

Unfortunately, as Schmidt intimated in his original diagnosis, the petals and the stamens can be found only in the unopened buds. However, Schmidt states that the petals were suborbicular and densely pilose up the center. The pedicels are only 0.5 mm. long.

Closely allied to *C. vaccinioides* is *C. ternstroemioides* which differs in its larger leaves (2.0–3.3 cm. long and 1.4–1.9[–2.2] cm. wide), glabrous on the under surface. In the latter species, the very young parts (branchlets and leaves) are appressed-pilose, later becoming glabrous. There are fewer leaves because of the longer internodes which are 5–6 mm. long as compared with the 2–3 mm. long internodes of *C. vaccinioides*.

16. *Cleyera ternstroemioides* (O. C. Schmidt), comb. nov.

Eurya ternstroemioides O. C. Schmidt in Rep. Spec. Nov. 24: 79. 1927.
Freziera ternstroemioides (O. C. Schmidt) Kobuski in Ann. Missouri Bot. Gard. 26: 355. 1938.

DISTRIBUTION: West Indies (Haiti).

HAITI: Massif de la Hotte, western group, Torbec, top of M. Formona, alt. 2225 m., *E. L. Ekman H 7487* (ISOTYPE of *Eurya ternstroemioides*, US), January 1, 1927.

Cleyera ternstroemioides is characterized by glabrous, coriaceous elliptic to obovate leaves, 2.0–3.3 cm. long and 1.4–1.9(–2.2) cm. wide, rotund at both ends, with the margin slightly dentate at the apex, punctate on the upper surface, the midrib sulcate above, the veins obscure on both surfaces. The branchlets and leaves are appressed-pilose at first, later becoming glabrous. The pedicels are about 1 cm. long. The petals are obcordate-orbicular, 8.5–10 mm. long and 8–9 mm. wide, densely pilose on the medial portion of the dorsal surface, ciliolate along the margin. The anthers are sparsely hirsute.

Closely related is *C. vaccinioides* which can be separated by its even smaller flowers (one-half), the appressed-pilose undersurface of the leaves and branchlets, the short internodes (2–3 mm.) and pedicels (0.5 mm.).

ARNOLD ARBORETUM,
HARVARD UNIVERSITY.

THE TRIBE PLUKENETHINAE OF THE EUPHORBIACEAE
IN EASTERN TROPICAL ASIA

LEON CROIZAT

Two specimens of Euphorbiaceae were found in the collections made by C. W. Wang in Yunnan, during 1938, which have a gross morphology suggesting that of *Tragia* L. A dissection made of their flowers shows that: (1) the ♂ perianth has three broadly triangular lobes, alternating with as many large triangular stamens, with an apical dehiscence and very short appendages; (2) the stamens stand upon a short column, without a central pistillode, and are surrounded by a slightly upraised, eglandular annulus, suggesting a similar structure commonly found in certain Asclepiadaceae of the Tribe Stapelieae; (3) the ♀ flower bears a style much thickened at the apex, without expanded stigmas.

Characters of this kind belong to several genera in the vicinity of *Tragia*, for instance, *Cnesmone* Bl., *Sphaerostylis* Baill., *Megistostigma* Hook f., *Clavistylus* J. J. Sm., *Cnesmon* Gagnep., and *Tragiella* Pax & Hoffm. Before the Wang collections could be determined all these genera had to be studied in detail, which necessarily entailed a consideration of the Tribe PLUKENETHINAE and its nearest allies. The result of this investigation proved to be fruitful of taxonomic and nomenclatural changes which are the subject of the present contribution.

In their latest work on the Euphorbiaceae, Pax & Hoffmann (Nat. Pflanzenfam. 19[c]: 141–148. 1931) includes *Cnesmon* among the genera of the MERCURIALINAE. It is not apparent why they should do this, since they remark "Die Gattung zeigt Beziehung zu *Cnesmone*", which is closely related to *Tragia*, the type-genus of the PLUKENETHINAE. *Tragia* alone numbers about 140 species, and the balance of the species of the tribe, about 40, are distributed by Pax & Hoffmann among not less than twenty genera, eleven of which are monotypic. Clearly, genera of this nature cannot be critically worked out unless by making reference to *Tragia*, of which they are bound to be comparatively minor segregates.

Tragia is a critical genus, which Pax & Hoffmann (Pflanzenr. 68[IV.147. IX–XI]: 32–101. 1919) divide into nine so-called sections. These nine sections very nearly fall into two natural groups. In one

be conspecific and perhaps even congeneric. At the very best, fully accepting the accuracy of Gagnepain's observations, *Cnesmon* could be maintained as a subsection of *Cnesmone* to include the species that have about reached a stage of evolution wherein their style *begins to look like* the style of certain species of *Tragia*. There can be no question of erecting two genera because the stigmas spread or fail to do so.

Cnesmone, as has been shown, differs from *Tragia* because it has appendaged anthers. Characteristically, *Cnesmon* is said by Gagnepain to differ from *Tragia* in the very same manner, that is to say, in carrying anthers that are appendaged. It is but a logical conclusion that *Cnesmon* is a synonym of *Cnesmone*, because none of the differences which are said to separate them has any value. It might be possible to treat *Cnesmone* as a subgenus of *Tragia*, denying generic validity to the presence or absence of the appendage in the anthers. Such a treatment, however, is neither necessary nor correct. *Cnesmone* is a good genus not because its anthers differ in some detail from those of *Tragia*. It is a good genus because it consists of species that are phylogenetically, phytogeographically and morphologically one unit, and form as such a natural group in the flora of eastern tropical Asia. It is conceivable that some of the species of *Cnesmone* may have anthers that are less manifestly appendaged than those of others, and that their position under *Cnesmone* may ultimately depend upon sums of intangibles rather than upon technicalities of floral morphology. Such technicalities have a very limited value in the Euphorbiaceae; were they stressed, every one of the fundamental genera of the family could be broken up into countless meaningless segregates.

I have not seen material of *Sphaerostylis Tulasneana* Baill. The classic illustrations of this species, prepared under the supervision of Baillon (Etud. Gén. Euphorb., pl. 21, fig. 19-21. 1858; in Grandidier, Hist. Madagascar 4[xxix]: pl. 196. 1890) are fortunately very clear. In view of what they show it is safe to conclude that *Tragiella* Pax & Hoffm. is merely a synonym of *Sphaerostylis*. The lobes of the ♀ calyx are manifestly pinnatifid in *Tragiella*, but they are at least toothed in *Sphaerostylis*. The peculiar coarctate ♂ perianth of the former is described by Pax & Hoffmann (op. cit., 104) as: "Calyx ♂ valvatum 3-partitum, parte inferiore campanulatum, ad faucem introrsum plicatum, lobi deinde patentem." The perianth of *Sphaerostylis* likewise is characterized by the two authors (op. cit., 106) as: "Calyx ♂ ultra medium valvatum partitum; lobi demum transversim introsum plicati, quasi discum simulantes." The lobes of the ♀ perianth are about 6 in both genera. The style of *Tragiella* is described as: "Styli in columnam infun-

dibuliformem, apice trilobam, vel in massam globosam connati," and that of *Sphaerostylis* as: "Styli in massam globosam, longitrossum trisulcam, ovario multo majorem connati, summo apice brevissime liberi." The differences in the stamens of the two genera are just as trifling as are those in the styles. In *Tragiella* the stamens are described as: "Stamina 3-4, alternisepala; filamenta brevina, basi incrassata et hic inter se connata; connectivum valde incrassatum; antherae introrsae, longitudinaliter dehiscentes; loculi paralleli. Ovarii rudimentum parvum evolutum, cum basi filamentorum connatum." In *Sphaerostylis* the stamens are said to be: "Stamina 3, alternisepala; filamenta fere nulla, in columnam connata; antherae in summa columna erectae, demum subreflexae, apiculatae; loculi introrsum contigui, paralleli, longitudinaliter dehiscentes. Ovarii rudimentum nullum." The presence of a pistillode, of course, is scarcely of significance in this tribe, because in the type-species of *Tragia* itself, *T. volubilis* L., the pistillode appears as: "Ovarii rudimentum nanum vel nullum" (see Pax & Hoffmann, op. cit., 48). In brief, since *Sphaerostylis* is based upon a plant from Madagascar, and the three species brought under *Tragiella* by Pax & Hoffmann range from South Africa to British East Africa, it may not be doubted that *Tragiella* is correctly treated as a synonym of *Sphaerostylis*, with which it agrees both in characters and in range. *Megistostigma*, which Pax & Hoffmann have reduced to *Sphaerostylis*, differs from this genus at least in respect to its range, to its more or less applanate ♂ perianths, to the entire lobes in its ♀ perianth. *Clavistylus*, which Pax & Hoffmann treat as a valid genus, with the note (op. cit., 104): "Genus certissime affine est *Cnesmonae*, sed non stimulosum; insuper differt disco ♂ evoluti, stylis foliisque peltatis," has much less to do with *Cnesmone* than with *Megistostigma*. Smith himself (in Meded. Dep. Landb. 10: 517. 1910) remarks that *Clavistylus* shares with *Megistostigma* the unisexual inflorescence and the characteristic disc of the ♂ flower, together with the thick columnar style. The difference between these two genera, Smith concludes, is that *Clavistylus* has peltate leaves, appendaged anthers, a 3-partite ♀ calyx and a style connate more extensively toward the apex. None of these differences has generic significance, and the new species described in the present contribution, based upon the Wang collections from Yunnan, is intermediate in its characters between the type-species of both *Megistostigma* and *Clavistylus*. It might be suspected that Pax & Hoffmann have not fully grasped the distribution and the morphology of these genera. They assume that *Cnesmone* has no disc, which is not the case. They bring together two monotypic genera based upon species endemic, re-

in French Indo-China. In India proper several species are known, one of which, *T. involucrata* L., appears to be the parent-form of several lesser segregates. In the anthers of *T. involucrata* the connective tends to be thicker than is usual in the genus, and the dehiscence may be introrse. However, *T. bicolor* Miq., which is near *T. involucrata* and like it is endemic in India, has thin filaments and small anthers that dehisce laterally and have no appendages. It seems well established that the Indian species are closely related to those of Africa. *Tragia*, consequently, enters the flora of tropical Asia to a small extent, as an overflow, as it were, of the large African complex under the genus.

(2) — *Cnesmone* Bl. (*Cnesmon* Gagnep., Syn. Nov.; *Tragia* auct. Non L.) — The great majority of the Euphorbiaceae of the Tribe PLUKENETIINAE endemic in tropical Asia and Malaysia belong to this genus. Technically, the anthers' structure, involving the presence of an appendage between the cells, is the generic character. The range extends from Yunnan, in S. W. China, to Malaysia.

(3) — *Megistostigma* Hook f. (*Clavistylus* J. J. Sm., Syn. nov.; *Sphaerostylis* auct. Non Baill.; ? *Tragia* auct. Non L.; ? *Cnesmone* auct. Non Bl.) — Close to *Sphaerostylis* Baill. (*Tragiella* Pax & Hoffm., Syn. nov.), which differs in range (Madagascar, east tropical Africa) and in structural details of the perianth, lobes and anthers. Reported, so far, in S. W. China (*M. yunnanense* Croiz. sp. nov.), in Malaya proper (*M. malaccense* Hook f.) and in the Sunda (*M. peltatum* (J. J. Sm.) Croiz. comb. nov.).

(4) — *Plukenetia* L. (*Pterococcus* Hassk.) — A nearly pandemic genus of less than 12 species ranging from America to eastern Asia through tropical Africa. Represented in Asia by one widespread species, *P. corniculata* Sm., with distribution N. E. India to eastern Malaysia.

These four genera can be keyed as follows:

Anthers numerous, fruit more or less winged. *Plukenetia* L.

Anthers (2-)3, fruit not winged.

Filaments not forming an appendage beyond the anthers, usually thin; styles spreading. *Tragia* L.

Filaments forming an appendage beyond the anthers, thick.

Stamens more or less triangular, apically dehiscent by a slit; styles thickened, more or less extensively connate or fused.
 *Megistostigma* Hook f.

Stamens ligulate to subclavate, with a manifest connective between the anther-cells, dehiscent laterally or introrsely; styles free or weakly connate. *Cnesmone* Bl.

Plukenetia L.

Plukenetia corniculata Sm. in Nov. Act. Upsal. 6: 4. 1799; Muell. Arg. in DC. Prodr. 15[2]: 772. 1866; Hook. f., Fl. Brit. Ind. 5: 464. 1887; J. J. Sm. in Meded. Dept. Landb. 10: 526. 1910; Merr. in Philip. Jour. Sc. 16: 564. 1920, Enum. Philip. Fl. Pl. 2: 447. 1923.

Pterococcus corniculatus (Sm.) Pax & Hoffm. in Pflanzenr. 68 [IV. 147. IX-XI]: 22. 1919; Merr. in Papers Mich. Acad. Sc. 24: 78. 1938.
Pterococcus glaberrimus Hassk. in Flora 25, Beibl. 41, 2: 41. 1842; Ridl., Fl. Malay Penins. 3: 309. 1924.

SPECIMENS SEEN:¹ *Rahmat Si Boeea* 7593 & 7827, east coast of Sumatra, 1935.

As noticed by Mansfeld (Kew Bull. 454. 1935) and by Merrill, *Pterococcus* Hassk. (1842) is a later homonym of *Pterococcus* Pallas (1776). Hasskarl's name is not worthy of being proposed as a *nomen conservandum*. The material seen strongly suggests at first sight a subherbaceous form of *Acalypha* L. The ♂ perianth is 4-partite, small, and has many stamens.

Tragia L.

Tragia Delpyana Gagnep. in Bull. Soc. Bot. France 71: 1027. 1924, in Lecomte, Fl. Gén. Indo-Ch. 5: 393. 1926.

SPECIMENS SEEN: *Thorel* 2205, Laos [isotype]; *Pierre* s.n., Cochinchina [isotype]; *Harmand*, delta of the Mekong.

This is the only authentic species of *Tragia* known to me east of India. The two subsessile stamens are very characteristic.

Megistostigma Hook f.

Megistostigma malaccense Hook. f. in Icon. 16: pl. 1592. 1887, Fl. Brit. Ind. 5: 467. 1888.

Sphaerostylis malaccensis Pax & Hoffm. in Pflanzenr. 68 [IV. 147. IX-XI]: 31, fig. 11 E, F-107. 1919; Ridl. Fl. Malay Penins. 3: 308. 1924.

Sphaerostylis glabrata Merr. in Papers Mich. Acad. Sc. Bot., 24: 78. 1938 [*quoad specimina Sumatrana. An: Cnesmone glabrata* Kurz?].

SPECIMENS SEEN: *Rahmat Si Boeea* 7186, 8780, 9864, east coast of Sumatra, 1935; *Rahmat Si Toroes* 1389, east coast of Sumatra, 1928.

Hooker's type-illustration is good, although the anthers it shows are

¹All the specimens cited belong to the herbarium of the Arnold Arboretum of Harvard University.

Cnesmone laotica (Gagnep.) Croiz. comb. nov.

Cnesmon laoticum Gagnep. in Bull. Soc. Bot. France 71: 867. 1924, in Lecomte, Fl. Gén. Indo-Chin. 5: 390. 1926.

SPECIMENS SEEN: *Thorel; Harmand* [Godefroy], Indochina.

Gagnepain describes six sepals in the perianth of this species, three of which are much smaller. Better collection may prove that *C. laotica* falls within the specific limits of *C. tonkinensis* or *C. anisosepala*.

Cnesmone linearis (Gagnep.) Croiz. comb. nov.

Cnesmon lineare Gagnep. in Bull. Soc. Bot. France 71: 867. 1924; in Lecomte, Fl. Gén. Indo-Chin. 5: 389. 1926.

SPECIMENS SEEN: *Thorel*, Indochina.

This, too, may prove to be an extreme form of the *C. tonkinensis* - *C. anisosepala* complex, with very narrow leaves.

Cnesmone peltata (Gagnep.) Croiz. comb. nov.

Cnesmon peltatum Gagnep. in Bull. Soc. Bot. France 71: 868. 1924; in Lecomte, Fl. Gén. Indo-Chin. 5: 392. 1926.

SPECIMENS SEEN: *Poilane 5493 & 8349*, Indochina.

Poilane 8349 has a gross morphology that is strongly reminiscent of *Megistostigma*, and this is probably the material that has prompted Gagnepain (in Bull. Soc. Bot. France 71: 866. 1924) to remark that one of the species of *Cnesmon* is close to *Clavistylus*. The holotype of the species, *Poilane 5493*, however, does not suggest *Clavistylus* and agrees with the gross morphology of *Cnesmone*. I may not say whether these differences are merely the result of individual variations, because the material I have at hand is sterile. Gagnepain's description of the flowers points to *Cnesmone*, witness the characterization of the style as having: "Stigmata 3, lanceolata, valde patentia, tenuia, 3 mm. longa, 1.5 mm. lata, supra papillis conicis majusculis marginantibus tecta."

Cnesmone Poilanei (Gagnep.) Croiz. comb. nov.

Cnesmon Poilanei Gagnep. in Bull. Soc. Bot. France 71: 869. 1924; in Lecomte, Fl. Gén. Indo-Chin. 5: 387. 1926.

SPECIMEN SEEN: *Poilane 2862*, Indochina.

The anthers are those of *Cnesmone*. Although near to small-leaved forms of *C. javanica* and *C. tonkinensis*, this species is likely to prove distinct. The *locus classicus* is the Island of Tré, near Nhatrang, Annam, which is rich in peculiar endemics characterized by small, often distinctly sclerophyllous types of foliage.

Cnesmone tonkinensis (Gagnep.) Croiz. comb. nov.

Cnesmon tonkinense Gagnep. in Bull. Soc. Bot. France 71: 869. 1924; in Lecomte, Fl. Gén. Indo-Chin. 5: 389. 1926.

SPECIMENS SEEN: *Bon 5810*, Indochina; *Balansa 3259*, Indochina; *Pételot 6520 & 6521*, Indochina.

It is difficult to distinguish at sight this species from *C. javanica*, which it matches in every detail of its gross morphology. The ♀ perianth has six lobes, three of which are much smaller. In *C. javanica* the ♀ perianth has only three lobes, suggesting a reduction from the perianth of *C. tonkinensis*. It is probable that intermediates between these two species will be found, with three subabortive lobes. Good material is needed which is now not available.

Cnesmone Mairei (Léveillé) Croiz. comb. nov.

Alchornea Mairei Léveillé Catal. Pl. Yun-nan 94. 1916.

SPECIMEN SEEN: *Maire s.n.*, Yunnan.

The nomenclature of this species is altogether confusing. Léveillé published it under *Alchornea* in 1916, basing it upon an unnumbered collection of Maire from the "Vallon de You-fong-kéou" in Yunnan. Handel-Mazzetti mistakenly identified Maire's material as a variety of *Tragia involuocrata* L. (Symb. Sin. 7: 218. 1931), which is a very different plant. Rehder accepted Handel-Mazzetti's misdetermination at first (in Jour. Arnold Arb. 14: 234. 1933), but later decided it was a distinct species and effected the combination *Tragia Mairei* (Léveillé) Rehd. (in Jour. Arnold Arb. 18: 214. 1937). While this was going on, Gagnepain found the Maire collection still unnamed in the Paris herbarium and based upon it *Cnesmon Mairei* Gagnep. (in Bull. Soc. Bot. France 71: 868. 1924; in Lecomte, Fl. Gén. Indo-Chin. 5: 391. 1926). Thus the same collection was independently used to publish a species under *Alchornea* and under *Cnesmon*, the same specific epithet being chosen by coincidence by Léveillé and by Gagnepain. A good fragment of the holotype of Gagnepain's binomial is in our herbarium. I have dissected its flowers and I am certain that *Cnesmone* and not *Tragia* is involved. The ♂ perianth has the very conspicuous annulus that is mistakenly believed to be characteristic of the flower of *Megistostigma* and not of that of *Cnesmone*.

Cnesmone anisosepala (Merr. & Chun) Croiz. comb. nov.

Tragia anisosepala Merr. & Chun in Sunyatsenia 2: 261. 1935.

Tragia involuocrata Merr. [fide *ipsius*] in Lingn. Jour. Sci. 5: 111. 1927. Non L.

SPECIMEN SEEN: *Lau 141*, Hainan.