STUDIES OF TROPICAL AMERICAN PHANEROGAMS—NO. 3.

By Paul C. Standley.

INTRODUCTION.

The third paper of this series[1] is devoted almost wholly to trees and shrubs of tropical and subtropical North America, chiefly those of Mexico. The principal exception is an account of the Panamanian species of *Leiphaimos*, a genus of the Gentianaceae, whose representatives are interesting because of their saprophytic habit and the diverse forms of their flowers.

The writer has been engaged recently upon a proposed systematic account of the woody plants of Mexico, and it is as a result of this work that many of the new species here described are published. Most of the latter belong to the group Leguminosae, although representatives of several other families of Mexican plants are described. There is included, in addition, a brief account of the Mexican and Central American species of *Erythrina*.

In the course of work upon the family Rubiaceae for the North American Flora, numerous plants have been discovered which are not referable to any of the published species. Some of the most interesting of these have been discussed elsewhere,[2] but others are treated in the present paper. Most of the Rubiaceae described here belong to the genera *Randia* and *Hoffmannia*.

THE MEXICAN SPECIES OF ATELEIA.

Several species of *Ateleia* have been described from South America and the West Indies, but only one, *A. pterocarpa* DC., the generic type, has been reported from Mexico. *Ateleia pterocarpa* was based upon one of Sessé and Mociño's plates, and the writer has been unable to find any published reference to the collection of specimens. There are, however, in the National Herbarium several Mexican col-

[1] See also Contr. U. S. Nat. Herb. 17: 427–458. *pls. 24–31.* 1914; 18: 87–142. 1916.

[2] Standley, Paul C., *Blepharidium*, a new genus of Rubiaceae from Guatemala, Journ. Washington Acad. Sci. 8: 58–60. 1918; *Omiltemia*, a new genus of Rubiaceae from Mexico, op. cit. 8: 426, 427. 1918.

lections of the genus, at least two of which represent undescribed species.

KEY TO THE SPECIES.

Seeds 12 to 15 mm. long, strongly compressed; leaflets mostly oblong or lance-oblong, 1 to 1.5 cm. wide. Upper suture of the fruit convex__1. **A. arsenii.**
Seeds 5 to 7 mm. long, turgid; leaflets mostly ovate to rounded-oval, usually 2.5 to 5.5 cm. wide.
Upper suture of the fruit straight or concave; seeds about 5 mm. long; leaflets oval or rounded-oval_____2. **A. pterocarpa.**
Upper suture of the fruit convex; seeds about 7 mm. long; leaflets mostly oblique-ovate_____3. **A. insularis.**

1. Ateleia arsenii Standl., sp. nov.

Branchlets copiously tomentose, especially when young, with fulvous hairs; rachis of the leaf 7 to 19 cm. long; leaflets about 15, oblong, lance-oblong, or ovate-oblong, 2.5 to 4.8 cm. long, 1 to 1.5 cm. wide, broadly and obliquely rounded at the base, rounded or very obtuse at the apex, coriaceous, with prominulous, finely reticulate venation, at first short-pilose on the upper surface, but glabrate in age, tomentose beneath when young, the pubescence scant in age; racemes very numerous, 8 to 14 cm. long, loosely many-flowered, the bracts minute, linear-subulate; calyx 4.5 mm. long, turbinate-campanulate, fulvous-tomentulose, very obscurely dentate or entire; blade of the standard petal rounded-oval, 8 to 9 mm. long, 7 to 8 mm. wide, pilose outside, abruptly decurrent to a short slender claw, the margin of the blade irregularly crenulate; stamens only slightly longer than the calyx; fruit about 2.8 cm. long and 1.6 cm. wide, glabrate, prominently reticulate-veined, abruptly decurrent at the base to a stipe 1.5 cm. long, the upper suture convex, sharply carinate but almost exalate; seeds 12 to 15 mm. long, 7.5 to 9 mm. wide, strongly compressed, castaneous.

Type in the U. S. National Herbarium, no. 1000106, collected on Pico de Quinceo, near Morelia, Michoacán, in 1910, by Brother G. Arsène (no. 6655). This specimen consists of fruiting material. Another collection, in flower, was obtained upon the same mountain, at an altitude of 2,800 meters, March 11, 1909, by Brother Arsène (no. 2790).

Readily distinguished from the other Mexican species by the large, flat seeds and small, narrow leaflets. This is the only species of which the writer has seen flowers.

It is a pleasure to be able to name this well-marked species in honor of one of the most assiduous collectors of Mexican plants. During about eight years' residence in Mexico Brother Arsène obtained one of the largest series of the plants of that country ever secured by one collector. This consists of nearly eleven thousand numbers of flowering plants, chiefly from the states of Puebla and Michoacán, besides a large quantity of cryptogams. Through the generosity of Brother Arsène, the most complete series of these collections has now been deposited in the National Herbarium.

2. Ateleia pterocarpa DC. Prodr. 2: 419. 1825.

Pterocarpus ateleia Moc. & Sessé; DC. Prodr. 2: 419. 1825, as synonym.

This, the type species of the genus, was based upon one of Sessé and Mociño's drawings,[1] and De Candolle gives the locality merely as Mexico. In the second edition of their Flora Mexicana[2] Sessé and Mociño give a long description of

[1] Calq. Dess. Fl. Mex. *pl. 288, pl. XXV, A.*

[2] 164. 1894.

the plant under the generic name *Amorpha*, but without a specific designation. In this later work the locality for the plant is given as "In agris Cordovae et in Praedio S. Josephi."

Of the specimens at hand those which agree best with the plate and description were collected at Acaponeta, Tepic, April, 1910, by J. N. Rose, P. G. Russell, and P. C. Standley (no. 14474). The fruit of these specimens agrees almost exactly with that figured. The leaflets, however, are less numerous, broader, and rounded rather than acute at the apex. It is not improbable that the Tepic specimens represent an additional new species, but it is unsafe to describe them as such until some plant agreeing better with the original illustration is collected. The tracings of Sessé and Mociño's plates are so obviously imperfect that no confidence can be placed in the characters they seem to indicate. The writer is unable to determine the location of the localities mentioned by Sessé and Mociño. If the well-known Córdoba in Veracruz is the one referred to, it is probable that the typical plant is still unknown in herbaria.

The specimens obtained by Doctor Rose and the writer were taken from a handsome tree about 6 meters high. The fruit is borne in the greatest profusion. It is about 2 cm. long and 1.3 cm. wide, with the upper suture straight or concave, and bordered by a thin wing about 1 mm. wide.

3. **Ateleia insularis** Standl., sp. nov.

Branchlets strigillose-puberulent, with numerous conspicuous pale lenticels; leaf rachis 15 to 24 cm. long; leaflets about 13, ovate or very obliquely oblong-ovate, 4 to 6.5 cm. long, 2.2 to 3 cm. wide, broadly rounded and very oblique at the base, obtuse at the apex, subcoriaceous, with prominulous, finely reticulate venation, in age nearly glabrous except for a few minute appressed hairs along the veins; racemes 6 to 12 cm. long, rather densely flowered, the flowers short-pedicellate; calyx truncate, strigillose-puberulent, 2.5 mm. long; fruit 2.2 to 3 cm. long, 1.5 to 2 cm. wide, glabrous, the upper suture convex, furnished with a thin wing 2 to 3 mm. wide; seed turgid, about 7 mm. long and 4 mm. wide, dark reddish brown.

Type in the U. S. National Herbarium, no. 345929, collected on María Madre Island, off the Pacific coast of Mexico, May, 1897, by E. W. Nelson (no. 4186). Also obtained at the same locality, May 7, 1897, by F. S. Maltby (no. 73).

Closely related to the Tepic plant discussed above, but sufficiently different in the form of the fruit and leaflets to deserve specific rank. Although only a small amount of Mexican material is available for study, examination of an extensive series of specimens of the Cuban *Ateleia cubensis* Griseb. indicates that the form of the fruit is very constant.

THE MEXICAN AND CENTRAL AMERICAN SPECIES OF ERYTHRINA.

The North American species of *Erythrina* have never been monographed, and no attempt has ever been made to correlate the large number of published names. Many of the species are known only from very imperfect descriptions or from equally unsatisfactory illustrations, and the difficulty of any attempt to formulate a satisfactory account of the genus is increased by the incompleteness of most herbarium specimens. The plants seldom bear flowers and fruit at the same time, and since they often flower when devoid of leaves it is difficult to assemble complete material that is certainly

of the same species. The following account of the continental North American species, though far from satisfactory, will make possible at least an approximate determination of collections.

The plants of this genus are of some economic importance, and there are many references to them in the literature relating to Mexican botany. Unfortunately, their nomenclature is in such confusion that no confidence may be placed in the specific names under which the properties of the plants have been discussed. This, however, is a matter of little importance, since it is probable that most of the species have approximately the same properties. The Mexican plants are generally referred to in literature as *Erythrina corallodendron* or *E. coralloides*. The application of the latter name is uncertain, and *E. corallodendron* probably does not occur in Mexico.

The vernacular names given below under the species have been verified from herbarium specimens. The following names are used in Mexico for the species, probably without discrimination as to specific limits: "Colorín" (Jalisco, Valley of Mexico, Puebla), "zumpantle" (Veracruz, Distrito Federal), "peonía" (Jalisco), "purénchequa" (Michoacán, Tarascan), "pureque" (Michoacán), "tzompantli" (Valley of Mexico), "tzinacanquáhuitl" (Nahuatl), "zompantle" (Valley of Mexico), "chacmol-ché" (Yucatán, Maya), "coralina" (Baja California), "chilacoyote" (seeds, Baja California), "chocolén," "iquimite," "pito" (Veracruz), "patol" (seeds), "pichoco."

The species of *Erythrina* are often planted for hedges, partly because of their usually well-armed branches and partly on account of their showy red flowers. It is stated that the Aztecs used the plants extensively in this way, just as the people of modern Mexico employ them. Branches of the trees or shrubs broken off and placed in the ground root readily. The wood is very soft and light, and is used for the same purposes as cork. The bark furnishes a yellow dye for cloth, etc. The succulent flowers are eaten, either raw or cooked, at Cuernavaca and elsewhere. The handsome seeds have been used by the Mexicans of both pre-Conquest and modern times as articles of ornament.

Various medicinal properties are attributed to the Mexican Erythrinas. The roots are said to be sudorific; a decoction of the flowers is sometimes used for chest affections; and the bark is reputed to have purgative and diuretic action. The juice of the stems is reported to have been used as a remedy for scorpion stings. The bark and seeds are said to contain a powerful alkaloid, to which the name erythrine has been given. This alkaloid has a marked effect upon the nervous system, causing paralysis of the motor nerves. If taken internally in sufficient quantities the seeds produce death. They have been used

by the natives of various parts of tropical America as a hypnotic. Because of the characteristic narcotic properties the crushed stems of the plants are sometimes thrown into water to stupefy fish.

KEY TO THE SPECIES.

Standard petal very broad, oval or flabelliform.
Standard long-clawed; leaflets rounded or very obtuse at the apex. Tree, armed with stout spines; corolla orange or salmon ..... 1. E. glauca.
Standard not clawed; leaflets acutish to acuminate at the apex.
Calyx truncate. Tree, armed with small spines ..... 2. E. darienensis.
Calyx bilobate. Shrub, armed with spines; seeds brown, large. 3. E. breviflora.

Standard petal narrow, linear to linear-oblong.
Fruit and ovary aculeate. Plants herbaceous.
Calyx dentate ..... 4. E. setosa.
Calyx cleft on one side at the apex, not dentate. Seeds very large, nearly black ..... 5. E. leptorhiza.
Fruit and ovary not aculeate.
Calyx cleft on one side at the apex, or conspicuously bilobate.
Calyx cleft on one side at the apex.
Pods coiled; leaflets ovate or ovate-oblong. Shrub; seeds scarlet. 6. E. cochleata.
Pods straight or nearly so; leaflets mostly deltoid. Large or small tree; flowers pink ..... 7. E. rubrinervia.
Calyx bilobate.
Leaflets ovate or lance-ovate; petioles aculeate. Small tree; flowers green and red ..... 8. E. lanceolata.
Leaflets suborbicular or deltoid; petioles usually unarmed.
Venation of the leaflets prominently reticulate; leaflets tomentulose beneath when young; pods only slightly constricted between the seeds ..... 9. E. montana.
Venation of the leaflets not prominently reticulate; leaflets sericeous beneath when young; pods deeply and abruptly constricted between the seeds ..... 10. E. costaricensis.

Calyx truncate.
Standard densely lanate or tomentulose. Shrubs or small trees.
Seeds about 8 mm. long; standard 7 cm. long; pods deeply constricted between the seeds ..... 11. E. lanata.
Seeds about 12 mm. long; standard 5 to 5.5 cm. long; pods shallowly constricted between the seeds ..... 12. E. occidentalis.
Standard glabrous or nearly so.
Leaflets, at least the terminal ones, conspicuously lobate. Shrubs or herbs; seeds scarlet; flowers red ..... 13. E. herbacea.
Leaflets never lobate.
Seeds about 15 mm. long; leaflets usually rounded or very obtuse at the apex ..... 14. E. flabelliformis.
Seeds about 10 mm. long; leaflets usually acute or acuminate at the apex.
Standard 8 cm. long; pods deeply constricted between the seeds; leaflets aculeate beneath ..... 15. E. goldmanii.
Standard 6.5 cm. long or shorter; pods only slightly constricted between the seeds; leaflets not aculeate ..... 16. E. americana.

1. **Erythrina glauca** Willd. Ges. Naturf. Freund. Berlin Neue Schrift 3: 428. 1801.

Erythrina patens DC. Prodr. 2: 414. 1825.

Duchassaingia glauca Walp. Ann. Bot. 2: 424. 1851.

TYPE LOCALITY: Caracas, Venezuela.

DISTRIBUTION: Guatemala (*Heyde & Lux* 6329); Nicaragua (*Shannon* 5023, *Baker* 690); Panama (*Pittier* 2571, 6942, 2744; *Fendler* 81; *Maxon* 4790; *Christopherson* 142; *Goldman* 1853). Also in Cuba, Porto Rico, the Lesser Antilles, and Venezuela.

Erythrina patens was based upon one of Sessé and Mociño's plates,[1] which agrees exactly with the present plant. De Candolle gives the habitat as Mexico, but the writer has seen no Mexican specimens. Perhaps the plate was drawn from Guatemalan or Porto Rican specimens.

2. **Erythrina darienensis** Standl. Contr. U. S. Nat. Herb. 18: 108. 1916.

DISTRIBUTION: Known only from the type locality, near Pauarandó, southern Darién, Panama.

3. **Erythrina breviflora** DC. Prodr. 2: 413. 1825.

Erythrina latiflora Sessé & Moc. Pl. Nov. Hisp. 15. 1887.

Erythrina petraea T. S. Brandeg. Zoe 5: 247. 1908.

TYPE LOCALITY: Ayacapixtla, Mexico.

DISTRIBUTION: Jalisco (*Rose & Painter* 7511); Guanajuato (*Duges* 2); Morelos (*Pringle* 6512); Michoacán (*Pringle* 11964; *Arsène* 2868); Puebla (*Purpus* 5554).

De Candolle's description was based upon one of Sessé and Mociño's plates.[2] The description by the latter authors is much more ample, and when combined with the illustration leaves no doubt concerning the identity of the species.

Erythrina petraea was based upon Purpus's no. 2680, from Cerro de la Yerba, Puebla. Although the writer has not seen the type, the description applies to the present plant, and other specimens determined by Brandegee as *E. petraea* evidently belong here. Specimens collected by Purpus in 1908 at the type locality of *E. petraea* are remarkable for their small leaflets.

4. **Erythrina setosa** Mart. & Gal. Bull. Acad. Brux. 10[2]: 194. 1843.

TYPE LOCALITY: Regla, at 1,800 meters, and the eastern Cordillera of Oaxaca, at 2,100 meters.

DISTRIBUTION: Oaxaca (*Pringle* 4687; *Rose & Hough* 4599; *Conzatti & González* 35; *Conzatti* 1422, 1507).

Probably *Erythrina horrida* DC.[3] is the same as *E. setosa*, but the plate of Sessé and Mociño,[4] upon which De Candolle's description is based, is too poor for certain determination. Perhaps *E. horrida* is, rather, the same as *E. leptorhiza*. De Candolle describes the calyx of the former as 5-dentate, and it is so illustrated, but in view of the fact that the only calyces shown are the old ones investing the stipe of the fruit, it is probable that their delineation is fictitious.

5. **Erythrina leptorhiza** DC. Prodr. 2: 413. 1825.

TYPE LOCALITY: Mexico, the description based on one of Sessé and Mociño's plates.[5]

DISTRIBUTION: State of Mexico (*Rose & Hay* 5410, 5639; *Pringle* 6638, 5743; *Rose & Painter* 7831); Morelos (*Pringle* 6869); Hidalgo (*Pringle* 11965; *Rose & Hay* 5299); Puebla (*Arsène* 10039; *Nicolas* 128); Oaxaca (*Conzatti* 1790); Michoacán (*Arsène* 7220, 6818, 7367).

Known in Michoacán as "patol" and "colorín negro."

Pringle's no. 6638 was distributed as a new species.

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[1] Calq. Dess. Fl. Mex. *pl. 255.* [2] Prodr. 2: 413. 1825. [3] Calq. Dess. Fl. Mex. *pl. 250.*

[4] Calq. Dess. Fl. Mex. *pl. 251.* [5] Calq. Dess. Fl. Mex. *pl. 252.*

6. Erythrina cochleata Standl., sp. nov.

Shrub, the branches gray, apparently unarmed; petioles stout, glabrous or nearly so, unarmed; leaflets ovate or ovate-oblong, 10.5 to 15.5 cm. long, 4.5 to 6.5 cm. wide, rounded at the base, narrowed to the acuminate apex, subcoriaceous, concolorous, glabrous at maturity, the venation finely and prominently reticulate; racemes about 6 cm. long, the rachis brown-tomentulose; calyx 2 cm. long, narrow, brown-tomentulose or glabrate, cleft on one side at the top for about 8 mm., the limb acute, with 2 small teeth on each side; standard oblong-linear, 7 cm. long, about 6 mm. wide, glabrous, the keel shorter than the calyx; fruit 2 or 3-seeded, coiled into a complete circle, slightly constricted between the seeds, glabrate, long-stipitate; seeds scarlet, about 9 mm. long.

Type in the U. S. National Herbarium, no. 861527, collected at Hacienda La Colombiana, Costa Rica, by A. Tonduz (no. 223).

The leaflets are similar to those of *E. lanceolata*, a species with a shallowly bilobate calyx. The fruit is quite unlike that of any other species known to the writer.

The vernacular name is given as "poró."

7. Erythrina rubrinervia H. B. K. Nov. Gen. & Sp. 6: 434. 1823.

TYPE LOCALITY: Near Fusagasuga, Colombia.

DISTRIBUTION: Oaxaca (*Nelson* 1966); Veracruz (*Nelson* 435, 79); Chiapas (*Nelson* 3842); Guatemala (*Goll* 246; *Heyde & Lux* 3293); El Salvador (*Pittier* 1930); Nicaragua (*Baker* 631); Panama (*Pittier* 2541, 6939, 4731). Also in Colombia.

Known in Guatemala as "pito."

Erythrina berteroana Urban,[1] described from Cuba and Colombia, seems to be this species. The Veracruz specimens have a slightly shorter standard than the more southern ones, but do not differ otherwise.

8. Erythrina lanceolata Standl. Contr. U. S. Nat. Herb. 17: 432. 1914.

DISTRIBUTION: Known only from the type locality, San Cristóbal de Candelaria, Costa Rica.

9. Erythrina montana Rose & Standl., sp. nov.

Stems herbaceous, from a stout elongate root, tomentulose when young but soon glabrate; leaflets suborbicular, deltoid-orbicular, or ovate-deltoid, 4 to 13 cm. long, 3 to 9 cm. wide, truncate or broadly rounded at the base, rounded to very acute at the apex, thick, bright green, concolorous, tomentulose along the veins when young, usually minutely aculeolate beneath along the veins, the venation very prominently reticulate on both surfaces; calyx 1.2 to 2.7 cm. long, thin, sparsely tomentulose or glabrate, shallowly bilobate; corolla apparently purplish green, the standard 5 to 7 cm. long, 0.8 to 1.2 cm. wide, slightly curved, glabrous; fruit 1 to 4-seeded, slightly constricted between the seeds, nearly glabrous.

Type in the U. S. National Herbarium, no. 301042, collected in the Sierra Madre, near Santa Teresa, Tepic, Mexico, August 9, 1897, by J. N. Rose (no. 2137).

ADDITIONAL SPECIMENS EXAMINED:

DURANGO: Otinapa, 1906, *Palmer* 450. Durango, 1896, *Palmer* 362. Near El Salto, July, 1898, *Nelson* 4546.

JALISCO: Chiquilistlán, May, 1892, *Jones* 180.

ZACATECAS: Near Plateado, September, 1897, *Rose* 3634. Near Monte Escobedo, August, 1897, *Rose* 3597.

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[1] Symb. Antill. 5: 370. 1908.

Because of the herbaceous habit, the prominently veined leaflets, and the form of the calyx, the proposed species is evidently related to the more southern *E. leptorhiza*. The absence of spines on the fruit is sufficient to distinguish the present plant specifically.

10. Erythrina costaricensis Micheli, Bull. Herb. Boiss. **2**: 445. *pl. 12*. 1894.

TYPE LOCALITY: River banks near Boruca, Costa Rica.

DISTRIBUTION: Costa Rica (*Cook & Doyle* 284; *Tonduz* 12805, 13926, 10050); Panama (*Pittier* 2287, 2656; *Goldman* 1854; *Maxon* 4808; *Williams* 782).

The Costa Rican vernacular names are given as "elekeme," "coralillo," and "poro."

11. Erythrina lanata Rose, U. S. Dept. Agr. N. Amer. Fauna 14: 81. *fig. 1*. 1899.

TYPE LOCALITY: Acapulco, Guerrero.

DISTRIBUTION: Guerrero (*Palmer* 129, type); Oaxaca (*Nelson* 2699).

12. Erythrina occidentalis Standl., sp. nov.

Shrub or small tree, the branches gray, tomentulose when young, armed with numerous short stout spines, or sometimes perhaps unarmed; petioles slender, unarmed or bearing 1 or 2 short curved spines; leaflets broadly deltoid or rhombic, 5 to 17 cm. long, 4 to 12.5 cm. wide, usually truncate at the base, rarely broadly cuneate, very acute to acutish at the apex, thin, bright green above, usually somewhat paler beneath, tomentulose when young but soon glabrate; racemes dense, elongate; calyx 8 to 10 mm. long, closely white-tomentulose, obliquely truncate, the limb obscurely denticulate; standard oblong-linear, 5 to 5.5 cm. long, 7 to 8 mm. wide, thinly white-tomentulose; fruit 18 to 28 cm. long, 5 to 10-seeded, slightly constricted between the seeds, at first densely white-tomentulose but later glabrate; seeds scarlet, about 12 mm. long.

Type in the U. S. National Herbarium, no. 636555, collected along the beach at Mazatlán, Sinaloa, Mexico, March 30, 1910, by J. N. Rose, P. C. Standley, and P. G. Russell (no. 13725).

ADDITIONAL SPECIMENS EXAMINED:

SINALOA: Rosario, July, 1897, *Rose* 1822, 1592. Near Colomas, July, 1897, *Rose* 1796. Guadalupe, April, 1910, *Rose, Standley & Russell* 14732. Culiacán, October 30, 1904, *Brandegee*. La Rastra, March, 1899, *Goldman* 365.

TEPIC: María Madre Island, May, 1897, *Maltby* 127, *Nelson* 4303.

The plant is leafless at time of flowering, and none of the specimens cited show both flowers and leaves. Probably, however, all are referred here correctly, though some were referred by Rose to *E. lanata* at the time of publication of that species. The present plant is most closely related to *E. lanata*, but differs in its smaller standard, this with a much less dense indument, its larger seeds, and its less constricted pod.

13. Erythrina herbacea L. Sp. Pl. 706. 1753.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Tamaulipas (*Palmer* 130, 328, 119, 544; *Pringle* 7687); San Luis Potosí (*Palmer* 219; *Pringle* 5123; *Rose & Hough* 4869). Also northward and eastward along the Gulf and Atlantic coasts to North Carolina.

So far as the writer knows, *E. herbacea* has not been reported previously from Mexico. All the Mexican specimens appear to have been taken from shrubs, although in many parts of its range the species is truly herbaceous, the stems dying to the ground each year. The shrubby Florida form has been

recognized as a distinct species, *E. arborea* Small,[1] but it seems to differ from typical *E. herbacea* only in habit.

14. Erythrina flabelliformis Kearney, Trans. N. Y. Acad. 14: 32. 1894.

Erythrina purpusi T. S. Brandeg. Zoe 5: 158. 1903.

TYPE LOCALITY: Near Fort Huachuca, Arizona.

DISTRIBUTION: Sonora (*Rose, Standley & Russell* 12707, 12943; *Mearns* 335, 376; *Hartman* 41); Baja California (*Nelson & Goldman* 7241, 7353); Sinaloa (*Palmer* 771); Durango (*Palmer* 179); Jalisco (*Rose & Hough* 4774, 4811; *Rose* 2887; *Pringle* 7626, 8658); Zacatecas (*Rose* 3554, 3612); Guanajuato (*Rose & Hough* 4835); San Luis Potosí (*Palmer* 686); Hidalgo (*Nelson* 3880; *Pringle* 6839; *Rose & Hay* 5301); Morelos (*Rose & Hough* 4346a). Also in southeastern Arizona and southwestern New Mexico.

15. Erythrina goldmanii Standl., sp. nov.

Branches fruticose, gray, sparsely pilose when young, armed with numerous very stout, short spines; petioles stout, bearing few stout recurved spines; leaflets rounded-ovate or suborbicular, 3.5 to 9 cm. long, 3 to 6.5 cm. wide, rounded at the base, abruptly acuminate at the apex, thick, concolorous, pilose when young but soon glabrate, the venation rather prominently reticulate, the veins armed beneath with few stout recurved spines; calyx about 1 cm. long and broad, glabrous or nearly so, somewhat obliquely truncate; standard oblong-linear, about 8 cm. long and 1 cm. wide, the wings only slightly exceeding the calyx; fruit several-seeded, 12 to 16 cm. long, deeply constricted between the seeds; seeds 9 to 10 mm. long, scarlet.

Type in the U. S. National Herbarium, no. 470671, collected at San Vicente, Chiapas, Mexico, April 20, 1904, by E. A. Goldman (no. 870).

A fruiting specimen, collected at La Razón, Chiapas, by Goldman (no. 1039), also belongs here.

Erythrina goldmanii is closely related to *E. americana*, but seems distinct in its larger flowers, deeply constricted pods, and aculeolate leaflets.

16. Erythrina americana Mill. Gard. Dict. ed. 8. *Erythrina* no. 5. 1768.

Erythrina carnea Alt. Hort. Kew. 3: 8. 1789.

TYPE LOCALITY: Veracruz.

DISTRIBUTION: Oaxaca (*Pringle* 6271; *Rose & Hough* 4627; *Conzatti* 1676); Morelos (*Rose & Hough* 4346; *Rose & Hay* 5351); Distrito Federal (*Pringle* 6838); Veracruz (*Nelson* 79); Yucatán (*Millspaugh* 306; *Schott* 831); Chiapas (*Goldman* 834); Puebla (*Arsène* 2372).

A fruiting specimen from San Luis Potosí (*Nelson* 4386) may belong here, but it has very large, thin, subattenuate leaflets; the form of the calyx is not determinable. A flowering specimen from Veracruz (*Orcutt* 3398) probably should be referred to *E. americana*, although the flowers are smaller than is usual in the species.

Erythrina coralloides DC.,[2] based upon Sessé and Mociño's plate[3] of a Mexican plant, is probably a synonym. The illustration, however, is so imperfect that it is impossible to be certain that it does not represent *E. flabelliformis*.

Specimens of *E. americana* have been determined as *E. corallodendron* L. That is a West Indian species, distinguished by a broad standard and red and black seeds.

The vernacular name in Puebla is "colorín."

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[1] Fl. Southeast. U. S. 647. 1903.

[2] Prodr. 2: 413. 1825.

[3] Calq. Dess. Fl. Mex. *pl. 253.*

DOUBTFUL SPECIES.

ERYTHRINA DIVARICATA DC. Prodr. 2: 414. 1825.

Based upon one of Sessé and Mociño's plates,[1] and said to be a Mexican plant. The standard, as illustrated, is very broad, and the plate does not agree with any material seen by the writer.

ERYTHRINA LONGIPES DC. Prodr. 2: 413. 1825.

This, too, was based upon one of Sessé and Mociño's plates.[2] The copy of the plate seen by the writer is poorly drawn, and it is impossible to place the plant with certainty.

ERYTHRINA PRINCEPS Dietr. in Otto & Dietr. Allg. Gartenz. 2: 305. 1834.

Described from Mexico. Not identifiable from the description.

ERYTHRINA ROSEA Dietr. in Otto & Dietr. Allg. Gartenz. 2: 253. 1834.

Described from Mexico. Identity doubtful.

FOUR NEW SPECIES OF CAPPARIDACEAE FROM MEXICO AND CENTRAL AMERICA.

The family Capparidaceae is extensively represented in Mexico by both herbaceous and arborescent species. One of the most interesting of these is a new genus described a few years ago by Brandegee[3] under the name *Setohellanthus*. The most noteworthy of those here described are the two species of *Forchammeria*, a very abnormal genus, concerning whose systematic position there has been great difference of opinion. *Forchammeria* is confined to Mexico, and only three older species are known.

Capparis discolor Standl., sp. nov.

Tree, 8 to 10 meters high, glabrous throughout, the branchlets slender, blackish brown; petioles slender, 2 to 7.3 cm. long; leaf blades elliptic-oblong, 10.5 to 15 cm. long, 3 to 6 cm. wide, narrowed to the obtuse base, acutely acuminate at the apex, broadest at the middle, bright green above, sublustrous, the venation prominent, closely reticulate, pale and brownish beneath, the costa and lateral nerves salient; flowers few, white, in a terminal raceme, the pedicels 3.5 to 4.3 cm. long; calyx lobes deltoid, subacute, 2 mm. long, reflexed in anthesis; petals elliptic-oblong, 12 to 15 mm. long, obtuse; stamens numerous (about 40), the filaments 3 to 4.5 cm. long, tortuous or spirally coiled, glabrous, the anthers about 2 mm. long; ovary ellipsoid, the stipe about as long as the filaments.

Type in the U. S. National Herbarium, no. 385447, collected on the banks of the Río Petatlán, Guerrero, Mexico, altitude 450 meters, November 24, 1898, by E. Langlassé (no. 558).

A species of the section *Capparidastrum*. It differs from the previously described Mexican and Central American species of that group in the very long petioles, those of the other species being only 1 cm. long or often much shorter. *C. macrophylla* H. B. K., of Colombia, also has long petioles, but the leaf blades are much larger and proportionally broader.

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[1] Calq. Dess. Fl. Mex. *pl. 256.*

[2] Calq. Dess. Fl. Mex. *pl. 254.*

[3] Univ. Calif. Publ. Bot. 3: 378. 1909.

The collector states that the native name is "naranjillo," and that the flowers have the odor of orange blossoms.

Forchammeria macrocarpa Standl., sp. nov.

Branchlets yellowish, angulate, glabrous; petioles stout, 5 to 7 mm. long, minutely pilose or glabrate; leaf blades linear, 9 to 17.5 cm. long, 5 to 7 mm. wide, gradually attenuate to the base, rarely rounded, gradually narrowed to the acute or acutish apex, coriaceous, pale green, minutely hirtellous on the upper surface or glabrate, sulcate along the costa, densely short-pilose beneath, the costa prominent, the venation closely reticulate and prominent on both surfaces but more prominent beneath, the margin revolute; pistillate racemes few-flowered, glabrous, the pedicels in fruit stout, 10 to 15 mm. long; fruit ellipsoid-globose, about 1.8 cm. long, 1.2 to 1.5 cm. in diameter, glabrous.

Type in the U. S. National Herbarium, no. 841145, collected in the vicinity of San Luis Tultitlanapa, Puebla, Mexico, in 1908, by C. A. Purpus (no. 3417).

The only other species of *Forchammeria* with linear leaves is *F. watsoni* Rose, which ranges from Sinaloa to Baja California. In that the leaf blades are almost invariably emarginate at the base, less densely pubescent, and shorter, the fruiting pedicels are scarcely half as long, and the fruit is much smaller.

Forchammeria lanceolata Standl., sp. nov.

Shrub or small tree, 3 to 4.5 meters high, glabrous throughout, the branchlets slender, grayish, with numerous prominent pale lenticels; leaves simple, the petioles 4 to 6 mm. long, the blades mostly lanceolate but varying to ovate or lance-elliptic, 6 to 8.2 cm. long, 1.7 to 3.2 cm. wide, unequal at the obtuse base, acute or acuminate at the apex, coriaceous, pale green, lustrous, the costa salient beneath, the venation prominulous and closely reticulate on both surfaces; flowers axillary, solitary, fasciculate, or in very short few-flowered racemes, the pedicels stout, 6 to 8 mm. long; fruit broadly oval, 12 to 13 mm. long, 8 to 9 mm. in diameter.

Type in the Gray Herbarium, collected somewhere in Mexico, in 1891, by C. G. Pringle (no. 3728).

Readily distinguished from the other species by the form of the inflorescence and the shape of the leaves.

Steriphoma macrantha Standl., sp. nov.

Branchlets stout, densely ferruginous-pubescent with stellate hairs; petioles slender, 4 to 10.5 cm. long, finely stellate-pubescent; leaf blades elliptic or elliptic-ovate, 14.5 to 27 cm. long, 5 to 10 cm. wide, acute or acutish at the base, narrowed to the acuminate or long-acuminate apex, membranaceous, green above, glabrous, slightly paler beneath, very sparsely and minutely stellate-pubescent or glabrate; racemes about 15 cm. long, densely many-flowered, the bractlets linear-subulate, caducous; pedicels 3 to 4 cm. long; calyx about 2 cm. long, densely orange-pubescent with close stellate hairs, the lobes acute; petals 2 to 2.5 cm. long, narrowly oblanceolate, acute or acutish; filaments 7 to 8 cm. long; carpophore about 11 cm. long, glabrate; young fruit densely stellate-puberulent.

Type in the U. S. National Herbarium, no. 716626, collected in forests around Pinogana, southern Darién, Panama, April, 1914, by H. Pittier (no. 6561).

The flowers and leaves are nearly twice as large as in the other species of the genus.

Crataeva palmeri Rose, Contr. U. S. Nat. Herb. 1: 301. 1895.

This species is distinguished from all others of the genus by the copious pubescence. The type was collected at Armeria, Colima, but the species has

a rather wide range, as shown by the following specimens in the National Herbarium.

SINALOA: Guadalupe, 1910, *Rose, Standley & Russell* 14676. Culiacán, 1910, *Rose, Standley & Russell* 14846. San Blas, 1910, *Rose, Standley & Russell* 13210. Fuerte, 1910, *Rose, Standley & Russell* 13482.

DURANGO: Without locality, August 15, 1897, *Rose*.

JALISCO: Between Bolaños and Guadalajara, September 19, 1897, *Rose*.

GUERRERO: Paso de las Vacas, 1903, *Nelson* 6973.

COLIMA: Colima, 1897, *Palmer* 117.

NEW MIMOSACEAE FROM MEXICO.

Few, if any, families of plants are represented in Mexico by a larger number of woody species than the Mimosaceae. Their study is made difficult by the fact that there are no monographic accounts available except those published by Bentham many years ago. Although Bentham's work is almost unrivaled in accuracy and lucidity, recent botanical explorations in Mexico have shown that his monographs are now too incomplete to be generally useful. There is a recent account of the genus *Mimosa*, by Robinson,[1] but there is no adequate literature covering the other groups. Eight new species of *Acacia*, one of *Calliandra*, two of *Leucaena*, and four of *Pithecollobium* are described below.

Acacia polypodioides Standl., sp. nov.

Stems slender, brown or purplish, copiously hirsute with slender stiff hairs, also puberulent and furnished with numerous minute sessile glands, unarmed; petioles 1.5 to 2.5 cm. long, hirsute and puberulent, eglandular, the pinnae 4 to 7 pairs, 2.5 to 6 cm. long; leaflets 12 to 25 pairs, oblong, 2.5 to 6 mm. long, 1 to 2.5 mm. wide, divaricate or ascending, obliquely truncate at the base, obtuse or rounded at the apex, chartaceous, dark green above, sublustrous, densely puberulent, paler beneath, densely puberulent with curved hairs or glabrate, the costa prominent beneath, the lateral nerves also usually prominulous, the margin revolute or subrevolute; flowers capitate, pedicellate, the heads axillary or short-racemose, the peduncles 1 to 1.5 cm. long, hirsute or puberulent, bracteate above the middle; calyx 0.8 mm. long, broadly campanulate, obscurely lobate, minutely pilose or puberulent; corolla 3 times as long as the calyx or longer, the lobes oblong, acute, strigose; stamens long-exserted; fruit long-stipitate, flat, 3.5 to 5.5 cm. long, 7 to 10 mm. wide, acute or abruptly short-decurrent at the base, rounded at the apex and rostrate, densely puberulent, the valves very thin.

Type in the U. S. National Herbarium, no. 470796, collected at Chiapa, Chiapas, Mexico, May 18, 1904, by E. A. Goldman (no. 1001).

The following additional collections belong here:

OAXACA: Vicinity of San Juan Guichicovi, alt. 135 to 450 meters, *Nelson* 2726. Las Pilas (Cerro Espino), alt. 400 meters, *Reko* 3612, 3755.

NICARAGUA: Granada, *Baker* 2325.

Acacia polypodioides is a member of Bentham's series *Filicinae*, and is related to *A. filicioides* (Cav.) Trel., *A. angustissima* (Mill.) Kuntze, and allied species. It is distinguished by the pubescent corolla and the peculiar

[1] Proc. Amer. Acad. 33: 305–331. 1898.

pubescence of the leaflets. The most striking character, however, which gives it an appearance decidedly different from the related species, is found in the more or less revolute margins of the leaflets. The pinnae closely resemble the fronds of certain species of *Polypodium*, hence the specific name.

Acacia leucothrix Standl., sp. nov.

Unarmed shrub, the branches stout, subtortuous, grayish, densely white-hirsute; stipules 2 to 3 mm. long, linear, persistent; petioles 3 to 7 mm. long, hirsute, eglandular, the pinnae 3 or 4 pairs, 1 to 1.5 cm. long, the rachis densely hirsute; leaflets 9 to 14 pairs, oblong or linear-oblong, 2 to 4 mm. long, 1 mm. wide or narrower, obliquely rounded at the base, rounded at the apex, chartaceous, glabrous, green above, slightly paler beneath, the costa and lateral nerves prominulous beneath, the margin plane; flowers glabrous, capitate, pedicellate, the heads axillary, solitary, the peduncles 8 to 13 mm. long, hirsute, bracteate near the apex; calyx 0.8 mm. long, broadly campanulate, obscurely lobate; corolla 3 times as long as the calyx, the lobes oblong, acute; stamens very numerous, long-exserted; fruit short-stipitate, flat, 3.5 to 5 cm. long, 6 to 7 mm. wide, attenuate to the base, rounded to acute at the apex and rostrate, glabrous, the valves very thin, prominently reticulate-veined; seeds suborbicular, subcompressed, 3 mm. long, olivaceous or grayish.

Type in the U. S. National Herbarium, no. 471006, collected at San Dieguito, San Luis Potosí, Mexico, June, 1904, by Edward Palmer (no. 143). Also collected in lowland meadows near Tampico, Tamaulipas, September 3, 1902, by C. G. Pringle (no. 9717).

Closely allied to the plant referred by Small and others to *Acacia cuspidata* Schlecht., but strikingly different in pubescence.

Acacia laevis Standl., sp. nov.

Stems slender, terete, purplish brown, glabrous, unarmed; stipules 4 to 5 mm. long, linear, hirsute-ciliate; petioles 4 to 6 cm. long, without glands; pinnae 8 to 11 pairs, the leaflets about 30 pairs, oval or oblong-oval, 3 to 5.5 mm. long, 1.5 to 2.8 mm. wide, obliquely semicordate at the base, rounded or very obtuse at the apex, subcoriaceous, glabrous, green above, the venation mostly plane, paler beneath, the venation prominent and laxly reticulate, the margin plane, appressed-ciliolate; flowers capitate, pedicellate, the heads partly axillary and partly in a long naked raceme, the peduncles 2 to 2.5 cm. long, fasciculate, glabrous, the bracts small, linear; flowers glabrous, the calyx about 1 mm. long, companulate, truncate, the corolla 3 mm. long; stamens very numerous, long-exserted; fruit (immature) about 5.5 cm. long and 8 mm. wide, long-stipitate, attenuate to the base, rounded and rostrate at the apex, glabrous, glaucescent, the valves very thin.

Type in the U. S. National Herbarium, no. 296758, collected near Guadalajara, Jalisco, Mexico, July 21, 1902, by C. G. Pringle (no. 11354).

Closely related to *A. tequilana* S. Wats., and perhaps only a form of that species. In *A. tequilana*, however, the pinnae are only 3 to 5 pairs, and the leaflets several times as large and much broader in outline.

Acacia penicillata Standl., sp. nov.

Stems slender, terete, purplish and glaucescent, glabrous, unarmed; stipules linear, about 4 mm. long; petioles 4.5 to 9 cm. long, glabrous, eglandular, the pinnae 3 to 5 pairs; leaflets 15 to 30 pairs, oblong-oval, 6 to 14 mm. long, 3.5 to 8 mm. wide, obliquely semicordate at the base, broadly rounded at the apex, chartaceous, glabrous, dark green or at first glaucescent above, paler beneath, the venation prominulous-reticulate, the margin plane, appressed-ciliolate; flowers capitate, pedicellate, the heads arranged in a long raceme, the peduncles

fasciculate, 2.5 to 4 cm. long, glabrous, the bracts ovate-oblong, 4 to 5 mm. long; flowers glabrous, the calyx campanulate, shallowy lobate, glaucescent, the corolla 3.5 to 4 mm. long, the lobes ovate, obtuse; stamens very numerous, long-exserted; fruit long-stipitate, 6.5 to 8.5 cm. long, 0.9 to 1.3 cm. wide, straight, flat, acute or attenuate at the base, rounded and rostrate at the apex, glabrous, glaucescent, the valves thin, reticulate-veined; seeds brown-olivaceous, 5 mm. long, 4 mm. wide, compressed, smooth.

Type in the U. S. National Herbarium, no. 371953, collected on Cerro de San Felipe, Oaxaca, Mexico, altitude 2,000 meters, August 29, 1897, by C. Conzatti and V. González (no. 564).

The description of the fruit is based upon a specimen collected somewhere in Jalisco, in 1897, by J. N. Rose (no. 3008a). It is possible that this collection is not conspecific with the type.

Acacia penicillata, like *A. laevis*, described above, is closely related to *A. tequilana*, and perhaps only an extreme variant of it. The leaflets are so much smaller and narrower in the present plant, however, that it seems probable that it is specifically different.

Acacia conzattii Standl., sp. nov.

Branches slender, dark gray or brownish, with many small pale lenticels, hirtellous when young, armed with numerous pairs of stipular spines, these stout, straight, 0.8 to 3.3 cm. long, connate at the base; petioles slender, 1.5 to 2.5 cm. long, sparsely and minutely hirtellous or glabrate, with an excavate gland near the base; pinnae one pair, the leaflets 2 pairs (the lower leaflets alternate), oblong, oblong-obovate, or ovate, the terminal ones asymmetric, obtuse or rounded at the unequal base, rounded to acute at the apex, mucronulate, chartaceous, bright green, with prominent or prominulous venation, minutely pilose beneath along the costa but elsewhere glabrous; flowers spicate, sessile, the spikes dense, 2 to 5 cm. long, the peduncle very short, pilose, subtended at the base by a tubular-campanulate involucel; bractlets filiform-spatulate, minutely pilose; calyx half as long as the corolla, puberulent on the upper part; stamens numerous, long-exserted.

Type in the U. S. National Herbarium, no. 572217, collected at Estación Almoloyas, Oaxaca, Mexico, altitude 700 meters, March, 1907, by C. Conzatti (no. 1756).

Related to *Acacia pringlei* Rose, a species distinguished from the present plant by its short spines and large, proportionally broader leaflets.

Acacia sororia Standl., sp. nov.

Branches stout, terete, dark gray or blackish, with few scattered stout spines 2 mm. long, the young branches densely cinereo-puberulent; petioles stout, 6 to 15 mm. long, with a large excavate gland at the apex; rachis of the leaves densely pilose with minute whitish hairs, the pinnae 2 or 3 pairs; leaflets 1 or 2 pairs, sessile, obliquely oval, suborbicular, or flabellate-orbicular, 0.9 to 2.5 cm. long, 0.7 to 2 cm. wide, rounded and very unequal at the base, broadly rounded at the apex, thick-coriaceous, densely cinereo-puberulent, palmately nerved, the venation prominent, especially beneath; flowers spicate, sessile, the spikes 1.3 to 2 cm. long, the peduncles solitary, 1.5 to 2.5 cm. long, densely and minutely pilose; calyx densely and minutely pilose; fruit stipitate, 4.5 to 8 cm. long, 1.5 to 2.5 cm. wide, straight or slightly curved, densely cinereo-puberulent, the stipe stout, 5 to 10 mm. long, the valves thick and hard, abruptly decurrent into the stipe, rounded and rostrate at the apex, usually slightly constricted between the seeds, the edges thickened; seeds 3 or 4, ovate-orbicular, strongly compressed, about 13 mm. long and 11 mm. wide, dark castaneous.

Type in the U. S. National Herbarium, no. 453250, collected near Higuerillas, Querétaro, Mexico, August 23, 1905, by J. N. Rose, J. H. Painter, and J. S. Rose (no. 9761). Also collected at the same place, on the same date, by F. Altamirano (no. 1668).

The only closely related Mexican acacia is *A. reniformis* Benth., described from the same general region, a species not represented in the National Herbarium. It is possible that *A. sororia* is only a form of *A. reniformis*, but Bentham's excellent description and illustration indicate several important differences. *A. reniformis* is described as "undique glaberrima"; the flowers are pediceliate and glabrous; and the pinnae are only one or two pairs, each with a single pair of leaflets. The stipules, too, are large and reniform and persistent, while in the specimens of *A. sororia*, although some of the leaves are immature, the stipules have all fallen.

Acacia rosei Standl., sp. nov.

Branchlets brown, glabrous or sparsely puberulent, unarmed; petioles 2 to 4 cm. long, without a large gland but with numerous minute ones, these scarcely elevated; rachis of the leaf (when present) 1.5 to 2.5 cm. long, the pinnae 1 or 2 pairs, the leaflets 2 or 3 pairs, oval, oval-elliptic, or ovate-oval, the terminal ones slightly asymmetric, 2.5 to 5 cm. long, 1.4 to 2.5 cm. wide, rounded at the base, obtuse or rounded at the apex, chartaceous, with prominent or prominulous venation, green above, pale beneath, with a few short scattered hairs along the veins, elsewhere glabrous, the margin plane or subrevolute, ciliolate; flowers white, pedicellate, capitate, the heads few, paniculate, the penduncles shorter than the heads, puberulent; calyx puberulent; corolla glabrous, 3 times as long as the calyx; stamens very numerous; fruit slender-stipitate, straight, the valves very thin, 3 to 4.5 cm. long, 0.9 to 1.4 cm. wide, acute at the base, rounded and rostrate at the apex, brown, prominently reticulate-veined; seeds olivaceous, 3.5 to 4 mm. long, very slightly compressed.

Type in the U. S. National Herbarium, no. 636502, collected on Observatory Hill, Mazatlán, Sinaloa, Mexico, March 30, 1910, by J. N. Rose, P. C. Standley, and P. G. Russell (no. 13673).

Because of the pedicellate flowers and the absence of petiolar glands it is evident that this plant belongs to the series *Filicinae* of Bentham, but it is not closely related to any of the described species of that group. It somewhat resembles *A. crinita* T. S. Brandeg., a species of the same region, notable for its hispid stems.

Acacia vernicosa Standl., sp. nov.

Shrub, 1 to 2 meters high, viscid throughout with minute glands, these not at all elevated, the branches reddish brown, glabrous or nearly so, armed with numerous stipular spines, these stout, gray or white, 0.5 to 1.6 cm. long; petioles 3 to 7 mm. long, usually with a minute gland at the apex, the pinnae 1 or 2 (very rarely 3) pairs; leaflets 7 to 9 pairs, oval or oval-oblong, 1.2 to 3 mm. long, 0.5 to 1.2 mm. wide, rounded at each end, very thick, extremely viscid, glabrous, plane, the venation obscure; inflorescence capitate, dense, the peduncles axillary, 1 to 2 cm. long, usually glabrous, the small involucel borne at or above the middle; flowers glabrous, yellow; fruit 4 to 7 cm. long, 2.5 to 4 mm. wide, dehiscent, the valves thin, convex, brown, lustrous, more or less constricted between the seeds; seeds oblong, 4 to 6 mm. long, gray, spotted with black.

Type in the U. S. National Herbarium, no. 573848, collected in the vicinity of Santa Rosalia, Chihuahua, Mexico, altitude about 1,200 meters, June, 1908, by Edward Palmer (no. 385).

The following additional specimens are in the National Herbarium:

TEXAS: El Paso, *Jones* 4218, *Stearns* 77; in 1881, *Vasey*. Del Rio, June 13, 1891, *Dewey*. Kent, *Tracy & Earle* 411. Mouth of Pecos River, *Bailey* 269. Boquillas, *Bailey* 356.

NEW MEXICO: Tortugas Mountain, *Standley* 6446. Mesa west of Organ Mountains, *Wooton* 129; June 13, 1906, *Standley;* August 19, 1906, *Wooton & Standley*. La Luz Canyon, August 27, 1901, *Wooton*. Lake Valley, 1914, *Mrs. Ida M. Beals*. North of Emory Peak, *Mearns* 305. Without locality, *Vasey* 130. Big Hatchet Mountains, *Goldman* 1342. Eddy, *Bailey* 142.

ARIZONA: Near Fort Huachuca, *Wilcox* 415, 181. Huachuca Plains, *Lemmon* 156. San Bernardino Ranch, *Mearns* 711.

CHIHUAHUA: Near Chihuahua, *Palmer* 116; *Rose & Hough* 4216; *Pringle* 370. Sabina, *Rose & Hay* 5264. Between Casas Grandes and Sabinal, *Nelson* 6370.

ZACATECAS: Cañitas, *Rose & Hay* 5266.

QUERÉTARO: Near Higuerillas, *Rose, Painter & Rose* 9762. Between Vizarrón and Higuerillas, *Altamirano* 1696.

Part of the material distributed as *Wright* 1050 and *Mexican Boundary Survey* 327 also belongs to this species.

The material here segregated as *Acacia vernicosa* has always been referred to *A. constricta* Benth. The two species are closely related and do not have separate ranges, but at the same time they seem to be clearly distinct. In *A. constricta* the pinnae are 4 to 9 pairs, the leaves are usually pubescent, and the leaflets are almost twice as large and very slightly or not at all viscid. Bentham evidently had both plants before him when the description of *A. constricta* was written, for he states[1] that the leaves of the sterile branches are more luxuriant, puberulent, with 4 to 6 pairs of pinnae, while those of the flowering branches are glabrous, with usually 2 pairs of pinnae. The writer is unable to find any indication that the difference in number of pinnae may be explained in this way. All the numerous specimens examined are clearly of one form or the other, and the two species are found associated on only one sheet, consisting of specimens collected by Wright (no. 1050). In this case, and in view of the method by which Wright's collections were distributed, it seems not improbable that the two plants came from widely separated localities.

Because of the fact that Bentham's description was based upon material of both species, there is naturally some question as to which should be taken as the type. The writer has arbitrarily chosen for that purpose the form with numerous pinnae, which has a rather wider distribution than *A. vernicosa*. The specimen of the type collection (*Wright* 162) in the National Herbarium consists of a single fruiting branch of this form.

Calliandra conzattii Standl., sp. nov.

Branches slender, grayish; petioles 6 to 12 mm. long; pinnae a single pair, the rachis slender, 2 to 4 cm. long, densely hirtellous; leaflets 5 or 7, ovate, elliptic, or elliptic-oblong, 2.2 to 6.2 cm. long, 1 to 2.5 cm. wide, the lower ones much smaller than the upper, rounded or very obtuse at the oblique base, usually acute but sometimes obtuse at the apex, subchartaceous, bright green, puberulent or hirtellous on the costa, but elsewhere glabrous, the venation prominulous; flowers capitate, sessile, the heads sessile, solitary, the bracts puberulent; calyx 1 mm. long, campanulate, puberulent; corolla 4 to 5 mm. long, greenish, sparsely puberulent above, the lobes very short, ovate, obtuse; stamen tube short-exserted.

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[1] Pl. Wright. 1: 67. 1852.

Type in the U. S. National Herbarium, no. 763864, collected along the Río de Pilas, Distrito de Pochutla, Oaxaca, Mexico, altitude 300 meters, April 27, 1917, by C. Conzatti (no. 3191).

Not closely related to any species of *Calliandra* previously reported from Mexico. In the absence of fruit it is impossible to be certain that the plant is not a *Pithecollobium*, but if so it can not be referred to any of the described species.

Leucaena cuspidata Standl., sp. nov.

Branches slender, subterete, reddish brown, glabrous; stipules 2 to 3 mm. long, ovate or deltoid-ovate, cuspidate; petioles 1.5 to 2.5 cm. long, with a depressed circular gland at the apex, the rachis 3 to 8 cm. long, glabrous, the pinnae 5 to 9 pairs, 4 to 7 cm. long, their rachises glabrous or at first sparsely pilose; leaflets 15 to 40 pairs, sessile, ovate-oblong, most of them about 4.5 mm. long and 2.2 mm. wide, obliquely rounded or truncate at the base, rounded or obtuse and cuspidate at the apex, coriaceous, glabrous, dark green on the upper surface, the venation plane or prominulous, much paler beneath, the venation prominent, the margin plane; peduncles axillary, 2 to 3.5 cm. long, glabrous, involucellate above the middle, the flowers sessile in a globose head 7 to 8 mm. in diameter; calyx 2 mm. long, shallowly dentate, glabrous or puberulent above; corolla 3 mm. long, glabrous; anthers short-exserted, glabrous; immature fruit sessile or nearly so, attenuate to the base, glabrous.

Type in the U. S. National Herbarium, no. 463766, collected at Minas de San Rafael, San Luis Potosí, Mexico, May, 1911, by C. A. Purpus (no. 5183).

The coriaceous, cuspidate leaflets, with prominent venation, are quite unlike those of any of the described species.

Leucaena plurijuga Standl., sp. nov.

Branches brown, terete, minutely puberulent when young, furnished with numerous small pale lenticels; stipules deciduous; petioles 3.5 to 5 cm. long, minutely puberulent or glabrate, furnished near the base with a large depressed oblong gland, the rachis 3 to 9.5 cm. long, the pinnae 3 to 5 pairs, 5 to 10 cm. long, leaflets 5 to 9 pairs short-petiolulate, oblong or elliptic-oblong, sometimes oblong-obovate, usually subfalcate and asymmetric, 1.4 to 5.2 cm. long, 0.7 to 1.5 cm. wide, rounded and more or less oblique at the base, rounded or very obtuse at the apex and apiculate, chartaceous, green above, minutely appressed-pilose when young, the venation prominulous, paler beneath, sparsely and minutely pilose when young but soon glabrate, the venation prominent-reticulate, the margin plane; peduncles axillary, 3 to 3.5 cm. long in fruit; fruit oblong-linear, about 24 cm. long and 4.3 cm. wide, acute at the base, acuminate at the apex, glabrous, the valves thin, brown, the stipe about 2 cm. long; seeds about 1 cm. in greatest diameter, flat, brown, smooth, sublustrous.

Type in the U. S. National Herbarium, no. 246386, collected at Monte León, Michoacán, Mexico, November 12, 1892, by C. G. Pringle (no. 5352).

Also collected near Querétaro, August, 1906, by J. N. and J. S. Rose (no. 11173). A sterile specimen collected at Celaya, Guanajuato, in 1897, by J. N. Rose (no. 3073), is probably of this species.

Related to *Leucaena macrophylla* Benth. and *L. macrocarpa* Rose, both of which differ in their less numerous pinnae and leaflets.

Pithecollobium leiocalyx Standl., sp. nov.

Younger branches brownish, puberulent at first, with numerous pale lenticels, furnished with few short stout straight ascending spines; petioles slender, 1.2 to 1.7 cm. long, with a small crateriform gland near the base, the rachis 6 to

14 mm. long, minutely pilose; pinnae 2 or 3 pairs, the leaflets 3 to 5 pairs, oval to broadly oblong, 7 to 14 mm. long, 3.5 to 7 mm. wide, rounded and oblique at the base, rounded at the apex, chartaceous or subcoriaceous, pilose with very short subappressed hairs or finally glabrate, green above, pale beneath, the margin plane; flowers capitate, sessile, the heads few-flowered, the peduncles 2.5 to 3 cm. long; calyx 7 to 8 mm. long, glabrous, the lobes oblong-ovate, variable in length, ciliate; corolla about 1.5 cm. long, copiously white-pilose above the calyx, the lobes lance-oblong, acute, about half as long as the tube; stamens very long, the tube exserted 1 to 1.5 cm.

Type in the U. S. National Herbarium, no. 567316, collected at Salina Cruz, Oaxaca, Mexico, April 28, 1910, by C. R. Orcutt (no. 3288).

Although the material at hand is rather imperfect, this plant seems sufficiently distinct to deserve recognition as a species. It is related, evidently, to *P. acatlense* Benth., but in that the calyx is densely pilose, the peduncles are very short, and the numerous leaflets are much smaller and proportionately narrower.

Pithecollobium calostachys Standl., sp. nov.

Tree, 4.5 to 6 meters high or larger, the younger branches green or grayish, conspicuously lenticellate, pubescent at first, armed with numerous short, stout, ascending or subdivaricate spines; petioles 0.6 to 4.5 cm. long, slender, glabrous or nearly so, bearing a low gland at the apex; pinnae one pair, the rachis 0.6 to 2.5 cm. long, the leaflets a single pair to each pinna, oblique, ovate to oblong or oval-ovate, 3 to 11 cm. long, 1.3 to 6 cm. wide, rounded or obtuse at the base and very unequal, narrowed to the obtuse or acute apex, thick-chartaceous, bright green, glabrous or nearly so, the venation prominent or prominulous on both surfaces; inflorescence spicate, the spikes dense, 2.5 to 7.5 cm. long, on long or short peduncles, axillary or usually paniculate, the rachis densely puberulent, the bracts linear-lanceolate, 2 to 3 mm. long, divaricate or reflexed, puberulent; calyx 2.5 to 3 mm. long, tubular-campanulate, pilose with minute, mostly appressed hairs; corolla 5 to 6 mm. long, sericeous, the lobes oblong-ovate, acute, about half as long as the tube; stamen tube much exserted, usually twice as long as the corolla or longer; fruit curved or coiled, glabrous, the valves 1.5 to 2 cm. wide, contorted after dehiscence, convex, very thick (6 to 8 mm.) and hard.

Type in the U. S. National Herbarium, no. 463247, collected in the vicinity of Tampico, Tamaulipas, Mexico, altitude about 15 meters, April, 1910, by Edward Palmer (no. 307).

The following additional specimens are in the National Herbarium:

TAMAULIPAS: Tampico, *Pringle* 7681; May, 1910, *Palmer*. Gómez Farias, *Palmer* 282.

SAN LUIS POTOSÍ: Tancanhuitz, alt. 360 meters, *Nelson* 4372. Without locality (perhaps from Tamaulipas), *Palmer* 1061.

VERACRUZ: Carrizal, *Goldman* 702, 703.

TABASCO: Mayito, *Rovirosa* 112.

OAXACA: Chivela, *Orcutt* 3189.

CHIAPAS: Tapachula, *Nelson* 3852.

This plant has always been confused with *P. lanceolatum* (Humb. & Bonpl.) Benth. (*P. ligustrinum* Benth.), a species described from Venezuela. The latter ranges northward from Venezuela and Colombia to Mexico, but in Mexico it is confined chiefly to the west coast, while *P. calostachys* is most abundant on the east coast. *P. lanceolatum* is distinguished from the species here described as new by the very short, triangular bracts and the included or short-exserted stamen tube. Its leaflets, too, are usually more obtuse at the apex, and the

valves of the fruit, in the few fruiting specimens examined, are much narrower and thinner.

Pithecollobium macrosiphon Standl., sp. nov.

Young branches green or gray, puberulent at first, roughened by numerous pale lenticels, furnished with short ascending straight spines; petioles stout, 1.5 to 4.8 cm. long, with a low crateriform gland at the apex; pinnæ a single pair, the rachises 4 to 13 mm. long; leaflets a single pair, short-petiolate, the blades obliquely elliptic, elliptic-oblong, or elliptic-oval, 3 to 7 cm. long, 1.5 to 3.8 cm. wide, rounded or very obtuse at the base and unequal, obtuse or very obtuse at the apex, mucronulate, subcoriaceous, brownish, especially beneath, glabrous, the venation prominent or prominulous on both surfaces; flowers spicate, the spikes 5 to 6 cm. long, very dense, the bracts deltoid, minute; calyx 1 to 1.2 mm. long, campanulate, puberulent; corolla 6 to 6.5 mm. long, minutely sericeous, the lobes oblong-ovate, acute, about half as long as the tube; stamen tube exserted 11 to 15 mm.; valves of the fruit (a single imperfect fruit seen) 1.5 to 1.8 cm. wide, very thick and hard, somewhat contorted after dehiscence; seeds 1.2 to 1.5 cm. long, compressed, dark brown, with a very large fleshy aril.

Type in the U. S. National Herbarium, no. 252338, collected between Tumbala and El Salto, Chiapas, Mexico, October 29, 1895, by E. W. Nelson (no. 3398).

Related to *P. lanceolatum* (Humb. & Bonpl.) Benth., and to *P. calostachys*, described above, but distinguished from both by the very short calyx. The stamen tube, also, is much longer than in any of the related species.

Pithecollobium confine Standl., sp. nov.

Densely branched shrub, 1 to 1.5 meters high, or sometimes a small tree, with very stout, grayish, flexuous or contorted branches, armed with numerous short stout straight spines; leaves clustered on short lateral spurs, the petiole 4 to 15 mm. long, puberulent, bearing a low gland at the apex between the lowest pair of pinnae, the pinnae usually one but sometimes 2 pairs, the rachis, if any, very short, the leaflets 3 to 5 pairs, oblong-oval to rounded-oval or broadly cuneate-obovate, 4.5 to 10 mm. long, 2.5 to 7 mm. wide, rounded or very obtuse at the unequal base, rounded to truncate at the apex, subcoriaceous, puberulent when young but usually soon glabrate, the venation commonly prominulous; inflorescence capitate, the heads globose, the peduncles mostly solitary and axillary, 5 to 10 mm. long, puberulent; calyx 1 to 1.2 mm. long, campanulate, puberulent; corolla 2.5 mm. long, purplish, the tube glabrous, the lobes ovate, obtuse, puberulent, less than half as long as the tube; stamens numerous, the tube included; fruit about 10 to 14 cm. long and 2.5 to 3 cm. wide, densely puberulent when young, black in age, the outer coat breaking into numerous irregularly angulate plates, the valves becoming very thick, hard, and woody, usually curved, convex, tardily separating; seeds usually 5 to 10, variously compressed, 10 to 18 mm. in greatest diameter, dark brown, smooth.

Type in the U. S. National Herbarium, no. 638396, collected at Cape San Lucas, Baja California, Mexico, March 23, 1911, by J. N. Rose (no. 16339).

The following additional specimens have been examined:

BAJA CALIFORNIA: Cape San Lucas and vicinity, *Xantus* 33. Los Angeles Bay, *Palmer* 548. La Paz, *Palmer* 86. San José del Cabo, *Rose* 16444. Catalina Island, *Rose* 16837. Cerralvo, *Rose* 16896. Agua Colorada to Cerro Colorado, *Nelson & Goldman* 7316.

This plant has been referred to *P. flexicaule* (Benth.) Coult., but in that the inflorescence is spicate and the pinnae are usually more numerous. The latter species is known in Mexico only from Tamaulipas and Nuevo León.

The common name is said to be "palo fierro."

TWO NEW SPECIES OF CALOPHYLLUM FROM MEXICO.

The genus *Calophyllum* of Linnaeus is composed of about 50 species, natives chiefly of tropical Asia and Africa. Vesque, in his monograph of the genus,[1] reports only four species from the Western Hemisphere: *C. calaba* Jacq., of the West Indies; *C. brasiliense* Camb., ranging from Brazil to Panama; *C. lucidum* Benth., of the Guianas; and *C. pachyphyllum* Triana & Planch., of Brazil. The recent discovery of two species in southern Mexico indicates that the range of the genus extends farther north than had been believed previously.

Calophyllum rekoi Standl., sp. nov.

Tree, 20 to 25 meters high, the branchlets stout, angulate and plicate-striate, pruinose-puberulent at first but soon glabrate, the internodes elongate; petioles stout, 2.2 to 3.2 cm. long, sulcate on the upper side, rounded beneath; leaf blades elliptic or narrowly elliptic-oblong, 10.5 to 16 cm. long, 4.3 to 6 cm. wide, obtuse or acute at the base, acutish or obtusely short-acuminate at the apex, coriaceous, lustrous above, the costa impressed near the base, prominent toward the apex, dull beneath, the costa salient, the lateral nerves very numerous, approximate, parallel, prominulous, the margin thickened; racemes axillary, mostly 7-flowered, 2.5 to 3.5 cm. long, short-pedunculate, the rachis and pedicels puberulent, the latter stout, 2.5 to 5 mm. long; bracts minute, caducous; polygamous flowers 8 mm. broad, the sepals 4, reflexed, oval, more or less cucullate, the 2 inner ones petaloid, the petals wanting; stamens 7 to 12, the anthers 1.5 to 2 mm. long; ovary globose, the stigma peltate, irregularly lobed.

Type in the U. S. National Herbarium, no 842605, collected at Cafetal Concordia (Cerro Espino), Oaxaca, Mexico, November 18, 1917, by B. P. Reko (no. 3557).

This species is related to *C. brasiliense*, but is distinguished by the long petioles (twice as long as the latter species) and by the puberulent inflorescence. The vernacular names are given as "cimarrón" and "cedro cimarrón."

Doctor Reko furnishes the following additional notes regarding the plant: "A most beautiful tree, about 20 to 25 meters high, growing very commonly here in nearly all the cafetales, at an altitude of about 600 to 800 meters, and highly appreciated on account of its excellent wood, which resembles mahogany. It is hardly possible to believe that such a tree should still be unknown in Mexico, and only the great difficulty in discovering the small, white flowers so high up in the foliage of the tree would account for it. The tree, when cut, produces a yellow, sticky sap, something similar to the 'chicle,' and is used as 'leche María' by the Indians. The flowers are very fragrant. The fruit is spheric, of the size of a walnut (4 to 5 cm.)."

Calophyllum chiapense Standl., sp. nov.

Branches thick, grayish, the branchlets very stout, pruinose-puberulent at first but soon glabrate, densely leafy; petioles stout, 8 to 10 mm. long, sulcate on the upper surface, rounded beneath; leaf blades elliptic or obovate-elliptic, 6.5 to 8.5 cm. long, 2.2 to 4 cm. wide, acute or cuneate at the base, obtuse or acutish at the apex, coriaceous, glabrous, lustrous above, the costa sulcate near the base, prominulous toward the apex, the lateral nerves very numerous,

[1] In DC. Monogr. Phan. 8: 529–610. 1893.

approximate, parallel, prominulous, slightly paler beneath and dull, the costa salient, the lateral nerves prominulous, the margin thickened; racemes axillary, mostly 5-flowered, short-pedunculate, about 2.5 cm. long, the rachis and pedicels obscurely puberulent, the latter 2 to 4 mm. long, stout, opposite, the bracts minute, deciduous; polygamous flowers 8 to 10 mm. broad, the sepals 4, more or less cucullate, minutely scaberulous on the margins; stamens numerous.

Type in the U. S. National Herbarium, no. 860362, collected at Los Pinos, near Tonalá, Chiapas, Mexico, December 13, 1906, by G. N. Collins and C. B. Doyle (no. 59).

Calophyllum chiapense is related to some of the forms of *C. brasiliense*, but is distinguished by the smaller, relatively narrower leaf blades, these being usually broadest slightly above the middle. In the latter species, too, the racemes are usually much longer and the flowers smaller.

The present species is known in Chiapas as "leche de María." The wood is used for making cart wheels.

THREE NEW SPECIES OF EBENACEAE FROM TROPICAL AMERICA.

In the last paper of this series the writer described five new species of *Maba* and *Diospyros* from Mexico. The three following ones are based upon additional material now available for study.

Maba nicaraguensis Standl., sp. nov.

Tree, 4.5 to 6 meters high, with a short trunk and dense rounded crown; branches grayish, the branchlets densely puberulent; petioles stout, 5 to 6 mm. long, densely fulvous-pilose with short hairs; leaf blades oblong or oblong-obovate, 5.5 to 8 cm. long, 2.2 to 3.3 cm. wide, rounded to cuneate at the base, obtuse or acutish at the apex, coriaceous, grayish green above, velvety-pilose with short grayish hairs, the costa plane, the lateral veins inconspicuous, brownish beneath, copiously pilose with short slender hairs, the costa and lateral veins prominent, the latter about 7 on each side, irregular, the transverse veins prominulous, laxly reticulate, the margin plane or subrevolute; fruit globose, about 2.2 cm. in diameter, umbonate, densely fulvous-sericeous near the apex, subsessile, solitary; calyx trilobate to the middle, about 2 cm. broad, densely fulvous-tomentulose, the lobes broadly rounded, reflexed.

Type in the U. S. National Herbarium, no. 862725, collected on dry hills, Granada, Nicaragua, February 16, 1903, by C. F. Baker (no. 629).

This is the first species of *Maba* to be reported from Central America. It is related, perhaps, to *M. albens* (Presl) Hiern, a species with thin leaves, canescent-tomentulose beneath.

Maba rekoi Standl., sp. nov.

Branchlets brown, rimose, densely fulvous-pilose when young with short hairs, glabrate in age; petioles stout, 4 to 5 mm. long, hirtellous; leaf blades oval or oval-oblong, 10 to 11 cm. long, 5 to 5.5 cm. wide, rounded at the base, very obtuse or rounded at the apex, chartaceous, bright green above, minutely pilose or glabrate, the costa impressed, grayish green beneath, minutely pilose with spreading hairs, the costa and lateral veins very prominent, the latter 6 or 7 on each side, arcuate, the transverse veins prominent, laxly reticulate, the margin subrevolute; fruit globose, 1.5 to 2 cm. in diameter, glabrous, short-pedunculate, solitary; calyx deeply 3-lobate, 1.5 to 2 cm. broad, densely puberulent, the lobes broadly rounded, reflexed.

Type in the U. S. National Herbarium, no. 842523, collected at Puerto Angel, Oaxaca, Mexico, September 28, 1917, by B. P. Reko (no. 3429).

The leaves are larger than in any other Mexican species. *Maba latifolia* Standl. is closely related but is distinguished by its small, coriaceous, rugose leaves.

Diospyros oaxacana Standl., sp. nov.

Branches grayish, the branchlets slender, densely brownish-pilose, the pubescence persistent; petioles stout, 2 to 3 mm. long, densely pilose; leaf blades oblong, obovate-oblong, or elliptic-oblong, 4 to 7.5 cm. long, 2.8 to 4 cm. wide, rounded or obtuse at the base, rounded at the apex, chartaceous, green above, velutinous-pilose with short hairs or in age glabrate, paler beneath, densely short-pilose, the margin subrevolute; pistillate flowers solitary, the fruiting peduncles about 1 cm. long; pistillate calyx 5-parted to the base, short-pilose, the lobes linear-oblong, 1 to 1.5 cm. long, widest toward the apex, obtuse or rounded; immature fruit subglobose, 1.5 cm. in diameter, glabrous.

Type in the U. S. National Herbarium, no. 381771, collected at Cuicatlán, Oaxaca, Mexico, altitude 600 meters, September 16, 1899, by V. González (no. 982).

Because of the glabrous fruit it is probable that this species belongs to the section *Danzleria*. Two Mexican species, *D. palmeri* Eastw. and *D. blepharophylla* Standl. (*D. ciliata*, A. DC.), have glabrous fruit (and ovary), but they differ from the present plant in having glabrous leaves.

THE PANAMANIAN SPECIES OF LEIPHAIMOS.

The species of this genus form one of the most interesting groups of tropical American plants. They are parasites or saprophytes, without chlorophyll, resembling in general appearance the Orobanchaceae or even some of the saprophytic Orchidaceae and Burmanniaceae. They have a comparatively simple structure, but vary widely in the form of the flowers, the shape of the corolla and calyx and the structure of the stamens affording excellent characters for specific segregation. The flowers are usually small, the largest, perhaps, being those of one of the Panamanian species, *L. pulcherrimus*, whose corolla has a length of nearly 3.5 cm. and a breadth of 2 to 2.5 cm. The corolla is commonly bright-colored, of various shades of blue, yellow, or purplish red, but is often white or cream-colored.

Until recently the species of *Leiphaimos* have been included in the genus *Voyria*. The treatment adopted here is that followed by Gilg in his account of the Gentianaceae in Engler and Prantl's Natürlichen Pflanzenfamilien.[1] *Voyria*, as limited by Gilg, is characterized by the dehiscence of the capsule, which is apical rather than lateral as in *Leiphaimos*. In the former the pollen grains are elongate and curved, while in *Leiphaimos* they are ovoid. Gilg remarks that the two genera are far removed from each other in many points. To *Voyria* Gilg refers 3 species, all from the Guianas. These form a homogeneous group, closely resembling one another in habit.

[1] 4: 50–108. 1895.

Leiphaimos was based by Schechtendal and Chamisso in 1831 upon a plant collected by Schiede and Deppe upon rotten logs in the forests of Papantla, Mexico. The original species, *Leiphaimos parasitirus*, has the most northern range and possibly the widest distribution of any plant of the genus, occurring from southern Mexico to the West Indies and the keys of Florida. Five other generic names have been published which, for the present, are considered synonyms of *Leiphaimos*. *Ciminalis* of Rafinesque[1] contained 3 species which are said to be synonyms of *Leiphaimos aphyllus*, the earliest published species of the group, described by Jacquin in 1760 as *Gentiana aphylla*.[2]

Leianthostemon of Miquel[3] was based upon two closely related species with corymbose inflorescence. Miquel describes two other genera at the same time, *Disadena*[4] and *Pneumonanthopsis*.[4] The first, under which he described a single species, *D. flavescens*, is the name to be used for those species having glanduliferous ovaries, should it ever be deemed necessary to resegregate them as a distinct genus. *Pneumonanthopsis* consisted of two species of rather diverse form. *Biglandularia* of Karsten,[5] like *Disadena*, was based upon a plant with gland-bearing ovaries, *B. azurea* (*Leiphaimos azureus* Gilg), one of the species listed here from Panama.

It seems to the writer that it will probably be necessary later to resurrect some of these names and to form several additional genera. The plants composing the genus vary greatly in general appearance as well as in floral structure, variations more conspicuous than those separating most of the genera of the Gentianaceae. So little material exists in herbaria, however, and this often incomplete, that it does not seem wise to attempt generic segregations at present. From the nature of the plants the species must have a localized distribution, and few of them are known from more than a single collection. They are said to be represented by only a few individuals, and these usually widely separated, in a given locality.

Leiphaimos has a rather wide distribution in tropical America, extending from Mexico and the keys of Florida, through the West Indies, to Bolivia and central Brazil. Two species have been described from tropical western Africa.[6]

There is at least one good monograph of the genus, and many of the species have been illustrated. Grisebach, in his Genera et Species Gentianearum, in 1839, lists seven species, with keys and descriptions. In the next year Splitgerber published a revision of the group, de-

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[1] Fl. Tellur. 3: 19. 1836.
[2] Enum. Pl. Carib. 17.
[3] Stirp. Surin. Sel. 147. 1850.
[4] Stirp. Surin. Sel. 150. 1850.
[5] Linnaea 28: 416. 1856.
[6] Baker, Kew Bull. 1894: 25, 26. 1894.

scribing four new species,[1] which are well illustrated with hand-colored plates. The best monograph of *Voyria* (including *Leiphaimos*) is that of Progel in Martius's Flora Brasiliensis,[2] where twenty-one species are keyed and described, and six figured. Gilg, in Engler and Prantl's Natürlichen Pflanzenfamilien,[3] divides the genus into five sections or subgenera, under which he enumerates most of the species, seven of which are figured.

Of the eight species here listed from Panama, six are described as new. The large number of new forms is not remarkable, since the material studied comes from a more northern region than any in which a considerable number of species have been collected. One species, described from Panama by Griesbach, is known to the writer only from description, while two Panamanian specimens seem to belong to a species described by Karsten from Venezuela.

KEY TO THE SPECIES.

Calyx limb wanting. Corolla blue, the tube 3 times as long as the lobes; scales one on each stem ..... 7. L. simplex.

Calyx limb present.

Ovary bearing 2 stipitate glands at the base; corolla blue ..... 8. L. azureus.

Ovary without glands; corolla not blue.

Corolla lobes obtuse.

Filaments many times longer than the anthers; flowers long-peduncu-late; corolla tube gradually dilated upward ..... 6. L. pulcherrimus.

Filaments about as long as the anthers; flowers subsessile; corolla tube cylindric, slightly dilated in the throat ..... 1. L. Truncatus.

Corolla lobes acute.

Flowers numerous, in a compact terminal corymb ..... 4. L. albus.

Flowers solitary, or few and the stems fastigiately branched.

Anthers appendaged at the base; stems fastigiately branched at the base ..... 5. L. thalesioides.

Anthers not appendaged; stems usually simple and one-flowered.

Anthers subsessile; corolla tube twice as long as the calyx or shorter ..... 2. L. stellatus.

Anthers on long slender filaments; corolla tube 3 times as long as the calyx ..... 3. L. pittieri.

1. Leiphaimos truncatus Standl., sp. nov.

Stems very stout, erect, 3 to 3.5 cm. high, fasciculately branched at the base, the branches simple or again branched, closely covered with scales but these not imbricate; scales opposite, 3 to 5 mm. long, rounded or acutish at the apex, connate for half or two-thirds their length, the sinus between the two bracts very broad, the bracts ascending; pedicels very short, 4 mm. long or less, 1.5 mm. thick; calyx cylindric-campanulate, 6 mm. long, 3.5 mm. in diameter, the 5 teeth broadly ovate, obtuse, minutely ciliolate, scarcely 1 mm. long; corolla apparently pale yellow, the tube cylindric, 3 cm. long, 2.5 mm.

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[1] Tijdschr. Nat. Gesch. 7: 129–139. *pls. 1, 2.* 1840.
[2] 6[1]: 219–226. *pl. 60, figs. 3–5, pl. 61, figs. 1–3.* 1865.
[3] 4[3]: 104–105. *fig. 46. A–M, S–Y.* 1895.

in diameter, slightly dilated above but somewhat contracted at the mouth; corolla lobes 5, spreading or ascending, oblong, obtuse, 7 mm. long; filaments stout, about 1 mm. long, inserted 3 mm. below the mouth of the corolla; anthers almost rotund in outline, deeply bilobate, exappendiculate; style slender, 2.2 cm. long; stigma capitate, 1.5 mm. broad, obscurely papillose on the upper surface, smooth beneath; ovary sessile, oblong in outline, rounded at the base, truncate at the apex; ovules ovoid, not appendaged.

Type in the U. S. National Herbarium, no. 888489, collected on the high hills back of Puerto Obaldía, San Blas Coast, Panama, altitude 50 to 200 meters, August, 1911, by H. Pittier (no. 4306a).

Of the subgenus *Euleiphaimos* Gilg and related to *L. spathaceus* and *L. calycinus*. Both these species have blue or lilac corollas with acute lobes and more foliaceous, less completely connate cauline bracts. ***Leiphaimos truncatus*** may be distinguished from all other species by the truncate ovary. The type material is fragmentary, but it is sufficient to show all the important characters.

2. Leiphaimos stellatus Standl., sp. nov.

Stems very slender, erect, 1-flowered, succulent, terete, pinkish, glabrous, 4 to 12 cm. high; bracts opposite, 4 or 5 pairs, distant, oblong-linear or lance-oblong, 5 to 8 mm. long, with long-acuminate subulate tips, united for about half their length; peduncles slender, 11 to 23 mm. long; calyx pinkish or nearly colorless, ebracteate, 5 to 12 mm. long, 5-lobate to about the middle, the tube cylindric-campanulate, 1 to 2 mm. in diameter, the lobes linear-lanceolate, long-acuminate, with subulate tips; corolla bright orange-yellow, the tube slender, cylindric, 12 to 17 mm. long, slightly dilated in the throat, the lobes narrowly lanceolate to narrowly elliptic, 8 to 14 mm. long, 1.5 to 3 mm. wide, acuminate, rather conspicuously parallel-nerved, especially in old specimens, puberulent on the upper surface near the base, the pubescence extending to the throat of the tube; anthers subsessile, oblong, distinct, not appendaged; style slender, 6 to 8 mm. long, glabrous; stigma capitate, minutely tuberculate on the upper surface; ovary oblong, abruptly acute or acuminate, sessile; ovules ovoid.

Type in the U. S. National Herbarium, no. 679407, collected in forests around Puerto Obaldía, San Blas Coast, Panama, altitude 50 meters or less, August, 1911, by H. Pittier (no. 4294).

This belongs to Gilg's subgenus *Euleiphaimos*, and is closely related to *L. tenuiflorus* (Griseb.) Miquel. That species, however, has a short calyx, only one-fourth as long as the corolla tube, aud subulate cauline scales.

3. Leiphaimos pittieri Standl., sp. nov.

Stems very slender, 5 to 12 cm. high, erect, terete, glabrous, purplish, simple or once dichotomous above, the branches when present strictly erect; cauline bracts 4 or 5 pairs, distant, lanceolate or linear-lanceolate, acuminate to a subulate tip, 5 mm. long, erect or appressed, purplish, free nearly to the base; peduncles slender, 6 to 14 mm. long; calyx purple, ebracteate, cleft about halfway to the base, 5 mm. long, 1.5 mm. in diameter, the tube narrowly campanulate, the lobes lanceolate or lance-linear, long-acuminate to a subulate tip; corolla lilac or pale blue, the tube very slender, 14 to 16 mm. long, slightly dilated in the throat and there 3 to 4 mm. wide; corolla lobes narrowly oblong or oblong-lanceolate, acuminate or abruptly acuminate, 5 to 6 mm. long; anthers narrowly oblong, 1 mm. long, not appendaged, on very slender, slightly puberulent filaments, these inserted about one-third the distance above the base of the tube; style slender, 12 mm. long, puberulent; stigma capitate, slightly tuberculate on the upper surface; ovary oblong or lance-oblong in outline, 2.5 mm. long, obtuse, sessile; ovules ovoid, not appendaged.

Type in the U. S. National Herbarium, no. 679405, collected in the forests around Puerto Obaldía, San Blas Coast, Panama, altitude 50 meters or less. August, 1911, by H. Pittier (no. 4292).

Of the subgenus *Euleiphaimos*, but not closely related to any of the described species. The blue corolla and long filaments enable one to distinguish it readily.

4. Leiphaimos albus Standl., sp. nov.

Whole plant white; stems slender, erect, sometimes decumbent at the base, 6 to 14 cm. high, succulent, terete, glabrous, simple up to the inflorescence, or rarely with a short erect branch; cauline scales 4 or 5 pairs, 2 to 4 mm. long, distinct almost to the base, lanceolate, long-acuminate; inflorescence a several or many-flowered terminal flat-topped corymb, 1.2 to 3 cm. broad, 1.5 to 3 cm. high, the flowers all sessile or the terminal one short-pediceled; bracts usually present at the base of each branch and commonly 2 at the base of the calyx, small, thin, lanceolate, acuminate; calyx 3 to 4 mm. long, cleft halfway to the base, the tube campanulate, the lobes linear-subulate, the sinuses obtuse; corolla tube slender, cylindric, dilated in the throat, 10 mm. long, about 1 mm. thick; corolla lobes 5, ascending or spreading, trianguar-lanceolate, 2 to 2.5 mm. long, acute or acuminate; anthers subsessile, oblong, 1.25 mm. long, deeply bilobate, each lobe prolonged at the base into a short subulate appendage; style slender, 3 mm. long; stigma capitate, 0.75 mm. in diameter, yellowish, tuberculate on the upper surface; ovary 6 mm. long, linear-lanceolate in outline, gradually tapering upward.

Type in the U. S. National Herbarium, no. 679408, collected in forests around Puerto Obaldía, San Blas Coast, Panama, altitude 50 meters or less, August, 1911, by H. Pittier (no. 4295).

ADDITIONAL SPECIMEN EXAMINED:

PANAMA: In forests, Loma de la Gloria, near Fató (Nombre de Dios), Province of Colón, alt. 10 to 100 meters, August, 1911, *Pittier* 4094.

This is undoubtedly a member of the subgenus *Leianthostemon*. That group has been described as having long filaments, but the discovery of this plant necessitates a modification of its characterization in this respect. *Leiphaimos albus* is related to *L. corymbosus* (Splitg.) Gilg, a species with a lilac corolla and long anthers.

5. Leiphaimos thalesioides Standl., sp. nov.

Stems fastigiately branched at the base, the branches simple up to the inflorescence or with one or two erect branches, purplish yellow, terete, succulent, glabrous; cauline scales usually 3 pairs, distant, thin, distinct nearly to the base or sometimes united for half their length, lanceolate or lance-ovate, acuminate to a subulate apex, glabrous; inflorescence a congested terminal corymb, composed of about 6 flowers, or the corymb sometimes fastigiately branched; pedicels stout, 2 to 4 mm. long, subtended at the base by bracts similar to those of the stems; calyx 5 mm. long, ebracteate, cleft halfway to the base, the tube campanulate, 2 to 2.5 mm. in diameter, the lobes linear-lanceolate, long-acuminate, glabrous; corolla yellow, the tube 13 to 16 mm. long, slender-cylindric, 1 to 1.5 mm. in diameter, dilated in the throat; corolla lobes 4 mm. long, oblong, acute or abruptly acute, more or less puberulent; anthers subsessile, oblong, appendaged at the base; style 6 mm. long, rather stout, glabrous; stigma capitate, 1 mm. in diameter, coarsely tuberculate on the upper surface; capsule narrowly oblong, sessile, acute, 5 to 7 mm. long.

Type in the U. S. National Herbarium, no. 679499, collected on the hills of Sperdi, near Puerto Obaldía, San Blas Coast, Panama, altitude 20 to 200 meters, September, 1911, by H. Pittier (no. 4351).

This, like *L. albus*, is a somewhat anomalous representative of the subgenus *Leianthostemon*, differing from the described species of that group in its subsessile anthers. It is not very closely related to any of them in its other characters.

6. Leiphaimos pulcherrimus Standl., sp. nov.

Stems slender, simple below, sparsely fastigiate-branched above, erect, 8 to 13 cm. high, the branches erect, terete, purplish; scales of the stem opposite, the pairs 8 to 17 mm. apart, rather thick, broadly oblong or oblong-oval, rounded or obtuse at the apex and ciliolate, united for about half their length; peduncles slender, 13 to 22 mm. long; calyx ebracteate, purplish, narrowly campanulate, 5 to 6 mm. long, 2.5 to 3 mm. in diameter, the 5 teeth broadly ovate or semi-orbicular, rounded at the apex, ciliolate, about 1 mm. long; corolla bright yellow, the tube 2.1 to 2.6 cm. long, gradually dilated from above the base to the mouth, about 2 mm. in diameter at the base and 5 to 7 mm. at the mouth, minutely papillose within, the lobes 5, oval or oval-oblong, rounded at the apex and minutely puberulent, about 9 mm. long and 5 to 6 mm. wide, spreading, papillose at the base; filaments slender, inserted about 1 cm. above the base of the corolla, about 15 mm. long, minutely retrorse-pilose; anthers narrowly oblong, 2 mm. long, with short slender appendages at the base, coherent; pollen grains ovoid; style slender, 16 mm. long, glabrous; stigma capitate, short-conic, 1.5 mm. broad, nearly smooth on the upper surface; ovary sessile, narrowly oblong, 6 to 7 mm. long, obtuse at the apex.

Type in the U. S. National Herbarium, no. 679430, collected on the high hills back of Puerto Obaldía, San Blas Coast, Panama, altitude 50 to 200 meters, August, 1911, by H. Pittier (no. 4306).

This doubtless belongs to the subgenus *Leianthostemon*, of which four species are known. It has little to do with any of the described species of this group, however, differing from all of them in its fastigiately branched stems, obtuse calyx lobes, long filaments, and large flowers of peculiar form. It has larger flowers, probably, than any other species of the genus.

7. Leiphaimos simplex (Griseb.) Standl.

Voyria simplex Griseb. in Seem. Bot. Voy. Herald 170. 1854.

TYPE LOCALITY: Woods near Ancón Hill, Panama; type collected by Seemann (no. 665).

Stem simple, slender, one-flowered, with a solitary abbreviated scale inserted at the middle; bracts and calyx limb none; corolla salverform, its cylindric-campanulate tube twice longer than the oblong obtuse blue lobes; ovary short-stipitate.

This species is not represented in the recent collections. According to Hemsley [1] it was collected also by Hayes (no. 236) in damp woods near Empire Station. The species is said by Grisebach to be closely related to *Voyria nuda*, a plant described by Splitgerber from Surinam.[2] The latter belongs to the subgenus *Disadena*, but Grisebach does not indicate that the ovary of *Voyria simplex* is glanduliferous; so perhaps it may not belong to this group.

8. Leiphaimos azureus (Karst.) Gilg in Engl. & Prantl, Pflanzenfam. 4²: 105. 1895.

Biglandularia azurea Karst. Linnaea 28: 417. 1856.

TYPE LOCALITY: "Crescit locis humidis umbrosis, altitudine 1,000 metr. radicibus Galactodendri adhaerens ad pedem septentrionalem montis 'Cumbre de Valenzia' prope Puerto Cabello," Venezuela.

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[1] Biol. Centr. Amer. Bot. 2: 344. 1882.

[2] Tijschr. Nat. Geschied. Phys. 7: *pl. 1, fig. 2*. 1840.

RANGE: In damp or wet woods, Panama to Venezuela.
ILLUSTRATION: Engl. & Prantl, Pflanzenfam. 4^2: *fig. 46, L, M.*
SPECIMENS EXAMINED:

PANAMA: Loma de la Gloria, near Fató (Nombre de Dios), Province of Colón, near sea level, *Pittier* 4081. Forests around Puerto Obaldía, San Blas Coast, near sea level, *Pittier* 4293.

This species is distinguished from all others so far found in Panama by the presence of two small but conspicuous stipitate glands at the base of the ovary. It is upon this character that Karsten based his generic name *Biglandularia*. It is very probable that when more complete material of the various members of the genus has been secured, it will be found that *Disadena*, which antedates *Biglandularia*, is a valid genus. Four species of this section are known, but they do not form a homogeneous group. One of them has no calyx, while of the other three two have appendaged anthers and one has unappendaged ones.

Leiphaimos azureus is a slender plant with few or numerous slender, very succulent stems, each of which is furnished with two or several pairs of thin bracts. The roots often form a dense mass, and are fleshy and knotted. The flowers are small, the corolla limb being about 1 cm. broad, resembling those of some species of *Primula*. The resemblance of the corolla to those of some of the primroses led Baker to apply the name *primuloides* to one of the African species.[1]

A NOTE CONCERNING THE GENUS RANDIA, WITH DESCRIPTIONS OF NEW SPECIES.

The genus *Randia* is one of the larger groups of the family Rubiaceae and is represented in North America by about 40 species. Other members of the genus occur in South America, and a still larger number in the tropics of the Old World. The group is not a particularly well-marked one, being very closely related to *Gardenia*. Indeed, most of the genera of the tribe Gardenieae are seperated by rather artificial characters.

In 1873 Hooker[2] removed from *Randia* a group of American species, associating them in a new genus which he named *Basanacantha*. *Randia* was limited to the species with perfect flowers, the flowers of *Basanacantha* being dioecious. The latter group was characterized also by certain habital peculiarities, none of them of very great importance. As the genus *Basanacantha* was originally delimited it included a homogeneous group of species, but Urban later added two West Indian plants of very different habital characters, plants which in general appearance are very like the common species of *Randia* proper. After study of all the North American species it seems to the writer that the two genera are separated by too artificial a character, and that they should be united. The species of *Basanacantha* listed below are, therefore, transferred to the genus *Randia*. For the other North American species of the group the proper combinations have already been made.

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[1] Kew Bull. **1894**: 26. 1894.
[2] In Benth. & Hook. Gen. Pl. **2**: 82.

Randia cinerea (Fernald) Standl.

Genipa (?) cinerea Fernald, Proc. Amer. Acad. **33**: 93. 1897.

Randia lasiantha Standl.

Basanacantha lasiantha Standl. Contr. U. S. Nat. Herb. **18**: 134. 1916.

Randia pittieri Standl.

Basanacantha pittieri Standl. Contr. U. S. Nat. Herb. **18**: 134. 1916.

Randia portoricensis (Urban) Standl.

Basanacantha portoricensis Urban, Symb. Antill. **5**: 507. 1908.

Randia spinifex (Roem. & Schult.) Standl.

Ehretia spinifex Roem. & Schult. Syst. Veg. **4**: 806. 1819.

Gardenia sagraeana A. Rich. in Sagra, Hist. Cuba **11**: 10. 1850.

Randia subcordata Standl.

Basanacantha subcordata Standl. Contr. U. S. Nat. Herb. **18**: 133. 1916.

Randia calycosa Standl., sp. nov.

Unarmed tree, 3 to 10 meters high, the branches grayish, the branchlets stout, densely leafy; stipules 2 to 3 mm. long, rounded-ovate, mucronate, brown, glabrous; petioles 2 to 5 mm. long, glabrous; leaf blades obovate, elliptic-ovate, or oblong-elliptic, 3.5 to 6.5 cm. long, 1.5 to 2.8 cm. wide, attenuate or acuminate at the base, acute or acutish at the apex, chartaceous, glabrous above, lustrous, the venation prominulous, slightly paler beneath, sparsely pilose along the costa with long whitish appressed hairs or glabrate, the lateral veins inconspicuous, usually 4 on each side, the margin plane or subrevolute; flowers perfect (?), terminal, solitary, sessile, 5-parted; calyx tube and limb 1.4 cm. long, densely sericeous-strigose, the lobes foliaceous, rhombic-orbicular, subapiculate, 6 to 9 mm. long and broad, sparsely strigose outside, glabrous within; corolla salverform, the tube 2.7 to 3.2 cm. long, sericeous-strigose outside, the lobes lance-oblong, 1.7 to 2.5 cm. long, acute, glabrate outside, glabrous within, the throat naked; anthers included; fruit oval-globose, 3 to 3.8 cm. long, 2 to 2.5 cm. thick, smooth or obscurely costate, sparsely strigillose or glabrate, the pericarp very thick and hard; seeds numerous, rhombic-orbicular, 8 to 9 mm. long.

Type in the U. S. National Herbarium, no. 677593, collected in humid forest around Los Siguas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, altitude about 1,700 meters, March, 1911, by H. Pittier (no. 3198).

A very distinct species, not closely related to any other described from North America. The broad, foliaceous calyx lobes are the most noteworthy character.

Randia laevigata Standl., sp. nov.

Unarmed shrub, about 2 meters high, the branchlets brownish, rimose, glabrous or sparsely puberulent when young, the internodes often elongate; stipules connate at the base, triangular-ovate, about 1 cm. long, acute, cuspidate-mucronate, thick, glabrous or puberulent outside, glabrous within; leaves sessile or short-petiolate, the blades obovate-oblong or rhombic-ovate, 14 to 23 cm. long, 5 to 8.5 cm. wide, acuminate or long-attenuate at the base, acute or acuminate at the apex, chartaceous or membranaceous, bright green and lustrous above, puberulent when young, glabrate in age, the venation plane or impressed, paler beneath, densely and minutely pilose when young, glabrate in age except along the veins, the lateral veins prominent, 10 to 13 on each side, nearly straight, ascending at an angle of 45° or more; calyx glabrous, the tube prolonged beyond the ovary, the 5 lobes triangular-subulate, 2 to 3 mm. long; fruit subglobose, about 6.5 cm. long, umbonate, glabrous, borne on a terminal peduncle about 3.5 cm. long; seeds oval or suborbicular, 8 to 10 mm. long, yellowish brown.

Type in the U. S. National Herbarium, no. 635870, collected in the Sierra de Álamos, Sonora, Mexico, March 18, 1910, by J. N. Rose, P. C. Standley, and P. G.

Russell (no. 13051). Specimens from Acaponeta, Tepic, collected in 1897 by J. N. Rose (nos. 1488 and 3166) apparently belong here also.

Randia laevigata appears to be related to *R. formosa* (Jacq.) K. Schum., but the latter is well distinguished by its small leaves, sericeous-strigose ovary, and small fruit.

Randia pleiomeris Standl., sp. nov.

Branches slender, brownish, strigose when young, with mostly elongate internodes, bearing few pairs of stout ascending spines 1 to 1.5 cm. long, the leaves crowded on very short lateral spurs; stipules ovate-deltoid, about 2 mm. long, strigose or glabrous outside, pilose within at the base; petioles slender, 4 to 8 mm. long, glabrous or sparsely puberulent; leaf blades cuneate-orbicular or broadly obovate, 0.8 to 1.8 cm. long, 0.7 to 1.3 cm. wide, cuneate or abruptly decurrent at the base, rounded or truncate at the apex, membranaceous, glabrous above, sparsely appressed-pilose beneath along the costa, the lateral veins obscure; flowers terminal, solitary, sessile; calyx tube appressed-pilose, 2.5 mm. long, the limb glabrous, 2 mm. long, the lobes usually 7, linear, about 4 mm. long, sparsely ciliate; corolla salverform, glabrous outside, the tube slender, 2.5 cm. long, the 5 lobes ovate or ovate-oblong, about 1 cm. long, acuminate, glabrous within, the throat naked; anthers subexserted.

Type in the U. S. National Herbarium, no. 888490, collected at Santa Rosa, Guatemala, altitude 900 meters, May, 1892, by Heyde and Lux (J. D. Smith, no. 3166, in part).

The type collection was distributed as "*Randia Xalapensis*, Mart. et Gal.," with the note, "Flores steriles pollicares et ultra, fertiles vix 4-lineares." It is evident, however, that two distinct plants, not closely related, have been confused. *Randja pleiomeris* is the plant with large flowers. It appears to be related to *R. longiloba* Hemsl., of Yucatán, but in the latter the tube of the corolla is only as long as the lobes and the leaves are glabrous beneath.

Randia guatemalensis Standl., sp. nov.

Branches reddish brown, the branchlets stout, subdivaricate, densely puberulent when young, bearing at the apex 2 stout spines 4 to 8 mm. long, the leaves fasciculate in the axils; stipules ovate-deltoid, 1 to 1.5 mm. long, mucronate, strigillose outside; petioles 1 to 11 mm. long, scaberulous or glabrate; leaf blades mostly oblong-elliptic, sometimes elliptic, broadly obovate, broadly ovate, or suborbicular, 0.6 to 5.5 cm. long, 0.6 to 2.8 cm. wide, rounded to attenuate at the base, usually obtuse or acutish at the apex, often mucronulate, subcoriaceous, lustrous above, the costa prominent, puberulent along the costa, paler beneath, minutely pilose along the costa, the lateral veins obscure, 5 to 8 on each side, the margin plane; flowers perfect, 5-parted, axillary, solitary, sessile; calyx 1.5 mm. long, scaberulous, the lobes minute, triangular-subulate, less than half as long as the limb; corolla 4 to 5 mm. long, glabrous outside, acuminate in bud, the tube cylindric, the throat densely white-barbate, the lobes broadly ovate, apiculate, shorter than the tube; anthers subexserted.

Type in the U. S. National Herbarium, no. 472930, collected near Secanquim, Alta Verapaz, Guatemala, altitude 550 meters, May, 1905, by H. Pittier (no. 271).

Related to *Randia erythrocarpa* Krug & Urban, of Haiti, and *R. mitis* L. (*R. aculeata* L.), a widely distributed species of tropical America. The former differs in its large corolla, and the latter in its long corolla lobes.

Randia malacocarpa Standl., sp. nov.

Shrub, about 1 meter high, the branches dark reddish brown or grayish, the branchlets divaricate, stout, short-pilose when young, bearing at the apex 2 stout spines 0.6 to 1.5 cm. long, the leaves mostly crowded on very short

lateral spurs; stipules ovate, acuminate, 1 to 2 mm. long, thick, brownish, glabrous or short-pilose outside, glabrous within; petioles stout, 3 mm. long or shorter, short-pilose; leaf blades mostly ovate, ovate-oblong, or narrowly elliptic-oblong, rarely rounded-obovate, 2.5 to 5.5 cm. long, 0.8 to 2.5 cm. wide, acute to long-attenuate at the base, or rounded or obtuse and short-decurrent, usually acute at the apex, sometimes obtuse or rounded, often subapiculate, membranaceous or chartaceous, puberulent or scaberulous above, densely short-pilose beneath, the lateral veins inconspicuous, 3 to 5 on each side; flowers perfect, terminal, sessile, solitary or clustered; calyx densely short-pilose, the tube about 2 mm. long, the 5 lobes linear or oblong, 1 to 1.5 mm. long, acute or obtuse, spreading; corolla salverform, sparsely hirtellous outside, the tube 3 to 4 mm. long, ampliate above, the 5 lobes rounded, 2 to 3 mm. long, glabrous within, the throat naked; anthers subexserted; fruit globose, 1.2 cm. in diameter (or larger?), smooth, densely velvety-pilose, the pericarp very thick and hard; seeds numerous.

Type in the U. S. National Herbarium, no. 302274, collected near Acaponeta, Tepic, Mexico, July 30, 1897, by J. N. Rose (no. 3298).

The following additional specimens belong here:

SINALOA: Mazatlán, in thickets, April, 1910, *Rose, Standley & Russell* 13833. Rosario, April, 1910, *Rose, Standley & Russell* 14526.

TEPIC: Acaponeta, July, 1897, *Rose* 1514; April, 1910, *Rose, Standley & Russell* 14454.

Allied to *R. xalapensis* Mart. & Gal., but easily recognized by the copious spreading pubescence of the fruit.

Randia rosei Standl., sp. nov.

Branches brownish, with short internodes, short-pilose when young with appressed hairs, armed with numerous pairs of stout divergent spines 1 to 2 cm. long, the leaves mostly crowded on very short lateral spurs; stipules about 2 mm. long, rounded-ovate, obtuse, mucronate, thick, brownish, glabrous; petioles slender, 1 to 5 mm. long, ciliate; leaf blades suborbicular, rhombic-oval, or rhombic-ovate, 1 to 2.5 cm. long, 0.7 to 1.8 wide, rounded or obtuse at the base and short-decurrent, rounded or very obtuse at the apex, sometimes apiculate, herbaceous, bright green, ciliate, short-pilose beneath along the veins, elsewhere glabrous, the lateral veins inconspicuous, 5 or 6 on each side, ascending or subdivaricate; flowers perfect, terminal, solitary, sessile; calyx tube about 2 mm. long, pilose, the 5 lobes linear, 3 to 6 mm. long, ciliate; corolla salverform, glabrous outside, the tube 10 to 12 mm. long, ampliate above, the throat naked, the 5 lobes ovate-oval, 8 mm. long, 5 to 7 mm. wide, obtuse or acutish, apiculate, glabrous within; anthers 1.5 to 2 mm. long, included; fruit (very immature) subglobose, rather sparsely pilose.

Type in the U. S. National Herbarium, no. 300395, collected at Rosario, Sinaloa, Mexico, July 7, 1897, by J. N. Rose (no. 1551).

Near *R. canescens* Greenm., a species with densely pilose leaves and pilose corolla.

NINE NEW SPECIES OF HOFFMANNIA FROM MEXICO AND CENTRAL AMERICA.

Hoffmannia obtains its greatest development in North America. Recent monographic study indicates that at least 33 species occur on this continent, chiefly in Mexico and Central America, only two being natives of the West Indies. They must be of very local distribution,

for it is unusual to find in herbaria more than two or three specimens of any species.

Hoffmannia rotundata Standl., sp. nov.

Branchlets stout, subterete, glabrate, the internodes elongate; leaves opposite, the petioles stout, 1.5 to 3 cm. long, sparsely villosulous or glabrate, the blades broadly oval-elliptic, 10.5 to 16 cm. long, 6 to 7.5 cm. wide, acutish or short-acuminate at the base, very obtuse to acute at the apex and short-acuminate, membranaceous, dark green above, glabrous, paler beneath, ferruginous-villosulous, especially along the veins, the costa very stout, prominent, the lateral veins slender, strongly arcuate, about 12 on each side; cymes dense, sessile, with numerous flowers, these sessile or short-pedicellate; calyx sparsely ferruginous-villous or glabrate, 2 to 2.5 mm. long, the tube turbinate, angulate, the lobes deltoid, acute, shorter than the tube; corolla 6 to 8 mm. long, glabrous or with a few scattered hairs, the lobes lance-oblong, acutish, twice as long as the tube.

Type in the herbarium of the Missouri Botanical Garden, no. 765057, collected on Cerro del Boquerón, Chiapas, Mexico, June, 1914, by C. A. Purpus (no. 7268, in part).

Of the previously described species, *H. tuerckheimii* Donn. Smith, of Guatemala, is most closely related to the present plant. That species, however, has a long-villous corolla, fewer flowers, and subcoriaceous leaves.

Purpus's no. 7268 is evidently a mixture. Specimens of this collection in other herbaria are referred to *Hoffmannia chiapensis*, described below.

Hoffmannia uniflora Standl., sp. nov.

Branches fruticose, slender, brownish, the branchlets very slender, subterete, bifariously rufous-puberulent, the internodes short; stipules deltoid, acutish, about 1 mm. long, deciduous; leaves opposite, the petioles slender, 3 to 6 mm. long, sparsely puberulent, the blades narrowly oblong-elliptic or lance-elliptic, 4 to 8 cm. long, 1 to 2 cm. wide, attenuate to the base, acuminate or long-acuminate at the apex, membranaceous, deep green above, glabrous, paler beneath, sparsely puberulent along the veins or glabrate, the lateral veins very slender, about 6 on each side, arcuate-divaricate or ascending; flowers mostly solitary, sometimes in 2-flowered cymes, the pedicels slender, 3 to 6 mm. long, glabrate; calyx lobes linear, acute, in fruit 2 to 3 mm. long; fruit oval, 6 to 7 mm. long, 5 to 6 mm. wide, costate, glabrous; seeds minute, brownish, coarsely reticulate.

Type in the U. S. National Herbarium, no. 941382, collected near Cobán, Alta Verapaz, Guatemala, altitude 1,100 meters, February, 1908, by H. von Türckheim (no. II. 2107).

Related to *H. mexicana* (Link, Klotzsch & Otto) Hemsl., but in that the calyx lobes are minute and broadly deltoid.

Hoffmannia panamensis Standl., sp. nov.

Shrub or small tree, 2 to 4 meters high, glabrous throughout, the branches slender, subterete, the internodes elongate; leaves opposite, the petioles slender, 1 to 3.5 cm. long, the blades oblong, elliptic-oblong, or lance-oblong, 7 to 15.5 cm. long, 2.5 to 5.5 cm. wide, acute or very obtuse at the base, long-acuminate or cuspidate-acuminate at the apex, membranaceous, bright green above, pale yellowish green beneath, the lateral veins prominent, about 11 on each side; cymes sessile, few or many-flowered, dense, the flowers 4-parted, short-pedicellate or subsessile; calyx 2.5 mm. long, the lobes triangular or lance-triangular, acute, minute at anthesis, sometimes elongate in fruit; corolla yellow, 7 to 8 mm. long, the lobes lance-oblong, acutish, twice as long as the tube or longer; ovary 2-celled.

Type in the U. S. National Herbarium, no. 677443, collected in forests along the Río Ladrillo, above El Boquete, Chiriquí, Panama, altitude 1,200 to 1,300 meters, March, 1911, by H. Pittier (no. 3056).

Hoffmannia calycosa Donn. Smith, of Guatemala, is a near relative, but is distinguished by the long, linear calyx lobes.

Hoffmannia tonduzii Standl., sp .nov.

Shrub, the branchlets slender, subterete, glabrous, the internodes elongate; stipules minute; leaves opposite, the petioles stout, 2 to 6 mm. long, glabrous, the blades oval-elliptic or broadly obovate-elliptic, 6.5 to 12 cm. long, 3.5 to 5.5 cm. wide, acute or cuneate at the base, acuminate or cuspidate-acuminate at the apex, with an obtuse acumen, membranaceous, glabrous, dark green above, paler beneath, the lateral veins slender, about 8 on each side, subarcuate; cymes few-flowered, sessile or subsessile, the pedicels in fruit up to 5 mm. long, some of the flowers usually sessile; calyx glabrous or sparsely puberulent, the tube turbinate, angulate, 2.5 mm. long, the lobes narrowly triangular, 1 to 1.5 mm. long, acute; corolla 6 to 7 mm. long (perhaps longer), glabrous outside, the lobes lance-oblong, acute, twice as long as the tube.

Type in the U. S. National Herbarium, no. 941386, collected in forests of Las Nueltas, Tucurrique, Costa Rica, altitude 635 to 700 meters, May, 1899, by A. Tonduz (no. 13373).

Distinguished from *H. panamensis*, described above, by the few-flowered inflorescences, elongate pedicels, turbinate calyx tube, and proportionately broader leaf blades.

Hoffmannia orizabensis Standl., sp. nov.

Low shrub, the branches slender, decumbent, rufous-villosulous when young; leaves opposite, the petioles slender, 0.5 to 2 cm. long, rufous-villosulous or puberulent, the blades elliptic or elliptic-oblong, 3 to 8 cm. long, 1 to 3 cm. wide, acute at the base, acute or subacuminate at the apex, membranaceous, deep green on the upper surface, rufous-villosulous along the costa, conspicuously white-striolate, paler beneath, rufous-villosulous along the veins, the costa slender, prominent, the lateral veins slender, prominulous, 7 to 9 on each side, ascending, strongly arcuate; inflorescence 4-flowered, the peduncles slender, about 1 cm. long, rufous-villosulous, the pedicels slender, 2 to 3 mm. long; calyx sparsely villosulous, the tube oblong-turbinate, 2.5 mm. long, the lobes narrowly triangular, acute; corolla 12 to 13 mm. long, sparsely villosulous outside, the throat ampliate, the lobes ovate-oval, obtuse or rounded, half as long as the tube; anthers obtuse.

Type in the Gray Herbarium, collected in the region of Orizaba, Veracruz or Puebla, Mexico, in 1855, by Mueller (no. 1359).

Hoffmannia affinis Hemsl., of Costa Rica, known to the writer only from the original description, must be closely related to the present plant, but it is described as having a corolla only 6 to 8 mm. long, with lobes slightly longer than the tube.

Hoffmannia decurrens Standl., sp. nov.

Shrub, the branches grayish, the branchlets stout, subangulate, rufous-villosulous or glabrate, the internodes mostly elongate; stipules deltoid, minute; leaves opposite, the petioles stout, 0.5 to 3 cm. long, villosulous or glabrate, the blades oblong-oblanceolate or narrowly elliptic, 7.5 to 16.5 cm. long, 1.8 to 4.5 cm. wide, long-attenuate to the base, acute or short-acuminate at the apex, membranaceous, dark green above, glabrous, paler beneath, villosulous along the veins or finally glabrate, the lateral veins slender, arcuate-ascending, 8 to 10 on each side; cymes usually many-flowered, sessile or short-pedunculate,

the branches rufous-villosulous, the flowers subsessile or the pedicels sometimes 5 mm. long, the bracts minute; calyx rufous-villous or villosulous, the tube obovoid, 2.5 to 3 mm. long, the lobes triangular or narrowly triangular, 1 to 1.5 mm. long, obtuse; corolla 8 to 9 mm. long, white, tinged with rose, sparsely villous or villosulous, the lobes oblong, obtuse, slightly shorter than the tube; fruit oval, about 6 mm. long, villosulous; seeds about 1 mm. long, brown, dull, coarsely reticulate.

Type in the U. S. National Herbarium, no. 392077, collected in forests of Santa Rosa Copey, Costa Rica, altitude 1,800 to 2,000 meters, April, 1898, by A. Tonduz (no. 12230). Tonduz's numbers 11671 and 11909, from the same locality, collected in February, 1898, represent the same species.

Hoffmannia cuneatissima Robinson, described from Morelos, Mexico, is a similar plant, but in it the calyx lobes are minute and the lobes of the corolla longer than the corolla tube.

Hoffmannia confertiflora Standl., sp. nov.

Branches slender, obtusely quadrangular, glabrous, the internodes elongate; stipules caducous; leaves opposite, the petioles 5 to 10 mm. long, glabrate, the blades elliptic or oblong-elliptic, 6 to 11.5 cm. long, 2.5 to 4 cm. wide, acuminate or long-attenuate at the base, acuminate at the apex, membranaceous, deep green above, copiously ferrugino-villous, paler beneath, villosulous along the veins, the lateral veins prominent, about 11 on each side, arcuate-divaricate; cymes sessile, few-flowered, dense, the flowers sessile or short-pedicellate, 4-parted; calyx 2 to 2.5 mm. long, glabrous, the lobes minute, broadly deltoid; corolla 9 mm. long, glabrous, the lobes lance-oblong, acute, equaling the tube; anthers 3 mm. long.

Type in the U. S. National Herbarium, no. 888491, collected at San Miguel Uspantán, Quiché, Guatemala, altitude 2,100 meters, April, 1892, by Heyde and Lux (J. D. Smith, no. 3169).

Readily distinguished from related species by the villosulous upper surface of the leaves.

Hoffmannia angustifolia Standl., sp. nov.

Suffrutescent, glabrous throughout, the branches stout, subterete, the internodes short; leaves opposite, the petioles 1 to 2.5 cm. long, the blades very narrowly elliptic, 10.5 to 20 cm. long, 3.5 to 5 cm. wide, long-attenuate at the base, long-attenuate or subacuminate to the obtuse apex, subchartaceous, bright green above, slightly paler beneath, the lateral veins prominent, 12 to 14 on each side, arcuate-ascending at an obtuse angle; cymes sessile, few or many-flowered, dense, shorter than the petioles, the flowers sessile or nearly so, 4-parted; calyx tube 2 mm. long, the lobes lance-oblong, 1 to 1.5 mm. long, obtuse, minutely ciliolate; corolla 12 mm. long, glabrous, the lobes linear-oblong, obtuse, ascending, equaling or slightly shorter than the tube; anthers 3 mm. long.

Type in the U. S. National Herbarium, no. 888492, collected at Acatepeque, Department of Zacatepequez, Guatemala, altitude 1,290 meters, March, 1892, by John Donnell Smith (no. 2747).

Hoffmannia psychotriaefolia (Benth.) Griseb., of Costa Rica, is closely related, but is separated by its minute, deltoid calyx lobes and broad, cuspidate-attenuate leaf blades.

Hoffmannia chiapensis Standl., sp. nov.

Branches stout, obtusely quadrangular, glabrous, the internodes mostly elongate; stipules small deltoid; leaves opposite, the petioles slender, 1.7 to 6 cm. long, glabrous, the blades elliptic or elliptic-oblong, 10 to 19 cm. long, 4 to 7.5 cm. wide, acuminate or attenuate at the base, acuminate at the apex, often falcate-acuminate, membranaceous, bright green above, glabrous, pale beneath, sparsely

villosulous along the costa or glabrate, the lateral veins prominent, about 14 on each side, arcuately subdivaricate; cymes sessile or short-pedunculate, few or many-flowered, about 2 cm. long, the flowers 4-parted, the pedicels slender, 1 to 6 mm. long; calyx tube oblong, glabrous, 2 mm. long, the lobes lance-triangular or oblong, obtuse, 1 to 2.5 mm. long, sparsely puberulent; corolla 10 to 12 mm. long, yellow, glabrous, the lobes narrowly oblong, obtuse, about equaling the tube; anthers 3 mm. long, yellow; fruit oblong, 5 mm. long or larger.

Type in the U. S. National Herbarium, no. 567526, collected on Cerro del Boquerón, Chiapas, Mexico, June, 1914, by C. A. Purpus (no. 7268, in part). Specimens of the same collection in the Gray Herbarium and the herbarium of the New York Botanical Garden also belong here.

Hoffmannia conzattii Robinson and *H. strigillosa* Hemsl. are both close relatives, but have the leaves glabrous or strigillose beneath and of different outline.

A specimen of Purpus's no. 7268 in the herbarium of the Missouri Botanical Garden is the type of *Hoffmannia rotundata*, described above.

NEW RUBIACEAE OF VARIOUS GENERA FROM NORTH AMERICA.

Of the species of this group discussed here the most interesting is the new *Duroia*, for this genus has been known previously only from South America. It is a characteristic example of the numerous genera added to the known flora of North America by recent explorations in Panama and Costa Rica. The writer has already described species of *Cassupa*[1] and *Stachyarrena*[2] from Panama, two other genera previously believed to be exclusively South American.

Alseis Schott; Spreng. Syst. Veg. 4: Cur. Post. 404. 1827.

A collection made by Dr. G. F. Gaumer at Buena Vista Xbac, Yucatán (no. 1043), is of unusual interest, because it belongs undoubtedly to this genus. The material collected consists of leafless fruiting branches, and so, unfortunately, it is impossible to determine what species is represented. *Alseis* is represented by four known species, three of them natives of Brazil and Venezuela, the other, *A. blackiana* Hemsl., of Colombia and Panama. The Yucatán collection, consequently, represents a large extension of range for the genus. So far as may be judged from the fruit the Yucatán plant may be the same as the Panamanian one. Doctor Gaumer gives the Maya name as "cacaoché."

Hamelia costaricensis Standl., sp. nov.

Branchlets stout, angulate, densely and minutely fulvous-puberulent; stipules small, deltoid; leaves opposite, the petioles slender, 1.2 to 3.5 cm. long, minutely puberulent, the blades oval-ovate or oval-elliptic, 8 to 19 cm. long, 4 to 10.5 cm. wide, rounded and short-decurrent at the base, very acute or subacuminate at the apex, membranaceous, minutely puberulent along the veins, the venation prominent beneath, the lateral veins about nine on each side, subarcuate; inflorescence pedunculate, branched, the branches puberulent, the flowers sessile, secund; calyx densely puberulent, the tube oblong, 3.5 mm. long, the lobes subu-

[1] Contr. U. S. Nat. Herb. 18: 135. 1916.
[2] Contr. U. S. Nat. Herb. 18: 142. 1916.

late, 1 to 1.5 mm. long; corolla densly fulvous-puberulent in bud, becoming glabrate, the tube 2.2 cm. long, ampliate upward, 6 to 7 mm. wide in the throat, the lobes rounded, 5 mm. long, spreading.

Type in the U. S. National Herbarium, no. 764417, collected near San Mateo, Costa Rica, August, 1890, by P. Biolley (no. 2656).

The material available is scanty but sufficient to show the essential characters of the plant. *H. xorullensis* H. B. K. is perhaps the nearest ally, being distinguished by a larger corolla which is copiously pilose or villosulous outside.

Hamelia panamensis Standl., sp. nov.

Tree, 4.5 meters high, with a trunk 10 cm. in diameter, the bark gray, the branchlets grayish, glabrous; leaves apparently opposite, the petioles about 5 cm. long, the blades oval or broadly ovate, 11 to 19 cm. long, 6 to 12 cm. wide, broadly rounded at the base and short-decurrent, acute or short-acuminate at the apex, membranaceous, glabrous, bright green, the lateral veins about 12 on each side, arcuate-divaricate, the margin plane; inflorescence very ample, much branched, 15 cm. wide or larger, pedunculate, the branches slender, elongate, glabrous, the flowers sessile, the bractlets subulate, very small; calyx glabrous, 2.5 to 3.5 mm. long, the lobes deltoid, acute; corolla about 2.5 cm. long, glabrous, the tube gradually ampliate upward, 4.5 mm. thick in the throat, the lobes ovate, about 6 mm. long, spreading; fruit cylindric, 6 to 7 mm. long, 5-celled; seeds brown, foveolate.

Type in the U. S. National Herbarium, no. 678258, collected above Paca, Panama, April 16, 1908, by R. S. Williams (no. 744). Another specimen of the same collection is in the herbarium of the New York Botanical Garden.

A well-marked species, related to *H. ventricosa* Swartz and *H. cuprea* Griseb., natives of Cuba and Jamaica, but differing from them in the very large leaves and spreading corolla lobes.

Casasia jacquinioides (Griseb.) Standl.

Alibertia jacquinioides Griseb. Cat. Pl. Cub. 123. 1866.

Casasia parvifolia Britton, Bull. Torrey Club 43: 461. 1916.

A very distinct plant, described properly by Britton in the genus *Casasia*. A specimen of the type collection of *Alibertia jacquinioides* in the herbarium of the Missouri Botanical Garden is, however, clearly the same as *Casasia parvifolia*.

Duroia costaricensis Standl., sp. nov.

Branchlets stout, hirsute, densely leafy at the ends; leaves opposite, the petioles stout, 7 mm. long or shorter, densely hirsute, the blades oblong-obovate, 10 to 17.5 cm. long, 3.5 to 6.5 cm. wide, cuneately narrowed to the base, obtuse at the apex and abruptly cuspidate-acuminate, with a narrow falcate acumen, chartaceous, copiously hirsute with slender fulvous hairs, the venation prominent beneath, the lateral veins slender, 7 or 8 on each side, the margin plane; staminate flowers fasciculate-cymose at the ends of the branchlets, short-pedicellate; calyx very densely hirsute with pale brownish hairs, the tube 1.5 mm. long, the limb 4 to 4.5 mm. long, densely whitish-sericeous within, the lobes 6 or 7, distant, linear-subulate, as long as the limb; corolla (in bud) 14 mm. long, densely sericeous outside, the tube stout, glabrous or nearly so within, the 6 lobes lance-oblong, acutish, longer than the tube, finely sericeous within; anthers sessile, 4 mm. long.

Type in the U. S. National Herbarium, no. 938658, collected at Marais de Sierpe, Costa Rica, March, 1892, by H. Pittier (no. 6803).

The genus *Duroia* has not been reported previously from North America. The species are chiefly Brazilian, although some occur in Colombia.

Phialanthus macrostemon Standl., sp. nov.

Branches stout, brownish, roughened by the persistent stipules, the branchlets slightly resinous, minutely papillose-scaberulous; stipule sheath about 2 mm. long; petioles stout, 4 to 5 mm. long, papillose-scaberulous; leaf blades elliptic-oblong or narrowly elliptic, 4 to 5 cm. long, 1.2 to 1.7 cm. wide, broadest at or near the middle, acute or attenuate at the base, narrowed to the rounded apex, rigid-coriaceous, glabrous, the lateral veins obsolete, the costa salient, deep green above, lustrous, brownish beneath, the margin thickened, revolute; inflorescence few-flowered, short-pedunculate, the flowers sessile or nearly so; calyx lobes spatulate, obtuse, at anthesis 1.5 to 2 mm. long, glabrous; corolla, 3.5 mm. long, the lobes ovate-oval, rounded at the apex, less than half as long as the tube; stamens long-exserted, the anthers exceeding the corolla lobes.

Type in the herbarium of the New York Botanical Garden, collected at Pinar de El Purio, Cabonico, Cuba, September 15, 1917, by J. T. Roig (no. 143).

Related to *Phialanthus rigidus* Griseb., a species with narrowly lanceolate leaf blades (3 to 8 mm. wide) and very short petioles. All the species of *Phialanthus* are very closely related, and their validity can not be established until much more material is obtained. The present plant seems to be quite as distinct as the species already described.

Machaonia coulteri (Hook. f.) Standl.

Microsplenium coulteri Hook. f. in Benth. & Hook. Gen. Pl. **2**: 4. 1873.

Machaonia fasciculata A. Gray, Proc. Amer. Acad. **19**: 77. 1883.

The genus *Microsplenium* Hook. f. was referred originally to the family Caprifoliaceae, but, as has been pointed out by other writers, it differs in no essential character from *Machaonia*. Gray's *Machaonia fasciculata* was founded upon one of the two collections upon which Hooker based the genus *Microsplenium*.

Chiococca pubescens Standl., sp nov.

Branches slender, green or grayish, short-pilose when young, the internodes shorter than the leaves; stipules 1.5 to 2 mm. long, subulate-cuspidate from a broad base; petioles 2 to 4 mm. long; leaf blades ovate, oblong-ovate, or oval-ovate, 3 to 6 cm. long, 1.2 to 3.2 cm. wide, rounded or obtuse at the base, short-acuminate or subacuminate at the apex, chartaceous, green above, sparsely short-pilose when young, becoming glabrous, the costa and lateral veins prominulous, paler beneath, densely short-pilose or subtomentose when young, often glabrate in age, the costa slender, prominent, the lateral veins prominulous, the margin plane or subrevolute; racemes few-flowered, short-pedunculate, the pedicels 2 to 4 mm. long, short-pilose, the bracts minute; calyx 2.5 mm. long, densely short-pilose, the lobes deltoid, acute; corolla 5 to 6 mm. long, sparsely villosulous or glabrate, the lobes triangular-oblong, obtuse, nearly as long as the tube; anthers semiexserted; fruit (immature) about 3 mm. long, compressed, short-pilose.

Type in the U. S. National Herbarium, no. 840975, collected in the vicinity of San Luis Tultitlanapa, Puebla, Mexico, July, 1908, by C. A. Purpus (no. 3334). Also collected in the vicinity of Victoria, Tamaulipas, altitude about 320 meters, in 1907, by Edward Palmer (no. 136).

A very distinct plant because of its pubescence, all the others of the genus being glabrous or practically so. The type collection was assigned a new generic name, fortunately unpublished, by Brandegee.

Guettarda deamii Standl., sp. nov.

Tree, 3.5 to 4.5 meters high, the branches blackish, lenticellate, the branchlets stout, densely short-pilose, the internodes short; stipules ovate-oblong,

2.5 to 4 mm. long, obtuse or acutish, appressed-pilose outside, soon deciduous; leaves opposite, the petioles stout, 5 to 9 mm. long, densely short-pilose, the blades mostly oval, sometimes oblong-oval or obovate-oval, 4 to 8.5 cm. long, 2.5 to 4.5 cm. wide, rounded at the base, broadly rounded at the apex, chartaceous, green above, densely short-pilose or pilose-scaberulous, the venation prominulous but more or less embedded, paler beneath, densely velutinous-pilosulous, the costa and lateral veins prominent, the latter 8 to 10 on each side, subarcuate, ascending at an angle of 50° or more, the intermediate veins prominulous, laxly reticulate, the margin recurved; cymes subcapitate, 3 to 5-flowered, the peduncles very stout, 3 to 10 mm. long, densely short-pilose, the flowers sessile, the bractlets subulate, 3 to 4 mm. long, persistent; fruit globose, about 8 mm. in diameter, 3 or 4-celled, minutely tomentulose.

Type in the U. S. National Herbarium, no. 796136, collected on mountain ridges near Gualán, Guatemala, altitude 185 meters, June 15, 1909, by C. C. Deam (no. 6271).

A very distinct plant, of the group of *Guettarda elliptica* Swartz. *Guettarda dichotoma* Mart. & Gal., described from Veracruz, may be a near relative, but it is an imperfectly known species.

Guettarda filipes Standl., sp. nov.

Branches blackish or reddish brown, lenticellate, the branchlets slender, densely pilose, the internodes elongate; stipules triangular-lanceolate, filiform-acuminate, about 5 mm. long, deciduous; leaves opposite, the petioles slender, 3 to 8 mm. long, short-pilose, the blades ovate, elliptic, or oblong-elliptic, 3 to 5.5 cm. long, 1.2 to 2.5 cm. wide, rounded to acutish at the base, short-acuminate at the apex, membranaceous, green above, densely short-pilose, at least when young, the venation plane, paler beneath, densely pilose with short, whitish, mostly spreading hairs, the costa and lateral veins prominulous, the latter about 7 on each side, subarcuate, the intermediate veins mostly obsolete, the margin plane; cymes lax, few-flowered, the peduncles subfiliform, 1.3 to 3.5 cm. long, pilose, the branches short, slender, the flowers partly sessile and partly on slender pedicels 1 to 3 mm. long, the bractlets linear, equaling or much longer than the calyx; calyx appressed-pilose, the limb 1.5 mm. long, shallowly bilobate; corolla minutely sericeous outside, the tube slender, 6 to 7 mm. long, the lobes rounded, 1 to 1.5 mm. long, glabrous within; ovary 2-celled.

Type in the U. S. National Herbarium, no. 302475, collected near Huasemote, Durango, Mexico, August 15, 1897, by J. N. Rose (no. 3498).

Related, although probably not very closely, to *G. deamii*, described above; distinguished by the 2-celled ovary, acuminate leaves, and partly pedicellate flowers.

DESCRIPTIONS OF NEW SPECIES OF SEVERAL FAMILIES, WITH MISCELLANEOUS NOTES.

All the new species described below are Mexican plants. Of greatest interest is the *Coussapoa*, obtained in Oaxaca by Doctor Reko, for not only is the species an unusually distinct one but it adds another genus to the long list of known Mexican trees. Another genus, *Tonduzia*, also may be reported from Mexico as the result of Doctor Reko's explorations. The two new species of *Platanus* described here are noteworthy additions to one of our smallest genera of North American trees.

Brosimum conzattii Standl., sp. nov.

Branches grayish, rimose, glabrous; stipules 8 to 13 mm. long, attenuate, sparsely and minutely puberulent outside; leaves glabrous, the petioles stout, 3 to 8 mm. long, the blades narrowly oblong or lance-oblong, sometimes narrowly elliptic-oblong, 4 to 9.5 cm. long, 1.5 to 3.2 cm. wide, rounded or very obtuse at the base, obtuse or acutish at the apex or obscurely obtuse-acuminate, coriaceous, grayish green above, lustrous, the costa prominent, the lateral veins prominulous, 11 to 15 on each side, subdivaricate, slightly paler beneath, the costa stout, prominent, the lateral veins prominulous, the intermediate veins finely reticulate, impressed, the margin plane; flower heads 4 to 6 mm. in diameter, the peduncles 4 mm. long or shorter, obscurely puberulent; bractlets 0.7 to 1.2 mm. broad, glabrous, minutely ciliolate; fruits oblique, slightly compressed, 1.5 to 1.8 cm. in diameter, dark brown; seed depressed-globose, 1.3 to 1.6 cm. in diameter; radicle obtuse.

Type in the U. S. National Herbarium, no. 763895, collected at Cafetal San Rafael, Distrito de Pochutla, Oaxaca, Mexico, altitude 800 meters, May 14, 1917, by Conzatti, Reko, and Makrinius (no. 3286).

The only other Mexican species of the genus is *Brosimum alicastrum* Swartz. It is distinguished from *B. conzattii* by the much larger, relatively broad, acuminate leaves and much larger flower heads.

Coussapoa rekoi Standl., sp. nov.

Branchlets thick, grayish, rugose, minutely puberulent, sparsely aculeolate; stipules 3.5 to 4.2 cm. long, minutely ferrugino-puberulent, copiously aculeolate with short, stout, divaricate or antrorse prickles; petioles very stout, about 1.5 cm. long, obscurely puberulent or glabrate; leaf blades broadly ovate-oval or rounded-ovate, 11 to 19 cm. long, 7.5 to 13 cm. wide, rounded and somewhat unequal at the base, rounded or very obtuse at the apex and abruptly acuminate-apiculate, coriaceous, grayish green above, sublustrous, minutely puberulent or glabrate, the costa and lateral veins prominent, slightly paler beneath, densely and very minutely grayish-puberulent or tomentulose, the costa and lateral veins very prominent, sparsely armed with short stout prickles, the lateral veins 6 to 9 on each side, straight, the transverse veins prominulous, the margin plane or subrevolute; pistillate and staminate heads solitary, the peduncles stout, 0.6 to 1.4 cm. long, minutely puberulent, the heads globose, 1 to 1.4 cm. in diameter; bracts of the staminate heads broad, cucullate, puberulent, the calyx parted almost to the base, the lobes cucullate-obovate, puberulent; stamens 2; bracts of the pistillate heads concrete, the exposed portion muricate and minutely puberulent.

Type in the U. S. National Herbarium, no. 842612, collected at Cafetal Concordia (Cerro Espino), Oaxaca, Mexico, November 15, 1917, by B. P. Reko (no. 3590).

Distinguished from all other species of the genus by the prickles of the branchlets, stipules, and leaves. The vernacular names are "carnero" and "chirimoya." Doctor Reko states that the fruit is edible and that the leaves are sometimes half a meter long.

Ficus involuta (Liebm.) Miquel, Ann. Mus. Bot. Lugd. Bat. 3: 298. 1867.

Urostigma involutum Liebm. Dansk. Vid. Selsk. Skrivt. V. 2: 320. 1851.

Urostigma bonplandianum Liebm. Dansk. Vid. Selsk. Skrivt. 2: 323. 1851.

Ficus bonplandiana Miquel, Ann. Mus. Bot. Lugd. Bat. 3: 298. 1867.

In a recent paper dealing with the Mexican and Central American species of *Ficus*,[1] the writer listed[2] this species as *Ficus bonplandiana*, but suggested

[1] Contr. U. S. Nat. Herb. 20: 1–35. 1917. [2] Op. cit. 30.

that the name *Urostigma involutum* probably referred to the same plant. Through the kindness of Dr. C. H. Ostenfeld, a leaf of the type of *U. involutum*, in the herbarium at Copenhagen, has now been examined, and this shows conclusively that the two specific names are synonymous. The correct name for the plant, then, is *Ficus involuta* (Liebm.) Miquel.

Struthanthus densiflorus (Benth.) Standl.

Loranthus densiflorus Benth. Pl. Hartw. 62. 1840.

Struthanthus diversifolius (Benth.) Standl.

Loranthus diversifolius Benth. Pl. Hartw. 63. 1840.

Struthanthus grahami (Benth.) Standl.

Loranthus grahami Benth. Pl. Hartw. 62. 1840.

Struthanthus haenkeanus (Presl) Standl.

Spirostylis haenkeanus Presl; Schult. Syst. Veg. 7: 163. 1829.

Loranthus spirostylis DC. Prodr. 4: 315. 1830.

Struthanthus hartwegi (Benth.) Standl.

Loranthus hartwegi Benth. Pl. Hartw. 62. 1840.

Struthanthus inconspicuus (Benth.) Standl.

Loranthus inconspicuus Benth. Bot. Voy. Sulph. 102. 1844.

Struthanthus inornus (Robins. & Greenm.) Standl.

Loranthus inornus Robins. & Greenm. Amer. Journ. Sci. 50: 163. 1895.

Phrygilanthus sonorae (S. Wats.) Standl.

Loranthus sonorae S. Wats. Proc. Amer. Acad. 24: 73. 1889.

Ximenia pubescens Standl., sp. nov.

Branches slender, grayish, armed with stout straight spines 5 to 8 mm. long, the branchlets densely pilose with short fulvous hairs, the pubescence persistent in age; petioles stout, 3 to 5 mm. long, densely puberulent; leaf blades orbicular or broadly oval, 2.2 to 4 cm. long, 2 to 3.5 cm. wide, rounded at the base, rounded at the apex and often obscurely emarginate, coriaceous, densely puberulent; pedicels and calyx densely puberulent; calyx lobes minute, broadly ovate, obtuse or acutish; petals 4.5 to 5 mm. long, acute or acutish, puberulent outside, densely barbate within from the middle to the base; anthers about 1.5 mm. long.

Type in the U. S. National Herbarium, no. 888478, collected between Mixtepec and Colotepec, Oaxaca, Mexico, altitude 75 to 240 meters, March 6, 1895, by E. W. Nelson (no. 2448).

Two other species of *Ximenia* are known from Mexico, *X. americana* L. and *X. parviflora* Benth., both of which are glabrous plants. *X. pubescens* differs from both in its broad leaves, but the small corolla indicates a relationship with the latter species.

A specimen collected in the foothills of the Sierra Madre, Sinaloa, by J. N. Rose, July 13 to 20, 1897, also has pubescent leaves, but the blades are oblong or elliptic-oblong, and very small. It is accompanied by fruit, but without flowers its position is doubtful. Probably it represents an undescribed species, but it may be only a variant of *X. pubescens*.

Platanus chiapensis Standl., sp. nov.

Tree, 15 meters high, the branchlets grayish brown, with a feltlike brownish tomentum at first but soon glabrate; petioles stout, 2 to 6 cm. long, tomentose at first; leaf blades very broadly ovate or ovate-orbicular, 8.5 to 23.5 cm. long, 5.5 to 19 cm. wide, rounded or subtruncate at the base and usually abruptly short-decurrent, very acute to long-acuminate at the apex, with a few coarse mucronate teeth near or above the middle or sometimes shallowly trilobate,

with entire acute lobes, brownish-tomentose at first on the upper surface but soon glabrate, beneath densely covered with a close, grayish or yellowish tomentum; peduncle and rachis together 24 cm. long, slender, glabrate; heads 3 or 4, 2.5 to 3 cm. in diameter, borne on stout stalks 1 to 2 cm. long; achene 5 to 5.5 mm. long, glabrous below, densely pilose above, about equaled by the basal hairs, the persistent style 3 to 4 mm. long.

Type in the U. S. National Herbarium, no. 470790, collected at Zincantán, Chiapas, Mexico, May 16, 1904, by E. A. Goldman (no. 993). Immature specimens, apparently referable here, were obtained at Teopisca, Chiapas, by G. N. Collins and C. B. Doyle (no. 128).

Most closely related to *P. lindeniana* Mart. & Gal., but easily distinguished by the stalked pistillate heads.

Platanus oaxacana Standl., sp. nov.

Young branches grayish or dark brown, glabrate; petioles stout, 1 to 3.5 cm. long, tomentose; leaf blades 6.5 to 15 cm. long, 7.5 to 18.5 cm. wide, truncate or subcordate at the base, obscurely or not at all decurrent, usually shallowly trilobate, the lobes long-acuminate, irregularly dentate with coarse acuminate teeth, green and glabrate on the upper surface, covered beneath with a sparse close grayish tomentum; heads 3 or 4, sessile, 3 to 3.8 cm. in diameter, the peduncle stout, 4 to 5 cm. long; achene 6 to 7 mm. long, tomentose at the apex at first but soon glabrate, the persistent style 3 to 4 mm. long.

Type in the U. S. National Herbarium, no. 888488, collected at San Miguel Alborrados, Oaxaca, Mexico, altitude 1,950 meters, July 2, 1894, by E. W. Nelson (no. 540).

The present plant is evidently related to *P. lindeniana* Mart. & Gal., of which it may be only a form, but in that species the leaves are narrower, rounded, and decurrent at the base, with a loose whitish tomentum, and the long, narrow lobes are commonly entire.

Prunus prionophylla Standl., sp. nov.

Plant glabrous throughout, the branches dark brown or blackish, roughened with numerous lenticels; petioles stout, about 1 cm. long; leaf blades lance-oblong or narrowly elliptic-oblong, 9 to 11 cm. long, 3 to 3.5 cm wide, rounded or obtuse at the base, acute at the apex, the venation impressed, pale beneath, the costa very stout and salient, the lateral veins plane or prominulous, the margin coarsely serrate almost to the apex, the lower surface usually with 2 glands at the base adjacent to the costa; racemes axillary, subsessile, solitary, naked, 4 to 5 cm. long, densely many-flowered, the pedicels very stout, 3 to 4 mm. long; calyx tube 3 mm. long, glabrous within, soon deciduous, the lobes oblong-oval; petals rounded, about 3 mm. long and broad, glabrous, white; ovary ovoid, tapering to the style; stigma about 1 mm. broad.

Type in the U. S. National Herbarium, no. 470171, collected along brooks on Ixtaccihuatl, Mexico, altitude 2,100 to 2,400 meters, in 1903, by C. A. Purpus (no. 249).

A species of the subgenus *Laurocerasus*, but not closely related to any known from Mexico. The coarse teeth of the leaves suggest the very different *Prunus ilicifolia* (Nutt.) Walp., of California and Baja California.

Caesalpinia acapulcensis Standl., sp. nov.

Unarmed shrub or small tree; branches terete, brown, with large pale lenticels, puberulent when young and furnished with short-stipitate glands; petioles 2.5 to 3 cm. long, sometimes with scattered stipitate glands; pinnae 2 or 3 pairs; leaflets 1 or 2 pairs, opposite, short-petiolulate, obliquely ovate, oval-oblong, or oval, 2 to 4 cm. long, 1.5 to 2.7 cm. wide, very oblique at the base,

rounded at the apex, chartaceous, glabrous, green above, pale beneath, the venation prominent or prominulous; racemes 5 to 14 cm. long, paniculate, few or many-flowered, the pedicels 5 to 11 mm. long, minutely pilose and densely covered with stipitate glands; calyx densely glandular, the tube about 4 mm. broad, the lobes oval, entire; petals 8 to 10 mm. long, yellow, with numerous sessile or stipitate glands outside on the lower part; stamens longer than the petals, the filaments white-villous below; fruit 6.5 to 7.5 cm. long, about 1.7 cm. wide, subsessile, minutely pilose, eglandular, elastically bivalvate.

Type in the U. S. National Herbarium, no. 266490, collected in the vicinity of Acapulco, Guerrero, Mexico, in 1894 or 1895, by Edward Palmer (no. 505).

Related to *C. mexicana* A. Gray as closely as to any of the described Mexican species. In that, however, the inflorescence is without glands and the leaflets are smaller and more numerous.

Caesalpinia caladenia Standl., sp. nov.

Unarmed shrub or small tree, the branches terete, striate, brown or reddish brown, with numerous pale lenticels, short-pilose and glandular when young; petioles 1.5 to 3 cm. long, short-pilose or glabrate and sometimes glandular; pinnae 2 to 4 pairs; leaflets 3 or 4 (rarely 2) pairs, short-petiolulate, oval, elliptic-oblong, or oblong-obovate, 1 to 2.6 cm. long, 0.5 to 1.7 cm. wide, rounded to subacute at the base and often oblique, rounded at the apex, glabrous, slightly paler beneath, chartaceous, with prominulous venation; racemes many-flowered, 6.5 to 17 cm. long, the pedicels 6 to 16 mm. long, jointed below the calyx, densely short-pilose and furnished with numerous reddish stipitate glands; calyx tube 5 to 7 mm. broad, pilose and stipitate-glandular, the lobes 6.5 to 8.5 mm. long, oblong, rounded at the apex, velvety-pilose, glandular on the margins; petals 10 to 12 mm. long, glandular outside on the lower portion; stamens equaling or slightly exceeding the petals, the filaments densely white-villous except near the apex; fruit 4.5 to 6.5 cm. long, 1.2 to 1.6 cm. wide, subsessile, straight, densely velutinous and covered with sessile or stipitate glands, elastically bivalvate.

Type in the U. S. National Herbarium, no. 635473, collected on hills about 5 miles below Minas Nuevas, Sonora, Mexico, March 12, 1910, by J. N. Rose, P. C. Standley, and P. G. Russell (no. 12660).

Here, also, may be referred the following collections:

COLIMA: Manzanillo, *Palmer* 1397. Colima, 1891, *Palmer* F.

The Colima specimens have somewhat larger leaflets than the type. *Caesalpinia caladenia* is related to *C. acapulcensis*, described above, but differs in the glandular fruit, larger flowers, and smaller, narrower, more numerous leaflets.

Caesalpinia sclerocarpa Standl., sp. nov.

Unarmed tree, the branches slender, brown or grayish, with numerous pale lenticels, glabrous; leaves glabrous, usually odd-pinnate, the petioles 1 to 1.6 cm. long, the pinnae 4 or 5, the leaflets 3 or 4 pairs, opposite, short-petiolulate, elliptic to oblong, 10 to 18 mm. long, 5 to 9 mm. wide, rounded or obtuse at the base, usually slightly oblique, broadly rounded at the apex, chartaceous, the costa prominent beneath but the other venation inconspicuous; racemes axillary or paniculate, 4 to 7 cm. long, few or many-flowered, dense, the rachis angulate, fulvous-puberulent, the pedicels stout, 2 to 3 mm. long; calyx densely fulvous-puberulent, the tube 3 to 4 mm. broad, the lobes very unequal, entire, the outer one larger than the others; petals about 7 mm. long; stamens equaling the petals, the filaments villous below; fruit 3.5 to 8 cm. long, 1.4 to 1.8 cm. wide, rounded at both ends, short-rostrate at the apex, blackish, glabrous, borne on a stout stipe 5 mm. long, indehiscent, the valves very thick (about 3 mm.) and hard.

Type in the U. S. National Herbarium, no. 229315, collected between San Gerónimo and La Venta, Oaxaca, Mexico, altitude 60 meters, July 13, 1895, by E. W. Nelson (no. 2784).

The following additional collections belong here:

SINALOA: Between Rosario and Acaponeta, *Rose* 1870. Guadalupe, *Rose, Standley & Russell* 14748. Near Colomas, *Rose* 3241.

JALISCO: Jayamita, *Jones* 164.

Closely related, apparently, to *C. glabrata* H. B. K., a plant of Peru and Colombia, with glabrous calyx and smaller leaflets. *C. vesicaria* L., known in Mexico only from Yucatán, is a similar plant, but it has very large, coriaceous leaflets of different shape.

Cassia chiapensis Standl., sp. nov.

Erect shrub, the branches stout, terete, very densely pilose with grayish or fulvous hairs; stipules lance-linear, 11 to 15 mm. long, attenuate, deciduous, pilose outside; petioles 1.5 to 3.5 cm. long, the rachis 4 to 7 cm. long, densely pilose, a slender clavate gland usually present between each pair of leaflets; leaflets 3 to 6 pairs, oval, oblong-oval, or ovate-oval, 2 to 4 cm. long, 1.2 to 2.5 cm. long, petiolulate, rounded and subequal at the base, rounded at the apex, chartaceous, green on the upper surface, glabrous, the venation rather conspicuous, densely pilose beneath with slender whitish subappressed hairs; flowers racemose, the racemes many-flowered, dense, 4.5 to 10 cm. long, borne on a stout pilose peduncle 4 to 8 cm. long, the pedicels 6 to 13 mm. long, the bracts short, lance-linear, caducous; outer sepals oval, 3.5 mm. long, sparsely short-pilose, green, the inner ones rounded-obovate, 5 mm. long, yellowish, ciliate; petals 5 to 7 mm. long, spatulate-obovate, short-clawed, glabrous, pale yellow, conspicuously veined; stamens 10, 3 of them abortive, 3 of them with stout anthers 3.5 mm. long, the other 4 with anthers 2.5 mm. long, the anthers erostrate, opening by apical pores; ovary densely pilose; fruit about 5 cm. long and 7 mm. wide, very acute and stipitate at the base, obtuse or acutish and short-rostrate at the apex, glabrous at maturity, the valves thin, flat, the seeds transverse-oblique.

Type in the U. S. National Herbarium, no. 470740, collected at Teopisca, Chiapas, Mexico, May 7, 1904, by E. A. Goldman (no. 939). Also collected between San Cristóbal and Teopisca, Chiapas, altitude 2,000 to 2,550 meters, December 4, 1895, by E. W. Nelson (no. 3481a).

This plant belongs to Bentham's section *Chamaesenna*, and apparently to the series *Pachycarpae*, but it is not closely related to any of the species referred there by that author. The small flowers are the most prominent character.

Cassia tonduzii Standl., sp. nov.

Tree or large shrub, the branches slender, striate-angulate, fulvous-puberulent; stipules subulate, deciduous; petioles 1.5 to 2 cm. long, the rachis 5 to 10 cm. long, sparsely puberulent, usually with a long slender clavate gland between each pair of leaflets; leaflets 4 to 6 pairs, short-petiolulate, elliptic to narrowly lance-elliptic, 2 to 9 cm. long, 1 to 2.8 cm. wide, rounded to subacute at the base, acuminate or abruptly acuminate at the apex, rarely only acute, membranaceous, green on the upper surface, sublustrous, glabrous or very minutely puberulent, the venation mostly impressed, scarcely paler beneath, thinly strigillose with slender, grayish or yellowish hairs, the costa and lateral nerves slender but very prominent, the margin plane or revolute; flowers in 2 or few-flowered axillary racemes borne on slender peduncles, very numerous, the pedicels long and slender, puberulent; sepals orbicular, the outer

ones 5 mm. long, sparsely puberulent, the inner ones 8 to 10 mm. long, glabrous; petals very unequal, 2 of them about 2.5 cm. long and 2 cm. wide, the others lanceolate or ovate, 1 to 1.5 cm. long and 2 to 4 mm. wide, slender-clawed, all more or less puberulent; stamens 10, 3 of them abortive, the 3 largest ones with curved anthers nearly 1 cm. long terminating in a slender tube 5 to 6 mm. long, the other 4 with erostrate anthers 4 mm. long; ovary densely appressed-pilose with fulvous hairs; fruit (immature) 16 to 18 cm. long, 5 to 6 mm. wide, glabrate, long-stipitate, rounded and rostrate at the apex, the valves flat, thin.

Type in the U. S. National Herbarium, no. 471718, collected along the Río Tiliri, Costa Rica, November 23, 1892, by A. Tonduz (no. 7213).

The following additional specimens belong here:

COSTA RICA: Río Tiliri, December, 1890, *Tonduz* 3197. Alajuelita, alt. 1,100 meters, December, 1889, *Tonduz* 1484.

CHIAPAS: Between Tuxtla and Cristóbal, alt. 690 to 1,650 meters, 1895, *Nelson* 3127.

This species belongs to Bentham's section *Chamaesenna*, series *Rostratae*. It seems to be related to *Cassia robiniaefolia* Benth., but in that the leaflets are more numerous and obtuse or acutish, with inconspicuous venation. One of the Costa Rican collections was determined by Micheli as *C. laevigata* Willd., a species not closely related to the present one.

Indigofera sphinctosperma Standl., sp. nov.

Shrub, the branches very slender, densely white-strigose; stipules very short, subulate; leaves petiolate, the rachis very slender, the leaflets usually 11 to 15, oval or rounded-oval, the largest 13 mm. long and 8 mm. wide, rounded or very obtuse at the base, broadly rounded at the apex and mucronulate, densely or sparsely gray-strigose on both surfaces, conspicuously petiolulate; racemes slender, 5 to 15 cm. long, the flowers short-pedicellate, at first dense but distant in anthesis, the bracts filiform-subulate; calyx densely strigose, the lobes triangular, equaling or slightly longer than the tube; standard petal about 3.5 mm. long, densely strigose; fruit 3 to 4 mm. long, tetragonous, white-strigillose, sessile, subtruncate at each end, slightly constricted; seed 1.2 to 2.5 mm. long, cylindric, subtruncate at each end, olivaceous, usually with 2 shallow transverse constrictions.

Type in the U. S. National Herbarium, no. 840446, collected in the Barranca de Santa María, Zacuapan, Veracruz, Mexico, November, 1906, by C. A. Purpus (no. 2332).

The following collections also belong here:

VERACRUZ: Baños de Carrizal, *Purpus* 6077. Barranca de Santa María, *Purpus* 3641.

Several other species of *Indigofera* found in Mexico have short, one or few-seeded pods, but in all of them the seeds are shorter and of different shape, and the fruit is either globose or ovoid, with an acute or rounded apex.

Phyllocarpus septentrionalis Donn. Smith, Bot. Gaz. **55**: 433. 1913.

This recently described plant is a most interesting one, because of the fact that the only other known representative of the genus is a native of Brazil. The type of *P. septentrionalis* was collected near Gualán, Guatemala. Recently there have been received at the National Herbarium complete specimens collected one mile above El Progreso, Guatemala, at an altitude of 510 meters, by F. W. Popenoe (no. 759). Mr. Popenoe's notes regarding this collection are as follows: "Large tree, about 15 meters high, in sandy soil along the banks of streams. Flowers light scarlet. The tree blooms when nearly devoid of leaves, and is a mass of flowers." The vernacular name is given as "flor de nico."

Cracca brandegei Standl., sp. nov.

Plants slender, erect or ascending, herbaceous or suffrutescent, much branched from the base, the stems angulate, densely hirtellous with short spreading whitish hairs; stipules subulate, 3 mm. long; petioles 1 to 2 cm. long, the rachis 2 to 5 cm. long, hirtellous; leaflets 9 to 19, distant, linear or oblong-linear, 0.6 to 4.5 cm. long, 1.5 to 6 mm. wide, acute at the base, acute or obtuse at the apex, thin, copiously pilose on the upper surface with very short whitish subappressed hairs, thinly sericeous or short-pilose beneath, the lateral nerves numerous, parallel, ascending at a very acute angle; racemes leaf-opposed, 10 to 23 cm. long (including the peduncle), slender, the flowers remote, the bracts short, subulate; pedicels slender, 2 to 4 mm. long, hirtellous; calyx 2.5 to 3.5 mm. long, hirtellous, the lobes triangular, attenuate, as long as the tube; corolla purple, the standard 7 to 8 mm. long, finely sericeous outside; fruit 3 to 4 cm. long, 2.5 to 3 mm. wide, very flat, minutely pilose with spreading or subappressed hairs; seeds 2.5 to 3 mm. long, mottled with black and olivaceous brown, with a minute strophiole.

Type in the U. S. National Herbarium, no. 572116, collected at Altata, Sinaloa, Mexico, September 2, 1904, by T. S. Brandegee. Also collected in the vicinity of Durango in 1896 by Edward Palmer (no. 375).

Closely related to *C. purpurea* L. (*Tephrosia tenella* A. Gray), but in that the pubescence is closely appressed. *Cracca vicioides* (Schlecht.) Kuntze also is a near relative, but that is a bright green, nearly glabrous plant, with brown pubescence on the stems, and with leaflets glabrous on the upper surface.

Cracca tepicana Standl., sp. nov.

Plants apparently decumbent, herbaceous or suffrutescent, the stems slender, flexuous, hispidulous when young, glabrate in age; stipules small, subulate; leaves sessile or petiolate, the rachis 3.5 to 10 cm. long; leaflets 5 to 11, oblong, elliptic-oblong, or oval-oblong, 2 to 4.8 cm. long, 1 to 2 cm. wide, short-petiolulate, rounded at the base, rounded or very obtuse at the apex, chartaceus, green on the upper surface, strigillose or glabrate, the venation prominulous and reticulate, thinly strigose beneath, the venation prominent, the margin hispid-ciliate; racemes 10 to 22 cm. long (including the long peduncle), the flowers in distant or approximate fascicles, the slender pedicels 4 to 8 mm. long, strigose, the bracts filiform-subulate, 8 mm. long or shorter; calyx 5 mm. long, strigillose, the lobes triangular-acuminate, about as long as the tube; standard petal 11 to 13 mm. long, and nearly as wide, brownish-sericeous outside; ovary densely sericeous.

Type in the U. S. National Herbarium, no. 305316, collected at Tepic, Mexico, in 1892, by Edward Palmer.

A very distinct plant, related as closely to *C. langlassei* (Micheli) Rose, as to any of the Mexican species. The latter is distinguished by its long, copious pubescence and acute leaflets.

Andira galeotttiana Standl., sp. nov.

Branches terete, reddish brown or grayish, rimose, the young branchlets stout, angulate, fulvous or ferruginous-tomentose; petioles stout, 4.5 to 6 cm. long, the rachis 5 to 14.5 cm. long, brown-tomentose; leaflets 5 to 13, all opposite or the lower ones alternate, the petiolules very stout, about 6 mm. long, the blades oblong or oval-oblong, rarely obovate-oblong, 3 to 13 cm. long, 2.8 to 5.5 cm. wide, rounded or subtruncate at the base, rounded at the apex and apiculate, subcoriaceous, green on the upper surface, tomentulose when young, becoming glabrate, the venation impressed, beneath densely tomentose or sub-

sericeous with brown lustrous hairs, the margin plane or revolute; racemes densely flowered, pedunculate, 6 to 8.5 cm. long, forming a panicle 20 to 30 cm. long, the branches ferruginous-tomentose, the flowers solitary or fasciculate, short-pedicellate; calyx 8 mm. long, densely tomentose, the lobes deltoid, obtuse or acutish, about 2 mm. long; petals glabrous, long-clawed; standard 17 mm. long, the blade suborbicular, 11 mm. wide, deeply retuse at the apex, subtruncate at the base, the claw 5 to 6 mm. long; blades of the wings oblong, 9 mm. long, 3 mm. wide, rounded at the apex, produced at the base into a rounded auricle, the claw 6 mm. long; keel petals similar to the wings in size and form; stamens diadelphous, the filaments 10 to 14 mm. long; ovary long-stipitate, glabrous, 1 or 2-ovulate.

Type in the U. S. National Herbarium, no. 888479, collected at Catemaco, Veracruz, Mexico, altitude 300 meters, April 26, 1894, by E. W. Nelson (no. 424). Also collected at Lalana (Chinantla), Puebla, July, 1844, by H. Galeotti (no. 3464).

The only other species of *Andira* found in Mexico is *A. jamaicensis* (W. Wright) Urban, a widely distributed plant with glabrous, acute or acuminate leaflets, much smaller flowers, and pubescent ovary.

Galeotti gives the vernacular name as "macayo."

Picramnia pistaciaefolia Blake & Standl., sp. nov.

Branches very slender, flexuous, brownish gray, puberulent when young; leaves 8 to 18 cm. long, the rachis slender, puberulent; leaflets 19 to 23, short-petiolulate, the upper ones opposite, the lower ones smaller and alternate, the lowest pair borne at or near the base of the rachis, the blades ovate-rhombic or the lowest rhombic-oval, 1 to 3.5 cm. long, 0.6 to 1.2 cm. wide, very oblique at the base and obtuse to acuminate, subabruptly obtuse-acuminate at the apex, thin, minutely puberulent when young, glabrate in age; panicles slender, 15 to 20 cm. long, the staminate ones spiciform, the pistillate racemiform, the rachis puberulent; sepals 3, about 1 mm. long, ovate or ovate-oval, obtuse, puberulent outside; petals 3, ligulate, slightly longer than the sepals; stamens 3, twice as long as the petals; fruit (immature) obovoid, about 1 cm. long and 6 mm. in diameter.

Type in the U. S. National Herbarium, no. 842534, collected at Cafetal San Rafael (Cerro Espino), Oaxaca, Mexico, altitude 800 meters, October 28, 1917, by B. P. Reko (no. 3452). The type material consists of a fruiting branch. Specimens in flower were obtained on Cerro de Huatulco, Oaxaca, altitude 900 meters, August 28, 1917, by Doctor Reko (no. 3360).

In the key to the species of *Picramnia* in the North American Flora[1] this plant would run at once to *P. antidesma* Swartz, a species widely different from the present one in the size, form, and texture of the leaflets, and in the size of the flowers. *Picramnia pistaciaefolia* seems to be different also from any of the Mexican species described by Tulasne, which are only mentioned as doubtful in the North American Flora.

Doctor Reko states that the vernacular names are "ramón" and "lentisco."

Rhus barclayi (Hemsl.) Standl.

Rhus terebinthifolia barclayi Hemsl. Biol. Centr. Amer. Bot. 1: 219. 1880.

This is distinguished sufficiently from *R. terebinthifolia* Schlecht. by the long petiolules of the lateral leaflets. The pubescence on the lower surface of the leaflets, too, is much less dense, and consists of long, straight, stiff, rather slender hairs. In *R. terebinthifolia* the lateral leaflets are nearly sessile, and

[1] 25: 235. 1911.

densely velvety-pilose or almost tomentose beneath. The following specimens belong here:

TEPIC: Tepic, 1892, *Palmer* 1907. Between Colomos and Arroyo Juan Sánchez, 1897, *Nelson* 4166.

The type was collected at Acapulco.

Rhus jaliscana Standl., sp. nov.

Shrub, 3 to 4.5 meters high, the branchlets reddish brown, rough-lenticellate, puberulent; leaves pinnate, 9 to 15-foliolate, the petioles slender, 1.5 to 2.5 cm. long, puberulent, the pairs of leaflets 6 to 14 mm. apart, the petiolules 1 to 3 mm. long, slender, the blades elliptic or elliptic-oblong, sometimes ovate, 1.4 to 2.6 cm. long, 0.6 to 1.5 cm. wide, rounded to acutish at the base and usually unequal, commonly obtuse at the apex but sometimes acute or subacuminate, mucronulate, chartaceous, entire, green above, dull, sparsely short-pilose with subappressed hairs or glabrate, the venation more or less impressed, only slightly paler beneath, very sparsely pilose with minute, mostly appressed hairs or subbarbate in the axils of the veins, the lateral veins 4 to 6 on each side, the margin plane or subrevolute; panicles usually much longer than the leaves, the branches very slender, spiciform, remotely flowered, the flowers sessile; bracts rounded-ovate, obtuse, scarious; sepals rounded-ovate, obtuse, glabrous; petals obtuse, about half longer than the sepals; fruit 5 mm. long, 6 to 7 mm. wide, compressed, sparsely setose-pilose.

Type in the U. S. National Herbarium, no. 19926, collected in moist places in the barranca near Guadalajara, Jalisco, Mexico, November 3, 1888, by C. G. Pringle (no. 1774).

ADDITIONAL SPECIMENS EXAMINED:

JALISCO: Between Bolaños and Guadalajara, 1897, *Rose* 3093. Barranca near Guadalajara, 1907, *Safford* 1458a; in 1902, *Pringle* 9712.

Pringle's collections were distributed as *Rhus terebinthifolia* Schlecht., a species with larger, less numerous, subsessile or short-petiolulate leaflets, these usually more acute and more densely pubescent. *R. barclayi* is closely related to *R. jaliscana*, but differs in its large, less numerous, acuminate leaflets.

Bernoullia flammea Oliver in Hook. Icon. Pl. **12**: 62. *pl. 1169, 1170.* 1873.

This remarkable tree, of the family Bombacaceae, was based by Oliver upon specimens and a drawing obtained by Dr. G. Bernoulli in the "Costa Grande of Guatemala, from about 500 to 2,000 ft."[1] So far as the writer knows, the species has been known heretofore only from the original collection. Recently, however, Dr. Blas P. Reko forwarded to the National Herbarium specimens, accompanied by a water-color sketch, which he had obtained at the Cafetal Nueva Esperanza, Oaxaca, Mexico, at an altitude of about 800 meters. Doctor Reko's rediscovery of this little known plant is of unusual interest, since it indicates a noteworthy extension of range for the species. Moreover, this new material shows that the diagnosis of the genus must be corrected in one important respect. The plant was described originally as having digitately trifoliolate leaves, but Doctor Reko states, and the specimens show, that the number of leaflets, though variable, is usually five or six.

Doctor Reko's notes give the following additional information about the plant: "The tree grows in a very limited area on the Cerro Espino, at an altitude of about 800 meters, and reaches a height of 30 to 40 meters. In appearance it reminds one of the ceiba tree, which it resembles also in the soft, spongy

[1] In Engler and Prantl's Natürlichen Pflanzenfamilien (3[6]: 65. *fig. 34.* 1895) Schumann gives the range of the plant as Costa Rica, but presumably this is due to a slip of the pen.

texture of its wood, whence it has received its popular name, 'palo de calabaza.' The deciduous leaves are alternate. The flowers, which appear in the dry season, before the new leaves, are of a vermilion color in all their parts, likewise the branches of the terminal inflorescence. The pollen is smooth on its surface. The fruit resembles in shape that of the genus *Cheirostemon*, although much larger (20 cm. long). It is a 5-valved woody capsule with smooth interior, with grooves and numerous dents for the reception of the ascending seeds."

Marcgravia guatemalensis Standl., sp. nov.

Branches dark brown, glabrous, minutely papillose; petioles very stout, about 2 mm. long; leaf blades narrowly lance-oblong, 9 to 14.5 cm. long, 2 to 4 cm. wide, rounded or very obtuse at the base, somewhat oblique, long-acuminate at the apex, chartaceous, glabrous, minutely papillose, green above, the costa impressed, the lateral veins mostly obsolete, brownish beneath, the costa stout, salient, the lateral veins very slender, usually prominulous, about 13 on each side; racemes short-pedunculate, umbelliform, about 16-flowered, the pedicels about 2.5 cm. long, stout, divaricate, puberulent, the flower inserted obliquely, the rachis prolonged about 8 mm. above the fertile flowers; sepals 1 to 1.5 mm. long, much broader than long, very broadly rounded at the apex; corolla ovoid, 8 mm. long, obtuse, glabrous; stamens about 12; nectaries about 4, tubular-cucullate, straight, clavate above, puberulent, the stipe 1 to 1.2 cm. long, the hood 2 to 2.3 cm. long, 3.5 mm. thick above, the orfice about 3 mm. broad.

Type in the U. S. National Herbarium, no. 408015, collected near the Finca Sepacuité, Alta Verapaz, Guatemala, March 28, 1902, by O. F. Cook and R. F. Griggs (no. 230). Additional material of the same collection, consisting of a sterile branch, is mounted on sheet no. 408014.

This plant is most closely related to *M. eichleriana* Wittmack, of Brazil, but is distinguished by the subsessile leaves and narrow nectaries.

Tonduzia parvifolia Pittier, Contr. U. S. Nat. Herb. **12:** 103. 1908.

Heretofore this species has been known only from Costa Rica. Specimens collected at Cafetal Montecristo, Oaxaca, by Dr. B. P. Reko (no. 3382) seem to belong here rather than to *T. stenophylla* (Donn. Smith) Pittier, a Guatemalan species. Doctor Reko gives the vernacular name as "chamizillo."