

Flore des Guyanes

Apocynaceae



FLORA OF THE GUIANAS**140. APOCYNACEAE**

by

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Trees, shrubs, lianas or rarely perennial herbs, usually with milky latex. Ramification (see Fig. 1) sympodial, with modules indefinite or definite. Leaves simple, margin entire, penniveined, usually opposite, sometimes alternate (*Aspidosperma*, *Geissospermum*, *Laxoplumeria*), congested at top of branches (*Plumeria*, *Himatanthus*), or verticillate (*Allamanda*, *Rauvolfia*, *Couma*). Stipules absent, intrapetiolar colleters often present. Inflorescences of cymes, thyrses, racemes or panicles, or flowers sometimes solitary. Flowers bisexual, usually actinomorphic, rarely zygomorphic (some *Allamanda* species) twisted in bud (corolla lobes sinistrorsely or dextrorsely contorted in aestivation); calyx usually 5-lobed, rarely 2-lobed, often with glandular colleters within; corolla lobes gamopetalous, usually 5-lobed, infundibuliform, salverform to urceolate or campanulate, corona sometimes present; stamens 5, inserted on corolla tube, alternating with corolla lobes, anthers free or adherent to style head, 2-celled, pollen usually granular, sometimes in tetrads; disc often present around base of ovary, often free, annular, sometimes adnate or absent; ovary generally superior (subinferior in *Plumeria*, *Himatanthus*), bicarpellate (in the Guianas), apocarpous or syncarpous, surmounted by a style and thick style head, composed of a central part with 2-lobed apex ("clavuncle" according

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to Miers, 1878: 2). Fruits indehiscent berries, capsules, drupes, or dehiscent follicles; seeds naked, winged or arillate, or with a hair tuft at micropylar end (in the Guianas), endosperm present.

D i s t r i b u t i o n : A cosmopolitan family, best represented in the tropics, with about 2000 species and 200 genera; in the Neotropics ca. 650 species in 72 genera; in the Guianas 140 species in 37 genera.

E c o n o m i c u s e s : The family contains many plants with pharmaceutical as well as ornamental properties; in some genera several species have edible fruits, like *Ambelania* and *Parahancornia*, or edible fruits and latex, like *Couma* and *Lacmellea*, or species furnish timber, like *Aspidosperma* and *Himatanthus*, etc.

LITERATURE

- Allorge, L. 1985. Monographie des Apocynacées - Tabernaemontanoidées américaines. Mém. Mus. Natl. Hist. Nat., B, Bot. 30. 216 pp.
- Allorge, L. & H. Couderc. 1983. La syncarpie chez Tabernanthe et sa particularité dans la sous-famille des Tabernaemontanoideae (Apocynaceae). Bull. Mus. Natl. Hist. Nat., B, Adansonia 5: 223-236.
- Aublet, J.B.C.F. 1775. Histoire des plantes de la Guiane française 1: 258-273.
- Brown, R. 1810. On the Asclepiaceae, a natural order of plants separated from the Apocineae of Jussieu.
- Leeuwenberg, A.J.M. 1994. A revision of Tabernaemontana. 2. The new world species. pp. 213-450.
- Lemée, A.M.V. 1954-1956. Flore de la Guyane française. Apocynacées. 3: 289-326, 1954 ('1953'); 4: 52-53, 1956.
- Markgraf, F. 1932, 1937. Apocynaceae. In A.A. Pulle, Flora of Suriname 4(1): 1-65, 1932; 443-467, 1937.

- Markgraf, F. 1938. Die Amerikanischen Tabernaemontanoideen. Notizbl. Bot. Gart. Berlin-Dahlem 14: 151-184.
- Miers, J. 1878. On the Apocynaceae of South America. 291 pp.
- Monachino, J. 1958. Apocynaceae. In B. Maguire *et al.*, The botany of the Guayana Highland. Part III. Mem. New York Bot. Gard. 10(1): 117-138.
- Morillo, G.N. & J. Carmona. 1995. Clave genérica para las Apocynoideae (Apocynaceae) de Venezuela y las Guayanas. *Ernstia* 5: 161-180.
- Morillo, G.N. 1996. Clave genérica de las Apocynaceae (SF Plumerioideae) del Norte de Sudamérica. *Pittieria* 25: 43-69.
- Müller Argoviensis, J. 1860, 1865. Apocynaceae. In C.F.P. von Martius, *Flora Brasiliensis* 6(1): 1-180, 1860; 181-196, 1865.
- Schumann, K.M. 1895. Apocynaceae. In H.G.A. Engler & K.A.E. Prantl, *Die Natürlichen Pflanzenfamilien* 4(2): 145-149.
- Woodson, R.E. 1933, 1935, 1936. Studies in the Apocynaceae. IV. The American genera of Echitoideae. *Ann. Missouri Bot. Gard.* 20: 605-790, 1933; 22: 153-306, 1935; 23: 169-439, 1936.
- Zarucchi, J.L., G.N. Morillo, M.E. Endress, B.F. Hansen & A.J.M. Leeuwenberg. 1995. Apocynaceae. In P.E. Berry *et al.*, *Flora of Venezuelan Guayana* 2: 471-570.

LITERATURE ON CHEMISTRY

- Allorge, L., H.-P. Husson & C. Sastre. 1981. Morphologie et chimiotaxonomie des Apocynacées. Conclusions phylogéniques et biogéographiques. *Compt. Rend. Séances Soc. Biogéogr.* 57: 112-126.
- Grenand, P., C. Moretti & H. Jacquemin. 1987.. *Pharmacopées traditionnelles en Guyane. Apocynaceae.* pp. 111-131. ORSTOM, Paris.

KEY TO THE GENERA

1	Trees or shrubs.....	2
	Lianas, subshrubs or herbs.....	21
2	Leaves alternate, or spirally arranged and congested at top of branches.....	3
	Leaves opposite or verticillate.....	8
3	Fruit drupaceous.....	33. <i>Thevetia</i>
	Fruit of 2 follicles (or one by abortion).....	4
4	Ovary subinferior.....	5
	Ovary superior.....	6
5	Floral bracts large, > 1 cm long, petaloid or foliaceous, persistent until anthesis; seeds with circular wing.....	13. <i>Himatanthus</i>
	Floral bracts small, < 0.5 cm long, caducous; seeds with basal wing.....	26. <i>Plumeria</i>
6	Seeds surrounded by long hairs.....	16. <i>Laxoplumeria</i>
	Seeds not surrounded by long hairs.....	7
7	Corolla aestivation sinistrorse; fruit woody, more or less laterally compressed; seeds winged	4. <i>Aspidosperma</i>
	Corolla aestivation dextrorse; fruit fleshy; seeds without wing.....	12. <i>Geissospermum</i>
8	Leaves opposite.....	9
	Leaves verticillate.....	20
9	Fruit a berry or a drupe.....	10
	Fruit follicular.....	14

- 10 Fruit drupaceous; cultivated plants (gardens).....14. *Kopsia*
 Fruit a berry ; native plants.....11
- 11 Trunk with numerous spines; inflorescences axillary; berries with persistent style...15. *Lacmellea*
 Trunk without spines; inflorescences not axillary; berries without persistent style.....12
- 12 Inflorescences borne on stem.....2. *Ambelania*
 Inflorescences terminal.....13
- 13 Anthers with 2 sterile appendages at base; seeds arillate.....17. *Macoubea*
 Anthers without sterile appendages; seeds without aril.....24. *Parahancornia*
- 14 Anthers adhering to style head, completely exerted (except *M. gracilis*); disc 5-lobed, free from
 ovary19. *Malouetia*
 Anthers free from style head, included; disc adnate to ovary, or lacking.....15
- 15 Corolla with corona lobes on inner surface.....31. *Stemmadenia*
 Corolla without corona lobes.....16
- 16 Stamens inserted at base of corolla tube.....17
 Stamens inserted at middle of corolla tube.....18
- 17 Modules (see Fig. 1, ramification type 1) composed of 3-8 pairs of equal leaves.....25. *Peschiera*
 Modules (see Fig. 1, ramification type 2) composed of 2 pairs of leaves, with unequal pair under
 inflorescence.....32. *Stenosolen*
- 18 Modules (see Fig. 1, ramification type 3) composed of 1 pair of leaves; seed aril white.....
5. *Bonafousia*
 Modules composed of more than 1 pair of leaves; seed aril orange-red or red.....19

- 19 Modules (see Fig. 1, ramification type 2) composed of 2 pairs of leaves, with unequal pair under inflorescence; native plants.....3. *Anartia*
 Modules (see Fig. 1, ramification type 1) composed of 6-7 pairs of equal leaves; cultivated plants (gardens).....9. *Ervatamia*
- 20 Leaves in verticils of 3; fruit a berry.....8. *Couma*
 Leaves in verticils of 4-5; fruit a drupe.....28. *Rauvolfia*
- 21 Herbs; seeds 0.1-0.2 cm long; cultivated plants.....6. *Catharanthus*
 Lianas or subshrubs; seeds more than 0.2 cm long.....22
- 22 Fruits spherical berries or capsules.....23
 Fruits follicular.....24
- 23 Inflorescence without hook, flowers in a thyrs; fruits dry valvate capsules, spiny or not.....
1. *Allamanda*
 Inflorescence with axis in form of a hook, flowers in subcapitate clusters; fruits globose berries....
23. *Pacouria*
- 24 Anthers free from style head; aestivation of corolla lobes sinistrorse; seeds not comose.....
7. *Condylocarpon*
 Anthers adherent to style head; aestivation of corolla lobes dextrorse; seeds comose.....25
- 25 Inflorescence thyriform.....26
 Inflorescence not thyriform, but corymbose, cymose or racemose.....27
- 26 Leaves with or without domatia below; corolla 0.3-0.5 cm long; anthers usually exserting corolla tube.....10. *Forsteronia*
 Leaves without domatia; corolla ca. 1 cm long; anthers included in corolla tube ...30. *Secondatia*

27	Corolla throat annulate; anthers slightly exserted or included in corolla tube	27. <i>Prestonia</i>
	Corolla throat not annulate; anthers wholly included in corolla tube.....	28
28	Colleters lacking at nodes.....	29
	Many colleters present at nodes.....	30
29	Leaves with many domatia along primary vein, colleters at base of blade; corolla salverform21. <i>Mesechites</i>
	Leaves with neither domatia nor colleters; corolla infundibuliform, sometimes salverform.....22. <i>Odontadenia</i>
30	Inflorescence racemose.....	31
	Inflorescence corymbose or cymose.....	32
31	Bracts of inflorescence numerous, linear, persistent.....	18. <i>Macropharynx</i>
	Bracts of inflorescence one per flower, often caducous.....	20. <i>Mandevilla</i>
32	Leaves subsessile, apex obtuse.....	11. <i>Galactophora</i>
	Leaves petiolate, apex mucronate.....	29. <i>Rhabdadenia</i>

1. **ALLAMANDA** L., Mant. Pl. 2: 146. 1771.

Type: *A. cathartica* L.

Lianas; latex white. Branches green, pubescent when young, becoming brown with age. Ramification modules indefinite. Leaves verticillate, usually in whorls of 4 (3-5) at each node, with or without intrapetiolar colleters. Inflorescences axillary or terminal thyrses. Flowers large, 3.5-6.5 cm long; sepals acute, with or without colleters; corolla yellow or purple, actinomorphic or zygomorphic, tube with cylindrical lower part and infundibuliform upper part, lobes sinistrorsely twisted in bud; stamens

inserted at upper end of cylindrical part of tube, covered by pubescent appendages in throat and 5 corona lobes, anthers with 2 basal sterile appendages, pollen 3-colporate, smooth; disc of 5 more or less concrescent nectaries; ovary unilocular, postgenitally fused, placentation parietal with numerous ovules arranged in 4 series, style head spool shaped with thick wreath of hairs at top and collar at base, surmounted by 2 free apical appendages. Fruits dry, septicidal, spherical capsules covered by spines or not, 2-valved, dehiscent; seeds numerous, winged, compressed, brown, anemochorous or hydrochorous, funicles centrally attached, embryo cordiform.

D i s t r i b u t i o n : 14 species in the Neotropics, 4 of which occur in the Guianas.

L i t e r a t u r e : Allorge, L. 1975. Rattachement de la tribu des Allamandées aux Echitoïdées (Apocynacées). *Adansonia*, ser. 2. 15: 273-276.

Costa, O.A. de. 1961. Estudo farmacognóstico da *Allamanda cathartica* L. *Revista Brasil. Farmacogn.* 42(9-10): 35-50.

Fallen, M.E. 1985. The gynoecial development and systematic position of *Allamanda* (Apocynaceae). *Amer. J. Bot.* 72: 572-579.

Sakane, M. & G.J. Shepherd. 1986. Uma revisão do gênero *Allamanda* L. (Apocynaceae). *Revista Brasil. Bot.* 9: 125-149.

KEY TO THE SPECIES

- 1 Corolla violet.....1. *A. blanchetii*
 Corolla yellow.....2
- 2 Corolla zygomorphic, lobes half as long as infundibular part of tube, < 1.5 cm long; sepals with
 2-8 colleters within.....3. *A. schottii*



Allamanda schotii

- Corolla actinomorphic, lobes equal to infundibular part of tube, 2-3 cm long; sepals without
colleters.....3
- 3 Sepals pubescent only outside; fruit spiny.....2. *A. cathartica*
Sepals pubescent on both faces; fruit not spiny.....4. *A. setulosa*

1. **Allamanda blanchetii** A. DC., Prodr. 8: 319. 1844. Type: Brazil, Bahia, Serra da Jacobina, Blanchet 2695 (holotype G, isotypes BM, P).

Liana 7-8 m long; latex copious. Bark green, smooth on young wood, turning pale brown. Leaves 3 (rarely 4 or 5) per node; petiole 0.2-0.3 cm long, with colleters; blade subcoriaceous, obovate or oblong-lanceolate, 4.5-11 x 1.8-5.5 cm, apex acuminate, base attenuate, shiny above, opaque beneath, more or less hispid between veins, pubescent on veins; secondary veins 10-12 pairs, united at margin. Inflorescence terminal, composed of 3-5 flowers, inodorous; peduncle ca. 2 cm long; bracts 0.1-0.2 cm long. Sepals pale green, pubescent outside, 0.15-0.2 x 0.5-0.6 cm, without colleters; corolla violet, actinomorphic, cylindrical part of tube yellow, 3-3.2 x 0.2 cm, infundibuliform part ca. 2-3.5 x 2 cm, inside violet striped with black-violet lines, lobes violet, 3-4 cm long, oblique; anthers oblanceolate-sagittate, ca. 0.8 cm long. Fruit ca. 5 x 3.5 cm, green turning brown, spines 1-1.3 cm, endocarp white; seeds ca. 30, ca. 3 x 3.5 cm, white turning brown, with circular wing, , embryo 0.7-0.75 x 0.5-0.6 cm.

D i s t r i b u t i o n : Native to Brazil, cultivated as ornamental in French Guiana and tropical areas; 10 collections studied (FG: 1).

S p e c i m e n e x a m i n e d : French Guiana: Route de Montjoly, Cayenne, Allorge 1093 (CAY, P).

2. **Allamanda cathartica** L., Mant. Pl. 2: 214. 1771, as 'Allemanda' (holotype LINN. 298.1, microfiche Linn. Soc. London 163). – Plate 16.

Orelia grandiflora Aubl., Hist. Pl. Guiane 1: 270, 3: pl. 106. 1775. – *Allamanda grandiflora* (Aubl.)

Lam., Encycl. 4: 601. 1798. Type: French Guiana, Aublet s.n. (holotype P-JJR 6, n. 223).

Echites verticillata Sessé & Moç., Fl. Mexic. [ed. 1] 43, col. 1. 1893. Type: Mexico, Sessé & Moçifio 5070 (lectotype MA), syn. nov.

Liana 10 m long or more; latex copious. Bark green, smooth on young wood, turning pale brown or often red on surfaces exposed to sun. Leaves 4 (rarely 3 or 5) per node; petiole 0.3-0.7 cm long, with colleters; blade subcoriaceous, obovate or oblong-lanceolate, 10-13 x 2.5-5 cm, apex acuminate, base acute, shiny above, opaque beneath, more or less hispid between veins, pubescent on veins; secondary veins 10-15 pairs, united at margin. Inflorescence axillary or terminal, composed of 5-10 flowers; peduncle ca. 1 cm long; bracts 0.1-0.2 cm long. Sepals pubescent outside, 1-1.2 x 0.5-0.6 cm, without colleters; corolla yellow or orange, actinomorphic, cylindrical part of tube 3-4 x 0.2 cm, infundibuliform part ca. 1.5-2.5 x 1 cm, inside striped with orange lines, lobes yellow, 2.5-3 cm long, oblique; anthers oblanceolate-sagittate, ca. 0.8 cm long. Fruit ca. 5 x 3.5 cm, green turning brown, spines 1-1.5 cm long, endocarp white; seeds ca. 30, ca. 3 x 3 cm, white turning brown, with circular wing.

D i s t r i b u t i o n : Costa Rica, Panama, Venezuela, the Guianas and Brazil; very common along large rivers on sunny banks, in swamps among mangroves and along beaches, where it often covers trees; about 60 collections studied (GU: 25; SU: 13; FG: 80).

S e l e c t e d s p e c i m e n s : Guyana: Demerara-Berbice, Essequibo-Cuyuni-Mazaruni Rs., Hahn *et al.* 5206 (P, US); Demerara-Berbice, 3 km of Macouria,

Henkel *et al.* 350 (P, US). Suriname: railroad Paramaribo-Dam, Krukoff 12304 (NY); Kwakoe Gron, Maguire & Stahel 23634 (NY, P, U, US). French Guiana: Bassin du haut Marouini, camp 1, Langa Soula, de Granville *et al.* 9604, 10285 (B, CAY, P, NY, MG, U, US).

V e r n a c u l a r n a m e s : Guyana: golden-trumpet. Suriname: pu gaasi (Djuka), sraitje (NE); baruda balli, barae da balke (Arawak); kieraporan (Carib); jasbita, anoura, wilkens-bitá. French Guiana: allamande, canari, liane jaune, orélie, ka'ilekwi (liana), tasiyasiy (fruit).

P h e n o l o g y : Flowers throughout the year. Fruits in August-September.

U s e s : Cultivated for horticultural purposes in tropical areas throughout the world. Easily grown and propagated by cuttings in greenhouses, where it apparently never fruits. Introduced in 1785 to England (Linné).

N o t e : Pollination by hummingbirds.

3. **Allamanda schottii** Pohl, Pl. Bras. Icon. Descr. 1: 73, pl. 58. 1827. Type: Brazil, Rio de Janeiro, Rio Parayba, Schott 5379 (holotype W, isotype G, photo US). – Plate 20.

Allamanda neriifolia Hook. in Curtis, Bot. Mag. 77: t. 4594. 1851. Type: t. 4594.

Liana or shrub, more or less slender, to 2.5 m tall. Branches terete, glabrous. Leaves generally 4 (3-5) per node; colleters remaining attached to stem; petiole 0.3-0.6 cm long; blade membranous, obovate to oblong-lanceolate, 6.5-13.5 x 1.6-3.5 cm, apex shortly acuminate, base acute and attenuate, glabrous and shiny above, shortly-pubescent on veins and opaque beneath; secondary veins 8-11 pairs. Inflorescence

axillary and/or terminal cymes, divaricate, deciduous bracts; pedicels 0.8-1 cm long. Sepals pubescent, 1-1.2 x 0.25-0.4 cm, 2-8 colleters within; corolla yellow scored with orange, zygomorphic, lobes half as long as infundibuliform part of tube, glabrous outside, hairy inside above and below stamens, cylindrical part of tube 1-1.2 x 0.4-0.6 cm, infundibuliform part 2.5-3.5 x ca. 1.5 cm; anthers sagittate, ca. 0.1 cm long; ovary glabrous, subglobose. Fruit, globose, 2.5-3 x 2-3 cm, spines 1-1.5 cm long; endocarp cream; seeds obovate, 0.2-0.23 x 0.13-0.15 cm.

D i s t r i b u t i o n : Native to Brazil; cultivated as ornamental in French Guiana; about 20 collections studied (FG: 1).

S p e c i m e n e x a m i n e d: French Guiana: in gardens at Kourou and near the boarding place for "îles du Salut", Allorge 411 (P).

V e r n a c u l a r n a m e : Guyana: bush allamanda (from literature).

P h e n o l o g y : Flowers throughout the year. Fruits only in June-July.

4. **Allamanda setulosa** Miq., *Linnaea* 18: 743. 1844. Type: Suriname, Kappler 1400 (holotype G, isotypes P, S, U, W, photo US).

Liana or subshrub, to 2 m tall. Branches quadrangular, pubescent when young. Leaves 3 or 4 per node; without colleters; petiole 0.3-0.4 cm long; blade subcoriaceous, lanceolate-elliptic, 8-9 x 2.5-3.5 cm, apex shortly apiculate, base cuneiform, upper surface bullate, sparsely pubescent on veins; primary vein conspicuous, light-colored, secondary veins fine, in 10-12 pairs. Inflorescence axillary, 0.5-0.6 cm long; bracts inconspicuous. Sepals pale green, pubescent on both faces, more sparsely so on inner surface, lanceolate, subacute, 1-1.5 x 0.3-0.6 cm, without colleters at base; corolla yellow, pubescent, actinomorphic, cylindrical

part of tube ca. 3 x 0.3 cm, infundibuliform part 2-2.5 x 1.5-1.8 cm at throat, corolla lobes rounded, 1.8-2 x 1.7-2 cm, glabrous at throat; ovary glabrous. Fruit pubescent, not spiny, green, ovoid, 7 x 5.5 cm (dry: 6.8 x 5.2 cm); seeds 14-15, orbicular, wing papyraceous, embryo 0.8 x 0.6 cm.

D i s t r i b u t i o n : Guyana and Suriname (GU: 1; SU: 1).

S p e c i m e n s e x a m i n e d : Guyana: Rupununi Distr., Jerome's Place, Jansen-Jacobs *et al.* 5049 (P, U). Suriname: Suriname R., near Victoria plantation, Kappler 1400 (G, P, S, U, W).

P h e n o l o g y : Flowers in September-December. Fruits in September.

2. **AMBELANIA** Aubl., Hist. Pl. Guiane 1: 265. 1775.

Type: *A. acida* Aubl.

Trees up to 10 m high (occasionally 30 m); latex white. Branches stout, glabrous; twigs opposite, cylindrical except at node (node flattened), decussate at every fourth one, plagiotropic, architecture characteristic when young, apex covered by brown wax. Ramification modules indefinite. Leaves opposite, decussate; petiole without colleters; blades coriaceous, secondary veins not joined, running almost to margin. Inflorescences borne on stem. Calyx white, lobes unequal, without colleters, corolla white, salverform, cylindrical part of tube pubescent inside, lobes obtuse, sinistrorsely twisted in bud; stamens inserted at base of tube, free from style head, anthers sagittate, with 2 sterile basal appendages, pollen 3-colporate, smooth; disc absent; ovary syncarpous, bilocular with numerous ovules, style persistent after corolla falls, style head with horizontal involucre, body pentagonal, with 2 terminal free appendages as long as or longer than style head. Fruits orange berries, narrowly ellipsoid or pyriform, pulp white, edible but with copious white latex; seeds not

arillate, brown, ellipsoid, glabrous with honeycombed testa, endozoochorous, embryo straight, with very short cotyledons.

D i s t r i b u t i o n : About 12 species in the Neotropics, one of which occurs in the Guianas.

L i t e r a t u r e : Monachino, J. 1945. A revision of *Ambelania*, inclusive of *Neocouma* (Apocynaceae). *Lloydia* 8: 109-130.

1. ***Ambelania acida*** Aubl., *Hist. Pl. Guiane* 1: 265, pl.104.1775. – *Willughbeia acida* (Aubl.) J.F. Gmel., *Syst. Nat.* 2: 434. 1791. Type: French Guiana, Aublet s.n. (holotype BM, isotypes LINN. Sm. 440/1, P-JJR 7, n. 242).– Fig. 2, Plate 6.

Ambelania sagotii Müll. Arg., *Linnaea* 30: 389. 1860, as 'sagoti'. Type: French Guiana, Poiteau s.n. (holotype B, presumed destroyed, isotype LEN.); paratype: French Guiana, Acarouany, Sagot 393a (G, P, U, photo US).

Ambelania tenuiflora Müll. Arg. in Mart., *Fl. Bras.* 6(1): 16, pl. 3. 1860. Type: Brazil, Pará, Riedel 1368.

Ambelania cucumerina Spruce ex Miers, *Apocyn. S. Amer.*: 13, pl. 1B. 1878. Type: Brazil, Rio Negro, Spruce 2413 (K).

Tree up to 30 m high; latex sticky, abundant. Bark reddish-brown, finely cracked into rectangles. Leaves glabrous; petiole 1 cm long; blade elliptic, 18-20 x 4.5-5.5 cm, apex shortly acuminate, base subobtuse to rounded; secondary veins 12-14 pairs, spaced ca. 1 cm apart. Inflorescence sessile, corymbose. Flowers fragrant, calyx 0.3 cm long, corolla lobes and tube each ca. 1 cm long; anthers mucronate, basifixed; ovary conic, 0.2 cm high, style head with 2 appendages as long as body. Fruit oblongoid, ca. 10 x 4 cm; seeds dark brown, ca. 1 cm long.

D i s t r i b u t i o n : Colombia, the Guianas and Brazil (Amazonas); locally abundant in the subcanopy; about 100 collections studied (GU: 10; SU: 9; FG: 30).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo R., Sandwith 465, 537 (NY, U, US). Suriname: Cottica R., Lanjouw 416 (U); Lucie R., Irwin *et al.* 55676 (NY, U, US). French Guiana: Sinnamary, Route de Saint Elie, Sastre 5449 (P); Saül, Boom & Mori 1746 (CAY, NY).

V e r n a c u l a r n a m e s : Guyana: makurriro, makoriro. Suriname: balati, batbati, bati bati (Sranan), mambali (Saramacca). French Guiana: mapa, mambaye (Takitaki), papaye-bich (Créole), ambelani (Galibi), inuba = inufa (Palikur), akusiwalapalu poko (cacao de l'Agouti) (Wayampi), makulira (Arawak).

P h e n o l o g y : Flowers in August-October. Fruits in August-November.

U s e s : The fruits are edible. The wood is used under the commercial name bagasse. The latex does not have the qualities that might make it of value as chewing-gum. It is often mixed into "balata" in small quantities and used to adulterate the latex of *Couma*, which is used to manufacture chewing-gum.

C h e m i s t r y : The seeds of *A. acida*, collection Moretti 217, French Guiana, have yielded the alkaloid (-) tabersonine 1, at 9.5 %: (Husson, A., C. Moretti & H.-P. Husson. 1986. Alcaloïdes de graines d'Apocynacées. *Caldasia* 15: 365-367).

3. **ANARTIA** Miers, *Apocyn.* S. Amer. 79. 1878.

Type: *A. flavicans* (Roem. & Schult.) Miers (*Tabernaemontana flavicans* Roem. & Schult.)

Shrubs or small trees; latex white. Branches slender, cylindrical. Ramification (see Fig. 1, ramification type 2) module definite, composed of 2 decussate pairs of leaves, first pair equal, second pair unequal, inflorescence subtended by a pair of bracts. Leaves opposite, often long-acuminate, glabrous. Inflorescences simple racemes. Flowers long-pedicellate; sepals 5, free, with outer ones slightly smaller, not ciliate, colleters in 1-3 series within; corolla tube widened above stamens; stamens inserted in upper half of tube, included, infrastaminal indument at least equaling stamens, anthers basifixed, sagittate, with 2 sterile appendages, free from style head, pollen 4-colporate with distinctly raised equatorial zone; disc adnate to ovary; ovary long-attenuate into style, style head with 2 short terminal appendages, entire, horizontal involucre at base. Fruits consisting of 2 follicles, longer than wide, acuminate; seeds entirely enveloped in orange-red aril, embryo inferior-radicular.

D i s t r i b u t i o n : 6 species in the Neotropics, 3 of which occur in the Guianas.

E t y m o l o g y : Miers explains his choice of the name *Anartia*, "imperfect" by the unequal leaves and few-flowered inflorescences .

N o t e : The genus *Anartia* is kept separate from *Bonafousia* because it has a ramification module which is composed of 2 unequal pairs of leaves (see Fig. 1, ramification type 2) and the inflorescences in racemes, whereas *Bonafousia* has a ramification module which is composed of 6-8 equal pairs of leaves (see Fig. 1, ramification type 3) and the inflorescences in cymes.

KEY TO THE SPECIES

- 1 Sepals ca. 1-1.2 cm long; corolla lobes less than half as long as tube.....1. *A. cerea*
- Sepals < 0.5 cm long; corolla lobes 1/5-1/2 as long as tube, tube ca. 3 cm long.....2

- 2 Corolla lobes ca. 0.7 cm long, erect.....2. *A. meyeri*
 Corolla lobes half as long as tube, reflexed.....3. *A. olivacea*

1. **Anartia cerea** (Woodson) L. Allorge, Mém. Mus. Natl. Hist. Nat., B, Bot. 30: 58. 1985. – *Stemmadenia cerea* Woodson, Bull. Torrey Bot. Club 75: 557. 1948. – *Tabernaemontana cerea* (Woodson) Leeuwenb., Novon 1: 105. 1991. Type: Guyana, NW part of Kanuku Mts., Mt. Iramaikpang, A.C. Smith 3606 (holotype MO, isotypes A, B, G, GH, K, MG, NY, P, S, U, US, W).

Tree or shrub, 3-6 m high. Branches glabrous, dichotomous; internodes of terminal branches 4-5 cm long. Leaves with petiole ca. 1 cm long; blade, elliptic or ovate, 6-10 x 2.5-4 cm, apex incurved-acuminate acumen linear, more than 1 cm long, base slightly decurrent, shiny above; secondary veins 0.7-1 cm apart. Inflorescence ca. 10-flowered; peduncle ca. 1.5 cm long; pedicels ca. 1 cm long. Flowers pendent, ca. 2.5 cm long; sepals greenish white, ca. 1.2 cm long, slightly unequal, obtuse, numerous biseriate colleters inside; corolla whitish to yellow, tube ca. 2.5 cm long, 0.2-0.3 cm in diam. at base, ca. 0.5 cm diam. above stamens, lobes somewhat reflexed upon tube, ca. 0.7 cm long; stamens yellow, ca. 0.5 cm long, base of anthers enlarged into divergent tails, infrastaminal indument reaching only stamen tails; disc prominent; ovary 1 x 0.2 cm, style ca. 2.5 cm long, style head ca. 1 cm long, shortly appendiculate. Follicles olive-green to orange, curved, ca. 4 x 3 cm; seeds 1-1.2 x 0.5 cm, embryo straight, with radicle twice as long as cotyledons.

D i s t r i b u t i o n : Venezuela, Guyana and Suriname; 500-1000 m alt. (GU: 18; SU: 1).

S e l e c t e d s p e c i m e n s : Guyana: Potaro-Siparuni Region: Kaieteur Falls National Park, Hahn *et al.* 4713 (G, GH, MO, NY, P, US); Potaro R., Maguire &

Fanshawe 23536 (GH, MO, NY). Suriname: SE of Juliana Top, Irwin *et al.* 55079 (MO, NY, U).

V e r n a c u l a r n a m e s : Guyana: pero-ishi-lokodo; auri, buri or uri (Arawak).

P h e n o l o g y : Flowers in January, August, October, November. Fruits in January, April and June.

2. **Anartia meyeri** (G. Don) Miers, Apocyn. S. Amer. 80. 1878. – *Tabernaemontana meyeri* G. Don, Gen. Hist. 4: 89. 1838. – *Tabernaemontana undulata* G. Mey., Prim. Fl. Esseq. 135. 1818, non Vahl 1798. Type: Guyana, Essequibo R., near Rockstone, Maas & Westra 3936 (neotype U!, isoneotypes K, MO, NY, WAG; designated by Leeuwenberg, A.J.M. 1994. A revision of *Tabernaemontana*. 2. The new world species. p. 390).

Bonafousia attenuata Miers, Apocyn. S. Amer. 51. 1878. – *Tabernaemontana attenuata* (Miers) Urb., Repert. Spec. Nov. Regni Veg. 13: 471. 1915. – *Anartia attenuata* (Miers) Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 14: 165. 1938. Lectotype: Suriname, Hostmann 1314 (isolectotypes: C, CGE, G, GH, K, MO, P, S, U, W, designated by Leeuwenberg, 1994).

Tabernaemontana neriifolia sensu Miers, Apocyn. S. Amer. 55. 1878. Type: French Guiana, Acarouani, Sagot 391 (holotype BM, isotypes P, U). (non Vahl, 1807).

Shrub or small tree, 1.5-8 m high, 25 cm dbh. Branches dichotomous. Leaves with very slender petiole, 1-2 cm long; blade moderately thick, rigid, dark green above, pale green below, elliptic, 4-14 x 0.7-4 cm, acumen linear, more than 1 cm long, base decurrent; secondary veins ca. 1 cm apart, reticulate veins lacking.

Inflorescence ca. 10-flowered, to 3 cm long; peduncle ca. 0.5 cm long; pedicels more than 1 cm long. Sepals ca. 0.5 cm long, numerous 3-seriate colleters inside; corolla white, tube ca. 3 cm long, swollen at base, progressively contracted to level of

stamens, then suddenly expanded, corolla tube with lower part ca. 2 cm long, upper part ca. 1 cm long, lobes erect, linear, ca. 0.5 cm long, 5 times shorter than tube at anthesis, convolute; disc prominent, trigonal; ovary carpels free above, connate below, style 0.15 cm long, style head short. Follicles dark olive green, globular, ca. 3 x 2 cm, about 40-seeded; seeds brown, longitudinally sulcate.

D i s t r i b u t i o n : Colombia, Venezuela, Trinidad, Tobago, the Guianas and Brazil; occurring in forests on sandy soil; about 50 collections studied (GU: 3; SU: 4; FG: 33).

S e l e c t e d s p e c i m e n s : Guyana: Rudge s.n. (BM); Bartica-Potaro road, Tutin 212, 301 (U). Suriname: Mapane Cr., Elburg LBB 9884 (MO, NY, Z); Brinari, Zanderij, Stahel (Wood Herb.) 303 (GH, NY, U, Z). French Guiana: Sinnamary, piste de St. Elie, Moretti 474 (CAY, P); Iracoubo, Bellevue, Sastre 6107 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: buri, karina-separe (Arawak). Suriname: merkitiki. French Guiana: kaoué mapa (Paramaka); busiki tiki (Boni).

P h e n o l o g y : Flowers reported in January, April to August, November and December. Fruits reported in January, February, April, May, August and December.

C h e m i s t r y : From the leaves the following alkaloids have been isolated: angustine, epi-16-pleiocarpine, tubotaïwine, 11-hydroxycoronaridine, 11-hydroxyheyneanine and 10-hydroxyheyneanine; from the trunk bark: conopharyngine, jollyanine, voacangine, isovoacangine, ibophyllidine, coronaridine, coronaridine-hydroxy-7-indolenine, heyneanine and eglandine; from root bark: coronaridine, heyneanine, epi-19 heyneanine and eglandine. The 3 last alkaloids from the leaves are new. (see: Grenand *et al.* 1987: 114).

3. **Anartia olivacea** (Müll. Arg.) Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 14: 165. 1938. – *Tabernaemontana olivacea* Müll. Arg. in Mart., Fl. Bras. 6(1): 75. 1860. – *Bonafousia olivacea* (Müll. Arg.) Miers, Apocyn. S. Amer. 52. 1878. Type: Venezuela, Amazonas, Spruce 3114 (lectotype W, isolectotypes AWH, BM, BP, BR, C, FI, G, GH, GOET, K, LD, NY, P, TCD).

Shrub or small tree, 2-10 m high. Branches glabrous, dichotomous. Leaves with slender petiole, 1-2 cm long; blade subcoriaceous, dark green above, pale green below, narrowly elliptic, ovate or obovate, 8-13 x 3-5 cm, margin slightly undulate, acuminate linear, more than 1 cm long, base cuneiform; secondary veins ca. 1 cm apart, without apparent tertiary veins. Inflorescence axillary, 3-4-flowered; peduncle 0.2-1 cm long; pedicels 0.3-1 cm long. Flowers quickly caducous, fragrant, showy; sepals greenish white, obtuse, 7-8 colleters inside; corolla tube, yellow at apex, 3 cm long, enlarged at base and at level of stamen insertion, lobes white, reflexed, half as long as tube; stamens inserted in upper 1/3 of tube; disc not prominent; ovary glabrous, trigonal, style head small. Follicles yellow when mature, reniform, 3-4 cm long, subtended by reflexed sepals; seeds brown, longitudinally sulcate.

D i s t r i b u t i o n : Venezuela, Suriname, French Guiana, Brazil, and Peru (SU: 2; FG: 8).

S e l e c t e d s p e c i m e n s : Suriname: Tumuc-Humac Mts., Mt. Talouakem, de Granville *et al.* 12294 (CAY, B, BBS, P, U, US); Rikanau prope Moengo, Lindeman 6065 (GH, U). French Guiana: Tampock R., Moretti 626 (CAY, P); Bellevue Mts., Inini R., de Granville *et al.* 8000 (CAY, P, U).

V e r n a c u l a r n a m e : French Guiana: mapa (Paramaka).

P h e n o l o g y : Flowers and fruits in August.

C h e m i s t r y : . Extracted from the stems: 15 alkaloids, especially condilocarpin, ibogamine, ibogaine, akuammidine etc. (Achenbach, H. & B. Raffelsberger. Alkaloide in Tabernaemontana-Arten, XII. Untersuchung der Alkaloide von Tabernaemontana olivacea. Z. Naturf. 35: 885. 1980).

4. **ASPIDOSPERMA** Mart. & Zucc., Flora 7(1, Beil.): 135. 1824; nom. cons.

Type: *A. tomentosum* Mart. & Zucc.

Paralyxia Baill., Bull. Mens. Soc. Linn. Paris 1: 748. 1888.

Type: *P. schomburgkii* Baill. = *Aspidosperma macrophyllum* Müll. Arg.

Small to tall trees; latex only in stems, usually white, often oxidizing orange or red, rarely translucent. Trunk fluted from base to top, or cylindrical and unbuttressed..
 Ramification module indefinite. Leaves usually alternate, rarely opposite, often pubescent; petiole more or less twisted. Inflorescences terminal or axillary, compound cymes or thyrses. Calyx 4-5-lobed, without colleters at base; corolla 4-5-lobed, salverform, aestivation sinistrorse, sometimes twisted in bud; stamens with short filaments inserted midway or higher in tube, suprastaminal slits 5, infrastaminal indument present, anthers completely fertile, basifixed, free from style head, pollen globose, 4-5-porate; disc adnate or absent; ovary apocarpous, style head globose with 2 free appendages, 5-ribbed or sleeve-like, with 2 papillose appendages. Fruits consisting of 2 or often only 1 follicle, woody, more or less laterally compressed, oblique, with 2 lateral ribs, wrinkled inside, dehiscing along ventral suture; seeds numerous, membranously winged, orbicular, ovate or cordate, funicles peltately attached, anemochorous; cotyledons cordate, albuminous, radicle short.

D i s t r i b u t i o n : About 50 species in the Neotropics, from Mexico to Argentina, 13 of which occur in the Guianas.

E t y m o l o g y: *Aspidos* = shield, *spermum* = seed.

L i t e r a t u r e : Allorge, L. & C. Poupat. 1991. Position systématique et révision du genre *Aspidosperma* (Apocynaceae) pour les trois Guyanes. Bull. Soc. Bot. France, Lett. Bot. 138: 267-301.

Gómez Pompa, A. 1966. Estudios botánicos en la región de Misantla, Veracruz. Ed. Inst. Mex. Recurs. Nat. Renov., México, D.F. XVI + 173 p.

Marcondes-Ferreira, W. 1996. Uma nova divisao infragenérica para *Aspidosperma* Mart. (Apocynaceae). Revista Brasil. Bot. 19: 203-214.

Woodson, R.E. 1951. Studies in the Apocynaceae. VIII. An interim revision of the genus *Aspidosperma* Mart. & Zucc. Ann. Missouri Bot. Gard. 38: 119-206.

KEY TO THE SPECIES

- 1 Corolla lobes 1-1.3 cm long, ca. 2 x longer than corolla tube; calyx lobes linear, acute.....2
 Corolla lobes < 0.8 cm long, as long as or shorter than corolla tube; calyx lobes ovate.....3
- 2 Leaves membranous, 15-26 x 4-8 cm; fruit 2-5 cm long and wide, glabrous smooth
6. *A. macrophyllum*
 Leaves coriaceous, 15-16.5 x 6-6.5 cm; fruit 13-14 x 10-11 cm, granulate.....10. *A. schultesii*
- 3 Leaves with dense indument below when young, becoming discolorous.....4
 Leaves glabrous or pubescent below, concolorous.....7
- 4 Leaves coriaceous, margins reflexed, secondary veins 15-20, spaced 1-1.5 cm apart.....5
 Leaves membranous or coriaceous, margins revolute, secondary veins 20-30, spaced 0.5-1 cm apart.....6

- 5 Leaves, inflorescences and flowers covered by dense brown indument; corolla lobes ovate; fruit spiny, 7-8 x 6-7 cm.....2. *A. carapanauba*
 Leaves, inflorescence and calyx covered by dense white indument; corolla lobes linear; fruit smooth, ca. 16 x 11 cm, white pubescent.....9. *A. sandwithianum*
- 6 Leaves membranous, secondary veins 20-25 pairs, spaced 0.5 cm apart.....1. *A. album*
 Leaves coriaceous , secondary veins 25-30 pairs, spaced 0.5-1 cm apart.....11. *A. spruceanum*
- 7 Leaf margin undulate, reflexed for 1 cm at base.....8
 Leaf margin revolute.....9
- 8 Leaves 3.5-5 cm wide; calyx lobes unequal, the 2 outer longer, ca. 0.2-0.3 cm long, ciliate at margin.....7. *A. marcgravianum*
 Leaves 2-4 cm wide; calyx lobes equal, ca.0.1 cm long, tomentose8. *A. oblongum*
- 9 Leaf apex rounded to emarginate10
 Leaf apex acute-acuminate12
- 10 Secondary veins 20-22; corolla glabrous outside; follicles densely brown-pubescent.....
3. *A. cruentum*
 Secondary veins 10-12, corolla pubescent-sericeous outside; follicles not hairy.....11
- 11 Leaves coriaceous, 11-14 cm long; follicles verrucose and with conical tubercles....4. *A. excelsum*
 Leaves membranous, 4-10 cm long; follicles lenticellate at lower suture, not tuberculate.....
12. *A. ulei*
- 12 Secondary veins 30-35, not distinct from tertiary veins; calyx glabrous.....5. *A. helstonei*
 Secondary veins 10-15; calyx pubescent.....13. *A. vargasii*

1. **Aspidosperma album** (Vahl) Benoist ex Pichon, Bull. Mus. Natl. Hist. Nat. ser. 2. 19: 367. 1948. – *Macaglia alba* Vahl, Skr. Naturhist.-Selsk. 6: 107. 1810.
Type: French Guiana, Richard s.n. (holotype C-Vahl, isotype P).

Bignonia latisiliqua Poir. in Lam., Encycl. Suppl. 1: 632. 1811. – *Aspidosperma latisiliqua* (Poir.) A. DC., Prodr. 8 : 676. 1844. Type: French Guiana: Patris s.n. (P).

Tree up to 40 m high; latex oxydizing blood-red. Trunk brownish, longitudinally sulcate, cylindrical. Leaves alternate; petiole 1.5-2 cm long; blade membranous, becoming discoloured, elliptic, 8-8.5 x ca. 3.5 cm, margin revolute, apex emarginate, base cuneiform, above green, below whitish with dense indument; secondary veins 20-25 pairs, spaced 0,5 cm apart, not conspicuous. Inflorescence a branched cyme. Calyx densely whitish-pubescent, calyx lobes ovate; corolla yellow-green to white, glabrous, corolla lobes as long as tube, linear, twisted. Follicle 1, ca. 9 x 5.5 cm; seeds 8-14, orbicular, ca. 6 cm in diam, wing white, circular, membranous, embryo ca. 3 cm diam.

D i s t r i b u t i o n : Venezuela, the Guianas and Brazil; common in rain forest (GU: 9; SU: 12; FG: 41).

S e l e c t e d s p e c i m e n s : Guyana: Kanuku Mts., Moco-Moco, Maas & Westra 3907 (NY, P, U); Mazaruni Station, FD 3423 = Fanshawe 687 (NY,). Suriname: Mapane, LBB 8294 (U); Stahel (Wood Herb.) 77 (NY, U). French Guiana: Mana, Service Forestier 7492 (CAY, NY, P); Saül, Mori *et al.* 18153 (CAY, NY, P).

V e r n a c u l a r n a m e s : Suriname: shibadan (Arawak); (witte) kromanti-kopi (Sranan). French Guiana: Bois Macaye, koumanti oudou (Paramaka).

P h e n o l o g y : Flowers in April-November. Fruits in January-February.

U s e s : As timber for construction. (See Chapter on Wood and Timber).

2. **Aspidosperma carapanauba** Pichon, Bull. Mus. Natl. Hist. Nat. ser. 2. 19: 365. 1948. – *Geissospermum excelsum* Kuhl., Arch. Inst. Biol. Veg. Rio de Janeiro 2: 89. 1935, non *Aspidosperma excelsum* Benth. 1841. Type: Brazil, Amazonas, lake Uaicurapá, Parintins, Ducke, RB 24471 (holotype RB, isotypes P, U).

Tree up to 35 m high, to 50 cm dbh.; latex copious, reddish when dry. Trunk grooved and buttressed; bark light brown, very bitter, with longitudinal fissures, rarely exfoliating. Leaves, inflorescences and flowers covered by dense brown indument. Leaves alternate; petiole ca. 2.5 cm long; blade becoming discolorous, coriaceous, elliptic, 15-16 x ca. 5 cm, reflexed along margin especially at base, apex acute, base acute, asymmetric, below white; secondary veins 15-17 pairs, spaced ca. 1 cm apart. Inflorescence lateral near apex of young branches. Calyx lobes ovate; corolla lobes light brown to white, ovate, 0.7 cm long, with brownish ring at base. Follicles 1 or 2, these 7-8 x 6-7 cm, pericarp with numerous spines, each widened at base, rounded at apex, arranged in crooked longitudinal lines, bent towards suture of follicle; seeds ca. 6 cm in diam., wing yellow-brown, membranous, circular, embryo ca. 3 cm diam.

D i s t r i b u t i o n : French Guiana and Brazil (FG: 4).

S p e c i m e n s e x a m i n e d : French Guiana: Saül, Mori & Boom 14777 (NY, P); Allorge 355 (P); Sabatier & Prévost 1856 (CAY, P); road near Cayenne, Service Forestier 7565 (NY, P, U).

V e r n a c u l a r n a m e s : French Guiana: bois pagaie, bois chapelle (Créole); palioudou (Paramaka, Saramacca).

P h e n o l o g y : Flowers in August-October. Fruits in March-May.

U s e s : Timber for furniture, paddle wood.

E t y m o l o g y : carapa = mosquito, uba = tree, after Ducke.

2. ***Aspidosperma cruentum*** Woodson, Amer. J. Bot. 22: 684. 1935. Type:
Guatemala, Peten, Uaxactun, Bartlett 12570 (holotype MO, isotype NY).

– Fig. 3.

Tree up to 30 m high and 50 cm dbh; latex oxydizing blood-red. Trunk cylindrical; bark light brown, longitudinally and transversally striate forming rectangular scales; young branches black, without lenticels, pubescent. Leaves alternate; petiole 1-3 cm long, black when dry; blade elliptic to oblong, 13-15 x 4-5 cm, margin more or less undulate, revolute, apex acute to acuminate or emarginate, base cuneiform, above glabrous and shiny, below puberulent; secondary veins 20-22 pairs. Inflorescence many-flowered. Calyx lobes ovate; corolla yellowish white, glabrous outside, inside pubescent below stamens, corolla tube clearly swollen below stamens and at base, corolla lobes linear, 0.7 cm long; stamens ca. 0.1 cm long; ovary truncate at apex; style head appendages pubescent. Follicle 1, densely brown-pubescent, ca. 12 x 10 cm; stipe 1-1.5 cm long; seeds about 10-12, elliptic, ca. 7 x 2 cm, wing circular, diaphanous, light brown, cotyledons ca. 2.5 x 2 cm, radicle ca. 0.5 cm long.

D i s t r i b u t i o n : Abundant in Central America, from Mexico to Panama, and in South America from Colombia to the Guianas (GU: 4; SU: 22; FG: 39).

S e l e c t e d s p e c i m e n s : Guyana: Demerara, FD 3962 = Fanshawe 1226 (NY). Suriname: Nassau Mts., Lanjouw & Lindeman 2479 (NY, U); Stahel (Wood

Herb.) 121 (NY, U). French Guiana: Arataye R., Allorge 166 (P); Mts. Bellevue, Inini R., de Granville *et al.* 8124 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: my lady, red and white my lady, shibadan (Arawak). French Guiana: aie powaï (Wayana), mamey, tian tiou tiou = tyon tiu tiu (Taki-taki), chichique, koumanti oudou (Boni), bayalté and ballester.

P h e n o l o g y : Flowers in September-October. Fruits in April.

U s e s : The bitter bark (according to our local informant) is used as antipyretic for children and adults, on sugar, in infusion or in white rum (tafia).

N o t e s : Confused with *A. megalocarpon* by Woodson. Gómez Pompa (1966) separated the 2 species after seeing the type: Karwinsky 1348, Mexico, (holotype LE).

I thank the Director of Botanical Institute of Leningrad for sending me several type photos of *A. megalocarpon* Müll. Arg. in April 1988.

4. ***Aspidosperma excelsum*** Benth., J. Bot. (Hooker) 3: 245. 1841. – *Macaglia excelsa* (Benth.) Kuntze, Revis. Gen. Pl. 2: 416. 1891. Type: Guyana, Rob. Schomburgk I 468 (holotype K, isotypes P, W, SING).

Tree up to 40 m high; latex not copious, white. Trunk grooved, furrows up to 40 cm long, ca. 10 cm wide; bark blackish. Leaves alternate; petiole 1-2 cm long, blackish brown; blade coriaceous, elliptic, 11-14 x 5-7 cm, margin revolute, apex rounded to emarginate, base attenuate, above glabrous, yellow-green, below whitish; secondary veins 10-12 pairs, not conspicuous. Inflorescence often with parasitic lichen-like growth. Flowers fragrant, calyx and pedicels pubescent; calyx lobes ovate; corolla white, pubescent outside except at margin, corolla tube infundibuliform, 0.3 cm long,

corolla lobes 0.1 cm long, not incurved, shorter than tube,; anthers ca. 0.06 cm long; ovary glabrous. Follicles 2, suborbicular, verrucose, 5-7 x 5-7 x 2-2.5 cm, with conical tubercles, apex with oblique spines; seeds disciform, ca. 6 x 2 cm in diam., wing white, membranous, circular, embryo ca. 3 cm diam.

D i s t r i b u t i o n : Costa Rica, Panama, Colombia, Venezuela, the Guianas, Brazil and Peru; rain forest; in the Guianas locally abundant West of Nickerie R, in French Guiana only reported from Saül (GU: 10; SU: 16; FG: 16).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo R., Sandwith 321 (NY, P, U); Bartica-Potaro road, Mori *et al.* 8093 (NY). Suriname: Nickerie, LBB 8362 (U); Kabalebo, Heyde & Lindeman 38 (NY, U, US). French Guiana: Saül, Mori & Pipoly 15470 (NY, P), and Allorge 326 (P).

V e r n a c u l a r n a m e s : Guyana: paddlewood (commercial name); canjilón negro. Suriname: yaruru (Arawak), parelhout (Sranan), blaka pari-oedoe, pari-oedoe (Paramaca).

P h e n o l o g y : Flowers in June-September. Fruits in February-April.

U s e s : In Suriname is according to J.C. Lindeman (pers. comm.) the real paddlewood (parelhout) *A. excelsum*, while *A. marcgravianum* is called: "wit parelhout" and *A. oblongum*: "zwart parelhout".

5. **Aspidosperma helstonei** Donsel., Acta Bot. Neerl. 21: 253. 1972. Type: Suriname, Suriname R., van Donselaar 1487 (holotype U, isotypes BBS, K, NY).

Tree up to 30 m high, 70 cm dbh., latex not copious. Trunk cylindrical; bark rather smooth; young branches light-brown pubescent, lenticels at first pale, later brown. Leaves alternate; petiole 0.5-0.9 cm long, sulcate; blade coriaceous, 7-13 (-20) x 5-6 cm, margin revolute, apex acute or acuminate, base cuneiform, above shiny green, below densely brownish pubescent; secondary veins 30-35 pairs, not distinct from tertiary veins. Inflorescence terminal and axillary, 4-6 cm long. Calyx lobes incurved, glabrous outside, ciliate at margin; corolla tube ca. 0.2 cm long, pubescent, corolla lobes orange becoming black, longer than tube, hairy outside except along margin, pubescent only in middle for lower 2/3 of length; stamens inserted at 2/3 length of tube above base; ovary superior, pubescent at apex, carpels separating in upper half of ovary and lower half of style, style head very small, densely pubescent. Follicles 2, cinnamon-brown, oblique, to 5.5 x 2.6 x 1.3 cm, laterally compressed, velutinous, 1-ribbed on convex side, apex rounded and obliquely constricted, valves ca. 0.25 cm thick, reddish-brown and wrinkled inside; seeds yellow, to 4.2 x 2.2 x 0.05 cm, apex obtuse, base somewhat tapering, glabrous, smooth, wing apical or surrounding seed, somewhat undulate.

D i s t r i b u t i o n : Suriname and French Guiana; in rain forest near rivers (SU: 3; FG: 25).

S e l e c t e d s p e c i m e n s : Suriname: Suriname R., van Donselaar 1499, 1500 (U). French Guiana: Trois Sauts, Prévost & Grenand 940 (CAY, P); Maroni R., Papaïchton, Sastre & Moretti 4059 (CAY, P, U).

V e r n a c u l a r n a m e s : Suriname: apouquema (Sarawak), sarakriki- pinpin (Saramacca), gombe (Aucan). French Guiana: gombé (Taki-taki), bouangui = bois anguille (Créole), pīlakeï (Wayampi).

P h e n o l o g y : Flowers in July-August. Fruits in November-May.

U s e : Firewood even when green.

6. **Aspidosperma macrophyllum** Müll. Arg., *Linnaea* 30: 397. 1860. – *Macaglia macrophylla* (Müll. Arg.) Kuntze, *Revis. Gen. Pl.* 2: 416. 1891. – *Paralyxia macrophylla* (Müll. Arg.) Markgr., *Notizbl. Bot. Gart. Berlin-Dahlem* 13: 458. 1937. – *Paralyxia schomburgkii* Baill., *Bull. Mens. Soc. Linn. Paris* 1: 748. 1888. Type: Guyana, Tenette hills, Takutu R., Rich. Schomburgk 547 (holotype B, destroyed; neotype P-Baillon, designated here, isoneotypes: K, L-Henschelianum).

Prostrate shrub or small tree up to 10 m high (25 m), 20 cm dbh; latex white. Bark yellowish. Leaves alternate below, spiral or subopposite at top of young branches; petiole ca. 1 cm long; blade membranous, shiny, oblong to lanceolate, 15-26 x 4-8 cm, apex acute, base cuneiform, glabrous; secondary veins 24-26 pairs, spaced 0.5-1 cm apart. Inflorescence thyriform with about 50 flowers, sweet smelling. Calyx lobes linear, ca. 0.2 cm long, acute, pubescent; corolla white, in throat yellow-orange, pubescent, corolla tube 0.7-0.8 cm long, swollen in upper 2/3, pubescent outside at apex, glabrous at base and below stamens, corolla lobes 1.3-2 cm long, ca. 2 x longer than corolla tube; ovary pubescent except base, style twisted, surmounted by 5-ribbed style head with 2 papillose appendages. Follicles 2, brown, reniform, ca. 2-5 cm long and wide, flat, glabrous, smooth; seeds ca. 0.5 cm in diam., wing circular, embryo ca. 1 cm in diam.

D i s t r i b u t i o n : Venezuela, Guyana and Brazil (GU: 8).

S e l e c t e d s p e c i m e n s : Guyana: Rupununi Savanna, Mt. Shiriri, Jansen-Jacobs *et al.* 531, 2634, 3328 (P, U); Upper Takutu-Upper Essequibo Region, Harris *et al.* 1081 (P, US).

V e r n a c u l a r n a m e : Guyana: wrap-wrap.

P h e n o l o g y : Flowers in January-February. Fruits in March-October.

U s e s : Wood used in house building; seeds used in treating skin sores; leaves poisonous to cows, causing death.

7. ***Aspidosperma marcgravianum*** Woodson, Ann. Missouri Bot. Gard. 38: 170. 1951. Type: Brazil, Pará, Belém, Ducke 1263 (holotype MO, isotypes, RB, US).

Aspidosperma salgadense Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 12: 554. 1935. Type: Brazil, Ducke RB 22456 (holotype RB, isotype U).

Tree up to 30 m high; latex creamy white. Trunk buttressed, deeply furrowed to 90 cm dbh; bark black. Leaves alternate; petiole 0.8-1 cm long; blade coriaceous, elliptic-oblong, asymmetric, 8-15 x 3.5-5 cm, margin undulate, reflexed from 1 cm above petiole, apex acute-obtuse, above brownish green, shiny, below sea-green, dull; secondary veins 16-18 pairs, primary vein curved, prominent. Inflorescence thyriform, 3-6 cm long, pubescent. Calyx lobes unequal, 2 outer lobes longer, ovate, base cordiform, margin ciliate; corolla pubescent, glabrous where covered by calyx, greenish, 0.3 cm long, corolla lobes 1/2 as long as tube; ovary pubescent, apex with 4 raised areas, style longer than ovary, style head spherical. Follicles 2 or usually 1, pyriform or obliquely pyriform, 5-6 x ca. 6 x 1.2 cm, rugose, covered with warty, conical tubercles, 1.5-2 x ca. 0.1 cm thick, yellow-velutinous; seeds ca. 2 cm in diam., wing circular, membranous, embryo ca. 2 cm in diam., somewhat excentrically placed.

D i s t r i b u t i o n : Panama, the Guianas, Brazil and Bolivia (SU: 22; FG: 34).

S e l e c t e d s p e c i m e n s : Suriname: Nassau Mts., Lanjouw & Lindeman 2247 (NY, U); Mapane Cr., Lindeman 3858 (U). French Guiana: Acarouany, Service Forestier 344M (CAY, NY, U); Mts. Bellevue, Inini, de Granville *et al.* 8039 (CAY, P).

V e r n a c u l a r n a m e s : Suriname: wit parelhout; weti pari-oedoe (Sranan); pari-oedoe (Paramacca). French Guiana: bois pagaie, citronelle blanc (Créole); palukutapiyou (Wayampi); palioudou (Paramaka).

P h e n o l o g y : Flowers in August-October. Fruits in August-October.

U s e s : Timber for furniture and construction, hut beams, kitchen utensils, paddles, table legs etc.

8. ***Aspidosperma oblongum*** A. DC., Prodr. 8: 399. 1844. – *Macaglia oblonga* (A. DC.) Kuntze, Revis. Gen. Pl. 2: 416. 1891. Type: French Guiana, Martin s.n. (holotype G, isotype P).

Aspidosperma kuhlmannii Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 12: 555. 1935. Type: Brazil, Mato Grosso, Ouro Preto R., Kuhlmann 491 (RB 22453) (holotype RB, not seen).

Tree up to 45 m high; latex translucent. Trunk buttressed, deeply furrowed, to 1 m dbh; branches black, lenticellate, brown-pubescent when young. Leaves alternate; petiole 0.5-2 cm long, black when dry; blade elliptic-oblong, 7-14 x 2-4 cm, margin undulate, reflexed from ca. 1 cm above petiole, apex acute-obtuse, above dull green, below glaucous; secondary veins 16-17 pairs, inconspicuous. Inflorescence cymose; peduncle densely appressed-pubescent; pedicels ca. 0.1 cm long. Flowers fragrant; calyx lobes equal, ovate, ca. 0.1 cm long, tomentose; corolla white, 0.3 cm long, corolla lobes infused with violet, ca. 0.1 cm long; stamens inserted at about middle of corolla tube, suprastaminal clefts conspicuous; ovary ovate, pubescent, style twice

as long as ovary, style head tapering. Follicles 1 or 2, suborbicular, 7-7.5 x ca. 4.5 x 1.1 cm, apex obtuse, base tapering for ca. 0.5 cm, brown-pilosulous, coarsely verrucose-furrowed, lateral obtuse prickle halfway from base to apex; seeds ca. 5 cm in diam., wing orbicular, embryo yellow, ca. 3 cm long.

D i s t r i b u t i o n : Venezuela, the Guianas and North Brazil; in forest, 300-700 m alt. (GU: 1; SU: 11; FG: 15).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo R., Maguire & Fanshawe 22832 (F, GH, MO, NY, P, U, US). Suriname: Brokopondo, LBB 14816 (NY, U); Juliana Top, Irwin *et al.* 55021 (NY, P). French Guiana: Trois Sauts, Jacquemin 2327 (CAY, P); Inini, Mts. Bellevue, de Granville *et al.* 8094 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: olivo. Suriname: jaroso kharemore (K) toepoeloe apokuita (K); blaka pari-oedoe (Sranan); zwart parelhout. French Guiana: commercial name: yayamadou; moulouba, palakutapinu (Wayampi).

P h e n o l o g y : Flowers in September-October. Fruits in March.

U s e : Timber for construction and furniture.

9. ***Aspidosperma sandwichianum*** Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 12: 561. 1935. Type: Guyana, Rupununi R., Forest Dept. 2108 (holotype K).

Tree 30-40 m high; latex white, oxydizing red-orange. Trunk cylindrical from base to level of primary branches; bark longitudinally striate; branches green, white-pubescent when young. Leaves alternate; petiole 3-4 cm long, pubescent, brown; blade becoming discolorous, coriaceous, 12-25 x 5-7.5 cm, margin reflexed, apex obtuse, base asymmetric, above green-brown, below when living densely pubescent,

silvery white, brownish when dry; secondary veins about 20 pairs, spaced 1-1.5 cm, secondary and tertiary veins conspicuous. Inflorescence and flowers greenish grey, primary and secondary cymes densely white-pubescent. Flowers sessile; calyx white, contrasting with black corolla when dry, calyx lobes ovate, ca. 0.2 cm long; corolla pale yellow, 1 cm long, glabrous outside, corolla lobes linear, twisted, longer than tube. Follicles 1 or 2, smooth, ca. 16 x 11 cm, with straight median line from base to apex, white pubescent; seeds ca. 8 cm in diam., wing orbicular, embryo ca. 2.5 cm long.

D i s t r i b u t i o n : The Guianas (GU: 4; SU: 8; FG: 11).

S e l e c t e d s p e c i m e n s : Guyana: Mt. Makarapan, Maas *et al.* 7552 (P, U); Potaro-Siparuni Region, Clarke 1256 (P). Suriname: Fallawatra, Nickerie, LBB 14336 (BBS, NY, U); Mapane R. Lindeman 6754 (U). French Guiana: Saül, Mori & Pennington 17981(CAY, NY, P, U), Allorge 322 (P); Oyapock R., Sastre 4564 (P).

V e r n a c u l a r n a m e s : French Guiana: koumanti oudou (Boni), alalakapi (Wayampi), tian-tiou-tiou (Taki-taki), aïe powai' (Wayana).

P h e n o l o g y : Flowers in August. Fruits in January-March.

10. ***Aspidosperma schultesii*** Woodson, Ann. Missouri Bot. Gard. 38: 168. 1951.
Type: Brazil, Amazonas, path between headwaters of Ira-Igarapé and headwaters of Igarapé Abiú, Schultes & López 10178, (holotype MO, isotypes F, GH, P).

Aspidosperma macrophyllum Müll. Arg. subsp. *morii* L. Allorge, in Allorge, L. & C. Poupat, Bull. Soc. Bot. France Lett. Bot. 138: 274. 1991. Type: French Guiana, Saül, 400 m, Mori *et al.* 19167 (holotype CAY, isotypes NY, P, fl. in alcohol P).

Tree up to 22 m high, 50 cm dbh; white latex in branches. Trunk irregularly fenestrate, fluted towards base, flutes not continuous for entire length of trunk; bark rough with vertical fissures, pale gray brown, inner bark with alternating orange and yellow bands, wood white; branches cylindrical, blackish, spreading horizontally. Leaves in lax spirals; petiole 3-4 cm long, blackish; blade coriaceous, elliptic, 15-16.5 x 6-6.5 cm, margin somewhat undulate, apex obtuse or emarginate, base cuneiform, above glabrous, below silky-pubescent, whitish to ferruginous except for brown primary vein and margin. Inflorescence with 40-60 flowers. Calyx white pubescent, calyx lobes linear, ca. 0.1 cm long, acute, not appressed against corolla, margin scarious, corolla tube ca. 0.2 cm long, corolla lobes ca. 1.5 x 0.1 cm, pubescent inside on lowerhalf; ovary hirsute, style ca. 0.1 cm long, style head sleeve-like, ca. 0.01 cm long. Follicles 2 or usually 1, thickly woody, orbicular, 13-14 x 10-11 cm, sulcate with 12-13 ridges, granulate; seeds ca. 7 cm in diam., wing orbicular, embryo cordate, ca. 3 cm diam., excentrically placed.

D i s t r i b u t i o n : Guyana, French Guiana, Brazil and Peru; in non-flooded moist forest, 250-400 m alt. (GU: 1; FG: 7).

S e l e c t e d s p e c i m e n s : Guyana: Upper Demerara, Mabura Hill, Pipoly *et al.* 8809 (BRG, NY, P, US). French Guiana: Saül, La Fumée Mts., Mori *et al.* 18114 and 19167 (CAY, NY, P); Nouragues, Sabatier & Prévost 2551 (CAY, P).

V e r n a c u l a r n a m e s : French Guiana: tyon tiou tiou (Saramacca).

P h e n o l o g y : Flowers in August. Fruits in September.

11. **Aspidosperma spruceanum** Benth. ex Müll. Arg. in Mart., Fl. Bras. 6(1): 52. 1860. Type: Brazil, Amazonas, Spruce 2265 (holotype K, isotypes BR, C, F, G, GH, MO, P, W).

Aspidosperma igapoanum Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 12: 298. 1935. Type: Brazil, Amazonas, Rio Negro, Ducke RB24568 (lectotype RB, isotype U).

Aspidosperma centrale Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 12: 560. 1935. Type: Brazil, Amazonas, Parintins, Ducke RB24571 (holotype RB,).

Aspidosperma woodsonianum Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 12: 559. 1935. Type: Suriname, BW 2330, tree SO 613 (holotype U).

Tree 25-40 m high, to 40 cm dbh.; latex oxidizing red. Branches black, 3-angled, sometimes quadrangular. Leaves alternate; petiole ca. 1 cm long, brown; blade coriaceous, becoming discoloured, obovate, 10-20 x 4-8 cm, margin revolute, apex retuse, base cuneiform, above green-brown, shiny, below squamose, densely pubescent except on veins; secondary veins 25-30 pairs, fine, closely spaced, 0.5-1 cm apart. Inflorescence and calyx densely white-pubescent. Calyx lobes ovate; corolla white, pale yellow when dry, glabrous, corolla tube ca. 0.3 cm long, sulcate, corolla lobes as long as tube, linear, twisted in bud; ovary glabrous, ovate, with spherical style head. Follicle usually 1, ca. 8 x 4.5 cm, densely covered with ferruginous trichomes, prominent median vein and numerous secondary veins more or less parallel from base to apex; seeds 9-14 cm in diam., wing orbicular, embryo ca. 3.5 cm in diam.

D i s t r i b u t i o n : Mexico to Brazil; in periodically inundated forests (GU: 3; SU: 7; FG: 4).

S e l e c t e d s p e c i m e n s : Guyana: Rupununi R., A.C. Smith 2433 (F, G, NY, MO, S, U, US). Suriname: BBS 94 (BBS, U); Nassau Mts., Lanjouw & Lindeman

2556 (U). French Guiana: route St Laurent-Cayenne, km 10, Service Forestier 63M and 7492 (P); Saül, Mori *et al.* 18054 (CAY, NY).

V e r n a c u l a r n a m e s : Guyana: karuadpali (Wapisiana). Suriname: kromanti kopi (Saramacca). French Guiana: koumanti oudou, palioudou (Boni).

P h e n o l o g y : Flowers in October-June. Fruits in September.

12. ***Aspidosperma ulei*** Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 9: 78. 1924.

Type : Brazil, Ríó Branco, Surumu, serra de Mairary, Ule 8453 (holotype B, destroyed, photo MO, NY), neotype designated by Woodson: Brazil, Ule 8351 (neotype U, isoneotype G, MG).

Aspidosperma occidentale Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 15: 133. 1940, non Malme 1927. Type: Brazil, Ríó Acre, Ule 9700 (holotype K).

Tree 3-25 m high; latex white. Branches red-brown with whitish lenticels, white-pubescent when young. Leaves alternate; petiole 1-2 cm long; blade membranous, ovate or lanceolate, 4-10 x 2-5 cm, margin revolute, apex obtuse or emarginate, base attenuate, above rather squamose, below light brown, appressed-pubescent, veins with erect hairs. Inflorescence densely cymose, yellowish pubescent. Flowers sessile, fragrant; calyx pubescent, ca. 0,15 cm long, calyx lobes ovate; corolla green, on both sides sericeous except along margins of lobes, corolla tube ca. 0.3 cm long, corolla lobes white, ca. 0.1 cm long; ovary pubescent, ovoid, ca. 0.1 cm long, style head narrow. Follicle 1, membranous, oblique-pyriform, 4-5 x ca. 2.5 cm, lower suture lenticellate, apex pubescent, stipes ca. 1 cm, with 2 prominent ribs; peduncle red-brown, lenticellate; seeds ca. 2.5 cm in diam., wing orbicular, embryo ca. 1.5 cm long, radicle ca. 0.4 cm long.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana, Brazil (Acre, Amazonas, Minas Gerais) and Peru; in mixed low bush and transitional forest (GU: 9).

S e l e c t e d s p e c i m e n s : Guyana: without locality, FD 5784 = Wilson-Browne 370 (K, U); Rupununi Distr., Kanuku Mts., A.C. Smith 3151 (MO, NY, U, US), Jansen-Jacobs *et al.* 411 (CAY, U, US), 3545 (U).

V e r n a c u l a r n a m e : Guyana: shibadan (Arawak).

P h e n o l o g y : Flowers in June-September. Fruits in March.

13. ***Aspidosperma vargasii*** A. DC., Prodr. 8: 399. 1844. Type: Venezuela, Caracas, Vargas s.n. (holotype G).

Tree 10-12 m high; latex white. Leaves alternate; petiole 1-2 cm long; blade concolorous, elliptic to obovate, 5-6 x 3-4 cm, margin revolute, apex acuminate, base cuneiform, above brownish, glabrous, below ferruginous, densely appressed-pubescent. Inflorescence many-flowered. Flowers fragrant, pedicels rather pubescent; calyx pubescent, calyx lobes ovate, ca. 0.1 cm long, acute; corolla white, outside sericeous to densely yellow puberulent, corolla tube 4 times longer than calyx, sulcate, pubescent inside below stamens; ovary pubescent, style head shortly pubescent. Follicle usually 1, elliptic, 5-10 x 2.5-4 cm, apex mucronate, base attenuate towards pedicel, with 2 obscure ribs and whitish lenticels; seeds 6, ca. 4 cm in diam., wing orbicular, embryo ca. 2.5 cm long, radicle ca. 0.4 cm long.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana, Suriname, Brazil (Acre) and Peru; in rainforest and on rocky slopes (GU: 5; SU: 5).

S p e c i m e n s e x a m i n e d : Guyana: Kartabo triangle, FD 6315 = Fanshawe 2985. Suriname: W of Poika, Schulz 7800 (U); Brownsberg, Brokopondo, LBB 14652 (BBS, U).

V e r n a c u l a r n a m e s : Guyana: shibadan. Suriname: kromanti-kopi, walabadan (Sranan).

P h e n o l o g y : Flowers in June-October. Fruits in November.

5. **BONAFOUSIA** A. DC., Prodr. 8: 359. 1844.

Type: *B. undulata* (Vahl) A. DC.

Tabernaemontana sect. *Taberna* A.DC., Prodr. 8: 361. 1844.

Taberna A.DC. ex Miers, Apocyn. S. Amer.: 61. 1878.

Anacampta Miers, Apocyn. S. Amer.: 64. 1878.

Phrissocarpus Miers, Apocyn. S. Amer.: 71. 1878.

Codonemma Miers, Apocyn. S. Amer.: 72. 1878.

Merizadenia Miers, Apocyn. S. Amer.: 78. 1878.

Quadricasaea Woodson, Ann. Missouri Bot. Gard. 28: 271. 1941.

Trees or shrubs up to 17 m high. Stems slender, bark soft. Ramification (see Fig. 1, ramification type 1) sympodial module constant, comprising 1 pair of chlorophyllous and isophyllous leaves and 1 pair of bracts axillary to 1 inflorescence and 1 young branch (except in *B. sananho* and *B. siphilitica*). Latex white. Leaves opposite, membranous to coriaceous, with linear acumen. Inflorescences solitary, usually cymose, rarely racemose. Corolla white or with tube pink or lilac, exceptionally yellow; calyx often crassulate and white, with several colleters within at base; stamens usually inserted in the middle of and included in corolla tube, anthers sagittate with 2 sterile basal appendages and more than 1/2 of sterile part adnate to

filaments, free from style head, staminal tail straight and short, infra- and suprastaminal indument sparse, usually shorter than stamens, and shorter than length of staminal tail, pollen 3-colporate with distinctly raised equatorial zone; disc prominent and entire; ovary apocarpous, smooth, style filiform, 3-5 times longer than ovary, style head with an entire horizontal involucre at base, body pentagonal with 2 free terminal appendages often 1/3 as long as body. Fruit of 2 short follicles, these smooth, verrucose or muriculate, dehiscing along the ventral suture, with numerous endozoochorous seeds; aril white, incompletely covering seed (except in *B. siphilitica*); seeds brown or black, sulcate on raphae side.

D i s t r i b u t i o n : 26 species in Central America (Costa Rica, Panama), Trinidad and South America.

L i t e r a t u r e : Azambuja, D., Arq. Serv. Forest. 3 : 81. 1947; Nowicke, J.W., Ann. Missouri Bot. Gard. 57: 66. 1970.

KEY TO THE SPECIES

- 1 Sympodial module constant, comprising 1 pair of chlorophyllous and isophyllous leaves and 1 pair of bracts axillary to 1 inflorescence and one young root-stage branch..... 2
 - Sympodial module not constant, comprising 1-5 pairs of more or less isophyllous, chlorophyllous leaves, and 1 pair of bracts axillary to one inflorescence and 1 root-stage young branch..... 11
- 2 Leaves distinctly discolorous, upper surface dark green, lower surface yellow-green or whitish..... 3
 - Leaves not discolorous, upper surface shiny green, lower surface dull green 6
- 3 Leaves undulate at margin; secondary veins crowded, ca. 0.5 cm apart12. *B. undulata*

- Leaves not undulate at margin; secondary veins not crowded,
ca. 1-2 cm apart 4
- 4 Sepals retuse and glabrous, 0.5 cm; corolla white to pink-lilac
 8. *B. obliqua*
 Sepals acute and pubescent, > 1 cm; corolla yellow or orange..... 5
- 5 Stems 3-ribbed; sepals acute, free with 6-7 colleters in 1 row 6. *B. morettii*
 Stems 3-angled; sepals obtuse, united for 1/3 of length and
 20-30 colleters in 4 rows.....7. *B. muelleriana*
- 6 Stems 3-angled; leaves without linear acumen..... 7
 Stems 3-ribbed; leaves with linear acumen..... 8
- 7 Calyx < 0.5 cm long; lobes separate 2. *B. angulata*
 Calyx > 1 cm long; lobes united at base..... 5. *B. macrocalyx*
- 8 Secondary veins ca. 1 cm apart; corolla lobes shorter than tube;
 calyx not ciliate 3. *B. disticha*
 Secondary veins ca. 0.5 cm apart; corolla lobes as long as tube;
 calyx ciliate 9
- 9 Corolla tube and lobes ca. 2 cm long 1. *B. albiflora*
 Corolla tube and lobes ca. 1,5 cm long 10
- 10 Leaves petiolate, not cordate..... 4. *B. lorifera*
 Leaves sessile, cordate9. *B. rupicola*
- 11 Stems 3-angled or ribbed 10. *B. sananho*
 Stems cylindrical, without angles or ribs.....11. *B. siphilitica*

1. **Bonafousia albiflora** (Miq.) Boiteau & L.Allorge, Bull. Soc. Bot. France, Lett. Bot. 130 : 339. 1984.—*Peschiera albiflora* Miq., Natuurk. Verh. Holl. Maatsch. Wetensch. Haarlem ser. 2, 7: 165. 1851.—*Echites albiflora* (Miq.) Miers, Apocyn. S. Amer.: 204. 1878.—*Tabernaemontana albiflora* (Miq.) Pulle, Enum. Vasc. Pl. Suriname 382. 1905.—*Taberna albiflora* (Miq.) Markgr. in

Pulle, Fl. Suriname 4(1): 72. 1937. Type: Suriname, Victoria, Hostmann 1312 (holotype U, lectotypes BM, C, F, FI, G, GENT, K, MO, P, NY, S, W).

Shrub 1.5-3 m high, glabrous. Stem lenticellate, finely 3-ribbed, bark green. Leaves membranous, not discolorous, upper surface shiny green, lower surface dull green; petiole 0.2- 0.3 cm long; blades 7-14 x 3-5 cm, with linear acumens 1-1.5 cm long, undulate at margin, base decurrent into petiole, upper surface soft; secondary nerves inconspicuous, 0.3-0.8 cm apart. Inflorescence of 3-5 flowers; peduncle ca. 0.3 cm long; bracts triangular, ciliate; pedicels ca. 0.5 cm long. Flowers fragrant. Sepals elliptic, ciliate, ca. 0.1 cm long, with 3 colleters at base of each lobe; corolla white with yellow eye, lobes equalling tube, ca. 2 cm long, perpendicularly spreading, transparent, tube swollen at base of stamens; stamens ca. 0.25 cm long; infrastaminal indument present only at sterile part of staminal tails; disc rather prominent; ovary conical, style filiform, ca. 1.5 cm long, style head appendages 1/3 as long as body. Fruit of 2 spindle-shaped follicles, pale yellow to brown, slightly curved, ca. 3 x 1 cm, soft, glabrous; aril incompletely covering seed; seeds 4-6, brown, with foveolae.

D i s t r i b u t i o n : Along falls and rivers in the Guianas and Brazil; not common. (GU: 1; SU: 6; FG: 10).

S e l e c t e d s p e c i m e n s : Guyana: Archer 2238 (US). Suriname: Suriname R., Hostmann 160 (BM, G, K, P, MO, NY, W); Saramacca R., Maguire 24943 (G, K, MO, NY, P, U, US). French Guiana: Maroni, îlets Abattis-Cotica, Sastre 6458 (CAY, P); Oyapock, saut Maripa, Jacquemin 2112, 2487 (CAY, P, U).

V e r n a c u l a r n a m e s : Suriname: oli olirang (Carib); marmeldoosje. French Guiana: pare abam = pare afann (Palicour), busüki uri (Boni).

P h e n o l o g y : Flowers in June-February. Fruits in June-October.

C h e m i s t r y : Kan, C. et al. (Tetrah. L. 21: 55. 1980.) extracted from the bark of 2 Jacquemin collections (J. 1881, 2112, P) the 4 followings alkaloids: ibophyllidine, épi-20 ibophyllidine, desethylibophyllidine and coronaridine. Later (Pl. Med. 41: 195. 1981.) the same authors isolated 3 new alkaloids: albifloranine, hydroxy-19 epi-20 pandoline and (20R)dihydroxy-18,19 vincadiformine. See also Grenand, P. et al. (1987: 117).

2. **Bonafousia angulata** (Mart. ex Müll.Arg.) Boiteau & L.Allorge, Bull. Soc. Bot. France, Lett. Bot. 130 : 339. 1984.—*Tabernaemontana angulata* Mart. ex Müll.Arg. in Mart., Fl. Bras. 6(1): 72, t. 23, 1860.—*Anacampta angulata*(Mart. ex Müll.Arg.) Miers, Apocyn. S. Amer.: 65. 1878. Type: Brazil, Parà, Martius s.n. (holotype M). not seen.

Shrub or tree 1-6 m high. Stem plagiotropic, dark gray, 3-angled with 2 lateral ribs and third rib beneath inflorescence. Leaves sessile, not discolorous, upper surface shiny green, lower surface dull green; petiole ca. 0.1 cm long; blades ca. 20 x 6 cm, acuminate ca. 1.5 cm long, glabrous, brown green; secondary veins 12-13, ca. 1 cm apart. Inflorescence solitary, situated on upper flattened side of branch, 3-4-flowered; calyx green, lobes separate, ciliate, with 5 or 6 colleters at base; corolla tube pink, ca. 1.5 cm long, lobes white, pubescent at overlapping edge in bud, unknown at anthesis; infrastaminal indument 1/2 as long as stamens; disc inconspicuous; ovary attenuate into style, style slender, style head with 2 appendages 1/3 as long as body. Young fruit a reniform follicle, 3-4 x 1.2-2 cm, slightly granulous, brown externally, light green internally; aril incompletely covering seed; seeds brown.

D i s t r i b u t i o n : Only reported from French Guiana; locally abundant in sub-canopy. (FG: 11).

S e l e c t e d s p e c i m e n s : French Guiana: Oyapock, Petite Ouaqui, saut Baille, de Granville 1834 (CAY, P); rive droite du Yaroupi, au pied du Saut Couéki, de Granville 513 (CAY, P, U); Saül, Layon blanc vers Cr. Limonade, Allorge 339 (NY, P).

V e r n a c u l a r n a m e s : French Guiana: yapoucouliwa (Wayampi); abuki afuki (Palikur).

P h e n o l o g y : Flowers in April-July. Fruits in August-December.

C h e m i s t r y : Wiet, C. et al. studied the bark and found coronaridine, heyneanine, voacangine and voacangarine, communication CNRS-ORSTOM at Nouméa in 1980 (pub. Paris, CNRS, 1981). See also Grenand et al. (1987: 117-119).

3. **Bonafousia disticha** (A.DC.) Boiteau & L.Allorge, Bull. Soc. Bot. France, Lett. Bot. 130 : 339. 1984.—*Tabernaemontana disticha* A.DC., Prodr. 8: 362. 1844.—*Taberna disticha* (A.DC.) Miers, Apocyn. S. Amer. 64. 1878.—*Anacampta disticha* (A.DC.) Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 14: 162. 1938. Type: French Guiana, s.l., Martin 49 (holotype G-DC, isotypes FI, W)— Plate 3.

Shrub 1-3 m high, weak and slender. Stems very slender, 3-angled, brown-lenticellate, last internode flat and without lenticels. All inflorescences spreading above plagiotropic stems. Petiole 0.5-1 cm long; blades coriaceous, elliptic, 11-20 x 3.6-6 cm, slightly undulate at margin, acumen curved, linear, 1-1.5 cm long, decurrent at base, glabrous; secondary veins 0.7-1 cm apart. Inflorescence densely cymose, 4-7-flowered, much shorter than chlorophyllous leaves. Flowers with strong smell. Sepals ciliate, retuse, with 3 or 4 colleters at base; corolla lobes erect, shorter

than tube, ca. 1.3 cm long, tube mauve-lilac at base, white above, yellow at apex, ca. 3 cm long, glabrous except in bud; infrastaminal indument present at base of sterile part of stamens; disc adnate to lower half of ovary; ovary ca. 1.5 cm long, style ca. 1.7 cm long, style head ca. 0.1 cm long with 2 appendages 1/3 as long as body. Follicles yellow when mature, almost uncurved, ca. 4.5 x 1 cm, with lateral ribs; aril incompletely covering seed; seeds brown, testa with concave cells.

D i s t r i b u t i o n : The Guianas; in montane forest. (GU: 4; SU: 6; FG: 100).

S e l e c t e d s p e c i m e n s : Guyana: Tumatumari, Gleason 106 (NY); Potaro-Siparuni Region, Eagle Mt., McDowell & Gopaul 3468 (US, WAG). Suriname: Wilhelmina Mts., South East of Julianatop, Irwin et al. 55089 (F, K, NY, U, US); Saramacca R., Maguire 24139 (A, K, GH, MO, NY, U). French Guiana: Sinnamary, Ste Elie, Sastre 5464 (CAY, P); Saül, circuit La Fumée, Moretti 397 (CAY, P).

V e r n a c u l a r n a m e s : Suriname: Mirkitiki. French Guiana: perubia = perufia (Palikur), bois lézard (Créole).

P h e n o l o g y : Flowers in January-October. Fruits in February.

C h e m i s t r y : Wiet, C. et al. found in the trunk bark the following alkaloids: ibophyllidine, desethylibophyllidine & hydroxy-19 ibophyllidine, communication CNRS-ORSTOM (Paris, CNRS, 1981). See Grenand, P. et al. (1987: 118).

4. **Bonafousia lorifera** (Miers) Boiteau & L.Allorge, Bull. Soc. Bot. France, Lett. Bot. 130: 339. 1984.–*Peschiera lorifera* Miers, Apocyn. S. Amer.: 147. 1878.–*Tabernaemontana lorifera* (Miers) Leeuwenb., New World Tabernemontana: 330, 1994, syn. nov. Type: Guyana, Rob. Schomburgk II 138 (= Rich. Schomburgk 21) lectotype BM, designated by L. Allorge, 1985,

isolectotypes K, P.

Shrub 0.6-5 m high. Trunk 3-4 cm dbh; bark thin, pale brown. Stem slender, 3-ribbed, soft, without lenticels. Petiole 0.5-0.7 cm long; blades rather coriaceous, 8-12 x 4-5 cm, undulate at margin, acumen curved, 1-1.5 cm long, decurrent on petiole, upper surface green-brown, lower surface pale green; secondary veins 0.3-0.5 cm apart. Inflorescence 3-7-flowered; peduncle 0.1-0.3 cm long; pedicels slender, ca. 1 cm long; bracts ciliate, with 3 colleters at base inside. Flowers fragrant; corolla white with tube pink at base, ca. 1.5 cm long, lobes perpendicular to and ca. 0.9 cm, as long as tube; anthers ca. 0.2 cm long; infrastaminal indument situated at level of sterile part of stamens and equaling them; disc conspicuous, half as high as ovary; ovary conical, ca. 0.1 cm long, style ca. 0.4 cm long, style head with 2 appendages 1/2 as long as body. Fruit of 2 reniform, curved follicles, acuminate, ca. 4 x 1 cm, soft, laterally ribbed, pale green, drying brown at maturity; pedicels accrescent in fruit; aril incompletely covering seed; embryo with radicle twice as long as cotyledons.

D i s t r i b u t i o n : Guyana, Suriname and Brazil; near creeks and riverbanks; about 30 collections studied. (GU: 7; SU: 11).

S e l e c t e d s p e c i m e n s : Guyana: Waini R., de la Cruz 3761 (GH, MO, NY, US); Biara Cr., Moruka, FD 5476 (Fanshave 2683) (K, NY, S, U). Suriname: Wilhelmina Mts., Lucie R., Irwin et al. 54525 (F, K, MO, NY, U, US); Nassau Mts., Lanjouw & Lindeman 2296 (NY, U).

P h e n o l o g y : Flowers in January-August. Fruits in March.

5. **Bonafousia macrocalyx** (Müll.Arg.) Boiteau & L.Allorge, Bull. Soc. Bot. France, Lett. bot. 130: 339. 1984.—*Tabernaemontana macrocalyx*

Müll.Arg., *Linnaea* 30: 403. 1860.—*Codonemma macrocalyx* (Müll.Arg.)
 Miers, *Apocyn. S. Amer.:* 73. 1878.—*Anacampta macrocalyx* (Müll.Arg.)
 Markgr., *Notizbl. Bot. Gart. Berlin-Dahlem* 14: 163. 1938. Type : French
 Guiana, Acarouany, Sagot 394 (holotype G-DC, isotypes FI, G, P).

Anacampta longifolia (Benth.) Miers, *Apocyn. S. Amer.:* 66. 1878, pro parte. Type: French
 Guiana, Cayenne, von Rohr, BM, sub. *T. triquetra* (non *T. longifolia* Benth. = *B. siphilitica* (L.f.)
 L.Allorge).

Shrub to 2-4 m high. Stem dark brown conspicuously, 3-angled; bark brown. Leaves
 sessile; petiole ca. 0.5 cm long; blades subcoriaceous, 18-20 x ca. 6 cm,
 glabrous, concolorous, dark green; secondary veins 10-12, ca. 1 cm apart.
 Inflorescence of ca. 35 white flowers with pink tubes; calyx crassulate, pinkish white,
 1-1.5 cm long with lobes united for 1/3 of length and 7-8 colleters in sinuses at base,
 lobes not ciliate, convolute, curved at apex, near corolla tube; corolla tube ca. 2.5 cm
 long, swollen at base, lobes triangular, ca. 1 cm long, retuse, pinkish white with
 golden yellow eye; infrastaminal indument only reaching filaments; suprastaminal
 indument scattered; disc conspicuous; ovary tapering at apex, style ca. 4 times as
 long as ovary, style head with appendages 1/3 times as long as body. Fruit of 2
 reniform follicles, ca. 2.5 x 1 cm; pericarp granulous; aril incompletely covering seed;
 seeds black.

D i s t r i b u t i o n : Guyana, French Guiana and Brazil. (GU: 1; SU: 4; FG: 49).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo R., Sapparimo, 1° 34' N, 58° 41'
 W, 250 m, Jansen-Jacobs et al. 1794 (U, WAG). Suriname: Sipaliwini S.,
 Oldenburger et al. 1117 (U); French Guiana: Trois Sauts, Jacquemin 1124 (CAY, P);
 Saül, circuit Nouvelle France, roche Bateau, Prévost 1821 (BR, CAY, INPA, NY, P,
 U).

V e r n a c u l a r n a m e s : French Guiana: aïkanlantanan (Wayampi), impukiu (Palikur).

P h e n o l o g y : Flowers in March-August. Fruits in July-March.

C h e m i s t r y : Grenand et al. (1987: 119).

6. **Bonafousia morettii** L.Allorge, Bull. Soc. Bot. France, Lett. Bot. 130 : 339.1984. Type: French Guiana, Haut Maroni, Litani R., Moretti 711 (holotype P lost, isotype CAY).

Shrub to 2 m high. Stem subcylindrical, 3-ribbed when young; bark green. Leaves subsessile; petiole ca. 0.5 cm long; blades discolorous, elliptic, 20-25 x ca. 5 cm, acumens ca. 1 cm long, upper surface green-brown, lower surface whitish and velvety; secondary veins 15-17, ca. 1 cm apart. Inflorescence erect, of 3-5 yellow flowers; calyx somewhat thickened, white, ca. 1 cm long when living, ca. 0.7 cm long when dry, lobes acute, free to base, pubescent at apex, not ciliate, with 6-7 colleters in one row at base; corolla ochre yellow, lobes, ca. 1 cm long, lighter than tube, falciform, pubescent at overlapping margins in bud and at apex of tube, tube ca. 2.5 cm long, very slender; infrastaminal indument shorter than stamens; disc prominent around ovary, style short, style head with 2 appendages 1/3 as long as body. Follicles fusiform, yellow when mature, edible, ca. 5 x 1 cm, with acumens ca. 1 cm long and more or less contracted; sepals persistent in fruit; aril incompletely covering seed; seeds brown.

D i s t r i b u t i o n : The Guianas and Brazil; in open places. (GU: 1; SU: 1; FG: 32).

S e l e c t e d s p e c i m e n s : Guyana: New R., FD 7330 (Guppy 354). Suriname: Wilhelmina Mts., South West Juliana, Irwin et al. 54902 (K). French Guiana:

Approuague, Arataye, Saut Parare, Allorge 246 (P); Sabatier 929 (CAY, P, U); Trois Sauts, Oyapock, de Granville T-1119 (CAY, P).

V e r n a c u l a r n a m e s : French Guiana: wasakusili, aïlanlantan ananta, melu kanawy, sokosokowipê'i (Wayampi); bousso quiwi mâle.

P h e n o l o g y : Flowers throughout the year. Fruits in April-November.

U s e s : According Sastre, the species is considered to have magical properties and is used to drive away bad spirits.

C h e m i s t r y : Grenand et al. (1987:121).

7. **Bonafousia muelleriana** (Mart. ex Müll.Arg.) Boiteau & L.Allorge, Bull. Soc. Bot. Fr. 130, Lettres 4-5: 340. 1983.—*Tabernaemontana muelleriana* Mart. ex Müll.Arg., in Mart. Fl. Bras. 6, 1: 181. 1865.—*Anacampta muelleriana* (Mart. ex Müll.Arg.) Markgr. in Notizbl. Bot. Gart. Berlin-Dahlem 14: 163. 1938. Type: Brazil, Amazonas, Spruce 2110 (holotype G, isotypes BM, BR, CGE, K, OXF, P, TCD).

Codonema calycinum (Benth.) Miers, Apoc. S. Am. 73, 1878. Type: id.

Quadricasaea inequilateralis Woodson, Ann. Missouri Bot. Gard. 28: 271, 1941.—*Tabernaemontana inequilateralis* (Woodson) Pichon, Mém. Mus. Natn. Hist. Nat. II, Bot. 1: 148, 1950. Type: Colombia, Caquetá, Florencia, Cuatrecasas 8814, (holotype US, isotype MO, photo P).

Quadricasaea caquetensis Woodson, Ann. Missouri Bot. Gard. 28: 271, 1941. Type: Colombia, Caquetá, Sucre, Cuatrecasas 9062, (holotype US, photo P).

Shrub or tree 3-8 m high. Stem conspicuously 3-angled; bark green. Leaves sessile; petiole ca. 0.5 cm long; blades asymmetrical, coriaceous, elliptic-oblong,

20-30 x 7-9 cm, acumen ca. 1.5 cm long, triangular, cuneate at base, discolorous, upper surface green-brown, lower surface whitish and velvety; secondary veins 15-17, ca. 1 cm apart. Inflorescence of 5-8 flowers; peduncle robust, 1-1.5 cm; calyx somewhat thickened, white-pinkish, ca. 1 cm long when dry, lobes obtuse, united for 1/3 of length and with 20-30 colleters in 4 rows, sepals not ciliate, acute and pubescent, convolute, > 1 cm; corolla ochre yellow to orange, lobes falciform, ca. 1.5 cm long, pubescent at overlapping margins in bud and at apex of tube, tube ca. 3.5 cm long, wider at base; stamens inserted in the middle of and included in corolla tube; infrastaminal indument shorter than stamens; disc prominent around ovary; style short, style head with 2 appendages 1/4 as long as body. Follicles fusiform, yellow, ca. 5 x 1 cm, with acumen ca. 0.1 cm; sepals persistent in fruit; aril incompletely covering seed; seeds brown.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana, Ecuador and Peru; uncommon in understory of rain forest, near creeks and riverbanks. (GU: 8).

S e l e c t e d s p e c i m e n s : Guyana: Region: U. Takutu-U. Essequibo.

Kassakaityu R., 1° 48' N, 58° 44' W, 300-400m, Henkel et al. 5303 (P, US); Clarke 2888 (P, U, US); Behind mission, FD 7177 (P, U); Essequibo R., Gunn's, 240-490 m, Jansen-Jacobs et al. 1513 (U).

V e r n a c u l a r n a m e s : Guyana: vali.

P h e n o l o g y : Flowers throughout the year. Fruits in July-September.

8. **Bonafousia obliqua** Miers, Apocyn. S. Amer.: 49. 1878. Type: Venezuela, Amazonas, Spruce 3199 (holotype BM, isotypes BR, CGE, G, K, NY, P, TCD, W).

Tabernaemontana albescens Rusby, Descr. S. Amer. Pl.: 83. 1920. –*Anacampta albescens* (Rusby) Markgr. in Pulle, Fl. Suriname 4(1): 452. 1937; Notizbl. Bot. Gart. Berlin-Dahlem 14: 163.

1938. Type: Venezuela, Delta Amacuro, Rusby & Squire 300 (holotype NY, isotypes A, BM, E, F, G, GH, K, M, MO, US, WU, Z).

Shrub or tree 3-8 m high. Stems plagiotropic with leaves decussate but held in a nearly horizontal plane by twisting of petioles; internodes trigonal, especially in upper 1/3, with a rib corresponding to each leaf and scale just below petiole insertion, inflorescence facing upper side of plagiotropic branch. Leaves subsessile; petiole 0.5-0.6 cm long; blades coriaceous, elliptic, 10-25 x 3-8 cm, not undulate at margin; acumen triangular, 0.5-1 cm long, upper surface dark green, lower surface whitish and soft; secondary veins 10-14, ca. 1-2 cm apart. Inflorescence solitary, cymose, 6-7-flowered; peduncle ca. 0.5 cm long; pedicels ca. 0.5 cm long. Sepals free, retuse, ca. 0.5 cm, not ciliate, with 4-5 colleters in a line at base inside; corolla tube and lobes in bud white to pink-lilac, lobes white, spreading, ca. 2.5 x 1.5 cm, pubescent inside, tube ca. 2 cm long, swollen at base and at level of stamens; infrastaminal indument reaching only filaments, adnate to median zone of corolla; stamens tails straight, as long as fertile part of anthers; disc prominent, as long as free part of ovary, style slender, filiform, ca. 1.5 cm long, style head with 2 appendages 1/3 as long as body. Follicles fusiform, fleshy, smooth, ca. 7 x 1.2 cm; aril incompletely covering seed; seed brown, striate.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana, Brazil and Ecuador; uncommon in understory of rain forest, near creeks and riverbanks. (GU: 5).

S p e c i m e n s e x a m i n e d : Guyana: Pomeran R., de la Cruz 2912 (GH, MO, NY); Cuyuni-Mazaruni Region, Ayanganna Plateau, Pipoly et al. 10905 (NY, P, US); id., Chinoweing, Pipoly et al. 10422 (NY, P, US).

V e r n a c u l a r n a m e s : Guyana: kapoua wiri.

P h e n o l o g y : Flowers throughout the year. Fruits in July-September.

U s e s : According Froes and Steyermark on herbarium labels, the species is poisonous to fish.

9. **Bonafousia rupicola** (Benth.) Miers, Apocyn. S. Amer. 52. 1878.

–*Tabernaemontana rupicola* Benth., J. Bot. (Hooker) 3: 243. 1841.

–*Anacampta rupicola* (Benth.) Markgr. in Pulle, Fl. Suriname 4(1): 452. 1937.

Type: Brazil, Amazonas, Pedrera, Rob. Schomburgk 1 898 (holotype K, isotypes BM, CGE, E, F, FI, FI-W, G, L, NY, P, SING, TCD, US, W).

Tabernaemontana sessilifolia Klotzsch in R.M. Schomb., Reis. Br.-Guiana. 3: 952. 1848.

Type: Guyana, Rob. Schomburgk, II 117(= Rich. Shomburgk 23). nom. nud.

Bonafousia polyneura Miers, Apocyn. S. Amer. 53. 1878. Type: Brazil, Amazonas, Spruce 1758 (lectotype G, designated by Leeuwenb., isolectotypes AWH, BM, BR, CGE, K, P, TCD, W).

Shrub or tree 1-3 m high; stem somewhat 3-ribbed, with nodes 3-5 cm apart; bark light grayish brown. Leaves sessile, with linear acuminate; blades membranous to coriaceous, lanceolate, 9-11 x 2.5-3.5 cm, upper surface shiny green, lower surface dull green, gradually attenuate into an acuminate 1-1.5 cm long, asymmetric at base, cordate on only one side, cordate side facing inflorescence; secondary veins 0.3-0.5 cm apart; tertiary veins often conspicuous. Inflorescence cymose, with 8-10 flowers; peduncle ca. 0.5 cm long; pedicels slender, pink, ca. 0.8 cm long. Corolla white with pink corolla tube and calyx. Sepals retuse, ciliate, ca. 0.2 cm long, with 2-3 colleters at base; corolla tube ca. 1 cm long, swollen at base and at level of stamens, lobes oblique, oblong, diaphanous, 1-2 cm long; infrastaminal indument ending at level of

staminal tails and forming a tomentose ring at level with style head; ovary retuse, subtended by a prominent and ribbed disc; style slender, ca. 1 cm long; style head with appendages very short. Follicles reniform, ca. 2.5 x 1.3 cm, acuminate, reddish green when mature; aril incompletely covering seed; seeds sharply indented, embryo with slender radicle twice as long as cotyledons.

D i s t r i b u t i o n : Not common in the Guianas but more common in Brazil; in riverine and creeks forest, especially near rapids. (GU: 9; SU: 2; FG: 10).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo R., FD 6886 (K); Mazaruni R., Jenman 2434 (BM, NY). Suriname: Coppename R., LBB 13651 (U, Z); loc. id., Florschütz & Maas 2781 (K, NY, U, US). French Guiana: Inini R., de Granville C 22 (CAY, P, U); Cayenne, Martin s.n. (K).

V e r n a c u l a r n a m e s : French Guiana: pakira emu (Wayana).

P h e n o l o g y : Flowers throughout the year. Fruits in May-August.

C h e m i s t r y : Niemann & Kessel isolated 2 new alkaloids from the species: rupicoline & montanine s.n. (collectors: Brazil, Rodriguez s.n. (10.1959); Raffauf & da Silva (10.1961).

10. **Bonafousia sananho** (Ruiz & Pav.) Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 14: 166. 1938.—*Tabernaemontana sananho* Ruiz & Pav., Fl. Peruv. 2: 22, pl. 144, 1799.—*Merizadenia sananho* (Ruiz & Pav.) Miers, Apocyn. S. Amer.: 78. 1878. Type: Peru, Ruiz López & Pavón s.n. (holotype MA, isotypes B-W 5192, BR, F, G, G-BOIS, G-DC, OXF, US).

Boiteau,Phytologia 31: 246. 1975. Type: French Guiana, Martin s.n. (holotype P-LA).

Tabernaemontana poeppigii Müll.Arg., Linnaea 30: 405. 1860. –*Taberna poeppigii* (Müll.Arg.)

Miers,Apocyn. S. Amer.: 63. 1878. Type: Peru, San Martín, Tocache, Poeppig 1923 (holotype W).

Tree 3-17 m high; bark light brown, scaly. Stem 3-angled and with very strong ribs below petioles; sympodial module comprising 1-3 pairs of chlorophyllous and isophyllous leaves and 1 pair of bracts axillary to inflorescence and young branch. Petiole 0.7-1.5 cm long; blades membranous, ovate-elliptic, 15-20 x 6-8 cm, upper surface shiny yellow-green, lower surface pale green, acumen triangular, 1-1.5 cm long; secondary veins 14-16, inconspicuous. Inflorescence cymose, 10-30-flowered; peduncle 2-4 cm long; pedicels slender, as long as calyx; calyx ca. 0.1 cm long, ciliate, with 3-5 colleters at base; corolla lobes reflexed, longer than tube, dolabriform, fringed at margin, white (sometimes, with brown corolla throat), tube 1.2-1.5 cm long, slightly twisted; infrastaminal indument 1/2 as long as stamens; ovary subtended for more than half its height by inconspicuous disc, style slender, style head with appendages 1/4 as long as body. Follicles usually globose, 5-6 x ca. 5 cm, smooth, with lateral ribs, yellow-orange when mature; aril incompletely covering seed; seeds brown to black, embryo with membranous cotyledons and conspicuous venation, as long as radicle.

D i s t r i b u t i o n : Colombia, Venezuela, the Guianas, Brazil, Ecuador, and Peru. About 100 collections studied. (GU: 2; FG: 9).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo, Bassin of Shodikar, A.C. Smith 2842 (A, G, GH, K, MO, NY, P, S, U, US); Marudi Mts., Stoffers et al. 226 (U). French Guiana: haut Oyapock, de Granville 2476 (CAY, P); circuit Limonade, Saül, Moretti 36 (CAY, P).

V e r n a c u l a r n a m e s : The name of "sanango" is used, with or without an epithet, for numerous species of the subfamily *Tabernaemontanoideae* in South America. In 1799, Ruiz and Pavón reported the name sanango (Peru), which was also cited in the curare, by Humboldt and Bonpland (Voyages dans l'Amérique équinoxiale. I. Itinéraire. Paris, 1807, réed. FM/ Découverte 1980. p: 152). According to R. E. Schultes (Hallucinogenic plants, ed. Goldenpress, NY, p. 140-141, 1976) the same name is also used in Peru for the species *Brunfelsia chiricaspi* and *B. grandiflora* (Solanaceae) which have narcotic properties. In French Guiana: kapoua oui (Taki-taki).

P h e n o l o g y : Flowers and fruits throughout the year.

U s e s : The roots are used as a remedy for rheumatism.

11. **Bonafousia siphilitica** (L.f.) L.Allorge, Mém. Mus. Natl. Hist. Nat., sér. B, Bot. 30: 114. 1985.—*Echites siphilitica* L.f., Suppl. Pl. 167. 1782.
—*Tabernaemontana siphilitica* (L.f.) Leeuwenb., J. Ethno-Pharm. 10: 17. 1984. Type: Suriname, s.l., Dahlberg s.n. (hololectotype LINN 302.3!, designated by Leeuwenb. (1984), isolectotypes, S, S-LINN, UPS-Thunb. 6156 (photo)).

Tabernaemontana tetrastachya Kunth, in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 3: 227.

1819.—*Malouetia tetrastachya* (Kunth) Miers, Apoc. S. Amer.: 92, 1878. —*Bonafousia*

tetrastachya (Kunth) Markgr. in Pulle, Fl. Suriname 4(1): 454. 1937. Type: Colombia, Tolima,

Río Magdalena, Bonpland 1469, (holotype P-HB, isotype P.)

Tabernaemontana repanda G.Mey., Pl. Surin. coroll. 784. 1825. Type: Suriname, s.l., Hostmann 58 (B,destroyed, neotype: Hostmann 320, holotype K, isoneotypes BM, CGE, G, OXF, TCD).

Tabernaemontana longifolia Benth., J. Bot. (Hooker) 3: 243. 1841.—*Anacampta longifolia*

(Benth.)Miers, Apocyn. S. Amer.: 66. 1878. Type: Guyana, Rob. Schomburgk I 292

(hololectotype

K, isoelectotypes BM, CGE, E, F, FI-W, G, G-DC, L, OXF, P, SING, TCD, UPS, US, W).

Tabernaemontana guianensis Miq., Linnaea 18: 754. 1844. Type: Suriname, Paramaribo, Kappler 1627 (holotype U, isotypes G, MO, P, S, W).

Tabernaemontana guyanensis Müll.Arg., Linnaea 30: 404. 1860. Type: French Guiana, s.l.,

Poiteau s.n.(holotype LEN, isotype G).

Cupirana martiniana Miers, Apocyn. S. Amer.: 17. 1878. Type: French Guiana, Cayenne,

Martin s.n., (.....holotype BM, isotype P, photo NY, N.S.674), syn. nov.

Tabernaemontana duckei Huber, Bull. Soc. Bot. Genève, 2 sér., 6: 199. 1915. Type: Brazil, Ducke 2509 (holotype RB, isotype GH).

Tabernaemontana cuyabensis Malme, Ark. Bot. 21A (6): 11. 1927. Type: Brazil, Krukoff 1083 (G).

Tabernaemontana killipii Woodson, Ann. Missouri Bot. Gard. 18: 541. 1931. Type: Peru, Loreto, Iquitos, Killip & A.C. Smith 27414 (holotype MO; isotypes F, NY, US).

Bonafousia tessmannii Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 14: 182.

1938.—*Tabernaemontana tessmannii* (Markgr.) Macbride, Publ. Field Mus. Bot. Ser. 13: 410. 1959.

Type: Peru, Ucayali, Río Blanco, Tessman 3022 (holotype B, destroyed; hololectotype G, isoelectotypes NY, S).

Shrub 1.5-3 m high. Stems cylindrical, green, white-lenticellate; sympodial module comprising 2-5 pairs of isophyllous and chlorophyllous leaves and 1 pair of bracts axillary to an inflorescence and a young root-stage branch. Petiole 0.5-1 cm long; blades more or less coriaceous, lanceolate to obovate, 8-16 x 5-7 cm, acuminate at apex, attenuate at base, often bullate, glabrous; venation prominent. Inflorescence solitary, borne on a stout peduncle 2-6 cm long, consisting of 3-4 racemes with trigonal axes; flowers spirally inserted on angles of rachis; bracts persistent, ca. 0.2 cm long, acute. Sepals retuse, ciliate, ca. 0.4 cm long, with 6-8 colleters at base; bud acute at apex, not ciliate on margins of convolute lobes. Flowers white, fragrant, sometimes with a brown eye; corolla lobes ca. 2 cm long, as long as and

perpendicular to tube, undulate at margin, tube twisted at level of stamens, disc prominent around ovary, ovary attenuate into style, ca. 1.5 cm long, style head with appendages short. Follicles yellow to orange-brown, oblong, 3-5 x ca. 1.5 cm, acute, acuminate, with finely granular pericarp and lateral ribs; aril not edible, musty-smelling, completely covering black seeds; testa rugose with concentric, acute wings, embryo with straight radicle twice as long as cotyledons.

D i s t r i b u t i o n : From Colombia to Bolivia; near creeks and riverbanks in open places; common. About 200 collections studied, 128 for the Guianas (GU: 15; SU: 38; FG: 75).

S e l e c t e d s p e c i m e n s : Guyana: Kariako village, Barama R., van Andel et al. 910 (U); Region U, Takutu U, Hoffman 989 (U, US). Suriname: Paramaribo, Samuels 67 (NY); Tapanahoni R., Rombouts 648 (COL, P, U). French Guiana: Camopi R., affl. Oyapock, Oldeman & Sastre 169 (CAY, NY, P, U); Gabrielle Cr., Prévost 238 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: buri, pero-ishi-lokado (Arawak). Suriname: wako, kapoea kraroen, abuti abud, kapuwatiki (Sranan). French Guiana: melki tiki, barba de zontra; bois de lait, herbe du lézard (Créole); razier capiaï, kapoua tiki (Taki-taki), palukelan, tamukwanlankaa'a (Wayampi), kapwawi (Njuka), saig (Palikur).

P h e n o l o g y : Flowers throughout the year. Fruits in February-May, August-November.

U s e s : Used as an antipyretic and for rheumatism in warm bath in French Guiana. According to the first collector, Dahlberg, the species is a remedy for syphilis.

C h e m i s t r y : See Grenand, P. et al. (1987: 121).

12. **Bonafousia undulata** (Vahl) A.DC., Prodr. 8: 359. 1844. –*Tabernaemontana undulata* Vahl, Eclog. Amer. 2: 20. 1798. Type: Trinidad, s.l. Ryan s.n. (holotype C-VAHL, isotypes BM, P-LA).

Echites braziliensis Thunb., Echitis 5:1819. Type: Brazil, s.l. (holotype UPS-THUNB. 6135 & 6136 (microfiche P).

Tabernaemontana perrottetii A.DC., Prodr. 8: 362. 1844. –*Bonafousia perrottetii* (A.DC.) Miers, Apocyn. S. Amer.: 51. 1878. Type: French Guiana, Perrottet 275 (holotype G-DC).

Peschiera surinamensis Miq., Linnaea 18: 742. 1844. Type: Suriname, Victoria, Kappler 1398 (holotype U,isotypes FI-W, G, P, S, W).

Stemmadenia nervosa Standler & L. O. Williams, Ceiba 3: 126. 1952. Type: Costa Rica, Puntarenas, Allen 5834 (holotype US, isotypes BM, F, GH, UC).

Shrub or tree 5-11 m high; bark green with light green lenticels. Stems plagiotropic with leaves decussate but held in a nearly horizontal plane by twisting of petioles; internodes 3-angled, especially in upper 1/3, with rib corresponding to each leaf and scale just below petiole insertion; sympodial module comprising 1 pair of chlorophyllous and isophyllous leaves and 1 pair of bracts axillary to inflorescence and to young root-stage branch. Petiole ca. 0.5 cm long; blades lanceolate, 11-13 x 3-5 cm, undulate at margin, acumen triangular, 0.5-1 cm long, upper surface dark green, lower surface whitish and pubescent; secondary veins 18-20, ca. 0.5 cm apart. Inflorescence ascending above plagiotropic stem, solitary, cymose, reduced to 3-4 flowers, buds spherical at apex; rachis ca. 0.2 cm long; pedicels ca. 0.2 cm long. Sepals ciliate, deeply retuse, ca. 0.1 cm long, partially united with 6-7 colleters in each sinus at base; corolla lobes reflexed, pubescent outside, pink only on exposed margins in bud; lobes erect at anthesis, white, ca. 1 cm long, tube pink, swollen at base and at level of stamens, ca. 2 cm long; suprastaminal indument present; ovary subtended by a conspicuous, entire, tapering disc, style filiform, ca. 1.5 cm long,

style head with appendages 1/3 as long as body. Follicles reniform, strongly curved, 5-6 x ca. 3 cm, acuminate, reddish green when mature; pericarp granular; aril incompletely covering seed, not edible, musty-smelling; seeds about 50, black; testa with concave cells.

D i s t r i b u t i o n : Central America (Costa Rica, Panama), Trinidad and South America; locally abundant in the subcanopy of rain forest. (GU: 65; SU: 38; FG: 126).

S e l e c t e d s p e c i m e n s : Guyana: Mazaruni R., de la Cruz 4236 (NY); Rockstone, Gleason 591 (K, NY). Suriname: Zanderij, Lindeman, Stoffers et al. 471 (MO, NY, Z); Cottica R., Cowan 39011 (NY). French Guiana: Arataye, affl. Approuague, Allorge 8 (P); Tumuc Humac, de Granville 982 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: black stone; dog stone, perro emurutano (Carib-Indian). Suriname: beri mantabi bati, batttie battie, kokoni bobi wata (Saramaca), mambati bati, meliki tiki, mirki tiki (Ndjuka) wagoé ston. French Guiana: bois de lait (Créole), boi oudou (Taki-taki), djen djen pao (Saramaca), katawatatiki, pikin mapa (Paramacca).

P h e n o l o g y : Flowers and fruits throughout the year.

U s e s : Leaves: According to R. E. Schultes (1978, Journ. of Ethnopharm. 1: 165-192), the leaves, mixed with those of *Manihot esculenta* L., are frequently used to make a vermifuge infusion in Colombia.

C h e m i s t r y : The stem contains (J. Bruneton et al., Fitoterapia 3: 123. 1979), 5 alkaloids: coronaridine, voacangine, épi-heyneanine, quebrachine & voaphylline, the material came from French Guiana. Seeds were analyzed for the first time by A. Cavé et al. (Pl. méd. et Phyto. 6(3): 228.1972); the results are as follows: coronaridine (80% alkaloids) and voaphylline. See also Grenand et al. (1987: 122).

CATHARANTHUS G.Don, Gen. Hist. 4: 71 - 95. 1837.

Type: *C. roseus* (L.) G.Don (= *Vinca rosea* L.)

Lochnera Rchb., Consp. Regn. Veg. 134. 1828. nom. nud.; Endl., Gen. Pl. 583. 1838.

Ammocallis J.K.Small, Fl. Southeast. U. S. :935. 1903.

Herbs or subshrubs, mostly woody at base with brown bark; herbaceous branchlets with green bark, cylindrical or tetragonal (*C. ovalis*, *C. trichophyllus*). Latex white, copious. Leaves opposite. Inflorescences axillary, alternately on right and left sides at adjacent nodes, usually 2-flowered; calyx with linear lobes, without colleters; corolla pink or white, hypocrateriform, lobes 5, (exceptionally 4) perpendicular to corolla tube, acuminate at apex, often darker in throat, tube pubescent inside, enlarged at throat; stamens free from style head, completely or wholly fertile; pollen 3-colporate, smooth, perforate; nectaries 2, alternate with carpels; style head cylindrical with membranous basal collar; ovary apocarpous, ovules many in each carpel. Fruits of 2 narrowly cylindrical, many-seeded follicles; seeds black, small, ca. 0.1-0.2 cm, without appendages.

D i s t r i b u t i o n : 8 species, 7 from Madagascar, 1 from southern India; 1 is cultivated in the Guianas.

L i t e r a t u r e: Stearn, *Lloydia* 29: 196-200. 1966.

1. **Catharanthus roseus** (L.) G.Don, Gen. Hist. 4: 95 1837.—*Vinca rosea* L., Sp. Pl. ed. 2. 305. 1762. —*Pervinca rosea* (L.) Moench., *Methodus* 463. 1794. —*Lochnera rosea* (L.) Rchb., Consp. Regn. Veg. 134. 1828. nom. nud.; Endl.,

Gen. Pl.: 583. 1838. –*Ammocallis rosea* (L.) J.K.Small, Fl. Southeast U.S: 935. 1903.

Type: s. coll., s.l., holotype LINN. 299-4 .

Hottonia littoralis Lour., Fl. Cochinch. 105. 1790. Type: Viet Nam, Eo near Hue, Loureiro s.n.

(holotype BM).....

Erect perennial herb less than 50 cm high, finely pubescent. Branchlets cylindrical. Leaves elliptic-oblong, 2-7 x 1.5-3 cm, apiculate at apex. Flowers in axillary pairs, subsessile. Sepals linear-subulate, pubescent; corolla pink, white or white with pink or yellow eye; tube 2.3-2.9 long; lobes 1.3-1.9 long. Follicles cylindrical, ca. 3 cm long; seeds ca. 0.2 cm long, brown, glabrous.

D i s t r i b u t i o n : Native to southern Madagascar; cultivated worldwide.

S p e c i m e n s e x a m i n e d : French Guiana: Saül, village and airport, 200-250 m, Marshall & Rombold 173 (CAY); id., Leeuwenberg 11601; 11602 (CAY, NY, P, WAG).

V e r n a c u l a r n a m e s : Guyana: periwinkle, burying-ground flower, ramgoat rose. Suriname: kotomisi (Carib), jongemansliefde, soldatenbloem. French Guiana: pervenche de Madagascar, caca poule (Créole) - Daruty (Plantes médicinales de l'île Maurice: 17. 1911) indicates also the same name for *Mussaenda arcuata* (Rubiaceae) and *Guazuma tomentosa* (Sterculiaceae) = because the odor is the same).

P h e n o l o g y : Flowers and fruits throughout the year in the tropics, but never fruiting in greenhouse (Darwin wrote in *Gardeners' Chronicle*, 1861: "Mr Horwood has just been so kind as to bring me a small plant of *Vinca rosea* with nine flowers fertilized by insertion of horse-hair and it now bears nine fine pods, he says he has

grown many plants for the last eight or nine years and never saw a pod.""). Pollination entirely entomophilous.

C h e m i s t r y : Very important medicinal plant used in treatment of cancer.

Grenand et al. (1987: 123); Markgr., Fl. Madag. Apoc. 136-156. 1976, with chemopharmacology by P. Boiteau.

7. **CONDYLOCARPON** Desf., Mém. Mus. Hist. Nat. 8: 119, pl. 11. 1822.

Type: *C. guyanense* Desf.

Maycockia A.DC., Prodr. 8: 324. 1844.

Hortsmania Miq., Natuurk. Verh. Holl. Maatsch. Wetensch. Haarlem, ser.2, 7: 167. 1850.

Rhipidia Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 10: 1033. 1930.

Lianas slender, cylindrical, lenticellate. Latex white, copious. Leaves opposite and decussate or verticillate, glabrous to tomentose, membranous to subcoriaceous; petioles glabrous or nearly so. Inflorescence thyrsoid, axillary or terminal, many-flowered, glabrous to tomentose. Flowers small, aestivation sinistrorse; calyx 5-lobed, without colleter, lobes obtuse to triangular, ciliate and often hyaline at margin; corolla white, yellow or orange, salverform, often globose in bud, lobes oblique with red-brown streaks and appendages on left side in some species; stamens completely fertile, without sterile basal appendages, free from style head, inserted near middle of tube; filaments short, anthers basifixed; pollen in tetrads, reticulate; disc absent or adnate; ovary apocarpous, ovoid, depressed at top, style shorter than ovary, style head orbicular or turbinate, bilobed at apex. Fruits of 2 follicles, schizophyllous, mostly only one follicle developing in *C. myrtifolium*, pendent, articulated into one or several one-seeded, indehiscent segments, glabrous or

pubescent; seeds fusiform, longitudinally folded, testa verrucose, embryo straight, cotyledons narrowly elliptic.

D i s t r i b u t i o n : 7 species in the Neotropics from Nicaragua to Brazil; 5 species in the Guianas, in lowland wet and moist forest, generally along river banks.

E t y m o l o g y : from Greek: *condylo* = swollen; *carpon* = carpels.

L i t e r a t u r e : Fallen, M., A taxonomic revision of *Condylocarpon* (Apocynaceae). *Ann. Missouri Bot. Gard.* 70: 149 -169. 1983.

KEY TO THE SPECIES

- 1 Leaves verticillate..... 2. *C. guyanense*
 Leaves opposite 2
 Fruit covered by long spreading ferruginous-brown hairs..... 3
 Fruit glabrous 4
 Fruit of one-seeded follicles..... . 1. *C. amazonicum*
 Fruit of 5-16 one-seeded segments..... 5. *C. pubiflorum*
 4 Fruit of one-seeded follicles.....4. *C. myrtifolium*
 Fruit of 2-5 one-seeded segments.....3. *C. intermedium*

1. **Condylocarpon amazonicum** (Markgr.) Ducke, *Trop. Woods* 76: 28. 1943.

–*Anechites(?) amazonica* Markgr., *Notizbl. Bot. Gart. Berlin-Dahlem* 9:

960. 1926.–*Rhipidia amazonica* (Markgr.) Markgr., *Notizbl. Bot. Gart.*

Berlin-Dahlem 10: 1033. 1930. Type: Brazil, Pará, Tapajoz, Ducke s.n., RB.

17480 (holotype-B, destroyed in 1943; hololectotype-RB, designated by M. Fallen, *l.c.*: 156. 1983, isolectotype-MO).

Condylocarpon reticulatum Ducke, Trop. Woods 76: 28. 1943. Type: Brazil, Ducke 1172 (holotype MG, isotypes MO, NY).

Condylocarpon occidentale Markgr., Bradea 3: 80. 1980. Type: Brazil, Cordeiro 828 (holotype Z, isotype INPA).

Liana 9-40 m long, ca. 2 cm dbh. Stem terete, reddish brown, lenticellate or golden-verrucose. Leaves opposite; petiole 0.5-1 cm long, canaliculate; blades subcoriaceous, 7-12 x 2.5-5 cm, acuminate, obtuse at base, upper surface more or less glabrous, lower surface more or less pubescent. Inflorescence terminal and axillary, puberulous to densely tomentose. Flowers malodorous; calyx ciliate; corolla creamy yellow to light brown, tube ca. 0.2 cm long, enlarged near middle, lobes 0.1-0.18 x ca. 0.07 cm, ascending to spreading, oblique; anthers ovate; ovary conical, ca. 0.06 cm long, style subsessile, style head turbinate. Follicles 10-15 cm long, woody, pale green, densely velutinous with spreading ferruginous-brown hairs ca. 0.3 cm long; seed 1 per follicle, brown, ca. 1.5 x 0.3 cm, glabrous.

D i s t r i b u t i o n : Venezuela, Suriname, French Guiana, Brazil and Bolivia; in riverine non-inundated forest. (SU: 3; FG: 3).

S e l e c t e d s p e c i m e n s : Suriname: 3 km South of Juliana, Irwin et al. 55022 (K, NY, U); Distr. Nickerie, Heyde & Lindeman 65, 190 (NY, U), wood-sample U-22802. French Guiana: Sinnamary R., Petit Saut, Mori et al. 23517, 23639 (CAY, NY); Saül, 3° 37' N, 53° 12' W, Carbet Maïs, 300 m, Mori et al. 20860 (CAY, NY).

P h e n o l o g y : Flowers in August. Fruits in November.

2. **Condylocarpon guyanense** Desf., Mém. Mus. Hist. Nat. 8: 120, pl. 8. 1822. Type: French Guiana, Cayenne, Martin s.n. (holotype FI, designated by M. Fallen, l.c.: 159. 1983, isotypes CAY, P, US photo B).

Liana to 10 m long. Stems terete, reddish brown, lenticellate, at least younger portions puberulous. Leaves 3 per node; petiole 1.2-1.8 cm long; blades membranous to subcoriaceous, 9-13 x 3-4.5 cm, reticulate, glabrous, pale green with dark green; secondary and tertiary veins abaxially. Inflorescence lax, longer than leaves. Flowers subsessile; calyx pale green, pubescent, ciliate; corolla creamy yellow to orange, tube ca. 0.15 cm long, lobes ca. 0.1 cm long, streaked red-brown at throat, with lorate appendages; anthers lanceolate; ovary glabrous, conical, ca. 0.05 cm long, style very short, style head orbicular. Follicles reddish brown, glabrous, articulated into 1-5 one-seeded, indehiscent segments each 1.5-2.5 cm x ca. 0.7 cm; seeds brown, ca. 1 cm long, radicle as long as cotyledons.

D i s t r i b u t i o n : Lowland forest in Guyana, French Guiana and Brazil; infrequent, in clearings in high forest. (GU: 2; FG: 17).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo R., Maguire & Fanshawe 22890 (NY); Mazaruni R., de la Cruz 4117 (NY). French Guiana: Mana, Cremers 7494 (CAY, P, U); Mission Radeau des Cimes, Coulevre Cr., F. Hallé, 4014 (CAY).

V e r n a c u l a r n a m e : French Guiana: ipokasilisili (Wayampi).

P h e n o l o g y : Flowers in April-August. Fruits in September.

C h e m i s t r y : Grenand et al. (1987: 123).

3. **Condylocarpon intermedium** Müll.Arg. in Mart., Fl. Bras. 6(1): 65. 1860.
Type: Guyana, Pomaroon R., Rob. Schomburgk II 785, holotype BM, designated by Fallen, l.c.; isotypes G, K. Paratype: Guyana Rich. Schomburgk 1426, B destroyed, photo F. (NY, US).

Condylocarpon obtusiusculum Müll.Arg. in Mart., Fl. Bras. 6(1): 65. 1860. Type: Brazil, Bahia, Blanchet 1576 (holotype G).

Condylocarpon breviarticulatum Müll.Arg. in Mart., Fl. Bras. 6(1): 65, 1860. Type: Brazil, Sellow 571 (lectotype K, isolectotypes BM, F, designated by Fallen: 161, 1983).

Condylocarpon longii Standl. & L.O. Williams, Ceiba 3: 34. 1952. Type: Nicaragua, Long 132 (holotypeENAG, isotypes F, NY, US).

Liana. Stem subverrucose or lenticellate, grayish, more or less puberulent in younger portions. Leaves 3 per node, membranous to subcoriaceous; petiole 0.5-1.5 cm long, canaliculate; blades 6.5-10 x 2.8-4.5 cm, acute at apex, obtuse at base, glabrous on upper surface; primary vein sparsely pilose on lower surface. Inflorescence terminal and axillary. Flowers subsessile. Sepals ciliate and hyaline at margin; corolla yellow to orange, corolla tube 1-1.5 cm long, lobes 1-1.5 cm long, with lorate appendages and red markings; ovary glabrous, conical, style head orbicular, subsessile. Follicles green to yellow-brown, glabrous, pendent, woody, flattened, with about 5 one-seeded, ovoid, indehiscent segments ca. 1 x 0.7 cm; seed brown, stony.

D i s t r i b u t i o n : Nicaragua, Venezuela, Trinidad, Guyana and Brazil; in coastal forests. (GU: 7).

S e l e c t e d s p e c i m e n s : Guyana: Mabaruma, Aruka R., FD 5066 (Fanshawe 2330); FD 5193 (Fanshawe 2457) (U, US); Baramini Cr., Waini R., FD 5066 (U); Pomeroon R. 7° 14' N, 58° 57' W, Hoffman & Roberts 2750 (P, US).

V e r n a c u l a r n a m e : Guyana: monkey bora.

P h e n o l o g y : Flowers in January-April. Fruits in April.

4. **Condylocarpon myrtifolium** (Miq.) Müll.Arg. in Mart., Fl. Bras. 6(1): 65. 1860.—*Hortsmania myrtifolia* Miq., Natuurk. Verh. Holl. Maatsch. Wetensch. Haarlem, ser. 2, 7: 168. 1850. Type: Suriname, Hostmann 1196 (holotype U, isotypes F, G, GOET, K, MO, NY, P).

Liana to 15 m long, 2 cm dbh. Stem reddish brown becoming gray, densely lenticellate, puberulous becoming glabrous. Leaves opposite; petiole 0.2-0.4 cm long; blades membranous, 6-10 x 2-3.5 cm, acumens ca. 1 cm long, upper surface glossy, shiny, dark green, lighter abaxially. Inflorescence a very congested thyrse. Calyx pubescent, ciliate; corolla pale gold to creamy yellow, tube 0.2 cm long, enlarged at level of stamens, darker near base, lobes ca. 0.1 cm long, shortly auriculate, without appendages; anthers lanceolate; ovary conical, style ca. 0.03 cm long, style head orbicular. Fruit of follicles, usually one by abortion, pendulous, leathery, glabrous, with single one-seeded segment, flattened, 4-5 x 1.5-2 cm; seed striate.

D i s t r i b u t i o n : Venezuela, Guyana, Suriname and Brazil; in non-inundated forest. (GU: 9; SU: 10).

S e l e c t e d s p e c i m e n s : Guyana: Camaria, Tutin 162 (BM, RB, U); Mazaruni R., FD 4146 (Fanshawe 1410) (U); id., de la Cruz 2850 (NY). Suriname: Corantyne R., BW 120 (U); Coppename road, Heyde & Lindeman 305 (wood-sample U-22865, NY, U).

P h e n o l o g y : Flowers in July-September. Fruits in November.

Condylocarpon pubiflorum Müll.Arg. in Mart., Fl. Bras. 6(1): 67. 1860.

Type: Brazil, Amazonas, mouth of Rio Negro, Spruce 1564 (lectotype BR, isolectotypes F, G, GOET, K, M, NY, P).

Condylocarpon ciliatum Müll.Arg. in Mart., Fl. Bras. 6(1): 66. 1860. Type: Brazil, Amazonas, near Panuré, Spruce 2475 (lectotype BR, isolectotypes BM, G, K, NY, P).

Condylocarpon hirtellum Ducke, Trop. Woods 76: 28. 1943. Type: Brazil, Amazonas, Esperança, Ducke 1171 (holotype MG, isotype NY).

Liana large, woody. Stem terete, reddish brown, somewhat blackened at nodes, with a sparse indumentum golden-brown. Leaves opposite; petiole 0.8-1.2 cm long; blades membranous, 6.5-15 x 2.5-5 cm, acumens ca. 0.5-1 cm long, upper surface glossy, pubescent on veins only. Inflorescence a terminal thyrse, golden-brown, puberulous. Calyx glabrous, ciliate; corolla white to creamy yellow, tube 0.15-0.2 cm long, enlarged at level of stamens, lobes 0.2-0.5 cm long, shortly auriculate, without appendages; anthers lanceolate; ovary conical, style ca. 0.03 cm long, style head turbinate. Fruit of follicles, pendulous, woody, densely golden tomentose, with several (up to 15) one-seeded segments, flattened, 2-2.5 x 2-3.5 cm; seed striate.

D i s t r i b u t i o n : Brazil and French Guiana; in non-inundated forest. (FG: 2).

S e l e c t e d s p e c i m e n s : French Guiana: Saül, Civerel 1430 (NY); id., Mori 24733 (NY).

P h e n o l o g y : Flowers in June-October. Fruits in November.

8. **COUMA** Aubl., Hist. Pl. Guiane, Suppl. 39, pl. 392. 1775.

Type: *C. guianensis* Aubl.

Shrubs or trees to 25-30m. Latex copious, white. Leaves in verticils of 3, brittle; secondary veins straight; intrapetiolar colleters present. Inflorescence axillary, corymbose, many-flowered. Corolla white, pink, red or violet, aestivation sinistrorse.

Sepals 5, small, without colleters; corolla bearing stamens in middle of tube, salverform; anthers ovate, short, not adherent, free from style head; disc adnate or indistinct; ovary syncarpous, unilocular; style head cylindrical, with 2 free terminal appendages. Fruit a globose berry with ca. 10 ellipsoidal seeds, endozoochorous, embryo with radicle longer than cotyledons.

D i s t r i b u t i o n : 6 species in tropical America.

L i t e r a t u r e : Monachino, J., A revision of *Couma* and *Parahancornia* (Apocynaceae). *Lloydia* 6: 229-239. 1943. Allorge L. & C. Sastre, Distribution géographique dans les Guyanes d'Apocynaceae et d'Ochnaceae. *C.R. Soc. Biogéogr.* 67 (2): 92. 1991.

KEY TO THE SPECIES

- 1 Leaves usually acuminate, not black-punctate abaxially..... 2
 Leaves usually obtuse, black-punctate abaxially..... 3
- 2 Secondary veins joined 0.2-0.3 cm from leaf margin; tertiary veins mostly transverse, extending beyond secondary 2. *C. guianensis*
 Secondary veins reaching leaf margin; tertiary veins very dense, reticulate 3. *C. macrocarpa*
- 3 Petiole very short; corolla red..... 4. *C. rigida*
 Petiole 2-3 cm; corolla white..... 1. *C. catingae*

1. ***Couma catingae*** Ducke, *Arq. Inst. Biol. Veg.* 4: 59. 1938. Type: Brazil, Rio Negro, Ducke, RB 34693, (holotype RB, isotypes P, US).

Tree 10-12 m high, glabrous. Stems thick, 3-angled or quadrangular; stipular flange at base of petiole ca. 1 cm long. Leaves in verticils of 3; petiole 2-3 cm long, thick, 3-

angled; blades widest in upper third, 10-12 (35 cm) x 4-5 cm, black-punctate abaxially, shortly acuminate to obtuse, decurrent on petiole; secondary veins 18-20 pairs, perpendicular to primary vein, reaching revolute margin. Inflorescence of dense axillary cymes; peduncle 8-13 cm long. Flowers 1-1.2 cm long, corolla white, tube glabrous outside, lobes sparsely puberulent. Fruit a berry, ca. 4 x 4 cm, green; seeds flat, testa brown.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana and Brazil. About 19 collections studied. (GU: 1).

S p e c i m e n e x a m i n e d : Guyana: Potaro Siparuni Region, Kaieteur falls, 5° 11'N, 59° 29'W, 550 m, Kvist et al. 112 (BRG, P, NY, U, US).

P h e n o l o g y : Flowers in September. Fruits in October.

U s e s : Fruit with pulp edible, sweet when mature.

2. **Couma guianensis** Aubl., Hist. Pl. Guiane, Suppl. 39, pl. 392. 1775.

Type: French Guiana, Aublet s.n. (holotype BM).....– Plate 14, fig. 3.

Cerbera triphylla Rudge, Pl. Guian. 4: 31, pl. 48. 1806. Type: French Guiana, Acarouany, L.C.Richard s.n., (holotype P) (contrary to what Monachino (Lloydia 6: 236. 1943) indicates in appendix, attributing type to Joseph Martin).

Tree 20-25 m high. Trunk cylindrical, to 40 cm dbh; latex very abundant in bark and stem; wood soft, fibrous; bark regularly cracked, verrucose, greenish; young twigs brown, trigonous, later very rough and black; a branch borne in axil of each leaf. Leaves opposite in seedling, in verticils of 3; blades ca. 18 x 10 cm, pendent, caducous, dark green above, pale green abaxially; secondary veins impressed

above, joined 0.2-0.3 cm from leaf margin, prominent abaxially; tertiary veins mostly transverse, extending beyond secondary. Inflorescences in groups of 3 corymbs alternating with pale pink young leaves, slightly glutinous; inflorescence branches and calyx brown-violet with light brown lenticels. Corolla tube pubescent without, long-hairy within at throat; corolla lobes pink below, pubescent on both sides; infrastaminal indument, dark purple, ovary glabrous, style head barely surpassing calyx. Fruit a berry, ca. 4 x 4 cm, red at maturity; pulp edible; seeds 4-5, flat, elliptic, ca. 1 cm long.

D i s t r i b u t i o n : Suriname, French Guiana and Brazil; common in rain forest. (SU: 17; FG: 29).

S e l e c t e d s p e c i m e n s : Suriname: Marowyne R., Kappler 1985 (U); Forest Reserve, tree SO 656, BW 573 (U). French Guiana: Kourou-Sinamary, crique Malmanoury, Prévost 452 (CAY, P); Oyapock, Camopi R., Oldeman 2608 (CAY, P, NY).

V e r n a c u l a r n a m e s : Suriname: pera (Arawak), akoema (K). French Guiana: gan mapa (Bush), poirier des créoles (Exposition coloniale), milky oudou (Taki-taki), yuwa (Wayampi), ukum (Palikur).

P h e n o l o g y : Flowers before the leaves in August-September. Fruits in September-October.

U s e s : Pulp edible, sweet. Copious white latex drinkable added to tea or coffee in place of milk. This latex, mixed with oil of ricinus, is used as antihelminthic and antidysenteric. A gum is also produced, "goma de mascar"; Aublet gave this for analysis to Dr. Rouelle, and published it as an annex to his book: *Analyse de la résine du Coumier*: 41-47.

Chemistry : See Grenand & al. (1987: 124).

3. Couma macrocarpa Barb.Rodr., Vellozia, ed.2,1: 32, pl.1, B. 1891.

Type: Barb.Rodr. 460 (not seen).

C. sapida Pittier, Bol. Ci. Técn. Mus. Comercial Venez. 1: 69. 1925. Type: Venezuela, Río Lora, Pittier 10976, (holotype NY, isotypes P, G).

C. guatemalensis Standl., Trop. Woods 7: 8. 1926. Type: Guatemala, Entre Ríos, Record 42 (= Yale 8873) (holotype US, isotypes F, NY).

C. capiron Pittier, Bol. Soc. Venez. Ci. Nat. 5: 312. 1939. Type: Venezuela, valle del Caura, Soltero s.n., (holotype NY).

C. caurensis Pittier, Bol. Soc. Venez. Ci. Nat. 5: 313. 1939. Type: Venezuela, Bolivar, Williams 12009, (holotype F, isotype NY).

Tree 25-35 m high x ca. 30 cm dbh; wood soft, fibrous; bark very rough, brown or black; latex white, yielding a thick, sticky gum; young twigs brown, hirtellous, cylindrical. Leaves in verticils of 3; petiole 0.8-1.7 cm long; blades coriaceous, elliptic, 6-25 x 3.5-18 cm, short-acuminate to obtuse, base cuneate, glabrous above, densely pubescent abaxially, green, paler beneath; secondary veins impressed above, prominent beneath, reaching leaf margin; tertiary veins very dense, rectangular reticulate. Inflorescence equaling axillary leaves, generally 3 per node; flowers pink, borne in great abundance when tree is leafless. Sepals oblong-lanceolate, 0.2-0.25 cm long, obtuse, puberulent; corolla tube 0.7-0.8 cm long, puberulent, lobes 0.4-0.6 cm long. Fruit a berry, greenish-brown to brown, young ca.1.5 x 1.2 cm, older ca. 4 x 4 cm, yellow at maturity.

D i s t r i b u t i o n : Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Brazil and Peru. About 25 collections studied. (GU: 4).

S p e c i m e n s e x a m i n e d : Guyana: Rupununi R., Jansen-Jacobs et al. 5473 (U); Kuyuwini R., A.C. Smith 2579 (P, NY, U); Essequibo R., Cr. Ohoro, A.C. Smith 2713 (P, NY, U); 2nd hill, behind Mission, FD 7215 (Guppy 239) (NY, U).

V e r n a c u l a r n a m e s : Guyana: rokoroko (Arawak), osoku'(Waiwai), karimein (Wapisiana).

P h e n o l o g y : Flowers in September. Fruits in December.

U s e s : Pulp of fruit edible. Copious latex drinkable as in previous species and when dry, used as a cement to set the points into cassava graters. Important source of chicle, the basic ingredient of chewing gum.

4. ***Couma rigida*** Müll.Arg. in Mart., Fl. Bras. 6(1): 20. 1860. Type: Brazil, S. Domingo, Riedel s.n. (holotype G, isotype P).

Tree 10-12 m high in Brazil, up to 30 m in Guyana, to 25 cm dbh; latex white, very copious from all parts; young stem 3-angled, without lenticels. Leaves usually in verticils of 3, sometimes opposite, subsessile; petiole 0.2-0.4 cm, enlarged at base into collar-like flange; blades coriaceous, 13-16 x 5-5.7 cm, margin revolute, obtuse, base decurrent on petiole, black-punctate abaxially, brittle, stiff, dark green above, lighter abaxially; secondary veins 12-13, perpendicular to primary vein, reaching leaf margin. Inflorescence on peduncle 4-5 cm. Flowers with strong sweet fragrance; calyx and corolla deep red without; corolla light pink within, shading to white at margin, pubescent without and within except at level of ovary; stamens inserted in middle of corolla tube; ovary glabrous, truncate at summit, style filiform, twice as long as ovary. Fruit berries, 1-3 per inflorescence, ca. 3.5 x 4.5 cm, yellow at maturity, edible; seeds flat, oval, testa brown.

D i s t r i b u t i o n : Venezuela (Bolívar), Guyana and Brazil (Bahia: Nazareth, Ríó Pau, Olivença, Ilheus); rare to occasional, common in *Dicymbe* forest on laterite, 700 to 1100 m. (GU: 4).

S p e c i m e n s e x a m i n e d : Guyana: Potaro Siparuni Region, Kaieteur Falls, Kwist et al. 112; Kaieteur plateau, Maguire & Fanshawe 23232, (P, U). Upper Mazaruni R., Merume & Ayanganna Mts., Tillett et al. 44834, 45042 (NY).

P h e n o l o g y : Flowers in July-August. Fruit in October.

9. **ERVATAMIA** (A.DC.) Stapf, Fl. Trop. Afr. 4(1): 126. 1902.

Type: *E. coronaria* (Jacq.) Stapf

Trees or shrubs; sympodial flowering axis very variable, usually with 6-7 internodes, 6-7 pairs of chlorophyllous, isophyllous leaves, 1 pair of scale-leaves subtending 1 or 2 juvenile stems and 1 pair of bracts subtending 2 inflorescences (or 1 by abortion) and third inflorescence apical. Latex white. Leaves opposite, base of leaves and nodes covered by numerous colleters. Inflorescences cymose, several to many-flowered. Sepals united below, ciliate or eciliate, with several colleters inside at base; corolla white, membranous, more or less crassulate, tube bearing stamens in upper half and sometimes with 10 vascular bundles visible in lower half, tube usually straight in lower half and rather twisted below stamens; stamens free from style head, basifixed with manifest filaments, indented or not at base, anthers mucronate at apex, mucron very fine, sometimes hairy, with 2 sterile basal appendages, these very short, less than 1/10 as long as anthers; pollen 3-6-colporate, finely reticulate; disc inconspicuous or adnate to ovary and then prominent, carpels united or free, 2-100-ovulate, 2-6-seriate, style straight, slender, style head globose, ellipsoid or fusiform, usually covered with ring of glandular hairs at base, not sulcate or swollen,

appendages 2, terminal or apical, as long as or longer than body. Fruit of 2 follicles; seeds with red aril, 2-6 seriate, endozoochorous, testa tuberculate.

D i s t r i b u t i o n : 20 species from South Asia and the Pacific.

KEY TO THE SPECIES

- 1 Leaves not more than 3 cm wide; petiole ca.1 cm long; corolla lobes 1.2 cm long, shorter than cylindrical part of tube, ca. 1.8 cm; calyx ca.0.1 cm long 2. *E. cumingiana*
 Leaves more than 4 cm wide; petiole ca. 2 cm long; corolla lobes ca. 2.5 cm long, longer than cylindrical part of tube, the latter swollen at tip; calyx ca. 0.2 cm long 1. *E. coronaria*

1. ***Ervatamia coronaria*** (Jacq.) Stapf, Fl. Trop. Afr. 4 (1): 127. 1902. –*Nerium coronarium* Jacq., Icon. Pl. Rar., pl. 52, 1783; Collectanea Bot.1:

138. 1787.–*Tabernaemontana coronaria* (Jacq.) Willd., Enum. Pl. 275.

1809. Type: Herb. Jacq. (holotype W). – Plate 13.

Nerium antidysentericum Thunb., Fl. Jav. 5. 1825, cit. under *Wrightia zeylanica* (L.) R. Br. by mistake in Juel, Plantae Thunbergianae: 316. 1918. Type: Herb. Thunberg (holotype UPS-THUNB. 6124, microfiche P) syn. nov.

Kopsia cochinchinensis Kuntze, Revis. Gen. Pl. 2: 415. 1891. Type: Indochine, Saïgon, Kuntze 3953, (holotype NY), syn. nov.

Shrub 3-4 m high, glabrous. Stem slender; bark yellowish and warty; flowering axes composed 3-6 pairs of chlorophyllous, more or less isophyllous leaves, 1 pair of bracts axillary to a pair of juvenile stems, 1-3 bracts axillary to 1-3 inflorescences. Petiole ca. 2 cm long; blades lanceolate-oblong, 7-12 x 3-4 cm, acuminate, attenuate

at base; secondary veins 7-9. Inflorescence 2-10-flowered, fragrant, in cymes. Pedicels 0.5-2 cm long; calyx ca. 0.2 cm long, lobes acute at apex, with 3 colleter inside at base; corolla lobes ca. 2.5 cm long, longer than cylindrical part of tube, ca. 1 cm, sometimes with yellow eye, not swollen towards the right, hardly overlapping at left; stamens fertile almost throughout; filaments conspicuous; ovary conical without an apparent disc, style head with appendages as long as body. Follicles oblong, ca. 5 x 2 cm, acuminate; acumen curved; seeds brown, 4-seriate, testa papillose.

D i s t r i b u t i o n : Cultivated, introduced from Himalayas.

S e l e c t e d s p e c i m e n s : Guyana: Demerara-Berbice R., de la Cruz 1671 (GH, MO, NY); Wanama R., de la Cruz 4040 (GH, NY). French Guiana: Cayenne, garden of ORSTOM, Prévost 141 (CAY, P); Regina, garden, Allorge 260 (P).

V e r n a c u l a r n a m e s : (diploid) simple flower : "faux Gardenia", "faux tiaré", "jasmin en arbre"; (polyploid) double flower: cashmere; butterfly gardenia .

P h e n o l o g y : Flowers throughout the year. Never fruits in the Guianas.

U s e s : Ornamental shrub.

2. **Ervatamia cumingiana** (A.DC.) Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 12: 547. 1935.—*Tabernaemontana cumingiana* A.DC., Prodr. 8: 373. 1844. Type: Philippines, Cuming 604 (holotype G-DC, isotype P).

– Plate 12.

Nerium ceilanicum Thunb., Fl. Ceil. 4. 1825, cit. under –*Wrightia zeylanica* (L.) R. Br.

by Juel, Plantae Thunbergiae 316. 1918. Type: Herb. Thunberg (holotype UPS-Thunb. 6125, microfiche P).

Anartia recurva Sagot ex Miers, Apocyn. S. Amer. 80. 1878. Type: French Guiana, Sagot 388 (holotype BM, isotype P).

Tabernaemontana acapulcensis Miers, Apocyn. S. Amer.: 57. 1878. Type: Mexico, Pavon s.n. (holotype BM).

Shrub 1-3 m high. Stem very slender, cylindrical; bark green. Flowering axes composed of 3-6 pairs of chlorophyllous, more or less isophyllous leaves, 1 pair of scale-leaves axillary to a pair of juvenile stems, 1 pair of bracts axillary to inflorescence. Petiole ca. 0.5-1 cm long; blades membranous, 6-7 x 1.5-2 cm, acuminate, acumen 0.5-1 cm long, linear, discolorous; secondary veins 8-9. Inflorescence cymose with 8-10 flowers. Sepals obtuse, glabrous with 3 colleters at base; corolla white, corolla lobes ca. 1.2 cm long, reflexed along margin, rather swollen, diaphanous and yellow when dry, tube ca. 2.5 cm x 0.1 cm wide, swollen in middle, at level of stamen insertion; stamens filaments ca. 0.2 cm long; ovary conical, with distinct disc at base, style slender; style head globose with appendages as long as body. Follicles reniform, ca. 2 cm x 1 cm, red when mature; seeds black.

D i s t r i b u t i o n : Cultivated in gardens, introduced from Philippines.

S e l e c t e d s p e c i m e n s : Guyana: s.l., Bailey s.n. (MO). French Guiana: Cayenne, Broadway 317 (NY); Monjoly, Moretti 312 (CAY, P).

P h e n o l o g y : Flowers throughout the year; I have never seen fruits in French Guiana.

U s e s : Ornamental shrub, a very beautiful species when in bloom.

N o t e s : Perrottet introduced the species from the Philippines (See "Catalogue raisonné des plantes introduites dans les colonies françaises de Bourbon et de Cayenne", Paris, Lebel éd., 1824).

10. **FORSTERONIA** G.Mey., Prim. Fl. Esseq.: 133. 1818.

Type: *F. spicata* (Jacq.) G.Mey.

Syngosma Mart. ex Reichb., Consp. Regn. Veg.:134.1828. nom. nud.

Thyrsanthus Benth., J. Bot. (Hooker) 3: 245. 1841, non Schrank 1814, nec Elliot 1818.

Aptotheca Miers, Apocyn. S. Amer.: 150. 1878.

Lianas. Latex white, sticky. Stem brown, lenticellate. Leaves opposite (except *F. refracta*), upper surface with colleters at base of blades, lower surface with or without domatia (*F. adenobasis* and *F. gracilis*) along primary vein at axil of secondary veins, or with tufts of long hairs if lower surface puberulent; petiole caniculate with intrapetiolar colleters minute. Inflorescences thyriform clustered, terminal or axillary. Flowers very small, ca. 0.1 cm, aestivation dextrorse; calyx 5-lobed, ciliate, puberulent, glandless or with 1-4 glands per lobe, alternate; corolla tube very short, corolla lobes more or less puberulent with long hairs at apex; stamens inserted near base of tube, anthers usually exerted from the corolla tube, filaments curved, adherent to style head and united with it, anthers with tails obtuse, apex curved and usually pubescent; pollen 3-4 porate, smooth; disc 5-lobed, glabrous; ovary apocarpous, hairy, style very short, style head conical or fusiform, 5-ridged. Fruit of 2 follicles, apocarpous or syncarpous, cylindrical, angled or submonoliform, many seeded; seeds cylindrical, acuminate, anemochorous, with long, silky, hair tuft, 3 or 4 times longer than seed, embryo straight, cotyledons obtuse, 3 times longer than radicle.

D i s t r i b u t i o n : 46 species in tropical America.

L i t e r a t u r e : B.F. Hansen 1985, a monographic revision of *Forsteronia* (Apocynaceae). Ph.D. dissertation. Univ. of South Florida. Tampa (University Microfilms International, Ann. Arbor 1994).

KEY TO THE SPECIES

- 1 Leaves cordate 2
 Leaves cuneiform 5
- Leaves not discoloured, minutely puberulent abaxially, with 1 or 2
 colleters at base of blades 5. *F. gracilis*
 Leaves very discoloured, white pubescence abaxially 3
- 3 Sepals 0.1-0.2 cm long 11. *F. umbellata*
 Sepals 0.3 cm long 4
- 4 Inflorescence conic to subcylindric 2. *F. adenobasis*
 Inflorescence subumbellate, rounded 10. *F. schomburgkii*
- 5 Inflorescences terminal and lateral, shorter than subtending leaves..... 6
 Inflorescences terminal and lateral, equaling or surpassing subtending
 leaves 9
- 6 Leaves heavily coriaceous 3. *F. diospyrifolia*
 Leaves membranous 7
- 7 Ovary glabrous 7. *F. laurifolia*
 Ovary pubescent 8
- 8 Ovary pubescent above; anther filaments coalesced around style
 8. *F. obtusiloba*
 Ovary densely pubescent above; anther filaments free 9. *F. paraensis*
- 9 Leaves elliptic; fruit 8-15 x 0.7 cm; sepals 0.15 cm long or more 1. *F. acouci*
 Leaves lanceolate; fruit 25-50 x 0.3 cm; sepals 0.1 cm long or less 10
- Inflorescences composed of erect subglomerulate units; style head
 apices usually slightly exerted 4. *F. duckei*
 Inflorescences composed of spreading loose units; style head

apices included 6. *F. guianensis*

1. **Forsteronia acouci** (Aubl.) A.DC., Prodr. 8: 439. 1844. –*Apocynum acouci* Aubl., Hist. Pl. Guiane 1: 274; 3: pl. 107. 1775. –*Thyrsanthus acouci* (Aubl.) Miers, Apocyn. S. Amer.: 98. 1878. Type: French Guiana, Sinnamary R., Aublet s.n. (lectotype BM, designated by Hansen, isotype P-JJR 10, n. 343).

Apocynum paniculatum Lam., Encycl. 1: 214. 1783, based on illustration of Aublet, pl. 107, nom. illegit.

Thyrsanthus schomburgkii Benth., J. Bot. (Hooker) 3: 245. 1841. –*Forsteronia schomburgkii* (Benth.)Müll.Arg., in Mart., Fl. Bras. 6(1): 107. 1860. Not A.DC. 1844. Type: Guyana, Quitaro R., Rob. Schomburgk I 557 (holotype K, isotypes P, P-Baillon, NY, SING).

Forsteronia benthamiana Müll.Arg., in Mart., Fl. Bras. 6(1): 106. 1860. –*Thyrsanthus benthamianus* (Müll.Arg.) Miers, Apocyn. S. Amer.: 95, 1878. Type: Venezuela, Amazonas, San Carlos, Spruce 3481 (holotype BR, isotype P).

Forsteronia viridescens Blake, Contr. Gray Herb. 52: 80, 1917. Type: Belize, Manatee Lagoon, Peck 450 (holotype GH; isotype NY)..... – Fig. 4, 1-10.

Liana to 8 m long, 4 cm dbh; stems conspicuously lenticellate; nodal colleters 2-6 on each side of stem; bark brown, smooth. Petiole 0.3-0.7 cm long; blades membranous, obovate-elliptic, 6-9 x 3-7 cm, apex acuminate, base obtuse or rounded, shiny green above, paler green below, with numerous domatia along primary vein, at axil of secondary veins; secondary veins 7-8 pairs. Inflorescences terminal and lateral, surpassing subtending leaves, densely pubescent. Flowers puberulent, fragrant; calyx acute, 0.15-0.20 cm long, with one colleter per sepal within; corolla greenish-white, puberulent without, particularly towards apex, tube ca. 0.1 cm, hairy at insertion of stamens; filaments straight; anthers glabrous or puberulent at apex; disc equaling ovary, ovary minutely pubescent, indument longer at apex, 0.05 cm, style as long as ovary, style head cylindrical-conical, appendages

short. Follicles slender, cylindrical, 8-10 cm long, often lenticellate; seeds 1.5-2 cm, brown; hair tuft 2.8-3 cm, brown, embryo with cotyledons 2 times longer than radicle, straight.

D i s t r i b u t i o n : Mexico, Guatemala, Belize, Costa Rica, Panama, Colombia, Venezuela, Trinidad, the Guianas, Brazil, Ecuador, Peru and Bolivia. (GU: 14; SU: 15; FG: 29).

S e l e c t e d s p e c i m e n s : Guyana: Near Aishalton Hospital, Stoffers, Görstvan Rijn et al. 477 (U); Rupununi Distr., S of Kanuku Mts., Maas & Westra 4061 (NY, P, U, US). Suriname: Nickerie District, Heyde & Lindeman 91 (NY, U); Paramaribo, Samuels 439 (NY, P). French Guiana: s.l., Leprieur 379 (P); Kourou, Richard s.n. (P).

V e r n a c u l a r n a m e s : cited by Aublet and Lamarck: acouci antegri (Galibi)

P h e n o l o g y : Flowers in May and September-November.

U s e s : Incense. Decoction of leaves is drunk for relieving stomachache.

2. **Forsteronia adenobasis** Müll.Arg., *Linnaea* 30: 412. 1860.—*Thyrsanthus adenobasis* (Müll.Arg.) Miers, *Apocyn. S. Amer.*: 96. 1878. Type: Venezuela, Bolivar, Roraima, Rob. Schomburgk II 707 (holotype G, isotype NY, P) designated by Hansen. Paratype: Guyana, Pomeroon, Rich. Schomburgk 1438 (holotype B, destroyed).

Liana to 20 m long; bark brown, smooth. Stem pubescent when young; nodal colleters 2-4 on each side of stem. Petiole canaliculate ca. 1 cm; blades submembranous, oval or elliptic, very discolorous, 9-10 x 6-7 cm, with 6 large

colleters at base of primary vein on the upper surface, slightly cordate at base, without domatia, glabrous above, white pubescence abaxially, grayish; secondary veins 6-7, curved; tertiary veins quadrangular-reticulate, without domatia.

Inflorescence terminal, conic to subcylindrical, surpassing subtending leaves, many-flowered, pubescent. Flowers with petals hairy within. Corolla white, sepal 0.3-0.4 cm long. Follicles divergent at ca. 120°, 20-23 x 0.5 cm, glabrous, brown; seeds fusiform, hair tuft yellowish brown, 5 cm long.

D i s t r i b u t i o n : Venezuela and Guyana; riverine and creek forest. (GU: 4).

S e l e c t e d s p e c i m e n s : Guyana: Groete Cr., Essequibo R., FD 4732 (Fanshawe 1996) (U); Essequibo R., near Bartica, Sandwith 416 (RB, K, LE, NY, P, S, U, US).

P h e n o l o g y : Flowers in May. Fruits in February.

3. **Forsteronia diospyrifolia** Müll.Arg., *Linnaea* 30: 415. 1860.—*Thyrsanthus diospyrifolius* (Müll.Arg.) Miers, *Apocyn. S. Amer.*: 96. 1878. Type: Guyana, in savanna, Rich. Schomburgk 854. (holotype B, destroyed). Neotype designated by Hansen, Steyermark 59235 (holoneotype F 1203043, isoneotype MO).

Liana 30-40 m long. Stem stout, glabrous or minutely puberulent when young, lenticellate, gray, longitudinally striate; nodal colleters lacking. Petiole ca. 1 cm; blades coriaceous, cuneiform, 12 x 5.5 cm, glabrous above and abaxially, 6-7 domatia along primary vein, 8-9 curved secondary veins. Inflorescence terminal and lateral, shorter than subtending leaves; peduncle, pedicels, bracts and calyx minutely puberulent. Sepals acute, unequal, each with 1 colleter on inner surface; corolla white, puberulent without and within, corolla tube ca. 0.15 cm, corolla lobes ca. 0.2

cm; anthers exserted, acuminate; disc shorter than ovary; ovary minutely papillate, pubescent above, ca. 0.05 cm long, style equaling ovary; style head fusiform.

Follicles 35-40 x 1-1.5 cm, thick, woody, brown, tomentose with numerous brown lenticels, base truncate, dehiscing at maturity by 2 sutures; numerous seeds brown, ca. 1.5 cm; hair tuft brown, ca. 5.5 cm, described here.

D i s t r i b u t i o n : Venezuela and the Guianas. Known only from 7 collections. (GU: 2; SU: 1; FG: 1).

S p e c i m e n s e x a m i n e d : Guyana: Roraima, Rob. Schomburgk II 725 (BM, G-DEL., P). Suriname: Paramaribo, Stahel s.n. (U). French Guiana: Oyapock, St Marcel, Sastre 4641 (CAY, P).

P h e n o l o g y : Flowers in November. Fruits in April.

4. **Forsteronia duckei** Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 9: 962.

1926. Type: Brazil, Pará, Ducke s.n., RB 17478 (holotype RB, isotype US).

Liana. Stem glabrous, pubescent when young, lenticellate; lenticels brown, small, covering young stems; nodal colleters 2-4 on each side of stem. Petiole ca. 0.3 cm long; blades membranous, oblong to ovate-elliptic, 9-16 x 4-5 cm, apex very shortly acuminate; base obtuse, glabrous, colleters 2, inconspicuous at base of primary vein; domatia along primary vein. Inflorescences terminal and axillary, composed of erect subglomerulate units, equaling subtending leaves or 4-5 times longer; pedicels puberulent. Sepals obtuse, minutely pubescent, 0.1 cm long or less; colleters per sepal one, minute; corolla cream white, minutely pubescent except margin, scarious, corolla tube 0.08-0.1 cm long, lobes ca. 0.2 cm long, glabrous, ciliate on margin; disc shorter than ovary, ovary ovoid, ca. 0.07 cm long, pubescent. Follicles cylindrical, 35-

45 x 0.3-0.4 cm, rufous-tomentose, 2 ribbed, apex rounded; seeds brown, ca. 2 cm, hair tuft ca. 5 cm long, yellow-brown, described here.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana and Brazil; on low land, dense forest. Known only by 11 collections. (GU: 2).

S p e c i m e n s e x a m i n e d : Guyana: Shodikar Cr., Essequibo tributary, 1° 18' N., A.C. Smith 2843 (A, F, G, MO, NY, P, U, US); Kanuku Mts, in drainage of Moku-moku Cr., 150-400 m, A.C. Smith 3463 (NY, P, U).

P h e n o l o g y : Flowers in October-January. Fruits in March-April.

5. **Forsteronia gracilis** (Benth.) Müll.Arg., in Mart., Fl. Bras. 6(1): 101. 1860.

–*Thyrsanthus ? gracilis* Benth., J. Bot. (Hooker) 3: 246. 1841. Type: Guyana, Curassawaka, Rob. Schomburgk I 608 (hololectotype K, isolectotypes BM, G-DC, MO, NY, P, US, W).

– Fig. 5.

Liana to 25 m long, ca. 6 cm dbh. Stem glabrous, conspicuously lenticellate with puberulent bracts and one nodal colleter on each side. Leaves cordate, yellowish, short petiolate to sessile; petiole ca. 0.1 cm; blades oblong-elliptic, 5-11 x 3-5 cm, apex acuminate; base cordate, with 1 or 2 blackish colleters at base of primary vein, glabrous above, minutely puberulent abaxially with hairs along primary vein, without domatia. Inflorescences in very lax panicles, terminal and lateral, surpassing subtending leaves, puberulent, 10-15 cm long. Flowers minutely puberulent. Sepals triangular, not appressed to corolla, ca. 0.08 cm long, scarious, one colleter per sepal, corolla white or creamy green, corolla tube ca. 0.1 cm long, corolla lobes ca. 0.15 cm long, creamy green, minutely pubescent, hairy at tips; stamens yellowish,

glabrous except tip which is white hairy; disc pale green, shorter than ovary; ovary pubescent, ovoid, ca. 0.02 cm long, style as long as ovary, style head ca. 0.03 cm long, globose. Follicles trigonal, 24-26 x 0.4 cm, black, with ridges, moderately diverging, slender, glabrous; seeds 7-8, 2-2.5 cm long; brown hair tuft 4 cm long.

D i s t r i b u t i o n : Venezuela, Guyana, Suriname and Brazil; in rain forest. (GU: 11; SU: 7).

S e l e c t e d s p e c i m e n s : Guyana: Santa Mission, trail direction Georgetown, Görst-van Rijn et al. 438 (U); Demerara R., Jenman 6314 (NY, U). Suriname: Wilhelmina Geb., Irwin et al. 55084 (NY, U, US); 55139 (MO, NY, U, US); Table Mt., Maguire et al. 24799 (A, F, G, RB, MO, NY, P, U, US, W).

V e r n a c u l a r n a m e s : Guyana: makwariballi (Arawak).

P h e n o l o g y : Flowers in August-October. Fruits in September- October.

6. **Forsteronia guyanensis** Müll.Arg., *Linnaea*, 30: 414. 1860.—*Thyrsanthus guyanensis* (Müll.Arg.) Miers, *Apocyn. S. Amer.* 97. 1848. Lectotype designated by Hansen: Venezuela, Bolivar, Roraima, Rob. Schomburgk II 821 (holotype W, isotypes BM, F, G-DC, K, MICH, NY, P). Paratype: Guyana, Surura, Rich. Schomburgk 1466 (holotype B, destroyed, photo MO).

.....— Fig. 4, 11 - 21.

Liana at least 35 m long, woody. Trunk ca. 15 m x 3 cm dbh; bark rather smooth, cracked in small rectangles, living bark ca. 0.8 cm thick, pinkish, conspicuously lenticellate when fully mature; nodal colleters lacking. Leaves short petiolate or sessile; petiole 0.2 -0.5 cm; blades elliptic-obovate, 3-9 x 1.5-3.5 cm, shortly acuminate, base cuneate, glabrous; secondary veins 4-5 pairs. Inflorescence

thyrsiform, composed of spreading loose units, terminal, surpassing subtending leaves, pubescent. Flowers fragrant (*Syringa-like*), pubescent. Sepals densely papillate, ovate, acute, reflexed, glabrous within, with 1 colleter at base within, ca. 0.1 cm long; corolla cream-white, corolla tube 0.15-0.2 cm, pubescent within, hairy at base at level of stamens, lobes ovate-oblong, ca. 0.25 cm; stamens hairy at base and apex of connective, filaments straight; disc cylindrical, about as long as ovary; ovary ovoid, puberulent, ca. 0.06 cm long, style ca. 0.02 cm long, style head cylindrical, with involucre at middle, equaling style. Follicles slender, ca. 45-50 cm long x 0.3 cm diam., light green with rufous indument, very densely ferruginous-papillate; seeds 1-1.5 cm long, brown, hair tuft 2.8-3.2 cm, brown, embryo with cotyledons longer than radicle, straight.

D i s t r i b u t i o n : Venezuela, the Guianas and Brazil (Pará). (GU: 10; SU: 14; FG: 11).

S e l e c t e d s p e c i m e n s : Guyana: Berbice R., Maas et al. 5563 (NY, U, Z); Rupununi District, Kanuku Mts, Maas & Westra 3909 (NY, P, U). Suriname: Nickerie District, Lindeman, Görst-van Rijn et al. 551 (NY, U); Perica R., Lindeman 5323. French Guiana: Akarouany, Sagot 1067 (BM, BR, NY, P, S, U, W); Saül, Mori et al. 23152; 24191 (NY, P, U).

V e r n a c u l a r n a m e s : Guyana: makwariballi (Arawak).

P h e n o l o g y : Flowers in May, September-October and January. Fruits in February and November.

7. **Forsteronia laurifolia** (Benth.) A.DC., Prodr. 8: 438. 1844. = *Thenardia* ? *laurifolia* Benth., J. Bot. (Hooker) 2: 246. 1841. Type: (Not Guyana

as indicated by A.DC. and Woodson (Ann. Missouri Bot. Gard. 22: 179. 1935)), Brazil, Barcellos on the Rio Negro, Rob. Schomburgk I 953. (holotype K, isotypes BM, CGE, F, G-DC, MO, NY, P, US, loc. cit. by Bentham).

Note : Rich. Schomburgk wrote: An den Rändern der Oasen am Rio Branco; Blühtim Februar. Windender Strauch., Reisen Brit. Guiana: 1145. 1848. Woodson cited also Schomburgk 953, p. 159 as *F. gracilis*, with an other locality, Rupununi R., May 1843 (B, CAMB, G, G-DC, P, W).

Liana, glabrous. Young stem striated, later lenticellate; nodal colleters lacking. Petiole canaliculate, 0.5-0.7 cm long; blades membranous, elliptic, lanceolate or somewhat spatulate, 8-10 x 3-4 cm, limb recurrent on petiole, glabrous, domatia along primary vein; secondary veins, 7-8 pairs; tertiary veins prominent. Inflorescences terminal and lateral, much shorter than subtending leaves, relatively congested, 30-50 flowers. Flowers white; calyx puberulent, one colleter per lobe; corolla lobes ca. 0.2 cm long, glabrous; anthers exerted with apex glabrous; disc shorter than ovary; ovary glabrous ca. 0.05 cm long, style head fusiform, 2 appendages as long as body. Follicles slender, cylindrical, ca. 30 x 0.2 cm, obscurely articulate, apex rounded, ferruginous-tomentose; seeds brown, ca. 1 cm; hair tuft ca. 3 cm long.

D i s t r i b u t i o n : Venezuela, French Guiana and Brazil. (FG: 2).

S p e c i m e n e x a m i n e d : French Guiana: Sinnamary, piste de St Elie, Km 2, Billiet & Jadin 1118 (BR, CAY, P, U); s. loc., s. coll. n. 8, fruit (P) .

P h e n o l o g y : Flowers in September-December. Fruits in December-May

8. **Forsteronia obtusiloba** Müll.Arg., Linnaea 30: 413. 1860. Type: Venezuela, prov. Caracas, Funck & Schlim 310 (holotype G, isotypes G, P, W).

Liana, with young stems glabrous, lenticels cream; nodal colleters 2 on each side of stem. Leaves red when young; petiole 0.3-0.6 cm long; blades membranous, elliptic to ovate, 5-9 x 2.5-4 cm, 2-4 colleters at base of primary vein on upper surface, 6 domatia along primary vein on lower surface. Inflorescence terminal, mostly shorter than subtending leaves, many-flowered, glabrous to puberulent. Flowers puberulent, scented with jasmine-like odour. Sepals ciliate, 4-6 per lobes; corolla white, corolla tube glabrous outside, densely pubescent at throat within, corolla lobes glabrous; anthers exserted, dorsally glabrous; ovary pubescent above ca. 0.05 cm long, style 1/5 as long as ovary, style head 0.15 cm long. Follicles initially divergent at ca. 180°, incurved in 1/2 circle, cylindrical, 16-30 x 0.5-0.6 cm, ferruginous-tomentose, apex rounded, described here.

D i s t r i b u t i o n : Venezuela, Guyana and Suriname. (GU: 2; SU: 1).

S p e c i m e n s e x a m i n e d : Guyana: Rupununi R. Monkey Pond landing, South West of Makarapan, 3° 53' N, 58° 55' W, Maas et al. 7331 (CAY, P, U); Rupununi Distr., Kanuku Mts, Jansen-Jacobs 3406 (P, U). Suriname: Lely Mts., South West plateaux covered by ferrobauxite, Lindeman, Stoffers et al. 768 (NY, U).

P h e n o l o g y : Flowers in July.

9. **Forsteronia paraensis** B.F. Hansen, Ph.D. diss. Univ. South Florida, Tampa, 1985. Type: Brazil, Pará, Prance & Pennington 1258 (holotype NY, isotypes B, F, GH, S, U, US).

Liana. Young stems glabrous, becoming lenticellate, nodal colleters 4-6 on each side of stem. Petiole 0.4-0.7 cm long; blades coriaceous, elliptic, 8-15 x 3-7 cm, base acute, acuminate, upper and lower surfaces glabrous, colleters 1 on each side at

base of primary vein on upper surface, with domatia along primary vein.

Inflorescence terminal and lateral, shorter than leaves, densely thyriform, many-flowered, 2-8 x 1-3 cm, sessile. Flowers sessile. Sepals scarious, 0.1-0.15 cm long, without colletar at base; corolla white or cream, tube ca. 0.05 x 0.15 cm at throat, subcampanulate, glabrous without, puberulent at throat within; anthers included, glabrous, 0.15 cm long, lobes erect, glabrous, 2-3 x ca. 0.1 cm; ovary densely pubescent above; anther filament free. Fruit unknown.

D i s t r i b u t i o n : Guyana, Suriname and Brazil. 4 collections studied. (GU: 1; SU: 1).

S p e c i m e n s e x a m i n e d : Guyana: Cuyuni-Mazaruni Reg. Essequibo R., 6-8 km downstream of Omai, 5° 26'N, 58° 42' W, 10 m, Gillespie 1555 (P, US).

Suriname: Camp 3 ca. 18 km South West of the Kayser Airstrip, SSW of Paramaribo, Mori & Bolten 8596 (NY, Z).

P h e n o l o g y : Flowers in November.

10. **Forsteronia schomburgkii** A.DC., Prodr. 8: 438. 1844. –*Thenardia?*
corymbosa Benth., J. Bot. (Hooker) 3: 246. 1841.–*Thyrsanthus corymbiferus* (Benth.) Miers, Apocyn. S. Amer. 98. 1878. –*Forsteronia corymbifera* (Benth.) Sandwith, Kew Bull. 1939: 16, 1939. Type: Guyana, Rob. Schomburgk I 277 (holotype K, isotype P). Not (Benth.) Müll.Arg. = *Forsteronia acouci*, syn. nov.

Forsteronia sandwithiana Woodson, Ann. Missouri Bot. Gard. 22: 209. 1935. Type: Guyana, Morabill Cr., near Bartica, Sandwith 334 (holotype NY, isotypes K, RB, U).

Liana, 1 cm dbh; young stems pubescent, becoming glabrate, lenticellate. Leaves very discolorous, white pubescent abaxially; petiole pubescent, ca. 1 cm long; blades

membranous, elliptic, 6-12 x 2.5-6 cm, acuminate, base subcordate, rugose, colleters 1 on each side of primary vein, domatia if present obscured by axillary tufts; secondary veins 5-6 pairs, arched, angled at 45° to primary vein, reticulate. Inflorescence terminal, subumbellate, rounded, peduncles ca. 0.2 cm. Flowers puberulous. Sepals lanceolate, ca. 0.3 cm long, ciliate, scarious; corolla greenish white, corolla tube ca. 0.4 cm long, corolla lobes ca. 0.1 cm; anthers wholly exerted, dorsally pilose. Follicles 4-angled, 14-20 cm long, 0.3-0.5 cm large, divergent at 130-150°, glabrous, green when young; seeds glabrous, 1.3-1.5 x 0.2 cm; hair tuft brown, 3-4 cm long.

D i s t r i b u t i o n : Endemic in Guyana. 11 collections studied.

S e l e c t e d s p e c i m e n s : Guyana: Kaieteur Pl., Maguire & Fanshawe 23254 (NY, P, U, US); Mazaruni station, FD 6970 (Fanshawe 3406) (P, S, U). Moraballi Cr. near Bartica, Sandwith 334 (K, NY, MO); Potaro R., Amatuk, (Sandwith 1514) (P, U).

V e r n a c u l a r n a m e s : Guyana: makwariballi (Arawak).

P h e n o l o g y : Flowers in September-December. Fruits in December-May.

11. **Forsteronia umbellata** (Aubl.) Woodson, Ann. Missouri Bot. Gard. 22: 208, 1935.—*Apocynum umbellatum* Aubl., Hist. Pl. Guiane 1: 276-277; 3: pl. 108. 1775.—*Thenardia umbellata* (Aubl.) Spreng., Syst. 1: 636. 1825. Type: French Guiana, Ile de Cayenne, Loyola. Aublet in P-JJR 10, n. 343.

Forsteronia schomburgkii var *umbellata* A.DC., Prodr. 8: 438. 1844. Based on illustration of Aublet, pl.108.

Thyrsanthus aubletianus Miers, Apocyn. S. Amer.: 98. 1878. Based on illustration of Aublet, pl.108.

Forsteronia macrophylla Müll.Arg., Linnaea 30: 411. 1860.—*Thyrsanthus macrophyllus*
(Müll.Arg.)

Miers, Apocyn. S. Amer.: 96. 1878. Type: French Guiana, Cayenne, s. coll. (Le Blond?),
(holotype
G-DC).

Liana to 20 m long; bark brown, smooth. Stem minutely ferruginous when young, becoming glabrate and conspicuously lenticellate. Leaves very discolorous, white pubescent abaxially; petiole 0.8-1 cm long; blades coriaceous, 5-10.5 x 2.8-7 cm, apex very abruptly and shortly acuminate, lower surface very tomentose, grayish especially on veins, 2-3 colleters at base of primary vein abaxially. Inflorescence terminal, pyramidal-thyrsiform. Sepals ovate, 0.1-0.2 cm, acute, densely puberulent without except on margin; colleters minute; corolla purple, corolla tube ca. 0.1 cm long, lobes ca. 0.3 cm long, hairy without (except on margin) and within; anthers barbellate at tips; disc green pale; ovary ovoid, ca. 0.07 cm long, hirtellous. Follicles subcylindrical, divaricate, glabrous, lenticellate; seed unknown.

D i s t r i b u t i o n : French Guiana and Brazil; in riverine forest. (FG: 3).

S p e c i m e n s e x a m i n e d : French Guiana, Cayenne, Le Blond 477 (P);
Camopi R., Oldeman & Sastre 229 (CAY, NY, P).

P h e n o l o g y : Flowers in October-January. Fruits in February.

11. **GALACTOPHORA** Woodson, Ann. Missouri Bot. Gard. 19: 49. 1932.

Type: *G. crassifolia* (Müll.Arg.) Woodson.

Subshrubs or suffrutescent herbs, erect. Latex usually translucent, rarely white.
Stems opposite, many colleters on each side of stems. Leaves opposite, sessile

with glandular hairs, black-punctate abaxially. Inflorescences terminal, scorpioidally corymbose or racemose, bracteate, few-flowered; calyx 5-lobed, foliaceous, bearing within several to many colleters; corolla infundibuliform, large, showy, often with glandular hairs, tube with lower part below stamens cylindrical and upper part conical, lobes aestivation dextrorse, enlarged towards left; stamens adherent to style head; disc 5-lobed, coalescent to ovary, ovary apocarpous, each carpel with many ovules, style slender, style head pentagonal, fusiform. Fruit of 2 follicles, terete, acuminate, dehiscent along ventral suture, with glandular hairs; seeds brown, glabrous, truncate with apical hair tuft, anemochorous.

D i s t r i b u t i o n : 7 species from Colombia, Venezuela, Guyana and Brazil, 1 of which occur in the Guianas.

1. **Galactophora schomburgkiana** Woodson, Ann. Missouri Bot. Gard. 19: 50. 1932. Type: Guyana, Schomburgk s.n. (holotype K, photo MO, NY).

.....
 – Fig. 6.

Subshrub up to 2.5 m high. Stem glandular, stout, puberulent when young, becoming glabrate. Leaves sessile; petiole rose-red, 0.1-0.2 cm long; blades subcoriaceous, 4-7 x 3-5 cm, deep green, shining above, pale green, black-punctate below, with rose-red primary veins. Inflorescence subumbellate, 3-5-flowered; pedicels dull red. Calyx puberulent, with glandular hairs, red with yellow-green lobes, 0.5-0.6 cm long; corolla puberulent, creamy yellow to red, greenish within, maroon-red without on tube and lobe margins, lower tube 2-3 x 0.2 cm, upper tube 3-3.5 cm long, 0.8-1 cm diam. at throat, lobes ca. 1 x 1.2 cm. Follicles not separate at base, 12-14 cm x 0.4 cm, puberulent, stout, dark red; seeds ca. 0.6 cm long; hair tuft brown 1.5-2 cm long.

D i s t r i b u t i o n : Colombia, Venezuela and Guyana. (GU: 2).

S p e c i m e n s e x a m i n e d : Guyana: Cuyuni-Mazaruni, from Wanach Cr. 7 km W of Holitipu, summit to Holitipu camp, ± 1 km S of summit, $5^{\circ} 57' N$, $61^{\circ} 3' W$, 100 to 1150m, high savanna and forested ravines, McDowell & Gopaul 3015 (CAY, P, US); Pakaraima Mts., Aymatoi Mt., 1150m, $5^{\circ} 55' N$, $61^{\circ} W$, Maas, 5825 (U).

P h e n o l o g y : Flowers and fruits in May.

12. **GEISSOSPERMUM** Allemào, Pl. Novas Brasil. 707. 1846.

Type: *G. vellosii* Allemào, Diss., 1845.

Small to medium sized trees up to 30 m. Trunk channeled; young stem terete, glabrous or pubescent, plagiotropic. Latex very bitter. Leaves alternate, glabrous or densely sericeous or silvery abaxially. Inflorescences axillary, few or many-flowered. Flowers pubescent. Sepals 5, subtended by 2 or 3 bracts, dark-red within; corolla aestivation dextrorse, greenish or cream-colored, lobes 5, pubescent, reflexed or spreading, tube glabrous inside, except under stamens, with 5 suprastaminal slits; stamens inserted near throat, subsessile, free from style head; pollen 2-4-colporate, with prominent ridges; disc absent; ovary apocarpous, pubescent; style head simple, ovate. Fruit of 2 indehiscent follicles (or 1 by abortion) glabrous or tomentose, fleshy; seeds disciform, without wing, orbicular, ovate, endozoochorous, cotyledons cordate or ovate, albuminous, with straight radicle.

D i s t r i b u t i o n : 5 species from Colombia, Venezuela, Guyana, Brazil and Peru.

KEY TO THE SPECIES

- 1 Leaves glabrous abaxially, except when young..... 2. *G. laeve*
 Leaves densely tomentose abaxially 2
- 2 Leaves more than 5 cm long, ovate; pubescence silvery; bud obtuse,
 cylindrical; sepals acute 1. *G. argenteum*
- 2 Leaves less than 5 cm long, elliptic; pubescence cream-colored; bud acute,
 angled; sepals obtuse 3. *G. sericeum*

1. **Geissospermum argenteum** Woodson, in A.C.Sm., Pl. British Guiana:
 207. 1939. Type: Guyana, Kuyuwini R., A.C. Smith 2559 (holotype MO,
 isotype U). Paratype: Essequibo R., A.C. Smith 2825 (P, U).

.....
 – Fig. 7, 1-10.

Tree 20-30 m high, 40-50 cm dbh, with aerial roots and simple steep plank buttresses. Trunk cylindrical, channeled; outer bark smooth with papery flakes, dark reddish brown, longitudinally fissured; latex transparent in trunk, white in stems and fruits. Young stem tomentose. Petiole 0.6-0.7 cm long; blades ovate, 13-16 x 5-6.5 cm, base attenuate on petiole, long acuminate-mucronate, pale green above, shiny with shiny silvery pubescence abaxially; secondary veins curved towards margin. Inflorescence few-flowered. Corolla with yellowish-brown indument without; bud obtuse. Sepals ca. 0.2 cm long, acute, densely tomentose without; corolla tube not angled, cylindrical, 0.4-0.5 cm long, corolla lobes 0.1-0.2 cm long. Follicles ellipsoid, ca. 4 x 2.5 cm, tomentose, brown, with abundant milky latex; seeds ca. 2 x 1 cm, cotyledons ovate, as long as radicle, 0.5 cm each.

D i s t r i b u t i o n : The Guianas. (GU: 4; SU: 2; FG: 21).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo R., 1° 30' N, Blackwater Cr., A.C. Smith 2825 (P, U); Essequibo R., 250 m, Jansen-Jacobs et al. 1847 (CAY, P,

U). Suriname: French Guiana: Bassin du Haut-Marouini, de Granville et al. 9361 (CAY, P); Saül, Plateau de la Douane, Moretti 891 (CAY, P) (photos: fruit and seed).

V e r n a c u l a r n a m e s : Suriname: marisoba (Wapisiana), uataki (Waiwai); bergibita. French Guiana: bita oudou, maria congo (Créole).

P h e n o l o g y : Flowers in September-December. Fruits in March.

U s e s : The bark is boiled down to make a sirup-like liquid, considered as an effective remedy for malaria. See Grenand et al. (1987:124). Fruit eaten by animals (peccaries and monkeys)

2. **Geissospermum laeve** (Thunb.) Miers, Apocyn. S. Amer.: 83, pl. 12. 1878.
 –*Echites laevis* Thunb., Diss. Ech.: 4. 1819.–*Tabernaemontana laevis*
 Vell., Fl. Flum.: 105. pl. 18. 1827. Lectotype : Thunberg 6149. (microfiche P)
 designated here.

Geissospermum vellosii Allemáo, Pl. Novas Brasil, tab. 7., 1846. Type: tab. 7.

Illustration: Baill., Hist. Pl. 10: 155. 1888. – Fig. 7, 11-15.

Tree 25-30 m high, 15-100 cm in dbh; bark light brown; latex white in black stem. Young stem tomentose sericeous. Petiole ca. 1 cm, black; blades membranous, narrowly elliptic, 13-15 x 4-5 cm, margin undulate, apex acuminate to mucronate, base attenuate, asymmetric, glabrous abaxially except when young; secondary veins 5-6, arcuate, forming an angle of ca. 80° with primary vein. Inflorescence few-flowered. Sepals 0.4 cm long, not adpressed on corolla; corolla tube 0.9-1 cm long, corolla lobes 0.4-0.5 cm long. Follicle to 10-15 x 4.5-5 cm, green, with brown indument, becoming glabrous, hard when young, soft when mature; seeds ca. 3 x 1.5 cm, cotyledons cordiform, white, radicle shorter than cotyledons.

D i s t r i b u t i o n : The Guianas and Brazil; not-flooded moist forest. (GU: 1; SU: 3; FG: 28).

S e l e c t e d s p e c i m e n s : Guyana: Gillespie 1499. Suriname: Sauvain 133; Stahel 1272. French Guiana: Saül, layon Belvédère, 1 km après le plateau de la Douane, gros fruit charnu en alcool (photos fruit, seeds & embryo in Allorge & Poupat, 1991, pl. V), Moretti 887 (CAY, P). Along the road to Belizon, between Eaux Claires and Grand Boeuf Mort, ca. 250 m, Mori & Pepper 24259 (CAY, NY, P).

V e r n a c u l a r n a m e s : Guyana: manyok-inaballi (Arawak). Suriname: bergibita (Sranan).

P h e n o l o g y : Flowers in August. Fruits in January.

U s e s : Tonic and febrifuge plant. See Grenand et al. (1987:126).

3. ***Geissospermum sericeum*** Sagot ex Benth. & Hook.f., Gen. Pl. 22 : 707, 1876 (holotype BM, isotype P).

Geissospermum fuscum Markgr., Novedades de Apocynaceae, Acta Bot. Venez. 13: 353. 1978.

Type: Venezuela, Amazonas, Río Sipapo, Blanco 1195 (holotype VEN).

Tree 18-30 m high, 50 cm dbh. Trunk irregularly fenestrate; bark furrowed, detached by plaque, whitish, very bitter, thin; wood yellow. Stem pubescent, yellowish. Petiole 0.8-1 cm long; blades elliptic to ovate, 7-10 x 2.5-3 cm, pubescence cream-colored, acuminate, base asymmetric, cuneate, whitish to yellowish-brown below, sericeous on both faces when young, becoming glabrous and shiny above; secondary veins 7-8 pairs, somewhat arcuate towards margin, forming an angle of ca. 60° with primary

vein. Inflorescence cymose, many-flowered, densely pubescent. Flowers whitish within; bud acute, angled. Sepals obtuse, straight, ca. 0.2 cm long, densely pubescent without, sparsely pubescent within and dark-red; corolla tube 0.6-0.7 cm long, corolla lobes 0.2-0.3 cm long, with silky brown indument without. Fruit not seen.

D i s t r i b u t i o n : Venezuela, the Guianas and Brazil. (GU: 1; SU: 3; FG: 15).

S e l e c t e d s p e c i m e n s : Guyana: Marudi Mts, 2° 15' N-59° 10' W, Stoffers 322. Suriname: Nat. Res. Brownsberg, LBB 14640 (P, U, Z); Boschreserve, Brownsberg 1272 (U, Z). French Guiana: Bassin du Maroni, Lawa, 3° 50' N, 54° 12' W, Fleury 198 (CAY, P). Station des Nouragues, 4° 3' N, 52° 42' W, Sabatier 3504 (CAY, P, NY, U).

V e r n a c u l a r n a m e s : Guyana: manyokinaballi (Arawak). Suriname: bergibita bita-oedoe (Sranan). French Guiana: bita oudou (Boni), ouataki (Wayana); maria congo (Taki-taki).

P h e n o l o g y : Flowers in May-September.

U s e s : Bark very bitter. With rum, the bark is much used as a medicine for malaria by all the local peoples, Indians and others.

13. **HIMATANTHUS**² Willd. ex Schult. in Roem. & Schult., Syst. Veg. 5: 221, 1819.

Type: *H. rigida* Willd. ex Schult.

² By M.M. PLUMEL † (P).

Trees or shrubs. Latex white. Trunk round; secondary xylem thick; pith rather thick becoming hollow; epidermis with spirally arranged leaf scars. Leaves congested at top of branches, alternate, sessile or petiolate, without colleters at base of the blade. Inflorescences terminal, usually regularly thyrsoïd, secondary peduncles alternate and usually somewhat distant; bracts large, persistent until anthesis, petaloid or foliaceous, enclosing a pair of flowers and a bud, bearing numerous small, persistent colleters at base, which produce pectinaceous secretion. Flowers often fragrant, bud creamy white; calyx irregularly developed, often obsolete, or of 1-5 acute or lanceolate lobes, these very unequal, distinct almost to receptacle, not imbricate, without colleters; corolla white with yellowish central spot, salverform from straight or slightly flexuous tube, lacking internal appendices, 5-lobed, dextrorse, sometimes finely ciliate; anthers entirely fertile, without basal appendages, filaments short, inserted shortly above base of tube; pollen tricolporate; disc lacking; ovary partially inferior, style columnar, style head cylindrical, body covered by with a fine rim of papillae, with 2 free appendages at apex, ovules numerous, in rows on axile placenta that becomes corky and deciduous in fruit. Fruit of 2 follicles, fusiform, straight or incurved, somewhat compressed at apex, ventrally dehiscent; seeds numerous, dry, flat, surrounded by a membranous wing, anemochorous.

D i s t r i b u t i o n : 13 species in Panama and Tropical South America, 7 have been collected in the Guianas; the species are heliophilous.

L i t e r a t u r e : Pichon, Mém. Mus. Natl. Hist. Nat. 27: 209-209.1948; Plumel, C. R. Soc. Biogéogr. 66 (3) : 103-127. 1990.

KEY TO THE SPECIES

- 1 Leaves sessile or subsessile, petiole < 0.5 cm 5. *H. obovatus*
 Leaves clearly petiolate 2
- 2 Secondary veins straight for their entire length, reaching the margin 3

	Secondary veins curved towards margin.....	4
3	Sepals developed, acute or lanceolate	6. <i>H. speciosus</i>
	Sepals sometimes one, very small, barely visible	2. <i>H. bracteatus</i>
4	Tertiary veins forming lax network not apparent on upper surface	
	of leaf	7. <i>H. sucuuba</i>
	Tertiary veins forming dense, dendroid network quite apparent on	
	upper surface of leaf	5
5	Leaves obovate	3. <i>H. drasticus</i>
	Leaves oblong	6
6	Leaves obtuse at apex	4. <i>H. fallax</i>
	Leaves acute at apex, weakly acuminate	1. <i>H. articulatus</i>

1. **Himatanthus articulatus** (Vahl) Woodson, Ann. Missouri Bot. Gard. 25: 189.1937.—*Plumeria articulata* Vahl, Eclog. Amer. 2: 50. 1798. Type: Suriname, von Rohr s. n. (holotype C, isotype C).— Fig. 8.

Himatanthus rigida Willd. ex Schult. in Roem. & Schult., Syst. Veg. 5 : 121. 1819. Type: Brazil, Hoffmannsegg s. n. (holotype B, destroyed).

Plumeria microcalyx Standl., Publ. Field Columbian Mus., Bot. Ser. 4: 254.1929. Type: Panama, Cooper G. 642, (holotype F, isotype K).

Slender tree up to 22 m high x 0.3 m dbh; stems round, fleshy, sparingly leafy towards tips; bark of trunk ashy gray. Petiole thick, 2.5-3.5 cm long, 1/7 length of blades; blades subcoriaceous, oblong; apex acute to rectangular, shortly and obtusely acuminate, base rounded to cuneate, often drying verrucose, glabrous, shiny dark brown above, lighter abaxially; secondary veins 12-15, forming an angle of ca. 70° with primary vein, straight at base then curved, joined in regularly sinuous submarginal vein; tertiary veins forming dense, dendroid network, in evident relief on both surfaces of mature leaf when dry. Inflorescence of fasciculate spikes, branches

terminal, often paired, sometimes 3 or 4, simple, 8-12 cm long, flexuous, articulate; articles 0.6-0.8 cm long, somewhat broadened at upper margin, glabrous; bracts 1.2-1.5 cm long, keeled, acute. Flowers fragrant. Sepals 5, unequal, ovate to oblanceolate, acute; corolla lobes elliptic, finely veined, 1.5-2.5 cm long, somewhat overlapping at base, finely short-ciliate, tube shorter than lobes, ca. 1 cm long; supracorollary indument present; anthers acute; style clavate, slightly swollen at apex, style head measuring ca. 2/5 height of style. Follicles weakly incurved, cylindrical at middle, 20-30 cm long, with prominent lateral ribs; testa granular, embryo flat, oval, slightly convex, radicle straight.

D i s t r i b u t i o n : Neotropical, between 5° lat. N et 5°lat. S; Colombia, Venezuela, the Guianas and Brazil (mainly Pará, Amapá, Roraima); in tropical rain forest on sandy and rich soil. 160 collections studied of which 76 from the Guianas. (GU: 20; SU:16; FG: 40).

S e l e c t e d s p e c i m e n s : Guyana: Rupununi basin, Yapucari, A.C. Smith 2273 (K, NY, P, U); Rupununi, near Toroebaroe Cr., Jansen-Jacobs et al. 1128 (CAY, P, U). Suriname: Grote Zwiebelzwamp, Lanjouw et Lindeman 1126 (K, NY, U); Saramacca R., Stahel (Wood Herb.) 329 (CAY, K, NY). French Guiana: Haut Oyapock, Trois Sauts, Grenand 516 (CAY, P); île de Cayenne, route de Rochambeau, Oldeman B-619 (CAY, P, NY) .

V e r n a c u l a r n a m e s : Guyana: mabwa, hill mabua (Arawak), maboewa, sabana-ortri, weti-mapa. Suriname: savanna bolletrie, hoogland merkioedoc, sow taproepa, maboewa (konokodikoro), watra-pau (Sranan). French Guiana: bois lait, balata sauvage, bois chenille, franchipanier, melekeneu (Wayampi), ana (Galibi), bois de lait de banc de sable, balata blanc (Créole).

P h e n o l o g y : Flowers in October-March. Fruits in June-November.

U s e s : The wood is light and used for general construction. The latex has been used as a vermifuge; it is used in popular medicine especially as an anti-inflammatory and healing agent in the treatment of gastric ulcers. Ground trunk bark is used in poultices for the treatment of contusions and fractures.

2. **Himatanthus bracteatus** (A.DC.) Woodson, Ann. Missouri Bot. Gard. 25: 189. 1937.—*Plumeria bracteata* A.DC., Prodr. 8: 394. 1844. Type: Brazil, Bahia, Blanchet 13, 1840 (holotype G, isotype P).

.....
 – Plates 10-11(fr.).

Plumeria revoluta Huber, Bull. Soc. Bot. Genève II 6: 200. 1915. Type: Brazil, Ducke 8039 (holotype RB, photo US).

Tree up to 12 m. Petiole short, thick; blades drying, firmly coriaceous, oblong-obovate, spatulate, margin subrevolute, not very shiny; apex rounded, sometimes truncate, mucronate or slightly emarginate, base acute, rapidly narrowing to petiole; secondary veins ca. 16, prominent, straight, perpendicular or somewhat inclined, joined in strong, straight or slightly sinuous marginal vein; marginal vein impressed above in drying. Inflorescence a many-flowered cyme, its branches fleshy, articulated; bracts 2-2.5 cm long, mucronate. Flowers fragrant; calyx sessile, entire or slightly undulate, usually with a single acute sepal developed, a second barely visible; corolla lobes thick, obovate, spatulate, 3-3.5 cm long, tube a little shorter, 2.5-3 cm long; supstaminal and infrastaminal indument present; anthers obtuse; style finely pilose, style head appendages measuring about 1/4 of total length. Follicles cylindro-conical, ending in a flattened point, ca. 17 x 3 cm, green drying blackish, embryo with straight radicle.

D i s t r i b u t i o n : Neotropical : mainly in Amazonas, Colombia, Venezuela, the Guianas, Brazil and Peru; in primary forest, or in varzea forest on sandy soil or clayey sandy soil. 76 collections studied of which 38 from the Guianas. (GU: 27; SU: 6; FG: 5).

S e l e c t e d s p e c i m e n s : Guyana: Kaieteur plateau, Maguire & Fanshawe 23199 (RB, K, NY); Moraballi Cr., near Bartica, Sandwith 398 (RB, K, NY, U).
Suriname: near Brownsweg, Lanjouw 1252 (K, U); Brownsweg BW 6956 (U). French Guiana: road of Saint Laurent to Paul Isnard, Cremers 8152 (BR, CAY, P, U); road from Cayenne, km 8.5, Service Forestier 7529 (CAY, NY, P, U).

V e r n a c u l a r n a m e s : Guyana: mabwa (Arawak), mapa (Paramacca), hubudiballi (Wallaba) = wild cashew, wild frangipani, maubaw, mabwa, maboa, sucuuba. Suriname: buara bolletrie. French Guiana: mapa (Paramacca).

P h e n o l o g y : Flowers in July-October in the Guianas, later in Amazonas. Fruits in October and February-May.

U s e s : The wood is soft and can hardly be used for anything but light construction.

3. **Himatanthus drasticus** (Mart.) Plumel, Bradea 5: 18. 1991.—*Plumeria* *drastica* Mart. in Spix & Mart., Reise Bras. 2 : 547. 1828. Type: Brazil, Caetite, Martius, s.n. (holotype M, isotype F).

Tree up to 7 m high, densely leafy at end of stems. Petiole ca. 1 cm long; blades subcoriaceous, obovate, apex rounded to obtuse, sometimes somewhat apiculate, base rounded to obtuse; shining, glabrous, dark green above, lighter abaxially; secondary veins 15-19, straight to slightly flexuous, forming an angle of 75-80° with primary vein, joined in slightly sinuous submarginal vein; tertiary veins forming a

dense, dendroid network, in distinct relief on both leaf surfaces when dry.

Inflorescence cymose, simple to trichasial; bracts shortly ovate, 1.2-1.5 cm long.

Flowers sweetly fragrant; calyx of 5 unequal lobes, these ovate to lanceolate, 0.1-0.4 cm; corolla tube 1-1.5 cm long, lobes a little longer, broadly spreading, oblong, finely veined, slightly revolute, somewhat overlapping at base; suprastaminal indument reduced; anthers acute; style constricted at base; style head measuring about 1/3 length of style, appendages sometimes separate at tip. Follicles 15-20 x ca. 2.5 cm, slightly curved, cylindrical in middle, flattened and acute at end, smooth, with fine longitudinal striations, one of which is more prominent on each side, greenish drying blackish brown, after dehiscence leaving flattened shell with a pergamentaceous, light brown inner wall and retaining elongate, suberous, reddish brown placenta; seeds sometimes pointed at apex, ca. 2-3 cm long, testa with a granular mesh, embryo flat, oval, ca. 0.9 x 1.6 cm, radicle straight.

D i s t r i b u t i o n : The Guianas and Brazil, along the Atlantic coast and bordering inland areas to Bahia; on sandy or clayey sandy soils. 131 collections studied of which 14 of the Guianas. (GU: 8; SU: 5; FG: 1).

S e l e c t e d s p e c i m e n s : Guyana: Orinduik, Davis 721 (BRG, K, NY); Rupununi, Bij Lethem, Lanjouw & van Donselaar 862 (U). Suriname: Tumuc Humac, Sipaliwini sup., Rombouts 322 (U); Sipaliwini R., savanna area, Oldenburger et al. 228 (K, NY, U). French Guiana: R. Comté, Leprieur s.n., 1838 (P); Mt. Rorota, île de Cayenne, Bordenave 289 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: frangipani, caterpillar tree.

P h e n o l o g y : Flowers in November-May. Fruits in February, August and October.

U s e s : In popular medicine, more or less the same use as *H. articulatus*.

4. **Himatanthus fallax** (Müll.Arg.) Plumel, Bradea 5: 26. 1991.—*Plumeria fallax* Müll.Arg. in Mart., Fl. Bras. 6(1): 38. 1860. Type: Brazil, Santarem, Spruce 231 (holotype G).

Erect shrub 4-5 m high, leafy at end of stems. Petiole 1.5 to 2.5 cm long; blades subcoriaceous, oblong; apex obtuse; base obtuse, glabrous, shiny; secondary veins ca. 18, almost straight near primary vein, abruptly curved near margin, joined in sinuous marginal vein; tertiary veins forming dense, dendroid network, in distinct relief on both leaf surfaces when dry. Inflorescence a simple or dichasial cyme; peduncle elongate, nearly equaling leaves; bracts rather small. Flowers fragrant; sepals of central flowers somewhat unequal, ovate to ovate-lanceolate, 1/5-1/3 length of pedicels, those of lateral flowers small, ovate, almost equal; corolla lobes elliptic, longer than tube, tube 1.2-1.5 cm long; anthers acute; style constricted at base, style head appendages nearly 1/2 length of body. Follicles 15-20 x ca. 2.5 cm, cylindrical in middle, flattened and acute at end, smooth, white fine longitudinal striations, one of which is more prominent on each face; seeds 2-3 cm long, sometimes pointed at apex, testa granular, embryo central flat, ovate, radicle straight.

D i s t r i b u t i o n : Grows in dry forest, distributed inland between the Atlantic restinga and the moist Amazonian forest; on clayey sandy soils. 44 collections studied, of which 12 from the Guianas (GU:1; SU:7; FG: 4).

S e l e c t e d s p e c i m e n s : Guyana: Rupununi, Cook 182 (K, NY, U). Suriname: Palaïme R., Sipalawini, Wessels Boer 774 (NY, U); Zanderij 1, Stahel (Wood Herb.) 200 (K, NY). French Guiana: chemin des Hattes, village Galibi, embouchure de la Mana, Sastre & Moretti 4151 (CAY, P); 25 km W-NW of Mana, Raynal-Roques 19897 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: ana'a, ana'u (Carib-Indian), djoe bolletri (Bushman). Suriname: mabua (Arawak).

P h e n o l o g y : Flowers in November-March. Fruits in August and October.

U s e s : The latex is used in popular medicine for the treatment of gastro-intestinal problems.

5. **Himatanthus obovatus** (Müll.Arg.) Woodson, Ann. Missouri Bot. Gard. 25 : 201. 1937.—*Plumeria obovata* Müll.Arg. in Mart., Fl. Bras. 6(1): 40. 1860.
Type: Brazil, Minas Gerais, Lagoa Santa, Riedel 1082 (holotype G, isotype P).

Plumeria warmingii Müll.Arg. ex Warming in Vid. Meddel. Naturhist. Foren. Kjöbenhavn: 99. 1869. Type: Brazil, Amaro Leite, Weddel 2508 (holotype G, isotype P).

Shrub 4-6 m high, densely leafy at tips of stems; bark grayish, very corky, furrowed at base of trunk; stems thick, somewhat fleshy. Leaves sessile or subsessile; petiole 0.1-0.5 cm long, thick; blades firmly membranous, broadly obovate to oblong-obovate, apex round to obtuse, sometimes truncate and slightly mucronate, base rounded and sometimes subcordate, cuneate in young leaves, dark green above, lighter green abaxially; secondary veins 14-18, somewhat sinuous, forming an angle of ca. 60° with primary vein, recurved at end and joining in sinuous marginal vein; tertiary veins lax, inconspicuous. Inflorescence a cyme overtopping leaves with alternate, almost dichotomous spikes, its internodes not very crowded; bracts ovate, acuminate, calyx of unequal sepals, with the largest acute-lanceolate, 0.8-1 cm, the second triangular, ca. 0.1 cm and the third 0.025 cm long and others absent or obsolete; corolla lobes oblong, spatulate, veined, slightly fleshy, nearly twice length of tube, tube with suprastaminal and infrastaminal indument; filaments thick, anthers with acute apex; style head measuring about 1/4 of style length. Follicles divergent at

ca. 180°, cylindro-conical, ending in short flattened point, with fine longitudinal striations on sides, ventrally dehiscent; seeds with testa granular, 1.7 x 0.8 cm, embryo flat, radicle slightly inclined.

D i s t r i b u t i o n : Brazil mainly in Minas Gerais; on dry savanna (cerrado); only 1 collection in Guyana.

S p e c i m e n e x a m i n e d : Guyana: Rupununi, foothills of NW Kanuku Mts, near Moco-Moco village, Maas & Westra 3890 (U).

V e r n a c u l a r n a m e s : sucubinha, pau de leite (Brazil).

P h e n o l o g y : Flowers in November-February in central Brazil and Guyana

U s e s : in traditional medicine the bark of the root is used as a febrifuge, cathartic, emetic and the latex is diluted with water in the treatment of stomach ulcers.

6. **Himatanthus speciosus** (Müll.Arg.) Plumel, Bradea 5: 73. 1991.

–*Plumeria speciosa* Müll.Arg. in Mart., Fl. Bras. 6(1) : 36. 1860. Type:

Lhostsky J. 4392 (holotype B, destroyed, photo- F, MO). Neotype: Allorge

& Rombold 335, (holotype P, isotypes CAY, NY). – Plate 9.

Tree up to 20 m high with cylindrical trunk to 15 cm dbh. Petiole strong, short.

Juvenile leaves subcoriaceous, obovate-elliptic, to 45 cm long; apex acute, scarcely acuminate, base acute, gradually narrowing towards petiole; secondary veins 16-22, straight, prominent, forming an angle of ca. 80° with primary vein; marginal vein nearly straight. Inflorescence a long-peduncled cyme with reduced leaves, branched, subpaniculate; bracts 2-2.5 cm long, acuminate, carinate at base, greenish white drying rusty brown. Flowers 7-8 cm long, fragrant. Sepals well-developed, unequal in

central flowers, clearly separate, longest linear-lanceolate, mucronate, sometimes equaling length of pedicel, others ovate-lanceolate to obtuse, often poorly developed; sepals of lateral flowers even more reduced; corolla pure white, corolla tube ca. 2.5 cm long, lobes elliptic-oblong, ca. 4.5 cm, indument suprastaminal; anthers with obtuse apex; style constricted at base, widening towards joined appendages, nearly half length of body. Fruit unknown.

D i s t r i b u t i o n : French Guiana and Brazil; tropical rain forest on terra firma, on sandy or granitic soil. 4 collections studied, 3 of which from French Guiana.

S p e c i m e n s e x a m i n e d : French Guiana: Saül, Mts. La Fumée, Mori et al. 18592; 23792 (CAY, NY, P).

P h e n o l o g y : Flowers in August.

7. **Himatanthus sucuuba** (Spruce ex Müll.Arg.) Woodson in Ann. MissouriBot. Gard. 25: 189. 1937.—*Plumeria sucuuba* Spruce ex Müll.Arg. in Mart., Fl. Bras. 6(1): 40. 1860. Type: Brazil, Manaus, Spruce 1848 (holotype K, isotype P).

Tree up to 30 m high; crown rounded. Trunk cylindrical, to 0.5 m dbh. Petiole fine, flexible, 4-7 cm long, 1/5-1/4 length of blades; blades membranous, delicate, oblong to elliptic-oblong, apex rounded, base obtuse to rounded; secondary veins 12-15, curved, brochidodromous, slightly undulating, joined at margin and forming triangular areas; tertiary veins lax, not apparent on upper surface of leaf; veins and lower surface of leaf drying reddish brown. Inflorescence a compact cyme, rather few-flowered, with short articles; bracts oval, 1-1.5 cm long. Sepals very unequal in terminal flowers, three sepals small and triangular-ovate, fourth larger, ovate-lanceolate, fifth yet larger, long-acuminate, 1/3 length of pedicel; in lateral flowers

sepals almost equal, shortly ovate, obtuse to acute, recurved; corolla tube short, thick, 1-1.5 cm long, lobes obovate, 1.5 times as long as tube, veined; anthers acute; style head as long as style and appendages. Follicles cylindro-conical, slightly curved, flattened at end, longitudinally striate on sides, striations little prominent; seeds broadly winged, ca. 4-5 cm, embryo flat, ca. 1.5 x 1 cm, radicle inclined.

D i s t r i b u t i o n : Panama, Venezuela, the Guianas, Brazil (Amazonas, Pará, Rondônia, Mato Grosso), Peru and Bolivia; in tropical rain forest on terra firma, on sandy or clayey sandy soil. 164 collections studied of which only 4 from the Guianas (GU: 2; SU: 1; FG: 1).

S e l e c t e d s p e c i m e n s : Guyana: Mazaruni station, Tutin 73 (BM, K, RB, U); Christianburg, Demerara River, Ward 8626 (K); Suriname: on 4-Gebroeders Mts, Oldenburger et al. 212 (U). French Guiana: Haut Maroni, île d'Antecume Pata, Moretti 357 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: wild rubber, maboali. French Guiana: lapalapa (Wayana).

P h e n o l o g y : Flowers in September-March. Fruits in May and November.

U s e s : The wood is not very dense and is only suitable for light construction or making boxes. In popular medicine, the bark of the trunk is used as a febrifuge, a remedy for rheumatism, and in plasters for healing wounds and fractures. The latex is used in the same manner as that of *H. drasticus*, diluted with water in the treatment of stomach ulcers, gastritis and intestinal ailments.

C h e m i s t r y : The lactone, fulvoplulierine, was isolated and evaluated for anticancer activity (Perdue G.P. & R.N. Blomster, Journ. Pharm. Sciences 67 (9): 1322. 1978).

14. **KOPSIA** Blume, Catalogus 12. 1823 (nom. cons.), non Dum. 1822

(Orobanch.). Type: *K. arborea* Blume

Small or large shrubs, or big trees. Latex white. Leaves opposite, rather thin with secretory gland at apex of acumen on abaxial face. Bracts ovate, persistent with gland at apex. Inflorescence in short terminal racemes or cymes. Calyx 5-lobed, each sepals with gland at apex, colleters absent within; corolla 5-lobed, white cream or pink, salverform, tube slender, slightly dilated around stamens, lobes overlapping to right; stamens inserted at base of upper part of tube, anthers included above style head, fertile throughout, free from each other and from style head; pollen 3-colporate, smooth; disc of 2 nectaries often longer than ovary, alternate; ovary apocarpous, ovules 1 or 2 in each carpel, style filiform, style head thick surmounted by 2 short pubescent appendages. Fruit indehiscent, obovoid or obliquely 3- or 4-sided dry, flattened drupe; pericarp coriaceous, endocarp woody; seeds one per drupe, oblong, ex-albuminous, hydrochorous.

D i s t r i b u t i o n : 29 species in Indo-Malaya and China.

L i t e r a t u r e : Fallen, M., Floral structure in the Apocynaceae. Bot. Jahrb. Syst. 106 (2): 254, 1986; Sévenet, T., Allorge, L. & al., A preliminary chemotaxonomic review of *Kopsia* (Apocynaceae). J. Ethnopharm. 41: 147-183, 1994.

KEY TO THE SPECIES

- 1 Tree 8-10 m high; corolla white; fruit ovoid, purple black 1. *K. arborea*
 Shrub 2-3m high; corolla pink with mouth red-violet; fruit urn-shaped,
 brown purple 2. *K. fruticosa*

1. **Kopsia arborea** Blume, Catalogus: 12. 1823. Type: Java, Mt. Salak, Blume s.n. (holotype L, isotypes NY, P).

K. longiflora Merr., Publ. Bur. Sci. Govt. Lab. 29 : 47. 1905. Type : Philippines, Merrill 12155, (holotype PNH, destroyed 1945, isotype L).

K. laxinervia Merr., Philipp. J.. Sci. Bot.13 : 55 (1918). Type : Philippines, Luzon, Fénix (B.S. 28232) (holotype PNH, destroyed, isotype P), (y. fr.).

K. pruniformis Reich.f. & Zoll. ex Bakh. f., Blumea 6 : 391 (1950). Type : Java, Rogodjampi Zollinger 3832, (holotype NY).

Tree 8-10 m high, branched near base; bark gray, almost smooth. Stems cylindrical, flattened at last internode; module composed of 1-4 pairs of isophyllous leaves. Leaves grouped at twig ends,; petiole ca. 1 cm long; blades coriaceous, 10-11 x 4.5-5 cm, acuminate, green shiny above, dull abaxially; secondary veins 10-11, hardly distinct on both sides, cuneiform and decurrent for about half petiole. Inflorescence many-flowered, borne on thick peduncle 5-9 cm long. Flowers fragrant; corolla white with very light yellow throat, tube ca. 2 x 0.1 cm, inflated at throat and at stamen level, 3- or 5-lobed, ca. 1.3 x 0.4 cm. Fruit generally simple by abortion, purple black, ca. 2.5 x 1 cm, ovoid, slightly asymmetric at base; pulp very reduced and tasteless; seed with cotyledons oblong.

D i s t r i b u t i o n : Cultivated in gardens, native of Java.

S e l e c t e d s p e c i m e n s : French Guiana: Centre ORSTOM de Cayenne, cult., Prévost 167, 25. 1.1978 (fl & fr.) (CAY, P); id., Leeuwenberg 11690, 1. 2. 1978 (CAY, P, WAG).

2. ***Kopsia fruticosa*** (Ker Gawl.) A.DC. Prodr. 8: 352. 1844. = *Cerbera fruticosa* Ker Gawl., Bot. Reg., t. 391. 1819. Type: Herb. Poiret in Moquin Tandon (holotype P).= Plate 23.

Kopsia vinciflora Blume, Bijdr. 1030. 1826; Type: Java, Blume s.n. (holotype P, isotype NY).

Calpicarpum roxburgii G.Don, Gen. Hist. 4: 100. 1838. Type not seen.

Tabernaemontana rosea Tenore, Cat. Orto Bot. Napoli: 97. 1845. Type: Italy, cult. Tenore s.n., (holotype NAP).

Shrub, evergreen, 2-3 m high. Stem very slender, cylindrical; branchlets smooth, pale brown. Petiole 0.8 cm long; blades thinly coriaceous, 15-18 x 6-8 cm, undulate, apex linear, acuminate, ca. 1.5 cm long, glandular, base attenuate, shiny above, pale abaxially; primary vein prominent abaxially; secondary veins 10-14, curving at margin; tertiary veins distinct. Inflorescence of compact cymes, few-flowered, many bracted; bracts ciliate like sepals, minutely pubescent, without colleters at base, ca. 0.3 cm long; corolla tube slender, dilated at level of stamens, 2.4-2.6 cm long, glabrous except at throat on conspicuously thickened and glandular annulus; lobes obliquely obovate, obtuse, 0.9-1.2 cm long, pink with mouth red-violet; nectaries approximately equaling ovary, ovary glabrous, subglobose, each carpel uniovulated, ca. 0.5 cm long, style ca. 2 cm long, hypogynous. Fruit of 2 (or 1) drupes, these urceolate, flattened, brown-purple, more or less trigonal, villous, dehiscent on ventral margin; seed oblong-lanceolate, testa membranous, cotyledons large, lanceolate, radicle short.

D i s t r i b u t i o n : Cultivated in gardens, native of Burma (Duss 559, Martinique, indicates: cultivated in Botanical Garden of St Pierre, from where it was widely distributed, 1835, P). Seen in garden at Cayenne but no collected.

P h e n o l o g y : Flowers throughout the year.

15. **LACMELLEA** H. Karst., *Linnaea* 28: 449. 1857. *Zschokkea* Müll.Arg. in Mart.,

Fl. Bras. 6(1): 20. 1860. Type: *L. edulis* H. Karst.

Shrubs or trees 2-20 m high, with black bark, often spiny. Latex white, sweet, abundant. Stem often spiny, opposite, glabrous, plagiotropic. Leaves opposite, entire, petiolate; secondary veins rather close together. Inflorescences cymose, one in each axil; peduncle present. Sepals green, persistent after fall of corolla; corolla tubular to hypocrateriform, lobes overlapping to left, white or yellowish, short, about 1/7 length of tube (except *L. panamensis*), tube widened at base and at insertion of stamens; anthers included above style head, fertile throughout, free from style head with 2 parietal placentae; ovary syncarpous, unilocular, glabrous, subglobose, style and style head persistent after fall of corolla and development of fruit with 2 appendages as long as body. Fruit a spherical berry, apiculate, yellow or orange at maturity, with few (sometimes one) oval, yellow to brown; seeds, endozoochorous.

D i s t r i b u t i o n : About 22 species in tropical America.

U s e s : Used instead of milk in tea or coffee.

L i t e r a t u r e : Monachino, J., 1944, A revision of *Lacmellea* and the transfer of *Zschokkea* (Apocynaceae). *Lloydia* 7: 275- 302.

KEY TO THE SPECIES

- | | | |
|---|--|-------------------------|
| 1 | Corolla tube ca. 1.5 cm; corolla lobes glabrous | 2 |
| | Corolla tube ca. > 1.5 cm; corolla lobes pubescent | 3 |
| 2 | Corolla lobes ciliate | 4. <i>L. utilis</i> |
| | Corolla lobes eciliate | 3. <i>L. guyanensis</i> |

- 3 Sepals minutely pubescent outside, ciliate 1. *L. aculeata*
 Sepals glabrous, eciliate..... 2. *L. floribunda*

1. **Lacmellea aculeata** (Ducke) Monach., Lloydia 7: 292. 1944.—*Zschokkea aculeata* Ducke, Arch. Jard. Bot. Rio de Janeiro 3: 240. 1922. Type: Brazil, Pará, Belém, Huber 1290 (lectotype RB) not seen, compared at material cited by Monachino: Ducke 17456 (P).— Plate 17, fig. 9.

Shrub or tree up to 20 m high. Trunk to 40 cm dbh, covered with broad-based, caducous spines ca. 2 cm long; bark black; latex thick, potable. Petiole 0.5-0.9 cm long with colleters at base when young; blades subcoriaceous, 12-20 x 4-8 cm, acuminate, dull on both surfaces, dark green above, dull green below. Inflorescence with ascending stems, 3-7-flowered; bracts opposite; peduncle very short. Flowers odorless; calyx ca. 0.3 cm long. Sepals minutely pubescent outside, ciliate; corolla hypocrateriform, curved, creamy white to pale yellow with age, inside of lobes yellow or pale orange; tube ca. 3.5 cm long, lobes obtuse, ca. 0.6 cm long. Fruit a berry, ovoid, small, 1.5-1.7 x ca. 1 cm, with persistent style ca. 0.5 cm long, glabrous, orange when mature, pericarp ruminant, pulp sweet, yellow, thin, edible; seeds 1 or 2, brown.

D i s t r i b u t i o n : Venezuela, the Guianas and Brazil (Amapá, Pará, Roraima, Maranhão); in tall forest or riverine forest. 106 collections studied from the Guianas. (GU:6; SU:2; FG:96).

S e l e c t e d s p e c i m e n s : Guyana: Potaro-Siparuni Reg., Kaieteur falls, Hahn et al. 4755 (P, US); Essequibo, Watuwau Cr., Henkel et al. 4785 (P, US). Suriname: Lucie R., Irwin et al. 55457; 55764 (U, US). French Guiana: Mts. Bellevue, Inini, de Granville et al. 7473 (B, BR, CAY, G, MG, MO, P, U); Approuague R., Oldeman 2384 (CAY, P, NY, U) .

V e r n a c u l a r n a m e s : Guyana: awaratalla. Suriname: pritiari, boeboeraballi (Arawak), blaka pritiari (Sranan), maka mapa (Paramacca). French Guiana: mpoukou mambaye (Saramacca), baaka mapa (black mapa) (Bushman), tapeleyuwa (Wayampi), ten (Palikur).

P h e n o l o g y : Flowers in July-October. Fruits reported in March, May and August.

U s e s : Flowers open at night. Pollination by hummingbirds. Latex and fruits edible. Bark used in infusion for the treatment of colds; latex in decoction for fevers. See Grenand et al.(1987: 127).

2. **Lacmellea floribunda** (Poeppig) Benth. in Benth. & Hook., Gen. Pl. 2(2): 694. 1876.—*Hancornia floribunda* Poeppig, Nov. Gen 3: 70, pl. 279, 1845.—*Zschokkea floribunda* (Poeppig) Müll.Arg., Mart., Fl. Bras. 6(1): 23. 1860. Type: Brazil, Amazonas, Poeppig 2723, (holotype G, isotypes F, P).

Tree 9-12 m high, 10-12 cm dbh; spines on trunk. Petiole 0.5-0.9 cm long, with numerous colleters at base; blades subcoriaceous, elliptic, 14-15 x 3-7.5 cm, acuminate, cuneate at base; secondary veins 11-12 pairs, 0.5-0.7 cm apart, near middle. Pedicels subtended by 2 scarious bracts ca. 2 cm long. Sepals glabrous, ca. 0.2 cm long, eciliate; corolla cream, curved, tube ca. 3 cm long, inserted ca. 0.06 cm below throat, glabrous, lobes obtuse, 0.2-0.3 cm long, minutely pubescent outside and inside. Fruit a berry, globose, 1.5 cm in diam., green yellow at maturity, pericarp ruminant with style persistent, ca. 0.5 cm long; seeds 1-2, with reddish-brown testa.

D i s t r i b u t i o n : Suriname, Brazil and Peru; in mountains. (SU: 2).

S p e c i m e n s e x a m i n e d : Suriname: Tafelberg (Table Mt.), Maguire 24557a (NY, P); Coppename R., Maguire 24848 (NY, P).

3. **Lacmellea guyanensis** (Müll.Arg.) Monach., Lloydia 7: 295. 1944.

–*Zschokkea guyanensis* Müll.Arg., Linnaea 30: 391. 1860. Type : French Guiana, Poiteau s.n. (holotype LEN) not seen.

Lacmellea aculeata (Ducke) Monach. var. *surinamensis* Monach. Type: Guyana, Forest Reserve 4393 (holotype NY, isotype U) syn. nov.

Tree up to 10 m high; bark black; branchlets thin, glabrous, flattened when young. Petiole 0.1-0.4 cm long; blades coriaceous, elliptic, ca. 12 x 3-4 cm, margins recurved, acuminate, upper surface shining, dark green; secondary veins 9-11, 0.6-0.8 cm apart, near middle. Inflorescence lax; peduncle ca. 2 cm long; bracts 3-5. Sepals ca. 0.2-0.4 x 0.27 cm, ciliate, corolla white, tube ca. 1.5 cm long, lobes glabrous, eciliate; ovary oblong-ovoid, acute. Fruit unknown.

D i s t r i b u t i o n : Guianas; in secondary forest, often in riverine forest. (GU: 1; SU: 1; FG: 2).

S p e c i m e n s e x a m i n e d : Suriname: Forest Zanderij, Samuels 528 (P). French Guiana: Maroni, Wachenheim 223 (U); Nouveau chantier, Benoist 1321 (P).

P h e n o l o g y : Flowers in July.

4. **Lacmellea utilis** (Arn.) Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 15: 625. 1941.–*Tabernaemontana utilis* Arn., Edinburgh New Philos. J. 8: 318. 1830.–*Zschokkea utilis* (Arn.) Hemsley, Hooker's Icon. Pl. 27: pl.

2637. 1900.—*Lacmellea utilis* (Arn.) Monach., *Lloydia* 7: 293. 1944 [1945]. comb. superfl. Type: Guyana, James Smith s.n., not seen.

Tabernaemontana montana Oken, *Allg. Naturgesch.* 3 (2): 1039. 1841, not seen.

Tree 8-10 m high, spineless; latex copious, very sticky. Petiole 0.8-1.2 cm long; blades 6-8 x 1.6-3 cm, acuminate, base cuneate, glossy, veins not conspicuous on upper surface, lower surface with minute black dots. Inflorescence with about 15 flowers in fascicles, sessile; calyx subtended by 2 bracts, ca. 0.1-0.15 cm long, ciliate at margin; corolla straight, creamy-white, tube ca. 1-1.5 cm long, ca. 0.3 cm below throat, yellowish-green, lobes erect, ca. 0.1 cm long, ciliate at margin. Fruit a berry, globose, glossy, yellowish when ripe, pericarp smooth with minute dots.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana and Brazil (Pará, Amazonas, Roraima); in swamp forest or open forest on granite outcrops, ca. 600m. (GU: 4).

S p e c i m e n s e x a m i n e d : Guyana: Essequibo R. near sea-level, Sandwith 413 (NY, P, U, US); Demerara R., Jenman 4275 (NY, US).

V e r n a c u l a r n a m e s : Guyana: hya-hya, haiahaia, cow tree (English).

P h e n o l o g y : Flowers in September. Fruits in May.

U s e s : Fruit edible, very flavorful, used to prepare fruit juices and desserts. Latex used as a milk substitute in tea and coffee.

16. **LAXOPLUMERIA** Markgr., *Notizbl. Bot. Gart. Berlin-Dahlem* 9: 981. 1926

Type: *L. tessmannii* Markgr. (Illustr.: Azambuja, *Arqu. Serv. Flor.* pl. 11, 1947).

Trees. Leaves alternate, petiolate, penniveined, membranous or coriaceous, glabrous or pubescent. Inflorescences terminal, many-flowered; bracts and calyx minute, without colleter; corolla lobes linear, overlapping to left; stamens inserted in upper part of cylindrical part of corolla tube; anthers completely fertile, free from style head; ovary apocarpous, with 2 small nectaries alternating with carpels, ovules numerous; style head globose, appendages as long as body. Fruits of 2 follicles, long and slender; seeds surrounded by long hairs, anemochorous.

D i s t r i b u t i o n : About 3 species in tropical America, 1 in the Guianas.

1. **Laxoplumeria baehniiana** Monach., *Phytologia* 3: 67. 1949. Type: Brazil, Rio Jurua, Froes 21694, (holotype NY); paratype: Brazil, Acre, Rio Purus, Krukoff 5720 (photocopie fr., MO)– Fig. 10.

Tree, branches dark brown with elongate lenticels when young, becoming light brown. Leaves decreasing in size towards inflorescence, strongly discolourous; blades 13-15 x 4-5 cm, extending to base of petiole where still discernible as a lighter band, glabrous,; secondary veins 11-12 pairs, forming an angle of 90° with primary vein, somewhat arcuate, hardly visible at margin. Inflorescence much-branched. Sepals ca. 0.1 cm long, with scarious margins; corolla white, with tube cylindrical, widened at insertion of stamens, glabrous, lobes longer than tube; anthers lanceolate; disc adnate to ovary, with 2 lobes; ovary glabrous, longer than style, style head spherical ca. 0.1 cm long, with 2 long apical appendages, with annulus at base. Follicles 30-40 cm x ca. 0.2 cm at maturity, glabrous; seeds 10-12, 3 x 0.4 cm, surrounded by long brown hairs.

D i s t r i b u t i o n : Originally described from Brazil; now known only in French Guiana. (FG: 4).

S p e c i m e n s e x a m i n e d : French Guiana: Saül, La Fumée W, Mori & Pipoly 15537 (CAY, P, NY); Mori & al. 20933 (CAY, NY); road St Laurent to Paul Isnard, Cremers 8149 (BR, CAY, P); Maroni, Pompidou-Papaïchton, Sastre 6491 (CAY, P).

P h e n o l o g y : Flowers in April. Fruits in September-December.

17. **MACOUBEA** Aubl., Hist. Pl. Guiane 2, suppl.: 17. t. 378. 1775.

Type: *M. guianensis* Aubl.

Trees 10-35 m high. Latex white. Sympodial module comprising 5-6 pairs of isomorphic chlorophyllous leaves, upper leaves subtending 2 young stems, and 2 leaves or scale-leaves subtending 2 inflorescences and a terminal inflorescence. Stem and branches cylindrical with numerous colleters persistent at base of petioles. Leaves opposite; tertiary veins obscure. Inflorescences 1-3, many-flowered cymes; flowers fragrant. Sepals obtuse with 5-6 colleters at base within; corolla white, with lobes not dilated towards right, aestivation sinistrorse, tube swollen at level of stamens; stamens inserted at base, in suprastaminal slits or in simple recess of corolla, anthers lanceolate with sterile divergent tails; pollen 2-3-colporate, smooth, perforate; ovary pubescent, truncate at apex, apocarpous, style head almost sessile comprised of a horizontal involucre, a pentagonal body and 2 long terminal appendages. Fruit of one (by abortion) or 2 globose follicles-like, sometimes hemisyncarpous, with numerous arillate seeds; aril colorless, sometimes edible; seeds convex with small cavities on raphae side, compressed on hilar side with a long hilum, endozoochorous.

D i s t r i b u t i o n : 3 species from Costa Rica, Panama, Venezuela, Brazil and Peru, 1 in the Guianas.

L i t e r a t u r e : Boiteau, P., L. Allorge & C. Sastre. 1978. Morphologie florale des Apocynaceae: 2. Caractères distinctifs entre Ambelanieae (Plumerioideae) et Macoubeae (Tabernaemontanoideae). *Adansonia sér. 2*, 18: 267-277.

1. **Macoubea guianensis** Aubl., *Hist. Pl. Guiane* 2, suppl.: 18-19. pl. 378. ...1775.
Type: French Guiana, Forêt de Kaw, fr. February, Aublet s.n. (holotype-BM).

Tabernaemontana aubletii Pulle, *Recueil Trav. Bot. Néerl.* 9: 157. pl.3. 1912, nom illeg.

Tabernaemontana macrophylla Poir. in *Lam. Encycl.* 5: 276. 1817. Type: French Guiana, Poiret (holotype P).

Merizadenia amplifolia Miers, *Apocyn. S. Amer.* 79. 1878, nom illeg.

Tabernaemontana paucifolia Spruce ex Müll.Arg., in *Mart., Fl. Bras.* 6 (1): 87. 1860. –*Rhigospira paucifolia* (Spruce ex Müll.Arg.) Miers, *Apocyn. S. Amer.* 69. 1878. –*Macoubea paucifolia* (Spruce ex Müll.Arg.) Markgr. ex L.I. Williams, *Field Mus. Nat. Hist., Bot. Ser.* 15: 422, 1936. –*Macoubea sprucei* var. *paucifolia* (Spruce ex Müll.Arg.) Monach., *Lloydia* 8: 299. 1945 [1946]. Type: Brazil, Amazonas, Panuré, Spruce 2564 (holotype BM).

Rhigospira sinuosa Miers, *Apocyn. S. Amer.* 70. 1878. –*Macoubea sinuosa* (Miers) Markgr., *Notizbl. Bot. Gart. Berlin-Dahlem* 14: 178. 1938. Type: Brazil, Amazonas, Rio Negro, Spruce 3693 (holotype BM).

Parahancornia tabernaemontana Woodson, *Bull. Torrey Bot. Club* 75: 556. 1948. Type: Suriname, Maguire 24719 (holotype NY, isotype U). – Plate 1, 1(fl.), 2(fr.).

Tree 15-30 m high. Trunk spotted with gray; bark brown, wood yellow; sympodial module comprising 3-4 pairs of chlorophyllous leaves, 2 stage-stems, then again a pair of smaller and chlorophyllous leaves subtending 2 inflorescences or one by abortion, and to 1 terminal inflorescence. Petiole 2-3 cm long, base swollen into involucre with 14-16 colleters; blades elliptic to orbicular, 10-20 x 8-10 cm, obtuse at apex, more or less pubescent; secondary veins 12-14 on each side of primary vein, 1-1.5 cm apart. Inflorescence borne on peduncle up to 8 cm long, ca. 40-flowered. Flower with calyx and peduncle pubescent. Sepals ciliate with 7-8 colleters

at base within; corolla lobes glabrous, longer than tube, tube 0.4-0.5 cm long with suprastaminal indument; ovary globose, style 0.002 cm long, style head with horizontal involucre almost as wide as ovary. Fruit usually with only one indehiscent follicle, globular, 8-10 cm diam., with more or less conspicuous protuberance near peduncle corresponding to ovary shoulder; seeds brown, ca. 40, 1.5 cm long, with diaphanous aril.

D i s t r i b u t i o n : Venezuela, the Guianas and Brazil. (GU: 6; SU: 21; FG: 50).

S e l e c t e d s p e c i m e n s : Guyana: Kanuku Mts, 1500', FD 5942 (Wilson-Browne 543) (NY, U); Kopinang R., Altson 460 (NY). Suriname: Zanderij I, Stahel, (Wood Herb.) 183 (NY, GH, U); Brokopondo, van Donselaar 3841 (GH). French Guiana: Saül, Mts. La Fumée, 200-400m, Mori & Boom 14929 (CAY, NY, P); île de Cayenne, Matoury, Fouqué 29G (CAY).

V e r n a c u l a r n a m e s : Guyana: rokoroko (Arawak). Suriname: mapa, sokosoko, sokosoko mapa (Sranan). French Guiana: ka'iankan nî (Wayampi), tawatoum'moï (Wayana); pequéa; yapukait; serva; folha grande; uarma-gogo; gogode guariba; pitia de leite; jarabe huaco; pu-o'-ho-ko (Kubeo).

P h e n o l o g y : Flowers in September. Fruits in February.

U s e s : Fruits eaten by humans and monkeys; also used, when dry, as musical instrument.

C h e m i s t r y : Barks contains a curarising alkaloid: macoubeine (Freise F.W., Pharm. Zeitung 81: 818. 1936. L.A. Anderson, N.G. Bisset, J.D. Phillipson & J.L. Zarucchi, J. Ethnopharm. 14: 187-192. 1985: The authors also studied seeds, collected by Zarucchi, n. 2498, in Colombia; they found 2 alkaloids: (+) vincadiformine and (-) vincadine). The seeds of *M. guianensis* collected by Sastre &

Moretti 3885, in French Guiana have also yielded: (+) vincadiformine and (-) vincadine. (A. Husson, C. Moretti & H.-P. Husson, *Caldasia* 15: 365. 1986).

18. **MACROPHARYNX** Rusby, Mem. New York Bot. Gard. 7: 327. pl.6. 1927.

Type: *M. spectabilis* (Stadelm.) Woodson

Lianas, woody. Latex white or clear. Stem twining, opposite, many colleters present at nodes. Leaves opposite, base cordate, without colleters at base of blade on upper surface; petioles with colleters in axils. Inflorescences racemose, axillary, opposite with numerous filiform and lacerate bracts, pubescent. Sepals 5-13, lacinate or not; greenish white; corolla salverform or infundibuliform; lobes overlapping to right, anthers sagittate, with 2 sterile basal appendages, adnate to style head; nectaries 5, white, as long as or shorter than ovary; ovary apocarpous; style filiform, style head fusiform with basal collar. Fruit of 2 follicles, dehiscent along ventral suture, concrescent at base and apex when young, with numerous comose seeds, anemochorous .

D i s t r i b u t i o n : 5 species in Costa Rica to Colombia, Venezuela, the Guianas, Brazil, Ecuador, Peru, Bolivia and North Argentina, 1 of which occur in the Guianas.

L i t e r a t u r e : Morales J.F., 1997. A synopsis of the genus *Macropharynx* (Apocynaceae). *Rhodora* 99: 58-68.

1. **Macropharynx spectabilis** (Stadelm.) Woodson, Ann. Miss. Bot. Gard. 18: 552. 1931. *Fieldiana* 28: 500. 1953.—*Echites spectabilis* Stadelm., *Flora* 24(1), Beibl. 1-80 : 44. 1840.—*Elytropus spectabilis* (Stadelm.) Miers, *Apocyn. S. Amer.*: 116. 1878. Type: Brazil, Rio Negro, Stadelm. (Herb. and types unknown, Stafleu & Cowan, 1985). Lectotype: Brazil, Amazonas, Martius s.n.

(hololectotype M, isolectotype B, destroyed, photo F, INB, MO, NY, US ex M). – Fig. 11.

Macropharynx fistulosa Rusby, Mem. N. Y. Bot. Gard. 7: 329. pl. 6. 1927. Type: Bolivia, Rurrenabaque, 30 Jan. 1922, White 3260 (holotype NY, isotype MG).

Macropharynx strigillosa Woodson, Fieldiana Bot. 28: 499, 1953. Type: Brazil, Pará, Belem, 20 Oct. 1942, Archer 7770 (holotype MO, isotype US).

High-climbing liana, up to 10 m high; latex white. Stem and petiole covered with ferruginous tomentum; nodes with numerous bracts densely hirsute, internodes up to 10 cm long. Petiole 2 cm long; blades coriaceous, 6-14 x 4-8 cm, margin revolute, deep green and shining above with sulcate veins, pale green below with primary vein prominent, secondary veins 7-10 pairs also covered with ferruginous tomentum; apex acute or obtuse, base cordate. Inflorescence of axillary, simple, many-flowered, racemes, groups of 5-7 flowers appearing whorled; bracts linear, pale green, ca. 0.05 cm long, densely hirsute outside, glabrous inside with a solitary episepalous colleter inside, entire or minutely erose or denticulate. Flowers fragrant, pendent; calyx linear, corolla infundibuliform, tube pale yellow, cylindrical part of tube 0.05 cm long, upper part 1 cm long, lobes white, ca. 1.1 x 0.5 cm; anthers shortly pubescent in middle, disc as long as ovary; ovary pale green, subglobose, ca. 0.15 cm long. Fruit cylindrical, 20-25 x 1.5 cm, green, covered with brown tomentum; seeds 2.5 cm long, hair tuft ca. 6 cm, pale brown.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana, French Guiana, Brazil (Rondonia, Pará), Ecuador, Peru and Bolivia. (GU: 6; FG: 2).

S e l e c t e d s p e c i m e n s : Guyana: Demerara R. FD 3932 (Fanshawe 1196) (NY, U); Essequibo R., FD 4035 (Fanshawe 1299) (NY, U); . French Guiana: Maroni, Mélinon 132 (P), 323 (P, U); haut Oyapock, Sastre 4575 (CAY, P).

Phenology : Flowers in May-June. Fruits in October-February.

MALOUETIA A.DC., Prodr. 8: 378. 1844.

Type: *M. tamaquarina* (Aubl.) A.DC.

Robbia A.DC., Prodr. 8: 444. 1844.

Shrubs or small trees 2-12 m high. Latex white, sticky. Branchlets slender, glabrous, glossy reddish brown and flattened towards nodes in younger parts, becoming gray and lenticellate with age. Leaves opposite, upper surface without colleters, lower surface paler and with conspicuous, lenticular domatia in axils of primary and secondary veins (except *M.gracillis*). Inflorescences terminal or lateral, umbelliform, few- to several-flowered; calyx 5-lobed, bearing within 5 alternate, solitary or rarely geminate colleters; corolla 5-lobed, glabrous or puberulent, salverform, white or yellowish, dextrorsely convolute, throat usually constricted by 5 coronal scales and anthers apices generally exerted; stamens adherent to style head (except *M.gracilis*), completely exerted, sagittate, adnate to style head, often puberulent on abaxial side; disc 5-lobed; ovary apocarpous, often puberulent, style surmounted by fusiform style head with 2 very short apical appendages. Fruit of 2 follicles or one by abortion, more or less diverging, glabrous, fusiform, dehiscent along ventral suture, containing 6-10 seeds; seeds dry, ecomose, testa glabrous or lanate, convex on raphae side, hilar surface sulcate, anemo- or hydrochorous, embryo straight with cotyledons ovate.

Distribution : Africa and America: Amazonian Brazil and the Guianas in flooded and non-flooded lowlands.

KEY TO THE SPECIES

- 1 Stamens included 2. *M. gracilis*

	Stamens exserted	2
2	Leaves pubescent abaxially	4. <i>M. pubescens</i>
	Leaves glabrous abaxially	3
3	Sepals linear-lanceolate	1. <i>M. flavescens</i>
	Sepals ovate to lanceolate	4
4	Follicles divergent at ca. 180°, 7-13 cm long	3. <i>M. guianensis</i>
	Follicles divergent at ca. 30°, 30-35 cm long	5. <i>M. tamaquarina</i>

1. **Malouetia flavescens** (Willd. ex Roem. & Schult.) Müll.Arg. in Mart., Fl. Bras. 6(1): 95. 1860.—*Tabernaemontana flavescens* Willd. ex Roem. & Schult., Syst. Veg. 4: 798. 1819. Type: Brazil, Pará, Hoffmannsegg s.n. (holotype B, not seen).

Malouetia schomburgki Müll.Arg., Linnaea 30: 409. 1860. Type: Guyana, Pomeroun, Rich. Schomburgk I 386 (B). Paratype: Rob. Schomburgk II 830, (holotype G-BOIS., isotype P).

Malouetia cubana A.DC, Prodr. 8: 379. 1844. Type: Cuba, de la Ossa s.n. (holotype G).

Malouetia retroflexa Müll.Arg., Linnaea 30: 408. 1860. Type: St Vincent, in Herb. Mart. (holotype K, isotype MO).

Malouetia mexiae Woodson, Ann. Missouri Bot. Gard. 22: 246. 1935. Type: Brazil, Pará, Mexia 5994 (holotype MO).

Shrub or small tree 2-8 m high, 20 cm dbh. Stem slender, glabrous, reddish brown. Leaves membranous to thinly leathery, glabrous abaxially, oblong, 7-11 x 2.5-4 cm, acuminate or subacuminate, base obtuse; secondary veins 8-9, spaced ca. 1 cm apart, arched; tertiary veins reticulate; domatia in axil veins on lower surface. Inflorescences sessile, cymose, 5-6-flowered; pedicels 2.5-3 cm long, slender. Sepals linear-lanceolate, often rolled up, 0.3-0.4 cm long; corolla tube ca. 0.7 cm, flask-form, corolla lobes 0.9-1.2 cm long, white with greenish tinge, reflexed, longer than tube, densely hirsute with white hairs near base on upper surface; stamens

exserted, minutely pubescent dorsally; disc equaling ovary. Fruit of 2 follicles, terete, 16-36 x 0.3-0.4 cm, falcate, glabrous; seeds 2.5-4 cm long, glabrous.

D i s t r i b u t i o n : Colombia, Guyana, Brazil and Peru; riversides. (GU: 4).

S p e c i m e n s e x a m i n e d : Guyana: s.l.; Barima-Waini, Upper Sebai R., 8 km up R. from Sebai village, Hoffman et al. 636 (P, US); Baramani Cr., Waini R., NW, FD 5072 (Fanshawe 2336) (US).

U s e s : This species is extremely poisonous and used as a dart or arrow poison.

2. **Malouetia gracilis** (Benth.) A.DC, Prodr. 8: 380. 1844. –*Tabernaemontana*

gracilis Benth., J. Bot. (Hooker) 3: 244. 1841. Type: Guyana, upper

Essequibo

R., 1836, Rob. Schomburgk I 39. (holotype B destroyed, isotypes K, P, photo US).

Shrub 1-1.5 m high forming a dense bush 5 m dbh; latex abundant. Stem cylindrical. Leaves subcoriaceous, elliptic, lanceolate, 5-7 x 2.5-3 cm., margin recurved, acuminate, obtuse at base, without domatia in vein axils on lower surface.

Inflorescence terminal or axillary, in 3-4 most distal nodes, sessile. Sepals ciliate, acute, ca. 0.15 cm long, glabrous, light green, corolla tube salverform, in 2 parts, below stamens ca. 0.5 x 0.05 cm, above stamens ca. 0.5 x 0.1 cm, light green, lobes white becoming orange-red when mature, ca. 0.6 cm long, glabrous except at throat, where covered by long hyaline hairs; stamens included in tube. Fruit of 2 follicles or one by abortion, glabrous, fusiform, straight, divaricate, ca. 3-5 x 0.3-0.4 cm, dark brown.

D i s t r i b u t i o n : Guyana; in periodically flooded forest. (GU: 13).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo R., A.C. Smith 2142 (NY); Jenman s.n. (NY); Forest Dept. 7064 (U); Karanambo, Maas et al. 7208 (CAY, P, U); Karanambo, Hoffman 969 & 1245 (CAY, P, US).

P h e n o l o g y : Flowers in September. Fruits in February.

3. **Malouetia guianensis** (Aubl.) Miers, Apocyn. S. Amer. 87. 1878. –*Cameraria guianensis* Aubl., Hist. Pl. Guiane 1: 262. 1775. Type: French Guiana, Aublet s.n. (holotype P-J.J.R., 6, n. 225, isotype BM).

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– Fig. 12, 1-7.

Shrub or small tree 2-4 m high. Leaves membranous, 7-13 x 4.5-5.5 cm, glabrous abaxially, oblong, acuminate or subacuminate, base obtuse; secondary veins 8-9, spaced ca. 1 cm apart, arched; tertiary veins reticulate; domatia in axil vein on lower surface. Inflorescence terminal, 6-7-flowered. Sepals unequal, ovate to lanceolate, scarious; corolla white with anthers exserted, tube ca. 1 cm long, lobes 1.3-1.5 x 0.2-0.3 cm, sparsely pubescent on both faces, ciliate. Fruit of 2 follicles, trigonous, 7-13 x 0.4-0.5 cm, asymmetric, horizontally divergent at ca. 180°, green; seeds ca. 3 cm long, truncate at tip, obtuse at base, fitting into each other, sparsely pubescent, embryo straight, radicle obtuse.

D i s t r i b u t i o n : French Guiana; along rivers. (FG: 2).

S p e c i m e n s e x a m i n e d : French Guiana: Bassin du haut Marouini, 2°36' N, 54° W, de Granville et al. 10008 (B, CAY, COL, INPA, MY, NY, P, U, US, USM); R. Comté, Plantation Magnan, Jacquemin 1662 (CAY, P).

V e r n a c u l a r n a m e : guinguin paou (Boni).

P h e n o l o g y : Flowers and fruits in September.

4. **Malouetia pubescens** Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 9: 88.

1924. Type: Brazil, Amazonas, Rio Branco, Ule 7827 (holotype B destroyed, photo NY).

Shrub or tree 2-12 m high. Petioles ca. 1 cm long, blades coriaceous, lanceolate, ca. 8-12 x 3-5 cm, obtusely acuminate, falciform, cuneiform at base, pubescent abaxially, without domatia along primary vein; secondary veins arched. Inflorescence with many small flowers; corolla white, tube 0.2-0.4 cm long, lobes 0.3-0.6 cm long; anthers exserted. Fruit of 2 follicles, green, horizontally divergent at ca. 180°, ca. 15 x 0.5 cm, obtuse at apex; seeds brown, ca. 2 x 0.4 cm, covered by long lanate hairs, white.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana and Brazil (Roraima). (GU: 1).

S p e c i m e n e x a m i n e d : Guyana: Rupununi distr., Shea Rock, rocky outcrop, 300m, Jansen-Jacobs et al. 4826 (P, U).

P h e n o l o g y : Fruits in August.

5. **Malouetia tamaquarina** (Aubl.) A.DC., Prodr. 8: 378. 1844. –*Cameraria tamaquarina* Aubl., Hist. Pl. Guiane 1: 260, pl. 102. 1775. Type, French Guiana, Aublet s.n. (holotype P-J.J.R., 6, n. 225, isotypes BM, LINN. Sm. 448.1).

– Plate 5, fig. 12, 8-20.

Cameraria lutea Lam., Encycl. 1: 573. 1783. excl. syn., is Rubiaceae (holotype P-LA).

Tabernaemontana odorata Vahl, Ecl. II :2. 1796; –*Malouetia odorata* (Vahl) Miers, Apocyn. S. Amer. 87. 1878. Type: Suriname, von Rohr (holotype C). Paratype: Guyana, Rob. Schomburgk I 951 (holotype BM).

Malouetia furfuracea Spruce ex Müll.Arg. in Mart., Fl. Bras. 6(1): 93. 1860 : Type: Suriname, Kappler 2089 (holotype B). Paratype: French Guiana, L.C Richard s.n. (holotype P).

Malouetia furfuracea Spruce ex Müll.Arg. var. *grandifolia* Müll.Arg. Type: Brazil, Spruce 2305 (holotype P).

Malouetia albiflora Miq., Stirp. Suriname. Select.: 161. 1851. Type: Suriname, Marowynne, Kappler 1825 (lectotype U, isolectotypes G, P).

Malouetia obtusiloba A.DC., Prodr. 8: 379. 1844. Type: Suriname, Hostmann 269 (holotype G-DEL, isotypes CAM, FM, M, NY, P, S, W).

Small tree 8-12 m high; 15 cm dbh. Trunk grayish; bark smooth, reddish brown to black, lenticels green; wood yellowish. Petiole 0.2-0.4 cm long; blades discolorous, oblong to ovate-elliptic, 5-15 x 1.5-7 cm, glabrous abaxially, apex acuminate, base obtuse with numerous domatia along primary vein; veins prominent on both faces. Inflorescence axillary and terminal with numerous scented flowers; pedicels 1-2 cm long, glabrous. Sepals 0.2 cm long, ovate to lanceolate, scarious, ciliate, with 2 colleters within at base; corolla at first white, becoming yellowish or orangish with age, corolla tube greenish or reddish brown, 1-1.2 cm long, lobes 2 cm long, spreading and reflexed; disc shorter than ovary; ovary densely hirtellous. Fruit of 2 follicles, divergent at ca. 30°, 30-35 x 0.4-1 cm, curved, glabrous, not ribbed, striate; seeds 3.5-4.5 x 0.3 cm, glabrous or sparsely pubescent.

D i s t r i b u t i o n : Colombia, Venezuela, the Guianas, Amazonian Brazil and Peru; in the low flooded lowlands. (GU: 10; SU: 6; FG: 69).

S e l e c t e d s p e c i m e n s : Guyana: Demerara-Mahaica Reg., Hoffman et al. 764 (CAY, P, US); Demerara Reg., Hoffman et al. 912 (CAY, P, US). Suriname: s.l., Hostmann 444a (P); s.l., 867 (P); Marowyne R., Kappler 1825 (P). French Guiana: Oyapock, Cerisier, île Matabau, Sastre 4349 (CAY, P); Sinnamary, Courcibo R., 1.5 km village Adieu Vat, Oldeman B-1231 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: kirikahii. French Guiana: couillé-epcou (Wayana); bala tiki (Boni); yukigl (Palikur); bois-cuillère (Créole); paluke (Wayampi); boueni-mango, liba-mango (Taki-taki); eneko ikikai (Wittoto).

P h e n o l o g y : Flowers in September-January. Fruits in January-May.

U s e s : The very abundant white latex is used as an adulterant of Hevea rubber; the white wood is used for making spoons and other utensils. The seeds are highly poisonous and used to kill dogs (Schultes, R.E., 1960, A reputedly toxic Malouetia from the Amazon, Bot. Mus. Leaflet. 19: 123-124). It is an ingredient of certain curares which cause death by blocking respiratory function.

MANDEVILLA Lindl., Bot. Reg. n.s. 3, pl. 7. 1840. nom. cons.

Type: *Mandevilla laxa* (Ruiz & Pav.) Woodson, Ann. Missouri Bot. Gard. 19: 68. 1932.

Exosthostemon G.Don, Gen. Hist. 4 : 82. 1838. *pro parte*.

Echites Mart. ex Stadelm., Flora 24: 68. 1841. not P.Browne.

Laseguea A.DC., Prodr. 8: 481. 1844.

Dipladenia A.DC., Prodr. 8: 482. 1844.

Heterothrix Müll.Arg., in Mart., Fl. Bras. 6(1): 133. 1860.

Amblyanthera Müll.Arg., in Mart., Fl. Bras. 6(1) 141. 1860.

Prestoniopsis Müll.Arg., Bot. Zeit 18: 22. 1860.

Eriadenia Miers, Apocyn. S. Amer. 117.1878.

Micradenia Miers, Apocyn. S. Amer. 158. 1878.

Homaladenia Miers, Apocyn. S. Amer. 164. 1878.

Mitozus Miers, Apocyn. S. Amer. 217. 1878.

Angadenia Miers, Apocyn. S. Amer. 173. 1878. *pro parte*.

Temmadenia Miers, Apocyn. S. Amer. 207. 1878. *pro parte*.

Lianas, suffrutescent or occasionally suberect or erect shrubs. Latex white. Stem twining; stems usually opposite below, becoming alternate above. Leaves opposite or verticillate, adaxial surface bearing several colleters, clustered at base or distributed along primary vein, rarely without colleters. Inflorescences axillary or terminal racemes, simple, multiflorous, rarely few-flowered; calyx 5-lobed with few to many colleters inside; corolla 5-lobed, actinomorphic, aestivation dextrorse, white, pink or yellow, infundibuliform or salverform, adherent to style head, sagittate, blunt or truncate in some species; disc 2- to 5-lobed or composed by 2 or 5 nectaries more or less concrescent at base; ovary apocarpous, style slender, strongly 5-ribbed. Fruit of 2 follicles, dehiscing along ventral suture, concrescent at apex or not, or syncarpous; seeds numerous, dry, apically comose, anemochorous.

D i s t r i b u t i o n : About 120 species from Mexico to Bolivia and the north of Argentina; Antilles: Jamaica, Trinidad and Tobago.

KEY TO THE SPECIES

- | | | |
|---|---|---------------------------|
| 1 | Inflorescence subterminal, disc 2-lobed..... | 5. <i>M. kalmiaefolia</i> |
| | Inflorescence axillary and terminal, disc 5-lobed (except <i>M. tenuis</i> ,
<i>M. surinamensis</i>)..... | 2 |
| 2 | Leaves linear, subsessile or sessile | 3 |
| | Leaves not linear, petiolate | 4 |
| 3 | Corolla ca. 1.5-3 cm long | 14. <i>M. tenuifolia</i> |

	Corolla > 1.5 cm long	2. <i>M. duidae</i>
4	Leaves < 1 cm wide	5
	Leaves > 1 cm wide	6
5	Leaves verticillate; stem quadrangular, black-brown, lavender when young; corolla orange, yellow	1. <i>M. benthamii</i>
	Leaves opposite, mucronate; stem cylindrical; corolla pale yellow	6. <i>M. leptophylla</i>
6	Suffruticose undershrubs. Leaves glabrous, more or less coriaceous.....	7
	Lianas. Leaves pubescent or scaberulous	9
7	Leaves membranous with green veins. Corolla white, with pink and yellow throat; sepals linear 0.3 -0.5 cm long	12. <i>M. surinamensis</i>
	Leaves coriaceous with red veins. Corolla pale yellow; sepals triangular 0.1-0.2 cm long	8
8	Leaves cordate at base; pedicels not perpendicular to peduncle	
	
	<i>11. M. subcarnosa</i>	
	Leaves cuneate at base; pedicels perpendicular to peduncle	
	
	<i>16. M. vanheurckii</i>	
9	Bracts petaloid, white > 1 cm	10
	Bracts scarious, green < 0.5 cm	11
10	Leaves elliptical, base cuneate	10. <i>M. steyermarkii</i>
	Leaves hastate, base auriculate	17. <i>M. villosa</i>
11	Corolla salverform	7. <i>M. rugellosa</i>
	Corolla hypocrateriform or not	12
12	Corolla hypocrateriform, lower part cylindrical,1.5 cm long, upper part cylindrical,1.8 cm long	15. <i>M. trianae</i>
	Corolla not hypocrateriform	13
13	Corolla hairy	3. <i>M. hirsuta</i>
	Corolla glabrous	14
14	Fruit of 2 follicles, concrescent at the apex	

.....	13. <i>M. symphitocarpa</i>
Fruit of 2 follicles, not conerescent at the apex	15
Leaves cordate at base, subsessile, densely velutinous-pubescent.....	
8. <i>M. scaberula</i>	
Leaves not cordate at base, petiolate, pubescent or scabrous	16
16 Leaves not mucronate; petiole ca. 1 cm	
long	9. <i>M. scabra</i>
Leaves mucronate; petiole ca. 0.5-1 cm long	4. <i>M. holstii</i>

1. **Mandevilla benthamii** (A.DC.) K.Schum., Engl. & Prantl, Nat. Pflanzenfam. 4(2): 171. 1895; Woodson, Ann. Missouri Bot. Gard. 20: 170. 1933. –*Echites benthamii* A.DC., Prodr. 8: 467. 1844. –*Amblyanthera benthamii* (A.DC.) Müll. Arg., Linnaea 30: 451. 1860. Type: Guyana, Roraima, Rob. Schomburgk I 1053 (holotype K, photo NY).

Echites angustifolia Benth., J. Bot. (Hooker) 3: 247. 1841, not Poir. Type: Guyana, Rob.

Schomburgk I 1053. (holotype K, photo NY)(not 1953, Woodson, l.c.).

Mesechites angustata Miers, Apocyn. S. Amer. 231. 1878. Type: Guyana, Kaieteur, s.n. coll. (holotype BM).

Shrub perennial 0.3 cm high. Stem quadrangular, black, brown lavender when young. Leaves in clusters of 3 or 4, verticillate or subspiraled; blades coriaceous, subsessile, 1.5-4 x 0.2-0.4 cm, margin revolute, mucronate, with red primary vein, deep green above, pale silvery green below. Inflorescence terminal or subterminal; pedicels 0.1-0.2 cm long; bracts minute, ovate, scarious. Sepals ovate, acute, ca. 0.1 cm long with one colleter inside; corolla orange-yellow suffused red at base of tube, glabrous outside, cylindrical part of tube 1.3 cm long, infundibuliform part 2.5 cm long, lobes ca. 1 cm long, obovate. Follicles glabrous, articulated, 10-14 cm long,

slender, curved; young fruit crimson, turning to dark red; seeds 0.5 cm long, hair tuft 2 cm long.

D i s t r i b u t i o n : Venezuela and Guyana; on white sand savanna. (GU: 22).

S e l e c t e d s p e c i m e n s : Guyana: Cuyuni-Mazaruni Region, Pakaraima Mts, Maas & Westra 4363 (P, NY, U); id., Pipoly et al. 7847 (P, U, US); Kaieteur Plateau, Cowan & Soderstrom 2038 (NY, U); id., Maguire & Fanshawe 23128 (NY, U).

P h e n o l o g y : Flowers throughout the year. Fruits in May-October.

2. **Mandevilla duidae** (Woodson) Woodson, Fieldiana Bot. 28: 500. 1953.
 –*Salpinctes duidae* Woodson, Bull. Torrey Bot. Club 58: 454. 1931. Type:
 Guyana: dry ridge tops, Savanna Hills, 4400 ft. Tate 805 (holotype NY,
 photo P).

Woody climber, 50 cm high. Stem slightly winged or ridged, red. Leaves oblong-linear, sessile, obtuse at apex. Inflorescence terminal; corolla tube orange-crimson, lobes bright yellow, >1.5 cm long. Follicles slender, 10-12 cm long, glabrous, slightly constricted, acuminate, dark red.

D i s t r i b u t i o n : Venezuela, Guyana and Brazil (Roraima). Only the type from Guyana.

3. **Mandevilla hirsuta** (Rich.) K.Schum., Engl. & Prantl, Nat. Pflanzenfam. 4 (2): 171. 1895; Woodson, Ann. Missouri Bot. Gard. 20: 158. 1933. –*Echites hirsuta* Rich., Actes Soc. Hist. Nat. Paris 1: 107. 1792. –*Amblyanthera hirsuta*

(Vell.) Miers, Apocyn. S. Amer. 185. 1878. Type: French Guiana, Cayenne, Le Blond s.n. (holotype P-LA, isotype G-DC).

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– Plate 7.

Echites tomentosa Vahl, Symb. Bot. 3: 44. 1794. – *Temnadenia tomentosa* (Vahl) Miers, Apocyn. S. Amer. 213. 1878. – *Mandevilla tomentosa* (Vahl) Kuntze, Rev. Gen. 2: 416. 1891. – *Mandevilla tomentosa* (Vahl) K.Schum., l.c.: 171. 1895. comb. sup. Type: French Guiana, von Rohr s.n. (holotype C).

Echites tomentosa Vahl, var. *laticordata* A.DC., Prodr.8: 463. 1844. Type: French Guiana, Perrottet s.n. (holotype G-DC.).

Echites richardi Roem. & Schult., Syst. Veg. 4: 391. 1819. Type: French Guiana, Le Blond s.n., (holotype P-LA).

Echites macrophyllum Kunth in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 3: 218. 1819. – *Exostemon macrophyllum* (H.B.K.) G.Don, Gen. Hist. 4: 82. 1838. Type: Venezuela, Orenoque R., Humboldt 1214, Willdenow 5160 (holotype B, photo NY).

Echites hispida Willd. ex Roem. & Schult., Syst. Veg. 4: 795. 1819. – *Amblyanthera hispida* (Willd. ex Roem. & Schult.) Müll.Arg., in Mart., Fl. Bras.6(1): 147. 1860. – *Mandevilla hispida* (Willd. ex Roem. & Schult.) Hemsl. Biol. Centr.-Amer.Bot. 2: 316. 1882. Type: Brazil, Hoffmannsegg s.n., Willd. 5166 (holotype B-W, photos NY, US).

Echites campestris Vell., Fl. Flum. 113. 1830. Icon.3, lam.43. 1827. – *Amblyanthera campestris* (Vell.) Müll.Arg. in Mart., Fl. Bras.6(1): 149. 1860. – *Rhabdadenia campestris* (Vell.) Miers, Apocyn.

S. Amer. 121. 1878. Type: Brazil, Vellozo s.n. (holotype BM).

Echites auriculata Pohl ex Stadelm., Flora 24(1): 25. 1841. – *Mandevilla auriculata* (Stadelm.) K.Schum., in Engl. & Prantl, l.c.: 171. 1895. Type : Brazil, Pohl 657 (holotype NY).

Echites hirsuta Ruiz & Pav. var. *latifolia* Stadelm., Flora 24(1): 27. 1841.

Echites almadensis Stadelm., Flora 28. 1841. Type: Brazil, Almada, Dryas s.n. (holotype G-DC.)

Echites stadelmeyer Mart. ex Stadelm., Flora 29. 1841. Type: Brazil, Prov. Minarum, Achermann.

Echites ciliata Stadelm., Flora 32. 1841.–*Amblyanthera ciliata* (Stadelm.)Müll.Arg. in Mart., Fl. Bras.6(1):145. 1860. Type: Brazil, Bahia, s.n. coll. Paratype: Brazil, Claussen 1092.

Echites fluminensis A.DC., Prodr.8: 452. 1844.–*Amblyanthera fluminensis* (A.DC.) Müll.Arg. in Mart., Fl. Bras.6(1): 149. 1860.–*Mandevilla fluminensis* (A.DC.) Donn. Sm., Enum. Pl. Guat. 2: 47.

1891. Type: Brazil, Schott s.n. (holotype NY).

Echites palustris Salzm. ex Müll.Arg., l.c.: 146. 1860. nom. nud. en syn.–*Amblyanthera palustris* (Salzm.) Müll.Arg., in Mart., Fl. Bras. 6(1): 146. 1860.–*Temnadenia palustris* (Salzm.) Miers , Apocyn. S. Amer. 213. 1878.–*Mandevilla palustris* (Müll.Arg.) Hemsl., l.c.: 317. 1882. Type: Brazil, Bahia, Salzmann s.n. (holotype G-DC).

Amblyanthera clausenii (A.DC.) Miers, Apocyn. S. Amer. 187. 1878. Type: Brazil, Claussen s.n. (holotype G-DEL).

Amblyanthera ovata Miers, Apocyn. S. Amer. 188. 1878. Type: Brazil, Miers s.n. (holotype BM).

Temnadenia pallidiflora Miers, Apocyn. S. Amer. 211. 1878. Type: Brazil, Miers 403 (holotype BM).

Mandevilla rusbyi Britton, Bull. N.Y. Bot. Gard. 4: 409. 1907. Type: Bolivia, Britton & Rusby 2843 (holotype US).

Mandevilla denticulata S.F.Blake, Contr. Gray Herb. 52: 81. 1917. Type: Belize, Peck 696 (holotype GH).

Liana 4-5 m long. Stem brown-hirsute, internode ca. 10 cm long. Leaves opposite. Petiole ca. 1 cm long; blades ovate, ca. 8-10 x 3-4 cm, acuminate, auriculate at base, with some red in fresh collectors, along primary vein and on petiole, pubescent; secondary veins widely spaced, curved. Inflorescence hirsute; bracts filiform to subfoliaceous, 1 cm long. Sepals acute, pubescent; corolla yellow with purple throat, infundibuliform, tube : lower part 2 x 0.3 cm, pale green, upper part 2 x 1.5 cm, lobes 1.5 x 1 cm, with long white hairs without, glabrous within; anthers 0.4 cm, white; style head enlarged at base. Follicles apocarpous, straight, curved only at end and coalescent at top (in Guyana, totally syncarpous) 12 x 0.5 x 0.5 cm, brown, long-

hirsute, slightly constricted ca. every 1-1.5 cm; seeds ca. 0.8 cm, at apex obtuse; hair tuft brown ca. 2 cm long.

D i s t r i b u t i o n : From Mexico to Peru and Bolivia; common in clearings and second growth, on areas of poorer soils. (GU: 23; SU: 8; FG: 76).

S e l e c t e d s p e c i m e n s : Guyana: Rupununi R., Isherton, A.C. Smith 2454 (P); Takutu-U; Essequibo South Rupununi Savanna, Henkel et al. 3358 (P, US).
Suriname: Paramaribo, Kappler 1605 (P). French Guiana: Piste "Risque-tout", 40 km W of Cayenne, Skog et al. 5620 (US); road Cayenne-Matoury, Billiet & Jadin 1024 (BR, CAY, NY, P).

V e r n a c u l a r n a m e s : Guyana: lilo (Wapisiana). Suriname: wilkenstité (Sranan). French Guiana: bastard vanilla.

P h e n o l o g y : Flowers and fruits throughout the year.

4. **Mandevilla holstii** Morillo, *Ernstia* 53: 18, 1989. Type: Venezuela, Bolivar, Distr. Cedeño, Serrania Guanay, 1700m, 20-28. 10. 1985 (fl. & fr.) Huber 10955 (holotype MYF, isotypes NY, UCV, photos P).

Liana to 5 m long; latex copious. Stem minutely pubescent. Petiole ca. 0.0-5 cm long, peduncle, pedicels, calyx and corolla tube wine-red; blades coriaceous, 4-4.5 x 2-2.5 cm, mucronate, upper surface of blade glabrous, lower surface with glaucous tomentum formed by dense, short hairs, 6-10 colleters along primary vein; secondary veins 6-7, arched (brochidodromus). Corolla yellow or white, tube below stamens ca. 1.5 x 0.2 cm, upper part ca. 2 cm x 1 cm, red outside, infrastaminal part of tube pubescent inside, lobes 1 x 1 cm, throat light orange; anthers 0.62-0.75 cm. Follicles wine-red, monoliform, 9-10 cm long; seeds cylindrical, hair tuft yellow-brown.

D i s t r i b u t i o n : Colombia, Venezuela and Guyana; on riverbanks. (GU: 1).

S p e c i m e n e x a m i n e d : Guyana: Cuyuni-Mazaruni Region: to Great Falls on Kamarang R., 850-975m, 26. 5. 1990, McDowell & Gopaul 2918 (P, US).

P h e n o l o g y : Flowers and fruits in May-August.

5. **Mandevilla kalmiaefolia** (Woodson) J.F.Morales, Novon 8: 429, 1998.—*Salpinctes kalmiifolius* Woodson, Bull. Torrey Bot. Club 58: 453, pl. 37. 1931.
Type: Guyana, Savanna Hills, Tate 836, holotype NY, isotype MO, photo-P.

Erect shrub 0.6-1.5 m high. Stem quadrangular, pubescent-hirsute; nodes with interpetiolar line and 2 colleters. Leaves opposite, shortly petiolate; blades coriaceous, margin revolute, 4-6 colleters along primary vein, canaliculate. Inflorescence subterminal, up to 15-flowered; peduncle obsolete; bracts small and caducous. Sepals 5, triangular with many colleters within at base; corolla salverform, tube straight, glabrous, red outside. Anthers connective dorsally glabrous, sessile; disc 2, alternate, separate, glabrous; ovary surmounted by fusiform style head. Follicles terete, pubescent, dehiscing along ventral suture, thickened at ca. 1.5 cm intervals, their outer face reddish; seeds < 10, dry, rostrate, apically comose, embryo straight.

D i s t r i b u t i o n : Venezuela (Cerro Duida), Guyana and Brazil (Roraima). Only the type from Guyana.

6. **Mandevilla leptophylla** (A.DC.) K.Schum., Engl. & Prantl, Nat. Pflanzenfam. 4(2): 171. 1895. Woodson, Ann. Missouri Bot. Gard. 20: 158. 1933.—*Echites leptophylla* A.DC, Prodr. 8: 455. 1844.—*Mitozus leptophyllus* (A.DC) Miers, Apocyn. S. Amer. :13. 1878. Type: Brazil, Bahia,

Catinga, Stadelm. s.n., (Herb. and types unknown, Stafleu & Cowan, 1985).

Echites linearifolia Stadelm., Flora 24(1): 18, 1841. Type: Brazil, Bahia, Stadelm. s.n., (Herb. and types unknown), not Hamilton, Prodr. Pl. Ind. occ. 31, 1825.

Mandevilla linearis N.E.Br., Trans. Linn. Soc. London, Bot. ser. 2, 6: 48. 1901. Type: Guyana, Roraima Mts, Tolimbaru Cr., McConnell & Quelch 132 & 194 (holotype NY).

Liana to 1m long. Stem slender, reddish, puberulent. Blades linear-elliptic, 3-7 x 0.5 cm, margin revolute, apex mucronate, base attenuate, dark green above, whitish abaxially, 6-10 colleters along primary vein. Bracts ca. 0.4 cm long. Calyx green, minute, ca. 0.2 cm long; corolla pale yellow, glabrous, tube reddish at base, lower part 2-2.5 x 0.15 cm, upper part 1.5 x 1 cm, lobes bright yellow, 1.7-2.25 cm long. Follicles slender, articulate, 10-15 cm long, concrescent at apex; seeds ca. 0.8 cm long; hair tuft 1.5 cm long.

D i s t r i b u t i o n : Venezuela, Guyana and North Brazil. (GU: 14).

S e l e c t e d s p e c i m e n s : Guyana: Essequibo Region, NW Kanuku Mts, 750-950m alt., Hoffman et al. 3539 (P, US); Potaro-Siparuni, Pakaraima Mts, 550-585 m alt., Henkel et al. 764; 5450; 5579 (P, US); Upper Mazaruni R., Haieka Savannah, Chinowieng village, 740m alt., Tillett et al. 45225 (NY).

P h e n o l o g y : Flowers in January-February. Fruits in January, March, December.

7. ***Mandevilla rugellosa*** (Rich.) L.Allorge, Phytologia, 84(4): 304, 1999.—*Echites rugellosa* Rich., Actes Soc. Nat. Hist. Paris 1:107. 1792. Type: French Guiana, Le Blond 366 (holotype-P-LA, isotype: G-DC, photo NY, US).

Echites subspicata Vahl, *Eclog. Amer.*:2: 18. 1798. –*Laseguea subspicata* (Vahl) Miers, *Apocyn. S. Amer.*: 252. 1878. –*Mandevilla subspicata* (Vahl) Markgr., *Rec. Trav. Bot. Néerl.* 22: 380. 1926.

Woodson, *Ann. Missouri Bot. Gard.* 20: 135. 1933. Type: Suriname, s.loc., von Rohr s.n. (holotype C).

Echites rubricaulis Poir., *Encycl. Suppl.* 2: 535. 1812; *Tab. Encycl.* 2 314. 1819. Type: French Guiana, L.C. Richard s.n. (holotype P, isotype P-JUSS). syn. nov. Non *Mesechites trifida* (Jacq.) Müll.Arg.(Woodson, *Ann. Missouri Bot. Gard.* 23: 247. 1936).

Echites guianensis A.DC., *Prodr.*8: 458. 1844., –*Amblyanthera guianensis* (A.DC.) Müll.Arg., *Linnaea* 30: 448. 1860. –*Mesechites guianensis* (A.DC.) Miers, *Apocyn. S. Amer.*: 235. 1878. Type: French Guiana, Cayenne, s. coll. (holotype G-DEL, photo US).

Laseguea venustula Miers, *Apocyn. S. Amer.*: 252. 1878. Type: French Guiana, Cayenne, von Rohr (holotype BM).

Liana 8-10 m long; latex abundant. Stem terete, branches rough. Leaves elliptic, acuminate, somewhat cordate at base, rough above, pubescent below.

Inflorescences to 30 cm long, rough. Flowers sessile. Bracts and sepals ca. 0.2 cm long, pilose; corolla tube ca. 3 cm long, salverform, lobes obtuse, pubescent, 6-7 cm large, tube and lobes pale yellow, throat marked with red lines. Follicles to 20 x 0.3 cm, glabrous, striate, thickened at ca. 1 cm intervals; seeds ca. 0.8 cm, acute at base and apex; hair tuft ca. 2 cm long.

D i s t r i b u t i o n : Venezuela, the Guianas and Brazil; in open areas. (GU: 13; SU: 10; FG: 63).

S e l e c t e d s p e c i m e n s : Guyana: Takutu U. Essequibo, Makawata massif, 03° 05' N, 59° 26' W, Clarke 1850 (P). Anabisi R., NW distr., de la Cruz 1335 (F). Suriname: Tumuc Humac, Talouakem Mts. 450 m, Acevedo-Rodriguez et al. 5959 (P, US); id., Maguire & Stahel 23614, 24994 (US). French Guiana: Cayenne, Le Blond 53 (P-LA); Montagne de Kaw, 300m, Hoff et al. 6334 (CAY, P, U).

V e r n a c u l a r n a m e s : Suriname: merkitité (Sranan), melki tetei (Bushman).

P h e n o l o g y : Flowers and fruits in March-October.

8. **Mandevilla scaberula** N.E.Br., Trans. Linn. Soc. Bot. II 6: 48. 1901. Type: Guyana, Roraima Mts, Tolimbaru Cr., McConnel & Quelch 146 (holotype K, photo MO, NY).

Liana slender, to 3 m long. Stem terete, puberulous. Leaves opposite, subsessile; petiole puberulous; blades oblong-obtuse, 5-12 x 2.5-5 cm, apiculate, cordate at base, scaberulous upper surface, tomentose with a dense white indument above. Inflorescence axillary; bracts ca. 0.1 cm long. Sepals ca. 0.1 cm long; corolla infundibuliform, white with orange lines in throat, lower part of tube, arcuate 2.5-3 x 0.2 cm, upper part, 1.5-2 x 1 cm at throat. Follicles to 12-15 cm, purplish-green, articulated; seeds ca. 0.8 cm long, hair tuft ca. 1.5 cm long.

D i s t r i b u t i o n : Venezuela, Guyana, and Brazil. (GU: 4; SU: 1).

S e l e c t e d s p e c i m e n s : Guyana: Takutu U. Essequibo, Shea village, 02° 58' N, 59° 31' W, Clarke 1783 (P). Suriname: Zuid R., Kayser Airstrip, 45 km above confluence Lucie R., Irwin et al. 55930 (P, NY, US).

P h e n o l o g y : Flowers and fruits in September.

9. **Mandevilla scabra** (Roem. & Schult.) K.Schum., Engl. & Prantl Nat. Pflanzenfam. 4(2): 171. 1895; Woodson, Ann. Missouri Bot. Gard. 20: 148. 1933.—*Echites scabra* Roem. & Schult., Syst. Veg. 4: 795. 1819. Type: Brazil, Hoffmannsegg s.n., Willd. 5175 (holotype B-W, photo NY).

Echites brachystachya Benth., J. Bot. (Hooker) 3: 248. 1841.—*Mitozus brachystachyus* Miers, Apocyn. S. Amer.: 221. 1878. Type: Guyana, Rob. Schomburgk I 350 (holotype K, isotype P).

Echites rugosa Benth., J. Bot. (Hooker) 3: 248. 1841.—*Mitozus rugosus* (Benth.) Miers, Apocyn. S. Amer. 222. 1878.—*Mandevilla rugosa* (Benth.) Woodson, Ann. Missouri Bot. Gard. 19: 384. 1932. Type: Guyana, Rob. Schomburgk I 33 (holotype P).

Echites versicolor Mart. ex Stedelm., Flora 24(1): 38. 1841.—*Amblyanthera versicolor* (Stedelm.) Müll.Arg., Mart. Fl. Bras. 6: 146. 1860.—*Mitozus versicolor* (Stedelm.) Miers, Apocyn. S. Amer.: 221. 1878. Type: Brazil, Bahia, Ceara, Gardner 1755, (holotype P).

Echites priurei A.DC., Prodr. 8: 458. 1844. —*Amblyanthera priurei* (A.DC.) Müll.Arg., Linnaea 30: 448. 1860.—*Angadenia priurei* (A.DC.) Miers, Apocyn. S. Amer.: 252. 1878.—*Anisolobus priurei* (A.DC.) Miers, Apocyn. S. Amer.: 171. 1878. Type: French Guiana, Le Prieur 241 (holotype G-DEL., isotype P, photo US). syn. nov. Non *Mandevilla subspicata* (Vahl) Markgr. (Woodson, Ann. Missouri Bot. Gard. 23: 247. 1936).

Liana, woody at base. Petiole ca. 1 cm long; blades coriaceous, elliptic, 6-16 x 2-6 cm, acuminate, somewhat cordate at base, rough above, subglabrous below.

Inflorescences to 10 cm long, pubescent; buds red. Sepals reddish, 0.1-0.3 cm long, pilose; corolla lobes ca. 1 x 1 cm, bright yellow, tube ca. 3 cm long, varying from yellow to brown-orange, with orange lines, glabrous. Follicles to 20-25 x 0.3-0.5 cm, glabrous, thickened at ca. 1 cm intervals; seeds acute at base and apex, ca. 1 cm long; hair tuft ca. 2.5 cm long.

D i s t r i b u t i o n : Colombia, Venezuela, the Guianas and Brazil; in open areas. (GU: 22; SU: 12; FG: 27).

S e l e c t e d s p e c i m e n s : Guyana: 8 Km South, South West Matthew's Ridge, Mori et al. 8268 (NY); Mazaruni station, Sandwith 1599 (NY). Suriname: Tibiti savanna, Lanjouw & Lindeman 1703 (U); Whilelmina Mts., 2 km above confluence

Lucie R., Irwin et al. 55809 (U). French Guiana: Mana, chemin des Hattes, Moretti 289 (CAY, P); Entre Mana et Aouara, km 17, Prévost 631 (CAY, P).

V e r n a c u l a r n a m e s : Suriname: merkitité (Sranan).

P h e n o l o g y : Flowers in November-September. Fruits in January-September.

10. **Mandevilla steyermarkii** Woodson, Fieldiana Bot. 28: 502. 1953. Type: Venezuela, Terr. Fed. Amazonas, Steyermark 58504. (holotype MO, isotypes COL, F). not seen.

Suffrutescent liana to 5 m long; latex copious. Stem terete, glabrous. Petiole 1-2.5 cm long; blades membranous, 6-8 x 4-5 cm, apex acuminate, base cuneate densely tomentose, particularly on veins. Inflorescences 18 cm long; bracts light green to white, showy, 4-5 x 1-1.3 cm, acuminate. Sepals triangular, 0.5-0.7 cm long; corolla hypocrateriform, glabrous, tube ca. 2 x 0.2 cm below stamens, above 2 x 1 cm, cream, pink or reddish, lobes white to yellow, 1.5 cm long. Follicles 16-18 cm long, thickened at ca. 1.5 cm intervals; seeds 0.5 cm long, hair tuft 2 cm long.

D i s t r i b u t i o n : Colombia, Venezuela and Guyana (Roraima); in montane on forest slopes. (GU: 2).

S p e c i m e n s e x a m i n e d : Guyana: Cuyuni-Mazaruni Region: Mt. Ayanganna, eastern side on steep slopes, Pipoly et al. 11176 (P, US); Potaro-Siparuni Region, Pakaraima Mts., Mt. Wokomung, Henkel et al. 1447 (P, US).

P h e n o l o g y : Flowers in February-March. Fruits in March.

U s e s: Schultes & Raffauf, 1990, The healing Forest; Medicinal & Toxic plants of the Northeast Amazonia, Kew, indicate: the latex is considered helpful in healing sores and skin infections.

11. **Mandevilla subcarnosa** (Benth.) Woodson, in Gleason, Bull. Torrey Bot. Club 58: 453. 1931.—*Echites subcarnosa* Benth., J. Bot. (Hooker) 3: 247. 1841.—*Mesechites subcarnosa* (Benth.) Miers, Apocyn. S. Amer.: 231. 1878. Type: Guyana, Roraima, Rich. Schomburgk 183 (holotype K, photo NY).

Mandevilla dielsiana Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 9: 86, fig. 2. F-K, 1924. Type: Venezuela, Roraima, Río Cuquenán, Ule 8737 (holotype B, photo NY).

Suffrutescent shrub or small liana, glabrous, 2-6 m long; latex abundant. Young stems dark red; stem compressed, alate, dark red. Leaves opposite, petiolate, oblong-elliptic, 4.5-8 x 2 cm, apex obtuse, base cordate, margins and primary vein red. Inflorescence terminal, exceeding length of leaves. Corolla yellow, throat with ten red lines, lobes in bud red, tube green. Follicles red-flushed, thickened at ca. 1 cm intervals; seeds ca. 0.5 cm long; hair tuft ca. 1.5 cm long.

D i s t r i b u t i o n : Panama, Colombia, Venezuela, Guyana (Roraima) and Peru; in savannas. (GU: 7).

S e l e c t e d s p e c i m e n s : Guyana: Upper Mazaruni R., top of Eboropu escarpment, via Singh line from Akapai, Tillett et al. 45652 (P); Cuyuni-Mazaruni Region, camp at Utshe, 0.3 Km N of Utshe R., 950m, McDowell & Anselmo 2769 (P, US).

V e r n a c u l a r n a m e : Guyana: butter cup.

Phenology : Flowers reported in May-October. Fruits in May.

12. **Mandevilla surinamensis** (Pulle) Woodson, Ann. Missouri Bot. Gard. 20: 100. 1933.—*Dipladenia surinamensis* Pulle, Rec. Trav. Bot. Néerl. 6: 286. 1909. Type: Suriname, Litani R., Knopaiamoi Mt., Versteeg 382 (holotype B, photo at NY, isotype U).— Plate 8.

Dipladenia upatae Woodson, Ann. Missouri Bot. Gard. 18: 545. 1931. Type: Venezuela, Bolivar, Upata, Osta 1014 (holotype MO, isotype W).

Shrub or woody liana 0.5-5 m high. Stem black-red, longitudinally striate. Petiole ca. 0.5 cm long; blades subcoriaceous, 4-8 x 2.5-3 cm, margin revolute, apex abruptly acuminate, base obtuse, cordate, deep green above, pale green below, somewhat pubescent, ciliate at base of blade and along top of petiole, 2 colleters at base of primary vein; secondary and tertiary veins visible. Inflorescences 3-7-flowered. Corolla white with pink and yellow throat. Sepals green, 0.4-0.5 cm long, linear with 4 colleters per sepal within, lobes linear, 2.5-3.5 x 2.5-3 cm long, dilated at left, pink outside, glabrous, tube green within, pink outside, ca. 3 x 0.2 cm at base, enlarged to 0.7 cm in diam. at throat; stamens 0.7-0.9 cm long; ovary conical, ca. 0.2 cm long, glabrous, style slender, style head ca. 0.4 cm long. Follicles to 15-16 x 0.5 x 0.3 cm, fusiform, glabrous; seeds 0.7-0.8 cm; hair tuft 2-2.5 cm long.

Distribution : Venezuela, the Guianas and Brazil; in montane grassland on granite rocks. (GU: 1; SU: 6; FG: 5).

Selected specimens : Guyana: Hoffman et al. 3694. Suriname: Cr. Ouaremapan, 400 m alt., Sastre 1778 (P, U); frontier Suriname-Brazil, Rombouts 887 (P); Tumuc Humac, Inselberg Talonakem, 550m, de Granville et al. 12152 (B,

BBS, BR, CAY, G, K, P, NY, U, US). French Guiana: Tumuc Humac, savanna on rocks, 590m alt., de Granville 1397 (CAY, P); Tumuc Humac, trijunction point, on rocks, 500m alt, Sastre 1581 (P, U).

P h e n o l o g y : Flowers in February-October. Fruits in February-December.

13. **Mandevilla symphitocarpa** (G.Mey.) Woodson, Ann. Missouri Bot.

Gard. 20: 151. 1933.—*Echites symphitocarpa* G.Mey., Prim. Fl. Esseq.:

132. 1818.—*Mitozus symphitocarpus* (G.Mey.) Miers, Apocyn. S. Amer.:

222. 1878. Type: Guyana, Essequibo R., Meyer (not seen, probably lost).

Neotype:French Guiana, Mana, Sagot 886, (holotype P, isotypes K, V) designated here.....= Plate 7.

Liana climbing 2-3 m high. Stem glabrous to pubescent. Petiole ca. 1 cm long; blades 15-18 x 5-7 cm, acuminate, cordate to auriculate at base, pubescent; secondary veins 7-8, widely spaced, prominent below; tertiary veins perpendicular to secondary ones. Inflorescence robust, 0.2 cm wide; bracts linear, 1 cm long. Sepals linear, 0.5-1 cm long; corolla infundibuliform, glabrous, large, 7-8 cm long, tube below stamens, 3 cm long, upper part 3 x 2.8 cm, lobes yellow light, 1.7-3 cm. Follicles 30 to 35 cm long, connate at tip only, slightly constricted; seeds ca. 1 cm long, hair tuft ca. 2,5-3 cm long, yellow-brown.

D i s t r i b u t i o n : Venezuela, Trinidad, the Guianas and Brazil; sandy ground at the forest edge. (GU: 1; SU: 2; FG: 13).

S p e c i m e n s e x a m i n e d : Guyana: Rupununi R., Monkey Pond landing, South West Mt. Makarapan, Maas et al. 7365 (P, U). Suriname: Coppename R., Wessels Boer 1386 (NY, U); near Oude Rijkweg, Paramaribo, Samuels 457 (K, NY).

French Guiana: Piste de Ste Elie, Km 11, Prévost 494 (CAY, P); St Laurent du Maroni, terrain sablonneux, Mélinon 425; 430 (P).

P h e n o l o g y : Flowers in February-December. Fruits in September-December.

14. **Mandevilla tenuifolia** (Mikan) Woodson, Ann. Missouri Bot. Gard. 20: 75. 1933.—*Echites tenuifolia* Mikan, Fl. & Faun. Bras.: 3. 1820.—*Dipladenia tenuifolia* (Mikan) A.DC., Prodr. 8: 482. 1844.—*Homaladenia tenuifolia* (Mikan) Miers, Apocyn. S. Amer.: 164. pl. 24a. 1878. Type: Brazil, Goyaz, Gardner 3888 (hololectotype P, isolectotype G).

Echites pastorum Mart. ex Stedelm., Flora: 29. 1841.—*Dipladenia pastorum* (Mart. ex Stedelm.) A.DC., Prodr. 8: 482. 1844.—*Homaladenia pastorum* (Mart. ex Stedelm.) Miers, Apocyn. S. Amer.: 164. 1878.—*Dipladenia pastorum* (Mart. ex Stedelm.) A.DC., var. *tenuifolia* (Mikan) Hook., Bot. Mag. 3: 56, pl. 7725. 1900. Type: Brazil, Martius s.n. (holotype M, not seen).

Echites peduncularis Stedelm., Flora: 28. 1841.—*Dipladenia peduncularis* (Stedelm.) A.DC., Prodr. 8: 482. 1844. Type: Brazil, Minas Geraes, Ackermann s.n. (holotype BR, not seen).

Dipladenia linariaefolia A.DC., Prodr. 8: 482: 1844. Types: Brazil, Lund s.n., Blanchet 3406 (holotype P).

Dipladenia vincaeflora Lem., Fl. Serres & Jard. 2(8): pl. 6, 1846. Type: pl. 6, 1846.

Dipladenia polymorpha Müll.Arg. in Mart., Fl. Bras. 6(&): 121. 1860. Type: Brazil, Sello s.n. (holotype P).

Herb, suffrutescent, 30 cm high. Stem slender, glabrous. Leaves sessile, membranous, linear, 3-12 x 0.2-0.5 cm. Inflorescence lateral or subterminal; bracts scarious, 0.1-0.2 cm long; flower in bud bright red. Corolla light purplish blue to pink in Suriname, all other collections have corolla with strikingly contrasting coloration on outer and inner surfaces. Sepals acute, 0.4 cm long; corolla salverform, glabrous

without, slender, ca. 1.5-3 cm long, tube 1.3-3 x 0.1 cm; anthers inserted near throat. Follicles reddish green to dark red, 6-8 cm long, slightly constricted, glabrous; seeds ca. 0.75 cm long; hair tuft ca. 1 cm long, yellow-brown.

D i s t r i b u t i o n : Suriname and Brazil (Bahia, Minas Gerais, Pará, Mato Grosso). 24 collections studied, of which 11 from Suriname.

S e l e c t e d s p e c i m e n s : Suriname: Sipalawini savanna, on Brazilian frontier, Oldenburger et al. 260, 410a, 579, 710, 1390 (U); id., Rombouts 337, 394, 537 (U); Sipalawini savanna, Wessels Boer 747 (U).

P h e n o l o g y : Flowers in February-March. Fruits in October-November.

15. **Mandevilla trianae** Woodson, Ann. Missouri Bot. Gard. 19: 70. 1932.

Type: Colombia, s.l., 150 m, 4. 1853. Type: Colombia, Choco, Triana 3409 (holotype BM, isotype COL, not seen).

Liana 7-8 m long; latex sticky. Stem terete, puberulent-hirtellous. Petiole 0.5-0.6 cm long; blades membranous, ovate, 8-11 x 3-4.5 cm, acuminate, cordate to auriculate at base, green-yellow, puberulent-hirtellous on veins below, with ca. 10-12 colleters along primary vein on inner surface. Inflorescences 8-20-flowered, minutely pubescent. Sepals green, ca. 0.1-0.2 cm long, scarious, with one colleter within; corolla white, red at base with center orange, minutely pubescent, tube green within, pink outside, lower part cylindrical, ca. 1.5 x 0.2 cm, enlarged upper part cylindrical, 1.8 x 0.5 cm, lobes obovate 1.5 x 1.5 cm, dilated at left, white to pink outside, glabrous; stamens 0.7-0.9 cm long; ovary trigonal, ca. 0.2 cm long, glabrous, style slender, style head ca. 0.4 cm long. Follicles to 15-16 x 0.1 cm, articulated, glabrous; seeds ca. 0.5 cm; hair tuft 1.5 cm long.

D i s t r i b u t i o n : Colombia, Guyana and Peru. (GU: 2).

S p e c i m e n s e x a m i n e d : Guyana: Potaro-Siparuni region, Kaieteur Falls National Park, path just below Johnson's View, 10. 7. 1993, Kelloff et al. 866 (P, US); McDowell 3952.

P h e n o l o g y : Flowers and fruits in July.

16. **Mandevilla vanheurckii** (Müll.Arg.) Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 9: 87. pl. 2, 1924.—*Heterothrix vanheurckii* Müll.Arg., in Van Heurck, Bot. Obs. 164. 1871.—*Heterothrix vanheurckii* Müll.Arg. ex Miers, Apoc. S. Amer.: 264. 1879. Type: Peru, near Tarapoto, Spruce 4303, (holotype G, isotype K, not seen).

Eriadenia obovata Miers, Apoc. S. Amer.: 117. tab. 14 B, 1879. Type: Peru, near Tarapoto, Spruce 4303 (holotype BM, not seen).

Mandevilla glabra N.E.Br., Trans. Linn. Soc. Bot. II, 6: 11 & 47. 1901. Type: Guyana, Mt. Roraima, upper slopes McConnell & Quelch 16, (holotype K, photo NY).

Liana 6-10 m long; latex sticky. Stem glabrous, quadrangular, more or less succulent, red. Petiole ca. 0.7 cm long; blades coriaceous, 5-7 x 1.5-2.5 cm, reflexed at margin, acuminate at apex, cuneiform at base, bright green above, grayish below; margin and primary vein reddish; secondary veins 0.5-0.1 cm apart. Inflorescence with buds greenish-white, flower subsessile with pedicel 0.2-0.3 cm long; bracts minutely ovate, scarious. Sepals triangular, ca. 0.2 cm long with one colleter within, lacerate; corolla infundibuliform, glabrous, yellow within, narrow part of tube crimson, 2-3 cm long, lobes white to yellow, glossy, ca. 1 cm. Follicles glabrous, more or less articulated, 10-15 cm long; young fruit crimson to brownish; seeds ca. 0.6 cm long, hair tuft 1.5 cm long.

D i s t r i b u t i o n : Venezuela, Guyana and Peru; savanna, alt. 1300-1500 m. (GU: 9).

S e l e c t e d s p e c i m e n s : Guyana: Pakaraima Mts, Mt. Aymatoi (sandstone), 1150m, Maas et al. 5801, 5824, (U); Kaieteur Plateau, savannas, Maguire & Fanshawe 23170 (NY, U); Upper Mazaruni R. basin, Tillett et al. 44902 (NY, P).

P h e n o l o g y : Flowers in June-October. Fruits in July-January.

17. **Mandevilla villosa** (Miers) Woodson, Ann. Missouri Bot. Gard. 19: 70. 1932.—*Laseguea villosa* Miers, Apoc. S. Amer.: 250. 1879. Type: Nicaragua, Seemann 95 (holotype BM, not seen).

Echites comosa Kuntze, Rev. Gen. 2: 414. 1891. Type: Guatemala, Bernoulli & Cario 1341. (holotype B, isotype K, photo P). Paratypes: Venezuela, Spruce 3051 (holotype K, isotypes P, NY); Spruce 3599 (holotype K) .

Liana to 10 m long. Stem very slender, hirsute. Leaves hastate; petiole 1.5-3.5 cm long, slender; blades membranous, 8-9 x 3-3.5 cm, acuminate, acumen ca. 1 cm long, sagittate, auriculate at base; secondary veins straight, perpendicular to primary vein, densely hirsute. Inflorescence axillary; bracts petaloid, 1-3.5 cm long, foliaceous. Sepals triangular, acute, ca. 1.5 cm long; corolla light yellow externally, deep red inside lobes and throat, tube lower part 1.5 x 0.4 cm, upper part 2 x 1.3 cm, lobes obliquely obovate 2 x 1.5 cm. Follicles 14-15 x 0.4 cm, connate at tip, tomentose.

D i s t r i b u t i o n : From Mexico to Venezuela; is reported here from Guyana for the first time. (GU: 1).

Note : The species is close to *Mandevilla rutila* Woodson, but differs by its foliaceous bracts, 1-3.5 cm long.

Specimen examined : Guyana: upper Mazaruni R., Kamarang, trail W of airstrip, tropical moist forest, 505-545 m alt., Boom et al. 8210 (NY).

Phenology : Flowers in June.

MESECHITES Müll.Arg., in Mart., Fl. Bras. 6(1): 150. 1860.

Type: *M. mansoana* (A.DC.) Woodson

Lianas, sometimes shrubby. Latex white, milky. Leaves opposite, blades with few colleters near base of primary vein on upper surface, rounded or cordate at base. Inflorescence in axillary cymes; peduncle with lenticels. Sepals 5, persistent, basally connate, narrowly ovate, with colleters free or coalesced; corolla green, white or pink, tube of 2 cylindrical parts, longer than lobes, salverform, lobes aestivation dextrorse, oblique; stamens partly sterile, anthers long-ovate, adherent to style head, not sagittate; disc 5-lobed; ovary apocarpous, glabrous, style head enlarged at base with 5 prominent ridges, and 2 short apical appendages. Fruit of 2 cylindrical follicles, slightly constricted, apex acuminate, dehiscing along ventral suture, valves white and shiny inside; seeds brown, acuminate, apex truncate, with brownish apical hair tuft, anemochorous, embryo straight, cotyledons longer than radicle.

Distribution : 14 species from Central and South America, and the Greater and Lesser Antilles, 1 in the Guianas.

1. **Mesechites trifida** (Jacq.) Müll.Arg., in Mart., Fl. Bras. 6(1): 151. 1860.

–*Echites trifida* Jacq., Enum. Syst. Pl. 13. 1760; Select. Stirp. Amer. Hist. 31, pl. 24. 1763. Type: Colombia, Cartagena, Jacquin, bought by Banks, (J. Arnold Arbor. 63: 69. 1982) from Howard (holotype K)

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– Plate 4, fig. 13.

Echites japurensis Stadelm., Flora 24 (1): Beibl. 19. 1841. –*Mesechites japurensis* (Stadelm.) Müll. Arg., in Mart., Fl. Bras. 6(1): 152. 1860. Type: Stadelm. (Herb. and types unknown).

Echites tubulosa Benth., J. Bot. (Hooker) 3: 249. 1841. Type: Guyana, Rob. Schomburgk I 311 (holotype K, isotype SING).

Echites surinamensis Miq., Stirp. Suriname Select.: 155. 1851. –*Mesechites surinamensis* (Miq.) Müll. Arg., Linnaea 30: 454. 1860. Type: Suriname, Hostmann 1102, (holotype U, isotype NY).

Echites disadena Miq., Stirp. Suriname Select.: 156. 1851. –*Mesechites disadena* (Miq.) Müll. Arg.,

Linnaea 30: 454. 1860. Type: Suriname, Hostmann 549, (holotype U, isotype NY).

Echites pallida Miers, Apocyn. S. Amer. 195. 1878. Type: Ecuador, Guayaquil, Hartweg 670n (holotype BM).

Echites rigida Rusby, Mem. New York Bot. Gard. 7: 325. 1927. Type: Cardenas 2042 (holotype NY).

Echites varia Stadelm., Flora 24 (1): Beibl. 19. 1841. (Herb. and types unknown).

Liana, twining, slender. Stem rough, red when exposed to sun; internodes enlarged; each leaf axil bearing either an inflorescence or a stem-bud and central axis. Petioles slender, rather incurved, sulcate, ca. 1 cm long; colleters 2-5 at base of primary vein above; blades membranous, oblong-lanceolate, 5-12 x 2-8 cm, apex acuminate, base obtuse, glabrous, upper surface greenish brown, lower surface pale, wrinkled when dry; secondary veins 7-8 pairs; tertiary veins reticulate, rather distinct below. Primary inflorescence cymose, definite, composed of 3 partial inflorescences, each 3-5-flowered, indefinite, cymose. Flowers glabrous. Sepals with 5 asymmetric lobes,

ciliate, with numerous colleters at base, ca. 0.7 cm long; corolla tube with lower part, below stamens, ca. 2 cm long, pale pink or pale violet (color varying with exposure to sun), upper part green, ca. 1.2 cm long, lobes enlarged towards left, fringed, ca. 0.7 cm long, yellowish-green, reflexed; stamens narrow, filaments incurved, pubescent; a part of sterile anthers adherent to filaments; disc about half as high as ovary; style slender ca. 1.5 cm long. Follicles green, adherent when young at apex, later separate, mucronate, ca. 30 x 0.5 cm, rather inconspicuously contracted; seeds mucronate, ca. 0.7 cm long; hair tuft brownish, ca. 2 cm long, embryo straight.

D i s t r i b u t i o n : From Honduras to Brazil and the Guianas. (GU: 22; SU: 8; FG: 53).

S e l e c t e d s p e c i m e n s : Guyana: Kaieteur Falls, Hahn et al. 4009 (P, US); Takutu-Essequibo Reg., McDowell 1962 (CAY, P, US); 2380 (P, US). Suriname: Whilelmina Mts., Irwin et al. 55424; 55628 (NY, U). French Guiana: Sinnamary R., Cr. Tigre, Hoff et al. 6586 (CAY, P); Mt. Kaw, Cowan 38769 (NY).

V e r n a c u l a r n a m e : French Guiana: ipokasilisili (Wayampi).

P h e n o l o g y : Flowers throughout the year. Fruits in July-November.

U s e s : Grenand et al. (1987:128).

22. **ODONTADENIA** Benth., J. Bot. (Hooker) 3: 242. 1841.

Type: *O. macrantha* (Roem. & Schult.) Markgr.

Echites pro parte, not P. Browne.

Anisolobus A.DC., Prodr. 8: 395. 1844.

Cylicadenia Lem., Van Houtte, Illustr. Hort. 2: Misc. 9, 1855.

Angadenia Miers, Apocyn. S. Amer.: 182. 1878. pro parte.

Perictenia Miers, Apocyn. S. Amer.: 182. 1878.

Mitozus Miers, Apocyn. S. Amer.: 217. 1878. pro parte.

Codonechites Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 9 : 80. 1924.

Haplophandra Pichon, Mém. Mus. Nat. Hist. Nat. sér. 2, 20: 301. 1948.

Shrubby lianas, rarely suberect shrubs. Latex white. Leaves opposite, without colleter at base of blades; secondary veins curved; tertiary veins forming a fine, dense, network, perpendicular to secondary veins. Inflorescences cymose, axillary to terminal; buds trigonal, acute. Sepals equal or unequal with only 1-5 colleters inside at margins or numerous colleters at base; corolla infundibuliform, narrowly infundibuliform, rarely subsalverform to salverform; lobes symmetric, aestivation dextrorse; anthers sagittate, adherent and agglutinated to style head; disc entire to 5-lobed or with numerous divisions, concrescent at base; ovary apocarpous, many-ovulate, style head turbinate, apex bilobate. Fruit apocarpous, cylindrical or ovoid, 2 follicles, dehiscing along a ventral suture; seeds numerous, cylindrical, striate, apiculate with brown or white hair tuft, anemochorous, embryo straight, with short radicle.

D i s t r i b u t i o n : 20 species from the Antilles, Central and South America.

L i t e r a t u r e: Morales, J.F., A synopsis of the genus *Odontadenia*, Bull. Jard. Bot. Nat. Belg. 67: 381-477, 1999.

KEY TO THE SPECIES

- | | | |
|---|--|---|
| 1 | Sepals equal or nearly so, not ciliate | 2 |
| | Sepals very unequal, outer ones shorter, ciliate | 5 |
| 2 | Leaves very large, membranous, unicolorous | 3 |
| | Leaves < 10 cm long, coriaceous, bicolorous | 4 |

- 3 Sepals with 1 colleter at base, near margin; corolla tube
0.4 cm diam. 9. *O. sylvestris*
- Sepals with 2-4 colletes at base the margin; corolla tube
0.8 cm diam. 4. *O. macrantha*
- 4 Sepals ca. 0.1 cm long 3. *O. glauca*
Sepals 0.3-0.5 cm long 1. *O. cururu*
- 5 Corolla minutely puberulent on outside 7. *O. puncticulosa*
Corolla glabrous except margin of lobes, ciliate 6
- 6 Corolla infundibuliform..... 7
Corolla salverform 2. *O. geminata*
- 7 Sepals adpressed to corolla, tube twisted..... 5. *O. nitida*
Sepals not adpressed to corolla, tube not twisted 8
- 8 Sepals as long as lower part of corolla tube, glabrous..... 6. *O. perrottetii*
Sepals half the length of lower part of corolla tube,
pubescent 8. *O. sandwithiana*

1. **Odontadenia cururu** (Mart.) K.Schum., Engler & Prantl, Nat. Pflanzenfam.

4(2): 169. 1895.—*Echites cururu* Mart., in Buchn. Rep. Pharm. : 101.

1830.—*Anisolobus cururu* (Mart.) Müll.Arg., in Mart., Fl. Bras. 6(1): 112.

pl. 34. 1860.—*Angadenia cururu* (Mart.) Miers, Apocyn. S. Amer.: 175.

1878. Type: Brazil, Rio Negro, Martius 2875, not seen. lecto-M, designated by Morales.

Odontadenia kochii Pilger, Repert. Spec. Nov. Regni Veg. 8: 151. 1910. Type: Brazil,

Amazonas. Koch 70 (holotype B, photo-US) syn. nov.

Odontadenia surinamensis Woodson, Ann. Missouri Bot. Gard. 22: 310. 1935. Type: Suriname,

Tapanahoni, Versteeg 680 (holotype U, isotype MO).

Liana. Stem with numerous small lenticels. Petiole 1.3-1.4 cm long; blades elliptic, 14-15 x 5-7 cm, acuminate, base rounded; secondary veins 8-9 pairs, arched, anastomosing in an undulate vein 0.1-0.2 cm from margin; tertiary reticulation clearly visible. Inflorescence terminal, ca. 15-flowered; pedicels ca. 1.5 cm long, slender. Flowers very slender. Sepals sub-equal, very adpressed on corolla, becoming triangular after fall of corolla, 0.3-0.5 cm long; corolla yellow, tube gradually infundibuliform, 3-4 cm long, ca. 0.1 cm in diam. at base, 0.05 cm at throat, lobes 0.7-0.9 cm long. Follicles fusiform, ca. 1.9 x 2 cm, angled at 90-100°, ribbed, pubescent.

D i s t r i b u t i o n : Suriname and French Guiana. (SU:1; FG: 3).

S p e c i m e n s e x a m i n e d : French Guiana: Trois Sauts, Oyapock Grenand 512; 549 (CAY); Itany et Marouini, Serv. Forest. 7974 (CAY, P, U).

V e r n a c u l a r n a m e s : French Guiana: ipokasilisili (Wayampi); lait-tetei (Paramaca).

P h e n o l o g y : Flowers in July, September-October. Fruits in November.

2. **Odontadenia geminata** (Roem. & Schult.) Müll.Arg., in Mart., Fl. Bras. 6(1): 119. 1860 (pl. 35b, non *O. hypoglauca*).—*Echites geminata* Roem. & Schult., Syst. Veg. 4: 795.1819.—*Angadenia geminata* (Roem. & Schult.) Miers, Apocyn. S. Amer.: 178. 1878. Type: Brazil, Pará, Sieber in Hoffmannsegg s.n., Willd. 5157 (holotype B-W, photo NY).

Echites elegans Benth., J. Bot.(Hooker) 3: 249. 1841.—*Angadenia elegans* (Benth.)

Miers, Apocyn. S. Amer.: 177. 1878. Type: Guyana, Rob. Schomburgk I 965 (holotype B, isotype P), 1840 (fl.). Paratype: Guyana, Schomburgk 33. 1868 (holotype P).

Echites coriacea Benth., l.c.: 249. 1841.—*Odontadenia coriacea* (Benth.) Müll.Arg.,
 Linnaea 30: 450. 1860.—*Agadenia coriacea* (Benth.) Miers, Apocyn. S. Amer.: 177. 1878.

Type: Guyana, Pirara, Rob. Schomburgk I 738 (holotype K).

Odontadenia poeppigii Müll.Arg., in Mart., Fl. Bras. 6(1): 119. 1860.—*Angadenia
 poeppigii* (Müll.Arg.) Miers, Apocyn. S. Amer.: 179. 1878. Type: Brazil, Amazonas, Ega,
 Poeppig 2866 (holotype W).

Liana 8-10 m long, slender. Petiole 0.5-0.7 cm long; blades membranous, elliptic-lanceolate 14-15 x 4-7 cm, acuminate or rounded, mucronate, base obtuse, shining above, grayish-velvety abaxially, colleters numerous at node. Inflorescence axillary, surpassing leaves; each leaf axil bearing pseudo-raceme composed of 2 flowers subtended by one bract; pedicels, calyx, and corolla tube green. Sepals unequal, not adpressed to corolla, corolla salverform to subsalverform, scarious with 2-3 colleters at base of margin, tube not twisted, cylindrical, swollen at middle, upper part infundibuliform ca. 1 x 0.5-0.8 cm, lobes yellow, 2.5-3 cm long, ovate-dolabriform, mucronate; stamens 0.1 cm long, dorsally glabrous. Follicles cylindrical, straight or a few curved, 8-10 x 0.6 cm; seeds numerous with hair tuft brown.

D i s t r i b u t i o n : Colombia, Venezuela, Guyana, Suriname, Brazil, Peru and Bolivia. (GU: 27; SU: 5).

S e l e c t e d s p e c i m e n s : Guyana: Potaro R., Tumatumari, Gleason 414 (NY); Margins of upper Abary R., Maas et al. 5439 (U); Rupununi Distr., Jerome's place, Jansen-Jacobs et al. 5035 (U). Suriname: near Vierkinderen, savanna, Lanjouw & Lindeman 188 (U); Wonotobo, Corantine R., Stahel et al. 2862 (U).

P h e n o l o g y : Flowers in March-April and October-December. Fruits in February and December.

3. **Odontadenia glauca** Woodson, Ann. Missouri Bot. Gard. 18: 550. 1931 & 22: 304. 1935. Type: Venezuela, Amazonas, upper Orinoco R., Holt & Blake 750 (holotype US, photos MO).

Liana. Stem reddish, glabrous, not lenticellate. Leaves glabrous, coriaceous, elliptic to obovate, 13-15 x 4.5-5 cm, acuminate, cordate at base, margin strongly revolute, shining on upper face, glaucous abaxially; secondary veins 12-13 pairs; tertiary veins prominent abaxially. Inflorescence axillary, surpassing leaves, few-flowered (5-6); peduncle ca. 5 cm; pedicels ca. 2 cm long. Sepals ca. 0.1 cm long, scarious at margin, adpressed to corolla; corolla bright yellow, orange-yellow within tube, tube cylindrical at base ca. 0.7 x 0.2-0.3 cm, upper part infundibuliform, 2.3-2.5 x 0.8 cm at throat, lobes ca. 1.5 x 1 cm. Fruit unknown.

D i s t r i b u t i o n : Venezuela and Guyana. (GU: 5).

S e l e c t e d s p e c i m e n s : Guyana: upland forest, Butukari, Gleason 733 (NY); Atkinson, St Cuthbert's Trail, Flora of British Guiana 87 (NY); Potaro R. Amatuk, sandy ground by the Falls, Sandwith 1513 (U).

P h e n o l o g y : Flowers in September.

4. **Odontadenia macrantha** (Roem. & Schult.) Markgr., in Pulle, Fl. Suriname 4(1): 461. 1937.—*Echites macrantha* Roem. & Schult., Syst. Veg. 4: 795. 1819. Type: Brazil, s. loc., Sieber in Hoffmannsegg s.n., Willd. 5162 (holotype B-W, microfiche) (non Sprengel). – Fig. 14.

Echites grandiflora G.Mey., Prim. Fl. Essegu. 131. 1818, not Roxb.—*Odontadenia*

grandiflora (G.Mey.) Kuntze, Revis. Gen. Pl. 2: 416. 1891, non Miq. 1851. Type: Suriname,

Hostmann 1217, (holotype W; isolecto- BM, G, U).

Echites hoffmannseggiana Steud., Nomencl. Bot. ed. 2, 1: 539. 1840.—*Odontadenia*

hoffmannseggiana (Steud.) Woodson, ex Gleason & A.C.Sm., Bull. Torrey Bot. Club 60: 392.

1933; Woodson, Ann. Missouri Bot. Gard. 22: 296. 1935. Type: Guyana, Rob. Schomburgk I 309

(Holotype K).

Dipladenia harrisii Purdie in Hook. f, Bot. Mag. 81. t. 4825, 1855. Type: t. 4825, 1855.

Liana ca. 15 m, glabrous; latex copious. Petiole 1.2-3 cm long; blades firmly membranous, elliptic to ovate-lanceolate, 12-22 (-40) x 4-10 cm, acuminate, dark green, shiny; veins pale green. Inflorescence axillary in lax dichasial cymes; pedicels 2-2.5 cm long; bracts persistent. Flowers sweetly fragrant, tube yellow, reddish or orange-tinged. Sepals yellow, broadening like a goblet, ca 0.8-1 cm diam. at top, more or less equal, with 2-5 colleters at base of red margins, corolla tube inflated at base, ca. 0.8 cm in diam., constricted at insertion of stamens, infundibuliform above, 2.5-3.5 cm long, 1.8-2 cm in diam. at throat, lobes obliquely obovate, 2-3.5 cm long, with 5 red spots at top of tube; anthers hirtellous; disc 5-lobed and lacinate, around 2 ovaries, glabrous. Fruit of 2 follicles, or 1 by abortion, ellipsoid, 15-30 x 4-5 cm, glabrous, yellow-brown to black, longitudinally ribbed, shortly acuminate; seeds cylindrical, apiculate at base and apex, ca. 4.5 cm long; hair tuft white-brown, ca. 4 cm long, embryo straight, with short radicle.

D i s t r i b u t i o n : Honduras, Nicaragua, Costa Rica, Panama, Colombia, Trinidad, the Guianas, Brazil, Ecuador and Peru; cultivated in Botanical Gardens:

Georgetown, Singapore, etc. (GU: 35; SU: 24; FG: 36).

S e l e c t e d s p e c i m e n s : Guyana: Berbice R., Maas et al. 5568 (NY, P, U); E. Berbice-Corentyne Region, Hoffman 2437 (P, US). Suriname: Marowijne R., Lanjouw & Lindeman 2071 (NY, U); Wilhelmina, Lucie R., Irwin et al. 55603 (NY, U). French Guiana: Mana, entre Saut Tamanoir et Saut Dalles, Cremers 7207 (CAY, P); Oyapock, en aval des Trois-Sauts, Oldeman T 975 (CAY, P).

Vernacular names: Suriname: merkitité. French Guiana: manatkasi epit (Wayana); ipokasili (Wayampi).

Phenology: Flowers year-round. Fruits in December.

Uses: See Grenand et al. (1987: 128). Often cultivated, ornamental.

5. **Odontadenia nitida** (Vahl) Müll.Arg., in Mart., Fl. Bras. 6 (1): 119. 1860.
 –*Echites nitida* Vahl, Eclog. 2: 19. t.13. 1798.–*Angadenia nitida* (Vahl)
 Miers, Apocyn. S. Amer.:177. 1878. Type: South America, s. loc. 1796, von
 Rohr 64, (holotype: C).= Fig. 16, 1-10.

Echites lucida Roem. & Schult., Syst. Veg. 4: 795. 1819.–*Odontadenia lucida* (Roem. & Schult.)
 Müll.Arg., in Mart., Fl. Bras. 6(1): 119. 1860.–*Rhabdadenia ? lucida* (Roem. & Schult.) Miers,
 Apocyn. S. Amer. 123. 1878. Type: Venezuela, Orenoque R., Humboldt & Bonpland s.n. (holotype P).

Odontadenia cordata A.DC., Prodr. 8: 360. 1844. Type: Guyana, Demerara R., 1824, Parker s.n.
 (holotype G-DC, photo NY).

Odontadenia angustifolia A.DC., Prodr. 8: 360. 1844. Type: French Guiana, Cayenne s.d., s.
 coll. (hand-writing of von Rohr that I compared with others types) (holotype G-DC, isotypes G, W).

Mitozus tenellus Miers, Apocyn. S. Amer.: 220.1878. Type: id.

Odontadenia dusendschoenii K.Schum. ex Ule, Engler's Jahrb. 40: 403. 1908, nom.nud.

Liana scrambling over shrub, to 15 m long. Stem slender, not lenticellate. Petiole 1-1.5 cm long; blades coriaceous, elliptic, apex acuminate or obtuse, base cordate or subcordate, glabrous, thinly leathery, shining above, grayish-velvety abaxially.

Inflorescence axillary; flowers infundibuliform. Sepals sub-equal, adpressed to corolla; not scarious, acuminate, 0.4-0.5 cm long, 3 colleters at base along margin; corolla infundibuliform, green, tube pink at base, lower part 0.7-1 x 0.15 cm, spirally twisted, upper part cream-yellow, 1.7-2.3 x 0.6 cm, lobes ca. 1 cm long, pale yellow,

striped reddish orange in throat; anthers dorsally pubescent; disc 5-lobed shorter than ovaries, glabrous, crenulate. Follicles cylindrical, 19-22 x 0.8 cm, glabrous, flat, curved, green; seeds cylindrical, apiculate at apex; hair tuft ca. 3 cm long, pale brown, embryo straight with cotyledons five times as long as radicle.

D i s t r i b u t i o n : Colombia, Venezuela, Trinidad, the Guianas, Brazil, Peru and Bolivia. (GU: 18; SU: 23; FG: 41).

S e l e c t e d s p e c i m e n s : Guyana: Rupununi savanna, Jansen-Jacobs et al. 494 (CAY, U); Potaro-Siparuni region, Kvist et al. 7 (BRG, U, US). Suriname: Kayser Airstrip, Irwin et al. 55923 (U); Dam, Sarakreek, Florschütz 163 (U). French Guiana: Monpé Soula, haut Marouini, de Granville et al. 10108 (B, CAY, INPA, NY, P, U, US); 1.5 km South West Toukouchipan, Sastre 1750 (CAY, P).

P h e n o l o g y : Flowers throughout the year. Fruits in September.

U s e s : See Grenand et al. (1987: 129).

6. **Odontadenia perrottetii** (A.DC.) Woodson, Ann. Missouri Bot. Gard. 18: 546. 1931.—*Anislobus perrottetii* A.DC., Prodr. 8: 395. 1844. Type: French Guiana, Cayenne, Perrottet 270 (holotype G-DC, isotype P, photo NY, US).

Anislobus oblongus Miers, Apocyn. S. Amer. 169, pl. 26. 1878. Type: Brazil, Itagoahy, Bowie & Cunningham (holotype BM, not seen).

Note: Morales (455, fig. 19) make a new species, *Odontadenia markgrafiana* J.F. Morales, with included Mori et al. 21594, but not, Mori & Boom 15362 (CAY, NY, P); id., Mori & Gracie 21161, in the same locality. He has seen only 2 parts from

French Guyana for 33 parts in this work. Sepals are as long as the lower part of the corolla tube, ciliate, with 5 colleter within.

Liana 3 m x 1.8 cm diam.; latex produced in concentric ring. Stem with bark reddish brown with large transverse, lenticels split length wise. Leaves coriaceous, discolorous, ca. 8 x 3 cm, acuminate; tertiary veins with black dots. Inflorescence terminal, many-flowered (when axillary, subsessile, few-flowered, 5-6 flowers); pedicels very slender, 2-3 cm long. Sepals as long as lower part of corolla tube, obtuse, ciliate, 1.5 cm long; numerous colletes at base; corolla infundibuliform, light yellow, glabrous outside, lower part of tube slender, 1.5-2 x 0.2 cm, shorter than upper part, 2.5-3 x 0.8 cm, lobes 1-1.5 x 1 cm; anthers densely hirtellous dorsally; disc 5-lobed concrescent, longer than ovary, lacinate; ovary glabrous. Fruit of 2 follicles (or 1 by abortion), divergent at ca. 180-200°, green, tomentose, acuminate, calyx persistent, ca. 11-13 x 1.2-1.5 cm; seeds with hair tuft 3 cm long, pale brown.

D i s t r i b u t i o n : Panama, Venezuela, the Guianas, Brazil (Matto Grosso) and Bolivia. (GU: 12; SU: 6; FG: 33).

S e l e c t e d s p e c i m e n s : Guyana: South Timeuri, Walaba Forest, white sand, Maas et al. 3616; Mabura Hill, Stoffers et al. 63; 164 (CAY, P, U). Suriname: Lucie R., LBB (Schult) 10367 (U); Brokopondo, Natural Reserve Brownsberg, LBB (Teunissen) 14662 (U). French Guiana: Saül, Mts. La Fumée, Mori & Boom 15362 (CAY, NY, P); id., Mori & Gracie 21161 (CAY, NY, P), 21594 (CAY, NY, P, U, US).

P h e n o l o g y : Flowers in June-December. Fruits in March-April.

7. **Odontadenia puncticulosa** (Rich.) Pulle, Enum. Pl. Suriname: 383.1906.
–*Echites puncticulosa* Rich., Act. Soc. Hist. Nat. Paris 1: 107. 1792.

Type: French Guiana, s. loc., Le Blond 389, (holotype P-LA, isotypes G, P).

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– Fig. 16, 11-18.

Anisolobus kappleri Miq., Linnaea 18: 737. 1844. Type: Suriname, s. loc., Hostmann 357 (holotype P, isotype NY). Paratype: Suriname, Kappler 1203 a (holotype U).

Anisolobus puncticulosus Miq., Stirp. Suriname Select.: 158. 1851. Type: Suriname, Hostmann 629, (isotype P).

Anisolobus hostmanni Miq., Stirp. Suriname Select.: 158. 1851.–*Odontadenia hostmanni* (Miq.) Pulle, Type: Suriname, s. loc., Hostmann 357 (holotype U, isotypes BM, K, NY, PS, W).

Anisolobus fockei Miq., Stirp. Suriname Select.: 159. 1851. Type: Suriname, Hostmann 1203, (.....holotype U, isotype P).

Echites cururu Mart. var. *grandiflora* Stadelm., Bot. Zeit.: 78. 1841.–*Angadenia grandiflora* (Stadelm.) Miers, Apocyn. S. Amer.: 175. 1878. Type: Brazil, Stadelm. (Herb. and types unknown, Stafleu & Cowan, 1985).

Odontadenia spoliata Malme, Ark. Bot. 21 A (6): 16. 1927. Type: Brazil, Mato Grosso, Santa Ana da Chapada, Malme 2036 (holotype S).

Liana 30-40 m long; latex copious. Stem twining, with numerous lenticels. Leaves coriaceous, discolorous, ovate to ovate-elliptic; tertiary veins with black dots beneath. Inflorescence terminal and axillary, many-flowered, surpassing leaves; pedicels 0.75-1 cm long, slender. Sepals, 0.3-0.5 cm long (0.5-0.6 cm fresh), obtuse, pubescent, ciliate at tip, very unequal; corolla infundibuliform, yellow, minutely puberulent on outside, lower part of corolla tube slender, 1-1.5 x 0.3 cm, shorter than upper part, 2-2.5 x 0.6 cm, lobes obliquely oblong, 2-2.5 cm long; anthers densely hirtellous dorsally; disc concrescent, longer than ovary, glabrous, style spirally twisted. Follicles diverging < 180°, cylindrical, ca. 2.2 x 1.5 cm, abruptly acuminate, ribbed; pubescent pericarp woody, thin, brown-yellow; seeds 1.5 x 0.5 cm, glabrous, base abruptly acute, acuminate at top; hair tuft ca. 3 cm long.

D i s t r i b u t i o n : Panama, Colombia, Venezuela, the Guianas, Brazil and Peru. (GU: 15; SU: 16; FG: 52).

S e l e c t e d s p e c i m e n s : Guyana: margins of Berbice R., Maas et al. 5465 (U); Essequibo R., Moraballi Cr., near Bartica, Sandwith 611 (P, U). Suriname: s.loc. Hostmann 629n (P). French Guiana: Route Cayenne-Kourou, PK 63, Prévost 742 (CAY, P); Forest Macouria, Skog et al. 7047 (P, U, US).

V e r n a c u l a r n a m e s : French Guiana: blomqui (Serv. For. 5115); ipokasili là (Wayampi).

P h e n o l o g y : Flowers in October-December. Fruit in December. B. Bordenave has observed that the flowers are closed at night and open in the morning. They are pollinated by hummingbirds (pers. comm.) (see also B. Bordenave in Mission Radeau des cimes, Biologie d'une Canopée de forêt équatoriale: 115-124, 1989).

8. **Odontadenia sandwithiana** Woodson, Ann. Missouri Bot. Gard. 18: 547. 1931. Type: Guyana, Essequibo R., Sandwith 552 (holotype K, photo MO, NY).

Liana, slender. Leaves 9.5-10 x 3-3.5 cm. Inflorescence axillary or sub-terminal, longer than leaves. Sepals half the length of lower part of corolla tube, pubescent, ca. 0.5-1 cm long; corolla infundibuliform, ca. 3 cm long, slender, orange, glabrous except at margin of lobes, ciliate, tube 2 cm long, lobes ca. 1 cm long. Follicles fusiform, ca. 6 x 0.8 cm, divergent at ca. 180°, covered by minute pale-brown tomentum, acuminate, calyx persistent.

D i s t r i b u t i o n : Guyana, French Guiana and Brazil. (GU: 2; FG: 2).

S p e c i m e n s e x a m i n e d : Guyana: Anakura R., de la Cruz 3542 (NY); Essequibo R., Sandwith 552. French Guiana: Comté R., roche Fendue, 60 Km S S-W Cayenne, Mori & Veyret 8944 (CAY, P, NY); New road to Brazil, Comté R., 60 Km S Cayenne, Mori 8893 (CAY, P, NY).

P h e n o l o g y : Flowers in January-March. Fruits in January.

U s e s : See Grenand et al. (1987: 128 under *O. cururu* K.Schum.).

9. **Odontadenia sylvestris** (A.DC.) Müll.Arg., in Mart., Fl. Bras. 6(1): 17.1860.—*Echites sylvestris* A.DC., Prodr. 8: 464. 1844.—*Angadenia sylvestris* (A.DC) Miers, Apoc. S. Am.: 174. 1878. Type: Brazil, Prov. Río Negro, Japurensis, Martius 3009 (holotype M, microfiche).

.....
– Fig. 15.

Liana to 5 m long; latex copious. Stem green, soft, wood white. Leaves in whorls of 5 at base, opposite, beginning alternate at top of flowering stems, petiolate; blades membranous, ca. 25 x 10 cm, unicolorous, glabrous, glossy on upper surface; venation in very evident relief on both surfaces. Inflorescence much branched, pendulous, with numerous flowers, sweet-smelling. Sepals green, ca. 0.4 cm long with 1 colleter at base of margin; corolla yellow, tube ca. 0.35 x 0.4 cm at base, lobes ca. 2 cm, very pale orange on inner face. Fruit of 2 follicles often with only 1 follicle developed; seeds trigonal-cylindrical, apiculate at base and apex, 4.5 cm long, hair tuft white-brown, 4 cm long, embryo straight, with short radicle.

D i s t r i b u t i o n : Colombia, French Guiana and Brazil. (FG: 21).

S e l e c t e d s p e c i m e n s : French Guiana: Bassin de l'Oyapock, Cremers 9886 (B, CAY, P, U, NY, US); Cr. Gabaret, Oyapock, Jacquemin 2298 (CAY, P); Sinnamary, Cr. Tigre, Prévost 1553 (CAY, P).

V e r n a c u l a r n a m e : French Guiana: maoksi ababia (Palikur).

P h e n o l o g y : Flowers in February-August.

23. **PACOURIA** Aubl., Hist. Pl. Guiane 1: 268, pl. 105.1775.

Type: *P. guianensis* Aubl.

Lianas. Latex white, sticky; stems brown, with lenticels and indument when young. Leaves opposite, elliptic or oblong. Inflorescence a panicle, terminal or axillary; axis of panicle robust, forming a hook. Flowers clustered, subsessile; stamens free from style head; ovary globose, hairy, syncarpous, unilocular, ovules many (10-36) on 2 parietal placentas; style head simple, cylindrical, with 2 free apical appendages. Fruit a globose berry, green to yellow, with whitish lenticels; latex abundant; pulp yellowish, sweet-tasting; seeds ca. 12, ellipsoid, glabrous, endozoochorous, embryo cordate, radicle smaller than cotyledons.

D i s t r i b u t i o n : 2 species in the Guianas, Brazil and Bolivia; 1 of which occur in the Guianas.

L i t e r a t u r e : Pichon, M., Monographie des Landolphiées, Mém. Inst. Fr. Afrique noire 35: 245-250. 1953.

1. **Pacouria guianensis** Aubl., Hist. Pl. Guiane 1: 268, pl. 105. 1775. Poir. in Lam., Tabl. Encycl. 2: 291, pl. 169. 1819. Type: lectotype Aublet in P-JJR

7, n. 232 (designated by Pichon), isotypes BM, LINN. 440-2. –*Willughbeia guianensis* (Aubl.) J.F.Gmel., Syst. Nat. 2: 434. 1791. –*Landolphia guyanensis* (Aubl.) Pulle, Enum. Vasc. Pl. Suriname: 379, pl.16. 1906. Markgr., in Pulle, Fl. Suriname: 11. 1937. – Fig. 18.

Willughbeia scandens Willd., Sp. Pl. 1: 1231, 1798. Type: based on pl. 105, Aubl.

Landolphia paraensis Huber, Bol. Mus. Goeldi, Pará 6: 88. 1910. –*Pacouria paraensis* (Huber)

Pichon, Mém. Mus. Nat. Hist. Nat. sér. 2, 24: 144. 1948. Type: Brazil, Huber 9341 (holotype P, isotype U).

Liana to 10 m long. Branches cylindrical except at nodes, lenticellate, velutinous when young. Leaves decussate but with petiole twisted. Petiole ca. 0,5 cm long, pubescent, with numerous intrapetiolar colleters; blades elliptic, 17-18 x 8-9 cm, shortly acuminate, base cordate or subtruncate, upper surface dark green, lower surface pale green; secondary veins 9-14 pairs, prominent abaxially, tomentose; tertiary veins reticulate. Inflorescence 10-20-flowered. Sepals brown, hairy, ca. 0.2 cm long, glabrous and without colleters within; corolla tube salverform, ca. 1 cm long, cream to pale yellow, staminiferous at base, sparsely hairy at this level, lobes straight, linear-oblong, ca. 1 cm long, sparsely hairy and ciliate; anthers linear, rounded at base; ovary globose, ca. 0.1 cm long, style twice as long as ovary, style head as long as body. Fruit lenticellate, ca. 8-15 cm diam.; seeds 10-12, ca. 2.5 x 1.5-1.8 cm, white, flattened, not arillate, embryo as long as seed, cotyledons elliptic, radicle straight, short, ca. 0.1 cm.

D i s t r i b u t i o n : The Guianas and Brazil (Pará); in primary rain forest, especially along riverbanks. About 40 collections studied (SU: 7; FG: 4).

S e l e c t e d s p e c i m e n s : Suriname: Coppename R., Boon 1200 (U); Tapanahoni R., Versteeg 741 (U). French Guiana: Arataye R., de Granville 99 (CAY, P, NY); Inini R., de Granville et al. 8179 (CAY, P, U, US).

Vernacular names: French Guiana: pacouri-rana (Galibi in Aublet), prispris (Geay), uwakasi (Wayampi), welek (Wayana).

Phenology: Flowers in April, August-September. Fruit in February-May, August-October.

Uses: Fruit edible. The latex is a source of gum. See Grenand et al. (1987:127, under *Landolphia guianensis* (Aubl.) Pulle).

24. **PARAHANCORNIA** Ducke, Arch. Jard. Bot. Rio de Janeiro 3: 242.

errata & corrigenda. 4, pl. 21. 1925.

Type: *P. amapa* (Huber) Ducke

Trees 10-35 m high. Trunk columnar, not buttressed; bark smooth. Latex non-poisonous, sticky, white, sometimes edible. Leaves opposite, petioles without colleter. Inflorescence not axillary and terminal. Flowers small, < 2 cm long, widening at middle at insertion of anthers, fragrant, aestivation sinistrorse. Sepals 5- or 4-lobed, with subtending bract; corolla white, corolla lobes as long as tube, not dilated towards right; anthers lanceolate, elliptic without sterile appendages, obovate, without extensions at base, dorsifixed, filaments glabrous; infrastaminal indument sparse; ovary syncarpous, pubescent at top, glabrous at level of disc, style ca. 0.2 cm long, style head pyriform. Fruit a berry, sometimes edible, 6-10 cm in diam. spherical, pericarp smooth with several to many seeds; seeds flattened, with hilum circular, not arillate, embryo as long as seed, radicle straight, short, endozoochorous.

Distribution: 7 species in tropical America, 1 in the Guianas.

1. **Parahancornia fasciculata** (Poir.) Benoist ex Pichon, Mém. Mus. Natn. Hist. Nat. 24: 123, 1948.—*Tabernaemontana fasciculata* Poir. in Lam., Encycl. 7: 53. 1807.—*Thyrsanthus fasciculatus* (Poir.) Miers, Apocyn. S. Amer. 100. 1878.—*Couma fasciculata* (Poir.) Benoist, Arch. Bot. Caen, Mém. 5: 253. 1933. Monach., Lloydia 6(4): 240. 1943.—*Macoubea fasciculata* (Poir.) Lemée, Fl. Guyane fr. 3: 298. 1954. Type: French Guiana, Cayenne, s. coll. (Richard ?) (holotype P-LA., designated here). – Fig. 19, 1-8.

Hancornia amapa Huber, Bol. Mus. Goeldi, Pará 3: 443. 1902.—*Parahancornia amapa* (Huber) Ducke, Arch. Jard. Bot. Rio de Janeiro 3: 26, 242. 1922; 4: pl. 21. 1925. Type: pl. 21.

Tree 25-30 m high, 70 cm dbh; bark dark brown, thin. Latex slightly bittersweet, edible. Leaves subcoriaceous; blades elliptic, ca. 7-8 x 3.5 cm, acuminate, dark green and shining above, pale green below, with horizontally spreading veins, base cuneiform. Inflorescence with numerous flowers. Flowers sweet smelling. Sepals usually 4, glabrous inside, ca. 0.1 cm long, minutely pubescent; corolla white, becoming yellow, tube pubescent outside, lobes as long as tube, glabrous; ovary glabrous except at top. Fruit a berry, pendent, at tips of short to elongated lateral branches, globose, 6-10 cm diam., exocarp turning dull purplish brown when mature, endocarp salmon-pink, pulpy; seeds 20-22, 1,8 x 0,9 x 0,3 cm, black, shiny, flattened.

D i s t r i b u t i o n : Venezuela, the Guianas and Brazil. (GU: 3; SU: 9; FG: 56).

S e l e c t e d s p e c i m e n s : Guyana: Mazaruni st., FD 3442 (Fanshawe 706) (NY). Suriname: Zanderij, Stahel (Wood Herb.) 140 (U); loc. id., BW 2512; BW 3916 (U). French Guiana: Charvein, Service Forestier 293 M (CAY, P); Charvein-Acarouany, Km 5.1, Service Forestier 7319 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: ducali. Suriname: doekali (Arawak), amapa (K). French Guiana: docali, stopoli (Saramacca), balata boti (Saramacca); mapa, lobi mapa (Paramaca).

P h e n o l o g y : Flowers in July-August. Fruits in July-February.

U s e s : See Grenand et al. (1987:129). Mixed with balata (gum from Hevea) in a ratio of 4 l to 20 l.

N o t e : Although the latex is bitter, after a slash through the bark, numerous black, melipone bees will cover the cut the next morning about 10:30 am.

25. **PESCHIERA** A.DC., Prodr. 8: 360. 1844.

Type: *P. hystrix* (Steudel) A.DC.

Shrubs or trees up to 20 m high, latex white. Flowering axis very variable, usually with 3-8 internodes; 3-8 pairs of chlorophyllous, isophyllous leaves, 1 pair of scale-leaves subtending to 1 or 2 juvenile stems and 1 pair of bracts subtending 2 inflorescences or one by abortion, and third terminal inflorescence. Nodes covered by numerous colleters. Sepals with colleters at base within; corolla not longer than 3 cm, tube of corolla swollen at base and at level of stamens, attenuate towards throat, glabrous, lobes 5, aestivation sinistrorse; stamens inserted at base of tube, sagittate with 2 sterile appendages, included; pollen 3 colporate, finely reticulate; infrastaminal indument usually spreading to upper part of ovary; ovary apocarpous, without obvious disc, style and ovary about equal length, style head with a basal involucre, divided into 5-10 segments, apical appendages about equaling body. Fruit of 2 dehiscent, warty or echinate follicles; seeds numerous, sulcate on raphae side; aril orange or red, incompletely covering seed, endozoochorous.

D i s t r i b u t i o n : 17 species of tropical America, Greater and Lesser Antilles to Argentina, 2 of which occur in the Guianas.

KEY TO THE SPECIES

- 1 Sepals 0.05 cm long, puberulous on both sides with 6-7 colleters
 at base inside, revolute *P. lagenaria*
 Sepals ovate, 0.2 cm long, obtuse, glabrous except on the margin,
 with 2-3 colleters at base , straight *P. vanheurckii*

1. ***Peschiera lagenaria*** (Leeuwenb.) L.Allorge, comb. & syn nov.

–*Tabernaemontana lagenaria* Leeuwenb. (1994: 315). Type: French Guiana, Mt. Belvédère, de Granville 7000 (holotype P, isotypes CAY, G, MG, MO, US, WAG, photos CAY, P).

Tabernaemontana echinata Aubl., Hist. Pl. Guiane 1: 263, pl. 103. 1775. –*Peschiera echinata* (Aubl.) A.DC., Prodr. 8: 360. 1844. –*Anacampta echinata* (Aubl.) Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 14: 163. 1938. (type: not seen). Lectotype, pl. 103. nomen rejiciendum, description based on a flowering branch of *Malouetia tamaquarina* Aubl. with large nodes and 3 branchlets, a short terminal inflorescence pauciflowered; a separate flower, n. 1-6 of *Bonafousia siphilitica* (L.f.) L.Allorge and a separate fruit, n. 7-9 of *Stenosolen heterophyllus* (Vahl) Markgr.

Tree 15-30 m high. Trunk glabrous; bark gray; timber white. Sympodial module not constant, comprising 1-3 pairs of more or less isophyllous, chlorophyllous leaves, and 1 pair of bracts subtending 1 inflorescence and 1 young branch. Petiole 0.5-0.7 cm long; blades membranous, ovate, 8-12 x 3-5 cm, acuminate, rather discolorous, lower surface paler than upper; secondary veins 13-14 pairs. Inflorescence with peduncles slender, 0.5-1 cm long. Sepals 0.05 cm long, ciliate, puberulous on both sides, with 6-7 colleters at base inside; corolla white, tube narrow, 0.6 cm long, lobes

making reflex angle with tube, 0.7 cm long; infrastaminal indument spreading out to throat; ovary obtuse, style slender, style head with involucre divided into 10 segments. Follicles reniform, warty, not acuminate, ca. 4-5 x 3 cm; seeds sulcate on raphae side, brown to black, embryo cordate, radicle longer than cotyledons.

D i s t r i b u t i o n : French Guiana. (FG: 6).

S e l e c t e d s p e c i m e n s : French Guiana: Trois Sauts, Grenand 978 (CAY, P); id., Jacquemin 1895 (fl.) (CAY, P, U, WAG), 2350 (fr.) (CAY, P); Camopi R., Mt. Belvédère, de Granville 7000 (CAY, G, MG, MO, US, WAG); haut Camopi, 11 km du Mt. Belvédère, Sabatier & Prévost 1674 (CAY, K, NY, P, U).

V e r n a c u l a r n a m e : French Guiana: soko soko (Wayampi).

P h e n o l o g y : Flowers in August-November. Fruits in March-October.

C h e m i s t r y : Of *Peschiera echinata* (Aubl.) A.DC. synonymous to *P. lagenaria*, leaves, bark, stems and roots of the species have yielded a dozen alkaloids (Gorbel, N & al., Journ. Nat. Prod. 44: 717-721. 1981); 2 are new; methoxy-10 eglandine from the bark and hydroxy-10 heyneanine from the leaves; the plant was collected by Jacquemin (Jacquemin 1895, CAY, P) in French Guiana .

2. ***Peschiera vanheurckii*** (Müll.Arg.) L.Allorge, Mém. Mus. Natn. Hist. Nat. IIB, 30: 154. pl. 68, 1985.—*Tabernaemontana vanheurckii* Müll.Arg., in Van Heurck, Obs. Bot.:168. 1870.—*Stenosolen vanheurckii* (Müll.Arg.) Markgr., Notizbl. Bot. Gart., Berlin-Dahlem 14: 177. 1938. Type: Peru, San Martin, near Tarapoto, Spruce 4209 (holotype AWH, isotypes BM, BP, BR, C, CGE, E, F, G, GH, GOET, K, LD, LE, MPU, NY, P, TCD, W).

Peschiera blanda Miers, Apoc. S. Am. : 44. 1878. Type: id.

Peschiera lingulata Miers, op. cit.: 42, 1878. Type: Peru, San Martin, Tarapoto, Matthews 1542 (holotype BM, isotypes CGE, E, G, K).

Tabernaemontana macrosiphon Herz., Fedde, Repert. 7: 66. 1909.—*Stenosolen macrosiphon* (Herz.) Markgr., Notizbl. Bot. Gart., Berlin-Dahlem 14: 177. 1938. Type: Bolivia, Santa Cruz, Prov. Velasco, Herzog 374 (holotype Z).

Small tree, 2-12 m high. Trunk glabrous, 20 cm dbh; bark gray; branchlets cylindrical, glabrous, green-gray. Sympodial module not constant, comprising 2-3 pairs of more or less isophyllous, chlorophyllous leaves and 2-3 bracts subtending 1 inflorescence and 1-2 young stems. Petiole 0.5-1 cm long; blades membranous, lanceolate, 8-12 x 3-5 cm, acuminate, acumen arcuate, 0.5-0.7 cm long, glabrous, olive-green; secondary veins, 5-13 pairs, forming an angle of 50-60° with primary vein.

Inflorescence cymose of 10-12 flowers; bracts ciliate, ca. 0.1 cm long. Sepals ovate, ca. 0.2 cm long, obtuse, ciliate, with 2-3 colleters at base; corolla white, corolla tube 1-1.1 cm long, enlarged at base, glabrous outside, pilose inside from insertion of stamens to base of lobes, lobes 1-1.3 x 0.5 cm, dolabriform, obtuse; stamens with filaments glabrous; ovary ovoid, ca. 0.2 cm high, style as long as ovary, style head 0.13-0.18 cm high with 10 lobes at base, body pentagonal and 2 apical appendices. Follicles recurved, turning red at maturity, covered by spiny excrescences, acuminate, ca. 4-5 x 2.5 cm; seeds sulcate on raphae side, brown to black, embryo cordate, radicle longer than cotyledons.

D i s t r i b u t i o n : Colombia, Suriname, French Guiana, Brazil, Peru and Bolivia. (SU: 1; FG: 1).

S p e c i m e n s e x a m i n e d : Suriname: Brazilian frontier, Sipalawini savanna, Oldenburger et al. 406 (A, K, U, WAG). French Guiana: Tumuc Humac, de Granville B.4488 (CAY, P).

P h e n o l o g y : Flowers in August. Fruits in September.

C h e m i s t r y : Twigs, stems, trunk barks and leaves of *P. vanheurckii* collected in Ucayalli Valley (Peru) by Tournon, have been studied in *Planta Med.* 60: 496. 1994. Twenty five alkaloids belonging to the monomeric and dimeric indole series have been identified. The absence of aspidospermane and pseudo-aspidospermane alkaloids, found in *Stenosolen heterophyllus*, can be used to differentiate *Peschiera*, from the genus *Stenosolen*.

26. **PLUMERIA** L., Sp. Pl. 209. 1753.

Type: *P. rubra* L.

Shrubs or trees with stout, thick stems. Latex white, abundant, milky. Leaves congested at top of branches, alternate, petiolate or subsessile. Inflorescences terminal, stalked cymes; flowers numerous, fragrant; calyx 5-lobed, without colletar at base within; corolla salverform, overlapping towards left; stamens inserted near base of tube, anthers completely fertile, free from style head; pollen 3-colporate, smooth; disc lacking; ovary apocarpous, free at top, subinferior and adherent at base, ovules many; style head simple, cylindrical, with 2 free appendages. Fruit of 2 follicles, thick and divergent; seeds many, dry, basally winged, flat on hilar side and rounded on raphae side, anemochorous.

D i s t r i b u t i o n : 7 species native to Caribbean region, 3 of which occur in the Guianas.

L i t e r a t u r e : Woodson, R.E., 1938. Studies in the Apocynaceae VII, An evaluation of the Genera *Plumeria* L. and *Himatanthus* Willd., *Ann. Missouri Bot.*

Gard. 25: 189-224. Allorge, L., 1996. Les frangipaniers. Succulentes 2: 23-27, 3 pl. col.; 3: 6-10, 2 pl. col..

KEY TO THE SPECIES

- 1 Stems thickened as far as apex, corolla tube straight 3. *P. rubra*
 Stems gradually narrowing towards the apex, corolla tube bent 2
- 2 Leaves subsessile, blade lyre-shaped 2. *P. pudica*
 Leaves distinctly petiolate, blade obovate to lanceolate 1. *P. inodora*

1. **Plumeria inodora** Jacq., Sel. Stirp. Amer. Hist.: 37, 1763. =*P. alba* L. var. *inodora* (Jacq.) G.Don, Gen. Hist. 4: 94, 1838. Type: Jacquin s.n., not seen.

Shrub up to 3-7 m high, branching at ca. 50 cm, stems all reaching same height, gradually narrowing towards the apex; bark gray; leaves in terminal clusters. Petiole 2-3 cm long; spatulate, blades obovate to lanceolate, 20-21 x 7-8 cm, pointed, pubescent on lower surface, gradually attenuate into petiole; primary vein prominent; secondary veins arched, bright green; tertiary veins reticulate, margin 0.2-0.3 cm wide. Inflorescence terminal; peduncle 3-6 cm long; Sepals with corolla lobes pure white, ca. 2 x 1 cm, throat yellow, lacking odor during day light, scented at night, tube very narrow, ca. 2.5 cm long, straight in bud until 1.5 cm long, then bending and finally flower held horizontal, articulation 0.5 cm long, corolla widening at throat (0.5 cm diam.). Fruit curved back on pedicel at an angle of 50°, each follicles 10-20 cm long, olive-green, dotted with white lenticels, dehiscing to reveal ca. 150 seeds per follicle in 4 rows; seeds winged, ca. 5 x 1.8 cm, brown, color darker around seed; seed ca. 2 x 1 cm, wing ca. 3 x 1.8 cm.

D i s t r i b u t i o n : Venezuela, Guyana and Brazil. (GU: 3).

S e l e c t e d s p e c i m e n s : Guyana: Kanuku Mts, Moco Moco R. Forest near granite rocks and Cr., Jansen-Jacobs et al. 4491 (P, U); Takutu-U, Essequibo Region, Shiriri Mt., Peterson & Gopaul 7667 (P, US).

P h e n o l o g y : Flowers in July. Leaves deciduous in February-May.

2. **Plumeria pudica** Jacq., Sel. Strip. Amer. Hist.: 37. 1763. Type: Jacquin s.n., not seen.

Plumeria caracasana J.R.Johnson, Contrib. U. S. Nat. Herb. 12: 108. 1908. Type: Venezuela, La Guaira, Robinson & Lyon s.n., 13. 7. 1900 (holotype US).

Plumeria cochleata Blake, Contrib. Gray Herb., n.s. 53: 47. 1918. Type: Venezuela, between Coro and Alta Gracia, 1. 5. 1917, H.M. Curran & M. Haman 742 (holotype NY).

Shrub 3-4 m high. Stem thick, 1.5-2 cm in dbh, gradually narrowing towards the apex. Leaves subsessile, numerous along stem. Petiole ca. 0.5 cm; blades lyre-shaped, 28-31 x 6-7 cm, apex acuminate, base cuneate, decurrent on petiole, glabrous above; primary vein pubescent, secondary veins 20-23 pairs. Inflorescence cymose; peduncle 7-12 cm long, thick, glabrous; pedicels 1-1.2 cm long; corolla white with throat golden yellow, fragrant, lobes obovate, rounded, equaling tube, tube slender, 3 cm long, widening slightly above insertion of stamens, curved at ca. 0.5 cm. Fruit initially erect, of 2 follicles in shape of zebu horns, 12-14 x 2-3 cm, becoming pendent and curved back on pedicel before dehiscing to reveal ca. 50 seeds; seed ca. 2 x 1 cm, wing ca. 3 x 1.8 cm.

D i s t r i b u t i o n : Panama, Colombia, Curaçao, French Guiana; originating from Venezuela, cultivated as ornamental. (FG: 1).

S p e c i m e n s e x a m i n e d : Not collected in Guyana, but collected along Venezuelan frontier in gardens, supposed to be growing in Guyana and Suriname as well. French Guiana: in garden, route de Monjoly, Cayenne, Allorge 1092 (CAY, P).

3. **Plumeria rubra** L., Sp. Pl. 306. 1753. Type: LINN. 301-1.

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– Plate 18 (fl.), 19 (fr.).

Plumeria acuminata Aiton, Hort. Kew 2: 70. 1789. Type: cult. Kew in 1790 by Banks.

Plumeria acutifolia Poir., Encycl. Suppl. 2: 667. 1812. Type: Java, Commerson s.n. (holotype P-LA).

Plumeria tenorii Gasp., Ann. Civil. Regno Due Sicilie 1: 128. 1833. Type: not seen.

Tree or shrub, 8-10 m high. Stems gradually narrowing towards the apex. Leaves caducous, persistent only at end of stems; petiole 2-6 cm long; blades firmly membranous, obovate to lanceolate, 20-30 x 10-12 cm, obtuse to acuminate at apex, cuneate at base, glabrous to somewhat pubescent; secondary veins 20-30 pairs. Inflorescence corymbose, lax, with caducous bracts and 10-20 fragrant flowers; peduncle ca. 8-10 cm long. Sepals 1-2 cm long, mucronate and glandular at apex; corolla red or white with throat yellow to purplish, tube glabrous outside with suprastaminal indument, 1-2.5 x 0.15 cm, enlarged at base, lobes 2-3 cm long, rounded to obtuse, revolute on right margin; stamens 0.15 cm long; ovary glabrous, superior or more or less inferior, style head globose with 2 apical appendages equaling body. Fruit 9-30 x 4 cm; seeds 30-40, ca. 1.8 x 0.8 cm, striate, wing brown larger than seed, ca. 3 x 1.3 cm, cotyledons cordiform, radicle curved.

D i s t r i b u t i o n : Originating from Mexico, Nicaragua, El Salvador, Costa Rica and Panama along the pacific side; cultivated as ornamental and religious tree in the tropics.

S p e c i m e n s e x a m i n e d : French Guiana: Cayenne, Allorge s.n., fl. & fr. (P).

V e r n a c u l a r n a m e s : Guyana : temple tree, nosegay. French Guiana: frangipanier rouge.

P h e n o l o g y : Flowers throughout the year or November-May. Rarely fruiting.

U s e s : Used for making the famous necklace of flowers typical of Tahiti etc. A toxic plant. The root is used as a purgative and vermifuge, the leaves to prepare a pectoral poultice (cf. Descourtilz, l.c.); the seeds are eaten.

C h e m i s t r y : See Grenand et al. (1987: 130), under *P. alba* L. and *P. rosea* L. (as *P. alba* L. by mistake, which exists only in West Indies, see Allorge, 1996).

27. **PRESTONIA** R. Br., Mem. Wern. Soc. 1: 69. 1811. nom. cons.

Type: *P. tomentosa* R. Br.

Haemadictyon Lindl. Trans. Hort. Soc. 6: 70. 1826.

Rhaptocarpus Miers, Apocyn. S. Amer.:151. 1878.

Temnadenia Miers, Apocyn. S. Amer.: 217. 1878. *pro parte*.

Mitozus Miers, Apocyn. S. Amer.: 217. 1878. *pro parte*.

Exothostemon G.Don, Gen. Hist. 4: 70-82. 1838. *pro parte*.

Belandra S.F.Blake, Cont. Gray Herb. 52: 78. 1917.

Lianas, glabrous to densely tomentose. Latex white or translucent. Stem twining, rarely erect, frequently with lenticels; branches opposite or opposite below becoming alternate with numerous intrapetiolar colleters. Leaves opposite, often large; blades membranous to coriaceous, penniveined, veins widely spaced, without colleters at base of blade on upper surface. Inflorescences subaxillary, rarely terminal, racemose

or corymbose, bracteate. Sepals 5-lobed, glabrous or densely pubescent, often as large as corolla, with 5 denticulate colleters within; corolla yellow or yellowish green or with zones of white, pink or purple on lobes, salverform, rarely infundibuliform, usually with 5 corona lobes, rarely exappendiculate, throat bearing an annulus, corolla lobes 5, aestivation dextrorse; stamens adherent with style head, sagittate, inserted in upper part of tube, included or exserted; filament short; disc 5-lobed, more or less concrescent at base, denticulate or not; ovary apocarpous, glabrous, ovules many, style slender, style head fusiform with involucre at base and body twice as long as appendages. Fruit of 2 follicles, terete or slightly articulated, apocarpous or more or less syncarpous, dehiscent along suture; seeds numerous, comose, anemochorous, hair tuft brown or pale brown.

D i s t r i b u t i o n : About 60 species in tropical America, from Antilles to the north of Argentina, 11 of which in the Guianas.

KEY TO THE SPECIES

- | | | |
|---|---|------------------------------|
| 1 | Corolla densely pubescent outside | 2 |
| | Corolla glabrous or minutely pubescent outside | 3 |
| 2 | Blade cuneiform at base; tertiary veins reticulate. Leaves with
hirsute indumentum | 10. <i>P. surinamensis</i> |
| | Blade cordate at base; tertiary veins inconspicuous. Leaves with
lustrous indumentum | 11. <i>P. tomentosa</i> |
| 3 | Sepals small and inconspicuous, 0.1-0.2 cm., reflexed | 4 |
| | Sepals > 0.2 cm, not reflexed, ascending | 5 |
| 4 | Disc as long as ovary; fruit of 2 follicles, free | 1. <i>P. acutifolia</i> |
| | Disc shorter than ovary; fruit of 2 follicles, connate for their entire
length..... | 9. <i>P. quinquangularis</i> |
| 5 | Sepals 0.4-0.5 cm | 6 |
| | Sepals \geq 1 cm | 7 |

- 6 Sepals linear, 0.4-0.5 cm; fruit of 2 follicles, free 6. *P. marginata*
 Sepals foliaceous, 0.4-0.5 cm; fruit of 2 follicles, connate for
 their entire length 3. *P. coalita*
- 7 Inflorescence corymbose; anthers included 7. *P. megagros*
 Inflorescence racemose; anthers exerted 8
- 8 Sepals shorter than corolla tube 9
 Sepals as long as corolla tube 10
- 9 Leaves discolorous 5. *P. guianensis*
 Leaves concolorous 2. *P. annularis*
- 10 Secondary veins arched, angled at 45-50° with primary vein
 8. *P. portobellensis*
 Secondary veins arched, angled at 80-90° with primary vein
 4. *P. discolor*

1. ***Prestonia acutifolia*** (Benth. ex Müll.Arg.) K.Schum., Engl. & Prantl,
 Nat. Pflanzenfam. 4(2): 188. 1895.—*Haemadictyon acutifolium* Benth.
 ex Müll.Arg. in Mart., Fl. Bras. 6(1): 167. 1860. Type: Brazil, Rio Negro,
 Spruce 1002 (holotype B destroyed, photo of B at NY, P, US).

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 – Fig. 19, 9-16.

Haemadictyon caliginosum Miers, Apocyn. S. Amer. 260. 1878. Type: Peru, Tarapoto, Spruce
 4924 (holotype BM).

Echites bangii Rusby, Bull. NY. Bot. Gard. 4: 409. 1907. Type: Bolivia, Bang 2053
 (holotype NY, isotype US).

Echites hulkiana Pulle, Rec. Trav. Bot. Néerl. 9: 160. 1912. Type: Suriname: Hulk 383 (holotype
 U).

Echites laurentiae-disca Rusby, Descr. S. Am. Pl. : 85. 1920. Type: Bolivia, Britton & Rusby
 (holotype NY, isotype US).

Liana, slender, appearing glabrous, latex translucent. Leaves thick-membranous, elliptic to oblong-elliptic, 6-16 x 2-8 cm, abruptly acuminate, mucronate, obtuse at base, glabrous above, minutely puberulent abaxially. Inflorescence pseudo-racemose, finely pubescent; pedicels 0.5-1.2 cm long; bracts ovate 0.1-0.2 cm long, subfoliaceous. Sepals 0.15-0.2 cm long, reflexed, green; corolla tube green and mauve, 1.5-1 cm long, annulus white with 5 spots of dark yellow, corona lobes 0.05-0.2 cm long, white, wholly included, corolla lobes obliquely obovate, 0.7-1 cm, yellow, fimbrious at margin, with white lines and dark yellow honey guides; anthers dark yellow, pubescent dorsally, tips exerted; disc equaling ovary. Follicles free, curved, connected at apex when young, to more than 40 x 0.3-0.4 cm; seeds ca. 1 cm, hair tuft ca. 4.5 cm long.

D i s t r i b u t i o n : Panama, Colombia, Venezuela, Guyana, Suriname, Brazil, Peru, Bolivia, Paraguay and Argentina; on riverbanks. (GU: 11; SU: 4).

S e l e c t e d s p e c i m e n s : Guyana: Mazaruni R., FD 7139 (Fanshawe 3543) (NY, U); Kanuku Mts., Jansen-Jacobs et al. 98 (CAY, U, US); Rupununi R., Karanambo, Maas et al. 7301 (U). Suriname: Kabalebo airstrip, Florschütz et Maas 2591(U); Coppename R., Mennega 510 (U).

P h e n o l o g y : Flowers in February-November. Fruits in September-February.

2. **Prestonia annularis** (L.f.) G.Don, Gen. Hist. 4: 84. 1838.—*Echites annularis* L.f., Suppl. : 166. 1781.—*Haemadictyon ? annulare* (L.f.) A.DC., Prodr. 8: 428. 1844.....—*Temmadenia annularis* (L.f.) Miers, Apocyn. S. Amer.: 216. 1878. Type: Suriname, Dahlberg in Herb. Alstroem. n. 126 (holotype UPS, photo P).

Liana to 2 m long, latex translucent. Stem slender with nodes enlarged. Leaves coriaceous, concolorous, acuminate, 10-12(15) x 6-8 cm, glabrous and shiny above, minutely pubescent on veins on lower surface; secondary veins 6-7, arched, angled 75°-80° with primary vein; tertiary veins reticulate. Inflorescence racemose, 15-20-flowered, peduncle 1.8-2 (4) cm long, slender, bracts numerous. Sepals persistent, foliaceous, green or white mottled with purple below, glabrous, ovate, 1-1.2 x 0.4 cm, mucronate, opaque yellow at apex within, corolla glabrous or minutely pubescent outside, corolla tube 1.4-1.5 x 0.3 cm, yellow-brown, corona bright opaque yellow, corolla lobes 1-1.1 x 0.3-0.4 cm, pink to pinkish yellow at margins; stamens green, top of anthers maroon. Follicles curved, connected at apex when young, maroon, 35-40 x 0.7 cm; seeds ca. 1.8-2 x 0.2 x 0.1 cm, apex long-beaked, hair tuft white, 2-4 cm long.

D i s t r i b u t i o n : Honduras, Costa Rica, Panama, Venezuela, the Guianas and Brazil; in open low secondary forest and savanna. (GU: 5; SU: 3; FG: 2).

S e l e c t e d s p e c i m e n s : Guyana: Potaro-Siparuni region, Kaieteur National Park, Pipoly et al. 10019 (FDG, NY, P, US); Demerara-Mahaica Region, Ramsaroop Farm, Hoffman et al. 847 (P, US). Suriname: Suriname R., Kramer & Hekking 2087(U); Paramaribo, Focke 1056 (U). French Guiana: Haut Tampock, Moretti 67; 671 (CAY).

P h e n o l o g y : Flowers in January-February. Fruits in March.

3. **Prestonia coalita** (Vell.) Woodson, Ann. Missouri Bot. Gard. 18: 552. 1931.

–*Echites coalita* Vell., Fl. Flum.: 106. 1827 [1829]; Icon. 3: pl. 40. 1827.

–*Rhaptocarpus coalitus* (Vell.) Miers, Apocyn. S. Amer.:153. 1878. Type: Brazil, Sanctae Crucis, Vellozo s.n. not seen. Lectotype: pl. 40.

Echites vauthieri A.DC., Prodr.8: 457. 1844. Type: Brazil, Vauthier 78 (hololectotype G, isolectotype P).

Echites blanchetii A.DC., Prodr.8: 448. 1844.—*Mitozus blanchetii* (A.DC.) Miers, Apocyn. S. Amer.:

219. 1878. Type: Brazil, Bahia, Blanchet 3223 (hololectotype G, microfiche).

Echites martii Müll.Arg. in Mart., Fl. Bras. 6(1): 155. 1860.—*Rhaptocarpus martii* (Müll.Arg.) Miers,

Apocyn. S. Amer. 153. 1878. Type: Brazil, Bahia, Martius s.n (holotype G).

Rhaptocarpus apiculatus Miers, Apocyn. S. Amer.: 153. 1878. Type: Brazil, Gardner 1754 (holotype BM, isotype P).

Mitozus concinnus Miers, Apocyn. S. Amer.: 223. 1878. Type: Brazil, Gardner 1353 (holotype BM).

Liana, slender; latex white. Petiole ca. 1 cm long, minutely pubescent; blades coriaceous, 8-9 x 3-4 cm, margin revolute, acuminate, base rounded, dark green above, pale green abaxially, glabrous; secondary veins 6-7, arched, anastomosing 0.2-0.4 cm from margin. Inflorescence racemose, axillary at each node; bracts ca. 0.1 cm. Sepals foliaceous, with undulate margins, 0.4-0.5 x 0.1 cm, glabrous, not ciliate; corolla tube minutely pubescent, 1.4 x 1.2 cm, yellowish green, corolla lobes 0.5-0.6 x 0.2 cm, yellow. Follicles pendent, gray-green, connate for entire length, moniliform, obtuse at tip; seeds 0.8-0.9 cm, acuminate at both ends, 1.2-1.5 cm long, hair tuft pale brown.

D i s t r i b u t i o n : Venezuela, Guyana, Brazil and Paraguay. (GU: 6).

S e l e c t e d s p e c i m e n s : Guyana: Iramaipang, Kanuku Mts, FD 5905 (Wilson-Browne 503) (NY, U); Wabuwak, Kanuku Mts, FD 5768 (Wilson-Browne 348) (NY, U); Rupununi R., FD 5941 (Wilson-Browne 64) (NY, U).

P h e n o l o g y : Flowers in September-November. Fruits in May-June.

4. **Prestonia discolor** Woodson, Ann. Missouri Bot. Gard. 558, 1936.

Type:Guyana, Mazaruni R., Karau Cr., 25. 5. 1933 (fl.) Tutin 141
(holotype BM, photos P).

Liana. Stem glabrous, with numerous small lenticels. Petiole 1.5-1.8 cm long; blades glabrous, elliptic to oblong-elliptic, 11-21 x 6-11 cm, discolorous, acuminate, base obtuse; secondary veins arched, angled at 80-90° with primary vein. Inflorescence racemose, dichotomous, bearing 30-40 flowers. Sepals 1.2-1.3 cm long, acuminate, foliaceous, greenish; corolla salverform, glabrous or minutely pubescent outside, yellowish-pink; tube 1.2-1.3 x 0.3 cm at base, corona lobes included, ca. 0.1 cm long, throat callose-incrassate, lobes obliquely obovate, 1.4-1.5 cm long, reflexed; anthers ca. 0.6 cm long, tips exerted; disc equaling ovary, concrescent at base; ovary glabrous, ca. 0.15 cm long. Fruit unknown.

D i s t r i b u t i o n : Guyana. Only known from the type.

5. **Prestonia guianensis** Gleason, Bull. Torrey Bot. Club 53: 299. 1926.

Type: Guyana, Pomeroon Distr., Pomeroon R., de la Cruz 3097
(holotype NY, isotypes G, MO, US).

Liana. Stem woody, lenticellate, glabrous, brown, internodes 15-20 cm long. Petiole 0.7-1 cm long; blades subcoriaceous, oval to oblong-elliptic, discolorous, 8-13 x 4.5-6 cm, acuminate, base rounded, upper surface dark green, glabrous, lower surface brownish green, minutely scabrous on veins; secondary veins 8-10, arched, angled at 85°-90° with primary vein, anastomosing 0.2 cm from margin. Inflorescence racemose, dichotomous, bearing 30-40 flowers. Sepals ascending, membranous to subcoriaceous, 0.9-1 cm long, green, suffused with purple, acute, glabrous; corolla

salverform, glabrous, cream-colored to yellow, tube 1.2-1.4 x ca. 0.3 cm, corona lobes ca. 0.07-0.1 cm long, included; anthers ca. 0.5 cm long, slightly exerted; disc of 5 separate lobes, equaling ovary; ovary ovoid, ca. 0.1 cm long, glabrous. Fruit unknown.

D i s t r i b u t i o n : Guyana. Only known from the type.

6. **Prestonia marginata** (Benth.) Woodson, Ann. Missouri Bot. Gard. 23: 463. 1936.—*Haemadictyon marginatum* Benth., J. Bot.(Hooker) 3: 250. 1841.
Type: Guyana, Pirara, Rob. Schomburgk I 713 (K); not seen.

Haemadictyon cayennensis A.DC., Prodr. 8: 427. 1844.—*Prestonia cayennensis* (A.DC) Pichon, Mém. Mus. Natn. Hist. Nat. Paris, sér.B. 1: 25. 1951. Type: French Guiana, Cayenne, s.n. of coll. (Vargas? ou L.C. Richard?) (holotype G-DC, isotype NY, microfiche n. 7544).

Prestonia perplexa Woodson, Ann. Missouri Bot. Gard. 23: 476. 1936. Type: Brazil, Lund s.n. (holotype C). syn. nov.

Liana, glabrous; latex white. Stem slender. Petiole ca. 1 cm long; blades coriaceous, oblong, 10-12 x 3-4.5 cm, margin recurved, acuminate-mucronate, base cuneate, concolorous. Inflorescence racemose, many-flowered; peduncle 4-5 cm long, minutely pubescent; pedicels 1.5-1.7 cm slender, minutely pubescent; bracts 0.1-0.2 cm long. Sepals straight 0.4-0.5 cm long, glabrous; head of buds ca. 0.3-0.5 x 0.3-0.5 cm diam., hirsute at apex; corolla greenish yellow, corolla tube 1.5-1.7 x 0.1 cm, partially crimson, corolla lobes pale yellow, glabrous, reflexed. Follicles 13-15 x 0.1-0.2 cm, free, curved, connected at apex when young.

D i s t r i b u t i o n : Guyana, French Guiana and Brazil. (GU: 6; FG: 6).

S e l e c t e d s p e c i m e n s : Guyana: Potaro R., Kaieteur Falls, Maguire & Fanshawe 23351 (NY); Cowan & Soderstrom 2098 (NY); Kvist et al. 38 (BRG, CAY, P, US). French Guiana: L.C. Richard (P); Crique Angélique, Mt. Kaw, de Granville 10145 (CAY, P, VEN); Oyapock, îles en amont du saut Maripa, Jacquemin 2108 (CAY, P).

P h e n o l o g y : Flowers in September-November. Fruits in September.

7. **Prestonia megagros** (Vell.) Woodson, Ann. Missouri Bot. Gard. 21: 501. 1936.....–*Echites megagros* Vell., Fl. Flum. 110. 1827[1829]. Type: Icones 3, pl. 33. 1827.

Haemadictyon asperum Müll.Arg. in Mart., Fl. Bras. 6(1): 169. 1860. Type: Brazil, Rio de Janeiro,

Riedel s.n., not seen.

Haemadictyon megalagrion Müll.Arg. in Mart., Fl. Bras. 6(1): 170. 1860.–*Prestonia megalagrion* (Müll.Arg.) Miers, Apocyn. S. Amer.: 149. 1878. Type: Brazil, Campo Grande, Vellozo, pl. 33.

Prestonia laeta Miers, Apocyn. S. Amer.: 149. 1878. Type: Brazil, Rio de Janeiro, Miers s.n. (holotype BM).

Liana; latex white. Stem densely ferruginous-hirtellous to glabrate. Petiole 1-1.4 cm long; blades coriaceous, oval to obovate, 11-20 x 5-12 cm, upper surface ferruginous-puberulent to glabrate, lower surface opaque, densely ferruginous-puberulent, bullate. Inflorescence corymbose, di- or trichotomous, bearing 20-40 flowers, ferruginous-hirtellous. Sepals 1-1.6 cm long, green suffused with purple; corolla salverform, glabrous or puberulent, yellowish suffused with purple, tube 1.3-1.4 x 0.3 cm, throat with thickened, dark yellow annulus, epistaminal appendages slightly exserted, lobes obliquely obovate, shortly acuminate, 1-1.2 cm long, reflexed;

stamens inserted at 1/3 length from bottom of corolla tube; disc shorter than ovary; ovary ovoid, ca. 0.15 cm long, minutely papillate. Fruit unknown.

D i s t r i b u t i o n : Venezuela, the Guianas and Brazil. (GU: 1).

S p e c i m e n e x a m i n e d : Guyana: Demerara R., Sibaruni Cr., 3. 9. 1950 (fl.)
FD 6328 (Fanshawe 2998) (U).

8. **Prestonia portobellensis** (Beurl.) Woodson, Ann. Missouri Bot. Gard. 18: 553, 1931.—*Echites portobellensis* Beurl., Vet. Akad. Handl. Stock. : 137.

1854 [1856]. Type: Panama, Porto Bello, Billberg s.n. (holotype S), not seen.

Haemadictyon schizadenium Müll.Arg., Linnaea 30: 431. 1860.—*Prestonia schizadenia*

(Müll.Arg.)

Hemsl., Biol. Centr. Am. Bot. 2: 312. 1881. Type: Mexico, Papantla, Karwinski s.n. (holotype LEN).

Prestonia (Haemadictyon) macrocarpa Helms., Biol. Centr. Am. Bot. 2: 311, pl. 55. 1881-1882.

Type: Panama, Chagres, Fendler 250. (lectotype K, isotypes MO, P).

Liana 4-5 m long; latex white. Stem woody, bark brown with brown lenticels. Petiole 1-1.5 cm long; blades subcoriaceous, oblong-elliptic, 10-19 x 5-8 cm, acuminate, base obtuse or rounded, often asymmetric, glabrous; secondary veins 8-10 pairs, arched, forming an angle of 45°-50° with primary vein; tertiary veins transverse. Inflorescence axillary, globose, 20-30-flowered; peduncle 3.5-4 cm long; pedicel 0.6-1.8 cm long; bracts ca. 0.5 cm long. Sepals triangular, acuminate, 1.1-1.7 x 0.2 cm; head of bud conical, corolla yellow flushed with purplish, tube 1-1.5 cm long, ca. 1 x 0.6 cm, lobes 1-1.5 x 0.3-0.4 cm, striped light purple; anthers slightly exerted. Follicles glabrous, 33-35 cm, connected at apex when young; seeds 1.5-1.6 cm long, hair tuft 3-3.5 cm, brown-yellowish.

Distribution: Mexico, Honduras, Salvador, Costa Rica, Panama, Venezuela and Guyana. (GU: 1).

Specimen examined: Guyana: Corentine R., Malaroo, Nov. 1879, Jenman 350 (P).

Vernacular name: purihalli.

9. ***Prestonia quinquangularis* (Jacq.) Spreng., Syst. 1: 637 1825.**

–*Echites quinquangularis* Jacq., Enum. Pl. Carab. 13. 1760. Stirp. Amer.: 32, pl. 25. 1763.–*Temmadenia quinquangularis* (Jacq.) Miers, Apocyn. S. Amer.: 217. 1878. Type: pl. 25. 1763.

Echites nutans Anders., Trans. Soc. Arts Lond. 25: 203. 1807. Sims, Bot. Mag. 51: pl. 2473, 1824.–*Haemadictyon nutans* (Anders.) A.DC., Prodr. 8: 426. 1844. Type: island St. Vincent, Caley (holotype G), not seen.

Echites sanguinolenta Tussac, Fl. Antill.: 95, t. 11. 1808-1813. Type: t. 11.

Haemadictyon venosum Lindl., Trans. Hort. Soc. 6: 70. 1826. Type: island St. Vincent, Caley (holotype G), not seen.

Liana; latex white. Stem striate with bark green flushed with purple. Petiole 1.5-2 cm long, minutely pubescent; blades subcoriaceous, elliptic, 18-20 x 7-8 cm, gradually acuminate, base rounded, glabrous; primary and secondary veins purple, 5-6 pairs. Inflorescence racemose, axillary, 10-15-flowered; peduncle slender, 2.5-3 cm long; pedicels 1.3-1.5 cm long. Sepals reflexed, ca. 0.1 cm long, scarious; corolla and tube pale green, minutely pubescent, tube 1.5-1.6 x 0.3-0.4 cm, enlarged at level of stamens, anthers included, lobes reflexed on tube, glabrous, 0.9-1 x 0.4-0.6, yellow, white at throat, annulus white, thick; head of bud conical, 0.6-0.7 x 0.5 cm. Follicles

pendent, connate for entire length, 35-40 x 0.2-0.4 cm, obtuse at tip; seeds 2.2-2.4 cm long, acuminate at both ends, hair tuft ca. 2 cm long, brown.

D i s t r i b u t i o n : Jamaica, Martinique, Guadeloupe, Trinidad, Venezuela, Guyana, Suriname and Brazil. (GU: 4; SU: 2).

S e l e c t e d s p e c i m e n s : Guyana: Rupununi R. savanna, Davis 808 (BRG, K, NY); Essequibo R., Rockstone, Gleason 886 (NY). Suriname: Kabalebo R., Pulle 441 (NY); Saramacca R. Headwaters, Brokolonka, Maguire 23790 (NY).

V e r n a c u l a r n a m e s : nodding savannah flower or bloody savanna-flower .

P h e n o l o g y : Flowers in January-June. Fruits in June-September.

10. **Prestonia surinamensis** Müll.Arg., *Linnaea* 30 : 433. 1860. Type: Suriname, Hostmann 981 (holotype B, isotypes MO, NY, P, U, W). Paratype: Suriname, Wulschlaegel 1029 (photo B, BR, NY, W).

Liana, densely brown-tomentose, hispid, to 1m long; latex translucent. Stem cylindrical, light brown, pubescent, with many white lenticels; living bark ca. 0.2 cm thick. Petiole ca. 1 cm long, with hirsute indument, canaliculate; blades subcoriaceous, ovate, cuneiform at base, 26-28 x 15-17 cm, shortly acuminate, base obtuse, upper surface glabrous with long hairs along primary vein, densely tomentose abaxially; secondary veins arcuate; tertiary veins very distinct. Inflorescence globose, 8 cm in diam., axillary; bracts linear ca. 2 x 0.4 cm, densely tomentose. Sepals linear, ca. 2 x 1 cm; corolla tube ca. 2 cm long, pubescent, yellow with white annulus at throat, epistaminal appendages exerted, 0.2-0.4 cm long; bud tomentose, brown yellow, head of bud conical, 1 x 0.6-0.7 cm, lobes perpendicular to tube, ca. 1.7 x 1 cm, pubescent outside, yellow and glabrous within. Follicles

divergent at 160°-180°, fusiform, 10-12 x 1-2 cm, green-brown, pubescent, calyx persistent; seeds brown, numerous, 1.2-1.4 x 0.3 cm, trigonal, striate, hair tuft ca. 4 cm long.

D i s t r i b u t i o n : The Guianas, Brazil and Peru; in riverine forest. (GU: 4; SU: 8; FG: 2).

S e l e c t e d s p e c i m e n s : Guyana: Rupununi R., A.C. Smith 2210 (U); Barima-Waini Region: upper Sebai tributary of Kaituma R., Hoffman et al. 644 (P, US). Suriname: Paramaribo polder, den Outer 987 (U); Brokopondo, van Donselaar 1250 (U). French Guiana: Approuague, Oldeman 2424 (CAY, P, U); R. Mana, entre Cr. Loubère et saut Ananas, Cremers 7485 (CAY, P, U).

P h e n o l o g y : Flowers in August. Fruits in February.

11. **Prestonia tomentosa** R. Br., Mem. Wern. Soc. 1: 70. 1811. Type: Brazil, Rio de Janeiro, Solander in Herb. Banks n. 684, photo BM.

Prestonia latifolia Benth., J. Bot. (Hooker) 3: 250. 1841. Type: Guyana, Rob. Schomburgk I 755 (holotype B, isotypes CAM, K, NY, P, W).

Prestonia ipomaeifolia A.DC., Prodr. 8: 429. 1844. Type: French Guiana, Cayenne, Le Blond s.n. (holotype G-DC, photo NY).

Prestonia lutescens Müll.Arg. in Mart., Fl. Bras. 6(1): 164. 1860. Type: Brazil, Claussen 957. not seen.

Prestonia lanata Müll.Arg. in Mart., Fl. Bras. 6(1): 164. 1860. Type: Brazil, St Hilaire (holotype P).

Prestonia seemanni Miers, Apocyn. S. Amer.: 146. 1878. Type: Panama, Seemann s.n. (holotype BM).

Prestonia cearensis Miers, Apocyn. S. Amer.: 148. 1878. Type: Brazil, Ceara, Gardner s.n. (holotype BM).

Prestonia sericocalyx Malme, Bih. Kongl. Svenska Vetensk.-Akad. Handl. Afd. 3 24 (10): 29. 1899.

Type: Brazil, Malme 1276 B (holotype G-DEL.).

Liana, lustrous, with tomentum densely yellow, to 3 m long; latex translucent. Stem cylindrical with yellow pubescence. Blades membranous or subcoriaceous, acuminate, base cordate, covered with yellow tomentum, venation not distinct abaxially. Inflorescence globose, 8 cm in diam.; peduncle 1.5-2 cm long. Sepals pubescent on both faces, green; corolla tube pubescent outside, yellow, annulus white; corolla lobes pubescent, yellow on basal parts of lobes that are superimposed in bud, glabrous on upper part. Follicles ovoid-fusiform, 8-9 x 1.5-2 cm, divaricate at 180°, densely pubescent, calyx persistent.

D i s t r i b u t i o n : Mexico, Colombia, Venezuela, Guyana, Brazil, Peru, Bolivia, and Paraguay. (GU: 5)

S e l e c t e d s p e c i m e n s : Guyana: Rob. Schomburgk II 374; I 755 (B, CAM, K, NY, P, W); Rupununi savanna, Kumu head valley, Goodland & Maycock 437; 962 (U); U. Essequibo Region: Darukoban Mts., Gillepsie 1953 (U).

U s e s : The decoction of leaves is used for the treatment of snake bites.

28. **RAUVOLFIA** L. Sp. Pl. 208. 1753. [Often misspelled as Rauwolfia (but W does not exist in Latin)].

Type: *R. tetraphylla* L.

Shrubs or trees. Stems dichotomous or verticillate, terete; bark bitter, smooth. Latex white; nodes with numerous interpetiolar colleter, sometimes ascending onto petiole. Leaves verticillate, in whorls of 3-5 at each node, generally anisophyllous,

entire, simple, penniveined, petiolate or sessile, subtending inflorescences or stems. Inflorescences axillary or terminal. Flowers pedicellate or sessile, small (≤ 3 cm). Sepals 5, without colleters within; corolla white, yellowish or green, salverform or campanulate, lobes aestivation sinistorse, glabrous externally, more or less villous internally; stamens 5, included, epipetalous, free from each other and style head, completely fertile; disc entire or dentate around ovary; ovary superior, of 2 apocarpous or variously syncarpous carpels, style slender, style head in three parts: involucre horizontal, entire; body cylindrical, and appendages often $1/3$ as long as style head. Fruit of 2 follicles, drupaceous, smooth, separate or variously syncarpous, pericarp red, or orange or purple, sweet, probably endozoochorous, endocarp hard, brown, containing 1-2 seeds.

D i s t r i b u t i o n : About 120 species, pantropical, about 35 species in America and 5 in the Guianas.

L i t e r a t u r e : Rao, A.S., Ann. Missouri Bot. Gard. 43: 253-354, A revision of Rauvolfia with Particular Reference to the American Species, 1956. Fernandez-Perez, A., Caldasia 8(39): 303-404. 1960, map. de Mello Filho, L.E., Revista Brazil. Biol. 33: 507-520. 1973. Leite, A.M.C., Bol. Mus. Paraense Hist. Nat., n. ser. 49: 47-50. 1975.

KEY TO THE SPECIES

- | | | |
|---|--|--------------------------|
| 1 | Leaves subsessile | 2 |
| | Leaves distinctly petiolate | 3 |
| 2 | Leaves in whorls of 4, elliptic,
pubescent | 5. <i>R. tetraphylla</i> |
| | Leaves in whorls of 3, ovate,
glabrous | 1. <i>R. ligustrina</i> |
| 3 | Leaves ovate-lanceolate; inflorescence shorter than petiole, | |

- pendulous 4. *R. polyphylla*
 Leaves elliptic; inflorescence longer than petiole, erect 4
 4 Leaves coriaceous, corolla tube lilac or dark violet, 1.5-2 times as
 long as corolla lobes 2. *R. pachyphylla*
 Leaves subcoriaceous, corolla tube greenish, 2/3 times as long as
 corolla lobes 3. *R. paraensis*

1. ***Rauvolfia ligustrina*** Willd. ex Roem. & Schult., Syst. Veg. 4: 805, 1819.

Type: South America, Humboldt & Bonpland s.n. (holotype B-W).

Rauvolfia ternifolia H.B.K., Nov. Gen. & Sp. (Quarto ed.) 3: 232, 1818 [1819]. Type:

Colombia, río Magdalena, 4. 1801, Bonpland 1480 (holotype B, destroyed, isotype P).

Rauvolfia parvifolia Bert. ex Spreng., Syst. Veg. 1: 834. 1825 [1824]. Type: Guadeloupe,

Bertero s.n. (holotype G-DC).

Rauvolfia alphonsiana Müll.Arg., Linnaea 30: 394. 1860. Type: Cuba, Macurijes, Poeppig s.n.

(P).

Shrub 0.5-3 m high. Stem cylindrical, smooth, glabrous. Leaves in whorls of 3(-4), subsessile; blades ovate to obovate, 3.5-5.5 x 1.5-3.5 cm, acute to acuminate, with colleters ascending onto petioles, glabrous; secondary veins 3-5 pairs, inconspicuous. Inflorescence a dichasium, axillary, few-flowered. Flowers very small. Sepals ca. 0.15 cm long, lanceolate, acute, glabrous; corolla white, tube slender, 0.2-0.35 cm long, lobes ovate, 0.1-0.15 cm long; stamens inserted near throat; ovary 0.15-0.2 cm in diam. Fruit syncarpous, ovoid, ca. 0.3 x 0.5 cm, green to orange, 2 seeded, glabrous.

D i s t r i b u t i o n : Mexico, Salvador, Nicaragua, Costa Rica, Cuba, Colombia, Venezuela, Guyana, Suriname, Brazil and Bolivia; riparian shrub. (GU: 1; SU: 1).

S p e c i m e n e x a m i n e d : Guyana: Rupununi Distr., Manari R., Jansen-Jacobs et al. 4711 (U); Takutu, Essequibo Reg., Lethem, Gillespie & Gopaul 1992 (U, US). Suriname: Bergendal, Focke 1287 (GH, U).

2. ***Rauvolfia pachyphylla*** Markgr., in Repert. Spec. Nov. Regni Veg. 20: 117, 1924.Type: Brazil, Roraima, Ule 8736 (holotype B, destroyed, photo F, INB, MO).

Aspidosperma quadriovulatum Pittier, Bol. Cient. Tecn. Com. Venez. 1: 66. 1925. Type: Venezuela, near Caracas, quebrada de San Lázaro, Pittier 9465 (holotype US).

Tree up to 25 m high. Leaves in whorls of 5-6. Petiole 2-3 cm long; blades coriaceous, elliptic, 10-15 x 5-7 cm, base cuneate. Inflorescences 3, terminal, erect, longer than petiole. Sepals 0.15 cm long, triangular; corolla lilac or dark violet, tube 0.7 x 0.2 cm, lobes shorter, ca. 0.6 cm long. Fruit hemisyncarpous, 2.5 x 3 cm, green with white lenticels.

D i s t r i b u t i o n : Venezuela and Guyana. (GU:2).

S p e c i m e n e x a m i n e d : Guyana: Nassau Mts., Lanjouw & Lindeman 2664 (NY, U); Rupununi Distr., Kanuku Mts., Jansen-Jacobs 3530 (U).

3. ***Rauvolfia paraensis*** Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 167. 1926. Type: Brazil, Amazonas, Belem do Pará, silva non inundate, Ducke s.n. (holotype RB 43, photo B at F, INB, MO, US, isotype U).– Fig. 20.

Rauvolfia amazonica Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 9: 960. 1926. Type:

Brazil, Ducke s.n. (holotypes RB 917 & RB 11395 (photo of B at F, INB, MO, NY, US, isotype U).

Tree 20-30 m high x ca. 10 cm dbh; bark brown, lenticellate, with scanty white latex; stems sparsely lenticellate, with numerous colleters in axil of leaves. Leaves in whorls of 4, at tips of twigs. Petiole 1.5-2.5 cm long; blades anisophyllous, membranous to subcoriaceous, elliptic, acuminate, with largest 10-20 x 5-7 cm, and smallest 6-10 x 2-5 cm, glabrous; secondary veins in 7-10 pairs, perpendicular to primary vein, then arcuate and forming a submarginal vein 0.1 cm from margin. Inflorescence terminal, usually 2 together, longer than petiole, erect; peduncles 6-7 cm long, 3-4-branched, many-flowered. Sepals 5, deltoid, ca. 0.1 cm long, acute; corolla white, tube greenish, ca. 2 cm long, 2/3 times as long as corolla lobes, lobes greenish-white outside, white inside, with longitudinal purple stripes, erect; stamens inserted near throat; ovary hemisyncarpous, glabrous, with annular disc at base, style 1.5 cm, style head with hairy apical appendages. Drupe syncarpous, globose, ca. 4 x 2.5 cm, yellow-orange, 2-seeded; endocarp compressed, rugose, ca. 2 x 3 cm, embryo straight with radicle longer than cotyledons.

D i s t r i b u t i o n : Suriname, French Guiana and Brazil (Amazonas, Pará). 14 collections studied. (SU: 3; FG: 8).

S e l e c t e d s p e c i m e n s : Suriname: Brownsweg, Lanjouw 1255 (NY, U); Brokopondo, van Donselaar 2671 (U). French Guiana: Piste de Ste Elie, Sabatier 1691; 2245; 3623 (CAY, P); Km 16, Prévost 1335 (CAY, P); id., Lescure 720 (CAY, P).

V e r n a c u l a r n a m e s : Brazil: gogo de guariba. French Guiana: wilat; wilato? tawa (Wayampi).

P h e n o l o g y : Flowers in September-November. Fruits in May.

4. **Rauvolfia polyphylla** Benth., J. Bot. (Hooker) 3: 241. 1841. Type: Guyana
Rob.Schomburgk I 891(holotype W).

Rauvolfia polyphylla var. *connivens* Benth. ex Müll.Arg. in Mart., Fl. Bras. 6(1): 31. 1860.

Type: Brazil, Rio Negro, Spruce 1896 (holotype P).

Rauvolfia polyphylla var. *divergens* Benth. ex Müll.Arg. in Mart., Fl. Bras. 6(1): 31. 1860.

Type: Brazil, Rio Negro, Spruce 1837 (holotype P).

Tree 4-5 m high, 10 cm dbh, quadrangular stems, lenticellate. Leaves in whorls of 4-5, at tips of branches. Petiole slender, 2-5 cm long; blades anisophyllous, membranous, ovate-lanceolate, 11-15 x 3-5 cm, acute, attenuate at base into petiole, glabrous; secondary veins 5-10 pairs, arcuate, angled at 45° with primary vein and forming submarginal vein, 0.1 cm from margin. Inflorescence terminal, 2 together, shorter than petiole and pendulous. Flower scented. Sepals triangular, 0.15-0.2 cm long, acute; corolla tube white, 0.6-0.8 cm long, lobes shorter, 0.4-0.5 cm long, obtuse, adaxial surface red with white margins, throat red. Drupe hemisyncarpous, 2-seeded, 1.5-1.9 x 1.4-1.5 cm, glabrous.

D i s t r i b u t i o n : Guyana (Mts Roraima) and Brazil. 7 collections studied. (GU: 1).

S p e c i m e n e x a m i n e d : Guyana: Rupununi Distr., Kanuku Mts, saddle between tops Two-Head Mt., Jansen-Jacobs et al. 3530 (U).

5. **Rauvolfia tetraphylla** L., Sp. Pl. 208. 1753. Type : LINN. 293.4.
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– Fig. 21.

Rauvolfia hirsuta Jacq., Enum. Syst., Pl. 14. 1760; Select. Stirp. Amer. Hist.: 47. 1763.

Rauvolfia canescens L., Sp. Pl. ed.2: 303. 1762. (non *R. canescens* Descourt. Fl. Méd.

Antilles. 3:151. 1827).

Rauvolfia tomentosa Jacq., *Observ. Bot. pl.* 36, 1767. Type: Colombia, Carthagène, Jacquin in

Banks

(holotype BM).

Rauvolfia subpubescens L., *Mant. Pl.* 2: 345. 1771.

Rauvolfia heterophylla Roem. & Schult., *Syst. Veg.* 4: 805. 1819. Type: Willd. (B-Willd. s.n.).

Rauvolfia odontophora Van Heurck & Müll.Arg. in Van. Heurck, *Observ. Bot.*:150.

1871. Type: Brazil, Spruce 6302 (holotype P).

Rauvolfia nitida Sessé & Moç., *Fl. Mex.* 2^o ed. 48. 1894. Type: Mexico, Sessé & Moçifio 5066

(holotype M).

Rauvolfia mollissima Markgr., *Repert. Spec. Nov. Regni Veg.* 20: 119. 1924. Type: Costa

Rica, Tonduz 13940 (holotype P, isotype US).

Subshrub or shrub. Trunk slender. Stems terete, green when young, later pale brown. Leaves in whorls of 3-4 (generally)- or 5 at tips of twigs; blades elliptic, subsessile, anisophyllous, ovate, biggest 5-8 cm x 2-2.5 cm, and smallest 1-5 x 0.6-1.5 cm, shiny above, pale green abaxially, softly pubescent to glabrous, nodes and petiole with numerous colleters. Inflorescences few-flowered dichasia, pubescent. Sepals 0.1 cm long, acute, minutely pubescent outside; corolla white, tube 0.2 cm long, glabrous outside, minutely pubescent below stamens, with long hairs at throat, lobes obovate, 0.08 cm long; disc entire, glabrous. Drupes 2, totally syncarpous, subspherical, ca. 0.4 x 0.6 cm, glabrous, green turning to red and black, style persistent, 2-seeded, endocarp rugose, ovoid, embryo arcuate.

D i s t r i b u t i o n : Greater and Lesser Antilles, Central and Northern tropical South America (Colombia, Venezuela and Guyana). (GU:2).

S e l e c t e d s p e c i m e n s : Guyana: Georgetown, Botanical Garden, Dahlgren & Persaud s.n. (F). Suriname: without name of coll., LINN 293.2 et 3; Lemée wrote also in Herb. DenaiFFE. (G)

P h e n o l o g y : Flowers and fruits throughout the year.

U s e s : The decoction of bark and leaves has been used as a gargle and internally administered for intestinal disorders and syphilitic infections. The alkaloid reserpine is now obtained from these species in exploitable quantities. (A.S. Rao, Ann. Missouri Bot. Gard. 43: 268.1956).

29. **RHABDADENIA** Müll.Arg., in Mart. Fl. Bras. 6(1): 173. 1860.

Type: *R. pohlii* Müll.Arg.

Lianas woody. Latex white. Stem twining or rarely suberect, terete, usually opposite, sometimes alternate, many colleters present at nodes. Leaves opposite; blades membranous to coriaceous, without colleters at base of blade on upper surface, apex mucronate. Petioles somewhat circling node to form a rather inconspicuous, minutely appendiculate, stipular ring. Inflorescence a lateral or subterminal, reduced cyme. Flowers pedicellate, subtended by solitary bract. Sepals 5-lobed, with colleters within at base; corolla with cylindrical part of tube straight, infundibuliform part conical or tubular, limb 5-lobed, lobes aestivation dextrorse; stamens inserted at base of upper enlarged part of tube, adherent to style head, sagittate, connective dorsally pilose, filaments puberulent; disc 5-lobed, more or less concrescent at base; ovary apocarpous, glabrous, style surmounted by fusiform style head with basal involucre. Fruit of 2 follicles, terete, dehiscent along ventral suture, their dorsal side reddish; seeds numerous, dry, apically comose, anemochorous, embryo straight.

D i s t r i b u t i o n : 3 species in Greater and Lesser Antilles, Central and South America, 2 of which occur in the Guianas.

KEY TO THE SPECIES

- 1 Corolla white, throat yellow, conical; leaves coriaceous, blade obtuse at base 1. *R. biflora*
 Corolla pink, throat tubular; leaves membranous, blade auriculate at base 2. *R. macrostoma*

1. ***Rhabdadenia biflora*** (Jacq.) Müll.Arg., in Mart., Fl. Bras. 6(1): 175. 1860.

–*Echites biflora* Jacq., Enum. Syst. Pl. 13. 1760; L., Sp. Pl., ed. 2. 307.

1762. Jacq., Select. Stirp. Amer. Hist. 30. pl. 21. 1763. Type: pl. 21, 1763.

Echites paludosa Vahl, Eclog. Amer. 2: 19. 1798. –*Rhabdadenia paludosa* (Vahl)

Miers, Apocyn. S. Amer. 119. 1878. Type: South America, von Rohr s.n. (holotype C-VAHL, photo US).

Allamanda parviflora Presl, Bot. Bemerk. Prag.:103, 1844 Type: Martinique, Sieber s.n. in Herb.

Martius suppl. 91 (holotype PRC, photo P), syn. nov..

Echites billbergii Beurl., Kongl. Vetensk. Akad. Handl. 40: 137. 1854 (1856).

Rhabdadenia macrantha Donn.-Sm., Bot. Gaz. 40: 7. 1905. Type: Honduras.

Suffrutescent liana, glabrous, to 10 m long. Stem stout. Leaves decussate; petiole 1-2 cm long; blades coriaceous, obtuse, 5-12 x 1.5-5 cm, apex abruptly mucronate, dark green above, pale green abaxially. Inflorescence long pedunculate, with generally 2 (1 to 5) flowers; pedicels slender, 0.7-1 cm long. Sepals ovate-oblong, ca. 1 cm long, ciliate at margin, eglandular; corolla white, throat yellow-orange, lobes pure white above, exterior parts of lobes flushed with bud pink-crimson, 1.5-2 cm long, tube pinkish outside, cylindrical at base, infundibuliform above stamens, ca. 2.5 cm long; suprastaminal indument of long hairs to level of style head; anthers ca. 0.4 cm long, pilose dorsally; ovary with numerous ovules, style slender, coalescent with connective of stamens. Follicles slender, straight, purplish green, 9-14 cm x ca. 0.4 cm; seeds ca. 2.5 cm long.

D i s t r i b u t i o n : Florida, Greater and Lesser Antilles, Central and South America; a species of mangrove swamps and riverbanks, and ridges in coastal area. (GU: 5; SU: 12; FG: 27).

S e l e c t e d s p e c i m e n s : Guyana: Demerara R., Hitchcock 16713 (NY); Berbice R., Maas et al. 5548 (NY, U). Suriname: Saramacca R., Maguire & Stahel 23596 (NY); near Galibi plant., Lanjouw & Lindeman 1053 (NY, U). French Guiana: Kaw R., de Granville 6850 (CAY, P, US); plage de Susini, entre Bourda et Montjoly, Cremers 9523 (B, CAY, NY, P, U, US).

V e r n a c u l a r n a m e s : Suriname: merkitité (Sranan), palo de leche.

P h e n o l o g y : Flowers in May-November. Fruits in November-February.

U s e s : Purgative latex. Nectar and flowers are cardiac tonic and diuretic. Cortes, Fl. Colombia, Bogota, 1988. Grenand et al. (1987: 130).

2. **Rhabdadenia macrostoma** (Benth.) Müll.Arg., *Linnaea* 30: 435. 1860.

–*Echites macrostoma* Benth., *J. Bot. (Hooker)* 3: 248. 1841. Type:

Guyana,Rob. Schomburgk I 329 (holotype K, isotypes G-DEL., P, SING).

Suffrutescent liana, 2.5-8 m long. Stem pilose when young. Petiole 0.3-0.5 cm long; blades membranous, decussate 3-6 x 1.5 - 3.5 cm, apex abruptly mucronate, upper surface bullate, puberulent, lower surface sparsely pilose along primary and secondary veins, auriculate at base. Inflorescences lateral, bearing 2 flowers; peduncle 3-8 cm long; pedicels 0.3-0.5 cm long, somewhat accrescent in fruit; bracts scarious, lanceolate. Sepals scarious, linear-lanceolate, 0.2-0.5 cm long, sparsely pilose; corolla pink, with cylindrical part of tube 0.75-1 x 0.1 cm, throat broadly

tubular, 3-3.5 x ca. 1 cm, wide; lobes broadly obovate, ca. 1.5 cm long; anthers ca. 0.4 cm long, pilose above; disc shorter than ovary; ovary oblong, ca. 0.1 cm long, grading into style, glabrous, style head ca. 0.2 cm long. Follicles ca. 12 cm long, acuminate, relatively slender, glabrous, reddish green; seeds ca. 3 cm long.

D i s t r i b u t i o n : Colombia, Venezuela, the Guianas, Brazil and Peru; ridges and swamps in coastal area; not common. (GU: 3; SU: 2; FG: 4).

S e l e c t e d s p e c i m e n s: Guyana: Yawakuri Cr., Berbice R., Abraham 209 (NY); Berbice R., Jenman 6808 (NY). Suriname: Coppename R., Lanjouw & Lindeman 1555 (NY, U); Nickerie swamp, Lanjouw & Lindeman 3178 (NY, U). French Guiana: Mont Pères Juin, Petitbon 121 (CAY, P); Kaw R., Prévost 747 (CAY, P).

V e r n a c u l a r n a m e : fuente.

P h e n o l o g y : Flowers in May-December.

30. **SECONDATIA** A.DC., Prodr. 8: 445. 1844.

Type: *S. densiflora* A.DC.

Orthechites Urban, Symb. Antill. 6: 36. 1909.

Lianas with white latex. Stems opposite with intrapetiolar colleter. Leaves opposite, without colleters at base of blade on upper surface, finely reticulate. Inflorescence terminal or both terminal and lateral, thyriform, bracteate, several-flowered. Sepals equal, imbricate, with solitary or rarely paired colleters at margin; corolla small, white, salverform, lobes 5, aestivation dextrorse; stamens adherent to style head, inserted near base of tube; indument suprastaminal, abundant; anthers sagittate, adherent to

style head, with parallel tails, pubescent at apex; disc 5-lobed, concrescent at base; ovary bicarpellate, united at top, style short, style head fusiform. Fruit of 2 follicles, dehiscing along ventral suture; seeds numerous, comose, anemochorous.

D i s t r i b u t i o n : 7 species in South America and Jamaica, 1 of which occur in the Guianas.

1. **Secondatia densiflora** A.DC., Prodr. 8: 445. 1844. Type: Brazil, Martius 90, (holotype B destroyed, photo of B at US).

Liana to 7 m long; latex copious. Leaves opposite; blades membranous-chartaceous, obovate, 8-9 x 4-5 cm, acuminate, asymmetric, glabrous; secondary veins 9-12 pairs; tertiary veins reticulate, transversal. Inflorescence several-flowered. Flowers sweet-scented; corolla tube green, 0.5-0.82 cm long, corolla lobes cream. Follicles ca. 14 x 3 cm, glabrous, green to reddish brown, adaxially, orange abaxially; seeds brown, 1.8-2 x 0.4-0.5 cm long, hair tuft whitish, 4.5-5 cm.

D i s t r i b u t i o n : Colombia, Venezuela, the Guianas, Brazil, Bolivia and Paraguay. (GU: 3; SU: 3; FG: 1).

S e l e c t e d s p e c i m e n s : Guyana: Shunyutirir savanna, FD 7573 (Guppy 558) (NY, US); Rupununi R., Cook 246 (NY, U). Suriname: Joden savanne, Boerboom, LBB 8767 (U); Lawa, Versteeg 451 (U). French Guiana: Haut Marouini, de Granville et al. 9810 (CAY, P, photo fr. U).

P h e n o l o g y : Flowers in November-December. Fruits in August.

U s e s : Ducke (Revista Brazil. Farm. 47: 267. 1966) indicates *Secondatia floribunda* A.DC. as aphrodisiac.

L i t e r a t u r e : Azambuja, O., Retificação da diagnose genérica de *Secondatia*, *Rodriguesia* 9 (20): 9-12. 1946.

31. **STEMMADENIA** Benth., Bot. Voy. Sulphur 124, tab. 44. 1845.

Type: *S. glabra* Benth.

Shrubs or small trees 2-15 m high. Latex white. Sympodial module with 2-5 pairs of chlorophyllous leaves, second pair highly asymmetric, 1 pair of decussate bracts subtending an inflorescence and 2 juvenile stems. Leaves opposite. Petioles sheathing, meeting in a shallow ring around stem, with many small fusiform colleters in axil. Inflorescence terminal, a reduced raceme, several-flowered. Sepals 5-lobed, lobes imbricate, unequal, usually 3 interior ones larger than 2 exterior ones, bearing several cycles of small fusiform colleters within and near attachment of disc; corolla large, infundibuliform or salverform, white or yellow, lobes 5, equal, aestivation sinistrorse, occasionally auriculate, corolla with corona lobes on inner surface, opposite and slightly above attachment of stamens; stamens included, attached to corolla at summit of cylindrical part of tube, alternate with corolla lobes, filaments very short and thick, anthers free from style head; thecae elongate; disc adnate to ovary, entire; ovary superior, apocarpous, ovules many, upon a ventral placenta, style filiform, style head fleshy, truncate. Fruit of 2 follicles, divaricate, leathery, punctate; seeds numerous, striate, albuminous, enclosed in an orange-red, oily aril, embryo straight, radicle longer than ovoid cotyledons, endozoochorous.

D i s t r i b u t i o n : 15 species from Mexico to Bolivia, 1 of which occur in the Guianas.

1. **Stemmadenia grandiflora** (Jacq.) Miers, Apocyn. S. Amer.: 75. 1878.

–*Tabernaemontana grandiflora* Jacq., Enum. Pl. Carib.: 14. 1760. Select. Stirp. Amer. Hist. 40, pl. 31. 1763. Type: pl. 31, 1763.

Tabernaemontana riparia Kunth in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 3: 228. 1818.

–*Malouetia riparia* (Kunth) A.DC., Prodr.8: 380. 1844. Type: Colombia, Río Magdalena, Bonpland 1528 (holotype B destroyed; isotype P-Baillon).

Stemmadenia pauciflora Woodson, Ann. Missouri Bot. Gard. 15: 366, pl. 49. 1928. Type: Colombia, Pennell & Rusby 186 (holotype NY).

Stemmadenia pennellii Woodson, Ann. Missouri Bot. Gard. 15: 367. 1928. Type: Colombia, Pennell 4755 (holotype GH, isotypes K, MO, NY, US).

Tree or shrub, up to 10 m high. Sympodial module with 2 pairs of chlorophyllous leaves, second pair highly asymmetric, 1 pair of decussate bracts subtending an inflorescence and 2 juvenile stems. Petiole 0.5-0.7 cm long; blades ovate-oblong, 6-8 x 3-5 cm wide, glabrous; secondary veins 8-9 on each side of primary vein.

Inflorescence 3-5-flowered. Sepals 1-1.5 x 0.8-1.2 cm about 1/3 length of corolla tube; corolla spreading, yellowish white, tube 3-3.5 cm long, 0.4-0.5 cm wide at throat, lobes 1.5-2 cm wide; infrastaminal indument equaling stamens; stamens acute at top, with 2 tails; disc thick, 5-lobed for 1/3 its length; ovary glabrous, style head large, with basal involucrem and without terminal appendages. Follicles reniform, asymmetric, 3-3.5 x 2-3 cm, acute, somewhat flattened, orange-yellow; seeds black, sulcate.

D i s t r i b u t i o n : Mexico, Guatemala, Costa Rica, Panama, Colombia, Venezuela, the Guianas, Brazil and Bolivia; fairly common, forest edges in coastal area and along the rivers or areas periodically under water, to 1330 m. (GU: 10; SU: 6; FG: 3).

S e l e c t e d s p e c i m e n s : Guyana: W Kanuku Mts, Takutu R., A.C. Smith 3241 (A, B, F, G, K, GH, MO, NY, P, S, U, US); id., A.C. Smith 3280 (A, B, F, G, K, MO, NY, P, S, U, US). Suriname: along Saramacca R., Maguire & Stahel 23585 (A, BR, F, G, MO, NY, P, U, UC, US); near sea, Paramaribo NW, Teunissen & Vreden

LBB 14074 (P, U). French Guiana: Mana, Sagot 389 (BM, K, P, U); village des Hattes, Moretti 1103 (CAY, P).

Phenology : Flowers throughout the year when the plant reaches 1 m high. Fruits in March-November.

32. **STENOSOLEN** (Müll.Arg.) Markgr., in Pulle, Fl. Suriname 4(1): 455. 1937.

Type: *S. heterophyllus* (Vahl) Markgr.

Trees or shrubs 2-7 m high. Sympodial module usually with 2 (very rarely 1) pairs of chlorophyllous leaves, second pair highly anisomorphic, 1 pair of bracts subtending 2 (or 1) juvenile stems and 1 cymose few-flowered inflorescence; stems slender. Blades membranous, acuminate, acumen linear, curved. Inflorescence solitary, racemose. Sepals eciliate; corolla white, lobes shorter than tube, tube slender, scarcely swollen at base, with suprastaminal indument at throat; stamens inserted at base of tube; anthers sagittate at base; gynoecium barely exceeding calyx; disc lacking; ovary superior, apocarpous, style short, involucre of style head with 10 basal segments, inserted either between thecae or between 2 stamens. Fruit of 2 reniform follicles, muriculate; aril red or orange, incompletely covering black seeds, endozoochorous.

Distribution : 5 species in South America, 1 of which occur in the Guianas.

1. **Stenosolen heterophyllus** (Vahl) Markgr. in Pulle, Fl. Suriname 4(1): 455. 1937.—*Tabernaemontana heterophylla* Vahl, Eclog. Amer.2: 22. 1798. Icon. Ill. Pl. Amer. pl. 178. 1799.—*Peschiera heterophylla* (Vahl) Miers, Apocyn. S. Amer.: 38. 1878. Type: French Guiana, Cayenne, von Rohr s.n. (holotype C-VAHL, isotypes BM, C, MEL, P).

Tabernaemontana echinata Aubl., Hist. Pl. Guiane 1: 263, pl. 103. 1775, pro parte (fr.).

Peschiera diversifolia Miq., Stirp. Suriname Select. : 164, pl. 47. 1851. Type: French Guiana, Sagot 390.

Tree or shrub 3-7 m high; bark gray, corky; stems cylindrical. First pair of leaves with petioles ca. 0.1 cm long; second pair sessile. Inflorescence very slender, with persistent bracts, 0.3-0.5 cm long. Flowers slender. Sepals linear-lanceolate, ca. 0.2 cm long, with 3-4 colleters at base within; corolla lobes about 1/3 length of tube, falciform, tube dilated at base at level of calyx and above at insertion of stamens, glabrous outside, with suprastaminal indument spreading to throat of tube; ovary ovate; style half length of ovary. Follicles horizontally divergent, very densely covered with short spines, these broadened at base, orange-red when mature; aril orange-red, slightly sweet; seeds dorsally striate, ca. 0.7 x 0.5 cm.

D i s t r i b u t i o n : Costa Rica, Panama, Colombia, Venezuela, the Guianas, Brazil and Peru; common in ridges, rain forest, along creeks. (GU: 24; SU: 14; FG: 56).

S e l e c t e d s p e c i m e n s : Guyana: Corentyne R., FD 6485 (Wilson-Browne s.n.) (NY, U); Wanama R., de la Cruz 3890 (MO, NY). Suriname: Paramaribo, Maguire & Stahel 22745 (MO, NY); Tibiti, Lanjouw & Lindeman 1574 (NY, U). French Guiana: Bourda, Allorge 258 (P); Maroni, Mt. Française, Sastre & Moretti 4014 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: fowl comb; korotoko-emoséperu (Carib-Indian); karina-separe (Arawak). Suriname: merkitiki (Sranan).

P h e n o l o g y : Flowering and fruiting intermittently throughout the year. Fruits endozoochorous (birds, monkeys).

U s e s : According to Schultes (1978, Journ. of Ethnopharm. 1: 165-192) the leaves are used as an infusion for fortifying old people. A. Henriques studied the chemistry of Moretti 130 (CAY, P); six monomeric alkaloids of corynan type were isolated, also 7 of the ibogane & pseudo-aspidosperman type, 1 of the aspidosperman type, 3 dimerous alkaloids of the corynan-ibogan type and many others, 7 of them new (unpubl. doctoral thesis, Paris 1981).

33. **THEVETIA** L., Op. Var.: 212, 1758; Syst. Nat., ed. 8. 212. 1758. (nom. cons.)

Type: *T. ahouai* (L.) A.DC.

Shrubs or small trees. Leaves spirally arranged, caducous, crowded at tips of stems, with intrapetiolar colleters. Inflorescence terminal or pseudo-axillary, cymose, bracteate. Flowers infundibuliform, large. Sepals long, acute, with numerous colleters inside; corolla bright yellow or orange, thin, infundibuliform or rarely salverform, lobes oblique, obtuse, with infra- and suprastaminal scales; stamens inserted in mouth of upper tube, covered by 5 lanceolate, long-haired corona lobes, anthers short, with elongate apical connective appendage; pollen 3-colporate, microreticulate; disc 5-lobed, prominent, ovary globose, hemisyncarpous, each carpel containing 2 ovules, separated by false septum, style head large, cylindrical with basal involucre and 2 short apical appendages. Fruit drupaceous, laterally broadened, syncarpous, impressed around pedicel and finely furrowed longitudinally at apex, exocarp smooth, shining, mesocarp fleshy, endocarp very hard; seeds ovoid-conical, with reticulate endotesta, endozoochorous, embryo with thick, horny cotyledons.

D i s t r i b u t i o n : 9 species in tropical America, 1 of which occur in the Guianas.

L i t e r a t u r e : L. Allorge, 1998. - Les Thevetia, compagnons des succulentes, Succulentes, n° 1: 23-32, 3 pl. col., 1 black and white.

1. **Thevetia peruviana** (Pers.) K.Schum., in Engler & Prantl, Nat. Pflanzenfam. 4(2): 195. 1895.—*Cerbera peruviana* Pers., Synops. Pl. 1: 267. 1805.—*Cascabella peruviana* (Pers.) Raf., Sylva Tellur. 162. 1838.
Type: Pl. 1, 1805.....— Plate 22 (fl. & fr.).

Cerbera thevetia L., Sp. Pl. ed.1. 209. 1753.—*Thevetia thevetia* (L.) Millspaugh, Publ. Field Columb. Mus., Bot. ser. 2: 83. 1900.—*Ahouai thevetia* (L.) Maza Gómez, Bol. Estac. Exp. Agric. Santiago de las Vegas 22: 124. 1916.—*Cascabella thevetia* (L.) Lippold, Feddes Repert. 91: 45. 1980.
Type: Suriname, s.coll. (holotype LINN. 296.4).

Thevetia linearis Raf., Sylva Tellur.: 91. 1838.

Thevetia neriifolia (L.) Juss. ex Steudel, Nomencl. Bot., ed.2, 2: 680. 1841.

Small tree, 4-6 m high. Leaves sessile; blades linear, firmly membranous, 10-20 x 0.6-0.9 cm, attenuate at both ends; secondary veins scarcely visible above, with ca. a dozen colleters at insertion of petiole. Inflorescence cymes of 5-10 hanging flowers; peduncles ca.1 cm long; bracts linear, ca. 0.1 cm long. Corolla yellow, corolla tube in 2 parts, inferior part ca. 1.5 cm long, superior part 2.5-3 cm long, with protuberances above and below stamen; lobes sinistorse, ca. 2 cm long; anthers with elongate apex surmounted by hairs and infrastaminal indument; disc half height of ovary; style slender. Drupe globose-trigonous, bright red at maturity, 4-4.5 x ca. 2 cm; seeds 4, cotyledons obovate, triangular, radicle very short, about 0.1 cm.

D i s t r i b u t i o n : Originally from Peru. Probably transported by man as an ornamental necklace before discovery of America, according to Humboldt and Crevaux, now cultivated in the Tropics. About 100 collections studies. (GU: 3; SU: 5; FG: 2).

S e l e c t e d s p e c i m e n s : Guyana: Potaro-Siparuni, Koa Valley, Annuyeng Cr., Mutchnick 1604 (P, US); Demerara-Mahaica Reg., University of Guyana, Hahn 4855 (P, US). Suriname: Paramaribo, Kappler 1635 (P); Marowijine R., Lanjouw 577

(U). French Guiana: Cayenne, cult., Prévost 1243 (CAY, P); St Laurent du Maroni, cult., Fleury 309 (CAY, P).

V e r n a c u l a r n a m e s : Guyana: milk tree, yellow oleander, bastille tree, jorojoro, jurri-jurri (Bush), sewejoe (Arawak). Suriname: karawassi (Carib). French Guiana: noix de serpent, noix du diable, bois à lait, Kawai (Boni); away.

P h e n o l o g y : Flowers and fruits throughout the year.

U s e s : The latex and the seeds are poisonous (Leon & Alain, Fl. Cuba 181. 1957) producing progressive paralysis. The bark is a febrifuge and in high doses a drastic purgative and emetic. In Yucatan, it is a medicine to cure tooth-ache. See J.T. Roig y Mesa, Plantas medicinales, aromaticas y venenosas de Cuba: 233-235. 1974, Habana; Grenand et al. (1987: 131).

N o t e s : An attractive small tree cultivated in the Tropics. Depending on the cultivar, the flowers may be golden yellow, pale yellow or nearly white (var. *leucantha* Müll.Arg.). I have seen pigs eating the fruits without apparent harm.

NUMERICAL LIST OF ACCEPTED TAXA (140 sp.)

+ 4 genus and 4 species introduced:

Carissa L.

C. macrocarpa A.DC. (Davis, D.H. 1697)

Funtumia Stapf

F. elastica (Pruss) Stapf (Gleason, H.A. 910)

Nerium L.

N. oleander L.

Strophanthus A.DC.

S. gratus (Wall. & Hook.) Baill. (Allorge, L. 1094)

1. Allamanda L.

1-1. A. blanchetii A.DC.

1-2. A. cathartica L.

1-3. A. schottii Pohl

1-4. A. setulosa Miq.

2. Ambelania Aubl.

2-1. A. acida Aubl.

3. Anartia Miers

3-1. A. cerea (Woodson) L.Allorge

3-2. A. meyeri (G.Mey. ex G.Don) Miers

3-3. A. olivacea (Müll.Arg.) Markgr.

4. *Aspidosperma* Mart. & Zucc.

- 4-1. *A. album* (Vahl) Benoist ex Pichon
- 4-2. *A. carapanauba* Pichon
- 4-3. *A. cruentum* Woodson
- 4-4. *A. excelsum* Benth.
- 4-5. *A. helstonei* Donsel.
- 4-6. *A. macrophyllum* Müll.Arg.
- 4-7. *A. marcgravianum* Woodson
- 4-8. *A. oblongum* A.DC.
- 4-9. *A. sandwithianum* Markgr.
- 4-10. *A. schultesii* Woodson
- 4-11. *A. spruceanum* Benth. ex Müll.Arg.
- 4-12. *A. ulei* Markgr.
- 4-13. *A. vargasii* A.DC.

5. *Bonafousia* A.DC.

- 5-1. *B. albiflora* (Miq.) Boiteau & L.Allorge
- 5-2. *B. angulata* (Mart. ex Müll.Arg.) Boiteau & L.Allorge
- 5-3. *B. disticha* (A.DC.) Boiteau & L.Allorge
- 5-4. *B. lorifera* (Miers) Boiteau & L.Allorge
- 5-5. *B. macrocalyx* (Müll.Arg.) Boiteau & L.Allorge
- 5-6. *B. morettii* L.Allorge
- 5-7. *B. muelleriana* (Mart. ex Müll.Arg.) Boiteau & L.Allorge
- 5-8. *B. obliqua* Miers
- 5-9. *B. rupicola* (Benth.) Miers
- 5-10. *B. sananho* (Ruiz & Pav.) Markgr.
- 5-11. *B. siphilitica* (L.f.) L.Allorge
- 5-12. *B. undulata* (Vahl) A.DC.

6. *Catharanthus* G.Don6-1. *Catharanthus roseus* (L.) G.Don7. *Condylocarpon* Desf.7-1. *C. amazonicum* (Markgr.) Ducke7-2. *C. guyanense* Desf.7-3. *C. intermedium* Müll.Arg.7-4. *C. myrtifolium* (Miq.) Müll.Arg.7-5. *C. pubiflorum* Müll.Arg.8. *Couma* Aubl.8-1. *C. catingae* Ducke8-2. *C. guianensis* Aubl.8-3. *C. macrocarpa* Barb.Rodr.8-4. *C. rigida* Müll.Arg.9. *Ervatamia* (A.DC.) Stapf9-1. *E. coronaria* (Jacq.) Stapf9-2. *E. cumingiana* (A.DC.) Markgr.10. *Forsteronia* G.Mey.10-1. *F. acouci* (Aubl.) A.DC.10-2. *F. adenobasis* Müll.Arg.10-3. *F. diospyrifolia* Müll.Arg.10-4. *F. duckei* Markgr.10-5. *F. gracilis* (Benth.) Müll.Arg.10-6. *F. guyanensis* Müll.Arg.10-7. *F. laurifolia* (Benth.) A.DC.10-8. *F. obtusiloba* Müll.Arg.10-9. *F. paraensis* B.F.Hansen

- 10-10. *F. schomburgkii* A.DC.
- 10-11. *F. umbellata* (Aubl.) Woodson

- 11. *Galactophora* Woodson
 - 11-1. *G. schomburgkiana* Woodson

- 12. *Geissospermum* Allemào
 - 12-1. *G. argenteum* Woodson
 - 12-2. *G. laeve* (Thunb.) Miers
 - 12-3. *G. sericeum* Sagot ex Benth. & Hook.f.

- 13. *Himatanthus* Willd. ex Schult.
 - 13-1. *H. articulatus* (Vahl) Woodson
 - 13-2. *H. bracteatus* (A.DC.) Woodson
 - 13-3. *H. drasticus* (Mart.) Plumel
 - 13-4. *H. fallax* (Müll.Arg.) Plumel
 - 13-5. *H. obovatus* (Müll.Arg.) Woodson
 - 13-6. *H. speciosus* (Müll.Arg.) Plumel
 - 13-7. *H. sucuuba* (Spruce ex Müll.Arg.) Woodson

- 14. *Kopsia* Blume
 - 14-1. *K. arborea* Blume
 - 14-2. *K. fruticosa* (Ker Gawl.) A.DC.

- 15. *Lacmellea* H. Karst.
 - 15-1. *L. aculeata* (Ducke) Monach.
 - 15-2. *L. floribunda* (Poeppig) Benth.
 - 15-3. *L. guyanensis* (Müll.Arg.) Monach.
 - 15-4. *L. utilis* (Arn.) Markgr.

16. *Laxoplumeria* Markgr.
 - 16-1. *L. baehiana* Monach.

17. *Macoubea* Aubl.
 - 17-1. *M. guianensis* Aubl.

18. *Macropharynx* Rusby
 - 18-1. *M. spectabilis* (Stadelm.) Woodson

19. *Malouetia* A.DC.
 - 19-1. *M. flavescens* (Willd. ex Roem. & Schult.) Müll.Arg.
 - 19-2. *M. gracilis* (Benth.) A.DC.
 - 19-3. *M. guianensis* (Aubl.) Miers
 - 19-4. *M. pubescens* Markgr.
 - 19-5. *M. tamaquarina* (Aubl.) A.DC.

20. *Mandevilla* Lindl.
 - 20-1. *M. benthamii* (A.DC.) K.Schum.
 - 20-2. *M. duidae* (Woodson) Woodson
 - 20-3. *M. hirsuta* (Rich.) K.Schum.
 - 20-4. *M. holstii* Morillo
 - 20-5. *M. kalmiaefolia* (Woodson) J.F.Morales
 - 20-6. *M. leptophylla* (A.DC.) K.Schum.
 - 20-7. *M. rugellosa* (Rich.) L.Allorge
 - 20-8. *M. scaberula* N.E.Br.
 - 20-9. *M. scabra* (Roem. & Schult.) K.Schum.
 - 20-10. *M. steyermarkii* Woodson
 - 20-11. *M. subcarnosa* (Benth.) Woodson
 - 20-12. *M. surinamensis* (Pulle) Woodson
 - 20-13. *M. symphitocarpa* (G.Mey.) Woodson

- 20-14. *M. tenuifolia* (Mikan) Woodson
- 20-15. *M. trianae* Woodson
- 20-16. *M. vanheurckii* (Müll.Arg.) Markgr.
- 20-17. *M. villosa* (Miers) Woodson

- 21. *Mesechites* Müll.Arg.
 - 21-1. *M. trifida* (Jacq.) Müll.Arg.

- 22. *Odontadenia* Benth.
 - 22-1. *O. cururu* (Mart.) K.Schum.
 - 22-2. *O. geminata* (Roem. & Schult.) Müll.Arg.
 - 22-3. *O. glauca* Woodson
 - 22-4. *O. macrantha* (Roem. & Schult.) Markgr.
 - 22-5. *O. nitida* (Vahl) Müll.Arg.
 - 22-6. *O. perrottetii* (A.DC.) Woodson
 - 22-7. *O. puncticulosa* (Rich.) Pulle
 - 22-8. *O. sandwithiana* Woodson
 - 22-9. *O. sylvestris* (A.DC.) Müll.Arg.

- 23. *Pacouria* Aubl.
 - 23-1. *P. guianensis* Aubl.

- 24. *Parahancornia* Ducke
 - 24-1. *P. fasciculata* (Poir.) Benoist ex Pichon

- 25. *Peschiera* A.DC.
 - 25-1. *P. lageneria* (Leeuwenb.) L.Allorge
 - 25-2. *P. vanheurckii* (Müll.Arg.) L.Allorge

- 26. *Plumeria* L.

- 26-1. *P. inodora* Jacq.
- 26-2. *P. pudica* Jacq.
- 26-3. *P. rubra* L.

- 27. *Prestonia* R. Br.
 - 27-1. *P. acutifolia* (Benth. ex Müll.Arg.) K.Schum.
 - 27-2. *P. annularis* (L.f.) G.Don
 - 27-3. *P. coalita* (Vell.) Woodson
 - 27-4. *P. discolor* Woodson
 - 27-5. *P. guianensis* Gleason
 - 27-6. *P. marginata* (Benth.) Woodson
 - 27-7. *P. megagros* (Vell.) Woodson
 - 27-8. *P. portobellensis* (Beurl.) Woodson
 - 27-9. *P. quinquangularis* (Jacq.) Spreng.
 - 27-10. *P. surinamensis* Müll.Arg.
 - 27-11. *P. tomentosa* R. Br.

- 28. *Rauvolfia* L.
 - 28-1. *R. ligustrina* Willd. ex Roem. & Schult.
 - 28-2. *R. pachyphylla* Markgr.
 - 28-3. *R. paraensis* Ducke
 - 28-4. *R. polyphylla* Benth.
 - 28-5. *R. tetraphylla* L.

- 29. *Rhabdadenia* Müll.Arg.
 - 29-1. *R. biflora* (Jacq.) Müll.Arg.
 - 29-2. *R. macrostoma* (Benth.) Müll.Arg.

- 30. *Secondatia* A.DC.
 - 30-1. *S. densiflora* A.DC.

31. *Stemmadenia* Benth.

31-1. *S. grandiflora* (Jacq.) Miers

32. *Stenosolen* (Müll.Arg.) Markgr.

32-1. *S. heterophyllus* (Vahl) Markgr.

33. *Thevetia* L.

33-1. *T. peruviana* (Pers.) K.Schum.

COLLECTIONS STUDIED for Flora of the GUIANAS,

Lucile Allorge & Michel Hoff

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Asketanthera steyermarkii Markgr. = *Macropharynx strigillosa* Woods.

Echites rubricaulis Poir. = *Mandevilla rugellosa* (Rich.) L.Allorge

Echites verticillata Sessé & Moç. = *Allamanda cathartica* L.

Kopsia cochinchinensis Kuntze = *Ervatamia coronaria* (Jacq.) Stapf

Nerium antidysentericum Thunb. = *Ervatamia coronaria* (Jacq.) Stapf

Odontadenia kochii Pilger = *O. curucu* (Mart.) K. Schum.

Prestonia perplexa Woods. = *P. marginata* (Benth.) Woods.

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Anartia attenuata (Miers) Markgr. = 3-2
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recurva Sagot ex Miers = 9-2
Anechites amazonicum Markgr. = 7-1
Angadenia coriacea (Benth.) Miers = 22-2
cururu (Mart.) Miers = 22-1
elegans (Benth.) Miers = 22-2
geminata (Willd. ex Roem. & Schult.) Miers = 22-2
grandiflora (Stadelm.) Miers = 22-7
nitida (Vahl) Miers = 22-5
poepigii (Müll.Arg.) Miers = 22-2
prieurei (A.DC.) Miers = 20-8
sylvestris (A.DC.) Miers = 22-9
Anisolobus cururu (Mart.) Müll.Arg. = 22-1
fockei Mickel = 22-7
kappleri Miq. = 22-7
oblongus Miers = 22-6
perrottetii A.DC. = 22-6
prieurei (A.DC.) Miers = 20-8
puncticulosus Miq. = 22-7
Apocynum acouci Aubl. = 10-1

paniculatum Lam. = 10-1
umbellatum Aubl. = 10-11
Aspidosperma centrale Markgr. = 4-11
chiapense Matuda = 4-3
 forma *tenax* = 4-3
igapoanum Markgr. = 4-11
kuhlmannii Markgr. = 4-8
latisiliqua (Poir.) A.DC. = 4-1
macrophyllum Müll.Arg. subsp. *morii* L.Allorge = 4-10
matudai Lundell
megalocarpon Müll.Arg. see note 4-3
occidentale Markgr. = 4-12
quadriovulatum Pitt. = 28-2
salgadense Markgr. = 4-7
sanguineum Bartlett = 4-3
tomentosum Mart. & Zucc., type 4
woodsonianum Markgr. = 4-11
Bignonia latisiliqua Poir. in Lam. = 4-1
Bonafousia attenuata Miers = 3-2
calycina Benth. = 5-7
olivacea (Müll.Arg.) Miers
perrottetii (A.DC.) Miers = 5-12
polyneura Miers = 5-9
speciosa (Poir.) Boiteau = 5-10
tesmannii Markgr.
tetrastachya (Kunth) Markgr. = 5-11
undulata (Vahl) A.DC., type 5
Brunfelsia chiriscapi = 5-10
Brunfelsia grandiflora = 5-10
Calpicarpum roxburgii G.Don = 14-2

Cameraria guianensis Aubl. = 19-3
lutea Lam. = 19-5
tamaquarina Aubl. = 19-5
Cascabela peruviana (Pers.) Raf. = 33-1
thetia (L.) Lippold = 33-1
Catharanthus roseus (L.) G.Don type 6
Cerbera fruticosa Ker Gawl. = 14-2
peruviana Pers. = 33-1
thetia L. = 33-1
triphylloides Rudge = 8-2
Codonemma calycinum (Benth.) Miers = 5-7
macrocalyx (Müll.Arg.) Miers = 5-5
Condylocarpon breviararticulatum Müll.Arg. = 7-3
longii Standl. & L.O.Williams = 7-3
guyanense Desf., type 7
obtusiusculum Müll.Arg. = 7-3
occidentale Markgr. = 7-1
reticulatum Ducke = 7-1
Couma capiron Pittier = 8-3
caurensis Pittier = 8-3
fasciculata (Poir.) Benoist
guatemalensis Standl. = 8-3
guianensis Aubl., type 8
mocuge Caminhoa = 8-4
sapida Pittier = 8-3
Cupirana martiana Miers = 5-11
Dipladenia billbergii (Beurl.) Beurl. = 29-1
harrisii Purdie = 22-4
linearifolia A.DC. = 20-13
pastorum (Stadelm.) A.DC. = 20-13

peduncularis (Stadelm.) A.DC.
var. *tenuifolia* (Mikan) Hook.f. = 20-13
polymorpha Müll.Arg. = 20-13
surinamensis Pulle = 20-11
tenuifolia (Mikan) A.DC. = 20-13
upatae Woodson = 20-11
vincaeflora Lem. = 20-13
Echites albiflora (Miq.) Miers = 5-1
almadensis Stadelm. = 20-3
angustifolia Benth. = 20-1
annularis L.f. = 27-2
auriculata Pohl ex Stadelm. = 20-3
bangii Rusby = 27-1
benthamii A.DC. = 20-1
biflora Jacq. = 29-1
billbergii Beurl. = 29-1
blanchetii A.DC. = 27-3
brachystachya Benth. = 20-8
brasiliensis Thunb. = 5-12
campestris Vell. = 20-3
ciliata Stadelm. = 20-3
coalita Vell. = 27-3
comosa Kuntze = 20-16
coriacea Benth. = 22-2
cururu Mart. = 22-1
var. *grandifolia* Stadelm. = 22-7
disadena Miq. = 21-1
elegans Benth. = 22-2
geminata Willd. ex Roem. & Schult. = 22-2
grandiflora G.Mey. = 22-4

guianensis A.DC. = 20-6
hirsuta Rich. = 20-3
hirsuta Ruiz & Pav. var. *latifolia* Stadelm. = 20-3
hispida Willd. ex Roem. & Schult. = 20-3
hoffmannseggiana Steud. = 22-4
hulkiana Pulle = 27-1
japurensis Stadelm. = 21-1
laevis Thunb. = 12-2
laurentiae-disca Rusby = 27-1
leoptophylla A.DC. = 20-5
linearifolia Stadelm. = 20-5
lucida Roem. & Schult. = 22-5
macrantha Willd. ex Roem. & Schult. = 22-4
macrophyllum Kunth = 20-3
macrostoma Benth. = 29-2
martii Müll.Arg. = 27-3
megagros Vell. = 27-7
nitida Vahl = 22-5
nutans Anders = 27-9
pallida Miers = 21-1
paludosa Vahl = 29-1
palustris Salzman ex Müll.Arg. = 20-3
pastorum Mart. ex Stadelm. = 20-13
peduncularis Stadelm. = 20-13
portobellensis Beurl. = 27-8
prieurii A.DC. = 20-8
puncticulosa Rich. = 22-7
quinguangularis Jacq. = 27-9
richardi Willd. ex Roem. & Schult. = 20-3
rubricaulis Poir. = 20-6

- rugellosa* Rich. = 20-6
rugosa Benth. = 20-8
sanguinolenta Tussac = 27-9
scabra Willd. ex Roem. & Schult. = 20-8
siphilitica L.f. = 5-11
spectabilis Stadelm. = 18-1
stadelmeyeri Mart. ex Stadelm. = 20-3
subcarnosa Benth. = 20-10
subspicata Vahl = 20-6
surinamensis Miq. = 21-1
sylvestris A.DC. = 22-9
symphitocarpa G.Mey. = 20-12
tenuifolia Mikan = 20-13
tomentosa Vahl = 20-3
var. *laticorda* A.DC. = 20-3
trifida Jacq. = 21-1
tubulosa Benth. = 21-1
varia Stadelm. = 21-1
vauthieri A.DC. = 27-3
versicolor Mart. ex Stadelm. = 20-8
verticillata Sessé & Moç. = 1-2
Elythropus spectabilis (Stadelm.) Miers = 18-1
Ervatamia coronaria (Jacq.) Stapf, type 9
Eriadenia obovata Miers = 20-15
Exothostemon macrophyllum (Kunth) G.Don = 20-3
Forsteronia benthamianum Müll.Arg. = 10-1
corymbifera (Miers) Sandw. = 10-10
macrophylla Müll.Arg. = 10-11
sandwithiana Woodson = 10-10
schomburgkii Benth. = 10-1

schomburgkii A.DC. = 4-6

var. *umbellata* A.DC. = 10-11

spicata (Jacq.) G.Mey., type 10

viridescens Blake = 10-1

Galactophora crassifolia (Müll.Arg.) Woodson, type 11

Geissospermum excelsum Kuhl. = 4-2

vellosii Allemáo, type 12 = 12-2

Haemadictyon acutifolium Benth. ex Müll.Arg. = 27-1

annulare (L.f.) A.DC. = 27-2

asperum Müll.Arg. = 27-7

caliginosum Miers = 27-1

cayennensis A.DC. = 27-6

marginatum Benth. = 27-6

melagrion Müll.Arg. = 27-7

nutans (Anders) A.DC. = 27-9

papillosum see note = 27-6

schizadenium Müll.Arg. = 27-8

venosum Lindl. = 27-9

Hancornia amapa Huber = 24-1

floribunda Poepp. = 15-2

Heterothrix vanheurckii Müll.Arg. = 20-15

Himatanthus rigida Hoffmannss. ex Willd. in Roem. & Schult., type 13 = 13-1

Homaladenia pastorum (Mart. ex Stadelm.) Miers = 20-13

tenuifolia (Mikan) Miers = 20-13

Hortsmania myrtifolium (Miq.) Müll.Arg. = 7-4

Hottonia littoralis Lour. = 6-1

Kopsia arborea Blume, type 14

cochinchinensis Kuntze = 9-1

longiflora Merr. = 14-1

laxinervia Merr. = 14-1

- pruniformis* Reich.f. & Zoll. ex Bakh.f. = 14-1
- vinciflora* Blume = 14-2
- Lacmellea aculeata* (Ducke) Monach. var. *surinamensis* Monach.= 15-3
- edulis* H.Karst., type 15
- Landolphia guyanensis* (Aubl.) Pulle = 23-1
- paraensis* Huber = 23-1
- Laseguea subspicata* (Vahl) Miers = 20-6
- venustula* Miers = 20-6
- villosa* Miers = 20-15
- Laxoplumeria tessmannii* Markg., type 16
- Lochnera rosea* (L.) Rchb. ex K.Schum.
- Macaglia album* Vahl = 4-1
- excelsum* (Benth.) Kuntze = 4-4
- oblonga* (A.DC.) Kuntze= 4-8
- spruceanum* (Benth.) Kuntze = 4-11
- vargasii* (A.DC.) Kuntze = 4-13
- Macoubea fasciculata* (Poir.) Lemée = 24-1
- guianensis* Aubl., type 17
- paucifolia* (Spruce ex Müll.Arg.) Markgr. ex L.O.Williams= 17-1
- sinuosa* (Miers) Markgr. = 17-1
- sprucei* var. *paucifolia* (Spruce ex Müll.Arg.) Monach. =17-1
- Macropharynx spectabilis* (Stadelm.) Woodson, type 18
- fistulosa* Rusby = 18-1
- strigilosa* Woodson = 18-1
- Malouetia albiflora* Miq. = 19-5
- cubana* A.DC. = 19-1
- furfuracea* Spruce ex Müll.Arg. = 19-5
- obtusiloba* A.DC. = 19-5
- odorata* (Vahl) Miers = 19-5
- retroflexa* Müll.Arg. = 19-1

riparia (Kunth) A.DC. = 32-1
schomburgkii Müll.Arg. = 19-1
tamaquarina (Aubl.) A.DC., type 19
tetrastachya (Kunth) Miers = 5-11
Mandevilla auriculata (Stadelm.) K.Schum.= 20-3
denticulata S.F.Blake = 20-3
dielsiana Markgr. = 20-10
fluminensis (A.DC.) Donn.-Sm. = 20-3
glabra N.E.BR. = 20-15
hispida (Willd. ex Roem. & Schult.) Hemsl.= 20-3
laxa (Ruiz & Pav.) Woodson, type 20
linearis N.E. Br. = 20-5
palustris (Müll.Arg.) Hemsl.
rugosa (Benth.) Woodson = 20-8
rusbyi Britton = 20-3
subspicata (Vahl) Miers = 20-6
tomentosa (Vahl) K.Schum. = 20-3
Manihot esculenta L. = 5-11
Merizadenia amplifolia Miers = 5-10, 17-1
sananho (Ruiz et Pav.) Miers = 5-10
Mesechites angustata Miers = 20-1
disadena (Miq.) Müll.Arg. = 21-1
guianensis (A.DC.) Miers = 20-6
japurensis (Stadelm.) Müll.Arg. = 21-1
mansoana (A.DC.) Woodson, type 21
subcarnosa (Benth.) Miers = 20-10
surinamensis (Miq.) Müll.Arg. = 21-1
Mitozus blanchetii (A.DC.) Miers = 27-3
brachystachyus (Benth.) Miers = 20-8
concinus Miers = = 27-3

leptophylla (A.DC.) Miers = 20-5
rugosus (Benth.) Miers = 20-8
symphitocarpus (G.Mey.) Miers = 20-12
tenellus Miers = 22-5
versicolor (Stadelm.) Müll.Arg. = 20-8
Nerium antidysentericum Thunb. = 9-1
ceilanicum Thunb. = 9-2
coronarium Jacq. = 9-1
Odontadenia angustifolia A.DC. = 22-5
cordata A.DC. = 22-5
coriacea (Benth.) Müll.Arg. = 22-2
dusendschoenii K.Schum. = 22-5
grandiflora (G.Mey.) Kuntze
hoffmanseggiana (Steud.) Woodson = 22-4
kochii Pilger = 22-1
lucida (Roem. & Schult.) Müll.Arg. = 22-5
macrantha (Roem. & Schult.) Markgr., type 22
poepigii Müll.Arg. = 22-2
spoliata Malme = 22-7
surinamensis (Pulle) Woodson = 22-1
Orelia grandiflora Aubl. = 1-2
Pacouria guianensis Aubl., type 23
paraensis (Huber) Pichon = 23-1
Parahancornia amapa (Huber) Ducke, type 24 = 24-1
tabernaemontana Woodson = 17-1
Paralyxia schomburgkii Baill. = 4-6
Peltospermum latisiliquum (Poir.) A.DC. = 4-1
patrisii A.DC. = 4-1
Pervinca rosea (L.) Moench
Peschiera albiflora Miq. = 5-1

blanda Miers = 25-2
diversifolia Miq. = 32-1
echinata (Aubl.) A.DC. = 25-1, 32-1
heterophylla (Vahl) Miers = 32-1
hystrix (Steud.) A.DC., type 25
lingulata Miers = 25-2
lorifera Miers = 5-4
surinamensis Miq. = 5-12
Plumeria acuminata Ait. = 26-3
acutifolia Poir. = 26-3
alba L. var. *inodora* (Jacq.) G.Don = 26-1
articulata Vahl = 13-1
bracteata A.DC. = 13-2
caracasana J.R. Johnson = 26-2
cochleata Blake = 26-2
drastica Mart. = 13-3
duckei Markgr. = 26-1
fallax Müll.Arg. = 13-4
obovata Müll.Arg. = 13-5
oligoneura Malme = 13-5
revoluta Huber = 13-2
rubra L., type 26
speciosa Müll.Arg. = 13-6
sucuuba Spruce ex Müll.Arg. 13-7
tenorii Gasp. = 26-3
warmingii Müll.Arg. ex Warming = 13-5
Prestonia cayenensis (A.DC.) Pich. = 27-6
cearensis Miers = 27-11
exserta (A.DC.) Standl. see note 27-6
ipomaeifolia A.DC. = 27-11

laeta Miers = 27-7

lanata Müll.Arg. = 27-11

latifolia Benth. = 27-11

lutescens Müll.Arg. = 27-11

macrocarpa Helms. = 27-8

melagrion (Müll.Arg.) Miers = 27-7

perplexa Woodson = 27-6

schizadenia (Müll.Arg.) Hemsl. = 27-8

seemanni Miers = 27-11

sericocalyx Malme = 27-11

tomentosa R.Br., type 27

Quadricasaea caquetensis Woodson = 5-7

inaequilateralis Woodson = 5-7

Rauvolfia alphonsiana Müll.Arg. = 28-1

amazonica Markgr. = 28-3

canescens L. = 28-5

heterophylla Roem. & Schult. = 28-5

hirsuta Jacq. = 28-5

lamarckii A.DC. = 28-5

mollissima Markgr. = 28-5

nitida Sessé & Moç. = 28-5

odontophora Van Heurck & Müll.Arg. = 28-5

parvifolia Bert. ex Spreng. = 28-1

polyphylla var. *connivens* Benth. ex Müll.Arg. = 28-4

polyphylla var. *divergens* Benth. ex Müll.Arg. = 28-4

subpubescens L. = 28-5

ternifolia Kunth = 28-1

tetraphylla L., type 28

tomentosa Jacq. = 28-5

Rhabdadenia campestris (Vell.) Miers = 20-3

- lucida* (Willd. ex Roem. & Schult.) Miers = 22-5
macrantha Donn.-Sm. = 29-1
paludosa (Vahl) Miers = 29-1
pohlii Müll.Arg., type 29
Rhaptocarpus apiculatus Miers = 27-3
coalitus (Vell.) Miers = 27-3
martii (Müll.Arg.) Miers = 27-3
Rhigospira paucifolia (Spruce ex Müll.Arg.) Miers = 17-1
sinuosa Miers = 17-1
Rhipidia amazonica (Markgr.) Markgr. = 7-1
Salpinctes duidae Woodson = 20-2
kalmiaefolius Woodson = 20-4
Secondatia densiflora A.DC., type 30
Stemmadenia cerea Woodson = 3-1
glabra Benth., type 31
nervosa Standl. & L.O.Williams = 5-12
pauciflora Woodson = 31-1
pennellii Woodson = 31-1
Stenosolen heterophyllus (Vahl) Markgr., type 32
macrosiphon (Herz.) Markgr. = 25-2
vanheurckii (Müll.Arg.) Markgr. = 25-2
Taberna albiflora (Miq.) Markgr. = 5-1
disparifolia Miers = 3-3
disticha (A.DC.) Miers = 5-3
poeppigii (Müll.Arg.) Miers = 5-10
Tabernaemontana *albescens* Rusby = 5-8
albiflora (Miq.) Pulle = 5-1
angulata Mart. ex Müll.Arg. = 5-2
attenuata (Miers) Urb. = 3-2
aubletii Pulle = 17-1

cerea (Woodson) Leeuwenb. = 3-1
coronaria (Jacq.) Willd. = 9-1
cumingiana A.DC. = 9-2
cuyabensis Malme = 5-11
disticha A.DC. = 5-3
divaricata (L.) R.Br. ex Roem. & Schult. see 9-1
diversifolia Miq. = 32-1
duckei Huber = 5-11
echinata Aubl. = 25-1, 32-1
fasciculata Poir. 24-1
flavescens Willd. ex Roem. & Schult. = 19-1
gracilis Benth. = 19-2
grandiflora Jacq. = 31-1
guianensis Miq. = 5-11
guyanensis Müll.Arg. = 5-11
heterophylla Vahl = 32-1
humboldtii M.R.Schomb. = 4-6
inaequilateralis (Woodson) Pichon = 5-7
killipii Woodson = 5-11
laevis Vell. = 12-2
lagenaria Leeuwenb. = 25-1
longiflora Rusby = 5-11
longifolia Benth. = 5-11
lorifera (Miers) Leeuwenb. = 5-4
macrocalyx Müll.Arg. = 5-5
macrosiphon Herz. = 25-2
macrophylla Poir. = 17-1
meyeri Miers = 3-2
montana Oken = 15-4
muelleriana Mart. ex Müll.Arg. = 5-7

neriifolia Miers = 3-2
oblongifolia A.DC. = 3-2
odorata Vahl = 19-5
olivacea Müll.Arg. = 3-3
paucifolia Spruce ex Müll.Arg. = 17-1
perrottetii A.DC. = 5-12
poepigii Müll.Arg. = 5-10
repanda G.Mey. = 5-11
riparia Kunth = 31-1
rosea Tenore = 14-2
rupicola Benth. = 5-9
sananho Ruiz & Pav. = 5-10
sessilifolia Klotzsch = 5-9
siphilitica (L.f.) Leeuwenb. = 5-11
speciosa Lam. = 5-10
tessmannii Markgr. = 5-11
tetrastachya Kunth = 5-11
undulata G.Mey. = 3-2
undulata Vahl = 5-12
utilis Arn. = 15-4
vanheurckii Müll.Arg. = 25-2
Temmadenia annularis (L.f.) Miers = 27-2
pallidiflora Miers = 20-3
palustris (Salzm.) Miers = 20-3
quinquangularis Jacq. = 27-9
tomentosa (Vahl) Miers = 20-3
Thenardia? corymbosa Benth. = 4-6, = 10-10
laurifolia Benth. = 10-7
umbellata (Aubl.) Spreng. = 10-11
Thevetia ahouai (L.) A.DC., type 33

humboldtii M.R.Schomb. = 4-6
linearis Raf. = 33-1
neriifolia A.Juss. ex Steud. = 33-1
thetvetia (L.) Millsp. = 33-1
Thyrsanthus acouci (Aubl.) Miers = 10-1
adenobasis (Müll.Arg.) Miers = 10-2
aubletianus Miers = 10-11
benthamianus (Müll.Arg.) Miers = 10-1
corymbiferus Miers = 10-10
diospyrifolius (Müll.Arg.) Miers = 10-3
fasciculatus (Poir.) Miers = 24-1
gracilis Benth. = 10-5
guyanensis (Müll.Arg.) Miers = 10-6
macrophyllus (Müll.Arg.) Miers = 10-11
schomburgkii Benth. = 10-1
Vinca rosea L. = 6-1
Willughbeia acida (Aubl.) Oken = 2-1
acida (Aubl.) J.F.Gmel. = 2-1
guianensis (Aubl.) J.F.Gmel. = 23-1
scandens Willd. = 23-1
Zschokkea aculeata Ducke = 15-1
floribunda (Poepp.) Müll.Arg. = 15-2
guianensis Müll.Arg. = 15-3
utilis (Arn.) Hemsl. = 15-4

ILLUSTRATIONS

Ramification

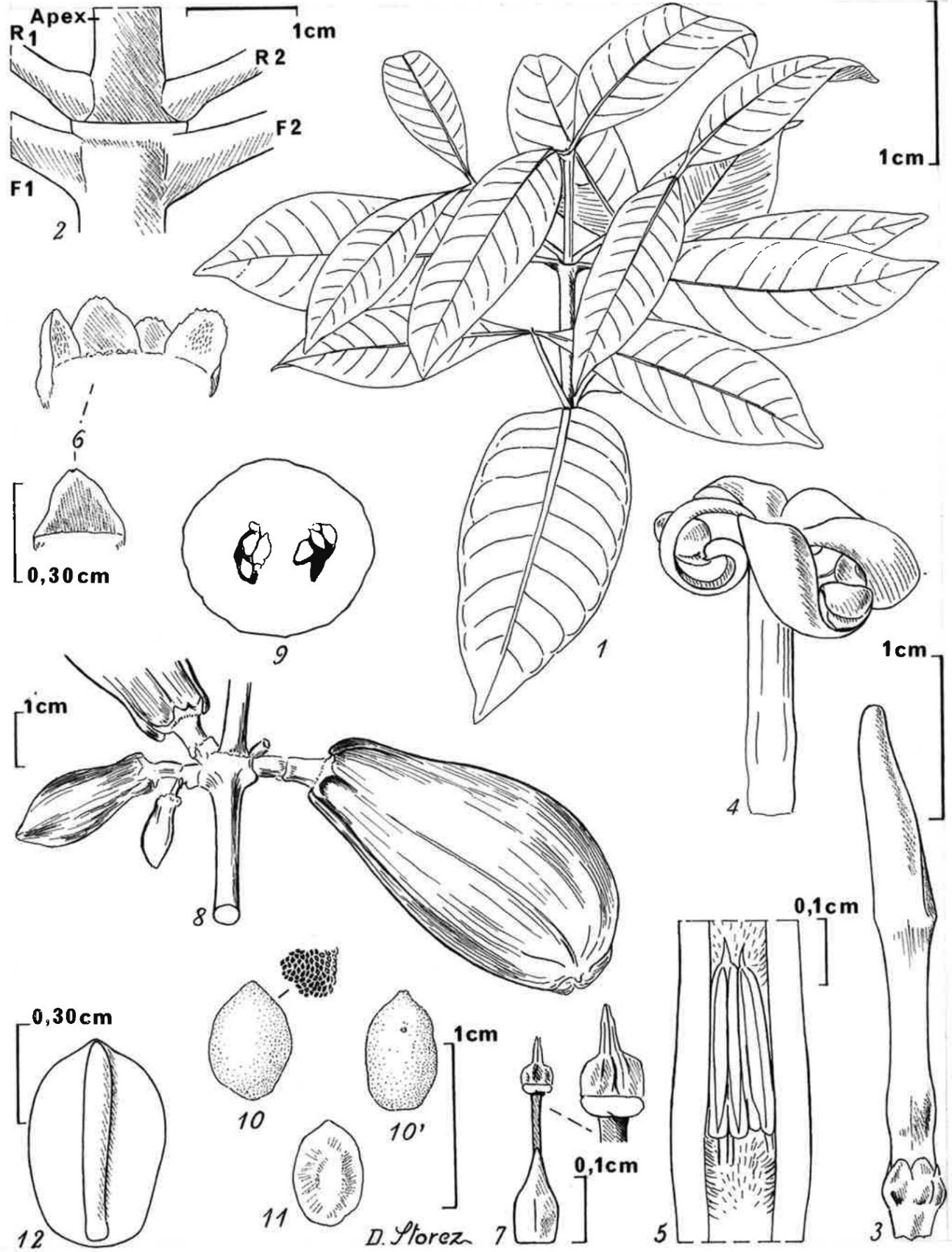
Type 1, module indefinite sympodial, numerous pairs of leaves (3 - 10), two branches-diverging, 2 or 3 inflorescences. Neotropical genera: *Tabernaemontana*, *Peschiera*, *Stemmadenia* (pro parte), paleotropical: *Ervatamia*, *Voacanga* etc.

Type 2, module definite sympodial, 2 pairs of leaves with strong anisophilly also affecting the pair of leaves immediately below the single inflorescence, 2 branches-diverging. Neotropical genera: *Anartia*, *Stenosolen*, *Stemmadenia* (pro parte), paleotropical: *Schizogygia* etc.

Type 3, module definite sympodial, 1 pair of isophyllous leaves and one inflorescence, only two genus in the world, neotropical: *Bonafousia* and *Stenosolen* (pro parte).

Fig. 1. *Ambelania acida* Aubl.: 1, habit; 2, detail branchlet, leaves (F1-F2) and branches (R1-R2); 3, bud; 4, corolla with lobes sinistrosely contorted; 5, flower opened with supra- and infrastaminal indument; 6, calyx with unequal lobes; 7, syncarpous ovary, style and style head; detail of style head; 8, fruit a berry; 9, cross section of fruit showing the location of the seeds; 10, seed, raphae side; 10', seed, hilar side; 11, albumen; 12, embryo (1-7, de Granville et al. 7796, mat. alcohol; 8, L.C. Richard s.n.; 9-12, de Granville et al. 7796).

Fig. 2. *Aspidosperma cruentum* Woodson: 1, leave, abaxial side; 1', detail cuticle and hairs on the primary vein; 2, inflorescence; 3, detail; 4, bud; 5, sepal without colleter; 6, corolla; 7, corolla opened; 8, gyneceous with opened carpel semi-inferous; detail style head; 9, fruit; 10, seed winged and funicle; 11, plantule; 12, bark (1-12, de Granville et al. 8124, mat. alcohol).



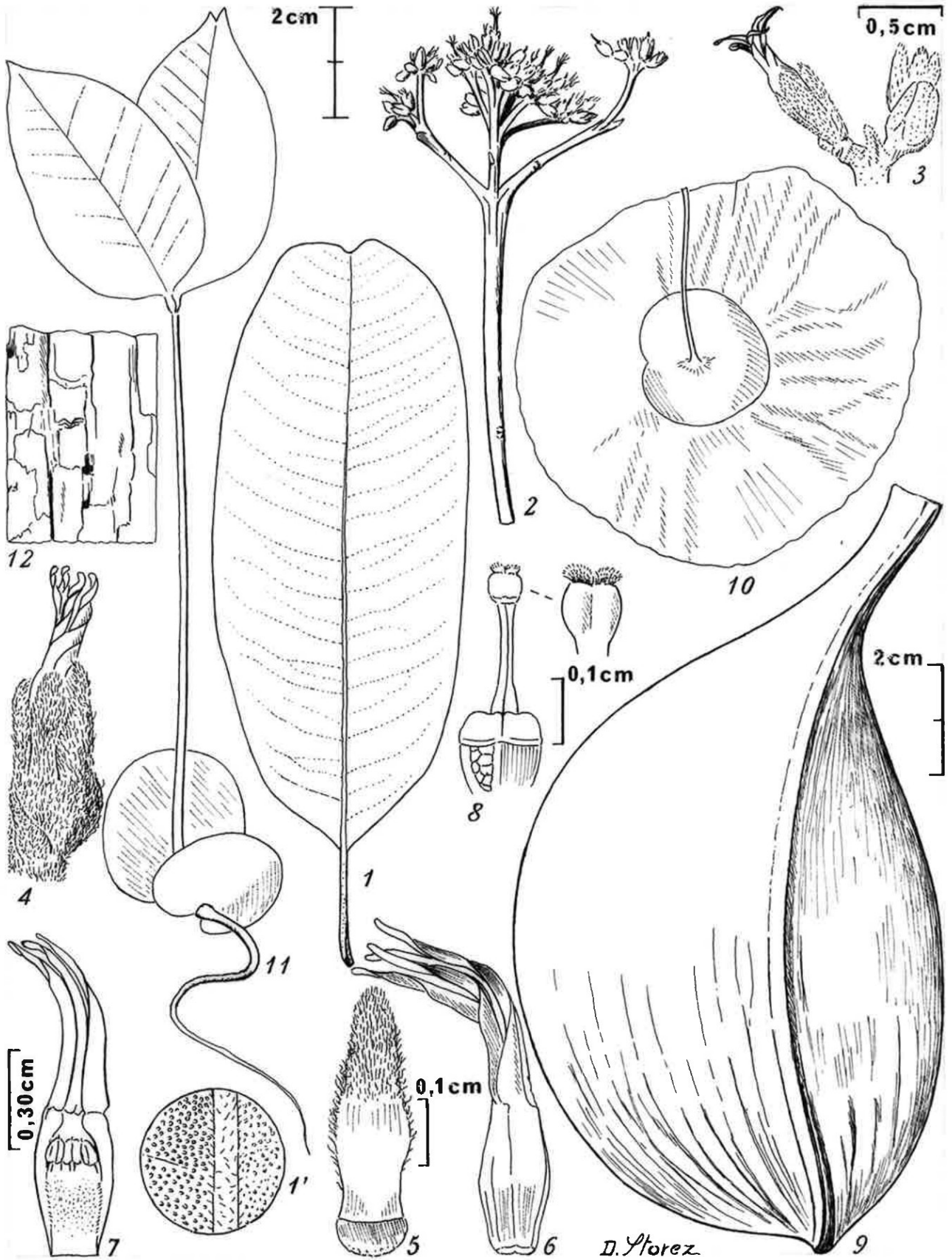


Fig. 3. *Couma guianensis* Aubl.: 1, habit; 2, leaf; 3, detail veins, underside of leaf; 4, flower with lobes sinistrosely contorted; 5, but at the anthesis; 6, sepal without colleter; 7, syncarpous ovary, style and style head; 8, fruits; 9, embryo (1-7, Allorge 401, mat. alcohol; 8, Prévost 825; 9, Fig. Delphy).

Fig. 4. *Forsteronia acouci* (Aubl.) A.DC.: 1, habit; 2, crypt underside of leaf, along the primary vein; 3, inflorescence; 4, sepals (3) without colleter; 5, pubescent ovary surrounded by glabrous disc pentalobed, style and style head; 6, stamens, face and profile, conectif velutinous; 7, bud opened; 8, young fruit; 9, seed with hair tuft; 10, embryo; *Forsteronia guyanensis* Müll.Arg.: 11, habit; 12, crypt under leaf; 13, inflorescence; 14, sepals with colleters; 15, corolla opened, indument suprastaminal, without anthers; 16, disc fringed; ovary densely pubescent, style head with involucrum, stamen with hairy conectif; 17, stamen, abaxial face; 18, stamens; 19, fruit; 20, seed with hair tuft; 21, embryo (1-7, 274-F 107; 8-10, Mélinon 460; 11-18, Schomburgk 821; 19-21, Gentry 50260).

Fig. 5. *Forsteronia gracilis* (Bentham) Müll.Arg.: 1, habit; 2, detail node and petiole; gland at base of blade; 3, detail apex with ligules; 4, primary vein, without crypt but hairs; 5, inflorescence; 6, flower without 2 lobes, showing disc; ovary and stamens; 7, disc; ovary, style head and 2 stamens; 8, stamen, profil; 9, fruit; 10, seed with hair tuft, before dehiscence (1, Schomburgk 608; 2-4, Pipoly et al. 8464; 5-8, Schomburgk 608; 9-10, Pipoly et al. 8464).

Fig. 6. *Galactophora schomburgkiana* Woods.: 1, habit; 2, node with colleters; 3, bud with colleters; 4, gyneceous and stamens; 5, stamens, ventral face & dorsal face; 6, young fruit; 7, fruit; 8, seed, ventral & dorsal face. (1-7 McDowell et al. 3015; 8, Hernandez et al. 1).

Fig. 7. *Geissospermum argenteum* Woods.: 1, habit; 2, node; 3, detail veins, abaxial side; 4, bud; 5, calyx and gyneceous; 6, corolla opened; 7, fruit; 8, seed, raphae side;

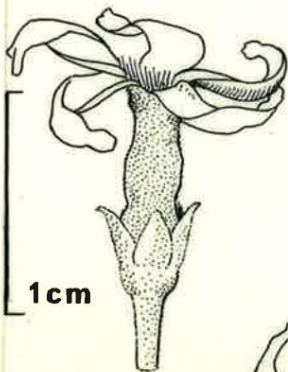


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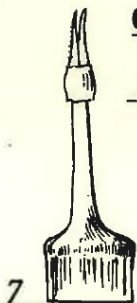
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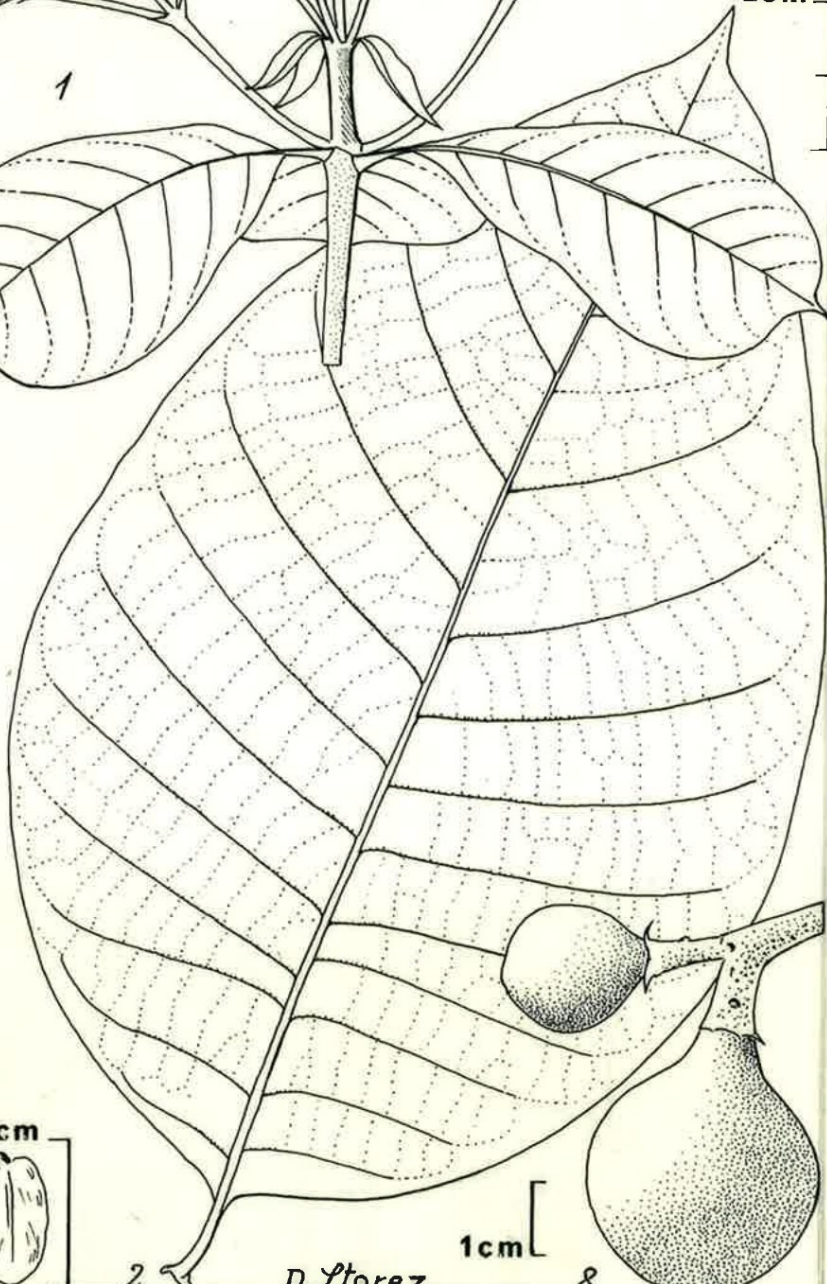
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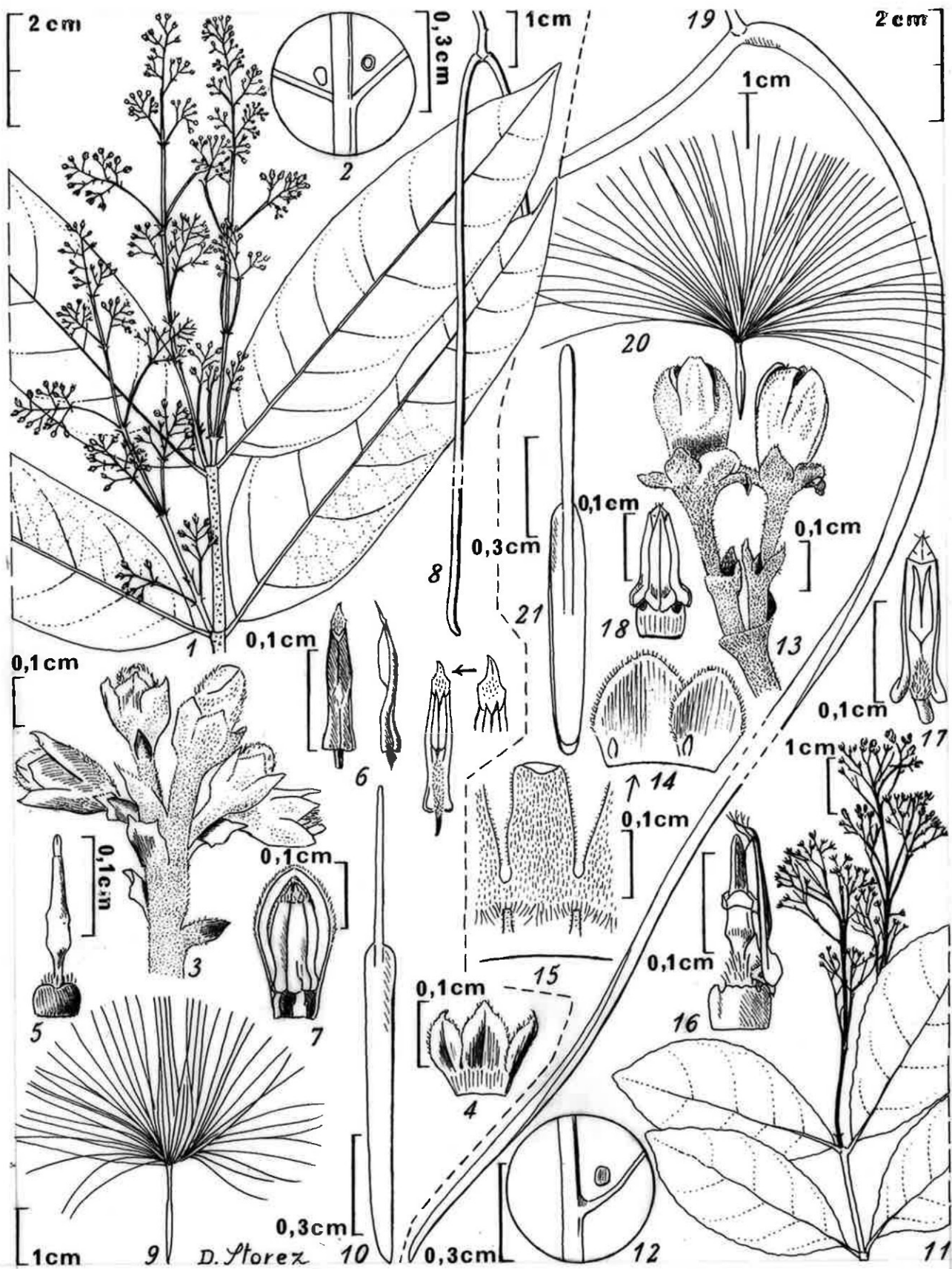
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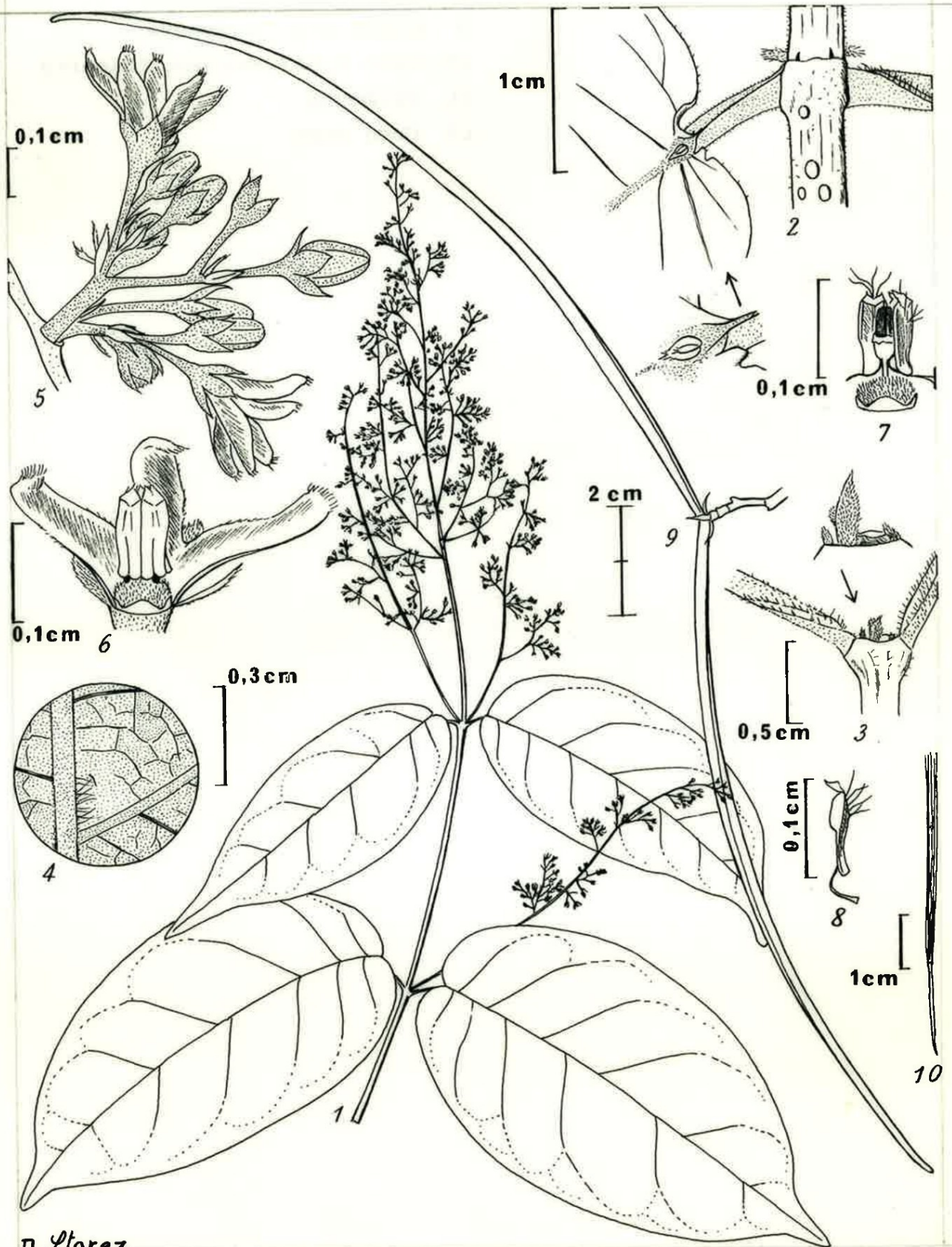


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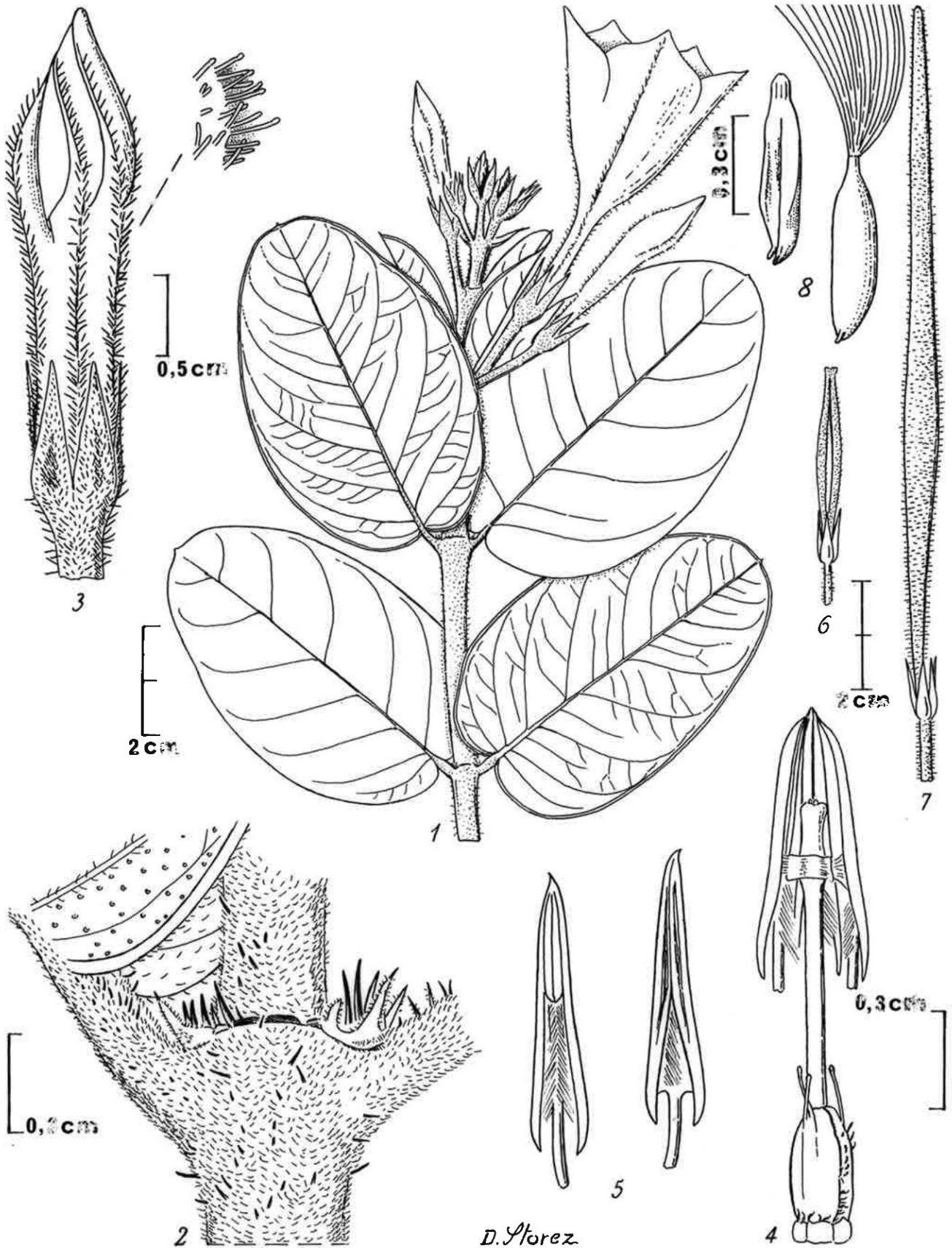
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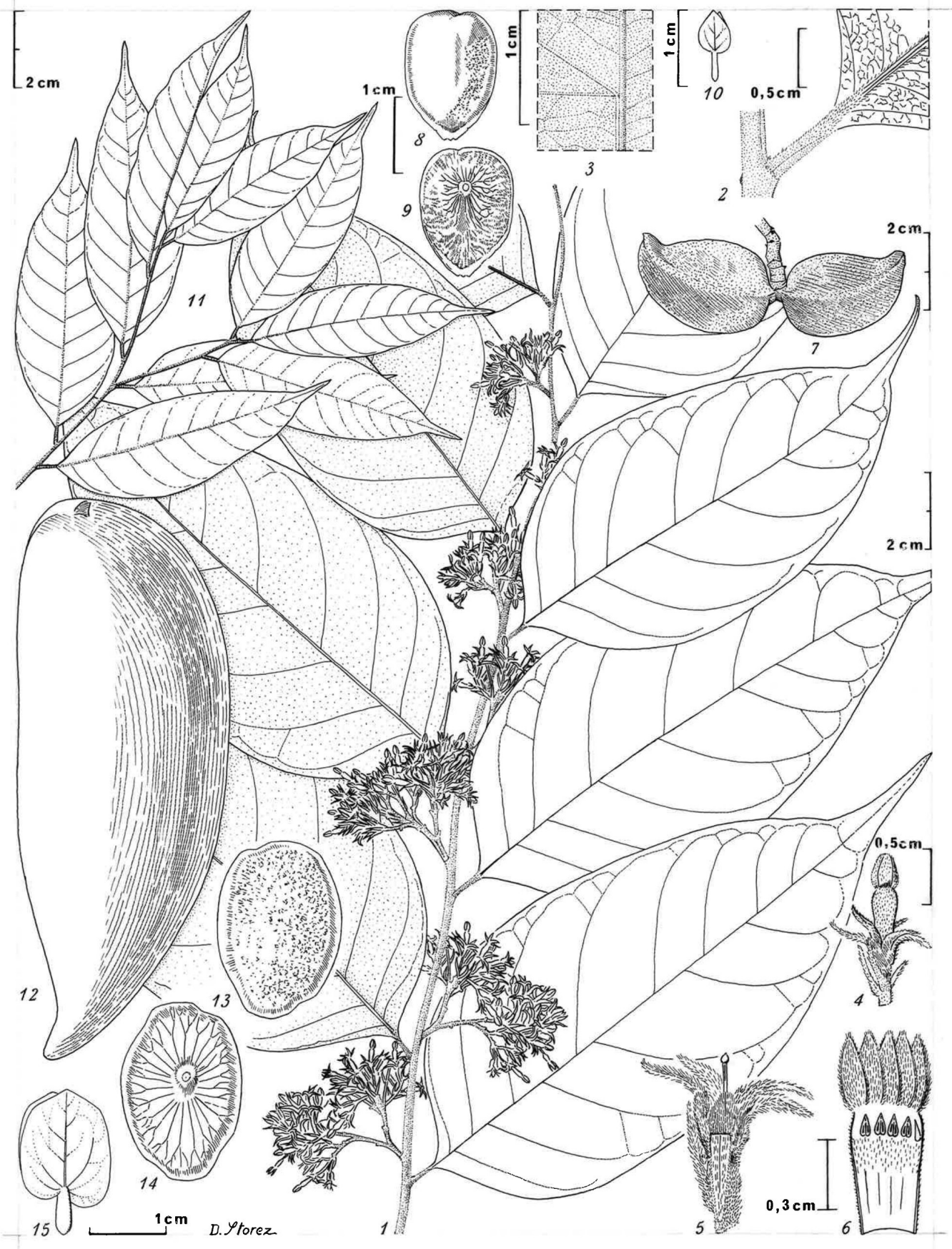
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9, seed, hilar side; 10, embryo; *Geissospermum laeve* (Vell.) Miers: 11, habit; 12, fruit; 13, seed, raphae side; 14, seed, hilar side; 15, embryo (1-3, A.C. Smith 2825; 4-6, Tawjoeran 14640; 7-10, Moretti 891, mat. alcohol; 11, s. coll. 46; 12-15, Moretti 887, mat. alcohol).

Fig. 8. *Himatanthus articulatus* (Vahl) Woodson: 1, tree; 2 habit; 3, inflorescence with 2 flowers by bract; 4, bract with small colleters at base; 5, bud; 6, corolla opened; 7, 8, calyx and gynoecious; 9, branches with scars; 10, follicle; 11, seed with orbicular wing; 12, seed, ventral face; 13, albumen; 14, 15, embryo. (1-2, 11, Plumel 11; 3-4, 9-10, Oldeman B619; 5-8, Plumel 8385; 11-15, Plumel 8363).

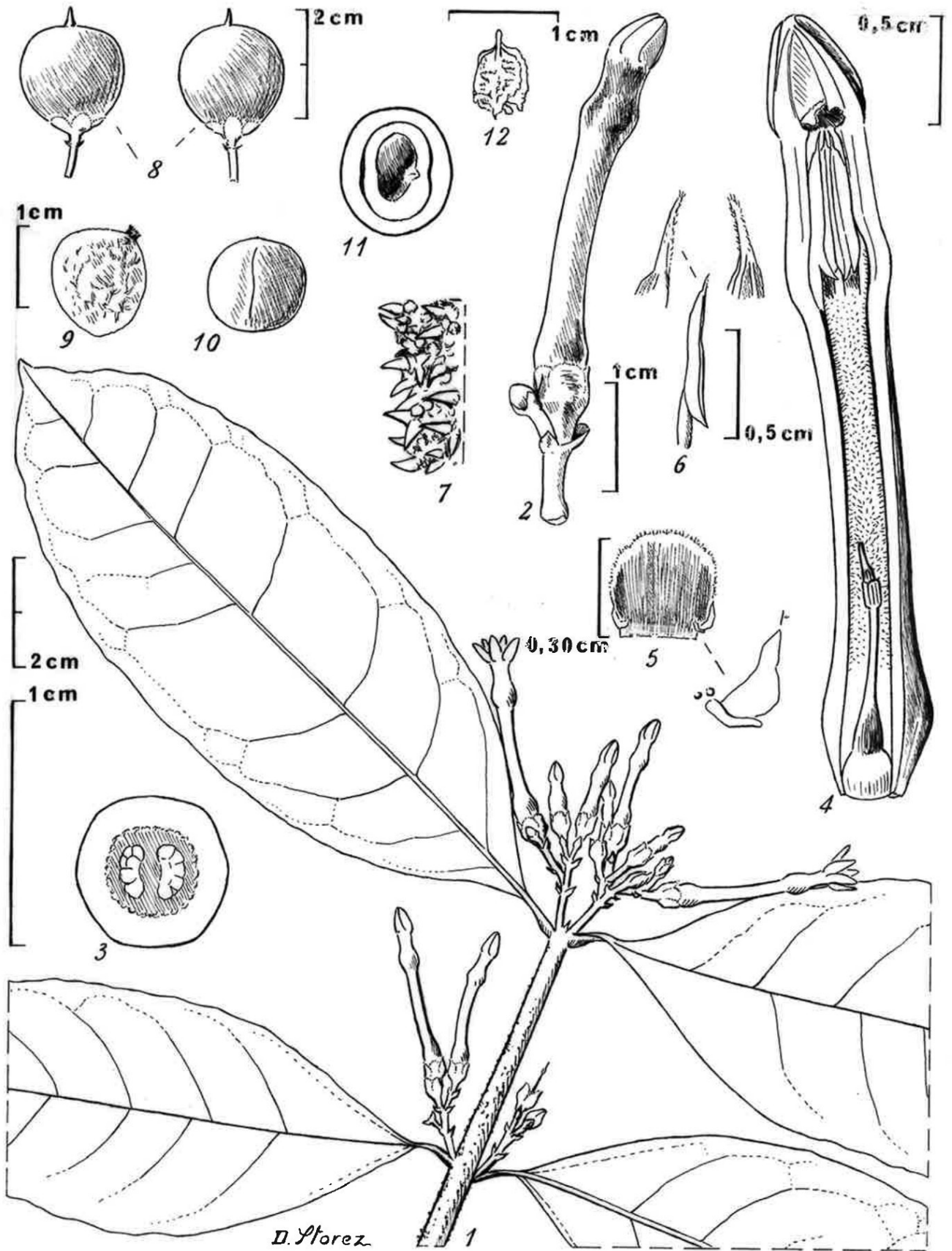
Fig. 9. *Lacmellea aculeata* (Ducke) Monach.: 1, habit; 2, bud; 3, cross section of ovary; 4, corolla opened; 5, sepal with colleters; detail; 6, stamen, profile and detail apex; 7, bark; 8, fruit; 9, endocarpous; 10, seed; 11, cross section of seed; 12, embryo (1, de Granville 3679; 2-12, de Granville et al. 7473, mat. alcohol).

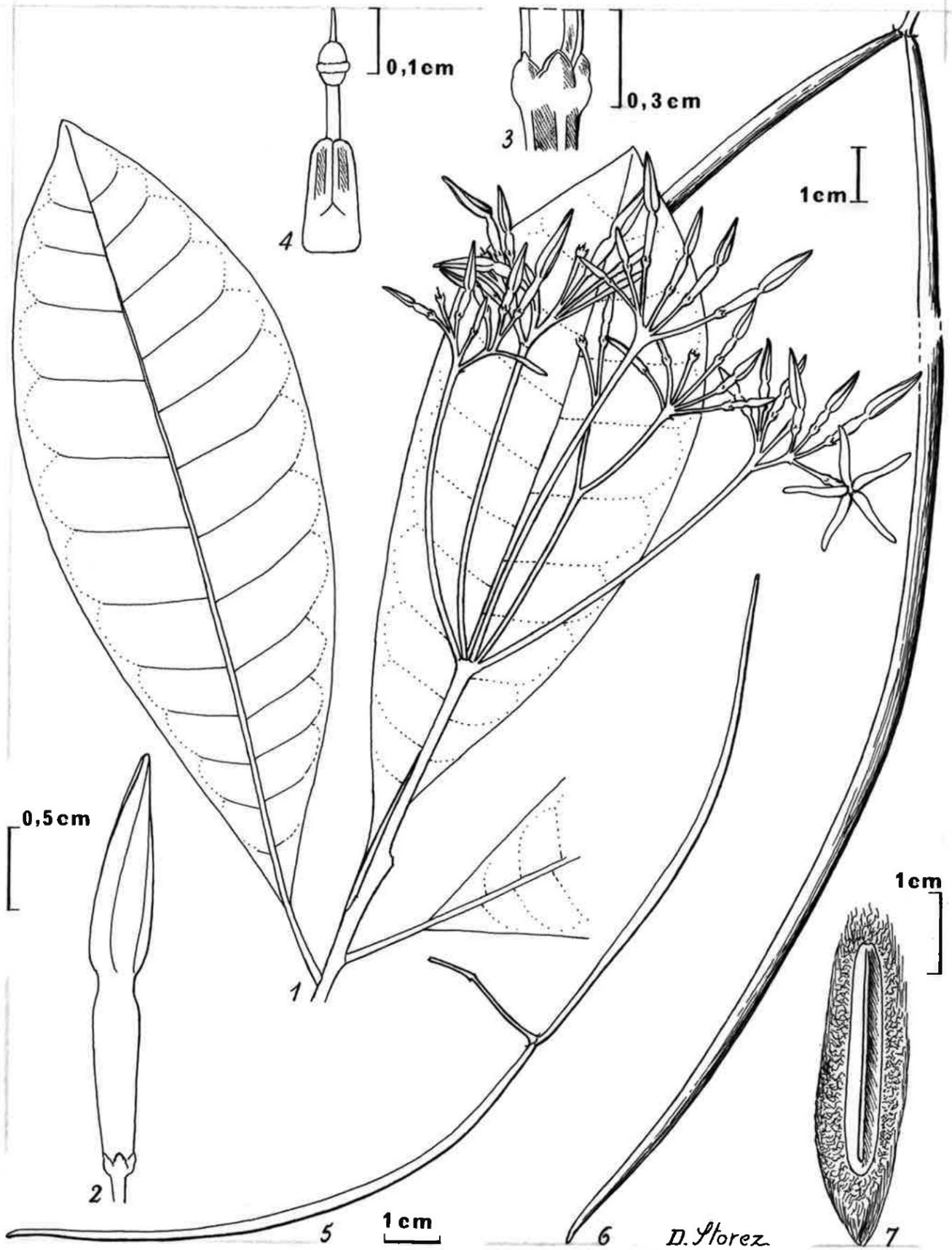
Fig. 10. *Laxoplumeria baehniiana* Monach.: 1, habit; 2, bud; 3, calyx; 4, ovary, style and style head; 5, young fruit; 6, fruit; 7, seed (1-4, Mori et al. 15537; 5, Sastre 6491; 6-7, Cremers 8149).

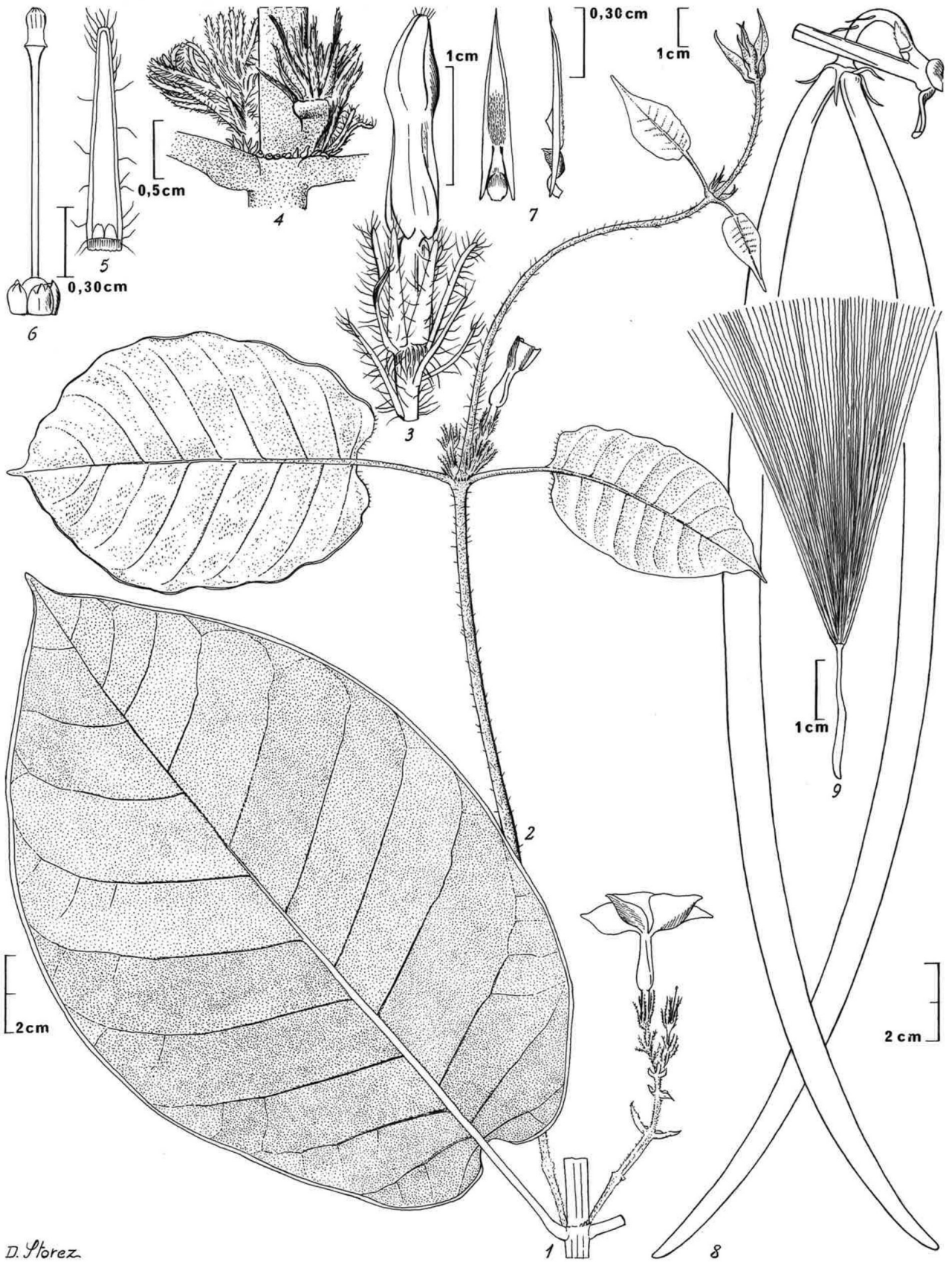
Fig. 11. *Macropharynx spectabilis* (Stadelm.) Woodson: 1, habit; 2, young branch; 3, bud with bracts; 4, node with ligules; 5, sepal within colleter; 6, disc, ovary, style and style head; 7, stamens, dorsal face and profile; 8, young fruit; 9, seed with hair tuft (1, Mélinon 323; 2, Mélinon 132; 3-9, Mélinon 323).

Fig. 12. *Malouetia guianensis* (Aubl.) Miers: 1, habit; 2, flower; 3, fruit, profile; 3', follicle with 2 lateral ribs, dehiscing along the ventral suture; 4, seeds furrowed, imbricate; 5, seeds with tegument opened; 6, albumen; 7, embryo; *Malouetia tamaquarina* (Aubl.) A.DC. : 8, leaf with position of domatia along the primary vein; 9, detail; 10, habit; 11, bud; 12, pubescent lobes; 13, calyx within gland; 14, sepal;

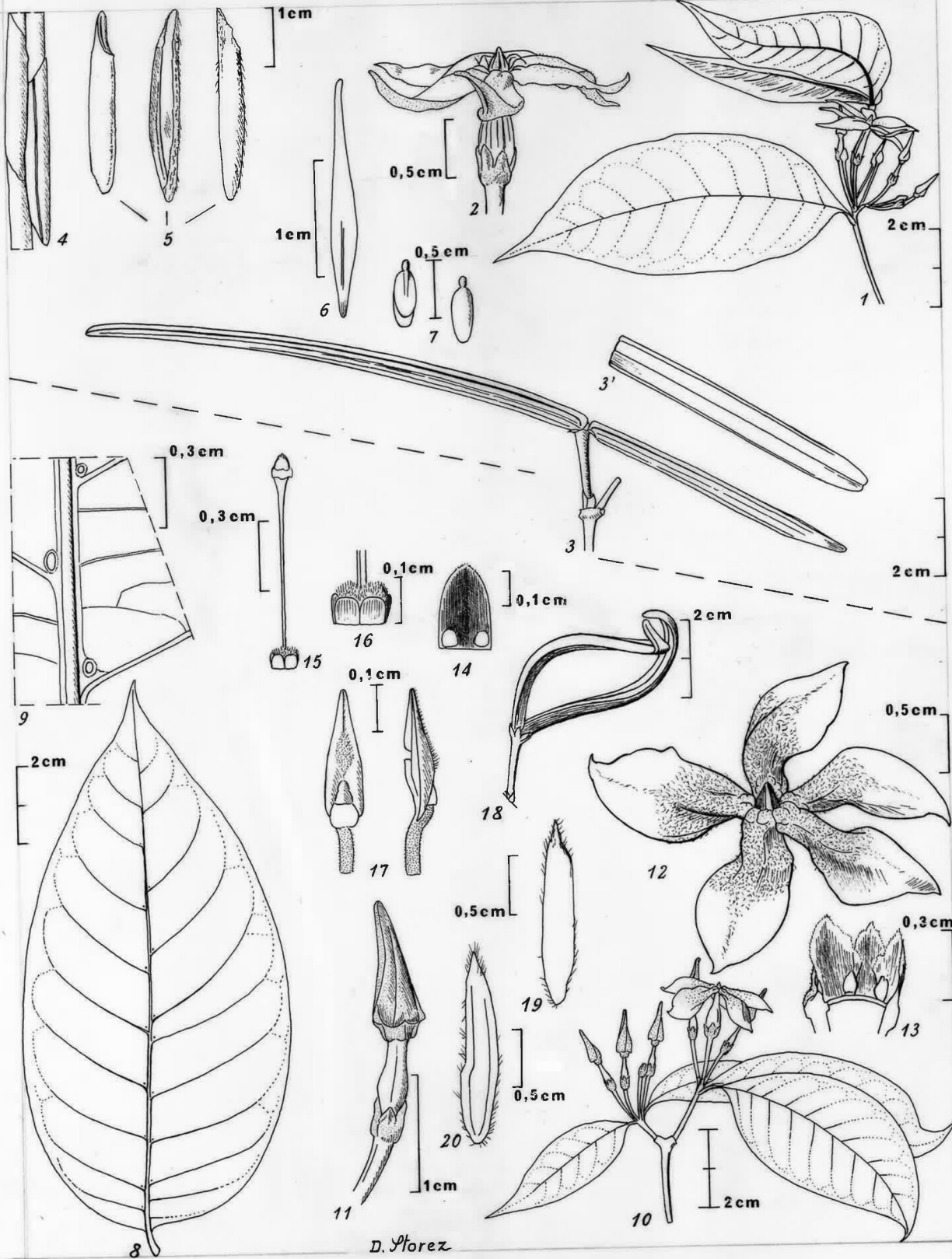








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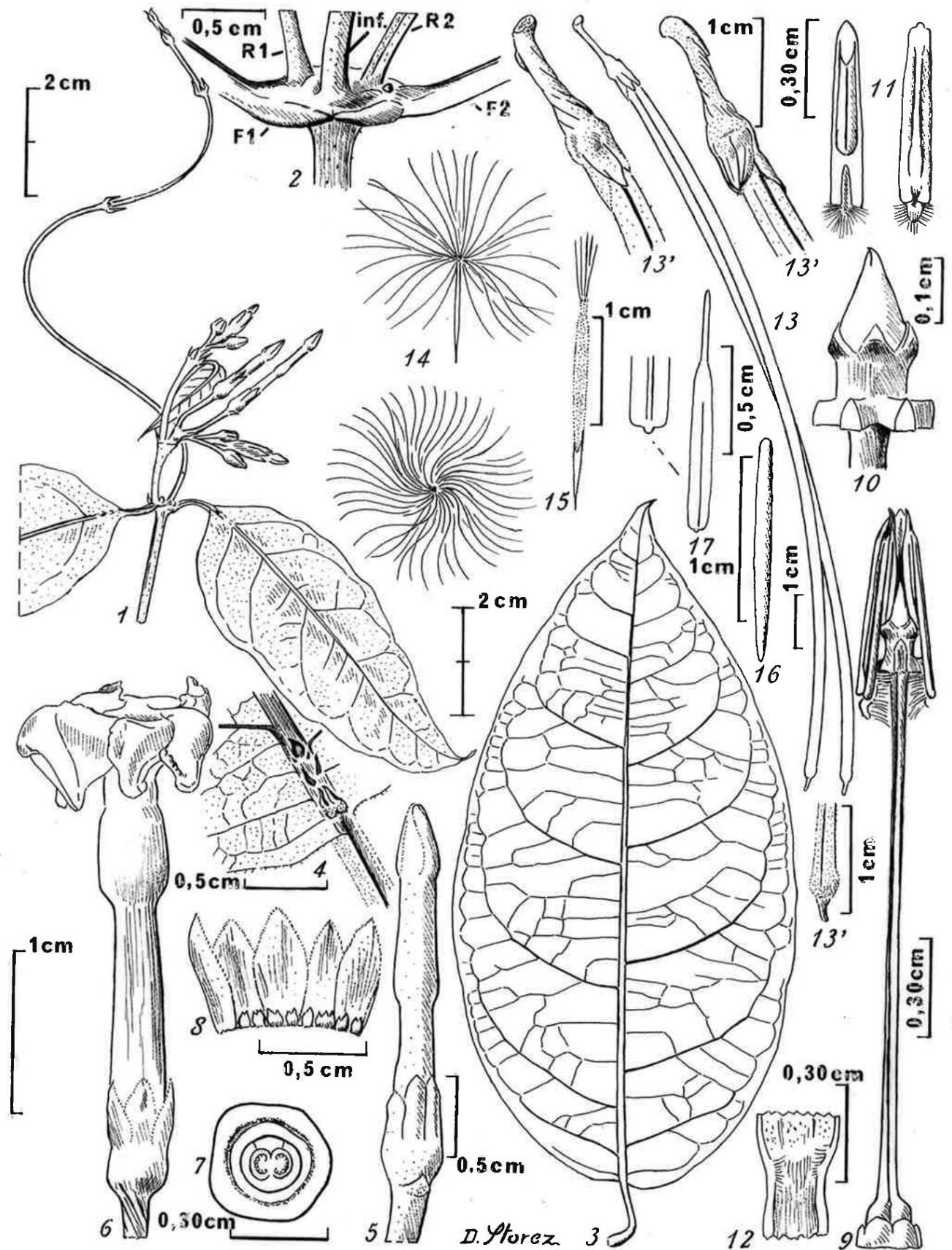
15, gyneceous; 16, disc 5-lobed and ovary; 17, stamen, abaxial face and profile; 18, young fruit; 19, seed; 20, seed, hilar side (1-7, de Granville et al. 10008, mat. alcohol; 8-20, de Granville et al. 10109, mat. alcohol).

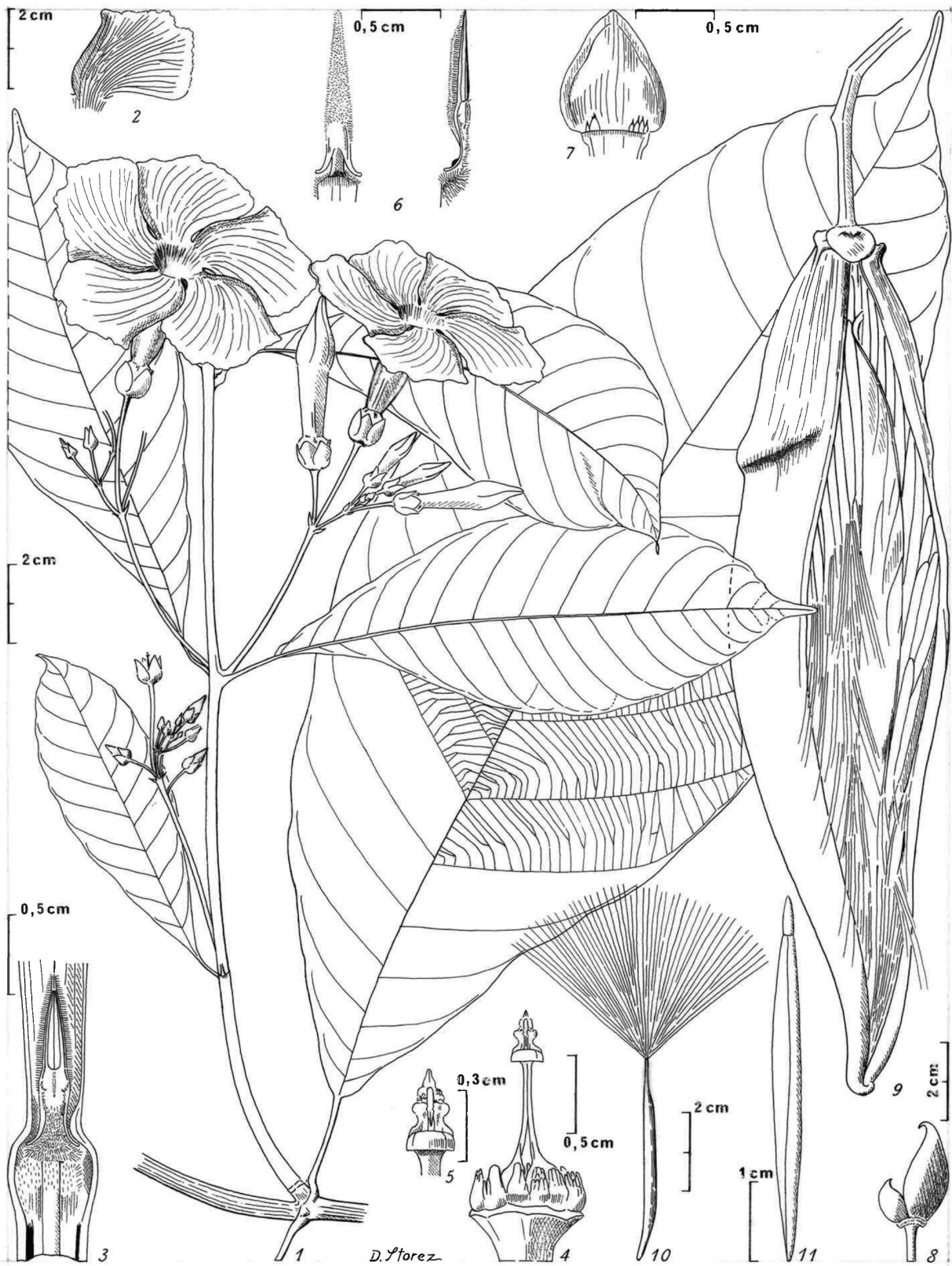
Fig. 13 *Mesechites trifida* (Jacq.) Müll.Arg.: 1, habit; 2, node with leaves (F1-F2) branches (R1-R2) and inflorescence; 3, leaf, underside; 4, base of blade with numerous colleters; 5, bud; 6, flower; 7, cross section of ovary; 8, calyx within gland; 9, gyneceous and stamens; 10, style head; 11, stamens, abaxial and ventral faces; 12, corolla opened at the stamens level; 13, fruit; 13' fruiting pedicels twisted and apex mucronate; 14, seed; 15, detail; 16, albumen; 17, embryo (1-17, de Granville et al. 8186, mat. alcohol).

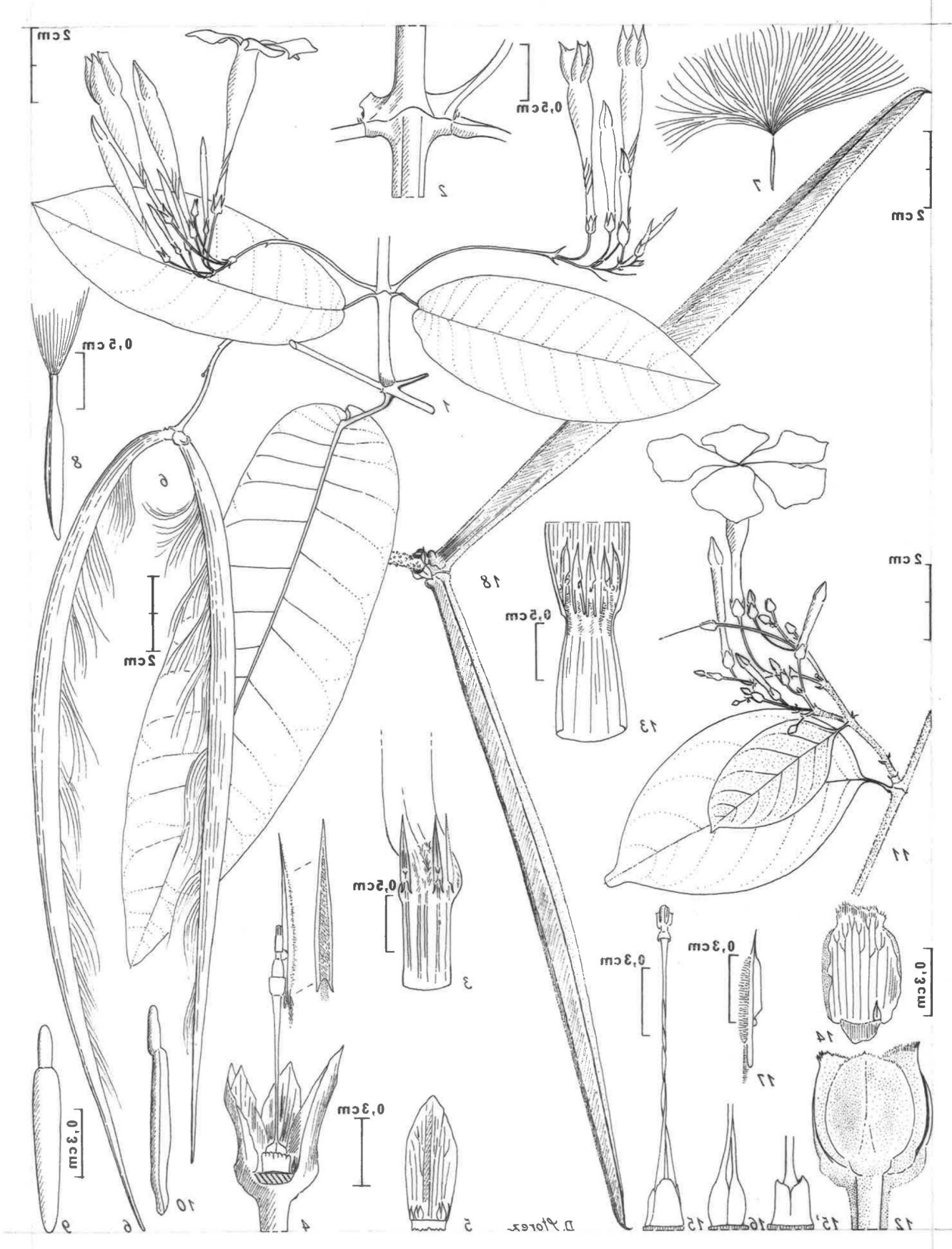
Fig. 14. *Odontadenia macrantha* (Roemer & Schultes) Markgr.: 1, habit; 2, petal; 3, part of corolla opened with style head and stamens; 4, gyneceous; 5, style head; 6, stamen, abaxial and profile side; 7, sepal with colleters; 8, young fruit; 9, fruit opened; 10, seed; 11, embryo (1-7, Sastre et al. 4160; 8, Sastre 5915; 9, fruit, Croat S 480; 10-11, Sastre 5915).

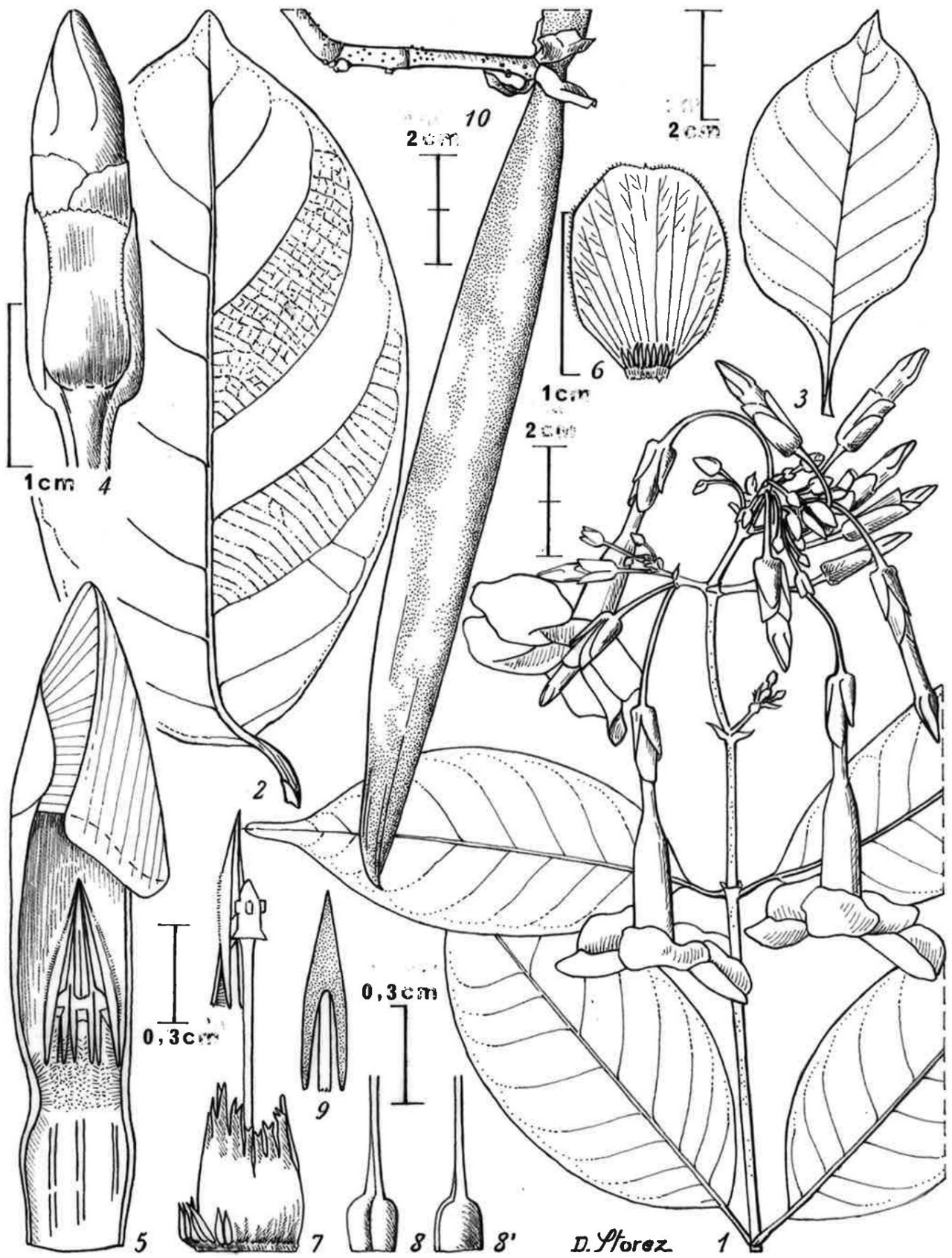
Fig. 15. *Odontadenia nitida* (Vahl) Müll.Arg.: 1, habit; 2, node; 3, part of corolla opened with stamens; 4, gyneceous and stamen; detail stamen; 5, sepal with colleters; 6, fruit; 7, seed with hair tuft; 8, seed; 9, embryo, face; 10, embryo, profile; *Odontadenia puncticulosa* (A.Rich.) Pulle: 11, habit; 12, calyx; 13, part of corolla with stamens; 14, sepal with colleter; 15, gyneceous; 15', detail disc; 16, ovary; 17, anther, profil; 18, fruit (1-5, Oldeman 2248; 6-10, Schnell 11963; 11-17, Sastre 6162; 18, Prévost 742).

Fig. 16. *Odontadenia perrottetii* A.DC: 1, habit; 2, leaf, detail of nerves, abaxial side; 3, young leaf, adaxial side; 4, bud; 5, longitudinal section; 6, sepal within colleters; 7, disc, ovary, style and style head with anther; 8, 8', ovary, front and lateral









view; 9, anther, abaxial side; 10, fruit with 2 follicles. (1, 4-9, S. Mori et al. 21594; 2, 3, 10, S. Mori et al. 21161).

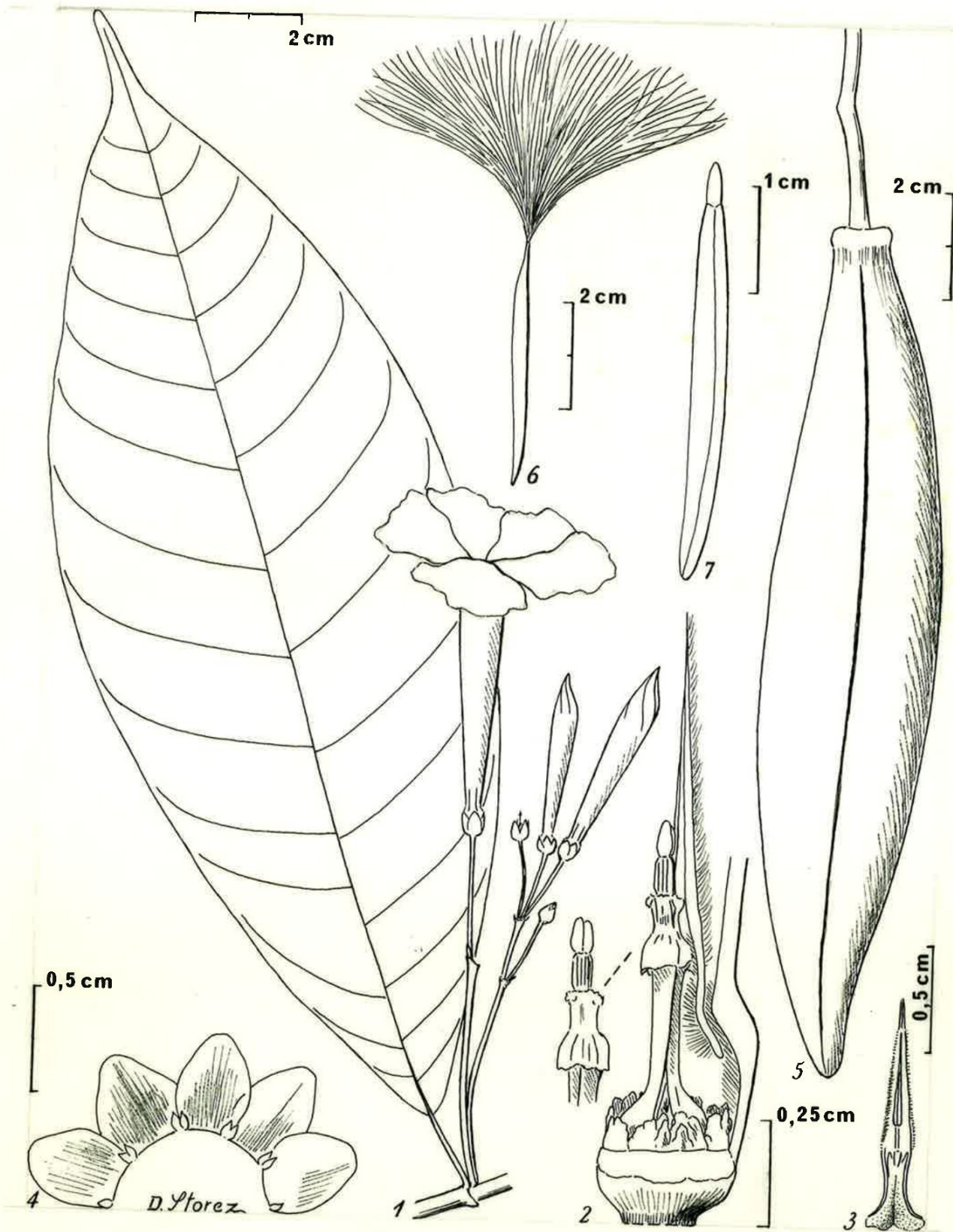
Fig. 17. *Odontadenia sylvestris* (A.DC.) Müll.Arg.: 1, habit; 2, stamen, disc, ovary, style and style head; detail style head; 3, anther, ventral face; 4, calyx developed within colleters; 5, fruit with 2 follicles connected; 6, seed with hair tuft; 7, embryo (1-2, Sastre 5778; 3-7, Sagot 383).

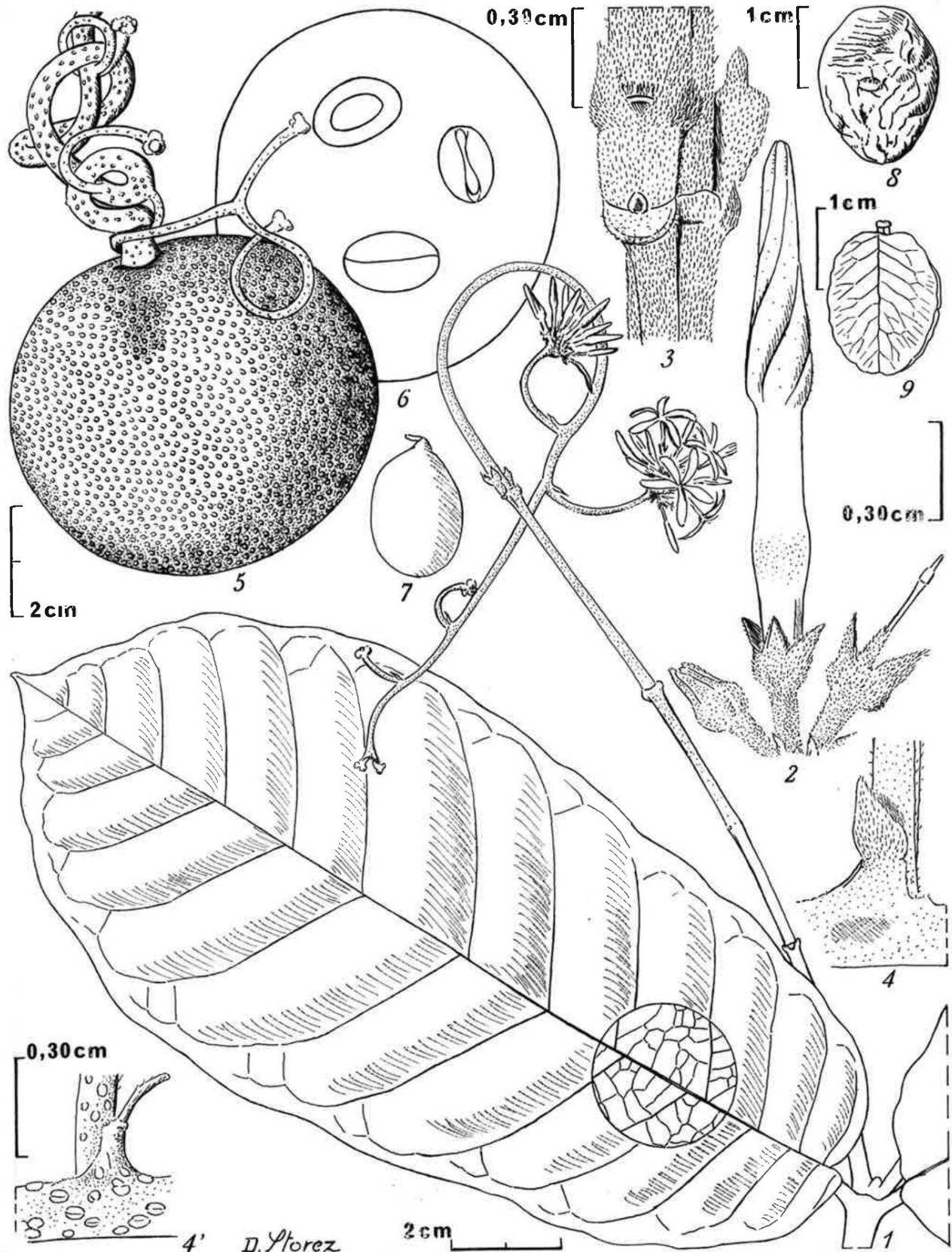
Fig. 18. *Pacouria guianensis* Aubl.: 1, habit; detail venation; 2, inflorescence with bud; 3, detail node before inflorescence; 4, vegetative node with lenticels; 5, fruit; 6, cross section with 3 seeds; 7, seed; 8, albumen; 9, embryo (1, Oldeman B3028; 2, de Granville 4809; 3-4', Oldeman B3028; 5-9, de Granville et al. 8179, mat. alcohol).

Fig. 19. *Parahancornia fasciculata* (Poir.) Benoist ex Pichon: 1, habit; 2, bud; 3, corolla opened; 4, sepal without colleter; 5, gyneceous; 6, fruit; 7, seed raphae side; 7', seed hilar side; 8, embryo; *Prestonia acutifolia* (Benth.) Schumann: 9, habit; 10, inflorescencial node; 11, vegetative node; 12, bud; 13, sepal with colleter; 14, gyneceous; 15, style head; 16, bud, part of corolla opened with epistaminal appendages, stamens and young style head (9, Glaziou s.n°; 2, Sastre & Raichel 5094, mat. alcohol).

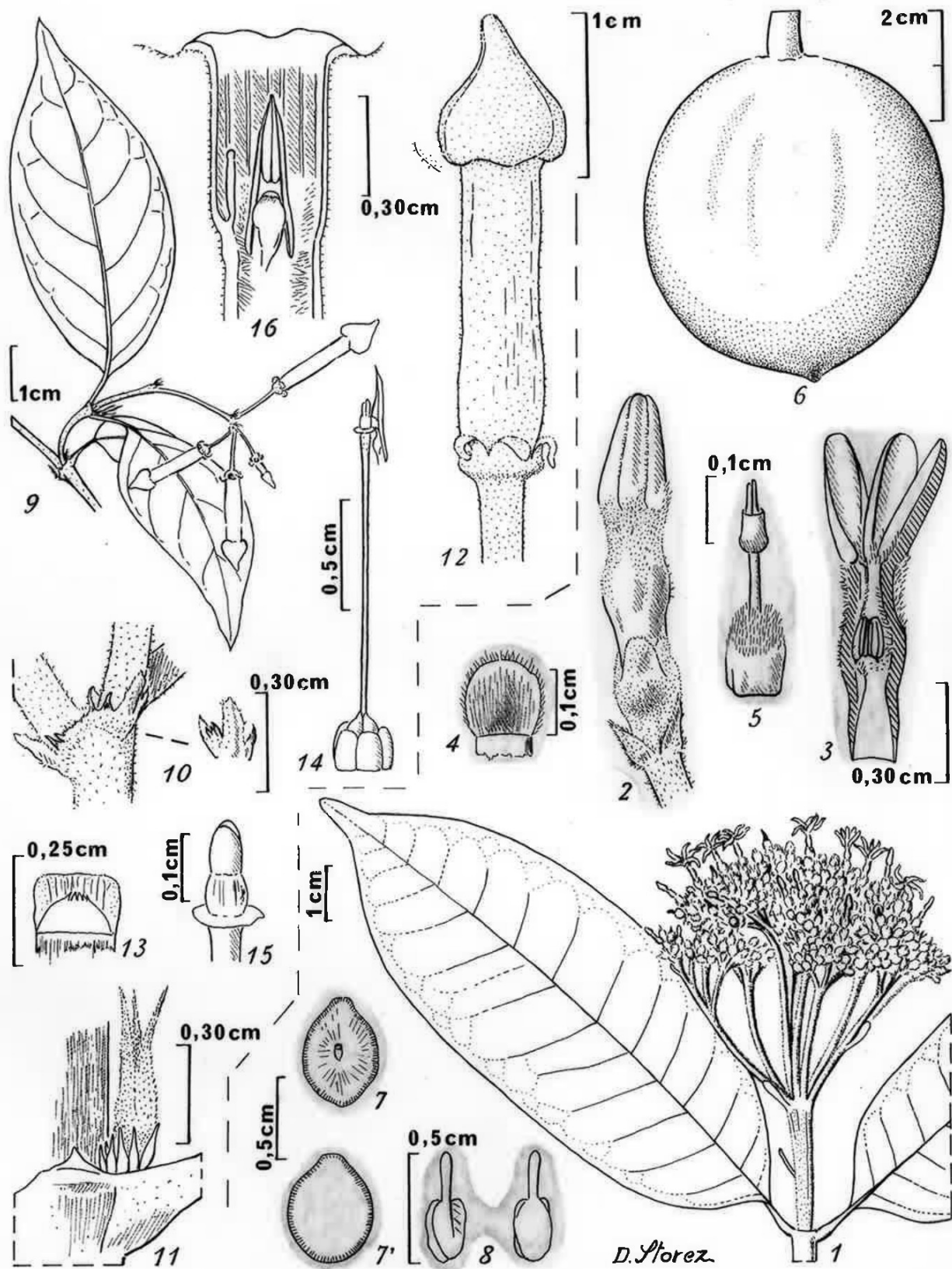
Fig. 20. *Rauvolfia paraensis* Ducke: 1, habit; 2, node with numerous colleters; 3, flower; 4, disc, ovary and style head; 5, fruit with 2 follicles connected; 6, seed; 7, seed, profile; 8, embryo (1-4, Krukoff; 5-8, Sabatier 1691).

Fig. 21. *Rauvolfia tetraphylla* L.: 1, habit; 2, node with colleters; 3, inflorescence; 4, corolla opened; 5, gyneceous; 6, fruit with persistent style and style head; 7, seed, hilar side and profile; 8, embryo, profile; 9, embryo, face (cult. Chèvreloup, Versailles, coll. Allorge).

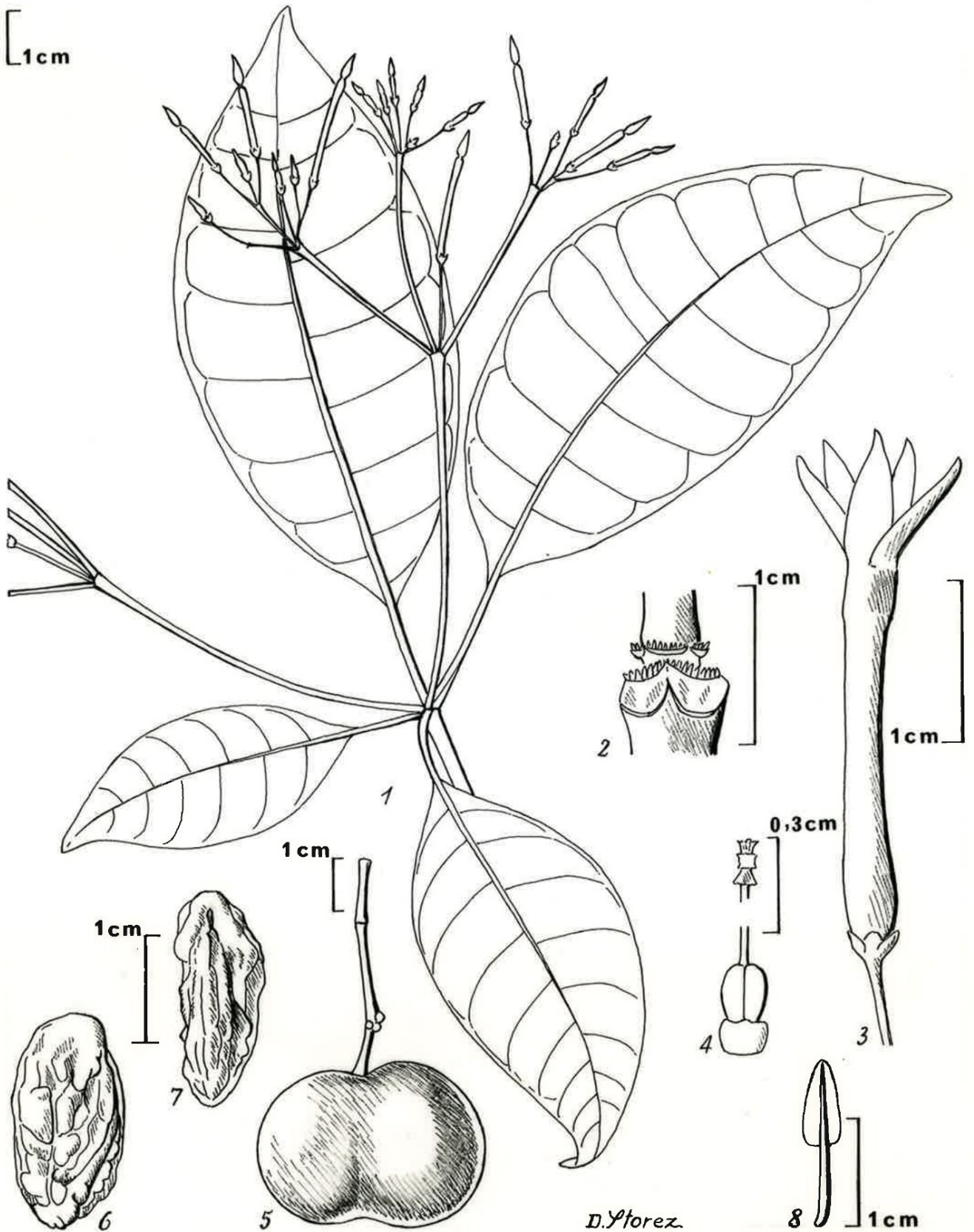




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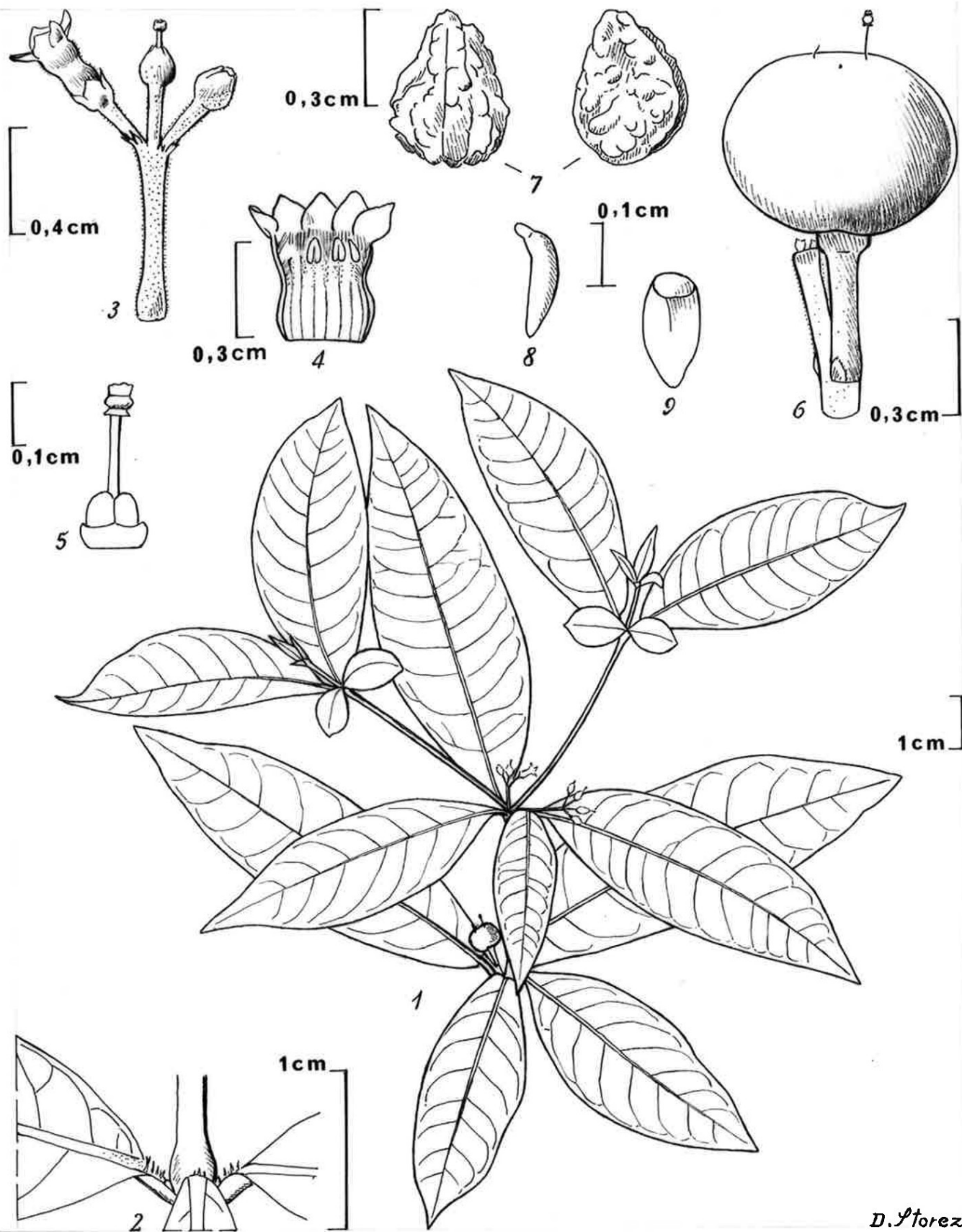


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PLATES

Plate 1. *Macoubea guianensis* (fl.), photographed by S. Mori et al. 10425.

Architectural type n. 1, 1 inflorescence terminal, many-flowered.

Plate 2. *Macoubea guianensis* (fr.), photographed by S. Mori 17501

Plate 3. *Bonafousia disticha*, French Guiana, Mts Bellevue, photographed by L.Allorge. Architectural type n. 3, 1 inflorescence few-flowered.

Plate 4. *Mesechites trifida*, (fl & fr.) French Guiana, Marouini, photographed by L.Allorge.

Plate 5. *Malouetia tamaquarina*, French Guiana, Marouini, photographed by L.Allorge.

Plate 6. *Ambelania acida*, French Guiana, photographed by S. Mori & Pipoly 15513.

Plate 7. *Mandevilla scabra* (top) & *Mandevilla hirsuta* (bottom) French Guiana, Roche n. 3, Marouini, photographed by L.Allorge.

Plate 8. *Mandevilla surinamensis*, photographed by S. Mori 13314.

Plate 9. *Himatanthus speciosa*, French Guiana, Saül, La Fumée, photographed by B. Allorge.

Plate 10. *Himatanthus articulata* (fruit & seeds with circular wing, compare with plate 19') photographed by S. Mori et al. 12073.

Plate 11. *Himatanthus obovata*, photographed by S. Mori et al. 11447.

Plate 12. *Ervatamia cumingiana*, cultivated. (look for flower with four petals on the left). Photographed by B. Allorge. Architectural type n. 1: 3 inflorescences many-flowered.

Plate 13. *Ervatamia coronaria*, cultivated. (Sterile double flowers). Garden of ORSTOM, Cayenne. Photographed by L.Allorge. Architectural type n. 1: 2 inflorescences per node.

Plate 14. *Couma guianensis*, photographed by S. Mori.

Plate 15. *Pacouria guianensis* (Fr.) French Guiana, Mts Bellevue, photographed by A.R.A. Görts van Rijn.

Plate 16. *Allamanda cathartica* (Fr.) French Guiana, Marouini, photographed by L.Allorge.

Plate 17. *Lacmellea aculeata*, photographed by S. Mori 18714.

Plate 18. *Plumeria rubra* (fl.) French Guiana, Cayenne, photographed by L.Allorge.

Plate 19. 19'. *Plumeria rubra* (fruit & seeds with a apical wing) French Guiana, Cayenne, photographed by L.Allorge and C. Bourgeois.

Plate 20. *Allamanda schottii*, Versailles, Chèvre-Loup, photographed by M. Plumel.

Plate 21. *Thevetia peruviana* (fl. & fr.), cultivated, French Guiana, Cayenne, photographed by L.Allorge.

Plate 22. *Thevetia peruviana* (fl. & fr.), cultivated, French Guiana, Cayenne, photographed by L.Allorge.

Plate 23. *Kopsia fruticosa*. Cultivated Brazil, Rio de Janeiro, Botanical Garden, photographed by M. Plumel 88.2520.

Plate 24. *Tabernaemontana citrifolia*, Type species. Guadelupe, Photographed by J. Jérémie. Architectural type n. 1. Inflorescence terminal, many-flowered.

Plate 25. *Anartia meyeri*. (fl. & fr.) Architectural type n. 2: 2 pairs of leaves; 1 inflorescence few-flowered. French Guiana, Monsinery, photographed by Jacquemin 2413.

Plate 26. Fruit of *Ervatamia lifuana* , Versailles, Chèvre-Loup, photographed by L.Allorge. Red aril completely surrounding the seeds.

Plate 27. Fruit of *Bonafousia albiflora*, with white aril incompletely surrounding the seeds, characteristic for the genus *Bonafousia*. French Guiana, Oyapock, saut Maripa, photographed by Jacquemin 2487.

Plate 28-29. Fruit of *Bonafousia undulata*, face & profile view, with white aril incompletely surrounding the seeds, typical.

Plate 30 -31. *Bonafousia morettii*, French Guiana, Approuague, Saut Parari, 2.3. 1981 (fl.) P, photographed by L.Allorge 246. Stamens above white calyx.

Architectural type n. 3: 1 pair of leaves; 1 inflorescence, few-flowered.

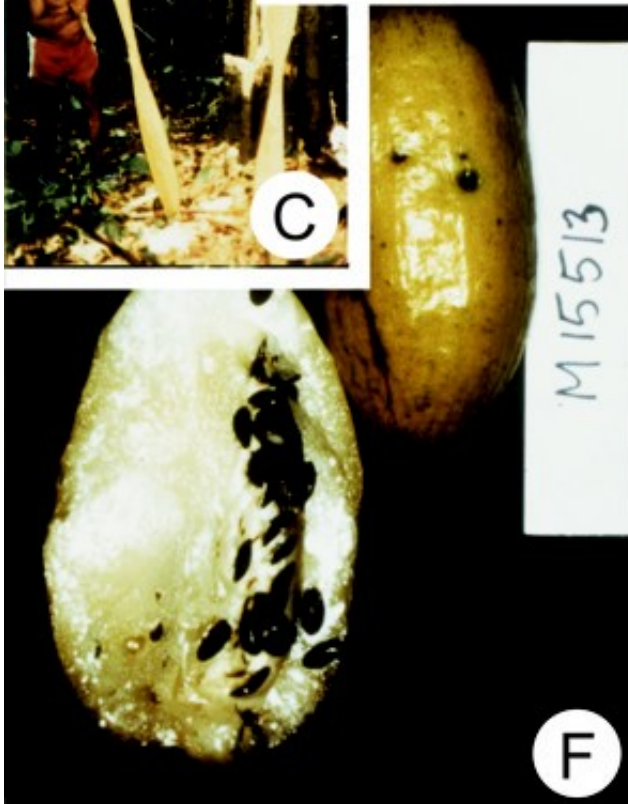
Plate 32. *Bonafousia disticha*, French Guiana, Mts Bellevue, photographed by L.Allorge. Architectural type n. 3: 1 pair of leaves; 1 inflorescence, few-flowered.

Plate 33. *Allamanda cathartica* L., photographed by L.Allorge.

Plate 34. *Odontadenia nitida*; Colombia, La Chorrera, liana to white corolla and throat orange, photographed by Sastre 2250.

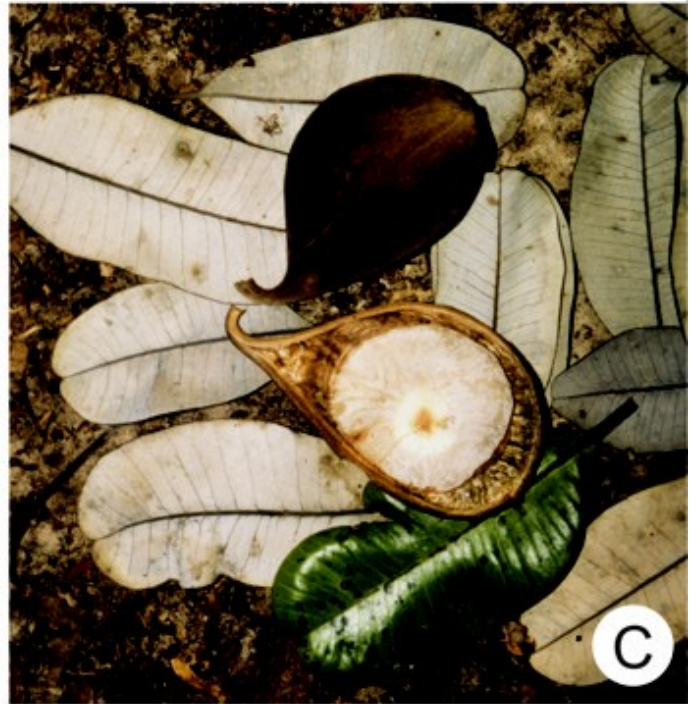
Plate 35. *Catharanthus roseus* var. *ocellatus*, cultivated. French Guiana, Cayenne, photographed by L.Allorge.

Plate 36. *Odontadenia sylvestris*. Colombia, río Caqueta, .photographed by Sastre et Raichel 4932.



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