PRELIMINARY REVISION OF THE GENUS INGA.

By Henry Pittier.

INTRODUCTION.

In the course of his work on the flora of Panama, the author has found it almost impossible to proceed in the determination of the species of Inga without attempting a revision of the whole genus. Since the publication of Bentham's extensive monograph, in 1875, no general study of this important group has been undertaken, although many new species have been described by Micheli, Harms, Oliver, Britton, and others. It is now found that the arrangement of the species has to undergo certain slight changes, that there have been misconceptions and unjustifiable modifications in the status of many species, and that a considerable number of new types await description in the American collections at hand. Of the latter, several collected by the author and others in Panama, Central America, and Venezuela are of unusual interest.

It was thought possible at first to limit the present study to a revision of the Inga species in the United States National Herbarium, but while this collection is relatively rich in new material, it did not offer many opportunities for comparison and definition of old types. This led to the present extension of the investigation, which embraces the material contained in most of the larger American herbaria.

The curators of the Gray Herbarium, the New York Botanical Garden, and the Field Museum of Natural History have most obligingly lent their extensive collections, for which grateful acknowledgment is here made. The Gray Herbarium is especially rich in specimens from old collectors, some of which are duplicates of types (if not the types themselves) of Schlechtendal's Mexican species, and many others the types or duplicates of types of Bentham's South American species. The John Donnell Smith Herbarium, always generously put at the disposal of botanical students, has also been freely consulted. Besides, the Director of the National Museum of Costa Rica had the kindness to lend the rich local collection of the defunct Instituto físico-geográfico, made mainly under the direction of the writer.

A general synopsis of the Central American species has been prepared for future publication, but descriptions of all new species will be published in the present series, together with other observations which may prove useful to the next monographer of Inga and its close ally, Pithecolobium.

SYSTEMATIC TREATMENT.

Section 1. LEPTINGA.

NEW SPECIES.

Inga mapiriensis Pittier, sp. nov.

A small tree 3 to 4 meters high; branchlets slender, glabrous.

Leaves entirely glabrous; petioles marginate or subalate, 0.7 to 1.3 cm. long; stipules subulate, glabrous, about 4 mm. long, early deciduous; leaflets 1-jugate, subsessile, coriaceous; glands very small, globose, pertuse; leaflet blades oblong-lanceolate to lanceolate, long-attenuate at the base, long-acuminate at the apex, the costa prominent above, the lower face delicately reticulate, the costa hardly prominent, the whole leaflet 7 to 14.5 cm. long, 2 to 4.5 cm. broad.

Inflorescences glabrous, rather few- (about 10 to 20-) flowered, single in the axils of the leaves or subpaniculate on defoliate axillary branchlets; peduncles 0.8 to 1.4 cm. long; bractlets minute, subulate, caducous; pedicels glabrous, 4 to 6 (5) mm. long; calyx tubular, 2.5 to 3 (2.7)[1] mm. long; corolla tubular, broadening toward the apex, 7 to 8 (7.6) mm. long, the lobes 1 to 2 mm. long, reflexed, minutely glandular-pubescent at the tips; staminal tube slightly exceeding the corolla.

Legume not known.

Type in the Herbarium of the New York Botanical Garden, collected at San Carlos, near Mapirí, Bolivia, at an altitude of 750 meters, flowers, August, 1907, by Otto Buchtien (no. 1768).

Also collected between Guanai and Tipuani, Bolivia, April–June, 1892, *Bang* 1421.

Closely related to *Inga heterophylla* and *I. panurensis*, the specimens cited having been identified with the former. But in that species the flowers, especially the calyces, are much smaller, the leaves, also less developed, are often 2-jugate, and the glands are very distinctly stipitate; in the latter species the flowers are also smaller, the rachis of the leaves much broader, and the glands very large and cuplike or subpeltate. In all the specimens of *I. mapiriensis* examined the umbels are comparatively few-flowered, and the leaves narrow, while in both *I. heterophylla* and *I. panurensis* the flowers are constantly very numerous and the leaflets rather broad.

Inga maxoniana Pittier, sp. nov. PLATE 81.

A tree 10 to 15 meters high; branchlets subangulate, more or less ferruginous-tomentose.

Leaves petiolate; rachis dark brown tomentose, about 5 cm. long, the petiolar part 2 to 3 cm. long, obscurely flattened or sulcate above, the part between the leaflets narrowly canaliculate; glands very small and subsessile or obsolete; leaflets 2 or rarely 3-jugate, petiolulate; petiolules more or less pubescent,

[1] In this and parallel cases the numbers in the text are the extremes, and that in parentheses the average of 10 measurements.

INGA MAXONIANA PITTIER.

4 to 5 mm. long; leaflet blades obovate or oblanceolate, cuneate at the base, rounded and abruptly acuminate at the apex, coriaceous, finely reticulate and glabrous on both faces, those of the lower pair 7 to 10 cm. long, 3 to 4.5 cm. broad, those of the upper pair 7.5 to 14 cm. long, 3 to 5.5 cm. broad; stipules small, ovate, ferruginous-tomentose, caducous.

Inflorescences axillary, single or geminate; peduncles 1 to 5 cm. long, ferruginous-pubescent; bracteoles persistent, navicular, pubescent, about 2 mm. long; pedicels 3 to 11 mm. long, ferruginous-pubescent; calyx 4.5 to 5 mm. long, pubescent, but the pubescence shorter than on the pedicel, tubular or subcampanulate, the teeth short (about 0.5 mm. long), with rounded sinuses between; corolla 8 mm. long, densely sericeo-pubescent, the lobes acute and deeply cleft (about 1.1 mm. long); staminal tube about 7 mm. long, included; ovary about 2 mm. long, ovate-fusiform, glabrous.

Legume not known.

Type in the U. S. National Herbarium, no. 601736, collected in a coffee plantation at Aguas Negras, Venezuela, on the seaward slope of the coast range, near Antímano, State of Miranda, flowers, April 7, 1913, by H. Pittier (no. 6012).

This species is used as a shade tree in the coffee plantations and is locally known as "guamo de hierro." On account of its hairy flowers it belongs to the *Inga quaternata* group, but it differs from that species in having smaller flowers, with the calyx not striate, and a lesser indument upon the 2-jugate leaves.

The name is given in honor of Mr. William R. Maxon, Associate Curator of the U. S. National Herbarium.

EXPLANATION OF PLATE 81.—Photograph of the type specimen of *Inga maxoniana*. Natural size.

Inga roussoviana Pittier, sp. nov. PLATE 82.

A small tree; branchlets subglabrous, densely covered with ferruginous lenticels; young growth densely ferruginous-tomentose.

Rachis of the leaves subangulate, glabrous or more or less ferruginous-pubescent, 5.5 to 15 cm. long, the petiolar part 1.5 to 4 cm. long; leaflets 3 or 4-jugate, coriaceous, short-petiolulate; glands small, sessile, subglobose, often obsolete; petiolules 3 to 4 mm. long, thick, dark-colored, more or less pubescent; leaflet blades glabrous or glabrescent, obovate or ovate, cuneate at the base, rounded and obtuse, acute, or abruptly acuminate at the apex, those of the basal pair 3.5 to 6.5 cm. long and 1.5 to 3.5 cm. broad, those of the terminal pair 9 to 18 cm. long and 3.5 to 8.5 cm. broad; costa and veins glabrous or pubescent, slightly prominent above, strongly so beneath; stipules ovate, about 5 mm. long, densely ferruginous-tomentose.

Inflorescences paniculate on short axillary or terminal shoots. Umbellules single or 2 to 4-fasciculate at the defoliate nodes; peduncles grayish or brownish tomentose, 0.8 to 1.5 cm. long. Flowers long-pedicellate; bractlets very small, ovate, ferruginous-hairy; pedicels pubescent, 4 to 7 mm. long; calyx tubular, broadened at the apex, pubescent, about 5 mm. long, the teeth acute; corolla long-funnelform, 9 to 11 mm. long, densely silky-villous or pubescent without, the hairs shorter on the lobes, these 2 to 3 mm. long; staminal tube included or slightly exserted; ovary sessile, obconical, glabrous, about 2 mm. long.

Legume 11 to 17 cm. long, pedunculate (the peduncles 0.5 to 0.8 cm. long), ferruginous-pubescent, rounded at the base, apiculate, the valves flat but slightly swollen over the seeds, 2 to 2.2 cm. broad, the margins 5 to 8 mm. broad, 2-sulcate and prominent around the valves; seeds 15 to 21.

Type in the U. S. National Herbarium, no. 715483, collected in woods around San Felix, eastern Chiriquí, Panama, flowers, December 23, 1911, by H. Pittier (no. 5270).

COSTA RICA: Santo Domingo de Osa, in woods, fruits, March, 1896, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 10032).

BRITISH HONDURAS: Punta Sierra, on the banks of a highland creek, flowers, January 16, 1903, *Percy Wilson* 41.

This is the first species of the section Leptinga reported from Central America. It is near *Inga quaternata* Poepp. & Endl. because of its villous-tomentose flowers, but differs in its short umbellules, much larger flowers, and glabrous or subglabrous leaves. It is named for Rear Admiral H. H. Rousseau, C. E., one of the Panama Canal builders, in acknowledgement of his never-falling interest in the progress of the botanical survey of Panama.

EXPLANATION OF PLATE 82.—Fruit of *Inga rousseviana*, collected in Costa Rica by Tonduz, the specimen cited above. Natural size.

Inga saffordiana Pittier, sp. nov.

A small, slender tree; bark grayish, smooth; young branchlets densely covered with long, brown hairs.

Rachis of the leaves terete, villous-hairy like the branchlets, 5 to 12 cm. long; stipules subulate, villous, persistent, 5 to 12 mm. long; leaflets 4 or 5-jugate, petiolulate, coriaceous; glands very small, long-stipitate (the stipe about 3.5 mm. long), concave; petiolules 2 to 3 mm. long, villous; leaflet blades oblique or suboblique, ovate to elliptic-lanceolate, rounded at the base, acutely acuminate at the apex, glabrous above, the costa and veins slightly prominent, beneath reticulate and glabrous except on the prominent costa and veins, sparsely long-ciliate on the margin; blades of the basal pair 3.5 to 5.5 cm. long, 2 to 2.5 cm. broad, those of the terminal pair 13 to 14 cm. long, 3 to 4 cm. broad.

Inflorescences axillary or issuing from the old wood, single, the peduncles villous, 4 to 13 cm. long; pedicels 1.5 to 2 cm. long; bractlets subulate, villous, 5 to 10 mm. long, persistent; flowers not known.

Legume (immature) thickly covered with a profusion of long brownish hairs, cuneate at the base, rounded, submarginate, and mucronate at the apex, 15 to 32 cm. long, 2.5 to 3 cm. broad; seeds up to 17 in each pod.

Type in the U. S. National Herbarium, no. 715957, collected in the forests of Cerro de Garagará, in the Sambú Valley, southern Darién, Panama, at an altitude of about 500 meters, young pods, February 8, 1912, by H. Pittier (no. 5676).

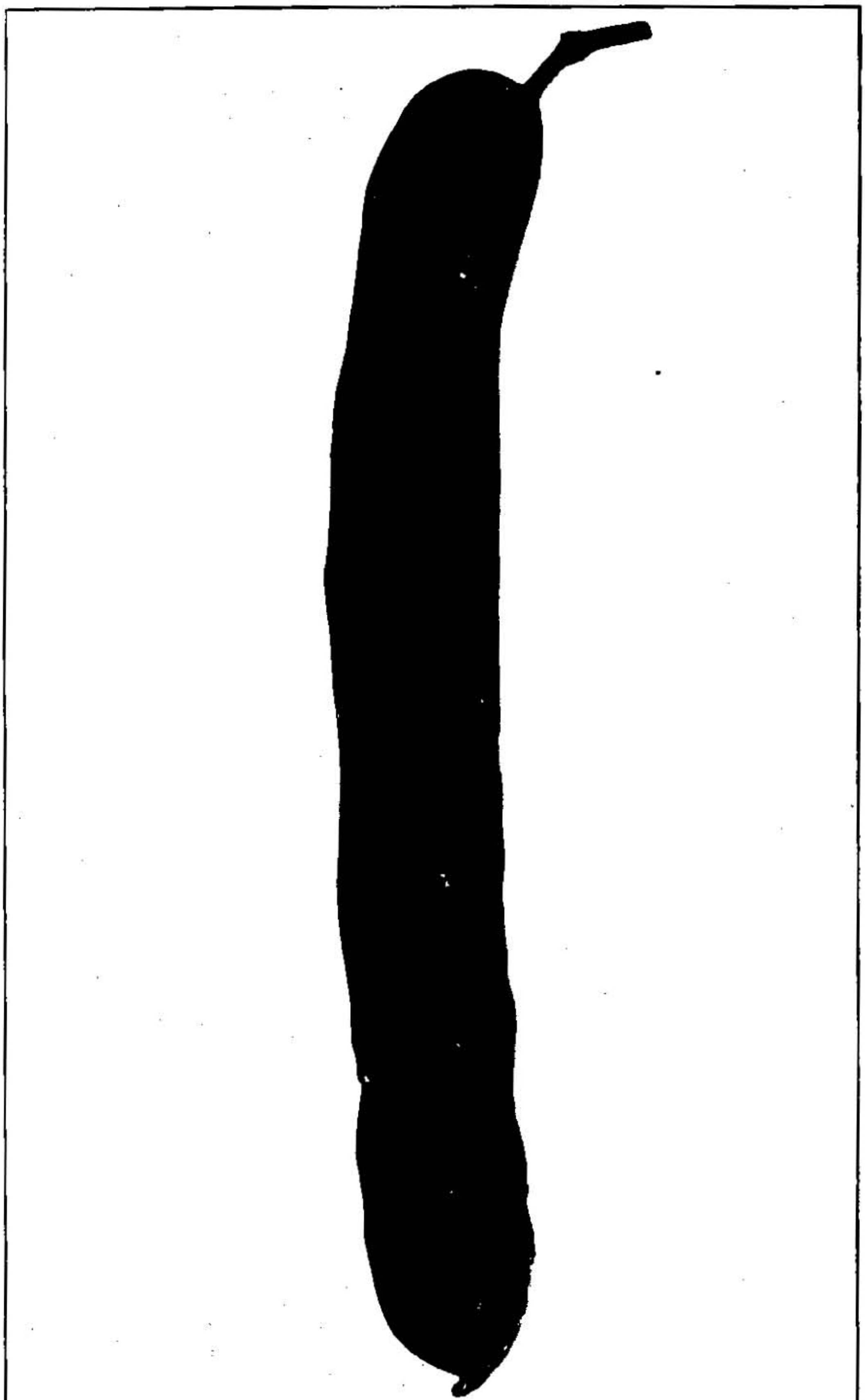
Notwithstanding the incompleteness of the specimens, this species is so distinctly *sui generis*, that I do not hesitate to describe it as new. The known characters indicate clearly that it should take its place in the section Leptinga. The tree, growing in the high forest, has long, slender, flexible stems and a very sparse, short ramification. Most of the inflorescences seem to issue from the old wood of the trunk.

Named in honor of Mr. William E. Safford, Economic Botanist of the Bureau of Plant Industry, U. S. Department of Agriculture.

Inga williamsii Pittier, sp. nov.

A small tree about 7 meters high, the trunk 13 cm. in diameter (Williams); branchlets terete, glabrous, the younger parts densely ferruginous-tomentose.

Rachis of the leaves terete, grayish or brownish-tomentose, 5 to 7.5 cm. long, the petiolar part 1.5 to 2.5 cm. long; stipules lanceolate, acute, 3 to 15 mm. long, caducous; leaflets 3 or 4-jugate, petiolulate; glands small, sessile,



FRUIT OF INGA ROUSSOVIANA PITTIER.

more or less obsolete in the mature leaves; petiolules 2 to 3 mm. long, pubescent; leaflets small, elliptic-lanceolate to ovate-elliptic, oblique, subcuneate at the base, acute, subacuminate, or emarginate at the apex, coriaceous, glabrous above except on the impressed, more or less pubescent costa and veins, glabrous or subglabrous beneath with prominent, pubescent costa and veins, the blades of the lowest pair 2 to 5 cm. long, 0.9 to 1.8 cm. broad, those of the apical pair 6 to 8.5 cm. long, 2 to 2.5 cm. broad.

Inflorescences single or geminate, axillary at the ends of the branchlets; umbels short-pedunculate, the peduncles ferruginous-tomentose, 1 to 1.5 cm. long; bractlets naviculiform-spatulate, ferruginous-pubescent, 2 to 3 mm. long; pedicels densely pubescent, 3.5 to 4 mm. long; calyx tubular-subcampanulate, 3.5 to 4.2 mm. long, the teeth acute, of irregular length; corolla densely villous, tubular-funnelform, 5.2 to 5.9 mm. long, the lobes about 1.2 mm. long; staminal tube hardly exserted; ovary about 2 mm. long, thick, glabrous; style usually longer than the stamens. Young pods densely ferruginous-tomentose, the mature ones not known.

Type in the Herbarium of the New York Botanical Garden, collected at Bismarck, above Penonomé, Province of Coclé, Panama, flowers and young pods, March 5, 1903, by R. S. Williams (no. 285).

This species, which belongs with *Inga lallensis* Spruce and *I. sellowiana* Benth. in the group of the Leptingae characterized by short pedicels, differs from all others heretofore described by its tomentose inflorescence, short-pedunculate umbels, and small leaves.

NOTES ON CRITICAL SPECIES.

Inga portobellensis Beurling, Svensk. Vet. Akad. Handl. **1854:** 122. 1856.

PLATES 83, 84.

Although published long before his Revision of the Suborder Mimoseae, Bentham did not mention this beautiful species, discovered at Porto Bello, Panama, by Billberg, and collected more recently (1896) by Tonduz around Santo Domingo de Osa, Golfo Dulce, Costa Rica (Inst. Fís. Geogr. Costa Rica, no. 9879). Its affinities seem to be with the section Leptinga.

EXPLANATION OF PLATES 83, 84.—Pl. 83, a characteristic flowering specimen of *Inga portobellensis* collected in Costa Rica by Tonduz (Inst. Fís. Geogr. Costa Rica, no. 9879), distributed by Capt. John Donnell Smith as no. 7021; specimen in U. S. National Herbarium. Pl. 84, fruit of a specimen of the same collection in the Costa Rican National Herbarium. Both natural size.

Inga cordistipula Mart. Herb. Fl. Bras. 111; Fl. Bras. 15^2 467. *pl. 123.* 1876.

This species is evidently more closely related to *I. paterno* Harms and *I. radians* Pittier, both of which will be described in this paper, than to any species of the section Leptinga. On the other hand, the last-named two species undoubtedly belong to the section Diadema, to which the former should be transferred.

Inga tarapotensis Spruce, Trans. Linn. Soc. **30:** 609. 1875.

Placed by Bentham in the section Bourgonia, but evidently belonging in Leptinga. The type number, *Spruce* 4221, is represented in the Gray Herbarium and shows an umbellate inflorescence, with short-pediceled, glabrous flowers.

A specimen in the Otto Kuntze Herbarium at the New York Botanical Garden, also labeled *I. tarapotensis*, is quite distinct and may belong to Pseudinga. It is, however, too imperfect for identification.

As further illustrating the characters of this section, there are here reproduced photographs of three additional species, *Inga myriantha* Poepp. & Endl. (pl. 85), *I. sertulifera* DC. (pl. 86), and *I. umbellifera* (Vahl) Steud. (pl. 87).

EXPLANATION OF PLATES 85–87.—Pl. 85, specimen of *Inga myriantha* in the Gray Herbarium, collected on the southern bank of the Amazon at the mouth of the Solimões River, June, 1851, by R. Spruce (no. 1706). Pl. 86, specimen of *Inga sertulifera* in the Gray Herbarium, collected in the vicinity of Pará, Brazil, by R. Spruce. Pl. 87, a specimen of the type collection of *Inga umbellifera* in the Gray Herbarium, collected near Panuré, along the Rio Uaupés, French Guiana, by R. Spruce (no. 2566). All natural size.

Section 2. DIADEMA.

NEW SPECIES.

Inga radians Pittier, sp. nov.

A tree; branchlets multilenticellate, more or less angulate, the young shoots more or less ferruginous-puberulous.

Leaves petiolate, almost glabrous; rachis remotely hairy or glabrous, obscurely marginate, 10 to 14 cm. long, the petiolar part 1.5 cm. long; stipules obovate, often oblique, rounded or acute at the apex, glabrous, persistent, about 1.5 cm. long, 0.6 cm. broad; leaflets 3 or rarely 4-jugate, petiolulate; glands stipitate, often reduced to the basal one or all obsolete; petiolules 5 mm. long, winged, pubescent; leaflet blades elliptic, elliptic-ovate, or ovate, rounded or subcuneate at the base, long-acuminate at the apex, glabrous, light green above, pale green beneath, those of the basal pair 7 to 12 cm. long, 4 to 5 cm. broad, those of the apical pair 17 to 18 cm. long, 6 to 7.5 cm. broad.

Inflorescences paniculate at the ends of the branchlets, the umbels long-pedunculate, 1, 2, or 3 in the axils of the leaves; peduncles 8 to 12 cm. long, striate, minutely and sparsely puberulous; bractlets naviculiform, caducous, about 2 mm. long, the reflexed tip acute; pedicels about 2 mm. long, glabrous or sparsely puberulous; calyx 2.3 mm. long, sparsely pubescent, the teeth mostly 6, 0.3 to 0.4 mm. long, separated by rounded sinuses; corolla tubular-funnelform, 8 to 8.5 mm. long, the lobes 1.5 to 2 mm. long, the apices rounded, inflexed, covered with minute glandular hairs; staminal tube hardly exserted; ovary glabrous, elongate (nearly 3 mm. long), substipitate; style as long as the stamens.

Legume pedunculate, rounded at the base, obtuse at the apex, glabrous, 40 cm. long or less, 3 cm. thick, 6.5 to 8.5 cm. broad, the margins thick, 1.2 to 1.5 cm. broad; seeds about 15, ovoid-oblong, slightly depressed, surrounded with a white, sweet pulp.

Type in the U. S. National Herbarium, no. 408524, collected at Tapachula, State of Chiapas, Mexico, in coffee plantations, flowers, April 26, 1902, by O. F. Cook (no. 805).

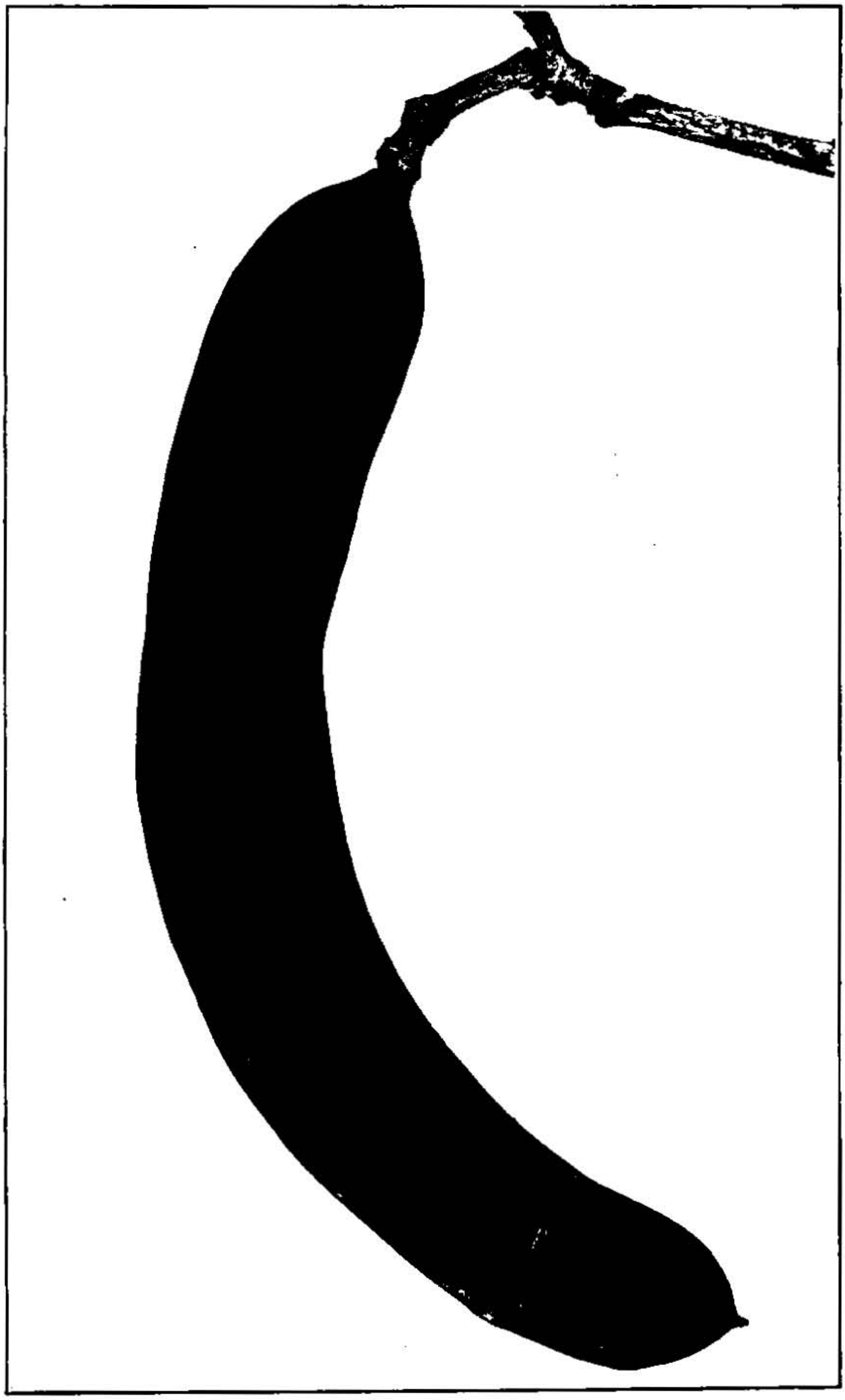
A second specimen in the same herbarium is from Oaxaca, State of Oaxaca, alt. 1,650 meters, flowers, December, 1900, *Conzatti & Gonzales* 1146.

This beautiful species, used as a shade tree in the coffee plantations of Central America and Mexico under the name of "cuajiniquil," belongs to the group of *Inga cordistipula* Mart.

The drawings given by Preuss[1] under the name of *Inga paterno* Harms probably refer to this and not to Harms's species. The two species differ mainly by the legumes, short and stipitate in *I. paterno*, very long and rounded at the base in *I. radians*. Besides the fruit characters, we find that in *I. radians*

[1] Preuss, Paul. Expedition nach Central- und Südamerika. 355. *pls.* 8, 9. 1901.

INGA PORTOBELLENSIS BEURLING.



FRUIT OF INGA PORTOBELLENSIS BEURLING.

INGA MYRIANTHA POEPP. & ENDL.

INGA SERTULIFERA DC.

INGA UMBELLIFERA STEUD.

the flowers are larger, the leaflets thinner and longer acuminate, and the glands very distinctly stipitate. In both species the fruits are prized for the thickness and flavor of the aril-like pulp surrounding the seeds.

Inga rusbyi Pittier, sp. nov.

Branchlets glabrous, subangulate, striate.

Leaves glabrous, the rachis striate and obscurely canaliculate, thick, 10 to 24 cm. long, the petiolar part 2.5 to 3 cm. long; stipules linear, obtuse, glabrous, subpersistent, 4 to 10 mm. long; leaflets 4 or 5-jugate, oblique, membranous, petiolulate; glands large, cuplike, sessile, but prominent; petiolules 2 to 3 mm. long; leaflet blades ovate-elliptic, rounded at the base, obtuse or abruptly narrowed to a broad, acute acumen at the apex, dark green above, paler and delicately reticulate beneath, those of the basal pair 4.5 to 6 cm. long, 2 to 3 cm. broad, those of the terminal pair 8 to 11 cm. long, 3 to 4 cm. broad, the intermediate pairs larger (up to 12 cm. long and 5.5 cm. broad).

Inflorescences single in the axils of the upper leaves; peduncles slender, glabrous, 4 to 8 cm. long; receptacle globose or ovoid, glabrous; bractlets linear, narrow, sparsely hairy toward the apex without, 2 to 4 mm. long, persistent; flowers numerous, sessile; calyx tubular, often substipitate, 5.1 to 6.3 (5.5) mm. long, sparsely setulose-hairy on the base and middle, densely hairy on the teeth; corolla tubular, slightly widening toward the apex, 8.2 to 9.7 (8.8) mm. long, glabrous at the base, densely villous toward the apex on the lobes, these 0.8 to 1.3 mm. long; staminal tube included.

Legume not known.

Type in the Gray Herbarium, collected at Mapirí, Bolivia, at an altitude of about 800 meters, flowers, May, 1886, by H. H. Rusby (no. 1001).

This species belongs to the group, heretofore with no known Andean representative, characterized by nude folial rachis and petiolulate leaflets. In the absence of fruit and on account of the immature condition of the leaves it is not possible to determine its affinities more closely, but the type is clearly a distinct one, not previously described.

TWO SPECIES PUBLISHED AS ONE.

Harms has published lately his *Inça paterno*, founding it, as it seems, on a plant distinct from the one illustrated by Preuss at the time of the first publication of the name.[1] Preuss's references in the body of the same work[2] seem to apply to the tree widely used as coffee shade in Guatemala under the name of "paterno," the fruit, for instance, being characterized as short and broad. The illustration in plate 9, however, reproduces in almost every detail the very distinct species cultivated on the Pacific coast of Guatemala, Chiapas, and Oaxaca, not only for its shade but for its long, many-seeded pods, which is described above under the name of *I. radians*. The pod in plate 8, figure 6, is also undoubtedly a reduction of the legume of this latter species.

It is possible that both species were mixed in the material studied by Harms, and in the absence of the fruits their confusion was to a

[1] Expedition nach Central- und Südamerika *pl. 8. f. 6, pl. 9.* 1901.

[2] Pages 355, 361.

certain degree excusable. The description of *Inga paterno*, although broad enough to include both types, seems to apply better to the species commonly known as "paterno." In the following paragraphs I have tried to define the specific characters more clearly, adding also those of the fruit.

Inga paterno Harms, Repert. Nov. Sp. Fedde **13**: 419. 1914. PLATE 88.

A medium-sized tree; branchlets terete, lenticellose, glabrous.

Leaves glabrous or glabrescent; rachis more or less broadly marginate between the leaflets, 8.5 to 15 cm. long, the petiolar part 2 to 2.5 cm.; stipules obovate to oblong, subobtuse, persistent, 1.5 to 2 cm. long, 0.6 to 1 cm. broad; leaflets 4 or 5-jugate, petiolulate; glands sessile, almost urceolate, sometimes obsolete or reduced to one between the basal leaflets; petiolules glabrescent, 4 to 6 mm. long; leaflet blades elliptic to ovate-lanceolate, oblique, rounded, acute, or subcuneate at the base, obtuse at the apex or acuminate with an obtuse tip, coriaceous, light green and lustrous above, dull beneath, more or less reticulate on both faces, those of the basal pair 4 to 8 cm. long, 2 to 3 cm. broad, those of the terminal pair 14 to 17 cm. long, 5 to 6 cm. broad.

Inflorescences axillary on foliate or defoliate nodes, or terminal and paniculate; spikes short-pedunculate or long-pedunculate, single or geminate; peduncles 3 to 7.5 cm. long, glabrous; bractlets subulate, pubescent, shorter than the pedicels; pedicels 1 to 2 mm. long, glabrous; calyx tubular, 1 to 2.5 (2) mm. long, almost glabrous, the teeth acute, about 0.5 mm. long, more or less puberulous; corolla glabrous, tubular-campanulate, 3.5 to 7.5 mm. long, the lobes acute, pilosulous, about 1.5 mm. long; staminal tube included; ovary glabrous, substipitate.

Legume pedunculate, laterally long-stipitate, rounded at the apex, glabrescent, 2 or 3-seeded, 9 to 12 cm. long, 4 to 5 cm. broad; seeds ovoid-oblong, about 3 cm. long and 1 cm. broad, depressed.

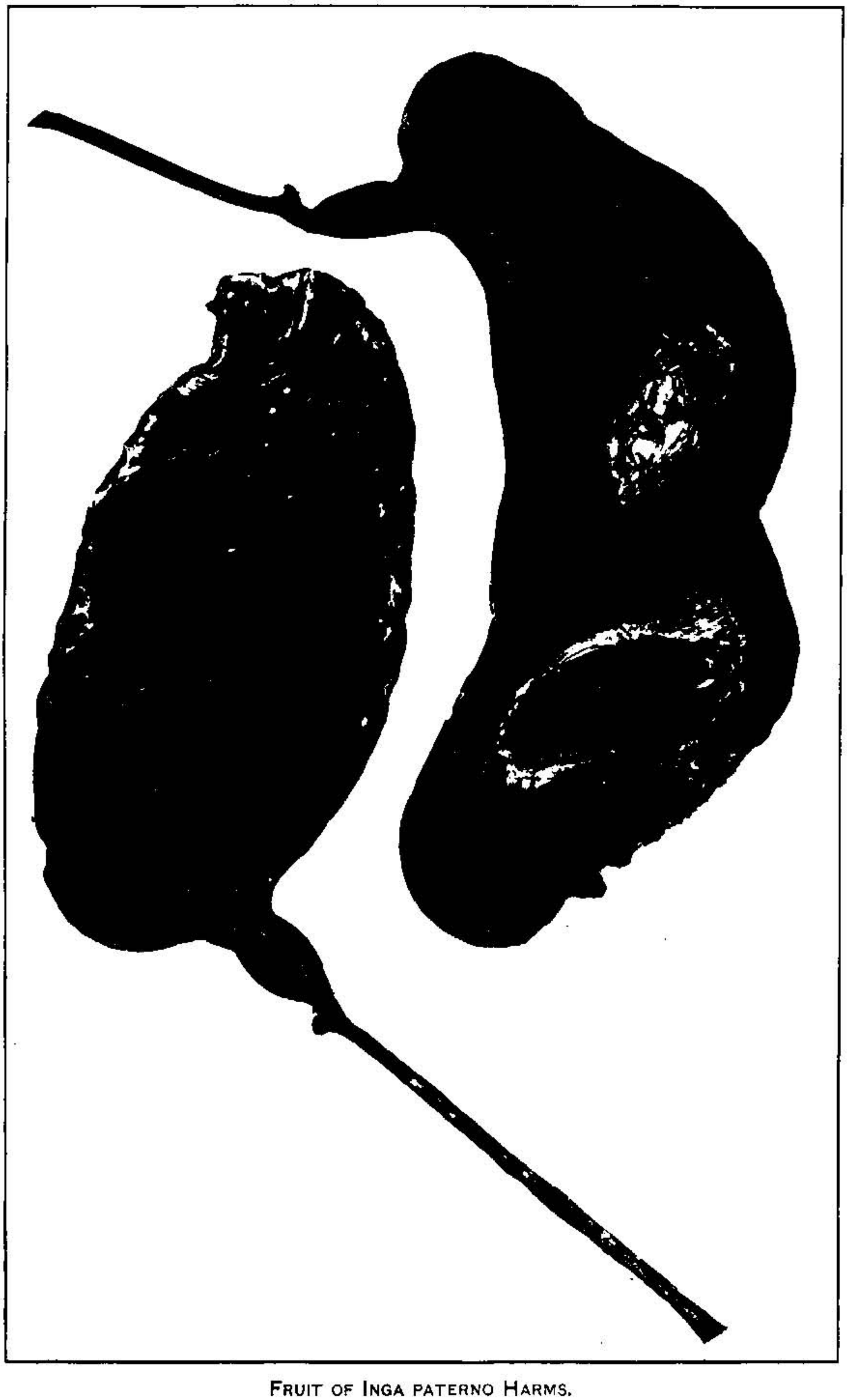
COSTA RICA: San José de Costa Rica, April 6, 1903, *Cook & Doyle* 15. In a coffee plantation near Alajuela, flowers, March, 1896, *J. D. Smith* 6490.

GUATEMALA: Barberena, Department of Santa Rosa, alt. 1,000 meters, flowers, July, 1893, *Heyde & Lux* (J. D. Smith, no 3280). San Miguel Uspantán, Department of Quiché, alt. about 2,000 meters, flowers, April, 1892, *Heyde & Lux* (J. D. Smith, no. 3309). Chinantla, near Guatemala City, fruits and flowers, May, 1892, *J. D. Smith* 2819. Escuintla, Department of Escuintla, fruits, April, 1892, *J. D. Smith* 2820. Cuajinilapa, Department of Santa Rosa, alt. 850 meters, flowers, November, 1893, *Heyde & Lux* (J. D. Smith, no 1893).

MEXICO: Oaxaca, flowers, April 9, 1894, *E. W. Nelson* 349.

Inga paterno is very variable in its characters, especially with regard to the dimensions of the flowers and leaves. The former, however, are always distinctly pedicellate, and this, along with the large, persistent stipules, distinguishes it from *I. jinicuil*, with which it often has been confused. It differs from *I. cordistipula* in the shape and number of leaflets and in the details of the much smaller flowers. The short, stipitate, few-seeded fruit is sufficient to distinguish *I. paterno* from *I. radians*, which has long, exstipitate, many-seeded legumes; but the leaflets also differ in shape, dominating number, and texture, while the floral spikes are erect in the former and loose in the latter, which has besides decidedly larger flowers.

EXPLANATION OF PLATE 88.—Two fruits of a Guatemalan specimen of *Inga paterno* mentioned above, *Heyde & Lux* (J. D. Smith, no. 2820), in the John Donnell Smith Herbarium. Natural size.



FRUIT OF INGA PATERNO HARMS.

SPECIES TRANSFERRED TO OR FROM DIADEMA.

With *Inga stipularis* DC., placed by Bentham under Pseudinga, series Glabriflorae, *I. cordistipula* Mart., considered as a Leptinga, and *I. cinnamomea* Spruce and *I. duckei* Huber, placed with Diadema, the Central American species *I. radians* Pittier and *I. paterno* Harms form a natural group, characterized by the large, foliaceous, persistent or subpersistent stipules. As the first two species further show the same short, capitate or clavate floral rachis which is characteristic of the other species of section Diadema, they should also be included in it.

In his notes on Mimoseae,[1] prefacing the enumeration of the species of Inga, Bentham states that the absolute character relied on for distinguishing Inga from Pithecolobium is the simply pinnate leaves. Without contradicting this assertion I feel obliged to assume, from the observation of the habit and general appearance of the trees and from the critical examination of their floral and carpological characters, that some once-pinnate species placed in the genus Inga really belong to the section Caulanthon of Pithecolobium. I refer to *Inga tubulifera*, *I. rufescens*, *I. globulifera*, and *I. billbergiana*, which are very closely related to each other and at the same time look strikingly like *Pithecolobium glomeratum*, but for their once pinnate leaves. In Panama I collected flowering and fruiting specimens of *I. rufescens* and of some related forms which I take to be *I. globulifera* and *I. billbergiana*. The trees had unmistakably the appearance of the above-mentioned Pithecolobium, and this likeness was thoroughly confirmed by the prefloral arrangement of the buds and especially by the curled, dehiscent, bright red pods. Considering that characters drawn from the flowers and fruits should have in every case more weight than one single leaf peculiarity, I do not hesitate to propose the transfer of these species, which also should be reduced to two, as follows:

Pithecolobium tubuliferum (Benth.) Pittier.
Inga tubulifera Benth. Lond. Journ. Bot. **4**: 584. 1845.
Pithecolobium rufescens (Benth.) Pittier.
Inga rufescens Benth. op. cit. **4**: 585.
Inga globulifera Benth. loc. cit.
Inga billbergiana Benth. loc. cit.

Section 3. BOURGONIA.

CRITICAL NOTES ON SEVERAL SPECIES.

Bentham divides this section into two groups, the one containing the species with axillary, elongate spikes; the other those with short spikes, usually clustered on defoliate nodes. *Inga bourgoni* (Swartz)

[1] Lond. Journ. Bot. 4: 578. 1845.

DC., the type of the section, placed in the second group, hardly belongs there, as its inflorescence does not differ sensibly from that of *I. marginata* or the other species of the first group, while it is very distinct from the dense, short panicles of *I. aggregata* or *I. alba*.

Inga alba (Swartz) Willd. Sp. Pl. **4**: 1013. 1806.

Mimosa alba Swartz, Prodr. Veg. Ind. Occ. 85. 1788.

Represented in the Gray Herbarium by several of Spruce's collections (246, 1076, 2289) identified by Bentham, and, in all the herbaria consulted by me, by *Rusby & Squires* 186, from Santa Catalina, Lower Orinoco, Venezuela. The specimens of this last number were distributed as *Inga bourgoni* DC., but the flowers are much smaller than in that species, and the type of the inflorescence is very distinct. The large, flat glands and the strongly veined leaves also are characteristic of *I. alba*. The average dimensions of 5 flowers of *Spruce* 2289 are 1.2 to 1.5 (1.3) mm. for the calyx and 3.4 to 3.8 (3.6) mm. for the corolla, as against 1 mm. and 3.1 mm., which are the dimensions given by Bentham.

Inga aggregata Don, Hist. Dichl. Pl. **2**: 391. 1832.

Represented in our collections by *Bang* 1439, from between Guanai and Tipuani, Bolivia, also distributed under the name of *I. bourgoni*. Although I have not seen authenticated material of that species, the Bang specimens agree so well with the descriptions that I have no doubt about their identity.

Inga marginata Willd. Sp. Pl. **4**: 1015. 1806, excl. syn.

This species is known to be exceedingly variable. In Central American specimens the flowers are usually pedicellate, though very shortly so; the calyx is always pubescent and the corolla broader and shorter than in the Brazilian tree. The form with marginate foliar rachis is very seldom met with, and wings are present below both the basal and terminal pairs of leaflets. However, as all grades of transition are observed between the extreme forms, the separation of the species into subspecies is hardly practicable.

Undescribed species of the *marginata* group probably will be found in Central America. Mr. William R. Maxon collected at Las Animas, near Mazatenango, Guatemala, specimens whose leaves resemble those of the marginate form of *Inga marginata*, or those of *I. laurina*, the leaflets being either 2 or 3-jugate. But the flowers are larger and the perfect pods are from 3 to 3.5 cm. broad and 12 cm. long, with a strongly prominent margin. It does not seem desirable to describe this as a new species until further material is obtained.

The same variability is noticed in *I. laurina* (Swartz) Willd., two or three apparently constant forms of which are found in Central America. The type is West Indian and the area of the species probably limited to the West Indies and the continental section between Panama and Mexico. The identification of the Bolivian plant distributed under this name by Dr. Buchtien (under no. 1767) is doubtful, but the specimens at hand are insufficient for the determination of their real relationship.

Section 4. PSEUDINGA.

Series 1. GLABRIFLORAE.

This group consists of a few Brazilian species, and has received no increase recently. Among its species *Inga capitata* Desv. is best known and has several varieties. Some specimens distributed under this name to American herbaria were found to belong to two distinct species of Pithecolobium.

Series 2. GYMNOPODAE.

NEW SPECIES.

Inga aestuariorum Pittier, sp. nov. PLATE 89.

A small, low, spreading tree, branching from near the ground; branchlets more or less ferruginous-pubescent, covered with white, dotlike lenticels.

Rachis of the leaves slender, terete or subangulate, densely ferruginous-hairy, 9 to 15 cm. long, the petiolar part 1.5 to 2.5 cm. long; leaflets 5 or 6-jugate, short-petiolulate, coriaceous; glands subsessile, prominent, cuplike, blackish; petiolules 1 mm. long or shorter; leaflet blades ovate to ovate-elliptic, broadly rounded and subemarginate at the base, obtuse or subacute and mucronate at the apex, pilosulous and more or less lustrous above, reticulate and sparsely pubescent beneath, the costa densely pubescent and prominent on both faces, the veins also pubescent and prominent beneath; leaflets of the basal pair 3 cm. long, 2 cm. broad, those of the terminal pair 6 to 12 cm. long, 2.5 to 4.5 cm. broad.

Floral spikes single or geminate in the axils of the upper leaves; peduncles and rachises densely ferruginous-pubescent, the former 3 to 5 cm. long; flower heads loose, elongate, 3 to 4 cm. long; flowers sessile; bractlets very small, ovate, acute, densely pubescent, deciduous; calyx tubular, striate, pubescent, 7 mm. long, the teeth very short; corolla tubular, very slightly broadened at the apex, 18.5 mm. long, white, silky-villous, the lobes narrow, about 2.5 mm. long; stamens pink, the tube hardly exserted; pistil glabrous, the style a little longer than the stamens.

Legume sessile, rounded at the base, apiculate, 14 to 20 cm. long, the valves flat, about 1.7 cm. broad, glabrescent, the margin 5 mm. broad, elevated around the valves, densely ferruginous-pubescent. Seeds about 10, immersed in a white, sweet pulp.

Type in the John Donnell Smith Herbarium, collected in the tide belt of the Pacific coast at Boca Zacate, Diquís Delta, Costa Rica, flowers and fruits, April, 1892, by A. Tonduz (Inst. Fís. Geogr. Costa Rica, no. 6793).

Also collected at Laguna de Sierpe, Costa Rica, *Pittier*.

This species belongs to the group of *I. multijuga*, but differs from that species primarily in the number of the leaflet pairs, in the shape and pubescence of the leaflets, and in the size of the flowers. While the former is stated to be a tree 7 to 15 meters high, *I. aestuariorum* is low and bushy, growing preferably along the tide channels in close proximity to the sea.

EXPLANATION OF PLATE 89.—Fruit of a specimen of the type collection of *Inga aestuariorum* in the Costa Rican National Herbarium. Natural size.

Inga latipes Pittier, sp. nov.

A tree; branchlets slender, angulate.

Rachis of the leaves wingless, glabrous, canaliculate or submarginate, 3 to 5 cm. long, the petiolar part about 1 cm. long; stipules not seen, caducous; glands large, sessile, subglobose or depressed; leaflets 3-jugate, scarcely oblique, coriaceous, the petiolules about 2 mm. long, sparsely pubescent or glabrescent, the blades ovate-elliptic, rounded-cuneate at the base, obtuse, acute, or acuminate at the apex, 3.5 to 12 cm. long, 2 to 4.5 cm. broad, glabrous, lustrous above, with slightly prominent costa and veins, paler and obscurely reticulate beneath, with very prominent costa and veins.

Inflorescence not known.

Legume subligneous, pedunculate, short-stipitate, 9 to 31 cm. long, about 4 cm. broad, broadly rounded at base and apex, glabrous, blackish, transversely

striate, the seeds very prominent, the margins thin and sulcate, the stipe slender, about 8 mm. long, the peduncles 3.5 cm. long.

Type in the John Donnell Smith Herbarium, collected at Las Vueltas de Tucurrique, Reventazón Valley, Costa Rica, in forests, at an altitude of 900 to 1,000 meters, fruits only, April, 1899, by A. Tonduz (Inst. Fís. Geogr. Costa Rica, no. 13056).

The leaves recall those of *Inga leptopoda* Schlecht., but the legumes are strikingly distinct from those of any other known species.

Inga cycladenia Pittier, sp. nov.

Branchlets terete, the minute pubescence covering the numerous dotlike lenticels.

Rachis of the leaves minutely pubescent, slightly marginate, 3.5 to 4.5 cm. long, the petiolar part 1.5 to 2 cm.; stipules lanceolate, acuminate, pubescent, about 7 mm. long; leaflets 2-jugate, coriaceous, very shortly petiolulate (petiolules about 1 mm. long); glands orbicular, peltate, up to 4 mm. in diameter; leaflets ovate, broadly cuneate at the base, abruptly contracted into a narrow acumen nearly 2 cm. long, sparsely pilosulous and lustrous above, minutely soft-puberulent beneath, 11.5 to 14.5 cm. long, 5 to 7 cm. broad, the densely pubescent costa and veins very prominent beneath.

Floral spikes 2 to 4-clustered in the axils of the terminal leaves, the peduncles pubescent, angulate, 3 to 5 cm. long, the flower heads short and dense; flowers small, sessile; calyx tubular-campanulate, sparsely and minutely pubescent, 3.4 to 4 (3.8) mm. long; corolla tubular, gradually broadening toward the apex, silky-pubescent, 6.6 to 7.4 (7.1) mm. long, the lobes broad, acute, 1.5 to 2 mm. long; staminal tube included, the stamens (measured from the base) about twice the length of the corolla, the capitellate style slightly longer.

Legume not known.

Type in the Herbarium of the New York Botanical Garden, collected at Micay-Sayjá and Timbiquí, Colombia, flowers, June, 1901, by F. C. Lehmann (B. F. 662).

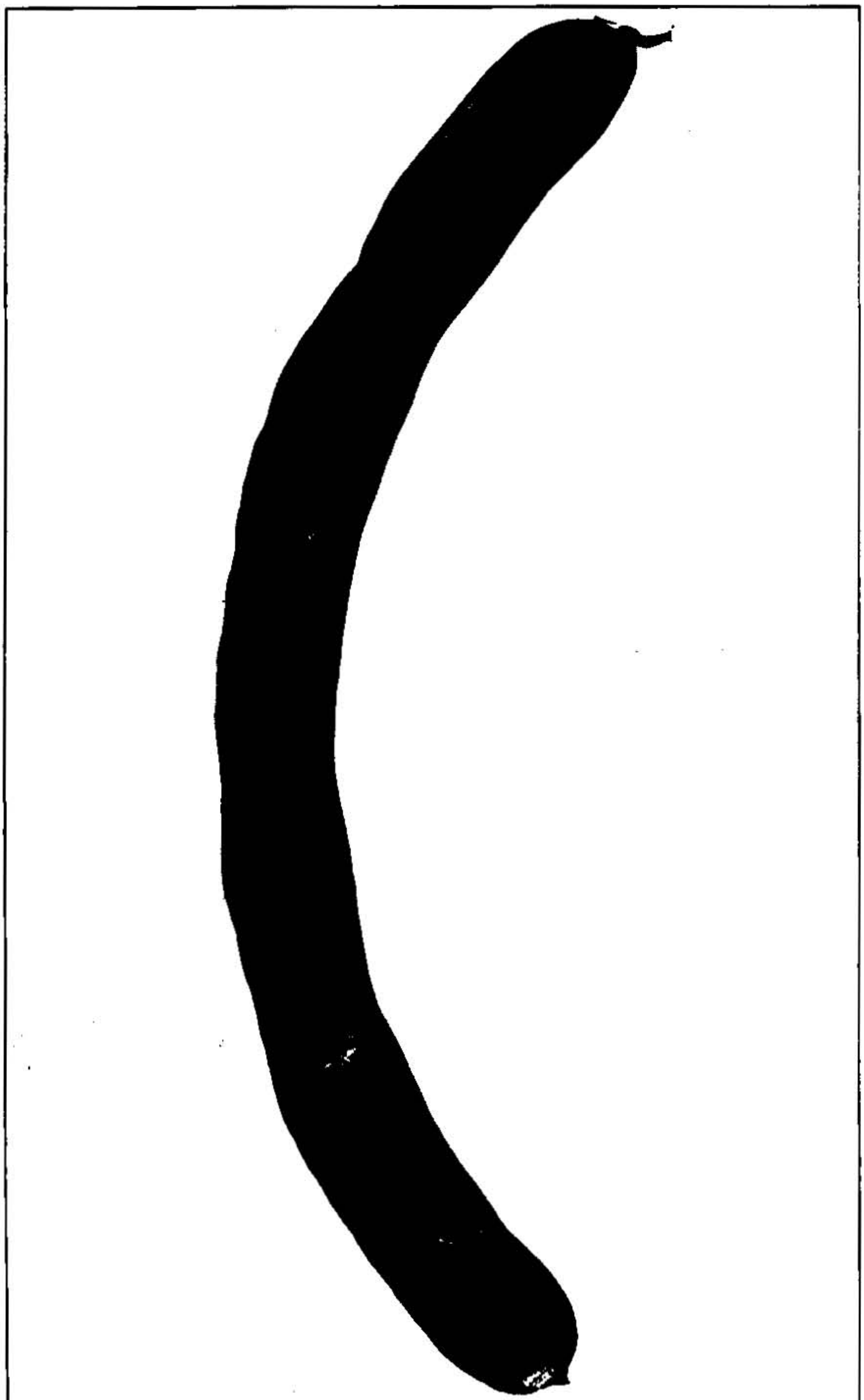
Conspicuous by its enormous discoid glands, this species reminds one somewhat of *Inga rufinervis* in the pubescence and arrangement of the inflorescence, and of *I. acrocephala* in the size of the flowers, these, however, being very distinctly shaped.

Inga myriocephala Pittier, sp. nov.

Branchlets angulate, densely set with linear-elliptic lenticels, the younger parts ferruginous-pubescent.

Rachis of the leaves glabrous, slightly marginate beneath each pair of leaflets, 5 to 15 cm. long, the petiolar part 1 to 4 cm. long; stipules linear, acute, about 8 mm. long, glabrescent, deciduous; leaflets 4-jugate, rarely 2 or 3-jugate, more or less oblique, short-petiolulate, coriaceous, glabrous; glands small, globose, pertuse, subsessile; leaflet blades elliptic-lanceolate, acute at the base, acuminate at the apex, dark green above, paler or ferruginous and reticulate beneath, the costa and veins slightly prominent on both sides, the blades of the basal pair 7.5 to 8.5 cm. long, 3 to 3.5 cm. broad, those of the upper pair about 15 cm. long, 6 cm. broad.

Inflorescences very numerous, paniculate on the terminal branchlets; spikes 2 or 3-clustered in the axils of undeveloped leaves, the peduncles 2 to 3 cm. long, slender, sparsely ferruginous-pubescent, the flower heads dense, very short, broader than long; flowers sessile; bractlets spatulate or subulate, glabrescent, about 2 mm. long, subpersistent; calyx tubular, 5.1 to 5.8 (5.4) mm. long, sparsely and minutely pubescent, the teeth very short and obtuse; corolla



FRUIT OF INGA AESTUARIORUM PITTIER.

INGA PINETORUM PITTIER.

tubular, 8.5 to 9.3 (9) mm. long, silky-pubescent, the lobes 0.5 to 1 mm. long; staminal tube included; stamens short, but exceeding the truncate style.

Legume flat, thin, glabrous, about 9 cm. long and 2.3 cm. broad, the prominent, thin margins bordering the valves.

Type in the U. S. National Herbarium, no. 32671, collected at Mapirí, Bolivia, at an altitude of about 800 meters, flowers and fruits, May, 1886, by H. H. Rusby (no. 1003).

This species is distinguished from its close relatives by the glabrous leaves, 4-jugate leaflets, and large paniculate inflorescences with numerous short and broad flower heads. The legume described seems to be immature. *Inga myriocephala* may be closely related to *I. acrocephala* Steud., from Surinam, but differs in the short petiolules, in having the costa and veins slightly prominent on both faces of the leaflets, and in the larger flowers.

Inga pinetorum Pittier, sp. nov. PLATE 90.

A tree; branchlets densely ferruginous-hairy, lenticellose.

Rachis of the leaves terete, densely ferruginous-pubescent, 2.5 to 3.5 cm. long, the petiolar part 0.5 to 1.2 cm. long; stipules ovate-acuminate, 3 to 4 mm. long, hairy, persistent; leaflets 2-jugate, petiolulate; glands very small, substipitate, urceolate, pertuse, smooth outside; petiolules densely ferruginous-hairy, about 3 mm. long; leaflet blades suboblique, obovate, cuneate at the base, subobtuse and mucronate or sometimes acuminate at the apex, coriaceous, the upper face darkish, dull (in sicco), and sparsely hairy except on the brownish-pubescent costa and the impressed veins, light brown and pilosulous beneath, with the costa, veins, and venules prominent, the blades of the lower pair 4 to 6.5 cm. long, 2 to 3.5 cm. broad, those of the upper pair 8 to 12 cm. long, 3 to 5 cm. broad.

Inflorescences axillary; floral spikes geminate, 7 to 9 cm. long; peduncles 5 to 6.5 cm. long, terete, ferruginous-hairy; rachis hairy, 1 to 2 cm. long; flowers sessile; calyx tubular, stipitate, 6.5 to 7.2 (6.9) mm. long, sparsely hairy, the teeth rather narrow and acute; corolla tubular-funnelform, silky-villous, 11.4 to 11.7 (11.6) mm. long, the lobes nearly 3 mm. long, narrow, acute; staminal tube slightly exserted; pistil about 4 cm. long; ovary long-stipitate, fusiform, glabrous; style subtruncate.

Legume not known.

Type in the Gray Herbarium, collected at Pineridge, near Manatee Lagoon, British Honduras, flowers, February 19, 1906, by M. C. Peck (no. 343).

Though identified as *Inga leptopoda*, this is a species quite distinct on account of its peculiar hairiness, its long flowers, and the fusiform, stipitate ovary.

EXPLANATION OF PLATE 90.—From a photograph of the type specimen of *Inga pinetorum*. Natural size.

Inga popayanensis Pittier, sp. nov. PLATE 91.

Branchlets terete or subangulate, the younger parts glabrous or glabrescent, 3-angulate.

Rachis of the leaves terete or submarginate, glabrous (pubescent as is the whole leaf at an early stage), 3 to 6.5 cm. long, the petiolar part 1.5 to 2 cm.; stipules linear-lanceolate, subulate, glabrous, 6 to 8 mm. long, caducous; leaflets 2 or 3-jugate, oblique, petiolulate, coriaceous; glands sessile, globose or urceolate, pertuse, sometimes obsolete; petiolules thick, 3 to 4 mm. long, glabrous; leaflet blades lanceolate, cuneate at the base, long-acuminate at the apex, dark green, glabrous or glabrescent, and sublustrous above, dull, rusty-colored, and sparsely pubescent beneath, the costa and veins glabrous and slightly prominent on the upper face, pubescent and very prominent beneath, the blades of

the basal pair 5 to 9 cm. long, 1.5 to 3 cm. broad, those of the terminal pair 7 to 14 cm. long, 2 to 4.5 cm. broad.

Inflorescences single or 2 to 5-clustered in the axils of the upper leaves; peduncles angulate, striate, more or less minutely appressed-pubescent, 2 to 6.5 cm. long; flower heads ovoid, 0.8 to 2 cm. long, the basal flowers deciduous during the elongation; flowers sessile; bractlets subulate, glabrous, 2 to 3 mm. long, caducous; calyx tubular, slightly constricted above the base, striate, minutely and sparsely pubescent, 6 to 7 (6.5) mm. long, the teeth about 1.5 mm. long, rounded at the apex; corolla tubular, slightly broadening above the calyx, 9 to 11.5 (10.4) mm. long, silky-pubescent, the lobes lanceolate, acute, reflexed, 2 to 3 mm. long; staminal tube exserted; style 22 to 23 mm. long, glabrous; ovary stipitate, depressed, about 2.5 mm. long; style clavate at the apex.

Legume not known.

Type in the John Donnell Smith Herbarium, collected in forests in the highlands of Popayán, Colombia, between 1,500 and 2,200 meters, by F. C. Lehmann (no. 5751).

There is a duplicate in the Herbarium of the New York Botanical Garden. Also collected near Popayán, Colombia, at 1,500 to 1,900 meters, flowers, August, 1881, *Lehmann* 820, and in Colombia (without exact locality data), *Lehmann* 7808.

While the calyx and corolla agree in size with those of *Inga nobilis* Willd., the stamens and style are much shorter and the pubescence distinct. The flowers, besides, are always sessile, with glabrous, subulate bracts. But the fundamental difference is in the lanceolate leaflets, with a larger number of parallel veins, hardly apparent venation, and a long, gradually narrowing acumen. Notwithstanding these very manifest characters, Micheli [1] identified this plant (no. 829) as *I. nobilis*.

EXPLANATION OF PLATE 91.—Specimen of *Inga popayanensis* in the John Donnell Smith Herbarium, *Lehmann* 7808, cited above. Natural size.

Inga semiglabra Pittier, sp. nov. PLATE 92.

A tree about 13 meters high (Eggers); branchlets terete, slender, glabrous, the younger parts also glabrous or glabrescent.

Leaves entirely glabrous, the rachis terete, slender, 4 to 8.5 cm. long, the petiolar part thicker and dark-colored at the base, 1 to 3 cm. long; leaflets 3-jugate, membranous, petiolulate; glands small, sessile, orbicular, concave; petiolules dark-colored, about 3 mm. long; leaflet blades ovate or obovate to lanceolate, long-cuneate at the base, acuminate at the apex, light green above, paler beneath, the costa and veins prominent on both sides, but more so beneath, the blades of the basal pair 3.5 to 6 cm. long, 2.5 to 3 cm. broad, those of the terminal pair 9 to 14.5 cm. long, 3 to 5 cm. broad.

Inflorescences axillary or terminal, the spikes single or 2 or 3-clustered; peduncles slender, 2.5 to 4 cm. long, the flower heads elongating and dropping their flowers from the base (rachis 2.5 to 3 cm. long); flowers sessile; bractlets small, ovate-acuminate, caducous; calyx tubular, slightly broadening toward the apex, covered with few minute appressed hairs, 5 to 6 mm. long, the obtuse teeth ending with a tuft of (glandular?) hairs; corolla tubular, broadened above the calyx, 9.3 to 10.7 (9.8) mm. long, glabrous on the lower half, minutely pubescent on the exposed upper half, the lobes broad, acute, inflexed, 1 to 2 mm. long; staminal tube short-exserted, the stamens 2 to 2.5 cm. long; pistil glabrous, 2.2 cm. long; ovary short, stipitate.

Legume not known.

[1] Bot. Jahrb. Engler **16**: Beibl. **37**: 9. 1892.

INGA POPAYANENSIS PITTIER.

INGA SEMIGLABRA PITTIER.

Type in the John Donnell Smith Herbarium, collected at El Recreo, Ecuador, flowers, December 14, 1896, by Baron Eggers (no. 15464). The same number is also in the Herbarium of the Field Museum.

Closely related to *Inga leiocalycina* Benth. of Brazil and British Guiana, but the pubescence is sparser, the glands small, the leaflets 3-jugate, the calyx sparsely covered with minute hairs, the corolla glabrous on the lower half, the staminal tube exserted, etc.

EXPLANATION OF PLATE 92.—A specimen of the type collection of *Inga semiglabra* in the Herbarium of the Field Museum of Natural History, no. 143132. Natural size.

NOTES ON CRITICAL SPECIES.

Inga multijuga Benth. Trans. Linn. Soc. **30**: 615. 1875.

Probably founded on Sutton Hayes's specimens from Panama, which I have not seen. Numbers 641, 729, 734, and 739 of the Guatemalan collection of Cook and Griggs (1902) agree with the diagnosis, except that in no. 641, the only one with flowers, the leaflets are only 5 or 6-jugate. The length of the calyx varies from 7 to 8 mm., and that of the corolla between 23 and 25 mm. The leaflets are always rounded at the base and either acute or acuminate at the apex; in size, they keep within the limits given by Bentham, except in no. 739, which, it is surmised, was taken from a sapling. These specimens show a close resemblance to *I. thibaudiana*, but the flowers are longer and more in accordance with the description of the above-named species.

Fendler's no. 51, from Chagres, Panama, cited after the diagnosis of *I. multijuga* and represented in the Gray Herbarium, is more likely to be a large-flowered form of *I. ruiziana*. The calyx measures only 4.3 mm. and the longest corolla 16.1 mm., which is much under the dimensions given for *I. multijuga*.

The identification of specimens from Costa Rica (Inst. Fís. Geogr. Costa Rica, no. 6793) as this species by Micheli is also wrong. These represent a distinct type which I have described above as *Inga aestuariorum* Pittier.

Inga peltadenia Harms, Verh. Bot. Ver. Brand. **48**: 160. 1906.

This species, if distinct, is very closely related to *Inga thibaudiana* DC., and is characterized mainly by the very large, peltate glands. Most of the Bolivian specimens in our collections classified under the last name would belong to the former type. The legume, as shown by Williams's no. 575 (Herb. N. Y. Bot. Gard.) from Zumupasa, Bolivia, is straight or almost so, flattened, rounded at the base, apiculate, about 19 cm. long, fulvous-pubescent, the faces flat, 2 cm. broad (including the elevated margins, these about 3 mm. broad); seeds 12 to 18. According to Bentham[1] the pods of *I. thibaudiana* are from 15 to 30 cm. long, 1.9 to 2.6 cm. broad, and identical with those of the former in their other characters.

Inga punctata Willd. Sp. Pl. **4**: 1016. 1806, excl. syn.

This species and *I. leptoloba* Schlecht., besides being both variable, are easily confused. An attempt has been made at separating two conspicuous varieties of the first, and others could undoubtedly be established within the latter species. This task, however, is made difficult by the scarcity of complete specimens, including mature pods.

The following characters seem to be essential in *I. punctata:* The leaflets are, as a rule, 2-jugate, broadly ovate, broadly rounded at the base, long and sharply acuminate, with an almost membranous texture and distant veins;

[1] In Mart. Fl. Bras. **15**[2]: 480. 1876.

the mature pods are 2.5 cm. broad, rounded at the base, and at most very shortly stipitate; and the seeds are separated by deep transverse furrows.

Inga leptoloba Schlecht. Linnaea **12**: 559. 1830. PLATES 93, 94.

In this species the leaflets are 3-jugate, very seldom fewer, ovate-elliptic or oblong-elliptic, usually cuneate or subcuneate at the base, with a broader acumen than in *I. punctata;* their texture also is firmer and the veins are nearer together; the mature pods are narrower, fuller, distinctly stipitate or at least cuneate, never broadly rounded, at the base.

An illustration of the fruit of *I. ruiziana* Don, another species of the same series, is given in plate 95.

EXPLANATION OF PLATES 93–95.—Pl. 93, from a field photograph of *Inga leptoloba* taken at Setzimaj, Guatemala, March 19, 1902, by Mr. G. N. Collins. Pl. 94, fruit of a specimen collected along the Río Torres at San Francisco de Guadalupe, near San José, Costa Rica, by Tonduz (Inst. Fís. Geogr. Costa Rica, no. 8010); specimen in the John Donnell Smith Herbarium. Pl. 95, two fruits of *Inga ruiziana* Don, in the U. S. National Herbarium, collected at Gamboa, Canal Zone, Panama, March 29, 1914, by H. Pittier (no. 6520). All natural size.

Series 3. PILOSIUSCULAE.

NEW SPECIES.

Inga cobanensis Pittier, sp. nov.

A tree, the young branchlets terete, densely ferruginous-pubescent.

Rachis of the leaves winged, 3.5 to 7.5 cm. long, ferruginous-pubescent, the petiolar part wingless, thicker at the base, 1.2 to 2 cm. long, the wings obovate, up to 8 mm. broad; stipules not seen; glands small, sessile, deep-pitted, transversely compressed; leaflets 3-jugate, oblique, coriaceous, the petiolules ferruginous-hairy, up to 2 mm. long, the blades ovate, rounded at the base, acute or subacuminate, glabrous above except on the ferruginous-pubescent costa and veins, reticulate and rufous-tomentose beneath, with the costa and veins densely pubescent and prominent; blades of the basal pair of leaflets 3 to 5.5 cm. long, 1.5 to 2.5 cm. broad, those of the terminal pair 7 to 11 cm. long, 3.5 to 5.5 cm. broad.

Floral spikes 3 to 6-clustered in the axils of the upper leaves, the peduncles terete, densely ferruginous-pubescent, 1 to 3 cm. long, the flower heads elongate, many-flowered; bractlets linear, acute, densely ferruginous-hairy, shorter than the calyx; flowers sessile; calyx densely rufous-pubescent, 4.3 to 6.3 (5.3) mm. long, the teeth short, triangular, acute; corolla 11.6 to 13.2 (12.4) mm. long, densely fulvous or rufous-villosulous, the lobes ovate-lanceolate, acute, 1.5 to 2 mm. long; staminal tube included, seldom slightly exserted, the filaments very long (about 3 cm. from base of the tube); ovary sessile, glabrous, flattened; style about 4.5 cm. long.

Legume not known.

Type in the John Donnell Smith Herbarium, collected at Cobán, Alta Verapaz, Guatemala, at an altitude of about 1,450 meters, flowers, April, 1887, by H. von Türckheim (J. D. Smith, no. 1214).

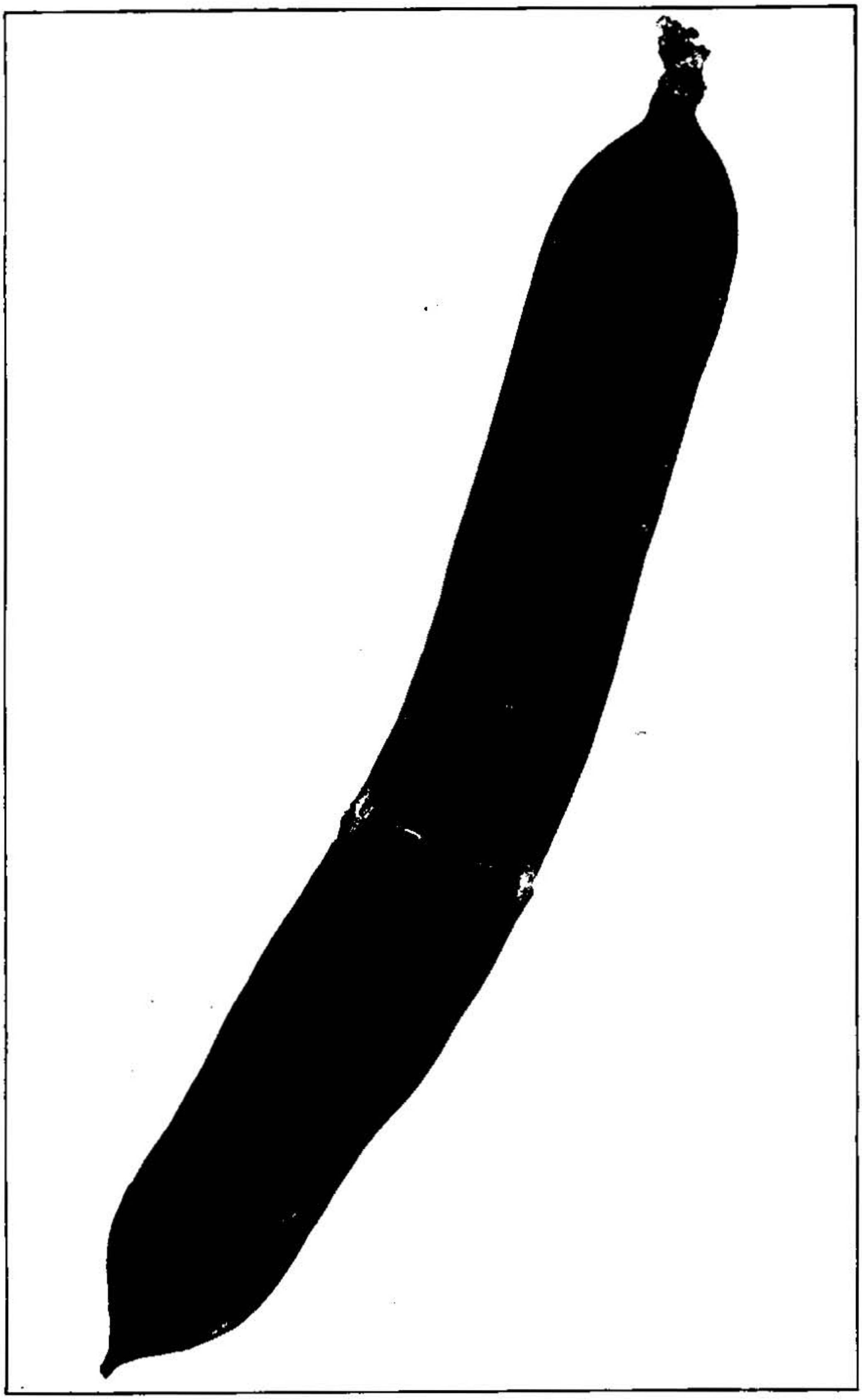
This species was distributed under the name *Inga edulis* Mart., but differs in its 3-jugate leaflets, smaller flowers, etc. The shape of the ovary seems to indicate a flat pod. On account of this and taking into account the other characters, I place *I. cobanensis* in the present section and series.

Inga hostmannii Pittier, sp. nov.

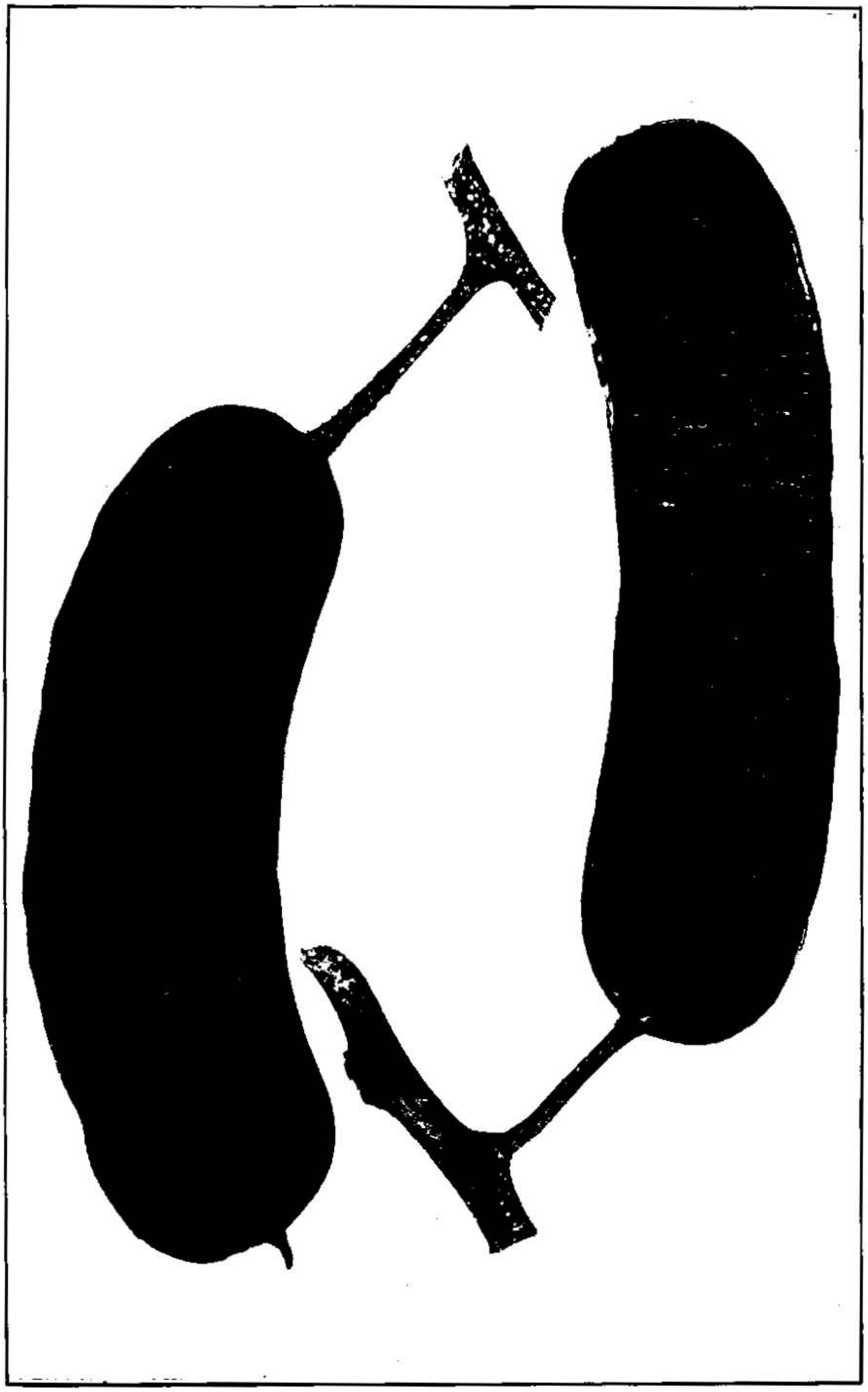
Branchlets angulate, thick.

Leaves entirely glabrous; rachis narrowly winged or marginate, 1.5 to 2.5 cm. long, the petiolar part 0.5 to 0.7 cm. long; leaflets 2-jugate, coriaceous, stiff,

INGA LEPTOLOBA SCHLECHT.



FRUIT OF INGA LEPTOLOBA SCHLECHT.



FRUIT OF INGA RUIZIANA DON.

petiolulate, more or less oblique; glands sessile, scutellate; petiolules thick, rugose, about 3 mm. long; leaflet blades ovate or obovate, cuneate-attenuate at the base, obtuse and emarginate at the apex, the costa and veins prominent on both faces, the blades of the basal pair 5.5 to 6.5 cm. long, 3 to 4 cm. broad, those of the terminal pair 8 to 14 cm. long, 4.5 to 6.5 cm. broad.

Inflorescence corymbose on axillary or terminal defoliate branchlets, the floral spikes single or geminate; peduncles glabrous or sparsely pubescent, 1.5 to 2.5 cm. long; flower heads elongate, dense at first, but the flowers somewhat remote later; flowers sessile; bractlets ovate, conchoid, pubescent without, 3 to 5 mm. long, caducous; calyx pubescent, more or less distinctly striate, 7 to 8 mm. long, the teeth ovate, rounded at the apex; corolla 15 to 17 mm. long, silky-villous, the lobes narrow, obtuse, about 3 mm. long.

Legume not known.

Type in the Gray Herbarium, collected in Surinam by F. W. Hostmann; other data not given.

The leaves and the arrangement of the inflorescence agree with the description of *Inga splendens* (Poir.) Willd., but the flowers are much smaller. This species corresponds to none of those enumerated by Bentham as collected by Hostmann in Surinam.[1]

Inga langlassei Pittier, sp. nov.

A tree 8 to 10 meters high (Langlassé); young branchlets velvety ferruginous hairy.

Rachis of the leaves winged, velvety-hairy (like the branchlets), 14 cm. long, the petiolar part almost nude, 2.5 cm. long, the wings sparsely villous; leaflets 5-jugate, petiolulate; glands stipitate, blackish, the pit broad, dark at the bottom, with light brown rim; petiolules densely hairy, about 1 mm. long; leaflet blades ovate to obovate, rounded and subemarginate at the base, subacuminate, the tip acute and long-mucronate, sparsely villous above, slightly lustrous, the costa prominent and densely hairy and the veins delicate and impressed, brownish and sparsely villous beneath, with the nervation very prominent and the costa and veins hairy, the margin thickly hairy; blades of the lowest pair about 5 cm. long, 2 cm. broad, those of the penultimate pair larger than those of the terminal one, 13 to 15 cm. long, 5 cm. broad.

Inflorescences axillary, ternate, the peduncles and rachis ferruginous-hairy, the former 2.5 to 3 cm. long, the flower heads dense, elongate (about 3 cm. long); flowers sessile; bractlets linear, acute, a little shorter than or equal to the calyx; calyx broad, tubular, sparsely hairy, 3.2 to 3.7 (3.5) mm. long; corolla tubular-campanulate, white, sparsely silky-villous, 6.4 to 7.3 (6.8) mm. long; staminal tube included; pistil about 13 mm. long, glabrous, the ovary subsessile, containing about 20 biseriate ovules, the style ending in a broad stigma.

Legume not known.

Type in the U. S. National Herbarium, no. 530548, collected on the eastern watershed of the Western Cordillera, Cauca Valley, Colombia, flowers, November 11, 1899, by E. Langlassé (no. 63).

The tree is cultivated and is known among the natives by the name of "navo." The fruit is edible.

This species is conspicuous for its flowers, which are the smallest in the group, the hairy fringe of its leaflets, and its comparatively large stigmas. It does not come very near any of the species I have seen.

Inga mollifoliola Pittier, sp. nov.

A tree; branchlets terete, glabrous, covered with brownish lenticels, the younger parts softly ferruginous-tomentose.

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[1] Trans. Linn. Soc. 30: 643. 1875.

Rachis of the leaves very narrowly winged, densely ferruginous-tomentose, 4.5 to 9.5 cm. long, the petiolar part nude, terete, 1 to 1.7 cm. long, the first interfoliar part nude or seminude; stipules lanceolate, acute, sparsely hairy, about 5 mm. long, caducous; leaflets 4 or 5-jugate, seldom 3-jugate, oblique, very shortly petiolulate, membranous; glands small, sessile, scutellate or cup-shaped, often obsolete; leaflet blades elliptic-ovate, obovate, or elliptic-oblong, narrow and more or less rounded at the base, acuminate at the apex, glabrous and lustrous above, the costa more or less hairy and subprominent and the veins impressed, softly ferruginous-tomentose beneath, the costa and veins densely hairy and prominent; blades of the basal pair 3.5 to 4.5 cm. long, 1.2 to 2 cm. broad, those of the terminal pair 8 to 12 cm. long, 3.5 to 4 cm. broad.

Inflorescences mostly terminal, the floral spikes single or 2 or 3-clustered in the axils of the upper leaves; peduncles densely ferruginous-pubescent, 2.5 to 4.5 cm. long; flower heads ovoid; flowers sessile; bractlets linear-subulate, hairy, 3 to 4 mm. long, subpersistent; calyx tubular, more or less stipitate, 5 to 6 (5.4) mm. long, covered with a coarse pubescence, this dense at the base, sparser toward the apex, the teeth short and rounded; corolla tubular, slightly widening toward the apex, 8.6 to 9.7 (8.9) mm. long, villous, the lobes lanceolate, obtuse, about 2 mm. long; staminal tube included, the tube and filaments pink; style clavate at the apex, longer than the stamens.

Legume not known.

Type in the John Donnell Smith Herbarium, collected at Rodeo de Pacaca, near San José, Costa Rica, in woods, flowers, January, 1891, by H. Pittier (Inst. Fís. Geogr. Costa Rica, no. 3251).

Also collected at San Marcos de Dota, in forests, flowers, March, 1893, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 7548).

Identified with *Inga densiflora* Benth. by Micheli, but differing from that Peruvian species in the tomentose indumentum, in the size, shape, and texture of the leaflets, and in the arrangement of the inflorescence, as well as in the minor details of the flowers.

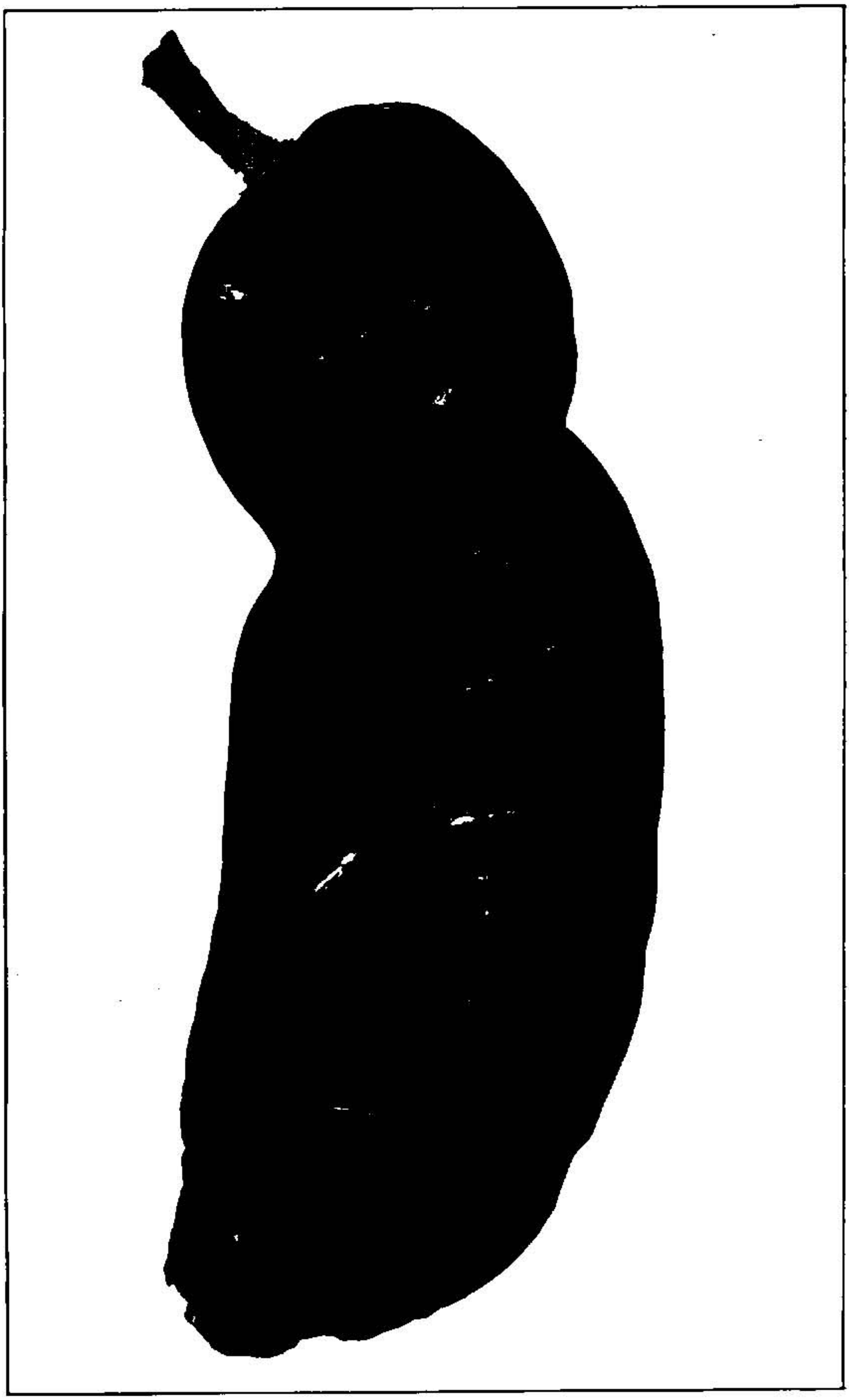
Inga monticola Pittier, sp. nov. PLATE 96.

A widely spreading tree, about 16 meters high (Williams); branchlets terete, pubescent, covered with round, whitish lenticels, the younger parts ferruginous-pubescent.

Rachis of the leaves very narrowly winged, ferruginous-pubescent, 5.5 to 10 cm. long, the petiolar part 0.7 to 1 cm. long; stipules unknown; leaflets mostly 4-jugate, seldom 3-jugate, oblique, membranous, short-petiolulate; glands large, sessile, subpeltate, orbicular; petiolules ferruginous-pubescent, 1 mm. long or less; leaflet blades ovate, oblong, or ovate-elliptic, more or less rounded at the base, acute or abruptly short-acuminate at the apex, glabrous and lustrous above except on the pubescent, prominent costa and veins, glabrous or sparsely hairy and reticulate beneath, the venation here pubescent and strongly prominent, the blades of the basal pair 4 to 5 cm. long, 1.5 to 2.5 cm. broad, those of the terminal pair 8 to 14.5 cm. long, 3 to 5.5 cm. broad.

Floral spikes single in the axils of the upper leaves; peduncles 3 to 4 cm. long, ferruginous-pubescent; flower heads elongate (2 to 3.5 cm. long), depauperate; flowers sessile; bractlets linear or subulate, 1 to 3 mm. long, pubescent, subpersistent; calyx tubular, substriate, sparsely puberulent, 4.1 to 4.3 mm. long; corolla 7 to 8 mm. long, tubular, the upper half subcampanulate, minutely pubescent, the lobes lanceolate, acute, reflexed, about 1.5 mm. long; staminal tube included.

Legume sessile, 8 to 16 cm. long, rounded or subcuneate at the base, acuminate at the apex, the valves 5 cm. broad, blackish, transversely grooved, at



FRUIT OF INGA MONTICOLA PITTIER.

INGA DENSIFLORA BENTH.

first ferruginous-pubescent, becoming glabrous and lustrous, the margin 7 mm. broad, slightly elevated around the valves, more or less ferruginous-pubescent; seeds 5 to 10.

Type in the U. S. National Herbarium, no. 678053, collected at Bismarck, above Penonomé, Province of Coclé, Panama, flowers and fruits, March 6, 1908, by R. S. Williams (no. 316).

In its dimensions the fruit of this species recalls that of *Inga densiflora* Benth., illustrated in plate 97, but this seems to be the only common character between the two types, the former apparently having no close ally among the known species of the series Pilosiusculae.

EXPLANATON OF PLATES 96, 97.—Pl. 96, fruit of the type specimen of *Inga monticola*. Pl. 97, specimen of the type collection of *Inga densiflora* in the Gray Herbarium, collected near Tarapoto, eastern Peru, 1855–56, by R. Spruce (no. 4504). Both natural size.

Inga organensis Pittier, sp. nov.

Young branchlets densely ferruginous-hairy.

Rachis of the leaves winged, densely ferruginous-hairy, 10 to 12 cm. long, the wings more or less attenuate toward the base, 5 to 12 mm. long, the petiolar part (also winged) 2 to 2.5 cm. long; stipules unknown; leaflets 4-jugate, subcoriaceous, petiolulate; glands small, suburceolate; petiolules densely ferruginous-pubescent, about 3 mm. long; leaflet blades ovate to elliptic-oblong, slightly attenuate and obtuse at the base, short-acuminate and mucronulate at the tip, dull above, paler and reticulate beneath, the costa and veins ferruginous-pubescent on both sides and prominent beneath, the blades of the basal pair 3 to 5 cm. long, 1.2 to 2 cm. broad, those of the terminal pair 11 to 12 cm. long, 4 to 4.5 cm. broad.

Floral spikes 2 or 3-clustered in the upper axils, the peduncles densely ferruginous-hairy, 2 to 2.5 cm. long, the flower heads ovoid; flowers sessile; bractlets linear, pubescent, 6 mm. long or less, caducous; calyx 1.5 to 2.1 (1.8) mm. long, broad, densely fulvous-pubescent, the teeth short, acute, parted by rounded sinuses; corolla 4.7 to 5 (4.9) mm. long, white, broadened above the calyx, densely silky-pubescent, the lobes triangular, subacute; staminal tube exserted; style much longer than the stamens.

Legume not known.

Type in the Gray Herbarium, collected in the Organ Mountains, Brazil; further data not given.

In this species, which is certainly not included in Bentham's last revision and seems not to have been described since, the flowers are even smaller than in *Inga chartacea*. It possibly belongs near *I. densiflora*.

Inga sordida Pittier, sp. nov.

A tree; branchlets terete, the younger parts densely ferruginous-tomentellous.

Rachis of the leaves ferruginous-tomentellous, winged, 8.5 to 17 cm. long, the petiolar part 2 to 2.5 cm. long, winged, the wings attenuate toward the base and the apex, 8 to 15 mm. broad; stipules unknown; leaflets 3 or 4-jugate, coriaceous, subsessile; glands rather large, subsessile, crateriform; leaflet blades ovate or oblong, broadly rounded and emarginate at the base, acuminate at the apex, glabrous, sordid brown and lustrous above, softly pubescent and reticulate beneath, the costa pubescent and prominent and the veins impressed on the upper face, the costa and veins densely hairy and strongly prominent on the lower face; blades of the basal pair 5 to 9 cm. long, 1.5 to 3.5 cm. broad, those of the terminal pair 16 to 18 cm. long, 6.5 to 7 cm. broad.

Floral spikes paniculate at the ends of the branchlets or on short, axillary, defoliate branchlets, the peduncles densely ferruginous-tomentellous, 2 to 2.5 cm. long, the flower heads elongate and very dense; flowers sessile; bractlets

ovate-lanceolate, obtuse, hairy, about 6 mm. long, deciduous; calyx 3.7 to 4.6 (4) mm. long, tubular, sparsely pubescent, the teeth broad, rounded, 1 to 2 mm. long; corolla 8.5 to 10 (9.2) mm. long, tubular, slightly broader at the apex, densely villosulous, the lobes acute, 2 to 3 mm. long; staminal tube included; style longer than the stamens, ending in a subpeltate stigma.

Legume not known.

Type in the John Donnell Smith Herbarium, collected near Popayán, Cauca, Colombia, at an altitude of 1,700 meters, flowers, August 28, 1881, by F. C. Lehmann (no. 904).

Perhaps nearly related to *Inga densiflora* Benth., from which it differs in having the leaves larger, broader, and thicker, the pubescence more abundant, the floral spikes longer, the flowers more numerous, etc.

Inga stenopoda Pittier, sp. nov. PLATE 98.

A tree; branchlets terete or subangulate, glabrous or very sparsely ferruginous-hairy.

Rachis of the leaves winged, sparsely ferruginous-hairy, 7 to 15 cm. long, the petiolar part nude, terete, 1 to 2 cm. long, the wings about 7 mm. broad, attenuate toward the base, rounded at the apex; leaflets 5-jugate, petiolulate, subcoriaceous; glands subsessile, prominent, semiglobose, transversely compressed; petiolules densely ferruginous-hairy, 2 to 3 mm. long; leaflet blades ovate-elliptic, more or less narrowed and rounded at the base, short-acuminate at the apex, glabrous and sublustrous above, rusty-colored and sparsely covered with minute hairs beneath, the costa and veins more or less ferruginous-pubescent, slightly prominent above, strongly so beneath; blades of the basal pair 3.5 to 4.5 cm. long, 1.5 to 1.7 cm. broad, those of the terminal pair largest, 7 to 10.5 cm. long, 3 to 4.5 cm. broad.

Floral spikes 2 to 4-clustered in the axils of the upper leaves or at the defoliate ends of the branchlets; peduncles minutely ferruginous-hairy, 1.5 to 2.5 cm. long; flower heads ovoid, the flowers sessile, the lower ones deciduous; bractlets ovate-oblong, pubescent without, about 6 mm. long, caducous; calyx tubular, striate, minutely pubescent, 5.3 to 5.6 (5.4) mm. long, the teeth long and acute; corolla tubular-campanulate, 11.3 to 12.6 (12.1) mm. long, silky-pubescent, the lobes ovate, acute, 2.5 to 3 mm. long; staminal tube included.

Legume (specimen genuine?) entirely glabrous, long-pedicellate (3 cm.), rounded-cuneate at the base, the valves 1.1 cm. broad, the margin narrow and effaced.

Type in the U. S. National Herbarium, no. 32668, collected at the junction of Río Beni and Río Madre de Dios, Bolivia, flowers (and fruits?), August, 1886, by H. H. Rusby (no. 995).

The detached basal portion of the legume accompanying the specimen in the Field Museum Herbarium and described above may belong to another genus. The affinities of this species seem to be with *Inga virescens* Benth., which I have not seen.

EXPLANATION OF PLATE 98.—From the type specimen of *Inga stenopoda*. Natural size.

Inga tuerckheimii Pittier, sp. nov.

A tree; branchlets subangulate, covered with numerous white lenticels, the younger parts ferruginous-pubescent.

Rachis of the leaves ferruginous-pubescent, winged, 3.5 to 6 cm. long, the wings 4 to 9 mm. broad, the petiolar part wingless, thickening toward the base, 1 to 2 cm. long; stipules not seen; glands small, substipitate, laterally compressed, pertuse; leaflets 3-jugate, petiolulate, suboblique, coriaceous; petiolules

INGA STENOPODA PITTIER

about 3 mm. long, ferruginous-pubescent; leaflet blades ovate, oblong, or ovate-lanceolate, broadly rounded at the base, acute at the apex, sparsely pubescent or glabrescent above, with the costa and impressed veins ferruginous-pubescent, fulvous-tomentose and reticulate beneath, with the densely pubescent costa and veins very prominent; blades of the basal pair of leaflets 2.5 to 4.5 cm. long, 1.2 to 2 cm. broad, those of the terminal pair 5.5 to 11 cm. long, 2.5 to 5.5 cm. broad.

Floral spikes 4 or 5-clustered and paniculate in the upper axils; peduncles ferruginous-pubescent, 1 to 2 cm. long; flower heads ovoid; bractlets ovate-lanceolate, acute, 3 to 5 mm. long, pubescent, caducous; flowers sessile; calyx tubular, densely ferruginous-pubescent, 5.5 to 6.5 mm. long, the teeth 1.5 to 2 mm. long; corolla tubular, broadening to the apex, ferruginous-pubescent, 12 to 14.5 mm. long, the lobes lanceolate, acute, 1.5 to 2 mm. long; staminal tube included; pistil about 6 cm. long, exceeding the stamens; ovary compressed, sessile.

Legume not known.

Type in the John Donnell Smith Herbarium, collected at Cobán, Alta Verapaz, Guatemala, at an altitude of 1,450 meters, flowers, April, 1887, by H. von Türckheim (J. D. Smith, no. 1214).

Distributed under the name *Inga edulis* Mart., with which, however, it has no close affinity. It takes its place near *I. haycsii* on account of its 3-jugate leaflets and short floral spikes, but it seems to be more closely related to *I. micheliana* and *I. pringlei*.

CRITICAL NOTES.

The series Pilosiusculae and Leptanthae appear to be distinguished from each other only by artificial and somewhat arbitrary characters. In the first series the bracts are said to be "small or caducous," which may be understood as if they were either small and then persistent or larger and then deciduous. As a matter of fact, in all the species that have come under my observation these bracts, either small or large, were found to be caducous or at the most, in a few isolated cases, to remain on the stalk only for a short time after the fall of the flower. In *I. leptantha* these bracts seem to be indefinitely persistent, and much longer than the calyx.

Inga micheliana, *I. pringlei*, and *I. mollifoliola* evidently form by themselves a natural group, characterized by the small, 4 or 5-jugate leaflets. In the last two the size of the flowers is practically the same, and to distinguish the two former from each other it is necessary to compare details which are not especially obvious at first glance. This group, furthermore, corresponds to the definition of the Pilosiusculae and should be considered as part of this series. It is difficult to understand how *I. micheliana* could be compared by Dr. Harms with *I. vestita* Benth., a Vulpina from southern Brazil with nude foliar rachis and very distinct flowers, while the closely related *I. pringlei* is brought near to *I. striata*, although its bracts are cadu-

cous or at the most only subpersistent. The knowledge of the fruit in these three species will certainly help very much in the definition of their relationship and true affinities, but meanwhile they should be placed side by side among the Pilosiusculae. A Guatemalan specimen of *I. micheliana* is illustrated in plate 99.

During my last stay in Panama, I collected specimens of a small tree closely corresponding to the description of *Inga hayesii* Benth. The supposition of its being this species was confirmed later by a comparison with the type at Kew. The fruit of this species is not yet known, but a full description of the leaves and flowers is now given.

Inga hayesii Benth. Trans. Linn. Soc. **30**: 617. 1875.

A small tree; branchlets terete, with a reddish, lenticellose bark; young shoots more or less brownish-villous.

Leaves light green above, paler beneath; rachis 5 to 11.5 cm. long, sparsely hairy, winged (the wings 7 to 10 mm. broad); stipules obovate, obtuse, densely pubescent without, strongly veined within, 3 to 4 mm. long, deciduous; leaflets 2 or 3-jugate, short-petiolulate; glands small, subsessile, brownish, with a dark pit; petiolules pubescent, about 1 mm. long; leaflet blades ovate to lanceolate, rounded and subemarginate at the base, obtuse or acute and apiculate at the tip, glabrous excepting the sparsely hairy costa, reticulate on both faces, the costa and veins more prominent beneath, the blades of the basal pair 3.5 to 7 cm. long, 1.7 to 4 cm. broad, those of the terminal pair 7 to 14 cm. long, 3.5 to 6 cm. broad.

Inflorescences axillary, single or geminate, very shortly pedunculate; peduncles and rachis strigose-hairy, the former 3 to 5 mm. long, the latter 10 to 15 mm. long; bractlets lanceolate, acute, pubescent without, about 2 mm. long, deciduous; flowers sessile; calyx 6.7 to 8.2 (7.4) mm. long, tubular but slightly broadening toward the tip, glabrous or sparsely hairy at the base, striate, the teeth irregular, acute, minutely pubescent at the tips; corolla tubular-funnelform, white, villous, 15.8 to 16.6 (16.3) mm. long, the lobes narrow, acute, 3.5 to 4 mm. long; staminal tube included; ovary sessile, glabrous, very short, deeply sulcate on both sides, 6-ovulate; style about 4 cm. long, equaling the stamens, the stigma capitellate.

Legume not known.

PANAMA: Panama, *Hayes*. Hills around the agricultural experiment station at Matías Hernández, near Old Panama, flowers, July 10, 1914, *Pittier* 6714.

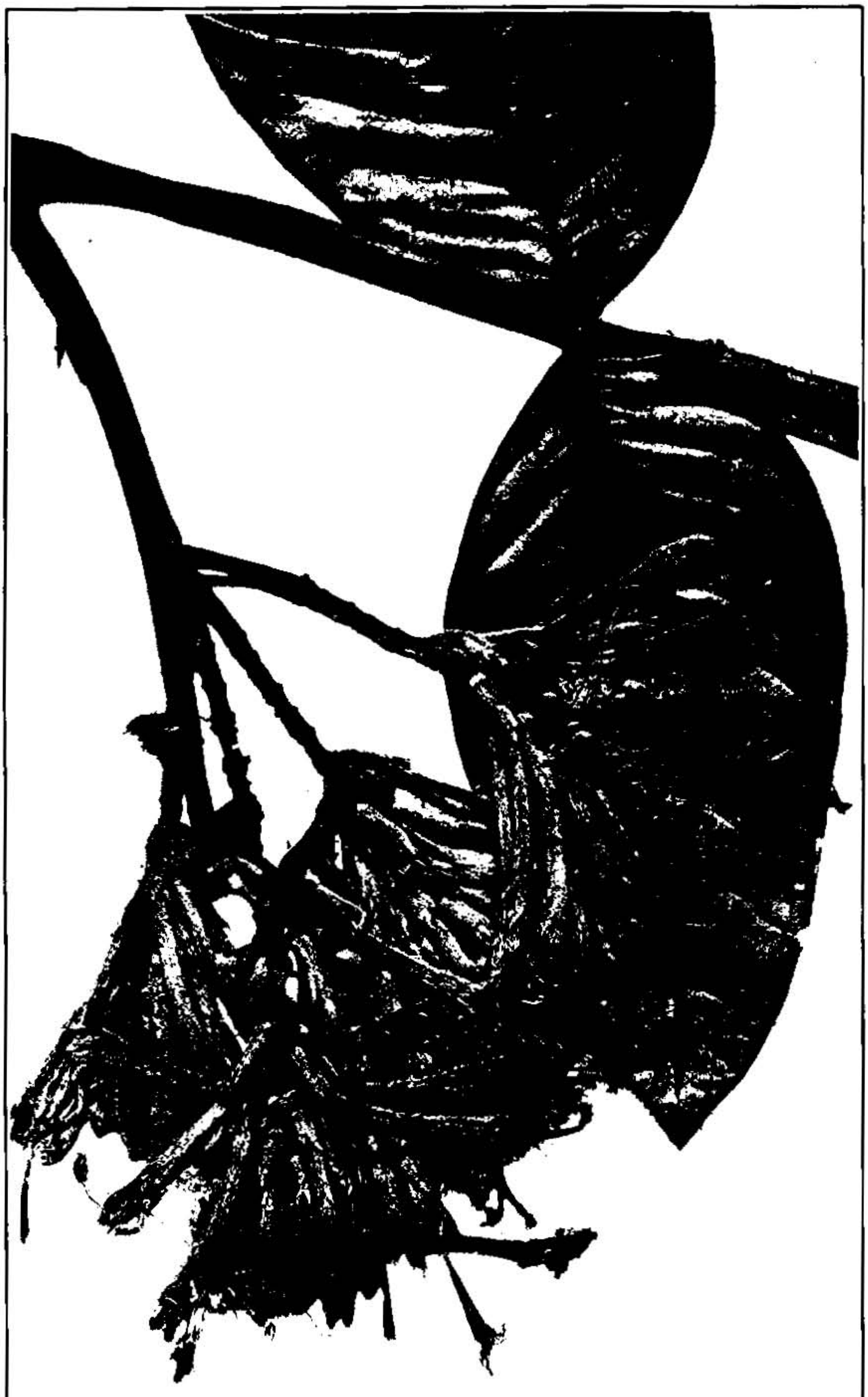
This species is characterized by its glabrous or almost glabrous calyx, in appearance not unlike that of *Inga longipes* Benth. and *I. hirsutissima* Rusby, and by its almost sessile spikes. The type has been wrongly compared with *I. maritima* Benth., which is illustrated in plate 100.

EXPLANATION OF PLATE 99.—Specimen of the type collection of *Inga micheliana* Harms, in the Gray Herbarium, collected at Río Negro, Department of Quiché, Guatemala, altitude about 1,080 meters, March, 1892, by Heyde and Lux (J. D. Smith, no. 3319). Natural size.

EXPLANATION OF PLATE 100.—Specimen of *Inga maritima* Benth., in U. S. National Herbarium, collected in the vicinity of Rio de Janeiro, Brazil, July, 1833, by Riedel (no. 442). Natural size.

INGA MICHELIANA HARMS.

INGA MARITIMA BENTH.



INGA LOMATOPHYLLA (BENTH.) PITTIER.

Series 4. LEPTANTHAE.

NOTES.

This small group is poorly represented in the collections at my disposal. It consists mainly of species native in the eastern and northeastern part of South America.

Inga acuminata Benth. Lond. Journ. Bot. 4: 600. 1845.

From Trinidad, this species presents in its long-pointed calyx a feature considered to be unique in the genus, but which we now find repeated in a specimen distributed by the Christiania Herbarium and purporting to have been collected by Eggers at El Recreo, Ecuador, April 27, 1897. It must be stated, however, that Baron Eggers also collected in Trinidad, and that the specimen referred to, in the Field Museum, is not numbered, so that there is the possibility of a label having been transposed. The two leaves on the specimen are 1-jugate, but all other details agree with Bentham's description of the Trinidad plant.

Inga hartii Urban is transferred to series 6, Calocephalae.

Series 5. LONGIFLORAE.

CRITICAL NOTES.

Bentham and Spruce considered no. 3097 of the latter's collection to be merely a variety of *Inga speciosa* Spruce, a view that is not justified by the comparison of the specimens. Bentham's variety *lomatophylla*, accordingly, is below given specific rank.

Inga speciosa Spruce, Trans. Linn. Soc. Bot. 30: 620. 1875.

In *I. speciosa* the leaflet pairs are close together, with the intermediate wings correspondingly short; the leaflets themselves are smaller (than in *I. lomatophylla*), sparsely pilosulous beneath with the costa and veins slender and sparsely hairy; the inflorescences, although of the same type as to their arrangement as in the so-called variety, are more slender and borne on a long, bracteate common peduncle; in the flower, the calyx measures from 8.5 to 9.5 mm., with teeth 1.5 to 2 mm. long, and the corolla is 32.5 to 34 mm., the lobes 3.5 to 4 mm. long; lastly, the staminal tube is very slender and exceptionally long-exserted, measuring nearly 6 cm. from the base.

Inga lomatophylla (Benth.) Pittier. PLATE 101.

Inga speciosa lomatophylla Benth. Trans. Linn. Soc. 30: 620. 1875.

In Spruce's no. 3097, now accepted as the basis of a species, the distinctive features, as compared with *I. speciosa* are:

Rachis of the leaves more elongate, the leaflet pairs more distant with the corresponding modification of the wings; leaflets reticulate, coarser, and twice as large as in *I. speciosa*, with the costa and veins much stronger and the indument much more dense; common peduncles of the fasciculate spikes shorter and thick; flowers also sensibly larger, the calyx measuring 11 to 11.5 mm., the corolla 37 to 38 mm. long, and the staminal tube projecting to a less distance.

These differences are sufficient, I think, to justify the elevation of the so-called variety to specific rank.

EXPLANATION OF PLATE 101.—Specimen of the type collection of *Inga lomatophylla*, in the Gray Herbarium, collected near San Carlos, upon the Rio Negro, northern Brazil, 1853–54, by R. Spruce (no. 3097). Natural size.

Inga mucuna Walp. & Duchass., reduced to *I. lindeniana* by Bentham, is evidently a distinct species, related perhaps to *I. poeppigiana* from Peru, which I have not seen, but from which it differs in having 4 instead of 3 pairs of leaflets, while the spikes, instead of being sessile, are long-pedunculate. The specimen in the Gray Herbarium is evidently part of the type collection. It has the broadly ovate leaflets, abruptly contracted into a linear acumen, a character given as specific in the original description but not apparent in our specimens; these, however, agree exactly in the dimensions of the flowers and in the particulars of the fruits. If the synonymy given by Bentham were exact, Walpers's name would have the priority, but the two species are quite distinct. In *I. mucuna* the calyx is 9½ and not 5 to 8 lines long, and the corolla 22⅓ lines, i. e. nearly 2 inches, and not almost 1 inch long.

The bractlets of *Inga mucuna* can hardly be said to be persistent, for which reason it takes its place with the Longiflorae. The description is as follows:

Inga mucuna Walp. & Duchass. Walp. Ann. Bot. **2**: 459. 1851–52.

A middle-sized tree with spreading crown; branchlets angulate, the bark brownish, lenticellate, the young shoots densely ferruginous-hairy.

Rachis of the leaves winged, densely covered with light brown or golden brown strigose hairs, 11 to 22 cm. long, the petiolar part nude or narrowly winged, 2.5 to 3.5 cm. long, the wings broad (1.7 to 3.5 cm.), attenuate or long-cuneate toward the base, rounded at the tip, distinctly veined transversely, the pubescence as in the blades; stipules cordiform, acute, persistent, 5 to 8 mm. long; leaflets 2 to 4-jugate, membranous, petiolulate; glands very small, subsessile, brownish, with a dark pit; petiolules about 3 mm. long, very hairy; leaflet blades ovate-orbicular to ovate, broadly rounded at the base, usually acute at the apex but sometimes abruptly contracted into a narrow, long-mucronate acumen, dull and strigose above except on the densely hairy costa, tomentose-pubescent beneath, with the densely hairy costa and veins prominent; leaflet blades of the basal pair 6 to 11.5 cm. long, 4 to 5 cm. broad, those of the terminal pair 10 to 17.5 cm. long, 6.5 to 11 cm. broad.

Inflorescences axillary, single, long-pedunculate; peduncles 5 to 8 cm. long, densely light brown hairy like the rachis; flower heads dense, 3 to 4 cm. long; flowers sessile; bractlets elliptic, acute, densely hairy, about 6 mm. long, caducous; calyx tubular, striate, 2 cm. long, glabrous except on the tips of the short teeth; corolla long-tubular, slightly broadened at the apex, white and white-villous, 4.5 to 5 cm. long, the lobes narrow, not over 7 mm. long; staminal tube slender, long-exserted (nearly 6 cm. long); pistil about 12 cm. long; ovary sessile, about 5 mm. long; stigma capitellate, flattened at the apex.

Legume spirally twisted, rarely plane, sessile, up to 30 cm. long, 5 cm. broad, rounded at the base, obtuse at the apex, densely ferruginous-strigose, the margins rounded and deeply sulcate along the line of dehiscence; seeds numerous.

PANAMA: Panama, 1850, *Duchassaing* (type). Banks of the Sambú River, southern Darién, near the limit of the tide, flowers and fruits, February 1, 1912, *Pittier* 5525.

The leaf and fruit specimens from the lower Orinoco, distributed by Rusby and Squires as *Inga mucuna*, seem to belong to still a third species, but in the

absence of the flowers this can not be decided at present. The conspicuous, persistent stipules would lead one to think that the bractlets also remain through anthesis, in which case the tree would range along with *I. lindeniana* among the Calocephalae.

Inga feuillei DC., renamed *I. cumingiana* by Bentham, should also take its place in this series and not, as Bentham had it, among the Euingae, from which it is excluded by its flat, narrowly marginate pods.

This species seems to be the pacai *par excellence* of the Peruvians, and it is said to be found in almost every garden at Lima. The name "pacai" is in Peru and Bolivia the popular generic name for Inga, corresponding to the "guamo" of Colombia, and "guavo" of Central America. It is used in compound nouns to designate many of the native species. Thus, *Inga feuillei* is, according to a verbal communication of Mr. O. F. Cook, the "pacai de mono" or "monkey pacai" of Santa Ana, in the Urubamba Valley.

Notwithstanding its reputation as a favorite fruit of the Peruvians the species is imperfectly known, so that the following attempt at a fuller description than those of Feuillée, de Candolle, and Bentham will not be out of place here.

Inga feuillei DC. Prodr. **2**: 433. 1825.

A tree with rounded-depressed, spreading crown, the young branchlets fulvous-pubescent, covered with numerous white lenticels.

Rachis of the leaves fulvous-hairy, narrowly winged, 14 to 25 cm. long, the petiolar part wingless, 2 to 3.5 cm. long; stipules not seen, caducous; glands small, subsessile, inconspicuous; leaflets 4 or 5-jugate, oblique, coriaceous, the petiolules not over 2 mm. long, thick, fulvous-hairy, the blades oblong-elliptic, rounded at the base, acutely acuminate at the apex, reticulate, sparsely hairy or glabrescent above, the costa, veins, and venules more or less sparsely hairy beneath, the blades of the basal pair 6 to 10 cm. long, 4 cm. broad, those of the terminal pair 10 to 20 cm. long, 7 to 9 cm. broad.

Inflorescences solitary in the axils of the leaves, the peduncles stout, at first fulvous-hairy, later glabrescent, 6 to 11 cm. long; floral heads subelongate; flowers sessile; bracts linear, shorter than the calyx, subpersistent; calyx tubular, fulvous-tomentose, 8.5 to 11 mm. long, persistent, the teeth short, acute; corolla fulvous-hairy, silky, 17 to 19 mm. long; stamens not seen.

Legume flat, 30 to 65 cm. long, at first densely rufous-pubescent, the margins rufous-hairy, dilatate, and obscurely bisulcate.

PERU: Lima, *Feuillée*, *Cuming* 980, etc. Santa Ana, alt. about 900 meters, young fruits, June 29, 1914, *Cook & Gilbert* 1573.

Bentham placed this species in section Euinga, near *Inga spuria*, but it obviously does not belong there. The tree is said to be a favorite in the gardens of Lima, not only because of its shade, but also on account of the succulent, sweet pulp which surrounds the seeds.

Series 6. CALOCEPHALAE.

NEW SPECIES.

Inga goldmanii Pittier, sp. nov.

A tree 6 to 10 meters high, usually with depressed, spreading crown; branchlets angulate, the younger growth densely rufous-hairy.

Rachis of the leaves rufous-hairy, winged, 9 to 25 cm. long, the wings 0.8 to 2 cm. broad, sparsely hairy, the petiolar part (also winged) 2 to 4 cm. long; stipules cordate, obtuse, about 1.5 cm. long and 1.2 cm. broad, minutely hairy; leaflets 3 or 4-jugate, coriaceous, subsessile; glands sessile, with a supernumerary one on the costa of each leaflet in the leaves of the seedlings, distinctly stipitate, occurring only on the main rachis in the adult leaves; leaflet blades oblique, ovate or oblong, rounded and subemarginate at the base, obtuse or acute at the apex, sparsely villous and sublustrous above, with the veins and hairy costa deeply impressed, dull and glabrous beneath excepting the sparsely hairy and strongly prominent venation, the blades of the lower pair 7 to 12 cm. long, 5 to 6 cm. broad, those of the terminal pair 17 to 20 cm. long, 9 to 11 cm. broad.

Inflorescences axillary, long-pedunculate, the peduncles densely rufous-hairy; flowers sessile; calyx 14 mm. long. densely fulvous-pubescent without, glabrous within; corolla tubular, densely fulvous-tomentose without, glabrous within, 25 mm. long, the lobes 8 mm. long, narrow, acute; staminal tube included; pistil about 5.5 cm. long, the ovary glabrous, the style capillary and scarcely thickened at the apex.

Legume flat or spirally twisted, sessile, long-stipitate (the stipe angular, about 2 cm. long), rounded or subacute at the apex, 20 cm. long or more, 3.5 to 4.3 cm. broad, densely rufous-hispid, the margin rounded, deeply sulcate on the sutural line.

Type in the U. S. National Herbarium, no. 690303, collected near Gatún, Canal Zone, Panama, fruits (with the persistent remnants of the flowers), February 10, 1911, by E. A. Goldman (no. 1866).

COSTA RICA: Banana River, near Port Limón, in forest, a seedling leaf only, May 1, 1903, *Cook & Doyle* 429. Río Hondo, plains of Santa Clara, fruits, May, 1902, *Pittier* (Inst. Fís. Geogr. Costa Rica, no. 16376). Xirores, Talamanca, on forest border, fruits, February, 1895, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 9358).

Supposed to be very closely related to *Inga lindeniana* Benth., from Mexico, which I have not seen, but the leaflets are oftener 4-jugate, are coriaceous and not membranous, and are not hirsute above and velvety beneath. In the original description of the Mexican species the calyx is stated to be 5 lines (10.6 mm.) long; that is to say, a little shorter than in our species, while in the Revision of 1875 the scale has been extended ("5 to 8 lines"), probably so as to include the Panama specimens cited. The calyx of *I. lindeniana*, however, is striate and pilosulous, thus a decided departure from that of *I. goldmanii*. Lastly, the pods of the former species are stated to be 1 to 1½ inches or 5 to 6.5 cm. broad, while in the latter they do not exceed 4.5 cm. Of the Panama specimens cited by Bentham the one collected by Duchassaing is the type of the very distinct *I. mucuna;* the other may belong under *I. goldmanii.*

An interesting feature of *I. goldmanii* is the presence of supernumerary glands or nectaries on the leaflets of the leaves taken from very young trees. These extrafloral nectaries are situated on the costa, at a distance of about 2 cm. from the one on the rachis. It may be mentioned here that the nature and functions of these glandular formations. as especially connected with the genus Inga, have never been investigated.

Inga purpusii Pittier, sp. nov.

A tree; young branchlets angulate, fulvous or brownish-hairy, covered with roundish, white lenticels.

Rachis of the leaves densely hairy, 10 to 13.5 cm. long, narrowly winged between the two upper leaflet pairs, terete or submarginate between the basal and middle pair, the petiolar part 5 to 5.5 cm. long, terete; stipules ovate or oblong, obtuse, densely pubescent, 7 to 10 mm. long, subpersistent; leaflets 2 or 3-jugate, short-petiolulate, membranous, suboblique; glands very small and subsessile or obsolete; petiolules densely hairy, about 1 mm. long; leaflet blades ovate to oblong, more or less narrowed or broadly rounded at the base, acute or short-acuminate at the apex, sparsely hairy, reticulate, and lustrous above, paler, reticulate, and hairy beneath, the costa and veins more or less pubescent and prominent on both faces, the blades of the basal pair about 10 cm. long, 5 cm. broad, those of the terminal pair 13 to 18 cm. long, 7.5 to 9 cm. broad.

Inflorescences axillary or terminal, the peduncles densely ferruginous-hairy, 3 to 5 cm. long, the flower heads elongate (up to 8 cm. long); flowers sessile; bractlets linear, hairy on both faces, 2 to 2.5 cm. long, persistent; calyx tubular, acute at the base, striate, sparsely and minutely hairy, 16.9 to 20 (18.9) mm. long, the teeth very narrow, 4 to 6 mm. long; corolla tubular, broadening toward the apex, 29 to 32 (30.4) mm. long, villous, the lobes rather broad, 2 to 3.5 mm. long; staminal tube included or very shortly exserted, the filaments purple and very long (6.5 to 7 cm. from the base of the tube), the pistil 7 to 7.5 cm. long, the stigma clavate.

Legume (immature?) about 30 cm. long, 2.7 cm. broad, thin, rounded at the base, long-apiculate, glabrous, the margin thick, rounded, slightly elevated around the valves.

Type in the Herbarium of the New York Botanical Garden, collected at Finca Yolanda, Chiapas, Mexico, flowers and fruits, September, 1913, by C. A. Purpus (no. 6811).

The specimen described is not very satisfactory, the leaves being few and badly pressed and the floral spikes all detached. The plant is very distinct from *Inga panamensis* Seem., the leaflets being differently shaped and very hairy, the flowers much larger, and the legume narrower and with a less prominent margin.

DESCRIPTIONS OF TWO OLD SPECIES WITH NOTES.

Inga spectabilis Willd., first mentioned and summarily characterized and figured by Vahl as a Mimosa species, has never been fully described under its present name. Kunth appears to have ignored Willdenow's mention and divided the species into two distinct types, *I. lucida*[1] and *I. fulgens*,[2] which, however, seem to differ only in the shape of the leaflets.

Of *Inga panamensis* we have only the short diagnosis in Bentham's revision. It will not be outside the scope of the present paper, then, to give full descriptions of both species.

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[1] In H. B. K. Nov. Gen. & Sp. 6: 287. 1823.

[2] Mimos. Pl. Légum. 36. *pl. 11.* 1819–1824.

Inga spectabilis (Vahl) Willd. Sp. Pl. 4: 1017. 1806.

Mimosa spectabilis Vahl, Skrivt. Naturhist. Selsk. (Kjøbenhavn) 2¹: 219. *pl. 10*. 1792.

A medium-sized tree with rounded crown; branchlets pubescent or glabrous, angular.

Leaves glabrous or glabrescent, the rachis marginate or narrowly winged below each pair of leaflets, terete and nude above them, 3.5 to 10 cm. long, the petiolar part 0.8 to 2 cm. long; stipules narrow-lanceolate or linear, acute, persistent, 6 to 12 mm. long; leaflets 1 to 3-jugate, sessile or almost so, coriaceous, bullate; glands large, sessile, salver-shaped; blades oblique, broadly ovate to obovate, rounded or attenuate toward the base and emarginate on the broader side, obtuse or subacute and often mucronate at the apex, dark green and lustrous above, with the costa prominent and minutely pubescent and the veins deeply impressed, beneath light green, with the costa, veins, and venules strongly prominent, the blades of the basal pair 8 to 19 cm. long, 5 to 10 cm. broad, those of the terminal pair 15 to 26 cm. long, 8 to 14 cm. broad.

Inflorescences paniculate and terminal; peduncles stout, 2.5 to 4 cm. long, minutely brownish-pubescent; flower heads dense, elongate, the rachis minutely pubescent, 3 to 4 cm. long; flowers sessile; bractlets ovate-lanceolate, pubescent without and within, shorter or longer than the calyx; calyx broad, irregularly cleft at the tip, minutely pubescent outside and inside, 7 to 8 mm. long; corolla tubular, broadening toward the tip, silky-villous, 18 mm. long, the lobes narrow, about 5 mm. long; staminal tube included; style subcapitellate.

Legume glabrous, 30 to 60 cm. long, about 7 cm. broad, and 2.5 to 3 cm. thick, the margins rounded and smooth, the apex obtuse; seeds 7 to 16 or more, immersed in an insipid white pulp.

The type material was from Santa Marta, Colombia.

COSTA RICA: Turrialba, flowers, November, 1893, *Tonduz;* October, 1894, *Pittier* (Inst. Fís. Geogr. Costa Rica, nos. 8333, 9041). Talamanca, *Pittier.* Boruca, fruits, February, 1891, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 4765). Buenos Aires, Diquís Basin, fruits, February, 1891, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 3826).

PANAMA: Chagres, January, 1850, *Fendler.* Matachín, Canal Zone, *Otto Kuntze* 1923. Hospital Grounds at Ancón, Canal Zone, fruits, March, 1910, *Chas. F. Mason.* Around Culebra, Canal Zone, leaves only, January 15, 1911, *Pittier* 2423. Between Las Cascadas and Bas Obispo, Canal Zone, flowers, July 1, 1911, *Pittier* 3746. Bismarck, above Penonomé, Province of Coclé, fruits, March, 1908, *Williams* 383, 584.

This tree is sometimes cultivated on account of the edible pulp contained in its enormous pods, but there is no doubt as to its being indigenous in Panama and Costa Rica. A leaf collected in the vicinity of Sepaculté, Alta Verapaz, Guatemala, by Cook and Griggs may also belong to this species.

Bentham's statement that the corolla is "subpollicaris"—almost an inch long—does not hold with our specimens, in which that part of the flower is only 18 mm., that is to say, 8½ lines long. The other discrepancies have already been mentioned by Seemann in the Voyage of the Herald.

Inga panamensis Seem. Bot. Voy. Herald 117. 1853.

A small tree; branchlets terete, slender, the younger parts sparsely light brown hairy.

Rachis of the leaves also light brown hairy, very narrowly winged, 4 to 8 cm. long, the petiolar part 3.5 to 6 cm. long; stipules ovate, acute, 6 to 9 mm. long, 4 mm. broad, pubescent, persistent; leaflets 1 to 3-jugate, petiolulate, membranous or subcoriaceous; glands very small, sessile; petiolules 4 mm. long, pubescent; blades ovate to obovate, rounded at the base, obtuse and often

mucronate at the apex, glabrescent on both sides, the costa, veins, and venules more or less hairy and prominent beneath, the blades of the inferior pair 7.5 to 10 cm. long, 4.5 to 5 cm. broad, those of the terminal pair 13 to 15 cm. long, 8 to 9.7 cm. broad.

Inflorescences single, axillary or terminal; peduncles angulate, striate, 1.5 to 3.5 cm. long, sparsely hairy; flower heads ovoid, the rachis 1.5 to 2.5 cm. long; flowers sessile; bractlets linear, acute, hairy, 1 to 1.5 cm. long, persistent; calyx broad, irregularly cleft, sparsely hairy, 7 to 8 mm. long; corolla tubular, broadened at the tip, silky-pubescent, 13 to 15 mm. long, the lobes short and broad.

Legume (fide Bentham) glabrous, thick, 15 cm. long and over, 3.8 cm. broad, the margins very prominent.

PANAMA: Near Cruces, Canal Zone, in woods, *Seemann* 407 (specimen of the type collection in the Gray Herbarium). Bismarck, above Penonomé, Province of Coclé, leaves only, March 19, 1908, *Williams* 589.

My measurements of the flowers are slightly less than those given by Bentham. The calyx, like that of *Inga spectabilis*, does not seem to open by 5 short teeth, as in most species, but to burst irregularly under the pressure of the growing corolla. I have not collected this species or seen the fruit.

Inga panamensis strikingly resembles *I. pittieri* Micheli, of the section Euinga, differing, however, in the shorter calyx and corolla and in the shape of the legume.

With reference to *I. lindeniana* Benth., the characters of the fruit were not given in the original description, and those given later may belong to a distinct species. Bentham's diagnosis in the Revision seems to have been modified so as to cover several species, among them *I. mucuna* Walp. & Duchass. and probably *I. goldmanii*.

Series 7. VULPINAE.

NEW SPECIES.

Inga balaensis Pittier, sp. nov.

A tree 10 meters high (Eggers), the young branchlets densely rufous-hispid.

Rachis of the leaves narrowly winged, rufous-hispid, 10 to 11 cm. long, the petiolar part also winged from the base, 4.5 to 5.5 cm. long, the wings narrower below the basal leaflets, 6 to 8 mm. broad; stipules ovate, acuminate, 1 to 2 cm. long, 0.5 to 1 cm. broad, densely ferruginous-pubescent without, persistent; leaflets 2-jugate, more or less oblique, petiolulate, membranous; glands small, long-stipitate, the stipels hispid, 4 mm. long or less; petiolules densely hispid, 3 to 4 mm. long; leaflet blades broadly ovate, rounded, or slightly attenuate and submarginate at the base, obtuse or abruptly short-acuminate at the apex, dull and glabrescent above, with hairy costa and veins, reticulate and glabrous beneath, with the costa and veins prominent and sparsely hairy, the blades of the basal pair 7.5 to 9 cm. long, 5 to 6 cm. broad, those of the terminal pair 11 to 17 cm. long, 7 to 10.5 cm. broad.

Floral spikes single or geminate in the axils of the upper leaves, the peduncles rufous-hispid, slender, striate, 7 to 9.5 cm. long, the flower heads loose, subelongate; bractlets linear or narrow-obovate, 4 to 8 mm. long, hairy without, deciduous; flowers sessile; calyx tubular, broadening toward the apex, 10 to 12 mm. long, striate, sparsely hairy, the teeth broad, obtuse, 3 to 4 mm. long; corolla tubular, gradually broadening to the apex, 21.5 to 23 mm. long, densely villous, the lobes acute, 2.5 to 3.5 mm. long; staminal tube included; pistil 5 to 5.5 cm. long, surpassing the stamens; ovary glabrous, depressed; stigma clavate.

Legume (immature) sessile, rounded at the base and apex, about 10 cm. long, 1.5 cm. broad, thin, densely hairy.

Type in the John Donnell Smith Herbarium, collected at El Balao, Province of Manabí, Ecuador, in forests, flowers, April, 1893, by Baron Eggers (no. 14648).

Through its pubescence and long-stipitate glands *Inga balaensis* evidently belongs to the Vulpinae, but it does not seem to be closely related to any other species of the group. The leaflets are 2-jugate, an exceptional feature recorded heretofore only in *I. guilleminiana* Benth. On the other hand, it has the broad stipules noted in *I. setosa*, *I. multicaulis*, *I. barbata*, and others. The flowers are comparable with those of certain species of the Longiflorae.

Inga codonantha Pittier, sp. nov. PLATE 102.

A tree, 10 to 12 meters high, the young branchlets, rachis of leaves, and peduncles fuliginous-hirtous.

Rachis of the leaves narrowly winged, about 9 cm. long, the petiolar part wingless, 1.5 cm. long, the wings 7 mm. long or less; stipules linear-lanceolate; glands small, subsessile, pertuse; leaflets 5-jugate, petiolulate, thick, coriaceous, the petiolules densely fuliginous-hirtous, 2 to 3 mm. long, the blades ovate, rounded at the base, acute at the apex, fuliginous-pubescent above, with the costa densely hirtous and the veins and venules impressed-reticulate, densely soft-pubescent and strongly reticulate beneath, with the hairy costa and veins very prominent; leaflets of the basal pair about 4 cm. long and 2 cm. broad, those of the terminal pair 8 to 8.5 cm. long, 3.5 to 4.5 cm. broad.

Floral spikes terminal, 2 or 3-clustered, the peduncles about 2.5 cm. long; floral buds large, globose, the bractlets absent or very small and deciduous; calyx stipitate (the stipels 2 to 4 mm. long), broadly campanulate, fuliginous-pubescent, 11 to 13 mm. long (including the stipels), the teeth ovate, 3 to 4 mm. long; corolla narrow at the base, broad at the apex, white, densely villous, 16 to 19 mm. long, the lobes broad and rounded, about 4 mm. long; staminal tube included; ovary 4-sulcate(?).

Legume not known.

Type in the U. S. National Herbarium, no. 530517, collected at Campoalegre (Cauca?), Colombia, at an altitude of 1,500 meters, flowers, November 6, 1899, by E. Langlassé (no. 27).

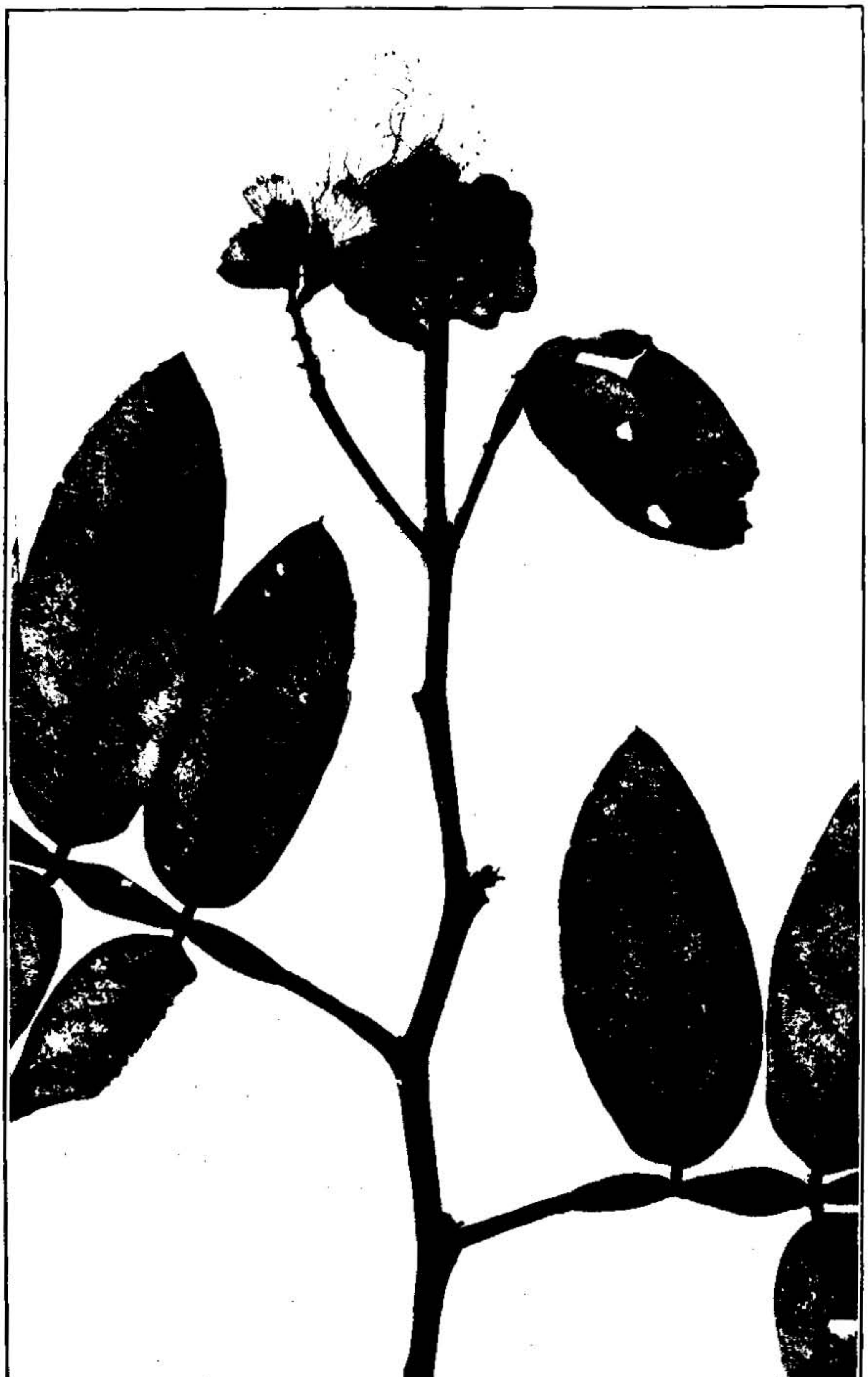
In the shape of the flowers and in the large globose buds *Inga codonantha* recalls *I. sessilis*, whose place among the Pseudingae seems to be with the Vulpinae. The ovary of the new species, however, is apparently 4-sulcate, and this may indicate a tetragonous fruit.

EXPLANATION OF PLATE 102.—From the type specimen of *Inga codonantha*. Natural size.

Inga chrysotricha Pittier, sp. nov.

A small tree; branchlets more or less hairy, the younger growth densely covered with long, golden yellow hairs.

Rachis of the leaves hirsute, narrowly winged, 5 to 10.5 cm. long, the petiolar part nude, about 5 cm. long, the wings 1 cm. broad or less; stipules broadly ovate-cordate, acute, persistent, about 8 mm. long and 10 mm. broad, hairy without, glabrous, brownish (in sicco), and finely parallel-veined within; leaflets 4 or 5-jugate, suboblique, membranous, almost sessile (the petiolules 1 mm. or less); glands small, long-stipitate, geminate between the lower pair of leaflets; leaflet blades ovate to lanceolate, rounded at the base, short-acuminate at the apex or abruptly contracted into a subulate point, sparsely hairy or glabrescent above, the costa and veins more or less covered with long hairs, paler and sparsely hairy beneath, the costa and veins hairy and prominent, the margin ciliate; blades of the basal pair 3 to 4 cm. long, 1.1 to 1.7 cm. broad, those of the terminal pair 8.5 to 12 cm. long, 2.5 to 6 cm. broad.



INGA CODONANTHA PITTIER.

Inflorescences solitary or geminate in the axils of the leaves, the peduncles 2.5 to 7 cm. long, densely covered with long, golden yellow hairs, the flower heads short and broad; flowers sessile; bractlets ovate to lanceolate, acute, 6 to 10 mm. long, hairy without, glabrous within, striate, persistent; calyx broad, 13.7 to 16.3 (14.7) mm. long, striate, the base sparsely covered with long hairs, these denser on the linear or subulate teeth, these 4.5 to 7 mm. long; corolla tubular, slightly broadened at the apex, 18 to 22.5 (20) mm. long, villous, the lobes lanceolate, reflexed, 3 to 4.5 mm. long; staminal tube included, the filaments numerous, white or purplish; style truncate.

Legume about 22 cm. long and 4 cm. broad, flat, long-stipitate, rounded and cuspidate at the apex, densely covered with long, stiff, golden yellow hairs, the seeds (up to 20) immersed in a white, sweet pulp.

Type in the Herbarium of the New York Botanical Garden, collected at Apolo, Bolivia, at an altitude of 1,560 meters, flowers and fruits, June 28, 1902, by R. S. Williams (no. 1640).

BOLIVIA: (Besides the type) Río Juntas in coca plantation, alt. 800 meters, flowers and fruits, April 13 to 21, 1892, *Otto Kuntze*. Polo-Polo, near Coroico, Yungas del Norte, alt. 1,100 meters, flowers and fruits, October and November, 1912, *Buchtien*.

PERU: Lucumayo Valley, alt. 1,800 to 3,600 meters, flowers and young fruits, June 20, 1915, *Cook & Gilbert* 1390.

This species, said to be cultivated in Bolivia under the name of "pacay" (Williams in sched.), has been and is easily confused with *Inga hirsutissima* Rusby, of which it may be only a subspecies. The flowers, however, are much larger, the calyx of the latter having an average length of 6.9 mm., which is less than half that of the same part in *I. chrysotricha;* and besides this, the calyx teeth of *I. hirsutissima* are broad and not over 3 mm. long, while in *I. chrysotricha* they are linear or subulate, ranging from 4.5 to 7 mm. in length.

In the corolla, which is not over 16 mm. long in Rusby's species, we note also appreciable differences in the shape, that of the latter species being a near approach to true campanulate, while in the former it is simply broadened a little at the apex.

A feature not noted heretofore in *I. hirsutissima* is the presence of paired glands between the lower leaflets. In the several specimens which I have examined they were found only at the insertion of the first pair, and were often confluent, so as to form a single, transversely flattened gland. In *I. chrysotricha* they appear between the leaflets of the two basal pairs and seem to be always distinct.

With reference to *I. hirsutissima* Rusby, it is to be observed that the description is in some respects inaccurate. We note for instance that the hairs are not ferruginous but fulvous, the stipules not "cartilaginous" but at most coriaceous, the leaves not quite sessile, the rachis not 5 cm. but 5 to 10.5 cm. long, the breadth of the wings ranging from 5 to 12 mm. and not from 5 to 7, the flowering peduncles from 4.5 to 7.5 cm. and not the fixed length of 3 cm., etc. The characters of the corolla have been omitted and it would appear from the description that each flower has several styles. A better description might certainly have been drawn from any of the 5 specimens of the type number which I have examined.

Inga cookii Pittier, sp. nov.

A shrub or a small tree; branchlets, rachis of the leaves, and peduncles densely covered with long, brown, setulose hairs.

Rachis of the leaves winged (the wings sparsely hirsute, ciliate, about 6 mm. broad, extending to the base), 5 to 7.5 cm. long, the petiolar part 0.5 to 1

cm.; stipules ovate, obtuse, sparsely hirsute, 3 to 4 mm. long; leaflets 3-jugate, subsessile, membranous; glands small, orbicular, light brown, pertuse, with a dark pit, long-stipitate (stipe about 2.5 mm. long, very slender); leaflet blades ovate to lanceolate, rounded or cuneate at the base, acuminate with a hairy mucro at the apex, sparsely covered with long hairs (mostly inserted on the veins and venules) on both sides, ciliate on the margin, the blades of the basal pair 3.5 to 5.5 cm. long, 2 to 3 cm. broad, those of the terminal pair 9.5 to 13 cm. long, 3.5 to 5 cm. broad.

Inflorescences axillary, single; peduncles long-hairy, slender, about 8 cm. long; flower heads oblong, the rachis about 3 cm. long; flowers pedicellate; bractlets lanceolate, 2 to 4 mm. long, hairy outside, glabrous inside, subpersistent; pedicels hairy, 1.9 to 2.8 (2.3) mm. long; calyx tubular, sparsely hairy, 4 mm. long, the teeth small, acute, separated by rounded sinuses; corolla tubular-funnelform, villous, 10.8 to 11.5 (11.1) mm. long, the lobes short (2.5 mm. deep), narrow, acute; staminal tube included; ovary glabrous.

Legume not known.

Type in the U. S. National Herbarium, no. 408211, collected near the Finca Sepaculté, Alta Verapaz, Guatemala, in forest, flowers, March 27, 1902, by O. F. Cook and R. F. Griggs (no. 505).

Numbers 202 and 226 of the same collectors are leaves obtained at the same date and locality.

The pedicellate flowers of this species constitute a new departure among the Pseudingae-Vulpinae. While its general affinities seem to lean indisputably to this group, the plant stands by itself on account of its habit and other characters, and no closer relationship can be suggested.

The collectors note that the flowers are almost scentless.

Series 8. DYSANTHAE.

A NEW SPECIES.

Inga standleyana Pittier, sp. nov.

A low tree with rounded crown, the young branchlets, peduncles, rachis of the leaves, and flower heads densely ferruginous-hairy.

Rachis of the leaves nude, terete, 10 to 15 cm. long, the petiolar part 2.5 to 4 cm. long; stipules absent or very early deciduous; leaflets 4-jugate, or very seldom 3-jugate, subsessile; glands large, sessile, pertuse, the rim light brown, the pit dark brown; leaflet blades suboblique, ovate or obovate, rounded and subemarginate at the base, acuminate or obtuse at the apex, glabrous and sublustrous above (except on the ferruginous-hairy costa), the veins slender and impressed, softly villous and prominently veined and reticulate beneath, ciliate on the margin, the blades of the basal pair 5 to 9 cm. long, 4 to 4.5 cm. broad, those of the terminal pair 11 to 13 cm. long, 6.5 to 8 cm. broad.

Inflorescences axillary, mostly geminate, sometimes single; peduncles 2.5 to 4 cm. long; flower heads elongate, the rachis 2.5 to 5 cm. long; flowers thick and short, deciduous; bractlets very small (about 1 mm. long), ovate, pubescent without, glabrous within, caducous; calyx 5 mm. long, tomentose without, hairy at the base, glabrous at the apex within, the teeth broad, obtuse, separated by shallow, rounded sinuses; corolla 20 mm. long, broad, tomentose outside, glabrous inside, the lobes 3 to 4 mm. long, broad, obtuse; staminal tube equaling the corolla, pink, as also the filaments; ovary with a single series of minute white hairs along the sutural lines; style about 5 cm. long.

Legume flat and densely rufous-hairy (not seen).

Type in the U. S. National Herbarium, no. 715742, collected in the vicinity of La Palma, southern Darién, Panama, in old clearings, flowers, January 26, 1912, by H. Pittier (no. 5496).

This is the only representative of the Pseudingae-Dysanthae so far reported from Central America. It differs from the two other species in its wingless leaf rachis, but except for the shorter calyx the flowers look exactly like those of the Brazilian *Inga dysantha* Benth. I was not able to collect the fruits, but was informed that they are small, flat, and rufous-hairy, the latter fact being confirmed by the local name of "guabito peludo."

Named in honor of Mr. Paul C. Standley, Assistant Curator of the U. S. National Herbarium.

Section 5. EUINGA.

As already noted by Bentham, the identification of the species of this group is extremely difficult, and it may be added that little progress has been made since the publication of that author's Revision of the Mimoseae in 1875. Few new species have been added and we are still in the dark with reference to the fruit characters of a large number of the old ones. Recent investigations in Central America have brought to light the existence of a number of forms of the *Inga insignis* type, characterized mainly by tetragonous fruits, accompanied by flowers not unlike those of the Longiflorae. These species, eight in number if we add *I. fendleriana* Benth., which probably belongs here, form in the section a distinct series, which is here separately treated under the name of Tetragonae, referring to the quadrangular cross section of the fruit. The remaining species, except one, resemble more or less *I. edulis* as to the legume, in which the many-sulcate margins are expanded so as to more or less obliterate the faces. On account of this characteristic form of the fruit this series, which may be again subdivided, is designated by the term Sulcatae.

These two series seem to constitute very natural groups and the distinction drawn between them will certainly help the student in determining the species of this very large section. As mentioned above, this new arrangement excludes one species, *I. sessilis* (Vell.) Mart., which, in my opinion, would be better placed with Pseudinga, among the Vulpinae.

Series 1. TETRAGONAE.

DESCRIPTIONS OF OLD AND NEW SPECIES.

Of the Central American species of this group, two, *Inga pittieri* Micheli and *I. preussii* Harms, have been published previously. As the original diagnosis of the first is not very satisfactory and we have in our collections the fruit of the second, not known heretofore, I deem it useful to repeat here full descriptions of both. Besides these, four new species are introduced. The six have in com-

mon the presence on the calyx and corolla of minute purple hairs mixed with the general pubescence, a character which evidently denotes a very close relationship.

Two more species, represented by *Cook & Griggs* 631, from Guatemala, and *Williams* 673, from Panama, are probably new, and belong to this series, but the specimens at hand are too imperfect to admit of description.

Inga pittieri Micheli, Bull. Herb. Boiss. 2: 446. *pl. 13.* 1894.

A small tree, 8 meters high, the trunk 10 cm. in diameter (Williams); branchlets terete or angulate, the grayish bark lenticellose, the younger parts densely fulvous-pubescent.

Rachis of the leaves rufous, fulvous, or greenish-pubescent, partly wingless, marginate, or narrowly winged, 6 to 17 cm. long, the petiolar part terete or subalate, 2.5 to 5.5 cm. long, the wings narrow but gradually broadening from the basal to the terminal leaflets; stipules ovate to oblong or lanceolate, obtuse, striate, minutely pubescent without, subpersistent, 8 to 16 mm. long, 5 to 9 mm. broad; leaflets 3-jugate, seldom 1 or 2-jugate, oblique, short-petiolulate, coriaceous; glands small, sessile or substipitate, pertuse; petiolules 2 to 4 mm. long, thick, densely fulvous-pubescent; leaflet blades ovate to ovate-elliptic, rounded or subcuneate at the base, acute or abruptly acuminate and often mucronate at the apex, light green and at first sparsely scabrous-pubescent above, glabrescent later, the costa and veins densely fulvous-pubescent, beneath paler, reticulate, and softly pubescent, the prominent costa and veins densely fulvous-pubescent, the blades of the basal pair 6 to 12 cm. long, 2.5 to 5 cm. broad, those of the terminal pair 13 to 23 cm. long, 6 to 11 cm. broad.

Inflorescences single, axillary or subterminal, the peduncles 1 to 4 cm. long, densely fulvous-pubescent; flower heads ovoid or elongate, dense, the rachis 2.5 to 3.5 cm. long, the bracts at the base of the heads often large, ovate-acuminate, 5 to 7 mm. long, caducous; floral bractlets linear-lanceolate or linear, pubescent without, 7 to 12 mm. long, subpersistent; flowers sessile, the calyx and corolla sparsely dotted with minute reddish hairs; calyx tubular, 8 to 13 (10.5) mm. long, more or less grayish-pubescent, striate, the sinuses between the linear, subulate teeth rounded, 3 to 4 mm. deep; corolla pinkish white, tubular, broadening toward the apex, sparsely appressed-villous, 19.5 to 24 (21.8) mm. long, the lobes densely villous, narrow, rounded or acute, 1 to 4 mm. long; staminal tube about equaling the corolla, the pinkish stamens about 5.5 to 6 cm. long; pistil 6 cm. long or over; ovary glabrous, sessile, often constricted at the base, 4-sulcate, about 3 mm. long; stigma peltate, concave.

Legume sessile, glabrous, 9 to 18 cm. long, the valves concave, 1.5 to 2.5 cm. broad, these and the margins more or less regularly 6-sulcate, 1.3 to 1.8 cm. broad, coming equally together in a cuspidate apex; seeds about 20, ovate-oblong.

PANAMA: Forests around San Felix, eastern Chiriquí, flowers, December 30, 1911, *Pittier* 5452. Bismarck, above Penonomé, Province of Coclé, alt. 700 to 1,000 meters, fruits, March 5 to 19, 1908, *Williams* 489.

COSTA RICA: Banks of Río Ceibo, near Buenos Aires, Diquís Valley, alt. about 300 meters, flowers and fruits, February, 1892, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 4977, type.) Around Santo Domingo de Osa, in forests, flowers and fruits, March, 1896, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 10030). Coffee plantations near Juan Viñas, Reventazón Valley, alt. 1,000 meters, fruits, April 26, 1903, *Cook & Doyle* 389.

The late M. Micheli compared this very variable species with *Inga insignis* Kunth, from the South American Andes. The relationship is not very apparent, except perhaps in the peculiar shape of the fruits. With reference to the habit, foliage, and flowers, the likeness with *I. panamensis* Benth. is much more striking, even if it is out of question to claim any close affinity between these two species.

Inga preussii Harms, Repert. Nov. Sp. Fedde **13**: 420. 1914.

A tree 15 meters high; branchlets angulate, the bark brownish gray, lenticellose, the younger parts densely brownish-pubescent.

Rachis of the leaves densely brownish-villous, winged between the leaflet pairs, 5 to 13 cm. long, the petiolar part 1.5 to 3 cm. long; stipules ovate or ovate-lanceolate, densely tomentose-pubescent without, about 5 mm. long; leaflets 3 or 4-jugate, petiolulate, coriaceous; glands small, subsessile, pertuse; petiolules 2 mm. long or less, densely brownish-pubescent; leaflet blades ovate to ovate-elliptic or oblong, subacute or obtuse at the base, acute or rarely acuminate at the apex, light green and sparsely pilose above, paler, reticulate, and densely villosulous beneath, the costa and veins pubescent on both faces and prominent beneath; blades of the basal pair 5.5 to 6.5 cm. long, 2.5 to 3 cm. broad, those of the terminal pair 10 to 12 cm. long, 5 to 7 cm. broad.

Inflorescences single or geminate in the axils of the leaves, the peduncles 6 to 10 cm. long, the flower heads ovoid-elongate; bractlets lanceolate, acute, 7 to 14 mm. long; flowers pedicellate(?); calyx tubular, villosulous or sparsely hairy, more or less striate, 10 to 12 mm. long; corolla densely silky-villous, about 2 cm. long; staminal tube short-exserted.

Legume sessile, stipitate, glabrous, 21 cm. long or less, the valves 2.5 to 3.5 cm. broad, concave, meeting in a rounded apex, the margins concave, broadly 3-sulcate, 1 to 1.5 cm. broad at the base and gradually narrowing toward the apex.

EL SALVADOR: Hacienda Guadalupe, near San Salvador, flowers, February, 1900, *Preuss* 1386 (type). Above Izalco, Department of Sonsonate, alt. 800 meters, fruits, February 25, 1907, *Pittier* 1974.

The "cujiniquil," or "cujín," is probably the species most frequently used as coffee shade in El Salvador and western Guatemala. According to the plate in Preuss's work,[1] where the species was first cited, the flowers are pedicellate, a character which would distinguish it from all the other members of the group; this character, however, is doubtful, as it is not mentioned by Harms, and the fruits appear to be sessile. *Inga rensoni*, which is closely related, is densely fulvous-pubescent; its bractlets are exceptionally developed, and its calyx is very long.

Inga biolleyana Pittier, sp. nov.

A tree; branchlets angulate, covered with lenticels, the younger parts ferruginous-pubescent.

Rachis of the leaves terete, exalate, marginate, or winged only under the upper leaflet pair, ferruginous-pubescent, 4 to 9 cm. long, the petiolar part always smooth, 2 to 3 cm. long, the wing, when present, up to 4 mm. broad; stipules broadly ovate, acute, 7 to 9 mm. long, ferruginous-pubescent without, persistent; leaflets sometimes 2-jugate, mostly 3-jugate, subcoriaceous, petiolulate, the terminal ones oblique; glands small, short-stipitate, often obsolete; petiolules pubescent, 2 to 3 mm. long; leaflet blades ovate-elliptic, cuneate to an obtuse base, acute at the apex, sparsely hairy or glabrescent and more or less lustrous above, paler, reticulate, and sparsely hairy beneath, the costa

[1] Expedition nach Central- und Südamerika 354. *pl. 8. f. 1, 2.* 1901.

and veins pubescent on both faces and very prominent on the inferior one, the blades of the basal pair 4.5 to 8 cm. long, 2 to 3.5 cm. broad, those of the terminal pair 11.5 to 15 cm. long, 4 to 6 cm. broad.

Floral spikes single in the axils of the upper leaves, the peduncles ferruginous-hairy, striate, 1 to 1.5 cm. long, the heads few-flowered; bractlets linear-lanceolate, acute, striate, sparsely pubescent, about equaling the calyx (9 to 12 mm. long), persistent; flowers sessile; calyx tubular, 10.3 to 12 (11.1) mm. long, the tube sparsely covered with a fulvous, appressed pubescence mixed with numerous short, purplish hairs, the teeth triangular, acute, 2 to 3.5 mm. long, densely hairy; corolla tubular, broadening toward the apex, silky-villous, 28 to 31 (29.5) mm. long, the lobes triangular, acute, 2 to 3 mm. long; staminal tube long-exserted, the filaments purple; ovary 4-sulcate.

Legume not known.

Type in the U. S. National Herbarium, no. 865489, collected at Turrialba, Costa Rica, altitude 570 meters, in pastures, flowers, November, 1893, by A. Tonduz (Inst. Fís. Geogr. Costa Rica, no. 8391).

A species conspicuous for the short, almost exalate rachis of the leaves, the relatively small leaflets, etc. The calyx has short, very hairy teeth, a feature which does not seem to occur in the other species of the group.

Inga biolleyana is dedicated to the memory of the late Prof. Paul Biolley, a Swiss naturalist, actively interested during his life in the investigation of the flora of Costa Rica.

Inga jimeneziana Pittier, sp. nov.

A tree with rounded crown; branchlets angulate, covered with large lenticels, the younger parts ferruginous-hairy.

Rachis of the leaves narrowly winged, sparsely ferruginous-hairy or glabrescent, 5 to 15 cm. long, the petiolar part nude or marginate, 2.5 to 5.5 cm. long; stipules ovate-lanceolate, subcordate at the base, acute, 1.2 to 2 cm. long, 0.6 to 0.8 cm. broad, pubescent without, coriaceous, persistent; leaflets 2 or 3-jugate, rarely 4-jugate, membranous, subsessile (the petiolules not over 1 mm. long); glands small, mostly long-stipitate; leaflet blades broadly ovate to ovate-elliptic, broadly rounded or subacute at the base, more or less abruptly acuminate at the apex, sparsely hairy or glabrescent and lustrous above, with the subprominent costa and veins more or less fulvous-hairy, paler and reticulate beneath, the costa, veins, and venules more or less fulvous-hairy; leaflets of the basal pair 7 to 13.5 cm. long, 3 to 6.5 cm. broad, those of the terminal pair 14 to 21 cm. long, 6.5 to 11 cm. broad.

Floral spikes single or geminate and subpaniculate in the axils of the upper leaves, the peduncles 1.5 to 4 cm. long, fulvous-hairy, striate, the flower heads elongate; bractlets lanceolate to linear, acute, 1 to 1.5 cm. long, pubescent without, persistent; flowers sessile; calyx tubular, striate, fulvous-pubescent, 11 to 13.2 (12) mm. long, the teeth narrow and subulate, 3.5 to 7 mm. long; corolla tube narrow, shortly broadened at the apex, white, villous, 31.7 to 32.5 (32.1) mm. long, the lobes broadly triangular, acute, 2.5 to 3.5 mm. long; staminal tube equaling the corolla or shorter, the filaments deep purple, the stamens 8 to 8.5 cm. long; style truncate, longer than the stamens.

Legume sessile, subcuneate at the base, cuspidate at the apex, glabrous, 11.5 to 30 cm. long, the valves almost flat or slightly depressed, 3 cm. broad, the margin concave, bisulcate, 1.5 cm. broad.

Type in the U. S. National Herbarium, no. 865512, collected on the banks of the Colorado River near Turrialba, Costa Rica, flowers and fruits, November, 1893, by A. Tonduz (Inst. Fís. Geogr. Costa Rica, no. 8333).

COSTA RICA: (Besides type) Aragón, near Turrialba, flowers, October, 1894, *Pittier* (Inst. Fís. Geogr. Costa Rica, no. 9041). Las Vueltas de Tucurrique, in pastures, flowers and fruits, April, 1892, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 13055).

This differs from *Inga pittieri*, with which it has been confused, in the pubescence of the leaves, the long-stipitate glands, the larger flowers, and the flat, compressed fruits. From *I. rodriguezíana* and *I. preussii* it is distinguished by the persistent stipules, the stipitate glands, the thicker pubescence, and the size of the flowers.

This species is named for Mr. Otón Jiménez Luthmer, an enthusiastic young botanist of Costa Rica.

Inga rensoni Pittier, sp. nov.

A tree; branchlets terete or subangulate, sparsely lenticellose, the younger parts densely fulvous-hairy.

Rachis of the leaves densely fulvous-hairy, winged, 8 to 12 cm. long, the petiolar part subalate, marginate, or terete, 2 to 2.5 cm. long; stipules ovate or oblong, obtuse, fulvous-pubescent, 6 to 12 mm. long, subpersistent; leaflets mostly 4-jugate, oblique, petiolate, coriaceous; glands subsessile, transversely ovate or irregular, concave or flat; petiolules densely fulvous-hairy, 2 to 3 mm. long; leaflet blades ovate or ovate-lanceolate, rounded at the base, acute at the apex, more or less pubescent and sublustrous above, the costa and impressed veins densely fulvous-hairy, reticulate and tomentose-pubescent beneath, with very prominent venation, the blades of the basal pair 6 to 8 cm. long, 2.5 to 3.5 cm. broad, those of the terminal pair 10 to 13 cm. long, 5 to 6 cm. broad.

Inflorescences single in the axils of the leaves, the peduncles 2 to 2.5 cm. long, fulvous-hairy, subangulate, the flower heads ovoid or elongate; bractlets conspicuous, linear-lanceolate to ovate, acute, pubescent without, subpersistent, 10 to 22 mm. long, the basal ones 8 mm., the upper ones 2 mm. broad; flowers sessile; calyx tubular, irregular in length, 14 to 22.5 (18.6) mm. long, striate, sparsely appressed-pubescent, often substipitate, the teeth linear, reflexed, 3 to 9.5 mm. long; corolla tubular, silky-villous, 21 to 22 mm. long, the lobes obtuse, 3 to 4 mm. long; staminal tube included, the stamens about 5 cm. long; ovary glabrous, sessile, about 4 mm. long, 4-sulcate; style capitellate.

Legume glabrous, short-pedunculate (the peduncles thick, 3 to 5 mm. long), substipitate, about 18 cm. long, the valves flat or concave, 3 to 3.5 cm. broad, more or less adnate at the pointed apex, the margins concave, broadly 2-sulcate, 1 to 2 cm. broad.

Type in the U. S. National Herbarium, no. 399534, collected in the vicinity of San Salvador, El Salvador, in coffee plantations, by C. Renson (no. 239).

This species differs from *Inga preussii* in the pubescence, in the length of the peduncles and calyx, in the shape of the fruits, and in the conspicuous bractlets. It is named for Dr. Carlos Renson, its discoverer, in recognition of his interest in the Salvadorean flora.

Inga rodriguezíana Pittier, sp. nov.

A tree; branchlets terete or subangulate, the bark grayish, lenticellose, the young parts densely ferruginous-pubescent.

Rachis of the leaves winged, densely ferruginous-pubescent, 13 to 19 cm. long, the petiolar part terete or submarginate, 4 to 4.5 cm. long, the wings narrow, shorter than the space between the leaflets; stipules ovate, obtuse, pubescent without, about 7 mm. long and 4 mm. broad, caducous; leaflets 3 or 4-jugate (usually 3-jugate), large, oblique, coriaceous, petiolulate, the pairs about 5 cm. distant; glands subsessile, flat at the apex, with a light rim and

dark pit; petiolules thick, 2 to 5 mm. long; costa and veins densely ferruginous-pubescent; leaflet blades elliptic-ovate or lanceolate, rounded and sometimes subemarginate at the base, sparsely villous and sublustrous above, reticulate and villous beneath, with prominent costa and veins, the blades of the lower pair 10 to 11 cm. long, about 5 cm. broad, those of the upper pair 17 to 21 cm. long, 8 to 10 cm. broad.

Inflorescences single in the axils of the leaves; peduncles stout, striate or subangulate, ferruginous-hairy, 5 to 7 cm. long; flower heads ovoid, dense; bractlets linear-lanceolate or narrowly oblanceolate, acute, pubescent without, subpersistent, 10 to 18 mm. long; flowers numerous, sessile; calyx tubular, striate, sparsely appressed-pubescent, 13 to 15 (14.1) mm. long, the teeth obtuse, 1 to 4 mm. long; corolla tubular, slightly widening toward the apex, densely silky-villous, 27.3 to 29.3 (28.2) mm. long, the lobes obtuse, irregular, 3 to 4 mm. long; staminal tube about equaling the corolla; pistil 6 cm. long, the ovary glabrous, 2-sulcate; stigma subpeltate.

Legume not known.

Type in the U. S. National Herbarium, no. 258943, collected at Las Viñas, Department of Santa Rosa, Guatemala, flowers, September, 1893, by Heyde and Lux (J. D. Smith, no. 6095).

GUATEMALA: (Besides type) Cubilquitz, Alta Verapaz, flowers, March, 1901, *von Türckheim* (J. D. Smith, no. 7855). El Rancho, Department of Jalapa, flowers, January 12, 1908, *Kellerman* 7670.

This species was determined by the late Micheli as *Inga insignis* Kunth, a South American species of which this Guatemalan plant is only a distant relative, differing in the size and shape of the leaves, in the number of leaflets, and in the appearance of the glands, as well as in the larger and less hairy flowers. It is more closely allied to *Inga pittieri*, from which it departs only in its coarser, narrower, and more hairy leaves and its much larger flowers. It is named for Mr. Juan J. Rodríguez, a well-known Guatemalan naturalist.

Series 2. SULCATAE.

DESCRIPTIONS OF NEW AND OLD SPECIES.

Inga adenophylla Pittier, sp. nov.

A low, spreading tree; branchlets terete or angulate, the younger growth rufous or fulvous-tomentellous.

Rachis of the leaves slender, winged, fulvous-pubescent or tomentellous, 8 to 18 cm. long, the petiolar part winged or wingless, 2 to 3 cm. long, the wings narrow (0.5 cm. broad) below the basal leaflets, broadening to 2.5 cm. toward the apex and there triangular, with the base toward the terminal leaflets; stipules linear, narrowly acute, pubescent, about 12 mm. long, deciduous; leaflets 5 or 6-jugate, petiolulate, coriaceous; glands small, substipitate, pertuse, inserted not only between the leaflets but also 5 or 6 of them along the costa of each leaflet; petiolules 2 to 4 mm. long, fulvous-tomentellous; leaflet blades ovate or obovate, rounded at the base, obtuse or subacute and mucronate at the apex, the upper face sparsely pilosulous or glabrescent, the costa pubescent and slightly prominent and the veins slender and impressed, the lower face tomentose and strongly reticulate, the costa and veins densely fulvous-pubescent and very prominent; blades of the basal pair of leaflets 4 to 6 cm. long, 1.5 to 3 cm. broad, those of the terminal pair 8 to 11 cm. long, 3.5 to 5.5 cm. broad.

Floral spikes geminate in the axils of the upper leaves, the peduncles stout, rufous or fulvous-tomentellous, 2 to 5 cm. long; bractlets linear-lanceolate, 7

mm. long or shorter, caducous; flowers sessile; calyx rufous-tomentellous, broad, 5 to 8.5 mm. long, the teeth either very short or up to 3 mm. long; corolla silky-villous, broader at the apex, 15 to 17 mm. long, the lobes 3 to 3.5 mm. long; staminal tube included or slightly exserted; pistil 4.5 to 5 cm. long, the stamens a little shorter; stigma capitellate, flat at the apex.

Legume funiculiform, slender (about 0.8 cm. in diameter), 10 to 15 cm. long, rufous-tomentellous, the sulcate margins almost entirely covering the valves.

Type in the Gray Herbarium, collected at Yungas, Bolivia, in 1890, by Miguel Bang (no. 236).

BOLIVIA: (Besides type) Unduavi, alt. 2,650 meters, flowers, October, 1885, *Rusby* 991. Apolo, along stream, alt. 1,600 meters, flowers and young fruits, September 6, 1902, *Williams* 1602. Polo-Polo, near Coroico, Yungas del Norte, alt. 1,100 meters, flowers, October, 1912, *Buchtien* 3779.

PERU: San Miguel, Urubamba Valley, alt. about 1,800 meters, flowers, May 23 and 28, 1915, *Cook & Gilbert* 875, 948.

The characteristic feature of this species is the presence on the costa of the leaflets of extrafloral nectaries like those found on the rachis. This has been reported so far only in the case of *Inga pruriens* Poepp. & Endl., a lost Peruvian species which belongs to another section. The shape of the wings, the size of the calyx, etc. seem to be very variable.

Inga cocleensis Pittier, sp. nov.

A tree; young branchlets, leaf rachis, and rachis of the floral spikes velvety rubiginous pubescent.

Rachis (of the only leaf present) wingless, terete, 18.5 cm. long, the petiolar part 2 to 2.5 cm. long; leaflets 6-jugate, petiolulate, coriaceous; glands mostly large, prominent, often transversely ovate, concave; petiolules 3 to 5 mm. long, thick, densely velvety-pubescent; leaflet blades oblong-elliptic, broadly rounded at the base, acuminate at the apex, pilosulous and more or less strigose above, the costa and impressed veins more or less ferruginous-pubescent, beneath densely pubescent and reticulate, the costa and veins very prominent, the blades of the basal pair 4 to 7.5 cm. long, 1.5 to 3 cm. broad, those of the terminal pair 9.5 to 13 cm. long, 2.5 to 4.5 cm. broad.

Inflorescences single in the axils of the leaves; peduncles terete or subangudate, 4 to 5 cm. long; rachis of the flower heads thick, 4 cm. long; calyx tubular, rubiginous-pubescent, 6 to 7 mm. long; corolla not seen.

Legume (immature) slender, terete, longitudinally sulcate, minutely rubiginous-pubescent, cuspidate, twisted, 10 to 20 cm. long.

Type in the Herbarium of the New York Botanical Garden, collected at Bismarck, above Penonomé, Province of Coclé, Panama, at an altitude of 700 to 1,000 meters, fruits, March 5 to 19, 1908, by R. S. Williams (no. 405).

Perhaps closely related to *Inga rubiginosa* DC., from the Guianas, but readily distinguished by the larger number and elongated shape of the leaflets. The only known specimen was found on the ground, broken off from the tree, and is very incomplete, but it is sufficient to show that the plant belongs to a small group represented in Central America by only one other species (*I. eriorhachis*), and to exclude the possibility of its being confused with any other type.

Inga donnell-smithii Pittier, sp. nov.

A low tree; branches terete, with gray bark, the younger parts densely rufous-hairy.

Rachis of the leaves thick, winged, densely rufous-hairy, 11 to 18 cm. long, the petiolar part wingless, 1 to 2 cm. long, the wings more or less sparsely

hairy, 4 to 10 mm. broad; stipules ovate, obtuse, densely rufous-hairy, about 4 mm. long, caducous; leaflets 7-jugate, short-petiolulate, coriaceous; glands small, subsessile, suborbicular, pertuse; petiolules thick, hairy, not over 1 mm. long; leaflet blades oblique, oblong, rounded at the base, acuminate, sparsely appressed-hairy on both faces, dark green above, paler and reticulate beneath, the costa and veins prominent and densely rufous hairy, the blades of the basal pair 4 to 5.5 cm. long, 1 to 2 cm. broad, those of the terminal pair 10 to 14 cm. long, 3 cm. broad.

Inflorescences single, axillary; peduncles and rachis densely rufous-hairy, the former 2 to 4.5 cm. long; flower heads elongate, the lower flowers deciduous, the rachis 4 to 6 cm. long; flowers large, sessile; bractlets ovate, acute, rufous-pubescent, 6 to 10 mm. long, early deciduous; calyx tubular, slightly broader at the apex, densely rufous-hairy without, 19 to 21 mm. long, the teeth about 6 mm. long; corolla tubular, densely rufous-hairy without, about 22 mm. long, the lobes ovate, acute, about 5 mm. long; staminal tube shorter than the corolla, the stamens about 7 cm. long; pistil 8 to 8.5 cm. long; ovary villous at the base; style capitellate.

Legume not known.

Type in the John Donnell Smith Herbarium, collected at El Guarda Viejo, near Guatemala City, Guatemala, at an altitude of about 1,670 meters, flowers, February, 1890, by John Donnell Smith (no. 2316).

The general affinities of this species are with *Inga spuria* Willd., but it differs in its abundant pubescence and 7-jugate leaflets, and in having the floral spikes always single in the axils of the leaves and the ovary villous at the base.

Inga eriocarpa Benth. Lond. Journ. Bot. 4: 615. 1845.

Branchlets subangulate, the younger parts, the rachis of the leaves, and the inflorescences densely fuliginous or brown-hairy.

Rachis of the leaves broadly winged, 10 to 12.5 cm. long, the petiolar part mostly nude, 1 to 2 cm. long; leaflets 5-jugate, rarely 4 or 6-jugate, subsessile, coriaceous; glands rather large, sessile, concave, darkish; leaflet blades suboblique, ovate, rounded or subemarginate at the base, subacute at the apex, glabrescent or sparsely appressed-hairy above, the costa densely fulvous-hairy, beneath softly hairy and subreticulate, the costa and veins strongly prominent, the blades of the basal pair 1.5 to 4 cm. long, 0.7 to 1.5 cm. broad, those of the terminal pair 7 to 8.5 cm. long, 3 to 3.5 cm. broad.

Inflorescences paniculate at the ends of the branchlets, sometimes sessile, but usually on peduncles 1.5 to 2.5 cm. long from base to insertion of the first flower; flower heads elongate, the lower flowers deciduous, the rachis up to 6 cm. long; flowers sessile; bractlets ovate, fulvous-hairy without, about 8 mm. long, caducous; calyx turbinate, thickly fulvous-hairy without, 13 to 14 (13.4) mm. long, the teeth acute, 4 to 6.5 mm. long; corolla tubular, the upper half broadened, silky-villous, 20.8 to 21.7 (21.1) mm. long, the lobes ovate, subobtuse, 5 to 5.5 mm. long; staminal tube almost equaling the corolla, the stamens 7 to 8 cm. long; pistil about 8 cm. long, the ovary short (4 mm.), sessile, 20-ovulate, the style capitellate.

Legume (fide Bentham) subterete, sulcate, densely tomentose.

MEXICO: Between San Blas and Guadalajara, Tepic or Jalisco, *Coulter* (type). Cuernavaca, State of Morelos, 1866, *Bilimek* 136; flowers, May 27 to 30, 1899, *Rose & Hough* 4361. Orizaba, State of Veracruz, flowers, March 15, 1867, *Bilimek* 127. Monte de Sta. Ignesa, State of Michoacán, alt. 1,500 meters, flowers, March 16, 1898, *Langlassé* 34. Along road between Jalapa and Mascota, State of Jalisco, alt. 1,300 to 1,600 meters, flowers, March 13, 1897, *Nelson* 4042.

This species, which is undoubtedly distinct from any other, corresponds fairly in its description with *Inga eriocarpa* Benth., which Bentham united later with *I. xalapensis*. The flowers, however, are larger than in the latter species and the pubescence of the calyx is quite distinct.

Inga fissicalyx Pittier, sp. nov.

Branchlets subangulate, the bark brownish and lenticellate, the younger parts, rachis of the leaves, and inflorescence more or less densely covered with a brown, hirtellous pubescence.

Rachis of the leaves narrowly winged, 11 to 14 cm. long, the petiolar part more or less distinctly winged, 1 to 2 cm. long, the wings 3 to 7 mm. broad, the terminal ones oblong, the others elliptic; stipules linear-lanceolate, pubescent, 8 to 10 mm. long, caducous; leaflets 6-jugate, petiolulate, coriaceous; glands small, sessile, convex, orbicular or transversely ovate; petiolules thick, 2 to 3 mm. long, densely brown-hairy; leaflet blades lanceolate or oblanceolate, narrow and rounded at the base, long-attenuate and acute at the apex, sparsely covered above with appressed hairs except on the densely pubescent costa, softly hairy and reticulate beneath, the costa and veins densely pubescent and prominent, the blades of the basal pair 2.5 to 3 cm. long, 1.5 cm. broad, those of the terminal pair 8 to 11 cm. long and 2.5 to 3.5 cm. broad.

Inflorescences axillary and geminate; peduncles striate, 5 to 7 cm. long; flower heads elongating in anthesis, the rachis 5 to 8 cm. long; flowers sessile, caducous; bractlets lanceolate, subobtuse, light brown pubescent, about 10 mm. long, caducous; calyx tubular, narrow at the base, gradually widening toward the apex, densely fuliginous-pubescent, 20 to 28 (23) mm. long, the teeth narrow and pointed, 8.5 to 12 mm. long; corolla tubular, narrow, gradually widening toward the apex, softly villous, 18 to 23 (21.5) mm. long, the lobes wide and obtuse, 3 to 4 mm. long, reflexed; staminal tube equaling the corolla, the stamens 5 to 6 cm. long; pistil about 8.5 cm. long, the ovary linear, sessile, 3 to 4 mm. long, bisulcate, glabrous, 20 to 22-ovulate; style filiform, attenuate, capitellate.

Legume not known.

Type in the Gray Herbarium, collected in the vicinity of Zacuapan, State of Veracruz, Mexico, flowers, May, 1906, by C. A. Purpus, (no. 1917).

Also collected in eastern Guatemala, without further data, *Bingham* (Gray Herb.).

This species has been distributed as *Inga xalapensis* Benth.? According to the incomplete diagnosis, however, the latter species has 5-jugate leaflets, and in specimens authentically identified the calyx is only about 11 mm. and the corolla about 16 mm. long, while in our species the calyx is 23 mm. long and the corolla shorter, even, or slightly longer than the calyx. The very long calyx teeth and the comparatively short corolla lobes are other characteristic features of *I. fissicalyx*.

Inga holtonii Pittier, sp. nov.

A tree; young branchlets angulate, densely ferruginous-velvety.

Rachis of the leaves thick, winged, densely ferruginous-velvety, 14 to 19 cm. long, the petiolar part narrowly winged, 3.5 to 4.5 cm. long, the interfoliolar wings 1 to 1.5 cm. broad; stipules linear, pubescent, about 1.5 cm. long, caducous; leaflets 4 or 5-jugate, short-petiolulate (the petiolules not over 1 mm. long), thick, coriaceous; glands very small, subsessile; leaflet blades oblong or obovate, broadly rounded at the base, acute and mucronate at the apex, the upper face sparsely appressed-hairy or glabrescent, the costa and veins densely ferruginous-hairy, the lower face ferruginous-tomentose, reticulate, the costa and veins very prominent and hairy; basal leaflets 7 to 8 cm. long, 3.5 cm. broad, the terminal ones 14 to 19 cm. long, 5 to 7 cm. broad.

Inflorescences paniculate at the ends of the branchlets, the spikes single or geminate in the axils; peduncles stout, densely ferruginous-velvety, 2.5 to 5 cm. long; bractlets linear, pubescent, 6 to 10 mm. long, caducous; flowers sessile; calyx stipitate or substipitate, ferruginous-hairy, 12.5 to 14 mm. long, the teeth broad-triangular, acute, 4 to 5 mm. long; corolla softly and densely villous, broad, 20 to 22 mm. long, the lobes ovate, acute, 5 to 7 mm. long; staminal tube included; pistil 6.5 to 7 cm. long; ovary glabrous, 1-sulcate; stigma clavate.

Legume not known.

Type in the Gray Herbarium, collected at La Paila, Cauca Valley, Colombia, flowers, March 17, 1853, by I. F. Holton (no. 1004).

COLOMBIA: Near Buga, Cauca Valley, alt. 900 meters, flowers, July 25, 1881, *Lehmann* 779. Fusagasugá, Province of Bogotá, alt. 1,500 meters, *Triana* 1170.

The specimens collected by Triana were distributed under the name *Inga ornata* Kunth, a species reduced by Bentham to *I. ingoides* (A. Rich.) Willd., in which the flowers are always pedicellate, the pedicel length varying from 2 to 5 mm. In Triana's plant as well as in Holton's and Lehmann's the calyx is short-stipitate but sessile. One of Holton's specimens is labeled *I. pachycarpa* Benth., which is supposed to be the same as *I. insignis* Kunth. That species, however, has a tetragonous fruit, while the shape of the ovary in *I. holtonii* indicates a subcylindrical, many-sulcate legume. The general characters also show a closer relationship with the species of the *I. spuria* group.

Inga pauciflora Walp. & Duchass. Walp. Ann. Bot. 2: 460. 1848–1850.

PLATE 103.

A shrub about 3 meters high, the single trunks about 5 cm. in diameter; bark smooth, brownish gray; young branchlets densely ferruginous-hairy.

Rachis of the leaves winged, densely ferruginous-hairy or pubescent, 4.5 to 8.5 cm. long, the petiolar part nude, 0.5 to 1.5 cm. long, the wings 4 to 10 mm. broad; stipules ovate, obtuse, hairy, about 4 mm. long, early caducous; leaflets 2 to 4-jugate, mostly 3-jugate, short-petiolulate, coriaceous; glands very small, rounded, pertuse, subsessile; petiolules fulvous or ferruginous-hairy, about 1 mm. long; leaflet blades ovate or obovate to elliptic, subcuneate or rounded at the base, obtuse or acuminate at the apex, appressed-pilosulous above, with impressed costa and veins, villous-tomentose beneath, principally on the prominent costa and veins, the blades of the basal pair 2 to 5 cm. long, 1.3 to 2 cm. broad, those of the terminal pair 5.5 to 13 cm. long, 2 to 5 cm. broad.

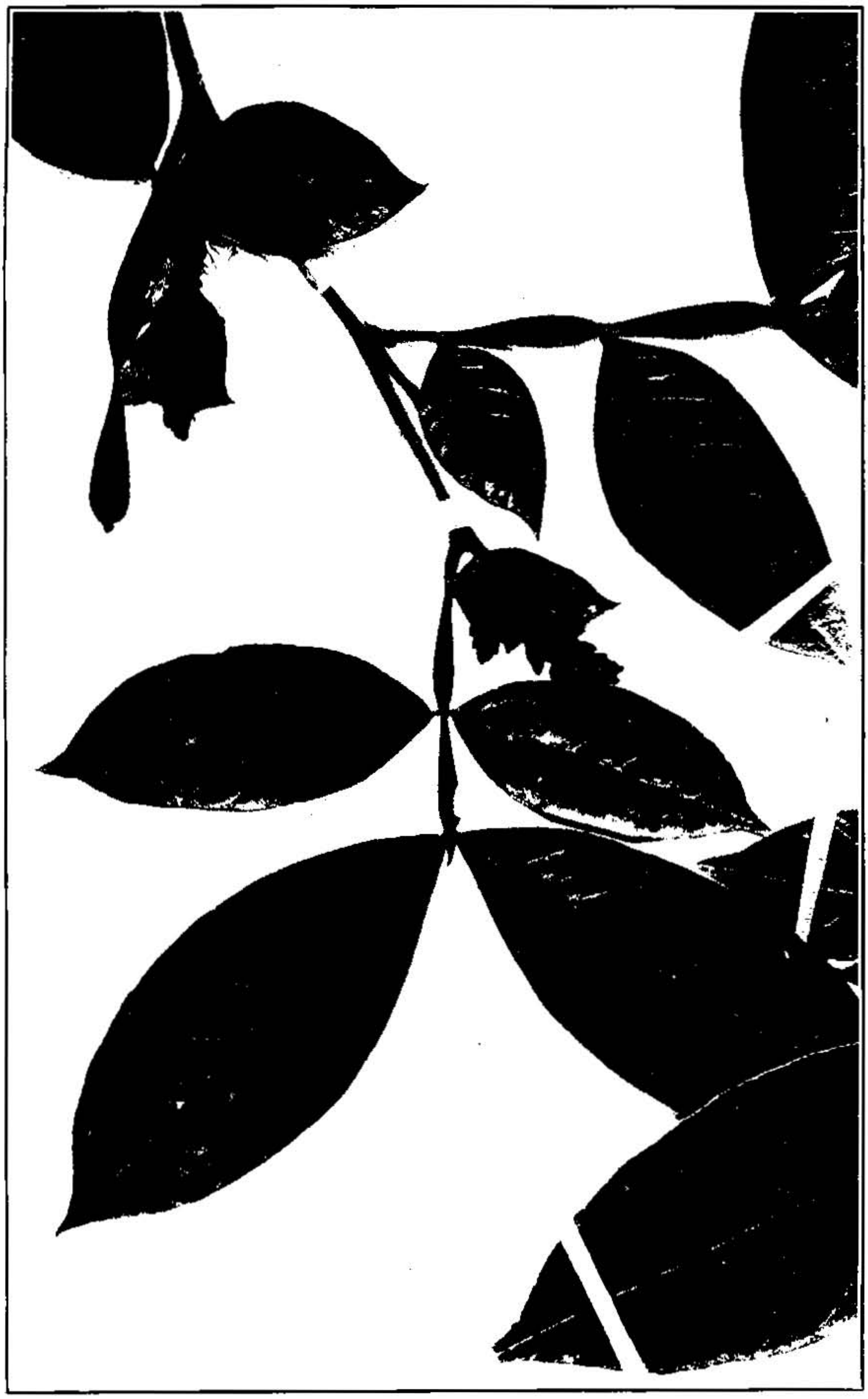
Inflorescences single or geminate, axillary or terminal; peduncles ferruginous-pubescent, 1.5 to 2 cm. long; flower heads ovoid, the rachis hairy, 1.5 to 2 cm. long; bractlets very small, short and broad, obtuse, caducous; calyx tubular, slightly broadened at the apex, ferruginous-pubescent, 8 to 10 mm. long, the teeth short, broad, acute; corolla tubular, white, silky-hairy, 15 to 17 mm. long, the lobes ovate, obtuse, about 3 mm. long; staminal tube included, the stamens about 4.5 cm. long from the base; pistil about 5 cm. long; stigma capitellate.

Legume not known.

PANAMA: Panama, *Duchassaing*, the specimen in the Gray Herbarium being the type or at least part of it. Ancón Hill, Canal Zone, alt. 200 meters, flowers, February 20, 1908, *Williams* 32.

This species is certainly distinct from *Inga eriocarpa*. The flowers in the original specimens in the Gray Herbarium are only in bud, but those of the Williams collection, perfectly developed, are much smaller than in the above species, and besides this the leaflets are distinctly different in shape and mostly 3-jugate.

EXPLANATION OF PLATE 103.—Specimen of *Inga pauciflora* in U. S. National Herbarium, *Williams* 32, cited above. Natural size.



INGA PAUCIFLORA WALP. & DUCHASS.

Inga ursi Pittier, sp. nov.

A tree; branchlets angulate, the younger growth, rachis of the leaves, and peduncles densely ferruginous-hirtous.

Rachis of the leaves winged, 8 to 14 cm. long, the petiolar part narrowly winged, 1.5 to 2.5 cm. long, the wings 7 to 9 mm. broad; stipules lanceolate, ferruginous-hairy, 5 to 10 mm. long, caducous; glands sessile, more or less triangular or transversely compressed; leaflets 5 or 6-jugate, coriaceous, more or less oblique, subsessile or the densely ferruginous-hairy petiolules less than 1 mm. long; leaflet blades ovate-oblong or ovate-elliptic, rounded at the base, obtuse or acute at the apex, sparsely hairy or glabrescent and lustrous above, reticulate and more or less brownish-tomentose beneath, the costa and veins ferruginous-hairy, very prominent beneath, the veins impressed on the upper face; blades of the basal pair of leaflets 4 to 7 cm. long, 1.5 to 3 cm. broad, those of the terminal pair 7 to 10.5 cm. long, 3 to 4 cm. broad.

Floral spikes single, geminate, or 3-clustered in the upper axils, the peduncles terete, 1.5 to 4.5 cm. long, the flower heads elongate, densely flowered; bractlets small, ovate, acute, caducous; flowers sessile; calyx tubular, ferruginous-tomentellous or hirtellous, 12.7 to 13.3 (13) mm. long, the teeth acute, 2 to 8.5 mm. long; corolla tubular, hardly broader at the apex, densely brownish-villous, 18.3 to 20.8 (19.5) mm. long, the lobes narrow, 3 to 4 mm. long; staminal tube included; pistil about 5 cm. long; ovary stipitate, 2-sulcate.

Legume not known.

Type in the John Donnell Smith Herbarium, collected in Colombia, at a point not stated but probably in the vicinity of Popayán, by F. C. Lehmann (no. 5750).

Known among the natives as "guavo de oso," this species may belong to the group of *Inga insignis* Kunth. The cross section of the ovary, however, though almost quadrangular, is not 4-sulcate, as is generally the case among the Tetragonae.

Inga xalapensis Benth. Lond. Journ. Bot. 4: 616. 1845.

A small tree; branchlets slender, subangulate, the younger parts more or less ferruginous-pubescent.

Rachis of the leaves narrowly winged, densely ferruginous-pubescent at first and then glabrescent, 5 to 12 cm. long (or more), the petiolar part usually wingless but sometimes winged, 1 to 1.5 cm. long; leaflets usually 5-jugate (the pairs sometimes more or fewer), coriaceous, subsessile; glands small or medium-sized, prominent, concave; leaflet blades ovate or oblong to lanceolate, rounded at the base, obtuse or acute and often mucronate at the apex, sparsely pubescent or glabrescent and sublustrous above, the slightly prominent costa and the impressed, delicate veins more or less densely ferruginous-pubescent, beneath reticulate and densely soft-pubescent to glabrescent, the costa and veins very prominent, the blades of the basal pair 2.5 to 3 cm. long, 1 to 1.5 cm. broad, those of the terminal pair 6 to 9 cm. long, 2 to 3.5 cm. broad, or larger.

Inflorescences more or less densely paniculate at the ends of the branchlets, the spikes usually geminate; peduncles and rachises densely ferruginous-pubescent, the former 2 to 4.5 cm. long; flower heads elongate, the flowers mostly numerous and caducous; bractlets ovate-lanceolate, acute, pubescent without, 5 to 8 mm. long; flowers sessile; calyx tubular, slightly widening toward the apex, densely ferruginous-pubescent, 10.3 to 11.5 (11 mm.) long, the teeth narrow, acute, 3.5 to 4.5 mm. long; corolla tubular, silky-villous, 14.5 to 17.2 (16.1) mm. long, the lobes broad, 1.5 to 3.5 mm. long; staminal tube included, much shorter than the corolla; pistil about 6 cm. long, the ovary sessile, glabrous, about 15-ovulate; stigma capitellate.

Legume densely ferruginous-pubescent, subterete, more or less stipitate, cuspidate at the apex, 10 to 15 cm. long, about 1 cm. broad, the valves narrow between the broad, obscurely sulcate margins.

Founded upon material from Jalapa, State of Veracruz, Mexico, *Linden* 671, of which I have seen no specimens.

MEXICO: Valley of Córdoba, State of Veracruz, flowers, March 12, 1866, *Bourgeau* 2040. Wartenberg, near Tantoyuca, State of Veracruz, flowers and fruits, 1858, *Ervendberg* 10. San Pedro, near Guadalajara, State of Jalisco, flowers, February 25, 1907, *Safford* 1414.

GUATEMALA: Laguna de Amatitlán, flowers, January 20, 1906, *Kellerman* 6374.

COSTA RICA: Desamparados, flowers, June, 1887, *Biolley* (Inst. Fís. Geogr. Costa Rica, no. 1018). Banks of Río Tirribí, near San José, fruits, June, 1891, *Pittier* (Inst. Fís. Geogr. Costa Rica, no. 4258). La Verbena, near San José, in woods, flowers, December, 1894, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 9078).

NOTES ON OLD SPECIES WITH DESCRIPTIONS OF NEW SUBSPECIES.

The species of the section form three distinct groups, the types of which are respectively *Inga vera* Willd., *I. edulis* Mart., and *I. spuria* Humb. & Bonpl.

GROUP OF INGA VERA.

Although Willdenow gives South America as the origin of *Inga vera*, this species seems to be exclusively Antillean, with few related species and subspecies. Among the numerous specimens of continental origin attributed to *I. vera* not one has been found that could safely be acknowledged as belonging to this species. *Inga uraguensis*, of the *I. spuria* group, may represent the nearest approach, but it is itself very variable, most of its forms leaning to the *I. spuria* type, with fruits very distinct from those of the West Indian tree.

The typical *I. vera*, as described by Willdenow, has glabrous leaves, a character which we find to belong only to a few specimens collected in Haiti and Jamaica. In other specimens from the same islands the rachis of the leaves is distinctly ferruginous-puberulous or pubescent, and the pubescence of the calyx, also rusty-colored, is perhaps a little more dense. But all other details agree with the corresponding ones in the glabrous form, from which these specimens could hardly be separated. This latter facies of the species I consider to be *Inga vera typica*. There are two forms so distinct as to deserve subspecific rank.

Inga vera lamprophylla Pittier, subsp. nov.

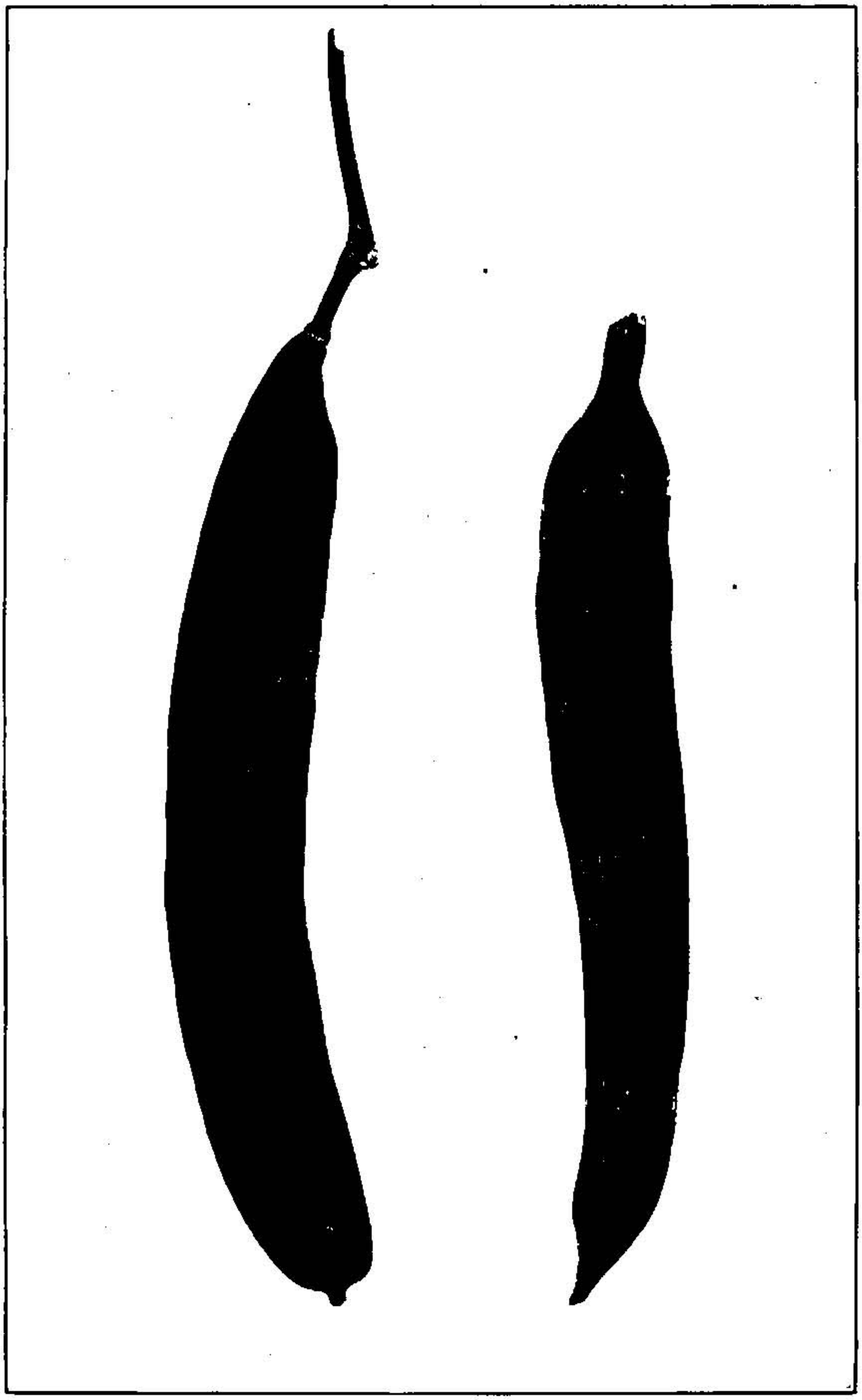
Inga lamprophylla Wright, in herb.

Young growth, rachis of the leaves, and floral peduncles densely ferruginous-pubescent; leaflets, narrow and ending in a long, acute acumen, lustrous above and light green or rusty-colored beneath. As these leaflets are not so broad as in the typical form, they seem to be farther apart. Moreover, the calyx is always stipitate, and often conspicuously so, with the teeth varying in length and breadth and the pubescence also ferruginous.

Type in the U. S. National Herbarium, no. 865550, collected in Haiti, January to March, 1871, by Charles Wright (no. 68).

This subspecies has been collected again by Nash (no. 337) in Haiti and by Britton and Cowell (no. 402) in Porto Rico. Specimens intermediate between

INGA VERA PORTORICENSIS PITTIER.



FRUITS OF INGA INGOIDES (A. RICH.) WILLD.

this and *I. vera typica* occur here and there. The facts do not warrant the recognition of this form as a distinct species.

Inga vera portoricensis Pittier, subsp. nov. PLATE 104.

Flowers of the typical plant, but the leaflets seeming stiffer and more coriaceous, with the costa and veins thicker and very prominent on the lower face; pubescence of the young growth, the rachis of the leaves, and the peduncles ferruginous, but the density of the indument variable; glands varying in size and shape and often obsolete.

Type in the U. S. National Herbarium, no. 362665, collected 40 miles northeast of Mayagüez, Porto Rico, by A. A. Heller (no. 4471).

Apparently endemic to Porto Rico.

In conclusion, it seems that the typical *Inga vera* of Willdenow is an exclusively Antillean species, restricted to the islands of Haiti and Jamaica, and that aberrant forms, the result of isolation, have developed within the area of the species in Cuba, Porto Rico, Haiti, Jamaica, and perhaps Trinidad. These forms, however, have not reached a stage of differentiation sufficiently marked to justify their being considered as distinct species. It is to be noted, moreover, that the 30 specimens at hand all proceed from the above-named islands, to the exclusion of the Lesser Antilles.

EXPLANATION OF PLATE 104.—From a field photograph of *Inga vera portoricensis* taken at Cayey, Porto Rico, in 1899, by Mr. G. N. Collins. Natural size.

GROUP OF INGA EDULIS.

In this group the calyx is long and narrow or short and broad. In the first case, illustrated in *I. edulis*, the flowers are sessile, while in the latter case, represented by *I. ingoides* (illustrated in pl. 105) and *I. subnuda*, they are long-pedicellate. This last character excludes numerous specimens of Central America thus named in our collections. So far as is known, and excepting a specimen of doubtful identification from Bolivia (*Williams* 661, in the New York Botanical Garden Herbarium), *Inga ingoides* is restricted to the Windward Islands, Trinidad, and the adjacent coastal parts of Venezuela and the Guianas.

Inga edulis has a form with a short calyx. Further, this species, *I. oerstediana* Benth., and *I. eriorhachis* insensibly grade into each other in such a way as often to make the identification difficult. The two latter species seem to be simply high altitudinal variations of the former.

EXPLANATION OF PLATE 105.—Two fruits of a Guadeloupe specimen of *Inga ingoides* Willd., in U. S. National Herbarium, collected by Père Duss (no. 3035). Natural size.

GROUP OF INGA SPURIA.

To judge by the existing confusion in the collections consulted, the species of this group, and especially the Central American ones, are very difficult to recognize. Bentham himself seems to have been in doubt more than once as to the standing of some of them, and in his last work on the genus he reduced to synonymy several of his own creating or the work of other authors, two of which, at least, appear to have been well founded.

Inga spuria does not seem to be quite the same thing at both extremes of its vast area of dispersion. Taking the Venezuelan specimens as typical, the species having been described originally from Carúpano, we find, for instance, that they possess a broad, short, stipitate calyx, with triangular, acute, rather short teeth. In Mexican specimens the same part may be narrower and

longer, distinctly broadened at the apex, and hardly, if at all, stipitate; the teeth may also be longer, narrower, and closer together. Similar variations can be observed in the shape, size, and indument of the leaflets, or in the arrangement of other parts, notwithstanding which we find it difficult to discriminate between the specimens, because these variations are combined in every possible way, some characters remaining constant all through the series. Certain forms could be separated, as has been done in other old polymorphic species of the temperate regions, split to-day into no end of so-called new species, but this goes against any rational definition of a specific unit, and besides this we are still in ignorance as to the environmental conditions under which these forms develop.

The reestablished species are *Inga pauciflora* Walp. & Duchass., a well-defined Panama type leaning perhaps to the *I. edulis* group, and *I. eriocarpa* Benth., distinguished from *I. xalapensis* Benth. by its larger flowers and the tomentose indument of the calyx.

LIST OF THE KNOWN SPECIES OF INGA.

The following enumeration includes all the species of Inga regarded by the writer as valid, described up to the present date, with indication of the origin of the type. The species marked with an asterisk are those *not* represented in the American herbaria consulted.

Section 1. LEPTINGA.

1. **Inga boliviana** Britton, Bull. Torrey Club **17**: 9. 1890. Bolivia.
2. ***brevipes** Benth. Journ. Bot. Hook. **2**: 144. 1840. British Guiana.
3. ***cynometrifolia** Harms, Verh. Bot. Ver. Brand. **48**: 158. 1907. Peru.
4. **flagelliformis** (Vell.) Mart. Flora **20**: Beibl. 112. 1837. Brazil.
5. ***graciliflora** Benth. Lond. Journ. Bot. **4**: 582. 1845. British Guiana.
6. **heterophylla** Willd. Sp. Pl. **4**: 1020. 1806. Brazil.
7. ***lallensis** Spruce; Benth. Trans. Linn. Soc. **30**: 603. 1875. Peru.
8. **lateriflora** Miquel, Linnaea **19**: 131. 1847. Surinam.
9. **mapiriensis** Pittier, above, p. 174. Bolivia.
10. **maxoniana** Pittier, above, p. 174. Venezuela.
11. **myriantha** Poepp. & Endl. Nov. Gen. & Sp. **3**: 77. *pl. 289*. 1845. Peru.
12. **panurensis** Spruce; Benth. Trans. Linn. Soc. **30**: 602. 1875. Brazil.
13. ***pardoana** Harms, Bot. Jahrb. Engler **42**: 89. 1908. Peru.
14. **portobellensis** Beurling, Svensk. Vet. Akad. Handl. **1854**: 122. 1856. Panama.
15. **quaternata** Poepp. & Endl. Nov. Gen. & Sp. **3**: 79. 1845. Peru.
16. **roussoviana** Pittier, above, p. 175. Panama.
17. **saffordiana** Pittier, above, p. 176. Panama.
18. **sciadion** Steud. Flora **26**: 758. 1843. Cayenne, French Guiana.
19. **sellowiana** Benth. Lond. Journ. Bot. **4**: 583. 1845. Brazil.
20. **sertulifera** DC. Prodr. **2**: 436. 1825. *Brazil.
21. **tarapotensis** Spruce; Benth. Trans. Linn. Soc. **30**: 609. 1875. Peru.
22. **umbellifera** (Vahl) Steud.; DC. Prodr. **2**: 432. 1825. French Guiana.
23. ***umbratica** Poepp. & Endl. Nov. Gen. & Sp. **3**: 77. 1845. Peru.
24. **virgultosa** (Vahl) Desv. Ann. Sci. Nat. **9**: 426. 1826. French Guiana.
25. **williamsii** Pittier, above, p. 176. Panama.
26. ***wittiana** Harms, Verh. Bot. Ver. Brand. **48**: 161. 1907. Brazil.

Section 2. DIADEMA.

27. **Inga *bullata** Benth. Lond. Journ. Bot. 4: 607. 1845. Brazil.
28. ***campanulata** Benth. Trans. Linn. Soc. 30: 607. 1875. Brazil.
29. **cinnamomea** Spruce; Benth. Trans. Linn. Soc. 30: 609. 1875. Brazil.
30. **cordistipula** Mart. Flora 20: Beibl. 111. 1837. Brazil.
31. **darienensis** Seem. Bot. Voy. Herald 117. *pl. 23.* 1853. Colombia.
32. **diadema** (Vell.) Mart. Flora 20: Beibl. 114. 1837. Brazil.
33. **duckei** Huber, Bol. Mus. Goeldi 5: 375. 1909. Brazil.
34. **jinicuil** Schlecht. Linnaea 12: 559. 1838. Mexico.
35. ***lanceaefolia** Benth. Trans. Linn. Soc. 30: 606. 1875. Brazil.
36. ***lentiscifolia** Benth. Lond. Journ. Bot. 4: 592. 1845. Brazil.
37. ***membranacea** Benth. Trans. Linn. Soc. 30: 606. 1875. Panama.
38. ***nutans** (Vell.) Mart. Flora 20: Beibl. 114. 1837. Brazil.
39. **paterno** Harms, Repert. Nov. Sp. Fedde 13: 419. 1914. El Salvador.
40. **peckii** Robinson, Proc. Amer. Acad. 49: 502. 1913. British Honduras.
41. **radians** Pittier, above, p. 178. Mexico.
42. **rusbyi** Pittier, above, p. 179. Bolivia.
43. ***schinifolia** Benth. Lond. Journ. Bot. 4: 584. 1845. Brazil.
44. ***sodiroi** Harms, Repert. Nov. Sp. Fedde 13: 527. 1915. Ecuador.
45. **stipularis** DC. Mém. Legum. 440. 1825. French Guiana.

Section 3. BOURGONIA.

46. **Inga aggregata** Don, Hist. Dichl. Pl. 2: 391. 1832. Peru.
47. **alba** (Swartz) Willd. Sp. Pl. 4: 1013. 1806. French Guiana.
48. **bangii** Harms, Repert. Nov. Sp. Fedde 13: 525. 1915. Bolivia.
49. **bourgoni** (Aubl.) DC. Prodr. 2: 434. 1825. French Guiana.
50. ***brachyrhachis** Harms, Verh. Bot. Ver. Brand. 48: 159. 1907. Peru.
51. ***coruscans** (Poir.) Humb. & Bonpl.; Willd. Sp. Pl. 4: 1017. 1806. South America (Colombia?).
52. **cylindrica** (Vell.) Mart. Flora 20: Beibl. 114. 1837. Brazil.
53. **fagifolia** (L.) Willd.; Benth. Trans. Linn. Soc. 30: 607. 1875. British Guiana(?).
54. **laurina** (Swartz) Willd. Sp. Pl. 4: 1018. 1806. St. Kitts.
55. **marginata** Willd. Sp. Pl. 4: 1015. 1806. Venezuela.
56. ***pezizifera** Benth. Lond. Journ. Bot. 4: 587. 1845. British Guiana.
57. ***tenuifolia** Benth. Lond. Journ. Bot. 4: 587. 1845. Brazil.
58. ***tenuirama** Harms, Repert. Nov. Sp. Fedde 13: 527. 1915. Ecuador.
59. **tomentosa** Benth. Trans. Linn. Soc. 30: 609. 1875. Peru.

Section 4. PSEUDINGA.

Series 1. GLABRIFLORAE.

60. **Inga capitata** Desv. Journ. de Bot. 3: 71. 1814. Brazil.
60a. **brevicalyx** Benth. in Mart. Fl. Bras. 15': 476. 1876. Brazil.
60b. **tenuior** Benth. loc. cit. Brazil.
61. **microcalyx** Spruce; Benth. Trans. Linn. Soc. 30: 611. 1875. Brazil.
62. **stenocalyx** Spruce; Benth. Trans. Linn. Soc. 30: 611. 1875. Brazil.

Series 2. GYMNOPODAE.

63. **Inga acrocephala** Steud. Flora **26**: 759. 1843. Surinam.
64. **aestuariorum** Pittier, above, p. 183. Costa Rica.
65. **cycladenia** Pittier, above, p. 184. Colombia.
66. **dominicensis** Benth. Trans. Linn. Soc. **30**: 612. 1875. Dominica.
67. ***dumosa** Benth. Trans. Linn. Soc. **30**: 612, 1875. Brazil.
68. ***gracilior** Sprague, Trans. Bot. Soc. Edinburgh **22**: 431. 1904. Colombia.
69. ***juglandifolia** (Poir.) Willd. Sp. Pl. **4**: 1018. 1806. Venezuela.
70. **latipes** Pittier, above, p. 183. Costa Rica.
71. **leiocalycina** Benth. Lond. Journ. Bot. **4**: 598. 1845. British Guiana.
72. ***lenticellata** Benth. Trans. Linn. Soc. **30**: 613. 1875. Brazil.
73. **leptoloba** Schlecht. Linnaea **12**: 560. 1838. Mexico.
74. ***lineata** Benth. Lond. Journ. Bot. **4**: 594. 1845. Peru.
75. **martinicensis** Presl, Symb. Bot. **1**: 65. *pl. 42*. 1832. Martinique.
76. **mathewsiana** Benth. Lond. Journ. Bot. **4**: 594. 1845. Peru.
77. ***maynensis** Benth. Trans. Linn. Soc. **30**: 613. 1875. Peru.
78. ***monzonensis** Harms, Bot. Jahrb. Engler **42**: 88. 1908. Peru.
79. **multijuga** Benth. Trans. Linn. Soc. **30**: 615. 1875. Panama.
80. **myriocephala** Pittier, above, p. 184. Bolivia.
81. **nobilis** Willd. Enum. Pl. 1047. 1809. Brazil.
82. **olivacea** Sprague, Trans. Bot. Soc. Edinburgh **22**: 430. 1904. Colombia.
83. **peltadenia** Harms, Verh. Bot. Ver. Brand. **48**: 160. 1907. Peru.
84. **pinetorum** Pittier, above, p. 185. British Honduras.
85. **popayanensis** Pittier, above, p. 185. Colombia.
86. **punctata** Willd. Sp. Pl. **4**: 1016. 1806, excl. syn. Martinique.
87. **rufinervis** Spruce; Benth. Trans. Linn. Soc. **30**: 612. 1875. Brazil.
88. **ruiziana** Don, Hist. Dichl. Pl. **2**: 391. 1832. Peru.
89. **semiglabra** Pittier, above, p. 186. Ecuador.
90. **strigillosa** Spruce; Benth. Trans. Linn. Soc. **30**: 612. 1875. Brazil.
91. **thibaudiana** DC. Prodr. **2**: 434. 1825. Brazil.

Series 3. PILOSIUSCULAE.

92. **Inga *bonplandiana** H. B. K. Nov. Gen. & Sp. **6**: 288. 1823. Peru.
93. ***chartacea** Poepp. & Endl. Nov. Gen. & Sp. **4**: 79. 1845. Peru.
94. **cobanensis** Pittier, above, p. 188. Guatemala.
95. **densiflora** Benth. Trans. Linn. Soc. **30**: 617. 1875. Peru.
96. **hayesii** Benth. loc. cit. Panama.
97. **hostmannii** Pittier, above, p. 188. Surinam.
98. **langlassei** Pittier, above, p. 189. Colombia.
99. **longipes** Benth. loc. cit. Peru.
100. **macrantha** J. R. Johnson, Proc. Amer. Acad. **40**: 687. 1905. Venezuela.
101. **maritima** Benth. Lond. Journ. Bot. **4**: 601. 1845. Brazil.
102. **micheliana** Harms, Repert. Nov. Sp. Fedde **13**: 525. 1915. Guatemala.
103. **mollifoliola** Pittier, above, p. 189. Costa Rica.
104. **monticola** Pittier, above, p. 190. Panama.
105. **nitida** (Poir.) Willd. Sp. Pl. **4**: 1013. 1806. Brazil.

106. Inga nuda Salzm. Lond. Journ. Bot. 4: 607. 1845. Brazil.
107. organensis Pittier, above, p. 191. Brazil.
108. pilosiuscula Desv. Journ. de Bot. 1: 71. 1814. French Guiana.
109. pringlei Harms, Repert. Nov. Sp. Fedde 13: 526. 1915. Mexico.
110. *rhabdotocalyx Harms, loc. cit. Ecuador.
111. *salzmanniana Benth. Lond. Journ. Bot. 4: 608. 1845. Brazil.
112. *sanctae-annae Moore, Trans. Linn. Soc. II. Bot. 4: 350. 1895. Brazil.
113. setifera DC. Prodr. 2: 432. 1825. Brazil.
114. sordida Pittier, above, p. 191. Colombia.
115. splendens (Poir.) Willd. Sp. Pl. 4: 1017. 1806. Brazil.
116. stenopoda Pittier, above, p. 192. Bolivia.
117. stenoptera Benth. Journ. Bot. Hook. 2: 143. 1840. Brazil.
118. tuerckheimii Pittier, above, p. 192. Guatemala.
119. ulei Harms, Verh. Bot. Ver. Brand. 48: 161. 1907. Brazil.
120. virescens Benth. Lond. Journ. Bot. 4: 605. 1845. Brazil.

Series 4. LEPTANTHAE.

121. Inga acuminata Benth. Lond. Journ. Bot. 4: 600. 1845. Trinidad.
122. ciliata Presl, Symb. Bot. 2: 11. *pl.* 58. 1833. Brazil.
123. disticha Benth. Journ. Bot. Hook. 2: 143. 1840. British Guiana.
124. leptantha Benth. Lond. Journ. Bot. 4: 603. 1845. Brazil.
125. *platyptera Benth. Lond. Journ. Bot. 4: 602. 1845. Brazil.
126. striata Benth. op. cit. 4: 608. Brazil.

Series 5. LONGIFLORAE.

127. Inga feuillei DC. Prodr. 2: 433. 1825.
128. lomatophylla (Benth.) Pittier, above, p. 195. Brazil.
129. *longiflora Spruce; Benth. Trans. Linn. Soc. 30: 620. 1875. Brazil.
130. micradenia Spruce; Benth. loc. cit. Brazil.
131. mucuna Walp. & Duchass. Walp. Ann. Bot. 2: 459. 1851–52. Panama.
132. negrensis Spruce; Benth. Trans. Linn. Soc. 30: 621. 1875. Brazil.
133. plumifera Spruce; Benth. loc. cit. Brazil.
134. *poeppigiana Benth. Lond. Journ. Bot. 4: 602. 1845. Peru.
135. speciosa Spruce; Benth. Trans. Linn. Soc. 30: 620. 1875. Brazil.
136. velutina (Poir.) Willd. Sp. Pl. 4: 1014. 1806. Brazil.

Series 6. CALOCEPHALAE.

137. Inga *brachyptera Benth. Lond. Journ. Bot. 4: 610. 1845. Colombia.
138. *bracteosa Benth. op. cit. 4: 609. British Guiana.
139. eggersii Harms, Bot. Jahrb. Engler 42: 88. 1908. Ecuador.
140. expansa Rusby, Bull. N. Y. Bot. Gard. 8: 90. 1912. Bolivia.
141. goldmanii Pittier, above, p. 198. Panama.
142. hartii Urban, Symb. Antill. 1: 311. 1899. Trinidad.
143. *heteroptera Benth. Lond. Journ. Bot. 4: 611. 1845. Colombia.
144. *lindeniana Benth. op. cit. 4: 608. Mexico.
145. *macrophylla (Poir.) Humb. & Bonpl.; Willd. Sp. Pl. 4: 1015. 1806. Peru.
146. obtusata Spruce; Benth. Trans. Linn. Soc. 30: 621. 1875. Brazil.

147. **Inga panamensis** Seem. Bot. Voy. Herald 117. 1853. Panama.
148. ***pavoniana** Don, Hist. Dichl. Pl. **2**: 388. 1832. Peru.
149. **purpusii** Pittier, above, p. 199. Mexico.
150. ***rufiseta** Benth. Trans. Linn. Soc. **30**: 621. 1875. Peru.
151. **rugosa** Rusby, Bull. N. Y. Bot. Gard. **4**: 350. 1907. Bolivia.
152. **?*sapindoides** (Poir.) Willd. Sp. Pl. **4**: 1012. 1806. Venezuela.
153. **spectabilis** (Vahl) Willd. op. cit. **4**: 1017. Colombia.
154. ***weberbaueri** Harms, Bot. Jahrb. Engler **42**: 90. 1908. Peru.

Series 7. VULPINAE.

155. **Inga balaensis** Pittier, above, p. 201. Ecuador.
156. **barbata** Benth. Lond. Journ. Bot. **4**: 604. 1845. Brazil.
157. ***blanchetiana** Benth. Trans. Linn. Soc. **30**: 624. 1875. Brazil.
158. **chrysotricha** Pittier, above, p. 202. Bolivia.
159. **codonantha** Pittier, above, p. 202. Colombia.
160. **cookii** Pittier, above, p. 203. Guatemala.
161. ***fastuosa** (Jacq.) Willd. Sp. Pl. **4**: 1014. 1806. Venezuela.
162. ***ferrugineo-hirta** Mart.; Benth. Trans. Linn. Soc. **30**: 625. 1875. Brazil.
163. ***guilleminiana** Benth. Lond. Journ. Bot. **4**: 605. 1845. Brazil.
164. **hirsutissima** Rusby, Bull. N. Y. Bot. Gard. **4**: 349. 1907. Bolivia.
165. ***hispida** Schott; Benth. Trans. Linn. Soc. **30**: 625. 1875. Brazil.
166. ***multicaulis** Spruce; Benth. op. cit. **30**: 624. Ecuador.
167. **sessilis** (Vell.) Mart. Flora **20**: Beibl. 114. 1837. Brazil.
168. ***setosa** Don, Hist. Dichl. Pl. **2**: 388. 1832. Peru.
169. **tonduzii** Donn. Smith, Bot. Gaz. **44**: 112. 1907. Costa Rica.
170. ***venosa** Griseb. Fl. Brit. W. Ind. 711. 1864, name only. Trinidad.
171. ***vestita** Benth. Lond. Journ. Bot. **4**: 604. 1845. Brazil.
172. ***villosissima** Benth. Trans. Linn. Soc. **30**: 624. 1875. Venezuela.
173. **vulpina** Mart.; Benth. Trans. Linn. Soc. **30**: 625. 1875. Brazil.

Series 8. DYSANTHAE.

174. **Inga cayennensis** Sagot; Benth. Trans. Linn. Soc. **30**: 626. 1875. French Guiana.
175. **dysantha** Benth. loc. cit. Brazil.
176. **standleyana** Pittier, above, p. 204. Panama.

Section 5. EUINGA.

Series 1. TETRAGONAE.

177. **Inga biolleyana** Pittier, above, p. 207. Costa Rica.
178. ***fendleriana** Benth. Trans. Linn. Soc. **30**: 630. 1875. Venezuela.
179. **insignis** Kunth, Mimos. Pl. Légum. 43. *pl. 13*. 1819–24. Ecuador.
180. **jimeneziana** Pittier, above, p. 208. Costa Rica.
181. **pittieri** Michell, Bull. Herb. Boiss. **2**: 446. *pl. 13*. 1894. Costa Rica.
182. **preussii** Harms, Repert. Nov. Sp. Fedde **13**: 420. 1914. El Salvador.
183. **rensoni** Pittier, above, p. 209. El Salvador.
184. **rodrigueziana** Pittier, above, p. 209. Guatemala.

Series 2. SULCATAE.

185. **Inga adenophylla** Pittier, above, p. 210. Bolivia.
186. **affinis** DC. Prodr. 2: 433. 1825. Brazil.
187. ***bahiensis** Benth. Lond. Journ. Bot. 4: 618. 1845. Brazil.
188. **cocleensis** Pittier, above, p. 211. Panama.
189. ***conferta** Benth. Lond. Journ. Bot. 4: 620. 1845. Peru.
190. **donnell-smithii** Pittier, above, p. 211. Guatemala.
191. **edulis** Mart. Flora 20: Beibl. 113. 1837. Brazil.
192. **eriocarpa** Benth. Lond. Journ. Bot. 4: 615. 1845. Mexico.
193. **eriorhachis** Harms, Repert. Nov. Sp. Fedde 13: 525. 1915. Costa
194. Rica.
***fasciculata** Poepp. & Endl. Nov. Gen. & Sp. 3: 79. 1845. Peru.
195. **fissicalyx** Pittier, above, p. 213. Mexico.
196. **holtonii** Pittier, above, p. 213. Colombia.
197. **ingoides** (A. Rich.) Willd. Sp. Pl. 4: 1012. 1806. French Guiana.
198. ***laxiflora** Benth. Lond. Journ. Bot. 4: 617. 1845. Peru.
199. **luschnathiana** Benth. op. cit. 4: 618. Brazil.
200. **meissneriana** Miquel, Stirp. Surinam. 2. 1850. Surinam.
201. **oerstediana** Benth. in Seem. Bot. Voy. Herald 117. 1853. Costa Rica.
202. **pallida** Rusby, Mem. Torrey Club 6: 30. 1896. Bolivia.
203. **pauciflora** Walp. & Duchass. Linnaea 23: 746. 1850. Panama.
204. ***rubiginosa** (A. Rich.) DC. Prodr. 2: 434. 1825. French Guiana.
205. **scabriuscula** Benth. Lond. Journ. Bot. 4: 606. 1845. Surinam.
206. **spuria** (Poir.) Humb. & Bonpl.; Willd. Sp. Pl. 4: 1011. 1806. Vene-
zuela.
207. **subnuda** Salzm.; Benth. Lond. Journ. Bot. 4: 613. 1845. Brazil.
208. **uraguensis** Hook. & Arn. Bot. Misc. Hook. 3: 202. 1833. Uruguay.
209. **ursi** Pittier, above, p. 215. Colombia.
210. **vera** Willd. Sp. Pl. 4: 1010. 1806. West Indies.
210a. **lamprophylla** Pittier, above, p. 216. Haiti.
210b. **portoricensis** Pittier, above, p. 217. Porto Rico.
211. ***vismiaefolia** Poepp. & Endl. Nov. Gen. & Sp. 3: 79. 1845. Peru.
212. **xalapensis** Benth. Lond. Journ. Bot. 4: 616. 1845. Mexico.