Fig. 170. *Solandra longiflora* (Solanaceae).

7. *Solanum* Linnaeus

Annual or perennial, armed or unarmed herbs, shrubs, vines or trees. Leaves alternate, simple or compound, sessile or petiolate. Inflorescence an axillary, extra-axillary or terminal raceme, cyme, corymb or panicle. Flowers regular, or sometimes irregular; calyx (4-) 5 (-10)- toothed; corolla rotate, 5 (-6)-lobed. Stamens 5, exserted; anthers united over the style, dehiscing by 2 apical pores. Fruit a 2-celled berry; seeds numerous, reniform.

Key to Species

1. Trees or shrubs; stems armed with spines; leaves simple or lobed, not pinnately compound; inflorescence a raceme ..... 1. *S. macranthum*
1. Vines; stems unarmed; leaves pinnately compound; inflorescence a panicle ..... 2. *S. seaforthianum*

1. *Solanum macranthum* Dunal, *Solanorum Generumque Affinium Synopsis* 43 (1816). AARDAPPELBOOM (Surinam); POTATO TREE. Shrub or tree to 9 m; stems and leaves spiny, pubescent. Leaves simple, toothed or up to 10-lobed, to 40 cm. Inflorescence a 7- to 12-flowered raceme. Corolla 5- or 6-lobed, bluish-purple, to 6.3 cm wide.

Range: Brazil. Grown as an ornamental in Surinam (Ostendorf, 1962).

2. *Solanum seaforthianum* Andrews, *Botanists Repository* 8(104): t.504 (1808). POTATO CREEPER. Vine to 6 m, with petiole-tendrils; stems and leaves unarmed, glabrous. Leaves pinnately compound with 3-9 leaflets, to 20 cm. Inflorescence a many-flowered panicle. Corolla 5-lobed, blue, purple or pinkish, to 5 cm wide.

Range: South America. Grown as an ornamental in Surinam (Ostendorf, 1962).

Sterculiaceae

Monoecious, dioecious or polygamous trees and shrubs. Leaves alternate, simple to palmately compound, petiolate. Inflorescence an axillary panicle, raceme, cyme or thyrse. Flowers unisexual or bisexual, regular; sepals 3-5, united in a 3- to 5-lobed calyx-tube; petals 0 or 5. Stamens 5-20, the filaments united in a column. Ovary superior, 3- to 6-celled. Fruit a follicle, capsule or samara.

Key to Genera

1. Leaves unlobed; sepals 3; petals 5; fruit a tuberculate capsule ..... 1. *Guazuma*
1. Leaves 5-lobed; sepals 5; petals absent; fruit a non-tuberculate follicle ..... 2. *Sterculia*

1. *Guazuma* Miller

Evergreen trees. Leaves alternate, often oblique at the base. Inflorescence an axillary raceme, cyme, panicle or thyrse, Flowers bisexual; sepals 3; petals 5, apically appendaged; stamens 15. Fruit a 5-valved, indehiscent or only partially dehiscent capsule.

1. *Guazuma ulmifolia* Lamarck, *Encyclopedie Methodique. Botanique* 3: 52 (1789). BASTARD CEDAR. Evergreen, buttressed tree to 25 m. Leaves ovate or lanceolate, unequal at the base, serrulate, subglabrous to stellate-tomentose beneath, to 16 x 6 cm. Sepals yellow. Petals hooded, yellowish-green, with a bifid, purple, awn-like appendage at apex. Fruit ellipsoid or globose, warty or tuberculate, black, to 4 cm; seeds numerous, in mucilaginous pulp.

Range: West Indies; Mexico to South America, including the three Guianas. Grown as an ornamental in Surinam (Ostendorf, 1962).

2. *Sterculia* Linnaeus

Evergreen or deciduous trees. Leaves alternate, simple to palmately compound. Inflorescence an axillary panicle or raceme. Flowers bisexual or unisexual; sepals 5, united in a 5-lobed calyx-tube; petals absent; stamens 7-15. Fruit of 1-5 free, radiating, coriaceous or woody, dehiscent follicles.

1. *Sterculia apetala* (Jacquin) Karsten, *Florae Columbiae* 2: 35, t.118 (1861). (Synonym: *S. carthaginensis* Cavanilles). Functionally monoecious, evergreen tree to 40 m. Leaves palmately 5-lobed, cordate at the base, coriaceous, stellate-tomentose beneath when young, to 35 (-50) x 45 cm. Flowers bisexual or functionally unisexual. Calyx greenish or yellowish, pubescent, c.2.5 cm wide. Stamens 15. Fruit of pod-like, reddish- or orange-tomentose follicles to 8 x 5 cm; inside of follicle with indumentum of acicular, orange-colored, irritating hairs; seeds 2-5 per follicle, c.2.5 cm.

Range: Tropical America. Grown as an ornamental in Surinam (Ostendorf, 1962).

Tropaeolaceae

Annual or perennial herbs. Roots sometimes tuberous. Stems somewhat succulent, with watery sap, prostrate or climbing by the petioles. Leaves alternate, simple, entire or palmately lobed, peltate, long-petiolate. Inflorescence of solitary, rarely umbellate, flowers. Flowers bisexual, irregular (zygomorphic); sepals 5 in a 2-lipped calyx, the upper sepal spurred; petals 5, free, in 2 sets, clawed, entire to fimbriate. Stamens 8. Ovary superior, 3-celled. Fruit indehiscent, separating into 3, 1-seeded segments (carpels).

Literature: Sparre, B. and L. Andersson. 1991. A taxonomic revision of the Tropaeolaceae. *Opera Botanica* 108: 5-139.

1. *Tropaeolum* Linnaeus

Characteristics of the family Tropaeolaceae.

1. *Tropaeolum majus* Linnaeus, *Species Plantarum* 345 (1753). NASTURTIUM. Annual herb. Stems somewhat succulent, climbing, glabrous. Leaves peltate, the blade orbicular or subreniform, nearly entire, glaucous, to 8.5 (-20) cm wide. Flowers orange, red or yellow, occasionally spotted or striped, to c.6 cm wide, 3 of the petals fringed on the claw; calyx-spur to 2.5 cm.

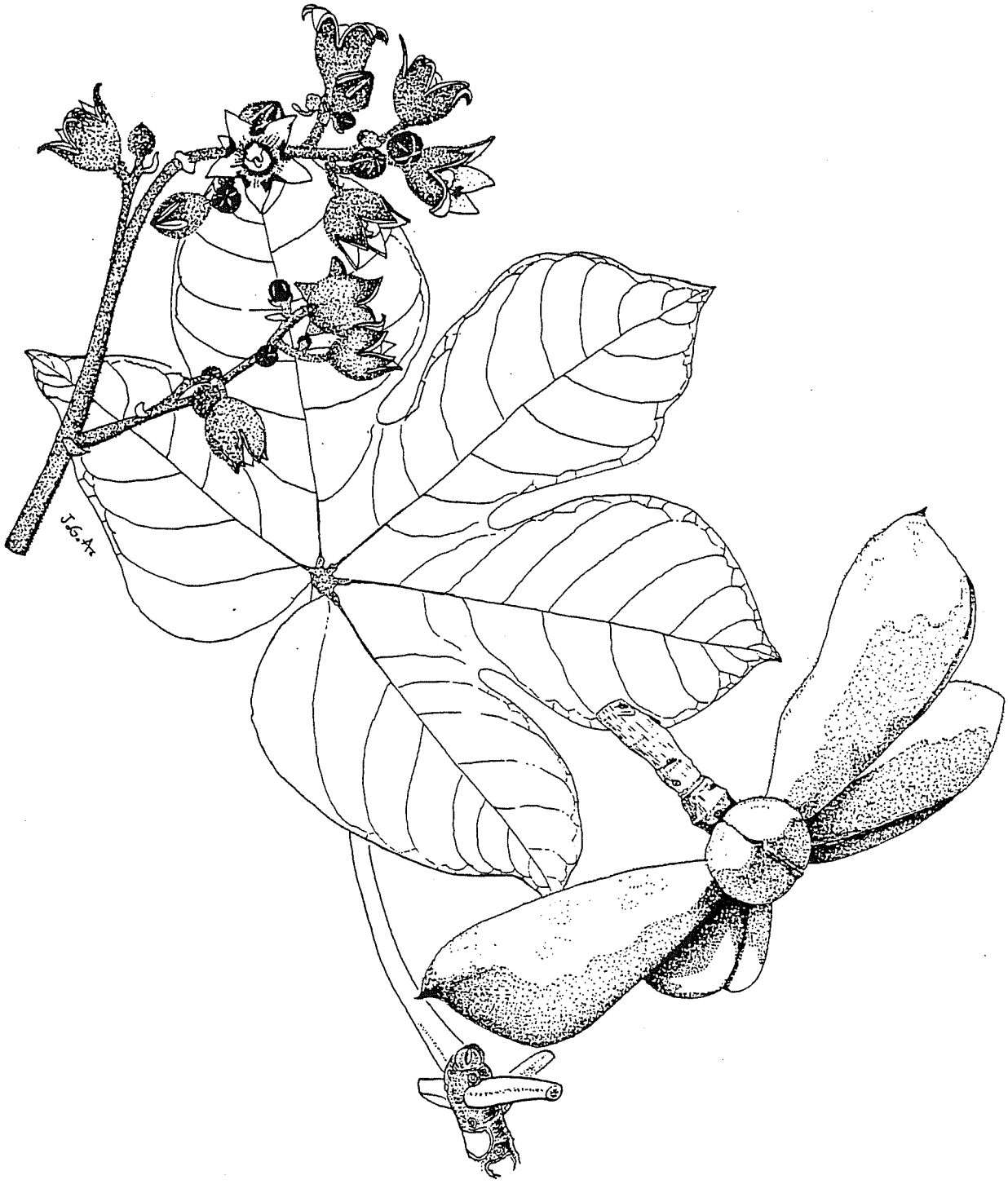


Fig. 171. *Sterculia apetala* (Sterculiaceae).

Range: South America (Andes Mts.). Grown as an ornamental in a Tankarastraat roadside garden, Paramaribo, Surinam.

Turneraceae

Trees, shrubs, and annual or perennial herbs, sometimes vines. Leaves alternate, simple, petiolate. Inflorescence of axillary, solitary flowers, rarely an axillary cyme. Flowers bisexual, regular, bracteate; perianth and stamens inserted on a hypanthium-like floral tube; sepals 5; petals 5, free; stamens 5, free. Ovary superior, 1-celled; styles 3. Fruit a capsule; seeds numerous.

1. *Turnera* Linnaeus

Characteristics of the family Turneraceae; shrubs with leaves bearing paired glands at base of the blade; stigmas fimbriate.

1. *Turnera subulata* J.E. Smith in Rees, *The Cyclopaedia* 36(2:72): no.2 (1817). KEMBANG POEKOEL DALAPAN (Surinamese Malayan). Shrub to 2 m, woody at the base. Leaves broadly elliptical, serrate, with 1 or 2 pairs of basal glands, to 5 cm. Inflorescence of solitary flowers. Petals pale yellowish-white distally, golden yellow towards the base, becoming dark purplish-brown at the base. Seeds pitted, 2 mm.

Range: Ecuador, Colombia, Venezuela, Brazil. Grown as an outdoor planted ornamental on hotel grounds and elsewhere in Paramaribo, Surinam.

Urticaceae

Monoecious or dioecious trees, shrubs, vines and herbs; plants with watery sap, sometimes with stinging hairs. Leaves alternate or opposite, simple, sessile or petiolate. Inflorescence of terminal or axillary cymes or fascicles. Flowers unisexual, regular; sepals 4-5, free or united below in a 4- or 5-toothed calyx; petals absent. Stamens 4-5, free. Ovary superior, 1-celled. Fruit an achene surrounded by the persistent calyx.

Key to Genera

1. Leaves alternate, asymmetrical at the base — 1. *Pellionia*
1. Leaves opposite, symmetrical at the base, those of a pair unequal in size — 2. *Pilea*

1. *Pellionia* Gaudichaud-Beaupre

Monoecious or dioecious herbs and shrubs. Leaves alternate, simple, 2-ranked, asymmetrical at the base, often subsessile. Inflorescence a dense cyme. Sepals (4) 5. Fruit an achene.

Key to Species

1. Leaves with bronze-green marginal area, and bright whitish-green central area 1. *P. daveauana*
1. Leaves purplish-green above, with purplish-black veins 2. *P. pulchra*

1. *Pellionia daveauana* (Godefroy-Lebeuf) N.E. Brown, *Gardeners' Chronicle* n.s. 14 (348): 262 (1880). TRAILING WATERMELON BEGONIA. Succulent, creeping herb; stems rooting at the nodes, pinkish. Leaves elliptical, oblong or oblong-orbicular, toothed above, the upper marginal area bronze-green, with bright whitish-green central area, the lower surface pinkish, to c.6.3 cm.

Range: Southeast Asia (Vietnam, Malaysia). Grown as an ornamental in Surinam (Ostendorf, 1962).

2. *Pellionia pulchra* N.E. Brown, *Gardeners' Chronicle* n.s. 18(466): 712 (1882). SATIN PELLIONIA, RAINBOW VINE. Succulent, creeping herb; stems purplish. Leaves broadly elliptical or oblong, purplish-green above, with purplish-black veins, the lower surface pale purplish, to c.6.3 cm.

Range: Vietnam. Grown as an ornamental in Surinam (Ostendorf, 1962).

2. *Pilea* Lindley

Monoecious or dioecious, annual or perennial herbs. Leaves opposite, simple, those of a pair unequal in size, symmetrical at the base. Inflorescence a loose cyme or panicle. Sepals 4 (male flower) or 3 (female flower). Fruit an achene.

Key to Species

1. Stems branched in a compound, fern-like disposition; larger leaf of a pair to 1 cm, smaller leaf of a pair to 3 mm; leaves entire 2. *P. microphylla*
1. Plant not of fern-like habit, sometimes globular; leaves of a pair both more than 1 cm, crenate.
   2. Plant globular, dioecious; stems creeping, rooting at the nodes; leaves orbicular or suborbicular, not variegated, villous, to 2.5 cm 3. *P. nummulariifolia*
   2. Plant not globular, monoecious; stems erect or ascending, not rooting at the nodes; leaves ovate or elliptical, variegated with silver bands, glabrous, to 9 cm 1. *P. cadieri*

1. *Pilea cadieri* Gagnepain & Guillaumin, *Bulletin du Museum d'Histoire Naturelle, Paris* 1938, ser.2, 10: 629 (1939). ALUMINUM PLANT. Monoecious, succulent herb to 60 cm. Leaves ovate or elliptical, crenate, green, variegated with interrupted, broad silver bands, glabrous, to 9 cm. Female inflorescence a pedunculate, loosely flowered cyme.

Range: Vietnam. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, and as an indoor potted plant in Paramaribo, Surinam.

2. *Pilea microphylla* (Linnaeus) Liebmann, *Det Kongelige Danske Videnskabernes*

Selskabs Skrifter, Raekke 5, 2: 296 (1851). KANONNEERPLANT (Surinam); ARTILLERY PLANT. Monoecious, succulent, annual or perennial herb to c.30 cm; stems branched in a compound, fern-like disposition. Leaves obovate, entire, green, glabrous, the larger leaf of a pair to 1 cm, the smaler leaf of a pair to 3 mm, subsessile, crowded. Female inflorescence a sessile or subsessile, small cyme.

Range: Tropical America. Grown as an ornamental in Surinam (Ostendorf, 1962).

3. *Pilea nummulariifolia* (Swartz) Weddell, *Annales des Sciences Naturelles, Botanique* ser.3, 18: 225 (1852). JODENBAARD (Surinam); CREEPING CHARLEY. Dioecious herb, of globular habit; stems creeping, rooting at the nodes. Leaves orbicular or suborbicular, crenate, green, villous, to c.2.5 cm. Female inflorescence a short, densely flowered cyme.

Range: West Indies; Central and South America. Grown as an ornamental in Surinam (Ostendorf, 1962).

Verbenaceae

Annual or perennial, evergreen or deciduous, armed or unarmed herbs, shrubs, trees or woody vines; stems often 4-angled. Leaves usually opposite or whorled, simple or compound, entire to lobed, petiolate, exstipulate. Inflorescence of terminal or axillary spikes, racemes, cymes or panicles; inflorescence-axis often prominently bracteate at the nodes (inflorescence-bracts), the bracts sometimes foliaceous and colored; flowers often individually bracteolate, or flower clusters bracteate at the base of peduncles or pedicels. Flowers bisexual, strongly or weakly irregular (zygomorphic); sepals 4-5, united below in a 4- or 5-toothed calyx-tube, sometimes connate in an orbicular limb; petals 4-5, united below in a 5-lobed or 2-lipped corolla-tube. Stamens (2) 4 (5), didynamous. Ovary superior, (2) 4 (-10) -celled; style bilobed. Fruit a dry or fleshy drupe, indehiscent or separating into 2-4 nutlets.

Literature: Jansen-Jacobs, M.J. 1988. Verbenaceae. 116 pp., in Gorts-van Rijn, A.R.A., ed., *Flora of the Guianas*. Koenigstein, Germany: Koeltz Scientific Books. Moldenke, H.N. 1940. Verbenaceae, pp.257-321, in Pulle, A., ed., *Flora of Suriname*, vol. IV, Part 2. Amsterdam: J.H. deBussy, Ltd. Moldenke, H.N. 1973. Verbenaceae, pp.41-148, in *Flora of Panama*, Part IX. *Annals of the Missouri Botanical Garden* 60(1): 41-154.

Key to Genera

1. Leaves digitately (palmately) compound with 5-9 leaflets — 9. *Vitex*
1. Leaves simple, lobed, or pinnately compound.
   2. Calyx a single large, orbicular or saucer-shaped, spreading disc or limb — 5. *Holmskioldia*
   2. Calyx not a single orbicular disc.
3. Branches spinose or prickly; stamens included.
   4. Fruit yellow, beaked; corolla light blue to purple, or white; inflorescence a raceme — 4. *Duranta*
   4. Fruit purplish-black, not beaked; corolla red, orange, yellow, white, pink or purple;

inflorescence a head 6. *Lantana*

3. Branches unarmed; stamens exserted.
5. Individual cymes (inflorescence-units) subtended by an involucre of 3 leaf-like, colored bracts 3. *Congea*
5. Individual cymes, or other inflorescence-units, not involucrate.
6. Calyx-lobes much longer than the corolla; calyx with coroniform crest inside at juncture of tube and lobes 7. *Petrea*
6. Calyx-lobes shorter than the corolla; calyx without coroniform crest.
7. Stems creeping, rooting at the nodes; leaves pinnatifid; flowers sessile 8. *Verbena*
7. Stems erect, or ascending as climbing vines; leaves simple (sometimes lobed); flowers pedicellate.
8. Inflorescence-bracts red, toothed; corolla yellow; shrub 1. *Amasonia*
8. Inflorescence-bracts green, entire; corolla red, white, pink or yellow; shrub, tree or vine 2. *Clerodendrum*

1. *Amasonia* Linnaeus fil.

Herbs or subshrubs. Leaves alternate or opposite, simple, toothed, petiolate. Inflorescence a terminal raceme or panicle; inflorescence-bracts prominent, foliaceous, colored. Calyx campanulate, 5-lobed. Corolla-tube long; limb 5-lobed, slightly 2-lipped, the lobes spreading or recurved. Stamens 4, exserted. Fruit a drupe.

1. *Amasonia campestris* (Aublet) Moldenke, *Torreya* 34: 8 (1934). (Synonym: *A. erecta* Linnaeus fil.). SAVANNEBLOEM (Surinam). Herb or subshrub to 2 m. Leaves subwhorled (spirally alternate); blades lanceolate or oblong-elliptical, to 30 cm. Inflorescence a large panicle; bracts red, becoming yellow below in age, toothed, to 5.5 cm. Flowers pendent, pubescent, yellow, to 3 cm; corolla-lobes reflexed.

Range: Northern South America, including the three Guianas. Infrequently grown as an ornamental in Surinam (Moldenke, 1940; Ostendorf, 1962).

2. *Clerodendrum* Linnaeus

Evergreen or deciduous shrubs, herbaceous or woody vines, or trees. Leaves opposite, rarely whorled, simple, entire, toothed or lobed. Inflorescence a corymb, cyme or panicle; inflorescence-bracts often conspicuous but not colored. Calyx campanulate, 5-lobed, sometimes colored. Corolla-tube long; limb 5-lobed, the anterior lobe often larger than the other 4. Stamens 4, long-exserted. Fruit a drupe, with persistent calyx.

Key to Species

1. Corolla-tube 10-12 cm; leaves mostly in whorls of 3-6 1. *C. indicum*
1. Corolla-tube 1-4 cm; leaves opposite.
2. Leaf-blades densely resinous-squamulose (resinous-scaly) beneath, cordate at the base 2. *C. japonicum*
2. Leaf-blades not resinous-squamulose beneath, often not cordate at the base (except nos. 3 & 4).
3. Corolla double, white or pink 4. *C. philippinum*

Fig. 172. *Clerodendrum indicum* (Verbenaceae).

3. Corolla single, red.
    4. Calyx white, conspicuously 5-angled — 6. *C. thomsonae*
    4. Calyx orange, red or purplish, angled or not angled.
5. Shrub; leaves 3- to 7-lobed; inflorescence a large panicle — 3. *C. paniculatum*
5. Vine; leaves unlobed; inflorescence of cymes — 5. *C.* x *speciosum*

1. *Clerodendrum indicum* (Linnaeus) O. Kuntze, *Revisio Generum Plantarum* 2: 506 (1891). (Synonym: *C. siphonanthus* R. Brown). MOUR FLOWER (Guyana); TUBEFLOWER. Shrub or tree to 3 m. Leaves mostly in whorls of 3-6, oblong or elliptical, entire, glabrous; blades to 23 cm. Inflorescence a terminal panicle to 45 cm or of axillary cymes to 6 cm. Calyx purplish. Corolla white or yellow; tube 10-12 cm.

Range: Malaysia. Grown as an ornamental in Surinam (Pulle, 1906; Moldenke, 1940; Jansen-Jacobs, 1988).

2. *Clerodendrum japonicum* (Thunberg) Sweet, *Hortus Britannicus* 322 (1826). WAN HON NA WAN NJARI (Surinam). Shrub or tree to 3 m. Leaves opposite, ovate, cordate at the base, glandular-toothed, glabrous above, resinous-squamulose (resinous-scaly) beneath; blades to 25 cm. Inflorescence a terminal panicle to 40 cm. Calyx red. Corolla red; tube to 2 cm.

Range: Asia. Grown as an ornamental in Guyana (Jansen-Jacobs, 1988) and in Surinam (Ostendorf, 1962).

3. *Clerodendrum paniculatum* Linnaeus, *Mantissa Plantarum* 1: 90 (1767). PAGODA FLOWER. Shrub to 3 m. Leaves opposite, ovate, 3- to 7-lobed, the margin entire or dentate between lobe-apices, glabrous or pubescent; blades to 40 cm. Inflorescence a large terminal, pyramidal panicle to 39 cm. Calyx red or orange. Corolla red or orange-red; tube to 1.6 cm.

Range: Southeast Asia. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, and in gardens and on University grounds in Paramaribo, Surinam.

4. *Clerodendrum philippinum* Schauer, in DeCandolle, *Prodromus Systematis Naturalis Regni Vegetabilis* 11: 667 (1847). (Synonyms: *C. fragrans* (Ventenat) Willdenow, *C. fragrans* var. *pleniflorum* Schauer). MADAN POLAN (Surinam); FRAGRANT GLORY BOWER. Deciduous shrub to 3 m. Leaves opposite, ovate, cordate to truncate at the base, toothed, pubescent; blades to 20 cm. Inflorescence a round-topped, terminal corymb to 6 cm. Calyx purple or red. Corolla double, pink or white, c.2.5 cm wide.

Range: China, Japan. Grown for ornament in Guyana (Ted Hubbard, pers. comm., 1986); and in Surinam (Ostendorf, 1962).

Literature: Howard, R.A. and D.A. Powell. 1968. *Clerodendrum philippinum* Schauer replaces "*Clerodendrum fragrans*". *Taxon* 17(1): 53-55.

5. *Clerodendrum* x *speciosum* Dombrain, *Floral Magazine (London)* 8: t.432 (1869). (*C. splendens* G. Don x *C. thomsonae* Balfour fil.). JAVA GLORY BEAN. Scandent shrub or

vine to 7 m. Leaves opposite, elliptical or ovate, entire, glabrous, to 4.5 cm. Inflorescence of axillary cymes to 9 cm. Calyx pale red or pinkish, somewhat angular. Corolla dull red or rose-purple; tube to 2.5 cm.

Range: Of hybrid origin, without natural range. Grown for ornament at the Promenade Gardens, Georgetown, Guyana, and on hotel grounds in Cayenne, French Guiana.

Clerodendrum thomsonae seems to have dominated or contributed most to this hybrid, which has calyx characteristics similar to *thomsonae* including an off-white color.

6. *Clerodendrum thomsonae* Balfour fil., *Edinburgh New Philosophical Journal* ser.2, 15: 233 (1862). BLOEDEND HART, BROEDOE NAHATTI (Surinam); BLEEDING HEART (Guyana). Woody, evergreen vine to 10 m, or low shrub. Leaves opposite, elliptical, elliptic-ovate or ovate, entire, glabrous, to 4.5 cm. Inflorescence of axillary cymes to 9 cm. Calyx white (at anthesis), to 2.5 cm, conspicuously 5-angled. Corolla red or crimson; tube to 2.5 cm.

Range: Tropical West Africa. Grown as an ornamental in Surinam (Ostendorf, 1962), and in the 1930's in the Botanic Gardens, Georgetown, Guyana (Department of Agriculture, 1934).

3. *Congea* Roxburgh

Evergreen or deciduous, climbing shrubs or vines. Leaves opposite, simple, entire. Inflorescence of terminal and axillary panicles of 3- to 9-flowered, capitate cymes; individual cymes subtended at base of peduncle by an involucre of 3-4 leaf-like, white or colored inflorescence-bracts. Calyx tubular or infundibuliform, 5-toothed. Corolla-tube short; limb 2-lipped, the upper lip 2-lobed, the lower lip 3-lobed. Stamens 4, exserted. Fruit drupaceous.

Literature: Munir, A.A. 1966. A revision of *Congea* (Verbenaceae). *Gardens' Bulletin Singapore* 21(3): 259-314.

1. *Congea tomentosa* Roxburgh, *Plants of the Coast of Coromandel* 3: 90, t.293 (1820). SHOWER ORCHID. Climbing shrub. Leaves ovate or elliptic-ovate, entire, pubescent above, densely tomentose beneath, to 18.5 cm. Inflorescence to 30 cm; cymes c.7-flowered; flowers sessile; inflorescence-bracts 3, free, elliptical, tomentose, pink or violet. Calyx pubescent, the lobes purple, developing long accessory awns (teeth) after anthesis. Corolla whitish or pale purple, with a band of hairs in throat, c.2.2 cm.

Range: India to Southeast Asia. Cultivated as an ornamental in Surinam (Ostendorf, 1962).

4. *Duranta* Linnaeus

Armed or unarmed, evergreen trees and shrubs. Leaves opposite or whorled, simple, petiolate. Inflorescence a terminal panicle of racemes; inflorescence-bracts not prominent or colored. Calyx tubular, 5-toothed. Corolla-tube cylindrical or salverform; limb 5-lobed.

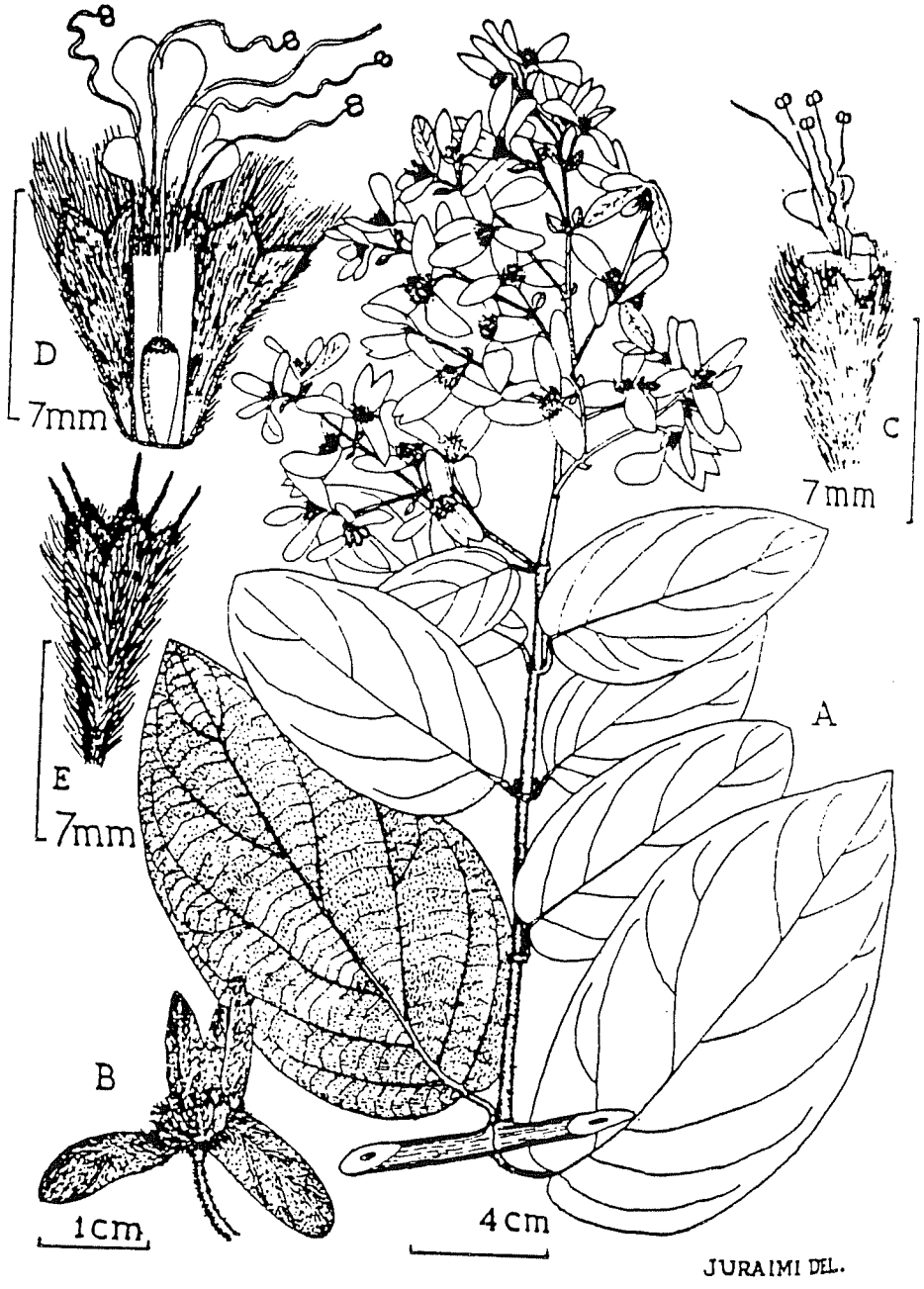


Fig. 173. *Congea tomentosa* (Verbenaceae).

Fig. 174. *Duranta erecta* (Verbenaceae).

Stamens 4, included. Fruit a drupe, with persistent, accrescent calyx; seeds 8.

1. *Duranta erecta* Linnaeus, *Species Plantarum* 637 (1753). (Synonyms: *D. plumieri* Jacquin, *D. repens* Linnaeus f. *alba* (Masters) Moldenke). GOLDEN DEWDROP, SKYFLOWER. Shrub or tree to 5 (-7) m; branches sometimes vine-like, the older branches also sometimes armed with spines and trailing on the ground or drooping. Leaf-blades ovate, oblong-lanceolate or obovate, usually entire or sometimes toothed above, glabrous or puberulent, to 7.5 cm. Inflorescence with racemes concentrated near ends of the branches, to 30 cm. Calyx pubescent. Corolla light blue to purplish, or white; tube pubescent. Persistent calyx yellow; fruit yellow, orbicular, juicy, beaked, c.1.1 cm.

Range: West Indies; southern United States to Argentina. Grown as an ornamental at the Promenade Gardens and Botanic Gardens, Georgetown, Guyana; and in the Cultuurtuin, Paramaribo (Teunissen & Lande, 1980) and elsewhere in Surinam (Ostendorf, 1962).

5. *Holmskioldia* Retzius

Armed or unarmed, evergreen shrubs, trees or woody vines. Leaves opposite, simple, petiolate; stipules absent. Inflorescence of terminal or axillary panicles, cymes or racemes; inflorescence-bracts not conspicuous or colored. Calyx of 5 sepals connate in a very short tube with large, orbicular, rotate, colored limb. Corolla-tube long, tubular; limb unequally 5-lobed or shortly 2-lipped, the upper lip 2-cleft, the lower lip 3-cleft. Stamens 4-5, exserted. Fruit a 2- to 4-lobed drupe, the calyx persistent and accrescent.

Literature: Moldenke, H.N. 1981. Notes on the genus *Holmskioldia* (Verbenaceae). *Phytologia* 48(4): 313-356.

1. *Holmskioldia sanguinea* Retzius, *Observationes Botanicae* 6: 31 (1791). CHINEES HOEDJE (Surinam); CHINESE HAT PLANT, CUP-AND-SAUCER PLANT. Unarmed shrub or tree to 10 m, sometimes clambering. Leaf-blades ovate, entire or shallowly crenate, glabrous above, pubescent below, to 12 cm. Calyx cup-shaped, rotate, reticulately veined, red, russet or orange, to 2.5 cm wide. Corolla curved, red or russet, to 2.5 cm. Stamens 4. Fruit 1- to 4-seeded.

Range: Nepal, Bhutan, Sikkim, Bangladesh. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, and in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam.

6. *Lantana* Linnaeus

Armed or unarmed, perennial herbs or shrubs. Leaves opposite or whorled, simple, petiolate. Inflorescence a terminal or axillary, pedunculate head, subumbellate head or spike; inflorescence-bracts not conspicuously enlarged or colored. Calyx minute, tubular, 5-toothed or 5-apiculate. Corolla-tube cylindrical or spindle-shaped; limb unevenly or nearly evenly 4- or 5-lobed, spreading. Stamens 4, included. Fruit a berry-like drupe with fleshy exocarp; nutlets and seeds 2.

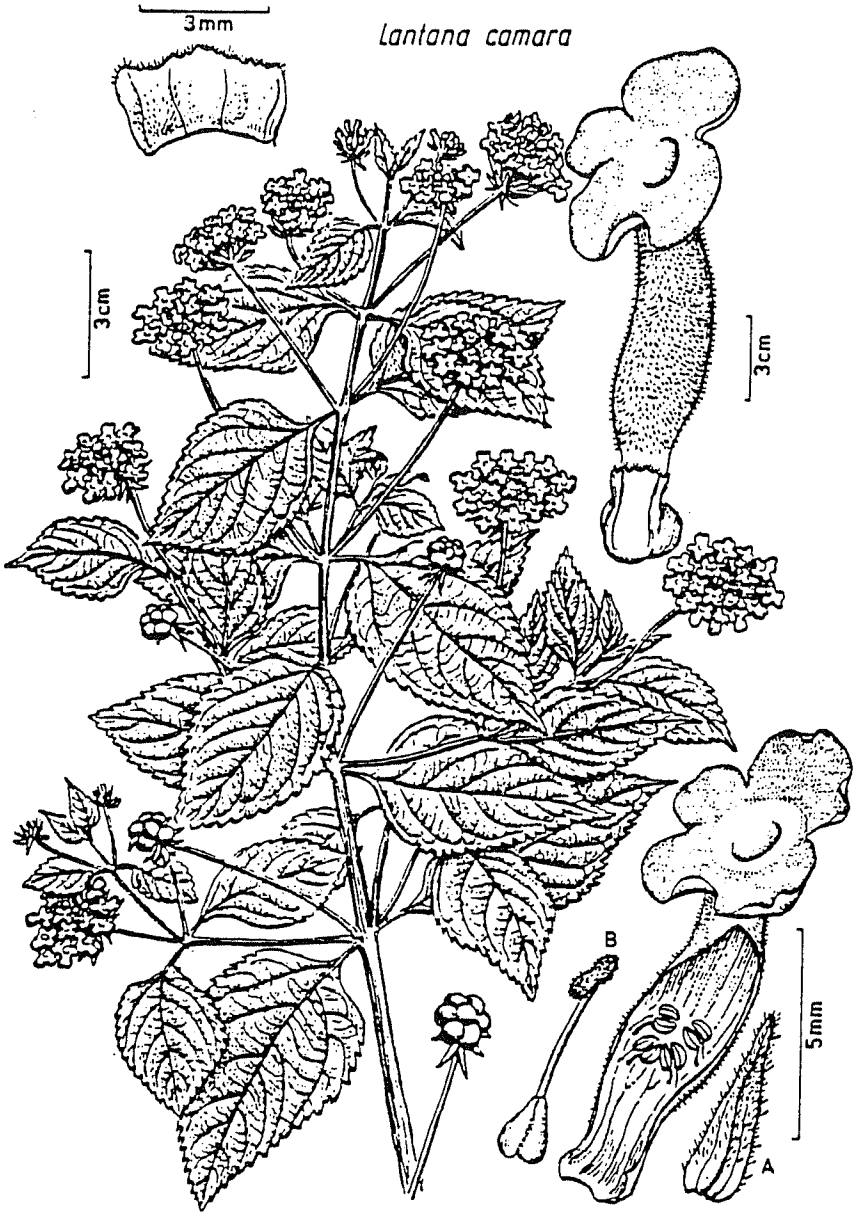


Fig. 175. *Lantana camara* (Verbenaceae).

Key to Species

1. Corolla red, orange, yellow, white, pink or purple; stems erect or climbing; leaves to 12.5 cm 1. *L. camara*
1. Corolla bright pink; stems pendulous or trailing; leaves to 2.5 cm 2. *L. montevidensis*

1. *Lantana camara* Linnaeus, *Species Plantarum* 627 (1753). SWEET SAGE, SAMANBALLI (Guyana); KOORSOE WIWIERIE (Surinamese Carib), SOLDATENTHEE (Surinam); AGOU-MAN-MAKA, THE INDIEN, MARIE-CRABE, KALAKA, TIBOMBE (French Guiana); LANTANA, YELLOW SAGE. Shrub of compact habit up to 2 m, or rising to 6 m; stems erect or climbing, sparsely prickly, or in var. *aculeata* (Linnaeus) Moldenke conspicuously and densely prickly. Leaves ovate, toothed, rugose-pubescent, to 12.5 cm. Inflorescence a terminal head 2-3 (-5) cm wide. Corolla either red, orange, yellow, white, pink or purple, the basic color changing to a different color at flower's maturity, the numerous flowers of a single head sometimes of several different basic colors. Fruit purplish-black.

Range: New World tropics, including Surinam and French Guiana. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; at the Half Flora nursery and in a private garden in Paramaribo, Surinam; and in French Guiana (de Granville, 1985).

Literature: Barrows, E.M. 1976. Nectar robbing and pollination of *Lantana camara*. *Biotropica* 8(2): 132-135. Moldenke, H.N. 1980. Reduction in taxonomic rank of some Verbenaceae and Eriocaulaceae. *Phytologia* 45(3): 296. Thaman, R.R. 1974. *Lantana camara*: its introduction, dispersal and impact on islands of the tropical Pacific Ocean. *Micronesica* 10(1): 17-39.

This attractive plant has vigorously spread in other parts of the tropical world as an uncontrollable weed in areas where vegetation is not meticulously managed. Biological control species (insect enemies) employed to weaken its grasp upon invaded landscapes and indigenous vegetation outside the Guianas include the lantana tortricid moth, lantana plume moth, lantana leaf bug, and lantana seed fly.

2. *Lantana montevidensis* (K. Sprengel) Briquet, *Annuaire du Conservatoire et du Jardin Botaniques de Geneve* 7-8: 301 (1904). TRAILING LANTANA, WEEPING LANTANA. Shrub; stems pendulous or trailing, to 90 cm. Leaves ovate, toothed, rugose, pubescent, to 2.5 cm. Inflorescence a terminal head to 2.5 cm or more wide. Corolla bright pink.

Range: South America (Paraguay and environs). Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana (Ted Hubbard, pers. comm., 1985).

7. *Petrea* Linnaeus

Unarmed, evergreen or deciduous trees, shrubs or woody vines. Leaves opposite or whorled, simple, entire, sessile or petiolate, exstipulate. Inflorescence of terminal or axillary racemes; inflorescence-bracts inconspicuous. Calyx-tube short; calyx-lobes 5, long, spreading, usually colored and paler than, as well as longer than, the corolla, with a short, 5-lobed coroniform crest (calycinal crest) inside where lobes join the tube. Corolla-tube

short; limb obliquely and unequally 5-lobed. Stamens 4, included. Fruit a drupe, completely enclosed by, and winged with, the persistent calyx.

Literature: Moldenke, H.N. 1938. A monograph of the genus *Petrea*. *Fedde's Repertorium* 43(1): 1-48; 43(11): 161-221.

Key to Species

1. Leaves sessile or subsessile — 2. *P. kohautiana*
1. Leaves distinctly petiolate.
   2. Leaves in whorls of 3 — 1. *P. bracteata*
   2. Leaves opposite.
3. Leaves bullate (puckered) on upper surface when mature — 1. *P. bracteata*
3. Leaves not bullate.
   4. Calyx-tube densely spreading-hirsute; inflorescence axillary — 3. *P. volubilis*
   4. Calyx-tube shortly pubescent, not spreading-hirsute; inflorescence terminal — 2. *P. kohautiana*

1. *Petrea bracteata* Steudel, *Flora* 26: 764 (1843). (Synonyms: *P. arborea* sensu Pulle (1906), non Kunth; *P. macrostachya* sensu Pulle (1906), non Bentham). PARAPO (Surinamese Carib), HAJARIBALLI SALEROE (Surinamese Arawak); LIANE GRIS (French Guiana); SANDPAPER VINE (Guyana). Woody vine more than 3 m. Leaves opposite or in whorls of 3, elliptical, rugose, bullate, glabrous or pubescent, to 30 cm. Inflorescence axillary or terminal, to 52 cm. Flowers purple; calyx-tube very sparsely and shortly pubescent.

Range: Venezuela, Brazil and the three Guianas. Grown as an ornamental in Surinam (Ostendorf, 1962).

The "bracts" denoted by the specific epithet "*bracteata*" are actually the calyx-lobes.

2. *Petrea kohautiana* Presl, *Botanische Bemerkungen* 99 (1844). LIANE GRIS (French Guiana). Shrub, or woody vine to 9 m. Leaves opposite, sessile or subsessile, elliptical, smooth, glabrous, to 15 cm. Inflorescence terminal, to 60 cm. Flowers blue or purple; calyx-tube shortly pubescent or puberulent.

Range: West Indies and northern South America. Grown as an ornamental in Surinam (Ostendorf, 1962). Moldenke (p.31, 1938) cites cultivated plants from the three Guianas. This may be the unidentified *Petrea* species grown for ornament in French Guiana (de Granville, 1985A).

3. *Petrea volubilis* Linnaeus, *Species Plantarum* 626 (1753). QUEEN'S WREATH, SANDPAPER VINE. Subshrub, or woody vine to 13 m. Leaves opposite, elliptical, scabrid but not bullate above, puberulent beneath, to 21 cm. Inflorescence axillary, to 30 cm. Flowers blue or purple; calyx-tube densely spreading-hirsute.

Range: West Indies, Mexico and Central America. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, and on hotel grounds in Paramaribo, Surinam.

8. *Verbena* Linnaeus

Annual or perennial herbs, or subshrubs; stems usually quadrangular. Leaves opposite, toothed, simple to pinnatifid, petiolate. Inflorescence of terminal, solitary to paniculately disposed, spikes; inflorescence-bracts narrow, not colored. Calyx tubular, unequally 5-toothed and -ribbed. Corolla-tube salverform or funnelform, 5-lobed, somewhat weakly 2-lipped. Stamens 4. Fruit of 4 dry nutlets, the calyx somewhat persistent.

1. *Verbena tenera* K. Sprengel, *Systema Vegetabilium*, ed.17, 2: 750 (1825). Shrub-like perennial; stems caespitose, creeping or decumbent, rooting at the nodes. Leaves pinnatifid into laciniate segments, roughly pubescent, to 2.5 cm. Inflorescence of compact, capitate spikes which become elongated after anthesis. Flowers reddish-violet; corolla-lobes emarginate, sometimes with white margin.

Range: Brazil and Argentina. Grown as an ornamental in Surinam (Ostendorf, 1962).

9. *Vitex* Linnaeus

Evergreen or deciduous trees and shrubs. Leaves opposite, palmately compound, petiolate. Inflorescence of axillary cymes, or cymes disposed in terminal panicles; inflorescence-bracts inconspicuous, linear. Calyx campanulate or tubular, 5-toothed or truncate. Corolla-tube funnelform, unequally 5-lobed, somewhat 2-lipped. Stamens 4, often exserted. Fruit a drupe.

1. *Vitex agnus-castus* Linnaeus, *Species Plantarum* 638 (1753). CHASTE TREE. Shrub or tree to 7.5 m; plant aromatic. Leaves palmately (digitately) compound; leaflets 5-7 (-9), narrowly lanceolate, entire or with few teeth, dark green and capitate-glandular above, densely greyish-tomentellous and pellucid-glandular beneath, to 15 cm. Inflorescence a terminal panicle to 30 cm, the component cymes sessile or nearly so. Flowers puberulent, pale violet, lilac or lavender; corolla 8 mm, the lower lip of corolla-tube with one lobe 5 mm and much longer than the 2 others.

Range: Mediterranean Sea region to Central Asia. Grown as an ornamental in Georgetown, Guyana (Jansen-Jacobs, 1988), and on University grounds and in gardens of Paramaribo, Surinam.

Literature: Turrill, W.B. 1962. *Vitex agnus-castus. Curtis's Botanical Magazine* n.s. 174(1): tab.400.

Vitex pinnata Linnaeus, with concolorous green leaves and inflorescence to 15 cm, is a tropical Asian species formerly cultivated at the Botanic Gardens, Georgetown, Guyana (Jansen-Jacobs, 1988).

Vitaceae

Evergreen or deciduous vines or shrubs; stems often with swollen or jointed nodes and tendrils; tendrils with or without adhesive discs. Leaves alternate, simple and often

Fig. 176. *Cissus quadrangula* (Vitaceae).

palmately lobed, or palmately compound. Inflorescence produced opposite the leaves, an umbellate cyme or panicle. Flowers bisexual, or unisexual and the plants monoecious, regular; sepals 4-5, united below in a 4- or 5-toothed calyx; petals 4-5, free or united below. Stamens 4-5. Ovary superior, 2-celled. Fruit a 1- to 4-seeded berry.

1. *Cissus* Linnaeus

Vines or shrubs; stems woody or herbaceous, with tendrils; tendrils without adhesive disc. Leaves simple and often palmately lobed, or palmately compound. Inflorescence of umbellate cymes. Flowers bisexual or unisexual; sepals 4; petals 4, free. Stamens 4. Fruit a 1- or 2-seeded berry.

Key to Species

1. Leaves simple; corolla green or pale yellow	2. *C. quadrangula*
1. Leaves trifoliolate; corolla red	1. *C. erosa*

1. *Cissus erosa* Richard, *Actes de la Societe d'Histoire Naturelle de Paris* 1: 106 (1792). Climbing vine. Stems 4-angled, often winged. Leaves trifoliolate, the leaflets subsessile, ovate to obovate, crenate-serrate, to 15 x 8 cm. Petals red or reddish-orange. Fruit globose, black.

Range: West Indies; Mexico to South America, including French Guiana. Infrequently grown as an ornamental in private gardens in French Guiana (de Granville, 1985).

2. *Cissus quadrangula* Linnaeus, *Mantissa Plantarum* 39 (1767). VELDT GRAPE. Climbing vine to 6 m. Stems strongly 4-angled, subalate, constricted at the nodes. Leaves falling early under dry conditions, simple, unlobed or often palmately 3-lobed, ovate, cordate or reniform in outline, serrate, to 11 x 11 cm. Petals greenish or pale yellow, with red specks. Fruit globose, red.

Range: Africa and Asia. Grown as an ornamental in the nursery area of the Botanic Gardens, Georgetown, Guyana.

Zygophyllaceae

Herbs, shrubs or trees; branches often swollen or jointed at the nodes. Leaves opposite, pinnately compound, petiolate; stipules sometimes spinose. Inflorescence of terminal or axillary, solitary, paired or fasciculate flowers. Flowers bisexual, regular; sepals 4-5, free; petals 4-5, free. Stamens 8-10, free. Ovary superior, 2- to 12-celled. Fruit a capsule, often angled or spinose; seeds with or without aril.

1. *Guaiacum* Linnaeus

Evergreen trees or shrubs. Leaves evenly pinnately compound. Inflorescence a terminal or axillary, subumbellate cluster; flowers long-pedicellate. Stamens 8-10. Fruit a 2- to 5-angled capsule; seeds arillate.

Fig. 177. *Guaiacum officinale* (Zygophyllaceae).

1. *Guaiacum officinale* Linnaeus, *Species Plantarum* 381 (1753). POKHOUT (Surinam); LIGNUM VITAE. Tree to 9 m. Leaves to 9 cm, petiolate; leaflets 4 or 6 (2 or 3 pairs), ovate, elliptical or obovate, entire, glabrous, to 3.5 cm, sessile. Sepals pubescent. Petals pubescent at the apex, blue, to 1.2 cm. Stamens 10, blue. Fruit obovoid or cordate, flattened and 2-angled, yellow, to 2 cm; seeds with red aril.

Range: West Indies; Panama and northern South America. Grown as an ornamental in Surinam (Ostendorf, 1962).

The extremely hard wood of this species is a desirable commercial product.

MONOCOTYLEDONS

Agavaceae

Perennials with cane-like stems or thick trunks, or stemless and the leaves in a basal rosette. Leaves spirally arranged, sheathing at the base, the margin often armed, the apex sometimes spine-tipped. Inflorescence a terminal raceme or panicle. Flowers usually bisexual, regular; perianth-segments 6, often united below in a tube or cup. Stamens 6. Ovary superior or inferior, usually 3-celled; ovules numerous. Fruit a capsule or berry.

Key to Genera

1. Ovary inferior.
   2. Leaves grass-2. 2.Leaves grass-like; flowers bilaterally symmetrical; corolla-tube bent 6. *Polianthes*
   2. Leaves not grass-like; flowers radially symmetrical; corolla-tube straight.
3. Filaments swollen near middle; anthers included within perianth 5. *Furcraea*
3. Filaments not swollen; anthers exserted from perianth 1. *Agave*
1. Ovary superior.
   4. Leaves long-linear; trunk swollen at the base; flowers unisexual (plants dioecious) 2. *Beaucarnea*
   4. Leaves usually lanceolate; trunk usually not swollen at the base; flowers bisexual.
5. Perianth campanulate, the lobes 2.5 cm or more; filaments swollen at apex; fruit indehiscent or capsular 8. *Yucca*
5. Perianth with narrow tube, the lobes to 2 cm; filaments not swollen at apex; fruit a berry.
   6. Leaves petiolate; ovules numerous in each cell of ovary; leaves pinnately veined 3. *Cordyline*
   6. Leaves sessile; ovule one in each cell of ovary; leaves parallel-veined, or veins obscure.
7. Rhizomes absent; leaves not succulent, clustered at the tips of stems or branches; trees or cane-like shrubs 4. *Dracaena*
7. Rhizomes present.
   8. Stem usually absent or short; leaves succulent, in basal rosettes from rhizomes; often stemless herbs 7. *Sansevieria*
   8. Stem present; leaves not succulent, well-distributed along the stem 3. *Cordyline*

1. *Agave* Linnaeus

Plants succulent, often monocarpic, perennial, rosette-forming and often producing offsets (suckers). Stem absent or present, sometimes forming a short trunk. Leaves in a spiral rosette, simple, glabrous, the margin often spinose, the apex with a sharp spine. Inflorescence a tall central, dense raceme or a panicle with flowers grouped in umbellate clusters. Flowers bisexual, regular; perianth-segments 6, united below in a cylindrical or funnelform tube, the lobes usually erect. Stamens 6. Ovary inferior, 3-celled. Fruit a loculicidal capsule; seeds numerous, flat, black, shiny.

Literature: Gentry, H.S. 1982. *Agaves of Continental North America*. 670 pp. Tucson, Arizona: University of Arizona Press.

Key to Species

1. Leaves unarmed on margin, or the margin cartilaginous-roughened.
   2. Leaves unarmed on margin, soft, ovate-lanceolate, to 70 cm, the terminal spine soft; inflorescence a dense raceme 3. *A. attenuata*
   2. Leaves sometimes with margin bearing cartilaginous-roughened prominences, stiff, narrowly oblanceolate, to 130 cm, the terminal spine hard; inflorescence a panicle 5. *A. sisalana*
1. Leaves armed with conspicuous spines on margin.
3. Leaves to 10 cm wide, linear to narrowly lanceolate, flexible, leathery and not very succulent, variegated with creamy-white margin; stem becoming 90 cm or more 2. *A. angustifolia*
3. Leaves 25-35 cm wide, lanceolate or spathulate, rigid and succulent, green or variegated with white; stem absent.
   4. Terminal spine of leaf decurrent for c.20 cm along the inrolled apex of the leaf; plants 2-2.7 (-3) m tall; leaves spathulate, much wider above the middle; leaves grey, not variegated with white 4. *A. franzosinii*
   4. Terminal spine of leaf not decurrent; plant 1-2 m tall; leaves lanceolate, widest at the base; leaves grey or variegated with white margin 1. *A. americana*

1. *Agave americana* Linnaeus, *Species Plantarum* 461 (1753). Stem absent; plants suckering. Leaves in a basal rosette, lanceolate, to 2 m x 25 cm, curved or reflexed, with spiny margin. Inflorescence paniculate, to 9 m. Flowers pale yellow, to 10 cm.

Literature: SECAB. 1989. *Agave americana. Especies Vegetales Promisorias* 1: 9-37.

Key to Varieties

1. Leaves glaucous-grey or pale green 1a. var. *americana*
1. Leaves with yellowish-white or yellow margin 1b. cv. Marginata

1a. *A. americana* var. *americana*. CENTURY PLANT. Range: Eastern Mexico. Grown as an ornamental at the Botanic Gardens and on hotel grounds in Georgetown, Guyana. Formerly grown as a fiber plant in French Guiana (Lemée, 1955).

1b. *A. americana* cv. Marginata. (Synonym: *A. americana* var. *marginata* Trelease). VARIEGATED CENTURY PLANT. Range: A horticultural variant without original geographical range. Grown as an ornamental in a private garden near Timehri, Guyana, and in urns at waterfront park along Surinam River in Paramaribo, Surinam.

This cultivar has leaves with a yellow margin (border). Other variegated kinds of *A. americana* have been named, e.g. with a wide yellow median band down the leaf (var. *medio-picta* Trelease); with green and yellow twisted leaves (var. *variegata* Trelease); or having several yellow or white lines on the leaves (var. *striata* Trelease). Regarding such

agaves, the specialist H.S. Gentry (1982) has observed that the varieties which are "segregated largely on the basis of yellow or whitish striations, are inconstant in their color patterns," and "appear as ... changeable forms from one generation to the next". However, while he believes they scarely merit the designation of a botanical variety, he agrees that the names are "convenient for agave fanciers ... for distinguishing and discussing their collections." Several variegated cultivars are shown to advantage in a color plate (Tafel 3) by Max Wisland in the 1988 reprint of A. Berger, *Die Agaven* (1915), Gustav Fischer Verlag, Stuttgart and New York.

Literature: Sydow, G. 1987. The first agave in Europe. *British Cactus and Succulent Journal* 5(3): 76-78.

2. *Agave angustifolia* Haworth, *Synopsis Plantarum Succulentarum* 72 (1812), cv. Marginata. (Synonym: *A. angustifolia* var. *marginata* Hort.). VARIEGATED CARIBBEAN AGAVE, WEST INDIAN AGAVE. Stem to 60 (-90) cm; plants suckering. Leaves in a basal rosette when young, linear to narrowly lanceolate, to 120 x 10 cm, stiff, with spiny margin, green with creamy-white margin. Inflorescence paniculate, to 5 m. Flowers greenish or yellow, to 6.5 cm.

Range: Typical all-green plants occur from Mexico to Costa Rica. Cultivar Marginata is grown as an ornamental at Timehri Airport and other sites in Guyana; on museum grounds, in a home garden near the University, and in roadside gardens near Paramaribo, Surinam; and at the Jardin Botanique, Cayenne, French Guiana.

3. *Agave attenuata* Salm-Dyck, *Hortus Dyckensis* 3 (1834). DRAGON-TREE AGAVE. Stem to 1.5 m; plants not suckering. Leaves in a basal rosette when young, ovate-lanceolate, to 70 x 16 cm, soft, unarmed, glaucous- or pale yellowish-green. Inflorescence racemose, to 3.5 m. Flowers greenish-yellow, to 5 cm.

Range: Central Mexico. Grown for ornament at the Botanic Gardens, Georgetown, Guyana.

4. *Agave franzosini* Baker, *Kew Bulletin of Miscellaneous Information* 1892: 3 (1892). Plants suckering. Leaves in a basal rosette, spathulate (much wider above the middle), to 2.2 m x 35 cm, often arching, with spiny margin, greyish-glaucous green or bluish. Inflorescence paniculate, to 11 m or more. Flowers yellow, to c.7 cm.

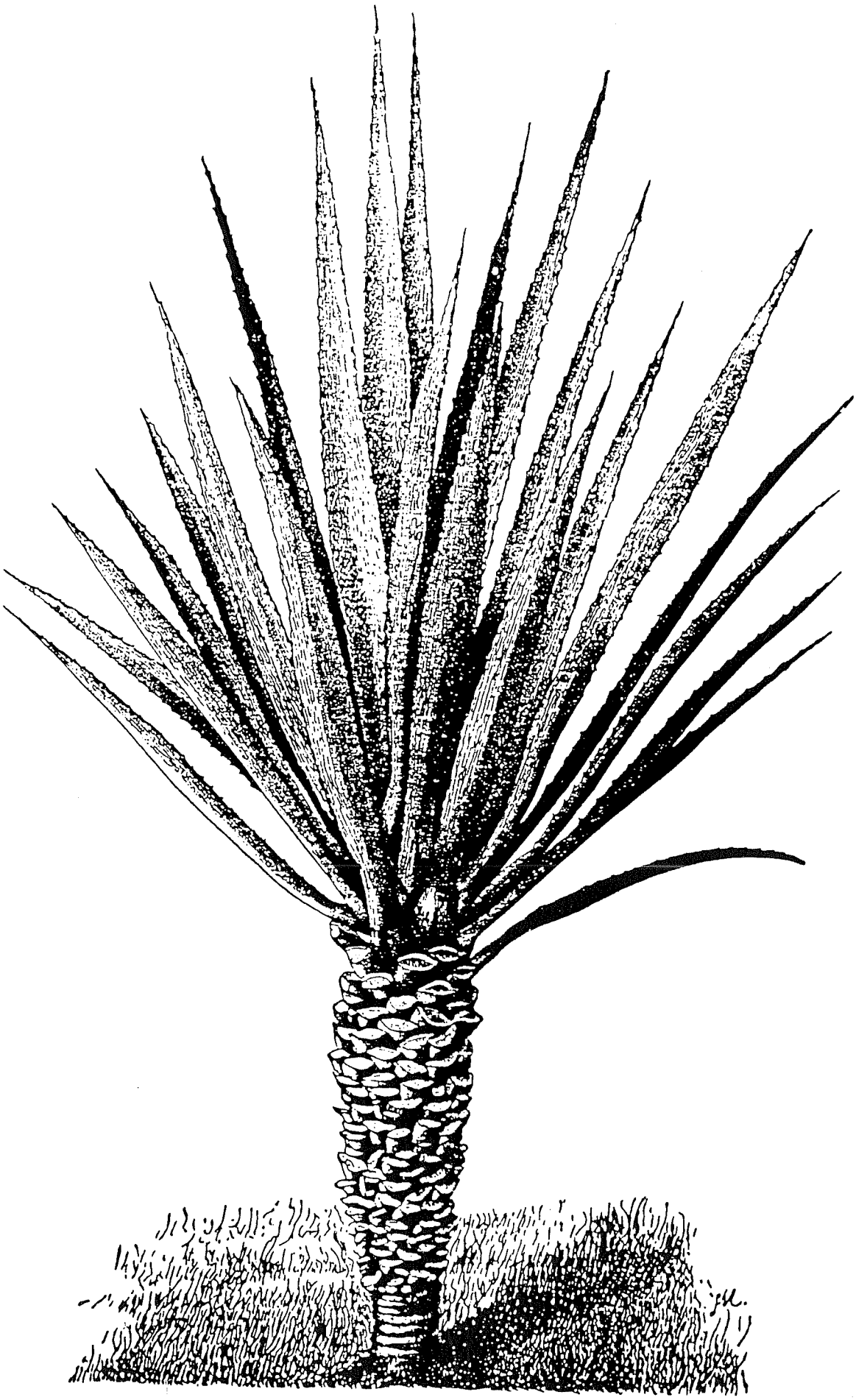
Range: Unknown, possibly Mexico. Grown as an ornamental in Surinam (Ostendorf, 1962).

5. *Agave sisalana* Perrine, *Congressional (House of Representatives) Document* 564: 8 (1838). SISAL, SISAL HEMP. Stems to 1.2 m; plants suckering. Leaves in a basal rosette when young, narrowly oblanceolate, to 1.8 m x 7.5 cm, spreading, but the lower leaves often trimmed away to give the effect of erect leaves, unarmed or on mature plants with margin bearing cartilaginous-roughened prominences, bluish-green. Inflorescence paniculate, 6-7 cm. Flowers green, to 6.5 cm.

Range: Unknown, but probably Yucatan Peninsula of Mexico. Grown as an outdoor

Fig. 178. *Agave franzosinii* (Agavaceae).

Fig. 179. *Agave sisalana* (Agavaceae).



accent plant at Timehri Airport, Guyana.

This plant is a pentaploid hybrid cultivar which is grown locally in Surinam for the natural hard fiber (sisal twine) (Ostendorf, 1962).

Literature: Purseglove, J.W. 1972. *Tropical Crops, Monocotyledons 1.* 334 pp. New York: John Wiley & Sons (pages 14-29). Thompson, E.H. 1903. Henequen - the Yucatan fiber. *National Geographic Magazine* 14(4): 150-158.

2. *Beaucarnea* Lamarck

Arborescent, dioecious perennial from a bulbous-swollen caudex, branched when mature. Leaves in an apical spiral rosette, numerous, long-linear. Inflorescence a large terminal panicle. Flowers unisexual, regular, small, bracteolate, pedicellate; perianth-segments 6, free. Stamens 6. Ovary superior, 1-celled. Fruit a 3-winged capsule.

1. *Beaucarnea recurvata* Lemaire, *L'Illustration Horticole* 8: Misc. 59 (1861). (Synonym: *Nolina recurvata* (Lemaire) Hemsley). PONYTAIL. Trunk to c.9 m x 9 m in circumference at base, tapering to c.50 cm wide (diameter) at breast height, and progressively narrowing above while forking into several irregularly-spaced branches. Leaves linear, entire, recurved, green, to 1.8 m x 2 cm. Inflorescence 30-60 cm. Flowers white, c.1.5 mm.

Range: Mexico. Grown in the Botanic Gardens nursery, Georgetown, and as an outdoor specimen planting on a farm near Timehri, Guyana.

Literature: Foster, M.B. 1953. Notes on *Beaucarnea recurvata*. *Plant Life* 9(1): 137-139. Martin, V.F. 1990. *Beaucarnea recurvata* Lemaire - "Because it bloomed". *Cactus and Succulent Journal* (U.S.) 62(4): 163-164.

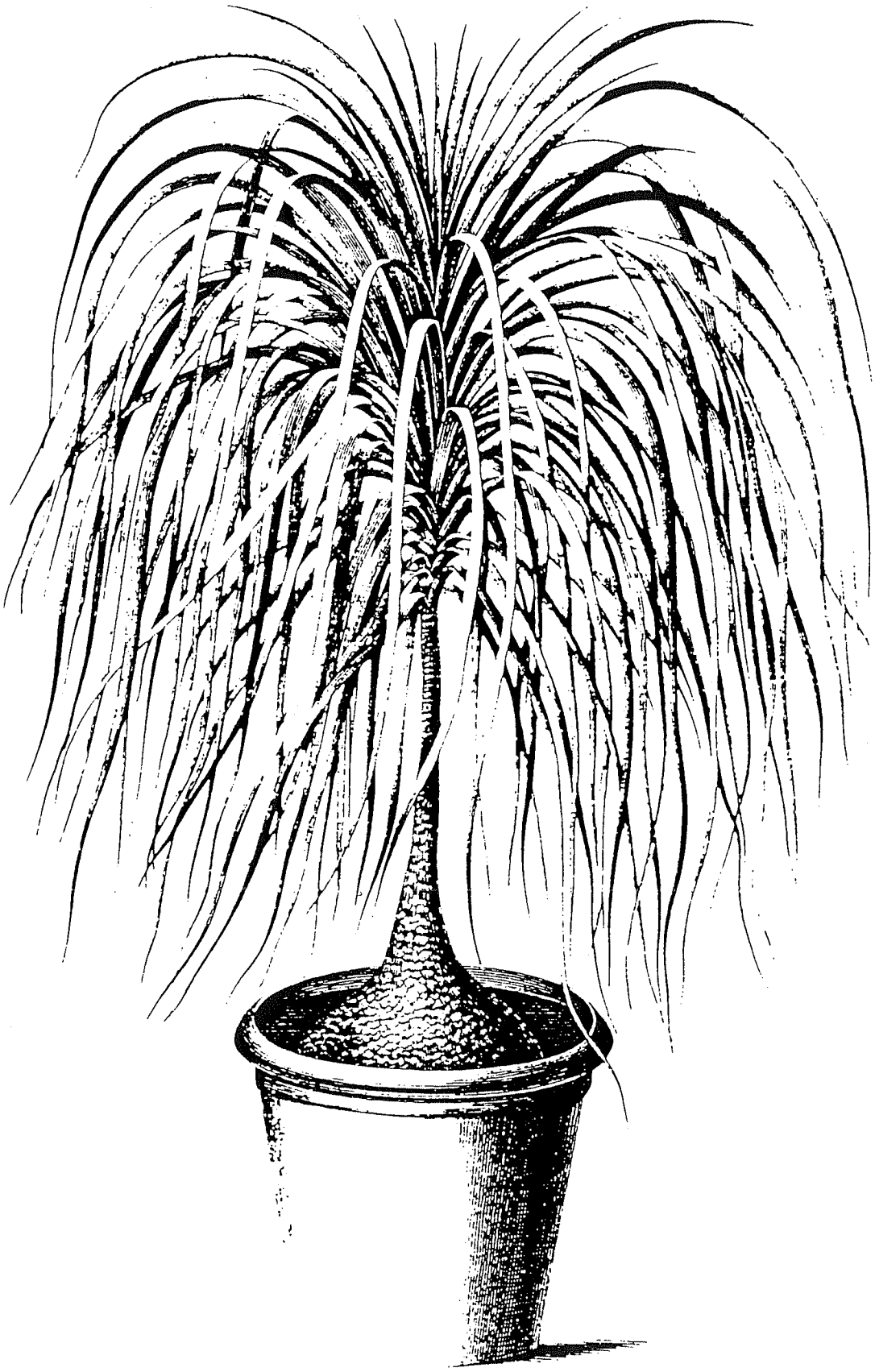
3. *Cordyline* R. Brown

Perennial cane-like shrubs from creeping rhizomes, with fleshy roots. Stems often clustered, simple or branched, ringed with leaf-scars above. Leaves alternate or spirally arranged, usually clustered at or near tips of stems, subsessile to petiolate. Inflorescence a terminal (though seemingly lateral), divaricately branched panicle. Flowers bisexual, regular, pedicellate, bracteolate; perianth-segments 6, united below in a short tube, the lobes erect to spreading. Stamens 6. Ovary superior, 3-celled; ovules 6-12 per cell. Fruit a succulent, 3-seeded berry; seeds numerous, flattened, black.

Key to Species

1. Leaves clustered at or near tips of stems, petiolate, often variegated, narrowly elliptical, oblong or lanceolate; flowers pink or reddish 1. *C. fruticosa*
1. Leaves well-distributed along stem, epetiolate, green, linear-lanceolate; flowers pale purple 2. *C. stricta*

Fig. 180. *Beaucarnea recurvata* (Agavaceae).



1. *Cordyline fruticosa* (Linnaeus) Chevalier, *Catalogue des Plantes du Jardin Botanique de Saigon* 66 (1919). (Synonym: *C. terminalis* (Linnaeus) Kunth). INDIAN PADDLE (Surinam); ANDONG (Surinamese Javan); TI PLANT. Tuberous root weighing up to 6.4 kg (14 lbs). Plants with clustered, cane-like, usually simple stems to 4(-5) m. Petiole channeled, 15-30 cm; leaf-blades narrowly elliptical, oblong or lanceolate, obtuse to acuminate, to c.75 cm, clustered at or near tips of stems. Inflorescence to 1 m; bracts pink. Flowers pink or reddish, to 12 mm.

Range: Eastern Asia, East Indies and South Pacific Islands to Hawaii. Grown as an ornamental in the Promenade Gardens, Georgetown and roadside gardens elsewhere in Guyana; at the Esther Stichting near Paramaribo, at the Palmentuin and on hotel grounds in Paramaribo, Surinam; and on hotel grounds in Cayenne, French Guiana. In Surinam, it is also planted as a boundary marker to delimit property lines, and in Javan cemeteries (Ostendorf, 1962).

Literature: Fisher, J.B. 1972. Control of shoot-rhizome dimorphism in the woody monocotyledon, *Cordyline* (Agavaceae). *American Journal of Botany* 59(10): 1000-1010. Fisher, J.B. and P.B. Tomlinson. 1972. Morphological studies in *Cordyline* (Agavaceae), II. Vegetative morphology of *Cordyline terminalis*. *Journal of the Arnold Arboretum* 53(1): 113-127. Fosberg, F.R. 1985. *Cordyline fruticosa* (L.) Chevalier (Agavaceae). *Baileya* 22(4): 180-181. Petard, P. 1946. *Cordyline terminalis*: ethnobotanique et medecine polynesiennes. *Journal de la Societe des Oceanistes* 2: 194-208. Smith, A.C. 1979. *Flora Vitiensis Nova* 1: 148-152.

Leaves may be green, or streaked or suffused with shades of cream, pink, red or purple. The nomenclature of this plant has been clarified by Fosberg (1985).

2. *Cordyline stricta* (Sims) Endlicher, *Annalen des Wiener Museums der Naturgeschichte* 1: 162 (1836). (Synonym: *C. congesta* Endlicher). Single-stemmed shrub to 4 m. Leaf-blades well-distributed along the stem, epetiolate, linear-lanceolate, acuminate, green, to 60 cm. Inflorescence to 60 cm; bracts purplish. Flowers pale purple, to c.7 mm.

Range: Australia. Grown as an ornamental on a flower-farm near Timehri, Guyana.

See observation under *Dracaena concinna* Kunth.

4. *Dracaena* Linnaeus

Perennial cane-like shrubs, or trees; rhizomes absent; roots often orange. Stems solitary or clustered, simple or branched, often ringed above. Leaves alternate, opposite or spirally arranged, sometimes clustered at or near tips of stems, sessile or petiolate. Inflorescence a terminal (though seemingly lateral) divaricately branched panicle, or subumbellate raceme. Flowers bisexual, regular, pedicellate, bracteolate; perianth-segments 6, united below in a short tube, the lobes erect to spreading. Stamens 6. Ovary superior, 3-celled; ovule 1 per cell. Fruit a succulent, 1(-3)- seeded berry.

Literature: Bos, J.J. 1984. *Dracaena in West Africa*. 126 pp. Wageningen, The Netherlands: Agricultural University Wageningen. Bos, J.J. and J. Cullen. 1986. *Dracaena*,

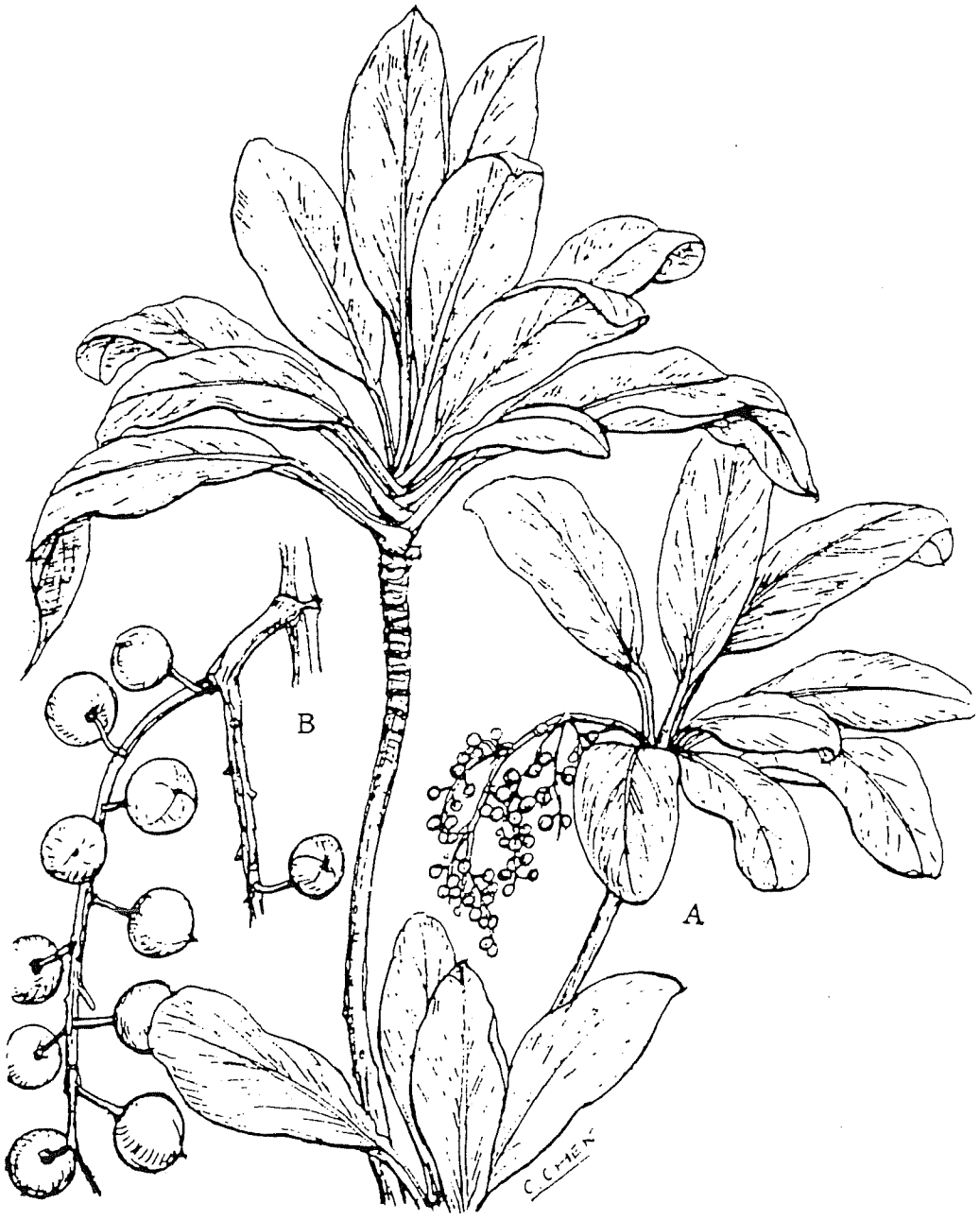


Fig. 181. *Cordyline fruticosa* (Agavaceae).

pp. 285-287, in Walters, S.M., et al., eds., *The European Garden Flora*, Volume I, Part I. Cambridge, England: Cambridge University Press.

Key to Species

1. Leaves petiolate (petiole short or long); small shrubs.
   2. Leaves not variegated.
3. Petiole distinct, narrow, almost as long as the blade, terete — 1. *D. aubryana*
3. Petiole strap-shaped, gradually tapering into the leaf-sheath — 7. *D. sanderiana*
   2. Leaves variegated.
   4. Leaves with longitudinal stripes of white or pale yellow — 7. *D. sanderiana*
   4. Leaves with spots, blotches or rings of white — 8. *D. surculosa*
1. Leaves with clasping, flaring base, epetiolate; trees or large shrubs.
5. Freely-branched shrub; leaves mostly less than 40 cm long.
   6. Leaves with distinct, narrow, red or purple margin — 2. *D. concinna*
   6. Leaves without colored margin — 6. *D. reflexa*
5. Small tree or single-stemmed tree; leaves mostly more than 40 cm long.
7. Leaves glaucous; leaf-scars often with dark red resin — 4. *D. draco*
7. Leaves not glaucous; resin absent.
   8. Leaves mostly less than 5 cm wide — 3. *D. deremensis*
   8. Leaves mostly 5 cm or more wide — 5. *D. fragrans*

1. *Dracaena aubryana* Brongniart ex E. Morren, *Belgique Horticole* 10: 348 (1860). (Synonyms: *Dracaena humilis* Baker, *D. thalioides* Hort. Makoy ex E. Morren, *Pleomele thalioides* (Hort. Makoy ex E. Morren) N.E. Brown). Shrub to c.1 m, unbranched. Leaves lanceolate or linear-lanceolate, arching, to 60 x 12 cm, green, distinctly and abruptly rounded into the petiole; petiole terete, almost as long as the blade.

Range: Tropical Africa. Grown as an outdoor ornamental in Guyana (Ted Hubbard, pers. comm., 1986); and on Torarica hotel grounds, Paramaribo, and at the CELOS buildings at Leysweg, Surinam.

2. *Dracaena concinna* Kunth, *Enumeratio Plantarum* 5: 8 (1850). (Synonym: *D. marginata* sensu hort., non Lamarck). Shrub to 5(-9) m, often smaller; older plants branched. Leaves narrowly linear to linear-lanceolate, to 40 (-90) x 1-6 cm, with distinct, narrow, red or purple margin, sometimes also variegated with white stripes.

Range: Mauritius. Grown as an ornamental at the Botanic Gardens, Georgetown and on a farm near Timehri, Guyana.

Horticultural specimens of this plant are often referred to *D. marginata* Lamarck, which is a valid Madagascan species with red-margined leaves, but probably not found in cultivation.

Plants which seem to be *D. concinna* but with leaves concolorous green (without purple margin) are likely to be *Cordyline stricta* (Sims) Endlicher, a very similar-appearing species.

Fig. 182. *Dracaena sanderiana* (Agavaceae).

D. concinna cv. Tricolor, the TRICOLOR DRACAENA, has leaves striped in cream-white and green, as well as with red margin, and is grown as an indoor and outdoor ornamental on hotel grounds in Paramaribo, Surinam.

3. *Dracaena deremensis* Engler, *Botanische Jahrbücher* 32: 95 (1903). Small tree to 5 m. Leaves lanceolate, to 45 (-60) x 5 cm, dark green, sometimes striped with paler green.

Range: Tropical Africa. A variant with yellowish-green stripes on the leaves is grown in Surinam (Ostendorf, 1962). The cv. Warneckii, with two white stripes down the leaves, is grown as an ornamental in Guyana (Ted Hubbard, pers. comm., 1986).

Different cultivars are variously striped in shades of pale or dark green, white, or less commonly yellow.

4. *Dracaena draco* Linnaeus, *Systema Naturae* ed.12, 246 (1767). DRAGON TREE. Tree 12-21 m, to 4.5 m circumference at the base, branched. Leaves linear-lanceolate, glaucous, to 60 (-90) x 4.5 cm, scarcely narrowed towards the flaring base; leaf-scars often with dark red resin.

Range: Canary Islands. Grown as seedlings at the Botanic Gardens, Georgetown, Guyana.

Literature: Emboden, W.A. 1970-1971. Dragon's blood. *Terra* 9(3): 12-17. Lyons, G. 1974. In search of dragons. *Cactus and Succulent Journal (U.S.)* 46(6): 267-282. Symon, D.E. 1974. The growth of *Dracaena draco*, dragon's blood tree. *Journal of the Arnold Arboretum* 55(1): 51-58.

This plant is the source of dragon's blood resin, used since antiquity as a varnish.

5. *Dracaena fragrans* (Linnaeus) Ker-Gawler, *Curtis's Botanical Magazine* 27: t.1081 (1808). (Synonym: *Pleomele fragrans* (Linnaeus) Salisbury). HERENBLAD (Surinam); IMMORTELLE (French Guiana); CORN PLANT. Tree to 15 m, sometimes branched; stems to 10 cm wide. Leaves lanceolate or narrowly oblong, to 150 x 10 cm, light or bright green, concolorous or variegated.

Range: Tropical West Africa. Grown as an ornamental in Guyana (cv. Victoria, fide Ted Hubbard, pers. comm., 1986); in yards along Kwattaweg road outside Paramaribo, and in gardens, as street plantings, on hotel grounds and for indoor decoration in Paramaribo, Surinam; and at the Jardin Botanique and on hotel grounds in Cayenne, French Guiana.

Cultivars range from plants with leaves all green to those with an extremely broad, cream or yellow marginal stripe; the latter is designated as cv. Victoria.

6. *Dracaena reflexa* Lamarck, *Encyclopedie Methodique. Botanique* 2: 324 (1786). (Synonym: *Pleomele reflexa* (Lamarck) N.E. Brown). Branched shrubs to 5 (-9) m. Leaves linear or lanceolate, to 20 x 5 cm, green or variegated.

Key to Varieties

1. Leaves all green — 6a. var. *reflexa*
1. Leaves with yellow margin — 6b. cv. Song of India

6a. *D. reflexa* var. *reflexa*. Range: Madagascar, Mauritius. Grown as an ornamental at the Botanic Gardens, Georgetown, and on a farm near Timehri, Guyana; and as an indoor potted plant in a hotel in Paramaribo, Surinam.

6b. *D. reflexa* cv. Song of India. Range: A horticultural variant without original range. Grown as a pot plant for ornamental purposes at a restaurant near Cayenne, French Guiana.

7. *Dracaena sanderiana* Hort. Sander ex M.T. Masters, *Gardeners' Chronicle* ser.3, 13: 442 (1893). BELGIAN EVERGREEN, RIBBON PLANT. Shrub to 1.5 m or more. Leaves elliptic-lanceolate, to 25 x 4 cm, tapering into a petiole, green or variegated.

Range: Cameroon. Plants with leaves having longitudinal stripes of white or pale yellow are grown for ornament at the Botanic Gardens and on restaurant grounds in Georgetown, Guyana, and at the Esther Stichting near Paramaribo as well as on hotel grounds in Paramaribo, Surinam. Plants with all-green leaves are grown as ornamentals at Rochambeau Airport, French Guiana.

8. *Dracaena surculosa* Lindley, *The Botanical Register* 14: t.1169 (1828). (Synonym: *D. godseffiana* Sander ex Baker). GOLD-DUST DRACAENA, SPOTTED DRACAENA. Shrub to 1(-8)m; stems branched, wiry, with prominent scarious sheaths at some nodes. Leaves broadly elliptical or oblong, to 20 x 6 cm, with irregular spots, blotches or rings of white or cream.

Range: Tropical West Africa. Grown as an ornamental in the Promenade Gardens, Georgetown and on a farm near Timehri, Guyana.

The inflorescence is a subumbellate raceme, in contrast to the other species treated herein, which are paniculate.

5. *Furcraea* Ventenat

Perennial, often monocarpic and rosette-plants, with or without stem. Leaves in a basal rosette or apical rosette at tip of stem, fibrous, often rigid and armed. Inflorescence a loose panicle, often proliferating vegetative bulbils from the flowers, with tall scape. Flowers bisexual, regular, pedicellate; perianth-segments 6, united below in a short tube, the lobes spreading. Stamens 6; filaments spongy-swollen in the middle. Ovary inferior, 3-celled; ovules numerous. Fruit a loculicidal capsule; seeds numerous, flat.

1. *Furcraea foetida* (Linnaeus) Haworth, *Synopsis Plantarum Succulentarum* 73 (1812). (Synonym: *F. gigantea* Ventenat). Nearly trunkless rosette-plant, or with trunk to 1.2 m, monocarpic, living 7-10 years. Leaves obovate-lanceolate, yellow-green, the lower surface rough, the margin spiny at base, subentire or with curved spines distally, the tip with sharp

spine, to 2.5 m x 25 cm. Inflorescence (including scape-axis) to 7.5 (-12) m. Flowers c.3.8 cm, white inside, often proliferating into vegetative bulblets.

Key to Varieties

1. Leaves not variegated	1a. var. *foetida*
1. Leaves variegated with cream-white stripes	1b. cv. Mediopicta

1a. *F. foetida* var. *foetida*. INJIE SOPO, MAURITIUSHENNEP (Surinam); MAURITIUS HEMP. Range: South America, including Surinam (Wessels Boer, et al. 1(1): 28, 1976) and French Guiana. Grown as an ornamental near Timehri, Guyana; in a home garden near the university, Paramaribo and at Zanderij Airport, Surinam; and on St. Joseph Island and Cayenne hotel grounds, French Guiana.

It is grown as a useful fiber plant in Surinam (Pulle, 1906), and for the same purpose in earlier times in French Guiana (Lemée, 1955); some Surinamese blacks and Amerindians wash their hair in the soapy sap of the plant, hence the name "Indian soap".

1b. *F. foetida* cv. Mediopicta. Range: A horticultural variant without a natural range. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

6. *Polianthes* Linnaeus

Perennial herbs from a bulbous-thickened rhizome. Leaves mostly (but not all) in a basal rosette, succulent, grasslike, channeled, entire or serrulate. Inflorescence a terminal raceme or spike with bracteate scape. Flowers bisexual, bilaterally symmetrical, often paired; perianth-segments 6, united below in a long, funnelform tube which is bent at a right angle near the base, the lobes spreading. Stamens 6. Ovary inferior, 3-celled; ovules numerous. Fruit a capsule, the persistent perianth at its apex; seeds numerous, flat.

1. *Polianthes tuberosa* Linnaeus, *Species Plantarum* 316 (1753). TUBEROOS, SEDEP MALAM (Surinam); TUBEROSE. Plant to 1.2 m at anthesis, from thick, erect rhizome. Leaves progressively smaller from base of rosette upwards to stem-leaves, clasping, linear-lanceolate, acuminate, brown-spotted beneath, to 45 x 12 cm. Inflorescence a raceme, to 1.2 m including scape-axis. Flowers in 1-bracteate pairs, fragrant, waxy, to 6 x 6.3 (at face) cm.

Range: Mexico. Grown as an ornamental in Guyana (Ted Hubbard, pers. comm., 1986), and used for cut flowers in Paramaribo, Surinam.

Literature: Trueblood, E. 1973. "Omixochitl" - the tuberose (*Polianthes tuberosa*). *Economic Botany* 27(2): 157-173.

A fragrant double-flowered (*flore pleno*) variant with 12 perianth-segments is usually cultivated.

7. *Sansevieria* Thunberg

Perennial herbs from a thick rhizome, freely producing offsets. Leaves in a basal fascicle or rosette or in a distichous fan atop short stem, succulent, fibrous, erect, sessile or narrowed into a short petiole, flat, semi-cylindrical or cylindrical, unarmed, bracteate at the base, often marbled and variegated. Inflorescence a many-flowered spike, raceme or panicle; pedicels jointed. Flowers bisexual, regular; perianth-segments 6, united below in a tube, the lobes spreading or recurved. Stamens 6. Ovary superior, 3-celled; ovule 1 per cell. Fruit a 1- to 3-seeded berry.

Literature: Elbert, V.F. and G.A. Elbert. 1982. Kind words for the mother-in-law's tongue. *Horticulture* 60(12): 44-51. Joyner, J.F. and E.O. Gangstad. 1951. *Sansevieria. Garden Journal* (New York) 1(1): 20-21. Morgenstern, K.D. 1979. Sansevierias. 112 pp. Kempten, Germany: Illertaler Offsetdruck. Speirs, D.C. 1983. Some notes on the genus *Sansevieria* (Liliaceae). *British Cactus and Succulent Journal* 1(1): 23-25. Stover, H. 1983. *The Sansevieria Book.* 72 pp. Tustin, California: Endangered Species Press.

Key to Species

1. Leaves cylindrical	1. *S. cylindrica*
1. Leaves flat.	
2. Leaves with reddish-brown margin	2. *S. hyacinthoides*
2. Leaves with green, yellow or white margin	3. *S. trifasciata*

1. *Sansevieria cylindrica* Bojer ex Hooker, *Curtis's Botanical Magazine* 85: t.5093 (1859). Stem absent. Leaves distichous, cylindrical (terete), channeled, rigid, with dark longitudinal stripes and cross-bands, to 1.5 m x 3 cm. Inflorescence a spiciform raceme to 90 cm.

Range: Angola. Grown as a nursery ornamental at the Botanic Gardens, Georgetown, and on a farm near Timehri, Guyana; at the Esther Stichting near Paramaribo, and in an indoor atrium of the Torarica Hotel, Paramaribo, Surinam. Planted also at Paramaribo Zoo, Suriname, seen by me.

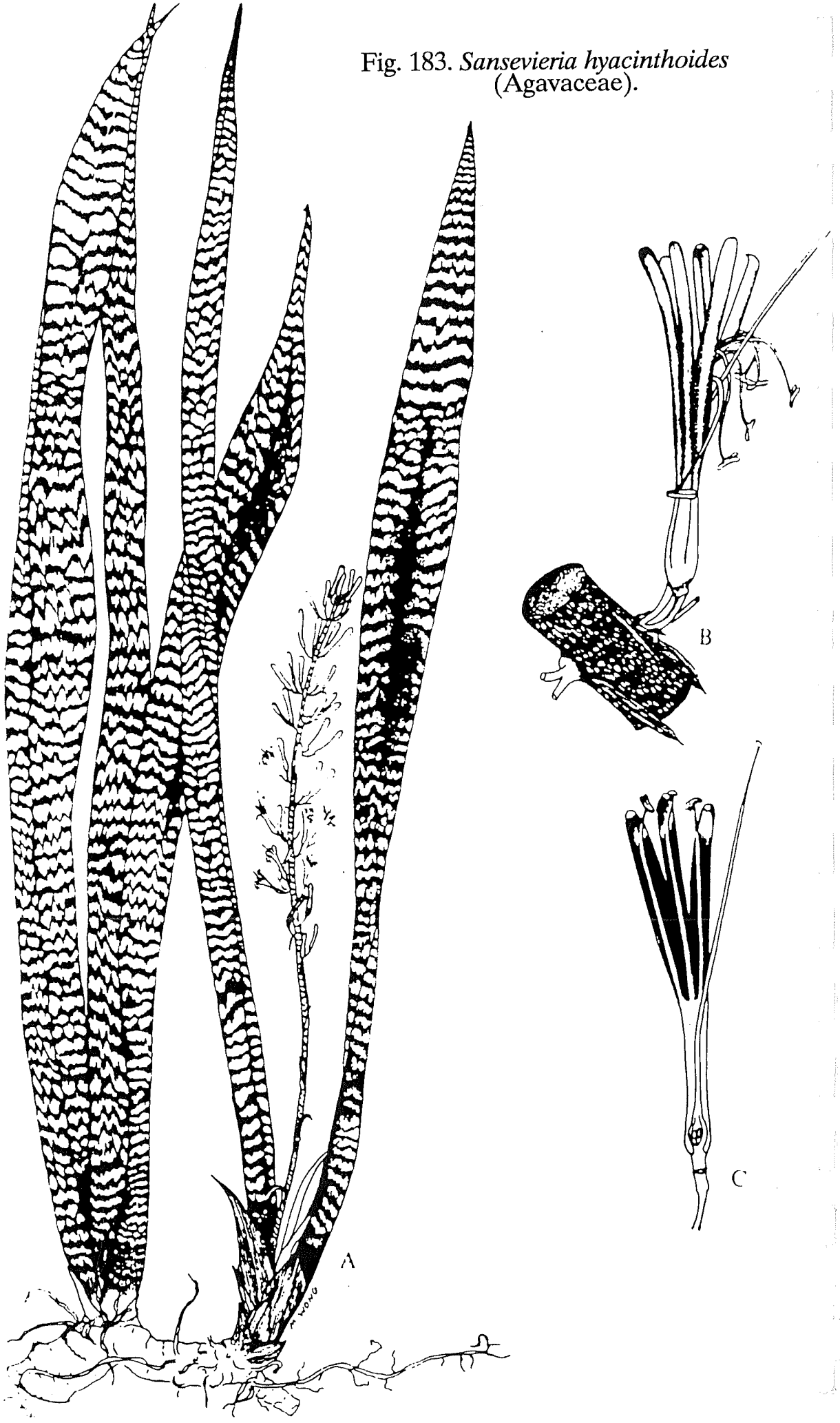
2. *Sansevieria hyacinthoides* (Linnaeus) Druce, *Report of the Botanical Exchange Club of the British Isles* 1913(3) : 423 (1914). (Synonyms: *S. guineensis* (Linnaeus) Willdenow, *S. thyrsiflora* Thunberg). AFRICAN BOWSTRING HEMP. Stem absent. Leaves flat, lanceolate, with pale cross-bands and distinct reddish-brown margin, to 45 x 9 cm. Inflorescence a spiciform raceme to 75 cm.

Range: South Africa. Grown as an ornamental at the Promenade Gardens, Georgetown, Guyana.

Literature: Wijnands, D.O. 1973. Typification and nomenclature of two species of *Sansevieria* (Agavaceae). *Taxon* 22(1): 109-114.

3. *Sansevieria trifasciata* Hort. ex Prain, *Bengal Plants* 2: 1054 (1903). Stem absent. Leaves flat, narrowly lanceolate (ovate in dwarf cultivars), to 1.2 m x 7 cm, with pale to dark cross-bands and margin green, yellow or white. Inflorescence a loose raceme to 75 cm.

Fig. 183. *Sansevieria hyacinthoides* (Agavaceae).



Range: Tropical West Africa.

Literature: Chahinian, B.J. 1986. *The Sansevieria trifasciata Varieties*. 109 pp. Reseda, California: Trans Terra Publishing. SECAB. 1989. *Sansevieria trifasciata. Especies Vegetales Promisorias* 1: 43-55.

Key to Varieties

1. Plants dwarf, the leaves to 15 cm, forming a low, "birds-nest" rosette — 3b. cv. Hahnii
1. Plants not dwarf, the leaves longer than 15 cm.
   2. Leaves not variegated with longitudinal stripes of color — 3a. var. *trifasciata*
   2. Leaves variegated with longitudinal stripes of yellow or cream-white.
3. Leaves with golden-yellow margin and stripes — 3d. cv. Laurentii
3. Leaves with some cream-white stripes — 3c. cv. Bantel's Sensation

3a. *S. trifasciata* var. *trifasciata*. LIDAH BOEWAJA (Surinamese Malayan, meaning "crocodile tongue"); SNAKE PLANT, MOTHER-IN-LAW'S TONGUE. Range: Tropical West Africa. Grown as an ornamental on a farm near Timehri, Guyana; for street plantings and indoors in Paramaribo, Surinam; and in the Jardin Botanique and on hotel grounds in Cayenne, French Guiana.

3b. *S. trifasciata* cv. Hahnii. BIRD'S NEST SANSEVIERIA, HAHN'S SANSEVIERIA. Range: A horticultural variant without natural range. Grown as an ornamental on a farm near Timehri, Guyana; on hotel grounds, at the Palmentuin, and in planters in Tankarastraat, Paramaribo, as well as in pots at the Esther Stichting near Paramaribo, Surinam; and on hotel grounds in Cayenne, French Guiana.

Literature: Chahinian, B.J. 1985. The *Sansevieria trifasciata* dwarf cultivars: a beginning with no end. *Cactus and Succulent Journal (U.S.)* 57(5): 199-203.

3c. *Sansevieria trifasciata* cv. Bantel's Sensation. Range: A horticultural variant without natural range. Grown as an ornamental on a farm near Timehri, Guyana, and at the Esther Stichting near Paramaribo, Surinam.

3d. *S. trifasciata* cv. Laurentii. (Synonyms: *S. guineensis* f. *laurentii* (De Wildeman) Degener, *S. trifasciata* var. *laurentii* (De Wildeman) N.E. Brown). Range: A horticultural variant without natural range, originally discovered near Kisangani, Zaire (formerly Stanleyville, Belgian Congo). Grown as an ornamental at Timehri Airport, Guyana; for street plantings and indoors in Paramaribo, Surinam; and on hotel grounds in Cayenne, French Guiana.

8. *Yucca* Linnaeus

Perennials, often forming colonies and producing basal offsets. Stem absent or plants with a woody, simple or branched trunk, often ringed with persistent leaf-bases near the apex. Leaves spirally arranged, stiff, usually spine-tipped, not petiolate. Inflorescence an erect panicle. Flowers bisexual, regular, bracteate; perianth-segments 6, free or united below in a bell-shaped cup; lobes mostly erect. Stamens 6. Ovary superior, 3-celled; ovules

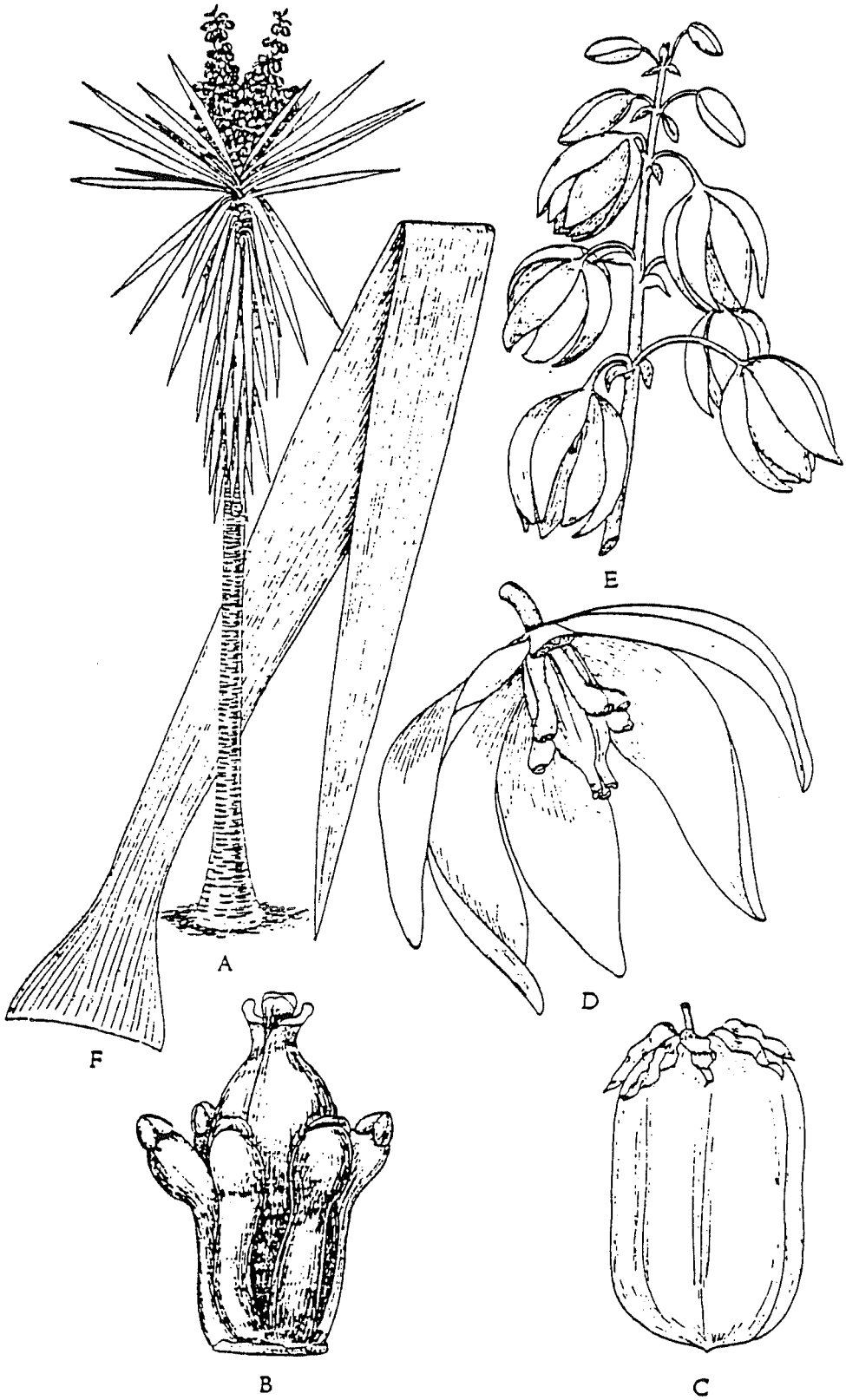


Fig. 184. *Yucca elephantipes* (Agavaceae).

many. Fruit indehiscent and fleshy, or a dehiscent, dry capsule; seeds smooth or roughened, winged or wingless.

Literature: Matuda, E. and I.P. Lujan. 1980. *Las Plantas Mexicanas del Genero Yucca.* 145pp. Toluca, Mexico: Gobierno del Estado de Mexico.

Key to Species

1. Plants without a stem; leaf-margin with conspicuous threads or fibers 3. *Y. filamentosa*
1. Plants with a trunk (stem); leaf-margin without threads.
   2. Inflorescence pendent; leaf-apex tipped with a spine; ovary shortly stalked (stipitate); base of trunk not conspicuously swollen 1. *Y. aloifolia*
   2. Inflorescence erect; leaf-apex soft; ovary sessile; base of trunk conspicuously swollen 2. *Y. elephantipes*

1. *Yucca aloifolia* Linnaeus, *Species Plantarum* 319 (1753). DAGGER PLANT, SPANISH BAYONET. Plants to 7(-10) m; trunk simple or branched above. Leaves linear-lanceolate, spine-tipped, the margin closely denticulate, to 40 x 6 cm. Inflorescence to 60 cm. Flowers white. Fruit indehiscent; seeds not winged.

Range: Southern United States, Mexico, Bahamas, West Indies. Grown as an ornamental on hotel grounds in Paramaribo, Surinam; and in French Guiana (de Granville, 1985).

2. *Yucca elephantipes* Hort. ex Regel, *Gartenflora* 8: 35 (1859). (Synonym: *Y. guatemalensis* Baker). BULB-STEM YUCCA, GIANT YUCCA, SPINELESS YUCCA. Plants to 10(-15) m, from a swollen base; trunk branched. Leaves linear-lanceolate, soft-tipped, the margin rough with obscure teeth, to 100 x 7 cm. Inflorescence to 1 m. Flowers white or cream. Fruit indehiscent; seeds not winged.

Range: Mexico. Grown as an ornamental in the Promenade Gardens, Georgetown, and on a farm near Timehri, Guyana.

3. *Yucca filamentosa* Linnaeus, *Species Plantarum* 319 (1753). ADAM'S NEEDLE. Plants without a stem. Leaves oblanceolate, spine-tipped, otherwise unarmed, the margin with conspicuous threads or fibers to 7.5 cm, the whole leaf to 75 x 10 cm. Inflorescence to c.1.8 (-4.5) m. Flowers white or yellowish-white. Fruit dehiscent; seeds winged.

Range: Southeastern United States. Grown as a garden ornamental in Paramaribo, Surinam (Ostendorf, 1962; Pulle, 1906).

Amaryllidaceae

Perennial herbs from tunicate bulbs. Leaves usually basal, few, entire, often 2-ranked. Inflorescence a few- to many-flowered, scapose, terminal umbel (rarely a solitary flower), subtended by 1-several bracts (spathes); bracts often tubular and sheathing, at least below; scape hollow or solid. Flowers bisexual, regular or irregular; perianth-segments 6, free, or often united in a funnelform tube below; cup-like outgrowth (corona) of the perianth

sometimes present and formed from either perianth tissue or expanded outgrowth of filament-bases; perianth-segments spreading to recurved. Stamens 6; filaments equal or of several lengths. Ovary inferior, 3-celled. Fruit a capsule or berry.

Key to Genera

1. Corona present in the flower, the filaments borne on a cup; flowers white.
   2. Perianth-lobes ovate, to 5 cm — 3. *Eucharis*
   2. Perianth-lobes linear, to 14 cm — 6. *Hymenocallis*
1. Corona absent; flowers white to red.
3. Leaves linear; inflorescence a solitary flower; bract 1 (-2), tubular below, bifid at apex; stamens of 2 different lengths.
   4. Stamens deflexed, curved upwards at their tips — 4. *Habranthus*
   4. Stamens straight, spreading — 8. *Zephyranthes*
3. Leaves strap-shaped to ovate; inflorescence a 2- to many- flowered umbel; bracts 1-10, not tubular or bifid; stamens of the same length, or of 4 different lengths.
5. Scape of inflorescence hollow; small, fimbriate scales present inside throat of perianth; seeds flat — 5. *Hippeastrum*
5. Scape of inflorescence solid; scales absent; seeds round.
   6. Perianth-lobes linear, to 5 mm wide; umbel up to 200-flowered; inflorescence-bracts 5-10 — 7. *Scadoxus*
   6. Perianth-lobes lanceolate to ovate, 1-4 cm wide; umbel 4- to 30-flowered; inflorescence-bracts 2.
7. Leaves with scabrid margin; perianth-tube 7.5 cm or more; flowers white with purple tinge or stripes outside; pedicels not elongating in fruit — 2. *Crinum*
7. Leaves not scabrid on margin; perianth-tube to c.3.8 cm; flowers red; pedicels elongating in fruit — 1. *Brunsvigia*

1. *Brunsvigia* Heister

Perennial herbs from large, underground or exposed, tunicate (layered) bulbs. Leaves basal, strap-shaped, produced after flowering. Inflorescence a large, terminal umbel at apex of scape, subtended by 2 free spathes. Flowers bisexual, asymmetrical; perianth tubular, with 6 segments, often curved. Stamens 6, adnate to perianth-tube, exserted. Ovary inferior. Fruit a 3-celled, loculicidal capsule; seeds numerous.

Literature: Dyer, R.A. 1950. A review of the genus *Brunsvigia. Plant Life* 6(1-4): 63-83; 7(1-4): 44-64 (1951).

1. *Brunsvigia josephinae* (Ventenat) Ker-Gawler, *Edwards's Botanical Register* 3: t.192-193 (1817). (Synonym: *Amaryllis josephinae* Ventenat). JOSEPHINE'S LILY. Plant to c.45 cm. Bulb ovoid, with many layers or coats (tunics), mostly or totally above ground, to 30 x 30 cm. Leaves oblong, glabrous, glaucous, 60-90 x 20 cm. Scape erect, compressed, 45-90 cm. Umbel 20- to 30-flowered, to c.90 cm wide; pedicels reddish, elongating in fruit, 15-30 cm. Flowers deep red, with small yellow spots; perianth 6.5-9 cm, the tube curved, c.3.8 cm. Fruit to 4 x 2.5 cm, dehiscing in irregular segments.

Range: Cape Province of South Africa. Grown in a private garden near Timehri,

Guyana.

Literature: Wallace, G.A. 1962. *Brunsvigia josephinae*: a giant among amaryllids. *Plant Life* 18(1): 36-40.

The species epithet is in honor of Josephine de Beauharnais (1763-1814), Empress of France from 1804 to 1809 as the wife of Napoleon I; a bulb she purchased in Holland flowered in her garden at La Malmaison.

2. *Crinum* Linnaeus

Perennial herbs from layered (tunicate) bulbs. Bulbs often tapering into a neck. Leaves strap-shaped, usually with scabrid margin. Inflorescence a terminal, scapose umbel, subtended by 2 bracts. Pedicels, when present, not elongating in fruit. Flowers bisexual, regular or irregular (zygomorphic); perianth-segments 6, connate below into a tube, or salverform, with 6 lobes. Stamens 6, adnate to throat of perianth-tube. Ovary inferior, 3-celled; ovules usually 2 per cell. Fruit an irregularly dehiscent capsule or indehiscent.

Literature: Nordal, I. 1977. Revision of the East African taxa of the genus *Crinum* (Amaryllidaceae). *Norwegian Journal of Botany* 24(3): 179-194.

Key to Species

1. Perianth salverform, white inside, tinged with purple outside, the tube straight, the lobes less than 1.5 cm wide; stamens and style not deflexed 1. *C. erubescens*
1. Perianth tubular, white, or white with a purple stripe on the back of the segments, the tube curved, the lobes 2-4 cm wide; stamens and style deflexed.
   2. Neck of bulb c.30-60 cm; perianth-segments white, with a purple stripe on the back; perianth-tube green tinged with purple; leaves erect 3. *C. zeylanicum*
   2. Neck of bulb absent or very short; perianth-segments pure white; perianth-tube green; leaves recurved or bent 2. *C. jagus*

1. *Crinum erubescens* Linnaeus fil. ex Aiton, *Hortus Kewensis* 1: 413 (1789). (Synonym: *C. commelynii* Jacquin). WATER-LELIE (Surinam). Bulb c.7.5-10 cm wide, with short neck. Leaves 60-100 (200) x 5-8.5 cm, scabrid on margin. Scape 45-60 cm. Umbel 4- to 12-flowered. Perianth salverform, white inside, tinged with purple outside; tube straight, 12.5-15 cm; lobes 6-7.5 x 0.6-1 cm.

Range: Tropical America, including the three Guianas. Grown as an ornamental in the Botanic Gardens, Georgetown, Guyana.

Literature: Wijnands, D.O. 1983. *Botany of the Commelins*. Rotterdam, The Netherlands: A.A. Balkema (page 36).

Crinum asiaticum Linnaeus, from tropical Asia, has a salverform perianth which is white with a greenish tube; it is grown as an ornamental along streets and in parks in French Guiana (de Granville, 1985A).

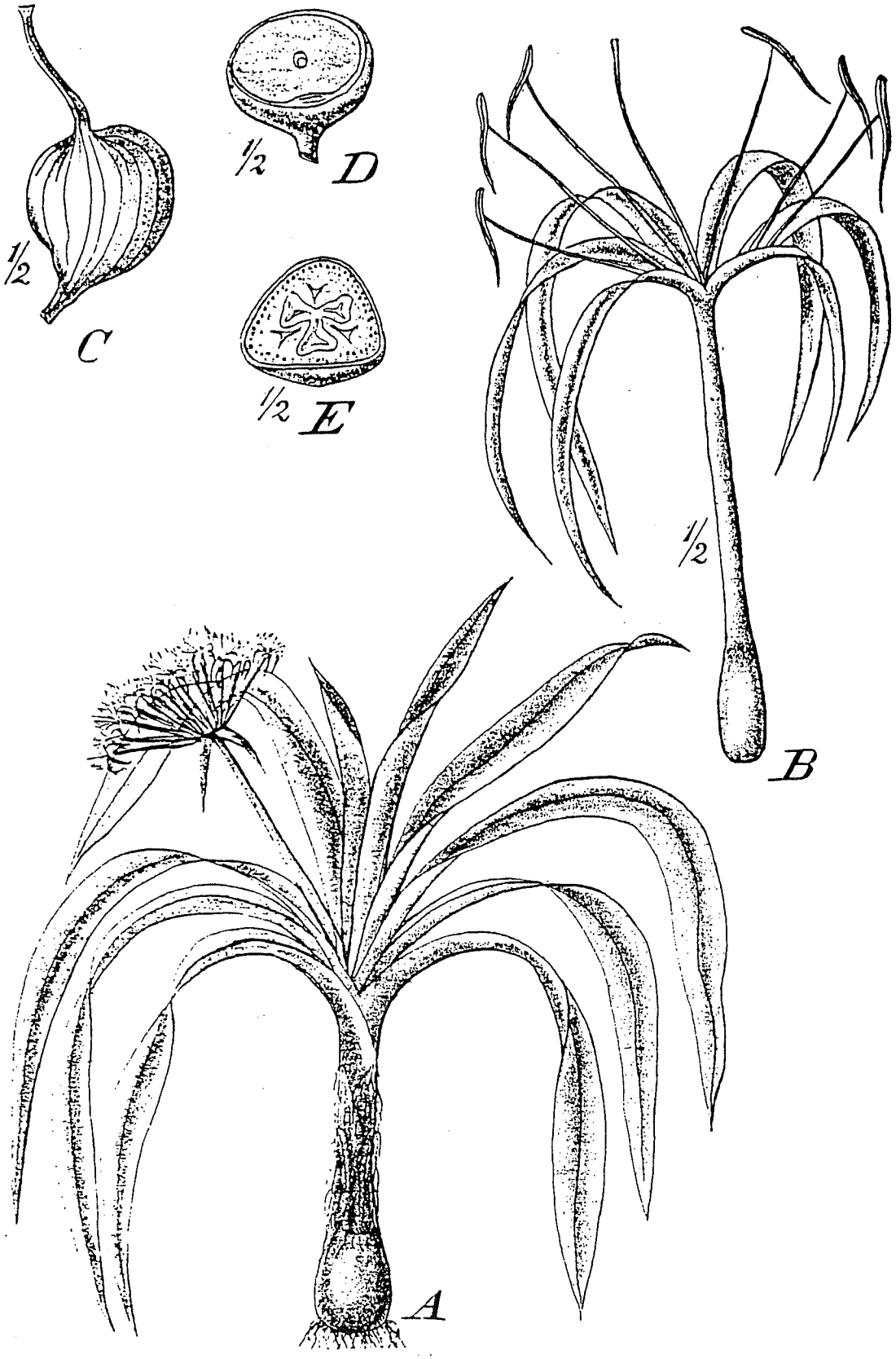


Fig. 185. *Crinum asiaticum* (Amaryllidaceae).

2. *Crinum jagus* (Thompson) Dandy, *Journal of Botany (London)* 77: 64 (1939). (Synonym: *C. giganteum* Andrews). Bulb 12.5-20 cm wide, with absent or short neck. Leaves 20-70 (-90) x 7.5-12 cm, scabrid on margin. Scape 60-90 cm. Umbel 4- to 6 (-12) -flowered. Perianth tubular, pure white; tube curved, 10-20 cm; lobes 7-10 x 2-4 cm.

Range: West Tropical Africa and Uganda. Grown as an ornamental in the Promenade Gardens, Georgetown, and other gardens in Guyana; and as an ornamental in Surinam (Ostendorf, 1962).

3. *Crinum zeylanicum* (Linnaeus) Linnaeus, *Systema Naturae* ed.12, 2: 236 (1767). (Synonym: *C. latifolium* Linnaeus var. *zeylanicum* (Linnaeus) Hooker fil. ex Trimen). MILK-AND-WINE LILY. Bulb to 25 cm wide, with neck to 30(-60) cm, often producing clusters of bulblets. Leaves 90-150 x 2-12 cm, scabrid and often undulate on margin. Scape 25-90 cm. Umbel (3-) 4-8 (-25) -flowered. Perianth tubular, white, with purple stripe on back of each segment; tube curved, green, 7.5-10 cm; lobes 7-13 x 2-4 cm.

Range: Tropical Africa, India, Sri Lanka. Grown as an ornamental in gardens of Paramaribo, Surinam (Ostendorf, 1962).

This plant propagates more readily by means of bulblets produced from the main bulb than most other species of *Crinum*. When leaves are cut, the fluffy white fibers of the vascular sclerenchyma are exposed in a cottony mass.

3. *Eucharis* Planchon

Perennial herbs from a subterranean, tunicate bulb. Leaves basal, petiolate. Inflorescence a terminal, scapose umbel, subtended by several bracts. Flowers bisexual, regular, pedicellate; perianth-segments 6, connate below into a cylindrical tube, with spreading lobes. Stamens 6, inserted on throat of perianth; filaments expanded below to form a prominent cup-shaped, usually toothed or lobed, membrane or corona. Ovary inferior, 3-celled. Fruit a 3-lobed capsule; seeds numerous.

1. *Eucharis amazonica* Linden ex Planchon, *Flore des Serres* 12: t.1216-1217 (1857). (Synonym: *E.* x *grandiflora* sensu auth., non Planchon & Linden). JOZEFSTAF, JOZEF LELIE (Surinam); AMAZON LILY, EUCHARIS LILY. Bulb to 6 cm wide, with neck to 4.5 cm. Petioles 25-30 (-50) cm; leaf-blades elliptical, to 40 (-50) x 18 cm. Scape of inflorescence to 70 cm; pedicels to 1.5 (-2.5) cm; umbel 5- to 6- (8-) flowered. Flowers pure white, fragrant, to 9 cm wide, pendulous; perianth-tube curved, to 5.8 cm; perianth-lobes to 4.5 cm; corona lobed, tinged with green.

Range: Amazonian Peru. Grown as an ornamental in the Botanic Gardens, Georgetown, and in a private garden near Timehri, Guyana; and in Surinam (Ostendorf, 1962).

Literature: Meerow, A.W. 1989. Systematics of the Amazon lilies, *Eucharis* and *Caliphruria* (Amaryllidaceae). *Annals of the Missouri Botanical Garden* 76(1): 136-220.

4. *Habranthus* Herbert

Perennial herbs from bulbs. Leaves linear, grasslike. Inflorescence scapose, of a usually solitary flower, rarely a 2- to 4-flowered umbel; spathe bifid at apex, sheathing the base of the pedicel on one side below. Flowers bisexual, slightly irregular, nodding; perianth-segments 6, united into a short tube below, with lobes of unequal length. Stamens 6, of 2 different lengths. Ovary inferior, 3-celled. Fruit a 3-lobed capsule; seeds numerous.

1. *Habranthus robustus* Herbert ex Sweet, in *Sweet's Hortus Britannicus* ed.2, 506 (1830). (Synonyms: *H. tubispathus* sensu auth., non (L'Heritier) Traub, *Zephyranthes robusta* (Herbert ex Sweet) Baker). Plant 15-27 cm tall, from a long-necked bulb c.2.5 cm wide. Leaves recurved-spreading, linear, to c.25 cm. Scape to 15 cm. Flowers to 8 cm, pale pink, with whitish throat and greenish tube. Stamens c.3 cm.

Range: Brazil (states of Parana and Santa Catarina). Grown as an ornamental in Surinam (Ostendorf, 1962).

Literature: Traub, H.P. 1958. *Zephyranthes* div. sp. and *Habranthus robustus. Taxon* 7(3): 109-113. Herklots, G.A.C. 1980. Wind flowers, Part II: *Habranthus. The Plantsman* 2(2): 90-99.

5. *Hippeastrum* Herbert

Perennial herbs from tunicate (layered) bulbs. Leaves basal. Inflorescence a terminal, few-flowered, scapose umbel; scape hollow; umbel subtended by 2 free bracts (spathes); flowers usually somewhat nodding. Flowers bisexual, regular, pedicellate; perianth-segments 6, united below in a trumpet-shaped tube; lobes spreading. Stamens 6, of 4 different lengths. Ovary inferior, 3-celled; style lobed or capitate. Fruit a loculicidal capsule; seeds usually numerous, flat.

1. *Hippeastrum puniceum* (Lamarck) Kuntze, *Revisio Generum Plantarum* 2: 703 (1891). (Synonyms: *H. equestre* (Aiton) Herbert, *Amaryllis equestris* Herbert). AMARYLLIS (French Guiana); GROTE PENPEN (Surinam), BARBADOS LILY. Plant to 60 cm, from a bulb to 5 cm wide. Leaves oblong or strap-shaped, produced after flowering of the plant, to 65 x 5 cm. Scape to 60 cm; bracts to 7 cm; inflorescence 2- to 4-flowered. Flowers to 13 x 10 cm; perianth-tube green, to 3.5 cm; perianth-lobes red or salmon with yellowish-green base, to 9 cm. Stamens shorter than the perianth-lobes. Style capitate.

Range: Tropical America, including Surinam and French Guiana. The type of this species is a 1705 illustration by Maria Sibylla Merian from *Metamorphosis Insectorum Surinamensium*. Grown for ornament in a private garden near Timehri, Guyana (as a rare, white-flowered variant); in Surinam (Ostendorf, 1962); and on hotel grounds in Cayenne, French Guiana.

Literature: SECAB. 1989. *Hippeastrum puniceum. Especies Vegetales Promisorias* 1: 129-131.

6. *Hymenocallis* Salisbury

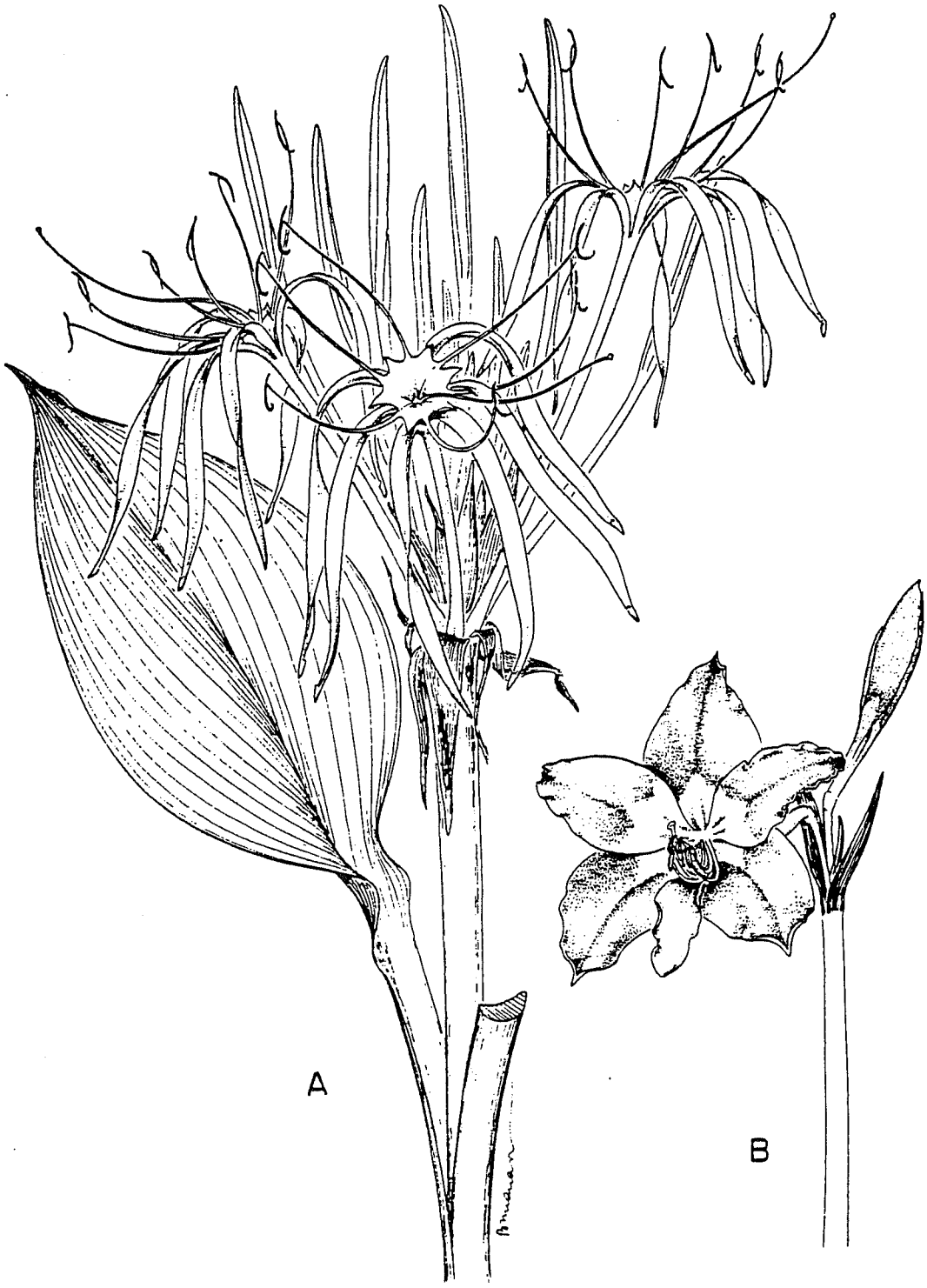


Fig. 186. *Hymenocallis tubiflora* (left); *Hippeastrum puniceum* (right) (Amaryllidaceae)

Perennial herbs from tunicate (layered) bulbs. Leaves basal, strap-shaped, sessile or petiolate. Inflorescence a scapose, terminal, few- to many-flowered umbel, subtended by two to several free, chaffy bracts (spathes); scape solid, flattened. Flowers bisexual, regular, sessile or pedicellate; perianth-segments 6, united below into a short or long tube; lobes narrow, spreading. Stamens 6; filaments united below into a prominent membrane-like cup or corona, the margin of the corona often toothed or lobed. Ovary inferior, 3-celled. Fruit a fleshy capsule; seeds few, fleshy or spongy, green.

Literature: Sealy, J.R. 1954. Review of the genus *Hymenocallis. Kew Bulletin* 1954(2): 201-240.

1. *Hymenocallis tubiflora* Salisbury, *Transactions of the Horticultural Society* 1: 341 (1812). VLIES LELIE (Surinam); SPIDER LILY. Bulb to 10 cm wide, with a short neck. Leaf-blades oblong, elliptical or ovate, 20-38 x 7.5 - 15 cm; petiole 15-30 cm. Scape to 60 cm; umbel 5- to 20- flowered. Flowers sessile, white; perianth-tube narrow, greenish, 2.5-20 cm; lobes linear, to 14 x 0.6 cm; corona funnelform, to 2.5 cm. Ovary with 4-5 ovules per cell.

Range: Trinidad and northern South America, including the three Guianas. Grown as an ornamental in the Botanic Gardens, Georgetown, Guyana; and in French Guiana (de Granville, 1985A).

This species originally reached England as a bulb from French Guiana, discovered on a captured French ship in 1803 during the Napoleonic Wars. Several *Hymenocallis* taxa of speculative identity and origin may be grown as ornamentals in Surinam (Ostendorf, 1962).

According to de Granville (1985), the West Indian *H. caribaea* (Linnaeus) Herbert (as *H.* cf. *obtusata* (Grisebach) Grisebach ex Walpers) is possibly grown as an ornamental in French Guiana. It has a perianth-tube to 6.5 cm with lobes to 10 cm, and ovary with 2 ovules per cell.

7. *Scadoxus* Rafinesque

Perennial herbs from bulbs. Stem absent or a pseudostem formed of petiole-bases. Leaves basal, often fleshy or leathery (coriaceous), spirally arranged, petiolate; petiole sheathing, spotted. Inflorescence a scapose, densely many-flowered umbel on a solid scape, subtended by 4 or more bracts. Flowers bisexual, regular; perianth-segments 6, united below in a short tube; lobes narrow, often spreading. Stamens 6, often long-exserted. Ovary inferior, 3-celled. Fruit a 1- to 3- seeded berry.

1. *Scadoxus multiflorus* (Martyn) Rafinesque, *Flora Telluriana* 4: 19 (1838). (Synonym: *Haemanthus multiflorus* Martyn). BLOOD LILY; VUURBLOEM (Surinam). Plant c.45-120 cm. Bulb globose, c.7.0 cm wide with long neck-pseudostem. Leaves rather thin, oblong, lanceolate or ovate, to 45 x 15 cm; petiole with purple spots below. Scape 30-90 cm; bracts 5-10, reflexed, to 6 cm. Inflorescence of up to 200 flowers, 7.5-26 cm wide. Flowers red, fading to salmon; perianth-tube 5-26 mm; lobes linear, spreading, to 3.2 x 0.5 cm. Stamens long-exserted. Berry orange or red.

Range: Tropical Africa. Cultivated as an ornamental at the Botanic Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

Literature: Bjornstad, I.N. and I. Friis. 1974. Studies on the genus *Haemanthus* L. (Amaryllidaceae), III. A revision of the sections *Gyaxis* and *Nerissa*. *Norwegian Journal of Botany* 21(4): 243-275. Coombs, S.V. 1950. South African amaryllids as house plants: *Haemanthus* (Blood Lily; Snakeshead Lily). *Plant Life* 6(1): 41, 125-128; 6(2): 147. Hayward, W. 1959. *Haemanthus multiflorus* culture. *Plant Life* 15(1): 113-115.

8. *Zephyranthes* Herbert

Perennial herbs from a tunicate (layered) bulb. Leaves basal, linear, grasslike. Inflorescence scapose, a solitary flower subtended by a tubular bract (spathe); bract sheathing below, free and often bifid above; scape hollow. Flowers bisexual, regular, usually pedicellate; perianth-segments 6, united below in a funnelform tube; lobes spreading or recured. Stamens 6, in 2 series, 3 long alternating with 3 short. Ovary inferior, 3(-4)-celled; style capitate or 3-lobed. Fruit a loculicidal capsule; seeds flat, shining, D-shaped.

1. *Zephyranthes grandiflora* Lindley, *Edwards's Botanical Register* 11: t.902 (1825). KLEINE PENPEN, CHOCOLADEBLOEMPJE (Surinam); SMALL PINK ATAMASCO LILY. Bulbs to 2.5 cm wide, producing bulblets. Leaves linear, to 20 x 0.6 cm. Scape 9-25 x 0.3 cm; bract pink, bifid above, 1.9-2.5 cm; pedicel longer than the bract, 1.8-2.5 cm. Flower rose or pink; perianth-lobes 3-4 cm.

Range: Mexico to Guatemala. Grown as an ornamental in border rows at the Palmentuin, Paramaribo, Surinam.

This well-known plant is often misrepresented in cultivation as the Cuban species *Z. rosea* Lindley.

Araceae

Plants terrestrial or epiphytic, rarely aquatic. Stems often with thickened rhizomes or corms, climbing and with alternate leaves, acaulescent and rosulate, or erect. Leaves usually with a sheathing or winged petiole; petiole sometimes pulvinate at apex. Leaf-blades with striate or reticulate veins, simple, lobed or pinnatifid, occasionally perforated. Inflorescence a terminal or lateral, pedunculate, often stipitate spike (spadix) of flowers, subtended by an often foliaceous or bract-like sheath (spathe), which is free, or partially or wholly adnate to the spadix. Flowers bisexual or unisexual, when unisexual arranged on the spadix with a female zone at base and male zone above, the zones sometimes separated by zone of sterile filaments or scales. Perianth of 4 or 6 free or connate segments (tepals), or absent. Stamens 1-6, free or connate. Ovary superior, 1- to numerous-celled; ovules 1-numerous. Fruit a berry, sometimes an aggregate. Seeds 1-numerous.

Literature: Birdsey, M.R. 1951. *The Cultivated Aroids*. 140 pp. Berkeley, California: Gillick Press. Bown, D. 1988. *Aroids*. 256 pp. Portland, Oregon: Timber Press. Croat, T.B. and N. Lambert. 1986. The Araceae of Venezuela. *Aroideana* 9(1-4): 3-213. Milstein, G.

1976. The aroids. *Garden Journal* 26(6): 180-183. Plowman, T. 1969. Folk-uses of New World aroids. *Economic Botany* 23(2): 97-122. Singer, W. 1965. Aroids in the home. *Garden Journal* 15(6): 252-255. Bunting, G.S. 1955. Vining aroids in cultivation. *Baileya* 3(4): 182-187.

Key to Genera

1. Plant a floating aquatic; leaves sessile, pubescent, spongy below — 10. *Pistia*
1. Plant terrestrial, often epiphytic; leaves petiolate, glabrous, not spongy.
2. Leaves peltate.
3. Leaves sinuately lobed — 2. *Alocasia*
3. Leaves not sinuately lobed.
4. Leaves green — 2. *Alocasia*
4. Leaves variegated.
5. Leaves variegated with white — 2. *Alocasia*
5. Leaves variegated with red, pink or yellow — 4. *Caladium*
2. Leaves not peltate.
6. Scale-like fibrous leaves often present amid the foliage leaves; plants sometimes rosulate (with leaves in a central rosette).
7. Leaf-venation reticulate; petiole with apical pulvinus; spathe not clasping spadix; flowers bisexual; perianth present — 3. *Anthurium*
7. Leaf-venation striate; petiole without pulvinus; spathe convolute-clasping tightly around spadix, especially below; flowers unisexual; perianth absent — 9. *Philodendron*
6. Scale-like fibrous leaves usually absent amid the foliage leaves (except in basal part of plant); plants not rosulate.
8. Leaf-blades prominently lobed, or compound, sometimes perforated.
9. Leaf-blades with 3 leaflets, or pedately divided; plants climbing — 12. *Syngonium*
9. Leaf-blades pinnatifid or pinnatisect; plants terrestrial or climbing.
10. Terrestrial; petiole without a pulvinus — 2. *Alocasia*
10. Climber; petiole with apical pulvinus.
11. Mature leaves with pinprick-like holes along edge of midrib — 6. *Epipremnum*
11. Mature leaves without pinprick-like holes but with or without large perforations.
12. Mature leaves entire — 6. *Epipremnum*
12. Mature leaves pinnatifid or with perforations — 7. *Monstera*
8. Leaf-blades simple, sometimes shallowly pinnately lobed, without perforations.
13. Climbing vine or with stem trailing on the ground.
14. Climber; venation reticulate; juvenile leaf-blades sagittate — 12. *Syngonium*
14. Terrestrial; venation striate; juvenile leaf-blades not sagittate — 1. *Aglaonema*
13. Plant erect, at least when young, or the stem recumbent at the base.
15. Plant sub-arborescent, not tuberous, growing in swamps or standing water; stems often prickly at least below; leaves to 3 dm — 8. *Montrichardia*
15. Herbs or vines, not sub-arborescent, (or if sub-arborescent, then without tubers and the leaves 3-12 dm); plant not growing in standing water; stems smooth.
16. Plants with enlarged rhizome or tuber; stem becoming an erect trunk to c.18 dm; spadix terminated by naked apical appendage — 2. *Alocasia*
16. Plants without enlarged rhizome or tuber; stem not becoming a free-standing trunk; spadix without apical appendage.
17. Spathe white, freely produced in cultivation — 11. *Spathiphyllum*

17. Spathe greenish, infrequently seen in cultivation.
    18. Stamens of each male flower united into a synandrium; juvenile leaves sagittate; spathe free from spadix 12. *Syngonium*
    18. Stamens united or free; juvenile leaves not sagittate; spathe partly adherent to spadix below.
19. Leaves often asymmetrical at the base; female flowers without staminodes; male flowers with free anthers 1. *Aglaonema*
19. Leaves symmetrical at the base; female flowers with clavate, tepal-like staminodes; male flowers with united anthers 5. *Dieffenbachia*

1. *Aglaonema* Schott

Terrestrial. Stems erect, sometimes from creeping rhizomes. Leaves simple; petiole sheathing the stem, well-developed, leaving a ring scar after abscission; blade entire, often slightly asymmetrical at the base, the primary lateral veins with numerous fine minor veins parallel to them. Peduncles often clustered in the leaf-axils. Spathe margins often overlapping below; spathe open and flat or inrolled above, greenish to yellow. Spadix stalked (on a stipe) or sessile, free from the spathe or partially attached to it at the base. Flowers naked (perianth absent), unisexual; zone of female flowers lowermost and adjacent to the much longer male flower zone. Stamens free but massed, not grouped into separately recognizable flowers; staminodes absent in female flowers. Fruit a 1-seeded berry, orange to red.

Literature: Henny, R.J. 1988. *Aglaonema* breeding. *Aroideana* 11(2): 15-22. Jervis, R.N. 1978. *Aglaonema Grower's Handbook*. 28pp. Clearwater, Florida: published by the author; revised edition,1980, 64 pp. Nicolson, D.H. 1969. A revision of the genus *Aglaonema* (Araceae). *Smithsonian Contributions to Botany* 1: 1-69. Nicolson, D.H. 1984. *Aglaonema* Schott. *The European Garden Flora* 2(2): 94-96.

Key to Species

1. Leaves ovate to ovate-lanceolate, with undulate margin, green, not variegated; spadix sessile, the "stipe" portion of spadix and most of the female zone of spadix united to the spathe 2. *A. modestum*
1. Leaves narrowly oblong-elliptical, without undulate margin, variegated with considerable differently colored patches; spadix stalked (stipitate), the stipe and female zone of the spadix free from the spathe 1. *A. commutatum*

1. *Aglaonema commutatum* Schott, *Synopsis Aroidearum* 123 (1856). Terrestrial. Stems erect, 20-150 cm, freely producing suckers (offshoots). Leaf-blades usually narrowly oblong-elliptical, to lanceolate, obtuse to subcordate at base, dark glossy green, with often large bars or patches of variegation, to 30 x 10 cm, often smaller. Peduncle to 15 cm; spathe 3.5-9 cm; spadix stipitate, the stipe free from spathe. Fruit to 2.5 cm, yellow, turning red.

Range: Philippines.

Key to Cultivars

1. Variegation ashen, in irregular bars 1a. var. *commutatum*
1. Variegation brighter, not ashen, in extensive blotches and streaks.
   2. Leaf-blade heavily variegated in 3 shades (including yellow) in a somewhat marbled composition 1b. cv. Pseudobracteatum
   2. Leaf-blade mostly silvery green, edged and streaked dark green 1c. cv. Silver Queen

1a. *A. commutatum* var. *commutatum*. Range: Grown as a potted ornamental in Paramaribo, Surinam.

1b. *A. commutatum* cv. Pseudobracteatum. Range: Grown as an ornamental potted subject on hotel premises in Paramaribo, Surinam.

1c. *A. commutatum* cv. Silver Queen. Range: Specimens of *Aglaonema* infrequently displayed as tub plants in public buildings in Georgetown, Guyana most closely resemble this variant.

Literature: Brown, B.F. 1980. *Aglaonema*: new discoveries, new hybrids, and related knowledge. *Aroideana* 3(4): 120-126. Conover, C.A., et al. 1982. *Aglaonema Production Guide for Commercial Growers*. 5 pp. University of Florida, Cooperative Extension Service, IFAS.

It is believed that *A. commutatum* may have a hybrid origin involving *A. nitidum*, *A. marantifolium*, and *A. simplex* in its parentage (Nicolson, 1969); the cultivar Silver Queen was developed in Florida and is probably the result of a cross between *A. commutatum* cv. Treubii and *A. nitidum* var. *nitidum* f. *curtisii* (Brown, 1980). Silver Queen is presently the most popular and widely grown *Aglaonema* cultivar (Conover et al., 1982); numerous other variegates have been developed.

2. *Aglaonema modestum* Schott ex Engler, in A. & C. DeCandolle, *Monographiae Phanerogamarum* 2: 442 (1879). CHINESE EVERGREEN. Terrestrial. Stems erect, to 50 cm, not freely producing suckers (offshoots). Leaf-blades ovate to ovate-lanceolate, obtuse or rounded at base, glossy green (lustrous), with undulate margin, to c.25 x 11 cm, long-acuminate. Peduncle to 10 cm; spathe to 7.5 cm; spadix sessile, the "stipe" portion and most of the female zone united (adnate) to the spathe. Fruit to 3 cm, orange.

Range: Southeast Asia and South China. In Guyana, recently introduced into cultivation as a nursery subject at the Botanic Gardens, Georgetown.

2. *Alocasia* (Schott) G. Don

Terrestrial. Plants rhizomatous or tuberous, erect. Leaves entire to pinnatifid, the juvenile leaves often peltate; petioles long, sheathing at the base. Peduncles often clustered in axils. Spathe with a short, constricted, persistent tube and long, expanded, deciduous blade. Spadix densely flowered, terminated by a naked appendage. Flowers unisexual; perianth absent; flower-zones, from base to apex, comprising a female zone, subnaked zone with staminodes, zone of fertile male flowers with 3-8 connate stamens per flower

Fig. 187. *Alocasia macrorrhizos* (Araceae).

(synandria), and subnaked apical zone. Ovary 1-celled. Fruit a 1- to few-seeded, reddish berry.

Literature: Burnett, D. 1984. The cultivated *Alocasia*. *Aroideana* 7(3-4): 67-162. Challis, M. 1986. Alocasias and some relatives. *The Garden* (RHS) 111(7): 329-332. Dortort, F. and T. Thompson. 1979. Alocasias. *Aroideana* 2(2): 35-51.

Key to Species

1. Leaves peltate, sinuately lobed, with white veins and margin; plant trunkless 3. *A. sanderiana*
1. Leaves not peltate, unlobed, the veins and margin not white; plant developing a trunk.
   2. Foliage green, or variegated with cream-white blotches 1. *A. macrorrhizos*
   2. Foliage (including leaves, at least beneath, veins, petioles and peduncles) purplish-violet 2. *A. plumbea*

1. *Alocasia macrorrhizos* (Linnaeus) G. Don in Sweet, *Hortus Britannicus* ed.3, 631 (1839). (Synonym: *A. indica* (Loureiro) Spach). Terrestrial. Plant attaining height of 4.8 m or more; aerial stem becoming a stout trunk to 18 x 3 dm. Petioles to 13.5 dm, sheathing in the basal half. Mature leaves not peltate; leaf-blade (lamina) erect or spreading, ovate-sagittate, to 12.5 x 7.5 dm. Peduncles 15-20 (-30) cm. Spathe yellowish-green, up to c.24 cm, the tube c.7.5 cm, the blade 12.5-15 cm, boat-shaped. Spadix mostly shorter than the spathe, the sterile appendage c.5 cm.

Key to Varieties

1. Leaf-blades and petioles green 1a. var. *macrorrhizos*
1. Leaf-blades and petioles variegated with cream-white in large, irregular patches or zones, sometimes covering up to half the leaf surface 1b. cv. Variegata

1a. *A. macrorrhizos* var. *macrorrhizos*. Range: Sri Lanka. Planted as an ornamental on hotel grounds in Paramaribo, and at CELOS buildings at Leysweg, Surinam, and infrequently in ornamental situations in Cayenne, French Guiana.

A similar giant aroid, *A. odora* (Loddiges) Spach, has leaves all peltate when mature. In parts of Southeast Asia and Polynesia, where people eat less rice, the rhizomes of *A. macrorrhizos* are cooked for the edible starch content. D.H. Nicolson, in *Flora Vitiensis Nova* 1: 456 (1979), observed that in living plants of *A. macrorrhizos* "the apex of the leaf tends to point up and the posterior lobes down; in the cultivated *Colocasia* this is reversed; and in *Xanthosoma*, the leaf tends to be horizontal with the posterior lobes pointing up." These useful differentiating features find an application for two economic aroids encountered in the Guianas, as follows: *Colocasia esculenta* (Linnaeus) Schott, known as eddo, dasheen or taro, a tropical Asiatic species cultivated for edible tubers and leaves; and *Xanthosoma sagittifolium* (Linnaeus) Schott, known as tayove or tajer (Surinam), tannia or yautia, a species indigenous to the West Indies, and cultivated for edible tubers and leaves in the Guianas.

1b. *A. macrorrhizos* cv. Variegata. (Synonym: *A. macrorrhizos* var. *variegata* (C. Koch &

Fig. 188. *Alocasia sanderiana* (Araceae).

Bouché) Furtado). Range: Grown as an ornamental in garden of the Arilang Cafe and elsewhere in Paramaribo, Surinam; infrequently grown as an outdoor and indoor ornamental in French Guiana.

2. *Alocasia plumbea* (C. Koch) Van Houtte, *Flore des Serres* 21: t.2206 (1875). (Synonym: *A. indica* var. *metallica* sensu auth., non (Schott) Engler). Similar to *A. macrorrhizos* but smaller; as an adult plant, to c.9 dm with stems to 2 dm, petioles to 6 dm, leaf-blades to 3.6 dm, and a dark purplish-violet or metallic purplish-silvery coloration to the foliage and spathe-tube, especially pronounced on undersurface of leaves.

Range: Java. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana; in Surinam (Ostendorf, 1962); and on hotel grounds in Cayenne, French Guiana.

Literature: Bunting, G.S. and D.H. Nicolson. 1963. The *Alocasia plumbea* confusion. *Baileya* 11(4): 142-146.

3. *Alocasia sanderiana* W. Bull, *Catalogue* 8 (1894). KRIS PLANT, SANDER'S ALOCASIA. Terrestrial plant to 2 m from a tuberous rootstock, not developing a trunk. Petioles to 6 dm. Leaves sagittate, peltate, sinuately lobed, glossy green above, with white veins and margin, sometimes dark purple beneath, to 4 x 2 dm. Peduncles to 30 cm. Spathe to 11 cm; tube green, 3 cm; blade cream, 8 cm, sickle-shaped. Spadix almost as long as the spathe, the sterile appendage 2.3 cm.

Range: Philippines. Grown as an ornamental in Guyana (Ted Hubbard, pers. comm., 1986); and at the Esther Stichting near Paramaribo, Surinam.

3. *Anthurium* Schott

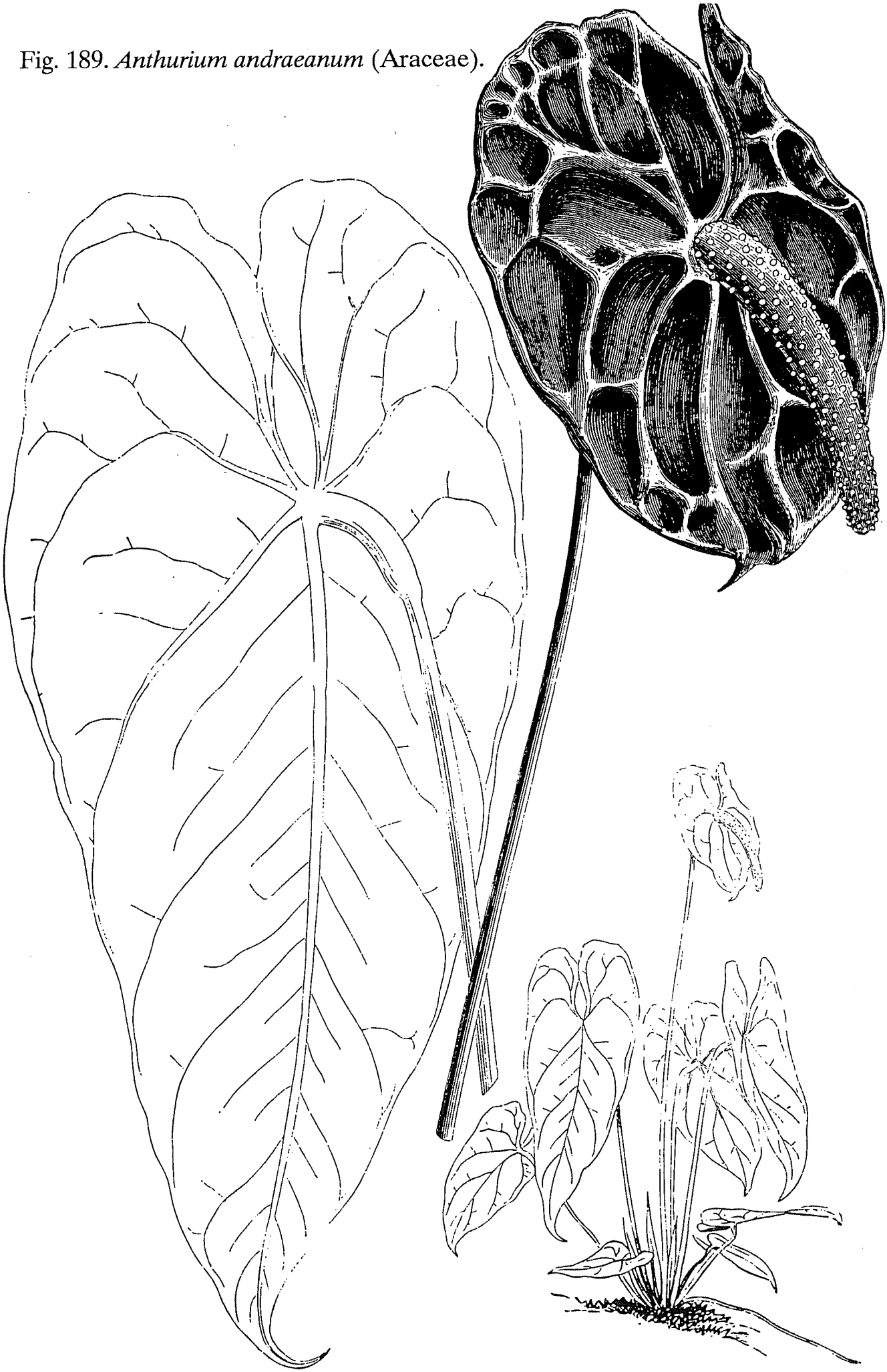
Epiphytic or terrestrial; plants rosulate or climbing. Stems short to elongate. Leaves in a basal rosette, or alternate along a stem, simple or palmately compound, petiolate; venation reticulate; petioles geniculate, with an apical pulvinus. Spathe persistent, not enclosing the spadix, spreading or reflexed. Spadix cylindrical, straight or twisted, tail-like, entirely covered with compact flowers. Flowers bisexual; perianth-segments 4; stamens 4. Fruit a berry, usually colored; seeds with mucilaginous appendages.

Literature: Croat, T.B. 1984. *Anthurium* Schott. *The European Garden Flora* 2(2): 80-85. Croat, T.B. and R.D. Sheffer. 1983. The sectional groupings of *Anthurium* (Araceae). *Aroideana* 6(3): 85-123.

Key to Species

1. Leaves green, not variegated nor appearing velvety; spathe puckered, glossy pink or red ..... 1. *A. andraeanum*
1. Leaves variegated with white midvein and lateral veins, appearing velvety; spathe not puckered, green, sometimes tinged purplish.
   2. Petiole cylindrical (terete), not winged or ridged ..... 2. *A. crystallinum*
   2. Petiole with 4 wings or ridges ..... 3. *A. magnificum*

Fig. 189. *Anthurium andraeanum* (Araceae).



1. *Anthurium andraeanum* Linden ex Andre, *L'Illustration Horticole* 24: 43, t.271 (1877). ANTHURIUM (French Guiana); FLAMINGO FLOWER, FLAMINGO LILY, WAX FLOWER. Epiphytic, rosulate non-climber. Stems to 30 cm, often less, with short internodes. Petioles 20-60 cm, terete. Leaves narrowly- or oblong-cordate, sagittate at the base, subpeltate, green, 17-50 x 11-22 cm. Peduncles to c.60 cm or slightly longer. Spathe orbicular to ovate, cordate at the base, the lobes overlapping or not, puckered (bullate) with irregular depressions, lustrous pink or red, 6-15 cm. Spadix often somewhat recurved (but not coiled), yellowish or white, to 9 cm.

Range: Colombia and Ecuador. Cultivated as an ornamental in yard at the Esther Stichting near Paramaribo, and for cut flowers in Paramaribo, Surinam; displayed as long-lasting cut flowers in public buildings in Cayenne, and frequently grown as an ornamental in French Guiana (de Granville, 1985).

Literature: Chardon, C.E. 1947. Edouard André (1840-1911), jardinero-naturalista y sus viajes por Colombia y el Ecuador. *Caldasia* 4(19): 283-292. Kamemoto, H. 1981. *Anthurium* breeding in Hawaii. *Aroideana* 4(3): 77-86. Madison, M. 1980. Aroid profile no.6: *Anthurium andreanum*. *Aroideana* 3(2): 58-60. Sheffer, R.D., Kamemoto, H. and T.B. Croat. 1980. *Anthurium andraeanum* versus *A. andreanum* (Araceae). *Taxon* 29: 502-505. Smith, L.B. 1945. Andre's bromeliad collecting in Colombia and Ecuador. *Plant Life* 1(2-3): 31-39.

This species is used as a parent in hybrid crosses with at least 8 other species, to produce progeny with variously colored and shaped spathes. It was originally discovered in Colombia in 1876 by the French horticulturist E.F. André (Chardon, 1947; Smith, 1945), who justifiably exclaimed it to be more compelling than the already-known *A. scherzerianum* Schott, itself a splendid Costa Rican plant of similar habit which produces a spirally coiled spadix. *A. scherzerianum* is occasionally grown in Guyana as an ornamental (Ted Hubbard, pers. comm., 1986).

2. *Anthurium crystallinum* Linden & André, in Linden, *Catalogue* no.90: t.128 (1873). CRYSTAL ANTHURIUM. Epiphytic, rosulate non-climber. Stems to 25 cm, with short internodes. Petioles cylindrical, 15-42.5 cm. Leaves narrowly to broadly ovate, cordate at the base, velvety-appearing, green, variegated with white midvein and lateral veins, 25-39 x 15-22 cm. Peduncles to 28 cm. Spathe linear-oblong, green tinged with reddish-violet, c.7-9 cm. Spadix yellowish-green, c.15 cm.

Range: Panama to Peru. Recently introduced as a house plant subject in Guyana at the Botanic Gardens, Georgetown.

3. *Anthurium magnificum* Linden, *Belgique Horticole* 15: 98 (1865). Terrestrial, rosulate non-climber. Stems very short. Petioles with 4 wings or ridges. Leaves ovate, deeply cordate at base, velvety-appearing, green, variegated with white midvein and lateral veins. Peduncles 50-60 cm. Spathe lanceolate, green tinged with reddish-violet, 15-20 cm. Spadix purplish, 20-25 cm.

Range: Colombia. Cultivated as an ornamental in Surinam (Ostendorf, 1962).

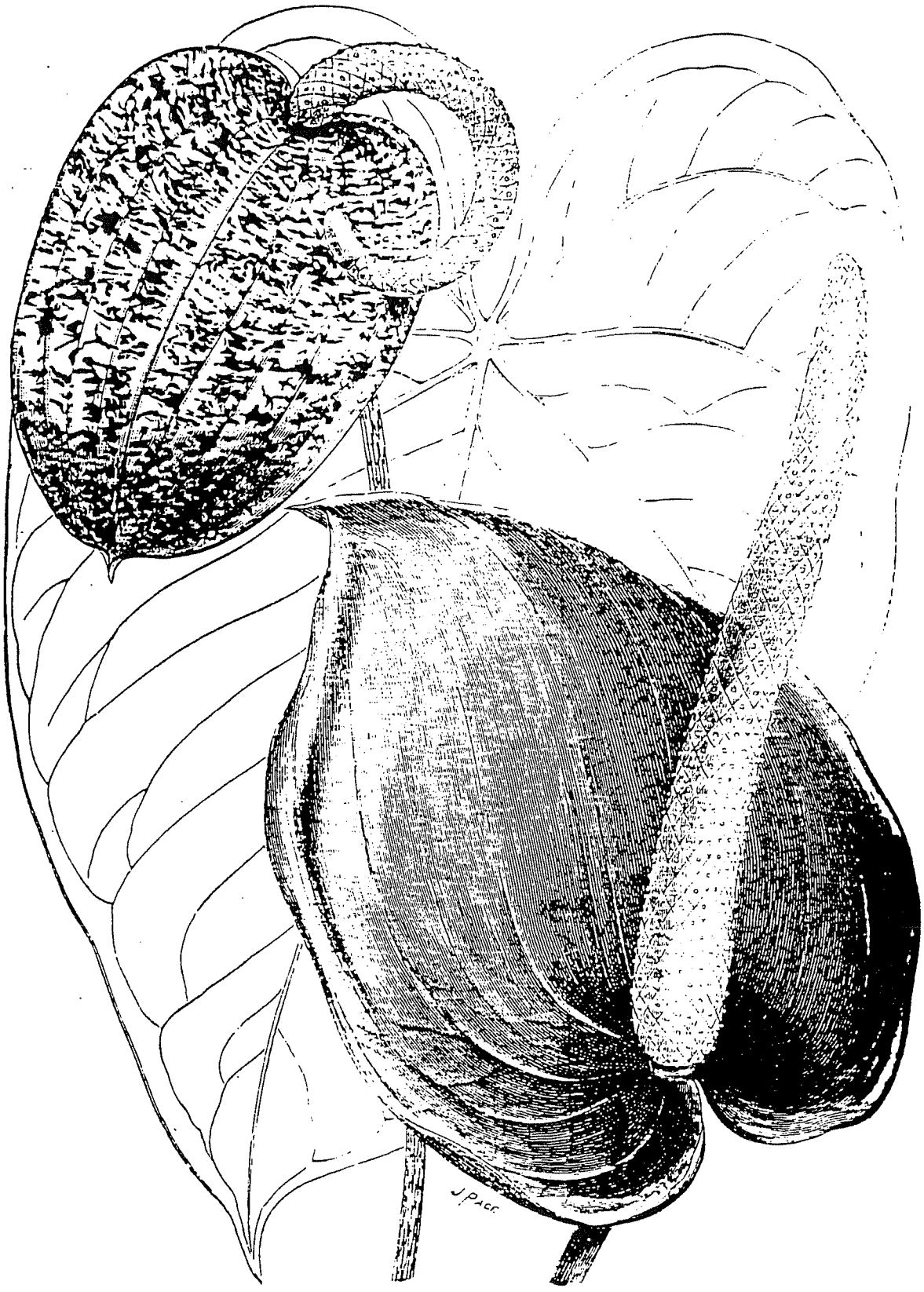


Fig. 190. *Anthurium scherzeranum* (upper left); *Anthurium* x *ferrierense* (*A. andraeanum* x *A. ornatum*) (lower right) (Araceae).

4. *Caladium* Ventenat

Plants from a depressed-globose tuber (tuberous rhizome). Leaves simple or trifoliolate, petiolate, arising in a basal fascicle, often peltate, sagittate and variegated. Peduncles solitary. Spathe hooded, constricted above the tube, the spathe-blade partially expanded. Spadix included in the spathe, the dense flowers arranged in 3 zones, with female flowers at the base, sterile male flowers in the constricted middle, and male flowers of 3-5 stamens each in the upper part. Flowers unisexual; perianth (of tepals) absent. Fruit a 1- or 2-celled, whitish berry.

Literature: Hayward, W. 1950. Fancy-leaved caladiums. *Plant Life* 6(2): 131-142. Joiner, J.N. and T.C. Smith. 1958. The tropical fancy-leaved caladium. *Garden Journal* 8(5): 164-165. Madison, M. 1981. Notes on *Caladium* (Araceae) and its allies. *Selbyana* 5(3-4): 342-377. LaForest, V.J. 1975. Meet the caladiums. *Garden Journal* 25(2): 54-58.

Key to Species

1. Petiole attached to base or margin of leaf-blade, the leaves not peltate, unlobed at the base 3. *C. schomburgkii*
1. Petiole attached to the lower surface of the leaf, the leaves peltate, sagittately or cordately lobed at the base.
   2. Leaves with at least some red or pink variegation, the petioles more than 4 mm wide, the leaf-blades to 60cm; inflorescence present 1. *C. bicolor*
   2. Leaves with white variegation only, the petioles up to 2mm wide, the leaf-blades 4-11.5cm; inflorescence not produced (unknown) 2. *C. humboldtii*

1. *Caladium bicolor* (Aiton) Ventenat, *Description...Jardin J.M. Cels* 3: t.30 (1801). (Synonym: *C.* x *hortulanum* Birdsey). ELEPHANT EAR, FANCY-LEAVED CALADIUM, HEART OF JESUS; JABAFOETOE (Surinamese Creole), KIMPOEL (Surinamese Javan); DASINI, TAYER, WILDE TAYER (Surinam); PALETTE DE PEINTRE (French Guiana). Leaves peltate, the blades ovate to elliptical, sagittately lobed or cordate at the base, with flat to ruffled margin, 10-60 x 12-40 cm, variegated with red, pink, yellow or white markings, suffusions or spots in various color combinations. Petioles longer than the leaves, up to 95 cm. Spathe to 15 cm, the tube green, the spathe-blade whitish or yellowish.

Range: Panama and northern South America, including the three Guianas. Many hybrid cultivars are grown in the city and Botanic Gardens of Georgetown, Guyana. Grown as a potted plant at the Esther Stichting near Paramaribo, and as a garden ornamental in Paramaribo, Surinam, and to decorate hotel grounds in Cayenne, French Guiana.

Literature: Wijnands, D.O. 1983. *Botany of the Commelins*. Rotterdam, The Netherlands: A.A. Balkema (pages 45-46; plate 52).

The wild plant reached Europe from South America at an early date, for it was depicted by Maria Moninckx already in 1704 in the Moninckx Atlas of exotic plants growing in the Amsterdam physic garden (Wijnands, 1983). Wild populations exhibit numerous different patterns and mixes of variegated coloring, many of which were accorded varietal

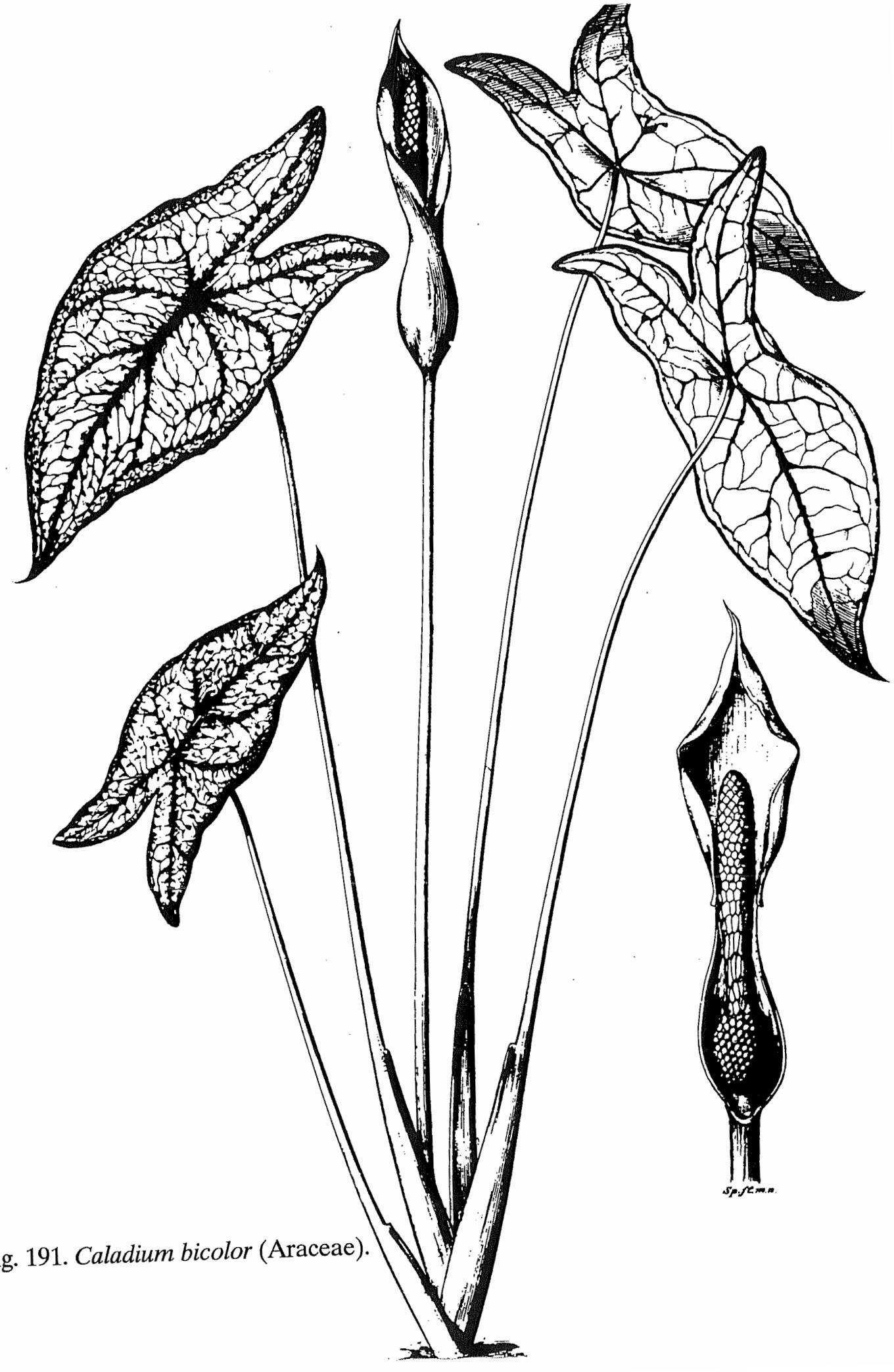


Fig. 191. *Caladium bicolor* (Araceae).

status by the German botanist H.G.A. Engler. From this *C. bicolor* complex of indigenous forms, of which the most modest seem to have been the plants with a red- and white-spotted, heart-shaped field of variegation inside a green border, were selected the principal parental strains for the breeding of modern caladiums with fancy leaves. Hybrid crosses of *C. bicolor* with *C. picturatum* C. Koch (the most frequent crossing partner) have been segregated into more than 1500 variations of progeny in the past, and such cultivars were named as the "*C.* x *hortulanum* group". The x *hortulanum* swarms of various hybrids between cultivars, as well as the variation exhibited by wild *C. bicolor*, are treated as belonging to a single complex species, following the precedent of aroid specialist D.H. Nicolson, in A.C. Smith, *Flora Vitiensis Nova* 1:458 (1979). The fresh plant of *C. bicolor* is employed in herbal baths in Surinam (Plowman, 1969).

2. *Caladium humboldtii* Schott, *Oesterreichisches Botaniches Wochenblatt* 4: 417 (1854). (Synonym: *C. argyrites* Lemaire). MINIATURE CALADIUM. Plant suckering freely. Leaves peltate, the blades ovate, ovate-oblong or oblong-cordate, the lobes cordate at the base, 4-11.5 x c.6 cm, bright green, variegted with white blotches and spots. Petioles longer than the leaves, up to 24 cm. Inflorescence unknown.

Range: Brazil and Venezuelan Amazonia. Grown as an ornamental in Surinam (Ostendorf, 1962; Pulle 1(2): 397. 1968), and in French Guiana (de Granville, 1985).

Literature: Botting, D. 1973. *Humboldt and the Cosmos*. New York: Harper & Row. 295pp. Lecoufle, M. 1981. *Caladium humboldtii* and its cultivar Marcel. *Aroideana* 4(4): 114-115.

This diminuitive plant is favored in north temperate zones where selected indoor situations require a smaller plant than *C. bicolor*. Its petite leaf-blades and overall stature inspired the Belgian horticulturist Emile Rodigas in 1895 to name a Venezuelan form of the plant as a new species *C. lilliputiense*, a reference to the island of Lilliput, whose miniature inhabitants were encountered by Lemuel Gulliver in Jonathan Swift's *Gulliver's Travels* (1726). The species epithet *humboldtii* honors Baron Alexander von Humboldt, the famous Prussian explorer (Botting, 1973) who first collected the plant in the Amazonian rain forest.

Curiously, the inflorescence of this plant is yet unknown in the wild and in cultivation, interdicting propagation by seed. The plant must be multiplied by division of the "eyes" or nodes of the tuberous rhizome - a modified stem. By means of tissue-culturing, which is another mode of vegetative propagation, a nearly albino cultivar has been produced in Paris, France. The possibility that *C. humboldtii* may be a chromosomal race of *C. bicolor* has been suggested by M. Madison (1981).

3. *Caladium schomburgkii* Schott, *Oesterreichisches Botanisches Wochenblatt* 8: 122 (1858). Leaves not peltate, the blades ovate, lacking posterior lobes, to 10-15 x c.15 cm, with ruffled margin, green variegated with white (occasionally red) spots, the veins white to reddish. Petioles to 20 cm or longer. Spathe to c.14 cm, the tube green, the spathe-blade white.

Range: Venezuela (Bolivar state) and the three Guianas. A variant with mostly

Fig. 192. *Caladium bicolor* (Araceae).

reddish-spotted leaves (var. *pictum* Engler) is grown as an ornamental in Surinam (Ostendorf, 1962; Pulle 1(2): 398. 1968).

The type specimen of this species was collected by Richard Schomburgk in the early 1840's at the Waraputa Falls of the Essequibo River, Guyana.

5. *Dieffenbachia* Schott

Terrestrial. Stems erect, stout, with prominent leaf scars, unbranched, with leaves clustered at the top on older plants. Leaves alternate, entire, often with sheathing petioles, usually variegated. Peduncles solitary. Spathe convolute. Flowers unisexual; perianth absent. Spadix with the lower (female) part entirely adnate (united) to the spathe along one side, bearing zones comprising, from base to apex, scattered female flowers with 4-5 conspicuous club-like staminodes; a short sterile section; and apical zone of male flowers with 4-5 united stamens each. Fruit a 1- to 3-celled, orange berry.

Literature: Arditti, J. and E. Rodriguez. 1982. *Dieffenbachia*: Uses, abuses and toxic constituents: a review. *Journal of Ethnopharmacology* 5(3): 293-302. Henny, R.J. and E.M. Rasmussen. 1980. Growing and breeding *Dieffenbachia. Aroideana* 3(2): 65-68. Singer, W. 1953. Dieffenbachias. *Garden Journal* 3(6): 193.

1. *Dieffenbachia seguine* (Jacquin) Schott, *Wiener Zeitschrift für Kunst* 803 (1829). (Synonyms: *D. maculata* G. Don, *D. picta* Schott). AWAREPOLANG (Surinamese Carib); BOESIE DONTJE, DONKE, DONKIN (Surinamese Creole); DUMB CANE. Terrestrial plants on cane-like stalks to 3 m. Leaf-blades ovate-elliptical, varying to oblong-elliptical, lanceolate or ovate, the base truncate, subcordate or acute, the apex cuspidate to acuminate, to 43 x 21 cm, glossy, green or variegated with white, ivory, cream, yellowish or yellowish-green irregular spots and/or blotches. Petiole green or spotted, with or without a sheath up to half its length. Spathe to 26 x 7 cm, green. Spadix stipitate, yellow.

Range: Tropical America, from the West Indies and Mexico to Central and northern South America, including the three Guianas. Infrequently grown as an ornamental in French Guiana (cultivar unspecified, de Granville, 1985).

Literature: Bunting, G.S. 1962. The correct name of two common dieffenbachias. *Baileya* 10(4): 145-146. Dore, W.G. 1963. Crystalline raphides in the toxic house plant *Dieffenbachia. Journal of the American Medical Association* 185: 1045. Nicolson, D.H. 1979. *Flora Vitiensis Nova* 1: 452-453.

Recognized as two polymorphic species as early as 1915 by A. Engler, and its elements more recently lumped into a single polymorphic (highly morphologically complex) species by D.H. Nicolson (1979), it exists with many variegated wild variants as well as numerous cultivars. Crushed leaves release a poisonous milky or yellowish liquid which causes painful irritation in the mouth escalating to the point of speechlessness; the resulting inability to speak engenders to the plant the common name of "dumb cane". As explained by T.H. Everett in the *New York Botanical Garden Illustrated Encyclopedia of Horticulture* 4: 1067 (1981), "the cause is largely mechanical, the result of sharp, almost glasslike slivers of

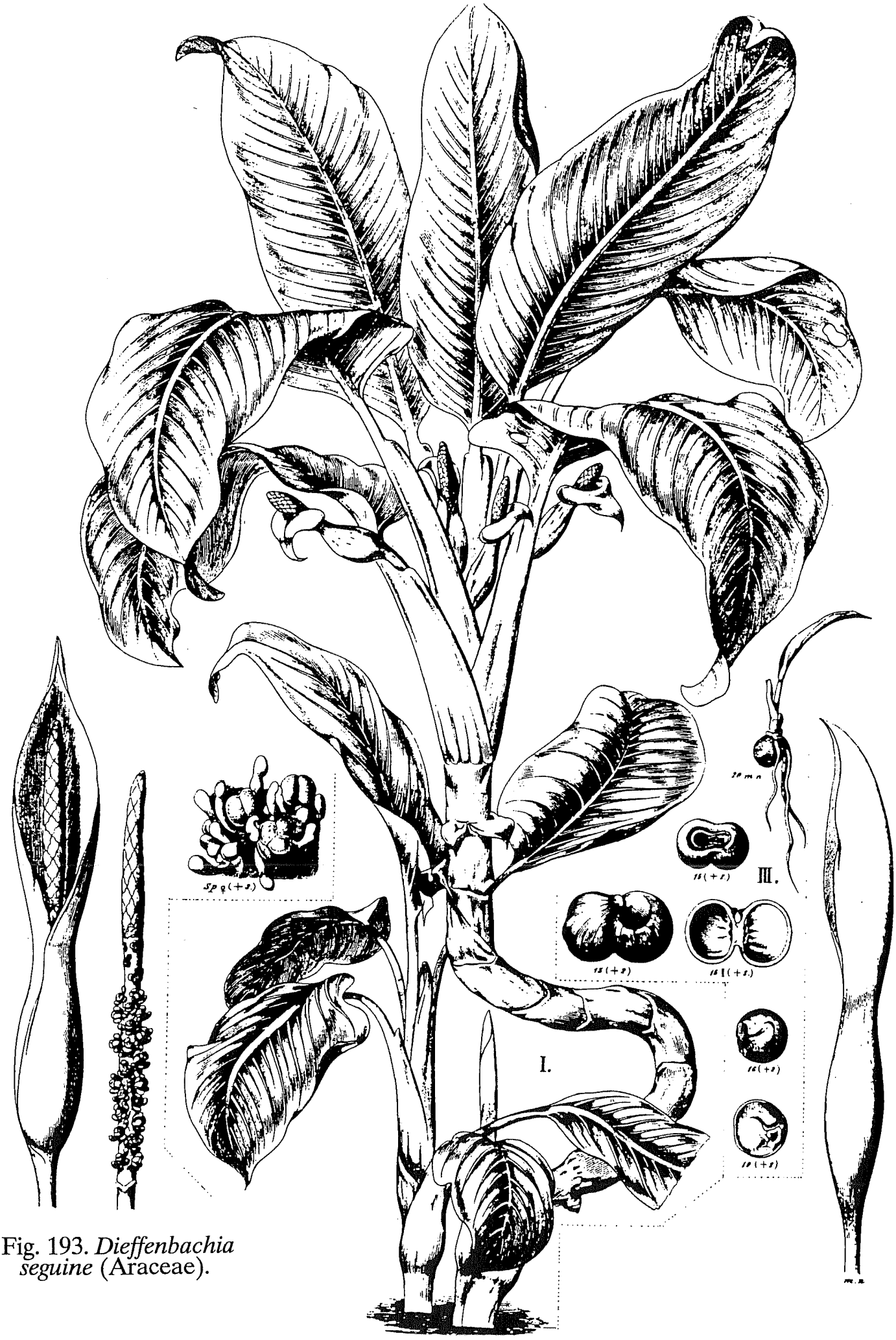


Fig. 193. *Dieffenbachia seguine* (Araceae).

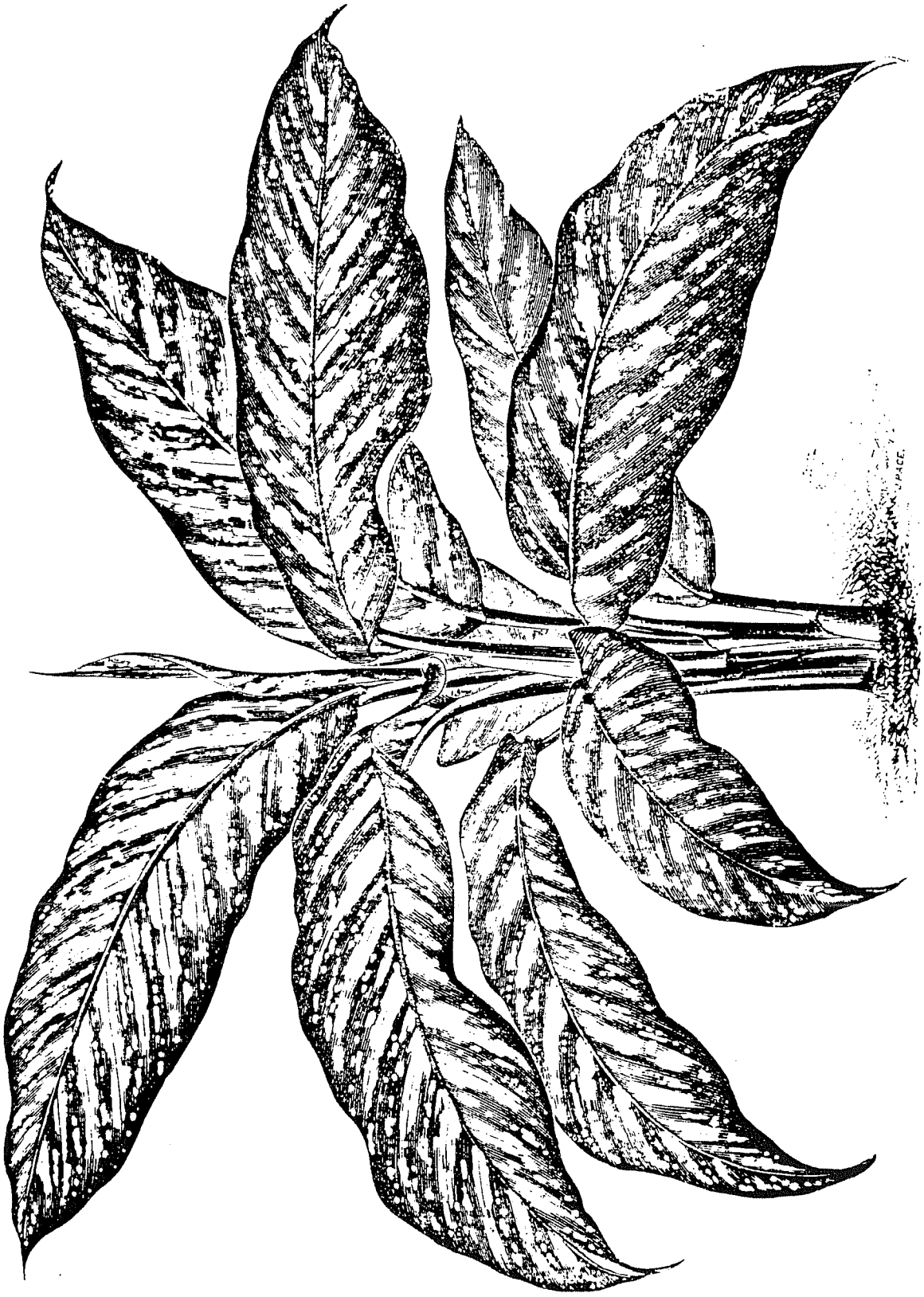


Fig. 194. *Dieffenbachia seguine* cv. Jenmanii (Araceae).

calcium oxalate contained in the plant becoming embedded in the flesh, but toxic proteins are also involved." The plant reportedly has a sterilizing effect and in the West Indies it has been employed as a contraceptive (Plowman, 1969).

In the Guianas, several cultivars in addition to those keyed below are grown, and may be separated with difficulty based on their variegation patterns as shown in comprehensive picture books.

Key to Cultivars

1. Leaves generally ovate-elliptical, green, generously blotched and spotted with creamy-white all over the leaf-blades 1a. cv. Superba
1. Leaves narrowly oblong, green, with white parallel bands confined along the lateral veins in a zebra-stripe or feather-like pattern 1b. cv. Jenmanii

1a. *D. seguine* cv. Superba. Range: Occasional as a potted plant in Georgetown, Guyana. This beautiful compact plant arose as a mutant of the typical foliar form of the *D. picta* element of this complex species (Birdsey, 1951; Bunting, 1962).

1b. *D. seguine* cv. Jenmanii. (Synonyms: *D. jenmanii* Veitch ex Regel, *D. picta* Schott var. *angustior* Engler subvar. *jenmanii* (Veitch ex Regel) Engler). Range: Grown as an ornamental in a large private garden near Timehri, Guyana. This plant was originally recognized and sent from Guyana to the horticultural house of Veitch in England, c.1884 by G.S. Jenman, superintendent of the Botanic Gardens, Georgetown.

6. *Epipremnum* Schott

Vines climbing by roots. Leaves entire or pinnatifid; petioles sheathing at the base, geniculate. Spathe deciduous (fugacious). Spadix included inside spathe, densely covered with flowers. Flowers bisexual; stamens 4; perianth absent. Ovary 1-celled; ovules 2-4(-8), basal. Fruit a 1-seeded berry.

Literature: Bunting, G.S. 1962. Generic delimitation in the Araceae, Subfamily Monsteroideae. *Baileya* 10(1): 21-31.

1. *Epipremnum pinnatum* (Linnaeus) Engler, in Engler & Krause, *Das Pflanzenreich* 37(IV. 23B): 60 (1908). Plant climbing to 20 m. Stems to 4 cm wide, with fibrous covering at juncture of petiole-base. Leaf-blades (adult) elliptic-oblong, truncate at base, regularly to rather irregularly pinnatifid, the lobes deep to rather shallow, oblong, 8-14 on each half of leaf, 1-veined, curved, with or without a row of many very small pin-holes along the blade at the midrib; leaf-blades (juvenile) oblong- lanceolate, entire (sometimes pinnatifid), with or without pin-holes, sometimes remaining at same time as adult leaves are produced. Spathe to 22.5 cm, greenish.

Key to Taxa

1. Leaves green, not variegated 1a. var. *pinnatum*
1. Leaves sparingly to heavily variegated with yellow or white spots or blotches 1b. cv. Aureum

Fig. 195. *Epipremnum pinnatum* cv. Aureum (Araceae).

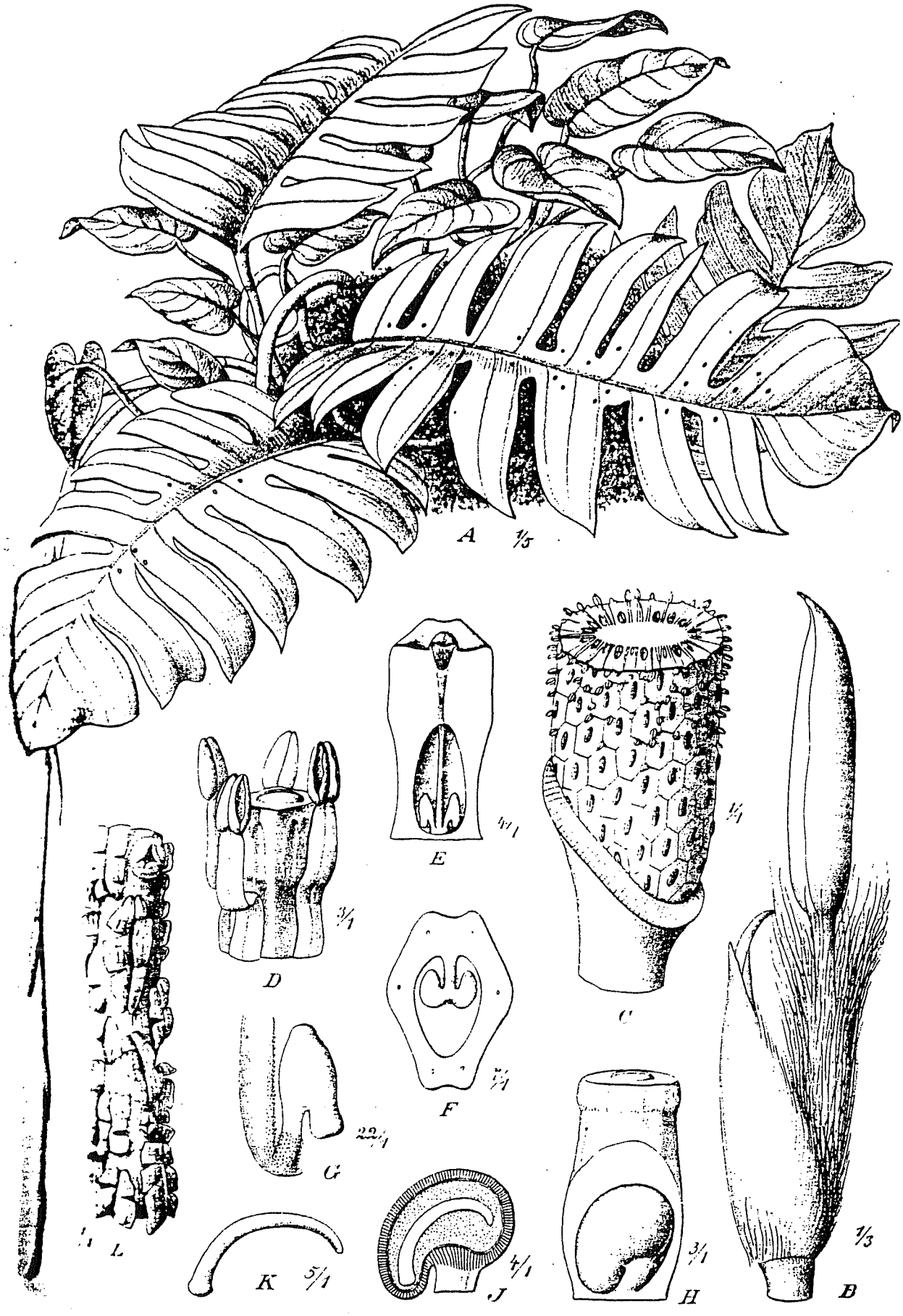


Fig. 196. *Epipremnum pinnatum* var. *pinnatum* (Araceae).

The genus Epipremnum Schott (Araceae - Monsteroideae - Monstereae) in West and Central Malesia. Blumea 43(1): 183 - 213. (E.P.), p. 205 - 208.

1a. *E. pinnatum* var. *pinnatum*. (Synonym: *E. mirabile* Schott). Range: Southeast Asia through Malaysia, Indonesia, and New Guinea to the Fiji and Marshall Islands. Presently grown in scattered plantings in Georgetown, Guyana. It was available from the Botanic Gardens, Georgetown as early as 1893 (Waby, 1893).

Literature: Waby, J.F. 1893. *Tropical Gardening in British Guiana*. 156 pp. Demerara: J. Thomson, Argosy Press (Appendix A, p.II).

1b. *E. pinnatum* cv. Aureum. (Synonyms: *E. aureum* (Linden & André) Bunting, *Pothos aureus* Linden & André, *Scindapsus aureus* (Linden & André) Engler). POTHOS. Range: First supposedly encountered in the Solomon Islands (1879) and rapidly propagated vegetatively for commercial horticulture around the world from that time. Grown as an ornamental at the Promenade Gardens, Georgetown, and occasionally elsewhere in Guyana; as an indoor and outdoor ornamental in Paramaribo (including the Palmentuin) and at Old Site Town near Paramaribo, Surinam; and in Cayenne, French Guiana.

Boyce, P.C. 1998.

Literature: Birdsey, M.R. 1962. *Pothos aureus* transferred to *Rhaphidophora*. *Baileya* 10(4): 155-159. Furtado, C.X. 1964. *Pothos aurea* Hort. Linden. *Gardens' Bulletin, Singapore* 20(4): 377-380. Nicolson, D.H. Araceae, pp. 345-348, in Smith, A.C. 1978. A precursor to a new Flora of Fiji, *Allertonia* 1(6): 331-414; *Epipremnum*, in Smith, A.C. 1979. *Flora Vitiensis Nova* 1: 440-443.

Recognition of this, the popular ornamental "pothos", in the category of a cultivar of *E. pinnatum* was first espoused by D.H. Nicolson (1978), and is followed here. The inflorescence of this plant is very rarely produced, and the situation prevented determination of its true genus for many years.

7. *Monstera* Adanson

Epiphytic vines, climbing from aerial roots. Leaves alternate, petiolate, entire or pinnatifid, sometimes perforated (fenestrate), often oblique at the base; petiole long-sheathing, pulvinate at apex, geniculate. Flowers bisexual; stamens 4; perianth absent. Spathe deciduous, boat-shaped. Spadix densely flowered. Ovary 2-celled; ovules 2 per cell. Fruit a berry.

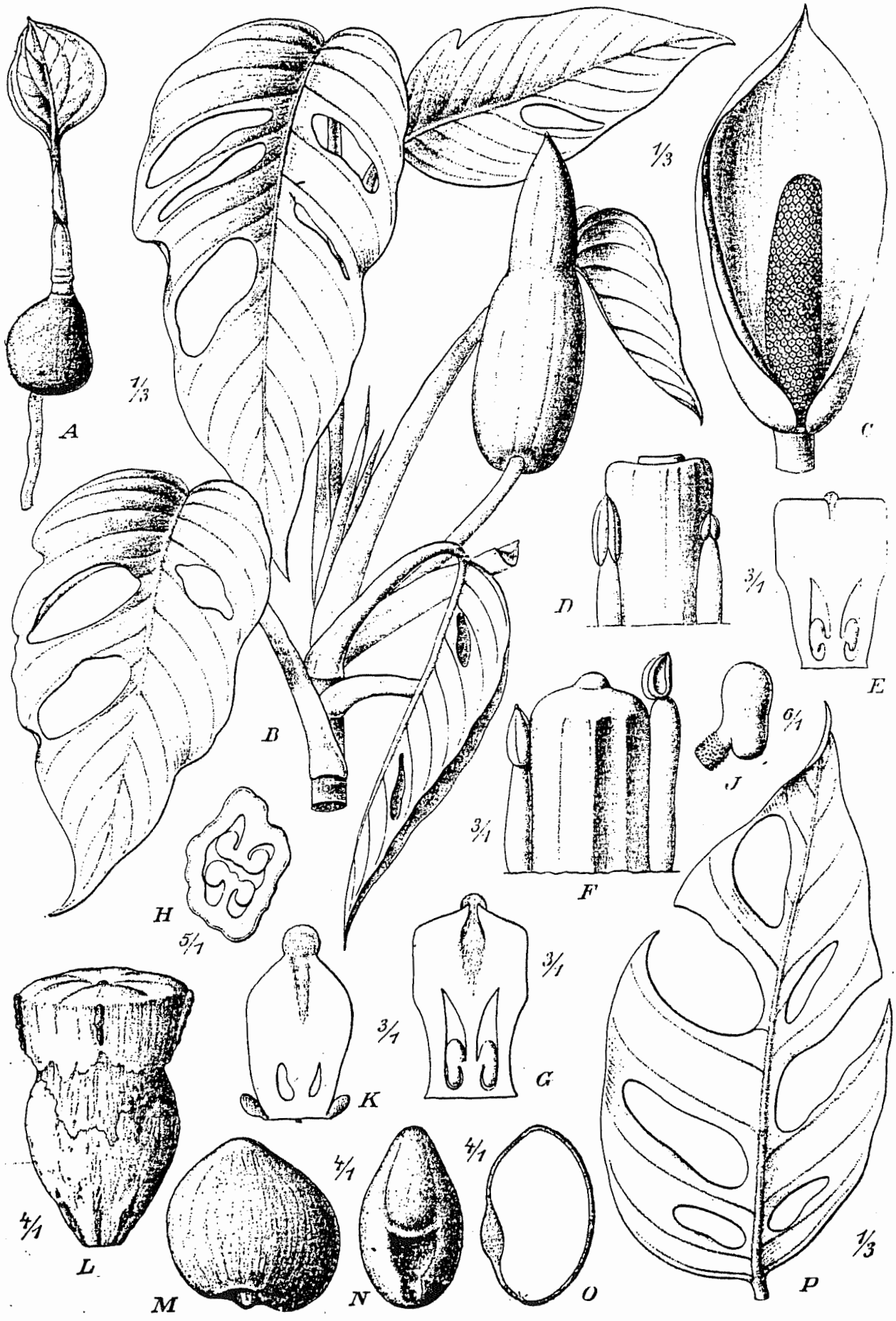
Literature: Madison, M. 1977. A revision of *Monstera* (Araceae). *Contributions from the Gray Herbarium* 207: 3-100. Madison, M.T. 1984. *Monstera*. *European Garden Flora* 2(2): 87.

(1-10) fide Boyce (1998 References)

Key to Species

1. Leaf-blades both perforated and regularly pinnatifid, orbicular-ovate, thick, to 90(-120) cm — 2. *M. deliciosa*
1. Leaf-blades perforated but (usually) not regularly pinnatifid, elliptical to ovate, thin, to 60 cm.
   2. Leaves (15-) 30-68 cm; spadix to 13 cm — 1. *M. adansonii*
   2. Leaves to 35 cm; spadix to 6 cm — 3. *M. obliqua*

Fig. 197. *Monstera adansonii* (a-o) (Araceae).



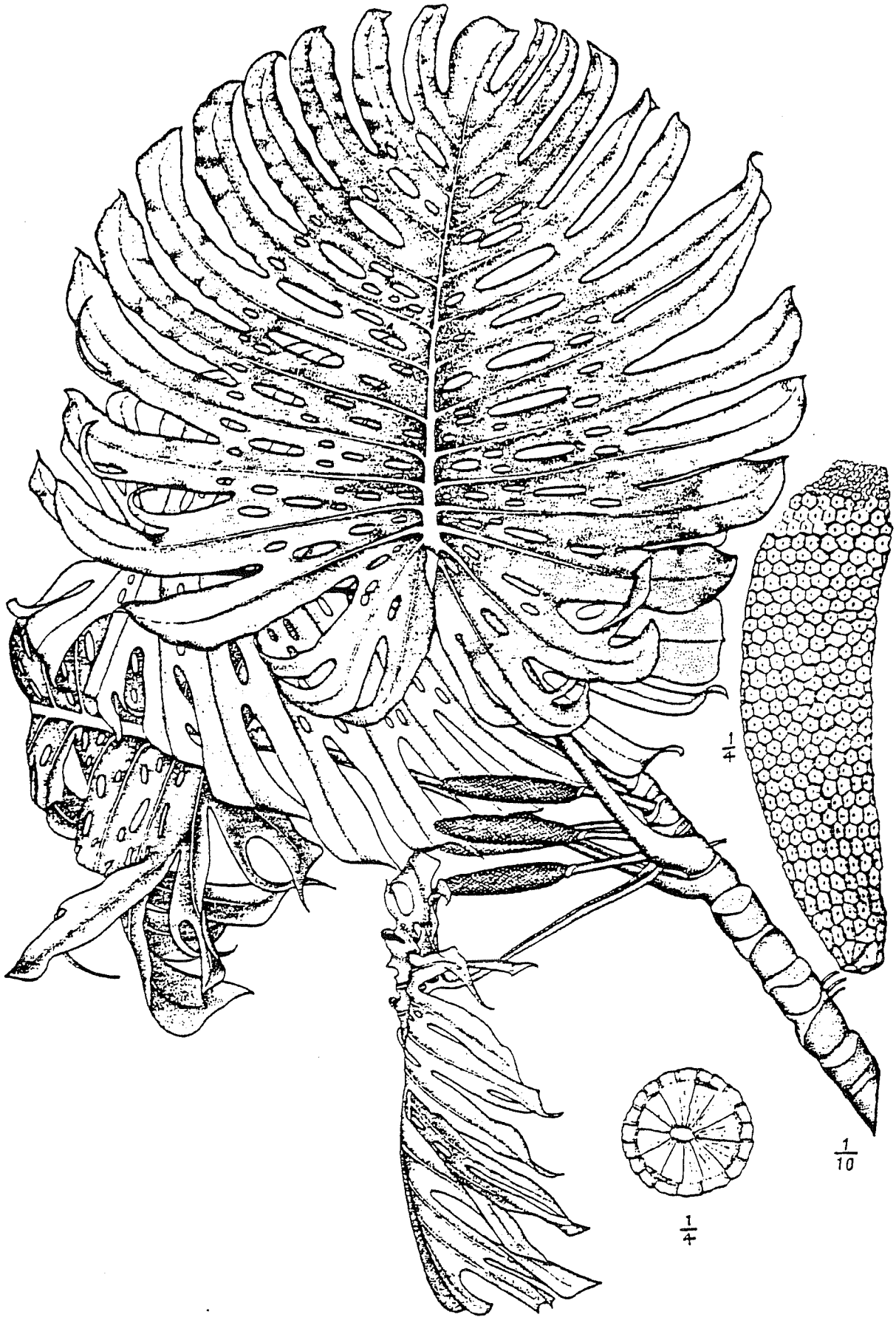


Fig. 198. *Monstera deliciosa* (Araceae).

Fig. 199. *Monstera deliciosa* (Araceae).

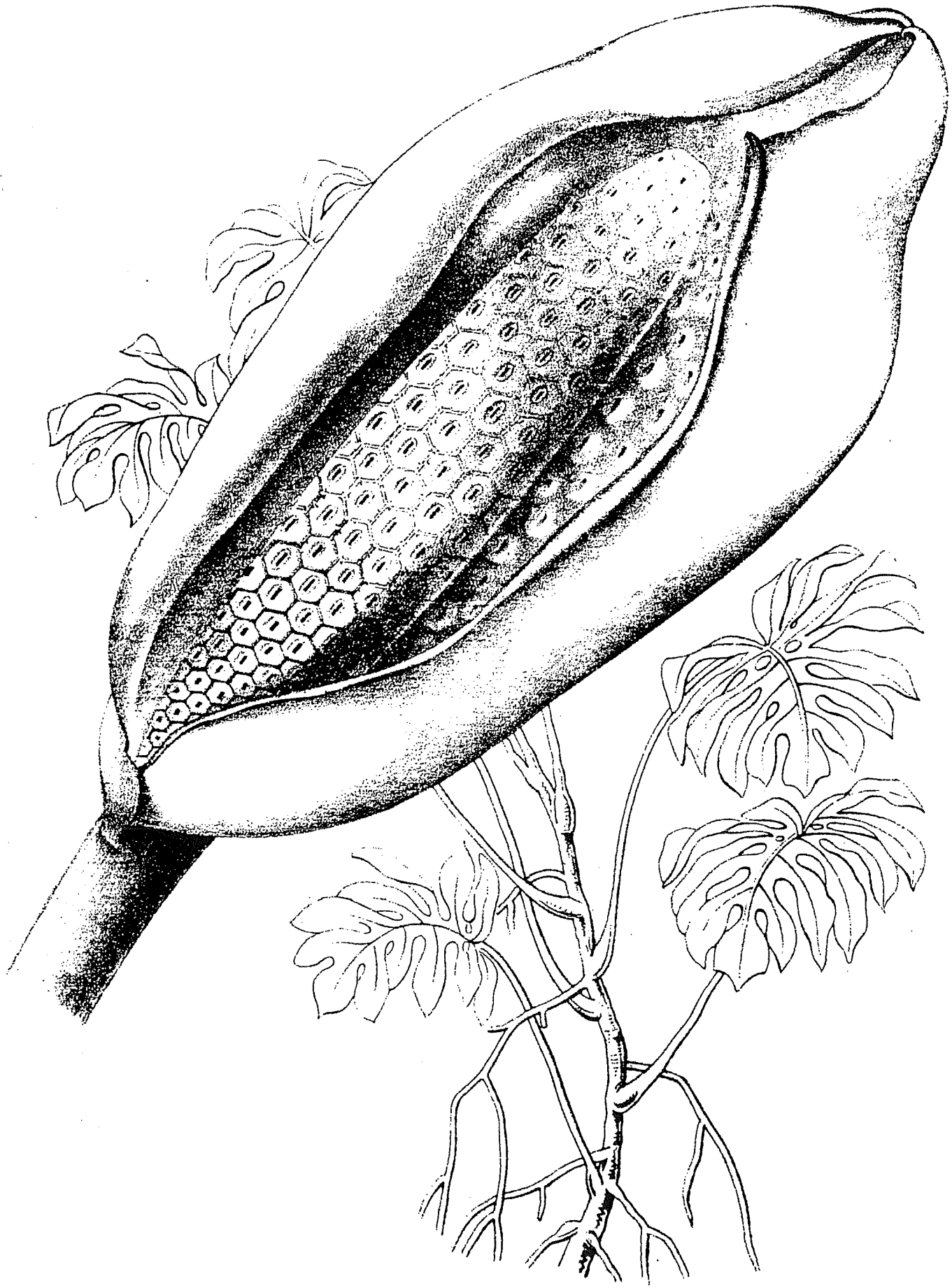


Fig. 200. *Monstera obliqua* (Araceae).

1. *Monstera adansonii* Schott, *Wiener Zeitschrift für Kunst* 4: 1028 (1830). (Synonym: *M. pertusa* (Linnaeus) De Vries). FEFI-OLO-WIWIRI, GATENPLANT, SIETJOEBIE (Surinam). Plant climbing to c.8 m. Leaf-blades ovate or broadly ovate-oblong or -elliptical, 22-68 (-90) x 15-40 cm, very oblique at the base, entire to lacerate, often with perforations; petiole shorter than the blade. Spadix to 13 cm.

Range: Central America and northern South America, including the three Guianas. Employed as an ornamental in indoor plantings in Paramaribo, Surinam, and around office buildings in Cayenne, French Guiana.

Literature: SECAB. 1989. *Monstera pertusa. Especies Vegetales Promisorias* 1: 428-431.

2. *Monstera deliciosa* Liebmann, *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening Kjobenhavn* 1849-1850: 19 (1849). (Synonym: *Philodendron pertusum* Kunth & Bouché). CERIMAN, SPLIT-LEAF PHILODENDRON, SWISS CHEESE PLANT. Plant climbing to 20 m. Leaf-blades orbicular-ovate, cordate at the base, the juvenile leaves entire, the mature leaves perforated with elliptical holes and regularly pinnatifid, thick, to 90 (-120) x 75-90 cm; petiole significantly longer than the leaf-blade, the geniculum flattened and winged. Spadix to 18 (-25) cm. Ripe fruit edible, with sweet taste of pineapple and strawberry.

Range: Mexico, Guatemala, Costa Rica, Panama. Recently introduced to Guyana as an ornamental at the Botanic Gardens, Georgetown, and grown for indoor ornament in hotel and as a house plant in Paramaribo, Surinam.

Literature: Madison, M. 1978. Aroid profile no.1: *Monstera deliciosa. Aroideana* 1(1): 14-16. SECAB. 1989. *Monstera deliciosa. Especies Vegetales Promisorias* 1: 423-427.

3. *Monstera obliqua* Miquel, *Linnaea* 18: 79 (1844). (Synonym: *M. expilata* Schott). WINDOWLEAF . Plant climbing to c.10 m. Leaf-blades lanceolate to ovate, perforated, entire (or rarely irregularly and sparingly lacerated), 8-35 x 4-12 cm; petiole shorter than the blade. Spadix to 6 cm.

Range: Panama and northern South America, including the three Guianas. Cultivated for ornament at the Botanic Gardens, Georgetown, Guyana; as a decorative outdoor planting on hotel grounds, as well as a potted plant in florist shop, in Paramaribo, Surinam.

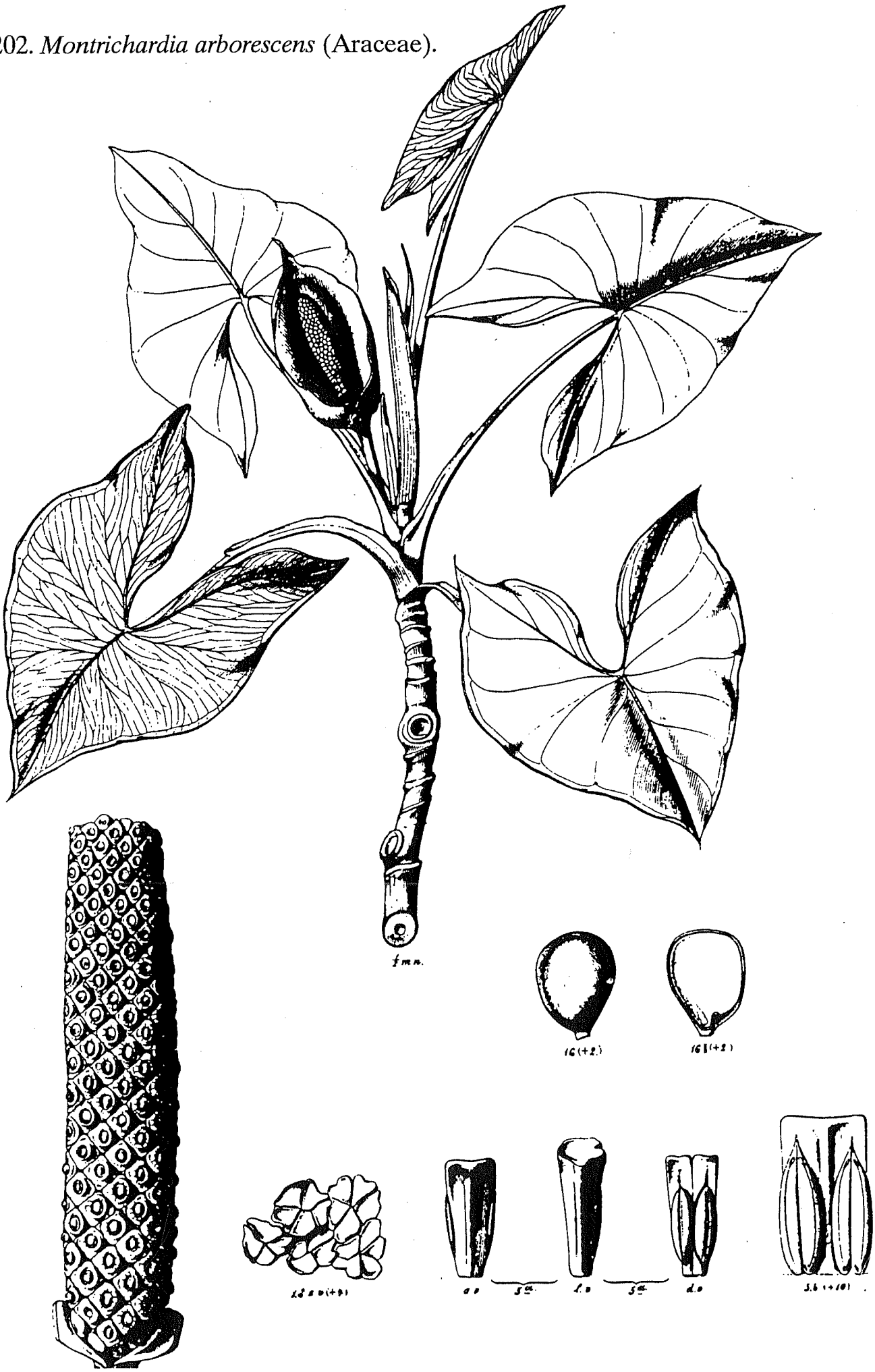
Literature: Phillips, C. 1987. Aroid profile no.12. *Monstera obliqua. Aroideana* 10(2): 20-22.

8. *Montrichardia* Crueger

Terrestrial, tall sub-arborescent plants of semi-aquatic habitats. Stems woody, with conspicuous leaf-scars. Leaf-blades sagittate; petiole sheathing. Peduncles solitary. Spathe convolute at the base, deciduous after anthesis. Flowers unisexual; stamens 3-7; perianth absent. Spadix with female flowers below, male flowers above. Ovary 1-locular, with 1-2 ovules. Fruit a 1-seeded berry, spongy below, woody above.

Fig. 201. *Montrichardia arborescens* (Araceae).

Fig. 202. *Montrichardia arborescens* (Araceae).



1. *Montrichardia arborescens* (Linnaeus) Schott, *Araceen Betreffendes* 1: 4 (1854). MOKKO-MOKKO, MOKO-MOKO (Surinamese Creole). Plants forming colonies. Stems to 4 m x 2.5 dm, often swollen and prop-rooted at the base, bamboo-like, with prominent leaf-scars, sometimes sparingly branched, smooth or often armed with prickles at least below. Leaf-blades sagittate-cordate or ovate-cordate, 8-30 (-45) x 8-30 (-45) cm; petiole as long as or longer than the leaf-blade, clasping at the base, to 30 cm. Peduncle up to c.1/3 as long as spathe. Spathe white or cream, the base pinkish or yellowish inside, 10-20 x 7.5 cm. Ripened spadix (infructescence) cone-like, to 15 x 10 cm; fruits to 3 x 3 cm; seeds buoyant, c.2.5 cm.

Range: Lesser Antilles, Central America (Guatemala, Belize, Panama) and northern South America; abundant in wet ditches, roadbanks and swamps of coastal areas in the three Guianas. Grown as an outdoor, semi-aquatic, ornamental poolside planting on Torarica hotel grounds in Paramaribo, Surinam.

Literature: Bown, D. 1988. *Aroids*. 256 pp. Portland, Oregon: Timber Press. Croat, T.B. and N. Lambert. 1986. The Araceae of Venezuela. *Aroideana* 9(1-4): 3-213. Howard, R.A. 1979. Nomenclatural notes on the Araceae of the Lesser Antilles. *Journal of the Arnold Arboretum* 60(2): 272-289. Jonker-Verhoef, A.M.E. and F.P. Jonker. 1953. Notes on the Araceae of Suriname. *Acta Botanica Neerlandica* 2(3): 349-362. Riedl, H. 1965. Heinrich Wilhelm Schott (1794-1865). *Taxon* 14(7): 209-213. SECAB. 1989. *Montrichardia arborescens. Especies Vegetales Promisorias* 1: 432-435.

The genus was named in 1854 by Hermann Crueger, superintendent of the Botanical Gardens of Trinidad, in honor of his friend Count Gabriel Montrichard, a patron of science in Trinidad. The species was named by Heinrich W. Schott, an important student of aroids whose botanical career has been described by Riedl (1965). In Surinam, moko-moko provides local people with stem-fibers to tie together bundles of wood; the beaten stem is applied to wounds as a plug (tampon) to stop bleeding; and the immature worm-like spadix is used as a fish lure (Ostendorf, 1962). A brief discussion of the plant in Guyana is given in Bown (1988, pp. 81-82).

Differences in leaf-shape, venation and sinus-lobes among populations have been discerned by some workers who retain as a distinct species the entity *M. linifera* (Arruda) Schott (Croat & Lambert, 1986; Jonker-Verhoef & Jonker, 1953), while Howard (1979) has discussed transitional, intergrading aspects of such variation to be found in single populations. Degree of spininess also varies, and the possibility of hybridization between typical *arborescens* and *linifera* resulting in intermediate plants has been suggested by Croat and Lambert.

9. *Philodendron* Schott

Epiphytic, climbing, non-climbing or shrubby-arborescent plants. Stems often with aerial roots, sometimes with persistent fibrous scale-like covering. Leaves entire, lobed, cleft or pinnatifid; petiole usually short-sheathed, clasping what appears to be a lateral bud. Peduncles usually short, sometimes clustered. Spathe persistent in fruit, fleshy, encircling the spadix. Flowers unisexual; stamens 2-6; female flowers without staminodes; perianth

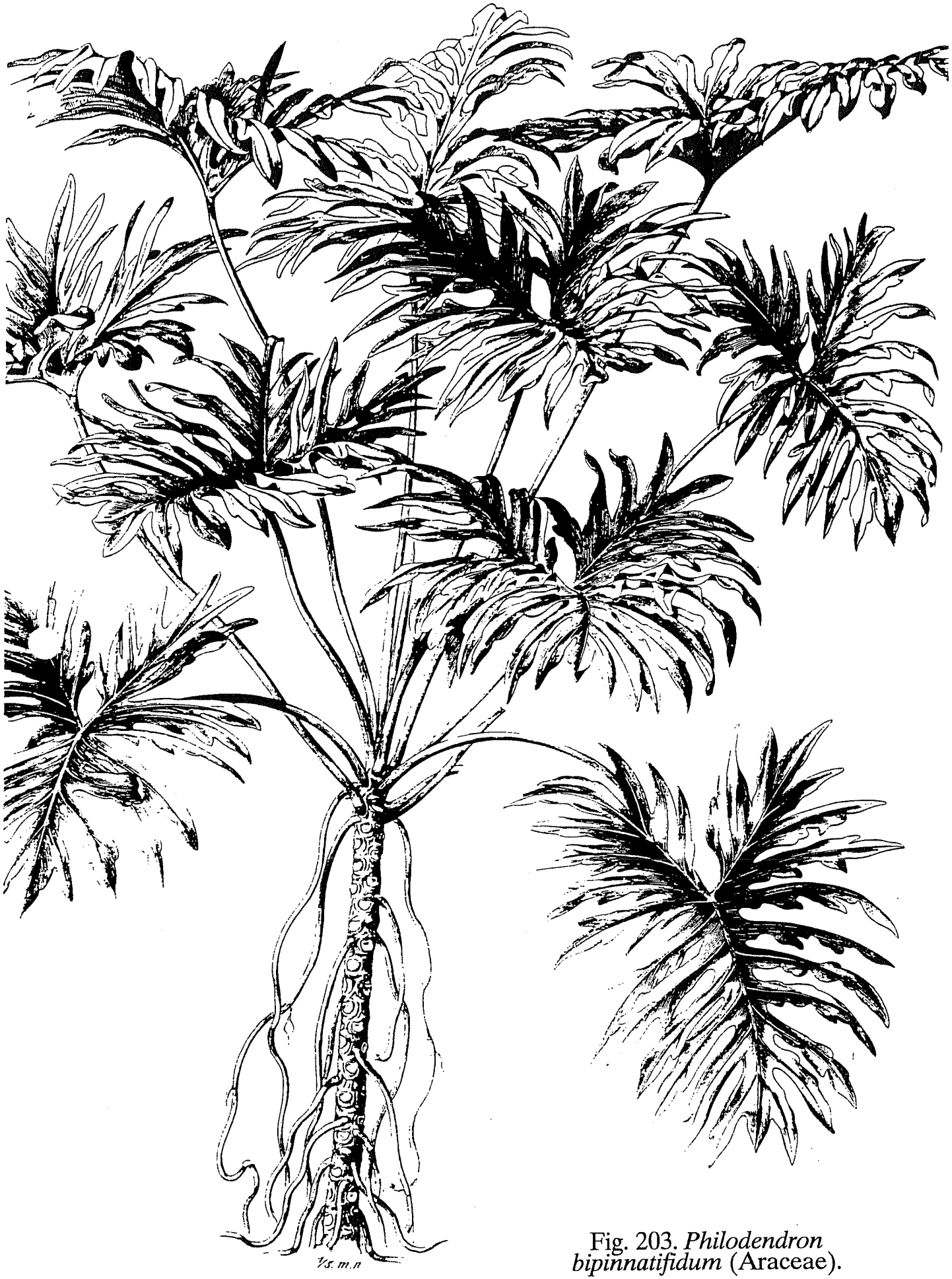


Fig. 203. *Philodendron bipinnatifidum* (Araceae).

absent. Spadix densely flowered, the zone of female flowers at base, contiguous with the zone of male flowers above. Ovary 2- to several-celled. Fruit a berry, white to orange.

Literature: Mayo, S.J. 1990. History and infrageneric nomenclature of *Philodendron* (Araceae). *Kew Bulletin* 45(1): 37-71. Rich, F. 1953. Philodendrons. *Garden Journal* 3(6): 188-192.

Key to Species

1. Plant shrubby or arborescent; mature leaf-blades regularly pinnatifid or bipinnatifid, to 90 cm — 1. *P. bipinnatifidum*
1. Plant a vine with elongated stem, or "self-heading" with very short stem; mature leaf-blades entire, lobed, cleft or irregularly pinnatifid, usually less than 90 cm.
2. Leaf-blades entire (but sagittate or cordate (2-lobed) at the base).
3. Stem internodes without fibrous covering; petiole flattened above; leaf-blades yellow — 2. *P. erubescens* cv.Golden Erubescens
3. Stem internodes covered with fibrous remains of scales; petiole D-shaped (half-round) in cross-section; leaf-blades green above, pinkish-purple beneath — 4. *P. melinonii*
2. Leaf-blades lobed, cleft or irregularly pinnatifid.
4. Petioles densely bristly; peduncles warty — 6. *P. squamiferum*
4. Petioles and peduncles smooth.
5. Leaves pedately cleft or irregularly pinnatifid, to 45 cm — 5. *P. pedatum*
5. Leaves pinnately lobed or crenately incised, to c.75 cm — 3. *P. lacerum*

1. *Philodendron bipinnatifidum* Schott in Schott & Endlicher, *Meletemata Botanica* 20 (1832). (Synonym: *P. selloum* C. Koch). Erect to decumbent, shrubby or arborescent plant. Stem 2-5 m, with thick aerial roots. Leaf-blades reflexed, ovate, sagittate, regularly pinnatifid, the segments often with secondary lobes, causing leaf to be bipinnatifid, to 90 x 60 cm. Petiole flattened on upper surface. Spathe to 30 cm, green to purplish-brown outside, white inside.

Range: Southern Brazil. Grown as an indoor and outdoor potted ornamental on hotel grounds in Paramaribo, Surinam, and infrequently grown as an ornamental in public places, such as Rochambeau Airport, in French Guiana.

Literature: Hayward, W. 1954. Giant arborescent philodendrons. *Plant Life* 10(2-4): 113-116.

2. *Philodendron erubescens* C. Koch & Augustin, *Index Seminum Hortus Berolinensis Appendix* 6 (1854), cv. Golden Erubescens. Climbing vine with elongated stem. Leaf-blades reflexed, ovate-triangular, sagittate-cordate, entire, golden yellow, to c. 40 x 19 cm. Petiole flattened above. Spathe c.15 cm, dark purple outside, red inside.

Range: The typical form originated in Colombia. This mutant with completely yellow leaves was recently introduced to Guyana at the Botanic Gardens, Georgetown.

Philodendron cv. Red Emerald, a hybrid having *P. erubescens* parentage and similarly shaped, but dark green, leaves and purple stems, is grown as an ornamental house plant in

Fig. 204. *Philodendron melinonii* (Araceae).

Paramaribo, Surinam.

3. *Philodendron lacerum* (Jacquin) Schott, in Schott & Endlicher, *Meletemata Botanica* 19 (1832). Climbing vine with elongated stem. Leaf-blades reflexed, ovate or ovate-lanceolate, cordate, pinnately lobed or crenately incised, to c.75 x 70 cm. Petiole terete. Spathe to 12.5 cm, tube reddish-purple outside, blade pale greenish-yellow.

Range: Greater Antilles (Cuba, Jamaica, Hispaniola). Infrequently grown as an ornamental tub plant in Georgetown, Guyana, and in planter at Torarica hotel, Paramaribo, Surinam.

This species was introduced to cultivation as an attractive foliage plant in Europe prior to 1800, and had reached the Cambridge garden in England, via Venezuela, by 1822 (Birdsey, 1951).

4. *Philodendron melinonii* Brongniart ex Regel, *Gartenflora* 23: 67, t.789 (1874). RED BIRDSNEST. Plant "self-heading" with very short stem. Stem shaggy, covered with fibrous remains of scales. Leaf-blades erect, narrowly ovate-oblong, shallowly cordate, entire, to 60 (-90) x 50 cm, the juvenile leaves pinkish-purple beneath. Petiole D-shaped in cross-section, and with narrow wings on the angles, purple-spotted. Spathe c.16 cm, tube reddish outside, blade white or cream.

Range: Venezuela, Guyana, French Guiana, Brazil. Occasionally planted outdoors as a terrestrial ornamental near Timehri Airport, Guyana, and grown as an ornamental in private and hotel gardens as well as in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam.

5. *Philodendron pedatum* (W.J. Hooker) Kunth, *Enumeratio Plantarum* 3: 49 (1841). (Synonym: *P. laciniatum* (Vellozo) Engler). Climbing vine with elongated stem. Leaf-blades reflexed, ovate in outline, pedately cleft or irregularly pinnatifid, overall to 45 x 30 cm, the basal lobes flaring. Petiole terete, smooth. Spathe to 14 cm, greenish outside, purplish toward the base.

Range: Venezuela to Brazil; Surinam, French Guiana.

See observation under *Philodendron squamiferum* Poeppig.

6. *Philodendron squamiferum* Poeppig, in Poeppig & Endlicher, *Nova Genera ac Species Plantarum* 3: 17 (1845). Climbing vine with elongated stem. Leaf-blades reflexed, trullate-ovate in outline, pinnately 5-lobed with entire lobes (juvenile leaves entire to 3-lobed), to 60 x 45 cm. Petiole terete, reddish with dense bristles or scales which are forked or laciniate and up to 5 mm. Peduncles warty. Spathe 10-15 cm, tube red outside, blade cream.

Range: Surinam, French Guiana, Brazil.

Philodendron cv. Florida, a hybrid between *P. pedatum* and *P. squamiferum*, has leaves 5-lobed but the lobes of the leaf-blade sometimes apically re-lobed and petioles little if at

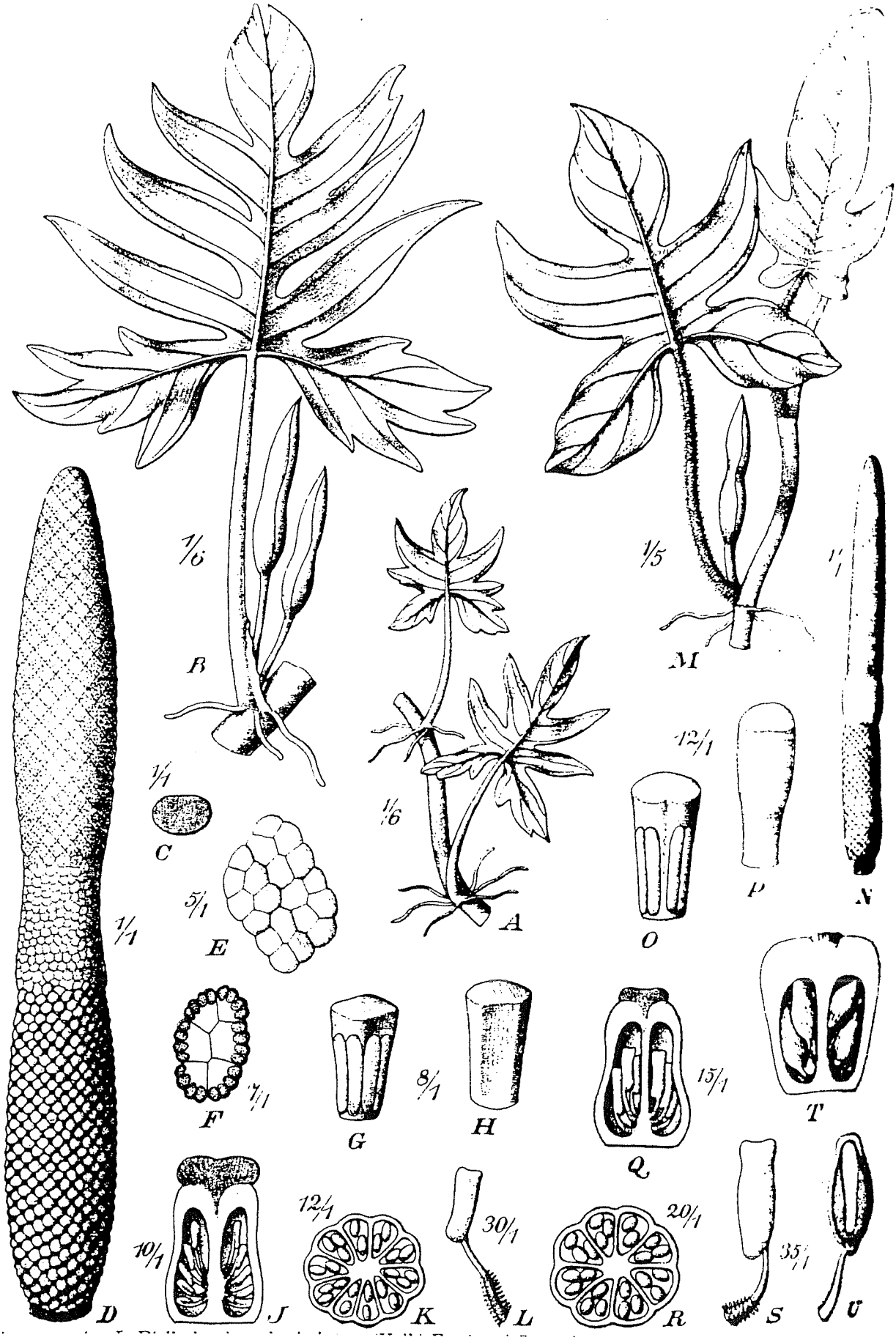
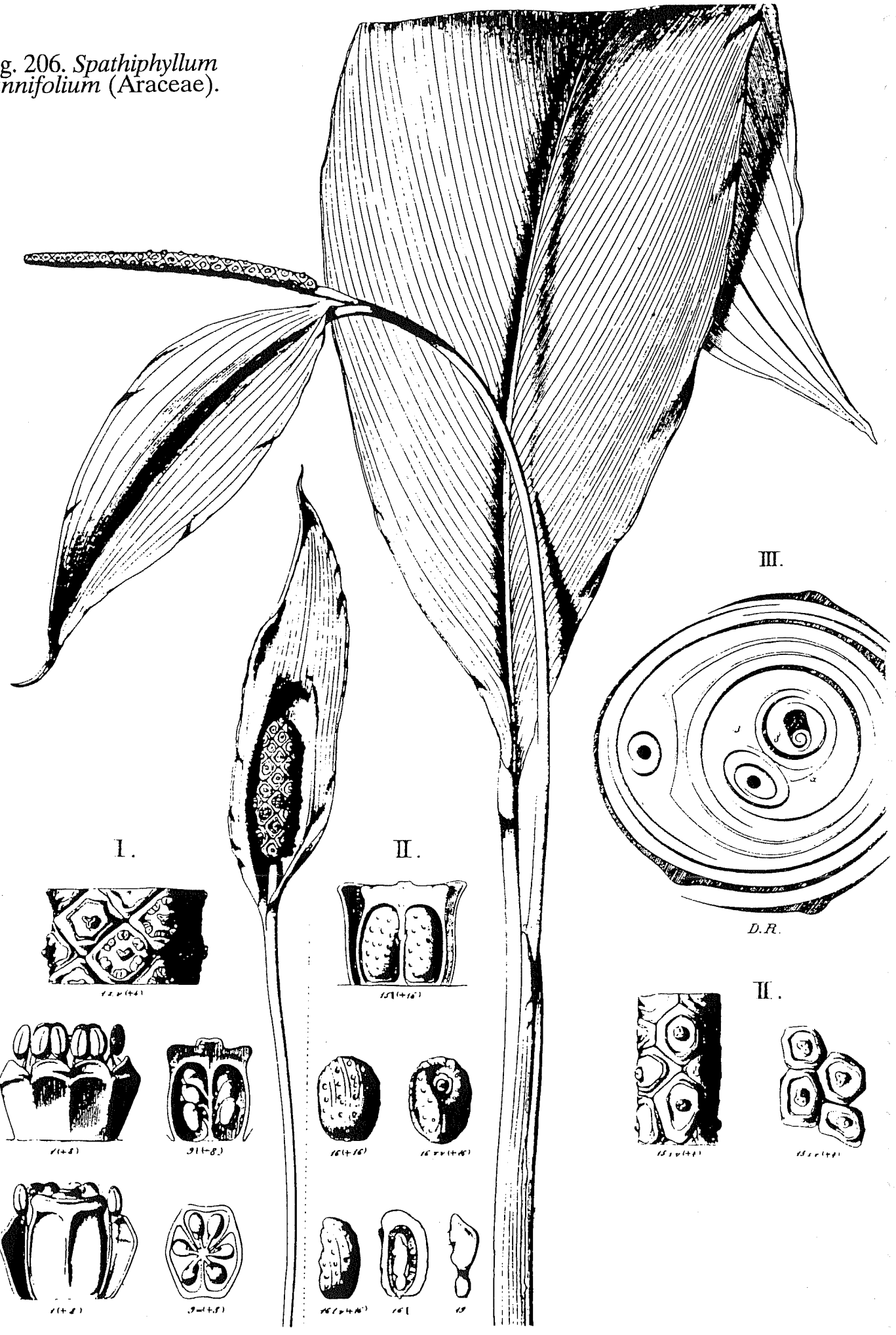


Fig. 205. *Philodendron pedatum* (a-l); *Philodendron squamiferum* (m-u) (Araceae).

Fig. 206. *Spathiphyllum cannifolium* (Araceae).



all bristly. It is grown as an ornamental indoor potted plant in Paramaribo, Surinam.

10. *Pistia* Linnaeus

Floating, stoloniferous aquatic plants with extensive fibrous root system, forming colonies by offsets. Leaves in a compact spiral rosette, spongy, pubescent, sessile or subsessile, prominently longitudinally veined. Inflorescence inconspicuous, axillary. Flowers few, unisexual; perianth absent. Spathe small, leaf-like, pubescent. Spadix adnate to spathe; female portion comprising 1 pistil with a 1-celled ovary; male portion comprising 1 synandrium of 2-8 stamens with connate anthers. Fruit a berry; pericarp thin.

Literature: Dunn, L.H. 1934. Notes on water lettuce, *Pistia stratiotes* L., as a nursery of insect life. *Ecology* 15(3): 329-331.

1. *Pistia stratiotes* Linnaeus, *Species Plantarum* 963(1753). KLEIN SARASARA-WIWIRIE, NIJLSLA (Surinam), WATER LETTUCE. Plant free-floating, or floating with roots anchored in substratum. Leaf-rosettes to 15 cm in diameter. Leaves orbicular, obovate, obcordate, or spathulate-oblong, the apex rounded, emarginate, or truncate, spongy-inflated in the basal 2/3 of leaf, pale green, velvety-haired on both sides, 4-12 (-20) x 8 cm, sessile or cuneate-tapering to the base. Spathe c.1.5 cm, greenish or whitish, pubescent. Flowers greenish.

Range: Nearly pantropical and subtropical, including Guyana and Surinam. In Guyana, it is maintained as an ornamental pool plant in the Botanic Gardens, Georgetown.

This plant, which sheds water droplets quickly from the silky leaves, has become abundantly naturalized as a serious weed-pest in some regions of the world; in other circumstances, it is a prized aquatic decoration due to the lovely shape and overall grace of the plant.

11. *Spathiphyllum* Schott

Terrestrial, caespitose, nearly stemless plants. Leaves in a basal cluster, oblong or elliptical, entire, with prominent midvein; petioles long-sheathing, geniculate near the apex. Spathe white or green, foliaceous, not enclosing the spadix. Spadix on a stalk or stipe, the stipe free or partly adnate to base of spathe; spadix usually white, densely many-flowered. Flowers bisexual; stamens (2-) 3 (4-); perianth present, the segments (tepals) free or connate (fused, united). Ovary 3-celled. Fruit a berry.

Literature: Bunting, G.S. 1960. A revision of *Spathiphyllum* (Araceae). *Memoirs of the New York Botanical Garden* 10(3): 1-53. Bunting, G.S. 1961. The cultivated species of *Spathiphyllum. Baileya* 9(3): 109-117.

1. *Spathiphyllum cannifolium* (Dryander) Schott, *Aroideae* 1: 1, t.8 (1853). SPATHE FLOWER. Terrestrial. Leaf-blades lanceolate to broadly elliptical, or oblanceolate, often widest above the middle, acute or obtuse, 17-45 (-52) x 8-19 cm; petioles 30-37.5 cm, strongly geniculate (bent) at apex, the geniculum to 3.5 cm, the petioles soon with fibrous remains of fraying sheaths. Spathe elliptic-oblong to lanceolate, 12-25 x 2.5-6.5 cm, reflexed,

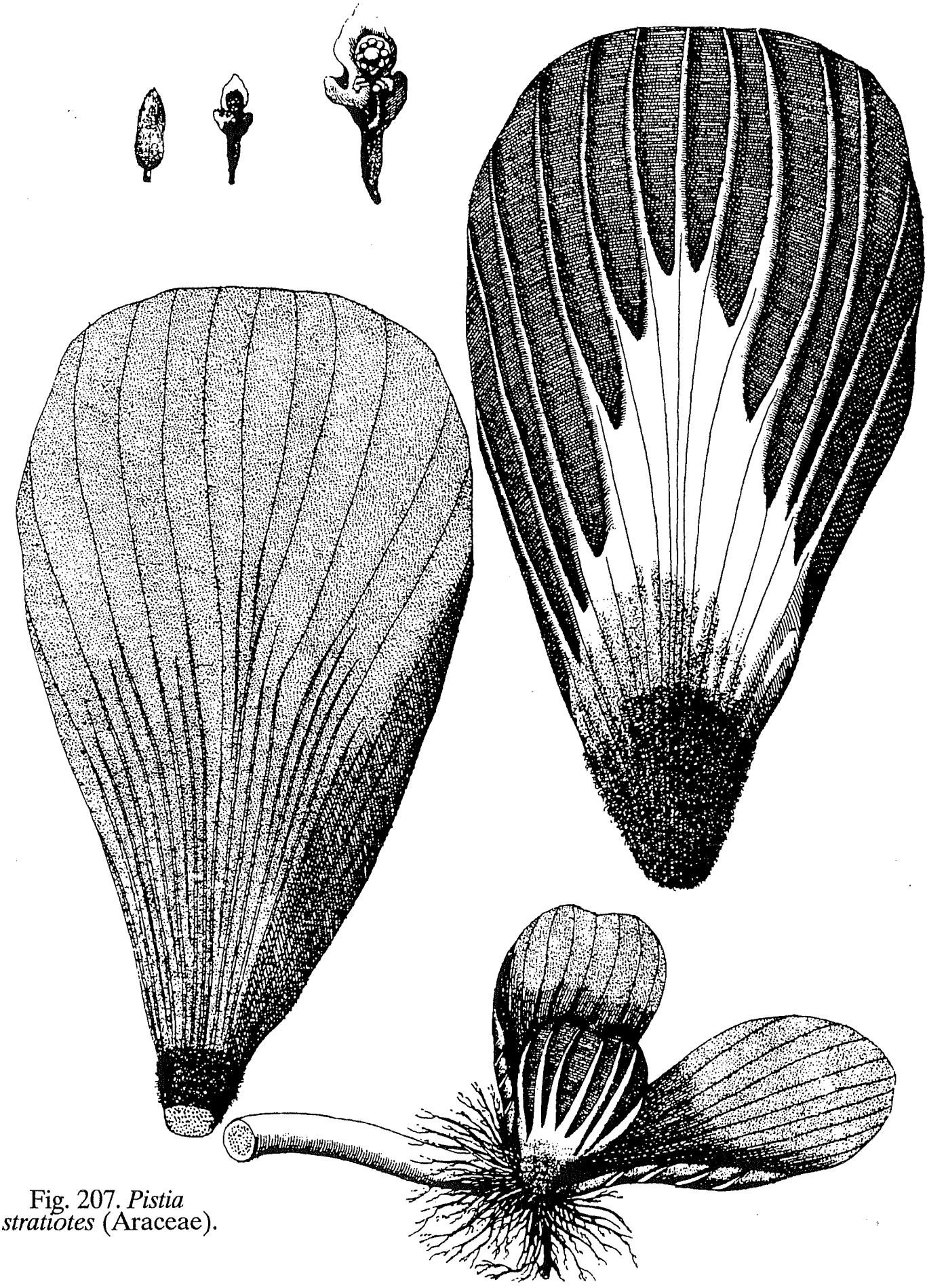


Fig. 207. *Pistia stratiotes* (Araceae).

Fig. 208. *Syngonium podophyllum* (Araceae).

white on the showy inner surface, sometimes greenish outside. Spadix to 12 cm, stalked, the stipe free and not decurrent on spathe. Perianth white, cup-like, the tepals completely fused.

Range: Trinidad and northern South America, including Guyana. Occasionally grown as an ornamental in public places in Guyana (such as the Botanic Gardens, Georgetown), and in French Guiana.

12. *Syngonium* Schott

Epiphytic climbing vines with milky sap. Stems with long internodes. Adult leaf-blades pedately divided, the middle segment or lobe the largest; juvenile leaf-blades simple, often sagittate. Petiole sheathing in lower half. Flowers unisexual; stamens 4, united in a synandrium; perianth absent. Spathe with inflated, persistent tube and hooded, deciduous blade. Spadix with female flowers below, sterile male flowers in the middle forming a distinct zone or merging imperceptibly into the upper zone of fertile male flowers. Fruit an aggregate, compounded from fused, fleshy ovaries.

Literature: Croat, T.B. 1981. A revision of *Syngonium* (Araceae). *Annals of the Missouri Botanical Garden* 68(4): 565-651.

1. *Syngonium podophyllum* Schott, *Botanische Zeitung* 9:85 (1851). (Synonyms: *S. affine* Schott, *S. vellozianum* Schott). AFRICAN EVERGREEN, ARROWHEAD VINE, NEPHTHYTIS (juvenile phase); OERAMA TONEME (Surinamese Carib). Epiphytic vine with adult stems to 3 cm or more wide. Leaves glossy; adult leaf-blades pedately divided into 5-7 (-11) segments, the middle segment (or lobe) elliptic-lanceolate to obovate, obtuse, 20-38 x 6-17 cm, the outermost segments prominently auriculate; juvenile leaf-blades simple, entire, sagittate or hastate. Petioles to 60 cm. Inflorescences in groups of 4-11 per axil. Spathe 8.5-10 cm, the tube green, the blade whitish, cuspidate, becoming bright red in fruit. Peduncle of spadix whitish-scaly.

Range: Mexico to northern South America, including the three Guianas. Cultivated in a streetside garden in Paramaribo, Surinam and as an outdoor ornamental in Cayenne and Isle Royale, French Guiana.

for white-veined plants: S. [illegible] var. *albolineatum* Hort. ex Bull. Cat. (see Birdsey book, p. 120). + 124

Literature: SECAB. 1989. *Syngonium podophyllum. Especies Vegetales Promisorias* 1: 436-439.

for S. sp cv. 'White Wonder' Exmouth

Arecaceae

Trees, shrub-like plants or climbers, either monoecious, dioecious or with bisexual flowers. Stems simple or rarely branched, sometimes appearing absent, either solitary or multiple (caespitose), occasionally arising from long rhizomes, often ringed by leaf-scars, the surface smooth, armed with spines, or with covering of woody or fibrous-matted leaf-bases. Leaves spirally arranged, produced along the stem or in an apical crown, sometimes forming a crownshaft; petiole usually present, sometimes armed. Leaf-blades pinnate, palmate, or costapalmate, rarely simple and not parted or divided into segments; segments 1- to several-ribbed. Inflorescence spicate or paniculate, formed of few to many bracteate

branches (rachillae), produced among the leaf-bases (axillary) or below them, or in a terminal mass in some monocarpic species; peduncle with a prophyll and subtended by 1-2 to many bracts which are persistent or deciduous, membranous or woody, rarely sac-like. Flowers borne singly along the rachillae or in triads of 1 female and 2 male flowers grouped tightly together, sometimes sunk in pits or in a line of one female and several males (ascervulae) along the rachillae. Sepals and petals mostly 3, free or united. Stamens 6 to numerous. Ovary superior; carpels (1-2) 3(-7). Fruit a dry or fleshy, 1- to 3-seeded drupe, often with bony endocarp and copious endosperm.

Literature: Baggiani, L.M. 1985. Palms: update on a Victorian fancy. *Garden* 9(1): 4-7,32. Balick, M.J., ed. 1986. *The Palm - Tree of Life: Biology, Utilization and Conservation.* Advances in Economic Botany, Vol. 6. 282 pp. Bronx, New York: New York Botanical Garden. Balick, M.J. 1989. *Useful Palms of the World: A Synoptic Bibliography.* Bronx, New York: New York Botanical Garden. Bernardi, L. 1973. Les Palmiers,1. *Museés de Genéve* 138: 13-17; 2, *op.cit.* 139: 2-7. Blombery, A. and T. Rodd. 1982. *Palms.* 199 pp. Australia: Angus & Robertson Publishers. Corner, E.J.H. 1966. *The Natural History of Palms.* 393 pp. Berkeley and Los Angeles, California: University of California Press. De Granville, J.J. 1990. Les palmiers de la Guyane francaise. *Bois et Forets des Tropiques, Special Guyane* 220: 43-54. Dowe, J.L. 1989. *Palms of the South-West Pacific.* 198 pp. Milton, Queensland, Australia: Palm and Cycad Societies of Australia. Henderson, A. 1986. A review of pollination studies in the Palmae. *Botanical Review* 52(3): 221-259. Im Thurn, E.F. 1884. Memoranda on the palms of British Guiana. *Timehri* 3: 219-276. Ledin, R.B., ed. 1961. *Cultivated Palms.* Special Issue, *The American Horticultural Magazine* 40(1): 1-189. Lötschert, W. 1980. Palmen. *Natur und Museum* 110(3): 61-88. McCurrach, J.C. 1960. *Palms of the World.* 290 pp. New York: Harper & Brothers. McGeachy, B. 1955 (1982 reprint). *Handbook of Florida Palms.* 63 pp. St. Petersburg, Florida: Great Outdoors Publishing Co. Pesce, C. 1985. *Oil Palms and Other Oilseeds of the Amazon.* 199 pp. Algonac, Michigan: Reference Publications, Inc. Read, R.W. 1979. Palmae, pp.320-368, in Howard, R.A., *Flora of the Lesser Antilles,* Volume 3: *Monocotyledoneae.* 586 pp. Jamaica Plain, Massachusetts: Arnold Arboretum of Harvard University. Romney, D. 1981. Winning back the palms. *Garden* 5(2): 24-29 (lethal yellowing disease). Rosenthal, E. 1979. Palms indoors. *Garden* 3(1):1-4,8 (insert). Stevenson, G.B. 1974. *Palms of South Florida.* 251 pp. Published by the author. Tomlinson, P.B. 1990. *The Structural Biology of Palms.* 477 pp. Oxford: Clarendon Press. Uhl, N.W. and J. Dransfield. 1987. *Genera Palmarum.* 610 pp. L.H. Bailey Hortorium and The International Palm Society. Wessels Boer, J.G. 1965. *The Indigenous Palms of Suriname.* 172 pp. Leiden, The Netherlands: E.J. Brill. Whitmore, T.C. 1973. *Palms of Malaya.* 132 pp. London, England: Oxford University Press.

Key to Genera

1. Leaves simple, often wind-sheared, or pinnatisect, and irregularly divided into segments, to 7.5 m but often less; major or primary bract a fibrous mesh pouch enclosing inflorescence; fruit corky-tuberculate 1. *Manicaria*
1. Leaves palmate or compound or lobed, parted or divided symmetrically into segments, often less than 7.5 m; bract not a fibrous pouch; fruit smooth or scaly, not tuberculate.
   2. Leaves bipinnate, with fishtail-shaped pinnae; plants flowering successively in separate lateral inflorescences from apex to base of stem and then dying (hapaxanthic) 6. *Caryota*

2. Leaves once-pinnate, palmate or costa-flabellate; plants rarely monocarpic, if dying after flowering, with one terminal inflorescence (*Corypha*).
3. Leaves palmate (fan-shaped), palmately ribbed or divided,or costa-flabellate (with numerous divisions cut nearly to base of leaf-blade).
4. Leaves costa-flabellate and cut nearly to the base; fruit covered with tightly imbricated scales 22. *Mauritia*
4. Leaves not costa-flabellate; fruit usually without scales.
5. Leaf undivided except for a very shallowly lobed margin 18. *Licuala*
5. Leaf divided, or partially cut, into segments.
6. Stem (trunk) dichotomously few-branched 16. *Hyphaene*
6. Stem not branched.
7. Fruit a very large "coconut" with 2-lobed seed; plants dioecious with markedly dimorphic (dissimilar between male and female) inflorescences 20. *Lodoicea*
7. Fruit a small, berry-like drupe with unlobed seed; plants with bisexual flowers, or with nearly similar inflorescences when dioecious.
8. Leaves palmately parted into separate (discrete) segments with truncate apex; stems clumping, covered with fibrous leaf- bases 27. *Rhapis*
8. Leaves with prominent central portion of blade remaining uncut, without completely separated segments; stems solitary, rarely clumping, without fibrous covering.
9. Petiole not armed.
10. Leaves glaucous-bluish beneath; peduncle of inflorescence short; petals free, not circumscissile; plants dioecious 17. *Latania*
10. Leaves green beneath; peduncle very long; petals in a circumscissile cap; flowers bisexual 25. *Pritchardia*
9. Petiole armed with serrate teeth.
11. Petiole very sparsely toothed; leaves white-tomentose beneath 17. *Latania*
11. Petiole prominently toothed; leaves glabrous or without white tomentum beneath.
12. Stem 18-24 m; petiole c.2.7-3 m; inflorescence terminal; plants monocarpic (dying after flowering and fruiting) 11. *Corypha*
12. Stem and petiole shorter than the above dimensions; inflorescence axillary; plant not monocarpic.
13. Leaves with whitish wax coating, not costapalmate 10. *Copernicia*
13. Leaves without wax, costapalmate (the petiole extending as a rib into the leaf-blade to some extent).
14. Teeth of petiole black; plants dioecious 5. *Borassus*
14. Teeth of petiole not black; plants with bisexual flowers.
15. Leaf-segments 1-ribbed and bifid; filaments free; stems solitary or clustered 9. *Livistona*
15. Leaf-segments several-ribbed; filaments usually connate in a tube; stems solitary 18. *Licuala*
3. Leaves pinnate (feather-shaped) or pinnately parted.
16. Lower leaflets modified into spines or teeth.
17. Leaflets displayed in one plane, induplicate (V-shaped in x.s.); plants dioecious 24. *Phoenix*
17. Leaflets in several planes, reduplicate (inverted V-shaped in x.s.); plants monoecious 13. *Elaeis*
16. Lower leaflets not modified into spines or teeth.
18. Plants with a crownshaft.
19. Tips of leaflets irregularly toothed.

20. Stems caespitose; petiole with woolly tomentum; stamens 26-40; fruit to 1.6 cm; seed with 5 longitudinal grooves 26. *Ptychosperma*
20. Stem solitary; petiole glabrous; stamens 6; fruit to 5 cm; seed not grooved 2. *Areca*

19. Tips of leaflets acute or bifid, not irregularly toothed.
21. Stem solitary.
22. Stem less than 20 cm wide, not swollen near middle; inflorescence simply branched; fruit globose 14. *Euterpe*
22. Stem more than 30 cm wide, sometimes swollen near the middle; inflorescence twice-branched; fruit ovoid 28. *Roystonea*

21. Stems clustered.
23. Crownshaft green or grey; flowers not sunk in pits along rachillae; petioles yellowish 8. *Chrysalidocarpus*
23. Crownshaft reddish-green or orange-red; flowers sunk in pits along rachillae; petioles green.
24. Crownshaft orange-red; stems to 10 m; rachillae glabrous 12. *Cyrtostachys*
24. Crownshaft reddish-green; stems to 20 m; rachillae white-tomentose 14. *Euterpe*

18. Plants without a crownshaft.
25. Stems and petioles armed.
26. Stems narrow, to 15 cm wide, often less; pinnae green beneath; male flowers not sunk in pits along rachillae 4. *Bactris*
26. Stems to 30 cm wide; pinnae greyish beneath; male flowers at distal part of rachillae sunken in pits.
27. Spines of the stem in rows on the short internodes; fresh leaves 20 or more in the crown; margin of pinnae glabrous; stem solitary 1. *Acrocomia*
27. Stem with long internodes forming broad, spiniferous zones; fresh leaves up to 12 in the crown; margin of pinnae setose; stems solitary or clumping 3. *Astrocaryum*

25. Stems and petioles unarmed.
28. Fruit a large, fibrous-husked "coconut" with liquid-filled central cavity in seed, the endocarp thick, with 3 pores 9. *Cocos*
28. Fruit a small, berry-like drupe.
29. Plants in caespitose colonies, semi-aquatic 23. *Nypa*
29. Plants solitary, terrestrial.
30. Stem slender, cane-like, less than 5 cm wide; plants dioecious 7. *Chamaedorea*
30. Stem at least 5 cm wide, usually more; plants monoecious.
31. Leaves held horizontally; inflorescence spicate; bracts papery, not grooved; stamens 80-100 15. *Howea*
31. Leaves erect; inflorescence a few-branched panicle; large bract woody, deeply grooved; stamens 6 30. *Scheelea*

1. *Acrocomia* Martius

Plants monoecious, solitary. Trunk columnar, sometimes slightly swollen in middle at maturity, armed on the short internodes with comb-like annular rows of prickles. Leaves pinnate (feather-leaf), deciduous or with persistent leaf-bases, plumose, the pinnae (leaflets) narrow, recurved, with glabrous margin, the rachis prickly; petiole very short. Inflorescences axillary, numerous, prickly, 1-branched, with numerous rachillae, with a few female flowers basally and many male flowers above in discs or cuplets of connate petals. Stamens 6. Upper (inner) spathe woody, often prickly or pubescent. Ovary 3-celled. Fruit

an oil-bearing, globose, 1-seeded drupe with bony endocarp.

1. *Acrocomia lasiospatha* Martius, *Palmetum Orbignianum* 81 (1844). MOUCAYA (French Guiana), PALM BONG (Surinamese Creole), YAWARRA (Guyana Arawak). Trunk to 12 m x 3 dm, columnar or slightly swollen in middle, spiny, with globular crown (coma) of 30-40 leaves. Leaves deciduous; petiole 5-6 dm; rachis c.3 m; leaflets c.120 pairs, greyish beneath, very narrow or sublinear, to 80 x 3.5 cm. Upper spathe narrow, acuminate, to 13 dm, brownish-hairy and with brown spines 1-3 cm long. Fruit globose, yellowish-brown, to 3.7 cm wide.

Range: Guyana , Surinam and French Guiana. Sometimes intentionally planted as an ornamental in Surinam (Wessels Boer, 1965).

The Lesser Antillean species *A. aculeata* (Jacquin) Loddiges ex Martius (Synonym: *A. lasiospatha* Grisebach) is grown near Paramaribo, Surinam for the edible oil of its kernels, and is known there as kaw-maka to the black Surinamers and mokaja in the Carib language (Ostendorf, 1962). It may be the same Lesser Antillean species as the plant referred to as gri-gri, *Martinezia corallina* Martius, reportedly growing in the Promenade Gardens, Georgetown, Guyana in 1909 (Bayley, 1909), whose proper name *Aiphanes minima* (Gaertner) Burrett is still of uncertain application (Read, 1979); *Aiphanes*, like *Acrocomia*, is monoecious, solitary, prickly, and pinnate-leaved.

2. *Areca* Linnaeus

Plants monoecious, solitary or clumping (clustered with multiple trunks). Trunk slender, unarmed, topped by a crownshaft formed of leaf-bases. Leaves pinnate (feather-leaf), the pinnae toothed at the apex, glabrous. Inflorescences below the crownshaft many-branched or spicate, with flowers in triads (groups of 1 female and 2 male flowers), or with male flowers in distichous or secund pairs in distal parts and the triads in proximal part; stamens 3-24. Primary bracts papery, deciduous, glabrous. Ovary 1-celled. Fruit a tannin-bearing, ovoid or globose drupe with fibrous husk (mesocarp).

Literature: Corner, E.J.H. 1966. *The Natural History of Palms*. Berkeley and Los Angeles: University of California Press (pages 278-283).

1. *Areca catechu* Linnaeus, *Species Plantarum* 1189 (1753). ARECA PALM, BETEL NUT PALM, BETEL PALM; DJAMBE (Surinamese Javan), PINANG (Surinamese Malayan). Trunk solitary, to 30 m x 2 dm, with green crownshaft of few leaves. Leaves arched, 1-2 m; pinnae many, soft, irregularly toothed at apex, narrowly lanceolate, 30-60 x c.3 cm. Spathe glabrous. Inflorescence a panicle to 60 cm; female flowers few, at base of rachillae; male flowers in upper (distal) part of rachillae in distichous pairs; stamens 6. Fruit ovoid, yellow, orange or red, to 5 cm.

Range: Malaysia. Grown for ornament at the Botanic Gardens, Georgetown, Guyana. Introduced in French Guiana (Lemée, 1955) and in Surinam as a useful plant (Ostendorf, 1962).

Literature: Purseglove, J.W. 1972. *Tropical Crops: Monocotyledons 2*. New York: John

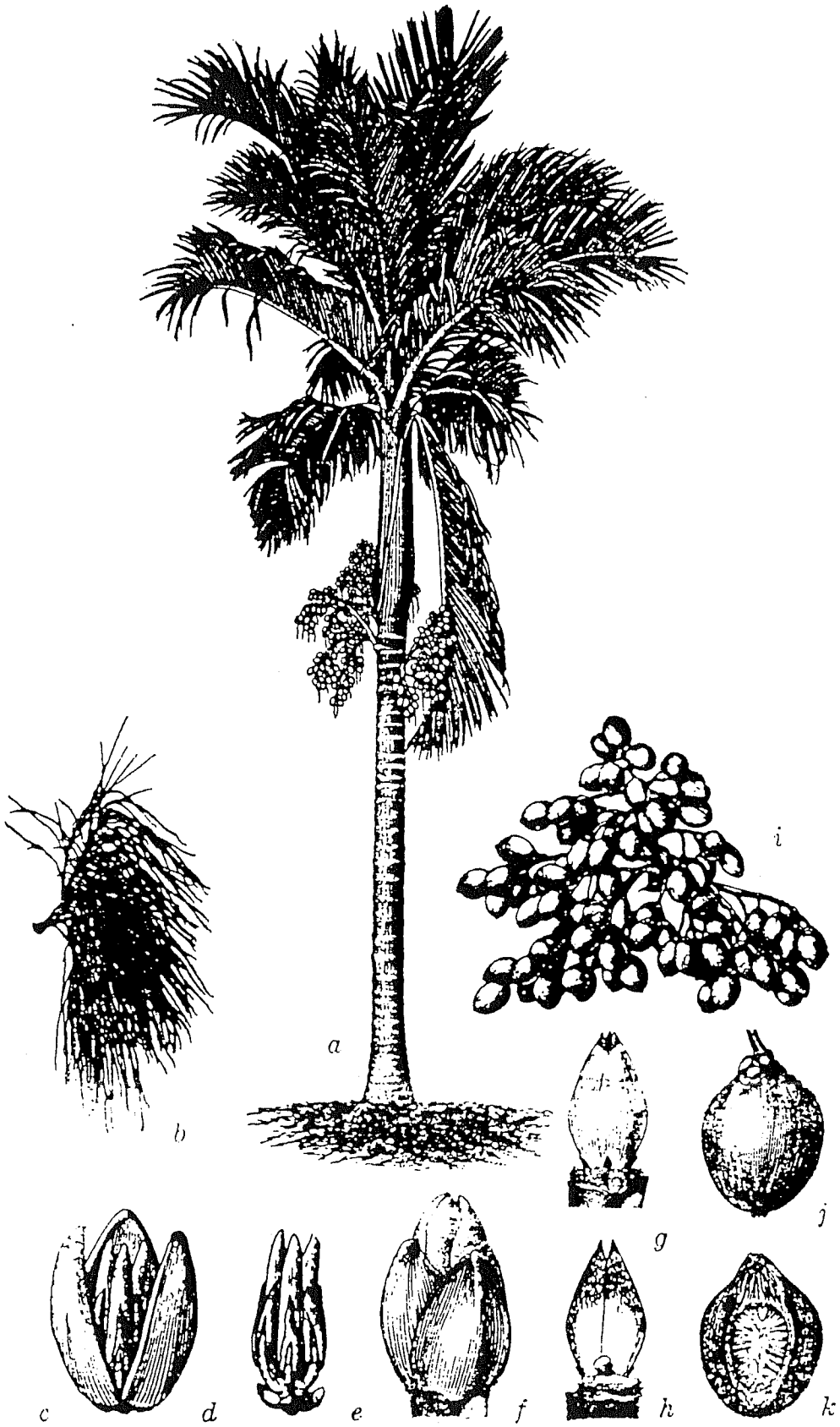


Fig. 209. *Areca catechu* (Arecaceae).

Wiley & Sons (pp.434-440). Zizka, G. 1991. Die Areca- oder Betelnuszpalme, *Areca catechu* L. *Der Palmengarten* 55(1): 50-53. Raghavan, V. and H.K. Baruah. 1958. Arecanut: India's popular masticatory - history, chemistry and utilization. *Economic Botany* 12(4): 315-345.

Areca is the type genus of the palm family Arecaceae of which the older alternative name is Palmae. The astringent (from tannins) kernel of *A. catechu* is sliced and chewed with other ingredients in the Old World tropics, to stimulate good digestion of food and salivation. The endosperm (kernel) contains stimulant alkaloids such as arecoline and arecaine; with almost habit-forming usage, one's sputum turns red and the teeth black.

3. *Astrocaryum* G.F.W. Meyer

Plants monoecious, solitary or clumping (clustered with multiple trunks), sometimes stemless. Trunk slender, ringed, the long internodes armed with spines. Leaves pinnate (feather-leaf), the pinnae acute or toothed at apex, often grey-lepidote beneath, setose. Inflorescences axillary, prickly, much-branched; flowers in lower part of inflorescence either in triads (groups of 1 female and 2 male flowers), or with a solitary female flower below the male flowers; stamens 6. Upper (inner) bract long, woody, persistent, prickly. Ovary 3-celled. Fruit an oil-bearing, often angled drupe with fleshy or dry mesocarp and bony endocarp.

Key to Species

1. Plant with solitary stem to 25 m	1. *A. aculeatum*
1. Plant with multiple stems to 9 m	2. *A. vulgare*

1. *Astrocaryum aculeatum* G.F.W. Meyer, *Primitiae Florae Essequeboensis* 266 (1818). (Synonym: *A. tucuma* Martius). ACQUERO (Guyana Arawak), AMANA (Surinamese Creole), ARAPIPI (Arawak), TOEKOEMAW (Surinam), TUCUMA (Guyana Carib), WARAU (Surinam). Stems solitary, to 25 m x 3 dm, densely spiny. Leaves (petiole plus lamina) to 5.5 m; pairs of leaflets arranged in several planes, linear, bifid at apex, greyish beneath. Inner bract c.2 m. Fruit subglobose to ovoid, beaked, greenish-yellow or yellowish-orange, c.6 cm, yielding an edible oil.

Range: Trinidad and northern South America, including the three Guianas. Grown at the Botanic Gardens, Georgetown, Guyana; sparingly planted as a street tree in Georgetown, Guyana as early as 1909 (Bayley, 1909).

Literature: Schultes, R.E. 1977. Promising structural fiber palms of the Colombian Amazon. *Principes* 21(2): 72-82.

In Surinam this species always grows in disturbed forests near human habitation and it has been postulated (Wessels Boer, 1965) that the plants have been possibly subjected to selection for cultivars by the Amerindians. In the western Amazon Valley, the strong fibers of the leaves are used for cord, rope, and string products such as fishing lines, nets and hammocks (Schultes, 1977), and *A. vulgare* fiber is similarly employed in that region.

2. *Astrocaryum vulgare* Martius, *Historia Naturalis Palmarum* 2: 74 (1824). (Synonyms: *A. segregatum* Drude, *A. tucumoides* Drude). AOUARA, AWARRA, WARA (Guianas Arawak and Carib), MURU-MURU (Surinamese Bush Creole). Stems multiple (few to many), to 9 m x 2 dm, densely spiny. Leaves (petiole plus lamina) to 6 m; leaflets arranged in several planes, linear, somewhat bifid at apex, greyish beneath. Inner bract c.2 m or more. Fruits subglobose to ovoid, shortly beaked, red or yellowish-red, c.4.5 cm, yielding an edible oil.

Range: Northern South America, including the three Guianas. Grown at the Botanic Gardens, Georgetown, Guyana; and in the Cultuurtuin, Paramaribo, Surinam (Teunissen & Lande, 1980).

4. *Bactris* Jacquin ex Scopoli

Plants monoecious, usually clumping, sometimes solitary, sometimes nearly acaulescent. Trunk slender, ringed, armed with spines. Leaves pinnate (feather-leaf), scattered along the stem or in an apical crown; pinnae acute to acuminate; rachis spiny. Inflorescence axillary, prickly, branched or unbranched, the bract rupturing through middle of the leaf-sheath during expansion for flowering. Bracts 2, spiny, the main, upper spathe boat-shaped, woody. Flowers all in triads (groups of 1 female and 2 male flowers), or with male flowers among the triads; stamens 6-12; female flowers with staminodes absent or usually united in a ring. Ovary 3-celled. Fruit a small, 1-seeded, fleshy drupe with bony endocarp.

Key to Species

1. Corolla with a ring of united staminodes, which remain at base of fruit — 3. *B. major*
1. Corolla without ring of staminodes.
   2. Trunk to 20 meters tall and 10-15 cm wide; fruit red, yellow or orange, 4-6 cm — 2. *B. gasipaes*
   2. Trunk less than 5 m tall and 2 cm wide; fruit purplish-black, c.1.5 cm — 1. *B. elegans*

1. *Bactris elegans* Barbosa Rodriques & Trail in Barbosa Rodriques, *Enumeratio Palmarum Novarum* 35 (1875). AKAMIN EKOENARI, HEEGRONMAKA, MOEROEKOE, TAMOETOEBEH (Surinamese Amerindian). Stems clustered, to 2-3 m tall and 1 cm wide, spiny. Leaves to 1 m; pinnae 20-28 pairs, all in the same plane. Longest bract to 35 cm. Fruit subglobose, c.1.5 cm, purplish-black.

Range: Brazil, Guyana , Surinam. Cultivated in the ORSTOM Garden, Cayenne, French Guiana.

2. *Bactris gasipaes* Humboldt, Bonpland and Kunth, *Nova Genera et Species Plantarum* 1:302 (1816). (Synonyms: *B. utilis* (Oersted) Bentham & Hooker ex Hemsley, *Guilielma gasipaes* (Humboldt, Bonpland and Kunth) Bailey). PAREPOU (French Guiana); PARIPE, PARIPOE (Surinamese Carib); PEACH PALM, PEJIBAYE. Stems clustered, sometimes solitary, to 20 (-30) m tall and 10-15 cm wide, densely spiny. Leaves 3-4 m; pinnae to 120 pairs, arranged in several planes. Longest bract to 60 cm. Fruit ovoid, 4-6 cm, red, yellow or orange.

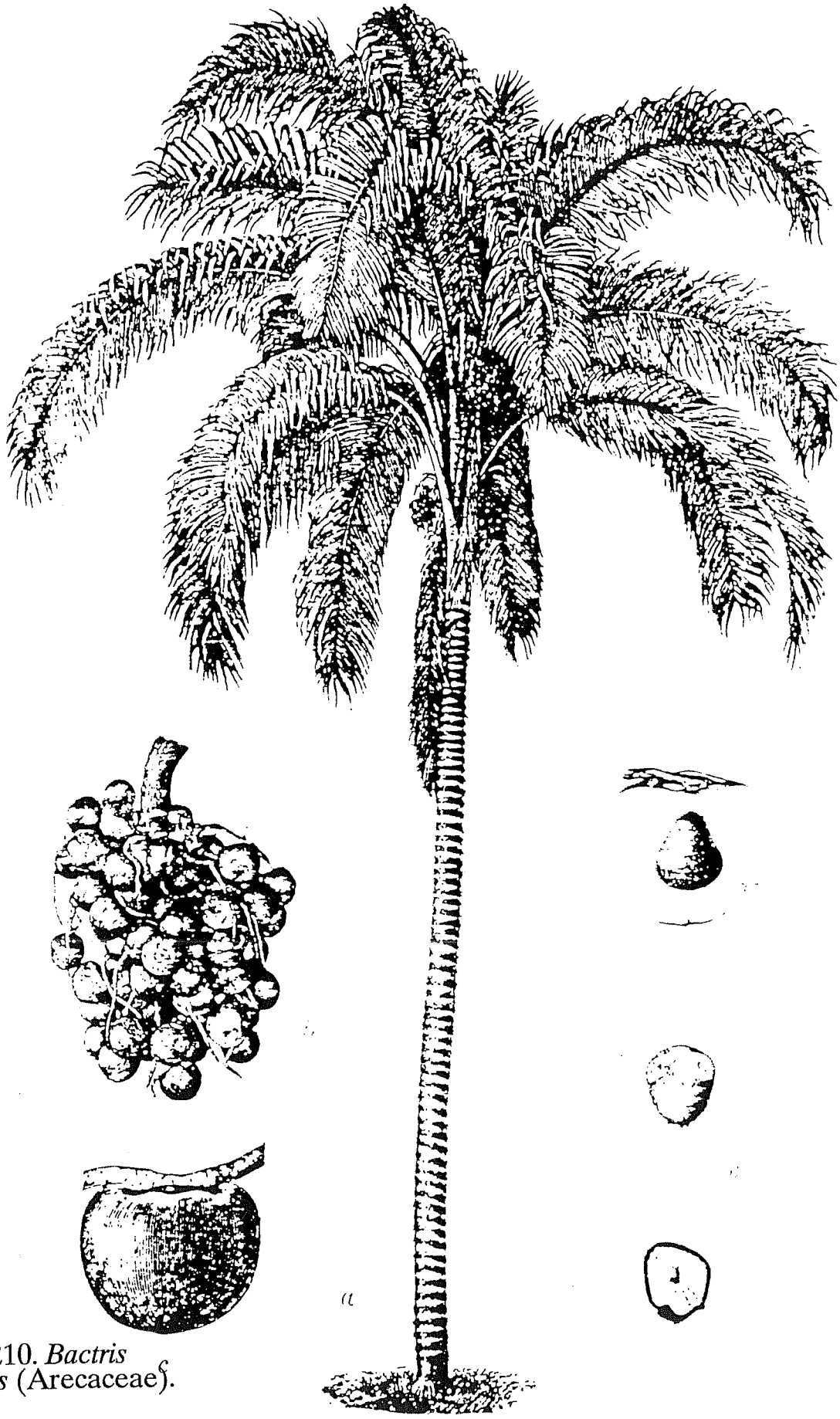


Fig. 210. *Bactris gasipaes* (Arecaceae).

Range: Original range unknown, perhaps western Amazonia. Planted as an ornamental in French Guiana (de Granville, 1985).

Literature: Heineck, A. 1991. Uwi (*Bactris gasipaes* H.B.K.), Lebensbaum und Schopfergott. *Der Palmengarten* 55(1): 11-15. Balick, M.J. 1976. The palm heart as a new commercial crop from tropical America. *Principes* 20(1): 24-28. Johannessen, C.L. 1966. The domestication process in trees reproduced by seed: the pejibaye palm in Costa Rica. *Geographical Review* 56(3): 363-376. Beach, J.H. 1984. The reproductive biology of the peach or "pejibaye" palm (*Bactris gasipaes*) and a wild congener (*B. porschiana*) in the Atlantic lowlands of Costa Rica. *Principes* 28(3): 107-119. Clement, C.R. 1988. Domestication of the pejibaye palm (*Bactris gasipaes*): past and present. *Advances in Economic Botany* 6: 155-174. Clement, C.R. and J. Mora Urpi. The pejibaye palm (*Bactris gasipaes*) comes of age. *Principes* 26(3): 150-152. National Academy of Sciences. 1975. *Underexploited Tropical Plants With Promising Economic Value*. 190pp. Washington, DC: National Academy of Sciences (pages 73-77). Patiño V.M. 1992. An ethnobotanical sketch of the palm Bactris (Guilielma) gasipaes. Principes 36(3): 143-147.

This plant is extensively grown locally in Central and South America for its abundantly produced fruit, the nutritious, meaty flesh of which is prized. In Surinam a seedless variant is often cultivated (Wessels Boer, 1965), and elsewhere selection for variation in fruit size and color, cluster size and length of spines has been done (National Academy of Sciences, 1975). In addition to flour made from the fruit, the protein content of which is double that of bananas and which can provide more carbohydrate and protein than maize (*Zea mays*), the wood is used extensively, as "chonta", for blowpipes, bows and arrows; an alcoholic drink "chica" is produced from the fermented flesh of the fruit as well. It has been demonstrated that the plants are pollinated by weevils and scarab beetles (Beach, 1984). The economic botanist Michael J. Balick has discussed the commercial potential of this species for producing the edible "hearts of palm" (Balick, 1976). In general, the spininess of the trunk has prevented this species from being more eagerly embraced for economic exploitation, although spineless variants are known to occur in the Amazon.

3. *Bactris major* Jacquin, *Selectarum Stirpium Americanarum Historia* 280 (1763). KAWMAKA (Surinamese Creole), MASWAH (Guyana), PIMPLER PALM, PRICKLY PALM; SAMOERA (Surinamese Arawak). Stems clustered, to 5-7.5 (-10) m tall and 3.5-5 cm wide, spiny, glabrescent with age. Leaves to 4 m; pinnae 25-41 pairs, arranged in one plane. Longest bract to 35 cm. Fruit ovoid, c.5 cm, purplish-black.

Range: Central America, Trinidad and Tobago, and northern South America, including the three Guianas. Occasionally planted in Surinam as an impenetrable hedge (Wessels Boer, 1965). Grown at the Botanic Gardens and in the city of Georgetown, Guyana, from early times (Graham, 1934; Department of Agriculture, 1934).

5. *Borassus* Linnaeus

Plants dioecious, solitary. Trunks ringed, unarmed. Leaves costapalmate (fan), pleated, greyish-green or bluish, in a dense crown; petiole elongate, armed with saw-teeth. Inflorescence axillary, branched, sheathed in persistent bracts. Male flowers clustered in catkin-like spikes, stamens 6; female flowers solitary, much larger than the male flowers,

Range: Original range unknown, perhaps western Amazonia. Planted as an ornamental in French Guiana (de Granville, 1985).

Literature: Heineck, A. 1991. Uwi (*Bactris gasipaes* H.B.K.), Lebensbaum und Schopfergott. *Der Palmengarten* 55(1): 11-15. Balick, M.J. 1976. The palm heart as a new commercial crop from tropical America. *Principes* 20(1): 24-28. Johannessen, C.L. 1966. The domestication process in trees reproduced by seed: the pejibaye palm in Costa Rica. *Geographical Review* 56(3): 363-376. Beach, J.H. 1984. The reproductive biology of the peach or "pejibaye" palm (*Bactris gasipaes*) and a wild congener (*B. porschiana*) in the Atlantic lowlands of Costa Rica. *Principes* 28(3): 107-119. Clement, C.R. 1988. Domestication of the pejibaye palm (*Bactris gasipaes*): past and present. *Advances in Economic Botany* 6: 155-174. Clement, C.R. and J. Mora Urpi. The pejibaye palm (*Bactris gasipaes*) comes of age. *Principes* 26(3): 150-152. National Academy of Sciences. 1975. *Underexploited Tropical Plants With Promising Economic Value*. 190pp. Washington, DC: National Academy of Sciences (pages 73-77). Patiño, V.M. 1992. An ethnobotanical sketch of the palm Bactris (Guilielma) gasipaes. Principes 36(3): 143-147.

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5. *Borassus* Linnaeus

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Range: Central America, Trinidad and Tobago, and northern South America, including the three Guianas. Occasionally planted in Surinam as an impenetrable hedge (Wessels Boer, 1965). Grown at the Botanic Gardens and in the city of Georgetown, Guyana, from early times (Graham, 1934; Department of Agriculture, 1934).

5. *Borassus* Linnaeus

Plants dioecious, solitary. Trunks ringed, unarmed. Leaves costapalmate (fan), pleated, greyish-green or bluish, in a dense crown; petiole elongate, armed with saw-teeth. Inflorescence axillary, branched, sheathed in persistent bracts. Male flowers clustered in catkin-like spikes, stamens 6; female flowers solitary, much larger than the male flowers,

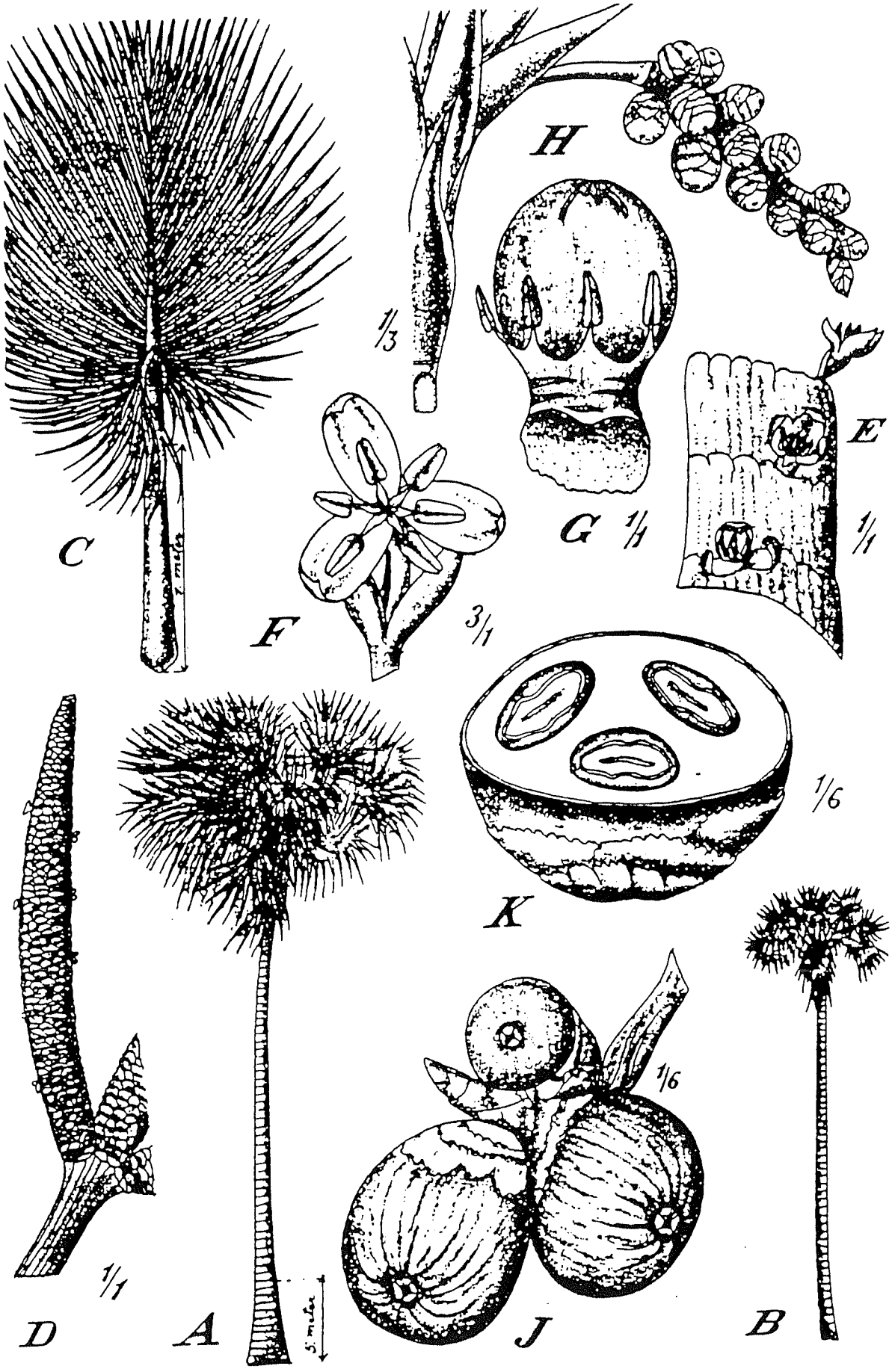


Fig. 211. *Borassus flabellifer* (Arecaceae).

with a lobed ring of staminodes. Ovary 3-celled. Fruit large, berry-like, 3-seeded, with fibrous husk (mesocarp).

1. *Borassus flabellifer* Linnaeus, *Species Plantarum* 1187 (1753). PALMYRA PALM. Stems to 70 (-100) m tall and to 1.7 m wide. Leaves to 3 m, with 60-80 ribs or plaits, these segments bifid at the apex; petiolar teeth jagged, black. Male inflorescence c.1.5 m; flowering portion of female inflorescence c.3 dm. Fruit to 15 cm wide, orange; seeds with a very hard wall.

Range: Tropical East Asia, from India to Malaysia. Cultivated at the Botanic Gardens, Georgetown, Guyana.

Literature: Seemann, B. 1956. *Borassus. Principes* 1(1): 20-28. Davis, T.A. 1985. Palmyra palm, the state tree of Tamilnadu, is on the verge of extinction: protect this very useful tree. *Environmental Awareness* 8(4): 95-106. Morton, J.F. 1988. Notes on distribution, propagation, and products of *Borassus* palms (Arecaceae). *Economic Botany* 42(3): 420-441.

In Asia this plant is a very intensively utilized palm of the drier lands, providing lumber, food, leaf-thatch, and a stimulating drink (toddy) from sap liberated from the inflorescences.

6. *Caryota* Linnaeus

Monoecious plants flowering from apex to base of plant and then drying. Plants solitary or with multiple trunks, unarmed. Trunks often with persistent petiole-bases, becoming ringed. Leaves bipinnate, the leaflets (pinnae) irregularly toothed, oblique at apex, one-half fan-shaped so as to resemble a "fish tail". Bract keeled, with fibrous margin. Flowering proceeding from apex to lowest inflorescence, whereupon the trunk dies; inflorescences axillary, once-branched with numerous rachillae; flowers in triads (1 female and 2 male flowers in a group), the male and female flowers maturing at different times; stamens 9-100. Ovary 3-celled. Fruit a 1- to 2-celled, globose, inedible drupe with irritant crystals.

Key to Species

1. Stems clustered, to 13 m x 1.3 dm; leaves to 3 m; inflorescence c.30 (-60) cm — 1. *C. mitis*
1. Stems solitary, to 20 m x 3 dm; leaves to c.6 m; inflorescence c.3.6 m — 2. *C. urens*

1. *Caryota mitis* Loureiro, *Flora Cochinchinensis* 569 (1790). CLUSTERED FISHTAIL PALM. Stems suckering, multiple in clusters of 6 or more, 3.6-13 m x c.1.3 dm. Leaves 1.2-3 m; leaflets obliquely cuneate, 10-17.5 cm. Petioles and spathes with short, black fluff. Inflorescence c.30 (-60) cm. Male flowers with stamens 12-17. Fruit 1-seeded, c.1.2 cm wide, blackish.

Range: Southeast Asia, from Burma to the Philippines. Occasionally planted in Georgetown, Guyana, and in the sierplanten area of the Cultuurtuin in Paramaribo, Surinam.

Fig. 212. *Caryota urens* (Arecaceae).

Due to the multiple trunks, any given flowering trunk will die afterwards in monocarpic fashion but the plant as a whole survives the flowering ordeal, rather than having the entire plant die back as in the solitary-stemmed *C. urens*.

2. *Caryota urens* Linnaeus, *Species Plantarum* 1189 (1753). TODDY PALM, WINE PALM. Stems solitary, to 20 m x 3 (-5.4) dm. Leaves to c.6 m or more; leaflets obliquely cuneate, 15-22.7 cm. Inflorescence to 3.6 m. Male flowers with stamens 40-45. Fruit 1- to 2-seeded, c.1.8 cm wide, reddish.

Range: India, Sri Lanka. Cultivated in Guyana at the Botanic Gardens and elsewhere in Georgetown, from early times to the present; and in a roadside garden towards Leysweg, Surinam.

Literature: Kimnach, M. 1980. The "fish-tail" palms. *Principes* 24(3): 125-127.

In its native range this species is intensively utilized for fiber, matting, toddy, sugar, timber and sago. Both *C. mitis* and *C. urens* possess stinging crystals. Kimnach (1980) has noted that "the name "*urens*" means "burning" and refers to a notorious character of the caryotas. The fruits are red and conspicuous and they are impregnated with crystals of calcium oxalate which is very irritating to the tongue and skin; it is said that even the bark of the trunk, if wetted, will irritate the skin."

7. *Chamaedorea* Willdenow

Plants dioecious, solitary or with multiple trunks, unarmed. Stems slender, ringed. Leaves pinnate, or apically cleft, sheathed with a tubular base, the sheath usually splitting. Inflorescences axillary, or emanating below the leaves, solitary or few per node, spicate in the female plant, branched into several rachillae in the male plant. Flowers usually solitary, sometimes in rows or the male flowers in clusters. Male flowers with stamens 6 and prominent pistillode; female flowers with 0-6 very small staminodes. Ovary 3-celled. Fruit a usually 1-seeded, red or black drupe.

Key to Species

1. Stems caespitose (clumping) 3. *C. erumpens*
1. Stem solitary.
   2. Leaves pinnate, with 11-20 pairs of leaflets; flowers yellow 1. *C. elegans*
   2. Leaves deeply cleft at apex, otherwise not divided; flowers orange 2. *C. ernesti-augusti*

1. *Chamaedorea elegans* Martius, *Linnaea* 5: 204 (1830). (Synonyms: *Collinia elegans* (Martius) Liebmann ex Orsted, *Neanthe bella* nom. invalid.). PARLOR PALM. Stem solitary, to 3 m. Leaves pinnate; pinnae 11-20 pairs, linear-lanceolate, entire, to c.20 x 1.7 cm. Inflorescence single; bracts 4-9; flowers pale yellow. Fruit globose, black, c.6 mm wide.

Range: Guatemala and Mexico. Grown as a potted ornamental at the Esther Stichting near Paramaribo, Surinam.

2. *Chamaedorea ernesti-augusti* H. Wendland, *Allegemeine Gartenzeitung* 20(10): 73

Fig. 213. *Chrysalidocarpus lutescens* (Arecaceae).

(1852). Stem solitary, cane-like, with small prop and aerial roots, to 2 (-3) m x 1.5 cm. Leaves obovate in outline, deeply cleft at apex, otherwise not divided, the upper edges serrate, to 3 (-4) dm. Inflorescences many from among the leaves, to 23 cm; bracts 5; flowers orange. Fruit ellipsoid, black, c.8 cm wide.

Range: Mexico, Guatemala, Honduras. Recently introduced to French Guiana at the ORSTOM Garden, Cayenne.

This graceful plant was first found in Tabasco, Mexico and was grown in European glasshouses including those of King Ernst August of Hannover, for whom the species is named.

3. *Chamaedorea erumpens* H.E. Moore, *Gentes Herbarum* 8: 232 (1951). BAMBOO PALM. Stems caespitose, to 4 m. Leaves pinnate; pinnae 14-20 pairs, lanceolate, entire, to c.27.5 x 2.8 cm. Inflorescence single, the male inflorescence erupting from base of leaf-sheath, to 30 cm; bracts 5; flowers yellow. Fruit globose, black, 8 mm wide.

Range: Guatemala, Belize. Grown as an ornamental in private gardens, and in the sierplanten area of the Cultuurtuin, in Paramaribo, Surinam.

8. *Chrysalidocarpus* H. Wendland

Plants monoecious, solitary or with multiple, clustered trunks, unarmed. Stems usually ringed, with an inconspicuous or somewhate evident crownshaft at apex. Leaves pinnate with many narrow leaflets; petioles sheathing at base. Inflorescence axillary and below the leaves, branched, with 2 unequal basal bracts. Flowers in triads (1 female and 2 male flowers in a cluster) at proximal part of inflorescence, with male flowers solitary or paired in distal part. Male flowers with stamens 6 and elongated pistillode. Ovary 3-celled. Fruit a 1-seeded drupe with stigma asymmetrically off-center.

1. *Chrysalidocarpus lutescens* H. Wendland, *Botanische Zeitung* 36: 117 (1878). BAMBOO PALM, BUTTERFLY PALM, MADAGASCAR PALM; SUGAR CANE PALM (Guyana); MULTIPLIANT (French Guiana); YELLOW BUTTERFLY PALM. Stems many, clustered, with small prop roots and suckering from the base, greyish or yellowish, 7.5-9 (-12) m x 10-15 cm, with crownshaft. Leaves arched and curving at apex, the petiole (excluding sheath) to 6 dm, yellowish, the blade 1.8-2.4 m, green, with 40-60 pairs of leaflets c.60 x 1.3 cm. Inflorescences among the leaves, 3-9 dm; flowers densely arranged, yellow. Fruit oblongoid or narrowly ellipsoid, purplish-black, 1.5-2 x 1.0-1.2 cm.

Range: Littoral forests of northeastern Madagascar ; nearly reduced to extinction in the wild, but universally cultivated as an ornamental. Grown in decorative situations in Georgetown, Guyana, in outdoor plantings around public areas and roadside gardens in Paramaribo, Surinam, and in Cayenne, French Guiana.

The fruit is shaped like the chrysalis of a butterfly, hence the generic name *Chrysalidocarpus*.

9. *Cocos* Linnaeus

Plants monoecious, solitary, unarmed. Stem with adventitious roots at the base, often leaning from the base, without apical crownshaft. Leaves in a crown, pinnate, with numerous, regularly arranged leaflets; petiole-base forming a fibrous sheath. Inflorescences among the leaves, of once-branched, simple panicles; flowers in one or 2 triads (1 female and 2 male flowers in a tight cluster) in proximal part, and paired or solitary male flowers along rest of rachilla. Male flowers with stamens 6 and a pistillode; female flowers much larger than the male, globose. Ovary 3-celled. Fruit large (coconut), a 1-seeded, buoyant drupe with fibrous husk (mesocarp), a bony, thick endocarp with 3 soft disc-like germination pores ("eyes"), and large, hollow seed filled with water (embryo sac juice).

Literature: Child R. 1964. *Coconuts*. 216 pp. London: Longmans; ed.2, 1974. Eden, D.R.A. 1963. The quest for the home of the coconut. *South Pacific Bulletin* 13(3): 39-42. Furtado, C.X. 1964. The origin of the word "Cocos". *Gardens' Bulletin, Singapore* 20(4): 295-312. Harries, H. C. 1978. The evolution, dissemination and classification of *Cocos nucifera* L. *Botanical Review* 44: 265-320. Howard, F.W. and C.I. Barrant. 1989. Questions and answers about lethal yellowing disease. *Principes* 33(4): 163-171. McCoy, R.E. 1988. What's killing the palm trees? *National Geographic* 174(1): 120-130. Menon, K.P.V. and K.M. Pandalai. 1958. *The Coconut Palm: A Monograph*. 384 pp. Ernakulam, India: Indian Central Coconut Committee. Moore, O.K. 1948. The coconut palm: mankind's greatest provider in the tropics. *Economic Botany* 2(2): 119-144. Ohler, J.G. 1984. *Coconut, Tree of Life*. 446 pp. Rome: FAO. Parthasarathy, M.V. and W.G. van Slobbe. 1978. Hartrot or fatal wilt in palms. I.Coconuts (*Cocos nucifera*). *Principes* 22(1): 3-14. Purseglove, J.W. 1972. *Tropical Crops - Monocotyledons 2*. New York: John Wiley & Sons (pages 440-479). Rosengarten, F. 1986. Coconut. *Principes* 30(2): 47-62. Van Slobbe, W.G. 1976. Hartrot disease in Surinam. *Principes* 20(2): 60-61.

1. *Cocos nucifera* Linnaeus, *Species Plantarum* 1188 (1753). COCONUT, COCONUT PALM; COCOTIER (French Guiana); KOKOSPALM, KOKRONOTO (Surinam). Stems to 24 (-30) m x 7 dm at the base. Leaves to 6 m, comprising sheath of petiole nearly 6 dm, petiole-shaft to 1.5 m, and blade to 4.5 m; leaflets c.100 pairs, to 9-1.2 dm, linear-lanceolate, yellowish-green. Inflorescence to 1.8 m; male flowers to 1.5 cm; female flowers to 2.5 cm wide. Fruit ellipsoid to obovid, often with 3 blunt angles, to 30 cm, green, yellow, orange-red or brown.

Range: Origin unknown, but probably Melanesia in the western Pacific Ocean. Tall- and short-trunked specimens are cultivated extensively as outdoor ornamental plantings near buildings, along streets and in gardens of Guyana, Surinam and French Guiana.

Coconut plants were introduced to Surinam by Governor Van Aerssen van Sommelsdijk around the year 1685 (Child, 1964), and they are now grown extensively for economic purposes in the Distrikt Coronie. The Coronie plantations were recently troubled by outbreaks of hartrot, a phloem disease caused by flagellates, the symptoms of which resemble lethal yellowing, a virus disorder; among the coconut varieties affected were Surinam Dwarf, Ceylon Dwarf, and Malaysian Dwarf. The latter variety is tolerant or resistant to the lethal yellows.

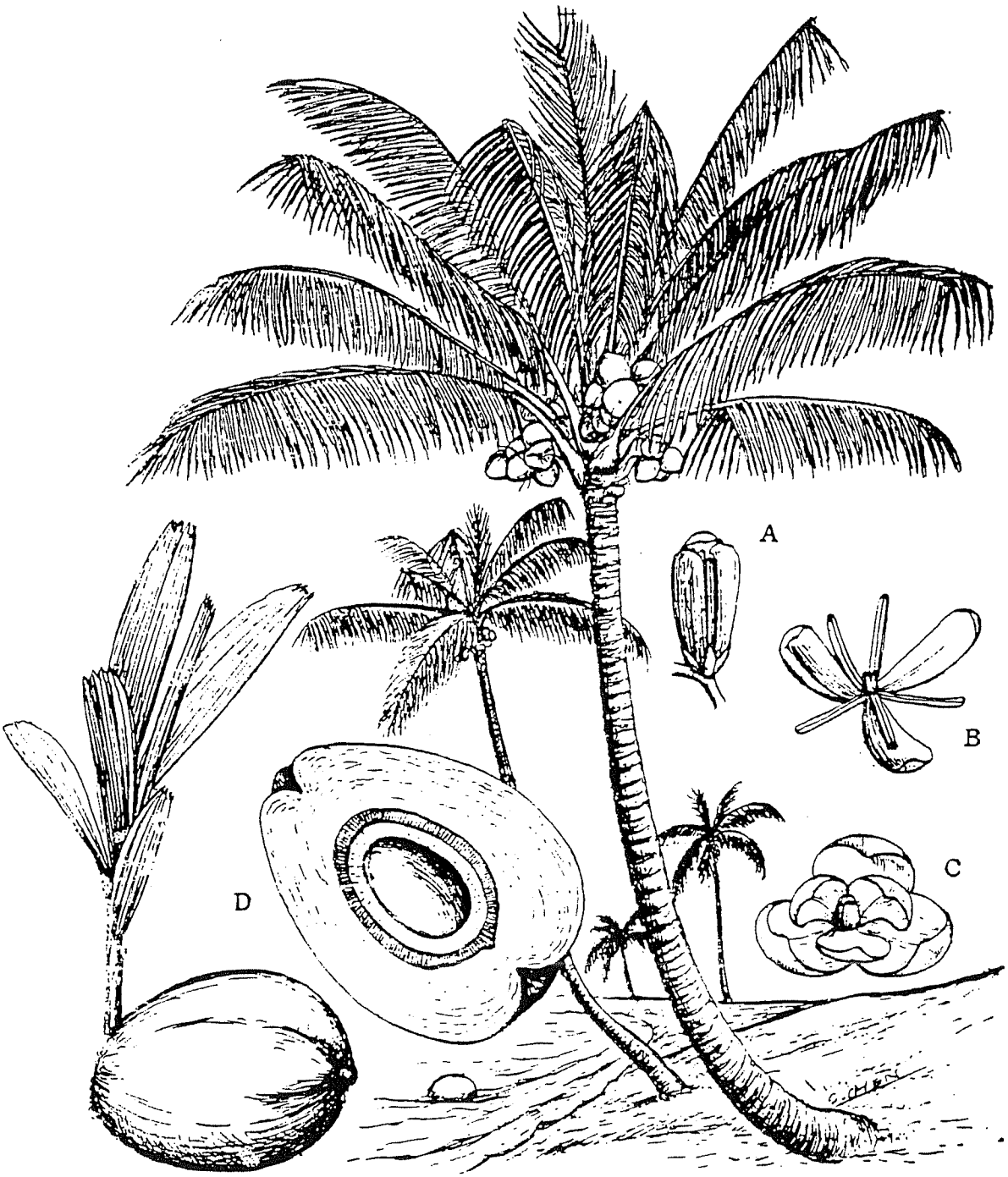


Fig. 214. *Cocos nucifera* (Arecaceae).

10. *Copernicia* Martius

Plants solitary, the stems with persistent leaf-bases. Leaves in a crown, palmate (fan-shaped), subsessile to petiolate; petiole often spiny. Inflorescence an axillary panicle with tubular bracts. Flowers bisexual, solitary or in clusters of 2-4; stamens 6, bases of filaments adnate to the corolla. Ovary 3-celled. Fruit a 1-seeded drupe.

1. *Copernicia prunifera* (Miller) H.E. Moore, *Gentes Herbarium* 9(3): 242 (1963). (Synonym: *C. cerifera* (Arruda da Camara) Martius). CARNAUBA WAX PALM. Stem to c.13.5 m x 2.5 dm, with persistent leaf-bases. Leaf-blades orbicular, to 9 dm at longest segment, when mature with up to 62 apically bifid segments; petiole to 1.2 m, coarsely toothed with black, hooked teeth to 1 cm. Inflorescence to 2.7 m, the rachillae to 1.8 m; flowers in clusters of 2-4, pilose. Fruit ovoid, to c.2.7 x 2.2 cm.

Range: Northeastern Brazil. Presently grown for ornament at the Botanic Gardens, Georgetown, Guyana. Specimens were in the Promenade Gardens and Botanic Gardens, Georgetown as of the early 1900's (Bayley, 1909; Department of Agriculture, 1934).

Literature: Dahlgren, B.E. and S.F. Glassman. 1961. A revision of the genus *Copernicia*. *Gentes Herbarum* 9(1): 1-40. Johnson, D. 1972. The carnauba wax palm (*Copernicia prunifera*). I.Botany. *Principes* 16(1): 16-20; II.Geography, *op.cit.* 16(2): 42-48; III.Exploitation and plantation growth, *op. cit.* 16(3): 111-114; IV.Economic uses, *op. cit.* 16(4): 128-131.

The genus is named in honor of Nicolaus Copernicus (Kopernik), 1473-1543, a Polish astronomer who elaborated the revolutionary theory of a sun-centered (heliocentric) planetary system in the universe. This plant reportedly was infrequently cultivated for useful products in French Guiana around the turn of the century (Lemée, 1955). The processed wax from the leaves is variously used in floor and automobile polish, varnish, candles, carbon paper, lipstick, candy, and cable-coatings.

11. *Corypha* Linnaeus

Plants solitary, monocarpic (dying after flowering and fruiting, hapaxanthic), very large. Trunk ringed, unarmed, without a crownshaft. Leaves in a terminal crown, large, costapalmate, deeply divided into 1-ribbed, apically obtuse to 2-cleft segments; petiole with marginal serrate teeth. Inflorescence a large, terminal, somewhat pyramidal, compound panicle; spathes many, tubular, sheathing; flowers clustered on rachillae, bisexual; stamens 6. Ovary 3-celled. Fruit a globose, 1- to 3-seeded drupe.

Key to Species

1. Plant usually to c.18 (-20) m; trunk at maturity with a faint spiral furrow (in addition to rings);leaf-blades to c.1.8 (-3) m wide; teeth on petiole large, stout; compound inflorescence to 3 (-4.5) m 1. *C. elata*
1. Plant to c.24 m; trunk at maturity ringed, but without spiral furrow; leaf-blades to c.4.8 m wide; teeth on petiole very short; compound inflorescence to 6 m 2. *C. umbraculifera*

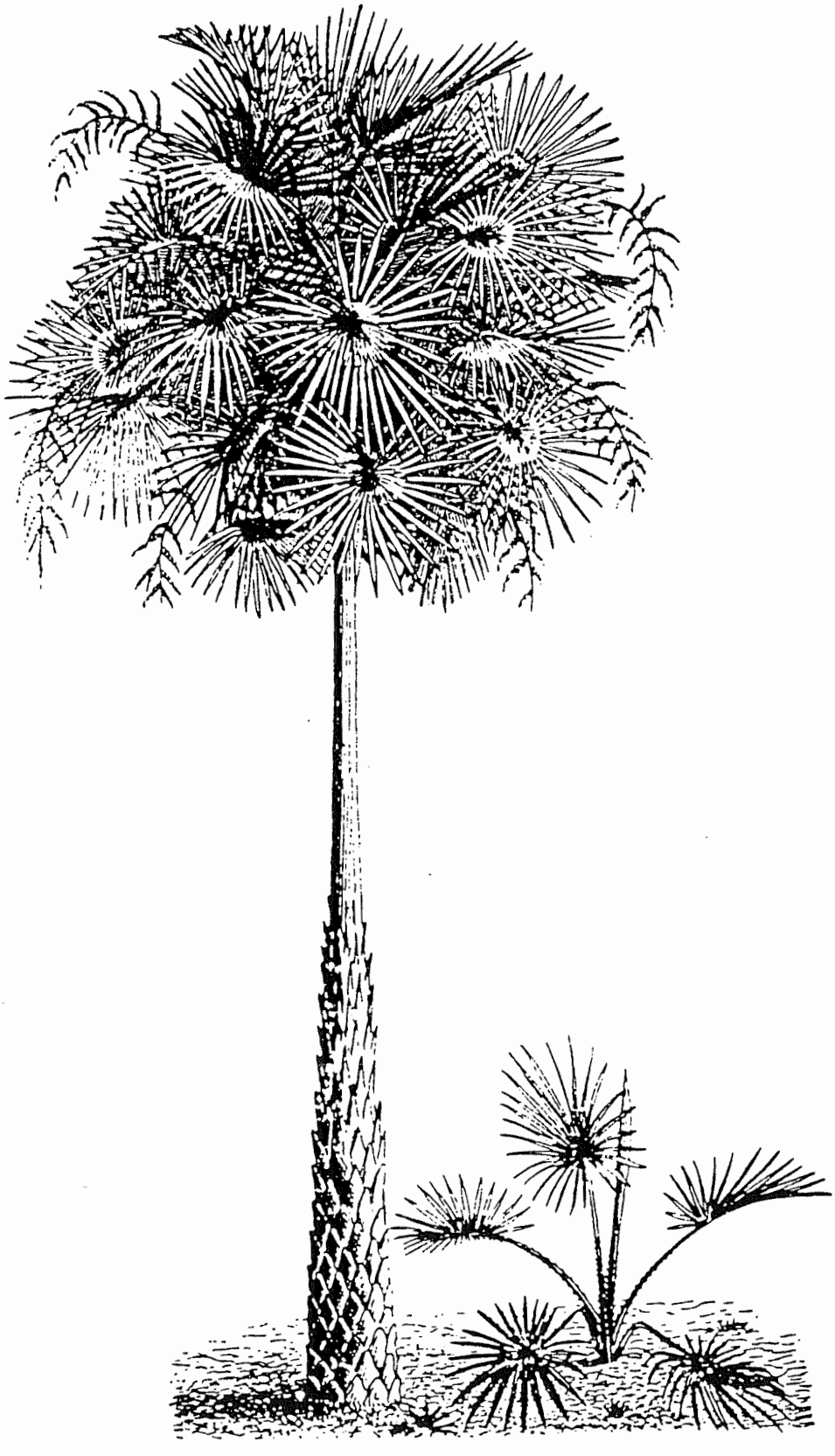


Fig. 215. *Copernicia prunifera* (Arecaceae).

1. *Corypha elata* Roxburgh, *Flora Indica* ed.2, 2: 176 (1832). GEBANG PALM. Plant usually to c.18 (-20) m. Trunk ringed with scars of leaf-bases which go only partially around the trunk, at maturity with a faint spiral furrow seemingly formed by compression of the rings along whole trunk; trunk to 7.5 dm wide. Leaf-blades orbicular, to c.1.8 (-3) m wide, cleft into 80-100 segments; petiole to 2.7 (-4) m, the margin with large, stout, curved, black teeth. Compound inflorescence to 3 (-4.5)m, the individual panicles emerging from the orifice of the bracts on the trunk. Fruit to 2.5 cm wide.

Range: India, Sri Lanka, Southeast Asia and East Indies to the Philippines. Grown in the Botanic Gardens, Georgetown, Guyana from the turn of the century (Department of Agriculture, 1934).

Literature: Douglas, J. and R.R. Bimantoro. 1956. Identification of the *Corypha* palms which flowered in the Hortus Bogoriensis during 1953 to 1955. *Annales Bogoriensis* 2(2): 137-145, +13 plates. Menninger, E.A. 1972. The self-sacrificers. *Garden Journal* 22(6): 166-169. Olah, L.V. 1962. Cytology of *Corypha elata* Roxburgh. *Bulletin of the Torrey Botanical Club* 89(1): 28-42. Tomlinson, P.B. and P.K. Soderholm. 1975. The flowering and fruiting of *Corypha elata* in South Florida. *Principes* 19(3): 83-99.

2. *Corypha umbraculifera* Linnaeus, *Species Plantarum* 1178 (1753). GROTE WAAIERPALM (Surinam); TALIPOT PALM. Plant to c.24 m. Trunk ringed with scars of leaf-bases which go completely around the trunk; trunk to 9 dm wide. Leaf-blades orbicular, to c.4.8 dm wide; petiole to 3 m, the margin with very short, dark teeth. Compound inflorescence to 6 m, the individual panicles piercing the bracts on the trunk as they emerge. Fruit to 2.8 cm wide.

Range: Southern India, Sri Lanka. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, and in the Palmentuin and several private gardens adjacent to the Palmentuin in Paramaribo, Surinam. Several Palmentuin specimens were flowering in 1989.

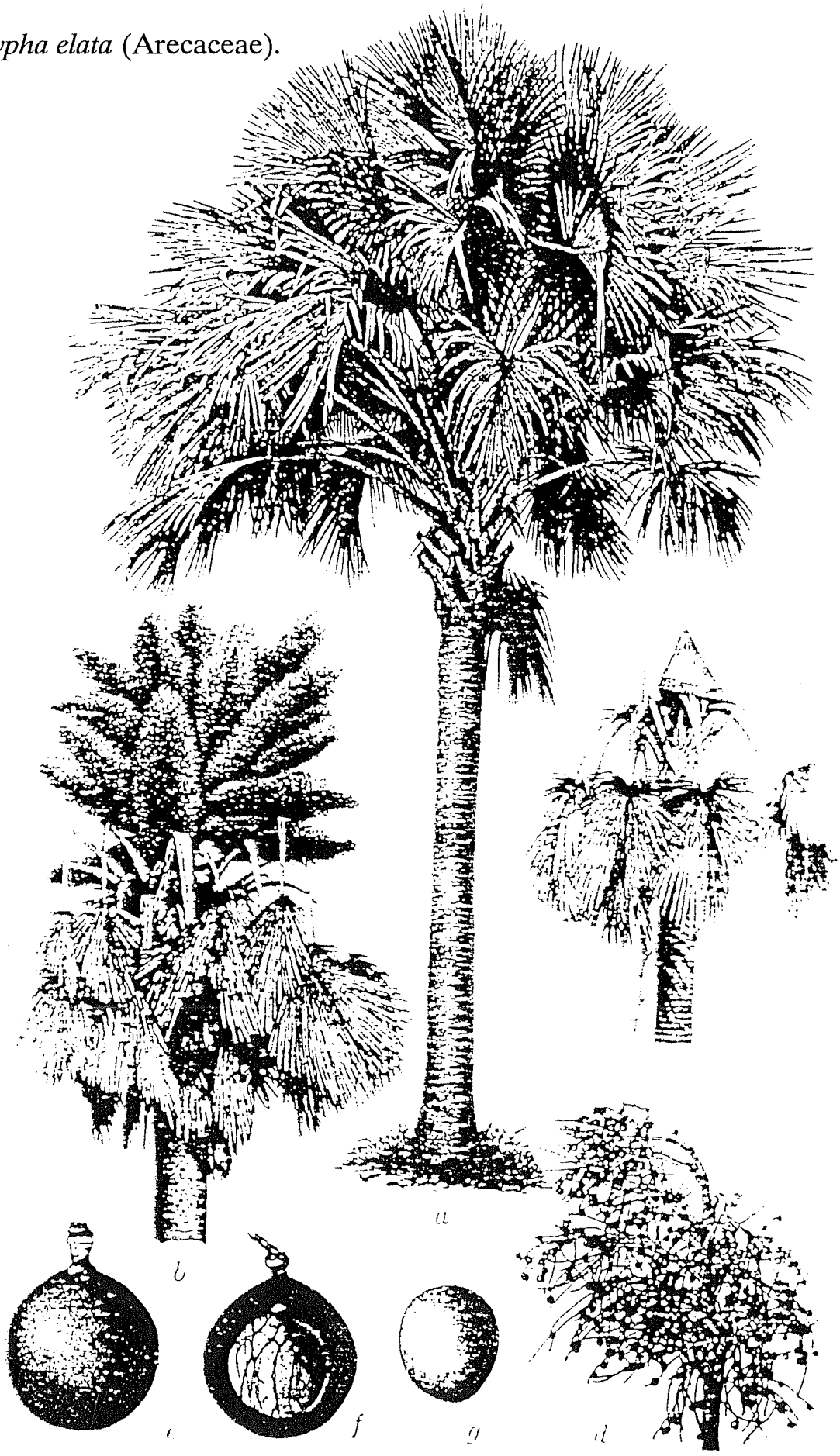
Literature: Boos, H. 1981. The life and death of a talipot palm. *The Naturalist Magazine* (Trinidad) 3(11): 32-34. Fisher, J.B., Sangers, R.W. and N. Edmonson. 1987. The flowering and fruiting of *Corypha umbraculifera* in Miami, Florida. *Principes* 31 (2): 68-77. Hodge, W.H. 1961. Nature's biggest bouquet. *Principes* 5(4): 125-134. Olah, L.V. 1954. The cytology of *Corypha umbraculifera* L. Part I. *Annales Bogorienses* 1(3): 201-237; Part II, *op. cit.* 2(2): 149-173 (1956). Rizzini, C.T. and A.M. Filho. 1984. Nota sobre a floracao e fructificacao de *Corypha umbraculifera* L. *Rodriquesia* (Rio de Janeiro) 36(61): 49-50.

This species produces the largest and most prodigious inflorescence known to exist in the plant kingdom; the compound inflorescence consists of an estimated 24 million flowers (Fischer et al., 1987).

12. *Cyrtostachys* Blume

Plants monoecious, clustered, unarmed. Stems slender, ringed with a crownshaft. Leaves pinnate. Inflorescence produced below the crownshaft of leaves, a panicle with drooping branches. Spathes 2, deciduous. Flowers sunken in prominent open pits along the

Fig. 216. *Corypha elata* (Arecaceae).



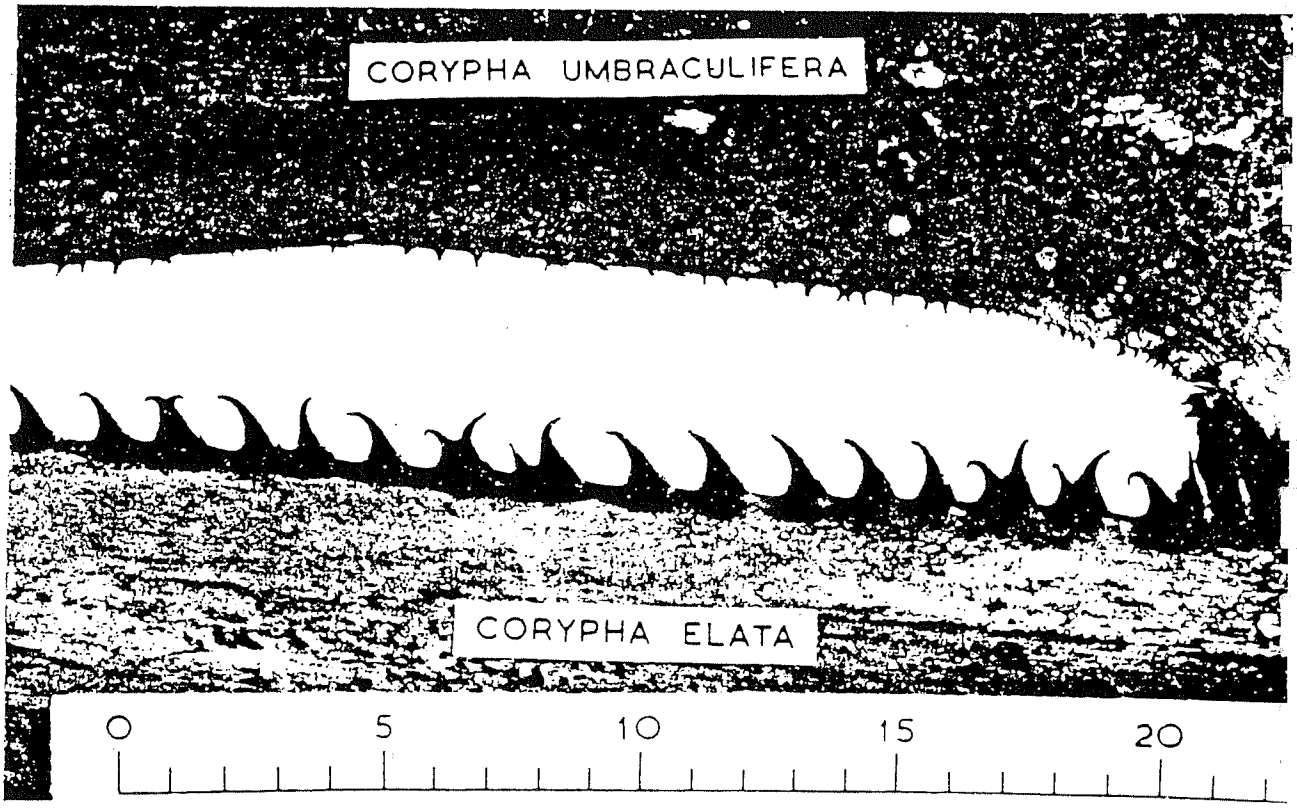


Fig. 217. Petiole-teeth of *Corypha elata* (below) and *Corypha umbraculifera* (above) (Arecaceae).

rachillae, in triads (1 female and 2 male flowers in a tight cluster) at the base, with single or paired male flowers above; male flowers with stamens 6-15 and a pistillode; female flowers with toothed staminodial ring. Ovary 1-celled. Fruit an ovoid drupe.

1. *Cyrtostachys renda* Blume, *Bulletin des Sciences Physiques et Naturelles en Neerlande* 1:66 (1838). (Synonym: *C. lakka* Beccari). LIPSTICK PALM, SEALING WAX PALM. Stems to 10 m x 15 cm, green or brown. Leaves 1.2-1.5 m x 6 dm, the crownshaft, sheaths, petiole and rachis bright red, orange-red, or brownish red; pinnae c.50 pairs, greyish-green beneath, arched upwards in a "V" at least towards base of leaf, to 45 x 4 cm. Fruit globose or ovoid, black with red base.

Range: Malaysia (Malay Peninsula, Sumatra, Borneo). Cultivated in the Botanic Gardens, Georgetown and sparingly elsewhere in Guyana.

13. *Elaeis* Jacquin

Plants monoecious, solitary. Stems unarmed, ringed with persistent leaf-bases. Leaves in a terminal crown, pinnate, the lowermost pinnae reduced to a spine-like midrib; petioles with fibrous sheath, often with spinose margin at least below. Inflorescence usually unisexual, a densely bunched fascicle of rachillae, produced among the leaves (axillary), shortly peduncled; rachillae with spinose apex. Spathes 2, the upper fraying into fibers. Male flowers solitary or paired, subtended by united bracts, with stamens 6; female flowers solitary, subtended by spinose bracts. Ovary 3-celled. Fruit a usually 1-seeded drupe, with fleshy, oily mesocarp and bony endocarp with 3 apical germination pores, of which one becomes functional.

1. *Elaeis guineensis* Jacquin, *Selectarum Stirpium Americanarum Historia* 280, t.172 (1763). AFRICAN OIL PALM, OIL PALM; OBE, OLIEPALM (Surinam); AOUARA DINDE, WARA DINDE, WARA PAYS NEG (French Guiana). Stems to 18(-30) m, prominently ringed. Leaves 3-4.5 (-7.5) m including petiole; pinnae arranged in 4 ranks, 100-160 pairs, 1-ribbed, linear-lanceolate, to 1.2 m x 5 cm; petiole to 2.1 m, spinose-serrate on margin. Inflorescence subglobose, 3 dm or more; rachillae with terminal spine. Fruit ovoid or conical, red or black, 2-5 cm.

Range: West and Central Africa. Cultivated for ornament in the Botanic Gardens, Georgetown, Guyana; in the Palmentuin, University grounds, Torarica hotel grounds, and occasionally as a residential yard plant in Paramaribo, and at the Esther Stichting near Paramaribo, Surinam; and in Cayenne, French Guiana.

Literature: Hardon, J.J. 1986. *Elaeis guineensis* Jacq., pp. 35-40, in Westphal, E. and P.C.M. Jansen, eds., *Plant Resources of South-East Asia: Proposal for a Handbook.* 72pp. Wageningen, The Netherlands: Pudoc. Hartley, C.W.S. 1988. *The Oil Palm (Elaeis guineensis* Jacq.). ed.3. 761 pp. Burnt Mill, Harlow, Essex, England: Longman. Purseglove, J.W. 1972. *Tropical Crops: Monocotyledons 2.* 607pp. New York: John Wiley & Sons (pages 479-510). Jarrett, H.R. 1957. The oil palm and its changing place in the economy of Sierra Leone. *Geography* 42(1) (195): 50-59. Rees, A.R. 1965. Evidence for the African origin of the oil palm. *Principes* 9(1): 30-36. Van Slobbe, W.G., Parthasarathy, M. V. and J.A.J. Hesen. 1978. Hartrot or fatal wilt of palms, II.Oil palm (*Elaeis guineensis*) and other palms.

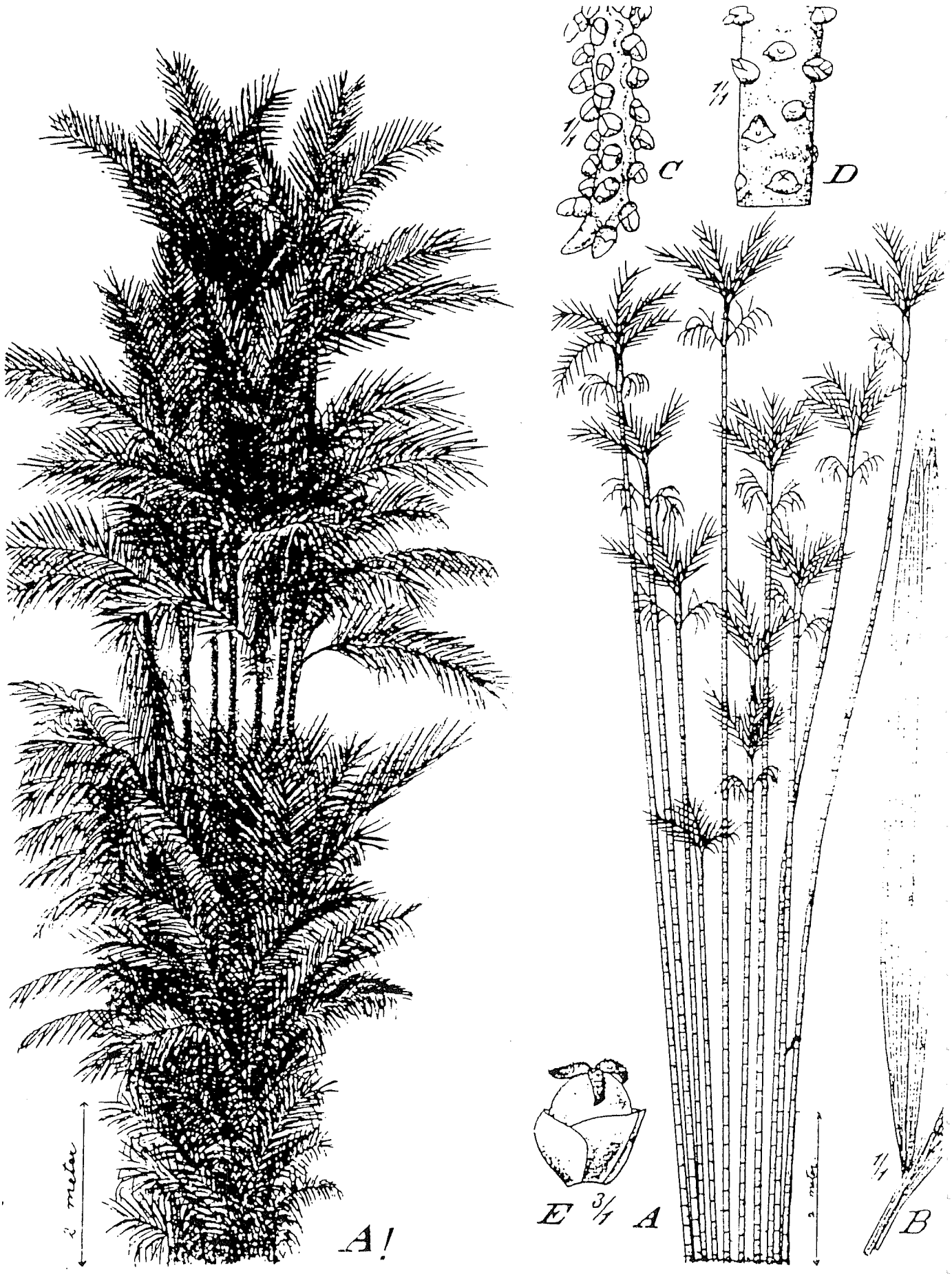


Fig. 218. *Cyrtostachys renda* (Arecaceae).

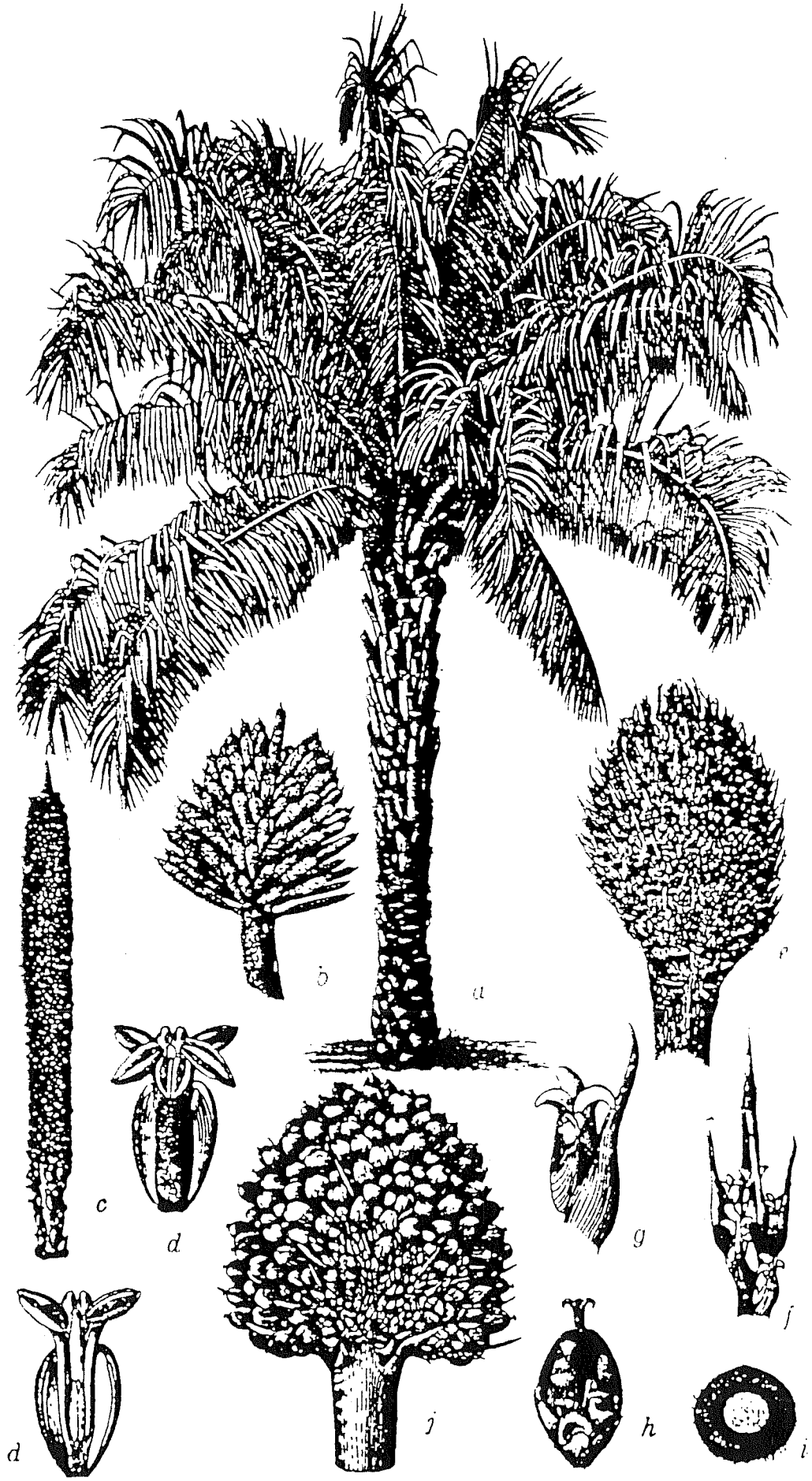


Fig. 219. *Elaeis guineensis* (Arecaceae).

The species is grown on several commercial plantations in Surinam, the most noteworthy estates as of the 1970's being the Cultuurtuin (Paramaribo); Oema; the OBE plantation at Victoria; Brokobaka; and La Poule (near Groningen) (Van Slobbe et al., 1978). Oil palms are grown extensively in Central America, Brazil, Indonesia and Malaysia as a very important source for palm oils from the mesocarp and kernel; palm wine is made locally from the sap of the male inflorescence. The oils are processed as an ingredient for margarine, cooking oil, soap, candles, candy and other confectionery, ice cream, mayonnaise and detergents.

Genetic selection has been made for improving characteristics such as disease resistance, bunch production, and kernel yield per bunch. An interesting hybrid cross has succesfully been made between a coconut and an oil palm, performed at Serdang, Malaya. From this experiment, as related by T.C. Whitmore (1973), "The resulting palm looks similar to an oil palm except the leaflets are in two ranks (like *Cocos*) and are much broader than usual. The fruits are of variable size, and are like tiny orange coconuts in an oil palm-like cluster".

14. *Euterpe* Martius

Plants monoecious, solitary or caespitose, unarmed. Trunk smooth, not or obscurely ringed. Leaves in a crownshaft, pinnate, shortly petiolate; pinnae (leaflets) narrow, 1-ribbed, spreading or pendent. Inflorescence from below the crownshaft, a simple panicle. Spathes 2, long. Flowers sunk in depressions along the rachillae, in triads (1 female and 2 male flowers in a tight cluster) at the base, with solitary or paired male flowers above; male flowers with stamens 6. Ovary 3-celled. Fruit a globose, pea-like, 1-seeded drupe.

Literature: Wessels Boer, J.G. 1965. *The Indigenous Palms of Suriname*. 172pp. Leiden: E.J. Brill (pages 46-53).

1. *Euterpe oleracea* Martius, *Historia Naturalis Palmarum* 2: 29 (1824). MANAKA (Surinamese Arawak); PINA, PRASARA (Surinam); WAPOE, WASEL (Surinamese Carib and Tirio); MANICOLE, WASSI, MANAKA, MOROKKE (Guyana); PINOT, WASSAIE (French Guiana). Stems caespitose, in clusters of up to 12 trunks, to 20 m x 18 cm. Crownshaft reddish-green, to 14 dm. Leaves with petiole to 4 dm; leaf-blade to 3.5 m, with 50-80 pairs of pinnae to 11 dm x 4 cm. Rachillae of inflorescence white-tomentose. Fruit purplish-black, to 1.5 cm wide.

Range: Venezuela, Trinidad, Brazil, and the three Guianas. Grown for ornament in the Botanic Gardens and elsewhere in Georgetown, Guyana; on Torarica hotel grounds in Paramaribo, in roadside yards near Lelydorp, and on grounds of CELOS buildings at Leysweg, Surinam; and in the Jardin Botanique and elsewhere in Cayenne, French Guiana.

Utilized as an economic plant in Surinam for the edible center of the crownshaft (palm cabbage, heart of palm) (Ostendorf, 1962). Often misidentified as *E. edulis* Martius, a caespitose native of Brazil and Paraguay having glabrous rachillae.

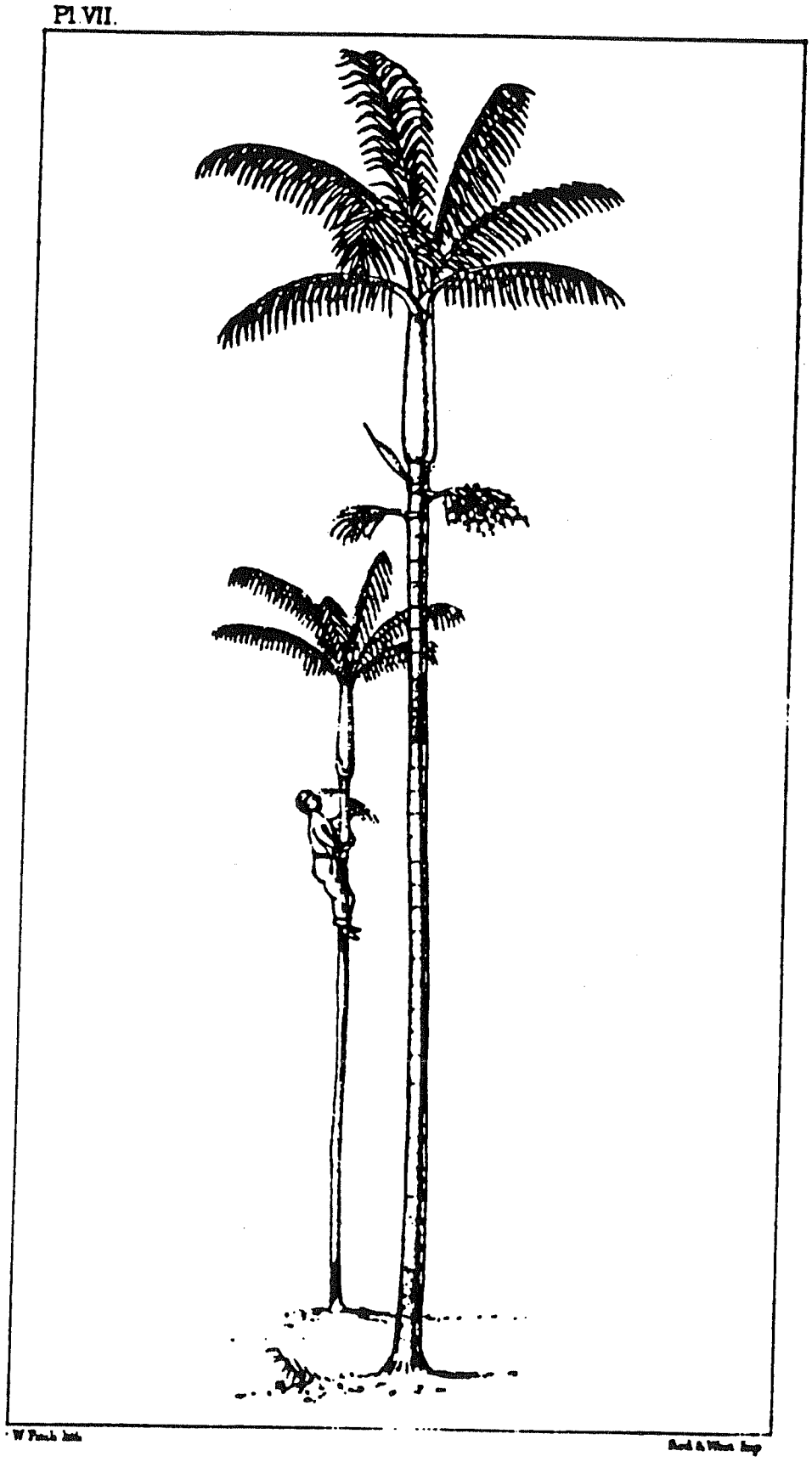


Fig. 220. *Euterpe oleracea* (Arecaceae).

15. *Howea* Beccari

Plants monoecious, solitary, unarmed. Stems slender, ringed, without an apical crownshaft. Leaves pinnate; pinnae 1-ribbed. Inflorescences axillary, of 1-several spikes; spathe long, papery, sheathing. Flowers in triads (1 female and 2 male together in a tight cluster), sunken in pits; male flowers with numerous stamens; female flowers without staminode. Ovary 1-celled. Fruit an ellipsoid or ovoid, 1-seeded drupe.

Literature: Bailey, L.H. 1939. *Howea* in cultivation: the sentry palms. *Gentes Herbarum* 4(6): 188-198.

1. *Howea forsteriana* (C. Moore & Mueller) Beccari, *Malesia* 1: 66 (1877). (Synonym: *Kentia forsteriana* C. Moore & Mueller). FORSTER SENTRY PALM. Stem 10-20m. Leaves held horizontally, not arched, 3-4 m; petiole 1-2 m; central pinnae 3-4 cm wide. Inflorescence of 3-8 spikes per axil, 60-100 cm; male flowers with stamens 80-100. Fruits densely arranged on rachis, narrowly ellipsoid, orange to dark red, 3-5 cm.

Range: Lord Howe Island, in the Southwest Pacific Ocean. Occasionally grown for ornament in Surinam (Ostendorf, 1962).

Literature: Clark, H.L. 1935. Paradise of the Tasman (Lord Howe Island): a Pacific island provides the palm which decorates. *National Geographic* 68: 115-136. Moore, H.E. 1966. Palm hunting around the world, IV.Lord Howe Island. *Principes* 10(1): 13-21.

16. *Hyphaene* Gaertner

Plants dioecious, solitary or with multiple trunks, without crownshaft. Stems unarmed, often branched, often ringed. Leaves in a terminal crown, costapalmate; petiole split at the base, with serrate margin; leaf-segments sometimes bifid. Inflorescences among the leaves, with numerous spathes each sheathed by a tubular bract, paniculately branched. Flowers borne in pit-like depressions made by the bractlets; male flowers in clusters of (2-) 3, with stamens 6 (-7); female flowers solitary, pedicellate. Ovary 3-celled. Fruit a usually 1-seeded drupe with fibrous mesocarp and woody shell.

1. *Hyphaene thebaica* (Linnaeus) Martius, *Historia Naturalis Palmarum* 3: 226 (1839). DOUM PALM. Stem solitary, forked in nearly dichotomous fashion, to 12 m. Leaf-blades rigid, suborbicular, greyish-green, to 1.8 m, cut deeply into 20 or more segments; petiole serrate with black teeth, to 90 cm. Inflorescence to 1.2 m. Fruit large, oblongoid or irregularly ovoid, deep orange, with taste of gingerbread, to 9 cm.

Range: Egypt (Upper Nile region; Sinai Peninsula near Eilat), Sudan, Ethiopia. Grown in Guyana at the Botanic Gardens, Georgetown. A photograph of a specimen in Guyana appears in J.C. McCurrach (1960, p.104).

Literature: Rolla, S.R. 1964. The doum palms in India. *Principes* 8(1): 49-54.

17. *Latania* Commerson ex Jussieu

Plants dioecious, solitary. Stems unarmed, prominently ringed. Leaves costapalmate (fan), deeply cut into bifid segments; petiole sometimes serrate. Inflorescences among the leaves, sheathed with tubular bracts, dissimilar, the male spikes digitately branched, the female spikes zigzag, simple. Male flowers solitary, with stamens 15-30; female flowers larger than the male, solitary. Ovary 3-celled. Fruit a 1- to 3-seeded, berry-like, usually angular drupe with fleshy mesocarp and woody endocarp.

Literature: Bailey, L.H. 1942. Palms of the Mascarenes. *Gentes Herbarum* 6(2): 50-104.

Key to Species

1. Fresh leaves glaucous-blue; hastula of petiole conical; shaft of petiole green1. *L. loddigesii*
1. Fresh leaves greyish-green, not heavily glaucous; hastula of petiole very wide, not conical; shaft of petiole purple or reddish 2. *L. lontaroides*

1. *Latania loddigesii* Martius, *Historia Naturalis Palmarum* 3: 224, t.161 (1838). (Synonym: *L. glaucophylla* Hort.). BLUE LATAN PALM, SILVER LATANIA; WHITE PALM (Guyana). Stems to 15 m. Petiole 5-6 cm wide, green, sometimes sparsely serrate. Leaf-blades to 1.5 x 1 m, glaucous-blue, with fluffy tomentum beneath. Male spikes 10-25 cm, woolly-tomentose. Fruit brown, obovoid or subcylindrical to nearly 3-angled, 5-7 cm.

Range: Mascarene Islands (Round I., Flat I., Coin de Mire I.). Cultivated in the Botanic Gardens, Georgetown, Guyana.

2. *Latania lontaroides* (J. Gaertner) H.E. Moore, *Principes* 7(3): 85 (1963). (Synonyms: *L. borbonica* Lamarck, *L. commersonii* J.F. Gmelin, *L. rubra* Jacquin). RED LATAN PALM. Stems to 15 m. Petiole to 15 cm wide, purple or reddish, unarmed. Leaf-blades to 1.8 x 2.4 m, greyish-green, not heavily glaucous, with sparse fluffy tomentum beneath. Male spikes to 30 cm, glabrous or subglabrous. Fruit brown, obovoid, to 4.5 cm.

Range: Mascarene Islands (Mauritius, Reunion). Cultivated in the Botanic Gardens, Georgetown, Guyana.

In 1934 it was reported that two hybrid plants, the result of open air cross-pollination between *L. loddigesii* and *L. lontaroides*, had arisen in the Botanic Gardens, Georgetown, Guyana (Department of Agriculture, 1934); the characteristics of *L. loddigesii* were dominant in the hybrids.

18. *Licuala* Thunberg

Plants solitary or clustered. Stem without a crownshaft, with persistent petiole-bases. Leaves in a terminal crown or along upper part of stem, palmate (fan) or shortly costapalmate, often deeply divided into several wedge-shaped, blunt-tipped segments, rarely undivided; petiole often spiny. Inflorescence among the leaves, a few-branched panicle, usually with several sheathing spathes (bracts). Flowers bisexual, solitary or in few-flowered clusters; stamens 6, filaments free or united. Ovary 3-celled. Fruit a small, 1-

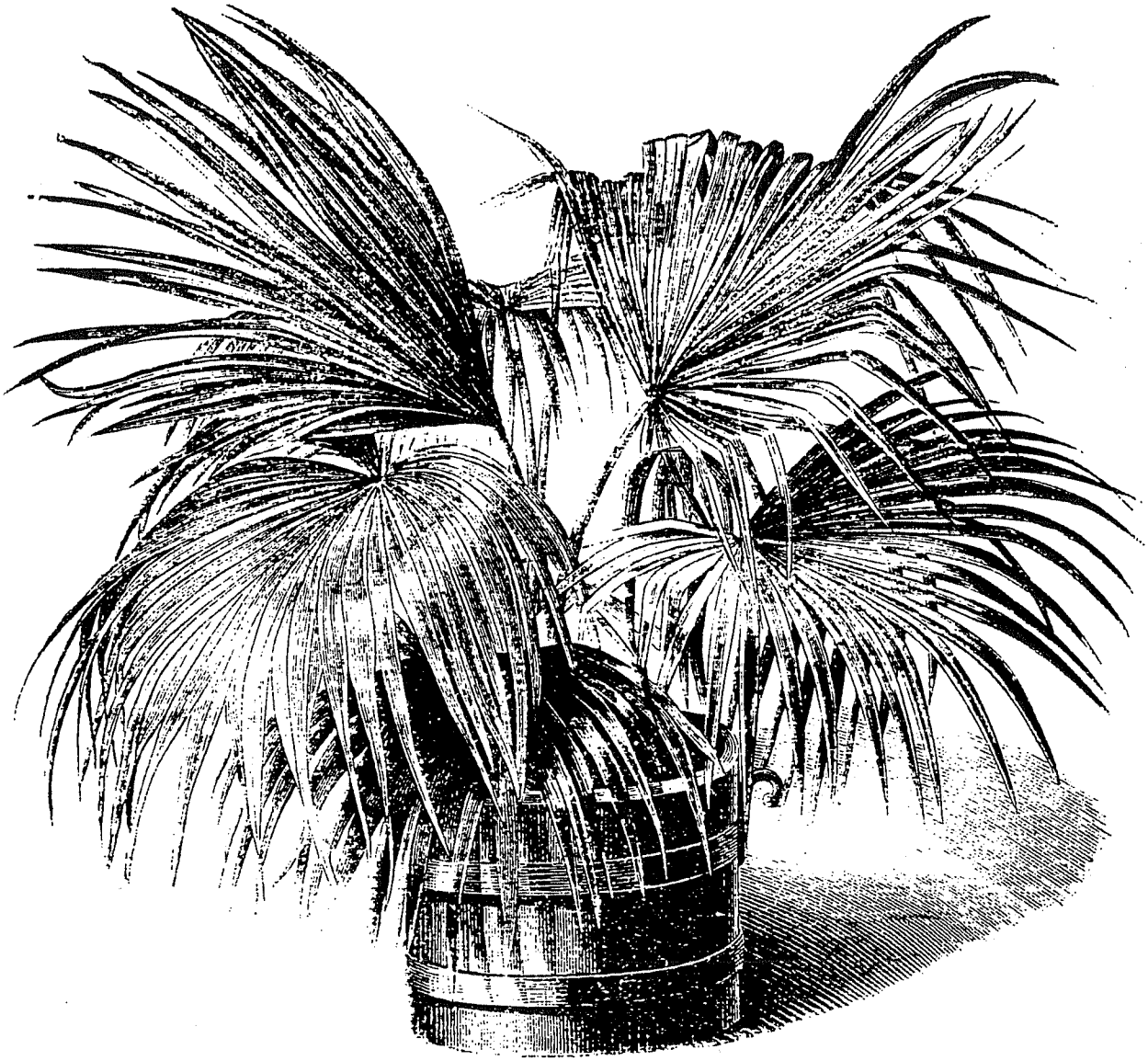


Fig. 221. *Livistona chinensis* (Arecaceae).

seeded, red or orange drupe.

Key to Species

1. Stem solitary, to c.1.8 (-3)m; leaf-blade undivided 1. *L. grandis*
1. Stems clustered, to 4.5 (-6)m; leaf-blade deeply divided into wedge-shaped segments 2. *L. spinosa*

1. *Licuala grandis* H. Wendland ex Hooker, *Curtis's Botanical Magazine* 109: t.6704 (1883). Stem solitary, to c.1.8 (-3) m. Leaf-blades orbicular or suborbicular, to 9 dm wide, undivided, but with the margin shortly indented into bifid lobes; petiole spiny. Inflorescences to 1.5 m. Flowers solitary, c.5 mm; filaments united in a 3-lobed ring. Fruit red or orange, c.1.3 cm wide.

Range: New Hebrides (Espiritu Santo I., Malekula I.) in the Southwest Pacific Ocean. Cultivated at the Promenade Gardens and Botanic Gardens in Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

2. *Licuala spinosa* Thunberg, *Kungliga Svenska Vetenskaps-Akademiens Handlingar* nov.ser., 3: 287 (1782). Stems clustered, to 4.5 (-6) m. Leaf-blades suborbicular, to 1.4 m wide, deeply parted or divided into c.14-19, several-ribbed, blunt (plane-tipped) segments; petiole spiny. Inflorescence to 3 m; rachillae pubescent. Flowers in groups of 3 below, or solitary above, c.3 mm; filaments united in a 6-toothed ring. Fruit orange-red, c.1.5 cm wide.

Range: Southeast Asia. Cultivated in the Botanic Gardens, Georgetown, Guyana, and in the sierplanten area of the Cultuurtuin in Paramaribo, Surinam.

19. *Livistona* R. Brown

Plants solitary, unarmed except for the petioles. Stems ringed, clothed with fiber of petiole-bases. Leaves in a terminal crown, costapalmate (fan), often deeply divided into many narrow, 1-ribbed segments bifid at apex; petiole spiny-serrate at least below. Inflorescences among the leaves (axillary), paniculately branched; bracts (spathes) several, long, tubular, sheathing. Flowers bisexual, solitary or in clusters; stamens 6. Carpels 3, separated below; ovary 1-celled. Fruit a colorful 1-seeded drupe.

Literature: Murray, E. 1986. The *Livistona* palms. *Garden* 10(2): 5-8 (*Lasca*).

Key to Species

1. Leaf-blade with some of the lower segments cut down to the center of the blade 3. *L. saribus*
1. Leaf-blade with a conspicuous uncut central portion.
   2. Leaf-segments with long, drooping (pendulous) tips; fruit blue-green; crown of leaves somewhat greyish, usually with a skirt of dead leaves persisting below 1. *L. chinensis*
   2. Leaf-segments not with drooping tips; fruit brick red, ripening black; crown of leaves

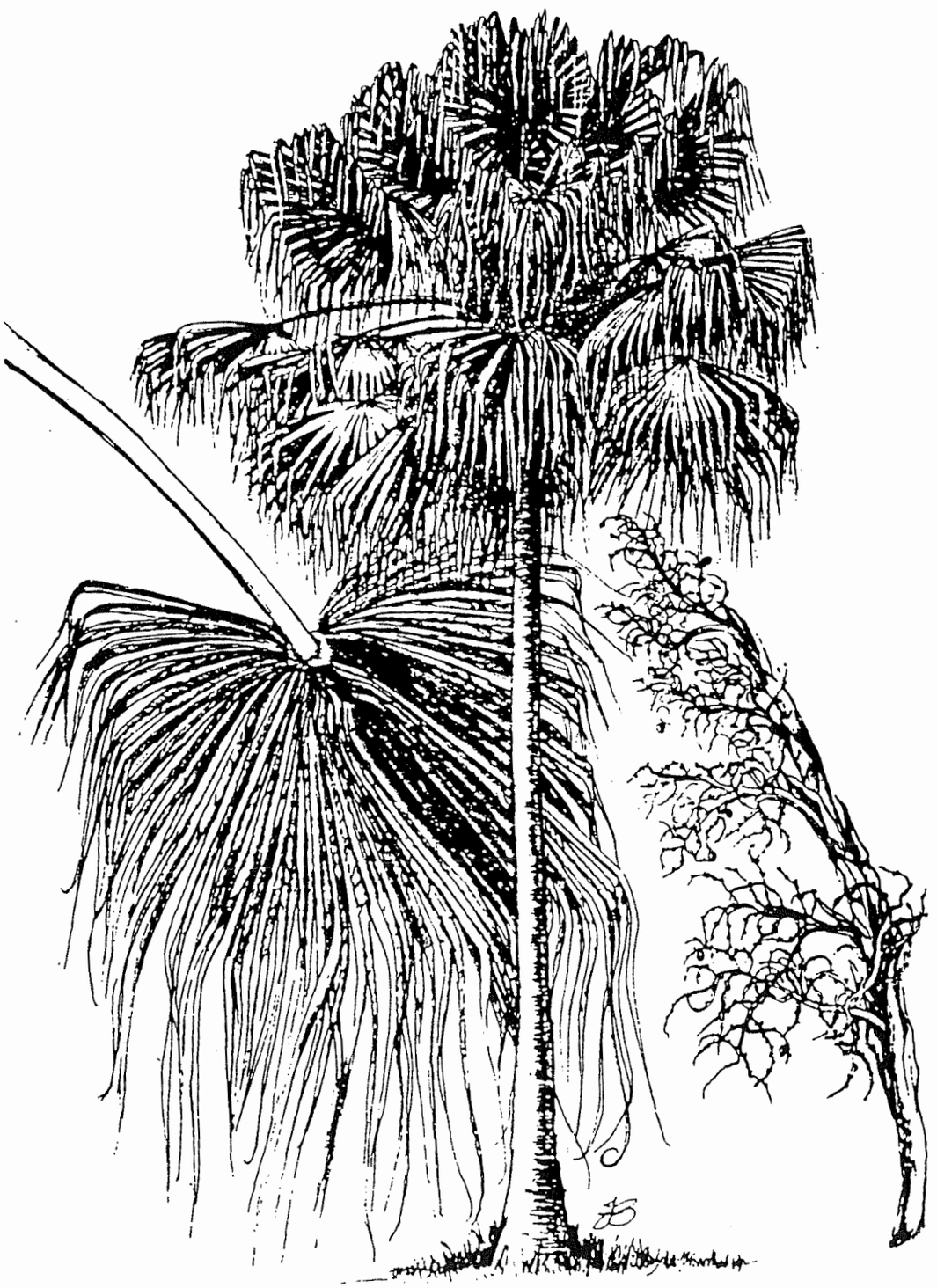


Fig. 222. *Livistona chinensis* (Arecaceae).

green, without skirt of leaves below 2. *L. rotundifolia*

1. *Livistona chinensis* (Jacquin) R. Brown ex Martius, *Historia Naturalis Palmarum* 3: 240 (1839). CHINESE FAN PALM, CHINESE FOUNTAIN PALM. Stems to 10 (-15)m. Leaf-blades reniform or suborbicular, divided up to 2/3 to the base into 50-60 segments to 9 dm long in the middle, with threads between the segments, the segments with pendulous tip, the whole blade to c.1.8 m wide; petiole to 1.8 m, retrorse-serrate below with teeth to 5 cm. Inflorescence few-branched; flowers up to 6 per cluster. Fruit ovoid, bluish-green, to 2.5 cm.

Range: Islands near Kyushu, Japan and near Taiwan; also Ryukyu, Volcano, and Ogasawara (Bonin) Islands. Grown at the Botanic Gardens, Georgetown, Guyana; as a potted plant on university grounds in Paramaribo, Surinam; and at the Jardin Botanique, Cayenne, French Guiana.

Literature: Moore, H.E. and F.R. Fosberg. 1956. The palms of Micronesia and the Bonin Islands. *Gentes Herbarum* 8(6): 432-438.

2. *Livistona rotundifolia* (Lamarck) Martius, *Historia Naturalis Palmarum* 3: 241 (1839). (Synonym: *L. altissima* Zollinger). Stem to 30 m. Leaf-blades reniform, suborbicular or orbicular, divided mostly one-third to base into 60-90 segments which completely encircle the petiole-tip (giving appearance of a peltate wheel to the young leaves), the segments not drooping, the whole blade to 1.5 m wide; petiole to 1.8 m, retrorse-serrate. Inflorescence few-branched; flowers solitary. Fruit globose, brick red, ripening black, to 2 cm.

Range: East Indies. Grown at the Botanic Gardens, Georgetown, Guyana, and in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam.

3. *Livistona saribus* (Loureiro) Merrill ex A. Chevalier, *Bulletin Economique de l'Indochine* ser.2, 22: 501 (1919). (Synonym: *L. hoogendorpii* Teysmann & Binnendijk ex Miquel). HOOGENDORP'S LIVISTONA. Stem to 22.5 (-30) m. Leaf-blades suborbicular, divided more than half-way to base into 10-12 primary segments which are again divided (less deeply) into long-bifid segments; at least some of the lower segments divided to the base of blade, the segments drooping, the whole blade to 1.8 m wide; petiole to 2.4 m, retrorse-serrate with teeth to 5 cm. Inflorescence severally branched; flowers 3-5 per cluster. Fruit globose, bright blue or bluish-green, c.2 cm.

Range: Southeast Asia. Grown at the Botanic Gardens, Georgetown, Guyana.

20. *Lodoicea* Commerson ex DeCandolle

Plants dioecious, solitary, unarmed. Stem from a basal bowl-shaped, socket-like structure through which the roots emerge, obscurely ringed. Leaves in a terminal crown, costapalmate (fan, with midvein reaching apex of leaf); petiole elongate. Inflorescences among the leaves (axillary), emerging through split petiole-base, pendulous, spicate, with several basal sheathing bracts (spathes); male inflorescence a long, thick spike with numerous flowers in clusters, recessed in pits formed by bractlets, with stamens 14 or more; female inflorescence a shorter, somewhat zigzag spike with solitary, large, bracteate

flowers. Ovary 3-celled. Fruit very large, the shell (husk) smooth on surface, with coarse fibers inside surrounding seed, 1 (-3) -seeded, the seed 2-lobed, with bony, black endocarp and hollow central cavity.

1. *Lodoicea maldivica* (Gmelin) Persoon, *Synopsis Plantarum* 2: 630 (1807). (Synonyms: *L. callipyge* Commerson ex J. Saint-Hilaire, *L. sechellarum* Labillardiere). COCO-DE-MER, DOUBLE COCONUT. Stem to 28 m (male) and 18 m (female) x 3 dm. Leaf-blades 3-6 x 2-4 m, glossy above, cut 1/3 or more to the base into numerous segments and drooping at the tips; petioles 2-4 m. Male inflorescence thick, sausage-like, to c.1.2 m x c.7-10 cm. Female inflorescence 1-2 m, with 5-13 flowers; ovary 5-10 cm wide. Fruits several in clusters, ovoid to broadly ellipsoid, usually 1-seeded with 2-lobed seed, weighing 30-50 pounds, buoyant when past the viable stage.

Range: Seychelles Islands in the Indian Ocean (Praslin I., Curieuse I.). A specimen of unknown sex is cultivated near the entrance to the Botanic Gardens, Georgetown, Guyana.

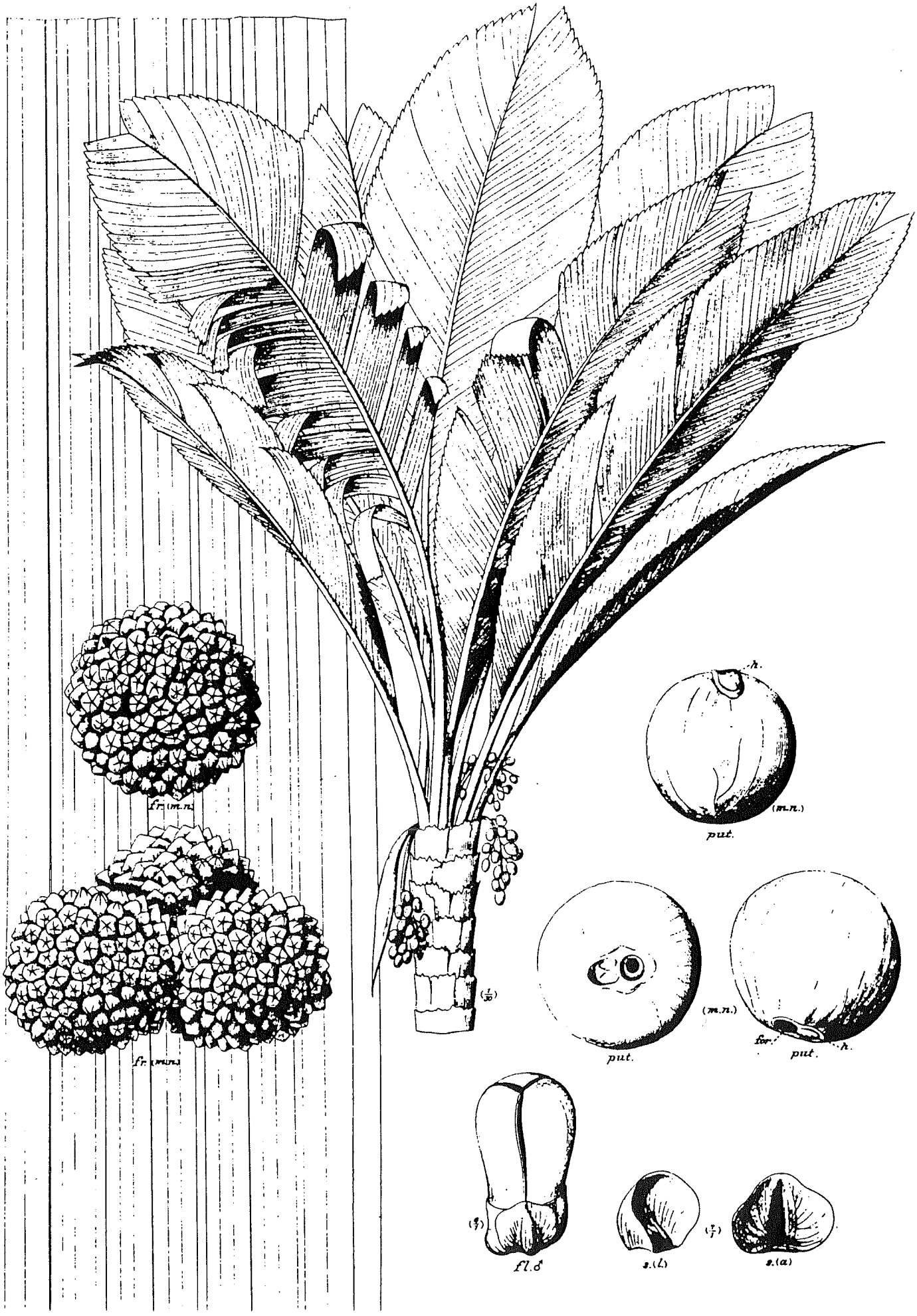
Literature: Bailey, L.H. 1942. Palms of the Seychelles Islands. *Gentes Herbarum* 6(1): 3-48. Emboden, W.A. 1970. The fabulous coco-de-mer. *Terra* 9(2): 6-13. Jeffrey, C. 1964. Coco-de-mer. *New Scientist* 21(372): 34-37. Krochmal, C. and A. Krochmal. 1978. Double coconut: the largest seed. *Garden* 2(3): 22-25; condensed in *Pacific Tropical Botanical Garden Bulletin* 9(1): 31-33 (1979). Lionnet, J.F.G. 1965. The Vallée de Mai and the coco-de-mer palm. *Principes* 9(4): 134-138. Lionnet, G. 1970. *Coco-de-mer: The Romance of a Palm*. 36pp. Imprimerie Saint-Fidele. Lucas, S.A. 1982. The coco-de-mer palm at Pacific Tropical Botanical Garden. *Pacific Tropical Botanical Garden Bulletin* 12(2): 25-28. Pavard, C. [Undated (post-1982)]. *Seychelles, From One Island to Another*. 176pp. Editions Delroisse. Savage, A.J.P. and P.S. Ashton. 1991. Tourism is affecting the stand structure of the coco-de-mer. *Principes* 35(1): 47-48. Silvertown, J. 1987. Possible sexual dimorphism in the double coconut: reinterpretation of the data of Savage and Ashton. *Biotropica* 19(3): 282-283. Sneed, M.W. 1976. In quest of the big seed. *Principes* 20(1): 11-23.

In the 1930's the Botanic Gardens, Georgetown, Guyana had three palms (2 female, 1 male) growing from nuts imported from the Seychelles in 1893, and they were believed to have been the first individuals of this species to flower in the Western Hemisphere (Department of Agriculture, 1934). Photographs of fruiting *Lodoicea* at Georgetown are shown in David Fairchild's article on plant collecting in the Caribbean, *National Geographic Magazine* 66(6): 726 (1934), and in Bailey (1942). This species bears the largest seed known in the plant world; when it germinates, the seedling is attached to the nut for three or four years by means of a cotyledon-stalk or "umbilical cord" which ranges from 3-12 feet (9 dm - 3.6 m) long. Plants in the Vallée de Mai Nature Reserve on Praslin Island, Seychelles, attain an age of 800 years, having reached onset of maturity at 100 years. The young jelly nuts contain sweet white albumin of gelatinous consistency, and water, which people consume as a local delicacy.

21. *Manicaria* Gaertner

Plants monoecious, solitary, unarmed. Stems prominently ringed, with exposed clusters of aerial roots at the base, without a crownshaft. Leaves in a terminal cluster, very large, simple, often torn by action of wind into irregularly pinnatisect segments, petiolate.

Fig. 223. *Manicaria saccifera* (Arecaceae).



Inflorescence axillary (among the leaves), a simple spike or few-branched panicle, entirely enclosed by a very long sac-like, finely meshed, fibrous spathe which ruptures with maturity of inflorescence. Flowers of both sexes on the same inflorescence; male flowers solitary or in pairs below, with stamens 20-34; female flowers solitary and between 2 male flowers. Ovary 3-celled. Fruit a large, 1- to 3-seeded, 1- to 3-lobed, strongly tuberculate, buoyant drupe.

1. *Manicaria saccifera* Gaertner, *Fructibus et Seminibus Plantarum* 2(3): 468 (1791). TIMITI (Guyana and Surinam Arawak), TOOROORI (Guyana Carib), TOULOURI (French Guiana), TROELI, TROELIEPALM (Surinam), TROOLIE (Guyana), YA-HOO-I (Guyana Warrau). Stem to 6 m x 3 dm. Leaf-blades simple, usually irregularly torn by the wind, to 7.5 x 2.3 m, coarsely toothed at margin, prominently veined, erect; petiole soft, not woody, grooved, 1-1.3 m. Inflorescence 0.9-1.7 m; spathe a fine-textured, meshed pouch to 1.1 m. Flowers with petals 6-10 mm. Fruit subglobose, with corky tubercles, 1- to 3-lobed depending on number of seeds inside, to c.3.7 cm wide; seeds smooth.

Range: Central America and northern South America, including the three Guianas. Grown at the Botanic Gardens, Georgetown, Guyana.

In Guyana, the milk inside the cracked nuts was drunk as a remedy for cough and asthma (Im Thurn, 1884). The plants were reputed to have the largest undivided leaf-blade of any palm, until the discovery in 1982 by Dr. Mardy E. Darian of *Marojejya darianii* Dransfield & Uhl in the swamps of Madagascar; also monoecious, but epetiolate, the leaf-blades of *Marojejya* are 7-9 m long.

22. *Mauritia* Linnaeus fil.

Plants dioecious, solitary, or with multiple stems from creeping rhizomes. Stems ringed, unarmed or with spines derived from transformed aerial roots. Leaves in a terminal crown (crownshaft absent), palmately divided nearly to the base into narrow, 1-ribbed segments, a costa absent in leaves of juvenile plants, present in adult plants; petiole elongated. Inflorescence axillary (among the leaves), an elongated panicle, the peduncle, primary and secondary branches sheathed with tubular bracts at base. Male flowers with stamens 6. Ovary 3-celled. Fruit a hard, 1-seeded drupe covered with tightly imbricated scales.

1. *Mauritia flexuosa* Linnaeus fil., *Supplementum Plantarum* 454 (1781). AETA (Guyana Arawak), GWY (Guyana Macusi), ITA (Guyana), KOJ (Surinamese Tirio), MAURISIE, MAURITIEPALM (Surinam), MOREECHI (Guyana Carib), MORISI (Surinamese Creole), OHEED (Guyana Warrau), PALMIER BACHE (French Guiana), TOERISIRI (Surinam Carib). Stem solitary, columnar, unarmed, often bearing short aerial roots, to 35 (-c.50) m x 4 dm. Leaf-blades flabellate, divided 9/10 to the base into c.100 narrow segments 3-7 cm wide, drooping at the tips, dark green above, glaucous beneath; petiole semiterete, to 3.9 m. Inflorescences 1.2-3 m, with zigzag rachillae. Fruit globose to ellipsoid, to c.5 x 5 cm, covered with diamond-shaped yellowish or reddish-brown scales 6-7 mm, which are grooved on the back and arranged in geometric rows.

Range: Trinidad and northern South America, including the three Guianas. Cultivated

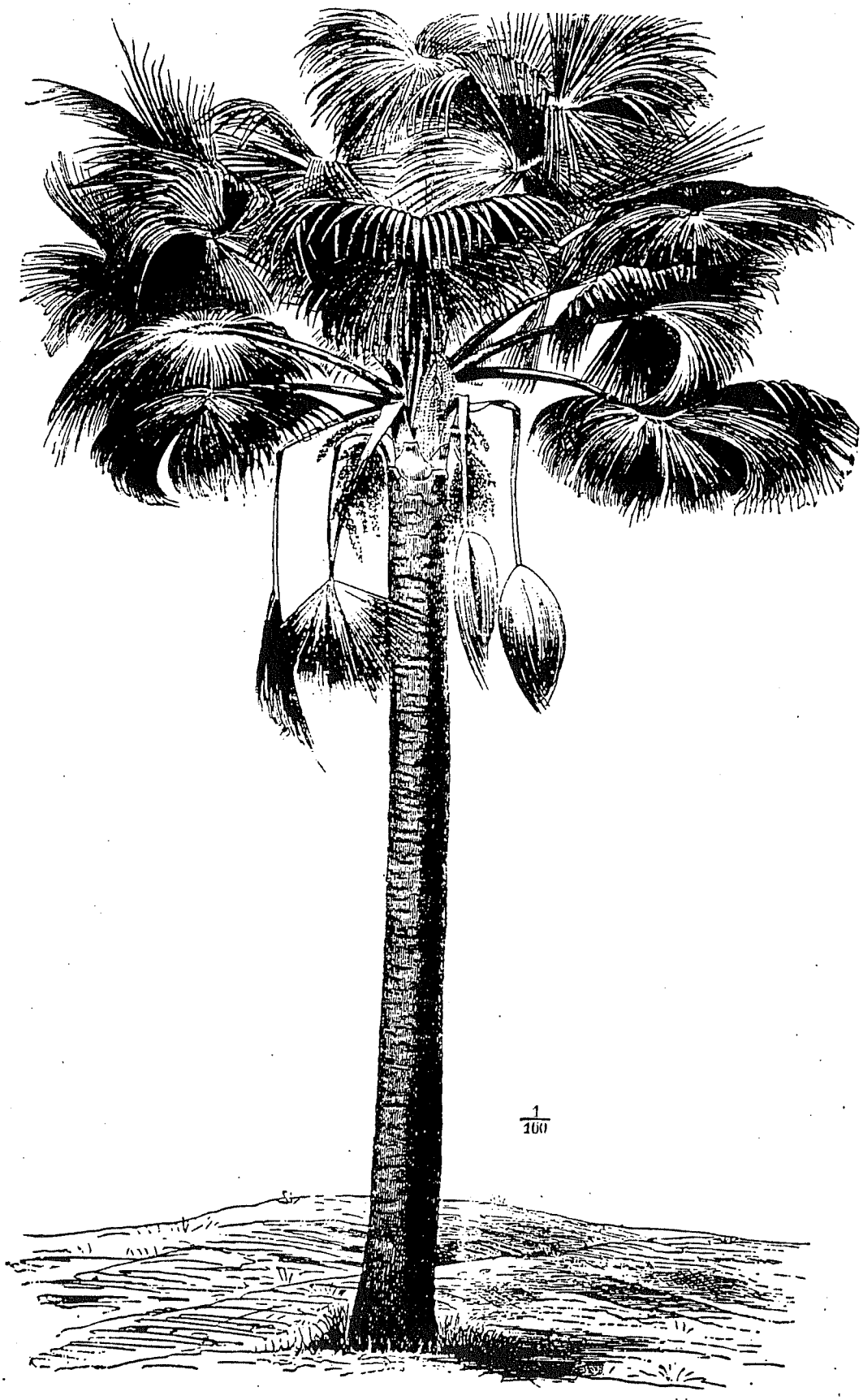


Fig. 224. *Mauritia flexuosa* (Arecaceae).

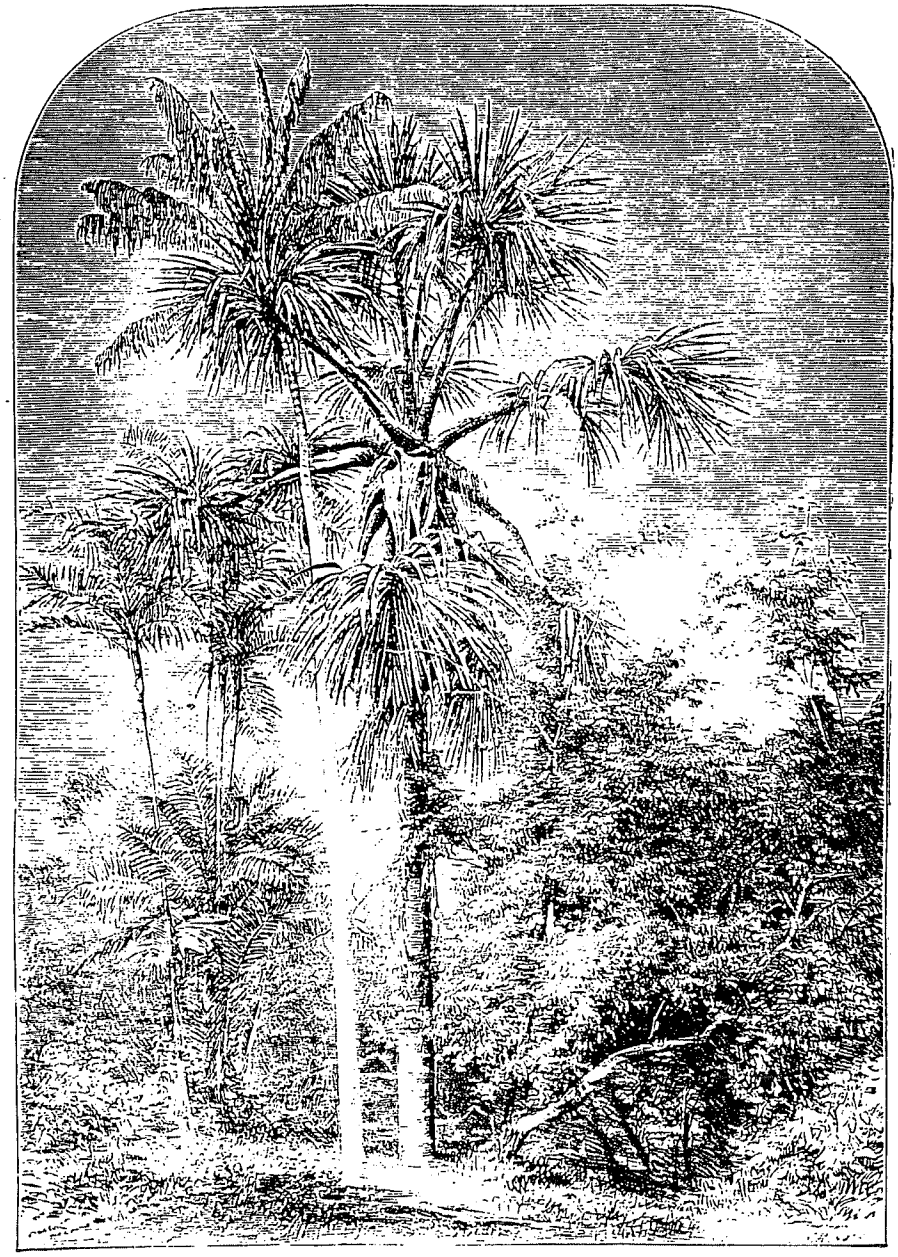


Fig. 225. *Mauritia flexuosa* (Arecaceae).

in the Botanic Gardens, Georgetown, Guyana; as a specimen planting on Torarica hotel grounds in Paramaribo, and in roadside yards and garden grounds near Waterland, Lelydorp and Zanderij Airport, Surinam; and occasionally planted as roadside decorations near Kourou, French Guiana.

Oil from the mesocarp, employed for the frying of food, is currently underutilized (National Academy of Sciences, 1975; Pesce, 1985), though the Guianan Amerindians intensively use the leaves which provide fiber for hammocks, sandal materials, palm cabbage, and the pith of the trunk for food products, liquor, and sugar from the sap; the yellow fruit-pulp also is edible when soaked and pressed into cakes. At a distance the leaf is suggestive, with its numerous drooping segments, of the fountain-like spray of the papyrus (*Cyperus papyrus*) inflorescence.

Literature: National Academy of Sciences. 1975. Buriti palm, pp.133-137, in *Underexploited Tropical Plants With Promising Economic Value*. 190 pp. Washington, D.C.: National Academy of Sciences. Pedersen, H.B. and H. Balslev. 1990. *Mauritia flexuosa*, pp. 37-52, in *Ecuadorian Palms for Agroforestry*. AAU Reports 23. Botanical Institute, Aarhus University, Denmark. 122 pp.

23. *Nypa* Wurmb

Plants monoecious, forming colonies, unarmed. Stems subterranean, horizontal, with forked branches. Leaves arising in a crown from tip of stem at ground level, pinnate (feather), erect; petiole elongated, with many air spaces inside, buoyant. Inflorescence subterminal, seemingly arising from among the leaves, erect, paniculately branched, the infructescence remaining after male rachillae have fallen. Inflorescence axes subtended by large foliaceous bracts (spathes); male flowers on short club-like spikes below the female head, with stamens 3, united; female flowers in a dense terminal head or aggregate. Carpels 3, separate; ovary 1-celled. Fruit a ridged, fibrous, 1-seeded drupe in densely-fruited clusters suggesting the aggregate of *Pandanus* fruit.

1. *Nypa fruticans* Wurmb, *Verhandelingen Bataviaasch Genootschap Kunsten* 1: 350 (1779). NIPA PALM. Underground stem to 6 dm wide. Leaves erect, in a basal rosette from prostrate, creeping stem, the petiole 1.2-1.5 m, the leaf-blade 3-9 m; pinnae numerous, to c.17 dm, lanceolate, acuminate, glaucous with powdery white scales below. Spathes orange or brick red. Peduncle c.7.5-9 dm; female flowers dark purple; male flowers yellow. Fruiting head globose, 2.5-3.0 dm wide; individual fruits obovoid, ribbed, beaked, hard, c.10-12.5 cm.

Range: Estuaries and other brackish waters in India, Sri Lanka, Malaysia, and Queensland (Australia), to the Caroline, Solomon and Ryukyu Islands. Cultivated in a tidal pool at the Botanic Gardens, Georgetown, Guyana.

Literature: Fong, F.W. 1987. An unconventional alcohol fuel crop. *Principes* 31(2): 64-67. Hamilton, L.S. and D.H. Murphy. 1988. Use and management of nipa palm (*Nypa fruticans*, Arecaceae): a review. *Economic Botany* 42(2): 206-213. Loomis, H.F. 1956. The nipa palm of the Orient. *Principes* 1(1): 41-45.

"Nypa" is the Moluccan name for this plant, and was conferred as its scientific name by Fredrik, Baron von Wurmb (d. 1781), secretary of the Java-based Bataviaasch Genootschap, a society for the advancement of scholarly pursuits in the Dutch East Indies. The peduncles of the nipa inflorescence are bruised to produce a sugary sap which can be used for industrial alcohol, and interest in this promising field of exploitation has recently been revived by Fong (1987) in Malaysia.

24. *Phoenix* Linnaeus

Plants dioecious, solitary or with clustered multiple stems, unarmed except for spine-like lower pinnae on petioles. Stems ringed with petiole-base scars. Leaves in a terminal crown, pinnate (feather), the pinnae arranged in 1 to several ranks or planes, V-shaped in cross-section. Inflorescences among the leaves (axillary), a panicle of fascicled or subumbellate rachillae clustered mostly near apex of peduncle. Spathe 1, deciduous. Flowers borne singly along the rachis; male flowers with stamens 6. Carpels 3, separate; ovary 1-celled. Fruit a 1-seeded drupe with fleshy mesocarp.

Key to Species

1. Pinnae in clusters, arranged in 2-4 ranks or planes along the leaf rachis; leaves greyish-green ..... 3. *P. sylvestris*
1. Pinnae in pairs, arranged in 1 plane; leaves green.
   2.Stem massive, to 20 x c.1 m; leaflets to 6 m; pinnae 150-200 pairs ..... 1. *P. canariensis*
   2. Stems dwarf, to 3 m x 22.5 cm; leaves to 1.5 m; pinnae to 50 pairs ..... 2. *P. roebelenii*

1. *Phoenix canariensis* Hort. ex Chabaud, *La Provence Agricole* 19: 293 (1882). CANARY ISLAND DATE PALM. Stem solitary, massive, to 20 x c.1 m. Leaves to 6 m; pinnae 150-200 pairs, regularly arranged in 1 plane, green. Fruit oblongoid or ellipsoid, reddish-yellow, to 2 cm.

Range: Canary Islands. Occasionally planted as an ornamental on hotel grounds in Paramaribo, Surinam, and along roadsides near Kourou, French Guiana.

2. *Phoenix roebelenii* O'Brien, *Gardeners' Chronicle* ser.3,6 (148): 475 (1889). MINIATURE DATE PALM, PYGMY DATE PALM. Stem solitary, or sometimes clustered, to 3 m x 22.5 cm. Leaves to 1.5 m; pinnae to 50 pairs, regularly arranged in 1 plane, green. Fruit oblong-ellipsoid, blackish, to 1.2 cm.

Range: Laos. Grown as a potted ornamental in Paramaribo, Surinam.

3. *Phoenix sylvestris* (Linnaeus) Roxburgh, *Flora Indica* 3: 787 (1832). INDIAN DATE PALM, INDIAN WINE PALM. Stem solitary, to 16 x 1 m. Leaves to 4.5 m; pinnae c.125, arranged in clusters in 2-4 planes along the rachis, greyish-green. Fruit oblongoid or ellipsoid, reddish-yellow, 2-3 cm.

Range: India. Cultivated as an ornamental in the Botanic Gardens, Georgetown, Guyana.

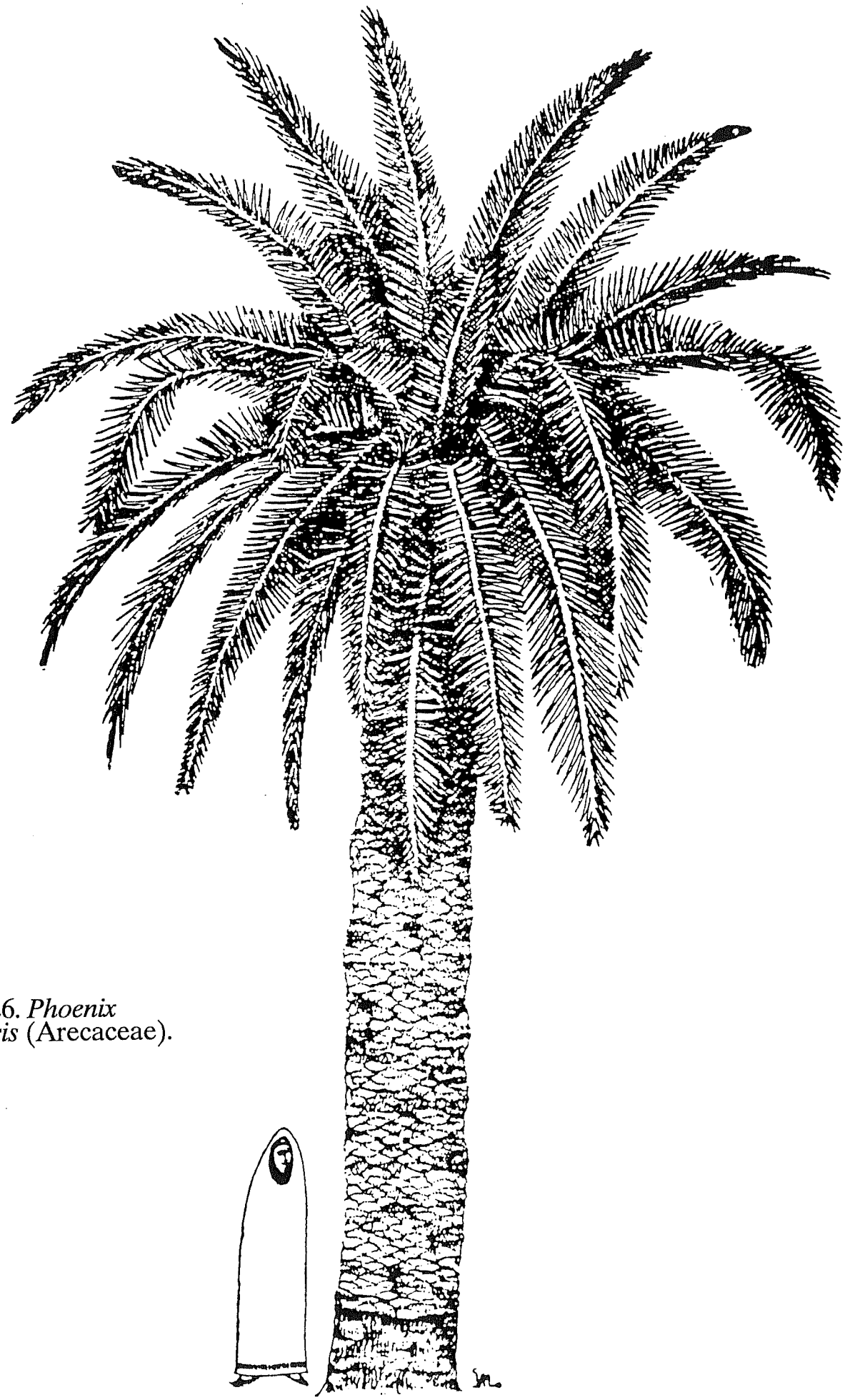


Fig. 226. *Phoenix canariensis* (Arecaceae).

Literature: Davis, T.A. 1972. Tapping the wild date. *Principes* 16(1): 12-15.

Phoenix reclinata Jacquin, the African wild date or Senegal wild date, is an introduced fruit plant in Surinam along the Commewijne and Surinam rivers and near Matapica (Distrikt Commewijne) (Ostendorf, 1962); it forms slender, sometimes inclined stems to 6 m, with arcuately spreading leaves. The date palm of commerce, *P. dactylifera* Linnaeus of the Near East and North Africa, has suckering, clustered multiple stems (all but one of which are removed from plants grown for harvesting) and glaucous-greyish leaves; it has been introduced in Surinam but the plants do not produce ripened fruit, suggested as probably due to the lack of an arid environment (Ostendorf, 1962). This species was reported by Aublet (2: 974. 1775) as growing in a Cayenne, French Guiana garden.

25. *Pritchardia* Seemann & H. Wendland

Plants solitary, unarmed. Stems ringed, smooth or roughened. Leaves in a terminal crown, costapalmate (fan), pleated, the segments bifid at apex; petiole with fibers at base. Inflorescences among the leaves (axillary), erect or pendent, short- or long-pedunculate, a panicle with branched or unbranched rachillae; spathes (bracts) tubular, sheathing, subtending the peduncle and rachillae. Flowers bisexual, solitary along the rachillae; stamens 6, the filaments united below in a tube. Ovary of 3, 1-celled carpels free except at the styles above. Fruit a 1-seeded drupe with persistent, peg-like calyx.

1. *Pritchardia pacifica* Seemann & H. Wendland, *Bonplandia* 10: 197 (1862). FIJI FAN PALM. Stem to 10 x 0.9 m, roughened. Leaf-blades flabelliform-orbicular, pleated, green, white-flocculose when young, cut to c.1/3 to the middle of blade, to 1.2 m or more, with c.70-90 segments; petiole white-scaly tomentose, to c.1 m or more. Inflorescences of 2-3 panicles per leaf-axil, shorter than the leaves. Flowers 7-8 mm. Fruit globose, c.1.2 cm wide.

Range: Tonga Islands; perhaps Fiji Islands. Cultivated in the Botanic Gardens, Georgetown, Guyana; in occasional town residential plantings and in the Cultuurtuin, Paramaribo, Surinam; and in the Jardin Botanique and private gardens of Cayenne, French Guiana.

26. *Ptychosperma* Labillardiere

Plants monoecious, solitary or with multiple clustered stems, unarmed. Stems with a crownshaft, smooth, ringed, often cane-like. Leaves pinnate (feather), scaly or woolly on petiole and rachis at least beneath; pinnae praemorse (obliquely and irregularly toothed) or notched at apex, regularly or irregularly arranged on apex. Spathes (bracts) 2, tubular, with smaller bracts at base of rachillae. Inflorescence axillary (among the leaves) or sometimes below the leaves, solitary at a node, a shortly peduncled panicle. Flowers in triads (1 female and 2 male flowers in a tight cluster); male flowers with stamens numerous (9-100); female flower with 1-6 staminodes. Ovary 1-celled. Fruit a fleshy, 1-seeded drupe; seeds with 5 longitudinal grooves, of which 2 are sometimes indistinct.

Literature: Essig, F.B. 1977. *Ptychosperma* in cultivation. *Principes* 21(1): 3-11. Essig, F.B. 1978. A revision of the genus *Ptychosperma* Labill. (Arecaceae). *Allertonia* 1(7): 415-

Key to Species

1. Stem solitary; pinnae to 84 cm; stamens 20-22 — 1. *P. elegans*
1. Stems caespitose; pinnae to 56 cm; stamens 26-40 — 2. *P. macarthurii*

1. *Ptychosperma elegans* (R. Brown) Blume, *Rumphia* 2: 118 (1843). SOLITAIRE PALM. Stem solitary, grey or greenish-grey, to 12 m x 8 cm. Leaf-sheath c.65 cm; middle pinnae of the rachis to 84 cm; pinnae to c.14 pairs, praemorse (jagged) at the apex. Stamens 20-22. Fruit globose or ellipsoid, red, to 14 x 10 mm.

Range: Queensland, Australia. Grown as an ornamental in a garden near Zanderij Airport, Surinam.

2. *Ptychosperma macarthurii* (H. Wendland ex Veitch) H. Wendland ex Hooker fil., *Kew Gardens Report* 1882: 55 (1884). (Synonym: *Actinophloeus macarthurii* (H. Wendland ex Veitch) Beccari). MACARTHUR PALM. Stems multiple, caespitose, grey or greenish-grey, 7-8 m x 4-8 cm. Leaf-sheath 30-60 cm, white-woolly; leaf-rhachis (overall leaf-blade) 100-200 cm; middle pinnae of the rachis to 56 x c.4-6 cm; pinnae to 14 pairs, praemorse (jagged) at apex. Stamens 26-40. Fruit ovoid, red, 12-16 x 8 mm.

Range: New Guinea and Queensland, Australia. Cultivated as an ornamental in the Botanic Gardens, Georgetown, Guyana, and on hotel grounds in Paramaribo and in roadside yard near Lelydorp, Surinam.

27. *Rhapis* Linnaeus

Plants dioecious, stoloniferous, forming clumps of multiple stems, unarmed except sometimes with serrate petiole. Stems cane-like, ringed, clothed with persistent fibrous-matted leaf-bases. Leaves borne along the stem and at its apex, palmately divided nearly to the base, the segments longitudinally ribbed and transversely cross-veined or puckered with shallow teeth or clefts at the apex. Inflorescence among the upper leaves (axillary), a shortly branched panicle; spathes 2(-3), membranous, dry, subtending the peduncle. Flowers solitary along the rachillae; male flowers with stamens 6. Ovary 1-celled; carpels 3, separate. Fruit a rather soft, 1-seeded drupe.

Literature: Bailey, L.H. 1939. Species of *Rhapis* in cultivation. *Gentes Herbarum* 4(6): 199-208. Yamaguchi, K. and D. Barry. 1974. The culture of *Rhapis* in Japan. *Principes* 18(3): 75-83.

1. *Rhapis excelsa* (Thunberg) Henry ex Rehder, *Journal of the Arnold Arboretum* 11: 153 (1930). (Synonym: *R. flabelliformis* L'Heritier ex Aiton). BAMBOO PALM, LADY PALM. Stems caespitose, 1.5-3(-4.5) m x 2.5-3.5 cm, clothed with coarse, fibrous matting. Leaves divided into (3) 5 to 10 - 12(-20) radiating segments, green (striped yellow or cream in variegated cultivars), the segments narrowly oblong, curved or drooping, to 25-35 x 2.5-8 cm, plaited, minutely serrulate on the margin; petiole obscurely serrate, to 45 cm. Inflorescence 10-15 cm. Fruit globose or oblong, c.7-10 mm.

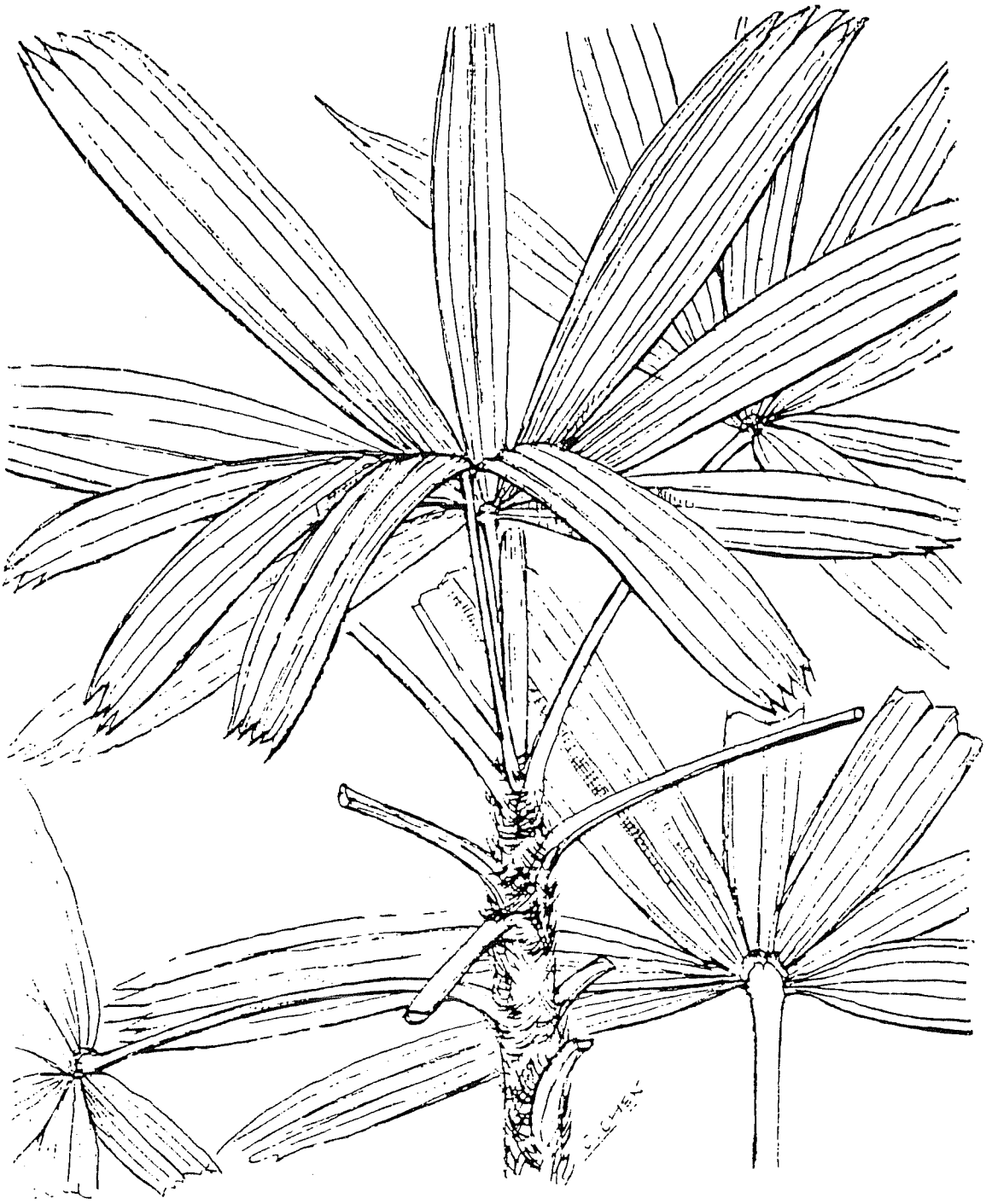


Fig. 227. *Rhapis excelsa* (Arecaceae).

Range: Southern China. Introduced to cultivation in Paramaribo, Surinam in 1924 (Ostendorf, 1962) and currently grown as a hotel decoration in Paramaribo, as well as for an hotel decoration in Cayenne, French Guiana.

Literature: McKamey, L. 1983. Secret of the Orient: Dwarf *Rhapis excelsa*. 52 pp. Gregory, Texas: Rhapis Gardens. McKamey, L. 1989. *Rhapis* palms - cultivated species and varieties: culture and care of the ladies. *Principes* 33(3): 129-139. Zimmermann, M.H. and P.B. Tomlinson. 1965. Anatomy of the palm *Rhapis excelsa*, I. *Journal of the Arnold Arboretum* 46(2): 160-178; II, *op. cit.* 47(3): 248-261 (1966); III, *op. cit.* 47(4): 301-312 (1966).

Rhapis humilis Blume from southern China, with leaf-sheaths finely fibrous and leaves having 9 or more stiffly spreading segments less than 3 cm wide, may be sought in cultivation in the Guianas.

28. *Roystonea* Cook

Plants monoecious, solitary, unarmed. Stems columnar, sometimes swollen at or near the middle, with a crownshaft, smooth, obscurely ringed. Leaves in a terminal crown, pinnate (feather), the pinnae linear-lanceolate, unequally and shallowly bifid at apex. Inflorescence below the leaves (at base of crownshaft), a much-branched panicle; spathes (bracts) 2, deciduous, the outer erect, woody, boat-shaped, enclosing the inflorescence in bud. Flowers in triads (1 female and 2 male flowers in a tight cluster); male flowers with stamens 6-12. Ovary 3-celled, with only 1 functional cell. Fruit a 1-seeded drupe.

Literature: Bailey, L.H. 1935. The royal palms: preliminary survey. *Gentes Herbarum* 3(7): 342-387. Coons, C.C. 1974. General Roy Stone: portrait of a gentleman. *Principes* 18(3): 99-104.

Key to Species

1. Stem tapering upwards from the base in an uninterrupted cylindrical column, to 40 m; inflorescence with very undulate rachillae; pinnae in 2 horizontal ranks, the arrangement giving the leaf a flat appearance 1. *R. oleracea*
1. Stem somewhat swollen and thickest at or near the middle, appearing narrowly or more prominently spindle-shaped, to c.22.5 m or more; inflorescence with straight rachillae; pinnae in 4 ranks, the arrangement giving the leaf a bushy or tousled appearance 2. *R. regia*

1. *Roystonea oleracea* (N. Jacquin) Cook, *Bulletin of the Torrey Botanical Club* 28: 554 (1901). (Synonyms: *R. caribaea* (Sprengel) P. Wilson; including *R. oleracea* var. *excelsior* Bailey). CARIBBEAN ROYAL PALM, ROYAL PALM, CABBAGE PALM; PALMIER ROYAL, PALMISTE (French Guiana); PINA, PALISADE (Surinam). Stem whitish-grey, cylindrical from a swollen base, to 40 m. Leaves to 7 m; pinnae in 2 horizontal ranks, giving the leaf a flat appearance, 50 cm - 1 m x c.5 cm. Inflorescence to 9 dm, with distinctly undulate rachillae; filaments of male flowers usually exceeding the petals. Fruit oblong-ellipsoid or obovoid-oblong, purplish-black when mature, 1.5-2 x 0.8 cm.

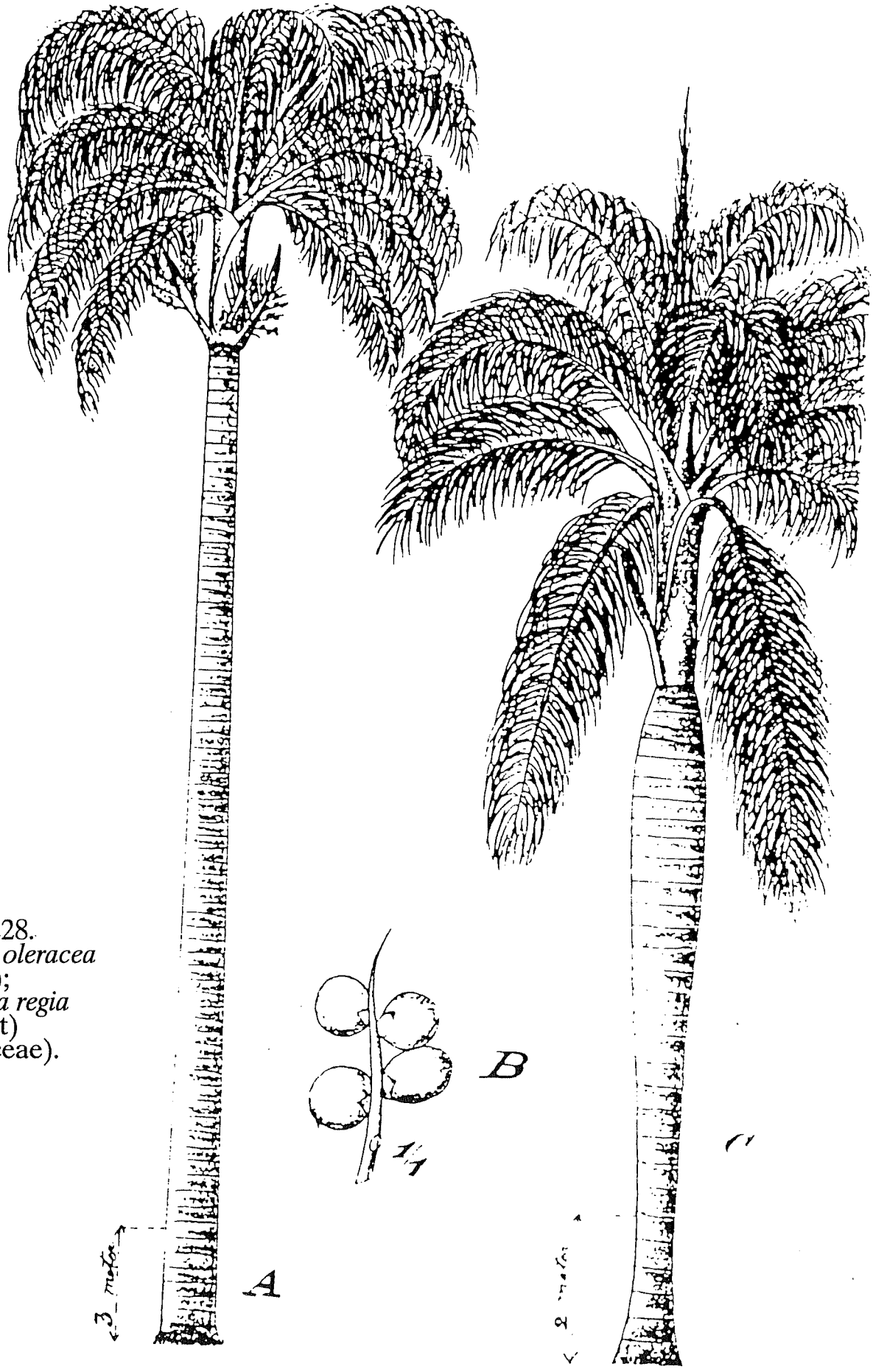


Fig. 228.
Roystonea oleracea
(left);
Roystonea regia
(right)
(Arecaceae).

Fig. 229. Variation in *Roystonea* (Arecaceae).

Range: Lesser Antilles, Trinidad and Tobago, Venezuela. Grown for ornament in the Botanic Gardens and elsewhere in Georgetown, Guyana; in Surinam (Ostendorf, 1962); and in French Guiana.

Literature: Johnson, D. 1981. An early account of palm utilization in Surinam. *Principes* 25(1): 38-39.

2. *Roystonea regia* (Humboldt, Bonpland & Kunth) Cook, *Science* ser.2, 12: 479 (1900). (Synonyms: *R. jenmanii* (Wright) Burret, *Euterpe ventricosa* Wright, *Oreodoxa regia* Humboldt, Bonpland & Kunth). CUBAN ROYAL PALM, ROYAL PALM; KONINGSPALM, PALMIET (Surinam). Stem whitish-grey, somewhat swollen and thickest at or near the middle, to c.22.5 m or more. Leaves to 3 m; pinnae in 4 ranks, giving the leaf a bushy-cylindrical or tousled appearance, to 90 x 2.5-3.7 cm. Inflorescence to 9 dm, with straight rachillae; filaments of male flowers not exceeding the petals. Fruit subglobose to obovoid, dark red to purplish or black, to 1.3 x 1 cm.

Range: Cuba. Grown for ornament at the Botanic Gardens and elsewhere in Georgetown, Guyana, and in the Palmentuin, on hotel and University grounds, and as a street tree (e.g. as an avenue of palms along Maagoenstraat) in Paramaribo, Surinam.

Additional characters sometimes used to separate these species are that *R. oleracea* has essentially oblong fruits and ascending leaves which give the overall crown a nearly flat appearance on the lower side, whereas *R. regia* has essentially round fruits and lower leaves which droop to give the overall crown a nearly globose apppearance.

29. *Scheelea* Karsten

Plants solitary, monoecious, unarmed, sometimes acaulescent. Stems inconspicuously ringed, often appearing only after many years of growth. Leaves in a terminal crown, pinnate (feather), erect or ascending; pinnae 1-ribbed, the middle ones sometimes clustered. Inflorescence among the leaves (axillary), often pendulous, a few-branched panicle with simple rachillae. Spathes (bracts) 2, the upper, or main, bract woody, deeply grooved, beaked, enclosing the inflorescence in bud. Rachillae unisexual or bearing flowers of both sexes in triads; male flowers with stamens 6. Ovary 3- to 7-celled, with 3-7 stigmas. Fruit a usually beaked, 1- to several-seeded drupe with fibrous exocarp, fibrous and pulpy mesocarp, and stony endocarp.

Literature: DeFilipps, R.A. 1987. Carl Wilhelm Scheele, of the palm genus *Scheelea*. *Principes* 31(3): 107-109. Glassman, S.F. 1977. Preliminary taxonomic studies in the palm genus *Scheelea* Karsten. *Phytologia* 37(3): 219-250.

1. *Scheelea osmantha* Barbosa Rodriques, *Plantas Novas Cultivadas no Jardin Botanico do Rio de Janeiro* 4: 24 (1894). (Synonym: *S. urbaniana* Burrett). Plant 10-16 m; stem grey. Leaves erect, to c.5 m; pinnae to 1.2 m x 3-5 cm, cross-veined, the middle pinnae not clustered. Main spathe 2 m or more, woody, deeply grooved. Fruit ellipsoid, to 6.5 x 3.5 cm, dark, the beak 4-7 mm.

Range: Tobago, Trinidad, Venezuela. Grown in the Botanic Gardens of Georgetown, Guyana, and in Paramaribo, Surinam.