

**ICONES
ROXBURGHIANAE
OR
DRAWINGS OF
INDIAN PLANTS**

FASC. III



BOTANICAL SURVEY OF INDIA

CALCUTTA

1969

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LIST OF PLATES

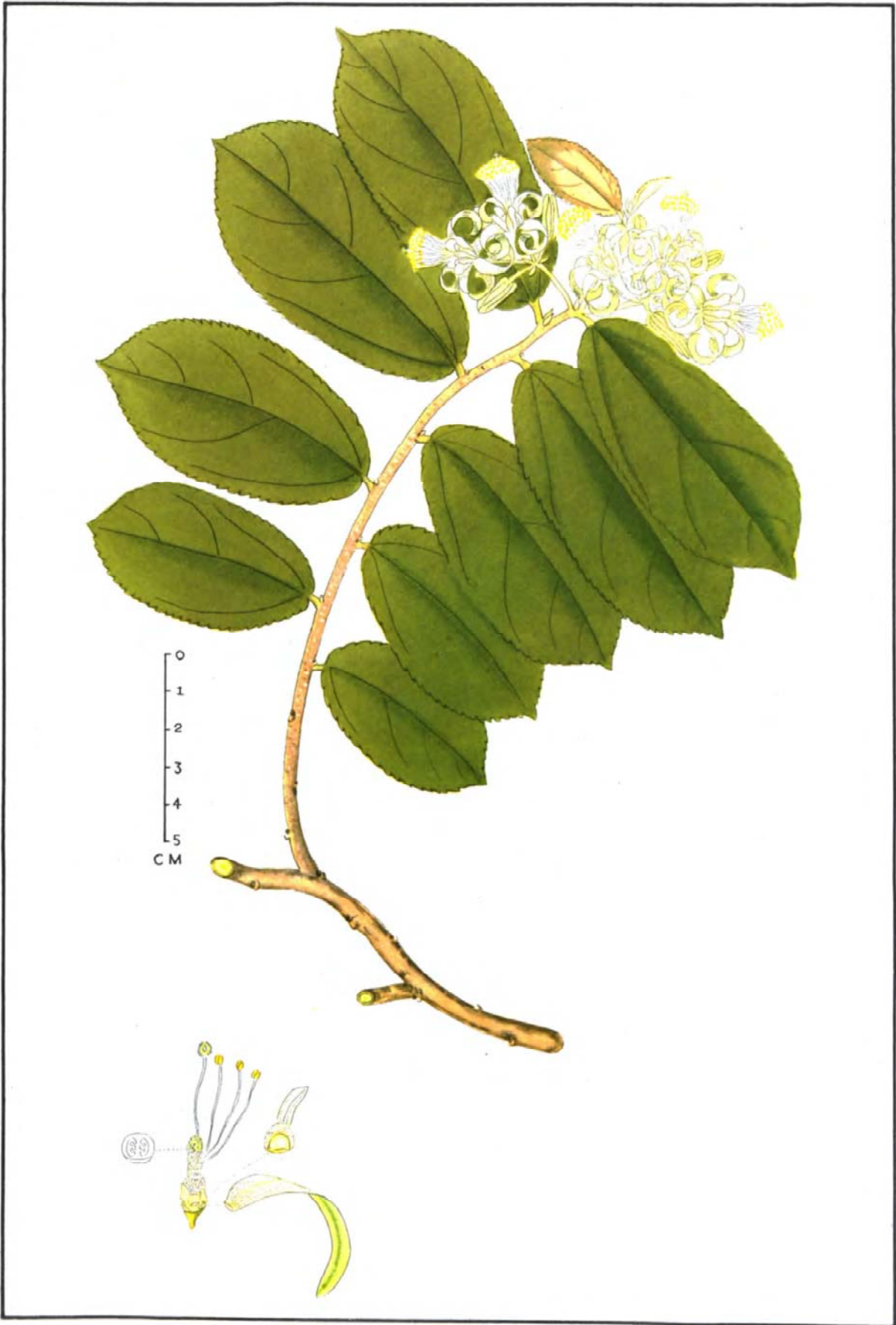
<i>Plate No.</i>	<i>Name</i>	<i>Roxburgh's Icon No.</i>
1	<i>Grewia umbellata</i> Roxb.	2522
2	<i>Impatiens tripetala</i> Roxb.	2458
3	<i>Zanthoxylum alatum</i> Roxb.	1916
4	<i>Vitis lanata</i> Roxb.	584
5	<i>Vitis latifolia</i> Roxb.	1224
6	<i>Vitis parvifolia</i> Roxb.	2454
7	<i>Cissus adnata</i> Roxb.	1787
8	<i>Cissus angustifolia</i> Roxb.	2035
9	<i>Cissus elongata</i> Roxb.	1528
10	<i>Cissus glauca</i> Roxb.	540
11	<i>Cissus lanceolaria</i> Roxb.	2429
12	<i>Cissus setosa</i> Roxb.	542
13	<i>Harpullia cupanioides</i> Roxb.	2187
14	<i>Brucea sumatrana</i> Roxb.	1529
15	<i>Canarium bengalense</i> Roxb.	2311
16	<i>Melia tomentosa</i> Roxb.	1430
17	<i>Walsura piscidia</i> Roxb.	47
18	<i>Walsura robusta</i> Roxb.	2245
19	<i>Walsura ternata</i> Roxb.	646
20	<i>Heynea trijuga</i> Roxb.	1843
21	<i>Cedrela toona</i> Roxb.	922
22	<i>Celastrus monosperma</i> Roxb.	2184
23	<i>Hippocratea arborea</i> Roxb.	1316
24	<i>Hippocratea obtusifolia</i> Roxb.	2013

1. GREWIA UMBELLATA Roxb.

Shrubby, scandent. *Leaves* cuneate-oblong, serrate. *Umbellets* terminal. *Petals* linear, entire. *Receptacle* cylindric, with pentagonal base.

A native of Sumatra. It flowers in the Botanic Garden at Calcutta in April and May.

(W. Roxburgh, *Flora Indica* 2: 591, 1832)



GREWIA UMBELLATA Roxb.

2. IMPATIENS TRIPETALA Roxb.

Leaves alternate, opposite and tern, broad-lanceolar, serrate. *Peduncles* from one to many-flowered. *Corol* three petalled; horn of the ample nectary hooked.

A native of the mountains near Silhet, where it flowers and ripens its seed more or less the whole year round. *Rheede's Tilo-Onapu* is, I think, more like this than it is to *I. balsamina*, though quoted for that species; and I can scarcely conceive this to be that plant in its original wild state.

Root annual, fibrous. *Stem* erect, swelled at the leaves, scarcely pubescent in any respect. *Branches* opposite, several pairs, and generally below the middle of the plant; whole height from one to two feet. *Leaves* on the stem opposite, and tern; on the branches often alternate, long-petioled, broad-lanceolar, serrate, a little hairy, particularly the serratures; about three inches long, by one broad. *Flowers* axillary, from one to many, in the latter case their long pedicels are inserted on a very short, common peduncle. *Perianth* of two, small, bract-like leaflets. *Corol* three-petalled; the upper one forming a roof over the interior part of the whole flower; *lateral* pairs composed of two, large, roundish lobes each; the lower lobes thereof forming the lip. *Nectary* large, with a hooked or incurved slender horn from its obtuse end. *Stamina*, &c. as in the genus.

It has a pretty appearance when in full blossom, the flowers being numerous, large, and of a lively red colour, with the nectary deeply tinged yellow.

(W. Roxburgh, *Flora Indica* 1: 651, 1832)



IMPATIENS TRIPETALA Roxb.

3. ZANTHOXYLUM ALATUM Roxb.

Shrubby, ramifications straight. *Thorns* stipulary; *leaflets* from two to five pair, opposite, lanceolate, serrulate, common petioles winged. *Panicles* axillary, male flowers with from six to eight stamina.

Hind. Durmur.

Zanthoxylum. *Asiat. Res.* vi. 376.

A native of Nepal, and other mountainous countries north of Bengal, Rohilcund and Oude. In the Botanic Garden they blossom during the hot and rainy seasons.

Trunk short. *Branches* several, straight, expanding, covered with dark-brown bark, spotted with small, scabrous, white dots; our plants now ten years old, are from ten to twelve feet high. *Prickles* stipulary, straight, dark-coloured and sharp. *Leaves* alternate, unequally pinnate, from two to four inches long. *Leaflets* from three to thirteen, five or seven most common, opposite, sessile, lanceolate, in young plants crenulate, pretty smooth on both sides, with a few pellucid points containing a fragrant juice. *Petioles* winged. *Stipules* none. **MALE.** *Racemes* axillary, often compound, shorter than the leaves. *Flowers* minute, pale yellow. *Calyx* small, one-leaved, with from six to eight acute divisions. *Corol* none. *Filaments* six, seven, eight, much longer than the calyx. *Anthers* twin. *Pistillum* or hemispheric gland, with two or three elevations in the centre, like so many stigmas. **FEMALE.** *Racemes* as in the male. *Flowers* very minute, greenish yellow. *Calyx* as in the male. *Corol* none. *Stamens* none. *Germes* superior, as far as five, three or four are most common, one-celled, containing two ovula, attached to the top of the inner angle of the cell. *Styles* single, shorter than the germes, recurved. *Stigmas* single. *Capsules*, in general one, two, or three come to maturity, roundish, reniform or ovate, of the size of a small pea when recent, when dry wrinkled, and much smaller, short-pedicelled, one-celled, two-valved, opening round the apex. *Seeds* solitary, conform to the capsule, attached to the middle of the margins of the capsule, on one side. *Integuments* two; the *exterior* one of a shining black, thick, porous and brittle; the *inner* one thinner and brown. *Perisperm* conform to the seed, fleshy. *Embryo* inverse, nearly as large as the perisperm. *Cotyledons* round-cordate, three-nerved. *Radicle* superior, oblong.

Every part of the plant possesses a peculiar aromatic pungency, which I cannot well compare to any smell, or taste I am acquainted with. The seeds are used medicinally by the natives of the countries where the plants grow.

(W. Roxburgh, *Flora Indica* 3: 768, 1832)



ZANTHOXYLUM ALATUM Roxb.

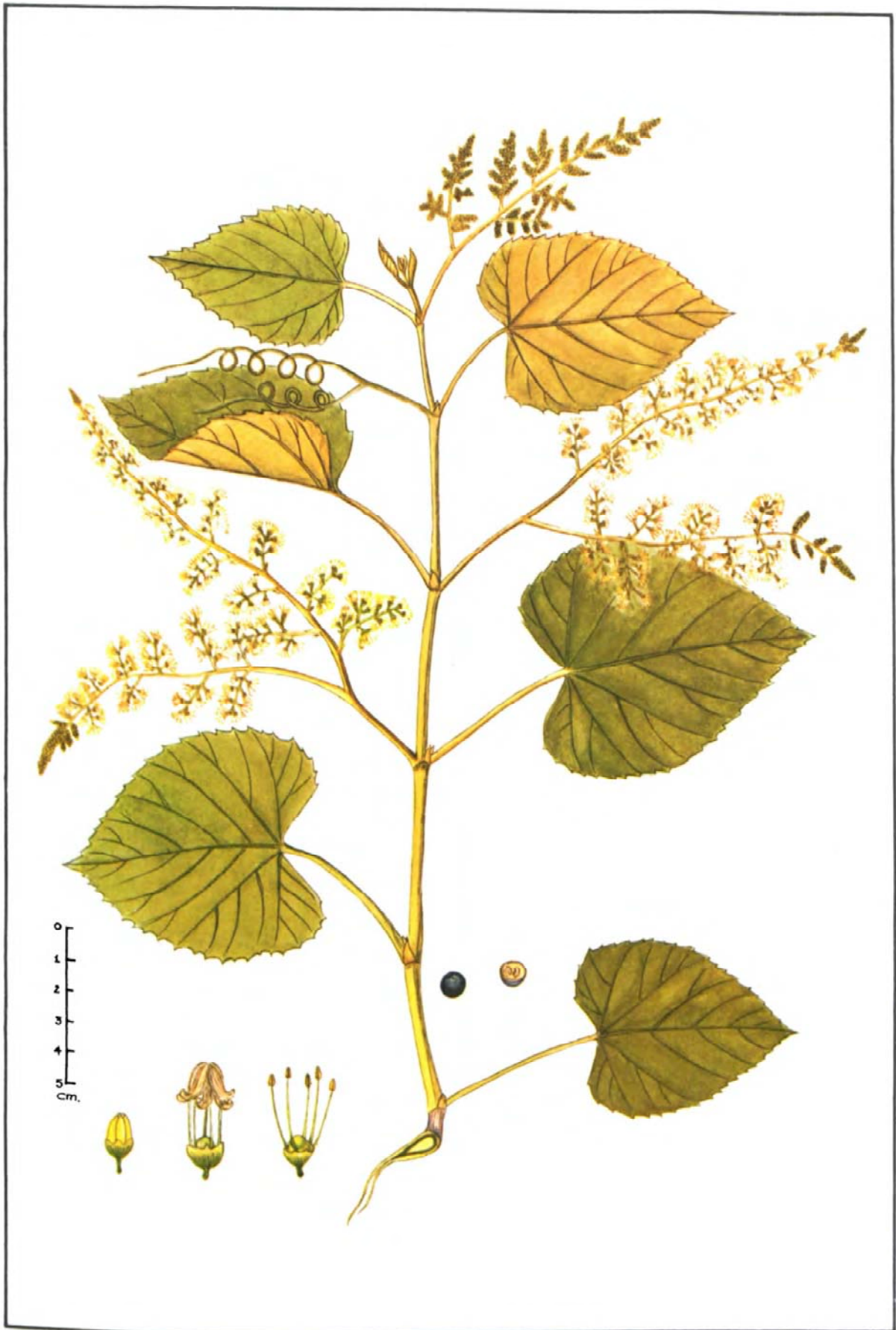
4. VITIS LANATA Roxb.

Shrubby, climbing. *Leaves* cordate, serrate, woolly underneath. *Racemes* paniced, leaf-opposed. *Petals* cohering at top.

A native of the forests amongst the Circar mountains. Flowering time the cold season.

Trunk woody, climbing over trees, &c.; *young shoots* very long covered with a little rusty wool. *Tendrils* opposite, simple or split. *Leaves* alternate, petioled, cordate, serrate; above a little woolly, below much so; four inches long, by three broad. *Petioles* round, woolly, two inches long. *Peduncles* opposite, composed of compound racemes, a little woolly. *Flowers* very numerous, small, green, fascicled. *Petals* cohering at the top; when they drop they seem to be a monopetalous corol, and what was at the top must then be considered as the bottom. *Berries* round, purple, succulent, size of a pea, one- or two-seeded.

(W. Roxburgh, *Flora Indica* 1: 660, 1832)



VITIS LANATA Roxb.

5. VITIS LATIFOLIA Roxb.

Herbaceous, climbing. *Leaves* cordate-lobate, crenate-serrate, smooth. *Tendrils* panicle-bearing. *Petals* oblong. *Germ*s embraced by a nectarial cup.

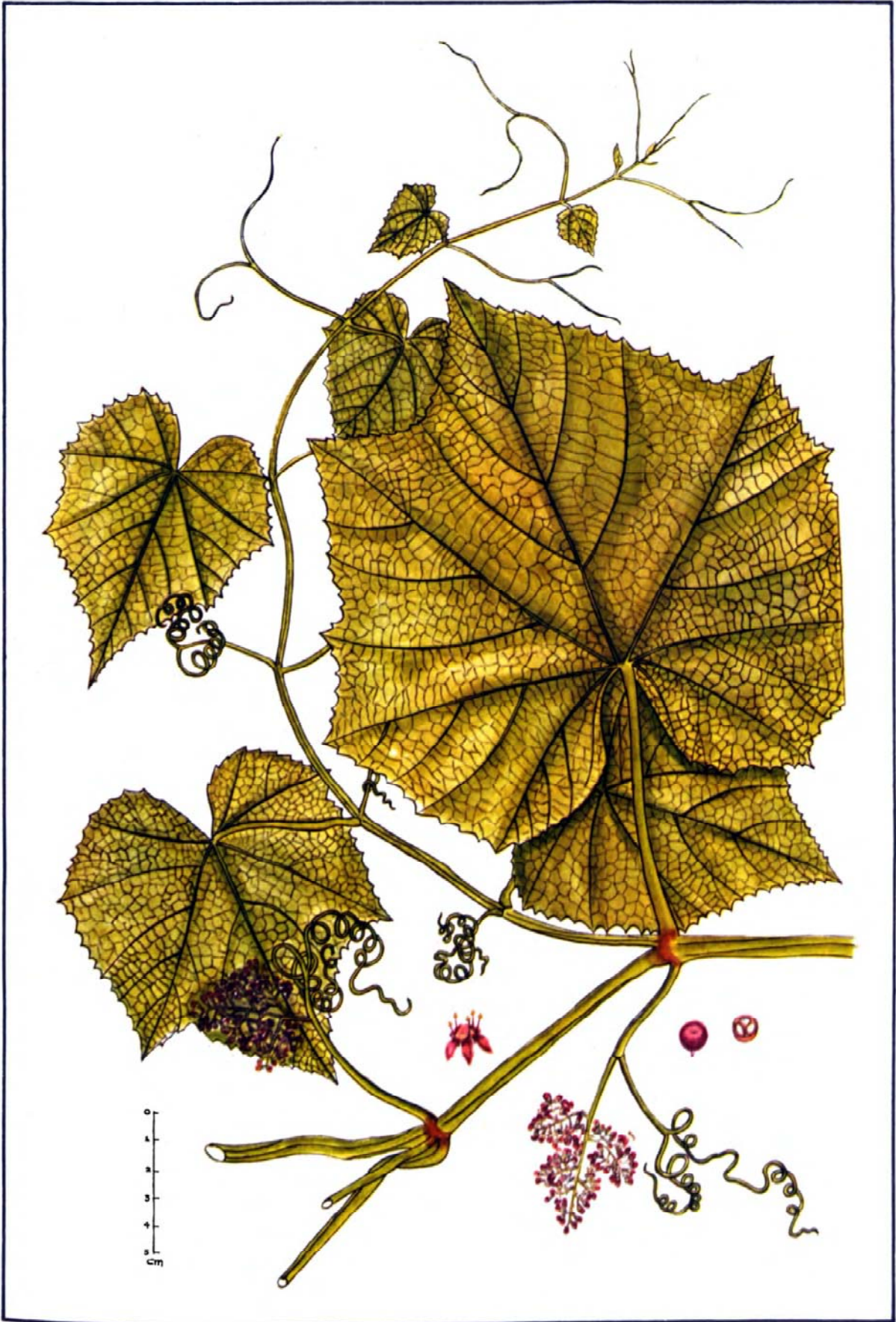
Vallia-Pira-Pitica, *Rheed. Mal.* vii. 13. t. 7.

Beng. Govila.

A native of Bengal and of the warmer maritime parts of India, blossoming about the beginning of the rainy season; and ripening its fruit in July.

Root tuberous. *Stem* and *branches* herbaceous, climbing, round and smooth, very long and slender, running over trees, &c. to a great extent. *Tendrils* leaf-opposed, generally two-parted panicle-bearing. *Leaves* petioled, alternate, always opposite to a tendril, nearly of a round, cordate-lobate shape, with three, five or seven rather acute lobes; margins serrate-dentate, pretty smooth on both sides, length and breadth from three to nine inches. *Panicles* issuing solitarily from the middle of the tendrils before they divide; *peduncles* ovate, dense. *Flowers* very numerous, small, of a deep reddish brown. *Bracts* linear. *Calyx* small, obscurely five-toothed. *Petals* oblong, at first expanding, then reflexed. *Germ* superior, nearly round, two-celled, with two ovula in each, attached to the bottom of the cell. *Style* none. *Stigma* a pit in the lobate apex of the germ. *Berry* the size, shape and appearance of a black currant, rarely more than two-seeded. *Perisperm* conform to the seed. *Embryo* erect, in the lower half of the perisperm. *Cotyledons* nearly round. *Radicle* inferior.

(W. Roxburgh, *Flora Indica* 1: 661, 1832)



VITIS LATIFOLIA Roxb.

6. VITIS PARVIFOLIA Roxb.

Leaves angle-cordate, three-lobed, crenate-serrate, smooth. *Stipules* oval. *Thyrses* leaf-opposed, few-flowered.

A slender, perennial vine of exactly the habit of the common grape vine; a native of the eastern part of Bengal. Flowers in February.

Stems and old *branches* ligneous, considerably flattened, ten or twelve feet high. *Bark* dark-brown, with the exterior lamina thin and frequently peeling off; *young shoots* somewhat angular, and pretty smooth. *Leaves* simple, cordate, sometimes three-lobed, crenate-serrate, apex somewhat attenuate, smooth on both sides, about two inches long. *Tendrils* bifid. *Stipules* oval, caducous. *Thyrses* opposite to the leaves, diverging, very small, and only a little longer than the petioles. *Flowers* very minute, green. *Calyx* obscurely five-lobed. *Petioles* five, cohering, and falling off in one body. *Nectary* five-rounded scales, embracing the base of the germ, alternate with the filaments. *Filaments* five, length of the germ, at first erect, but by age becoming recurved. *Anthers* ovate. *Germ* round, four-celled, with one *ovulum* in each, attached to the base of the axis. *Style* scarcely any. *Stigma* obscurely lobed.

(W. Roxburgh, *Flora Indica* 1: 662, 1832)



VITIS PARVIFOLIA Roxb.

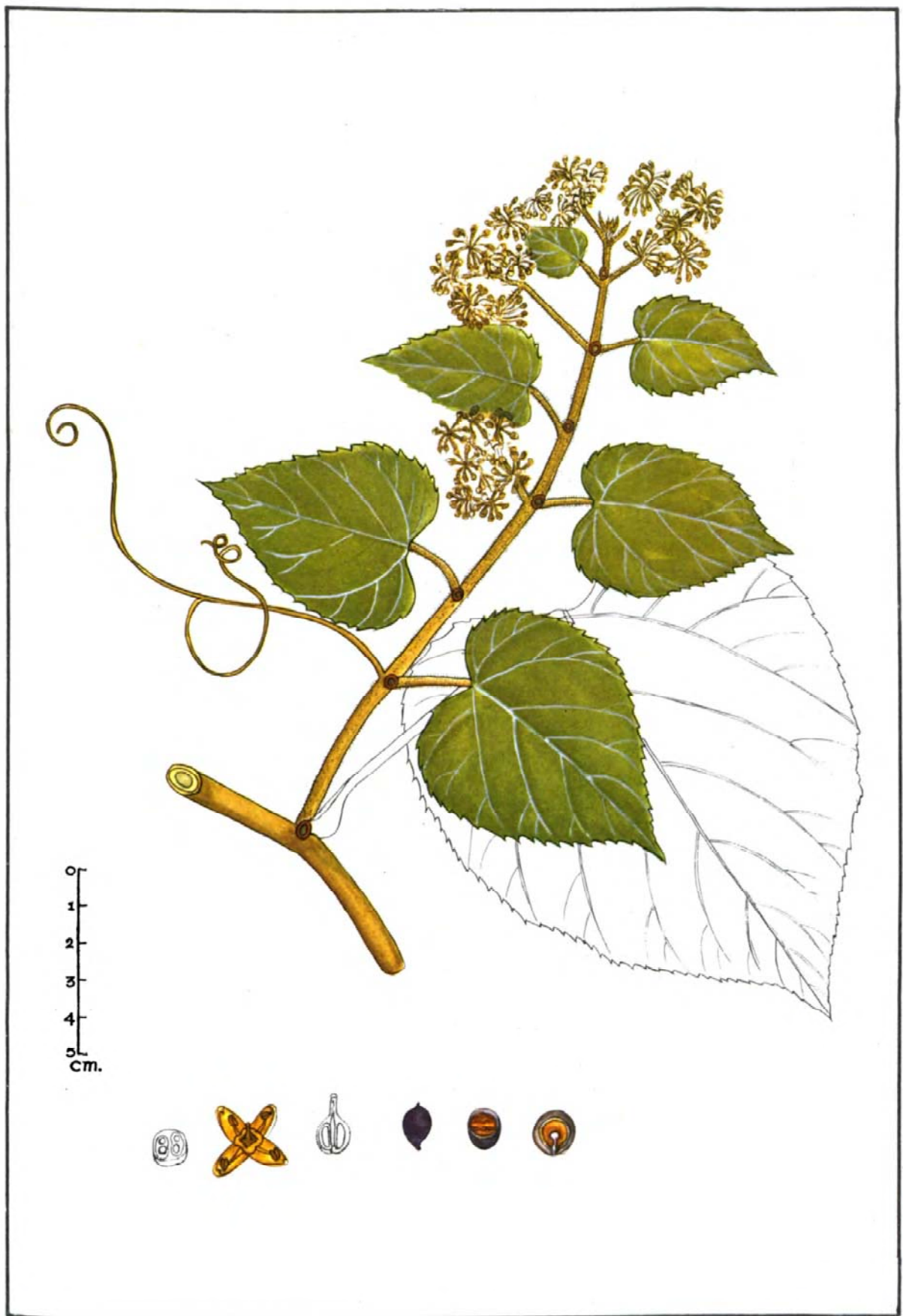
7. CISSUS ADNATA Roxb.

Leaves round-cordate, bristle-serrate, acuminate. *Stipules* orbicular, adnate, with gibbous centre and scariose margins. *Cymes* flat, flowers drooping.

A native of the country about Dacca, from thence the late Colonel Peter Murray sent it to the Botanic Garden, where it thrives well, blossoms in May and June, and ripens its fruit in September.

Stem and large *branches* ligneous, climbing over trees to a considerable extent, *young shoots* round, a little downy and slightly furrowed. *Leaves* alternate, round-cordate, and often obliquely so, acuminate, bristle-serrate, the largest sometimes slightly repand; pretty smooth above, but downy underneath, particularly the veins, from two to six inches long, one-fourth less in breadth. *Peduncles* half the length of the leaves, downy. *Stipules* nearly oval, adnate, elevated, and of a deeper green in the middle; *margins* scariose and brown. *Tendrils* opposite to the leaves where there is no cyme. *Cymes* opposite to the leaves, on villous peduncles, as long as the petioles, very ramous, flat. *Flowers* numerous, small, drooping. The germ has two cells, in each of which are two seeds attached from their lower end to the partition at the bottom of the cell. *Berry* succulent, size of a pea, when ripe black and smooth, generally one-celled. *Seed* for the most part solitary, obovate, lower end pointed. *Integuments* two, exterior nuciform, and rugose; *inner* a very thin, white membrane, which adheres firmly to the perisperm. *Perisperm* conform to the seed, dull white, cartilaginous, divided by two fissures into three, nearly equal parts. *Embryo* scarcely half the length of the perisperm. *Cotyledons* reniform. *Radicle* oblong, inferior.

(W. Roxburgh, *Flora Indica* 1: 405, 1832)



CISSUS ADNATA Roxb.

8. CISSUS ANGUSTIFOLIA Roxb.

Dioicous. *Leaves* ternate; *leaflets* lanceolate, serrate, smooth. *Stipules* ovate, acute. *Cymes* shorter than the petioles. *Berries* spherical, one or two-seeded.

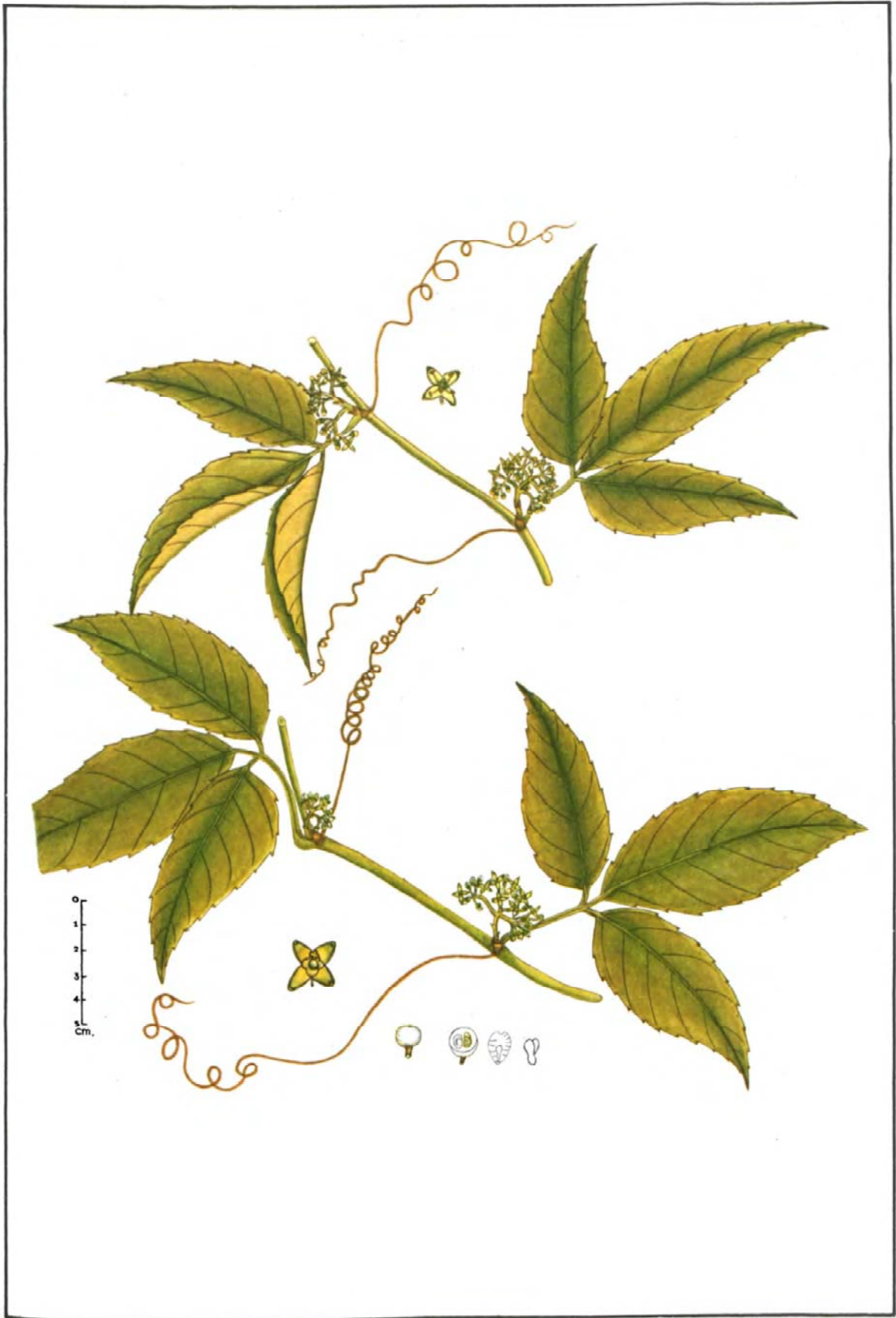
A delicate, scandent, perennial species, a native of Sumatra. Flowers in February; seeds ripen in November.

Stem scandent, slender, flat like a piece of tape. *Tendrils* simple. *Leaves* ternate. *Leaflets* petiolate, lanceolate, remotely serrate, acuminate, smooth on both sides, from three to six inches long, and from one to one and a half broad. *Petioles* shorter than the leaflets, channelled, smooth. *Stipules* triangularly ovate, acute, smooth. *Cymes* axillary, solitary, nearly round, small and shorter than the petioles. *Flowers* small, greenish yellow, male on one plant and female on another.

MALE. *Calyx*, *corol* and *stamina* as in the genus. *Pistil* no other than a small abortive roundish body on the centre of a four-lobed gland.

FEMALE. *Calyx* and *corol* as in the male. *Germ* round, two-celled, with two seeds in each. *Style* none. *Stigma* large, obscurely four-lobed, and somewhat lacerated. *Berries* spherical, smooth, size of a pea, white, one or two-seeded, when cut or bruised very fetid. *Perisperm* conform to the seed. *Embryo* lodged in the lower half of the perisperm. *Cotyledons* nearly round. *Radicle* cylindric, inferior.

(W. Roxburgh, *Flora Indica* 1: 408, 1832)



CISSUS ANGUSTIFOLIA Roxb.

9. CISSUS ELONGATA Roxb.

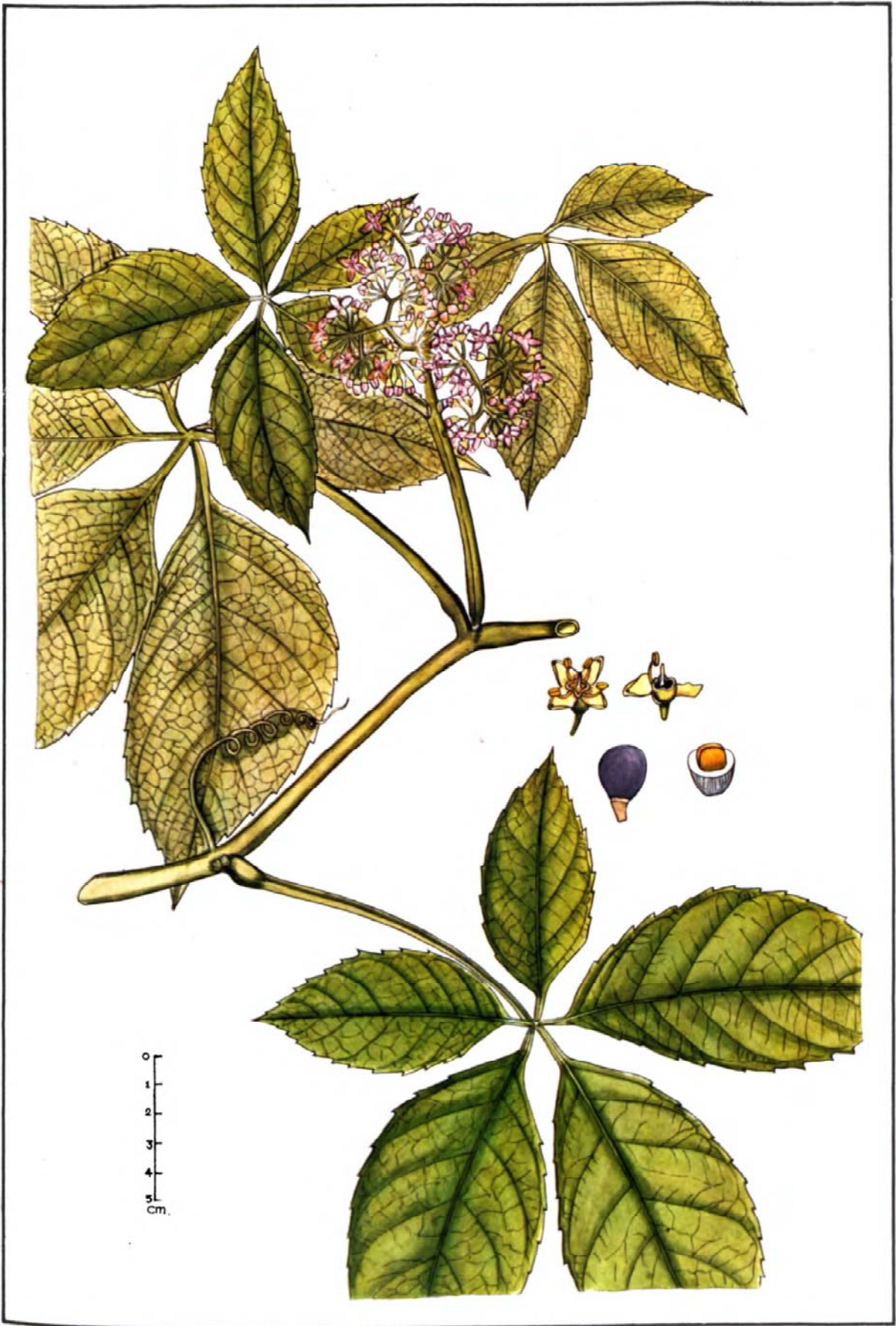
Tender shoots succulent, polished. *Leaves* digitate; *leaflets* petiolate, oblong, acute, remotely serrate, smooth.

Beng. Dhemna, which is also the name of a long serpent.

Found amongst the mountains of the coast of Coromandel, as well as in the forests of Bengal. Flowering time the hot season.

Stem very long, running up and over the highest trees, a little compressed, and until many years old smooth, polished, succulent, deep green. *Branches* few or none, until the plant arrives at a great height, and is several years of age. *Leaves* alternate, petioled, digitate. *Leaflets* five, petioled, oblong, the lower pair obliquely so, serrate, smooth on both sides, from two to six inches long, and from one to three broad. *Petioles* round, smooth, from four to five inches long. *Petiolets* channelled. *Stipule* cordate, small, sub-adjointed. *Tendrils* leaf-opposed, simple. *Cymes* trichotomous and dichotomous; the last divisions short, and ending in small umbellets. *Bracts* cordate, permanent. *Calyx* four-toothed. *Corol*, petals four, inserted in a belt which surrounds the body of the germ. *Nectary* a four-lobed, coloured elevation between the stamina and the insertion of the style. *Filaments* four, inserted opposite to and just within the petals. *Anthers* incumbent. *Germ* oval. *Style* short. *Stigma* simple. *Berry* the size of a cherry, round-turbinate, smooth, when ripe black. *Seed* single, large, somewhat rugose.

(W. Roxburgh, *Flora Indica* 1: 411, 1832)



CISSUS ELONGATA Roxb.

10. CISSUS GLAUCA Roxb.

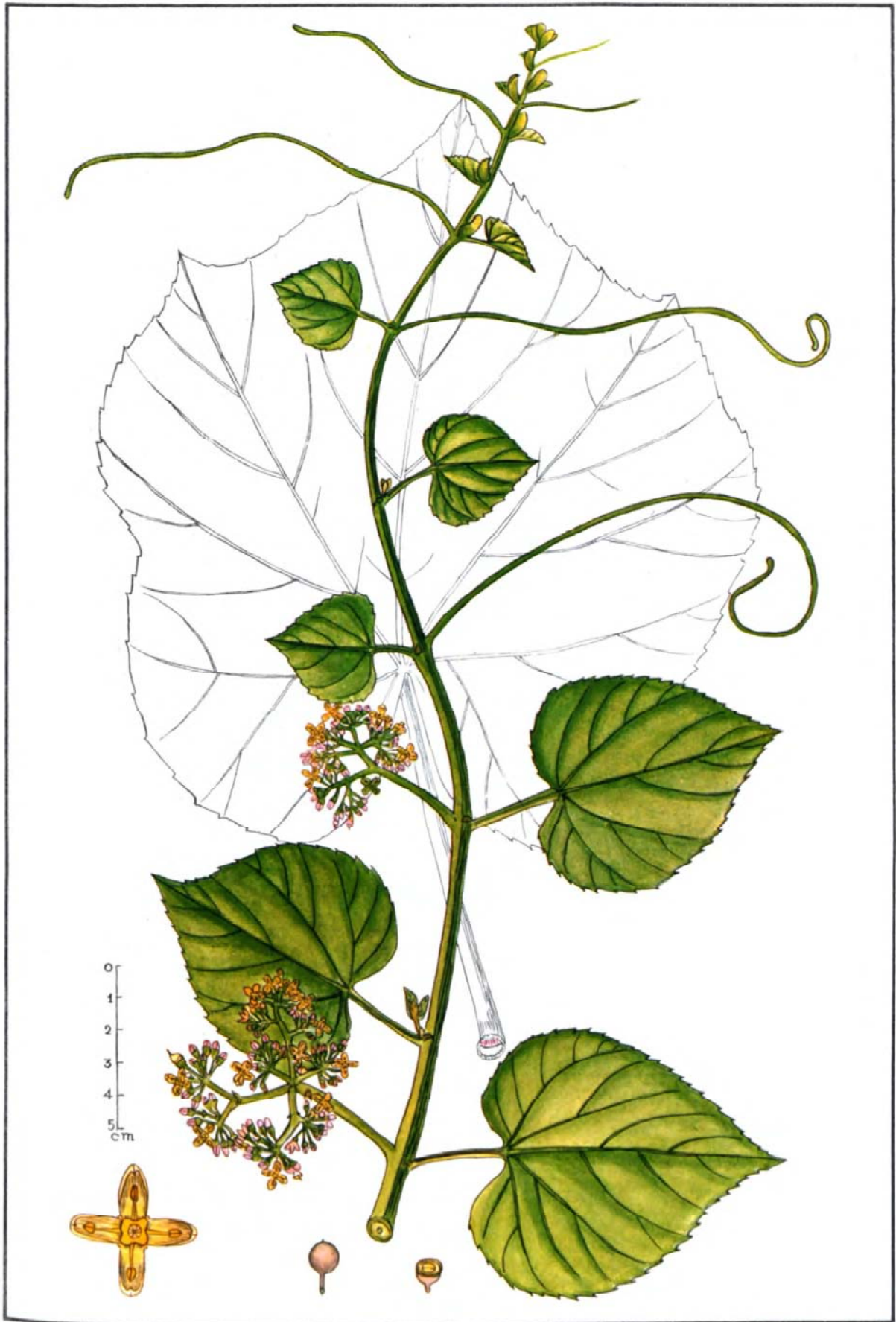
Leaves cordate, bristle-serrate, smooth. *Stipules* broad-sulcate. *Cymes* compound. *Berries* one-seeded.

Schunambu Valli. *Rheed. Mal.* vii. p. 21. t. 11.

This species is still larger than the last, and a native of the same or similar places; the shoots, the tendrils, petioles and peduncles are all quite smooth and somewhat glaucous, which does not admit of my considering it to be either *repanda* or *latifolia*.

Tendrils leaf-opposed, undivided. *Leaves* alternate, petioled, broad-cordate, more or less acuminate, sometimes when large slightly lobed, bristle-serrate, smooth, from four to eight inches each way. *Stipules* broad-fulcate, apex rounded, caducous. *Cymes* with from three to five primary branches; ultimate divisions umbelliferous. *Berry* nearly round, size of a pea, smooth, succulent, purple, rarely more than one-seeded. *Seed* obovate. *Integument* a double membrane, with a spongy silver-coloured substance between. *Perisperm* and *embryo* as in the genus.

(W. Roxburgh, *Flora Indica* 1: 406, 1832)



CISSUS GLAUCA Roxb.

11. CISSUS LANCEOLARIA Roxb.

Dioicous. *Leaves* pedate-quinate; *leaflets* lanceolar, smooth, remotely serrulate. *Stipules* conically lanceolate. *Cymes* the length of the petioles.

Vallia-Tsjori-Valli. *Rheed. Mal.* vii. p. 15. t. 8.

A native of the mountains along the eastern frontier of Bengal. In the Botanic Garden it blossoms in February and March.

Trunk scandent, stout, ligneous, in six years old plants as thick as a man's wrist, flattened and grooved on the two flat sides. *Bark* dark-brown, rough or deeply cracked. *Branches* and *branchlets* climbing or pendulous when not supported; young parts round, green and generally smooth; extent of the whole plant several fathoms. *Tendrils* leaf-opposed, generally undivided. *Leaves* alternate, petioled, pedate. *Leaflets* generally five, lanceolar, recurvate, most remotely and sharply serrulate, long, taper, acute-pointed, both sides polished, texture rather fleshy, length from three to six inches, and from one to two broad. *Petioles* and *petiolets* clothed with short, reddish hairs. *Stipules* large, of a narrow conic shape. *Cymes* sub-axillary, or close by the side of the base of the petioles, shorter than the petioles, or when most luxuriant much shorter than the leaves, the ultimate divisions each supporting a small globular umbellet, of small pale yellow flowers. *Bracts* round the base of the peduncles, cordate.

MALE. *Calyx* scarcely any. *Corol* and *stamina* as in the genus. *Pistil* none, an umbilicate, yellow, round, convex gland occupying its place.

(W. Roxburgh, *Flora Indica* 1: 412, 1832)



CISSUS LANCEOLARIA Roxb.

12. CISSUS SETOSA Roxb.

Herbaceous, scandent, bristly. *Leaves* sessile, ternate; leaflets grossly bristle-serrate. *Berries* one-seeded.

Teling. Barubutsali.

A native of forests and hedges in the Rajamundree Circar. Flowering time the rainy season.

Root fusiform, perennial. *Stems* herbaceous, succulent, round, striated, and covered with distinct, glandular, round-headed, white bristles, as is every part of the plant, even to the fruit. *Tendrils* leaf-opposed, generally two cleft. *Leaves* alternate, sessile, ternate, rarely quinate. *Leaflets*, lateral two (or four, when there are five) are sessile, the middle one is short-petioled; all are oval, waved, fleshy, irregularly and grossly bristle-serrate, both sides armed with the fore-mentioned bristles, size various, from one to five inches long. *Stipules* cordate. *Cymes* as in the former species. *Petals* revolute.

Obs. Every part of the plant is exceeding acrid. I unfortunately tasted both the roots and berries.

The leaves toasted and oiled, are applied to indolent tumours to bring them to suppuration.

(W. Roxburgh, *Flora Indica* 1: 410, 1832)



CISSUS SETOSA Roxb.

13. HARPULLIA CUPANIOIDES Roxb.
(*Harpullia cupanoides* Roxb.)

Harpulli the vernacular name at Chittagong.

A small tree; a native of the hilly parts near Chittagong, it flowers in April; and the fruit ripens in July.

Trunk straight. *Branches* few, and tending to be erect also; *bark* ash-coloured; *young shoots* smooth. *Leaves* alternate, abruptly pinnate, from twelve to eighteen inches long. *Leaflets* from four to six pairs, short-petiolate, from alternate to opposite, from ovate below to lanceolar above; all are entire, and smooth on both sides; apex considerably pointed; from three to six inches long, by one or two broad. *Petioles* round and smooth. *Panicles* axillary, solitary, erect, thin of branches and shorter than the leaves. *Flowers* small, pale yellow. *Bracts* subulate. *Calyx* inferior, five-leaved, permanent; *leaflets* oval. *Petals* five, lanceolate, obtuse, spreading, becoming recurved. *Filaments* five, alternate with the petals and much shorter. *Anthers* oblong. *Germ* ovate, hairy, somewhat two-lobed, two-celled, with one pendulous ovulum in each attached to the upper end of the partition. *Style* short. *Stigma* two-lobed; lobes reflex, adnate. *Capsules* pendulous, orbicular, two-lobed, considerably compressed, villous, two-celled, two-valved, opening all round. *Partition* opposed to the valves. The whole very exactly resembling the capsule of *Geloneum cupanoides* Gaert. *Carp.* ii 271. *t.* 139. *Seed* solitary, semi-oval; the inner side being straight, the exterior rounded, arilled. *Integument* single, rather thin, smooth, chesnut colour. *Aril* deep orange, covering the whole seed from the base except the apex. *Perisperm* none. *Embryo* green. *Cotyledons* two, conform to the seed, incumbent, their line of separation being nearly through the middle of the seed, which makes them equal. *Radicule* on the exterior or convex side of the seed, apex rather acute and turned up into a small hollow in the upper-most cotyledons, so that it points to the apex of the seed. After it has lengthened a little by the progress of vegetation, the two-lobed *plumula* is very conspicuous.

(W. Roxburgh, *Flora Indica* 1: 645, 1832)



HARPULLIA CUPANIOIDES Roxb.
(*Harpullia cupanioides* Roxb.)

14. BRUCEA SUMATRANA Roxb.

Shrubby. *Leaflets* serrate. *Racemes* axillary, generally compound.

Lussa-Radja, *Rumph. Amb. Auctuar.* 27. t. 15.

Mal. Ampadoo-Barrowing.

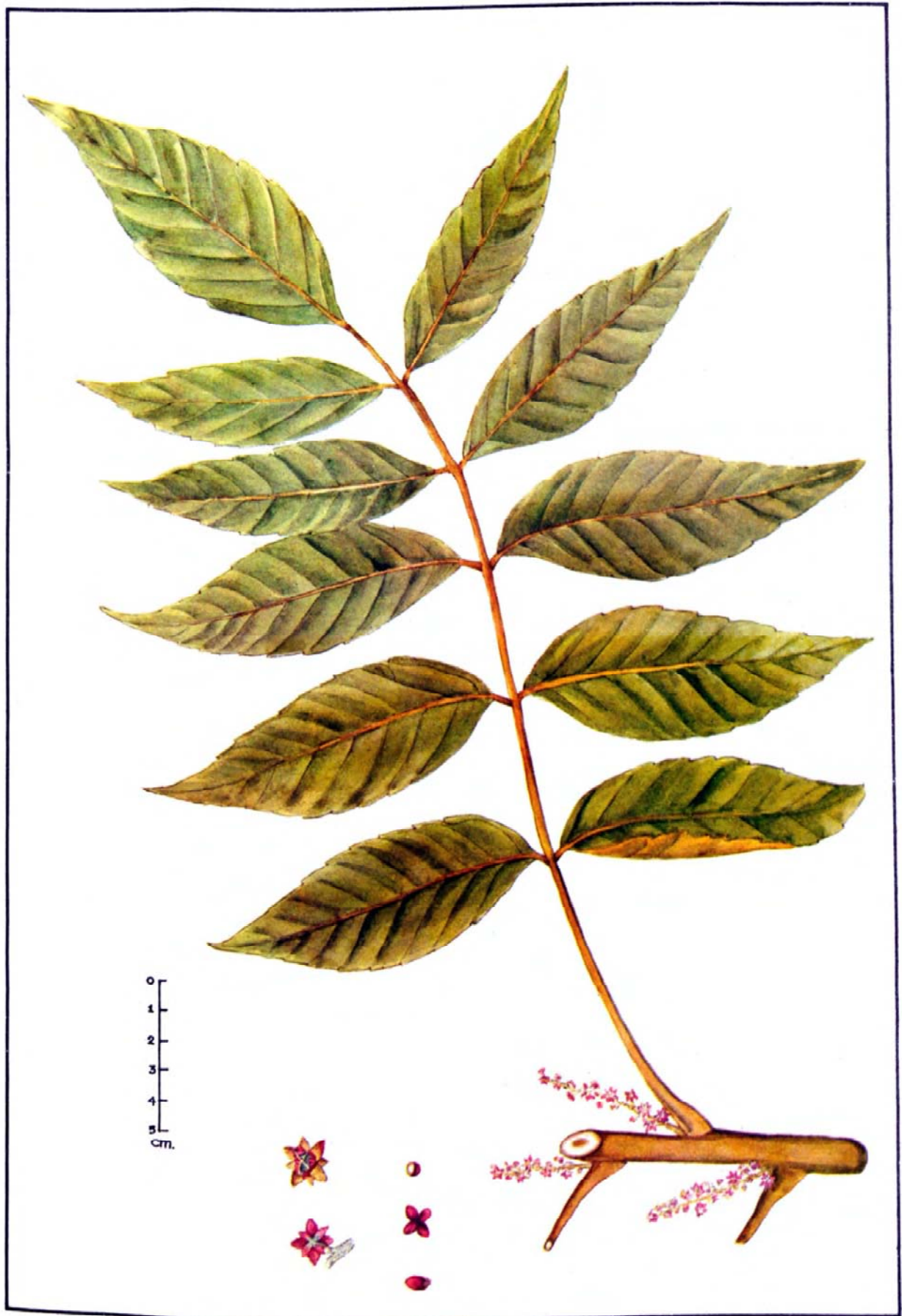
A native of Sumatra. From thence Mr. Ewer sent the seeds to the Botanic Garden, where in one year the plants were about four feet high with a straight ligneous stem; and few branches. They then began to flower in May, and continued to blossom and ripen their seed all the year.

Leaves scattered, unequally-pinnate, from twelve to eighteen inches long. *Leaflets* from four to six pair, opposite, short-petioled, obliquely ovate-lanceolate, grossly and obtusely serrate, pointed, villous underneath, from three to six inches long, very bitter, and somewhat foetid. *Petioles* common, round and villous. *Stipules* none. *Racemes* axillary, solitary, from one to six, or eight inches long, somewhat compound, dark purple, and clothed with a few white hairs. *Flowers* numerous, very minute, dark purple, and in all the Sumatra plants completely hermaphrodite. *Bracts* subulate, hairy, very small and caducous. *Calyx* four-leaved, or deeply four-parted. *Segments* small, ovate-lanceolate, deep purple, hairy on the outside and with the corols becoming reflexed. *Petals* four, longer than the calyx, lanceolate, dark purple, and hairy on the outside. *Nectary* a dark purple four-lobed, fleshy cup surrounding the insertion of the germs. *Filaments* four, short, purple, inserted under the margin of the nectary. *Anthers* oval, large and deep purple till they discharge their pollen. *Germes* four, superior, one-celled, with one *ovulum* in each attached to the upper and inner side of the cell. *Styles* single, short, recurved, one to each germ. *Stigmas* simple. *Drupes* four, when all come to maturity, size of a small grain of black pepper, smooth, dark purple, one-celled. *Nut* conform to the drupe, rugose, one-celled, inner edge thinner, and the upper half of it marked with a white line (the umbilicus). *Seed* conform to the nut. *Integuments* single, adhering to the perisperm, thin and white. *Perisperm* in very small quantity, indeed it may be called a fleshy inner integument. *Embryo* as long as the perisperm, straight, inverse. *Cotyledons* oval, fleshy. *Plumula* two-lobed. *Radicle* roundish, superior.

Obs. Since I first described this tree and only from plants that were completely hermaphrodite I have found some plants perfectly male, and others as completely female. In this plant, therefore, we have another instance of Trioicous Polygamy.

From the sensible qualities of the green parts of this plant, being somewhat foetid and simply, though intensely bitter, it promises to be as good an antedysenterical medicine as *Bruce's Abyssinian Wooginos* itself. As soon as the plants arrive at greater maturity the bark shall be dried, and compared with *Angustura* bark which has by some been thought that of *Brucea antedysenterica* of *Bruce's Travels & C.* vol. v. p. 69. also of *I. F. Miller, Tab.* 25. and still better described and figured by *L. Heritier* under the name *Brucea ferruginea, Stirp. Nov.* 19. t. 10. See also *Linn. Sp. Pl. ed. Willd.* iv. 742.

(W. Roxburgh, *Flora Indica* 1: 449, 1832)



BRUCEA SUMATRANA Roxb.

15. CANARIUM BENGALENSE Roxb.

Leaflets ovate, lanceolate, from six to ten pairs. *Stipules* subulate. *Panicles* sub-axillary, linear. *Drupe* ovate.

An immense forest tree, a native of Silhet and the adjoining mountainous countries north and east of that district; flowers in May and June, and the seed ripens about the beginning of the year. From fissures, or wounds in the bark, a large quantity of a very pure, clear, amber-coloured resin exudes, which soon becomes hard and brittle, and is not unlike *copal*, yet the natives set little or no value on it. It has hitherto, so far as I can learn, been unnoticed by any one else. In the Calcutta bazar, it is only valued at from two to three Rupees, for seven maunds of eighty pounds weight each.

Trunk erect, straight, many feet in circumference, the whole tree tall, and uncommonly well furnished. *Young shoots* void of pubescence, except the thin, tender, shooting points, and they are covered with a little rust-coloured, pubescence. *Leaves* alternate, round the ends of the branchlets, unequally pinnate, from twelve to twenty-four inches long. *Leaflets* sub-opposite, from six to ten pairs, from ovate-oblong to lanceolate, firm, entire and smooth, acuminate, from three to six inches long, by from one to two broad; *common petioles* round and smooth. *Stipules* subulate, clothed with long soft ferruginous down. *Racemes* solitary, insertion above the axils, sub-panicled, shorter, in flower and fruit all the year round. *Flowers* rather small, but numerous, many of them abortive, male hermaphrodites. *Calyx* inferior, cup-shaped, three-toothed. *Petals* three, obovate-oblong, smooth, while in the bud imbricated. *Nectary*, a three-lobed, hairy cup around the lower part of the germ, and within the tube, formed by the filaments. *Filaments* six, united into a tube for half their length. *Anthers* oblong, erect. *Germ* superior, ovate, small, three-celled, with two ovula in each attached to the top of the axis. *Style* short. *Stigma* three-cleft. *Drupe* oblong, size of a large olive, smooth, one-celled. *Pulp* in considerable quantity, firm and yellowish; surface dark purple, covered with bloom like the common plum. *Nut* conform to the drupe, pointed, obscurely three-cornered, with an aril from the apex to the base, runs down each of the three sides or faces, thick and very hard, three-celled, &c. almost exactly as in Gaertner's *Canarium sylvestre*, ii. p. 98. t. 102. except in the ribs on the three sides, not represented in his figure. *Seed* one, rarely two, in each cell, oblong. *Integument* single, rather spongy and brown. *Perisperm* none. *Embryo* inverse. *Cotyledons* intricately folded up as represented by Gaertner. *Radicule* superior, oblong.

(W. Roxburgh, *Flora Indica* 3: 136, 1832)



CANARIUM BENGALENSE Roxb.

16. MELIA TOMENTOSA Roxb.

Leaves pinnate; *leaflets* ten paired, entire. Thryses axillary, solitary, long-peduncled, simple.

Mal. Barang babee.

A native of Pulo Pinang, where it grows to be a large tree.

Leaves alternate, pinnate, six feet, or more in length. *Leaflets* opposite, ten or more pairs, sub-sessile, lanceolate, entire, fine-pointed, of a firm, leathery texture, reticulated, and very downy underneath; exterior pairs largest, often a foot in length. *Petioles* round, very downy. *Stipules* none. *Racemes* axillary, solitary, long-peduncled, thyriform, compound. *Flowers* pretty large, very numerous, crowded. *Bracts* subulate, downy. *Calyx* cup-shaped, almost entire, downy. *Petals* five, wedge-shaped, expanding. *Nectary* cylindric, nearly the length of the petals, the ten divisions of its mouth linear, and ragged on the inside; exceedingly hairy. *Stamens* as in the genus. *Germ* ovate, hairy. *Style* as long as the nectary, hairy. *Stigma* globular.

The ripe fruit has not been found, but the germ has five cells, with one seed in each.

(W. Roxburgh, *Flora Indica* 2: 394, 1832)



MELIA TOMENTOSA Roxb.

17. WALSURA PISCIDIA Roxb.

Leaves subternate; *leaflets* subternate oblong, obtuse.

Teling. Wallursi.

Tam. Walsura.

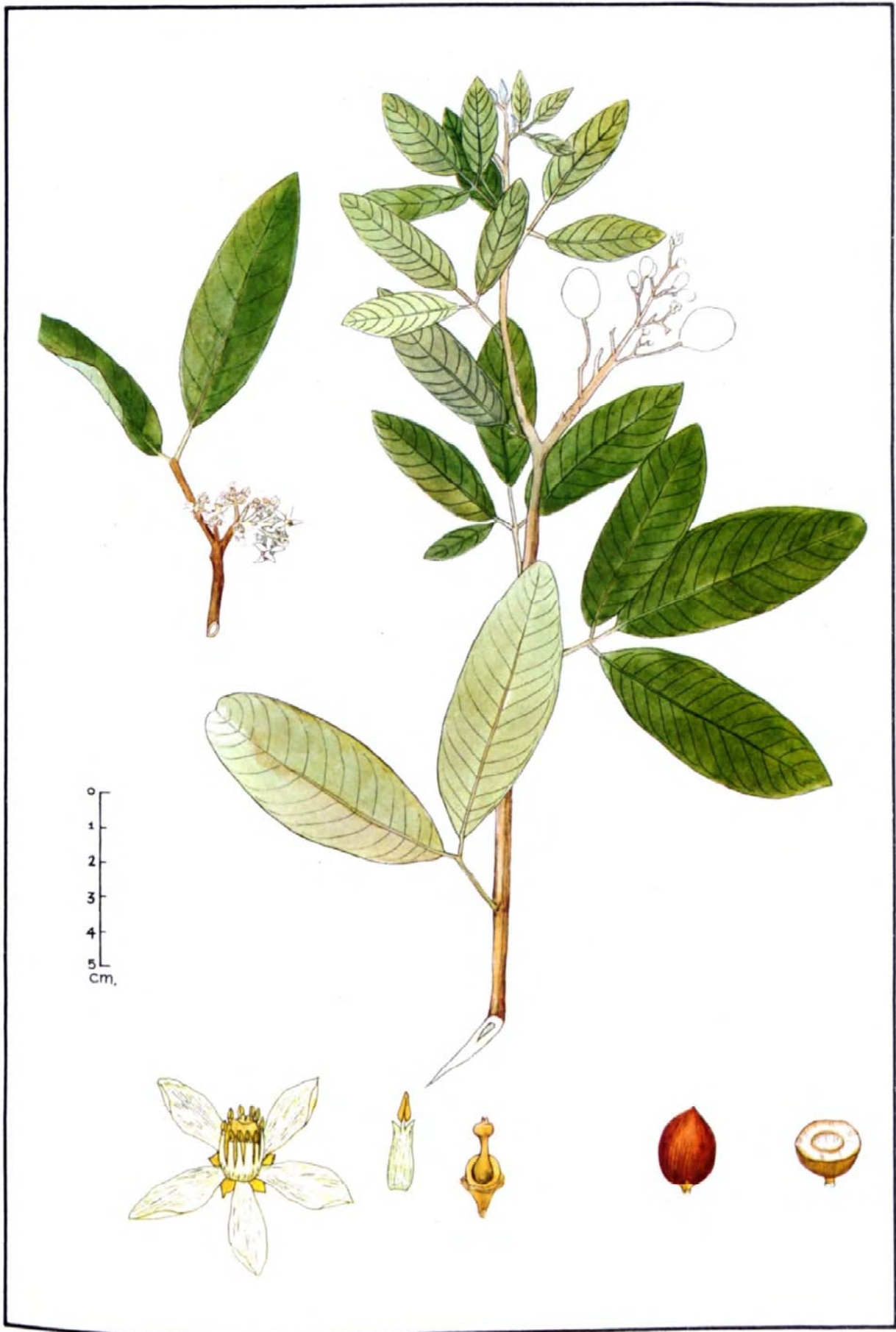
A tree, a native of the mountainous parts of the Circars. It flowers during the cold season. Specimens of this, in the Banksian herbarium, are referred to *Trichilia*.

Trunk erect. *Bark* ash-coloured; in old trees deeply cracked. *Branches* very irregularly scattered, forming a thin head. *Leaves* alternate, petioled, sub-pinnate. *Leaflets* from two to four, alternate, oblong, entire, frequently emarginate, above smooth, of a deep, shining green, below whitish, from two to three inches long, and about one broad. *Stipules* none. *Flowers* numerous, small, of a dirty yellowish white colour, collected on small terminal panicles. *Bracts* minute, falling. *Calyx* interior, five-cleft, permanent. *Petals* five, equal, lanceolate, expanding. *Nectary* double; *exterior* cylindric, half the length of the petals, ten-cleft for two-thirds of its length; *divisions* emarginate, staminiferous; *interior*, a fleshy ring surrounding the base of the germ. *Filaments* ten, short, inserted into the notches of the divisions of the exterior nectary. *Anthers* oblong, erect. *Germ* roundish, sunk deep into the interior nectary, two, rarely three-celled with two *ovula* in each, attached to the partition. *Style* the length of the exterior nectary. *Stigma* large, turbinate. *Berry* oblong, downy, pulpy, one-celled. *Seed* one, large, oblong.

This tree has nearly the flowers of *Melia*, *Trichilia* and *Swietenia*, but the fruit of *Murraya*; it may therefore constitute a new genus.

The wood serves for various economical purposes. I am informed by the natives, that if the bark in quantity is thrown into fish ponds, it soon kills the fish, which I believe is true, for it is rare to meet with a tree that has not been deprived of its bark. They do not esteem the fish the less wholesome, and it renders them easily caught, as they soon float, probably before they die; as is the case when *Cocculus indicus* is employed. This is the second species of fish poison, employed by the natives of this country, to enable them to catch fish, with little or no trouble. The fruit of *Gardenia dumetorum*, was the first which has been already taken notice of.

(W. Roxburgh, *Flora Indica* 2: 387, 1832)



WALSURA PISCIDIA Roxb.

18. WALSURA ROBUSTA Roxb.

Leaves quinate-pinnate; *leaflets* lanceolate. *Panicles* terminal and axillary. *Filaments* distinct (consequently the exterior nectary is not found).

Uppingh, the vernacular name in Silhet, where it grows to be one of their largest timber trees; having a trunk seven feet in circumference, and other parts in proportion.

It flowers in March and April, and the seed ripens in June.

Young shoots rough with scabrous specks, but void of pubescence. *Leaves* alternate, unequally pinnate, some ternate; from six to nine inches long. *Leaflets* generally five. The pairs opposite, from oblong to lanceolate, acuminate, entire, smooth; from four to five inches long, and from one to two broad. *Petioles* marked with the same sort of elevated rough white specks that are to be found on the young shoots. *Panicles* terminal, and from the exterior axils, length of the leaves, much crowded and very dense; their numerous ramifications scarcely villous. *Bracts* minute. *Flowers* numerous, rather small and white. *Calyx* five-parted; *segments* nearly equal, small and oval. *Petals* five, oblong, spreading, a little villous. *Nectary*, a large fleshy crenate ring round the base of the germ, within the filaments. *Filaments* ten, broad towards the base, but not in the least united, tapering regularly to the apex, which is very slender; they are inserted under the exterior part of the nectary, and are alternately a little shorter. *Anthers* small, oval. *Germ* superior, ovate, two-celled; *ovula* two in each cell, attached to the middle of the partition. *Style* short. *Stigma* peltate. *Berry* oval, size of a small olive, resting on the permanent corol, calyx and stamina, one-celled. *Cortex* rather thin, and bright grey. *Seed* solitary, conform to the berry, before maturity or when imperfectly ripe, a pretty large quantity of a clear, very succulent exterior envelope, or aril is found, but when ripe it is scarcely to be seen. *Integuments* besides the aril, single. *Perisperm* none. *Embryo* straight, inverse. *Cotyledons* conform to the seed. *Radicle* obovate-truncate, superior.

(W. Roxburgh, *Flora Indica* 2: 386, 1832)



WALSURA ROBUSTA Roxb.

19. WALSURA TERNATA Roxb.

Leaves ternate; *leaflets* narrow-lanceolate. *Panicles* axillary. *Nectary* gibbous, with divisions alternately rounding and bidentate.

Tam. Kaka-walsura.

Teling. Chinna-wallursi.

A small tree growing on the sides of hills. It flowers during the hot season.

Trunk erect; *bark* smooth, rust colour. *Leaves* alternate, petioled, ternate. *Leaflets* narrow-lanceolate, equal, entire, above smooth, of a deep shining green, whitish underneath; from four to five inches long and one broad. *Petioles* semi-cylindric, rust-coloured, two inches long. *Stipules* none. *Panicles* axillary, middle-sized. *Bracts* single, small, caducous. *Flowers* very numerous, small, milk white. *Calyx* and *corol* as in *W. piscidia*. *Nectary*, the *exterior* one gibbous, and having only the apex of every other division bifid; the intermediate one, rounded, and a little shorter. *Interior* salver-shaped, with a large, high, callous margin. *Stamens* as in the former species. *Style* half the length of the gibbous nectary. *Stigma* large; apex two-lobed.

I have not seen the pericarp, but from the structure and contents of the germ, I imagine it will be a one-seeded berry.

(W. Roxburgh, *Flora Indica* 2: 389, 1832)



WALSURA TERNATA Roxb.

20. HEYNEA TRIJUGA Roxb.

Leaves unequally pinnate; *leaflets* three pair. *Panicles* axillary, long-peduncled.

Kapyakooshee.

A native of Nepal; from thence, in 1802, Dr. Buchanan sent seeds of this tree, to the Botanic Garden at Calcutta, under the vernacular name *yakooshee*, where in seven years, the young trees were about fifteen, and twenty feet high, with much the habit of the Walnut tree. Flowering time in the Botanic Garden, March; the seed ripens in October.

Trunk straight, in our young trees about as thick as a man's thigh. *Bark* dark ash-coloured, and pretty smooth. *Branches* few; *young shoots* marked with scabrous spots. *Leaves* unequally pinnate, alternate, from one to two feet long. *Leaflets* opposite, short-petiolated, two or three pairs, ovate-oblong, acuminate, entire, smooth, from four to eight inches long, and from two to four broad. *Petioles* round, smooth, swelled at the insertion of the leaflets. *Petioles* channelled, less than an inch long. *Stipules* none. *Panicles* axillary, solitary, long peduncled, smooth, erect. *Flowers* numerous, small, white. *Bracts* minute, caducous. *Calyx* one-leafed, five-toothed, permanent. *Petals* five, cuneate-lanceolate, spreading. *Nectarium* subcylindric, shorter than the petals, half ten-cleft, division alternately a little shorter, bifid. *Filaments* scarcely any. *Anthers* ten, ovate, three-lobed, crowned with an obtuse point, attached to the inside of the divisions of the nectary. *Germ* superior, immersed in a large fleshy ring, two-celled, with two *ovula* in each, attached to the middle of the partition. *Style* short. *Stigma* large, nearly round, with a two-toothed apex which is rather within the mouth of the nectary. *Capsule* round, the size of a small cherry, fleshy, one-celled, two-valved, opening round the apex. *Seed* solitary, round, invested in a complete, thin, white, scabaceous aril, which with the seed, as in the germ, are attached to what was the partition, now pressed to one side by the abortion of three-fourths of its original contents. *Integument* single, when recent orange, but soon changing to a chesnut colour, smooth, and strong, with a long white umbilicus strongly marking the side of attachment. *Perisperm* none. *Embryo* inverse. *Cotyledons* two, hemispheric, conform to the seed, firm, green. *Plumula* small, two-lobed. *Radicle* superior, small.

The bark, leaves and tender parts possess a considerable share of a peculiar bitter taste; and the cold infusious thereof, with the addition of a little sulphate of iron, becomes black; two principles very generally found amongst the plants of this natural order, which grow in India.

(W. Roxburgh, *Flora Indica* 2: 390, 1832)



HEYNEA TRIJUGA Roxb.

21. CEDRELA TOONA Roxb.

Panicles pendulous. *Leaflets* from six to twelve pairs, lanceolate, entire, acute.

Surenus. *Rumph. Amb.* iii. 66. t. 39.

Beng. Toon, Lood.

This most elegant, large timber tree is now found common in Bengal, probably brought thither originally from the mountainous parts of the Northern and North East Frontier. *Leaves* deciduous during the cold season, appearing again with the flowers in February. *Seed* ripe in May and June.

Trunk erect, growing to a great size and height, though I have only seen small trees about Calcutta. *Bark* smooth, grey. *Branches* numerous, forming a large, beautiful, shady head. *Leaves* alternate, abruptly pinnate, drooping, from twelve to eighteen inches long. *Leaflets* from six to twelve pairs, opposite or nearly so, short-petiolated, obliquely lanceolate, the upper half broadest, and extending further down the petiolet than the lower; margins waved, smooth on both sides, tapering to a long acute point; from two to six inches long. *Petioles* and *petiolets* round and smooth. *Stipules* none. *Panicles* terminal, nearly as long as the leaves, pendulous, composed of numerous, diverging, compound ramifications, smooth in every part. *Bracts* minute, deciduous. *Flowers* very numerous, small, white, and possessing a fragrance like that of fresh honey. *Calyx* five-parted. *Petals* five, oblong, with the margins ciliate, the apices incurved over the stamens, and keeled on the inside near the base. *Nectary* consisting of five, large, hairy, orange-coloured glands, sitting round the lower half of the germ. *Filaments* erect, inserted into the centre of the five nectarial glands, rather shorter than the petals. *Anthers* bent in towards the stigma. *Germ* superior, oblong, internal structure and contents as in the capsule. *Style* length of the corol. *Stigma* large, flat, composed of five lobes. *Capsules* oblong, rather larger than a field bean, smooth, five-celled, five-valved; valvelets opening from the apex and falling off with the seeds. *Seeds* numerous, imbricated, both the ends and the exterior side membrane-winged, affixed to the upper end of the sharp ridges of the receptacle, &c. exactly as in *Swietenia febrifuga* and *Mahogani*. See *Gaert. carp.* ii. 86. *Perisperm* in very small quantity, and more like a fleshy interior integument. *Embryo* inverse. *Cotyledons* oval, three-nerved. *Radicle* obliquely superior.

The wood of this tree is much like mahogany, but lighter, consequently not so close in the grain. It is much used for furniture and various other purposes. The bark is a powerful astringent, and though not bitter is a tolerably good substitute for *Peruvian Bark* in the cure of remitting and intermitting fevers; particularly when joined with a small portion of the powdered seed of *Cesalpinia bonduccella* (*Kutkulegei* of the Bengalees), which is a most powerful bitter.

(W. Roxburgh, *Flora Indica* 1: 635, 1832)



CEDRELA TOONA Roxb.

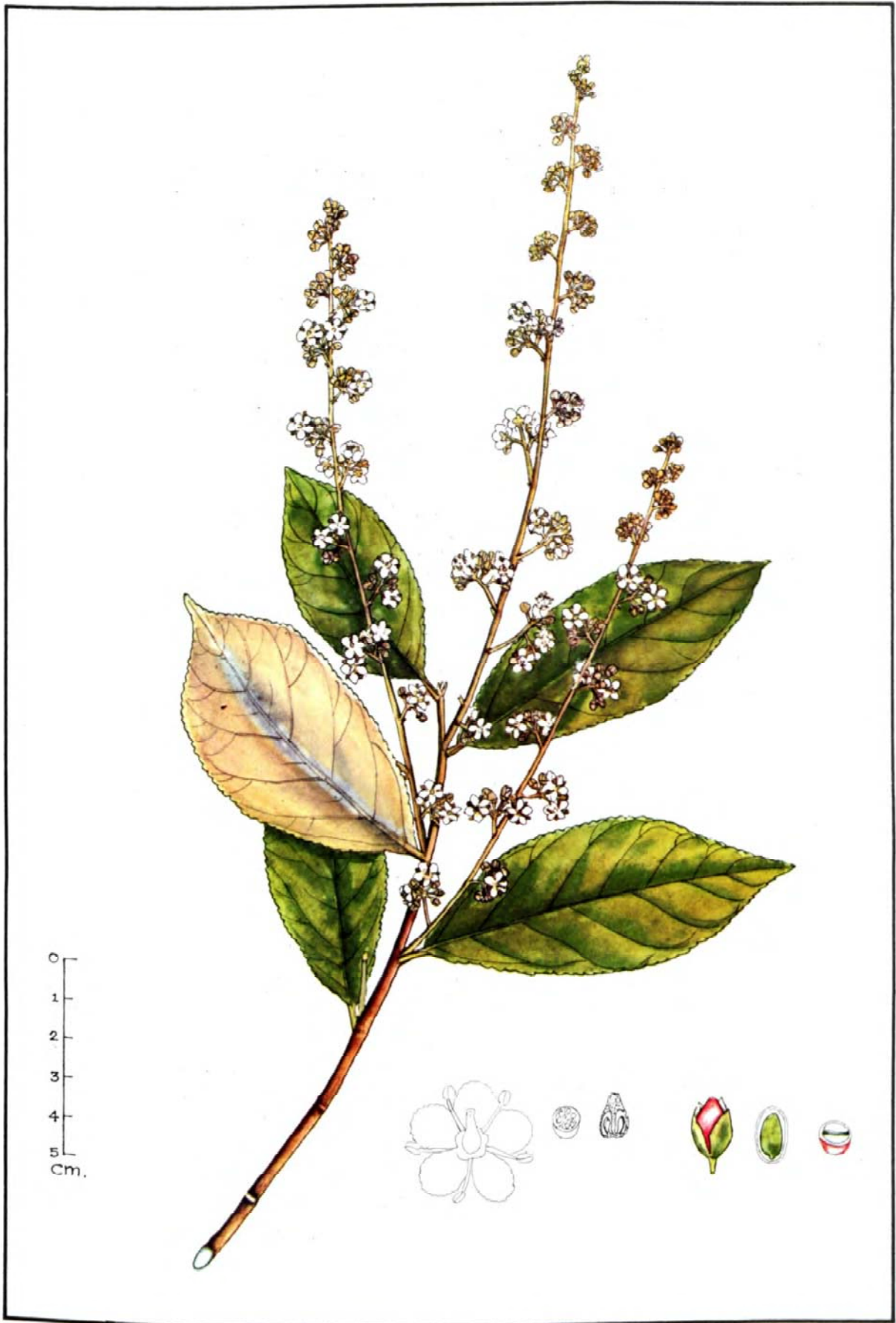
22. CELASTRUS MONOSPERMA Roxb.

Shrubby, scandent. *Leaves* oblong, glossy, serrulate. *Panicles* thin, linear, axillary and terminal, longer than the leaves. *Capsules* three-valved, one-seeded.

Tiara the vernacular name in Silhet, where it is found wild in thin forests, climbing up and over trees, &c. to a great extent. Flowering time the month of April. Seeds ripe in October.

Young shoots smooth and brown, perfectly void of every kind of pubescence. *Leaves* alternate, short-petioled, from obovate-oblong to lanceolar, glossy on both sides, serrulate, obtusely pointed, from three to five inches long, and one or two broad. *Panicles* axillary and terminal, linear, thin of branches, two, three, or even four times longer than the leaves, smooth. *Flowers* numerous, small, pale greenish yellow. *Bracts* subulate, small, smooth. *Calyx* five-parted, segments short and rounded. *Petals* five, sub-orbicular, inserted, alternate with the stamens under the margin of the flat repand nectary, which embraces the base of the germ. *Filaments* five, short. *Anthers* oval. *Germ* obovate, oblong, three-celled, with two ovula in each attached to the bottom of the cell. *Style* short. *Stigma* trigonal. *Capsule* the size of a field bean, oblong, smooth, three-valved, but I never found more than one cell. *Seed* solitary, covered with an orange-coloured, pulpy tunic, under it a single, tender integument, of a light brown colour. *Perisperm* conform to the seed, pure white. *Embryo* erect, deep green. *Cotyledons* oblong. *Radicle* oval, inferior.

(W. Roxburgh, *Flora Indica* 1: 625, 1832).



CELASTRUS MONOSPERMA Roxb.

23. HIPPOCRATEA ARBOREA Roxb.

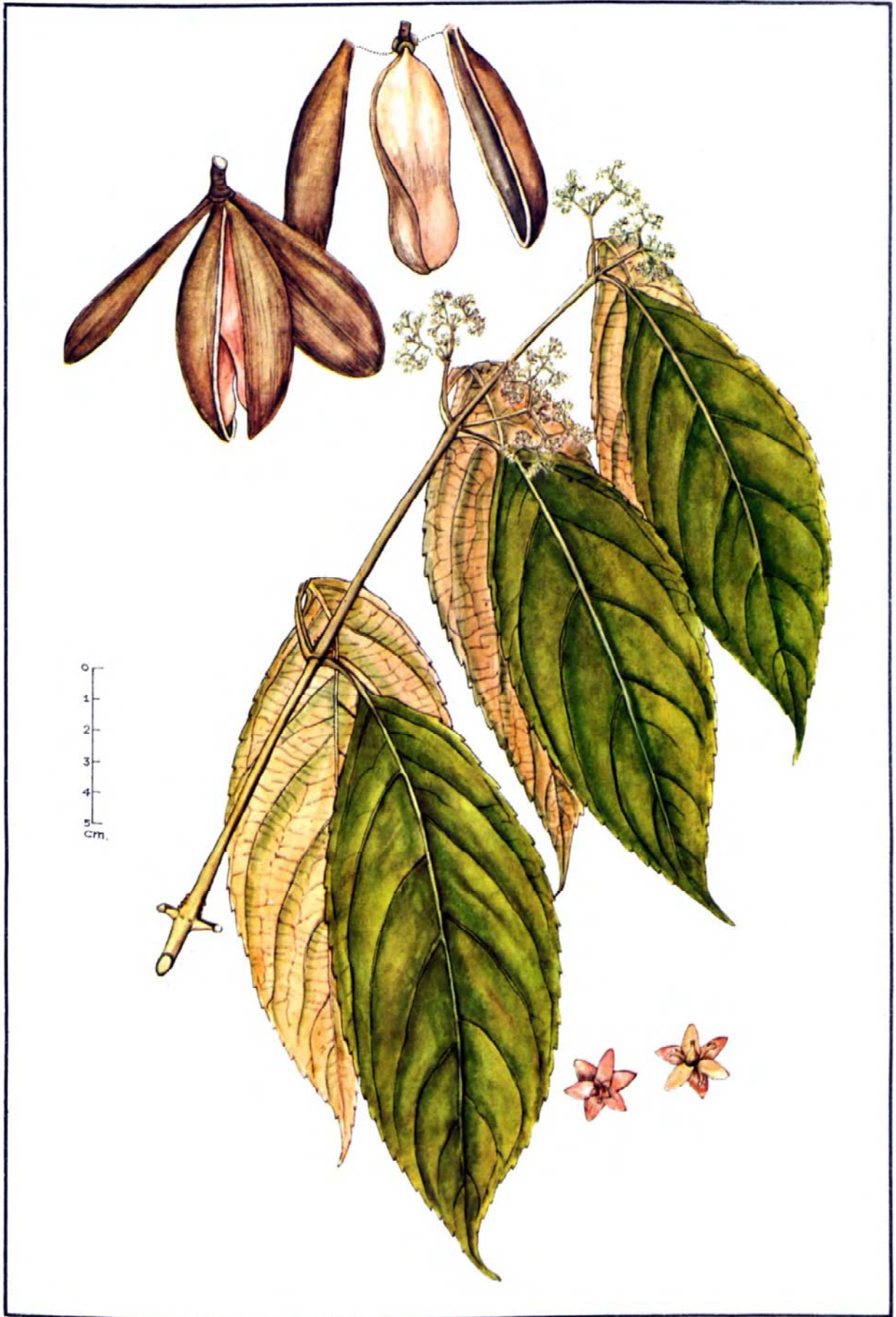
Sub-arboreous, with climbing branches. *Leaves* opposite, oblong, serrulate, cuspidate. *Corymbs* axillary. *Capsules* linear-oblong, two-seeded.

Beng. Katha-paharia.

A native of the interior parts of India. It blossoms in July and the seeds ripen in March.

Trunk tolerably straight, but short, about as thick as a man's thigh, covered with smooth, dark-brownish ash-coloured bark. *Branches* and *branchlets* spreading and climbing to a great extent, young shoots round and smooth, indeed highly polished; many of them form the claspers. *Leaves* opposite, short-petioled, drooping, oblong, taper-pointed, serrate, very smooth on both sides; from six to seven inches long, and about three broad. *Stipules* none, but two or three small, dark-brown, scaly germs are found in each axil. *Corymbs* axillary, dichotomous, with a pedicelled flower in the divisions. *Bracts* opposite, small, permanent. *Flowers* very numerous and small, pale greenish yellow. *Calyx* beneath, generally four, though sometimes five or even six-parted; *divisions* rounded, and only about half the length of the corol. *Corol* four, five or six-petalled, (six is the most common and I suppose the natural number,) in a double series, equal, ovate-oblong, smooth. *Nectary* a three-sided, fleshy cup surrounding the insertion of the stamens and germ. *Filaments* three, membranaceous, shorter than the corol. *Anthers* four-lobed. *Germ* ovate. *Style* short. *Stigma* simple. *Capsules* three, cuneiform, striated, three inches long, and about one and a half broad, one-celled, two-valved; *valves* exactly boat-shaped. *Seeds* two, ovate, compressed, enlarged with an oblong, soft, thin, spongy wing, the attachment is between its apex and the base of the capsules. *Integument* single, ochraceous. *Perisperm* none. *Embryo* oblique, compressed. *Cotyledons* conform to the seed, yellow. *Plumula* two-lobed. *Radicle* oval, sub-inferior.

(W. Roxburgh, *Flora Indica* 1: 167, 1832)



HIPPOCRATEA ARBOREA Roxb.

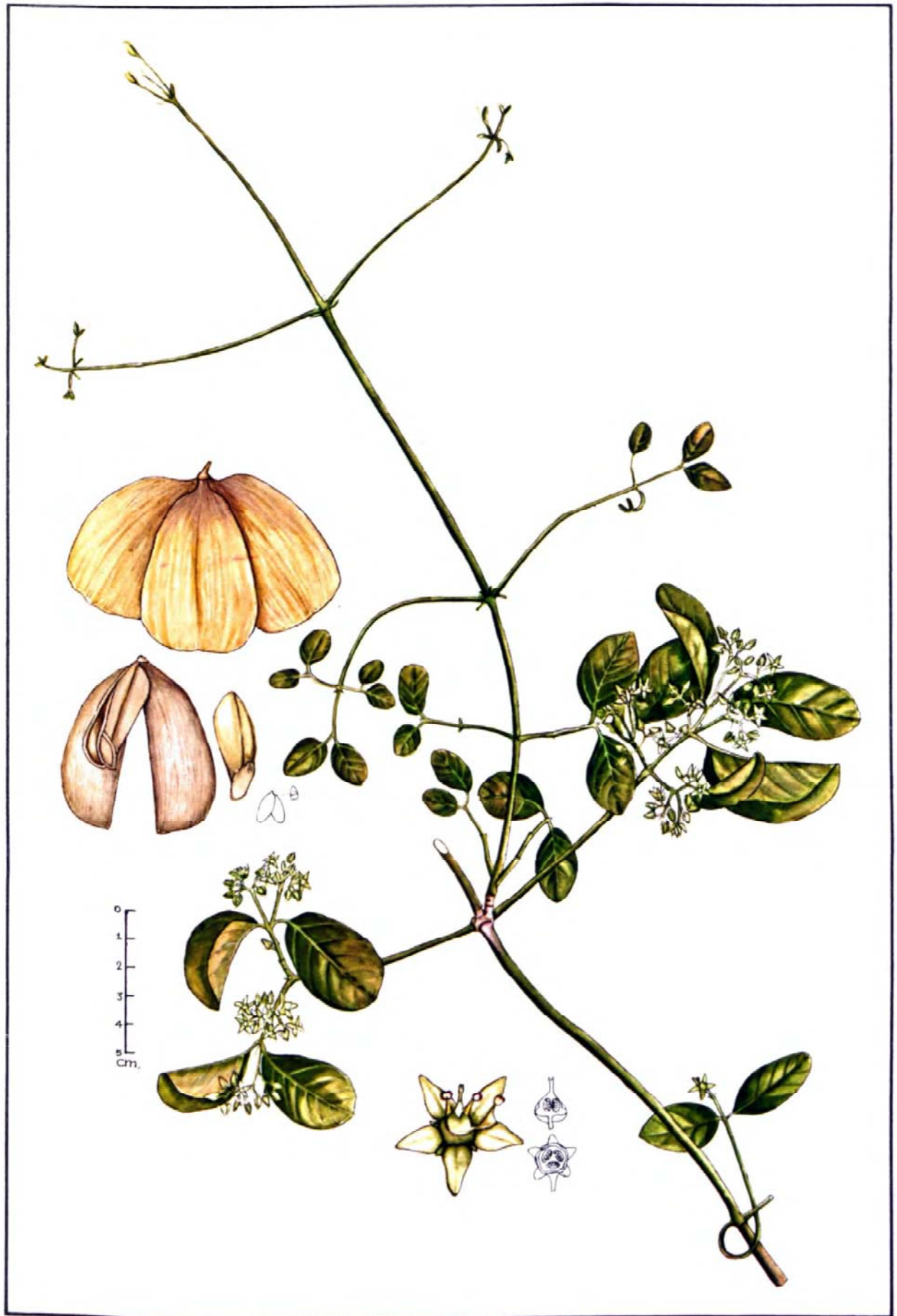
24. HIPPOCRATEA OBTUSIFOLIA Roxb.

Shrubby, climbing by the help of cirrhose branchlets. *Leaves* elliptically-oblong, entire, obtuse. *Corymbs* terminal and axillary. *Capsules* obovate, four-seeded.

A native of the coast of Coromandel. Flowering time in the Botanic Garden, March and April; the seeds take one year to ripen.

Stems and larger *branches* ligneous, and covered with cracked, spongy grey *bark*, climbing to a great extent by the help of the smaller, round, smooth, diverging, opposite branchlets, which take a turn or two round their supporters. *Leaves* opposite, short-petioled, oblong, entire, (large luxuriant leaves are sometimes obscurely serrate,) obtuse, firm, polished, length from three to four inches. *Stipules* of the leaves four-fold, minute, subulate; those of the branchlets larger. *Corymbs* terminal, or from the exterior axils, often compoundly dichotomous and shorter than the leaves. *Bracts* minute, ovate. *Flowers* small, pale greenish yellow. *Calyx* five-leaved. *Petals* five, ovate-lanceolate. *Nectary*, a large, fleshy receptacle receiving the base of the germ; its margin becomes thin, and is divided into three, tapering, antheriferous segments, which are at first erect, but soon become revolute. *Filaments* no other than the three segments of the nectary. *Anthers* two, round, one-celled lobes. *Germ* three-lobed, immersed in the thick, fleshy nectary, three-celled, each cell containing several seeds, attached to the axis. *Style* the length of the filaments; *stigma* three-toothed. *Capsules* three, obovate, thin, smooth, slightly veined, about two inches long, by one and a half broad, one-celled, two-valved. *Seeds* generally four in each capsule, two on each side, lodged about its middle, of a narrow-oblong shape, with a large, oblong, membranaceous wing proceeding from the base, and attached by its extremity to the very base of the capsule. *Integuments* two; *exterior* a very thin, smooth membrane; *interior* rather thick and somewhat spongy. *Perisperm* none. *Embryo* erect. *Cotyledons* oblong, pale green while recent. *Plumula* two-leaved. *Radicle* short, inferior.

(W. Roxburgh, *Flora Indica* 1: 166, 1832)



HIPPOCRATEA OBTUSIFOLIA Roxb.