Bromeliaceae

Epiphytic or terrestrial. Roots usually present as holdfasts. Leaves spirally arranged, often in a basal rosette or fasciculate, simple, sheathing at the base, entire or spinose-serrate, scaly-lepidote. Inflorescence terminal or lateral, simple or compound, a spike, raceme, panicle, capitulum, or a solitary flower; inflorescence-bracts and flower-bracts usually conspicuous, highly colored. Flowers regular (actinomorphic), mostly bisexual. Sepals 3, free or united. Petals 3, free or united; corolla with or without 2 scale-appendages inside at base. Stamens 6; filaments free, monadelphous, or adnate to corolla. Ovary superior to inferior. Fruit a dry capsule or fleshy berry; sometimes a syncarp (*Ananas*). Seeds naked, winged, or comose.

Literature: GENERAL: Duval, L. 1990. *The Bromeliads*. 154 pp. Pacifica, California: Big Bridge Press. Kramer, J. 1965. *Bromeliads, The Colorful House Plants*. 113 pp. Princeton, New Jersey: D. Van Nostrand Company. Kramer, J. 1981. *Bromeliads*. 179pp. New York: Harper & Row. Padilla, V. 1971. *Bromeliads*. 134 pp. New York: Crown Publishers. Rauh, W. 1979. *Bromeliads for Home, Garden and Greenhouse*. 431pp. Poole, Dorset: Blandford Press. Singer, W. 1963. Bromeliads. *Garden Journal* 13(1): 8-12; 13(2): 57-62; 13(3): 104-108; 13(4): 146- 150. Smith, L.B. and R.J. Downs. 1974. *Flora Neotropica*, Monograph No.14 (Bromeliaceae): Part 1 (Pitcairnioideae), pp.1-658, New York: Hafner Press; Part 2 (Tillandsioideae), pp.663-1492, New York: Hafner Press; Part 3 (Bromelioideae), pp.1493-2142, Bronx, New York: New York Botanical Garden. Weber, W. 1981. Introduction to the taxonomy of the Bromeliaceae. *Journal of the Bromeliad Society* 31(1): 11-17; 31(2): 70-75. Zahl, P.A. 1975. Hidden worlds in the heart of a plant. *National Geographic* 147(3): 388-397. GUIANAS: Gouda, E.J. 1987. *Flora of the Guianas*, Series A, Fascicle 3, 189. Bromeliaceae Subfamily Tillandsioideae. 112pp. Kalmbacher, G. 1973. Trip to Haiti, Guadeloupe, Guyana and again to Trinidad. *Journal of the Bromeliad Society* 23(1): 9-15. Lecoufle, M. 1969. Plant collecting in French Guiana. *Bromeliad Society Bulletin* 19(1): 13-16. Soderstrom, T.R. 1963. Collecting bromeliads in British Guiana. *Bromeliad Society Bulletin* 13(3): 54-60. Wilson, L.F. 1980. Surinam diary. *Journal of the Bromeliad Society* 30(5): 200-213.

Key to Genera

1. Mature seeds unappendaged; fruit berry-like (baccate); ovary inferior or nearly so; leaf margin spinose-serrate; indument almost always of obvious scales; plants often terrestrial.
   2. Flowers laxly arranged in simple or compound inflorescenes; axes wholly visible.
3. Inflorescence simple — 1. *Aechmea*
3. Inflorescence compound.
   4. Filaments fused into a tube (connate) — 5. *Bromelia*
   4. Filaments not connate — 1. *Aechmea*
   2. Flowers in dense spikes or racemes, or in dense compound, often prominently bracteate inflorescences.
5. Inflorescence simple; flowers solitary in the axil of each bract.
   6. Inflorescence with an apical crown of sterile, leaf-like bracts; ovaries fused with each

other and with the fleshy flower-bracts to form a syncarp 2. *Ananas*

6. Inflorescence without apical crown of bracts; ovaries always free from each other 1. *Aechmea*

5. Inflorescence compound, or sometimes pseudo-simple with fascicles of 2 or more flowers concealed by the outermost bracts.

7. Flowers in terete cone-shaped groups, little if at all hidden by the outer bracts; inflorescence obviously compound 1. *Aechmea*

7. Flowers in more or less flattened spikes, racemes or fascicles; inflorescence often pseudosimple with 2 or more flowers concealed beneath large outer bracts.

8. Flowers pedicellate 5. *Bromelia*

8. Flowers sessile or subsessile 1. *Aechmea*

1. Mature seeds mostly appendaged; fruit a capsule; ovary mostly superior, sometimes inferior; leaf margin entire or spinose- serrate.

9. Plants terrestrial; leaf margin spinose-serrate; indument of finely to scarcely divided scales; seed-appendages entire 4. *Brocchinia*

9. Plants mostly epiphytic; leaves entire; indument almost always of obvious radially symmetrical scales; seed-appendages finely divided and forming a coma, always present.

10. Spikes polystichous-flowered 5. *Guzmania*

10. Spikes distichous-flowered 6. *Vriesea*

1. *Aechmea* Ruiz & Pavon

Epiphytic, sometimes terrestrial. Leaves in a basal rosette or cup, ligulate, serrate. Inflorescence a simple or compound spike, raceme, or panicle, with well-developed, bracteate scape; inflorescence-bracts usually prominent; flowers arranged in 2 opposite rows (distichous) or in many ranks or rows (polystichous), bracteate. Sepals free or united (connate), often mucronulate. Petals free, often with 2 basal scales or appendages. Stamens shorter than the petals; anthers dorsifixed. Ovary inferior. Fruit a berry.

Literature: Foster, R. 1957. Blue-berried bromeliads. *Bromeliad Society Bulletin* 7(6): 92-94. Padilla, V. 1962. The cultivated aechmeas. *Bromeliad Society Bulletin* 12(1): 9-14; 12(2): 35-40.

Key to Species

1. Flower-bracts serrulate, pink; flowers polystichous, blue 2. *A. fasciata*

1. Flower-bracts entire, red or orange; flowers distichous, yellow and red 1. *A. chantinii*

1. *Aechmea chantinii* (Carriere) Baker, *Handbook of the Bromeliaceae* 49 (1889). AMAZONIAN ZEBRA PLANT. Epiphytic. Leaves up to 12, ligulate, 40-100 x 6-9 cm, green above, white-banded beneath with silvery-white crossbars, serrulate. Inflorescence a laxly bipinnate, shortly pyramidal panicle; peduncle c.30 cm; scape-bracts bright orange to red. Sepals 1.0-1.2 cm, muticous. Petals yellow and red, c.2 cm.

Range: Colombia, Venezuela, Brazil. Occasionally grown for its horticultural appeal in Guyana.

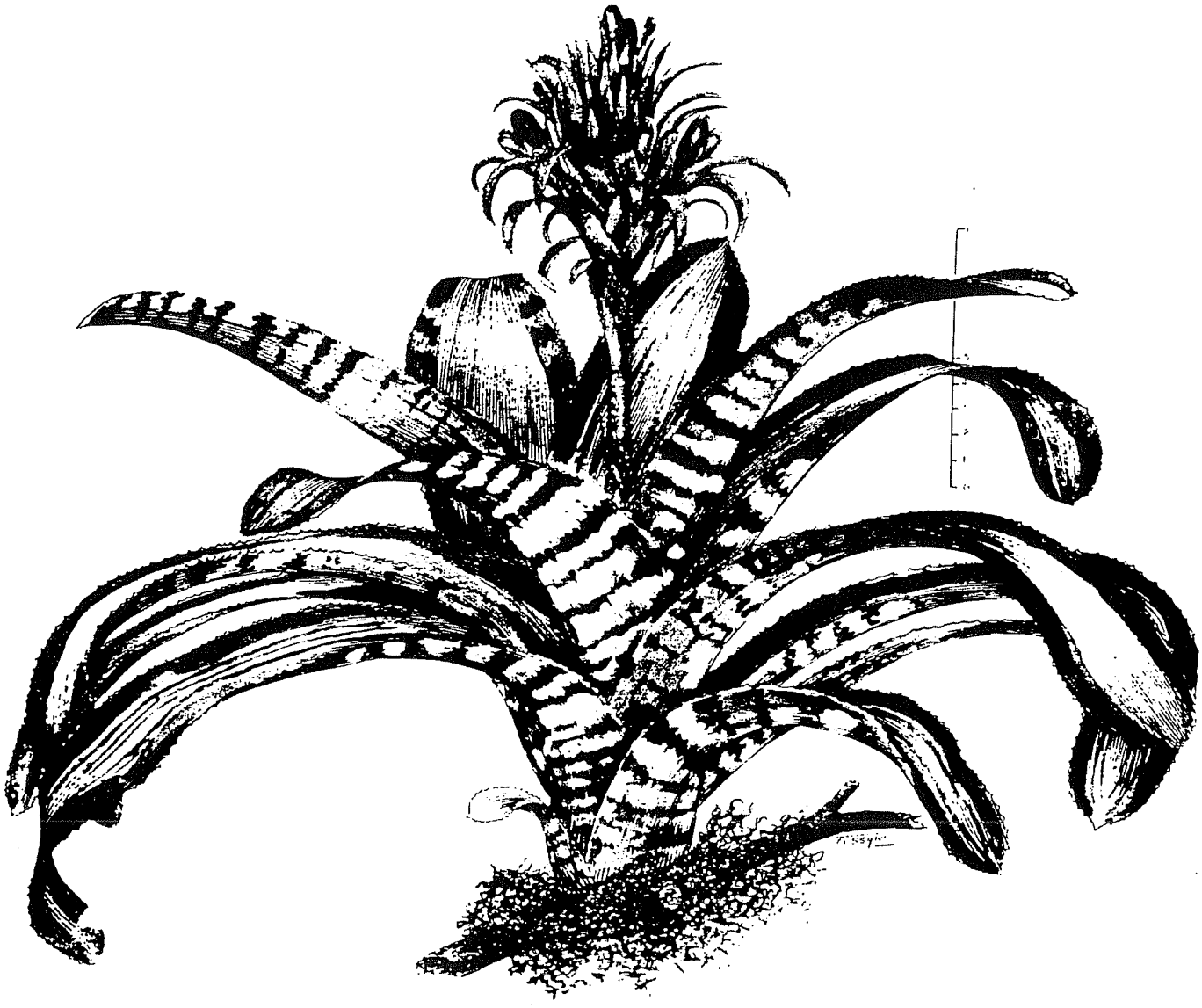


Fig. 230. *Aechmea fasciata* (Bromeliaceae).

Literature: Padilla, V. 1975. *Aechmea chantinii*: a love story. *Journal of the Bromeliad Society* 25(2): 63-65.

Platyachmea fasciata (Lindley) Smith & Kress, Phytologia 69(4): 273 (1990).

2. *Aechmea fasciata* (Lindley) Baker, *Journal of Botany* (London) 17: 231 (1879). PINK TORCH PLANT, SILVER VASE, URN PLANT. Epiphytic. Leaves up to 20 in a rosette, ligulate, 30-100 x 3-8 cm, green, banded and streaked with white or silver beneath, serrate. Inflorescence a dense, conical to pyramidal, compound head of spikes; scape-bracts pink, white-flocculose, serrate. Sepals united at base, 1.0-1.2 cm. Petals pale blue, becoming red, 2.5-3.0 cm.

Syn: Billbergia fasciata Lindley

Range: Rio de Janeiro and the Distrito Federal of Brazil. Recently introduced to cultivation in Guyana at the Botanic Gardens, Georgetown.

Literature: Hahn, E. 1954. Stricter selection of *Aechmea fasciata. Bromeliad Society Bulletin* 4(3): 48-49. Lineham, T.U. 1991. Bromeliad culture, No. 3: *Aechmea fasciata. Journal of the Bromeliad Society* 41(2): 55-57. Padilla, V. 1957. Popular bromeliads around the world, No.4 - Europe. *Aechmea fasciata. Bromeliad Society Bulletin* 7(6): 83-84.

A very desirable bromeliad for the combination of pink inflorescence and white- or grey-banded leaves. It is grown as a pot (terrestrial) plant around the world, and propagated from plantlets which are produced after the flowering of the mother plant.

2. *Ananas* Miller

Terrestrial. Leaves in a basal rosette, long, rigid, serrate with spinose margin. Inflorescence a dense, simple, scapose spike or strobilus, with a crown of sterile foliaceous bracts at the apex. Sepals free. Petals free, each with 2 funnelform scales, reddish or purplish. Ovary inferior. Fruit a compound, ovoid or globose, usually fleshy syncarp (pineapple) from the fused ovaries, proliferous with plantlets at the base.

Literature: Innes, C. 1988. Notes on the genus *Ananas. The Plantsman* 10(1): 30-36. Santiago, A. 1970. Variegated pineapple from Puerto Rico. *Bromeliad Society Bulletin* 20(1): 3-7,24.

Key to Species

1. Flower-bracts large, concealing the apex of the ovaries, imbricated, coarsely serrate, bright red ..... 1. *A. bracteatus*
1. Flower-bracts small, not concealing the apex of the ovaries, not imbricated, finely serrulate, green ..... 2. *A. comosus*

1. *Ananas bracteatus* (Lindley) Schultes fil., in Roemer & Schultes, *Systema Vegetabilium* 7(2): 1286 (1830), var. *tricolor* (Bertoni) L.B. Smith, *Leaflets, Botanical Museum of Harvard University* 7:76 (1939). (Synonym: *A. bracteatus* var. *striatus* M.B. Foster). VARIEGATED WILD PINEAPPLE. Terrestrial. Leaves to c.90 x 4 cm, serrate with prickles, with an apical spine, with broad, longitudinal white stripes. Flower-bracts large, to c.3.5 cm, imbricated, concealing the apex of the ovaries, coarsely serrate, bright

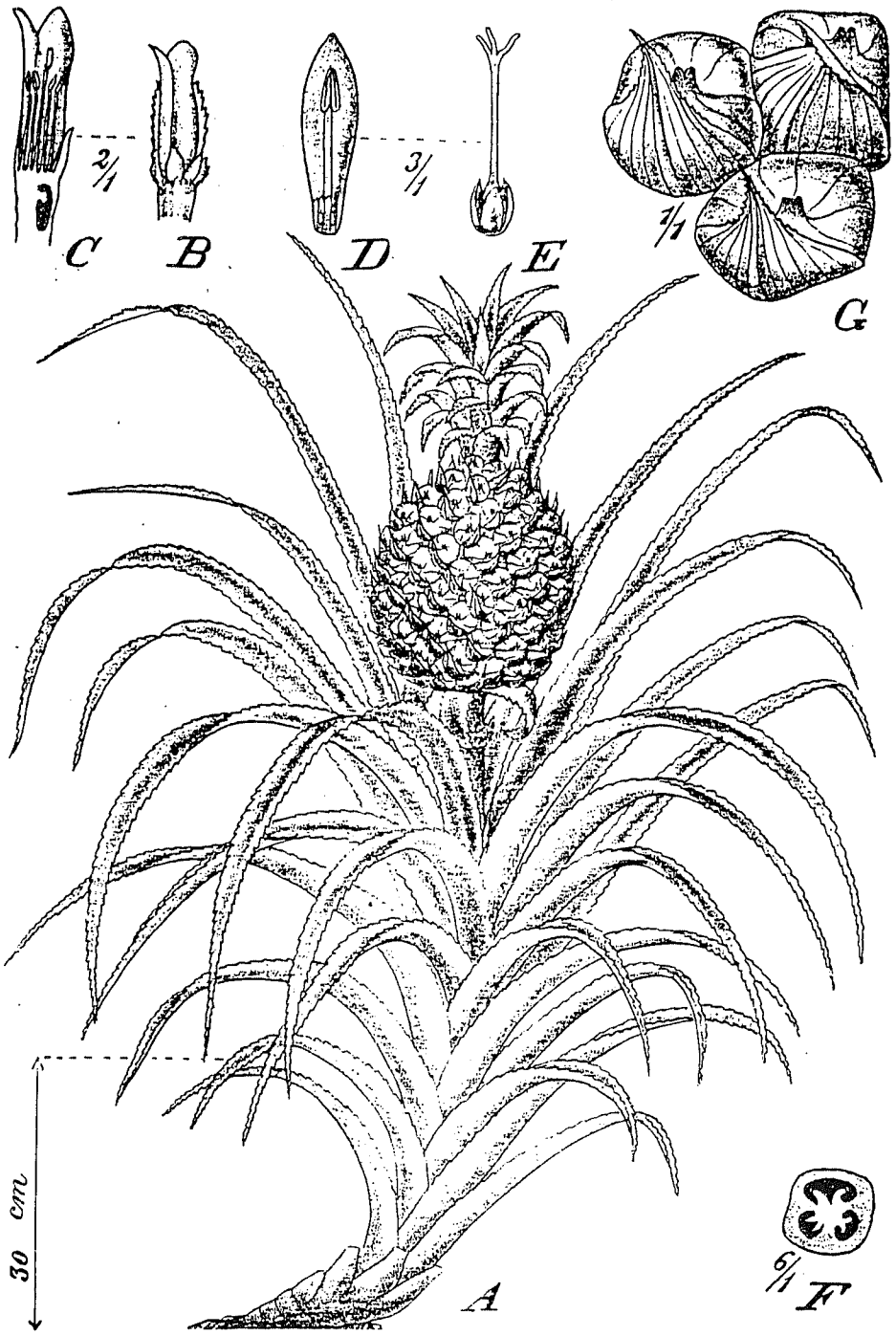


Fig. 231. *Ananas comosus* (Bromeliaceae).

red. Flowers reddish or purplish. Fruit seeded, fleshy, to 15 cm or longer.

Range: Variety *tricolor* arose in cultivation as a mutant with an unknown provenance, and was first detected in Brazil. It is grown to display the showy striped leaves in public places in Guyana.

Literature: Hahn, E. 1958. Variegated pineapples. *Bromeliad Society Bulletin* 8(6): 98.

Typical var. *bracteatus* with all-green leaves occurs in Brazil, Paraguay, and Argentina.

2. *Ananas comosus* (Linneaus) Merrill, *Interpretation of Rumphius' Herbarium Amboinense* 133 (1917), var. *comosus*. (Synonym: *A. sativus* Schultes fil.). ANANAS (Surinam), PINEAPPLE. Terrestrial. Leaves 30-50 in a rosette, to 150 x 5 cm, serrate with prickles, with an apical spine, green. Flower-bracts small and inconspicuous, not imbricated, exposing the apex of the ovaries, serrulate, green. Flowers reddish or purplish. Fruit seedless, fleshy, to 20-30 cm.

Range: Originated in central Brazil. The common pineapple is planted in the ground as an ornamental at the Esther Stichting near Paramaribo, and on hotel grounds in Paramaribo, Surinam, and occasionally in Cayenne, French Guiana.

Literature: Collins, J.L. 1949. History, taxonomy and culture of the pineapple. *Economic Botany* 3(4): 335-359. Collins, J.L. 1951. Notes on the origin, history, and genetic nature of the Cayenne pineapple. *Pacific Science* 5(1): 3-17. Collins, J.L. 1960. *The Pineapple: Botany, Cultivation and Utilization*. 294pp. New York: Interscience, and London: Leonard Hill. Hayward, W. 1956. The pineapple meets the press. *Bromeliad Society Bulletin* 6(3): 35-39. Purseglove, J.W. 1972. *Tropical Crops, Monocotyledons 1*, pp.76-91. New York: John Wiley & Sons.

The smooth-leaved cv. Smooth Cayenne is the widely grown commercial plantation fruit of Hawaii used for canning and juice. A variant with white-striped leaves, *A. comosus* var. *variegatus* (Lowe) Moldenke, has been grown for ornament in Europe and elsewhere since the mid-1800's.

3. *Brocchinia* Schultes fil.

Terrestrial. Plants stemless or trunk-forming. Leaves in a rosette, large, entire, apiculate. Inflorescence a loosely branched, compound panicle; scape large, bracteate. Flower-bracts small, scarious. Flowers pedicellate, small. Petals free, without scales inside. Ovary 1/3- to completely inferior. Fruit a capsule.

Literature: Steyermark, J.A. 1961. *Brocchinia*: genus of the Guayana. *Bromeliad Society Bulletin* 11(3): 35-41. Varadarajan, G.S. 1986. Habitats of *Brocchinia*: a descriptive account. *Journal of the Bromeliad Society* 36(5): 209-216.

1. *Brocchinia micrantha* (Baker) Mez, in Martius, *Flora Brasiliensis* 3(3): 464 (1894). (Synonym: *Cordyline micrantha* Baker). Trunk-forming terrestrial plant to 8 m. Stem attaining 3.6-4.5 m x 1.5-2 dm. Leaf-rosettes at first sessile, then borne at apex of the

unbranched, lengthening trunk. Leaves numerous, broadly elliptical or ligulate, acute, entire, 80-120 x 12-20 cm. Inflorescence c.2 m, many-flowered, glabrous, erect from center of the leaf-rosette, with branches pendulous at the tips. Flower-bracts minute. Flowers whitish; sepals 3 mm; petals unguiculate, 4 mm. Ovary 3/4 inferior. Fruit 8 mm.

Range: Venezuela and Guyana. Utilized as a landscape plant on building grounds in the Kaieteur Falls area, Guyana.

Literature: Aristeguieta, L. 1961. *Brocchinia micrantha* (Baker) Mez. *Bromeliad Society Bulletin* 11(3): 41-42. Smith, L. and R. Smith. 1972. Bromeliads of the Lost World. *Journal of the Bromeliad Society* 22(6): 139-143.

The genus name commemorates Giovanni Brocchi, an Italian geologist (born 1772 in Bassano, Italy; died 1826 in Khartoum, Sudan) who was professor of botany and director of the Brescia botanic garden as of 1802. While seldom introduced to cultivation in the tropics (cf. Aristeguieta, 1961), this plant seems deserving of more attempts to propagate it as a specimen planting of gigantic proportions in acid, well-aerated soil. The arborescent habit and large rosette of entire leaves caused J.G. Baker to initially present it to the scientific world as a "*Fourcroya*-like" plant in the genus *Cordyline*.

4. *Bromelia* Linnaeus

Terrestrial. Stem usually absent. Leaves in a basal rosette, rigid, spinose-serrate. Inflorescence a sessile or scapose, dense head, panicle or corymb; scape-bracts often bright red. Sepals free or united. Petals united at base, free above. Stamens included inside flower, forming a filament-tube. Ovary inferior. Fruit a large, succulent berry.

Key to Species

1. Scape well-developed; inflorescence a cylindrical head, longer than wide 1. *B.alta*
1. Scape absent; inflorescence a dense corymb, wider than long, sessile in the center of the leaf-rosette 2. *B. plumieri*

1. *Bromelia alta* L.B. Smith, *Acta Botanica Neerlandica* 5: 91 (1956). BOESI-NANASI, BOSANANAS, KAROEADA, KOERAWA, OKELI, SINGRASI (Surinam). Terrestrial. Leaves 300-400 x c.7 cm, rigid, linear, numerous in a large rosette, pale-lepidote beneath, laxly serrate with spines c.6 mm. Inflorescence a densely cylindrical head, c.27 x 7 cm; scape prominent. Flowers pink to purplish; sepals 2-2.4 cm; petals c.2.7 cm. Fruit c.2 cm.

Range: Surinam. A large clump of this fence-bromeliad is grown as a specimen planting on an ornamental plant farm near Timehri, Guyana.

2. *Bromelia plumieri* (E. Morren) L.B. Smith, *Phytologia* 15(3): 173 (1967). (Synonym: *B. karatas* sensu auth., non Linnaeus). ANARIKI, BOSANANAS (Surinam). Terrestrial, forming clumps to 3 m wide. Leaves 150-300 x 3-5 cm, rigid, linear, numerous in a large rosette, pale-lepidote beneath, densely serrate with spines 5-8 mm. Inflorescence a sessile, dense corymb-panicle, in the center of reddish inner rosette-leaves; flower-bracts membranaceous, densely scaly-lepidote. Flowers pink to purplish; sepals c.3 cm; petals c.4

cm. Fruit c.8 cm.

Range: Mexico, West Indies, and northern South America, including the three Guianas. Occasionally utilized as a fencing plant in French Guiana (Lecoufle, 1969).

Literature: Lecoufle, M. 1969. Plant collecting in French Guiana. *Bromeliad Society Bulletin* 19(1): 13-16.

L.B. Smith, in *Phytologia* 15(3): 173 (1967), notes that "this common widespread species...has always gone under the name of *Bromelia karatas* L.", but due to technicalities the correct name must be accepted as *B. plumieri*. A fine photograph of this species, accompanied by Mrs. Lecoufle and taken near Cayenne, French Guiana, appears in Lecoufle (1969) and is reprinted in Padilla, V., *Bromeliads*, p.43 (1973); the latter states that ripe fruits of this plant are made into a drink, and the plant is sometimes employed as a living fence or protective barrier along property lines.

5. *Guzmania* Ruiz & Pavon

Epiphytic or terrestrial. Leaves in a basal rosette, entire, stiff, shining. Inflorescence scapose, a terminal, mostly bipinnate, fascicle, panicle or corymb of polystichous spikes; scape-bracts showy. Flowers white or yellowish. Petals united, without scales. Sepals free or united. Ovary superior. Fruit a capsule. Seeds plumose.

Literature: Kent, J. 1982. *Guzmania* culture can be easy. *Journal of the Bromeliad Society* 32(1): 25-27. Padilla, V. 1963. The cultivated guzmanias. *Bromeliad Society Bulletin* 13(2): 34-43.

1. *Guzmania lingulata* (Linnaeus) Mez, in A. & C. De Candolle, *Monographiae Phanerogamarum* 9: 899 (1896). BOOM-ANANAS (Surinam); ANANAS SAUVAGE (French Guiana). Epiphytic. Leaves ligulate, to c.45 x 4 cm. Inflorescence a scapose, corymbiform raceme. Outer scape-bracts broadly lanceolate, bright red or pink, much larger than the reduced, hooded, orange-red, yellow-tipped inner bracts, and forming collectively an involucre surrounding the flowers. Flower-bracts linear, shorter than the flowers. Flowers white, to c.4.5 cm.

Range: West Indies to northern South America, including the three Guianas. Introduced to cultivation in Guyana at the Botanic Gardens, Georgetown and occasionally elsewhere.

Literature: Padilla, V. 1979. *Guzmania lingulata. Journal of the Bromeliad Society* 29(2): 51.

6. *Vriesea* Lindley

Epiphytic, rarely terrestrial. Leaves in a basal rosette, entire, rigid. Inflorescence usually a simple, distichous-flowered spike, sometimes of polystichous-flowered spikes or a panicle. Flower-bracts conspicuous. Sepals free or nearly free, symmetrical or subsymmetrical. Petals free or united, with 2 basal scales inside. Ovary superior. Fruit a

Fig. 232. *Vriesea splendens* (Bromeliaceae).

capsule. Seeds with basal coma of hairs.

1. *Vriesea splendens* (Brongniart) Lemaire, *Flore des Serres* 6: 162 (fig.) (1850-1851), var. *splendens*. FLAMING SWORD. Epiphytic. Leaves ligulate, green, with dark brown horizontal cross-bands, to 75 x 6.5 cm. Inflorescence a simple, strongly flattened, narrowly lanceolate or oblong, many-flowered spike, to c.55 x 6 cm. Flower-bracts imbricate, distichous, keeled, bright red or orange, 6-8 cm. Petals yellow; scales large.

Range: Venezuela to the three Guianas. Grown as an ornamental in French Guiana (de Granville, 1985).

Literature: Lecoufle, M. 1967. Early illustrations of *Vriesea splendens. Bromeliad Society Bulletin* 17(3): 64-66.

Cannaceae

Characteristics of the sole genus *Canna*.

1. *Canna* Linnaeus

Perennials from enlarged rhizomes. Stems simple, leafy. Leaves alternate or subopposite, simple, entire, with sheathing petioles. Inflorescence a terminal raceme or few-branched panicle; flowers subtended by bract and bracteole. Flowers bisexual, irregular (asymmetrical); sepals and petals 3; sepals persistent at apex of fruit; petals united in a tube at the base. Fertile stamen 1, comprising one-half anther at the side of petaloid structure; sterile stamens (staminodes) 1-4, petaloid, the lower (inner) one often curved to form a lip. Ovary inferior, 3-celled. Fruit a loculicidal, papillose capsule; seeds numerous, not arillate.

Literature: Segeren, W. and P.J.M. Maas. 1971. The genus *Canna* in northern South America. *Acta Botanica Neerlandica* 20: 663-680.

Key to Species

1. Flowers showy, the outer staminodes broadly obovate, more than 5 cm wide, colored red, yellow, cream, orange, or salmon ..... 1. *C.* x *generalis*
1. Flowers not obviously showy, the outer staminodes linear to narrowly spathulate or oblanceolate, to 1.5 cm wide, red ..... 2. *C. indica*

1. *Canna* x *generalis* L.H. Bailey, *Gentes Herbarum* 1(3): 120 (1923). CANNA, GARDEN CANNA. Plant to c.2 m. Flowers to 10 cm wide. Outer staminodes (the showy parts of the flower) of various bright colors, broadly obovate, to 5 cm or more wide; lip spotted or not.

Range: Of artificial hybrid origin, and thus without a natural geographical range. Grown in gardens along roads and avenues in Georgetown, Guyana, and as an ornamental street planting and on university grounds in Paramaribo, Surinam.

2. *Canna indica* Linnaeus, *Species Plantarum* 1 (1753). (Synonym: *C. coccinea* Miller).

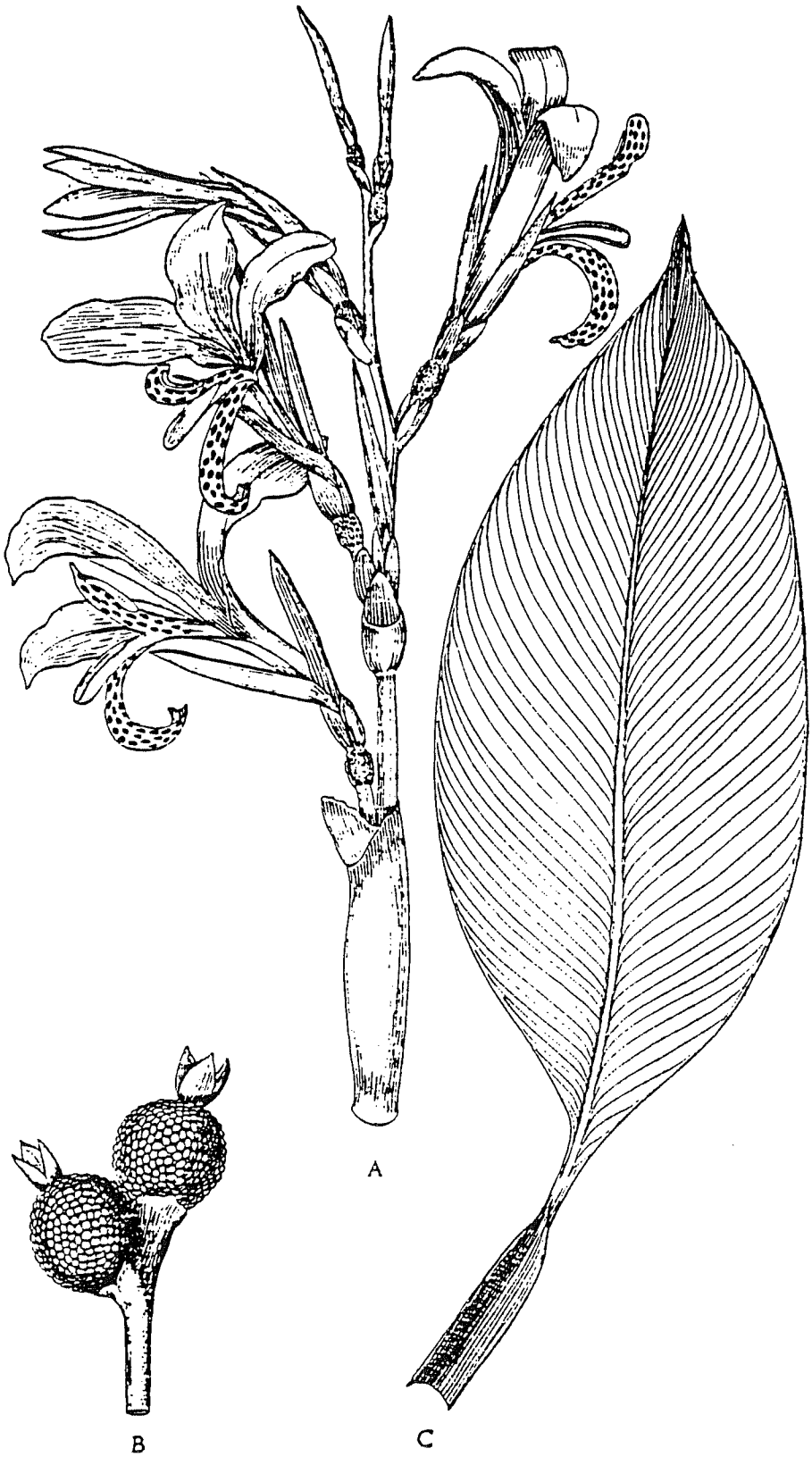


Fig. 233. *Canna indica* (Cannaceae).

INDIAN SHOT; KREKRERE, SAKKA, SAKKA SIRIE (Surinam). Plant to 3.5 m. Flowers less than 10 cm wide. Outer staminodes (the showy parts of the flower) red, linear to narrowly spathulate or oblanceolate, to 1.5 cm wide; lip spotted or not.

Range: Tropical America, including the three Guianas. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, in gardens of Paramaribo, Surinam, and in French Guiana.

Literature: SECAB. 1990. *Canna indica. Especies Vegetales Promisorias* 4: 5-59.

Commelinaceae

Perennial or annual herbs, sometimes acaulescent. Stem often semi-succulent, swollen and/or rooting at the nodes, creeping to erect or ascending. Leaves alternate or basal, simple, entire, sheathing at the base. Inflorescence terminal and/or axillary, of 1-to several-flowered, sessile or pedunculate, alternate, paired or whorled cincinni (coiled cymes), each often subtended by inconspicuous to conspicuous bracts. Flowers bisexual or male, rarely female, regular or irregular; sepals 3, free or united below; petals 3, free or united below, equal or unequal. Stamens 0-6, free or slightly epipetalous, all fertile or some staminodial; filaments often hairy. Ovary superior, 2- or 3-celled. Fruit a dehiscent capsule, rarely indehiscent, rarely a fleshy berry.

Key to Genera

1. Cincinnus-bracts and petals inconspicuous; stamens 0-6 — 1. *Callisia*
1. Cincinnus-bracts and petals conspicuous; stamens 6 — 2. *Tradescantia*

1. *Callisia* Loefling

Perennial, creeping to ascending herbs. Stems simple or branched. Leaves spirally arranged or 2-ranked. Inflorescences axillary or terminal, of sessile or pedicellate, paired cincinni. Flowers bisexual or female, regular; sepals 3; petals 3; stamens (0-) 3-6, free, with filaments glabrous or rarely bearded. Ovary 2- or 3-celled, with (1-) 2 ovules per cell; style filiform, stigma usually resembling a brush. Fruit a small capsule.

1. *Callisia repens* Linnaeus, *Species Plantarum* ed.2, 62 (1762). TURTLE VINE. Stems creeping, thin, often matted, rooting at the nodes, to 1.8 m. Leaves 2-ranked, ovate, ciliate, to 2.5(-4) x 2 cm; leaf-sheath striped, ciliate at the apex. Flowers in sessile, dense clusters, 2-3 mm; sepals green; petals white. Stamens 0 or 3-6. Ovary 2-celled, pubescent at apex. Fruit c. 1.5 mm; seeds brown, wrinkled.

Range: West Indies; Texas (U.S.A.) south to South America (Argentina), including French Guiana. Grown as a hanging basket ornamental on hotel premises in Georgetown, Guyana; and as a ground cover on museum grounds in Paramaribo, Surinam.

Literature: Moore, H.E. 1958. *Callisia elegans*, a new species, with notes on the genus. *Baileya* 6(3): 135-147.

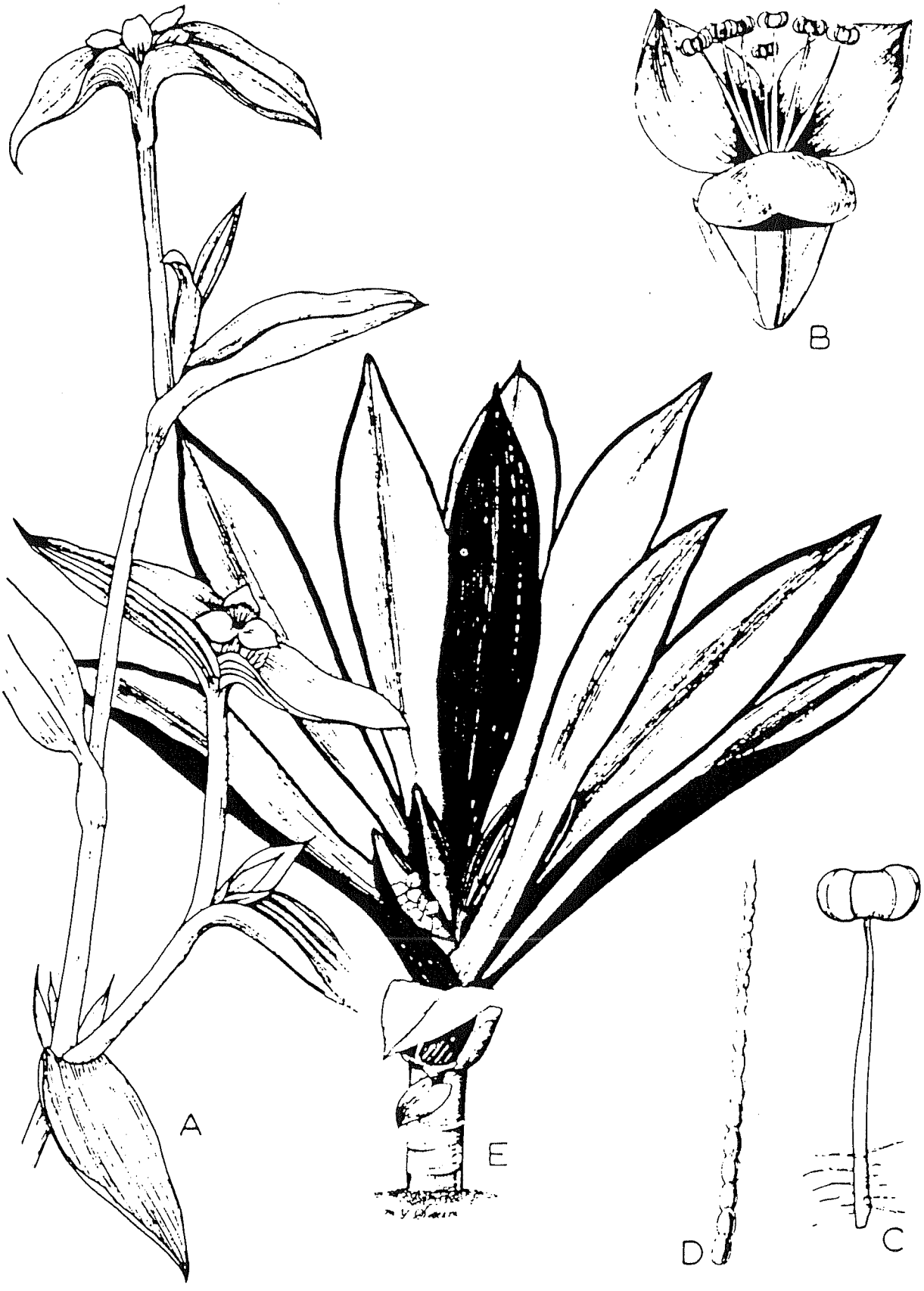


Fig. 234. *Tradescantia pallida* cv. Purpurea (left); *Tradescantia spathacea* (right) (Commelinaceae).

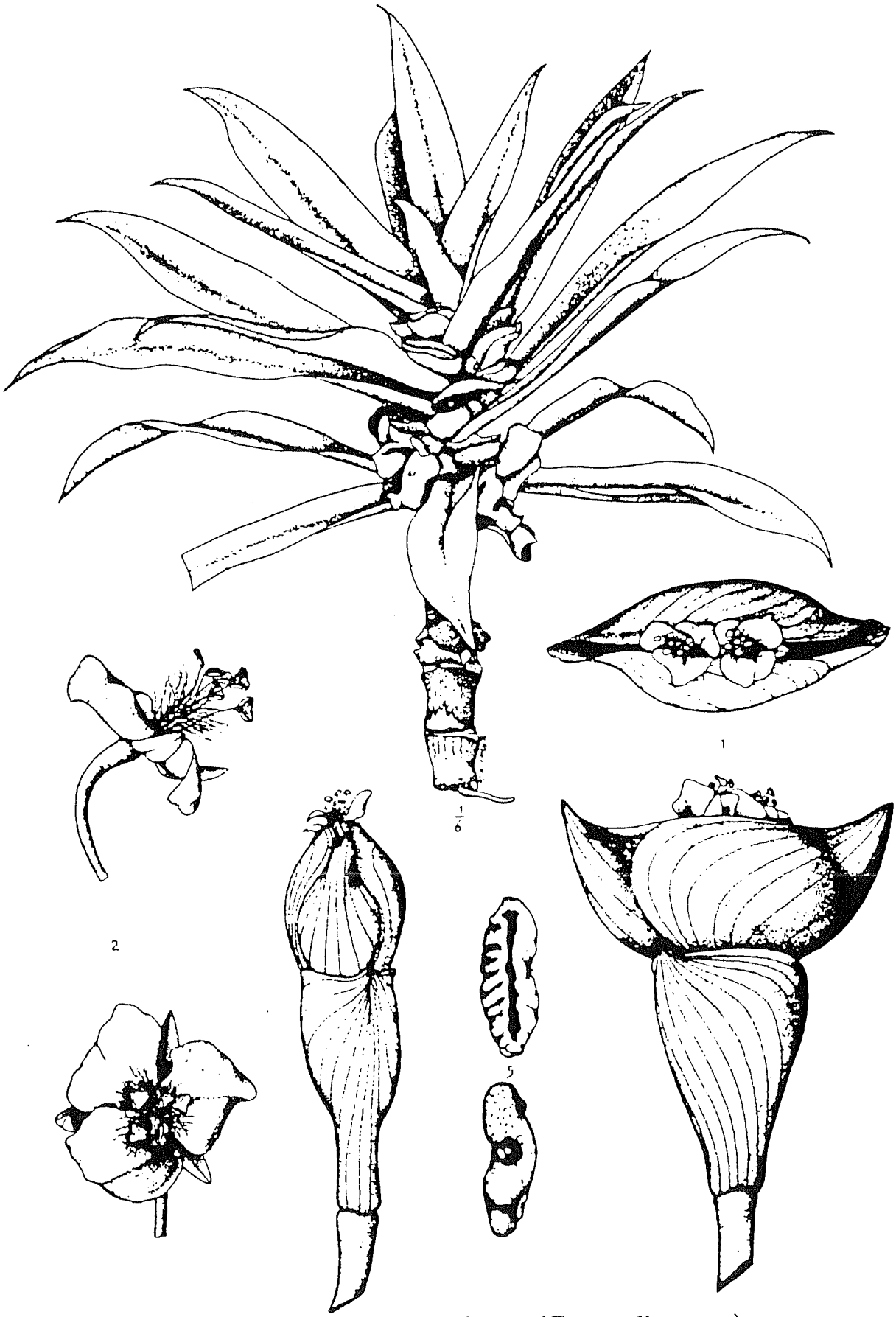


Fig. 235. *Tradescantia spathacea* (Commelinaceae).

2. *Tradescantia* Linnaeus

Perennial, acaulescent to creeping or ascending herbs. Stems simple or branched. Leaves sheathing the stem at the base, often somewhat succulent. Inflorescences axillary or terminal, of paired cymes subtended by large bracts similar to the leaves or strongly differentiated from them. Flowers bisexual, regular; sepals 3; petals 3, sometimes united at the base; stamens 6, epipetalous, with filaments often hairy. Ovary 3-celled, with 1 or 2 ovules per cell. Fruit a small capsule.

Key to Species

1. Leaves overlapping, crowded in a basal rosette; stem absent or up to 20 cm; inflorescence axillary; bracts forming a boat-shaped involucre, strongly differentiated from the leaves; petals free, white 2. *T. spathacea*
1. Leaves distant, not in a basal rosette; stem present, to 40 cm or more; inflorescence terminal or leaf-opposed; bracts not forming a boat-shaped involucre, similar to the leaves but smaller; petals united basally, pink or purplish.
   2. Leaves completely violet-purple, narrowly oblong-lanceolate, to 16 cm; plant erect or ascending (or becoming decumbent) 1. *T. pallida*
   2. Leaves purple beneath, and green or purple, overlain with 2 bands of white or silver above, ovate or ovate-oblong, to 10 cm (usually shorter); plant creeping or pendent 3. *T. zebrina*

1. *Tradescantia pallida* (Rose) D.R. Hunt, *Kew Bulletin* 30(3): 452 (1975), cv. Purpurea. (Synonyms: *Setcreasea purpurea* Boom; *S. pallida* Rose, cv. Purple Heart). PURPLE HEART. Plants deep violet-purple. Leaves succulent, narrowly oblong-lanceolate, to 16 x 3.5 cm, sparsely pilose above, glabrous beneath, the margin ciliate or pilose. Inflorescence composed of long-pedunculate, terminal and leaf-opposed pairs of cincinni; inflorescence-bracts unequal, to 4 cm. Petals violet-purple or pink.

Range: Of cultivated origin; typical green plants occur in eastern Mexico. The purple variant is grown as an ornamental in the Botanic Gardens, Georgetown, Guyana; on museum grounds and in Flustraat roadside plantings in Paramaribo, Surinam; and at the Jardin Botanique, Cayenne, French Guiana.

Literature: Hermann, F.J. 1957. The correct name for *Setcreasea* "tampicana". *Baileya* 5(4): 149-151.

2. *Tradescantia spathacea* Swartz, *Nova Genera et Species Plantarum seu Prodromus* 57 (1788). (Synonyms: *Rhoeo discolor* (L'Heritier) Hance, *R. spathacea* (Swartz) Stearn). OESTERPLANT (Surinam); BOAT LILY, MOSES IN A CRADLE, OYSTER PLANT. Plants developing an erect stem to 20 x 2.5 cm. Leaves somewhat leathery, broadly linear to narrowly lanceolate, to 45 x 7.5 cm, green above, purple beneath. Inflorescences of axillary, shortly peduncled, crowded pairs of cincinni, each pair subtended and nearly concealed by a pair of boat-shaped bracts; inflorescence-bracts to c.4.5 cm. Petals white. Ovule and seed one per cell.

Range: Southern Mexico, Belize, Guatemala and West Indies. Cultivated as an indoor

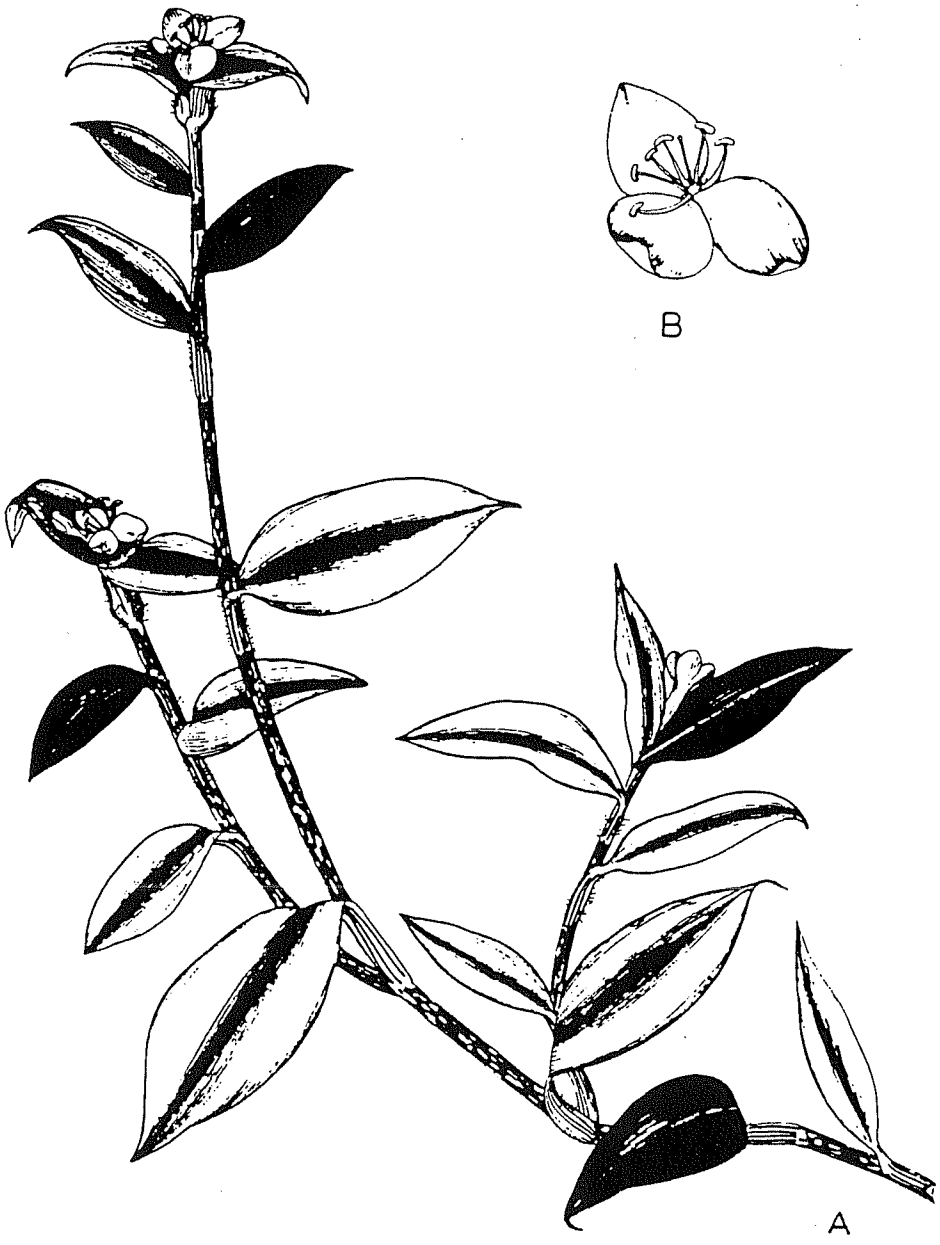


Fig. 236. *Tradescantia zebrina* (Commelinaceae).

Fig. 237. *Costus speciosus* (Costaceae).

and outdoor ornamental in Georgetown and elsewhere in Guyana; near Kwattaweg and on museum grounds, at the Palmentuin and at a waterfront monument along the Surinam River in Paramaribo, Surinam; and in Cayenne, French Guiana, where it has become sparingly naturalized as an epiphyte on large trees fronting the Montabo Hotel.

A variant with longitudinal yellow stripes upon the green upper leaf-surface is cv. Vittata (Synonyms: *Rhoeo spathacea* f. *variegata* (Hooker) Stehle, *R. spathacea* cv. Variegata, *R. spathacaea* cv. Vittata), which is grown at the Botanic Gardens, Georgetown, Guyana.

Literature: Hunt, D.R. 1986. *Campelia, Rhoeo* and *Zebrina* united with *Tradescantia*. American Commelinaceae: XIII. *Kew Bulletin* 41(2): 401-405. Stearn, W.T. 1957. The boat-lily (*Rhoeo spathacea*). *Baileya* 5(4): 195-198.

3. *Tradescantia zebrina* Hort. ex Bosse, *Vollständiges Handbuch der Blumengärtnerei* 4: 655 (1849). (Synonyms: *T. pendula* (Schnizlein) D.R. Hunt, *Zebrina pendula* Schnizlein). WANDERING JEW. Plants decumbent or pendent, rooting at the nodes. Leaves 2-ranked, ovate-oblong or narrowly ovate, 5-7 (- 10) x 2-3 (-3.5) cm, green or purple and striped or banded with white or silver above, purplish beneath. Inflorescence of pedunculate, terminal, paired cincinni, subtended by a pair of unequal bracts, the outer 2-5 cm, the inner 1-2 cm. Petals rose-pink.

Range: Neotropics (original range uncertain). Grown as an ornamental in the Promenade Gardens and Botanic Gardens, Georgetown, Guyana; as a bedding plant on grounds of the Esther Stichting near Paramaribo, Surinam; and on hotel premises in Cayenne, French Guiana.

Costaceae

Perennials from tuberous rhizomes. Stems sometimes branched. Leaves spirally arranged; sheaths closed, tubular. Inflorescence a usually terminal spike, sometimes capitate with numerous imbricated bracts. Flowers bisexual, bilaterally symmetrical (zygomorphic); perianth-segments 6, the outer 3 united, the inner 3 united, petaloid, showy. Fertile stamen 1, petaloid, exserted, the anther attached to middle of the corolla-tube; sterile stamens (staminodes) absent. Ovary inferior, 3-celled. Fruit a loculicidal capsule; seeds numerous, arillate.

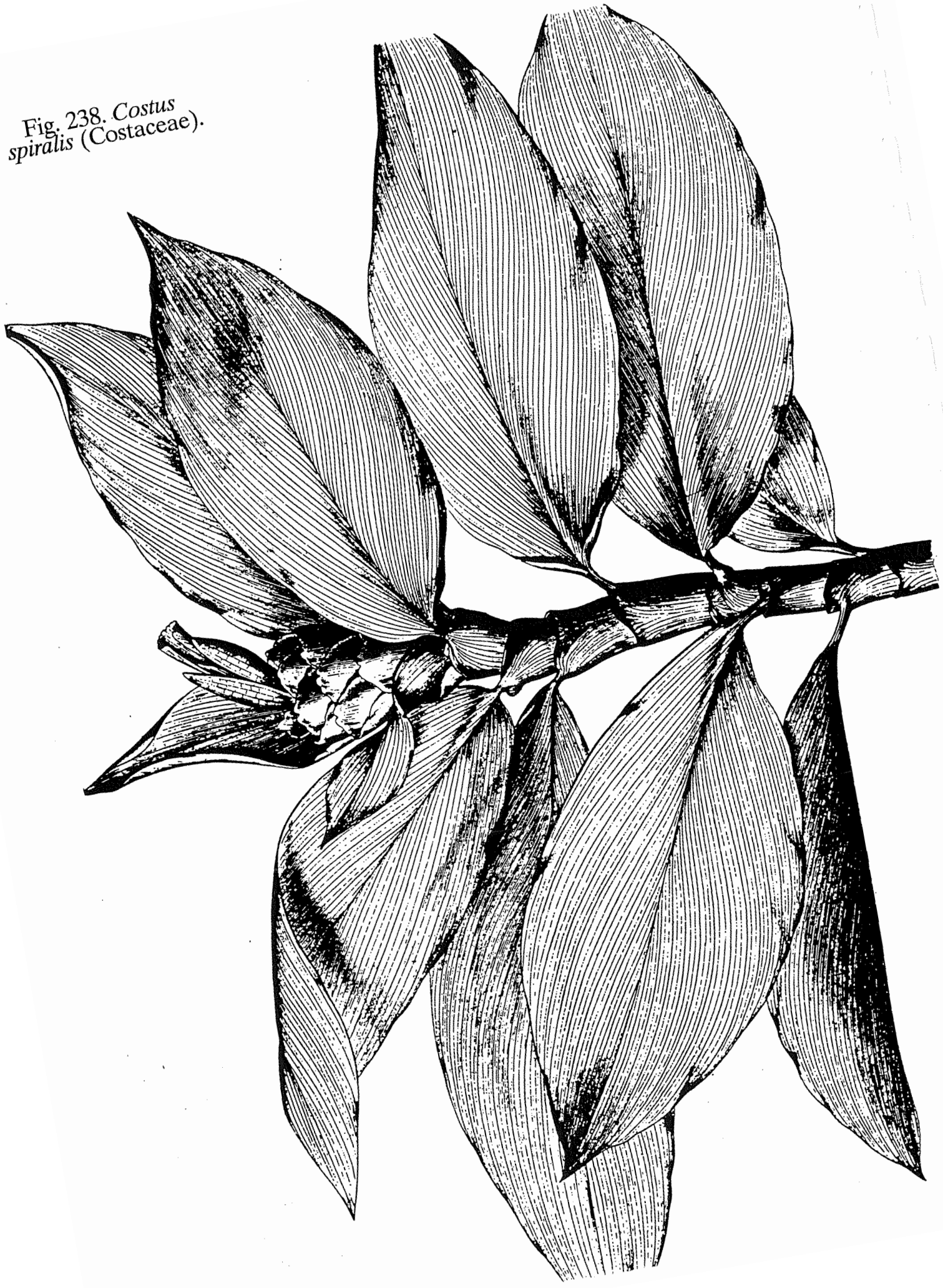
1. *Costus* Linnaeus

Rhizomatous perennials. Leaves simple, spirally arranged. Inflorescence a dense spike, often cone-like, terminal on the stem; bracts imbricate. Flowers showy. Corolla tubular, cleft, with a central enlarged bell-shaped, petaloid staminode. Fertile stamen 1. Seeds black; aril large, lacerate, white.

Key to Species

1. Flowers white with yellow or orange center, to 9 cm wide; inflorescence-bracts spine-tipped 1. *C. speciosus*

Fig. 238. *Costus spiralis* (Costaceae).



1. Flowers pinkish-red, to 2.5 cm wide; inflorescence-bracts not spine-tipped 2. *C. spiralis*

1. *Costus speciosus* (J. Koenig) J.E. Smith, *Transactions of the Linnean Society of London* 1: 249 (1800). CREPE GINGER, SPIRAL FLAG, SPIRAL GINGER. Plant to 3 m, rhizomatous. Leaves oblong or oblanceolate, glabrous or pubescent, to 25 x 8 cm. Inflorescence an ovoid spike to 12.5 cm; bracts spine-tipped. Flowers white with yellow or orange center, irregularly toothed on margin, 6.5-9 cm wide.

Range: Southeast Asia and East Indies. Occasionally grown as an ornamental in gardens of Paramaribo, Surinam.

2. *Costus spiralis* (Jacquin) Roscoe, *Transactions of the Linnean Society of London* 8: 350 (1807). SCARLET SPIRAL FLAG. Plant to 3.5 m, rhizomatous. Leaves narrowly elliptical to obovate-oblong, glabrous or pubescent, to 43 x 14 cm. Inflorescence an ovoid spike to 6 cm; bracts not spine-tipped. Flowers pinkish-red, irregularly toothed on margin, to 2.5 cm wide.

Range: Venezuela, Brazil and the three Guianas. Cultivated at the Botanic Gardens, Georgetown, Guyana, and occasionally planted in dooryard gardens in Cayenne, French Guiana.

Cyclanthaceae

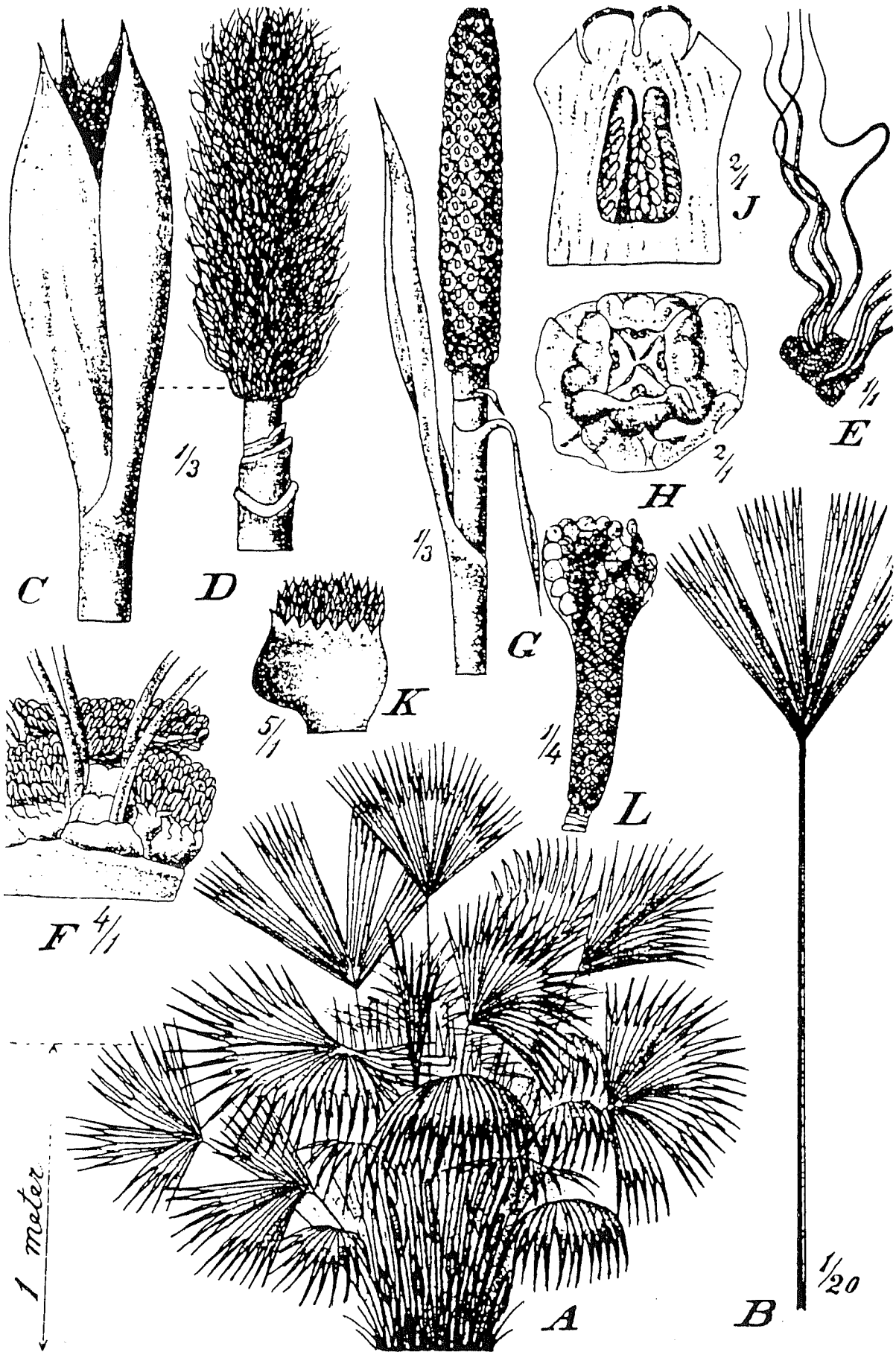
Monoecious, with the leaves resembling palms (Arecaceae) but the plants often herbaceous, perennial. Stems absent or short. Leaves sheathing at the base, petiolate. Male and female flowers in spirals or whorls of one, or alternatingly both, sexes, or in tightly clustered groupings of 4 male surrounding one female flower. Inflorescence a compact spike subtended by 2 or more bracts (spathes), the spathes foliaceous. Perianth of 4-24 (male) or 4 (female) segments, sometimes in a toothed or lobed cup, or absent. Male flowers with numerous stamens; female flowers often with very elongated staminodes. Ovary inferior, 1-celled, of 4 carpels. Fruit of aggregated, succulent berries; seeds numerous.

1. *Carludovica* Ruiz & Pavon

Plants sometimes forming a short stem from leaf bases. Leaves fan-shaped, deeply parted, plaited. Male and female flowers alternating spirally to form individually square units comprising 1 female surrounded by 4 male flowers. Spike with 3-4 bracts. Male flowers with 15-20 perianth-segments. Female flowers sunk in inflorescence axis. Fruits crowded into dense heads.

1. *Carludovica palmata* Ruiz & Pavon, *Systema Vegetabilium Florae Peruvianae et Chilensis* 291 (1798). HOEDESTRO PALM (Surinam), PANAMA HAT PLANT. Plant to 4.5 m, caespitose, sometimes developing a short stem. Petioles terete, glabrous, to 3.5 m; leaf-blades (3-) 4 (5-) -parted, the segments wedge-shaped, plaited, irregularly toothed, often nodding at the tips. Inflorescence c.30 cm. Staminodes of female flowers filiform, wavy, 4-6 cm. Individual fruit a quadrangular berry with yellowish-orange pulp; seeds white.

Fig. 239. *Carludovica palmata* (Cyclanthaceae).



Range: Central and South America, from Guatemala to Bolivia. Grown as an ornamental in the Promenade Gardens, Georgetown, Guyana, and as an outdoor planting on Torarica hotel grounds and elsewhere in Paramaribo, as well as in Old Site Town and Leysweg gardens in Surinam.

In Ecuador, and to a lesser extent in other countries, the unopened leaf-blades are cut in strips, boiled, dried, bleached, and then woven into "Panama" hats. Such an industry existed in Surinam from 1913-1950, but succumbed to foreign competition (Ostendorf, 1962).

Cyperaceae

Rhizomatous, perennial grasslike herbs, often caespitose. Stems (culms) solid, often triangular. Leaves 3-ranked, linear, with closed sheaths. Inflorescence capitate to umbellate, sometimes compound or decompound. Flowers (florets) unisexual or bisexual, 2-ranked or spirally arranged, in spikelets, subtended by one scale per floret. Perianth of bristles or absent. Stamens 1-3. Ovary superior, 1-celled; stigmas 2-3. Fruit a 1-seeded trigonous (triangular) or lenticular (plano-convex) achene.

1. *Cyperus* Linnaeus

Stems often leafy near base and subscapose. Inflorescence a terminal head to compound umbel, with basally bracteate peduncles (rays) bearing spikes or clusters of spikes. Spikelets compressed; scales of florets distichous, keeled; bristles absent; rachilla not articulate at base of each scale. Florets bisexual; stamens usually 3. Style 2- or 3-branched, without tubercle at the base. Achene trigonous or lenticular.

1. *Cyperus alternifolius* Linnaeus, *Mantissa Plantarum* 28 (1767). (Synonym: *C. involucratus* Rottboel). UMBRELLA PLANT. Plant caespitose from a short rhizome, leafless, the basal sheaths on stem having blade 5-50 (-100) mm. Stems to 1(-1.9) m x 2 cm (at base), obtusely triangular. Involucral bracts subtending the inflorescence 12-28, scabrid, 15-40 x 0.1 -1.5 cm, held in a flat, spreading posture. Inflorescence decompound, of 14-32 primary rays, each with 8-15 spikelets at apex. Spikelets 6- to 30-flowered, compressed, 5-10 x 1.5-2 mm; scales ovate, pale brown. Stamens 3. Achene trigonous, brown.

Range: Africa, including Madagascar. Grown as an ornamental on museum grounds and occasionally in streetside gardens in Paramaribo, at fountains of CELOS buildings at Leysweg, and near dooryard at Old Site Town, Surinam; and in damp areas on hotel and similar grounds in Cayenne and Isle Royale, French Guiana.

Literature: Baijnath, H. 1975. A study of *Cyperus alternifolius* L. sens. lat. (Cyperaceae). *Kew Bulletin* 30(3): 521-526. Kukkonen, I. 1990. On the nomenclatural problems of *Cyperus alternifolius*. *Annales Botanici Fennici* 27: 59-66.

Heliconiaceae

Characteristics of the sole genus *Heliconia*.

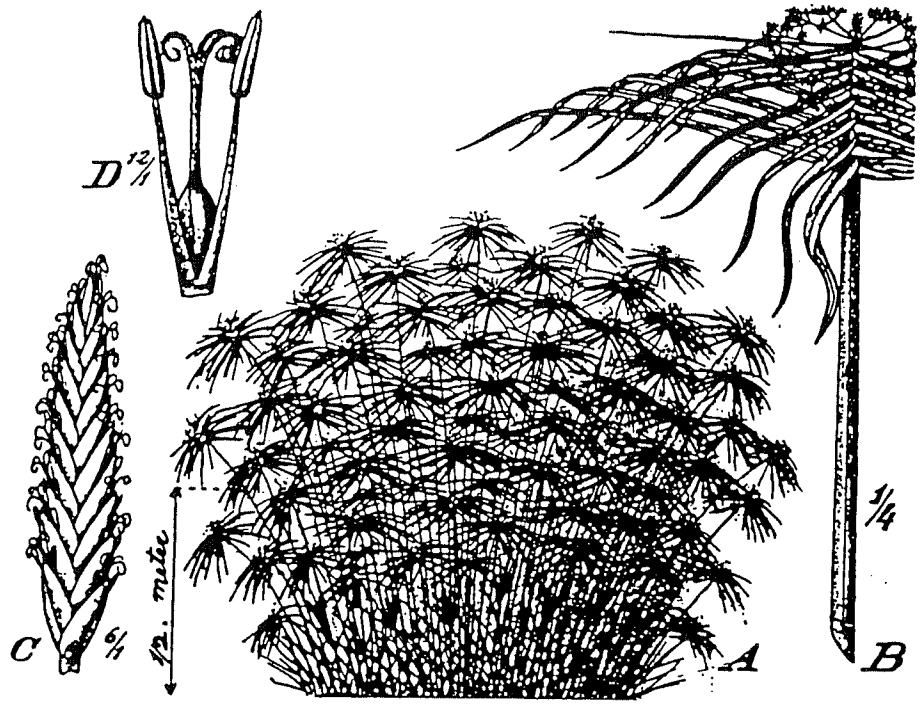


Fig. 229. **Cyperus alternifolius** Linn. — *A* Habitus; *B* Blütenstand; *C* Blütenährchen; *D* Blüte (Original Herb. Hort. Bot. Bog.). — Kds., Exkflora I. 193.

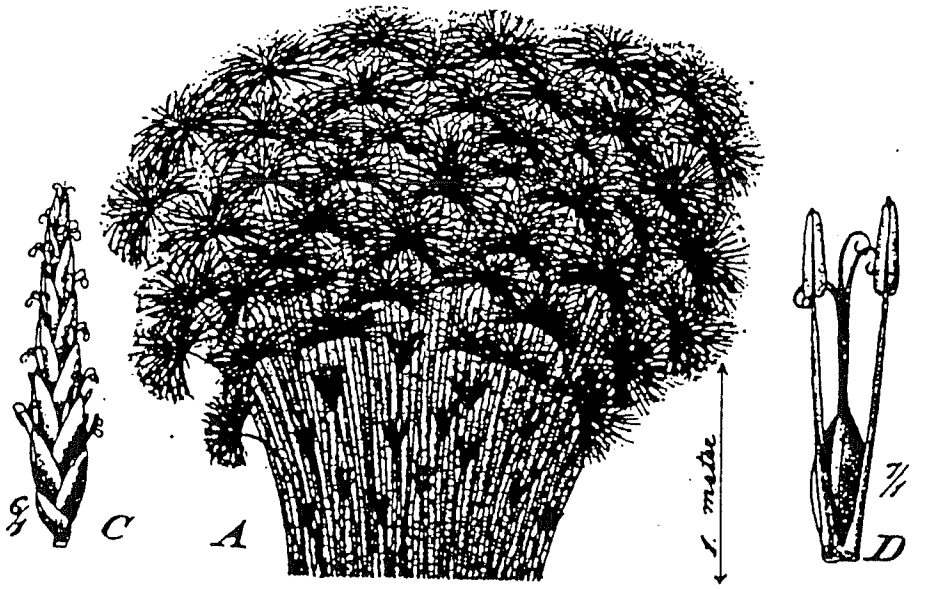


Fig. 230. **Cyperus papyrus** Linn. — *A* Habitus; *B* Stengel; *C* Blütenährchen; *D* Blüte (Original Hort. Bog.). — Kds., Nachträge.

Fig. 240. *Cyperus involucratus* (above), compared to *Cyperus papyrus* (below) (Cyperaceae).

1. *Heliconia* Linnaeus

Perennial herbs from sympodial rhizomes, acaulescent or with unbranched stems. Leaves distichous, simple, entire (rarely cut), sessile to long-petiolate. Inflorescence a terminal spike, erect or pendulous, the flowers in cincinni in axils of bracts; bracts distichous or spirally arranged, colorful and showy, large, keeled; bracteoles of flowers small. Flowers bisexual, irregular (zygomorphic); sepals 3; petals 3, united in a short tube; fertile stamens 5. Ovary inferior, 3-celled. Fruit a 1- to 3-seeded drupe; seeds not arillate.

Literature: Andersson, L. 1981. Revision of *Heliconia* Sect. *Heliconia* (Musaceae). *Nordic Journal of Botany* 1(6): 759-784. Berry, F. and W.J. Kress. 1991. *Heliconia - An Identification Guide*. 334 pp. Washington, D.C.: Smithsonian Institution Press. Maas, P.J.M. 1985. 192.Musaceae, in Görts-van-Rijn, A.R.A., ed., *Flora of the Guianas*. Königstein, Germany: Koeltz Scientific Books (*Heliconia*, pp.2-21). Watson, J.B. 1986. Heliconias: a new challenge for landscape design. *Fairchild Tropical Garden Bulletin* 41(1): 6-19. Huiswoud, R.R. 1988. Workshop Abstract: Notes on *Heliconia* production in Suriname - status, problems and perspectives. *Heliconia Society International Bulletin* 3(4): 10-11. Ramsaroop, B. 1988. Abstract: Heliconias of Guyana. *Heliconia Society International Bulletin* 3(4): 1-3.

Key to Species

1. Mature leaves torn to the midvein into many segments; bracts chartaceous when dry (papery or tissue-like texture) 4. *H. chartacea*
1. Mature leaves entire; bracts not chartaceous.
   2. Inflorescence pendulous; bracts spreading or reflexed.
3. Bracts spreading, red on the side, yellow at apex, with greenish margin 10. *H. rostrata*
3. Bracts reflexed, red with yellow margin 7. *H. marginata*
   2. Inflorescence erect; bracts erect to horizontal.
   4. Leaves sessile or with petiole to 4 mm 5. *H. hirsuta*
   4. Leaves petiolate, the petiole at least 1 cm.
5. Bracts shallowly to moderately boat-shaped, 0.2-2.8 (-3) cm wide; flowers orange or yellow.
   6. Bracts spirally arranged 6. *H. latispatha*
   6. Bracts alternate.
7. Bracts with inrolled margin; basal bract sometimes with a well-developed apical blade 11. *H. spathocircinata*
7. Bracts without inrolled margin; bracts without apical blade.
   8. Two lowermost bracts (1.3-) 1.5-2.3 cm wide, red, obtuse; flowers slightly curved, 4.5-5 cm 8. *H.* x *nickeriensis*
   8. Two lowermost bracts 0.4-0.7 (-0.8) cm wide, orange, often acute; flowers straight, 2.8-4 (-5) cm.
9. Flowers with a green spot near apex 9. *H. psittacorum*
9. Flowers without spot or sometimes white-tipped 1. *H. acuminata*
5. Bracts deeply boat-shaped, 2.8-4.5 cm wide; flowers whitish or greenish.
   10. Bracts not overlapping, or overlapping at base only; bracteoles decaying into a fibrous mass 2. *H. bihai*
   10. Bracts overlapping for most of their length; bracteoles not decaying into a fibrous

mass.

11. Ventral sepals densely villous along margin; perianth distally white for more that 2 mm; staminode usually less that 1 mm wide 12. *H. stricta*
11. Ventral sepals glabrous or subglabrous; perianth dark green at apex or the white apical portion very short; staminode usually more than 1 mm wide.
    12. Bracts red or yellow, with yellow margin 3. *H. caribaea*
    12. Bracts with yellowish-green background, red patch in upper two-thirds, and green margin 13. *H. wagneriana*

1. *Heliconia acuminata* L.C. Richard in A. Richard, *De Musaceis* t. 11-12 (1831). Plants to 1.5 (-3) m. Petiole to 45 cm; leaf-blade to 60 x 12 cm. Inflorescence erect, 10-23 cm; peduncle to 60 cm; bracts 3-7, red or pink. Flowers yellow to green.

Range: South America, including the three Guianas. Grown as an ornamental in Guyana (Ramsaroop, 1988).

Literature: Berry, F. 1991. A small *Heliconia* valuable for pot culture. *Heliconia Society International Bulletin* 5(2): 4.

2. *Heliconia bihai* (Linnaeus) Linnaeus, *Mantissa Plantarum* 2: 211 (1771). BALISIER. Plants 2-5 m. Petiole to 1 m; leaf-blade 50-100 x 20-45 cm. Inflorescence erect, 30-70 cm; peduncle to 5 cm; bracts 5-12 (-15), red on the sides, yellow on the keel, yellow and/or green on the margin. Flowers white below, pale green above.

Range: Jamaica, Hispaniola, Lesser Antilles and northern South America, including the three Guianas. Grown as an ornamental in the Promenade Gardens, Georgetown, and elsewhere in Guyana; and in Surinam (Ostendorf, 1962).

Ramsaroop (1988) reports the cultivars Napi Bihai, Napi Yellow, Timehri Bihai and Cocoa Bihai as under cultivation in Guyana.

3. *Heliconia caribaea* Lamarck, *Encyclopedie Methodique. Botanique* 1: 426 (1783). Plants to 6 m. Petiole to 2 m; leaf-blade to 1 m (or more) x 35 cm. Inflorescence erect, 40-60 cm; peduncle short; bracts 6-15, deeply boat-shaped, overlapping at the base, red or yellow, with yellow margin. Flowers green or greenish-yellow.

Range: West Indies. Grown as an ornamental in the sierplanten area of the Cultuurtuin, on hotel grounds, and for cut flowers in Paramaribo, Surinam.

4. *Heliconia chartacea* Lane ex Barreiros, *Revista Brasileira de Biologia* 32(2): 205 (1972). Plants 3-5 m. Petiole 30-100 cm; leaf-blade 50-150 x 19-35 cm. Inflorescence pendulous, 30-45 cm; peduncle 6-25 cm; bracts 9-16, dark red to pinkish on the sides, green on the margin. Flowers green.

Range: Northern South America, including the three Guianas. Grown for ornament on private grounds near Timehri, and elsewhere in Guyana, and used for cut flowers ("cuts") in Guyana. Ramsaroop (1988) reports the cv. Maroon Chartacea (Marisa), which is the same

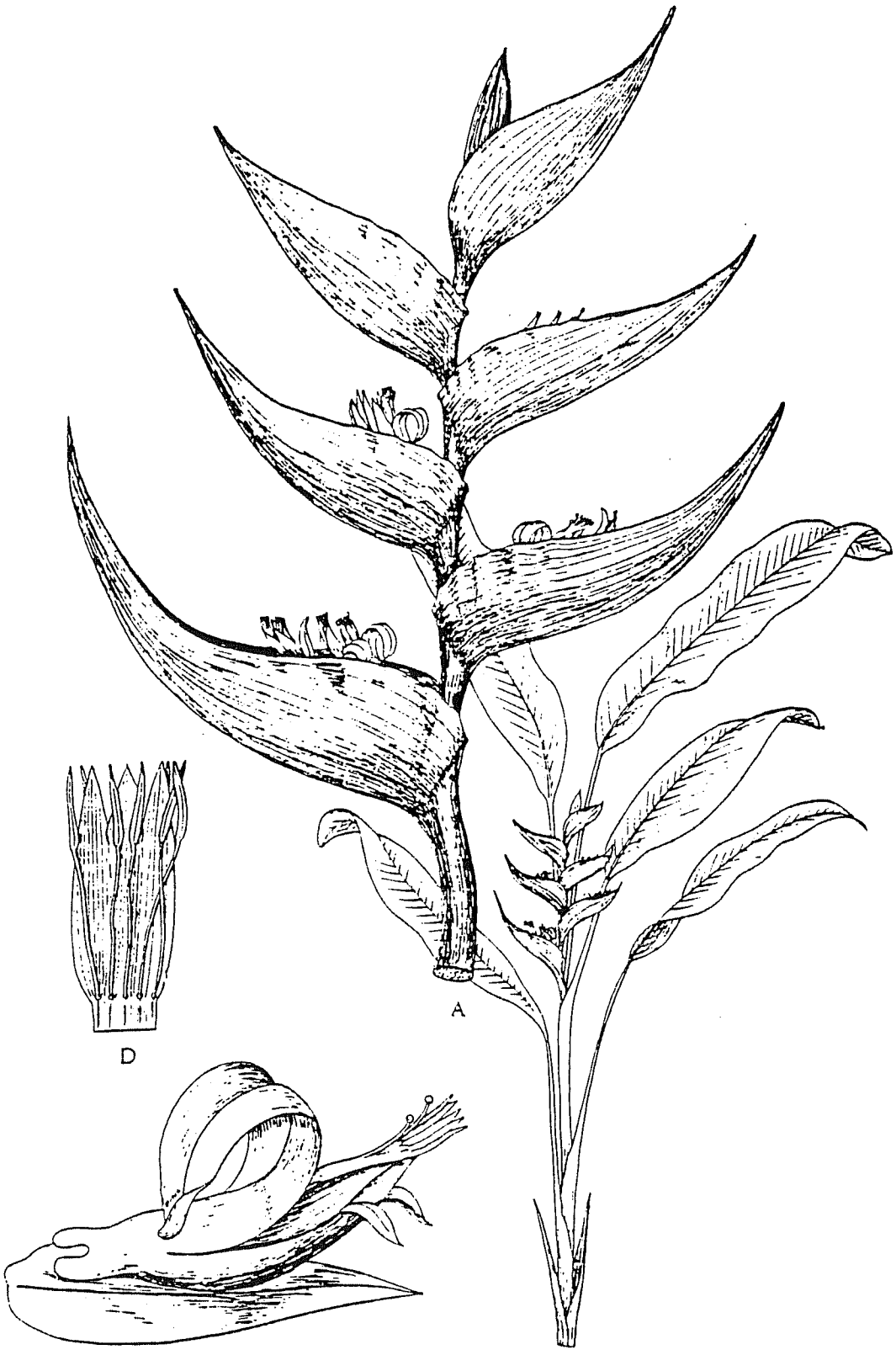


Fig. 241. *Heliconia bihai* (Heliconiaceae).

as cv. Sexy Scarlet, as grown in Guyana.

5. *Heliconia hirsuta* Linnaeus fil., *Supplementum Plantarum* 158 (1781). Plants to 3 m. Petiole absent or to 4 mm; leaf-blade to 32 x 12 cm. Inflorescence erect, 6-13 cm; peduncle to 32 cm; bracts 4-7, pubescent below, orange to red. Flowers orange with dark green apex.

Range: West Indies, Central and South America, including the three Guianas. The cv. Peach Hirsuta is grown as an ornamental in Guyana (Ramsaroop, 1988).

6. *Heliconia latispatha* Bentham, *The Botany of the Voyage of H.M.S. Sulphur* 170 (1844). Plants to 4 m. Petiole to 65 cm; leaf-blade to 150 x 30 cm. Inflorescence erect, twisted, to 40 cm; peduncle absent or to 40 cm; bracts to 10-20, spirally arranged, remote, yellowish-green, orange or dark red. Flowers yellow.

Range: Central portion of South America. Grown and cut for the ornamental inflorescence in Paramaribo, Surinam.

7. *Heliconia marginata* (Griggs) Pittier, *Manual de las Plantas Usuales de Venezuela* 299 (1926). Plants to 4 m. Petiole to 65 cm; leaf-blade to 110 x 27 cm. Inflorescence pendent, to 28 cm; peduncle to 50 cm; rachis flexuous; bracts 9-10, shallowly boat-shaped, reflexed, red with yellow margin. Flowers yellow.

Range: Central and South America, including Guyana and Surinam. Grown as an ornamental in Guyana (Ramsaroop, 1988) and in Paramaribo, Surinam (Maas, 1985).

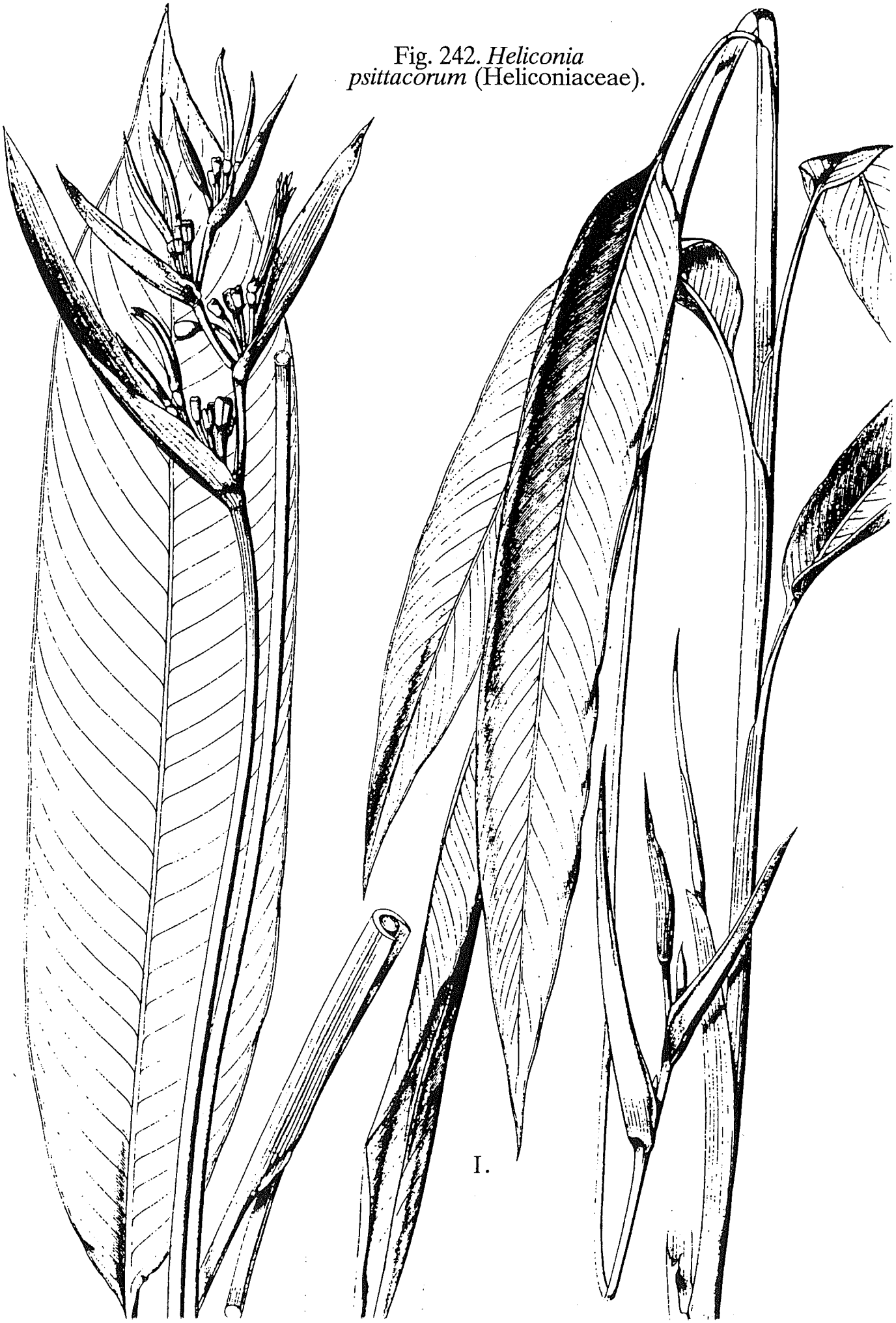
8. *Heliconia* x *nickeriensis* Maas & de Rooij, *Acta Botanica Neerlandica* 28(1): 91 (1979). Plants 1-3(4) m. Petiole 22-60 cm; leaf-blade 40-82 x 9-16 cm. Inflorescence erect, 10-20 cm; peduncle 35-50 cm; bracts 3-7, red on the sides, yellow on the margin and apex. Flowers orange to yellowish-orange or orange-red.

Range: Guyana (Berbice and Essequibo districts) and Surinam (Distrikt Nickerie). Grown as an ornamental in the Berbice Canje area, Guyana (Ramsaroop, 1988); the cv. Suriname Red is grown in Surinam (Huiswoud, 1988). According to Huiswoud, this species is probably a natural cross between *H. psittacorum* and *H. marginata*.

9. *Heliconia psittacorum* Linnaeus fil., *Supplementum Plantarum* 158 (1781). FOWL-FOOT (Guyana); PARROT'S TONGUE, PARROT FLOWER; KULEWAKO ANURU (Surinamese Carib); PAPEGAAIETONG, PAPEGAYBEK (Surinamese Dutch); POPOKAI-TONGO (Surinamese Creole); PETIT BALISIER (French Guiana). Plants to 2 m, often shorter. Petiole 1-25 cm; leaf-blade 40-55(-60) x 1.3-10(-12) cm. Inflorescence erect, 6-10 cm; peduncle 15-55 cm; bracts 2-5(-6), commonly orange-red throughout. Flowers orange, with a greenish spot near apex.

Range: Lesser Antilles and South America, including the three Guianas. Cultivated for ornament commercially, for use as cut flowers, near Timehri and elsewhere in Guyana; planted for ornament in garden rows and on hotel grounds in Paramaribo, as well as in a garden at the Esther Stichting near Paramaribo, Surinam; and grown for ornament in Cayenne and Isle Royale, French Guiana.

Fig. 242. *Heliconia psittacorum* (Heliconiaceae).



I.

Literature: Donselman, H. and T.K. Broschat. 1986. Heliconias for South Florida. *Fairchild Tropical Garden Bulletin* 41(1): 20-23.

In nature, *H. psittacorum* typically has flame-orange bracts, which may vary in certain populations from orange to red or pink, or from shades of cream-yellow to pure yellow. Unusual variants selected from the wild by Mr. Adrian Thompson of Georgetown, Guyana, for propagation and hybridization as cut flower subjects, include plants with long (to 15 cm) bracts red below and orange above; and with bracts greenish-yellow outside, with the inside red in the upper two-thirds and yellow in the lower one-third.

Mr. Boyo Ramsaroop of Double B Exotic Farms near Timehri, Guyana grows approximately 20 color forms (cultivars) of this species, such as Burgundy Red, five shades of pink, including Double B Pink, as well as Yellow Torch, Golden Torch and the Double B Gold.

Heliconia cv. Golden Torch (Synonyms: *H.* cv. Yellow Bird, *H.* cv. Parrot), a sterile, naturally occurring hybrid probably between *H. psittacorum* and *H. spathocircinata*, resembles the former but has larger, yellow-orange bracts and produces fewer inflorescences; it probably originated in Guyana, and has been introduced into cultivation at the Botanic Gardens, Georgetown.

10. *Heliconia rostrata* Ruiz & Pavon, *Flora Peruviana et Chilensis* 3: 71, t.305 (1802). Plants 2-5 m. Petiole to c.50 cm; leaf-blade to 200 x 40 cm. Inflorescence pendulous, 30-60 cm; bracts 15-35, red on the side, yellow at the apex, greenish on the margin. Flowers pale to bright yellow, often with greenish apex.

Range: Argentina to Colombia. Grown as an ornamental on private grounds near Timehri, and elsewhere in Guyana (Ramsaroop, 1988), and planted in yard near Billiton Bauxite plant in the vicinity of Waterland, Surinam.

11. *Heliconia spathocircinata* Aristeguieta, *El Genero Heliconia en Venezuela*, species 14 (1961). Plants to 3 m. Petiole to 90 cm; leaf-blade to 130 x 28 cm. Inflorescence erect, 11-40 cm; peduncle to 25 cm; bracts 5-10, the margin and apex inrolled or recurved, red with whitish punctation, the basal bract sometimes with a well-developed lamina. Flowers yellow.

Range: Central and South America, including the three Guianas. Grown as an ornamental in Guyana (Ramsaroop, 1988).

12. *Heliconia stricta* Huber, *Boletim Museu Paraense Historia Natural* 4: 543 (1906). Plants 1.5-4 m. Petiole 20-75 cm; leaf-blade 40-190 x 12-33 cm. Inflorescence erect, 20-42 cm; peduncle absent to 8.5 cm; bracts 3-8(-10), red or orange on the side, yellowish on keel and margin, green on the margin. Flowers white below and at the very tip, with bright green central zone.

Range: Western South America to Amazonian Brazil and northwestern Surinam. The cultivars Mabura Stricta and Bucky are grown as an ornamental in Guyana (Ramsaroop,

1988).

13. *Heliconia wagneriana* Petersen in Martius, *Flora Brasiliensis* 3(3): 13 (1890). Plant to 4 m. Petiole to c.45 cm; leaf-blade 50-150 x 20-130 cm. Inflorescence erect, 25-45 cm; peduncle absent; bracts 6-13(-20), red or orange on the sides, yellowish on the keel (on lower spathes), and green on the margin, i.e. the bracts with yellowish-green background or base color, and red patch in upper two-thirds, and green margin. Flowers white below and at the very tip, with bright green central zone.

Range: Central America and Colombia. Grown as an ornamental on a private farm near Timehri, and elsewhere in Guyana (Ramsaroop, 1988); and for cut flowers in Paramaribo, Surinam.

Literature: Daniels, G.S. and F.G. Stiles. 1979. The *Heliconia* taxa of Costa Rica: keys and descriptions. *Brenesia* 15: Supplement, 1-150. Seifert, R.P. 1975. Clumps of *Heliconia* inflorescences as ecological islands. *Ecology* 56(6): 1416-1422. Seifert, R.P. 1982. Neotropical *Heliconia* insect communities. *Quarterly Review of Biology* 57: 1-28. Skutch, A.F. 1933. The aquatic flowers of a terrestrial plant, *Heliconia bihai* L. *American Journal of Botany* 20(8): 535-544.

Hypoxidaceae

Perennial herbs from tuberous rhizomes or corms. Stems absent or nearly so. Leaves mostly basal, often pubescent, linear and grasslike to elliptical, parallel-veined, the veins sometimes in plicate folds of the leaf. Inflorescence a solitary flower, spike, raceme or racemiform capitulum, sessile or scapose. Flowers bisexual, regular; perianth-segments 6, often somewhat hairy on back, free or united below in a short tube; lobes spreading. Stamens 6. Ovary inferior, 3-celled; ovules numerous per cell. Fruit a capsule or berry; seeds small, black, rough.

1. *Curculigo* Gaertner

Herbs from tuberous rhizomes. Leaves petiolate, wide, plicately veined, glabous or pubescent. Flowers 1-bracteate, borne at or near the ground in dense racemiform heads (capitula). Ovary beaked. Fruit a berry-like (fleshy) capsule.

1. *Curculigo latifolia* Dryander ex Aiton, *Hortus Kewensis* ed.2, 2: 253 (1811). DJAMBEAN (Surinamese Javan). Petiole 7-30 cm; leaf-blade lanceolate to oblong-lanceolate, arching, glabrous or pubescent beneath, to 60 x 10 cm. Inflorescence a capitulum borne at soil level. Flower-bract green, glabrous; flowers yellow, villous on the back, c.2. cm wide.

Range: Southeast Asia and East Indies. Grown as a foliage ornamental in Surinam (Ostendorf, 1962).

Iridaceae

Perennial or annual, fibrous-rooted plants from a rhizome, bulb or corm. Stem usually

present. Leaves basal or also cauline, usually 2-ranked (distichous), linear to equitant. Flowers solitary, in bracteate pairs or fascicles, or the inflorescence a terminal or axillary raceme or panicle. Flowers bisexual, regular or irregular; perianth-segments 6, petaloid, free or united, inserted on perianth-lobes. Ovary inferior, usually 3-celled; styles 3. Fruit a 3-valved, loculicidal capsule.

Key to Genera

1. Caulescent (stem to 1 m), from thick rhizomes; flowers orange-yellow with red or purple spots 1. *Belamcanda*
1. Acaulescent, from a bulb or corm; flowers white or various solid colors, not spotted.
   2. Plant from a tunicate bulb with several coats of reddish-brown scales; flowers pedicellate, in several pairs at apex of scape; flowers white, to 2.5 cm wide; perianth-segments free, the upper segment not hooded 2. *Eleutherine*
   2. Plant from a corm without reddish scales; flowers sessile, borne singly on a spike; flowers white, yellow, pink or purplish, to 15 cm wide; perianth-segments united in a tube below, the upper segment often hooded 3. *Gladiolus*

1. *Belamcanda* Adanson

Caulescent herbs from thickened rhizomes. Leaves basal and cauline, ensiform, broadly linear. Inflorescence a loose, terminal, bracteate scape with clusters of flowers. Flowers bisexual, regular, spirally twisting as they close; perianth-segments 6, free; stamens 3, the filaments free. Ovary inferior, 3-celled; style-branches 3. Fruit a capsule; seeds globose, shiny.

1. *Belamcanda chinensis* (Linnaeus) A. DeCandolle in Redoute, *Les Liliacees* 3: t.121 (1805). BLACKBERRY LILY, LEOPARD FLOWER. Perennial herb; stems to 1m. Leaves folded, broadly linear, equitant, to 25 (-50) x 2 cm. Inflorescence to 50 cm, of 3-12 clusters of flowers, the bracts similar to the leaves. Flowers orange-yellow with red or purple spots, the perianth-segments flat. Capsule to 2.5 cm; seeds shiny, flat.

Range: Asia. Grown as an ornamental in a garden at the Esther Stichting near Paramaribo, Surinam.

2. *Eleutherine* Herbert

Herbs from a bulb. Leaves all basal, few, often narrow or ensiform. Inflorescence terminal (appearing axillary from leaf-sheaths), a bracteate scape with flowers single, paired or paniculate. Flowers bisexual, regular; perianth-segments 6, sometimes connate below; stamens 3 (6), filaments free. Ovary inferior, 3-celled; styles 3. Fruit a loculicidal capsule; seeds angled.

1. *Eleutherine bulbosa* (Miller) Urban, *Feddes Repertorium* 15: 305 (1918). RED ROOT. Acaulescent herb from a bulb with several coats or thick scales (tunicate); scales reddish-brown. Leaves basal, 14-45 (-60) x 1-3 cm, glabrous, plicate, linear to oblong-lanceolate, acuminate, with 5-6 prominent longitudinal ribs. Scape with inflorescence subtended by leaf-like bracts, 15-35 cm, the flowers in pairs on pedicels subtended by

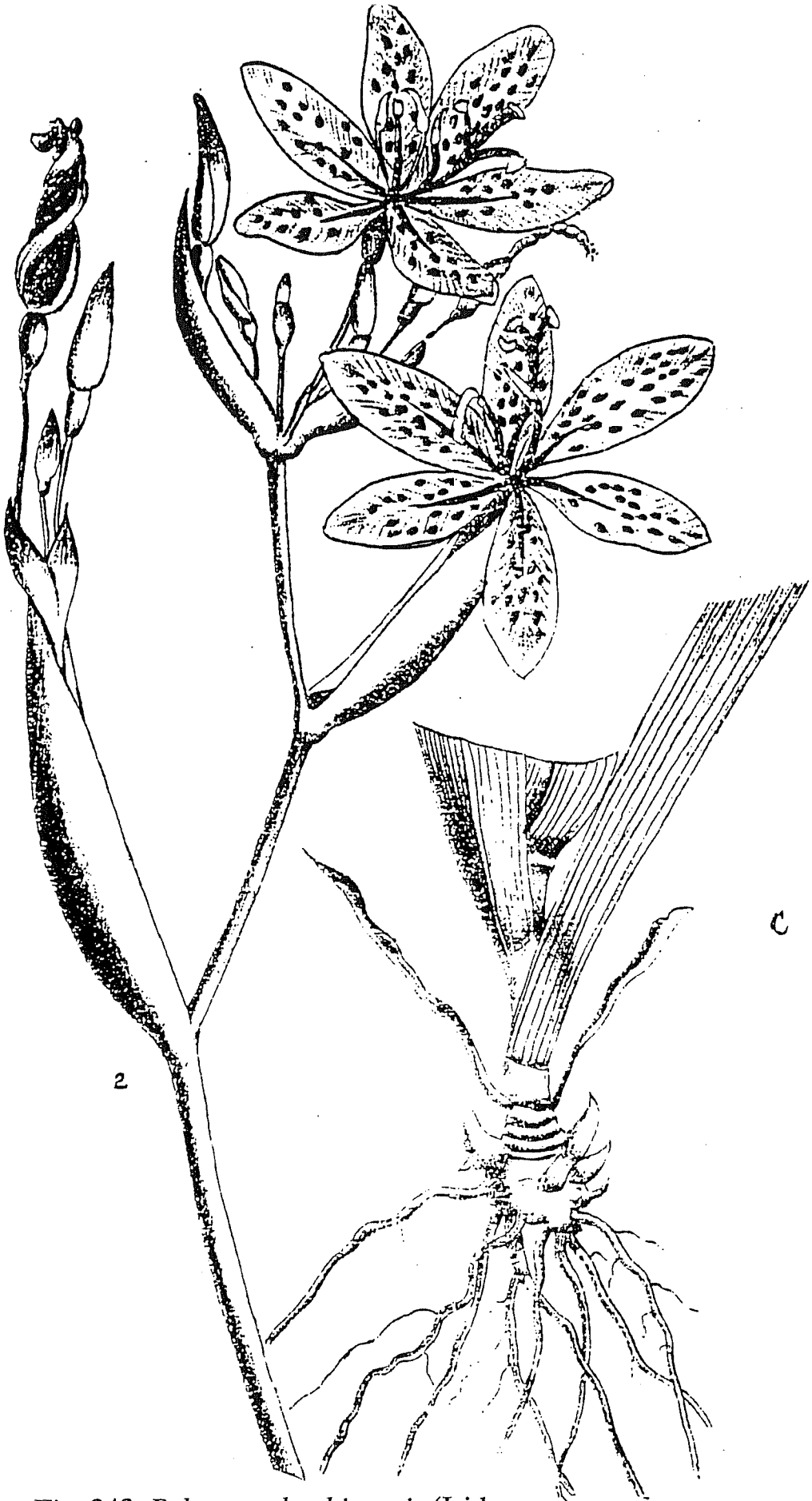


Fig. 243. *Belamcanda chinensis* (Iridaceae).

narrow bracts. Perianth white, to c.2.5 cm wide, the segments 6, free (not connate in a tube), ovate or obovate, obtuse. Stamens 3 (6), filaments free. Ovary triangular. Capsule 6-20 x 10 mm; seeds numerous, blackish.

Range: West Indies, Central and South America, including French Guiana. Cultivated as a garden ornamental in Surinam (Ostendorf, 1962).

3. *Gladiolus* Linnaeus

Plants usually from a corm, unbranched, leafy. Leaves basal and cauline, 2-ranked (distichous), usually sword-shaped (equitant). Inflorescence terminal or lateral, an often 1-sided spike, rarely branched. Flowers bisexual, bilaterally symmetrical, subtended by a bract and bracteole, sessile. Perianth-segments 6, united in a tube below, the upper 3 segments larger than the lower 3. Stamens 3; filaments free, arching under the concavity (hood) of the upper perianth-segments. Ovary inferior, 3-celled; style-branches 3. Fruit a 3-valved capsule; seeds winged.

1. *Gladiolus* x *hortulanus* L.H. Bailey, *Hortus* 277 (1930). ZWAARD LELIE (Surinam); GLADIOLUS. Acaulescent herb. Stems robust, to c.1.4 m, from a corm 4 cm or more wide. Leaves sword-shaped, to 5 cm wide. Spikes terminal, 60-90 cm; flowers 12-20 per spike, 6-15 cm wide, of various colors such as white, yellow, pink, red, purple (except true blue), the upper 3 perianth-segments flat or hooded.

Range: Of hybrid origin. Grown at the Half Flora nursery in Paramaribo, Surinam for distribution as an ornamental.

Literature: Hamilton, A. 1976. A history of the garden gladiolus. *The Garden* (R.H.S.) 101(8): 424-428.

The progeny from various breeding programs between *Gladiolus* x *gandavensis* (a hybrid between the southern African species *G. natalensis* (Ecklon) J.D. Hooker (Synonym: *G. psittacinus* J.D. Hooker)) and *G. oppositifolius* Herbert have formed the basis of the commonly seen summer-flowering garden and florists gladiolus, *G.* x *hortulanus* L.H. Bailey.

Liliaceae

Perennial herbs, rarely shrubs or trees, from rhizomes, tubers, corms or bulbs. Stems present or absent, sometimes climbing or modified into leaf-like cladophylls. Leaves alternate, opposite, whorled, or all basal. Inflorescence often scapose, a few- to many-flowered raceme, panicle or cyme, or flowers solitary. Flowers bisexual or unisexual, regular; perianth-segments 6 (8), free or united below in a tube; lobes spreading to recurved. Stamens 6 (8). Ovary superior, 3(4)-celled. Fruit a capsule or berry.

Key to Genera

1. Leaves fleshy-succulent, the margin with distant teeth — 1. *Aloe*
1. Leaves not succulent, the margin entire (rarely serrulate).

2. Leaves with an apical tendril; margin of perianth-segments often wavy; style abruptly geniculate at apex of ovary 5. *Gloriosa*
2. Leaves without tendril; margin of perianth-segments not wavy (inner 3 segments sometimes wavy in *Hemerocallis*); style straight, not geniculate.
3. Leaves distinctly petiolate; perianth-segments and stamens 8; flower solitary, borne at or near ground level 3. *Aspidistra*
3. Leaves sessile; perianth-segments and stamens 6; flowers not solitary (sometimes solitary in *Asparagus*), not borne at ground level.
4. Fruit a red berry; stems present, leafy, diffusely branched; true leaves modified into spines or scales, and subtended by often narrow or setaceous cladophylls (modified branchlets) which resemble normal green leaves 2. *Asparagus*
4. Fruit a capsule; stems absent; leaves all basal, not modified into scales or spines.
5. Flowers large, the perianth more than 5 cm, orange or brownish-red 6. *Hemerocallis*
5. Flowers small, the perianth to c.1 cm, white or pale violet.
6. Leaves variegated with white median stripe; plants proliferous, producing plantlets from apex of inflorescence;inflorescence laxly flowered, arching or pendent; perianth rotate; ovules 4-8 per cell 4. *Chlorophytum*
6. Leaves all green; plants not proliferous; inflorescence densely flowered, erect; perianth campanulate; ovules 2 per cell 7. *Liriope*

1. *Aloe* Linnaeus

Perennial, succulent herbs or trees. Stems absent or present, simple or branched. Leaves often in a dense basal rosette or clustered at the tips of branches, sessile, clasping at the base, with spines or teeth along the margin. Inflorescence a terminal or axillary raceme or panicle; scape mostly longer than and exserted above the leaves. Flowers bisexual, regular; perianth tubular; perianth-segments 6, united below or free. Stamens 6. Ovary superior, 3-celled. Fruit a loculicidal capsule; seeds many.

1. *Aloe vera* (Linnaeus) Burman fil., *Flora Indica* 83 (1768). (Synonym: *A. barbadensis* Miller). ALOE (Surinam); MEDICINAL ALOE. Plant caespitose, stoloniferous, freely suckering. Stem absent or developed only slightly at maturity. Leaves in a basal rosette, lanceolate, narrowly acuminate, green, often with pale blotches, glaucous, to 60 x 7.5 cm, the margin with distant, white teeth. Inflorescence erect, branched or unbranched, to 90 cm. Flowers deflexed, yellow or orange, to 3 cm.

Range: Canary Islands. Grown as an ornamental in the Promenade Gardens, Georgetown, Guyana, and at the Esther Stichting near Paramaribo and on hotel grounds in Paramaribo, Surinam.

Literature: Bloomfield, F. 1985. *Miracle Plants: Aloe vera*. London: Century Publishing. Foster, G.B. 1965. *Aloe* again. *Garden Journal* 15(6): 239-240. Grindlay, D. 1985. *Aloe vera*. *The Garden* (R.H.S.) 110(11): 534-535. Morton, J.F. 1961. Folk uses and commercial exploitation of *Aloe* leaf pulp. *Economic Botany* 15(4): 311-319. Norris, J. 1973. *Aloe vera*, the ancient wonder drug. *Garden Journal* 23(6): 172-173. Watson, J.B. 1983. Aloe. *Fairchild Tropical Garden Bulletin* 38(2): 24-28.

The mucilaginous sap that issues from the cut leaves is applied to burns and bruises in

Fig. 244. *Aloe vera* (Liliaceae).

many parts of the world where the plant has been introduced. It is also used in commercial skin-conditioning lotions and cosmetics, and the laxative "bitter aloes" is derived from the plant. Concerning the well-known botanical synonym of this species, R.A. Howard in *Flora of the Lesser Antilles* 3: 455,457 (1979) has observed that "Burman's *Flora Indica* was published shortly before April 6, 1768, hence the name *Aloe vera* (L.) Burm. f. has priority over *Aloe barbadensis* Miller, published April 16, 1768."

2. *Asparagus* Linnaeus

Perennial herbs, climbing or scrambling vines, or shrubs, often with tuberous roots. True leaves scale-like or spinose, subtending modified branchlets which are leaf-like, narrow cladophylls resembling ordinary "leaves". Flowers solitary, umbellate, or in simple or branched racemes. Flowers bisexual or unisexual, pedicellate; perianth-segments 6, free or united below. Stamens 6, free. Ovary superior, 3-celled. Fruit a 1- to 6-seeded berry.

Literature: Jessop, J.P. 1966. The genus *Asparagus* in Southern Africa. *Bothalia* 9(1): 31-96.

Key to Species

1. Branches pinnately decompound into a flat, triangular structure resembling a fern-frond; leaves (cladophylls) filiform (thin as a thread) or bristle-like, terete, to 6 mm, borne in clusters of 8-20; fruit black 3. *A. setaceus*
1. Branches not arranged to resemble a fern-frond; leaves (cladophylls) linear or linear-lanceolate, not bristle-like, 25-90 mm, borne in clusters of 3-5; fruit red or brown.
   2. Leaves (cladophylls) straight or slightly curved, less than 38 mm; fruit red 1. *A. aethiopicus*
   2. Leaves (cladophylls) curved or sickle-shaped, 45-90 mm; fruit brown 2. *A. falcatus*

1. *Asparagus aethiopicus* Linnaeus, *Mantissa Plantarum* 32 (1767), cv. Sprengeri. (Synonyms: *A. sprengeri* Regel; *A. densiflorus* (Kunth) Jessop, cv. Sprengeri). SPRENGER ASPARAGUS. Stems climbing to 2 m or more (when unconfined), flexuous and loosely branched. True leaves modified into hooked prickles. Leaves (cladophylls) in clusters of (1-) 3 (-8), linear, straight or slightly curved, 1-3.2 cm. Flowers bisexual, in axillary racemes 1.5 cm or more, white or pale pink. Fruit red.

Range: South and East Africa. Grown as an ornamental at the Botanic Gardens and Promenade Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

Literature: Green, P.S. 1986. The correct name for *Asparagus sprengeri. The Plantsman* 7(4): 249-250.

A variant known as PLUME ASPARAGUS, *A. aethiopicus* Linnaeus cv. Myers (Synonyms: *A. densiflorus* (Kunth) Jessop cv. Myers; *A. myersii* Hort.), differs from SPRENGER ASPARAGUS in its erect, densely and narrowly conical-cylindrical, "plume-like" branches which are densely packed with short leafy branchlets; it is occasionally grown as an ornamental in Guyana (Ted Hubbard, pers. comm., 1986).

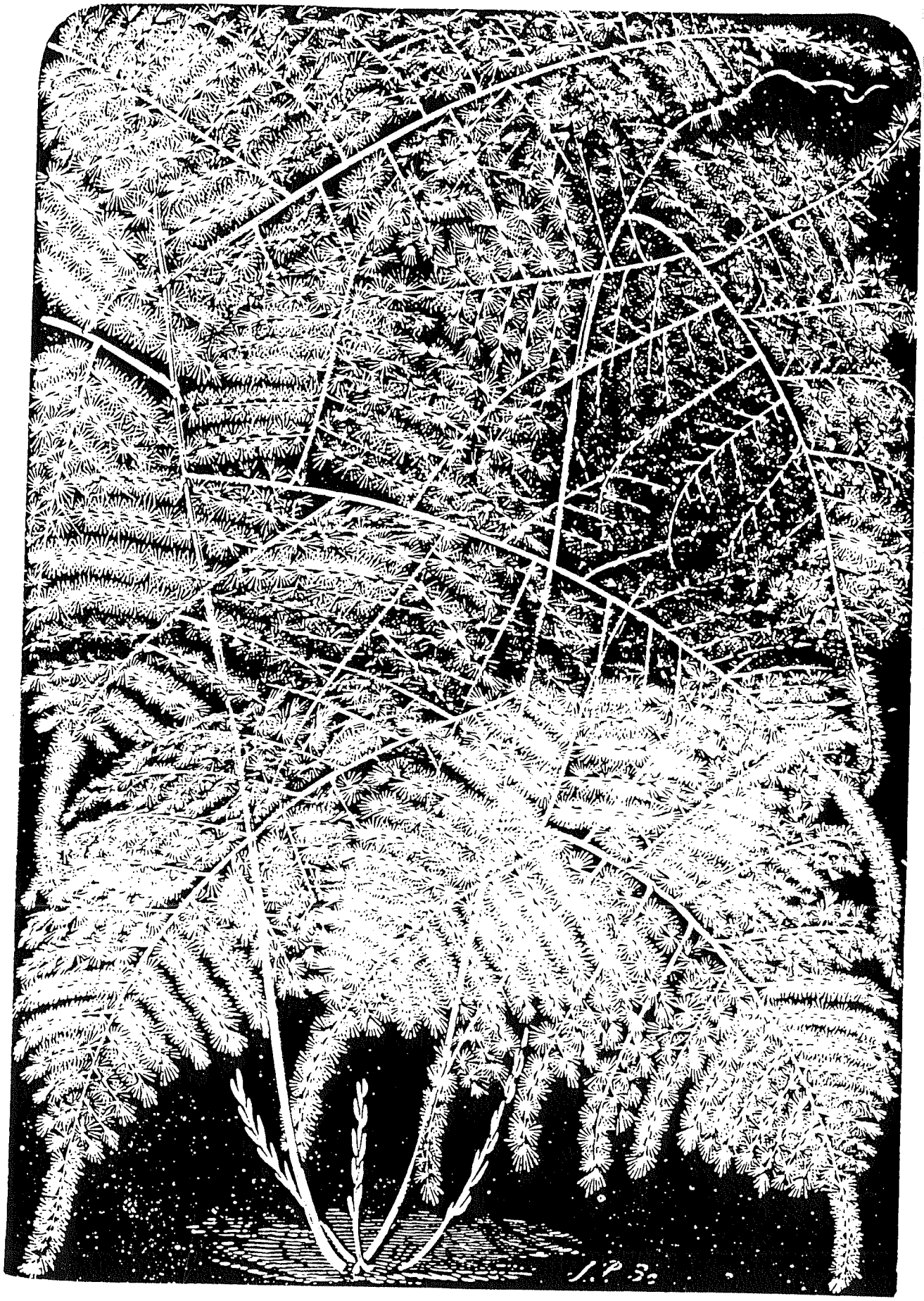


Fig. 245. *Asparagus setaceus* (Liliaceae).

2. *Asparagus falcatus* Linnaeus, *Species Plantarum* 313 (1753), var. *falcatus*. SICKLETHORN ASPARAGUS. Stems climbing to 12 m. True leaves modified into large, recurved thorns. Leaves (cladophylls) in clusters of 3-5, linear-lanceolate, curved or sickle-shaped, 4.5-9 cm. Flowers bisexual, in axillary racemes to 5 cm, white. Fruit brown.

Range: South and East Africa. Grown as an ornamental in Surinam (Ostendorf, 1962).

3. *Asparagus setaceus* (Kunth) Jessop, *Bothalia* 9(1): 51 (1966). (Synonym: *A. plumosus* Baker). ASPARAGUS FERN. Stems climbing to 3 m or more; branches pinnately decompound into a flat, triangular structure resembling a fern-frond. True leaves modified into small spines. Leaves (cladophylls) in clusters of 8-20, filiform or bristle-like, straight, to 6 mm. Flowers bisexual, solitary or 2-4 in short clusters or racemes, white. Fruit black.

Range: South Africa. Grown as an ornamental at the Esther Stichting near Paramaribo, and as a hanging basket or potted ornamental in Paramaribo, Surinam.

3. *Aspidistra* Ker-Gawler

Perennial, stemless herbs. Leaves arising at nodes along a rhizome, with a basal sheath, parallel-veined, leathery, petiolate. Flowers borne solitary at ground level, often dull purplish. Flowers bisexual, regular, shortly pedicellate; perianth-segments 6-8, united below in a cup which is lobed above. Stamens 6 or 8, attached perpendicular to perianth-tube or base of perianth-lobes. Ovary 4-celled; stigma a peltate, ribbed disc. Fruit a berry.

1. *Aspidistra elatior* Blume, in Van der Hoeven & De Vriese, *Tijdschrift voor Natuurlijke Geschiedenis en Physiologie* 1(2): 76, t.4 (1834). ASPIDISTRA, CAST IRON PLANT. Leaves oblong-lanceolate, solitary, glossy, to 75 x 10 cm, long-petiolate. Perianth-segments 8; flowers campanulate, brownish-purple, 2.5-3 cm wide; pedicels to 5 cm. Stamens 8.

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

4. *Chlorophytum* Ker-Gawler

Perennial, rhizomatous herbs from fibrous or fleshy-thickened roots. Leaves in a basal cluster, linear to ovate, sessile or petiolate. Inflorescence a bracteolate raceme or few-branched panicle; plantlets sometimes proliferating from apical nodes of inflorescence. Flowers bisexual, regular; pedicels jointed; perianth-segments 6, free. Stamens 6; filaments widest at the middle. Ovary 3-celled. Fruit a 3-angled, loculicidal capsule; seeds discoid, compressed.

Literature: Dress, W.J. 1961. *Chlorophytum* (Liliaceae) in cultivation. *Baileya* 9(1): 29-50.

1. *Chlorophytum comosum* (Thunberg) Jacques, *Journal de la Societe Imperiale et Centrale d'Horticulture* 8: 345 (1862), cv. Vittatum. SPIDER PLANT. Roots fleshy-thickened. Plants proliferous, producing rooted aerial, pendent plantlets from upper nodes of inflorescences. Leaves tender, linear to linear-lanceolate, recurved, glabrous, sessile, to 40 x 1.8 cm. Inflorescence a raceme or few-branched panicle; scape cylindrical, to 80 cm.

Flowers rotate, white; pedicels jointed above the middle; perianth-segments c.8 mm. Fruit c.9 mm; seeds 3-5 per cell.

Range: Typical green-leaved plants are from Natal, South Africa. Variegated plants with leaves bearing a white median stripe are grown for ornament at the Botanic Gardens, Georgetown, Guyana; as potted plants in Paramaribo, Surinam; and in French Guiana (de Granville, 1985).

Literature: Dress, W.J. 1961. *Chlorophytum capense* and *C. comosum. Baileya* 9(3): 104-108.

5. *Gloriosa* Linnaeus

Perennial, often climbing plants from forked, tuberous rhizomes. Leaves alternate, opposite or whorled, sessile, often with a coiled terminal tendril. Flowers bisexual, regular, solitary, borne on the stem near the leaf-axils, pedicellate; perianth-segments 6, free, spreading or reflexed. Stamens 6; filaments long. Ovary superior, 3-celled; style strongly bent (geniculate) at point of insertion on ovary. Fruit a loculicidal capsule; seeds numerous.

1. *Gloriosa superba* Linnaeus, *Species Plantarum* 305 (1753). (Synonyms: *G. rothschildiana* O'Brien, *G. simplex* Linnaeus, *G. virescens* Sims). KLIMMENDE LELIE, SPINNEBLOEM, KEMBANG SOENSANG (Surinam); GLORY LILY. Plants climbing 90 cm - 3 m. Leaves lanceolate to oblong- or ovate-lanceolate, 10-17.5 cm. Flowers greenish-yellow, yellow, red or orange, often paler or greenish at base of the segments; perianth-segments linear to ovate-lanceolate, reflexed or recurved, the margin flat or wavy, sometimes also crisped (irregularly curled). Seeds orange.

Range: Tropical Africa and Asia. Grown as an ornamental in the Promenade Gardens and building grounds in Georgetown, Guyana, and on Torarica hotel grounds and in residential gardens of Paramaribo, Surinam.

Literature: Field, D.V. 1971. The identity of *Gloriosa simplex* L. (Liliaceae). *Kew Bulletin* 25(2): 243-245. Hayward, W. 1951. The *Gloriosa* lilies. *Plant Life* 7(2): 145-153. Kumar, C.R. and P.K.K. Nair. 1985. *Gloriosa* - a cytopalynological study. *New Botanist* (New Delhi) 12(1): 1-68.

Distinctive variants involving factor-combinations of plant height, leaf shape and the perianth-segment shape, margin and coloration have not yet received cultivar designations as recommended by D.V. Field in 1973 and further noted by V.A. Matthews in *The European Garden Flora* 1(1): 169-170 (1986) and G. Herklots, *Flowering Tropical Climbers*, pp.127-128 (1976). Flower color often is initially greenish-yellow or yellow before turning to red or orange with age. The entire plant is poisonous due to the content of colchicine, an alkaloid which is otherwise used as a medicine to treat gout, and also employed to inhibit mitotic cell-plate formation as a means to induce chromosome doubling (polyploidy) in cytology and genetics experiments.

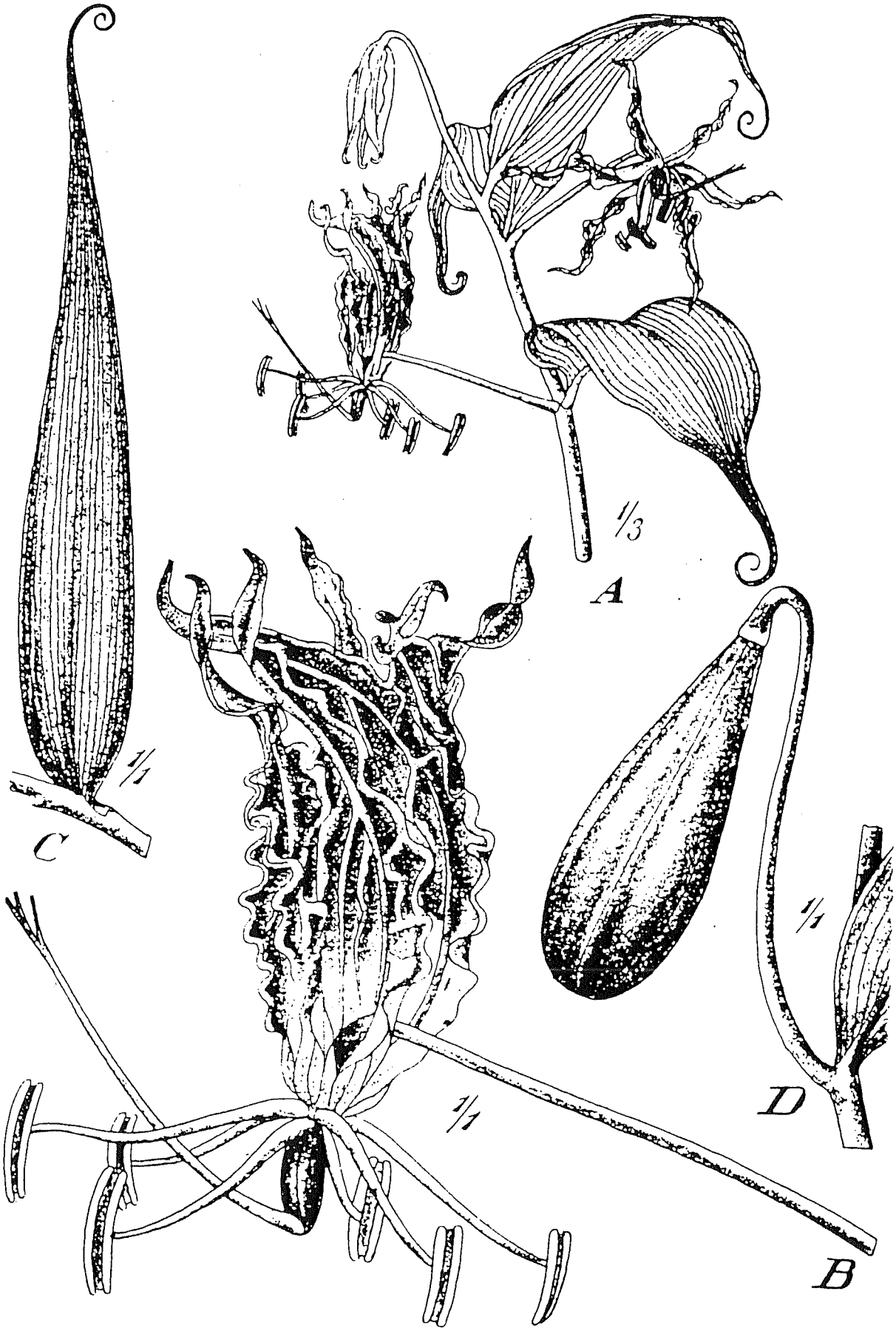


Fig. 246. *Gloriosa superba* (Liliaceae).

6. *Hemerocallis* Linnaeus

Perennial, caespitose herbs from rhizomes, with fibrous roots often enlarged at the tips. Stems absent. Leaves in a basal cluster, linear, entire, keeled. Inflorescence scapose, the simple or few-branched, bracteate scape bearing an apical raceme or panicle of showy flowers. Flowers bisexual, regular, pedicellate; perianth funnelform; perianth-segments 6, united below in a narrow tube, free and spreading to reflexed above. Stamens 6, inserted in the throat of the perianth-tube. Ovary superior, 3-celled. Fruit a loculicidal, triangular capsule; seeds few.

Literature: Bailey, L.H. 1930. *Hemerocallis*: the day-lilies. *Gentes Herbarum* 2(3): 143-156. Cohen, S. 1986. The well-tinkered daylily. *Garden* 10(5): 16-19. Fitch, C.M. 1974. The delightful daylilies. *Garden Journal* 24(1): 20-24. Stout, A.B. 1986. *Daylilies*. 145 pp. Millwood, New York: Sagapress, Inc.

1. *Hemerocallis fulva* (Linnaeus) Linnaeus, *Species Plantarum* ed.2, 462 (1762). ORANGE DAYLILY. Plants clumping, to 1.8 m, often shorter; roots fleshy-enlarged at the tips. Leaves linear, arching, to 90 x 2.5 cm. Scapes erect, branched, to c.1.2 m; inflorescence 6- to 20-flowered. Flowers orange-red or brownish-red, often with a darker central stripe on each segment, to 12.5 x 9 cm; perianth-tube to c.2.5 cm; perianth-lobes reflexed, the inner series of 3 with margin slightly undulate.

Range: China and Japan. Recently introduced to the Botanic Gardens, Georgetown, Guyana from Virginia, U.S.A.; as of 1985 the plants remained vegetative in Guyana.

7. *Liriope* Loureiro

Perennial, clumping or sod-forming, slender-rooted, rhizomatous or tuberous-rooted plants. Stems absent. Leaves in a basal cluster, linear, grasslike. Inflorescence scapose, a terminal spike or raceme with flowers in axillary whorls of 2-7. Flowers bisexual, regular, campanulate (bell-shaped); perianth-segments 6, free nearly to the base. Stamens 6. Ovary superior, 3-celled. Fruit a capsule; seeds 1 or 2, fleshy.

1. *Liriope spicata* (Thunberg) Loureiro, *Flora Cochinchinensis* 201 (1790). CREEPING LILYTURF. Plants sod-forming but not clumping, from slender roots with a few small tubers. Leaves linear, to 42 x 0.7 cm, the margin serrulate. Inflorescence erect, to 25 cm, with 5-9 whorls of 2-4 flowers each; flowers whitish or pale violet, 2-5 mm wide. Seeds black.

Range: China, Vietnam, Korea, Japan. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

Clumping plants with leaves to 2 cm wide, inflorescence with more than 10 whorls of flowers, and flowers purple to bluish, have been called *L. spicata* var. *densiflora* Hort., but more properly are referred to *L. muscari* (Decaisne) L.H. Bailey, BIG BLUE LILYTURF, a species not yet recorded in cultivation in the Guianas.

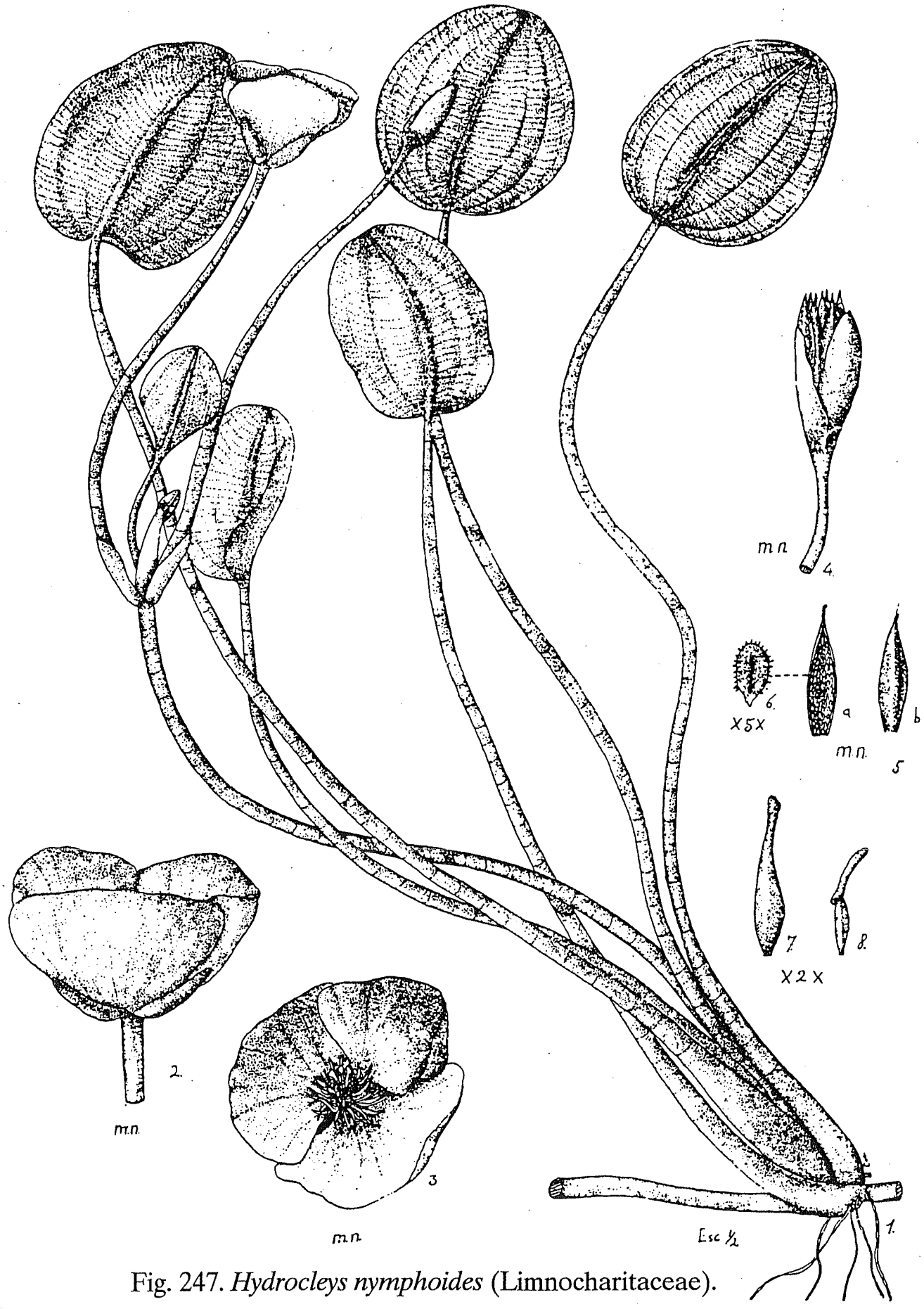


Fig. 247. *Hydrocleys nymphoides* (Limnocharitaceae).

Limnocharitaceae

Perennial aquatic herbs, floating or rooted at the nodes. Leaves in a close basal spiral-like rosette, petiolate. Inflorescence a pedunculate, few-flowered umbel, or scapose and the flower solitary. Flowers bisexual, regular; sepals 3, free, persistent; petals 3, free, deciduous. Stamens 3, all fertile, or numerous and the outer ones often sterile (staminodes). Ovary superior; carpels 3-20 in one whorl; ovules numerous. Fruit a cluster of free follicles; seeds many.

1. *Hydrocleys* L.C. Richard

Perennial aquatic herbs with milky sap; stems prostrate, rooting, stoloniferous. Leaves floating, in groups arising from nodes of stem; petiole thick, septate. Flowers solitary or umbellate. Stamens numerous, the outer ones sterile. Carpels 3 or 6; ovules numerous. Fruiting follicles united at the base.

1. *Hydrocleys nymphoides* (Humboldt & Bonpland ex Willdenow) Buchenau, *Abhandlungen Naturwissenschaftlichen Vereine Bremen* 2: 2 (1869). WATER POPPY. Leaves floating on surface of water; petiole to c.65 cm; leaf-blades broadly ovate or elliptical, cordate at the base, to c.7.5 x 7 cm, pubescent beneath. Flowers solitary, but seemingly in loose fascicles of 2-3, lifted above the water surface on long pedicels. Sepals green, to 2.5 cm, persistent; petals yellow, suborbicular, to 35 mm, deciduous. Androecium of c.20 purple, fertile stamens surrounded by c.20 sterile stamens. Carpels 6 (-8), united at the base. Fruit c.1.5 cm.

Range: Tropical South America, including Guyana and Surinam. Grown as a pond ornamental at the Botanic Gardens, Georgetown, Guyana.

Marantaceae

Perennial herbs, often clumping, from rhizomes and often with tubers. Leaves in 2 ranks (distichous), simple, entire, pinnately veined; petioles sheathing, with a terminal swelling (pulvinus) and joint at junction with the leaf-blade. Inflorescence a bracteate head, spike, raceme or panicle; bracts persistent or deciduous. Flowers bisexual, asymmetrical; sepals 3, free; petals 3, united below in a tube. Fertile stamen 1, outer staminodes 1-2, petaloid. Ovary inferior, 1- to 3-celled. Fruit a 1- to 3-seeded capsule, berry or nut-like structure.

Key to Genera

1. Inflorescence a densely-flowered spike; ovary 3-celled; fruit 3-seeded 1. *Calathea*
1. Inflorescence a loosely-flowered raceme or panicle; ovary 1-celled; fruit 1-seeded.
   2. At least some leaves in an apical or basal rosette; inflorescence-bracts persistent; plants to 4 m 2. *Ischnosiphon*
   2. Leaves not in a basal rosette; inflorescence-bracts early deciduous; plants to 2 m, often smaller 3. *Maranta*

1. *Calathea* G.F.W. Meyer

Herbs with stems present or absent. Leaves mostly basal, often variegated. Inflorescence a densely-flowered spike with spirally arranged bracts, or a raceme with 2-ranked bracts, axillary and pedunculate. Flowers bisexual, asymmetrical; sepals 3; petals 3, united below in a tube, as long as or longer than the sepals. Fertile stamen 1; outer staminode 1. Ovary inferior, 3-celled. Fruit a (1-) 3-seeded capsule; seeds with bilobed aril.

Key to Species

1. Young leaves with closely set pink lines or stripes — 1. *C. ornata*
1. Young leaves with rather distant yellow or yellowish-green stripes — 2. *C. zebrina*

1. *Calathea ornata* (Linden ex Lemaire) Koernicke, *Gartenflora* 7: 87 (1858). (Synonyms: *C. ornata* var. *roseo-lineata* (Linden ex Lemaire) Regel; *Maranta ornata* Linden ex Lemaire, var. *roseo-lineatis* Linden ex Lemaire). Plant to 90 cm (-2.7 m); stems seeming absent. Petiole to 1.5 m or more, with an apical swelling (pulvinus) to 10 cm; leaf-blade ovate- or oblong-lanceolate to ovate, to c.60 cm or more, green above, with pinnate pattern of pink lines or stripes on young leaves, purple beneath. Peduncle to 35 cm; spike ovoid, c.8 cm; bracts spirally arranged, yellowish. Petals white and violet.

Range: South America, from Colombia and Ecuador to Guyana. Grown as an ornamental in gardens and hotel grounds in Paramaribo, Surinam.

2. *Calathea zebrina* (Lindley) Lindley, *Edwards's Botanical Register* 14: sub t.1210 (1828). (Synonym: *Maranta zebrina* Lindley). ZEBRA PLANT. Plant to 1 m; stems absent. Petiole with an apical swelling (pulvinus) to 4 cm; leaf-blade oblong-lanceolate or elliptical, to 65 cm, green above, with yellow or yellowish-green stripes, purple beneath. Peduncle to 35 cm; spike ovoid or subspherical, c.10 cm; bracts spirally arranged, green, tinged with purple. Petals white and purple.

Range: Eastern Brazil. Grown as a potted outdoor ornamental on hotel grounds in Paramaribo, Surinam.

Several undetermined species of *Calathea* are grown as ornamentals in French Guiana (de Granville, 1985).

2. *Ischnosiphon* Koernicke

Herbs with stems often terminated by a rosette of leaves. Leaves basal, cauline or apical on a scape. Inflorescence of one to many axillary spikes, often paniculate; spikes with spirally arranged or distichous bracts. Flowers bisexual, asymmetrical; sepals 3, free; petals 3, united below in a tube. Fertile stamen 1; outer staminode 1. Ovary inferior, 1-celled. Fruit a 1-seeded capsule; seed arillate.

Key to Species

1. Leaves in an apical rosette on scapose stem; petiole to 43 cm; blade to 51 cm 1. *I. arouma*

1. Leaves in a basal rosette from which leafy stems arise; petiole absent or to 3 cm; blade to 22 cm 2. *I. gracilis*

1. *Ischnosiphon arouma* (Aublet) Koernicke, *Bulletin de la Societe Imperiale des Naturalistes de Moscou. Section Biologique* 35(1): 88 (1862). ECHTE WARIMBO, PAGARAWARIMBO, WARIMBO (Surinamese Creole); ITIRITI, KOELESIRILOCO, TIRITI, TITIRITI (Surinamese Arawak); KARANARE, MOEKOEROE, WAROEMA (Surinamese Carib). Plants to 3-4 m. Stems scapose, the leaves rosulate at apex of stem. Petiole to 43 cm; pulvinus of petiole to 7.5 cm; blade coriaceous, ovate to lanceolate, to 51 x 26 cm. Inflorescence a branched panicle of 4-5 spikes; spikes to 40 cm. Flower-bracts to c.3.5 cm; sepals linear, to 2.5 cm, reddish; corolla to c.4.2 cm, the lobes yellow with a red apex.

Range: West Indies and South America, including Surinam. Grown as a clumping ornamental in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam.

2. *Ischnosiphon gracilis* (Rudge) Koernicke, *Bulletin de la Societe Imperiale des Naturalistes de Moscou. Section Biologique* 35(1): 94 (1862). KNOPO WARIMBO, KOLIBRI WARIMBO, WARIMBO, WARIEMBO (Surinamese Creole); AKESEREKILIO, KOESJO AROMADE (Surinamese Arawak); WALOEMALE (Surinamese Carib). Plants to 3 m. Stems with basal rosette and cauline leaves. Petiole absent (-3 cm); pulvinus of petiole (when present) to 2.5 cm; blade coriaceous, lanceolate-ovate, to 22 x 9 cm. Inflorescence a short panicle of single or paired spikes; spikes to c.30 cm. Flower-bracts to 3 cm; sepals linear, to 2.1 cm; corolla to c.4.8 cm, the lobes yellow, red, violet, brownish or white.

Range: South America, including Surinam. Grown as an ornamental on Torarica hotel grounds in Paramaribo, Surinam.

3. *Maranta* Linnaeus

Herbs with stems present or absent. Stems branching, rhizomatous. Leaves basal and cauline, often variegated. Inflorescence a spike, raceme, or loosely few-branched panicle with linear bracts. Flowers bisexual, asymmetrical, borne in pairs with unequal peduncles; sepals 3; petals 3, united in a tube below. Fertile stamen 1; outer staminodes 2. Ovary inferior, 1- celled. Fruit a 1-seeded, indehiscent nut; seed triangular, arillate.

Key to Species

1. Leaves lanceolate or ovate-lanceolate, acuminate, more than 3 times longer than wide, to 33 cm 1. *M. arundinacea*
1. Leaves oblong or broadly elliptical, obtuse and apiculate, less than twice as long as wide, to 12.5 cm 2. *M. leuconeura*

1. *Maranta arundinacea* Linnaeus, *Species Plantarum* 2 (1753), cv. Variegata. ARROWROOT, WEST INDIAN ARROWROOT. Plant to 1.8 (-3) m. Stems slender, erect and zigzag, from rhizomes bearing scaly, fleshy tuberous organs. Leaf-blades lanceolate or ovate-lanceolate, acuminate, to 33 x 11 cm, variegated in streaks of dark to

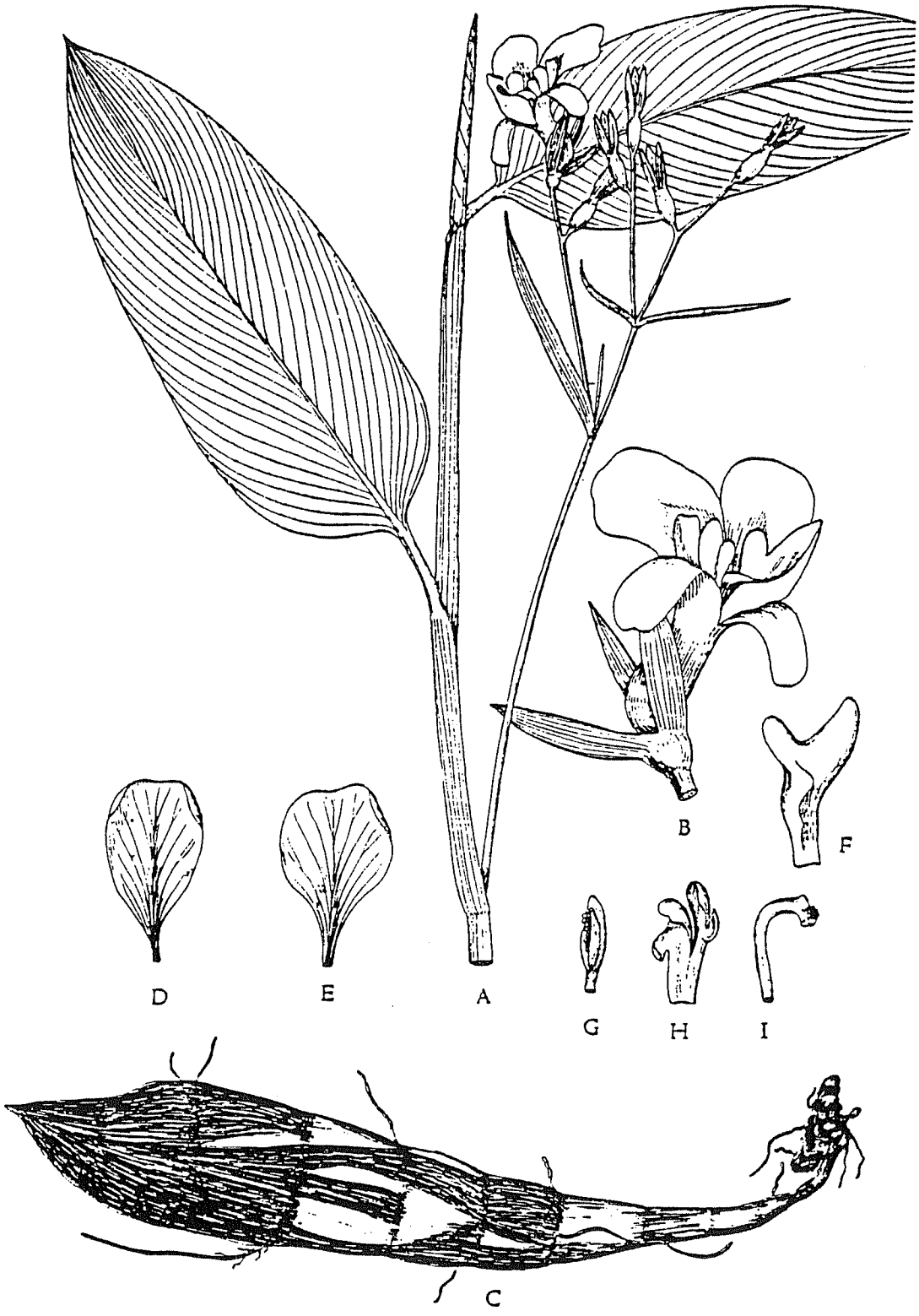


Fig. 248. *Maranta arundinacea* (Marantaceae).

light green and white. Inflorescence a laxly-branched raceme or panicle; flowers white.

Range: The species is indigenous to tropical America, including the three Guianas. The variegated cultivar is grown for ornament in the Promenade Gardens, Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

Literature: Purseglove, J.W. 1972. *Tropical Crops: Monocotyledons 2*. New York: John Wiley & Sons (pages 336-342).

The thick rhizomes of arrowroot are the source of edible starch in the American tropics, including Surinam (Ostendorf, 1962).

2. *Maranta leuconeura* Morren, *Belgique Horticole* 24: 323 (1874). PRAYER PLANT. Plant to 30 cm. Stems short, slender, often spreading or pendent at maturity, from tuberous rhizomes. Leaf-blades oblong or broadly elliptical, obtuse and apiculate, to 12.5 x 9 cm, variegated with white veins and squarish blotches of chocolate-brown above, glaucous or reddish-purple beneath; terminal pulvinus of petiole facilitating up and down movement of leaf-blade. Inflorescence a slender raceme; flowers white.

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

Musaceae

Perennial, caespitose or solitary giant herbs. Leaf-sheaths forming a trunk-like pseudostem from a large corm, the pseudostem producing new plants ("suckers") after flowering and fruiting (*Musa*) or monocarpic(*Ensete*); pseudostem of uniform width (*Musa*) or enlarged at the base. Leaves spirally arranged, petiolate; leaf-blades simple, entire, often tearing due to action of wind. Inflorescence terminal, sometimes pendent, a complex spike with flowers in 1/2-whorled clusters ("hands") in rows on transverse pads; rows subtended by large bracts, the basal bracts (nearest insertion of inflorescence at top of plant) soon deciduous (*Musa*) or persisting. Flowers irregular (zygomorphic), arranged in 1 or 2 rows per cluster, the lower (at base of inflorescence) female or bisexual, the upper flowers (at tip of inflorescence) male. Calyx tubular, of 5 united segments, 3- to 5- toothed at apex, becoming split down one side; corolla of 1 free segment (petal), entire or 3-toothed; stamens 5. Ovary inferior, 3-celled. Fruit an elongate, angled, usually fleshy or pulpy berry ("finger" or "banana"), with or without seeds.

Literature: Moore, H.E. 1957. *Musa* and *Ensete*, the cultivated bananas. *Baileya* 5(4): 167-194. Purseglove, J.W. 1972. *Tropical Crops: Monocotyledons 2*. New York: John Wiley & Sons (pages 344-384). Simmonds, N.W. 1982. *Bananas*. 568 pp. London: Longman. Van Amson, F.W. 1989. A Review of Agricultural Crops in Suriname, Part II.Bananas and Plantains (*Musa*). Paramaribo, Suriname: Landbouwbank.

1. *Musa* Linnaeus

Characteristics of the family, and indicated above for *Musa* when different from *Ensete* Horaninow.

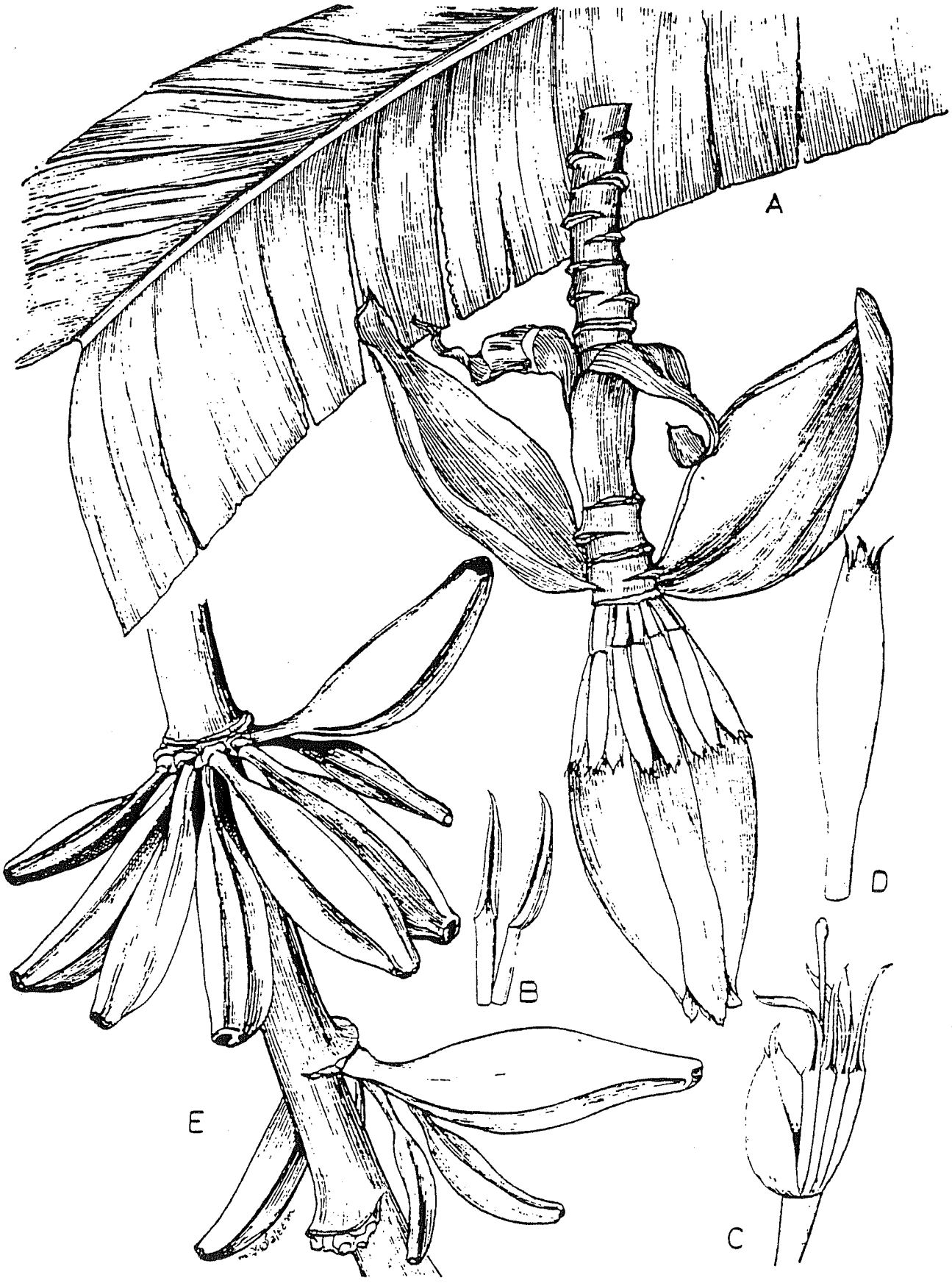


Fig. 249. *Musa acuminata* (Musaceae).

1. Inflorescence pendulous or semi-pendulous; fruits reflexing towards base of the inflorescence axis (tips pointing upwards); flowers 16-20 per bract, in 2 rows or series; bracts red, dark purple or yellow outside; pseudostem usually exceeding 3 m
1. *M. acuminata*
1. Inflorescence erect; fruits not reflexed, tips pointing towards apex of the inflorescence-axis; flowers 3-6 per bract, in 1 row or series; bracts pink outside; pseudostem 1-3 m
2. *M. ornata*

1. *Musa acuminata* Colla, *Memorie della Reale Accademia delle Scienze di Torino* 25: 394 (1820). (Synonym: *M. cavendishii* Paxton). BANANA, CAVENDISH BANANA, EDIBLE BANANA; BACOVE (French Guiana, Surinam); BANA, BANAAN, PSANG, GEDANG (Surinam). Pseudostems few to numerous, 3-5 (-8) m x 25 cm at base. Leaves 2-2.5 m x 40-60 cm. Inflorescence bent downwards (pendulous); female flowers c.16-20 per bract, in 2 rows, white or yellowish, or tinged with purple; bracts of male flowers bright red, dark purple or yellow; male flowers c.20, in 2 rows. Fruit to 13 x 3 cm or more, the pulp whitish to yellow, often seedless.

Range: India, Southeast Asia and East Indies. Grown as an ornamental at the Palmentuin and on hotel grounds in Paramaribo, Surinam; infrequently cultivated as an ornamental tub subject in Cayenne, French Guiana.

Musa acuminata includes the familiar triploid clones and cultivars of sweet, seedless dessert bananas with high sugar content, such as the Dwarf Cavendish (LADYFINGER BANANA) and cv. Gros Michel. The complex, closely related *Musa* x *paradisiaca* Linnaeus, a hybrid between *M. acuminata* and *M. balbisiana* Colla, and often considered to encompass *M.* x *sapientum* Linnaeus (with *sapientum* as a synonym, since the latter plants have the same hybrid origin as x *paradisiaca*), includes some, but not all, of the starchy, larger, cooking bananas or "plantains" which are unpalatable unless boiled or fried, and are not eaten raw as is the common banana (*M. acuminata* cv. Gros Michel). *Musa* x *paradisiaca* is known as "bananier" in French Guiana, where it is grown as an ornamental in private gardens (de Granville, 1985A, as *M. sapientum*).

2. *Musa ornata* Roxburgh, *Hortus Bengalensis* 19 (1814). (Synonym: *M. rosacea* misapplied, non Jacquin). FLOWERING BANANA. Pseudostems numerous, 1-3 m x 10 cm at base. Leaves to 2 m x 35 cm. Inflorescence erect; female flowers 3-5 per bract, in 1 row, deep orange-yellow; bracts of male flowers pink with yellow apex; male flowers 3-6, in 1 row. Fruit to 8 x 2 cm, the pulp white, with numerous black seeds.

Range: Bangladesh. Infrequently cultivated as a dooryard ornamental in Georgetown, Guyana.

Orchidaceae

Epiphytic, lithophytic or terrestrial, perennial herbs. Plants photosynthetic or saprophytic. Stems of terrestrial plants sometimes cormous, tuberous, climbing or vining; stems of epiphytic plants often modified into enlarged, leaf-bearing organs (pseudobulbs).

Leaves alternate or mostly basal. Inflorescence a terminal or lateral, few- to many-flowered spike, raceme or panicle, or a solitary flower. Flowers bilaterally symmetrical (zygomorphic), bisexual or sometimes unisexual, often resupinate with the labellum, or lip, in the lowermost position of the corolla; sepals 3, sometimes fused into 2 structures; petals 3, the median one modified into a prominent lip; nectary or spur often present. Fertile stamen 1 (2-3); anther borne along with stigma on a style-column (column); pollinia 2-8; pollen granular or waxy, congested into masses that may be stalked. Ovary inferior. Fruit a capsule; seeds numerous; embryo minute; endosperm absent.

Literature: Adderley, L. 1974. The elegant upstarts. *Garden Journal* 24(6): 180-187. Anderson, F.J. 1979. *An Illustrated Treasury of Orchids.* 157 pp. New York: Abbeville Press. Anonymous. 1952. Orchids in the Guianas. *Orchid Journal* 1(7-8): 277. Ayensu, E.S. 1974. Beautiful gamblers of the biosphere. *Natural History* 83(8): 36-45. Bechtel, H., Cribb, P. and E. Launert. 1981. *The Manual of Cultivated Orchid Species*. 444 pp. Cambridge, Massachusetts: The MIT Press (Revised edition, 1986). Bernhardt, P. 1986. Orchidelirium. *Garden* 10(4): 6-11. Bingham, R.S. 1987. Orchids on stamps: an update. *American Orchid Society Bulletin* 56(6): 591-595 (Guyana postage). Broekhuizen, J.W. 1973. Orchid hunting in Surinam. *American Orchid Society Bulletin* 43 (12): 1069-1074. Dodson, C.H. 1978. The catasetums (Orchidaceae) of Tapakuna, Guyana. *Selbyana* 2(2-3): 159-168. Dressler, R.L. 1981. *The Orchids: Natural History and Classification*. Cambridge, Massachusetts and London: Harvard University Press. Dunsterville, G.C.K. and L.A. Garay. 1959-1976. *Venezuelan Orchids Illustrated*. 6 vols. London: A. Deutsch. Gorinsky, P.D. 1974. Orchids in a growing Guyana, South America. *American Orchid Society Bulletin* 43(4): 290-294. Hawkes, A.D. 1965. *Encyclopedia of Cultivated Orchids*. 602 pp. London: Faber and Faber Ltd. Luer, C.A. 1972. *The Native Orchids of Florida*. 293 pp. Bronx, New York: The New York Botanical Garden. Marden, L. 1971. The exquisite orchids. *National Geographic* 139(4): 485-513. Pawilowski, C. [Undated]. *Orchidées de Guyane*. 80 pp. Cayenne, French Guiana: Imprimerie des Amandiers. Sheehan, T. and M. Sheehan. 1979. *Orchid Genera Illustrated*. 207 pp. New York: Van Nostrand Reinhold Company. Shuttleworth, F.S., Zim, H.S. and G.W. Dillon. 1970. *Orchids*. 160 pp. New York: Golden Press. Tan, K.W. 1971. Orchids of Dawa, Guyana. *American Orchid Society Bulletin* 40(7): 585-590. Tanner, O. 1985. The flowers that afflict us with "a sort of madness". *Smithsonian* 16(8): 168-170,172,174-181. Werkhoven, M.C.M. 1986. *Orchids of Suriname*. 256 pp. Paramaribo, Surinam: VACO. Williams, N.H. and C.H. Dodson. 1972. Selected attraction of male euglossine bees to orchid floral fragrances and its importance in long distance pollen flow. *Evolution* 26(1): 84-95 [Experiments conducted at Dawa, Guyana]. Yearsley, G.G. 1976. Orchidomania - a brief look. *American Orchid Society Bulletin* 45(8): 672-676.

The treatment below includes only a fraction of the orchid species which may be present in specialist and hobbyist collections in the Guianas.

Key to Genera

1. Plants with distinct pseudobulbs, or with stems swollen above or below.
   2. Lip spurred — 6. *Oeceoclades*
   2. Lip not spurred.
3. Sides of lip attached to the column, at least basally — 4. *Epidendrum*
3. Sides of lip free from the column.

4. Lip white, with violet stripes — 5. *Menadenium*
4. Lip pink or purple, not striped — 3. *Cattleya*
1. Plants without pseudobulbs, or without swollen stems.
5.Inflorescence terminal, or borne directly on the rhizome.
6. Leaves 1.5-2.5 cm wide, linear-lanceolate, flat; pollinia 8 — 2. *Arundina*
6. Leaves 3-10 cm wide, elliptic, oblong, lanceolate or ovate, flat or cylindrical; pollinia 2 or 4.
7. Lip fused to lower half of column — 4. *Epidendrum*
7. Lip free from column — 3. *Cattleya*
5. Inflorescence lateral, often axillary.
8. Lip spurred, pink, red, or yellowish-green with maroon blotches.
9. Pollinia 4; flowers red or yellowish-green.
10. Flowers red — 7. *Renanthera*
10. Lip yellow-green, with maroon blotches — 1. *Arachnis*
9. Pollinia 2; flowers pink — 8. *Vanda*
8. Flowers not spurred, greenish-yellow, without blotches — 9. *Vanilla*

1. *Arachnis* Blume

Epiphytic or terrestrial. Pseudobulbs absent. Stems often climbing. Leaves flattened, sheathing at the base. Inflorescence a lateral raceme or panicle. Sepals and petals free, similar, spreading. Lip 3-lobed; lateral lobes erect, spreading; midlobe fleshy, with raised lamellae. Pollinia 4.

1. *Arachnis flos-aeris* (Linnaeus) Reichenbach fil., *Botanisches Centralblatt* 28: 343 (1886). SPIDER ORCHID. Stems terete, often branching, climbing to c.4.5 m. Leaves linear-oblong, to 17.5 x 5 cm. Inflorescence a raceme or panicle to 1.6 m. Flowers fleshy, pale yellow-green, with irregular, dark maroon blotches, spots and bars. Sepals and petals similar, linear-spathulate, curved, to 7 cm. Lip 3-lobed, pale yellow-green and purplish-brown, to 2 cm, with several orange lamellae. Spur blunt, pouch-like.

Range: Malaysia, Indonesia, Philippines. Trained on poles as a garden ornamental, and grown for cut flowers, in Paramaribo, Surinam.

2. *Arundina* Blume

Terrestrial. Stems caespitose, reedy, erect, unbranched. Leaves alternate, distichous (2-ranked), grasslike. Inflorescence a terminal, several-flowered spike or raceme. Bracts prominent. Sepals and petals similar (except the labellum, or lip); lateral sepals angled forward, cupping under the lip. Lip weakly 3-lobed, with scalloped margin. Pollinia 8.

1. *Arundina graminifolia* (D. Don) Hochreutiner, *Bulletin of the New York Botanical Garden* 6: 270 (1910). (Synonym: *A. bambusifolia* Lindley). BAMBOO ORCHID. Terrestrial. Pseudobulbs absent. Stems cane-like (resembling bamboo), leafy, 90-150 cm. Leaves linear-lanceolate, 12-25 x 1.5-2.5 cm, with tubular, overlapping sheaths 4-7 cm. Inflorescence with c.3-5 flowers opening singly in succession. Flowers pale pink or rose. Sepals and petals similar, lanceolate, spreading; sepals 3.7-4 x c.1.5 cm; petals c.4 x 2.5 cm. Lip weakly 3-lobed, 3.4-4 x 3.5-4.0 cm, purple, the lateral margin coarsely crenulate (crisped

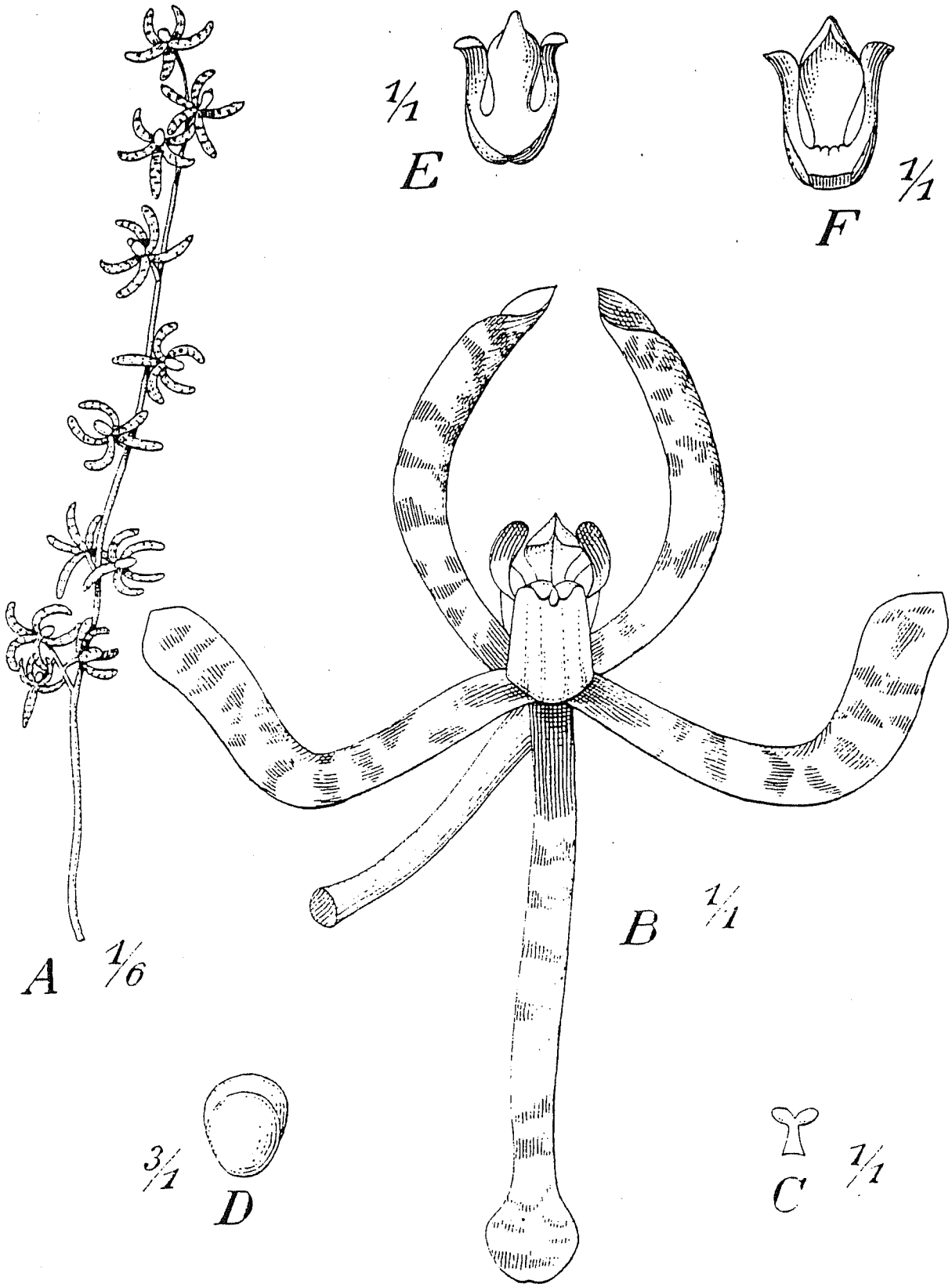


Fig. 250. *Arachnis flos-aeris* (Orchidaceae).

or scalloped) or incised; throat (center) of the lip yellow on the disc. Lip-callus of 2-3 white ridges (lamellae or carinae) 2.5 cm long, pinkish distally, yellowish proximally.

Range: Himalayan India, Nepal, South China, Sri Lanka, Malaysia, Indonesia, Tahiti; naturalized in Hawaii. Recently introduced to Guyana at the Botanic Gardens, Georgetown.

Literature: Herklots, G.A.C. 1977. Nepalese and Indian Orchids. *Orchid Review* 85(1013): 330-331. Teuscher, H. 1976. *Thunia alba* and *Arundina graminifolia. American Orchid Society Bulletin* 45(3): 209-214.

3. *Cattleya* Lindley

Epiphytic or terrestrial. Pseudobulbs swollen, or narrow, cane-like stems. Leaves 1 or 2 from apex of pseudobulbs. Inflorescence a solitary flower or a terminal raceme from apex of the pseudobulb. Sepals and petals free, spreading, the petals often wider than the sepals. Lip entire to 3-lobed. Pollinia 4.

Key to Species

1. Stems 1 cm or less in diameter, swollen at base; flowers 6-8 cm wide; labellum bilobed at apex 1. *C. bowringiana*
1. Stems 2-3 cm in diameter, not swollen at base; flowers 9-12 cm wide; labellum retuse at apex 2. *C. skinneri*

1. *Cattleya bowringiana* O'Brien, *Gardeners' Chronicle* n.s. 24 (611): 683 (1885). (Synonym: *C. skinneri* var. *bowringiana* (O'Brien) Kraenzlin). Terrestrial. Pseudobulbs 20-35 x 0.5-1.0 cm, with swollen base containing dormant "eyes". Leaves 2, oblong to elliptical, 12-20 x 5-6 cm. Flowers 5-10 (-20), very exceptionally to 45, per raceme, purple to pink, 6-8 cm wide. Sepals oblong to ovate or elliptical, 3.8-5 x 1-1.4 cm. Lip 3.5-4 cm, bilobed at apex, dark purple; throat with white blotch or spot at disc.

Range: Belize. Recently introduced to Guyana at the Botanic Gardens, Georgetown.

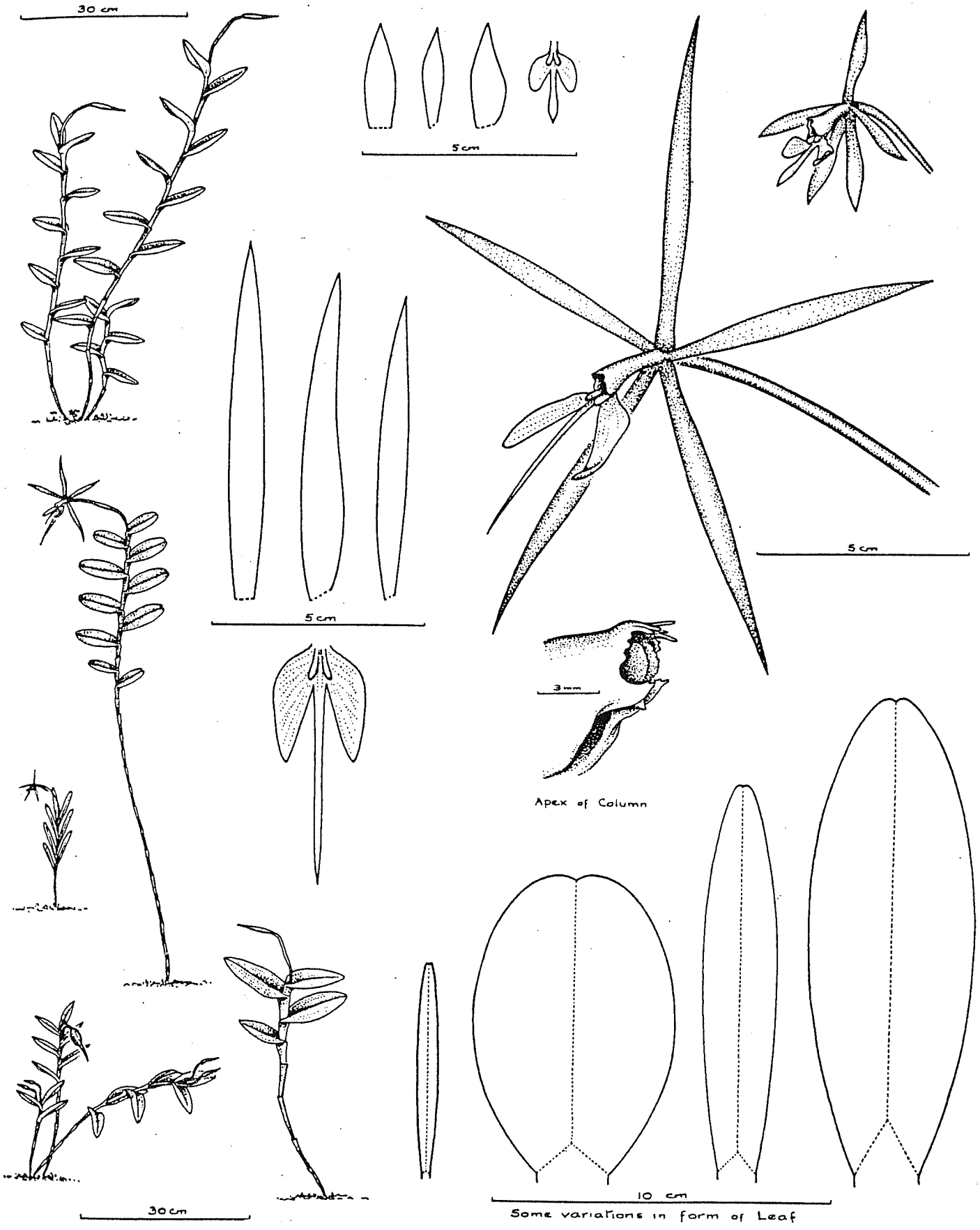
Literature: Hetherington, E. 1981. *Cattleya bowringiana*: the little known matriarch from Central America. *Orchid Digest* 45(5): 194-199. Hunt, P.F. 1964. *Cattleya bowringiana. Curtis's Botanical Magazine* n.s. 175(2): tab.451. Lowry, G.R. 1953. *Cattleya bowringiana*: an orchid with a future? *American Orchid Society Bulletin* 22(8): 570-576.

Used extensively as a parent in hybridization for blue cattleyas.

2. *Cattleya skinneri* Bateman, *The Orchidaceae of Mexico and Guatemala* t.13 (1838). Epiphytic or terrestrial. Stems (pseudobulbs) clavate, 2-3 cm wide, not swollen at base. Leaves 2, oblong to elliptical, to 20 x 6 cm. Flowers 4-15 per raceme, rose-pink or purple, 9-12 cm wide. Sepals linear- to elliptic-lanceolate, c.3.8-5.0 cm. Lip 3.5-4 cm, retuse at apex, rose-purple; throat with white spot at disc.

Range: Mexico, Central America, Colombia. Recently introduced to Guyana at the

Fig. 251. *Epidendrum nocturnum* (Orchidaceae).



Botanic Gardens, Georgetown.

Literature: Jones, H.G. 1960. The culture of orchid species in the West Indies, 7. *Cattleya skinneri. Orchid Review* 68(807): 301-302. Anderson, F.J. 1979. *An Illustrated Treasury of Orchids*. New York: Abbeville Press (pages 120-121).

4. *Epidendrum* Linnaeus

Epiphytic or lithophytic. Primary stem or rhizome well-developed or absent; secondary stems erect, creeping or pendent, often as pseudobulbs. Leaves distichous along the stem, or borne at apex of a stem, branch or pseudobulb; leaves flat to terete. Inflorescence terminal, simple or compound; flowers solitary to many in a capitulum, spike, raceme, corymb, umbel or panicle. Sepals and petals free, spreading or reflexed, the petals similar to, but smaller and narrower than, the sepals. Lip clawed, simple or 3-lobed, the midlobe simple or lobulate, the sides of lip attached to column; disc usually with 2 calli. Pollinia 4.

1. *Epidendrum nocturnum* Jacquin, *Enumeratio Plantarum Caribaeis* 29 (1760). (Synonyms: *E. longicolle* Lindley; including *E. nocturnum* var. *minus* Cogniaux). Primarily epiphytic. Stems reedy, caespitose, compressed, 8 cm - 2.4 m long. Leaves variable, elliptical to oblong-lanceolate, c.20 x 3 cm. Inflorescence a 1-2 (-5) -flowered raceme, the flowers opening one at a time, with conspicuous bracts. Sepals and petals filiform, greenish-yellow or greenish-white. Lip deeply 3-lobed, white; lateral lobes ovate; midlobe linear to acicular; disc with large yellow blotch and 2 basal, yellow or orange calli.

Range: Southern Florida, Mexico, Central America and northern South America, including the three Guianas. Recently introduced into cultivation at the Botanic Gardens, Georgetown, Guyana.

Literature: Dunsterville, G.C.K. and E. Dunsterville. 1977. *Epidendrum nocturnum*, a schizoid species. *American Orchid Society Bulletin* 46(10): 888-893.

5. *Menadenium* Cogniaux

Epiphytic. Rhizome ascending. Pseudobulbs remote, 1- to 2-leaved. Leaves conduplicate when young. Inflorescence a lateral, 1- to 2-flowered scape. Sepals and petals free, similar, spreading. Lip flat, entire or obscurely 3-lobed, much larger than the sepals and petals; callus an erect, semicircular ridge. Pollinia 4.

1. *Menadenium labiosum* (L.C. Richard) Cogniaux, in Martius, *Flora Brasiliensis* 3(5): 582 (1902). (Synonym: *Zygosepalum labiosum* (L.C. Richard) Garay). Epiphytic. Rhizomes elongated, branched. Pseudobulbs distant, ovoid-oblong, compressed, to 7.5 x 3 cm, 1- to 2-leaved. Leaves narrowly oblanceolate, to 25 x 5 cm. Inflorescence shorter than the leaves, a 1 (-2) -flowered, bracteate scape. Flowers fleshy, greenish or greenish-yellow, suffused with purple in the center. Sepals and petals lanceolate, acuminate, to c.5 x 1.5 cm, with recurved apex and undulate margin. Lip held perpendicular to the flat face of the flowers, unlobed, ovate-cordate, with acute or apiculate apex, c.4 x 4 cm, white, with c.15 violet stripes radiating from center (in front of the callus); callus a fleshy, erect, semicircular, violet ridge or crest 3 mm high.

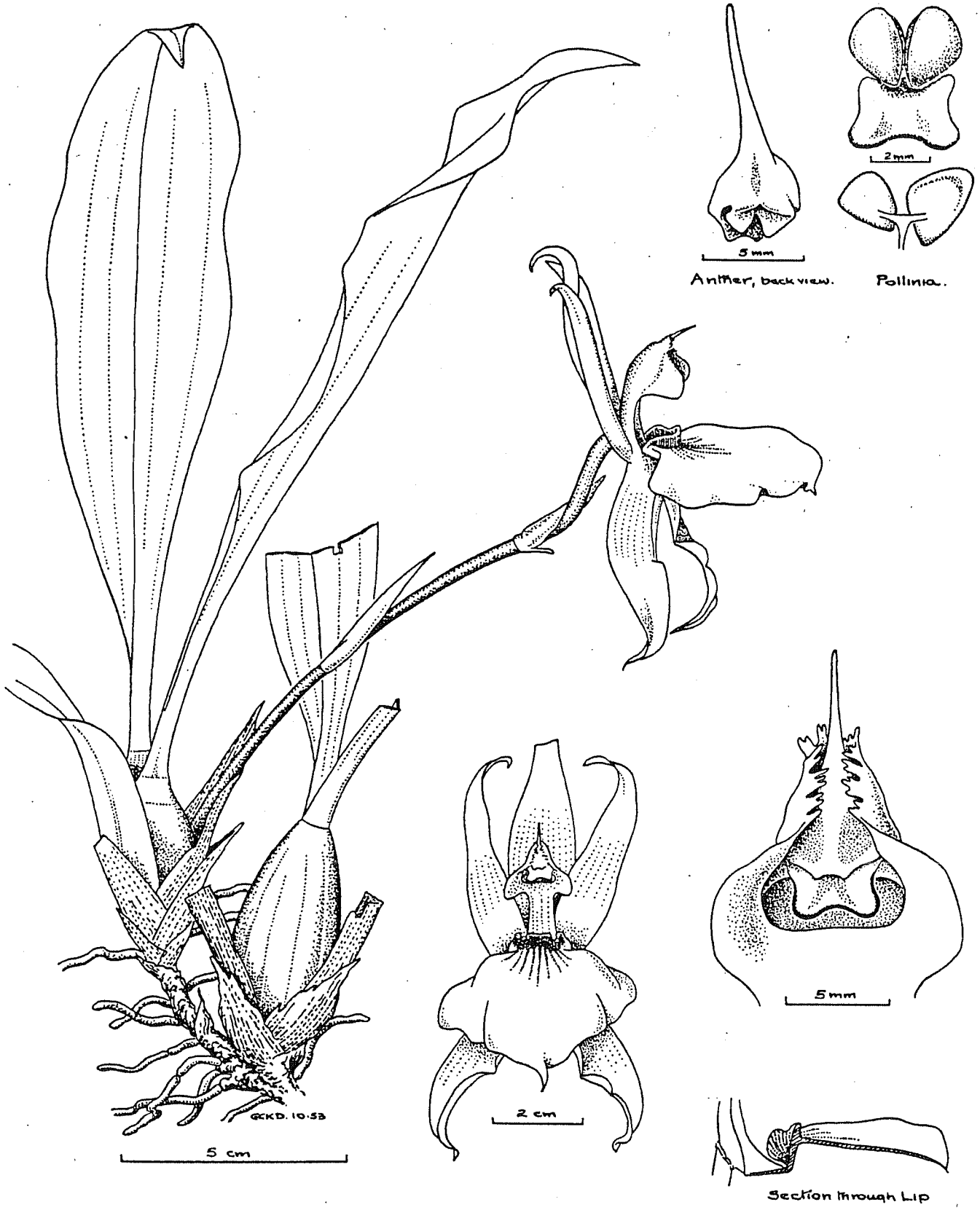


Fig. 252. *Menadenium labiosum* (Orchidaceae).

Range: Venezuela, Amazonian Brazil, and the three Guianas. Recently introduced to cultivation in Guyana at the Botanic Gardens, Georgetown.

Literature: Dunsterville, G.C.K. and L. Garay. 1961. Venezuelan orchids: *Menadenium labiosum. Orchid Review* 69(817): 222-223. Teuscher, H. 1972. Collector's item: *Zygosepalum (Menadenium) labiosum* compared with *Zygopetalum mackayi* and *Mendoncella (Galeottia) grandiflora. American Orchid Society Bulletin* 41(4): 316-321.

6. *Oeceoclades* Lindley

Terrestrial, rarely epiphytic, with thick roots. Pseudobulbs 1- to 3-leaved at apex. Leaves fleshy. Inflorescence a lateral, loosely few- to many-flowered raceme or panicle, from the base of the pseudobulb. Sepals and petals subsimilar, free, spreading. Lip 3-lobed, with a short spur at base. Pollinia 2.

1. *Oeceoclades maculata* (Lindley) Lindley, *The Genera and Species of Orchidaceous Plants* 237 (1833). (Synonym: *Eulophidium maculatum* (Lindley) Pfitzer). Terrestrial. Pseudobulbs ovoid or cylindrical, 1-leafed, to 5 x 3 cm. Leaves oblanceolate to broadly ovate, dark green, with silvery transverse bands or markings resembling the leaf of *Sansevieria*, to 30 x 6 cm. Inflorescence a bracteate raceme of 10-15 (-25) flowers, to 50 cm. Sepals and petals pinkish-green to purplish-brown, 0.8-1 x 0.2-0.3 cm. Lip 3-lobed, whitish, 0.8-1 x 0.8 cm, the lateral lobes purplish, the midlobe deeply emarginate or 2-lobulate, with a red spot on either side of the center; spur curved, brownish-green, nearly spherical in cross-section, 0.5 cm long; disc with a white central ridge as a callus.

Range: Bahamas, West Indies, Trinidad, tropical South America (including Surinam), tropical Africa. Recently introduced to cultivation in Guyana at the Botanic Gardens, Georgetown.

Literature: Beckner, J. 1964. *Eulophidium maculatum. American Orchid Society Bulletin* 33(12): 1066-1068. Moll, G.R. 1982. Yes, it is an orchid! *The Naturalist Magazine* (Trinidad) 4(1): 11,13. Teuscher, H. 1977. Collector's item: *Eulophidium, Eulophia* and the former genus *Lissochilus. American Orchid Society Bulletin* 46(2): 123-130.

7. *Renanthera* Loureiro

Epiphytic. Pseudobulbs absent. Stems vining or self-supporting, leafy. Leaves distichous, clasping, often obliquely bilobed at apex. Inflorescence an axillary, many-flowered raceme or panicle. Flowers predominantly red, or red and yellow. Sepals and petals free, spreading. Lip much smaller than the other perianth parts, 3-lobed, often saccate or spurred; disc with bilamellate callus. Pollinia 2.

Literature: Sheehan, T. and M. Sheehan. 1973. Orchid genera illustrated, 32. *Renanthera. American Orchid Society Bulletin* 42(5): 436-437.

1. *Renanthera coccinea* Loureiro, *Flora Cochinchinensis* 521 (1790). Epiphytic vine. Stems climbing to 900 cm, with long aerial roots. Leaves oblong, c.6-12 x 3-4 cm, bilobed at

apex. Inflorescence axillary from upper part of the stem, a panicle of up to 150 flowers. Flowers red. Dorsal sepal and petals linear-spathulate, c.2.5 cm, red with yellow or pale orange spots; lateral sepals oblong-spathulate, much wider, undulate, lobed on the inner side towards base, clear red, 3.5-4.5 cm. Lip 3-lobed, minute; lateral lobes erect, yellow with red streaks; midlobe reflexed, acuminate, red, becoming yellow at the base; spur conical, saccate; disc with white or yellowish calli.

Range: Vietnam; Hainan (China). Recently introduced into cultivation in Guyana at the Botanic Gardens, Georgetown.

This species was named by Padre Loureiro (1710-1791), a Portuguese missionary and naturalist resident in Hue (a town in the Annam region, central Vietnam), in his flora of Cochin China (being the region of southern Vietnam in the vicinity of Ho Chi Minh City, formerly Saigon).

8. *Vanda* R. Brown

Epiphytic. Pseudobulbs absent. Stems sheathed at base. Leaves distichous, fleshy or coriaceous, flat to cylindrical, often asymmetric at apex. Inflorescence a lateral raceme, axillary or leaf-opposed. Sepals and petals free, subequal, usually spreading. Lip 3-lobed, saccate or spurred at base; lateral lobes erect; midlobe spreading, fleshy; disc usually of 2 ridges. Pollinia 2.

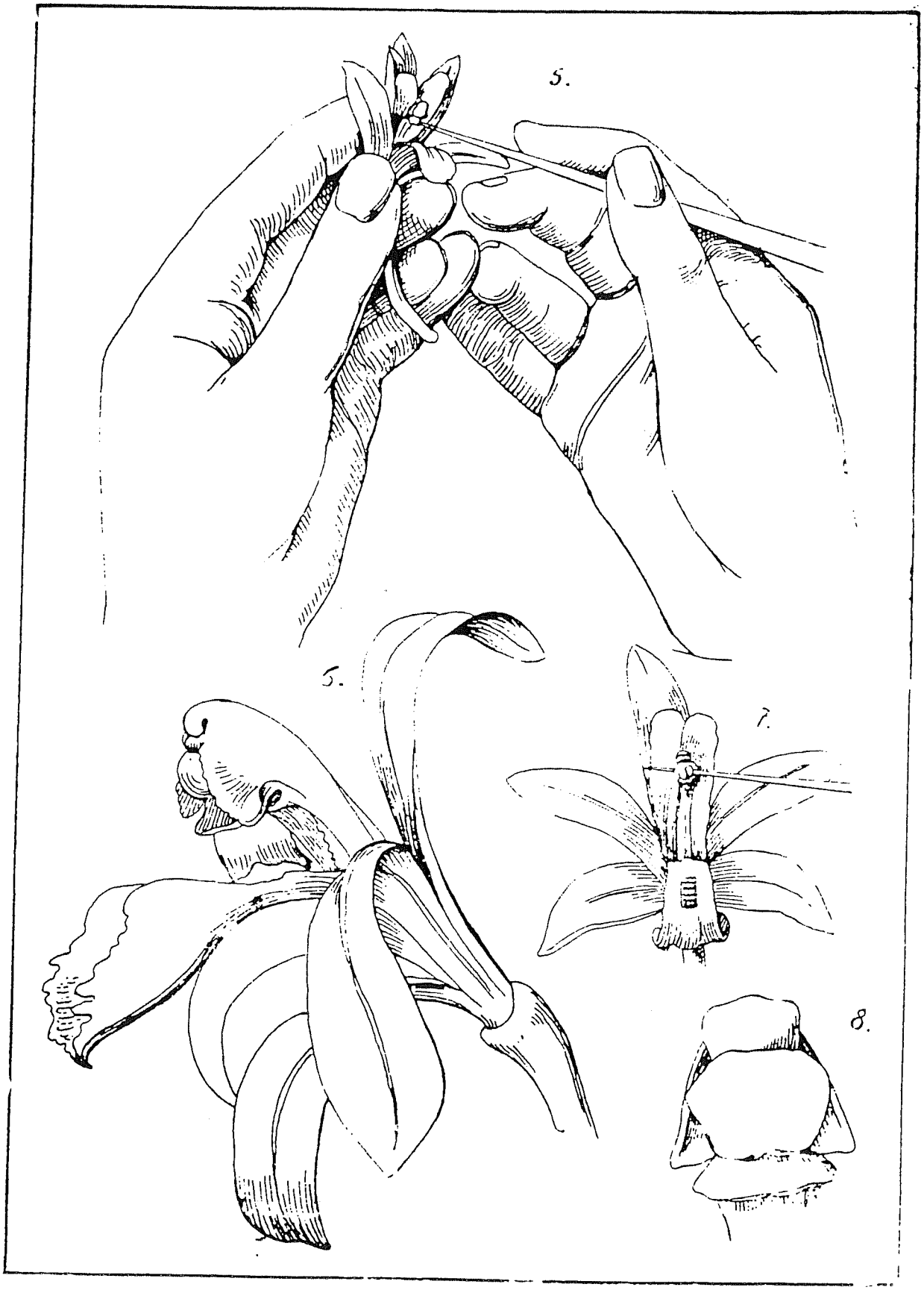
1. *Vanda teres* (Roxburgh) Lindley, in Wallich, *Catalogue* No.7324 (1832). (Synonym: *Papilionanthe teres* (Roxburgh) Schlechter). Epiphytic. Stems climbing or clambering, vinelike, forming tangles, cylindrical, up to 4.5 m long. Leaves cylindrical (terete), 10-15 cm. Inflorescence loosely 2- to 6- (-8) -flowered, to 25 cm, usually leaf-opposed. Flowers to 10 cm wide. Sepals and petals 3.5-4.2 x 2.5-2.9 cm. Sepals white, tinged with pink, the upper sepal obovate, the lateral sepals rhomboid; petals rose-pink or violet, spreading horizontally, undulate. Lip 3-lobed, 4-4.3 x 4-5.2 cm; lateral lobes convolute over the column, purplish; midlobe obovate, 2-lobulate, purple or rose, spotted and striped in lines of crimson or reddish-brown dots, the throat yellow or orange, pubescent basally; spur funnelform, c.2.5 cm.

Range: Khasi Hills District in Meghalaya State (formerly Assam), India; Sikkim, Nepal, Bangladesh, Burma, Thailand. Recently introduced to cultivation in Guyana at the Promenade Gardens, Georgetown; grown on a trellis in Tankarastraat, Paramaribo, and used for cut flowers in Paramaribo, Surinam.

The hybrid between this species and *V. hookeriana* Reichenbach fil. is known as *Vanda* cv. Miss Agnes Joaquim, and is a popular corsage orchid hardly distinguishable in its mauve-purple-tinted flowers from *V. teres*. The hybrid is also used for cut flowers in Paramaribo, Surinam. Miss Agnes Joaquim was an orchid hybridist in Singapore around 1893.

Literature: Teuscher, H. 1977. Collector's item: *Vanda, Vandopsis* and *Rhynchostylis. American Orchid Society Bulletin* 46(4): 329-344. Herklots, G.A.C. 1975. Nepalese and Indian orchids: *Vanda* Br. *Orchid Review* 83(979): 32-33. Bannochie, I. 1975. Growing

Fig. 253. *Vanilla planifolia* (artificial pollination) (Orchidaceae).



vandaceous orchids in Barbados. *Orchid Review* 83(981): 91-94. Baruah, B. and C.L. Boissya. 1978. *Vanda teres* and *Dendrobium acinaciforme* - two orchids of Assam. *American Orchid Society Bulletin* 47(5): 416-417. Wayne, R.E. 1947. Vanda culture in Hawaii. *American Orchid Society Bulletin* 16(8): 446-447. Kennedy, G.C. 1979. Some monopodial orchids, Part II.The genera *Euanthe, Papilionanthe, Hygrochilus, Vandopsis* and *Esmerelda. Orchid Digest* 43(3): 85-91.

9. *Vanilla* Swartz

Epiphytic to terrestrial vines. Pseudobulbs absent. Stems simple or branching, leafy or with scale-like bracts, with adventitious aerial roots. Leaves alternate, coriaceous or fleshy, sessile or shortly petiolate. Inflorescence a lateral, axillary raceme or spike. Sepals and petals free, similar, spreading. Lip simple or obscurely 3-lobed, clawed, the blade tubular; disc often with retrorse, denticulate lamellae. Capsule elongated, fleshy, indehiscent (vanilla bean or pod). Pollinia 2.

Key to Species

1. Lip obscurely 3-lobed, to 4 (-5) cm; disc with verrucose lines or papillae; capsule subcylindrical; leaves green, or green striped with whitish-yellow 1. *V. planifolia*
1. Lip simple, to 9 cm; disc smooth, not lined or papillate; capsule 3-angled; leaves green 2. *V. pompona*

1. *Vanilla planifolia* G. Jackson in H.C. Andrews, *Botanists Repository* 8: t.538 (1808). (Synonym: *V. fragrans* (Salisbury) Ames). VANILLA, COMMON VANILLA; BANILLA, BANIRIE (Surinam). Vine to 100 m. Stems branched. Leaves oblong-lanceolate or oblong-ovate, to 27 x 7.5 cm, shortly petiolate. Inflorescence 10-15 (-20) -flowered. Sepals and petals greenish-yellow or pale green, linear-oblong to oblanceolate, to 6 x 1 cm. Lip tubular, to 4 (-5) cm, yellow or whitish, crenulate-undulate; disc with verrucose lines or papillae along the veins, and retrorse, denticulate crest. Capsule subcylindrical, 15-25 cm.

Range: Tropical America, including the three Guianas. The variegated common vanilla, cv. Variegata, which has green leaves striped with whitish-yellow, has recently been introduced into cultivation as an ornamental in Guyana at the Botanic Gardens, Georgetown.

The capsules of this species provide the major world source of natural vanilla flavoring, and are mostly grown on a commercial scale in Mexico and Madagascar. In the wild in Guyana, the plants are pollinated by the euglossine bee, *Eulaema meriana*, whereas under domestication the flowers must be hand-pollinated to ensure commercial supplies of the vanilla fruit ("beans").

Literature: Arditti, J. 1971. Vanilla: an historical vignette. *American Orchid Society Bulletin* 40(7): 610-613. Ashley, J. 1976. The culture of *Vanilla planifolia* in Uganda. *American Orchid Society Bulletin* 45(4): 291-296. Champon, B.P. 1956. The orchid that flavors. *Garden Journal* 6(6): 181-184. Correll, D.S. 1953. Vanilla: its botany, history, cultivation and economic import. *Economic Botany* 7(4): 291-358. Nauman, C.E. 1991. Vanilla: the fragrant, flavorful orchid. *Fairchild Tropical Garden Bulletin* 46(2): 10-14.

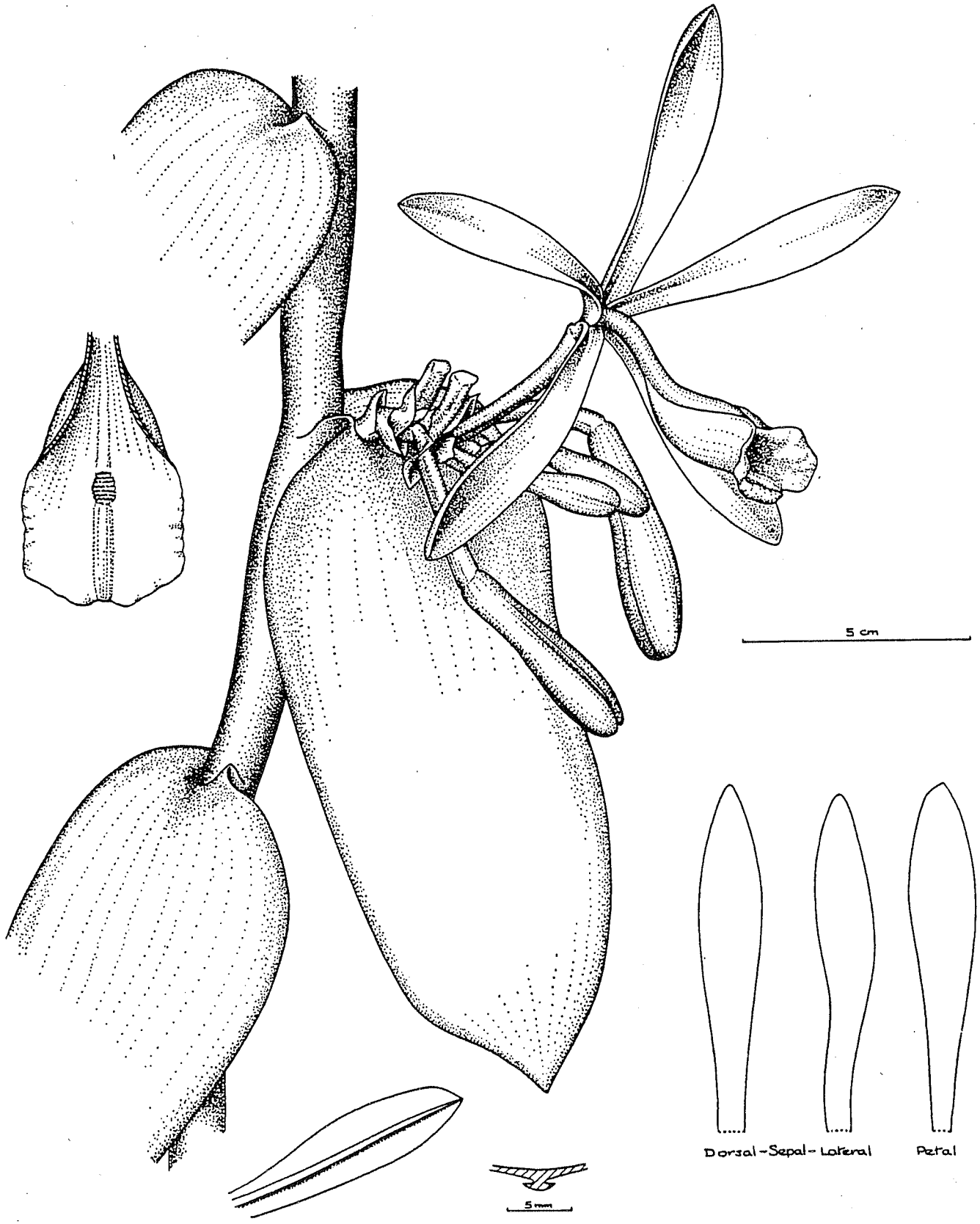


Fig. 254. *Vanilla pompona* (Orchidaceae).

Spitzel, J.N. 1973. Vanilla: Mexico's mystery plant. *American Orchid Society Bulletin* 42(2): 134-140. Spitzel, J.N. 1973. Cooking with the vanilla bean. *American Orchid Society Bulletin* 42(10): 900-902. Withner, C.L. 1955. Ovule culture and growth of vanilla seedlings. *American Orchid Society Bulletin* 24(6): 380-392. Purseglove, J.W., et al. 1981. *Spices.* 2 vols. London and New York: Longman (pp. 644-735).

2. *Vanilla pompona* Schiede, *Linnaea* 4: 573 (1829). (Synonyms: *V. guianensis* Splitgerber, *V. surinamensis* Reichenbach fil.). WEST INDIAN VANILLA. Tall vine. Stems often not branched. Leaves oblong-obovate to narrowly elliptical, to 30 x 10 cm, very shortly petiolate. Inflorescence to c.8 -flowered. Sepals and petals greenish-yellow or pale green, oblanceolate, to 9.5 x 1.8 cm. Lip tubular, to 9 cm, orange-yellow, crenulate-undulate; disc smooth, not lined or papillate along the veins, with retrorse, denticulate crest. Capsule 3-angled, to 15 cm, often less, stubby.

Range: Tropical America, including Guyana and Surinam. Grown as an ornamental in the sierplanten area of the Cultuurtuin, Paramaribo, Surinam, and in French Guiana.

Of secondary importance to *V. planifolia* as a commercial source of vanilla and produced mainly in the French Antilles, this species is used in hybridization for producing plants resistant to *Fusarium* root-rot disease.

Pandanaceae

Dioecious trees, shrubs or woody vines. Stems ringed, few-branched, often with prop roots and aerial supporting roots; aerial roots with conspicuous rootcap. Leaves numerous in a crowded spiral at tips of branches, linear, evergreen, parallel-veined; sheath open. Male inflorescence terminal and axillary, a several-branched raceme or panicle with crowded flowers; stamens numerous, in crowded fascicles or umbels. Female inflorescence terminal, a crowded head of bracteate pistils. Spathes green or brightly colored. Perianth absent. Ovary superior, 1-celled. Fruit a multiple structure (syncarp) of many woody or fleshy phalanges of drupes.

1. *Pandanus* Parkinson

Trees or shrubs. Stems branched, often with stilted prop roots and aerial roots, often suckering. Leaves in corkscrew spirals, linear, often spinose-serrate on margin and on midvein beneath. Inflorescence bracteate; flowers densely crowded in racemes or panicles (male) or heads (female). Perianth absent. Individual fruits often aggregated into multiple-phalanged syncarps.

Key to Species

1. Leaves smooth, not serrate on margin, with bluish-glaucous cast, to 2.5 cm wide
   1. *P. baptistii*
1. Leaves antrorsely spinose-serrate on margin, without bluish cast, to 3 cm or more wide.
   2. Leaves green, not variegated
      3. *P. tectorius*
   2. Leaves variegated in longitudinal stripes.
3. Variegation yellow or golden; leaf margin minutely serrate
   2. *P. sanderi*

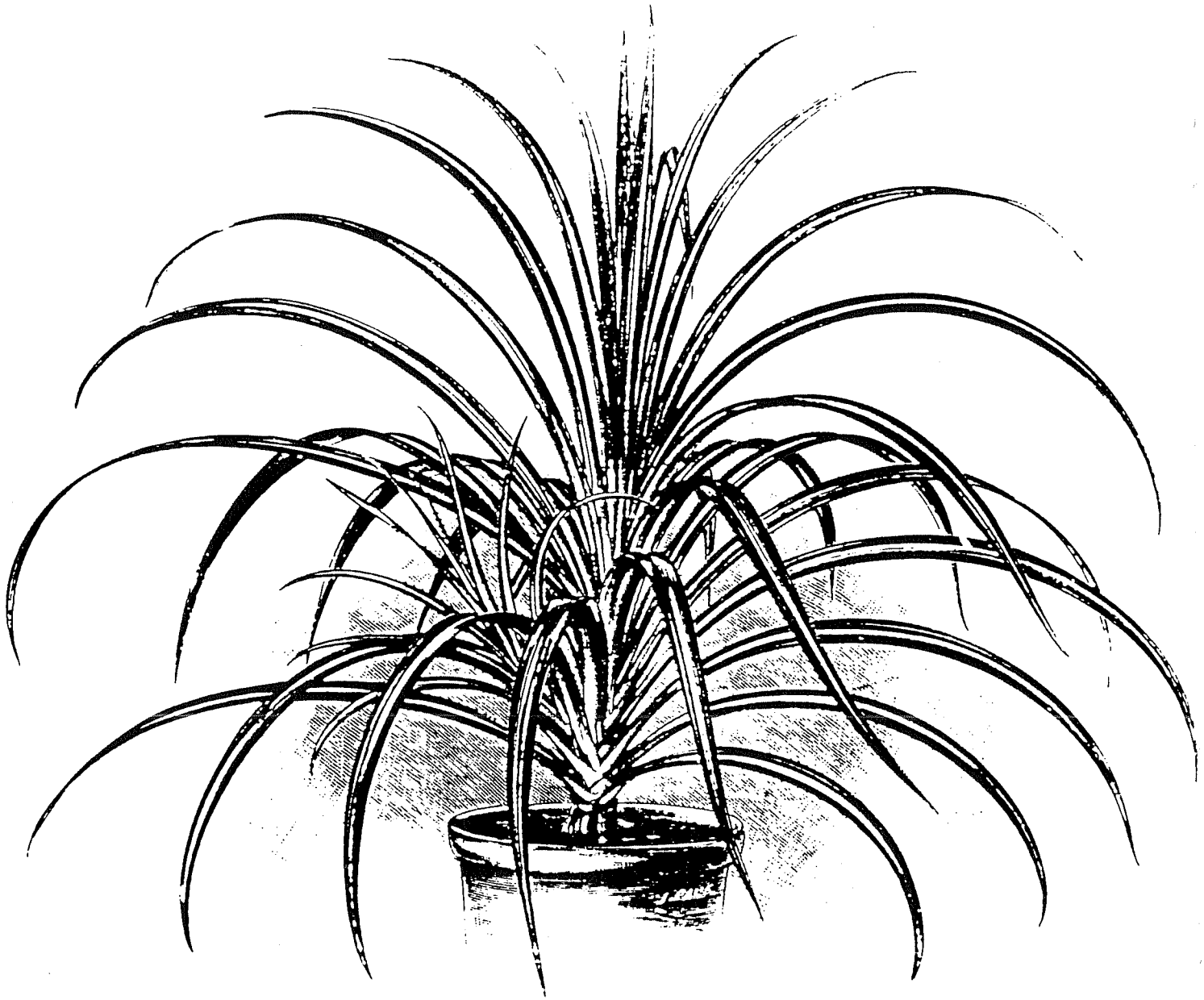


Fig. 255. *Pandanus baptistii* (Pandanaceae).

3. Variegation white or silvery; leaf margin prominently serrate 4. *P. veitchii*

1. *Pandanus baptistii* Hort. Veitch ex Missone, *Revue Horticulture Belge* 19: 166, fig.35 (1893). BLUE SCREW PINE. Stem short. Leaves entire, variegated with whitish-yellow stripes, with a bluish-glaucous cast or sheen, to 2.5 cm wide.

Range: New Britain Island. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana, and in a restaurant planter in Paramaribo, Surinam.

2. *Pandanus sanderi* Hort. Sander ex M. T. Masters, *Gardeners' Chronicle* 1: 243 (1898). SANDER PANDANUS. Stem short. Leaves minutely serrate, variegated with yellow or golden stripes, to 5 cm wide.

Range: Timor. Grown as an ornamental at the Botanic Gardens, Georgetown, Guyana.

3. *Pandanus tectorius* Parkinson ex J.P. du Roi as "Z", *Der Naturforscher* 4: 240 (1774). SCHROEF PALM, PANDAN (Surinam); SCREW PINE. Stem tall, the plant to 6-7 m. Leaves serrate, green, to 10 cm wide.

Range: Papua New Guinea to Polynesia. Grown for ornament in the Botanic Gardens, Georgetown, Guyana, and in yard in vicinity of Billiton Bauxite plant near Waterland, as well as on hotel grounds in Paramaribo, Surinam. It has been grown as a useful plant in Surinam since introduced in 1910 at Lelydorp (Ostendorf, 1962).

Literature: Stone, B.C. 1981. *Pandanus tectorius* in the Hawaiian Islands. *Notes from Waimea Arboretum* 8(2): 4-10.

In the tropics the leaves are employed to make rope, mats, sacks and carpets; fruit is edible.

4. *Pandanus veitchii* Hort. Veitch ex M.T. Masters & T. Moore, *Gardeners' Chronicle* 2: 349 (1868). VARIEGATED SCREW PINE. Stem tall, the plant to 10 m. Leaves serrate, variegated with white or silvery-white stripes near margin, to 8 cm wide.

Range: Southern Polynesia. Grown as an ornamental at the Botanic Gardens, Georgetown and in private gardens near Timehri, Guyana; and in town residential plantings as well as in lawn at the Cultuurtuin in Paramaribo, Surinam.

An unidentified species of *Pandanus* is grown as a garden ornamental in French Guiana (de Granville, 1985A).

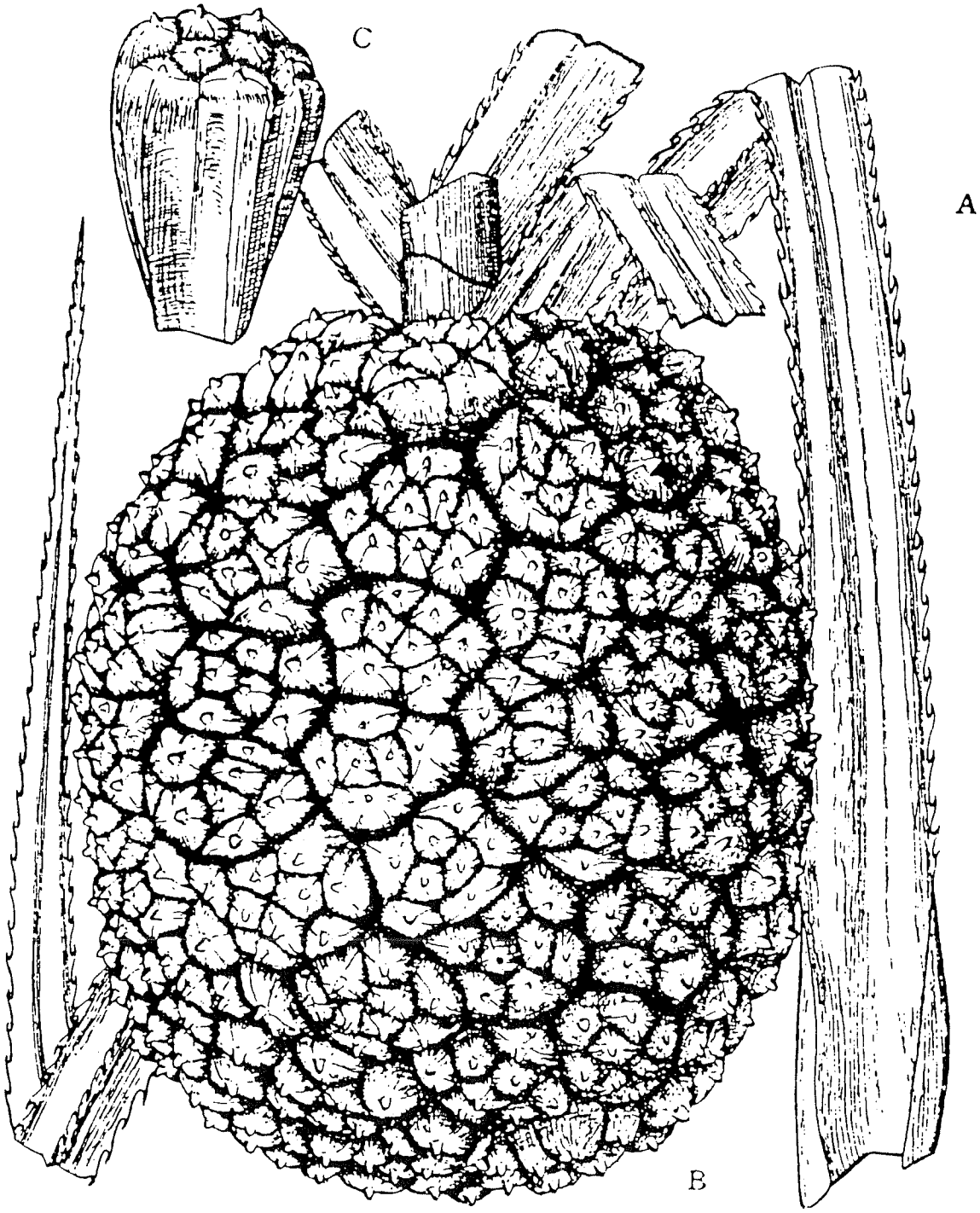


Fig. 256. *Pandanus tectorius* (fruit) (Pandanaceae).

Fig. 257. *Pandanus tectorius* (Pandanaceae).

Poaceae

Annual to perennial herbs, shrubs, or (bamboo) trees. Stems (culms) solitary or clumping, simple or branched, often with creeping rhizomes or stolons. Leaves in two ranks, narrow, with usually open sheath, sessile or (bamboo) shortly petiolate. Inflorescence a spike, raceme or panicle of spikelets; spikelets of 2 to numerous flowers (florets) subtended by hyaline scales; florets bisexual or unisexual, the sepals and petals absent and replaced by 2-3 rudimentary lodicules; scales of floret comprising an outer bract (lemma) and an inner bract (palea), the whole spikelet with the 2 lowermost bracts (glumes) empty. Stamens (1-) 3 (-6). Ovary 1-celled; ovule one. Fruit a 1-seeded grain (caryopsis).

Literature: Judziewicz, E. 1990. Poaceae, in Gorts-van Rijn, A.R.A., ed., *Flora of the Guianas*. 727 pp. Koenigstein, Germany: Koeltz Scientific Books.

Cymbopogon nardus (Linnaeus) Rendle from Sri Lanka, known as CITRONNELLE or CITRONELLA GRASS, is a clumping plant to 2 m with a very congested, usually interrupted panicle; it is infrequently grown as an ornamental in private gardens in French Guiana (de Granville, 1985).

Key to Genera

1. Herbs with fragile stems, not woody, reed-like or cane-like; inflorescence of 2 spike-like racemes; stamens 3 3.*Ischaemum*
1. Shrubby or tree-like plants, often woody, with reed-like or cane-like stems; inflorescence a panicle; stamens 2 or 6.
   2. Leaves alternate, uniformly distributed along the stem; internodes of stem often hollow; inflorescence a full-round panicle; flowers bisexual; stamens 6 1.*Bambusa*
   2. Leaves arranged in a distichous fan near apex of the stem; internodes of stem solid; inflorescence with secund branches, i.e. branches produced only on one side of inflorescence-axis; flowers unisexual, the plants monoecious; stamens 2 2.*Gynerium*

1. *Bambusa* Schreber

Perennial clumping plants from thick rhizomes. Stems (culms, canes) woody, cylindrical, jointed, with hollow or solid internodes, erect, sometimes spinose. Leaves with sheathing base and short petiole, narrow, the leaf-blade jointed at insertion on sheath. Inflorescence a panicle; flowers (florets) borne in spikelets which are often clustered in glomerules on the panicle-branches. Spikelets sessile, 2- to many-flowered, comprising either bisexual or unisexual florets; glumes small; rachilla jointed below the florets. Stamens 6. Fruit a one-seeded grain (caryopsis).

Literature: Andrews, L.M. 1971. Bamboo: the "noble plant". *Garden Journal* 21(1): 16-23. Austin, R. and K. Ueda. 1970. *Bamboo*. 215pp. New York and Tokyo: Walker/Weatherhill. Farrelly, D. 1984. *The Book of Bamboo*. 332pp. San Francisco,

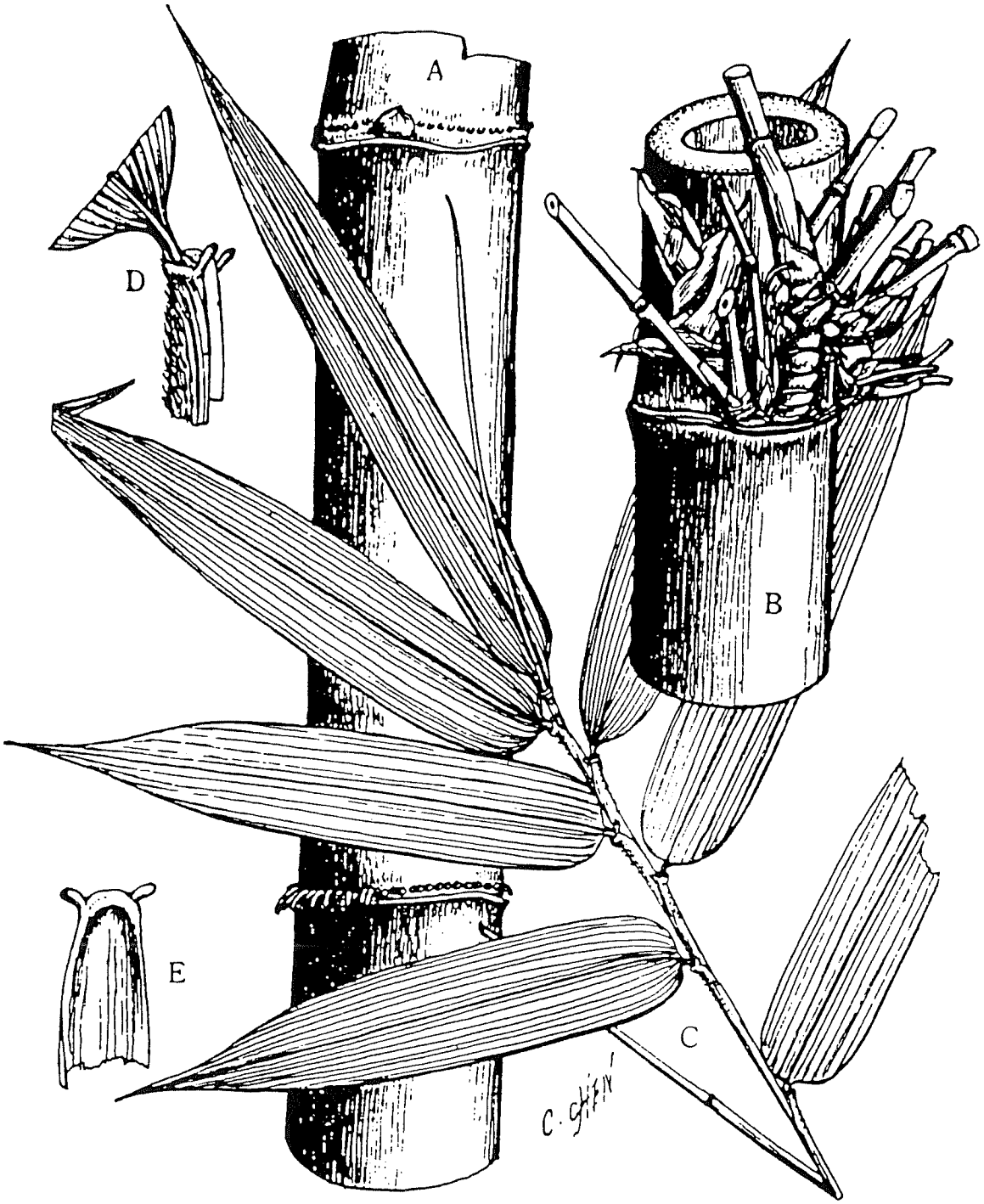


Fig. 258. *Bambusa vulgaris* (Poaceae).

California: Sierra Club Books. Hidalgo Lopez, A. 1974. *Bambu*. 318pp. Cali, Colombia: Estudios Tecnicos Colombianos Limitada. Janzen, D.H. 1976. Why bamboos wait so long to flower. *Annual Review of Ecology and Systematics* 7: 347-391. Lawson, A.H. 1968. *Bamboos*. 192pp. New York: Taplinger Publishing Co. Marden, L. 1980. Bamboo, the giant grass. *National Geographic Magazine* 158(4): 502-529. McClure, F.A. 1966. *The Bamboos: A Fresh Perspective*. 347pp. Cambridge, Massachusetts: Harvard University Press. Minakami, T. and S. Takama. 1983. *The World of Bamboo*. 236pp. South San Francisco, California: Heian International, Inc. Stover, R. 1983. *The Bamboo Book*. 64pp. Tustin, California: Endangered Species Press.

Key to Species

1. Plants dwarf to shrubby; culms 3-5 (-9) m x 2-3 m, with almost solid internodes; panicle lax, with few spikelets; spikelets 3- to 5-flowered; auricles of leaf-sheaths absent 1.*B. glaucescens*

1. Tall trees; culms to 18 m x 12.5 cm, with hollow internodes; panicle ample, with many spikelets; spikelets 4- to 12-flowered; auricles of leaf-sheaths present, large 2.*B. vulgaris*

1. *Bambusa glaucescens* (Willdenow) Siebold ex Munro, *Transactions of the Linnean Society of London* 26: 89 (1868). (Synonyms: *B. multiplex* sensu auth., non (Loureiro) Raeuschel ex J.A. and J.H. Schultes, *B. nana* Roxburgh). DWERGBAMBOE (Surinam); HEDGE BAMBOO, ORIENTAL HEDGE BAMBOO. Plants dwarf to shrubby. Culms much-branched from the base, 3-5 (-9) x 2-3 cm, unarmed. Leaves linear or linear-lanceolate, to 18 x 1.6 cm. Panicle lax, with few spikelets; spikelets 3- to 5- flowered.

Range: Asia. A dwarf cultivar is grown as an ornamental in the Promenade Gardens, Georgetown, Guyana; taller plants are grown in Surinam (Ostendorf, 1962).

2. *Bambusa vulgaris* Schrader ex J.C. Wendland, *Collectio Plantarum* 2(2): 26, t.47 (1808). SURINAAMSE BAMBOE (Surinam), PRING GADING (Surinamese Javan); BAMBOU (French Guiana); COMMON BAMBOO. Tall trees. Culms branched, to 18 m x 12.5 cm, unarmed. Leaves linear-lanceolate, to 25 x 3.5 cm. Panicle ample, with many spikelets; spikelets 4- to 12-flowered.

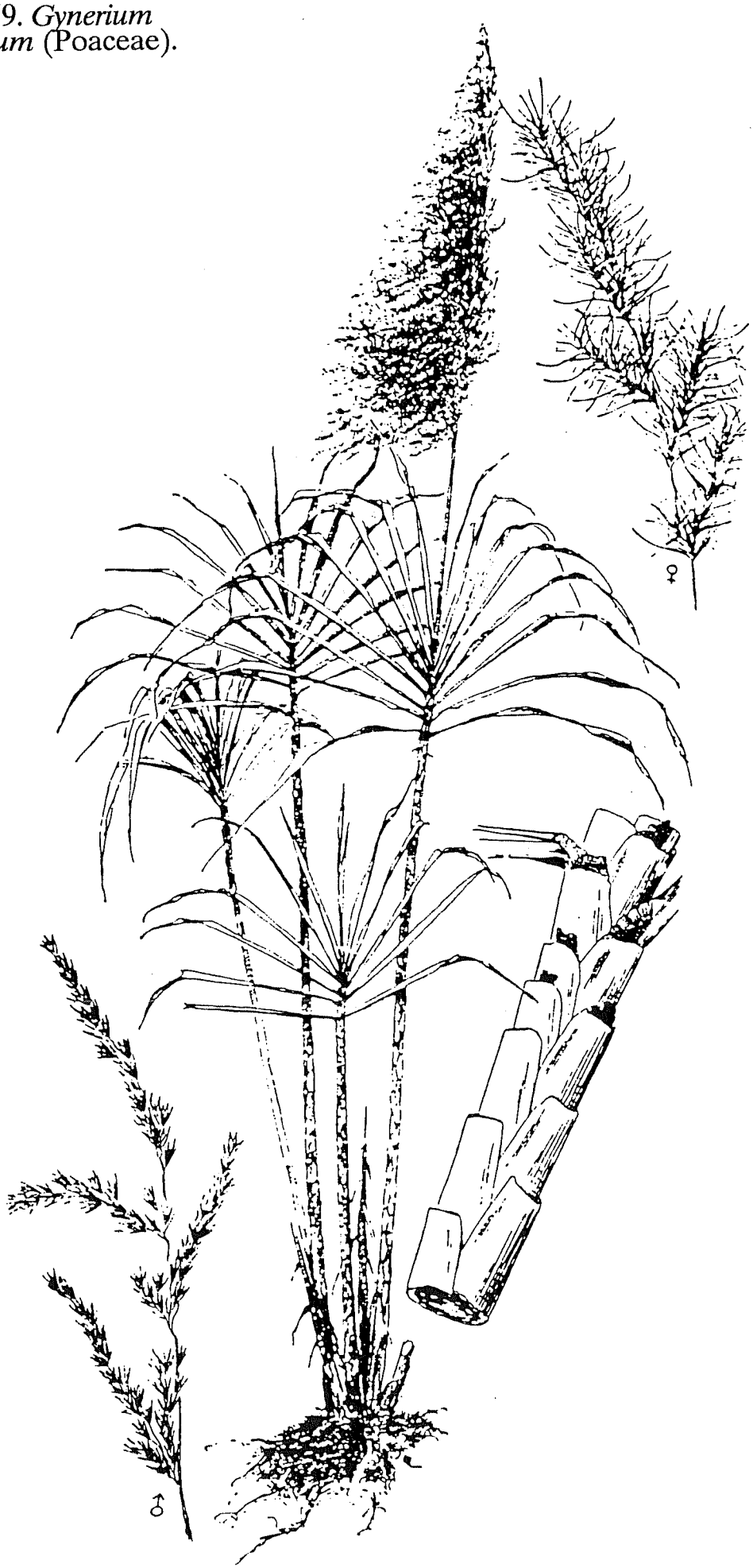
Range: Asia. Typical green-stemmed plants, as well as var. *striata* Gamble with stems striped with yellow-green, are cultivated in Surinam (Ostendorf, 1962). Green-stemmed colonies occur as ornamental and shade plantings along hotel roads in Cayenne, French Guiana.

2. *Gynerium* Willdenow ex Palisot de Beauvois

Dioecious perennial reeds from creeping rhizomes. Stems clumping, solid, becoming woody, often branching from the base. Leaves sheathing, narrow, forming an ascending, distichous fan at apex of culms. Inflorescence a terminal, plumose panicle with branches drooping and secund on the main rachis at maturity. Spikelets several-flowered; lemmas of the pistillate flowers silky, of the staminate spikelets glabrous. Stamens 2. Fruit a one-seeded grain (caryopsis).

1. *Gynerium sagittatum* (Aublet) Palisot de Beauvois, *Essai d'une Nouvelle*

Fig. 259. *Gynerium sagittatum* (Poaceae).



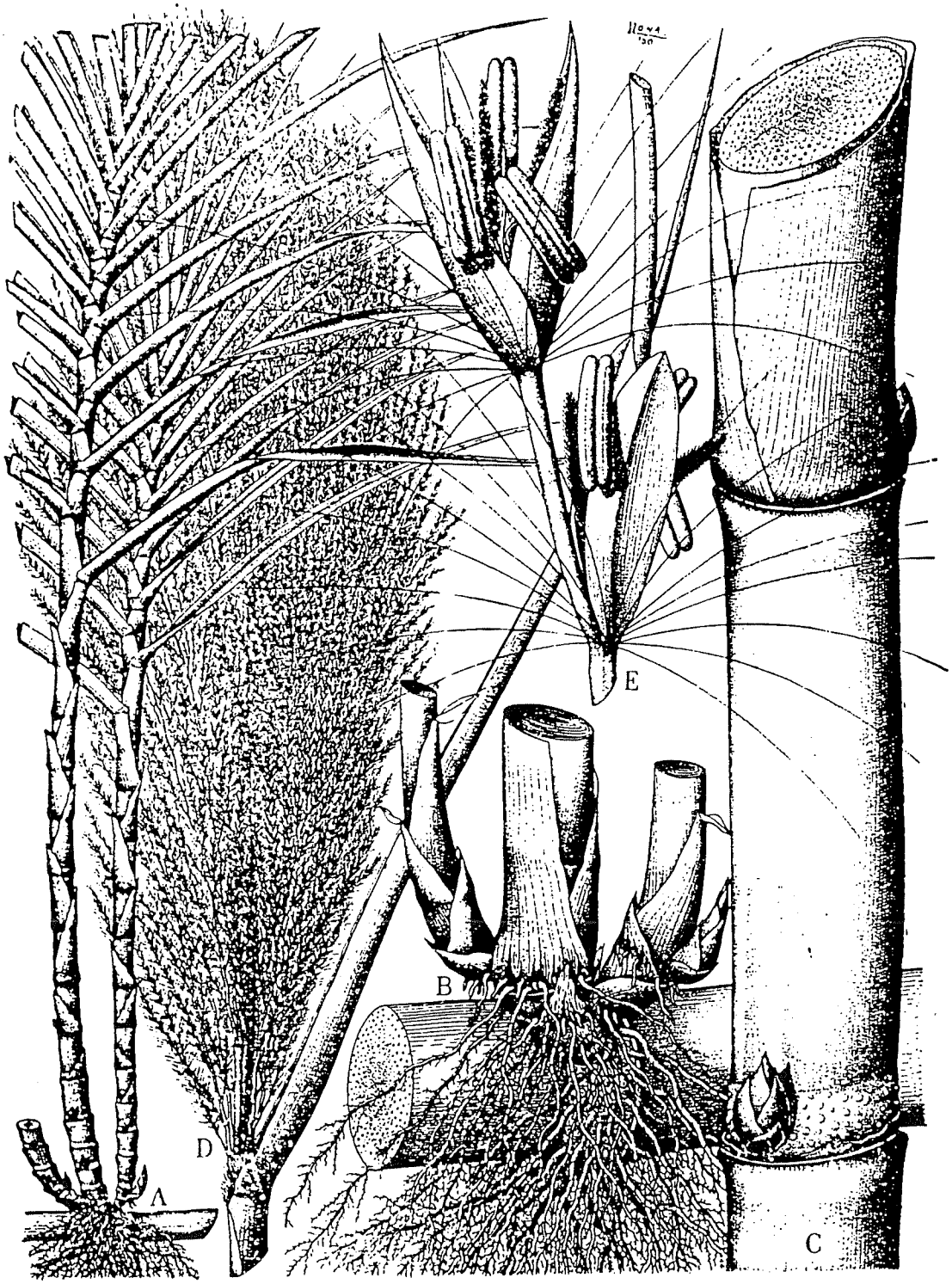


Fig. 260. *Saccharum officinarum* (Poaceae).

Agrostographie 138, t.26, fig.6 (1812). (Synonym: *G. saccharoides* Humboldt & Bonpland). ROSEAU FLECHE (French Guiana); WILD SUIKERRIET, INDIAANSCH PIJLGRAS, PEIRI, PIJLRIET (Surinam); KAMAROEA (Surinamese Carib); WILD CANE, ARROW GRASS. Culms (stems) with persistent, imbricate leaf-sheaths below, to 10 m x 2.5 cm. Leaves linear-lanceolate, serrulate, to 2 m x 6 cm, forming an ascending, distichous fan at apex of culms. Panicle densely flowered, c. 90-180 cm, the branches drooping and secund on the main rachis at maturity.

Range: West Indies, Mexico, Central and South America, including the three Guianas. Grown as an ornamental at the Promenade Gardens and occasionally as an ornamental dooryard accent plant in Georgetown, Guyana; and infrequently in private gardens in French Guiana (de Granville, 1985A).

This plant is a tall, cane-like grass which superficially resembles sugar cane (*Saccharum officinarum* Linnaeus). Sugar cane, which is cultivated in the Guianas, has leaves fairly well distributed along the stem rather than all in a discrete fan at the stem-apex, and a full-round (not secund) panicle.

3. *Ischaemum* Linnaeus

Perennial or sometimes annual, tufted, erect or creeping plants from long stolons. Stems (culms) branching, sometimes decumbent at the base. Leaf-sheaths compressed, open, with small ligule; leaf-blades narrow. Inflorescence terminal or axillary, of spike-like racemes which may be solitary, fasciculate or digitate, fragile, compressed; spikelets paired, one sessile and one pedicellate, 2-flowered; sessile spikelet with 4 glumes, the second and fourth glume awned or awnless, the third glume awned, the first lemma enclosing a male floret, the second lemma enclosing a bisexual or female floret; pedicellate spikelet similar or reduced. Stamens 3. Fruit a 1-seeded caryopsis.

1. *Ischaemum indicum* (Houttuyn) Merrill, *Journal of the Arnold Arboretum* 19(4): 320 (1938). (Synonym: *I. ciliare* Retzius). INDIA DUCK-BEAK GRASS. Perennial. Stems (culms) geniculate or ascending, rooting at the lower nodes, 15-90 cm. Leaves linear-lanceolate, pubescent, 5-30 x 5-7.5 cm. Racemes 2(3-4), 3-6.5 cm; spikelets to 4.5 mm, the lower lemma c.3.5 mm, keeled, cleft at apex, with an awn 8-12 mm.

Range: India, Sri Lanka; Southeast Asia to Fiji. Used for a short lawn grass at the Botanic Gardens, Georgetown, Guyana. As noted by A.C. Smith, *Flora Vitiensis Novae* (1979), there are large and small forms of this variable plant, which is "a useful pasture and lawn grass, but is sometimes a weed of cultivation. However, it smothers weeds and therefore is useful for pastures when management standards are low."

Pontederiaceae

Perennial aquatic or semi-aquatic herbs, free-floating or rooted to substrate. Leaves in a basal rosette, or alternately to spirally arranged along a stem, sheathed, petiolate, the petiole sometimes inflated. Inflorescence a terminal spike, raceme or panicle. Flowers bisexual, regular or irregular (zygomorphic); perianth of 6 segments united at the base into a tube and with 6 spreading lobes above. Stamens (3) 6; filaments borne on perianth-tube.

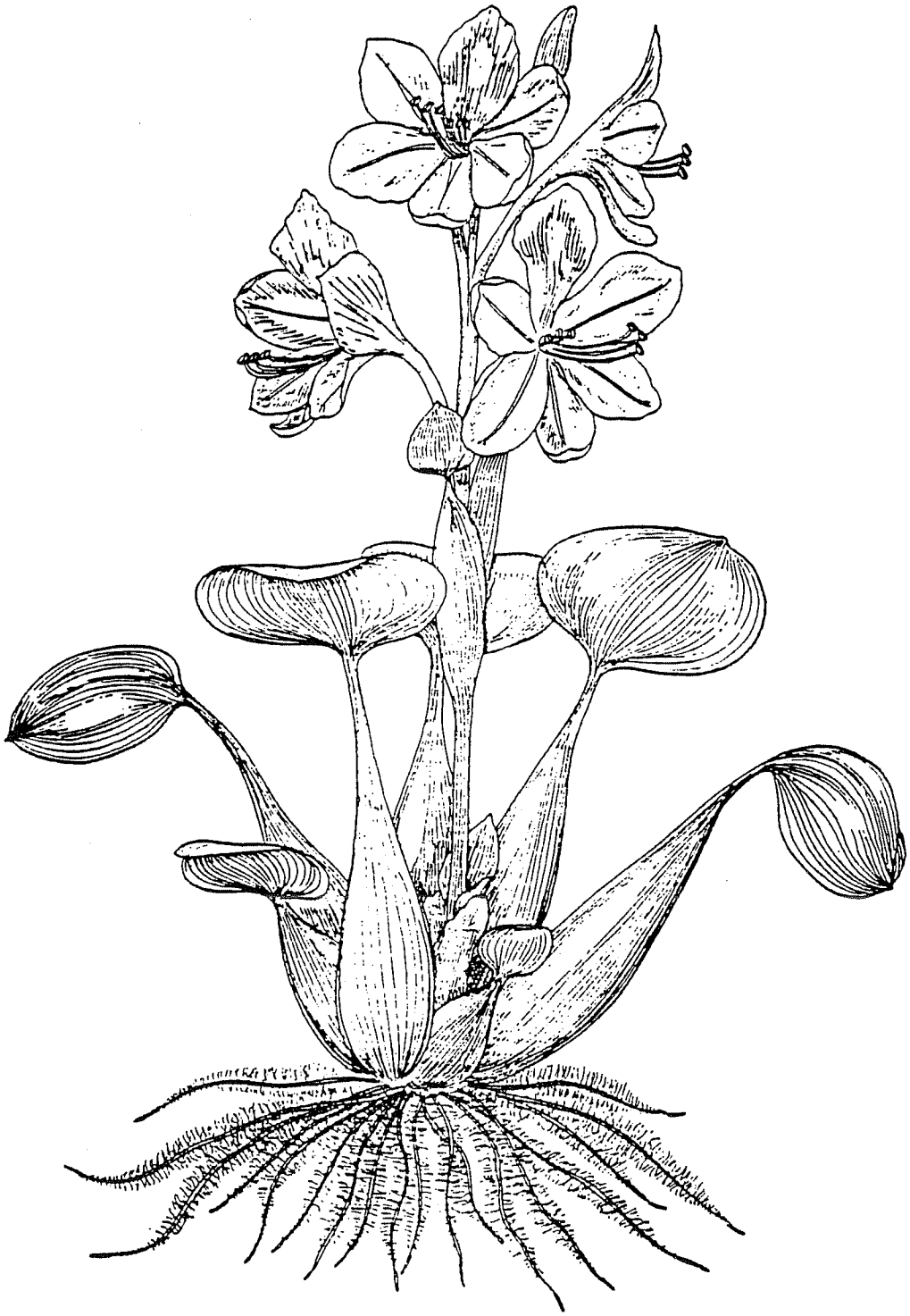


Fig. 261. *Eichhornia crassipes* (Pontederiaceae).

Ovary superior, (1-) 3-celled. Fruit a loculicidal capsule with numerous seeds, or a dry indehiscent, 1-seeded structure.

1. *Eichhornia* Kunth

Floating or partly submerged, perennial aquatic herbs, often forming plantlets at the tips of stolons. Leaves in a basal cluster; petioles sometimes inflated. Inflorescence a terminal spike or panicle. Flowers bisexual, slightly irregular, funnelform, with a tubular base and a limb of 6 spreading perianth-segments. Stamens 6, unequal, often 3 short and 3 long, the filaments glandular-pubescent. Ovary superior, 3-celled. Fruit a capsule; seeds many.

1. *Eichhornia crassipes* (Martius) Solms-Laubach in A. and C. DeCandolle, *Monographiae Phanerogamarum* 4: 527 (1883). WATER HYACINTH. Floating plant with feathery fibrous root system and thick stolons. Petioles markedly inflated and bulbous at the base, to 33 cm; leaf-blades ovate to orbicular or reniform, shining, to 16 x 14 cm. Inflorescence a loosely many-flowered spike of 6-35 flowers, to c.35 cm. Flowers glandular-pubescent outside, to c.6 x 5-10 cm, violet or bluish-purple, the upper perianth-segment (lobe) with a darker violet patch with a yellow center.

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

This plant can become a weed in situations where its multiplication is unrestricted. It is a freshwater plant which cannot for long physiologically tolerate either brackish or salt water. As noted by Otto Degener in *Flora Hawaiiensis* (1946), "Actually three types of plant occur: one bears short styles and 3 medium size and 3 long stamens; another bears medium size styles and 3 short and 3 long stamens; the third bears long styles and 3 short and 3 medium size stamens."

An undetermined species of *Pontederia* Linnaeus, which has non-inflated petioles, occurs in pools at the Botanic Gardens, Georgetown, Guyana. If an indigenous plant it may be either *P. rotundifolia* Linnaeus or *P. subovata* (Seubert) Lowden, *Rhodora* 75(803): 478 (1973).

Strelitziaceae

Perennial, caespitose, rhizomatous herbs, or trees with woody, ringed trunks. Leaves simple, distichous or nearly so, glabrous, long-petiolate. Inflorescence terminal or lateral (axillary), shortly to long-pedunculate, of a racemiform axis bearing monochasial cymes resembling spikes of flowers enclosed in large, boat-shaped bracts. Flowers bisexual, individually bracteolate, slightly to strongly irregular (zygomorphic); perianth-segments 6; sepals 3, free or partly fused; petals 3, of which 2 are sometimes fused. Stamens 5 or 6; anthers linear. Ovary inferior, 3-celled. Fruit a loculicidal, 3-valved, woody or leathery capsule; seeds numerous, with aril of tufted orange or blue hairs.

Literature: Maas, P.J.M. 1985. 192.Musaceae, pp.1-28, in Görts-van-Rijn, A.R.A., ed., *Flora of the Guianas.*

Key to Genera

1. Flowers orange and dark purple; woody trunk absent 3.*Strelitzia*
1. Flowers white, cream or greenish-white; woody trunk sometimes present at maturity.
   2. Inflorescence terminal, long-pedunculate, much longer than the leaves 1. *Phenakospermum*
   2. Inflorescence axillary, subsessile or shortly pedunculate, shorter than the leaves 2.*Ravenala*

1. *Phenakospermum* Endlicher

Caespitose herbs, a hard woody stem rare or absent. Leaf comprising a short basal sheath, petiole and blade; leaves distichous, borne in an apical cluster; leaf-blades entire, banana-like. Inflorescence terminal, erect, usually long-pedunculate, with alternate, conspicuous, boat-like bracts subtending spikes of flowers; individual flowers within each bract subtended by a bracteole. Flowers bisexual, irregular (zygomorphic); outer segments or sepals 3, with 2 partly fused and 1 free; inner segments or petals 3, with 2 partly fused and 1 free. Stamens 5, free. Ovary inferior, 3-celled. Fruit a 3-valved, loculicidal capsule; seeds many, arillate; aril a dense tuft of orange-red filaments.

1. *Phenakospermum guyannense* (L.C. Richard) Endlicher ex Miquel, *Botanische Zeitung* 3: 345 (1845). (Synonym: *Ravenala guyannensis* (L.C. Richard) O.G. Petersen). ACAROUANY, BANANIER SAUVAGE (French Guiana); HARITSI (Surinamese Arawak); GROTE PALOELOE, PALOELOE (Surinamese Creole). Clumping, large herb or tree up to 12 m, acaulescent or with trunk to 3 m x 15 cm. Leaves with petiole to 150 cm, and elliptical leaf-blade to 300 x 75 cm. Inflorescence to 3 m, including the shaft-like peduncle. Bracts (spathes) c.3-8 per inflorescence, to c.45 cm, green or greenish-yellow. Flowers opening at night, creamy-white, to 28 cm. Stamens 5. Capsule to 20 cm, hard, cylindrical. Seeds black, with red aril.

Range: Tropical South America, from Bolivia to the three Guianas. Grown as a specimen planting in Guyana at the Botanic Gardens, Georgetown (Ted Hubbard, pers. comm., 1985); as an ornamental on grounds of a private farm near Timehri, Guyana; in Laluni, Guyana (Ramsaroop, 1988); and (flowering in 1990) in an enclosed courtyard of the casino renovation area of the Torarica hotel, Paramaribo, as well as grouped in ornamental settings within several fenced roadside farm gardens near Zanderij Airport, Surinam.

Old inflorescences are sometimes used in dry floral arrangements in Surinam (Dr. Marga Werkhoven, pers. comm., 1989).

Literature: Anonymous. 1986. Strelitziaceae - *Phenakospermum. Notes from Waimea Arboretum* 13(1): 8-9. Kress, W.J. 1991. Pollination of the neotropical bird-of-paradise, *Phenakospermum* (Strelitziaceae). *Heliconia Society International Bulletin* 5(2): 8-10. Lemaire, C. 1860. *Phenakospermum guianense*, Planche 239. *L'Illustration Horticole* 77: 4 pp.(unpaginated). Longwood Gardens. 1975. *Plants Growing in Conservatories and Gardens.* 127 pp. Longwood Gardens: Kennett Square, Pennsylvania. Tomlinson, P.B. 1960. The anatomy of *Phenakospermum* (Musaceae). *Journal of the Arnold Arboretum* 41: 287-297.

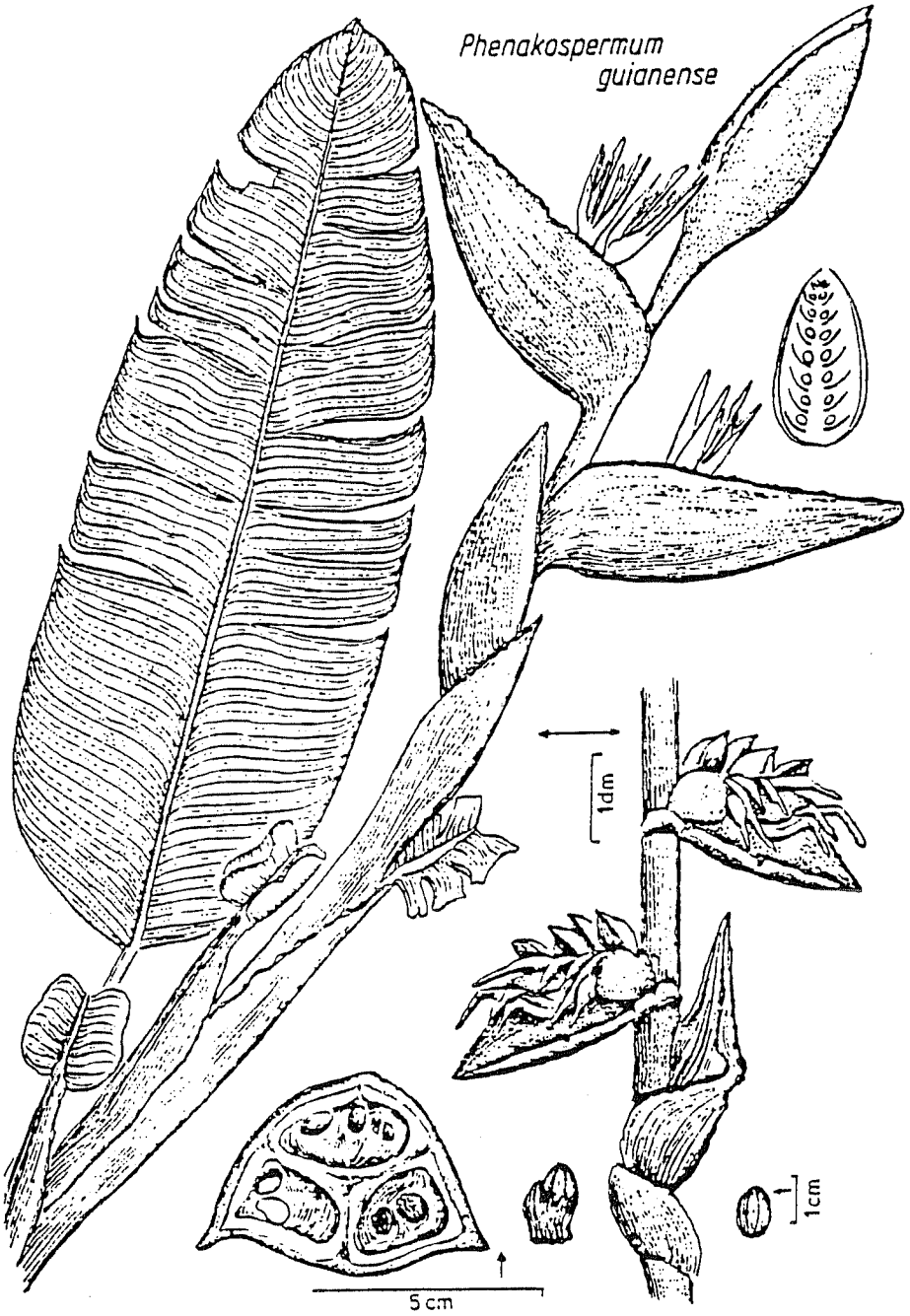


Fig. 262. *Phenakospermum guyannense* (Strelitziaceae).

Ramsaroop, B. 1988. Abstract: Heliconias of Guyana. *Heliconia Society International Bulletin* 3(4): 1-3.

The stems of *Phenakospermum* die after fruiting (Anonymous, 1986), but the plant can be propagated by division of the young plants or suckers formed at the base of the clump, as well as by seeds. It is a species which often occurs in secondary successional communities at forest edges, and its size, small or large, is believed to depend on ecological conditions (J. Zarucchi, pers. comm., 1983). Plants having a ligneous trunk and foreshortened peduncle were separated into the genus *Musidendron* Nakai (1948), which was not maintained by later botanists. Studies on the nocturnal pollination of *Phenakospermum* by bats in French Guiana have been conducted by Dr. W. John Kress, Smithsonian Institution, Washington, D. C. (Kress, 1991). The chromosome number has been determined by Dr. Peter Goldblatt, of the Missouri Botanical Garden, St. Louis, to be the same as its close relative *Ravenala* (2n=22).

The correct spelling of the specific epithet of this plant, "*guyannense*", is often ignored in favor of the more familiar spelling "*guianensis*" or similar orthographic variants.

Phenakospermum was stocked for sale in the nursery of the Botanic Gardens, Georgetown, Guyana in 1887 (Jenman, 1888). It was only sparingly grown in European glasshouses and conservatories of the 1800's (Lemaire, 1860), and it remains only occasionally grown outdoors in tropical botanical gardens, such as Bogor, Java (1957); Kaneohe, Hawaii (1984); Waimea, Hawaii (1986); the garden of Roberto Burle-Marx, Rio de Janeiro, Brazil; and the Jardim Botanico, Rio de Janeiro. It is worthwhile to note that this species, which exhibits an ornamental potentiality still in the infancy of recognition, is grown elsewhere at Marie Selby Botanical Gardens (Sarasota, Florida); National Aquarium (Baltimore, Maryland); Farms of Costa Flores, Costa Rica; Flamingo Gardens (Fort Lauderdale, Florida); Bill Harris residence at Castaways, Mero in Dominica (plant grown from seed collected on the Adrian Thompson flower-farm near Timehri, Guyana in 1985 by R. DeFilipps); and, as of 1975, at Longwood Gardens, Kennett Square, Pennsylvania (Longwood Gardens, 1975). Grown for experimental studies by Dr. W. John Kress at the greenhouse of the Department of Botany, National Museum of Natural History, Smithsonian Institution, and at the U.S. National Botanical Garden in Washington, D.C., at the present time.

2. *Ravenala* Adanson

Caespitose trees with palm-like trunk. Stem (trunk) simple, ringed. Leaf comprising a basal sheath, in a flattened, fan-shaped, semi-circular crown; leaf-blades entire, banana-like, usually frayed by the wind. Inflorescence an axillary, shortly pedunculate racemiform axis with distichous, conspicuous, boat-like bracts subtending spikes of flowers; individual flowers within each bract subtended by a bracteole. Flowers bisexual, irregular (zygomorphic); outer segments or sepals 3, free, equal in size; inner segments or petals 3, free, with 2 petals longer and similar to the sepals, and 1 shorter petal. Stamens 6, free. Ovary inferior, 3-celled. Fruit a 3-valved, loculicidal capsule; seeds many, arillate; aril blue.

1. *Ravenala madagascariensis* Sonnerat, *Voyage aux Indes Orientales* 3: 223 (1782). TRAVELLER'S TREE; ARBRE DU VOYAGEUR (French Guiana);

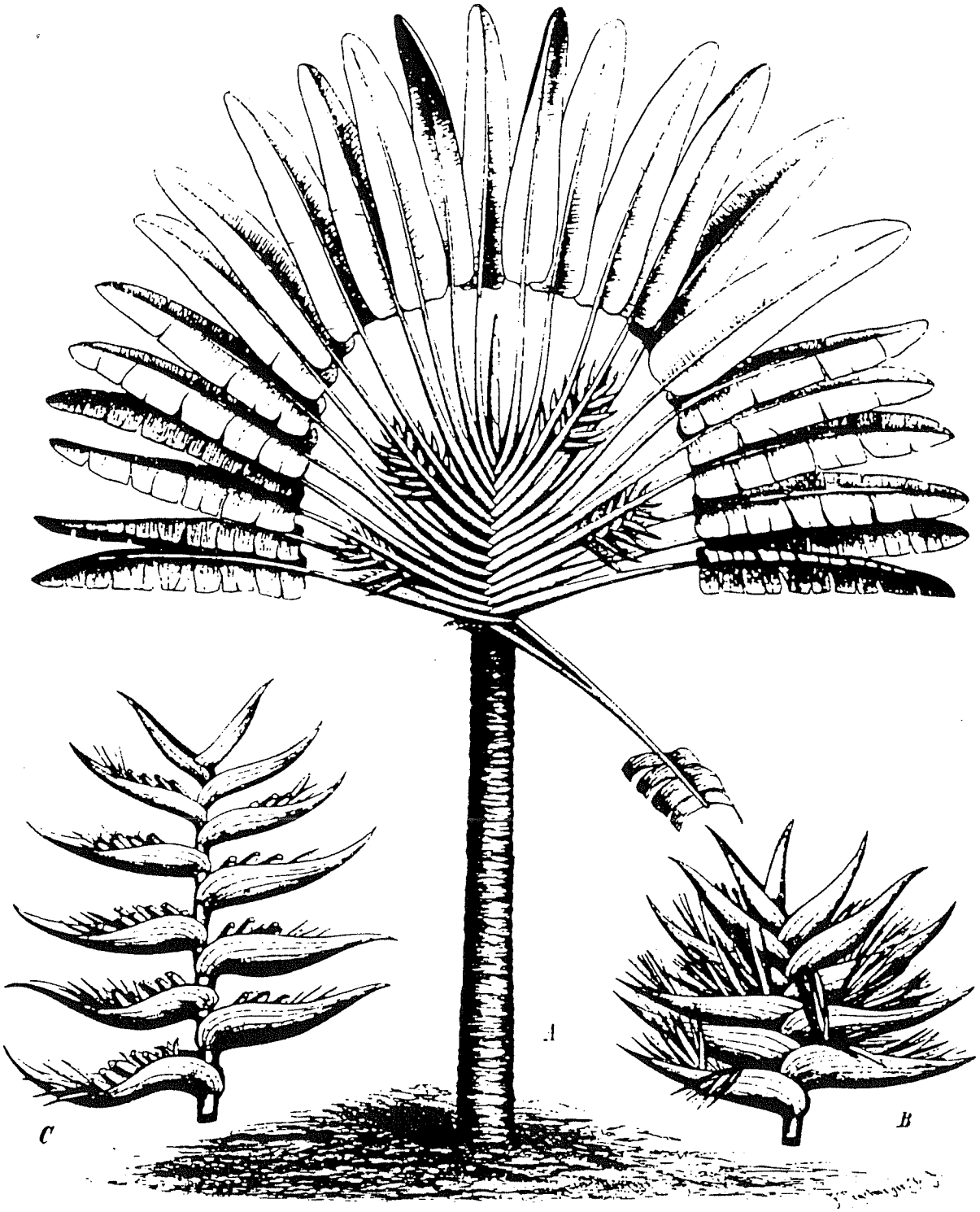


Fig. 263. *Ravenala madagascariensis* (Strelitziaceae).

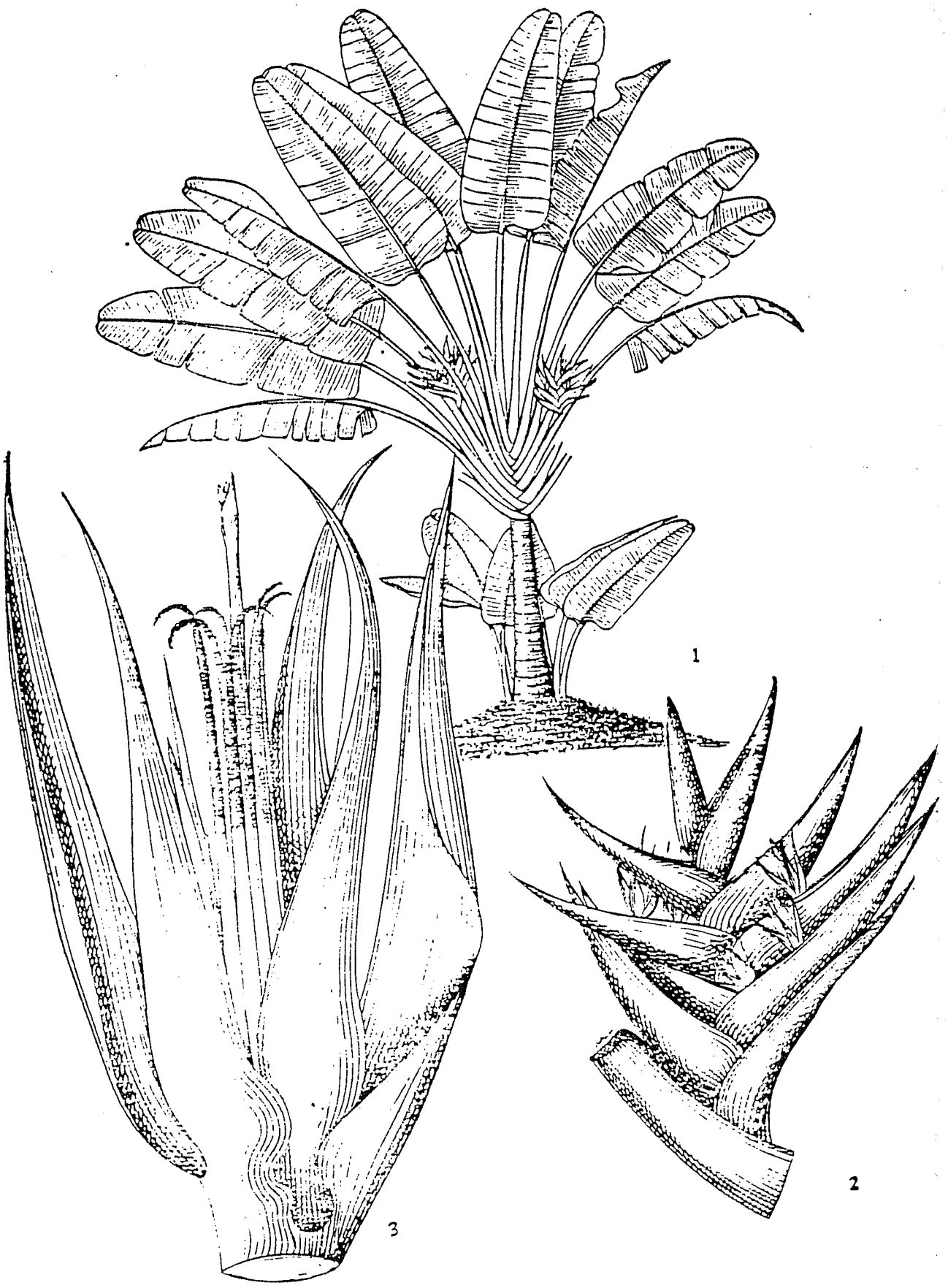


Fig. 264. *Ravenala madagascariensis* (flower) (Strelitziaceae).

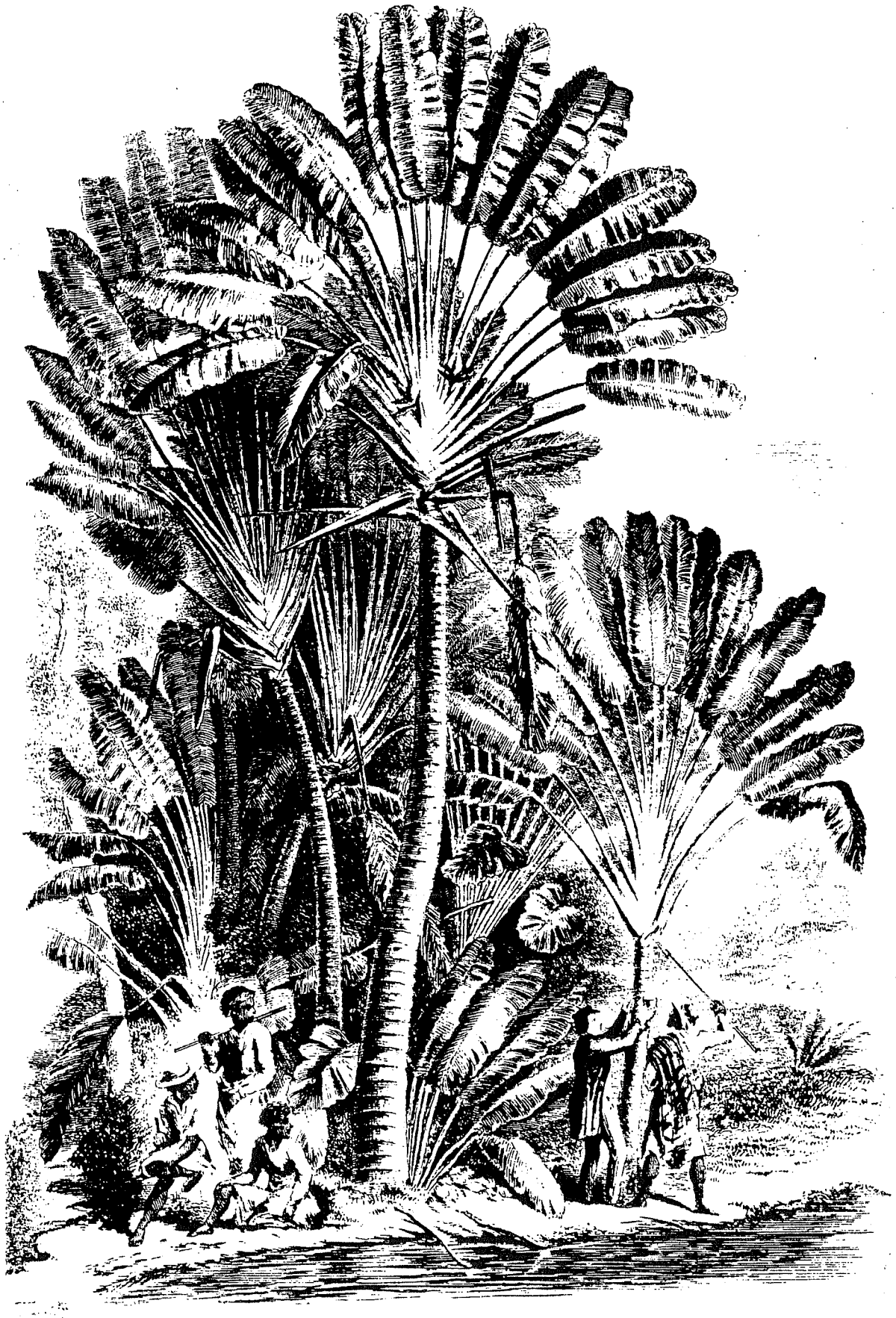


Fig. 265. *Ravenala madagascariensis* (habit) (Strelitziaceae).

REIZIGERSBOOM, WAAIERPALM, WAAIERPISANG (Surinam). Stems clumping, 9-12 (-18) m x c.30 cm. Leaves to c.3 m or more, comprising basal sheath c.60 cm, petiole 90 cm - 1.5 (-3) m, and elliptical leaf-blade 1.2-2.1 (-3) m; leaf-sheaths closely pressed together at core of the spreading fan of leaves. Inflorescence to c.60 cm. Bracts (spathes) c.7-9 (-12) per inflorescence, c.17.5 cm, pale green. Flowers whitish, 15-20 cm. Stamens 6, 10-12.5 cm. Capsule to 10 cm, hard, cylindrical. Seeds black, with blue aril.

Range: Madagascar. Grown as an ornamental at the Promenade Gardens and several places elsewhere in Georgetown, Guyana; in numerous roadside gardens, as well as on hotel and university grounds in Paramaribo and on grounds of CELOS buildings at Leysweg, Surinam; and in Cayenne, French Guiana.

Literature: Lemaire, C. 1860. *Ravenala madagascariensis*, Planche 234. *L'Illustration Horticole* 7: 9 pp. (unpaginated). Lotschert, W. 1958. Der Baum der Reisenden. *Natur und Volk* 88(1): 30-34. Naudin, C.V. 1858. *Ravenala madagascariensis. Flore des Serres* 13: 117-121; t. 1355.

Tropical gardeners often thin out a clump of suckers (young plants) until only one individual remains, which is cultured as a specimen tree. In contrast to *Phenakospermum*, the stem of *Ravenala* does not die back after the formation of the infructescence. The seeds of this bird-pollinated plant are edible. The base of the leaf-sheath collects potable water which reportedly was, in the early days of African exploration, tapped and drunk by thirst-maddened travellers wielding sharpened sticks.

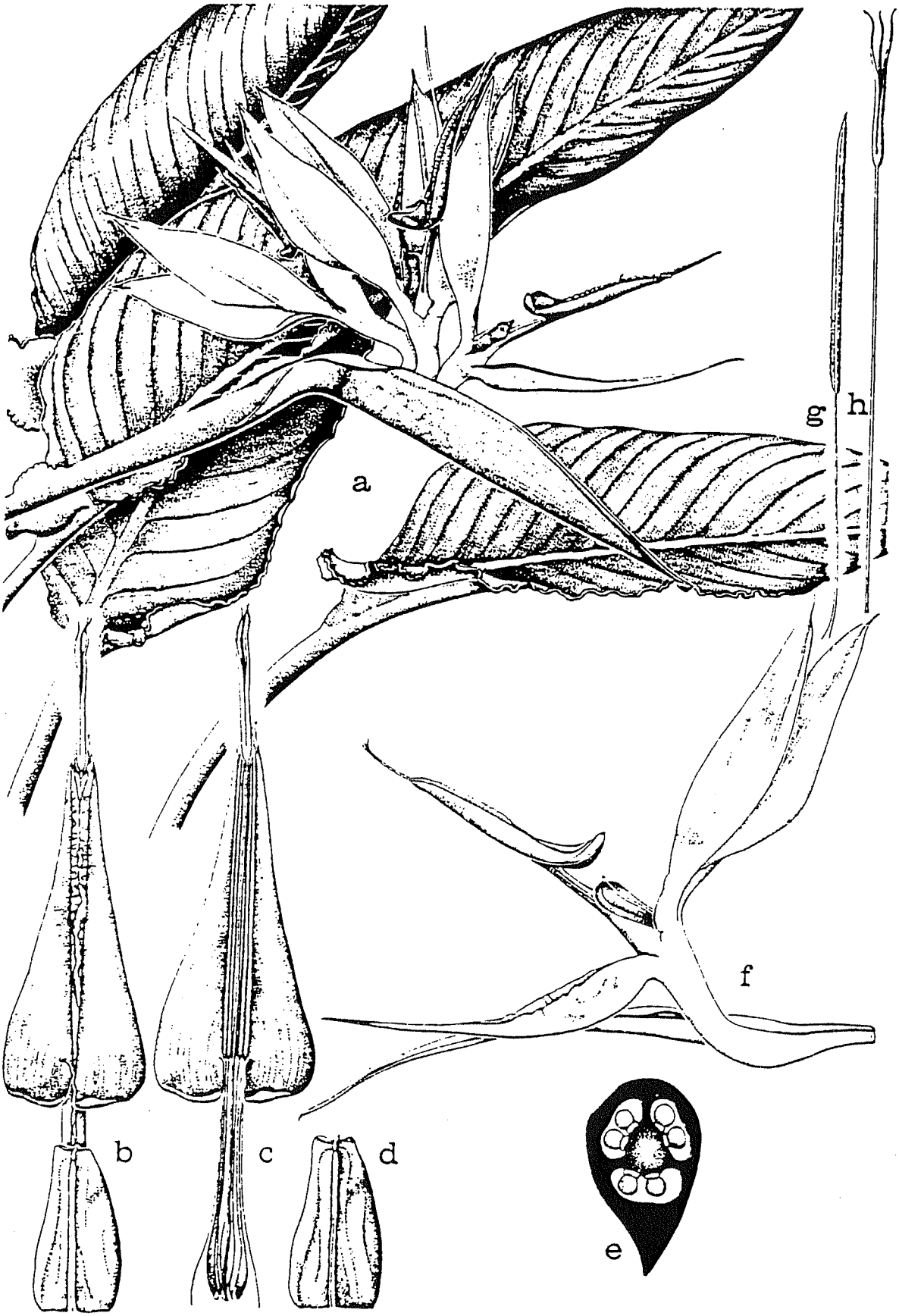
3. *Strelitzia* Aiton

Perennial herbs, with palm-like woody trunks or acaulescent and rhizomatous. Leaves 2-ranked (distichous), terminal or all nearly basal, petiolate, often somewhat glaucous; sheaths open, partly clasping. Flowers in a terminal or lateral inflorescence comprising a 1- to 5-bracteate scape with 1 or a few cincinni of flowers inside; largest bract (spathe) boat-shaped, rigid; flowers appearing successively. Flowers bisexual, irregular (bilaterally symmetrical, zygomorphic); sepals 3, conspicuously colored and displayed in the form of a spreading bird's crest, free, keeled; petals 3, with 1 small, and 2 united into an arrow-shaped structure ("tongue") enclosing stamens and style; stamens 5, anthers long-linear. Ovary inferior, 3-celled; style 3-parted into slender divisions at apex. Fruit a 3-celled, leathery capsule; seeds numerous, with aril of matted hairs.

1. *Strelitzia reginae* Aiton, *Hortus Kewensis* 1: 285, t.2 (1789). BIRD OF PARADISE, CRANE FLOWER. Plant to c.0.9-1.5 (-2.4) m, clumping, acaulescent. Petiole 25-100 cm; leaf-blades ovate to oblong-lanceolate, often undulate in the lower half, glaucescent beneath, 22-50 x 10-25 cm. Inflorescence-bract usually 1, green with purple or reddish margin, to 20 cm. Flower with 3 lanceolate, orange sepals c.7.5 cm, and arrow-shaped, azure blue or purplish-blue "tongue" of fused petals c.7.5 cm; smallest inner perianth-segment (petal) blue. Seed black, with aril of orange tufted hairs.

Range: East coast of southern Africa, from Patensie to Zululand. Grown as an ornamental at the Botanic Gardens, Georgetown (introduced via Cuba), and on private

Fig. 266. *Strelitzia reginae* (Strelitziaceae).



flower-farm grounds near Timehri, Guyana. Grown as an ornamental at the Gravenberch family property in Distrikt Para, Surinam, the plants introduced from Washington, D.C. in 1990 by Robert DeFilipps.

Literature: Anonymous. 1913. Coloured Supplement. *The Gardeners' Chronicle* ser. 3, 54: 86-87, with color illustration of *Strelitzia reginae*. Anonymous. 1916. *Strelitzia kewensis. The Garden* (London) 80(2304): 25. Drysdale, W.T. 1988. Strelitzias in California. *Heliconia Society International Bulletin* 3(2): 5,7. Dyer, R.A. 1972. Vegetative multiplication of *Strelitzia reginae* and its allies. *Bothalia* 10: 575-577. Johnson, C.T. 1977. An anatomical investigation of the flower of *Strelitzia reginae* Banks. *Journal of South African Botany* 43(1): 81-91. Kronstedt, N. and B. Walles. 1986. Anatomy of the *Strelitzia reginae* flower. *Nordic Journal of Botany* 6(3): 307-320. Moore, H.E. and P.A. Hyypio. 1970. Some comments on *Strelitzia* (Strelitziaceae). *Baileya* 17: 64-74. Small, J.G.C., van de Venter, H.A. and C.J. Garner. 1980. Acaulescent growth forms of *Strelitzia*: hybridization and chromosome numbers. *Journal of South African Botany* 46(2): 167-171. Van de Venter, H.A. and J.G.C. Small. 1975. Evidence for the presence of a germination inhibitor in seeds of *Strelitzia* Ait. *Journal of South African Botany* 41(4): 211-223. Van de Venter, H.A., Small, J.G.C., and P.J. Robbertse. 1975. Notes on the distribution and comparative leaf morphology of the acaulescent species of *Strelitzia* Ait. *Journal of South African Botany* 41(1): 1-16. Bensa, S. 1952. Improvement of *Strelitzia reginae* through selection of forms obtained from seed. *Annali della Sperimentazione Agraria*, n.s. 6: 33-52 (in Italian.)

This bird-pollinated plant is named in honor of Charlotte, Queen of England and wife of King George III; she was, prior to marriage, Princess Sophie Charlotte of the house of Mecklenburg-Strelitz, in northern Germany. The queen was a devotee of botanical art and pastimes; her granddaughter, Princess Alexandrina Victoria of Kent, eventually ruled the British Empire as Queen Victoria, Empress of India.

Experiments on horticultural improvement of *S. reginae* were conducted in Italy by Bensa (1952), who calculated various correlations between superior flower production and factors of length and width of leaf-blade and petiole.

Strelitzia reginae was used at Kew in 1898 as the female parent in an artificial hybrid cross with *S. alba* (Linnaeus fil.) Skeels (Synonym: *S. augusta* Thunberg), one of the three white-flowered, tree-like species from South Africa (the others being *S. nicolai* Regel & Koernicke and *S. caudata* Dyer). The resulting hybrid plant was named *Strelitzia* x *kewensis* S.A. Skan, *Kew Bulletin of Miscellaneous Information* 1910: 65 (1910), and was c.3 m tall with sepals of a pale ochre yellow color and blue petals (Anonymous 1913, 1916).

Zingiberaceae

Perennials from often thickened rhizomes. Stems not branched. Leaves 2-ranked (distichous); sheaths open, tubular at base. Inflorescence a terminal spike, panicle or head, at apex of a leafy stem or arising on a separate peduncle from the subterranean rhizome, bracteate or without bracts. Flowers bisexual, bilaterally symmetrical (zygomorphic); perianth-segments 6; calyx of 3 sepals in a 3-lobed tube; corolla of 3 petals in a 3-lobed tube. Fertile stamen 1, not petaloid; sterile stamens (staminodes) present or absent, often the terminal one formed into a petaloid labellum, and the lateral ones petaloid or not.

Ovary inferior, 1- to 3-celled; ovules numerous. Fruit a capsule, or berry-like and indehiscent; seeds arillate.

Literature: Holttum, R.E. 1950. The Zingiberaceae of the Malay Peninsula. *The Gardens' Bulletin, Singapore* 13(1): 1-250 + 33 figs. Maas, P.J.M. 1985. 193.Zingiberaceae, pp.29-67, in Görts-van-Rijn, A.R.A., ed., *Flora of the Guianas*. Königstein, Germany: Koeltz Scientific Books. Steiner, M.L. 1959. A new and illustrated flora of Manila, I. Zingiberaceae. *Philippine Journal of Science* 88(1): 1-40.

Key to Genera

1. Inflorescence terminal on a leafy stem.
   2. Inflorescence an open, sometimes pendent raceme, the bracts prominent and red or pinkish, or absent; lateral staminodes small or absent 1.*Alpinia*
   2. Inflorescence a dense spike, the bracts green; lateral staminodes petaloid 3.*Hedychium*

1. Inflorescence terminal on a separate, leafless shoot.
3. Plant nearly acaulescent; inflorescence subsessile; leaves purple beneath; labellum lilac 4.*Kaempferia*

3. Plant with tall stems; inflorescence on a peduncle up to 2m; leaves green beneath; labellum red or yellow.
   4. Bracts green when young, red with green margin when mature; corolla white or yellowish; labellum yellow; peduncle to 45 cm 5.*Zingiber*
   4. Bracts red with white margin, or pink; corolla red; labellum red with yellow margin; peduncle to 2 m 2.*Etlingera*

1. *Alpinia* Roxburgh

Perennials from rhizomes. Stems simple. Leaves 2-ranked (distichous). Inflorescence a terminal spike, raceme or panicle; bracts present or absent. Flowers bisexual, bilaterally symmetrical (zygomorphic); sepals usually united in a tube with 3 teeth or lobes; corolla-tube 3-lobed, often with a showy labellum or lip. Fertile stamen 1; sterile stamens (staminodes) small or absent. Ovary inferior, 3-celled. Fruit a capsule.

Literature: Smith, R.M. 1990. *Alpinia* (Zingiberaceae): a proposed new infrageneric classification. *Edinburgh Journal of Botany* 47(1): 1-75.

Key to Species

1. Leaves variegated with white or cream streaks 2.*A. vittata*
1. Leaves green, not variegated.
   2. Flower-bracts present, red or pink; inflorescence erect; labellum white 1.*A. purpurata*
   2. Flower-bracts absent, the flowers subtended by bracteoles white with pink tip; inflorescence pendent; labellum yellow with red veins 3.*A. zerumbet*

1. *Alpinia purpurata* Vieillard ex K. Schumann in Engler, *Das Pflanzenreich* 20(IV. 46): 323 (1904). BOKKEPOOT (Surinam); RED GINGER. Plant to 4(-5) m. Leaves green, to 35 x 15 cm. Inflorescence erect, to 50(-90) cm, often viviparous; flower-bracts bright red. Flowers, including the labellum, white.

Fig. 267. *Alpinia zerumbet* (Zingiberaceae).

Range: Melanesia.

Literature: Hirano, R.T. 1991. *Alpinia purpurata* (Vieill.) K. Schum. in Hawaii. (The red and pink ginger). *Heliconia Society International Bulletin* 5(2): 5-7.

Key to Cultivars

1. Flower-bracts white to pale pink — 1c. var.*albo-bracteata*
1. Flower-bracts red.
   2. Inflorescence unbranched, narrowly cylindrical — 1a. var.*purpurata*
   2. Inflorescence proliferous (at least below) into numerous leafy, flowering axes, giving an overall ovoid shape — 1b. cv.Plena

1a. *A. purpurata* var. *purpurata*. RED GINGER. Range: Grown as an ornamental in the Promenade Gardens, Georgetown and in private gardens in Guyana; at the Palmentuin and on university and hotel grounds in Paramaribo, Surinam; and on hotel grounds in Cayenne, French Guiana.

1b. *A. purpurata* cv. Plena [F. Perry & R. Hay, *A Field Guide to Tropical and Subtropical Plants* 108 (1982)]. (Synonym: *A. purpurata* cv. Double [G. Courtright, *Tropicals* 20 (1988)]. TAHITIAN GINGER. Range: Grown for cut flowers in Paramaribo, Surinam.

1c. *A. purpurata* var. *albo-bracteata* K. Schumann in Engler, *Das Pflanzenreich* 20(IV. 46): 324 (1904). (Synonym: *A. purpurata* cv. Jungle Queen [G. Courtright, *Tropicals* 20 (1988)]. JUNGLE QUEEN GINGER. Range: Solomon Islands. Grown for cut flowers in Paramaribo, Surinam.

2. *Alpinia vittata* Bull, *Catalog* no. 83: 4 (1873). (Synonym: *A. sanderae* Sander). VARIEGATED GINGER. Plant to 45 cm or more. Leaves variegated with white or cream streaks and bands, to 20 x 2.5 cm. Inflorescence pendent, to 15 cm; flower-bracts green tinged with pink. Flowers whitish or greenish, with whitish or greenish labellum.

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

3. *Alpinia zerumbet* (Persoon) Burtt & R.M. Smith, *Notes from the Royal Botanic Garden Edinburgh* 31(2): 204 (1972). (Synonyms: *A. nutans* misapplied, *A. speciosa* (Wendland) K. Schumann). SHELL FLOWER, SHELL GINGER. Plant to 3(-6) m. Leaves green, to 60(-70) x 12 cm. Inflorescence pendent, to 40 cm; flower-bracts absent, the flowers subtended by bracteoles lustrous cream-white with pink tip. Flowers pinkish-white, with yellow labellum veined or striped in red.

Range: China. Grown as an ornamental in the Promenade Gardens and private gardens in Georgetown, Guyana; and in Surinam (Ostendorf, 1962).

2. *Etlingera* Giseke

Perennials from thick rhizomes. Stems leafy. Leaves alternate and 2-ranked

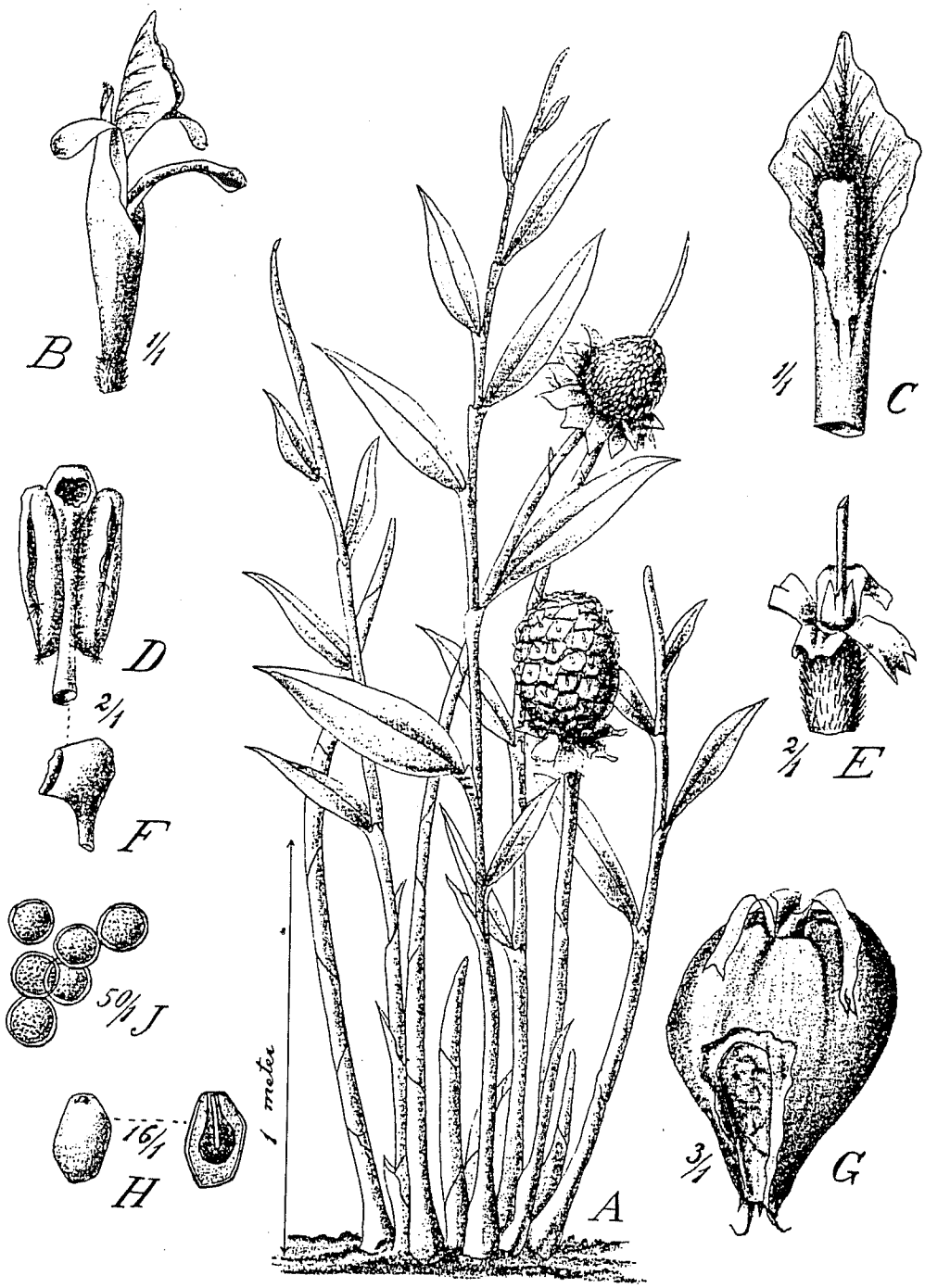


Fig. 268. *Etlingera elatior* (Zingiberaceae).

(distichous). Inflorescence a dense cone-like head or spike borne on long peduncle and separate from the leafy stems; outer (lowermost) bracts sterile, forming an involucre; inner bracts progressively smaller, fertile. Flowers perfect, bilaterally symmetrical (zygomorphic), solitary in axils of inflorescence-bracts; sepals united in a 3-lobed calyx-tube; petals united in a 3-lobed corolla-tube, the upper lobe largest. Fertile stamen 1, filament-connective without a crest; lateral sterile stamens (staminodes) absent; terminal staminode a prominent petaloid labellum. Ovary inferior, 3-celled. Fruit an aggregate of berry-like individual fruits in a cluster.

1. *Etlingera elatior* (Jack) R.M. Smith, *Notes from the Royal Botanic Garden Edinburgh* 43(2): 244 (1986). (Synonyms: *Nicolaia elatior* (Jack) Horaninow, *N. imperialis* Horaninow, *N. speciosa* (Blume) Horaninow, *Phaeomeria magnifica* (Roscoe) Schumann, *P. speciosa* (Blume) Merrill). TORCH GINGER; BRAZILIAANSE LELIE (Surinam). Leafy stems to 4(-6) m, forming clumps. Leaves linear-lanceolate, glabrous, to 85 x 18 cm. Leafless peduncle of inflorescence up to 2 m. Inflorescence a pyramidal or cone-like spike to 12.5 cm; outer bracts sterile, waxy, reflexed, red with white margin, or pink; inner bracts fertile, progressively smaller to 5 cm. Corolla red. Labellum of terminal staminode red, with yellow margin. Fruit reddish or yellowish; seeds black.

Range: Southeast Asia. Plants with red bracts are grown as ornamentals in the Promenade Gardens, Georgetown, Guyana; in Surinam (Ostendorf, 1962); and in French Guiana (de Granville, 1985, as *Alpinia coccinea*, "atoumo"). Plants with pink bracts are grown for ornament on Torarica hotel grounds and for cut flower arrangements in Paramaribo, Surinam.

Literature: Burtt, B.L. and R.M. Smith. 1986. *Etlingera*: the inclusive name for *Achasma*, *Geanthus* and *Nicolaia* (Zingiberaceae). *Notes from the Royal Botanic Garden Edinburgh* 43(2): 235-241.

3. *Hedychium* Koenig

Perennials from rhizomes. Stems simple. Leaves 2-ranked (distichous), sessile or nearly so. Inflorescence a terminal spike or panicle; bracts present. Flowers bisexual, bilaterally symmetrical (zygomorphic), in cincinni in axils of inflorescence-bracts; sepals united in a calyx-tube with 3 unequal teeth; petals united in a long tube with 3 reflexed, narrow lobes. Fertile stamen 1, filament long, the connective not crested; anther not spurred at base; sterile stamens (staminodes) 3, the terminal one petaloid and bilobed at apex, the lateral 2 petaloid, unlobed. Ovary inferior, 3-celled. Fruit a loculicidal capsule.

Literature: Schilling, T. 1982. A survey of cultivated Himalayan and Sino-Himalayan *Hedychium* species. *The Plantsman* 4(3): 129-149.

1. *Hedychium coronarium* Koenig in Retzius, *Observationes Botanicae* 3: 73 (1783). WHITE GINGER; GEMBER LELIE, GANDASOELI (Surinam). Plant to 2(-3) m. Leaves lanceolate or oblong-lanceolate, appressed-pubescent beneath, to 50(-60) x 12.5 cm. Inflorescence an ellipsoid or ovoid spike to 20 x 11 cm; bracts imbricate, green, 4-6 cm. Flowers 2-6 per cincinnus in the axil of bract, very fragrant, white, the prominent petaloid staminodial labellum 2-lobed, obcordate, with filament to 35 mm. Seeds red, shiny.

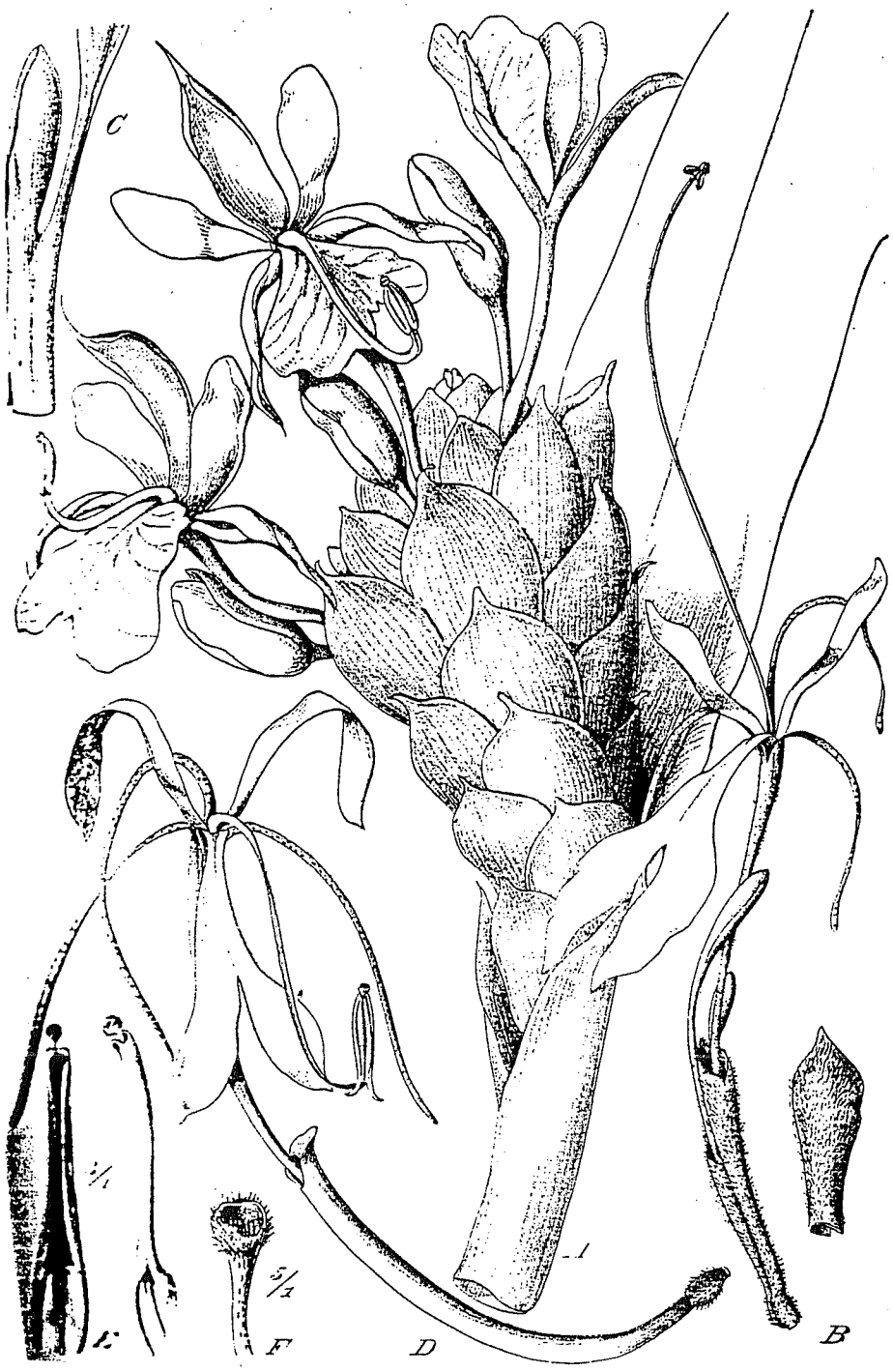


Fig. 269. *Hedychium coronarium* (Zingiberaceae).

Range: Himalayan region of India and Burma. Grown as an ornamental in the Promenade Gardens, Georgetown and in roadside gardens of Guyana; in Surinam (Albina, along the Marowijne River and elsewhere) (Ostendorf, 1962); and in French Guiana (de Granville, 1985).

Literature: Pineda-Ocampo, M., Oliveros-Belardo, L. and E. Fermin-Silva. 1954. A study of the volatile oil of the rhizome of *Hedychium coronarium* Koenig. *Proceedings of the Eighth Pacific Science Congress* 4A: 145-160.

The aromatic rootstock (rhizome) yields an oil which, when distilled, has properties similar to ginger oil as a household carminative remedy for flatulence and gas pain (Pineda-Ocampo et al., 1954).

4. *Kaempferia* Linnaeus

Perennials from thick rhizomes and often thickened roots. Stems very short or plant acaulescent. Leaves basally clustered, or cauline and 2-ranked (distichous); sheaths open. Inflorescence a spike or head arising at base of plant or on leafy stem; bracts present. Flowers perfect, bilaterally symmetrical (zygomorphic), solitary in axils of inflorescence-bracts; sepals united in a calyx-tube often split along one side; petals united in a short or long corolla-tube with 3 spreading or reflexed lobes. Fertile stamen 1, filament very short, the connective usually crested; anther not spurred at base; sterile stamens (staminodes) 3, the terminal one a petaloid labellum and usually bilobed at apex, the lateral 2 petaloid. Ovary inferior, 3-celled. Fruit a loculicidal capsule; seeds arillate.

1. *Kaempferia rotunda* Linnaeus, *Species Plantarum* 3 (1753). RESURRECTION LILY. Plants to 50 cm, from tuberous roots. Leaves 2-5, erect, lanceolate or oblong, to 45 x 11 cm, often variegated in shades of light and dark green above, purple and puberulent beneath. Inflorescence a spike, arising at ground level from a sheathed axis produced by a leafless rhizome; sheaths purplish, to 7.5 cm. Flowers up to 16 per inflorescence, often fewer; corolla white, to 14 cm; labellum (of terminal staminode) lilac, deeply bilobed, to 7 x 4 cm; lateral staminodes white or pinkish, to 5 cm. Crest of filament-connective 2- to 4-lobed.

Range: Southeast Asia. Grown for ornament in Surinam (Ostendorf, 1962).

Flowers are produced when the plant is in leafless condition.

5. *Zingiber* Boehmer

Perennials from thick rhizomes. Stems leafy. Leaves 2-ranked (distichous). Inflorescence a dense spike on a peduncle and separate from the leafy stem; bracts imbricate. Flowers perfect, bilaterally symmetrical (zygomorphic), solitary in axils of inflorescence-bracts; sepals united in a 3-lobed calyx-tube; petals united in a 3-lobed corolla-tube, the upper lobe largest. Fertile stamen 1, filament-connective crested; lateral sterile stamens (staminodes) absent; terminal staminode a prominent petaloid labellum. Ovary inferior, 3-celled. Fruit a 3-locular, somewhat fleshy capsule.

Fig. 270. *Kaempferia rotunda* (Zingiberaceae).

1. *Zingiber zerumbet* (Linnaeus) J.E. Smith, *Exotic Botany* 2: 105, t.112 (1805). BITTER GINGER, WILD GINGER. Leafy stems to 2 m, forming clumps. Leaves lanceolate, pubescent beneath, to 100 x 7.5 cm. Leafless peduncle of inflorescence up to 45 cm. Inflorescence a dense spike to 13 cm; bracts green when young, dark red with green margin when mature. Corolla white or yellowish. Labellum of terminal staminode pale yellow, tinged deep yellow at the base.

Range: India. Grown as an ornamental on Torarica hotel grounds in Paramaribo, Surinam; and in French Guiana (de Granville, 1985).

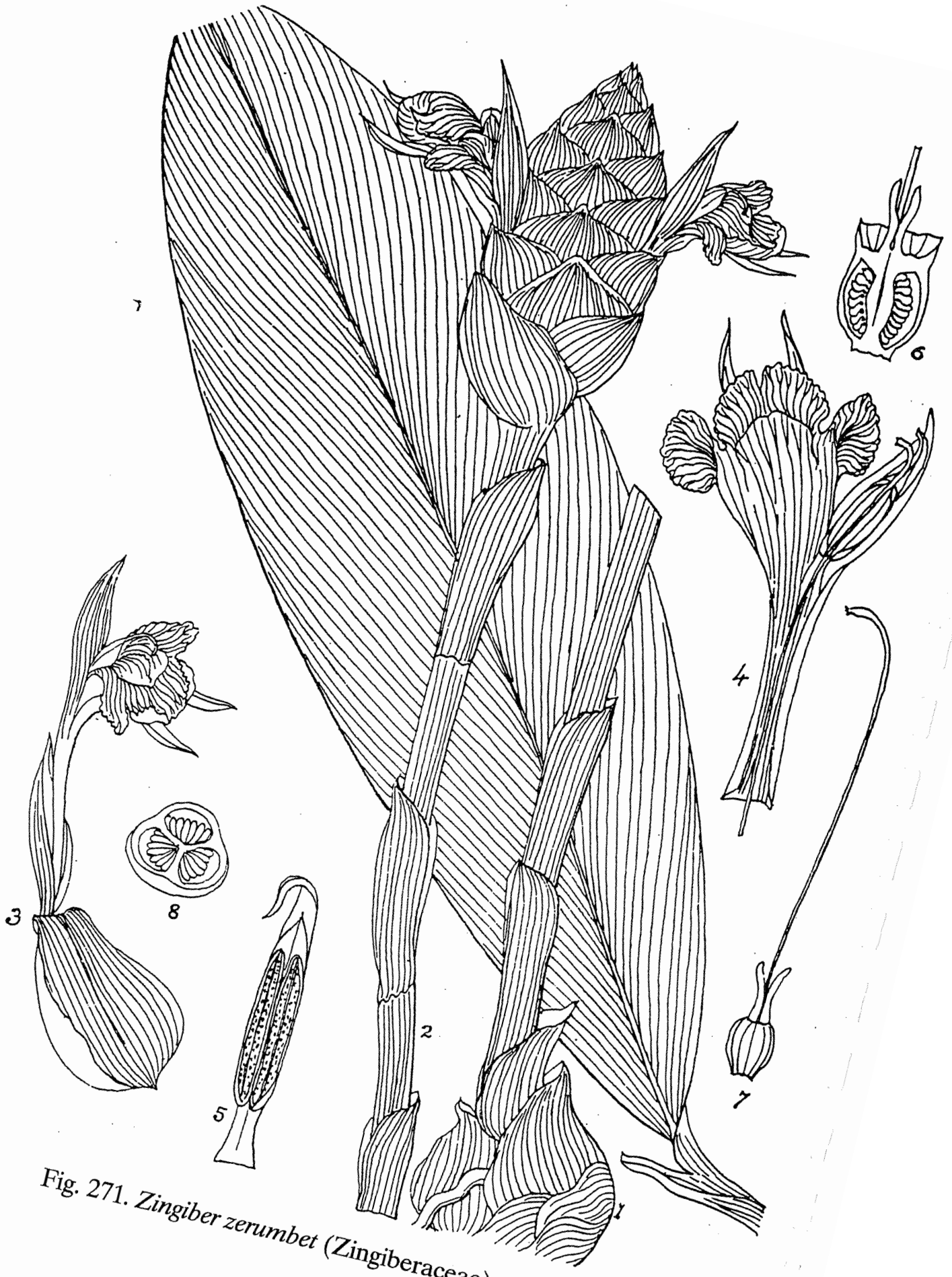


Fig. 271. *Zingiber zerumbet* (Zingiberaceae).

TITLE PAGE. Appun, Carl Ferdinand. 1871. *Unter den Tropen*. Vol. 2. *Britisch Guiana*. Frontispiece: Gruppe von Itapalmen und Ravenala's in der Nahe von Pirara. Jena: Hermann Costenoble. This plate depicts *Mauritia flexuosa* ("Itapalmen"), *Phenakospermum guyannense* ("Ravenala's"), *Montrichardia arborescens* and *Gynerium sagittatum*, indigenous species used to varying degrees as ornamentals in the Guianas, in a locale near Pirara, Guyana.

MAP OF THE GUIANAS. Courtesy of the Biological Diversity of the Guianas Program, National Museum of Natural History, Smithsonian Institution.

MAP OF GUYANA. U.S. Department of State, Bureau of Public Affairs. 1985. *Background Notes: Guyana*. P. 2. Department of State Publication 8095, Background Notes Series. Washington, D.C.: U.S. Department of State.

MAP OF SURINAM. Pulle, A. 1906. *An Enumeration of the Vascular Plants known from Surinam, together with their Distribution and Synonymy*. Endpaper Map. Leiden: E.J. Brill.

MAP OF FRENCH GUIANA. Courtesy of ORSTOM, Cayenne, French Guiana.

PLATE I. The city of Amsterdam receiving products of the four continents, including a gift from an allegorized American, during the Dutch Golden Age. Van Meurs, Jacob. 1663. *Historische Beschryvinghe van Amsterdam*. Amsterdam, The Netherlands.

PLATE II. Potted pineapple (*Ananas*) and other plants, with attendant allegory of America as an Amerindian, at the Amsterdam Hortus Medicus, or botanical garden. Commelin, Jan. 1697. *Horti Medici Amstelodamensis Rariorum...Plantarum*. Title Page. Amsterdam, The Netherlands.

PLATE III. Allegory of America as an Amerindian presenting the gift of the pineapple (*Ananas*) to Europe. Zanoni, Giacomo. 1742. *Rariorum Stirpium Historia*. Frontispiece. Bologna, Italy.

PLATE IV. Drawing of banana (*Musa*) inflorescence and fruits from Surinam, by Maria Sibylla Merian. Merian, Maria Sibylla. 1705. *Metamorphosis Insectorum Surinamensium*. Plate 12. Amsterdam, The Netherlands.

PLATE V. Plants of French Guiana depicted by the botanist Aublet in 1775. Aublet, J.B.C.F. 1775. *Histoire des Plantes de la Guiane Francoise*. Vol. 1. Frontispiece. London & Paris: Didot.

PLATE VI. The Ewaipanema, a tribe of headless giants said to reside in the area of El Dorado, sought by Sir Walter Raleigh in the Guianas. Raleigh, Walter. 1595. *The Discovery of the Large, Rich, and Beautiful Empire of Guiana, with a Relation of the Great and Golden City of Manoa*.

PLATE VII. Display of exotic tropical plants in the Palm House at the Royal Botanic Gardens, Kew, England c. 1850 during the Victorian Age. Seemann, Berthold C. 1856. *Popular History of the Palms*. Frontispiece. London: L. Reeve.

Acalypha hispida (Euphorbiaceae). Tang-Shui Liu. 1960. *Illustrations of Native and Introduced Plants of Taiwan*. Vol. 1, p. 357, fig. 296. Taipei, Taiwan: College of Agriculture, National Taiwan University. Illustration used by permission of Dr. Tang-Shui Liu, National Taiwan University, Taipei, Taiwan, Republic of China.

Adansonia digitata (Bombacaceae). Little, E.L., Woodbury, R.O. and F.H. Wadsworth. 1974. *Trees of Puerto Rico and the Virgin Islands. Second Volume*. P. 525, fig. 499. Agriculture Handbook No. 449. Washington, D.C.: U.S. Department of Agriculture, Forest Service. Illustration used by permission of the Forest Service, USDA.

Adenanthera pavonina (Mimosaceae). Koorders, S.H. 1913. *Exkursionsflora von Java* 4 (Atlas): fig. 1173. Jena: Gustav Fischer Verlag. Illustration used by permission of Gustav Fischer Verlag Jena.

Adenium obesum (Apocynaceae). Irvine, F.R. 1961. *Woody Plants of Ghana*. P. 610, fig. 118. London: Oxford University Press. Copyrighted illustration used by permission of Oxford University Press.

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Allamanda cathartica (Apocynaceae). Cronquist, A. 1981. *An Integrated System of Classification of Flowering Plants*. P. 877, fig. 6-6. New York: Columbia University Press. Illustration copyright 1981, The New York Botanical Garden; reprinted by permission.

Alocasia macrorrhizos (Araceae). Martius, C.F.P. 1878-1882. *Flora Brasiliensis - Tafeln* 3(2): fig. 46-47. Reprint 1967 by J. Cramer, Lehre, Germany; illustration used by permission of Mrs. J. Cramer; courtesy of Sven Koeltz, Koeltz Scientific Books, Koenigstein, Germany.

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Aloe vera (Liliaceae). Brown, W.H. 1950. *Useful Plants of the Philippines*. Vol. 1, p. 373, fig. 150. Technical Bulletin No. 10. Manila: Department of Agriculture and Commerce. Illustration used by permission of the Director, Department of Science and Technology, Industrial Technology Development Institute, Republic of the Philippines.

Alpinia zerumbet (Zingiberaceae). We Te-lin and Chen Sen-jen. 1981. Zingiberaceae, p. 87, fig. 27, in Wu Te-lin, ed., *Flora Reipublicae Popularis Sinicae* 16(2). Illustration used by permission of Dr. T.L. Wu, South China Institute of Botany, Academia Sinica, Guangzhou, China.

Anacardium occidentale (Anacardiaceae). Little, E.L. and F.H. Wadsworth. 1964. *Common Trees of Puerto Rico and the Virgin Islands*. P. 287, fig. 130. Agriculture Handbook No. 249. Washington, D.C.: U.S. Department of Agriculture, Forest Service. Illustration used by permission of the Forest Service, USDA.

Ananas comosus (Bromeliaceae). Koorders, S.H. 1913. *Exkursionsflora von Java*. 4 (Atlas): 211, fig. 419. Jena: Gustav Fischer Verlag. Illustration used by permission of Gustav Fischer Verlag Jena.

Anthurium andraeanum (Araceae). *Gardeners' Chronicle* n.s., 13(329): 497, fig. 88 (1880).

Antigonon leptopus (Polygonaceae). Tang-Shui Liu. 1960. *Illustrations of Native and Introduced Ligneous Plants of Taiwan*. Vol. 1, p. 174, fig. 147. Taipei, Taiwan: College of Agriculture, National Taiwan University. Illustration used by permission of Dr. Tang-Shui Liu, National Taiwan University, Taipei, Taiwan, Republic of China.

Arachnis flos-aeris (Orchidaceae). Koorders, S.H. 1913. *Exkursionsflora von Java* 4 (Atlas): 413, fig. 679. Jena: Gustav Fischer Verlag. Illustration used by permission of Gustav Fischer Verlag Jena.

Araucaria heterophylla (Araucariaceae). Little, E.L., Woodbury, R.O. and F.H. Wadsworth. 1974. *Trees of Puerto Rico and the Virgin Islands. Second Volume*. P. 57, fig. 259. Agriculture Handbook No. 449. Washington, D.C.: U.S. Department of Agriculture, Forest Service. Illustration used by permission of the Forest Service, USDA.

Araucaria heterophylla (Araucariaceae). Step, E. 1897. *Favourite Flowers of Garden and Greenhouse*. Vol. 4: t. 235.

Areca catechu (Arecaceae). Brown, W.H. 1951. *Useful Plants of the Philippines*. Vol. 1: p. 219, fig. 79. Technical Bulletin No. 10. Manila: Department of Agriculture and Commerce. Illustration used by permission of the Director, Department of Science and Technology, Industrial Technology Development Institute, Republic of the Philippines.

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Alpinia zerumbet (Zingiberaceae). We Te-lin and Chen Sen-jen. 1981. Zingiberaceae, p. 87, fig. 27, in Wu Te-lin, ed., *Flora Reipublicae Popularis Sinicae* 16(2). Illustration used by permission of Dr. T.L. Wu, South China Institute of Botany, Academia Sinica, Guangzhou, China.

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Asclepias curassavica (Asclepiadaceae). Sanchez, O.S. 1968. *La Flora del Valle de Mexico*. Fig. 243. Mexico, D.F.: Editorial Herrero.

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Bambusa vulgaris (Poaceae). Tang-Shui Liu. 1962. *Illustrations of Native and Introduced Ligneous Plants of Taiwan*. Vol. 2, p. 1293, fig. 1094. Taipei, Taiwan: College of Agriculture, National Taiwan University. Illustration used by permission of Dr. Tang-Shui Liu, National Taiwan University, Taipei, Taiwan, Republic of China.

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Bombax ceiba (Bombacaceae). Cronquist, A. 1981. *An Integrated System of Classification of Flowering Plants.* P. 357, fig. 4-11. New York: Columbia University Press. Illustration copyright 1981, The New York Botanical Garden; reprinted by permission.

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Bougainvillaea spectabilis (Nyctaginaceae). Koorders, S.H. 1913. *Exkursionsflora von Java* 4 (Atlas): 649, fig. 936. Jena: Gustav Fischer Verlag. Illustration used by permission of Gustav Fischer Verlag Jena.

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COMMON NAMES INDEX

SCIENTIFIC NAMES INDEX

ENDPIECE. Vignette of *Pachira* (Bombacaceae) and *Couroupita* (Lecythidaceae) in Surinam. Baron Albert von Sack. 1821. *Beschreibung einer Reise nach Surinam*. Berlin.