

# STUDIES OF TROPICAL AMERICAN PHANEROGAMS— NO. 2.

By PAUL C. STANDLEY.

## INTRODUCTION.

The present paper is in continuation of a series begun in 1914.<sup>1</sup> It contains descriptions of new species and taxonomic notes upon various groups of plants, but chiefly the Amaranthaceae, Allioniaceae, Malvaceae, and Rubiaceae, and the group of families formerly known as the Leguminosae. There are included descriptions of two new genera in the Malvaceae.

The new species described are based chiefly upon the extensive collections obtained in Panama by Mr. H. Pittier. Study of the Panama collections shows very clearly the close alliance of the flora of the Isthmus with that of Colombia, as was to be expected. Quite unforeseen, however, is its inclusion of certain genera which are characteristically Brazilian, a fact recently pointed out by Mr. Pittier.<sup>2</sup> Two Brazilian genera, *Cassupa* and *Stachyarrhena*, are here reported for the first time from North America. Moreover, several of the species described as new have their closest allies in Brazilian plants.

## NEW CYPERACEAE FROM PANAMA.

While working with the Cyperaceae of Panama, the writer discovered two apparently undescribed species, a *Rynchospora* and a *Scleria*, descriptions of which are published below. The *Rynchospora* is particularly interesting, being very unlike any species previously reported from North America.

There are also included new combinations in *Cyperus*, *Stenophyllus*, and *Calyptrocarya*, which are necessary for properly listing the Panama Cyperaceae.

*Rynchospora argentea* Standley, sp. nov.

Tufted perennial; leaves 30 to 40 cm. long, 2 to 3 cm. wide, acuminate, narrowed at the base into broadly winged petioles, prominently nerved, scabrous on the margins, elsewhere glabrous, silvery white, especially on the upper surface, at least when dry;

<sup>1</sup> Contr. U. S. Nat. Herb. 17: 427-458. pls. 24-31. 1914.

<sup>2</sup> Journ. Washington Acad. Sci. 5: 468-469. 1915.

inflorescence 20 cm. long or less, much shorter than the leaves, nearly naked, bearing only 1 or 2 much reduced thin pale leaves, paniculate but only sparingly branched, the branches angled, glabrous; spikelets solitary, on peduncles 1.5 to 3 mm. long; empty scales several, nearly white, hyaline, lanceolate or oblong, acute, with short subulate tips, glabrous except for the scaberulous midnerve; bristles of the involucre 6, white, scaberulous; style branches very short; fruit not seen.

Type in the U. S. National Herbarium, no. 679431, collected on high hills back of Puerto Obaldía, on the San Blas Coast, Panama, August, 1911, by H. Pittier (no. 4307).

In general appearance this is very unlike any other species of which material or descriptions have been seen. Its broad, elongated, silvery leaves and the very short inflorescence, nearly leafless and bearing but few spikelets, will enable one to recognize it readily.

***Scleria hitchcockii* Standley, sp. nov.**

Underground parts not seen; plants slender, about 70 cm. high, rather sparingly leafy; culms triquetrous, sharply angled, striate, yellowish green, obscurely scaberulous; sheaths closely investing the culms and nearly covering them, 3 to 5 cm. long, sharply angled, striate, glabrous, or hirsutulous near the summit; ligule very short, about 1 mm. long, truncate, hirsute; leaf blades 12 to 18 cm. long, narrow, 2 to 4 mm. wide, yellowish green, acute, conspicuously nerved, nearly glabrous, but often hirsute-ciliate on the margins and on the midvein beneath; inflorescence much exserted, on a slender peduncle; panicle about 11 cm. long, composed of few very slender spikes, the branches short-ciliate on the angles; bract subtending the inflorescence 3.5 cm. long, very narrow; spikelets in sessile fascicles of 2, each consisting of one fertile and one sterile flower; glumes of the fertile flower about 2 mm. long, reddish brown, ovate, oblong-ovate, or lanceolate, thin, strongly keeled, the midnerve extended as a short awn; glumes of the sterile flowers slightly longer, about 3 mm. long, narrower; achenes smooth and shining, white, spherical or depressed, 1.2 mm. in diameter, disk fused with the achenes as a short thick stipe.

Type in the U. S. National Herbarium, no. 678393, collected on a grassy hillside in the foothills near El Boquete, Province of Chiriquí, Panama, altitude 1,000 to 1,300 meters, September 28 to October 7, 1911, by A. S. Hitchcock (no. 8326).

The proposed species is related to *Scleria lithosperma*, but differs conspicuously in the slender branches, short scales of the flowers, and small, depressed achenes.

***Calyptrocarya glomerulata* (Brongn.) Standley.**

*Becquerelia glomerulata* Brongn. in Duperrey, Bot. Voy. Coquille 2: 163. 1829.

*Calyptrocarya fragifera* Kunth, Enum. Pl. 2: 364. 1837.

Tropical America.

***Cyperus hermaphroditus* (Jacq.) Standley.**

*Carex hermaphrodita* Jacq. Coll. Bot. 4: 174. 1790.

*Mariscus jacquinii* H. B. K. Nov. Gen. & Sp. 1: 216. 1815.

West Indies and Mexico to Argentina.

***Stenophyllus paradoxus* (Spreng.) Standley.**

*Schoenus paradoxus* Spreng. Syst. Veg. 1: 190. 1825.

*Bulbostylis paradoxa* Kunth, Enum. Pl. 2: 206. 1837.

Central America and tropical South America.

**NEW AMARANTHACEAE FROM TROPICAL NORTH AMERICA.**

Recently the writer has been engaged in monographing the family Amaranthaceae for the North American Flora. In a group to which so little attention had been given it was to be expected that more

than a few new species would be discovered. Some of these have been published during the past year.<sup>1</sup> A considerable number of others, chiefly in the genera *Iresine* and *Achyranthes*, are described in the present paper. The name *Achyranthes* is here used for the genus generally known as *Alternanthera*. The reasons for the use of the name in this sense the writer has recently explained at length.<sup>2</sup> He has also published a synoptic account of the North American representatives of the family.<sup>3</sup>

***Achyranthes panamensis* Standley, sp. nov.**

Stems weak and probably clambering over shrubs, herbaceous, much branched, the branches slender, angulate, short-pilose with solitary or fasciculate, spreading or reflexed hairs; petioles 1 to 4 mm. long; leaf blades oblong-elliptic or ovate-oblong, 2 to 5.5 cm. long, 0.6 to 2 cm. wide, acute or acuminate, acutish at the base, firm, bright green, appressed-pilose on both surfaces with short slender fulvous hairs; peduncles axillary and terminal, simple or usually branched, 1 to 6 cm. long, slender, densely short-pilose; spikes usually solitary, globose-ovoid or short-cylindric, 8 to 11 mm. long, 7 mm. thick; bracts broadly ovate, acuminate, glabrous; bractlets broadly ovate, half as long as the sepals, aristate-acuminate, sparsely short-villous; sepals lance-oblong, 2.5 mm. long, acute or acutish, 3-nerved, purplish (brownish or fuscous when dry), glabrous; filaments short, linear-subulate; staminodia equaling or exceeding the anthers, two-thirds as long as the sepals or shorter, lacerate at the apex; style short, the stigma entire; seed subglobose, 1 mm. long, black and shining.

Type in the Herbarium of Columbia College (New York Botanical Garden), collected in Panama by Sutton Hayes (no. 944).

In floral characters this plant is similar to *Achyranthes mexicana* (Schlecht. & Cham.) Standley, but in that species the slender peduncles are simple and the flowers are white or slightly stramineous.

***Achyranthes williamsii* Standley, sp. nov.**

Stems herbaceous, clambering over shrubs and herbs, sparsely branched, the branches stout, striate, cinereous-puberulent; petioles stout, 2 to 10 mm. long; leaf blades oblong, ovate-oblong, or rarely elliptic, 2.5 to 8 cm. long, 8 to 33 mm. wide, acute, acutish, or obtuse at the apex, acute or obtuse at the base, pubescent on both surfaces with very short, lightly appressed hairs, bright green, rather thick; peduncles axillary, simple or rarely branched, 2 to 6 cm. long, stout, cinereous or glabrate; heads solitary, short-cylindric or ovoid, 1 to 3 cm. long, 10 to 12 mm. thick; bracts broadly ovate, acuminate, glabrous; bractlets half as long as the sepals, ovate, aristate-acuminate, short-pilose; sepals narrowly lance-oblong, 5 mm. long, acuminate, whitish or stramineous, 3-nerved, short-pilose, the tips slightly spreading; filaments very short, the staminodia ligulate, longer than the anthers and slightly shorter than the sepals, lacerate at the apex; style evident, the stigma entire.

Type in the U. S. National Herbarium, no. 678206, collected near Citura, Panama, April 14, 1908, by R. S. Williams (no. 675).

<sup>1</sup> Standley, Paul C. New or notable species of *Amaranthus*. Bull. Torrey Club 41: 505-510. 1914. A new species of *Achyranthes* from Tobago. Proc. Biol. Soc. Washington 28: 87. 1915.

<sup>2</sup> The application of the generic name *Achyranthes*. Journ. Washington Acad. Sci. 5: 72-76. 1915.

<sup>3</sup> The North American tribes and genera of *Amaranthaceae*. Journ. Washington Acad. Sci. 5: 391-396. 1915.

## ADDITIONAL SPECIMENS EXAMINED:

PANAMA: Ancón, April 20, 1911, *Mrs. G. N. McMillan* (Herb. Gray). Without locality, *Seemann* (Herb. Gray). Ahorca Lagarto, 1905, *Cowell* 255 (Herb. N. Y.).

NICARAGUA: San Juan del Sur, *Torrey* (Herb. Gray). Island Ometepe, Lake Nicaragua, January, 1893, *C. L. Smith* (Herb. Gray).

This plant has no very close relatives among the previously described species reported from Central America, unless it may be *Achyranthes pycnantha* (Benth.) Standley. In that the sepals are densely long-pilose and 6 to 7 mm. long, the leaves are nearly glabrous, and the peduncles are usually branched.

***Achyranthes stenophylla* Standley, sp. nov.**

Stems slender, branched, the branches ascending or suberect, striate, very sparsely pilose or glabrate; leaves numerous, the internodes short, the petioles 2 to 10 mm. long; leaf blades linear to elliptic-linear, 2.5 to 5 cm. long, 3 to 6 mm. wide, acute or acutish, acuminate at the base, very sparsely appressed-pilose or glabrate; peduncles axillary, simple, 2 to 5 cm. long, short-pilose, very slender; spikes ovoid or short-cylindric, 6 to 10 mm. long, 6 mm. thick; bracts broadly ovate, acute, glabrous; bractlets half as long as the sepals, acuminate, long-aristate, sparsely short-villous; sepals lance-oblong, 2.5 mm. long, acute or acutish, membranaceous, 3-nerved, sparsely short-pilose, stramineous, the tips erect or slightly incurved; filaments short, the staminodia ligulate, longer than the anthers, two-thirds as long as the sepals, lacerate at the apex; style evident, the stigma entire.

Type in the Herbarium of Columbia College (New York Botanical Garden), collected in Panama by Sutton Hayes (no. 941).

This plant belongs to the same group as *A. pycnantha*, *A. williamsii*, and *A. cordobensis*, but it is very distinct from all of them in its smaller spikes and very narrow leaves.

***Achyranthes laguroides* Standley, sp. nov.**

Erect or ascending, suffruticose below, the stems 1 meter long or less, much branched, the branches striate, sparsely pilose-strigose or glabrate; leaves very shortly petiolate, the blades narrowly lanceolate to elliptic-linear, 1.5 to 5.5 cm. long, 2 to 6 mm. wide, acuminate or attenuate at both ends, pilose-sericeous, densely so beneath; peduncles simple or branched, 5 to 20 mm. long, or the heads often sessile or subsessile, the peduncles densely pilose-sericeous; spikes ovoid or short-cylindric, 1 to 2 cm. long, 9 mm. thick, the flowers whitish-stramineous; bracts and bractlets ovate-triangular, half as long as the sepals, acuminate or long-acuminate, sparsely pilose or glabrate; sepals linear-oblong, 4 to 5 mm. long, acuminate, membranaceous, 1-nerved, pilose near the base with straight erect jointed white hairs, these equaling or slightly exceeding the sepals; stamen tube elongate, the antheriferous lobes short; staminodia ligulate, exceeding the anthers, deeply and acutely lacinate at the apex; style elongate.

Type in the U. S. National Herbarium, no. 471849, collected near San Francisco de Guadalupe, Costa Rica, May, 1893, by A. Tonduz (Inst. Fís. Geogr. Costa Rica no. 8006). There is a specimen of the same plant in the herbarium of the Missouri Botanical Garden, collected somewhere in Costa Rica in April, 1910, by G. C. Worthen.

The species is a very distinct one. It is to be placed nearest *Achyranthes stenophylla*, but that has flowers only half as large and sparsely short-pilose sepals.

***Achyranthes cordobensis* Standley, sp. nov.**

Plants much branched, the branches spreading, loosely short-pilose, or glabrate in age; petioles 1 to 3 mm. long; leaf blades ovate-oblong or oval, or the uppermost lance-oblong, 3 to 6 cm. long, 8 to 20 mm. wide, rather abruptly long-acuminate, obtuse at the base, thin, densely pilose-sericeous beneath, less densely so on the upper surface; peduncles simple, axillary, 2 to 6 cm. long, pilose with ascending hairs; spikes solitary, rarely sessile, ovoid or short-cylindric, 8 to 15 mm. long, 11 mm. thick;

bracts and bractlets half as long as the sepals, broadly ovate, aristate-acuminate, subscarious, stramineous; sepals lance-oblong, 5 mm. long, acutish, subcartilaginous in age, 3-nerved, stramineous, sparsely short-pilose, the tips slightly spreading; stamen tube short; staminodia much exceeding the anthers, less than half as long as the sepals, ligulate, deeply fimbriate at the apex; style evident, the stigma entire.

Type in the U. S. National Herbarium, no. 125547, collected in the Valley of Córdoba, Mexico, February 11, 1866, by Bourgeau (no. 1946).

Related to *A. williamsii*, described above, but differing in the long-acuminate or abruptly acuminate leaves, which are densely pilose-sericeous beneath, and in the merely acutish, rather than acuminate, sepals.

***Gomphrena dispersa* Standley, sp. nov.**

*Gomphrena decumbens* Moq. in DC. Prodr. 13<sup>a</sup>: 410. 1849, in part, not *G. decumbens* Jacq.

*Gomphrena decumbens genuina* Stuehlk, Repert. Nov. Sp. Fedde 11: 156. 1912, in part, not *G. decumbens* Jacq.

*Gomphrena decumbens grandifolia* Stuehlk, Repert. Nov. Sp. Fedde 11: 157. 1912, in part.

Prostrate or procumbent annual or perennial, much branched, the branches 20 to 100 cm. long, slender, sparsely or densely appressed-pilose; leaves numerous, short-petiolate, the blades oval-obovate to oblong, 1.5 to 5 cm. long, 5 to 20 mm. wide, obtuse to rounded at the apex, mucronate, acuminate to attenuate at the base, bright green, pilose-sericeous, often glabrate on the upper surface; spikes usually solitary, terminal or axillary, subglobose or short-cylindric, 9 to 13 mm. in diameter, each subtended by 2 acute sessile leaves, these usually shorter than the spikes; bracts rounded-ovate, acuminate, white, often denticulate; bractlets 5 to 6 mm. long, about 3 times as long as the bracts, thin, acute to obtuse, white or rarely purplish red, narrowly cristate at the apex, the crest extending along the keel for only a short distance, denticulate or laciniate; perianth usually equaling the bractlets, densely lanate, the lobes oblong-linear, acuminate or attenuate, white; stamen tube commonly included; style elongate, the stigmas slender; seed 1.5 mm. long, reddish brown, shining.

Type in the U. S. National Herbarium, no. 698287, collected at the edge of a cultivated field, Sierra de Anafe, Pinar del Río, Cuba, December 21, 1911, by Percy Wilson and Brother León (no. 11485).

ADDITIONAL SPECIMENS EXAMINED:

FLORIDA: Waste ground, near Tampa, 1913, *Tidestrom* 7005. Without locality, *Rugel* 98.

MEXICO: Guadalajara, Jalisco, 1886, *Palmer* 238. Atlixco, Puebla, 1893, *Nelson*. Valley of Oaxaca, 1894, *Nelson* 1307. Corral de las Piedras, vicinity of Zacuapan, Veracruz, 1906, *Purpus* 2284. Yucatán, *Gaumer* 369 pt. Vicinity of Mérida, Yucatán, 1912, *Collins* 11.

GUATEMALA: Escuintla, 1890, *J. D. Smith* 1977. Livingston, 1905, *von Türckheim* (*J. D. Smith*, no. 8738). Morán, Depart. Amatitlán, *Kellerman* 4840.

NICARAGUA: *C. Wright*.

EL SALVADOR: *Renson* 154.

COSTA RICA: Hacienda Babilonia, *Tonduz* 215. Río Hondo, Plains of Santa Clara, 1903, *Cook & Doyle* 596. Nicoya, 1900, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 13701).

CUBA: Herradura, 1907, *Earle* 766. Vicinity of La Gloria, Camaguey, 1909, *Shafer* 63. San Luis, Province of Pinar del Río, 1911, *Britton, Britton & Cowell* 9738. Isle of Pines, 1904, *Curtiss* 410; 1901, *A. A. Taylor* 88; 1900, *Palmer & Riley* 1117. Pinar del Río, 1900, *Palmer & Riley* 45. Camaguey to Santayana, 1909, *Britton* 2350.

JAMAICA: Up Park Camp, 1912, *Harris* 11542.

PORTO RICO: Santurce, 1913, *Chase* 6345½.

The specimens cited above are only a part of those examined by the writer. The species appears to be very abundant in the Greater Antilles and along the eastern coast of Central America, occurring chiefly as a weed in waste or cultivated ground. It has always been confused with *Gomphrena decumbens* Jacq., described in 1804. It is remarkable that a plant so common in the West Indies has never received a name, but apparently no one has ever questioned its identity with Jacquin's species.

*Gomphrena decumbens* was described<sup>1</sup> from cultivated specimens whose origin was not known. The description is ample and fortunately is accompanied by an excellent plate. There is no doubt that it applies to a plant which is common from eastern and central Mexico to Guatemala and is found also in South America. So far as the writer knows, it does not occur in the West Indies. It differs from *Gomphrena dispersa* in having the crests of the bractlets widest much below the apex, if they are perceptibly widest anywhere, the flowers thus appearing pointed or acuminate. Moreover, the bractlets are much longer than the flowers, while in *G. dispersa* they equal or are shorter than the perianth. In the latter species the crests are widest at or near the apex of the bractlets, and the flowers thus appear obtuse or merely acutish. In *Gomphrena decumbens*, furthermore, the flowers are very frequently tinged with red, or are yellowish, while in the proposed new species they are a dull, clear white. It is very probable that *G. dispersa* is to be found also in northern South America, but so far no specimens have been seen nor do any of the descriptions of species from that region appear to apply to it.

***Gomphrena parviceps* Standley, sp. nov.**

*Gomphrena decumbens pringlei* Stuehlk, Repert. Nov. Sp. Fedde 11: 156. 1912, in part, not *G. pringlei* Coult. & Fish. 1892.

Prostrate or procumbent annual, much branched, the stems 10 to 30 cm. long, slender or stout, often tinged with red, appressed-pilose; leaves numerous, sessile, the blades oblong or spatulate, 1 to 3.5 cm. long, 4 to 10 mm. wide, rounded or obtuse at the apex, acutish at the base, green, appressed-pilose beneath, glabrate above; spikes solitary or glomerate, terminal or axillary, subglobose, 7 mm. in diameter, each spike or cluster of spikes subtended by 2 or several sessile leaves, these usually 2 to 3 times as long as the spikes; bracts broadly ovate, acuminate; bractlets 3 mm. long, scarious, white, tinged with pink, twice as long as the bracts, narrowly cristate at the apex, the crest obscurely denticulate, pink or white; perianth conspicuously exceeding the bractlets, the lobes oblong, obtuse, truncate, or emarginate at the apex, the outer ones subcoriaceous, white or pink, glabrous, the inner ones thin, bright green except along the margin, very sparsely lanate; stamen tube about equaling the perianth; style elongate, the stigmas filiform; seed ovoid, 1.5 mm. long, reddish brown.

Type in the U. S. National Herbarium, no. 354471, collected in the Valley of Mexico, Federal District, Mexico, altitude 2,190 meters, October 3, 1899, by C. G. Pringle (no. 8251).

Related to *Gomphrena pringlei* Coult. & Fish., but in that species the calyx lobes are acute and the perianth merely equals the bractlets instead of exceeding them.

***Gossypianthus brittonii* Standley, sp. nov.**

Caudex much branched both above and below the surface of the soil, the branches stout or slender; stems numerous, prostrate, 4 to 9 cm. long, slender, lanate when young but soon glabrate; basal leaves petiolate, the blades oblanceolate, 6 to 8 mm. long, 1.5 to 2 mm. wide, obtuse or acutish, pilose above, pilose-sericeous beneath; cauline leaves short-petiolate, the blades orbicular to oval, 2 to 4 mm. long, obtuse or rounded at the apex, glabrate above, pilose beneath; flowers glomerate, the glomer-

<sup>1</sup> Jacq. Pl. Hort. Schönbr. 4: 41. pl. 482. 1804.

ules much longer than the subtending leaves; bracts ovate to orbicular-ovate, nearly equaling the sepals, obtuse or rounded at the apex, white, scarious, glabrous; sepals 2.5 to 3 mm. long, lance-oblong, acute, faintly 3-nerved, green along the nerves, the margins white and scarious; filaments linear, dilated at the base; utricle oval; seed oval, 1.2 mm. long, brown, shining.

Type in the herbarium of the New York Botanical Garden, collected on a rocky hill in a palm barren, Santa Clara, Cuba, April, 1912, by N. L. Britton and J. F. Cowell (no. 13318).

Apparently there are two species of *Gossypianthus* in the West Indies. One of these, *G. lanuginosus*, was described from Santo Domingo, and is known also from Mexico and Texas. In the Bernhardt Herbarium (Herb. Mo. Bot. Gard.) there is a specimen from Santo Domingo, labeled *Achyranthes piloselloides* Poit., which agrees in all respects with the common Texan plant. The Cuban *Gossypianthus* is apparently distinct in having obtuse rather than acute or acuminate bracts and bractlets, a much branched caudex, and much smaller leaves.

*Iresine acicularis* Standley, sp. nov.

Stems erect, stout, very sparsely pubescent with short slender hairs, the internodes 10 to 23 cm. long; petioles slender, 1 to 5.5 cm. long; leaf blades ovate or broadly ovate, 6.5 to 20 cm. long, 3.5 to 10 cm. wide, or those within the inflorescence somewhat smaller, rather abruptly long-attenuate or acute, rounded or obtuse at the base and abruptly short-decurrent, thin, bright green, very sparsely villous on the upper surface with short remote soft yellowish white hairs, similarly pubescent beneath and furnished in addition with numerous appressed shining amber-colored or bright yellow acicular hairs, villous-ciliate, rather prominently veined, but the veins slender, diverging at angles of from 50 to 70 degrees; inflorescence a broad, dense, somewhat leafy panicle, 25 cm. long and 15 cm. broad, the rachises sparsely villous and bearing in addition numerous stout, acicular, glistening amber-colored or yellow hairs, these most abundant at the base of the spikelets; spikelets alternate, pediceled or sessile, densely flowered, stout, 4 to 12 mm. long; bracts white, rounded-ovate to narrowly ovate, acute, from half as long to fully as long as the sepals; sepals about 1.5 mm. long, narrowly oblong, acute, those of the pistillate flowers 3-nerved, the flowers furnished at the base with copious long white wool; staminal cup not lobed; utricle shorter than the sepals; seed suborbicular, 0.5 mm. in diameter, dark reddish brown, shining.

Type in the U. S. National Herbarium, no. 399603, collected on the Volcán de Fuego, Department of Sacatepequez, Guatemala, at an altitude of 2,700 meters, February 20, 1905, by W. A. Kellerman (no. 4549).

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Near the Finca Sepacuité, 1902, *Cook & Griggs* 214.

COSTA RICA: Chirripó Farm, 1900, *Pittier* 16078.

The proposed species is related to *Iresine celosioides* L., but is distinguished by the dentate bracts, and more strongly by the peculiar pubescence of the inflorescence. No other species of the genus is known to have trichomes of the same form.

*Iresine arenaria* Standley, sp. nov.

Erect perennial, suffrutescent at the base, much branched, the branches slender, erect-ascending, green, striate, glabrous; petioles slender, 4 to 5 mm. long; leaf blades linear to narrowly ovate, 2.5 to 4.5 cm. long, 2 to 12 mm. wide, acute or acuminate, obtuse to acuminate at the base, rather thick, deep green, glabrous; flowers polygamous, narrowly paniculate, the panicles open or congested, nearly naked, 4 to 20 cm. long, the branches slender or stout, ascending, short, the spikelets few, short or elongate, pedunculate or sessile, the rachis densely lanate; bracts and bractlets rounded-ovate, obtuse or acutish, short-cuspidate, hyaline, whitish-stramineous,

densely short-villous; sepals oblong-oval, 1.5 mm. long, rounded at the apex, 3-nerved, densely pilose with soft white hairs; filaments subulate-linear, shorter than the sepals, the staminodia one-third as long as the filaments, narrowly triangular, entire; style short, the stigmas slender; utricle orbicular, compressed; seed orbicular, 1 mm. broad, dark reddish brown, shining.

Type in the U. S. National Herbarium, no. 636123, collected on a dry hillside at Topolobampo, Sinaloa, Mexico, March 23, 1910, by J. N. Rose, P. C. Standley, and P. G. Russell (no. 13292). Also obtained at the same locality in 1897 by Edward Palmer (no. 191).

Similar in most respects to *Iresine angustifolia*, but distinguished by the well-developed staminodia, the obtuse or rounded rather than acute or acutish sepals, and the densely villous bracts.

***Iresine calea* (Ibáñez) Standley.**

*Gomphrena latifolia* Mart. & Gal. Bull. Acad. Sci. Brux. 10<sup>1</sup>: 349. 1843.

*Alternanthera latifolia* Moq. in DC. Prodr. 13<sup>1</sup>: 351. 1849.

*Achyranthes calea* Ibáñez, Naturaleza 4: 79. 1879.

*Iresine latifolia* Benth. & Hook. Gen. Pl. 3: 42. 1880, not *I. latifolia* D. Dietr. 1839.

*Iresine laxa* S. Wats. Proc. Amer. Acad. 21: 454. 1886.

There are very few North American species of *Iresine* which have so extensive a list of synonyms as the present species. Usually it has been known as *Iresine latifolia* (Mart. & Gal.) Benth. & Hook., but that name is homonymous and consequently not available. In spite of the fact that Ibáñez uses several large pages of text and a colored plate to characterize his proposed species, the present writer is not absolutely certain that that plant is the same as the one heretofore known as *Iresine latifolia*. Ibáñez's description, however, applies better to the latter species than to any other of which the writer has seen specimens, and his material came from a region in which *I. latifolia* is known to grow; for which reasons it seems best to use Ibáñez's name in this application, at least for the present.

***Iresine costaricensis* Standley, sp. nov.**

Scandent shrub, much branched, the branches stout, terete, smooth, the younger ones and those of the inflorescence densely pubescent with short stout appressed fulvous hairs; petioles stout, 7 to 17 mm. long; leaf blades oval to oblong-elliptic, 11 to 18 cm. long, 4 to 7 cm. wide, abruptly acuminate or long-attenuate, obtuse at the base, thick, sparsely short-villous on the upper surface and deep green, appressed-pilose beneath with slender stiff hairs; flowers perfect, in a loose, much branched, naked, terminal panicle sometimes 50 cm. long, the branches slender, spreading, opposite or verticillate, the spikelets 3 mm. thick or less, sessile, few-flowered, the rachis canescent; bracts and bractlets less than half as long as the sepals, suborbicular, fuscous-stramineous, sparsely short-villous; sepals oval-oblong, 1.5 mm. long, obtuse, 3-nerved, brownish-fuscous, densely pilose, the hairs stiff, grayish, scarcely exceeding the sepals; filaments shorter than the sepals, the staminodia short, entire; style short, the stigmas short and stout.

Type in the U. S. National Herbarium, no. 861225, collected at Las Vueltas, Tucurrique, Costa Rica, in 1899, by A. Tonduz (Inst. Fís. Geogr. Costa Rica, no. 13183). Also collected at the same locality by the same collector in 1898 (no. 12919).

The proposed species belongs to that section of the genus which was once given generic rank by Martius under the name *Trommsdorffia*. It is a relative of *Iresine argentata* (Mart.) D. Dietr., a species occurring in Porto Rico, Colombia, and Venezuela, which has larger flowers, mostly pedunculate spikelets, and acute or abruptly acute leaf blades.



*Iresine heterophylla* Standley, sp. nov.

*Iresine celosioides obtusifolia* Coulter, Contr. U. S. Nat. Herb. 2: 364. 1894.

*Iresine paniculata obtusifolia* Coulter; Uline & Bray, Bot. Gaz. 21: 354. 1896.

Perennial from long slender branching woody rootstocks; stems herbaceous, stout, erect or ascending, solitary or several from a single base, simple up to the inflorescence, 50 to 100 cm. high, swollen at the nodes, often sulcate, short-villous at the nodes, sparsely pubescent elsewhere with very short stout soft hairs, the internodes 1.5 to 10 cm. long; leaves usually asymmetrical, very variable in outline, the lower ones much broader and more obtuse than the upper ones; petioles stout, 2 to 20 mm. long, the uppermost leaves usually sessile or subsessile; blades of the lower leaves broadly rhombic-ovate, often as broad as long, frequently with fascicles of small leaves in the axils, 3 to 6 cm. long, 2 to 4 cm. wide, rounded to acutish, the apex always blunt, rounded or abruptly acute at the base and more or less decurrent, thick and firm, yellowish green, scabrous or smooth on the upper surface, pubescent beneath along the veins with short stiff hairs, scabrous and denticulate on the margins, the veins prominent beneath, coarse, the lateral ones diverging at a very acute angle, nearly parallel and all extending more than halfway to the margin; blades of the upper leaves ovate to narrowly ovate or oval, obtuse or acute, smaller than the lower blades but with similar pubescence; inflorescence a narrow, dense, much branched panicle 15 to 40 cm. long and 3 to 9 cm. broad, the branches erect or ascending, sparsely villous; spikelets stout, densely flowered, 4 to 23 mm. long; bracts one-half to one-third as long as the sepals, ovate-orbicular, acute, entire; sepals 1 to 1.3 mm. long, elliptic-oblong, yellowish white, acuminate to acutish, those of the pistillate flowers 3-nerved; lobes of the staminal cup broadly rounded; utricle shorter than the sepals; seed suborbicular, 0.6 mm. in diameter, dark reddish brown, shining.

Type in the U. S. National Herbarium, no. 304251, collected near the city of Durango, Mexico, in 1896, by Edward Palmer (no. 562).

## ADDITIONAL SPECIMENS EXAMINED:

TEXAS: Wright 587. Mexican Boundary Survey 1199. Nealley 231. Uvalde, 1880, Palmer 1137. Lindheimer 1110. Georgetown, 1880, Palmer 1135.

NEW MEXICO: Gila Hot Springs, 1903, Metcalfe 827 (Herb. N. Y.).

ARIZONA: Mule Mountains, 1911, Goodding 1009.

SONORA: Oputo, 1894, Hartman 213.

CHIHUAHUA: Candelaria, 1911, Stearns 235. 1885, Palmer 291. Santa Eulalia Hills, 1885, Wilkinson. Near Chihuahua, 1885, Pringle 348.

COAHUILA: 1880, Palmer 1136. Sierra de Paila, 1910, Purpus 5086 (Herb. Univ. Calif.).

The specimens listed above have been referred to *Iresine celosioides*, but that widely dispersed plant is an annual, or essentially so, with all its leaves similar, and the sepals of the pistillate flowers obtuse or merely acutish.

*Iresine nitens* Standley, sp. nov.

Erect shrub, sparsely branched, the branches erect, striate, densely and closely pilose-sericeous with lustrous silvery white hairs, glabrate in age; petioles 5 to 7 mm. long; leaf blades lanceolate or ovate-lanceolate, 2 to 6 cm. long, 5 to 13 mm. wide, long-acuminate or acute, acute at the base, thick and firm, when young strigose-pilose with lustrous white hairs, soon glabrate, the lateral veins conspicuous, ascending; flowers dicecious, paniculate, the panicle on a long naked peduncle, very narrow, elongate, the simple primary branches very short, the spikelets elongate, mostly sessile, the rachis densely lanate; bracts and bractlets of the pistillate flowers equaling the sepals, ovate or ovate-oblong, acute or acuminate, hyaline, stramineous or fuscous, glabrous, the sepals narrowly lanceolate, 2 mm. long, long-attenuate, 3-nerved, densely lanate, the long soft hairs brownish; style nearly as long as the ovary, the stigmas short, slender; utricle oblong, acute; seed 1 mm. long, yellowish brown, shining.

Type in the U. S. National Herbarium, no. 464048, collected at Tehuacán, Puebla, Mexico, September, 1911, by C. A. Purpus (no. 5667).

Closely related to *Iresine schaffneri* S. Wats., but distinguishable by the lustrous pubescence of the stems and by the fact that the leaves are early glabrate rather than permanently pubescent.

*Iresine pacifica* Standley, sp. nov.

Erect shrub, much branched, the branches ascending, slender, striate, green, glabrous except about the inflorescence, there very sparsely short-villous; petioles slender, 4 to 11 mm. long; leaf blades broadly ovate or rhombic-ovate to lance-oblong, or the uppermost lanceolate, 3.5 to 10.5 cm. long, 1.3 to 4 cm. wide, acute to long-acuminate, acute at the base, thin, glabrous, or very sparsely short-villous along the veins beneath; flowers polygamo-monoecious, in broad, open, much branched, sparsely leafy panicles, the branches elongate, very slender, ascending or spreading, the spikelets short, nearly all sessile, the rachis lanate; bracts and bractlets less than half as long as the flowers, suborbicular, rounded at the apex, short-villous, brown; sepals oval-oblong, 1.5 mm. long, rounded at the apex, 3-nerved, densely pilose with long soft brownish hairs; filaments shorter than the sepals, the staminodia less than half as long as the filaments, narrowly triangular, entire; style short, the stigmas slender; seed orbicular, slightly compressed, 0.6 mm. broad, black and shining.

Type in the U. S. National Herbarium, no. 208570, collected near Manzanillo, Mexico, December, 1890, by Edward Palmer (no. 1074).

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Manzanillo, 1890, *Palmer* 932. Cerro Colorado, Sinaloa, November 1, 1904, *Brandege*.

This species is related to *Iresine angustifolia* Euphrasén (*I. elatior* Rich.), but is readily distinguished by the rounded or obtuse bracts and bractlets and the broader leaves.

*Iresine rotundifolia* Standley, sp. nov.

Low shrub, fruticose nearly throughout, much branched, the branches stout, ascending or divergent, dark gray or blackish, the branchlets stout, densely tomentose; leaves few, remote, undeveloped in the staminate plant at anthesis; petioles stout, 1 to 4 mm. long; leaf blades orbicular to broadly ovate-oval, 3.5 to 17 mm. long, 3.5 to 12 mm. wide, broadly rounded at the base, rounded or obtuse at the apex, sometimes emarginate, coriaceous, deep green and puberulent or glabrate on the upper surface, densely yellowish-tomentose beneath, the veins conspicuous beneath and usually evident on the upper surface; flowers dioecious; staminate spikelets 6 to 9 mm. long, densely flowered, in fascicles of 2 to 4 at the ends of short fruticose branches; bracts and bractlets ovate-orbicular, less than a third as long as the sepals, scarious, yellowish white, glabrous or nearly so, the sepals narrowly oblong, 3 mm. long, obtuse, sparsely short-villous at the apex; filaments slightly exserted, the tube very short, the staminodia minute; pistillate spikes (immature) short, densely flowered, in short, narrow terminal panicles, the bracts and bractlets broadly ovate, obtuse or acute, fuscous, glabrate.

Type in the herbarium of the University of California (fragment in the U. S. National Herbarium), no. 135872, collected in the vicinity of San Luis Tultitlanapa, Puebla, Mexico, May, 1908, by C. A. Purpus (no. 3452). This specimen is taken from a staminate plant. The pistillate plant, with the inflorescence very immature, was collected at Esperanza in May, 1911, by C. A. Purpus (no. 5864), this also in the herbarium of the University of California.

A very distinct species, because of the prevailingly suborbicular leaves and the peculiar form of the staminate inflorescence.

*Iresine stricta* Standley, sp. nov.

Erect shrub, 30 to 80 cm. high, sparsely branched, the branches suberect, slender or stout, striate, densely stellate-canescens; petioles stout, 2 to 6 mm. long; leaf blades oblong-oval, ovate-oblong, broadly ovate, or ovate-rhombic, 1.3 to 3.5 cm. long, 5 to 15 mm. wide, rounded or obtuse at the apex, obtuse or rounded at the base, subcoriaceous, stellate-canescens on the upper surface when young, glabrate in age, densely stellate-canescens beneath, subrugose, the veins coarse, prominent beneath, ascending; flowers dioecious, the panicle on a naked peduncle 10 to 15 cm. long, narrow, the primary branches elongate and ascending or usually very short; spikelets elongate, slender, sessile, the rachis lanate; bracts and bractlets of the staminate flowers half as long as the sepals, broadly ovate, pilose, the sepals oblong, obtuse or acute, pilose, hyaline, dull white; filaments equaling the sepals, the staminodia short, fimbriate at the apex; bracts and bractlets of the pistillate flowers equaling the sepals, pilose, the sepals ovate-lanceolate, 1.5 mm. long, acuminate, 3-nerved, white, densely long-pilose, the hairs exceeding the perianth, soft, white; stigmas elongate, filiform; seed 1 mm. long, reddish brown, shining.

Type in the U. S. National Herbarium, no. 453412, collected near Tehuacán, Puebla, Mexico, in 1905, by J. N. Rose, J. H. Painter, and J. S. Rose (no. 9919).

## ADDITIONAL SPECIMENS EXAMINED:

PUEBLA: San Luis Tultitlanapa, 1907, *Purpus* 2834. Cerro de Coatepec, August, 1907, *Purpus* 2757 (Herb. Univ. Calif.).

In general appearance and in floral characters near *Iresine schaffneri* S. Wats., but clearly distinct in its indument of branched hairs.

*Iresine tomentella* Standley, sp. nov.

Shrub; branches slender, sparsely whitish-tomentose when young, glabrate in age; petioles 0.8 to 1.5 cm. long, tomentulose when young; leaf blades oblong-elliptic, elliptic, or oblanceolate-oblong, 12.5 to 21.5 cm. long, 3.3 to 6.5 cm. wide, cuneate at the base, acute or long-acuminate at the apex, usually somewhat abruptly so, thin, bright green, glabrous above, loosely tomentose beneath along the veins when young, glabrate in age, the lateral veins conspicuous, arcuate-ascending; flowers polygamous, loosely paniculate, the panicle 9.5 cm. long and as broad, the branches ascending, thinly tomentose, the basal bracts linear, 2 to 2.5 cm. long; spikelets sessile, few, flowered, 2 to 2.5 mm. in diameter, the rachis lanate; bracts and bractlets ovate-orbicular, half as long as the sepals, obtuse or acutish, stramineous, hyaline, glabrous; sepals oval, 1.5 to 2 mm. long, obtuse, sparsely lanate at the base, stramineous; staminodia minute.

Type in the U. S. National Herbarium, no. 572522, collected near Gómez Farias-Tamaulipas, Mexico, altitude 350 meters, April, 1907, by Edward Palmer (no. 291).

A near relative of *Iresine arbuscula* Uline & Bray, which is known only from the type locality, Volcán de Tecuamburro, Guatemala, but differing from that species by the tomentose branches and leaves and shorter petioles.

*Iresine wrightii* Standley, sp. nov.

Shrub; branches slender, terete, smooth, the young ones and those of the inflorescence densely canescens; petioles stout, 3 to 7 mm. long; leaf blades obovate-oblong or oval-oblong, broadest above the middle, 7 to 9 cm. long, 3 to 4 cm. wide, acute at the apex, acute or acuminate at the base, rather thin, sparsely appressed-pilose beneath or glabrate; flowers perfect, paniculate, the panicles pyramidal, loosely branched, naked, the branches spreading, opposite, the spikelets short, pedunculate or sessile; bracts and bractlets one-third as long as the sepals, suborbicular, stramineous, sparsely short-villous or glabrate; sepals elliptic-oblong, 2.5 mm. long, acute, brownish-fuscous, faintly nerved, short-villous at the apex, pilose at the base, the hairs sordid white, stiff, about equaling the sepals; filaments filiform, shorter than the sepals, the staminodia very short, entire; style short, the stigmas short and stout.

Type in the U. S. National Herbarium, no. 48566, collected in Nicaragua by Charles Wright.

This, like *Iresine costaricensis*, is related to *I. argentata*. It differs from the latter, however, in having thin rather than subcoriaceous leaf blades, which are acute at the base and broadest above the middle, rather than rounded at the base and broadest at or below the middle.

### NEW OR NOTABLE ALLIONIACEAE.

In the course of preparing a monograph of the North American representatives of the genus *Torrubia* two undescribed species have been discovered—one from Mexico and one from Guadeloupe. This group has usually been referred to *Pisonia*, but several years ago Dr. N. L. Britton showed<sup>1</sup> the inconsistency of retaining it in that genus, and transferred to it all the West Indian species then known. A number of West Indian species of *Pisonia* have since been described which are properly referable to *Torrubia* and are here transferred to that genus. At the same time it seems desirable to make the proper nomenclatorial combinations for the South American species of *Torrubia*. There is appended also a description of a new Panamanian species of the closely related genus *Neea*.

Several years ago the writer proposed the name *Commicarpus*<sup>2</sup> for that section of the genus *Boerhaavia* having glanduliferous fruits borne in umbels or verticels. The genus is well marked, besides, by the scandent habit of the plants. At the time the new genus was proposed only the Mexican species were transferred to it. Most of the other species are African. The writer takes this opportunity of transferring them, also, to *Commicarpus*.

Two South American Allioniaceae, also, described as species of *Mirabilis*, are here transferred to *Allionia*.

*Neea delicatula* Standley, sp. nov.

Branches slender, greenish gray, glabrous, the branchlets slender, ferrugino-puberulent when young but soon glabrate, the internodes short; petioles slender, 4 to 7 mm. long; leaves alternate, the blades elliptic, elliptic-obovate, or oblong-oval, 2.2 to 6 cm. long, 9 to 20 mm. wide, cuneate to acutish at the base, abruptly acuminate at the apex, the tip narrowly triangular, acutish or usually obtuse, the blades thin, deep green, concolorous, glabrous and dull on the upper surface, sparsely rufo-puberulent beneath along the midvein, the margins plane, the lateral veins obsolete or nearly so; peduncles of the staminate cymes 2.2 to 4.5 cm. long, terminal and axillary, nearly filiform, flexuous, glabrous, the cymes few or many-flowered, 2 to 5 cm. wide, the flowers on slender pedicels 4 to 15 mm. long; bractlets triangular-oblong, acute, 1 mm. long, puberulent; staminate perianth urceolate, acutish at the base, 4.5 mm. long, 3 mm. wide, puberulent at the apex, elsewhere glabrate, minutely 5-dentate; stamens 7, the filaments very unequal, the anthers 1 mm. long; pistillate flowers and fruit not known.

<sup>1</sup> Bull. Torrey Club 31: 611-615. 1904.

<sup>2</sup> Contr. U. S. Nat. Herb. 12: 373. 1909.

Type in the U. S. National Herbarium, no. 678516, collected in forests on dry limestone around Alhajuela, Chagres Valley, Panama, altitude 30 to 100 meters, May, 1911, by H. Pittier (no. 3472).

Related to *Neea psychotrioides*, but that species has much larger leaves with more conspicuous veins, broader cymes which are more pubescent, a larger perianth, and usually 5 stamens.

**Torrubia dussii** Standley, sp. nov.

*Pisonia obtusata* Heimerl, Bot. Jahrb. Engler 21: 624. 1896, in part, not *P. obtusata* Jacq.

Tree of medium size; branches stout, rugose, sordid-grayish, the branchlets stout, glabrous except along the nodes, there puberulent, the internodes short; leaves opposite, unequal, the petioles rather stout, 4 to 8 mm. long, glabrous; leaf blades oval or oval-oblong, 8 to 10 cm. long, 4 to 6 cm. wide, rounded or obtuse at the base, abruptly acute or cuspidately short-acuminate at the apex, rarely acute, the tip usually obtuse, thin, concolorous, lustrous above, dull beneath, glabrous, the margins plane, the lateral veins slender, straight, 6 to 12 on each side, the veinlets nearly obsolete, laxly and sparsely reticulate; peduncles stout, 3.5 to 4.5 cm. long, glabrous, the inflorescence cymose, 6 to 8 cm. broad, many-flowered, glabrous, the branches stout, the flowers sessile, glomerate, the bractlets oblong or deltoid-oblong, acutish, 1 mm. long or shorter, glabrous; staminate perianth funnelform-campanulate, 6 to 7 mm. long, glabrous, the limb nearly entire; stamens 6, half longer than the perianth; anthocarp ellipsoid, 11 mm. long, 3 mm. in diameter.

Type in the U. S. National Herbarium, no. 592420, collected in Guadeloupe, April 15, 1893, by Père Duss (no. 2170).

Related to *Torrubia fragrans*, but distinct in the large, nearly glabrous staminate perianth and the glabrous branches of the inflorescence.

**Torrubia potosina** Standley, sp. nov.

Branches slender, grayish, striolate, the branchlets slender, sparsely ferrugino-puberulent when young, the internodes 1.5 to 7 cm. long; leaves opposite, subequal or unequal, the petioles slender, 4 to 6 mm. long, sparsely ferrugino-puberulent; leaf blades oval or oblong-oval, rarely orbicular-oval, 5 to 10.5, or rarely only 3.5, cm. long, 2.2 to 5 cm. wide, rounded or acutish at the base, acute or usually cuspidately acute or acuminate at the apex, thin, glabrous, concolorous, slightly lustrous on the upper surface, the lateral veins prominent, divergent, nearly straight, about 8 on each side, laxly anastomosing near the margins, the secondary veins laxly and inconspicuously reticulate; pistillate peduncles terminal and axillary, 2.5 to 7.5 cm. long, very slender, sparsely puberulent or glabrous, the inflorescence few-flowered, cymose-paniculate, 1.5 to 3.5 cm. long, the branches opposite or dichotomous, divergent, sparsely ferrugino-puberulent, the flowers solitary or in cymules of 3, sessile or on pedicels 4 mm. long or shorter, the bractlets acute, about 0.5 mm. long, puberulent; pistillate perianth elliptic-oblong, 2.5 to 3 mm. long, slightly constricted in the throat, sparsely puberulent, the teeth triangular, acute, erect; anthocarp oval, 7 mm. long and 4.5 mm. in diameter; fruit finely striate; seed elliptic-oblong, 6 mm. long and 2.5 to 3 mm. in diameter, brown.

Type in the U. S. National Herbarium, no. 570197, collected near Rascón, San Luis Potosí, Mexico, June, 1905, by Edward Palmer (no. 675).

The proposed species is of particular interest, since it is the second *Torrubia* to be reported north of Costa Rica. The other Mexican species, *T. linearibracteata*, has been described only recently, from Yucatán. *Torrubia potosina* is related, apparently, to *T. costaricana* and *T. linearibracteata*, but differs from both in its lax, few-flowered inflorescence and broader leaves.

**Torrubia areolata** (Heimerl) Standley.

*Pisonia areolata* Heimerl, Nat. For. Kjöbenhavn Vid. Medd. 1890: 159. 1891.

**Torrubia boliviana** (Britton) Standley.

*Pisonia boliviana* Britton, Bull. Torrey Club 27: 125. 1900; Heimerl, Bot. Jahrb. Engler 42: 80. 1908.

**Torrubia cafferiana** (Casar.) Standley.

*Pisonia cafferiana* Casar. Nov. Stirp. Bras. Dec. 68. 1842.

**Torrubia campestris** (Netto) Standley.

*Pisonia campestris* Netto, Ann. Sci. Nat. V. 5: 83. 1866.

**Torrubia combretiflora** (Mart.) Standley.

*Pisonia combretiflora* Mart.; Schmidt in Mart. Fl. Bras. 14<sup>2</sup>: 360. 1872.

**Torrubia coriifolia** (Heimerl) Standley.

*Pisonia coriifolia* Heimerl in Urban, Symb. Antill. 7: 213. 1912.

**Torrubia cuspidata** (Heimerl) Standley.

*Pisonia cuspidata* Heimerl, Bot. Jahrb. Engler 21: 628. 1896.

**Torrubia domingensis** (Heimerl) Standley.

*Pisonia obtusata domingensis* Heimerl in Urban, Symb. Antill. 7: 215. 1912.

**Torrubia eggersiana** (Heimerl) Standley.

*Pisonia eggersiana* Heimerl, Bot. Jahrb. Engler 21: 627. 1896.

**Torrubia ferruginea** (Klotzsch) Standley.

*Pisonia ferruginea* Klotzsch; Choisy in DC. Prodr. 13<sup>2</sup>: 445. 1849.

**Torrubia fragrans** (DuM. de Cours.) Standley.

*Pisonia fragrans* DuM. de Cours. Bot. Cult. ed. 2. 7: 114. 1814.

*Pisonia inermis* Jacq. err. det. Griseb. Fl. Brit. W. Ind. 71. 1864, in part.

**Torrubia graciliflora** (Mart.) Standley.

*Pisonia graciliflora* Mart.; Schmidt in Mart. Fl. Bras. 14<sup>2</sup>: 358. 1872.

**Torrubia harrisiana** (Heimerl) Standley.

*Pisonia harrisiana* Heimerl in Urban, Symb. Antill. 7: 214. 1912.

**Torrubia hassleriana** (Heimerl) Standley.

*Pisonia hassleriana* Heimerl, Oesterr. Bot. Zeitschr. 56: 426. 1906.

**Torrubia hirsuta** (Choisy) Standley.

*Pisonia hirsuta* Choisy in DC. Prodr. 13<sup>2</sup>: 445. 1849.

**Torrubia laxiflora** (Choisy) Standley.

*Pisonia laxiflora* Choisy in DC. Prodr. 13<sup>2</sup>: 444. 1849.

**Torrubia ligustrifolia** (Heimerl) Standley.

*Pisonia ligustrifolia* Heimerl in Urban, Symb. Antill. 7: 507. 1913.

**Torrubia linearibracteata** (Heimerl) Standley.

*Pisonia linearibracteata* Heimerl, Repert. Nov. Sp. Felde 12: 221. 1913.

**Torrubia luteovirens** (Heimerl) Standley.

*Pisonia luteovirens* Heimerl, Oesterr. Bot. Zeitschr. 56: 425. 1906.

**Torrubia microphylla** (Heimerl) Standley.

*Pisonia microphylla* Heimerl in Urban, Symb. Antill. 7: 215. 1912.

**Torrubia nitida** (Mart.) Standley.

*Pisonia nitida* Mart.; Schmidt in Mart. Fl. Bras. 14<sup>2</sup>: 356. 1872.

**Torrubia noxia** (Netto) Standley.

*Pisonia noxia* Netto, Ann. Sci. Nat. V. 5: 80. pl. 7. 1866.

**Torrubia olfersiana** (Link, Klotzsch & Otto) Standley.

*Pisonia olfersiana* Link, Klotzsch & Otto Icon. Pl. Rar. 1: 36. pl. 15. 1841.

**Torrubia pacurero** (H. B. K.) Standley.

*Pisonia pacurero* H. B. K. Nov. Gen. & Sp. 2: 218. 1817.

**Torrubia paraguayensis** (Heimerl) Standley.

*Pisonia paraguayensis* Heimerl, Verh. Zool. Bot. Ver. Wien 62: 7. 1912.

**Torrubia pernambucensis** (Casar.) Standley.

*Pisonia pernambucensis* Casar. Nov. Stirp. Bras. Dec. 69. 1842.

**Torrubia salicifolia** (Heimerl) Standley.

*Pisonia salicifolia* Heimerl in Urban, Symb. Antill. 7: 216. 1912.

**Torrubia schomburgkiana** (Heimerl) Standley.

*Pisonia schomburgkiana* Heimerl, Jahresb. Staats-Oberrealsch. Fünfhaus 23:  
[Reprint, 34.] 1897.

**Torrubia tomentosa** (Casar.) Standley.

*Pisonia tomentosa* Casar. Nov. Stirp. Bras. Dec. 69. 1842.

**Torrubia suspensa** (Heimerl) Standley.

*Pisonia suspensa* Heimerl, Med. Rijks Herb. Leiden 19: 34. 1913.

**Torrubia uleana** (Heimerl) Standley.

*Pisonia uleana* Heimerl, Bot. Jahrb. Engler 42: 80. 1908.

**Torrubia venosa** (Choisy) Standley.

*Pisonia venosa* Choisy in DC. Prodr. 13<sup>2</sup>: 444. 1849.

**Commicarpus grandiflorus** (A. Rich.) Standley.

*Boerhaavia grandiflora* A. Rich. Tent. Fl. Abyss. 2: 209. 1851.

**Commicarpus plumbagineus** (Cav.) Standley.

*Boerhaavia plumbaginea* Cav. Icon. Pl. 2: 7. pl. 112. 1793.

**Commicarpus repandus** (Willd.) Standley.

*Boerhaavia repanda* Willd. Sp. Pl. 1: 22. 1797.

**Commicarpus squarrosus** (Heimerl) Standley.

*Boerhaavia squarrosa* Heimerl, Bull. Herb. Bolss. 4: 813. 1896.

**Commicarpus tuberosus** (Lam.) Standley.

*Boerhaavia tuberosa* Lam. Tabl. Encycl. 1: 10. 1791.

**Commicarpus verticillatus** (Poir.) Standley.

*Boerhaavia verticillata* Poir. Dict. Sci. Nat. 5: 56. 1804.

**Allionia arenaria** (Heimerl) Standley.

*Mirabilis arenaria* Heimerl, Bot. Jahrb. Engler 42: 74. 1908.

**Allionia campanulata** (Heimerl) Standley.

*Mirabilis campanulata* Heimerl, Bot. Jahrb. Engler 42: 75. 1908.

## NEW CAESALPINIACEAE FROM PANAMA.

The genus *Cassia* is represented in Panama by at least 20 species of diverse forms. Three of them appear to be new and are described here. There occur in the same region 10 species of *Chamaecrista*, one of which is undescribed. In this connection there are included also two new combinations in *Chamaecrista*, for species occurring in Panama.

*Cassia falcinella* Standley, sp. nov.

Stems terete or very obscurely 5-angled, striate, copiously cinereous-puberulent with tawny hairs; leaves numerous, approximate; stipules linear, falcate, 10 mm. long, 0.75 mm. wide, green, nerved, subulate-tipped, cinereous-puberulent; rachis of the leaf about 35 mm. long, tipped with a subulate appendage 3 mm. long, the lower pair of leaflets borne 20 to 25 mm. above the base; petiolar glands 2, one or rarely 2 glands borne between each pair of leaflets, 2 to 3 mm. long, slender-cylindric or rarely conic, acute, black; leaflets 2 pairs, asymmetrical, oblong-obovate to elliptic-oblong, 5 to 8 cm. long, 2 to 4 cm. wide, abruptly long-acuminate at the apex, the tip acute, 14 mm. long or less, obtuse or rounded and unequal at the base, firm in texture, subcoriaceous, glabrous, lustrous on the upper surface, concolorous, conspicuously veined; inflorescence a dense many-flowered leafy terminal panicle, its branches densely cinereous-puberulent with yellow hairs; peduncles rather stout, 7 to 18 mm. long; bracts similar to the stipules but shorter and thinner, some of them narrowly linear-lanceolate and not falcate; sepals subequal, 4 mm. long, oblong-ovate, obtuse, densely pubescent with short appressed curved yellow hairs; petals bright yellow, about 13 mm. long, oblong or oblong-oblong, obtuse, clawed, abundantly cinereous on the outer surface; anthers glabrous, nearly equal, the 3 lower slightly beaked; ovary strongly curved, densely covered with appressed yellowish hairs.

Type in the U. S. National Herbarium, no. 715333, collected in the vicinity of San Felix, eastern Chiriquí, Panama, altitude 120 meters or less, December, 1911, by H. Pittier (no. 5147).

Closely related to *Cassia undulata*, but distinguished readily by the narrower stipules and bracts and by the broader, abruptly acuminate leaflets. In that species the stipules are more than 2 mm. wide and the bracts of the inflorescence oblong-lanceolate to oval, while the leaflets are acute or abruptly acute.

*Cassia caudata* Standley, sp. nov.

Mature stems not seen, the young ones slender, terete, glabrous; rachis of the leaves terete, striate, 15 to 19 cm. long, the lower pair of leaflets borne 9 to 12 cm. above the base; stipules not seen; petiolar gland one, 2.5 mm. long, obtusely conic, borne between the lower pair of leaflets; petiolules stout, about 5 mm. long; leaflets 2 pairs, elliptic-oblong to ovate, 13 to 21 cm. long, 7 to 9 cm. wide, obtuse or rounded at the base and slightly unequal, acutish at the apex and abruptly contracted into an acute caudate tip 15 to 30 mm. long, thin, glabrous, bright green on the upper surface but not lustrous, decidedly paler beneath; leaflets of the lower pair shorter and broader than those of the upper; inflorescence of axillary several-flowered racemes or panicles about 7 cm. long, the branches appressed-puberulent with yellowish hairs; bracts linear-subulate, 3 mm. long; pedicels ascending, 15 to 20 mm. long; calyx lobes unequal, 4 to 7 mm. long, obtuse, sparingly puberulent, green; petals bright yellow with dark veins, about 20 mm. long, 12 mm. wide or less, rounded at the apex, conspicuously clawed; anthers glabrous, slightly unequal, the 3 lower with short cylindric beaks; ovary terete, densely appressed-pubescent.



Type in the U. S. National Herbarium, no. 679652, collected in forests of the upper Mamoní River, Province of Panama, Panama, altitude 150 to 400 meters, October, 1911, by H. Pittier (no. 4491).

In Bentham's revision of the genus this falls into the section *Chamaefistula*, series *Bacillares*.<sup>1</sup> It is related to *Cassia bacillaris* and *C. inaequilatera*, but from these and their allies it differs in having long-caudate leaflets. From each species it differs also in various minor respects.

*Cassia regia* Standley, sp. nov.

Tree; older branches blackish gray, slightly furrowed; young branches succulent, obtusely 5-angled, densely velvety-pubescent with short yellowish hairs; stipules linear-subulate, 2 mm. long, early deciduous; rachis of the leaf about 30 cm. long, the lowest pair of leaflets borne 2 cm. above its base, densely velvety-pubescent; petiolar glands none; leaflets about 20 pairs, approximate, narrowly oblong, 26 to 60 mm. long, 10 to 16 mm. wide, the lower and the uppermost shorter than those along the middle of the rachis, all acute, or the lower obtuse, apiculate, slightly unequal at the base and from truncate to acute, lustrous on the upper surface, conspicuously veined, and furnished with numerous fine short stiff appressed hairs, beneath slightly paler, with sparse, short, spreading or appressed hairs, more prominently veined than on the upper surface; petiolules very thick, about 1 mm. long; inflorescence of numerous slender, solitary or clustered racemes 10 to 16 mm. long, borne on the old branches, densely velvety-pubescent with short hairs; bracts subulate, small, deciduous before anthesis; pedicels ascending, 14 to 18 mm. long; sepals subequal, 7 mm. long, 4 mm. wide, oval-oblong, rounded at the apex, purple, with rather few minute appressed hairs; petals 12 mm. long, 8 mm. wide, orbicular-oval or broadly obovate, rounded at the apex, contracted at the base into a slender claw, pale yellow with conspicuous purple veins, glabrous; anthers 2 mm. long, sparingly pilose, the lobes smooth; ovary strongly curved, densely covered with appressed whitish hairs.

Type in the U. S. National Herbarium, no. 677196, collected around El Paraíso, Canal Zone, Panama, altitude 30 to 100 meters, January 24, 1911, by H. Pittier (no. 2532). Additional material is mounted on sheet 677197.

Similar to *Cassia grandis*, but readily distinguished by its purple, sparingly pubescent sepals, and by its acute leaflets. The pubescence of the leaflets is much less abundant than in *C. grandis*, where it might be called tomentose. Specimens of the two species are very unlike in general appearance.

*Chamaecrista simplex* Standley, sp. nov.

Annual; stems erect, very slender, simple or with a few erect branches above, sparingly cinereous below, densely so above; leaves few and distant; stipules narrowly linear-lanceolate, 10 to 13 mm. long, attenuate, aristate-tipped, appressed, strongly nerved, ciliolate; rachis of the leaf 65 to 80 mm. long, bearing leaflets to within 3 or 4 mm. of the base; petiolar gland sessile, cup-shaped, inserted just below the lowest pair of leaflets; leaflets 18 to 25 pairs, oblong or linear-oblong, 5 to 7 mm. long, about 1.5 mm. wide, acutish, mucronate, very oblique at the base, glabrous, ciliolate, rather thick and subcoriaceous, very prominently pinnate-nerved, the midvein excentric; flowers few in each cluster, on pedicels 3 mm. long or less, the bracts similar to the stipules but smaller and broader; sepals lanceolate, 5 mm. long, acute or acuminate, appressed, pubescent; petals about 6 mm. long; legumes erect, 35 to 40 mm. long, 4 mm. wide, obtuse, short-beaked, abundantly hirtellous.

Type in the U. S. National Herbarium, no. 679815, collected in the Sabana de Dormisolo, near Chepo, Province of Panama, Panama, at an altitude of 60 to 80 meters, October, 1911, by H. Pittier (no. 4655).

<sup>1</sup> Trans. Linn. Soc. Bot. 27: 519. 1871.

Related, perhaps, to *C. patellaria*, which it resembles in the sessile petiolar glands, but from which it differs conspicuously enough in the slender, simple or nearly simple stems with appressed pubescence, and in the small, subcoriaceous leaflets which are very oblique at the base.

**Chamaecrista stenocarpa** (Vog.) Standley.

*Cassia stenocarpa* Vog. Gen. Cass. Syn. 68. 1837.

**Chamaecrista tagera** (L.) Standley.

*Cassia tagera* L. Sp. Pl. 538. 1753.

### NEW OR NOTABLE MIMOSACEAE FROM PANAMA.

This characteristically tropical family is well represented in Panama by both herbaceous and woody forms. A new species each of *Calliandra*, *Morongia*, and *Mimosa* is described here. An old subspecies of *Mimosa* published by Bentham appears to deserve specific rank and is redescribed.

**Calliandra pittieri** Standley, sp. nov.

A tree with a flat crown; branches grayish or yellowish green, smooth, the younger ones puberulent and sparingly appressed-pilose with tawny hairs; stipules persistent, linear-lanceolate, acute, 3 mm. long, ciliolate, slightly puberulent; rachis of the leaf 45 to 105 mm. long, slender, densely cinereous-puberulent; pinnæ 7 to 11 pairs, 20 to 55 mm. long; leaflets 20 to 65 pairs, linear or oblong-linear, 3 to 5 mm. long, less than 1 mm. wide, acute to obtuse, minutely scabrous-ciliolate with a few longer hairs interspersed, otherwise glabrous, rather prominently veined, the midvein nearly central, pale green, lustrous on the upper surface; inflorescence axillary, the solitary or clustered peduncles slender or stout, 15 to 45 mm. long, sparingly puberulent; flowers rather few in each head, sessile; calyx 1.25 mm. long, campanulate, glabrous or obscurely puberulent, the teeth very short and separated by broad sinuses; corolla short-funnelform, 5 to 6 mm. long, sparingly short-puberulent or appressed-pilose, the lobes oblong-lanceolate, obtuse; stamens pink, about 3 cm. long; fruit densely pubescent with short yellow hairs, the margins very thick, the valves coriaceous (only imperfect specimens seen).

Type in the U. S. National Herbarium, no. 531146, collected at La Esmeralda, near Jamundí, Cauca Valley, State of Cauca, Colombia, at an altitude of 1,200 meters, January, 1905, by H. Pittier (no. 951).

Apparently the same is a specimen in flower, collected near Cana, Panama, in 1908 by R. S. Williams (no. 707). This is from a small tree nearly 5 meters high, with a trunk 10 cm. in diameter. The Panama plant has slightly smaller and more obtuse leaflets than the type, but seems not to differ otherwise.

The proposed species is related to *Calliandra purdiaei* Benth., but differs in having much smaller flowers as well as more numerous and smaller leaflets.

**Mimosa panamensis** (Benth.) Standley.

*Mimosa debilis panamensis* Benth. Trans. Linn. Soc. Bot. 30: 391. 1875.

Stems slender, prostrate, sparingly setose-hirsute, abundantly armed with stout recurved spines 4 mm. long or less; stipules linear, rigid, 4 mm. long, strongly nerved, pectinate-ciliate; petioles 15 to 25 mm. long, sparingly setose and bearing a few very slender spines; pinnæ a single pair, each consisting of 2 pairs of leaflets, the inner leaflet of the lower pair much reduced; leaflets oblong-obovate, 8 to 18 mm. long, 4 to 7 mm. wide, very unequal at the base, but the midvein only slightly excentric, from rounded to acutish at the apex, mucronate, short-strigose on the upper surface, beneath more densely strigose; peduncles slender, 12 to 35 mm. long, glabrous; bracts

of the capitate inflorescence linear, subulate-tipped, pectinate-ciliate, inconspicuous; corolla puberulent, not striate; stamens 5, 6 mm. long; corolla puberulent, not striate; legumes narrowly oblong, 16 mm. long or less, 3 mm. wide, acute, short-beaked, acute at the base and nearly sessile, densely spiny-hispid, the slender spines 2 to 3 mm. long.

TYPE LOCALITY: Panama, in meadows near the town of Nata; type collected by Seemann (no. 98).

SPECIMENS EXAMINED:

PANAMA: Aguadulce, Province of Coclé, in savannas, near sea level, *Pittier* 4952. Ancón Hill, *Brother Celestine* 66.

This seems worthy of specific rank, differing from *Mimosa debilis* in its numerous spines, broader stipules, and narrow leaflets.

Known in Panama as "dormidera de escobilla" and "ciérrate de escobilla" (Brother Celestine).

*Mimosa williamsii* Standley, sp. nov.

A slender vine with trailing stems 2 meters long or more; branches terete, green-glabrate or very sparsely retrorse-strigose, unarmed, or with a very few short slender spines; stipules linear, acuminate, 3 to 4 mm. long, rigid, erect, canescent, pectinate, ciliate; petioles slender, 35 to 60 mm. long, tipped with a subulate appendage 4 to 7 mm. long, retrorsely strigose and puberulent, each bearing 1 or 2 slender recurved spines 1.5 mm. long; pinnae 1 pair, divergent, their rachises 15 to 20 mm. long; leaflets 2 pairs on each rachis, the inner one of the lower pair usually much reduced and not more than one-fifth the length of the others; leaflets elliptic-oblong to oblong-ob lanceolate, very unequal at the base, the midvein strongly excentric, acutish, abruptly contracted into a mucro 1.5 mm. long, setose-strigose on the upper surface and with numerous very slender soft white hairs, beneath densely strigose; peduncles slender, 15 to 32 mm. long, glabrous or nearly so, ascending or recurved; bracts of the capitate inflorescence linear, with subulate tips, scarcely equaling the corollas; corolla about 2 mm. long, glabrous, not striate; stamens 5; fruit oblong or oval, 8 to 20 mm. long, about 7 mm. wide, obtuse or abruptly acute at the apex and bearing a subulate tip 2 mm. long, contracted at the base into a stipe 3 to 4 mm. long, 1 to 3-seeded, the valves plane, articulate, abundantly setose-strigose and cinereous-puberulent.

Type in the U. S. National Herbarium, no. 677919, collected in the vicinity of Penonomé, Panama, February or March, 1908, by R. S. Williams (no. 101).

Most closely related to *Mimosa albida*, but differing conspicuously in its prominently stipitate, short, few-seeded fruit, sparse, retrorse-strigose pubescence, and glabrous corolla.

*Morongia pilosa* Standley, sp. nov.

Stems prostrate, stout, sharply 5-angled, green, copiously pilose with slender white hairs, armed on the angles with numerous slender recurved spines 2 mm. long; stipules setaceous, erect, 3 mm. long; petioles 35 to 80 mm. long, slender, pilose, closely beset with rather stout recurved spines, bearing 5 to 7 closely approximate pairs of pinnae; rachises of the pinnae 12 to 25 mm. long; leaflets 11 to 22 pairs, the lowest pair borne almost at the base of the rachis, linear-oblong, 3.5 mm. long, hardly 1 mm. wide, thin, smooth, appressed-pilose, obtuse, oblique at the base, sessile; peduncles 5 to 8 mm. long, rather stout, villous, bearing numerous short recurved spines, solitary or 2 together, axillary or racemose at the ends of the branches; heads of flowers small, 3 to 4 mm. in diameter exclusive of the stamens; bracts linear, setaceous-tipped, pilose-ciliate; corolla glabrous, short-stipitate; stamens pink, exerted 3 to 4 mm.; mature fruit not seen, the slightly developed ovaries 4-angled, glabrous on the faces and smooth, densely setose-hispid on the angles.

Type in the U. S. National Herbarium, no. 679704, collected along the Camino del Boticario, near Chepo, Province of Panama, Panama, altitude 30 to 50 meters, October, 1911, by H. Pittier (no. 4544).

Related to *Morongia distachya* (DC.) Cook & Collins, a species of southern Mexico, but differing in its numerous short, approximate pinnæ, which are leaflet-bearing nearly to the base, its pilose stems, and its smaller heads of flowers, these supported on shorter peduncles.

### NEW PANAMANIAN FABACEAE.

During the study of the herbaceous representatives of this family collected in Panama by Mr. Pittier there have been discovered specimens of several South American species not hitherto known from North America. It is expected that an account of these will be published later. New species of several genera have also been detected, diagnoses of which are published here.

#### *Bradburya heteroneura* Standley, sp. nov.

Perennial vine with slender prostrate or climbing stems, these pubescent with short white slender hairs or glabrate; stipules lanceolate or lance-ovate, acuminate, 3 to 4 mm. long, closely parallel-nerved, glabrous; petioles 6 to 25 mm. long, puberulent or soft-pubescent or glabrate; petiolules 1 to 1.5 mm. long; stipellæ subulate, 2 to 3 mm. long; leaves pinnately trifoliolate, the leaflets lanceolate to narrowly oblong-lanceolate, 22 to 45 mm. long, 4 to 11 mm. wide, acute or obtuse, mucronulate, rounded or subcordate at the base, thick and somewhat coriaceous, bright green, scaberulous on the upper surface, glabrous beneath, the prominent veins much reticulated, 8 to 12 of the lateral ones much more conspicuous than the others, diverging from the midvein at an acute angle and anastomosing near the margin; peduncles short, axillary, 7 mm. long or less, 1 or 2-flowered, white-villous; pedicels glabrous, about 7 mm. long, the bracts at their base 6 to 7 mm. long, broadly ovate, deeply cordate-clasping; bracts at the base of the calyx ovate, inequilateral, 15 mm. long, acute, finely parallel-nerved, finely pubescent on the outer surface, twice as long as the calyx or more; calyx broadly campanulate, thin, pale, the upper lobes almost wanting, the margin appearing undulate, the lower lobe linear, equaling or exceeding the tube, finely villous; flowers blue, the standard with a yellowish spot; standard 25 to 30 mm. long and of the same breadth, the upper edge nearly straight, finely soft-pubescent outside; keel and wings 15 to 20 mm. long; young fruit linear, long-beaked, glabrous, the margins much thickened.

Type in the U. S. National Herbarium, no. 678060, collected near Penonomé, Panama, February or March, 1908, by R. S. Williams (no. 328).

This is most nearly related to *Bradburya angustifolia*. The venation of the leaves is very different in *B. heteroneura* and the bracts are pubescent instead of glabrous.

#### *Canavalia bicarinata* Standley, sp. nov.

Slender vine with purplish flowers; young stems finely tomentose with tawny hairs, the older ones glabrate; stipules small, linear-subulate, deciduous; petioles stout, 15 to 55 mm. long, finely tomentose or in age glabrate; stipellæ deciduous; petiolules 3 mm. long, densely pubescent with tawny hairs; leaflets ovate to ovate-oblong or elliptic-ovate, abruptly short-acuminate, the tip obtuse or emarginate, rounded to cordate at the base, dull green, thick and subcoriaceous, prominently veined, finely soft-pubescent on the upper surface, becoming glabrate, beneath sparingly pubescent with mostly appressed hairs; racemes 11 to 27 cm. long, rather slender, the rachises finely appressed-pubescent or glabrate, conspicuously nodulose, with numerous somewhat remote flowers; bracts and bractlets much shorter than the calyx, broadly ovate, obtuse or acutish, conspicuously parallel-nerved, glabrous but ciliolate; pedicels very

short and thick, scarcely more than 1 mm. long; calyx tubular-campanulate, 12 mm. long, the lobes short, the upper broad and truncate, the lower smaller, ovate, obtuse, the whole green, appressed-pubescent; corolla about 25 mm. long, the banner emarginate, the keel and wings of about the same length, the keel very narrow, strongly incurved; legumes oblong-linear, 11 to 14 cm. long, 15 to 18 mm. wide, densely sericeous with short white hairs; valves keeled along the sutures, and each with 2 longitudinal keels 1 to 2 mm. high, these about equidistant from the margins and from each other; seeds numerous, oval-oblong, 9 mm. long, flattened laterally, dark brownish or greenish black, more or less spotted with a lighter tint.

Type in the U. S. National Herbarium, no. 676590, collected in clearings around Alhajuela, Province of Panama, Panama, altitude 30 to 100 meters, January 11 or 12, 1911, by H. Pittier (no. 2354).

ADDITIONAL SPECIMENS EXAMINED:

PANAMA: Vicinity of Penonomé, *Williams* 132.

COSTA RICA: Nicoya, *Pittier*.

Readily distinguished from the other Panamanian species by the 2 keels of each valve of the legume. The only other species with similar fruit is *Canavalia acuminata* Rose,<sup>1</sup> which has larger legumes, differently shaped seeds, and thin, glabrous leaflets of very different outline. That species is known only from Manzanillo, Mexico.

*Dolicholus angulatus* Standley, sp. nov.

Stems twining, the young ones stout, sharply 3-angled, very densely tomentose with short, soft, straight, whitish or tawny hairs; stipules persistent, large, 7 to 15 mm. long, ovate or oblong-ovate, rounded to rather obtuse, sessile, foliaceous, finely parallel-nerved, densely tomentose; petioles stout, angled, densely villous or tomentose, 4 to 6 cm. long; petiolules very stout, about 4 mm. long; stipellæ subulate, equaling the petiolules; leaflets broadly ovate or rounded-ovate, 35 to 80 mm. long, abruptly short-pointed, entire, rounded at the base, bright green, abundantly sericeous on the upper surface, beneath densely soft-pubescent and sparingly gland-dotted, the terminal leaflet larger than the lateral ones, the latter somewhat inequilateral; racemes rather slender, 10 to 15 cm. long, the rachises angled, tomentose, the flowers numerous, sometimes remote and subverticillate; bracts soon deciduous, lanceolate or lance-oval, abruptly long-acuminate, shorter than the calyx; pedicels stout, very short, 1 to 2 mm. long; calyx 1 cm. long, slightly accrescent in age, the lobes several times longer than the very short tube, subequal, lanceolate, acuminate, 3 mm. wide or less, glabrous or sparingly pubescent within, densely tomentose outside, conspicuously pinnate-nerved; corolla yellow, slightly shorter than the calyx; standard ovate, rounded at the apex, short-clawed, with very small rounded auricles, glabrous; wings and keel of about the same length as the standard, the keel somewhat incurved; mature fruit not seen, the very young legume densely pubescent along the margins, gland-dotted, 2-ovuled.

Type in the U. S. National Herbarium, no. 676693, collected along the railroad between Miraflores and Pedro Miguel, Canal Zone, Panama, altitude 30 to 50 meters, January 21, 1911, by H. Pittier (no. 2510).

This is related to *D. reticulatus*, but differs conspicuously in the large, persistent stipules, the glabrous banner, and the broader calyx lobes.

*Dolicholus ixodes* Standley, sp. nov.

Perennial from a slender or sometimes woody root; stems rather stout, terete, erect or twining, densely glandular-hirsutulous; stipules lanceolate, 4 to 5 mm. long, acute, rather persistent, brown, with few parallel nerves, sparingly pubescent; petioles slender, 12 to 18 mm. long, densely viscid-hirsutulous and glandular; petiolules about 1 mm. long; leaflets ovate-triangular, 10 to 25 mm. long, 11 to 20 mm. broad, acute or

<sup>1</sup> Contr. U. S. Nat. Herb. 1: 322. 1895.

abruptly acute, broadly rounded or truncate at the base, prominently veined, dull green, densely viscid-pubescent on both surfaces; racemes axillary, 3 to 11 cm. long, with 3 to 7 flowers near the apex, the rachis pubescent like the stems; bracts shorter than the calyx, inconspicuous; pedicels 2 to 4 mm. long; calyx about 5 mm. long, the lobes about twice as long as the campanulate tube, subequal, the lowest slightly longer than the others, all linear or linear-lanceolate, attenuate, densely viscid-hirsute with tawny hairs; corolla 8 to 9 mm. long, reddish brown, the banner broadly oblong, viscid-pubescent outside, the keel and wings of about the same length; legumes about 16 mm. long, elliptic-oblong, acutish, sessile, viscid-hirsute with yellow hairs and glandular, short-beaked; seeds 2, 3.5 mm. long, flattened, dark reddish brown.

Type in the U. S. National Herbarium, no. 677931, collected in the vicinity of Penonomé, Panama, in February or March, 1908, by R. S. Williams (no. 119). The same collector's no. 581, from the vicinity of Penonomé, also belongs here.

The plant is related to *D. phaseoloides*, but differs widely in its lesser stature, small leaflets, dense, viscid pubescence, few-flowered racemes, and pubescent legumes which are not constricted between the seeds.

**Dolicholus calycosus** (Hemsl.) Standley.

*Rhynchosia calycosa* Hemsl. Diag. Pl. Mex. 48. 1880.

**Erythrina darlienensis** Standley, sp. nov.

Petioles somewhat fleshy, 10 to 13 cm. long, sparingly and minutely puberulent, bearing a large (4 mm. high) cuplike gland at the base of each lateral leaflet; leaflets thin, bright green, glabrous, or sparingly puberulent upon the veins beneath, the terminal ones 15 to 16 cm. long and of the same breadth, rhombic-ovate, obtuse but abruptly short-pointed, broadly rounded at the base; lateral leaflets similar in outline to the terminal one but inequilateral and smaller, 13 to 14 cm. long; petiolules stout, 1 cm. long; inflorescence of stout racemes 8 to 19 cm. long aggregated at the ends of the branches, their rachises densely and very finely tomentulose with tawny hairs; pedicels stout, divergent, 5 mm. long or less; calyx campanulate, 7 mm. long, 5 to 6 mm. broad, contracted into a short stipelike base, truncate at the top and entire except for a very short triangular lower tooth, minutely tomentulose-puberulent; banner recurved, about 45 mm. long and 15 mm. wide, elliptic, obtuse, sessile, glabrous; keel 35 mm. long, falcate, obtuse or acutish, the petals 10 mm. wide near the base, united for nearly their whole length; wings rhombic-oval, obtuse, 10 mm. long; stamens 10, the filaments of 9 of them united nearly to the top, that of the tenth free nearly to the base; ovary long-stipitate, tomentulose.

Type in the U. S. National Herbarium, no. 715845, collected near Boca de Pauarandó, on the Sambú River, southern Darién, Panama, at an altitude of about 20 meters, February, 1912, by H. Pittier (no. 5578).

Distinguished from the South American species with united keel petals by the narrow standard. The glands of the petioles seem to be peculiar to this plant.

*Erythrina darlienensis* is a characteristic tree of the flats along the Sambú River, attaining a height of 30 meters. The straight trunk is 1.2 meters in diameter, with grayish bark, supported at the base by "saponemas" or buttresses. The wood is soft and white. The young branches are armed with short spines.

**Meibomia maxonii** Standley, sp. nov.

Section Chalarium. Much branched shrub about 2 meters high; stems stout, brown, terete, the younger ones densely hirsute with white hairs, the older ones becoming glabrate; stipules distinct, persistent, broadly lanceolate to broadly ovate, 5 to 8 mm. long, abruptly long-acuminate, finely parallel-nerved, brown, thin, glabrous within, densely and coarsely sericeous on the outer surface; petioles 10 to 22 mm. long, hirsute; leaflets ovate to oblong or oval, 20 to 38 mm. long, 11 to 23 mm. wide, obtuse to acutish, rounded at the base, thick, dull green, conspicuously reticulate-veined, sparingly pubescent on the upper surface with short, closely appressed hairs, or glabrate,

beneath abundantly hirsute with soft white or tawny hairs; inflorescence consisting of numerous short-peduncled terminal racemes, these 4 to 8 cm. long, loosely many-flowered, the rachises abundantly hirtellous with tawny hooked hairs; bracts similar in form and pubescence to the stipules, large, conspicuous before anthesis, early deciduous; pedicels slender, ascending, about 10 mm. long; calyx 3 mm. long, purplish, hirsute, the upper lobe triangular-ovate, acutish; corolla 10 mm. long, bright deep purple; loment short-stipitate, the stipe slightly shorter than the calyx; joints 4 to 6, 4 to 4.5 mm. long, with a central isthmus, rhombic-oval, with more or less contorted edges, thick and turgid, obscurely reticulate, sparingly uncinately puberulent.

Type in the U. S. National Herbarium, no. 675728, collected on open, brushy, steep slopes, Cuesta de Cerro Quemado, eastern slope of Chiriquí Volcano, Panama, altitude 1,900 meters, March 11, 1911, by William R. Maxon (no. 5370). Additional material is mounted on sheet 675727.

Also collected by Mr. H. Pittier at the same place on the same date (no. 3112).

A most distinct member of the section Chalarium, readily distinguished from the other shrubby species by the abundant, white, hirsute pubescence, the large, deep purple flowers, and the rhombic, contorted joints of the loment.

**Phaseolus chiriquinus** Standley, sp. nov.

Stems stout, striate-angled, sparingly pubescent with short, fine, straight or curled, whitish hairs, or glabrous; stipules triangular-lanceolate, acute, small, thin, brownish; petioles stout, 25 to 40 mm. long, hirtellous; petiolules thick, 3 to 4 mm. long, tawny-villous or hirtellous; stipellæ 1.5 to 2 mm. long, ovate to oblong-linear, acutish, 1-nerved; leaflets ovate to oblong-ovate, 4 to 7 cm. long, 4.5 cm. wide, acute or abruptly short-acuminate, rounded at the base, prominently veined, pubescent on the upper surface with fine spreading hairs, beneath sericeous with tawny hairs; racemes 10 to 38 cm. long, much exceeding the leaves, the rachis stout, obtusely angled, hirtellous with tawny hairs, glabrate below, the flowers very numerous, in fascicles of 2 to 5; bracts linear, acute, 4 to 6 mm. long, appressed-pubescent, somewhat persistent; pedicels slender, 4 to 9 mm. long, ascending; calyx campanulate, 3 to 4 mm. long, copiously pubescent with short tawny hairs, the lobes shorter than the tube, the upper one broad and low, emarginate, the 3 lower ones ovate, acutish, slightly longer, the mouth of the calyx very oblique; bractlets very small, much shorter than the calyx; banner purple, the wings and keel pale yellowish, more or less tinged with purple; banner about 14 mm. long and 12 mm. wide, rounded-obovate, recurved, deeply emarginate, glabrous, narrowed at the base and with a rounded auricle on each side, this folded over against the inner surface, glabrous; wings narrow, about equaling the banner, with a rounded auricle at the base; keel strongly spirally coiled; young legumes flat, broadly falcate, about 3 times as long as broad, mostly 4-ovuled, very densely pubescent with loose tawny hairs.

Type in the U. S. National Herbarium, no. 677501, collected on the Cuesta de Cerro Quemado, eastern slope of Chiriquí Volcano, Panama, altitude 1,800 to 2,160 meters, March 10 to 13, 1911, by H. Pittier (no. 3111).

From the form of the fruit, this plant evidently belongs to the group Drepanospron. It is related to *Phaseolus multiflorus* Willd., but differs in its more elongate inflorescence, numerous flowers, shorter pedicels, and small, deciduous bractlets.

**NEW OR NOTABLE SPECIES OF GERANIUM FROM COLOMBIA AND VENEZUELA.**

In a large collection of plants secured in Venezuela by Dr. Alfredo Jahn there are specimens of several species of *Geranium*. One of these is apparently new, while a second has been known previously only from the type collection. In 1906 Mr. Pittier obtained in Colombia specimens of another *Geranium* which can not be referred to any published species.

***Geranium stoloniferum* Standley, sp. nov.**

Perennial from a thickened caudex covered by the persistent imbricated stipules and petiole bases; plants producing long slender prostrate branches 30 to 50 cm. long, these rooting at the nodes and forming there thick caudices similar to the basal ones; stems slender, puberulent and bearing numerous somewhat retrose or spreading, subhispid hairs, the tips of the branches ascending, the internodes 2.5 to 15 cm. long; leaves numerous, usually densely clustered at each node; stipules lanceolate, attenuate into a long subulate tip, 6 to 20 mm. long, dark brown to nearly black, puberulent on the outer surface; petioles slender, those of the basal leaves 5 to 8 cm. long, several times as long as the blades, those of the upper cauline leaves mostly shorter than the blades and only 2 to 10 mm. long; leaf blades rounded to subreniform in outline, 10 to 28 mm. broad, thick and firm, yellowish green, prominently veined, at first sparsely hispidulous on the upper surface but soon glabrate, abundantly hispidulous beneath along the veins and the revolute margins, the blades 5-cleft (or the smaller ones only 3-cleft) about three-fifths the distance to the base, the divisions broadly obovate to cuneate in outline, very shallowly 3-lobed at the apex, the lobes obtuse to broadly rounded, the divisions of the smaller leaves sometimes entire; peduncles usually 2-flowered, about 15 mm. long, much longer than the subtending leaves, densely pilose with spreading whitish hairs and somewhat villous; bracts 4 to 5 mm. long, lanceolate, attenuate to a subulate tip; pedicels slender, 8 to 25 mm. long, densely pilose with spreading gland-tipped hairs; sepals 5 mm. long, narrowly oblong or elliptic-oblong, acutish, short-mucronate, pilose with spreading, often gland-tipped hairs; petals 1 cm. long, broadly cuneate-spatulate to obovate, shallowly emarginate, nearly glabrous; fruit not seen.

Type in the U. S. National Herbarium, no. 602320, collected in the Páramo de la Cristalina, State of Trujillo, Venezuela, at an altitude of 2,900 meters, December 20, 1910, by Dr. Alfredo Jahn (no. 126).

It is not possible to determine with certainty the color of the petals, since they are discolored, but they appear to have been white or pink. Apparently of the same species is a specimen from the Páramo de Timotes, State of Táchira, collected at an altitude of 3,000 to 3,500 meters, in March, 1910, by Doctor Jahn (no. 164). This is a mere fragment, but it agrees in the form of the leaves and flowers.

The proposed species belongs to the section *Diffusa*, as outlined by Dr. R. Knuth.<sup>1</sup> It differs from most of the species of that section in its peculiar habit, bracteate 2-flowered peduncles, and revolute leaf margins. It is most closely related to *Geranium diffusum* H. B. K., a plant with ascending or nearly erect stems, mostly shorter petioles, much shorter stipules (3 to 4 mm. long), and petals only 7 mm. long. It is also related to two Venezuelan species, *G. lindenianum* Turcz. and *G. subnudicaule* Turcz., but both these are of different habit and have incised leaf divisions.

<sup>1</sup> In Engl. Pflanzenreich 53: 209. 1912.



*Geranium velutinum* Turcz. Bull. Soc. Nat. Moscou 31<sup>1</sup>: 417. 1858.

Specimens agreeing very well with the original description of this species were collected in the Páramo de Timotes, State of Táchira, Venezuela, at an altitude of 3,000 to 3,500 meters, in March, 1910, by Dr. Alfredo Jahn (no. 5). The type was collected by Funck and Schlim (no. 1251) in the Páramo de Portechuelo, State of Mérida, Venezuela, at an altitude of 2,500 to 2,700 meters. Knuth, in his monograph of the genus, places the species doubtfully in the section *Gracilia*.<sup>1</sup> If the present specimen is correctly determined, the species can be better placed in some other section.

*Geranium confertum* Standley, sp. nov.

Plant perennial, densely caespitose with much thickened caudices from a stout elongate frutescent root; leaves and flowers all basal; stipules 10 to 15 mm. long, scarious, stramineous, ovate or oblong-ovate, attenuate to a filiform tip, glabrous or nearly so; petioles stout, 1.5 to 5 cm. long, densely pilose with short, spreading or retrorse hairs, slightly viscid; leaf blades rotund in outline, 1 to 2 cm. wide, cleft three-fifths the distance to the base into 5 or 7 broadly cuneate divisions, these 3-lobed at the apex, the lobes ovate to oval, rounded at the apex, the whole blade firm and subcoriaceous, dull green, prominently veined, sparsely pubescent on the upper surface with slender appressed hairs, glabrate in age, abundantly pilose beneath along the veins with spreading hairs; flowers very numerous, the peduncles 1-flowered, ebracteate, 15 to 20 mm. long, densely pilose with spreading or retrorse white hairs; sepals 7 to 8 mm. long, oblong-linear or lance-linear, acute, short-mucronate, pilose-ciliate, especially near the base, sparsely pilose; petals purplish pink, 12 to 15 mm. long, narrowly spatulate, rounded at the apex, glabrous; fruit about 9 mm. long, the valves and beak densely pubescent with short stiff spreading hairs.

Type in the U. S. National Herbarium, no. 531305, collected in the Páramo de Buena Vista, Huila Group, Central Cordillera, State of Cauca, Colombia, at an altitude of 3,000 to 3,600 meters, January, 1906, by H. Pittier (no. 1107).

A member of the section *Andina* proposed by Knuth<sup>2</sup> and most nearly related to *Geranium sessiliflorum* Cav., a species which ranges in the Andes from Bolivia to Patagonia. In the U. S. National Herbarium there are several collections of that species, some of which are cited by Knuth. *Geranium sessiliflorum* is similar in habit to the species here described, but it has mostly appressed pubescence, thin and more deeply parted leaves, densely hirsute, smaller sepals (only 4 to 5 mm. long), and smaller, white petals.

### WERCKLEA, A NEW GENUS OF MALVACEAE.

The tree here described was first discovered by Mr. Pittier in 1898 at a time when he was unable to collect specimens of it. Later, material was secured under his direction, which is the basis of the description here published. It is one of the most showy members of the Malvaceae, the flowers equaling in size those of any species of *Hibiscus* and being borne in great profusion. Very few, if any, of the arborescent members of that genus reach so large a size.

<sup>1</sup> In Engl. Pflanzenreich 53: 104. 1912.

<sup>2</sup> In Engl. Pflanzenreich 53: 78. 1912.

**WERCKLEA** Pitt. & Standl., gen. nov.

A tree of medium size; leaves alternate, long-petioled, the blades broadly rounded, entire or repand-undulate, palmately nerved; stipules broad and foliaceous; pubescence sparse, of short stellate hairs; flowers solitary in the axils, long-peduncled; involucre tubular-campanulate, shallowly 3-lobed, usually split nearly to the base on one side by the developing flower; calyx narrowly campanulate, 5-lobed to about the middle, the lobes acute, 3-nerved; petals 5, united for a short distance at the base with each other and with the stamen tube, spatulate-oblongate, somewhat clawed, palmately nerved; stamen tube striate, one-third as long as the petals, antheriferous for half or two-thirds its length, shallowly 5-lobed at the summit; anthers oblong, longitudinally dehiscent; ovary sessile, 5-celled; ovules pendulous, numerous in each cell, amphitropous; style filiform, striate, with 5 ascending branches; stigmas capitate or fimbriate; capsule oblong, with a long stout beak at the apex, broadly winged along the sutures by the well developed exocarp; seeds ovoid-reniform, hispid.

Wercklea is a member of the subfamily Hibisceae, and is most closely related to the genus *Hibiscus*. Several important points of difference, however, make it unwise to refer it to that genus. The involucre is merely 3-lobed before anthesis, while in all species of *Hibiscus* the bracts are separate. Paritium, sometimes referred to *Hibiscus*, has united bracts, but they are 5 instead of 3. The winged capsule, oblong anthers, and comparatively few stamens are other distinguishing features, but the best, perhaps, is the fact that the ovules are amphitropous rather than anatropous.

The genus is named for Mr. C. Wercklé, the collector of the type, who has botanized extensively in little known regions of Central America and Colombia.

**Wercklea insignis** Pitt. & Standl., sp. nov.

A tree 9 to 10 meters high with a trunk 30 to 40 cm. in diameter and a rounded top; young branches stout and succulent, sparingly pubescent with whitish stellate hairs; stipules foliaceous, orbicular or broader to obovate or oblong, sessile by a broad base, entire; petioles 6 to 32 cm. long; leaf blades reniform-orbicular, 15 to 40 cm. broad, entire or repand-undulate, bright green, with a few scattered stellate hairs on the upper surface and more numerous ones beneath, the principal veins usually 7; peduncles stout, 5 to 14 cm. long, stellate-pubescent at anthesis but soon glabrate; involucre monophyllous, 14 to 20 mm. long, 3-lobed, the sinuses often very shallow but sometimes extending nearly to the base, the lobes obtuse or rounded, sparingly stellate-pubescent, cleft almost half way to the base; calyx lobes triangular or triangular-ovate, acute; corolla about 12 cm. long and of the same breadth; petals spatulate-oblongate, obtuse to truncate at the apex, entire, lilac rose, yellow at the base, sparingly pilose; capsule oblong, 5 cm. long, with a stout beak 10 to 12 mm. long, densely hispid, glabrous within, with thin double wings along the angles, these dividing with the dehiscence of the capsule; seeds 3 mm. long, dark brown, densely covered with stiff tawny hairs about 3 mm. long.

Type in the U. S. National Herbarium, no. 678449, collected in the forests near La Palma, central Costa Rica, altitude about 1,460 meters, by C. Wercklé. Additional material of the same collection is mounted on sheets 678448 and 678451.

## ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: La Palma, September 8, 1898, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 12536). Cultivated in a garden, Guadalupe, October, 1910, *Jiménez* 19.

The tree grows in the humid forest at the summit of the mountains about La Palma, a region swept by the moist trade winds from the east. The surrounding trees are usually covered with lichens and other epiphytes, but the trunks of *Wercklea* are bare of such growths.

**PELTAEA, A NEW GENUS OF MALVACEAE.**

There is a small group of Malvaceae, consisting of 4 to 6 species, which has generally been treated as a section of Malache (*Pavonia*), although two of the species were described by Presl in the genus *Malachra*. The plants of this group in general appearance are very unlike the species of true Malache, and are distinguished also by the large leaflike floral bracts and the peltate-appendaged involucre bracts. The writer wishes to propose for the genus the name *Peltaea*, first used by Presl for a section of *Malachra*.

**PELTAEA** (Presl) Standley, gen. nov.

*Malachra* section *Peltaea* Presl, Rel. Haenk. 2: 125. 1836.

*Pavonia* section *Peltaea* Gürke in Mart. Fl. Bras. 12<sup>3</sup>: 475. 1892.

Low shrubs, or sometimes herbaceous plants woody only at the base, with slender or stout branched stems; pubescence usually abundant and composed of stellate hairs; leaves usually broad, petiolate, toothed; stipules narrow, commonly deciduous; inflorescence capitate or subcapitate, 3 to 10-flowered, on a long axillary peduncle, or sometimes sessile; bracts large, similar to the leaves, 1 or 2 subtending each head of flowers and usually surpassing them and concealing the carpels; bracts of the involucre 8 to 11, in a single series, each commonly with a peltate enlarged blade at the apex, at least always enlarged toward the apex; calyx campanulate, 5-lobed; petals yellow or purplish red, showy; stamen tube and pistil about equaling the petals; styles 10, rather short, erect; stigmas capitate; carpels 5, blunt, sometimes mucronulate, glabrous or pubescent, with a longitudinal dorsal nerve, elsewhere smooth or obscurely rugulose; seeds glabrous.

TYPE SPECIES: *Pavonia sessiliflora* H. B. K.

***Peltaea ovata*** (Presl) Standley.

The type was collected on the Isthmus of Panama by Haenke. Two Panama collections may be referred here: Fendler's no. 21, from Chagres, and Pittier's no. 2149, from "among bushes around Culebra." It seems fairly certain that these specimens represent Presl's species, although one can not be absolutely certain without examining the type. They differ from *P. sessiliflora* in having 5-nerved or 3-nerved, lanceolate or lance-ovate leaves, with a short rough pubescence and pubescent carpels. In *P. sessiliflora* the leaves are 7-nerved, broadly ovate-cordate, and velvety with a very dense pubescence and the carpels are glabrous.

***Peltaea riedelii*** (Gürke) Standley.

*Pavonia riedelii* Gürke in Mart. Fl. Bras. 12<sup>3</sup>: 493. pl. 91. f. 2. 1892.

Province of Matto Grosso, Brazil.

***Peltaea sessiliflora*** (H. B. K.) Standley.

*Pavonia sessiliflora* H. B. K. Nov. Gen. & Sp. 5: 281. 1821.

*Pavonia bracteosa* Benth. Journ. Bot. Hook. 4: 118. 1842.

*Malachra trinervis* Presl, Rel. Haenk. 2: 126. 1836.

Trinidad and Panama to Colombia and Brazil.

***Peltaea speciosa*** (H. B. K.) Standley.

*Pavonia speciosa* H. B. K. Nov. Gen. & Sp. 5: 231. pl. 477. 1821.

Colombia and Venezuela to Brazil and in the West Indies.

THE GENUS *LOPIMIA*.

This genus of Malvaceae, described by Martius in 1823, was recognized by several writers in the earlier part of the nineteenth century, but in later years has always been included in *Pavonia*. Indeed, it has not been separated even as a subgenus or section. To the writer, the two species to be placed here seem well worthy of generic recognition. The genus may be characterized as follows:

*LOPIMIA* Mart.

*Lopimia* Mart. Nov. Act. Acad. Caes. Leop. Carol. 11: 96. 1823.

Branched shrubs with large ovate-cordate soft-pubescent toothed petioled leaves; stipules and bracts linear to subulate, persistent or deciduous; flowers on axillary, 1 to many-flowered peduncles near the ends of the branches, numerous, appearing paniculate, the clusters of the inflorescence mostly shorter than the leaves; bracts of the involucre 12 to 22, linear or narrowly linear-lanceolate, densely pubescent, in a single series; calyx very short, one-fourth as long as the involucral bracts or shorter, shallowly lobed; corolla large and showy, much exceeding the involucre, the petals somewhat clawed at the base, entire, densely soft-pubescent on the outer surface; stamen tube about as long as the corolla; style branches 10, slender, elongate, exceeding the corolla, erect, the stigmas small, capitate, tuberculate or pubescent; carpels 5, more or less reticulate, at maturity with a thin viscid mucilaginous coating, becoming glabrous and shining when dried, rounded at the apex, readily separable when mature from the ringlike hollow gynobase, tardily if at all dehiscent; seeds reniform, smooth, glabrous.

The genus was held distinct, originally, because of the mucilaginous covering of the carpels and the very numerous involucral bracts. In the second species of the genus listed here from Panama the bracts are only 12, a number equaled in true species of *Malache* (*Pavonia*). The mucilaginous coating of the carpels, however, suffices to distinguish the genus. When dry this gives the fruit a glossy appearance quite unlike that of the dull surface of species of *Malache*. In addition, the two species of *Lopimia* are very different in general appearance from the members of the genus *Malache* by the large, showy, very numerous flowers and the broad, densely soft-pubescent leaves. Another character worthy of mention is found in the very short, thin calyx which is pressed almost flat by the growth of the carpels. In the form of the flowers and fruit, *Lopimia* suggests *Malvaviscus* rather than *Malache*.

*Lopimia dasypetala* (Turcz.) Standley.

*Pavonia dasypetala* Turcz. Bull. Soc. Nat. Moscou 31: 189. 1858.

TYPE LOCALITY: Near San Cristóbal, Province of Mérida, Venezuela, at an altitude of 750 meters.

RANGE: Costa Rica to Venezuela.

SPECIMENS EXAMINED:

PANAMA: Without locality, *Hayes* 216. Sunny edge of forest, railroad relocation between Gorgona and Gatún, *Pittier* 2273. Lion Hill, Gatún, *Goldman* 1855.

COSTA RICA: Térraba, February 5, 1891, *Pittier*.

A shrub 1 to 3 meters high, with purplish pink flowers.

This is probably the plant collected by Hayes (no. 482) reported by Hemsley<sup>1</sup> as *Pavonia velutina* St. Hil., that name being a synonym of *Lopimia malacophylla*.

Our Panamanian and Costa Rican plants may not be true *dasypetala*, for the writer has seen no Venezuelan specimens. They agree fully with the original description of the species, but this is not as complete as might be desired. Turczaninow states that

<sup>1</sup> Biol. Centr. Amer. Bot. 1: 117. 1879.

the fruit does not have a mucilaginous coat, but he makes the same statement of *Lopimia insignis* Fenzl, which is a synonym of *L. malacophylla*. He could not be certain regarding this point from dried fruit alone.

The only other species of this genus known at present is the type species, *Lopimia malacophylla*. It is characterized by its numerous (18 to 22) involucre bracts, *L. dasypetala* having usually only 12. These are much wider, too, in the latter species. There are other prominent differences besides, *L. dasypetala* having a less abundant pubescence and larger flowers.

*Lopimia malacophylla* has a wide range in South America, extending from Colombia and Bolivia through most of Brazil. It is found also in Cuba and in southern Mexico. From the latter region Hemsley<sup>1</sup> reports a single specimen collected by Jurgensen (no. 909). In the National Herbarium there is a second sheet, collected by E. W. Nelson (no. 2479) near Plunia, Oaxaca, altitude 900 to 1,440 meters, March 17, 1895. Seeds of this collection were brought to Washington, where the plants were grown in the greenhouse, flowering and fruiting in 1897. It may be that the plant in Mexico is introduced.

#### FOUR NEW SPECIES OF MALACHE FROM PANAMA AND COSTA RICA.

Many of the species of Malache (better known under the name Pavonia) are widely dispersed tropical weeds. Others, however, are local in their distribution. To the latter group belong four species of Panama and Costa Rica which appear to be without names.

##### *Malache fulva* Standley, sp. nov.

Stems stout, flexuous, densely pubescent with short stout white hairs, besides being densely hispid with long yellow hairs; stipules subulate, 5 to 8 mm. long, deciduous, hispid; leaf blades elliptic-oblong, asymmetrical, 7 to 14 cm. long, 26 to 55 mm. wide, abruptly short-acuminate, rounded at the base, coarsely crenate or crenate-dentate, pinnately veined, abundantly hispid on both surfaces, some of the hairs sometimes branched; petioles stout, 9 mm. long or less, densely hispid, the uppermost leaves nearly sessile; peduncles solitary in the axils or in a terminal few-flowered corymb, 20 to 75 mm. long, stout, abundantly hispid; involucre bracts about 10, linear-subulate, 15 to 20 mm. long, hispid with yellow bristles; calyx 4 mm. long, puberulent, shallowly lobed, the lobes broad and rounded; flowers not seen; fruit hemispheric, scarcely lobed; carpels 5, glabrous, with prominent dorsal and lateral nerves and less prominent transverse ones, each carpel with 3 slender spinose processes at the apex, these spreading, about 1 cm. long, retrorsely barbed at the apex; seeds brown, puberulent.

Type in the U. S. National Herbarium, no. 578479, collected in cultivated fields at the Hacienda de Chirripó, Costa Rica, altitude 100 meters, March, 1900, by H. Pittier (Inst. Fís. Geogr. Costa Rica, no. 16080). An additional specimen examined is from the Hacienda de Zent, Costa Rica (*Tonduz* 388).

A member of the subgenus *Typhalaea*, but not closely related to any described species of the group. The leaves are similar in size and outline to those of *M. typhalaea* and *M. rosea*, but the inflorescence and fruit are very different. *Malache fulva* may be distinguished at once from all the Mexican and Central American species by the abundant yellow, hispid pubescence.

<sup>1</sup> Biol. Centr. Amer. Bot. 1: 117. 1879.

**Malache maxonii** Standley, sp. nov.

Stems herbaceous, about 70 cm. high, stout, branched, densely hispid with stiff, fulvous, stellate or sometimes simple hairs; petioles stout, 7 to 30 mm. long, hispid like the branches; leaf blades obovate to rhombic-obovate or oblanceolate-oblong, 10 to 18 cm. long, 3 to 7 cm. wide, acute to somewhat abruptly acuminate, narrowed to the base, coarsely and very irregularly crenate, sometimes doubly crenate, some of the lobes often much enlarged, hispidulous on both surfaces with stiff, spreading, yellowish, simple or stellate hairs, more densely so beneath; stipules linear-subulate, 9 to 12 mm. long; peduncles axillary or terminal, loosely branched, hispid, 8 to 15 cm. long; pedicels 1 to 10 cm. long, elongating in age, sparsely hispid or glabrate; bracts at the base of the pedicels 5 to 9 mm. long, hispid, 3-parted into linear lobes; involucre bracts 10 to 12, linear, about 8 mm. long, united only at the base, hispidulous with simple or 2-parted hairs; calyx scarcely more than half as long as the bracts, finely pubescent with short stout stellate hairs, the lobes broadly triangular; corolla pink, 8 to 10 mm. long, the petals finely and sparsely stellate-pubescent on the outer surface; carpels of the fruit 7 mm. high, thin-walled, smooth on the back, glabrous, each bearing 3 slender, erect, retrorsely barbed beaks of about the same length.

Type in the U. S. National Herbarium, no. 693056, collected on a partially shaded bank by the trail in the forest along the Río Ladrillo, above El Boquete, Chiriquí, Panama, at an altitude of 1,200 to 1,300 meters, March 17 to 19, 1911, by William R. Maxon (no. 5394). Additional material of the same collection is mounted on sheets nos. 675761 and 675762. Also collected by Mr. Pittier (no. 3287) in the same locality at the same time.

In general appearance this resembles *M. rosea*, but it is amply distinct in the 3-parted bracts and coarse pubescence. The inflorescence, too, is not congested as in that species, but is loose and open. The proposed species is related to two South American ones, *Malache peruviana* and *M. warmingiana*, both of which have very different involucre bracts.

**Malache panamensis** Standley, sp. nov.

Annual, 1 meter high or less, simple at the base, with numerous ascending branches above; branches slender, minutely cinereous, with an admixture of long soft white hairs above, especially on the peduncles; leaves rather numerous, ovate to oblong-ovate or lanceolate, 3.5 to 7 cm. long, 1.6 to 3.2 cm. wide, rather abruptly acuminate, rounded to subcordate or cordate at the base, the lobes often overlapping, coarsely but evenly serrate, the teeth acute, 3 or 5-nerved, when 5-nerved the two lateral nerves less conspicuous than the others, bright green on the upper surface but sparsely scaberulous, dull and slightly paler beneath and sparsely pubescent with very slender short stellate hairs; petioles slender, 1.6 to 3.2 cm. long, cinereous and often pilose; stipules subulate, 3 mm. long or less, early deciduous; pedicels 1-flowered, solitary in the axils, slender, 2 to 3 cm. long, ascending, jointed above the middle, pilose or short-pubescent; involucre bracts usually 8, linear, 6 to 8 mm. long, acute, hirsute-ciliate and slightly cinereous; calyx half to two-thirds as long as the bracts, cleft halfway to the base or more, the lobes oblong-lanceolate to triangular, acute, 3-nerved, ciliate and somewhat hirsute, whitish near the base but green near the tip; corolla white, the petals spreading, broadly oblong, rounded or emarginate, short-clawed, ciliolate, sparingly pubescent on the outer surface; stamen tube less than half as long as the petals, glabrous; styles 10, spreading, stout, little exceeding the stamen tube; stigmas capitate, rounded, pubescent; carpels 5, about half as long as the bracts, rounded at the apex, glabrous, smooth or obscurely nerved; seeds very dark brown, pubescent with short coarse appressed hairs.

Type in the U. S. National Herbarium, no. 677212, collected on the edge of the forest, Sabana de Panama, Canal Zone, Panama, altitude 10 to 50 meters, January 25, 1911, by H. Pittier (no. 2548).

An additional specimen examined is from Chepo, Province of Panama, altitude 60 meters (*Pittier* 4448).

Related to *Pavonia geminiflora* Moric., but differing in its pubescent seeds, lack of glandular pubescence, narrow, fewer nerved leaves, and smaller flowers. The leaves of the type specimen suggest the leaflets of *Clematis virginiana* and its allies. Another plant which resembles *M. panamensis* in vegetative characters is *Malache arachnoidea* (Presl) Kuntze. That species, however, has spiny carpels. The name *arachnoidea* is given to the species of western Mexico, not because of the character of the pubescence, as one might expect, but on account of the resemblance of the fruit and bracts to the body and legs of a spider.

***Malache penduliflora* Standley, sp. nov.**

Stems slender, branched, densely pubescent with short stiff tawny stellate hairs; petioles stout, 6 to 12 mm. long, densely stellate-hispidulous; leaf blades elliptic to elliptic-oblong or even obovate, usually broadest at the middle but sometimes above the middle, 8.5 to 15 cm. long, 2.5 to 5.5 cm. wide, long-acuminate, sometimes abruptly so, more or less oblique at the base and rounded, thin, bright green, stellate-hispidulous with tawny hairs on both surfaces, rather sparsely so on the upper surface; stipules 4 to 5 mm. long, linear, long-attenuate, soon deciduous; flowers solitary, axillary, pendulous, on stellate-hispidulous peduncles 2 to 8.5 cm. long; involucre bracts 8 to 10, united only at the base, linear, attenuate, about 7 mm. long, densely stellate-hispidulous; calyx of the same length as the bracts, the lobes ovate, acute, reddish, finely pubescent with stiff stellate hairs; corolla pink, 12 mm. long; carpels 5, about 9 mm. high, reddish, glabrous, coarsely reticulate-veined on the back, each bearing 3 retrorsely barbed spines about 5 mm. long.

Type in the U. S. National Herbarium, no. 677582, collected in the humid forest around Los Sigüas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of about 1,700 meters, March 17 to 19, 1911, by H. Pittier (no. 3188).

In the form of the flowers and in the small stipules this resembles *Malache leucantha*, a South American species, but that has a broad, much branched inflorescence and the involucre bracts are united for nearly half their length.

**A NEW WALTHERIA FROM COLOMBIA.**

The plant described below was distributed as *Waltheria involucreta* Benth., "narrow bracted form." It is not closely related, however, to that species, in which the bracts are united, thin, and accrescent. Apparently it is allied to the Panamanian *Waltheria glomerata* Presl, which is distinguished by its obovate-oblong leaves, rounded at the base, its closely sessile flower clusters, and its narrower acute bracts.

***Waltheria subcordata* Standley, sp. nov.**

Young branches densely and finely stellate-pubescent, slender, straight, the internodes 3 to 8 cm. long; stipules linear-subulate, 4 to 7 mm. long; petioles stout, 1 to 2 cm. long, densely and finely stellate-pubescent with brown hairs; leaf blades narrowly oblong-ovate to broadly ovate or rounded-ovate, 6.5 to 13 cm. long, 2.5 to 9.5 cm. wide, acute at the apex, subcordate or even cordate at the base, often inequilateral, finely or coarsely crenate, densely and finely stellate-pubescent on the upper surface when young, becoming glabrate in age, somewhat paler beneath and velvety-pubescent with short stellate hairs; flowers in dense clusters 1 to 2 cm. broad, these peduncled in the axils of the leaves, or the upper racemose; peduncles 5 to 12 mm. long, or some of the clusters sometimes sessile; flowers usually 2 together, subtended by several bracts, these distinct, 6 mm. long, usually obovate-spatulate but sometimes narrowly oblanceolate, obtuse, finely and very densely stellate-pubescent; flowers very shortly

pediceled; calyx obpyramidal, 6 mm. long, the lobes triangular, acute, about half as long as the tube; corolla yellow, about equaling the calyx; fruit not seen.

Type in the U. S. National Herbarium, no. 533011, collected in the region of Santa Marta, Colombia, at an altitude of 150 meters, by Herbert H. Smith (no. 493).

### NEW OR NOTABLE EBENACEAE FROM MEXICO.

There are here included descriptions of 3 new species of *Diospyros* and 2 of *Maba*, chiefly from the western coast of Mexico. Several species of these two genera have been described from Mexico, but most of them are poorly represented in American herbaria. The Mexican species of *Diospyros* are particularly interesting. Probably most of them are of local distribution.

The common persimmon of the eastern United States, *Diospyros virginiana*, apparently deserves greater attention than has heretofore been given it. Early American botanists, notably Pursh and Rafinesque, believed that two or more species of *Diospyros* occurred in the eastern United States. Casual inspection of the material in the National Herbarium inclines the writer to the belief that at least two distinct forms are included under *virginiana*, and probably several species can be distinguished when there has been accumulated a large amount of herbarium material properly annotated. At present the material available is altogether insufficient for a critical study of the supposed aggregate.

#### *Maba latifolia* Standley, sp. nov.

Section *Macreightia*. Shrub or small tree; branches slender, dark brown or grayish, the branchlets densely hirtellous with short fulvous hairs, glabrate in age; petioles stout, 1.5 to 3 mm. long, densely hirtellous; leaf blades broadly oblong, oval, or oval-obovate, 3.2 to 6.5 cm. long, 1.7 to 3 cm. wide, rounded at the apex or broadly obtuse, rounded or obtuse at the base, subcoriaceous, grayish green on the upper surface and sparsely puberulent, or densely short-villous when young, beneath copiously short-villous, the margins slightly revolute, the veins prominent beneath, coarsely reticulate; flowers not known; fruit solitary, axillary, subsessile on a very short thick pedicel; fruiting calyx 3-lobed nearly to the base, the lobes orbicular-ovate, obtuse or rounded at the apex, coarsely veined, densely puberulent throughout; fruit subglobose, about 2.5 cm. in diameter, yellowish outside and densely pubescent about the apex, elsewhere glabrate, 6-celled, the pulp reddish; seeds oval or oval-oblong in outline, 11 mm. long, 6 to 7 mm. in diameter, about 5 mm. thick, acute or obtuse on the inner edge, dark reddish brown, finely and distinctly rugulose.

Type in the U. S. National Herbarium, no. 637592, collected in dry coastal thickets near Guadalupe, Sinaloa, Mexico, April 18, 1910, by J. N. Rose, Paul C. Standley, and P. G. Russell (no. 14709). Specimens in fruit, just coming into leaf, were collected on a dry hillside at Mazatlán, Sinaloa, April 7, 1910 (*Rose, Standley & Russell* 14147).

Three species of *Maba*, all of the section *Macreightia*, have been described from Mexico: *M. intricata* (A. Gray) Hiern, from Cape San Lucas, Lower California; *M. albens* (Presl) A. DC., from Acapulco; and *M. acapulcensis* (H. B. K.) Hiern, also from Acapulco. The habitats of two other species, *M. pavonii* (A. DC.) Hiern and *M. salicifolia* (H. B. K.) Hiern, are doubtful and may be Mexican. Judging from descriptions, the present species is clearly distinct from all of these, differing from each in definite characters of the fruit, leaf outline, or pubescence. Unfortunately only two



of the five species, *M. intricata* and *M. albens*, are represented in the National Herbarium by specimens. The last mentioned species, until recently unrepresented, was collected on the Cerro de Picacho, Oaxaca, in July, 1914, by C. A. Purpus (no. 7176).

***Maba verae-crucis* Standley, sp. nov.**

Branches slender, the older ones gray, the branchlets at first canescent but later glabrate; petioles 3 mm. long, densely covered with short appressed hairs; leaf blades rhombic-obovate or elliptic-oblongate, 5.5 to 8.5 cm. long, 1.8 to 4 cm. wide, narrowed at both ends, acute or acuminate at the apex, acute at the base, thin, green, concolorous, the upper surface at first canescent but finally glabrate and obscurely papillose, the lower surface sparsely strigose, minutely pellucid-punctate, the midvein impressed above, prominent beneath, the lateral veins and the veinlets weak and inconspicuous; flowers not known; fruits solitary, axillary, on very stout pedicels 3 to 4 mm. long; fruiting calyx 15 mm. broad, shallowly 3-lobed, the lobes broadly rounded, densely sericeous and smooth inside, coarsely rugose and sparsely sericeous outside; fruit subglobose, 12 to 16 mm. in diameter, 6-celled, glabrate at maturity, but sericeous when young; mature seeds not seen.

Type in the U. S. National Herbarium, no. 569278, collected at Catemaco, Veracruz, Mexico, altitude 300 meters, April 26, 1894, by E. W. Nelson (no. 429).

This proposed species appears to be related to *Maba acapulcensis*, but it differs in its smaller fruit and shallowly lobed calyx, and it does not have the hirtellous leaves ascribed to the latter.

***Diospyros blepharophylla* Standley.**

*Diospyros ciliata* A. DC. in DC. Prodr. 8: 229. 1844, not *D. ciliata* Raf. 1836.

***Diospyros palmeri* Eastw. Proc. Amer. Acad. 44: 604. 1909.**

The species was described from fruiting material collected in the vicinity of San Dieguito, San Luis Potosí, Mexico, early in June, 1905, by Dr. Edward Palmer (no. 631). In 1907 Dr. Palmer made two additional collections of the same species in the vicinity of Victoria, Tamaulipas (nos. 116 and 369). These are exactly like the one from San Luis Potosí. One of them (no. 116) bears very young fruits, upon some of which the corolla still persists. This is globose-urceolate, about 5 mm. long, glabrous outside near the base, but puberulent above. The corolla lobes are oval, rounded at the apex, glabrous on the inner surface, but densely pubescent on the outer. The species is a member of the section *Danzleria*, to which *Diospyros virginiana* also belongs, but there is little resemblance in the general appearance of the two species.

***Diospyros rosei* Standley, sp. nov.**

Section *Paralea*. Tree with persistent leaves; branches covered with grayish brown bark having numerous lighter colored lenticels, the branchlets slender, brownish yellow, puberulent when young but soon glabrate; leaves alternate, on stout petioles 6 to 8 mm. long, these finely puberulent or in age glabrate; leaf blades oblanceolate-oblong or rarely oblong-obovate, 6 to 14.5 cm. long, 3 to 4.5 cm. wide, rounded at the apex, cuneate or rarely only obtuse at the base, subcoriaceous, green or grayish green on the upper surface and glabrous except along the puberulent veins, minutely puberulent beneath, especially along the veins, the midvein very prominent, the lateral veins 5 to 7 on each side, irregularly spaced, laxly anastomosing near the margin, the veinlets very numerous, prominent, and reticulated; flowers not known; fruit axillary, the pedicels solitary or fascicled, 5 to 15 mm. long, stout, puberulent; fruiting calyx 3.5 to 4 cm. broad, puberulent throughout or finally glabrate, lobed nearly to the base, the 5 (rarely 4) lobes ovate or oval-ovate, 6 to 10 mm. broad, acute or acutish, prominently veined; fruit depressed-globose, 8 to 10-celled, about 2.5 cm. in diameter, densely pubescent when young with short appressed hairs, glabrate in age; mature seeds not seen.

Type in the U. S. National Herbarium, no. 300363, collected at Acaponeta, Territorio de Tepic, Mexico, July 2 or 3, 1897, by J. N. Rose (no. 1522). Collected again by Dr. Rose near Acaponeta, July 29, 1897 (no. 3285).

Very probably to be referred here are specimens of fruit sold in the market at Mazatlán, Sinaloa (*Rose, Standley & Russell* 13981), under the name "guayaparín." The form of the calyx lobes suggests *Diospyros rosei*, but there are, of course, no leaves present. The fruit is black and nearly 4 cm. in diameter; the seeds are broadly oval to suborbicular in outline, 11 to 13 mm. long, 9 to 10 mm. wide, and 3 to 4 mm. thick, acute or acutish on the inner side, dark brown, and slightly roughened.

*Diospyros rosei* is closely related to *D. sonorae*. The calyx lobes, however, are of different form, being broadest below the middle and acute or acutish at the apex, rather than broadest above the middle and obtuse, as in the latter species; and the leaves are much more narrowed at the base, thinner, and on longer petioles.

***Diospyros sonorae* Standley, sp. nov.**

Section Paralea. A small or large tree with stout thick trunk and rounded crown, the branches spreading; branchlets slender, gray, at first densely puberulent but glabrate in age; leaves persistent, alternate, the petioles stout, 2 to 3 or rarely 6 mm. long, puberulent; leaf blades oblong, narrowly oblong, or rarely oblanceolate-oblong, 5.5 to 13 cm. long, 2 to 4.2 cm. wide, rounded at the apex and sometimes emarginate, broadly rounded or obtuse at the base or sometimes obtusely cuneate, subcoriaceous, pale grayish green, glabrous on the upper surface, minutely puberulent beneath, at least when young, the midvein prominent beneath, slightly impressed above, the lateral veins 6 or 7 on each side, connected by numerous prominent reticulate veinlets; flowers not seen; fruit solitary or fascicled in the axils, on stout ligneous pedicels 12 to 15 mm. long; fruiting calyx 3 to 4 cm. broad, 5 (rarely 4-) lobed nearly to the base, the lobes oblong or elliptic-oblong, 5 to 11 mm. broad, broadest at or above the middle, obtuse or rounded at the apex, finely puberulent or glabrate, conspicuously veined; fruit depressed-globose, about 2.5 cm. in diameter, densely fulvous-puberulent when young, glabrate in age, 8-celled; seeds suboval in outline, 12 mm. long, 8 mm. broad, 6 mm. thick, blackish brown, cuneate in cross section, the inner edge very acute.

Type in the U. S. National Herbarium, no. 335774, collected at Alamos, Sonora, Mexico, December 27, 1898, by E. A. Goldman (no. 276).

ADDITIONAL SPECIMENS EXAMINED:

SONORA: Alamos, cultivated in the edge of town, March 10, 1910, *Rose, Standley & Russell* 12947. Two miles west of Hermosillo, cultivated, March 8, 1910, *Rose, Standley & Russell* 12543.

In spite of the absence of flowers there is little doubt that this species is referred correctly to the section Paralea. It is related probably to *D. guianensis* (Aubl.) Gürke (*D. paralea* Steud.), a native of the Guianas, Brazil, and Colombia, a species with sessile fruit and broader, thinner, acute, deep green leaves. The Sonoran tree has been confused with *Diospyros ebenaster* Retz., a species which is probably native in Malaysia and is widely cultivated in tropical regions. At the beginning of the nineteenth century *D. ebenaster* was found growing at Cuernavaca, Mexico, doubtless cultivated. In the U. S. National Herbarium there are Mexican specimens from Cuernavaca (*Rose & Hough* 4435, *Pringle* 6992), La Junta, Chiapas (*Collins & Doyle* 14), and the vicinity of Guadalajara (*Safford* 1416, 1463). *Pringle's* no. 6992 was distributed as *D. ebenum* Koen., but it is evidently not that species. *Diospyros ebenaster* is distinguished from *D. sonorae* by its very large, inconspicuously veined, glabrous leaves and larger fruit on short pedicels.

*Diospyros sonorae* appears to be known only in cultivation, but probably it is a native of the western slopes of the northern Sierra Madre. It is known at Hermosillo as "guayaparín," a name applied also to other species of this genus. The fruit is edible, but the black pulp is unattractive in appearance and insipid to the taste.

**Diospyros sphaerantha** Standley, sp. nov.

Section Paralea. Tree with deciduous leaves; branches dark gray, bearing numerous large, pale gray lenticels, the branchlets slender, fulvous-puberulent and sparsely strigillose with slender white hairs; leaves (immature) alternate, on petioles 4 to 5 mm. long, these strigillose and puberulent; leaf blades oblong or oblong-elliptic, 4.3 to 8 cm. long, 2 to 3.3 cm. wide, obtuse at the apex, obtuse or rounded at the base, thin, drying black, sparsely strigillose on both surfaces with very short slender whitish hairs, the veins only slightly prominent in the young leaves; pistillate flowers very numerous, axillary, solitary or fascicled, the slender pedicels 5 to 10 mm. long, densely fulvous-puberulent; calyx at anthesis 3 cm. in diameter, spreading, lobed nearly to the base, the 5 lobes ovate, narrowly ovate, or ovate-oval, 5 to 8 mm. broad, acute to acuminate, thin, densely puberulent outside the base and thinly pubescent upward, within puberulent at the base but glabrous toward the apex; corolla globose-urceolate, about 8 mm. in length and diameter, densely fulvous-tomentulose outside, the lobes rounded at the apex, glabrous within; ovary globose, densely tomentulose, the style 1 to 1.5 mm. long.

Type in the U. S. National Herbarium, no. 302159, collected in the foothills of the Sierra Madre near Colomas, Sinaloa, Mexico, July 13 to 20, 1897, by J. N. Rose (no. 3194).

Apparently *Diospyros sphaerantha* is closely related to *D. rosei* and at first the writer believed that the specimens represented a single species. In the latter species, however, the leaves are persistent, while in *D. sphaerantha* they are certainly deciduous. In the latter, too, the calyx lobes are not pubescent throughout and they are more acute. Furthermore, there is considerable difference in leaf outline. The proposed species is noteworthy because of the unusual development of the calyx at anthesis.

**A NEW STYRAX FROM PANAMA.**

There appeared a few years ago an elaborate monograph of the genus *Styrax*, by Miss Janet Perkins.<sup>1</sup> Specimens collected in Panama by Mr. Pittier, however, can not be referred to any of the Central American or Colombian species described in that work, and are accordingly here described as new.

**Styrax panamensis** Standley, sp. nov.

A tree, 8 to 10 meters high; branches terete, the older ones grayish, the young ones slender, densely covered with short fulvous stellate hairs; leaves alternate, the petioles stout, 6 to 16 mm. long, fulvous-tomentulose; leaf blades oval or oval-elliptic, 13 to 20 cm. long, 6 to 11 cm. wide, abruptly acuminate or attenuate at the apex, the acute tip 5 to 18 mm. long, rounded or rounded-cuneate at the base, chartaceous, entire, bright green and glabrate above in age, beneath densely covered with microscopic stellate gray hairs, the veins furnished with numerous coarser fulvous stellate hairs, the midvein stout, impressed above, the lateral veins 6 or 7 on each side, prominent beneath, impressed above, curvately joined near the margin, the veinlets conspicuously reticulate; inflorescence axillary, of numerous densely flowered panicles 3 to 4.5 cm. long, the rachis densely fulvous-tomentulose, the bracts and bractlets linear or subulate, densely stellate-tomentulose; flowers about 1 cm. long, on pedicels 3 to 8 mm. long; calyx cupuliform, about 4.5 mm. high and 4 mm. in diameter, densely fulvous-tomentulose outside, sparsely so within, the margin truncate, very obscurely 5-denticulate; corolla 5-parted, the tube 1 mm. long, the lobes valvate, 8 to 9 mm. long, 2 mm. wide, thick, densely covered outside with minute grayish appressed hairs, densely pubescent within; stamens 10, the free part of the filaments

<sup>1</sup> In Engl. Pflanzenreich 30: 1907.

plane, densely pubescent on the inner side, glabrous without, the anthers densely pilose on the margins; ovary densely pilose, the style glabrous, slightly longer than the stamens.

Type in the U. S. National Herbarium, no. 679343, collected in forests on Loma de la Gloria, near Fató, Province of Colón, Panama, altitude 10 to 104 meters, August, 1911, by H. Pittier (no. 4242).

Among the species treated in the monograph previously mentioned this appears to be nearest *S. bogotensis* Perkins,<sup>1</sup> described from the vicinity of Bogotá, Colombia. That species, however, has much smaller leaves (7 to 12 cm. long), shorter pedicels (2 to 3 mm.), and paniculate inflorescence.

Mr. Pittier collected another species of the genus, *Styrax argenteus* Presl, in the vicinity of Olá, Province of Coclé, Panama, early in December, 1911 (no. 5076). Miss Perkins in 1902 described another species, *S. warscewiczii*,<sup>1</sup> from Veraguas, Panama, the type being Warscewicz's no. 203.

### TARDAVEL A VALID GENERIC NAME TO REPLACE BORRERIA.

It is evident that the name *Borreria* Meyer can not be applied to a genus of Rubiaceae, since it had been used previously by Acharius to designate a group of lichens, as stated by Meyer<sup>2</sup> when he dedicated the second genus to the lichenologist Borrer. The name *Diodioides* is the first synonym of *Borreria* cited by Dalla Torre and Harms.<sup>3</sup> This, however, was merely cited by Loefling<sup>4</sup> as a synonym, so is a nomen nudum. *Tardavel* was published by Adanson<sup>5</sup> in 1763. No specific name is cited, but there is a reference to plate 76 of Rheede's *Hortus Indicus Malabaricus*. This plate had been cited by Linnæus in the second edition of the *Species Plantarum*<sup>6</sup> under *Spermacoce hispida*. That plant thus becomes the type of the genus *Tardavel*. The generic name was taken up in 1898 by Hiern,<sup>7</sup> who transferred a number of species of *Borreria* to *Tardavel*.

The genus is a large one, numerous species occurring in tropical America. Only five, *Tardavel ocymoides* (Burm.) Hiern, and the following, have so far been found in Panama:

***Tardavel laevis* (Lam.) Standley.**

*Spermacoce laevis* Lam. Tabl. Encycl. 1: 273. 1791.

*Borreria laevis* Griseb. Abh. Ges. Wiss. Göttingen 7: 231. 1857.

***Tardavel latifolia* (Aubl.) Standley.**

*Spermacoce latifolia* Aubl. Pl. Guian. 1: pl. 19. f. 1. 1775.

*Borreria latifolia* Schum. in Mart. Fl. Bras. 6<sup>o</sup>: 61. 1888.

***Tardavel spinosa* (L.) Standley.**

*Spermacoce spinosa* L. Sp. Pl. ed. 2. 148. 1762.

*Borreria spinosa* Schlecht. & Cham. Linnaea 3: 340. 1828.

***Tardavel tenella* (H. B. K.) Standley.**

*Spermacoce tenella* H. B. K. Nov. Gen. & Sp. 3: 270. 1818.

*Borreria tenella* Schlecht. & Cham. Linnaea 3: 317. 1828.

<sup>1</sup> Bot. Jahrb. Engler 31: 480.

<sup>2</sup> Prim. Fl. Esseq. 79. 1818.

<sup>3</sup> Gen. Siph. 506. 1900-1907.

<sup>4</sup> Iter Hisp. 201. 1759.

<sup>5</sup> Fam. Pl. 145. 1763.

<sup>6</sup> Page 149.

<sup>7</sup> Cat. Pl. Welw. 2: 503.

## RESTORATION OF THE GENERIC NAME EVEA, WITH DESCRIPTIONS OF TWO NEW SPECIES.

The genus to which it is here proposed to restore the earliest name, *Evea*, has usually been known as *Cephaelis* or *Uragoga*, when it has been distinguished from *Psychotria*. The name *Uragoga* was used for it prior to 1753, but not afterwards until taken up by Baillon in 1880.<sup>1</sup> *Cephaelis* was published by Swartz in 1788.<sup>2</sup> In 1775 Aublet had published three generic names, *Evea*, *Carapichea*, and *Tapogomea*, all of which have always been referred to *Cephaelis* or *Uragoga*. *Evea* has priority of place in Aublet's *Histoire des Plantes de la Guiane Française* and consequently is the name to be adopted for the genus. The type species is *Evea guianensis* Aubl.

The following list of species includes all those known to occur in Panama. There are included descriptions of two new species, one from Panama and one from Colombia.

***Evea axillaris* (Swartz) Standley.**

*Cephaelis axillaris* Swartz, Prodr. Veg. Ind. Occ. 45. 1788.

*Tapogomea axillaris* Poir. in Lam. Encycl. Suppl. 7: 585. 1806.

***Evea elata* (Swartz) Standley.**

*Cephaelis elata* Swartz, Prodr. Veg. Ind. Occ. 45. 1788.

*Cephaelis punicea* Vahl, Eclog. Amer. 1: 19. 1796.

*Cephaelis costaricensis* Schlecht. Linnaea 28: 546. 1857.

***Evea ipecacuanha* (Brot.) Standley.**

*Calicocca ipecacuanha* Brot. Trans. Linn. Soc. 6: 137. pl. 11. 1802.

*Ipecacuanha officinalis* Arruda, Diss. Pl. Braz. 44. 1810.

Collected in the vicinity of San Felix, eastern Chiriquí, Panama, at an altitude of 120 meters or less, by H. Pittier (no. 5271).

This plant furnishes the ipecac of commerce, which is exported in large quantities from northern South America and in small amounts from Panama. The Panama specimens are in fruit only, but seem to agree well with descriptions of the Brazilian plant, except that they are less pubescent.

***Evea muscosa* (Jacq.) Standley.**

*Morinda muscosa* Jacq. Enum. Pl. Carib. 16. 1760.

*Cephaelis muscosa* Swartz, Prodr. Veg. Ind. Occ. 46. 1788.

***Evea tomentosa* (Aubl.) Standley.**

*Tapogomea tomentosa* Aubl. Pl. Gulan. 1: 160. pl. 61. 1775.

*Cephaelis tomentosa* Vahl, Eclog. Amer. 1: 19. 1796.

***Evea campyloneuroides* Standley, sp. nov.**

Small tree; young branches stout, densely covered with loose slender whitish hairs; stipules united at the base, green, persistent, 15 to 18 mm. long, bilobate, the lobes lanceolate, long-attenuate, densely sericeous outside, glabrous within; petioles stout, 2 to 3 cm. long, densely pubescent like the stems; leaf blades oval or elliptic-oval, 14 to 18 cm. long, 5.5 to 7 cm. wide, abruptly acuminate or short-caudate, the tip 10 to 15 mm. long, acute or acuminate at the base, thin, deep green on the upper surface, slightly paler beneath, glabrous above except along the midvein, sericeous beneath

<sup>1</sup> Hist. Pl. 7: 280.

<sup>2</sup> Prodr. Veg. Ind. Occ. 45.

along the veins with slender, loose, rather long, dirty white hairs, the lateral veins conspicuous, 27 to 32 on each side, parallel, anastomosing near the margin, finer secondary veins present between the primary ones and parallel with them, connected with the primary veins by fine transverse veinlets at regular intervals; peduncles terminal, 6 to 13 cm. long, very densely covered with long, fine, spreading, dirty white hairs; bracts orbicular-rhombic, 1 cm. long, apiculate, sericeous, green, each pair including 3 short-pedunculate heads 10 to 15 mm. in diameter, the inner peduncles 2 to 13 mm. long; bractlets green, oval-obovate, 10 mm. long, obtuse, apiculate, sericeous on both surfaces; calyx twice as long as the ovary, the two together 3 mm. long, densely sericeous, the lobes ovate, acute; corolla white, the slender tube about 7 mm. long, the lobes 2.5 mm. long, oblong, pubescent outside; fruit not seen.

Type in the U. S. National Herbarium, no. 530768, collected in sunny places in the forest near Córdoba, Dagua Valley, Pacific Coastal Zone, State of Cauca, Colombia, altitude 30 to 100 meters, December, 1905, by H. Pittier (no. 581).

Apparently not closely related to any other species; well distinguished by the form of the inflorescence and the abundant pubescence. The venation of the leaves is very similar to that found in ferns of the genus *Campyloneurum*.

*Evea dichroa* Standley, sp. nov.

Glabrous branched shrub 1.5 to 2 meters high; branches slender, nearly terete; stipules united at the base, green, persistent, 3 to 4 mm. long, deeply bilobate, the lobes oblong, obtuse; petioles slender, 1.5 to 2.5 cm. long; leaf blades elliptic or oblong-elliptic, 5.5 to 10.5 cm. long, 1.5 to 3.5 cm. wide, acuminate at the apex, acute or acuminate at the base, firmly herbaceous, bright green on the upper surface, slightly paler beneath, prominently veined, the lateral veins 9 to 12 on each side, parallel; peduncles terminal or rarely also axillary, 3 to 9 cm. long; bracts 15 to 20 mm. long, rounded-ovate, acutish, slightly united at the base, green or tinged with red or yellow, subtending 3 pedunculate heads, the peduncles 3 to 25 mm. long; each secondary head subtended by 2 orbicular-rhombic bracts 12 to 15 mm. long, these yellow or tinged with purple, each head consisting of 3 flowers, each flower subtended by an oblong-obovate acute bract 10 to 12 mm. long and an oblong-linear bracteole somewhat shorter; flowers sessile; calyx 3 mm. long, twice as long as the ovary, somewhat oblique, yellow, deeply 5-lobed, the lobes ovate to oblong, acute; corolla yellowish white, the tube 10 mm. long and 2 mm. in diameter, the 5 lobes 2.5 to 3 mm. long, oblong, obtuse; stamens included, inserted in the middle of the tube, the filaments about as long as the anthers, these linear, 2.5 mm. long; fruit not seen.

Type in the U. S. National Herbarium, no. 677615, collected in the humid forest of Cuesta de las Palmas, southern slope of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 1,700 to 2,100 meters, March 17 to 19, 1911, by H. Pittier (no. 3218).

Known also from specimens collected in humid forest of Alto de las Palmas, southern slope of Cerro de la Horqueta, Chiriquí, altitude, 2,100 meters, *Pittier* 3266.

In the type collection the bracts are purple or greenish purple, more or less tinged with yellow, while in the second collection they are pale yellow or greenish yellow. The species seems very distinct in the form of the inflorescence, although some of the Brazilian species likewise have 3-parted heads.

#### DUGGENA AN OLDER NAME THAN GONZALAGUNIA.

There is a small genus of tropical American Rubiaceae which was long known under the name *Gonzalea* Pers. In recent years the name *Gonzalagunia* Ruiz & Pavon has generally been adopted for it, this name (1794) clearly having precedence over that of Persoon (1805). There seems no valid reason why the oldest generic name,

*Duggena* Vahl, published in 1793, should not be applied to the group. Its type is *Duggena richardii* Vahl, which apparently is a synonym of *D. spicata*, listed below.

Four species of the genus occur in Panama: *D. ovatifolia*, described from Costa Rica; *D. panamensis*, first characterized by Cavanilles in 1801 from specimens collected on Ancón Hill, Panama; *D. hayesii*, also described from Panama; and a fourth, collected recently by Mr. Pittier, which appears to be undescribed.

***Duggena rudis* Standley, sp. nov.**

Branches slender, brownish, densely strigose with whitish tawny hairs; stipules 4 to 6 mm. long, triangular, with long filiform tips; leaves nearly sessile, the petioles 1 to 2 mm. long, the blades ovate or oblong-ovate, 35 to 55 mm. long, 14 to 24 mm. wide, rather abruptly acuminate, rounded at the base, thin, bright green, strigose on the upper surface, more densely pubescent beneath, especially along the veins, with appressed whitish hairs; racemes slender, 6 to 9 cm. long; flowers about 3 in each cluster, on very short peduncles; pedicels about 1 mm. long; bracts linear-subulate, 3 mm. long or less; corolla not seen; fruit 4-celled, depressed-globose, 2.5 mm. in diameter, densely hirsute; calyx lobes persistent, lance-linear, attenuate, nearly as long as the fruit, sparingly pubescent outside, glabrous within.

Type in the U. S. National Herbarium, no. 676602, collected in shady places along the Chagres River, near El Vigía, Panama, January 12, 1911, by H. Pittier (no. 2378).

Resembling *Duggena panamensis* in the 4-celled fruit, but readily distinguished by the small, nearly sessile leaves, narrow and longer calyx lobes, and densely pubescent fruit.

***Duggena asperula* (Wernham) Standley.**

*Gonzalea asperula* Wernham, Journ. Bot. Brit. & For. 51: 219. 1913.

***Duggena brachyantha* (A. Rich.) Standley.**

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

*Gonzalagunia brachyantha* Urban, Symb. Antill. 7: 400. 1912.

***Duggena bracteosa* (Donn. Smith) Standley.**

*Gonzalea bracteosa* Donn. Smith, Bot. Gaz. 33: 252. 1902.

*Gonzalagunia bracteosa* Robinson, Proc. Amer. Acad. 45: 405. 1910.

***Duggena grisea* (Wernham) Standley.**

*Gonzalea grisea* Wernham, Journ. Bot. Brit. & For. 51: 218. 1913.

***Duggena hayesii* (Wernham) Standley.**

*Gonzalea hayesii* Wernham, Journ. Bot. Brit. & For. 51: 219. 1913.

***Duggena leptantha* (A. Rich.) Standley.**

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

*Gonzalagunia leptantha* Urban, Symb. Antill. 7: 400. 1912.

***Duggena mollis* (Spruce) Standley.**

*Gonzalagunia mollis* Spruce; Schum. in Mart. Fl. Bras. 6<sup>o</sup>: 290. 1889.

*Gonzalea mollis* Spruce; Schum. in Mart. Fl. Bras. 6<sup>o</sup>: 291. 1889, as synonym; Wernham, Journ. Bot. Brit. & For. 51: 219. 1913.

The type collection is the same in both places of publication cited above; Mr. Wernham, however, makes no reference to the earlier publication of the species by Schumann.

***Duggena nivea* (Bartling) Standley.**

*Gonzalea nivea* Bartling; DC. Prodr. 4: 436. 1830.

*Gonzalagunia nivea* Kuntze, Rev. Gen. Pl. 1: 284. 1891.

**Duggena ovatifolia** (Donn. Smith) Standley.*Gonzalea ovatifolia* Donn. Smith, Bot. Gaz. 27: 336 1899.*Gonzalagunia ovatifolia* Robinson, Proc. Amer. Acad. 45: 405. 1910.**Duggena panamensis** (Cav.) Standley.*Buena panamensis* Cav. Icon. Pl. 6: 50. pl. 571. 1801.*Gonzalea panamensis* Pers. Syn. Pl. 1: 133. 1805.**Duggena petesia** (Griseb.) Standley.*Gonzalea petesia* Griseb. Mem. Amer. Acad. n. ser. 8: 504. 1863.*Gonzalagunia petesia* Robinson, Proc. Amer. Acad. 45: 405. 1910.**Duggena pulverulenta** (Humb. & Bonpl.) Standley.*Gonzalea pulverulenta* Humb. & Bonpl. Pl. Aequin. 1: 228. 1808.*Gonzalagunia pulverulenta* Kuntze, Rev. Gen. Pl. 1: 284. 1891.**Duggena rugosa** Standley.*Gonzalagunia rugosa* Standley, Contr. U. S. Nat. Herb. 17: 446. 1914.**Duggena sagraeana** (Urban) Standley.*Gonzalagunia sagraeana* Urban, Symb. Antill. 7: 399. 1912.**Duggena spicata** (Lam.) Standley.*Lygistum spicatum* Lam. Tabl. Encycl. 1: 286. 1791.*Gonzalea spicata* DC. Prodr. 4: 437. 1830.**Duggena thyrsoidea** (Donn. Smith) Standley.*Gonzalea thyrsoidea* Donn. Smith, Bot. Gaz. 13: 188. 1888.*Gonzalagunia thyrsoidea* Robinson, Proc. Amer. Acad. 45: 405. 1910.**Duggena tomentosa** (Humb. & Bonpl.) Standley.*Gonzalea tomentosa* Humb. & Bonpl. Pl. Aequin. 1: 225. pl. 64. 1808.*Gonzalagunia tomentosa* Kuntze, Rev. Gen. Pl. 1: 284. 1891.**NEW OR NOTABLE SPECIES OF ARCYTOPHYLLUM.**

The genus *Arcytophyllum*, a member of the Rubiaceae, is represented by some 20 species, confined chiefly to the high mountains of northern South America. Several species are contained in the recent collections of Mr. Pittier in Colombia and Venezuela, two of which are undescribed. The species found in Costa Rica and Panama was given a manuscript name several years ago by Dr. Schumann, but this has never been formally published. A diagnosis of it is given in the present paper. There are included also transfers of 4 species previously published under other generic names.

***Arcytophyllum capitatum*** (Benth.) Standley.*Rhachicallis capitata* Benth. Pl. Hartw. 195. 1845.*Hedyotis capitata* Walp. Repert. Bot. 6: 56. 1846, not Lam.*Hedyotis hartwegiana* Wedd. Chlor. And. 2: 45. 1857.

Collected by Hartweg (no. 1070) in the Province of Popayán, Colombia.

***Arcytophyllum caracasana*** (H. B. K.) Standley.*Hedyotis caracasana* H. B. K. Nov. Gen. & Sp. 3: 393. 1818.*Rachicallis caracasana* DC. Prodr. 4: 434. 1830.

First found by Bonpland on the Silla de Caracas, Venezuela, and collected by Otto Kuntze at the same locality in 1874. The species was collected by Mr. H. Pittier (no. 6237) in the upper belt of Pico de Naiguatá, State of Miranda, Venezuela, on the southern slope at an altitude of 2,400 to 2,765 meters, in May, 1913. Here, too, appar-



ently, belong specimens collected by Pittier (no. 1114) in the Páramo de Buena Vista, Huila Group, Central Cordillera, State of Cauca, Colombia, at an altitude of 3,000 to 3,600 meters. The Colombian plant has rather narrower leaves than the Venezuelan one but does not seem to differ otherwise.

*Arcytophyllum caucanum* Standley, sp. nov.

Low, much branched shrub, 20 to 30 cm. high; branches stout, quadrangular, glabrous, or scabro-ciliate along the angles, erect or strongly ascending; leaves numerous, crowded; stipules broadly ovate, divided into several bristle-like laciniae at the apex; leaf blades 6 mm. long and 3 mm. wide, oval, obtuse or acutish, mucronulate, nearly flat, margined, thick and coriaceous, glabrous, abruptly contracted at the base into a very short petiole; flowers short-pedicel, in subsessile few-flowered terminal clusters; pedicels glabrous; calyx 4 to 5 mm. long, the lobes triangular-oblong, acute or acuminate, much longer than the tube, with intermediate setose appendages nearly as long as the lobes; corolla tube 5 to 7 mm. long, much exceeding the lobes, these triangular-ovate, acute, pilose within with fine short hairs; capsule about 2 mm. high.

Type in the U. S. National Herbarium, no. 531334, collected in the Páramo de Buena Vista, Huila Group, Central Cordillera, State of Cauca, Colombia, at an altitude of 3,000 to 3,600 meters, January, 1906, by H. Pittier (no. 1137). Also collected in the Páramo de Moras, between Mozoco and Pitayó, in the same State, at a similar altitude, February, 1906, by Mr. Pittier (no. 1412).

Related to *A. capitatum* but differing in the smaller, less acute leaves, the larger flowers which surpass the leaves, and the proportionally longer corolla tube.

*Arcytophyllum cephalanthum* (Wedd.) Standley.

*Hedyotis cephalantha* Wedd. Chlor. And. 2: 46. 1857.

This was based by Weddell upon three collections from the provinces of Pamplona and Ocaña, Colombia. Weddell states that it is perhaps the largest of the species, the leaves being often 2 cm. long.

*Arcytophyllum latifolium* Standley, sp. nov.

Low shrub; stems erect, branched, stout, glabrous, yellowish, obtusely quadrangular; leaves numerous but scarcely crowded; leaf blades 10 to 14 mm. long, 5 to 8 mm. wide, broadly ovate or ovate-oblong, broadly obtuse, mucronulate, glabrous, thick and coriaceous, the margins usually strongly revolute, abruptly contracted at the base into a very short petiole; stipules broadly ovate, rounded at the apex and dissected into setose laciniae, scarious, stramineous, conspicuous; flowers nearly sessile in dense few-flowered terminal clusters; calyx 3 mm. long, the lobes lanceolate or lance-oblong, acute, twice as long as the tube or more, with intermediate setose appendages much shorter than the lobes; flowers surpassing the leaves; corolla tube 3 to 4 mm. long, only slightly longer than the ovate acutish lobes, these abundantly pubescent within with short, white, very coarse hairs; capsules not seen.

Type in the U. S. National Herbarium, no. 531356, collected in the Páramo de Buena Vista, Huila Group, Central Cordillera, State of Cauca, Colombia, at an altitude of 3,000 to 3,600 meters, January, 1906, by H. Pittier (no. 1159).

Nearest *A. capitatum* and *A. caucanum*; differing from the former in its smaller obtuse leaves and larger flowers, and from the latter in the broader, more obtuse leaves with revolute margins and in the shorter corolla tube. The pubescence of the corolla is very different in *A. caucanum* and *A. latifolium*.

*Arcytophyllum lavarum* Schum. sp. nov.

*Mallostoma lavarum* Donn. Smith, Enum. Pl. Guat. 5: 36. 1899, hyponym.

*Arcytophyllum lavarum* Schum. loc. cit. as synonym.

Low, much branched shrub, 12 to 25 cm. high; branches stout, erect, glabrous, quadrangular; leaves numerous, dense; stipules about 1 mm. long, triangular-ovate, acuminate, papillose on the outer surface or smooth, with usually 2 laciniae on each

side near the apex; leaves 4 to 6 mm. long, 2 to 3 mm. wide, oblong to oblong-ovate or oval, obtuse or rounded at the apex, thick and coriaceous, glabrous, flat or nearly so, shining on the upper surface, abruptly contracted at the base into a very short petiole; flowers few, short-pedicel, in solitary or clustered, pedunculate, terminal cymes; pedicels glabrous; calyx 2 mm. long, glabrous, thick and firm, the lobes oblong to oval or ovate, obtuse or acutish, longer than the tube, with low and inconspicuous intermediate lobes; corolla tube 3.5 mm. long, much longer than the lobes, these densely pilose within with coarse white hairs; capsule 2 mm. long.

Type in the U. S. National Herbarium, no. 675707, collected on bare rock slopes at the summit of Chiriquí Volcano, Panama, at an altitude of 3,374 meters, March 12, 1911, by William R. Maxon (no. 5349).

ADDITIONAL SPECIMENS EXAMINED:

PANAMA: Volcán de Chiriquí, April, 1899, *K. Sapper*.

COSTA RICA: Volcán de Poás, Province of Alajuela, alt. 2,700 meters, *J. D. Smith* 6635. Volcán de Turrialba, Province of Cartago, alt. 2,800 meters, *Pittier* (J. D. Smith, no. 7506; Inst. Fís. Geogr. Costa Rica, no. 13239).

Related to *A. hartwegianum* and *A. cephalanthum*, of Colombia, by its pubescent corollas, but readily distinguished by its small, obtuse leaves and loose inflorescence. Only one other species of the genus is known from Central America, *A. shannoni*, described from Guatemala.

*Arcytophyllum shannoni* (Donn. Smith) Standley.

*Mallostoma shannoni* Donn. Smith, Bot. Gaz. 18: 203. 1893.

### NEW SPECIES OF PSYCHOTRIA FROM PANAMA.

*Psychotria* is represented in Panama by a larger number of species than any other genus of the Rubiaceae. At present 26 species are known from the region, but when remote parts of the country are explored this number will doubtless be greatly increased. An excellent account of the West Indian *Psychotrias* by Dr. Urban has appeared recently,<sup>1</sup> which has been of great service in the study of the Panamanian species. Most of the forms found in Panama are confined, so far as known, to continental North America, and probably many of them are endemic.

*Psychotria aggregata* Standley, sp. nov.

Branches stout, succulent, glabrous, lineolate; stipules united at the base, green, each abruptly contracted into a narrowly oblong tip 3 mm. long; petioles 3 to 3.5 cm. long; leaf blades oblanceolate, 12 to 20 cm. long, 3 to 5 cm. wide, acuminate, attenuate at the base, subcoriaceous, glabrous, dull green on the upper surface, whitish beneath, prominently veined, the veins coarse, white beneath; peduncles axillary, 4 to 5 cm. long, minutely puberulent, bearing mostly 3 pedunculate, densely many-flowered heads, the heads composed of few-flowered fascicles each subtended by several narrowly oblong to ovate, acute or acutish, ciliolate, green bracts, these equaling or slightly exceeding the calyces; calyx and ovary subequal in length, together 3 mm. long, the calyx lobed to the middle, whitish, the lobes ovate, obtuse or acutish, minutely and sparsely puberulent; corolla white, 4 mm. long, puberulent outside, the tube dilated upward, the lobes very short, hooded; fruit not seen.

Type in the U. S. National Herbarium, no. 677655, collected in the humid forest, between Alto de las Palmas and top of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 2,100 to 2,260 meters, March 18, 1911, by H. Pittier (no. 3264).

<sup>1</sup> Urban, Symb. Antill. 7: 433-477. 1913.

Readily distinguished from the other species with axillary inflorescence by its numerous small, densely clustered flowers, large green bracts, whitish calyx, and conspicuously hooded corolla lobes.

***Psychotria calophylla* Standley, sp. nov.**

Young branches stout, obtusely angled, short-villous with short soft spreading multicellular ferruginous hairs; stipules not seen, deciduous; petioles stout, 1 to 2.5 cm. long, pubescent like the branches; leaf blades broadly obovate or rounded-obovate, 16 to 22 cm. long, 7.5 to 12 cm. wide, rounded at the apex and short-apiculate, the apex broadly triangular, acute or acutish, rather abruptly long-acuminate or attenuate at the base, firmly herbaceous, glabrous on the upper surface, densely pubescent beneath along the veins with short soft ferruginous hairs, softly ferrugino-puberulent between the veins, the veins conspicuous beneath but slender, 11 to 13 lateral ones on each side; inflorescence sessile, 7 cm. long, and about 12 cm. wide, loosely branched, the branches short, spreading or divaricate, densely short-villous with ferruginous hairs; flowers sessile, capitate at the ends of the branches; ovary and calyx together 3.5 to 5 mm. long, densely ferrugino-pubescent with short soft fine multicellular hairs, the calyx limb shallowly and obtusely lobed; corolla not seen; fruit sharply 12-costate, about 12 mm. long, the seeds not sulcate on the inner surface.

Type in the U. S. National Herbarium, no. 48568, collected in the vicinity of Chagres, Isthmus of Panama, March 15, 1850, by August Fendler (no. 60). Duplicate in the Gray Herbarium.

Well marked by the large, broad leaves, soft, ferruginous pubescence, sessile inflorescence, and large fruit.

***Psychotria chiriquina* Standley, sp. nov.**

Shrub 3 meters high, glabrous throughout; branches stout, succulent, densely leafy, the internodes 4 to 10 mm. long; stipules 6 mm. long, oblong-ovate, obtuse, united only at the base, reddish brown, early deciduous; petioles stout, 3 to 6 mm. long; leaf blades elliptic or oblong-elliptic, 4.5 to 6.5 cm. long, 1 to 2 cm. wide, acuminate to an obtuse tip, acuminate at the base, subcoriaceous, rather pale green, the veins not prominent; peduncles 2 to 2.5 cm. long, terminal, bearing a trichotomous corymb 2 to 3.5 cm. long; pedicels 2 to 3 mm. long, stout; bracts rounded-ovate, 1 mm. long; calyx 1 mm. long, the limb subentire; corolla white, 5 mm. long, the tube stout, the lobes oblong, obtuse, leathery, one-third to half as long as the tube, appendaged outside below the apex, spreading, densely bearded in the throat; anthers oblong, nearly sessile; style glabrous; fruit not seen.

Type in the U. S. National Herbarium, no. 677509, collected on Alto de la Cuesta, eastern slope of Chiriquí Volcano, Panama, at an altitude of 2,100 to 2,200 meters, March 10 to 13, 1911, by H. Pittier (no. 3118).

Remarkable for the densely leafy branches, firm leaves, and subentire calyx.

***Psychotria fendleri* Standley, sp. nov.**

Branches stout, nearly terete, glabrous; stipules united only at the base, broadly ovate to oblong, 7 to 9 mm. long, entire, obtuse, brown, soon deciduous, glabrous; petioles very stout, 2 to 5 mm. long; leaf blades broadly obovate to oval-obovate, 5 to 9 cm. long, 2.5 to 5 cm. wide, rounded at the apex and very broadly apiculate, the apex obtuse or abruptly acutish, acute or broadly cuneate at the base, coriaceous, glabrous, pale green, the margins often revolute, the veins conspicuous beneath, the lateral ones 7 to 9 on each side; peduncles terminal, 3.5 to 4 cm. long, stout, glabrous, the primary branches of the inflorescence 3 to 5, about 7 mm. long, each bearing several short-pedunculate clusters of sessile or short-pedicellate flowers; bracts subtending the primary branches of the inflorescence 5 to 6 mm. long, lance-oblong, acute, thin, brown; calyx and ovary glabrous, together 2.5 mm. long, the calyx shallowly and

broadly dentate; corolla 5 mm. long, glabrous outside, the lobes shorter than the tube, oblong, obtuse; fruit not seen.

Type in the U. S. National Herbarium, no. 48567, collected in the vicinity of Chagres, Panama, February 25, 1850, by August Fendler (no. 59). Duplicate in the Gray Herbarium.

Here also belongs a specimen from the region of Santa Marta, Colombia, at an altitude of 600 meters, collected by Herbert H. Smith (no. 1832). In this some of the leaves are as much as 11.5 cm. long, the inflorescence is more open and much branched, 5 to 7 cm. long, and the corolla is densely villous in the throat. The Colombian collection was distributed as *Psychotria granadensis* Benth., a species originally described from Nicaragua, but that is characterized as having shorter stipules, much longer, narrower leaves, subsessile inflorescence, and longer corolla lobes.

***Psychotria goldmanii* Standley, sp. nov.**

Shrub; branches slender, subterete, glabrous; stipules united, green, firm, persistent, bilobate, the lobes short, lance-subulate; petioles slender, 3 to 8 mm. long; leaf blades elliptic to elliptic-oblong, 3.5 to 8 cm. long, 0.8 to 1.5 cm. wide, abruptly long-attenuate, the tip nearly linear, 5 to 12 mm. long, obtuse, acuminate, or cuneate at the base, firmly herbaceous, deep green and glabrous on the upper surface, pale beneath and sometimes puberulent along the veins, these conspicuous, the lateral ones parallel, with finer veins between them; inflorescence terminal, the slender peduncles about 2 cm. long, bearing a corymbose panicle 2.5 to 3 cm. high and of about the same breadth, the branches ascending, sparsely puberulent; flowers sessile or subsessile, clustered at the ends of the peduncles, each cluster subtended by 2 connate ovate acute bracts, the bracts subtending the branches of the inflorescence linear, 2 to 4 mm. long; calyx longer than the ovary, the lobes shorter than the tube, ovate to oblong, obtuse or acute; corolla 5 mm. long, glabrous outside, the tube dilated above the middle, the lobes scarcely 1 mm. long, obtuse, erect; fruit 4 mm. high, compressed, conspicuously costate, glabrous.

Type in the U. S. National Herbarium, no. 716141, collected at the head of Río Limón, Mount Pirre, Province of Panama, Panama, at an altitude of 1,500 meters, March 6, 1912, by E. A. Goldman (no. 1883).

Very distinct in the pale lower surface of the leaves and the short corolla lobes. In general appearance the plant resembles the Brazilian *Psychotria leiocarpa*.

***Psychotria insignis* Standley, sp. nov.**

Branches woody, the young ones stout, obtusely angled, densely short-pubescent with dark ferruginous spreading hairs; stipules distinct, soon deciduous, 1.5 cm. long, oblong, acutish, thin, densely short-pubescent outside; petioles 2.5 to 5 cm. long, stout; leaf blades ovate to oblong or oval, 14 to 22 cm. long, 7 to 9 cm. wide, gradually acuminate, cordate or subcordate at the base, herbaceous, glabrous on the upper surface except along the midvein, there short-pubescent, densely short-pubescent beneath along the veins with rigid spreading ferruginous hairs, very finely pubescent elsewhere, prominently veined beneath, the lateral veins 17 to 20 on each side, parallel, arcuate, anastomosing to form a vein near the margin; inflorescence terminal, sessile, 5-rayed at the base, each branch bearing 3 or more peduncled heads of sessile flowers, the branches densely pubescent with short spreading ferruginous hairs; flowers numerous in each head; calyx 2 mm. long, 5-lobed to the middle, the lobes oblong, obtuse or rounded at the apex, densely pubescent outside; ovary shorter than the calyx, densely covered with short soft ferruginous hairs; mature corollas not seen, those in bud pubescent outside with short stiff white hairs; fruit not seen.

Type in the U. S. National Herbarium, no. 679567, collected on the hills of Sperdi, near Puerto Obaldía, San Blas Coast, Panama, at an altitude of 20 to 200 meters, September, 1911, by H. Pittier (no. 4410).

Remarkable for the large, obtuse calyx lobes, and especially for the cordate leaves.

***Psychotria albonervia* Standley, sp. nov.**

Shrub; young branches stout, obscurely angled, green, glabrous; stipules distinct, 12 to 17 mm. long, 6 to 8 mm. wide, coriaceous, green tinged with purple, conspicuously parallel-veined, soon deciduous, each 2-lobed to the middle, the lobes narrowly lanceolate, acuminate, ciliolate; petioles 5 to 15 mm. long, stout, leaf blades narrowly oblong-oval to elliptic-oblong or rarely obovate, 10 to 16 cm. long, 2.5 to 6 cm. wide, abruptly acuminate or attenuate, obtuse and somewhat decurrent to cuneate at the base, coriaceous, bright green, shining, and glabrous on the upper surface, beneath paler, glabrous except along the veins, these very conspicuous, broad, white, minutely ciliolate, the lateral ones 17 to 25 on each side, parallel, anastomosing to form an irregular marginal vein; peduncles terminal, 3 to 5.5 cm. long, glabrous, the inflorescence thyrsoid-paniculate, 3 to 6 cm. long, 3 to 5.5 cm. wide, the main branches verticillate, divaricate, stout, sparsely pubescent with short spreading white hairs; flowers clustered at the ends of the peduncles, sessile or subsessile; bracts whitish, 6 to 8 mm. long, lanceolate to oblong or oval, obtuse or acutish, ciliolate, prominently veined; calyx very short, the teeth triangular, acute; corolla 8 to 10 mm. long, white, glabrous outside, villous within near the base, the tube 1.5 to 2 mm. in diameter, the lobes oblong to broadly ovate, half as long as the tube, obtuse or acutish; filaments elongate, the anthers exerted; fruit not seen.

Type in the U. S. National Herbarium, no. 47282, collected in the vicinity of Chagres, Panama, in February or March, 1850, by August Fendler (no. 62). Another specimen of the same collection is in the Gray Herbarium.

Also collected in the Sabana de Marcelito near El Vigía, Panama, on edge of forest, January 12, 1911 (*Pittier* 2379).

This finds its nearest ally in *Psychotria arcuata* Benth.,<sup>1</sup> described from British Guiana, but occurring also in Grenada, Tobago, and Trinidad, according to Urban,<sup>2</sup> and in Brazil, according to Schumann.<sup>3</sup> Schumann considers *P. arcuata* a synonym of *P. inundata* Benth., published at the same time, but specimens of the type collections in the U. S. National Herbarium appear to represent distinct species. *Psychotria arcuata* is distinguished from the Panamanian species here proposed as new by the very different persistent stipules and the thinner, smaller leaves.

***Psychotria magna* Standley, sp. nov.**

A shrub 3 meters high; young branches stout, obtusely angled, minutely puberulent or glabrate; stipules not seen, evidently soon deciduous; petioles stout, 2 to 4 cm. long, glabrous; leaf blades oval or elliptic-oval, 18 to 25 cm. long, 8 to 11.5 cm. wide, abruptly caudate or attenuate from an obtuse apex, the tip narrowly triangular, 2 to 3 cm. long, obtuse or broadly cuneate at the base, herbaceous, drying dark brown, glabrous, or very minutely puberulent on the veins beneath, the lateral veins prominent, 17 to 20 on each side, parallel, scarcely anastomosing at the margin; inflorescence terminal, cymose-paniculate, sessile, about 10 cm. long and broad, much branched, the branches spreading, very minutely puberulent; flowers sessile, capitate at the ends of the peduncles; no bracts seen; calyx and ovary together 1.5 mm. long, the limb of the calyx undulate, ciliolate; corolla yellowish white, 3 to 4 mm. long, glabrous outside, densely white-villous within, the tube thick, the lobes as long as the tube, oblong or ovate-oblong, obtuse or acutish, spreading; filaments stout, elongate, the anthers exerted; fruit not seen.

Type in the U. S. National Herbarium, no. 679188, collected in forests, Loma de la Gloria, near Fató, Province of Colón, Panama, at an altitude of 10 to 100 meters, August, 1911, by H. Pittier (no. 4092).

<sup>1</sup> Journ. Bot. Hook. 3: 229. 1841.

<sup>2</sup> Symb. Antill. 7: 475. 1913.

<sup>3</sup> In Mart. Fl. Bras. 6<sup>o</sup>: 310. 1881.

Without stipules and fruit it is impossible to determine the true position of this plant, but it seems to be different from all the species ascribed to Central America or northern South America. It is well distinguished by the very large, caudate leaves.

***Psychotria panamensis* Standley, sp. nov.**

Small tree with glabrous leaves and branches; stipules 4 to 6 mm. long, united only at the base, broadly ovate or oval, entire, obtuse, thick and leathery, deciduous, short-pubescent on the inner surface near the margins; petioles 1 to 2 cm. long; leaf blades obovate to obovate-oblong, rarely ovate, 5.5 to 10 cm. long, 2 to 4 cm. wide, obtuse or rarely acutish, firmly herbaceous, dull green, rather prominently veined beneath; peduncles 1 to 1.5 cm. long, stout, the inflorescence corymbose-paniculate, 4 to 5.5 cm. long, many-flowered, the branches minutely puberulent; flowers capitate at the ends of the branches, subsessile before anthesis, but the stout pedicels in fruit 3 to 4 mm. long; bracts early deciduous; calyx 1.5 mm. long and fully as broad, the limb subentire, ciliolate; developed corollas not seen, those in bud glabrous outside; fruit globose, 7 mm. high, obtusely costate, glabrous; seeds 5 mm. long, smooth, not sulcate on the inner surface.

Type in the U. S. National Herbarium, no. 677588, collected in the humid forest around Los Sigüas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 1,700 meters, March 17 to 19, 1911, by H. Pittier (no. 3194).

Related, apparently, to *Psychotria carthaginensis*, but distinguished by the large fruit, longer petioles, and obtuse leaves.

***Psychotria peperomia* Standley, sp. nov.**

A low shrub, glabrous throughout; stems stout, the younger ones succulent, branched, terete or obtusely angled; stipules 2 mm. long, united to form a truncate sheath, the margin marcescent; petioles 4 to 6 mm. long; leaf blades broadly obovate to obovate-oval, 2.5 to 5 cm. long, 1 to 2.5 cm. wide, obtuse or rounded at the apex, apiculate, the tip 1 to 2 mm. long, acute or cuneate at the base, fleshy, inconspicuously veined; peduncles chiefly terminal, 1 to 2.5 cm. long, slender, bearing a loosely few-flowered corymbose inflorescence; bracts linear, attenuate, brownish, 2 to 3 mm. long; pedicels 2 to 5 mm. long, slender; calyx 1 mm. long, the 4 lobes longer than the tube, ovate-triangular, acute; corolla 5 mm. long, the tube slightly dilated above, the lobes oblong or broadly oblong, about one-third as long as the tube, their tips incurved, the throat glabrous within; anthers nearly sessile, inserted in the throat of the corolla; fruit subglobose, 3 mm. high, nearly smooth.

Type in the U. S. National Herbarium, no. 677632, collected in the humid forest on the top of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 2,265 meters, March 18, 1911, by H. Pittier (no. 3235).

In general form and in the tetramerous flowers most closely related to *Psychotria crassa* Benth.<sup>1</sup> That species differs in the larger, acuminate leaves, bearded throat of the corolla, and longer corolla lobes.

***Psychotria pittieri* Standley, sp. nov.**

Shrub; young branches slender, densely pubescent with rather long, coarse, white, appressed or spreading hairs; stipules 4 to 6 mm. long, united at the base, bilobate, the lobes linear-subulate; petioles 3 to 5 mm. long, slender, pubescent like the branches; leaf blades elliptic-oval, 4 to 5.5 cm. long, 1.5 to 2.5 cm. wide, abruptly acuminate or attenuate, the tip acute, obtuse to cuneate at the base, herbaceous, deep green on the upper surface except along the midvein, there hirsutulous, pale beneath and finely pubescent with short appressed hairs, conspicuously veined, the lateral veins parallel with many finer veins between them; peduncles terminal, 1.5 cm. long, slender, densely covered with soft white hairs, bearing few-flowered panicles about 2 cm. long; flowers clustered at the ends of the branches, subsessile; bracts small, linear; calyx 1

<sup>1</sup> Journ. Bot. Hook. 3: 227. 1841.

mm. long, densely appressed-pubescent with white hairs, the lobes rounded-ovate, obtuse; corolla white, 4 to 5 mm. long, appressed-pubescent outside, the lobes triangular-oblong, acute, about as long as the tube, spreading; fruit not seen.

Type in the U. S. National Herbarium, no. 676523, collected in forest between Gorgona and Gatún, Canal Zone, Panama, at an altitude of 10 to 50 meters, January 7, 1911, by H. Pittier (no. 2266).

Peculiar in the long whitish pubescence of the stems and inflorescence, the appressed pubescence of the leaves, and the short, oblong inflorescence.

*Psychotria psychotriaefolia* (Seem.) Standley.

*Cephaelis psychotriaefolia* Seem. Bot. Voy. Herald 138. 1852-7.

TYPE LOCALITY: "In dense forests near Cruces, Province of Panama, and Chirambira, Darien."

DISTRIBUTION: Panama.

Shrub; young branches and inflorescence ferrugino-tomentulose; stipules united, thin, brown, deciduous, 1.5 to 2 cm. long, abruptly long-attenuate, ciliate, the apex usually bifid; leaf blades very shortly petiolate, obovate to obovate-oblong, 9 to 17 cm. long, acute or short-acuminate, cuneate at the base, glabrous above, puberulent beneath, at least along the veins; inflorescence axillary or rarely terminal, sessile, the branches 1 to 6, 2 cm. long or less, each bearing 1 or several heads of sessile flowers, each head subtended by several more or less united bracts; corolla 3 mm. long; fruit 4 to 5 mm. long, glabrous.

PANAMA: Without locality, *Seemann* (Gray Herb.). Chagres, *Fendler* 58. Gatún, *Hayes* (Gray Herb.).

Several sheets of some of the above collections have been examined. They do not agree in all respects with the original description, especially in the axillary inflorescence. It seems probable, however, that Seemann described the species from young material, which might account for some of the discrepancies.

## NEW SPECIES OF RUBIACEAE OF SEVERAL GENERA, CHIEFLY FROM PANAMA.

The species described below are chiefly based upon the collections made in Panama, but a few are from other parts of tropical America. Two of the species, *Cassupa panamensis* and *Stachyarrhena heterochroa*, are of particular interest because they represent genera not previously reported from North America.

*Basanacantha subcordata* Standley, sp. nov.

Shrub or small tree with sweet-scented white flowers; branches slender, divaricate, glabrous, each bearing near the apex 2 slender or stout spines 5 to 7 mm. long; stipules free, 6 to 8 mm. long, ovate to oblong, obtuse or acute, mucronate, glabrous outside, densely white-sericeous within; petioles slender, 10 to 25 mm. long, canescent; leaf blades thin, dull green, oblong to ovate or broadly oval-ovate, 4 to 10 cm. long, 2.5 to 6 cm. wide, very unequal, acute or abruptly acute, rarely obtuse, with a subulate tip 1 to 2 mm. long, from rounded to cordate at the base, somewhat decurrent upon the petiole, strigillose or scaberulous on the upper surface, abundantly strigose and scabrous beneath; staminate flowers 2 or more together at the end of the branches, sessile, the calyx tubular-campanulate, 7 mm. high, with 5 subulate lobes about 5 mm. long, abundantly pubescent, with long whitish appressed hairs; corolla tube 5 to 6 cm. long, slender, abundantly hirtellous outside, the lobes 2.5 to 4 cm. long, ovate or lanceolate, attenuate, sparingly pubescent; anthers slightly exserted; pistillate flowers solitary at the ends of the branches; ovary densely tomentose, the calyx tube tubular-campanulate, 6 mm. long, densely pubescent with whitish hairs, the lobes linear,

15 to 18 mm. long, acuminate to a subulate tip, narrowed toward the base, sparingly pubescent; corolla tube 45 mm. long, scabro-hirtellous; fruit not seen.

Type in the U. S. National Herbarium, no. 861251, collected in thickets and along roadsides near Nicoya, Costa Rica, May, 1900, by A. Tonduz (Inst. Fis. Geogr. Costa Rica, no. 13934). The specimens on this sheet bear staminate flowers. The description of the pistillate flowers is based upon a specimen mounted on sheet 474620, collected near Las Huacas, Nicoya Peninsula, Costa Rica, altitude 900 meters, May 24, 1903, by O. F. Cook and C. B. Doyle (no. 724).

The only closely related species described from Central America is *Basanacantha monantha* (Benth.) Hook. f., the type locality of which is Guatemala. That has thickish, differently shaped leaves, and a very different calyx and corolla. The native name of the Costa Rican plant is "crucilla."

***Basanacantha pitteri* Standley, sp. nov.**

Branches stout, spreading, glabrous, grayish brown, with numerous light-colored lenticels; stipules distinct, broadly ovate, acutish, thin, brown, glabrous outside, densely silky-pilose within with white hairs; petioles stout, 9 to 14 mm. long, densely pubescent with stiff stout spreading tawny hairs; leaf blades broadly obovate or oval, 12 to 46 cm. long, 7 to 10 cm. wide, abruptly acute, with a subulate tip 1 to 2 mm. long, rounded at the base, thin, dull green, loosely strigose above, slightly paler beneath and densely pubescent with long slender stiff loose hairs; only staminate flowers seen, these few together at the ends of the branches; calyx tube campanulate, 4 mm. long, the lobes subulate, of about the same length, the whole calyx glabrous except for a few long slender white hairs on the lobes and about the margin of the tube; corolla white, the tube 6 cm. long, slender, slightly dilated in the throat, glabrous outside, villous within, the lobes lanceolate or elliptic-lanceolate, 25 to 30 mm. long, long-attenuate; anthers linear, sessile in the throat of the corolla, 1 cm. long; style slender, 45 mm. long, glabrous.

Type in the U. S. National Herbarium, no. 578473, collected at Zent Junction, near Matina, Costa Rica, February, 1900, by H. Pittier (Inst. Fis. Geogr. Costa Rica, no. 16036).

There is a well developed style present in all of the flowers, but it appears to be abortive, and the form of the calyx and the sterile ovary shows very plainly that the flowers are not fertile. In general appearance *B. pitteri* is similar to the preceding species, but it differs conspicuously in the nearly glabrous calyx, glabrous corolla, larger, broader leaves, and short petioles.

***Basanacantha lasiantha* Standley, sp. nov.**

Branches rather slender, glabrous, divaricately branched, each bearing near the end 2 short stout spines 6 mm. long; stipules distinct, 6 to 8 mm. long, ovate or ovate-oblong, obtuse, glabrous outside, densely pilose within; petioles slender, 6 to 15 mm. long, tomentose; leaf blades broadly obovate, thin, 7 to 12 cm. long, 3.5 to 6.5 cm. wide, acute, sometimes abruptly so, acute or rounded at the base, abundantly scabro-hirtellous on the upper surface, densely pubescent beneath with rather short loose soft whitish hairs, not conspicuously veined; only pistillate corollas seen; corolla tube 6 to 7 cm. long, densely pubescent outside with long soft white appressed hairs, villous within, the 5 lobes narrowly lanceolate, 45 to 70 mm. long, 9 to 12 mm. wide, long-attenuate, more or less sericeous outside, glabrous within; anthers inserted in the throat of the corolla tube, linear, sessile, 10 mm. long.

Type in the U. S. National Herbarium, no. 678517, collected in forests on dry limestone around Alhajucla, Chagres Valley, Province of Panama, Panama, altitude 30 to 100 meters, May 12 to 15, 1911, by H. Pittier (no. 3473).

The specimens are incomplete, the flowers being represented only by staminate corollas, no calyx being present. This is perhaps nearest *Basanacantha monantha*, but



the form of the corolla is altogether different, the flowers being much larger than those of other members of the genus.

*Cassupa panamensis* Standley, sp. nov.

A small tree; young branches stout, obtusely quadrangular, densely tomentose with short tawny hairs; stipules 10 to 12 mm. long, triangular-oblong, acuminate, ciliate; petioles stout, 3 to 6.5 cm. long, cinereous-puberulent; leaf blades oval or oval-obovate, 26 to 34 cm. long, 12 to 17 cm. wide, abruptly acuminate, the tips 25 to 30 mm. long, obtuse, shortly acuminate at the base, coriaceous, rugose, dark green on the upper surface and glabrous except for the puberulent veins, the lower surface densely white-puberulent, appearing tomentose, the lateral veins conspicuous, parallel, 18 to 20 on each side, the secondary veins finely reticulate; inflorescence a many-flowered thyriform panicle 15 to 19 cm. long and about 11 cm. wide, on a stout peduncle 5 cm. long, or a few flowering branches present at the base of the peduncle, the branches of the inflorescence ascending, stout, compressed, 25 to 35 mm. long, densely hirtellous or tomentose with tawny hairs, the terminal flower sessile, the others on stout compressed pedicels 5 to 10 mm. long; bracts ovate, acute, 2 to 3 mm. long, ciliate, puberulent outside; calyx 1.5 to 2 mm. high, obscurely repand-dentate, ciliolate, glabrous; corolla white, the tube 52 mm. long, slightly dilated in the throat, finely and sparsely puberulent outside and verrucose, villous within the throat; corolla lobes 6, oblong, 11 mm. long, 4.5 mm. wide or less, obtuse or acute, imbricated before anthesis, puberulent outside and within, bearded at the base; filaments 3 mm. long, inserted 28 mm. above the base of the tube; anthers 9 mm. long, abruptly acuminate at the apex; style slender, 32 mm. long, scaberulo-puberulent; stigma oblong, 5 mm. long; fruit elongate-globose, 8 or 9 mm. in diameter, 10 mm. high, 2-celled, smooth, glabrous; seeds numerous, 1 mm. in diameter, foveolate.

Type in the U. S. National Herbarium, no. 678965, collected along the Río Fató, Province of Colón, Panama, altitude 10 to 100 meters, July and August, 1911, by H. Pittier (no. 3889). Additional material is mounted on sheet 678964.

This is the first species of the genus to be reported north of Colombia. It is related to *Cassupa alba* Schum. & Krause, described from the mountains of the interior of Colombia, but is distinguished by the longer corollas, which are tuberculate and puberulent outside rather than smooth and glabrous. The inflorescence is considerably narrower than that described for *C. alba*, but this may be an individual variation.

*Chomelia boliviana* Standley, sp. nov.

*Chomelia tenuiflora* Benth.; Rusby, Mem. Torrey Club 3<sup>2</sup>: 45. 1893, not Benth. Journ. Bot. Hook. 3: 235. 1841.

Branches slender, terete, grayish brown, the younger ones pubescent with short loose yellowish hairs, the older ones glabrate, furnished with numerous slender or stout spines 7 to 22 mm. long; stipules not seen, early deciduous; petioles slender, 5 to 12 mm. long; leaf blades elliptic-oval to elliptic-oblong, 4 to 9 cm. long, 15 to 30 mm. wide, acute or abruptly acuminate at the apex, acuminate or attenuate at the base, thin, bright green on both surfaces, sparsely pubescent on the upper surface with short fine appressed hairs, abundantly pubescent beneath, especially along the veins, with slender appressed hairs, the lateral veins prominent; peduncles axillary, 3 to 5 cm. long, densely pubescent, bearing numerous sessile or subsessile flowers in a loosely branched cyme; bracts subulate, 2 to 3 mm. long; calyx 2 mm. long, densely appressed-pubescent, the 4 teeth unequal, about equaling the tube, narrowly triangular, acute; corolla tube slender, 12 to 20 mm. long, densely sericeous, the lobes 4 to 5 mm. long, oblong to oblong-ovate, acute or obtuse.

Type in the U. S. National Herbarium, no. 46974, collected near Yungas, Bolivia, in 1890, by Miguel Bang (no. 342). Also collected between Tipuani and Guanai, Bolivia, by Bang in December, 1892 (no. 1738).

This was described as a new species by Rusby in 1893 under the name of *Chomelia tenuiflora* Benth. "in Herb. Kew." Bentham, however, had published a species of this name many years before, based upon Schomburgk's no. 314 from British Guiana. Schomburgk's plant, a specimen of which is found in the U. S. National Herbarium, is similar in general appearance to the present species, but is easily distinguished by the few flowers, short peduncles, attenuate corolla lobes, and the long, filiform calyx lobes, twice as long as the tube or much longer. Rusby, at the time of publishing a second species under the same name, lists two other specimens besides Bang's no. 342, namely, Matthews's no. 1944 from Peru and a specimen collected by Pearce at Santa Cruz. It is from one of these, presumably, that Bentham's name was taken. It is not probable that so discriminating a botanist as Bentham would have confused so different a plant with that of British Guiana, and it would seem that there must be some confusion of data in the present instance.

The fruit is not present upon either specimen seen by the writer and was not described by Doctor Rusby in his publication of *Chomelia tenuiflora*, but he described it later<sup>1</sup> from Bang's no. 1738 in the following words:

"Nearly 1 cm. long, 2-2.5 mm. broad, oblong, the base slightly narrower, the apex subtruncate, tipped by the conspicuous cup of the calyx-limb, which about equals the strongly recurved teeth, blackish, minutely hispidulous, irregularly and rather lightly costate, slightly curved."

*Chomelia boliviana* is related to *C. pohliana* Muell. Arg.,<sup>2</sup> described from Brazil, but differs in its looser, more ample cymes, abundant pubescence, less acute corolla lobes, and deciduous stipules.

***Chomelia brachyloba* Standley, sp. nov.**

Branches slender, reddish brown, the older ones glabrate, the younger ones finely pubescent with short, appressed, whitish or brownish hairs, armed with few stout sharp spines 6 to 10 mm. long; stipules subulate, 3 to 4 mm. long, brown; leaves numerous, the slender petioles 10 to 12 mm. long; leaf blades elliptic-oval to oval or broadly ovate, 32 to 80 mm. long, 20 to 35 mm. wide, abruptly acute, the tip about 3 mm. long, attenuate or abruptly acute at the base, thin, bright green on both surfaces, sparsely pubescent on the upper surface with rather long, slender, appressed hairs, more abundantly pubescent beneath, especially along the veins, with similar hairs, the lateral veins prominent, parallel; peduncles slender, 17 to 35 mm. long, densely pubescent with fine appressed hairs, bearing a congested cyme of 6 to 10 sessile or subsessile flowers; bracts half as long as the calyx or less; calyx 1.5 to 2 mm. long, densely appressed-pubescent below, sparsely pubescent above, the lobes triangular-ovate to lanceolate, rather obtuse, much shorter than the tube, unequal; corolla tube slender, 14 to 22 mm. long, densely sericeous, the lobes 5 to 6 mm. long, linear or narrowly lanceolate, abruptly attenuate to the slender tips; fruit oblong, 10 to 12 mm. long.

Type in the U. S. National Herbarium, no. 679833, collected in the Sabana de Juan Corso, near Chepo, Province of Panama, Panama, at an altitude of 60 to 80 meters, October, 1911, by H. Pittier (no. 4673).

Here belongs also a specimen collected in the region of Santa Marta, Colombia, at an altitude of 45 meters, by H. H. Smith (no. 392). This collection was distributed as *C. tenuiflora* Benth. Comparison of these two specimens with one of the type collection of *C. tenuiflora*, Schomburgk's no. 314 from British Guiana, in the U. S. National Herbarium, shows that the proposed species is well distinguished by its long peduncles, numerous flowers, short spines, and more abundant pubescence, and especially by the short calyx lobes. In *C. tenuiflora* the calyx lobes are filiform-subulate and twice as

<sup>1</sup> Mem. Torrey Club 6: 48. 1896.

<sup>2</sup> See Mart. Fl. Bras. 6<sup>b</sup>: 34. pl. 4. 1881.

long as the tube or even longer. *Chomelia brachyloba* is also related to *C. filipes* Benth., described from Nicaragua, but that species is described as having smaller, fewer flowers, shorter peduncles, and different pubescence. To the present species is probably to be referred Seemann's no. 341, collected near Panama City and reported by Hemsley as *C. tenuiflora*.<sup>1</sup>

*Cosmibuena ovalis* Standley, sp. nov.

Young branches stout, somewhat fleshy, pale brown; petioles 15 to 25 mm. long; leaf blades oval to broadly oval-obovate, 10 to 14 cm. long, 6 to 8 cm. broad, rounded at the apex, the extreme tip abruptly acute, coriaceous, lustrous above, paler beneath, with 5 to 8 veins on each side, these distant, not conspicuous; inflorescence terminal, 5-flowered; ovary oblong, 12 mm. long, contracted into a stipe of the same or slightly greater length; calyx cylindric, 11 mm. long, with 5 very short, broadly triangular, acute teeth; corolla tube 6 to 7 cm. long, 3.5 to 5 mm. in diameter; corolla lobes narrowly oblong, 25 to 32 mm. long, 9 to 11 mm. wide, rounded at the apex, with short rounded auricles at the base, papillose at the base and short-ciliate; anthers 15 mm. long, subsessile, attached near the base, obtuse, with 2 short appendages at the base; style 65 mm. long, villous above for half its length, the stigma bilamellate, the lamellae thick, 5 to 6 mm. long; ovules with rather short, entire or nearly entire, hyaline appendages.

Type in the U. S. National Herbarium, no. 715202, collected in the vicinity of Olá, Province of Coclé, Panama, altitude 100 to 350 meters, December 7 to 9, 1911, by H. Pittier (no. 5074).

In general appearance this is similar to *Cosmibuena macrocarpa*. The venation of the leaves, however, is very different; the calyx is much larger; and the corolla is larger, with narrow lobes. It does not appear probable that the ovaries would ever develop into a fruit like that figured by Bentham.

Here may belong a specimen in fruit, Pittier 3309, collected on cliffs along the Caldera River, between El Boquete and Caldera, Chiriquí. The mature fruit is cylindrical and about 45 mm. long.

*Cosmibuena paludicola* Standley, sp. nov.

Small tree, 4 to 5 meters high, glabrous throughout; young branches thick and somewhat fleshy; stipules oblong-obovate, about 12 mm. long, rounded at the apex, deciduous, thick and leathery; petioles short, stout, 8 to 12 mm. long; leaf blades narrowly obovate to oblong-oblongate, 8 to 10 cm. long, 3.5 to 5 cm. wide, rounded at the apex, cuneate at the base, thick and leathery, with about 5 veins on each side, these distant, not conspicuous, anastomosing near the margin; inflorescence terminal, of about 5 flowers; ovary 12 to 14 mm. long, cylindrical, contracted into a stout stipe of about the same length; calyx cylindrical, circumscissile, 9 mm. long, cleft one-third to one-half the distance to the base, the teeth oblong-ovate, obtuse; corolla white, the tube 6 to 6.5 cm. long, 5 to 6 mm. in diameter, gradually dilated upward; corolla lobes narrowly oblong, 25 mm. long, 9 to 11 mm. wide, rounded at the apex; anthers subsessile, attached near the base, 17 mm. long, obtuse at the apex, with 2 slender appendages at the base; style 65 mm. long, hirsute above; stigma bilamellate, the lamellae oblong, 10 mm. long; ovules with long hyaline appendages.

Type in the U. S. National Herbarium, no. 679204, collected in mangrove swamps, vicinity of Viento Frio, Province of Colón, Panama, August 7 and 8, 1911, by H. Pittier (no. 4107).

Distinguished from all related species, including those of South America, by the combination of obtuse leaves and obtuse corolla lobes. The leaves are unlike those of any other species. The pubescence of the style, too, seems to be characteristic. The plant grows at a lower altitude than most of the species.

<sup>1</sup> Biol. Centr. Amer. Bot. 2: 43. 1881.

***Deppea longipes* Standley, sp. nov.**

Young stems reddish brown, succulent, cinereous-puberulent; stipules very small and inconspicuous, about 1 mm. long; petioles 10 to 20 mm. long; leaf blades oval, broadly oval, or elliptic-oval, 8 to 11 cm. long, 3.5 to 5.5 cm. wide, abruptly acuminate, the tips about 10 mm. long, obtuse, acute, or abruptly acute at the base, bright green, prominently veined, glabrous on the upper surface, sparingly tomentulose beneath along the veins; peduncles 22 to 35 mm. long; cymes many-flowered, 5 to 9 cm. broad, the branches tomentulose; bracts minute; pedicels 2.5 to 6 mm. long, often longer than the fruit; calyx lobes triangular, about 0.6 mm. long; corolla bright yellow, glabrous, the tube about twice as long as the calyx lobes, the lobes of the limb 5 mm. long, oblong, obtuse; anthers exserted, the filaments glabrous, slightly longer than the anthers; capsules 5 mm. long, turbinate, conspicuously costate, glabrate.

Type in the U. S. National Herbarium, no. 677458, collected around Camp Aguacatal, eastern slope of Chiriquí Volcano, Panama, altitude 2,100 to 2,200 meters, March 10 to 13, 1911, by H. Pittier (no. 3070).

In general appearance this resembles *D. floribunda* Hemsl., but it is distinguished from that and the other Mexican and Central American species by the large capsules and long pedicels.

***Faramea luteovirens* Standley, sp. nov.**

A small tree or large shrub, often branched from the base, with straight trunk, smooth bark, and radiate branches, glabrous throughout; young stems stout, yellowish green; stipules much wider than long, with a subulate tip, soon deciduous; petioles stout, 6 to 10 mm. long; leaf blades oblong-oval, 9 to 14 cm. long, 4 to 6 cm. wide, obtuse at the base, abruptly caudate at the apex, with an obtuse or acute, narrowly triangular tip 10 to 14 mm. long, yellowish green, coriaceous, the midvein very prominent, the lateral veins conspicuous, 8 to 13 on each side, diverging at nearly right angles, anastomosing near the margin, but not forming a regular or conspicuous marginal vein; inflorescence a sessile panicle, sparsely branched, the central axis 6 cm. long, the lateral ones 1 cm. long or less, the pedicels rather stout, thicker above, 3 cm. long; fruit subglobose, 8 to 9 mm. in diameter, smooth, thick-walled, bearing at the summit the truncate calyx limb (or base of the limb?); no mature seeds seen, the immature ones solitary, with a very deep basal depression.

Type in the U. S. National Herbarium, no. 679194, collected on Loma de la Gloria, near Fató, Province of Colón, Panama, in forests, altitude 10 to 100 meters, August, 1911, by H. Pittier (no. 4098).

Readily distinguished from the other Panamanian species by the yellowish green, coriaceous leaves and long pedicels.

***Faramea ovalis* Standley, sp. nov.**

A small slender tree, 6 to 8 meters high, with a straight trunk and pyramidal crown, glabrous throughout; young branches very slender, green; stipules broadly rounded, 1.5 mm. long or less, each bearing a subulate tip 3 to 9 mm. long; petioles slender, 4 to 10 mm. long; leaf blades oval or rarely obovate-oval or oval-oblong, 4 to 8 cm. long, 2 to 5 cm. wide, rounded to acute at the base, abruptly caudate at the apex, the tip 6 to 10 mm. long and 2 to 3 mm. wide, obtuse or rounded, the blades bright green, thin, with 7 to 11 lateral veins on each side, these not conspicuous, diverging at nearly right angles; peduncles 12 to 17 mm. long; flowers in simple umbels, usually 4 on each peduncle, on pedicels 12 to 14 mm. long; calyx and ovary together 3 mm. long, narrowly campanulate, green, glabrous, the limb very shallowly and obscurely dentate; corolla purplish white, 14 to 17 mm. long, glabrous outside, the tube 10 to 11 mm. long, 2.5 mm. in diameter, the throat but slightly inflated, the lobes ovate-oblong, acute or acutish, puberulent within; style slightly exserted; fruit not known.

Type in the U. S. National Herbarium, no. 675764, collected in forests along the Río Ladrillo, above El Boquete, Chiriquí, Panama, altitude 1,200 to 1,300 meters, March

17 to 19, 1911, by William R. Maxon (no. 5397). Also collected 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 17 to 19, 1911, by H. Pittier (no. 3159).

Related to *Faramea occidentalis* (L.) A. Rich., which is represented by several Panama collections, but differing in its smaller leaves, umbellate rather than corymbose inflorescence, and shorter corolla.

*Faramea scalaris* Standley, sp. nov. \*

A glabrous shrub; young branches slender, green; stipules 5 to 7 mm. long, united and sheathing, the free border rounded, obtuse, or acutish, with a mucronate tip 1.5 mm. long or less; petioles very stout, 2 to 5 mm. long; leaf blades narrowly elliptic-oblong to narrowly oblanceolate, 10 to 16 cm. long, 1.5 to 3 cm. wide, acuminate, often rather abruptly so, to a rounded tip, acute at the base, bright green, rather thin, the midvein very prominent, the lateral nerves 8 to 14 on each side, divergent nearly at right angles, anastomosing near the margin in a very conspicuous marginal vein; flowers in a compound umbellate inflorescence about 4 cm. long, the peduncle about 15 mm. long; bracts minute, pedicels 3 to 4 mm. long, strongly tinged with blue; calyx and ovary together 2 mm. long, campanulate, glabrous, blue, the limb dentate, the teeth triangular, acutish, corolla purplish white, glabrous, 11 to 12 mm. long, the tube slender, slightly broadened in the throat, the lobes ovate-oblong, 4 mm. long, obtuse; fruit not known.

Type in the U. S. National Herbarium, no. 677656, collected in the humid forest between Alto de las Palmas and top of Cerro de la Horqueta, Chiriquí, Panama, altitude 2,100 to 2,268 meters, March 18, 1911, by H. Pittier (no. 3265).

The affinities of the present species are apparently with the Brazilian *Faramea salicifolia* Presl, but in that plant the stipules are long-aristate and the venation of the leaves is very different.

*Guettarda foliacea* Standley, sp. nov.

A small tree or large shrub, branching from the base, with spiny arcuate branches; older branches slender, terete, dark brown, the youngest ones obtusely quadrangular, densely strigose-hispidulous; stipules 5 mm. long, oblong-triangular, early deciduous; petioles slender, 10 to 22 mm. long, strigose-hispidulous; leaf blades elliptic or elliptic-oval, 10 to 16 cm. long, 3.5 to 5.5 cm. wide, rather abruptly acute, acute to obtuse at the base, thinly membranous, bright green, very sparsely hispid on the upper surface with rather short hairs, strigillose beneath, prominently veined, the veins slender, about 8 on each side; peduncles slender, 10 to 15 mm. long, strigose-hispidulous, bearing few densely cymose sessile or short-pedicellate flowers; bracts 4 to 5 mm. long, narrowly oblong or linear-oblong, obtuse, green and foliaceous, persistent, glabrous on the inner surface, sparsely pubescent on the outer, long-ciliate; calyx broadly cylindrical, 2 mm. long, densely pubescent with short appressed hairs, the margin truncate and entire or nearly so; corolla tube 15 to 17 mm. long, slender, densely sericeous, the lobes oblong or oblong-oval, obtuse, 4 mm. long; style about 2 cm. long, slender, bearing a few long slender appressed hairs, the stigma very small; fruit not seen.

Type in the U. S. National Herbarium, no. 679116, collected along the Trinidad River, Canal Zone, Panama, near sea level, July 19 to 21, 1911, by H. Pittier (no. 4031).

Readily distinguished by the large, foliaceous, long-ciliate bracts. The leaves, too, are very large and thin, being similar in texture to those of *G. ramuliflora*.

*Hamelia pauciflora* Standley, sp. nov.

Shrub with slender branches, the older ones grayish, terete, the younger ones obtusely angled, sparsely short-villous; stipules very small; petioles rather stout, 2.5 mm. long or less; leaves mostly in 3's, the blades broadly ovate to ovate or oval-ovate, 15 to 28 mm. long, 7 to 15 mm. wide, acute or acutish, acute or obtuse at the base,

very thin, bright green, glabrous on the upper surface, sparsely short-villous beneath, ciliate, very faintly veined, the lateral veins 3 or 4 pairs; peduncles terminating short lateral branches, 2 to 4-flowered, sometimes dichotomous or often reduced to a single secund branch, the flowers in the axils of the branches sessile or subsessile, the others on slender pedicels 10 mm. long or less, the peduncles slender, 7 to 15 mm. long, sparsely villous; calyx 3 to 3.5 mm. long, glabrous or nearly so, the lobes broadly triangular, less than half as long as the tube; corolla about 22 mm. long, slightly broadened upward, very sparsely villous outside, especially about the lobes, these oval-ovate, obtuse, 1.5 mm. long; anthers equaling or usually slightly exceeding the corolla lobes; fruit not seen.

Type in the U. S. National Herbarium, no. 678513, collected in forests on dry limestone, around Alhajuela, Chagres Valley, Province of Panama, Panama, at an altitude of 30 to 100 meters, May 12 to 15, 1911, by H. Pittier (no. 3469).

Distinct from all other species by the much reduced inflorescence and small leaves. It is related, possibly, to *H. chrysantha* Swartz, but has fewer, differently arranged flowers, shorter petioles, and more pubescent, thinner, verticillate leaves.

***Hoffmannia pittieri* Standley, sp. nov.**

Stems herbaceous, terete, glabrous; stipules triangular, acutish, 3 mm. long; petioles slender, glabrous, 2 to 3 cm. long; leaf blades oblong-obovate to oval-oblong, 12 to 24 cm. long, 6 to 9 cm. wide, abruptly acuminate, the tips obtuse, attenuate to the base, glabrous, dull green above, paler beneath, prominently veined; cymes on peduncles 2 to 3 mm. long, the secondary branches 10 to 18 mm. long, angled, puberulent, the whole inflorescence loose and open; bracts oblong-linear, acute, deciduous; pedicels (in fruit) about 4 mm. long; open flowers not seen, the corolla said to be yellow; calyx and ovary together (in bud) about 3 mm. long, sparingly puberulent, the calyx lobes ovate, obtuse or acutish; fruit cylindric-campanulate, 5 mm. long, glabrous, costate; seeds numerous, brown, favose.

Type in the U. S. National Herbarium, no. 677642, collected in the humid forest between Alto de las Palmas and top of Cerro de la Horqueta, Chiriquí, Panama, altitude 2,100 to 2,250 meters, March 18, 1911, by H. Pittier (no. 3247).

Distinguished from the other Costa Rican and Panamanian species by its open inflorescence and large, broad leaves.

***Palicourea chiriquina* Standley, sp. nov.**

A shrub 2 to 3 meters high, glabrous throughout; branches rather stout, yellowish green, obtusely quadrangular; stipules united to form a sheath 2 to 3 mm. long, each stipule bilobate, the lobes linear, acute, slightly shorter than the sheath; petioles stout, 6 to 15 mm. long; leaf blades elliptic-oval or elliptic-oblong, 5 to 10.5 cm. long, 2 to 5 cm. wide, acute or acuminate, often abruptly so, obtuse to broadly cuneate at the base, subcoriaceous, yellowish green, somewhat lustrous on the upper surface, the veins conspicuous on both surfaces, diverging nearly at right angles, the lateral ones about 15 on each side, parallel; inflorescence thyrsoid-paniculate, on peduncles 2 to 4 cm. long, the panicles 4 to 5 cm. long and 2.5 to 4.5 cm. wide, loosely branched, the branches spreading, green; bracts oblong or narrowly ovate, 1.5 to 3 mm. long; pedicels slender, 2 to 4 mm. long; calyx scarcely 1 mm. long, about equaling the ovary, the lobes of the limb rounded-ovate, obtuse; corolla 6 mm. long, stout, sulphur-yellow, glabrous outside, long-bearded within at about the middle, the lobes of the limb very short, rounded-ovate; fruit not seen.

Type in the U. S. National Herbarium, no. 677607, collected in the humid forest of Cuesta de las Palmas, southern slope of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 1,700 to 2,100 meters, March 17 to 19, 1911, by H. Pittier (no. 3211). Additional material is mounted on sheet 677606.

Related to *Palicourea mexicana*, but sufficiently distinguished by the short yellow corolla, spreading green branches of the inflorescence, and smaller leaves.

Along with the type specimens Mr. Pittier collected a short branch of another and probably undescribed species. This has a densely pubescent inflorescence, oval leaves, and very small corollas. The material is too fragmentary for diagnosis.

*Palicourea heterantha* Standley, sp. nov.

Young branches stout, obtusely quadrangular, the lower internodes glabrous, the uppermost densely villous with multicellular hairs, or sometimes villous only along the angles; stipules united into a loose sheath 5 to 7 mm. long, each stipule bilobate, the lobes oblong-linear, acute, as long as the sheath or sometimes longer, glabrous, sometimes ciliate; petioles stout, 1 to 2 cm. long, villous; leaf blades obovate to broadly oval-obovate, 8 to 13 cm. long, 4.5 to 7 cm. wide, rounded at the apex and coarsely apiculate, the tip triangular, 3 mm. long, acutish or broadly cuneate at the base, subcoriaceous, dull green, slightly lustrous above and glabrous beneath, short-villous, especially along the veins; peduncles stout, 3 to 3.5 cm. long; inflorescence thyrsoid-paniculate, 5 to 6 cm. long and of about the same breadth, copiously branched, the branches stout, ascending or spreading, densely short-villous; bracts lanceolate or lance-ovate, 3 to 8 mm. long; pedicels stout, 1 to 4 mm. long; calyx 2 mm. long, slightly longer than the ovary, deeply lobed, the lobes broadly ovate-oblong, obtuse, glabrous, bluish when dried; corolla 10 to 12 mm. long and 5 to 6 mm. in diameter, very gibbous at the base, the lobes very broad, rounded, thick and leathery, glabrous outside, sparsely villous within below the middle; stamens inserted at the middle of the corolla tube, the filaments short, the anthers included; fruit not seen.

Type in the U. S. National Herbarium, no. 531296, collected on the headwaters of the Río López, Río Palo Basin, Tierra Adentro, State of Cauca, Colombia, at an altitude of 2,500 to 3,000 meters, January, 1906, by H. Pittier (no. 1098).

Although the fruit has not been seen, there is little doubt that this plant is a member of the genus *Palicourea*. From the Colombian species previously described it is well distinguished by the very broad corolla, the loose sheaths of the stipules, and the villous pubescence. It is impossible to state the color of the fresh flowers, but when dried they are bluish.

*Rondeletia secunda* Standley, sp. nov.

Shrub; young branches slender, glabrous, brown; stipules 4 to 5 mm. long, persistent, triangular, with a subulate apex; petioles stout, 3 to 7 mm. long, glabrous; leaf blades elliptic to elliptic-oval, 10.5 to 16 cm. long, 3.5 to 6.5 cm. wide, abruptly acuminate or subattenuate, obtuse or acutish at the base, firm, green, glabrous on both surfaces or sometimes with a very few short hairs along the veins beneath, the veins prominent, the lateral ones about 8 pairs; flowers numerous, secund and subsessile along the slender, spreading or scorpioid branches of the loose panicle, this 6 to 7 cm. long and of about the same breadth, on a peduncle about 6 cm. long, the flowers rather distant upon the branches; branches of the inflorescence sparsely villous, the bracts small, green, linear; calyx tube 1.5 mm. long, villous but not densely so, the 4 lobes linear or oblong-linear, green, sparsely pubescent, longer than the tube, sometimes twice as long, unequal, one of the lobes usually broader and longer than the others; corolla white, the tube slender, 10 to 12 mm. long, rather sparsely villosulous outside, the 4 lobes rounded, 3 to 4 mm. long, the throat naked; stamens inserted below the middle of the tube; stigma shortly 2-lobed; capsules 4 mm. high, bearing the persistent calyx lobes; seeds very small, light brown, favose.

Type in the U. S. National Herbarium, no. 679392, collected in forests around Puerto Obaldía, San Blas Coast, Panama, at an altitude of 50 meters or less, August, 1911, by H. Pittier (no. 4279).

Distinguished from the other species of Central America and northern South America by the secund arrangement of the flowers in the open panicles and by the glabrous leaves and long calyx lobes.

**Rustia ferruginea** Standley, sp. nov.

A small tree; young branches stout, obtusely quadrangular, villous-puberulent with soft reddish hairs; stipules not seen, deciduous; petioles stout, very short, 1 to 3 cm. long; leaf blades obovate or oval-obovate, 15 to 30 cm. long, 7 to 12 cm. wide, rather abruptly acute or acuminate, acuminate or attenuate at the base, firm, rather inconspicuously veined, the lateral veins numerous, parallel, meeting at their apices in a marginal vein, glabrous on the upper surface, densely puberulent beneath with ferruginous hairs; inflorescence a densely flowered, short-pedunculate, terminal panicle 8 to 10 cm. long and of about the same width, the branches abundantly puberulent; bracts deciduous; calyx broadly campanulate, 1.5 mm. high, puberulent outside, the margin shallowly 5-lobed; corolla white, the tube 2 to 4 mm. long, slightly dilated above, glabrous outside, the lobes valvate, thick, about as long as the tube, lance-triangular, acute or acutish, puberulent, reflexed in anthesis, the throat of the corolla densely bearded within with coarse white hairs; stamens mostly concealed by the hairs of the corolla, the filaments subulate, the anthers erect, attached by the base; style exserted, shortly 2-lobed at the apex; ovary 2-celled; mature fruit not seen.

Type in the U. S. National Herbarium, no. 679302, collected along the Río Fató, Province of Colón, Panama, in forests or thickets, altitude 10 to 100 meters, August, 1911, by H. Pittier (no. 4201).

From all other species of the genus this differs in its ferruginous pubescence.

**Stachyarrhena heterochroa** Standley, sp. nov.

A small tree, 8 to 10 meters high, with a straight trunk, radiate branches, and a pyramidal crown; bark grayish, smooth; young branches stout, terete, lustrous, glabrous; stipules 2 to 3 mm. high, united and forming a truncate sheath; petioles stout, 2 to 3 cm. long; leaf blades oval to oblong-elliptic or rarely oblong-obovate, 15 to 28 cm. long, 5 to 9 cm. wide, abruptly acuminate or sometimes caudate, the tip about 15 mm. long, acute at the base, coriaceous, glabrous, shining on the upper surface, the veins prominent, especially the midrib, the lateral veins 9 to 12 on each side; spikes pendulous, mostly terminal, 18 to 28 cm. long, glabrous, naked at the base for 4 to 7 cm., the flowers sessile, solitary and remote, or sometimes verticillate; calyx broadly campanulate, 2 mm. high, the margin very obscurely repand-denticulate; corolla 8 mm. long, turbinate, purplish pink inside, pale pink or lavender outside, the 5 lobes broadly oblong or rounded-oblong, slightly spreading, densely villous within; stamens inserted on the middle of the tube, the filaments very short; stigmas broad, acute.

Type in the U. S. National Herbarium, no. 679174, collected in forests on Loma de la Gloria, near Fató, Province of Colón, Panama, altitude 10 to 100 meters, August, 1911, by H. Pittier (no. 4078).

The fruit, which was not collected, is said to be the color of a cherry.

Only three other species of this genus have been described, all from Brazil. The Panama plant resembles *Stachyarrhena penduliflora* Schum.<sup>1</sup> in its pendulous inflorescence. That species, however, has yellow flowers, obtuse leaves, and a tubular corolla.

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<sup>1</sup> In Mart. Fl. Bras. 6<sup>o</sup>: 370. 1889.