

oblique stigma, nevertheless both of these characters are found in *Citronella* as a whole. Valetton places the two genera side by side but fails to comment on them beyond recognizing their similarities. In the structure of the flower, and the wood this genus is indistinguishable from *Citronella* and likewise has the characteristic ovary and inflorescence which easily separates this group from the rest of the Icacinaceae.

Another form worthy of mention is *Citronella costaricensis* (Donn. Sm.) Howard which was originally described as a *Villaresia*. Its inflorescence approaches that found in *Briquetina incarum*; its leaves are more nearly like those of *Citronella paniculata* and *Citronella megaphylla* and in its wood structure it has certain peculiarities which are commonly found in the Old World species of *Chariessa*. The range is new world and thus the species serves as another example of a plant with intermediate characters which supports the consideration of these genera as one large group under the name *Citronella*, the oldest valid name.

The fruit of this genus contains its most interesting and distinctive character. In the pistil the funiculus runs up the inside of the locule appearing as a ridge protruding into the space. The two ovules are pendant from near the apex, one on each side of this ridge. (Plate IV, fig. 6-7.) When the fruit matures the ridge enlarges and forms a radial partition extending half the diameter of the locule and running vertically. Miers called this ridge a dissepiment since he believed it was formed through the abortion of one or more extra locules. He considered the genus as belonging in the Aquifoliaceae and therefore a continuation of the tendency in that family to reduce the carpellary number of the flower. Miers also found a pistil with two locules which he regarded as support to his conclusion. Valetton, contrarily does not regard this as formed through abortive carpels. He found this ridge to contain vascular strands and so to be of independent origin from any loss of carpels. To this ridge he applied the term "richel." Only one of the two ovules in the pistil of the Icacinaceae develops and in the fruit the seed is curved around the partition. Thus in a cross section the seed appears to be hippocrepiform. While this fruit and seed shape are distinctive and diagnostic for the genus *Citronella* of the Icacinaceae, instances of similar characters have been reported in other families. Miers (Ann. Mag. Nat. Hist. ser. 3, 9: 108. 1862) and A. Jussieu (Ann. Sci. Nat. 25: 14. 1832) and others have considered these in detail. The one I have found most often confused in the herbarium, however, is *Bursinopetalum* or *Mastixia* of the Cornaceae which has this same projection of the endocarp or putamen into the locule. This is easily distinguished however by its perigynous flowers and inferior fruit. The

comparison is often made with the condition found in the Menispermaceae, however the situations in these two groups are not strictly similar. In the Menispermaceae as A. Jussieu (l.c.) points out the entire seed and embryo are curved upon a horizontal plane with the partition thus formed running horizontally instead of vertically and so are easily distinguished from the genus *Citronella*.

A second peculiarity of the genus *Citronella* is the aestivation of the corolla. (cf. Plate IV, fig. 3, 5.) The petals are free, very fleshy for the family and with a strongly protruding mid-rib. The apex of the petals is inflexed and the top of the bud shows all five petals at its depressed center. The margins of these petals, however, are usually membranaceous, not at all fleshy as at their centers, and overlap. For this reason the petals have been regarded as imbricated. A. Gray (U. S. Explor. Exped. Bot. Phan. 1: 301. 1854) calls this condition a mixture of the two forms since the petals at their bases are valvate abutting each other or often separated. Although the petals overlap at the margins and especially so at the shoulders or curve of the corolla in bud condition I believe the condition to be a modified valvate aestivation rather than an imbricated one. I know of no example where the corolla, regarded as truly imbricated has the apices of the petals free and inflexed as they are here. Usually in an imbricated condition the apices too overlap. Engler's key distinction, that the old world *Chariessa* forms are valvate in contrast with the remainder of the forms is not exact and can not be used. The amount of overlapping of the margins of the petals is variable and flower buds on the same inflorescence show all degrees of this.

The leaves of this genus, particularly several of the new world species, may have their margins spinose. Miers (Ann. Mag. Nat. Hist. ser. 3, 9: 112. 1862) described *Villaresia pungens* from a specimen of this sort. Many of the collections I have examined have both types of leaves on the same sheet. Apparently the plant develops spinose margined leaves on the young or sucker shoots. Sprague, (Bot. Mag. t. 8376. 1911) in his plate labeled *Villaresia mucronata*, which is really *Citronella Gongonha*, also shows variations of this type which exist on the same tree in cultivation. It is likewise apparent that the distinctions used to separate *C. Gongonha* and *C. cuspidata* on the basis of entire or spinose-margined leaves is not acceptable, especially since many leaves with one or two spines on the margins are to be found. I regard these two species as synonymous. The case of *C. peruviana* has already been mentioned.

The leaves of several of the South American forms of *Citronella* bear small cavities in the axils of the veins on the ventral side of the leaf.

These have been called glands by various authors. I have not been able to verify this glandular condition although they often bear inside a thin walled clavate or thick walled lanceolate pubescence. In the larger forms small insects have been found. Miers considers the presence of these pores a major character and from my material their occurrence seems to be quite consistent.

#### CANTLEYA RIDLEY

**Cantleya** Ridley, Fl. Mal. Penin. **1**: 436. 1922.

Flowers hermaphroditic, calyx 5-parted, segments lightly imbricated, petals 5, rarely 4, bearing a longitudinal ridge inside, apex inflexed or appendaged, valvate, glabrous; stamens 5 rarely 4, alternating with the petals, filaments thickened, fleshy, broad, bearing inside and outside a clavate pubescence, anthers ovate diverging at the base, introrsely and longitudinally dehiscent, affixed at the apex; ovary cylindrical to ob-ovoid, unilocular, style none, stigma sunken in the middle of a large fleshy ring of differentiated tissue which caps the ovary, ovules 2, pendent from near the apex on a common funiculus; fruit unknown.

**Cantleya corniculata** (Becc.) comb. nov.      PLATE II, FIGS. 1-7.

*Platea corniculata* Becc. Mal. **1**: 117. 1877.

*Urandra* sp. Foxw. Philip. Jour. Sci. **4**: 492, 542, fig. 47. 1909.

*Urandra corniculata* (Becc.) Foxw. Philip. Jour. Sci. **6**: 179. 1911.

*Cantleya johorica* Ridl. Fl. Mal. Penin. **1**: 436. 1922.

*Stemonurus corniculatus* (Becc.) Ridl. Fl. Mal. Penin. **5**: 297. 1925.

A small tree, branches angular, internodes short 1-2 cm. long, bark rough, gray to brown: lamina of the leaves broadly ovate-elliptic to sub-ovate, 5-6.5 cm. long and 3.5-4.5 cm. wide, the apex abruptly narrowed into an acuminate point 4-7 mm. long and 2-3 mm. wide, obtuse, base rounded, coriaceous, fragile when dry, when young velutinous pubescent, at maturity glabrous, margin entire or slightly revolute, mid-rib sulcate above, prominent below, veins inconspicuous, drying a tobacco brown; flowers perfect, 5- rarely 4-parted; calyx short, 0.8-1 mm. high and 1.6-1.8 mm. in diameter, lobes imbricate, fleshy, ovate, pilose-pubescent; corolla valvate, petals free, oblong, 5.2 mm. long by 1.2 mm. wide, inflexed tip 0.6 mm. long, fleshy, glabrous, mid-rib evident; stamens alternate, 4.5 mm. long in the mature bud; filaments broad, fleshy, thick, bearing clavate thin-walled hairs below the anther inside and on the shoulder of the filament outside; anthers ovate, diverging at the base, anther sacs commonly reniform, 0.7 mm. long, affixed to the top of the filament and hanging free at the base; ovary

cylindrical to obovoid, 2.8 mm. high, stigma slightly eccentric, ovules two from a common funiculus. Fruit unknown. Inflorescence axillary, of peduncled cymes, peduncles 1–2 cm. long, at the base covered by a number of spirally arranged bracts, flowers sessile, articulated, in clusters of 4 to 8.

BORNEO: ex Herb. Hort. Bot. Kew 2797 (A); *Moulton s.n.* (A). FEDERATED MALAY STATES: Singapore Bot. Gard., Field no. 26182 (*Corner*) (A). SUMATRA: ex Herb. Hort. Bot. Kew 18559 (A). JAVA: ex Herb. Hort. Bot. Bog. (UC. 265771).

Beccari described the flowers of this plant as monoecious to polygamous. In the staminate flowers he mentions "ovarî rudimentum depressum discoideum." In the female flowers he reports, petals none. Ridley reports (Suppl. Fl. Mal. Pen. 5: 297. 1925) the flowers to be perfect. In the five collections I have examined both fertile anthers and fertile pistils were present. More material of this genus is badly needed for study but on the basis of the specimens available it seems certain the flowers are perfect.

*Cantleya corniculata* was originally described by Beccari as a species of *Platea*. In 1911 Foxworthy reports sending specimens collected by Moulton to Beccari for identification and receiving a reply that the material was identical with that described as *P. corniculata* from incomplete material cultivated at the Buitenzorg gardens. A copy of this excerpt is on file at the Arnold Arboretum Herbarium. Foxworthy felt the plant belonged in *Urandra* and therefore made the new combination. Ridley in 1922 described a new genus on incomplete material which he called *Cantleya johorica*, since it was collected by Cantley in Johor. This was also based on incomplete material. In the supplement to Fl. Mal. Pen. he relates having seen the material described by Foxworthy and concluded his previously described monotype was identical with it. He disagreed with Foxworthy's choice of genera and made a new combination in the genus *Stemonurus*.

I have examined material of Moulton's collections which have been so frequently cited in the literature, as well as material from Kew and Buitenzorg. The material has several basic differences which makes it advisable to consider this a distinct genus. This conclusion is supported by striking differences from other genera of the Icacinaceae in the wood structure and in the pollen grains. This latter information will be published in further studies of the family. This genus in the form of its pistils resembles *Stemonurus*. However, the flowers in *Cantleya* are perfect instead of unisexual. The leaves are entire, revolute margined, coriaceous and inconspicuously veined as in *Urandra* but the

flower structure is different in these two. The branching habit of the inflorescence is somewhat like that of *Medusanthera* but the perfect flowers and the lack of development of an asymmetrical pistil as well as the basically different stigma allow easy separation. The inflorescence in its bracts at the base and the flowers articulated from the alveoli is characteristic and distinct.

Ridley (Kew Bull. 1926: 61) described *Stemonurus pauciflorus* with "affinis *S. corniculato* Ridl., sed inflorescentia multo laxiore floribusque paucioribus minoribus." I have not seen material of this and from the general description given I can not place the plant in the genus here considered. Two clues can be discerned which might designate it as a species of *Urandra* namely, "floribus albis 5-6 secundis" and "ovario conico acuminato." If this plant should prove to be a distinct species the name must be changed since Blume, Stapf, and Merrill have already used this name for different plants in this complex.

The valid name for *C. corniculata* representing a generic unit is *Cantleya*. There appears to be only one species.

#### GASTROLEPIS VAN TIEGHEM

**Gastrolepis** Van Tieghem, Bull. Soc. Bot. Fr. 44: 115. 1897.

Flowers hermaphroditic, calyx short-campanulate, 5-toothed or -lobed; petals 5, valvate, free, or if agglutinated into a tube with the sutures evident, apex inflexed or appendaged, glabrous inside; stamens 5, filaments broad, fleshy, arched behind the anther sacs into a shoulder, continuous into a filiform connective at the upper portion of which are attached the anther sacs, filaments bearded from lateral margins and not an adaxial flap, barbate abaxially between the anther sacs, anthers oblong, introrsely and longitudinally dehiscent; ovary unilocular, pyramidal, slightly curved with a large fleshy free lobe at the base, style short, stigma capitate, slightly eccentric, ovules 2, flattened, lying parallel to the ovarian lobe, pendent from near the apex of the locule, anatropous with the micropyle turned laterally; fruit a drupe (seen only in an immature state), compressed, incurved, asymmetrical, when drying longitudinally striated on the convex side, bearing a fleshy evanescent portion on the concave side, seed flattened, single. Inflorescence axillary, cymose, flowers articulated, in small clusters. Tree with alternate, entire, glabrous, coriaceous leaves. One species from New Caledonia.

**Gastrolepis austro-caledonica** (Baill.) comb. nov. PLATE I, FIGS. 23-28.

*Lasianthera austro-caledonica* Baillon, Adans. 11: 193. 1874.

Van Tieghem based this genus on *Lasianthera austro-caledonica* of

Baillon. Since he only implied the combination and I have been unable to find it in print elsewhere it is given here as a new combination. Likewise, a complete generic description has not been published and that accompanying is a more ample characterization of the genus.

The only conformation of *Gastrolepis* with *Lasianthera* is in the lateral flap of the ovary wall. It differs in its geographical distribution and its inflorescence being axillary instead of opposing the leaves. The corolla here is composed of free petals or if they are agglutinized into a tube their sutures are evident. In the stamens of *Lasianthera* there is an adaxial flap on the filament below the anthers to which clavate and barbate hairs are attached. In *Gastrolepis*, however, this flap is absent and the hairs which in all my material are lanceolate and not clavate are located on the lateral margins of the filament and are sparse to absent in the center. The leaves of *Gastrolepis* are thick and coriaceous and similar to *Urandra*, in contrast with the thin membranaceous ones found in *Lasianthera africana*. On the basis of the immature fruits of both genera the drupes appear to be similar. In the pollen grains there is a striking difference between them.

Baillon describes the leaves of this species as obovate to subelliptical, apex round to emarginate, base cuneate rarely round. Of the material I have had for study one collection (Franc 1791) has typical obovate leaves with cuneate bases and emarginate apices. A second collection (Franc 234) has one sheet (U. S. 1595512) with acute apices, elliptical to oblong leaves and rounded bases. Two other sheets with the same collector's number, however, are more intermediate with rounded apices, elliptical leaves and broadly cuneate to rounded bases. With so little material at my disposal with which to ascertain the limits of leaf variation it seems inadvisable to call the latter collection a new species although it may well be. Further study may reveal a single polymorphic species. However, the first form mentioned (Franc 1791) has so little variation in the stages of development represented in the collections I have seen, that it appears unlikely to be a case of leaf polymorphy.

#### PLEURISANTHES BAILLON

##### ***Pleurisanthes parviflora* (Ducke) comb. nov.**

*Leretia parviflora* Ducke, Arch. Jard. Bot. Rio Janeiro 4: 119. 1925.

*Mappia parviflora* (Ducke) Baehni, Candollea 7: 174. 1936.

This interesting species is in agreement with *Pleurisanthes* by its flowers which are not articulated with the pedicel; the petals which are glabrous within, by its leaves which have a setose pubescence of sculptured and smooth walled hairs, and by the supra-axillary inflo-

rescences which have flattened branches. These developments are characteristic of the genus *Pleurisanthes*. In habit *P. parviflora* approaches *P. flava* Sandw. from which it is easily distinguished by its elongated and gracefully branching racemes, as well as by its flowers which have a pistil with a glabrous style as long as the ovary, and its petals which in my material bear on the inside at the base a globe of tissue which has a diameter equal to that of the raised mid-rib. *Pleurisanthes flava* appears to be a rope-liana while *P. parviflora* appears to be more woody and have a more normal habit. Only the terminal shoots of *P. parviflora* are wiry and coiled. Ducke and Krukoff report the plant to be a vine.

BRAZIL: Near Livramento on the Rio Livramento, Municipality Humayta, State of Amazonas, *Krukoff* 6954.

The above collection is from the basin of the Rio Madeira in southwestern Brazil and is a great extension of the known range of the genus. *Pleurisanthes Artocarp*i Baill. and *P. emarginata* Van Tieghem are known only from French Guiana while *P. flava* Sandw. has been collected only in British Guiana.

The type specimens of *P. Artocarp*i and *P. emarginata* are unicates in the Paris herbarium and are not available for study at the present time. I can find no record of other collections of these unusual plants of the Guianas. The genus has been considered by Van Tieghem as the type of a distinct family. The merits of this proposal will be considered in the subsequent monograph of the genus.

#### OECOPETALUM GREENMAN & THOMPSON

##### **Oecopetalum guatemalense** sp. nov.

PLATE III.

Arbor usque ad 20 m. alta; trunco 30 cm. diametro; ramulis novellis sparse albis vel fulvis sericeo-pubescentibus vel subglabris; laminis foliorum ellipticis vel elliptico-oblongis latissimis infra medium 10–14 cm. longis 3.5–6 cm. latis, apice anguste acutis, basi subrotundatis, margine leviter revoluta integris, supra glaberrimis viridibus, subtus pallidioribus adpressis pilis malpighiaceis sparse ornatis, costas subtus prominentes et venas primarias prominulas 4–6 arcuatas gerentibus, petiolis 0.7–1.0 cm. longis; cymis axillaribus usque ad 2.5 cm. longe pedunculatis plus minusve sordide fulveque adpresse pubescentibus; calyce breviter campanulato 2.1 mm. longo, basi loborum 1.2 mm. diametro; lobis ovatis obtusis 1.0–1.2 mm. longis, 0.9 mm. latis, dense sericeo-pubescentibus, calyce fructifero ca. 1.5 cm. diametro 0.6–0.7 cm. alto incrassato explanato persistente; petalis oblongo-lanceolatis, 8 mm. longis, 1.7–2.0 mm. latis crassis carnosissimis extus sparse sericeo-pubescentibus intus glabris; staminibus 6.5–7.0 mm. longis; antheris oblongis

5–5.3 mm. longis 1.3–1.5 mm. latis, connectivo rufo-brunneo crasso; ovario et stylo glabro; fructu drupaceo globoso rugoso glabro fulvo-brunneo 1.8–2.0 cm. diametro; seminibus in loculo solitariis globosis anatropis; embryo in medio albuminis immerso curvato, cotyledonibus foliaceis ovatis, radiculam subaequantibus.

GUATEMALA: Finca Moca, Dept. of Suchitepequez, alt. 1140 m., tree 60 ft., 1 foot d.b.h., straight slender trunk with smooth brown bark, flowers white fragrant, nut in a fleshy cup from which it falls when ripe, Jan. 8, 1935, *Skutch* 2080, (TYPE, Arnold Arboretum, ISOTYPE N.Y.); Volcan Zunil, Dept. of Quezaltenango, alt. 1765 m., tree in virgin forest 40 ft. high, 1 foot d. b. h., flowers white, August 7, 1934, *Skutch* 954 (A, N.Y.).

MEXICO: Finca Irlanda, Chiapas, June 1914, *Purpus* 7609, (A, G, N.Y., U.S., sub "Mappia").

The leaves of the Mexican collection are larger than the type but the characters are still distinctive.

*Oecopetalum guatemalense* is readily distinguished from *O. mexicanum* by its elliptical to elliptical-oblong leaves which are broadest below the middle and the bases of which are narrowed or subrotund but are not cuneate, its longer pedunculate inflorescences which approach 2.5 cm. in length, its oblong anthers only slightly narrowed at the apex and by its corolla which is more pubescent on the outside. This new species extends the range of the genus to Guatemala and represents the second species of the formerly monotypic genus.

The fruit of this genus has never been described. Contrary to the original description there are two ovules in the ovary, one with a short funiculus, and the second borne on a longer funiculus and placed directly under the first. In drying or under pressure these two ovules may become fused together but careful dissection shows that two are present. This condition is found in both species. Only one ovule develops. The mature fruit is a one-seeded drupe. The sarcocarp is glabrous and light brown and is coarse in texture. It contains masses of stone cells. The putamen is rugose giving a similar surface to the fruit. The single locule is smooth to slightly pitted inside containing a single pendulous, anatropous, globose seed with a thin testa. The embryo is located in the center of the albumen and is curved. The cotyledons are foliaceous and ovate. They are borne on stalks about one fourth their length. The cotyledons about equal the cylindrical radicle in length. The calyx enlarges in fruit, a condition exceedingly uncommon in the Icacinaceae and retains its green color. The drupe falls away from the calyx at maturity, and not with it, as is customary in the Icacinaceae.

## GENERA TO BE EXCLUDED

## METTENIUSA KARSTEN

Karsten (Fl. Columb. **1**: 79, t. 39. 1859) proposed the genus *Metteniusa* as the type of a new family near the Convolvulaceae or Boraginaceae and particularly near the genus *Cordia*. Engler (Nat. Pflanzenf. Nachtr. 226. 1893) places this genus in the Icacinaceae. In 1934, Sleumer (Notizbl. Bot. Gart. Berlin **12**: 148) described a new species of the genus *Aveledoa* Pittier of the Olacaceae and suggested its affinity with the Icacinaceae. Later in 1936 (Notizbl. Bot. Gart. Berlin **13**: 359) he combined this genus with *Metteniusa* which he placed in the Icacinaceae.

I have examined a co-type of *Metteniusa nucifera* (Pittier) Sleumer and also have the descriptions of the other species for study. On the basis of these it seems improbable that the Icacinaceae is the correct family for this genus. As figured by Karsten and described by Karsten, Pittier, Sleumer and verified by my own examinations the corolla has a tube approaching 1.2 cm. in length and lobes of 2.4–2.6 cm. long or a total corolla length of 3.5–4 cm. The corolla is described as twisted before anthesis and there is no mention in the text or indication in the figures of an inflexed corolla tip or of appendages. These developments are very different from those found in the Icacinaceae. A large tubular corolla 1.3 cm. long is found in *Leptaulus* but in no other species of the family known to me does the tube or entire corolla exceed 1 cm. in length. I have found no occurrence of corolla twisting in the Icacinaceae. A constant character of the Icacinaceae is the inflexed corolla tips which often bear broader appendages. There is no indication of this in *Metteniusa*. The stamens in *Metteniusa* are attached to the corolla-tube. The genus *Leptaulus* is the single genus in the Icacinaceae bearing the stamens attached to a definite corolla-tube. The anthers in *Metteniusa* are given as 1 cm. long on filaments 1.5 cm. long. In length this vastly surpasses anything found in the Icacinaceae. Karsten figures the lower ends of the anthers as free and recurving when mature which also has no counterpart in the Icacinaceae.

The filiform style of *Metteniusa* is about 2 cm. long while for comparison the longest style thus far encountered was about 7 mm. long in *Leptaulus*, perhaps a third of the length of that of the former plant. Apparently *Metteniusa* has the flowers attached to the pedicels without an articulation. The constancy of this articulation in the Icacinaceae is contrastingly significant as only *Pleurisanthes* and some of the Phytocreneae are without it. There are two bracts figured by Karsten immediately below the calyx and more further down the pedicel. There

is nothing comparable to this in the Icacinaceae. Finally, Karsten figures a curved embryo with foliaceous cotyledons and the only counterpart of that in the Icacinaceae is found in the group of genera with broad connectives to the stamens which lacks a parallel in *Metteniusa*.

I can offer no suggestion at this time concerning the proper position of this genus; however, it seems apparent to me it does not belong in the Icacinaceae.

#### POGONOPHORA MIERS EX BENTHAM

**Pogonophora Schomburgkiana** Miers ex Bentham in Hook. Jour. Bot. 6: 372. 1854.

*Poraresia anomala* Gleason, Bull. Torr. Bot. Club 58: 385. 1931; Sandwith, Kew Bull. 1935: 121.

*Poraresia anomala* is synonymous with *Pogonophora Schomburgkiana* earlier described by Miers. Mr. Sandwith had indicated this on the type sheet at the New York Botanical Garden Herbarium. The suggestion was also made that the genus *Pogonophora* might belong in the Icacinaceae. On the basis of the flower form, the internal structure of the wood, and the fruits, it appears to me that this genus is better left in the Euphorbiaceae where Bentham placed it. It certainly does not belong to the Icacinaceae.

#### EXPLANATION OF PLATES

All examples of staminate hairs are reduced in size and number. Sizes of all floral parts are taken from the mature bud condition unless otherwise stated.

##### PLATE I

*Urandra lanceolata* (Becc.) O. Ktze. (Haviland 1773). Figs. 1-6.

Fig. 1. Mature drupe with portion of the pericarp removed to show the fibrous nature.  $\times 1$ .

Fig. 2. Pistil showing the membranaceous complete skirt at its base.  $\times 14$ .

Figs. 3, 4, 5. Adaxial, lateral, and abaxial views of the stamens. Abaxial hairs bent over the anther in bud.  $\times 12$ .

Fig. 6. Mature bud showing the loose calyx.

*Stemonurus* Bl. Figs. 7-15.

Fig. 7. A mature fruit of *Stemonurus* showing the umbilicate disk at the apex and the vascular ridge on the surface.  $\times 1.7$ .

Fig. 8. Mature pistil of *S. axillaris* (Wall. ex Lindl.) Miers (Hook. f. and Thompson, Khasia), showing the enlarged apical ring of fleshy tissue with the depressed stigmatic surface.  $\times 9$ .

Figs. 9, 10. Lateral and adaxial views of the sterile stamens from an open pistillate flower of the same.  $\times 10$ .

Figs. 11, 12. Adaxial and lateral views of fertile stamens from an open flower of *S. apoensis* Elmer (Elmer 15416) showing the region of elongation in the filament between the internal hair cluster and the anther.  $\times 8.5$ .

Fig. 13. Stamen of the same in bud condition to show the contrast.  $\times 11$ .

Fig. 14. Pistillate rudiment from the staminate flower of the same.  $\times 12.5$ .

Fig. 15. Pistillate rudiment from the staminate flower of *S. axillaris* (Hook. f. and Thompson, Khasia).  $\times 15$ .

*Lasianthera africana* Beauv. (Coman 41).

Figs. 16-22.

Fig. 16. Face view of fertile pistil showing the large appressed flap of the ovarian wall.  $\times 20$ .

Fig. 17. Lateral view of the same.  $\times 20$ .

Fig. 18. Face view of the pistil with the lobe of the ovarian wall removed.  $\times 20$ .

Figs. 19, 20, 21. Adaxial, lateral, and abaxial views of stamens showing internal hairs attached to the lobe of the filaments as well as the quite broad filament.  $\times 14$ .

Fig. 22. An adaxial view of a portion of the opened corolla showing the inflexed lobes and appendages, sutures present at the apex and the base but not at all evident in between.  $\times 13$ .

*Gastrolepis austro-caledonica* (Baill.) Howard. (Franc 1791). Figs. 23-28.

Fig. 23. Face view of the pistil showing the small flap of the ovarian wall at the base.  $\times 17$ .

Fig. 24. Lateral view of the same showing the lobe to be very fleshy but only slightly appressed.  $\times 17$ .

Fig. 25. Lateral view of the mature fruit showing the asymmetry and appendage.  $\times 2.5$ .

Figs. 26, 27. Lateral and adaxial view of the stamens of the same showing the absence of the internal lobe of the filament.  $\times 15$ .

Fig. 28. Mature bud showing the distinct sutures of the corolla and the articulation with the pedicel.  $\times 8$ .

## PLATE II

*Cantleya corniculata* (Becc.) Howard. (U. C. 265771 ex Herb. Hort. Bog.). Figs. 1-7.

Fig. 1. Pistil.  $\times 12.5$ .

Figs. 2, 3, 4. Adaxial, lateral, and abaxial views of the stamens.  $\times 7.5$ .

Fig. 5. Lateral view of the petal showing the inflexed tip.  $\times 7$ .

Fig. 6. Adaxial view of the petal.  $\times 7$ .

Fig. 7. A portion of the inflorescence axis showing the series of imbricated scales at the base.  $\times 0.8$ .

*Medusanthera glabra* (Merr.) Howard.

Figs. 8-15.

Figs. 8, 9. Lateral and face view of the pistil showing the basal gibbosity. (Wenzel 1744.)  $\times 12$ .

Figs. 10, 11. Face and lateral views of the mature fruit. (Wenzel 1628.)  $\times 1.5$ .

Fig. 12. Adaxial view of a fertile stamen. (Wenzel 1029.)  $\times 10$ .

Fig. 13. Lateral view of the sterile stamen from a pistillate flower. (Wenzel 1744.)  $\times 10$ .

Figs. 14, 15. Side and face view of the pistillate rudiment from a staminate flower. Notice the indication of a gibbosity. (Wenzel 1029.)  $\times 1$ .

*Gonocaryum* Miquel.

Figs. 16–20.

Fig. 16. Fertile pistil of *Gonocaryum*. (Wang 73190.)  $\times 12$ .

Fig. 17. Pistillate rudiment from a staminate flower of *G. longe-racemosum* King. (Sargent, sine no.)  $\times 14$ .

Fig. 18. View of opened corolla of same showing the petal sutures at the apex, the filaments fused to the corolla tube, and the anthers held away from the tube by the development of a small knob of tissue. (Arrow.)  $\times 7$ .

Fig. 19. Abaxial view of the stamen removed from the corolla tube of the same.  $\times 9$ .

Fig. 20. Bud of the same showing the sutures of the petals at the apex only.  $\times 7.1$ .

*Platea* Blume.

Figs. 21–27.

Fig. 21. Pistillate flower which is not articulated. (Elmer 10613.)  $\times 8$ .

Figs. 22, 23, 24. Adaxial, abaxial and lateral views of stamens of *Platea parviflora* Koord. & Valet. (Brass 11564.)  $\times 15$ .

Fig. 25. Pistillate rudiment from the staminate flowers of the same. Quite often this bears long hairs from the apex.  $\times 12$ .

Fig. 26. Mature drupe of *Platea philippinensis* Merr. (Elmer 15264.)  $\times 0.8$ .

Fig. 27. Dorsal view of expanded corolla of *P. parviflora* showing the short tube and two of the five stamens in place. (Brass 11564.)  $\times 7.5$ .

### PLATE III

*Oecopetalum guatemalense* Howard. (Skutch 2080.)

Fig. 1. Habit.  $\times 0.5$ .

Fig. 2. Para-sagittal section of the ovary showing the two ovules placed one above the other.  $\times 7.5$ .

Fig. 3. Mature fruit.  $\times 1.2$ .

Fig. 4. Mature bud showing the articulation.  $\times 3.5$ .

Fig. 5. Pistil.  $\times 5$ .

Fig. 6. Lateral view of the petal.  $\times 5$ .

Fig. 7. Adaxial view of the petal showing the lateral ridges.  $\times 5$ .

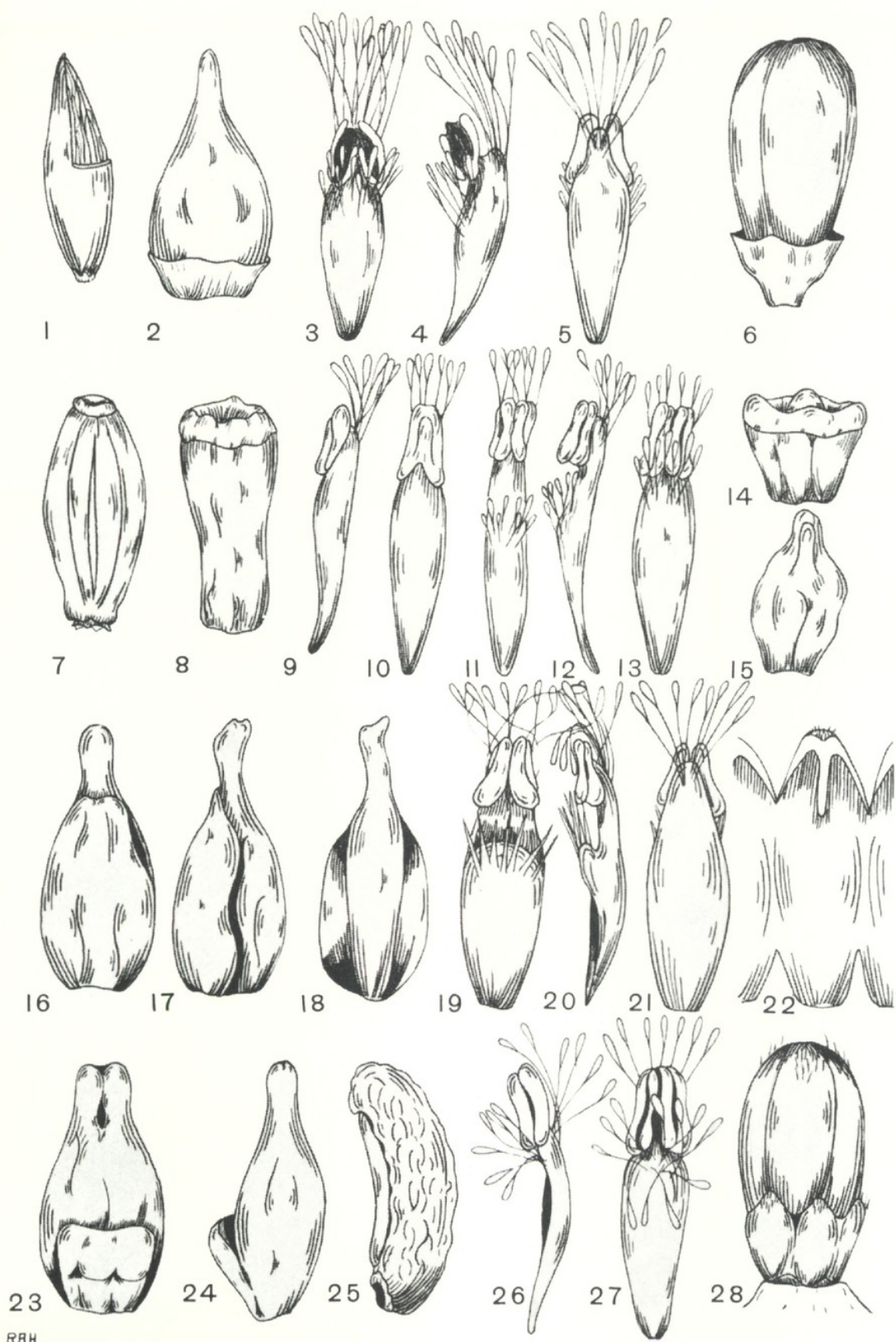
Fig. 8. Fruit with mature calyx as seen from below.  $\times 1$ .

Fig. 9. Diagrammatic cross-section of the seed showing the curved embryo included in the albumen.  $\times 1.5$ .

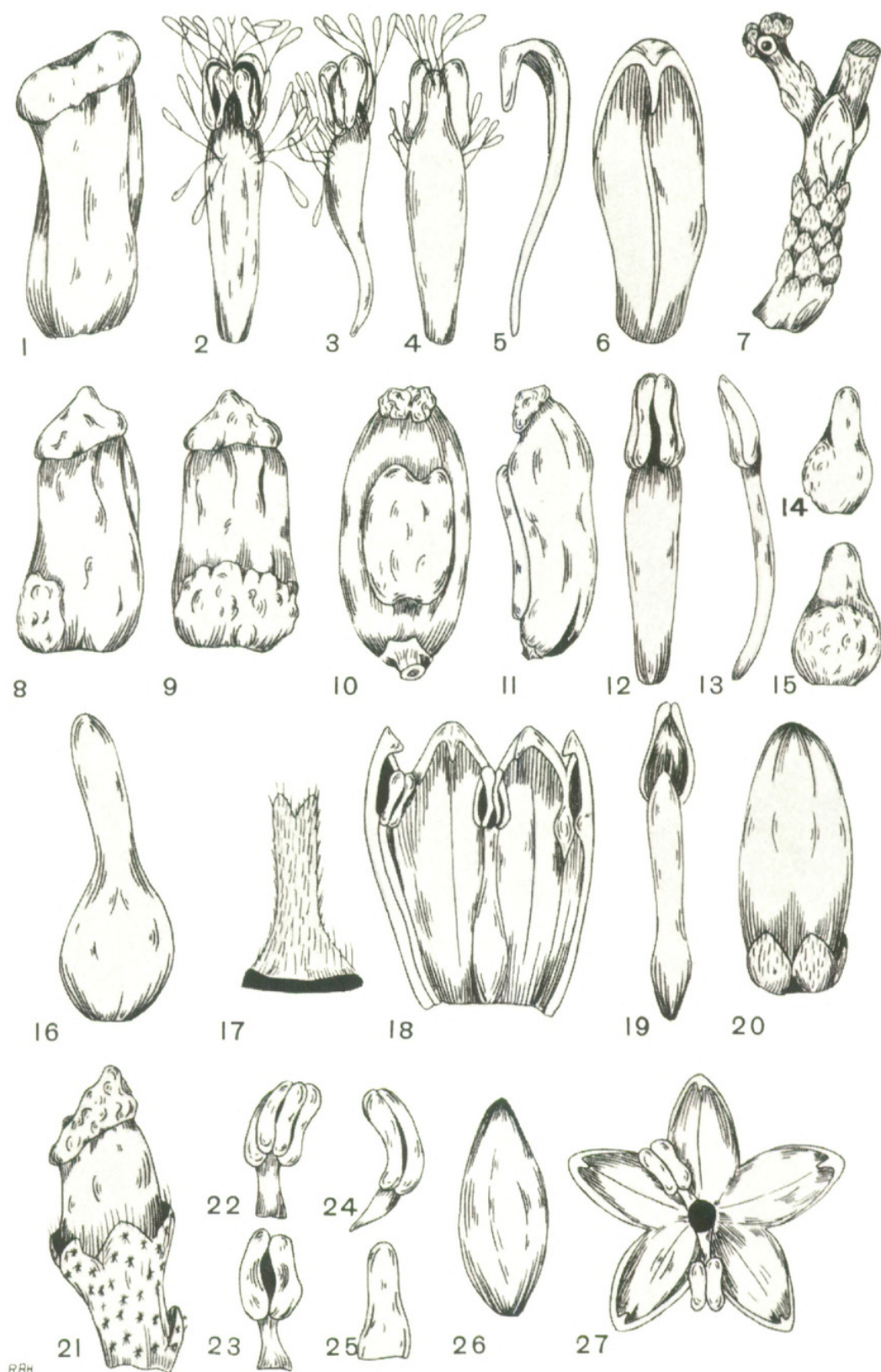
Fig. 10. Malpighiaceae hairs found on the leaf.  $\times 100$ .

Fig. 11. Embryo.  $\times 1.2$ .

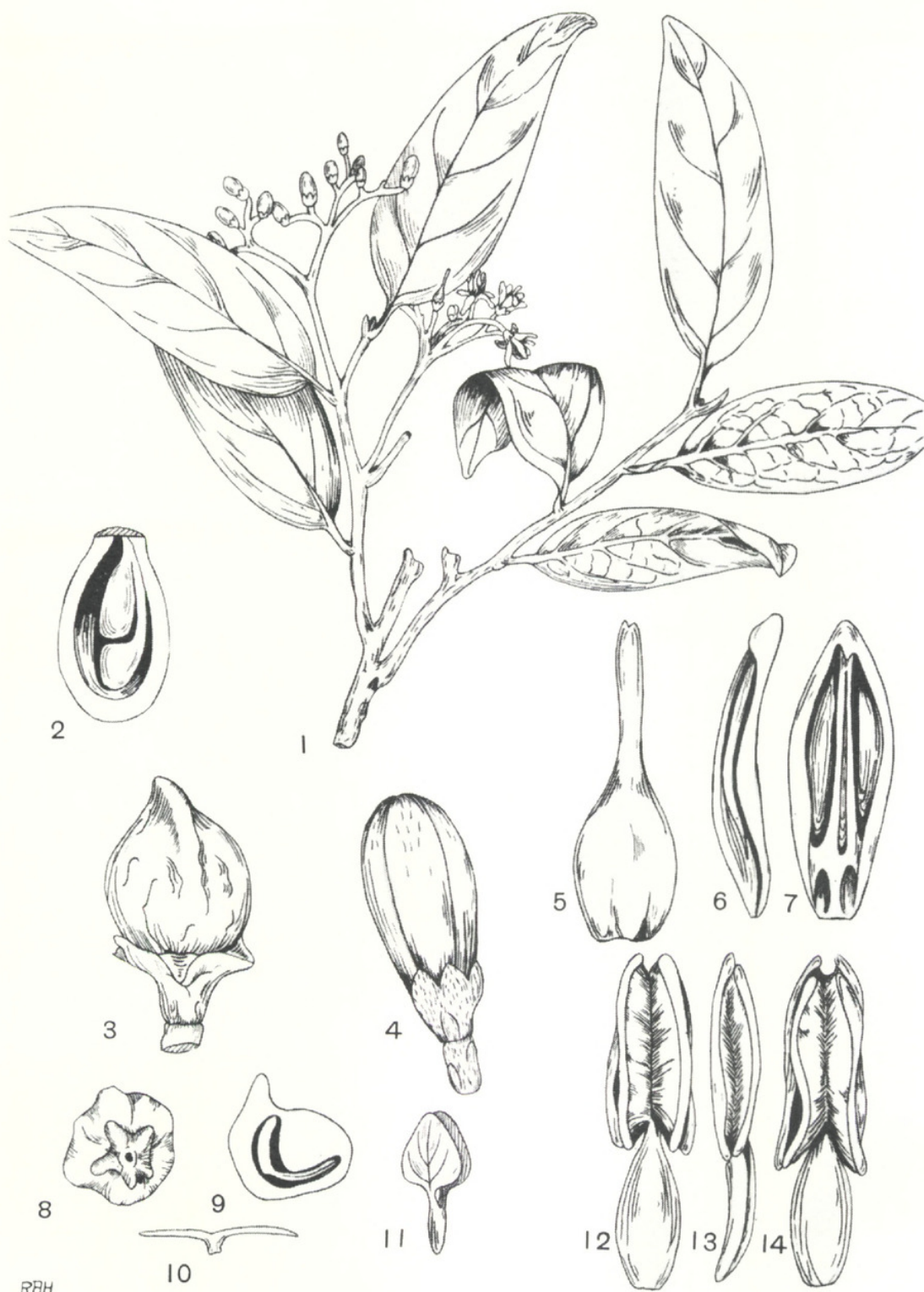
Figs. 12, 13, 14. Adaxial, lateral and abaxial views of stamens.  $\times 6$ .



STUDIES OF THE ICACINACEAE



STUDIES OF THE ICACINACEAE



STUDIES OF THE ICACINACEAE  
OECOPETALUM GUATEMALENSE Howard



RAH

STUDIES OF THE ICACINACEAE  
CITRONELLA PERUVIANA Howard

## PLATE IV

*Citronella peruviana* Howard. (Weberbauer 6617.)

Fig. 1. Habit.  $\times 0.5$ .

Fig. 2. Pistil.  $\times 17$ .

Fig. 3. Bud.  $\times 11$ .

Fig. 4. Lateral view of the petals of a mature flower with the tip reflexed.  $\times 8$ .

Fig. 5. Adaxial view of the petal showing the inflexed apex and raised mid-rib.  $\times 10$ .

Fig. 6. Diagrammatic cross section of the ovary showing the projecting vascular supply and the two ovules.

Fig. 7. Para-sagittal section of the ovary showing the two ovules, one on each side of the internal ridge.  $\times 13$ .

Figs. 8, 9, 10. Abaxial, lateral, adaxial views of stamens.  $\times 16$ .

GRAY HERBARIUM,  
HARVARD UNIVERSITY.

## NEW AND CRITICAL EUPHORBIACEAE FROM EASTERN TROPICAL ASIA

LEON CROIZAT

IN THIS PAPER is presented a selection of novelties, critical notes and transfers chiefly dealing with Chinese species. *Breyniopsis* Beille is reduced to *Sauropus* Bl.; a discussion of what constitutes a *nomen provisorium* is given in the note following the publication of *Croton Hookeri*, sp. nov. Lastly, notes on general issues of classification bearing upon *Euphorbia* in the Linnean sense appear in the treatment of *Chamaesyce pseudochamaesyce* (Fisch. & Mey.) Komar.

The material cited, specimens or fragments, unless otherwise specified, belongs to the herbarium of the Arnold Arboretum of Harvard University.

### ACTEPHILA BL.

#### ***Actephila inopinata*, sp. nov.**

Frutex ad 1.5 m. altus, pilis lanulosis in axillis atque ad alabastra perpaucis exceptis glaberrimus, subverticillatim ramosus. Foliis alternis, subverticillatis, firme membranaceis, integerrimis, pallide olivaceo-brunneis, concoloribus, ellipticis vel oblanceolatis, apice breviter acuminatis, basi cuneatis vel rotundatis, 8–3 cm. longis, 2.5–1.5 cm. latis, venis 4–5-jugis, obscuris, latissime patentibus, reticulatis, petiolo 0.5–1.5 cm. longo, stipulis late triangularibus ad 1.5 mm. longis. Floribus ♀ more generis longe pedunculatis, pedunculo capillaceo ad 3 cm. longo, divaricatim exserto; lobis in sicco purpureo-brunneis, ovatis, foliaceis, ca. 5 mm. longis, 3 mm. latis, venulosis, parallelinerviis; ovario glabro sessili ca. 3 mm. magno, stylis carnosulis ultra medium in stigmatibus 2 discretis partitis ca. 3 mm. longis, disco hypogyno in annulum ad 1 mm. crassum efformato. Caetera desiderantur.

HAINAN: Loktung, a shrub in dense woods, flowers greenish yellow. S. K. Lau 27041, June 1936.

The first species of the genus recorded for Hainan was *A. Merrilliana* Chun (Sunyats. 3: 26. 1935), which is characteristically pubescent, while *A. inopinata* is characteristically glabrous. *Actephila subsessilis* Gagn.,

from Indo-China, differs in the larger and less delicate floral and vegetative parts. The type specimen has only one flower, which discourages dissection and leaves undisclosed for the present the minute characters of the gynoeceum.

SECURINEGA A. de Juss.

**Securinega acicularis**, sp. nov.

*Fluggea leucopyrus* sensu Hutchinson in Sargent, Pl. Wilson. 2: 520. 1916, *saltem pro maxima parte*. Non Willd.

Frutex 2–6 m. altus, totus glaber, spinosus, aculeis (= ramulis abortivis) interdum apice dichotomis, cortice brunneo-discolori, ruguloso, minute lenticellato. Foliis anthesis tempore obcordatis, emarginatis, ad 7 mm. longis, 5 mm. latis, petiolulo 2–3 mm. longo fultis. Floribus in brachyblastis inermibus vel spinescentibus axillaribus, vulgo paucis fasciculatis (ca. 5 in fasciculo quove), ad 4 mm. latis, pedicello capilliformi rigidusculo ad 5 mm. longo fultis; lobis calycis ♂ obovatis vel ellipticis, costula carnosula, marginibus scariosis, 1.5–2 mm. longis, 1 mm. latis; staminibus 5, gracilibus, 3 mm. longis; pistillodio trifido, cruribus reflexis plus minusve clavatis, ca. 3 mm. longo; ♀ floribus fructibusque ignotis.

WESTERN HUPEH: Patung Hsien, bush 2–6 ft., cliffs and rocky places, alt. 100–1000 ft., *Wilson* 3336 (HOLOTYPE, 2 sheets), 3335, March 24, 1908; Wushan Gorge, bush 3–4 ft., *Wilson* (Veitch Coll.) 3344, March 1908.

This plant does not closely resemble *S. leucopyrus* (Willd.) Muell. Arg. commonly found in the arid plains of India from Ceylon to Burma. *Securinega leucopyrus*, as shown by: *Leschenault* 102, Mts. de Cottalam sud de la peninsule de l'Inde; *Kanoth Yeshoda* 140, Hosur Taluk, South India; *Pierre s.n.* Galles, Ceylon; *Jacquemont* 775, in arenosis Hammerpoor; has ♂ flowers about one-half to one-third as large as those of the present species, borne in many-flowered, congested clusters with more or less flexuose pedicels, and resembles in habit the common *Securinega virosa*.

*Securinega acicularis*, *S. leucopyrus* and *S. virgata* (Poir.) Maire [*S. buxifolia* (Poir.) Muell. Arg.] are a closely knit phylogenetic group which ranges from Hupeh to Portugal and has some affinity with peculiar endemics of arid southwestern United States, namely, with *Halliophytum fasciculatum* Johnst. and its allies. The range: Iberian Peninsula - Central China is shared by other *Euphorbiaceae*, for instance by *E. isatidifolia* Lam. (N. E. Spain); *E. Wallichii* Boiss. (Himalayas,

Yunnan); *E. Pallasii* Turcz.,<sup>1</sup> which species are also related to *E. Darlingtonii* A. Gray (N. E. United States); and *E. ebracteolata* Hay. (Japan).

Hutchinson and other authors keep *Fluggea* and *Securinega* distinct. I accept instead the concept of Pax & Hoffmann who have reduced (Nat. Pflanzenfam. 19[c]: 60. 1931) the former to the latter. The group of genera around *Securinega* is in need of a fundamental revision.

#### GLOCHIDION Forst.

##### **Glochidion silheticum** (Muell. Arg.), comb. nov.

*Phyllanthus silheticus* Muell. Arg., Flora 48: 378. 1865; DC. Prodr. 15<sup>2</sup>: 297. 1866.—Hooker f., Fl. Brit. Ind. 5: 327. 1887.

Hooker lists *P. silheticus* among the imperfectly known and doubtful species, and says "I do not recognize this" despite the fact that the type of the species is a specimen of his own collection. I could not trace this type in the Kew herbarium, but found in the herbarium of the Museum of Natural History of Paris a specimen, *Bradleia* (9) *Silhet* J. D. Hook., determined by Mueller Arg. himself, which perfectly agrees with the description and, if not the holotype, is certainly an isotype.

This specimen, fragments of which were secured through the generosity of Prof. H. Humbert, agrees closely with two Chinese collections, namely YUNNAN: Szemao, forests 4500–5000 ft., tree 20 ft. spreading, red flowers, *Henry* 11929, 11929A.

*Glochidion silheticum* is closely related to *G. dasyphyllum* C. Koch, as Hara and myself have interpreted it (Jour. Jap. Bot. 26: 317. 1940), and in a final revision of this obscure group may prove to be a synonym of this species. Attention is called upon our discussion of the generic validity of *Glochidion* (op. cit., 315).

<sup>1</sup>In a recent work on the Euphorbieae of Eastern Asia (Jour. Jap. Bot. 6: 345. 1940), Hurusawa has preferred *E. Fischeriana* Steud. to *E. Pallasii* Turcz., mistakenly assuming that Turczaninov's publication of this binomial is a *nomen nudum*. This publication, on the contrary (Bull. Soc. Nat. Moscou 11: 100. 1838) definitely refers to *E. verticillata* Pall. as synonym, showing that Turczaninov was aware of the previous publication of *E. verticillata*. Pallas himself did not publish *E. verticillata* but referred to this plant in herb. as *E. macrorhiza*. Turczaninov erred in attributing the authorship of the binomial to Pallas, but this *lapsus* has no vital bearing upon the fact that *E. Pallasii* Turcz. is a nomenclatural transfer, not a *nomen nudum*, which antedates the publication of *E. Fischeriana* Steud. by three years. The validity of the transfer effected by Turczaninov is recognized by Litvinov (Sched. Herb. Fl. Ross. 8: 97–98. 1922), who, nevertheless, accepts *E. verticillata* Fisch. on the ground that *E. verticillata* Vell. and *E. verticillata* Desf. are "*nomina abortiva*." Litvinov's interpretation, of course, is not valid under the Rules of Nomenclature now in vigor.

**Glochidion eriocarpum** Champ., Kew Jour. Bot. 6: 6. 1854.

*Glochidion villicaule* Hooker f., Fl. Brit. Ind. 5: 326. 1887.—Handel-Mazzetti, Symb. Sin. 7: 225. 1931, *pro maxima parte, syn. nov.*

*Glochidion Esquirolii* Lévl. in Fedde, Repert. 12: 186. 1913.

I have seen the holotype of *G. villicaule* in the herbarium at the Botanical Garden at Kew. It is a specimen of Anderson, collected "at the Silver Mines," Burma, and it is identical with classic material of Champion's widespread and very common species; with *Handel-Mazzetti* 5945 and with *Cavalerie* 3536, which last was determined by Beille as *G. velutinum*.

*Glochidion velutinum* of Beille and Gagnepain (in Lecomte, Fl. Gén. Indo-Chine 5: 624. 1927) is a mixture of hairy species of *Glochidion* but is prevailingly based upon *G. eriocarpum*. One of the specimens cited by Beille, Tonkin: Yeng-khé, Bon (in herb. 1705. 1882), now in our herbarium, is an excellent sample of Champion's species.

**Glochidion oblatum** Hooker f., Fl. Brit. Ind. 5: 312. 1887.

*Bradleya* 15 collected by Hooker & Thomson in Khasia and distributed without a Kew number, is the same as Griffith (Kew No. 4853), from the Sikkim Himalaya, the type of *G. oblatum*. This species is not uncommon in subtropical southwestern China. It is represented in our herbarium by: YUNNAN: mountains southeast of Mengtze, alt. 4000 ft., shrub 8 ft., *Henry* 10755; Nan-chiao, alt. 1450 m., 6 ft., in forest, *Wang* 75205; Fo-Hai, woody plant 15 ft., alt. 1540 m., *Wang* 74218.

The record is new for China.

## BREYNIA Forst.

**Breynia hyposauropus**, sp. nov.

Frutex, habitu phyllanthoideo, totus glaberrimus; ramulis (scilicet: ramulis veris inflorescentisque foliosis) in axillis stipularum triangulari-subulatis, singulis vel paucis fasciculatis. Foliis (revera bracteis foliariibus) vulgo 2 cm. longis, 1 cm. latis, ellipticis, membranaceis, supra brunneis, subtus griseo-glaucis, margine more generis integerrimis, apice basique rotundatis, venis simplicibus, tenuibus, 3-4-jugis, petiolo minimo, ad 1.5 mm. longo, basi stipulis 2 setaceis parvis armato. Floribus ♂ campanulatis, 2.5-3 mm. magnis, perianthio margine 5-lobulato, lobis rotundatis, columna staminali 3-dyma crassiuscula, ca. 2 mm. longa; floribus ♀ late campanulatis, ad 6 mm. latis, 3 mm. longis, lobis ovatis vel quadrangulato-ovatis, apiculatis, columna stylari 1.5-2 mm. longa, stigmatibus patentibus, more generis arcuatis. Fructu (*Ching* 6814) capsulari, ca. 1 cm. magno, epicarpio rufobadio, tenui, calyce vix accrescente.

KWANGSI: Loh Hoh Tsuen, Lin Yuin Hsien, "on slope, 1150 m., shrub with yellow flowers," *Steward & Cheo* 434, May 17, 1933; Tsin Hung Shan, N. Hin Yen, "shrub 3 feet, common, fruit orange yellow globular," *R. C. Ching* 6814, August 11, 1928. (LU).

Originally distributed either as *B. cernua* Muell. Arg. or as *B. rhamnoides* Muell. Arg., the present species differs from the former in the longer styles, in the larger capsule, in the differently shaped ♀ calyx, in the broader and longer leaves. It is much to be doubted that *B. cernua* reaches China or any of its islands; none of the Chinese specimens which I have seen determined under this binomial agrees with the holotype of *Melanthesa cernua* Decne. (?Riedlé: Timor) which is a full match of: *Neth. Ind. For. Service hb.* 1785: *Timor*, 1933 (optime! det. Van Steenis: *Breynia cernua* [Decne] Muell. (Arg.). *Breynia rhamnoides* (Willd.) Muell. Arg. has a very different ♀ calyx (*Perrottet, Pondichéry; Voigt, Serampore; etc.*) and larger leaves. *Breynia hyposauropus* is easily separated from *B. officinalis* Hemsl. (*Oldham* 484: Tamsuy, Formosa) by its much larger ♀ calyx and ♂ flower. It resembles *B. patens* (Muell. Arg.) Hook. f. [*Roxburgh: Phyllanthus patens; Wallich* 7911 C; *J.D.H. & T.T.: Mount Khasia*], but this last has larger and more acuminate leaves, and a much more accrescent calyx.

#### SAUROPUS BL.

**Sauropus Pierrei** (Beille), comb. nov.

*Breyniopsis Pierrei* Beille, in *Lecomte, Fl. Gén. Indo-Chine* 5: 630, fig. 75, 1-9. 1927.—Pax & Hoffmann, *Nat. Pflanzenfam.* 19(c): 58. 1931. *Sauropus grandifolius* sensu Beille, op. cit. 648. [*excl. planta yunnanensi et varietate*]. Non Pax & Hoffmann.

Beille separates *Breyniopsis* from *Breynia* (op. cit., 236. 1925) in a key, stating that *Breyniopsis* has spreading outer sepals and inflexed inner sepals while *Breynia* has all inflexed sepals. *Sauropus* is keyed by him separately with *Agyneia*, these two genera supposedly having sepals with a basal appendage that surrounds the androecium.

Pax & Hoffmann have voiced the suspicion that *Breynia* and *Breyniopsis* are synonymous (op. cit., 59) but, in this as in too many other cases, they have failed to secure authentic material to decide the issue. Fortunately, I have seen all the specimens of *Breyniopsis Pierrei* preserved in the Herbarium of the Museum of Natural History of Paris, and have secured for our herbarium: *Pierre* 1792: Cochinchina, Baochang 1877; *Poilane* 2442: same Province, without locality, 1925; *Evrard* 110: Cochinchina, Trang Bom near Bienhoa, which bear

Beille's own determination and have been cited in the original publication. Two other collections representing this same plant in our herbarium are: *Poilane 18173*: Annam, Mt. Nam Ray, Prov. Kontum, in a bamboo forest at 1800 feet; *Poilane 19566*: Cochinchina, on the road to the mountain-pass No. 20 near Song Lagna, prov. of Bienhoa.

Beille has determined and cited (op. cit., 648) as *S. grandifolius* Pax & Hoffmann, a specimen of Pierre from Cochinchina, s.l., which I am unable to separate from the specimens from the same region that are typic of *Breyniopsis Pierrei*. The true *S. grandifolius* is a plant of Yunnan, typified by a Henry collection from Szemao, which is hardly distinct from *S. longipedicellatus* Merr. & Chun from Hainan. This plant has little in common with the material from Cochinchina, which Beille treats as *S. grandifolius*, but fully agrees with: *Balansa*: Tonkin, Valley of Langkok, Mt. Bavi (*sic*); which Beille elects as the type of a trinomial, *S. grandifolius* var. *tonkinensis*.

It is not surprising that Beille himself should fail to extricate *Breyniopsis* from *Sauropus*. The limits between *Breynia* and *Sauropus* are as ill defined as those between *Glochidion* and *Phyllanthus*, *Mallotus* and *Macaranga*, *Croton* and *Julocroton*. These genera, in fact, are purely natural groups, which cannot be circumscribed. *Glochidion*, *Macaranga* and *Julocroton* rest upon tradition and intangibles; they are "good" in one region and "bad" in another; were they treated with the concept now ruling the classification of *Euphorbia*, they would barely be considered worthy of sectional rank. The belief that "good generic characters" exist which actually separated *Breyniopsis* from *Breynia* and *Sauropus* is grounded upon a misconception. *Breynia* and *Sauropus* may be kept separate as are kept separate, e.g., *Phyllanthus* and *Glochidion*, that is to say, for the sake of taxonomic convenience and of traditional values, but *Breyniopsis* cannot be rescued from synonymy, as it is practically identical with *Sauropus*. The phylogenetic background of the Euphorbiaceae is unlike that of other families, the Magnoliaceae for instance, a genus of which is prevailingly a clean cut dead-end of evolution. Every one of the major aggregates of the Euphorbiaceae, flows — as it were — into one or more others, and every one of them ultimately stands up or falls because it is intuitively perceived to be phylogenetically and systematically incompatible with its next of kin. On account of the peculiar evolution of the Euphorbiaceae certain characters are valuable for their classification which may not be at all important for the classification of other groups. The inflorescence, for instance, is relevant to a sound treatment of this family, which Bentham & Hooker have not failed to emphasize (Gen. Plant.

3: 241. 1883). Contrarywise, characters that are unimportant for the taxonomy of the Euphorbiaceae are of great moment for the classification of other families. Classification is a form of art, that is to say an intellectual activity which freely uses a few constant and fundamental principles, endlessly varying their application as the circumstances and the nature of things themselves dictate. *Breyniopsis* that relies for its separate status as a genus upon minor details of the style and of the calyx, if such indeed are not ephemeral, might, perhaps, stand up as a genus of the Olacaceae, of the Magnoliaceae, of the Celastraceae and the like. It conspicuously fails as a genus of the Euphorbiaceae.

**Sauropus Delavayi**, sp. nov.

Frutex minusculus, vix ultra 15 cm. altus, at bene lignosus, glaberri-mus, caulibus hypogeis crassitie pennae anserinae vel digiti minoris, ramulis novellis vulgo quadrangulis, sub lente tenuiter alatis vel costu-latis, levibus. Foliis orbicularibus vel quadranguli-orbicularibus, supra brunneis, subtus glaucescentibus saepius emarginatis, maximis 10–12 mm. longis, 6–8 mm. latis, crassiusculis, margine incrassatis, venis utrin-que more *Phyllanti Urinariae* acerrimis, patentibus, sub margine laminae liberis, pluries dichotomis, petiolo crassiusculo vix 1.5 mm. longo, basi bistipulato, stipulis late triangularibus ca. 0.7 mm. magnis. Floribus ♂ minimis, in alabastro 0.3–0.5 mm. magnis; floribus ♀ 3 mm. latis, lobis late ovatis, carnosus, profunde partitis, quapropter imbricativis, ovario globuloso vix 1 mm. magno, stylis more generis adpressis, stig-matibus apice recurvis.

YUNNAN: without exact locality, *Delavay* 2845, ? 1887.

I believe that this is the specimen cited by Beille (in Lecomte, Fl. Gén. Indo-Chine 5: 655. 1927) under *S. orbicularis* Craib, from Yunnan, without name of collector, as the type of the new species secured from the Museum of Natural History of Paris, bears Beille's mss. determina-tion: *S. orbicularis* Craib. This determination is an error, because *S. orbicularis* (*Kerr* 2635) is an altogether different plant, with leaves at least three times as large as those of the Delavay collection and of a very different texture and aspect. The new species is close to *S. con-cinnus* Coll. & Hemsl. (*Collett* 818) in the texture and size of its leaves, but this last has altogether different veins, which anastomose at the margins instead of ending in almost straight, free, and many-branched tips.

ANTIDESMA Burm. f. ex L.

**Antidesma pseudomicrophyllum**, sp. nov.

Frutex intricatim ramosus ad 3 m. altus, innovationibus pube adpressa

setulosa brunneo-discolori more generis indutis, vetustioribus glabris, griseis, rugulosis. Foliis pro genere minoribus, discoloribus, glaberrimis, integris, elliptico-lanceolatis, ligulatis, apice acuminatis vel sublinearilanceolatis, 8–4 cm. longis, 1–0.8 cm. latis, venis tenuibus 6–8-jugis utrinque obviis, latissime patentibus subhorizontalibus, anastomosatis, petiolo 2–3 mm. longo. Fructu unico viso, ellipsoideo, complanato, 5 mm. longo, 3 mm. lato, nigro-brunneo, stigmate subterminali.

HAINAN: Po-ting, in forest, shrub 3 m., *S. K. Lau* 28228, November 1936.

Although the specimen is incomplete, it is clear that a form of the aggregate very indifferently classified in herbaria as *A. japonicum* S. & Z. is not involved. The Formosan endemic species of *Antidesma* are also excluded by manifest vegetative characters. *Antidesma microphyllum* Hemsley of southeastern China and northern Tonkin is the species that *A. pseudomicrophyllum* Croizat more nearly suggests, the difference being that in Hemsley's species the primary veins are distinctly ascending, while in the new species they are very broadly spreading, the anastomoses being arranged subparallel with the margins of the leaf.

#### CROTON L.

##### **Croton Chunianus**, sp. nov.

Frutex 2 m. altus, innovationibus pube fasciculata subsimplici setososcabridis. Foliis pallide brunneis, verticillatis, firme chartaceis, lanceolatis, apice cuspidato-caudatis, basi coarctato-repandulis, subintegris 12–3 cm. longis, 8–2 cm. latis, pilis fasciculatis secus nervum medium gracilem exceptis glaberrimis, venis ca. 10-jugis gracillimis, late patentibus, penninerviis, anastomosatis, reticulum laxum efformantibus, petiolo brevissimo, hispido ca. 0.5 cm. longo. Cymis brevibus, depauperato-paucifloris (an semper?) ad 6 cm. longis. Flore ♀: pedicello hispido 3 mm. longo, lobis ellipticis acuminatis, margine subherbaceis, costulatis, integris, 2 mm. longis, 1 mm. latis, petalis exacte triangularibus, lobis dimidio brevioribus; ovario levi ellipsoideo, stylis 3 in columnam coalitis, apice breviter partitis, stigmatibus capitato-bilabiatis. Capsula globosa, levissima, coriacea, ca. 5 mm. magna. Caetera desiderantur.

HAINAN, Loktung, in dense woods, shrub 2 m. tall, *S. K. Lau* 27012, June 1936.

Very near *C. dongnaiensis* Gagn., which has less narrowly elliptic leaves and a tomentose lepidote capsule. It appears to belong in the sectional affinity of *C. Verreauxii* Baill., an Australian species which Baillon selected as the type of section GYMNOCROTON (Étud. Gén.

Euphorb. 356. 1858), but which Mueller Arg. unjustifiably reduced (DC. Prodr. 15<sup>2</sup>: 620. 1866) to his own section *EUCROTON*.

***Croton Merrillianus*, sp. nov.**

Frutex 1.5 m. altus, apicibus totis pallide ochraceo-tomentosis. Foliis elliptico-lanceolatis, longe acuminatis, basi coarctata subrotundatis, 14–4.5 cm. longis, 7–2 cm. latis, integris, suboppositis, verticillatis, supra nitidiusculis levissimis pallide cinereo-viridibus, subtus pube stellata modice conferta ochraceo-cinereis, venis ca. 9-jugis, utrinque obviis, adscendentibus, anastomosatis, trabeculis eminentibus; petiolo validiusculo tomentoso 3–1 cm. longo, stipulis subsetaceis ad 0.5 cm. longis, glandulis 2, ceraceis, substipitatis. Cyma quoad visa 3 cm. haud excedente, certissime longiora, tomentosa, ♂ tantum. Flore: staminibus ca. 15 inflexis, calyce 5 mm. lato, 2.5 mm. longo, lobis ellipticis ca. 2 mm. longis, 1 mm. latis, filamentis glabris nigris.

HAINAN, Po-ting, 900 ft., in forest, leaf lustrous above, *F. C. How* 73181, July 1935.

Although the type-specimen is incomplete, the generic disposition under *Croton* is made certain by the inflexed anthers, venation, by the glands at the apex of the petiole that are stipitate, by the pubescence, and by more intangible characters. I know of no species from eastern tropical Asia that can be said to be close to the present one. It might be that *C. Merrillianus* is related with *C. Hutchinsonianus* Hoss. and with the Indo-Chinese and Siamese species of the latter's affinity. *Croton Hutchinsonianus*, however, is subsilvery and, at any rate, more definitely tomentose than the present species.

***Croton Hookeri*, sp. nov.**

*Croton khasianus* Hooker f., Fl. Brit. Ind. 5: 392. 1887, in observ. sub *C. Griffithii*. *Nomen provisorium*.

*Croton laevifolius* Hooker f., op. cit., 393. *Non* Blume.

I have so far seen only one Chinese specimen, namely: YUNNAN: mountains south of Szemao, 4500 ft., tree 20 ft., *Henry* 12106. The binomial proposed by Hooker for this entity is a *nomen provisorium* not allowed by the Rules of Nomenclature now in vigor.

Article 37 *ter* (Proc. Sixth Intern. Bot. Congr., 365–6. 1936) statutes: "A name of a taxonomic group is not validly published unless it is definitely accepted by the author who published it. A name proposed provisionally (*nomen provisorium*) in anticipation of the eventual acceptance of the group, or of a particular circumscription, position or rank of a given group, or merely mentioned incidentally is not validly published."

Hooker took up *C. laevifolius* Bl. for a Khasian plant of Wallich's collection, following the lead of Mueller Arg. (DC. Prodr. 15<sup>2</sup>: 619. 1866), without having seen Javanese or Sumatran material. Then, in the publication of *C. Griffithii* sp. nov. he added, in a note: "A solitary specimen of Griffith's from Malacca (Kew Distr. 4799) has the very slender racemes of *C. laevifolius* and lepidote ovaries. It is possible that this is true *laevifolius* of Blume; and if so, the Khasian plant so called should bear the name of *khasianus*."

It is patent that what Hooker did was:

(a) To take up *C. laevifolius* Bl. for a Khasian plant, with question, which as such is a legitimate procedure.

(b) To propose for this plant a new binomial, *C. khasianus*, to be in force only *if* the cited specimen of Griffith from Malacca should prove to be *C. laevifolius* Bl., and not *C. Griffithii* or any other species.

Thus Hooker proposed *C. khasianus* in "anticipation of the eventual acceptance of the group," leaving it meanwhile to other taxonomists to decide whether this group had been covered or not by the earlier publication of *C. laevifolius*. In so doing, Hooker offered these taxonomists a *nomenclatural alternative* which might *automatically* be voided by the discovery that the cited specimen of Wallich was, indeed, *C. laevifolius*.

The fact that Hooker published a *nomen provisorium* to be possibly applied to the Khasian plant is flagrant, and this name cannot be used, as it originally appears, because a taxonomist who uses it violates Art. 37 *ter*. There may be a question whether I should legitimate *C. khasianus* under my own authorship, in order to preserve, somehow, the epithet of Hooker. The doctrine of legitimation of invalidly published circumscriptions is admittedly in need of elucidation. It is my personal opinion at present that any name, binomial or trinomial, published in *direct violation* of the word and spirit of an accepted article of the Rules cannot, and should not ultimately be healed by the action of another author. Validations of this nature involve at least an element of confusion and controversy in the citation of the valid binomial, as there is doubt now whether the primary author of the binomial is the validator or the validee. On the other hand, if the invalidly published name or epithet is allowed to lapse into the synonymy of a new, validly published one, no confusion of citation results, and the spirit of Article 37 *ter*, which *for just cause* forbids the use of *nomina provisoria*, is respected.

*Croton Hookeri* is very near *C. laevifolius* and there would be a serious question as to its being specifically distinct if the ranges were contiguous. The form represented by *C. laevifolius* is widespread in tropical eastern

Asia, and much critical study remains to be done before the species of this exceedingly difficult group are properly defined and understood.

**Croton euryphyllus** W. W. Smith, Not. Bot. Gard. Edinb. **13**: 159. 1921.

*Croton Cavaleriei* Gagnepain, Bull. Soc. Bot. France **68**: 550. 1922.

*Croton caudatiformis* Handel-Mazzetti Anzeig. Akad. Wiss. Wien, **62**: 225. 1925; Symb. Sin. **7**: 217. 1931.

The synonymy is established upon types or classic specimens seen in the Museum of Natural History of Paris or available in our herbarium. *Croton euryphyllus* varies much in age and in season, and the differences which, according to Handel-Mazzetti, separate it from *C. caudatiformis*, are of no moment. *Croton euryphyllus* has the hard, large capsule of *C. caudatus*, but does not seem to be very near this species. It is not comparable with *C. Tiglium* L. The following are cited as illustrative specimens: YUNNAN: Mengtze, woods, alt. 4700 ft., tree 20 ft., Henry 10867; region of Tungshan, Yangtze Drainage Basin, east of Likiang, Rock 10471, 1923.

**Croton yunnanensis** W. W. Smith, Not. Bot. Gard. Edinb. **13**: 159. 1921. — Handel-Mazzetti, Symb. Sin. **7**: 218. 1931.

*Croton Duclouxii* Gagnepain, Bull. Soc. Bot. France **68**: 553. 1922.

This synonymy, like that of the preceding species, is established after comparison of types or of classic specimens. The following two collections are worthy of mention: YUNNAN: Yangtze watershed, District of Likiang, Rock 3907, 1923; SZECHUAN, north of Yenyuen, Handel-Mazzetti 2794, 1914.

**Croton kongensis** Gagnepain, Bull. Soc. Bot. France **67**: 555. 1921; in Lecomte, Fl. Gén. Indo-Chine **5**: 287. 1925.

This species appears to be very common in certain regions of southwestern tropical China. It is represented in our herbarium by the following collections among others: YUNNAN: Szemao, forests, alt. 4000 ft., shrub 8 ft., Henry 12917, 12917A; Chen-Kang-Hsien, alt. 2000 m., bush 5 m., common, Wang 71705, 1936; Tsang Yuan, alt. 1500 m., height 1 m., Wang 73294, 1936; Fo-Hai, alt. 975 m., woody plant 8 ft., Wang 74615, 1936.

The Yunnan plant is identical with that of Laos which was used to typify the binomial. The specimen cited by Gagnepain for Cochinchina: Mt. Din, Pierre s.n., is possibly *C. argyratus* Bl., with which *C. kongensis* is easily confused.

The record is new for China.

## MALLOTUS Lour.

**Mallotus conspurcatus**, sp. nov.

Frutex (e collectore), innovationibus pube stellato-pulverulenta badia detergibili mox decidua indutis. Foliis  $16 \times 12$ ,  $9 \times 7$  cm. magnis, firmis, subcoriaceis, ovatis, subintegris, breviter cuspidatis, bene peltatis, ad petioli insertionem glandulis parvis ad 6 notatis, supra brunneis, levibus, subtus indumento stellato rubro-brunneo, glandulis minutis luteo-ceraceis suboccultante, venis 5–8-jugis arctius adscendentibus, primo jugo in venulis ad 5 cm. longis utrinque ad marginem abeunte, quam media lamina multo longiore; petiolo tomentoso ad 9 cm. longo. Floribus ♂, ♀ ignotis. Inflorescentia sub fructu ad 15 cm. longa, capsulis congestis, globulosis, ad 1.5 cm. magnis, processibus filiformibus tomento stelligero indutis confertissime echinato-lanosis, pedicello vix 3–5 mm. longo. Semine ad 5 mm. longo, 4 mm. lato, testa verrucosa, arillo tenuiori badio tecto, hilo rapheque externo conspicuis.

KWANGSI, Pin-Lam, shrub in woods by hill, *S. P. Ko 55683*, September, 1935.

A species unlike any other known to me from continental China. It somewhat resembles an unnamed plant from Hainan, but this (*How 72987*) has manifestly tricoccus capsules with a thin indument and few flowered ♀ cymes.

**Mallotus Metcalfianus**, sp. nov.

Arbor 5–7 m. alta, innovationibus pube minuta stellata laete rubiginosa demum decidua indutis. Foliis  $25 \times 17$  ad  $11 \times 9$  cm. magnis, firme membranaceis, ovatis vel triangulari-ovatis, margine laxo dentatis ad subintegris, leviter peltatis, ad petioli insertionem glandulis 2–3 parvis notatis, supra glabris, brunneis vel badiis, interdum impresso-rugosis, subtus tomento confertissimo badio-rubiginoso indutis, glandulis ceraceis nullis, venis optime penninerviis 7–10-jugis, petiolis 5–10 cm. longis. Floribus ♂, ♀ ignotis. Inflorescentia ♀ sub fructu conferta valida ad 25 cm. longa, 5 cm. crassa, *Typhae* capitulum quemadmodum admonente, capsulis processibus stellato-tomentosis echinatis, ad 15 mm. magnis.

TONKIN: Tu-Phap, “arbre de 5–6 mètres de hauteur dans les bois,” *Balansa 3320*, September 1886.—KWANGSI: Foo Lung, Sup Man Ta Shan, tree 7 m., in shaded and dense woods along streamside, *H. Y. Liang 69716*, July 16, 1937.

This plant is probably included in Gagnepain's concept of *M. ricinoides* Mueller Arg. as he cites (in Lecomte, *Fl. Gén. Indo-Chin.* 5: 356. 1925) a Balansa specimen from Tu-Phap, without giving its num-

ber. The type has remained for a long time in our herbarium under Mueller's binomial and I have regarded it as an extreme form of that very variable species, unlike anything else collected from eastern tropical Asia. The Liang specimen has been eventually found to match the Balansa collection so perfectly as to leave no doubt that the very same plant occurs in Tonkin and Kwangsi, which provinces are known to form a single floristic domain.

*Mallotus Metcalfianus* is intermediate among three other species, namely, *M. tetracoccus* Kurz, *M. Lianus* Croiz., *M. ricinoides* Muell. Arg. It might be considered as a variety of any one of them if a broad concept of specific limits were to be followed. To follow such a concept is clearly not advisable in the present case as this would involve a general revision of *Mallotus* which largely consists of forms with a restricted range tending to merge gradually with one, or more of their nearest allies. *Mallotus Metcalfianus* has in fruit a much stouter and much closer ♀ inflorescence than *M. ricinoides*, differently colored indument and coarser vegetative parts; it differs from *M. Lianus* and *M. tetracoccus* in the much thicker indument of the capsule and in intangibles of the vegetative organs.

*Croton mollissimus* Geisel, which I have discussed in a previous note without having seen the type (Jour. Arnold Arb. 19: 141. 1938) is correctly treated by Mueller Arg. (DC. Prodr. 15<sup>2</sup>: 964. 1866) as a synonym of *M. ricinoides*. The type of *C. mollissimus* shows that the Geiseler's note (Croton. Monogr. 74. 1807) "Flore masculi cum foemineis mixti" is the result of an error of observation, the young fruits that Geiseler saw "growing" on the ♂ cyme of *C. mollissimus* having been glued at mounting. It is to be assumed that the report that *C. mollissimus* is a Chinese plant is due to an error or to a confusion in the notes of the collector. *Mallotus ricinoides* is not endemic to China.

It gives me pleasure to dedicate this species to Prof. F. P. Metcalf, to whose intimate knowledge of the flora of southeastern China I am indebted for the elucidation of many controversial issues which could not be decided by the study of herbarium material.

***Mallotus subjaponicus* (Croiz.), comb. nov.**

*Mallotus tenuifolius* Pax var. *subjaponicus* Croizat, Jour. Arnold Arb. 19: 138. 1938.

Frutex speciosus (fide Handel-Mazzetti). Foliis subintegris, plerumque tricuspidatis, tenuiter tomentosis ad glabrescentibus, ad 18 cm. longis, 15 cm. latis, petiolo vulgo 10 cm. longo. Floribus ♂, ♀ ignotis. Cymis sub fructu ad 10–15 cm. longis, capsulis ad 1 cm. magnis, processis

bus plus minusve tomentosis; semine ca. 5 mm. magno, columella fructu delapso 5–6 mm. longa.

? A *M. japonico* Muell. Arg. cymis integris, capsulis majoribus, indumento epicarpium molliore differt; a *M. tenuifolio* notis vegetativis, habitu inflorescentiae, habitu dignoscitur.

Ad specimina classica addatur: S. ANHWEI: Chu-hwa-san, R. C. *Ching* 2772 (L.U. H.K. 34055), in herb. Lingn. Univ.

The work now being done on the Euphorbiaceae of Fukien, Kwangtung, and adjacent provinces has demonstrated that it is advisable to elevate this variety to species. Its characters, critically studied on the background of *Mallotus* in the whole of southern China, with much additional material available, prove to be adequate for the presentation of an independent binomial.

***Mallotus tetracoccus*** Kurz, Jour. As. Soc. Beng. 16: 245. 1873.—Alston in Trimen Handb. Fl. Ceyl. 6: 267. 1931.

*Mallotus albus* Mueller Arg., Linnaea 34: 188. 1865 and DC. Prodr. 15<sup>2</sup>: 965. 1866, *saltem p.p.*—Hooker f., Fl. Brit. Ind. 5: 429. 1887.—Pax & Hoffmann, Pflanzenr. 63 (IV. 147. VII): 168. 1914.—Gagnepain in Lecomte, Fl. Gén. Indo-Chine 5: 353. 1925.—Croizat in Jour. Arnold Arb. 19: 144. 1938.—Non *Rottlera alba* Roxb.

Alston has called attention to the fact that if Roxburgh's original specimen of *Rottlera alba* was from Penang, it could not typify *Mallotus albus* (Roxb.) Muell. Arg., but must be some other species, perhaps *M. barbatus*. Alston, accordingly, had reduced *M. albus* to *M. tetracoccus*.

The surmise of Alston is in the main correct. The isotype of *Rottlera alba* and Wallich 7818 E, in the herbarium of the Museum of Natural History of Paris, do not represent *M. albus* of Mueller Arg. and of the authors who have followed him. These two specimens belong to *M. paniculatus* (Lam.) Muell. Arg.: fragments kindly given by Prof. H. Humbert, director of the section of Phanerogamy of the Parisian Museum, are now preserved in our herbarium.

#### CLEIDION Bl.

***Cleidion xyphophylloides***, sp. nov.

Fruticulus (e collectore), innovationibus subfistulosis (i.e., medulla nulla, ligno duriusculo) glabris vel parcissime strigulosis. Foliis pro genere sat magnis, ad 30 cm. longis, 7–8 cm. latis, longe oblanceolatis, utrinque glabris vel subtus hinc inde pilis strigulosis perpaucis obsitis, margine distanter uncinato-denticulatis, dentibus apice callosis, venis camptodromis ad 12-jugis, basi in petiolum validum vix 5 mm. longum

brevissime coarctatis. Floribus ♂, ♀ ignotis. Capsulae coccis ad 1–1.5 cm. longis: epicarpio tenui, glabro, tenuissime rugoso, semine rotundato trigono, 8 mm. magno, brunneo, maculis ochraceis subleprosis marmorato; columella fructu delapso 1 cm. longa; pedicello ca. 12 mm. longo.

- HAINAN: without locality, small shrub in dense forest, flower yellow, *C. Wang* 34006, September 17, 1933; without locality, small shrub in shade, flower yellow, *C. Wang* 36745, January 15, 1934.

Although the material is very scanty and the specimens have been distributed as *Trigonostemon* I feel quite certain that *Cleidion* is the genus involved. The cymes of *Trigonostemon* have a more delicate and diffuse habit than those of the present specimens; in addition intangibles of leaf texture and aspect tend to rule out that genus.

*Cleidion Vieillardii* Baill. and *C. macrophyllum* Baill., both from New Caledonia, are the species known to me that in vegetative characters more closely approach *C. xyphophylloides*.

#### EPIPRINUS Griff.

##### ***Epiprinus hainanensis*, sp. nov.**

Frutex ad 3 m. altus, foliis ad internodia verticillatim aggregatis, innovationibus pube velutinoso stellata pallide lutea totis tomentosis, demum glabris, cortice subochraceo. Foliis pallide ochraceis discoloribus, adultis firme membranaceis, glabris, novellis membranaceis pube tenui stellata adspersis, 12–5 cm. longis, 7–3 cm. latis, basi subauriculatis, margine integris revolutis, repandulis, venis ca. 7-jugis, elevatis, arcuato adscendentibus, obscure anastomosatis, nervo medio valido, petiolis velutino-tomentosis, crassis, 0.5 cm. longis, ad basim glandulis 2 magnis atris sessilibus obsitis. Cyma bisexuali, illam *Crotonis* mentiente, ad 5 cm. longa. Floribus ♂ in cymulis Urticacearum more vix 0.5 cm. magnis aggregatis, minutissimis, calyculo glabro vix 0.75 mm. magno, antheris 3, sessilibus. Flore ♀ sessili, calyce velutino, pallide luteo, 2.5 mm. lato, 1.5 mm. longo, laciniis praesertim sub fructu utrinque ad basim biglandulosis, apice discretis, fimbriatis, 1 mm. longis, 0.5 mm. latis; ovario velutino, globoso-pyriformi, ca. 2 mm. magno, stylis 3, papillois, bifidis, iis *Malloti* simillimis. Capsula subglabra, pericarpio coriaceo, ca. 1 cm. magna, pedicello 5–7 mm. longo fulta. Caetera desiderantur.

HAINAN, Chung Ngo Shan (Ch'ang-kiang District), fairly common on dry, steep slope, sandy soil, rocky thicket, woody, erect; ht. 3 m., diam. 9 cm., *S. K. Lau* 3291, 1934; without exact locality, tree, 10 m.

high, in shady forest, ravine along stream, *H. Y. Liang* 65325, 1934; Yaichow, alt. 2400 ft., shrub in forests, in fruit, *F. C. How* 70700, 1933.

The bisexual cyme immediately distinguishes the new species from *Mallotus* which in vegetative characters it much resembles. The position and characters of the ♀ flower are altogether unlike those found in *Cleidion*. The characters of the ♂ flower and the bisexual cymes exclude *Macaranga*. The genus is new for Hainan, the nearest species, geographically speaking, being *E. Balansae* from Tonkin, which is a very different plant.

#### SAPIUM P. Br.

##### **Sapium Laui**, sp. nov.

Arbor 12 m. alta, tota glabra. Foliis membranaceis, elliptico-lanceolatis, longe acuminatis, basi subcuneato-rotundatis, margine integris, utrinque olivaceo brunneis haud glaucescentibus, 11–3 cm. longis, 6–2.5 cm. latis, venis tenuissimis ca. 10-jugis, primo jugo subtriplinervio, caeteris latissime patentibus, petiolo gracili 6.5–4.5 cm. longo, glandulis parvis patelliformibus primo intuitu a lamina ipsa discretis. Cyma tantum ♂ visa, habitu subcomosa, conferta, sub lente acri, bracteis floralibus ovatis, longe aristatis vel acuminatis, axi florigero 1.5–2 mm. crasso. Floribus fasciculato-glomerulatis ad 5 in axilla bractee cuiusvis, bractea ovato-setosa, seta ad 1.5 mm. longa, nectariis utrinque ellipticis, 2 mm. longis, 1 mm. latis, pedicello tereti haud clavato, 4 mm. longo, calyx ca. 1 mm. magno, antheris 2 globosis, 0.5 mm. latis.

HAINAN, Chim Fung near Fong Ngau Po Village, Kan-en District, *S. K. Lau* 5498, February 1935.

*Sapium discolor* Muell. Arg. as so far interpreted is a collective species with numerous local forms connected by intermediates. Compared with the type of *S. discolor* (*Wright*, Hongkong) *S. Laui* shows appreciable differences in the floral structure. The glands of *S. discolor* are only half as long as those of *S. Laui*; its floral bracts are bluntly apiculate while those of *S. Laui* are aristate, the cyme as seen under a moderate magnification having altogether different habit. Other differences in the vegetative parts are less striking, but they add weight to the belief that the present species is sufficiently unlike *S. discolor* to deserve segregation.

#### EUPHORBIA L.

##### **Euphorbia hainanensis**, sp. nov.

Frutex totus glaberrimus, 1 m. altus, innovationibus herbaceis fistulosis. Foliis integris tenuiter membranaceis, ellipticis, supra brunneo-viridibus, subtus discoloribus, apice rotundatis rarissime subemarginatis,

basi cuneatis subverticillatim congestis, 7–3 cm. longis, 2–1 cm. latis, nervo medio carnosulo validiusculo, venis ca. 4-jugis, subtus obsoletis, supra graciliter reticulatis, petiolo herbaceo 3–2 cm. longo, basi stipulis glandulosis obsoletis obsito. Inflorescentiis unifloris, ramos steriles (an tantum?) anthesi peracta e basi pedunculi edentibus. Cyathio exacte obconico, ca. 4 mm. magno, pedunculo 4 mm. longo in involucrem evadente, nectariis (glandulis) 3, 2 mm. latis, 1.5 mm. longis, pallide luteis, carnosis, ellipticis ad subreniformibus, margine integro omnino exappendiculatis; lobis quadrangularibus, ca. 2 mm. magnis, dorso carinatis, margine levissime ciliato-erosulis; ovario levissimo subgloboso, stylo 5 mm. longo, ad apicem breviter 3-partito; stigmatibus ca. 1 mm. longis, gynophoro valido sub fructu longe exserto, 7–5 mm. longo, reflexo, capsula ovoideo-trigona, ca. 6 mm. magna, semine immaturo globuloso, testa levi, 3 mm. magno, caruncula videtur nulla.

HAINAN, Loktung, shrub in dense woods, 1 m. tall, S. K. Lau 27036, June 1936.

A strongly characterized species, probably related to *E. sessiliflora* Roxb. and *E. Lacei* Craib from eastern tropical India, Siam and Indo-China, and to *E. Ridleyi* Croiz. (*E. Synadenium* Ridl.) from Penang. The new species may also be near *E. Brownii* Baill. and *E. corynocladia* F. v. Muell. from Northern Australia. Its affinities with *E. plumerioides* Teijsm. require further study. The group formed by the species mentioned has a relationship with species from Madagascar and adjacent islands (*E. pyrifolia* Lam., *E. Abbotii* Balf., etc.) but none with the strictly Asiatic phyla of the genus.

**Euphorbia Milii** Ch. des Moulins in Bull. Hist. Nat. Soc. Linn. Bordeaux 1: 27–30, pl. 1. 1826.—Desfontaines, Cat. Pl. H. Paris, edit. 3, 475. 1829.

*Euphorbia splendens* Bojer ex Hooker, Bot. Mag. 56: t. 2902. 1829.—Denis, Euphorb. Iles Austr. Afrique 82 (Rev. Gén. Bot. 34: 114) 1922.

Nothing can be done to rescue Bojer's well known binomial from synonymy. Denis' comment (op. cit. 83: 115) on the uselessness of reinstating the overlooked binomial of Charles des Moulins may suggest to its reader that the original publication of this binomial is in some manner inadequate or controversial. This is not the case; the description is excellent and very detailed, with text both in Latin and French and an illustration. *Euphorbia splendens*, moreover, was reduced to *E. Milii* by Desfontaines the very same year W. J. Hooker announced it.

Specimens determined as *E. splendens* or *E. Bojeri* (which last Denis does not consider as a distinct species) are preserved in several classic herbaria, but it is not known whether any of these specimens has holotypic status. The plants of this group are exceedingly polymorphous and the publications of their binomials were made from cultivated specimens, which, barring uncontrovertible evidence to the contrary, leaves the first given description and illustration as the type. No attempts ever seem to have been made to trace the material that may be preserved in the herbarium of des Moulins. *Euphorbia Milii* does not belong to sect. DIACANTHIUM.

The species of this affinity are being cultivated throughout the world as favorite ornamental plants and in some tropical countries they tend to become established as escapes. Under the binomial of Bojer they are listed in Asiatic floristic work (e.g., in Gamble, Fl. Presid. Madras 7: 1278. 1925) as introduced or adventitious.

*Euphorbia Milii* is almost certainly an ecospecies in the sense of Clausen, Keck & Hiesey (Carnegie Inst. Washington Publ. No. 520: vii etc. 1940), with many ecotypes and races, which are likely to be accepted sooner or later as taxonomic subspecies. *Euphorbia Bojeri* and *E. Hislopii* N. E. Br. are two of such ecotypes, while at least some of the species proposed by Drake del Castillo, for instance: *E. rubrostriata*, *E. melanacantha*, *E. platyacantha*, are apparently not better than races in the Turessonian sense.

CHAMAESYCE S. F. Gray, emend. Croiz.

**Chamaesyce pseudochamaesyce** (Fisch. & Mey.) Komarov, Oprel. Rast. D. V. K. 286. 1925.

*Chamaesyce humifusa* (Willd.) Prokh., Bull. Acad. Sc. URSS, sér. 6, 21: 195. 1927; Consp. Syst. Tith. Asiae Med. 16. 1933., *quoad plantam asiaticam, pro maxima parte*.

*Euphorbia pseudochamaesyce* Fisch. & Mey., Ind. Sem. Hort. Petrop. 9: 73. 1843.—Litvinov, Sched. Herb. Fl. Ross. 8: 95. (no. 2575) 1922.

*Euphorbia humifusa* Auct. fl. sin. *pro maxima parte*.

The differences of the testa are emphasized by Litvinov as the fundamental difference between *C. humifusa* and *C. pseudochamaesyce*. This may not be true in every case, but it is certain, nevertheless, that the Far Eastern plant is not like the plant of Hungary and Central Europe. The asiatic plant has a more robust habit, larger leaves and a somewhat larger capsule. I have cultivated the true *C. humifusa*, that is to say, the Central European and Hungarian plant [= *E. humifusa* Willd.]

and *C. pseudochamaesyce* from northern China side by side for four years and have reached the conclusion that these differences are constant and not negligible. Parallel forms, which are similar and yet quite distinct, frequently occur in *Euphorbia* sensu lato (e.g.: *E. segetalis* L., *E. portlandica* L., *E. azorica* Steud.; *E. Terracina* L., *E. obliquata* Forskh.) and the classification of these groups has been handled very differently by different taxonomists. In the present case it is convenient to follow Komarov and Litvinov in granting specific rank to the binomial of Fischer & Meyer, not less on phytogeographical grounds than as a preliminary step towards the classification of the large group of species to which this binomial belongs. While it is likely that *C. pseudochamaesyce* and *C. humifusa* are not distinct ecospecies, and that the former is merely an ecotype of the latter, *sensu* Turesson and Clausen, Keck & Hiesey (Amer. Jour. Bot. **26**: 103–6. 1939), it remains to be seen whether the concept of coenospecies and its subdivisions may be usefully applied to the taxonomic treatment of plants *which range all over two continents*.

In the last four years I have found no reason to alter my opinion that the segregation of *Chamaesyce* from *Euphorbia*, which I have effected with an emended description (in Degener, Fl. Hawaii., December 9th, 1936) is necessary as a preliminary to a better classification of the Euphorbieae. Sherff's bold footnote (Ann. Missouri Bot. Gard. **25**: 2. 1938) and his more sober comments of a later date on this segregation (Bull. Torrey Bot. Club **67**: 377. 1940) are not adequate ground for a scientific discussion. The age-old statement that the characters used to segregate *Chamaesyce* from *Euphorbia* are merely vegetative habit (Haber, Ann. Bot. **39**: 702. 1925, etc.) has been repeated by Hurusawa (Jour. Jap. Bot. **26**: 333. 1940) in the very recent past. This statement is based upon a fundamental misconception of what constitutes habit and upon the confusion of *habit* induced by edaphic factors with *habit* that depends upon anatomical and phyletic specialization. Von Veh found (Ann. Jard. Bot. Buitenz. **38**<sup>2</sup>: 155. 1928) that the "leaves" of *Chamaesyce* are homologous with the floral bracts of other Euphorbieae. Gaucher who has made the most complete investigation of the anatomy of Euphorbiaceae so far available clearly states (Ann. Sci. Nat. 8 sér. **15**: 293. 1902) his conviction that great anatomical differences separate *Chamaesyce* from the other species of *Euphorbia*, which differences are associated with weighty morphological characters. Gaucher presents *Chamaesyce* as a subgenus of *Euphorbia* remarking that he does so only because the floral structure of the Linnaean genus is very constant. The cyathium, of course, is as constant as a floral structure as the

capitulum of the Compositae, which inflorescence is not used by modern taxonomists to bring together all the genera of this family that resemble each other. In groups in which definite and strongly marked anatomical specializations take place in the stem and in the leaves (Cactaceae, Euphorbiaceae, Aizoaceae, Geraniaceae, etc.) a sound classification cannot restrict itself to an artificial selection of "floral" characters, neglecting other basic phylogenetic data.

If *Chamaesyce* is to be treated as a section or as subgenus of *Euphorbia* it is made imperative by the very concepts that suggest this lumping that *Croton*, *Codiaeum* and *Julocroton*; *Mallotus* and *Macaranga*; *Glochidion* and *Securinega*; *Stillingia* and *Sapium*; *Synadenium*, *Monadenium*, *Diplocyathium*, and *Euphorbia* are lumped together. A clear understanding of generic conceptual limits and of the need of the classification of the whole family is required to end the confusion in the taxonomy of *Euphorbia* of which Pax & Hoffmann rightly complain (Nat. Pflanzenfam. 19[c]: 209. 1931). A mere shift of subgenera, sections and the like, leaving at the same time, the old confused concepts to rule the field of classification of the Euphorbieae serves no useful purpose. The question is not that of liking or disliking "smaller generic units." *Chamaesyce* is not a small unit; it numbers about 600 species, that is to say one-third of the total of the species of *Euphorbia* sensu lato, which genus is one-fourth of the Euphorbiaceae, this family in its turn being fifth by order of importance among the Phanerogames. The question involved here is one that cuts deep into the very fundamentals of systematic botany and taxonomy and must be faced with a clear understanding both of the uselessness of effecting partial transfers based upon unsupported or ill-informed opinion and of the damages caused to botany by preconceived tenets. It is to be regretted that the preferences of local botanists, who are normally familiar with but few of the species out of the Linnean genus, cannot be considered in working out the classification of the Euphorbieae which are a pandemic aggregate of about 2500 species.

Work is now in progress to define and segregate the remaining major units of *Euphorbia* L. sensu lato. The genus, as now understood, falls in three main units of which *Chamaesyce* is one. A large body of opinion holds to the belief that *Euphorbia* in the Linnean sense should be broken up altogether and at the same time or not at all, and refuses to accept the validity of segregates which are effected without complying with this belief. It is sound taxonomy, undoubtedly, to accept novelties after a careful consideration of their truth and advantages. It is not to be easily understood, however, why the taxonomy and the



Howard, Richard A. 1940. "Studies of the Icacinaceae, I. Preliminary taxonomic notes." *Journal of the Arnold Arboretum* 21(4), 461–489.

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