ON THE IDENTITY OF THE GENERA MAPOURIA AUBL. AND GRUMILEA GAERTN. (RUBIACEAE, PSYCHOTRIEAE)

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In the course of my revision of the *Psychotrieae* of Madagascar, of which so far only a part has been published, I came across a comparatively large number of species which resembled each other in the presence of a ruminate endosperm and in the peculiarity that stipules are seen only at the tip of the shoots and, sometimes, at the base of the peduncles; on the vegetative part of the shoot they are rejected as soon as the pair of leaves which they enclose, begin to expand. As a ruminate endosperm and "deciduous" stipules are characteristic for a group of species to which now mostly the name *Grumilea* Gaertn. is applied, it seemed plausible to use this name also for these species of Madagascar.

The conclusion that the species of Madagascar meant in the preceding paragraph belong to *Grumilea* would be fully justified if we knew for certain that a ruminate endosperm and deciduous stipules were confined to this genus. This, however, is not so. My work on the *Psychotrieae* of tropical America has taught me that these characters are found also in the species of the genus *Mapouria* Aubl.

Whereas the use of the name *Grumilea* has always been restricted to species occurring in the tropical parts of Africa, Asia and the region further eastwards, the name *Mapouria*, which of late has been used for American species only, was applied by some of the older authors, like HOOKER (in Benth. et Hook. f., Gen. Pl. **2**: 122. 1873) and K. SCHUMANN (in Nat. Pflanzenfam. IV. **4**: 112. 1891) also to species occurring eastwards of the Atlantic.

Hooker, who knew that the *Mapouria* species are provided with deciduous stipules, but who was very badly informed with regard to the structure of their seeds and who undervalued the taxonomic importance of the differences that are found in the latter, included this genus in *Psychotria*, where he gave it the rank of a subgenus. In this subgenus he recognized two series, the "*Ebracteatae*" and the "*Bracteatae*"; to the *Ebracteatae* he referred besides a number of American species two entirely different Asiatic ones, viz. *Ps. tortilis* Bl., which is the type of the genus *Streblosa* Khs. (cf. BREMEKAMP in Journ. Arnold Arbor. **28**: 145–185. 1947), and *Ps. sarmentosa* Bl., and in the *Bracteatae* he included "mostly" paleotropic species, but as not one of those which he mentioned by name, is provided with deciduous stipules, it is difficult to see why this series which, to make matters worse, forms a rather heterogeneous mixture, was included by him

in this subgenus. Moreover, in not one of them the seeds possess a ruminate endosperm of the type found in *Mapouria* and *Grumilea* (v. infra).

Schumann too included in *Mapouria* a number of species found outside America, but he was apparently unaware of the fact that the type species has deciduous stipules, and that stipules of this kind are found also in the other American representatives of this genus. Of the Asiatic species which according to him would belong to *Mapouria*, only two are mentioned by name, viz. *M. fulva* (Ham.) K. Sch., a species which was included by Hooker in his series *Bracteatae*, and *M. connata* (Wall.) K. Sch. These species were apparently transferred from *Psychotria* to *Mapouria* because their seeds show no intrusion on the commissural side of the seeds, but although this is, as will be shown below, a character of considerable taxonomic importance, it is in itself insufficient to justify the transfer.

In view of the fact that *Grumilea* and *Mapouria* agree with each other in the presence of a ruminate endosperm and of deciduous stipules, it seemed desirable to see whether they agree also in other respects, and if so, what position they occupy on account of these points of resemblance with regard to the other genera of the *Psychotrieae*, especially with regard to those to which they seem to come nearest. If it would appear that they show a nearer affinity to each other than to any other genus, then we would be confronted with the question "are the two genera sufficiently distinct to be kept apart, or is it better to unite them?"

SCHUMANN gives in his monograph of the Rubiaceae (Nat. Pflanzenfam. IV. 4. 1891) a key to the genera of the *Psychotrieae* (p. 110) in which *Mapouria* is contrasted with a group of genera in which *Grumilea* is included; in the latter the commissural side of the seed is said to be provided with a narrow fissure, whereas in *Mapouria* it is said to be entirely flat. This difference, which MÜLLER–ARGAU had used already in his treatment of the *Psychotrieae* in the "Flora Brasiliensis" (VI. **5**: 383, 1881) in order to distinguish *Mapouria* from *Psychotria* and *Rudgea*, is doubtless of great taxonomic importance, as in all those genera of the *Psychotrieae* which may be regarded as well-defined, the seeds prove to be always of the same type, i.e. either in all species without an intrusion on the commissural side or in all of them with such an intrusion. Unfortunately Schumann made a serious mistake by including *Grumilea* in the group of genera in which the intrusion on the commissural side of the seed is always present. In reality this intrusion is in the seeds of *Grumilea* always absent, and in this important character there is therefore complete agreement between this genus and *Mapouria*.

The absence of an intrusion on the commissural side of the seed brings the genera *Mapouria* and *Grumilea* much closer together than they would have been if they had differed in this respect, and it accentuates more sharply the difference between them and the plants which were included by Schumann in the genus *Psychotria* and by Hooker, who, as we have seen, had put *Mapouria* as a subgenus in *Psychotria*, in the other subgenera of the latter.

To the three characters in which, as we now know, the genera *Mapouria* and *Grumilea* agree, another one may be added, viz. the heterostylism of the flowers.

In order to estimate the taxonomic value of these four characters, the deciduous stipules, the heterostylism of the flowers, the absence of an intrusion on the commissural side of the seed, and the presence of a ruminate endosperm, we will have to study the distribution of these characters among the related genera.

Deciduous stipules, i.e. stipules that are thrown off at the moment the next pair of leaves begin to expand, prove to be very rare indeed. Except in *Mapouria* and *Grumilea* they are known only from *Naletonia* Brem., a monotypic genus confined to Guiana and occupying a rather isolated position. It differs from *Mapouria* and *Grumilea* in the presence of a very deep intrusion at the commissural side of the seed and in the non-ruminate endosperm. To the diagnostic features of this genus belong the comparatively large bracts which are shifted from the base of the branchlet to the place where the next pair of branchlets is produced, and the imbricate aestivation of the corolla lobes. An imbricate aestivation of the corolla lobes is very rare in the *Psychotrieae*; in fact, it seems to be confined to this genus and *Notopleura* Brem. (v. infra). The deciduous stipules of *Mapouria*, *Grumilea* and *Naletonia* should not be confused with such stipules as are found e.g. in the genus *Chasallia* Comm. ex Juss. Stipules of that kind possess a marcescent upper part which is usually shed rather early, though not at the moment at which the next pair of leaves begin to expand; the non-marcescent basal part persists much longer.

The heterostylism, which in *Mapouria* as well as in *Grumilea* seems to be a general feature, is found also in the majority of the species which so far have been left in *Psychotria*. It proved to be present, for instance, in all the American species of this group which I could investigate. It is, moreover, a general feature in *Palicourea* Aubl., *Naletonia*, *Gamotopea* Brem., *Cephaëlis* Sw. and, probably, in *Notopleura*. *Naletonia* and *Notopleura* agree with *Mapouria* and *Grumilea* in one other taxonomically important character, *Naletonia*, as we have mentioned already, in the presence of deciduous stipules, *Notopleura* in the absence of an intrusion at the commissural side of the seed; in the other genera not a single of the taxonomically important characters of *Mapouria* and *Grumilea* is met with. In *Chasallia* heterostylous as well as isostylous species are found. In *Carinta* W. F. Wight (syn. *Geophila* Don), *Ronabea* Aubl., *Chytropsia* Brem. and *Nonatelia* Aubl. the flowers are always isostylous. As *Carinta*, *Ronabea* and *Chytropsia* agree with *Mapouria* and *Grumilea* in the absence of an intrusion on the commissural side of the seed, the absence of heterostylism in these genera is worth noting, because it accentuates the distance which separates these three genera from *Mapouria* and *Grumilea*, the more important differences being found in the persistent stipules and in the non-ruminate endosperm. On the whole, however, the presence or absence of heterostylism gives us but little information with regard to the degree of affinity between the various genera, and

this feature is in this respect doubtless of less importance than the three other diagnostic characters of the couple formed by *Mapouria* and *Grumilea*.

Seeds without an intrusion at the commissural side are found in some other genera too, viz. in *Ronabea*, *Notopleura*, *Carinta*, *Chytropsia* and *Gamotopea*, and further in a number of African and Asiatic species which so far have been left in *Psychotria*, although Schumann had referred at one time some of them to *Mapouria* (v. supra). However, when the genus *Psychotria* is subjected to a more thorough analysis than so far has been customary, these African and Asiatic species will doubtless be referred to one or more new genera. *Ronabea*, *Notopleura*, *Chytropsia* and *Gamotopea* are exclusively American genera, but *Carinta* is represented in Africa as well as in America, in Africa especially in the western part (it is found also in other tropical regions, but outside America and Africa as an introduced weed only). In none of these genera either deciduous stipules or a ruminate endosperm are met with (note, however, the restriction made further on with regard to *Gamotopea*). *Ronabea* differs moreover from *Mapouria* and *Grumilea* by the shape of its stipules, which are narrow and pointed, its few-flowered axillary inflorescences, its isostylous flowers, and the rather thick wall of the pyrene which on the convex side is provided with massive ribs; the commissural side of the pyrene, moreover, is not fully flat as in *Mapouria* and *Grumilea*, but slightly concave. In *Notopleura* the flowers are articulated with the top of the pedicel, the aestivation of the corolla lobes is not valvate, but imbricate, a character which seems to be confined to this genus and *Naletonia* (v. supra), and the pyrenes are dorsiventrally compressed. The species of *Carinta* are creeping herbs, a habit which is never met with in *Mapouria* and *Grumilea*, and the inflorescences are borne by axillary brachyblasts consisting of a single internode, the flowers are isostylous, the calyx lobes rather long, and the stamens included. It is noteworthy that among the Madagascar species to which I referred in the introductory paragraph of this paper, a small number proved to be provided with inflorescences borne by axillary brachyblasts, but whereas the brachyblasts of *Carinta* are always provided with well-developed and normally persistent leaves, they are in these species provided with rudimentary and short-living leaves. In *Chytropsia* the flowers are arranged in capitula which eventually may be arranged in an umbel, and they are, like those of *Ronabea* and *Carinta*, isostylous, but in this genus the stamens are not included but exserted. The species of *Gamotopea* are hirsute decumbent herbs with stipules which are divided in two linear or filiform lobes, with a calyx split to the base in narrowly triangular or filiform segments, and with pyrenes without any grooves or ribs. The structure of the endosperm is not yet known with certainty, as the seeds that could be investigated, were not fully ripe; however, as the proliferation of the spermoderm manifests itself, as a rule, already at a relatively early stage in the development of the seed, and as in this case no trace of such a proliferation could be detected, it does not look probable that the endosperm will become

ruminate. Among the species that so far have been left in *Psychotria* because they possess a non-ruminate endosperm, a small number are provided with seeds of which the commissural side is not provided with a longitudinal intrusion. This condition is found in the Asiatic species which Schumann referred on insufficient grounds to *Mapouria* (v. supra), and in some African ones like *Ps. pauridiantha* Hiern and *Ps. oddoni* de Wild. These species deserve a closer study, but it is now already quite clear that they can not be left in *Psychotria*, even if the latter is accepted in the rather wide delimitation proposed by Schumann, as the presence of an intrusion at the commissural side of the seed is regarded by the latter as an indispensable condition.

According to some remarks found in the literature it would sometimes be difficult to decide whether the endosperm is to be regarded as ruminate or as non-ruminate. In this connection it is worth noting that Hooker (l.c. p. 124) rejected the genus *Grumilea* because he was of opinion that it differed from *Psychotria* in one point only, viz. in the ruminate endosperm. This pronouncement, however, should not be taken too literally. As he certainly did not apply this rigorous, though undoubtedly fully justified condition in every case, it seems plausible to assume that his real motive is to be sought in a lack of confidence in the taxonomic value of this character. It is not improbable that this lack of confidence was due to some critical remarks made a few years before by MIQUEL in a paper (in Ann. Mus. Bot. Lugd.-Bat. **4**: 204. 1869) in which he reduced *Grumilea*, which at an earlier date had been accepted by him (Fl. Ind. Bat. II: 295. 1856), to the genus *Psychotria*.

In dealing with *Psychotria* Miquel remarked in this later publication "Ab hoc genere *Grumilea* Gaertn. nullo certe characteri differt. Corollae tubus longior vel brevior cum nulla alia differentia conjunctim occurrens characterem differentialem praebere nequit. Baccae costatae in utroque genere inveniuntur. Albumen *Grumileae* perperam ruminatum dictum potius cum semine lobatum vel costato-sulcatum est, tela tenui quae spermodermidem efficit inter lobos intrante, ruminatum dici nequit, quamvis in sectione transversa tale videatur. Eius modi seminum fabricam in plurimis *Psychotriae* genuinis speciebus observavi."

The two remarks with which Miquel begins, viz. that there is no general difference in length between the corolla of *Grumilea* and that of *Psychotria*, and that in both genera the fruits may be costate as well as ecostate, are correct, but this can not be said of his remarks on the structure of the endosperm. There can not be the slightest doubt that the endosperm of *Grumilea* is in this respect fully comparable to that of the nutmeg, and that the term "ruminate" is therefore fully justified. Nor can it be doubted that there is in *Grumilea* no direct connection between the intrusions of the spermoderm and the grooves by which the ribs on the surface of the seed are separated from each other. These grooves are not always present, but in the species in which they are found, they are confined to the convex side of the seed, whereas the intrusions of the spermoderm are found also

on the flat side; in fact, they may even be confined to that side. However, whether they are found on both sides or on the flat side only, they always appear to form a more or less regular network. On the commissural side this network can easily be exposed to view by rubbing the seed on a sheet of fine sandpaper.

Miquel was probably led astray by the existence of another type of ruminate endosperm in species belonging to this circle of affinity, though not to *Grumilea*. In this type we find indeed a relation between the proliferation of the spermoderm and the grooves between the ribs on the convex side, but as the species in which this type of ruminate endosperm occurs, are never provided with deciduous stipules and as the commissural side of their seeds is always provided with a longitudinal intrusion, they can not be included in *Grumilea*.

Miquel may also have been influenced by the fact that in a transverse section of the *Grumilea* seed we see at the commissural side, as a rule, but three or four intrusions of the spermoderm; this may create the impression that these three or four intrusions represent three or four longitudinal fissures, but this impression is entirely wrong; as soon as a tangential section is made, the presence of a more or less regular network is revealed.

The network mentioned in the preceding paragraph is present in the seeds of *Mapouria* too, though the meshes are here, as a rule, somewhat wider and less regular than in *Grumilea*, but as there is in this respect in both genera a good deal of variability, this difference is not very sharp. In *Pyragra* Brem., a genus of the *Psychotrieae* which is confined to Madagascar (cf. BREMEKAMP in Candollea **16**: 148 et Fig. 21. 1958), we also find a ruminate endosperm, and here the meshes are as small and as regular as in *Grumilea*, but this genus can nevertheless not be regarded as a very near ally, as the seeds show a deep intrusion on the commissural side and as the stipules are persistent. In the endosperm of *Pagamea* Aubl., an American genus which agrees with the paleotropic genus *Gaertnera* Lam. in the almost completely superior ovary and in the form of the stipules which are united in a high amplexicaul sheath, but which differs from *Gaertnera* in the ruminate endosperm, the meshes are even wider and less regular than they are in *Mapouria*.

The last remark made by Miquel, viz. that he had seen a similar structure of the endosperm in a large number of *Psychotria* species, rests doubtless, as indicated above, on a confusion of two types of ruminate endosperm, of which one occurs in *Grumilea*, *Mapouria*, *Pyragra* and *Pagamea*, whereas the other is found in a number of species that on account of the persistent stipules and the presence of an intrusion on the commissural side of the seed can not be included in *Grumilea* or *Mapouria*, and which therefore are provisionally retained in *Psychotria*. This second type occurs also in some species of *Cremocarpon* Boiv. ex Baill., viz. in *Cr. lantzii* Brem. and in *Cr. trichanthum* (Baker) Brem. (cf. BREMEKAMP in Candollea **16**: 148, 169 and 173. 1958). In the first type the intrusions of the spermoderm are completely independent of the grooves on the convex side of the seed,

which in the seeds of the plants where this type is found, may even be absent, and the intrusions are moreover best developed at or may even be confined to the commissural side, whereas in the second type the intrusions are mainly or exclusively found at the bottom of the grooves between the ribs on the convex side. "In plurimis *Psychotriae* speciebus" apparently should be understood as "in a large number of *Psychotria* species", not as "in most of the *Psychotria* species", as *Psychotria* species with a ruminate endosperm form after all but a small percentage of the large number of species which so far have been left in this genus. In none of the American representatives of this group I have ever seen seeds with a ruminate endosperm, and although such an endosperm is not very rare among its paleotropic representatives, the species in which it occurs form nevertheless but a minority. As an example I may quote *Psychotria vogeliana* Bth., a species which was included by Hooker in the series *Bracteatae* of his subgenus *Mapouria*. In the seeds of this species the commissural side is provided with two contiguous grooves, a structure which returns in most of the paleotropic *Psychotria* species, and its stipules are persistent. In this connection it is perhaps worth while to draw attention to the fact that Schumann committed a mistake when he said that *Grumilea aurantiaca* Miq. is a "*Psychotria*"; the deciduous stipules, the absence of an intrusion on the commissural side of the seed, and the presence of a network of spermoderm intrusions extending over the whole surface of the seed prove that it is a true "*Grumilea*".

The preceding exposition shows that *Mapouria* and *Grumilea* agree with each other in four important points, of which three, viz. the absence of an intrusion at the commissural side of the seed, the presence of a ruminate endosperm of a kind which differs from that found in some *Psychotria* species, and the presence of a type of stipules which is called "deciduous", deserve special attention, because in other genera of the *Psychotrieae* at the most but one of these characters is met with (deciduous stipules in *Naletonia*, the absence of an intrusion on the commissural side of the seed in *Ronabea*, *Notopleura*, *Carinta*, *Chytropsia* and *Gamotopea* and in a number of species which erroneously have been left in *Psychotria*, the presence of a ruminate endosperm of the same kind as that found in *Mapouria* and *Grumilea*, in *Pyragra* and in *Pagamea*). It is therefore impossible to sink *Mapouria* and *Grumilea* either in the "rump" genus *Psychotria* or in any other genus of the *Psychotrieae*.

Now that this point has been settled, we may turn our attention to the question whether *Mapouria* and *Grumilea* show differences of sufficient importance to justify their retention as distinct genera. If it proves impossible to find such differences, the two genera will have to be merged in one.

The best way to solve this problem seems to be to take a detailed description of one of these genera, and to compare it with a similar one of the other genus. The most recent description of *Mapouria* in which sufficient details are to be found, seems to be that which I myself have given in "Pulle, Flora of Surinam" (IV: 223. 1934). This

description is more suitable than that given by Müller-Argau in the "Flora Brasiliensis", because Müller-Argau included in this genus, apart from some insufficiently known elements, also a quite incongruous one, viz. that for which Don had proposed the already occupied name *Geophila*, and which is now known as *Carinta*. Of *Grumilea* no up-to-date description is available, and for this reason I will have to use instead the data which I myself have collected by the analysis of representatives of this genus occurring in various parts of its area of distribution.

My description of *Mapouria* reads:

"Glabrous or subglabrous shrubs, usually drying with a reddish brown tinge. Leaves opposite. Stipules rather large, thrown off when the next leaves expand, interpetiolar and simple. Inflorescence terminal, corymbose or paniculate, rarely two or three times umbellate; bracts and bracteoles present, but small, connected by a rim. Flowers sessile or shortly pedicellate, 5-merous, heterostylous. Ovary bilocular, with a solitary ascending ovule in each cell. Calyx truncate or shortly lobed, with or without glands on the inside. Corolla hypocrateriform or infundibuliform; tube in the upper half villous; lobes in the bud valvate with the tip bent inwards. Stamens inserted midway or somewhat above the middle of the tube; in the short-styled flower slightly exserted, in the long-styled one included; anthers dorsifixed. Disk entire, globose, conical or cylindrical. Style glabrous, filiform, ending in two linear lobes. Fruit a globose drupe with two pyrenes. Pyrenes sulcate on the convex side, entirely smooth on the flat side." We may add to this that the pollen grains are oblate and 3- or, occasionally, 4-porous, that the wall of the pyrenes is thin and corneous, and that the endosperm is ruminate, the intrusions of the spermoderm forming a network that is equally spread over the whole surface.

The species of *Grumilea* that were investigated by me, proved to be glabrous or hairy shrubs or, occasionally, suffrutices or small trees, and they too often assumed a reddish brown colour in drying. In these species too the leaves were always opposite, but this is of little importance, as species with verticillate leaves are very rare in the *Psychotrieae*. The stipules were rather large, and appeared to be shed when the next pair of leaves began to expand, but in contrast with those found in *Mapouria* they were, as a rule, bidentate to bipartite, though in a small number of species which seem to be confined to Madagascar and which on account of their large fruits occupy a somewhat isolated position in the genus, they seemed to be simple; this, however, is not fully certain, as in these species only the stipules at the base of the inflorescence were seen, and as these stipules are, as a rule, larger and less deeply incised than those on the vegetative part of the shoot, it is not entirely excluded that in these species too the stipules on the latter will prove to be incised; at any rate in these species too the stipules proved to be provided with two distinct keels converging towards the top, a character that is found in all paleotropic species. In *Grumilea* too the inflorescences proved to be terminal,

although in a small group of species which seem to be confined to Madagascar, it looked at first sight as if they were axillary; however, on closer inspection it appeared that they are borne here by axillary brachyblasts consisting of a single internode and provided with a pair of rudimentary, early deciduous leaves. The inflorescences, moreover, were always corymbose or, more rarely, paniculate, and the bracts and bracteoles proved to be small and often, though not always, connected by a rim. Here too the flowers were sessile or shortly pedicellate, usually 5-merous, though in one of the species found in Madagascar they proved to be 4-merous, and in another one 6- or 7-merous, and here too they were always heterostylous. The ovary was everywhere bilocular, and, as in all *Psychotrieae*, each locule contained a single ascending ovule. The calyx was shortly lobed, but with regard to the presence of glands on the inside I have no definite information, as this character, to which Müller-Argau attached great importance, is in my opinion not very reliable; for this reason I paid no attention to it. In *Grumilea* too the corolla proved to be hypocrateriform or infundibuliform, but this is of little importance, as these shapes return in most *Psychotrieae*; the tube was in the upper half or, more precisely, between the points of insertion of the stamens and somewhat above the latter provided with tufts of hairs, and as in the great majority of the *Psychotrieae* the lobes were valvate in the bud, with the tip bent inwards. The stamens proved to be inserted, as in most other *Psychotrieae*, in the middle or slightly above the middle of the corolla tube, and here too the anthers proved to be dorsifixed, but this too is a situation found in most *Psychotrieae*. Here too the pollen grains proved to be oblate and generally 3-porous. Here too the disk was found to be semi-globose, conical or cylindrical. The style was here too glabrous, filiform and at the top divided into two narrow lobes. Here too the fruit proved to be a globose or subglobose drupe with two pyrenes; the pyrenes had a thin and corneous wall, and they were either smooth or sulcate on the convex side and flat on the commissural one, and the endosperm was ruminate with intrusions of the spermoderm spread in the form of a network either over the commissural side or over the whole surface.

Apart from the difference in the structure of the stipules of which it is not fully certain that it is a general one, no differences of any importance are revealed in these descriptions, and the conclusion that the two genera are to be united, seems therefore unavoidable.

The conclusion that *Mapouria* and *Grumilea* are to be united, confronts us with a very difficult nomenclatural problem. Which name is to be applied to the combined genus?

As *Mapouria* Aubl. dates from 1775, and *Grumilea* Gaertn. from 1788, the problem seems to offer no difficulty, but a closer inspection reveals that the situation is less simple. The trouble is not caused by a difficulty in the identification of the type species. It is true that the identity of *Grumilea nigra*, Gaertner's type, is not absolutely certain, but there can be no doubt that it is either conspecific with or at least very nearly related to *Gr. nudiflora* Thw. (syn. *Psychotria thwaitesii*

Hook. f.), and with regard to the identity of *Mapouria guianensis* Aubl. there appears to be no uncertainty at all. The real trouble is found in the difficulty to find an answer to the question whether the genus proposed by Aublet may be regarded as a new one.

When we compare Aublet's generic description of *Mapouria* with that which Linné had given a few years before of *Psychotria*, it strikes us that there is not a single point of difference.

LINNÉ's description of *Psychotria* (Syst. Nat. ed. 10: 929. 1759) reads:

"Psychotria. Cal. 5-dentatus coronans. Cor. rotata. Bacca globosa. Sem. 2, hemisphaerica, sulcata.

Asiatica A. Psychotria stipulis emarginatis. Brown. jam. t. 17. f. 2.

AUBLET's description of *Mapouria* (Pl. de la Guiane I: 175. 1775) gives the following particulars:

"**Cal.** Perianthemum monophyllum, turbinatum, quinque-dentatum.

Cor. monopetala; tubus brevis, disco suprà germen insertus; limbus quinquefidus, lobis acutis.

Stam. Filamenta quinque, longitudine corollae, tubo inserta. Antherae subrotundae, biloculares.

Pist. Germen subrotundum, calici adnatum. Stylus oblongus. Stigma bilamellatum."

Fruit and seed were unknown to Aublet, but in the description of his only species, viz. *M. guianensis*, it is noted that the stipules are deciduous. The idea that this character might be of value for the recognition of the genus, did not enter Aublet's mind, as the latter, like most of his contemporaries, accepted the Linnaean fiction that the generic characters are to be derived from the organs of reproduction.

Linné's description of *Psychotria* and Aublet's description of *Mapouria* are both very incomplete, and apply to quite a number of genera in the *Psychotrieae* and, in fact, also to several Rubiaceous genera that fall outside this tribe. From a taxonomic point of view they are therefore of no value. The first acceptable definition of *Mapouria* was given more than half a century after the genus was proposed, by A. RICHARD (Mém. sur la famille des Rubiacées: 93. 1831), and of *Psychotria* even to-day no satisfactory definition is available. That Linné himself had no very clear idea with regard to the delimitation of *Psychotria*, follows from the fact that he afterwards included in it such a totally different plant as that described in 1760 by Jacquin as *Psychotria herbacea*, which at present is known as *Carinta herbacea* (Jacq.) W. F. Wight.

From a purely nomenclatural point of view the considerations given above are of no importance. To the nomenclaturist of to-day the only points which matter are whether for each of the genera a type can be indicated, and if so, whether these types are sufficiently different to be regarded as representing distinct genera. Now, with regard to the identity of the type of the genus *Mapouria* there is, as stated above, no doubt at all, but in the case of the genus *Psychotria* the position is unfortunately by no means clear.

With regard to the identity of the type species of *Psychotria* we have to rely on indications that are to be found in the generic name, the specific epithet, the, very laconic, diagnosis and the synonymy, and these indications prove to be contradictory. The generic name is a modification of the name "*Psychotrophum*" proposed by Patrick Browne for a plant from Jamaica, and points therefore to a species of American origin. The specific epithet "*asiatica*", on the other hand, points to an asiatic species. This is doubtless of importance, because in this circle of affinity the area of distribution of the species is on the whole very small; in fact, apart from one or two anthropochorous weeds there is not a single representative of the *Psychotrieae* which, so far as we know at present, occurs in both hemispheres. The diagnosis "Psychotria stipulis emarginatis" seems to exclude the possibility that it might be the plant described by Browne which, nevertheless, is quoted as a synonym. The plant of Patrick Browne, for which Sprengel introduced the name *Psychotria brownii*, is almost certainly a *Mapouria*, and its stipules therefore must have been entire; so they are indeed in the species to which this name is applied in Fawcett and Rendle "Flora of Jamaica". The name *Psychotria asiatica* is therefore clearly a nomen confusum.

It might perhaps be thought that the description of *Ps. asiatica* given in the same year 1759 in Gabriel Elmgren's "Pugillus Jamaicensium Plantarum" (reprinted in Amoenitates Academicae **5**: 395) would give us some information, but this is not so. It reads "26. *Psychotria asiatica.* Folia opposita, petiolata, lanceolata, integerrima, nuda. Thyrsi brachiati, e dichotomia caulis, foliis breviores." It contains therefore not a single item which might help us in our attempt to identify the plant.

Summarizing we may say that it is impossible to make out what species Linné had before him when he described the genus *Psychotria*, but that it is hardly believable that it would have been the Jamaican plant described by Patrick Browne. It seems more probable that it actually was an Asiatic plant, and that he erroneously assumed that the latter was conspecific with the Jamaican one of Patrick Browne. The identity of the specimen in the Linnaean herbarium which bears the name *Psychotria asiatica*, seems to be of little importance, as it will hardly be possible to prove that this specimen was already in Linné's possession when he described the genus, or that it was at that moment the only specimen he possessed. For the moment, however it seems to be sufficient to draw attention to the fact that Linné's attention had been drawn by the structure of the stipules. This makes it very probable that it was a plant with persistent stipules, for in a plant with deciduous stipules, he would hardly have noticed them. If this conclusion is right, the plant can not have been a *Mapouria*, and its affinity with the Jamaican plant of Patrick Browne must have been very remote.

It is perhaps of some interest to note that Aublet accepted the genus *Psychotria* and mentioned three species from French Guiana, viz. *Ps. violacea* Aubl. (l.c. p. 145 and tab. 56), *Ps. herbacea* L and *Ps.*

asiatica L. The two first-mentioned species are creeping herbs and belong to *Carinta*, but what he meant with *Ps. asiatica* is unknown. He describes it as a shrub, and as he quotes "Browne Jam. 160. t. 17. f. 2", it must have been a plant resembling the species described by Patrick Browne, but as he says that he had found this plant also in Ile de France, i.e. in Mauritius, the resemblance need not have been very strong. The Guiana plant may have been a species of *Mapouria*, but in that case it would have been a near ally of *M. guianensis*, the species on which the genus *Mapouria* was founded, and then it would be even more difficult to understand why he did found it.

More interesting is what Richard (l.c. p. 91) had to say on the genus *Psychotria*, as this author seems to have been the first who subjected it to a critical examination. *Chasallia*, *Ronabea*, *Cephaëlis*, *Mapouria*, *Palicourea* and *Naletonia* were accepted by him as generically distinct, but *Geophila* (i.e. *Carinta*) which had been split off by Don, was returned to *Psychotria*, and he also reduced *Grumilea* to this genus. The inclusion of these two genera is to be regarded as a mistake, for they do not agree with the generic description. As mentioned above, the seeds are in these two genera never provided with a longitudinal intrusion at the commissural side, and according to Richard this intrusion must be regarded as a general feature of *Psychotria*. The generic description does not apply to *Psychotrophum* Browne either, which Richard quotes in his synonymy, at least if we assume that the plant of Patrick Browne is identical with *Psychotria brownii* Spreng. as it is understood to-day, for in that species too the intrusion at the commissural side of the seed is absent (v. supra). A rather serious mistake is that the stipules of *Psychotria* are said to be entire, whereas in the species which he left in this genus they are in reality always bidentate to bipartite.

If we accept *Psychotria* in the delimitation given to it by Richard, then the name *Mapouria* may be retained for the species described under this name by Aublet and for those species which agree with the latter in the deciduous stipules, the heterostylous flowers, the absence of an intrusion at the commissural side of the seed, and the presence of an endosperm with a network of intrusions from the spermoderm either extending over its whole surface or confined to the commissural side.

It is in this connection perhaps noteworthy that the points of difference between *Mapouria* and *Psychotria* on which Richard himself laid special emphasis, viz. the much shorter corolla of *Mapouria*, its exserted stamens, its shorter anthers and its bearded corolla throat, are all of them illusory; in fact, in none of these points a constant difference between these genera exists. That he regarded the stamens of *Mapouria* as exserted and those of *Psychotria* as included, shows that he did not examine a very large number of specimens, otherwise he would have noted that the flowers are everywhere heterostylous, and that the stamens are in the dolichostylous flowers always included and in the brachystylous ones always exserted. This mistake, however, is excusable, as heterostylism, although observed already by C. K.

SPRENGEL (Das entdeckte Geheimniss der Natur: 103, 1793) in *Hottonia palustris*, was in Richard's time generally overlooked; in fact, its importance was not recognized before 1877 when DARWIN published his "Different Forms of Flowers in Plants of the same Species".

SUMMARY

The generic name *Mapouria* Aubl. should be applied to those *Psychotrieae* in which the following set of characters is found: deciduous stipules, heterostylous flowers, seeds without a longitudinal intrusion on the commissural side and an endosperm in which the spermoderm penetrates in the form of a network which may be confined to the commissural side but which, as a rule, extends over the whole surface. This means that it should be used also for those species which up to now have been included in *Grumilea* Gaertn. It need not be given up in favour of *Psychotria*.

The name *Psychotria* may provisionally be retained in the conventional sense, with the proviso, however, that species with deciduous stipules or without a single or double longitudinal intrusion at the commissural side of the seed should be excluded. The endosperm may be ruminate, but the intrusions of the spermoderm should be confined to the bottom of the grooves on the convex side. The choice of a type species for this genus is better postponed until a decision has been reached on the question whether this group of species may be regarded as a natural one.