

STUDIES OF TROPICAL AMERICAN PHANEROGAMS— NO. 1.

By PAUL C. STANDLEY.

INTRODUCTION.

The present paper introduces a series which is intended to include notes upon plants of tropical and subtropical North and South America and descriptions of miscellaneous new species, as also taxonomic reviews of some of the smaller genera. The plants discussed in the first installment are some which were studied by the writer while preparing a report upon certain families for a proposed flora of Panama. They belong to the Cyperaceae, Gentianaceae, Rubiaceae, and the families formerly associated as the Leguminosae. The determination of the Panaman species of *Sommeria*, *Watsonia*, and *Cobaea* has necessitated a revision of these genera, the results of which are here published. Most of the new species are from the large collections made by Mr. H. Pittier in Colombia and in Central America, especially in Costa Rica.

Unless otherwise indicated, all specimens cited are in the United States National Herbarium.

TWO NEW SPECIES OF *DICHROMENA*.

Dichromena is one of the smaller genera of the Cyperaceae, but several of its species have a wide distribution in tropical America. The two species described here are apparently of limited distribution.

Dichromena pittieri Standley, sp. nov.

Perennial from a cluster of fibrous roots; leaves very numerous, flat, 8 to 15 cm. long, 2 to 4 mm. wide, attenuate, not dilated at the base, pale grayish green, densely velvety-pubescent on both surfaces with short, very fine hairs; culms numerous, obtusely angled, slender, slightly surpassing the leaves, 16 to 21 cm. high, densely pubescent; bracts of the inflorescence about 6, 2 to 10 cm. long, often with a few very short additional ones, about as wide as the leaves, slightly discolored at the base and ciliate, elsewhere finely and densely pubescent; spikelets numerous, 8 to 12, 4.5 to 5 mm. long, densely capitate, the whole head about 1 cm. in diameter; scales white, glabrous, oblong, ovate, or lanceolate, acute, thick and firm, prominently keeled but without other evident nerves; style linear, the branches much elongated; achene about 1 mm. long, broadly obovoid, brownish white, shining, very finely and rather obscurely transversely undulate; beak broadly pyramidal, about one-fourth as long as the achene.

Type in the U. S. National Herbarium, no. 691286, collected between Quebrada del Bollo and El Platanal, on the trail from Río Frío to San Andrés de la Sierra, State of Magdalena, Colombia, altitude about 1,000 meters, July, 1906, by H. Pittier (no. 1692).

A very distinct species, related to *D. ciliata*, but distinguished by its abundant pubescence, pale leaves, densely capitate inflorescence of numerous small spikelets, and pale achenes.

***Dichromena ebracteata* Standley, sp. nov.**

Perennial from a slender dark brown creeping rhizome; leaves numerous, thin, flat, bright green on the upper surface or sometimes glaucous, glaucous beneath, 8 to 16 cm. long, about 2.5 to 5 mm. wide, dilated at the base and ciliate, elsewhere finely pubescent with spreading or somewhat appressed hairs or glabrate; culms very slender, 6 to 20 cm. high, usually shorter than the longer leaves but sometimes longer, finely villous or glabrous; bracts represented by 1 or 2 subulate-lanceolate green membraceous-margined scales 2 mm. long or less; spikelets 3 to 8, subspicate, sessile or one of them short-pedunculate, 5 to 10 mm. long; scales of the spikelets nearly white, thin, glabrous, oblong, obtuse, often emarginate, keeled; style linear, with elongated branches; achenes broadly obovoid, 1 mm. long, yellowish green, finely rugulose with faint transverse undulate lines, the beak one-third as long, white, thin.

Type in the U. S. National Herbarium, no. 692624, collected in Lot 42, Island of Tobago, along banks, April 21, 1913, by W. E. Broadway (no. 4455).

ADDITIONAL SPECIMENS EXAMINED:

TOBAGO: Forest Reserve, above Caledonia, *Broadway* 3071.

VENEZUELA: El Valle, Island of Margarita, *Miller & Johnston* 190.

Dichromena ebracteata is as closely related to *D. ciliata* Vahl as to any species, but from this and all others heretofore described it may be distinguished by the abortive involucre bracts, these being much shorter than the spikelets. The Venezuelan specimen was distributed as *Dichromena leucocephala* Michx. (*D. colorata* (L.) Hitchc.), a species with which it has little in common.

THE GENUS BISBOECKELERA.

In 1842 Nees von Esenbeck described in Martius's *Flora Brasiliensis*¹ a new genus of Cyperaceae, which he called *Hoppia* in honor of the German botanist Hoppe. Unfortunately, there was already a genus *Hoppea* of the Gentianaceae, dedicated by Willdenow in 1801² to a man of the same name. This was used in the form *Hoppea* by Sprengel in 1818.³ Taking the proper view that Nees's name should be replaced, Otto Kuntze in 1891⁴ suggested *Bisboeckelera* as a substitute, and this name, although ill-formed, is the one that must be used.

The genus consists of but few species, all from the western and northern parts of tropical South America. It was considered by Nees a member of the tribe Cariceae, while Bentham and Hooker⁵ placed it in the Cryptangieae. Pax, in his treatment of the family in Engler and Prantl's *Natürlichen Pflanzenfamilien*,⁶ associated

¹ 2¹: 199. pl. 30.

² Ges. Naturf. Freund. Berlin Mag. 3: 434.

³ Anleit. Gewächs. 2²: 889.

⁴ Rev. Gen. Pl. 2: 747.

⁵ Gen. Pl. 3: 1042. 1883.

⁶ 2²: 119. 1887.



BISBOECKELERA VINACEA STANDLEY.

this and five other related genera of South American plants as a new tribe, the Hoppieae. On account of the lapse of the generic name *Hoppea* in the Cyperaceae, this was replaced by the same author with the tribal name *Bisboeckelerieae*¹

The species, so far as known, are enumerated below. Two of them, *B. bicolor* and *B. vinacea*, are closely related to the type of the genus (*Hoppia irrigua* Nees), but the others diverge considerably in general appearance and may not be congeneric.

Bisboeckelera angustifolia (Boeckel.) Kuntze, Rev. Gen. Pl. 2:747. 1891.

Hoppia angustifolia Boeckel. Flora 54:37. 1871.

TYPE LOCALITY: French Guiana.

Bisboeckelera berroi (Clarke) Standley.

Hoppia berroi Clarke, Kew Bull. Misc. Inf. add. ser. 8:62. 1908.

The type is from Paso de los Toros, Uruguay, collected by Berro (no. 2169).

Bisboeckelera bicolor (Clarke) Standley.

Hoppia bicolor Clarke, Kew Bull. Misc. Inf. add. ser. 8:62. 1908.

Collected by Riedel in Brazil, Minas Geraes, Una, near Ouro Preto. It is described as having the upper surface of the leaves of a copper-brown color and the lower surface glaucous.

Bisboeckelera irrigua (Nees) Kuntze, Rev. Gen. Pl. 2:747. 1891.

Hoppia irrigua Nees in Mart. Fl. Bras. 2¹:199. pl. 30. 1842.

The type was collected "In lapidosis udis silvarum ad flumen Japurá prope Manacarú et ad portum prov. fluminis Nigri."

Bisboeckelera longifolia (Rudge) Standley.

Schoenus longifolius Rudge, Pl. Gulan. 14. pl. 16. 1805.

Hoppia microcephala Boeckel. Flora 54:37. 1871.

Bisboeckelera microcephala Kuntze, Rev. Gen. Pl. 2:747. 1891.

The type of this species was collected somewhere in the Guianas by an unknown collector. The type of *Hoppia microcephala* is from Surinam.

Bisboeckelera vinacea Standley, sp. nov.

PLATE 24.

Perennial with many coarse purplish fibrous roots and numerous horizontal rhizomes covered with overlapping purplish leaflike bracts; leaves all radical, 38 cm. long or less, the outermost shortest, about 2 cm. wide, acute, glaucous on the upper surface and glabrous or with a few scattered hairs, scabrous and glandular on the midvein, beneath of a deep purplish red, strongly nerved, glandular-puberulent, narrowed below but expanded into a broad and sheathing base, scaberulous on the margins, these inrolled in drying; culm naked, about 25 cm. long, triangular, brown, scaberulous on the angles; bracts of the inflorescence 2, similar to the leaves, the longer 50 mm. long, the other about 15 mm.; inflorescence of about 7 dense oblong sessile spikes 15 to 20 mm. long; glumes at the base of each spikelet 2, oblong-lanceolate, acute, purplish, puberulent; spikelets consisting each of 1 fertile and 2 sterile florets; mature perigynium 5 to 6 mm. long, ovoid, tapering into a long subulate beak, purplish red, faintly nerved, puberulent; achene 2 mm. long and of the same diameter, obtusely angled, dark brown, shining, smooth, contracted at the base into a short stipe, bearing on the apex a short beak about one-fourth the length of the body.

¹ In Engl. & Prantl, Pflanzenfam. Nachtr. 47. 1897.

Type in the U. S. National Herbarium, no. 530770, collected near Córdoba, in the Dagua Valley, Pacific Coastal Zone, State of Cauca, Colombia, altitude 30 to 100 meters, December, 1905, by H. Pittier (no. 583).

Closely related to the type of the genus, *B. irrigua*, but differing in the form of the fruit, which is not ridged on the angles and depressed on the sides, in the short involucre bracts, and in the more ample, differently arranged inflorescence. Nees does not speak of a purplish coloration of the lower surface of the leaves of his plant, although he does state that the petioles are reddish. Probably the coloration of the leaf surfaces is distinctive in this Colombian species.

EXPLANATION OF PLATE 24.—Type specimen. Two-fifths natural size.

NEW LEGUMINOUS PLANTS OF SEVERAL GENERA.

The two species of *Phaseolus* of the section *Leptospron* described below have been confused with *P. speciosus* H. B. K. That plant was described from specimens collected along the Orinoco River, and it is doubtful whether it occurs in Central America. It differs from both the Guatemalan species in having the lower calyx lobes only slightly longer than the upper, as well as in other minor characters.

The remaining species are of the genera *Chamaecrista*, *Calliandra*, *Mimosa*, *Erythrina*, and *Dolicholus*. All are from Guatemala and Costa Rica, except a new species of *Dolicholus* collected by Mr. Pittier in Colombia.

Phaseolus spectabilis Standley, sp. nov.

PLATE 25.

Stems twining, slender, densely pilose with rather short hairs; stipules oblong-ovate, 3 to 4 mm. long, persistent, obtuse or acute, finely parallel-nerved, pilose, not produced at the base; petioles 2 to 9 cm. long, pilose; stipellæ oblong to rounded-ovate, obtuse, 2 mm. long; petiolules 3 mm. long or less; leaflets ovate to oblong or rhombic-lanceolate, 5 to 11 cm. long, 2 to 6 cm. wide, the lateral ones asymmetrical, the terminal one larger than the others, all rounded at the base, acute or abruptly short-acuminate, thick and firm, lustrous on the upper surface and scaberulous, beneath sericeous but not densely so, prominently veined; racemes 8 to 17 cm. long, nodose, pilose; bracts deciduous, ovate, acute to abruptly acuminate, 5 to 7 mm. long; pedicels 4 mm. long or less; calyx 15 to 20 mm. long, pilose, the tube broadly campanulate, 5 mm. long, the upper lip very broad, shallowly emarginate, the lower lip 3-lobed, the lobes twice as long as the tube or more, lanceolate or ovate, overlapping at the base, 6 mm. wide or less, attenuate to the apex; banner 3 cm. long, broadly obcordate, sessile, glabrous; wing petals and keel of about the same length, the latter several times spirally coiled; style strongly bearded; legumes about 14 cm. long and 8 mm. broad, straight, the valves glabrous, with thickened carinate margins.

Type in the U. S. National Herbarium, no. 472942, collected in the vicinity of Secanquím, Department of Alta Verapaz, Guatemala, altitude 550 meters, May 7, 1905, by H. Pittier (no. 281).

ADDITIONAL SPECIMENS EXAMINED

GUATEMALA: Near the Finca Sepacuité, Alta Verapaz, Cook 15. Vicinity of Secanquím, Alta Verapaz, alt. 550 meters, Mazon & Hay 3145, 3146. Cubilquitz, Alta Verapaz, alt. 350 meters, von Türckheim (J. D. Smith, no. 7856).

EXPLANATION OF PLATE 25.—Leaf, fruit, and flowers of *Phaseolus spectabilis*, from the Finca Sepacuité, Alta Verapaz, Guatemala. Photographed by O. F. Cook. Natural size.



PHASEOLUS SPECTABILIS STANDLEY.

Phaseolus stenolobus Standley, sp. nov.

Stems slender, twining, pilose with reddish brown hairs; stipules persistent, not produced at the base, lanceolate, acute, 3 to 4 mm. long, conspicuously parallel-nerved, pilose; petioles slender, 4 to 8 cm. long, pilose; stipellæ minute; petiolules 3 mm. long or less; leaflets thin, rhombic-ovate to triangular-oblong, 6 to 11 cm. long, 3.5 to 7 cm. wide, acuminate, rounded or obtuse at the base, abundantly pubescent on the upper surface with long, very slender, appressed hairs having bulbous bases, softly pubescent beneath with similar hairs; peduncles 16 to 22 cm. long, pilose, the racemes short, few-flowered, nodose; bracts lance-linear or lanceolate, 9 to 12 mm. long, deciduous; pedicels 4 mm. long or less; calyx about 12 mm. long, sparsely pilose, the tube broadly campanulate, 3 mm. long, the upper lobe very short, shallowly emarginate, the 3 lower lobes linear, acute, 2 or 3 times as long as the tube; corolla segments about 3 cm. long, glabrous, subequal, the keel several times spirally coiled; style abundantly bearded above; fruit not seen.

Type in the U. S. National Herbarium, no. 355066, collected at Cerro Redondo, Department of Santa Rosa, Guatemala, altitude 1,500 meters, October, 1893, by Heyde and Lux (J. D. Smith, no. 6135).

Differing from the preceding species in the narrow calyx lobes, narrow bracts, and the different pubescence of the leaflets.

Chamaecrista macropoda Standley, sp. nov.

Stems probably prostrate, stout, abundantly setose and cinereous, copiously leafy; stipules lanceolate or ovate-lanceolate, about 12 mm. long, rather abruptly attenuate, aristate-tipped, obliquely rounded at the base, appressed to the stems, strongly nerved, setose on the margins; leaf rachis 2 to 3 cm. long, subulate-appendaged above the uppermost pair of leaflets, the lowest pair of leaflets borne near the base; petiolar gland very small, short-stipitate; leaflets 3 to 5 pairs, rather firm, narrowly oblong, 10 to 20 mm. long, 3.5 to 5 mm. wide, obtuse, aristate-tipped, obliquely rounded at the base, glabrous or sparingly ciliate, conspicuously pinnate-veined, the midvein excentric; flowers solitary or 2 in each axil; pedicels 20 to 37 mm. long, ascending, slender, glabrous, bearing a pair of small linear-subulate bracts near the apex; sepals 6 to 7 mm. long, thin, oblong-lanceolate, acute, subulate-tipped, glabrous or sparingly setose; petals about 8 mm. long; legumes 35 to 45 mm. long, 4.5 mm. wide, abruptly acutish, the beak about 1 mm. long, minutely appressed-pubescent, 10 to 12-seeded.

Type in the U. S. National Herbarium, no. 258959, collected on the Cerro Redondo, Department of Santa Rosa, Guatemala, altitude about 1,400 meters, in September, 1893, by Heyde and Lux (J. D. Smith, no. 6133).

Originally distributed as *Cassia grammica* Spreng., a South American species, the determination by Micheli. That species, however, has pubescent leaflets and larger flowers, and the leaflets are smaller and of different form. The Guatemalan plant is related to *Chamaecrista pilosa* and *C. serpens*; from the former it differs in having petiolar glands and from the latter in its larger, glabrous leaflets, much larger, broader stipules, and elongated, many-seeded legume.

Calliandra mollis Standley, sp. nov.

Stems herbaceous, erect or ascending, stout, branched, abundantly villous with tawny hairs; stipules triangular-ovate or triangular-lanceolate, acute, 5 to 7 mm. long, striate, pilose; rachis of the leaves 50 to 65 mm. long, villous with tawny hairs; pinnæ 4 to 6 pairs, 25 to 55 mm. long; leaflets 7 to 22 pairs, approximate, narrowly oblong, 8 to 18 mm. long, 2.5 mm. wide, obtuse, apiculate, oblique at the base, densely pilose with white hairs on both surfaces; inflorescence of terminal or axillary racemes, each of several or numerous heads; peduncles slender, 15 to 32 mm. long, densely villous with tawny hairs; bracts

conspicuous, triangular-lanceolate, acute, striate, ciliate, pilose; calyx subsessile, 2 mm. long, glabrous, cleft nearly to the base into triangular-oblong acutish lobes; corolla glabrous, about 4 mm. long, the lobes oblong, acute; stamens 15 to 20 mm. long; legumes about 8 cm. long, 6 or 7 mm. wide, rounded-obtuse, short-beaked, attenuate at the base, densely pilose with tawny hairs, about 8-seeded.

Type in the U. S. National Herbarium, no. 578114, collected in thickets near Nicoya, Costa Rica, in January, 1900, by A. Tonduz (Inst. Fís. Geogr. Costa Rica, no. 13536). Additional material is mounted on sheet 577750.

Closely related to *Calliandra portoricensis* and *C. tetragona*, but easily distinguished from both by the copious pubescence. In both of those species the fruit is glabrous. The leaflets are similar in form to those of *C. tetragona*, being broader than those of *C. portoricensis*.

Mimosa maxonii Standley, sp. nov.

A vine with slender terete green glabrous branches armed with numerous slender recurved spines 2 mm. long; stipules triangular-lanceolate, 3 to 4 mm. long, prominently nerved, pectinate-ciliate; petioles 30 to 55 mm. long, slender, glabrous, bearing very numerous slender recurved spines; pinnæ 2 pairs, their rachises about 1 cm. long, slightly puberulent, yellow-setose at the point of insertion of the leaflets; leaflets 2 pairs, unequal, the inner leaflet of the lower pair much reduced, all elliptic-lanceolate or oblong-lanceolate, 38 mm. long or less, 4 to 11 mm. wide, acute or acuminate, rounded or obtuse and very unequal at the base, with a strongly excentric midvein, glabrous on the upper surface, beneath glabrous or with a few scattered setose-strigose yellowish hairs, the margin appearing nerved from the presence of a series of overlapping spiny-strigose hairs; peduncles 10 to 27 mm. long, divergent or ascending, stout, sparingly spiny; bracts of the spherical inflorescence (5 to 6 mm. in diameter) linear-lanceolate, about equaling the flowers, each with a rigid subulate tip; corolla glabrous, smooth, 2 mm. long; stamens 5; fruit oblong or narrowly oblong, 18 to 25 mm. long, 6 to 8 mm. wide, obtuse or abruptly acute, bearing a beak 1 mm. long, subsessile, 2 to 4-seeded, spiny-setose on the margins, the spreading setæ 3 to 5 mm. long, the valves finely and very densely velvety-pubescent, articulate.

Type in the U. S. National Herbarium, no. 473478, collected in the vicinity of Mazatenango, Guatemala, altitude about 350 meters, February 20, 1905, by William R. Maxon and Robert Hay (no. 3497).

Related to *Mimosa velloziana* Mart., but readily distinguished by the velvety-pubescent valves of the fruit.

Erythrina lanceolata Standley, sp. nov.

A small, densely branched tree; branches slender, grayish, closely armed with stout, dark brown spines about 4 mm. long; petioles slender, striate, 45 to 60 mm. long, swollen at the base, armed with numerous short stout spines, glabrous; petiolules stout, 5 or 6 mm. long; leaflets rather thick and firm, dull green, lanceolate or rhombic-lanceolate, 7 to 11 cm. long, 28 to 44 mm. broad, rather abruptly acuminate, cuneate or broadly cuneate at the base, glabrous, 3-nerved, with a few lateral nerves from the midvein, the veins conspicuous and more or less reticulate, the lateral leaflets slightly smaller than the terminal one and inequilateral; racemes 5 to 17 cm. long, rather slender, few-flowered, the rachises at first tomentulose but soon glabrate; pedicels 5 mm. long or shorter; calyx tubular-campanulate, 8 mm. long or less, obtuse at the base, shallowly 2-lipped, the upper lip retuse, obscurely tomentulose, soon glabrate; banner green and red, about 6 cm. long, 9 mm. wide, linear-oblong, straight, glabrous; keel petals distinct, 45 mm. long,

abruptly acute at the base, with a short acute triangular beak at the apex, undulate-margined; wings oblong, obtuse, about equaling the keel; stamens 10, 9 of the filaments adnate for nearly half their length, the tenth free nearly to the base; ovary tomentulose.

Type in the U. S. National Herbarium, no. 678761, collected at San Cristóbal de Candelaria, province of Cartago, Costa Rica, altitude 1,700 meters, by C. Wercklé (H. Pittier, no. 3693).

Similar to *Erythrina americana* Mill. in the form of the flowers, but differing in the short calyx, slender branches, and narrow leaflets. The leaflets are much narrower than those of any other American species.

***Dolicholus pittieri* Standley, sp. nov.**

Stems twining, stout, woody, the younger ones terete, densely viscid-tomentose with short yellow hairs; stipules lanceolate, acute, 4 to 5 mm. long, densely tomentose, soon deciduous; petioles 2 to 3 cm. long, densely viscid-tomentose; stipellæ 2 mm. long, subulate; petiolules about 2 mm. long; leaflets oblong or oblong-lanceolate to ovate, 40 to 65 mm. long, 22 to 33 mm. wide, abruptly acute, rounded to subcordate at the base, dull green, thick and subcoriaceous, glandular on the upper surface and softly pubescent with fine short hairs, conspicuously reticulate-veined beneath and abundantly tomentose with short tawny hairs; racemes axillary, stout, 12 to 17 cm. long, the rachises densely viscid-tomentose, the few flowers rather distant; bracts deciduous, lanceolate, shorter than the buds; calyx about 2 mm. long, about equaling the corolla, the lobes linear or linear-lanceolate, attenuate, the lowest much longer than the others, all several times longer than the short campanulate tube, the whole calyx densely glandular-pubescent; corolla pale yellow, the banner obovate, emarginate, glabrous, the keel and wings of about the same length; legume 3 to 4 cm. long, 1 cm. broad, straight along the upper suture, curved below, broadest toward the apex, acute, short-beaked, glandular and viscid-hirsute with tawny hairs; seeds 2, mature ones not seen.

Type in the U. S. National Herbarium, no. 530856, collected around Cali, western side of Cauca Valley, State of Cauca, Colombia, altitude 1,000 to 1,200 meters, December, 1905, by H. Pittier (no. 668).

In general appearance this is similar to *Dolicholus discolor* (Mart. & Gal.) Rose, a plant of Guatemala and southern Mexico. It differs in its viscid pubescence, narrower and longer calyx lobes, and glabrous banner.

TWO NEW SPECIES OF LEIPHAIMOS.

Leiphaimos, better known by the name *Voyria*, is a remarkable genus of the Gentianaceae which might well be taken as the type of a distinct family, as has been suggested. The plants differ from other Gentianaceae in being colorless parasites whose leaves are reduced to scales. A large number of species are known from the humid forests of northern South America and a few from tropical North America.

***Leiphaimos costaricensis* Standley, sp. nov.**

Stems slender, succulent, terete, glabrous, erect, simple, 7 to 13 cm. high, one-flowered; cauline scales 4 or 5 pairs, distant, 5 to 6 mm. long, connate for about one-third their length, narrowly oblong, acute, subulate-tipped, glabrous; calyx subtended at the base by a pair of connate scales similar to the cauline ones, or the flowers sometimes short-pedunculate; calyx 7 mm. long, cleft one-

third the distance to the base, the tube cylindrical-campanulate, the lobes oblong-linear to narrowly triangular, acuminate; corolla yellow, the tube slenderly cylindrical, dilated in the throat for about 6 mm., 35 to 45 mm. long, about 1 mm. in diameter, puberulent within; corolla lobes elliptic to narrowly elliptic-lanceolate, 10 to 12 mm. long, 2 mm. wide or less, acuminate, conspicuously veined, spreading or somewhat reflexed, puberulent at the base on the inner surface; corolla tube bearing at the base outside a cuplike appendage adherent to the tube, this 1.25 mm. high, with obtusely 5-toothed margin; anthers sessile, broadly oblong, united by their edges, 1.25 mm. long, not appendaged; style stout, 20 to 22 mm. long, puberulent, flattened and very narrowly winged; stigma capitate, 1.5 mm. in diameter and about as high, convolute and tuberculate on the upper surface; capsules sessile, 11 mm. long, 2 mm. in diameter. linear-oblong in outline, acutish at the base, tapering gradually to the base of the style.

Type in the U. S. National Herbarium, no. 365960, collected in the Helechales del General, Diquís Valley, Costa Rica, altitude 700 meters, February 2, 1898, by H. Pittier (Inst. Fís. Geogr. Costa Rica, no. 12010).

Related to *Leiphaimos aphylla* (Jacq.) Gilg, one of the most widely dispersed members of the genus. That species has much broader and shorter corolla lobes and free anthers.

***Leiphaimos oreophila* Standley, sp. nov.**

Stems slender, terete, glabrous, erect, simple, 6 to 8 cm. high, commonly twisted, one-flowered; cauline scales usually 5 pairs, 5 mm. long, connate for half their length, the free portion lance-oblong or narrowly triangular, acuminate, glabrous; peduncles stout, 3 to 11 mm. long; calyx tubular, somewhat inflated by the maturing capsule, 6 mm. long, 1.5 mm. in diameter, the teeth one-half as long as the tube or less, triangular, acute or acutish, a discoid gland borne inside the calyx near the base, one below each lobe; corolla apparently yellow, the tube cylindrical, 11 mm. long, 1.5 mm. in diameter, dilated in the throat; corolla lobes 6 to 8 mm. long, linear-oblong or oblong, obtuse or acutish; anthers sessile, oblong or oblong-cuneate, 1 mm. long, each lobe with a slender pubescent appendage slightly longer than the body of the anther; style slender, 6 to 7 mm. long; stigma discoid, obscurely tuberculate, 1 mm. in diameter; capsule lanceolate in outline, attenuate upward, 5 mm. long, sessile.

Type in the U. S. National Herbarium, no. 600079, collected around San Andrés de la Sierra, western slope of the Cordillera de Santa Marta, State of Magdalena, Colombia, altitude 1,100 to 1,300 meters, June 1 to 6, 1906, by H. Pittier (no. 1676).

Because of its appendaged anthers this falls at once into the subgenus *Lelanthostemon*, but it differs from the species heretofore included in that group in having the anthers sessile. It slightly resembles *L. sulphurea* (Progel) Gilg, but the form of the corolla and calyx is very different. *Leiphaimos oreophila* has a higher altitudinal range than most species of the genus, the greater number of them being natives of lowland forests.

THE GENUS SOMMERA.

The genus *Sommeria*, a member of the Rubiaceae, was published by Schlechtendahl in 1835,¹ a single species, *S. arborescens*, being described, based upon a plant collected in Mexico by Schiede. An-

¹ *Linnaea* 9: 602. 1835.

other species was described by Schumann in 1889, from northwestern Brazil.

Heretofore all material of this genus from Central America has been referred, without hesitation, to *Sommeria arborescens*. Examination of a sheet of the type collection in the U. S. National Herbarium shows that the Mexican plant is very different from any of the Central American specimens. Schlechtendahl states that in his specimens the cymes are 3 to 5-flowered and in our Mexican specimens this number is never exceeded, while the flowers are closely aggregated at the end of the peduncle. All of our other specimens, however, have an open, broad, many-flowered cyme.

The most striking peculiarity of the genus is the lineolate appearance of the tissue between the reticulate veins. This is characteristic, also, of the closely related genus *Watsonamra*, several species of which are found in Central America.

KEY TO THE SPECIES.

- Style glabrous at the apex..... 1. *S. sabiceoides*.
 Style pilose at the apex.
 Cymes 3 to 5-flowered; calyx lobes lanceolate or oblong-lanceolate, acuminate..... 2. *S. arborescens*.
 Cymes many-flowered; calyx lobes oblong to broadly oblong or ovate, from broadly rounded to merely acute at the apex.
 Bracts of the inflorescence broadly ovate to oblong, obtuse or shortly and abruptly acuminate; calyx lobes longitudinally veined, the veins not conspicuously reticulate; peduncles slender, 2 to 5 cm. long..... 3. *S. guatemalensis*.
 Bracts of the inflorescence lance-ovate to linear, attenuate or long-acuminate at the apex; calyx lobes conspicuously reticulate-veined; peduncles stout, 8 to 15 mm. long.
 Leaf blades oval to broadly oblong-obovate, not more than twice as long as broad, round or broadly cuneate at the base, pubescent beneath with very short appressed hairs, the surface not velvety to the touch; bracts lance-ovate or lanceolate, without green tips; corolla tube sparingly pubescent outside..... 4. *S. donnell-smithii*.
 Leaf blades oblanceolate to elliptic-oblanceolate or rarely obovate, usually much more than twice as long as broad, cuneate to attenuate at the base, pubescent beneath with long and usually spreading hairs, somewhat velvety to the touch; bracts mostly linear or lance-linear, with green tips; corolla tube densely pubescent outside..... 5. *S. mesochora*.

1. *Sommerera sabiceoides* Schum. in Mart. Fl. Bras. 6^s: 300. pl. 133. f. 1. 1889.

The type was collected by Martius along the River Yapurá, State of Amazonas, northwestern Brazil. Apparently, it is known only from this single collection.

2. *Sommerera arborescens* Schlecht. Linnaea 9: 602. 1835.

Type collected by Schiede (no. 272) near the Hacienda de la Laguna, southern Mexico.

ILLUSTRATIONS: Schum. in Engler & Prantl, Pflanzenfam. 4^t: f. 26. J, K.

SPECIMENS EXAMINED:

MEXICO: Hacienda de la Laguna, Schiede 272, type collection. Barranca Tenampa, near Zacuapan, Vera Cruz, in damp forests, Purpus 2062.

3. *Sommerera guatemalensis* Standley, sp. nov.

Young branches terete or nearly so, succulent, sparingly strigose; stipules narrowly lanceolate, 35 to 45 mm. long, long-attenuate, thin, brown, strigose along the midvein and margin; petioles 2 to 5 cm. long, strigose; leaf blades oblong-obovate to oval, 17 to 32 cm. long, 8 to 14 cm. wide, rounded to broadly cuneate at the base, abruptly short-acuminate, the tip 15 to 20 mm. long, acute, densely strigose on both surfaces when young, in age glabrate on the upper surface, strigose beneath with very short hairs; peduncles relatively slender, 2 to 5 cm. long, many-flowered, the flowers in a rather dense cyme with several branches; bracts broadly ovate to oblong, obtuse or abruptly acuminate, thin, brown, finely parallel-veined, strigose along the midnerve, ciliate; flowers sessile or very shortly pediceled; ovary densely strigose; calyx lobes 3 to 6 mm. long, unequal, oval to broadly ovate, obtuse or acute, longitudinally nerved, finely strigillose on both surfaces; corolla tube 6 to 8 mm. long, densely pubescent outside above the calyx, densely villous within above the middle, the lobes one-fifth to one-third as long as the tube, triangular-ovate, acute; filaments inserted about the middle of the tube, somewhat longer than the oblong anthers; pistil stout, pilose above; fruit elongate-spherical, 12 mm. long and 9 or 10 mm. in diameter, sparingly strigose, capped with the persistent calyx.

Type in the U. S. National Herbarium, no. 398487, collected near Cubilquitz, Department of Alta Verapaz, Guatemala, altitude 350 meters, May, 1902, by H. von Türckheim (J. D. Smith, no. 8225).

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Pansamalá, Department of Alta Verapaz, alt. 1,140 meters, April, 1889, J. D. Smith 1737.

Distinguished from the other Central American species by the broad bracts and the long peduncles, as well as by the large and broad leaves.

4. *Sommerera donnell-smithii* Standley, sp. nov.

Branches stout, terete, densely pubescent with long ascending tawny hairs; stipules 15 to 20 mm. long, lanceolate or ovate-lanceolate, acuminate, thin, brown, strigose along the midvein and margins or glabrate, ciliate; petioles 1 to 2 cm. long, densely strigose with tawny hairs; leaf blades oval to oval-obovate, 11 to 20 cm. long, 5 to 10 cm. wide, abruptly acuminate, the tips 15 to 20 mm. long, acute, rounded or broadly cuneate at the base, glabrous or remotely strigillose on the upper surface, sparingly pubescent beneath with very short appressed hairs, strigose-ciliate; peduncles 9 to 12 mm. long, stout, densely pubescent with tawny, appressed or ascending hairs; cymes many-flowered, with several stout divaricate branches, the flowers crowded at the ends of the branches, nearly sessile, but the pedicels in fruit 3 to 8 mm. long; bracts lanceolate to lance-ovate, acute to attenuate, thin, brown, strigose; ovary densely strigose; calyx lobes 3 mm. long or less, broadly oval or oblong, rounded at the

apex or obtuse, sparingly strigose, green, conspicuously reticulate-veined; corolla 5 to 7 mm. long, the tube minutely strigillose outside, densely villous within, the lobes about one-fourth as long as the tube, ovate, obtuse; style almost glabrous; fruit nearly spherical, 9 mm. in diameter, sparingly strigose.

Type in the U. S. National Herbarium, no. 245836, collected near Alajuelita, Province of San José, Costa Rica, altitude 990 meters, March, 1894, by John Donnell Smith (no. 4771).

ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: Alajuela, Province of Alajuela, alt. 900 meters, March, 1896, *J. D. Smith* 6592.

5. *Sommeria mesochora* Standley, sp. nov.

Tree, about 8 meters high; young branches stout, terete, densely pubescent with loose tawny hairs; stipules 20 to 35 mm. long, lance-ovate, attenuate, thin and scarious, sparingly strigose along the midnerve and margins, strigose-ciliate; petioles 10 to 25 mm. long, densely pubescent with long loose hairs; leaf blades 12 to 22 cm. long, 3.5 to 8 cm. wide, oblong-oblongate to oblong-obovate, acuminate, sometimes rather abruptly so, gradually tapering from one-third the distance below the apex to a cuneate or very acute base, sparingly pubescent on the upper surface with very short appressed hairs, beneath rather densely pubescent with long, slender, loose or spreading, whitish hairs, ciliate; peduncles 10 to 15 mm. long, densely pilose; cymes many-flowered, with several divaricate branches, the flowers rather densely clustered at the ends of the branches, short-pedicelled; bracts linear or lance-linear, the tips green, conspicuously reticulate-veined, abundantly pubescent with long loose hairs; ovary densely pubescent with long loose whitish hairs; calyx lobes 3 to 4 mm. long, oblong to broadly ovate, acutish to broadly rounded at the apex, strigose, conspicuously reticulate-veined; corolla white, 5 to 8 mm. long, densely and finely pubescent outside, loosely villous inside, the lobes one-fourth to one-third as long as the tube, oblong, obtuse or acutish; style densely pilose at the apex; filaments inserted near the middle of the tube, about as long as the anthers; fruit not seen.

Type in the U. S. National Herbarium, no. 675326, collected in a wet forest ravine, near El Boquete, Chiriquí, Panama, altitude 1,000 to 1,300 meters, March 2 to 8, 1911, by William R. Maxon (no. 4941).

ADDITIONAL SPECIMENS EXAMINED:

PANAMA: Near El Boquete, Chiriquí, alt. 1,000 to 1,300 meters, *Pittier* 3137.

COSTA RICA: Las Cruces de Boruca, February 19, 1898, *Pittier* (Inst. Fis. Geogr. Costa Rica, no. 12071). Cañas Gordas, alt. 1,100 meters, February, 1897, *Pittier* (Inst. Fis. Geogr. Costa Rica, no. 11155).

This is closely related to the preceding species, but seems distinct in its long, narrow leaves of different outline, the densely pilose style, the long and loose pubescence, and the narrow, green bracts.

NOTHOPHLEBIA, A NEW GENUS OF RUBIACEAE FROM COSTA RICA.

Among the plants in the U. S. National Herbarium collected in Costa Rica by Mr. H. Pittier the writer has found one which at first glance recalls the genus *Watsonamra*, especially in the form of the leaves, these having the lineolate appearance or "Moiréestreifung" characteristic of a group of four genera of the tribe *Mussaendeae*. Although the specimen is only in flower, the form of the ovary clearly indicates that the plant is a member of this tribe, but

the form of the flowers is so different from that of *Hippotis*, *Sommera*, *Watsonamra*, or *Tammsia*, that the Costa Rican plant must become the type of a new genus.

NOTHOPHLEBIA Standley, gen. nov.

Tree with large opposite leaves, these petiolate, the blades leathery, entire, nearly glabrous, the leaf tissue finely lineolate between the veins; stipules large, distinct; flowers bracteate, rather large, in axillary many-flowered pedunculate cymes; calyx tube campanulate, as broad as long, very obscurely 5-lobed, the margins faintly crenulate, naked within; corolla funnelform, the tube gradually widening upward, the 5 lobes valvate, much shorter than the tube, leathery; stamens 5, inserted near the base of the tube, the filaments slender, flexuous, unequal, pilose at the base, the anthers introrse, oblong, attached near the base, obtuse at the apex, caudate at the base, included; disk cupulate, 5-lobed; ovary 2-celled, the ovules numerous, compressed, inserted on elongated placentæ adnate to the septum; style slender; stigmas oblong or lanceolate.

Nothophlebia is most nearly related to *Watsonamra*, but it differs decidedly in the form of the calyx, that genus having a tubular and conspicuously toothed calyx or a tubular-campanulate and deeply lobed one. The corollas are very different in the two, the tube being cylindrical in *Watsonamra* and obconic in *Nothophlebia*.

The name refers to the striæ of the leaves, which falsely appear to be a part of the venation.

Nothophlebia costaricensis Standley, sp. nov.

Tree with a depressed crown; young branches stout and fleshy, obtusely quadrangular, glabrous; stipules 35 to 40 mm. long, lance-oblong, attenuate, sparsely strigillose-puberulent, glabrous within; petioles stout, 40 to 55 mm. long, nearly glabrous, sparingly tuberculate near the base; leaf blades oval or obovate-oval, about 33 cm. long and 17 cm. wide, obtuse, acuminate at the base, leathery, glabrous, or very obscurely pubescent upon the veins beneath with appressed hairs, the veins prominent, about 12 on each side, dichotomous near the margin; cymes many-flowered, loosely branched, the branches minutely puberulent and tuberculate, the peduncle 2 cm. long and the secondary branches of about the same length; pedicels 7 mm. long or less, some of the flowers sessile; bractlets at the base of the flowers subulate, 2 mm. long; ovary turbinate, 4 mm. long, strigillose; calyx 4 to 5 mm. long and of about the same diameter, minutely puberulent outside, glabrous within; corolla tube 2 cm. long, 3.5 mm. thick at the base, expanding to 8 or 9 mm. in the throat, glabrous outside near the base, puberulent above, glabrous within except at the point of insertion of the stamens, there pilose; corolla lobes spreading, ovate, acute or acutish, 4 to 5 mm. long, densely puberulent outside, glabrous within or nearly so; filaments inserted 2 mm. above the base of the tube, 9 to 10 mm. long; anthers 2.5 long; style 1 cm. long, the stigmas about 2 mm. long.

Type in the U. S. National Herbarium, no. 578472, collected on Collines de Moin, Atlantic coastal belt, Costa Rica, November, 1899, by H. Pittier (Inst. Ffs. Geogr. Costa Rica, no. 16024).

Only a few bracts are present upon the inflorescence, showing that they are early deciduous. There is no indication that any are ever present except at the base of the ovary or pedicel.

A REVISION OF THE GENUS WATSONAMRA.

The name *Pentagonia* was applied by Bentham in 1844 to a rubiaceous plant collected by Hinds in Panama, which he called *Pentagonia macrophylla*. Unfortunately this generic name had been used twice before, *Pentagonia* having been applied by Ventenat in 1841 to a member of the Campanulaceae and *Pentagonium* by Schauer in 1843 to an asclepiad.

In the Kew Index, as well as in Dalla Torre and Harms's *Genera Siphonogamarum*, *Seemannia* of Hooker¹ is cited as a synonym of *Pentagonia*, dating from 1848. Upon investigating this reference one finds that *Seemannia* was scarcely published here, Hooker merely saying in discussing *Pentagonia pinnatifida*, " * * * should future observations discover marks sufficient to constitute of our present plant a new genus, I can not but wish it should have the name of its discoverer, *Seemannia*." A genus of the Gesneriaceae was named *Seemannia* by Regel in 1855.

The two works cited also list *Megaphyllum* Spruce as a synonym of *Pentagonia*, but this was cited by Baillon as a synonym,² hence is not published. It is not clear what the plant is to which Spruce applied the name of *Megaphyllum*, for the writer has not found a citation in literature of Spruce's number mentioned by Baillon.

Otto Kuntze, in 1891, finding the rubiaceous group to be without a name, designated it as *Watsonamra*, in honor of Dr. Sereno Watson. This is the name that apparently must stand for the genus.

Heretofore six species of *Pentagonia*, or *Watsonamra*, have been described from Central America and northwestern South America. The recent collections of this genus in Panama comprise a more extended series of specimens than has been brought together heretofore. Among the collections of Mr. Pittier and Mr. Williams the writer has found four plants that seem different from those already described. A plant from Costa Rica, distributed as *Pentagonia wendlandi*, also appears to be new. Thus the number of known species is increased to eleven.

Watsonamra is remarkable because of the venation of the leaf blades, the tissue being finely lineolate between the reticulate veins. When a piece of the blade is broken, the fragments are held together by the fine white threads drawn from the striæ. The genus is not peculiar in this respect, a few other members of the family exhibiting the same structure. It is remarkable, however, in containing the only members of the Rubiaceae which have pinnatifid leaves.

¹ Lond. Journ. Bot. 7: 567. 1848.

² Hist. Pl. 7: 456. 1880.

WATSONAMRA Kuntze.

Pentagonia Benth. Bot. Voy. Sulph. 105. pl. 39. 1844, not Vent. 1841.

Watsonamra Kuntze, Rev. Gen. Pl. 1: 302. 1891.

Type species, *Pentagonia macrophylla* Benth.

KEY TO THE SPECIES.

Leaves entire.

Leaf blades sessile or subsessile.

Corolla red, the lobes spreading; calyx lobes not more than half as long as the tube..... 1. *W. magnifica*.

Corolla yellow, the lobes erect; calyx lobes as long as the tube..... 2. *W. wendlandi*.

Leaf blades on long petioles.

Calyx not glandular within..... 3. *W. spathicalyx*.

Calyx glandular within.

Leaves finely soft-pubescent on both surfaces; corolla hirtellous..... 4. *W. pubescens*.

Leaves glabrous, or the veins beneath appressed-pubescent; pubescence of the corolla appressed.

Bracts deciduous; corolla lobes oblong, twice as long as broad, densely pubescent outside; calyx tube campanulate..... 5. *W. donnell-smithii*.

Bracts persistent; corolla lobes ovate, nearly as broad as long, sparsely pubescent; calyx tube turbinate... 6. *W. macrophylla*.

Leaves pinnatifid.

Petioles not auriculate at the base.

Inflorescence closely sessile, many-flowered; petioles winged to the base; fruit densely tuberculate..... 10. *W. tinajita*.

Inflorescence short-pedunculate, few-flowered; petioles winged on the upper half, naked below; fruit sparsely tuberculate..... 11. *W. gymnopoda*.

Petioles auriculate at the base.

Calyx 30 mm. long, tubular, appendaged within at the base, the lobes 3 mm. long or less; corolla only slightly exceeding the calyx... 7. *W. pinnatifida*.

Calyx 12 to 20 mm. long, cylindric-campanulate or tubular, not appendaged within, the lobes one-third as long as the tube or longer; corolla twice as long as the calyx or longer.

Auricles nearly half as long as the petioles; calyx tubular, 20 mm. long, the lobes one-third as long as the tube; inflorescence many-flowered; bracts oblong or narrowly oblong, 10 to 20 mm. long... 8. *W. pittieri*.

Auricles less than one-fourth as long as the petioles; calyx cylindric-campanulate, 15 mm. long, the lobes half as long as the tube; bracts broadly ovate, 5 to 10 mm. long..... 9. *W. brachyotis*.

1. *Watsonamra magnifica* (Krause) Standley.*Pentagonia magnifica* Krause, Bot. Jahrb. Engler 40: 325. 1908.

TYPE LOCALITY: Along the Rio Timbiqué, Colombia.

RANGE: Panama and Colombia.

SPECIMENS EXAMINED:

COLOMBIA: Along the Rio Timbiqué, March, 1889, *Lehmann* 8886, type collection (in herb. N. Y. Bot. Gard.).PANAMA: Along the Rio Culebra, above Santa Isabel, Province of Colon, near sea level, *Pittier* 4158.

It is impossible to be certain that the Panama specimen is of this species, since it is in fruit, and even the persistent calyces are mutilated so that their form can not be determined definitely. Krause describes the fruit as being perfectly spherical and 12 to 15 mm. in diameter. In the Panama plant it is ovoid-spherical, about 22 mm. in diameter and 24 to 28 mm. high, and finely striate longitudinally. The specimen of the type collection in the herbarium of the New York Botanical Garden has no fruit. The inflorescence is described as sessile, but in this specimen the peduncle is a centimeter long. In the plant from Panama the peduncles are even longer. It is very probable that, when the flowers of the latter are collected, it will be found to be an undescribed species. The single leaf of Mr. Pittier's collection is 78 cm. long and 29 cm. wide in the broadest part.

2. *Watsonamra wendlandi* (Hook.) Kuntze, Rev. Gen. Pl. 1: 302. 1891.*Pentagonia wendlandi* Hook. Curtis's Bot. Mag. 87: pl. 5230. 1861.

TYPE LOCALITY: The plant was described from cultivated specimens. Hooker states that it was brought by Wendland from some part of Central America. Hemsley¹ gives the locality as Central Mexico, but this is probably a slip of the pen for Central America, since many such lapses are found in the *Biologia*.

3. *Watsonamra spathicalyx* (Schum.) Kuntze, Rev. Gen. Pl. 1: 302. 1891.*Pentagonia spathicalyx* Schum. in Mart. Fl. Bras. 6^o: 302. 1889.

TYPE LOCALITY: In forests along the River Yapurá and near Ega, State of Amazonas, northwestern Brazil. Type collected by Martius.

Described from fruiting specimens; the corolla has not been seen.

4. *Watsonamra pubescens* Standley, sp. nov.

A small tree, 3 to 4 meters high; young branches thick and succulent, hirtellous; stipules not seen; petioles naked, 4 to 10 cm. long, densely hirtellous with short hairs; leaf blades oval-obovate to elliptic-oval, 26 to 48 cm. long, 12 to 23 cm. wide, acute, rounded to acute at the base, densely pubescent on both surfaces with fine short spreading hairs, velvety to the touch, conspicuously veined, with 12 to 14 veins on each side, these branching near the margin; cymes subsessile or the peduncles 5 mm. long, few-flowered, the branches densely pubescent; pedicels 2 or 3 mm. long, very stout; bracts oblong to broadly ovate, 10 to 15 mm. long, obtuse, finely nerved, appressed-pubescent on the outer surface; ovary 6 mm. long; calyx about 18 mm. long, the tube turbinate, densely pubescent with appressed hairs, the lobes rounded at the apex, sparingly pubescent on the outer surface, the tube glandular within; corolla tube slenderly cylindrical, 25 mm. long, 3.5 mm. in diameter, hirtellous outside, villous within, the lobes ovate, acute, 5 mm. long; stamens inserted 7 mm. above the base of the tube, the filaments slender, villous; style 18 mm. long, pilose above; immature fruit spherical, 12 to 14 mm. in diameter, crowned by the persistent and accrescent calyx, vertically striate, densely hirtellous.

¹ Biol. Centr. Amer. Bot. 2: 38. 1881.

Type in the U. S. National Herbarium, no. 678894, collected along the railroad near Tabernilla, Canal Zone, Panama, altitude 20 to 25 meters, July 6, 1911, by H. Pittier (no. 3822).

Easily distinguished from all other species by the densely pubescent leaves and hirtellous corolla.

5. *Watsonamra donnell-smithii* Standley, sp. nov.

Young branches stout, glabrate or sparingly strigillose; stipules about 5 cm. long and 2.5 cm. broad, ovate, acuminate or attenuate, densely and finely silky-strigillose on the outer surface, glabrous on the inner surface; petioles 9 to 11 cm. long, minutely strigillose, naked; leaf blade (a single one seen) entire, oval, 45 cm. long, 28 cm. wide, obtuse at the base, glabrous above, glabrous beneath except along the finely silky-strigose veins, these conspicuous, 14 on each side; cymes rather densely many-flowered, on stout peduncles 10 to 13 mm. long; bracts not seen, evidently early deciduous, or possibly wanting; pedicels very stout, 4 to 6 mm. long; ovary densely appressed-pubescent; calyx 12 to 15 mm. long, the tube campanulate, 5 to 7 mm. broad, finely pubescent with appressed hairs, glandular within near the base, the lobes about equaling the tube, obovate or oval-obovate, rounded at the apex, finely striate, sparingly pubescent outside, glabrous within; corolla tube 25 mm. long, 3.5 mm. in diameter, densely pubescent outside with short appressed hairs, except near the base, there glabrous, nearly glabrous within; corolla lobes 6 or 7 mm. long, oblong, about twice as long as broad, pubescent outside like the tube, but more densely so, glabrate within; stamens inserted 6 mm. above the base of the corolla tube, the slender filaments unequal, 11 mm. long or less, villous near the base; fruit not seen.

Type in the U. S. National Herbarium, no. 355176, collected near La Emilia, Llanuras de Santa Clara, Costa Rica, altitude 250 meters, April, 1896, by John Donnell Smith (no. 6590).

This was distributed as *Pentagonia wendlandi*, but is very unlike that plant. It is most closely related to *Watsonamra macrophylla*, but that species has persistent bracts, broader corolla lobes, and a very different calyx. The peduncles, pedicels, and bases of the petioles in the type are very densely beset with brownish, gland-like tubercles. A few similar tubercles are found on some of the specimens of closely related species.

6. *Watsonamra macrophylla* (Benth.) Kuntze, Rev. Gen. Pl. 1: 302. 1891.

Pentagonia macrophylla Benth. Bot. Voy. Sulph. 105. pl. 39. 1844.

TYPE LOCALITY: Panama. Type collected by Hinds.

RANGE: Canal Zone and vicinity, Panama.

SPECIMENS EXAMINED:

CANAL ZONE: Agua Clara, on the Trinidad River, alt. 10 to 40 meters, Pittier 3992. Matachín, June, 1874, Kuntze. Culebra, Cowell 217. Colon to Empire, Joseph Crawford 512.

Three meters high or less; leaves 25 to 60 cm. long; calyx red; corolla greenish.

7. *Watsonamra pinnatifida* (Seem.) Kuntze, Rev. Gen. Pl. 1: 302. 1891.

Pentagonia pinnatifida Seem. Lond. Journ. Bot. 7: 566. pl. 18. 1848.

TYPE LOCALITY: Banks of the River Cupica, State of Cauca, Colombia. Type collected by Seemann.

A small tree, about 3 meters high; larger leaves nearly a meter long and half as wide. This differs from all other species in the narrowly tubular corolla which extends only slightly beyond the calyx and in the peculiar interior appen-

dages of the calyx. It may be the type of a distinct genus, as suggested by Hooker, but in general appearance it is very similar to the other species with pinnatifid leaves.

8. *Watsonamra pittieri* Standley, sp. nov.

Stems stout and succulent, obtusely quadrangular, glabrate; stipules 55 mm. long, narrowly oblong, rather abruptly attenuate, finely pubescent outside with minute appressed hairs, glabrous within; petioles 14 to 17 cm. long, stout, smooth, minutely puberulent with appressed hairs, auriculate at the base, the purplish red auricles rounded, crispate, about 8 cm. long, undulate-margined, finely and sparsely strigose-puberulent, especially on the lower surface; leaf blades 68 cm. long or less (in the specimens), up to 58 cm. wide, truncate or obtuse at the base, pinnatifid about two-thirds the distance to the midrib, the lobes 4 or 5 on each side, ascending or subdivergent, narrowly oblong, acute or abruptly acute, the terminal lobe broader than the others, the blade glabrous throughout or minutely strigose-puberulent on the veins beneath; cymes few-flowered, on stout peduncles 25 mm. long or less; bracts oblong or narrowly oblong, 10 to 20 mm. long, acute, persistent, striate, finely appressed-pubescent outside, glabrous within, ciliate; flowers subsessile; calyx tubular, 20 mm. long, silky-strigose outside, glabrous and naked within, the lobes one-third as long as the tube or shorter, oblong-ovate, obtuse or acutish, ciliate; corolla tube much exerted (a perfect corolla not seen), sparingly puberulent; fruit subspherical, about 2 cm. in diameter, striate vertically, not tuberculate, strigose-puberulent.

Type in the U. S. National Herbarium, no. 679414, collected in forests around Puerto Obaldía, San Blas Coast, Panama, at an altitude of 50 meters or less, August, 1911, by H. Pittier (no. 4298). Additional material is mounted on sheet 679415.

The leaves of this species agree very well with those figured and described for *Watsonamra pinnatifida*. The form of the calyx, however, is very different in the two. Only a single mutilated corolla of *W. pittieri* has been seen, but this is sufficient to show that it is very unlike that of *W. pinnatifida*.

9. *Watsonamra brachyotis* Standley, sp. nov.

A small tree 3.5 meters high, the trunk 2.5 cm. in diameter; wood yellowish white; bark on the older stems grayish, slightly furrowed; young branches succulent, glabrous or nearly so; stipules not seen; petioles 8 to 10 cm. long, slender, strigose-puberulent, each bearing at the base 2 rounded reddish auricles 2.5 cm. long or less, these crispate, undulate-margined, strigose-puberulent; leaf blades (in the specimens examined) rhombic in outline, 33 to 37 cm. long, 42 to 46 cm. broad, obtuse at the base, glabrous on the upper surface, glabrous beneath except for the strigillose veins, pinnatifid nearly to the midvein, the lobes 3 on each side, narrowly oblong, 4 to 6 cm. wide, acuminate, the tips obtuse, the terminal lobe broader, oval-oblong or ovate; cymes closely few-flowered, very shortly pedunculate; bracts persistent, broadly ovate, 5 to 10 mm. long, acute or acutish, striate, brown, sparingly silky-strigose, ciliate; calyx cylindrical-campanulate, 15 mm. long or less, sparingly silky-strigillose, the lobes half as long as the tube or more, ovate or oval, rounded at the apex, ciliolate; corolla tube slender, 30 mm. long, nearly glabrous outside, but with a few appressed hairs, glabrous within except at the insertion of the anthers, there pilose; corolla lobes spreading, 3 to 4 mm. long, ovate, acute or acutish; stamens inserted 8 mm. above the base of the tube, the filaments slender, pilose at the base, 10 mm. long or less; style 15 to 20 mm. long; fruit not seen.

Type in the U. S. National Herbarium, no. 678351, collected near Marraganti, Panama, April 3, 1908, by R. S. Williams (no. 999). Duplicate type in the herbarium of the New York Botanical Garden.

This is closely related to the preceding species, but seems amply distinct in the short auricles, short, broad calyx, broader and shorter bracts, and few-flowered cymes. The collector states that the leaves are sometimes a meter long and that the flowers are red.

10. *Watsonamra tinajita* (Seem.) Kuntze, Rev. Gen. Pl. 1: 302. 1891.

Pentagonia tinajita Seem. Bot. Voy. Herald 134. pl. 28. 1854.

TYPE LOCALITY: Near David, Province of Chiriquí, Panama. Type collected by Seemann (no. 1595).

RANGE: Province of Chiriquí, Panama.

SPECIMENS EXAMINED:

PANAMA: Vicinity of David, Chiriquí, alt. 30 to 80 meters, *Pittier* 3369.
Vicinity of San Felix, eastern Chiriquí, alt. 0 to 120 meters, *Pittier* 5214.

A small tree, 2 to 4 meters high. According to Seemann, the native name is "tinajita" and the fruit is edible, but of an insipid flavor. The fruits are 10 to 17 mm. in diameter and densely tuberculate. The seeds are about 3 mm. long, obtusely angled, and few.

11. *Watsonamra gymnopoda* Standley, sp. nov.

A shrub, 2 to 2.5 meters high; young stems fleshy, stout, obtusely quadrangular, glabrous or nearly so; stipules 3 to 6 cm. long, oblong-ovate or lance-oblong, acuminate or attenuate, silky-strigillose outside, glabrous within; petioles 7 to 23 cm. long, slender, naked below, winged on the upper half, the wings 15 mm. wide or less, strigillose-puberulent or glabrate; leaf blades 54 to 68 cm. long, 66 to 72 cm. wide, ovate-triangular in outline, glabrous above, strigillose-puberulent along the veins beneath, pinnatifid nearly to the midrib, with 4 to 6 divisions on each side, these divergent, oblong-linear, 6.5 cm. wide or less, narrowed toward the base, gradually tapering toward the acute apex, prominently veined, the terminal one short and only slightly broader than the others; cymes densely few-flowered, on stout peduncles 6 to 9 mm. long; bracts oblong, obtuse or acute, 23 mm. long or less, sparingly strigillose-puberulent outside, ciliate; flowers not seen; fruit globose-ovoid, 14 mm. in diameter and 18 mm. high, sparsely tuberculate and puberulent, not striate; seeds numerous, brown, obtusely angled, minutely favose, 3 to 4.5 mm. long.

Type in the U. S. National Herbarium, no. 678935, collected in forests, Loma de Gloria, near Fató, Province of Colon, Panama, altitude 10 to 100 meters, in July or August, 1911, by H. Pittier (no. 3858). Additional material, consisting of young leaves, is mounted on sheet 678934.

This is most closely related to *Watsonamra tinajita*, but the petioles are not winged to the base, as in that species, the leaf segments are narrower, the inflorescence is pedunculate and fewer flowered, and the fruit is larger, of a different shape, and not densely tuberculate.

GEOCARDIA, A NEW NAME TO REPLACE GEOPHILA.

The name *Geophila* Don, applied in 1825 to a group of herbaceous plants of the family Rubiaceae, is antedated by *Geophila* Bergeret, given in 1803 to a member of the Liliaceae. No other name seems

ever to have been applied to the rubiaceous genus, although Mueller considered the species congeneric with *Mapouria* Aubl.¹ The genus being clearly distinct, the writer proposes the name *Geocardia* (alluding to the heart-shaped leaves borne on prostrate stems) as a substitute for the homonym *Geophila*.

GEOCARDIA Standley, nom. nov.

Geophila D. Don, Prodr. Fl. Nepal. 136. 1825, not Berg. 1803.

The following is a list of the principal American species. Several others have been described from Africa:

Geocardia cordata (Miq.) Standley.

Geophila cordata Miq. Linnaea 17: 72. 1843.

Mapouria cordata Muell. Arg. in Mart. Fl. Bras. 6^o: 426. 1881.

Geocardia herbacea (L.) Standley.

Psychotria herbacea L. Sp. Pl. ed. 2. 245. 1762.

Cephaelis reniformis H. B. K. Nov. Gen. & Sp. 3: 377. 1818.

Geocardia macrocarpa (Muell. Arg.) Standley.

Mapouria macrocarpa Muell. Arg. in Mart. Fl. Bras. 6^o: 425. 1881.

Geocardia picta (Rolfe) Standley.

Geophila picta Rolfe, Kew Bull. 1896: 18. 1896.

Geocardia pleuropoda (Donn. Smith) Standley.

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

Geocardia tenuis (Muell. Arg.) Standley.

Mapouria tenuis Muell. Arg. in Mart. Fl. Bras. 6^o: 425. 1881.

Geocardia violacea (Aubl.) Standley.

Psychotria violacea Aubl. Pl. Guian. 1: 145. pl. 55. 1775.

Geophila violacea DC. Prodr. 4: 537. 1830.

Geocardia violaefolia (H. B. K.) Standley.

Cephaelis violaefolia H. B. K. Nov. Gen. & Sp. 3: 379. 1818.

Geophila violaefolia DC. Prodr. 4: 537. 1830.

Geophila herbacea Morong, Ann. N. Y. Acad. 7: 129. 1893.

Geophila herbacea violaefolia Chod. & Hassl. Bull. Herb. Boiss. II. 4: 180. 1904.

NEW RUBIACEAE FROM COLOMBIA AND COSTA RICA.

The following new species comprising one in each of the genera *Cassupa*, *Gonzalagunia*, *Genipa*, and *Cosmibuena*, have been noted in the large series of specimens collected by Mr. H. Pittier in Costa Rica and Colombia.

Cassupa pittieri Standley, sp. nov.

Small pyramidal tree, 4 to 5 meters high; young branches stout, obtusely quadrangular, densely tomentulose with tawny hairs; stipules 7 to 12 mm. long, triangular-lanceolate, attenuate, puberulent outside; petioles 4 to 5 cm.

¹ In Mart. Fl. Bras. 6^o: 424. 1881.

long, stout, minutely puberulent; leaf blades oval, about 28 cm. long and 14 cm. wide, acuminate, abruptly short-acuminate at the base, the upper surface dark green and shining, glabrous except for the puberulent veins, beneath paler green, puberulent, especially along the veins, prominently nerved, about 22 parallel lateral veins on each side; panicle about 9 cm. long (excluding the corollas), many-flowered, the secondary branches stout, compressed, 25 mm. long or less, puberulent, the terminal flowers sessile, the others on pedicels 5 to 8 mm. long; bracts ovate to lanceolate, acute; ovary and calyx together 6 or 7 mm. long, glabrous or obscurely puberulent, the calyx margin minutely repand-denticulate; corolla white, the tube 57 mm. long, slightly dilated in the throat, glabrous and smooth near the base, above verrucose and puberulent, densely bearded within in the throat; corolla lobes 6, ovate or oval, 11 mm. long, 6 or 7 mm. wide, rounded or obtuse at the apex, puberulent, bearded within at the base, imbricated; filaments 3 mm. long; anthers 10 mm. long; style 55 mm. long, glabrous below, scaberulo-puberulent above; stigmas oblong, 5 mm. long; fruit not seen, the ovaries 2-celled.

Type in the U. S. National Herbarium, no. 530697, collected near Córdoba, Dagua Valley, State of Cauca, Colombia, in the Pacific coastal zone, altitude 30 to 100 meters, December, 1905, by H. Pittier (no. 514).

This resembles *Cassupa alba* Schum. & Krause in the color of its flowers, but the corolla is longer and is verrucose and puberulent outside and the leaves are green beneath instead of densely white-puberulent.

Gonzalagunia rugosa Standley, sp. nov.

Young branches terete, densely matted-tomentose with pale brownish hairs, becoming glabrate in age; stipules 3 to 4 mm. long, triangular, with subulate tips; petioles very stout, 4 to 7 mm. long, densely tomentose; leaf blades lanceolate or elliptic-lanceolate, 7 to 10 cm. long, 25 to 35 mm. broad, rather abruptly acuminate, rounded or obtuse at the base, thick and subcoriaceous, very conspicuously rugose, glabrous on the upper surface or tomentulose along the veins, densely matted-tomentose beneath with pale yellowish or brownish hairs; inflorescence a spike-like panicle 10 to 15 cm. long and about 1.5 cm. broad, on a peduncle 25 mm. long; bracts linear, about 7 mm. long, persistent, before anthesis divaricate and exceeding the branches of the panicle; flowers in short-pedunculate many-flowered approximate cymes; calyx 4-lobed, the lobes broadly triangular, obtuse, persistent, the calyx and ovary together about 1.5 mm. long, densely tomentose; pedicels about 1 mm. long; corolla 5 mm. long, densely tomentose outside, the tube stout-cylindric, the 4 lobes broadly rounded, villous within; filaments very short, inserted above the base of the tube; anthers oblong, 1.25 mm. long; style 3.5 mm. long, puberulent; stigma 4-lobed, capitate; fruit depressed-demispheric, 4-celled, 3 mm. in diameter, densely tomentose; seeds rather few, brown, favose.

Type in the U. S. National Herbarium, no. 531453, collected around Hulla, an Indian village in the Rio Paez Valley, Tierra Adentro, State of Cauca, Colombia, altitude 1,600 to 1,900 meters, January, 1906, by H. Pittier (no. 1258).

Distinguished from the other South American species of the genus by the very short corolla, as well as by the long bracts and densely tomentose lower surface of the leaves.

Genipa codonocalyx Standley, sp. nov.

Tree; young branches stout and succulent, glabrous or nearly so; stipules triangular-ovate, 10 to 12 mm. long, abruptly acuminate; petioles short, 5 to 15

mm. long, cinereous-puberulent; leaf blades oblanceolate to oblong-oblanceolate, 12 to 17 cm. long, 4 to 7 cm. wide, abruptly short-acuminate, the obtuse tip 10 to 13 mm. long, attenuate to the base, shining and glabrous on the upper surface, dull beneath and hirtellous or puberulent along the veins, these prominent, 9 to 12 on each side; cymes sessile or nearly so, branched, many-flowered, the branches very stout, glabrate; bracts broadly ovate, obtuse, connate at the base; pedicels 3 to 7 mm. long; calyx and ovary together broadly campanulate, 5 to 9 mm. high, 6 to 9 mm. broad, glabrous, the truncate limb of the calyx with 5 minute and inconspicuous teeth; corolla tube 11 mm. long, gradually widening upward, glabrous outside for 3 mm. above the base, elsewhere densely pubescent with long tawny appressed hairs, long-bearded within; corolla lobes spreading, 15 mm. long, oblong-obovate or oval, rounded at the apex, densely sericeous outside, bearded on the lower half, especially along and near the midnerve; anthers subsessile, 15 mm. long, linear; style and stigma together 22 mm. long, the former papillose and bearded near the apex; fruit not seen.

Type in the U. S. National Herbarium, no. 577536, collected near Boca Matapalo, Pacific coastal belt, Costa Rica, at sea level, April 10, 1898, by H. Pittier (Inst. Fís. Geogr. Costa Rica, no. 12085). Corolla yellowish white; native name, *jagua*.

This differs from both *Genipa americana* and *G. caruto* in the short, broad calyx, as well as in the form of the bracts. The leaves are not densely pubescent beneath, as in the second species, nor glabrous, as in *G. americana*.

Cosmibuena arborea Standley, sp. nov.

A tree, 8 to 12 meters high, glabrous throughout; young branches stout, somewhat fleshy, grayish brown; stipules not seen; petioles 20 to 25 mm. long; leaf blades elliptic-obovate or elliptic-oblong, 9 to 11 cm. long, 42 to 56 mm. wide, thick and leathery, shining on the upper surface, rounded at the apex, cuneate or broadly cuneate at the base, with 7 to 9 parallel veins on each side, these not conspicuous; inflorescence terminal, of about 5 sessile flowers; stipules ovate or rounded-ovate, 10 to 15 mm. long, obtuse, thin; ovary oblong, about 12 mm. long, contracted into a stout stipe as long or longer; calyx cylindrical, 10 to 13 mm. long, cleft two-fifths the distance to the base, the teeth somewhat unequal, oblong-triangular, acute, the whole calyx circumscissile, glandular within near the base; corolla tube slender, 6 to 7 cm. long, 3 to 4 mm. in diameter, gradually dilated toward the throat; corolla lobes 5, narrowly oblong, obtuse, 25 to 30 mm. long, 8 to 11 mm. wide, yellowish white; anthers sessile or nearly so, attached near the base, 2 cm. long, mucronate at the apex, with 2 short appendages at the base; style about 65 mm. long; stigma bilamellate; ovules numerous, winged, the wings lacinate.

Type in the U. S. National Herbarium, no. 531184, collected near Espejuelo, Cauca Valley, State of Cauca, Colombia, altitude 1,000 meters, January, 1906, by H. Pittier (no. 985).

Flowers very fragrant.

Related to *Cosmibuena triflora* as closely as to any species, but readily distinguished by the narrow corolla lobes, very obtuse leaves with longer petioles, and longer calyces.

A REVISION OF THE GENUS COBAEA.

The genus *Cobaea* of the Polemoniaceae as published by Cavanilles consisted of a single species, *C. scandens*, described from plants grown in the Royal Botanical Garden at Madrid from seeds received from Mexico. The only other generic name that has been given to a member of the group here discussed is *Rosenbergia*-Örst., published in 1856, based upon *Rosenbergia gracilis*, which came from Costa Rica. Örsted believed that his plant belonged to a genus distinct from *Cobaea*, because of the elongated linear corolla lobes. A second species of *Rosenbergia* was published by Karsten in 1858. If no other members of the group treated here had been discovered it might naturally be divided into two genera; but later explorations have revealed intermediate forms, *Cobaea aschersoniana* Brand, especially, standing almost exactly midway between the types of *Cobaea* and *Rosenbergia*.

In 1908 Mr. H. D. House transferred all the species of *Cobaea* to *Rosenbergia*,¹ claiming that Cavanilles's generic name was invalidated by *Cobaea* Necker, published in 1790. Necker's name was applied to a group of Linnæan species of *Lonicera* sometimes known as *Xylosteum*; but it appears to be a hyponym, since it is not associable by citation with a previously published species. Consequently the name *Cobaea* is to be retained for the genus with which it has always been associated.

Cobaea is unique among the Polemoniaceae in having the leaves terminated by tendrils. Some authors have placed it in the Bignonaceae, while others have considered it the type of a distinct family, the Cobaeaceae.

The species are all inhabitants of humid mountain forests of tropical and subtropical North and South America, ranging from the State of Nuevo León in Mexico south through Central America to northern Chile, Venezuela, and northwestern Brazil. So far as now known the species are of local distribution. *Cobaea scandens*, the most generally known species, has been found only within a small area in southern Mexico. Although a wide geographical range has been ascribed to certain species, it is probable that this is the result of hasty or careless determinations. Several have been introduced into cultivation in Europe and *C. scandens* is often seen in North America.

There are only three accounts of the genus that attempt to be complete. The first was published by Hemsley in *The Garden* in 1880.² This is a popular discussion of the group, although there are

¹ *Mulenbergia* 4: 22-25. 1908.

² 17: 352-353.

appended technical descriptions of two new forms. Hemsley lists 8 species. More recently the group has been monographed by Brand in Engler's *Pflanzenreich*.¹ Brand recognizes three sections which include 9 species and 1 subspecies. House, in the paper cited above, published a key to the known species, 11 in all, 1 of which he described as new. Examination of the material of the genus in the U. S. National Herbarium indicates the presence of several undescribed species, some of them very unlike any of these hitherto recognized. These new species, seven in all, are described in the accompanying enumeration, which includes all members of the genus so far as now known. It is probable that more extended exploration of the mountains of Central and South America will bring to light a number of additional species. The writer has seen no specimens from Colombia or Nicaragua, regions in which some of the species doubtless occur.

COBAEA Cav.

Cobaea Cav. *Icon. Pl.* 1: 11. *pl.* 16, 17. 1791. (Name misspelled "Cobbea" by Andrews and "Cobea" by Desfontaines.)

Rosenbergia Örst. *Vid. Medd. Naturh. For. Kjøbenhavn* 1856: 30. 1856.

KEY TO THE SPECIES.

Corolla lobes linear or with linear tip.

Calyx lobes densely long-villous; corolla lobes ovate at the base, abruptly contracted into a long linear tip..... 5. *C. aschersoniana*.

Calyx lobes glabrous or minutely pilose; corolla lobes either linear or tapering gradually from the base.

Stamens shorter than the corolla; corolla lobes bifid at the apex..... 2. *C. hookeriana*.

Stamens longer than the corolla; corolla lobes entire.

Corolla yellow; calyx segments villous-ciliate. 4. *C. gracilis*.

Corolla purple or greenish purple; calyx segments not villous-ciliate.

Calyx lobes minutely pilose, about equaling the corolla tube; stigmas very short; corolla lobes of about equal breadth throughout, obtuse. 1. *C. penduliflora*.

Calyx lobes glabrous, much longer than the corolla tube; stigmas elongated; corolla lobes tapering to the long-attenuate apex..... 3. *C. panamensis*.

¹ 27: 24-29. 1907.

Corolla lobes ovate-triangular to orbicular, never with linear tips.

Calyx lobes broadly rounded at the apex, united for nearly half their length----- 18. *C. scandens*.

Calyx lobes acute to attenuate, united only at the base.

Corolla lobes ovate to triangular, acute or acuminate.

Calyx shorter than the corolla tube; corolla 5 cm. long or more, yellow----- 8. *C. lutea*.

Calyx longer than the corolla tube; corolla 4 cm. long or less, yellowish green.

Stems and calyx glabrous; leaflets acute, bright green----- 6. *C. viorna*.

Stems densely villous about the nodes; calyx lobes villous-ciliate; leaflets obtuse, glaucescent----- 7. *C. villosa*.

Corolla lobes suborbicular to rounded-ovate, rounded to obtuse at the apex.

Peduncles shorter than the leaves; leaflets 4 cm. long or less----- 11. *C. minor*.

Peduncles longer than the leaves; leaflets usually 5 to 10 cm. long.

Lowest pair of leaflets much reduced, stipule-like----- 17. *C. stipularis*.

Lowest pair of leaflets similar in size and form to the others.

Corolla 4 cm. long or less.

Calyx lobes half as long as the corolla, hirsute; leaflets obovate-oblong----- 10. *C. campanulata*.

Calyx lobes more than half as long as the corolla, glabrous; leaflets oblong----- 9. *C. triflora*

Corolla 5 to 7 cm. long. (Calyx lobes half as long as the corolla, or often much shorter.)

Lowest leaflets more or less auriculate, constricted above the base; calyx lobes glabrous.

Calyx lobes broadly oblong-ovate, 13 to 15 mm. wide; corolla 6 cm. long, the tube campanulate; peduncles solitary; leaflets acute or acuminate----- 15. *C. baurita*.

Calyx lobes lanceolate or ovate-lanceolate, 8 to 11 mm. wide; corolla 7 cm. long, the tube obconic, tapering to the base; peduncles 2 together or 2-flowered; leaflets obtuse----- 16. *C. pringlei*.

Lowest leaflets rounded to subcordate at the base, never auriculate, not constricted; calyx lobes pubescent.

Calyx lobes more than half as long as the corolla tube, glabrous outside; leaflets oval to elliptic..... 12. *C. trianaei*.

Calyx lobes much less than half as long as the corolla tube, pubescent over all or nearly all the outer surface; leaflets narrowly oblong, narrowed toward the apex.

Leaflets glabrous; calyx lobes sparsely puberulent..... 13. *C. pachysepala*.

Leaflets loosely villous beneath; calyx lobes densely tomentulose..... 14. *C. tomentulosa*.

1. *Cobaea penduliflora* (Karst.) Hook. f. Curtis's Bot. Mag. 95: pl. 5757. 1869, as to name only.

Rosenbergia penduliflora Karst. Fl. Columb. 1: 27. pl. 14. 1858.

TYPE LOCALITY: Caracas, Venezuela.

RANGE: Venezuela. Brand also reports¹ collections from Ecuador and Peru. Whether they really are of this species, or belong to *C. hookeriana*, or are undescribed, can not be determined without an examination of the specimens.

ILLUSTRATIONS: Brand in Engl. Pflanzenreich 27: f. 8.

No collections of this have been seen by the writer, but it is so well portrayed in Karsten's colored plate (copied by Brand) that there can be no doubt concerning its characteristics. In his description of this species, Brand contradicts his key to the two species which he refers to his section *Rosenbergia*. *Cobaea penduliflora* and *C. gracilis* are distinguished in the key by a single character, the former having "flores virides," and the latter "flores luteae." In the description of *Cobaea penduliflora*, however, the corolla is described as "viridi-rubescens" and "sordide violaceis." The same author cites plate 5757 of the Botanical Magazine as representing this species, but his abbreviation of Karsten's description has not been so amended as to include the plant figured there.

2. *Cobaea hookeriana* Standley, sp. nov.

PLATE 26.

Cobaea penduliflora Hook. f. Curtis's Bot. Mag. 95: pl. 5757. 1869, not *Rosenbergia penduliflora* Karst. 1858.

Stems slender, glabrous; leaves 7 to 12 cm. long, the leaflets oblong, 35 to 50 mm. long, pale green, thin, acute or acuminate, obtuse to subcordate at the base, conspicuously petiolulate; peduncles solitary, 20 to 25 cm. long, the flowers pendulous; calyx segments united only at the base, 35 to 40 mm. long, narrowly oblong, acute or acuminate, glabrous, green; corolla pale green, 10 to 12.5 cm. long, the tube 20 to 25 mm. long, campanulate, the lobes broadly linear, 4 to 5 mm. broad, of about the same length throughout, undulate, bifid at the apex, the sinuses between the lobes acute; stamens spreading, the filaments 7.5 cm.

¹ In Engl. Pflanzenreich 27: 28. 1907.

long, purplish red, villous at the base, the anthers yellow, 15 to 20 mm. long; style filiform, green, longer than the corolla, the stigmas slender, 1 cm. long; disk thick, 5-lobed, the lobes again 2-lobed; ovary 3-celled; fruit not known.

The type of this species is plate 5757 of Curtis's Botanical Magazine, the present description being drawn from the plate and from the accompanying description by Hooker. The plant figured was grown at Kew from seeds sent from Caracas, Venezuela, by Mr. A. Ernst. It flowered in the Palm House of the Royal Gardens in December, 1868. The same illustration is reproduced by Hemsley as a text figure in volume seventeen of *The Garden*, page 353.

As soon as one places Hooker's plate beside the excellent one of *Rosenbergia penduliflora* published by Karsten, it is obvious that two very different plants are represented. *Cobaea hookeriana* differs from Karsten's species in the less acute leaflets, longer, glabrous calyx lobes, larger corolla, broad, bifid, pale green corolla lobes, acute sinuses, short stamens, and elongated stigmas. The fact that both plants come from Venezuela means nothing, when one considers the number of species of the genus found in Guatemala. Although the seeds from which Hooker's plant were grown were sent from Caracas, they may have come from some locality far distant from that city.

As stated under *Cobaea penduliflora*, Brand cites the Botanical Magazine plate as that species, although his description excludes it. Hemsley¹ attempts to reconcile the differences between the two plates, apparently, stating that the length of the stamens and the color of the corolla is variable.

EXPLANATION OF PLATE 26.—Photograph of plate 5757 of Curtis's Botanical Magazine.

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

PLATE 27.

Stems very slender, glabrous, purplish green; leaflets subequal, narrowly oblong to oblanceolate, 6 to 8 cm. long, 15 to 25 mm. wide, abruptly acute or acuminate, oblique and rounded to subcordate at the base, thin, glabrous, bright green, slightly paler beneath; petiolules 4 to 8 mm. long; peduncles solitary, pendulous, slender, 15 to 21 cm. long; calyx lobes united only at the base, glabrous, green, linear-lanceolate, 25 to 35 mm. long, long-attenuate; corolla deep brownish purple, the tube campanulate, 18 to 20 mm. long, with acute sinuses, puberulent outside, glabrous within, the lobes 6 cm. long, 5 or 6 mm. wide at the base, tapering to the long-attenuate tips; filaments very slender, purple, 9 to 11 cm. long, much exceeding the corolla, villous at the base; anthers purple, 1 cm. long; style slender, 10 to 13 cm. long, glabrous; stigmas slender, 8 mm. long; immature capsule elliptic, acute, glabrous.

Type in the U. S. National Herbarium, no. 677661, collected in sunny but cool places, between the Río Ladrillo and Los Sigüas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, altitude 1,200 to 1,700 meters, March 18, 1911, by H. Pittier (no. 3270).

From the other species with much elongated and very narrow corolla lobes, this may be distinguished by the deep purple corolla with long-attenuate lobes. It is most closely related to *Cobaea penduliflora*, but differs in the narrower, long-attenuate, glabrous calyx lobes, acute sinuses of the corolla, and differently shaped leaflets.

EXPLANATION OF PLATE 27.—Part of type specimen. Scale $\frac{1}{2}$.

4. *Cobaea gracilis* (Örst.) Hemsl. *The Garden* 17:352. 1880.

PLATE 28.

Rosenbergia gracilis Örst. Vid. Medd. Naturh. For. Kjøbenhavn 1856:31. 1856.

TYPE LOCALITY: Naranjo, Costa Rica. Type collected by Örsted.

RANGE: Costa Rica and Panama.

ILLUSTRATIONS: Örst. *Amér. Centr. pl.* 15. 1863.

¹The Garden 17: 353. 1880.



COBAEA HOOKERIANA STANDLEY.



COBAEA PANAMENSIS STANDLEY.



COBAEA GRACILIS (ÖRST.) HEMSLEY.

The writer has seen no specimens of this species. Brand refers here a specimen collected by Polakowsky (no. 395) between Augusta and Zapoto, Province of Cartago, Costa Rica, and one collected by Warscewicz (no. 2, in part) in the province of Veraguas, Panama.

The calyx lobes are figured by Örsted as villous-ciliate, at least in part of the flowers illustrated, but this character is not mentioned in any of the descriptions.

EXPLANATION OF PLATE 28.—Photograph of plate 15 of L'Amérique Centrale, by A. S. Örsted. Scale $\frac{1}{2}$.

5. *Cobaea aschersoniana* Brand, Helios 21: 87. f. 2. 1904.

Rosenbergia aschersoniana House, Muhlenbergia 4: 25. 1908.

TYPE LOCALITY: Forests of La Esmeralda, Volcán de Barba, Costa Rica. Type collected by Biolley (Pittier & Durand, no. 7178).

RANGE: Costa Rica.

ILLUSTRATIONS: Brand in Engl. Pflanzenreich 27: f. 7A.

SPECIMENS EXAMINED:

COSTA RICA: Bordes du Rio Pedregoso au Copey, alt. 1,800 meters, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 12217). Forêts de la Esmeralda, Volcán de Barba, alt. 2,000 meters, *Biolley* (Inst. Fís. Geogr. Costa Rica, no. 7178). Bord des ruisseaux près de chaléts de Turrialba, alt. 2,500 meters, *Pittier* (Inst. Fís. Geogr. Costa Rica, no. 867).

Well distinguished by the densely villous calyx lobes and by the form of the corolla. Brand¹ made this the type of a new section of *Cobaea*, which he called "Aschersoniophila."

The fruit had not been seen by Brand. It may be described as follows: Capsule elliptic in outline, 5 cm. long, 2 cm. in diameter, acute, glabrous, glaucous; seeds 3 in each cell, 20 to 25 mm. long, 11 mm. wide, with very broad thin entire wings.

Brand² refers here a specimen collected by Warscewicz (no. 2, in part), no locality being stated. Since the remainder of this number came from Veraguas, Panama, it is probable that *Cobaea aschersoniana* also should be credited to Panama.

6. *Cobaea viorna* Standley, sp. nov.

Stems slender, glabrous, or sparingly puberulent about the nodes; petioles glabrous; leaflets thin, bright green, glabrous, similar and subequal, oval to oblong, 25 to 50 mm. long, 10 to 18 mm. wide, acute, mucronate, unequal and rounded or subcordate at the base, on petiolules 4 to 11 mm. long; peduncles solitary, 15 to 24 cm. long, much exceeding the leaves; calyx segments united only at the base, linear-oblong, 23 to 30 mm. long, 4 to 5.5 mm. wide, acute to abruptly acuminate, glabrous; corolla greenish yellow, 3.5 to 4 cm. long, the tube campanulate, sparingly puberulent outside, the lobes slightly shorter than the tube, ovate-triangular, acuminate, erect; filaments 35 to 55 mm. long, slender, villous at the base; anthers yellow, 1 cm. long; capsule oval in outline, 42 mm. long, 20 mm. wide, acute, glabrous, the cells each with 2 seeds.

Type in the U. S. National Herbarium, no. 256732, collected between Rodeo and Malacate, Guatemala, altitude 420 to 1,050 meters, January 20, 1895, by E. W. Nelson (no. 3745).

Most closely related to *Cobaea lutea*, but with smaller flowers, a greenish corolla, elongated peduncles, and longer calyx lobes. In general appearance the plant suggests some species of *Viorna*, this resemblance being due to the form of the buds, the appearance of the leaves, and the long peduncles.

¹ Helios 21: 88. 1904.

² In Engl. Pflanzenreich 27: 28. 1907.

7. *Cobaea villosa* Standley, sp. nov.

Stems rather stout, striate or subangulate, densely villous about the nodes and sparingly so elsewhere; petioles and tendrils villous to puberulent; leaflets subequal, similar, obovate to oblong-obovate or oblong, 40 to 65 mm. long, 16 to 40 mm. wide, obtuse, mucronate, unequal and rounded or truncate at the base, thin, glaucescent, usually glabrous on the upper surface, sparingly puberulent beneath or glabrate, on petiolules 4 to 12 mm. long; peduncles solitary or 2 together, 13 to 19 cm. long, slender or stout, frequently flattened and usually coiled in age, puberulent or glabrous; calyx lobes united only at the base, 18 to 28 mm. long, 3 to 8 mm. wide, linear-oblong to lance-oblong, rather abruptly acuminate, conspicuously nerved, villous-ciliate; corolla yellowish green, 4 cm. long or slightly less, the tube campanulate, glabrous, the lobes about as long as the tube, ovate-triangular, acuminate, densely short-villous outside, glabrous within; filaments 8 cm. long or less, slender, villous at the base, the anthers yellow, 1 cm. long; capsule elliptic-oval, 4 cm. long, acute, glabrous, the cells 3 or 4-seeded; seeds irregularly oval or oblong, 18 to 21 mm. long, the wings very broad, finely reticulate-veined.

Type in the U. S. National Herbarium, no. 575607, collected in Salvador by Carlos Renson (no. 213).

ADDITIONAL SPECIMENS EXAMINED:

SALVADOR: San Salvador, *Velasco* (J. D. Smith, no. 8882).

From *Cobaea lutea* the present species differs in about the same respects as does *C. viorna*, besides having villous-ciliate instead of usually glabrous calyx lobes. From the latter species it differs in its villous stems, broader, obtuse, glaucescent leaflets, and villous-ciliate calyx segments.

8. *Cobaea lutea* Don, Edinburg Phil. Journ. 10: 112. 1824.

Cobaea macrostema Pav.; Don, loc. cit., as synonym; Hook. Curtis's Bot. Mag. 66: pl. 3780. 1840.

Cobaea acuminata DC.; Hook. loc. cit.

Cobaea macrostoma DC. Prodr. 9: 322. 1845.

Rosenbergia macrostoma House, *Muhlenbergia* 4: 24. 1908.

TYPE LOCALITY: Originally given as "Ad Portum Guayaquil in Regno Quitensi Peruvianorum," but Hooker states¹ that this locality was probably incorrect and that the type came perhaps from Mexico. If, however, the plant that has usually been given this name is correctly determined, the type probably came from Guatemala.

RANGE: Guatemala. Brand² also reports a specimen from Salvador, and credits the species to Costa Rica. It may have this range, but possibly these reports are the result of incorrect identifications.

SPECIMENS EXAMINED:

GUATEMALA: Laguna de Ayarza, Department of Jalapa, alt. 2,400 meters, *Heyde & Lux* (J. D. Smith, no. 3987). San Lucas, Department of Antigua, *C. & E. Scler* 2452. Between Guatemala City and Chiquimula, August 18, 1860, *Hayes*. Without locality, *Heyde* 240.

Well distinguished from the related species by the large corolla. The specimen figured by Hooker in the Botanical Magazine was grown at Kew from seeds sent from Guatemala by Skinner.

It is impossible to justify the use of the name *macrostema* (or any of its variations) for this species. Don plainly publishes the plant as *lutea*, citing Pavon's manuscript name *macrostema* as a synonym. Yet *lutea* has never been used by any other author to designate this species.

¹ Loc. cit.

² In Engl. Pflanzenreich 27: 28. 1907.

9. *Cobaea triflora* Donn. Smith, Bot. Gaz. 13: 75. 1888.*Cobaea macrostoma triflora* Brand in Engl. Pflanzenreich 27: 26. 1907.*Rosenbergia triflora* House, Muhlenbergia 4: 25. 1908.

TYPE LOCALITY: Banks of the Rio Cajabón, near Cobán, Department of Alta Verapaz, Guatemala, at an altitude of 1,290 meters. Type collected by H. von Türckheim (no. 204).

RANGE: KNOWN only from type collection.

SPECIMENS EXAMINED:

GUATEMALA: Type specimen.

The fruit, which has not been described, may be characterized as follows: Capsule elliptic or elliptic-oval in outline, about 43 mm. long and 18 mm. broad, acute, glabrous; seeds 2 or 3 in each cell, oval, 20 to 22 mm. long, 10 to 12 mm. wide, acute at the apex, deeply retuse at the base, the wings very broad, entire.

The transference of this species to rank as a subspecies of *Cobaea macrostoma* was unfortunate, since the two are not closely related. This is at once apparent upon comparing the original descriptions. Indeed, they are as distinct from each other as any other two species of the genus. The corolla lobes of *Cobaea triflora* are broadly rounded, while those of *C. lutea* (*macrostoma*) are acuminate. In the latter the stamens are long exserted, while in *C. triflora* they only slightly exceed the corolla. The only differences which Brand indicated between the two plants were the slightly different outline of the leaflets and the ternate rather than solitary arrangement of the peduncles of *triflora*. The flowers of this species seem to be more often solitary than in threes in the specimens seen by the writer, while in *Cobaea lutea* the peduncles are not always solitary.

Brand's error with regard to *Cobaea triflora* can be better understood after noting the specimens he cites under *Cobaea macrostoma triflora*. Three are enumerated. The first, collected in Guatemala by C. and E. Seler (no. 2293), the writer has not seen. The second is the type collection of *Cobaea triflora*. The third is Heyde and Lux's no. 3987, which is here referred to *Cobaea lutea*.

House,¹ in his treatment of *Rosenbergia*, refers to Brand's confusion of *Cobaea macrostoma* and *C. triflora*; but he himself does not clarify matters, for the only specimen which he cites under *triflora* is very different from Captain Smith's type and is evidently of the species here called *C. lutea*.

10. *Cobaea campanulata* Hemsl. The Garden 17: 352. 1880.*Rosenbergia campanulata* House, Muhlenbergia 4: 24. 1908.

TYPE LOCALITY: Atacama, Chile. Type collected by Hinds.

RANGE: KNOWN only from the type collection.

Hemsley describes the calyx segments as hirsute. The pubescence of the calyx in other species is villous and composed of jointed hairs. Probably it is not essentially different in the South American plant.

11. *Cobaea minor* Mart. & Gal. Bull. Acad. Sci. Brux. 12: 276. 1845.*Rosenbergia minor* House, Muhlenbergia 4: 24. 1908.

TYPE LOCALITY: Mountain of Orizaba, Mexico, at 3,000 meters. Type collected by Galeotti (no. 1447).

RANGE: Southern Mexico to Costa Rica.

SPECIMENS EXAMINED:

MEXICO: Pié d' Orizaba, Vera Cruz, Galeotti 1447.

COSTA RICA: Volcán de Turrialba, Province of Cartago, alt. 2,400 meters, Pittier (Inst Fís. Geogr. Costa Rica, no. 13075; J. D. Smith, no. 7539).

¹ Muhlenbergia 4: 22. 1908.

As suggested by Hemsley, the foliage of this species somewhat resembles that of some of the vetches. The leaflets are much smaller than those of any other species. They are dark or dull green and glabrous above, but much paler and loosely villous beneath. The pubescence was not mentioned by Martens and Galeotti, and Brand describes the stems as glabrous. Our specimens, which are of the same and only collections cited by Brand, have numerous loose villous hairs on the stems, especially about the nodes, the pubescence being still more abundant on the petioles. The corolla is violet, according to Galeotti's label, although this was not mentioned in the original description. Brand describes the stamens as "longiuscule exserta," but in all the flowers examined by the writer they are well included. Martens and Galeotti state that the stigma is exserted, but they make no such statement concerning the stamens.

12. *Cobaea trianaei* Hemsl. *The Garden* 17: 353. 1880.

Rosenbergia trianaei House, *Muhlenbergia* 4: 24. 1908.

TYPE LOCALITY: Colombia. Brand cites a specimen collected in the Province of Bogotá at 2,300 meters by Triana (no. 2180). This may be the type collection, although Hemsley says the plant was collected in New Granada "without any special locality."

RANGE: Colombia.

ILLUSTRATIONS: Brand in *Engl. Pflanzenreich* 27: f. 7 B.

The writer has seen no specimens of this. Hemsley states that it was collected at Ibaque on the Quindiu by Purdie, at Antioquia by Jervise, and at Tollma de Nevado by Goudot.

13. *Cobaea pachysepala* Standley, sp. nov.

PLATE 29.

Stems stout, angulate or striate, glabrous except about the nodes, there sparsely villous; petioles glabrous or sparsely short-villous; leaflets equal, similar, 60 to 85 mm. long, 23 to 27 mm. wide, narrowly oblong, tapering from about two-thirds the distance above the base to an acuminate mucronate apex, rounded to subcordate at the base, dull green, slightly paler beneath, glabrous, or sparsely villous-ciliate when young; peduncles solitary, stout, straight in anthesis but curved or coiled in fruit, 12 to 18 cm. long; sepals united only at the base, lanceolate, 20 to 24 mm. long, rather abruptly attenuate, thick and leathery, puberulent outside near the base, finely tomentulose inside along the margins; corolla yellow, 5.5 to 6 cm. long, narrowed rather abruptly near the base, 4 to 4.5 cm. wide in the throat, finely and sparsely villous outside, the lobes short, 15 to 20 mm. long, rounded-ovate, obtuse, apparently erect; stamens about equaling the corolla, the filaments stout, villous near the apex, the anthers about 6 mm. long; style about 12 mm. longer than the corolla, the stigmas stout, 2.5 mm. long; capsule oblong-oval, 57 mm. long, 21 mm. broad, obtuse, glabrous; seeds numerous (about 8 or 9) in each cell, oblong-oval, about 2 cm. long, obtuse or rounded at the apex, subcordate at the base, broadly winged.

Type in the U. S. National Herbarium, no. 399435, collected on the Volcán de Agua, Department of Sacatepequez, Guatemala, February 15, 1905, by W. A. Kellerman (no. 4395).

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Volcán de Agua, alt. 2,700 to 3,000 meters, *Mason & Hay* 3747.

It is difficult to tell with which of the previously described species this should be compared, for it is not very closely related to any of them. Perhaps it is nearest *Cobaea triflora*, but it differs widely in the size and form of the leaflets, as well as in the numerous seeds. The leaflets are different from those of any



COBAEA PACHYSEPALA STANDLEY.



COBAEA BIAURITA STANDLEY.

other species except *C. tomentulosa*, being of nearly uniform width for two-thirds their length, then tapering to the apex.

EXPLANATION OF PLATE 29.—Specimen of *Cobaea pachyrepala*, *Mason & Hay* 3747. Scale $\frac{1}{2}$.

14. *Cobaea tomentulosa* Standley, sp. nov.

Stems stout, obscurely tomentulose except about the nodes, there tomentose; petioles stout, abundantly tomentulose; leaflets narrowly oblong to lance-oblong or elliptic, 5 to 9 cm. long, 25 to 30 mm. wide, acute, mucronate, rounded or subcordate at the base, dull green, sparsely puberulent on the upper surface, loosely villous beneath with rather short hairs, on petiolules 7 to 14 mm. long; peduncles stout, solitary, 22 to 24 cm. long, at first straight and erect, curved or coiled in age, sparsely puberulent; calyx segments united only at the base, 20 to 25 mm. long, lanceolate to narrowly oblong, acuminate, thick, densely tomentulose outside and along the margins within; corolla 55 to 60 mm. long, truncately obconic, villous outside, glabrous within, yellow, the lobes about half as long as the tube, rounded-ovate, obtuse; stamens only slightly surpassing the corolla, the filaments villous, densely so at the base, the anthers yellow, 8 mm. long; style slightly exserted, the stigmas thick, 3 mm. long; capsule oblong-elliptic, 55 mm. long, acutish, glabrous; seeds 4 to 6 in each cell, about 2 cm. long.

Type in the U. S. National Herbarium, no. 250869, collected near Zunil, Guatemala, altitude 2,340 to 2,400 meters, January 20, 1896, by E. W. Nelson (no. 3683).

Similar in general form to the preceding species, but distinguished by the densely tomentulose calyx and the villous leaflets of slightly different outline on longer petiolules.

15. *Cobaea biaurita* Standley, sp. nov.

PLATE 30.

Stems slender, glabrous; leaflets glabrous, green, slightly paler beneath, rather abruptly acute or acuminate, mucronate, the lowest pair sessile, elliptic or narrowly oval, constricted above the base, with 2 rounded unequal basal auricles, the upper leaflets oval, unequal and rounded to acutish at the base, on petiolules 5 to 7 mm. long; peduncles stout, solitary, about 20 cm. long; calyx lobes united for only a short distance at the base, broadly oblong-ovate, about 3 cm. long, 13 to 15 mm. wide, rather abruptly narrowed to a triangular-subulate tip, green, glabrous outside, densely puberulent within; corolla 6 cm. long, 2.5 cm. wide above the base, sparsely villous-puberulent outside, the lobes less than half as long as the tube, broadly rounded; stamens slightly exserted, the anthers about 8 mm. long; style exserted about 2 cm., the stigmas stout, 2 mm. long; fruit not seen.

Type in the U. S. National Herbarium, no. 233329, collected near Tumbala, Chiapas, Mexico, altitude 1,200 to 1,650 meters, October 20, 1895, by E. W. Nelson (no. 3363).

Nearest *Cobaea scandens*, but distinguished by the green foliage, differently shaped leaflets, and very different calyx lobes, which are united for only a short distance at the base. In *C. scandens* the calyx segments are broadly rounded at the apex and mucronate. The plant is said to be a vine 4.5 to 6 meters high, with greenish flowers.

EXPLANATION OF PLATE 30.—Type specimen. Scale $\frac{1}{2}$.

16. *Cobaea pringlei* (House) Standley.

PLATE 31.

Rosenbergia pringlei House, *Muhlenbergia* 4: 24. 1908.

TYPE LOCALITY: In the Sierra Madre near Monterey, State of Nuevo Leon, Mexico. Type collected by Pringle (no. 11901), August 29, 1903.

RANGE: Known only from type collection.

SPECIMENS EXAMINED:

MEXICO: Type collection.

This comes from a locality far north of those reported for other members of the genus. It is related to the last preceding species; but the corolla is larger, the calyx lobes of very different form, and the leaflets obtuse (rather than acute or acuminate) and glaucescent.

EXPLANATION OF PLATE 31.—Specimen of type collection in the U. S. National Herbarium. Scale $\frac{1}{2}$.

17. *Cobaea stipularis* Benth. Pl. Hartw. 45. 1840.

Rosenbergia stipularis House, *Muhlenbergia* 4: 23. 1908.

TYPE LOCALITY: Near San Cornello, State of Hidalgo, Mexico. Type collected by Hartweg (no. 344).

RANGE: Southern Mexico.

ILLUSTRATIONS: Edwards's Bot. Reg. 27: pl. 25.

The only specimen the writer has seen is one in the U. S. National Herbarium, grown in the Royal Botanical Garden at St. Petersburg. This has no open flowers, but the form of the leaves is exactly that described and figured for *Cobaea stipularis*. The species is readily distinguished by having the lowest pair of leaflets reduced and stipule-like. Brand¹ reports a specimen from Guayaquil, but it is very doubtful whether it is correctly determined. Hemsley² refers here Coulter's 928 from Zimapan, Mexico, while House cites Mueller's no. 634 from Orizaba.

18. *Cobaea scandens* Cav. Icon. Pl. 1: 11. pl. 16, 17. 1791.

Rosenbergia scandens House, *Muhlenbergia* 4: 23. 1908.

TYPE LOCALITY: Described from plants cultivated at Madrid, grown from seeds said to have come from near the City of Mexico.

RANGE: Southern Mexico.

ILLUSTRATIONS: Curtis's Bot. Mag. 21: pl. 851; Fl. Serr. Jard. 14: pl. 1467; Engl. & Prantl, Pflanzenfam. 4^{te}: f. 19; Lubbock, Contr. Knowl. Seedl. 2: f. 529; Engl. Pflanzenreich 27: f. 6.

SPECIMENS EXAMINED:

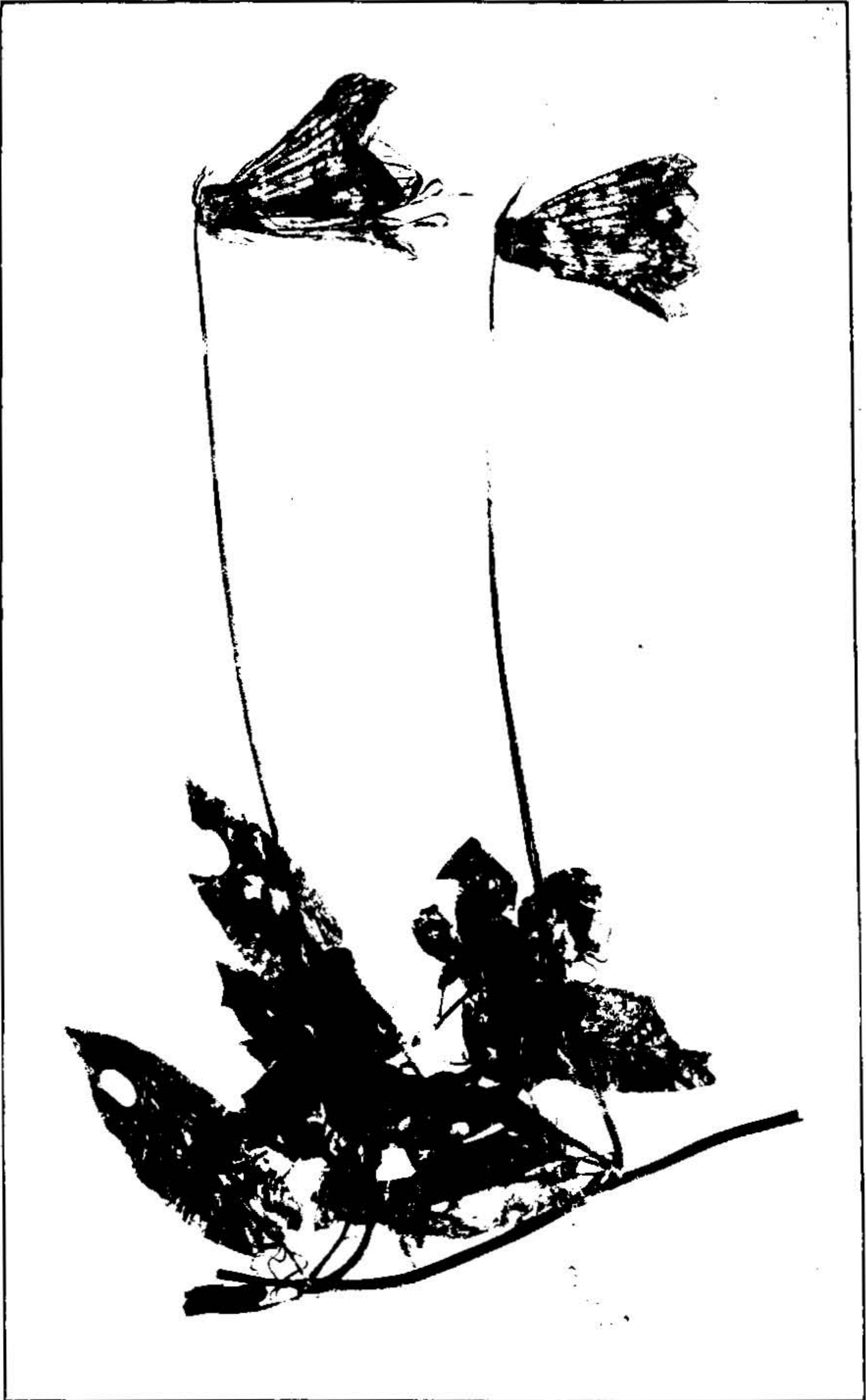
MEXICO: Orizaba, *Botteri* 294. Environs de Puebla, October 10, 1909, *Nicolas*.

The plant is not uncommon in cultivation, having been introduced into Europe as early as 1787. Most of the seedsmen of the United States offer the seeds. A form with variegated leaves is known, this being the one illustrated in the *Flore des Serres*.

This species is readily distinguished from all the others by the very broad, rounded calyx lobes which are united nearly to the middle. According to Brand¹ it has escaped from cultivation in Brazil.

¹ In Engl. Pflanzenreich 27: 26. 1907.

² The Garden 17: 352. 1880.



COBAEA PRINGLEI (HOUSE) STANDLEY.