BOTANY.—*New plants from Central America*—II.[1] PAUL C. STANDLEY, U. S. National Museum.

The species here described as new are mostly plants of the Canal Zone, which have been studied during the preparation of a flora of that region. There are included also descriptions of two Costa Rican plants, and of a new cactus from the Republic of Salvador.

Inga gracilipes Standl., sp. nov.

Tree 6 m. high, the young branchlets sparsely puberulent but soon glabrate; petioles 1.5–3 cm. long, glabrous, narrowly winged above, bearing at the middle and at the apex a sessile cup-shaped gland; rachis 1.5–2 cm. long, with a cup-shaped gland at apex, narrowly winged, the wing attenuate below, the rachis 4 mm. wide at apex; leaflets 2 pairs, elliptic-oblong, 6–11 cm. long, 2.5–4.5 cm. wide, abruptly and shortly obtuse-acuminate, obtuse at base, coriaceous, glabrous, lustrous above, with prominent venation; flowers umbellate, the umbels paniculate, the peduncles very slender, 2.5–4.5 cm. long, solitary or fasciculate, obscurely puberulent or glabrate; pedicels filiform, 8–10 mm. long, minutely and very sparsely puberulent; calyx tubular, 3 mm. long, sparsely and very minutely puberulent; corolla greenish white, narrow-funnelform, 8–9 mm. long, glabrous; stamen tube short-exserted; very young fruit oblong, strongly compressed, with scarcely thickened margins, glabrous, acute at base, subsessile.

Type in the U. S. National Herbarium, no. 1,219,236, collected on brushy slope between France Field, Canal Zone, and Cativa1, Province of Colón, Panama, near sea level, January 9, 1924, by Paul C. Standley (no. 30353).

The vernacular name is "guava," a term applied locally to all species of *Inga*. *Inga gracilipes* belongs to the section *Leptinga*, characterized by pedicellate flowers, but in its nearly glabrous flowers it is distinct from the other Central American species of the group. It is, however, closely related to some of the Brazilian species, although it appears to differ from each of them in one or more details.

Anaxagorea panamensis Standl., sp. nov.

Slender shrub 1–2 m. high, the branchlets sparsely ferruginous-puberulent when young but soon glabrate; petioles 3–5 mm. long, glabrate; leaf blades lance-oblong, 9–16 cm. long, 2.5–4 cm. wide, acuminate, obtuse or acutish at base, thin, deep green and lustrous above, glabrous, beneath paler, when very young puberulent along the costa, but elsewhere glabrous, the lateral nerves 6 or 7 pairs, diverging at a wide angle, arcuately anastomosing remote from the margin; flowers axillary, solitary, the pedicels 2.5 cm. long, very slender, obscurely puberulent or glabrous, with a minute bractlet near the base; sepals ovate-acuminate, 8 mm. long, ferruginous-puberulent, thin; outer petals pale dull yellow, linear-oblong, obtuse, 2 cm. long, thin, puberulent, the inner petals scarcely 1 cm. long, triangular-ovate, acuminate; follicles numerous, bronze-green, glabrous, the stipe 1–1.5 cm. long, the body about 1 cm. long, apiculate, splitting along one side at maturity and exposing the lustrous seed.

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Type in the U. S. National Herbarium, nos. 1,216,855–6, collected in wet forest along the Río Tapia, Province of Panama, Panama, near sea level, Dec. 7, 1923, by Paul C. Standley (no. 26168). The following collections are of the same species:

PANAMA: Río Tapia, *Standley* 28247, 28289, 30660. Hills north of Frijoles, Canal Zone, *Standley* 27589.

One other species, *A. crassipetala* Hemsl., has been described from Central America (Nicaragua), but according to the description it is not closely related to the present plant. The Panama species is related to *A. acuminata* St. Hil., of South America, which has coriaceous leaves with very different venation.

Annona hayesii Safford, sp. nov.

Large shrub or small tree, the young branchlets ferruginous-tomentose at first but soon glabrate; petioles 3–7 mm. long; leaf blades elliptic-obovate or oblong-obovate, 12–25 cm. long, 5–9 cm. wide, abruptly acuminate, obtuse or rounded at base, thin, deep green above, paler beneath, when young sparsely and minutely sericeous with brownish hairs but soon glabrate; pedicels 10–15 mm. long, solitary or fasciculate in the leaf axils, brown-tomentose, bearing a small ovate bract below the middle; calyx lobes triangular, acute, 2.5 mm. long, tomentose; outer petals linear, dilated at base, about 3 cm. long, obtuse, densely brown-tomentose, the inner petals minute; fruit subglobose, 5 cm. long or more, smooth, with scant pulp and thin skin; seeds smooth, brown, lustrous, compressed, 1 cm. long.

Type in the U. S. National Herbarium, no. 717078, collected near Yaviza, southern Darién, Panama, April, 1914, by H. Pittier (no. 6592). The following additional collections are referred here:

PANAMA: La Palma, southern Darién, *Pittier* 6598. Matías Hernández, Province of Panama, *Pittier* 6749. Corozal Farm, Canal Zone. *Pittier* 6684. Road to Corozal, *Bro. Gervais* 141. Old Las Cruces Trail, between Fort Clayton and Corozal, *Standley* 29179. Tumba Muerto Road, near Panama, *Standley* 29723. Punta Paitilla, Province of Panama, *Standley* 26272. Near Juan Franco Race Track, Province of Panama, *Standley* 27704.

Annona hayesii is related to *A. reticulata*, a species distinguishable at a glance by its uniformly narrow leaves.

Unonopsis pittieri Safford, sp. nov.

Medium-sized tree with pyramidal crown, the branchlets at first minutely sericeous but soon glabrate; petioles 4–6 mm. long; leaf blades oblong-elliptic or elliptic-oblong, 14–32 cm. long, 5.5–8.5 cm. wide, abruptly acuminate, obtuse and slightly unequal at base, thin, concolorous or nearly so, minutely sericeous beneath along the costa, elsewhere glabrous; flowers greenish, borne in few-flowered racemes on old wood, the pedicels 2 cm. long, minutely sericeous, with a minute bractlet near the middle; calyx shallowly trilobate, minutely sericeous, the lobes obtuse; petals rounded-elliptic, very thick and fleshy, sparsely and minutely sericeous outside, strongly concave, the outer ones 8 mm. long, the inner slightly shorter.

Type in the U. S. National Herbarium, no. 716051, collected along the Río Fató, Province of Colón, Panama, altitude 100 meters or less, July, 1911, by H. Pittier (no. 3871).

Here probably belongs a fruiting specimen, *Maxon* 6890, from the Río

Chinilla, Canal Zone. The berries are globose, 1.5 cm. in diameter, glabrous, red at maturity, and long-stipitate. The single globose seed is deeply pitted.

Pittier states that the vernacular name is "yaya," and that the soft wood is used for building purposes. The genus is a South American one, and no species has been known previously from North America. Species from Central America formerly placed in *Unonopsis* are now referred to *Desmopsis*.

Trichilia unifoliola Blake & Standl., sp. nov.

Shrub or small tree 3–6 m. high; branchlets nearly or quite glabrous; leaves alternate, 1-foliolate, very rarely 3-foliolate; petioles flattened and hispidulous above, 1–3.3 cm. long; leaflet sessile or obscurely petiolulate, oval or oblong-oval, sometimes slightly obovate-oblong, 4–12 cm. long, 2.2–5.5 cm. wide, obtuse or retuse, often with short blunt apiculation (2.5 mm. long or less), cuneate to rounded and usually unequal at base, usually firm, deep green and somewhat shining above, glabrous on both sides except for the often barbatulate cups in the axils of the veins beneath, prominulous-reticulate on both sides, the principal veins 6–8 pairs, whitish and prominent beneath; panicles axillary and terminating the branchlets, subsessile, about 1 cm. long and thick, 3-fid, densely flowered; flowers sessile; calyx 2 mm. long, glabrous, the teeth 5, very short, obtuse, obscurely ciliolate; petals 5, free, oblong, 3.8 mm. long, obtuse, glabrous; stamens 10, 3.8 mm. long, the filaments alternately unequal, connate for nearly half their length into a glabrous tube, the free portions hirsute on margin and inside, cuspidate-bifid at apex, the anthers glabrous; ovary densely strigose, inserted in a fleshy, crenately 10-lobed disk about half its length, 3-celled; style glabrous, thick, about equaling ovary, the stigma small; capsule subglobose, warty, short-pilose, 7 mm. thick, brownish, 3-seeded.

PANAMA: Sabana de Juan Corso, near Chepo, Oct. 1911, *H. Pittier* 4755 (type no. 679918, U. S. Nat. Herb.). Near Punta Paitilla, *Piper* 5426; *Standley* 26314, 30810. Bella Vista, *Standley* 25333. Near Matías Hernández, *Standley* 28881. Between Matías Hernandez and Juan Díaz, *Standley* 31989. Near big swamp east of Río Tecumen, *Standley* 26685.

All the specimens cited are from the Province of Panama, where the plant is common in thickets. The species seems clearly to be a derivative of *Trichilia trifolia* L., agreeing with it in flowering and fruiting characters, but differing in its almost always solitary leaflet, much larger than those of *T. trifolia* and of different outline. Two of the specimens examined show on the flowering branchlets one or two small leaves that bear a single lobe on one side at the base of the leaflet, or occasionally a single small lateral leaflet, rarely a third abortive one. *Trichilia trifolia* has a rather wide range in America, from Mexico to Venezuela and the islands off the Venezuelan coast, but it is not known in Panama, where it appears to be entirely replaced by *T. unifoliola*.

Bernardia macrophylla Standl., sp. nov.

Erect shrub 1.5–2.5 meters high; branchlets densely covered with very short ascending hairs; petioles 3–10 mm. long; leaf blades oblanceolate-oblong or oblong-obovate, 11–19 cm. long, 3.5–8.5 cm. wide, acute or acu-

minate, cuneately narrowed to the base, penninerved, crenate-serrate, copiously pilose on both surfaces with short simple hairs, the lateral nerves about 12 on each side; staminate spikes axillary, 3–4 cm. long, much interrupted, the rachis hirtellous with ascending hairs, the bracts broadly ovate, many-flowered; pistillate spikes terminal, many-flowered, about 2.5 cm. long, the flowers sessile; capsule 5 mm. long, covered with minute appressed hairs.

Type in the U. S. National Herbarium, no. 1,218,687, collected in moist thicket near the Río Tecumen, Province of Panama, Panama, near sea level, Jan. 3, 1924, by Paul C. Standley (no. 29389). Nos. 29380 and 29471 from the same locality belong to this species.

The nearest relative of the Panama plant is *B. corensis* (Jacq.) Muell. Arg., in which the leaves are relatively broader, mostly obtuse, coarsely crenate, and with few lateral nerves.

Opuntia salvadorensis Britt. & Rose, sp. nov.

Plant 8–10 cm. high, much branched and spreading; joints flattened, orbicular to short-oblong, 10–15 cm. long, glabrous; areoles rather few, 1.5–3 cm. apart, small, circular, bearing tawny felt; spines usually 1 to 3, very unequal, slender-acicular, the longest ones up to 6 cm. long, white or becoming tawny; flowers yellow; petals about 2 cm. long; ovary about 2.5 cm. long, obovoid, bearing small areoles without spines; fruit not seen.

Type in the U. S. National Herbarium, no. 1,207,015, collected by Dr. Salvador Calerón at the Hacienda La Concordia, Departamento de Usulután, El Salvador, January 19, 1924 (no. 2100).

No species of *Opuntia* has heretofore been reported from El Salvador, although it is quite possible that there may be several native species. We should refer this species to the series *Tunae* as limited in our monograph of the cactaceae. It is probably to be placed nearest *O. triacantha* and *O. antillana*, two West Indian species.

Tontanea glabra (Bartl.) Standl.

Coccocipsilum glabrum DC. Prodr. 4: 397. 1830.

This species, described from Panama from specimens collected presumably by Née over a century ago, has not been found again until recently. It was collected near Fort Lorenzo, Canal Zone, March, 1923, by C. V. Piper (no. 5983).

Evea guapilensis Standl., sp. nov.

Stem suffrutescent, simple, terete, about 25 cm. high, green, glabrous, the internodes 2–5 cm. long, stipules green, persistent, 1 cm. long or more, bilobate, the lobes linear from a narrowly triangular base; petioles slender, 3–4 cm. long; leaf blades elliptic, 14–21 cm. long, 6.5–9.5 cm. wide, abruptly short-acuminate at each end, thin, deep green and glabrous above, paler beneath, sparsely hirtellous along the nerves; flower head terminal, solitary, subsessile, 2 cm. in diameter, the bracts purplish green, rounded and apiculate at apex, densely furnished on both surfaces with soft slender multicellular appressed hairs.

Type in the U. S. National Herbarium, no. 1,153,029, collected in wet forest near Guápiles, Province of Limón, Costa Rica, altitude about 500 meters, March 12–13, 1924, by Paul C. Standley (no. 37025).

Evea nana Standl., sp. nov.

Stems suffrutescent, simple, 15 cm. high, subterete, green, glabrous, the internodes 1–2 cm. long; stipules green, persistent, glabrous, about 6 mm. long, bilobate, the lobes oblong-linear; petioles slender, 3.5 cm. long; leaf blades oblong-elliptic, 15–16 cm. long, 6 cm. wide, acuminate at each end, thin, glabrous, deep green above, paler beneath; flower head terminal, solitary, on a stout peduncle about 2 cm. long, in fruit about 3 cm. in diameter, dense; bracts bright purple, broad, glabrous; nutlets 4 mm. long, grayish, obscurely tricostate dorsally, plane on the inner surface.

Type in the U. S. National Herbarium, no. 1,153,871, collected in open thicket on hills north of Frijoles, Canal Zone, Panama, Dec. 19, 1923, by Paul C. Standley (no. 27550).

Although a single specimen in rather poor condition is at hand, it is evident that the species represented is something quite distinct from anything previously reported from Central America.

Pyschotria chagrensis Standl., sp. nov.

Densely branched shrub 1–2 m. high, the branches slender, terete, glabrous, very leafy; stipules 8–10 mm. long, triangular-ovate, long-cuspidate, thin, brown, caducous; petioles slender, 4–12 mm. long; leaf blades elliptic-obovate, 4–8.5 cm. long, 2–3 cm. wide, usually abrupt-acuminate, with acute tip, at base usually abruptly and cuneately decurrent, thin, glabrous, slightly paler beneath; flowers mostly terminal, in a few-flowered head, surrounded by thin brown glabrous bracts similar to the stipules, the flowers sessile, enclosed in large bractlets; calyx limb brown, the lobes linear; corolla white, glabrous outside, villous in the throat, the tube 4 mm. long, ampliate above, the 5 lobes spreading, less than half as long as the tube; fruit oval, 5 mm. long, multicostate, glabrous.

Type in the U. S. National Herbarium, no. 1,215,962, collected along stream in wet forest, Barro Colorado Island, Canal Zone, Panama, Jan. 17, 1924, by Paul C. Standley (no. 31373). The following specimens also belong here:

PANAMA: Chagres, *Fendler* 110. Porto Bello, *Pittier* 2433. Barro Colorado Island, *Standley* 31370. Fort Sherman, Canal Zone, *Standley* 31109.

NICARAGUA: San Juan del Norte, *Pittier* 9657.

No other American *Psychotria* known to the writer has a similar inflorescence.

Diodia denudata Standl., sp. nov.

Erect perennial herb 30–100 cm. high, branched, the branches stout, quadrangular, glabrous, the angles narrowly winged, the wings green, with smooth margins; stipular sheath puberulent, the margin bearing numerous scabrous-margined bristles 4–9 mm. long; leaves short-petiolate, the blades ovate-elliptic to narrowly elliptic, 3–5 cm. long, 1–2.5 cm. wide acute, abruptly decurrent at base, deep green above, paler beneath, scaberulous on

both surfaces; flowers sessile in dense axillary clusters about 6 mm. in diameter, the subtending leaves much reduced above or obsolete, the upper flower clusters usually about 4 mm. in diameter; calyx lobes 4, triangular, acute, 0.5 mm. long, green, scaberulous-ciliolate; corolla white, exceeding the calyx lobes; fruit subglobose, bisulcate, 1 mm. long, scaberulous, separating into 2 indehiscent cocci.

Type in the U. S. National Herbarium, no. 1,154,022, collected on wet stream bank along the Río Tapia, Province of Panama, Panama, near sea level, Dec. 24, 1923, by Paul C. Standley (no. 28123). The following specimens also belong here:

PANAMA: Río Tecumen, Province of Panama, in moist forest, *Standley* 29364. Fort Lorenzo, *Piper* 5895.

This plant is very unlike any other species known from North America, but it is related to *D. alata* Nees & Mart. of Brazil. In that the wings of the stem are wider and retrorse-aculeolate, and the calyx is 2-lobed.

Vernonia lankesteri Blake, sp. nov.

Shrubby, 2–3.3 m. high; branches stout, herbaceous, pithy, densely griseous-lanate-tomentose, glabrescent; leaves alternate; petioles slender, pubescent like the branches, 1.5–3.5 cm. long; blades obovate, 12.5–21.5 cm. long (including the decurrent base), 5–7.5 cm. wide, acuminate, at base long-acuminate and narrowly decurrent on the petiole, serrate or serrulate except toward base and apex (teeth about 1 mm. high, acutely callous-tipped, 3–8 mm. apart), papery, above deep dull green, densely and sordidly pubescent on costa and veins with short several-celled subglandular hairs, sparsely and finely so on surface, beneath paler green, griseous-subtomentose when young, glabrescent except along the veins and veinlets, on surface densely dotted with small, mostly yellow glands, penninerved, the chief lateral veins 10–15 pairs, prominulous beneath, curved-anastomosing toward margin; heads in terminal or subterminal corymbiform panicles of 4–8, very many-flowered; pedicels pubescent like the stem, 3–8.5 cm. long, thickened below the heads; disk 2 cm. high, about 2.5 cm. thick; involucre about 7-seriate, strongly graduate, 1.5–1.7 cm. high, the 5 outer series of phyllaries triangular (outermost) to oblong-oval or oblong-obovate, with indurate greenish-white bases and shorter, usually broader, spreading or loose, somewhat nervose, herbaceous tips (those of the outermost phyllaries linear or lanceolate, acutish, of the others deltoid, obtuse or rounded), scantily appressed-tomentose, the middle ones 3–5 mm. wide, the 2 inner series erect, oblong, essentially glabrous, with brownish, subscarious, obtuse to acuminate tips; corollas "Amparo purple (Ridgway)," 19 mm. long (tube 5 mm., throat cylindric, 8 mm., teeth 6 mm.), sparsely glandular; achenes (submature), blackish brown, glabrous, 5-angled, 2 mm. long; pappus yellowish white, the outer setae similar to inner but shorter, 1–2.5 mm. long, the inner about 4.2 mm. long.

COSTA RICA: La Palma, altitude 1500 meters, Nov., 1897, *C. Wercklé* 11604. In roadside undergrowth, Santa Clara de Cartago, 23 Feb., 1924, *C. H. Lankester* 712 (type no. 1,207,014, U. S. Nat. Herb.). La Hondura, Province of San José, March, 1924, *Standley* 36602.

The specimen collected by Wercklé has been identified by Dr. H. A. Gleason as *Vernonia salvinae* Hemsl., and the Costa Rican portion of the range given in the North American Flora[2] for that species is doubtless de-

[2] **33**: 81. 1922.

rived from this specimen. In *V. salvinae*, as described by Hemsley and exemplified by two specimens from Chiapas now before me, the heads are only 1 to 3; the leaves are evenly strigose-pilose over the whole surface beneath; and the considerably broader phyllaries have shining, glabrous, more or less purplish brown, indurated bases, and their tips are acuminate or apiculate and (except in the innermost) short-strigose and more or less glandular.

ENTOMOLOGY.—*The wasp* Hoplisus costalis, *a hunter of tree-hoppers.* EDWARD G. REINHARD, Canisius College (Communicated by S. A. ROHWER).

About twenty nests of the solitary wasp *Hoplisus costalis* (Cress.) were found scattered among the burrows of a large colony of bee-hunting wasps, *Philanthus gibbosus*, at Woodstock, Maryland, during the summers of 1922 and 1923. The site of this community was a sandy path, loosely paved with bricks and sheltered by a long balcony.

Exteriorly, the burrow of Hoplisus is indicated by a small mound of sand, in expanse no larger than the area which could be covered by the palm of one's hand. The nest entrance is always concealed under a covering of sand. A straw probe quickly finds the hidden doorway. From thence a slanting shaft penetrates the earth for five or six inches, making a moderate dip of about 30 degrees with the horizontal surface. At a depth of two inches the gallery is terminated by a scattered group of cells, each of which is stored with sufficient food to nourish a single Hoplisus during its larval growth. Every nursling receives for its nutriment a common diet of tree-hoppers, but the communistic system does not distribute an equal share to all. Of the 34 larvae whose provisions were listed, seven enjoyed six pieces of game, nine had five, seventeen had four, and one had only three articles to satisfy its appetite.

The victims that are selected by Hoplisus for the nourishment of her grubs are all tree-hoppers, all members of the great Homopterous family Membracidae.[1] In hunting these Membracids the wasp shows no exclusive preference for any particular species, but she does seem to restrict her choice to the mature adults, as if deeming the mere undeveloped nymphs undesirable game. I have taken more than a dozen different species of tree-hoppers from the nests which Hop-

[1] G. P. Barth states of *Gorytes canaliculatus:* "The prey of the wasp seems to be exclusively leaf-hoppers of the species *Cyrtolobus fenestratus* Fitch and *Atymna inornata* Say." Cyrtolobus and Atymna however are *Membracidae*, "tree-hoppers" therefore, though the writer calls them "leaf-hoppers" throughout his account, a term which common usage has restricted to the *Jassidae*.