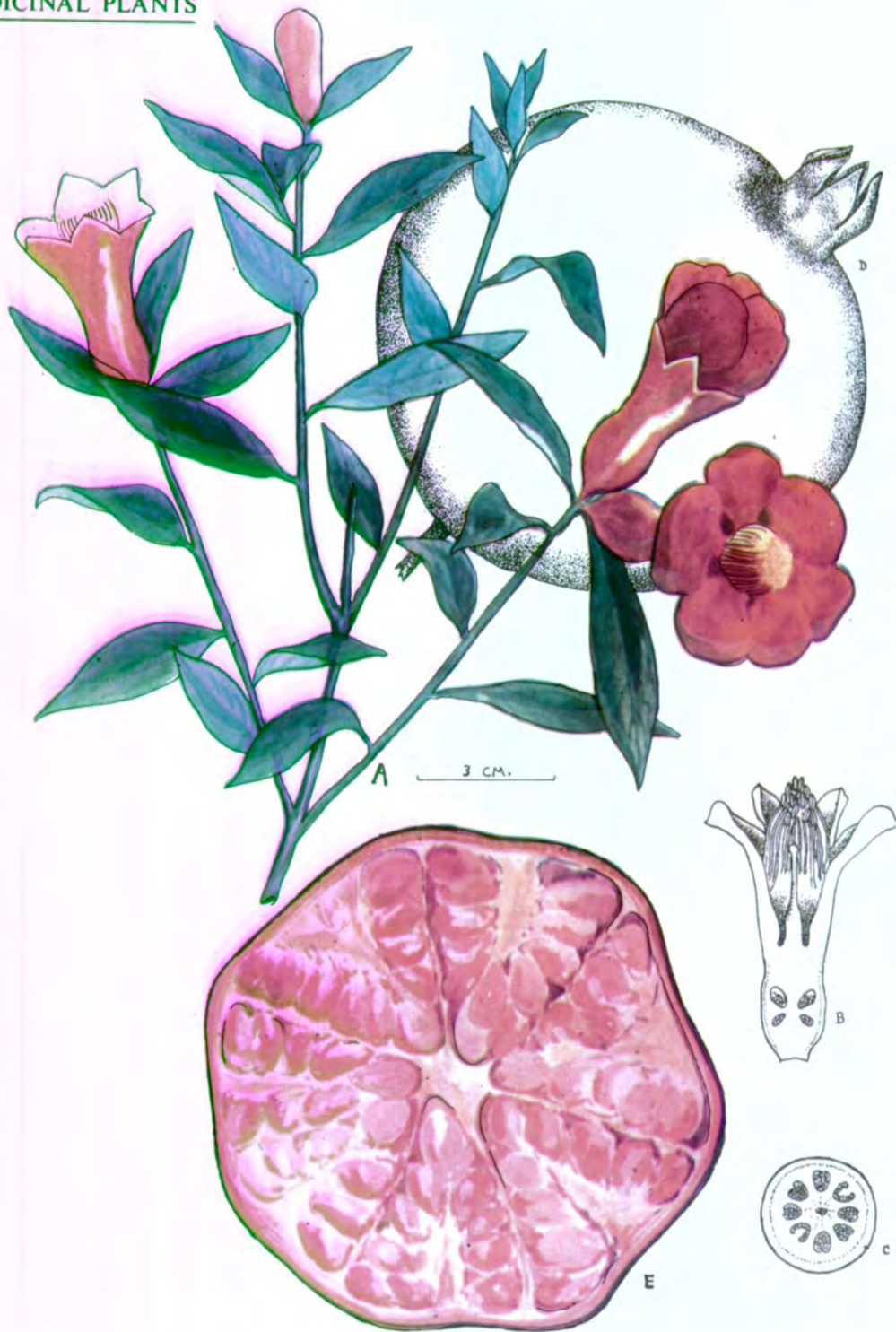


PLATE XVII. *Punica granatum*. A, branch with leaves and flowers. B, longitudinal section of flower. C, transverse section through the upper tier of cells of the ovary. D, fruit. E, transverse section of fruit showing seeds.

94. PUNICACEAE

1. *Punica granatum* Linn. Sp. Pl. 472. 1753. (Plate XVII).

Punica grandifolia Hort.—*Punica nana* Linn.—*Punica spinosa* Lam.

Engl. Pomegranate Tree; *Sinh.* Delun, Delungaha; *Tam.* Kalumal, Madalai, Madulam, Madulungam, Pumadalai, Pulimadalai, Tadimadalai, Tadimam, Tusagam; *Sans.* Bijapura, Dadima, Dadimasara, Dadimba, Dalika, Dantabija, Dantabijaka, Karaka, Kuchaphala, Kuttima, Lohitapushpaka, Madhubija, Milapatra, Milapatraka, Mukhavallabha, Nagarata, Parvarut, Phalashadava, Pindapushpa, Pindira, Raktabija, Raktapushpa, Shukadana, Shukavallabha, Sunile, Suphala, Svadvamala, Valkaphala, Vrittaphala.

A large shrub or small tree 3.3—5 m tall with slender, somewhat angular branches often with spiny ends, bark pale brownish grey, furrowed longitudinally, the young parts and buds red in colour; leaves usually opposite, sometimes alternate, often fasciated on the older branches, shortly stalked, without stipules, 2.5—5 cm long, oblong-ovate or lanceolate, tapering at both ends, entire, rather thick and stiff, smooth and shining, often persistent; flowers regular, bisexual, large, solitary or 2 or 3 together in the axils of the leaves near the ends of branches, very shortly stalked; calyx large, broadly tubular, over 3.1 cm long, thick and leathery, adherent to the ovary below, cut into 5—7 thick, triangular, acute, valvate lobes above, smooth, shining and scarlet; petals 5—7, inserted in the throat of the calyx and alternating with its lobes, spreading, imbricate, crumpled, roundish, with a short broad claw, crimson; stamens very numerous, free, inserted in several rows on the calyx-tube below the petals, crowded, erect, anthers ovoid, dorsifixed, 2-celled, introrse, yellow, dehiscing longitudinally; ovary completely amalgamated with the lower part of the calyx-tube, thick and leathery, with 2 tiers of loculi, the lower tier of 3 loculi, the upper tier of 5—8 loculi, ovules very numerous, sessile, covering the whole surface of the placenta which in the loculi of the lower tier are axile and in those of upper tier parietal, style tapering, stigma simple, capitate; fruit as large as an orange, 6—7 cm or more diam., hard, depressed-globose, bluntly 5—8 angled, abruptly contracted at the top into a short neck terminated by the thick calyx lobes and containing the withered stamens; pericarp thin, very smooth, tough, yellow or reddish, cavity irregularly divided below the middle into two storeys by a thin somewhat conical diaphragm extending from the centre to the sides, upper storey divided into 5—8 irregular chambers by thin, tough, membranous, dissepiments, lower storey often also with one or more vertical partitions, seeds very numerous, entirely filling the fruit attached to the upper chambers on all sides of thick, strong, spongy placentae, which project from the wall but do not extend to the top or bottom of the chambers and in the lower chamber or chambers either all over the floor of the fruit or on several irregular projecting placentae, seed 1.2 cm long, polygonal, composed of a thick, translucent, pink, juicy coating, inner coat hard, white, cotyledons foliaceous, convolute, exalbuminous.

Illustrations. Griffith, *Ic. Pl. Asiat.*, pl. 634; Curtis, *Bot. Mag.*, pl. 1832. 1816; Wight, *Ill. Ind. Bot.* pl. 97; Bentley and Trimen, *Med. Plants*, pl. 113. 1880; Kirtikar and Basu, *Indian Med. Plants*, pl. 435. 1933; Herb. Peradeniya, drawing.

Distribution. A native of Kabul and Persia and is now cultivated in most tropical and temperate countries including Africa, India and Ceylon.

India. Himal. Bor. Occ., *T. Thomson*. Ceylon. Central Prov., Peradeniya, Bot. Gard. cultivated, *Herb. Peradeniya*, Aug. 1902. Maldive Islands. *Didi* 115, 1896; *Gardiner*, 1899—1900.

Composition. The bark of this plant contains the alkaloids pelletierine, isopelletierine, methyl-pelletierine and pseudopelletierine in addition to tannin, a glucoside, granatic and gallic acids. The fruit contains invert sugar, saccharose, the enzyme invertine and citric and malic acids. It is also rich in vitamin C and is a good source of iron.

Uses. The root bark is a specific for cases of tapeworm and tuberculous diseases in children. It is also used in diseases of the eye, painful micturition and catarrh. The rind of the fruit is excellent for diarrhoea and dysentery and the bark of the stems a good anthelmintic. In Africa, the different parts of the plant are used for the same diseases. The plant is used as a diuretic in Vietnam, while in Sumatra the root bark is employed as an abortifacient. In Java, the bark of the stem is used as a poison.



FIG. 434. *Aconitum ferox*. A, upper portion of the plant with a lower leaf, flowers and fruits. B, sepals dissected, dorsal view. C, D, posterior petal. D, enlarged.

95. RANUNCULACEAE

1. *Aconitum ferox* Wall. in Seringe Mus. Helvet. d'Hist. Nat. 1: 60. 1822. (Fig. 434).

Aconitum virosum Don.—*Aconitum napellus* var. *rigidum* Hook. f.—*Aconitum dissectum* Stein.

Engl. Bish, Nepal Aconite; *Sinh.* Vachanabhi; *Tam.* Vashanavi; *Sans.* Aheya, Amrita, Bhugara, Brahma Putra, Darada, Gara, Garada, Garala, Ghora, Halahala, Haridra, Jangala, Jangula, Jivanaghata, Kakola, Kalakuta, Kasakula, Kishala, Kshveda, Nila, Pradipana, Pranahara, Raktashringika, Rasa, Rasayana, Shanklakeya, Shringi, Sowrashtrika, Tikshana, Vatsanabha, Visha.

A perennial herb with a fleshy, fusiform, tuberous rootstock attenuated below into the root giving off laterally near the summit one or two similar tubers, stem about 2 m high, erect, stout, smooth below, finely hairy above, simple or branched; leaves alternate, the lower ones long-stalked, upper ones shorter, deeply and palmately cut into 5 acute, irregularly indented lobes, glabrous and dark green above, paler with prominent veins beneath, the upper ones passing insensibly into the bracts; flowers irregular, bisexual, pale dirty blue, large, pedicels long, glandular pubescent in erect racemes; sepals 5, petaloid, very unequal, deciduous, imbricate, all glandular hairy outside, lateral ones not hairy within, the upper ones arched, laterally compressed, two lateral ones broadly ovate, blunt, the two inner ones oblong or lanceolate, unequal; petals reduced; stamens numerous, hypogynous, filaments rather long, slightly hairy, outer ones drooping, anthers small, 2-celled, dull green; ovary superior, 5-carpellary, carpels distinct with numerous ovules; fruit of 5 follicles tipped with styles, erect, transversely wrinkled, strongly pubescent, seeds black with pitted or plaited testa.

Flowers in July and August.

Illustrations. Wallich in Seringe Mus. Helvet. 1: pl. 15, figs. 43 and 44. 1823; Edinburgh New Philosoph. Journ. 47, pl. 5.

Distribution. Occurs in India, in the temperate sub-alpine regions of Himalaya extending from Sikkim to Garhwal. It does not grow in Ceylon.

India. N. W. Himalaya: Gulmar Pass, *Duthie* 725, Aug. 1883. Sikkim: *Thomson*, Oct. 1857; *Tumboch*, *Clarke* 12742C, Oct. 1870; *J. D. Hooker*, all between 10,000—14,000 feet altitude.

Composition. The roots of this herb contain aconite and an unnamed alkaloid of the composition $C_{30}H_{47}NO_7$.

Uses. The root is used in the treatment of inflammatory conditions of the throat, lungs, intestines, joints, etc., leprosy, fever, cholera and rheumatism. Externally, a paste of it is applied in the form of a plaster on the skin for neuralgia, boils, etc.

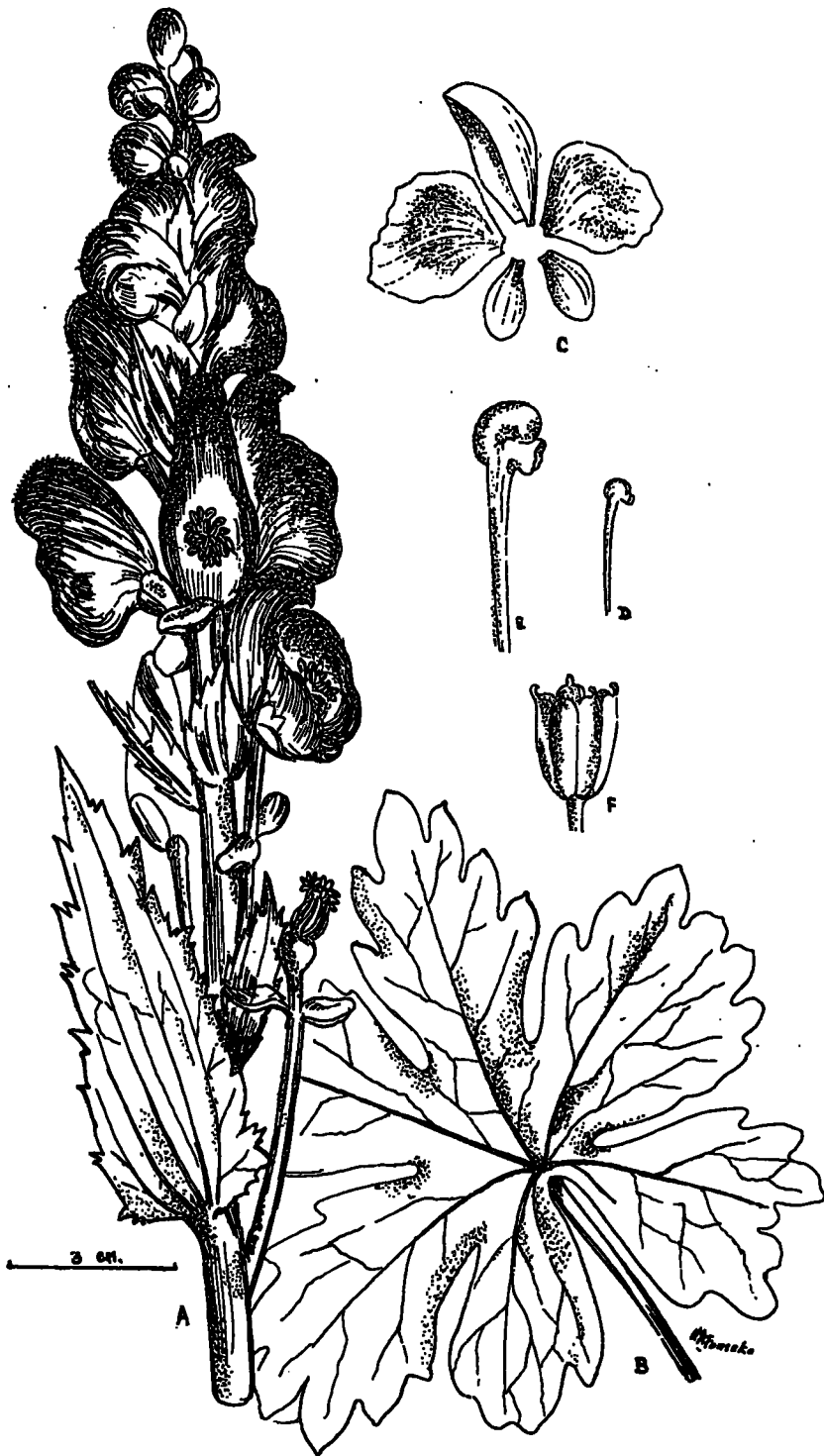


FIG. 435. *Aconitum heterophyllum*. A, raceme of flowers. B, lower leaf. C, sepals dissected and spread out. D, E, posterior petal. F, fruit. E, enlarged.

2. *Aconitum heterophyllum* Wall., List of E. Indian Plants No. 4772. 1828. (Fig.435).

Aconitum cordatum Royle.—*Aconitum atees* Royle.—*Aconitum ovatum* Lindl.

Sinh. Atiudayan, Atividayan; *Tam.* Atividayan; *Sans.* Amrita, Aruna, Ataicha, Atisaraghni, Atis, Ativisha, Bhangura, Bhringi, Ghunavallabha, Kashmiri, Madri, Mahoshadha, Mridvi, Prativisha, Shishubhaishyaja, Shokapaha, Shringi, Shringhika, Shuklakanda, Shveta, Shvetakanda, Shvetavacha, Shyamkanda, Upvisha, Vira, Virupa, Visha, Visharupa, Vishva.

A perennial herb with an oblong-ovoid or fusiform perpendicular rootstock, pale grey externally, white within and with numerous spreading root fibres; stem erect, 30—90 cm high, simple or slightly branched, cylindrical and pubescent above, somewhat angled below; leaves variable, the lower ones long petioled, reniform, base cordate, deeply 5-lobed, the lobes deeply and irregularly inciso-crenate, upper ones very shortly stalked or sessile, amplexicaul, narrowly ovate with a cordate base and acuminate apex, strongly inciso-serrate, glabrous, bright green paler beneath; flowers irregular, bisexual, purplish-blue or yellowish-green, large on long rufous-pubescent pedicels closely appressed to the stem in racemes, bracts leaf-like, cordate, acuminate, bracteoles oblong, membranous, entire, sub-opposite; sepals 5, petaloid, very unequal, deciduous, imbricate, the upper one large, boat-shaped, laterally compressed, pointed, the lateral ones obliquely ovate and the anterior ones small, oval, pendulous, all pubescent on the exterior; petals 5, posterior petal with a thick dorsal, black, incurved knob with an inferior membranous appendage but no backward spur; stamens numerous, hypogynous, filaments long, slightly hairy, outer ones drooping, anthers small, 2-celled, dull green; ovary superior, 5-carpellary, carpels quite distinct, shorter than stamens, somewhat divergent, smooth with numerous ovules in two rows; fruit of 5 follicles, pericarp papery, slightly veined, minutely downy, seeds large, irregularly angled, bright brown.

Illustrations. Royle, Ill. Bot. Himal., *pl.* 13. 1834; Curtis, Bot. Mag., *pl.* 6092. 1874; Bentley and Trimen, Med. Plants, *pl.* 7. 1880.

Distribution. Occurs in India in the West temperate regions of the Himalaya. It does not grow in Ceylon.

India. Himalaya: *Herb. Munroanum* 290, Sept. 1844; Kashmir: Pharkian Pass, *Keshavanam* 476, Aug. 1906; Srikantha, Dudu Gadh, *Duthie* 723, Aug. 1883. Simla: *Thomson*, all between 8,000—15,000 feet altitude.

Composition. The roots of this plant contain the alkaloids atidine, atisine, heteratisine and hetisine.

Uses. The root is used as a cure for diarrhoea, dysentery, bilious complaints and vomiting in children. It is also given for intermittent and paroxysmal fevers and as a tonic in convalescence.

In Ceylon, *Cryptocorine* spp. are used as a substitute.



FIG. 436. *Clematis gouriana*. A, branch with leaves and inflorescences of flowers. B, flower, lateral view. C, longitudinal section of flower with perianth removed. D, fruit. E, achene.

3. *Clematis gouriana* Roxb. Fl. Ind. 2: 670. 1824. (Fig. 436).

Clematis cana Wall.—*Clematis javana* DC.

Engl. Indian Traveller's Joy; *Sinh.* Nara-wel.

A perennial woody climber with wide spreading branches, pubescent when young; leaves opposite, exstipulate, pinnate or bipinnate, petiole and rachis elongated, leaflets stalked, ovate, oblong or lanceolate-oblong, 2.5—12.5 cm long, 1.2—3.7 cm broad, caudate acuminate, serrate, glabrous on the upper surface, pubescent beneath; flowers regular, bisexual, yellowish or greenish-white, 1.9 cm diam., borne in large, axillary, compound inflorescences; sepals 4, petaloid, valvate, pubescent; petals absent; stamens numerous, free, filaments narrowly linear, glabrous, connective not produced; ovary superior, carpels numerous, distinct, each with a solitary pendulous ovule; fruit a head of achenes each with a hairy tail.

Flowers in October and November.

Illustrations. Wight, Ic. Pl. Ind. Or., pls. 933 and 934. 1843—1845; Kirtikar and Basu, Indian Med. Plants, pls. 3 and 3A. 1933.

Distribution. Occurs in India, Ceylon, Malay Peninsula, Java and Philippine Islands. It is rather rare in the montane zone between 3,000—6,000 feet altitude in Ceylon. Hakgala, Nuwara Eliya, Ramboda, Dimbula, etc.

India. Nepal: *Wallich* 4673H; N. W. Himalaya: *Griffith*; *Mussourie*, *King*, 1869; E. Himalaya: *Herb. Griffith* 5. Sikkim: *Thomson*, Nov. 1857. Khasia: *J. D. Hooker and T. Thomson*. Bombay, Yellapore, *Talbot*, Oct. 1880. Coonoor: Nilghiri, *Hook f. and T. Thomson*; *Clarke* 10348C, March 1870. Malabar, Concan, etc., *Stocks, Law, etc.*, Jullundur, *Clarke* 23367A; *Clarke* 23401C, Oct. 1874; Prasnath, *Clarke* 33771D, Oct. 1883. Pen. Ind. Or., *Herb. Wight* 1 and 2, Kew Distribution 1866—7. Ceylon. Central Prov., Hakgala, *Willis*, March 1906; without locality, *Thwaites* C.P. 680.

Uses. The fresh leaves of this plant, if bruised and applied on the skin, cause vesication. A decoction of the plant is given for puerperal fever.

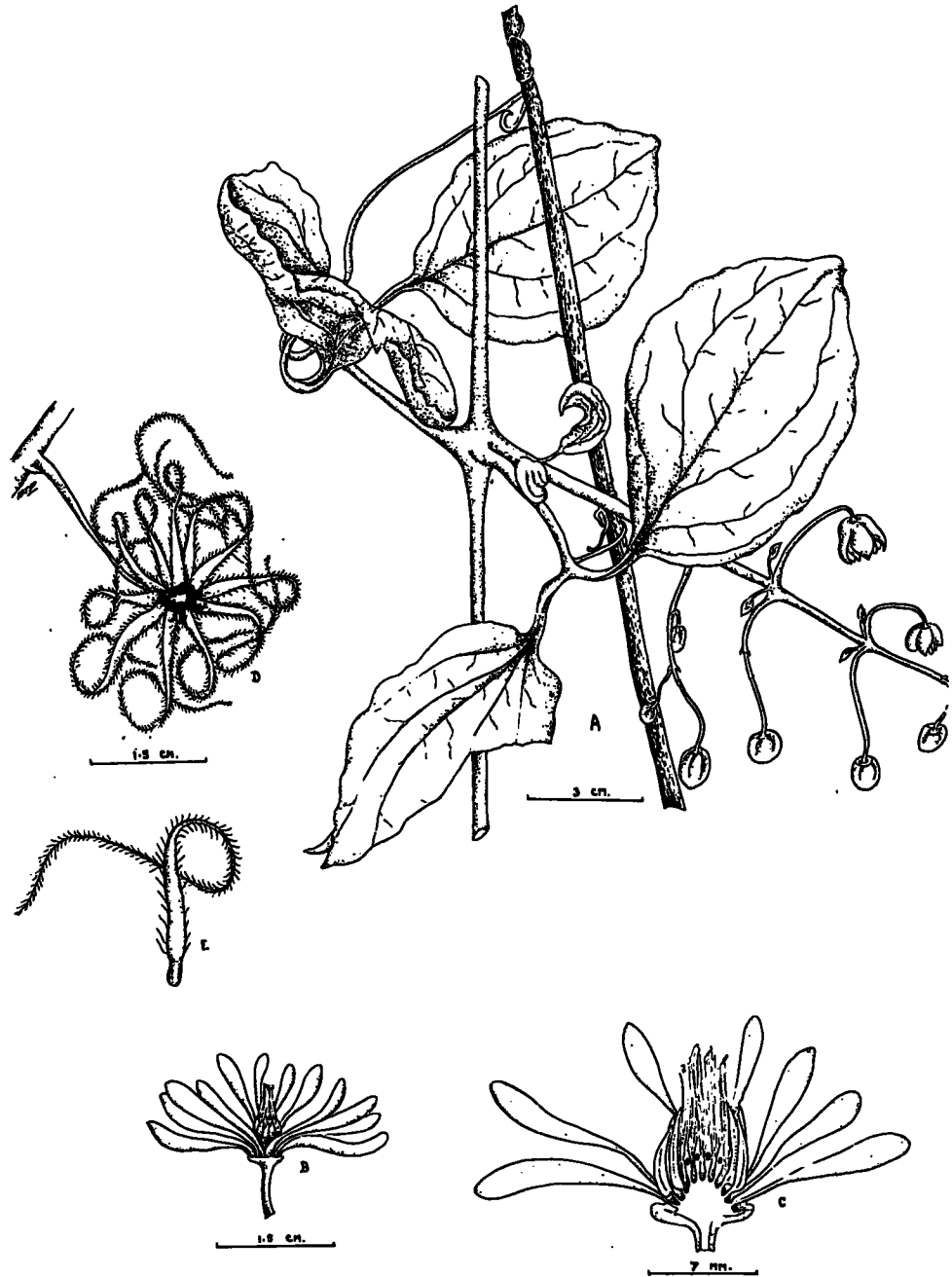


FIG. 437. *Naravelia zeylanica*. A, twig with leaflets, leaflet-tendrils and inflorescence of flowers. B, flower, lateral view with the sepals fallen off. C, longitudinal section of flower showing petals, stamens and carpels. D, fruit-head of achenes. E, achene.

4. *Naravelia zeylanica* (Linn.) DC. Syst. 1: 167. 1818. (Fig. 437).

Atragene zeylanica Linn.—*Clematis zeylanica* Herm.

Sinh. Narawel; *Sans.* Laghukarni, Murva.

A climbing shrub with pubescent branches; leaves opposite, exstipulate, long-petioled, 3-foliate, the central leaflet modified into a tendril which is trifid at apex, leaflets broadly oval, acute, often unequal at base, entire or gashed, glabrous on the upper surface, more or less silky pubescent beneath, 5-nerved; inflorescence axillary, compound; flowers regular, bisexual green; sepals 4, valvate, ovate-lanceolate, subacute, pubescent, soon falling; petals 12, longer than sepals, linear-spathulate, 1.2—1.9 cm long, spreading; stamens indefinite, distinct, free; ovary superior of many free carpels with long styles and stigmas, each with a single ovule; fruit a head of achenes and shortly stalked, acuminate, whip-like and slightly hairy.

Flowers from September to February.

Illustrations. Roxburgh, *Pl. Corom.*, 2: pl. 188. 1798; Herb. Peradeniya, drawing.

Distribution. Occurs in India and is rather rare in the moist low-country in Ceylon. Hiniduma, Galle, Colombo, Lunugala, Kalutara, Kandy, etc.

India. Silhet: Gurhatty Hills, *Wallich 4787A, G, C & H.* Assam: Damra Plains, Goalpara District, *King's Collector*. Dec. 1890; *Jenkins; Simons 380.* Bombay: N. Canara, *Talbot*, Nov. 1880. Travancore: *Lawson 151*, Nov. 1893; Mt. Nilghiri, *Hooker f. and T. Thomson*. Pen. Ind. Or., *Herb. Wight 4*, Kew Distribution 1866—7. Ceylon. Western Prov., Colombo, *Herb. Peradeniya*, Sept. 1856. Uva Prov., *Trimen*, Jan. 1888. Southern Prov., Hiniduma, *Livera*, Feb. 1923; Galle, *Thwaites C.P. 1009*, Dec. 1853. Without locality, *Alston A16*.

Uses. This plant is used on itch, eczema, eruptions due to impure blood and for malaria.

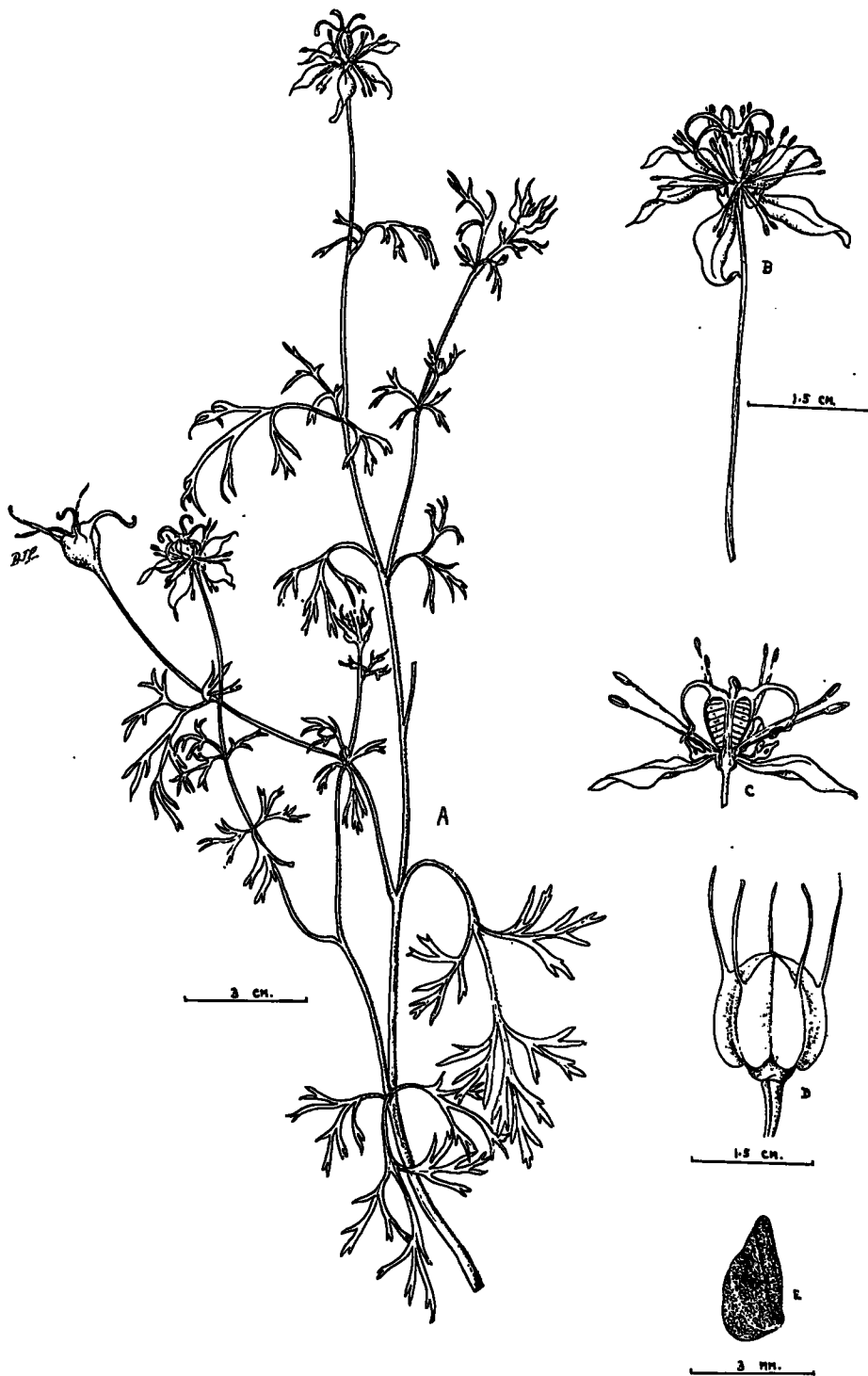


FIG. 438. *Nigella arvensis*. A, twig with leaves and flowers. B, flower, dorsal and lateral view. C, longitudinal section of flower showing perianth, honey-leaves, stamens and ovary. D, fruit, lateral view. E, seed.

5. *Nigella sativa* Linn. Sp. Pl. 753. 1753. (Fig. 438).

Nigella indica Roxb. ex Flem.

Engl. Black Cummin, Nutmeg Flower, Small Fennel; *Sinh.* Kaluduru; *Tam.* Karungiragam; *Sans.* Bashpika, Kalajaji, Karava, Karavi, Krishnajiraka, Kunchi, Kunchika, Kunjika, Musavi, Prathvika, Prithvi, Prithu, Prithuka, Sthulajiraka, Sushavi, Upakunchiraka.

An annual herb 35—50 cm tall, branching at the top, stem green, round, hairy, 2—5 mm diam., internodes 2—5 cm long; leaves alternate, pinnate, lower leaves small, petioled, upper leaves sessile, 6—10 cm long, pinnæ irregularly lobed, glabrous on the upper surface, hairy beneath and on the rachis; flowers regular bisexual, terminal on branches, white or greenish white about 3 cm diam., long-stalked, pedicels 1.5—5.5 cm long becoming longer as the fruit matures; perianth 5, free, greenish white, lanceolate, 1.2—1.5 cm long, 0.4—0.5 cm broad, 3-veined, veins branching; honey leaves 8, 5 mm long, 2.5 mm broad, 3-lobed, anterior lobe, small ovate, acuminate, blue, flapped over the fused concave hairy base of the pair of posterior lobes, posterior lobes ovate, greenish white, apex blue with a blue line across the body, each carrying a shining green mass, scantily ciliated; stamens numerous, outer ones longer than the inner ones, basifixed, filaments 2.5—5.2 mm long, slender, anthers 1.5—2 mm long; ovary superior, .5 mm long, smooth, 5-carpellary, syncarpous, 5-locular, axile placentation, styles and stigmas about 7 mm long; fruit capsule with many black trigonal seeds.

Distribution. Though this herb is not a native of India, it is sometimes cultivated in Punjab and Bihar. It is not grown in Ceylon.

Afghanistan. *Herb. Griffith 38A*, Kew Distribution 1861—62.

Composition. The seeds of this herb contain the alkaloids, connigelline and nigelline.

Uses. The seeds are aromatic stimulant with a sharp taste having anthelmintic and carminative properties. They are used in lung complaints, coughs and jaundice, both internally and externally. They are also employed in the treatment of hydrophobia, tertiary fever, paralysis and eye sores. The powdered seed mixed with gingelly oil is applied on eruptions of the skin.



PLATE XVIII. *Colubrina asiatica*. A, branch with leaves and flower cymes. B, flower, dorsal view. C, 4-merous flowers, dorsal view. D, stamens. E, twig with fruits. F, transverse section of fruit. G, seeds. D, enlarged.



PLATE XVIII. *Colubrina asiatica*. A, branch with leaves and flower cymes. B, flower, dorsal view. C, 4-merous flowers, dorsal view. D, stamens. E, twig with fruits. F, transverse section of fruit. G, seeds. D, enlarged.

96. RHAMNACEAE

1. *Colubrina asiatica* Brongn. in Ann. Sc. Nat. Ser'1, 10: 369. 1827. (Plate XVIII).

Colubrina javanica Miq.—*Ceanothus asiaticus* Lamk.—*Ceanothus capsularis* Forst.—*Pomaderris capsularis* G. Don—*Rhamnus acuminata* Colebr.

Sinh. Tel-heeriya, Wel-heeriya; *Tam.* Majir-manikkam.

A much branched shrub with glabrous young parts; leaves simple, alternate, 3.7—6.2 cm long, ovate, rounded or subcordate at base, acuminate, obtuse, crenate-serrate, glabrous, thin, somewhat 3-veined at base, petioles 1.2—1.8 cm long; flowers regular, bisexual, greenish—yellow, pedicellate in small axillary nearly sessile cymes; sepals 5, fused into a 5-lobed, hemispherical tube, slightly hairy, segments acute; petals 5, as long as sepals, clawed, involute; stamens 5, inserted outside the disc; disc fleshy filling the calyx-tube; ovary half inferior immersed in the disc, 3-locular, style 3-lobed; fruit a septicidally dehiscent, 3-valved, globose capsule, 1 cm long, smooth, valves cartilaginous, seeds dull brownish grey.

Illustrations. Wight, Ill. Ind. Bot., pl. 74. 1838; Burmann, Thes. Zeyl., pl. 48. 1737; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya, Java, Borneo, Australia and S. W. Africa. It is rather common in the dry regions in Ceylon. Trincomalee, Batticaloa, Kurunegala, etc.

India. Pen. Ind. Or., *Herb. Wight* 17. Ceylon. Northern Prov., Jaffna, *Herb. Peradeniya*, Feb. 1890; Karitivu, *Herb. Peradeniya*, Aug. 1883. Without locality, *Thwaites C. P.* 1239. *Maldive Islands.* *Gardiner*, 1899-1900; Hulule, *Gardiner* 27, 1899-1900; *Didi* 122, 1896. *Malaya.* Penang: *Curtis* 235, Nov. 1885. Tenasserim and Andaman Islands. *Herb. Helfer* 2020/2, Kew Distribution 1861-2. New Caledonia. *Franc* 1704; *Deplanche* 321. Aldabra Island. *Abbott*.

Composition. The leaves, flowers, roots and bark of this plant contain an alkaloid.

Uses. This plant is used for the preparation of poultices and medicinal oils for treatment of rheumatism and inflammations caused by impure blood.



PLATE XIX. *Rhamnus wightii*. A, branch with leaves, flowers and fruits. B, flower, lateral view. C, petal and stamen. D, stamen. E, longitudinal section of pistil. F, G, transverse sections of 4 and 3-locular ovaries. H, seed. I, longitudinal section of seed showing cotyledons. B—I, enlarged.



PLATE XIX. *Rhamnus wightii*. A, branch with leaves, flowers and fruits. B, flower, lateral view. C, petal and stamen. D, stamen. E, longitudinal section of pistil. F, G, transverse sections of 4 and 3-locular ovaries. H, seed. I, longitudinal section of seed showing cotyledons. B—I, enlarged.

2. *Rhamnus wightii* Wight & Arn., Prodr. 164. 1834. (Plate XIX).*Ceanothus wightiana* Wall.

Eng. Indian Buckhoro; Tam. Peyppula; Sans. Raktharohita.

A large shrub with puberulous young parts; leaves simple, alternate, stipulate, 5—8.5 cm long, ovate-oval or ovate, rounded or acute at base, acuminate, obtuse, apiculate, finely glandular-serrate, glabrous on both sides, petioles 1.2 cm long, stipules very early caducous; flowers regular, bisexual, small, yellowish-green, 1—5 in axillary clusters on glabrous pedicels; sepals 5, fused into a 5-lobed calyx, glabrous, segments triangular; petals 5, very small, spathulate; stamens 5, inserted in the mouth of the calyx-tube (perigynous), disc inconspicuous; ovary superior, 3—4-locular, styles 3 or 4 connate halfway up; fruit a globose berry, 0.5 cm long, supported on flat persistent calyx-tube tipped with persistent styles, smooth and reddish purple.

Flowers in September.

Illustrations. Wight, Ic. Pl. Ind. Or., *pl.* 159. 1839; Kirtikar and Basu, Indian Med Plants, *pl.* 244B, 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India and is common in the upper montane zone in Ceylon. Nuwara Eliya, Hakgala, Ambawela, etc.

India. South India: *Fischer* 2901, Sept. 1911. Pen. Ind. Or., *Herb. Wight* 484, Kew Distribution 1866-7. **Ceylon.** Central Prov., Nuwara Eliya, Elephant Plains, *Thwaites C. P.* 2535; Sita Eliya, *A. M. Silva*, April 1906; Hakgala, *de Alwis*, April 1920; *J. M. Silva*, May 1911; Ambawela, *Alston* 1038, Feb. 1927.

Uses. The bark of this plant is valuable owing to its tonic, astringent and deobstruent properties.

3. *Ventilago maderaspatana* Gaertn. Fruct. 1: 223. 1788.*Ventilago bracteata* Wall.

Engl. Red Creeper; *Sinh.* Kobowakka, Yakada-wel; *Tam.* Pappili, Surul, Surul-battaikkodi, Vembadam; *Sans.* Raktavalli.

A large woody climber with elongated slender branchlets and pubescent young parts; leaves simple, alternate, stipulate, 3.7—12.5 cm long, ovate or ovate-lanceolate, obtuse or rounded at base, acuminate, obtuse or rarely acute at apex, shallowly crenate-serrate or entire, glabrous and shining, lateral veins 6—12 on each side, fine but conspicuous, oblique, connected by very fine transverse reticulation, petioles 3—6 mm long, stipules very small, lanceolate, pubescent; flowers regular, bisexual, pale green, small, numerous, 4 mm long, on short pubescent pedicels, arranged in clusters on the branches of large, spreading and drooping, pubescent, elongated, terminal panicles; sepals 5, fused into a 5-lobed, obconical calyx-tube, pubescent, lobes erect, very acute; petals 5, small, shorter than calyx, 2-lobed; stamens 5, slightly adnate to base of petals and as long; disc broad, flat, slightly 5-lobed; ovary half-inferior, 2-locular, styles 2, short; fruit a small globular, 1-seeded, indehiscent nut supported by persistent calyx, wing 2.5—3.7 cm long, linear-oblong, leathery, pubescent, veined, slightly bifid at apex.

Flowers in June and July.

Illustrations. Gaertner, *Fruct. et Sem. Plant.*, 1: *pl.* 49. *fig.* 2. 1788; Wight, *Ic. Pl. Ind. Or.*, *pl.* 163. 1839; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 238A. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India and in the hot dry places in Ceylon. It is very common in the low-country and rather rare in the moist regions. Heneratgoda, Pasdun Korale, Mirigama, Dambulla, Anuradhapura, etc.

India. Concan: *Stocks*. *Pen Ind. Or.*, *Herb. Wight* 511; *Herb Wight* 472, Kew Distribution 1866-7. **Ceylon.** North-Central Prov., Kekirawa, *Herb. Peradeniya*, Aug. 1885. Central Prov., Kandy, Lady Horton's, *F. W. de Silva*, May 1928; Siyambalagastenne, *Alston*, Sept. 1926. Uva Prov., Bibile, *J. M. Silva*, Oct. 1925; Uma Oya, *Herb. Peradeniya*, 1880. Without locality, *Thwaites C.P.* 1236.

Uses. The root bark of this plant is a tonic, carminative, stomachic and stimulant. It is useful for cases of low fever and for atonic dyspepsia. The powdered bark is applied externally on itch and other skin diseases with good results.

4. *Zizyphus jujuba* Lam. Enaf. 3: 319, 1789.

Zizyphus sativa Gaertn.—*Zizyphus vulgaris* Lamk.—*Zizyphus flexuosa* Wall.—*Zizyphus nitida* Roxb.—*Zizyphus sinensis* Lamk.

Engl. Common Jujube; *Sinh.* Masan; *Tam.* Ilantai.

A glabrous shrub or small tree about 10 m tall, thorny, spreading, branchlets often fascicled, slender and having frequently the appearance of pinnate leaves; leaves simple, alternate, petioled, oblong-ovate to ovate-lanceolate, 2.5—5 cm long, obtuse or sometimes emarginate, serrate, 3—5-nerved from base, glabrous underneath, stipules often transformed into spines; flowers regular, bisexual, small, yellowish in short, axillary cymes; sepals 5, fused into a 5-lobed calyx; petals 5; stamens 5, opposite petals and inserted with them at or below margins of fleshy disc which lines the calyx-tube, filaments free, slender; ovary immersed in the disc and adnate to it at base, 2-locular with 2-parted style; fruit a fleshy, subglobose to oblong, dark red or brown drupe, 1.2—2.5 cm long with whitish flesh and a hard 2-chambered stone.

Illustration. Kirtikar and Basu, *Indian Med. Plants*, pl. 241. 1933.

Distribution. Occurs in India, Southern Europe, and China.

India. Himal. Bor. Occ., *T. Thomson*. Calcutta, Bot. Gard., cultivated. **Japan.** Yokohama, *Maximowicz*, 1862.

Composition. The leaves of this plant contain an alkaloid.

Uses. A syrup of the dried fruit of this plant is given for bronchitis.

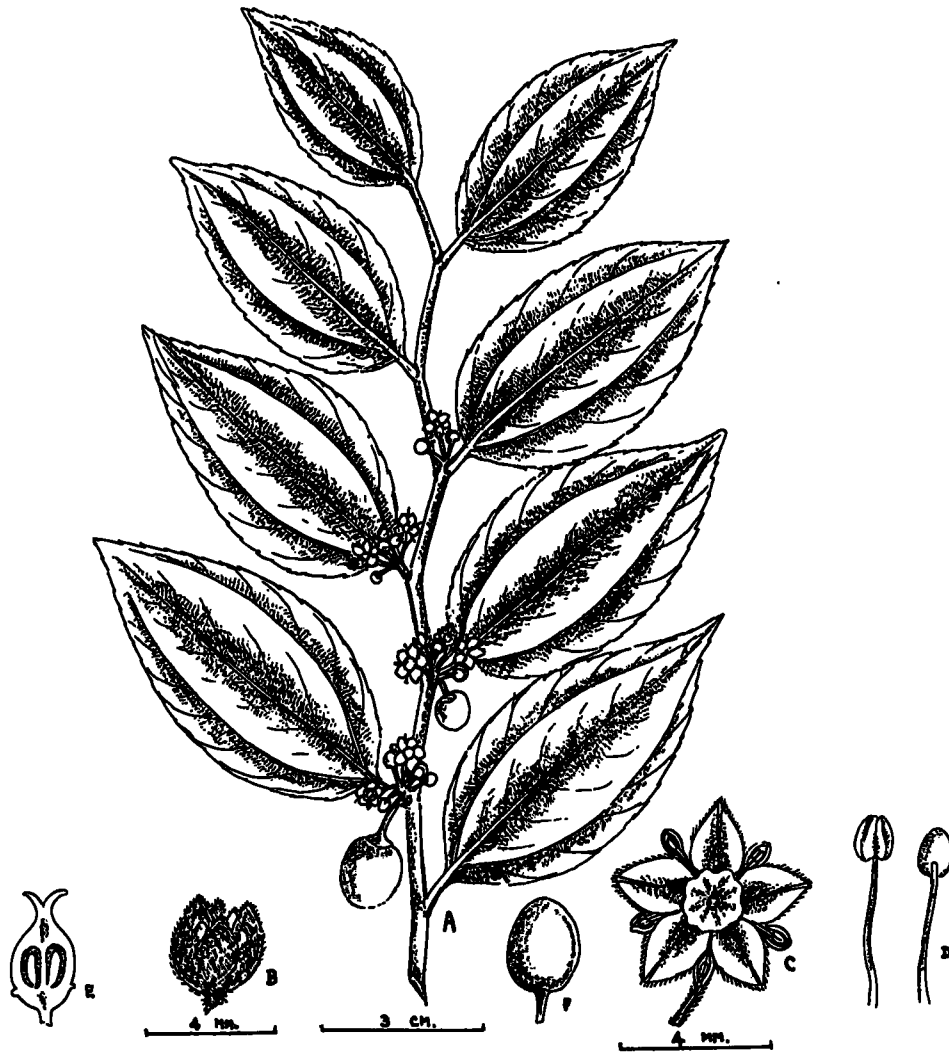


FIG. 439. *Zizyphus mauritiana*. A, twig with leaves, clusters of flowers and fruits. B, flower, lateral view. C, flower, dorsal view. D, stamens. E, longitudinal section of pistil F, fruit. D, E, enlarged.

5. *Zizyphus mauritiana* Lamk. in Wall. Cat. 4245. 1828. (Fig. 439).

Zizyphus jujuba Lamk.—*Zizyphus sororia* Schult.—*Zizyphus trinervius* Roth.—*Rhamnus jujuba* Linn.

Engl. Indian Cherry; *Sinh.* Ilanga, Debara, Masan; *Tam.* Adidaram, Attiram, Ilandai, Iradi, Iratti, Koli, Kondai, Kullari, Kulvali, Padari, Sivagam, Vadari, Vettiram, Veyam; *Sans.* Ajaproya, Badari, Balashta, Dridhabija, Dviparni, Ghonta, Gudaphala, Kantaki, Karkarmadhu, Koli, Kuvali, Madhuraphala, Mahadebara, Nakli, Nripabadari, Nripeshta, Prithukoli, Phalashayshira, Rajabadari, Rajakoli, Rajavallabha, Sukshmaphala, Sukshmapatrika, Srigalakoli, Svachha, Sukrapriya, Suphala, Tanubija, Ubhayakantaka.

A large shrub or a small much branched tree with dark grey longitudinally fissured bark and elongated, flexuose, woolly pubescent branchlets; leaves simple, alternate, 3-veined, with or without stipular spines, 2.5—3.7 cm long, broadly oblong-oval or rotundate, rounded at both ends, faintly and irregularly denticulate, glabrous on the upper surface, densely covered beneath with whitish or buff-coloured tomentum, petioles short, woolly, stipular spines short, very sharp, one usually curved and the other straight, often absent; flowers small, regular, bisexual, greenish white, on hairy pedicels in small axillary clusters or very shortly pedunculate cymes; sepals 5, fused into an obconical, 5-lobed tube, woolly outside, segments very acute; petals 5, very small, spatulate, recurved; disc 10-lobed, 10-grooved; stamens 5, slightly adnate to base of petals; ovary half-inferior, 2—4-locular, styles 3, connate, trifid; fruit a globose drupe, 1.2 cm long, fleshy, smooth, yellow, stone 2-celled, brown, excavated on the surface.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, *pl.* 99. 1838; Hooker, *Journ. Bot.* 1: *pl.* 140; Brandis *For. Flor.* *pl.* 17; Beddome, *Flor. Sylvat.* *pl.* 149. 1868—1873; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 239. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, China, Australia and Africa. It is rather common in the dry regions of Ceylon. Trincomalee, Anuradhapura, etc.

India. Uttar Pradesh: Dehra Dun, *Dimri* 26, March 1926; Asarori, *Abdul Hamid* 25, Thanu, *Sewal* 6, Dec. 1921. Punjab: *T. Thomson*. Sylhet: *Wallich* 4244D. Concan: *Stocks*. Pen. Ind. Or., *Herb. Wight* 500; *Herb. Wight* 501. Ceylon. Without locality, *Thwaites C.P.* 1242. Southern Prov., Ruhuna National Park, Andunoruwa Wewa, *Fosberg and Mueller-Dombois* 50138, April 1968; *Fosberg* 50139, April 1968; Yala Road, *Comanor* 1163, March 1968; Tissakataragama, *Cooray* 69090415R, Sept. 1969. Maldives Islands. *Didi* 147, 1896; Horsburgh Atoll, *Gardiner*, 1899—1900. Burma and Malay Peninsula. Without locality, *Herb. Griffith* 2035, Kew Distribution 1861—62.

Composition. The root and bark of this plant contain tannin, the latter with ziziphic acid in addition. The leaves and bark contain an alkaloid. The fruit is rich in mucilage, sugar and other fruit acids.

Uses. A decoction of the leaves and bark is employed as an effective remedy for dysentery and diarrhoea. The root is a purgative and used for fevers. The powdered root is applied to ulcers and wounds. The ripe fruit purifies the blood and relieves coughs.



PLATE XX. *Zizyphus napeca*. A, branch with leaves, stipule spines and flowers in cymes. B, fruit. C, seed.

MEDICINAL PLANTS



PLATE XX. *Zizyphus napeca*. A, branch with leaves, stipule spines and flowers in cymes. B, fruit. C, seed.

6. *Zizyphus napeca* Willd. Sp. Pl. 1104. 1797. (Plate XX).

Rhamnus napeca Linn.

Sinh. Yak-eraminiya.

A shrub with very woolly, rufous tomentose young parts; leaves simple, alternate, oval, 3-nerved, slightly oblique at base, abruptly acuminate, obtuse, finely serrulate, glabrous on both surfaces, shortly petioled, stipular spines solitary or in pairs, both recurved, short, stout, hairy, purple; flowers small, regular, bisexual, pale greenish-yellow in rufous, hairy, axillary cymes; sepals 5, fused into a calyx-tube; petals 5, small, reflexed; stamens 5, slightly adnate to base of petals, disc with 5—10-lobed free margin; ovary half-inferior, 2—4-locular, styles 2, recurved; fruit globular, about 2 cm long with a single, rugose seed.

Flowers in July.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in South India, Ceylon and Malaya. It is rather rare in the low-country in Ceylon.

India. Madras: *Cleghorn* 105. Ceylon. Without locality, *Thwaites* C.P. 1241; *Walker*; *W. Ferguson*. Malaya. Penang: 1822 without name of collector.

Uses. A decoction of the bark of this plant is given for fever, dysentery and loss of appetite.

7. *Zizyphus oenoplia* Mill. Gard. Dict. ed. 8, No. 3. 1868.

Zizyphus albens Roxb.—*Zizyphus centidifolia* DC.—*Zizyphus ferruginea* Heyne—*Zizyphus rufula* Miq.—*Zizyphus scandens* Roxb.—*Rhamnus oenoplia* Linn.

Engl. Jackal Jujube; *Sinh.* Hin-eraminiya, Wel-masan; *Tam.* Ambulam, Amburi, Surai, Suraimullu, Suraiyilandi; *Sans.* Bahukantaka, Dusparsa, Karkhandu, Madhura, Srigalakoli.

A scrambling shrub, semi-scandent by its prickles, bark very rough, branchlets rufous pubescent becoming glabrous; leaves simple, alternate, stipulate, 3-veined, numerous, distichous, 3.2—4.5 cm long, lanceolate or oval, very unequal sided, acute and oblique at base, acute and rounded and apiculate at apex, entire or minutely denticulate, glabrous or closely pubescent above, silky with adpressed, fulvous hair beneath, petioles short and hairy, stipular spines strong, short, compressed, hooked, usually only one developed; flowers very small, regular, bisexual, crowded on shortly pedunculate cymes about 6 mm diam.; sepals 5, fused into an obconical, 5-lobed, very hairy calyx-tube; petals 5, very small, reflexed; stamens 5, disc flat with free margins ovary half-inferior, 2—4-locular; fruit a small drupe, 6 mm long, ovoid, apiculate, black and shining.

Flowers during March and April.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in tropical Asia, Australia, the warmer parts of India, Ceylon and Malacca. It is very common in the low-country, chiefly in the dry regions of Ceylon.

India. Siwalik and Jaunsar: *Sen* 34, 1921. East Bengal: *Herb. Griffith* 2037, Kew Distribution 1862—63. Pen. Ind. Or., *Herb. Wight* 499; *Herb. Wight* 476. Ceylon. North-Central Prov., Anuradhapura, *Herb. Peradeniya*, March 1883. Uva Prov., *Herb. Peradeniya*, Jan. 1888. Without locality, *Thwaites C.P.* 1240. Malaya. Perak: *Scortechini* 1541. Penang: *Wallich* 4246G.

Uses. A decoction of the bark is used to promote the healing of fresh wounds. A conjee prepared from the juice of the bark, leaves, flowers and roots is given to counteract wasp stings. In India, the fruit is used for the preparation of pills for pains in the stomach.

8. *Zizyphus rugosa* Lamk. Encycl. 3: 319. 1789.

Zizyphus glabra Roxb.—*Zizyphus latifolia* Roxb.—*Zizyphus obliqua* Heyne—*Zizyphus paniculata* Roth.

Sinh. Maha-eraminiya; *Tam.* Churai, Kattilandai, Todari.

A large straggling or climbing shrub, with long virgate branches, fulvous-tomentose when young; leaves simple, alternate, 3-veined, stipulate, 5—7.5 cm long, broadly oval or rotundate unequal sided, oblique at base, very shortly acuminate, denticulate, glabrous on the upper surface, densely fulvous-tomentose becoming glabrous beneath, petioles 1 cm long, tomentose, prickles usually solitary, strong, broad based, recurved or nearly straight, hairy; flowers small, regular, bisexual, greenish in tomentose, pedunculate cymes, about 2.5 cm long, arranged along one side of short, usually leafless, lateral branches; sepals 5, fused into an obconical, 5-lobed calyx, hairy outside; petals absent; stamens 5, disc 5-lobed; ovary half-inferior, 2—4-locular, styles 2, connate at base; fruit a pyriform-globose drupe, apiculate, smooth, stone very thin, 1-seeded.

Illustrations. Kirtikar and Basu, Indian Med. Plants, *pl.* 242. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs throughout India, Ceylon and Burma. It is common in the moist low-country in Ceylon up to an altitude of 2000 feet. Ratnapura, Hantane, Ambegamuwa, etc.

India. Uttar Pradesh: Dehra Dun, Lachiwala, *Sethi* 41, April 1921. Sikkim: *J. D. Hooker*. Ceylon. Western Prov., Colombo, *W.F.*; without locality, *Thwaites C.P.* 2719. Upper Burma. South Shan State: Laikaw, *Khalil*, 1894.

Uses. This plant is beneficial for menorrhagia along with other ingredients. It is an antidote for mercurial poisoning. The fresh parts of the plant are used for poulticing fractures, sores, boils and also to draw out thorns from the eye.

97. ROSACEAE

1. *Prunus cerasoides* D. Don, Prodr. Fl. Nep. 239. 1825.

Prunus puddum Roxb.—*Prunus sylvatica* Roxb.—*Cerasus puddum* Wall.—*Cerasus phoshia* Ham.

Engl. Himalayan Cherry; *Sans.* Charu, Hima, Kaidara, Kedaraja, Malaya, Maleya, Padmagandhi, Padmaka, Padmakashtha, Padmaksha, Padmavhaya, Padmavriksha, Patala-pushpavarnaka, Pataputrasanibha, Pita, Pitaka, Pitarakta, Rakta, Shitala, Shitavirya, Shubha, Sugrabha.

An unarmed glabrous tree; leaves simple, stipulate, usually provided with a pair of glands at the base, ovate, 6.2—12.5 cm long, pointed, toothed, teeth glandular, petioles glandular, stipules long, 3—5-partite, glandular-fringed; flowers regular, bisexual, pink, 2.5 cm diam., solitary or in small clusters crowded towards the ends of branches; calyx without bracteoles, free, 5-lobed, lobes acute, falling off early, tube 8 mm long; petals 5, oblong, obtuse; stamens numerous, inserted with the petals on the hypanthium; ovary superior at the bottom of the calyx-cup, unilocular with 2 ovules, style long, terminal, stigmatic lobes 3 spreading; fruit a fleshy and hairy ovoid drupe, ash-coloured, red and yellow, acid, juicy enclosing a hard 1-seeded stone which is wrinkled and furrowed.

Flowers in October and November.

Illustrations. Wallich, Pl. As. Rar. 2: pl. 143. 1831; Kirtikar and Basu, Indian Med Plants, pl. 389A. 1933.

Distribution. Occurs in the temperate Himalaya in India and Upper Burma. It is often cultivated in the hill-country in Ceylon.

India. Nepal: Wallich 714A, 1821. Sikkim: J. D. Hooker. Ceylon. Central Prov., Nuwara Eliya, cultivated, Park, Aug. 1926; Grand Hotel, Herb. Peradeniya, Aug. 1922; Deltota hospital premises, Appuhamy 19, May 1949.

Composition. The bark of this tree contains amygdalin.

Uses. The kernel of the fruit is used for treating stones in the bladder and kidneys. It is also prescribed along with other drugs as an antidote for snake-bite poisoning.

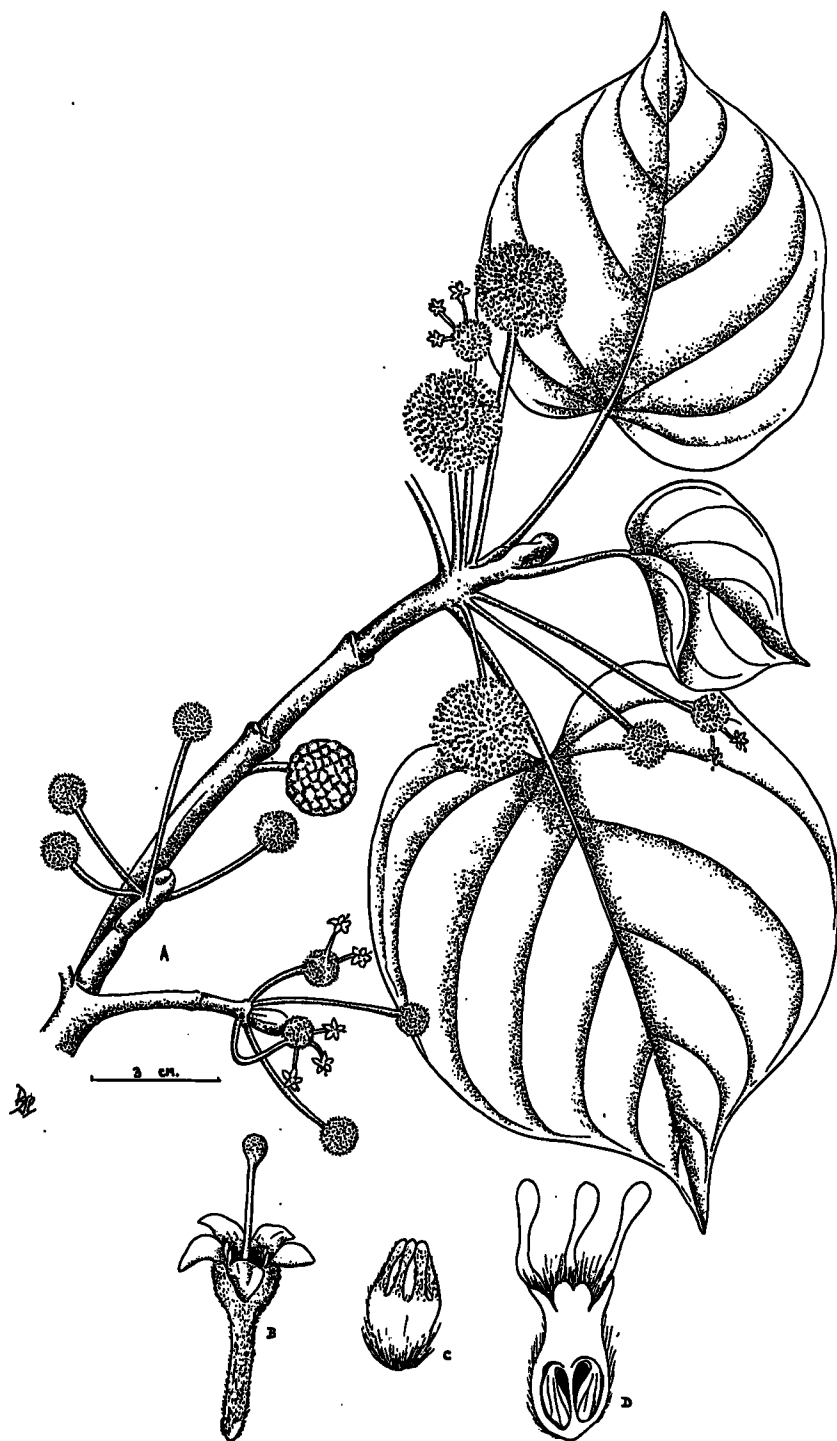


FIG. 440. *Adina cordifolia*. A, twig with leaves and flower heads. B, upper portion of flower, lateral view. C, calyx. D, longitudinal section of fruit. B—D, enlarged.

98. RUBIACEAE

1. *Adina cordifolia* Benth. and Hook. f., Gen. Pl. 2: 30. 1873. (Fig. 440).

Nauclea cordifolia Willd.

Sinh. Kolong; *Tam.* Kadambai, Manjatkadambu; *Sans.* Bahuphala, Bhramarapriya, Bringavallabha, Dharakaramba, Dhulikaramba, Gauradruma, Haridraka, Haridru, Haridruma Hardra, Kadambaka, Kesharadhya, Mahakadamba, Meghabha, Nipa, Pitadaru, Pitaka, Pitakadruma, Pitakashtha, Pitavarna, Pravrishya, Priyaka, Pulaki, Shatpadapriya, Supushpa, Suravha.

A very large tree with an erect trunk, horizontal branches, brownish-grey bark and pubescent young parts; leaves simple, opposite, stipulate, closely placed, 8.8—11.4 cm long, very broadly ovate, cordate at base, acuminate, acute at apex, glabrous on the upper surface, softly pubescent beneath especially when young, minutely reticulate, petioles long, 5—10 cm pubescent, stipules oblong-oval, obtuse, pubescent; flowers small, regular, bisexual, yellow, crowded in globose axillary heads about 1.8 cm long, peduncles long, slender, usually in threes from axils of young leaves, jointed a little below the head, flowers numerous, bractlets clavate; sepals 5, fused, hairy inside and outside, segments club-shaped; petals 5, fused into a slender corolla-tube, dilated above, pilose, lobes subacute, recurved, valvate; stamens 5, inserted at the mouth of the corolla; ovary inferior, 2-locular with numerous ovules in each loculus, style very slender, much exserted, stigma globose; fruit capsule very small, 3 mm long, readily dehiscent into 2 valves, turbinate, very hairy, seeds tailed at both ends.

Flowers in July.

Illustrations. Roxburgh, Pl. Corom. 1: pl. 53. 1795; Beddome, Flor. Sylvat., pl. 33. 1868—1873; Kirtikar and Basu, Indian Med. Plants, pl. 490. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Cambodia and Indo-China. It is rather common in the dry regions in Ceylon, extending into the intermediate regions. Kurunegala, Anuradhapura, Haragama, etc.

India. Assam: *Jenkins.* Uttar Pradesh: Dehra Dun, *Hamid* 62; Rajwar Road, *Singh* 63, Siwalik and Jaunsar Div., Lachiwala, *Dewan* 67, Jan. 1921. Misor and Carnatic: *G. Thomson.* Pen. Ind. Or., *Herb. Wight* 1299, Kew Distribution 1866—7. Ceylon. Northern Prov., Vaddukodai, Pandateruppu, *R. L. T. Silva*, Aug. 1952. North-Central Prov., Anuradhapura, *Herb. Peradeniya*, March 1883. Without locality, *Thwaites C.P.* 1660. Upper Burma. Kachin Hills, Metkina, *Mokin*, June 1899. Cochinchina. *Pierre* 1707, March 1877.

Uses. The juice of the bark is used to kill worms in sores. In Cambodia, the root is employed as an astringent for dysentery.

2. *Anthocephalus cadamba* (Roxb.) Miq. Fl. Ind. Bot. 2: 135. 1856.

Anthocephalus morindaefolia Korth.—*Nauclea cadamba* Roxb.—*Sarcocephalus cadamba* Kurz

Sinh. Ela-Bakmi, Embul-Bakmi, Kadamba; *Tam.* Arattam, Indulam, Kadappai, Kadambu, Kolayilal, Vellaikkadambu; *Sans.* Ashokari, Dasa, Deva, Halipriya, Haridra, Haripriya, Jala, Jirnaparna, Kadamba, Kadambaryya, Karnapuraka, Lalanapriya, Mahadhya, Nadija, Nipa, Pravrishenya, Priya, Priyaka, Shatpadeshta, Sidhupushpa, Surabhi, Vrittapushpa.

A large tree with an erect trunk and horizontally spreading branches and pubescent young parts; leaves simple, large, opposite, stipulate, 15—27.5 cm long, oblong-lanceolate, acute or rounded at base, acuminate acute at apex, glabrous and shining on the upper surface, pubescent on veins beneath, petioles 2.5—3.1 cm long, stipules about 1.2 cm long, narrowly lanceolate, acute; flowers regular, bisexual, orange-yellow with white styles, fragrant in dense globose terminal heads 3.1—3.7 cm diam., on short stout peduncles; sepals 5, calyx-tubes closely pressed together but not fused, without bractlets, segments obtuse, pilose at ends, persistent; petals 5, fused into funnel-shaped long tube, lobes imbricate, erect, lanceolate, acute; stamens 5, inserted at the mouth of the corolla; ovary inferior, 2-locular below, 4-locular above with numerous ovules in each loculus, style long, stigma large, ovoid; fruit capsule about 6 mm long, compressed, angular, closely packed and crowned by long persistent calyx segments, pericarp transparent in the lower part, seeds numerous, very small, angular, muricate.

Flowers in September.

Illustrations. Beddome, *Flor. Sylvat. pl.* 35. 1868—1873; Kirtikar and Basu, *Indian Med. Plants, pl.* 489A. 1933.

Distribution. Occurs in India, Ceylon, Burma, Malacca, Borneo and Sumatra. It is common in the low-country in Ceylon up to 2000 feet altitude. Alagalla, Kurunegala, Pussellawa, etc.

India. Bengal: *J. D. Hooker and T. Thomson.* Ceylon. Without locality, *Thwaites C.P.* 1659.

Composition. The leaves and bark of this tree contain an alkaloid.

Uses. The bark is prescribed as a tonic and febrifuge. It is given for coughs and fever. A decoction of the leaves is used as a gargle for aphthae and stomatitis.

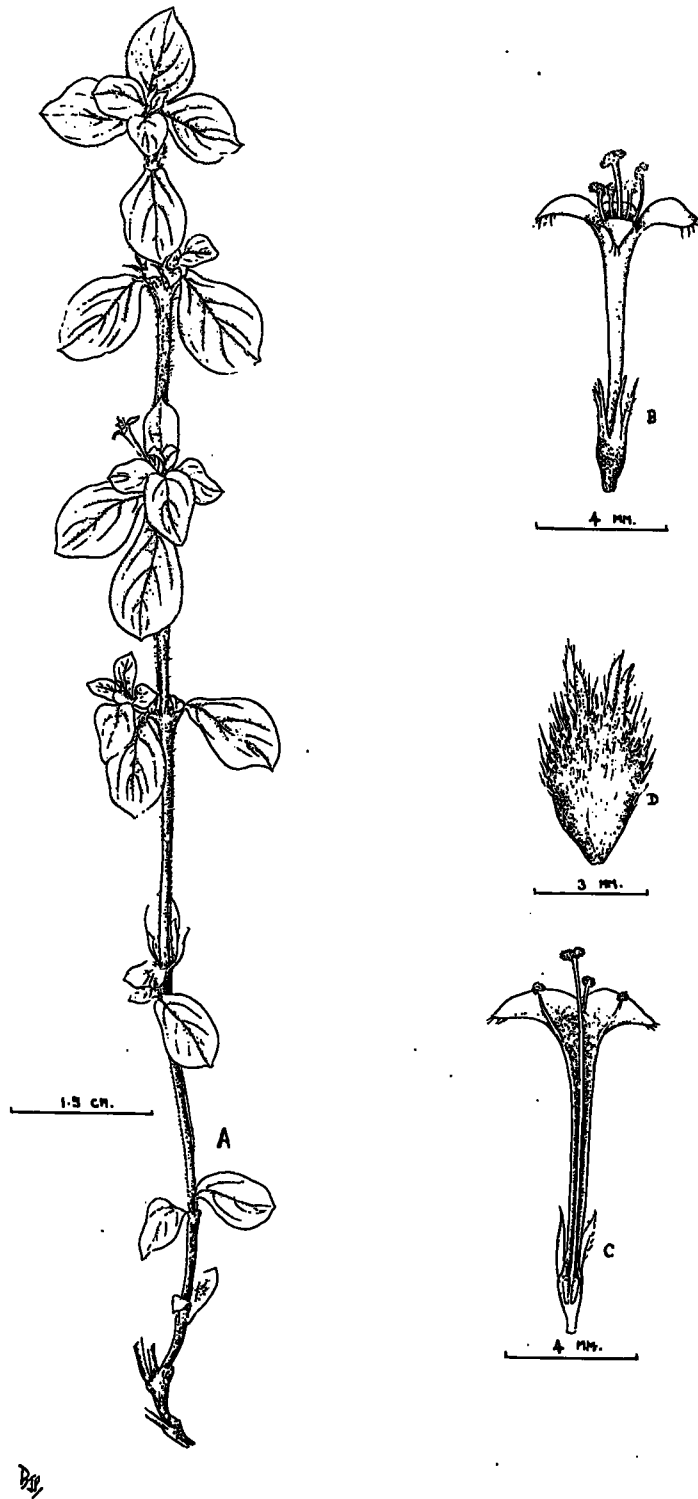


FIG. 441. *Borreria hispida*. A, twig with leaves and flowers B, flower, lateral view. C, longitudinal section of flower. D, fruit.

3. *Borreria hispida* (Linn.) K. Schum. in Engl. and Prantl. Pflanzenf. 4 (4): 144. 1891. (Fig. 441).

Spermacoce hispida Linn. f.—*Spermacoce articularis* Linn.—*Spermacoce scabra* Willd.—*Spermacoce hirta* Rottl.—*Spermacoce longicaulis* Wall. ex Hook. f.—*Spermacoce muriculata* Blanco—*Spermacoce scaberrima* F.Vill.—*Borreria discolor* Bartl.

Sinh. Galkura, Hin-getakola; *Tam.* Nattaichuri; *Sans.* Madanaghanti.

An annual (sometimes perennial) herb with prostrate stems which are long, sharply quadrangular, roughly hairy on the angles, stiff, internodes generally long; leaves simple, opposite, sessile with stipules adnate to the base forming a cup round the stem and pectinate, 1.2—2.5 cm long, oblong-oval, acute, slightly pubescent on both surfaces, scabrous-ciliate on margin, rather thick, veins conspicuous, stipules short, membranous with a few long bristles; flowers regular, bisexual, few, pale violet, sessile within the stipular cup, bracts long, filiform, hyaline; sepals 4, linear, twice as long as the ovary, ciliate; petals 4, fused into a slender corolla-tube, valvate, lobes short, bristly on the back; stamens 4, inserted in the throat of the corolla; ovary inferior, 2-locular with a single ovule in each loculus; fruit a small dry capsule, 3 mm long, oblong-ovoid, hairy, crowned with the long calyx segments, septicidally dehiscent into 2 carpels one of which is dehiscent again ventrally, the other closed by the septum and remaining attached to it, seeds smooth, brown with a groove down the ventral surface.

Flowers from March to August.

Illustrations. Burmann, Thes. Zeyl. pl. 20, fig. 3. 1737; Kirtikar and Basu, Indian Med. Plants, pl., 509B. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya, China, Java and the Philippine Islands. It is very common in waste dry places in the low-country in Ceylon.

India. Orissa: Clarke 21722, May 1874. Chota Nagpore, Clarke 20827B, Nov. 1873. *Ceylon.* Northern Prov., Talaimannar J. M. Silva, July 1916. Western Prov., Hunupitiya, Alex Sylva, Nov. 1943. Southern Prov., Labuduwa, Simpson 8410, July 1931. Without locality, Thwaites C.P. 1695. *Java.* Kooders 39156, 1901.

Uses. This plant is used as a cure for haemorrhoids and the seeds for diarrhoea and dysentery. It is eaten as a vegetable.

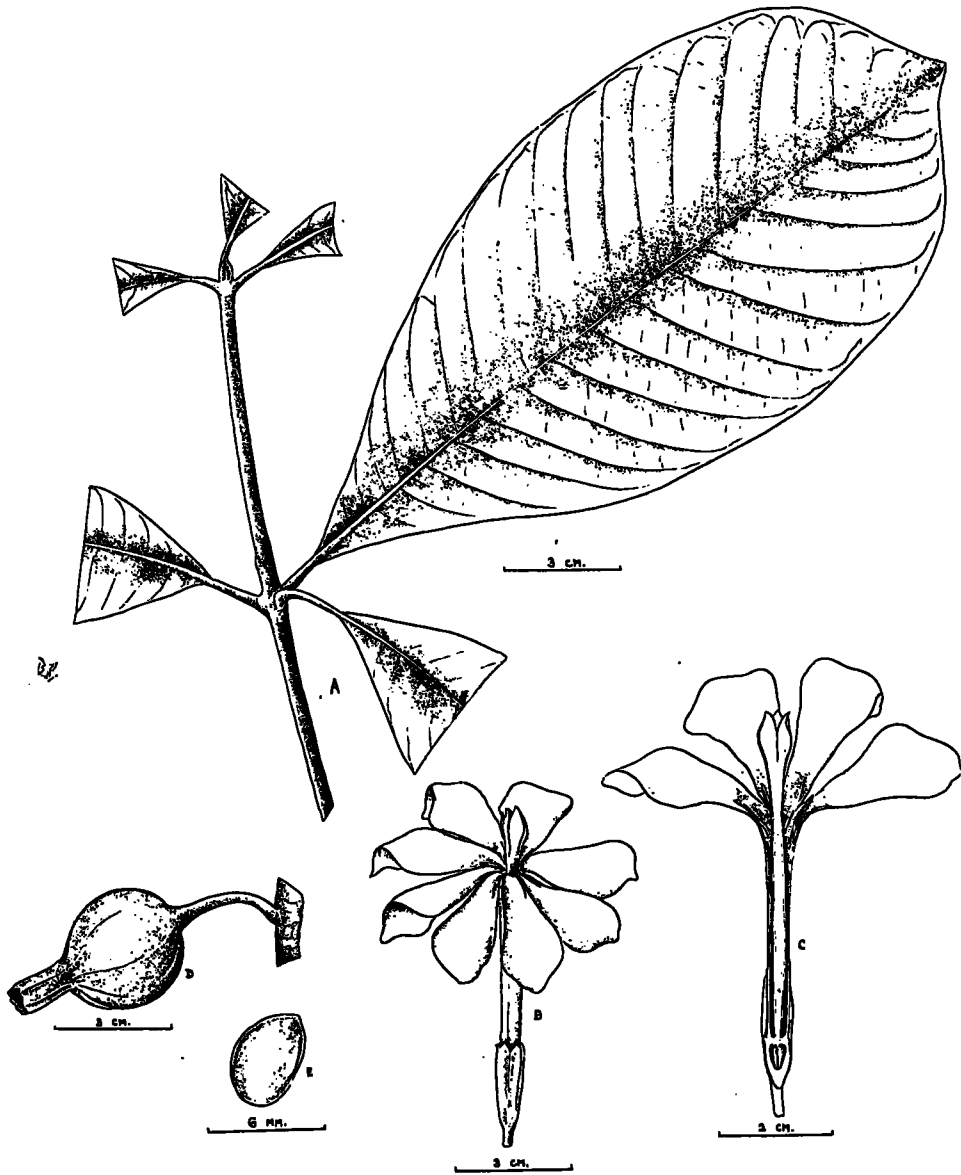


FIG. 442. *Gardenia latifolia*. A, twig with leaves showing stipules. B, flower, lateral view. C, longitudinal section of flower. D, fruit. E, seed.

4. *Gardenia latifolia* Ait. Hort. Kew ed. 1; 294. 1789. (Fig. 442).

Sinh. Galis; *Tam.* Dikamali, Kumbai; *Sans.* Hingu-nadika, Nadi-hingu.

A large shrub or small tree with a smooth, pale grey bark flaking off in small, rounded pieces and glabrous young parts coated with a resinous exudation; leaves simple, opposite, stipulate, crowded at the ends of branches, 10—17.5 cm long, obovate-oval, slightly tapering to base, rounded or very shortly acuminate and obtuse at apex, slightly scabrous on both sides, especially on the veins (often pubescent) beneath, stiff, thin, bright apple green, paler beneath, lateral veins 16—20 on each side, parallel, very prominent beneath, petioles very short, stipules adnate to base of petiole, connate forming a tube which is thin, truncate, at first enclosing a young bud but after fall of leaf separating at base and forming a loose ring round the stem; flowers regular, bisexual, very large, solitary, pale lemon yellow becoming orange when fading, apparently terminal (really leaf-opposed), on short stout peduncles; sepals fused into a long tubular calyx limb, slightly dilated at top, either truncate (without segments) or 7—9 segments, conduplicate, recurved, usually with 7—9 prominent ridges or wings, margin ciliate; petals 7—9, fused into a long straight tube 5—7.5 cm long, lobes 3.7—5 cm long, horizontal, obovate-oblong, obtuse, twisted in bud; stamens as many as the corolla lobes, anthers nearly sessile, half exerted; ovary inferior, unilocular with numerous ovules on 3 parietal placentae, stigma very large, exerted, 3-lobed; fruit nearly globose 3.7 cm diam. without ribs, crowned with the large, erect, persistent, rigid enlarged, winged calyx limb which is 1.8 cm long, slightly pubescent, pale green, epicarp dry-fleshy, valves of endocarp 3, splitting along the placentae, bony, yellow, polished within, seeds, small, very numerous, horizontal, flattened, pale brown, pulp purplish-grey filling the fruit.

Flowers in March.

Illustrations. Roxburgh, *Pl. Corom. pl.* 134. 1798; Wight, *lc. Pl. Ind. Or., pl.* 759. 1843—1845; Gaertner, *Fruct. et Sem. Plant., 1: pl.* 193. 1788; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India and Ceylon. It is rare growing in the moist low-country in damp places in Ceylon. Colombo, Kalutara, Pasdun Korale, etc.

India. Bundipur: *No.* 262, June 1857, without name of collector. **Ceylon.** Western Prov., Colombo, *Thwaites C.P.* 1655, Aug. 1858; Pasdun Korale, *Herb. Peradeniya*, March 1887.

Uses. The leaves are used for preparation of plasters applied on deep seated sores. The resin is burnt and the smoke produced held on the sores. A decoction of the leaves is given for pulmonary diseases and persistent fevers.

5. *Geophila herbacea* O. Kuntze, Rev. Gen. 300. 1891.

Psychotria herbacea Jacq.—*Chephaelis reniformis* H.B.K.—*Chephaelis herbacea* Kurz—*Geocardia herbacea* Standl.—*Geophila reniformis* Don—*Geophila diversifolia* DC.

Sinh. Koturu-bedde; *Sans.* Agukarni.

A small creeping herb with prostrate stems rooting at nodes, filiform, puberulous with short erect branches; leaves simple, opposite, stipulate, small, 1.2—2.5 cm long, ovate-reniform, obtuse, slightly pubescent or glabrous, paler beneath, petioles erect, 1.2—2.5 cm long, pubescent, stipules broadly ovate, obtuse; flowers regular, bisexual, on short pedicels, 1—3 together with 2 linear bracts beneath each, terminal; sepals 5, fused into a tube, segments longer than the tube, acuminate, ciliate; petals 5, fused into a tube, dilated upwards, slightly pubescent outside, lobes oblong, acute, shorter than the tube, valvate; stamens 5, inserted low down in the tube, anthers sagittate at base; ovary inferior, 2-locular with one erect basal ovule in each loculus, stigma bilobed; fruit a berry 1 cm long, globose, crowned with large calyx limb, smooth, pulpy, red, pyrenes small, flat and smooth on ventral surface, convex, rough and bluntly keeled on dorsal surface.

Flowers from May to June.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 54. 1838; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Andaman Islands, tropical Africa and America, Polynesia, S. China and Malay Archipelago. It is rather common in the moist low-country upto 3,000 feet altitude in Ceylon. Kalutara, Hantane, Kurunegala, etc.

Ceylon. North-Central Prov., Ritigala, *Willis*, March 1905. Without locality, *Walker*; *Thwaites C.P.* 1705. *Java.* *Herb. Kooders* 22812B.

Uses. This plant is given for worm infections in children, rickets and anaemia. Externally, it is used on sores.

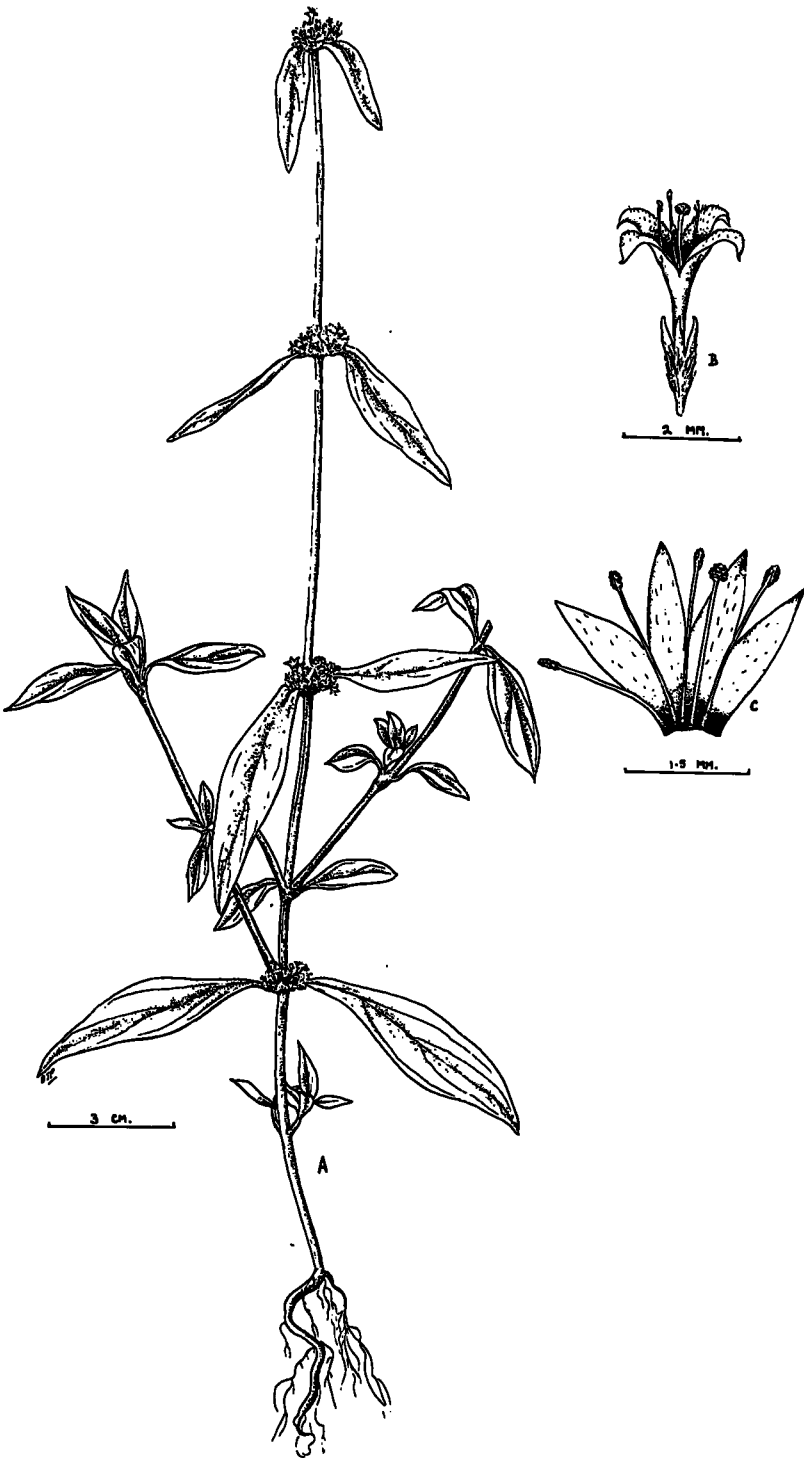


FIG. 443. *Hedyotis auricularia*. A, entire plant with roots, leaves and clusters of flowers. B, flower, lateral view. C, corolla opened out showing the pistil and stamens.

6. *Hedyotis auricularia* Linn. Sp. Pl. 101. 1753. (Fig. 443).

Hedyotis nervosa Wall.—*Hedyotis procumbens* Wall.—*Hedyotis castata* Br.—*Hedyotis venosa* Korth—*Metabolus venosus* Bl.—*Oldenlandia auricularia* F.—Muell.

Sinh. Geta-kola; *Sans.* Aladana-ghanta.

An annual herb with numerous, prostrate, spreading, not rooting at nodes, nearly cylindrical, hairy especially at nodes and along two lines on opposite sides, dark purple stems; leaves simple, opposite, stipulate, 2.5—5 cm long, oval, lanceolate or linear-lanceolate, slightly rounded at base, acute, very minutely spinous on edge, slightly hairy on the upper surface, more so beneath, lateral veins much curved, impressed above, prominent beneath, petioles usually very short, stipules short, not connate, very slightly adnate to base of petiole, membranous, hairy, with 3 or 5 unequal filiform bristly teeth; flowers regular, bisexual, white, on very short glabrous pedicels, crowded in small, very dense axillary cymes; sepals 4, small, triangular, acuminate, hairy, recurved; petals 4, fused into a very short corolla-tube, lobes valvate, oblong, obtuse, recurved, hairy at base; stamens 4, inserted in the tube or throat of the corolla; ovary inferior, 2-locular, ovules numerous on large axile placentae, style simple, stigmas 2; fruit a small capsule, nearly globular, hairy, hard, indehiscent.

Flowers from June to September.

Illustrations. Beddome, Ic. Pl. Ind. Or., pl. 27; Herb. Peradeniya., drawing.

Distribution. Occurs in India, Ceylon, Malaya and Burma. It is a common weed in the mid and low-country in Ceylon.

India. Khasia: *J. D. Hooker and T. Thomson.* Sylhet: *Clarke* 7144, May 1868. E. Bengal: *Herb. Griffith* 2891, Kew Distribution 1862—3. Assam: Margarata, *Prairie's Collector*, June 1898. Nilghiri and Kurg: *G. Thomson.* Maisor and Carnatic: *G. Thomson.* Madras: Annamalay, *Beddome.* Pen. Ind. Or., *Herb. Wight* 1368, Kew Distribution 1866—8. Ceylon. Central Prov., Peradeniya, *Thwaites C.P.* 1694. Southern Prov., Galle, *Gardner* 374, Herb. Wight's property.

Composition. The stem of this herb contains the alkaloid auricularine, the root hedyotine and the leaves another alkaloid.

Uses. This plant has emollient properties and is used in the treatment of dysentery and cholera in India. In Ceylon, it is taken as a vegetable to reduce high blood pressure.

7. *Hedyotis fruticosa* Linn. Sp. Pl. 101. 1753.*Spermacoce hedyotides* DC.*Sinh.* Weraniya.

A much branched shrub, 1.3—2 m high, with a white, smooth bark and whitish quadrangular glabrous and shining twigs with very blunt angles; leaves simple, opposite, 7.5—10 cm long, narrowly lanceolate, tapering to base, long acuminate acute at apex, glabrous, dark green on the upper surface, pale whitish-green beneath, rather thick, lateral veins fine and very oblique, pellucid, petioles very short about 6 mm long, stipules slightly connate, broadly triangular, acute, thick, stiff, finely serrate with dark brown glands in the serratures and in plenty on the inner surface; flowers regular, bisexual, white, sessile, numerous, cymes both terminal and in axils of upper leaves, much branched, paniculate, branches quadrangular, often slightly pubescent, bracts short, truncate, glands ciliate; sepals 4, fused, calyx limb broadly campanulate, often pubescent, segments narrow, acute, curved outwards with shaggy white hair within, shorter than the tube; petals 4, fused, funnel-shaped, valvate; stamens 4, inserted in the corolla-tube; ovary inferior, 2-locular with numerous ovules on large axile placentae, style simple, stigmas 2; fruit a small capsule about 4 mm long, oblong-oval, pubescent with the calyx segments covering the top, septicidally dehiscent, carpels opening ventrally, seeds few.

Flowers from April to August.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is common in the moist regions in the low-country up to 3,000 feet altitude. Adam's Peak, Hewaheta, Ratnapura, Ritigala, etc.

India. Pen. Ind. Or., *Herb. Wight* 1354, Kew Distribution 1866—8. Ceylon. North-Central Prov., Ritigala, *Willis*, March 1905. Central Prov., Hatton, *Willis*, May 1906; Hiyare Reservoir, *Alston* 579, March 1926. Sabaragamuwa Prov., Ratnapura, *A. de Alwis*, April 1930. Without locality, *Thwaites* C.P. 108; *Walker*, Herb. Wight's property.

Uses. This plant is given in decoction for stones in the bladder and for worm infestations in buffalo calves.

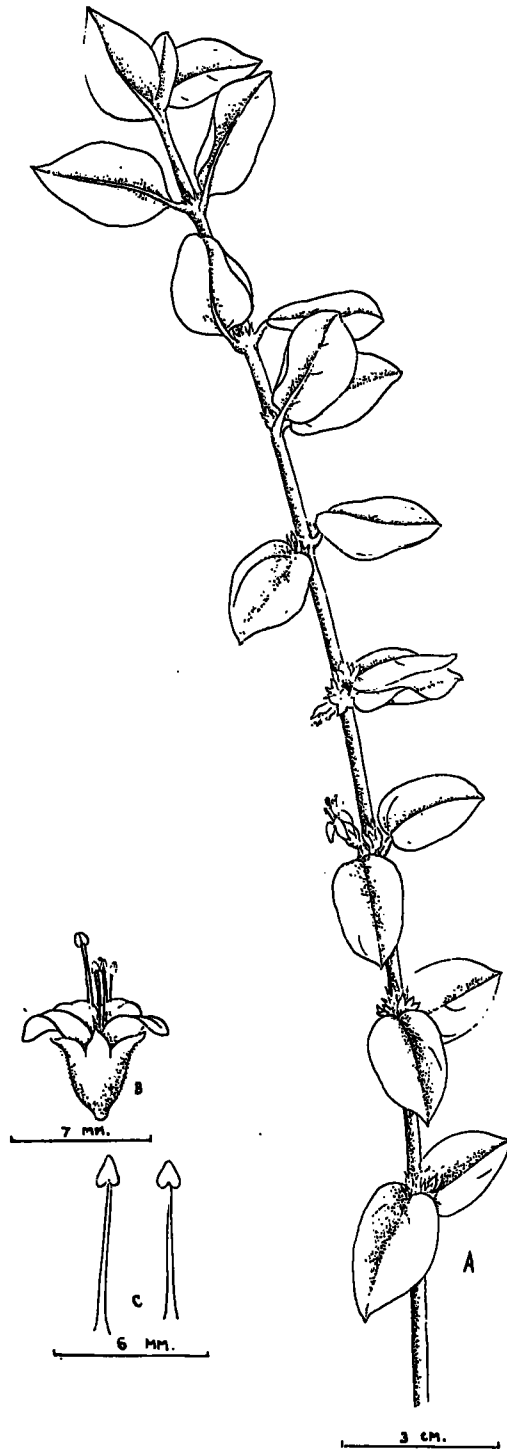


FIG. 444. *Hedysotis nitida*. A, branch with leaves and flowers. B, flower, lateral view. C, stamens enlarged.

8. *Hedyotis nitida* Wight and Arn. Prodr. 412. 1834. (Fig. 444).*Hedyotis neesiana* Arn.—*Hedyotis glabella* Br.*Sinh.* Pitasudupala, Ulweraniya; *Sans.* Atisaka.

An annual herb with numerous, slender, prostrate or ascending quadrangular rough branches; leaves simple, opposite, stipulate, 2.5—4.3 cm long, ovate or oblong or linear-lanceolate, acute or rounded at base, acute at apex, margin rough often slightly revolute, bright light green, glabrous and shining on the upper surface, whitish with the midrib often slightly rough beneath, stiff and rigid, petioles very short, stipules of long filiform ciliate bristles; flowers regular, bisexual, white, axillary, solitary or 2 or 3 together, sessile; sepals 4, fused, calyx segments large, broadly lanceolate, rigid, spinous-ciliate, recurved; petals 4, fused into a tube, lobes longer than the tube, valvate; stamens 4, inserted in the corolla-tube; ovary inferior, 2-locular with numerous ovules on large axile placentae, style simple, stigmas 2; fruit a globose capsule crowned with large calyx segments, glabrous, veiny, dehiscent on summit only.

Flowers in March.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is rather rare in the lower montane zone in Ceylon. Ramboda, Ella, Belihul-oya, Ambagamuwa, etc.

Ceylon. Central Prov., Kandy, *Alston* 1258, June 1926. Uva Prov., Ella, *A. M. Silva*, April 1906. Sabaragamuwa Prov., between Delgoda and Karawita, *Lewis and J. M. Silva*, March 1919. Without locality, *Thwaites C.P.* 122.

Uses. This herb is used for hepatitis, anaemia and insomnia. It increases the powers of digestion and the quantity of urine exuded. It is effective on inflammations of the urino-genital tract and externally on ulcers. The leaves made into a poultice are tied over the eye to draw out thorns or pieces of glass.

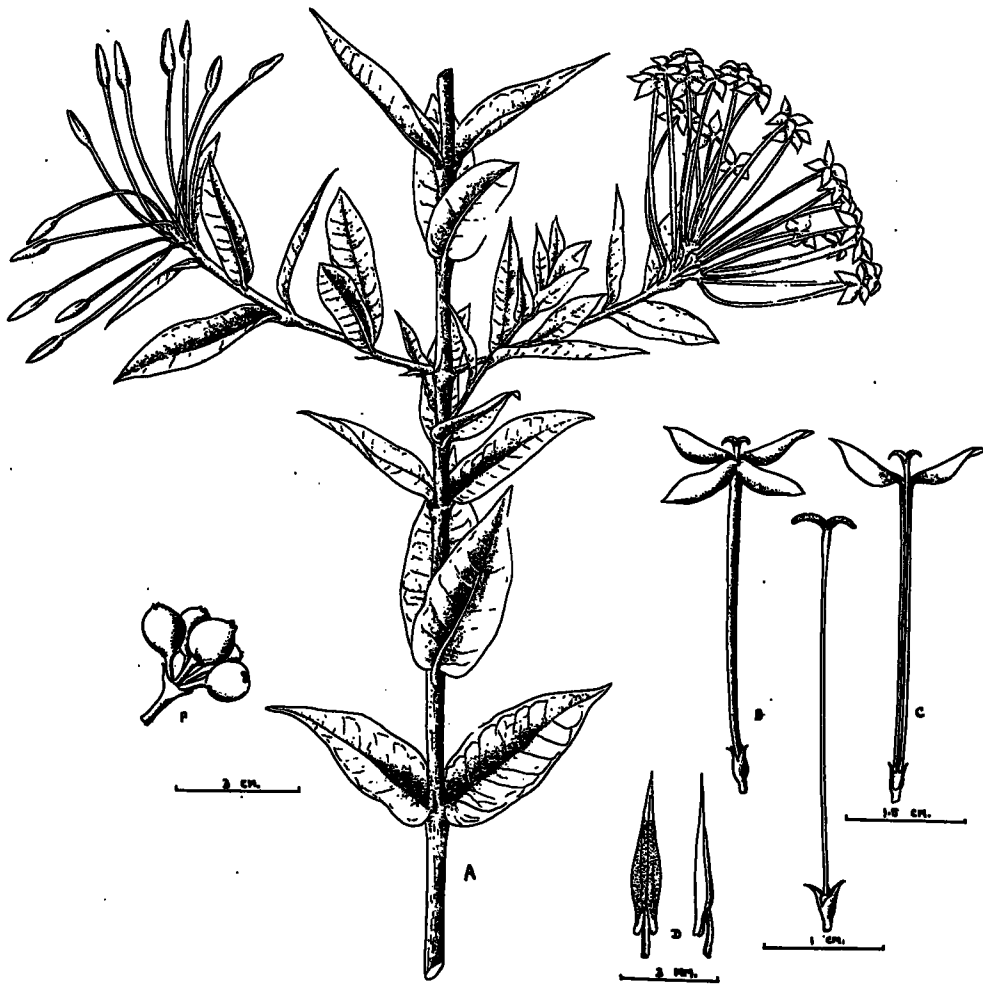


FIG. 445. *Ixora coccinea*. A, branch with leaves and clusters of flowers. B, flower, lateral view. C, longitudinal section of flower. D, stamens. E, pistil and calyx. F, fruits.

9. *Ixora coccinea* Linn. Sp. Pl. 110. 1753. (Fig. 445).

Ixora grandiflora Br.—*Ixora propinqua* Br.—*Ixora incarnata* DC.—*Ixora obovata* Heyne—*Ixora bandhuca* Roxb.—*Pavetta coccinea* Bl.—*Pavetta incarnata* Bl.—*Pavetta bandhuca* Miq.

Engl. Flame of the Woods; *Sinh.* Ratmal, Ratambala; *Tam.* Kullai, Sedaram, Setti, Sinduram, Vedji; *Sans.* Bandhuka, Bandhujivaka, Parali, Raktaka.

A shrub with long branches and compressed twigs thickened at nodes; leaves simple, opposite, stipulate, 5—7.5 cm long, obovate or oval-oblong, rounded or even subcordate at base, acute often cuspidate at apex, glabrous and shining, rather rigid, lateral veins somewhat conspicuous, pellucid, petioles extremely short, stout, stipules with a long rigid bristle, subpersistent; flowers regular, bisexual, shortly stalked, brilliant scarlet, in lax trichotomous cymes; sepals 4, small, segments either short with toothed margin or longer and acute, shorter than the ovary; petals 4, fused into a long slender corolla-tube, 2.5—3.7 cm long, lobes oblong-oval, acute or obtuse, about 1/3 as long as the tube, spreading; stamens 4, inserted at the mouth of the corolla, filaments very short, anthers small, linear; ovary inferior, 2-locular with a single ovule in each loculus attached to the septum, style exerted, stigmas 2; fruit fleshy, indehiscent, 1.2 cm long, nearly globose, purple.

Flowers all the year round.

Illustrations. Wight, Ic. Pl. Ind. Or., pls. 149 and 153. 1839; Edward. Bot. Reg., pls. 154 and 513; Kirtikar and Basu, Indian Med. Plants, pl. 504. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Burma. It is very common everywhere in the low-country in Ceylon, up to 2,000 feet altitude.

India. Canara: *Talbot*, July 1882. Malabar and Concan: *Stocks, Law, etc.* Pen. Ind. Or., *Herb. Wight* 1464, Kew Distribution 1866—7. Ceylon. North-Central Prov., Ritigala, *Willis*, March 1905. North-Western Prov., Nikaweratiya, *Senaratne* 10072, April 1953. Without locality. *Thwaites C.P.* 190.

Composition. The roots of this shrub contain an aromatic oil, acrid oil, tannin, fatty acids and a white crystalline substance. The flowers contain colouring matter, an astringent principle, wax and a yellow colouring matter related to quercitrin.

Uses. A decoction of the roots is given for dysentery and as a sedative for hiccoughs, nausea, loss of appetite, fever and gonorrhoea. The flowers and bark are used on reddened eyes and eruptions in children. A decoction of the flowers is given for haemoptysis, catarrhal bronchitis and dysmenorrhoea.

10. *Mitragyna parvifolia* Korth, Obs. Naucl. Ind. 19. 1839.

Stephagyne parvifolia Korth—*Nauclea parvifolia* Willd.—*Cephalanthus pilulifer* Lamk.

Sinh. Helamba; *Tam.* Kadambai, Nichulam, Nirkkadambu, Pattakkadambu, Pudakkadambai, Sinnakkadambu; *Hindi* Kaddam, Kallam, Kangi, Keim.

A moderate sized tree with a smooth whitish grey thick bark flaking off in pieces and glabrous young parts; leaves simple, opposite, stipulate, 6.2—7.5 cm long, rotundate or broadly obovate-oval, acute or rounded at base, very obtuse or rounded at apex, entire, glabrous on both sides save for small tufts of hair in vein axils beneath, thin, bright apple green, pale beneath and minutely pellucid-reticulate, petioles less than 1.2 cm long, stipules 1.2 cm long, oblong-spathulate, very obtuse, pink; flowers regular, bisexual, greenish-yellow, scented, sessile, crowded in shortly peduncled heads 1.8 cm across; sepals 5, fused into a very short calyx limb without segments; petals 5, fused into a tubular corolla, lobes valvate, acute, recurved; stamens 5, inserted at the mouth of the corolla-tube; ovary inferior, 2-locular with numerous ovules in each loculus, style long, white, stigma large, oblong-ovoid; fruit a septicidally dehiscent, 2-chambered capsule; capsules crowded with quite separate, oblong with blunt rounded tops marked with calyx limb and 10 blunt vertical ribs; seeds numerous, small, winged.

Flowers during April, July and August.

Illustrations. Roxburgh, Pl. Corom. 1: pl. 52. 1795; Wight, Ill. Ind. Bot. pl. 123. 1838; Beddome, Flor. Sylvat. pl. 34. 1868—1873; Herb. Peradeniya, drawing.

Distribution. Occurs in the drier parts of India, Ceylon and Burma. It is quite common in the dry zone in Ceylon. Trincomalee, Minneriya, Anuradhapura, Polonnaruwa, Puttalam, etc.

India. Bengal: *Clarke* 17329, July 1872; Calcutta, Bot. Gard., cultivated. North Canara: Yellapore, *Talbot*, 1880. Maisor and Carnatic: *G. Thomson*. Concan: *Stocks*. Mysore: Bangalore, No. 255, 1857, without collector's name. Pen. Ind. Or., *Herb. Wight* 1298, Kew Distribution 1866—7. Ceylon. Eastern Prov., Trincomalee, *Herb. Peradeniya*, Aug. 1885 Without locality *Thwaites C.P.* 780.

Composition. This plant contains the alkaloids mitragynine, mitragynol, mitraversine and rynchophylline.

Uses. A decoction of the root and bark is given for fever and colitis. An allied species, *Mitragyna speciosa*, is used as a narcotic in Malaya. The leaves are smoked or an infusion of the leaves drunk like tea for an opium-like effect.

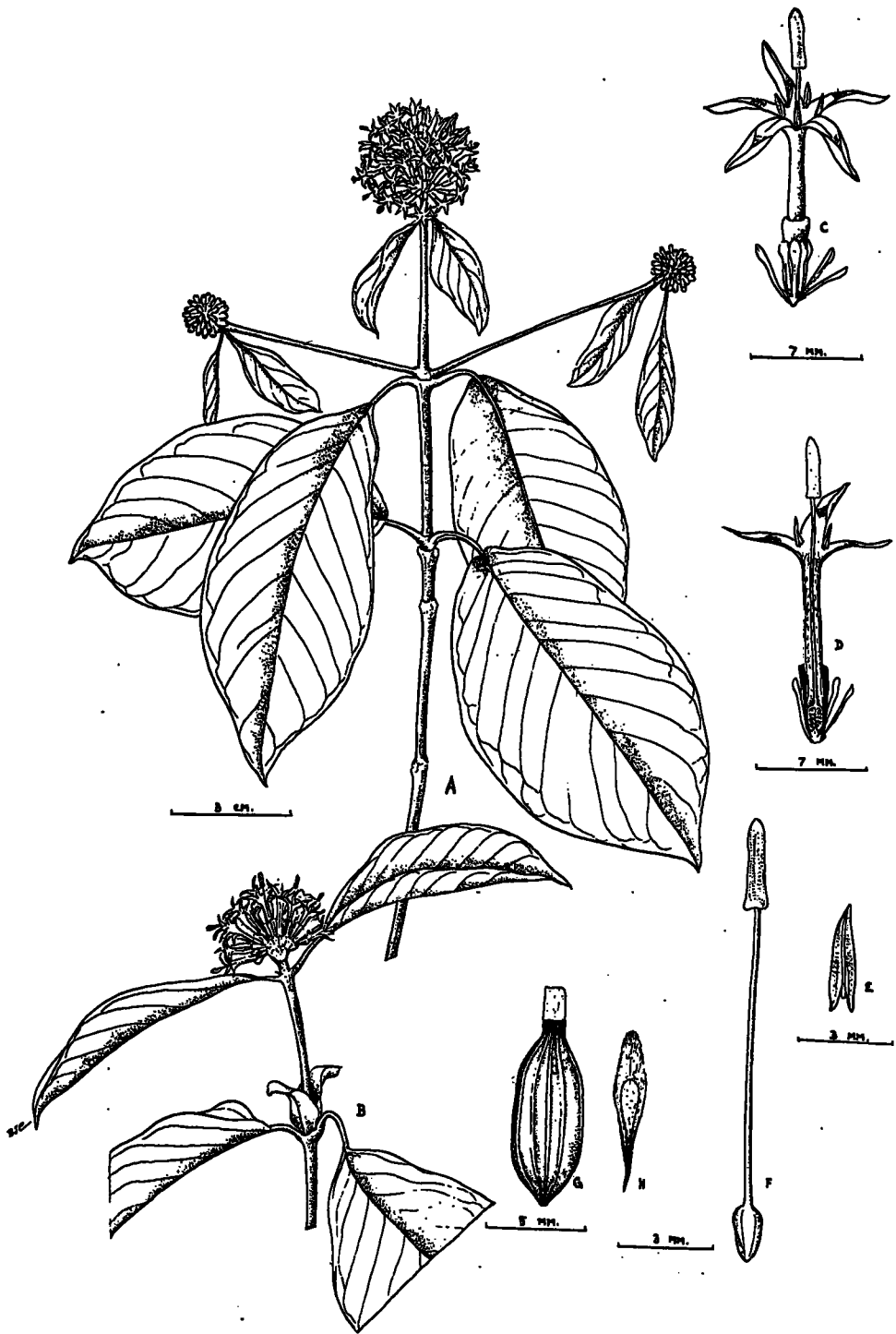


FIG. 446. *Mitragyna tubulosa*. A, twig with leaves and flower heads. B, twig with leaves, stipules and a portion of a flower head. C, flower, lateral view. D, longitudinal section of flower. E, stamen, F, pistil. G, fruit. H, seed.

11. *Mitragyna tubulosa* Kuntze, Rev. Gen. 288. 1891. (Fig. 446).

Stephegyne tubulosa Hook. f.—*Nauclea tubulosa* Arn.—*Nauclea parvifolia* Moon.

Sinh. Helamba.

A small tree about 10 m high with a spread of about 3 m, bark smooth, pale brown, young parts slightly pubescent; leaves simple, opposite decussate, sometimes whorled in threes, thin, oblong-ovate, 9—26 cm long, 5—13 cm broad with 9—12 pairs of lateral veins which are prominent below, glabrous on the upper surface, pubescent on lateral veins beneath, hairs crowded at the axils of lateral veins in tufts, petioles green or reddish, 1.2—4 cm long, round, slightly pubescent, stipules interpetiolar protecting the buds, 1.9—3 cm long, 1—2.2 cm broad, oval, green or reddish fringed, strongly keeled and veined, rounded at apex and glabrous on both surfaces; flowers regular, bisexual, sessile, crowded together in terminal globose heads 3.5—4 cm across, bractlets numerous, spatulate, 3—3.5 mm long with a few hairs at the base of each; flowers 1.5 cm long, calyx-tube fleshy, tubular, truncate with no individual segments, 4 mm long, glabrous; petals 5, fused into a tube 9.5 mm long, hairy inside, lobes 4.5 mm long, valvate, recurved, linear-triangular at apex with a tuft of hair midway; stamens 5, inserted at the mouth of the corolla-tube alternating with the corolla lobes, apparently sessile, anthers basifixed, 1.2 mm long; ovary inferior, 1.5 mm long, 2-locular with about 20 ovules in each loculus on an axile placenta, style long exerted 1.2 cm long, glabrous, stigma oblong, cylindrical, 3.2—3.6 mm long, the lower portion encasing the style; fruit a fusiform or ovoid-oblong, septicial capsule, 7 mm long, crowned by a persistent calyx limb, puberulous, 10-ribbed; seeds flat, linear, winged, 3.5—4.5 mm long.

Flowers in May.

Illustration. Beddome, Ic. Fl. Ind. Or. *pl.* 18.

Distribution. Occurs in South India and Ceylon. It is rare in the low-country moist regions in Ceylon. Colombo, Kalutara, Hiniduma, Kukul Korale, etc.

Ceylon. Western Prov., Kalutara, *Thwaites C.P.* 1656; *Thwaites C.P.* 1657; Colombo, *W. Ferguson*.

Composition. This plant contains a crystalline alkaloid, resin and a wax.

Uses. This tree is used for treating the same diseases as *M. parvifolia* is employed.

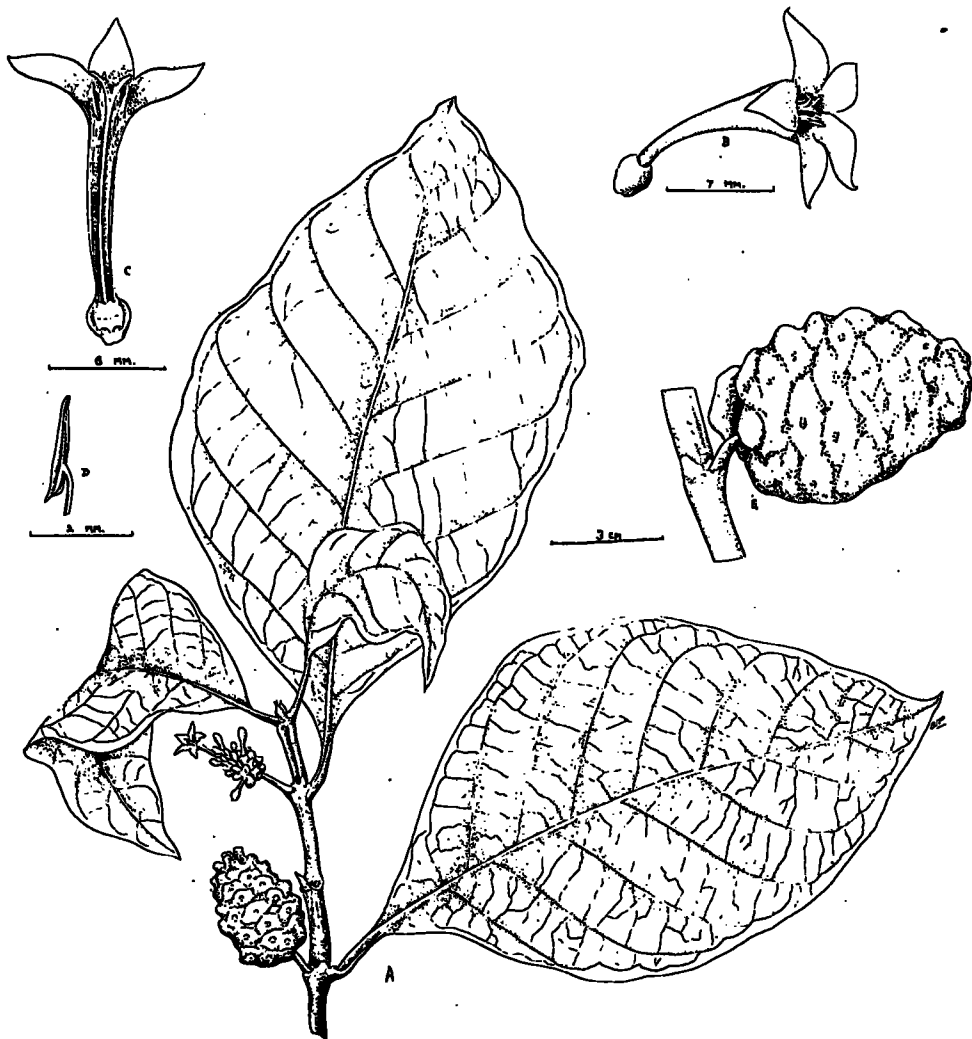


FIG. 447. *Morinda citrifolia*. A, twig with leaves, cluster of flowers and fruit. B, flower, lateral view. C, longitudinal section of flower. D, stamen. E, fruit.

12. *Morinda citrifolia* Linn. Sp. Pl. 176. 1753. (Fig. 447).*Morinda littoralis* Blanco.

Engl. Indian Mulberry; *Sinh.* Ahu; *Tam.* Manjatbavattai, Manjatti, Nuna, Periyana, Seyal, Tunnavu, Vellainuna; *Sans.* Achchuka, Ashyuka.

A small tree with yellowish white bark and stout branchlets marked with leaf scars, twigs glabrous; leaves simple, opposite, stipulate; closely placed, large, 15—20 cm long, oval, attenuate at base, shortly acuminate, acute, glabrous, shining with glandular pits at the axils of lateral veins beneath, rather thick, bright apple green, veins strongly marked, prominent beneath, pellucid, petioles 1.2 cm long, very stout, stipules short, broad, obtuse, persistent; flowers regular, bisexual, white in globose heads, peduncles long, solitary or rarely 2 or 3 together; sepals fused into a calyx-tube which in turn is fused with the adjacent ones in a head, lobes 5; petals 5, fused into a corolla-tube, lobes valvate; stamens 5, anthers oblong; ovary inferior, 2-locular but spuriously 4-locular with 4 ovules, stigmas 2, linear; fruit head ovoid, over 2.5 cm long, very fleshy, white, some of the enlarged calyx of the lowest fruits developing large and leafy bract-like segments; pyrenes ovoid, compressed, winged on one edge, convex on one surface and concave in the other.

Flowers in October.

Illustrations. Gaertner, *Fruct. et. Sem. Plant.* 1: *pl.* 29. 1788; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 506. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya, Burma, Java, Sumatra and China. It is common along the sea coast in the moist regions in Ceylon. Colombo, Galle, Tangalla, etc.

India. Sikkim, *J. D. Hooker*. Ceylon. Southern Prov., Galle ramparts, *Alston*, Jan. 1928; *Thwaites C.P.* 765. Maldives. *Didi* 148, 1896; Horsburgh Atoll, *Gardiner*, 1899—1900; *Java.* Besuki Prov., *Kooders* 6532. Sumatra. East Coast, *Yates* 1148.

Composition. The leaves and fruits of this plant contain an alkaloid. The root bark contains a crystalline glucoside, morindine and colouring matter. The fruit has a volatile oil (morinda oil) which consists of n-capron and n-capryl acids, paraffin and fatty acids.

Uses. The root is used as a cathartic and the juice extracted from the leaves applied externally on gout to relieve pain. The tender leaves ground into a paste and roasted in gingelly oil are applied as a poultice on chronic ulcers with beneficial effects. They are also ground with turmeric and the paste applied on snake-bite injuries. The unripe berries, charred and mixed with salt, are applied on spongy gums. In Hawaii, a decoction of the leaves and stem bark is given for tuberculosis, while in Indo-China the fruit is administered as an emmenagogue and deobstruent in dysentery and asthma. The fruit is used for various preparations given for diseases of the liver, kidney and spleen, diabetes, beriberi, haemorrhage and coughs.



FIG. 448. *Morinda tinctoria*. Branch with leaves, flowers and fruit.

13. *Morinda tinctoria* Roxb. Hort. Beng. 15. 1814. (Fig. 448).

Morinda aspera W. & A.—*Morinda coreia* Buch.—Ham.—*Morinda nodosa* Buch.—Ham.—*Morinda leiantha* Kurz—*Morinda citrifolia* Bedd.—*Morinda zollingeriana* Miq.—*Morinda teysmanniana* Miq.—*Morinda exserta* Roxb.

Sinh. Ahu; *Tam.* Manjanatti, Manjanuna, Nuna; *Sans.* Achchuka.

A small tree with a thick spongy bark which is longitudinally furrowed and branchlets thickened at nodes, leaf scars prominent and twigs compressed and glabrous; leaves simple, opposite, stipulate, 7.5—12.5 cm long, lanceolate, tapering to base, acuminate, acute, glabrous except for tufts of hairs at the axils of lateral veins beneath, dull green, not shining, petioles very short, stipules broadly triangular acute, deciduous; flowers regular, bisexual, white, very sweet scented, large in globose heads, peduncles long, solitary or 2 or 3 together; sepals fused into a calyx-tube, 0.6 cm long, and in turn with the adjacent ones in a head, lobes 5, narrowly oblong, more than half as long as the tube; petals 5, fused into a corolla-tube, lobes valvate, hairy at the mouth; stamens 5, anthers oblong; ovary inferior, 2-locular or spuriously 4-locular with 4 axile ovules, stigmas 2, linear; fruit 1.8 cm diam., globose, fleshy, pyrenes oblong, usually 4 to each berry.

Flowers in September and October.

Illustrations. Beddome, *Flor. Sylvat. pl.* 220. 1868—1873; Kirtikar and Basu, *Indian Med. Plants, pl.* 507. 1933, right hand figure; Herb. Peradeniya., drawing.

Distribution. Occurs in India, Ceylon, Burma, Malaya and Java. It is rather common in the dry regions of Ceylon. Jaffna, Trincomalee, Anuradhapura, Badulla, etc.

India. Maisor and Carnatic: *G. Thomson.* Ceylon. North-Central Prov., *Herb. Peradeniya*, Oct. 1883. Without locality, *Thwaites C.P.* 1668. Java. *Kooders* 6538β.

Uses. The root of this tree is used internally as an astringent and externally to relieve pain in gout and rheumatism. The leaves are given for diarrhoea and applied on wounds.

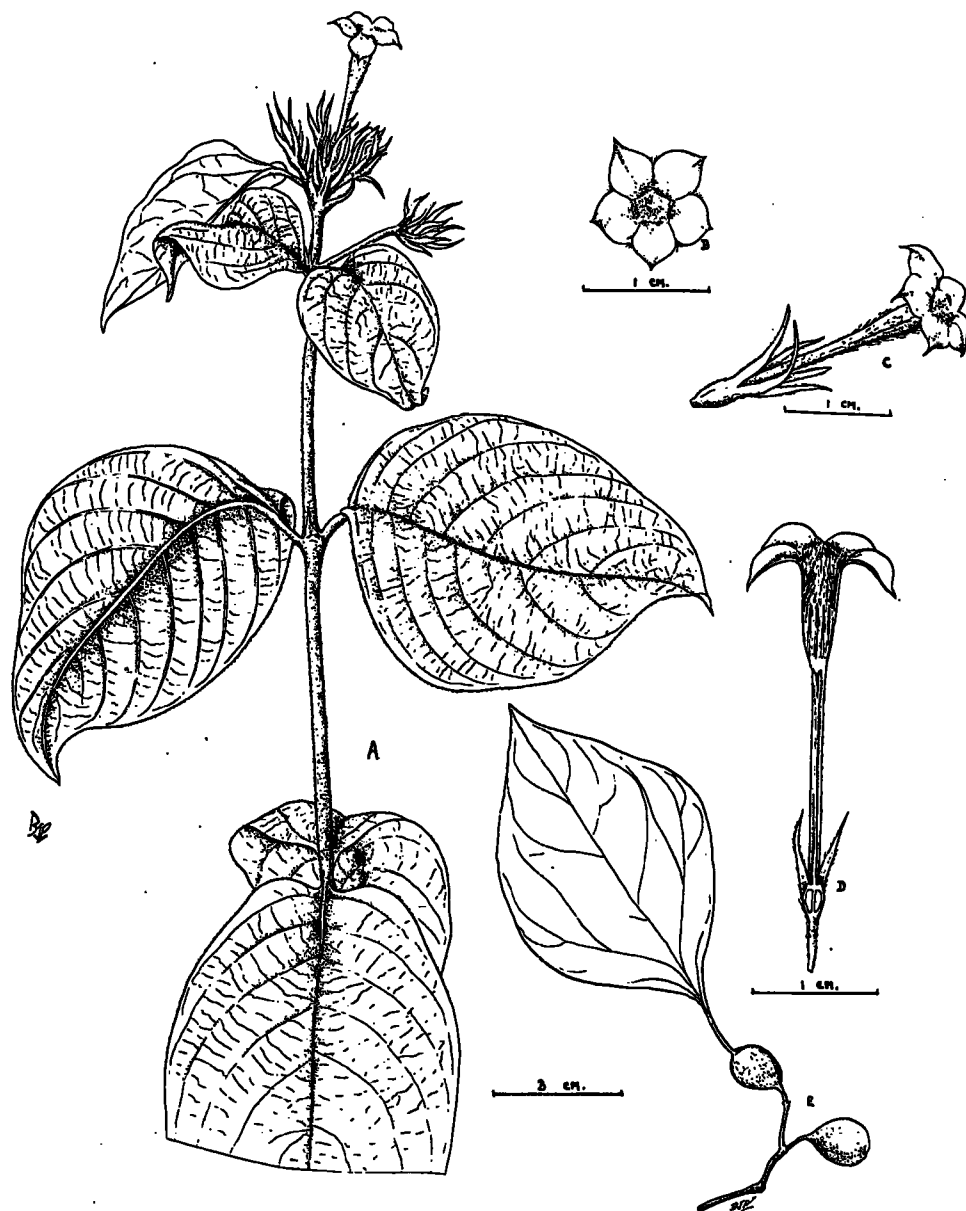


FIG. 449. *Mussaenda frondosa*, A, twig with leaves, stipules and cluster of flowers. B, flower, dorsal view. C, flower, lateral view. D, longitudinal section of flower: E, fruits one of which carries a persistent petaloid sepal.

14. *Mussaenda frondosa* Linn. Syst. Nat. ed. 10, 2: 931. 1759. (Fig. 449).

Mussaenda zeylanica Burm.—*Mussaenda formosa* Linn.—*Mussaenda fruticosa* Linn.—*Mussaenda sumatrensis* Roth.—*Mussaenda flavescens* Buch.—Ham.—*Mussaenda tomentosa* Wight—*Mussaenda villosa* Wall.

Sinh. Mussenda, Muswenna; *Tam.* Vellaiyillai, Vellimadandai; *Sans.* Nagavalli, Shrivati.

A scandent shrub with hirsute young stems curving gracefully over other shrubs, older stems glabrate; leaves simple, opposite, stipulate, 4.4—13 cm long, 2—8.3 cm broad, ovate, elliptic, orbicular, lanceolate, oblong or obovate, short-acuminate, acute, base cuneate, obtuse or rounded, rather scantily hirsute on the upper surface, densely and softly white tomentose on the lower surface, primary lateral veins 6—10 pairs, more prominent on the lower surface and more hairy, petioles 0.35—2.1 cm long, densely hirsute with grey or brownish hairs, stipules 3.5—6.5 mm long, oblong-ovate, broadly triangular or oblong from a broad base narrowing towards the apex and bifurcate, lobes straight, hairy on both surfaces with few or many glands at base inside; flowers regular, bisexual, brilliant orange, heterostylous in terminal contracted dichotomously branched, densely hirsute, few flowered cymes, bracts and bracteoles subulate, pubescent and caducous; sepals 5, lobes deciduous, narrowly linear, 6.5—15 mm long, 0.5—1.5 mm broad, pubescent, petaloid sepal creamy white, ovate or oblong-ovate, 3.7—12 cm long, 2.2—8.9 cm broad, petiolate, acuminate, attenuate or cuneate at base, puberulous on the upper surface, hirsute below, 3 or 5-veined; petals 5, fused into a long corolla-tube 2—2.7 cm long, hairy on the outer surface, densely hairy within as far as the base of the anthers, tufted at the mouth, lobes broadly ovate, 3—4.5 mm long, 4—5 mm broad, apiculate, hairy on the outer surface, papillate within; stamens 5, with short filaments halfway or 3/4 way on the tube, anthers linear, dorsifixed, introrse, 4.5—5.5 mm long, bilobed at the sterile base; ovary inferior, obconical or turbinate, 3—4 mm long, hairy, 2-locular with numerous ovules on cushion-shaped axile placentae, style 1—2.5 cm long, stigma lobes 2—4 mm long; fruit a globose berry 1 cm long, seeds numerous, minute, reticulate, 0.6—0.8 mm long, albuminous.

Flowers from April to August.

Illustrations. Burmann, Thes. Zeyl. pl. 76. 1737; Lindley, Bot. Reg. 6: pl. 517. 1820; Wight, Ill. Ind. Bot. 2: pl. 124. 1850; Beddome, Flor. Sylvat. pl. 16, fig. 3. 1873; Jayaweera, Journ. Arn, Arbor. 44 (2): pl. 4. 1963; 44 (1): fig. 1. 1963.

Distribution. Occurs in India and Ceylon. It is very common in the dry and moist regions, upto 4,000 feet altitude in Ceylon.

India. Kodaikanal Region, Pulney Hills, *Fr. Anglade*; Yellapur-Karwar Dist., *Nana* 5816; *Herb. Wight* 1267; Concan: *Herb. Hooker and Thomson*; Calcutta, *Wallich* 434. **Ceylon.** Central Prov., Peradeniya, *Gardner* 333; *de Silva* 38; *Jayaweera* 8. Sabaragamuwa Prov., Ratnapura, Kotamulla, *Jayaweera* 2; Gilimale, *Jayaweera* 22. North-Central Prov., Welimada, *Jayaweera* 41; Ritigala, *Jayaweera* 11. **China.** Kwangtung University Campus (probably cultivated), *Metcalf* 17245.

Uses. The root of this plant is used for treating white leprosy, the petaloid sepals for jaundice, the flowers for asthma, intermittent fever and dropsy. The leaves and flowers are used externally to remove inflammations and as a detergent for ulcers. A congee made from all the parts of the plant is a specific for hepatitis.

15. *Nauclea orientalis* Linn. Sp. Pl. 95. 1753.

Sarcocephalus cordatus Miq.—*Sarcocephalus orientalis* Merr.—*Nauclea cordata* Roxb.—*Nauclea roxburghii* Don—*Nauclea wallichiana* Br.—*Nauclea parviflora* Wall.—*Plantanocarpum cordatum* Korth—*Cephalanthus chinensis* Lam.—*Cephalanthus orientalis* Linn.

Sinh. Bakmi; *Tam.* Attuvangi, Vammi; *Sans.* Bhantriya.

A small tree with silvery-grey smooth bark and prominently leaf-scarred branches and minutely stellate-pubescent young branches; leaves simple, opposite, stipulate, large, 10—20 cm long, broadly ovate-oval, slightly cordate at base, rounded or very obtuse apex, entire, undulate, glabrous on the upper surface, glabrously or finely pubescent beneath, petioles 1.8—2.5 cm long, stipules 1.2—2.5 cm long, obovate-rotundate, slightly connate, deciduous; flowers regular, bisexual, pale yellow, very numerous, sessile, fused together by their fleshy calyx-tubes into globose heads 1.8—2.5 cm diam. on stout peduncles; sepals 4 or 5, fused into a calyx-tube which is connate to the adjoining ones forming a fleshy mass, segments small, club-shaped; petals 4 or 5, fused into a long tube, lobes acute, imbricate; stamens 4 or 5, inserted in the mouth of the corolla, included; ovary inferior, long, 2-locular with numerous imbricated axile ovules, style long, white, much exserted, stigma large, clavate; fruit sunk in a solid fleshy mass, 2-locular, globose, 2.5 cm long with a few, small oblong seeds.

Flowers in May and June.

Illustrations. Beddome, *Flor. Sylvat. pl.* 318. 1868—1873; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malaya and Philippine Islands. It is rather common in both moist and dry regions of the low-country in Ceylon. Batticaloa, Trincomalee, Kurunegala, Bibile, etc.

Ceylon. North-Western Prov., Ganewatte, *Simpson* 8212, June 1931. Central Prov., Peradeniya, Bot. Gard., *Thwaites C.P.* 1658. Uva Prov., Bibile Dist., *J. M. Silva*, Aug. 1924. Without locality, *Thwaites C.P.* 781. *Philippine Islands.* Luzon: Pangasinan Prov., *Clemens* 18184, March 1828.

Composition. The leaves and bark of this tree contain alkaloids.

Uses. The leaves are applied on boils and tumours. The bark is anti-pyretic, vulnerary and anti-diarrhoeic. It is a cure for toothache.



FIG. 450. *Oldenlandia biflora*. A, twig with leaves and flowers. B, fruit.

16. *Oldenlandia biflora* Linn. Sp. Pl. 119. 1753. (Fig. 450).

Oldenlandia paniculata Burm. f.—*Hedyotis biflora* Wall.—*Hedyotis racemosa* Lam.

Sinh. Pepiliya; *Tam.* Parpadagam; *Hindi* Damanpapa; *Sans.* Parpata.

An annual herb with erect ascending stems 10—30 cm tall, quadrangular, glabrous, slightly branched; leaves simple, opposite, stipulate, 1.2—3.7 cm long, oblong-oval, tapering to base into an obscure petiole, subacute, apiculate, glabrous, rather thick, stipules short, broadly triangular, acute; flowers regular, bisexual, white, pedicellate, 2 or 3 together on short axillary peduncles, or the leaf being small and bract-like together forming a short racemose panicle; sepals 4, fused, segments lanceolate, acute, glabrous; petals 4, fused into a corolla-tube, lobes valvate; stamens 4, epipetalous on corolla-tube; ovary inferior, 2-locular with numerous ovules on large axile placentae, distinctly quadrangular, glabrous, style simple, stigmas 2; fruit a small capsule, turbinate-ovoid, strongly 4-ribbed, truncate, crowned with distant calyx segments, loculicidally dehiscent on the crown, seeds numerous, pitted.

Flowers all the year round.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 312. 1840; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, Ceylon and Malay Peninsula. It is rather common in the low-country, chiefly along the coast. Galle, Mannar, Batticaloa, Trincomalee, etc.

Ceylon. Northern Prov., Vaddukodai, *Koshie*, Nov. 1951; Mannar Dist., *Herb. Peradeniya*, Feb. 1890; Talaimannar, *J. M. Silva*, July 1916. Eastern Prov., Trincomalee, *Herb. Peradeniya*, Nov. 1890. North-Central Prov., Mahallupalama, *Herb. Peradeniya*, March 1905. Western Prov., Negombo, *Simpson* 8868, Nov. 1931. Southern Prov., Gintota, *Alston*, Aug. 1926. Without locality, *Thwaites C.P.* 1679.

Composition. The entire plant, excluding the root, contains the alkaloids, biflorine and biflorone.

Uses. It is used for remittent fever, gastric irritation and nervous depression.

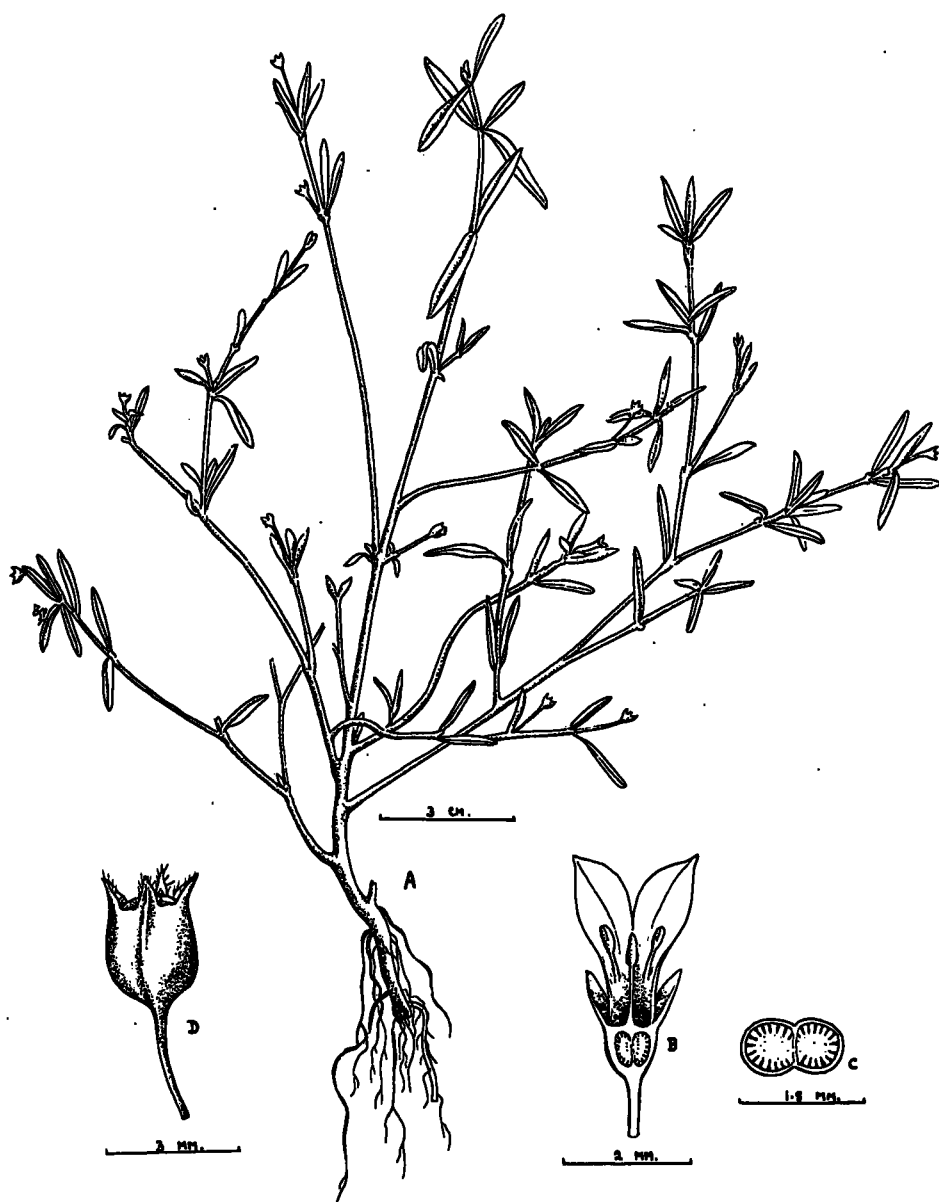


FIG. 451. *Oldenlandia corymbosa*. A, plant with roots, stems, leaves and flowers. B, longitudinal section of flower. C, transverse section of ovary. D, fruit. C, enlarged.

17. *Oldenlandia corymbosa* Linn. Sp. Pl. 119. 1753. (Fig. 451).

Hedyotis corymbosa Lamk.—*Hedyotis biflora* Roth.—*Hedyotis ramosa* Bl.—*Hedyotis graminicola* Kurz—*Oldenlandia biflora* Lamk.—*Oldenlandia ramosa* Roxb.

Sinh. Walpathpadagam; *Hindi* Damanpapar; *Sans.* Parpata.

A small annual herb with numerous, slender, erect or spreading stems, 15—20 cm high, glabrous or slightly hispid and cylindrical; leaves simple, opposite, stipulate, 1.2—2.5 cm long, linear, sessile, apiculate, margin usually scabrous, stipules short, truncate, pectinate with few teeth; flowers regular, bisexual, white on filiform pedicels longer than calyx in pairs (rarely solitary), peduncles very slender, shorter than leaves; sepals 4, erect, small, narrowly triangular, mucronate; petals 4, fused into a corolla-tube, valvate; stamens 4, epipetalous on corolla-tube; ovary inferior, 2-locular with numerous ovules in each loculus on large axile placentae, style simple, stigmas 2; fruit capsule nearly globose, slightly pyriform, truncate, glabrous, loculicidally dehiscent on the crown, seeds numerous.

Flowers from July to September.

Illustrations. Kirtikar and Basu, *Indian Med. Plants*, pl. 492B. 1933. Burmann, *Thes. Zeyl.* pl. 11. 1737; *Herb. Peradeniya*, drawing.

Distribution. Occurs in tropical Africa, America, Asia including India and Ceylon, Java and Philippine Islands. It is a common weed in the low-country in Ceylon. Jaffna, Kurunegala, Maturata, etc.

Ceylon. Central Prov., Peradeniya, *Alston* 2206, June 1928; Hakinde on rocks, *Alston* 2216, Dec. 1927; Haputale, *Herb. Peradeniya*, Sept. 1891. Without locality, *Thwaites C.P.* 1676.

Composition. The leaves of this plant contain caffeine.

Uses. The whole plant is given in the form of a decoction in remittent fever and heat eruptions. It is used as an anthelmintic and administered for jaundice and diseases of the liver.

18. *Oldenlandia herbacea* (Linn.) Roxb. Hort. Beng. 11. 1814.*Hedyotis herbacea* Linn.*Sinh.* Pepiliya; *Tam.* Parpadagam; *Sans.* Parpata.

An erect, rigid, much branched annual herb with dichotomous, slender, quadrangular, glabrous, divaricate branches with long internodes; leaves simple, opposite, stipulate, 1.8—3.7 cm long, linear (the lower rather broader), sessile, acute, glabrous, margin often recurved, stipules very short, inconspicuous; flowers regular, bisexual, white, solitary on stiff, divaricate, axillary pedicels longer or shorter than leaves; sepals 4, fused, calyx segments lanceolate, acute, short; petals 4, fused into a corolla-tube, lobes 4, valvate; stamens 4, on the corolla-tube; ovary inferior, 2-locular, with numerous ovules in each loculus on large axile placentae, style simple, stigmas 2; fruit a small ovate-ovoid capsule with the top rounded and protruded beyond the erect calyx segments, loculicidally dehiscent on the crown, seeds numerous.

Flowers all the year round.

Illustration. Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, tropical Africa and Malayan Islands. It is very common in the dry, sandy places in the low-country in Ceylon up to 4,000 feet altitude. Colombo, Ratnapura, Maturata, Hakgala, Badulla, etc.

Ceylon. Central Prov., Maturata in the patana, *A. M. Silva*, May 1906; Hakgala, *A. M. Silva*, Oct. 1906. Uva Prov., Haputale, *Herb. Peradeniya*, Sept. 1890; Badulla, *Herb. Peradeniya*, Jan. 1888. Without locality, *Thwaites C.P.* 1673.

Uses. A decoction of this plant is given for malarial fever of a low remittent type. In Africa, it is used as an abortifacient.

19. *Oldenlandia umbellata* Linn. Sp. Pl. 119. 1753.

Hedyotis puberula Lamk.—*Hedyotis linarifolia* Wall.—*Oldenlandia puberula* G. Don

Engl. Chaya Root, Indian Madder; *Sinh.* Saya, Sayamul; *Tam.* Chiruver, Emburel, Imbural, Imburaver, Saya; *Hindi* Chirval.

A prostrate or ascending annual herb with a semi-woody base and quadrangular or compressed glabrous or rough stems 15—20 cm long; leaves simple, opposite, numerous, stipulate, rather close, sessile, 1.2—2.5 cm long linear, very acute, margin setaceous and often reflexed, stipules very short, pectinate; flowers regular, bisexual, white on short pedicels, 3—10 together in very short, numerous irregular small umbels on stiff erect peduncles; sepals 4, erect, fused into a glabrous calyx, segments triangular, cuspidate, spinous-ciliate; petals 4, fused into a tubular corolla, segments valvate; stamens 4, epipetalous on corolla-tube; ovary inferior, 2-locular with numerous ovules in each loculus on large axile placentae, style simple, stigmas 2; fruit a small nearly globose capsule, broader than long, the top slightly protruded above calyx, loculicidally dehiscent on the crown, seeds numerous.

Flowers all the year round.

Illustrations. Roxburgh, Pl. Corom. 1: *pl.*3. 1795; Kirtikar and Basu, Indian Med. Plants, *pl.* 492A. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Burma. It is common on sandy ground, especially near the coast, in the dry regions of Ceylon. Jaffna, Batticaloa, Colombo, Negombo, Chilaw, etc.

Ceylon. Northern Prov., Jaffna Dist., *Herb., Peradeniya*, Feb. 1890. North-Western Prov., Chilaw, *Herb. Peradeniya*, Dec. 1880. Western Prov., Negombo, Ekala, *Alston*. 2393, Aug. 1928. Without locality, *Thwaites C. P.* 1674.

Uses. The leaves and roots of this herb possess expectorant properties and are prescribed for cases of bronchial catarrh, bronchitis and asthma. The root is a specific for snake-bite poisoning.

Chaya root is an important dyeing material for cloth, as it makes it very durable.

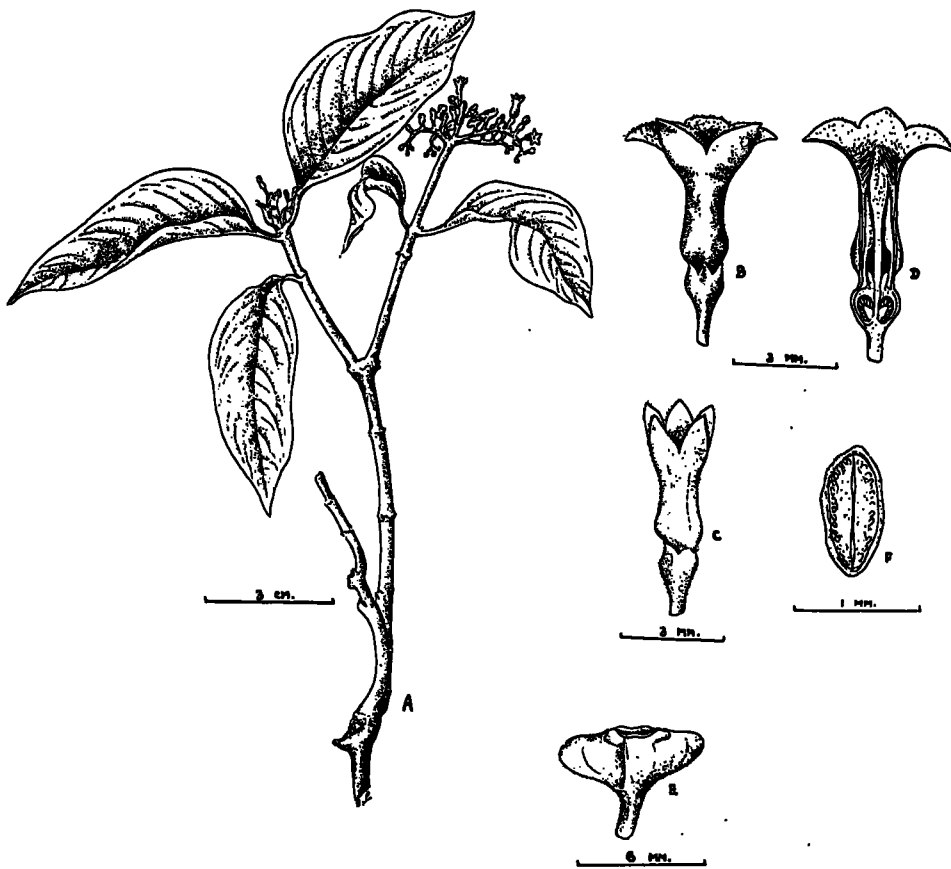


FIG. 452. *Ophiorrhiza mungos*. A, twig with leaves and inflorescence. B, flower, lateral view. C, opening flower bud. D, longitudinal section of flower. E, fruit. F, seed.

20. *Ophiorrhiza mungos* Linn. Sp. Pl. 150. 1753. (Fig. 452).*Ophiorrhiza camiguinensis* Elm.

Engl. Indian Snake Root, Mongoose Plant; *Sinh.* Datketiya, Walekaweriya; *Tam.* Kirippundu, Kirippurandan, Sadaichi; *Sans.* Bhiyangakshi, Chhatrika, Gandali, Gandhanakuli, Garudaputa, Nadikalapaka, Nakuleshtha, Nakuli, Nava, Patalabhedi, Patalagaruda, Rasna, Sarpakshi, Sarpari, Sugandha, Surasa, Suvaha.

A herbaceous undershrub about 45—60 cm high, erect, cylindrical, slightly branched, glabrous or very finely puberulous; leaves simple, opposite, stipulate, rather large, 10—20 cm long, lanceolate, much tapering to base and decurrent on short petiole, shortly acuminate, subacute, glabrous on the upper surface, finely puberulous on veins beneath, thin, bright green above, pale beneath, lateral veins very numerous, depressed above, prominent beneath, stipules very short; flowers regular, bisexual, white, in horizontally spreading cymes arranged subumbellately in a flat-topped terminal inflorescence without bracts, pedicels short; sepals 5, very short, triangular; petals 5, fused into a tubular corolla inflated at the base, broad with a ring of silky hair at the mouth, lobes much shorter than the tube, disc of two lobes, very prominent; stamens 5, inserted in the tube; anthers linear; ovary inferior, 2-locular, placentae arising from the base of loculi with many ovules; fruit a loculicidal capsule, 1 cm wide, coriaceous, three times wide as long, very much compressed, protruded beyond calyx and dehiscent on top; seeds very numerous, angular, pale brown.

Flowers all the year round.

Illustrations. Gaertner, *Fruct. et Sem. Plant.* 1: *pl.* 55. 1788; Kirtikar and Basu, *Indian Med. Plants*, *pl.* 493. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Burma, Malaya and Philippine Islands. It is common in shady moist places from sea level to 6,000 feet altitude in Ceylon.

India. Assam: *Chatterjee*, May 1902. East Bengal: *Herb. Griffith* 2845, Kew Distribution 1862—3. Pen. Ind. Or., *Herb. Wight* 1340, Kew Distribution 1866—8. Ceylon. North-Central Prov., Ritigala, *Willis*, March 1905. Central Prov., Kitulgala, Kalugala, *Alston* 895, Aug. 1927; Kandy, *Alston* 1259, June 1926; Nuwara Eliya, to Ramboda. *Thwaites C.P.* 1704. Malay Peninsula. Perak, Larut, *King's Collector* 1828, June 1881. Philippine Islands. Alabat Island: *Ramos & Edano* 48111, Sept.—Oct. 1926; *Ramos & Edano* 48265, Sept.—Oct. 1926.

Composition. According to Nadkarni, the plant contains an amorphous alkaloid.

Uses. The root of this plant possesses laxative and sedative properties. It is used in snake-bite cures. A decoction of the leaves, roots and bark is administered as a stomachic. The leaves are used for dressing ulcers.

21. *Paederia foetida* Linn. Mant. 1: 52. 1767.

Paederia ovata Miq.—*Paederia sessilifolia* DC.—*Paederia tomentosa* Bl.—*Apocynum foetidum* Burm. f.

Sinh. Apasu-madu; *Sans.* Bala, Balya, Bhadrabala, Bhadrarni, Chandraparni, Chadravalli, Charuparni, Gandhabhadra, Gandhali, Gandholi, Gandhya, Katambhara, Prabala, Prabhadra, Prasara, Prasarani, Prasarini, Pratanika, Pratanini, Rajabala, Rajaparni, Sara, Sarana, Sarani, Saruparni, Sharana, Sharani, Somraji, Suprarasa, Suprasara.

A twining, slender, foetid shrub; leaves opposite, ovate or lanceolate, long-petioled, acute, or cuspidate, base broad and narrowed, rather thin, 5—7.5 cm long, 2.5—3.7 cm broad, stipules ovate-lanceolate, bifid; flowers numerous in axillary and terminal trichotomous often scorpioid cymose panicles about 15 cm long and 7.5 cm wide, spreading, regular, bisexual, violet, shortly pedicelled; calyx campanulate, acutely toothed; corolla funnel-shaped, usually pubescent, lobes short with crenulate, inflexed edges; stamens linear-oblong, inserted in the tube; ovary inferior, 2-locular with a single ovule in each loculus, stigmas 2, twisted; fruit orbicular, winged, about 1 cm across.

Illustration. Kirtikar and Basu, *Indian Med. Plants*, pl. 508. 1933.

Distribution. Occurs in India, Malaya, Siam and Borneo. It is cultivated in Ceylon.

India. Sikkim: *J. D. Hooker; Clarke* 12580C, Oct. 1870. Assam: Mongot, Jaintea Hills, *Prain's Collector*, July 1899; *Jenkins*, Khasia: *J. D. Hooker & T. Thomson*. Chittagong: *King's Collector* 216. 1886. Bengal: Calcutta, Bot. Gard., cultivated. Java. *Kooders* 22878. β Japan. *Oldham* 516, 1862.

Composition. This plant contains the alkaloids α and β — paederine and indole in the leaves.

Uses. Regarded as a specific for rheumatism and administered both internally and externally. In Malaya, the leaves are used for flatulence and rheumatism and also as a diuretic for inflammation of the urethra. In the Philippines, a decoction of the leaves is used for dissolving vesical calculi. The leaves are applied on the abdomen for retention of urine.



FIG. 453. *Pavetta indica*. A, twig with leaves. B, inflorescence. C, flower, lateral view. D, longitudinal section of flower.

22. *Pavetta indica* Linn. Sp. Pl. 110. 1753. (Fig. 453).

Pavetta alba Vahl—*Pavetta petiolaris* Wall.—*Pavetta barnesii* Elm.—*Ixora paniculata* Lamk.—*Ixora pavetta* Roxb.

Engl. Indian Pellet Shrub; *Sinh.* Pawatta; *Tam.* Araniya, Karanai, Kattukkaranai, Pavattai; *Hindi* Kankra, Karnikara, Kathachampa, Papari; *Sans.* Kakachedi, Papata, Tiriakphala.

A bush or small tree with a smooth yellowish white bark and glabrous, cylindrical twigs; leaves simple, opposite stipulate, 7.5—15 cm long, lanceolate, tapering to base, acuminate, subacute, glabrous on both sides, green and shining on the upper surface with scattered, large, thickened, hard warts, more prominent above than beneath, petioles 0.6—1.2 cm long, stipules connate, triangular, acute, thin, deciduous; flowers regular, bisexual, white, very numerous, on pedicels longer than calyx, cymes copious, lax, corymbose, terminal, glabrous, often with bracts below the branches; sepals 4, very small, tooth-like; petals 4, fused into a corolla-tube, twisted in bud, about 1.2 cm long, lobes oblong-obtuse about half as long as the tube; stamens 4, epipetalous on corolla-tube; ovary inferior, 2-locular with a single ovule in each loculus, style exerted for fully 1.8 cm, very slender, stigmas slightly clavate; fruit fleshy, indehiscent, 0.6—1.5 cm long, nearly globose, black and polished.

Flowers from December to May.

Illustrations. Wight, *Ic. Pl. Ind. Or., pl.*, 148. 1839; Kirtikar and Basu, *Indian Med. Plants, pl.* 505. 1933.

Distribution. Occurs in India, Ceylon, Burma, Malaya, Malacca, China, Sumatra and Philippine Islands. It is common in the low-country in Ceylon, both along the sea coast and inland. Jaffna, Batticaloa, Deltota, Ritigala, Hambantota, etc.

India. Sikkim: *Prain's Collector*, June 1903. Assam: Nakachari, *Reporter Eco. Prod. Ind.* 11185, April 1895. Canara: *Talbot*, May 1882. Maisor & Carnatic: *G. Thomson*. Pen. Ind. Or. *Herb. Wight* 1480, Kew Distribution 1866—7. Ceylon. North-Central Prov., Ritigala, *Willis* 2, March 1905. Central Prov., Katugastota, *Senaratne* 10099, April 1953; Maskeliya, near Gartmore Estate, *J. M. Silva*, April 1926. Southern Prov., Kirinda, *Herb. Peradeniya*, Dec. 1882; Hambantota, *Simpson* 8428, July 1931. Without locality, *Thwaites C. P.* 1663; *Walker*, *Herb. Wight* property. Sumatra. (East Coast): Asahan, *Yates* 1632. **Philippine Islands.** Luzon: Tayabas Prov., Casiguran, *Ramos & Edano* 45461, May-July 1925; Panpanga Prov., Stotsenburg, *Clemens* 17651, Nov. 1927.

Composition. The roots of this plant contain a green resin, starch, an organic acid and a bitter glucoside, while the stem contains an essential oil, resin, an alkaloid, tannin and a pectic principle.

Uses. The root possesses aperient properties and is commonly prescribed for visceral obstructions, particularly in children. It is given for dropsy. A fomentation with its leaves relieves haemorrhoidal pains. In Indo-China, an infusion of the wood is given for rheumatism.

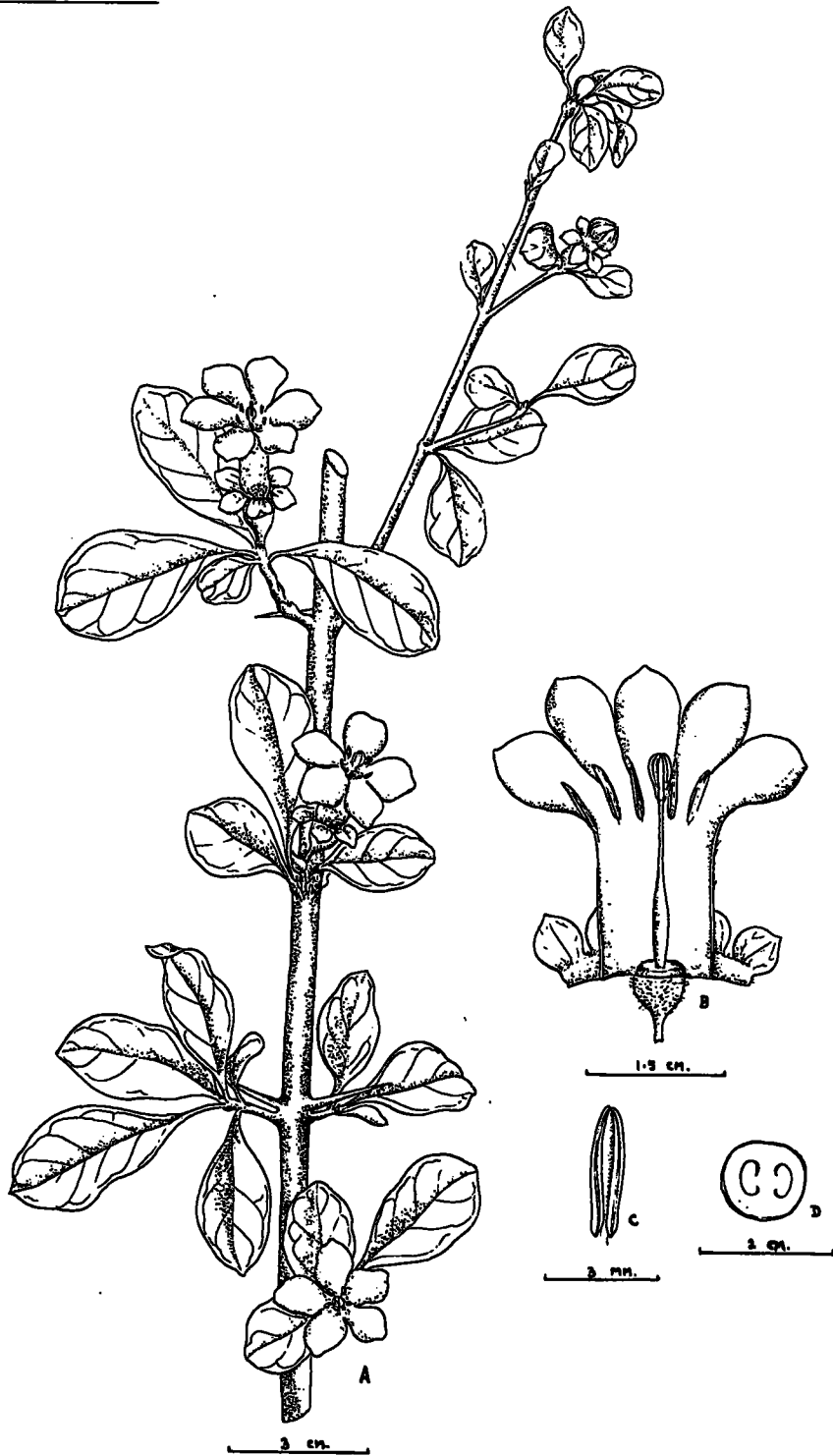


FIG. 454. *Randia dumetorum*. A, twig with leaves, spines and flowers. B, flower opened out showing the calyx, corolla, stamens and pistil. C, stamen. D, transverse section of ovary.

23. *Randia dumetorum* Lamk., Tab. Encycl. 2: 227. 1793. (Fig. 454).

Randia rottleri W. & A.— *Randia tomentosa* W. & A.— *Gardenia dumetorum* Retz.— *Posoqueria dumetorum* Roxb.

Engl. Common Emetic Nut; *Sinh.* Et-kukuruman, Kukuruman, Vali-kukuruman; *Tam.* Kadudam, Kalagam, Karai, Karadam, Karudam, Madukkarai, Marukkalam, Marukkarai, Pungarai, Sirattagalagam, Wagata; *Hindi* Arar, Karhar, Madan, Main, Maindal, Mainhuri, Mainphal, Manneal; *Sans.* Bastishodhana, Chharddana, Dharaphala, Galla, Ghantala, Granthiphala, Kaitarya, Kantaki, Kantha, Karahata, Karahataka, Madana, Marubaka, Maruvaka, Muchukunda, Pichuka, Pindinata, Pindaluka, Pinditaka, Ramachhardanaka, Ratha, Shalya, Shalyaka, Tagara, Vishapushpaka.

A shrub or small tree with horizontal rigid branches, lateral ones suppressed and very short, spines in opposite pairs coming off immediately above the branchlets, 1.2—2.5 cm long, horizontal, woody, strong and very sharp; leaves simple, one leaf of opposite pairs often absent, usually fasciculate on the suppressed branchlets, nearly sessile, 2.5—3 cm long, obovate-oval or spatulate, tapering to base, obtuse, apiculate, glabrous or slightly pubescent, thin, reticulate-veined, stipules acuminate; flowers regular, bisexual, large, yellowish white, 2.5 cm diam., 1—3 at the ends of suppressed branchlets, pedicel short; sepals 5, fused into broadly tubular calyx limb, nearly glabrous or very hairy, segments leafy, ovate, imbricate, glabrous or slightly hairy; petals 5, fused into a corolla-tube as long as or longer than the calyx, hairy outside, lobes rounded, spreading; stamens 5, epipetalous, anthers nearly sessile, long, exserted; ovary inferior, 2-locular with many or several ovules in each loculus sunk in fleshy axile placentae, stigma large, clavate or fusiform, 2-fid; fruit a globose broadly ovoid 2-chambered berry about 1.8 cm long, crowned with a large calyx limb, pilose, yellow, pericarp thick, seeds flat, numerous, surrounded with pulp.

Flowers in August.

Illustrations. Wight, *Ic. Pl. Ind. Or.*, pl. 580. 1840—1843; Beddome, *Flor. Sylvat, Anal. Gen. pl.* 16, fig. 1. 1874; Roxburgh, *Pl. Corom.* 2 pl. 136. 1798; Gaertner, *Fruct. et Sem. Plant.* 1: pl. 28. 1788; Kirtikar and Basu, *Indian Med. Plants*, pl. 496. 1933; *Herb. Peradeniya*, drawing.

Distribution. Occurs in India, Ceylon, Burma, Java, Sumatra, S. China and east tropical Africa. It is common in the dry regions and in sandy places, especially near the sea coast in Ceylon. Jaffna, Batticaloa, Trincomalee, Kalpitiya, etc.

India. Dehra Dun: Bindalhala, *Kumar* 63. Maisor and Carnatic, *G. Thomson*. Mysore: Bangalore, *No. 265*, 1857; *No. 264*, Aug. 1856. Pen. Ind. Or., *Herb. Wight* 1316, *Kew Distribution* 1866—67. Ceylon. Eastern Prov., Trincomalee, *Varigal Alston* 557. May 1927. North-Western Prov., Kalpitiya, *Herb. Peradeniya*, Aug. 1883. Without locality, *Thwaites C.P.* 1652.

Composition. The seed of this plant contains an alkaloid.

Uses. A decoction of the root is given for diarrhoea and biliousness. The bark is given for fever and applied externally on bruises. The pulp of the fruit possesses anthelmintic properties and used as an emetic. The fruit in combination with other drugs is administered for snake-bite poisoning. The powdered root is used as a fish poison.

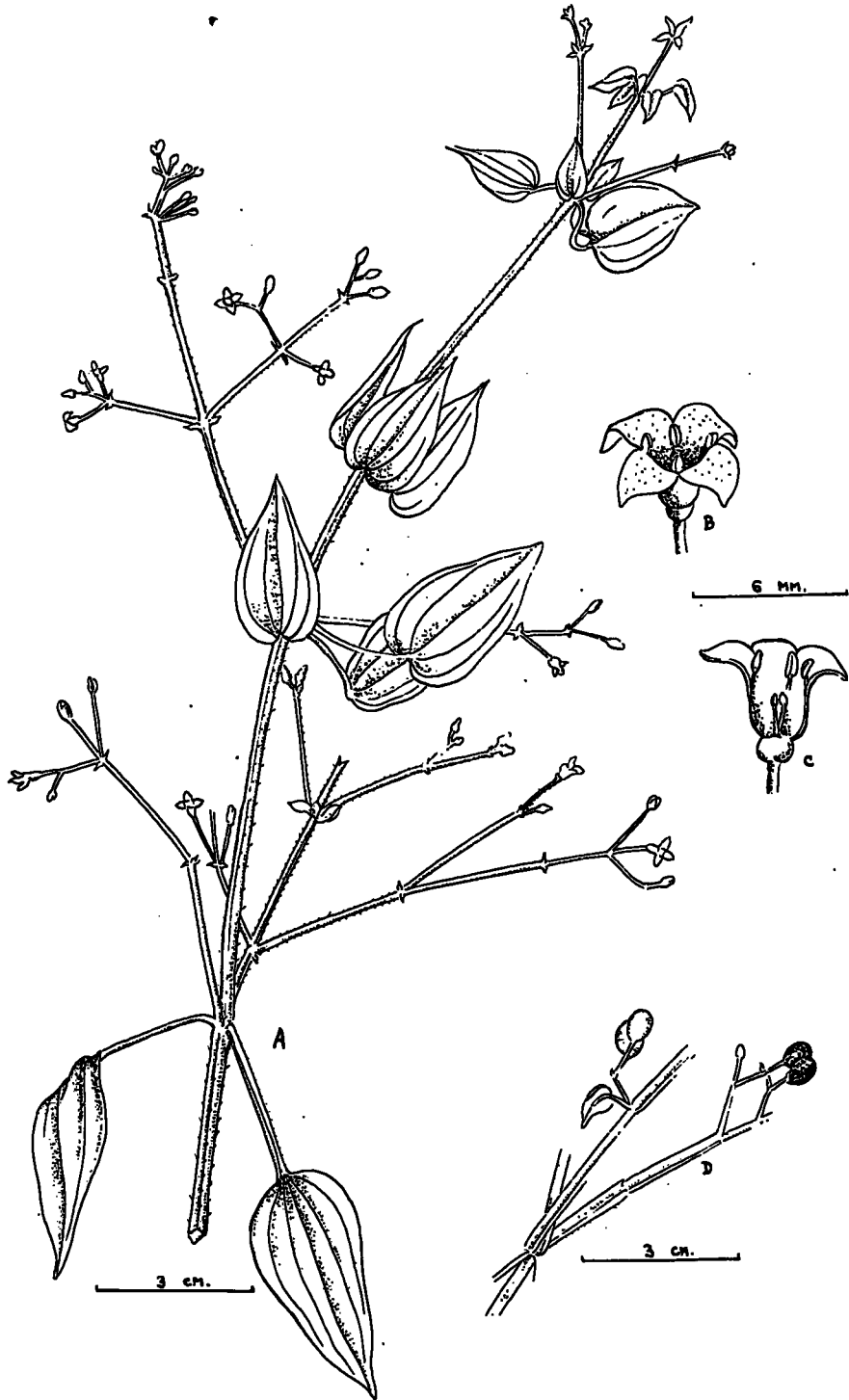


FIG. 455. *Rubia cordifolia*. A, branch with leaves and flowers. B, flower, lateral view. C, longitudinal section of flower. D, fruits.

24. *Rubia cordifolia* Linn. Syst. Nat. ed. 12, 3: 229. 1768. (Fig. 455).

Rubia munjista Roxb.—*Rubia mungisth* Desv.—*Rubia javana* DC.—*Rubia secunda* Moon—*Rubia scandens* Zoll. and Morr.—*Rubia chinensis* Regel et Maack—*Rubia mitis* Miq.

Engl. Indian Madder; *Sinh.* Mandamadiniwel, Manjista, Wel-madata, Yoganawel; *Tam.* Manjitti, Shevelli; *Hindi* Manjit, Majit; *Sans.* Aruna, Bhandā, Bhandiralatika, Bhandiri, Bhanditaki, Chhatra, Chhatrini, Chitra, Chitralata, Chitrangi, Gandiri, Gauri, Harini, Hemapushpi, Janani, Jingi, Jvarahantri, Kala, Kalabhandika, Kalameshika, Kandira, Kandiri, Kshetrini, Latyashti, Lohitalata, Mandukaparni, Manduki, Manjishta, Manjusha, Nagakumarika, Ragadhya, Ragangi, Rakta, Raktangi, Raktayashti, Raktayashtika, Rasayani, Rohini, Samanga, Tamramuli, Tamravalli, Tamrika, Vapra, Vasrabhushana, Vसरaranjani, Vijaya, Vikasa, Yojanaparnika, Yojanavallika.

A straggling perennial with very long cylindrical, flexuose roots with a red cortex and very long flexible, tough, white-barked cylindrical stems, branches scandent by means of very numerous, divaricate or deflexed branchlets and petioles, quadrangular, sometimes prickly on the angles, smooth, shining; leaves simple, whorled, exstipulate, 4 in a whorl, 1.8—3.7 cm long, ovate, cordate at base, tapering to acute apex, scabrous above and on the veins beneath, and especially on the margin with small white recurved prickles, 5 or 7-veined from the base, stiff, often convex above with the apex hooked, sometimes pubescent beneath, petioles about twice as long as the leaves, usually deflexed, tapering, stiff and branch-like, deeply channelled above, triangular with many sharp recurved prickles on the angles; flowers regular, bisexual, greenish-white, on short glabrous pedicels, cymes lax, trichotomous, glabrous; sepals absent; petals 4, fused into a campanulate corolla-tube, thick, very short, lobes ovate, obtuse, valvate; stamens 4, very small, inserted in the tube; ovary inferior, 2-locular with one ovule in each loculus, styles 2, stigmas globose: fruit fleshy, didymous, 0.8 cm long, carpels almost distinct, smooth, shining, purplish-black.

Flowers in August and September.

Illustrations. Wight, Ic. Pl. Ind. Or., pl. 187. 1839; Kirtikar and Basu, Indian Med. Plants, pl. 510. 1933; Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon, Malay Peninsula, Java, Philippine Islands and tropical Africa. It is very common in bushy places in the montane zone in Ceylon at an altitude of 3,000—7,000 feet. Nuwara Eliya, Wattedoda, Horton Plains, etc.

Natal. Durban, Wood 422, May 1885. *India.* Himal. Bor. Occ., T. Thomson. Sikkim: J. D. Hooker: Darjeeling, Clarke 8839, Aug. 1869. East Bengal: Herb. Griffith 3069, Kew Distribution 1862—3. Canara: Talbot, Oct. 1881. Nilghiri Hills: No. 301, April 1855. Pen. Ind. Or., Herb. Wight 1508, Kew Distribution 1866—7. *Ceylon.* Central Prov., Horton Plains, Bogawantalawa Road, Willis, Jan. 1906. Sabaragamuwa Prov., Ratnapura, A. de Alwis, April 1930. Without locality, Thwaites C. P. 2705; Walker 151, Herb. Wight property. *Java.* Herb. Kooders 26316 B. *Japan.* Yokohama, Maximowicz, 1862.

Composition. The roots of this plant contain the colouring principles, purpurin, pseudopurpurin or purpiro-xanthin carbolic acid and probably oxalic acid.

Uses. A decoction of the roots is given for certain disorders of the urinary organs, inflammatory conditions of the chest and colic. The root is applied externally on fractures and other inflamed organs. A paste of the root with honey is used to remove freckles and other discolourations of the skin. In Africa, a decoction of the leaf and root is given for pleurisy and other inflammatory conditions of the chest. The Zulus take a decoction of the root to cure lack of seminal emission and for overdue menses. In Tanganyika, the root and fruit are used as a red dye for staining floor boards.

25. *Tarenna asiatica* (Linn.) Alston in Trim. Handb. Fl. Ceyl. 6: Suppl. 150. 1931.

Rondeletia asiatica Linn.— *Werbera corymbosa* Willd.— *Werbera asiatica* Bedd.— *Werbera glomeriflora* Kurz— *Chomelia asiatica* O. Ktze.— *Stylocoryne werbera* A. Rich.— *Stylocoryne rigida* Wight— *Tarenna zeylanica* Gaertn.

Sinh. Tarana; *Tam.* Karanai.

A small tree or large bush with smooth pale grey bark, compressed glabrous twigs and the buds exuding a waxy secretion; leaves simple, opposite, stipulate, 6.2—15 cm long, oblong-lanceolate, acute at both ends, glabrous, polished above, rather thick, lateral veins prominent beneath, usually with small pits at their axils, petioles 1.2 cm long, stipules narrowly triangular, acute, closely pressed to the stem and at first glued to it by waxy secretion, subpersistent; flowers regular, bisexual, white on short nearly glabrous pedicels, in trichotomous cymes; sepals 5, fused, limb short, calyx segments oblong, obtuse, faintly pilose; petals 5, fused into a tube, hairy at the mouth, lobes longer than the tube, oblong, acute, reflexed, twisted in bud; stamens 5, inserted at the mouth of the corolla, filaments short, exerted; ovary inferior, 2-locular with few ovules in each loculus, half immersed in fleshy axile placentae, stigma and portion of the style exerted; fruit a globose 2-chambered berry, glabrous, dull green becoming black usually without calyx segments at the top.

Flowers from February to April and in September.

Illustrations. Edward, Bot. Reg. *pl.* 119. 1816; Beddome, Flor. Sylvat. Anal. Gen. *pl.* 16, *fig.* 2. 1874; Wight, Ic. Pl. Ind. Or., *pl.* 309. 1840; *pl.* 584. 1840—1843; *pl.* 1064. 1846. Herb. Peradeniya, drawing.

Distribution. Occurs in India, Ceylon and Java. It is very common from sea level to 7,000 feet elevation in Ceylon. Jaffna, Matale, Balangoda, Madugoda, etc.

India. Khasia: *J. D. Hooker & T. Thomson.* Malabar, Concan, etc. *Stocks, Law, etc.* Pen. Ind. Or., *Herb. Wight* 1331, Kew Distribution 1866—7. **Ceylon.** Central Prov., Haragama, *Alston* 1265, April 1926; Between Nugatenne and Madugoda, *Alston*, Sept. 1926; *Alston* 1264, March 1927. Without locality, *Thwaites C. P.* 185. **Java.** *A. Richard.*

Uses. The fruit of this plant mashed and applied on boils, promotes suppuration.

26. *Wendlandia bicuspida* Wight & Arn. Prodr. 403. 1834.

Wendlandia thyrsoidea Steud.— *Wendlandia notoniana* Wall.— *Werbera thyrsoidea* Roth.—
Canthium thyrsoideum Roem.

Sinh. Rawanidala.

A small tree or large shrub with erect or ascending branches and orange red bark coming off in fibrous strips; branches densely pubescent and buds silky; leaves simple, stipulate, usually 3 at a node, 10—12.5 cm long, lanceolate oval, much tapering to base, acuminate, acute at apex, slightly pilose on the upper surface, pubescent beneath, undulate, rather thick, bright light green, paler beneath with the prominent veins pink, petioles very short, pubescent, stipules 0.6 cm long, linear-lanceolate, acute, conduplicate, sometimes bifid; flowers regular, bisexual, white, sessile or nearly so, very numerous, rather close on the branches of dense pubescent pyramidal terminal panicles 15—30 cm long, bracts small, setaceous; sepals 5, fused into a nearly glabrous calyx, segments small, acute; petals 5, fused, tubular below, then recurved, hairy within, lobes twisted in bud; stamens 5, epipetalous in corolla-tube, ovary inferior, 2-locular, globose with numerous ovules on large axile placentae, style long stigma large, bilobed, slightly exerted; fruit a 2-valved capsule, capped by the calyx, splitting from above loculicidally about half-way down.

Flowers during February and March.

Illustrations. Wight, Ic. Pl. Ind. Or., *pl.* 1033. 1843—1845; Beddome, Flor. Sylvat. *pl.* 224. 1868—1873; Herb. Peradeniya, drawing.

Distribution. Occurs in India and Ceylon. It is very common in open places in the moist regions of Ceylon from sea level to all elevations.

India. Pen. Ind. Or., *Herb. Wight* 1336 & *Herb. Wight* 1338, Kew Distribution 1866—1868. **Ceylon.** Central Prov., Nuwara Eliya, *Thwaites C. P.* 315; Hakgala, *A. M. Silva*, March 1906; Ramboda, Nuwara Eliya, *Mueller-Dombois & Cooray* 68011201, Jan. 1968; Ohiya, *Mueller-Dombois* 67091503, Sept. 1967. Southern Prov., Mawenella, *Herb. Peradeniya*, Feb. 1881.

Uses. This plant is used medicinally in Ceylon.