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I. CONTRIBUTIONS TO NORTH AMERICAN EUPHORBIACEAE—VI

II. VEGETATION OF ALACRAN REEF

BY

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Curator Department of Botany.



CHICAGO, U. S. A.

April, 1916.

CONTRIBUTIONS TO NORTH AMERICAN EUPHORBIACEÆ—VI

CHARLES F. MILLSPAUGH, M. D.

CHAMAESYCE S. F. Gray, Nat. Arr. Brit. Pl. 2:260. 1821.

Leaves opposite, inaequilateral; inflorescence solitary or capitulate, axillary and terminal; bracteoles plumose or ciliate; seeds minute, ovoid or elongate-ovoid, more or less quadrangular the facets smooth or transverse-rugulose.

Type species: Euphorbia peplis Linn. Sp. Pl. 652. 1753.

Chamaesyce barbicarina sp. nov.

Plants semi-erect, about 2dm. high, annual. Stems many, from a but slightly raised rootstalk; branches many, virgate, terete, long-pilose especially upon the upper surface. Inflorescence solitary in the axils of the terminal branchlet leaves. Leaves opposite, 5–8 x 2–4mm., ovate, obtuse, broadest at the rounded apex, base strongly auriculo-oblique, glabrous the thickened margin crenate-dentate; petioles about 1mm., hairy; stipules broadly triangular-lanceolate, lacerate. Involucres turbinate, glabrous without and within; peduncle about the length of the involucre (in fruit twice the length); involucral lobes triangular, ciliate; sulcus shallow; glands scutelliform; appendages white, irregular-ovate, margin crenate or 2-3-crenate-dentate; bracteoles none; male pedicels few, short; female pedicel ciliate-hairy; styles short, bilobed at the apex. Capsule obpyriform, glabrous except on the blunt keels of the otherwise smooth carpels which are long-ciliate fringed; seeds red, ovoid, acute, .9 x .6mm., angles sharp, facets marked by a few very slightly raised irregular and broken transverse ridges.

Between Ch. dioica and Ch. yucatanensis but readily distinguished from both by the peculiar ciliate-fringed keels of the carpels.

Sitilpech Road, November, 1895, *Gaumer 939a* (Type sheet, Field Mus. cat. no. 196,352.) It was gathered as a part of a mass of Ch. rutilis by the collector. Also collected at Chichankanab, *Gaumer 1452, 2074;* and at Pocoboch *2405.*

Chamaesyce cozumelensis comb. nov.

Euphorbia cozumelensis Millsp. Field. Mus. Bot. 2:261. 1900.

A large number of sheets of this species show an intergradation from the absolutely glabrous and glaucous original collection, on Cozumel Island, through a form with a few long, scattered hairs in the capsular sulci (*E. cozumelensis pilosulca* Millsp. ibid. 262); a form with a few long hairs on the nodes, petioles and leaves; to plants densely long-pilose throughout. The extremes of these plants appear like widely different species but the characters do not warrant the application of even varietal names.

The distribution of the forms is as follows: The glaucous form — Cozumel Island, *Millspaugh 1604, 1606, 1608, 1609, 1611;* the form with the capsular sulci hairy — Cozumel Island, *Millspaugh 1501, 1502;* the form with the nodes, petioles and leaves long-pilose — Cozumel Island, *Millspaugh 49, 53,* Chichankanab, *Gaumer 1456;* whole plant densely long-pilose — Mugeres Island, *Millspaugh 24,* Izamal, Silam and Progreso, *Gaumer 314, 629, 1887, 2407.*

CHAMAESYCE HIRTA (L.) Millsp. Field Mus. Bot. 2:303.

I have gathered a large number of forms of this species from many localities in Hawaii, south China, Straits Settlements, Java, the Philippines, Burma, India, and from Bermuda, Florida and the Bahamas through the West Indian islands, Mexico and South America to Pernambuco, Brazil. With all this material and a large number of sheets from other collectors I can not satisfy myself that there is any specific differentiation between E. hirta and *E. pilulifera* L., *capitata* Lam., *globulifera* Kth., *verticillata* Vell., *nodiflora* Steud., *procumbens* DC., *obliterata* Jacq., *ophthalmica* Pers., *discolor* Engelm., *gemella* Lag., and *Karwinskyi* Boiss. the type material of all of which I have examined. These are only intergradient forms and there are a multitude of others that have luckily escaped specific nomination.

Chamaesyce Rosei sp. nov.

Annual, short-crispid-multicellular hairy. Root straight and deep; stems many, terete, wiry; internodes long; branches profuse, ascending. Inflorescence in terminal, globose heads. Leaves inaequilateral, narrowly lanceolate, 13–25 x 3–6mm., crisp-hairy on both surfaces and with a broad, deep-red, central line of maculation; apex acute; base narrowing to the petiole; margin shallow-toothed toward the apex; petioles short (about 2mm.); stipules mere aristate teeth about .8mm. long. Involucres turbinate, roseate, sessile or nearly so, thin walled, the outer surface pubescent the inner densely bearded; lobes deltoid,

aristate; sulcus V-shaped, the fundus occupied by 2-3-aristate lobes; glands minute, stipitate, cupulate; appendages roseate, distant from the glands and but little larger, inserted about half way down the stipe; male flowers about 6, short, absent in many involucres of each cluster; filaments glabrous; female flower short pedicelled; ovary densely pubescent; styles roseate, bifurcate two-thirds their length, the branches divaricate and somewhat capitulate at the stigmatic tips. Capsule strongly tricoccous, bearing very short, thick, crispid, golden, multicellular hairs; seeds pink-ashen, ovate-quandrangular, acute, .8 x .5mm., angles sharp, facets marked by irregular, complete and incomplete transverse ridges.

Near Ch. hirta (L.) Millsp.

Mexico, along an arroyo in the vicinity of Alamos, State of Sonora, *Rose, Standley & Russell*, March 13, 1910, *12728* (Type in herb. New York Botanical Garden).

Chamaesyce vallis-mortae sp. nov.

Perennial from a long, cylindrical root; densely woolly-pubescent above. Stems many, wiry, divergently branching toward the tips. Inflorescence solitary in the leaf axils of the branchlets. Leaves thick, ovate, cordate, rounded at the apex, entire, 5 x 4 – 6 x 5mm., densely woolly on both surfaces; petioles about 1mm. long; stipules short, triangular, ciliate. Involucres campanulate; peduncle about one-third the length of the tube; outer surface woolly, inner surface fasciculate-hairy; lobes triangular; sulcus deeply V-shaped, the fundus unoccupied; glands green, longitudinal, scutelliform; appendages large, white, flabelliform, the outer margin papulo-ciliate and often slighty 3-crenate; male flowers about 6, glabrous; female flower pedicellate; ovary woolly-pubescent; styles bifid two-thirds their length, the branches divergent not swollen at the stigmatic tips. Capsule obpyriform, hairy; seeds salmon-color, quadrangular-ovate, pointed, the angles rounded, facets smooth or nearly so.

Near Ch. tonsita Millsp.

California, Death Valley between Mohave and Keeler, alt. 750 meters, June 21, 1891, *Coville & Funston 1008* (Type in U. S. National Herbarium cat. no. 16203).

Chamaesyce tamaulipasana sp. nov.

Annual, prostrate, pilose. Stems many from the thickened rootstalk; branches unilateral on the stems, densely foliate; branchlets very short. Inflorescence solitary in the axils of the branchlet leaves. Leaves appressed, inaequilateral, ovate, acute, cordate, entire, 3.5 x 2 – 5 x 3

mm., long-crisp-hairy on both surfaces; petioles short, thick; stipules elongate-linear, hairy. Involucres elongate-turbinate narrowing to the peduncle which is about the length of the tube; both surfaces pilose; sulcus U-shaped with a short, linear lobe in the fundus; glands transverse, ovoid, short stipitate, scutelliform; appendages flabelliform, twice the width of the glands, entire, the margin papilliform-ciliate; male flowers few; pedicels glabrous; filaments very short; female flower pedicellate; ovary densely pilose; styles bifurcate to the middle, the stigmatic lobes divergent. Capsule obpyriform, pilose, strongly tricoccous; seeds red-ashen, elongated ovoid-quadrangular, pointed, 1.2 x .5mm., angles sharp; facets nearly smooth, indistinctly marked by a median longitudinal line approached on both sides by numerous, irregular, faint, transverse ridges.

Near Ch. velleriflora (Boiss).

Known only from the vicinity of Victoria, Tamaulipas, Mexico, where it was collected by *Dr. Edward Palmer*, Feb. 1–Apr. 9, 1907 as his no. *98* (Type in herb. Field Museum cat. no. 217,435).

Chamaesyce Standleyi sp. nov.

Annual, prostrate, finely pilose. Stems many, from a thickened rootstalk; branches densely pilose, short, each subtended by a pair of large leaves; branchlets very short. Inflorescence solitary in the axils of the branchlet leaves. Leaves strongly inaequilateral, ovate, 3 x 4–5 x 10 mm., nearly glabrous, cordate, blunt, lightly crenate-dentate more pronounced at the rounded apex; petioles short (.8mm.); stipules linear entire. Involucres cylindro-turbinate on a very short peduncle with bract-like leaflets at the base, densely pilose without and within; lobes triangular, long-ciliate; sulcus narrow, about half the depth of the involucral tube, fundus unoccupied; glands transverse, narrowly scutelliform and somewhat plicate; appendages white, rounded, entire, very narrow on the lower and somewhat broader on the upper pair of glands; male flowers few, very short pedicelled and inserted in a ring at the base of the tube, not as long as the pedicel of the female flower; glabrous; female flower short pedicelled; ovary obpyriform, pilose; styles long, bifurcate at the apex. Capsule pilose, deeply tricoccous; seeds ashen, ovoid-quadrangular, blunt, .9 x. 4mm., the angles sharp and somewhat included by the ridges; facets marked by 3–4 often incomplete transverse ridges.

Near Ch. thymifolia (Burm.).

Only known from the vicinity of Acaponeta, Tepic, Mexico, where it was collected by *Rose, Standley & Rose*, Apr. 10, 1910, no. *14342* (Type in U. S. National Herbarium cat. no. 637,211).

Chamaesyce sulfurea sp. nov.

Annual, prostrate-rosulate, sulphur color when dried, glabrous. Root short; stems many, radiating from the rootstalk, thick, terete; branches and branchlets many, dichotomous. Inflorescence solitary in the leaf axils throughout the plant. Leaves ovate-lanceolate, inaequilateral, somewhat falcate, 5 x 3–11 x 7 mm., the midrib prominent beneath, base unequally-cordate, apex acute, margin entire, somewhat thickened and revolute; petioles about one-quarter the length of the blade; stipules lacerate-fimbriate. Involucres globular, 5-columnar, glabrous; peduncle two-thirds the length of the tube; involucral lobes deltoid, truncate, 3-toothed at the apex; sulcus shallow, rounded, unoccupied; glands large, stipitate, scutelliform; appendages none; bracteoles numerous, ligulate, interspersed with 5, thin, lanceolate, fimbriate, ciliate petaloid rudiments; stamens few, filaments short, glabrous; female flower long-columnar-pedicellate, glabrous; ovary smooth, styles clustered in an erect close mass nearly as large as the ovary itself, styles thick, clavellate, approximate, bifurcate to the middle. Capsule strongly tricoccous, the carpels smooth, line of dehiscence strongly marked; seeds white, 1.5 x 1 mm., dorsal angle prominent, the whole surface beautifully sculptured into short, rounded, high, broken transverse ridges appearing like a miniature white cluster of earthworm casts.

Near Ch. ocellata from which the seeds readily differentiate it.

Type station Butte Co., California, on hills east of Chico, near Big Chico Creek, September 16, 1913, *A. A. Heller 11140* (Type in herb. Field Museum cat. no. 411,411). Also collected at or near the type station by *H. M. Hall*, July, 1914, *9759*.

Chamaesyce Gooddingii sp. nov.

Glabrous, prostrate, annual, reddish-green in general color, with a mass of wiry stems and branches from the somewhat thickened rootstalk. Inflorescence solitary in the terminal axils. Leaves ovate, obtuse, 4 x 2–7 x 5 mm. palmately 3-nerved, the midvein prominent beneath, unequally cordate, margin entire; petioles about one-quarter the length of the blade; stipules: the lower filiform, entire, the upper ligulate and often few-lacerate at the apex. Involucres turbinate, glabrous, peduncles about one-half the length of the tube; lobes triangular, apiculate, the margins blunt-ciliate; sulcus shallow, its fundus occupied by a narrow, lanceolate fifth lobe; glands stipitate, transversely narrow-scutelliform, the outer edge crenate-dentate to the appearance of an appendage; bracteoles none; petaloid rudiments flabelliform, many-fimbriate; stamens few, filaments long, glabrous; female flowers long-pedicelled, glabrous, styles divergent, bilobate at the apex. Capsule

glabrous, strongly tricoccous, the carpels rounded-keeled and minutely white-punctate; seeds white, .9 x .5 mm., elongated ovoid-quandrangular, angles rounded, the dorsal prominent; facets marked medially with two longitudinal lines of short, rounded, inconspicuous, irregular, transverse rugae.

Near Ch. sulfurea from which its seed readily differentiate it.

Type locality Lee Canyon, Charleston Mountains, in limestone at 8000 ft. alt., Clark Co., Nevada, *A. A. Heller 11058* (Type in herb. Field Museum cat. no. 411,087); previously gathered by *Leslie N. Goodding*, in sandy washes at Las Vegas, Nevada, in 1907, No. *2282*.

Chamaesyce aureola sp. nov.

An erect, or prostrate, pilose annual (?) with a ligneous root from which spreads a dense mass of terete, divaricate branches and branchlets. Inflorescence solitary, terminal and upperaxillary. Leaves thick. strongly inaequilateral, ovate, obtuse, 2–4 x 1.5–2 mm., densely pilose, cordate, entire; petioles less than one-half the length of the blade; stipules: the lower deltoid, the upper filiform, those of the upper surface with a flat, purplish gland at the base. Involucres turbinate, the throat densely pilose; peduncle about one-half the length of the tube; tube densely pilose without and within; lobes deltoid, pilose; sulcus V-shaped; glands transverse, oblong, reddish-brown, flat and but little cupped; appendages large, white or creamy, ovate, nearly entire; bracteoles many, ligulate, glabrous; stamens few, filaments glabrous, the joint close to the anther base; female pedicel thick, pilose; ovary pilose; styles 3, bifurcate to the middle, the branches divaricate and not sensibly enlarged at their stigmatic apices. Capsule strongly tricoccous, densely pilose; seeds smooth, white, creamy-white or sage-color, elongate-ovate, 1.2 x .6 mm., the dorsal angle prominent, 4-angled at the base, pointed at the apex, the facets smooth and showing but a few slight indications of scattered pits.

Near Ch. polycarpa and Ch. vestita from each of which the characters readily distinguish it.

So far seen only in a series of specimens collected at Azusa, Los Angeles Co., California, at an elevation of 800 ft. *Huron H. Smith 4933* (Type in herb. Field Museum cat. no. 389,282).

Chamaesyce prostrata (Ait.) Small Fl. SE. U. S. 713, 1333. 1903.

A species of wide distribution misinterpreted in previous Yucatan publications of species as *E. rhytisperma* and *serpyllifolia* on account of variation from the type form.

The species is represented in the Yucatan Flora by *Schott 967a* from Merida where it was gathered in a mass of Ch. hirta; *Millspaugh 27*

(1887), also from Merida; *Gaumer 254* from cultivated ground at Izamal, *460* from stone walls at the same place, and on waste ground at Tekax, *1123*.

Chamaesyce rutilis Millsp. Field Mus. Bot. 2:385. 1914.

This species of Guatemala and Honduras has turned up in the Yucatan region. The type is *Chas. C. Deam, 6189*, Field Mus. cat. no. 285,111 from Fiscal, Guatemala, alt. 3700 ft.

The Yucatan localities are: Chaltumha Road, Sitilpech Road, *Gaumer 938, 939*.

Chamaesyce villifera (Scheele) Small Fl. SE. U. S. 712, 1333. 1903.

The previously known range of this striking species, Texas to Orizaba, Mexico, is extended farther south by a number of specimens collected by *Dr. Gaumer* at Buena Vista Xbac and Chichankanab, Yucatan, *1103, 1186, 2229*.

Chamaesyce yucatanensis sp. nov.

Rosulate-prostrate from a slender annual root; stem and branches filiform, pilose. Inflorescence solitary in the axils of the upper leaves. Leaves inaequilateral, 5–7 x 2–4 mm., oblong-lanceolate, strongly oblique at the base, acute, the margin distantly serrate; petioles about 1mm. long; stipules represented below by a somewhat denser mass of the stem hairs, above by a scale-like, waxy gland at the base of the petiole. Involucres tubular-campanulate, sessile or apparently so, pilose without glabrous within; lobes represented by clusters of hairs except where flanking the deep, round-based sulcus where they are triangular, acute; glands bright-green, scutelliform, appendages white, unequal, about twice the size of the glands, ovate, unequally crenate-margined; bracteoles none; male pedicels 3–5; female pedicel about the length of the ovary; styles 3, bifurcate at the upper third; ovary pilose. Capsule pilose, ovoid, deeply sulcate; seed pinkish-ashen, .8 x .5 mm., sharply angled, the facets marked by irregular and broken transverse ridges.

Near Ch. cozumelensis.

Progreso, Yucatan, on the rocky plain south of the lagoon, *Millspaugh 1696*, March 5, 1899. Type in herb Field Mus. cat. no. 61,696. Erroneously referred to **Ch. Karwinskyi** (Boiss.) (*E. Karwinskyi* Boiss.) in Field Mus. Bot. 2:65.

The other North American species of this genus not previously transferred to it are:

Chamaesyce acuta (Engelm)

Euphorbia acuta Engelm. Mex. Bound. 189.

Chamaesyce albescens (Urban)
Euphorbia portoricensis albescens Urban Symb. Antill. 1:339.

Chamaesyce ammatotricha (Boiss.)
Euphorbia ammatotricha Boiss. Cent. Euph. 10.

Chamaesyce Andromedae (Millsp.)
Euphorbia Andromedae Millsp. Field Mus. Bot. 2:63.

Chamaesyce anychioides (Boiss.)
Euphorbia anychioides Boiss. Cent. Euph. 12.

Chamaesyce arenicola (Parish)
Euphorbia arenicola Parish Erythea 7:93.
Euphorbia cuspidata Engelm. in herb. non Bertol.

Chamaesyce astyla (Engelm.)
Euphorbia astyla Engelm. Boiss. DC. Prodr. 15:40.

Chamaesyce Balbisii (Boiss.)
Euphorbia Balbisii Boiss. Cent. Euph. 11.

Chamaesyce bartolomaei (Greene)
Euphorbia bartolomaei Greene Pittonia 1:290.

Chamaesyce Brandegeei (Millsp.)
Euphorbia Brandegeei Millsp. Proc. Calif. Acad. ser. 2, 2:226.

Chamaesyce bryophylla (Donn-Sm.)
Euphorbia bryophylla Donnell-Smith Bot. Gaz. 56:62.

Chamaesyce capitellata (Engelm.)
Euphorbia capitellata Engelm. Mex. Bound. 2:188.

Chamaesyce carmenensis (Rose)
Euphorbia carmenensis Rose Contr. U. S. Nat. Herb. 1:133.

Chamaesyce centunculoides (Kth.)
Euphorbia centunculoides HBK. Nov. Gen. 2:41.

Chamaesyce chalicophila (Wetherb.)
Euphorbia chalicophila Wetherb. Proc. Am. Acad. 45:426.

Chamaesyce chamaecaula (Wetherb.)
Euphorbia chamaecaula Wetherb. idem.

Chamaesyce conjuncta (Millsp.)
Euphorbia conjuncta Millsp. Proc. Calif. Acad. ser. 2, 2:227.

Chamaesyce consanguinea (Engelm.)
Euphorbia consanguinea Engelm. Mex. Bound. 187.

Chamaesyce crassinodis (Urban)
Euphorbia crassinodis Urban Symb. Antill. 1:340.

Chamaesyce cumbrae (Boiss.)
Euphorbia cumbrae Boiss. Cent. Euph. 161.

Chamaesyce Deppeana (Boiss.)
Euphorbia Deppeana Boiss. Cent. Euph. 6.
Euphorbia Anthonyi Brandegee Erythea 7:7.
Euphorbia clarionensis Brandegee idem.

Although Deppe remarks "in California" he must have collected the plant on some one of the out islands near the California coast. The species has not been found on the mainland.

Chamaesyce dorsiventralis (Urban)
Euphorbia dorsiventralis Urban Symb. Antill. 5:391.

Chamaesyce floribunda (Engelm.)
Euphorbia floribunda Engelm. Boiss. DC. Prodr. 15:39.

Chamaesyce florida (Engelm.)
Euphorbia florida Engelm. Mex. Bound. 189.

Chamaesyce fruticosa (Engelm.)
Euphorbia fruticosa Engelm. Boiss. DC. Prodr. 15:38.

Chamaesyce Garkeana (Boiss.)
Euphorbia Garkeana Boiss. DC. Prodr. 15:38.

Chamaesyce glyptosperma (Engelm.) Small Fl. SE. U. S. 712; 1333.
Euphorbia Greenei Millsp. Pittonia 2:88.
Chamaesyce aequata Lun. Am. Midl. Nat. 1:204.
Chamaesyce aequata claudicans Lun. ibid 205.
Chamaesyce glyptosperma integrata Lun. ibid 3:142.

Chamaesyce gracillima (Wats.)
Euphorbia gracillima Wats. Proc. Am. Acad. 21:438.

Chamaesyce grisea (Engelm.)
Euphorbia grisea Engelm. Boiss. DC. Prodr. 15:41.

Chamaesyce gymnadenia (Urban)
Euphorbia gymnadenia Urban Symb. Antill. 5:390.

Chamaesyce Heraldiana nom. nov.
Euphorbia glaberrima Klotz. Seem. Bot. Herald. 276, non Koch.

Chamaesyce hirtula (Engelm.)
Euphorbia hirtula Engelm. Wats. Bot. Calif. 2:74.

Chamaesyce incerta (Brandegee)
Euphorbia incerta Brandeg. Proc. Calif. Acad. ser. 2, 3:171.

Chamaesyce interaxillaris (Fern.)
Euphorbia interaxillaris Fernald Proc. Am. Acad. 36:495.

Chamaesyce intermixta (Wats.)
Euphorbia intermixta Watson Proc. Am. Acad. 24:74.

Chamaesyce involuta (Millsp.)
Euphorbia involuta Millsp. Proc. Calif. Acad. ser. 2, 2:227 et 3:170.

Chamaesyce Jonesii (Millsp.)
Euphorbia Jonesii Millsp. Pittonia 2:89.

Chamaesyce leucantha (Kl. & Gke.)
Anisophyllum leucanthum Kl. & Gke. Tricocc. 27.

Chamaesyce leucophylla (Bth.)
Euphorbia leucophylla Bentham Bot. Sulph. 50.
Euphorbia velutina Greene Bull. Calif. Acad. ser. 2, 5:57.

Chamaesyce liliputiana (Wright)
Euphorbia liliputiana Wright Urban Symb. Antill. 5:390.
Euphorbia minutula Boiss. DC. Prodr. 15:1263.

Chamaesyce linearis (Retz.)
Euphorbia linearis Retz. Obs. 3:32.
Euphorbia articulata Aubl. Pl. Gui. 1:480.

Chamaesyce lineata (Wats.)
Euphorbia lineata Wats. Proc. Am. Acad. 21:454.

Chamaesyce longeramosa (Wats.)
Euphorbia longeramosa Watson Proc. Am. Acad. 25:161.

Chamaesyce luisensis nom. nov.
Euphorbia tomentella Engelm. Boiss. DC. Prodr. 15:32,
non Zipp. ex Span. in Linnaea 15:350.

Chamaesyce magdalenae (Benth.)
Euphorbia magdalenae Bentham Bot. Sulph. 50.

Chamaesyce melanadenia (Torrey)
Euphorbia melanadenia Torr. Pacif. R. R. Exped. 4:135.
Euphorbia polycarpa vestita Wats. Bot. Calif. 2:73.

Chamaesyce Mendezii (Boiss.)
Euphorbia Mendezii Boiss. Cent. Euph. 15.

Chamaesyce multinodis (Urban)
Euphorbia multinodis Urban Symb. Antill. 1:341.

Chamaesyce myrtillifolia (L.)
Euphorbia myrtillifolia Linn. Syst. ed. X:1048.

Chamaesyce occidentalis (Drew)
Euphorbia occidentalis Drew Bull. Torr. Club 16:152.

Chamaesyce ocellata (Dur. & Hilg.)
Euphorbia ocellata Dur. & Hilg. Pacif. R. R. Rep. V:5:15.

Chamaesyce paucipila (Urban)
Euphorbia paucipila Urban Symb. Antill. 5:389.

Chamaesyce petrina (Wats.)
Euphorbia petrina Watson Proc. Am. Acad. 24:75.

Chamaesyce picachensis (Brandeg.)
Euphorbia picachensis Brandegee Univ. Calif. Bot. 6:185.

Chamaesyce pileoides (Millsp.)
Euphorbia pileoides Millsp. Field Mus. Bot. 2:62.

Chamaesyce podadenia (Boiss.)
Euphorbia podadenia Boiss. DC. Prodr. 15:40.

Chamaesyce polycarpa (Benth.)
Euphrobia polycarpa Bentham Bot. Sulph. 50.

Chamaesyce Pondii (Millsp.)
Euphorbia Pondii Millsp. Contrib. U. S. Natl. Herb. 1:12.

Chamaesyce portulana (Wats.)
Euphorbia portulana Watson Proc. Am. Acad. 24:75.

Chamaesyce pseudoserpyllifolia (Millsp.)
Euphorbia pseudoserpyllifolia Millsp. Pittonia 2:87.

Chamaesyce puberula (Fern.)
Euphorbia puberula Fernald Proc. Am. Acad. ser. 2, 36:494.

Chamaesyce purissimana (Millsp.)
Euphorbia purissimana Millsp. Proc. Calif. Acad. ser. 2, 2:225.

Chamaesyce pycnanthema (Engelm.)
Euphorbia pycnanthema Engelm. Mex. Bound. 2:188.

Chamaesyce radicans (Moric.)
Euphorbia radicans Moric. in Berland. Pl. Exsic.
Euphorbia serpens radicans Engelm. Boiss. DC. Prodr. 15:30.

Chamaesyce radioloides (Boiss.)
Euphorbia radioloides Boiss. DC. Prodr. 15:45.

Chamaesyce ramosa (Seaton)
Euphorbia ramosa Seaton Proc. Am. Acad. ser. 2, 28:121.

Chamaesyce Rattanii (Wats.)
Euphorbia Rattanii Watson Proc. Am. Acad. 20:272.

Chamaesyce rubrosperma (Lotsy)
Euphorbia rubrosperma Lotsy Bot. Gaz. 20:349.

Chamaesyce Rusbyi (Greene)
Euphorbia Rusbyi Greene Bull. Calif. Acad. 57.

Chamaesyce scopulorum (Brandeg.)
Euphorbia scopulorum Brandegee Univ. Calif. Bot. 4:184.

Chamaesyce Seleri (Donn-Sm.)
Euphorbia Seleri Donn-Smith Bot. Gaz. 27:441.

Chamaesyce thymifolia (Linn.)
Euphorbia thymifolia Linn. Sp. Pl. 454.

Chamaesyce tomentulosa (Wats.)
Euphorbia tomentulosa Watson Proc. Am. Acad. 22:476.

Chamaesyce tonsita nom. nov.
Euphorbia polycarpa hirtella Boiss. DC. Prodr. 15:44, non E. hirtella Boiss. Cent. Euph. 7.
Chamaesyce polycarpa hirtella Millsp. Parish Cat. Pl. Salton Sink 6.

Chamaesyce Torralbasii (Urban)
Euphorbia Torralbasii Urban Symb. Antill. 1:340.

Chamaesyce trachysperma (Engelm.)
Euphorbia trachysperma Engelm. Mex. Bound. 2:189.

Chamaesyce Turpini (Boiss.)
Euphorbia Turpini Boiss. Cent. Euph. 12.

Chamaesyce umbellulata (Engelm.)
Euphorbia umbellulata Engelm. Boiss. DC. Prodr. 15:40.

Chamaesyce velleriflora (Kl. & Gke.)
Anisophyllum velleriflorum Kl. & Gke. Tricocc. 28.
Euphorbia velleriflora Boiss. DC. Prodr. 15:40.

Chamaesyce velligera (Schaur.)
Euphorbia velligera Schaur. in Linnea 20:728.

Chamaesyce vestita (Boiss.)
Euphorbia vestita Boiss. Cent. Euph. 7.

Chamaesyce villosior (Greenm.)
Euphorbia villosior Greenman Proc. Am. Acad. ser. 2, 32:297.

Chamaesyce Urbanii nom. nov.
Euphorbia villosula Urban Symb. Antill. 1:340 (1899), non Pax Bot. Yahrb. 19:118 (1894).

Chamaesyce Watsoni (Millsp.)
Euphorbia Watsoni Millsp. Zoe 1:347.

EUMECANTHUS Kl. & Gke. Monat. Akad. Berl. 1859:248.

Leaves aequilateral, usually sparse below, the upper opposite; inflorescence solitary or cymose; bracteoles obsolete; seeds ovoid-globose, deeply and regularly honeycomb-pitted each pit with a secondary pit or papule in its fundus.

Type species: Euphorbia ariensis HBK.

LEPTOPUS Kl. & Gke. ibid 249, non Decne.

ADENOPETALUM Kl. & Gke. ibid 250, non Turcz.

Eumecanthus Armourii.

Euphorbia Armourii Millsp. Field Mus. Bot. 1:28. 1895.

The range of this species is Cozumel Island and the main land of Yucatan from Merida to Izamal, San Anselmo, Chichan Itza and Buena Vista Xbac. *Schott 76; Millspaugh 108, 1569, 1570; Gaumer 975, 1821; Seler 3927, 4012; Goldman 536.*

Eumecanthus astroites (Fisch. & Mey.).

Euphorbia astroites F. & Mey. Anim. Ind. Sem. Petrop. 1845, Ann. Soc. Nat. ser. 3, 5:371.

Euphorbia astroites heterappendiculata Millsp. Field Mus. Bot. 1:28. 1895.

The range of this species is: Mexico at Tampocoala, *Karwinsky;* Izamal, *Millspaugh 64, Gaumer 521;* and Guatemala, *Kellerman 8038.*

Eumecanthus gramineus (Jacq.) comb. nov.

Euphorbia graminea Jacq. Stirp. Amer. 151. 1763.

This species has a broad distribution from Chihuahua, Mexico, southward to U. S. Colombia and Ecuador. In Yucatan it has been returned from Calotmul, Izamal, Tekax, Temax, Yaxcab and Chichankanab.

Eumecanthus xbacensis.

Euphorbia xbacensis Millsp. Field Mus. Bot. 1:374. 1898.

Only known from the type station, Buena Vista Xbac, Yucatan, *Gaumer* 1108, "rare."

The other North American species are:

Eumecanthus ariensis (Kth.) Kl. & Gke. Tricocc. 42. 1859.
Euphorbia ariensis Kunth. HBK. Nov. Gen. 2:46. 1817.
Eumecanthus Benthamianus Kl. & Gke. idem.

Eumecanthus adiantoides (Lam.)
Euphorbia adiantoides Lam. Encyc. 2:422.
Leptopus Hartwegii Kl. & Gke. Tricocc. 46.

Eumecanthus Barnesii
Adenopetalum Barnesii Millsp. Field Mus. Bot. 2:377.

Eumecanthus bifurcatus (Engelm.)
Euphorbia bifurcata Engelm. Mex. Bound. 2:190.

Eumecanthus boerhaavifolius (Boiss.)
Euphorbia boerhaavifolia Boiss. DC. Prodr. 15:54.

Eumecanthus bracteatus (Kl. & Gke.)
Adenopetalum bracteatum Kl. & Gke. Tricocc. 48.
Euphorbia scabrella Boiss. DC. Prodr. 15:55.

Eumecanthus delicatulus (Boiss.)
Euphorbia delicatula Boiss. Cent. Euph. 19.

Eumecanthus dioscoreoides (Boiss.)
Euphorbia dioscoreoides Boiss. Cent. Euph. 22.

Eumecanthus discolor (Boiss.)
Euphorbia discolor Boiss. DC. Prodr. 15:54.

Eumecanthus Francoanus (Boiss.)
Euphorbia Francoana Boiss. Cent. Euph. 22.

Eumecanthus Hoffmanni (Kl. & Gke.)
Adenopetalum Hoffmanni Kl. & Gke. Tricocc. 47.

Eumecanthus digitatus (Wats.)
Euphorbia digitata Watson Proc. Am. Acad. 26:146.

Eumecanthus calcicolus (Fern.)
Euphorbia calcicola Fernald Proc. Am. Acad. ser. 2, 36:496.

Eumecanthus chiapensis (Brandeg.)
Euphorbia chiapensis Brandegee Univ. Calif. Bot. 6:54.
Euphorbia tetradenia Brandegee exsic. distrib.

Eumecanthus cofradianus (Brandeg.)
Euphorbia cofradiana Brandegee Zoe 5:207.

Eumecanthus colimae (Rose)
Euphorbia colimae Rose Contrib. U. S. Natl. Herb. 1:356.

Eumecanthus guadalajaranus (Wats.)
Euphorbia guadalajarana Watson Proc. Am. Acad. 22:449.

Eumecanthus humayensis (Brandeg.)
Euphorbia humayensis Brandegee Zoe 5:208.

Eumecanthus latericolor (Brandeg.)
Euphorbia latericolor Brandegee Univ. Calif. Bot. 4:377.

Eumecanthus mexicanus (Kl. & Gke.)
Adenopetalum mexicanus Kl. & Gke. Tricocc. 50.

Eumecanthus microappendiculatus (Lotsy)
Euphorbia microappendiculatum Lotsy Bot. Gaz. 20:349.

Eumecanthus monanthus (Wr.)
Euphorbia monantha Wright Pl. Cub. Griseb. 1866.

Eumecanthus multisetus (Bth.)
Euphorbia multiseta Benth. Pl. Hartw. 51.

Eumecanthus muscicolus (Fern.)
Euphorbia muscicola Fernald Proc. Am. Acad. 36:495.

Eumecanthus ocymoideus (L.)
Euphorbia ocymoidea Linn. Sp. Pl. 453.

Eumecanthus pedunculosus (A. Rich.)
Euphorbia pedunculosa A. Rich. Hist. Cuba 11:198.

Eumecanthus physalifolius (Boiss.)
Euphorbia physalifolia Boiss. Cent. Euph. 19.

Eumecanthus pubescens (Kl. & Gke.)
Adenopetalum pubescens Kl. & Gke. Tricocc. 49.
Adenopetalum irasuense Kl. & Gke. ibid. 50.

Eumecanthus segoviensis (Boiss.)
Euphorbia segoviensis Boiss. DC. Prodr. 15:58.

Eumecanthus sinaloensis (Brandg.)
Euphorbia sinaloensis Brandegee Zoe. 5:208.

Eumecanthus subpeltatus (Wats.)
Euphorbia subpeltata Watson Proc. Am. Acad. 25:146.

Eumecanthus subreniforme (Wats.)
Euphorbia subreniforme Watson Proc. Am. Acad. 21:438.

Eumecanthus subsinuatus (Boiss.)
Euphorbia graminea subsinuata Boiss. DC. Prodr. 15:54.

Eumecanthus tenerus (Wats.)
Euphorbia tenera Watson Proc. Am. Acad. 18:150.

Eumecanthus triphyllus Kl. & Gke. Tricocc. 43.
Euphorbia triphylla Willd. Herb. 9316.
Euphorbia scabrella Boiss. DC. Prodr. 15:55.

Eumecanthus umbrosus (Bertero)
Euphorbia umbrosa B[illegible]tero Spr. Syst. 3:791.

Eumecanthus violaceus ([illegible]eenm.)
Euphorbia violacea Gr[illegible]man Proc. Am. Acad. ser. 2, 33:480.

Eumecanthus xalapensis ([illegible]th.)
Euphorbia xalapensis HBK. Nov. Gen. 2:48

Eumecanthus zierioides (Boiss.)
Euphorbia zierioides Boiss. DC. Prodr. 15:58.

AKLEMA Rafin. Fl. Tell. 4:114. 1836–1838.

Branches articulate; leaves aequilateral, ternate or verticillate; stipules glandular; inflorescence in axillary and terminal cymes, corymbs or panicles; bracteoles numerous, plumose; seeds ovoid-globose, shallowly open and regular pitted with no secondary pits.

Type species: Euphorbia nudiflora Jacq.

EUPHORBIA Linn. Sp. Pl. 453, in part. 1753.
ALECTOROCTONUM Schlecht. in Linn. 19:252. 1847.
PECCANA Rafin. Sylv. Tell. 114. 1838.

Aklema Gaumeri

Euphorbia Gaumeri Millsp. Field Mus. Bot. 1:372.

The only known range of this species is Yucatan, at San Anselmo and Buena Vista Xbac, *Gaumer 1039, 1073, 1443.*

Aklema Mayana

Euphorbia Mayana Millsp. Field Mus. Bot. 1:304.

Only known from Yucatan, at Izamal and Buena Vista Xbac *Gaumer 302, 1039.*

The other North American species are:

Aklema adinophylla (Donn-Sm.)

Euphorbia adinophylla Donn-Smith Bot. Gaz. 47:261.

Aklema apocynoides (Kl.)

Euphorbia apocynoides Klotzsch Seem. Bot. Herald 99.

Aklema colletioides (Bth.)

Euphorbia colletioides Benth. Sulph. Voy. 163.

Aklema comonduana

Euphorbia comonduana Millsp. Proc. Calif. Acad. ser. 2, 2:229.

Aklema cotinifolia (L.)

Euphorbia cotinifolia Linn. Sp. Pl. 453.

Aklema elliptica (Kl. & Gke.)

Adenopetalum ellipticum Kl. & Gke. Tricocc. 50.

Euphorbia saccharata Boiss. Cent. Euph. 18.

Aklema Friderichthalii (Boiss.)

Euphorbia Friderichthalii Boiss. DC. Prodr. 15:61.

Aklema ligustrina (Boiss.)

Euphorbia ligustrina Boiss. Cent. Euph. 22.

Aklema Nelsonii

Euphorbia Nelsonii Millsp. Bot. Gaz. 26:268.

Aklema nudiflora (Jacq.) Rafin. Fl. Tell. 4:114.

Euphorbia nudiflora Jacq. Coll. 3:180.

Aklema oaxacana (R. & G.)

Euphorbia oaxacana Robn. & Greenm. Proc. Am. Acad. 32:37.

Aklema ovata (Schlecht.)

Alectoroctonum ovatum Schlecht. in Linn. 19:252.

Euphorbia Schlechtendahlii Boiss. Cent. Euph. 18.

Aklema peganoides (Boiss.)

Euphorbia peganoides Boiss. Cent. Euph. 22.

Aklema petiolare (Sims) Millsp. Ann. Mo. Bot. Gard. 2:43. 1915.

Euphorbia petiolaris Sims. Bot. Mag. t. 883.

Aklema plicata (Wats.)
Euphorbia plicata Watson Proc. Am. Acad. 21:438.

Aklema Scotana (Schlecht.)
Alectoroctonum Scotanum Schlecht. in Linn. 19:252.
Euphorbia Scotana Boiss. DC. Prodr. 15:60.

Aklema tricolor (Greenm.)
Euphorbia tricolor Greenm. Proc. Am. Acad. 33:479.

Aklema Xanti (Engelm.)
Euphorbia Xanti Engelm. Boiss. DC. Prodr. 15:62.
Euphorbia gymnoclada Engelm. Proc. Am. Acad. 5:171, non Boiss.

Aklema yavalquahuitl (Boiss.)
Alectoroctonum yavalquahuitl Schlecht. in Linn. 19:252.

Acalypha flagellata sp. nov.

A dioecious shrub, 2-5 meters high, glabrous or nearly so, with terete, pithy branches, large leaves (7.5 x 12 cm.) and very long spikes (15-35 cm.).

Stipules leafy, narrowly ovate-lanceolate, serrate, apiculate, 1-2 cm. long; petioles 6–7 cm. long; blade palmately 5-veined, ovate, acuminate, thin, minutely wrinkle-pitted in drying, crenate-dentate, each tooth mucronate. Infloresence in long, simple, lash-like, axillary spikes often in pairs on the male shrubs though generally single, rarely one monoecious spike appears, this always on the female shrub. Female flowers single, on a long, filamentous pedicel (8–12 mm.); pedicel bibracteate, pilose; calyx 4-parted the lobes linear-lanceolate, ciliate, acute; ovary hairy and stalked-tuberculate; stylar column glanduliferous, turbinate, the upper portion cut into three lobes from each of which issues a fascicle of six long, filiform, transparent stigmas. Male flowers densely fasciculate on slender, cylindrical spikes, very short pedicellate; sepals 4, scaphoid, minute, caducous; stamens 8, filaments ligulate, ciliate. Capsule 5 mm. diam. deeply tricoccous the cocci globular, strongly marked by the line of dehiscence, scurfy and stalked-glanduliferous-tuberculate beneath; seed red-brown, globose, apiculate, 1.2 mm. diameter, minutely papillate-carunculate, the surface minutely puncticulate.

Type station Buena Vista Xbac, Yucatan, *Gaumer*, September 1896, *1107* (Type in herb. Field Museum, cat. no. 438,224). Also gathered by Dr. Gaumer at Chichankanab *2178*, *2179*.

Acalypha simplicissima sp. nov.

An erect, simple, slender annual about 4.5 cm. high. Stem terete, crispidulous-hairy. Petioles filiform about the length of the thin, ovate,

acute leaves; leaves 3 x 1.5–4 x 2.5 cm., glabrous, palmately 5-nerved at the rounded base, margin slightly crenate-dentate. Inflorescence axillary, the female flowers on long (3–6 cm.), pedunculate, wiry, 10-18-bracted, open spikes; the male on a short, rudimentary, capitulate spike separate in the same axils. Bracts of the female flowers 6–7 mm. ovate, narrowed to the sessile base, acute, the margin few-serrate, ciliate. Female flowers usually 3 to the bract, sessile; calyx 3-parted, lobes narrowly lanceolate; styles 6, fibrillate, about four times the length of the ovary. Male flowers 10 or more in a dense, pedunculate head; calyx of four linear lobes with transparent, chaff-like margins. Capsule strigose-hairy; seed ashen, smooth, ovoid-apiculate, 1.2 x 1 mm.

Yucatan, at Progreso in a shady coppice, *Gaumer 1182* (Type in herb. Field Museum, cat. no. 438,255), and at Chichankanab, *Gaumer 2225*.

Croton Gaumeri sp. nov.

Dioecious, fruticose, open stellate-pubescent. Leaves thin, lanceolate-acuminate, 3–4.5 x .75–1.50 cm.; petioles one-third the length of the blade; male shrubs with leaf margins distantly glandulose, on some individuals these glands become long-stalked though by no means on all nor on all leaves on any one shrub. Leaves (male) papillate on both surfaces, the margin generally distantly glandulose and often stalked-glandular especially near the base, in young leaves both surfaces are openly stellate-pubescent; stipules triangular, seldom found at the older leaves; leaves on female shrubs scattered stellate-pubescent above, more closely and prominently so beneath. Inflorescence terminal, in long, slender spikes floriferous above, flowers pedicellate, bracts minute, the male spikes slightly pubescent the female decidedly so and with long, straight hairs mixed with the closely appressed stellate ones; male flowers: calyx stellate-hairy, 4-lobed, the lobes ovate, acute, rudimentary petals 4, lanceolate, stamens about 20, filaments glabrous; female flowers: pedicels half the length of the calyx, calyx stellate-pubescent, 5-lobed, lobes oblong-lanceolate, acute, margin glandular, rudimentary petals 5, alternate with the calyx lobes, narrowly ligulate and tipped with a globular gland, appearing like stamens, styles 3 divided to the base, digitately 4-lobed, lobes cylindrical, incurved at the tip. Ripe capsule about 5 mm. diam., smooth as if varnished and bearing a few isolated stellate hairs; seed scaraboid, smooth and shining greenish-brown, 3.5 x 2.8 mm., caruncle strongly reniform, thin, waxen.

Yucatan, vicinity of Izamal. Unnumbered specimens collected by *Dr. Gaumer* in 1894 (Type in herb. Field Museum cat. no. 187,265). Two sheets of twigs of male shrubs appear in the series of Dr. Gaumer's

Izamal collection of 1888 deposited in Kew Herbarium; duplicates of these in herb. Field Museum bear its cat. nos. 181,499 and 181,500.

Croton glandulosepalus sp. nov.

A tall, white-barked shrub with long, terminal spikes and thin, ovate-lanceolate leaves clustered toward the tips of the branchlets leaving the branches bare. Leaves ovate-lanceolate, sparingly appressed-stellate, acute to acuminate, apiculate, 4–6 x 2–3 cm., 3-nerved at the base, both surfaces dotted with scattering, fine, slender, stellate hairs which nearly disappear when the leaves are fully mature; petioles slender, about one-third the length of the blade, puberulous; stipules aristate, about 5 mm. long. Inflorescence monoecious, terminal in elongate, rather openly flowered spikes with large, ovate bracts bearing a number of long-stalked, ciliate glands on the margin. Male flowers short-pedicellate enclosed by the scaphoidally enveloping bracts, calyx 4-lobed, woolly with stellate hairs, lobes ovate, petals 4, thin, ovate-scaphoid, glabrous or nearly so; stamens 10, filaments short (about the length of the anthers), glabrous, anthers large, innate. Female flowers: thick pedicelled and densely white-woolly below; calyx 4-lobed the lobes ovate-lanceolate, sarcous, exteriorly invested with a dense mass of red, stalked-globular glands and enclosing the pistil closely; petals small, flabelliform, margin stalk-glandular; ovary densely white-stellate woolly; styles 3, each 4-cleft to the base, the filamentous branches incurled at their tips. Capsule and seed unknown.

Yucatan, common on the open plain from Progreso to Merida, *Gaumer 1154* (Type in herb. Field Museum cat. no. 438,492). Also returned by Dr. Gaumer from Buena Vista Xbac, *1046* and from Chichankanab *2204*.

Croton malvavisciifolius sp. nov.

Shrub with terete, ferrugineous branches, large bi-colorate, irregularly and doubly serrate-dentate leaves, and short monoecious terminal spikes. Stems rusty stellate-hairy the central ray of the stellae erect and acicular the base appressed to the bark; stipules ligulate; petioles somewhat less than one-third the length of the leaf blade. Leaves broadly ovate, 7–14 x 5–10 cm., acute to acuminate, palmately 7-nerved, dark-brown, papillate and scattered stellate-hairy above, light-green and densely felted with stellate hairs beneath, each leaf bearing 2 funnel-shaped, long, stalked glands at the petiole, base strongly cordate, apex acute, margin irregularly doubly-serrate, dentate with a stalked, funnel-shaped gland in the sinus of each of the larger dentations. Inflorescence monoecious, terminal, short, female below male above,

densely ferrugino-stellate pubescent. Female flower short-pedicellate, bicolorate (dark within light without) color and pubescence a counterpart of that of the leaves; calyx lobes 5, spatulate, deeply 3-5-dentate toward the apex; ovary ovate, rusty-hairy, styles 3 each bifid to the base, the branches long and cylindrical, with flattened, incoiled apices. Male flower bicolorate as in the female, pedicellate; calyx 5-lobed the lobes ovate, obtuse; petals 5, obovate-spatulate, thin, red-brown; stamens 6, filaments with a tuft of hairs at the base. Capsule densely stellate-pubescent, enclosed in the persistent calyx; seed flatly scaraboid, 3 x 2 mm., caruncle very thin, papyraceous.

Yucatan, at Yot Tzonot, *Gaumer 1319* (Type in herb. Field Museum cat. no. 438,278).

Tragia (*Eutragia*) **yucatanensis** sp. nov.

An erect, shrubby climber, 1 meter high. Stem terete, puberulent, branches virgate; stipules small, cordate-lanceolate, acute, closely appressed to the stem; petioles one-third to one-half the length of the leaf blade; leaves ovate-lanceolate, 3–6 x 2–4 cm., 5-nerved, somewhat cordate at the base, acuminate, dentate, scattered-hairy on both surfaces. Inflorescence in few flowered, slender, short, simple racemes one-half to three cm. long, inserted opposite the upper leaf petioles, the female solitary near the base of the raceme, the male few, terminal; bracts minute, sessile, lanceolate, acute, entire. Male flowers pedicelled; pedicel about equaling the width of the calyx, pilose, somewhat thickened below; calyx 3-parted, lobes ovate, acute, glabrous; stamens 3, filaments turgid-bulbous below; anthers ovate; rudimentary ovary wanting. Female flowers pedicelled; pedicel about one-half the width of the calyx; calyx segments 6, ovate, acute; ovary 3-celled, densely acicular-hairy; style turgid, trifurcate to the middle, the branches tightly recurved at the tips. Capsule densely invested with long, white, acicular hairs; seed globose, 2.3 mm. diameter, yellow, mottled in irregular anastomosing splotches and stippled with minute dots of red-brown.

Yucatan, in woodlands at Chichankanab, *Gaumer 2154* (Type in herb. Field Museum cat. no. 438,347); and at San Anselmo, *1931*. This species and Tragia nepetaefolia are called P o p o x by the Mayas.

VEGETATION OF ALACRAN REEF

The Alacran Reef forms the northeasternmost danger on the Campeche Bank, in the Gulf of Mexico, 75 miles N. by E. ½ E. from Sisal Fort on the Yucatan mainland. The position of Perez Cay, its most southern islet, is latitude 22°33′36″N.; longitude 89°41′45″W.

The general form of the reef is semilunar, convex to the NE., the straight western face trending NNW. ½ W. 14 miles, its greatest width being 8 miles. The weather, or NE. side, is composed of a compact mass of coral, dry in many places, over which, on all parts, the sea breaks with violence. The lee side, similar to all reefs of this character in these seas, is composed of detached coral heads, easily seen in the clear, deep water of the bank.

At the SE. extreme of the reef are three small, sandy cays rising not over 5 ft. high. These are known as Perez, Pajaros and Chica Cays. Pajaros and Chica lie ¼ mile apart 800 yds. from the SE. extremity of the reef, Perez lying about a mile westward from them. Between the eastward pair and Perez there is an excellent reef-harbor for small vessels; formerly 4 fathoms could be carried into this harbor but at the time of our visit it held, in a few places, but a precarious 2 fathoms.

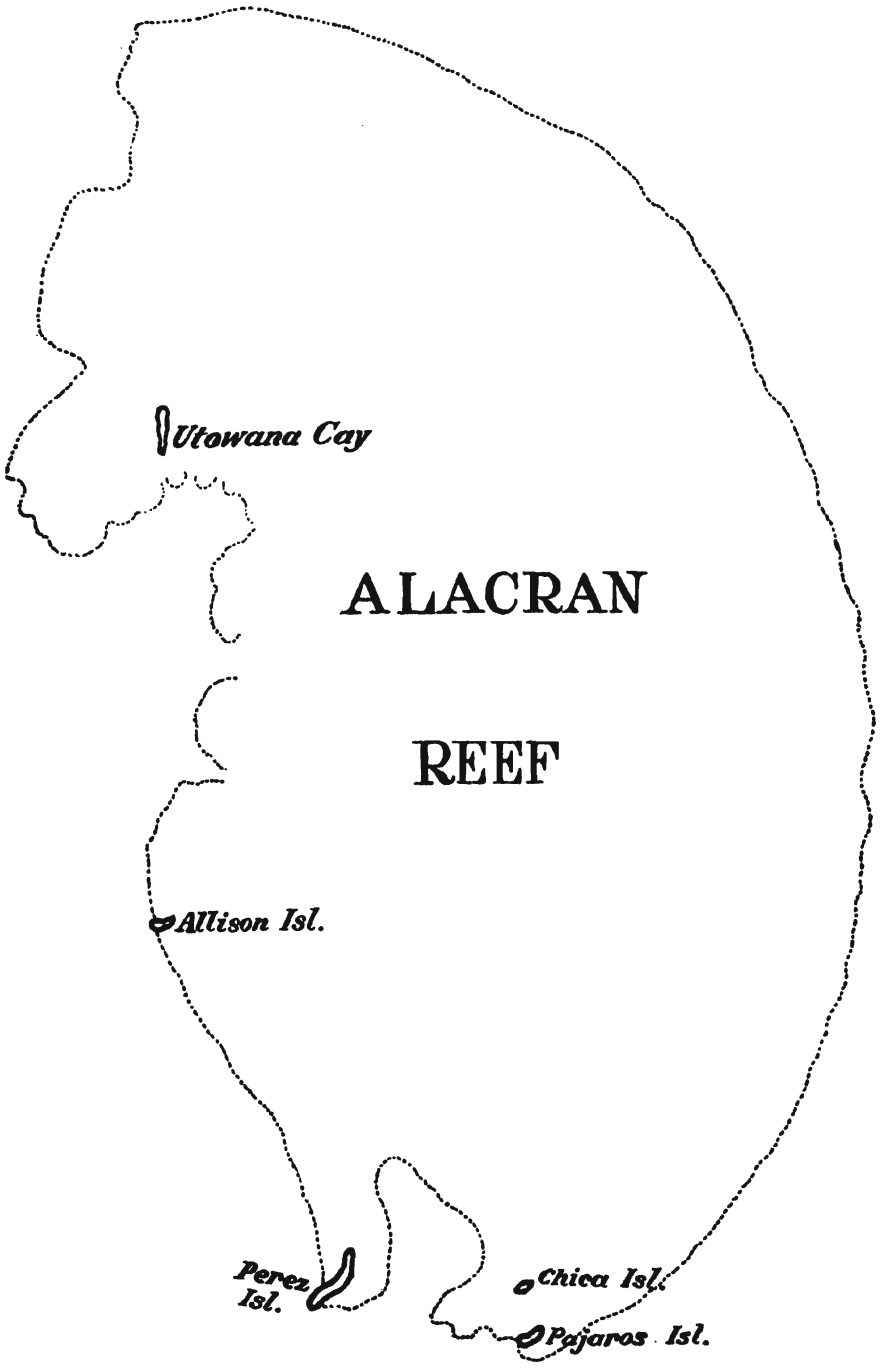
NW. by N., 3 miles from Perez, is a small cay, about 8 feet high, which we named Allison Island, and about the same distance southward of the NW. end of the reef is another islet, about 10 feet high, which we named Utowana Cay, though we were unable to land upon it on account of sea conditions at the time of our approach.

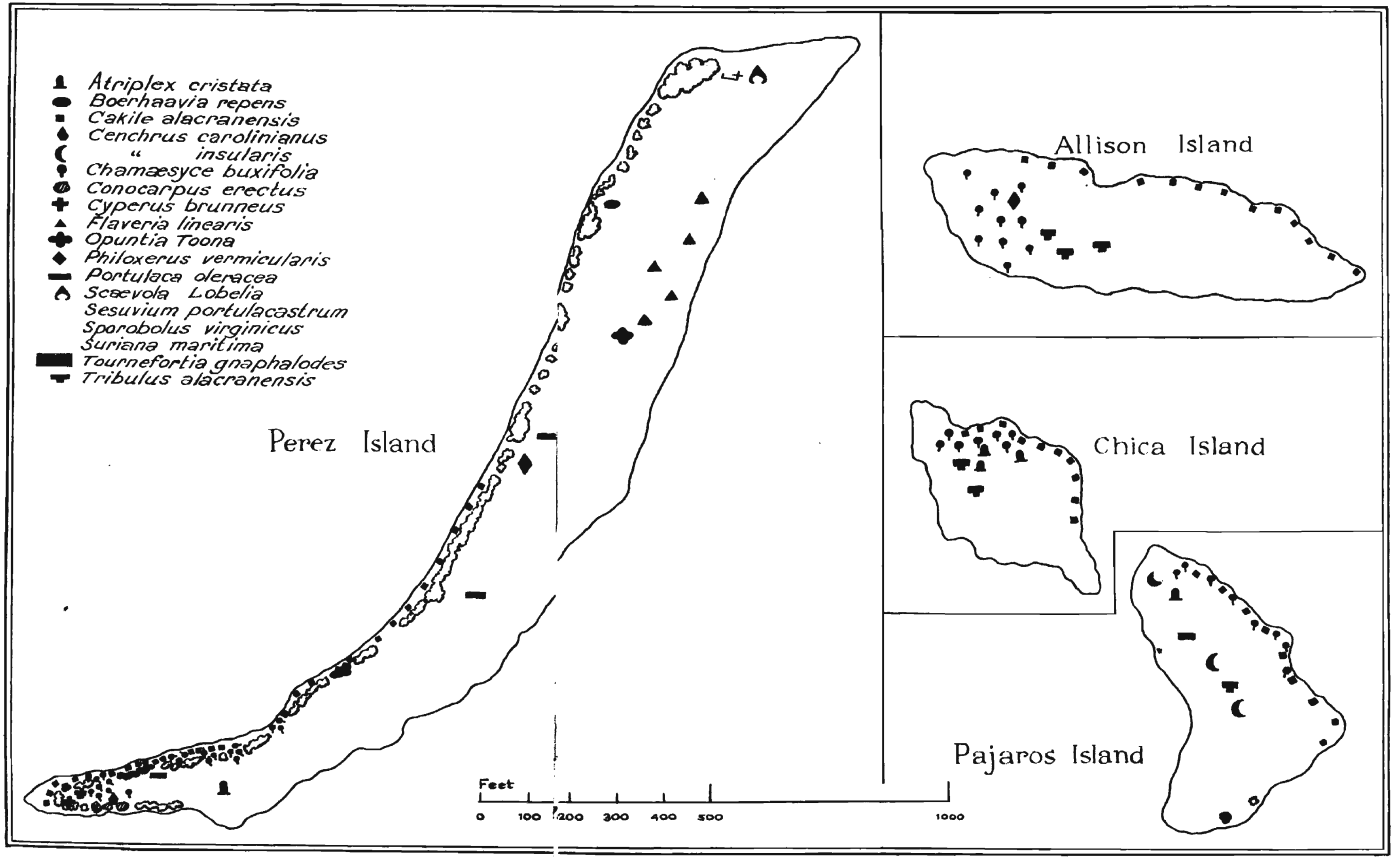
The Alacran Bank is everywhere so steep-to that there is no safe anchorage for larger vessels, not even on the lee side, the only clear landing place is on the inner side of Perez Cay at the mouth of the reef-harbor mentioned.

The approach to this shoal, when working to windward, requires more than ordinary attention as the soundings near it do not give sufficient warning and the islets are invisible if the sea be high. As the Yacht Utowana (which the owner and master Mr. Allison V. Armour allowed to approach the reef on the voyage of which I had the honor of being his guest) arrived in the neighborhood, the captain slowed the vessel down and sent a lookout to the cross trees. Though we proved to be but about two miles from Allison Island yet nothing could be seen of the reef until a cloud of frigate-birds* arose indicating its presence.

As the reef lies directly within the sweep of the Gulf Stream in the youth of its course we judged that it might receive aquavectent seeds

*Fregata aquila (Linn.).


Utowana Cay
ALACRAN
REEF
Allison Isl.
Perez Isl.
Chica Isl.
Pajaros Isl.


Atriplex cristata
Boerhaavia repens
Cakile alacranensis
Cenchrus carolinianus
" insularis
Chamaesyce buxifolia
Conocarpus erectus
Cyperus brunneus
Flaveria linearis
Opuntia Toona
Philoxerus vermicularis
Portulaca oleracea
Scaevola Lobelia
Sesuvium portulacastrum
Sporobolus virginicus
Suriana maritima
Tournefortia gnaphalodes
Tribulus alacranensis
Perez Island
Allison Island
Chica Island
Pajaros Island
Feet
0 100 200 300 400 500 1000

from the east coast of Yucatan, Cozumel Island, and the Caribbean mainland; and, on that account, desired to record its vegetation at this time (March, 1899).

At the time of the charting of this reef by the British Admiralty, in 1842, Pajaros and Chica were "bare sand spits devoid of vegetation;" Perez, the largest cay, and Allison Island, had upon them "grass* and samphire† only." This record we are bound to accept as a careful and comprehensive one for the reason that on account of the dangerous character of the reef it was essential that it should be accurately described, even to its vegetation. Accumulated observations from 1842 to 1896 added "brushwood" to the southern cays and "bushes" to Allison Island, though no traces of bushes were to be found on the latter at the time of our visit; this indicates one of two facts: either that they had been removed, even to their roots, by fishermen for firewood, or by natural erosion. The age of the stunted trees termed "brushwood," as I have recorded further on under Suriana maritima, proves that "brushwood" was not on Perez in 1842 at the time of the Admiralty survey.

In searching out the vegetation of the cays a most careful survey was made. Each cay was minutely examined by our party over every square foot of its surface, I am certain that no species escaped our attention. A detailed indication of each of the eighteen species found is given in conjunction with the map.

The discovery, on these islets, of three species new to science, with the proof that they have evolved within the known and definite period of 57 years, is a fact impressive as it is important.

PEREZ ISLAND, the largest cay, rises about 5 feet in height, its beach being more or less abrupt on the west and gradually sloping on the east or inner coast line. It is about 2550 feet in length and about 325 feet wide as its broadest point. Its surface is entirely coral sand except for a small cairn of weathered coral heads as indicated below.

I was informed that a few years previous to our visit a party of men was left on this cay, by the Mexican Government, with material for the purpose of constructing a beacon. Their supplies gave out and no more were sent to them. They were finally rescued by a fishing vessel and brought to the mainland in a dying condition. One died before the rescue and was buried at the north end of the cay. Several holes in the cay attested to the piteous attempts of these neglected men to secure

*Sporobolus virginicus.

†Sesuvium portulacastrum.

drinkable water. From the largest of these holes at the northern third of the islet a mound of weathered coral heads was heaped during its excavation. This forms the only prominence on the surface of the cay and is the habitat of a growth of cactus (Opuntia Toona) the seed of which was doubtless dropped here by some resting bird. In like manner a seed dropped from an arm of the little wooden cross marking the grave's head accounts for the only plant of Scaevola Lobelia. The "wooden, pyramidal framework 30 feet high" erected by this party at the south end of the islet, mentioned in the U. S. Coast Pilot for 1896, had long since disappeared as kindling for fishermen's cuddy fires.

The main extent of the surface is densely clothed, about 8 in. deep, with a level carpet of Sesuvium portulacastrum broken in only three places by small patches of Sporobolus virginicus associated, in one instance, with Portulaca oleracea; in another with Boerhaavia repens; and in a third with Flaveria linearis which has scattered in among the Sesuvium as mentioned under the consideration of this species. The whole of the south end is clothed with a nearly pure growth of the Sporobolus in which a few plants of Atriplex cristata have found a rooting.

The whole west, or weather, bank is lined with a fringe of Suriana which exists without the admixture of any other species for the northern two-thirds of its length; to the southward a few shrubs of Tournefortia intermingle and still further south six clumps of Conocarpus. Between the Suriana fringe, on the top of the bank, and the wave line of the narrow strand at the southern third, a scattering growth of the new Cakile, intermixed further southward with Chamaesyce buxifolia, completes the flora of the west shore. The interspersed species of the toe of the stocking-shaped islet, where boobies* evidently alight during fishing, were Cenchrus carolinianus, Portulaca oleracea and one individual each of Tribulus alacranensis and Cyperus brunneus.

For some reason neither the booby nor the frigate-bird, prevalent on the other cays, nest on this islet. The reason is not apparent to me unless mayhap the presence of the complete fringe of shrubbery on the west shore may prove, in some way, inimical to them.

PAJAROS (Bird) CAY, the southeast islet of the shoal, is a low, pure sand microcosm, rounded to the center, with the eastern or weather shore line slightly banked and the western, or inner, beach sloping. It is about 650 x 325 feet in extent.

The distribution of plant species on its surface is in exact duplication of that on Perez; Cakile and Chamaesyce on the beach line of the weather shore and no plant life on the marge of the sloping strand.

*Sula cyanops (Sunderval).



THE GRAVE ON PEREZ ISLAND.



A BOOBY ON ITS NEST COMPOSED ENTIRELY OF THE STEMS OF TRIBULUS ALACRANENSIS.



NORTHWEST END OF CHICA ISLAND CARPETED WITH SESUVIUM. LOOKING TOWARD PAJAROS ON THE HORIZON.

Two shrubs only had secured a footing on this cay, one each of Conocarpus and Tournefortia. Scattered amongst the dense growth of Sesuvium was found a number of clumps of the new Cenchrus, forming its only habitat, and one clump each of the new Tribulus, Portulaca oleracea and Atriplex cristata. In the clear sand beyond the Sesuvium at its northernmost margin was another colony of the new Cenchrus.

CHICA (Little) ISLAND is another low, pure sand cay, fusiform in outline, 575 x 325 feet in extent.

On this islet the disposition of the Sesuvium and Sporobolus areas is reversed in comparison with the other two cays, while the scattering other species are interspersed with the Sporobolus colony instead of the Sesuvium. In this the clothing of the islet is quite similar to that of the foot of Perez and shows plainly that it forms a resting place for web-footed birds. Here the new Tribulus, Atriplex cristata and the Chamaesyce grow in profuse masses while the new Cakile maintains its characteristic habitat on the weather beach line.

ALLISON ISLAND, three miles from the other cays described, differs in several respects from the other three. First: it lies east and west—the others essentially north and south; second: its entire coast line is weather shore; i. e., abrupt and eroded above a narrow strand, except a small portion of its western extremity which is somewhat spit-like; third: it is considerably higher (about 8 ft.) and flat like a table-land. Its dimensions are about 1000 x 275 feet.

Notwithstanding the fact that this islet is comparatively large it nevertheless gives place to but six plant species. Its "grass" and "samphire" colonies are pure, as on the other islets. The largest bird colonies of all are on this cay, in fact it is almost wholly a nidulation ground. Boobies appropriate the grass colony and frigate-birds the Sesuvium tract. It is on this cay that Tribulus alacranensis evolved, its presence on the other cays being a matter of transplantation through its burs having adhered to the feet of the booby. The species exists in dense colonies amongst the Sporobolus, and it is of its ligneous stems and branches that the boobies build their nests. The only colony of Philoxerus vermicularis on the cays is here in the Sporobolus, as well as a widely scattering growth of the Chamaesyce. Again the new Cakile lines itself along the weather strand but only on the weathermost side.

UTOWANA CAY, which we sighted but were unable to attain, is the northernmost islet of the group. Through the glass its surface appeared very like that of Allison Island. As it lies north and south much further within the bank of the reef than any of the other cays its vegeta-

tion should prove particularly interesting, we were deeply disappointed that the risk was too great to allow of the yacht being brought near enough to grant us a landing.

THE PLANT SPECIES

1. Sesuvium portulacastrum (L.) Linn. Syst. ed. X, 1058.

This is by far the prevalent species of the cays and here forms the most extensive and succulent masses I have ever seen. It clothes the easterly areas of all the islets with a dense carpet about eight inches thick. Only a few individuals were in flower at the time of our visit. As the stems of this plant are fragile; broken pieces long-lived; and as such pieces put forth strong and viril rootlets in water, I am inclined to place its dispersional character as bodily aquavectent. It is possible also that ripe fruits may be transported in like manner. Its characters are strongly against avevectence.

2. Sporobolus virginicus (L.) Kunth. Rev. Gram. 1:67.

The second species in extent on the cays. This grass appears to spread only where some influence has checked the growth of the Sesuvium, as for instance the tramping about of the birds or the digging of water-holes and the constructive efforts of the men who built the beacon structure on the south end of Perez. This is so pronounced a fact that a glance at the distinguishing colors on the maps shows by the yellow, for Sporobolus, the location of the three water-holes and the area of the beacon-site; while the yellow on the maps of the other cays demarks perfectly the booby nesting areas — always, for some reason westerly on the islets. Note, by the same token, that the booby sections are always where the land slopes gently to spit-like extremities.* The booby never nests near the weather, or abrupt, shore.

From its habitat it is evident that Sporobolus is aquavectent; it has however only been found, on the Yucatan mainland, in protected situations near lagoons, whence, if its Alacran source is the mainland, its spikes must first have been blown to the sea before its real transportation began.

3. Suriana maritima L. Sp. Pl. 284.

A fringe of low shrubs of this species lines the top of the "bank" of the western or weather shore of Perez Island. The growth is pure in the northern two-thirds of the fringe, the southern third has an intermixture of a few clumps of Tournefortia and, further south, of Conocarpus.

* In order that the fledglings may get to the water and back to the nest?



SOUTH END OF PEREZ ISLAND.

ing west at the beginning of the fringe of Suriana bushes. The line of demarcation between the Sporobolus of the foreground and the Sesuvium of the background is plainly evident at the first live bush.

In order to check up the record of the Admiralty survey I cut down the two apparently oldest shrubs and made cross sections of the trunks.* In so far as the annual rings may determine they proved to be 25 and 30 years old respectively. Should the rings prove a faulty record the error would be in favor of a shorter period of growth, it is therefore certain that the shrubs did not exist there at the time of the survey, the notes of which state: "Grass and samphire only." One shrub, judged to be not over four years old, grew on the southern shore of Chica.

At the period of ripened fruits the fruiting twigs of this species become quite brittle and, as the plant frequents the immediate sea shore, these twigs are often broken off by heavy winds and blown into the sea. That they float away and are later washed ashore on the crests of waves was apparent in the "wash line" on the weather side of Perez where I found a large quantity of fruiting twigs newly come ashore. This leaves no doubt of the species being bodily aquavectent.

4. Cakile alacranensis Millsp. Field Mus. Bot. 2:130.

This new species of the shoal differs from all others known in its short silique bearing four channelled lines instead of 8 or more (angles in most species); in its upper joint being globose-apiculate and very turgid; in its infundibuliform lower joint which is but little more than a swelling of the pedicel, and in having its seeds dotted with brownish punctae. The leaves are yellowish-green, spatulate-lanceolate tapering to a partly clasping petiolar base, and entire or rarely slightly crenate or crenate-dentate at the apex.

This species grows upon the north strand of Allison Island; on the north weather strand of Chica and Pajaros; and on the southern half of the weather strand of Perez.† While the plants from both Perez and Pajaros are large fruit producers they have a sickly yellow appearance compared with the fresh, cool green of those of Chica. It is evident that the original habitat of this species is either Allison Island, or possibly unexplored Utowana Cay, as the distribution of the plants on the southern cays is quite apparently more recent.

It appears to me that this species is evolving for the purpose of more highly developed aquavectence. The upper, or floating joint, is certainly developing far more rapidly than the lower, or fixed, joint of the fruit: the upper at the expense of the lower.

Distributionally the upper joint of the fruit is aquavectent while the lower, being fixed upon the rhachis and on that account not adapted to

*These sections are mounted on the herbarium sheets of the species from this island in the Museum herbarium.

†The treatment of Cakile in Field Mus. Bot. 2:43 and 2:128–130 to the contrary notwithstanding.

dispersion, is evidently intended to perpetuate the species only in the habitat of the parent plant.

5. Chamaesyce buxifolia (Lam.) Small.

This common seaside Euphorbia is found, on the booby rest-strands only, on all the islets. It does not associate (except on Pajaros) with the aquavectent Cakile nor with other aquavectent species.

The seed coat of this species swells greatly and becomes mucilaginous when moist. This causes the seeds to adhere to the wet webs of swimming birds when resting along the shore. Thus the plants are widely distributed on the island strands of the Gulf of Mexico region.

6. Tribulus alacranensis Millsp. Field Mus. Bot. 2:54.

This new species differs from its probable parent, T. maximus of the mainland, in its long, heavy, tangled and jointed ligneous stems and branches; its mass growth; its larger flowers and smaller fruits; its 4-6-spined carpids; and in its leaves being densely woolly on both surfaces. The original habitat* of this species is apparently the Sporobolus colony of Allison Island, where the boobies construct their nests wholly of its stems and branches.

The dispersional character of the species is avevectent, through the sharp-spined fruits clinging to the webbed feet of swimming birds.

7. Tournefortia gnaphalodes R. Br. Prod. 496.

This common sea shore shrub of the Antillean region has found a place of growth amongst the Suriana shrubs at the southern extension of the fringe on Perez. One shrub only was just appearing on the south shore of Pajaros. The specimens appear to differ in no respect from those of the mainland.

As with Suriana the fruiting branch tips of this species break off during high winds and are often blown into the sea, whence they are drifted to new places of growth. The species is, again like Suriana bodily aquavectent in dispersional characters. It is very seldom, if ever, found on the shores of bays or on shores guarded by partly dry reefs.

8. Conocarpus erectus Linn. Sp. Pl. 147.

A few clumps of this shrub have established themselves amongst the Suriana bushes at the south end of the fringe on Perez Island, where the shore being free on the weather edge of the reef, there has accumulated quite a congregation of wave carried species.

Two of the largest trunks of this species showed, by the annual rings, a growth of 19 years.

*As Utowana Cay was not explored this statement is open to doubt.

From its association on these cays I judge that the fruits are aquavectent. Its growth in no wise gives the appearance of bird transportation.

9. Flaveria linearis Lag. Gen. et Sp. Nov. 33.

A few plants of this species were found near the coral cairn on Perez Island. A few more were found scattered in the Sesuvium carpet a short distance northwestward from the cairn. The species is fairly common on the coast of the mainland of Yucatan and on the island of Cozumel.

This dispersion of this species to the Alacran Reef must have been intestinally avevectent as the seeds have no coma and the position of the plants on Perez savors highly of resting birds.

10. Portulaca oleracea Linn. Sp. Pl. 445.

A few individuals of this species were found scattered amongst the Sesuvium of Perez and Pajaros cays. It had not yet become implanted on the other cays visited.

In my studies of the intimate dispersion of species upon sand islets* I have found this species only upon inhabited islands and then generally in areas that were at the time, or had been, more or less cultivated for some purpose. The position of the plants on Perez and Pajaros in no way indicate homovectence, though on Perez this might have been possible. The dispersional indications in regard to this species are not sufficiently plain to me at this time to permit a distinct statement.

11. Cyperus brunneus Sw. Fl. Ind. Occ. 1:116.

One clump only of this species was found on the cays that on the southwest end of Perez Island just beyond the Sporobolus colony.

This species is quite a common element of the Antillean strand flora from the Bahamian Archipelago through to Vera Cruz, Mexico. It occurs in places all along the Yucatan coast and on the strands of the island of Mugeres.

The seeds are avevectent *per pedis et intestinis*.

12. Atriplex cristata H. & B. ex Willd. Sp. Pl. 4:959.

A group of a few individuals of this species was found in the Sporobolus colony on the south end of Perez and quite a large cluster in the same association on Chica. On Pajaros a small group was found in association with the Sesuvium. The species has also been returned from the Yucatan main coast at Progreso and Silam.

I judge that the fruits are avevectent, being transported on the webbed feet of the booby, and that the clump in the Sesuvium of Pajaros came originally from the older implantation on Chica.

*"Flora of the Sand Keys of Florida," Field Museum of Natural History, Botany, Vol. 2, no. 5.

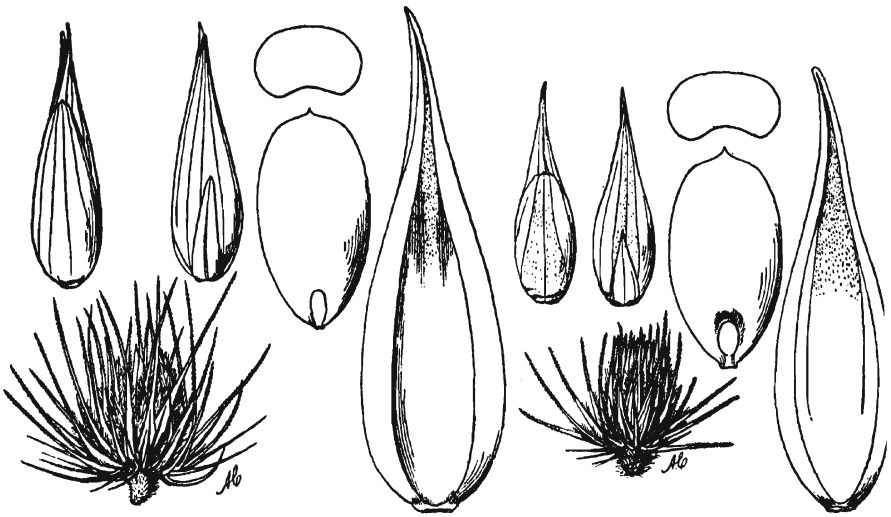
13. Cenchrus carolinianus Walt.

This species* was found only at one spot, that on the south shore of Perez Island near the clumps of Conocarpus at the edge of the Sporobolus colony at that point. The species has also been returned from Cozumel Island but not from the Yucatan mainland.

The species is avevectent through the spiny burs clinging to the webbed feet of the booby.

14. Cenchrus insularis Scribn. Field Mus. Bot. 2:26.

This new species is represented by a few plants† on Pajaros Island only. These were all in full ripe fruit. That this is the full representation of so strongly a differentiated species is open to doubt and will so



C. insularis. C. echinatus

remain until opportunity is had to visit Utowana Cay, where it would seem more than probable that a fuller growth may be found.

The characters clearly differentiate this species from C. carolinianus as found on Perez Island; in many of its characters it is much nearer C. echinatus as found abundantly on cultivated lands near Izamal, eighty miles inland on the main, and on the rocky plain south of Progreso. I am strongly inclined to judge the latter species to be its parentage. The fruiting characters of the two species are here illustrated in conjunction. The species differ in the size of inflorescence; number and size of the involucres; character of the basal bristles (barbellate in

*Reported as C. tribuloides L. in Field Mus. Bot. 2:44.

†The specimen from Cozumel reported as this species under the description of the type proves to be C. carolinianus Walt.

C. echinatus, glabrous in C. insularis); and in the shape and size as well as the nervation of the first glume.

The plant is dispersionally avevectent, the burs attaching themselves by their sharp, barbed bristles to the webbed feet of swimming birds during their walks along the strand.

15. Philoxerus vermicularis (L.) R. Br.*

This species, common on the shores of the lagoon at Progreso and Silam on the Yucatan mainland, is found on the Alacrans only on a bare spot in the Sesuvium colony of Perez and Allison Islands.

From its position on the islands I am strongly inclined to judge its dispersional character to be avevectent through the agency of small migratory birds.

16. Boerhaavia repens Linn. Sp. Pl. 3.†

This species was found only on one of the bare spots in the Sesuvium carpet of Perez Island, where it nearly covered the small area in which it had become implanted. It occurs also on the borders of the lagoon at Progreso on the main but has not been gathered at any other part of the Yucatan region.

In regard to the Alacran Reef the dispersional character of this species is avevectent, the viscous-glandular fruits attach themselves to the feet and feathers of migratory birds.

17. Opuntia Tuna (L.) Mill. Dict. ed. VIII:3.

Two low, spreading clumps of this cactus were observed growing from the interstices in the cairn of old coral heads thrown up in the center of the north half of Perez Island. The plants were vigorous and had apparently well adapted themselves to their environment.

Their location plainly indicates that, in this instance, the dispersional character continues to be avevectent. That some migratory bird, resting from flight upon the cairn, deposited the seed between the topmost coral heads is evident.

18. Scaevola Lobelia Murr. Linn. Syst. ed. XIII:178.

One individual only of this seaside species was seen upon the islets of the reef. This was growing directly under the left arm of the little wooden cross erected at the head of the grave on the north end of Perez Island. I removed a portion of this plant for herbarium purposes: this may possibly affect its continuance.

The position in which the plant grew leaves no doubt as to the avevectent character of its dispersion.

*Lithophila vermiculata Uline in Field. Mus. Bot. 2:39.

†Dr. Heimerl considers our Alacran plant to be nothing but a form transitional between the B. viscosum and B. hirsuta of Lagasca.

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PRÆNUNCIÆ BAHAMENSES—II.

CONTRIBUTIONS TO A FLORA OF THE BAHAMIAN ARCHIPELAGO.

BY

CHARLES FREDERICK MILLSPAUGH, M.D.

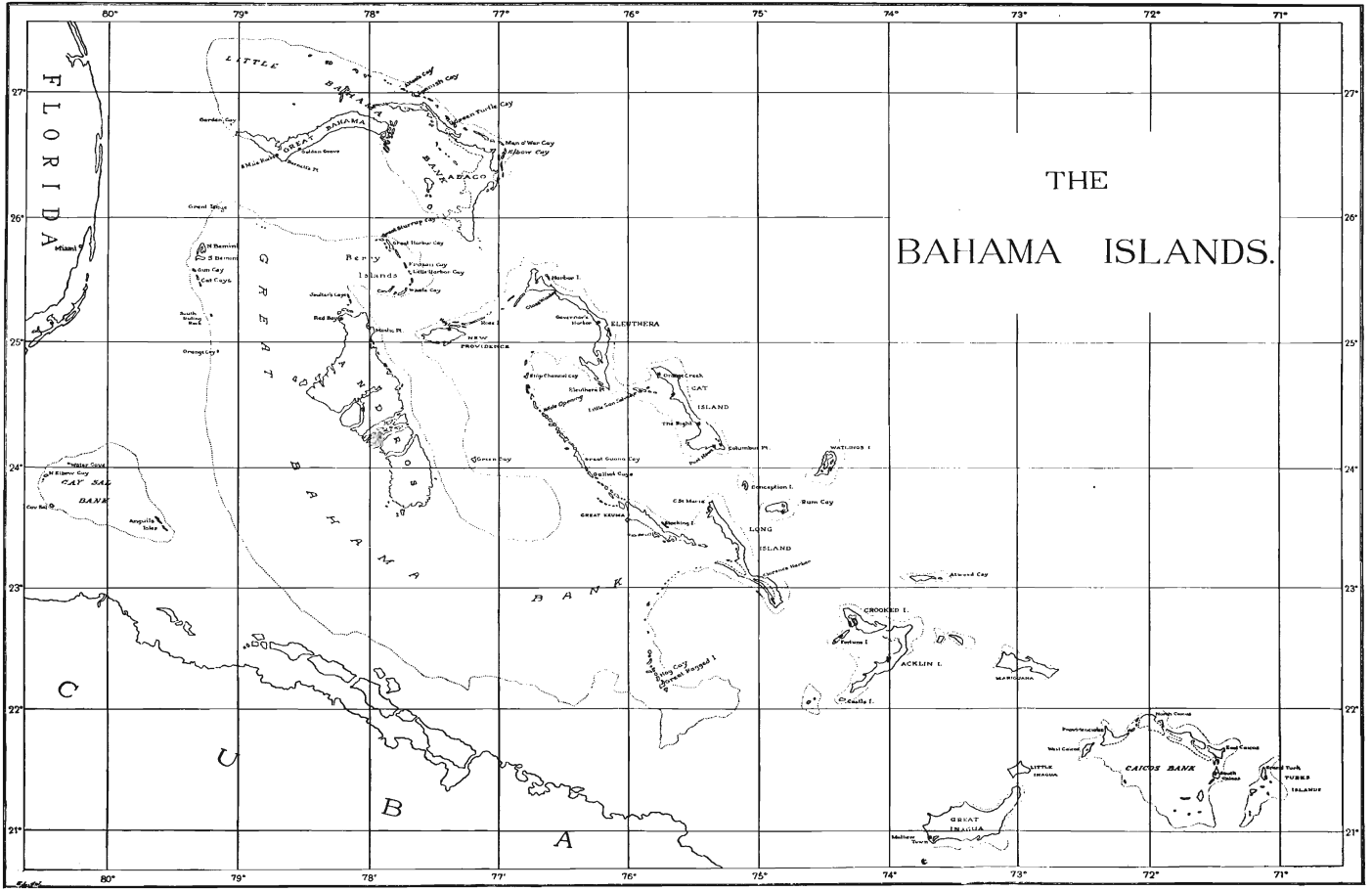
Curator, Department of Botany.



CHICAGO, U. S. A.

August, 1909.

Issued


THE
BAHAMA ISLANDS.
FLORIDA
Miami
LITTLE BAHAMA BANK
GREAT BAHAMA
BANK OF BIMINI
Garden Cay
Great Stirrup Cay
Man o' War Cay
Great Sale Cay
N Bimini
S Bimini
Gun Cay
Cat Cays
Berry Islands
Great Harbour Cay
Frazers Hog Cay
Little Harbour Cay
Chub Cay
Nassau
Orange Cay
GREAT BAHAMA BANK
PROVIDENCE
Harbour I.
Governors Harbour
ELEUTHERA
Hatchet Bay
Gregory Town
Current I.
Rock Sound
Ship Channel Cay
Cistern
Little San Salvador
Egg I.
Rocky Point
CAT ISLAND
The Bight
Columbus Pt.
WATLINGS I.
Green Cay
Arawak Cay
Ballast Cays
Conception I.
Rum Cay
C St Maria
GREAT EXUMA
Stocking I.
LONG ISLAND
Clarence Harbour
Attwood Cay
BANK
CROOKED I.
Portune I.
ACKLIN I.
Castle I.
MARIGUANA
Hogsty Reef
Mangrove Cay
Duncan Town
Ragged I.
Salina Point
Cockburn Town
Grand Turk
West Caicos
East Caicos
CAICOS BANK
South Caicos
TURKS ISLANDS
LITTLE INAGUA
GREAT INAGUA
Matthew Town
CUBA
80°
79°
78°
77°
76°
75°
74°
73°
72°
71°
27°
26°
25°
24°
23°
22°
21°

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CONTRIBUTIONS TO A FLORA OF THE BAHAMIAN ARCHIPELAGO.

CHARLES F. MILLSPAUGH, M.D.

Since the issue of the first of these papers* the co-workers upon the Flora of the Bahamian Archipelago have continued their investigations as outlined in that publication and have extended the survey to embrace Andros, Eleuthera, Little San Salvador, Cat Island, Conception Island, Rum Cay, Watling's, Atwood's Cay (Samana), Long Island, Great Ragged Island, Crooked Island, Fortune Island, Turk's Islands and the Caicos and Cay Sal Groups.

The collections have been increased to some 12,000 sheets and embrace the field work of the following collectors in the localities indicated under each:

Brace— Mr. Louis J. K. Brace, in addition to the field work outlined on page 138, has been commissioned by the New York Botanical Garden and this Museum to make three further explorations. From these he has returned over 1,800 numbers as follows: Rum Cay (3919–3993); Fortune Island (3994–4179); Acklin's Island (4260–4471); Crooked Island (4533–4776); and Andros (4876–5377 and 6657–7139). In the Andros work he not only traversed the East side but also made his way around to the difficult swash region of the West coast, and penetrated the dividing channel across the southern third of the Island. Mr. Brace has also continued his search for interesting plants on New Providence (7141–7161 and 7905–7910). Our collections of his plants have been further enriched through securing his personal set of the series he collected in 1886 which formed the basis of Gardiner & Brace's Plants of the Bahama Islands.†

*Field Col. Mus. Bot., 2: 137-184. Feb. 17, 1906.

†Gardiner & Brace per Dolley in Proc. Acad. Nat. Sci. Phila., 1889, 349-426.

Britton — Dr. N. L. Britton, see page 138.

Britton & Brace — Dr. N. L. Britton and Mr. Louis J. K. Brace, see page 139.

Britton & Millspaugh — Dr. N. L. Britton and the author, in addition to the field work outlined on pages 139–140, undertook, in 1907, a very exhaustive exploration of the Out Islands, embracing the following localities: Eleuthera, from the Glass Window to Harbor Island (5376–5404); Glass Window to Gregorytown (5405–5440); Governor's Harbor and vicinity (5441–5542); Rock Sound and vicinity (5543–5590); Miller's and Bannermantown and vicinities (5591–5613) and in the vicinity of the extreme southern point of the island (5614–5656). Little San Salvador (5657–5701). Cat Island, from Orange Creek around the extreme north end of the island, down the northeast shore to Cotton Point and across (5702–5791); the vicinity of The Bight and across the island and back (5792–5945); and Port Howe and vicinity (5946–5986). Conception Island (5987–6043). Watling's Island, Cockburntown vicinity (6044–6144); from Cockburntown across Little and Great Lakes to the Light on the east coast (6145–6169); Graham's Harbor south along the east coast to Columbus' Monument (6170–6188); Graham's Harbor around the north end of the island to Cockburntown (6189–6224). Long Island, vicinity of Clarencetown and across the island to the west shore, and on Thatch and Strachan's Cays (6225-6359); and the extreme north end of the island at Cape St. Maria (6360–6370). New Providence in the vicinity of Nassau (5354–5366).

Coker — Prof. William C. Coker, see page 140.

Cooper — Dr. William Cooper, see page 140.

Curtiss — Mr. A. H. Curtiss, see page 140.

Earle — Prof. F. S. Earle, see page 140.

E. G. Britton — Mrs. N. L. Britton, in addition to her field work noted on page 141, accompanied her husband and the author as far as Harbor Island and remained there, as a base, while working that island and the extreme north end of Eleuthera (6370–6527). Returning to New Providence she did further discriminating field work on that island (6529–6656) while awaiting the return of the Out Island Expedition.

Hitchcock — Prof. Albert S. Hitchcock, see page 141.

Through a later purchase of Prof. Hitchcock's "Florida Herbarium" this Museum secured 133 duplicate sheets of his Bahamian collections, these are in addition to his original collection which is still a loan to this Museum by the Missouri Botanical Garden.

Howe — Dr. M. A. Howe, in addition to his field work on the algae of the

Bahamas as indicated on page 141, accompanied Mr. Percy Wilson on the expedition to the southern islands (see Wilson) whence he returned a large amount of interesting and critical additional material.

Millspaugh — The author, see page 141.

Nash & Taylor — Dr. George V. Nash and Mr. Norman Taylor, see page 142.

Northrop — Mrs. Alice (Rich) Northrop, see page 142.

Rothrock — Prof. J. T. Rothrock made, in the interests of the University of Pennsylvania, an expedition to the British West Indies in his 51-ton Yawl "White Cap" during the winter of 1890–91. On this expedition he collected 4 days on New Providence; 2 on Cat Island; a part of one day on Watling's; 2 days on Crooked Island; 2 on Fortune Island, and a day on Great Inagua. His collecting was done independently from that of Prof. Hitchcock, who accompanied him. The first set was deposited in the herbarium of the University of Pennsylvania; the second, comprising 162 sheets, he has kindly placed in the herbarium of this Museum.

Wight — Mr. Alex. E. Wight, under the patronage of the Gray Herbarium, Cambridge, Mass., made a Bahamian collection of 281 numbers from December, 1904, to May, 1905. He collected on New Providence and Hog Island (1–226 and 271–274), and on Andros at Mangrove Cay, Fresh Creek, Calabash Bay, and Small Hope (227–270). The resulting plants were determined by the author and the initial set retained at this Museum (with the exception of about six numbers in the Orchidaceae which are in the herbarium of Prof. Oakes Ames). Duplicate sets have been deposited in the Gray Herbarium and the herbarium of The New York Botanical Garden. [This paragraph should substitute that concerning Mr. Wight's collections on page 142.]

Wilson — Mr. Percy Wilson, of the New York Botanical Garden, on a commission from that institution and this Museum, and accompanied by Dr. Howe, made an exploration of the southeastern islands from November 22d to December 29th, 1907. His field was as follows: Cat Island, at The Bight (7163–7197) and the southwest end of the island (7198–7202). Watling's Island, at Cockburntown (7203–7225); Graham's Harbor (7226–7258); and the extreme southeast and southwest ends (7259–7336 and 7337–7359). Atwood's Cay (Samana) (7360–7424 and 7903–7904). Mariguana, at a point ten miles west of Abraham Bay (7425–7451); Abraham Bay and vicinity (7452–7540); five miles west of Southeast Point (7541–7557) and at Southeast Point (7558–7589). The Caicos Islands: on South Caicos (7590–

7693); Pine Cay (7694-7697); North Caicos at Kew and vicinity (7698–7748); Providenciales (7749–7752) and West Caicos (7753–7763); Little Inagua, at the western end (7764–7782). Castle Island (7783–7802). The Ragged Cays, at Great Ragged Island (7803–7869) and Hog Cay (7870–7882). The Exuma Chain, at Harvest Cay (7883–7898); and Rose Island (7899–7902). From May 13 to June 7, 1909, he explored the Cay Sal Bank, spending four days on Anguilla Islands (7932–8078) and one day each on Salt Cay (8079–8124), Water Cay (8132–8159), and Elbow Cay (8125–8131). On the trip out he spent one day at Riding Rocks (7912 7924), and one on Orange Cay (7925–7931), of the Bimini Group; and on his return to Nassau: six days collecting on New Providence (8168–8247, 8323–8343, 8370–8413, 8434–8436) and four on Hog Island (8248–8322, 8344–8369, 8414–8433). The collections are deposited in duplicate in the herbaria of The New York Botanical Garden and this Museum.

Islands Represented in these Collections.

Abaco — *Brace, Coker.*
Acklin's Island — *Brace.*
Allen's Cay (Abaco) — *Brace.*
Andros — *Brace, Coker, Northrop, Wight.*
Anguilla Island — *Wilson.*
Atwood's Cay (Samana) — *Howe, Wilson.*
Big Golden Cay (Andros) — *Wight.*
Bimini, North — *Brace, Howe, Millspaugh.*
Bimini, South — *Brace, Howe, Millspaugh.*
Broad Rock Cay (Andros) — *Brace.*
Caicos, North — *Howe, Wilson.*
Caicos, South — *Howe, Wilson.*
Caicos, West — *Howe, Wilson.*
Castle Island — *Howe, Wilson.*
Cat Cay, North (Biminis) — *Brace, Howe, Millspaugh.*
Cat Cay, South (Biminis) — *Howe, Millspaugh.*
Cat Island — *Britton & Millspaugh, Hitchcock, Howe, Wilson, Rothrock.*
Cave Cay (Exuma Chain) *Britton & Millspaugh, Howe.*
Conception Island — *Britton & Millspaugh.*
Crab Cay (Watling's Isl.) — *Britton & Millspaugh.*
Crooked Island — *Brace, Hitchcock, Rothrock.*
Delectable Cay (Acklin's) — *Brace.*
Eleuthera — *Britton & Millspaugh, Coker, E. G. Britton, Hitchcock, Rothrock*
Elbow Cay (Abaco) — *Brace, Coker.*
Elbow Cay (Cay Sal Bank) — *Wilson.*
Exuma — *Britton & Millspaugh, Howe.*
Fortune Island (or Long Cay) — *Brace, Hitchcock, Rothrock.*
Frozen Cay (Berry Is.) — *Britton & Millspaugh, Howe.*
Galiot Cay, Great (Exuma Chain) — *Britton & Millspaugh, Howe.*
Galiot Cay, Little (Exuma Chain) — *Britton & Millspaugh, Howe.*
Garden Cay (Great Bahama) — *Brace.*
George's Island (Eleuthera) — *Coker.*
Goat Cay (Berry Is.) *Britton & Millspaugh.*
Goat Cay (Andros) — *Brace.*
Great Bahama Island — *Brace, Britton & Millspaugh, Howe.*
Green Cay — *Coker.*
Green Turtle Cay (Abaco) — *Brace.*

Guana, Great (Exuma Chain) — *Britton & Millspaugh, Howe.*
Gun Cay (Biminis) — *Howe, Millspaugh.*
Harbor Cay, Great (Berry Is.) — *Britton & Millspaugh, Howe.*
Harbor Cay, Little (Berry Is.) — *Britton & Millspaugh, Howe.*
Harbor Island — *E. G. Britton.*
Harvest Cay (Exuma Chain) *Howe, Wilson.*
High Point Cays (Andros) — *Brace.*
Hog Cay (Ragged Group) — *Howe, Wilson.*
Hog Island (New Providence) — *Brace, Britton, E. G. Britton, Britton & Brace, Britton & Millspaugh, Northrop, Wight, Wilson.*
Inagua — *Hitchcock, Nash & Taylor, Rothrock.*
Inagua, Little — *Howe, Nash & Taylor, Wilson.*
Isaac, Great — *Brace.*
Joulter's Cays (Andros) — *Howe, Millspaugh.*
Lignum Vitae Cay (Berry Is.) — *Britton & Millspaugh, Howe.*
Little San Salvador — *Britton & Millspaugh.*
Long Bay Cays (Andros) — *Brace.*
Long Cay, see Fortune Island.
Long Island — *Coker, Britton & Millspaugh.*
Mangrove Cay (Andros) — *Brace, Coker, Wight.*
Mangrove Cay, Little (Andros) — *Brace, Coker.*
Man o'War Cay (Abaco) — *Brace.*
Mariguana — *Howe, Wilson.*
New Providence — *Brace, Britton, E. G. Britton, Britton & Brace, Britton & Millspaugh, Coker, Cooper, Curtiss, Earle, Hitchcock, Howe, Millspaugh, Northrop, Rothrock, Wight, Wilson.*
No Harbor Cay (Rose Island) — *Britton & Millspaugh.*
Orange Cay — *Wilson.*
Pigeon Cay (Abaco) — *Brace.*
Pine Cay (Caicos) — *Howe, Wilson.*
Providenciales — *Howe, Wilson.*
Ragged Island, Great — *Howe, Wilson.*
Riding Rocks — *Wilson.*
Rose Cay (Andros) — *Brace.*
Rose Island — *Britton & Millspaugh, Howe, Northrop, Wilson.*
Rum Cay — *Brace, Coker.*
Salt Cay (Cay Sal Bank) — *Wilson.*
Salt Cay (New Providence) — *Northrop.*
Samana, see Atwood's Cay.
San Salvador, Little — *Britton & Millspaugh.*
Sheep Cay (Inagua) — *Nash & Taylor.*

Ship Channel Cay (Exuma Chain) — *Britton & Millspaugh, Howe.*
Silver Cay (New Providence) — *Howe, Millspaugh.*
Spanish Cay (Abaco) — *Brace.*
Stocking Island (Exuma Chain) — *Britton & Millspaugh, Howe.*
Strahan's Cay (Long Isl.) — *Britton & Millspaugh, Howe.*
Sturrup Cay (Berry Is.) — *Britton & Millspaugh, Howe.*
Thatch Cay (Long Isl.) — *Britton & Millspaugh.*
Turk Island, Grand — *Nash & Taylor.*
Water Cay (Cay Sal Bank) — *Coker, Wilson.*
Watling's Island — *Britton & Millspaugh, Coker, Hitchcock, Howe, Rothrock, Wilson.*
Whale Cay (Berry Is.) — *Britton & Millspaugh, Howe.*
Wide Opening, Cay North of (Exuma Chain) — *Britton & Millspaugh, Howe.*

The following, chronologically arranged, additional publications, based upon critical examination of the above collections, have appeared since the issue of Prænuncia I and may be noted in connection with the list on page 144:

"The Polyporaceae of North America — IX." W. A. Murrill in Bull. Torrey Club, 31: 604. Sesia striata (Sw.) Murr. (Jan. 9, 1905.)

"Additions to the Flora of Subtropical Florida." John K. Small in Bull. N. Y. Bot. Gard., 3: 424, 437. Linum Curtissii, Scutellaria longiflora. (Jan. 27, 1905.)

"The Polyporaceae of North America — XIII." W. A. Murrill in Bull. Torrey Club, 32: 648, 651, 652. Cariolus membranaceus (Sw.) Pat., C. pinisitus (Fr.) Pat., C. arenicolor (B. & C.) Murr. (Jan. 22, 1906.)

"Prænunciæ Bahamenses — I." C. F. Millspaugh in Pub. Field Mus. Bot. Ser., 2: 137–184. (Feb. 17, 1906.)

"Contributions to the Flora of the Bahama Islands — III." N. L. Britton in Bull. N. Y. Bot. Gard., 4: 137–143. (Mar. 19, 1906.)

"The Genus Vernonia in the Bahamas." Henry A. Gleason in Bull. Torrey Club, 33: 183–188. (Apr. 7, 1906.)

"Tectaria minima sp. nov." Lucien M. Underwood in Bull. Torrey Club, 33: 199–200. (Apr. 7, 1906.)

"Report on the Continuation of the Botanical Exploration of the Bahama Islands." N. L. Britton in Jour. N. Y. Bot. Gard., 8: 71–81. (Apr., 1907.)

"Epidendrum cochleatum L." Geo. V. Nash in Bull. Torrey Club, 34: 117. (May 7, 1907.)

"Agave Seen by Columbus found." Popular account of the Britton & Millspaugh expedition of 1907. "Discovery," 1: 30–32. (June, 1907.)

"Oxalidaceae." John K. Small in N. Am. Flora, 25: 43. Ionoxalis intermedia (A. Rich.) Small. (Aug. 24, 1907.)

"Erythroxylaceae." N. L. Britton in N. Am. Flora, 25: 61, 63, 65. Erythroxylon rotundifolium Lun., E. areolatum L., E. reticulatum Northrop, E. obovatum Macf. (Aug. 24, 1907.)

"Linaceae." John K. Small in N. Am. Flora, 25: 72, 74, 75. Cathartolinum Curtissii, C. corallicola, C. Bracei, C. lignosum. (Aug. 24, 1907.)

"Contributions to the Flora of the Bahama Islands — IV." N. L. Britton in Bull. N. Y. Bot. Gard., 5: 311–318. (Oct. 26, 1907.)

"Phycological Studies—III." Marshall A. Howe in Bull. Torrey Club, 34: 503, 512. Halimeda simulans, Avrainvillea sordida. (Dec. 17, 1907.)

"Opuntionidae of North America." N. L. Britton. Britton & Rose in Smithson. Misc. Coll., 50: 513–514. (Feb. 20, 1908.)

"New Species of Uredineae." J. C. Arthur in Bull. Torrey Club, 34: 587–588. Prospodium bahamense sp. nov. (Feb. 27, 1908.)

"Report on the Botanical Exploration of the Bahama and Caicos Islands." M. A. Howe and Percy Wilson in Jour. N. Y. Bot. Gard., 9: 41–50. (Mar. 1908.)

"Two Bahamian Species of Evolvulus." Homer D. House in Bull. Torrey Club, 35: 89–90. (Mar. 9, 1908.)

"Studies in North American Convolvulaceae." Homer D. House in Bull. Torrey Club, 35: 103. (Apr. 20, 1908.)

"The Genus Ernodea Swartz: A Study of Species and Races." N. L. Britton in Bull. Torrey Club, 35: 204–208. (Apr. 29, 1908.)

"The North American Species of the Genus Ipomoea." Homer D. House in N. Y. Acad. Sci., 18: 216. Ipomoea carolina, Ipomoea gracilis. (May 11, 1908.)

"New West Indian Lejeunae." Alexander W. Evans in Bull. Torrey Club, 35: 383. Brachiolejeunea bahamensis. (Aug. 26, 1908.)

"Studies in West Indian Plants — II." N. L. Britton in Bull. Torrey Club, 35: 564. Harrisia Brookii. (Jan. 2, 1909.)

"Phycological Studies — IV." Marshall A. Howe in Bull. Torrey Club, 36: 84–99. Neomeris mucosa, N. Cokerii; Acetabulum pusillum, A. polyphysoides; A. p. deltoideum; Halimeda lachrymosa; Udotea spinulosa. (Mar. 4, 1909.)

OBSERVATIONS AND NEW SPECIES.

The genus Dondia, in so far as it is represented in our Bahamian collections, may be considered as follows:

DONDIA Adans. Fam. 2:261. 1763.

Type species: *Chenopodium altissimum* L. Sp. Pl. 221. 1753.

Stamens as long or longer than the calyx; anthers exserted.

Leaves 3–5 cm. elongated-linear; sepals strongly hooded. 1. **D. linearis.**

Leaves 4–7 mm. narrowly-oblong; sepals simply inflexed. 2. **D. Wilsonii.**

Stamens shorter than the calyx; anthers included.

Leaves 1–3 cm. linear; sepals carinate-hooded. 3. **D. carinata.**

Leaves 2–4 mm. oblong to ovate-spatulate; sepals simply inflexed. 4. **D. insularis.**

1. **Dondia linearis** (Ell.) Heller Cat. N. A. Pl. 69. 1900.

Salsola linearis Ell. Carol. 1:332. 1821.

Saline borders and maritime rocks. Andros, at Red Bays, *Northrop 455*. Eleuthera, Rock Sound vicinity, *Britton & Millspaugh 5563*:— North Carolina to South Florida and Texas; Cuba.

Referred by Mrs. Northrop to *D. fruticosa* (Forsk.) an Asiatic species.

2. **Dondia Wilsonii** sp. nov.

Annua? ramis ad rhizomam brevam divergentibus 1–3 dm. longis; foliis separatis inapproximatis anguste-oblongis 4–7 mm. longis 0.7–1 mm. crassis ad apicem rotundatis, breve petiolatis vel subsessilis; flores 1–2 in axillam foliorum supremis, 1.5–2 mm. latis; sepalis ovatis, acutis, apice inflexis; stamina in longitudinem prope sepalas, filamentae antheram tres partes longior, cellulae antherarum ad apicem contiguuae. Fructus ignotus.

Margins of salt pans. South Caicos Island, *Percy Wilson 7616* **Type.**

3. **Dondia carinata** sp. nov.

Herba perennis; ramis ad basim lignosis, erectis, 1.5–2.5 dm longis; foliis approximatis, anguste-linearis, 1.3 cm. longis, 0.8–1 mm. crassis, apiculatis, ad basim attenuatis, amplexicaulibus; inflorescentia fere unica in axilas supremis foliorum bracteacearum depositis, 2–2.5 mm. latis; sepalis scaphoideis, obtusis, apice cucullatis, carinatis; stamina sepalas medio longo, cellulae antherarum plus minus didymae filamentae aequalia; semina nigerrima nitida, 1.4 x 1 mm.

Borders of savannas. South Bimini, margin of a mangrove swale, *Millspaugh 2361*. New Providence, near Nassau, *Northrop 150* **Type,** *194*. Inagua, near Blakeville, *Nash & Taylor 1121*:—Cuba, *C. Wright 2030* in Herb New York Botanical Garden; on coast near the mouth of the Bueyraca, *Britton & Wilson 54*.

Referred by Mrs. Northrop to *D. linearis* (Ell.) Heller.

4. **Dondia insularis** Britton Bull. N. Y. Bot. Gard. 4: 138. 1906.

In a salina. Grand Turk Island, *Nash & Taylor 3873* **Type.**

This species has somewhat the habital appearance of the South Florida D. conferta Small, which, however, has larger flowers and filaments longer than the sepals.

The genus Portulaca, in so far as it is represented in our Bahamian collections, may be considered as follows:

PORTULACA L. Sp. Pl. 445. 1753.

Type species: *Portulaca oleracea* L. infra.

Leaves flat.	1. **P. oleracea.**
Leaves subterete.	
Flowers yellow; seeds brown.	2. **P. phaeosperma.**
Flowers purple; seeds black.	3. **P. gagatosperma.**

1. **Portulaca oleracea** L. Sp. Pl. 445. 1753.

Cultivated soil, waste places, and maritime rocks. Gun Cay, *Millspaugh 2320*. Andros, Cormorant Cay, *Northrop 658;* Road to Morgan's Bluff, *Brace 6675*. Eleuthera, Savanna Sound, *Hitchcock;* Governor's Harbor vicinity, *Britton & Millspaugh 5457, Hitchcock*. Fortune Island, *Brace 4148*. Crooked Island, Marine View Hill, *Brace 4773*. Inagua, *Hitchcock*. Far more common than the actual collections indicate:—All temperate and tropic regions.

2. **Portulaca phaeosperma** Urban, Symb. Ant. 4:233. 1905.

Dry, rocky, and cultivated soil. Great Bahama, West end, *Brace 3529*. Great Sturrup Cay, *Britton & Millspaugh 2258*. Andros, Conch Sound, *Northrop 580;* Fresh Creek, *Wight 260;* Mangrove Cay, *Brace 4871, 4920;* Pure Gold, *Brace 5047*. New Providence, Farringdon Road, *Britton & Brace 196*. Eleuthera, Savanna Sound, *Hitchcock;* Governor's Harbor, *Hitchcock*. Great Galiot Cay, *Britton & Millspaugh 2858*. Watling's Island, *Hitchcock*. Long Island, Clarencetown vicinity, *Britton & Millspaugh 6256*. Fortune Island, *Hitchcock*. Acklin's Island, Jumbie Hole, *Brace 4452*. Mariguana, Southeast Point, *Wilson 7566*. Doubtless throughout the Archipelago:—South Florida; Cuba to St. Croix; Jamaica.

Referred by Mrs. Northrop to *P. halimoides*, and by Profs. Hitchcock and Coker to *P. pilosa*.

3. **Portulaca gagatosperma** sp. nov.

Annua suffruticosa diffusa; ramis numerosis nodibus lanato-pilosis; foliis alternis brevis 6–10 mm. longis 1.5–2 mm. latis subcylindricis acuminatis breve petiolatis; inflorescentia terminalia flores ad basim lanatis pedicelis longis, lobae calycis late ovatis apiculatis non carinatis, petala purpureis emarginatis, stylis elongatis longitudae tertia 3–4-partitis; capsula 4 mm. lata infra media circumcissis, semina 0.6 mm. diam. nigerissima rugae stellulatae conjunctae in centro non mamillatae.

In waste soil and the mud of pond borders. Great Bahama, at Eight Mile Rocks, *Britton & Millspaugh 2411*. New Providence, *Brace 368* (Anno 1880); Lake Cunningham, *Britton & Brace 637*, Inagua, *Nash & Taylor 1064* **Type**; *Hitchcock*. Grand Turk Island, *Nash & Taylor 3791*.—Endemic.

Referred by Prof. Hitchcock to *P. pilosa*.

Cassia tora Linn. Sp. Pl., 376. 1753.

The only specimen of this species that I have seen from our region is the one collected by Prof. *Hitchcock* at Governor's Harbor, Eleuthera. This was referred by him to C. obtusifolia.

Cassia bicapsularis Linn. Sp. Pl., 376. 1753.

The first return of this species from the Bahamas is Mr. *Wilson's 7739* collected in the vicinity of Kew, North Caicos.

Kallstroemia maxima (Linn.) W. & A. Prodr., 145. 1834.

Rarely seen in the Bahamas. Our only specimens are: *Britton & Brace 784* from waste places at Nassau, New Providence; *Rothrock*, and *Hitchcock* from Fortune Island.

§ EUPHORBIEAE.

As concerns this area the *Euphorbicae* may be considered as follows:

Male and female flowers together in an involucre.
  Involucre calceiform, glands internal. 1. **Pedilanthus.**
  Involucre campanuliform, glands external.
    Glands with petaloid appendages.
      Leaves inaequilateral, oblique at the base. 2. **Chamaesyce.**
    Glands without petaloid appendages.
      Herbs or suffrutices, leafy throughout.
        Leaves alternate below, opposite above, inflorescence solitary or cymose. 3. **Poinsettia.**

Leaves scattered or whorled, inflorescence umbelliform. 4. **Tithymalus.**
Trees, leafy only at tips of branches. 5. **Euphorbiodendron.**
Shrubs or trees, without true leaves.
Stems woody, articulate. 6. **Arthrothamnus.**
Stems fleshy, ribbed, or tuberculate, often with spines or thorns. 7. **Euphorbia.**

1. **PEDILANTHUS** Poit. Ann. Mus. Par., 19:390. 1812.

Type species: *Euphorbia tithymaloides* Linn. Sp. Pl., 453. 1753.

1. **Pedilanthus tithymaloides** (Linn.) Poit. Ann. Mus. Par., 19:390. 1812.

Euphorbia tithymaloides Linn. Sp. Pl., 453. 1753.

About dwellings and escaped to coppices. Andros and Cat Islands southward to Grand Turk Island:—South Florida, West Indies, Mexico, Central and South America, Old World Tropics and Sub Tropics.

2. **CHAMAESYCE** S. F. Gray, Nat. Arr. Brit. Pl., 2:260. 1821.

Type species: *Euphorbia peplis* Linn. Sp. Pl., 652. 1753.

Suffrutices, leaves thick, mostly entire.
Leaves ovate.
Inflorescence terminal, clustered.
Plants glabrous. 1. **buxifolia.**
Plants densely hairy. 2. **cayensis.**
Inflorescence axillary, solitary.
Leaves glabrous
entire, stipules deltoid acicular-bristled. 3. **Wilsonii.**
stipules aristate, not bristled. 4. **lecheoides.**
dentate, at least at the apex. 5. **exumensis.**
Leaves canescent, entire. 6. **Bracei.**
Leaves linear-oblong, glabrous. 7. **vaginulata.**
Herbaceous, leaves thin, mostly serrate.
Leaves glabrous.
Inflorescence clustered.
Leaves oblong, acute, sharply serrate.
broadly falcate, seeds red. 8. **hypericifolia.**
narrowly falcate, seeds black. 9. **brasiliensis.**
Inflorescence solitary.
Leaves ovate, blunt, dentate, or entire.
Capsules glabrous. 10. **Blodgettii.**
Capsules hairy on the angles. 11. **prostrata.**
Leaves hairy.
Inflorescence clustered.
Leaves ovate-lanceolate, sharply serrate, acute. 12. **hirta.**

Leaves ovate, crenate-dentate, obtuse. 13. **Berteriana.**
Inflorescence solitary.
Leaves orbicular or rotund, entire or apically dentate.
14. **Brittonii.**

1. **Chamaesyce buxifolia** (Lam.) Small, Fl. S. E. U. S., 712. 1903.
Euphorbia buxifolia Lam. Encyc., 2:421. 1786.

Maritime sands throughout the Archipelago:—Coasts of the Gulf of Mexico and the Caribean Sea.

2. **Chamaesyce cayensis** (Millsp.). comb. nov.
Euphorbia cayensis Millsp. Torrya, 4:172. 1904.

Coastal whitelands of Joulter's Cays and the Berry Islands:—Endemic.

3. **Chamaesyce Wilsonii** sp. nov.

Glabra purpureo-cinerea diffuso-prostratis multo-remosissimis, ramis tenuissimis divaricatis, foliis carnosis ovatis basi oblique auriculo-cordatis apice obtusis margine integris, stipulis deltoideis blepharo-ciliatis, involucris in dichotomia superiori terminalibusque solitariis cylindro-campanulatis brevissime pedicelatis extus glabris intus dense crispulo-pilosis lobis aristatis glandulis 4 orbiculatis convexis appendices rudimentariis glandulis quintus lobo triangularibus amplior representavit, stylis brevibus stigmata bilobis, capsulae ovatis coccis laeve carinatis, seminibus triangularibus albis angulis acutis faciem laevis.

Plants rosulate prostrate 14–20 cm. in diameter; leaves 2–4 mm. long, 1.5–2.5 mm. broad, seeds 1 mm. x.7 mm.

Whitelands of Castle Island, *Wilson 7795*, type in herb. Field Museum, sheet no. 221,916:—Endemic.

4. **Chamaesyce lecheoides** (Millsp.). comb. nov.
Euphorbia lecheoides Millsp. Field Mus. Bot., 2:163. 1906.

Scrublands of Inagua and Grand Turk Island:—Endemic.

5. **Chamaesyce exumensis** sp. nov.

Glabra purpureo- aut virido-cinerea, caulibus multo-ramosissimis erectis vel declinato-prostratis denudatis ramisque strictis ad articulos brevissimos nodosis, ramis secundariis subtenuis divaricatis, foliis crassis ovatis petiolatis ad basim obliquo-cordatis ad apicem obtusis vel acutis margine integris saepe remote-dentatis praesertim ad apicem discerni potest, stipulis aristatis, involucris in dichotomia superiori terminali-busque solitariis turbinatis brevi pedicelatis extus glabris intus dense barbatis lobis triangularibus ad apicem setaceis glandulis 4 ovatis planis appendice alba integra glandulis quintus lobo triangularibus amplior representavit, staminibus 5 filamentae ad basim cristato-barbatis stylis brevibus profunde bifidis, capsulae ovatae coccis acute-carinatis, semini-bus triangularibus roseo-cinereis farinosis angulis prominens fere rotundis faciem transverse et leve anastomoso-rugosis.

Plants 30 cm. to 1.5 m. tall; leaves 3–10 mm. long, 2–6 mm. broad; seeds 1.1 mm. long, .8 mm. broad. The plants have much the general appearance of C. cayensis though the likeness entirely disappears on intimate examination.

Coastal sands and whitelands and sand filled pockets in rocks. Great Exuma, on Stocking Island, *Britton & Millspaugh 3071* **type** in herb. Field Museum sheet No. 174,208. Eleuthera, at the southernmost end, *Britton & Millspaugh 5620*. Little San Salvador, *Britton & Millspaugh 5666*. Cat Island, the Bight vicinity, *Britton & Millspaugh 5804*. Ship Channel Cay, *Britton & Millspaugh 2747*. Cay north of Wide Opening, *Britton & Millspaugh 2777, 2779*. Conception Island, *Britton & Millspaugh 5987, 5996*. Watling's Island, Cockburntown vicinity and at Graham's Harbor, *Britton & Millspaugh 6143, 7239*. Rum Cay, at Port Nelson, *Coker 452; Brace 3927*. Long Island, Clarencetown vicinity, *Britton & Millspaugh 6323*. Great Ragged Island, *Wilson 7807*. Crooked Island, Landrail Point, *Brace 4588*. Fortune Island, on the south side, *Brace 4179*:—Endemic.

Referred to by Prof. Coker as *Euphorbia cayensis* Millsp.

In Praenuncia I, I remarked upon this plant under *Euphorbia flexuosa* Kth. Since then I have had an opportunity of examining the type of Kunth's species and found, as I apprehended, that our species is plainly distinct from his, which, in reality, is a true Chamaesyce buxifolia.

6. **Chamaesyce Bracei** (Millsp.) comb. nov.

Euphorbia Bracei Millsp. Field Mus. Bot., 2:159. 1906.

Whitelands of Abaco and Man-o-War Cay:—Endemic.

7. **Chamaesyce vaginulata** (Griseb.) comb. nov.

Euphorbia vaginulata Griseb. Fl. Brit. W. I., 52. 1859.

Rocky whitelands. Inagua, Little Inagua and Grand Turk Island:—Endemic.

8. **Chamaesyce hypericifolia** (Linn.) comb. nov.

Euphorbia hypericifolia Linn. Sp. Pl. 454. 1753.

In open and grassy situations in good soils throughout the archipelago:—Bermuda, the southern United States, West Indies, Mexico to South America. Old World tropics.

9. **Chamaesyce brasiliensis** (Lam.) Small, Fl. S. E. U. S., 712. 1903.

Euphorbia brasiliensis Lam. Dict., 2:423. 1790.

Open places and grassy coverts of New Providence and Eleuthera:—South Florida to Arizona and southward to Brazil; the West Indies.

The most apparent characters separating this species from its near

congeners are: its tenuous branchlets, short-ciliate stipules, and its black seeds with but two ridges transversing the dorsal facets.

10. **Chamaesyce Blodgettii** (Engelm.). Small, ibid.

Euphorbia Blodgettii Engelm. Hitchc. in Rep. Mo. Bot. Gard., 4:126. 1893.

On rocks, sands, whitelands, and in pot holes throughout the archipelago from the southern coast of Great Bahama southward:—South Florida, Jamaica, and the Caymans.

11. **Chamaesyce prostrata** (Ait.) Small, ibid. 713.

Euphorbia prostrata Ait, Hort. Kew., 2:139. 1789.

Grassy places on New Providence and Grand Turk Island:—Bermuda; North Carolina to Missouri and southward to Brazil and Peru; the West Indies.

12. **Chamaesyce hirta** (Linn.) comb. nov.

Euphorbia hirta Linn. Sp. Pl., 454 ante. 1753

Euphorbia pilulifera Linn. Sp. Pl., 454 post. 1753.

Both the erect and the prostrate form (*Euphorbia pilulifera* var. *procumbens* Boiss.) are frequent in cultivated grounds and along paths from Andros and New Providence to Inagua:—Bermuda; South Florida; the West Indies and Mexico; American and Old World tropics.

The species exists in three forms: the ascending or erect form (*Euphorbia pilulifera* and *hirta* Linn., *E. globulifera* Kunth., *E. capitata* Lam.); the same but with purple-tinged or maculate leaves (*E. pilulifera discolor* Engelm.); and the decumbent or prostrate form (*E. pilulifera procumbens* Boiss., *E. procumbens* D. C., *E. ophthalmica* Pers., *E. obliterata* Jacq., *E. gemella* Lag.). I cannot concede even varietal rank to these forms, especially as plants exist in this herbarium having *E. pilulifera* and *E. pilulifera procumbens* springing from the same rootstock; and others with *E. pilulifera* and *E. pilulifera discolor* on the same stem. All plants in our region having multicellular amber-colored hairs and ovate, acute, sharply serrate leaves, are the species.

13. **Chamaesyce Berteriana** (Balb.) comb. nov.

Euphorbia Berteriana Balbis, in Spr. Syst., 3:794. 1826.

Redlands of Exuma, Long Island, Atwood's Cay, Mariguana and Castle Island:—Hayti and Porto Rico southward to Guadeloupe and Martinique.

14. **Chamaesyce Brittonii** (Millsp.) comb. nov.

Euphorbia Brittonii Millsp. Field Mus. Bot., 2:159. 1906.

Whitelands of New Providence near Nassau:—Endemic.

3. **POINSETTIA** R. Grah., Edinb. N. Phil. Jour., 20:412. 1836.

Type species: *Euphorbia pulcherrima* Willd. ex Klotzsch in Otto & Dietr. Allg. Gartenz. 2:27. 1834.

1. **Poinsettia heterophylla** (Linn.) Kl. & Gke., Tricocc., 104. 1860.
Euphorbia heterophylla Linn. Sp. Pl., 649. 1753.

Grassy places in good soil, throughout the archipelago:—Bermuda; Illinois to Montana southward to Florida, the West Indies, Mexico, Central America, and South America tropics.

From thorough field examination in a large number of localities I am convinced that the supposed *E. havanensis* Willd. of South Florida and the Bahamas is nothing more than a form of the above species. Not only is this form very frequently found intermixed with the species but the two occur often upon the same plant. There are in this herbarium several sheets that show two forms of this species growing upon the same stem. Of these the Bahamian instances are as follows:

Poinsettia havanensis (Willd.) *Euphorbia havanensis* Willd. Boiss.,
and D. C. Prodr., 15:73 1862.
Poinsettia graminifolia (Mx.) *Euphorbia graminifolia* Mx. Fl. Bor. Am., 2:210. 1803.

Collected at the southeast end of Watling's Island by Mr. Percy Wilson *7317* together with the next:

Poinsettia havanensis (Willd.)
and
Poinsettia cyathophora Kl. & Gke., Tricocc., 104. 1859.

Collected by Mr. Wilson with the last and under the same field number; and from Abaco and Great Bahama by Mr. Brace *1503, 3499*.

Poinsettia heterophylla (Linn.) Kl. & Gke.
and
Poinsettia prunifolia Kl. & Gke. ibid.

Collected on New Providence at Nassau by Mr. Curtiss, *73*.

Poinsettia heterophylla (Linn.) Kl. & Gke.
and
Poinsettia havanensis (Willd.).

Collected on Eleuthera near Governor's Harbor by Britton & Millspaugh *5536;* this colony also showed a large number of pure *heterophylla* and of pure *havanensis.*

4. **TITHYMALUS** Adans. Fam., 2:355. 1763.

Type species: *Euphorbia Peplus* L. Sp. Pl., 456. 1753.

1. **Tithymalus trichotomus** (Kth.) Kl. & Gke., Tricocc., 81. 1860.
Euphorbia trichotoma (Kth.) in H. B. K. Nov. Gen. et Spec., 2:60. 1817.

Coastal sands on Allen's Cay, Great Bahama and Andros:--South Florida; Cuba, and the Cayman Islands.

5. EUPHORBIODENDRON gen. nov.

Arbores, arbusculae vel frutices latex ex vulneribus profunderunt. Ramis crassiusculis inferne denudatis cicatricosis superne ad ramis terminalibus foliosis. Folia sparsa, integra saepe ampla. Cymae corymbosae 1-pleurocephalae ex axillis supremis vel subterminalibus. Involucrum majusculum; glandulis quinis; styli inferne plus minus longe coaliti, longiusculi bifidi, apice rarius incrassati. Semina laevia semper ecarunculata. § *Laurifoliae* Boiss. in D. C. Prodr., 15:105.

1. **Euphorbiodendron gymnonotum** (Urban) comb. nov.

Euphorbia gymnonota Urban, Symb. Antill., 4:396. 1908.

Coppices. Watling's Island, and Fortune Island to Inagua:—Endemic.

Referred to in Praenuncia-I as *Euphorbia punicea;* also by Grisebach, Hitchcock, and Coker.

The other species in this genus are:

EUPHORBIODENDRON PUNICEUM (Sw.) comb. nov.

Euphorbia punicea Sw., Prod. Veg. Ind. Occ., 76. 1788.

Poinsettia punicea Kl. & Gke., Tricocc. 102. 1860.

Habitat:—Jamaica.

EUPHORBIODENDRON HELENAE (Urban) comb. nov.

Euphorbia Helenae Urban, Symb. Antill., 4:393. 1908.

Euphorbia punicea Griseb., Fl. Br. W. I., 53. 1862.

Habitat:—Cuba.

EUPHORBIODENDRON TROYANUM (Urban) comb. nov.

Euphorbia troyana Urban loc. cit., 394.

Habitat:--Jamaica.

EUPHORBIODENDRON FULVUM (Stapf) comb. nov.

Euphorbia fulva Stapf, Bul. Kew., 294. 1907.

Euphorbia elastica Alt. & Rose, Bul. Inst. Med. Nac. Mex., 1:1905 non Jumelle.

Habitat:—Mexico.

EUPHORBIODENDRON CALYCULATUM (Kth.) comb. nov.

Euphorbia calyculata Kunth in H. B. K. nov. Gen. et Sp., 2:59. 1817.

Tithymalus calyculatus Kl. & Gke., Tricocc., 81. 1860.

Habitat:—Mexico.

EUPHORBIODENDRON LATAZI (Kth.) comb. nov.

Euphorbia Latazi Kunth, loc. cit., 58.

Habitat:—New Grenada.

EUPHORBIODENDRON CESTRIFOLIUM (Kth.) comb. nov.

Euphorbia cestrifolia Kth. loc. cit., 59.

Habitat:—Peru.

EUPHORBIODENDRON CUBENSIS (Boiss.) comb. nov.
Euphorbia cubensis Boiss. in D. C. Prodr., 15:1265. 1864.
Habitat:—Cuba.

EUPHORBIODENDRON DUSSII (Kr. et Urban) comb. nov.
Euphorbia Dussii Kr. & Urban, in Duss. Fl. Ant. Franc., 44. 1897.
Habitat:—Martinique.

EUPHORBIODENDRON GUDOTI (Boiss.) comb. nov.
Euphorbia Gudoti Boiss., loc. cit., 106. 1862.
Habitat:—New Grenada.

EUPHORBIODENDRON LAURIFOLIUM (Juss.) comb. nov.
Euphorbia laurifolia Juss. in Lam. Dict., 2:418. 1790.
Habitat:—Peru.

EUPHORBIODENDRON SINCLAIRIANUM (Bth.) comb. nov.
Euphorbia Sinclairiana Benth. in Bot. Voy. Sulph., 163. 1844.
Habitat:—Panama region.

6. **ARTHROTHAMNUS** Kl. & Gke. Monatsb. Akad. Berl., 251. 1859.
Type species: *Euphorbia tirucalli* L. Sp. Pl., 452. 1753.

1. **Arthrothamnus cassythoides** (Boiss.) comb. nov.
Euphorbia cassythoides Boiss. Cent. Euph., 20. 1860.
Sandy soil. Andros:—Cuba.

7. **EUPHORBIA** Linn. Sp. Pl., 450. 1753.
Type species: *Euphorbia antiquorum* Linn. Sp. Pl., 450. 1753.

1. **Euphorbia lactea** Haw. Pl. Succ., 127. 1812.

Widely escaped from cultivation and in many places forming dense thickets. New Providence, Cat Island, Watling's, Long Island and Inagua:—West Indies and Mexico. Naturalized from India and the Maluccas.

Referred by Mrs. Northrop and Prof. Hitchcock to *Euphorbia antiquorum*.

Croton Cascarilla.

On account of the doubt that has surrounded this species, as well as the interest in Cascarilla bark economically, it has been the object of special investigation by all of our collectors. No plant agreeing with the plate of Catesby has been found. Wherever we have seen the bark gathered for the market, or for native use, it has been called Sweetwood bark and was taken from the stems and branches of Croton eluteria (L.) Sw. (*Clutia eluteria* Linn.). Linnaeus himself says, in his Flora

Zeylanica, that Sweet bark and Cascarilla are the same; and in his Materia Medica that Cascarilla bark is the *Ricinoides elaeagni folio* of Catesby. Catesby says, in the place referred to by Linnaeus (Carolina 2:46), "*An Ricinoides Aeleagini folio.* The Ilathera bark. These shrubs grow plentifully on most of the Bahama Islands; seldom above ten Feet high, and rarely so big as a Man's Leg" etc. On page xxxviii he refers to the natives collecting Ilathera bark as a means of support, and to the fact that Cascarilla bark is another common name just as frequently used among the natives.

The remarks of Catesby, his description, and the references of Linnaeus all indicate plainly that he depicts in his plate 46 the plant from which the common product is gathered. This must bear the name Croton eluteria (Linn.) Sw. As to the drawing, that has proved so misleading to all authors since its appearance on account of the narrow leaves and long petioles depicted, one need only examine his plates 40 (Rhus Metopium) and 42 (Jacaranda caerulea) of vol. i, to be assured of his inaccuracy in the matter of proportions.

There remain not the least doubt but that Linnaeus' *Clutia Cascarilla* is synonymous with his Clutia Eluteria, and that his *Croton Cascarilla* of the second edition of the Species Plantarum, and Bennett's *Croton Cascarilla* of the Journal of the Linnean Society, 4:30, 1860, (of which I have had the opportunity to examine the type) are synonymous with the Croton linearis of Jacquin.

The synonomy of the two species is as follows:

Croton eluteria (L.) Sw. Prod. Veg. Ind. Occ., 100. 1788.

Clutia eluteria Linn. Sp. Pl., 1042 (ante). 1753.

Clutia Cascarilla Linn. Sp. Pl., 1042 (post). 1753.*

Croton Cascarilla Benn. Jour. Linn. Soc., 4:30. 1860, as to references.

Once common in the Bahamas but becoming quite scarce.

Croton linearis Jacq. Pl. Carib., 32. 1760.

Croton cascarilla Linn. Sp. Pl., ed. 2:1424. 1763. Excluding reference to Catesby.

Croton cascarilla Benn. Jour. Linn. Soc., 4:30. 1860 as to his specimen and the description.

Croton Fergusonii Small, Fl. Southeastern U.S., 695. 1908.

Croton cascarilla var. *lincaris* Willd. Sp. Pl., 4: 532. 1805.

A very common coastal species showing a multitude of races in the Bahamas, the extremes of leaf form being:

*Linnaeus draws his description of this species from Catesby's plate 46. vol. ii, and errs in his statement "Habitat in Carolina." Catesby says "Bahama."

Leaves linear 4.5 cm. x 1.5 mm. Eleuthera, *Britton & Millspaugh 5551*.

Leaves linear-oblong 5.5 cm. x 0.8 cm. Watling's Island, *idem 6164*.

Leaves oblong-lanceolate 3.5 cm. x 1 cm.
Leaves elliptic-oblong 4 cm. x 1.5 cm.
Leaves obovate 2.2 cm. x 1.3 cm.
} On same plant but different branches. Watling's, *idem 6177*.

Croton bahamensis sp. nov.

Frutex 1–2 m. alt. sub-di-trichotome ramosus pipero-aromaticus ramis ramulisque teretis infra glabris supra stellato (albo) tomentosis, foliis petiolis limbum 4-plo brevioribus penninervio basi 2-patellari glanduligeris lanceolatis acuminatis mucronatis ad basim breviter oblique-rotundatis, supra viridis ex equae distans stellato-pubescentibus subtus dense stellato-tomentosus, stellae ad centro granularibus, margine subintegris vel crenato-dentatis cum tota sinu stipitato-glandulosis, stipulis fimbriatis stipitato-glandulosis; racemis terminalibus subdensifloris, calycis foem. laciniis oblongis tota stellato-pilosis stylis ad basi 4-fidis monile-villosis stigmae circinnatae, calycis masc. non glanduligeris, petala alba cymbiforma apice minute fimbriata staminibus 35–50; capsulis globosis profunde sulcatis infra glabris supra et in sulcam longe pilosis, seminibus nigro-fuscis coccinelliformis, rugae laeve costaeformae, carunculo gilvo-cereo.

Near C. humilis. Leaves 3–7 cm. long, 0.6–1.8 cm. broad; capsules 4 mm. diameter; seeds 3 mm. long, 2 mm. broad.

Open pastures and in thickets bordering openings. Eleuthera, near Rock Sound, *Britton & Millspaugh 5574* **type** (4 sheets of same in herb. Field Museum Nos. 198402–3–4–5). Cat Island, Port Howe vicinity, *Britton & Millspaugh, 5954, Hitchcock, Rothrock 566*. Conception Island, *Britton & Millspaugh 6021*. Watling's Island, Graham's Harbor to Columbus' Monument, *Britton & Millspaugh 6176*, Southeast End, *Wilson 7330*. Mariguana, Abraham Bay vicinity, *Wilson 7486*. Rum Cay, Road to Sclaters, *Brace 3979*. Long Island, old pasture near Clarencetown, *Britton & Millspaugh 6240*, and in a thicket nearby, *6246*. Fortune Island, on Hanna Hill, *Brace 4064*, and Cove Road to the southside *4165*. Acklin's Island, at Spring Point, *Brace 4293*.

Referred to in Praenuncia I and by Prof. Hitchcock as C. humilis.

Centaurium Brittonii Millspaugh & Greenman, sp. nov.

Herba annua pusilla erecta 5–15 cm. alta glaberrima a basi plerumque ramosissima ; caulibus quadrangularibus et plus minusve anguste alatis

subdichotomo-ramosis; foliis oppositis sessilibus, primis oblongo-spathulatis, ceteris oblongo-lanceolatis vel linearis 3–12 mm. longis 15mm. latis plerumque acutis integris; floribus longe pedicellatis tetrameris, pedicellis gracilis usque ad 2 cm. longis; calyce circiter 5 mm. longo, laciniis lineari-attenuatis tubo multo longioribus; corolla alba 6–10 mm. longa, lobis elliptico-oblongis 4–4.5 mm. longis retusis vel irregulariter et minute dentatis; stigmate bilamellato; capsula elliptico-lanceolata circiter 8 mm. longa e calyce persistente exsertis; semina subsphaerica foveolato-reticulata.

A low, much-branched annual having much the aspect of CENTAURIUM DIVARICATUM (Schaffner) Millsp. & Greenm. comb. nov. (*Erythræa divaricata* Schaffn. ex. Schlecht. Bot. Zeit., 1855, p. 920), but readily distinguished by its profuse subdichotomous branching and small white flowers; from C. tetramerum (Schiede) Eastw., a species of similar habit and tetramerous flowers, C. Brittonii differs in having white flowers with retuse or minutely dentate corolla-lobes and smaller capsules.

Sandy roadsides and rocky scrublands. Watling's Island, northwest of Cockburntown, March 15, 1907, *Britton & Millspaugh 6224* (hb. Field Mus. cat. No. 198651) **Type.** Great Exuma, near Georgetown, Feb. 22, 1905, *Britton & Millspaugh 3125.* Eleuthera, vicinity of Eleuthera Point, Feb. 24, 1907, *Britton & Millspaugh 5632.*

Heliotropium Nashii sp. nov.

Caulibus suffruticosis prostratis diffusis ramosissimis glabris; foliis sessilis cum pila griseo strigosis laxe vestitis oppositis ascendentibus ovatis acuminatis 1.5–2 mm. longis 0.8–1 mm. latis internodam aequalibus margine integris non revolutis; inflorescentia in axilis supremis solitariis, flores sessilis vel subsessilis, sepalae ovatis acuminatis inaequalis vix a foliis recens discerni potest, corallae albae 2 mm. longae lobis ovatis acuminatis inequalibus patentibus tubum tres partes brevior; staminae sessilis ad tubo corrollam supramedium coalitis; stylus ovariam semel brevior crassis erectis, stigma incrassata peltata 4-lobata apice producto mamillata; drupa ovata 1 mm. diam. plane sulcatim in carpellae quatior, seminae cuneiformae facies duo planis tertius (dorsalis) convexis.

Scrublands. Inagua, near Mathewtown, *Nash & Taylor, 1011* **Type;** *Hitchcock, Dec. 3, 1890.*

Referred by Prof. Hitchcock to *H. microphyllum* Sw.

The genus Varronia, in so far as it is represented in our Bahamian collections, may be considered as follows:

VARRONIA P. Br. Hist. Jam., 172. 1756.

Type species: *Lantana corymbosa* L. Sp. Pl., 628. 1753.

Flowers in globose heads.

Calyx teeth filiform; leaves coarsely dentate. 1. **V. globosa.**

Calyx teeth deltoid; leaves entire or few toothed. 2. **V. bahamensis.**

Flowers in spikes.
Leaves linear-oblong; filaments pilose at the base. 3. **V. Brittonii.**
Leaves spatulate-obovate; filaments not pilose. 4. **V. lucayana.**

1. **Varronia globosa** Jacq. Enum. Pl. Carib., 14. 1760.

Cordia globosa H. B. K. Nov. Gen. et Sp., 3: 76. 1818.

Scrublands and old fields. Andros, at Kemp Bay, *Brace 5028.* Watling's at the north end, *Britton & Millspaugh 6208.* Long Island, near Clarencetown, *Britton & Millspaugh 6223, Coker 501:*—Florida Keys; Cuba to Porto Rico; Jamaica; Grand Cayman. Also credited to the French Antilles, Venuezula, and Panama.

2. **Varronia bahamensis** (Urban), comb. nov.

Cordia bahamensis Urban Symb. Ant., 1: 392. 1899.

Coppices, scrublands, pinelands, and whitelands. Man-o-War Cay, *Brace 1586.* Abaco, at Marsh Harbor, *Brace 1601.* Great Bahama, at Barnett's Point, *Britton & Millspaugh 2645;* at Eight Mile Rocks, *Brace 3733,* and at West End, *Brace 3536.* Andros, at Nichol's Town, *Northrop 376, Brace 6719, 6842;* along road to Conch Sound, *Brace 6822;* Mastic Point vicinity, *Brace 7095.* New Providence, at Waterloo, *E. G. Britton 6620;* at Fox Hills, *Wight 194;* near Carmichael, *Eggers 4193;* near Nassau, *Hitchcock, Coker 77, 106, Curtiss 78;* Blue Hills, *Millspaugh 2075;* at South Beach, *Britton 47, Millspaugh 2119;* along Fox Hills road, *Britton & Brace 373.* Eleuthera, along path from Harbor Island to Spanish Wells and from Harbor Island to the Bluff, *E. G. Britton 6494, 6516;* along the path from the Glass Window to Harbor Island, *Britton & Millspaugh 5384, 5401;* Governor's Harbor vicinity, *Britton & Millspaugh 5456, Hitchcock;* Rock Sound vicinity, *Britton & Millspaugh 5580.* Conception Island, *Britton & Millspaugh 5993.* Cat Island, Orange Creek vicinity, *Britton & Millspaugh 5761;* at Port Howe, *Hitchcock;* at the southwest end, *Wilson 7199.* Watling's, Cockburntown vicinity, *Britton & Millspaugh 6058, Wilson 7209;* at the southeast end, *Wilson 7264; Hitchcock.* Rum Cay, near Port Nelson, *Coker 443, Brace 3972.* Great Guana Cay, *Britton & Millspaugh 2893.* Great Exuma, near Georgetown, *Britton & Millspaugh 2924.* Long Island, Clarencetown vicinity, *Britton & Millspaugh 6296.* Crooked Island, at Landrail Point, *Brace 4648.* Fortune Island, *Hitchcock, Brace 4038.* Mariguana, Abraham Bay vicinity, *Wilson 7498,* Inagua, *Hitchcock:*—Endemic.

The species includes a large number of races the extremes represented in the collections being: *Brace's 3536,* from the west end of Great Bahama, with leaves 1.5–2.5 cm. long and 0.4–0.7 cm. wide and on young shoots 5.5–6.5 cm. long and 1.5–2 cm. broad; and *Britton &*

Millspaugh 6058, from Watling's near Cockburntown, with leaves 4.4–5 cm. long and 2–3 cm. broad and on young shoots 7–8 cm. long by 3.5–4 cm. broad.

The species is referred by Mrs. Northrop to *Cordia lima* R. & S., and by Prof. Hitchcock to *Cordia globosa* H. B. K. and *Cordia sp.*

3. **Varronia Brittonii** sp. nov.

Ramis teretibus tenuis glabris junioribus pulverentis; foliis 1.5–3 cm. longis 2.5–4 mm. latis, linearo-oblongis ad basim cuneatis ad apicem truncatis vel rotundatis raro acutis infrequens crenato-dentatis, pagina minute scabris et resino-punctatis; pedunculis terminalibus spicis aequalibus vel brevioribus; calyce pulverentis corollam duplo brevioribus, limbus 4–5 dentatis dentibus deltoideus, corollae 5-lobatis lobis deltoideis vel triangulo-ovatis inaequaliter et diversiter repando-dentatis; filamentae ad tubo corollam infra medium coalitis ad basim pilosis antheram longioribus, antherae in corollam inclusit; drupa 2–2.5 mm. longis in calyce persistens plane inclusis.

The species differs from V. bahamensis it its spicate inflorescence, leaf form, size and texture and all its minor characters. It differs from V. angustifolia Desv. (*Cordia angustifolia* R. & S.) which has [type seen] narrowly lanceolate, acute, petiolate leaves, papillose-scabrous above, woolly beneath and dentate throughout the margin.

Coppices and scrublands. Great Bahama, at Eight Mile Rocks, *Britton & Millspaugh 2481* **Type**; *Brace 3710*. Andros at Fresh Creek, *Northrop 619*: at Deep Creek, *Brace 5210*. Eleuthera, at Governor's Harbor, *Britton & Millspaugh 5426*; at Gregorytown, *Coker 378*. Cat Island, Orange Creek vicinity, *Britton & Millspaugh 5737*. Long Island, near Clarencetown, *Britton & Millspaugh 6306*; *Coker 496*.—Cuba, C. *Wright 3114* in Herb. Torrey, New York Botanical Garden. This sheet has two plants attached thereto, one being this species, the other V. LEPTOCLADA (Urban & Britton) (*Cordia leptoclada* Urban & Britton in Urban Symb., 5:478).

The collections show a race with somewhat narrower leaves than those of the type.

Referred by Prof. Coker to *Cordia cylindristachya* R. & S., and by Mrs. Northrop to *Cordia angustifolia* R. & S.

4. **Varronia lucayana** sp. nov.

Frutices humilis diffusis 1–1.8m. altus, ramis teretibus glabris cicatrici foliorum delapsorum valide scabris, ramules junior nonihil ferrugineo-pulverentis; foliis 0.7–2cm. longis 0.4–0.8cm. latis obovato-spathulatis ad basim coarctatis, apice truncatis inaequaliter repando-dentatis, utrinque pagina puberulo-scabris et resino-punctatis, petiolae 1–1.5mm. longis ferrugineo-pulverentis; inflorescentia spicata ramulorum junior terminalia, spicae 1–1.5cm. longa pauciflora pedunc-

ulae 0.5–0.8 cm. longa; calyce corollam circa tres partes brevioribus, limbus 5-dentatis dentae inaequalis obtuso-triangulatis: corollae glabra alba, limbus inaequaliter 5-lobatus, lobis ovatis crenato-dentatis; filamentae ad tubo corollam supra medium coalitis ad basim non pilosis antheram brevioribus, antherae in corollam inclusit; drupa 2.5–3 mm. longa in calyce persistens semisepultus.

Rocky plains. Acklin's Island, at Spring Point, *Brace 4245*. Mariguana, near Abraham Bay and at South East Point, *Wilson 7533, 7586*. South Caicos Island, *Wilson 7672*. Inagua, on James' Hill, *Nash & Taylor 1175*. **Type**:–Endemic.

Psychotria undata Jacq. Hort. Schoenb., 3: 5. 1798.

We had several opportunities, on the north end of Watling's Island, to compare living specimens of this species with P. bahamensis Millsp.** The leaves of P. undata were, in every case, strongly wavy throughout their length, while those of P. bahamensis were always plane. P. undata is a much larger shrub and has deeper green leaves.

Catesbaea foliosa sp. nov.

§ *Erectiflorae*. Frutex aculeatus vel eaculeatus ramis validis cortice laxis albogriseis ramulis dense et minute resino-setulosis, foliis crassis fuscoviridis lineari-spathulatis vel obovatis sub-sessilis, apice obtusis raro mucronulatis margine integris revolutis supra vernicosis, flores pedicellatis, calycis dentibus subulatis obtusis explicatis minute setulosis, bacca alba globosa, seminibus rubidis ovatis planis utrinque facies ad centro umbonatis.

A thick branched, spreading shrub 1 to 2 m. high; leaves 0.8 to 1 cm. long, 2 to 6 mm. broad; fruit 3 mm. in diameter, the persistent sepals 1 mm. long; seeds 1.7 mm. long, 1.5 mm. broad.

Scrublands. Mariguana, Abraham Bay vicinity, *Wilson 7507;* five miles west of Southeast Point, *idem 7555*. Crooked Island, road to Stopper Hill, *Brace 4785; Hitchcock.** Fortune Island, Forsyth Road, *Brace 4210*, Acklin's Island, at Abercorn, *idem 4473*. Inagua, Miner's Tent to Balsam Hill, *Nash & Taylor 1272.** Grand Turk Island, *idem 3771.** Caicos Islands, on West Caicos, *Wilson 7761* **type**, in herb. Field Museum sheet No. 221880.

Referred to by Prof. Hitchcock as C. parviflora.

Callicarpa Hitchcockii sp. nov.

Frutex scandens ramis divaricatis pallido-gilvis ramulis cum cymis dense furfuraceo-ferrugineo-tomentosis, foliis bicoloribus crassis anguste oblanceolatis ad basim attenuatis ad apicem obtusis valide petiolatis, margine revolutis integris supranitidis ad nerviam profunde sulcatis infra prominente nervatis dense stellato-lanatis; cymis supra-

* Referred, in Praenuncia—I, to C. campanulata. ** Bull. N. Y. Bot. Gard., 3: 451. 1905.

axillaribus corymbosis submultifloris pedunculo petiolum bis superante folio triplo brevioribus, calyce glabris resino-punctatis obscuriter vel nequaquam dentatis; bacca glabra minute rugosa et resino-punctata.

A climbing shrub 2–3 m. high with a strong odor of fenugreek. Leaves 2–2.5 cm. long, 5–7 mm. broad, petioles 4 mm. long.

It differs strongly from C. fulva Rich. the type of which has ovate-lanceolate acuminate sharply dentate leaves up to 10 cm. long and 3.5 cm. wide (fide Briquet); from C. ferruginea Sw. which has lanceolate membranous leaves also dentate or dentate-serrate; and from C. cubensis Urban which has ovate or elliptic-ovate leaves woolly beneath (not stellate) 3 to 6 cm. long, 1.5 to 3.5 cm. broad and are subtruncate or rotund at the base.

Shrubbery edge of a rocky plain back of the settlement of Port Howe, Cat Island, *Britton & Millspaugh 5946;* The Bight, on the edge of a coppice back of The Point, *ibid. 5819;* and in the edge of a coppice over the hill East of the last station, *ibid. 5913* **type.** Prof. Hitchcock's specimens were collected at or near the first station mentioned above, in October, 1890. Mr. Brace also returns the species from a savanna on the west side of Andros Island across from Mastic Point (*7100*), and from a pine barren near Mastic Point itself (*6965*):—Endemic.

Since I included this species under *C. fulva* Rich. in Praenuncia–I, I have had the kind assistance of Professors C. de Candolle, Le Compte and Briquet in establishing its status through comparisons of our material in their herbaria, Prof. Briquet has the type of Richard's C. fulva in Linden's Cuban 2066 and has favored me with a sketch of the same which satisfies me of my error in first considering our material to be that species. Prof. Robinson, Gray Herbarium, Cambridge, Mass., has also kindly loaned this Museum the Wright sheets of Callicarpa, from Cuba, from each of which our species is distinct.

Solanum didymacanthum Millsp. Field Mus. Bot., 2: 183. 1909.

After persistent search Dr. Britton succeeded in finding this species, both in flower and ripe fruit, on Columbus' Point, near Port Howe, Cat Island, Prof. Hitchcock's and Prof. Rothrock's original station. The doubtful mark may now be removed from line 12 of the original description reading: "corolla alba (?)"; and the words "Bacca ignota" are to be replaced by: Fructae sessilae globosae aurantiaceae translucidae basi et apice saepe compressis sepalis persistente non longiore.

Cestrum pallidum Lam. Encycl., 1:688. 1783.

One of Prof. Hitchcock's Cat Island sheets, recently secured by this Museum, is this species. The two sheets in the herbarium of the Missouri Botanical Garden are, however, C. bahamense Britton.

NATIVE PLANT NAMES.*

Above all	Tecoma bahamensis
Abraham bush	Phyllanthus epiphyllanthus
Almond	Catappa Catappa
Bamboo	Agave bahamana
Bastard Torch	Ocotea Catesbyana
Bay Bean	Canavalia sps.
Bay Cedar	Suriana maritima
Bay Geranium	Ambrosia hispida
Bay Hops	Ipomoea pes-caprae
Bay Lavender	Tournefortia gnaphaloides
Bay Marigold	Borrichia arborescens
Bay Rush**	Zamia sps. Echites umbellata
Bay top	Coccothrinax argentea
Bay Wormwood	Croton linearis
Bean, bay	Canavalia sps.
Beefwood	Torrubia longifolia
Benny	Sesamum indicum
Black Buttonwood	Conocarpus erecta
Black Ebony	Pera bumeliaefolia
Black-eyed Susan	Abrus precatorius
Black Mangrove	Avicennia nitida
Black Torch	Erithalis fruticosa, Amyris elemifera
Blolly	Torrubia longifolia
Boar-hog bush	Callicarpa Hitchcockiana
Bow pidgeon	Coccoloba Krugii
Boxwood	Jacaranda caerulea
Brier	Anthacanthus acicularis
Brier, China	Smilax bahamensis
Broom brush	Evolvulus arbuscula
Buffalo top	Thrinax microcarpa
Bullrush	Uniola spicata
Bull's wood	Hypelate trifoliata
Butter bough	Exothea paniculata
Buttercup	Turnera ulmifolia
Buttonwood	Conocarpus erecta

*Only such names as have been given to us personally, by natives while confronting the plant indicated, are included in this list.

**This appellation belongs properly to Zamia sps. The only locality in which it is applied to Echites, so far as we know, is on Cat Island where a starch, similar to that made from Zamias, is manufactured from its tubers.

Buttonwood, black	Conocarpus erecta
Buttonwood, white	Conocarpus sericea
Candlewood	Dodonea Ehrenbergii, Phialanthus myrtilloides
Cane, wild	Panicum divaricatum
Canker berry	Solanum bahamense
Cascarilla bark	Croton linearis
Cassava wood	Dipholis salicifolia
Cathartic bark	Thevetia Thevetia
Cat's paw	Solanum didymacanthum
Cedar, bay	Suriana maritima
Chew stick	Gouania domingensis
China	Smilax Beyrichii
China brier	Smilax bahamensis
Christmas vine *	Ipomoea antillana
Cinnamon	Pimenta Pimenta
Cinnamon bark	Canella Winterana
Cinnecord	Acacia choriophylla
Coco Plum	Chrysobalanus sps.
Coffee, wild	Psychotria sps.
Cow bush	Helicteres spiralis
Crabwood	Coccoloba Krugii,† Gymnanthes lucida
Darling Plum	Reynosia septentrionalis
Day lily	Hymenocallis caribaea
Devil's Pumpkin	Passiflora cuprea
Dildo	Pilocereus and Cephalocereus sps.
Dogwood	Ichthyomethia piscipula
Ebony, black	Pera bumeliaefolia
Elemi, gum	Terebinthus Simaruba
Feather bed	Maba caribaea
Frogwood ‡	Guettarda Krugii
Gardena	Cakile aequalis
Geranium, bay	Ambrosia hispida
Goldenrod	Lantana bahamensis
Granny bush	Croton linearis
Grape, sea	Coccoloba uvifera
Guava, wild	Eugenia bahamensis
Gum Elemi	Terebinthus Simaruba
Gunwood	Tecoma bahamensis

*Used in decorating churches at Christmas.

† "Crab, he like eat um berries, much."

‡ "Frog, he like climb um up."

Hard head	Phyllanthus epiphyllanthus
Haulback	Mimosa bahamensis
Hippo	Asclepias curassavica
Hog bush	Rhachicallis maritima
Hog Palmetto	Pseudophenix Sargentii
Honeysuckle	Diapedium assurgens
Hops, bay	Ipomoea pes-caprae
Horse bush	Gundlachia domingensis
Horseflesh	Lysiloma Sabicu
Horseradish tree	Moringa Moringa
Hurricane grass	Fimbristylis glomerata
Jackmadá	Eupatorium villosum
Jerusalem Parsley	Chenopodium spathulatum
Jimbay	Lucaena glauca
Joe wood	Jacquinia keyensis
Lavender, bay	Tournefortia gnaphaloides
Lightwood	Lasiocroton
Lignum vitae	Guaicum officinale
Lime, wild	Fagara Fagara
Link vine	Vanilla sps.
Logwood	Haematoxylon campechianum
Love vine	Cuscuta sps.
Madeira	Swietenia Mahogani
Mahogany	Swietenia Mahogani
Manchineel	Hippomane mancinella, Excoecaria lucida
Mangrove	Rhizophora Mangle
Mangrove, black	Avicennia nitida
Mangrove, white	Laguncularia racemosa
Marigold	Stemmodontia bahamensis
Marigold, bay	Borrichia arborescens
Mastic	Sideroxylon foetidissimum
Milk bush	Euphorbia cayensis
Mistletoe	Dendropemon sps.
Mosquito bush	Cassia angustisiliqua
Moujean tea	Lantana balsamifera
Nickers	Guilandina sps.
Old Man's beard	Dendropogon usneoides
Olive	Picrodendron macrocarpum
Pain-in-back	Trema Lamarckiana
Palmetto, hog	Pseudophoenix Sargentii
Parsley, Jerusalem	Chenopodium spathulatum

Pea, pidgeon	Cajanus Cajan
Pepper bush	Croton bahamensis
Pigeon pea	Cajanus Cajan
Pigeon plum	Coccoloba and Chrysobalanus sps.
Plum, coco	Chrysobalanus sps.
Plum, darling	Reynosia septentrionalis
Plum, pigeon	Coccoloba and Chrysobalanus sps.
Poison bush	Hippomane mancinella
Poison wood	Metopium Metopium
Pond top	Sabal Palmetto
Pork bush	Cakile aequalis
Pork-and-doughboy *	Bumelia loranthifolia, Acacia acuifera
Prickly apple	Catesbaea spinosa
Princewood	Exostemma caribaeum
Quinine	Ammocallis rosea
Ram's horn	Pithecolobium keyense
Sage, wild	Lantana sps.
Sapodilla, wild	Mimusops sps.
Satinwood	Fagara flava
Sea Grape	Coccoloba uvifera
Seven year Apple	Genipa clusiaefolia
Shanks	Salmea pterobioides
Shepherd's needle	Bidens leucantha
Silver top	Coccothrinax argentea
Slag	Typha domingensis
Snakeroot	Picramnia pentandra
Stopper	Eugenia axillaris
Stopper, white	Calyptranthes pallens
Strong-back	Bourreria havanensis
Sweet potato	Ipomoea batatas
Sweet William	Ammocallis rosea
Sweetwood bark	Croton eleuteria
Tea, Moujean	Lantana balsamifera
Thyme, wild	Rhachicallis maritima
Torch, bastard	Ocotea Catesbyana
Torch, black	Erithalis fruticosa, Amyris elemifera
Turk's head	Melocactus sps.
What-o'clock †	Jacaranda caerulea
White Buttonwood	Conocarpus sericea

* The thorns are used in lieu of forks in eating pork and dumplings.

† Our guide could not explain reference.

White Mangrove	Laguncularia racemosa
White Stopper	Calyptranthes pallens
Whitewood	Drypetes keyensis
Wild Cane	Panicum divaricatum
Wild Coffee	Psychotria sps.
Wild Guava	Eugenia bahamensis
Wild Lime	Fagara Fagara
Wild Sage	Lantana sps.
Wild Sapodilla	Mimusops sps.
Wild Thyme	Rhachicallis maritima
Woe vine	Cassytha americana
Woman's tongue*	Lysiloma Sabicu
Wormwood, bay	Croton linearis

* Said to allude to the noise made by the pods in a high wind.

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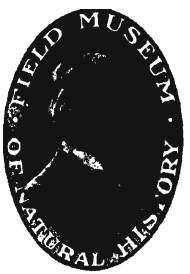
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R. I. PUS

I. NEW SPECIES OF CUBAN SENECIONEAE.
II. DIAGNOSES OF NEW SPECIES AND NOTES ON OTHER SPERMATOPHYTES, CHIEFLY FROM MEXICO AND CENTRAL AMERICA.

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.—NEW SPECIES OF CUBAN SENECIONEÆ.

By J. M. GREENMAN.

Dr. N. L. BRITTON has kindly submitted to the writer for identification a very unusual assemblage of *Senecioneæ* from Cuba collected by Mr. J. A. SHAFER in 1909 and 1910. The results of a study of this remarkable series of specimens are recorded as follows:

Senecio Brittonii Greenman, nom. nov. *Cacalia discolor* Griseb. Cat. Pl. Cuba, 157 (1866), not *Senecio discolor* (Sw.) DC. Prodr. vi. 412 (1837).

Frutex 1–2 m. altus; ramis teretibus dense lanato-tomentosis plus minusve glabratis; foliis alternis petiolatis lanceolatis 4–8 cm. longis 1–1.5 cm. latis obtusis juventate supra arachnoideo-tomentulosis mox glabratis maturitate pallido-viridibus sublucidisque subtus persistenter tomentosis obscure nervatis marginibus integris revolutisque basi sensim angustatis; petiolis 8 mm. vel minus longis; inflorescentiis terminalibus corymbo-cymosis multicapitatis; capitulis discoideis ca. 1 cm. altis calyculatis; involucri squamis 5 lineari-lanceolatis 6–7 mm. longis acutis arachnoideo-tomentulosis; floribus 5, corollis albido-ochroleucis; pappi setis albis corolla brevioribus; achæniis hirtellis.—Along rivulets in "pinales," Mulgajita, Cuba, *C. Wright*, no. 2870 (hb. Gray); in arroyos on a palm barren, Santa Clara, Province of Santa Clara, Cuba, 21, 22 March, 1910, *N. L. Britton & J. F. Cowell*, no. 10180 (hb. Field Museum cat. no. 294752, and hb. N. Y. Bot. Garden).

Senecio carinatus Greenman, sp. nov.

Frutex 1–1.5 m. altus; ramis subancipito-angulatis dense tomentosis; foliis alternis rhomboideo-ovatis 3–8 cm. longis 1-3 cm. latis acutis remote sinuato-dentatis basi integris cuneatisque supra glabris et sublucidis subtus fulvo-tomentosis; petiolis usque ad 1.5 cm. longis; inflorescentiis terminalibus corymbo-cymosis multicapitatis tomentulosis; capitulis 1 cm. altis discoideis calyculatis; involucri squamis 5 oblongis 7 mm. longis 2–2.5 mm. latis obtusis glabris vel juventate sparse arachnoideis; floribus 5; corollis infundibuliformibus flavibus vel flavo-albidis 5-dentatis; pappi setis albis corolla brevioribus; achæniis pubescentibus.—On rocky banks of river, vicinity of Camp San Benito, Oriente, Cuba, altitude 900 m., 24 February, 1910, *J. A. Shafer*, no. 4079 (hb. Field Museum, cat. no. 300837, and hb. N. Y. Bot. Garden).

The species is well marked on account of the strongly discolorous leaves, which are densely tawny pubescent on the under surface, and by the decurrence of the petioles on the stem thus causing the younger branches to be subancipitally angled, or strongly keeled, hence the specific name.

Senecio cubensis Greenman sp. nov.

Caulis lignescens; ramulis ultimis teretibus tomentulosis; foliis alternis petiolatis lanceolatis vel lanceolato-oblongis 3–9 cm. longis 1–2.5 cm. latis acutis vel obtusis in sicco supra livido-vel atro-viridibus juventate arachnoideo-tomentulosis glabratis subtus dense et persistenter canotomentosis, marginibus integris revolutisque; petiolis 1 cm. vel minus longis; inflorescentiis terminalibus foliaceis laxe cymosis sparse tomentulosis pauci-capitatis; capitulis cylindratis minute calyculatis ca. 8 mm. altis; involucri squamis 5 linearibus acutis 6–7 mm. longis sparse subarachnoideo-tomentulosis vel glabris; floribus 5 exsertis; pappi setis albis corolla brevioribus; achæniis 3.5 mm. longis hirtellis.— Along rocky river, vicinity of Camp San Benito, Province of Oriente, Cuba, altitude 900 m., 24 February, 1910, *J. A. Shafer*, no. 4084 (hb. Field Museum, cat. no. 294788, and hb. N. Y. Bot. Garden); Camp La Gloria, south of Sierra Moa, Province of Oriente, Cuba, 24–30 December, 1910, *J. A. Shafer*, no. 8223 (hb. Field Museum, cat. no. 294805, and hb. N. Y. Bot. Garden).

A species somewhat similar to *Senecio trichotomus* Greenm., but differs in having broader leaves and leafy open few-headed cymes.

Senecio leucolepis Greenman, sp. nov.

Suffrutescens 3–4 dm. altus; caule tereti glabro; ramis ramulisque tomentosis; foliis alternis brevi-petiolatis lanceolatis vel anguste lanceolato-oblongis 1.5–5.5 cm. longis 0.5–1.5 cm. latis acutis integris supra juventate parce arachnoideo-tomentulosis glabratis subtus dense tomentosis; petiolis 3–5 mm. longis; inflorescentiis terminalibus cymosis paucicapitatis; capitulis subsessilibus cylindratis ca. 8 mm. altis 2 mm. diametro calyculatis discoideis; involucri squamis 5 lineari-lanceolatis 6 mm. longis acutis extrinsecus dense albo-tomentosis; floribus plerumque 5; corollis albis, tubo cylindrato 2.5 mm. longo faucibus sensim ampliatis subæquali, dentibus limbi 5 brevibus patentibus; pappi setis albis tenuibus corollam æquantibus; achæniis brunneis 3 mm. longis hirsutulis.— On trail from Camp Toa to Camp La Barga, Province of Oriente, Cuba, altitude 400–450 m., 22–26 February, 1910, *J. A. Shafer*, no. 4146 (hb. Field Museum, cat. no. 300836, and hb. N. Y. Bot. Garden).

The general aspect of this species is similar to *Senecio Brittonii* Greenm., but it differs in having an essentially sessile inflorescence, fewer heads, shorter and densely white-pubescent involucral bracts, and in the characters of the corolla.

Senecio pachylepis Greenman, sp. nov.

Frutex 1.5–2 m. altus; caule lignescente; ramis ramulisque teretibus glabris vel juventate dense cano-tomentosis; foliis alternis petiolatis oblongo-obovatis vel oblanceolatis 3.5–10 cm. longis 1.5–3.5 cm. latis utrinque glabris ad apicem obtusis sinuato-dentatis ad basin integris marginibus plus minusve revolutis; petiolis usque ad 1.5 cm. longis; inflorescentiis terminalibus cymosis sessilibus; capitulis discoideis calyculatis; involucri squamis 8 lanceolatis vel lanceolato-oblongis 4–5 mm. longis obtusis vel acutis glabris vel parce arachnoideo-tomentosis, bracteolis calyculatis 5 spathulatis 2–3.5 mm. longis 1 mm. latis obtusis crassiusculis; floribus 10–12 flavibus; pappi setis fulvis; achæniis striatis hirtellis.— Along rocky river trail, Rio Yamaniguey to Camp Tao, Oriente, Cuba, 22–26 February, 1910, *J. A. Shafer*, no. 4008 (hb. Field Museum, cat. no. 294785, type, and hb. N. Y. Bot. Garden).

In habit and foliar characters this species resembles *S. eriocarphus* Greenm., but differs in having a close matted tomentum on the young branches, glabrous leaves, smooth or slightly arachnoid involucral bracts, and finally in having strongly spatulate and thickened calyculate bracteoles. The plant cited under the above number has been referred to *S. plumbeus* Griseb.; but from that species, which it resembles in habit and in foliar characters, it is readily distinguished by the shorter petioles, blunter leaves, sessile crowded terminal inflorescence, and the spatulate thick calyculate bracteoles.

Senecio pachypodus Greenman, sp. nov.

Frutex 1–2 m. altus; ramis ramulisque cortice verrucoso tectis glabris ad apicem foliaceis; foliis alternis numerosis coriaceis linearilanceolatis 5–8 cm. longis 2–4 mm. latis margine integris revolutisque basi gradatim angustatis supra glabris subtus dense albo-lanatis; inflorescentiis terminalibus paucicapitatis glabris; capitulis 8–10 mm. altis calyculatis discoideis; squamellis calyculatis lineari-attenuatis ca. 6 mm. longis; involucri squamis 5 oblongo-lanceolatis ca. 7 mm. longis brevi-acuminatis obtusis penicillatisque glabris, basi crassis; floribus 5; corollis 5–6 mm. longis; pappi setis albis; achæniis columnaribus 2 mm. longis cano-pubescentibus.— Collected at Camp La Gloria, south of Sierra Moa, Province of Oriente, Cuba, 24–30 December, 1910, *J. A. Shafer*, no. 8186 (type in hb. N. Y. Bot. Garden; fragment and photograph in hb. Field Museum, cat. no. 300835).

A plant of quite unusual habit in this genus. The numerous linear leaves, tufted at the ends of the branches, and the naked stem and lower portion of the branches, roughened by the persistent bases of old leaves, render it of striking appearance, which indeed at first glance is not unlike a coniferous growth.

Senecio rivalis Greenman, sp. nov.

Verisimiliter arborescens; caule tereti glabro vel juventate arachnoideo-tomentuloso foliaceo; foliis alternis petiolatis oblongo-oblanceolatis 7–14 cm. longis 2.5–4 cm. latis acutis supra livido-viridibus glabris subtus dense albo-tomentosis, marginibus integerrimis revolutisque, basi in petiolam sensim gradatim angustatis; petiolis usque ad 2 cm. longis; inflorescentiis terminalibus cymosis arachnoideo-tomentosis; capitulis discoideis 8–10 mm. altis calyculatis; bracteolis subdeltoideis; squamis involucri 8 lanceolatis vel oblongo-lanceolatis 8 mm. longis 2–3 mm. latis acutis vel obtusis; floribus circiter 20; pappi setis rufo-albidis; achæniis parce hirtellis.— In deciduous woods and thickets, near water, Sierra Nipe, near Woodford, Province of Oriente, Cuba, altitude 450–550 m., 5 January, 1910, *J. A. Shafer*, no. 3454 (hb. Field Museum, cat. no. 294775, and hb. N. Y. Bot. Garden).

Senecio Shaferi Greenman, sp. nov.

Caule lignescens; ramis subteretibus striatis lanato-tomentosis; foliis suboppositis vel distincte alternis petiolatis lanceolatis vel lanceolato-ovatis 5–8 cm. longis 1.5–2.5 cm. latis acutis integris basi sensim in petiolam coarctati supra atro-viridibus juventate lanato-tomentosis mox glabratis subtus conspicue reticulato-venosis dense et persistente fulvo-tomentosis; inflorescentiis terminalibus corymbo-cymosis pedunculatis multicapitatis; capitulis discoideis 10–12 mm. altis calyculatis; involucri squamis 5 linearibus acutis 6 mm. longis fulvo-tomentosis; floribus 5 exsertis; pappi setis albis; achæniis cano-hirtellis.— In moist thickets on the Sierra Nipe, along trail between Piedra Gorda and Woodfred, serpentine formation, Oriente, Cuba, altitude 400–500 m., 8 December, 1909, *J. A. Shafer*, no. 3107 (hb. Field Museum, cat. no. 294771, and hb. N. Y. Bot. Garden).

Senecio trichotomus Greenman, sp. nov.

Fruticosus; ramis ramulisque teretibus striatis glabris vel glabrescentibus; foliis alternis brevi-petiolatis anguste lanceolatis 2–5 cm. longis 3–8 mm. latis acutis vel obtusis supra atro-viridibus et glabris marginibus integris revolutisque basi in petiolum angustatis; inflorescentiis dense cymosis; capitulis subcylindratis calyculatis 7–8 mm. altis discoideis; involucri squamis 5 lineari-oblongis 6–7 mm. longis acutis vel obtusis

glabris; floribus 5 paullum exsertis; pappi setis albis corolla brevioribus; achæniis hirtellis.— In deciduous woods near base of Loma Menquara, Province of Oriente, Cuba, altitude about 680 m., 1–3 February, 1910, *J. A. Shafer*, no. 3821 (hb. Field Museum, cat. no. 294780, and hb. N. Y. Bot. Garden).

A well-marked and easily recognized species on account of the trifurcate branching of stem, the narrowly lanceolate discolorous leaves, and the close inflorescence of cylindrical glabrous discoid heads.

Shafera Greenman, gen. nov. *Compositæ Senecioneæ.*

Capitula homogama discoidea calyculata. Involucrum campanulatum, squamis 3–4-seriatis imbricatis lanceolatis exterioribus gradatim brevioribus. Receptaculum planum vel paulo convexiusculum foveolatum et breviter fimbrilliferum. Corollæ tubulosæ angustæ elongatæ sursum gradatim ampliatæ, limbo æqualiter 5-dentato. Antheræ basi brevissime setacco-mucronatæ apice distincte appendiculatæ. Styli rami subcomplanati brevirecurvato-patentes, apice obtusi. Achaenia subteretia columnaria costata. Pappi setæ copiosæ tenues albæ persistentes.— Herbæ scandentes perennes. Folia alterna late ovata.

S. platyphylla Greenman, sp. nov.

Caulis subangularis dense tomentosus; foliis petiolatis, limbo crassiusculo late ovato vel elliptico-oblongo 7–14 cm. longo 5–11 cm. lato apice rotundato integerrimo basi obtuso vel subcordato juventate utrinque tomentoso supra mox glabratis et valide reticulato-venoso subtus dense et persistente fulvo-tomentoso; petiolis usque ad 4 cm. longis tomentoso-pubescentibus; inflorescentiis axillaribus terminalibusque paucicapitatis; capitulis calyculatis 2–2.5 cm. altis et diametro multifloris, bracteolis calyculatis spathulato-oblongis 1–1.5 cm. longis 3–5 mm. latis dense tomentosis; involucri squamis numerosis 3–4-seriatis lanceolatis 8–10 mm. longis 2.5–3.5 mm. latis acutis extrinsecus dense fulvo-tomentosis exterioribus brevioribus; flosculis numerosis; pappi setis albis corolla brevioribus; achæniis maturatis 4 mm. longis costatis cano-hirsutis.— Collected at Camp Gloria, south of Sierra Moa, Province of Oriente, Cuba, 24–30 December, 1910, *J. A. Shafer*, no. 8134 (hb. Field Museum, cat. no. 294802, and hb. N. Y. Bot. Garden).

The plant here described belongs to the *Senecioneæ* and is related to the genus *Senecio* from which, however, it differs in having the bracts in three or four series and in the obtuse style-branches. It seems to be related on the one hand to *Senecio* and on the other to *Culcitium*, but

amply distinct from both. The angulate stem, the large thick almost leathery leaves with a dense permanent tomentum on the under surface, combined with the large heads and many bracted involucre, give the plant a most striking appearance quite distinct from anything known to the writer. The genus is dedicated to the keen and indefatigable collector for the New York Botanical Garden Mr. J. A. SHAFER.

II.—DIAGNOSES OF NEW SPECIES AND NOTES ON OTHER SPERMATOPHYTES, CHIEFLY FROM MEXICO AND CENTRAL AMERICA.

By J. M. GREENMAN.

The diagnoses and notes following are the results of critical study in the determination of several collections of plants which have been received from time to time during the last few years at the Field Museum of Natural History for identification. Particularly valuable series have been received from Professor CASSIANO CONZATTI, from the late Professor W. A. KELLERMAN, from Mr. CHARLES R. ORCUTT, and from the late Professor CHARLES R. BARNES and Dr. W. J. G. LAND. These collections while not containing a large percentage of new plants do include many which belong to recently published and hence little-known species; thus there are here introduced several brief notes, relating to additional localities for such species, which it is hoped may be helpful in tracing their geographical distribution.

TRADESCANTIA ANGUSTIFOLIA Rob. Proc. Am. Acad. xxvii. 185 (1892).

The type of this species is perfectly matched by specimens collected on the Cerro de San Antonio de la Cal, State of Oaxaca, Mexico, altitude 1700 m., 18 August, 1907, *C. Conzatti*, no. 1995 (hb. Field Museum).

FICUS SUBROTUNDIFOLIA Greenm. Proc. Am. Acad. xli. 237 (1905).

Specimens agreeing in all essential details with this species were collected at Chichen Itza, State of Yucatan, Mexico, 28 January and 10 February, 1901, *E. W. Goldman*, no. 553 (hb. Field Museum). *Dr. Geo. F. Gaumer's*, no. 599, coll. of 1905 from Yucatan seems also to be conspecific.

PHORADENDRON ROBINSONII Urban, Engl. Bot. Jahrb. xxiii. Beibl. lvii. 4 (1897).

This species, which was based on no. 6272 of Mr. C. G. PRINGLE'S *Plantæ Mexicanæ*, has been collected at San Nicolás, Tehuacan, State of Puebla, Mexico, altitude 2000 m., 22 June, 1908, *C. Conzatti*, no. 2199 (hb. Field Museum). The species is well marked and one of the most attractive of the genus.

ARISTOLOCHIA OAXACANA Eastwood, Proc. Am. Acad. xliv. 603 (1909).

Complete flowering and fruiting specimens secured by Professor *C. Conzatti* at Camino Montelobos, Dto. Nochixtlán, De Rancho Nopalera á Huitzo, State of Oaxaca, Mexico, altitude 2000 m., 23 June, 1907, no. 1838 (hb. Field Museum) have been compared with the type of the above species and accord in all essential details. The present collection records another station in determining the distribution of a very interesting and distinct species.

Celosia Orcuttii Greenman, sp. nov.

Suffruticosa (?); caule striato-anguloso ferruginoso glabro; foliis brevipetiolatis lanceolatis acutis vel mucronatis integerrimis basi attenuatis utrinque glabris flavo-viridibus; inflorescentiis pyramido-paniculatis usque ad 4 dm. longis 2.5 dm. latis inconspicue ferrugineo-puberulentis vel hirtellis; floribus sessilibus; bracteis trangulare-ovatis acutis 1 mm. vel minus longis; bracteolis obliquo-ovatis 1. mm. longis uninerviis; sepalis ovatis vel ovato-ellipticis subnavicularibus circiter 2.5 mm. longis acutis vel obtusis 5–7-nerviis glabris pallido-straminibus et persistentibus; cupulo staminorum circiter 1 mm. alto; utriculo maturo incluso subgloboso circumscisse dehiscens; seminibus lenticularibus nitidulis 1–1.5 mm. diametro.— MEXICO. State of Colima: vicinity of Colima, 24 October, 1910, *C. R. Orcutt*, no. 4587 (hb. Field Museum cat. no. 283404).

A species similar to *C. Moquini* Guillem., but with smaller yellowish-green leaves, reddish-brown stem and inflorescence, and with uniformly pale-stramineous instead of more or less fuscous sepals, and with a sessile instead of stipitate utricle.

Pfaffia Hookeriana (Hemsl.) Greenman, comb. nov. *Hebenanthe Hookeriana* Hemsl. Biol. Cent.-Am. Bot. iii. 19 (1882).

APOPLANESIA PANICULATA Presl Symb. Bot. i. 63, t. 41 (1831).

The punctate leaflets, persistent samara-like calyx-lobes and short glandular fruit render this species, although apparently somewhat rare, an easily recognized one. It is well represented by specimens secured by *Dr. G. M. Emrick* at Tecoman, State of Colima, Mexico, November, 1906, nos. 153, 154 (hb. Field Museum), and by collections made at Manzanillo, Mexico, 1890–91, *Dr. Edward Palmer*, nos. 967, 1373*a*, and 1810 (hb. U. S. Nat. Museum). These collections extend the known geographical range of the species considerably to the north of previously recorded localities.

Cæsalpinia Gaumeri Greenman, sp. nov.

Arbor 15–20 m. alta inrerma; amis ramulisque teretibus glabris cortice griseo tectis; foliis petiolatis stipulatis impari- vel abrupte-

pinnatis, pinnis 2–3-jugis; foliolis sessilibus oppositis vel alternis oblongis vel oblongo-obovatis 1–2 cm. longis apice rotundatis vel subemarginatis integris glabris basi cuneatis et plus minusve obliquis, juventate punctatis, maturate utrinque reticulato-venosis supra sublucidis subtus pallidioribus; petiolo communi glabro usque ad 3 cm. longo, rhachis et rhachillis plerumque crispo-puberulentis; stipulis ovatis ca. 4 mm. longis cuneatis punctatis caducis; racemis subterminalibus 1–1.5 dm. longis multifloris glabris vel sparse puberulentis, pedicellis gracilibus 8–14 mm. longis superne incrassatis infra apicem articulatis et sparse glandulosis; floribus 1.5–2 cm. diametro; calycis limbi laciniis oblongis 5–8 mm. longis 3–4 mm. latis glandulosis utrinque minute sed plus minusve dense tomentulosis; petalis 5 flavis glanduliferis basi pilosis; staminibus corollæ subæqualibus supra basin stipitatam glandulosis et pilosis; ovario dense glandulifero et sparse piloso.— YUCATAN: Progresso, 5 March, 1899, *Dr. C. F. Millspaugh*, no. 1675 (hb. Field Museum, cat. no. 61675, type); Izamal, *Dr. Geo. F. Gaumer*, no. 349 (hb. Field Museum, cat. no. 36152), and coll. of 1888, without number (hb. Field Museum, cat. no. 181486; San Anselmo, *Dr. Geo. F. Gaumer*, no. 1623 (hb. Field Museum, cat. no. 58421).

This species is named in honor of Dr. GEORGE F. GAUMER who first collected the plant in 1888. Dr. GAUMER states that it is a tree often becoming sixty feet in height and is abundant in the brush and forest lands about Izamal, where it is known by the native name of Xcitinché.

Dalea delicata (Rose) Greenman, comb. nov. *Parosela delicata* Rose Contr. U. S. Nat. Herb. viii. 304 (1905).

Specimens collected in Mexico by *Mr. C. R. Orcutt*, no. 4215 (hb. Field Museum, cat. no. 282126) agree in all details with the original material on which this species was based.

Dalea vernicia (Rose) Greenman, comb. nov. *Parosela vernicia* Rose Cont. U. S. Nat. Herb. viii. 303 (1905).

In addition to the original material on which this species was founded, the following specimens are here referred: Sluice-way above power house, Barranca de Oblatos, State of Jalisco, Mexico, altitude 1110 m., 29 September, 1908, *Barnes & Land*, no. 211 (hb. Field Museum); railroad banks, along the Mexican Central Railway below Tuxpan, altitude 1170 m., State of Jalisco, Mexico, 9 October, 1908, *Barnes & Land*, no. 337 (hb. Field Museum).

Desmodium Conzattii Greenman, sp. nov.

Frutex 1–1.5 m. altus, ramulis ramulisque subadpresso-sericeis; foliis brevi-petiolatis trifoliolatis, foliolis elliptico- vel oblongo-lanceolatis 1.5–3.5 cm. longis 0.5–1.5 cm. latis acutis integris utrinque adpresso-sericeis

subtus pallidioribus et reticulato-venosis, stipulis triangulari-lanceolatis 6–7 mm. longis albo-sericeis subpersistentibus, petiolis 3–8 mm. longis dense pubescentibus, petiolulis circiter 1 mm. longis, stipellis filiformibus; racemis terminalibus axillaribusque dense floriferis 2–4 cm. longis, rhachis albovillosis; bracteis ovato-lanceolatis 6–10 mm. longis acuminatis subchartaceis brunneis sericeo-villosis; floribus pedicellatis, pedicellis 3–5 mm. longis puberulis; calycibus sericeo-pilosis persistentibus, dentibus acutis; petalis purpureis vel pallido-purpureis; leguminibus stipitatis uncinulato-puberulentis, 3–6-articulatis.— MEXICO. State of Oaxaca: San Bernardino, District of Teotitlan, altitude 2000 m., 11 December, 1907, *C. Conzatti*, no. 2117 (hb. Field Museum, cat. no. 225895, type); Sierra de San Felipe, altitude 2430 m., 13 October, 1894, *C. G. Pringle*, no. 4983 (hb. Field Museum, hb. Gray, hb. U. S. Nat. Museum, and hb. N. Y. Bot. Garden) distributed as "*Desmodium Jaliscanum* Watson." Valley of Oaxaca, altitude 2000-3000 m., 3 October, 1894, *E. W. Nelson*, no. 1528 (hb. U. S. Nat. Museum); mountains of Telixtlahuaca, altitude 2285 m., 18 October, 1895, *Rev. Lucius C. Smith*, no. 868 (hb Gray); Cuicatlan, altitude 500 m., 2 December, 1897, *C. Conzatti & V. Gonzalez*, no. 659 (hb. Gray); Oaxaca, 23 October, 1899, *E. W. Nelson*, no. 3723 (hb. Gray). The species here described differs from *D. jaliscanum* Watson in having uniformly shorter petioles, smaller leaflets and puberulent pods. *D. Conzattii* suggests *D. amplifolium* Hemsl., but that species again has longer petioles, larger leaflets, and stipules of quite different outline.

Desmodium pinetorum (Rose & Painter) Greenman, comb. nov.
Meibomia pinetorum Rose & Painter Bot. Gaz. xl. 144 (1905).

In addition to the material cited under the orginal publication, the following collections well represent this species: Real del Monte, State of Vera Cruz (?), Mexico, *Dr. Th. Coulter*, without number (hb. Gray); banks of the Avenida Hidalgo, Tezuitlan, State of Hidalgo, Mexico, 27 October, 1908, *Barnes & Land*, no. 549 (hb. Field Museum).

MIMOSA XANTI Gray Proc. Am. Acad. v. 157 (1861).

Fruiting specimens collected at Cerro San Antonio, Distrito del Centro, State of Oaxaca, Mexico, altitude 1700 m., 6 September, 1908, *C. Conzatti*, no. 2239 (hb. Field Museum), agree well with the type of this species in the Gray Herbarium and with material secured at San Jose del Cabo, Lower California, 9 September, 1890. The species has not been recorded hitherto outside of Lower California. Notwithstanding the considerable remoteness of Professor CONZATTI's station from the peninsular localities for the species there can be no doubt of the identity of the Oaxaca specimens with the above species.

BUNCHOSIA LINDENIANA Ad. Juss. Arch. Mus. Paris, iii. 335 (1843).

Specimens collected at Santa Maria del Tule, altitude 1550 m., State of Oaxaca, Mexico, *C. Conzatti*, no. 1679 (hb. Field Museum) in flower, and at the same station 12 May, 1907, *C. Conzatti*, no. 1798 (hb. Field Museum) in fruit, agree well with the original description of the above species. The drupaceous fruit is subglobose, 2 to 2.5 cm. in diameter; the seeds, moreover, are discoidal and about 1.5 cm. broad.

CONDALIA PEDUNCULATA Brandg. Univ. Calif. Pub. Bot. iii. 384 (1909).

This recently described species has been collected at Cuesta de Quiotepec, Dto. Cuicatlán, State of Oaxaca, Mexico, alt. 700 m., 21 June, 1909, Plantæ Mexicanæ *C. Conzatti*, no. 2414 (hb. Field Museum). Professor CONZATTI's specimen agrees well with the type and records a second station towards ascertaining the geographical distribution of the species.

Malvaviscus Conzattii Greenman, sp. nov.

Frutex; ramis teretibus glabris; ramulis stellato-pubescentibus; foliis petiolatis ovatis 2.5–6 cm. longis 1.5–4.5 cm. latis inæqualiter crenato-dentatis obtusis basi sæpissime brevi-cordatis supra hispidulis subtus pallidioribus sparsissime stellato-pubescentibus glabratisque; petiolis 5–18 mm. longis pilosis; floribus axillaribus solitariis, pedicellis 1–3 cm. longis pubescentibus; bracteolis calycis circiter 8 spathulatis calyce brevioribus obtusis plus minusve ciliatis; calycis 1.2–1.5 cm. longis 5-lobatis conspicue venosis extus sparsissime et minute stellato-pubescentibus, lobis æqualibus ovatis acutis vel obtusis ad apicem ciliatis intus pulverulentis; corollis 4.5–5 cm. longis rubris, petalis oblongo-cuneatis, basi unilaterali conspicue auriculatis; staminibus stylisque exsertis.— MEXICO. State of Oaxaca: San Pablo, Huitzo, alt. 1600 m., 25 August, 1907, *C. Conzatti*, no. 1981 (Field Museum, cat. no. 226144, type); Santo Domingo, alt. 1600 m., 22 December, 1906, *C. Conzatti*, no. 1683 (hb. Field Museum, and U. S. Nat. Museum).

In general appearance this species resembles *M. arboreus* Cav., but it differs in having uniformly shorter petioles and fully twice larger corollas. The flowers of *M. Conzattii* suggest those of *M. grandiflorus* HBK., but from the original description of that species it differs markedly in foliar and calyx characters.

ROBINSONELLA CORDATA Rose and Baker f. Gard. & Forest x. 244, *fig. 31* (1897).

Specimens representing this species were collected by Professor *C. Conzatti* on the hacienda de Guadalupe, Oaxaca, Mexico, altitude 1600

m., December 6, 1908, no. 2322 (hb. Field Museum). Professor CONZATTI'S specimens are in full flower, but the leaves are not entirely expanded, thus giving at first glance a very different appearance from the type specimens secured by Dr. PRINGLE in 1895. In all essential characters there is exact correspondence. This collection records a second known locality for this very distinct and showy species.

PASSIFLORA PLATYNEURA Eastwood, Proc. Am. Acad. xliv. 604 (1909).

Specimens collected at De Pueblo Viejo al Rancho Nopalera, Dto. de Nochixtlán, State of Oaxaca, Mexico, altitude 2500 m., 22 June, 1907, *C. Conzatti*, no. 1834*a* (hb. Field Museum) correspond well with the type of the above species in the Gray Herbarium.

Bumelia eriocarpa Greenman & Conzatti, sp. nov.

Arbor (?) vel frutex; ramis inermis vel spinescentibus crebre nodosis juventate cinereo-tomentosis deinde glabratis; foliis alternis petiolatis coriaceis oblongo-ellipticis 2.5–10 cm. longis 1–3 cm. latis ad apicem rotundatis vel subemarginatis integris basi cuneatis supra primum tomentulosis mox glabratis plus minusve lucidisque subtus dense et persistenter fulvo-tomentosis; petiolis 3–10 mm. longis; floribus sessilibus vel brevipedicellatis numerosis fasciculatim aggregatis, fasciculis plerumque multifloris; calycis segmentis orbiculari-ovatis extus ferrugineo-pubescentibus intus glabris; corollæ appendicibus anguste obliquo-lanceolatis acuminatis lobis oblongo-obovatis subæquantibus; staminodiis ovatis acuminatis subobtusis, lobis corollæ pæne æquantibus; ovario dense piloso; fructibus subglobosis vel oblongo-obovoideis 13–22 mm. longis 13–18 mm. diametro dense ferrugineo-tomentosis; seminibus subglobosis usque ad 13 mm. diametro.— MEXICO. State of Oaxaca: Cerro San Antonio, altitude 1700 m., 28 October, 1906, *C. Conzatti*, no. 1586 (Field Museum, cat. no. 241796, type); Cerro del Tule, altitude 1700 m., 31 March, 1907, *C. Conzatti*, no. 1772 (hb. Field Museum, cat. no. 225938); Cerro San Antonio, altitude 1600 m., 27 October, 1907, *C. Conzatti*, no. 2028 (hb. Field Museum, cat. no. 225794).

Specimens of Conzatti's no. 1586 were sent to the Kew Herbarium for comparison with *Bumelia subsessiliflora* Hemsl. with which species the plant in question seemed from description to be most closely related. Mr. N. E. BROWN has very kindly made a careful comparison for me and states that the Conzatti plant is not only specifically different from *B. subsessiliflora*, but that it is distinct from all the species of *Bumelia* represented at Kew. From the several characters noted by Mr. BROWN as distinguishing *B. eriocarpa* from *B. subsessiliflora* may

be mentioned the following: thicker and much more conspicuously tomentose stem, thicker and more coriaceous leaves which are persistently tomentose (not glabrous) when old, and finally slightly longer and thicker pedicels and rather larger flowers.

EUSTOMA RUSSELLIANUM G. Don in Sweet Hort. Brit. ed. III. 473 (1839), forma **leucantha** Greenman, f. nov.

Corolla albida; ceteris formæ typicæ simillima.— Border of black land prairie, Montgomery County, Texas, 18–21 July, 1909, *Royal A. Dixon*, no. 479 (hb. Field Museum, cat. no. 248395).

Halenia Conzattii Greenman, sp. nov.

Herba erecta ramosissima 3–4 dm. alta foliosa glabra; caulibus ramisque teretibus vel nonnihil angularibus; foliis sessilibus lanceolatis 1.5–3.5 cm. longis 0.5–1 cm. latis acutis integris trinerviis basi sensim angustatis; cymis terminalibus axillaribusque; pedicellis usque ad 2 cm. longis gracilibus subalato-tetrangularibus; calycis segmentis obovato-spathulatis 6–8 mm. longis 2–3 mm. latis acutis vel obtusis foliaceis; corollis 8–12 mm. longis viridibus vel flavo-viridibus, corollæ lobis oblongo-ovatis 3–5 mm. longis breviacuminatis acutis viridibus, calcaribus tenuibus pendulis rectis vel incurvis 1.5–2 mm. longis; staminibus inclusis; capsulis oblongo-lanceolatis 15–18 mm. longis subfalcatis; seminibus numerosis subglobosis.— MEXICO. State of Oaxaca: Cerro San Felipe, Distrito del Centro, altitude 2000 m., 20 September, 1908, *C. Conzatti*, no. 2295 (hb. Field Museum, cat. no. 239593); Sierra de San Felipe, altitude 3050 m., 15 September, 1894, *C. G. Pringle*, no. 4908 (hb. Gray and hb. U. S. Nat. Museum); Cerro (Sierra) San Felipe, altitude 3000–3350 m., coll. of 1894, *E. W. Nelson*, no. 1115 (hb. Gray). This species is well-marked on account of the obovate-spatulate foliaceous calyx-segments, the green or greenish corolla, and short straight or slightly incurved spurs. It is perhaps nearest allied to the little-known *Halesia elongata* Don, but that species is said to have *linear-lanceolate* leaves.

IPOMŒA CONZATTII Greenm. Field Col. Mus. Bot. Ser. ii. 258 (1907).

Specimens of this species have been recollected at the original locality, and these together with detailed notes from Professor CONZATTI permit of the following additional characters to be recorded: roots tuberiform about 5 cm. in diameter in the dried state; leaves petiolate, ovate, entire or 3-lobed, obtuse to distinctly cordate at the base, acute or acuminate, terminated by a mucro, dark green and sparingly crisp-hirsute above, paler and subtomentose beneath; petioles 1 to 5 cm. long, pubescent.— MEXICO. State of Oaxaca:

procedente de Almoloyas, altitude 800 m., 15 August, 1907, *C. Conzatti*, no. 1959 (hb. Field Museum). The plant is known in Oaxaca by the vernacular name of "*Jicama del Monte.*"

IPOMŒA DASYSPERMA Jacq. Eclog. i. 132, *t. 89* (1811–1816).

This species was described from plants grown in the garden of the University of Vienna from seeds which, it is stated, were sent from England in 1814; the seeds, it is said moreover, came originally from China. The correspondence of the specimens at hand with the description and illustration in JACQUIN'S *Eclogiæ* is so strikingly coincident there can be little doubt that we are dealing with one and the same species. It is quite possible that there may have been some mixture of the seeds grown, as it is a well known fact that Jacquin at this time was growing many American plants in Vienna, and it is not unlikely that he may have confused certain American importations with the seeds which were supposed to have come indirectly from China. At all events several complete specimens at hand agree in all essential details with the above species, as it is characterized and illustrated, and the writer has no hesitation in referring thereto the following Mexican plants.— State of Yucatan: Merida, 20 August, 1865, *A. Schott*, no. 589 (hb. Field Museum); Izamal, coll. of 1896, *Dr. Geo. F. Gaumer*, no. 989 (hb. Field Museum); Chichankanab, *Dr. Geo. F. Gaumer*, nos. 1393, 1472 (hb. Field Museum).

Ipomœa oaxacana Greenman, sp. nov. *I. dimorphophylla* House Ann. N. Y. Acad. Sci. xviii. 257 (1908), in part, not Greenman.

Caule volubili lignescenti glabro subtereti; ramis ramulisque juventate pilosis glabratis; foliis petiolatis ovatis 2.7 cm. longis 1–4.5 cm. latis acutis vel acuminatis mucronatis integris vel 3-lobatis basi obtusis vel subcordatis supra glabris vel sparse pilosis subtus persistenter griseo-tomentulosis, petiolo gracili usque ad 4 cm. longo sparse piloso; inflorescentiis axillaribus subsessilibus brevi-pedunculatis 1–6 floribus; pedicellis 1.5 cm. vel minus longis sursum plus minusve incrassatis albo-tomentulosis; calyce profunde 5-lobato, lobis inæqualibus ovato-oblongis 5–8 mm. longis apice rotundatis vel emarginatis cuspidatisque integris glabris; corolla tubulo-campanulata 6–7 mm. longa alba vel in plicis rubella glabra; ovario ovideo glabro; stylo persistente basi piloso.— MEXICO. State of Oaxaca: Cerro San Antonio, Distrito de Etla, altitude 1700 m., 27 October, 1907, *C. Conzatti*, no. 2057 (hb. Field Museum, cat. no. 225829, type); Cerro de Frujano, altitude 1800 m., Distrito del Centro, 15 November, 1908, *C. Conzatti*, no. 2313 (hb. Field Museum); on talus cliffs, Sierra de San Felipe, altitude 2135 m.,

11 October, 1894, *C. G. Pringle*, no. 5677 (hb. Gray); hills of Soledad de Etla, altitude 1985 m., 19 November, 1895, *C. Conzatti*, no. 968 (hb. Gray); Cerro San Felipe, altitude 1750 m., 10 October, 1897, *C. Conzatti & V. Gonzalez*, no. 505 (hb. Gray).

The species here proposed resembles *I. dimorphophylla* Greenm. to which some of the collections cited above have been referred. *I. oaxacana*, however, differs from *I. dimorphophylla* in having a distinctly woody stem, uniformly shorter peduncles, persistently pubescent lower leaf-surface, and conspicuously white-tomentulose pedicels.

IPOMŒA PRÆCANA House, Ann. N. Y. Acad. Sci. xviii. 227 (1908).

Hereto are referred excellent flowering and fruiting specimens collected by *C. Conzatti* at Estacion Almoloyas, altitude 800 m., State of Oaxaca, Mexico, 29 September, 1907, *Conzatti*, no. 2052, in flower (hb. Field Museum); De Almoloyas á Sta. Catarina, altitude 1000 m., State of Oaxaca, Mexico, 26 December, 1906, *Conzatti*, no. 1656, in fruit (hb. Field Museum). Señor CONZATTI'S specimens have been compared with the type at the Gray Herbarium and are certainly conspecific. The material, however, shows additional characters and some variation in size of flowers which may be recorded as follows: Inflorescentia cymosa; pedunculis 1–5-floris; corollis usque ad 12 cm. longis; capsulis ovato-oblongis circiter 2 cm. longis, glabris; seminibus obovato-oblongis, 10–12 mm. longis, propter marginibus comatis, comis 1–1.5 cm. longis.

BOURRERIA OBOVATA Eastwood, Proc. Am. Acad. xliv. 606 (22 May, 1909). *Beurreria strigosa* Brandegee, Univ. Calif. Pub. Bot. iii. 390 (24 May, 1909).

Excellent flowering specimens of a very attractive Mexican shrub have been communicated to the writer by Professor C. CONZATTI for identification; these were compared recently at the Gray Herbarium with the type of Miss EASTWOOD'S *Bourreria obovata* and prove to be identical. Only two days subsequent to the date of publication of Miss EASTWOOD'S paper, Mr. BRANDEGEE issued a paper dealing with a collection of plants made in Mexico by Dr. C. A. PURPUS and among other novelties described *Beurreria strigosa* founded on *Purpus'* no. 3360. This material is almost the counterpart of the type of *B. obovata*, hence by the rule of priority *B. strigosa* must give way to the earlier published name. In addition to the material cited in the above publication the following may be recorded: Cuesta de Quiotepec, District of Cuicatlán, Mexico, altitude 600 m., 21 June, 1909, *C. Conzatti*, no. 2480 (hb. Field Museum).

Bourreria pulchra Millsp., comb. nov. *Cordia pulchra* Millsp. in Engl. Bot. Jahrb. xxxvi. Beibl. lxxx. 24 (1905).

A re-examination of the specimens on which this species was founded, in the light of additional material, shows the generic affinity to be with *Bourreria* rather than with *Cordia*. In addition to the specimens cited under the original description the following collection is here referred.—MEXICO. State of Yucatan: Colonia San Cosme, vicinity of Merida, 20 February, 1906, *J. M. Greenman*, no. 360 (hb. Field Museum). The plant is rather common at this station where it grows as a shrub from 1 to 2 m. high and produces corymbose-paniculate clusters of numerous creamy white flowers the fragrance of which is at first pleasing but soon becomes heavy and somewhat unpleasant.

Cordia appendiculata Greenman, sp. nov.

Frutex 1.5–4 m. altus; ramis teretibus hispido-strigosis et pilis minute puberulentis intermixtis; foliis petiolatiso vato-lanceolatis 3–7 cm. longis 1.2–3 cm. latis acutis leviter crenato-serratis, basi cuneatis supra scabris subtus pallidioribus griseo-strigosis; petiolis .5–1.5 cm. longis pubescentibus; pedunculis terminalibus et lateralibus 3–6 cm. longis hirsuto-strigosis; capitulis globosis 2–2.5 cm. diametro; calyce 8–10 mm. longo 5-lobato cano-strigoso-hirsuto; lobis ovatis circiter 2 mm. longis acutis vel paullo acuminatis dorso infra apicem appendiculatis, appendicibus setaceis 3–6 mm. longis hirsutis; corolla 2–2.6 cm. longa alba membranacea infundibuliformi extrinsecus intusque glabra calyce circiter triplo longiore, limbo 2–3 cm. diametro; staminibus 5 inclusis inæqualibus; stylo et ovario glabro; fructu ignoto.—MEXICO. State of Oaxaca: Cañon de Tomellin, Dto. de Cuicatlán, altitude 700 m., 20 June, 1908, *Carlos & Cassiano Conzatti*, no. 2218 (hb. Field Museum cat. nos. 235154, 246874, type); Tomellin Canyon, alt. 760 m., 18 May, 1894, *C. G. Pringle*, no. 4630 (hb. Gray and hb. U. S. Nat. Museum); between San Geronimo and La Venta, 13 July, 1895, *E. W. Nelson*, no. 2785 (hb. Gray); Cuesta de Quiotepec, alt. 1525 m., 13 August, 1895, *Lucius C. Smith*, no. 700 (hb. Gray).

The species here described resembles superficially *C. macrocephala* HBK. with which it had been confused, but differs in having larger leaves and appendaged calyx-lobes.

CORDIA BREVISPICATA Mart. & Gal., var. **hypomalaca** Greenman, var. nov.

Habitu et floribus formæ typicæ; foliis 2–6 cm. longis .5–1.5 cm. latis hirsuto-hispidulis subtus niveo-tomentosis; spicis plerumque longe pedunculatis usque ad 12 cm. longis.—MEXICO. State of Oaxaca: Cerro San Felipe, altitude 1700 m., 30 June, 1907, *C. Conzatti* no. 1831 (hb. Field Museum, cat. nos. 225986 and 246873).

Ehretia tehuacana Greenman, sp. nov.

Arbor (?); ramis teretibus glabris; ramulis juventate glanduloso-puberulentis et interdum sparsissime hirsutis ætate glabris; foliis petiolatis ovato-oblongis 4–8.5 cm. longis 2–5 cm. latis acutis vel rotundatis apicem versus dentatis infra mediam integerrimis basi plus minusve inæqualibus obtusis vel subrotundatis supra hispido-scabris atroviridibus subtus pallidioribus cano-hirsutisque; petiolis 0.5–1.5 cm. longis pubescentibus; calyce campanulato 2.5–3 mm. longo 5-lobato subglabro, lobis ovatis acutis ciliatis; corolla alba (?) infundibuliformi circiter 10 mm. longa glabra, limbo 5-lobatis, lobis ovato-rotundatis 2.5 mm. longis 2 mm. latis patentibus; staminibus exsertis; drupa ovoidea 6–8 mm. longa glabra; seminibus subcylindratis circiter 4 mm. longis.— MEXICO. State of Puebla: las Mohoneras, Tehuacán, altitude 2200 m., 22 June, 1908, *C. Conzatti*, no. 2220 (hb. Field Museum, cat. no. 235156, type), flowering specimen; San Nicolás, Tehuacán, alt. 2000 m., 22 June, 1908, *C. Conzatti*, no. 2221 (hb. Field Museum, cat. no. 235157), fruiting specimen. Of the known species, *E. tehuacana* is most nearly related to *E. viscosa* Fernald, from which it may be readily distinguished by the more oblong leaves, larger flowers and less glandular tomentum; the calyx is nearly twice as large as in *E. viscosa* and except for the ciliation it is essentially glabrous.

Lithospermum Conzattii Greenman, sp. nov.

Herbaceum perenne 3–4 dm. altum; caulibus basi lignosis erectis vel adscendentibus hirsutis et subcrispo-strigosis; foliis sessilibus lanceolatis vel lanceolato-oblongis 1–7 cm. longis 4–14 mm. latis acutis integris utrinque adpresso-tuberculato-hispidis supra atro-viridibus subtus pallidioribus; racemis usque ad 13 cm. longis foliaceis; floribus brevi-pedicellatis, pedicellis 2–5 mm. longis; calycis lobis lineari-lanceolatis 5–7 mm. longis hirsutis; corolla tubiformi 8–10 mm. longa externe pilosa 5-lobata, lobis subrotundatis; staminibus inclusis, antheris subsessilibus; nuculis ovoideis 4–5 mm. longis nitidis levibusque. — MEXICO. State of Oaxaca: de Huauclilla á Nochixtlán, Rancho Pozuclos, altitude 2400 m., 19 June, 1907, *C. Conzatti*, no. 1846 (hb. Field Museum, cat. no. 226002, type). Habitally resembling *L. calcicola* Rob. from which it differs in having larger flowers and smooth nutlets.

Lantana macropodioides Greenman, nom. nov. *Lantana pupurea* Benth. & Hook. f. Gen. Pl. ii. 1142 (1876), not Hornem. Hort. Hafn. ii. 583 (1815). *Lippia purpurea* Jacq. f. Eclog. i. 126, *t.* 85 (1816); DC. Prodr. xi. 581 (1847), excluding synonomy.

To this species are referred the following.— MEXICO. State of Coahuila: Soledad, about 15.5 kilometers southwest of Monclova, 9–19 September, 1880, *Dr. Edward Palmer*, no. 1023 (hb. Field Museum).

State of Nuevo Leon: valley near Monterey, altitude 500 m., 1 September, 1903, *C. G. Pringle*, no. 11671 (hb. Field Museum). State of San Luis Potosi: San Diequito, 13–16 June, 1904, *Dr. Edward Palmer*, no. 139 (hb. Field Museum). State of Morelos: hills near Yautepec, altitude 1220 m., 21 October, 1902, *C. G. Pringle*, no. 11081 (hb. Field Museum); near Cuernavaca, altitude 1525 m., 11 September, 1903, *C. G. Pringle*, no. 11672 (hb. Field Museum); Cuernavaca, 31 August, 1901, *C. R. Orcutt*, no. 3880 (hb. Field Museum). State of Puebla: El Riego, July, 1905, *C. A. Purpus*, no. 1298 (hb. Field Museum); vicinity of San Luis Tultitlanapa, July, 1908, *C. A. Purpus*, no. 3410 (hb. Field Museum). State of Vera Cruz: Orizaba, altitude 1220 m., 31 July, 1891, *H. E. Seaton*, no. 136 (hb. Field Museum). State of Oaxaca: Les Sedas, altitude 1830 m., 3 December, 1895, *C. G. Pringle*, no. 6270 (hb. Field Museum); San Pablo Etla, altitude 1700 m., 22 September, 1907, *C. Conzatti*, no. 2064 (hb. Field Museum). Honduras. Piedra pintada, near Copan, altitude 900 m., 8 January, 1907, *H. Pittier*, no. 1831 (hb. Field Museum and hb. U. S. Nat. Museum).

Habitally this species resembles *Lantana macropoda* Torr. and has often been confused with it, but may be distinguished readily by the larger, acuminate and sharply dentate leaves, coarser and more scattered pubescence.

Lippia albicaulis Greenman, sp. nov.

Frutex 3 m. altus; ramis teretibus cortice albo tectis, ramulis novellis tetragonis puberulentis et minute setoso-aculeatis glabratis; foliis petiolatis elliptico-lanceolatis 5–10 cm. longis 2–4 cm. latis acutis ad apicem crenato-dentatis infra mediam integris basi cuneatis supra hispidulis subtus pallidioribus et præcipue ad venas laxe hirtello-puberulentis; pedunculis axillaribus solitariis bis quaternis gracilibus usque ad 3 cm. longis substrigillosis et atamifero-glandulosis; capitulis subglobosis circiter 1 cm. diametro, bracteis laxe imbricatis lato-ovatis vel subreniformibus acutis vel breviter subacuminatis 6–7 mm. longis 4–9 mm. latis membranaceis hirtello-puberulis ciliatisque; calyce subvilloso 2–2.5 mm. longo; corolla parva circiter 3 mm. longa externe atomifero-glandulosa fauce pulverulente 4-lobatis, lobis inæqualibus subrotundatis; staminibus inclusis, antheris sessilibus vel subsessilibus; coccæ glabræ 1.5–2 mm. longæ.— MEXICO. State of Yucatan: near Izamal, coll. of 1896, *Gaumer*, no. 971 (hb. Field Museum, cat. no. 37319, type); in the same locality, *Gaumer*, no. 871 (hb. Field Museum); Chichankanab, *Gaumer*, no. 1475 (hb. Field Museum); Calotmul, *Gaumer*, no. 2109 (hb. Field Museum).

In general appearance *L. albicaulis* resembles *L. umbellata* Cav. with

which a part of the material above cited has been hitherto confused. The more striking characters distinguishing *L. albicaulis* from *L. umbellata* and other species of the immediate group to which it belongs are its smooth ashy white stem and branches, puberulent branchlets, dark green elliptic-lanceolate leaves which are but slightly pubescent on both surfaces.

Lippia (§Rhodolepis) Kellermanii Greenman, sp. nov.

Frutex, ramis ramulisque plus minusve tetragonis ad nodos compressis cortice brunneo tectis dense pubescentibus cum pilis hirsutis et glanduliferis; foliis brevipetiolatis ovatis 3–18 cm. longis 1.5–10 cm. latis acuminatis crenato-dentatis ad basin cordatis vel abrupte contractis et obtusis supra rugosis et scabrido-hispidis subtus hirsuto-tomentosis; petiolis 0.5–1.5 cm. longis pubescentibus; pedunculis 4–6 axillaribus usque ad 3.5 cm. longis quam folia multo brevioribus hirsutis et glanduloso-pubescentibus; capitulis subglobosis 12–20 mm. diametro, in apice ramorum folioso-paniculatis, bracteis lato-ovatis vel subreniformibus 6–10 mm. longis 5–15 mm. latis acuminatis acutis integris utrinque glanduloso-pubescentibus pallido-viridibus et subchartaceis; calyce circiter 2.5 mm. longo bifido villosissimo et brevi-stipitato-glanduloso; corolla 6 mm. longa obliqua infra glabra supra pubescente albida.— GUATEMALA. Department of Amatitlan; Laguna (Lake Amatitlan) altitude 1200 m., 20 January, 1906, *W. A. Kellerman*, no. 6372 (hb. Field Museum, cat. no. 225152, type).

Hereto are referred with some doubt the following Guatemalan specimens: Department of Alta Vera Pax, Cobán, altitude 1400 m., March, 1903, *H. von Tuerckheim*, no. 8441 (exsiccatæ John Donnell Smith); Cobán, altitude 1350 m., February, 1907, *H. von Tuerckheim*, no. II. 715 (hb. Field Museum).

The species here proposed has its affinity with *L. lupulina* Cham., *L. umbellata* Cav., *L. substrigosa* Turcz., and L. *nutans* Rob. & Greenm.; but it is amply distinct and easily recognized among all the known species of the genus on account of the large broadly ovate leaf-blade, which is cordate or abruptly contracted at the base, rugose and hirsute-hispid above and sub-tomentose beneath, and glandular hairs intermixed with a spreading hirsute pubescence on stem, petioles and peduncles.

SALVIA FLACCIDIFOLIA Fernald, Proc. Am. Acad. xliii. 66 (1907).

This species is well represented by specimens collected on moist hillsides, Honey, State of Jalisco, Mexico, altitude 2130 m., 21 October, 1908, *Barnes & Land*, no. 496 (hb. Field Museum).

SALVIA TILIÆFOLIA Vahl var. CINERASCENS Fernald, Proc. Am. Acad. xxxv. 495 (1900).

Excellent specimens of this very interesting variety were collected on banks along the Mexican Central Railway below Tuxpan, altitude 990 m., State of Jalisco, Mexico, 9 October, 1908, *Barnes & Land*, no. 321 (hb. Field Museum).

Scutellaria oaxacana Greenman, sp. nov.

Herba ramosa perennis; ramis erectis vel adscendentibus 7–13 cm. altis breviter et dense pubescentibus; foliis petiolatis late ovatis .5–1.5 cm. longis .4–1.4 cm. latis obtusis irregulariter crenato-dentatis vel subintegris supra sparse hirsutis subtus secus nervos pilosis; petiolis 2–3 mm. longis pubescentibus; inflorescentiis racemosis hirsuto-pubescentibus cum pilis glandulosis intermixtis, bracteis brevi-petiolatis vel sessilibus ovato-oblongis obtusis integris; pedicellis 1–2 mm. longis; calyce per anthesem 2–3 mm. longo in fructu usque ad 5 mm. longo pubescente plus minusve purpureo; corollis purpurascentibus circiter 1.5 cm. longis extus pilosis; staminibus anticis longioribus et exsertis; nuculis glabris.— MEXICO. State of Oaxaca: Camino Montelobos, Dto. Nochixtlán, Rancho Nopalera, altitude 2000 m., 22 June, 1907, *C. Conzatti*, no. 1849 (hb. Field Museum, cat. no. 226005, type).

The affinity of this species is apparently with *S. cærulea* Moc. & Sesse and *S. Seleriana* Loes. From the former it differs in the low stature, small leaves, shorter and reddish to dark purple flowers and distinctly racemose inflorescence; from *S. Seleriana* it differs in the color of the flowers and in the exserted stamens.

BACOPA DECUMBENS (Fern.) Greenm. Field Col. Mus. Pub. Bot. Ser. ii. 262 (1907).

Specimens collected by *Mr. C. F. Baker* at Herradura, Province of Pinar del Rio, Cuba, 30 September, 1904, correspond well with the original specimens, secured by Dr. ED. PALMER in the vicinity of Acapulco, Mexico, from which the above species was described. The leaves in Mr. BAKER'S specimens are slightly broader, but the habit of the plant and detailed characters of the flower are identical.

SEYMERIA INTEGRIFOLIA Greenm. Proc. Amer. Acad. xxxix. 89 (1903).

A second station for this species may be recorded, as follows.— MEXICO. State of Jalisco: Sierra de San Estaban, altitude 1700 m., 28 September, 1908, *Barnes & Land*, no. 157 (hb. Field Museum).

Anisacanthus tulensis Greenman, sp. nov.

Fruticosus; caulibus teretibus levibus, cortice exfolianti; ramulis ultimis dense subsordido-pubescentibus; foliis brevi-petiolatis anguste lanceolatis 1.5–3 cm. longis 5–10 mm. latis acutis integris basi obtusis supra puberulentis subtus sparse pubescentibus; petiolis 1–4 mm. longis pilosis; floribus axillaribus pedicellatis, pedicellis 2–4 mm. longis dense pilosis; calyce 10–12 mm. longo infra mediam 5–partito extrinsecus plus minusve piloso et granuloso, lobis lanceolato-attenuatis acutis; corolla 5–5.5 cm. longa bilabiata coccinea extus fulvo-pilosa, tubo circiter 2 cm. longo superne paullum ampliato, labio postico lineari-elongato circiter 3 cm. longo ad apicem minute 2-lobo, labio antico 3-partito cum lobis lineari-elongatis 2.5 cm. longis obtusis; stylo glabro; disco breviter cupuliformi; capsula ovata 2–2.5 cm. longa glabra, basi in stipitem latam longe contracta maturitate segmenta calycis æquanti; seminibus suborbiculatis compressis plerumque 6 mm. longis 5 mm. latis minute muricatis.— MEXICO. State of Oaxaca: Santa Maria del Tule, altitude 1600 m., 31 March, 1907, *C. Conzatti*, no. 1773 (hb. Field Museum, cat. no. 225939).

A species most nearly related to *A. pumilum* Nees and *A. Greggii* (Torr.) Gray, but readily separated by the densely pubescent branchlets and longer calyx.

Ruellia Palmeri Greenman, sp. nov.

Frutex .75–2.5 m. altus; ramis teretibus vel obtuse tetragonis dense atomifero-glandulosis et plus minusve hirsuto-pubescentibus ad nodos compressis; foliis subcoriaceis petiolatis ovatis vel ovato-oblongis 5–15 cm. longis 1.5–7.5 cm. latis acutis vel acuminatis integris basi subrotundatis vel breviter cuneatis supra puberulentis atamifero-glandulosisque glabratis subtus pallidioribus subglabris vel cano-tomentulosis, venis primariis transversis conspicuis; petiolis 1–2.5 cm. longis plus minusve pubescentibus; floribus axillaribus brevipedicellatis ad apicem ramulorum dispositis; pedicellis 4–18 mm. longis; calycibus 2–2.5 cm. longis 5-partitis, segmentis lanceolatis subacutis extus dense puberulentis glandulosisque intus plus minusve sericeo-canescentibus; corollis 7–8.5 cm. longis ad basin cylindrico-tubulosis infra medium incurvis vel subito ventricoso-inflatis, limbi lobis subæquantibus oblongo-ovatis circiter 2 cm. longis 1.5 cm. latis apice obtusis vel rotundatis ciliatis; staminibus exsertis, filamentis glabris; ovario dense piloso et glanduloso, loculis 4-ovulatis, stylo subhirsuto. Capsulam maturam non vidi.— MEXICO. State of Guerrero: vicinity of Acapulco, October, 1894, to March, 1895, *Dr. Edward Palmer*, no. 382 (hb. Field Museum, cat. nos. 36949, 265631, type). State of Oaxaca: Teojomulco, Distrito de

Inguila, altitude 2000 m., 31 December, 1908, *C. Conzatti*, no. 2351 (hb. Field Museum).

The species here proposed belongs to the same group as *Ruellia Bourgæii* Hemsl. and *R. pulcherrima* T. Anders. From the former it differs in the outline, size, pubescence and texture of the leaves, smaller flowers, more lanceolate calyx-divisions, pubescent ovary and fewer ovules; from *R. pulcherrima* it differs in having larger leaves, shorter calyx, the absence of stipitate glands, and in the more conspicuously ventricose and larger corolla.

COUTAREA ACAMPTOCLADA Rob. & Millsp. Engl. Bot. Jahrb. xxxvi. Beibl. lxxx, 28 (1905).

This species was described originally from flowering specimens (*Seler*, no. 4044) with quite undeveloped leaves, hence the following characters pertaining to foliage and fruit may be here recorded, as follows: Folia petiolata elliptica vel oblongo-obovata 2–3.5 cm. longa 1–1.7 cm. lata ad apicem sæpissime rotundata et cuspidata rarius emarginata integerrima basi cuneata utrinque glabra subtus palidiore; petiolis 1 cm. vel minus longis; capsulis pedicellatis oblongo-ovoideis 1.5–2 cm. longis circiter 1 cm. latis muriculatis; seminibus numerosis alatis.— MEXICO. State of Yucatan: Port Silam (Tzilam), *Dr. G. F. Gaumer*, coll. of 1895, no. 682 (hb. Field Museum).

Adenostemma nutans Greenman, sp. nov.

Herba glabra 1 m. alta; caule striato-angulato; foliis oppositis, superioribus sessilibus ovatis acuminatis obtusis minute serrato-dentatis 3-nerviis; inflorescentiis terminalibus corymboso-cymosis; capitulis numerosis homogamis plerumque nutantibus 8–10 mm. altis; squamis involucri 2-seriatis lineari-oblongis vel spathulatis 4–6 mm. longis glabris obtusis vel rotundatis integerrimis, exterioribus brevioribus; floribus numerosis; pappi setis plerumque 2 (1–3) papillo-clavatis perbrevibus vel multoreductis; corollis ca. 4 mm. longis flavo-viridibus 5-dentatis extus sparsissime subglanduloso-hirtis; achæniis obliquis 2.5–3 mm. longis 5-costatis inter costis tuberculoso-glandulosis.— MEXICO. State of Vera Cruz: in marshy land near the City of Vera Cruz, 13 April, 1910, *C. R. Orcutt*, no. 3410 (hb. Field Museum, cat. no. 280116).

But for the presence of a reduced pappus the plant here described might be referred equally well to *Gymnocoronis*, and habitally it resembles *G. subcordata* DC., but differs in involucral and achenial characters. In most cases, however, the pappus is present in the form of one to three papillose-clavate much reduced setæ, hence its affinity seems rather to be with *Adenostemma*.

EUPATORIUM CRASSIRAMEUM Rob. Proc. Am. Acad. xxxv. 332 (1900).

This very interesting and unique species has been collected at the following stations.— MEXICO. State of Oaxaca: Estacion de Almoloyas, altitude 800 m., 3 March, 1907, *C. Conzatti*, no. 1753 (hb. Field Museum). SALVADOR. Above Izalco, altitude 800 m., 25 February, 1907, *H. Pittier*, no. 1978 (hb. U. S. Nat. Museum, and hb. Field Museum).

Xanthocephalum linearifolium (DC.) Greenman, comb. nov. *X. Alamani* Benth. & Hook. f. Gen. Pl. ii. 249 (1876); Hemsl. Biol. Cent.-Am. Bot. ii. 109 (1881). *Gutierrezia Alamani* Gray Pl. Wr. i. 91 (1852). *Keerlia linearifolia* DC. Prodr. v. 310 (1836).

Melampodium villicaule Greenman, sp. nov.

Herba annua erecta 2.5–3 dm. alta; caule ramoso dense villoso-pubescenti; foliis oppositis petiolatis vel superioribus subsessilibus ovatis vel ovato-oblongis 2–6 cm. longis 1–3.5 cm. latis acutis vel obtusis et submucronatis integris basi abrupte cuneatis 3-nervatis atroviridibus utrinque sparse plus minusve adpresso-tuberculato-hirsutis; petiolo 1 cm. vel minus longo; pedunculis filiformibus 2–8 cm. longis pubescentibus; capitulis 7–10 mm. diametro; involucri squamis exterioribus 5 ovatis 4–5 mm. longis acutis subadpresso-villosis herbaceis; flosculis liguliferis plerumque 5, ligulis late ovatis circiter 5 mm. longis flavis; fructu (achænio squama involucri interiore amplexo) a latere compresso et tuberculato apice in cornu longissimum circinato-revolutum glabrum vel nonnihil sericeum producto.— Collected in Mexico, by *C. R. Orcutt*, no. 4386 (hb. Field Museum, cat. no. 282534).

This species is most nearly related to *Melampodium longipilum* Rob. but differs in having a less branched stem, broader leaves which are abruptly contracted below the middle to a petiolate base, longer peduncles, and fewer heads.

SANVITALIOPSIS LIEBMANNII Schz. Bip. Leopoldina xxiii. 89 (1887); Greenm. Proc. Am. Acad. xli. 261 (1905).

So far as known to the writer no collection of this apparently rare species has been made since it was discovered in the early forties by LIEBMANN along the Rio Taba in southern Mexico. Excellent specimens were obtained by Professor *C. Conzatti* on the Cerro San Antonio de la Cal, altitude 1600 m., State of Oaxaca, Mexico, 18 August, 1907, no. 1952 (hb. Field Museum), which were taken to represent the above species and accordingly were sent to the Gray Herbarium for comparison with authentic material. Professor

B. L. ROBINSON has very kindly compared for me the CONZATTI plant with a part of the original LIEBMANN material now at the Gray Herbarium and states there is no doubt that they are conspecific. Hence a second locality may be definitely recorded for this interesting composite shrub.

Sclerocarpus multifidus Greenman, sp. nov.

Herba annua (?); caule erecto vel ascendente; ramis ramulisque striatis strigosisque; foliis alternis petiolatis vel summis sessilibus ambitu ovatis vel oblongo-ovatis 5–8 cm. longis 1–4 cm. latis pinnato-multifidis utrinque adpresso-pubescentibus subtus pallidioribus, lobis lineari-lanceolatis acutis integris vel irregulariter dentatis; inflorescentiis terminalibus; capitulis longe pedunculatis, pedunculis 4–16 cm. longis nudis plus minusve adpresso-pubescentibus; bracteis involucri foliaceis lanceolatis 7–12 mm. longis acutis hirsutis persistentibus; corollis florum radii flavis, tubo gracili 2.5–3 mm. longo, radiis oblongo-ovatis bidentatis supra minuto-papillosis subtus parce strigosis; paleis receptaculi achænia maturata arte involventibus 4–5 mm. longis tuberculatis et parce hirsutis; achæniis obliquo-obovatis circiter 4 mm. longis striatulis glabris.—MEXICO. State of Guerrero: Rio Balsas, 26 August, 1910, *C. R. Orcutt*, no. 4177 (hb. Field Museum, cat. no. 282101, type). The character of the leaves renders this a unique and very easily recognized species.

Sclerocarpus Orcuttii Greenman, sp. nov.

Herba annua (?); caule erecto ramoso purpurascenti; ramis ramulisque striatis parce substrigosis; foliis alternis petiolatis ovatis 2–3.5 cm. longis 1–2 cm. latis acutis vel obtusis subintegris trinerviis utrinque strigoso-hispidis basi cuneatis subtus pallidioribus; petiolis usque ad 1.5 cm. longis; pedunculis 1–6 cm. longis subadpresso-hispidis; capitulis radiatis; bracteis exterioribus involucri foliaceis obovatis 5–6 mm. longis 3–5 mm. latis submucronatis strigoso-hispidis; radiis ovato-oblongis juventate aurantio-flavis; paleis florum disci achænia maturata amplectentibus parce tuberculatis hirsutisque; achæniis obliquis 2.5–3 mm. longis epapposis glabris.—MEXICO. State of Colima: Colima, 24 October, 1910, *C. R. Orcutt*, no. 4599 (hb. Field Museum, cat. no. 283411, type).

SCLEROCARPUS UNISERIALIS (Hook.) Benth. & Hook. f., var. **papposus** Greenman, var. nov.

Caulis dense strigoso-pubescens; foliis inferioribus longe petiolatis subtus incano-strigosis; achæniis oblongo-obovatis glabris, pappo coronato-lacinato 2.5 mm. longo.—MEXICO. State of Guerrero: Rio Balsas, 26 August, 1910, *C. R. Orcutt*, no. 4208 (hb. Field Museum,

cat. no. 282121). Similar to the species but with a closely appressed-pubescent stem, minute outer involucral bracts and a well developed pappus.

Isocarpha blepharolepis Greenman, sp. nov.

Herba perennis tota subvilloso-tomentosa; ramis ramulisque teretibus; foliis infra oppositis supra alternis brevipetiolatis vel sessilibus oblongo-lanceolatis 1–3.5 cm. longis 3–12 mm. latis acutis integris vel denticulatis utrinque pubescentibus; capitulis ad apicem ramulorum dispositis conferto-cymosis multifloris ovato-oblongis 5–8 mm. longis; squamis involucri biseriatis oblongo-lanceolatis 2–3 mm. longis acutis ciliatis et extrinsecus pubescentibus; receptaculo elongato, paleis spathulato-cuneatis obtusis uninerviis conspicue ciliatis dorso pubescentibus plus minusve viridibus vel purpurascentibus, margine membranaceis; corollis tubulosis ad faucem ampliatis albis vel purpurascentibus, tubo extus sparsissime glanduloso-hirtello; achaeniis calvis circiter 1.5 mm. longis 5-angulatis glabris.—PERU: Somate, altitude 100 m., 18 November, 1910, *C. H. T. Townsend*, no. 825 (no. 534396 hb. U. S. Nat. Museum), type; fragment and photograph in hb. Field Museum.

This species at first suggests the common *Isocarpha oppositifolia* R. Br. from which it is readily distinguished by the alternate upper leaves and by the thin one-nerved blunt and strongly ciliated pales of the receptacle.

Gymnolomia guatemalensis Greenman, comb. nov. *G. patens* var. *guatemalensis* Rob. & Greenm., Proc. Bost. Soc. Nat. Hist. xxix. 94 (1899). *G. microcephala*, var. *guatemalensis* Rob. & Greenm., Proc. Am. Acad. xxxix. 101 (1903).

This species was originally characterized as a variety of *G. patens* Gray with the following brief description,—"With copious spreading pubescence on the stem: pedicels 1–2.5 cm. long: pappus none." Several specimens have since been examined and all possess the copious spreading pubescence on stem, leaves, and in the inflorescence, thus rendering it easily separated from *G. microcephala* Less. with which it has been associated as a variety. Hereto are referred the following,—GUATEMALA: San Miguel Uspantán, Department of Quiché, altitude 1825–3650 m., April, 1892, *Heyde & Lux*, no. 3370 of John Donnell Smith's sets; Cobán, Department of Alta Verapaz, altitude 1300 m., February, 1903, *H. von Tuerckheim*, no. 8423 of John Donnell Smith's sets; Sierra de las Minas, Department of Verapaz, 3 March, 1907, *W. A. Kellerman*, no. 6284 (hb. Field Museum); near Jalapa, Department of Jalapa, altitude 1360 m., 7 January, 1908, *W. A. Kellerman*, no. 7984 (hb. Field Museum); Cobán, Department of Alta Verapaz, altitude,

1350 m., February, 1907, *H. von Tuerckheim*, no. II. 1602, and March, 1907, no. II, 927 in part (hb. Field Museum).

Perymenium strigillosum Greenman, comb. nov. *P. grande* Hemsl., var. *strigillosum* Rob. & Greenm. Proc. Am. Acad. xxxiv. 529 (1899); Jones l. c. xli. 166 (1905). *Zexmenia fasciculata* Coulter in J. D. SMITH'S Enum. Pl. Guat. iv. 86 (1895), not Gray.

Fruticosum; caule subtetragono 4-sulcato strigilloso; foliis oppositis petiolatis ovato-lanceolatis 0.5–2 dm. longis 1–6.5 cm. latis acuminatis acutis crenato-serratis basi cuneatis integris utrinque hispidis supra basin 3-nerviis; petiolis usque ad 4 cm. longis et pedunculis adpresse pilosis; inflorescentiis paniculato-cymosis terminalibus; capitulis numerosis radiatis; involucri campanulati ca. 6 mm. alti squamis 2–3-seriatis inæqualibus ovatis vel ovato-oblongis 3–6 mm. longis apice obtusis vel subrotundatis plus minusve ciliatis extrinsecus strigillosis; ligulis conspicuis flavis elliptico-oblongis ca. 1.5 cm. longis 5 mm. latis; pappi setis valde inæqualibus numerosis; achaeniis maturatis 3–4 mm. longis parce pubescentibus, radii triquetris 3-alatis, disci latero-compressis et plus minusve 2-alatis, alis sursum productis pappo liberis.—GUATEMALA: Department of Santa Rosa, Cenaguilla, altitude 1200 m., November, 1892, *Heyde & Lux*, no. 4244, exiccatæ John Donnell Smith (hb. Field Museum cat. nos. 264839, 264840); Department of Sacatipéquez, Volcano Agua, altitude 2130–2285 m., 15 February, 1905, and 4 February, 1908, *W. A. Kellerman*, nos. 5326, 7425 (hb. Field Museum, cat. nos. 195454, 224429). Department of Talapa, Volcano Imay, altitude 1500 m., 8 January, 1908, *W. A. Kellerman*, no. 7040 (hb. Field Museum, cat. no. 224250). SAN SALVADOR: Amatepeque Hill, near San Salvador, altitude 1200 m., 2 February, 1907, *H. Pittier*, no. 1906 (hb. U.S. Nat. Museum, cat. no. 578308, fragments in hb. Field Museum).

A re-examination of the material referred to *Perymenium grande* Hemsl. by ROBINSON and GREENMAN in their revision of this genus shows that the variety *strigillosum* may be clearly differentiated from Mr. HEMSLEY'S species by the appressed or strigillose pubescence on stem, branches, inflorescence and petioles, by the uniformly shorter and narrower involucral bracts, and by the thicker leaves. It seems therefore best to regard this plant as a species rather than a variety, hence it is here raised to specific rank and a description appended.

ZEXMENIA ELEGANS Schz. Bip., var. **Kellermanii** Greenman, var. nov.

A forma typica recedit foliis subtus pedunculisque strigoso-pubescentibus.—GUATEMALA. Department of Izabal: Las Amates, 15 February, 1908, and 17 January, 1905, *W. A. Kellerman*, nos. 7612, 5332 (hb. Field Museum).

TAGETES JALISCENSIS Greenm. Proc. Am. Acad. xl. 47 (1904).

Specimens well exemplifying this species were collected on hillsides along the road to San Domingo mine, altitude 1580 m., near Etzatlan, State of Jalisco, Mexico, 6 October, 1908, *Barnes & Land*, no. 287 (hb. Field Museum).

Liabum adenotrichum Greenman, sp. nov.

Frutex 3–4 m. altus; caulibus juvenilibus floccoso-tomentosis glabratis striatisque; foliis oppositis vel ternatis petiolatis trinervatis ovatis 6–13 cm. longis 2–7.5 cm. latis acuminatis calloso-denticulatis ad basin abrupte contractis cuneatis et petiolam decurrentibus supra arachnoideo-tomentulosis glabratisque subtus densissime albo-lanatis petiolis 2.5–3 cm. longis subglabratis; inflorescentiis paniculatis terminalibus albo-tomentosis et pilis stipitato-glandulosis intermixtis; capitulis discoideis circiter 20-floris; involucri squamis 4–5-seriatis acutis vel obtusis exterioribus triangulari-ovatis acutis circiter 3 mm. longis striatis externe sparsissime tomentosis et pilis stipitato-glandulosis intermixtis, squamis interioribus gradatim majoribus lanceolatis vel lanceolato-oblongis acutis vel obtusis 3–10 mm. longis; corollis 11–12 mm. longis flavidulis sparsissime pilosis; achæniis circiter 2 mm. longis hirsuto-pubescentibus et stipitato-glandulosis; pappi setis 2-seriatis.— MEXICO. State of Oaxaca: Cerro de Frujano, Distrito del Centro, altitude 1700 m., 15 November, 1908, *C. Conzatti*, no. 2316 (hb. Field Museum, cat. nos. 239615, 246875).

In general appearance *L. adenotrichum* resembles *L. glabrum* Hemsl., var. *hypoleucum* Greenm., but differs in the more pointed involucral bracts, the presence of stipitate-glandular hairs in the inflorescence, and pubescent achenes.

Senecio (§Suffruticosi) alvarezensis Greenman, sp. nov.

Herbaceus perennis ubique floccoso-tomentosus; caule erecto ramoso striato plus minusve lignoso; foliis in partibus caulinis superioribus laternis sessilibus irregulariter laciniato-lobatis vel subpinnatis 3–8 cm. longis 1–4.5 cm. latis supra arachnoideo-tomentulosis subtus dense et persistenter albo-lanatis basi subamplexicaulibus, laciniis irregulariter sinuato-denticulatis margine revolutis; inflorescentiis subcorymboso-cymosis multicapitatis; capitulis radiatis ca. 1 cm. altis heterogamis; involucris campanulatis calyculatis tomentulosis, bracteolis calyculatis lineari-attenuatis conspicuis; involucri squamis plerumque 21 lanceolato-linearis 7–8 mm. longis acuminatis acutis nigro-penicillatis; floribus feminibus ligulatis 10–12, ligulis flavis; floribus disci ca. 50 numero squamis involucri paullo longioribus; pappi setis albis; achæniis maturatis

2.5 mm. longis cano-hirtellis.— MEXICO. State of San Luis Potosi; Alvarez, 28 September to 3 October, 1902, *Dr. Edward Palmer*, no. 177 (hb. Gray and hb. Field Museum).

Senecio (§Terminales) Orcuttii Greenman, sp. nov.

Arborescens 2–3 m. altus; foliis petiolatis oblongo-ovatis usque ad 6 dm. longis 3–3.5 dm. latis profunde pinnato-partitis, lobis oblongo-lanceolatis 4–18 cm. longis 1.5–4.5 cm. latis acuminatis acutis remote apiculato-dentatis ciliatis supra atro-viridibus subtus pallidioribus utrinque parce pubescentibus vel glabris; inflorescentiis terminalibus corymboso-cymosis glabris vel sparsissime pubescentibus; capitulis numerosis 12–15 mm. altis heterogamis minute calyculatis; involucris subcylindratis vel anguste campanulatis, squamis 8 lineari-lanceolatis 12–13 mm. longis acutis vel obtusis glabris; floribus femineis ligulatis, tubo ca. 7 mm. longo, ligulis flavis 1 cm. longis 3–4 mm. latis; floribus disci 12–15, corollis sursum gradatim ampliatim 5-dentatis; pappi setis albis caducissime; achæniis striato-costatis ca. 4 mm. longis glabris.— MEXICO. State of Vera Cruz: Omealca, near Cordova, on limestone cliffs, 6 April, 1910, *C. R. Orcutt*, no. 3150 (hb. Field Museum, cat. nos. 279188–90).

The writer has at hand but a leaf and a part of an inflorescence yet the plant belongs evidently to the section *Terminales* Greenm. and is allied to *S. arborescens* Seem. and *S. copeyensis* Greenm. From both these species, however, *S. Orcuttii* is distinguished readily by the deeply pinnately parted almost compound leaf and large heads.

PICRIS ECHIOIDES L. Sp. Pl. 792 (1753).

Good specimens of this species were collected at Cherubusco, Distrito Federal, Mexico, 4 October, 1910, *C. R. Orcutt*, no. 4283 (hb. Field Museum, cat. no. 282479). The plant is well established at this station, but the species seems not to have been reported hitherto from Mexico.

FIELD MUSEUM OF NATURAL HISTORY

PUBLICATION 172.

BOTANICAL SERIES. VOL. II, NO. 9.

I. THE GENERA PEDILANTHUS AND CUBANTHUS, AND OTHER AMERICAN EUPHORBIACEAE

BY

CHARLES FREDERICK MILLSPAUGH.

II. TWO NEW STONECROPS FROM GUATEMALA

BY

RAYMOND HAMET.

CHARLES FREDERICK MILLSPAUGH,
Curator, Department of Botany.



CHICAGO, U. S. A.
December, 1913.

ISSUED [illegible]-30-1913.

I.—THE GENERA PEDILANTHUS AND CUBANTHUS AND OTHER AMERICAN EUPHORBIACEAE.

By CHAS. F. MILLSPAUGH.

PEDILANTHUS Neck.

Tithymaloides Tourn. Inst., 654. 1700.
Euphorbia sp. Linn. Sp. Pl., 453. 1753.
Pedilanthus Neck. Elem. Bot., 2:354. 1790.
Ventenatia Tratt. Gen. Pl. Disp., 87. 1802.
Crepidaria Haw. Succ., 136. 1812.
Hexadenia Kl. & Gke. Tricocc., 19. 1849.
Diadenaria Kl. & Gke. ibid.

Involucres oblique, shoe-shaped, on a slender peduncle; the tube more or less fissured superiorly and notched inferiorly at the bilabiate apex or throat, with two lateral and one median accessory lobes more or less closing the fissure, the tube bearing an appendix on the superior aspect of its posterior extremity. Appendix gibbous and interiorly glandular posteriorly, its lip notched or 2–3-lobed and extending anteriorly above the posterior end of the superior fissure of the tube. Flowers pedicellate, the male numerous, ecalyculate, sometimes with linear bracteoles at the base; female single with a long style, finally protruding and generally declinate from the throat of the tube, stigmas 3, long connate, often separate at the apex and frequently bi-lobed. Seeds ecarunculate. Leaves with the midrib thickened and often keeled beneath.

Tropical American and Madagascarian shrubs with fleshy branches and milky juice, alternate leaves, glandular stipules if any, opposite floral leaves and cymose terminal or upper-axillary involucres.

Type species: Euphorbia tithymaloides Linn.

§*EUPEDILANTHUS:* Involucres more or less horizontal, the tube long-fissured above, shallowly notched below, 5-lobed, the two main lobes much broader, the two lateral small and more or less connate with the main lobes along their fissural margin, the fifth lobe partially connate with the base of the lateral lobes or sometimes entirely free. Appendix 1–2 or 3-lobed anteriorly, the saccate posterior portion separated from the floral cavity of the tube and including 2–6 small, verrucose glands. Stems with a small stipular gland on each side of the leaf attachment.

KEY

INVOLUCRE SHOE-SHAPED. Appendix smaller than the tube.
- Lobe of the appendix entire:
  - Tube glabrous without and within:
    - Male and female pedicels hairy — 1 retusus
    - Male pedicels hairy, female glabrous:
      - Appendix one third the length of the tube:
        - Lobe hairy-margined — 2 tithymaloides
        - Lobe not hairy-margined — 3 Deamii
      - Appendix one half the length of the tube — 4 jamaicensis
    - Male and female pedicels glabrous:
      - Leaves glabrous — 5 parasiticus
      - Leaves pubescent:
        - Bracts minute, cuculliform, style 6-toothed — 6 Pringlei
        - Bracts large, foliaceous; style 3-lobed — 7 Smallii
  - Tube glabrous without, hairy within — 8 padifolius
  - Tube pubescent without, glabrous within:
    - Bractlets longer than the peduncles — 9 angustifolius
    - Bractlets half the length of the peduncles, or less:
      - Male and female pedicels puberulent throughout — 10 bahamensis
      - Male and female pedicels puberulent above — 11 Fendleri
      - Male pedicels glabrous, female pubescent at base — 12 Grisebachii
- Lobe of the appendix bipartite:
  - Colored floral bracts conspicuous: exceeding the inflorescence:
    - Involucral tube glabrous:
      - Glands of the appendix 2 — 13 articulatus
      - Glands of the appendix 4 — 14 bracteatus
    - Involucral tube puberulent:
      - Capsule cornuate — 15 spectabilis
      - Capsule not cornuate:
        - Male and female pedicels glabrous:
          - Lobes of the appendix laterally compressed:
            - Lobes glabrous — 16 Greggii
            - Lobes puberulent — 17 Olsson-Sefferi
          - Lateral and fifth lobes of the tube flabellate — 18 involucratus
          - Lateral and fifth lobes of the tube linear — 19 rubescens
        - Male pedicels glabrous, female pubescent:
          - Filaments and anthers glabrous — 20 Palmeri
          - Filaments and anthers pubescent — 21 tomentellus
    - Involucral tube hairy — 22 Pavonis
  - Colored floral bracts not exceeding the inflorescence:
    - Bracts the length of the peduncles — 23 macradenius
  - Colored floral bracts wanting:
    - Peduncle posteriorly affixed to the tube:
      - Appendix projected along the margin of the fissure:
        - Peduncles glabrous — 24 Œrstedi
        - Peduncles puberulous — 25 aphyllus
      - Appendix not projected along the margin of the fissure:
        - Tube glabrous within — 26 nodiflorus
        - Tube hairy within — 27 cymbiferus
    - Peduncle centrally affixed to the tube — 28 macrocarpus
- Lobe of the appendix tripartite:
  - Two of the divisions superior, one inferior — 29 peritropoides
  - All three divisions on one plane — 30 Itzæus

INVOLUCRE HOOD-SHAPED. Appendix larger than the tube — 31 Finkii

1. PEDILANTHUS RETUSUS Benth. in Hook. Jour. and Kew Misc., 6:321. 1854.

Shrubby 9 dm.–1.50 m.: leaves glabrous, ovate, 3.8–5 cm. long, 2.5 cm. broad, subsessile, oblique, cuneate at the base, retuse, lightly keeled beneath. Cymes terminal and upper axillary, short. Involucres 7–8 mm. long: tube glabrous, thrice as long as the appendix; male and female pedicels hairy; appendix lobe entire, truncate, thickened (glandular *sic.*) slightly below the apex, 4-glandular. Capsule large, rotund; seeds subcarinate on the dorsum.

Differs from P. tithymaloides in the shape of the leaves, the hairy female pedicel, smaller involucres, and the lip of the appendix being thickened at the apex.

Type locality: COLOMBIA, Barra, Rio Negro, *Spruce* 1469. Type in herb. Boissier, Geneva.

Distribution: VENEZUELA, Margarita Island, *Johnson* 59.

2. PEDILANTHUS TITHYMALOIDES (L.) Poit. An. Mus. Paris, 19:390. 1812.

Tithymaloides myrtifolius Curassavicus Commel. Hort., t. 16. 1706.
Euphorbia tithymaloides Linn. Hort. Cliff., 198. 1737: Sp. Pl., 453. 1753.
Euphorbia myrtifolia Lam. Dict., 2:419. 1786.
Crepidaria myrtifolia Haw. Pl. Succ., 136. 1812.
Euphorbia carinata Don. Hort. Cantab., Ed. 9:195. 1819.
Euphorbia canaliculata Lodd. Bot. Cab., t. 727. 1822.
Pedilanthus canaliculatus Sweet, Hort. Brit., ed. 1:355. 1827.
Pedilanthus myrtifolius Lk. Hort. Bot. Berol., 2:18. 1833.
Pedilanthus carinata Raf. Fl. Tell., 4:117. 1836.
Pedilanthus myrsifolius Raf. loc. cit.

Shrubby 1.20–1.80 m.; leaves glabrous, subsessile, cuneate at the base, ovate or oblong, 3.5–7.5 cm. long, apex acute often recurved, margin subundulate, the mid-vein often prominently undulate-carinate beneath. Cymes terminal, dense; floral leaves ovate, long-acuminate, slightly longer than the peduncles, early deciduous. Involucres purple, 1.1–1.3 mm. long; tube thin, smooth. Appendix 4-glandular, the lobe linear, short. Male pedicels hairy, female glabrous. Style shortly bifid. Capsule 7.5 mm. long, 9 mm. broad, truncate at base and apex, coccæ keeled; seeds ovate, 5 mm. long.

Type locality: CURAÇAO.

Distribution: VENEZUELA, *Lyon; Gollmer.* COLOMBIA, *Holton; H. H. Smith* 1295. GUATEMALA, 2072, 6764 *John Donnell-Smith;* 5011

Shannon. HONDURAS, 5467 *Thieme.* MEXICO, *Nickels.* CUBA, *de la Ossa; de la Sagra; Wright, Britton, Britton & Cowell* 12512; *Combs* 498. SANTO DOMINGO, *Poiteau.* PORTO RICO, *Sintenis* 3698, 5717; *Mr. & Mrs. Heller* 34; *Millspaugh* 157. FLORIDA, *Britton* 281. BAHAMAS, *Brace* 4144; *Britton & Millspaugh* 5791. ST. CROIX, *Ricksecker.* MONTSERRAT, *Shafer* 216. BARBADOS, *Dash* 631. GRENADA, *Broadway.*

Illustrations: Commel. Hort., t. 91; Jacq. Amer., t. 92; Descourt. Ant., t. 116. Bot. Cab., t. 727; Bot. Reg., t. 837; Bot. Mag., t. 2514.

3. **Pedilanthus Deamii** Millsp. sp. nov.

Shrubby; branches smooth, leafy above, naked below, young leafy branchlets tomentose. Leaves thin, sessile, ovate to suborbicular, inæquilateral, acute, narrowed to the base, crispidulous-puberulous on both surfaces, 4.5–6 cm. long, 2.5–3.5 cm. wide, midrib prominent beneath. Cymes nodal, simply bi-cephalic or cymose-bicephalic; bracts small (one fourth the length of the peduncles), cucullate, tomentose; peduncles smooth, 5–6 mm.; involucres small and slender, 1.2 x .3 cm.; tube walls very thin, lower notch shallow, upper fissure extending to the appendix, few-ciliate at the posterior third, principal lobes ovate, erose-dentate, few-ciliate in the sulcus, lateral lobes ligulate, one third free, the apices slightly rounded-truncate, ciliate. Appendix small, less than one third the length of the tube, the lip ligulate, truncate, retuse; glands 4, scutelliform. Male pedicels hairy at the apex, filaments hairy; female pedicel glabrous; style slender, slightly 3-lobed at the apex. Capsule smooth, strongly 3-coccous; seeds grayish-olive, subcylindric, apiculate, 3.8 x 2.5 mm., irregularly and minutely mottled.

Type locality: GUATEMALA, Fiscal, in ravines, alt. 3700 ft.; May 31, 1901, *Chas. C. Deam* 6081. Type in herb. Field Museum of Natural History, Chicago, sheet No. 247.005.

Distribution: Known only from the type.

4. **Pedilanthus jamaicensis** Millsp. & Britton. sp. nov.

Shrubby, 4 dm. high; branches tenuous, glabrous. Leaves short petioled (5 mm.), minutely and sparsely puberulous, oblong to ovate, 3–10 cm. long, narrowed to the petiole, apex blunt. Cymes nodal; involucres 1 cm. x 4 mm.; tube-walls thin, the superior fissure open back to the appendix, inferior notch about one fourth the length of the tube; main lobes ovate, the lateral rectangular-oblong, one half free, all fimbrio-ciliate; male flowers long-exserted, filament one quarter the length of the glabrous pedicel; female pedicel glabrous; style minutely 3-forked at the apex the lobes 2-cleft. Appendix about one half the

length of the tube, lobe deltoid-ligulate, notched at the truncate apex, ciliate-margined; glands 4, small, scutellate, thin.
Type locality: JAMAICA, Negril vicinity, March, 1908, *N. L. Britton & Arthur Hollick*, 2067. Type in herb. New York Botanical Garden.
Distribution: JAMAICA, *Harris* 10.238.

5. PEDILANTHUS PARASITICUS Kl. & Gke. (*nec* Boiss.). Tricocc., 105. 1859.
Euphorbia parasitica Pavon in herb.
Pedilanthus ramosissimus Boiss. in D. C. Prodr., 15:5. 1862.

Shrubby, stem 15.3 cm., alternately and repeatedly short-branched; branches as thick as a goose quill. Leaves sessile, rotund or subcordate at the *base, somewhat crisp-puberulent beneath*, undulate, the larger 2.5 cm. Cymes at the apex of the attenuate floral branchlets which are 1.3–1.8 cm. long, 1.5–2 cm. diameter, capitate, densely many involucred; leaves of the inflorescence ovate-oblong, acute, deciduous; involucres small, 7–11 mm. (*8 x 4 mm.*) long, the tube glabrous, its main lobes broadly rounded, ciliate, the superior fissure two thirds the length of the tube; inferior notch deep; lateral lobes short; *oblong, one third free at their rounded, ciliate apex;* fifth lobe ligulate-spatulate, free to the base, rounded and entire at the ciliate apex; male and female pedicels glabrous. Appendix one third the length of the tube, its lip *ligulate-deltoid*, retuse; *glands 2; large, shaped like a ruptured anther, stipitate.*
Type locality: MEXICO, *Ruiz & Pavon.* Type (*visa*) in herb. Boissier, Geneva.

6. PEDILANTHUS PRINGLEI Robinson, Proc. Amer. Acad., 29:322. 1894.

Shrubby, 1.20–1.50 m.; stems smooth, alternately few branched. Leaves softly and closely puberulent on both surfaces, lanceolate, acuminate, 3.8–5.1 cm. long, subsessile by an abruptly narrowed base, midrib white and prominently keeled beneath. Cymes terminal; bracts minute, grayish-tomentose, caducous; peduncles 2.5–5 mm. long; involucres acutish at the base, dark purplish-red, 11 mm. long, glabrous without and within; tube: the lobes finely ciliated on the free margins; male pedicels and filaments glabrous, female pedicel glabrous; style slender, dark-red, trifid. Appendix 4-glandular, glabrous, abruptly bent, attenuate to a very narrow, truncate, entire or slightly retuse apex. Capsule smooth, 6.5–7 mm. in length, upon a stipe 13 mm. long; seeds ashen, ovoid, apiculate.
Type locality: MEXICO, limestone ledges at La Palmas, San Luis Potosi, July 25, 1891, *Cyrus G. Pringle* 5107. Type (*visa*) in herb. Gray, Cambridge, Mass.

Distribution: MEXICO, Oaxaca, *Pringle* 6043; *Nelson* 1682; *Cæc. & Ed. Seler* 1682; Tomellin, *Conzatti* 1672; Salina Cruz, *Deam* 119. GUATEMALA, Gualan, *Deam* 234.

7. **Pedilanthus Smallii** Millsp. sp. nov.

Shrubby, 2 m. high, profusely branching, the branches and branchlets more or less zig-zag (in the type very sharply and strongly so), branchlets slender, stipular glands plainly evident. Leaves densely crisp-puberulent when young, pubescent when developed, sessile, ovate-lanceolate to ovate, acute, the mid-rib inconspicuously keeled beneath. Inflorescence terminal on the young branchlets; bracts foliaceous, exceeding the peduncles, ovate-lanceolate, attenuate at the apex, crisp-pilose; involucres salmon to pink, glabrous without and within, 1 cm. x 4 mm., superior fissure open to the appendix, inferior cleft shallow; main lobes of the tube ovate, rounded and ciliato-fimbriate on the margin, strongly folded into a plait along the margin of the fissure; lateral lobes free only at their rounded apices; fifth lobe free throughout, narrowly ligulate, obtuse. Male and female pedicels glabrous; male flowers about 10; style deeply 3-lobed. Appendix one third the length of the tube; lobe deltoid, not ciliate margined, retuse, strongly marked by a longitudinal channel as if nearing bilobation (in fact in one flower it was found to be deeply bilobed); glands 4, in pairs the outer pair minute. Fruit unknown.

Type locality: FLORIDA, in pine lands near Miami; *John K. Small* 2286, November, 1904. Type in the herbarium of the New York Botanical Garden. Full size photograph in herb. Field Museum.

Distribution: BERMUDA, at Castle Point, *Brown & Britton*, 820, September, 1912.

8. PEDILANTHUS PADIFOLIUS (L.) Poit. An. Mus. Paris, 19:391. 1812.
Tithymaloides laurocerasi folio Dillen. Elth., t. 288. 1732.
Euphorbia tithymaloides padifolia Linn. Sp. Pl., 453. 1753.
Euphorbia anacampseroides Lam. Dict., 2:420. 1786.
Pedilanthus anacampseroides Kl. & Gke. Tricocc., 106. 1859.

Shrubby. Leaves glabrous, 9–12 x 3–5 cm., subsessile, cuneate at the base, oblong-ovate, obtuse or retuse, keeled beneath. Cymes terminal, open; floral leaves ovate, acute; involucres large, sarcous, hairy within, 1.2 cm. long; tube with the lateral lobes all spatulate and one third connate; male and female peduncles hairy; style entire at the apex the stigmatic point slightly marked with three shallow sulci. Capsule "the size of a hazel nut."

Type locality: ANTILLEAN ISLANDS, *Plumier*.

Distribution: ANTILLEAN ISLANDS, *Descourtils*. SANTO DOMINGO, *Schomburgk* 168. ST. CROIX, *Ricksecker* 181; *Mrs. Ricksecker* 165. ST. KITTS, *Britton & Cowell* 256.

Illustrations: Descourt. Ant., t. 117; Dillen. Elth., t. 288; Bot. Reg., t. 837; Bot. Mag., t. 254.

9. PEDILANTHUS ANGUSTIFOLIUS Poit. An. Mus. Paris, 19:393, t. 19. 1812.

Crepidaria subcarinata Haw. Rev. Pl. Succ., 61. 1821.
Crepidaria cordellata Haw. Rev. Pl. Succ., 136. 1821.
Euphorbia cordellata Haw. Misc. Natur., 185.
Pedilanthus cordatus Spr. Syst., 3:802.
Pedilanthus cordellatus. Steud. Nom., Ed. 2, 2: 282. 1840.
Pedilanthus subcarinatus Steud. Nom., ibid.
Pedilanthus tithymaloides angustifolius pt. Griseb. Fl. Br. W. I.,'52. 1859.

Shrub 1–1.3 m. Leaves pubescent, lanceolate, obtusely keeled beneath, 7–10 cm. long, 1.5–2.5 cm. wide. Cymes upper axillary and terminal; bracts ovate, pointed, longer than the peduncles; involucres strongly gibbous, somewhat puberulent, 1 cm. long; tube abruptly truncate, pubescent within; main lobes with ovate, entire, blunt-pointed apices, the two lateral lobes connate to the apex, fifth lobe ligulate with a rounded apex and connate half its length; male and female pedicels hairy the male on the upper third. Appendix strongly gibbous at the base, the lip ligulate, emarginate, not thickened at the apex; glands 4. Seeds strongly trigonal, 4.5 x 3 mm., sharply apiculate, dull ashen, the dorsal angle most prominent.

Type locality: SANTO DOMINGO, *Poiteau*. Type in herb. Paris.

Distribution: CUBA, *Wright*. SANTO DOMINGO, *Poiteau; Ehrenberg*. PORTO RICO, *Garber* 107; *Sintenis* 769; *Britton & Shafer* 1869. CULEBRA; *Britton* 130; *Britton & Wheeler* 121. ST. CROIX, *Ricksecker*. JAMAICA, *Grisebach*.

Illustration: An. Mus. Paris, 19:t.19.

10. **Pedilanthus bahamensis** Millsp. sp. nov.

Shrubby, glabrous, 1–1.5 m., leafless,* irregularly much branched, branches about the size of a lead pencil, gray, roughened with silicious

* I describe the plant as leafless from the fact that no Native has ever seen leaves on the plant even in the most prolonged rainy season; they all know, however, that a cutting will produce leaves if kept in water for a period of about three weeks. I thus produced leaves myself which were oblong-lanceolate, 2 cm. x 8 mm., rounded at the apex, somewhat narrowed to a sessile base, midrib keeled on the lower third, glabrous. (See sheet No. 288.150 in herb. Field Museum).

transverse ridges.* Inflorescence terminal on the branchlets; bracts cucullate, one third to one quarter the length of the peduncles. Involucres about 9 mm. puberulent, bright and lasting madder-lake color; inferior cleft of the tube shallow, the superior fissure open half the length of the tube; main lobes blunt, finely erose-lacerate, the two lateral lobes minute, free only at the apex, the fifth lobe flabelliform, free half its length; male pedicels glabrous, slightly longer than the tube, anthers glabrous, female pedicel minutely puberulent, style very slightly trifid. Appendix narrow, about one half the length of the tube, sarcous, usually sigmoid, the lobe blunt, very slightly notched at the apex, strongly gibbous at the base; glands 2, stipitate, of the form of a ruptured 2-celled anther. Capsule flattened-globose, deeply 3-carpelled; seeds trigonal, olivaceous, the dorsal angle quite prominent, apiculate and with a minute raised pimple at the apex, 3 x 2.5 mm.

Type locality: GRAND TURK ISLAND, on the rocky plain south of the town where it is one of the common shrubs, *C. F. & C. M. Millspaugh* 9030, February, 1911. Type in herb. Field Museum of Natural History, Chicago, sheet No. 287.782.

Distribution: The BAHAMA ISLANDS from Deep Creek, ANDROS, to ATWOOD CAY, ACKLIN ISLAND, INAGUA, and GRAND TURK to SALT CAY.

11. PEDILANTHUS FENDLERI Boiss. in D. C. Prodr., 15:5. 1862.

Pedilanthus gritensis Zahlbr. An. K. K. Nat. Hofmus. Wien., 12:104. 1897.

Shrubby. Leaves 3.8–5 cm. long, short petioled, puberulent at least beneath, cuneate at the base, acute, subcarinate. Cymes terminal, few-involucred, dense; bracts one half the length of the peduncles; involucre purple, 9 mm. long, rusty-hairy without, smooth within; tube somewhat gibbous, the notch obtuse; main lobes rotund, lateral pair blunt-ligulate, connate except at the apex, fifth lobe ligulate, half free, rounded at the apex, all ciliate on the apical margin; male and female pedicels hairy on the upper two thirds; style trifid at the apex, the stigmatic lobes bifid. Appendix strongly ascending, one third the length of the tube, the ligulate lobe round-margined; glands 4.

Type locality: VENEZUELA, *Fendler* 1202. Type (*co-type visa*) in herb. de Candolle, Geneva.

Distribution: VENEZUELA, *Karsten*. COLOMBIA, *H. H. Smith* 1295. MARGARITA ISLAND, *Miller & Johnston* 31.

* The peculiar silicious ridges of the stems and branches produce a high squeak when they are rubbed together — children play at fiddling with them, hence the local name "Monkey-fiddle." (The play of children being locally termed "monkey play.")

12. **Pedilanthus Grisebachii** Millsp. & Britton. sp. nov.

Pedilanthus angustifolius Griseb. pt. (*non Poit.*), Fl. Br. W. I., 52. 1859.

Shrubby, 1 m. high, alternately branching, canescent above. Leaves canescent, narrowly lanceolate to linear, 1–3 cm. long, 3–4 mm. wide, narrowed to the base, blunt at the apex, the midrib keeled beneath. Inflorescence terminal on the branches, few to several involucred; bracts small about half the length of the peduncles; peduncles hairy, .8–1 cm. long; involucres small, 6.5–7 mm., canescent without, pubescent within; tube truncate at the apex, the main lobes broad, erose dentate; lateral lobes minute, spatulate, free only at the erose apex; the fifth lobe spatulate, fimbriate, connate two thirds its length; female pedicel slightly hairy at the base, style slightly 3-cleft at the apex; male pedicels glabrous. Appendix strongly gibbous at the base, somewhat more than half the length of the tube, the lobe thickened and emarginate at the apex; glands 4. Capsule smooth, not strongly angled; seeds very slightly trigonal almost without angles, 3.5 x̄ 2.5 mm., deep reddish-brown mottled with irregular, light maculæ.

Type locality: JAMAICA, Bull Bay, on a roadside bank, *N. L. Britton* 3677, September 14, 1908. Type in herb. New York Botanical Garden.

Distribution: JAMAICA, *Harris* 9645. PORTO RICO, Yauco, *Underwood & Griggs* 637; Ponce, *Heller* 6192.

13. PEDILANTHUS ARTICULATUS (Kl. & Gke.) Boiss. in D. C. Prodr., 15:6. 1862.

Diadenaria articulata Kl. & Gke. Tricocc., 108. 1859.

Leaves 3.8–5 cm. long, crisp-puberulent, sessile, shortly cuneate at the base, oblong, obtuse or retuse, ribbed-plicate. Cymes terminal, repeatedly dichotomous, its branches long and leafy, appressed hairy; floral leaves (*bracts*) longer than the involucres, ovate, puberulent, subcordate, cornucopia-shaped, mucronate; involucres *central upon the peduncle, 2.8–1.4 cm.; tube* glabrous *without minutely and densely puberulent within, the superior fissure open to the appendix and the inferior notch to the peduncle; lobes all* fimbriate, *the main pair ovate, the lateral ligulate-flabellate connate three quarters their length, the fifth free nearly throughout;* male *and female* pedicels glabrous, filaments *densely* hairy. *Appendix lobes deltoid, densely pubescent upon the inner surface, the terminal half revolute;* glands 2 *urceolate, long stipitate the lower half connate with the walls.* Near P. Pavonis from which it differs in its obtuse, plicate leaves and the inflorescence characters.

Type locality: MEXICO, *Pavon*. Type (*visa*) in Herbarium Boissier, Geneva.
Distribution: Known only from the type.

14. PEDILANTHUS BRACTEATUS (Jacq.) Boiss. in D. C. Prodr., 15:6. 1862.

Euphorbia bracteata Jacq. Schoenb., 3:14, t. 276. 1798.
Ventenatia bracteatus Tratt. Gen. Pl. Disp., 87. 1802.

Shrubby, 1.20 m., branches scabrous leafless before flowering. Leaves smooth, 1 dm. long, subsessile, rounded at the base, oblong, obtuse or retuse, keeled beneath. Cymes terminal, repeatedly dichotomous, the articulations elongated, glabrous, leafy; floral leaves longer than the involucres, ovate, acuminate, concave, glabrous; tube of the involucre glabrous; lateral lobes linear, villous, shorter than the fifth lobe; pedicels and filaments glabrous; styles connate throughout. Appendix somewhat short, 4-glandular. Capsule subsphærical, 3-angled.
Type locality: MEXICO.
Distribution: Known only from the type.
Illustrations: Jacq. Schoenb., 3:t.276.

15. PEDILANTHUS SPECTABILIS Robinson, Proc. Am. Acad., 43:23. 1907.

Shrubby; stems about 9 dm., terete, thick, leafy, gray. Leaves ovate-oblong, shortly and thickly petioled, 9 cm. long, 3.8–6.3 cm. broad, entire, smooth above, short and soft pubescent beneath, apex rotund, sometimes retuse, always mucronulate, slightly cordate at the base. Cymes terminal, dichotomous, densely bracteate, 16.5 cm. broad; bracts broadly ovate, cordate, sessile, opposite, entire, 3.8–5 cm. diameter, longer than the internode, acute or acuminate, extended into a tail, puberulous, purple-red, margin tomentellate; peduncles gray-tomentose on the lower half glabrous above; involucre white, 1.9 cm. long the base slightly invaginate; the inferior notch extending nearly to the peduncle; main lobes shorter and broader, the other three ligulate, free nearly to the base, all erose at the apex and tomentellate on the margins; stipe of ovary smooth, nodding; filaments smooth; style 9.5 mm. long; stigma unevenly 3-pronged; capsule subsphæric, about 9.5 mm. in diameter, obtuse, 3-lobed, each carple cornuate at the upper and lower dorsal ends; seeds grayish-green, angular, 5 mm. long. Appendix deeply 2-parted, lobes linear, acute, about 18 mm. long, much shorter than the tube, scaphoid, thickened and bi-laterally scutellate at the prow-shaped tips; 4-glandular, glands morchellæform.

Type locality: MEXICO, Iguala Cañon, on limestone ridges, alt. 2.500 ft., December 28, 1906, *Cyrus G. Pringle* 13.914. Type (*visa*) in herb. Gray, Cambridge, Mass.
Distribution: Known only from the type.

16. **Pedilanthus Greggii** Millsp. sp. nov.

Shrubby; stems ligneous, irregularly branching. Leaves oblong-lanceolate, subsessile, about 9 x 3 cm., keeled beneath, finely puberulent, cuneate at the base, acute. Bracts large, including the involucres, ovate, broad, 1.5 cm. x 8 mm., rounded at the base acuminate at the apex, reddish; involucres 1.8 cm. long, finely puberulent without pubescent within; tube truncate, the inferior cleft one third its length; main lobes broad, truncate, erose-dentate; lateral lobes ligulate, erose dentate, two thirds connate with the main lobes; fifth lobe similar but connate for only half its length; female pedicel short, glabrous; male pedicels unknown.* Appendix projecting backward in a sac, 9 mm. long, deeply cleft into two ligulate lobes each of which is folded upon itself to the form of a canoe with a bifid prow; glands 2, large, deltoid, stipitate. Capsule depressed-globose shortly exserted; seeds trigonal, 5 x 4 mm., white-farinose, apiculate at both base and apex, angles prominent the dorsal most strongly so.
Type locality: MEXICO, *Dr. J. Gregg* 1156. Type in herb. Missouri Botanical Garden, St. Louis, sheet No. 13.466.
Distribution: Known only from the type.

17. **Pedilanthus Olsson-Sefferi** Millsp. sp. nov.

Shrubby; stems and branches succulent, hollow. Leaves short petioled, glabrous above densely crisp-puberulent beneath, 3–6 x 1.5–2 cm., oblong to ovate, obtuse, midrib keeled beneath. Inflorescence terminal, cymose, puberulent; floral leaves oval, 4–2.5 x 2–1.5 cm., acute to acuminate, twice the length of the involucre and its peduncle; peduncles shorter than the breadth of the involucre. Involucre small, 1 x .5 cm., minutely puberulent especially at the base; tube thick; inferior notch half the length of the tube, superior fissure also half its length; main lobes oblong, the free margin minutely and evenly serrate; lateral lobes ligulate, truncate, serrate, connate at the lower third; fifth lobe ligulate, rounded and serrate at the apex, free to its base; male pedicels and filaments glabrous, anthers pilose; female pedicel pilose, style 6-cleft at the apex. Appendix half the length of the tube, sarcous, the lip deeply cleft into two ligulate, blunt lobes folded upon themselves like a trough, the margins and apices hairy; glands 2, large, cymbali-

*All destroyed by insect pests in the specimens seen.

form, set closely facing each other at the base of the tube. Fruit unknown.

Type locality: MEXICO, Tomellin, collected by the late *Dr. Pehr Olsson-Seffer*, August, 1910. Type in herb. Missouri Botanical Garden, St. Louis, sheet No. 13. 465.

Distribution: Known only from the type.

18. PEDILANTHUS INVOLUCRATUS (Kl. & Gke.) Boiss. in D. C. Prodr., 15:6. 1862.

Diadenaria involucrata Kl. & Gke. Tricocc., 107. 1859.

Shrubby, 9 dm.–1.2 m. Leaves petiolate (petioles 6 mm. long), glabrous above, deflexed puberulent beneath, oblong, short-apiculate, 7.5 cm. long, 4.2 cm. broad. Cymes terminal bi-cephalic; bracts of the inflorescence puberulent, orbicular, apiculate, 2 cm. long, 1.6 mm. broad; involucres small, 10 mm. long; filaments glabrous.

Type locality: MEXICO. Type a living plant in the Botanical Garden, Berlin, 1859.

Distribution: Known only from the type.

19. PEDILANTHUS RUBESCENS Brandegee, in Zoe, 5:209. 1905.

Stems numerous 1–2 m. high, much branched. Leaves nearly glabrous, ovate-lanceolate, cuneate at the base into a short petiole, midrib keeled and excurrent at the tip, 9 cm. long, 3.5 cm. broad. Cymes terminal, the floral leaves brick-red; involucres pubescent, cuneate at the base, 2 cm. x 9 mm., the inferior notch extending nearly to the base, the two main lobes oblong-oval, the two lateral narrow, linear, erose at the apex, connate four fifths their length, fifth lobe ligulate, truncate, erose-dentate; male and female pedicels glabrous, filaments glabrous; style nearly 1 cm. long; capsule smooth, on a stipe 1 cm. long, 12 mm. broad; seeds somewhat cuboid, apiculate, 5.5 x 4.5 mm., strongly 3-angled the dorsal most prominent, reddish-brown, pulverulent (not pubescent). Appendix with two elongated-deltoid lobes thickened and compressed laterally at the bilobate apex, each with a large, phalloid gland at its base.

Type locality: MEXICO, Culican, August 30, 1904, *T. S. Brandegee*. Type (*visa*) in herb. University of California, Berkeley.

Distribution: Known only from the type locality where it was also collected by *Dr. Edward Palmer* in 1891 (his number 1767 in herb. New York Botanical Garden).

20. **Pedilanthus Palmeri** Millsp. sp. nov.

Shrubby; stems hollow except at the nodes. Leaves broadly lanceolate-ovate, acute, narrowed to a cuneate base, glabrous, keeled beneath.

Cymes trichotomous ultimately 3-cephalic; peduncles 1–2 cm. long, slender, finely puberulent; bracts 1.5 x .8 cm., oval, acute, slightly exceeding the peduncles; involucres puberulent, 1.5 x .6 cm., the superior fissure closed to the throat by the connate lateral and fifth lobes; tube short, deeply notched beneath, projecting narrowly backward to support the long appendix; main lobes broader than long, the apex rounded, each with a projecting deltoid tooth connate with the lanceolate, acute, lateral lobes which, in turn, are connate with the ligulate, truncate, fifth lobe so that all together entirely close the usual superior fissure of the tube, all three minor lobes are free at their apices the fifth being slightly longer than the lateral; the notch of the tube has three to four raggedly-deltoid teeth at the base of its sulcus; male pedicels glabrous, female puberulent. Appendix as long as the tube, projecting posteriorly half its length and extending anteriorly along the margin of the fissure to the throat, split its entire length into two separate, linear lobes folded upon themselves upward like a trough; glands 4, of two sorts, circular with raised thickened margin: two single ones placed flat against the walls of the gibbum, two double ones placed back-to-back at the summits of long stipes connivent with the walls at the base of the linear lobes (these latter resemble stamens with ruptured, 2-celled adnate anthers).

Type locality: MEXICO, Tepic, 1892, *Dr. Edward Palmer* 1995. Type in herb. New York Botanical Garden.

Distribution: Known only from the type.

21. PEDILANTHUS TOMENTELLUS Robn. & Greenm. Am. Jour. Sci., 50:164. 1896.

Tall, 1.5–2.4 m., rusty-tomentulose; branches stout, terete. Leaves short petioled, ovate-oblong to oblong-lanceolate, narrowed at both ends, obtusish, tomentulose upon both surfaces, 4.8 cm. long, 2.4 cm. broad. Cymes terminal, twice dichotomously forked, about 5 cm. diameter, outer floral leaves and those of the forks large, bright red, sessile, broadly ovate or suborbicular, cordate, shortly acuminate, tomentulose, 2.4–3 cm. long, enclosing the smaller bracts and the involucres thus giving the cyme a somewhat 2-cephalic appearance. Involucres 1.2 cm. in length, tomentulose throughout, unequally 5-cleft at the throat the divisions rounded to sub-truncate with an erose or fimbriated margin, the three interior much smaller, linear-oblong; pedicels of the staminate flowers glabrous, filaments and anthers pubescent; pedicel ovary and style of the pistillate flowers ferrugineous-tomentose; style 5 mm. long the three divisions 2-cleft. Appendix deeply 2-cleft the lobes about 7 mm. long, lanceolate, obtuse, thickened at the apex; glands 2 or 4.

Type locality: MEXICO, Oaxaca, in hedgerows, alt. 5,500 ft., September 6, 1894, *Cyrus G. Pringle* 4912. Type (*visa*) in herb. Gray, Cambridge, Mass.

Distribution: Known only from the type locality where it was also collected by *Seler* 1402; *Chas. L. Smith* 216, 1182; and *E. W. Nelson* 1201.

22. PEDILANTHUS PAVONIS (Kl. & Gke.) Boiss. in D. C. Prodr., 15:6. 1862.

Diadenaria Pavonis Kl. & Gke. Tricocc., 108. 1859.

Leaves large, 12.5–17.5 cm. long, 6.5–7.5 cm. broad, subsessile, coriaceous, glabrous, rounded at the base, oblong, acute. Cymes terminal, many times dichotomous, compactly corymbose, closely hirsute; floral leaves ample, 1.8–2 cm. long, longer than the involucres, oval, subcordate at the base, apiculate, persistent, puberulent. Involucres puberulent, 1.6–1.8 cm. long; tube narrower than the appendix and scarcely longer, the main lobes fimbriate on the margins; pedicels of the male flowers filamentosely hairy. Appendix scarcely shorter than the tube, 2-glandular, the lip plainly inflexed with an evident fold beneath the apex within.

Type locality: MEXICO, *Ruiz & Pavon*. Type (*visa*) in herb. Boissier, Geneva.

Distribution: MEXICO, Colima, *Palmer* 1328 (1891).

23. PEDILANTHUS MACRADENIUS Donnell-Smith, in Bot. Gaz., 19:263. 1894.

Arboreous; leaves glabrous, 10–15 x 5–7.5 cm., at the apex of the branches, olive-green, broadly ovate-oblong, obtuse at both base and apex; petioles glabrous, 6 mm. long. Cymes short, few-involucred, springing from the upper axils; bracts oblong-ovate, longer than the peduncles, 12 x 6 mm., rubescent beneath hoary pubescence; peduncles hairy; involucre rubescent, 1–1.5 x .6 cm., glabrous without, densely pubescent within including the lobes; superior fissure closed to the throat, inferior notch about one third the length of the tube; main lobes ovate, acute, long-hairy at the apex; lateral lobes free only at the spatulate, hairy apex; fifth lobe ligulate-spatulate hairy at the apex; male and female pedicels glabrous, bracteoles many, threadlike. Appendix nearly one half the length of the tube, cleft for about one third its length into two broadly ovate, flat lobes; glands 2, large, oval, flat. Capsules 8 mm. diameter, depressed-spherical, marked with six broad white lines of dehiscence; coccules carinate; seeds trigonal-globose.

Type locality: GUATEMALA, Canival, Huehuetenango, alt. 3,200 ft. December, 1891, *Dr. W. C. Shannon*, U. S. A. 412. Type (*visa*) in herb. Capt. John Donnell-Smith, in herb. U. S. National Museum, Washington, D. C.

24. PEDILANTHUS OERSTEDII Kl. & Gke. Tricocc., 106. 1859.

Branches virgate, leafless, terete, sparsely branchleted, long and stiffly puberulent. Cymes terminal; involucres solitary or few, peduncles glabrous.

(Said to differ from P. aphyllus only in the above characters).

Type locality: NICARAGUA, Segovia, *Oersted*. Type in herb. Botanical Museum, Copenhagen.

Distribution: Known only from the type.

25. PEDILANTHUS APHYLLUS Boiss. in Kl. & Gke. Tricocc., 100. 1859.

Pedilanthus calcaratus Schlecht. in Linnæa, 19:155. 1847. *ex ref. et descr. pl. non visa.*

Branches virgate, leafless, whitish, nearly simple. Cymes terminal; floral leaves deciduous; involucres single or in twos; peduncles pubescent; *involucres 2 cm. long* (1.2–1.4 cm.); *tube* hairy within, *deeply notched below, the main lobes rounded and erose-dentate at the apex, the two lateral lobes connate somewhat more than half their length and the fifth lobe one half connate with them, all spatulate, the rounded apices finely erose, ciliate;* pedicels of the male and female flowers glabrous, *the female bent strongly back toward the base of the involucre immediately upon its issuance from the tube,* style *at first* entire at the apex *later shortly 3-cleft. Appendix about half the length of the tube and projected along its margin to the apex, prolonged posteriorly into a sarcous, 4-lobed, spurlike sac, its two lobes narrowly elongated-ligulate, blunt, emarginate; glands 4.* (The italicized characters are drawn from Pringle No. 6291).

Type locality: MEXICO, *Ruiz & Pavon*. Type in herb. Boissier, Geneva.

Distribution: MEXICO, Orizaba, *Botteri* 968; Tehuacan, Puebla, *MacDougal & Rose, Pringle* 6291, *Purpus* 3419, *Rose & Rose; Liebmann* (*P. calcaratus* Schl.).

26. PEDILANTHUS NODIFLORUS Millsp. Field. Col. Mus. Bot., 1:305. 1896.

Shrubby, 2 m. high; stems whitish-farinose, jointed, widely branching; branches virgate, alternate, leafless. Inflorescence in lateral, spiciform, densely white-tomentose cymes at the nodes. Involucre red, hairy without and within, 8 x 4.5 mm., the superior fissure closed by the united lateral and fifth lobes, the inferior notch about half the

length of the tube; main lobes truncate, erose-dentate, overlapping to form an oval orifice of the sinus; lateral and fifth lobes ligulate, free at the apex, equal, truncate, the lateral connivent with the edges of the fissure; the fifth lobe keeled, all saccate at the base; male and female pedicels glabrous; young capsule hairy. Appendix nearly as long as the tube, 2-saccate and 2-glandular at the base, deeply bi-lobed, the lobes narrowly ligulate, unequally 2-digitate, appearing like an extended and apposed thumb and forefinger of a human hand.

Type locality: MEXICO, Yucatan, Silam, abundant about the port, April, 1895, *Dr. George F. Gaumer* 649. Type in herb. Field Museum Natural History, Chicago; sheet No. 36.452.

Distribution: MEXICO, Yucatan, Progreso, *Millspaugh* 1667.

Illustration: Field. Col. Mus. Bot., 1:pl.17.

27. PEDILANTHUS CYMBIFERUS Schlecht. in Linnæa, 19:253. 1847.

Branches crispid-hairy; leafless. Cymes . . .; peduncles glabrous, 8 mm. long; involucres glabrous, 1.2 cm. long; tube with the inferior notch 4 mm. deep; main lobes equal, rounded and finely serrate at the apex; lateral lobes connate to near the obtuse, serrate apices, pubescent without; fifth lobe spatulate; male and female pedicels glabrous; ovary glabrous; style 6 mm. long, shortly 3-cleft at the apex. Appendix sarcous the gibbous portion warty-tuberculate without and closely puberulent within including the lip; lobes ligulate, 6 mm. long, obtuse; glands unknown.

Type locality: MEXICO, *Liebold* 213. Type in herb. University of Kiel, Germany.

Distribution: Known only from the type.

28. PEDILANTHUS MACROCARPUS Benth. Bot. Voy. Sulph., 4:t.23, f. A. 1844.

Hexadenia macrocarpa Kl. & Gke. Tricocc., 107. 1859.

Shrubby, 9 dm. high; dichotomously branching; branches terminal, thick, fleshy, articulated by constriction. Leaves of the stem unknown. Cymes lax, few-flowered; floral leaves or bracts minute, 6-8 mm., *cucullate, one quarter the length of the peduncle; peduncles shorter than the involucres;* involucres 1.8–3.2 cm. long (*2.3 x 1 cm.*) *the peduncle central on the tube;* tube plainly gibbous, 4-lobed (*sic.*) *the superior fissure closed to the throat, the inferior notch shallow; main lobes orbicular and erose-dentate at the apex; lateral and fifth lobes* narrowly linear *and connate into a trefoil at their apices where only they are free, apices flabellate,* ciliate; male flowers ligulo-bracteolate, *the pedicels with that of the female flower glabrous;* styles bi-lobed at the apex; capsule large, fleshy, 2.4 cm.

(including the horns), 3-carpellate (*one aborted in all specimens seen*); carpels each prolonged downward into two conical horns; seeds *globose-lenticular, 7.5 mm. diameter, rusty-brown, smooth, apiculate.* Appendix *fleshy*, slightly shorter than the tube (*usually about one half its length*), *deeply cleft into two ligulate, laterally compressed, bi-geniculate lobes turned upward at the rounded apex; glands 8 (often by abortion 6) in two sets of four each at the bases of the lobes.* (Characters in italics drawn from the Palmer, Agiabampo plant).

Type locality: MEXICO, Lower California, Magdalena Bay, *Hinds.* Type in herb. Kew, England.

Distribution: MEXICO, Agiabampo, *Palmer* 802 (1890); Manzanillo, *Palmer* 802 (1891); Magdalena Island, *Brandegee;* El Lano de Santana, *Brandegee;* Los Angeles Bay, *Palmer* 604, 605 (1887).

Illustrations: Bot. Voy. Sulph., 4:t.23, f. A.

29. **Pedilanthus peritropoides** Millsp. sp. nov.

Shrubby, glabrous. Leaves sessile, 12–15 cm. long, 5–6 cm. broad, thin, ample, glabrous, oblong to ovate, rounded and often emarginate at the apex, cuneate at the base, the midrib keeled for its lower third beneath. Inflorescence terminal, cymose, crisp-pubescent, bracteate; bracts oval, pointed, 1.8 x 1.5 cm., as long as or slightly longer than the peduncles. Involucre 2 x 1 cm. crispidulous-puberulent without, glabrous within, the tube broad and truncate anteriorly; main lobes ovate, pointed, entire; the three accessory lobes short, flabellate, equal, free at the ciliate apex only; male pedicels numerous, glabrous; female crisp-puberulent throughout; style 3-parted at the apex, stigmatic branches bi-lobed. Appendix small, about one third the length of the tube, its lobes entirely concealed within the wing-margined fissure of the tube; lobes 3, the superior pair ligulate, the margins folded upward upon themselves like a trough, the third lobe elongated-linear with a deltoid base, all crisp-puberulent; glands 4 at the gibbum: one pair at the inner bases of the superior folded lobes the other pair on the walls of the gibbum beneath the base of the third lobe.

The involucres, with their large, rounded anterior end, appear as if reversed from their usual form, the posterior exactly resembling the usual anterior extremity. The male flowers are exserted upward in a plumelike fascicle from the fissure instead of forward, as usual, along the female pedicel.

Type locality: MEXICO, Coahuayula, Michoacan, *Dr. G. M. Emrick* 80, November, 1902. Type in herb. Field Museum of Natural History, Chicago; sheet No. 200.416.

Distribution: Known only from the type.

30. PEDILANTHUS ITZÆUS Millsp. Field. Col. Mus. Bot., 1:305. 1896.

Shrubby, glabrous, 1.5 m. high; branches virgate, strongly zig-zag, succulent. Leaves sessile, sarcous, ovate, acute, deltoid at the base, 5–7.5 x 4–6 cm., mid-vein prominent beneath, lateral veins nearly at right angles. Inflorescence terminal, 1 or 2 involucred; involucres glabrous, light-pink, 1 cm. x 3.5 mm., superior fissure open three quarters the length of the tube; inferior notch shallow; main lobes rounded; lateral lobes comparatively large, ovate, one third free; fifth lobe ligulate, free two thirds its length, truncate; all ciliate; male and female pedicels glabrous. Appendix small, about one third the length of the tube, 3-lobed, 4-glandular, lobes deltoid at the base, the central truncate, notched, the two lateral triangular, acuminate, shorter. Style 3-cleft, the divisions 2-lobed.

Yaxhalalche. Also cultivated for ornamental purposes and used in domestic medicine. The Mayas consider the plant very poisonous. They use quarter drop doses, in water, as a certain and effectual purgative.

Type locality: MEXICO, Yucatan, Silam, March to June, *Dr. Geo. F. Gaumer* 452. Type in herb. Field Museum of Natural History, Chicago, sheet No. 36.255.

Distribution: MEXICO, Yucatan, Merida, *Dr. Arthur Schott* 552 (in herb. Field Museum); *Porfirio Valdez* 85. CUBA, *Britton, Britton & Shafer* 156. SANTO DOMINGO, *Wright, Parry & Brummel.*

Illustration: Field Col. Mus. Bot., 1:t.18.

§*CALCEOLASTRUM:* Involucre bilabiate, gibbous at the base of the superior lip. Superior lip (appendix) large, anteriorly curved, shoe-shaped, inflated, compressed, orbicular, opening by a small rounded aperture at the base, 4-glandular internally. Lower lip (tube of the involucre) short, urn-shaped; lobes 5, short, somewhat connivent, ciliate; inferior pair ovate, three to four times broader, superior oblong, scarcely shorter. Floral bracts none. Ovary not cup-shaped. Differs from *Eupedilanthus* in the following characters: shrubs with glanduliform stipules; upper-lip (appendix) ample and shoe-shaped, the anterior and posterior facies compressed.

31. PEDILANTHUS FINKII Boiss. in D. C. Prodr., 15:1261. 1866.

Shrubby; stems smooth, *hollow except at the nodes.* Leaves subsessile, oblong, 10–14 cm. long, the base long-attenuate, apex acute *and bearing a dark, cornuous mucron;* midrib prominently keeled beneath. Cymes terminal, often twice-dichotomous, branching from the base,

10.2–12.7 cm. including the peduncles; *floral bracts* oblong-lanceolate, acute, *slightly puberulent, as long as the puberulent peduncles, not early deciduous;* peduncles but slightly exceeding the involucres; involucres obconic at the base, 1.3 cm. long, 9 mm. broad, *the appendix and tube* nearly parallel, beautifully roseate *or greenish, or the appendix roseate while the tube is greenish; tube thin;* male *and female* pedicels glabrous; style long-exserted, very slender *or threadlike,* deeply cleft *into three lobes at the apex.* Appendix calceolate, dorsally concave with a rounded margin, 3.5 mm. broad, *thicker than the tube; glands circular, flat, thick rimmed.* (Characters in italics are drawn from plants grown in the Missouri Botanical Garden).

Type locality: MEXICO, Cordova, *Finck.* Type in herb. Kew, England.

Distribution: Known only from the type and from a plant brought by the Mexican Commission to the Louisiana Purchase Exposition, St. Louis, in 1904, from which cuttings were grown in the Missouri Botanical Gardens up to 1907; of this plant there is a herbarium sheet in the herb. Missouri Botanical Garden and in herb. Field Museum of Natural History, through the courtesy of the Director of the Garden.

SPECIES NON SATIS NOTÆ.

Pedilanthus Houlletii Baill. Adansonia, 1:341. 1861.

The description of this species was drawn from a plant cultivated for several years in the gardens of M. Houllet, Paris. I am not certain that a herbarium specimen was preserved. No nativity of the original plant is recorded in the description.

Pedilanthus Ghiesbreghtianus Baill. Adansonia, 1:340. 1861.

A species credited to Mexico but with insufficient description to satisfactorily establish its status.

CUBANTHUS Millsp. Gen. nov.

Pedilanthus Sectio *Cubanthus* Boiss. in D. C. Prodr., 15:7. 1862.

Involucre equal, urn-shaped, the apex (throat) constricted, truncate, minutely and irregularly denticulate-erose, erect upon the peduncle; appendix a concave, glandular disk upon the middle of the dorsum; peduncle jointed and bearing two leafy bracts; fruiting pedicel strictly erect; bracteoles numerous.

This genus apparently joins Pedilanthus to Euphorbiodendron, to the

latter its species bear great general resemblance in being small trees bare of leaves except at the apices of the young branches and in bearing its glandular appendix on the outer wall of the involucre.
Type species: Pedilanthus linearifolius Griseb.

Bracteoles glabrous; branchlets slender	1. linearifolius
Bracteoles hairy; branchlets thick and stubby	2. Brittoni

C. linearifolius (Griseb.) Millsp. comb. nov.

Pedilanthus linearifolius Griseb. Wright Cub., in Mem. Am. Acad., 1860: 161.

Leaves elongate, linear, attenuate at the base, acuminate, the midrib keeled throughout. Cymes terminal, 2-several cephalic, umbellulo-corymbose, shorter than the leaves, the peduncles jointed and bearing two ovate, acute, leafy bracts nearly equaling the involucre. Styles connate to the apex.

A shrub or small tree appearing much like a Euphorbiodendron or Thevetia neriifolia. Branches smaller than a goose quill, the younger ones leafy or leaf-scarred throughout. Leaves 2.5–10 cm. long, 2–3 mm. wide, margin sub-revolute, the midrib whitish and keeled beneath, glabrous. Branchlets 3–5 mm. thick (*pl. sicc.*), bark reddish-brown, striate. Appendage more or less scutellæform, sessile, ovate, the margin corrugate. Male flowers numerous, subincluded, pedicels glabrous, bracteoles numerous, glabrous; female pedicel long exserted, strictly erect; capsule 6 mm. long, transversely anastomose-wrinkled; calycle small, acutely 3-lobed, lobes minutely deltoid, acuminate; seeds cylindro-lenticular, buff, hilum dark brown, 4.2 x 3.7 mm. Peduncles in fruit 2 cm. long. Involucres 5.1 mm.

CUBA: Farallones, N. Sophie, *Wright* No. 1677, Nov. 12, 1859. Type (*visa*) in Herbarium Gray, Cambridge, U. S. A., type photograph in Herb. Field Museum. Pitajones, Province of Santa Clara, Shafer No. 12.194, 12.200, February 28, 1912.

C. Brittoni Millsp. sp. nov.

Leaves . . . Branches and branchlets thick (*pl. sicc.*) short and stubby; leaf scars crowded at the apex only; bark yellow or coppery, smooth. Peduncles in fruit 1 cm. long; involucres 6.1 mm. long; appendix more or less rectangular, thickened and glandular below; bracteoles hairy. Ripe capsules 4 mm. long; seeds globose-lenticular, olivaceous, hilum yellowish, 4 x 3.8 mm.

The species as so far known is without leaves, young involucres and leafy bracts, it is, however, strongly differentiated from the preceding

in its thick, stubby, much more numerous branchlets; its larger involucres and shorter peduncles; its hairy bracteoles and its seeds.

CUBA: Rio San Juan, Province of Santa Clara, rocky hillsides, *Britton, Earle & Wilson* No. 5874, March 24, 1910. Type in Herbarium New York Botanical Garden.

EUPHORBIODENDRON Millsp. Field. Mus. Bot., 2:305. 1909.

Euphorbiodendron Shaferi Millsp. sp. nov.

Shrub or small tree 3–3.3 m. high, profusely branching; branches divaricate, leafy and leaf-scarred at the apex only; bark finely transverse fissured. Leaves glabrous, coriaceous, oval, short petiolate, 2–3 x .8 cm., slightly narrowed at the base, apiculo-mucronate, the midrib prominent and somewhat keeled on the lower third. Inflorescence solitary at the apex of the young branchlets; floral leaves 2, opposite, brilliant red, orbicular, 1.4 cm. diameter, apiculate. Involucre turbinate, subsessile, 5 x 6 mm., glabrous, papillate without hairy at the throat within; lobes various, mostly ligulate and irregularly 3-toothed, some deltoid, thin and fimbriate; glands marginal, oval laterally compressed to scaphoid; bracteoles many, threadlike, hairy; female pedicel glabrous, style 3-lobed, the lobes revolute. Fruit unknown.

Type locality: CUBA, vicinity of Camp San Benito, Oriente, alt. 900 m., in a thicket along the rocky river; collected by *J. A. Shafer* 4078, February 24, 1910. Type in herb. New York Botanical Garden.

Distribution: Known only from the type.

Euphorbiodendron linearifolium Millsp. sp. nov.

Tree 5 m., profusely branching; branches ascending, leafy and leaf-scarred at the apex of the young branchlets only; bark silvery-white to light coppery-brown, coarsely transverse fissured. Leaves sessile, linear, pointed, only slightly if at all narrowed at the base, thick, glabrous, olive-green, 1.5–4 cm. long, 1.5–3 mm. broad, the midrib light colored and keeled beneath. Inflorescence solitary at the apex of the new branchlets; floral leaves or bracts bright scarlet, orbicular-ovate, 1.8 x 2.2 cm., pointed. Involucre cupulate, 4 x 6 mm., glabrous without and within, thick, sarcous; lobes small, flat, with three thick, sarcous, blunt, finger-like teeth; glands oval, laterally compressed to scaphoid; flowers surrounded by 5 oval, fimbriate bracts enclosing a mass of ligulate-fimbriate bracteoles and a few (about 5) male flowers; female pedicel glabrous; style short, 3-lobed. Fruit unknown.

Type locality: CUBA, Oriente, Sierra Nipe, along trail Piedra Gorda to Woodfred; in dry rocky thickets serpentine formation, alt. 400–500 m. Collected by *J. A. Shafer* 3092, December 8, 1909. Type in herb. New York Botanical Garden.

Distribution: Known only from the type.

DENDROCOUSINSIA Millsp. gen. nov.

Flowers dioecious, apetalous; disk none. Female flowers: calyx cupuliform, fleshy, sepals 3, minute, each basally subtended (internally) by a bract fringed with filamentous glands, ovary 3-celled, stigma 3-branched. Male flowers diskless, stamens 3 with 2-celled anthers opening by a longitudinal fissure, calyx lobes three, each subtended (internally) by a minute bract with a glandularly fringed margin. Capsule tricoccous, seeds carunculate.

Trees with thick, coriaceous leaves alternate below opposite or faciculate above, the lateral veins evident and tipped with a minute gland when ending at the margin of the leaf; inflorescence in terminal spikes or clusters, the male and female flowers sessile or appearing so, minute, diskless, each accompanied by two flanking glands.

Near Sebastiania. Dedicated to the Hon. H. H. Cousins, M. A., F. C. S., Director of the Department of Agriculture of Jamaica.

Flowers spicate, leaves petiolate	1. D. spicata
Flowers fasciculate, leaves sessile	2. D. fasciculata

1. **Dendrocousinsia spicata** Millsp. sp. nov., *typus gen.*

A small tree. Leaves alternate below, often opposite upon the flowering branchlets, glabrous, pale-green, thick, coriaceous, 4.5–8 cm. long, 3–4.5 cm. broad, oval to orbicular, blunt or slightly emarginate; margin entire, revolute (*pl. sicc.*) and pitted with very minute glandular dots; midrib prominent beneath; lateral veins generally opposite and substantially at right-angles to the mid-vein; petioles about 5 mm. long; stipules discoid-glandular. Inflorescence in terminal spikes, the flowers flanked on each side by a nearly globular gland pitted centrally; male spikes glabrous, slender, elongated, about 10 cm., the flowers glabrous, sessile upon a nodular prominence; stamens 3, divaricate, contiguous at the base, filaments rigid, anthers bilocular opening with an erose margin; calyx lobes oval, alternate with the filaments, involute to the appearance of a cup, apex generally acute, erose; internal basal bracts deeply fringed into 5–7 glandular filaments. Female spike shorter, about 4 cm.,

flowers subsessile; calyx cupulate, lobes 3, scaphoid-ovoid, sarcous, margin erose, internal bracts as in the male; ovary 3-celled; stigma sessile, the three branches divaricate, lying closely appressed to the ovary and incurved at the tips. Capsule glabrous, 5 mm. diameter, strongly 3-coccous, the cocci rotund, but slightly keel-marked and minutely transverse wrinkled; seeds light brownish-gray, elongated-ovoid, 5 x 3.5 mm., smooth, caruncle flattened-discoid, umbonate, chartaceous. Sap watery.

Type locality: JAMAICA, Upper Clarendon, Peckham woods, on limestone rocks at 8.5 m. altitude. Collected by *Wm. Harris* 10,980; 10,981; 11.204, July to September, 1911. Types in herb. Field Museum of Natural History, sheets Nos. 376.686 (male), 376.685 (female), 376,690 (fruit collected from the same tree as the female flowering specimens, September 9, 1912).

Distribution: Known only from the type locality.

2. **Dendrocousinsia fasciculata** Millsp. sp. nov.

A small tree, 5 m. Leaves alternate below, opposite and fasciculate (appearing trifoliate) above, gray-green, glabrous, 3–9 cm. long, 1.5–5 cm. broad, ovate to oval, coriaceous, reticulate-veined, rounded at the apex, margin slightly and irregularly wavy dotted with a few minute, glandular points; midrib prominent and yellowish beneath, the lateral veins irregularly disposed and ascending; stipular glands on each side of the base of the midrib. Inflorescence (female) in sessile, crowded fascicles at the apex of the terminal branchlets surrounded by the fascicle of leaves. Female flowers subsessile, roseate; calyx cupulate, lobes oval, narrow, margin irregularly 3-toothed, teeth broad, erose; internal basal bracts short-lacerate-glandular; basal glands antler-like with one, two or three prongs, their bases connected by an oval, erose-margined, bractlike scale; branches of the style appressed to the ovary, not incurved at the tips. Fruit and male flowers unknown. Sap milky.

Type locality: JAMAICA, Westmoreland and Hanover, in woods at the summit of Dolphin Head, alt. 690 m. Collected by *N. L. Britton* 2219, March 18–20, 1908. Type in herb. New York Botanical Garden.

Distribution: Known only from the type and *Harris* 10,266 gathered from the same tree.

CHAMÆSYCE S. F. Gray, Nat. Arr. Brit. Pl., 2:260. 1821.

(§*HYPERICIFOLIÆ*)

Chamæsyce Lansingii Millsp. sp. nov.

Hirta, ad rami pilis canescentes ad folii longe et sparse pilosi; prostrata alternatim pauci ramoso; foliis brevissime petiolatis e basi oblique, oblongo-ovatis, acutis, margine acute et plene serratis, stipulis deltoideis. Involucri pauci ad basi foliis supremis, longe pedunculatis, anguste turbinati extus glabri intus ad fauci longe pilosi, lobis integris (excepta duo ad sulci lace ratis), triangularis in ligula prolongatis, glandularum appendice ovata, alba crebro roseo coloratis, integris. Capsulæ glabræ, coccis minus carinatis; semine nigro-argenteus ovoideo-quadrangulatis minute et transverse anastomoso-rugulosis.

Plants rather firm stemmed, branches lurid, appressed-downy, 2–3 dm. long, internodes about 2 cm., leaves 1.2–1.8 cm. long, 6–8 mm. broad, petioles 1.5–2 mm. long, seeds 1.2 x .9 mm. Inflorescence solitary in the axils.

Type locality: ILLINOIS. Collected by *Odell E. Lansing, Jr.*, in paved ditches of Chicago streets, August 6, 1898, No. 402. Type in herb. Field Museum of Natural History, Chicago, sheet No. 196.668. Mr. Lansing re-collected the plant in the original locality in 1908, finding the plants persisting in all characters.

Distribution: ILLINOIS and WISCONSIN to MASSACHUSETTS and southward.

Chamæsyce Rothrockii Millsp. sp. nov.

Glabra, caule erecto, simplici vel alternatim ramoso, teretis, internodiis elongatis; foliis brevissime petiolatis e basi oblique, oblongo-ovatis, acutis, margine serratis; stipulis triangulatis ad apice laceris; cymis pauci floralis, terminalibus foliis supremis basi suffultis, involucri anguste-turbinati extus et intus glabri, lobis integris, triangularis in ligula prolongatis, glandularum appendice alba plus minusve rudimentariis, albis, ovalis, integris. Capsulæ glabræ; coccis carinatis; semine fusco-olivaceus, ovoideo, quadrangulis, transverse anastomoso-rugulosis.

Plants firm stemmed, branches terete, ligneous, 3–4 dm. long, internodes 3–5 cm. long; leaves 1–1.5 cm. long, .5–.8 cm. broad; petioles 2–3 mm. long; inflorescence 2–6 flowered; seeds 1.3 x .8 mm.

Type locality: ARIZONA. Collected by *Dr. J. T. Rothrock* in 1874, his number 872 of the Wheeler Expedition. Type in herb. Field Museum of Natural History, Chicago; sheet No. 197.499.
Distribution: MEXICO, Culiacan, 1891, *Dr. Edwd. Palmer* 1517.

Chamæsyce glomerifera Millsp. sp. nov.

Glabra, caule erecto simplici vel alternatim ramoso, purpurascento, foliis brevissime petiolatis e basi oblique auriculatis, oblongo-ovatis, obtusis, margine plane serrulatis; stipulis rubellis, carnosis, triangularibus, indivisis. Cymis densiuscule glomeratis, terminalibus foliis supremis basi suffultis; involucri anguste turbinati extus et intus glabri, lobis fimbriatis, glandularum appendice alba, ovato-rotunda eis latiori integra; stylis brevibus dimidiatus bifidis. Capsulæ glabræ coccis manifeste carinatis; semine roseus ovato-tetrangulo transverse anastomoso-ruguloso.

Plants heavily stemmed; branches terete, ligneous, 2–3 dm. long, purplish; internodes 8 cm. long; leaves 2.5–3.5 cm. long, 1.5–2 cm. broad; petioles about 3 mm. long; glomerules 2–2.5 cm. broad; seeds 1 mm. long, .7 mm. broad.
Type locality: GUATEMALA. Collected by the late *Dr. W. A. Kellerman*, January 20, 1908, No. 8053. Type in herb. Field Museum of Natural History, Chicago; sheet No. 224.827.
Distribution: Known only from the type.

ADENOPETALUM Kl. & Gke. Tricocc., 47. 1859.

Adenopetalum Barnesii Millsp. sp. nov.

Caule brevi duriusculo alternatim ramosissimo, ramis tenuis filiformis glabris ad apice umbelliformis; foliis minimis petiolatis orbiculatis acutis barbulato-hirtis; stipulis obsoletis; involucris terminalibus pedunculatis extus barbulatis intus glabris, lobis deltoideis erosis, glandulis minutis ovalis concavis, appendice quinquepartita laciniis digitoideis glandula multo longioribus; stylis bipartitis. Seminibus griseis ovatis profunde sculptis ad angulos fovearum albotuberculatis.

A low, erect, spreading plant 13–16 cm. high, 4–12 cm. broad with all characters minute; internodes 1–3 cm. long; leaves 3–6 x 1.55 mm.; petioles about one half the length of the blade; seeds .8 x .4 mm.
Type locality: MEXICO, Jalisco, along the road to San Domingo Mine near Etzatlan. Collected by the late *Dr. Charles Reid Barnes* and *Dr. W. J. G. Land* 306, October 6, 1908. Type in herb. Field Museum of Natural History, Chicago, sheet No. 247.472.
Distribution: Known only from the type.

II—TWO NEW STONECROPS FROM GUATEMALA

By RAYMOND HAMET.

Sedum Millspaughi Raymond Hamet, sp. nov.

Planta perennis? Radices . . . Caules floriferi erecti, robustiusculi, glabri. Folia alterna, glabra, sessilia, infra insertionem in calcar non producta, plana, obovata, marginibus integerrimis, apice acutiuscula, longiora quam latiora. Inflorescentia laxa, in cymis uniparis et raro biparis. Bractæ alternæ, sessiles, infra insertionem in calcar non producta, ovatæ, marginibus integerrimis, apice acutiusculæ, glabræ, longiores quam latiores. Pedicelli calyce paulo breviores, glabri. Calyx glaber, segmentis 5, infra insertionem in calcar non productis, suboblongis, marginibus integerrimis, apice acutiusculis longioribus quam latioribus. Corolla glabra, calyce paulo longior vel paulo brevior, segmentis 5, tubo multo longioribus, obovatis, in parte inferiore attenuatis, marginibus integerrimis, apice acutis et aristatis, arista petali apicem superante, longioribus quam latioribus. Stamina 10; filamenta omnia longe lineari-deltoidea, glabra, oppositipetala infra corollæ medium inserta; antheræ suborbiculares, basi et apice emarginatæ, tam longæ quam latæ vel paulo latiores quam longiores, oppositipetalæ corollæ medium superantes sed petalorum apicem non attingentes. Carpella 5, multiovulata, glabra, in stylos carpellis breviores attenuata, placentis a gracili ligamine secundum carpellorum margines disposito constitutis, apice obtusæ, longiores quam latiores. Folliculi 5, multiseminati, erecti, lateribus internis non gibbosis. Semina testa duabus extremitatibus nucleum non superante.

Caulibus floriferi 11–13 cm. longi. Folia 25 mm. longa, 9.50 mm. lata. Bractæ 4.50 mm. longæ, 1.60 mm. latæ. Pedicelli 4 mm. longi. Calycis pars concreta 0.75–1 mm. longa, pars libera 4.20–5.75 mm. longa, 1.30–2.25 mm. lata. Corollæ pars concreta 0.30 mm. longa, pars libera 4.75–5.50 mm. longa, 2.30–2.50 mm. lata. Staminum alternipetalorum pars concreta 0.30 mm. longa, pars libera 2.20–2.25 mm. longa, 0.30 mm. lata; staminum oppositipetalorum fiamentorum pars concreta 1 mm. longa, pars libera 1.75–1.80 mm. longa, 0.20 mm. lata. Antheræ 0.50 mm. longæ, 0.50–0.60 mm. latæ. Carpellorum pars concreta 0.50–0.60 mm. longa, pars libera 1.75–2 mm. longa. Styli 0.75–0.80 mm. longi. Squamæ 0.80–1 mm. longæ, 0.40–0.50 mm. latæ.

GUATEMALA, Depart. Amatitlan, Laguna (Lake Amatitlan); alt. 1200 m.; 25 January, 1906 [*W. A. Kellerman* No. 6559 — typus in herb. Field Museum of Natural History, Chicago; sheet No. 220.889].

Sedum Triteli Raymond Hamet sp. nov.

Planta perennis. Radices fibratæ. Caules basi subrepentes et steriles caules edentes, deinde erecti et simplices, glabri et papillosi. Folia alterna, sessilia, infra insertionem in calcar non producta, obovato, sublinearia vel obovato, suboblonga, integra, glabra, apice obtusa vel obtusiuscula, longiora quam latiora. Inflorescentia biflora. Bractæ foliis similes sed eis minores. Pedicelli calyce breviores, glabri. Calyx glaber, segmentis 5, tubo longioribus, infra insertionem in calcar non productis, longe lineari-deltoideis, basidilatatis, marginibus integerrimis, apice obtusiusculis, longioribus quam latioribus. Corolla glabra, calyce longior, segmentis 5 tubo multo longioribus, suboblongis, marginibus integerrimis, apice obtusiusculis, dorso subcarinatis, carina petali apicem non superante, longioribus quam latioribus. Stamina 10; filamenta omnia longissime lineari-subdeltoidea, glabra, oppositipetala infra corollæ medium inserta; antheræ subovato, reniformes basi emarginatæ, apice obtusæ, tam longe quam latæ, oppositipetalæ corolla medium superantes sed petalorum apicem non attigentes. Carpella 5, pauciovulata, glabra, in stylos carpellis breviores attenuata, placentis a gracili ligamine constitutis. Squamæ 5, sublineares, basi leviter dilatatæ, medio coartatæ, apice leviter dilatatæ, inflatæ et obtusæ, longiores quam latiores. Folliculi 5, pauciseminati, divergentes, lateribus internis non gibbosis; semina testa duabus extremitatibus nucleum non superante.

Planta 3–5 cm. longa. Caules steriles 6 mm. longi. Folia 4.50–7 mm. longa, 2–3 mm. lata. Inflorescentia 9 mm. longa, 12 mm. lata. Pedicelli 0.60 mm. longi. Calycis pars concreta 1–1.20 mm. longa, pars libera 4.50–5.50 mm. longa, 1.75–2 mm. lata. Corolla pars concreta 0.15–0.25 mm. longa, pars libera 5.50–6 mm. longa, 0.55 mm. lata. Staminum oppositipetalorum filamentorum pars concreta 1.60–2 mm. longa, pars libera 3.50 mm. longa. Styli 2 mm. longi. Squamæ 1.40 mm. longæ, 0.50 mm. latæ.

GUATEMALA, on rocks of the Sierra Madre, 400 m.; flowers yellow, June 10, 1882. [*F. C. Lehmann*, No. 1528. Type in herb. Barbey, Boissier].

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CONTRIBUTIONS TO NORTH AMERICAN EUPHORBIACEAE—V

1. "EUPHORBIA ADENOPTERA" IN NORTH AMERICA.
2. CHAMAESYCEAE NOVAE.
3. NOTULAE HYPERICIFOLIAEARUM.

BY

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CONTRIBUTIONS TO NORTH AMERICAN EUPHORBIACEAE—V*

BY

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1. "EUPHORBIA ADENOPTERA" IN NORTH AMERICA

M. Boissier, in his treatment of the species of Euphorbia in De Candolle's Prodromus, grouped all North American specimens that bore the vespertilloid involucral appendages characteristic of *Euphorbia dioica* Kunth under Bertoloni's *Euphorbia adenoptera*, retaining the latter name solely because Kunth's species proved to be monoecious.

In the light of a large amount of material collected since M. Boissier's consideration of the genus, it is evident that Bertoloni labored better than he knew, his *adenoptera* being good and in no way conflicting with Kunth's *dioica*. Herr Klotzsch, and later Herrn Klotszch u. Garcke saw with keen perception that there were several distinct species that bore a general likeness; these, however, M. Boissier did not recognize and so compiled his description of *adenoptera* as to include at least some characters of each.

Through the kindness of Dr. Engler, Dr. Prain, Dr. Casimir de Candolle and M. Beauverd, I have been granted the privilege of studying the types of *dioica*, *adenoptera*, *densiflora*, *inaequalis*, *Lindeniana* and other material from the herbaria of Kew, Berlin, Boissier and De Candolle; these, with the large series in the herbarium of the Field Museum and the specimens in the collections of the Missouri Botanical Garden, New York Botanical Garden, United States National Herbarium and the Gray Herbarium, Cambridge, all of which have been courteously loaned me, have rendered the following solution of the group possible.

The North American "*adenopterae*" resolve into eight clearly characterized species which may be summarized as follows:

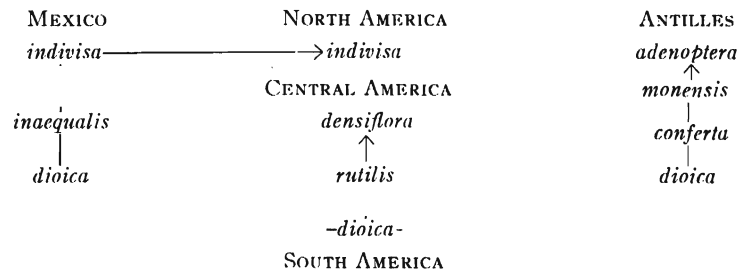
*Contribution — I appeared in Proc. Calif. Acad. ser. 2, 2:217–230. 1889.
II " Pittonia 2:82–90. 1890.
III " Botanical Gazette 25:13–25. 1898.
IV " Botanical Gazette 26:265–270. 1898.

INVOLUCRAL APPENDAGES GLABROUS:
Seeds triangular ovoid:
Angles not tuberculate,
Sulci 4, closed, the two basal anastomosing, coat pitted; leaves serrate, hairs long, monocellular *dioica*
Sulci 5, closed to mere slits, distinct, coat farinose; leaves serrate, hairs cottony, multicellular *rutilis*
Sulci 5, shallow, concave, distinct, coat pitted; leaves entire, glabrous *inaequalis*
Angles tuberculate,
Sulci 4, open, coat farinose; leaves serrate, hairy especially beneath *indivisa*
Seeds ovoid:
Sulci 3, narrow, distinct; leaves fabiform, short crispid-hairy *adenoptera*
Sulci 5, broad, the two basal often anastomosing; leaves lanceolate, scatteringly straight-hairy *conferta*

INVOLUCRAL APPENDAGES HAIRY:
Seeds ovoid, sulci 6, closed to mere slits; leaves minutely crispid-hairy, stem hairs moniliform *densiflora*

INVOLUCRAL APPENDAGES WANTING:
Seed triangular-ovoid,
Sulci 4–5, closed, the dorsal transverse the ventral oblique; leaves oblong-ovate, crispid-puberulous *monensis*

These species are as distinct in their distribution as in their characters.



While the terminal species *adenoptera*, *densiflora* and *indivisa* are strikingly clear-cut and constant in their special regions, *dioica* is strongly mutational, hardly two specimens having been seen that exactly duplicate each other.

Chamaesyce dioica (Kunth) comb. nov.

Euphorbia dioica Kunth, H. B. & K. Nov. Gen. et Sp. 2:53. 1817.
Euphorbia ocymoides Hook. & Arn. Bot. Beechy 310. 1841. non Linn.
Euphorbia anceps Benth. Bot. Voy. Sulph. 162. 1844.
Anisophyllum dioicum Kl. & Gke. Tricoce. 31. 1860.

Shrubby, tufted, diffuse, procumbent; branches compressed, long-villous except on the under surface, terete, less than 15 cm. long, hairs monocellular. Inflorescence axillary, solitary or in threes, shorter than

the leaves. Leaves opposite, pilose on both surfaces, 2–5 mm. long, oblong or ovate-oblong, unequally subcordate at the base, obtuse to acutish, the margin closely denticulate especially toward the apex; petioles 1 mm. pilose; stipules interpetiolar, subulate, 1.5 mm., pilose. Involucres pyriform-globose, peduncle bracteate, unilateral, somewhat pilose; lobes minute, lanceolate, inflexed; glands in two pairs, squamiform, cupped; appendages white, the two upper auriculiform, thrice the size of the lower flabelliform pair; stamens minute, ligulate, pilose at the base. Capsule somewhat pilose; seed triangular-ovoid, .60 x .40 mm., pinkish-ashen; facets plane; ridges evenly convex; sulci 4, closed, the two basal anastomosing; seed-coat pitted.

Type locality: VENEZUELA, Valles de Aragua, near Cura. Humb. Bonpl. & Kunth. Type in herb. Paris; fragment in herb. Berlin.

Distribution: From Brazil through British Guiana to the U. S. Colombia, and in our region as follows:

NICARAGUA, Omotopec, *Wright* (hb. Gray; F. 409466; Mo. 39421).

HONDURAS, San Pedro Sula, *Thieme* 5475 (F. 197624).

GUATEMALA, Gualan, *Deam* 234 (F. 413605; hb. Gray). Retalulcu, *Bernoulli & Cario* 2421 (hb. Berlin).

YUCATAN, *Gaumer* 629 pt. (F. 196353; Mo. 39402), 938 pt. (F. 196349, 196350, 196351, 196354; Mo. 39403; U. S. 571824), 939 pt. (Mo. 39404); Izamal, *Caec. et Ed. Seler* 3924 (F. 413598; hb. Berlin); Chichen Itza, *Millspaugh* 107 (F. 196973).

MEXICO, *Orcutt* 4444 (F. 283317); Jipimeo, *Gregg* 812 (hb. Gray); Vera Cruz, *Pringle* 8477 (F. 143598, 400497; Mo. 39406; U. S. 396334; hb. Gray), *Greenman* 250 (F. 189715); Oaxaca, *Seler* 1990 (F. 413597; hb. Gray; hb. Berlin), *Conzatti & Gonzales* 1189 (F. 413603; hb. Gray); Sinaloa, *Lamb* 372 (F. 413581; hb. Berlin).

LOWER CALIFORNIA, San Blas, *Wright* 1358 (F. 166388, 267605, 409509; Mo. 39405; U. S. 22163; hb. Gray).

SANTO DOMINGO, *Mayerhoff* (hb. Berlin).

Chamaesyce rutilis sp. nov.

Prostrate, spreading from a rather ligneous base; stems few and very short; branches compressed, woolly except on the median line beneath, divaricate, internodes long; hairs multicellular. Inflorescence solitary in the axils of the leaves or leafy bracts. Leaves slightly pilose beneath, oblong to oblong-lanceolate, 4 x 7 to 6 x 10 mm., broadest at the upper third, inaequilateral, narrowly or broadly auriculo-oblique

at the base, acute, denticulate along the longer edge and about the apex; stipules subulate, the under pair thrice the length of the upper. Involucres minute, nearly sessile by their narrowing bases, pyriform, stiff pilose especially above; lobes mere bundles of ciliae; glands as in dioica; appendages deep red, the upper pair 1.5 x .8 mm., narrowing to a blunt apex, margins irregularly repand-dentate, the lower pair flabellate. Male flower pedicels glabrous; female stiff-pilose especially above; ovary stiff-pilose, styles united at the lower third, bifurcate one-quarter their length into recurved stigmas; capsule setaceous-pilose, cocci rounded; seed triangular-ovoid, pinkish, .90 x .60 mm., acute at the apex; angles slightly corrugate; facets plane; ridges broadly convex, sulci 5, narrowed to a mere line.

Type locality: GUATEMALA, Fiscal, alt. 3700 ft., *Chas. C. Deam* 6189. Type in herb. Field Museum No. 285111. (Other sheets 274011, 279578; hb. Gray.)

Distribution: HONDURAS, *Niederlein* 179 (hb. Berlin).

Chamaesyce inaequalis (Kl. & Gke.) comb. nov.

Anisophyllum inaequale Kl. & Gke. Tricocc. 27. 1859.

Euphorbia inaequalis Klotzsch obs. in Peters Nat. Reise Mossamb. Bot. 94. 1862.

Euphorbia callitrichoides Schaur in Linn. 20:727. 1847. non Linn.

Prostrate, spreading from a slender, elongated, ligneous root; stems many from the base, compressed, pilose above and especially on the margins, glabrous beneath; branches profuse, divergent, internodes short, 4–6 mm.; branchlets alternate. Inflorescence solitary in the upper leaf axils of the branchlets and tips of the branches. Leaves ovate, 5 x 3 to 7 x 4 mm., glabrous on both surfaces, unequally cordate, more or less acute, slightly crenate-dentate; petioles 1 mm. or less, mostly glabrous; stipules slender subulate-aristate, mostly glabrous, the upper somewhat exceeding the petioles, the under twice their length. Involucres turbinate-campanulate, the outer surface minutely pilose, the inner densely woolly; lobes flabellate, ciliate; glands transversely oval, cupped, somewhat less than half the size of the appendages; appendages white, the larger (1.2 x .3 mm.) crenate-margined, the smaller (.6 x .2 mm.) erose-dentate; pedicels of the male flowers ligulate, glabrous, those of the female pilose above; ovary pilose; style trifid to the base, the branches bifid one-third their length. Capsule pyriform, pilose, cocci rounded; seed triangular-ovoid, .90 x .60 mm., pinkish; apex acute, the dorsal angle most prominent, facets plane, ridges rather broad and rounded, sulci 5, shallow but well defined, seed-coat minutely pitted.

Type locality: MEXICO, *Ehrenberg* 1034. Type in herb. Berlin.

Distribution: MEXICO, *Schaffner* 792, 797 (hb. Berlin); *Coulter* 1447c (hb. Gray); *Uhde* 1164 pt. (hb. Berlin). Oaxaca, *Nelson* 1484 (F. 413610; hb. Gray); *Conzatti & Gonzales* 435 (F. 413602; hb. Gray); *Purpus* 3423 (F. 276357, 413612; hb. Gray). Vera Cruz, *Purpus* 2318 (F. 201867; Mo. 39424; U. S. 840431; hb. Gray). Orizaba, *Mueller* 1535 pt. (F. 346508; hb. N. Y.); Puebla, *Arsène* 61=437 (F. 413571; hb. Berlin); Tacubaya, *Aschenborn* (hb. Berlin); Guanajuato, *Dugès* (F. 409498; hb. Gray); San Luis Potosi, *Schaffner* 1034 pt. (F. 409500; hb. Gray).

Chamaesyce indivisa (Engelm.) comb. nov.

Euphorbia dioica indivisa Engelm. Mex. Bd. 2:187. 1858.

Prostrate, spreading from an apparently annual root; stems many, 5–12 cm. long; branches few, divaricate, compressed, pilose above glabrous beneath. Inflorescence as in dioica but more open. Leaves ovate, 5–8 x 1.3–6 mm., glabrous or subglabrous above, slightly pilose beneath, auriculo-oblique at the base, acute, the margin few dentate-serrate especially above though sometimes appearing entire; petioles 1 mm., long-pilose; stipules subulate-setaceous, pilose. Involucres short-campanulate, the outer surface pilose, the inner glabrous; lobes broadly-deltoid, ciliate; glands transversely-oval, cupped; appendages pale-buff, the larger pair 1.7 x .8 mm., few-crenulate on the lower and outer margin, the smaller pair one-sixth the size, slightly 3-crenulate; pedicels of the male and female flowers glabrous; ovary densely pilose; styles 3, divided to the base, the stigmatic apices undivided. Capsule pyriform, pilose even in age; cocci rounded; seed triangular-ovoid, 1.00 x .60 mm., buff, the angles nearly equal and strongly tuberculate at the juncture of the ridges; facets somewhat convex; sulci 4, broad and open; seed-coat farinose.

Type locality: NEW MEXICO, Copper Mines, *Chas. Wright* 1845. Type in Gray Herbarium. Other sheets (F. 408360; U. S. 22166).

Distribution: MEXICO, *Alaman* 100910 (hb. de Candolle); San Luis Potosi, *Parry & Palmer* 816, 819 (F. 409505–7; U. S. 22169, 22173; Mo. 39420; hb. Gray); *Schaffner* 855 (F. 409499; hb. Gray), Durango, *Palmer* 878 (F. 197681, 51930; U. S. 315588; Mo. 29400; hb. Berlin); Coahuila, *Palmer* 1206 (F. 409502; U. S. 22174); Chihuahua, *Pringle* 326 (F. 104207, 197343, 262753–4; U. S. 22164; Mo. 39401); *Palmer* 381 (F. 409501; U. S. 22175; hb. Gray; hb. Berlin 326); Sonora, *Lloyd* 459 (hb. Gray); *Thurber* 963 (hb. Gray).

ARIZONA, Churricahua Mts., *Lemmon & wife* (F. 111081, 196749; U. S. 22167); Tucson, Range Reserve, *Wooton* (F. 413506; U. S. 690675); Rucker Valley, *Lemmon* (F. 196750, 196753–4, 409459;

U. S. 22167; Mo. 39414; hb. Gray); Santa Rita Forest Reserve, *Griffiths* 5954 (F. 413505; U. S. 496852); Bisbee, *Mearns* 868, 1075 (F. 413503–4; U. S. 229157, 560210); Fort Sewell, *Lemmon* (F. 409458; Mo. 39417); Fort Whipple, *Coues* (F. 288308, 409457; Mo. 39418).

NEW MEXICO, Organ Mts., *Wooton* (F. 413507–8; U. S. 735273–5); *Wooton & Standley* (F. 413509; U. S. 564056); Black Range, *Metcalfe* 1292 (F. 187626; U. S. 498091; hb. Gray; hb. Berlin); Silver City, *Greene* 434 (F. 409464; Mo. 39413); Hillsboro, *Greene* 1292 (F. 187626; U. S. 498091).

TEXAS, Alpine, *Mackensen* (F. 300276); La Grange, *Schneck* (F. 373890).

Illustration: Millsp. Bot. Gaz. 26:21.

CHAMAESYCE ADENOPTERA (Bertol.) Small Fl. SE. U. S. 714, 1334. 1903.

Euphorbia adenoptera Bertol. Misc. Bot. 3:20. 1843.

Euphorbia Lindeniana A. Rich. in Sagra Hist. Cub. 11:197. 1850.

Euphorbia serpyllifolia Kunth H. B. K. Nov. Gen et Sp. 2:53. 1817. non Pers.

Euphorbia pergamena Small. Bull. Torr. Club 25:615. 1898.

Anisophyllum Lindenianum Kl. & Gke. Tricocc. 33. 1859.

Chamaesyce pergamena Small Fl. SE. U. S. 713, 1333. 1903.

Euphorbia Gundlachii Urban Symbol. Antill. 5:392. 1908.

Plants rosulate, tufted, compact; root perennial, thick, nodose, short and heavy; stem prostrate, terete; branches numerous, alternate, minutely pilose laterally and above. Inflorescence solitary, upper axillary. Leaves opposite, thick, opaque, indistinctly 3-nerved, wrinkling in drying, green and subglabrous above, generally crispid-pilose beneath, ovate to fabiform, strongly inaequilateral, 6 x 2.5 to 8 x 3.5 mm., obliquely cordate at the base, obtuse, the margin obsoletely subcrenate or more or less indistinctly repand, thickened and revolute; petioles short, pilose; stipules subulate-setaceous, deciduous. Involucres subsessile, campanulate, 1–1.5 mm., including the peduncle, puberulous without and within; lobes deltoid, truncate, ciliate; glands transversely oblong, somewhat cupped; appendages petaloid, the lower pair rotund, 3-crenate, 1 x .4 mm., about twice smaller than the ascending, wing-like, sanguinate upper pair; pedicels of the male flowers glabrous, the female short-pilose above; ovary densely pilose; style trifid two-thirds its length, the branches bifid one-third. Capsule globose, whitish pubescent; cocci rounded; seed ovoid, .85 x .70 mm., ashen; apex obtuse; the angles not strongly marked; facets convex, ridges broad and rounded; sulci 3, narrow, distinct; seed-coat finely pitted.

Type locality: Santo Domingo, *Bertero*. Type in herbarium de Candolle.

Distribution: SANTO DOMINGO, Prov. Barahona, *Fuertes* (F. 385336); Constanza, *von Tuerckheim* (F. 298607; U. S. 656169).

CUBA, *Wright* 13 (F. 409467; Mo. 39410), 547 (F. 409468; Mo. 39408), 2014 (F. 409469; Mo. 39407), 2015 (F. 409470; Mo. 39408); *Linden* 1706, type of *Lindeniana* (hb. Boissier; hb. de Candolle; hb. Krug & Urban; F. 413582 comm. Urban); Pinar del Rio, *Shafer* 10702 (F. 409487; hb. N. Y. Bot. Gard); 10840 (N. Y.; F. 409489), 11093 (N. Y.; F. 409490); Santa Clara, *Cuesta* 248 (N. Y.; F. 409491); Cojimar, *Percy Wilson* 9532 (N. Y.; F. 409492), *Bro. Leon* 1931 (N. Y.; F. 409494); Isle of Pines, Pedernales Point, *Millspaugh* 1436 (F. 61436, 196921), 1442 (F. 61442, 196923), 1443 (F. 61443, 196922).

FLORIDA, Biscayne Bay, *Palmer* (F. 409504; Mo. 39411; hb. Gray), *Curtiss* (F. 409462); Miami, *Garber*, type of *pergamena* (F. 196330–1; U. S. 16179, 22171; Mo. 39416; hb. Gray); East Border of the Everglades, *Curtiss* (F. 196258–9, 259796, 308418; Mo. 39426; U. S. 22168; hb. Gray; hb. Berlin); near Cutler, *Small & Carter* (N. Y.; F. 172417, 172448, 185184); near Lemon City, *Simpson* 523 (F. 258583; U. S. 22162; hb. Gray); near Homestead, *Small & Wilson* (N. Y.; F. 172585); Sanibel Island, *Tracy* 7223 (F. 101954 badly diseased but doubtless the species).

Illustrations: Bertol. Misc. Bot. t. 23, f. 3; Boiss, Euph. Icon. t. 19.

Chamaesyce monensis sp. nov.

Perennial, lurid, prostrate from a thick, ligneous rootstalk; stem short, ligneous; branches terete, puberulous, 3–6 cm. swollen at the nodes. Inflorescence solitary, terminal and terminal-axillary. Leaves opposite, ovate to oblong-ovate, 2.5 x 2 to 4 x 3 mm., sarcous, closely crispid-puberulous, subcordate, obtuse, the margin crenulo-serrate especially on the upper half; petiole 1 mm.; stipules triangular, ciliate. Involucres subsessile, campanulate, the outer surface white-crispid-pilose, inner surface smooth with a fold or keel-like band of tissue extending from the fundus to, and projecting beyond, the base of the sulcus to form a lacerate, ciliate, fifth lobe of the involucre; lobes lanceolate, ciliate, sarcous; glands transversely oval, greenish, in two pairs, one pair twice the size of the other; appendages none; bracteoles numerous, lacerate-plumose; male and female flowers glabrous, ovary white-crispid-pilose; style pilose, trifid to near the base, the apices of the branches shortly bifid. Capsule short-pilose; seed triangular-ovoid, white, .90 x .70 mm., apex acute, angles sharp, facets plane, transversely

broad and flat ridged; sulci 4–5, tight closed, those of the dorsal facets transverse of the ventral oblique.

Type locality: West Indies, Mona Island, Ubero, on limestone plateau, *Britton, Cowell & Hess* 1841. Type in herb. Field Museum, sheet No. 413680.

Distribution: Known only from the type.

CHAMAESYCE CONFERTA Small Fl. SE. U. S. 713, 1903.

Plant spreading, prostrate, red-tinged throughout; root slender, elongated, annual; branches virgate, compressed, .5–2 dm. long, often forking, pilose above, glabrous beneath, internodes on diffuse plants 1–1.5 cm. long. Inflorescence solitary in the axils of the upper leaves or leafy bracts. Leaves approximating in pairs or, in small, dense plants and on the branchlets of diffuse ones closely ranked, lanceolate-ovate, 5–10 mm. long 3–5 mm. broad, sparsely long and straight pilose while young, glabrous in age, the base strongly oblique, sub-cordate in the larger leaves, acute, serrate; petioles short, glabrous except those of the young leaves; stipules subulate-aristate, crisp-pilose, the bases often broadened and sometimes bifurcate. Involucres sessile or nearly so, tubular-campanulate, villous without and within; lobes ligulo-deltoid, ciliate; glands narrowly-oblong, transverse, cupped; appendages small, the larger pair broader above and irregularly erose-dentate, the smaller crenate-dentate, but slightly exceeding the glands; pedicels of the male flowers glabrous, of the female villous; ovary pilose; style trifid two-thirds its length, the branches bifid one-third. Capsule ovoid-globose, minutely pilose; cocci rounded; seed ovoid, .70 x .50 mm., ashen, slightly quadrangular, obtuse, facets convex, the angles rounded, the ridges broad and convex, sulci 5, mere closed fissures, the basal pair often anastomosing; seed-coat farinose.

Type locality: Florida, Coconut Grove, *Small & Nash*. Type in herb. New York Botanical Garden; fragments in herb. Field Museum No. 197585.

Distribution: FLORIDA, Lemon City, *Hitchcock* (F. 233636); Miami, *Pollard & Collins* 229 (F. 76683, 197286; U. S. 330180; *Small & Carter* 1079 (N. Y.; F. 185172), *Curtiss* 173 (F. 409460; Mo. 39415); Coconut Grove, *Simpson* 536 (U. S. 22161), *Curtiss* 5486 (F. 409461; U. S. 247194; Mo. 39298); Biscayne Bay, *Curtiss* (F. 109189, 308419, 23190; U. S. 22172; Mo. 39425; hb. Gray; hb. Berlin); Long Prairie, *Britton* 211 (N. Y.; F. 172783); between Homestead and Camp Jackson, *Small & Wilson* (N. Y.; F. 172583); Jenkins to Everglades, *Eaton* 206 (F. 230855).

Chamaesyce densiflora (Klotzsch) comb. nov.

Euphorbia densiflora Klotzsch obs. in Peters Nat. Reise Mossamb. Bot. 94. 1862.

Anisophyllum densiflorum Kl. & Gke. Tricocc. 28. 1859.

Euphorbia adenoptera Boiss. D. C. Prodr. 15:49. 1860. non Bertol.

Plants prostrate, spreading from a woody base; root rather thick, ligneous; rootstalk nodose; stems many, compressed, simple or branching; branches divaricate, pilose on both surfaces but shorter on the ridged upper side, densely leafy bracted on the branchlets. Inflorescence axillary, glomerately crowded in ranks at the ends of the branches and along the leafy branchlets. Leaves oblong to ovate-oblong, 1–1.5 x .5–1 cm., more or less falcate, finely and shortly crispid-pilose on both surfaces, the old ones sometimes glabrous above, strongly unequal, the base auriculo-cordate, the apex rounded or sub-truncate, margin finely denticulate especially toward the apex; petioles very short, one-tenth the length of the blade, villous or glabrate; stipules subulate-aristate, always recurved, often unequally bifid at the base, slightly and minutely pilose. Involucres campanulate, outer surface pilose; lobes broad fimbriate, ciliate; glands large, plane, not cupped, somewhat smaller than the appendages, the larger pair reniform, the smaller oval; appendages white, pilose often on both surfaces, the hairs longest on the under, outer margin erose-dentate; pedicels of the male flowers glabrous, of the female pilose above, male flowers frequently all aborted in those involucres bearing female flowers and vice versa; ovary densely pilose; style tripartite two-thirds the branches bifid half their length. Capsule densely short-pilose even in age; seed ovoid, slightly quadrangular, .85 x .60 mm., pinkish, obtuse; facets convex; ridges broad, the lower pair generally more or less anastomosing; sulci 6, narrowed to mere deep lines; seed-coat minutely pitted.

Type locality: MEXICO, Papantla *Schiede*. Type in herb. Berlin. (A sheet in herb. Kew bears a branch of the type plant and the *Skinner* specimen from Guatemala, both determined, in Klotzsch's handwriting, *Euphorbia densiflora*.)

Distribution: CANAL ZONE, *Pittier* 2848 (hb. Berlin).

NICARAGUA, in Monte Masaya; in Monte Candelaria; in Monte El Viejo and in San Jose, *Oersted* (hb. Berlin).

COSTA RICA, San Francisco de Guadalupe, *Tonduz* 7245 (F. 413500; U. S. 471734); Cañas Gordas, *Pittier* 11083 (F. 413499; U. S. 392010); in Monte Irasu, *Oersted* (hb. Berlin).

GUATEMALA, *Skinner* (hb. Kew); Santa Rosa, Jumaytepec, *Heyde & Lux* 4569 (F. 264921); Baja Verapaz, San Augustine,

Kellerman 7617 (F. 224524, 224561); Zacapa, Gualan, *Kellerman* 5666 (F. 413498; U. S. 578730); Barranca de Incienso, *Bernoulli* 222 (F. 413497; hb. N. Y.; hb. Berlin).

MEXICO, Oaxaca, *Conzatti* 834 (F. 413601; hb. Gray); *Franco* (hb. Boissier); *Purpus* 6949 (F. not yet organized). Puebla, Maltrata, *Kerber* 244 (hb. Berlin). Hidalgo, Atotonilco el Grande, *Ehrenberg* 810 (hb. Berlin). Vera Cruz, *Mueller* 241 pt. (F. 346505; hb. N. Y.); Huasteca, Wartenberg, Tantoy, *Ervendberg* 251 (hb. Gray). Morelos, Cuernavaca, Xochicoles, *Cacec. et Ed. Seler* 371 (hb. Berlin). Jalisco, Barranca de Oblatos, *Barnes & Land* 204 (F. 247416, 356937); San Pedro, *Mrs. Sheldon* (F. 354642; hb. Gray); Rio Blanco, *Palmer* 567 (F. 413501; U. S. 22605; hb. Gray). Guadalajara, La Barranca, *Safford* 1431 (F. 413502; U. S. 573426); *Pringle* 11847 (F. 413611; hb. Gray); *Gregg* 862 (F. 413608; hb. Gray). Without locality, *Orcutt* 2894 (F. 279025); 4682 (F. 283459).

EXTRA LIMITAL

Chamaesyce amoena (Klotzsch) comb. nov.

Euphorbia amoena Klotzsch in Schomb. Faun. et Fl. Br. Guiana 1184. 1848.

Anisophyllum amoenum Kl. & Gke. Tricocc. 33. 1859.

There is a part specimen of this British Guianian species in the herbarium at Kew, labeled "Ehrenberg, Mexico," that is such a perfect counterpart, in size, form, and color of drying, of a part specimen in the same herbarium, and in herb. Berlin as well, labeled "Schomburgk, Guian. Angl." that I am quite certain of error in the labeling of the former; especially as there is no Ehrenberg sheet in herb. Berlin and because the Kew specimen is labeled "*Euphorbia graminea L.*" written by the same hand as the "Ehrenberg, Mexico." No one would for a moment consider the plant to be that species. A mixture doubtless occurred in the mounting of the Kew sheet.

2. CHAMAESYCEÆ NOVAE

Chamaesyce camaguayensis sp. nov.

Plants glabrous, densely tufted from a heavy, deep rootstalk; root perennial; stems rosulate, 6–10 cm., slender, wiry, internodes long. Inflorescence terminal, solitary in the upper axils. Leaves oval, 2.5–

3.5 x 1.5–2.5 mm., mostly reddish, strongly inaequilateral, subcordate, obtuse, entire; petioles 1.5 mm.; stipules: the upper elongated-triangular, more or less lacerate or bi-acicular, the lower short-triangular, the margin lacerate-dentate. Involucres turbinate, peduncle nearly the length of the tube, tube glabrous without, densely ciliated at the throat within; lobes triangular, ciliate; sulcus with an acicular, fimbriate lobe at the fundus; glands plane, reniform; appendages showy, white or roseate, oval, entire; bracteoles many, ligulate, finely fimbriate; pedicels of the male flowers ligulate, anthers centrally fixed to the apex of the pedicel; style trifid to the base, the branches bifid, stimgatic surface large, half the length of the style. Capsule glabrous, cocci strongly angled, glabrous; seed pink, farinose, ovoid-triangular, .8 x .6 mm., obtuse, the dorsal angle strongest, dorsal facets slightly marked by indefinite ridges.

Type locality: CUBA, in savannas near Camaguey, April, 1912, *N. L. & E. G. Britton & J. F. Cowell* 13233. Type in herb. New York Botanical Garden; fragmentary portions in herb. Field Museum No. 409482.

Distribution: CUBA, vicinity of El Morro, Santiago Bay, *Britton & Cowell* 12537; Camaguey to Santayana, *Britton* 2394.

Chamaesyce paredonensis sp. nov.

Perennial from a heavy, thick, ligneous root; plants in dense, prostrate masses, crispid-pilose; stems vastly numerous, many times divaricately branching; branches tenuous. Inflorescence solitary in the forks of the upper branchlets. Leaves minute, 2–4 x 1–2 mm., opposite, oblong, fleshy, inaequilateral, scattered pilose above and beneath, subcordate, obtuse, margins of the terminal leaves entire, those of the median and lower leaves irregularly and unequally few crenate-dentate; petioles 1 mm. or less, interpetiolar, bulbous-triangular, bi or tri-aristate, pilose. Involucres campanulate, about the length of the pedicels, glabrous, the inner surface woolly except at the fundus; lobes broadly-triangular, ciliate; sulcus broad and not demarked from the general margin; glands transverse, oval; appendages white, ovate, slightly emarginate, about twice the breadth of the glands; male flowers few, the pedicels ligulate, glabrous, female pedicel and ovary glabrous; style trifid, spreading, the stigmatic lobes bifid two-thirds. Capsule glabrous; seed triangular-ovoid, greenish-white, 1.2 x .8 mm., acute, the dorsal angle very sharp, the facets smooth, the two ventral about equal to one dorsal.

Type locality: CUBA, Cayo Paredon, *J. A. Shafer* 2763, October 25, 1909. Type in herb. New York Botanical Garden; fragments and co-types in herb. Field Museum sheets 409486 and 286093.

Near **Chamaesyce portoricensis** (Urban) comb. nov. (*Euphorbia portoricensis* Urban Symb. Antill. 1:338. 1899). Our species differs strongly in its oblong, mostly crenate-dentate leaves, involucral teeth and appendages, and larger, smooth, triangular seeds.

Chamaesyce anegadensis sp. nov.

Annual from a wiry root; plants short-stemmed, prostrate, rosulate-spreading, densely white-villous; branches tenuous, short, .2–5 cm. Inflorescence solitary, terminal in the bifurcations and axils. Leaves opposite, thick, suborbicular, 3–6 mm. long, pilose on both surfaces, base strongly oblique-cordate, apex obtuse, margin entire, revolute; petioles short, about 1 mm.; stipules deltoid, densely ciliate-margined. Involucres turbinate, pilose without and within, pedicel about the length of the tube, lobes broadly deltoid, tufted-ciliate, sulcus V-shaped, ciliate; glands transverse, oval, green; appendages sarcous, white or pinkish, about the width of the glands, margin entire, ciliate; bracteoles tomentose; pedicels of the male flowers ciliate, of the female glabrous below and woolly above; ovary densely woolly; styles distinct, short, bifid to the base or nearly so. Capsule ovoid, long white-pilose even in age; seed ovoid-triangular, acute, .9 x .6 mm., pinkish, the coat cellulo-farinose; angles strong and sharply defined; facets smooth, convex.

Type locality: Anegada, Dutch West Indies, *N. L. Britton & W. C. Fishback* 998, February 19–20, 1913. Type in herb. Field Museum, sheet No. 408241.

Near Ch. portoricensis (above) from which it differs specifically in its long-hairiness; thicker, larger, suborbicular leaves, short petioles, entire stipules and its triangular smooth seeds.

Chamaesyce nirurioides sp. nov.

Annual; plants low, glabrous, erect or ascending; stem red, ligneous, terete; branches alternate, 5–10 cm. Inflorescence solitary in the terminal bifurcation and the axils of the upper leaves. Leaves opposite, appressed, obovate, 3-nerved, oblique at the base, obtuse, margin serrate-dentate especially at the upper third; petioles 1 mm. Stipules interpetiolar, deltoid, thick, the margins glandular punctate. Involucres long-pedicellate, campanulate, glabrous without and within; lobes elongated triangular, few ciliate at the apex; glands waxen, orbicular, cupped; appendages white or pink, orbicular, thrice the diameter of the glands, entire or mostly so; male flowers glabrous; female pedicel and ovary glabrous: Style trifid to the base, the branches bifid one-half their length; capsule glabrous, tricoccous, cocci rounded; seeds triangular-ovoid, 1 x .8 mm., blackish with yellowish angles, apex acute,

the hilum distinct, facets convex, marked by a few indistinct and incomplete ridges.

Near *Chamaesyce brasiliensis* from which it is readily distinguished by its yellowish seed angles, glandular-dotted stipules, and a striking resemblance in habit to Phyllanthus Niruri.

Type locality: Jamaica, in a pasture at Malvern, *N. L. Britton* 1186. Type in herb. Field Museum, sheet No. 217319.

Distribution: Known only from the type.

Chamaesyce insulaesalis sp. nov.

Perennial, erect, 7–10 cm. from a densely nodular rootstalk; branches densely tufted, wiry, terete, glabrous, internodes 1.5–2 cm. Inflorescence solitary, terminal and terminal-axillary. Leaves opposite, sarcous, glabrous, 2–4 x 1.5–3 mm., ovate, inaequilateral, marked only by the thick midrib, subcordate, acute, the margin entire or in the lowermost indistinctly and minutely denticulate; petioles about 1 mm., often with a tuft of ciliae between the base and the stipule; stipules of many forms from deltoid and entire through lanceolate, bifid, and lanceo-aristate to a mere tuft of ciliae. Involucres campanulate, sessile or nearly so, the outer surface smooth, the inner densely woolly, the wool especially long and dense at the fauces; lobes triangulo-aristate, densely woolly on the inner, recurved surface; glands transverse, oval; appendages greenish-white, entire or nearly so, about as broad as the glands; bracteoles dense tufts of woolly hairs; male and female flowers glabrous; style trifid to the base, the branches bifid to half their length. Capsule glabrous, strongly tricoccous; seed 1 x .7 mm. triangulo-ovate, white, acute at the apex, the angles sharp, the facets smooth or nearly so, some marked by a few irregular, low and indistinct ridges.

Type locality: BAHAMAS, Salt Key Bank, Salt Key, in sandy places, *Percy Wilson* 8082. Type in herb. Field Museum, sheet No. 246476.

Distribution: Known only from the type.

3. NOTULAE HYPERICIFOLIÆARUM.

CHAMAESYCE HYPERICIFOLIA (Linn. Sp. Pl., 454. 1753); Millsp. Field Col. Mus. Bot., 2:302, 1909.

The reference to this species in Gray's Manual from the first to the fifth edition should have been to *C. Preslii* Guss. *C. hypericifolia* is tropical and sub-tropical, its distribution extending from the southern

coast of the Caribbean Sea to Miami, Florida, and central Mexico, the Bahamas and Bermuda. The references to *C. nutans* in manuals and lists of Northern American plants is plainly a misinterpretation of species; *C. nutans* is sub-tropical and is readily differentiated from *C. hypericifolia* by its inflorescence, being single in the axils of the upper leaves instead of glomerulate as in C. HYPERICIFOLIA. Seeds brownish-red, .8 x .6 mm., manifestly tetrangular, the ventral facets not ridged.

CHAMAESYCE RAFINESQUEI (Greene) Heller in Muhlenbergia 8:48. 1912.

Euphorbia Rafinesquii Greene, Pittonia, 3:207. 1897.

Euphorbia hypericifolia hirsuta Torrey Fl. N. Y. & Mid. States 331. 1826.

Euphorbia hirsuta Wiegand Bot. Gaz. 24:50. 1897. non Schur. nec Kit.

The long hairs on the stems of this species immediately distinguish it. It differs strongly in the involucre from its nearest cogeners in having all the lobes lacerate and of equal size. The appendages are transversely ovate and irregularly repand. The capsules are glabrous, the cocci but slightly keeled and the seeds oblong, brown, 1.2 x .8 mm. rather sharply angled upon the dorsum, the facets but slightly rugose.
Type locality: NEW YORK, campus of Cornell University at Ithaca, *K. M. Wiegand.* Type in herb. Cornell University.
Distribution: From ONTARIO southward through NEW YORK and southwest through OHIO, INDIANA, and ILLINOIS to ARIZONA.

CHAMAESYCE NUTANS (Lag.) Small, Fl. SE. U. S., 712. 1903.

Euphorbia nutans Lagasca, Gen. et Sp. Nov., 17. 1816.

The inflorescence, solitary in the upper and middle leaf-axils, and the small leaves, at once distinguishes this glabrous species from its cogeners. The involucral walls show almost equal, substantially 3-fingered, lobes with a similar process at the base of the sulcus. The glandular appendages are very rudimentary being little more than a ridge on the dorsum of the gland. The seeds are elongated-ovate, 1.3 x .9 mm., very dark red with an ashen covering, the transverse rugae of the dorsal facets more prominent than those of *C. Preslii.*
Distribution: MEXICO, near Durango and Vera Cruz.

Chamaesyce rubida (Greenm.) comb. nov.

Euphoriba rubida Greenm. in Proc. Am. Acad., 39:83. 1903.

The differentiating macroscopic characters of this species lie substantially in its capsules and seeds. Its affinity is between *nutans* Lag.

and *Rafinesquii* Greene, differing from the former in being hairy and from the latter in having hairy capsules. The roseate involucres are very hairy within, glabrous or nearly so without; the lobes are equal, triangular and entire, the pair flanking the sulcus not larger nor differing from the other three; the sulcus shallow with a small, ligulate tooth rising from its fundus. Capsules hairy, the cocci scarcely keeled. Seeds ovoid, 1 x .7 mm. olive, or whitish-olive, the outer coat minutely punctate, more or less quadrangular, the dorsal and lateral angles markedly distinct, the slight anastomosing ridges of the facets hardly distinguishable.

Type locality: MEXICO, from dry ledges in Tultenango Cañon, State of Mexico, October 9, 1902, *C. G. Pringle* 8673. Type in herb. Gray, Cambridge, Mass.

Distribution: Known only from the type.

CHAMAESYCE LASIOCARPA (Klotzsch) Arthur, in Torreya, 11:260. 1911.

Euphorbia lasiocarpa Klotzsch Nov. Act. Nat. Cur., xix suppl: 414. 1843.

This species is readily distinguished from other *hypericifoliae* by its cinereous appearance; general short-hairy pubescence; long internodes and the more distinctly ridged facets of the obtuse-angled, brownish-red to ashen, elongated-ovate seeds (1.1 mm. long, .7 mm. broad). The involucral sulcus is unoccupied, the lobes entire and the appendages of the glands heterogeneous.

Distribution: JAMAICA and CENTRAL AMERICA to FLORIDA and northern MEXICO.

CHAMAESYCE HYSSOPIFOLIA (Linn.) Small Bull. N. Y. Bot. Gard. 3:429. 1905.

Euphorbia hyssopifolia Linn. Syst. ed. 2,10:1048. 1759.

The characters of this plant are strongly specific. The plant hardly belongs under *C. brasiliensis* (*Euphorbia brasiliensis hyssopifolia* Boiss.) being distinct with its oblong, blunt, almost ligulate leaves mostly entire though sometimes sparingly toothed; its large, white, seldom entire appendages; and olivaceous, ovoid seeds upon the facets of which the transverse ridges are very inconspicuous.

Distribution: The GREATER ANTILLEAN ISLANDS and CENTRAL AMERICA.

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