

*Osmanthus megacarpa* Small; Gray Herbarium Card-Index, Issue 141; "In synon."

*Osmanthus megacarpus* Small; Hill, Index Kew. Sup. 9: 196. 1938; "in syn."

When he published the new genus *Amarolea* Small (Man. Southeast. Fl. 1043, 1507. 1933), a segregate from *Osmanthus* Lour. (family Oleaceae), Small described one new species, *Amarolea megacarpa* Small, listing at the end

BOTANY.—*Notes on American Euphorbiaceae, with descriptions of eleven new species.*<sup>1</sup> LEON CROIZAT, Arnold Arboretum of Harvard University. (Communicated by E. P. KILLIP.)

It was my privilege to visit the United States National Herbarium during the summer of 1941, and the descriptions and notes that follow are based largely upon material seen at that time. Herbaria at which the specimens cited in this paper are deposited are indicated thus: AA, Arnold Arboretum; GH, Gray Herbarium of Harvard University; US, U. S. National Herbarium.

#### *Andrachne* L.

Pax and Hoffmann completely misunderstood this genus within the American range. They treat<sup>2</sup> *Andrachne phyllanthoides* Nutt. as a species of *Savia* Willd., a manifest error as the floral morphology of these two genera is very different and they are not even closely related. *Andrachne* is nearest *Phyllanthus* and *Acephala*, whereas *Savia* is consanguineous with *Cleistanthus* and *Amanoa*. Further, these authors place *A. brittonii* Urb. in the section *Phyllanthidea*, which is another error as this species is not close to *A. microphylla* Baill., the standard-species of that section, but is probably nearest to *A. telephioides* L. *Andrachne* ? *cuneifolia* Britton, which is overlooked by Pax and Hoffmann in their account of the American species, is not an *Andrachne* but a species of *Phyllanthus* (see the new combination effected under *Phyllanthus*).

*Andrachne microphylla* (Lam.) Baill. Et. Gén. Euphorb. 577. 1858; Muell.-Arg. in DC. Prodr. 15<sup>2</sup>: 237. 1866; Pax & Hoffm. Pflanzenreich IV. 147. 15: 178. 1922.

<sup>1</sup> Received August 12, 1942.

<sup>2</sup> Pflanzenreich IV. 147. 15: 184. 1922; Nat. Pflanzenfam. 19c: 66. 1931.

of the description and as a synonym the name "[*Osmanthus megacarpa* Small]." This name in *Osmanthus*, just cited as a synonym, was not validly published there under Article 40. The *Gray Herbarium Card-Index* and *Index Kewensis Supplementum* both stated that the name was published in synonymy and thus did not validate it. The combination is published here merely to avoid making it unintentionally.

*Croton microphyllum* Lam. Encycl. Méth. 2: 212. 1786.

*Phyllanthidea microphylla* Didr. Kjöb. Vid. Meddel. 1857: 150. 1857.

So far as I am aware, nothing in the literature indicates that this species has been reported since the time of Dombey. A fragment of the type, generously given me by Professor Humber of the Muséum d'Histoire Naturelle, Paris, shows that here belong (1) *Pennell* 14492—Peru: Depto. Lima: Near Viscas, along Río Chillón, alt. 1,800–2,000 meters (US); (2) *Haught* 39—Peru: Depto. Piura: Prov. Paita: Talara (US; distributed as "Tragia?").

*Andrachne ciliato-glandulosa* (Mills.) Croiz., comb. nov.

*Phyllanthus ciliato-glandulosus* Millsp. Proc. California Acad. II, 2: 219. 1889.

*Tragia ciliato-glandulosa* M. E. Jones, MS. in sched. (*an tantum?*).

This annual, endemic to Lower California, so closely resembles *A. microphylla* as to be very easily confused with it. Its characters are those of *Andrachne* sect. *Phyllanthidea*, there being a minute pistillode in the female flower. Millspaugh erred in crediting this species to *Phyllanthus* sect. *Menarda*, with which it has no relationship. The occurrence of very similar plants in Peru and lower California is not altogether unexpected, but it is interesting to note that *A. aspera* Spreng., endemic from the Punjab to Morocco, is very closely allied to *A. microphylla* and *A. ciliato-glandulosa*, and that *A. phyllanthoides* from the United States, is near *A. colchica*, from the Caucasus. The distribution of all these species is undoubtedly pre-Tertiary.

**Phyllanthus L.**

**Phyllanthus cuneifolius** (Britton) Croiz., comb. nov.

*Andrachne? cuneifolia* Britton, Mem. Torrey Club 16: 72. 1920.

Apparently near *P. orbicularis* H.B.K., as it seems to have the stipitate ovary and the peculiar ♂ disc of that species.

A species published with a question mark as to the genus is not a nomen provisorium.<sup>3</sup>

**Phyllanthus botryanthus** Muell.-Arg. in DC. Prodr. 15<sup>2</sup>: 323. 1866.

*Glochidion botryanthum* Pax & Hoffm. Nat. Pflanzenfam. 19c: 58. 1931.

The two following collections, on comparison with *Plée* 55 and 56 (type material, AA), belong here: (1) *Pittier* 10521—Venezuela: San Martín, Río Palomar (AA); (2) *Pittier* 11914—Venezuela: Miranda: Puente de Turumo, road from Petare to Guatire, "Small tree in forest, up to 4 meters" (AA).

Pax and Hoffmann have an untenable concept of *Glochidion*. This may be retained as a genus only with the understanding that its species form a natural group that it is not possible to define with reference to a set of conventional characters. *Glochidion* is "good" in India, China, Indochina, and Malaysia but is apt to turn "bad" in New Guinea and Oceania, for here its characters merge with those of *Phyllanthus*. Naturally, it is a serious error to introduce *Glochidion* to the floras of America merely because certain species of American *Phyllanthus* have styles that tend to remain connate rather than to expand. These species may exhibit the *technicalities* of the style that are used to circumscribe *Glochidion*, but since they lack a *natural affinity* with this genus they can not be treated under it. I know few other families in which the problems of generic definition are so involved as those of the Euphorbiaceae, a genus under this family more often than not standing or falling on account of considerations that do not immediately bear upon the peculiarity of its floral morphology.

**Phyllanthus L. Sect. Elutanthos**  
Croiz., sect. nov.

Foliis fructibusque magnis, inflorescentiis

<sup>3</sup> See Croizat, Journ. Arn. Arb. 21: 499. 1940; op. cit. 22: 137. 1941.

laxe racemosis ramis filiformibus habitu effusis; perianthio utriusque sexus 6-lobo, staminibus saepissime in columnam connatis, disco in ♀ subconnato vel libero, in ♂ libero. Species typica: *Phyllanthus glaucescens* H.B.K. (= *P. adenodiscus* Muell.-Arg.).

Leaves and fruit usually large to very large but these not woody; inflorescence laxly racemose, 10–30 cm long, axillary or pseudoterminal, its axes mostly slender or filiform; flowers ♂ numerous, prevailingly clustered in groups, ♀ fewer, basal or apical; perianth usually 6-lobed, ♂ with 1–3 stamens connate within a staminal column or more seldom free, ♀ with a disk of erect, subconnate, or free glands alternating with the lobes.

Prevailingly Mexican and Central American woody endemics with a striking habit, reminiscent of certain Menispermaceae (e.g., *Hyperbaena* Miers), at first suggesting a genus other than *Phyllanthus* but closely related to classic species of this genus in every technical detail of their floral morphology. Standard-species: *Phyllanthus glaucescens* H.B.K. Nov. Gen. 2: 115. 1817 (= *P. adenodiscus* Muell.-Arg. Linnaea 32: 23. 1863).

The material of this section is insufficient and too imperfect to make an adequate key to the species, at least one, *P. oaxacanus* Brandeg., lacking staminate flowers. The following outline, however, will be of some use in distinguishing them. Two new species described below are included.

KEY TO THE SPECIES

- Staminal column none; stamens 3, solute. . . . .  
     . . . . . *P. coalcomanensis* Croiz.
- Staminal column present; stamens connate.  
   Anthers 2. . . . *P. tequilensis* Robins. & Greenm.  
   Anthers 6.  
     Male flowers delicate, lobes longer than broad; staminal column slender; axes of inflorescence often squamulose. . . . .  
     . . . . . *P. glaucescens* H.B.K.
- Male flowers delicate; axes of inflorescence bearing flowers from pulvinate buds. . . . .  
     . . . . . *P. huallagensis* Croiz.
- Male flowers not delicate with broadly ovate lobes; staminal column robust; axes of inflorescence not squamulose.  
       Inflorescence long, diffuse. . . . .  
       . . . . . *P. laxiflorus* Benth.
- Inflorescence short. . . . .  
       . . . . . *P. chiapensis* Brandeg.
- Male flowers unknown. . . . .  
     . . . . . *P. oaxacanus* Brandeg.

**Phyllanthus coalcomanensis** Croiz., sp. nov.

Arbor; foliis magnis ad 15 cm longis; inflorescentia laxiflora; floris ♂ perianthio 6-lobo, ca. 6 mm lato, staminibus 3 liberis, glandulis discretis; floris ♀ perianthio 6-lobo, disco e glandulis discretis, ovario globuloso, stylis 3 reflexis. Ad *P. glaucescentem* H.B.K. accedit, at staminibus discretis statim dignoscitur.

A tree or shrub about 3 m high, the older bark reddish, wrinkled and lenticeled, quite glabrous; leaves 5–15 cm long, 4.5–12 cm broad, blackish when dried (only young leaves seen), thinnish, probably slightly glaucescent beneath in life, broadly ovate, very broadly acuminate at the tip, truncate to truncate-cordate at the base, with about six pairs of spreading primaries, widely branching toward the margin of the blade; petiole not over 1 cm long; stipules nearly petaloid in texture at least at the margin, irregularly broad-ovate, entire, much veined, up to 1 cm long, 0.7 cm wide; inflorescence ♂ of effuse, many-flowered sub-filiform lateral and subterminal racemes up to 25–30 cm long, monoecious; inflorescence ♀ perhaps fasciated and axillary but, more likely, occupying the basal part of some or all the ♂ axes; flower ♂: perianth about 6–7 mm broad on a slender pedicel about 6–8 mm long, the lobes 6, hyaline, costate in center, ligulate, rounded at the tip, about 3 mm long, alternating with as many disciform to globulose glands (nectaries), these not forming a continuous disk; stamens 3, free, connate merely at the base; filaments fleshy about 1 mm long, the anthers transverse; flower ♀: perianth (not dissected, only one seen) up to 20 mm broad on a pedicel about 15 mm long, the lobes apparently 5, blackish when dry, thinly hyaline at the margin, broadly ovate to rotundate, about 8 mm long and broad; ovary globulose, quite glabrous, manifestly sulcate on the keels and commissures, about 4 mm long and wide; styles 3, reflexed, apparently shortly bilobed at the tip, about 1–1.5 mm long; glands as many as the lobes and alternating with them, erect, punctulate at the upper lip, apparently not connate into a close disk.

Type: *Hinton* 15857, Mexico: Michoacán, Distr. Coalcomán, Aquila, 400 meters. "Tree 3 meters high. Flowers white, raceme pendulous, in barranca" (US). Syntype: *Hinton* 15859, same locality and date, "2 meters high.

Flowers purple, racemes pendulous; different from 15857" (US).

*Hinton* 15857 and 15859 are the same species, the collector having been misled by the changing color of the flowers, apparently purple at unfolding or before unfolding, white in full anthesis.

**Phyllanthus huallagensis** Standl. MS. in sched.

Arbor, foliis ad 9 cm longis, subtus glaucescentibus; inflorescentia racemosa ad 25 cm longa; floris ♂ perianthio ca. 4 mm lato, staminibus 3 in columnan connatis, glandulis discretis; floris ♀ perianthio ca. 6 mm lato, glandulis subconnatis, ovario globuloso ad 2 mm lato, stylis 3 brevibus. *Phyllanthum tequilensem* Robins. & Greenm. admet.

A tree, 6 m high, quite glabrous, the older bark much lenticeled and fissured, reddish brown; leaves 4–9 cm long, 3–5 cm broad, brownish when dried, firmly chartaceous, glaucescent beneath in life and slightly so in dried specimens, round-elliptic, shortly and broadly acuminate at the tip, cuneate to round-cuneate, not cordate at the base, with about six pairs of broadly ascending primaries, conspicuous beneath, less so above, the veinlets fairly conspicuous; petiole less than 5 mm long; stipules triangular, small, apparently not long persistent; inflorescences of axillary and subterminal, slender but not filiform racemes up to 20–25 cm long, bearing numerous clustered ♂ flowers arising from manifestly pulvinate buds and many less ♀ flowers, as seen in an apical position; flower ♂: perianth about 4 mm broad, borne on a slender pedicel about 10 mm long, the lobes 6, more or less ovate to elliptic, about 2 mm long and 1.5–2 mm broad, alternating with 6 small glands; stamens 3, fused into a staminal column about 1 mm long; flower ♀: perianth about 5–6 mm broad, borne on a pedicel about 3.5 mm long, the lobes 6, more or less ovate, 1.5–2 mm long, alternating with six suberect curved glands, almost connate to form a continuous disc underneath the ovary; ovary globose, about 2 mm long and broad; styles 3, short, more or less reflexed and cleft at the tip.

Type: *Klug* 4240, Depto. San Martín, Peru: Juan Jui, Alto Río Huallaga, alt. 400–800 meters, in forest, Jan. 1936 (AA).

This is the only species of this section known, so far, from Peru, somewhat reminiscent of *P. tequilensis* Robins. & Greenm. from Mexico and not too far removed from *P. botryanthus* Muell. from Venezuela.

As a further help in sight-identification of species of the section *Elutanthos*, the following ranges are given: *P. coalcomanensis*, Michoacán, Mexico; *P. tequilensis*, Jalisco, Mexico; *P. glaucescens* (including *P. adenodiscus*, which might be retained as a variety in a critical study of this group, but does not impress me as having a clear specific status), the entire eastern coast of Mexico from British Honduras and Yucatan to Tamaulipas, Mexico; *P. laxiflorus*, Guatemala; *P. chiapensis*, Chiapas, Mexico—very near *P. laxiflorus* as far as seen; *P. huallagensis*, Depto. San Martín, Peru; *P. oaxacanus*, Oaxaca, Mexico. These ranges are fairly indicative of the various centers of endemism for the Euphorbiaceae of this region.

***Phyllanthus neoleonensis* Croiz., sp. nov.**

Fruticulus ligneus, intricatus; foliis vix 2 cm longis, petiolis quam stipulis brevioribus, vix 2 mm longis; inflorescentia cymulosa, axillari; perianthio floris ♂ ca. 2 mm lato, 6-lobo, staminibus 3 ad basem liberis, glandulis 6 liberis; perianthio floris ♀ ca. 5 mm lato, 6-lobo, stylis brevibus; semine trigono, arillo granuloso scabro. *Phyllanthum galeottianum* Baill. atque *P. liebmannianum* Muell.-Arg. admonet.

A low, woody and much intricate shrub, probably not over 1–2 feet high, the innovations herbaceous or subherbaceous, quite glabrous, the older shoots woody, slender, sometimes zigzag; leaves 1–2 cm long, 0.5–1.5 cm broad, obovate to elliptic, rounded and obscurely mucronate at the tip, more or less rounded to cuneate at the base, pale olive above, grayish or pink-grayish underneath, the primaries obscure, delicate, about 4–5 pairs; petiole less than 2 mm long; stipules 2–3 mm long (that is, longer than the petioles), setaceous towards the tip, irregularly broadened towards the base, venulose, mostly purplish; inflorescences bisexual in axillary cymules; flower ♂: perianth about 2–2.5 mm wide on a slender pedicel about 4 mm long, the lobes 6, elliptic to elliptic-ovate, 1.5 mm long, 0.75 mm broad, alternating with as many roundish

glands: stamens 3, free except at the very base; flower ♀: perianth about 5 mm wide, on a pedicel about 10 mm long: lobes 6, about 2–2.5 mm long, 1.5–2 mm wide, ovate, sometimes acuminate and slightly glandular at the tip, glands 6, erect, curving against the ovary, not connate into a disc; ovary glabrous, 2 mm long and wide or less, sulcate; styles 3, short, barely bilobed at the apex; seed trigonous, 2 mm long, 1.5 mm broad, the testa brown, smoothish, the aril black, as a loose, hard, granular dust on the testa.

Type: *Pringle* 13881 bis, Nuevo León, Mexico: Limestone ledges, Sierra Madre, near Monterrey (GH). Syntypes: *C. H. & M. I. Mueller* 314 & 315, same locality as the type (AA); *Pringle* 10810, Monterrey (GH); *Pringle* 1198, Sierra Madre (GH).

The Muller material was originally determined with doubt as *P. ferax* Standl., a species that *P. neoleonensis* superficially resembles in its vegetative characters but from which it differs in the much more robust habit and in the details of floral morphology. *Phyllanthus galeottianus* Baill., which is in all probability represented by *Pringle* 4443, collected near Guadalajara, Jalisco (GH), is unlike *P. neoleonensis* because of its more robust habit and its stamens being connate to form a staminal column. A plant bearing some resemblance to *P. neoleonensis*, but more delicate and probably not different from *P. liebmannianus* Muell.-Arg., is represented by *Purpus* 2313, Zacuapan and vicinity, Veracruz (GH). Lastly, *Gaumer* 508, *Gaumer* 1817, *Gaumer & Sons* 23543 (all AA), distributed as *P. lathyroides*, are probably conspecific with *P. ferax* Standl. (*Bartlett* 12157, Petén, Guatemala; US).

***Phyllanthus mexiae* Croiz., sp. nov.**

Frutex; foliis setaceis, bracteis in ramulis florigeris (vulgo pro foliis laudatis) ad 4 cm longis; inflorescentia cymulosa axillari; floris ♂ perianthio ca. 2 mm lato, staminibus 3 in columnam connatis; floris ♀ perianthio ca. 7 mm lato, 6-lobo, ovario vix 1 mm magno, stylis 3 brevibus.

A shrub, quite glabrous, the innovations smooth and ribbed; leaves (strictly speaking) none, transformed into acuminate stipules 2 mm long or less, marcescent at the axil of the stiffly spreading, leafy-bracteate florigerous

axes; bracts of the florigerous axes ("leaves") 2.5-4 cm long, 2-2.5 cm broad, elliptic-ovate, thinly membranous, greenish above, pale grayish below but probably not glaucescent, very broadly acuminate, sometimes mucronate at the tip, more or less broadly and irregularly cuneate at the base with 5-7 pairs of thin primaries; petiole about 3 mm long; stipules triangular, not over 2 mm long, marcescent or deciduous; inflorescences bisexual in lax clusters in the axils of foliaceous bracts ("leaves"); flower ♂: perianth 2 mm broad or less, on a capillary pedicel 3-5 mm long, the lobes thin, hyaline, the glands 3 surrounding the base of the column formed by 3 connate stamens, about 1.5 mm long; flower ♀: perianth about 7 mm broad on a pedicel about 10 mm long, the lobes 6, ovate-elliptic, 3 mm long, 1.5 mm broad, hyaline, thinly greenish-costate along the middle, alternating with as many erect, incurved, more or less regular glands; ovary glabrous, somewhat depressed, about 1 mm long and wide, with 3 reflexed styles, short and manifestly cleft at the tip.

Type: *Ynes Mexia* 6718, Ecuador, Prov. of Leon, Canton Pajilli: Hacienda Solento, near Santa Rosa, alt. 1,000 meters, "shrub 5 m. high, in forest in cloud belt. Fish-poison," Nov. 1934 (US).

In certain groups of *Phyllanthus* true leaves are present, the florigerous axes being often reduced, bracteate, and, strictly speaking, leafless branchlets (see *P. laxiflorus*). In other groups of the same genus the true leaves are represented only by scales, the aspect and function of foliage being assumed by the bracts of the florigerous axes (see *P. mexiae*). These peculiarities, seldom if ever noticed, are of the utmost importance because they furnish a ready key to the understanding of all the very variable inflorescences of the phyllanthoid alliance. It is worthy of note that true leaves appear on seedlings of species (e.g., *E. niruri* L.) which in their more mature aspect bear only "leafy" florigerous axes.

#### Croton L.

*Croton aristophlebius* Croiz., sp. nov.

Ligneus; apicibus brunneo-ochraceis, subargillaceo-tomentosis; foliis elliptico-lanceolatis ad 12 cm longis, venulis venisque valde impressis, primariis ca. 9-12 jugis; perianthio

floris ♀: lobis sub fructu discretis, ca. 6 mm longis, pedicello ca. 15 mm longo, columella ad 7 mm longa.

*Crotonem celtidifolium* Baill. habitu bene simulat at indumento toto caelo discrepat.

A tree or shrub; innovations brown-ochraceous, the indumentum of rough, very persistent, subargillaceous trichomes; leaves 6-12 cm long, 2-5 cm wide, elliptic-lanceolate, acuminate to short-caudate at the tip, round-cuneate at the base, glabrous, dull green, smooth above, with sharply impressed veins and veinlets, underneath pale-ochraceous, the indument compactly scurfy-tomentose, the veins about 9-12 pairs, anastomosing near the entire margin, the tertiary veins sharp; petiole 1.5-2.5 cm long, vestite like the innovations, bearing 2-4 pedicelled, disciform glands at the apex on the abaxial face of the blade; stipules almost none; inflorescence of spicate, bisexual axes, rather slender, up to 15-20 cm long; flower ♂: perianths immature, about 2 mm long; flower ♀ (only the perianth seen after fruiting): calyx about 12-14 mm wide, on an ascending, ultimately recurved pedicel about 14-17 mm long, rather slender, the lobes 5, entire, ligulate to elliptic, short-acuminate to rounded at the tip, nowhere imbricating, 5-6 mm long, 1.5-2 mm wide, not accrescent; petals as setaceous brownish ligulae between the sepals; columella after dehiscence about 7 mm long.

Type: *Bro. Daniel* 1912, Depto. Antioquia, Colombia: Piedras Blancas, July 1938 (US).

A strong species, distantly suggesting *C. celtidifolius* Baill. but with a very different indumentum.

#### Caperonia St.-Hil.

*Caperonia chiltepecensis* Croiz., sp. nov.

Herba, indumento delicato interdum glanduloso; foliis elliptico-lanceolatis vel obovatis, nervis primariis ca. 10-14-jugis, haud profunde dentatis; floris ♂ perianthio delicato, sepalis triangularibus ca. 1.5 mm longis, petalis tenuissimis, ligulatis ad 2 mm longis, staminibus ca. 10 in serie duplici dispositis; floris ♀ perianthio ad 5 mm magno, sepalis petalisque cum ♂ sat congruentibus, ovario depresso 1 mm longo, 2 mm lato, dorso processibus 5-7 in cocco quolibet ornato. *Caperoniam zaponetam* Mansf. Peruvianam potius in mentem vocat quam *C. palustrem*, at magis delicata est.

Herb with dimorphic pubescence of short, appressed setulose eglandulose hairs and more or less spreading, delicate glandulose trichomes, these not over 1 mm long; leaves fairly thin, greenish on both faces, 5–8 cm long, 2–4 cm broad, elliptic-lanceolate at the apex of the shoot, more or less regularly obovate at its base, sparingly and weakly setulose on both faces, the indumentum scattered below, mostly restricted to the primaries above, the primaries in 10–14 pairs, thin, ascending the tertiaries manifest, the serration shallow, the teeth barely spreading at their apex, the petiole 5–10 mm long; stipules setaceous, up to 3–4 mm long; inflorescences on slender axillary axes, short-branched or dichotomous, up to 8–10 cm long: flower ♂: perianth delicate, about 3 mm broad; sepals 5, about 2.5 mm long and 1.5 mm wide, triangular; petals very thin, ligulate, about 2 mm long, 1.5–2 mm broad; stamens apparently 10, alternating in two even series, the lower subsessile, the upper borne upon a staminal column 1–1.5 mm long with filaments 0.5–1 mm long; flower ♀: perianth 4–5 mm broad, with a pedicel about 2.5 mm long; sepals 5, elliptic, entire, slightly glandular and cucullate at the apex, somewhat strigulose on the back; petals 5, very thin, white, 2–3 mm long, abruptly produced at the base into a filiform claw about 1 mm. long, otherwise ligulate, rotundate at the apex; ovary depressed, 1 mm long, 2 mm broad, each keel bearing 5–7 triangular processes, fleshy at the base, glandulose at the apex; styles 3 flabellate, irregularly cleft into 5–6 nearly terete branches, about 3–4 mm long.

Type: *Martínez-Calderón* 334, Mexico, Oaxaca: Distr. Tuxtepec, Chiltepec and vicinity, 20 meters, 1941 (US).

Despite its being much more delicate in all its parts this species seems to be most closely allied with *C. Zaponeta* Mansf., from Peru (*Klug* 3954, *GH*). It differs from *C. palustris* St. Hil. in the finer indument, in the less open and spreading serration, in the different epicarp, and in the general outline of the foliage.

### *Jatropha* L.

*Jatropha deutziiflora* Croiz., sp. nov.

Stimulosa, folia visa ad 35–27 cm magna, 7-loba, basi optime sinuata; inflorescentia longe pedunculata ca. 40 cm longa; perianthio floris ♀ ca. 10 mm longo, lobis 5 albicantibus, car-

nosulis, calyptratim deciduis; ovario glaberrimo 3 mm longo in disco insidente integro ca. 1 mm crasso, stylis 3, quolibet apice in laciniis 6 diviso. Cum *J. longipede* Pax e descriptione congruere videtur, in sect. *Calyptosolene*.

Probably a large shrub, the specimen consisting only of a leaf, a petiole, and a cyme with ♀ flowers; leaf large, about 27 cm long, 35 cm broad, quite glabrous on both faces, very thin, brittle, greenish on both faces with brownish veins, 7-lobed, the 3 median lobes subsimilar, about 20 cm. long and 8 cm wide, with about 7–9 pairs of broadly spreading primaries and with distant tertiaries often running parallel to the main veins, the margin of the lobes coarsely and not profoundly dentate, lined by numerous stimulose hairs, these not over 1.5–2.5 mm long, inconspicuous, almost parallel with the margin the lateral lobes falcating and shorter, the external 2 hardly more than lobules, 5–6 cm long, about 3.5 cm broad, the base of the leaf cut to form a wide sinus very nearly lined by the excurrent midribs of the outer lobes, the petiole quite herbaceous, ribbed, glabrous; inflorescence a long-peduncled cyme about 40 cm long, armed below with ascending, rather small, stimulose hairs, becoming almost unarmed and finely puberulous at the tip, the flowers much crowded upon short dichotomous branches; perianth ♀ about 10–11 mm long, the 5 lobes about 8 mm long, 3 mm broad, obovate to subspatulate, fleshy, quite whitish, falling off neatly from the persistent greenish base of the perianth; ovary quite glabrous, 3 mm long, 2 mm broad, on a continuous disk about 1 mm thick; styles 3 about 2.5–3 mm long, each divided at the tip into about six branches, these sometimes shallowly cleft or lobed at the apex.

Type: *Martínez-Calderón* 77, Mexico, Oaxaca: Tuxtepec, Chiltepec and vicinity, alt. about 20 meters, July, 1940–February, 1941 (US).

Nearest to *J. longipes* Pax from Colombia. Differs from the Mexican species of sect. *Calyptosolen*, to judge from descriptions, in the glabrous ovary.

### *Manihot* Mill.

*Manihot aesculifolia* (H.B.K.) Pohl, Pl. Bras. Ic. Descr. 1: 55. 1827; Muell.-Arg. in DC. Prodr. 15<sup>2</sup>: 1065. 1866; Pax & Hoffm. Pflanzenreich IV. 147. 2: 58. 1910.

*Janipha aesculifolia* H.B.K. Nov. Gen. 2: 85. pl. 109. 1817.

Pax describes this species as having "limbus membranaceus, basi cordatus, concolor," listing only the type, collected by Humboldt on the Gulf of Campeche. *Bangham* 300, Honduras: San Pedro Sula, 1929 (AA), erroneously distributed as *M. dulcis*, so perfectly agrees with the type-illustration of *M. aesculifolia* in its vegetative and in floral characters that I have little hesitation in referring it to this species, despite its having a leaf that is not "concolor" but strongly glaucescent at the lower face.

*Manihot dulcis* (J. F. Gmel.) Pax, Pflanzenreich, IV. 147. 2: 71. 1910.

*Jatropha dulcis* J. F. Gmel. Onom. Bot. 5: 7. 1772-1778, *vide* Pax.

Three collections from Peru, which very likely represent the same species are: *Killip & Smith* 22722, Depto. Ayacucho: Aina; *Klug* 2662, Depto. San Martín: Pongo de Cainarachi; *Skutch* 5009, Depto. Loreto: Río Ucayali (all AA). In this plant the leaf is almost always 3-foliolate, sparingly pubescent to glabrate on the veins, innovations, and floral axes. The *Skutch* collection has a fruit that lacks "wings," which, taken together with all the other characters, identifies the specimens cited as *M. dulcis*, in the sense of Pax. *Killip & Smith* 22722 shows remnants of a fine rufous pubescence and may be *M. dulcis* var. *ferruginea* (Muell.-Arg.) Pax, accepted by Mueller for the subandine regions of Peru (*DC. Prodr.* 15<sup>2</sup>: 1063. 1866, under *M. palmata* (Vell.) Muell.-Arg.), but questioned there by Pax. *Manihot pavoniana* Muell.-Arg., another Peruvian species, agrees so far as the descriptions with the cited collections in some characters, but differs in the glabrous perianth and stamens. *Killip & Smith* 22722 and *Klug* 2662 have been identified as *M. utilissima* Pohl, a determination which the fruit of *Skutch* 5009 now shows to be untenable.

#### Gymnanthes Swartz

*Gymnanthes texana* Standl. Proc. Biol. Soc. Washington 39: 135. 1926.

This species is to be excluded from the Euphorbiaceae. Inspection of *Tharp* 3634, the type in the U. S. National Herbarium,

having convinced me that the plant was not of this family, I called it to the attention of E. J. Palmer, of the Arnold Arboretum, and of V. L. Cory, of the Texas Agricultural Experiment Station in Sonora. Both these botanists promptly recognized it as *Forestiera reticulata* Torr., an identification confirmed by the characters of the wood of *Tharp* 3634, which show unquestionable kinship with the Oleaceae. I am deeply indebted to Mr. Cory for the following additional data (*in litt.*, Nov. 24, 1941): "[Tharp's] material is identical with that which I collected on a hillside sixteen miles north of Comstock on August 15 of this year. My study had convinced me that this was *Forestiera reticulata* Torr. Mr. Ernest J. Palmer reports that my material undoubtedly is of that species. The peculiar thing about this plant is the remarkable difference between the pistillate and the staminate aspect. In my limited observation, the former grows to an height of six feet or more, with leaves that are prominently porulose beneath, and the plant is, in appearance, a typical *Forestiera*. On the other hand, the staminate plant, or at least the one I have seen growing, is a foot or less in height with the aspect of a shrubby species of *Croton* and the leaves imperceptibly porulose. I made additional collections from this plant on November 12 and at this time it was easy to take it as a *Forestiera* and not a *surge*."

The following synonymy is consequently affirmed:

*Forestiera reticulata* Torr. U. S. & Mex. Bound. Bot. 168. 1859 = *Gymnanthes texana* Standl. Proc. Biol. Soc. Washington 39: 135. 1926.

#### Senefeldera Mart.

The generic name has been spelled *Senefeldera* and *Sennefeldera*, and Mueller-Argovienensis has proposed<sup>4</sup> the latter spelling as an alternative to the former. The correct version is *Senefeldera* as given<sup>5</sup> by Pax and Hoffmann, the genus having been named by Martius in honor of Alois Senefelder (1771-1834), a citizen of Munich, and the inventor of lithography. The name of the lithographer of Vellozo, Flora Fluminensis, as shown on the title-page of this work, is Senefelder.

<sup>4</sup> Mart, Fl. Bras. 11<sup>2</sup>: 528. 1874.

<sup>5</sup> Pflanzenreich IV. 147. 5: 23. 1912.

*Senefeldera verticillata* (Vell.) Croiz., comb. nov.

*Omphalea verticillata* Vell. Fl. Flum. 10: pl. 15. 1827.

*Senefeldera multiflora* Mart. Flora 24<sup>2</sup>, Beibl. 2: 29. 1841; Pax & Hoffmann, Pflanzenreich IV. 147. 5: 23. 1912.

Pax and Hoffmann and J. Mueller have placed *O. verticillata* Vell. in the synonymy of *S. multiflora* Mart., failing, however, to effect the combination required under the International Rules. I present this combination here, believing that Vellozo's plate 15 (not 152, as cited by Pax and Hoffmann) is correctly understood by all these authors to illustrate *Senefeldera*, not *Omphalea*.

*Senefeldera macrophylla* Ducke, Arch. Jard. Bot. Rio de Janeiro 4: 113. 1925.

To this species or to a very nearly related one belongs A. C. Smith 2960 (AA), collected on the southern slopes of the Akarai Mountain in the drainage basin of Rio Mapuera, Pará, Brazil, 1938.

*Senefeldera nitida* Croiz., sp. nov.

Arbor; foliis 10–18 cm longis, 6.5–8 cm latis, late ellipticis, apice breviter acuminato-mucronatis, more proprio nitidis, venis primariis ca. 12-jugis; capsula submatura 1.5 cm longa, 2.5 cm lata, laevissima.

A medium-size tree with quite glabrous innovations; leaves 10–18 cm long, 6.5–8 cm broad, very broadly elliptic and very broadly and shortly acuminate-mucronate, coriaceous, brownish, glossy on both faces but especially above, quite entire, very obscurely cordate at the base and here barely glandular, the glands scarlike and inconspicuous; primaries about 12 pairs, all patent, thin but sharp, the anastomoses inconspicuous, the petiole 3–4 cm long; inflorescence seen only in fruit and mostly broken off, typical of the genus, subapical and many-branched, the branches stoutish; only one capsule seen, almost ripe, 1.5 cm long, 2.5 cm broad, manifestly trigonous and depressed, the rounded keels of the cocci thinly grooved, the epicarp quite smooth.

Type: *Krukoff* 7126, Brazil, State of Amazonas: Basin Rio Madeira, Municipality Humayta, on plateau between Rio Livramento and Rio Ipixuna, 1934 (AA).

Distributed as *S. karsteniana* Pax & Hoffm., *Triana* 5791–1, in the Colombian National Herbarium, collected at Villavicencio, the classic locality of *S. karsteniana*, and in all probability this species, is certainly different from *Krukoff* 7126. The peculiarly glossy foliage is characteristic.

*Senefeldera skutchiana* Croiz., sp. nov.

Arbor; foliis 15–10 cm longis, 8–3 cm latis, late ellipticis, nervis primariis ca. 10–14-jugis utrinque conspicuis, glandulis nullis vel subnullis, petioli apice atrato; inflorescentia apicali, paniculam decompositam simulante; floribus ♂ vulgo ternatis, staminibus 5–8 in bracteolae axilla ad 2 mm longae, margine hyalino erosae; floribus ♀ bracteis 3 integris lanceolatis circumdatis, ad 2.5 mm longis, interdum flore laterali ♂ auctis, ovario ad 2 mm longo subfusiformi, stylis carnosis vix divaricatis.

A medium-sized tree, quite glabrous; leaves 10–15 cm long, 3–8 cm broad, firmly chartaceous to subcoriaceous, greenish when dry, broadly elliptic, short-acuminate to apiculate at the tip, the apex of the blade slightly glandular at the end of the midrib and here somewhat reflexed, broadly cuneate to subrotund at the base, the margins entire, the primary veins about 10–14 pairs, sharp on both faces not all anastomosing, the glands almost wanting, only the apex of the petiole slightly enlarged, blackish when dry, and the base of the blade in certain leaves obscurely spotted above, near the insertion of the petiole, the petiole comparatively slender, 2.5–8 cm long; inflorescence apical, of numerous spiciform stiffish axes, about 20 cm long and wide, appearing as if compound-panicled, the ♂ flowers very numerous, the ♀ fewer and basally borne or tending to be mixed with the staminate on certain axes; flowers ♂ usually borne in 3's in the axil of an ovate to elliptic-ovate scale, 1.5–2 mm long, erose and thin at the margin, the central flower very seldom reaching maturity in the lower part of the florigerous axes but usually evolute and alone in the upper one by abortion of the lateral flowers, the pedicel with a low articulation, about 2 mm long, bearing adaxially a bract, open and holding 5–8 stamens about 1.5–2 mm long; flower ♀: perianth of 3 lanceolate entire imbricate bracts, sometimes glandular at the base inside,



about 1.5–2.5 mm long, with an occasional lateral ♂ flower; ovary 1.5–2 mm long, tapering at both ends with rather fleshy styles not divaricate, as seen, about 3 mm long.

Type: *Skutch* 4967, Peru, Depto. Huánuco, Tingo María, alt. 2,500 feet, a tree 60 feet high with yellowish flowers, August, 1940 (AA). Syntype: *Skutch* 4961, same locality and date, at 2,300 feet, (AA).

A very distinct species, suggesting at first sight some rutaceous plant (for instance, resembling *Evodia*), with comparatively slender and numerous florigerous axes.

### *Pedilanthus* Neck.

I reinstated<sup>6</sup> *Tithymalus* Mill., this being the earlier validly published name for this group, but *Pedilanthus* has subsequently been proposed<sup>7</sup> as a *nomen genericum conservandum* by Wheeler. In view of the existing international situation it is not likely that the Botanical Congress can decide in the near future between *Tithymalus* and *Pedilanthus*. Thus, not to deepen the existing controversy and further to disturb nomenclature, I accept *Pedilanthus* as proposed by Wheeler.

### *Pedilanthus coalcomanensis* Croiz., sp. nov.

Arbor 15-pedalis: innovationibus inflorescentiis lanulosis; bracteis floralibus conspicuis, viosis, ad 2.5 cm longis; cyathio horizontali calcarato 15 mm longo, 10 mm lato; appendice integra ad 10 mm longa, apice callosula, dorso impresso-canaliculata, glandulis 4, lobis superioribus 3 connatis, apice acuminatis, lobis lateralibus 2 apice rotundato-carinatis; floribus ♂ (staminibus) ad 30; flore ♀ (ovario) ad 4 mm longo (ut adest), gynophoro 5–7 mm longo, stylo filiformi ad 13 mm longo, apice breviter trifido, cruribus ad 2 mm longis. Species more proprio bracteata, appendice cyathii integra.

A tree about 5 m high; innovations lanulose, older wood with a grayish smooth bark, glabrous; leaves seen none; inflorescence surrounded by conspicuous bracts of variable length but probably not longer than 2.5 cm and about 1.75–2.25 cm broad, ovate, mucronulate, subcordate at the broadly clasping base, wine-colored at the margins, softly whit-

ish pubescent, indument lanulose; internodes of the cyme scarcely over 1 cm long, all lanulose; cyathium manifestly calcarate, about 15 mm long, and 10 cm broad, the anterior margin rounded, the posterior evidently produced, horizontal or nearly so, wine-colored, on a pedicel about 10–12 mm long, sparingly lanulose; appendix entire, about 10 mm long, that is, shorter than the cyathium, bearing three grooves above, ending in an entire or scarcely lobulate glandular tip; glands four, set under the fornicate appendix, not stipitate, rather small; upper calyx-lobes 3, connate for a longer or shorter tract, about as long as the lateral calyx-lobes, acuminate; stamens (in reality, ♂ flowers) about 20–30, 10–15 mm long; ovary (♀ flower), as seen, about 4 mm long, 2.5 mm broad, glabrous, on a gynophore about 5–7 mm long; style filiform, 10–13 mm long, shortly trifid at the tip, the branches 1.5–2 mm long, slightly cleft to bilobed.

Type: *Hinton* 15765, Mexico: Coalcomán, Michoacán. Sierra Naranjillo 1,550 m, tree 5 m, bracts red, locally known as *candelilla*, in woods, 1941 (US).

The apparently involved morphology of the cyathium of *Pedilanthus* can easily be explained, if only it is realized that this cyathium is homologous with a much coarctate inflorescence of *Dalechampia*, the upper part of the inflorescence, which bears glands and ♂ flower in this genus, being replaced by a chamber with glands in *Pedilanthus*. The lower part of the inflorescence carries three ♀ flowers in *Dalechampia* but only one ♂ flower and numerous ♀ flowers in *Pedilanthus*. It stands to reason that the structural details of the cyathium of *Pedilanthus* have as much taxonomic significance as those of the inflorescence of *Dalechampia* and that, unlike *Euphorbia* and *Chamaesyce*, *Pedilanthus* can readily be keyed on floral characters once the proper position and evolution of these characters is understood.

Millspaugh's fundamental paper<sup>8</sup> keys out the species of sect. *Eupedilanthus* in two groups,<sup>9</sup> one having an appendix entire, the other bipartite. The latter group is once again divided into two lesser divisions, with and without colored floral bracts. *Pedilanthus coalcomanensis* thus belongs to a group of its own,

<sup>6</sup> Amer. Journ. Bot. 24: 703. 1937.

<sup>7</sup> Contr. Gray Herb. no. 124: 47. 1939.

<sup>8</sup> Field Mus. Bot. 2: 353–371. 1913.

<sup>9</sup> *Op. cit.* 354.

having an entire appendix and colored floral bracts. I find no species, either in the herbaria I have visited or in the descriptions I have read, that agree with this new one.

***Pedilanthus personatus* Croiz., sp. nov.**

Frutex ad 10 ped. altus; innovationibus puberulis; cyathio calcarato, horizontali ad 12 mm longo, 8 mm lato, appendice 8 mm longa, acuminata, ad basem imam partita, glandulis 4, quarum 2 in infundibulo sacciformi ex appendice fornicata, 2 in suturis inter lobos superiores lateralesque; lobis superioribus 3, longe acuminatis vix connatis; floribus ♂ (staminibus) ad 20 vel ultra; flore ♀ (ovario) tomentello ca. 2.5 mm longo, gynophoro optime articulado, stylo ca. 10 mm longo, stigmatibus brevissimis.

A shrub 10 feet high; stems pale green, puberulous at the tips, the inflorescence congested in apical, very short cymes; leaves and bracts not seen; cyathium puberulous, about 10–12 mm long and 8 mm broad, the appendix fully 8 mm long, rather pointed, cleft down to its obscurely saccate base, bearing at the base and on either side 2 stipitate glands; lateral lobes 2, rounded at their apex; upper lobes 3, subconnate and readily separating, about 10 mm long, slightly spatulate at the tip, the lateral 2 bearing each a gland along the line of connation with the adjacent lobes, these two glands being visible from the outside in a characteristic manner (hence the specific name); stamens (♂ flowers) numerous, 20 or more; ovary (♀ flower) finely grayish-tomentellous, about 2.5 mm long, on a gynophore deeply articulate, ca. 10 mm long, the style about 10 mm long, incrassate at the base; stigmas very short, apparently cleft and elobulate.

Type: *J. B. Edwards* 581, Honduras, Comaguaya, in semiarid country, at 1,800 feet, locally called "ditamo real," February, 1933 (A.A.).

Distributed as *P. macradenius* Donn. Smith, an altogether different species. It keys near *P. oerstedii* Kl. & Gareke and *P. aphyllus* Boiss., but it does not agree in the slightest with the latter, as interpreted by Millspaugh<sup>10</sup> and illustrated by *Botteri* 968 (GH). *Pedilanthus oerstedii* is published with an inadequate description, there being a possible question

whether its status is better than that of a *nomen nudum*. Its classic locality is not far from that of *P. personatus* but it may not be the same species if, as it is affirmed<sup>11</sup> by Boissier and by Millspaugh, it is closely related with *P. aphyllus*. The specimen of *P. oerstedii* is now inaccessible.

***Euphorbia* L.**

***Euphorbia crispata* Hornem.** Hort. Bot. Hafn. Suppl. 58. 1819; Link, Enum. Pl. Hort. Berol. Edit. Alt. 2: 15. 1822.

*Euphorbia undulata* Bernh. ex Hornem. Hort. Bot. Hafn. 2: 507. 1815; Willd. (Schlecht.) Enum. Pl. Hort. Berol. Suppl. 28. 1813, *nomen nudum*. Non *E. undulata* M. a B. Fl. Taur.-Cauc. 1: 371. 1808.

*Euphorbia pubescens* Desf. Fl. Atl. 1: 386. 1798 (*excl. syn. Vahl*); Gussone, Syn. Fl. Sic. 1: 541. 1842, and 2: 828. 1843; Reich. Ic. Fl. Germ. 5: pl. 138, fig. 4769. 1841; Boiss. in DC. Prodr. 15<sup>2</sup>: 134. 1862; Batt. & Trab. Fl. Algér. 795. 1890 (*excl. var.*); Lojacono-Pojero, Fl. Sic. 2<sup>2</sup>: 333. 1904; Jahand. & Maire, Cat. Pl. Maroc 2: 464. 1932 (*saltem p. p.*). Non *E. pubescens* Vahl, Symb. Bot. 2: 55. 1791.

With Jacquin,<sup>12</sup> Gussone, and Lojacono-Pojero I believe that Desfontaines and the authors who have followed him erred in their interpretation of Vahl's *E. pubescens*, the whole trend of the evidence standing against Desfontaines's and Boissier's decisions. The correct binomial for the plant called by these authors *E. pubescens* is *E. crispata* Hornem., so far as I may learn from the literature. It is strange that Vahl's species, not to mention misapplications, should have accumulated not less than four probable synonyms, as follows: (1) *E. vahlii* Jacq. Ecl. 1: 99. in not. 1813; (2) *E. vahliana* Guss. Syn. Fl. Sic. 2: 829. in not. 1843; (3) *E. bonae* Mutel, Fl. Franç. 3: 151. (in not.) 1836; (4) *E. cossoniana* Boiss., in DC. Prodr. 15<sup>2</sup>: 135. 1862; Vahl, Mutel, and Boissier practically giving the same descriptions and suggesting the same comparisons with *E. helioscopia* L.

*Martínez* s. n., Chapultepec, near Mexico City, July, 1940, belongs to *E. crispata* Hornem. (*E. pubescens* auct., non Vahl), and is apparently the first record of this Mediterranean plant as an escape in American floras.

<sup>11</sup> DC. Prodr. 15<sup>2</sup>: 6. 1862.

<sup>12</sup> Ecl. 1: 98–99. pl. 66. 1813.

<sup>10</sup> *Op. cit.* 367.