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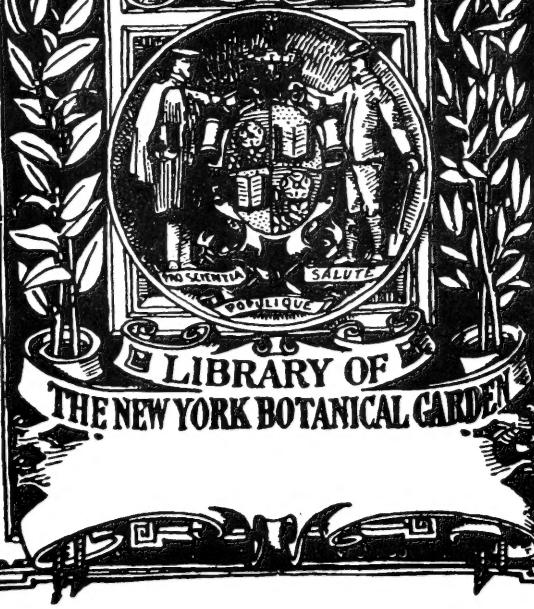
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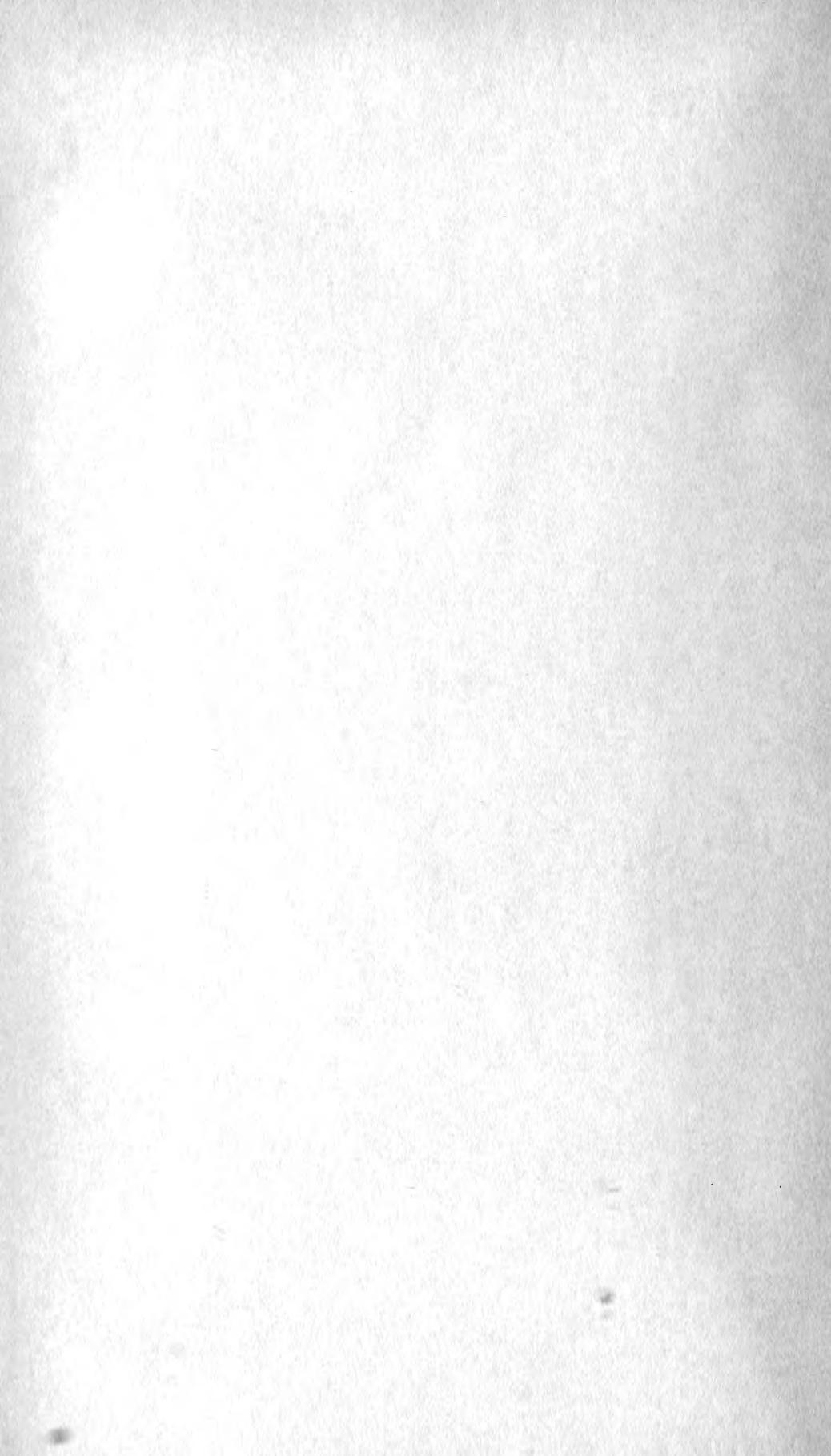
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VOLUME 32

PART 2

NORTH AMERICAN FLORA

RUBIALES

RUBIACEAE (pars)

PAUL CARPENTER STANDLEY



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pt. 2

21. PINAROPHYLLON Brand. Univ. Calif. Publ. Bot. 6: 71.
1914.

Low perennial herbs, sometimes suffrutescent at the base, pubescent. Leaves opposite, short-petiolate, membranaceous. Stipules foliaceous, deciduous. Flowers small, ebracteolate, the inflorescence axillary, on filiform peduncles, these 1-flowered or unilaterally few-flowered; hypanthium turbinate; calyx 4- or sometimes 5-lobate, the lobes subequal, persistent; corolla yellow, subrotate, the tube very short, the throat glabrous, the limb 4- or sometimes 5-lobate, the lobes spreading, imbricate, acute; stamens 4 (or 5), inserted at the base of the corolla-tube; filaments short, compressed; anthers exserted, oblong-linear, dorsifixed near the base, obtuse. Disk depressed. Ovary 2-celled; style filiform, elongate; stigma clavate or bilobate; ovules numerous, the placentae oblong, peltately affixed to the septum. Capsule small, turbinate or oblong-turbinate, costate, membranaceous, dehiscent at the apex. Seeds numerous, minute, globose, punctate; endosperm fleshy.

Type species, *Pinarophyllum flavum* Brand.

Inflorescence few-flowered; leaf-blades acuminate or attenuate at the apex, the secondary veins very prominent beneath.

Inflorescence usually 1-flowered; leaf-blades obtuse or acute, the secondary veins obscure.

1. *P. flavum*.

2. *P. bullatum*.

1. *Pinarophyllum flavum* Brand. Univ. Calif. Publ. Bot. 6: 71.
1914.

Herbaceous, the stems simple, stout, 5-6 cm. long, densely leafy; leaf-blades oblanceolate, 6-14 cm. long, 1.5-3 cm. wide, long-attenuate at the base to a short marginate petiole, acuminate or long-attenuate at the apex, bright-green above, sparsely villous with long multicellular hairs, the venation impressed, slightly paler beneath, puberulent or villosulous, especially along the veins, and bearing numerous long multicellular hairs, the venation prominent, the lateral veins numerous (about 20 on each side), arcuate-ascending, the secondary veins very prominent; peduncles numerous, filiform, 3.5-5 cm. long, sparsely long-villous, 3-10-flowered, simple, the flowers secund, the pedicels 2 mm. long or shorter; hypanthium 1-1.5 mm. long, bearing a few long weak hairs; calyx-lobes 4, lance-triangular, acute, about as long as the hypanthium; corolla glabrous, about 4 mm. long, greenish-yellow, the 4 lobes lance-oblong, acute or acuminate; capsule about 3 mm. long, broadly turbinate; seeds minute, dark-brown.

TYPE LOCALITY: Wet rocks of barrancas near Finca Mexiquito, Chiapas.

DISTRIBUTION: Known only from the type locality.

2. *Pinarophyllum bullatum* Standley, sp. nov.

Plants suffrutescent at the base, the stems stout, 3-12 cm. long, erect or decumbent, simple or sparsely branched, densely villous with long slender weak ferruginous hairs, densely leafy; petioles 1 cm. long or shorter; leaf-blades obovate, oblanceolate, or oblong-oblanceolate, 2.5-5.5 cm. long, 0.7-1.8 cm. wide, attenuate at the base, acute to rounded at the apex, conspicuously bullate, striolate, bright-green above, sparsely long-villous, the venation impressed or prominent, paler beneath, copiously villous along the veins with weak ferruginous multicellular hairs, the lateral veins prominulous, 5-8 on each side, arcuately divaricate, the secondary veins obscure; peduncles numerous, 1.5-3.5 cm. long, sparsely villous, filiform, flexuous, mostly 1-flowered, sometimes 2-flowered, when 2-flowered the pedicels 1.4 cm. long or shorter; hypanthium sparsely ferrugino-villous, narrowly turbinate, about 2 mm. long; calyx-lobes 4 or 5, narrowly triangular, acute, about 1 mm. long; corolla 3-4 mm. long, glabrous, the lobes 4 or 5, lance-oblong, acute; anthers 1.5 mm. long; capsule narrowly oblong-turbinate, 5-7 mm. long, thin, costate, striolate; seeds minute, dark-brown.

Type collected between Sepacuité and Secoyocté, Alta Verapaz, Guatemala, altitude 1100 meters, May, 1905, H. Pittier 348 (U. S. Nat. Herb. no. 473013).

DISTRIBUTION: Wet shaded banks, Alta Verapaz, Guatemala.

22. **DEPPEA** Schlecht. & Cham. *Linnaea* 5: 167. 1830.

Choristes Benth. Pl. Hartw. 63. 1840.

Shrubs, more or less pubescent. Leaves opposite, petiolate, membranaceous. Stipules interpetiolar, small, deciduous. Flowers small, yellow, arranged in axillary or terminal cymes or umbels, sometimes solitary in the axils, pedicellate, ebracteolate; hypanthium turbinate or hemispheric; calyx 4-lobate, the lobes equal or unequal, persistent; corolla rotate or short-funnelform, the throat glabrous, the limb 4-lobate, the lobes spreading, contorted. Stamens 4, inserted in the throat of the corolla; filaments short, linear, compressed; anthers exserted, dorsifixed, oblong or linear, obtuse or apiculate, bifid at the base. Disk depressed. Ovary 2-celled; style slender; stigma capitate or bilobate; ovules numerous, imbricate, the placentae oblong, peltately affixed to the septum. Capsule small, turbinate or obovoid, coriaceous or chartaceous, costate, 2-celled, loculicidal from the apex, the valves cleft. Seeds numerous, subglobose, minute, obtusely angulate, the testa coriaceous, granulate; endosperm fleshy; embryo clavate, bifid.

Type species, *Deppea erythrorhiza* Schlecht. & Cham.

Inflorescence 1- or 2-flowered.

Leaf-blades 1 cm. long or shorter; calyx-lobes obtuse.

1. *D. microphylla*.

Leaf-blades 2.5–4.5 cm. long; calyx-lobes acute.

2. *D. Purpusii*.

Inflorescence few- or many-flowered.

Inflorescence umbellate or subumbellate.

Capsule 2 mm. long, about as broad as long.

3. *D. umbellata*.

Capsule 3–4 mm. long, much longer than broad.

4. *D. excelsa*.

Inflorescence cymose-corymbose.

Corolla 2.5 mm. long.

5. *D. erythrorhiza*.

Corolla 4–10 mm. long.

6. *D. pubescens*.

Capsule oval, obscurely costate, puberulent; corolla 5 mm. long or shorter.

7. *D. cornifolia*.

Capsule turbinate, conspicuously costate, glabrous; corolla 6–10 mm. long.

8. *D. obtusiflora*.

Buds and corolla-lobes very acute or acuminate.

9. *D. grandiflora*.

Buds and corolla-lobes obtuse or rounded.

Leaf-blades 1.5–3.5 cm. long; calyx-lobes about as long as the hypanthium.

Leaf-blades 5–15 cm. long; calyx-lobes shorter than the hypanthium.

1. **Deppea microphylla** Greenman, Proc. Am. Acad. 41: 249. 1905.

Shrub, the branches slender, grayish, densely puberulent when young, the internodes short; stipules minute; petioles 1–2.5 mm. long; leaf-blades rhombic-ovate or oval-elliptic, 4–10 mm. long, 2–5 mm. wide, obtuse or acute at the base, obtuse at the apex, bright-green above, glabrous, the venation obsolete, pale beneath, sparsely puberulent or glabrate, the costa prominent, the lateral veins obscure, the margins plane, sparsely ciliate; peduncles axillary, solitary, 1- or rarely 2-flowered, slender, 4–10 mm. long; hypanthium glabrous or very sparsely strigillose, hemispheric, 1 mm. long, smooth; calyx-lobes 1 mm. long, oblong or ovate-oblong, obtuse; corolla 5 mm. long, glabrous, the tube very short, the lobes oblong, obtuse; anthers narrowly oblong, 2 mm. long, obtuse; capsule globose-turbinate, 3 mm. long.

TYPE LOCALITY: River bluffs below Trinidad Iron Works, Hidalgo, at an altitude of 1710 meters.
DISTRIBUTION: Known only from the type locality.

2. **Deppea Purpusii** Standley, sp. nov.

Shrub, the branches slender, grayish, densely puberulent or villosulous when young, the internodes elongate; petioles slender, 0.5–2 cm. long; leaf-blades ovate or oblong-ovate, 2.5–4.5 cm. long, 1.2–2.2 cm. wide, obtuse or rounded at the base, acute at the apex, bright-green above, sparsely pilose when young, the venation prominent, 3–5 on each side, arcuate, the margins plane, ciliate; peduncles axillary, 1- or 2-flowered, in fruit 7–13 mm. long; capsule globose-turbinate, 3–4 mm. long, 9-costate, densely villosulous when young, glabrate in age, the persistent calyx-lobes oblong or elliptic, acute, 2–3 mm. long.

Type collected in the Sierra Madre between Misantla and Naolinco, Veracruz, August, 1912, C. A. Purpus 6260 (U. S. Nat. Herb. no. 464734).

3. *Deppea umbellata* Hemsl. Diag. Pl. Nov. 31. 1879.

Shrub, the branches slender, grayish or brownish, bifariously puberulent when young, the internodes elongate; stipules broadly deltoid, about 1 mm. long; petioles slender, 0.4–2.5 cm. long, puberulent; leaf-blades ovate, oval-ovate, oval-elliptic, or lance-ovate, 4–11.5 cm. long, 2–5 cm. wide, acute or abruptly acuminate or attenuate at the base, subabruptly acuminate or attenuate at the apex, with an obtuse or acute acumen, very thin, bright-green above, very sparsely pilose or glabrate, the venation plane or prominulous, paler beneath, sparsely puberulent or glabrate, the lateral veins slender, prominulous, 5–7 on each side, arcuate, the margins plane, ciliolate; inflorescence axillary, umbellate, mostly 4–8-flowered, the peduncles 3–12 mm. long, the pedicels filiform, 2–5 mm. long; hypanthium less than 1 mm. long, sparsely puberulent, hemispheric; calyx-lobes minute, deltoid, acute or acutish; corolla 2–3 mm. long, glabrous, the tube very short, the lobes ovate-oblong, obtuse; anthers 1.5 mm. long, obtuse; capsule globose-turbinate, about 2 mm. in diameter, conspicuously 9-costate, glabrous; seeds minute, brownish-black.

TYPE LOCALITY: Orizaba, Veracruz.

DISTRIBUTION: Veracruz.

ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. pl. 38, f. 1–6.

4. *Deppea excelsa* (H.B.K.) Standley.

Psychotria excelsa H.B.K. Nov. Gen. & Sp. 3: 355. 1819.

Choristes excelsa Benth.; Walp. Rep. 2: 506. 1843.

Deppea tenuiflora Benth. Pl. Hartw. 349. 1857.

Shrub, the branches slender, grayish, bifariously puberulent when young, the internodes elongate; stipules minute, deltoid; petioles slender, 3–10 mm. long, puberulent; leaf-blades ovate, elliptic-oblong, or lance-oblong, 3–7.5 cm. long, 1.5–3 cm. wide, acute to attenuate at the base, subabruptly acuminate or attenuate at the apex, very thin, bright-green above, sparsely pilose when young, the venation plane or prominulous, paler beneath, puberulent or sparsely pilose along the veins, glabrate in age, the lateral veins slender, arcuate; inflorescence axillary, umbellate, 3–10-flowered, the peduncles 3–10 mm. long, the pedicels slender, 2–5 mm. long; hypanthium glabrous; calyx-lobes minute, deltoid, acutish; corolla glabrous, the tube cylindric, the lobes oblong, obtuse, slightly longer than the tube; capsule turbinate, 3–4 mm. long, conspicuously costate; seeds minute, dark reddish-brown.

TYPE LOCALITY: Near Jalapa, Veracruz, altitude about 1345 meters.

DISTRIBUTION: Veracruz and Chiapas.

ILLUSTRATION: H.B.K. Nov. Gen. & Sp. pl. 282.

5. *Deppea erythrorhiza* Schlecht. & Cham. Linnaea 5: 168. Ja 1830.

Deppea hedyotidea DC. Prodr. 4: 618. 1830.

Slender shrub, the branches brownish-gray, glabrous, the internodes short; stipules minute; petioles slender, 5–10 mm. long, glabrous; leaf-blades elliptic, elliptic-oblong, or ovate, 4–7 cm. long, 1–2.5 cm. wide, acute or acuminate at the base, acute or short-acuminate at the apex, glabrous, bright-green above, paler beneath; inflorescence loosely cymose, many-flowered, long-pedunculate, the branches subfiliform, elongate, glabrous, the pedicels 4–12 mm. long, filiform; hypanthium glabrous, about 0.8 mm. long; calyx-lobes deltoid, half as long as the hypanthium; corolla 2.5 mm. long, the tube very short, the lobes oblong, acute; anthers about 1 mm. long.

TYPE LOCALITY: Hacienda de La Laguna, Veracruz.

DISTRIBUTION: Veracruz.

ILLUSTRATIONS: Endl. Atakta pl. 24; E. & P. Nat. Pfl. 44: f. 10, N, O.

6. *Deppea pubescens* Hemsl. Diag. Pl. Nov. 31. 1879.

Shrub, the branches stout, brownish, densely villosulous when young, the internodes short; stipules minute, deltoid; petioles slender, 0.5–1.8 cm. long, densely villosulous; leaf-blades ovate or lance-oblong, 3.5–7.5 cm. long, 1.2–3 cm. wide, acute at the base, acute or acuminate at the apex, chartaceous, bright-green above, puberulent, slightly paler beneath, densely villosulous or tomentose, the lateral veins prominent, arcuate; inflorescence axillary, cymose-corymbose, few-flowered, about as long as the leaves, the peduncles very slender, elongate, the pedicels

filiform, 2–5 mm. long; hypanthium 0.8 mm. long, puberulent; calyx-lobes ovate-deltoid, obtuse, nearly as long as the hypanthium; corolla 2–3 mm. long, nearly rotate, glabrous; capsule oval, 3 mm. long, puberulent, very obscurely costate.

TYPE LOCALITY: Santa Gertrudis, Mexico.

DISTRIBUTION: Known only from the type locality.

7. *Deppea cornifolia* Benth. Pl. Hartw. 349. 1857.

Rondeletia cornifolia Benth. Pl. Hartw. 39. 1840.

Choristes cornifolia Benth. Pl. Hartw. 64. 1840.

Shrub, about 1 meter high, the branches stout, grayish, sparsely puberulent when young or glabrate, the internodes often very short; stipules minute; petioles slender, 3–5 mm. long, cinereo-puberulent; leaf-blades ovate or lance-ovate, 1.5–4.2 cm. long, 0.7–2 cm. wide, acute to rounded at the base, acute or acuminate at the apex, bright-green above, glabrous or very sparsely puberulent, the venation subimpressed, paler beneath, sparsely cinereo-puberulent or glabrate, the lateral veins prominent, subarcuate; inflorescence terminal, cymose-corymbose, few-flowered, the peduncles slender, about 1 cm. long, the pedicels stout or slender, 1–6 mm. long, glabrous; hypanthium turbinate, conspicuously costate, glabrous, 0.8 mm. long; calyx-lobes narrowly triangular, acute, ciliolate, half as long as the hypanthium or shorter; corolla 8–11 mm. long, glabrous, the lobes oblong to oval, acute or acuminate, longer than the tube; anthers 2.5–3 mm. long, mucronulate; capsule about 3.5 mm. long, conspicuously costate.

TYPE LOCALITY: Forests near Morelia, Michoacán.

DISTRIBUTION: Michoacán and Mexico (state) to Oaxaca.

8. *Deppea obtusiflora* Benth. Pl. Hartw. 349. 1857.

Choristes obtusiflora Benth. Pl. Hartw. 63. 1840.

Shrub, the branches slender, brownish-gray, puberulent when young, the internodes short; stipules minute; petioles slender, 2–4 mm. long, puberulent; leaf-blades elliptic or elliptic-ovate, 1.5–3 cm. long, 0.7–1.3 cm. wide, acute or long-acuminate at the base, narrowed or acuminate to the obtuse apex, bright-green above, glabrous, paler beneath, villosulous along the veins; inflorescence cymose-corymbose, few-flowered, the peduncles slender, about 1 cm. long, the pedicels slender, 2–4 mm. long, sparsely puberulent; hypanthium about 0.8 mm. long, glabrous; calyx-lobes narrowly triangular, acute, about as long as the hypanthium; corolla 8–9 mm. long, glabrous, the lobes oval, rounded at the apex, the tube very short.

TYPE LOCALITY: Llano Verde, Oaxaca.

DISTRIBUTION: Oaxaca.

9. *Deppea grandiflora* Schlecht. Linnaea 19: 748. 1847.

Deppea costaricensis Polak. Linnaea 41: 566. 1877.

Deppea floribunda Hemsl. Diag. Pl. Nov. 31. 1879.

Deppea longipes Standley, Contr. U. S. Nat. Herb. 18: 138. 1916.

Shrub, 1–2.5 meters high, the branches slender, brownish or grayish, densely puberulent when young, the internodes usually elongate; stipules minute, broadly deltoid, glanduliferous; petioles slender, 0.3–2.5 cm. long, puberulent; leaf-blades oblanceolate, obovate, ovate, ovate-oblong, elliptic-oblong, or obovate-oval, 5–15 cm. long, 1.5–6.5 cm. wide, acute to attenuate at the base, sometimes abruptly acuminate, subabruptly acuminate or attenuate at the apex, bright-green above, glabrous or sparsely puberulent, the venation usually plane, slightly paler beneath, puberulent or villosulous, especially along the veins, often glabrate in age, the lateral veins prominent, arcuate; inflorescence mostly terminal, cymose-corymbose, usually many-flowered, long-pedunculate, the pedicels 1–6 mm. long, puberulent; hypanthium broadly turbinate, costate, glabrous or obscurely puberulent, 1.5–2 mm. long; calyx-lobes minute, deltoid, acute; corolla glabrous, 6–8 mm. long, the tube very short, the lobes oblong or ovate, obtuse; anthers 2.5–3 mm. long, linear, obtuse; capsule turbinate, 3–5 mm. long, glabrous, prominently 8-costate, coriaceous, dark-brown; seeds minute, dark-brown.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Veracruz and Oaxaca to Panama.

ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. pl. 38, f. 7–10.

23. ELAEAGIA Wedd. Hist. Nat. Quinq. 94. 1849.

Trees or shrubs, pubescent, the branches terete. Stipules interpetiolar, free or connate at the base. Leaves opposite, petiolate, coriaceous, large, glabrous or pubescent. Flowers small, in terminal racemes or panicles; hypanthium small, hemispheric, sulcate; calyx ampliate, 5-lobate, persistent; corolla short-funneliform, the throat villous, the limb 5-lobate, the lobes oblong, recurved, contorted in bud. Stamens 5, inserted between the corolla-lobes; filaments exserted, appendaged at the base; anthers dorsifixed, oblong. Disk orbicular. Ovary 2-celled; style short, bifid, the branches short, obtuse; ovules numerous, crowded, the placentae thick, peltately attached to the septum. Capsule very small, crustaceous, crowned by the persistent calyx, 2-celled, loculicidally bivalvate, the valves finally bifid. Seeds numerous, minute elongate; testa membranaceous.

Type species, *Elaeagia utilis* Wedd.

Leaf-blades 12.5–17.5 cm. long, auriculate at the base.
Leaf-blades 5–7 cm. long, exauriculate at the base.

1. *E. auriculata*.
2. *E. cubensis*.

1. *Elaeagia auriculata* Hemsl. Diag. Pl. Nov. 32. 1879.

Tree, the branches stout, obtuse-quadrangular, puberulent; stipules large; leaves very short-petiolate, the blades ovate-elliptic or subobovate, 12.5–17.5 cm. long or smaller, auriculate at the base, subcoriaceous, puberulent, the lateral veins parallel, conspicuous; flowers white, pedicellate, racemose-paniculate, the panicles large, lax, the branches divaricate; calyx cupular, sublobate; corolla deeply 5-parted, the lobes oblong, recurved, squamulose-barbate within; stamens exserted, the filaments barbate below. (Description compiled.)

TYPE LOCALITY: Costa Rica, at an altitude of 1350 meters.

DISTRIBUTION: Known only from the type locality.

2. *Elaeagia cubensis* Britton, Bull. Torrey Club 39: 10. 1912.

Shrub, 2.5–3.2 meters high, the branches stout, grayish, the branchlets stout, subangulate, minutely puberulent when young, the internodes very short; stipules oblong, about 1 cm. long, obtuse, finally deciduous; petioles stout, 4–9 mm. long; leaf-blades oblong-obovate, 5–7 cm. long, 2.2–3 cm. wide, acute at the base, abruptly short-acuminate at the apex, coriaceous, glabrous, green above, sublustrous, the costa prominent, pale-brownish beneath, the venation prominent, the lateral veins mostly opposite, about 8 on each side, the margin plane or subrevolute; panicles sessile or short-pedunculate, 4.5–7.5 cm. wide, the branches minutely puberulent, the pedicels 1–3 mm. long, the bractlets minute; hypanthium obconic, 2.5 mm. long, glabrous; calyx obscurely 5-lobate; corolla white, 4 mm. long, the lobes oblong, obtuse, about twice as long as the tube; filaments equaling the corolla-lobes, the scale near the base of each bearing a dense tuft of white hairs; stigma-lobes one fourth as long as the style.

TYPE LOCALITY: Monte Juquareto, Sierra Maestra, Oriente, Cuba, at an altitude of 1100 meters.

DISTRIBUTION: Known only from the type locality.

24. OMILTEMIA Standley, Jour. Wash. Acad. 8: 427. 1918.

Branched shrubs, more or less pubescent, the branchlets angulate. Leaves opposite and ternate, petiolate, membranaceous. Stipules minute, deciduous. Flowers of medium size, red, axillary, solitary, long-pedicellate, the pedicels bibracteolate at the base; hypanthium narrowly turbinate; calyx 4-lobate, the lobes linear-subulate, subequal, persistent; corolla tubular, glabrous, the tube elongate, slender and constricted near the base, ampliate in the upper three fourths, the limb 4-lobate, the lobes short, oblong-ovate, subulate-acuminate, erect or ascending, contorted. Stamens 4, inserted at the base of the ampliate portion of the corolla-tube; filaments filiform, exserted; anthers linear, dorsifixed, mucronate, bifid at the base. Disk depressed. Ovary 2-celled; style filiform, exserted, glabrous; stigma fusiform; ovules numerous, imbricate, the placentae oblong, peltately affixed to the septum. Capsule 2-celled, cylindric, elongate, subcoriaceous, costate, loculicidally bivalvate at the apex. Seeds numerous, minute, subglobose, obtusely angulate, the testa lustrous, reticulate; endosperm fleshy.

Type species, *Omiltemia longipes* Standley.

1. *Omiltemia longipes* Standley, Jour. Wash. Acad. 8: 427. 1918.

Shrub, about 3 meters high, the branches stout, grayish, terete, the branchlets slender, puberulent when young, densely leafy; stipules deltoid, about 1 mm. long; leaves mostly ternate, the petioles slender, 2–6 mm. long, puberulent, often marginate to the base, the blades oblanceolate or oblanceolate-oblong, 3–7 cm. long, 0.8–1.7 cm. wide, acuminate or long-attenuate at the base, acute to long-attenuate at the apex, often abruptly so, thin, bright-green, concolorous, glabrous above or puberulent along the costa, the venation plane, villosulous beneath along the veins or glabrate, inconspicuously striolate, the costa slender, prominent, the lateral veins prominulous, 4–6 on each side, arcuate; pedicels 1.7–3.5 cm. long, filiform, sparsely short-pilose, the bractlets minute, linear, green; hypanthium very sparsely short-pilose or glabrate, 6–7 mm. long; calyx-lobes 3–4 mm. long; corolla red, about 4 cm. long, the contracted portion of the tube about 1 cm. long and 1.2 mm. thick, the upper portion 5–6 mm. thick, the lobes about 5 mm. long; anthers 7 mm. long, the filaments about 2.5 cm. long; style about 4.5 cm. long; capsule 1.4 cm. long, 2.5–3 mm. thick; seeds brown.

TYPE LOCALITY: Omilteme, Guerrero.

DISTRIBUTION: Known only from the type locality.

25. *LINDENIA* Benth. Pl. Hartw. 84. 1841.*

Shrubs, glabrous or pubescent, the branches terete. Stipules interpetiolar, short, connate, cuspidate, subpersistent. Leaves opposite, short-petiolate, narrow. Flowers large, showy, in few-flowered terminal cymes, short-pedicellate; bracts subulate; hypanthium elongate-turbinate, 5-angulate or 5-costate; calyx 5-lobate, the lobes elongate-subulate or lanceolate, equal or unequal, persistent; corolla salverform, white, the tube terete, much elongate, the throat naked, the limb 5-lobate, the lobes oblong, spreading, contorted in bud. Stamens 5, inserted at the top of the corolla-tube; anthers sessile, linear-oblong, obtuse, recurved, exserted. Disk annular. Ovary 2-celled; style filiform, bifid, pilose, the lobes erect; ovules very numerous, crowded, the placentae semicylindric, stipitate, longitudinally adnate to the septum. Capsule clavate or pyriform, 2-celled, septicidally bivalvate, many-seeded, the valves bifid, often elastically coiled after dehiscence. Seeds small, angulate, smooth; endosperm fleshy; embryo clavate, the radicle terete.

Type species, *Lindenia rivalis* Benth.

1. *Lindenia rivalis* Benth. Pl. Hartw. 84. 1841.

Lindenia acutiflora Hook. Ic. pl. 475. 1842.

Shrub, 3–10 dm. high, the branches stout, dark-brown or reddish-brown, usually pilosulous when young, sometimes glabrate; stipules annular, 3–5 mm. long, the lobes subtruncate to acute, cuspidate, thin, brown, glabrous or pilosulous; leaves crowded at the ends of the branches, the petioles stout, 2–10 mm. long, usually pilosulous, the blades oblanceolate to linear-elliptic, 3.5–16.5 cm. long, 0.7–2.8 cm. wide, attenuate or long-attenuate at the base, acute to attenuate at the apex, thin, bright-green, glabrous above or minutely pilosulous along the costa, the venation plane or subimpressed or the costa prominulous, beneath scarcely paler, densely or sparsely puberulent or pilosulous, rarely quite glabrous, the venation prominent, the lateral veins 6–12 on each side, ascending at an angle of 45° or less, arcuate, extending to the margin, this plane or revolute; cymes mostly 3-flowered, the peduncles short, stout, the pedicels very stout, 1 cm. long or shorter; hypanthium 7–10 mm. long, sparsely or densely hirsutulous, calyx-lobes linear-subulate, 1–2 cm. long, green, erect, pilosulous or hirsutulous; corolla-tube usually 10–16 cm. long, 2.5–3 mm. thick, copiously pilosulous outside, the lobes elliptic to oblong-oval, 2.5–3 cm. long, acute to very obtuse at the apex, short-pilosulous; anthers linear, about 1 cm. long; capsule pyriform, 1.2–2 cm. long, costate, hirsutulous, thick and woody, the exocarp finally separating from the endocarp; seeds 1.5–2 mm. long, brownish.

* The name *Siphonia* was first suggested by Bentham for this genus, and was printed in the text of the fascicle of *Plantae Hartwegianae* containing page 84. Before the publication was distributed, however, the name *Lindenia* was substituted, with a pen, in all the copies. There is no reason, consequently, for citing the homonymous *Siphonia* Benth. as a synonym of *Lindenia*, for the former was never published, except as it has since appeared in synonymy.

TYPE LOCALITY: Stream banks, Verapaz, Guatemala.

DISTRIBUTION: Along streams, Michoacán to Veracruz and Panama.

ILLUSTRATIONS: Hook. Ic. pl. 475, 476; Bot. Mag. pl. 5258.

26. STYLOSIPHONIA Brand. Univ. Calif. Publ. Bot. 6: 70. 1914.

Nearly glabrous shrubs, the branchlets subangulate. Leaves opposite, petiolate, membranaceous. Stipules interpetiolar, small, glandular-dentate. Inflorescence axillary and terminal, cymosely few-flowered or sometimes 1-flowered, pedunculate, the flowers pedicellate, bracteolate; hypanthium oblong; calyx 5-lobate, the lobes narrow, unequal, deciduous (?); corolla salverform, the tube slender, elongate, terete, the limb 5-lobate, the lobes lance-linear, elongate, contorted. Stamens 5, inserted in the corolla-tube; filaments short; anthers dorsifixated, erect, linear-oblong, obtuse, included. Ovary 2-celled; style filiform, elongate, bifid; ovules numerous. Capsule ovoid, 2-celled, coriaceous, septicidally bivalvate, the valves bipartite. Seeds numerous, angulate, rugose.

Type species, *Stylosiphonia glabra* Brand.

1. *Stylosiphonia glabra* Brand. Univ. Calif. Publ. Bot. 6: 70. 1914.

Branches slender, brownish, glabrous or sparsely pilose at the nodes, the internodes elongate; stipules deltoid, cuspidate, about 2 mm. long, thick, deciduous; petioles slender, 0.5-2.3 cm. long, sparsely puberulent; leaf-blades lanceolate, oblong-lanceolate, or oblanceolate, 6.5-14 cm. long, 1.5-3 cm. wide, acute to long-attenuate at the base, abruptly long-acuminate or very long-attenuate at the apex, with an acute, often falcate acumen, bright-green, subconcolorous, glabrous above, the venation plane, sparsely short-pilose beneath along the veins or glabrate, the lateral veins slender, prominulous, arcuate; inflorescences 1-4-flowered, the peduncles slender, glabrous, about 2 cm. long, the pedicels slender, 1-1.5 cm. long; bractlets minute; hypanthium glabrous, 3 mm. long; calyx-lobes linear or oblanceolate, 3-5 mm. long, acute; corolla glabrous, the tube about 1.8 cm. long and 1 mm. thick, the lobes more than half as long as the tube, with a long subulate apex; capsule about 9 mm. long.

TYPE LOCALITY: Chiapas.

DISTRIBUTION: Known only from the type locality.

27. SIPANEA Aubl. Pl. Guian. 147. 1775.

Annual or perennial herbs, pubescent or glabrate, erect or prostrate, the branches terete. Stipules linear, elongate, persistent. Leaves opposite, petiolate, the blades broad or narrow. Flowers cymose or paniculate, the cymes corymbose, axillary or terminal, white or pink; hypanthium turbinate or ovoid; calyx 5-lobate, the lobes subulate, persistent; corolla funnel-form or salverform, the tube elongate, the throat dilated, glabrous, villous, or squamate, the limb 5-lobate, the lobes equal, broadly ovate, spreading, contorted in bud. Stamens 5, inserted in the corolla-throat; filaments short; anthers dorsifixated, linear, obtuse, included. Disk annular. Ovary 2-celled; style filiform, included, bipartite, the branches linear, acute; ovules numerous, the placentae small, affixed to the septum. Capsule ovoid or subglobose, coriaceous, 2-celled, loculicidally bivalvate, many-seeded. Seeds minute, horizontal, angulate; testa reticulate; endosperm fleshy; embryo clavate.

Type species, *Sipanea pratensis* Aubl.

1. *Sipanea pratensis* Aubl. Pl. Guian. 147. 1775.

Sipanea dichotoma H.B.K. Nov. Gen. & Sp. 3: 397. 1820.

Plants perennial, erect or decumbent, the branches stout, densely or sparsely pilose-sericeous, the internodes shorter or longer than the leaves; stipules subulate or triangular-subulate, 3-7 mm. long, pilose-sericeous; petioles stout, 2-4 mm. long; leaf-blades lanceolate or ovate-lanceolate, 3-7 cm. long, 0.7-1.8 cm. wide, obtuse or acute at the base, long-attenuate at the apex, bright-green, copiously pilose-strigose on both surfaces, especially along the veins, the venation prominulous beneath, the lateral veins 5-7 on each side, nearly straight, ascending at a very acute angle, the margins plane; inflorescence terminal, densely cymose, rather few-

flowered, the flowers sessile or nearly so; bracts linear, elongate, foliaceous; hypanthium about 2 mm. long, strigose: calyx-lobes narrowly linear, 6–8 mm. long, green, sparsely pilose-strigose; corolla-tube slender, 9–13 mm. long, setose-pilose above, the throat densely yellow-bearded, the lobes oblong-ovate, about 6 mm. long, obtuse or acutish, minutely papillose within; capsule oblong-cylindric, 7–8 mm. long, costate, setose-pilose; seeds about 0.5 mm. long, dark-brown, punctulate.

TYPE LOCALITY: Guiana.

DISTRIBUTION: Wet soil, Trinidad and the Guianas; reported from Dominica.

ILLUSTRATIONS: Aubl. Pl. Guian. pl. 56; E. & P. Nat. Pfl. 4⁴: f. 11, C-F.

28. *LIMNOSIPANEAE* Hook. f. in Hook. Ic. 11: 38. 1868.

Slender erect herbs, branched above, the stems terete. Stipules obsolete. Leaves verticillate or the uppermost opposite, narrow. Flowers small, in trichotomous terminal cymes, bracteate and bibracteolate, pink; hypanthium ovoid, hispid; calyx 5-lobate, the lobes lanceolate, glandular within at the base, persistent; corolla salverform, the tube slender, the throat pubescent, the limb 5-lobate, the lobes oblong, obtuse, spreading, contorted in bud. Stamens 5, inserted in the corolla-throat; filaments filiform; anthers dorsifixed, oblong, obtus³, exserted. Disk conic. Ovary 2-celled; style filiform, exserted, the 2 branches linear, obtuse; ovules numerous, the placentae dilated, peltately affixed to the septum. Capsule ovoid, crustaceous, 2-celled, tardily and locudically bivalvate. Seeds numerous, minute, horizontal, angulate; testa reticulate; endosperm fleshy.

Type species, *Limnosipanea Spruceana* Hook. f.

1. *Limnosipanea palustris* (Seem.) Hook. f. in Hook. Ic. 11: 38. 1868.

Sipanea palustris Seem. Bot. Voy. Herald 136. 1854.

Perennial herb, about 20 cm. high, the stems decumbent, hirsute; leaves ternate, sessile, ovate-lanceolate, about 8 mm. long and 2 mm. wide, acute at the apex, glabrous; inflorescence dichotomous, the flowers solitary, sessile; calyx-lobes linear-lanceolate, acute, biaristate; corolla rose-colored, about 3 mm. broad, glabrous, or subpuberulent within; capsule subglobose, setose-pilose. (Description compiled.)

TYPE LOCALITY: Swamps near Panama City, Panama.

DISTRIBUTION: Known only from the type locality.

IV. CINCHONEAE. Trees or shrubs, rarely herbs, sometimes scandent. Stipules entire. Flowers perfect; corolla usually symmetric, sometimes asymmetric, the lobes valvate, imbricate, or contorted. Anthers usually dorsifixed. Ovary 2-celled, the ovules numerous. Fruit capsular. Seeds numerous, usually minute, vertical or ascending, peltate, imbricate; radicle usually superior.

Corolla-lobes valvate.

Placentae pendulous from the apex of the cell; trees with spicate flowers.

30. *ALSEIS*.

Placentae peltate or ascending; flowers not spicate.

31. *MANETTIA*.

Plants twining, with mostly herbaceous stems; placentae ascending from the base of the septum.

32. *BOUVARDIA*.

Plants erect, often fruticose; placentae peltately affixed to the septum.

33. *MACROCNEMUM*.

Flowers 4-parted; capsule subglobose; stems often herbaceous;

29. *LADENBERGIA*.

leaves often verticillate.

Flowers 5-parted; capsule oblong or clavate; stems fruticose;

leaves opposite.

Capsule loculicidal; anthers included.

34. *CALYCOPHYLLUM*.

Capsule septicidal; anthers exserted.

35. *COSMIBUENA*.

Corolla-lobes imbricate or contorted.

36. *HILLIA*.

Calyx-lobes dissimilar, one of them often expanded into a large white petiolate limb.

Calyx-lobes similar, none expanded into a petiolate limb.

Corolla-lobes contorted.

Calyx tubular, deciduous; seeds not bearded.

Calyx parted to the base or wanting; seeds bearded.

Anthers borne on long filaments.

Corolla symmetric, the tube very slender, terete, the limb 4-5-lobate.

38. EXOSTEMA.

Corolla often asymmetric, the tube obconic or gibbous, the limb 6-8-lobate.

39. COUTAREA.

Anthers sessile or on very short filaments.

Anthers sessile.

40. BLEPHARIDIUM.

Anthers on short filaments.

35. RAVNIA.

29. LADENBERGIA Klotzsch, in Hayne, Arzn. Gew. 14: pl. 15. 1846.

Cascarilla Wedd. Ann. Sci. Nat. III. 10: 10. 1848. Not *Cascarilla* Raf. 1838.

Trees or shrubs, the branchlets terete or angulate. Leaves opposite or verticillate, petiolate, coriaceous. Stipules interpetiolar, deciduous, glandular within at the base. Flowers small or of medium size, white, arranged in terminal panicles; hypanthium ovoid or turbinate, pubescent; calyx cupular, 5-lobate, valvate, persistent or deciduous; corolla subfunneliform or salverform, pubescent outside, the tube glabrous within, the limb 5-lobate, valvate, the lobes papillose within and on the margins. Stamens 5, inserted below the middle of the tube; filaments short; anthers linear, dorsifixed, included. Disk pulvinate. Ovary 2-celled; style filiform, the branches oblong or linear, included; ovules numerous, imbricate, the placentae terete, adnate to the septum. Capsule oblong, clavate, or cylindric, 2-celled, septically bivalvate from the apex to the base. Seeds numerous, imbricate, peltate, the body oblong, surrounded by a membranaceous, dentate or lacerate wing, the placentae terete or angulate; endosperm fleshy; cotyledons ovate; radicle terete.

Type species, *Ladenbergia undata* Klotzsch.

1. *Ladenbergia undata* Klotzsch, in Hayne, Arzn. Gew. 14: pl. 15. 1846.

Cascarilla undata Wedd. Ann. Sci. Nat. III. 10: 12. 1848.

Shrub or tree, the branchlets stout, obtusely angulate, pilose when young; stipules ovate, about 3 cm. long, obtuse or acutish, coriaceous, the margins revolute; petioles stout, 1-3.5 cm. long, pilose or glabrate; leaf-blades oblong or oval-oblong, 7-20 cm. long, 3.5-10 cm. wide, rounded to acutish at the base, obtuse or acutish at the apex, thick-coriaceous, more or less bullate, lustrous above, glabrous, the venation often impressed, brownish beneath, pilose, especially along the veins, the lateral nerves very prominent, about 10 on each side, the margin strongly revolute; inflorescence cymose-paniculate, pedunculate, few-flowered, the flowers sessile or short-pedicellate; hypanthium densely ferrugino-pilose with mostly appressed hairs; calyx-lobes ovate-triangular, acute; corolla about 3.5 cm. long, densely sericeous-pilose with ferruginous hairs, the lobes lance-oblong, acute, about half as long as the tube; capsule linear-clavate, about 4.5 cm. long and 6 cm. thick, brownish; seeds reddish-brown, broadly winged, the wing lacerate-dentate.

TYPE LOCALITY: Near Mérida, Venezuela.

DISTRIBUTION: Costa Rica to Colombia and Venezuela.

30. ALSEIS Schott; Spreng. Syst. 4²: 404. 1827.

Trees or shrubs, more or less pubescent, with terete branches. Leaves opposite, petiolate, the blades of medium size. Stipules interpetiolar, short or elongate. Flowers small, white or yellow, ebracteolate, spicate, the spikes simple or branched, axillary and terminal; hypanthium obconic; calyx 5-lobate, the lobes broad or narrow, deciduous; corolla cylindric, short, pilose within, the limb 5-lobate, the lobes valvate. Stamens 5, inserted at the base of the corolla-tube; filaments elongate, villous, complanate at the base; anthers versatile, oblong, exserted, bipartite at the base. Disk broad, swollen. Ovary 2-celled; style elongate, exserted, pilose or glabrous, bipartite, the branches recurved, obtuse; ovules numerous, imbricate, the placentae elongate, pendulous from the apex of the cell. Capsule oblong-turbinate, 2-celled, septically bivalvate from the apex, the valves entire, crustaceous. Seeds linear-fusiform, the body oblong, the testa thick, long-produced at each end; endosperm fleshy; embryo elongate, the cotyledons narrow, the radicle terete, subelongate.

Type species, *Alseis floribunda* Schott.

1. Alseis Blackiana Hemsl. Diag. Pl. Nov. 30. 1879.

Tree, the trunk furrowed and twisted, the crown small, flat, the branchlets thick, glabrous; stipules lance-linear, 1–1.5 cm. long, thick, glabrous, ciliate; leaves crowded at the ends of the branches, the petioles slender, 1–3.5 cm. long, glabrous, the blades oblanceolate or obovate-oblong, 7–20 cm. long, 1.8–6 cm. wide, long-attenuate at the base, subabruptly acuminate at the apex, or very obtuse and apiculate, thin, bright-green, concolorous, sparsely strigose when young but soon glabrate, the venation prominent beneath, the lateral veins slender, numerous, nearly straight; spikes stout, short-pedunculate, simple, 6–25 cm. long, densely flowered, the rachis tomentulose, the flowers very shortly pedicellate; hypanthium narrowly turbinate, 2 mm. long, puberulent or glabrate; calyx-lobes ovate, acute, glabrous, scarcely 0.5 mm. long; corolla white, 2.5–3 mm. long, glabrous outside, the lobes very short, semi-orbicular; filaments densely bearded; anthers 0.8 mm. long; style glabrous; capsule 9–12 mm. long, about 2 mm. thick, brownish; seeds brown.

TYPE LOCALITY: Panama.

DISTRIBUTION: Panama and Colombia.

ILLUSTRATION: Hemsl. Biol. Centr. Am. Bot. pl. 37.

This or a closely related species occurs in Yucatan. Of the Yucatan plant the writer has seen only fruiting specimens, without leaves.

31. MANETTIA Mutis; L. Mant. 553, 558. 1771.

Nacibea Aubl. Pl. Guian. 95. 1775.

Lygistum P. Br. (Hist. Jam. 142; homonym. 1756); Lam. Tab. Encyc. 1: 286. 1791.

Guagnebina Vell. Fl. Flum. 45. 1825.

Conotrichia A. Rich. Mém. Soc. Hist. Nat. Paris 5: 277. 1834.

Scandent herbs, sometimes suffrutescent, glabrous or pubescent. Leaves opposite, petiolate. Stipules short, broad, acute, often adnate to the petiole. Flowers small or large, solitary in the axils or arranged in small cymes or panicles, white, red, or yellow, the peduncles often bibracteolate; hypanthium turbinate, obovoid, or campanulate; calyx usually 4-lobate, persistent, the lobes short or elongate, broad or narrow, often alternating with minute teeth or large lobes; corolla tubular or funnel-form, the tube short or elongate, terete or angulate, straight or curved, glabrous or pilose within or villous in the throat, the limb 4- (rarely 5-) lobate, the lobes usually short, erect or recurved, valvate. Stamens 4 (rarely 5), inserted in the throat of the corolla; filaments short, included or exserted; anthers versatile, oblong, short or elongate. Disk annular or pulvinate. Ovary 2-celled; style filiform; stigma clavate or bifid; ovules numerous, peltate, imbricate, the placentae swollen, erect. Capsule ovoid or turbinate, bisulcate, coriaceous or chartaceous, 2-celled, septicidally bivalvate from the apex. Seeds numerous, compressed, surrounded by a broad, irregularly dentate wing; endosperm corneous; embryo straight, the cotyledons ovate, the radicle cylindric.

Type species, *Manettia reclinata* L.

Calyx-lobes usually 8, subequal; corolla red.

Corolla-lobes ovate or ovate-oblong.

1. *M. coccinea*.

Corolla-lobes orbicular.

2. *M. orbifera*.

Calyx-lobes 4, sometimes with small intermediate teeth..

Corolla red or white; leaves membranaceous; calyx-lobes without intermediate teeth or with minute ones.

Corolla 3–4 cm. long.

3. *M. domingensis*.

Flowers solitary, axillary; calyx-lobes oblong, obtuse.

4. *M. hirtella*.

Flowers in terminal cymes; calyx-lobes linear-subulate.

5. *M. zimapanica*.

Flowers subsessile.

Flowers on pedicels 1–2 cm. long.

6. *M. calycosa*.

Corolla 1.8 cm. long or shorter.

7. *M. dominicensis*.

Calyx-lobes 5–10 mm. long; corolla-tube 8–13 mm. long.

Calyx-lobes distinct.

8. *M. barbata*.

Calyx-lobes united at the base into a short tube.

9. *M. flexilis*.

Calyx-lobes 1.5–4 mm. long; corolla-tube 7 mm. long or shorter.

10. *M. Lygistum*.

Leaf-blades lance-linear, 5–6 mm. wide.

Leaf-blades mostly ovate, 10–30 mm. wide.

Corolla blue; leaves coriaceous; calyx-lobes with conspicuous intermediate teeth.

1. *Manettia coccinea* (Aubl.) Willd. Sp. Pl. 1: 624. 1797.

Nacibea coccinea Aubl. Pl. Guian. 96. 1775.
Manettia uniflora H. B. K. Nov. Gen. & Sp. 3: 387. 1820.

Manettia havanensis H. B. K. Nov. Gen. & Sp. 3: 388. 1820.
Manettia cuspidata Bertero; Spreng. Syst. 1: 415. 1825.

? *Manettia tenuifolia* Schultes, in R. & S. Syst. Veg. Mant. 3: 145. 1827.
Bouvardia uniflora A. Rich. Mém. Soc. Hist. Nat. Paris 5: 272. 1834.

Bouvardia havanensis A. Rich. Mém. Soc. Hist. Nat. Paris 5: 272. 1834.
Manettia panamensis Duchass. & Walp. Linnaea 23: 733. 1850.

Manettia costaricensis Wernham, Gen. Manettia 38. 1919.

Stems herbaceous or suffrutescent below, slender, angulate, glabrous, puberulent, or short-pilose, usually retrorse-pilose on the angles, the internodes short or elongate; stipules 1–2 mm. long, denticulate; petioles slender or stout, 2–14 mm. long; leaf-blades lanceolate, ovate, or ovate-oblong, 3–10 cm. long, 1–5 cm. wide, acute or obtuse at the base, often short-decurrent, acute or usually subabruptly acuminate at the apex, thin, bright-green above, glabrous or scaberulous, paler beneath, short-pilose, especially along the veins, or glabrous, the lateral veins conspicuous, arcuate; peduncles axillary, elongate, mostly 1-flowered but often cymosely few-flowered, the pedicels slender, 1.5–6 cm. long; hypanthium 3–5 mm. long, contracted and slightly prolonged above the ovary, glabrous or short-pilose, the 8 calyx-lobes subequal, linear or oblanceolate, attenuate, 4–14 mm. long, glabrous or sparsely short-pilose, ciliate, recurved; corolla subsalverform, 1.7–2.8 cm. long, red, more or less pilose outside, densely barbate within at the base, sparsely barbate in the throat or naked, the lobes 4–5 mm. long, ovate or triangular-oblong, glabrous within or nearly so; stamens inserted in the corolla-throat, included, the anthers 2.5–3 mm. long; capsule 6–10 mm. long, 6–8 mm. broad, thin; seeds 2–3 mm. broad, the wing pale-brown, the body dark-brown.

TYPE LOCALITY: French Guiana.

DISTRIBUTION: Veracruz and Oaxaca, south to Colombia and the Guianas; Cuba, Jamaica, St. Vincent, and Trinidad.

ILLUSTRATION: Aubl. Pl. Guian. pl. 37, f. 1.

2. *Manettia orbifera* Wernham, Gen. Manettia 41. 1919.

Stems scandent, filiform, glabrous; stipules reduced to a very short truncate sheath, this sometimes glandular-fimbriate; petioles 1 cm. long or shorter; leaf-blades ovate, 4–7 cm. long, 2–3 cm. wide, sometimes unequal at the base, acutely acuminate at the apex; flowers axillary, solitary, the pedicels 2 cm. long or shorter; calyx-lobes 5–8, linear-lanceolate, 6 mm. long or longer, acuminate, glabrous; corolla salverform, the tube broad, nearly 1.5 cm. long, 4 mm. broad, glabrous outside, barbate within in the throat, the lobes orbicular, 8 mm. long and wide, subacute.

TYPE LOCALITY: Retalhuleu, Guatemala.

DISTRIBUTION: Known only from the type locality.

3. *Manettia domingensis* Sprague, Bull. Herb. Boiss. II. 5: 266. 1905.

Stems slender, tetragonal, scaberulous, the angles retrorse-pilose; stipules truncate, glandular-ciliate, pilose outside; leaves short-petiolate, the blades ovate-oblong or narrowly ovate, 7–16 mm. long, 3–7 mm. wide, rounded at the base, acute at the apex, coriaceous, glabrous above, beneath, especially on the costa and margin, sparsely falcate-pilose; flowers axillary, solitary, the pedicels 6–7 mm. long; hypanthium oblong-turbinate, 3.5 mm. long, glabrous, the 4 calyx-lobes oblong, obtuse, 2.5 mm. long, glabrous; corolla-tube 2.5 cm. long, villous within, the lobes deltoid-lanceolate, 6 mm. long, about 4 mm. wide at the base; stamens inserted about 1 mm. below the top of the corolla-tube, the filaments 6 mm. long, the anthers 2.7 mm. long; style slightly exceeding the stamens.

TYPE LOCALITY: In pine woods, Valle Nuevo, Santo Domingo, altitude 1900 meters.

DISTRIBUTION: Known only from the type locality.

4. *Manettia hirtella* Mart. & Gal. Bull. Acad. Brux. 11¹: 238. 1844.

Lygistum hirtellum Kuntze, Rev. Gen. 287. 1891.

Stems herbaceous, slender, tetragonal, glabrous; leaves petiolate, the blades ovate, 3.7 cm. long, 1.2 cm. broad, attenuate at the base, acute at the apex, hirtellous above, paler

beneath, short-pilose along the nerves, elsewhere glabrous; flowers terminal, glomerate, subsessile, subtended by 4 leaves; calyx-lobes 4, linear-filiform, pilose, one-fourth as long as the corolla-tube; corolla red, about 3.7 cm. long, tubular-funnelform, hirtellous at the base, the lobes ovate-lanceolate, 6 mm. long; stamens exserted, inserted in the corolla-throat. (Description compiled.)

TYPE LOCALITY: Along streams in the forests of Tonaguia, eastern cordillera of Oaxaca, altitude 1200 to 1500 meters.

DISTRIBUTION: Known only from the type locality.

5. *Manettia zimapanica* Hemsl. Diag. Pl. Nov. 30. 1879.

Lygistum zimapanicum Kuntze, Rev. Gen. 287. 1891.

Branches slender, terete, striate, minutely puberulent or glabrate; stipules glandular-ciliate, 3-aristate; petioles 2-3 mm. long; leaf-blades ovate or ovate-lanceolate, 6-9.5 cm. long, 2-4 cm. wide, attenuate at the base, attenuate-acuminate at the apex, thin, puberulent above along the veins, beneath short-pilose along the veins and elsewhere puberulent, the lateral veins 3 or 4 on each side, excurrent near the apex; inflorescence terminal, cymose, 3-5-flowered, the pedicels slender, 1-2 cm. long, minutely puberulent; hypanthium short-campanulate, 2 mm. long, glabrous, the 4 calyx-lobes linear-subulate, attenuate, 12-15 mm. long, ciliate; corolla clavate-tubular, glabrous outside, villous within near the base, the tube 2.6-3.1 cm. long, the lobes ovate-oblong, 5-6 mm. long; stamens inserted 1 mm. below the top of the corolla-tube, the filaments 0.5 mm. long, the anthers 3.5-4 mm. long, subexserted; style 2.2-2.5 cm. long, the lobes 1.3-1.7 mm. long.

TYPE LOCALITY: Zimapán, Hidalgo.

DISTRIBUTION: Known only from the type locality.

6. *Manettia calycosa* Griseb. Fl. Brit. W. Ind. 330. 1861.

Lygistum calykosum Kuntze, Rev. Gen. 287. 1891.

Stems slender, glabrous or minutely pilose on the angles; stipules short, deltoid, denticulate; leaves short-petiolate, the blades ovate or lance-ovate, 2-8 cm. long, 1-3 cm. wide, obtuse or acute at the base, acutely acuminate at the apex, membranaceous, glabrous, or short-pilose beneath along the costa; inflorescence axillary, cymose, few- or many-flowered, subsessile, the pedicels slender and elongate; calyx-lobes 4 or 5, ovate or ovate-lanceolate, 4-6 mm. long, spreading, often 4 mm. wide; corolla salverform, red, 1.6 cm. long, thinly short-pilose or puberulent outside, barbate within in the throat.

TYPE LOCALITY: Haïti.

DISTRIBUTION: Hispaniola; also in Colombia and Venezuela.

7. *Manettia dominicensis* Wernham, Gen. Manettia 37. 1919.

Manettia calycosa Griseb. Fl. Brit. W. Ind. 330, in part. 1861.

Stems herbaceous, slender, angulate, shortly retrose-pilose on the angles, elsewhere puberulent or glabrous; stipule-sheath 1-2 mm. long, the lobes deltoid, cuspidate, glandular-ciliate; petioles stout, 3-10 mm. long; leaf-blades ovate, ovate-oblong, or broadly ovate, 3.5-9 cm. long, 1-4 cm. wide, rounded or obtuse at the base, subabruptly acuminate to long-attenuate at the apex, thin, glabrous, or sparsely short-pilose beneath along the veins, the lateral veins conspicuous, slender, arcuate; inflorescence axillary, cymose, few-flowered, sessile or short-pedunculate, the pedicels mostly 1-2 cm. long or shorter; bracts often large and foliaceous; hypanthium 2-3 mm. long, glabrous or sparsely strigose, the calyx-lobes 4 or 5, broadly ovate to lance-linear, 5-10 mm. long, acute or acuminate, ciliate; corolla white or red, the tube stout, 8-13 mm. long, sparsely short-villous outside, pilose within near the base, the lobes broadly ovate, 3-5.5 mm. long; anthers included; capsule 4-5 mm. broad, thin.

TYPE LOCALITY: Dominica.

DISTRIBUTION: Dominica and St. Vincent.

8. **Manettia barbata** Oerst. *Vidensk. Meddel.* 1852: 47. 1852.

Lygistium barbatum Kuntze, *Rev. Gen.* 287. 1891.
Manettia stenophylla Donn. Smith, *Bot. Gaz.* 56: 58. 1913.

Stems suffrutescent, slender, terete, striate, glabrous, the internodes elongate; stipule-sheath short, the lobes deltoid, often bidentate, glandular-ciliate; petioles 0.5–1 cm. long; leaf-blades lance-linear, 3–4.5 cm. long, 5–6 mm. wide, acute at the base, acuminate at the apex, thin, glabrous, the lateral veins mostly obsolete, the margin revolute; flowers cymose or solitary in the axils, the cymes few-flowered, the peduncles 2–3 mm. long, the pedicels 1–2 mm. long; hypanthium obovoid, 2 mm. long, the 4 calyx-lobes short-connate above the ovary, oblong-ovate, 2 mm. long; corolla white, subsalverform, 5–6 mm. long, glabrous outside, the tube glabrate within, the lobes oblong-ovate, barbate within; stamens inserted near the top of the corolla-tube, the anthers linear, 1 mm. long; style equaling or shorter than the corolla; capsule thin, obovoid, 4.5 mm. long.

TYPE LOCALITY: Monte Aguacate, Costa Rica, altitude 600 meters.

DISTRIBUTION: Mountains of Costa Rica.

9. **Manettia flexilis** Brand. *Univ. Calif. Publ. Bot.* 6: 196. 1915.

Stems herbaceous, slender, angulate, puberulent or villosulous, the internodes elongate; stipule-sheath short, glandular-ciliate; petioles stout, 2–6 mm. long; leaf-blades ovate, ovate-oblong, or lance-ovate, 3–7 cm. long, 1–3 cm. wide, acute or obtuse at the base, acute to long-attenuate at the apex, usually subabruptly so, thin, glabrous above or puberulent along the veins, beneath usually short-pilose along the veins, elsewhere sparsely puberulent or glabrous, the lateral veins conspicuous, slender, arcuate; inflorescence axillary, cymose, few-flowered or sometimes 1-flowered, the peduncles 1.5 cm. long or shorter, the pedicels 0.3–2.5 cm. long; hypanthium 2–3 mm. long, glabrous or pilose, the 4 calyx-lobes linear to lance-ovate, 1.5–4 mm. long, acute, glabrate, recurved, usually ciliate; corolla rose-colored, glabrous outside or sparsely pilose, salverform, the tube stout, 6–7 mm. long, pilose within above the middle, the lobes 2–3 mm. long, densely barbate within; anthers 1.5 mm. long, subexserted; capsule 4.5–7 mm. broad, thin; seeds 2–3 mm. broad, dark-brown.

TYPE LOCALITY: Cerro del Boquerón, Chiapas.

DISTRIBUTION: Chiapas to Costa Rica; also in Ecuador.

10. **Manettia Lygistum** (L.) Sw. *Prodri. 37.* 1788.

Petesia Lygistum L. *Syst. Nat. ed.* 10. 894. 1759.

Lygistium axillare Lam. *Tab. Encyc.* 1: 286. 1791.

Gonzalea Lygistum Schultes, in R. & S. *Syst. Veg. Mant.* 3: 132. 1827.

Manettia lygistoidea Griseb. *Mém. Am. Acad.* II. 8: 505. 1862.

Manettia Lygistum lygistoidea K. Schumann, in *Mart. Fl. Bras.* 6⁶: 180. 1889.

Stems herbaceous or suffrutescent at the base, stout, angulate, retrorse-pilose, puberulent, or glabrate, the internodes usually short; stipule-sheath short, the lobes acute or truncate, glandular-ciliate; petioles stout, 2–10 mm. long; leaf-blades usually rounded-ovate, sometimes ovate or lance-ovate, 2–4.5 cm. long, 1–3 cm. wide, broadly rounded or subcordate at the base, acute or acuminate or sometimes very obtuse or rounded and subcuspidate, usually coriaceous, lustrous above, glabrous, the primary veins usually impressed, sparsely sordid-villosus beneath along the veins, the lateral veins very prominent, arcuate, the secondary veins usually prominently reticulate on both surfaces, the margins often revolute; inflorescence usually axillary, cymose, 3–5-flowered or sometimes 1-flowered, the cymes short-pedunculate, the pedicels 2–5 mm. long; hypanthium 3 mm. long, sparsely viscid-villosulous or glabrate, the 4 calyx-lobes ovate or triangular, 1.5–2.5 mm. long, acute, viscid-ciliate, alternating with small teeth; corolla blue, subsalverform, more or less villosulous outside, the tube stout, 10–12 mm. long, villous within in the upper part, the lobes deltoid-ovate, about 4 mm. long, acutish, minutely papillose within; stamens inserted in the corolla-throat, exserted, the anthers 1–1.5 mm. long; capsule about 4 mm. in diameter, coriaceous, blue or blackish; seeds 1–2 mm. long, dark-brown.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Mountains of Cuba, Jamaica, and Haïti; also in Venezuela and the Guianas.

ILLUSTRATION: P. Br. Hist. Jam. pl. 3, f. 2.

DOUBTFUL OR EXCLUDED SPECIES

MANETTIA RECLINATA L. Mant. 558. 1771. (*Nacibea reclinata* Poir. in Lam. Encyc. 4: 416. 1797. *Lygistum reclinatum* Kuntze, Rev. Gen. 287. 1891.) The type species of the genus; described from Mexico. It is evidently closely related to *M. coccinea*, but is said to have white flowers. Possibly it is the same as that species, and, if so, *M. coccinea* should be reduced to synonymy.

MANETTIA SECUNDIFLORA (Poir.) DC. Prodr. 4: 364. 1830. (*Paederia secundiflora* Poir. in Lam. Encyc. Suppl. 2: 450. 1812.) Described from Santo Domingo.

MANETTIA SERRATA Spreng.; Schultes, in R. & S. Syst. Veg. Mant. 3: 147. 1827. *Alchornea latifolia* Sw. (Euphorbiaceae).

32. BOUWARDIA Salisb. Parad. Lond. pl. 88. 1807.

Aeginetia Cav. Anal. Ci. Nat. 3: 129. 1801. Not *Aeginetia* L. 1753.
Houstonia § *Christimia* Raf. Ann. Gén. Sci. Phys. 5: 226. 1820.

Herbs or shrubs, more or less pubescent, the branches terete or angulate. Leaves opposite or 3–5–verticillate, usually petiolate. Stipules interpetiolar, connate with the petioles into a sheath, entire or laciniate or aristate. Flowers usually large, white, yellow, or red, cymose or cymose-corymbose, sometimes solitary; hypanthium subglobose, turbinate, or campanulate; calyx 4-lobate, the lobes short or elongate, erect or spreading, persistent, often with small intermediate teeth; corolla tubular or salverform, the tube straight or slightly curved, glabrous, pilose, or with a densely villous ring within, the limb 4-lobate, the lobes short or elongate, erect or spreading, valvate, glabrous or pubescent within. Stamens 4, inserted in the throat of the corolla or in the tube above the middle; filaments very short or elongate; anthers versatile, linear or oblong, included or exserted, dehiscent by lateral slits. Disk annular, sometimes pilose. Ovary 2-celled; style filiform; stigma usually bifid; ovules numerous, crowded, the placentae swollen, peltately affixed to the septa. Capsule didymous-globose, coriaceous, 2-celled, loculedly bivalvate, the valves finally bifid. Seeds numerous, orbicular, imbricate, peltate, compressed; testa membranaceous, expanded into a broad entire wing; endosperm fleshy; embryo minute, the cotyledons rounded, the radicle terete.

Type species, *Bouvardia triphylla* Salisb.

Leaves all or mostly 3–5–verticillate; corolla red.

Corolla glabrous outside.

Corolla-lobes erect or ascending, 2–5 mm. long.

Upper leaves sessile or nearly so, short-villous or tomentulose beneath; corolla-lobes 2–3 mm. long.

Upper leaves petiolate, puberulent, scaberulous, or glabrate beneath; corolla-lobes 3–5 mm. long.

Corolla-lobes widely spreading, 5–8 mm. long.

Stems and leaves villous or tomentulose with slender whitish hairs; calyx-lobes 2.5–4.5 mm. long.

Stems and lower surface of the leaves villous with very coarse yellowish hairs; calyx-lobes 8–12 mm. long.

Corolla pubescent outside.

Leaf-blades obovate, often 5–verticillate.

Leaf-blades not obovate, 3–4–verticillate.

Corolla-tube glabrous within or sparsely villous, the hairs not collected in a dense ring.

Corolla-tube with a densely villous ring within near the base.

Leaves densely whitish-tomentose beneath.

Leaves not tomentose beneath.

Leaves elongate-linear, 3–9 cm. long and 0.6–3.5 mm. wide, often glabrous.

Leaves not elongate-linear, if very narrow the blades usually less than 3 cm. long, usually lanceolate to ovate.

Leaves opposite.

Corolla-lobes usually 3–5 mm. long, of an ovate or triangular-oblong type, mostly erect or ascending; corolla yellow, red, white, or greenish-white, the tube 1–3.3 cm. long.

Inflorescences usually 3–5-flowered, simply cymose, sometimes 1-flowered; leaves pinnately nerved.

Corolla red or yellow.

Corolla-lobes villous outside with coarse hairs; leaf-blades mostly rounded-ovate and cordate or subcordate at the base.

Corolla-lobes glabrous outside; leaves not cordate at the base.

1. *B. leiantha*.

2. *B. bouvardioides*.

3. *B. viminalis*.

4. *B. scabra*.

5. *B. obovata*.

6. *B. glaberrima*.

7. *B. scabrida*.

8. *B. tenuifolia*.

9. *B. ternifolia*.

10. *B. subcordata*.

- Corolla-tube glabrous within; leaves 2–3.5 mm. wide.
Corolla-tube more or less villous within; leaf-blades 5 mm. wide or wider.
- Hypanthium densely puberulent or short-hirtellous; calyx-lobes 2–4.5 mm. long; inflorescences mostly 3-flowered.
- Hypanthium glabrous or very sparsely villous or puberulent; calyx-lobes 4–11 mm. long; inflorescences mostly with 5 or more flowers.
- Corolla 1.3–1.5 cm. long.
Corolla 2.5–4 cm. long.
- Pedicels 3 mm. long or shorter; leaves pale beneath, the lateral veins mostly obsolete.
- Pedicels 6–28 mm. long; leaves subconcolorous, the lateral veins evident.
- Corolla white or greenish-white.
- Corolla densely villous outside.
- Corolla glabrous outside.
- Corolla-tube 2.4–3.3 cm. long.
Corolla-tube 1–2 cm. long.
- Leaf-blades, at least part of them, suborbicular, abruptly long- or short-acuminate; pedicels 2–8 mm. long; corolla-tube 1.8–2 cm. long.
- Leaf-blades mostly ovate or lanceolate, not abruptly acuminate; pedicels 3 mm. long or shorter; corolla-tube 1–1.5 cm. long.
- Inflorescences many-flowered, compound; corolla-tube 6–11 mm. long; leaves sometimes palmately nerved.
- Leaves 3–5-nerved from the base.
- Hypanthium, calyx, and corolla hirtellous.
- Hypanthium, calyx, and corolla glabrous.
- Leaves pinnately nerved; corolla (so far as known) glabrous.
- Leaves puberulent beneath along the veins; calyx-lobes 1–1.5 mm. long.
- Leaves glabrous; calyx-lobes 2.5–3.5 mm. long.
- Corolla-lobes mostly 7–25 mm. long, of an oblong or elliptic type, spreading, narrowed at the base; corolla white, the tube often 4 cm. long or longer.
- Leaves sessile, the blades broadly ovate; calyx-tube developed.
- Leaves petiolate; calyx-tube obsolete.
- Corolla more or less villous outside.
- Corolla densely villous outside.
- Corolla villous only on the upper part of the tube.
- Corolla glabrous outside or pruinose-puberulent.
- Leaf-blades linear or lanceolate, 1.5–4 mm. wide; corolla pruinose-puberulent.
- Leaf-blades mostly ovate or broadly ovate, more than 5 mm. wide; corolla glabrous.
- Corolla-tube 1.5–3.5 cm. long.
- Calyx-lobes foliaceous, 4–12 mm. long, mostly elliptic or oblanceolate.
- Calyx-lobes lance-triangular, 1–1.5 mm. long.
- Corolla-tube 4–8.5 cm. long.
11. *B. macilenta*.
12. *B. versicolor*.
13. *B. Conzattii*.
14. *B. chrysantha*.
15. *B. laevis*.
16. *B. villosa*.
17. *B. macrantha*.
18. *B. heterophylla*.
19. *B. multiflora*.
20. *B. quinquenervata*.
21. *B. Rekoi*.
22. *B. gracilipes*.
23. *B. dictyoneura*.
24. *B. Rosei*.
25. *B. induta*.
26. *B. Langlassaei*.
27. *B. erecta*.
28. *B. glabra*.
29. *B. latifolia*.
30. *B. longiflora*.

1. *Bouvardia leiantha* Benth. Pl. Hartw. 85. 1841.

Bouvardia corymbosa Oerst. Vidensk. Meddel. 1852: 46. 1852.

Branches stout, terete, brownish or grayish, densely puberulent and villosulous when young; stipule-sheath 5 mm. long or shorter, long-cuspidate, sometimes glandular-dentate; leaves 3–4-verticillate or opposite, sessile or subsessile, the lowest sometimes with petioles 3 mm. long, the blades ovate, broadly ovate, or ovate-oblong, 3–7 cm. long, 1.3–3 cm. wide, rounded at the base, acute or subabruptly acuminate or attenuate at the apex, thin, bright-green above, scaberulous or villosulous, short-villous beneath or densely whitish-tomentose; inflorescence usually terminal, cymose-corymbose, densely many-flowered, 4–9 cm. broad, the pedicels 1–4 mm. long; hypanthium hemispheric, 1.5 mm. long, hirsutulous or glabrate; calyx-lobes lance-linear, 2–4 mm. long, ciliolate and often hirsutulous; corolla deep-red, glabrous outside, the tube 12–16 mm. long, tapering from the top to the base, 2–2.5 mm. thick above, with a villous ring within near the base, the lobes rounded-ovate, 2–3 mm. long, obtuse or rounded at the apex, erect or ascending; anthers 1.5–2 mm. long, included or exserted, the filaments short or elongate.

TYPE LOCALITY: Near Tejar and Chimaltenango, Guatemala.

DISTRIBUTION: Chiapas to Costa Rica.

2. *Bouvardia bouvardioides* (Seem.) Standley.

Hedysotis bouvardioides Seem. Bot. Voy. Herald 296. 1856.
Houstonia bouvardioides Benth. & Hook. Gen. Pl. 2: 60. 1873.

Stems stout, terete or subangulate, pruinose-puberulent above, glabrous below, the internodes elongate; stipule-sheath 3 mm. long or shorter, long-cuspidate, usually pluriaristate; leaves mostly ternate, the petioles slender, 3–6 mm. long, pruinose-puberulent, the blades ovate to lanceolate, 6–10 cm. long, 2.5–3.5 cm. wide, rounded or obtuse at the base, long-attenuate to the apex, thin, bright-green, subconcolorous, very sparsely and minutely puberulent or scaberulous or glabrate, the lateral veins conspicuous, arcuate; inflorescence terminal, densely cymose-corymbose, many-flowered, 6–10 cm. broad, the pedicels slender, 2–4 mm. long; hypanthium hemispheric, 1.5 mm. long, densely puberulent or hirsutulous; calyx-lobes linear or lance-linear, 2–5 mm. long, hirsutulous; corolla red, glabrous outside, the tube 10–15 mm. long, 3 mm. thick above, tapering from the top to the base, villous within, the lobes ovate-oblong, 3–5 mm. long, erect or ascending, obtuse or acutish, glabrous within; filaments elongate, exserted, the anthers 1.5–2 mm. long; style exserted.

TYPE LOCALITY: Sierra Madre [Durango?].

DISTRIBUTION: Mountains of Durango and Jalisco.

ILLUSTRATION: Seem. Bot. Voy. Herald pl. 64.

3. *Bouvardia viminalis* Schlecht. Linnaea 26: 120. 1854.

Shrub, the branches slender or stout, terete or subangulate, densely whitish-villosulous or tomentulose when young, the internodes mostly elongate; stipule-sheath 5 mm. long or shorter, long-cuspidate or pluriaristate; leaves mostly ternate, sessile or subsessile, the blades ovate, lance-oblong, or broadly ovate, 3–5.5 cm. long, 0.7–2.5 cm. wide, rounded or obtuse at the base, acuminate to long-attenuate at the apex, thin, bright-green above, scaberulous or villous, paler beneath, densely or sparsely villous-tomentose with short whitish hairs, the lateral veins conspicuous, arcuate-ascending; inflorescence terminal, cymose-corymbose or cymose-capitate, dense, many-flowered, 4–6 cm. broad, the pedicels 3 mm. long or shorter; hypanthium subglobose, 1.5 mm. long, densely hirsutulous or short-villous; calyx-lobes linear or lance-linear, 2.5–4.5 mm. long, white-hirsutulous; corolla red, glabrous outside, the tube 15–17 mm. long, 2 mm. thick above, villous within near the base, the lobes ovate, obovate-oblong, or broadly ovate, 5–6 mm. long, obtuse or acutish, apiculate, glabrous within, spreading; filaments very short or elongate, the anthers included or exserted, 2 mm. long; style usually exserted.

TYPE LOCALITY: Mexico, the exact locality not known.

DISTRIBUTION: Puebla and Oaxaca.

4. *Bouvardia scabra* H. & A. Bot. Beech. Voy. 427. 1840.

Bouvardia obovata Benth. Pl. Hartw. 16. 1839. Not *B. obovata* H. B. K. 1820.

Herbaceous or suffrutescent, 4–6 dm. high, the stems simple or sparsely branched below, very stout, subangulate or terete, densely villous with long yellowish hairs, the internodes elongate; stipule-sheath 3 mm. long or shorter, aristate-cuspidate; leaves 3–4-verticillate, sessile or short-petiolate, the blades rhombic-orbicular, elliptic-oval, rhombic-ovate, or ovate, 3.5–7.5 cm. long, 1.5–4.8 cm. wide, obtuse or acute at the base, rounded and abruptly short-acuminate, acute, or attenuate at the apex, thick, bright-green above, densely scabrous or short-villous with stiff hairs, paler beneath, densely and very coarsely villous along the veins, elsewhere scabrous, the veins very prominent beneath, the lateral ones numerous, arcuate-ascending, the secondary veins usually prominently reticulate; inflorescence terminal and axillary, cymose-corymbose, often long-pedunculate, densely many-flowered, 5–14 cm. broad, the pedicels stout, 5 mm. long or shorter; hypanthium 2–2.5 mm. long, densely hirsutulous or short-villous; calyx-lobes linear or linear-subulate, 8–12 mm. long, hirsutulous; corolla red, glabrous outside, the tube 17–21 mm. long, 2–2.5 mm. thick above, densely villous within near the base, the lobes broadly ovate or oblong-ovate, 6–8 mm. long, obtuse or acutish, apiculate, glabrous within, spreading; anthers nearly sessile, included, 1.5–2 mm. long; style included or exserted; capsule subglobose, 6–7 mm. broad, hirsutulous, wholly inferior; seeds dark-brown, broadly winged.

TYPE LOCALITY: Tepic, Tepic.

DISTRIBUTION: Jalisco and Tepic.

5. *Bouvardia obovata* H. B. K. Nov. Gen. & Sp. 3: 385. 1820.

Stems herbaceous, erect, 6–10 dm. high, stout, simple below, sparsely branched above, the branches stout, angulate, glabrous or puberulent at the nodes, the internodes elongate; stipules short, cuspidate, pluriaristate; leaves 4–5-verticillate, sessile or on petioles 6 mm. long or shorter, the blades obovate or obovate-oblong, sometimes elliptic-oblong, 5.5–12.5 cm. long, 1.5–4 cm. wide, cuneate at the base, obtuse or acute at the apex, apiculate, thin, bright-green, glabrous, sublustrous above, the lateral veins conspicuous; inflorescence terminal, cymose-corymbose, 6–8 cm. broad, many-flowered, the pedicels stout, 1–4 mm. long; hypanthium glabrous or minutely puberulent, 1.5–2 mm. long; calyx-lobes lance-triangular, 1.5–3 mm. long, scabro-ciliolate; corolla red, papillose-puberulent outside, the tube 2.5–3.3 cm. long, 2.5–5 mm. thick above, sparsely villous within near the base, the lobes ovate-oval, 3–5 mm. long, obtuse or acutish, erect or ascending; anthers subsessile, included, 3–3.5 mm. long; style included or exserted; capsule subglobose, 7–9 mm. broad, bisulcate, glabrate; seeds dark-brown, about 3 mm. broad, broadly winged.

TYPE LOCALITY: Between Chapultepec and Texcoco, Mexico (state).

DISTRIBUTION: Mountain slopes, Morelos and Mexico (state).

6. *Bouvardia glaberrima* Engelm. in Wisliz. Tour Northern Mex. 106. 1848.

Bouvardia ovata A. Gray, Pl. Wright. 2: 67. 1853.

Bouvardia triphylla A. Gray, Syn. Fl. N. Am. 1²: 23, in part. 1884. Not *B. triphylla* Salisb. 1807.

Erect shrub or sometimes herbaceous almost to the base, often much branched, the branches slender or stout, terete or subangulate, hirtellous or glabrate, the internodes short or elongate; stipule-sheath short, long-cuspidate or pluriaristate; leaves mostly ternate, the petioles slender or stout, 2–8 mm. long, the blades ovate, broadly ovate, ovate-oblong, or lanceolate, 2.5–10 cm. long, 0.7–2.5 cm. wide, acute or obtuse at the base, often abruptly short-decurrent, acute to attenuate at the apex, usually thin, bright- or pale-green, subconcolorous, scaberulous above or glabrate, beneath sparsely scaberulous or often glabrous, the lateral veins evident, 4–6 on each side, the margin usually plane; inflorescence terminal, cymose or cymose-corymbose, often subcapitate, usually few-flowered, the pedicels slender and often 5–14 mm. long; hypanthium glabrous, scabrous, or hirsutulous, 1.5–2 mm. long; calyx-lobes triangular-lanceolate or linear, 2.5–9 mm. long; corolla red, puberulent or villosulous outside with short coarse hairs, the tube 2–3.2 cm. long, 2–3.5 mm. thick above, tapering from the top to base, glabrous within or sparsely villous, the hairs scattered, the lobes ovate-oval, 2–3 mm. long, obtuse or acutish, erect or ascending; anthers usually subsessile and included, 2.5–3 mm. long; style included or exserted; capsule subglobose, 5–7 mm. broad, bisulcate, usually almost wholly inferior; seeds dark-brown, 2–3 mm. long, broadly winged.

TYPE LOCALITY: Cosihuiriachic, Chihuahua.

DISTRIBUTION: Southwestern New Mexico and southeastern Arizona, southward along the mountains of Chihuahua, to Durango.

7. *Bouvardia scabrida* Mart. & Gal. Bull. Acad. Brux. 11¹: 237. 1844.

Bouvardia hypoleuca Benth. Pl. Hartw. 288. 1848.

Shrub, 1–6 dm. high, or sometimes herbaceous almost throughout, densely white-hirtellous when young, the internodes short or elongate; stipule-sheath short, long-cuspidate or pluriaristate; leaves 3–4-verticillate, usually erect or ascending, sessile or on stout petioles 3 mm. long or shorter, the blades lanceolate to linear, 1.2–6.5 cm. long, 1–6.5 mm. wide, acute at the base, acute to long-attenuate at the apex, thick, often rigid, bright-green above, very scabrous, densely villous-tomentose beneath with coarse whitish hairs, the lateral veins mostly obsolete, the margin usually strongly revolute; inflorescence terminal, cymose or cymose-corymbose, usually few-flowered, often subcapitate, the pedicels stout, 3 mm. long or shorter; hypanthium hirsutulous or very scabrous, 1.5–2 mm. long; calyx-lobes linear or linear-subulate, 1.5–5 mm. long; corolla red, puberulent or villosulous outside with short coarse thick hairs, the tube 14–20 mm. long, 2.5–3 mm. thick above, tapering from top to base, with a densely villous ring within near the base, the lobes ovate-oval, 2–2.5 mm. long, very obtuse to acutish,

minutely papillose-puberulent within; anthers nearly sessile, included, 2–2.5 mm. long; style included; capsule subglobose, 5–7 mm. broad, bisulcate; seeds dark-brown, broadly winged.

TYPE LOCALITY: Rocky slopes of the ravine of Yavezia, eastern cordillera of Oaxaca, altitude 1800 to 2100 meters.

DISTRIBUTION: Dry rocky hillsides, San Luis Potosí to Veracruz and Oaxaca.

8. *Bouvardia tenuifolia* Standley, sp. nov.

Stems erect, herbaceous, or suffrutescent at the base, usually simple, slender, terete, glabrous or rarely hirtellous, the internodes elongate; stipule-sheath 3 mm. long or shorter, the lobes acute or short-cuspidate; leaves ternate, sessile or subsessile, linear, 3–9 cm. long, 0.6–3.5 mm. wide, long-attenuate at the apex, thick, often rigid, sometimes falcate, pale-green, glabrous or rarely soft-hirtellous, the costa prominent, the lateral veins obsolete, the margin revolute; inflorescence terminal, cymose-corymbose, dense, few- or many-flowered, about 5 cm. broad, the pedicels slender, 1–3 mm. long; hypanthium subglobose, 1–1.5 mm. long, scaberulous; calyx-lobes linear or subulate, 1–2.5 mm. long, hirsutulous or scaberulous; corolla red, scabro-puberulent outside, the tube 2–2.5 cm. long, 2–3 mm. thick above, with a villous ring within near the base, the lobes ovate-oval, 3–3.5 mm. long, obtuse or acutish, erect or ascending, papillose-puberulent within; anthers subsessile, included, 2.5 mm. long; style usually exserted.

Type collected on grassy hillsides near Guadalajara, Jalisco, October, 1889, C. G. Pringle 2292 (U. S. Nat. Herb. no. 49960).

DISTRIBUTION: Jalisco, Tepic, and Sinaloa.

9. *Bouvardia ternifolia* (Cav.) Schlecht. Linnaea 26: 98. 1854.

- Ixora ternifolia* Cav. Ic. 4: 3. 1797.
Ixora americana Jacq. Hort. Schoenb. 3: 4. 1798.
Houstonia coccinea Andr. Bot. Repos. pl. 106. 1800.
Bouvardia triphylla Salisb. Parad. Lond. pl. 88. 1808.
Bouvardia linearis H. B. K. Nov. Gen. & Sp. 3: 383. 1819.
Bouvardia angustifolia H. B. K. Nov. Gen. & Sp. 3: 384. 1819.
Bouvardia hirtella H. B. K. Nov. Gen. & Sp. 3: 384. 1819.
Bouvardia Jacquini H. B. K. Nov. Gen. & Sp. 3: 385. 1820.
Bouvardia coccinea Link, Enum. 1: 139. 1821.
Bouvardia quaternifolia DC. Prodr. 4: 365. 1830.
Carphalea? pubifolia Moc. & Sessé; DC. Prodr. 4: 365, as synonym. 1830.
Hedyotis mexicana Moc. & Sessé; DC. Prodr. 4: 365, as synonym. 1830
Bouvardia Jacquini exogyna DC. Prodr. 4: 365. 1830.
Bouvardia Jacquini ovala DC. Prodr. 4: 365. 1830.
Bouvardia splendens Graham, Bot. Mag. pl. 3781. 1840.
Bouvardia tolucana H. & A. Bot. Beech. Voy. 427. 1840.
Aeginetia hyssopifolia Willd.; Schlecht. Linnaea 26: 60, as synonym. 1854.
Bouvardia tenuiflora Schlecht. Linnaea 26: 97. 1854.
Bouvardia microphylla Schlecht. Linnaea 26: 112. 1854.
Bouvardia viperalis Schlecht. Linnaea 26: 114. 1854.
Bouvardia Houtteana Schlecht.; Planch. Fl. Serres 10: 149. 1855.
Bouvardia triphylla angustifolia A. Gray, Syn. Fl. N. Am. 1²: 24. 1884.
Hedyotis fruticosa Sessé & Moc. Fl. Mex. 22. 1893.
Bouvardia ternifolia angustifolia B. L. Robinson, Proc. Am. Acad. 45: 405. 1910.

Erect shrub, often much branched, or the stems sometimes herbaceous except at the base and simple, stout, terete or subangulate, hirtellous or puberulent when young, the internodes short or elongate; stipule-sheath short, long-cuspidate or pluriaristate; leaves 3–4-verticillate, or partly opposite, the uppermost often sessile, the lowest on stout petioles 2–3 mm. long, the blades ovate, lanceolate, lance-elliptic, linear-lanceolate, or almost linear, 1.5–6.5 cm. long, 0.2–2 cm. wide, acute or obtuse at the base, often abruptly decurrent, acute to long-attenuate at the apex, usually thin, green above, scabrous or scaberulous, sometimes glabrate, green or slightly paler beneath, hirtellous or scabrous or sometimes glabrate in age, the lateral veins few (2–4), conspicuous or often obsolete, the margin plane or revolute; inflorescence terminal, cymose or cymose-corymbose, often subcapitate, usually few-flowered, the pedicels 1–5 mm. long; hypanthium scabrous or puberulent; calyx-lobes triangular-lanceolate or subulate, 2–4 mm. long; corolla red, puberulent to short-villous outside with coarse thick hairs, the tube 1.5–3.2 cm. long, 2–3 mm. thick above, tapering from top to base, with a short, densely white-villous ring within near the base, the lobes ovate-oval or ovate-oblong, 2–3 mm. long, obtuse or

acuteish, minutely papillose-puberulent within, erect or ascending; anthers subsessile, included, 2.5–3 mm. long; style included or exserted; capsule subglobose, 5–7 mm. broad, bisulcate, one fourth to one third superior, rounded or subretuse at the apex; seeds dark-brown, about 3 mm. broad, broadly winged.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Dry soil, western Texas to Sonora, Oaxaca, and Veracruz.

ILLUSTRATIONS: Cav. Ic. pl. 305; Jacq. Hort. Schoenb. pl. 257; Salisb. Parad. Lond. pl. 88; Bot. Mag. pl. 1054, 3781; Bot. Reg. 2: pl. 107; Fl. Serres pl. 904, 1024; E. & P. Nat. Pl. 4¹: f. 18, A-E.

10. *Bouvardia subcordata* Standley, sp. nov.

Shrub, the branches stout, subangulate, grayish, villosulous when young; stipule-sheath very short, long-cuspidate, glandular-dentate; leaves opposite, the petioles stout, 1–3 mm. long, the blades rounded-ovate or broadly ovate, 2.5–4.2 cm. long, 1.5–3.5 cm. wide, broadly rounded to cordate at the base, acute to very obtuse at the apex, sometimes rounded and broadly short-acuminate, thin, dark-green above, sparsely villous, much paler beneath, densely short-villous along the veins and sparsely villous elsewhere, the lateral veins conspicuous, arcuate; flowers in terminal clusters of 3–5, the pedicels slender, 2–5 mm. long; hypanthium subglobose, 1.5 mm. long, densely villous; calyx-lobes oblong-linear or lance-oblong, 2–6 mm. long, sparsely or densely villous; corolla red (?), sparsely villous outside above, the tube about 3 cm. long, tapering from top to base, 3.5–4 mm. thick above, sparsely villous within, the lobes ovate-orbicular, 3–4 mm. long, erect, obtuse, subapiculate, finely papillose within; anthers sessile, included, 2.5 mm. long; style included.

Type collected between Rosario and Colomas, Sinaloa, July 13, 1897, J. N. Rose 1628 (U. S. Nat. Herb. no. 300476).

11. *Bouvardia macilenta* Blake, Contr. Gray Herb. 53: 65. 1918.

Branches suffrutescent, slender, grayish, puberulent or glabrate, the branchlets densely hispidulous with short grayish spreading hairs; leaves opposite, the petioles about 0.5 mm. long, minutely hispidulous, the blades lanceolate or ovate-lanceolate, 8–11 mm. long, 2–3.5 mm. wide, rounded or subcordate at the base, acuminate at the apex, green above, sparsely and minutely strigillose or glabrate, paler beneath, hispidulous at the base of the costa and on the margin, elsewhere glabrous; cymes 3–5-flowered, the pedicels 1–2 mm. long; hypanthium glabrous, 2.5–3 mm. long; calyx-lobes linear-subulate, acuminate, 2 mm. long; corolla 2 cm. long, glabrous outside and within, red, the lobes broadly ovate, 2.7 mm. long, subobtuse; anthers 3 mm. long, included; capsule subglobose, didymous, glabrous, 4 mm. in diameter.

TYPE LOCALITY: Cerro El Zopilote, Miahuatlán, Oaxaca, altitude 2100 meters.

DISTRIBUTION: Known only from the type locality.

12. *Bouvardia versicolor* Ker, Bot. Reg. 3: pl. 245. 1817.

? *Bouvardia triflora* hirsuta Mart. & Gal. Bull. Acad. Brux. 11¹: 236. 1844.
Bouvardia bicolor Kunze, Linnaea 20: 24. 1847.

Shrub, much branched, the branches usually slender, terete, grayish, densely puberulent or hirsutulous when young, the internodes short or elongate; stipule-sheath short, often pluristarate; leaves opposite, the petioles slender, 2–3 mm. long, the blades mostly ovate, sometimes lanceolate or broadly ovate, rounded or very obtuse at the base, acute to attenuate at the apex, thin, bright-green above, scaberulous, beneath slightly paler, hirsutulous along the veins, elsewhere scaberulous, the lateral veins evident, arcuate-ascending at an acute angle; flowers mostly in 3–5-flowered terminal cymes, these sessile or short-pedunculate, the pedicels slender, 2–6 mm. long, densely puberulent or hirsutulous, the flowers sometimes pendulous; bracts often large and leaf-like; hypanthium subglobose, 1.5–2 mm. long, densely puberulent or short-hirsutulous; calyx-lobes lance-linear, 2–4.5 mm. long, scaberulous; corolla red, or sometimes yellow at first, glabrous outside, the tube 2.2–3.4 cm. long, tapering from top to base, 3.5–4 mm. thick above, sparsely villous within, the lobes ovate-oblong or triangul-

oblong, 3–5 mm. long, obtuse or acutish, glabrous within, ascending; anthers nearly sessile or on elongate filaments, included or exserted, 1.5–2.5 mm. long; style exserted.

TYPE LOCALITY: Described from cultivated plants of Mexican origin.

DISTRIBUTION: Guanajuato to Oaxaca.

ILLUSTRATION: Bot. Reg. 3: pl. 245.

13. **Bouvardia Conzattii** Greenman, Proc. Am. Acad. 39: 92.
1903.

Shrub, the branches slender, grayish or brownish, minutely puberulent or glabrous when young; stipules 3–7 mm. long; leaves opposite, the petioles 2 mm. long or shorter, the blades ovate or ovate-lanceolate, 1.5–4 cm. long, 0.5–2 cm. wide, rounded or obtuse at the base, acute to attenuate at the apex, yellowish-green above, puberulent or glabrate, paler beneath, puberulent along the veins; inflorescence terminal, cymose, few-flowered, the flowers short-pedicellate; hypanthium hemispheric, 1.5 mm. long, glabrate; calyx-lobes linear, acute, 3–5 mm. long, hirtellous; corolla red or yellowish-red, glabrous outside, 1.3–1.5 cm. long, the tube bearing a ring of hairs within above the base, the lobes deltoid-ovate, 2 mm. long; anthers subsessile, included.

TYPE LOCALITY: Oaxaca, at an altitude of 1,750 meters.

DISTRIBUTION: Oaxaca.

14. **Bouvardia chrysanthia** Mart. Hort. Monac. Sem. 1848:
4. 1848. — Linnaea 24: 194. 1851.

? *Bouvardia quinqueflora* Dehnh.; Walp. Rep. 2: 507. 1843.

Bouvardia myrlifolia Schlecht. Linnaea 26: 121. 1854.

Shrub, the branches stout, terete or subangulate, brown or grayish, glabrous or sparsely villous when young; stipule-sheath short, long-cuspidate, glandular-dentate; leaves opposite, sessile or subsessile, the blades lance-oblong, oblong, or broadly ovate, 1–4 cm. long, 0.5–1.5 cm. wide, obtuse to truncate at the base, acute or obtuse at the apex, rather thick, bright-green above, glabrous or scaberulous, paler and yellowish beneath, glabrous or sparsely villosulous, the lateral veins mostly obsolete; inflorescence terminal, cymose, dense, 3-many-flowered, the pedicels 3 mm. long or shorter; hypanthium hemispheric, 1.5–2 mm. long, usually glabrous, sometimes sparsely short-villous; calyx-lobes linear or lanceolate, 4–8 mm. long, glabrous or sparsely villous; corolla yellow, glabrous outside, the tube about 2.5 cm. long, tapering from top to base, 3–4 mm. thick above, sparsely villous within, the lobes broadly ovate, 2–4 mm. long, obtuse or acutish, erect or ascending, glabrous within; anthers nearly sessile, 2–2.5 mm. long, usually included; style included.

TYPE LOCALITY: Near Santiago, Mexico (state).

DISTRIBUTION: Jalisco and Colima to Morelos.

15. **Bouvardia laevis** Mart. & Gal. Bull. Acad. Brux.
11¹: 236. 1844.

Bouvardia flava Decaisne, Fl. Serres 1: 90. 1845.

Bouvardia mollis Linden; Schlecht. Linnaea 26: 85. 1854.

Branched shrub, the branches slender, subangulate; grayish, glabrous or sparsely puberulent; stipule-sheath short, long-cuspidate, often pluriaristate; leaves opposite, the petioles slender or stout, 2–5 mm. long, glabrous or puberulent, the blades ovate, lance-ovate, or broadly ovate, 3.5–10.5 cm. long, 1.2–4.8 cm. wide, rounded or truncate at the base, acute to long-attenuate at the apex, very thin, bright-green above, glabrous or minutely scaberulous, slightly paler beneath, glabrous or nearly so, the lateral veins evident, arcuate; inflorescence terminal, 3–7-flowered, cymose, the pedicels slender, 6–28 mm. long, usually glabrous; hypanthium hemispheric, 1.5–2 mm. long, glabrous or rarely sparsely puberulent; calyx-lobes linear, 6–11 mm. long, ciliolate; corolla red or yellow, glabrous outside, the tube 2.5–3.2 cm. long, tapering from top to base, 3.5–4.5 mm. thick above, villous within near the base, the lobes broadly ovate or ovate-oblong, 4–6 mm. long, obtuse or acutish, erect or ascending, glabrous within; anthers sessile, included, 2.5–3 mm. long; style included or exserted.

TYPE LOCALITY: Ravines near Zacuapan, Veracruz, altitude 900 meters.

DISTRIBUTION: Mountains of Hidalgo and Veracruz.

ILLUSTRATIONS: Fl. Serres 1: pl. opp. 90; Bot. Reg. 32: pl. 32.

16. *Bouvardia villosa* Standley, sp. nov.

Shrub, the branches stout, grayish, the branchlets stout, densely pilose with short soft spreading whitish hairs; stipules 4–5 mm. long; leaves opposite, the petioles stout, 3–5 mm. long, villous, the blades oval, broadly ovate, or elliptic-oblong, 1.7–2.5 cm. long, 0.6–1.5 cm. wide, rounded or obtuse at the base, obtuse to short-acuminate at the apex, green above, densely short-pilose or villosulous, paler beneath, densely whitish-villous; inflorescence terminal, cymose, dense, few-flowered, the flowers subsessile; hypanthium densely white-pilose, 2 mm. long; calyx-lobes lance-linear, attenuate, as long as the tube, or sometimes 6 mm. long; corolla white, densely white-villous outside, sparsely villous within near the base, the tube 1.7–2 cm. long, the lobes broadly ovate, 2.5–3 mm. long, obtuse, erect; anthers sessile, included.

Type collected on Alturas de Matatlán, Oaxaca, altitude 1800 meters, June, 1906, C. Conzatti 1486 (U. S. Nat. Herb. no. 764094).

17. *Bouvardia macrantha* Standley, sp. nov.

Shrub, much branched, the branches stout or slender, terete or subangulate, grayish, densely puberulent when young, the internodes very short; stipule-sheath very short, cuspidate or pluriaristate; leaves opposite, the petioles slender, 1–3 mm. long, puberulent or villosulous, the blades ovate or broadly ovate, 1–2.5 cm. long, 0.3–1.2 cm. wide, rounded to acutish at the base, often short-decurrent, subabruptly acuminate to obtuse at the apex, thin, green above, scaberulous or villosulous, paler beneath, sparsely scaberulous or villosulous, the lateral veins evident beneath, ascending at a very acute angle; flowers in terminal, 3–few-flowered, sessile or short-pedunculate cymes, the pedicels 5 mm. long or shorter; hypanthium 1.5–2 mm. long, puberulent or hirsutulous; calyx-lobes narrowly triangular, lanceolate, or linear, 2–6 mm. long, scaberulous; corolla white, glabrous outside, the tube 2.4–3.3 cm. long, 2.5–3 mm. thick above, sparsely villous within, the lobes triangular-oblong or lance-oblong, ascending, 4–7 mm. long, acute or acutish, glabrous within; anthers subsessile, included, and 2 mm. long, or on long filaments, exserted, and about 1 mm. long; style included or exserted; capsule subglobose, almost wholly inferior, 4–6 mm. in diameter.

Type collected at Tlalcuitolepec, Puebla, altitude 2100 to 2400 meters, July, 1909, C. A. Purpus 3981 (U. S. Nat. Herb. no. 841341).

DISTRIBUTION: Jalisco to Oaxaca.

18. *Bouvardia heterophylla* Standley, sp. nov.

Shrub, the branches slender, terete, grayish, pruinose-puberulent when young, the internodes short or elongate; stipules short, long-cuspidate, sometimes laciniate; leaves opposite, the petioles slender, 2–4 mm. long, the blades suborbicular, broadly ovate, or lance-ovate, 2–4 cm. long, 0.8–3 cm. wide, obtuse to truncate at the base, usually abruptly short-decurrent, the narrower leaves attenuate or acuminate at the apex, the broader ones abruptly long- or short-acuminate, with an acumen 3–8 mm. long, very thin, bright-green above, glabrous, paler beneath, glabrous or sparsely puberulent along the veins, the lateral veins evident, arcuate-ascending; flowers in terminal, sessile or short-pedunculate, 3–5-flowered cymes, the pedicels slender, 2–8 mm. long; hypanthium hemispheric, 1.5 mm. long, obscurely pruinose-puberulent; calyx-lobes lanceolate or linear, 2.5–5 mm. long, glabrous; corolla white, glabrous outside, the tube 18–21 mm. long, 2–3 mm. thick above, glabrous within, the lobes triangular-oblong, 4–5 mm. long, obtuse or acutish, ascending, glabrous within; filaments elongate, the anthers exserted, about 2 mm. long; style short-exserted.

Type collected at Santa Rosa, Guatemala, altitude 1000 meters, May, 1892, Heyde & Lux 3137 (U. S. Nat. Herb. no. 398167).

DISTRIBUTION: Jalisco to Guatemala.

19. *Bouvardia multiflora* (Cav.) Schultes, in R. & S. Syst. Veg. Mant. 3: 118. 1827.

- Aeginetia multiflora* Cav. Anal. Ci. Nat. 3: 131. 1801.
Bouvardia triflora H. B. K. Nov. Gen. & Sp. 3: 386. 1820.
Cestrum spermacoeifolium Willd.; R. & S. Syst. Veg. 4: 808, as synonym. 1819.
Bouvardia Cavanillesii DC. Prodr. 4: 366. 1830.
Anotis longiflora Benth. Pl. Hartw. 23. 1839.

- ? *Bouvardia Schiedeana* Schlecht. Linnaea **26**: 123. 1854.
Houstonia triflora A. Gray, Proc. Am. Acad. **4**: 314. 1860.
Bouvardia gracilis A. Gray, Proc. Am. Acad. **22**: 306. 1887.
Bouvardia versicolor graciliflora A. Gray, in S. Wats. Proc. Am. Acad. **22**: 416. 1887.

Shrub, 1–1.5 meters high, the branches stout or slender, terete or subangulate, brown or grayish, rimose, finely puberulent when young; stipule-sheath short, long-cuspidate, dentate or laciniate; leaves opposite, the petioles slender, 1–6 mm. long, puberulent, the blades lanceolate, ovate, or broadly ovate, 1.5–5 cm. long, 0.4–1.6 cm. wide, very obtuse to acuminate at the base, short-decurrent, acute to attenuate at the apex or rarely obtuse, thin, subconcolorous, finely puberulent or scaberulous, sometimes glabrate in age; flowers in terminal and axillary, 3–5-flowered, sessile or short-pedunculate cymes, the pedicels 3 mm. long or shorter; hypanthium densely whitish-hirsutulous; calyx-lobes oblong-lanceolate or lance-subulate, 2–10 mm. long, hirtellous; corolla white or greenish-white, glabrous outside, the tube slender, 10–15 mm. long, 1.5–2 mm. thick in the throat, sparsely villous within near the base, the lobes oblong, spreading, 4–5 mm. long, acute or acutish, glabrous within; filaments usually elongate, the anthers exserted, 1–1.5 mm. long; capsule didymous-globose, 4–6 mm. broad, almost wholly inferior, glabrous, the pedicel usually recurved; seeds orbicular, 2–3 mm. broad, dark-brown, broadly winged.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Cliffs and rocky hillsides, Chihuahua to Querétaro and Guerrero.

ILLUSTRATIONS: Cav. Ic. pl. 572, f. 2; H. B. K. Nov. Gen. & Sp. pl. 288.

20. *Bouvardia quinquenervata* Standley, sp. nov.

Shrub, the branches slender, terete, grayish, minutely hirtellous when young, the internodes elongate; stipule-sheath 3 mm. long or shorter, the lobes acute, cuspidate, dentate; leaves opposite, the petioles slender, 3–4 mm. long, the blades of the lower leaves rounded-deltoid, 3.5–5 cm. long, 2.7–3 cm. wide, subtruncate at the base, acute or acuminate at the apex, those of the upper leaves ovate or lanceolate, 4–5.5 cm. long, 1.5–2.5 cm. wide, acute to rounded at the base, subabruptly long-attenuate at the apex, thin, bright-green above, slightly paler beneath, obscurely puberulent along the veins, 5-nerved from the base, the lateral nerves subarcuate, extending almost to the apex; inflorescence terminal, cymose-corymbose, few- or many-flowered, the pedicels 2–6 mm. long; hypanthium hirtellous, 1.5 mm. long; calyx-lobes linear-subulate, 1.5–3 mm. long; corolla sparsely hirtellous outside, the tube 6–8 mm. long, slender, sparsely hirtellous within, the lobes oblong or triangular-oblong, about 3 mm. long, acute, glabrous within; filaments elongate, the anthers exserted, 2 mm. long; style exserted; capsule globose-oblong, 3.5–4 mm. long, 3–3.5 mm. wide, shallowly bisulcate, short-hirtellous; seeds broadly winged.

Type collected at San Bartolomé, Chiapas, March, 1904, E. A. Goldman 769 (U. S. Nat. Herb. no. 470574).

DISTRIBUTION: Chiapas.

21. *Bouvardia Rekoi* Standley, sp. nov.

Shrub, the branches slender, grayish, subterete, glabrous or obscurely pruinose-puberulent, the internodes elongate; stipules triangular, 2–2.5 mm. long, acute, entire; leaves opposite, the petioles 1–2 mm. long, pruinose-puberulent, the blades lanceolate, ovate, or narrowly triangular-ovate, broadest at the base, 3–6.5 cm. long, 1–2.5 cm. wide, rounded or truncate at the base, gradually or subabruptly long-attenuate to the apex, membranaceous, subconcolorous, glabrous, palmately 3- or 5-nerved, the 2 chief lateral nerves extending to the apex, the intermediate nerves closely prominulous-reticulate; inflorescence terminal, cymose-corymbose, few-flowered, the pedicels filiform, 8–11 mm. long, glabrous; hypanthium glabrous, hemispheric, 1–1.2 mm. long; calyx-lobes broadly deltoid-acuminate, shorter than the tube; corolla glabrous outside, the tube 14 mm. long, villous within in the lower part, the lobes triangular-oblong, 3–4.5 mm. long, acute, glabrous within; anthers included.

Type collected at Cafetal Montecristo (Cerro Espino), Oaxaca, altitude 1000 meters, December 7, 1917, B. P. Reko 3650 (U. S. Nat. Herb. no. 867149).

22. Bouvardia gracilipes B. L. Robinson, Proc. Am. Acad.
45: 404. 1910.

Shrub, the branches slender, terete or subangulate, grayish, glabrous, the internodes mostly elongate; stipule-sheath short, more or less dentate or laciniate, long-subulate; leaves opposite, the petioles slender or stout, 2–3 mm. long, puberulent, the blades ovate or lance-oblong, 3.5–6.5 cm. long, 1.4–2.2 cm. wide, rounded at the base, long-attenuate at the apex, thin, subconcolorous, puberulent beneath along the veins, the costa slender, prominent beneath, the lateral veins few, distant, arcuate, the secondary veins finely reticulate; inflorescence axillary and terminal, cymose-corymbose, many-flowered, short-pedunculate, the pedicels slender, 5–18 mm. long, glabrous; calyx-lobes lance-subulate, 1–1.5 mm. long, glabrous, often ciliate; capsule didymous-globose, 4–6 mm. broad, glabrous; seeds suborbicular, about 2 mm. broad, dark-brown, broadly winged.

TYPE LOCALITY: Tepic, Tepic.

DISTRIBUTION: Known only from the type locality.

23. Bouvardia dictyonera Standley, sp. nov.

Stems slender, terete, herbaceous or suffruticose, grayish, glabrous, or sparsely pilose at the nodes; stipules short, subulate; leaves opposite, sessile or short-petiolate, the blades lanceolate or lance-ovate, 2.5–9 cm. long, 1.2–4 cm. wide, rounded at the base, long-attenuate to the apex, membranaceous or chartaceous, prominently reticulate-veined, concolorous, glabrous, the costa and lateral veins impressed above, prominent beneath, the lateral veins 5 or 6 on each side, arcuate-ascending; inflorescence terminal, cymose-corymbose, usually many-flowered, the pedicels slender, 3–10 mm. long; hypanthium glabrous, hemispheric, 1–1.5 mm. long, costate; calyx-lobes linear-subulate, 2.5–3.5 mm. long; corolla glabrous outside, the tube stout, about 11 mm. long, 1.5–2 mm. thick, with a villous ring within near the base, the lobes ovate-oval, 3.5–4 mm. long, acute or acutish, ascending; anthers sessile, included, 2.5 mm. long; style included; capsule subglobose, 4–5 mm. broad, costate, reticulate-veined.

Type collected at Chichorras, Chiapas, February, 1896, E. W. Nelson 3757 (U. S. Nat. Herb. no. 256554).

DISTRIBUTION: Chiapas.

24. Bouvardia Rosei Standley, sp. nov.

Shrub, the branches stout, subangulate, grayish, pruinose-puberulent when young, the internodes short; stipules 3–5 mm. long, the base triangular, the apex subulate-cuspidate; leaves opposite, sessile, the blades oval-ovate, broadly ovate-oval, or ovate, 2–3.5 cm. long, 0.8–1.5 cm. wide, rounded or obtuse at the base, obtuse to short-acuminate at the apex, rather thick, subconcolorous, minutely scaberulous above when young, glabrous beneath; inflorescence terminal or axillary, usually 3–5-flowered, the flowers sessile; hypanthium 4 mm. long, pruinose-puberulent; calyx-tube about 2 mm. long, the lobes linear or lance-linear, 7–11 mm. long, acute to attenuate, scaberulo-ciliolate; corolla white, glabrous outside, the tube slender, 4.5–6 cm. long, 2.5 mm. thick above, the lobes oblong or elliptic-oblong, 12–16 mm. long, 4.5–6 mm. wide, acute or acutish, sparsely villosulous within; anthers oblong-linear, 4 mm. long, included; style-branches slender, about 5 mm. long.

Type collected in the Sierra Madre, Durango, August 16, 1897, J. N. Rose 3516 (U. S. Nat. Herb. no. 302493).

25. Bouvardia induta (B. L. Robinson) Standley, sp. nov.

Bouvardia longiflora induta B. L. Robinson, Proc. Am. Acad. 45: 404. 1910.

Shrub, about 4 dm. high, sparsely branched, the branches slender, subangulate, densely grayish-hirtellous; stipules triangular-acuminate, 1–2 mm. long, hirtellous; leaves opposite, the petioles stout, 1–3 mm. long, hirtellous, the blades ovate or lance-ovate, 2–3 cm. long, 0.6–1.2 cm. wide, acute or acuminate at the base and short-decurrent, acute to long-attenuate at the apex, thick, concolorous, densely hirtellous or villosulous above, densely villous-tomentose beneath, the lateral veins nearly obsolete, the margin plane or subrevolute; flowers axillary and terminal, mostly in 3-flowered cymes, sessile or nearly so; hypanthium subglobose, 2–3 mm.

long, densely tomentose; calyx-lobes linear or lanceolate, 5–8 mm. long, acute, tomentose; corolla densely villous-tomentose outside, the tube 4–5 cm. long, about 2 mm. thick above, the lobes spreading, oblong or elliptic-oblong, 8–9 mm. long, 3 mm. wide, acute, villosulous within; anthers linear, 4 mm. long; style-branches slender, 5 mm. long.

TYPE LOCALITY: Chiapas.

DISTRIBUTION: Chiapas.

26. *Bouvardia Langlassaei* Standley, sp. nov.

? *Bouvardia longiflora latifolia* Mart. & Gal. Bull. Acad. Brux. 11¹: 236. 1844.

Shrub, about 1 meter high, the branches stout, subangulate, brown or grayish, hirtellous or villosulous when young, the internodes short; stipules 3–5 mm. long, lobed or laciniate, villosulous; leaves opposite, the petioles slender, 3–7 mm. long, hirtellous or villosulous, the blades ovate, lanceolate, ovate-rhombic, or oblong-rhombic, 1.7–4 cm. long, 0.5–1.4 cm. wide, acute or obtuse at the base, more or less decurrent, long-attenuate to obtuse or even rounded at the apex, thin, subconcolorous, villosulous or glabrate above, hirtellous or villosulous beneath, the lateral veins plane, ascending at an acute angle; flowers terminal, solitary, sessile or subsessile; hypanthium subglobose, 2–3 mm. long, densely villous or tomentulose; calyx-lobes linear or lance-linear, 3–9 mm. long, villosulous; corolla white, the tube very slender, 4.5–5.5 cm. long, 1.5–2 mm. thick above, villosulous or hirtellous above, glabrous below, the lobes oblong or elliptic-oblong, 1–1.7 cm. long, 3–5 mm. wide, obtuse or acute, glabrous, spreading; anthers linear, 3–3.5 mm. long.

Type collected at Testla, Michoacán or Guerrero, altitude 1500 meters, June, 1899, *E. Langlassé* 1049 (U. S. Nat. Herb. no. 386352).

DISTRIBUTION: Guerrero and Oaxaca.

27. *Bouvardia erecta* (DC.) Standley.

Catesbaea erecta DC. Prodr. 4: 401. 1830.

Hedyotis spinescens Sessé & Moc. Fl. Mex. 22. 1893.

Bouvardia Flos-Joannis K. Schumann, in Loesener, Bull. Herb. Boiss. 3: 621. 1895.

Shrub, 1–2 dm. high, the branches stout, rigid, spreading, subangulate or acutely angulate, scaberulous when young, the internodes very short; stipule-sheath very short, pluriaristate; leaves opposite, subsessile or short-petiolate, the blades lanceolate or linear-lanceolate, 5–16 mm. long, 1–4 mm. wide, acute to attenuate at the base, attenuate to the acute apex, yellowish-green, scaberulous or glabrate, the venation mostly obsolete; flowers terminal and axillary, mostly in sessile 3-flowered cymes, the pedicels 1–5 mm. long; hypanthium about 1.5 mm. long, hemispheric, scaberulous; calyx-lobes lance-triangular or lance-linear, 2.5–6 mm. long, thick, scaberulous; corolla white, pruinose-puberulent or glabrate outside, the tube 1.8–5.5 cm. long, glabrous within, the lobes oblong or elliptic, 5–11 mm. long, acute or subobtuse, spreading, sometimes sparsely villosus within; anthers subsessile, included, 3.5 mm. long; style included.

TYPE LOCALITY: [Near Tehuacán, Puebla] Mexico.

DISTRIBUTION: Puebla.

ILLUSTRATIONS: Bull. Herb. Boiss. 3: pl. 17, f. 5; Moc. & Sessé, Calq. Dess. pl. 460.

28. *Bouvardia glabra* Polak. Linnaea 41: 565. 1877.

Bouvardia glabra gracilis Polak. Linnaea 41: 566. 1877.

Shrub, the branches stout, subangulate, grayish, the internodes short or elongate; stipule-sheath short, cuspidate and glandular-aristate; leaves opposite, the petioles stout, 2–9 mm. long, glabrous, the blades ovate, lance-ovate, or broadly ovate, 3–7 cm. long, 0.8–2.5 cm. wide, obtuse or abruptly short-acuminate at the base, acute to attenuate at the apex, thin, glabrous, bright-green above, paler beneath, the lateral veins few, conspicuous, arcuate, ascending at an acute angle; flowers in terminal or axillary, pedunculate, mostly 3–5-flowered cymes, the pedicels 2–12 mm. long or sometimes wanting, glabrous; bracts usually large and leaf-like; hypanthium 2 mm. long, glabrous; calyx-lobes lanceolate, elliptic, or oblanceolate, foliaceous, 4–12 mm. long, acute, scaberulous on the margins; corolla white, glabrous outside, the tube slender, 1.5–3.5 cm. long, about 1 mm. thick, glabrous within, the lobes oblong or elliptic, 6–11 mm. long, 2–5 mm. wide, acute or acutish, glabrous within; anthers sessile or nearly so,

included, about 2.5 mm. long; style included or exserted; capsule subglobose, about 6 mm. in diameter.

TYPE LOCALITY: San José, Costa Rica.
DISTRIBUTION: Guatemala to Costa Rica.

29. *Bouvardia latifolia* Standley, sp. nov.

Shrub, about 1.5 meters high, the branches stout, terete or subangulate, grayish, scaberulous when young; stipule-sheath short, long-cuspidate, glandular-dentate; leaves opposite, the petioles stout, 2–4 mm. long, pruinose-puberulent, the blades broadly ovate or rounded-ovate, 2.5–4 cm. long, 1.5–2.5 cm. wide, broadly rounded or subtruncate at the base, acute or acutish at the apex, thin, pale-green, concolorous, finely puberulent beneath along the veins or glabrous, the lateral veins conspicuous, usually 3 on each side, arcuate-ascending; inflorescence terminal, 3–5-flowered, sessile or long-pedunculate, the pedicels stout, 3 mm. long or shorter, scaberulous; hypanthium subglobose, 1–1.5 mm. long, scaberulous; calyx-lobes triangular or lance-triangular, 1–1.5 mm. long, acute, scaberulo-ciliolate; corolla pure white, glabrous outside, the tube 3–3.3 cm. long, 2 mm. thick above, glabrous within, the lobes oblong or elliptic, 6–7 mm. long, obtuse or acutish, spreading, glabrous within; anthers nearly sessile, 1.5–2 mm. long, included; style exserted.

Type collected on Monte de la Piedra, near Aguila, Guerrero, altitude 450 meters, July, 1898, E. Langlasse 246 (U. S. Nat. Herb. no. 385804).

30. *Bouvardia longiflora* (Cav.) H. B. K. Nov. Gen. & Sp. 3: 386. 1820.

Aeginetia longiflora Cav. Anal. Ci. Nat. 3: 130. 1801.
Houstonia longiflora A. Gray, Proc. Am. Acad. 4: 314. 1860.

Shrub, the branches stout, subangulate, brown or grayish, glabrous or nearly so when young, the internodes very short; stipules 3–6 mm. long, lance-triangular, lobed or laciniate, green; leaves opposite, the petioles stout, 2–6 mm. long, glabrous, the blades ovate or lanceolate, 2–4.5 cm. long, 0.6–1.7 cm. wide, acute to attenuate at the base and abruptly decurrent, acute to attenuate at the apex, thin, yellowish-green, concolorous or nearly so, glabrous, the lateral veins slender, plane, ascending at a very acute angle; flowers solitary, terminal, sessile or short-pedicellate; hypanthium glabrous, 2–3 mm. long; calyx-lobes linear to lanceolate, 8–18 mm. long, green, acute to attenuate, glabrous, scaberulo-ciliolate; corolla white, glabrous, the tube slender, 4–8.5 cm. long, 2–3 mm. thick, the lobes spreading, oblong or oblong-oval, 1.5–2.8 cm. long, 7–10 mm. wide, acute or acuminate; anthers sessile, linear, 5 mm. long, included; style-branches very slender, elongate; capsule subglobose, 8 mm. in diameter, bisulcate, subcostate, broadly rounded at the apex; seeds suborbicular, 2–3 mm. long, dark-brown, broadly winged.

TYPE LOCALITY: Near Querétaro and Guanajuato, Mexico.
DISTRIBUTION: San Luis Potosí to Oaxaca.
ILLUSTRATIONS: Cav. Ic. pl. 572, f. 1; Bot. Mag. pl. 4223; Fl. Serres 2: pl. 10.

DOUBTFUL SPECIES

BOUVARDIA CHLORANTHA Bertol.; R. & S. Syst. Veg. Mant. 3: 116. 1827. (*Houstonia chlorantha* Bertol. Elench. 5. 1820. *Houstonia ochroleuca* Raf. Ann. Gén. Sci. Phys. 5: 226. 1820.) Described from cultivated plants. Leaves opposite.

BOUVARDIA CORDIFOLIA DC. Prodr. 4: 366. 1830. Mexico. The description and poor illustration (Moc. & Sessé, Calq. Dess. pl. 487) are insufficient for the determination of the species.

BOUVARDIA ROSEA Schlecht. Linnaea 26: 116. 1854. The description is very ample but no specimens have been seen which agree with it. Possibly it is *B. tenuifolia*, but the corolla is described as glabrous.

BOUVARDIA XYLOSTEOIDES H. & A. Bot. Beech. Voy. 428. 1840. Described from Oaxaca. Probably not of this genus.

HEDYOTIS LUTEA Sessé & Moc. Fl. Mex. 22. 1893. Described from Mexico. Probably the same as *Bouvardia cordifolia* DC. Its identity is doubtful from the description.

33. MACROCNEUM P. Br. (*Hist. Jam.* 165; *hyponym.*
1756); *L. Pl. Jam. Pug.* 31. 1759.

Lasionema D. Don, *Phil. Mag.* 2: 377. 1833.

Trees or shrubs, glabrous or pubescent, the branches terete. Stipules interpetiolar, obovate or oblong, deciduous. Leaves opposite, petiolate. Flowers small or of medium size, white or pink, arranged in terminal and axillary panicles; hypanthium oblong; calyx cupular, 5-dentate, persistent, the lobes sometimes unequal and petaloid; corolla funnellform or salver-form, the tube elongate, the limb 5-lobate, the lobes broad, spreading, puberulent within, valvate or reduplicate. Stamens 5, inserted near the middle of the corolla-tube, unequal; filaments barbate below; anthers dorsifixed, oblong, included. Disk thick, annular. Ovary 2-celled; style filiform, the branches ellipsoid, plane; ovules numerous, peltate, imbricate, the placentae thick, adnate to the septum. Capsule chartaceous, oblong or subcylindric, bisulate, 2-celled, loculicidally bivalvate, the septum entire or cleft. Seeds numerous, minute, compressed; testa membranaceous, produced into a narrow entire wing; endosperm fleshy; cotyledons ovate; radicle short, obtuse.

Type species, *Macrocnemum jamaicense* L.

Corolla-tube very stout, 3–4 mm. thick, glabrous outside; calyx-teeth remote; flowers long-pedicellate.

Corolla-tube slender, about 1.5 mm. thick; calyx-teeth approximate; flowers sessile or short-pedicellate.

Corolla glabrous outside; hypanthium glabrous or nearly so; leaf-blades acute at the base.

Corolla and hypanthium minutely pilose; leaf-blades mostly rounded or subcordate at the base.

1. *M. jamaicense*.

2. *M. glabrescens*.

3. *M. pastoense*.

1. Macrocnemum jamaicense L. *Pl. Jam. Pug.* 31. 1759.

Small tree, 4.5–6 meters high, the branches stout, grayish-brown, minutely puberulent when young, sometimes barbate at the nodes; stipules ovate, oblong, or oval, 2–2.5 cm. long, obtuse, brownish, sparsely strigillose or glabrous; petioles stout, 1–2 cm. long, strigillose; leaf-blades obovate, oval-obovate, or oval-oblong, 11–20 cm. long, 4.5–9.5 cm. wide, acute or cuneate at the base, rarely obtuse, acute or abruptly or subabruptly short-acuminate at the apex, with an acute or obtuse acumen, membranaceous, sublustrous, glabrous above, the venation plane or impressed, strigose beneath along the veins, the venation prominent, the lateral veins slender, 7–9 on each side, subarcuate, ascending at an angle of 50° or more, the margin plane; inflorescence terminal and axillary, cymose-corymbose, 7–15 cm. broad, many-flowered, the peduncles 8–20 cm. long, the pedicels stout, mostly 4–12 mm. long; bracts often leaf-like, the bractlets triangular, minute; hypanthium 1–2 mm. long, glabrous; calyx-teeth minute, deltoid, very remote; corolla greenish-yellow, fleshy, glabrous outside, the tube 10–13 mm. long, 3–4 mm. thick, the lobes broadly ovate, 3–4 mm. long, densely papillose-puberulent within; anthers 1.5 mm. long; capsule cylindric, 1.5–2.5 cm. long, 3–5 mm. thick, blackish-brown, striate, glabrous, narrowed at each end; seeds elongate, about 2 mm. long, brownish.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica; reported from Guadeloupe.

ILLUSTRATION: Sw. Obs. *pl. 3, f. 1.*

2. Macrocnemum glabrescens (Benth.) Wedd. *Ann. Sci. Nat.*
IV. 1: 76. 1854.

Lasionema glabrescens Benth. *Bot. Voy. Sulph.* 105. 1845.

Tree, 10–15 meters high, the branches stout, brown or grayish, minutely puberulent when young, the internodes short or elongate; stipules oval, oblong, or oblong-ovate, 1–1.8 cm. long, rounded at the apex, minutely strigillose outside; petioles stout, 5–15 mm. long, minutely puberulent or strigillose; leaf-blades obovate, obovate-elliptic, or oval-obovate, 7–21 cm. long, 3–8 cm. wide, usually cuneate or attenuate at the base, rarely obtuse, acute or broadly short-acuminate at the apex, sometimes rounded, membranaceous, dark-green above, sublustrous, glabrous, the venation plane or prominulous, or the costa sulcate, paler beneath, strigose along the veins and elsewhere sparsely strigillose or often nearly glabrous, usually sparsely barbate

in the axils of the veins, the lateral veins slender, 7–10 on each side, subarcuate, ascending at a broad angle, the margin plane; inflorescence cymose-paniculate, terminal and axillary, many-flowered, 6–20 cm. broad, the peduncles 5–11 cm. long, the rachis subcompressed, the flowers sessile or short-pedicellate; bracts often leaf-like but usually small, triangular, the bractlets minute; hypanthium 3–4 mm. long, glabrous or nearly so; calyx-teeth minute, ovate, acute, approximate; corolla pink, glabrous outside, the tube 4–10 mm. long, about 1.5 mm. thick, the lobes rounded, about 4 mm. long, very minutely papillose-puberulent within; anthers about 0.5 mm. long.

TYPE LOCALITY: Nicoya, Costa Rica.

DISTRIBUTION: Costa Rica to Colombia.

3. *Macrocnemum pastoense* Karst. Linnaea 30: 150. 1859.

Tree, the branches stout, brownish, sparsely strigose when young; stipules oval or oblong, 1–2 cm. long, rounded at the apex, sparsely strigillose outside; petioles stout, 0.7–2.5 cm. long, strigillose; leaf-blades oval or obovate-oval, often broadly so, 8–15 cm. long, 4.5–8.5 cm. wide, subcordate to obtuse at the base, rounded or very obtuse at the apex and abruptly short-acuminate, with a very broad obtuse acumen, membranaceous, deep-green and sublustrous above, glabrous or very sparsely strigillose, the venation plane or the costa sulcate, slightly paler beneath, strigose along the veins, minutely strigillose elsewhere or glabrate, the venation prominent, the lateral veins slender, 6–8 on each side, arcuate, ascending at an angle of 60° or more, the margin plane; inflorescence axillary and terminal, cymose-paniculate, many-flowered, 5–12 cm. broad, the peduncles 5–10 cm. long, subcompressed, the branches strigose, the flowers sessile or short-pedicellate; bracts often leaf-like, mostly triangular and reduced, the bractlets minute; hypanthium 3–4 mm. long, densely and minutely pilose; calyx-teeth minute, rounded, much broader than long; corolla pink, minutely pilose outside, the tube 7–10 mm. long, about 1.5 mm. thick, the lobes rounded, 3–4 mm. long, minutely papillose-puberulent within; anthers yellow, about 0.5 mm. long.

TYPE LOCALITY: Banks of the rivers Mayo and Juanambu, near Pasto, Colombia.

DISTRIBUTION: Panama and Colombia.

34. *CALYCOPHYLLUM* DC. Prodr. 4: 367. 1830.

Eukylista Benth. Jour. Bot. & Kew Misc. 5: 230. 1853.

Trees, the branchlets terete. Leaves opposite, petiolate, the blades broad. Stipules interpetiolar, narrow, caducous. Flowers small, white, in branched terminal corymbose panicles, sessile or short-pedicellate, ebracteolate or minutely bibracteolate, in bud inclosed by membranaceous bracts; hypanthium oblong, cylindric; calyx truncate, sometimes expanded into a large foliaceous petiolate lamina; corolla short-funnelform, the tube short, the throat villous, the limb 6–8-lobate, the lobes broad, imbricate or contorted, one lobe exterior. Stamens inserted in the throat of the corolla; filaments subulate, subelongate; anthers versatile, oblong, exserted. Disk annular. Ovary 2-celled; style filiform, glabrous, the 2 branches linear-oblong, obtuse; ovules numerous, imbricate, the placentae subcylindric, adnate to the septum. Capsule oblong-cylindric, truncate, 2-celled, septicidally bivalvate, the valves coriaceous, entire. Seeds few or numerous, imbricate, usually minute, the body oblong, compressed, the testa membranaceous, produced at each end into an elongate wing; endosperm fleshy; cotyledons ovate, the radicle elongate.

Type species, *Macronemum candidissimum* Vahl.

1. *Calycophyllum candidissimum* (Vahl) DC. Prodr. 4: 367. 1830.

Macrocnemum candidissimum Vahl, Symb. 2: 38. 1791.

Mussaenda candida Poir. in Lam. Encyc. 4: 395. 1797.

Mussaenda candidissima R. & S. Syst. Veg. 5: 251. 1819.

Tree, 5–12 meters high, the branchlets slender, reddish-brown, glabrous or nearly so, often hirsute at the nodes; stipules triangular or lanceolate, 1 cm. long or shorter; petioles slender, 0.4–3.5 cm. long; leaf-blades rounded-oval, oval, oval-ovate, or ovate, 4–13 cm. long, 1.5–7.5 cm. wide, acute or obtuse at the base, abruptly short-decurrent, abruptly acuminate or

cuspidate-acuminate at the apex, with an obtuse acumen, rather thick, bright-green above, lustrous, glabrous, paler beneath, usually sparsely hirsute along the costa, elsewhere glabrous or nearly so, the venation prominent, the lateral veins few, arcuate, the secondary veins reticulate, the margin plane; corymbs few- or many-flowered, the flowers cymose-globose, sessile or short-pedicellate; bracts brown, inclosing the buds, thin, caducous; hypanthium 2.5–3 mm. long, setose-hirsute and minutely hirtellous or glabrate; calyx in many of the flowers expanded into a white lamina, this subreniform, rhombic-orbicular, or ovate-rhombic, 1.2–3 cm. long, 1–3.5 cm. wide, rounded at the apex, obtuse to subcordate at the base and abruptly decurrent into a petiole 1–1.5 cm. long, glabrous, prominently veined, sometimes shallowly 3-lobed; corolla white, the tube obconic, 3 mm. long, glabrous or sparsely puberulent outside, the lobes ovate-triangular, slightly longer than the tube, obtuse or acutish, the throat densely white-villous; stamens long-exserted, the anthers 1 mm. long; capsule 6–10 mm. long, 2.5–4 mm. wide, compressed, shallowly bisulcate, costate, acute at the base; seed-body 1–1.5 mm. long, brown, produced at each end into a short acute wing.

TYPE LOCALITY: Vicinity of Santa Marta, Colombia.

DISTRIBUTION: Guerrero to Chiapas and Colombia; Cuba.

ILLUSTRATIONS: Vahl, Symb. pl. 30; E. & P. Nat. Pfl. 4^t: f. 19, F-J.

35. RAVNIA Oerst. Vidensk. Meddel. 1852: 49. 1852.

Epiphytic shrubs, glabrous, the branchlets terete. Leaves opposite, short-petiolate, fleshy. Stipules interpetiolar, large, oblong, obtuse. Flowers large, ternate at the ends of the branches, subsessile; hypanthium narrowly turbinate; calyx 5–6-lobate, the lobes unequal, linear; corolla tubular, incurved, the tube slender, glabrous within, the throat ampliate, constricted below the limb, this 5–6-lobate, the lobes short, ovate, obtuse, spreading, imbricate. Stamens 5 or 6, inserted in the throat of the corolla; filaments short; anthers linear, subexserted. Disk pulviniform. Ovary 2-celled; style filiform, with 2 obtuse branches; ovules numerous, ascending, the placentae affixed to the septum.

Type species, *Ravnia triflora* Oerst.

Leaf-blades elliptic or elliptic-oblong, 2.4–4.5 cm. wide; calyx without teeth between the lobes.

1. *R. triflora*.

Leaf-blades linear-lanceolate, 1.2–2.8 cm. wide; calyx with linear teeth between the lobes.

2. *R. Pittieri*.

1. *Ravnia triflora* Oerst. Vidensk. Meddel. 1852: 49. 1852.

Branchlets fleshy, thickened at the nodes, the internodes shorter than the leaves; stipules about 1.4 cm. long, thick; petioles very stout, 2–3 mm. long; leaf-blades elliptic or elliptic-oblong, 5–10 cm. long, 2.4–4.5 cm. wide, obtuse or acute at the base, long-acuminate at the apex, thick-coriaceous, the costa scarcely prominent, the lateral veins obsolete or obscure, few; hypanthium 3–5 mm. long; calyx-lobes very unequal, acute, green, the longest about equaling the hypanthium; corolla rose-colored, 5–5.5 cm. long, attenuate at the base and 2 mm. thick, ampliate above and 7–10 mm. thick, the lobes about 3 mm. long; anthers 5 mm. long.

TYPE LOCALITY: Near Cartago and Candelaria, Costa Rica, at an altitude of 1800 to 2400 meters.
DISTRIBUTION: Costa Rica.

2. *Ravnia Pittieri* Standley, sp. nov.

Branches stout, the internodes short; stipules oblong-ob lanceolate, 3.5 mm. long, 6–7 mm. wide, acute, green; petioles stout, 2–4 mm. long; leaf-blades linear-lanceolate, 5–15 cm. long, 1.2–2.8 cm. wide, obtuse or acute at the base, gradually long-attenuate to the apex, coriaceous, green, the costa plane above, prominent beneath near the base, the lateral veins obsolete; flowers sessile, in clusters of 3; hypanthium 6–7 mm. long; calyx-lobes linear, 5–8 mm. long, obtuse, with one or more linear or subulate teeth between each 2 lobes; corolla about 5.5 cm. long, the tube 2.5 mm. thick at the base, about 12 mm. thick at the middle, constricted below the limb, the lobes oval-ovate, about 5 mm. long.

Type collected at Santa Clara, Costa Rica, July, 1899, H. Pittier 13461 (herb. N. Y. Bot. Gard.).

36. COSMIBUENA R. & P. Fl. Per. 3: 3. 1802.

Glabrous shrubs, usually epiphytic, erect or pendent. Leaves opposite, petiolate, succulent. Stipules large, interpetiolar, deciduous. Flowers large, terminal, solitary or cymose, rarely paniculate, pedicellate, bracteate and bracteolate; hypanthium oblong or turbinate; calyx tubular or campanulate, 5-6-dentate, deciduous, the teeth usually unequal; corolla salverform or funneliform, the tube elongate, the limb 5-6-lobate, the lobes spreading, contorted. Stamens 5 or 6, inserted below the throat of the corolla; filaments short; anthers basifix, linear, included. Disk cupular. Ovary 2-celled; style elongate, clavate at the apex, bifid; ovules numerous, ascending, imbricate, the placentae longitudinally bilamellate, adnate to the septum, revolute. Capsule narrowly oblong or cylindric, coriaceous, 2-celled, septicidally bivalve from the apex, the epicarp separating from the endocarp. Seeds numerous, oblong, the body small, the testa membranaceous, produced at each end into a narrow bifid wing; endosperm fleshy; cotyledons ovate, the radicle short, obtuse.

Type species, *Cosmibuena acuminata* R. & P.

Calyx truncate, entire or minutely dentate.

1. *C. Skinneri*.

Calyx coarsely dentate.

Leaf-blades abruptly pointed or short-acuminate at the apex.

2. *C. ovalis*.

Leaf-blades broadly rounded at the apex.

3. *C. paludicola*.

1. ***Cosmibuena Skinneri* (Oerst.) Hemsl.** Biol. Centr. Am.

Bot. 2: 12. 1881.

Buena Skinneri Oerst. Vidensk. Meddel. 1852: 48. 1852.

Branches thick, fleshy; petioles about 1.2 cm. long; leaf-blades obovate, 6.2-7.5 cm. long, 3.7-5 cm. wide, obtuse at the apex; cymes 3-flowered; calyx truncate, entire or minutely dentate, slightly longer than the hypanthium; corolla-lobes oblong, obtuse; capsule oblong; seeds winged at each end, the wings acute, entire. (Description compiled.)

TYPE LOCALITY: Volcán de Masaya, Nicaragua, at an altitude of 600 to 900 meters.

DISTRIBUTION: Known only from the type locality.

2. ***Cosmibuena ovalis* Standley,** Contr. U. S. Nat. Herb.

18: 137. 1916.

? *Cosmibuena macrocarpa* Hemsl. Biol. Centr. Am. Bot. 2: 12. 1881. Not *C. macrocarpa* Klotzsch, 1846.

Young branches very thick, fleshy, brownish; stipules obovate-oval, 1.3-2 cm. long, rounded at the apex, thick; petioles stout, 0.5-2.5 cm. long; leaf-blades oval, broadly obovate-oval, or oval-orbicular, 6-14 cm. long, 3.5-8 cm. wide, acute or subacute at the base, rounded or obtuse at the apex and abruptly short-acuminate, with a broad obtuse or acutish acumen, subcoriaceous, lustrous above, slightly paler beneath, the lateral veins prominent, 5-8 on each side, distant, nearly straight, ascending at an acute angle; inflorescences 3-5-flowered, the pedicels very stout, 1-2 cm. long; hypanthium cylindric, 10-12 mm. long; calyx 11 mm. long, 5-dentate, the teeth deltoid, acute; corolla-tube 6-7 cm. long, 3.5-5 mm. thick, the lobes oblong, 2.5-3.2 cm. long, 9-11 mm. wide, rounded at the apex, minutely ciliolate; anthers 10-13 mm. long; style villous above, the branches 5-6 mm. long; capsule oblong, 4.5 cm. long, 10-12 mm. thick; seeds brown, 5 mm. long, 0.5 mm. wide.

TYPE LOCALITY: Vicinity of Olá, Province of Coclé, Panama, at an altitude of 100 to 350 meters.

DISTRIBUTION: Costa Rica and Panama.

3. ***Cosmibuena paludicola* Standley,** Contr. U. S. Nat. Herb.

18: 137. 1916.

Small tree, 4-5 meters high, the branches stout, succulent; stipules oval-obovate, about 12 mm. long, rounded at the apex, thick; petioles very stout, 8-12 mm. long; leaf-blades obovate, obovate-oblong, or oval-obovate, 8-10 cm. long, 3.5-5 cm. wide, acute or cuneate at the base, broadly rounded at the apex, coriaceous, the lateral veins evident, about 5 on each side, nearly straight, arcuately anastomosing near the margin; inflorescence usually 5-flowered, the pedicels very stout, about 1 cm. long; hypanthium cylindric, 12-14 mm. long; calyx 9 mm.

long, the 5 lobes about one third the length of the tube, ovate-oblong, obtuse; corolla white, the tube 6–6.5 cm. long, 4–6 mm. thick, the lobes oblong, 2.5 cm. long, 9–11 mm. wide, rounded at the apex; anthers 1.7 cm. long; style hirsute above, the branches 1 cm. long.

TYPE LOCALITY: Mangrove swamps, vicinity of Viento Frio, Province of Colón, Panama.
DISTRIBUTION: Panama.

37. *HILLIA* Jacq. Enum. Pl. Carib. 3. 1760.

Fereiria Vell.; Vand. Fl. Lusit. 21. 1788.
Saldanha Vell. Fl. Flum. 141. 1825.

Shrubs, often epiphytic, glabrous, the branches subangulate. Leaves opposite, petiolate, fleshy. Stipules intrapetiolar, membranaceous, caducous. Flowers large, white, terminal, solitary, subsessile, bracteate and bracteolate; hypanthium obovoid or cylindric; calyx wanting or of 2–4 foliaceous caducous lobes; corolla salverform, the tube elongate, the throat ampliate, naked, the limb 3–7-lobate, the lobes spreading, contorted. Stamens 4–7, inserted below the throat of the corolla; filaments very short; anthers basifix, elongate-linear, obtuse at each end, included. Disk swollen. Ovary 2-celled; style filiform, clavate above, bifid, included; ovules numerous, ascending, the placentae cylindric, bifid, adnate to the septum. Capsule elongate-oblong or cylindric, truncate, 2-celled, septicidally bivalvate. Seeds numerous, imbricate, the body minute, the testa spongy, produced at the base into an appendage and at the apex into a tuft of hairs; endosperm fleshy; embryo compressed, the cotyledons ovate, the radicle short, obtuse.

Type species, *Hillia parasitica* Jacq.

Capsule 4–12 cm. long; leaves 1–6 cm. wide.

1. *H. tetrandra*.

Corolla 4-parted; leaf-blades rounded at the apex.

2. *H. parasitica*.

Corolla 6-parted; leaf-blades cuspidate-acuminate at the apex.

3. *H. panamensis*.

Capsule 1.2–2.5 cm. long; leaves 2–3 mm. wide.

1. *Hillia tetrandra* Sw. Prodr. 58. 1788.

Shrub, 2–10 dm. high, often epiphytic, the roots bearing small tubers, the branches very thick, grayish; stipules oval or oblong, 7–10 mm. long, rounded at the apex; petioles very stout, 2–8 mm. long; leaf-blades obovate, obovate-oblong, or oval-oblong, 2.5–7 cm. long, 1–3.5 cm. wide, acute or attenuate at the base, rounded at the apex, thick and fleshy, the costa stout, the venation usually obsolete, the lateral veins nearly straight, ascending at a very acute angle; bracts stipule-like; hypanthium cylindric, 5–8 mm. long; calyx-lobes 4 or wanting, oblong-spatulate, 7–12 mm. long, obtuse; corolla-tube 2.5–8 cm. long, 3–4 mm. thick, the 5 lobes oval or obovate, 1.5–2.5 cm. long; capsule 4.5–7 cm. long, 5–7 mm. thick, narrowed at each end; seed-body 1–2 mm. long, the tuft of brown hairs 10–12 mm. long.

TYPE LOCALITY: Mountains of Jamaica.

DISTRIBUTION: On trees or among rocks, mountains of Cuba and Jamaica; Guatemala to Costa Rica.

2. *Hillia parasitica* Jacq. Enum. Pl. Carib. 18. 1760.

Hillia longiflora Sw. Prodr. 58. 1788.

Shrub, 0.5–2 meters high, epiphytic upon trees, often pendent, the branches stout, brown; stipules oblong or oval, 1–2.5 cm. long, thin, obtuse or rounded at the apex; petioles stout, 0.4–2.5 cm. long; leaf-blades obovate, oval, elliptic-oval, or oval-obovate, 5.5–14 cm. long, 2.2–6 cm. wide, acute or obtuse at the base, usually rounded or very obtuse at the apex and cuspidate-acuminate, with an acute or obtuse acumen, sometimes acuminate, thick, bright-green, concolorous, lustrous above, the lateral veins mostly obsolete; bracts large, stipule-like; hypanthium cylindric, 3–5 mm. long; calyx-lobes 6, linear-lanceolate, obtuse, about 4 mm. long, sometimes wanting; corolla-tube 6–10.5 cm. long, 3–4 mm. thick, the 6 lobes lanceolate or lance-oblong, 2.5–4 cm. long; anthers 4–6 mm. long; capsule 4–12 cm. long, 7–9 mm. thick, brown; seed-body 2–3 mm. long, the brown or yellowish coma 8–12 mm. long.

TYPE LOCALITY: Martinique.

DISTRIBUTION: Widely distributed in the West Indies; also from Venezuela to Ecuador and Brazil; reported from Mexico.

ILLUSTRATIONS: Sw. Obs. pl. 5, f. 1; Jacq. Sel. Stirp. Am. pl. 66; Mart. Fl. Bras. 6^o: pl. 110; Lam. Tab. Encyc. pl. 257, f. 1; Andr. Bot. Repos. pl. 145; Bot. Mag. pl. 721; E. & P. Nat. Pf. 4^o: f. 19, P-R.

3. *Hillia panamensis* Standley, sp. nov.

Epiphytic shrub, glabrous throughout, the branches slender, brownish, the branchlets with short internodes; stipules linear-oblong, 3–4 mm. long, obtuse, brownish; petioles stout, 1–2 mm. long; leaf-blades linear-oblong or elliptic-linear, 7–12 mm. long, 2–3 mm. wide, acute at the base, obtuse or rounded at the apex, subcoriaceous, bright-green, concolorous, the costa obsolete above, prominulous beneath, the margin subrevolute; flowers short-pedicellate; capsule linear-oblong, 1–2.5 cm. long, brown, the valves 5–6 mm. wide; seeds numerous, elliptic-oblong, 2 mm. long, brown, bearing at the apex numerous brown hairs 5–6 mm. long.

Type collected in the humid forest around Los Siguas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, altitude 1700 meters, March, 1911, H. Pittier 3190 (U. S. Nat. Herb. no. 677584).

38. *EXOSTEMA** Rich.; Humb. & Bonpl. Pl. Aequin.
1: 131. 1908.

Solenandra Hook. f. in Hook. Ic. 12: 45. 1876.
Steudelago Kuntze, Rev. Gen. 298. 1891.

Shrubs or trees, glabrous or pubescent, the branchlets usually terete. Leaves opposite, petiolate or subsessile, the blades large or small, membranaceous or coriaceous. Stipules interpetiolar, entire or bifid, deciduous or persistent. Flowers small or large, axillary and solitary or arranged in terminal panicles or corymbs, white, red, or yellow, pedicellate, bracteolate or ebracteolate; hypanthium cylindric or obovoid; calyx 5-(rarely 4-)lobate, the lobes broad or narrow; corolla short or elongate, the tube elongate, often very long, the throat glabrous or pilose, the limb 5-(rarely 4-)lobate, the lobes oblong or linear-elongate, imbricate, 2 of them exterior. Stamens 5, inserted at the base of the corolla-tube; filaments filiform, elongate; anthers basifix, linear, usually exserted. Disk annular. Ovary 2-celled; style filiform, usually exserted; stigma capitate, entire or bilobate; ovules numerous, ascending, the placentae adnate to the septum. Capsule usually oblong-cylindric, 2-celled, septically bivalvate, the valves entire or bipartite. Seeds usually numerous, imbricate, the body oblong, compressed, the testa membranaceous, produced into a wing; endosperm fleshy; embryo small, the radicle terete, inferior.

Type species, *Exostema parviflorum* Rich.

Stamens included; corolla-lobes short, rounded.

1. *E. Coultieri*.

Stamens exserted; corolla-lobes linear or oblong.

2. *E. spinosum*.

Inflorescence 1-flowered, rarely 2–3-flowered, axillary or rarely terminal.

Leaf-blades very small, 3–8 mm. long; branchlets spinose; flowers 4-parted.

Leaf-blades 2 cm. long or usually much longer; branchlets not spinose; flowers 5-parted.

Calyx-lobes linear or subulate, 2–6 mm. long; corolla-tube 12–14 cm. long.

Leaf-blades coriaceous, obtuse at the apex; branchlets glabrous; flowers terminal.

Leaf-blades membranaceous, attenuate at the apex; branchlets puberulent or villosulous when young; flowers mostly axillary.

Calyx-lobes 1 mm. long or shorter, triangular; corolla-tube 1.5–5 cm. long.

Leaf-blades obtuse at the apex, 7–11 mm. wide, sessile or nearly so.

Leaf-blades acute or acuminate at the apex.

Corolla-tube 1.5–2.5 cm. long; leaves coriaceous or chartaceous, the lateral veins mostly obsolete beneath.

Corolla-tube 2–2.5 cm. long, the lobes about twice as long; leaf-blades lanceolate or ovate-lanceolate.

Corolla-tube 1.5 cm. long, the lobes of about the same same length; leaf-blades mostly ovate or elliptic-oblong.

Corolla-tube 3–5 cm. long; leaves membranaceous, the lateral veins conspicuous beneath.

Inflorescences few- or usually many-flowered, all or chiefly terminal.

Corolla glabrous outside.

Corolla 2.5 cm. long or longer; anthers usually 8–12 mm. long.

Hypanthium pubescent; leaves linear-lanceolate.

Hypanthium glabrous; leaves oblong or ovate or broader.

3. *E. stenophyllum*.

4. *E. longiflorum*.

5. *E. salicifolium*.

6. *E. acuminatum*.

7. *E. purpureum*.

8. *E. caribaeum*.

9. *E. angustifolium*.

* Sometimes written *Exostemma*.

- Leaves sessile or nearly so, broadly rounded or subcordate at the base.
 Corolla 3–3.5 cm. long; leaf-blades rounded at the base; capsule 12–15 mm. long.
 Corolla 4.2–5 cm. long; leaf-blades mostly subcordate at the base; capsule 5–8 mm. long.
- Leaves conspicuously petiolate, usually acute or obtuse at the base.
 Leaf-blades elliptic-oblong, lance-oblong, or lanceolate.
 Petioles about 8 mm. long; leaf-blades 5–7 cm. long.
 Petioles 3–6 mm. long; leaf-blades 3–4.5 cm. long.
- Leaf-blades mostly oval, elliptic-oval, or rounded-ovate.
 Capsule oval, coarsely 10-costate; corolla-tube twice as long as the lobes.
 Capsule oblong-cylindric, smooth or obscurely costate.
 Leaf-blades 10–18 cm. long; corolla-tube about as long as the lobes.
 Leaf-blades 5–9 cm. long.
 Corolla-tube about 4 cm. long, almost twice as long as the lobes.
 Corolla-tube about 2.5 cm. long, the lobes of the same length.
- Corolla 7–16 mm. long; anthers 1.5–2.5 mm. long.
 Leaves 0.8–1.2 cm. long; pedicels 3–4 mm. long.
 Leaves 1.5–9 cm. long; pedicels 2 mm. long or shorter.
- Hypanthium glabrous.
 Calyx-lobes linear or linear-spatulate, obtuse, often equaling the hypanthium.
 Calyx-lobes triangular, acute, half as long as the hypanthium or shorter.
- Hypanthium pubescent.
 Leaves glabrous beneath.
 Capsule 2.5–4 mm. long; leaf-blades 1.8 cm. long or shorter, rounded at the apex.
 Capsule 4.5–5.5 mm. long; leaf-blades 2–3 cm. long, acute or acutish.
- Leaves pubescent beneath.
 Leaves acutish, long-petiolate, densely velvety-pilose beneath.
 Leaves rounded or very obtuse at the apex, long-petiolate, with tufts of hairs beneath along the costa.
- Corolla pubescent outside, 1.5–2 cm. long.
 Corolla-tube 8–10 mm. long; hypanthium sparsely puberulent.
 Corolla-tube 6 mm. long; hypanthium densely puberulent.
10. *E. lineatum.*
 11. *E. subcordatum.*
 12. *E. triflorum.*
 13. *E. rupicola.*
 14. *E. brachycarpum.*
 15. *E. floribundum.*
 16. *E. rotundatum.*
 17. *E. ellipticum.*
 18. *E. myrtifolium.*
 19. *E. elegans.*
 20. *E. parviflorum.*
 21. *E. crassifolium.*
 22. *E. Shaferi.*
 23. *E. velutinum.*
 24. *E. barbatum.*
 25. *E. mexicanum.*
 26. *E. indutum.*

1. *Exostema Coulteri* Hook. f.; Hemsl. Diag. Pl. Nov. 32. 1879.

Shrub, glabrous throughout, the branches slender, densely leafy; stipules subulate, deciduous; petioles slender, about 6 mm. long; leaf-blades ovate-oblong, 5–6.2 cm. long, cuneate at the base, acuminate at the apex with an acutish acumen, coriaceous; inflorescence terminal, cymose-corymbose, few-flowered, the pedicels very short; calyx-lobes subulate; corolla subcylindric, 1.2–1.6 cm. long, the lobes very short, rounded, erect or ascending; stamens included; capsule oblong, 4–6 mm. long. (Description compiled.)

TYPE LOCALITY: Zimapán, Hidalgo.

DISTRIBUTION: Known only from the type locality.

2. *Exostema spinosum* (Le Vavass.) Krug & Urban; Urban, Ber. Deuts. Bot. Ges. 15: 262. 1897.

Cinchona spinosa Le Vavass. Obs. Phys. 37: 243. 1790.
Catesbeia Vavassorii Spreng. Syst. 1: 416. 1825.
Catesbeia elliptica Spreng.; DC. Prodr. 4: 401, as synonym. 1830.
Exostema Vavassorii Griseb. Cat. Pl. Cub. 126. 1866.

Shrub, 1–2 meters high, much branched, the branches stout, rigid, grayish, the branchlets slender, rigid, spinose, minutely puberulent or hirtellous when young; stipules minute, deltoid, acute, brownish; petioles 1 mm. long or shorter; leaf-blades oval or oblong, 3–8 mm. long, 1.5–4 mm. wide, rounded or obtuse at the base, broadly rounded at the apex, thick-coriaceous, lustrous above, the costa evident beneath, the lateral veins obsolete, the margin often subrevolute; flowers axillary, solitary, the pedicels very slender, 5–7 mm. long, the bractlets

minute; hypanthium oblong, 3–4 mm. long, glabrous; calyx-lobes 4, minute, 0.5 mm. long or shorter, deltoid, acute; corolla 1.5–2 cm. long, glabrous outside, the 4 lobes linear, 6–9 mm. long; stamens 4, exserted, the anthers about 4 mm. long; capsule oval-oblong, 8–12 mm. long, dark-brown, smooth, lustrous.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Eastern Cuba and Hispaniola.

ILLUSTRATIONS: Obs. Phys. 37: pl. 2; Lamb. Descr. Cinchona pl. 13.

3. ***Exostema stenophyllum*** Britton, Bull. Torrey Club 42:
517. 1915.

Shrub, 2 meters high or less, glabrous throughout, the branches stout, brownish, densely leafy; stipules 1–2 mm. long, the lobes deltoid, obtuse; leaves sessile, linear-ob lanceolate, 2–6 cm. long, 3–6 mm. wide, attenuate at the base, slightly narrowed to the obtuse apex, thick-coriaceous, bright-green, the costa slender, impressed above, prominulous beneath, the lateral veins obsolete, the margin subrevolute; flowers terminal, solitary, the pedicels very stout, 1–1.5 cm. long; hypanthium 6–7 mm. long, oblong-cylindric; calyx-lobes 5, triangular-subulate, 2.5–3.5 mm. long; corolla white, the tube about 14 cm. long, 1.5 mm. thick, the 5 lobes linear, 2–3 cm. long; anthers linear, about 1.8 cm. long, the filaments of about the same length; capsule oblong-obvoid, 1.5–2.2 cm. long, 8 mm. thick, nearly smooth, shallowly bisulcate.

TYPE LOCALITY: Among rocks at the water's edge, Río Guayabo, above the falls, Oriente, Cuba, at an altitude of 450 to 550 meters.

DISTRIBUTION: Known only from the type locality.

4. ***Exostema longiflorum*** (Lamb.) R. & S. Syst. Veg. 5: 18.
1819.

Cinchona longiflora Lamb. Descr. Cinchona 38. 1797.

Shrub, 1–2 meters high, the branches stout or slender, gray or brownish, puberulent or villosulous when young, usually densely leafy; stipules oblong or lanceolate, 2.5–6 mm. long, acuminate or attenuate, thin, green, puberulent; petioles slender or stout, 3–12 mm. long, rarely wanting; leaf-blades linear-lanceolate, very narrowly lance-elliptic, or oblanceolate, 5–11 cm. long, 0.8–2.5 cm. wide, long-attenuate at the base, usually long-attenuate to the acutish apex, membranaceous, bright-green, sparsely white-pilose beneath in the axils of the chief veins, elsewhere glabrous, the costa impressed above, prominent beneath, the lateral veins evident, few, distant, ascending, the margin usually plane; flowers axillary and solitary or 1–3 at the ends of the branches, the pedicels stout, shorter than the calyx; hypanthium cylindric, 6–8 mm. long, glabrous; calyx-lobes 5, linear-subulate, 3–6 mm. long; corolla white or pink, glabrous, the tube 12–14 cm. long, 2–2.5 mm. thick, curved, the 5 lobes linear, 4–5 cm. long, recurved; stamens exserted, the anthers linear, about 2 cm. long; capsule oval-ellipsoid, about 1.5 cm. long, coarsely costate, the valves about 8 mm. wide after dehiscence.

TYPE LOCALITY: Given as Guiana [an error for Santo Domingo].

DISTRIBUTION: Along streams, Cuba and Hispaniola.

ILLUSTRATION: Lamb. Descr. Cinchona pl. 12.

5. ***Exostema salicifolium*** Griseb. Cat. Pl. Cub. 125. 1866.

Shrub, 3 meters high, glabrous throughout, the branches very slender, grayish, the internodes about 1 cm. long; stipules about 1 mm. long, deltoid, acute, thick; petioles 1.5 mm. long or shorter; leaf-blades oblong-ob lanceolate or narrowly elliptic-oblong, 3–4 cm. long, 0.7–1.1 cm. wide, acute or attenuate at the base, slightly narrowed to the obtuse apex, sub-coriaceous, lustrous above, slightly paler beneath, the costa prominent on both surfaces, the lateral veins mostly obsolete; flowers axillary, solitary, the pedicels very slender, 1–1.8 cm. long; hypanthium 3–4 mm. long, oval-elliptic; calyx-lobes minute, nearly obsolete; corolla purplish outside, white within, the tube 2 cm. long, the 5 lobes linear, about as long as the tube; stamens exserted, the anthers 1.4 cm. long; capsule ellipsoid, 1.2–1.8 cm. long, obscurely costate, the valves after dehiscence flat, 6–9 mm. wide.

TYPE LOCALITY: [Toscana] western Cuba.

DISTRIBUTION: Known only from the type locality.

6. *Exostema acuminatum* Urban, Symb. Ant. 3: 378. 1903.

Exostema salicifolium Griseb. Cat. Pl. Cub. 125, in part. 1866.

Shrub or tree, sometimes 7 meters high, glabrous throughout, the branches yellowish or gray, rimose and lenticellate; stipules 1–2.5 mm. long, broadly triangular, filiform-acuminate; petioles 2–3 mm. long; leaf-blades lanceolate or ovate-lanceolate, 4–6 cm. long, 1–2.2 cm. wide, rounded at the base, gradually attenuate to the acute apex, chartaceous, lustrous above, the costa prominent above, the lateral veins prominulous, arcuate, nearly obsolete beneath, the margin subrevolute; pedicels axillary, mostly 1-flowered, 1–1.5 cm. long; hypanthium 5 mm. long, oblong or elliptic-oblong; calyx-lobes 5, minute, triangular; corolla white, 6–7 cm. long, the tube 2–2.5 cm. long, 1.5 mm. thick, the 5 lobes linear, twice as long as the tube or longer; stamens exserted, the anthers 1.2–1.5 cm. long; capsule elliptic-oblong, 1.8 cm. long, 6 mm. thick, brownish-black, lustrous.

TYPE LOCALITY: Near Gonaïves, Haiti.

DISTRIBUTION: In forests, Hispaniola.

7. *Exostema purpureum* Griseb. Cat. Pl. Cub. 125. 1866.

Shrub, 2–15 dm. high, glabrous throughout, the branches stout, gray or brownish, the internodes elongate; stipules 1–1.5 mm. long, subcuspidate, thick; petioles stout, 2.5–7 mm. long; leaf-blades lance-oblong, ovate-oblong, ovate, or elliptic-oblong, 3.5–6.5 cm. long, 1.5–2.5 cm. wide, rounded or obtuse at the base, acute or subacuminate at the apex, with a broad obtuse acumen, thick-coriaceous, lustrous, bright-green above, paler beneath, the costa impressed above, stout and prominent beneath, the lateral veins usually obscure or obsolete, 4–6 on each side, distant, divergent, the margin often revolute; pedicels mostly axillary, solitary or geminate, very slender, 0.5–2 cm. long; hypanthium ellipsoid, 4–5 mm. long; calyx-lobes 5, minute, triangular, acute; corolla purple outside, rose within, the tube about 1.5 cm. long, the lobes of equal length; capsule ellipsoid, about 1.5 cm. long, smooth, the valves after dehiscence 8 mm. broad.

TYPE LOCALITY: Near Baracoa, Cuba.

DISTRIBUTION: Arroyos and dry thickets, Oriente, Cuba.

8. *Exostema caribaeum* (Jacq.) R. & S. Syst. Veg. 5: 19. 1819.

Cinchona caribaea Jacq. Enum. Pl. Carib. 16. 1760.

Cinchona jamaicensis Wright, Phil. Trans. Roy. Soc. London 67: 506. 1778.

Cinchona myrtifolia Stokes, Bot. Mat. Med. 1: 359. 1812.

Cinchona racemosa Schrank; Steud. Nom. Bot. ed. 2. 1: 363. 1840.

Exostema longicuspis Oerst. Vidensk. Meddel. 1852: 48. 1852.

Shrub or tree, sometimes 8 meters high, the branchlets stout, grayish or brownish, rimose, glabrous, densely leafy; stipules 2.5–5 mm. long, the lobes rounded or acute, long-cuspidate, thick, ciliolate; petioles slender, 3–12 mm. long, glabrous or short-pilose; leaf-blades mostly ovate, sometimes broadly ovate, ovate-oval, ovate-oblong, or elliptic-oblong, 5–11 cm. long, 1.3–5 cm. wide, obtuse or acute at the base, often abruptly short-decurrent, usually rather abruptly acuminate at the apex, sometimes acute or attenuate, membranaceous, yellowish-green, glabrous above, usually glabrous beneath except for tufts of hairs in the axils of the veins, or sometimes quite glabrous, rarely densely white-pilose with short hairs, the venation usually impressed above and prominent beneath, the lateral veins few, arcuate-ascending, the margin plane; flowers axillary, solitary, the pedicels stout, 4–10 mm. long; hypanthium glabrous, 4–5 mm. long; calyx-lobes 5, 1 mm. long or shorter, broad, obtuse or acutish; corolla white, glabrous, the tube 3–5 cm. long, 2 mm. thick, often curved, the 5 lobes linear, recurved, about equaling the tube; stamens long-exserted, the anthers linear, about 2 cm. long; capsule oval or ellipsoid, 1–1.5 cm. long, smooth, dark-brown, lustrous; seeds oval, 3–6 mm. long, black, with a narrow brownish wing.

TYPE LOCALITY: [Thickets near Havana, Cuba].

DISTRIBUTION: Florida Keys; San Luis Potosí to Colima and Costa Rica; general in the West Indies.

ILLUSTRATIONS: Phil. Trans. Roy. Soc. London 67: pl. 10; Jacq. Sel. Stirp. Am. pl. 179, f. 95; Britton, N. Am. Trees f. 765; Lamb. Descr. Cinchona pl. 4; Andr. Bot. Repos. pl. 481; Gaertn. Fruct. pl. 33; Sarg. Silva pl. 226; Sarg. Man. f. 635.

9. ***Exostema angustifolium* (Sw.) R. & S. Syst. Veg. 5: 19. 1819.***Cinchona angustifolia* Sw. Sv. Vet.-Akad. Nya Handl. 8: 119. 1787.

Branchlets grayish, puberulent when young, the internodes elongate; stipules deltoid, acute; petioles short, stout, puberulent; leaf-blades usually large, linear-lanceolate, obtuse or acute at the base, long-attenuate to the apex, puberulent beneath, the lateral veins conspicuous, ascending; inflorescence terminal, corymbose, broad, many-flowered, the pedicels equaling or longer than the calyx, puberulent; hypanthium villosulous, 2 mm. long, turbinate; calyx-lobes 5, subulate, as long as the hypanthium or longer; corolla large, glabrous, the tube slender, elongate, the 5 lobes linear, spreading or recurved, about half as long as the tube; anthers linear, elongate; capsule oblong, angulate.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Hispaniola.

ILLUSTRATIONS: Sv. Vet.-Akad. Nya Handl. 8: pl. 3; Lamb. Descr. Cinchona pl. 9.

10. ***Exostema lineatum* (Vahl) R. & S. Syst. Veg. 5: 18. 1819.***Cinchona lineata* Vahl, Skr. Nat.-Selsk. Kjøb. 11: 22. 1790.*Exostema Picardae* Krug & Urban; Urban, Symb. Ant. 1: 422. 1899.

Branches grayish or purplish, puberulent when young, the internodes elongate; stipules ovate-triangular; petioles 1–2 mm. long; leaf-blades ovate or ovate-oblong, 4–6 cm. long, 1.5–2.5 cm. wide, obtuse or rounded at the base, subabruptly acuminate or attenuate to the obtuse apex, subcoriaceous, bright-green above, dull, glabrous, the venation impressed, minutely pilosulous along the veins; inflorescence terminal and axillary, corymbose, broad, many-flowered, the pedicels 5–9 mm. long; hypanthium 3.5–4 mm. long, glabrous, oblong; calyx-lobes 5, linear, obtuse, equaling the hypanthium; corolla 3–3.5 cm. long, glabrous, the tube 1.5 mm. thick, the lobes linear, obtuse, about equaling the tube; stamens exserted, the anthers 8–10 mm. long; capsule oblong-cylindric, 1.2–1.5 cm. long, 3.5–4 mm. thick; seeds narrowly winged.

TYPE LOCALITY: Santo Domingo.

DISTRIBUTION: Hispaniola.

ILLUSTRATIONS: Skr. Nat.-Selsk. Kjøb. 11: pl. 4; Lamb. Descr. Cinchona pl. 6.

11. ***Exostema subcordatum* Krug & Urban; Urban (Ber. Deuts. Bot. Ges. 15: 262; nomen nudum. 1897),
Symb. Ant. 1: 422. 1899.**

Shrub, 2–3 meters high, the branches stout, grayish, minutely puberulent or glabrous, the internodes usually elongate; petioles stout, 1–3 mm. long; leaf-blades ovate or ovate-oblong, 4.5–7 cm. long, 2–4 cm. wide, subcordate or broadly rounded at the base, subabruptly long- or short-acuminate at the apex, subcoriaceous, bright-green above, sublustrous, glabrous, the venation subimpressed, slightly paler beneath, sparsely pilosulous along the veins or glabrous, the lateral veins prominent, distant, arcuate, the margin plane or subrevolute; inflorescence terminal, corymbose, 10–12 cm. broad, many-flowered, the pedicels slender, 5–10 mm. long; hypanthium 3–5 mm. long, glabrous, obovoid-oblong; calyx-lobes 5, linear, obtuse, about as long as the hypanthium; corolla glabrous, 4.2–5 cm. long, the tube 1.5 mm. thick, the lobes linear, obtuse, recurved, equaling or slightly longer than the tube; stamens exserted, the anthers 10–12 mm. long; capsule obovoid or obovoid-oblong, 5–8 mm. long, 3.5–4 mm. thick; seeds about 1 mm. long, suborbicular, narrowly winged.

TYPE LOCALITY: Rocky thickets of the mountains above La Rivière Froide, Haïti.

DISTRIBUTION: Haïti.

12. ***Exostema triflorum* (Wright) G. Don, Gen. Hist. 3: 481.
1834.***Cinchona triflora* Wright, London Med. Jour. 8: 240. 1787.*Exostema ellipticum triflorum* Maza, Anal. Soc. Esp. Hist. Nat. 23: 286. 1894.

Glabrous throughout; petioles 8 mm. long; leaf-blades lance-oblong, 5–7.5 cm. long, obtuse or acutish at the base, acuminate or long-acuminate at the apex, membranaceous, lustrous above, the costa subimpressed, sublustrous beneath, sometimes short-pilose in the axils of the

veins, the costa prominent, the lateral veins slender, prominulous, about 6 on each side, the margin plane; inflorescence terminal, corymbose, many-flowered, the pedicels 4–6 mm. long, longer than the hypanthium; hypanthium ovoid, 3–4 mm. long; calyx-lobes 5, triangular-acuminate, about 1 mm. long; corolla-tube 1.5 cm. long, the lobes slightly longer.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Jamaica.

13. *Exostema rupicola* Urban, Symb. Ant. 7: 399. 1912.

Shrub, the branches blackish, rimose, glabrous or minutely pilosulous when young; stipules triangular-lanceolate, acuminate, 2.5 mm. long, persistent; petioles 3–6 mm. long; leaf-blades elliptic-oblong or lanceolate, 3–4.5 cm. long, 1.2–1.6 cm. wide, acute at the base, narrowed to the short-acuminate apex, subcoriaceous, glabrous, green above, sublustrous or dull, the venation impressed, paler beneath, the venation prominent, the margin subrevolute; inflorescence terminal, corymbose, few-flowered, the pedicels 5–10 mm. long; hypanthium glabrous, 2.5–3 mm. long, oblong; calyx-lobes filiform, 2.5–3 mm. long, ciliolate; corolla white, glabrous, 2 cm. long or more in bud.

TYPE LOCALITY: Along streams near Bahoruco, Province of Barahona, Santo Domingo, at an altitude of 70 meters.

DISTRIBUTION: Known only from the type locality.

14. *Exostema brachycarpum* (Sw.) R. & S. Syst. Veg. 5: 19. 1819.

Cinchona brachycarpa Sw. Prodr. 41. 1788.

Tree, sometimes 12 meters high, glabrous throughout, the branches stout, grayish, the internodes short or elongate; stipules ovate-deltoid, 8–10 mm. long, obtuse or acutish; petioles stout, 0.5–1.2 cm. long; leaf-blades oval, ovate-oval, or oblong, 7–15 cm. long, 3.5–8 cm. wide, rounded or obtuse at the base, obtuse or acute at the apex, sometimes broadly short-acuminate, the venation plane above, prominent beneath; inflorescence terminal, cymose-corymbose, few- or many-flowered, the pedicels stout, longer than the calyx; hypanthium 4–5 mm. long; calyx-lobes 5, minute, deltoid, acute; corolla pale-red, glabrous, the tube slender, 2.5–5 cm. long, the 5 lobes linear, half as long as the tube; anthers 10–12 mm. long; capsule oval, 1.5 cm. long, coarsely 10-costate.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Mountains of Jamaica.

ILLUSTRATION: Lamb. Descr. Cinchona pl. 8.

15. *Exostema floribundum* (Sw.) R. & S. Syst. Veg. 5: 19. 1819.

Cinchona floribunda Sw. Prodr. 41. 1788.

Cinchona montana Badier, Obs. Phys. 34: 129. 1789.

Cinchona luciana Vitm. Summa Pl. Suppl. 1: 264. 1802.

Tree, the branchlets stout, brownish, glabrous, the internodes short; stipules sheathing, 9 mm. long or shorter, thin, brown, the lobes obtuse or acute; petioles stout, 5–12 mm. long, glabrous; leaf-blades elliptic, elliptic-oblong, oval, or oval-oblong, 11–22 cm. long, 4.5–11.5 cm. wide, obtuse or acutish at the base, abruptly short-acuminate at the apex, with an obtuse acumen, chartaceous, bright-green, lustrous above, glabrous, the venation impressed, glabrous beneath or pilose in the axils of the lateral veins, these prominent, 7–12 on each side, arcuate, the margin usually plane; inflorescence terminal, cymose-corymbose, 7–15 cm. broad, many-flowered, the pedicels stout, 3–12 mm. long; hypanthium ellipsoid, 6–7 mm. long, glabrous; calyx-lobes 5, triangular-subulate, 1–2 mm. long; corolla pale-red, the tube 2–3 cm. long, 1.5 mm. thick, the 5 lobes linear, obtuse, about as long as the tube; stamens exserted, the anthers 10–12 mm. long; capsule cylindric, 1.2–2 cm. long, dark-brown, obscurely costate.

TYPE LOCALITY: St. Lucia.

DISTRIBUTION: Lesser Antilles; perhaps also in Hispaniola.

ILLUSTRATIONS: Obs. Phys. 34: pl. 1; Lamb. Descr. Cinchona pl. 7; Phil. Trans. Roy. Soc. London 74: pl. 19.

16. *Exostema rotundatum* Griseb. Mem. Am. Acad. II. 8: 504.
1862.

Exostema ellipticum rotundatum Maza, Anal. Soc. Esp. Hist. Nat. 23: 286. 1894.

Slender tree, 6–9 meters high, glabrous throughout; petioles stout, 4–6 mm. long; leaf-blades oval or rounded-oval, 5–7.5 cm. long, 3.5–4.5 cm. wide, obtuse or acutish at the base, rounded at the apex, coriaceous, lustrous above, the costa impressed, dull beneath, the costa prominent, the lateral veins inconspicuous, about 4 on each side, the margin plane or subrevolute; inflorescence terminal, corymbose, few-flowered, the pedicels 1–2 cm. long; hypanthium cylindric, 4 mm. long; calyx-lobes 5, triangular-subulate, 1.5–2 mm. long, subobtuse; corolla at first greenish, becoming white, finally rose-colored or red, the tube 4–4.5 cm. long, the lobes about half as long; capsule oblong-cylindric, 1.5–2.4 cm. long, 4–5 mm. thick, smooth.

TYPE LOCALITY: Pine woods near Monte Verde, Oriente, Cuba.

DISTRIBUTION: Known only from the type locality.

17. *Exostema ellipticum* Griseb. Mem. Am. Acad. II. 8: 504.
1862.

Tree, glabrous throughout, the branches stout, brownish, the internodes short or elongate; stipules sheathing, 2.5–5 mm. long, thick, brown, deciduous; petioles stout, 2–8 mm. long; leaf-blades oval to elliptic-oblong, 5.5–8.5 cm. long, 3–4.5 cm. wide, rounded to acutish at the base, rounded to acutish at the apex, sometimes broadly and obtusely short-acuminate, lustrous above, bright-green, the venation impressed, slightly paler beneath, the lateral veins prominulous, few, distant, nearly straight, the margin plane or revolute; inflorescence terminal, corymbose, usually few-flowered, the pedicels slender or stout, 4–20 mm. long; hypanthium 3–3.5 mm. long; calyx-lobes 5, triangular, acute or acuminate, half as long as the hypanthium or shorter; corolla white, becoming rose, the tube slender, about 2.5 cm. long, the 5 lobes linear, recurved, about as long as the tube; stamens exserted; capsule subcylindric, 1.5–2.8 cm. long, 4–7 mm. thick, dark-brown, obscurely costate; seeds about 6 mm. long, brown, the body 2 mm. long, broadly winged at the ends, the wings narrow on the sides.

TYPE LOCALITY: Forests near Monte Verde, Oriente, Cuba.

DISTRIBUTION: Oriente, Cuba, and the Isle of Pines.

18. *Exostema myrtifolium* Griseb. Cat. Pl. Cub. 125. 1866.

Shrub, 1–2 meters high, the internodes short; stipules deltoid, about 1 mm. long; petioles stout, 1–2 mm. long; leaf-blades oval or rounded-oval, 7–12 mm. long, 4–9 mm. wide, obtuse or rounded at the base, rounded at the apex, coriaceous, glabrous, lustrous above, paler beneath, the lateral veins impressed, 2 or 3 on each side, the margin revolute; inflorescence terminal, cymose-corymbose, few- or many-flowered, the pedicels 2–4 mm. long; hypanthium 1 mm. long, puberulent; calyx-lobes 5, triangular-subulate, acute, half as long as the hypanthium; corolla white, the tube 6 mm. long, the 5 lobes half as long; stamens exserted; capsule subglobose, 3–4 mm. long, brown, smooth, glabrate; seeds 1.5–2 mm. long, brown, broadly winged.

TYPE LOCALITY: [Near Baracoa] Cuba.

DISTRIBUTION: Known only from the type locality.

19. *Exostema elegans* Krug & Urban; Urban, (Ber. Deuts. Bot. Ges. 15: 262; nomen nudum.) 1897
Symb. Ant. 1: 423. 1899.

Tree, 4–5 meters high, the branches stout, grayish, minutely puberulent when young, the internodes short; stipules 1–2 mm. long, deltoid or subtruncate, apiculate, thick, deciduous; petioles stout, 3–8 mm. long, minutely puberulent or glabrate; leaf-blades oval or oval-elliptic, 2.7–9 cm. long, 1.4–4 cm. wide, rounded or obtuse at the base, rounded or obtuse at the apex or sometimes obtusely short-acuminate, coriaceous, lustrous above, glabrous, the venation plane or impressed, paler beneath, glabrous or sparsely pilose in the axils of the veins, the lateral veins obscure, the margin plane or subrevolute; inflorescence terminal and axillary, cymose-corymbose, 1.5–6 cm. broad, densely many-flowered, the pedicels 1 mm. long or shorter,

glabrous; hypanthium 1.5–2 mm. long, glabrous; calyx-lobes 5, oblong-linear or linear-spatulate, obtuse, often equaling the hypanthium; corolla white, glabrous, 8–10 mm. long, the 5 lobes oblong, obtuse, about half as long as the tube; stamens exserted, the anthers 1.5–2 mm. long; capsule obovoid-oblong, 4 mm. long, 1.7 mm. thick, brown; seeds obovate-oblong, yellowish-brown, winged at each end.

TYPE LOCALITY: Near Port-au-Prince, Haiti.

DISTRIBUTION: Hispaniola.

20. *Exostema parviflorum* Rich.; Humb. & Bonpl. Pl. Aequin. 1: 132. 1808.

Exostema Valenzuelae A. Rich. in Sagra, Hist. Cuba pl. 48, homonym. 1850.

Cinchona parviflora Brign. Mem. Soc. Ital. Modena II. 1: 63. 1862.

Solenandra ixoroidea Hook. f. in Hook. Ic. 12: 45. 1876.

Steudelago ixoroidea Kuntze, Rev. Gen. 298. 1891.

Exostema Wrightii Krug & Urban; Urban, Symb. Ant. 1: 424. 1899.

Shrub or tree, 2–3 meters high, the branches stout, brown or grayish, lenticellate, minutely puberulent when young, the internodes short or elongate; stipules 1–2 mm. long, deltoid, acute or acutish, apiculate, thick; petioles stout, 3–10 mm. long, minutely puberulent or glabrous; leaf-blades oval, rounded-oval, or oval-ovate, 1.5–6 cm. long, 0.8–3 cm. wide, obtuse to broadly rounded at the base, rounded to acutish at the apex, sometimes broadly and obtusely short-acuminate, coriaceous, bright-green, lustrous, glabrous or sparsely pilose beneath in the axils of the veins, the venation impressed above, usually prominent beneath, the lateral veins 3–5, distant, arcuate, the margin plane or revolute; inflorescence terminal and axillary, cymose-corymbose, 3–6 cm. broad, dense, usually many-flowered, the pedicels 2 mm. long or shorter; hypanthium 2 mm. long, glabrous; calyx-lobes 4 or 5, triangular, acute, half as long as the hypanthium or shorter; corolla white, glabrous, 7–12 mm. long, the lobes 4 or 5, oblong or ovate-oblong, obtuse, about half as long as the tube, spreading; stamens exserted, the anthers 1.5–2.5 mm. long; capsule oblong-obvoid, 3.5–5.5 mm. long, smooth, dark-brown; seeds brown, 1.5–2 mm. long, wing-appendaged at each end.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Rocky hillsides, Cuba.

ILLUSTRATIONS: Sagra, Hist. Cuba pl. 48; Hook. Ic. pl. 1150.

21. *Exostema crassifolium* Standley, sp. nov.

Shrub, 6 dm. high, the branches stout, grayish-brown, the branchlets stout, puberulent, the internodes shorter than the leaves; stipules broadly deltoid, 1 mm. long, obtuse or acutish, puberulent; petioles very stout, about 1 mm. long, puberulent; leaf-blades oval or broadly elliptic-oval, 1.2–1.8 cm. long, 0.7–1.2 cm. wide, rounded at the base, broadly rounded or very obtuse at the apex, rigid-coriaceous, green above, lustrous, the costa impressed, brownish beneath, the costa prominent, the lateral veins subimpressed, 2 or 3 on each side, the margin revolute or subrevolute; inflorescence terminal, cymose-corymbose, 2.5–4.5 cm. broad, densely many-flowered, the branches puberulent, the pedicels slender, 1–2 mm. long; calyx-lobes 5, deltoid, acuminate, about 0.3 mm. long; capsule broadly obovoid, 2.5–4 mm. long, brown, lustrous, sparsely and minutely pilose; seeds 1.5–2 mm. long, broadly winged, reddish.

Type collected between Sabanilla and Yamuri Arriba, Oriente, Cuba, Jan. 30—Feb. 1, 1911, J. A. Shafer 8416 (herb. N. Y. Bot. Gard.).

22. *Exostema Shaferi* Standley, sp. nov.

Shrub, 3 meters high, the branches stout, grayish-brown, the branchlets stout, minutely pilose, the internodes short; stipules deltoid, 1 mm. long, acute or acuminate, puberulent; petioles stout, 1.5–2 mm. long, short-pilose; leaf-blades ovate, oval-ovate, or broadly elliptic-ovate, broadest at or below the middle, 2–3 cm. long, 1–1.8 cm. wide, obtuse or rounded at the base, acute or acutish at the apex, thick-coriaceous, glabrous, or puberulent beneath along the lower part of the costa, green above, sublustrous, the costa impressed, brownish beneath, the costa prominent, the lateral veins prominulous, 3 or 4 on each side, the ultimate veins laxly but evidently reticulate, the margin plane or subrevolute; inflorescence terminal, cymose-corymbose, short-pedunculate, 3–5 cm. broad, densely many-flowered, the branches puberulent,

the pedicels in fruit 2–3 mm. long; calyx-lobes oblong-triangular, obtuse or acutish, 0.8 mm. long; capsule obovoid, 4.5–5.5 mm. long, reddish-brown, densely puberulent when young, glabrate in age.

Type collected on a dry serpentine hill, Loma Santa Teresa, near El Yunque, Oriente, Cuba, December 2, 1910, J. A. Shafer 7746 (herb. N. Y. Bot. Gard.).

23. *Exostema velutinum* Standley, sp. nov.

Tree, 6 meters high, the branchlets slender, gray, lenticellate, densely short-pilose, the internodes equaling or shorter than the leaves; stipules deltoid, 1–2 mm. long, acute, brown, puberulent; petioles stout, 3–7 mm. long, densely short-pilose; leaf-blades ovate-oval, oval, or rounded-ovate, 3–5 cm. long, 1.8–3.5 cm. wide, broadly rounded at the base, acutish at the apex, subcoriaceous, green above, lustrous, glabrous, the venation plane or the costa subimpressed, paler beneath, densely velvety-pilose with short whitish hairs, the venation prominent, the lateral veins 3 or 4 on each, arcuate-ascending, the margin plane or nearly so; inflorescence terminal, cymose-corymbose, densely many-flowered, 3.5–7 cm. wide, the pedicels stout, 1–2 mm. long, short-pilose; calyx-lobes 4, minute, triangular-subulate; capsule obovoid, 3 mm. long, brown, short-pilose.

Type collected at border of mangrove swamp, Río San Juan, Santa Clara, Cuba, March, 1910, N. L. Britton, F. S. Earle, & Percy Wilson 5837 (herb. N. Y. Bot. Gard.).

24. *Exostema barbatum* Standley, sp. nov.

Shrub or small tree, 2–4.5 meters high, the branches stout, grayish, the branchlets densely and minutely pilose, the internodes short; stipules broadly deltoid, 1–1.5 mm. long, obtuse or acutish, puberulent; petioles very stout, 1–2 mm. long, minutely pilose; leaf-blades oval, rounded-oval, or oval-elliptic, 1.3–2.2 cm. long, 0.7–1.5 cm. wide, rounded or obtuse at the base, rounded or very obtuse at the apex, thick-coriaceous, deep-green above, lustrous, glabrous, the costa subimpressed, the lateral veins obsolete, slightly paler beneath, villous-barbate along the prominent costa, the lateral veins prominulous or plane, 3 or 4 on each side, the margin more or less revolute; inflorescence terminal, cymose-corymbose, few- or many-flowered, 1.7–3.5 cm. broad, sessile or short-pedunculate, the pedicels stout, 1–3 mm. long, short-pilose; calyx-lobes 5, linear-subulate, 1 mm. long; capsule obovoid or globose-obovoid, 3–3.5 mm. long, reddish-brown, often lustrous, sparsely or densely short-pilose; seeds brown, 1.5 mm. long, broadly winged.

Type collected on pine hills, Baracoa, Oriente, Cuba, March, 1903, L. M. Underwood & F. S. Earle 1360 (herb. N. Y. Bot. Gard.).

DISTRIBUTION: Oriente, Cuba.

25. *Exostema mexicanum* A. Gray, Proc. Am. Acad. 5: 180. 1861.

Small tree, the branches slender, gray, conspicuously lenticellate, glabrous or obscurely puberulent, the internodes elongate; stipules 2.5–4 mm. long, triangular, acuminate or long-cuspidate; petioles 2–5 mm. long, glabrous or obscurely puberulent; leaf-blades ovate-oval, ovate, or oval, 4.5–15 cm. long, 1.5–7.5 cm. wide, very obtuse or broadly rounded at the base, abruptly acuminate or attenuate at the apex, membranaceous, bright-green, glabrous except for tufts of short white hairs in the axils of the chief veins, the venation conspicuous, the lateral veins 6–8 on each side, arcuate-ascending, the margin plane; inflorescence terminal, cymose-corymbose, 7–10 cm. broad, densely many-flowered, the pedicels slender, 2–4 mm. long, minutely puberulent; hypanthium 2.5–3 mm. long, ellipsoid, sparsely and minutely puberulent; calyx-lobes 5, minute, deltoid, acute; corolla sparsely villosulous outside, the tube 8–10 mm. long, the 5 lobes oblanceolate-linear, obtuse, about 1 cm. long, ascending or spreading; stamens exserted, the anthers yellow, 3.5–4 mm. long.

TYPE LOCALITY: Vicinity of Wartenberg, near Tantoyuca, Veracruz.

DISTRIBUTION: San Luis Potosí and Veracruz.

26. *Exostema indutum* Standley, sp. nov.

Shrub, the branches slender, grayish, minutely hirtellous when young, the internodes elongate; stipules 2–3 mm. long, deltoid, acuminate, thick, brown; petioles slender, 3–5 mm. long, puberulent; leaf-blades ovate-oblong or elliptic-oblong, 5.5–9 cm. long, 2.5–3.5 cm. wide, obtuse or acutish at the base, abruptly acuminate at the apex, membranaceous, bright-green above, glabrous, the venation impressed, paler beneath, pilose, especially along the veins, with short white appressed hairs, the lateral veins prominent, arcuate, the margin plane; inflorescence terminal and axillary, cymose-corymbose, 4–8 cm. broad, densely many-flowered, the pedicels 1–3 mm. long, densely cinereo-puberulent; hypanthium 2.5–3 mm. long, cylindric, densely cinereo-puberulent; calyx-lobes 5, minute, ovate, acute; corolla yellow, densely cinereo-puberulent or pilosulous outside, the tube slender, 6 mm. long, the 5 lobes oblanceolate, obtuse, 7–9 mm. long, ascending or spreading; stamens exserted, the anthers 3–3.5 mm. long.

Type collected in Oaxaca, altitude 900 meters, Galeotti 2664 (U. S. Nat. Herb. no. 572997).

DOUBTFUL SPECIES

EXOSTEMA CANESCENS Bartl.; DC. Prodr. 4: 359. 1830. (*Cinchona canescens* Brign. Mem. Soc. Ital. Modena II. 1: 63. 1862.) Described from Mexico; inflorescence axillary, 1-flowered; leaves pubescent. Probably not of this genus.

EXOSTEMA CORIACEUM (Poir.) R. & S. Syst. Veg. 5: 20. 1819. (*Cinchona coriacea* Poir. in Lam. Encyc. 6: 38. 1804.) Described from Santo Domingo. The description suggests *E. purpureum* Griseb.

EXOSTEMA NERIIFOLIUM A. Rich. in Sagra, Hist. Cuba 11: 7. 1850. Described from Cuba. The description does not agree with any material examined by the writer.

39. *COUTAREA* Aubl. Pl. Guian. 314. 1775.

Trees or shrubs, the branchlets terete. Leaves opposite, petiolate, membranaceous. Stipules interpetiolar, short, acute. Flowers large, terminal or axillary, solitary or cymose, pedicellate, bracteolate or ebracteolate; hypanthium obovoid-turbinate; calyx 5–8-lobate, the lobes subequal, narrow, deciduous; corolla funnelform-campanulate, more or less oblique, the tube often curved and gibbosus-ventricose, often angulate, the throat glabrous, the limb 5–8-lobate, the lobes short, spreading, plicate-imbricate or contorted, one of the lobes exterior. Stamens 5–8, inserted at the base of the corolla; filaments filiform; anthers basifixed, elongate-linear, exserted. Disk swollen. Ovary 2-celled; style filiform; stigma clavellate-subulate, exserted; ovules numerous, horizontal, the placentae swollen, affixed to the septum. Capsule oval or obovoid, more or less obcompressed, coriaceous or ligneous, 2-celled, loculicidally bivalve, the valves cleft, the septum finally free. Seeds numerous, imbricate, ascending, the hilum marginal, the body compressed, the testa membranaceous, expanded into a broad wing; endosperm fleshy; cotyledons cordate, the radicle elongate, centripetal.

Type species, *Coutarea speciosa* Aubl.

Corolla 8-lobate, symmetric; calyx-lobes usually 8; capsule only slightly compressed; pedicels ebracteolate.

Corolla 6-lobate; calyx-lobes 6.

1. *C. octomera*.

Corolla symmetric or nearly so, the tube not gibbosus; capsule only slightly compressed; flowers solitary; stamens equaling or usually shorter than the corolla.

Pedicels ebracteolate; calyx-lobes 6–10 mm. long; corolla-lobes 6–10 mm. long, often half as long as the tube.

Pedicels bracteolate; calyx-lobes 10–20 mm. long; corolla-lobes about one fourth as long as the tube.

Capsule 2–3 cm. long; corolla 6–8 cm. long; leaf-blades mostly ovate or oval.

Capsule 1.2–1.4 cm. long; corolla about 10 cm. long; leaf-blades narrowly lance-oblong.

2. *C. latiflora*.

Corolla asymmetric, the tube gibbosus; capsule strongly compressed; flowers mostly in 3-flowered cymes; stamens longer than the corolla.

3. *C. pterosperma*.

4. *C. Lumaeana*.

5. *C. hexandra*.

1. *Coutarea octomera* Hemsl. Biol. Centr. Am. Bot. 4:
101. 1887.

Coutarea acamploclada Rob. & Millsp.; Millsp. Bot. Jahrb. 36: Beibl. 80: 28. 1905.

Shrub, the branches stout, grayish, glabrous, the leaves densely crowded at the ends of short stout branchlets; stipules short, broadly deltoid, obtuse; petioles slender, 2–8 mm. long, puberulent; leaf-blades oval, ovate-oval, rhombic-ovate, or oval-oblong, 1.5–5 cm. long, 1–3.5 cm. wide, obtuse or cuneate at the base, rounded or very obtuse at the apex, concolorous, glabrous, or sparsely short-pilose beneath along the veins, the venation impressed above, prominulous beneath, the lateral veins 4 or fewer, usually obscure, the margin subrevolute; flowers few, axillary, solitary, the pedicels stout, ebracteolate, 5–8 mm. long; hypanthium glabrous or obscurely puberulent, 5–6 mm. long; calyx-lobes 8 or 10, linear, acute, 5–8 mm. long; corolla greenish-yellow, 2.5–5 cm. long, symmetric, glabrous, 1.5–4 cm. wide in the throat, the tube obconic, costate, the 8 lobes triangular or ovate, obtuse or acutish, about one fourth as long as the tube; stamens 8, slightly shorter than the corolla, the anthers 1–1.5 cm. long; capsule (immature) subterete, 1.5 cm. long, 8 mm. broad, finely and obtusely tuberculate.

TYPE LOCALITY: Cozumel Island, Yucatán.

DISTRIBUTION: Yucatán.

2. *Coutarea latiflora* Moc. & Sessé; DC. Prodr. 4: 350.
1830.

Shrub or small tree, sometimes 5 meters high, the branchlets grayish, short-pilose when young or sometimes glabrous, the internodes short or elongate; stipules deltoid or narrowly triangular, 2–4 mm. long, acute or acuminate, usually gland-tipped; petioles slender, 0.4–2 cm. long; leaf-blades ovate, oblong, oval, or ovate-oval, 3.5–12 cm. long, 1.5–6 cm. wide, rounded to acute at the base, usually abruptly short-decurrent, obtuse, acute, or abruptly short-acuminate at the apex, bright-green, concolorous, usually short-pilose above, the venation plane or subimpressed, whitish-tomentose beneath when young or pilose, or sometimes glabrous except along the veins, these prominulous, the lateral veins arcuate; flowers axillary, solitary, the pedicels ebracteolate, 0.5–1.5 cm. long; hypanthium densely or sparsely tomentose or glabrous, about 5 mm. long; calyx-lobes 6, linear or subulate, 6–10 mm. long; corolla white, 5–7 cm. long, symmetric, glabrous or pilose outside, the tube obconic, 3–4.5 cm. wide in the throat, angulate, the 6 lobes plicate-imbricate, deltoid or ovate, obtuse, half as long as the tube or shorter; stamens 6, slightly shorter than the corolla, the anthers 1.8–2.5 cm. long; capsule oval, slightly compressed, about 2 cm. long, brown, obtusely short-tuberculate, 6-costate; seeds oval or orbicular, 5–7 mm. long, brown.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Puebla to Michoacán and Guatemala; also in southwestern Chihuahua.

ILLUSTRATION: Moc. & Sessé, Calq. Dess. pl. 458.

3. *Coutarea pterosperma* (S. Wats.) Standley.

Portlandia pterosperma S. Wats. Proc. Am. Acad. 24: 52. 1889.

Shrub, 1–3 meters high, the branches grayish or brownish, coarsely lenticellate, glabrous, the internodes short or elongate; stipules 2–4 mm. long, deltoid, acute or glandular-mucronate, short-pilose; petioles slender, 0.4–2 cm. long, short-pilose or glabrate; leaf-blades ovate, oval, rounded-oval, ovate-oblong, or ovate-oval, 4–10 cm. long, 2–6 cm. wide, rounded to acutish at the base, often short-decurrent, obtuse or acute at the apex or often abruptly short-acuminate, concolorous, glabrous or sparsely short-pilose above, the venation plane, short-pilose beneath or glabrous, often with tufts of white hairs in the axils of the veins, the lateral veins prominent or prominulous, arcuate, the margin plane; flowers axillary, solitary, the pedicels 1–2.5 cm. long, bracteolate at or below the middle, the bractlets small, subulate; hypanthium glabrous or pilose, 5–7 mm. long; calyx-lobes 6, broadly linear or subulate, 1–2 cm. long; corolla white, green when dry, 6–8 cm. long, the tube narrowly obconic, angulate, about 3 cm. broad in the throat, the 6 lobes plicate-imbricate, rounded-ovate or semi-orbicular, about one fourth as long as the tube; stamens 6, equaling or shorter than the corolla, the anthers 2–2.5

cm. long; capsule oval, 2–3 cm. long, 1.5–2 cm. wide, slightly compressed, coarsely 6-costate, lenticellate, finely tuberculate, brown; seeds oval or orbicular, 5–7 mm. long, brown.

TYPE LOCALITY: Deep canyons near Guaymas, Sonora.

DISTRIBUTION: Dry hillsides, Chihuahua and Sonora to Colima.

ILLUSTRATIONS: Garden & Forest 2: 209; Stand. Cycl. Hort. f. 3148.

4. *Coutarea Lumaeana* Baillon, Adansonia 12: 301. 1879.

Portlandia Lumaeana Baillon, Hist. Pl. 7: 381. 1880.

Shrub, glabrous throughout, the branches slender, brownish, the internodes short; stipules deltoid, 2–4 mm. long; petioles slender, 3–6 mm. long; leaf-blades narrowly lance-oblong, 8–11.5 cm. long, 1.5–3 cm. wide, obtuse to acuminate at the base, acuminate or long-acuminate at the apex, membranaceous, bright-green, concolorous, the venation prominent beneath, the lateral veins ascending at an acute angle, subarcuate; flowers axillary, solitary or in 3-flowered cymes, the pedicels slender, 5–14 mm. long, bracteolate below the middle, the bractlets small, subulate; hypanthium turbinate, 6–7 mm. long; calyx-lobes 6, linear-subulate, 1.5 cm. long; corolla white, 10 cm. long, symmetric, the tube narrowly obconic, 4.5 cm. broad in the throat, the 6 lobes plicate-imbricate, deltoid, acute, about one fourth as long as the tube; stamens 6, slightly shorter than the corolla; capsule oval-globose, 1.2–1.4 cm. long, coarsely 6-costate; seeds suborbicular, 4–5 mm. long, brown.

TYPE LOCALITY: Mountains of western Guatemala, at an altitude of 450 to 500 meters.

DISTRIBUTION: Veracruz to Guatemala.

5. *Coutarea hexandra* (Jacq.) K. Schumann, in Mart. Fl. Bras. 6⁶: 196. 1889.

Portlandia hexandra Jacq. Enum. Pl. Carib. 16. 1760.

Coutarea speciosa Aubl. Pl. Guian. 314. 1775.

Coutarea flavescens Moc. & Sessé; DC. Prodr. 4: 350. 1830.

Portlandia speciosa Baillon, Hist. Pl. 7: 381. 1880.

Coutarea hexandra pubescens K. Schumann, in Mart. Fl. Bras. 6⁶: 198. 1889.

Shrub or small tree, sometimes 5 meters high or more, the branchlets stout, brown or gray, whitish-lenticellate, usually glabrous, sometimes short-pilose, the internodes usually elongate; stipules deltoid, 2–4 mm. long, acute, mucronate, ciliate; petioles slender or stout, 3–11 mm. long; leaf-blades ovate, elliptic-ovate, oval, or ovate-oval, 4.5–12 cm. long, 2–6 cm. wide, rounded to acute at the base, usually acutely cuspidate-acuminate at the apex, sometimes acute or obtusely short-acuminate, bright-green, concolorous, glabrous above or sparsely short-pilose, the venation impressed, glabrous beneath or sometimes densely short-pilose, the venation prominent, the lateral veins few, distant, arcuate, the margin plane; flowers mostly in 3-flowered terminal and axillary cymes, sometimes solitary, the pedicels short, stout, bracteolate at the base, the bractlets lanceolate or subulate; hypanthium glabrous or sparsely puberulent, sometimes densely pilose, 4–6 mm. long; calyx-lobes 6, lance-subulate or linear-subulate, 5–12 mm. long; corolla white or yellowish, tinged with purple below, the tube gibbous, 1–2 cm. thick in the throat, terete, the 6 lobes contorted, ovate, acute or obtuse, usually about one third as long as the tube, sometimes shorter; stamens usually exceeding the corolla-lobes, the anthers yellow, 1.4–2 cm. long; capsule oblong-obvoid or oval-obvoid, 2.5–3.5 cm. long, about 2 cm. wide, strongly compressed, shallowly bisulcate, dark-brown, lustrous, whitish-lenticellate; seeds oval or orbicular, 8–10 mm. long, brown, the body 2–4 mm. long, broadly winged, the wing entire or undulate.

TYPE LOCALITY: [In thickets, Cartagena, Colombia].

DISTRIBUTION: Chiapas to Panama, southward to Peru and Argentina.

ILLUSTRATIONS: Jacq. Sel. Stirp. Am. pl. 182, f. 20; Aubl. Pl. Guian. pl. 122; Lam. Tab. Encyc. pl. 257, f. 2; Mart. Fl. Bras. 6⁶: pl. 108; Moc. & Sessé, Calq. Dess. pl. 459.

40. *BLEPHARIDIUM* Standley, Jour. Wash. Acad. 8: 59. 1918.

Shrubs or trees, the branchlets subterete. Leaves opposite, petiolate, the blades large, chartaceous. Stipules intrapetiolar, large, thin, acuminate, entire, caducous. Flowers large, pedicellate, in 3-flowered cymes, the cymes axillary, long-pedunculate, bibracteolate; hypan-

thium obovoid; calyx large, with a distinct tube, 4-lobate, the lobes very broad, imbricate, ciliolate; corolla salverform, coriaceous, the tube slender, elongate, densely villous within except near the base, the limb 4-lobate, the lobes broad, spreading, imbricate in bud, one of the lobes exterior. Stamens 4, inserted in the throat of the corolla; anthers sessile, dorsifixated below the middle, linear, obtuse, included. Disk annular. Ovary 2-celled; style filiform, included, the stigma bilobate, the lobes linear, elongate, acute; ovules numerous, imbricate, winged, the placentae attached to the septum.

Type species, *Blepharidium guatemalense* Standley.

1. Blepharidium guatemalense Standley, Jour. Wash. Acad.
8: 59. 1918.

Branchlets stout, green, glabrous, sparsely whitish-lenticellate, the internodes elongate; stipules ovate-triangular, 2–2.5 cm. long, acuminate or cuspidate-acuminate, brown, glabrous outside, within sericeous-pilose at the base and bearing numerous glands; petioles stout, 2.5–5 cm. long, glabrous; leaf-blades oval-oblong, 17–30 cm. long, 8–14.5 cm. wide, obtuse or acute at the base, obtuse or acute at the apex, concolorous, glabrous above, the costa impressed, the other venation prominent, sparsely short-pilose beneath along the prominent costa, the lateral veins prominent, about 8 on each side, arcuate-ascending; peduncles 3-flowered, slender, 7–21 cm. long, glabrous, the pedicels stout, 0.3–2 cm. long; bracts foliaceous, oval, about 1 cm. long, the bractlets broadly ovate, 3–4 mm. long, deciduous; hypanthium glabrous, 4–5 mm. long; calyx 4–5 mm. long, 7–8 mm. broad, the lobes half as long as the tube, broader than long, rounded or truncate, minutely ciliolate; corolla-tube about 6 cm. long, 4–5 mm. thick, glabrous outside, the lobes oval, about 1 cm. long; anthers 7 mm. long; stigma-lobes 6–7 mm. long.

TYPE LOCALITY: Forest along Saklak River, below Secanquím, Alta Verapaz, Guatemala, altitude 300 meters.

DISTRIBUTION: Known only from the type locality.

V. NAUCLEAEAE. Shrubs or trees, sometimes scandent. Flowers perfect, numerous, crowded on a globose receptacle; corolla funnelform, with an elongate tube, the lobes short, imbricate or valvate. Anthers short, usually subsessile. Ovary 2-celled; stigma clavate, capitate, or fusiform; ovules numerous or solitary. Fruit a many-celled syncarp or a capsule or dicoccous. Seeds minute, winged or exalate; radicle superior.

Ovules solitary; plants erect, unarmed.

Ovules numerous; plants climbing by recurved spines.

41. *Cephalanthus*.

42. *Orouparia*.

41. CEPHALANTHUS L. Sp. Pl. 95. 1753.

Acrodryon Spreng. Syst. 1: 386. 1825.

Silamnus Raf. Sylva Tell. 60. 1838.

Axolus Raf. Sylva Tell. 61. 1838.

Giliipus Raf. Sylva Tell. 61. 1838.

Eresimus Raf. Sylva Tell. 61. 1838.

Erect shrubs or trees, glabrous or pubescent, the branchlets terete or obtusely quadangular. Leaves opposite or 3–4-verticillate, petiolate. Stipules intrapetiolar, short. Flowers small, white or yellow, sessile in dense globose heads, intermixed with setaceous or paleaceous bractlets; hypanthium turbinate; calyx short-tubular, unequally 4–5-dentate or 4-lobate, often glanduliferous; corolla tubular-funnelform, the throat glabrous or pilose, the limb 4–5-lobate, the lobes erect or spreading, imbricate, one exterior, often with glands in the sinuses. Stamens 4, inserted in the throat of the corolla; filaments short; anthers dorsifixated, oblong, bicuspitate at the base. Disk inconspicuous. Ovary 2-celled; style filiform, elongate; stigma capitate or clavate; ovules solitary, pendulous from the top of the cell, anatropous, the funicle thickened. Fruit turbinate, 2–4-celled, the cells indehiscent, 1-seeded, or one or more of them empty. Seeds oblong, pendulous, covered at the apex with a white aril, the testa membranaceous, sometimes short-winged; endosperm subcartilaginous; cotyledons plane, linear-oblong, the radicle slender, superior.

Type species, *Cephalanthus occidentalis* L.

Calyx glabrous outside, or the tube with a few long white hairs at the base.
Calyx densely pubescent outside with short appressed hairs.

1. *C. occidentalis*.
2. *C. salicifolius*.

1. *Cephalanthus occidentalis* L. Sp. Pl. 95. 1753.

Cephalanthus oppositifolius Moench, Meth. 487. 1794.
Cephalanthus occidentalis pubescens Raf. Med. Fl. 1: 101. 1828.
Cephalanthus occidentalis macrophyllus Raf. Med. Fl. 1: 101. 1828.
Cephalanthus occidentalis obtusifolius Raf. Med. Fl. 1: 102. 1828.
Cephalanthus occidentalis brachypodus DC. Prodr. 4: 539. 1830.
Cephalanthus acuminatus Raf. New Fl. 3: 25. 1838.
Cephalanthus obtusifolius Raf. New Fl. 3: 25. 1838.
Cephalanthus angustifolius Raf. Sylva Tell. 61. 1838. Not *C. angustifolius* Lour. 1790.
Cephalanthus occidentalis californicus Benth. Pl. Hartw. 314. 1849.
Cephalanthus Berlandieri Wernham, Jour. Bot. 55: 175. 1917.
Cephalanthus Hansenii Wernham, Jour. Bot. 55: 176. 1917.

Shrub or small tree, sometimes 15 meters high, with a trunk 3 dm. in diameter, the branchlets slender, brown or grayish, glabrous or short-pilose, the internodes usually elongate; stipules 2–4 mm. long, deltoid, acute or acuminate, usually with glands along the margins; leaves opposite or ternate, the petioles stout or slender, 0.2–3 cm. long, glabrous or pilose, the blades ovate, oval-ovate, oval, ovate-oblong, oval-oblong, or narrowly lanceolate, 6–19 cm. long, 1–8.5 cm. wide, subcordate to rounded or sometimes acute at the base, abruptly or subabruptly long- or short-acuminate at the apex, with an acute acumen, bright-green above, usually lustrous, glabrous or scaberulous, the venation plane or impressed, glabrous or pilose beneath, the lateral veins prominent, slender, arcuate, ascending at an angle of 45–60°; peduncles terminal and axillary, simple or branched, stout, 3–10 cm. long, glabrous; heads 6–12 mm. in diameter (excluding the corollas); bractlets filiform-clavate, pilose above; hypanthium and calyx together 2–3 mm. long, glabrous or sparsely long-pilose at the base, the calyx about 1 mm. long, shallowly 4–5-dentate, densely pubescent within, the lobes rounded, usually glandular; corolla 5–9 mm. long, glabrous outside, the 4 or 5 lobes ovate or oval, sparsely pubescent within, with a small black gland in each sinus; capsule 4–8 mm. long; seed solitary, brown, with a large white aril.

TYPE LOCALITY: North America.

DISTRIBUTION: New Brunswick to Florida, Veracruz, and California; Cuba and the Isle of Pines; also in southern Asia.

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 59; Schkuhr, Handb. pl. 21; W. Barton, Fl. N. Am. pl. 91; Britt. & Brown, Ill. Fl. f. 3403; ed. 2, f. 3923; Nouv. Duham. 1: pl. 54; Britton, N. Am. Trees f. 766; E. & P. Nat. Pl. 4: f. 23, A; Sarg. Silva pl. 711; Rep. N. J. Mus. 1910: pl. 96, f. 1; Rep. Bot. Surv. Minn. 9: 276; Sarg. Man. f. 636.

2. *Cephalanthus salicifolius* Humb. & Bonpl. Pl. Aequin. 2: 63. 1809.

Cephalanthus occidentalis salicifolius A. Gray, Syn. Fl. N. Am. 1²: 29. 1884.
Cephalanthus occidentalis angustifolius Dippel, Handb. Laubh. 1: 164. 1889.
Cephalanthus peroblongus Wernham, Jour. Bot. 55: 176. 1917.

Shrub or small tree, the branches reddish-brown, glabrous; stipules 2–3 mm. long, deltoid, acute or acuminate, often with marginal glands, glabrous; leaves opposite and ternate, the petioles stout, 1–4 mm. long, glabrous, the blades narrowly oblong, elliptic-oblong, linear-lanceolate, or lanceolate, 4.5–12.5 cm. long, 0.8–2.3 cm. wide, acute to subcordate at the base, rounded and apiculate to long-attenuate at the apex, glabrous or sparsely pilose beneath along the veins, bright-green above, lustrous, the venation plane or the costa prominulous, paler beneath, the lateral veins slender, arcuate-ascending; peduncles mostly simple, 2–4 cm. long, glabrous, the heads 6–8 mm. in diameter, the receptacle very densely setose; calyx and hypanthium 2–2.5 mm. long, densely white-sericeous with short hairs, the calyx 1 mm. long or shorter, shallowly 4–5-dentate, densely pilose within, the lobes minute, rounded, often glandular; corolla 6–7 mm. long, glabrous outside, the lobes oblong or ovate, sparsely pilose within, often with black glands in the sinuses; capsule 4–5 mm. long, densely and minutely sericeous; seeds brown, with a large white aril.

TYPE LOCALITY: Near Acapulco, Guerrero.

DISTRIBUTION: In wet soil, Sonora to Nuevo León and Guerrero; also in Honduras.

ILLUSTRATION: Humb. & Bonpl. Pl. Aequin. 2: pl. 98.

42. OUROUPARIA Aubl. Pl. Guian. 177. 1775.

Uncaria Schreb. Gen. 125. 1789.*Uruparia* Kuntze, Rev. Gen. 301. 1891.

Scandent shrubs, glabrous or pubescent, climbing by stout hooked spines, these formed from abortive peduncles. Leaves opposite, petiolate. Stipules interpetiolar, entire or bifid. Flowers yellowish, usually pubescent, aggregate in dense globose heads, sessile or pedicellate, the heads pedunculate, axillary and solitary or paniculate; hypanthium elongate, fusiform, the calyx campanulate, funneliform, or short-tubular, 5-lobate or 5-partite; corolla tubular-funneliform, the tube elongate, glabrous in the throat, the limb 5-lobate, the lobes valvate. Stamens 5, inserted in the throat of the corolla; filaments short; anthers oblong, dorsifixed, bisetose at the base. Disk inconspicuous. Ovary fusiform, 2-celled; style slender, long-exserted, the stigma capitate; ovules numerous, ascending, the placentae affixed to the septum. Capsule elongate, 2-celled, septically bivalvate, the valves bipartite. Seeds numerous, imbricate, the body small, the testa winged at each end, the wings often bipartite; endosperm fleshy; embryo clavate, the cotyledons short, the radicle obtuse.

Type species, *Orouuparia guianensis* Aubl.1. *Orouuparia tomentosa* (Willd.) K. Schumann, in Mart. Fl. Bras. 6⁶: 132. 1889.*Nauclea aculeata* H. B. K. Nov. Gen. & Sp. 3: 382. 1819. Not *N. aculeata* Willd. 1797.*Nauclea tomentosa* Willd.; R. & S. Syst. Veg. 5: 221. 1819.*Uncaria tomentosa* DC. Prodr. 4: 349. 1830.

Scandent shrub, the branchlets quadrangular, densely or sparsely pilose or puberulent, glabrate in age, the internodes elongate; stipules broadly oblong-ovate to broadly deltoid-rounded, 6–11 mm. long, obtuse or rounded, short-pilose or puberulent, green, often reflexed; petioles stout, 7–15 mm. long; leaf-blades oval or ovate-oval, 9.5–15.5 cm. long, 5.5–8.5 cm. wide, broadly rounded or cordate at the base, very shortly obtuse-acuminate at the apex, chartaceous, very lustrous above, bright-green, glabrous, the venation plane, paler beneath, whitish-tomentulose, or in age glabrate except along the veins, there pilose, the lateral veins prominent, arcuate; heads paniculate, numerous, about 6 mm. in diameter (exclusive of the corollas), the peduncles naked, 3.5 cm. long or shorter, often compressed, the lowest ones usually sterile and spinose, large, flat, recurved; flowers sessile; calyx and hypanthium about 2 mm. long, the hypanthium sericeous, the calyx obscurely 5-dentate, puberulent, the teeth rounded; corolla 6 mm. long, densely retrorse-pilose outside with appressed yellowish hairs, the teeth very slender, the lobes oval or oblong, rounded at the apex, about 1.5 mm. long; fruit trigonous, 2–3 mm. long.

TYPE LOCALITY: Banks of the Magdalena River near Nares, Colombia.

DISTRIBUTION: Guatemala to Colombia and Surinam; also in Trinidad.

ILLUSTRATION: Karst. Fl. Columb. pl. 180, f. ii, 13.

VI. MUSSAENDEAE. Trees, shrubs, or herbs, sometimes scandent. Flowers usually perfect; calyx-lobes sometimes unequal, one of them expanded into a foliaceous limb; corolla-lobes valvate. Stamens usually inserted in the tube of the corolla, rarely in the throat. Ovary 2–6-celled, the ovules numerous. Fruit indehiscent and fleshy, baccate, or of 2 or more cocci. Seeds small or minute, exalate, usually globose or angulate; endosperm fleshy; embryo minute, ovoid or clavate; radicle inferior.

Inflorescence terminal.

43. URCEOLARIA.

Flowers in dense heads.

44. MUSSAENDA.

Flowers not in heads.

Calyx-lobes dissimilar, one of them expanded into a large colored limb.

45. DUGGENA.

Calyx-lobes similar, small.

Inflorescence a spike-like panicle; leaves membranaceous; ovary 2–4-celled.

46. CASSUPA.

Inflorescence broad, not spike-like; leaves coriaceous.

47. ISERTIA.

Ovary 2-celled; corolla tuberculate outside.

Ovary 4–6-celled; corolla not tuberculate.

Inflorescence axillary.

Leaves finely lineolate between the veins; inflorescence not capitate.
 Flowers in secund racemes, small.
 Flowers not racemose or secund, large.
 Calyx subtruncate, very shallowly and irregularly lobed.
 Calyx spathaceous or conspicuously and regularly lobed.
 Calyx spathaceous or lobate, the lobes not foliaceous; leaves often pinnatifid.
 Calyx deeply lobate, the lobes subfoliaceous; leaves entire.
 Leaves not lineolate; inflorescence usually capitate or cymose-capitate.
 Plants herbaceous, prostrate; ovary 2-celled.
 Plants woody or suffrutescent.
 Ovary 3–5-celled.
 Ovary 2-celled.

48. *PLOCANIOPHYLLON*.
49. *NOTHOPHLEBIA*.
50. *WATSONAMRA*.
51. *SOMMERA*.
52. *TONTANEA*.
53. *SABICEA*.
54. *XEROCOCCUS*.

43. URCEOLOARIA Willd. (in Cothen. Disp. Veg. Meth. 10; hyponym. 1790); J. F. Gmel. Syst. Nat. 2: 390. 1791.

Fuchsia Sw. Prodr. 62. 1788. Not *Fuchsia* L. 1753.

Schradera Vahl, Eclog. 1: 35. 1796.

Uncariopsis Karst. Linnaea 30: 152. 1859.

Glabrous shrubs, subepiphytic, sometimes scandent, the branches stout, terete. Leaves opposite, petiolate, coriaceous. Stipules interpetiolar, large, connate at the base, deciduous. Flowers densely globose-capitate, sometimes heterostylous, the heads terminal, pedunculate, involucrate; hypanthium turbinate or hemispheric; calyx short, truncate, persistent; corolla coriaceous, salverform, the tube short or elongate, the throat subampliate, villous, the limb 5–10-lobate, the lobes narrow, spreading, valvate. Stamens 5–10, inserted in the throat of the corolla; filaments very short; anthers dorsifixed, linear, obtuse at the apex, obtuse or bilobate at the base, included or exserted. Disk annular. Ovary 2–4-celled; style elongate, with 2–4 branches; ovules numerous, the placentae fleshy, affixed to the axis of the ovary. Fruit baccate, 2- or 4-celled. Seeds numerous, minute, suborbicular, compressed, the testa crustaceous, granulate; endosperm fleshy; embryo clavate, bifid.

Type species, *Urceolaria exotica* J. F. Gmel.

Style quadridid; lateral veins of the leaves prominent beneath, reticulately anastomosing; corolla-lobes usually 6–8, obtuse.

Style bifid; lateral veins scarcely prominent beneath, not anastomosing; corolla-lobes usually 5 or 6, acutish.

1. *U. involucrata*.
2. *U. exotica*.

1. Urceolaria involucrata (Sw.) Standley.

Fuchsia involucrata Sw. Prodr. 62. 1788.

Schradera cephalotes Willd. Sp. Pl. 2: 238. 1799.

Schradera jamaicensis Pers. Syn. Pl. 1: 201. 1805.

Schradera involucrata K. Schumann, in Mart. Fl. Bras. 6: 295. 1889.

Branches stout, yellowish; stipules spatulate-oblong, obtuse, as long as the petioles; petioles stout, 5–8 mm. long; leaf-blades elliptic, lance-oblong, or oval, 5–9.5 cm. long, 2–5.5 cm. wide, rounded at the base, acute to very obtuse at the apex, herbaceous, the lateral veins prominent beneath and reticulately anastomosing; heads pedunculate, solitary, the peduncles 2.5 cm. long or shorter; involucre entire, shorter than the calyces; corolla salverform, white, the tube 1.6–2 cm. long, 5–6 mm. thick, the lobes 5–10, oblong-lanceolate, obtuse, about as long as the tube, 3.5–4 mm. wide, cucullate at the apex; stamens exserted, the anthers 7 mm. long; style quadridid; fruit subglobose, about 12 mm. in diameter.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Mountains of Jamaica.

2. Urceolaria exotica J. F. Gmel. Syst. Nat. 2: 390. 1791.

Schradera capitata Vahl, Eclog. 1: 35. 1796.

Schradera brasiliensis Mart.; Schultes, in R. & S. Syst. Veg. 7: 164. 1829.

Schradera cephalophora Griseb. Mem. Am. Acad. II. 8: 504. 1862.

Urceolaria capitata Fritsch, Oesterr. Bot. Zeits. 44: 288. 1894.

Scandent shrub, the branches very stout, grayish or yellowish; stipules obovate, about 1.5 cm. long, rounded at the apex, brown; petioles stout, 1–2.5 cm. long; leaf-blades oval to oblong, 5.5–10.5 cm. long, 2.5–5.5 cm. wide, rounded or obtuse at the base, rounded or very obtuse at the apex, coriaceous, lustrous above, paler beneath, the lateral veins prominulous or obscure, the margin plane or revolute; heads solitary, the peduncles very stout, 2.5–4 cm. long;

involucræ entire, 8–10 mm. long; calyx and hypanthium about 1 cm. long, the calyx often split; corolla white, funnelform, the tube 7–17 mm. long, 3–5 mm. thick, the lobes 5–7, one and one half times as long as the tube or shorter, lance-linear or linear, acutish, 1.5–2.5 mm. wide; anthers 4–6 mm. long; style bifid.

TYPE LOCALITY: Montserrat.

DISTRIBUTION: Cuba, Porto Rico, and the Lesser Antilles; also in Brazil.

ILLUSTRATIONS: Vahl, Elog. pl. 5; E. & P. Nat. Pfl. 4⁴: f. 25, N.

44. MUSSAENDA L. Sp. Pl. 177. 1753.

Shrubs or rarely herbs, erect or scandent, the branchlets terete. Leaves opposite or ternate, petiolate or subsessile, membranaceous. Stipules interpetiolar, solitary or binate, free or connate, usually deciduous. Flowers ochraceous or white, arranged in terminal corymbs, pedicellate, the bracts and bractlets deciduous; hypanthium oblong or turbinate; calyx 5-lobate, the lobes short or elongate, erect or recurved, usually deciduous, one of them often expanded into a large, foliaceous, petiolate, white or colored blade; corolla funnelform, the tube elongate, usually sericeous, the throat villous, the limb 5-lobate, the lobes small, usually acute, reduplicate-valvate. Stamens 5, inserted in the throat of the corolla; filaments very short; anthers linear, acute or obtuse, dorsifixed. Disk annular or swollen. Ovary 2-celled; style filiform, with 2 short branches; ovules numerous, multiseriate, the placenta fleshy, peltately affixed to the septum. Fruit fleshy, indehiscent, oblong or globose, areolate at the apex or crowned with the persistent calyx, 2-celled. Seeds numerous, minute, oblong, turgid or compressed, the testa foveolate; endosperm fleshy; embryo minute, cylindric or clavate, bifid.

Type species, *Mussaenda frondosa* L.

1. *Mussaenda pubescens* Ait. Hort. Kew. ed. 2. 1: 372. 1810.

Erect shrub, the branches slender, strigose or strigillose when young; stipules binate, or solitary and cleft, lance-linear to ovate, 3–10 mm. long, sericeous-strigose; petioles stout, 0.3–1.7 cm. long; leaf-blades ovate, ovate-oblong, elliptic-oblong, or oblong-oval, 4–19 cm. long, 1.3–9 cm. wide, acuminate to attenuate at the base or sometimes obtuse, acute or abruptly acuminate at the apex, bright-green above, strigose-pilose, especially along the veins, or glabrate, the venation prominent, slightly paler beneath, densely sericeous-strigose along the veins and sparsely so elsewhere, the lateral veins numerous, slender, prominent, arcuate-ascending; corymbs few- or many-flowered, 4–9 cm. broad, the pedicels very short, stout; bracts linear, elongate; calyx and hypanthium strigose, the hypanthium 3 mm. long, the calyx-lobes 2.5–6 mm. long, linear-attenuate or subulate, erect, one of the lobes often expanded into a white limb, this ovate, oval, or elliptic, 3–9 cm. long, 0.8–4.5 cm. wide, abruptly acuminate, long-petiolate; corolla 3–4 cm. long, sparsely or densely strigose outside, the tube very slender, the lobes 4–6 mm. long, lance-triangular or ovate, attenuate-acuminate, the throat densely yellow-barbate; fruit subglobose, 6–10 mm. in diameter, sparsely strigose; seeds about 0.7 mm. in diameter, black, lustrous, coarsely favose.

TYPE LOCALITY: China.

DISTRIBUTION: China; escaped from cultivation in Jamaica and perhaps in Barbados.

ILLUSTRATIONS: Bot. Mag. pl. 2099; Bot. Cab. pl. 451.

DOUBTFUL SPECIES

MUSSAENDA ACUTIFLORA Bartl.; DC. Prodr. 4: 370. 1830. Described from Mexico. It is probable that the locality is incorrect.

45. DUGGENA West, Bidr. St. Croix 269. 1793.

Gonzalagunia R. & P. Fl. Per. Prodr. 12. 1794.

Buena Cav. Anal. Hist. Nat. 2: 278. 1800.

Gonzalea Pers. Syn. Pl. 1: 132. 1805.

Caryococca Willd.; Schultes, in R. & S. Syst. Veg. Mant. 3: 131. 1827.

Shrubs or small trees, more or less pubescent, the branchlets slender, terete. Leaves opposite, petiolate or subsessile. Stipules interpetiolar. Flowers small, sessile or pedicellate,

arranged in slender elongate terminal spikes or thyrsiform panicles; hypanthium globose or campanulate; calyx 4- or rarely 5-lobate, the lobes small, equal or unequal, persistent; corolla funnelform or salverform, the tube short or elongate, the throat ampliate or contracted, villous, the limb 4- or rarely 5-lobate, the lobes short, spreading, obtuse, valvate or imbricate, 1 or 2 lobes exterior. Stamens 4 or rarely 5, inserted in the tube of the corolla; filaments short; anthers dorsifixed, linear-oblong, obtuse, bilobate at the base, included. Disk elevated, crenulate. Ovary 2- or 4-celled; style filiform; stigma small, obtuse or 2- or 4-lobate, included or exserted; ovules numerous, the placentae small, peltately affixed to the septum. Fruit baccate, at least in age, globose, 2-4-sulcate, 2-4-celled or of 2 or 4 pyrenes, the pyrenes characeous to osseous, many-seeded. Seeds minute, subglobose, the testa deeply foveolate; endosperm fleshy; embryo clavate.

Type species, *Duggena Richardii* West.

- Fruit dicoccous; style bifid.
- Bracts longer than the calyx; corolla about 4 mm. long; flowers 5-parted.
 - Bracts shorter than the calyx; corolla 7-15 mm. long; flowers 4-parted.
 - Corolla 7-8 mm. long; calyx shorter than the hypanthium.
 - Corolla 10-15 mm. long; calyx equaling or longer than the hypanthium.
- Fruit tetracoccous; style quadridid.
- Leaf-blades nearly sessile, rounded at the base; calyx-lobes linear or oblong.
 - Calyx-lobes linear, attenuate.
 - Calyx-lobes mostly oblong, obtuse.
 - Leaf-blades usually conspicuously petiolate and acute at the base; calyx-lobes ovate or triangular.
 - Corolla about 3 mm. long.
 - Corolla 10-17 mm. long.
 - Corolla-lobes nearly half as long as the tube; corolla-tube 3 mm. thick in the throat.
 - Corolla-lobes one fourth as long as the tube or shorter; corolla-tube about 1 mm. thick in the throat.

1. *Duggena bracteosa* (Donn. Smith) Standley, Contr. U. S. Nat. Herb. 18: 125. 1916.

Gonzalea bracteosa Donn. Smith, Bot. Gaz. 33: 252. 1902.
Gonzalagunia bracteosa B. L. Robinson, Proc. Am. Acad. 45: 405. 1910.

Shrub, 3 meters high, the branchlets pilose-sericeous; stipules lance-triangular, 1.5-2 cm. long, attenuate, sericeous, persistent; petioles stout, 5-9 mm. long; leaf-blades lanceolate, oblanceolate-oblong, or narrowly elliptic-oblong, 9-21 cm. long, 2-7 cm. wide, acute at the base, acute to attenuate at the apex, membranaceous, sparsely appressed-pilose above or glabrate, the venation plane, slightly paler beneath, sparsely appressed-pilose, the lateral veins prominulous, 4-8 on each side, arcuate, ascending at an angle of 45° or less; inflorescence 5-18 cm. long, the peduncle 2-7 cm. long, the cymules few-flowered, sessile, subtended by foliaceous bracts, these linear or lanceolate, 5-12 mm. long, pilose; flowers about 4 mm. long, the hypanthium sericeous, the 5 calyx-lobes short, triangular; corolla funnelform, strigose, the 5 lobes villous within; fruit fleshy, black, 4 mm. in diameter, 2-celled.

TYPE LOCALITY: In deep forests near Suerre, Llanuras de Santa Clara, Costa Rica, altitude 300 meters.

DISTRIBUTION: Known only from the type locality.

2. *Duggena Sagraeana* (Urban) Standley, Contr. U. S. Nat. Herb. 18: 126. 1916.

Gonzalea spicata DC. Prodr. 4: 437, in part. 1830. Not *Lygistum spicatum* Lam. 1791.
Gonzalagunia Sagraeana Urban, Symb. Ant. 7: 399. 1912.

Shrub, 1-2 meters high, the branches slender, sericeous-strigose when young; stipules 3-6 mm. long, subulate from a triangular base; petioles 2-7 mm. long; leaf-blades lanceolate or lance-ovate, 5.5-11.5 cm. long, 1.3-4.5 cm. wide, acute at the base or obtuse and abruptly decurrent, abruptly or gradually long-acuminate or long-attenuate at the apex, membranaceous, bright-green above, strigillose or glabrous, the venation prominulous, paler beneath, appressed-pilose, especially along the veins, the lateral veins prominulous, 5-8 on each side, usually ascending at an acute angle; inflorescence interrupted-spiciform, 5.5-17 cm. long, short-pedunculate, the cymules 1-3-flowered, sessile, the pedicels 1-2 mm. long, the bracts minute,

1. *D. bracteosa*.
2. *D. Sagraeana*.
3. *D. spicata*.
4. *D. rufis*.
5. *D. ovatifolia*.
6. *D. brachyantha*.
7. *D. thyrsoidaea*.
8. *D. panamensis*.

subulate; hypanthium and calyx strigose, 1.5 mm. long, the 4 calyx-lobes triangular, acute, shorter than the hypanthium; corolla white, 7–8 mm. long, strigose, the tube stout, the 4 lobes ovate, about one third as long as the tube; style bifid at the apex; fruit subglobose, fleshy at maturity, dicoccous, 2–3 mm. broad; seeds brown, lustrous.

TYPE LOCALITY: Cuba.

DISTRIBUTION: Cuba.

3. Duggena spicata (Lam.) Standley, Contr. U. S. Nat. Herb.
18: 126. 1916.

Lystistum spicatum Lam. Tab. Encyc. 1: 286. 1791.

Duggena Richardii West, Bidr. St. Croix 269. 1793.

Petesia spicata Sw. Fl. Ind. Occ. 1945, excluding description. 1806.

Coccocypselum spicatum H. B. K. Nov. Gen. & Sp. 3: 406. 1820.

Hedyotis secunda Spreng.; Schultes, in R. & S. Syst. Veg. Mant. 3: 133. 1827.

Gonzalagunia Coccocypselum Cham. & Schlecht. Linnaea 4: 196. 1829.

Gonzalea spicata DC. Prodr. 4: 437. 1830.

Gonzalea spicata glabrata DC. Prodr. 4: 437. 1830.

Gonzalea Coccocypselum Steud. Nom. ed. 2. 1: 701. 1840.

Gonzalagunia hirsuta K. Schumann, in Mart. Fl. Bras. 6^e: 291. 1889. Not *Justicia hirsuta* Jacq. 1760.

Gonzalagunia hirsuta dicocca K. Schumann, in Mart. Fl. Bras. 6^e: 292, in part. 1889.

Gonzalagunia hirsuta f. *leucocarpa* Kuntze, Rev. Gen. 284. 1891.

Gonzalagunia hirsuta f. *cyanocarpa* Kuntze, Rev. Gen. 284. 1891.

Gonzalea grisea Wernham, Jour. Bot. 51: 219. 1913.

Duggena grisea Standley, Contr. U. S. Nat. Herb. 18: 125. 1916.

Shrub or small tree, 0.5–4 meters high, the branches slender, densely sericeous-strigose when young; stipules 4–11 mm. long, long-subulate from a triangular base; petioles 0.2–2.5 cm. long; leaf-blades broadly ovate, oblong-ovate, elliptic-oblong, or lanceolate, 6.5–19 cm. long, 2–8.5 cm. wide, acute to rounded at the base, often abruptly decurrent, usually subabruptly long-acuminate or attenuate at the apex, membranaceous, bright-green above, appressed-pilose or glabrate, the venation plane or prominulous, paler beneath, appressed-pilose, especially along the veins, the lateral veins prominulous, numerous, arcuate, usually ascending at an angle of 50° or less; inflorescence spiciform, 8–40 cm. long, short-pedunculate, often dense, secund, the cymules 1–few-flowered, sessile or short-pedunculate, the pedicels 2 mm. long or shorter, the bracts linear or subulate, sometimes foliaceous; calyx and hypanthium densely appressed-pilose, the hypanthium 1.5–2 mm. long, the 4 calyx-lobes equaling or longer than the tube, linear, lanceolate, oblanceolate, or oblong, acute; corolla white, 10–15 mm. long, densely appressed-pilose outside with white, often long hairs, the tube stout, ampiate above, the 4 lobes rounded, half as long as the tube or shorter, the throat densely white-pilose; stamens 4; style bifid at the apex; fruit subglobose, fleshy at maturity, white or blue, dicoccous, 3–4 mm. broad; seeds dark-brown, lustrous.

TYPE LOCALITY: Antilles.

DISTRIBUTION: Porto Rico, Hispaniola, and the Lesser Antilles; also from Venezuela and the Guianas to Brazil; reported from Veracruz and Costa Rica.

4. Duggena rudis Standley, Contr. U. S. Nat. Herb. 18:
125. 1916.

Branches very slender, brownish, densely whitish-strigose; stipules subulate, 3–6 mm. long; leaves subsessile, the stout petioles 2 mm. long or shorter, the blades ovate or ovate-oblong, 3.5–7 cm. long, 1.4–2.5 cm. wide, rounded at the base, subabruptly long-acuminate at the apex or acute, membranaceous, bright-green above, copiously strigose and strigillose, the venation prominulous, paler beneath, densely whitish-strigose when young, glabrate in age except along the veins, the lateral veins prominent, 5 or 6 on each side, arcuate-ascending at an angle of 45° or less; inflorescence interrupted-spiciform, 6–9 cm. long, slender, short-pedunculate, the cymules 1–3-flowered, sessile or subsessile, the pedicels 1 mm. long or shorter; bracts linear-subulate, 3 mm. long or shorter; calyx and hypanthium very densely setose-pilose, the 4 calyx-lobes linear-attenuate, 1–2 mm. long; corolla white, 5 mm. long, densely appressed-pilose, the tube stout, the lobes one third as long as the tube or shorter; stamens 4; style quadrifid; fruit tetracoccous, depressed-globose, 2.5 mm. broad, densely setose-pilose with subappressed hairs; seeds brown.

TYPE LOCALITY: In shady places along the Chagres River, near El Vigía, Panama.

DISTRIBUTION: Panama and Colombia.

5. Duggena ovatifolia (Donn. Smith) Standley, Contr.
U. S. Nat. Herb. 18: 126. 1916.

Gonzalea ovatifolia Donn. Smith, Bot. Gaz. 27: 336. 1899.

Gonzalagunia ovatifolia B. L. Robinson, Proc. Am. Acad. 45: 405. 1910.

Shrub, 2–3 meters high, the branchlets slender, densely pilose-sericeous; stipules narrowly triangular-subulate, 6–8 mm. long, strigose; leaves mostly subsessile, the petioles stout, 4 mm. long or shorter, the blades oval-ovate or broadly oblong-ovate, 7.5–12 cm. long, 3.5–6.5 cm. wide, rounded at the base, abruptly or subabruptly acuminate to long-attenuate at the apex, membranaceous, bright-green above, glabrous or strigose along the veins, the venation plane or prominulous, slightly paler beneath, sericeous-strigose when young, especially along the veins, glabrate in age, the lateral veins prominent, 8–11 on each side, broadly arcuate-ascending; inflorescence spiciform, 8–33 cm. long, the peduncles 2–3 cm. long, the cymules 1–5-flowered, sessile, the pedicels 2 mm. long or shorter; bracts subulate, 5 mm. long or shorter, the bractlets minute; calyx and hypanthium densely strigose, the hypanthium 1.5 mm. long, the 4 calyx-lobes 1–2 mm. long, oblong or elliptic, obtuse; corolla white, strigose, 3–3.5 mm. long, the tube stout, the 4 lobes rounded, half as long as the tube or shorter; stamens 4, included; style quadrifid, included; fruit depressed-globose, white at maturity, tetracocous, 2.5–3 mm. broad, strigose; seeds brown.

TYPE LOCALITY: Atirro, Province of Cartago, Costa Rica, altitude 600 meters.

DISTRIBUTION: Costa Rica and Panama.

6. Duggena brachyantha (A. Rich.) Standley, Contr. U. S.
Nat. Herb. 18: 125. 1916.

Petesia spicata Sw. Fl. Ind. Occ. 1945, in part. 1806.

Gonzalea brachyantha A. Rich. in Sagra, Hist. Cuba 11: 16. 1850.

Gonzalagunia Petesia Griseb. Fl. Brit. W. Ind. 321. 1861.

Gonzalagunia hirsuta Petesia Kuntze, Rev. Gen. 284. 1891.

Gonzalagunia Petesia Maza, Anal. Soc. Esp. Hist. Nat. 23: 289. 1894.

Gonzalagunia brachyantha Urban, Symb. Ant. 7: 400. 1912.

Duggena Petesia Standley, Contr. U. S. Nat. Herb. 18: 126. 1916.

Shrub or small tree, up to 5 meters high, the branches slender, brown, strigose or pilose when young; stipules 5–10 mm. long, triangular, subulate-acuminate, densely sericeous within; petioles 0.4–1.5 cm. long; leaf-blades narrowly elliptic-oblong, oblong-lanceolate, or ovate-oblong, 6.5–15.5 cm. long, 2–4.5 cm. wide, acute or attenuate at the base, usually subabruptly acuminate to long-attenuate at the apex, membranaceous or chartaceous, bright-green above, often lustrous, glabrous or when young sparsely pilose, the venation prominulous, paler beneath, sparsely pilose, especially along the veins, or glabrate, the lateral veins prominulous, 5–9 on each side, arcuate, usually ascending at an angle of 45° or less; inflorescence spiciform, 6–15 cm. long, often dense, short-pedunculate, the cymules few-flowered, sessile or subsessile, the bracts subulate, 2–3 mm. long, the pedicels 1 mm. long or shorter; calyx and hypanthium 1.5–2 mm. long, sparsely strigillose, the 4 calyx-lobes deltoid, acute or obtuse, shorter than the tube; corolla white, about 3 mm. long, sparsely appressed-pilose, the 4 lobes about half as long as the tube; style quadrifid; fruit tetracocous, globose, about 2.5 mm. in diameter; seeds brown.

TYPE LOCALITY: Near Santiago de Cuba, Cuba.

DISTRIBUTION: Cuba, Jamaica, and Hispaniola.

7. Duggena thyrsoidaea (Donn. Smith) Standley, Contr.
U. S. Nat. Herb. 18: 126. 1916.

Gonzalea thyrsoidaea Donn. Smith, Bot. Gaz. 13: 188. 1888.

Gonzalagunia thyrsoidaea B. L. Robinson, Proc. Am. Acad. 45: 405. 1910.

Branches stout, hirsute; stipules deltoid-acuminate, 6–7 mm. long; petioles stout, 5–8 mm. long, hirsute; leaf-blades elliptic or elliptic-oblong, 20–23 cm. long, acuminate at each end, lustrous above, sparsely pilose, pilose beneath along the veins; inflorescence about 30 cm. long, the flowers pedicellate, in 3–7-flowered subsessile cymes; hypanthium short, the calyx-lobes triangular, unequal; corolla sparsely appressed-pilose outside, the tube 14 mm. long, 3 mm. thick in the throat, the lobes nearly half as long, farinaceous and arachnoid within; anthers subexserted; style included, the stigma 4-lobate; ovary 4-celled.

TYPE LOCALITY: Mountains of Pansamalá, Alta Verapaz, Guatemala, altitude 1140 meters.

DISTRIBUTION: Known only from the type locality.

8. *Duggena panamensis* (Cav.) Standley, Contr. U. S. Nat. Herb. 18: 126. 1916.

Buena panamensis Cav. Anal. Hist. Nat. 2: 279. 1800.
Gonzalea cornifolia H. B. K. Nov. Gen. & Sp. 3: 325. 1819.
Gonzalea panamensis Spreng. Syst. 1: 417. 1825.
Gonzalea leptantha A. Rich. in Sagra, Hist. Cuba 11: 16. 1850.
Gonzalagunia panamensis K. Schumann, in Mart. Fl. Bras. 6^o: 292. 1889.
Gonzalagunia leptantha Maza, Anal. Soc. Esp. Hist. Nat. 23: 289. 1894.
Gonzalea Hayesii Wernham, Jour. Bot. 51: 219. 1913.
Duggena Hayesii Standley, Contr. U. S. Nat. Herb. 18: 125. 1916.
Duggena leptantha Standley, Contr. U. S. Nat. Herb. 18: 125. 1916.

Shrub, 0.6–3 meters high, the branches slender, brownish, densely sericeous or strigose when young; stipules triangular, subulate-acuminate, 3–8 mm. long; petioles 0.3–2.2 cm. long; leaf-blades ovate, ovate-oblong, lance-oblong, or lanceolate, 7–14 cm. long, 1.8–6 cm. wide, usually acute or obtuse at the base, rarely rounded, gradually or abruptly acuminate or long-attenuate at the apex, membranaceous, bright-green above, densely or sparsely strigillose or scaberulous or glabrate, the venation plane or prominulous, slightly paler beneath, sparsely or densely setose-pilose or soft-pilose or glabrate, the lateral veins prominent, 5–9 on each side, arcuate, usually ascending at an angle of 50° or less; inflorescence spiciform, usually dense, 8–24 cm. long, short-pedunculate, the cymules 1–few-flowered, sessile or subsessile, the pedicels 2 mm. long or shorter, the bracts subulate, 2–3 mm. long; calyx and hypanthium 1.5–2 mm. long, strigillose or short-pilose or glabrate, the 4 calyx-lobes deltoid, obtuse or acute, shorter than the tube; corolla white, 10–17 mm. long, the tube very slender, glabrous or sparsely pilose, the 4 lobes 2–2.5 mm. long, usually pilose outside, sparsely tomentose within; stamens 4, included; style quadrifid; fruit globose, tetracocous, 3–4 mm. in diameter, fleshy at maturity; seeds dark reddish-brown.

TYPE LOCALITY: Ancón Hill, Panama.

DISTRIBUTION: Veracruz to Michoacán and Colombia; Cuba and the Isle of Pines.

ILLUSTRATION: Cav. Ic. pl. 571.

DOUBTFUL OR EXCLUDED SPECIES

DUGGENA NIVEA (Bartl.) Standley, Contr. U. S. Nat. Herb. 18: 125. 1916. (*Gonzalea nivea* Bartl.; DC. Prodr. 4: 436. 1830. *Gonzalagunia nivea* Kuntze, Rev. Gen. 284. 1891.) Described from Mexico. Probably a species of *Rondeletia*.

GONZALAGUNIA PARVIFLORA Schlecht. & Cham. Linnaea 6: 414. 1831. (*Gonzalea parviflora* G. Don, Gen. Hist. 3: 537. 1834.) Described from Mexico. The description is too brief for determination.

GONZALEA GLabra S. Wats. Proc. Am. Acad. 25: 152. 1890. This is *Citharexylum glabrum* (S. Wats.) Greenman.

GONZALEA SECUNDA Mart. & Gal. Bull. Acad. Brux. 11^o: 235. 1844. (*Gonzalagunia secunda* Kuntze, Rev. Gen. 284. 1891.) Described from Jalapa, Veracruz. Perhaps a synonym of *Duggena panamensis*.

46. CASSUPA Humb. & Bonpl. Pl. Aequin. 1: 43. 1808.

Small trees, pubescent, the branchlets thick, terete or subangulate. Leaves opposite, petiolate, large, coriaceous. Stipules interpetiolar, acuminate, persistent. Flowers large, red or white, cymose, thyrsiform-paniculate, sessile or pedicellate, bracteate and bracteolate; hypanthium subglobose; calyx short, obscurely 6-lobate, persistent; corolla coriaceous, funnel-form, the tube elongate, often tuberculate, glabrous within, the throat villous, the limb 6-lobate, the lobes short, valvate, villous within. Stamens 6, inserted in the throat of the corolla; filaments subulate; anthers dorsifixed, acuminate, included. Disk cupular. Ovary 2-celled; style slender, thickened at the apex, with 2 short rounded lobes; ovules numerous, the placentae swollen, adnate to the septum. Fruit baccate, globose, 2-celled. Seeds numerous, minute, angulate.

Type species, *Cassupa verrucosa* Humb. & Bonpl.

1. *Cassupa panamensis* Standley, Contr. U. S. Nat.
Herb. 18: 135. 1916.

Branchlets densely short-pilose or tomentose with fulvous hairs; stipules triangular, 10–12 mm. long, acuminate, thick; petioles stout, 3–6.5 cm. long, cinereo-puberulent; leaf-blades oval or broadly oval, 26–34 cm. long, 12–17 cm. wide, rounded or obtuse at the base and abruptly decurrent, cuspidate-acuminate at the apex, with an acute acumen 2.5–3 cm. long, bright-green above, lustrous, puberulent along the veins, elsewhere glabrous, the venation impressed, whitish beneath with a fine close tomentum, puberulent along the veins, the lateral veins prominent, 18–20 on each side, straight, divergent, arcuately anastomosing near the margin, the secondary veins prominently reticulate; inflorescence many-flowered, 15–19 cm. long, 11 cm. wide, the peduncle 5 cm. long, the flowers partly sessile and partly on stout compressed pedicels 5–10 mm. long; hypanthium 4–5 mm. long, the calyx about 1 mm. long, ciliolate; corolla white, the tube 5.2 cm. long, dilated above, finely tuberculate, sparsely puberulent, the lobes oblong, 11 mm. long, 4.5 mm. wide or narrower, obtuse or acute; filaments 3 mm. long, the anthers 9 mm. long; style 3.2 cm. long, puberulent; fruit subglobose, 1 cm. long (immature), glabrous; seeds about 1 mm. long, foveolate.

TYPE LOCALITY: Along the Río Fató, Province of Colón, Panama, altitude 10 to 100 meters.

DISTRIBUTION: Known only from the type locality.

47. *ISERTIA* Schreb. Gen. 234. 1789.

Phosanthus Raf. Ann. Gén. Sci Phys. 6: 82. 1820.

Brignolia DC. Prodr. 4: 444. 1830.

Bruinsmania Miq. Linnaea 17: 72. 1843.

Trees or shrubs, more or less pubescent, the branchlets terete. Leaves opposite or ternate, petiolate, usually coriaceous. Stipules suprapetiolar, 2 between each 2 leaves, remote at the base, narrow, erect. Flowers usually large, short-pedicellate, red and yellow, rarely white, cymose-corymbose or cymose-paniculate, the pedicels bracteolate; hypanthium subglobose or ovoid; calyx short, 4–6-dentate or truncate, persistent; corolla tubular-funnelform or salver-form, coriaceous, the tube often costate, barbate in the throat, the limb 4–6-lobate, the lobes short, valvate, some of them sometimes larger and contorted-imbricate, the sinuses sometimes thickened. Stamens 4–6, inserted in the tube of the corolla; filaments short, complanate; anthers dorsifixed, linear, acuminate, included, bilobate at the base. Disk annular, swollen. Ovary 4–6-celled; style slender, 2–6-partite at the apex, or with a thickened stigma; ovules numerous, multiseriate, the placentae swollen, affixed to the axis of the ovary. Fruit baccate, small, globose or ovoid, 4–6-pyrenate, the pyrenes cartilaginous, many- or few-seeded. Seeds minute, subglobose, the testa crustaceous, foveolate; endosperm fleshy; embryo clavate, bifid.

Type species, *Guettarda coccinea* Aubl.

Corolla 7–8 cm. long.

Corolla 1.7–3.5 cm. long.

1. *I. coccinea*.

2. *I. Haenkeana*.

1. *Isertia coccinea* (Aubl.) J. F. Gmel. Syst. Nat. 2: 567. 1791.

Guettarda coccinea Aubl. Pl. Guian. 317. 1775.

Shrub or tree, the trunk sometimes 3–4 meters high and 15–20 cm. in diameter, the bark gray or reddish, the branchlets thick, ferrugino-tomentose; stipules oblong or ovate-oblong, rounded and mucronulate at the apex, 1.5 cm. long, 7 mm. wide, tomentulose or glabrate outside; petioles 1.5–4.5 cm. long, tomentulose; leaf-blades oval or oblong-oval, 15–34 cm. long, 6–17 cm. wide, rounded and abruptly short-decurrent at the base, abruptly acuminate at the apex, chartaceous, glabrous above, ferrugino-tomentulose beneath, the lateral veins prominent, 18–20 on each side, divergent; inflorescence cymose-paniculate, 12–20 cm. long, the lowest bracts sometimes foliaceous, the others small, lance-triangular; hypanthium 4 mm. long, the calyx 3–4 mm. long, purplish, truncate or 4-dentate; corolla 7–8 cm. long, red, ferrugino-tomentulose outside, the lobes about one eighth as long as the tube, oblong-lanceolate, acute, yellow-barbate within; anthers 9 mm. long, yellow; style 7.5–8.5 cm. long, divided at the apex

into 6 branches; fruit globose, about 1 cm. in diameter, red, tomentulose; seeds about 1 mm. in diameter, yellowish-red.

TYPE LOCALITY: Guiana.

DISTRIBUTION: St. Vincent; also in the Guianas and Brazil.

ILLUSTRATIONS: Miq. Stirp. Surin. pl. 48; Aubl. Pl. Guian. pl. 123; Lam. Tab. Encyc. pl. 259; Mart. Fl. Bras. 6^o: pl. 130.

2. *Isertia Haenkeana* DC. Prodr. 4: 437. 1830.

Isertia spicaeformis Hemsl. Biol. Centr. Am. Bot. 2: 31. 1881. Not *I. spicaeformis* DC. 1830.

Isertia Deamii Bartlett; Rob. & Bartl. Proc. Am. Acad. 43: 59. 1907.

Isertia Deamii stenophylla Donn. Smith, Bot. Gaz. 61: 374. 1916.

Shrub, 2-3 meters high, the bark grayish, the branchlets thick, angulate, densely grayish- or fulvous-sericeous; stipules linear to oblong-ovate, 6-12 mm. long, acuminate or attenuate, thin, glabrous or sparsely sericeous; petioles stout, 0.5-2.5 cm. long; leaf-blades obovate, oval-obovate, or oblong-obovate, 19-46 cm. long, 8-18 cm. wide, usually acute to attenuate at the base, abruptly long- or short-acuminate at the apex, membranaceous or chartaceous, bright-green above, often lustrous, the venation plane or impressed, paler beneath, densely short-pilose when young with grayish hairs, often glabrate in age, the lateral veins prominent, divaricate; inflorescence cymose-paniculate, often subthyrsiform, 7-20 cm. long, pedunculate, the lowest bracts often foliaceous, the others small, lance-linear; calyx and hypanthium 2.5-4 mm. long, puberulent or glabrous, the calyx very short, truncate or shallowly 4-6-dentate; corolla 1.7-3.5 cm. long, yellow or orange-red, sparsely or densely yellow-puberulent or tomentulose outside, sometimes glabrous, the lobes one fifth to half as long as the tube, oblong or lanceolate, acute, densely barbate within; anthers 4-5 mm. long, yellow; style with usually 6 branches at the apex; fruit purplish, depressed-globose, 5-6 mm. broad, puberulent or glabrate; seeds brown, about 0.8 mm. long, conspicuously favose.

TYPE LOCALITY: Given, perhaps incorrectly, as Mexico.

DISTRIBUTION: Mexico (?); Guatemala to Colombia; Cuba; reported from Guadeloupe.

48. *PLOCANIOPHYLLON* Brand. Univ. Calif. Publ. Bot. 6: 69. 1914.

Glabrous shrubs, with terete branchlets. Leaves opposite, petiolate, membranaceous, finely lineolate between the veins. Stipules intrapetiolar, minute, deltoid, erect, deciduous. Inflorescence axillary, the flowers small, yellow, arranged in slender simple secund racemes, the bracts minute, deciduous; hypanthium narrowly turbinate; calyx 4-lobate, the lobes triangular-lanceolate, persistent; corolla salverform, the tube very short, the limb 4-lobate, the lobes valvate. Stamens 4, the filaments short; anthers basifix, linear-oblong, obtuse, erect. Ovary 2-celled; style filiform, shallowly bilobate; ovules numerous, crowded. Fruit fleshy (?), oblong-turbinated, 2-celled, chartaceous. Seeds numerous, minute, rugose.

Type species, *Plocaniophyllum flavum* Brand.

1. *Plocaniophyllum flavum* Brand. Univ. Calif. Publ. Bot. 6: 69. 1914.

Branches slender, grayish, the internodes elongate; stipules about 1 mm. long; petioles slender, 3-6 mm. long; leaf-blades elliptic, elliptic-ovate, elliptic-oblong, or lance-oblong, 2.2-6 cm. long, 1-2.5 cm. wide, cuneate or acuminate at the base, acute to long-acuminate at the apex, with an obtuse or acute acumen, thin, conspicuously lineolate, green above, the venation subimpressed, paler beneath, the veins slender, prominulous, the lateral veins 5 or 6 on each side, arcuate-ascending, the margin plane; racemes few- or many-flowered, the peduncles filiform, 2-3.5 cm. long, the rachis nodose, the pedicels 1-3 mm. long; calyx and hypanthium about 2.5 mm. long, the calyx-lobes equaling the hypanthium, acute; corolla-tube 2.5 mm. long, the lobes 3-4 mm. long, narrowly oblong, acute; fruit about 6 mm. long.

TYPE LOCALITY: On wet rocks in a barranca near Finca Mexiquito, Chiapas.

DISTRIBUTION: Known only from the type locality.

49. NOTOPHLEBIA Standley, Contr. U. S. Nat. Herb. 17:
438. 1914.

Branched trees, the branchlets thick, succulent, subterete, more or less pubescent. Leaves opposite, large, petiolate, entire, subcoriaceous, finely lineolate between the veins. Stipules large, elongate. Flowers large, sessile and pedicellate, bracteate, the inflorescence axillary, cymose-corymbose, many-flowered, pedunculate; hypanthium turbinate; calyx campanulate, subtruncate, irregularly and very shallowly lobed, naked within, persistent; corolla funnel-form, coriaceous, the tube dilated from base to apex, villous at the base of the stamens, the throat glabrous, the limb 5-lobate, the lobes short, valvate. Stamens 5, inserted near the base of the corolla-tube, the filaments elongate, unequal, pilose at the base; anthers dorsifixed, oblong, obtuse, bilobate at the base, included. Disk cupular, 5-lobate. Ovary 2-celled; style included, slender, the branches oblong, obtuse; ovules numerous, the placentae oblong, adnate to the septum.

Type species, *Nothophlebia costaricensis* Standley.

1. Nothophlebia costaricensis Standley, Contr. U. S. Nat.
Herb. 17: 438. 1914.

Tree with depressed crown, the branchlets minutely sericeous or glabrate; stipules lance-oblong, 3.5–4 cm. long, attenuate, sparsely sericeous outside, glabrous within; petioles stout, 4–5.5 cm. long, glabrate, sparsely tuberculate near the base; leaf-blades oval, 33 cm. long and 17 cm. wide, rounded and short-decurrent at the base, very obtuse at the apex, glabrous above, minutely sericeous beneath along the veins or glabrate, the lateral veins prominent, about 12 on each side, divergent or subascending, dichotomous near the margin; inflorescence many-flowered, lax, the branches tuberculate, the peduncles 2 cm. long, the pedicels stout, 7 mm. long or shorter; hypanthium 4–5 mm. long, minutely sericeous, the calyx 4–5 mm. long and broad, sparsely and minutely sericeous outside, glabrous within; corolla minutely puberulent outside, the tube 2 cm. long, 3.5 mm. thick at the base and 8–9 mm. in the throat, the lobes ovate, acute or acutish, 4–5 mm. long; filaments 9–10 mm. long, inserted 2 mm. above the base of the tube, the anthers 2.5 mm. long; style 1 cm. long, the branches 2 mm. long.

TYPE LOCALITY: Collines de Moin, Atlantic coastal belt, Costa Rica.

DISTRIBUTION: Known only from the type locality.

50. WATSONAMRA Kuntze, Rev. Gen. 302. 1891.

Pentagonia Benth. Bot. Voy. Sulph. 105. 1845. Not *Pentagonia* Vent. 1841.

Erect shrubs or small trees with simple or branched, succulent stems, rarely scandent, the branchlets terete or obtusely tetragonal, glabrous or pubescent. Leaves large, opposite, sessile or petiolate, membranaceous or coriaceous, entire or pinnatifid, finely lineolate between the veins, the petioles sometimes auriculate. Stipules large, elongate. Inflorescence axillary, sessile or pedunculate, cymose-corymbose, few- or many-flowered, the flowers large, red or yellow, bracteate; hypanthium turbinate or campanulate; calyx often glanduliferous, spathaceous or 5–6-lobate, persistent, the lobes equal or unequal, obtuse; corolla funnel-form or tubular, coriaceous, the tube glabrous within or villous at the base of the stamens, the throat glabrous, the limb 5–6-lobate, the lobes short, valvate. Stamens 5 or 6, inserted below the middle of the corolla-tube; filaments equal or unequal, usually villous at the base; anthers dorsifixed, ovate or oblong, obtuse, bilobate at the base, included. Disk annular or cupular. Ovary 2-celled; style included, the branches linear-oblong, obtuse; ovules numerous, the placentae elongate, swollen, adnate to the septum. Fruit baccate, subglobose, thick, 2-celled. Seeds numerous, obtusely angulate, the testa thin; endosperm fleshy; cotyledons orbicular, the radicle short, terete.

Type species, *Pentagonia macrophylla* Benth.

Leaf-blades entire.

Leaves sessile or subsessile.

Corolla red, the lobes spreading; calyx-lobes half as long as the tube
or shorter.

Corolla yellow, the lobes erect; calyx-lobes as long as the tube.

1. *W. magnifica*.
2. *W. Wendlandi*.

Leaves long-petiolate.

Leaf-blades finely pilose with spreading hairs; corolla hirtellous.

Leaf-blades glabrous, or appressed-pilose beneath along the veins; pubescence of the corolla appressed.

Bracts caducous; corolla-lobes oblong, twice as long as broad.

Bracts persistent; corolla-lobes broadly ovate, nearly as broad as long.

Leaf-blades pinnatifid.

Petioles marginate to the base or naked.

Inflorescence sessile, many-flowered; petioles marginate to the base.

Inflorescence short-pedunculate; petioles naked.

Petioles naked above, with large auricles at the base.

Auricles nearly half as long as the petioles; calyx tubular, 2 cm. long, the lobes one third as long as the tube; bracts 1-2 cm. long.

Auricles less than one fourth as long as the petioles; calyx tubular-campanulate, 1.5 cm. long, the lobes half as long as the tube; bracts 0.5-1 cm. long.

3. *W. pubescens*.

4. *W. Donnell-Smithii*.

5. *W. macrophylla*.

6. *W. tinajita*.

7. *W. gymnopoda*.

8. *W. Pittieri*.

9. *W. brachyotis*.

1. Watsonamra magnifica (K. Krause) Standley, Contr. U. S. Nat. Herb. 17: 441. 1914.

Pentagonia magnifica K. Krause, Bot. Jahrb. 40: 325. 1908.

Small tree, about 3 meters high, the branches brownish, sericeous when young; stipules lance-oblong, about 5 cm. long, attenuate; leaves sessile or subsessile, the blades obovate or obovate-oblong, 30-78 cm. long, 15-29 cm. wide, narrowed to the obtuse or rounded base, acuminate at the apex, entire, glabrous or minutely sericeous beneath along the veins, the lateral veins prominent, 12-15 on each side; cymes densely flowered, sessile or short-pedunculate; bracts ovate, acute; hypanthium 3-4 mm. long, sericeous; calyx tubular, 1.5 cm. long, sparsely sericeous outside, red, the lobes ovate, 5-6 mm. long, obtuse; corolla red, puberulent, especially above, the tube 2-2.5 cm. long, the lobes short, oblong, obtuse, reflexed or spreading; filaments about 1 cm. long, the anthers linear; disk entire; fruit globose or ovoid-globose, 1.2-2.2 cm. in diameter or larger.

TYPE LOCALITY: Along the Río Timbiqué, Colombia.

DISTRIBUTION: Panama and Colombia.

2. Watsonamra Wendlandi (Hook.) Kuntze, Rev. Gen. 302. 1891.

Pentagonia Wendlandi Hook. Bot. Mag. pl. 5230. 1861.

Shrub, the branchlets thick, glabrate; stipules ovate-oblong, attenuate; leaves subsessile, the blades oblong-obovate, narrowed to the rounded base, acutish at the apex, coriaceous; inflorescence few-flowered, subsessile, the flowers sessile or nearly so; bracts ovate-oblong, obtuse; calyx green, sericeous outside, the limb tubular-campanulate, glandular within at the base, the lobes oval or suborbicular, about half the total length of the calyx, rounded at the apex; corolla yellow, the tube about 2.5 cm. long, very thick, the lobes triangular-ovate, obtuse, erect; disk entire; stamens unequal, the filaments stout, flexuous.

TYPE LOCALITY: Described from cultivated plants of Central American origin.

DISTRIBUTION: Known only from the original material.

ILLUSTRATION: Bot. Mag. pl. 5230.

3. Watsonamra pubescens Standley, Contr. U. S. Nat. Herb. 17: 441. 1914.

Tree, 3-4 meters high, the branchlets succulent, hirtellous; petioles naked, 4-10 cm. long, densely short-hirtellous; leaf-blades obovate-oval or elliptic-oval, 26-48 cm. long and 12-24 cm. wide or larger, acute at each end, chartaceous, densely short-hirtellous, green above, paler beneath, the lateral veins prominent, 12-14 on each side, dichotomous near the margin; inflorescence few-flowered, the peduncles 5 mm. long or shorter, the very stout pedicels 2-3 mm. long; bracts oval or broadly ovate, 1-1.5 cm. long, obtuse, sparsely sericeous outside; hypanthium 6 mm. long, densely sericeous; calyx about 2 cm. long, densely sericeous below, sparsely so above, the lobes oval or oblong, about 1.5 cm. long, obtuse; corolla hirtellous outside, the tube slender, 2.5 cm. long, 3.5 mm. thick, the lobes ovate, acute, 5 mm. long; filaments

slender, villous; style 1.8 cm. long, pilose above; fruit (immature) globose, 1.2–1.4 cm. in diameter, pilose.

TYPE LOCALITY: Along the railroad near Tabernilla, Canal Zone, Panama, altitude 20 to 25 meters.

DISTRIBUTION: Known only from the type locality.

**4. Watsonamra Donnell-Smithii Standley, Contr. U. S.
Nat. Herb. 17: 442. 1914.**

Branchlets succulent, thick, sparsely sericeous or glabrate; stipules ovate, about 5 cm. long and 2.5 cm. wide, acuminate or attenuate, finely sericeous outside, glabrous within; petioles naked, 9–11 cm. long, minutely sericeous; leaf-blades oval, about 45 cm. long and 28 cm. wide, entire, obtuse at the base, membranaceous, glabrous above, paler beneath, sericeous along the veins, the lateral veins prominent, 14 on each side, straight, dichotomous near the margin; cymes dense, the peduncles 1–1.3 cm. long, the pedicels thick, 4–6 mm. long, tuberculate; bracts caducous; hypanthium about 6 mm. long, sericeous; calyx 1.2–1.5 cm. long, 5–7 mm. broad, the lobes oval or oblong, 6–7 mm. long, rounded at the apex, striolate, glabrous within; corolla sericeous outside, densely so above, the tube 2.5 cm. long, 3.5 mm. thick, the lobes lance-oblong, 6–7 mm. long, acute; filaments villous near the base.

TYPE LOCALITY: Near La Emilia, Llanuras de Santa Clara, Costa Rica, altitude 250 meters.

DISTRIBUTION: Known only from the type locality.

**5. Watsonamra macrophylla (Benth.) Kuntze, Rev. Gen.
302. 1891.**

Pentagonia macrophylla Benth. Bot. Voy. Sulph. 105. 1845.

Shrub or small tree, about 3 meters high, the branchlets finely sericeous when young; stipules triangular-lanceolate or ovate, 3–4.5 cm. long, long-attenuate, minutely sericeous outside; petioles naked, 3.5–7 cm. long, minutely sericeous or glabrate; leaf-blades rhombic-oval, ovate-oval, or oblong-elliptic, 14–54 cm. long and 10–28 cm. wide or larger, attenuate to rounded and short-decurrent at the base, acute at the apex, entire, chartaceous, glabrous above, minutely sericeous beneath along the veins, the lateral veins prominent, 13 or 14 on each side, straight, dichotomous near the margin; cymes few- or many-flowered, sessile or short-pedunculate, the flowers sessile or short-pedicellate, the pedicels tuberculate; bracts oval or ovate, 1–2 cm. long, obtuse or acute, persistent; hypanthium 6–8 mm. long, densely sericeous; calyx about 1 cm. long, cleft nearly to the base, red, the lobes oval, suborbicular, or broadly ovate, rounded or obtuse at the apex, sparsely and minutely sericeous or glabrate; corolla yellowish-white, sparsely and minutely sericeous outside, the tube 2.5 cm. long, 2.5–6 mm. thick, the lobes broadly ovate, 4–7 mm. long, acute or acutish.

TYPE LOCALITY: Panama.

DISTRIBUTION: Panama.

ILLUSTRATION: Benth. Bot. Voy. Sulph. pl. 39.

6. Watsonamra tinajita (Seem.) Kuntze, Rev. Gen. 302. 1891.

Pentagonia tinajita Seem. Bot. Voy. Herald 134. 1854.

Shrub or small tree, 2–4 meters high, the branchlets minutely sericeous or glabrate; stipules ovate or ovate-oblong, 2.5–4 cm. long, acute or acuminate, sparsely sericeous or glabrate; leaf-blades 35–60 cm. long, 25–35 cm. wide, pinnatifid, with usually 7 or 9 lobes, abruptly long-attenuate to the base, the lower portion of the blade petiole-like, 8–16 cm. long, the lobes ovate to oblong, 3–6 cm. wide, acute, the blades membranaceous, bright-green above, glabrous, paler beneath, sparsely appressed-pilose, especially along the veins, with short hairs or glabrous, the venation prominent; cymes few- or many-flowered, sessile, the flowers sessile or subsessile; bracts large, oval, persistent; hypanthium about 5 mm. long, sericeous or glabrate; calyx 8–13 mm. long, the lobes 5–7 mm. long, oval or suborbicular, rounded at the apex, glabrous; corolla glabrous outside, the tube 2.5 cm. long, 5–7 mm. thick, the lobes oblong-ovate, 6–7 mm. long, obtuse or acute; fruit subglobose, 1–1.7 cm. in diameter, densely tuberculate; seeds few, 2.5–3 mm. long, reddish-brown, smooth.

TYPE LOCALITY: Near David, Chiriquí, Panama.

DISTRIBUTION: Chiriquí, Panama.

ILLUSTRATION: Seem. Bot. Voy. Herald pl. 28.

7. ***Watsonamra gymnopoda*** Standley, Contr. U. S. Nat. Herb. 17: 444. 1914.

Shrub, 2–2.5 meters high, the branchlets thick, minutely puberulent or glabrate; stipules oblong-ovate or lance-oblong, 3–6 cm. long, acuminate or attenuate, sparsely strigillose or glabrate outside; petioles 7–23 cm. long, naked below, winged above, strigillose-puberulent or glabrate, the wings 1.5 cm. wide or narrower; leaf-blades 25–68 cm. long and 17–72 cm. wide or larger, herbaceous or chartaceous, bright-green and glabrous above, paler beneath, strigillose-puberulent along the veins, pinnatifid nearly to the costa, with 9–13 lobes, these divergent, linear-oblong, 6.5 cm. wide or narrower, somewhat contracted below, attenuate to the acute apex, the venation prominent; cymes densely few-flowered, the peduncles 6–9 mm. long; bracts oblong, obtuse or acute, 2–3 cm. long or smaller, sparsely strigillose, ciliate; fruit ovoid-globose, 1.8 cm. long and 1.4 cm. thick, sparsely tuberculate; seeds numerous, brown, 3–4.5 mm. long, minutely reticulate.

TYPE LOCALITY: In forests, Loma de Gloria, near Fató, Province of Colón, Panama, altitude 10 to 100 meters.

DISTRIBUTION: Known only from the type locality.

8. ***Watsonamra Pittieri*** Standley, Contr. U. S. Nat. Herb. 17: 443. 1914.

Branchlets thick, obtusely quadrangular, glabrate; stipules lance-oblong, 5.5 cm. long, cuspidate-attenuate, densely and minutely sericeous outside; petioles 14–17 cm. long, minutely sericeous when young but soon glabrate, auriculate at the base, the auricles purplish-red, rounded, crispate, about 8 cm. long, the margins irregularly lobed; leaf-blades 68 cm. long and 58 cm. wide or smaller, truncate or obtuse at the base, chartaceous or subcoriaceous, glabrous, or minutely sericeous beneath along the veins, deeply pinnatifid, with 9 or 11 lobes, these ascending or subdivaricate, narrowly oblong, acute or abruptly acute; cymes few-flowered, the peduncles 2.5 cm. long or shorter, the flowers subsessile; bracts oblong or narrowly oblong, 1–2 cm. long, acute, persistent, finely sericeous outside, ciliate; hypanthium 5 mm. long, densely sericeous; calyx 1.5 cm. long, sparsely sericeous, striate, the lobes oblong-ovate, obtuse or acutish, about 4 mm. long; corolla-tube about 2.5 cm. long, sparsely appressed-pilose; fruit globose, about 2 cm. in diameter, smooth, glabrate.

TYPE LOCALITY: In forests around Puerto Obaldía, San Blas Coast, Panama, altitude 50 meters or less.

DISTRIBUTION: Known only from the type locality.

9. ***Watsonamra brachyotis*** Standley, Contr. U. S. Nat. Herb. 17: 443. 1914.

Small tree, about 3.5 meters high, the trunk 2.5 cm. thick, the wood yellowish-white, the branches grayish, glabrate; petioles 8–10 cm. long, minutely sericeous or glabrate, auriculate at the base, the auricles 2.5 cm. long or shorter, red, crispate, the margins undulate; leaf-blades rhombic, 33–37 cm. long, 42–46 cm. wide, obtuse at the base, chartaceous, glabrous above, minutely sericeous beneath along the veins, pinnatifid nearly to the costa, with 7 lobes, these narrowly oblong, 4–6 cm. wide, obtuse-acuminate; cymes densely few-flowered, short-pedunculate or subsessile; bracts broadly ovate, 5–10 mm. long, acute or acutish, persistent, striate, sparsely sericeous outside, ciliate; hypanthium 3–4 mm. long, sericeous; calyx tubular-campanulate, 10–12 mm. long, striate, sparsely sericeous, the lobes 5–6 mm. long, ovate-oval, obtuse, ciliate; corolla red, the tube 3 cm. long, 2.5–4 mm. thick, glabrous below, sparsely and minutely sericeous above, the lobes ovate, 3–4 mm. long, acute; filaments pilose at the base, about 1 cm. long; style 1.5–2 cm. long.

TYPE LOCALITY: Near Marragantí, Panama.

DISTRIBUTION: Known only from the type locality.

51. ***SOMMERA*** Schlecht. Linnaea 9: 602. 1834.

Branched shrubs or small trees, more or less pubescent, the branchlets terete. Leaves opposite, petiolate, membranaceous, broad, conspicuously lineolate with numerous fine parallel

veins in the areoles. Stipules interpetiolar, large, caducous. Flowers small, white, in axillary pedunculate cymes, corymbs, or racemes, bracteate and bracteolate; hypanthium turbinate; calyx 4-5-lobate, the lobes subfoliaceous, equal or unequal, persistent; corolla funnelform or subcampanulate, sericeous outside, the throat villous, the limb 4-5-lobate, the lobes short or elongate, valvate. Stamens 5, inserted in the throat of the corolla; filaments short, barbate; anthers dorsifixed, oblong, obtuse at each end. Disk thick, cupular or lobulate. Ovary 2-celled; style short, the branches linear, obtuse, glabrous or hirsute; ovules numerous, the placentae hemispheric, adnate to the septum. Fruit baccate, globose or ovoid, 2-celled. Seeds numerous, minute, obtusely angulate, the testa thin, foveolate; endosperm fleshy; cotyledons broad, the radicle terete, elongate.

Type species, *Sommera arborescens* Schlecht.

Leaves quite glabrous on the upper surface; branchlets glabrous or nearly so.

Calyx-lobes lanceolate or lance-oblong, acuminate; cymes mostly 3-flowered; leaf-blades acute at the base.

Calyx-lobes oval or suborbicular, rounded at the apex; inflorescence with more than 3 flowers.

Inflorescence racemose; leaf-blades acute at the base.

Inflorescence cymose-corymbose; leaf-blades subcordate at the base.

Leaves sparsely or densely pilose on the upper surface; branchlets pilose.

Calyx-lobes acute or acuminate; bracts broadly ovate or oblong, obtuse or abruptly short-acuminate; peduncles 2-5 cm. long.

Calyx-lobes rounded or obtuse, rarely acutish; bracts lance-ovate to linear, attenuate or long-acuminate; peduncles 1.5 cm. long or shorter.

1. *S. arborescens*.

2. *S. chiapensis*.

3. *S. subcordata*.

4. *S. guatemalensis*.

5. *S. grandis*.

1. *Sommera arborescens* Schlecht. *Linnaea* 9: 602. 1834.

Branches reddish-brown, very sparsely lenticellate, glabrous or very sparsely pilose; stipules lance-oblong, 1.5-2.5 cm. long, acuminate, brown, glabrous; petioles 0.7-2.5 cm. long, appressed-pilose; leaf-blades obovate-oblong or elliptic-oblong, 10.5-26 cm. long, 3.5-10.5 cm. wide, acute or attenuate at the base, subabruptly acuminate at the apex, bright-green above, sublustrous, glabrous, paler beneath, sericeous along the veins, the lateral veins slender, prominent, ascending, straight or subarcuate; inflorescence cymose, usually 3-flowered, the peduncles slender, 1.5-2.2 cm. long, the flowers subsessile; bracts and bractlets linear-lanceolate, attenuate; hypanthium 5-6 mm. long, densely appressed-pilose; calyx-tube about 1 mm. long, the lobes lanceolate or lance-oblong, 5-9 mm. long, acuminate, reticulate-veined, appressed-pilose; corolla densely pilose; fruit oval, 1.2-1.4 cm. long, 8 mm. wide, sparsely pilose.

TYPE LOCALITY: Near Hacienda de la Laguna, Veracruz.

DISTRIBUTION: Veracruz.

ILLUSTRATION: E. & P. Nat. Pfl. 4⁴: f. 26, J, K.

2. *Sommera chiapensis* Brand. Univ. Calif. Publ. Bot. 6: 196. 1915.

Branchlets succulent, glabrous; stipules linear-lanceolate, about 1.5 cm. long, attenuate, glabrous; petioles slender, 2-5 cm. long, sparsely appressed-pilose; leaf-blades obovate, oval-obovate, or obovate-oblong, 12-27 cm. long, 5-10 cm. wide, abruptly acuminate or attenuate at the base, abruptly acute-acuminate at the apex, bright-green above, glabrous, paler beneath, densely sericeous when young, sericeous along the veins in age, the lateral veins prominent, slender, ascending, subarcuate; inflorescence racemose or cymose-racemose, few-flowered, the pedicels 2-3 mm. long, usually solitary at the end of a peduncle of equal or greater length, the primary peduncles 1-2.5 cm. long; bracts small, oblong, obtuse; calyx-tube 1.5-2 mm. long, the lobes semiorbicular or ovate-orbicular, ciliolate; fruit (immature) globose, 7 mm. in diameter, glabrate.

TYPE LOCALITY: Near Finca Irlanda, Chiapas.

DISTRIBUTION: Known only from the type locality.

3. *Sommera subcordata* Standley, sp. nov.

Branchlets stout, glabrous; petioles 1.8-2.5 cm. long, glabrous or very sparsely pilose with spreading hairs; leaf-blades oval-obovate, about 15 cm. long and 8 cm. wide, subcordate or rounded at the base, abruptly short-acuminate at the apex, bright-green above, sublustrous,

glabrous, slightly paler beneath, sparsely pilose with short stiff hairs, the lateral veins prominent, slender, divergent or ascending at angle of 50° or more, arcuate; inflorescence cymose-corymbose, few-flowered, the peduncles about 1 cm. long, stout, the flowers sessile; bracts oblong-lanceolate, obtuse or acute, 6–15 mm. long; hypanthium 3–4 mm. long, appressed-pilose with fulvous hairs; calyx-lobes oval or rounded-oval, 2.5–3.5 mm. long, rounded at the apex, reticulate-veined; corolla densely appressed-pilose.

Type collected at Colomas, Sinaloa, 1897, J. N. Rose (U. S. Nat. Herb. no. 866799).
DISTRIBUTION: Sinaloa.

4. *Sommera guatemalensis* Standley, Contr. U. S. Nat. Herb.
17: 436. 1914.

Branches reddish-brown, sparsely lenticellate, appressed-pilose when young, soon glabrate; stipules narrowly lanceolate, 3.5–4.5 cm. long, attenuate, brown, more or less strigillose-sericeous; petioles 2–5 cm. long, sericeous; leaf-blades oval to oblong-obovate, 17–32 cm. long, 8–14 cm. wide, acute or obtuse at the base, abruptly or subabruptly acuminate at the apex, with an acute acumen 1.5–2 cm. long, sericeous when young, in age sparsely appressed-pilose above with minute hairs, paler beneath, appressed-pilose along the veins and sparsely and minutely so elsewhere, the lateral veins prominent, subascending, arcuate; inflorescence cymose-corymbose, many-flowered, the peduncles 2–5 cm. long, the flowers sessile or short-pedicellate; bracts broadly ovate or oblong, obtuse or abruptly short-acuminate, brown, sparsely appressed-pilose or glabrate; hypanthium 3–4 mm. long, densely sericeous; calyx-lobes oval or broadly ovate, 3–6 mm. long, usually acute or acuminate, sometimes obtuse, sparsely short-pilose, the venation not reticulate; corolla densely sericeous outside, the tube 6–8 mm. long, the lobes one fifth to one third as long as the tube, triangular-ovate, acute; style pilose above; fruit globoso-oval, 12 mm. long, 9–10 mm. wide, sparsely sericeous.

TYPE LOCALITY: Near Cubilquit, Alta Verapaz, Guatemala, altitude 350 meters.
DISTRIBUTION: Alta Verapaz, Guatemala.

5. *Sommera grandis* (Bartl.) Standley.

Petesia grandis Bartl.; DC. Prodr. 4: 395. 1830.

Petesia minor Griseb. Bonplandia 6: 8. 1858.

Sommera Donnell-Smithii Standley, Contr. U. S. Nat. Herb. 17: 436. 1914.

Sommera mesochora Standley, Contr. U. S. Nat. Herb. 17: 437. 1914.

Shrub or small tree, sometimes 8 meters high, the branches reddish-brown, sparsely lenticellate, densely pilose when young with appressed or ascending fulvous hairs; stipules lance-ovate or narrowly lanceolate, 1.5–3.5 cm. long, attenuate, brown, more or less strigose; petioles stout, 0.8–2.5 cm. long, fulvous-pilose with appressed or spreading hairs; leaf-blades obovate, rhombic-obovate, obovate-oval, oval, or oblanceolate-oblong, 10–22 cm. long, 3.5–10 cm. wide, rounded to attenuate at the base, abruptly acuminate at the apex, bright-green above, pilose, even in age, with minute appressed hairs, slightly paler beneath, sparsely or densely pilose with usually appressed hairs, the lateral veins prominent, ascending or sub-ascending, subarcuate; inflorescence cymose-corymbose, usually many-flowered, the peduncles 0.5–1.5 cm. long, the flowers subsessile or the fruiting pedicels 3–8 mm. long; bracts linear to lance-ovate, acute or attenuate, pilose; hypanthium densely appressed-pilose, 3–4 mm. long; calyx-lobes suborbicular to ovate-oblong, 2.5–4 mm. long, rounded or obtuse at the apex or rarely acutish, reticulate-veined, appressed-pilose; corolla white, sericeous outside, 5–8 mm. long, the lobes about one third as long as the tube, oblong or ovate, obtuse; fruit subglobose, about 9 mm. in diameter, sparsely pilose; seeds brown, about 1.5 mm. long.

TYPE LOCALITY: Mexico.
DISTRIBUTION: Colima to Panama.

52. *TONTANEA* Aubl. Pl. Guian. 108. 1775.

Coccocipsilum Lam. Encyc. 2: 56. 1786.

Bellarzia Schreb. Gen. 790; homonym. 1791; Willd. Sp. Pl. 1: 626. 1797. Not *Bellarzia* All. 1785.

Condalia R. & P. Fl. Per. Prodr. 11. 1794.

Prostrate, annual or perennial herbs, glabrous or pubescent, the branchlets terete. Leaves opposite, petiolate. Stipules solitary, small. Flowers small, purplish or blue, sometimes

dimorphous, the heads axillary, solitary, sessile or pedunculate; hypanthium ovoid or turbinate; calyx 4-lobate, the lobes narrow, persistent; corolla funnelform, the throat glabrous, the limb 4-lobate, the lobes oblong, valvate. Stamens 4, inserted in the tube of the corolla; filaments short; anthers dorsifixed near the base, oblong-linear, obtuse, bilobate at the base, short-exserted or included. Disk annular, bilobate. Ovary 2-celled; style slender, with 2 short or subelongate branches; ovules numerous, horizontal, the placentae small, adnate to the septum. Fruit baccate, ovoid, 2-celled, blue. Seeds numerous, orbicular, subangulate, plano-convex, the hilum ventral, the testa subcoriaceous, granulate; endosperm fleshy; embryo small, the cotyledons ovate, the radicle terete.

Type species, *Tontanea guianensis* Aubl.

Pubescence of the stems appressed or ascending, at least on young stems; flower-heads often sessile or subsessile.

Heads many-flowered, pedunculate; calyx-lobes obtuse.

Heads usually 3-flowered, often sessile; calyx-lobes very acute.

Flower-heads pedunculate.

Flower-heads all or mostly sessile.

Upper surface of the leaves appressed-pilose with short hairs.

Upper surface of the leaves hirsute with long spreading hairs.

Pubescence of the stems widely spreading or reflexed; flower-heads pedunculate.

Leaves appressed-pilose on the upper surface with short hairs.

Leaves hirsute with long spreading hairs.

Leaf-blades broadly ovate, rounded at the base.

Leaf-blades mostly reniform.

1. *T. canescens*.

2. *T. tenuis*.

3. *T. herbacea*.

4. *T. hispidula*.

5. *T. guianensis*.

6. *T. hirsuta*.

7. *T. pleuropoda*.

1. *Tontanea canescens* (Willd.) Standley.

Coccocipsilum repens H. B. K. Nov. Gen. & Sp. 3: 316. 1819. Not *C. repens* Sw. 1788.

Coccocipsilum canescens Willd.; Cham. & Schlecht. Linnaea 4: 139. 1829.

Branches stout, densely pilose-sericeous when young with yellow or whitish hairs; stipules linear-subulate, 3–10 mm. long; petioles stout, 0.4–2.5 cm. long, densely pilose with long, appressed or sometimes spreading hairs; leaf-blades oblong, ovate-oblong, or broadly ovate, 2–8 cm. long, 1–3.5 cm. wide, subcordate to obtuse at the base, acute or obtuse at the apex, densely pilose above with short, subappressed, mostly yellowish hairs, densely pilose beneath with longer, whitish or yellow, appressed or somewhat spreading hairs, the lateral veins numerous, conspicuous, arcuate; heads densely many-flowered, on peduncles 1–6 cm. long; bracts often large and foliaceous; calyx and hypanthium densely long-pilose, the calyx-lobes oblong or ovate, 2–3 mm. long, foliaceous, usually obtuse, twice as long as the hypanthium; corolla purplish-blue, about 5 mm. long, densely pilose, the lobes oblong or lance-oblong, obtuse or acute, nearly as long as the tube; fruit densely pilose, 5–7 mm. in diameter, bright-blue; seeds dark-brown, about 1.2 mm. broad.

TYPE LOCALITY: Near Popayán, Colombia.

DISTRIBUTION: Guatemala to Peru and Brazil; reported from Oaxaca.

2. *Tontanea tenuis* (Urban) Standley.

? *Coccocipsilum pseudotontanea* Griseb. Fl. Brit. W. Ind. 322. 1861.

Coccocipsilum tenue Urban, Repert. Sp. Nov. 13: 479. 1915.

Stems slender, pilose when young with short, appressed or ascending hairs; stipules linear-subulate, 1–3 mm. long; petioles slender, 4–13 mm. long, pilose like the stems; leaf-blades ovate, rounded-ovate, oblong-ovate, or oblong, 1.5–4 cm. long, 0.8–2.2 cm. wide, rounded or subtruncate at the base, often abruptly short-decurrent, acute or obtuse at the apex, often apiculate, appressed-pilose with short hairs, or the pubescence spreading beneath; heads 2–3-flowered, on peduncles 0.3–2.4 cm. long; bracts linear, 3–4 mm. long; calyx and hypanthium densely short-pilose, the calyx-lobes linear, acute, 2–4 mm. long, more than twice as long as the hypanthium; corolla 5 mm. long, short-pilose, the lobes lance-triangular, half as long as the tube; fruit short-pilose, 3–6 mm. in diameter.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Eastern Cuba, Jamaica, and Trinidad.

3. *Tontanea herbacea* (Lam.) Standley.

Coccocipsilum herbaceum Lam. Encyc. 2: 56. 1786.

Coccocipsilum repens Sw. Prodr. 31. 1788.

Stems stout or slender, densely pilose when young with short or long, appressed or ascending hairs; stipules linear-subulate, 2–6 mm. long; petioles usually slender, 0.4–2.5 cm. long, densely pilose with short or long, ascending or appressed hairs; leaf-blades broadly ovate, ovate-oblong, or oblong, 1.8–5 cm. long, 0.8–3 cm. wide, rounded or obtuse at the base, often short-decurrent, obtuse or acutish at the apex, sparsely or densely pilose above with short appressed yellow hairs, paler beneath, short-pilose, often densely so, with subappressed, mostly yellow hairs; heads usually sessile, sometimes partly short-pedunculate, mostly 2–3-flowered; bracts linear-subulate, 3–4 mm. long; calyx and hypanthium densely appressed-pilose, the calyx-lobes linear-subulate, 2–3 mm. long, twice as long as the hypanthium or longer; corolla blue, 5–7 mm. long, short-pilose, the lobes lance-oblong, obtuse or acute, about half as long as the tube; fruit 5–6 mm. in diameter, bright-blue, short-pilose; seeds dark-brown, about 1.2 mm. broad.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Greater Antilles; Guatemala to Colombia.

ILLUSTRATION: P. Br. Hist. Jam. pl. 6, f. 2.

4. *Tontanea hispidula* Standley, sp. nov.

Branches slender, pilose with stiff, whitish, appressed or ascending hairs; stipules subulate, 2–3 mm. long; petioles slender, 0.5–1.2 cm. long, pubescent like the stems; leaf-blades broadly ovate, rounded-ovate, or oblong-ovate, 1.7–3.5 cm. long, 1–2.5 cm. wide, rounded at the base and short-decurrent, acutish to rounded at the apex, hispid above with long slender yellow hairs, paler beneath, sparsely or densely hispid; heads mostly sessile, sometimes very short-pedunculate, the bracts linear or subulate, 3–4 mm. long; calyx and hypanthium hispid, the calyx-lobes linear, acute, 2–4 mm. long; corolla bluish-white, 7–9 mm. long, sparsely hispid; fruit oval, 8–15 mm. long, sparsely hispid; seeds brown, about 1 mm. broad, densely tuberculate.

Type collected at Chagres, Panama, 1850, A. Fendler 179 (U. S. Nat. Herb. no. 42058).

DISTRIBUTION: Costa Rica and Panama.

5. *Tontanea guianensis* Aubl. Pl. Guian. 108. 1775.

Bellardia repens Willd. Sp. Pl. 1: 626. 1797.

Tontanea repens Pers. Syn. Pl. 1: 134. 1805.

Coccocipsilum Tontanea H. B. K. Nov. Gen. & Sp. 3: 316. 1819.

Bellardia Tontanea R. & S. Syst. Veg. 3: 205. 1818.

Coccocipsilum nummulariifolium Cham. & Schlecht. Linnaea 4: 145. 1829.

Stems stout, densely pilose or hirsute with long, spreading, yellowish or purplish hairs; stipules filiform-subulate, 2–5 mm. long; petioles usually stout, 0.5–3 cm. long; leaf-blades oval, oval-ovate, ovate, or rounded-ovate, 2.5–7 cm. long, 1.5–4.5 cm. wide, truncate to obtuse at the base, often short-decurrent, rounded to acutish at the apex, often apiculate, densely pilose on the upper surface with long and short, mostly appressed, yellow, whitish, or purplish hairs, scarcely paler beneath, often purplish, densely soft-pilose; heads usually 2–4-flowered, the peduncles 1–4 cm. long, the bracts linear, 3–7 mm. long; calyx and hypanthium densely pilose, the calyx-lobes linear, acute, 3–4 mm. long; corolla blue, 7–10 mm. long, copiously pilose, the lobes lance-oblong, about half as long as the tube; fruit blue, pilose, 6–11 mm. in diameter; seeds dark-brown, 1.2 mm. broad, minutely tuberculate.

TYPE LOCALITY: Guiana.

DISTRIBUTION: Veracruz and Oaxaca, southward to Colombia and Brazil; Cuba and Jamaica.

6. *Tontanea hirsuta* (Bartl.) Standley.

Coccocipsilum hirsutum Bartl.; DC. Prodr. 4: 396. 1830.

? *Coccocipsilum ciliatum* Schlecht. & Cham. Linnaea 6: 414. 1831.

Branches slender or stout, densely hirsute or hispid; stipules subulate, 3–6 mm. long; petioles 0.4–2 cm. long, hirsute; leaf-blades oval, oval-ovate, or broadly oblong-ovate, 2–5.5 cm. wide, rounded at the base, often short-decurrent, rounded to acutish at the apex, often apiculate, hirsute or hispid above with long spreading yellowish hairs, scarcely paler beneath,

hirsute; heads 3-5-flowered, the peduncles 1-3 cm. long, the bracts linear, 3-4 mm. long; calyx and hypanthium densely hirsute, the calyx-lobes linear, acute, 2.5-5 mm. long; corolla 12-14 mm. long, hirsute, the lobes ovate-oblong or lance-oblong, half as long as the tube or longer; fruit hirsute, 6-10 mm. broad; seeds about 1 mm. broad, dark-brown, minutely tuberculate.

TYPE LOCALITY: Not stated, but probably Mexico.

DISTRIBUTION: Tepic to Veracruz and Panama; also in Trinidad.

7. *Tontanea pleuropoda* (Donn. Smith) Standley.

Geophila pleuropoda Donn. Smith, Bot. Gaz. 52: 50. 1911.

Geocardia pleuropoda Standley, Contr. U. S. Nat. Herb. 17: 445. 1914.

Stems slender, hirsute with long, spreading, white, yellow, or purplish hairs; stipules filiform, 1-3 mm. long; petioles 0.3-1.5 cm. long, hirsute; leaf-blades reniform or orbicular, 1-3.5 cm. long and broad, cordate or truncate at the base, broadly rounded at the apex, usually apiculate, hirsute or hispid above with spreading yellowish hairs, paler beneath, often purplish, sparsely or densely long-hirsute, the lateral veins 2-4 on each side, spreading, arcuate; heads mostly 2-4-flowered, the peduncles 1-3.5 cm. long, the bracts linear or leaf-like; calyx and hypanthium long-hirsute, the calyx-lobes linear or oblong-linear, acute, 2-4 mm. long; corolla about 12 mm. long, hirsute, the lobes lance-oblong, about two thirds as long as the tube; fruit densely hirsute.

TYPE LOCALITY: Between Secanquím and Sepacuité, Alta Verapaz, Guatemala, altitude 1220 meters.

DISTRIBUTION: Veracruz to Costa Rica; mountains of Oriente, Cuba.

DOUBTFUL SPECIES

Coccocipsilum glabrum DC. Prodr. 4: 397. 1830. Described from Panama; said to be quite glabrous; perhaps a species of *Carinta*.

53. *SABICEA* Aubl. Pl. Guian. 192. 1775.

Schwenkfelda Schreb. Gen. 123. 1789.

Shrubs, usually scandent, or rarely trees, commonly pubescent. Leaves opposite or rarely verticillate. Stipules intrapetiolar, persistent, erect or reflexed. Flowers usually small, capitate or cymose, axillary, bracteate; hypanthium subglobose; calyx 3-6-lobate, the lobes usually elongate and narrow, equal or unequal, persistent; corolla funnelform or salverform, the tube short or elongate, the throat villous, the limb 4-5-lobate, the lobes short, valvate. Stamens 4 or 5, inserted in the tube or throat of the corolla; filaments subelongate or very short; anthers dorsifixed, linear, obtuse, included. Disk annular, crenulate. Ovary usually 4-5-celled, rarely 2-celled; style erect, with 2-5 linear obtuse branches; ovules numerous, the placentae swollen, affixed to the axis of the ovary. Fruit baccate, 2-5-celled. Seeds numerous, minute, ovoid or angulate, the testa thin; endosperm fleshy; embryo clavate, bifid.

Type species, *Sabicea cinerea* Aubl.

Inflorescence dense at maturity, the flowers crowded, sessile.

1. *S. cinerea*.

Stems arachnid-tomentose; calyx-lobes about 7 mm. long.

2. *S. hirsuta*.

Stems not arachnid-tomentose; calyx-lobes 2-4.5 mm. long.

3. *S. flagenoides*.

Stipules broadly ovate, 5-10 mm. long; leaves hirsute or strigose.

Stipules setaceous, 2-3 mm. long; leaves puberulent or glabrate.

Inflorescence lax at maturity, the flowers pedicellate.

Calyx-lobes 6-10 mm. long.

4. *S. mexicana*.

Pubescence of the stems appressed; calyx-lobes linear; stipules longer than broad.

5. *S. hirta*.

Pubescence of the stems spreading; calyx-lobes ovate-lanceolate or elliptic; stipules usually as broad as long or broader.

6. *S. colombiana*.

Calyx-lobes 2-4.5 mm. long; pubescence of the stems appressed.

7. *S. panamensis*.

Bracts of the flower-heads conspicuous, connate at the base.

8. *S. costaricensis*.

Bracts inconspicuous, distinct.

Plants erect; leaf-blades obtusely acuminate.

Plants scandent; leaf-blades acutely acuminate.

1. *Sabicea cinerea* Aubl. Pl. Guian. 193. 1775.*Schwenkfelda cinerea* Sw. Fl. Ind. Occ. 452. 1797.

Scandent shrub, the branchlets arachnoid-tomentose; leaf-blades mostly elliptic, about 11 cm. long and 5.5 cm. wide, arachnoid-tomentose above when young, glabrate in age, densely covered beneath with a pale-yellow tomentum; inflorescence sessile, dense, the flowers sessile or subsessile; bracts oval, 9 mm. long and 8 mm. wide or smaller, conspicuous, involucre-like; calyx-lobes lanceolate or oblong, about 7 mm. long; corolla white, densely hirsute outside, the tube 12–15 mm. long, the lobes lanceolate, about 6 mm. long; fruit rose or purple, about 8 mm. in diameter.

TYPE LOCALITY: Guiana.

DISTRIBUTION: Porto Rico; also in the Guianas.

ILLUSTRATIONS: Aubl. Pl. Guian. pl. 75; Sw. Fl. Ind. Occ. pl. 10; Wernham, Monog. Sabicea pl. 12, f. 47.

2. *Sabicea hirsuta* H. B. K. Nov. Gen. & Sp. 3: 417. 1820.*Schwenkfelda hirsuta* Spreng. Syst. 1: 765. 1825.*Sabicea glabrescens* Hemsl. Biol. Centr. Am. Bot. 2: 33, in part. 1881. Not *S. glabrescens* Benth. 1841.*Sabicea hirta* Hemsl. Biol. Centr. Am. Bot. 2: 33, in part. 1881. Not *S. hirta* Sw. 1788.*Sabicea hirsuta adpressa* Wernham, Monog. Sabicea 55. 1914.

Scandent shrub, the branches densely yellowish-hirsute or sometimes pilose with ascending hairs; stipules broadly ovate or rounded, reflexed, 5–10 mm. long, obtuse or acutish; leaf-blades ovate, ovate-oblong, ovate-oval, or elliptic-oblong, 5–12 cm. long, 1.5–5.5 cm. wide, rounded or obtuse at the base, often short-decurrent, usually subabruptly acuminate at the apex, with an acute acumen, copiously hirsute, or sometimes merely strigose along the veins, the venation prominent beneath; flowers few, crowded and sessile in the axils; calyx and hypanthium densely hirsute, the calyx-lobes linear-lanceolate, acute, 2–4 mm. long, finally reflexed; corolla white, hirsute or strigose, the tube about 6 mm. long, the lobes narrowly triangular, 1.5–2 mm. long; fruit violaceous, about 1 cm. in diameter; seeds brown.

TYPE LOCALITY: Banks of the Orinoco River, Colombia.

DISTRIBUTION: Veracruz to Peru and Brazil; Porto Rico.

ILLUSTRATION: Wernham, Monog. Sabicea pl. 12, f. 65.

3. *Sabicea flagenoides* Wernham, Monog. Sabicea 57. 1914.

Shrub, the branchlets divaricate, tomentulose when young; stipules subulate-setaceous, 2–3 mm. long; leaf-blades lanceolate, about 5 cm. long and 1.5 cm. wide, acuminate, lustrous above, sparsely puberulent along the costa, sparsely puberulent beneath along the veins, elsewhere glabrous, the lateral veins few, obscure; flowers few, crowded and subsessile in the axils; calyx-lobes lanceolate or narrowly triangular, acutish, about 4.5 mm. long in fruit.

TYPE LOCALITY: Chichankanab, Yucatán.

DISTRIBUTION: Known only from the type locality.

4. *Sabicea mexicana* Wernham, Monog. Sabicea 41. 1914.*Sabicea glabrescens* Hemsl. Biol. Centr. Am. Bot. 2: 33, in part. 1881. Not *S. glabrescens* Benth. 1841.

Scandent shrub, the branchlets pilose with subappressed hairs; stipules broadly ovate, 10 mm. long and 8 mm. wide or smaller, acuminate; petioles about 1 cm. long; leaf-blades lance-oblong, ovate-oblong, or elliptic-oblong, 8–12 cm. long, 2.5–5 cm. wide, obtuse or acute at the base, short-decurrent, subabruptly acuminate or long-acuminate at the apex, with an acute acumen, copiously hirsute, sometimes strigose beneath along the veins, the venation prominent beneath; inflorescence rather lax, strigose or hirsute, subsessile, the flowers short-pedicellate or partly sessile; bracts inconspicuous; calyx-lobes linear, acuminate, 6–10 mm. long, pilose; corolla white, strigose outside, the tube 10–12 mm. long, the lobes lanceolate, acute, 3 mm. long.

TYPE LOCALITY: Mexico.

DISTRIBUTION: Oaxaca, and perhaps elsewhere in Mexico.

ILLUSTRATION: Wernham, Monog. Sabicea pl. 5, f. 1, 2.

5. *Sabicea hirta* Sw. Prodr. 46. 1788.

Schwenkfelda hirta Sw. Fl. Ind. Occ. 450. 1797.

Scandent shrub, the branchlets hirsute; stipules suborbicular, 10 mm. long and 14 mm. broad or smaller; petioles 1–3 cm. long; leaf-blades elliptic-oblong or oval-oblong, 8–12.5 cm. long, 3–5 cm. wide, obtuse or acute at the base, subabruptly acuminate at the apex, with an obtuse acumen, copiously hirsute, sublustrous above, paler beneath; inflorescence finally lax, umbellate, the peduncle 1.5 cm. long or shorter, the pedicels in fruit 6–9 mm. long; bracts ovate, often 1 cm. long, involucre-like; calyx and hypanthium hirsute, the calyx-lobes ovate-lanceolate or elliptic, 6–8 mm. long, acute or obtuse; corolla white, sparsely hirsute outside, the tube about 1 cm. long, the lobes ovate-lanceolate, acute, 4–5 mm. long; fruit white, sparsely hirsute, about 1 cm. in diameter; seeds minute, brown.

TYPE LOCALITY: Jamaica.

DISTRIBUTION: Mountains of Jamaica.

ILLUSTRATION: Wernham, Monog. *Sabicea* pl. 12, f. 33.

6. *Sabicea colombiana* Wernham, Monog. *Sabicea* 39. 1914.

Shrub, the branchlets stout, strigose or strigillose when young; stipules ovate, 7–10 mm. long, 7–8 mm. wide, soon reflexed, obtuse; petioles 1–1.5 cm. long; leaf-blades oval, 10 cm. long and 5.5 cm. wide or smaller, narrowed to each end, strigose or glabrate; inflorescence lax, sparsely strigose, subsessile, or the peduncles 0.7–1.5 cm. long, the pedicels 6–7 mm. long; bracts 2 or 3, conspicuous, ovate-lanceolate, long-acuminate, 7–8 mm. long, at first connate at the base; calyx-lobes linear-oblong, 4.5 mm. long or shorter, glabrous; corolla white, sparsely strigose outside, the tube 9 mm. long, the lobes lanceolate, acute, 2.5 mm. long.

TYPE LOCALITY: Colombia.

DISTRIBUTION: Panama to Venezuela.

ILLUSTRATION: Wernham, Monog. *Sabicea* pl. 12, f. 31.

7. *Sabicea panamensis* Wernham, Monog. *Sabicea* 30. 1914.

Erect shrub, 1–3 meters high, the branches reddish-brown, densely yellowish-sericeous when young; stipules ovate or ovate-oval, 7–10 mm. long, 4–6 mm. wide, acute or obtuse; petioles stout, 1–1.5 cm. long; leaf-blades oval to ovate or ovate-oblong, 6.5–10.5 cm. long, 2.7–5 cm. wide, rounded at the base, acute or subabruptly short-acuminate at the apex, with an obtuse acumen, lustrous above, sparsely strigose or strigillose, sericeous-strigose beneath along the veins, elsewhere sparsely strigose or glabrate, the venation prominent; inflorescence rather lax, many-flowered, densely yellowish-strigose, 2–3 cm. broad, the peduncle 1 cm. long or shorter, the pedicels 8 mm. long or shorter; bracts lanceolate, connate at the base; calyx-lobes linear or oblong, 2–3.5 mm. long, acute, finally reflexed; corolla whitish, densely strigose outside, the tube 6–8 mm. long, the lobes lanceolate, 2.5 mm. long.

TYPE LOCALITY: Chagres, Panama.

DISTRIBUTION: Guatemala to Panama.

ILLUSTRATION: Wernham, Monog. *Sabicea* pl. 12, f. 9.

8. *Sabicea costaricensis* Wernham, Monog. *Sabicea* 31. 1914.

Shrub, subscandent, the young branchlets densely yellow-sericeous, finally glabrate; stipules oval-oblong, 10 mm. long and 8 mm. wide or larger, rounded at the apex; petioles about 1.5 cm. long, densely strigose; leaf-blades elliptic or oblong, 12 cm. long and 4.3 cm. wide or smaller, usually subcordate at the base, subacutely acuminate at the apex, glabrate above or strigillose along the veins, the venation impressed, yellow-strigose beneath, the venation prominent; inflorescence rather lax, about 2 cm. broad, the peduncles 5 mm. long or shorter; bracts few, lanceolate or oval, acuminate, 7 mm. long and 4 mm. wide or smaller; calyx-lobes oblong, about 3 mm. long at anthesis, nearly glabrous; corolla sparsely strigillose outside, the tube about 8 mm. long, the lobes spreading, about 2 mm. long; ovary densely yellow-strigose.

TYPE LOCALITY: Buenos Aires, Costa Rica.

DISTRIBUTION: Costa Rica.

ILLUSTRATION: Wernham, Monog. *Sabicea* pl. 12, f. 11.

54. XEROCOCCUS Oerst. *Vidensk. Meddel.* 1852: 52.
1852.

Plants suffruticose, prostrate. Leaves opposite, membranaceous, petiolate. Flowers very numerous, subcapitate upon a somewhat fleshy axillary peduncle, the bracts short; hypanthium ovoid; calyx much longer than the hypanthium, 4-lobate, the lobes linear-elongate, erect, recurved at the apex, ciliate, persistent; corolla short, tubular, pubescent outside, the throat glabrous, the limb 4-lobate, the lobes short, erect, concave, valvate. Stamens 4, inserted in the throat of the corolla; filaments very short; anthers minute, dorsifixed, ovate-cordate, included. Disk annular. Ovary 2-celled; style filiform, the 2 branches obovate, obtuse, papillose outside; ovules numerous, horizontal, the placentae adnate to the septum. Fruit baccate, nearly dry, ovoid, 4-sulcate, 2-celled, separating into 2 cocci. Seeds numerous, angulate, the testa reticulate.

Type species, *Xerococcus congestus* Oerst.

1. Xerococcus congestus Oerst. *Vidensk. Meddel.* 1852:
52. 1852.

Petioles 3.5–5 cm. long; leaf-blades broadly ovate, about 15 cm. long and 10–12.5 cm. wide, narrowed at the base, short-acuminate at the apex, scaberulous above, ferrugino-villous beneath when young, glabrate in age, the lateral veins divergent, parallel; flowers very numerous, the glomerules 2.5 cm. broad; hypanthium about 2 mm. long, the calyx-lobes 8 mm. long; corolla 8–10 mm. long, the lobes 2–3 mm. long; fruit 4 mm. long.

TYPE LOCALITY: Turrialba, Costa Rica, at an altitude of 900 meters.

DISTRIBUTION: Known only from the type locality.

Description compiled. The proper position of the plant is doubtful; perhaps it is a species of *Sabicea*.

DOUBTFUL SPECIES

XEROCOCCUS LINDENII Kuntze, *Rev. Gen.* 285. 1891. Described from Mexico; the description is too brief for identification.

VII. GARDENIEAE. Shrubs or trees. Inflorescence terminal or axillary, the flowers often large and showy, regular, perfect or unisexual; corolla-lobes contorted or imbricate. Stamens usually inserted in the throat of the corolla, the anthers dorsifixed. Ovary usually 2-celled, sometimes 1- or several-celled, the ovules few or numerous. Fruit indehiscent, baccate, fleshy. Seeds large or small, compressed or obtusely angulate, the testa membranaceous, coriaceous, or fibrous; endosperm corneous or fleshy.

Corolla-lobes contorted.

Seeds large, the testa smooth or fibrous.

Flowers perfect.

• Inflorescence terminal.

Corolla somewhat irregular, curved in bud.

55. POSOQUERIA.

Corolla regular, not curved.

56. CASASIA.

Ovary 1-celled.

57. TOCOYENA.

Ovary 2-celled.

64. RANDIA.

Flowers in cymes.

58. GENIPA.

Flowers solitary or capitulate.

64. RANDIA.

Inflorescence axillary.

Corolla-tube villous in both throat and base; stigma pointed;

59. AMAIOUA.

testa of the seeds fibrous.

60. DUROIA.

Corolla-tube villous in throat or base but not in both; stigma

61. STACHYARRHENA.

not pointed; testa of the seeds not fibrous.

Flowers dioecious.

Stipules united into a conic cap, this deciduous by a circular slit;

flowers cymose, corymbose, or capitate.

62. GARAPATICA.

Pistillate flowers capitate or cymose; plants sericeous.

63. CORDIERA.

Pistillate flowers usually solitary; plants hirsute.

64. RANDIA.

Stipules free, or connate at the base.

Staminate flowers in long spikes.

Staminate flowers not spicate.

Pistillate flowers several, capitate; plants glabrous.

Pistillate flowers solitary; plants usually pubescent.

Staminate flowers terminal; plants unarmed.

Staminate flowers lateral, on short spurlike branchlets;

plants usually armed with spines.

Seeds very small, the testa foveolate.	65. BERTIERA.
Corolla-lobes imbricate.	
Calyx-lobes unequal, one of them foliaceous.	66. OTOCALYXX.
Calyx-lobes equal or nearly so, not foliaceous.	
Ovary 4-5-celled.	67. HAMELIA.
Ovary 2-celled.	
Plants unarmed; stamens inserted in the throat of the corolla.	68. HOFFMANNIA.
Plants armed with spines; stamens inserted at the base of the corolla-tube.	
Plants leafless.	69. PHYLLACANTHA.
Plants leafy.	70. CATESBAEA.

55. POSOQUERIA Aubl. Pl. Guian. 133. 1775.

Ramspenia Scop. Introd. 145. 1777.

Cyrtanthus Schreb. Gen. 122. 1789.

Solena Willd. Sp. Pl. 1: 961. 1797. Not *Solena* Lour. 1790.

Posoria Raf. Ann. Gén. Sci. Phys. 6: 80. 1820.

Stannia Karst. Ausw. Gew. Venez. 27. 1848.

Trees or shrubs, glabrous or pubescent, with terete branchlets. Leaves opposite, petiolate, coriaceous. Stipules large, intrapetiolar, deciduous. Flowers in terminal corymbs, large, white or red, the pedicels ebracteate; hypanthium obovoid; calyx short, 5-dentate, usually persistent; corolla-tube elongate, slender, the throat scarcely dilated, glabrous or villous, the limb gibbous in bud, 5-lobate, the lobes oblique, obtuse, contorted. Stamens 5, inserted in the throat of the corolla; filaments glabrous or pilose, erect or curved; anthers basifix, linear-oblong, acute, pilose, exserted, the connective produced at the base and bifid. Disk annular, swollen. Ovary 1-2-celled; style filiform; stigma small, bifid, included; ovules very numerous, peltate, the placentae stipitate, bilamellate, parietal. Fruit baccate, large, globose or ovoid, fleshy, 1-2-celled. Seeds large, obtusely angulate, the testa membranaceous; endosperm fleshy; embryo small, the cotyledons ovate, the radicle elongate, terete.

Type species, *Posoqueria longiflora* Aubl.

1. Posoqueria latifolia (Rudge) R. & S. Syst. Veg. 5: 227. 1819.

Solena latifolia Rudge, Pl. Guian. 1: 26. 1806.

Tocoyena latifolia Lam. Encyc. 7: 692. 1806.

Tocoyena macrophylla H. B. K. Nov. Gen. & Sp. 3: 412. 1820.

Posoqueria trinitatis DC. Prodr. 4: 375. 1830.

Posoqueria havanensis DC. Prodr. 4: 375. 1830.

Solena havanensis D. Dietr. Syn. Pl. 1: 799. 1839.

Posoqueria coriacea Mart. & Gal. Bull. Acad. Brux. 11¹: 240. 1844.

Tannia panamensis Duchass. & Walp. Linnaea 23: 755. 1850.

Tocoyena havanensis A. Rich. in Sagra, Hist. Cuba 11: 8. 1850.

Posoqueria panamensis Walp. Ann. 2: 797. 1852.

Posoqueria macrophylla Hemsl. Biol. Centr. Am. Bot. 2: 39. 1881.

Tree, sometimes 6 meters high, glabrous throughout, the branchlets stout, with short internodes; stipules oval or oblong, 8-15 mm. long, obtuse or acute, green; petioles stout, 8-12 mm. long, shallowly sulcate above; leaf-blades mostly oval to oblong, sometimes rounded-oval or lance-oblong, 7.5-25 cm. long, 3.5-13 cm. wide, obtuse or rounded at the base, rarely acute, acute or abruptly short-acuminate at the apex, rarely rounded, coriaceous, lustrous above, the venation prominent or prominulous, dull and slightly paler beneath, the costa stout and prominent, the lateral veins prominent, arcuate, about 6 on each side, the margins often revolute; corymbs few- or many-flowered, pedunculate, the flowers mostly pedicellate; calyx and hypanthium 4-5 mm. long, the calyx shallowly lobate, the lobes rounded, often ciliolate; corolla-tube 12.5-16.5 cm. long, 2-4 mm. thick, the lobes oblong or narrowly oblong, 1.5-2.5 cm. long, obtuse; anthers 6 mm. long; fruit globose, 4-5 cm. in diameter, yellow, umbonate; seeds irregularly angulate, about 1 cm. long, black or nearly so, dull.

TYPE LOCALITY: Guiana.

DISTRIBUTION: Oaxaca to Bolivia and Brazil; St. Vincent and Trinidad; Cuba (?).

ILLUSTRATIONS: Lam. Tab. Encyc. pl. 163, f. 2; Rudge, Pl. Guian. pl. 40; Lindl. & Paxt. Fl. Card. 3: p. 105 (as *P. revoluta*); Karst. Fl. Columb. pl. 16 (as *Stannia grandiflora*), pl. 25 (as *Stannia metensis*); Vell. Fl. Flum. Ic. 3: pl. 9 (as *Gardenia suaveolens*).

56. CASASIA A. Rich. in Sagra, Hist. Cuba 11: 9. 1850.

Trees or shrubs, unarmed, the branchlets terete. Leaves opposite, petiolate, chartaceous or coriaceous, lustrous. Stipules interpetiolar, persistent. Inflorescence terminal, cymose,

sessile or pedunculate; flowers usually large, white, 5-parted; hypanthium turbinate; calyx cupuliform, the lobes triangular or subulate, persistent; corolla salverform, glabrous outside, the tube elongate, cylindric, the lobes ovate or lanceolate, spreading, coriaceous, contorted. Stamens 5, inserted in the throat of the corolla; filaments very short; anthers dorsifixed, apiculate, included. Disk annular. Ovary 2-celled; style included, divided into 2 linear branches; ovules numerous, subimmersed in the parietal placentae. Fruit baccate, globose or pyriform, large, the pericarp thick and hard. Seeds numerous, large, horizontal, compressed, the testa thin, obscurely reticulate; endosperm corneous; cotyledons broad, foliaceous, the radicle terete.

Type species, *Casasia calophylla* A. Rich.

Lateral veins of the leaves very numerous, approximate, parallel.

Leaves glabrous.

Leaves densely velutinous beneath.

Lateral veins of the leaves few, distant.

Leaf-blades small, 1 cm. wide or narrower.

Leaf-blades large, 3-14 cm. wide.

Leaves chartaceous; fruit obovoid-pyriform.

Leaves coriaceous; fruit globose or obovoid-globose.

Lobes of the corolla equaling or longer than the tube; leaves not pungent-apiculate.

Lobes of the corolla shorter than the tube; leaves pungent-apiculate.

1. *C. calophylla*.

2. *C. nigrescens*.

3. *C. jacquiniooides*.

4. *C. piricarpa*.

5. *C. longipes*.

6. *C. clusiaefolia*.

1. *Casasia calophylla* A. Rich. in Sagra, Hist. Cuba 11: 9. 1850.

Randia calophylla Griseb. Cat. Pl. Cub. 123. 1866.

Genipa calophylla Maza, Anal. Soc. Esp. Hist. Nat. 23: 288. 1894.

Shrub or small tree, up to 8 meters high, glabrous throughout, the branches brown or yellowish; stipules deltoid, 1-3 mm. long, acute or obtuse, thick; petioles 2-8 mm. long; leaf-blades cuneate, cuneate-oblong, or obovate-cuneiform, 3.5-8.5 cm. long, 1-3.5 cm. wide, cuneate-attenuate at the base, rounded at the apex or usually retuse or emarginate, coriaceous, lustrous, the lateral veins very numerous, oblique, crowded, prominent on both surfaces; calyx 1.5 mm. long, the lobes triangular or lance-subulate, about as long as the limb; corolla-tube 2-2.5 cm. long, subcylindric, slightly ampliate above, glabrous within, the lobes lanceolate, subobtuse, half as long as the tube; fruit globose, 3.5-7 cm. in diameter.

TYPE LOCALITY: Vuelta de Abajo, Cuba.

DISTRIBUTION: Dry plains and hillsides, Cuba and the Isle of Pines.

ILLUSTRATION: Sagra, Hist. Cuba pl. 49.

2. *Casasia nigrescens* (Griseb.) C. Wright; Urban, Symb. Ant. 5: 505. 1908.

Randia nigrescens Griseb. Cat. Pl. Cub. 123. 1866.

Genipa nigrescens Maza, Anal. Soc. Esp. Hist. Nat. 23: 288. 1894.

Shrub, the branches brownish, velutinous when young; stipules ovate, acute, 1-3 mm. long; petioles stout, 3-7 mm. long; leaf-blades oblong or narrowly obovate-oblong, 2.5-10 cm. long, 1-4 cm. wide, cuneate at the base, obtuse or rounded at the apex, thick-coriaceous, lustrous above, glabrous or strigillose along the costa, the venation impressed, densely fulvous-velutinous beneath, the lateral veins very numerous, oblique, crowded, prominent; inflorescence few-flowered, pedunculate; calyx 5-lobate, the lobes mucroniform, distant; fruit globose, 3.5-4 cm. in diameter, brownish, seeds very numerous, flat, about 1 cm. long, dark-brown.

TYPE LOCALITY: Western Cuba.

DISTRIBUTION: Dry thickets, Cuba.

3. *Casasia jacquiniooides* (Griseb.) Standley, Contr. U. S. Nat. Herb. 20: 208. 1919.

Alibertia jacquiniooides Griseb. Cat. Pl. Cub. 123. 1866.

Casasia parvifolia Britton, Bull. Torrey Club 43: 461. 1916.

Shrub, the branchlets slender, scaberulous when young, densely leafy at the ends; stipules deltoid-acuminate, 1-3 mm. long; petioles stout, 2 mm. long or shorter; leaf-blades oblanceolate-

oblong or oblong-obovate, 1.2–4 cm. long, 0.3–1.7 cm. wide, attenuate to the base, rounded to acutish at the apex, thick-coriaceous, glabrous, lustrous above, the costa impressed, the lateral veins obsolete, brownish beneath, the costa very stout and prominent, the lateral veins prominulous, 4 or 5 on each side, distant, ascending at an acute angle, the margin revolute; flowers solitary, sessile; calyx and hypanthium scaberulous, the calyx 2.5–3 mm. long, 4-lobate, the lobes subulate; corolla glabrous, the tube 4 mm. long, the 4 lobes ovate, acuminate, about as long as the tube; fruit globose, 1–1.5 cm. in diameter, obtusely tuberculate; seeds about 6 mm. long.

TYPE LOCALITY: Near Baracoa, Oriente, Cuba.

DISTRIBUTION: Mountains of Oriente, Cuba.

4. *Casasia piricarpa* Urban, Symb. Ant. 5: 507. 1908.

Tree, about 8 meters high, glabrous throughout; stipules triangular-ovate, acuminate, about 1 cm. long; petioles stout, 2–3 cm. long; leaf-blades oval or oval-obovate, 18–25 cm. long, 8–14 cm. wide, obtuse or acute at the base and short-decurrent, abruptly and very shortly obtuse-acuminate at the apex, chartaceous, lustrous, paler beneath, the venation prominulous above, prominent beneath, the lateral veins 6–8 on each side, distant, ascending at an angle of 45° or less, the margin plane; fruit obovoid-pyriform, 5–6 cm. long, 3–3.5 cm. thick, borne on a pedicel about 2 cm. long, the pericarp about 5 mm. thick.

TYPE LOCALITY: Malvern Hill, near Potsdam, Jamaica, altitude 730 meters.

DISTRIBUTION: Known only from the type locality.

5. *Casasia longipes* Urban, Symb. Ant. 5: 506. 1908.

Tree, 8–9 meters high, glabrous throughout, the branchlets thick, densely leafy at the ends; stipules triangular-acuminate, 1–1.5 cm. long; petioles stout, 1–5 cm. long; leaf-blades ovate, obovate, oval, or oblong-obovate, 7–24 cm. long, 3–14.5 cm. wide, rounded to acute at the base, sometimes short-decurrent, obtuse or shortly triangular-acuminate at the apex, coriaceous, lustrous, the venation impressed above, prominent beneath, the lateral veins 7–9 on each side, distant, subarcuate, ascending at an angle of 50–60°, the veinlets reticulate, the margin plane; inflorescence few-flowered, pedunculate, the pedicels 6 mm. long or shorter; calyx 3–4 mm. long, the lobes subulate, 1–2 mm. long; corolla white, the tube about 2 cm. long, cylindric, gradually ampliate above, pubescent within in the throat, the lobes 2–2.5 cm. long, lance-oblong; anthers 9 mm. long, included; fruit globose, 5–6.5 cm. in diameter, borne on a pedicel about 3.5 cm. long, the pericarp 4–5 mm. thick; seeds suborbicular or oval, 9–11 mm. long, about 3 mm. thick.

TYPE LOCALITY: Near Troy, Jamaica, altitude 830 meters.

DISTRIBUTION: Mountains of Jamaica.

6. *Casasia clusiæfolia* (Jacq.) Urban, Symb. Ant. 5: 505. 1908.

Gardenia clusiæfolia Jacq. Coll. Suppl. 37. 1796.

Randia clusiæfolia Chapm. Fl. S. U. S. 179. 1860.

Genipa clusiæfolia Griseb. Fl. Brit. W. Ind. 317. 1861.

Shrub or small tree, sometimes 7.5 meters high, with a trunk 15 cm. in diameter, glabrous throughout, the leaves crowded at the ends of the branchlets; stipules triangular, acuminate, about 1 cm. long; petioles stout, 4–10 mm. long; leaf-blades oblong-obovate, cuneate-obovate, or broadly cuneate, 7–15 cm. long, 3.5–9 cm. wide, cuneate or acuminate at the base, rounded or truncate at the apex, pungent-apiculate, coriaceous, lustrous, the venation prominulous above, plane or prominulous beneath, the veinlets finely reticulate, the margin plane; cymes pedunculate, lax, the pedicels 2–10 mm. long; bracts subulate; calyx and hypanthium glabrous, the hypanthium 6–8 mm. long; calyx 3 mm. long, the lobes subulate, 4–6 mm. long; corolla glabrous, the tube 1.4–1.8 cm. long, cylindric, the lobes lanceolate or lance-oblong, 1.2–1.5 cm. long, acuminate or attenuate; anthers subexserted; fruit obovoid-globose, 5–7 cm. long, lustrous, the pericarp thick; seeds very numerous, flat, 5–7 mm. long, dark-brown.

TYPE LOCALITY: Bahamas.

DISTRIBUTION: Rocky coasts, southern Florida; Bermuda; Bahamas; Cuba.

ILLUSTRATIONS: Catesby, Nat. Hist. Car. 1: pl. 59; Jacq. Col. Suppl. pl. 4, f. 3; Britton, N. Am. Trees f. 767; Britton, Fl. Bermuda f. 392.

57. TOCOYENA Aubl. Pl. Guian. 121. 1775.

Ucriana Willd. Sp. Pl. 1: 961. 1797.

Shrubs, glabrous or pubescent, the branchlets compressed. Leaves opposite, petiolate, coriaceous. Stipules small, intrapetiolar, triangular, acute. Flowers large, white or yellow, ebracteate, subsessile, arranged in terminal cymes; hypanthium turbinate or obovoid; calyx 5-lobate, persistent; corolla funnel-form, the tube slender, naked in the throat, the limb 5-lobate, the lobes spreading, obtuse or acute, contorted. Stamens 5, inserted in the throat of the corolla; filaments very short; anthers linear, acute, bilobate at the base, dorsifixed, exserted or subexserted. Disk annular. Ovary 2-celled; style stout, elongate, glabrous, or pilose above, the branches stout, linear or obovate; ovules numerous, the placentae linear, affixed to the septum. Fruit baccate, oblong or oval, fleshy, 2-celled. Seeds numerous, immersed in the pulp, horizontal, compressed, the testa membranaceous; endosperm corneous; embryo minute, lateral, the cotyledons oblong, the radicle short, clavate.

Type species, *Tocoyena longiflora* Aubl.

1. *Tocoyena cubensis* Britton.

Sphinctanthus longiflorus Griseb. Mem. Am. Acad. II. 8: 503. 1862.

Tocoyena longiflora K. Schumann, in E. & P. Nat. Pl. 44: 74. 1891. Not *T. longiflora* Aubl. 1775.
Genipa longiflora Maza, Anal. Soc. Esp. Hist. Nat. 23: 288. 1894.

Shrub, 2-3 meters high, glabrous throughout, the branches grayish, the branchlets stout, compressed, rugulose, the internodes short; stipules triangular, acuminate, thick; petioles stout, 0.7-2 cm. long; leaf-blades obovate-oblong, cuneate-obovate, or oblanceolate, 7.5-12 cm. long and 2.2-5.5 cm. wide or larger, acute or larger, acute or cuneate at the base, obtuse or rounded at the apex, coriaceous, dark-green and very lustrous above, the venation prominent, paler and brownish beneath, the costa stout, prominent, the lateral veins slender, about 8 on each side, ascending, nearly straight, the margin more or less revolute; cymes few-flowered, short-pedunculate; hypanthium 1.5 cm. long, oblong; calyx 5 mm. long, shallowly lobate, the lobes broadly deltoid, acute; corolla-tube 16.5-20 cm. long, about 5 mm. thick, greenish, ampliate in the throat, the lobes white, 2 cm. long, lanceolate, acute; stigma-lobes ovate; fruit oval, 5 cm. long, 3.5 cm. thick.

TYPE LOCALITY: Forests near Monte Verde, Cuba.

DISTRIBUTION: Oriente, Cuba.

58. GENIPA L. Syst. Nat. ed. 10. 931. 1759.

Thevenotia L.; Post & Kuntze, Lex. Gen. Phan. 557. 1903.

Trees, glabrous or pubescent, the branchlets terete. Leaves opposite, petiolate or subsessile, large. Stipules intrapetiolar, elongate, deciduous. Flowers large, white or yellowish, pedicellate, arranged in few-flowered, axillary or terminal cymes; hypanthium turbinate or campanulate, the calyx ampliate, truncate or 5-6-lobate, persistent; corolla salverform, the tube short or elongate, the throat pilose or glabrous, the limb 5-6-lobate, the lobes spreading, obtuse or acute, contorted, coriaceous. Stamens 5 or 6, inserted at the top of the corolla-tube; anthers sessile, dorsifixed, linear, exserted. Disk cupular. Ovary 1- or 2-celled; style thick, the stigma fusiform, obtuse; ovules numerous, the placentae parietal, stipitate or longitudinally adnate to the septum. Fruit baccate, subglobose, large, the pericarp thick. Seeds numerous, large, compressed, the testa subfibrous; endosperm cartilaginous; embryo plane, the cotyledons broad, foliaceous, the radicle terete.

Type species, *Genipa americana* L.

Secondary veins parallel between the lateral veins, distinct; leaf-blades narrowed to an obtuse base.

Secondary veins irregularly reticulate; leaf-blades narrowed to a very acute base.

Leaves acute or short-acuminated at the apex; stipules triangular, acuminate.

Bracts distinct, acute or acuminate; calyx 5-8 mm. long.

Bracts connate, obtuse; calyx 3-3.5 mm. long.

Leaves rounded at the apex; stipules obovate, rounded.

1. *G. Maxonii*.

2. *G. americana*.

3. *G. codonocalyx*.

4. *G. Williamsii*.

1. Genipa Maxonii Standley, Jour. Wash. Acad. Sci. 8:
642. 1918.

Large spreading tree, the wood reddish, the branchlets glabrous, with short internodes; stipules lance-oblong, about 3.5 cm. long, filiform-attenuate, glabrous; petioles about 2 mm. long; leaf-blades obovate or rhombic-obovate, 34–44 cm. long, 13.5–25 cm. wide, narrowed from below the middle to a rounded or subtruncate base, narrowed to the apex and subabruptly obtuse-acuminate, chartaceous, bright-green above, reddish along the veins, sublustrous, glabrous, the costa and lateral veins impressed, paler and reddish beneath, obscurely puberulent when young, the venation prominent, the lateral veins slender, about 20 on each side, nearly straight, the secondary veins numerous, parallel, distinct, the ultimate veinlets prominulous, reticulate, the margin plane; fruit (probably immature) globose, 5.5 cm. in diameter, glabrous, the pericarp about 4 mm. thick; seeds irregularly rhombic, 1.5–2.5 cm. long, very thin, black, lustrous, the cork-like flesh breaking up into large flat irregular sections, each containing a single seed.

TYPE LOCALITY: In forest along the Río Indo de Gatún, Canal Zone, Panama.

DISTRIBUTION: Panama.

2. Genipa americana L. Syst. Nat. ed. 10. 931. 1759.

Gardenia Genipa Sw. Obs. 84. 1791.

Genipa grandifolia Pers. Syn. Pl. 1: 198. 1805.

Genipa Caruto H. B. K. Nov. Gen. & Sp. 3: 407. 1820.

Genipa pubescens DC. Prodr. 4: 378. 1830.

Genipa americana Caruto K. Schumann, in Mart. Fl. Bras. 6^o: 352. 1889.

Tree, up to 14 meters high, the branchlets stout, glabrous or densely short-pilose, with short internodes; stipules triangular, acuminate, 8–12 mm. long, brownish, glabrous, glandular within; petioles very thick, 1 cm. long or shorter; leaf-blades obovate, oblong-obovate, rhombic-obovate, or oblong, 14–35 cm. long, 5.5–19 cm. wide, attenuate to an acute base, acute or obtusely short-acuminate at the apex, sometimes rounded and apiculate, chartaceous or subcoriaceous, lustrous above, glabrous, or puberulent along the veins, the venation plane or subimpressed, lustrous and glabrous beneath or dull and densely short-pilose, the lateral veins prominent, 10–13 on each side, subarcuate, the secondary veins irregularly reticulate, the margin plane or subrevolute; inflorescence short-pedunculate, lax or dense, 4–10 cm. long, the pedicels 4–10 mm. long; bracts triangular-ovate, acuminate, 3–4 mm. long; calyx and hypanthium glabrous or short-pilose outside, the hypanthium 4–8 mm. long, the calyx 5–8 mm. long, truncate or shallowly crenate, sericeous within; corolla yellowish-white, 2–4.5 cm. long, the tube glabrous below, sericeous above, the 5 or 6 lobes oblong, obtuse, sericeous, longer than the tube, the throat villous; anthers 1.5–2.5 cm. long; fruit 6–7 cm. in diameter, smooth or sparsely tuberculate, glabrous or short-pilose; seeds irregular, thick, 6–12 mm. long, dark-brown.

TYPE LOCALITY: Tropical America.

DISTRIBUTION: Guerrero to Chiapas, southward to Peru and Brazil; Cuba, Hispaniola, Porto Rico, and the Lesser Antilles.

ILLUSTRATIONS: Mart. Fl. Bras. 6^o: pl. 143; Gaertn. Fruct. pl. 190; Lam. Tab. Encyc. pl. 158, f. 2; Vell. Fl. Flum. Ic. 2: pl. 141; Desc. Fl. Ant. 2: pl. 87; Pittier, Pl. Usual, Costa Rica pl. 19.

The typical form of the species is glabrous. The pubescent form, which is more common in continental North America, is *G. americana Caruto* (H. B. K.) K. Schumann.

3. Genipa codonocalyx Standley, Contr. U. S. Nat. Herb. 17:
446.. 1914.

Tree, the branchlets glabrous or sparsely short-pilose; stipules triangular-ovate, acuminate, 1–1.2 cm. long; petioles 0.5–1.5 cm. long, short-pilose; leaf-blades oblong-oblanceolate or narrowly oblong, 12–17 cm. long, 4–7 cm. wide, attenuate to the acute base, abruptly and shortly obtuse-acuminate at the apex, subcoriaceous, dark-green, glabrous, and lustrous on the upper surface, the venation plane, paler beneath, short-pilose along the veins, the lateral veins prominent, 9–12 on each side, subarcuate, the secondary veins inconspicuous, reticulate, the margin plane; cymes subsessile, lax, the pedicels 3–7 mm. long; bracts broadly ovate, obtuse, connate at the base; calyx and hypanthium glabrous, the hypanthium about 4 mm. long, the

calyx 3-3.5 mm. long, truncate, sericeous within; corolla yellowish-white, about 2.5 cm. long, the tube glabrous at the base, sericeous above, the 5 lobes oblong or oval, rounded at the apex, sericeous, longer than the tube, the throat villous; anthers 1.5 cm. long.

TYPE LOCALITY: Near Boca Matapalo, Pacific coastal belt, Costa Rica, at sea level.
DISTRIBUTION: Known only from the type locality.

4. ***Genipa Williamsii*** Standley, Jour. Wash. Acad. Sci. 8: 642. 1918.

Tree, 10 meters high, the trunk 12.5 cm. in diameter, the branchlets reddish-brown, glabrous, the internodes short; stipules broadly obovate, 1.8 cm. long, 1.2 cm. wide, cuneate at the base, rounded at the apex, brownish, sparsely strigose outside; petioles stout, 1-2.5 cm. long, glabrate; leaf-blades obovate or oblong-obovate, 12.5-19 cm. long, 6-9.5 cm. wide, acute or cuneate at the base, rounded at the apex, chartaceous, green above, sublustrous, glabrous, the venation plane or prominulous, brownish beneath, strigose along the veins, the costa stout, prominent, the lateral veins slender, 8 or 9 on each side, ascending at an obtuse angle, nearly straight, laxly anastomosed near the margin; fruit subglobose, 4.5 cm. in diameter, terminal, solitary, subsessile, the pericarp very thick; seeds (very immature) numerous.

TYPE LOCALITY: Vicinity of Cana, Panama, altitude 1350 meters.
DISTRIBUTION: Known only from the type locality.

59. ***AMAIOWA*** Aubl. Pl. Guian. Suppl. 13. 1775.

Trees or shrubs, the branchlets terete or tetragonal, usually sericeous. Leaves opposite or ternate, short-petiolate. Stipules interpetiolar, triangular or ovate, united into a conic cap, deciduous. Flowers white, arranged in short-pedunculate terminal fascicles or cymes, dioecious; hypanthium oblong to hemispheric; calyx cupular or short-tubular, deciduous, truncate or 6-dentate, the teeth short, subulate; corolla salverform, sericeous outside, the tube terete or ventricose, the throat tomentose, the limb 6-lobate, the lobes oblong, spreading, contorted. Stamens 6, inserted in the corolla-tube; filaments very short; anthers dorsifixed, linear, acute, included. Disk annular or swollen. Ovary 2-celled or sometimes almost 1-celled; style short, thickened above, the 2 branches coherent; ovules numerous, biserrate, the placentae thick, affixed to the septum. Fruit baccate, small, oblong, areolate at the apex, 1-celled, the cortex thin-coriaceous. Seeds numerous, embedded in pulp, horizontal, compressed, suborbicular, the testa fibrous; endosperm corneous; embryo small, the cotyledons ovate, the radicle short, clavate.

Type species, *Amaioua guianensis* Aubl.

1. ***Amaioua corymbosa*** H. B. K. Nov. Gen. & Sp. 3: 419. 1820.

Gardenia hexandra Willd.; R. & S. Syst. Veg. 5: 243. 1819.

Amaioua fagifolia Desf. Mém. Mus. Paris 6: 14. 1820.

Amaioua guianensis Hemsl. Biol. Centr. Am. Bot. 2: 39. 1881. Not *A. guianensis* Aubl. 1775.

Shrub, 2-5 meters high, the branches grayish or brown, the branchlets stout, subangulate, ferrugino-sericeous, the internodes stout; stipules lance-oblong, 1.5-2.5 cm. long, ferrugino-sericeous outside, glabrous and glandular within; petioles stout, 3-15 mm. long, densely ferrugino-sericeous; leaf-blades oval, ovate-oval, or oval-elliptic, 5-20 cm. long, 3-10 cm. wide, broadly rounded to short-acuminate at the base, short-acuminate at the apex, coriaceous, green above, glabrous, the venation impressed, paler beneath, brownish, more or less sericeous along the veins, the venation prominent, the lateral veins stout, about 7 on each side, arcuate-ascending, the margin plane or subrevolute; staminate inflorescence corymbose, lax, often long-pedunculate, the calyx cupular, 3-4 mm. long, sericeous, 6-denticulate, the corolla about 1.8 cm. long, the tube retrorse-sericeous, the lobes lanceolate, about as long as the tube; anthers 7 mm. long; pistillate inflorescence capitate or corymbose, few-flowered, long- or short-pedunculate, the calyx and hypanthium 3-4 mm. long, the corolla about 1 cm. long; fruit oval or obovoid, 1.2-1.5 cm. long, sparsely sericeous; seeds compressed, irregularly angulate, about 3 mm. long, reddish-brown, lustrous, striolate.

TYPE LOCALITY: Near Cumanacoa, Venezuela.

DISTRIBUTION: Panama to the Guianas; Cuba.

ILLUSTRATIONS: H. B. K. Nov. Gen. & Sp. pl. 294; Mém. Mus. Paris 6: pl. 5.

60. **DUROIA** L. f. Suppl. 30, 209. 1781.

Schachtia Karst. Linnaea 30: 156. 1859.

Shrubs or trees, glabrous or pubescent, the branchlets terete or tetragonal. Leaves opposite or verticillate, sessile or petiolate, coriaceous or chartaceous. Stipules interpetiolar, oblong, deciduous. Flowers often large, white or yellowish, dioecious, arranged in terminal, sessile or pedunculate fascicles or cymes, the pistillate rarely solitary; hypanthium oblong to hemispheric; calyx cupular or tubular, persistent, truncate or divided into 6–9 lobes; corolla salverform, thick, sericeous outside, the throat pilose or naked, the limb 6–9-lobate, the lobes oblong, contorted. Stamens 6–9, inserted in the corolla-tube; filaments very short or wanting; anthers dorsifixed, linear, acute, included. Disk annular or explanate. Ovary 2–4-celled; style short, thickened above, with 2 broad acute coherent branches; ovules numerous, biseriate, the placentae affixed to the septum. Fruit baccate, globose to oblong, with a thick cortex, 2–4-celled or 1-celled. Seeds large, horizontal, much compressed, suborbicular, covered with pulp, the testa thin, black; endosperm fleshy; embryo small, the cotyledons ovate, plane; radicle clavate.

Type species, *Duroia eriopila* L. f.

1. **Duroia costaricensis** Standley, Contr. U. S. Nat.

Herb. 20: 208. 1919.

Branchlets stout, hirsute, densely leafy at the ends; leaves opposite, the petioles stout, 7 mm. long or shorter, densely hirsute, the blades oblong-obovate, 10–17.5 cm. long, 3.5–6.5 cm. wide, cuneately narrowed to the base, obtuse at the apex and abruptly cuspidate-acuminate, with a narrow falcate acumen, chartaceous, copiously hirsute with slender fulvous hairs, the venation prominent beneath, the lateral veins slender, 7 or 8 on each side, the margin plane; staminate flowers fasciculate-cymose at the ends of the branchlets, short-pedicellate; calyx and hypanthium very densely hirsute with pale brownish hairs; hypanthium 1.5 mm. long, the calyx 4–4.5 mm. long, densely whitish-sericeous within, the lobes 6 or 7, distant, linear-subulate, as long as the limb; corolla (in bud) 14 mm. long, densely sericeous outside, the tube stout, glabrous or nearly so within, the 6 lobes lance-oblong, acutish, longer than the tube, finely sericeous within; anthers sessile, 4 mm. long.

TYPE LOCALITY: Marais de Sierpe, Costa Rica.

DISTRIBUTION: Known only from the type locality.

61. **STACHYARRHENIA** Hook. f. in Hook. Ic. 11: 54. 1870.

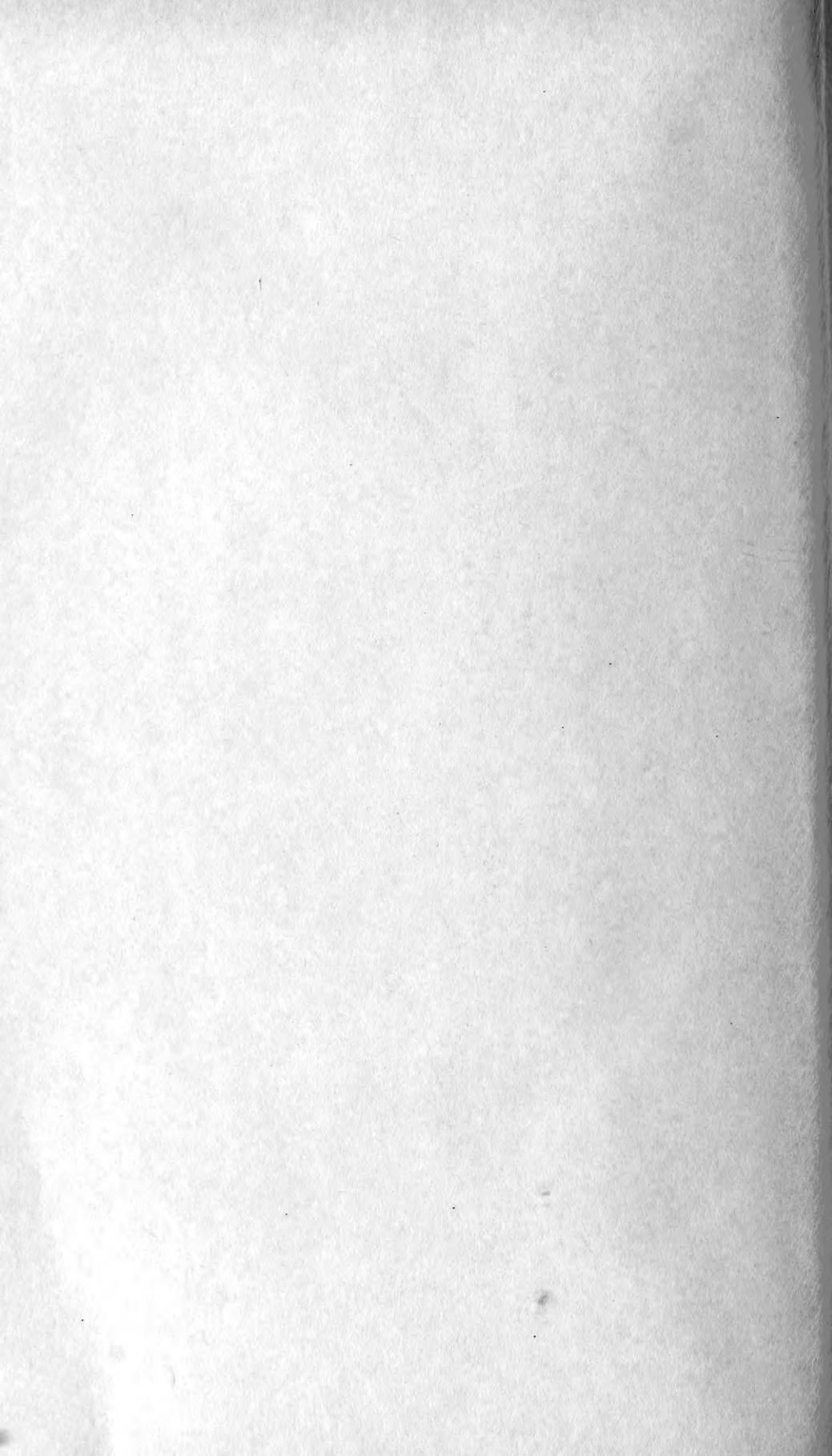
Small trees, glabrous throughout, the branchlets terete. Leaves opposite, petiolate, coriaceous. Stipules short, intrapetiolar, connate, subsessile, glandular within. Flowers dioecious, small, ebracteolate, the staminate fasciculate in narrow terminal spikes, the pistillate solitary; calyx of the staminate flower cupular, truncate or obscurely 5-dentate, persistent, the corolla funneliform or tubular, coriaceous, glabrous outside, the tube villous within in the upper part, the limb 5-lobate, the lobes short, contorted. Stamens 5, inserted in the corolla-throat, included; anthers linear, sessile, dorsifixed. Style (in the staminate flower) short, the stigma fusiform, acute, pilose. Ovary 4-many-celled; ovules very numerous, the placentae bilamellate, affixed to the axis of the ovary. Fruit baccate, small, short-pedicellate, globose, 4-celled, the pedicel involucellate at the base. Seeds horizontal, plane, the testa thin, subfibrous.

Type species, *Stachyarrhena spicata* Hook. f.

1. **Stachyarrhena heterochroa** Standley, Contr. U. S. Nat.

Herb. 18: 142. 1916.

Tree, 8–10 meters high, with straight trunk, radiate branches, and pyramidal crown, glabrous throughout, the bark grayish, smooth, the branchlets stout; stipules 2–3 mm. long, forming a truncate sheath; petioles stout, 2–3 cm. long; leaf-blades narrowly elliptic-oblong or oblanceolate-oblong, 15–28 cm. long, 5–9 cm. wide, acute at the base, short-acuminate or cuspidate-acuminate at the apex, lustrous on the upper surface, the venation prominent, dull



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