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Eumachia expanded, a pantropical genus distinct from Psychotria (Rubiaceae, Palicoureeae)

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Jomar G. Jardim & Maria Regina V. Barbosa

Abstract

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The pantropical genus *Margaritopsis* C. Wright (*Rubiaceae*, *Palicoureeae*) was recently separated from *Psychotria* L. and transferred to a different tribe, *Palicoureeae*, based on both molecular and morphological data. *Margaritopsis* has been studied in the Neotropics, and in Africa as *Chazaliella* E.M.A. Petit & Verdc.; the species that belong to this group in the Pacific are enumerated for the first time here. Recently *Eumachia* DC. was found to be an older name for this group, and a few species of *Margaritopsis* have been transferred nomenclaturally to that genus. Here *Eumachia* is surveyed comprehensively for the first time, with a list of species and an overview of morphological characteristics. The remaining species of *Margaritopsis* are nomenclaturally transferred here to *Eumachia*, along with one species of *Hodgkinsonia* F. Müll., one species of *Mapouria* Aubl., and several species of *Psychotria* from Asia, Australia, New Guinea, and the Pacific region. In this new circumscription *Eumachia* includes 83 species, and is characterized within *Palicoureeae* by a yellowish green drying color; stipules that are persistent or fall by fragmentation and are generally glandular when young and hardened when old; green to whitened inflorescence axes; white to cream or yellowish green, often rather small corollas; orange to red fruits; pyrenes with marginal pre-formed germination slits and no ethanol-soluble pigments; and non-ruminate endosperm. *Eumachia* includes 20 species, 8 subspecies, and 7 varieties in Africa, 27 species in the Neotropics, and 36 species and 6 varieties in Asia, Australasia, and the Pacific region. Here we publish 81 new nomenclatural combinations in *Eumachia* and two new synonymies for Neotropical names, and 11 names from various regions are lectotypified.

Keywords

RUBIACEAE – Palicoureeae – Psychotrieae – Chassalia – Eumachia – Mapouria – Margaritopsis – Psychotria – Readea – Nomenclature

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Introduction

Eumachia DC. has been included until very recently within the megadiverse pantropical genus *Psychotria* L. (Rubiaceae, subfamily Rubioideae, tribe Psychotrieae), which is systematically complex and not well understood. *Eumachia* was described with one species of shrubs and small trees found in humid to dry forest on a few islands in the tropical Pacific, *E. carnea* (G. Forst.) DC. However the characters of *E. carnea* do not match *Psychotria* in its present circumscription. *Eumachia* was included in *Psychotria* mainly because the characterization of *Psychotria* in the Pacific region was exceptionally broad, so its composition was heterogeneous. Recently a re-evaluation of the Asian, New Guinean, and Pacific species of *Psychotria* with molecular data (BARRABÉ et al., 2012; RAZAFIMANDIMBISON et al., 2014) confirmed that *E. carnea* does not belong to *Psychotria*, and found that it is part of a clade in a different tribe, *Palicoureeae*. The clade to which *Eumachia* belongs is pantropical, and has been studied by several recent authors as the genus *Margaritopsis* C. Wright (ANDERSSON, 2001; TAYLOR, 2005; BARRABÉ et al., 2012; RAZAFIMANDIMBISON et al., 2014). All of these authors have expanded *Margaritopsis* and clarified its separation from *Psychotria*, and BARRABÉ et al. (2012) and RAZAFIMANDIMBISON et al. (2014) also showed that this group is correctly called *Eumachia*. Here we synthesize recent studies of this clade to circumscribe and characterize it as *Eumachia* and enumerate its species.

The molecular study of NEPOKROEFF et al. (1999) was the first aimed at unravelling relationships of *Psychotria* and its relatives. At that time numerous genera similar to *Psychotria* were all classified in one tribe, *Psychotrieae*. The limited taxonomic sampling in this first study did not support robust taxonomic outcomes but did show that *Psychotria* was not monophyletic. ANDERSSON (2001, 2002a, 2002b) clarified the general systematics of *Psychotria* in further molecular analyses with broader taxonomic sampling, and found some different internal arrangements. ANDERSSON and NEPOKROEFF et al. both found that *Psychotria* contained two large lineages, each with several distinct component clades. Subsequent study has supported and clarified these component clades (BARRABÉ et al., 2012; RAZAFIMANDIMBISON et al. 2014). The two large lineages found by ANDERSSON (2001, 2002a, 2002b) and NEPOKROEFF et al. (1999) are now regarded as two tribes, *Palicoureeae* and *Psychotrieae* (ROBBRECHT & MANEN, 2006; RAZAFIMANDIMBISON et al., 2014), and the species of “traditional” *Psychotria* have been split between these tribes. One part of *Psychotria* remains in the tribe *Psychotrieae*, which now comprises only the genus *Psychotria* (RAZAFIMANDIMBISON et al., 2014). The remaining species of *Psychotria* now form part of the tribe *Palicoureeae*, which today comprises nine genera (RAZAFIMANDIMBISON et al., 2014). Three of these *Palicoureeae* genera are only recently recognized, and

all of their species were previously included in *Psychotria*. These three *Palicoureeae* genera were separated as *Carapichea* Aubl. (ANDERSSON, 2002a; TAYLOR & GEREAU, 2013), *Noto-pleura* (Benth.) Bremek. (TAYLOR, 2001), and *Margaritopsis* (ANDERSSON, 2001; TAYLOR, 2005; BARRABÉ et al., 2012).

The genus *Margaritopsis* originally included three species from the Greater Antilles, and its systematic position was unclear (LIOGIER, 1963, 1995). ANDERSSON’s study (2001) was the first to find that these Antillean species belong to a pantropical group within the *Psychotrieae-Palicoureeae* complex. The oldest name for this new group based on Andersson’s studies was *Margaritopsis*, and accordingly he expanded *Margaritopsis* to include several dozen species found worldwide but did not enumerate them all. He also synonymized three other genera under *Margaritopsis*: *Chytropsia* Bremek., with two species from South America; *Readea* Gillespie, with one species from the Pacific region; and *Chazaliella* E.M.A. Petit & Verdc., with 23 species from Africa. *Chytropsia* had previously been treated as a synonym of *Psychotria* (STEYERMARK, 1972), but the other two genera had been considered distinct from *Psychotria*. *Readea* was a monotypic genus restricted to Fiji (SMITH & DARWIN, 1988), and *Chazaliella* comprised a distinctive group of species rather recently separated from *Psychotria* (VERDCOURT, 1975). ANDERSSON found that the few species of *Chazaliella* included in his analysis formed a paraphyletic basal group in a well supported clade, and concluded that *Chazaliella* was better included in one genus together with these other taxa than maintained as separate (ANDERSSON, 2001 : 82). ANDERSSON (2001) presented a revised description of the expanded genus *Margaritopsis*, and noted that the species-level taxonomy of the group was poorly known. He made nomenclatural combinations only for the type species of the genera he synonymized. Those nomenclatural combinations were incompletely presented and invalid in this work, however, and were validated in a subsequent note (ANDERSSON, 2002c). ANDERSSON (2001 : 80) found that his *Margaritopsis* was not diagnosed by any unique morphological synapomorphy, but he could characterize it by several features: its “non-caducous” (i.e., to some degree persistent) stipules, its planoconvex pyrenes with the pre-formed germination slits (PGS’s) all marginal, and its seeds with a pale testa that lacks an ethanol-soluble pigment. These characters all separated *Margaritopsis* from *Psychotria* s. str., but agreed with most of the genera of *Palicoureeae*. Andersson then highlighted individual differences between *Margaritopsis* and each genus of *Palicoureeae*. These differences each comprised a distinctive synapomorphy that diagnosed the other genus and was not found in *Margaritopsis*. One of his distinctions here was inaccurate, however, because he separated *Margaritopsis* from *Rudgea* Salisb. by its lack of gland-tipped stipular appendages; many species of *Margaritopsis* do have gland-tipped stipule appendages (TAYLOR, 2005).

Margaritopsis was then studied in the Neotropics by TAYLOR (2005), who presented a more detailed morphological description of the genus based on the species of this region. She recognized 27 species of *Margaritopsis*. Some were previously included in this genus by Andersson, and 21 were newly separated from *Psychotria*. Taylor added glandular stipule appendages and terminal inflorescences to the characterization of *Margaritopsis*; both are common characters in *Palicoureeae*.

Margaritopsis was then studied in more detail with morphological and molecular data by BARRABÉ et al. (2012), who made a much broader sampling and focused on the poorly known Pacific species. They significantly expanded the size and morphological diversity of this genus. They identified at least 28 Asian, Australasian, and Pacific species of *Psychotria* that were more closely related to *Margaritopsis* than any other genus, and concluded that *Margaritopsis* should be expanded to include these species. Their analysis found again that *Readea* belongs to this clade, along with two additional species: *Eumachia carnea* and an Australian species that was inaccurately classified in *Hodgkinsonia* F. Müll. BARRABÉ et al. (2012) documented several additional morphological characters of *Margaritopsis*, but did not provide a detailed morphological review of their newly expanded genus because so many of the Pacific species are incompletely known. In particular some of the Pacific species they added to this group have the stipules fused into a well developed tube with two very short glandular lobes at the top, in contrast to the short triangular stipules found in most species of this group. BARRABÉ et al. also found that some Neotropical species of *Margaritopsis* have dorsal as well as ventral PGS's. BARRABÉ et al.'s study (2012) identified a core set of characters that is consistent within the genus, though not necessarily diagnostic for it: a shrub or small tree habit; terminal inflorescences with green to whitened axes and generally short bracts; white to cream or yellowish green corollas that are often barbate in the throat; orange to red fruits; pyrenes that are adaxially plane (i.e., without a longitudinal groove or intrusion, though the endosperm may have an intrusion); and endosperm that is not ruminant (though it may have an adaxial intrusion). BARRABÉ et al. (2012) did not make any new nomenclatural combinations, but separately BARRABÉ et al. (2013) presented a floristic treatment with three new combinations for *Margaritopsis* in New Caledonia.

In a molecular analysis with a broad sampling of African *Psychotria*, LACHENAUD (2013: 57-58) also found *Chazaliella* and *Margaritopsis* grouped together on a distinct clade. He regarded this clade as *Margaritopsis*. He made no nomenclatural combinations.

The circumscription and relationships of *Margaritopsis* were then studied with more sequence data and a broader Paleotropical sampling by RAZAFIMANDIMBISON et al.

(2014). Their results found *Margaritopsis* to be a monophyletic group, with the African *Chazaliella* species forming a paraphyletic basal group and the Neotropical species plus the Asian, New Guinean, and Pacific species supported as a monophyletic clade. Accordingly RAZAFIMANDIMBISON et al. (2014) also included *Chazaliella* within *Margaritopsis*, and they published nomenclatural combinations in *Margaritopsis* for the species of *Chazaliella*.

BARRABÉ et al. (2012) and BARRABÉ & DAVIS (2013) both noted that *Eumachia* is the oldest name for the clade that had been treated as *Margaritopsis*, so *Eumachia* has nomenclatural priority over *Margaritopsis*. *Eumachia* has been very poorly known, and its identity and separation as a genus were both considered doubtful by the few, mostly 19th-century authors who mentioned it. BARRABÉ & DAVIS (2013) therefore proposed nomenclatural conservation of *Margaritopsis* against *Eumachia*. However the Nomenclature Committee for Vascular Plants concluded that *Margaritopsis* is also an obscure name, and they rejected this proposal (APPLEQUIST, 2014). As a result, new nomenclatural combinations in *Eumachia* are needed for the species of *Margaritopsis*. DELPRETE & KIRKBRIDE (2015) published some of these, for thirteen selected Neotropical species along with the type species of the four Paleotropical genera that were synonymized with *Margaritopsis* by RAZAFIMANDIMBISON et al. (2014).

Here the component species and taxonomy of *Eumachia* are surveyed comprehensively for the first time, and the necessary new nomenclatural combinations are made for all the recognized taxa of this genus. The species of *Eumachia* are grouped here by region, with the regions presented in the order they are placed on the cladogram of RAZAFIMANDIMBISON et al. (2014: Fig. 3). Within each region the species are presented in alphabetical order, and the infrageneric taxa are in alphabetical order under the corresponding species. No keys are presented here, because these have been previously published for Africa (VERDCOURT, 1977) and the Neotropics (TAYLOR, 2005) while the species of Asia, New Guinea, and the Pacific region are not well enough known to construct a reliable key. Nomenclature is detailed for the accepted names of the species of *Eumachia*, but the only synonymies presented here are those that differ from those given by VERDCOURT (1977), TAYLOR (2005), and BARRABÉ et al. (2013). Typification is clarified as far as possible. Study of the Asian, New Guinean, and Pacific species of *Eumachia* is not expected to progress significantly in the near future, but the component species of this genus are outlined here to aid ongoing study of *Psychotria* and for the "World Flora Online" project [<http://www.worldfloraonline.org>].

Taxonomy

Eumachia DC., Prodr. 4: 478. 1830. = *Psychotria* sect. *Eumachia* A.C. Sm. in Bernice P. Bishop Mus. Bull. 141: 151. 1936.

Typus: *Eumachia carnea* (G. Forst.) DC.

- = *Margaris* Griseb., Cat. Pl. Cub. 134. 1866 [nom. illeg.] [not *Margaris* DC.]. = *Margaritopsis* C. Wright in Sauvage in Anales Acad. Ci. Med. Habana 6: 146. 1869 [nom. nov]. **Typus:** *Margaritopsis acuiifolia* C. Wright = *Eumachia acuiifolia* (C. Wright) Delprete & J.H. Kirkbr.
- = *Mapouria* ser. *Chaenotrichae* Müll. Arg. in Flora 59: 496. 1876. **Lectotypus** (designated here): *Mapouria chaenotricha* (DC.) Müll. Arg. = *Eumachia chaenotricha* (DC.) Razafim. & C.M. Taylor, **syn. nov.**
- = *Readea* Gillespie in Bernice P. Bishop Mus. Bull. 74: 35. 1930. **Typus:** *Readea membranacea* Gillespie = *Eumachia membranacea* (Gillespie) Delprete & J.H. Kirkbr.
- = *Chytropsia* Bremek. in Recueil Trav. Bot. Néerl. 31: 291. 1934. = *Psychotria* sect. *Chytropsia* (Bremek.) Steyererm. in Mem. New York Bot. Gard. 23: 484. 1972. **Typus:** *Chytropsia astrellantha* (Wernham) Bremek. = *Eumachia astrellantha* (Wernham) Delprete & J.H. Kirkbr.
- = *Chazaliella* E.M.A. Petit & Verdc. in Kew Bull. 30: 268. 1975. **Typus:** *Chazaliella abrupta* (Hiern) E.M.A. Petit & Verdc. = *Eumachia abrupta* (Hiern) Delprete & J.H. Kirkbr.

Eumachia includes 83 species of shrubs and small trees found in seasonal to wet vegetation at low to middle elevations in most tropical regions (Fig. 1; BARRABÉ et al., 2012: fig. 4). *Eumachia* is found widely in tropical continental Africa (20 species), the American tropics (27 species), southeast Asia, northeastern Australia, New Guinea, and numerous Pacific Islands (36 species). *Eumachia* apparently is absent in Madagascar and the Indian subcontinent (RAZAFIMANDIMBISON et al., 2014). The number of species of *Eumachia* in Asia, New Guinea, and the Pacific region is higher than previously estimated, and moves the center of diversity of the genus to this region.

Eumachia is characterized by raphides in its tissues; a woody habit, as a shrub or sometimes small tree; a characteristic yellowish green drying color of the vegetative structures and inflorescence axes; opposite leaves; stipules that are interpetiolar or sometimes united around the stem, at least partially persistent, and often bear a caducous gland on the tip of each segment; terminal inflorescences that are basically cymose with the axes and bracts green to whitened; four- or five-merous flowers that are generally distylous; salverform to funnellform, white to cream or yellowish green corollas with

valvate aestivation and usually barbate throats; bilocular ovaries with the ovules solitary and basal in each locule; drupaceous, ellipsoid to subglobose, orange to red fruits; pyrenes that are smooth to ribbed abaxially, plane to concave adaxially (i.e., without a longitudinal groove), and have hard walls that lack the ethanol-soluble pigment found in *Psychotria* and marginal PGS's (PIESSCHAERT, 2001); and seeds with the endosperm entire (i.e., not ruminant). The stipules vary morphologically among the species but all have a characteristic *Eumachia* form: they either become hard and yellowed to ocher with age and then slowly break off in fragments, or their top portion is deciduous and their basal portion persistent. The non-ruminant endosperm sometimes has a single T-shaped adaxial intrusion (PIESSCHAERT, 2001). Most of these features are general characters of the tribe *Palicoureeae*, and thus as noted by ANDERSSON (2001) *Eumachia* is not easy to diagnose morphologically. Dried specimens are generally recognizable by the combination of their yellowish green color, yellowed to ocher fragmented stipules, terminal inflorescences, small to medium-sized white flowers with usually barbate corolla throats, orange to red drupaceous fruits, and raphides in the tissues.

Several morphological features vary widely in *Eumachia*, and significantly more variation is found among the Pacific species than in other regions. The stipules range in all regions from triangular to bilobed on each interpetiolar side, and in a few species they are initially entire and later split longitudinally to become bilobed; additionally some Pacific species have stipules that are fused into a tube with two short apical lobes [e.g., *E. archboldiana* (Fosberg) Barrabé et al.]. Most *Eumachia* species have somewhat flattened stems with a medial longitudinal ridge on each interpetiolar side (TAYLOR, 2005: 174, Fig. 1), but some have rounded smooth internodes. Species that grow in seasonal vegetation in all regions often develop corky stems. The inflorescences of *Eumachia* show similar variation to many other *Rubiaceae* genera, with the arrangement basically dichasially cymose and ranging from lax [e.g., *E. cymuligera* (Müll. Arg.) Razafim. & C.M. Taylor, *E. leptothyrsa* (Miq.) Barrabé et al.] to short or contracted into a subcapitate head [e.g., *E. cephalantha* (Müll. Arg.) Delprete & J.H. Kirkbr., *E. kappeleri* (Miq.) Delprete & J.H. Kirkbr.]. The corollas range from 2 mm long to around 2 cm long. As documented by BARRABÉ et al. (2012), the pyrenes of all the species have PGS's located on their margins, and some species additionally have abaxial PGS's. A few specimens show all of the characters of *Eumachia* except they dry blackened rather than yellowish green; similar variation in drying color is found in some other genera of *Rubiaceae* (e.g., *Palicourea* Aubl.).

The pollen of *Eumachia* has been documented for only a few species, and is variously aperturate or inaperturate. ANDERSSON (2001) initially reported the pollen of this genus to be aperturate based on the species studied by him and

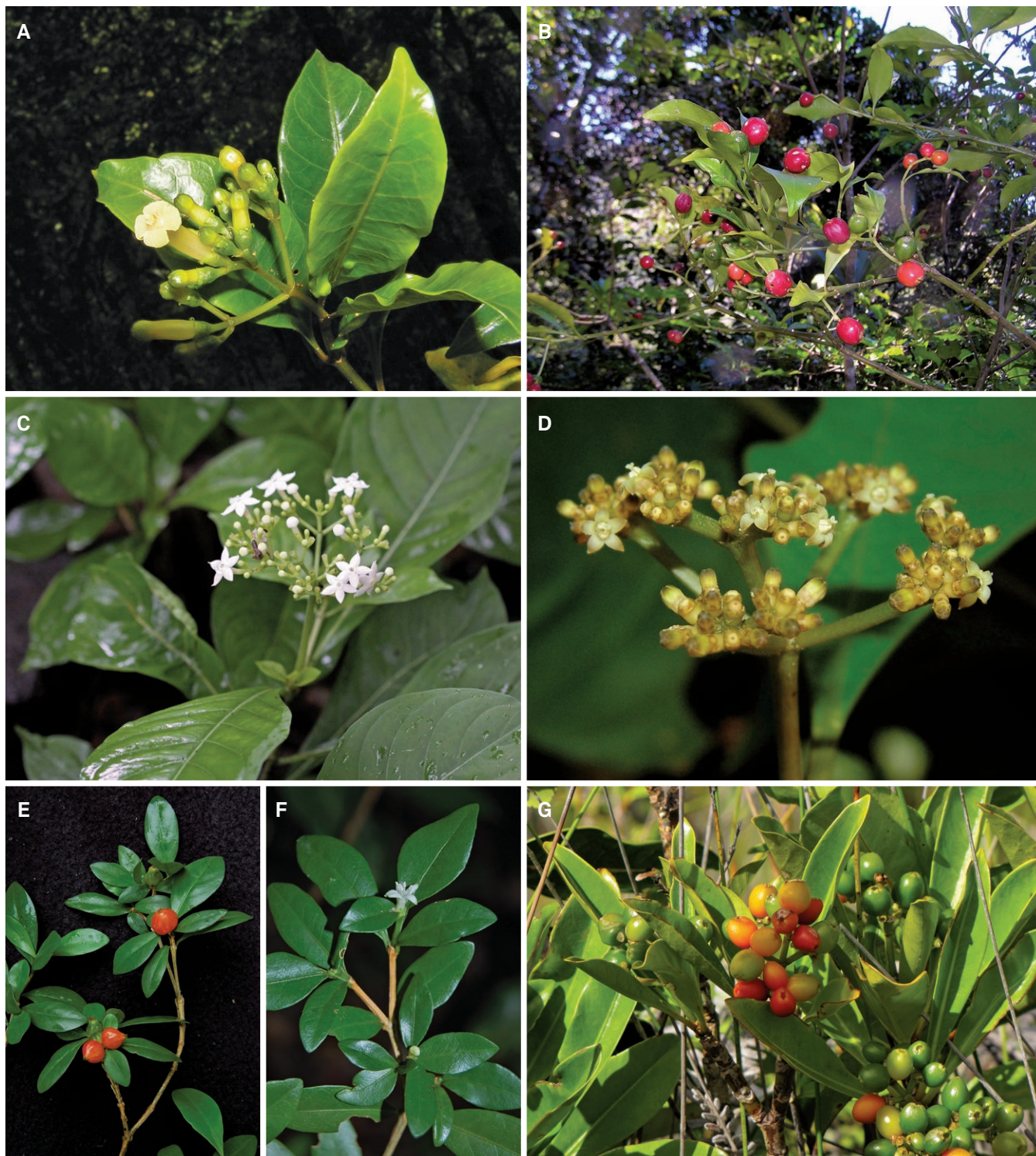


Fig. 1. – Photographs of *Eumachia* DC. **A, B.** *Eumachia lyciiflora* (Baill.) Barrabé, C.M. Taylor & Razafim.; **C.** *Eumachia microdon* (DC.) Delprete & J.H. Kirkbr.; **D.** *Eumachia boliviana* (Standl.) Delprete & J.H. Kirkbr.; **E, F.** *Eumachia depauperata* (Müll. Arg.) M.R. Barbosa & M.S. Pereira; **G.** *Eumachia oleoides* (Baill.) Barrabé, C.M. Taylor & Razafim.
[A: Barrabé & Barriole 747; B: Barrabé 589; C: Coronado 6251; D: Araujo 1247; E-G: Unvouchered photos] [Photos: **A, B:** L. Barrabé; **C:** O.M. Montiel; **D:** C. Davidson; **E, F:** J. Jardim; **G:** H. Vandrot]

by JOHANSSON (1992). JOHANSSON (1992) considered the aperturate pollen of the species of *Eumachia* that he studied to differ in form, and classified it variously in his type XII (2 spp.), type XVI (5 species), and type XIX (1 sp.). However BARRABÉ et al. (2012) found that *Psychotria leptothyrsa* Miq. also belongs to *Eumachia*, and JOHANSSON documented the pollen of this species as inaperturate and included it in his type XX. Two other species with inaperturate pollen have been suggested to be related to species of *Eumachia*, but these other species are not included in this genus here. One other species that JOHANSSON classified as having type XX pollen, *Psychotria hunteri* (Horne ex Baker) A.C. Sm., was considered by SMITH & DARWIN (1988) to be related to *Eumachia carnea* but more recent study (BARRABÉ, pers. obs.) finds that this species is related instead to a Fijian group of *Psychotria*. Inaperturate pollen of JOHANSSON'S type XXI was documented in another species that Steyermark included in the *Chytropsia* group, *Psychotria spiciflora* Standl., but that species belongs to *Palicourea* (TAYLOR, 2015).

Study of the secondary chemistry of the tribes *Psychotrieae* and *Palicoureeae* is just beginning (MARTINS & NUNEZ, 2015), but BERGER (2012) surveyed several species of *Palicoureeae*. He suggested for the first time that some chemical constituents, in particular cyclotryptamine alkaloids, may be another characteristic of *Eumachia* that distinguishes it from other genera of *Palicoureeae*, which appear to lack these compounds. His study was complicated by limited species sampling and lack of clarification as to which *Psychotria* species should be classified in *Eumachia*, particularly among the Pacific species where more chemical variation was found, so further study will be needed to confirm this.

A synoptic treatment of the African species of *Eumachia*, including a key and nomenclatural synonymy, was presented by VERDCOURT (1977; as *Chazaliella*). A comparable synoptic treatment of the Neotropical species was presented by TAYLOR (2005; as *Margaritopsis*). The Asian, Australian, New Guinean, and Pacific species of *Eumachia* have never been treated together before now. Lectotypifications for several Neotropical names were made by DELPRETE & KIRKBRIDE (2015).

Most of the 12 species included in *Mapouria* ser. *Chaenotrichae* (MÜLLER, 1881: 416–422) have been more recently classified in *Margaritopsis* (TAYLOR, 2005; some of them as synonymous names). No types were designated by MÜLLER (1876, 1881) for his infrageneric groups. Based on the general characterization of *Mapouria* ser. *Chaenotrichae* and the name Müller gave it, *M. chaenotricha* is here designated as the lectotype for this series. Two species originally classified in this series, *M. riedeliana* Müll. Arg. and *M. mandiocana* Müll. Arg., belong to *Psychotria*; nine of the original species belong to *Eumachia*; and the identity of the remaining name, *Mapouria vestita* (Presl) Müll. Arg., is not yet clear.

I. *Eumachia* in Africa

Eumachia includes 20 species with eight subspecies and seven varieties in Africa, and the genus is found widely across the tropical part of this continent. *Eumachia abrupta* and *E. sciadephora* are perhaps the most commonly collected species. This genus was studied here taxonomically as *Chazaliella* by VERDCOURT (1977). In addition to the species he treated, he mentioned five other specimens that appeared to represent new species of *Chazaliella* but were inadequate for description. VERDCOURT later (1980) transferred another species of *Polysphaeria* Hook.f. into this genus, and another new species of *Chazaliella* was subsequently described by ROBBRECHT (1989) and did not correspond to any of the problematic specimens VERDCOURT cited. More recently Lachenaud (unpubl. data) has studied the taxonomy of this group.

The name *Psychotria anacamptos* K. Schum. was transferred to *Chazaliella* by VERDCOURT (1975), and later to *Margaritopsis* by RAZAFIMANDIMBISON et al. (2014). However VERDCOURT noted in a later article (1977: 810–811) that this name was based on a single specimen at B that was destroyed and had no photographic or other documentation, and he concluded that the identity of this name is problematic. VERDCOURT (1975) noted a general confusion about the identity of this name, and its use by previous authors for plants variously of *C. oddonii* (De Wild.) E.M.A. Petit & Verdc. var. *oddonii*, *C. domatiicola* (De Wild.) E.M.A. Petit & Verdc., and all three subspecies of *C. obovoidea* Verdc. In this second article VERDCOURT provisionally synonymized *P. anacamptos* with *C. domatiicola*, but considered its placement here so doubtful that he did not adopt this name for this species even though it has priority. *Psychotria anacamptos* is not transferred to *Eumachia* here based on VERDCOURT'S (1977) conclusions.

Chazaliella pilosula (De Wild.) Petit & E.M.A. Petit was included in this genus by VERDCOURT (1975), and transferred to *Margaritopsis* by RAZAFIMANDIMBISON et al. (2014). However it was subsequently considered a synonym of *C. oddonii* var. *oddonii* by VERDCOURT (1977: 801), and thus is not recognized here.

Psychotria subcordatifolia De Wild. was included in *Chazaliella* by VERDCOURT (1975), but is not included here because it was later removed from *Chazaliella* and treated as *Chassalia subcordatifolia* (De Wild.) Piesschaert by PIESCHAERT et al. (1999).

1. *Eumachia abrupta* (Hiern) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 76. 2015.

- ≡ *Psychotria abrupta* Hiern in Oliver, Fl. Trop. Afr. 3: 205. 1877. ≡ *Uragoga abrupta* (Hiern) Kuntze, Revis. Gen. Pl. 2: 959. 1891. ≡ *Chazaliella abrupta* (Hiern) E.M.A. Petit & Verdc. in Kew Bull. 30: 268. 1975. ≡ *Margaritopsis abrupta* (Hiern) L. Andersson in Syst. Geogr. Pl. 72: 230. 2002.

Lectotypus (designated here): **MOZAMBIQUE**: Shigogo, XII.1860, *Kirk s.n.* (K [K000412356, plant on upper left] image seen). **Syntypus**: **MOZAMBIQUE**: Shiramba, XII.1860, *Kirk s.n.* (K [K000412356 plant on lower right] image seen).

Notes. – This species is found in Democratic Republic of Congo, Kenya, Tanzania, Mozambique, Malawi, Zambia, Zimbabwe, and Angola (VERDCOURT, 1977). This species was illustrated by VERDCOURT (1976: 118, fig. 8, 1989: 36, fig. 5), as *Chazaliella abrupta* var. *abrupta*. The name *Psychotria abrupta* apparently has not been lectotypified previously. This name was described based on two syntypes, both collected by Kirk in Mozambique and both mounted on one sheet at K [K000412356]. The plant on the upper left of that sheet has flowers and also shows well the characteristic indurated stipules, stem internodes with a medial longitudinal ridge, and whitened corky bark that is characteristic of *Eumachia*, and this plant is designated here as the lectotype. The other syntype has two inflorescences from which the corollas have fallen and stipules that have mostly already broken off.

1a. *Eumachia abrupta* (Hiern) Delprete & J.H. Kirkbr. var. *abrupta*

Note. – This variety is found in Democratic Republic of Congo, Kenya, Tanzania, Mozambique, Malawi, Zambia, Zimbabwe, and Angola (VERDCOURT, 1977).

1b. *Eumachia abrupta* var. *parvifolia* (Verdc.) C.M. Taylor, **comb. nov.**

= *Chazaliella abrupta* var. *parvifolia* Verdc. in Kew Bull. 30: 268. 1975.

Typus: **KENYA. Kilifi Distr. [Kilifi County]**: Arabuko, Malindi District, III.1930, *Graham 2339* (holo-: K [K000318634] image seen; iso-: EA [EA000001777, EA000001778, EA000001779] images seen).

Notes. – This variety was reported by VERDCOURT (1976) as found in Kenya but later (VERDCOURT, 1977, 1989) was reported also from Mozambique. The type locality was cited in the protologue as Kilifi District, while the locality on the original labels is given as Malindi District; political redistricting in Kenya has placed the collection locality, Arabuko, variously in both of these districts at different times (R. Gereau, pers. comm.).

2. *Eumachia coffeesperma* (K. Schum.) Razafim. & C.M. Taylor, **comb. nov.**

= *Psychotria coffeesperma* K. Schum. in Bot. Jahrb. Syst. 33: 363. 1903. = *Chazaliella coffeesperma* (K. Schum.) Verdc. in Kew Bull. 31: 813. 1977. = *Margaritopsis coffeesperma* (K. Schum.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1117. 2014.

Lectotypus (designated here): **CAMEROON**: Lolodorf, 1896, *Staudt 141* (S [S05-10884]!; isolecto-: G [G00341699], K [K000412362] image seen, P [P00551377, P00551378, P00551379] images seen, S [S-G-5099]!).

Notes. – This species is found in Cameroon and Democratic Republic of Congo, and its subspecies have separate ranges (VERDCOURT, 1977). The holotype of *Psychotria coffeesperma* was certainly at the B herbarium and has been destroyed. Several duplicates of the type collection are deposited in other herbaria, and the best sheet, with ample material and both flowers and fruits, is here designated as the lectotype.

2a. *Eumachia coffeesperma* (K. Schum.) Razafim. & C.M. Taylor subsp. *coffeesperma*

Note. – This subspecies is found in Cameroon.

2b. *Eumachia coffeesperma* subsp. *longipedicellata* (Verdc.) C.M. Taylor, **comb. nov.**

= *Chazaliella coffeesperma* subsp. *longipedicellata* Verdc. in Kew Bull. 31: 814. 1977.

Typus: **DEMOCRATIC REPUBLIC OF CONGO**: Kiyaka, Kwango, 17.X.1935, *Devred 2740* (holo-: BR [BR0000008415974] image seen; iso-: K [K000412363] image seen, MO-2572500!, P [P00551376] image seen).

Note. – This subspecies is found in Democratic Republic of Congo (VERDCOURT, 1977).

3. *Eumachia cupulicalyx* (Verdc.) Razafim. & C.M. Taylor, **comb. nov.**

= *Chazaliella cupulicalyx* Verdc. in Kew Bull. 31: 799, fig. 3. 1977. = *Margaritopsis cupulicalyx* (Verdc.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1117. 2014.

Typus: **LIBERIA**: Dukwia River, 2.VII.1929, *Cooper 360* (holo-: K [K000042881]!; iso-: K [K000042880]!).

Notes. – This species is found in Liberia (VERDCOURT, 1977). It was illustrated by VERDCOURT (1977: 800, fig. 3).

4. *Eumachia domatiicola* (De Wild.) Razafim. & C.M. Taylor, **comb. nov.**

- = *Psychotria domatiicola* De Wild., Pl. Bequaert. 2: 362. 1924. = *Chazaliella domatiicola* (De Wild.) E.M.A. Petit & Verdc. in Kew Bull. 30: 269. 1975. = *Margaritopsis domatiicola* (De Wild.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1117. 2014.

Lectotypus (designated here): **DEMOCRATIC REPUBLIC OF CONGO**: Zaire, entre Bolobo et Sandy Beach, 14.X.1913, *Bequaert 874* (BR [BR0000008415349] image seen; isolecto-: BR [BR0000008827906] image seen).

Notes. – This species is found in Ghana, Nigeria, Cameroon, continental Equatorial Guinea, and Democratic Republic of Congo (VERDCOURT, 1977). RAZAFIMANDIMBISON et al. (2014) cited the type material of *Psychotria domatiicola* as two specimens deposited at BR, one the holotype and the other an isotype. However these two specimens were not individually designated or identified as to their type status, there or apparently by any previous author. Possibly these sheets were both considered to comprise a holotype with multiple sheets (e.g., VERDCOURT, 1977: 810). However these two sheets are basically duplicates and their status is not clear, so we here lectotypify this name. The specimen designated as the lectotype has complete label data and several mature flowers, while the isolectotype has incomplete label data and flowers that are all in bud.

5. *Eumachia gossweileri* (Cavaco) Razafim. & C.M. Taylor, **comb. nov.**

- = *Grumilea gossweileri* Cavaco in Bull. Mus. Hist. Natl., sér. 2 29: 515. 1958. = *Chazaliella gossweileri* (Cavaco) E.M.A. Petit & Verdc. in Kew Bull. 30: 269. 1975. = *Margaritopsis gossweileri* (Cavaco) Razafim. & B. Bremer in Amer. J. Bot. 101: 1117. 2014.

Typus: **ANGOLA**: NE da Lunda, Dundo, prox. flumen Luacimo, 750 m, 31.X.1946, *Gossweiler 13799* (holo-: P [P00551375] image seen; iso-: BM [BM000903675] image seen, K [K000412571] image seen).

Note. – This species is found in the main region of Angola (i.e., not Cabinda; VERDCOURT, 1977).

6. *Eumachia insidens* (Hiern) Razafim. & C.M. Taylor, **comb. nov.**

- = *Psychotria insidens* Hiern in Oliver, Fl. Trop. Afr. 3: 208. 1877. = *Uragoga insidens* (Hiern) Kuntze, Revis. Gen. Pl. 2: 960. 1881. = *Chazaliella insidens* (Hiern) E.M.A. Petit & Verdc. in Kew Bull. 30: 269. 1975. = *Margaritopsis insidens* (Hiern) Razafim. & B. Bremer in Amer. J. Bot. 101: 1117. 2014.

Lectotypus (designated here): **EQUATORIAL GUINEA. Fernando Po [Bioko]**: 323 m, 1860, *Mann 310* (K [K000042912] image seen; isolecto-: P [P00300432] image seen). **Syntypus**: **EQUATORIAL GUINEA. Fernando Po [Bioko]**: 1861, *Mann 1155* (K [K000042911] image seen).

Notes. – This species is found in Nigeria, Liberia, and Bioko in Equatorial Guinea, and its subspecies have separate ranges (VERDCOURT, 1977). The name *Psychotria insidens* was based on collections made by Mann in Bioko and deposited at K, which VERDCOURT (1975: 269) detailed as the syntypes *Mann 310* and *Mann 1155*. This name has apparently not been typified further, so a lectotype is designated here. The collection *Mann 310* has more label data, a duplicate deposited in another herbarium, and mature flowers and it is here designated the lectotype. The other syntype *Mann 1155* has immature fruits.

6a. *Eumachia insidens* (Hiern) Razafim. & C.M. Taylor subsp. *insidens*

Note. – This subspecies is found in Nigeria, and on Bioko in Equatorial Guinea (VERDCOURT, 1977).

6b. *Eumachia insidens* subsp. *liberica* (Verdc.) C. M. Taylor, **comb. nov.**

- = *Chazaliella insidens* subsp. *liberica* Verdc. in Kew Bull. 31: 797. 1977.

Typus: **LIBERIA**: Cavalla Plantation, Las Palmas, 16 m, 22.X.1956, *Hale 47* (holo-: K [K000042914] image seen).

Note. – This subspecies is found in Liberia (VERDCOURT, 1977).

7. *Eumachia letouzeyi* (Robbr.) Razafim. & C.M. Taylor, **comb. nov.**

- = *Chazaliella letouzeyi* Robbr. in Bull. Mus. Natl. Hist. Nat., B, Adansonia. 11: 344. 1990.

Typus: **CAMEROON**: Mvam, 5 km SO d'Oveng, 26.X.1966, *Letouzy 8212* (holo-: BR [BR0000008827890] image seen; iso-: BR [BR0000008415646] image seen).

Notes. – This species is found in Cameroon (ROBBRECHT, 1989). VERDCOURT (1977) mentioned a set of specimens that were possible additional undescribed species of *Chazaliella*, and ROBBRECHT (1989) showed that his new species, *C. letouzeyi* Robbr., did not correspond to any of those.

8. *Eumachia longistylis* (Hiern) Razafim. & C.M. Taylor, **comb. nov.**

- = *Psychotria longistylis* Hiern in Oliver, Fl. Trop. Afr. 3: 209. 1877. = *Uragoga longistylis* (Hiern) Kuntze, Revis. Gen. Pl. 2: 961. 1891. = *Chazaliella longistylis* (Hiern) E.M.A. Petit & Verdc. in Kew Bull. 30: 269. 1975. = *Margaritopsis longistylis* (Hiern) Razafim. & B. Bremer in Amer. J. Bot. 101: 1117. 2014.

Typus: GABON: Gaboon River, VII.1861, *Mann 987* (holo-: K [K000412368] image seen; iso-: P [P00300435] image seen).

Notes. – This species is found in Gabon (VERDCOURT, 1977). A specimen of this species at P is labelled *Mann 887*, and appears to be an isotype with a typographical error in the collection number (O. Lachenaud, unpubl. data).

9. *Eumachia lophoclada* (Hiern) Razafim. & C.M. Taylor, **comb. nov.**

- = *Psychotria lophoclada* Hiern in Oliver, Fl. Trop. Afr. 3: 197. 1877. = *Uragoga lophoclada* (Hiern) Kuntze, Revis. Gen. Pl. 2: 961. 1891. = *Chazaliella lophoclada* (Hiern) E.M.A. Petit & Verdc. in Kew Bull. 30: 269. 1975. = *Margaritopsis lophoclada* (Hiern) Razafim. & B. Bremer in Amer. J. Bot. 101: 1117. 2014.

Lectotypus (designated by Razafimandimbison & B. Bremer in RAZAFIMANDIMBISON et al., 2014: 1117): **SIERRA LEONE:** Sugar Loaf Mountain, V.1857, *Barter s.n.* (K [K000412374]!). **Syntypi:** **SIERRA LEONE:** *sine loc.*, 1798, *Afzelius s.n.* (LINN [LINN-HS333-49] image seen); *sine loc.*, s.d., *Don s.n.* (BM [BM000903549] image seen).

Note. – This species is found in Sierra Leone, Liberia, Ivory Coast, and Ghana (VERDCOURT, 1977).

10. *Eumachia macrocarpa* (Verdc.) Razafim. & C.M. Taylor, **comb. nov.**

- = *Chazaliella macrocarpa* Verdc. in Kew Bull. 31: 794. 1977. = *Margaritopsis macrocarpa* (Verdc.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1117. 2014.

Typus: DEMOCRATIC REPUBLIC OF CONGO: Zaïre, Yangambí, à 5 km au N du fleuve, 470 m, 9.III.1937, *Louis 3463* (holo-: BR [BR0000008416094] image seen; iso-: BR [BR0000008827883] image seen, K [K000412369] image seen, P [P00551374] image seen).

Notes. – This species is found in Gabon and Democratic Republic of Congo (VERDCOURT, 1977). It was illustrated by VERDCOURT (1977: 795, fig. 2). Two specimens of the type of *Chazaliella macrocarpa* Verdc. are deposited at BR, one with a label and an annotation by VERDCOURT with this name, another with no label, no annotation with any name, a barcode number that indicates it was accessioned separately and later than the first specimen, and no indication that it was studied by Verdcourt, who routinely annotated the specimens he saw. Therefore the specimen annotated by Verdcourt appears to be the holotype, and the other specimen at BR an isotype.

11. *Eumachia obanensis* (Wernham) Razafim. & C.M. Taylor, **comb. nov.**

- = *Psychotria obanensis* Wernham, Cat. Pl. Oban. 53. 1913. = *Chazaliella obanensis* (Wernham) E.M.A. Petit & Verdc. in Kew Bull. 30: 269. 1975. = *Margaritopsis obanensis* (Wernham) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Typus: NIGERIA: Oban, 1911, *Talbot 244* (holo-: BM [BM000903548] image seen; iso-: K [K000412373] image seen).

Notes. – This species is found in Nigeria (VERDCOURT, 1977). The type collection of *Psychotria obanensis* has two duplicates, both of them deposited in institutions where Wernham apparently worked. The specimen at BM, where Wernham's types are assumed to be deposited (Stafleu & Cowan, 1988) has a typewritten or printed label that identifies it as *Talbot 244* from "Oban, S. Nigeria, 1911", and another typewritten label that identifies this as the type of *P. obanensis* with the place of publication of this name. The specimen at K has a label in Wernham's handwriting with the locality and collector data and the name *P. obanensis*. The specimen of *Talbot 244* at BM is in much better condition than the one at K. VERDCOURT (1977: 798) formally cited the BM specimen as the holotype and the K specimen as an isotype, and is followed here.

12. *Eumachia obovoidea* (Verdc.) Razafim. & C.M. Taylor, **comb. nov.**

- = *Chazaliella obovoidea* Verdc. in Kew Bull. 31: 803. 1977. = *Margaritopsis obovoidea* (Verdc.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Typus: DEMOCRATIC REPUBLIC OF CONGO: Zaïre, vallée de la N'kula, 24.IV.1947, *Toussaint 2270* (holo-: BR [BR0000008483300] image seen; iso-: BR [BR0000008828514] image seen, K [K000412366] image seen).

Notes. – This species is found in Cameroon and eastern to central Democratic Republic of Congo (VERDCOURT, 1977). Its typical subspecies was illustrated by VERDCOURT (1977: 805, fig. 4). Plants of *Eumachia obovoidea* are often notable for their corky or thickened stems. Two duplicates of the type specimen of *Chazaliella obovoidea* are deposited at BR, where the holotype was designated in the protologue without further detail. One of these specimens has a collection label, an annotation with this name by Verdcourt, and a significantly lower accession number, and is assumed to be the holotype. The other specimen has no label or annotation, and thus cannot be confirmed to have been studied by Verdcourt and is assumed to be an isotype. The specimen at K has one written designation on it as “holotype”, and another, apparently made later, as “isotype”, but this duplicate was not mentioned in the protologue.

12a. *Eumachia obovoidea* subsp. *longipedunculata* (Verdc.) C.M. Taylor, **comb. nov.**

= *Chazaliella obovoidea* subsp. *longipedunculata* Verdc. in Kew Bull. 31: 807. 1977.

Typus: DEMOCRATIC REPUBLIC OF CONGO: vallée [illegible], 1902, *Gillet 2832* (holo-: BR [BR0000008482525] image seen).

Note. – This subspecies is found in Democratic Republic of Congo (VERDCOURT, 1977).

12b. *Eumachia obovoidea* (Verdc.) Razafim. & C.M. Taylor subsp. *obovoidea*

Note. – This subspecies is found in Democratic Republic of Congo (VERDCOURT, 1977).

12c. *Eumachia obovoidea* subsp. *rhytidophloea* (Verdc.) C.M. Taylor, **comb. nov.**

= *Chazaliella obovoidea* subsp. *rhytidophloea* Verdc. in Kew Bull. 31: 808. 1977.

Typus: DEMOCRATIC REPUBLIC OF CONGO: Ifamu, IX.1921, *Vanderyst 10578* (holo-: BR [BR0000008482426] image seen).

Note. – This subspecies is found in Cameroon and Democratic Republic of Congo (VERDCOURT, 1977).

12d. *Eumachia obovoidea* subsp. *villosistipula* (Verdc.) C. M. Taylor, **comb. nov.**

= *Chazaliella obovoidea* subsp. *villosistipula* Verdc. in Kew Bull. 31: 808. 1977.

Typus: CAMEROON: Dengdeng, 7-750 m, 5°10'N 13°35'E, 19.IV.1914, *Mildbraed 8911* (holo-: K [K000412365] image seen; iso-: K [K000412364] image seen).

Note. – This subspecies is found in Cameroon (VERDCOURT, 1977).

13. *Eumachia oddonii* (De Wild.) Razafim. & C.M. Taylor, **comb. nov.**

= *Psychotria oddonii* De Wild., Etudes Fl. Bas-Moyen-Congo 2: 187. 1907. = *Chazaliella oddonii* (De Wild.) E.M.A. Petit & Verdc. in Kew Bull. 30: 269. 1975. = *Margaritopsis oddonii* (De Wild.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Syntypi: DEMOCRATIC REPUBLIC OF CONGO: Zaïre, Sanda, IV.1903, *Oddon in Gillet 3001* (BR [BR0000008482907] image seen); *ibid. loc.*, s.d., *Oddon in Gillet 3746* (BR, not found).

Notes. – This species is found in Nigeria, Cameroon, Republic of Congo, and Democratic Republic of Congo. The type material of this name was cited by VERDCOURT (1977: 799) as two collections deposited at BR. One collection, *Oddon in Gillet 3746*, has not been seen so this name cannot be further typified here. Verdcourt considered *Eumachia poggei* to be of somewhat unclear identity, but similar to or perhaps not distinct from *E. oddonii*.

13a. *Eumachia oddonii* var. *cameroonensis* (Verdc.) C.M. Taylor, **comb. nov.**

= *Chazaliella oddonii* var. *cameroonensis* Verdc. in Kew Bull. 31: 802. 1977.

Typus: CAMEROON: Bitaya, near river Ja, near Ndu, s.d., *Bates 1861* (holo-: K [K000412367] image seen; iso-: P [P00698481] image seen).

Note. – This variety is found in Nigeria and Cameroon (VERDCOURT, 1977).

13b. *Eumachia oddonii* var. *grandifolia* (Verdc.) C.M. Taylor, **comb. nov.**

= *Chazaliella oddonii* var. *grandifolia* Verdc. in Kew Bull. 31: 803. 1977.

Typus: DEMOCRATIC REPUBLIC OF CONGO: Zaïre, Yangambi, plateau de la Lusambila, 16.VII.1938, *Louis 10381* (holo-: BR [BR0000008828521] image seen).

Notes. – This variety is found in eastern Democratic Republic of Congo (VERDCOURT, 1977). VERDCOURT (1977: 792, Map 1) mapped the other two varieties of *Eumachia oddonii* but not this one.

13c. *Eumachia oddonii* (De Wild.) Razafim. & C.M. Taylor var. *oddonii*

Note. – This variety is found in Republic of Congo and widely across Democratic Republic of Congo (VERDCOURT, 1977).

14. *Eumachia parviflora* (R.D. Good.) Razafim. & C.M. Taylor, **comb. nov.**

= *Polysphaeria parviflora* R.D. Good in J. Bot. 64 (Suppl. 2): 21. 1926. = *Chazaliella parviflora* (R.D. Good) Verdc. in Kew Bull. 35: 128. 1980.

Lectotypus (designated by VERDCOURT, 1980: 28): ANGOLA. **Cabinda**: Maiumbe, near Luando River, Pango Munga, 24.XII.1915, *Gossweiler 6025* (BM [BM000903671] image seen; isolecto-: COI [COI00000062] image seen, LISC [LISC001016, LISC001017] images seen).

Note. – This species was known to VERDCOURT (1980) only from the type specimen, from Cabinda in northern Angola.

15. *Eumachia poggei* (K. Schum.) Razafim. & C.M. Taylor, **comb. nov.**

= *Psychotria poggei* K. Schum. in Bot. Jahrb. Syst. 28: 97. 1909. = *Chazaliella poggei* (K. Schum.) E.M.A. Petit & Verdc. in Kew Bull. 30: 269. 1975. = *Margaritopsis poggei* (K. Schum.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Syntypi: DEMOCRATIC REPUBLIC OF CONGO: near Mukenge, s.d., *Pogge 1039* (B⁺); *ibid. loc.*, *Pogge 1095* (B⁺); *ibid. loc.*, *Pogge 1251* (B⁺).

Notes. – This species was described from Democratic Republic of Congo, and VERDCOURT (1977) considered it poorly known. He noted that it is apparently similar to

Eumachia oddonii, and may even be the same in which case the name *E. poggei* has priority over *E. oddonii*. Both of these names are provisionally accepted here following VERDCOURT. *Psychotria poggei* was described based on several syntypes that were deposited at B and have since been destroyed. No duplicates of these have so far been located, so further study is needed before the typification and identity of this name can be resolved.

16. *Eumachia ramisulca* (Verdc.) Razafim. & C.M. Taylor, **comb. nov.**

= *Chazaliella ramisulca* Verdc. in Kew Bull. 31: 814. 1977. = *Margaritopsis ramisulca* (Verdc.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Typus: DEMOCRATIC REPUBLIC OF CONGO: Terr. Lukula, Prov. Kinshasa, Luki, 11.XII.1947, *Donis 1625* (holo-: BR [BR0000008828507] image seen; iso-: K [K000412361] image seen, LUKI [LUKI29969371] image seen).

Note. – This species is found in Democratic Republic of Congo (VERDCOURT, 1977). It was illustrated by VERDCOURT (1977: 815, fig. 5).

17. *Eumachia rotundifolia* (R.D. Good) Razafim. & C.M. Taylor, **comb. nov.**

= *Psychotria rotundifolia* R.D. Good in J. Bot. 64(suppl. 2): 32. 1926. = *Chazaliella rotundifolia* (R.D. Good) E.M.A. Petit & Verdc. in Kew Bull. 30: 270. 1975. = *Margaritopsis rotundifolia* (R.D. Good) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Lectotypus (designated by VERDCOURT, 1975: 270): ANGOLA. **Cabinda**: Portuguese Congo, Buco Zau, Maiumbe, 15.XI.1916, *Gossweiler 6812* (BM [BM000903544] image seen; isolecto-: LISC [LISC001010, LISC001011] images seen).

Note. – This species is found in Cabinda in northern Angola (VERDCOURT, 1977).

18. *Eumachia sciadephora* (Hiern) Razafim. & C.M. Taylor, **comb. nov.**

= *Psychotria sciadephora* Hiern in Oliver, Fl. Trop. Afr. 3: 202. 1877. = *Chazaliella sciadephora* (Hiern) E.M.A. Petit & Verdc. in Kew Bull. 30: 270. 1975. = *Margaritopsis sciadephora* (Hiern) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Lectotypus (designated by Razafimandimbison & Bremer in RAZAFIMANDIMBISON et al., 2014: 1118): CAMEROON: Mt. Cameroon, 1290 m, II.1862, *Mann 1192* (K [K000412372] image seen; isolecto-: BR). **Syntypus**: CAMEROON: Ambas Bay, I.1861, *Mann 729* (K [K000412371] image seen, P [P04004131] image seen).

Note. – This species is found in Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, and Cameroon (VERDCOURT, 1977).

18a. *Eumachia sciadephora* var. *condensata* (Verdc.) C. M. Taylor, **comb. nov.**

= *Chazaliella sciadephora* var. *condensata* Verdc. in Kew Bull. 31: 793. 1977.

Typus: CAMEROON: Dengdeng, III.1914, *Mildbraed 8732* (holo-: K [K000412370] image seen).

Note. – This variety is found in central Cameroon (VERDCOURT, 1977).

18b. *Eumachia sciadephora* (Hiern) Razafim. & C.M. Taylor var. *sciadephora*

Note. – This variety is found throughout the range of this species (VERDCOURT, 1977).

19. *Eumachia viridicalyx* (R.D. Good) Razafim. & C.M. Taylor, **comb. nov.**

= *Psychotria viridicalyx* R.D. Good in J. Bot. 64(suppl. 2): 33. 1926 [as *viridocalyx*]. = *Chazaliella viridicalyx* (R.D. Good) Verdc. in Kew Bull. 30: 816. 1977. = *Margaritopsis viridicalyx* (R.D. Good) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Typus: ANGOLA. Cabinda: Portuguese Congo, Maiumbe, Buco Zau, I.1916, *Gossweiler s.n.* (holo- BM [BM000903672] image seen).

Notes. – This species is found in Cameroon, and in Cabinda in northern Angola (VERDCOURT, 1977).

20. *Eumachia wildemaniana* (T. Durand ex De Wild.) Razafim. & C.M. Taylor, **comb. nov.**

= *Psychotria djumaensis* De Wild., Etudes Fl. Bas-Moyen-Congo 2: 182. 1907 [nom. illeg.] [non *P. djumaensis* De Wild.]. = *Psychotria wildemanniiana* T. Durand ex De Wild., Etudes Fl.

Bas-Moyen-Congo 2: 349. 1908 [nom. nov.]. = *Chazaliella wildemaniana* (T. Durand ex De Wild.) E.M.A. Petit & Verdc. in Kew Bull. 30: 270. 1975. = *Margaritopsis wildemaniana* (T. Durand ex De Wild.) Razafim. & B. Bremer in Amer. J. Bot. 101: 1118. 2014.

Syntypi: DEMOCRATIC REPUBLIC OF CONGO: *sine loc.*, s.d., *Gillet 2738* (BR, not found); *ibid loc.*, *Gillet 2762* (BR, not found); Djuma, VII.1902, *Gillet 2768* (BR [BR0000008482624] image seen); *ibid loc.*, VII.1907, *Gentil s.n.* (BR [BR0000008482242] image seen).

Notes. – This species is found in Republic of Congo and Democratic Republic of Congo (VERDCOURT, 1977). Four syntype specimens of *Psychotria wildemaniana* were cited by VERDCOURT (1977: 793), but some have not been located in this present study so the typification of this name cannot be resolved here.

II. *Eumachia* in the Neotropics

Eumachia includes 27 Neotropical species found from Mexico and the Antilles to Paraguay and Bolivia. This genus was studied as *Margaritopsis* by TAYLOR (2005). *Eumachia microdon* (DC.) Delprete & J.H. Kirkbr., *E. cephalantha*, and *E. chaenotricha* (DC.) C.M. Taylor & Razafim. are the most commonly collected species. TAYLOR (2005) separated three informal species groups, but these groups are not completely distinct and are not separated here. New nomenclatural combinations for some Neotropical *Eumachia* species were published by DELPRETE & KIRKBRIDE (2015), who also lectotypified several names and updated the ranges of some species.

Since the treatment by TAYLOR (2005), study has advanced on the species of eastern Brazil. Accordingly *Mapouria* ser. *Chaenotrichae* is newly synonymized with *Eumachia*, and the identities of three poorly known *Psychotria* names are clarified here. *Psychotria depauperata* Müll. Arg. is an older name for a previously known species, *Margaritopsis carrascoana* (Delprete & E.B. Souza) C.M. Taylor & E.B. Souza. *Psychotria inaequifolia* Müll. Arg. represents an additional species of *Eumachia* that was not noted previously. *Psychotria schuechiana* Müll. Arg. was treated as a species of *Margaritopsis* by TAYLOR (2005), but further study shows that it does not belong to *Eumachia* and is not separable from *P. subtriflora* Müll. Arg.

21. *Eumachia acuífolia* (C. Wright) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 76. 2015.

= *Margaritopsis acuífolia* C. Wright in Sauvalle in Anales Acad. Ci. Méd. Habana 6: 147. 1869. = *Margaritopsis nudiflora* K. Schum. in Engl. & Prantl, Nat. Pflanzenf. IV(4): 122. 1891 [nom. illeg.] = *Uragoga acuífolia* (C. Wright) M. Gómez, Dicc. Bot. Nom. Vulg. Cub. Puerto-Riquenos 88. 1869.

Typus: CUBA: Yateras, 1856-1857, *Wright 254* (holo-: GH, not found; iso-: BR [BR0000005315147] image seen, G [G00300179, G00300180, G00300181]!, GOET [GOET010376] image seen, MO-2092560!, MO-2092561!, NY [NY00115272, NY00132245] images seen, P [P02285213] image seen, US-74111 image seen) (Fig. 2).

Notes. – This species is found in eastern Cuba (LIOGIER, 1963). It has been assumed by various authors that the holotype of *Margaritopsis acuífolia* is among Wright's materials at GH, but his specimen numbering is complicated and many of his types need further study.

22. *Eumachia agustinae* (Acuña) C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria agustinae* Acuña in *Brittonia* 14: 225. 1962.
= *Margaritopsis agustinae* (Acuña) C.M. Taylor in *Syst. Geogr. Pl.* 75: 168. 2005.

Typus: CUBA: Oriente, prope Cayo de la Sabina, Sierra de Nipe, 17.VII.1960, *Acuña E.E.A. 21379* (holo-: SV; iso-: LS).

Note. – This species is found in eastern Cuba (LIOGIER, 1963).

23. *Eumachia albert-smithii* (Standl.) Delprete & J.H. Kirkbr. in *J. Bot. Res. Inst. Texas* 9: 76. 2015.

= *Psychotria albert-smithii* Standl. in *Publ. Field Mus. Nat. Hist., Bot. Ser.* 8: 203. 1930. = *Margaritopsis albert-smithii* (Standl.) C.M. Taylor in *Syst. Geogr. Pl.* 75: 169. 2005.

Typus: PERU. Loreto: Soledad on Río Itaya, 110 m, 20-22.IX.1929, *Killip & Smith 29766* (holo-: F-607482!; iso-: G [G00300217]!, NY [NY00132588] image seen, US-1463026).

Notes. – This species is found in Amazonian Brazil, Colombia, Ecuador, Peru, and Bolivia and also is disjunct in Suriname (TAYLOR, 2005). DELPRETE & KIRKBRIDE (2015) reported that this species is “widespread in South America”, but it may be restricted to the western Amazon basin. The Suriname plants are only known in immature fruit, and are included in this species provisionally. These have smaller inflorescences as well as a markedly disjunct distribution, and probably deserve re-evaluation as to their species identity.

24. *Eumachia astrellantha* (Wernham) Delprete & J.H. Kirkbr. in *J. Bot. Res. Inst. Texas* 9: 76. 2015.

= *Psychotria astrellantha* Wernham in *J. Bot.* 52: 316. 1914. = *Chytropsia astrellantha* (Wernham) Bremek. in *Recueil Trav. Bot. Néerl.* 31: 292. 1934. = *Margaritopsis astrellantha* (Wernham) L. Andersson in *Syst. Geogr. Pl.* 72: 230. 2002.

Typus: GUYANA: British Guiana, Potaro River below the Kaieteur, IX-X.1881, *Jenman 959* (holo-: K [K000173648] image seen).

Notes. – This species is found in the Guianas and Amazonian Venezuela, Ecuador, Peru, and northern Brazil (TAYLOR, 2005). See TAYLOR (2005) and DELPRETE & KIRKBRIDE (2015) for synonymy. DELPRETE & KIRKBRIDE (2015) reported that this species is found “throughout Brazil” but it seems to be restricted to the Amazon basin. *Eumachia astrellantha* has often been confused with *E. chaenotricha*, which is found widely in eastern and southeastern Brazil.

25. *Eumachia boliviana* (Standl.) Delprete & J.H. Kirkbr. in *J. Bot. Res. Inst. Texas* 9: 76. 2015 (Fig. 1D).

= *Psychotria boliviana* Standl. in *Publ. Field Mus. Nat. Hist., Bot. Ser.* 7: 302. 1931. = *Margaritopsis boliviana* (Standl.) C.M. Taylor in *Syst. Geogr. Pl.* 75: 170. 2005.

Typus: BOLIVIA. La Paz: San Carlos, region of Mapiri, 850 m, 3.XII.1926, *Buchtien 1489* (holo-: F-609011!; iso-: F-611732!).

Notes. – This species is found in the Guianas, Amazonian Brazil and Venezuela, and Amazonian to Andean Colombia, Ecuador, Peru, and Bolivia (TAYLOR et al., 2004; TAYLOR, 2005). This species was reported from Venezuela by TAYLOR et al. (2004) but that distribution was overlooked by TAYLOR (2005). See TAYLOR (2005) and DELPRETE & KIRKBRIDE (2015) for synonymy. DELPRETE & KIRKBRIDE did not report this species from Brazil, but it is here circumscribed to include also plants from there (e.g., TAYLOR et al., 2007; *A. Sergio et al. 1355*, *D.G. Campbell et al. P22035*, both at MO and NY).

26. *Eumachia cephalantha* (Müll. Arg.) Delprete & J.H. Kirkbr. in *J. Bot. Res. Inst. Texas* 9: 77. 2015.

= *Mapouria cephalantha* Müll. Arg. in *Flora* 59: 495, 497. 1876. = *Uragoga cephalantha* (Müll. Arg.) Kuntze, *Revis. Gen. Pl.* 2: 959. 1891. = *Psychotria cephalantha* (Müll. Arg.) Standl. in *Publ. Field Mus. Nat. Hist., Bot. Ser.* 11: 235. 1936. = *Margaritopsis cephalantha* (Müll. Arg.) C.M. Taylor in *Syst. Geogr. Pl.* 75: 171. 2005.

Lectotypus (designated by ANDERSSON 1992: 138): **BRAZIL. Minas Gerais:** prope Lagoa Santa, s.d., *Warming s.n.* (C; isolecto-: G [G00300254], F-667820 image seen, P [P02285215] image seen).

Notes. – This is the most widely distributed Neotropical species of *Eumachia*. It is found in Amazonian Colombia, Brazil, Peru, and Bolivia, and outside Amazonia in eastern Brazil and perhaps also Paraguay (TAYLOR, 2005). See TAYLOR (2005) and DELPRETE & KIRKBRIDE (2015) for synonymy.

27. *Eumachia chaenotricha* (DC.) C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria chaenotricha* DC., Prodr. 4: 509. 1830.
= *Mapouria chaenotricha* (DC.) Müll. Arg. in Flora 59: 496. 1876. = *Uragoga chaenotricha* (DC.) Kuntze, Revis. Gen. Pl. 2: 959. 1891. = *Margaritopsis chaenotricha* (DC.) C.M. Taylor in Syst. Geogr. Pl. 75: 171. 2005.

Typus: **BRAZIL. Bahia:** 1830, *Salzmann s.n.* (holo-: G-DC [G00667348]!; iso-: G [G00300190]!, MO-124279!).

Notes. – This species is commonly collected from eastern Brazil through northern Paraguay (TAYLOR, 2005). See TAYLOR (2005) and DELPRETE & KIRKBRIDE (2015) for synonymy.

28. *Eumachia cymuligera* (Müll. Arg.) C.M. Taylor & Razafim., **comb. nov.**

= *Mapouria cymuligera* Müll. Arg. in Flora 59: 496, 497. 1876. = *Uragoga cymuligera* (Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 960. 1891. = *Margaritopsis cymuligera* (Müll. Arg.) C.M. Taylor in Syst. Geogr. Pl. 75: 171. 2005.

Typus: **BRAZIL. Rio de Janeiro:** prope Mandioca [Mandioca], 12.I.1822, *Riedel 341* (holo-: BR [BR0000008259905]!; iso-: G [G00300195]!, K [K000174275] image seen, P [P02285220]!).

= *Mapouria umbelluligera* Müll. Arg. in Flora 59: 496. 497. 1876. = *Uragoga umbelluligera* (Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 963. 1891. = *Psychotria umbelluligera* (Müll. Arg.) Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 8: 209. 1930. **Typus:** **BRAZIL. Rio de Janeiro:** prope Mandioca [Mandioca], 23.I.1822, *L. Riedel 344* (holo-: G [G00300196]!; iso-: BR [BR0000008259882, BR0000008259974]!, E [E00285061]!, M [M0198234] image seen, S [S05-1053] image seen), **syn. nov.**

Notes. – This species is found in southeastern Brazil and northern Paraguay (TAYLOR, 2005). TAYLOR (2005) reported the place of deposit of the holotype of *Mapouria cymuligera* at M, but the specimen at BR with an annotation in Müller's hand appears to be the actual holotype. Another of *M. cymuligera* isotype was formerly deposited at B but has been destroyed (photo F neg. #25701). The identity of *M. umbelluligera* has not been clear until recently. Its type matches that of *M. cymuligera*, and in fact their types have sometimes been confused (e.g., K [K000174275], P [P02285220]). These names were published simultaneously; the name *M. cymuligera* has been used more often and is chosen here. The duplicate of the type collection of *M. umbelluligera* in Müller's herbarium at G was annotated with this name by him and has both flowers and fruits, and this is presumed to be the holotype. One other duplicate has an annotation in Müller's handwriting (BR [BR0000008259974]), and is deposited at BR and has ample material and complete label data. This BR specimen is labelled as being originally deposited at BR and not part of the Martius herbarium, and therefore is an isotype. The other duplicate at BR was originally deposited there, was unidentified until the 20th century, and lacks flowers.

See TAYLOR (2005) for synonymy, except ZAPPI (2003) showed that the type of *Mapouria xanthophylloides* Müll. Arg. belongs to *Rudgea coronata* subsp. *ochroleuca* (Müll. Arg.) Zappi.

29. *Eumachia deinocalyx* (Sandwith) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 77. 2015.

= *Psychotria deinocalyx* Sandwith in Kew Bull. 1939: 555. 1939. = *Margaritopsis deinocalyx* (Sandwith) C.M. Taylor in Syst. Geogr. Pl. 75: 172. 2005.

Typus: **GUYANA:** British Guiana, Kibihui Creek, Wiruni River, Berbice River, 9.II.1938, *Fanshawe 39/Forestry Dept. 2683* (holo-: K [K000173645] image seen).

Note. – This species was known from the Guianas and eastern through southern Venezuela (TAYLOR, 2005), and has also been recently reported from Amazonian northern Brazil (DELPRETE & KIRKBRIDE, 2015; e.g., *Farney & Batista 2031, Prance et al. 10647*, both at both MO and NY).

30. *Eumachia depauperata* (Müll. Arg.) M.R. Barbosa & M.S. Pereira, **comb. nov.** (Fig. 1E, 1F).

= *Mapouria depauperata* Müll. Arg., Fl. Bras. 6(5): 466. 1881. = *Uragoga depauperata* (Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 960. 1891.

Lectotypus (designated here): **BRAZIL. Rio de Janeiro:** Cabo Frio, 18.VII.1877, *Glaziou 10944* (P [P00507168] image seen; isolecto-: G [G00300188]!, K [K000174389] image seen, R-9986 image seen).



Fig. 2. – Isotype of *Eumachia acuífolia* (C. Wright) Delprete & J.H. Kirkbr. © Missouri Botanical Garden, MO

- = *Psychotria carrascoana* Delprete & E.B. Souza in Novon 14: 159, fig. 1. 2004. = *Margaritopsis carrascoana* (Delprete & E.B. Souza) C.M. Taylor & E.B. Souza in Syst. Geogr. Pl. 75: 171. 2005. **Typus: BRAZIL. Ceará:** mun. Ubajara, Planalto de Ibiapaba, Jabarana Sul, 830 m, 5.I.1995, *F.S. Araújo 1054* (holo-: EAC; iso-: NY), **syn. nov.**

Notes. – This species is found in dry vegetation, including caatinga, carrasco, restinga, and semideciduous forest, in Ceará, Paraíba, and Rio de Janeiro in eastern Brazil.

Mapouria depauperata was described in an addendum to Müller's main flora treatment for Brazil, and this name has been overlooked. Also the species *Margaritopsis carrascoana* has been poorly documented until recently. The type of *Mapouria depauperata* is not separable from *Margaritopsis carrascoana*, and these names are synonymized here. The protologue of *Mapouria depauperata* noted that this species resembles *Rudgea* Salisb. and *Coussarea* Aubl., thus similarly to other authors studying these species Müller apparently had difficulty classifying it to genus. (*Mapouria depauperata* has not been transferred to *Psychotria*, but has been confused with the name *P. depauperata* Merr. in some on-line indices.)

In the protologue of *Mapouria depauperata*, MÜLLER (1881: 466–467) cited the collector and number of the type specimen without a place of deposit, following his standard practice, and gave the collection locality as “Minas Gerais”. The labels of *Glaziou 10944* give the collection locality variously as Rio de Janeiro, where Cabo Frio is located, or Minas Gerais (P [P00507168]). The specimen of *Glaziou 10944* in Müller's herbarium at G comprises two short stems with leaves that are separated and perhaps taken from another specimen, and some annotations by him. This G specimen has two handwritten labels, but no original printed Glaziou label. One label has a determination in Müller's handwriting, which identifies this specimen with the unpublished name “*Rudgea depauperata*”. The other label is also in Müller's handwriting, and has the collector, number, “Rio de Janeiro”, and an identification. This identification was initially written as “*Rudgea depauperata*”, then “*Rudgea*” was crossed out and replaced by “*Mapouria*”. A duplicate of the type collection is deposited at P, where Glaziou's main specimen set is, and is labelled with the locality Minas Gerais and the name *Mapouria depauperata* in what is apparently Glaziou's handwriting. The G specimen lacks flowers and fruits, which are described in the protologue, which suggests this is not the principal material that Müller used. Müller did see specimens from P, and the sheet from Glaziou's main collection is here designated as the lectotype even though the collection locality on its label is inaccurate and this might be the holotype. Another duplicate of this type collection in good condition was once deposited in B, but has been destroyed (photo F neg. #451); this B specimen also could have been the holotype.

31. *Eumachia guianensis* (Bremek.) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 77. 2015.

- = *Chytropsia guianensis* Bremek. in Recueil Trav. Bot. Néerl. 31: 292. 1934. = *Psychotria moroidea* Steyerm. in Mem. New York Bot. Gard. 23: 485. 1972 [nom. nov.] [non *Psychotria guianensis* (Aubl.) Raeusch.]. = *Margaritopsis guianensis* (Bremek.) C.M. Taylor in Syst. Geogr. Pl. 75: 172. 2005.

Lectotypus (designated by DELPRETE & KIRKBRIDE, 2015: 77): **SURINAME:** Emma Range, 600 m, 15.III.1922, *Gonggrijp & Stabel B.W. 5667* (U; isolecto-: BM [BM001009040] image seen).

Note. – This species is found in the Guianas (TAYLOR, 2005) and northern to central Brazil (DELPRETE & KIRKBRIDE, 2015).

32. *Eumachia haematocarpa* (Standl.) C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria haematocarpa* Standl. in J. Wash. Acad. Sci. 18: 274. 1928. = *Margaritopsis haematocarpa* (Standl.) C.M. Taylor in Syst. Geogr. Pl. 75: 172. 2005.

Typus: COSTA RICA. Guanacaste: Naranjos Agrios, near Tilarán, 600–700 m, 29.I.1926, *Standley & Valerio 46407* (holo-: US-1254627!).

Note. – This species is found from Nicaragua to northwestern Ecuador (TAYLOR, 2005).

33. *Eumachia hassleriana* (Chod.) C.M. Taylor & Razafim., **comb. nov.**

- = *Rudgea hassleriana* Chod. in Bull. Herb. Boissier sér. 2, 4: 179. 1904. = *Margaritopsis hassleriana* (Chodat) C.M. Taylor in Syst. Geogr. Pl. 75: 172. 2005.

Typus: PARAGUAY: prope Vaqueria Capibary, IX.1885–1902, *Hassler 4442* (holo-: G [G00306726]!; iso-: F-767746!, G [G00306722, G00306727, G00306738]!, K [K000174388] image seen, P [P00634437] image seen, S [S05-1052]!).

Notes. – This species was known from Paraguay (TAYLOR, 2005) and has recently also been confirmed from eastern and northeastern Brazil (e.g., *Kuhlmann 3958*, MO and SP; *Stannard et al. H51938*, MO). Four duplicates of the type collection of *Rudgea hassleriana* are deposited at G, where Chodat worked. The only specimen in his personal herbarium has original drawings and is here considered the holotype.

34. *Eumachia huallagae* (Standl.) C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria huallagae* Standl. in Publ. Field Mus. Nat. Hist., Bot. Ser. 8: 376. 1931. = *Margaritopsis huallagae* (Standl.) C.M. Taylor in Syst. Geogr. Pl. 75: 172. 2005.

Typus: PERU. **Loreto:** Puerto Arturo, Yurimaguas, lower Río Huallaga, 155-210 m, 20.XI.1929, *Llewelyn Williams* 5265 (holo-: F-614356; iso-: G [G00305851]!).

Note. – This species is known from Amazonian Peru, Bolivia, and western Brazil (TAYLOR, 2005) and has also recently been documented in Ecuador (*G. Villa & P. Alvia* 982, MO).

35. *Eumachia impatiens* (Dwyer) C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria impatiens* Dwyer in Ann. Missouri Bot. Gard. 67: 385. 1980. = *Margaritopsis impatiens* (Dwyer) C.M. Taylor in Syst. Geogr. Pl. 75: 169. 2005.

Typus: PANAMA. **Darién:** N slope of Cerro Pirre, 700-900 m, 6.IV.1975, *Mori & Kallunki* 5446 (holo-: MO-2272508!).

Note. – This species is found from Nicaragua to northwestern Colombia (TAYLOR, 2005).

36. *Eumachia inaequifolia* (Müll. Arg.) C.M. Taylor & J.G. Jardim, **comb. nov.**

= *Psychotria inaequifolia* Müll. Arg. in Flora 53: 550, 553. 1876. = *Uragoga inaequifolia* (Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 959. 1891.

Lectotypus (designated here): BRAZIL. **Bahia:** prope Ilhéus, IV-V.1822, *Riedel* 768 (BR [BR0000008259912]!; isolecto-: F-617744!, G [G00300843]!, K [K000015626] image seen).

Notes. – This species is found in Bahia and Minas Gerais in eastern Brazil. The identity of *Psychotria inaequifolia* has been unclear for some time, but it has now been documented by several good collections. These collections show the characteristic flattened ridged internodes, bilobed stipules with glandular lobes and the basal portion becoming hard and yellowed, and red fruits of *Eumachia*. This species is additionally characterized by its leaves with reticulated higher-order venation that is raised on the lower surface; shortly pedunculate, subcapitate to shortly corymbiform inflorescences; sessile flowers; short corollas with tubes 1.5-3 mm long; somewhat large fruits for this genus, 5-8 × 5-6 mm; and an unusual blackened drying color.

In the protologue of *Psychotria inaequifolia*, MÜLLER (1876) cited the collector and number of the type specimen without a place of deposit following his standard practice. Two specimens of the type collection are annotated with this name in Müller's handwriting. The specimen in Müller's herbarium at G is fragmentary, and labelled with the locality, collector, number, and identification all written by Müller. The specimen at BR is originally from the Martius herbarium, and is a complete specimen with an original Riedel label with locality and date information and an annotation in Müller's handwriting. It is not clear which material Müller used for the description of this species, and presumably he saw both specimens. The BR specimen is more complete and has more complete data and is here designated as the lectotype to avoid future confusion.

37. *Eumachia inconspicua* (C.M. Taylor) C.M. Taylor & Razafim., **comb. nov.**

= *Margaritopsis inconspicua* C.M. Taylor in Syst. Geogr. Pl. 75: 173. 2005.

Typus: PERU. **Madre de Dios:** Tambopata Wildlife Reserve, 30 km S Puerto Maldonado, 12°15'S, 69°17'W, 260 m, 13.XI.1984, *Young & Stratton* 176 (holo-: MO-3609415!).

Note. – This species is found in Amazonian Venezuela, Brazil, Peru, and Bolivia. Its known range has been extended since its description, and it is not uncommonly collected in Brazil (C.M. Taylor, pers. obs., INPA).

38. *Eumachia kappleri* (Miq.) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 77. 2015.

= *Carapichea kappleri* Miq., Stirp. Surinam. Select. 181. 1850. = *Uragoga kappleri* (Miq.) Pulle, Enum. Vasc. Pl. Surinam 446. 1906. = *Cephaelis kappleri* (Miq.) Standl. in Publ. Field Mus. Nat. Hist., Bot. Ser. 4: 335. 1929. = *Psychotria kappleri* (Miq.) Müll. Arg. ex Benoist in Bull. Soc. Bot. France 58: 140. 1921. = *Margaritopsis kappleri* (Miq.) C.M. Taylor in Syst. Geogr. Pl. 75: 175. 2005.

Typus: SURINAM: “ad flumen Marrowyne” [Marowyne], IX.1847, *Kappler* 1871 (holo-: U; iso-: G [G00300293] image seen).

= *Cephaelis malmei* Standl. in Publ. Field Mus. Nat. Hist., Bot. Ser. 11: 189. 1936. = *Psychotria malmei* (Standl.) Zappi, Bot. Matto Grosso, Ser. B, 3: 258. 1998. **Typus:** BRAZIL. **Mato Grosso:** Santa Anna da Chapada, 27.IX.1902, *Malme* 2401 (holo-: S [S05-1507]!; iso-: F-646848! G [G00300555]!), **syn. nov.**

Note. – This species is found in the Guianas, in Amazonian Venezuela, Brazil, and Colombia, and in Costa Rica (TAYLOR, 2005).

39. *Eumachia lanceifolia* (Urb.) C.M. Taylor & Razafim., **comb. nov.**

= *Margaritopsis lanceifolia* Urb. in Ark. Bot. 22: 98. 1929.

Lectotypus (designated here): **HAÏTI. Dept. Sud:** Massif de la Hotte, Groupe Morne Rochelais, 31.X.1927, *Ekman 9201* (S [S-R-3424]!; isolecto-: S [S05-1513]!).

Notes. – This species is found in Haiti (LIOGIER, 1995). The holotype specimen deposited at B, where Urban worked, has been destroyed. Two duplicates of the type collection are deposited in Ekman's main collection at S, and the sheet with more material on it is here designated as the lectotype.

40. *Eumachia microdon* (DC.) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 77. 2015 (Fig. 1C).

= *Rondeletia microdon* DC., Prodr. 4: 408. 1830. = *Psychotria microdon* (DC.) Urb., Symb. Antill. 9: 539. 1928. = *Mapouria microdon* (DC.) Bremek. in Recueil Trav. Bot. Néerl. 31: 286. 1934. = *Margaritopsis microdon* (DC.) C.M. Taylor in Syst. Geogr. Pl. 75: 169. 2005.

Typus: CUBA: “ad Havanam”, 1825, *de la Ossa s.n.* (holo-: G-DC [G00478838]!; iso-: G [G003441703]!).

= *Psychotria cyrilli-nelsonii* Ant. Molina in Ceiba 30: 65. 1989. **Typus:** HONDURAS. **Comayagua:** Vado Alto, orilla del río Sulaco, 33 km E y 4 km N de Santa Cruz de Yojoa, 1500 m, 18.II.1981, *Nelson et al. 7629* (holo-: TEFH; iso-: MO-3729377!).

Notes. – This species is found throughout the Antilles, from southern Mexico through Central America, across Caribbean Venezuela through the Guianas, and on the Pacific coast of Colombia, Ecuador, and Peru (TAYLOR, 2005). See TAYLOR (2005), LORENCE et al. (2012), and DELPRETE & KIRKBRIDE (2015) for synonymy.

41. *Eumachia nana* (K. Krause) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 78. 2015.

= *Psychotria nana* K. Krause in Verh. Bot. Vereins Prov. Brandenburg 50: 109. 1908. = *Margaritopsis nana* (K. Krause) C.M. Taylor in Syst. Geogr. Pl. 75: 175. 2005.

Lectotypus (designated by DELPRETE & KIRKBRIDE, 2015: 78): **BRAZIL. Amazonas [Acre]:** Rio Juruá superioris, am Juruá Miry [Juruá-Mirim], VIII.1901, *Ule 5670* (K [K000173644] image seen; isolecto-: F-895487!, G [G00300185]!, L [L0058073]).

Notes. – This species is found in Amazonian Venezuela, Ecuador, Peru, Bolivia, and Brazil (TAYLOR, 2005; DELPRETE & KIRKBRIDE, 2015). See TAYLOR (2005) and DELPRETE & KIRKBRIDE (2015) for synonymy. The type locality was reported by Ule as Amazonas in Brazil, but the Rio Juruá-Mirim is actually in today's Brazilian state of Acre and at the time Ule was there, Acre was still part of Bolivia. The holotype was deposited at B and has been destroyed (photo F neg. #467).

42. *Eumachia nutans* (Sw.) C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria nutans* Sw., Prodr. 43. 1788. = *Uragoga nutans* (Sw.) Kuntze, Revis. Gen. Pl. 2: 961. 1891. = *Margaritopsis nutans* (Sw.) C.M. Taylor in Syst. Geogr. Pl. 75: 169. 2005.

Typus: HAÏTI / DOMINICAN REPUBLIC: Hispaniola, *sine loc.*, s.d., *Swartz s.n.* (holo-: S [S-R-5327]!).

Note. – This species is found in Cuba and Hispaniola (LIOGIER, 1963, 1995). See TAYLOR (2005) for synonymy.

43. *Eumachia pallidinervia* (Steyererm.) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 78. 2015.

= *Psychotria pallidinervia* Steyererm. in Mem. New York Bot. Gard. 23: 492, fig. 68. 1972. = *Margaritopsis pallidinervia* (Steyererm.) C.M. Taylor in Syst. Geogr. Pl. 75: 175. 2005.

Typus: VENEZUELA. **Amazonas:** trail betw. Camp 2 & Camp 3, Río Yatua, Cerro de la Neblina, 500-700 m, 7.XI.1957, *Maguire, Wurdack & Maguire 41996* (holo-: NY [NY00132763] image seen; iso-: COL [COL000004667], K [K000432835], U-256671, US-2575553, VEN-81954).

Note. – This species is found in southern Venezuela (TAYLOR et al., 2004; TAYLOR, 2005).

44. *Eumachia paupertina* (Standl. & Steyererm.) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 78. 2015.

- = *Psychotria paupertina* Standl. & Steyererm. in Fieldiana, Bot. 28: 603. 1953. = *Margaritopsis paupertina* (Standl. & Steyererm.) C.M. Taylor in Syst. Geogr. Pl. 75: 175. 2005.

Typus: VENEZUELA. **Amazonas:** near base camp (Caño Negro), SE base Cerro Duida, 215 m, 23.VIII.1944, *Steyermark 57919* (holo-: F-1181470!; iso-: NY [NY00132773] image seen, VEN-15878).

Notes. – This species is found in southern Venezuela (TAYLOR et al., 2004; TAYLOR, 2005).

45. *Eumachia podocephala* (Müll. Arg.) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 78. 2015.

- = *Mapouria podocephala* Müll. Arg. in Flora 59: 460, 466. 1876. = *Uragoga podocephala* (Müll. Arg.) Kuntze, Revis. Gen. Pl. 2: 961. 1891. = *Psychotria podocephala* (Müll. Arg.) Standl. in Publ. Field Mus. Nat. Hist., Bot. Ser. 7: 109. 1930. = *Margaritopsis podocephala* (Müll. Arg.) C.M. Taylor in Syst. Geogr. Pl. 75: 176. 2005.

Lectotypus (designated by DELPRETE & KIRKBRIDE, 2015: 78): VENEZUELA. **Amazonas:** prope San Carlos, ad Rio Negro, 1853-54, *R. Spruce 3076* (K [K00173642] image seen; isolecto-: BR [BR0000005523177]!, G [G00300186, G00402266]!, K [K000173641, K000173643] images seen, MO-1612141!, NY [NY00132228], P [P02285223, P02428065]!, W [W0014055] image seen).

Notes. – This species is found in Amazonian Colombia, Venezuela, Brazil, and Peru (TAYLOR, 2005). See TAYLOR (2005) and DELPRETE & KIRKBRIDE (2015) for synonymy. See TAYLOR (2005) also for discussion of the nomenclatural confusion between this species and the unrelated species *Psychotria turbinella* var. *sororiella* (Müll. Arg.) Steyererm.

TAYLOR (2005) attempted to designate a duplicate of the type collection in the Martius herbarium at M, which Müller likely studied, as the lectotype for *Mapouria podocephala*. However this lectotypification was inaccurate because this specimen is not deposited at M, but is at BR [BR0000005523177]. DELPRETE & KIRKBRIDE (2015: 78) noted that TAYLOR's lectotypification (2005) was also invalid because it did not include the words "designated here" (Art. 7.10 and Art. 7 Note 2). They presented a valid lectotypification for this name, and chose as the lectotype a specimen at K that Müller probably never saw.

46. *Eumachia triflora* (Urb.) C.M. Taylor & Razafim., **comb. nov.**

- = *Margaritopsis triflora* Urb. in Ark. Bot. 17(7): 59. 1921.

Lectotypus (designated here): HAITI. **Dept. Sud:** Morne de la Hotte, 11.V.1917, *Ekman 154* (S [S-R-3425]!; isolecto-: GH [GH00096406] image seen, S [S05-1514]!).

Notes. – This species is found in Haiti (LIOGIER, 1995). The holotype specimen of *Margaritopsis triflora* at B, where Urban worked, has been destroyed. Two duplicates of the type collection are deposited in Ekman's main herbarium at S, and one of these has several mature flowers and is here designated the lectotype.

47. *Eumachia wilhelminensis* (Steyererm.) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 79. 2015.

- = *Psychotria wilhelminensis* Steyererm. in Mem. New York Bot. Gard. 23: 487. 1972. = *Margaritopsis wilhelminensis* (Steyererm.) C.M. Taylor in Syst. Geogr. Pl. 75: 176. 2005.

Typus: SURINAME: 3 km S of Juliana Top, 12 km N of Lucie River, Wilhelmina Gebergte, 3°39'N, 56°32'W, 300 m, 24.VIII.1963, *Irwin et al. 55048* (holo-: NY [NY00132865] image seen; iso-: F-1704829 image seen, US-2575552, US-2579088, VEN-82114).

Notes. – This species is found in Surinam and northeastern Brazil (TAYLOR, 2005). The epithet of this species was misspelled by TAYLOR (2005) as *wilhemensis*.

III. Eumachia in Asia, Australia, and the Pacific Region

Eumachia includes 36 species with 6 varieties in Asia, Australia, and the Pacific region, where it is represented in southeastern Asia, northeastern Australia, New Guinea, New Caledonia, and various Pacific Islands (BARRABÉ et al., 2012: fig. 4B). *Eumachia leptothyrsa* (Miq.) Barrabé et al. and *E. straminea* (Hutch.) Barrabé et al. are the most commonly collected species here. Only two species of this genus, *E. straminea* and *E. ovoidea* (Pierre ex Pit.) Barrabé et al., are known from continental Asia. Three *Eumachia* species are found in Java and the Philippines, one in Australia, and three in New Caledonia. The remaining majority of the species of this general region are found in New Guinea and on various Pacific islands.

The species of *Eumachia* from this region are classified in this genus based on both molecular study (ANDERSSON, 2001; BARRABÉ et al., 2012; RAZAFIMANDIMBISON et al., 2014) and morphological characters (e.g., BARRABÉ et al., 2013).

The species from this region that are included here in *Eumachia* have previously been classified variously in *Eumachia*, *Hodgkinsonia*, *Margaritopsis*, *Readea*, and *Psychotria*, and are grouped together for the first time here. Most of these species are not well known, but several have been detailed in floristic treatments by SOHMER (1988), SOHMER & DAVIS (2007), WHISTLER (1986), and SMITH & DARWIN (1988). Three additional Asian and Pacific species, listed at the end of this section, may also belong to *Eumachia* but are not well enough known to confirm this.

The type species of *Readea* belongs to *Eumachia*, but the other species that have been included in that genus, *Readea prismoclavata* Fosberg and *R. roseata* Fosberg, belong instead to the Pacific Clade of *Psychotria* (ANDERSSON, 2002b; RAZAFIMANDIMBISON et al., 2014; BARRABÉ, pers. obs.). The type species of *Hodgkinsonia* does not belong to *Eumachia*, but the other species that has been placed in *Hodgkinsonia* was incorrectly classified there and belongs to *Eumachia*. The names *Psychotria extensa* Miq. and *P. rostrata* Blume also appear to belong to *Eumachia*, but their identities and typifications are not yet clarified.

48. *Eumachia amoena* (A.C. Sm.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria amoena* A.C. Sm. in J. Arnold Arbor. 34: 113. 1953.

Typus: FIJI. **Viti Levu:** Mba (formerly Tholo North), hills E of Nandala Creek, ca. 3 mi S Nandarivatu, 850–970 m, 9-25.IX.1947, *Smith 5949* (holo-: A [A00095550] image seen; iso-: BISH [BISH1004538] image seen, BRI [BRI-AQ0318154] image seen, K [K000777466]!, L [L0001059] image seen, NY [NY00132895] image seen, P [P00836949]!, US-1966297 image seen).

Note. – This species is found on Viti Levu and Vanua Levu in Fiji (SMITH & DARWIN, 1988).

49. *Eumachia aneityensis* (Guillaumin) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria aneityensis* Guillaumin in J. Arnold Arbor. 13: 9. 1932.

Typus: VANUATU. **Aneityum Island:** Anelgauhah Bay, 32 m, 11.II.1929, *Kajewski 733* (holo-: P [P04953739]!; iso-: A [A00095552] image seen, BISH [BISH1004541] image seen, BRI [BRI-AQ0317520] image seen, K [K000777503]!, NY [NY00132896] image seen).

Note. – This species is endemic to Vanuatu (GUILLAUMIN, 1932).

50. *Eumachia archboldiana* (Fosberg) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria archboldiana* Fosberg in Sargentia 1: 131. 1942.

Lectotypus (designated here): FIJI. **Viti Levu:** Tholo west, vicinity Mbelo, near Vatukarasa, 120–300 m, 8-24.V.1941, *Degener 15316* (US-2333966, US-2333967 images seen; isolecto-: A [A00095554] image seen, BISH [BISH1004544] image seen, K [K000777464]!, MICH [MICH1108244] image seen, MO-1256945!, NY [NY00132898, NY00132899] images seen, US-1759503 image seen).

Notes. – This species is found on Viti Levu and Kandavu in Fiji (SMITH & DARWIN, 1988). The type of this name was originally said to be deposited at “USNA” (FOSBERG, 1942; today NA), but was later cited by SMITH & DARWIN (1988) as being at US. Two specimens in the US collection correspond to the original diagnosis and were previously deposited at NA. These sheets are identified as two parts of one collection, and the first sheet is annotated as the type of this name in Fosberg’s writing. Of these two specimens, the first sheet (US-2333966) has several inflorescences while the second sheet (US-2333967) is sterile. An additional duplicate at US of this type collection (US-1759503) was not part of the NA collection, was not annotated by Fosberg, and is clearly an isotype.

51. *Eumachia balabacensis* (Merr.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria balabacensis* Merr. in Philipp. J. Sci. 10: 127. 1915.

Lectotypus (designated by SOHMER & DAVIS, 2007: 115): PHILIPPINES. **Prov. Palawan:** island of Balabac, VIII.1913, *Escritor 21605* (IUC-191662 image seen; isolecto-: BM [BM000945533] image seen, P [P00836906] image seen, US-902450 image seen).

Notes. – This species is found in the Philippines, where it is known from several scattered islands (SOHMER & DAVIS, 2007). It was illustrated by SOHMER & DAVIS (2007: 116, fig. 60). They cited the date of the type collection as January 1913, however the date on the label is August 1913.

52. *Eumachia carnea* (G. Forst.) DC., Prodr. 4: 479. 1830.

- = *Petesia carnea* G. Forst., Fl. Ins. Austr. 10. 1786. = *Ixora carnea* (G. Forst.) Benth. & Hook. f. ex Drake, Ill. Fl. Ins. Pacif. 197. 1890. = *Psychotria carnea* (G. Forst.) A.C. Sm. in Bernice P. Bishop Mus. Bull. 141: 151. 1936.

Lectotypus (designated by WHISTLER, 1986: 353): **TONGA**: Namuka, s.d., *Forster 51* (BM [BM001040362] image seen; isolecto-: BM [BM001040361] image seen, K [K000777569] image seen).

Notes. – WHISTLER (1986) reported this species from Fiji, Tonga, and Samoa, and circumscribed it to include *Psychotria oncocarpa* K. Schum. In contrast SMITH & DARWIN (1988) regarded these as two separate species, and considered *Eumachia carnea* to be restricted to Tonga; SMITH & DARWIN (1988) are followed here.

53. *Eumachia chlorocalyx* (K. Schum.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria chlorocalyx* K. Schum. in Bot. Jahrb. Syst. 25: 688. 1898.

Lectotypus (designated by WHISTLER, 1986: 351): **SAMOA**. **Upolu**: Le Pua [Lepue?], V.1894, *Reinecke 635* (G [G00356151] image seen; isolecto-: WRSL).

Note. – This species is endemic to Upolu in Samoa (WHISTLER, 1986).

54. *Eumachia collina* (Labill.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria collina* Labill., Sert. Austro-Caledon. 47. 1825. = *Uragoga collina* (Labill.) Kuntze, Revis. Gen. Pl. 2: 960. 1891. = *Margaritopsis collina* (Labill.) Barrabé & Mouly in Adansonia ser. 3, 35: 286. 2013.

Lectotypus (designated by BARRABÉ et al., 2013: 286): **NEW CALEDONIA**: *sine loc.*, s.d., *Labillardière s.n.* (FI [FI-081908 left portion with two branches] image seen; isolecto-: BM!, P [P00547101 lower right portion labeled A]!).

Note. – This species is endemic to New Caledonia (BARRABÉ et al., 2013).

55. *Eumachia damasiana* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria damasiana* Sohmer in Bishop Mus. Bull. Bot. 1: 77. 1988.

Typus: **PAPUA NEW GUINEA [BISMARCK ARCHIPELAGO]**. **Prov. West New Britain**: Hoskins sub-province, track from coast to base of Mt. Mululus, 150 m, 20.V.1979, *Sohmer et al. LAE 75351* (holo-: LAE; iso-: BISH [BISH1004580, BISH1004581] images seen, BM [BM000945342] image seen, BO, M [M0183275] image seen, US-3023643 image seen).

Note. – This species is found in the Bismarck Archipelago (SOHMER, 1988).

56. *Eumachia evansensis* (A.C. Sm.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria evansensis* A.C. Sm. in J. Arnold Arbor. 34: 112. 1953.

Typus: **Fiji. Viti Levu**: Mba, slopes of Mt. Nairoso, E flank of Mt. Evans Range, 700–1050 m, 26.IV–14.V.1947, *Smith 4072* (holo-: A [A00095602] image seen; iso-: K [K000777452]!, US-1965052 image seen).

Note. – This species is found in Fiji (SMITH & DARWIN, 1988).

57. *Eumachia forsteriana* (A. Gray) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria forsteriana* A. Gray in Proc. Amer. Acad. Arts 4: 44. 1860. = *Uragoga forsteriana* (A. Gray) Drake, Fl. Polynésie Franç. 98. 1893.

Lectotypus (designated by WHISTLER, 1986: 348): **SAMOA**: *sine loc.*, 1838–1842, *U.S. Expl. Exped. s.n.* (US-62339 image seen; isolecto-: GH [GH00095605, GH00095606] images seen).

Notes. – This species occurs in Fiji, Samoa and Tonga (WHISTLER, 1986; SMITH & DARWIN, 1988). WHISTLER recognized two varieties of this species, but SMITH & DARWIN synonymized them; SMITH & DARWIN are followed here.

58. *Eumachia frutescens* (C.T. White) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Hodgkinsonia frutescens* C.T. White in Proc. Roy. Soc. Queensland 53: 220. 1942.

Lectotypus (designated here): AUSTRALIA. Queensland: Yungaburra, 24.XII.1939, *Flecker s.n.* (BRI [BRI-AQ0317424] image seen; isolecto-: CNS [QRS14066] image seen). **Syntypus**: AUSTRALIA. Queensland: Atherton, Cook Pastoral District, XI-XII, *A.L. Merrotsy s.n.* (BRI [BRI-AQ0318037] image seen).

Notes. – This species is endemic to northeastern Australia (GOVAERTS et al., 2015). Two syntypes were cited in the protologue. The Flecker collection is preferred over the Merrotsy collection as the type because it is in a better state of conservation. The duplicate of this collection at BRI [BRI-AQ0317424] is designated as the lectotype because it has more buds and flowers, and is generally in a better state of conservation.

59. *Eumachia galorei* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria galorei* Sohmer in Bishop Mus. Bull. Bot. 1: 109. 1988.

Typus: PAPUA NEW GUINEA [BISMARCK ARCHIPELAGO]. Prov. West New Britain: Wariai sub-district, near Benim Village, upper Pulie River, 161 m, 23.III.1966, *Henty & Frodin NGF 27349* (holo-: LAE; iso-: BRI [BRI-AQ0150391] image seen, L [L0057547] image seen).

Note. – This species occurs from the Bismarck Archipelago to Papua New Guinea (SOHMER, 1988).

60. *Eumachia geminodens* (K. Schum.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria geminodens* K. Schum. in Bot. Jahrb. Syst. 25: 688. 1898.

Lectotypus (designated by WHISTLER, 1986: 349): SAMOA: Upolu, Lepua [Lepue?], V.1895, *Reinecke 636* (G [G00356153] image seen).

Notes. – This species is endemic to Upolu in Samoa (WHISTLER, 1986). The holotype was deposited at B, where Schumann worked, but has been destroyed.

61. *Eumachia goodenoughiensis* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria goodenoughiensis* Sohmer in Bishop Mus. Bull. Bot. 1: 116. 1988.

Typus: PAPUA NEW GUINEA. Prov. Milne Bay: Kiriwina sub-district, “East Shore”, near Gusweta, 0 m, 8°30'S 151°05'E, 1.X.1966, *Gillison NGF 25281* (holo-: LAE; iso-: A [A00095329] image seen, BO, BRI [BRI-AQ0129469] image seen, CANB [CANB180644] image seen, K [K000777396]!, L [L0001134] image seen).

Note. – This species is found in Papua New Guinea (SOHMER, 1988).

62. *Eumachia horsfieldiana* (Miq.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria horsfieldiana* Miq., Fl. Ned. Ind. 2: 285. 1857.
= *Uragoga horsfieldiana* (Miq.) Kuntze, Revis. Gen. Pl. 2: 960. 1891.

Typus: INDONESIA. Java: “Op den Oengaran”, 1802, *Horsfield s.n.* (holo-: K [K000777198] image seen; iso-: K [K000777197] image seen).

Notes. – This species is found in Java in Indonesia (GOVAERTS et al., 2015). This species has been compared to or confused with *Psychotria rostrata* Blume. More study will be needed to clarify the identity of the latter.

63. *Eumachia incompta* (A.C. Sm.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria incompta* A.C. Sm. in J. Arnold Arbor. 34: 114. 1953.

Typus: FIJI. Viti Levu: Mba [formerly Tholo North], upper W slopes of Mt. Tomanivi [Mt. Victoria], 1200 m, 10.VII.1947, *Smith 5208* (holo-: A [A00095626] image seen; iso-: BISH [BISH1004609] image seen, BRI [BRI-AQ0318197] image seen, K [K000777618]!, NY [NY00132951] image seen, P [P00836924]!, S [S-G-5107]!, US-1965788 image seen).

Note. – This species is found on Viti Levu in Fiji (SMITH & DARWIN, 1988).

64. *Eumachia lepiniana* (Baill. ex Drake) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria cernua* Nadeaud, Énum. Pl. Tahiti: 51. 1873 [nom. illeg.] [non *P. cernua* Steud.]. = *Uragoga lepiniana* Baill. ex Drake, Ill. Fl. Ins. Pacific: tab. XIX. 1886 [nom. nov.]. = *Psychotria lepiniana* (Baill. ex Drake) Drake, Ill. Fl. Ins. Pacific. 198. 1890.

Lectotypus (designated by WELSH, 1998: 246): **FRENCH POLYNESIA. Society Archipelago:** Tahiti, Oruopo à Orofero, 2.VIII.1857, *Nadeaud 345* (P [P02275121]!).

Notes. – This species is endemic to the Society Archipelago (WELSH, 1998). The names *Psychotria cernua* and *P. lepiniana* have sometimes been treated as two separate species (e.g., FOSBERG, *in sched.* in P) but these are not distinct nomenclaturally. The name *P. cernua* was an illegitimate later homonym when published, and the name *Uragoga lepiniana* was then published explicitly to replace it. Thus, *U. lepiniana* and the later combination based on it, *P. lepiniana*, are both typified by the type of *P. cernua*. No specimen at P exactly matches the protologue locality of *P. cernua*, “à la base du Mont Mahufaa au fond de la vallée d’Orofero, et sur les étages inférieures de l’Orohena vers 800 et 1000 m..... en fleurs et en fruit le 20 décembre 1857”. The collection *Nadeaud 345* at P generally corresponds to this locality and has been regarded as the type of this name (FOSBERG, *in sched.* in P; WELSH, 1998). This specimen has both flowers and fruits on it, but the dates given in the protologue for flowering and fruiting differ from the date on its label. WELSH (1998) cited this single specimen as the type of this species, which constitutes an effective lectotypification.

65. *Eumachia leptothyrsa* (Miq.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria leptothyrsa* Miq. in Ann. Mus. Bot. Lugduno-Batavi 4: 208. 1869.

Lectotypus (designated by SOHMER, 1988: 157): **INDONESIA. Prov. Moluccas:** Ceram, 1859-1860, *de Vriese & Teijsmann s.n.* (L [L0281705] image seen).

Note. – This species occurs from Malesia to the Western Pacific (SOHMER, 1988).

65a. *Eumachia leptothyrsa* var. *friabilis* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria leptothyrsa* var. *friabilis* Sohmer in Bishop Mus. Bull. Bot. 1: 163. 1988.

Typus: PAPUA NEW GUINEA. **Prov. Morobe:** Wau District, Aseki rd. ca. 57 km from Bulolo, ca. 2200 m, 3.V.1979, *Sohmer & Kerenga LAE 75243* (holo-: LAE; iso-: BISH [BISH1004634, BISH1004635] images seen, BO, L [10001173] image seen, M [M0183300] image seen, U-3023654 image seen).

Note. – This variety is found in Papua New Guinea (SOHMER, 1988).

65b. *Eumachia leptothyrsa* (Miq.) Barrabé, C.M. Taylor & Razafim. var. *leptothyrsa*

Note. – This variety is found in Papua New Guinea and on New Britain in the Bismarck Archipelago (SOHMER, 1988).

65c. *Eumachia leptothyrsa* var. *leptothyrsoides* (Kaneh.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria leptothyrsoides* Kaneh. in Bot. Mag. (Tokyo) 49: 355. 1935. = *Psychotria leptothyrsa* var. *leptothyrsoides* (Kaneh.) Fosberg in Allertonia 6: 259. 1991.

Lectotypus (designated by FOSBERG, 1991: 259): **MICRONESIA. Caroline Islands:** Truk [Chuuk], Tol Island, 300 m, 24.V.1931, *Kanehira 1279* (BISH [BISH1014846] image seen).

Note. – This variety occurs in the Caroline Islands and on Futuna in the Wallis and Futuna Islands (FOSBERG, 1991; GOVAERTS et al., 2015).

65d. *Eumachia leptothyrsa* var. *longicarpa* (Valeton) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

- = *Psychotria leptothyrsa* var. *longicarpa* Valeton in Bot. Jahrb. Syst. 63: 315. 1930.

Lectotypus (designated by FOSBERG, 1991: 259): **MICRONESIA. Caroline Islands:** Palau, Korror [Koror], 10-100 m, II.1914, *Ledermann 14230* (B [B100295926] image seen).

Notes. – This variety is found on Palau in the Caroline Islands (FOSBERG, 1991).

65e. *Eumachia leptothyrsa* var. *multifurca* (Valeton) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria multifurca* Valeton in Bot. Jahrb. Syst. 61: 90. 1927. = *Psychotria leptothyrsa* var. *multifurca* (Valeton) Sohmer in Bishop Mus. Bull. Bot. 1: 165. 1988.

Lectotypus (designated by SOHMER, 1988: 165): **PAPUA NEW GUINEA**: Sepik area, Lordberg, s.d., *Ledermann 10143* (L [L0001174] image seen).

Note. – This variety occurs in Papua New Guinea and Solomon Islands (SOHMER, 1988).

65f. *Eumachia leptothyrsa* var. *yapensis* (Fosberg) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria leptothyrsa* var. *yapensis* Fosberg in Allertonia 6: 260. 1991.

Typus: **MICRONESIA. Caroline Islands**: Yap, Gaanpan village, Dalipepinbau, 8.VII.1980, *Fosberg 60099* (holo-: US-3141912 image seen; iso-: A, BISH, BM, BRI, K [K000777554] image seen, MO, NSW, P [P04530696] image seen, POM, TI).

Note. – This variety is found on Yap in Caroline Islands (FOSBERG, 1991). Some isotypes cited in the protologue have not been located.

66. *Eumachia lyciiflora* (Baill.) Barrabé, C.M. Taylor & Razafim., **comb. nov.** (Fig. 1A, 1B).

= *Uragoga lyciiflora* Baill. in Adansonia 12: 290. 1879.
= *Psychotria lyciiflora* (Baill.) Schltr. in Bot. Jahrb. Syst. 39: 261. 1906. = *Margaritopsis lyciiflora* (Baill.) Barrabé & J. Florence in Adansonia ser. 3, 35: 290. 2013.

Lectotypus (designated by BARRABÉ et al., 2013: 290): **NEW CALEDONIA**: Forêt de Pessikara [Petchikara], partie supérieure du bassin du Dotio [Dothio], I.1872, *Balansa 3414* (P [P00633532]!; isolecto-: K [K000777483]!, P [P00633531, P00633533]!).

Note. – This species is endemic to New Caledonia (BARRABÉ et al., 2013).

67. *Eumachia membranacea* (Gillespie) Delprete & J.H. Kirkbr. in J. Bot. Res. Inst. Texas 9: 76. 2015.

= *Readea membranacea* Gillespie in Bernice P. Bishop Mus. Bull. 74: 35. 1930. = *Margaritopsis membranacea* (Gillespie) L. Andersson in Syst. Geogr. Pl. 72: 230. 2002.

Typus: **Fiji. Taveuni**: vicin. Waiyevo, 200 m, 20.II.1928, *Gillespie 4622* (holo-: BISH [BISH1004741] image seen; iso-: BISH [BISH1004740, BISH1004742] images seen, K [K000761856]!, NY [NY00133120, NY00133121] images seen, US-1454955 image seen).

Note. – This species is found on Viti Levu, Vanua Levu, and Taveuni in Fiji (SMITH & DARWIN, 1988).

68. *Eumachia membranifolia* (Bartl. ex DC.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria membranifolia* Bartl. ex DC., Prodr. 4: 522. 1830. = *Uragoga membranifolia* (Bartl. ex DC.) Kuntze, Revis. Gen. Pl. 2: 961. 1891. = *Chassalia membranifolia* (Bartl. ex DC.) Elmer in Leaf. Philipp. Bot. 3: 1032. 1911.

Typus: **PHILIPPINES. Prov. Sorsogon**: Luzon, s.d., *Haenke s.n.* (holo-: PR [PR612223] image seen; iso-: PR [PR612224] image seen).

Notes. – This species occurs in Papua New Guinea and the Philippines (SOHMER, 1988; SOHMER & DAVIS, 2007). An illustration was presented by SOHMER & DAVIS (2007: 117, fig. 61).

69. *Eumachia merrilliana* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria trichostoma* var. *macrophylla* Merr. & L.M. Perry in J. Arnold Arbor. 27: 214. 1946. = *Psychotria merrilliana* Sohmer in Bishop Mus. Bull. Bot. 1: 188. 1988 [nom. nov.] [non *P. macrophylla* Ruiz & Pav.].

Lectotypus (designated by SOHMER, 1988: 188): **SOLOMON ISLANDS. Prov. North Solomons**: Bougainville, Marmarromino, 50 m, 30.IX.1930, *Kajewski 2203* (A [A00095396] image seen; isolecto-: A [A00095397] image seen, BRI [BRI-0AQ0318270] image seen).

Note. – This species is endemic to the Solomon Islands (SOHMER, 1988).

70. *Eumachia monopedicellata* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria monopedicellata* Sohmer in Bishop Mus. Bull. Bot. 1: 200. 1988.

Typus: PAPUA NEW GUINEA [BISMARCK ARCHIPELAGO]. **Prov. West New Britain:** Talasea sub-province, Garu Wildlife Management Area, track from coastal logging road up to base of Mt. Gabuna, W slopes, 240 m, 23.V.1979, *Sohmer et al. LAE 75395* (holo-: LAE; iso-: BISH [BISH1004648, BISH1004649, BISH1004650] images seen, BRIT [BRIT23976] image seen, G [G00436504] image seen, GH [GH00095400] image seen, K [K000777365] image seen, PTBG-014427 image seen, US-3329138 image seen).

Note. – This species is found in the Bismarck Archipelago (SOHMER, 1988).

71. *Eumachia novohiberniensis* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria novohiberniensis* Sohmer in Bishop Mus. Bull. Bot. 1: 219. 1988.

Typus: PAPUA NEW GUINEA [BISMARCK ARCHIPELAGO]. **Prov. New Ireland:** Kavieng sub-district, near Lemusmus, 2°50'S, 151°12'E, 9.IX.1969, *Coodé NGF 40493* (holo-: LAE; iso-: BISH, BRI [BRI-AQ0129455] image seen, CANB [CANB207303] image seen, K [K000777360] image seen, L [L0001205], LAE).

Note. – This species is found in the Bismarck Archipelago (SOHMER, 1988).

72. *Eumachia oleoides* (Baill.) Barrabé, C.M. Taylor & Razafim., **comb. nov.** (Fig. 1G).

= *Uragoga oleoides* Baill. in Adansonia 12: 252. 1879.
= *Psychotria oleoides* (Baill.) Schltr. in Bot. Jahrb. Syst. 39: 262. 1906. = *Margaritopsis oleoides* (Baill.) Barrabé & Mouly in Adansonia ser. 3, 35: 290. 2013.

Lectotypus (designated by BARRABÉ et al., 2013: 290): **NEW CALEDONIA. Prov. Sud:** entre Ounia [Unia] et la plaine des Lacs, 8.XII.1870, *Balansa 2991* (P [P00633579]!; isolecto-: P [P00633577, P00633578]!).

Note. – This species is endemic to New Caledonia (BARRABÉ et al., 2013).

73. *Eumachia oncocarpa* (K. Schum.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria oncocarpa* K. Schum. in Bot. Jahrb. Syst. 25: 688. 1898. = *Psychotria carnea* subsp. *oncocarpa* (K. Schum.) Whistler in J. Arnold Arbor. 67: 354. 1986.

Lectotypus (designated by WHISTLER, 1986: 354): **SAMOA. Upolu:** XI.1893, *Reinecke 202* (G [G00356155] image seen) (Fig. 3).

Note. – This species occurs in eastern Polynesia, in Fiji and Samoa (SMITH & DARWIN, 1988).

74. *Eumachia ovoidea* (Pierre ex Pit.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Chassalia ovoidea* Pierre ex Pit., Fl. Indo-Chine 3: 366. 1924. = *Psychotria vietnamensis* Ruhsam in Bot. J. Linn. Soc. 157: 117. 2008 [nom. nov.] [non *P. ovoidea* Wall. ex Hook. f.].

Syntypi: CAMBODIA: Mulu-prey, Rivière de Pursat, s.d., *Harmand s.n.* (P [P04009111] image seen). **VIETNAM:** Cochinchine, Plaine des Tombeaux, I.1868, *Talmy s.n.* (P [P04009108] image seen); Go-viap, Bien-hoa, 1862-1866, *Thorel 772* (P [P04009119] image seen); *ibid. loc.*, *Thorel 795* (P [P04009121, P04009119, P04009123] images seen); Tong-hen, prov. De Bien-hoa, IX.1865, *Pierre 6249* (P [P04009124, P04009125] images seen); Saïgon, 19.V.1875, *Godefroy-Lebeuf s.n.* (P [P04009109, P04009128] images seen); Tay-ninh, 6.XI. 1919, *Poilane 731* (P [P04009112] image seen); *ibid. loc.*, *Poilane 740* (P [P04009113, P04009114] images seen).

Notes. – This species is found in continental southeastern Asia, in Vietnam and Cambodia (GOVAERTS et al., 2015). RUHSAM et al. (2008) concluded that this species does not belong to *Chassalia*, and transferred it to *Psychotria* but did not designate a lectotype. This species has the characters of *Eumachia* rather than *Psychotria*, and does not match any other *Eumachia* species treated here. Therefore this name is transferred to *Eumachia*, but this species is not well understood so but more study will be needed to clarify its typification.

75. *Eumachia purariensis* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria purariensis* Sohmer in Bishop Mus. Bull. Bot. 1: 235. 1988.

Typus: PAPUA NEW GUINEA. **Prov. Gulf:** Baimuru district, Purari River, 32.5 km E of Baimuru, 7°31'S, 145°7'E, 5 m, 24.III.1974, *Croft et al. LAE 61080* (holo-: LAE; iso-: BRI [BRI-AQ0372935] image seen, L [L0001233] image seen).

Note. – This species is found in Papua New Guinea (SOHMER, 1988).

76. *Eumachia saidoriensis* (Sohmer) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria saidoriensis* Sohmer in Bishop Mus. Bull. Bot. 1: 260. 1988.

Typus: PAPUA NEW GUINEA [BISMARCK ARCHIPELAGO]: Madang Distr., Saidor sub-distr., Matafuna Bay, Long Island, track to crater lake, 5°20'S, 147°05'E, 290 m, 11.V.1970, *Stevens LAE 50160* (holo-: LAE; iso-: BO, BRI [BRI-AQ_0129512] image seen, K [K000777528] image seen, L [L0001250] image seen).

Note. – This species is found in the Bismarck Archipelago (SOHMER, 1988).

77. *Eumachia samoana* (K. Schum.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria samoana* K. Schum. in Bot. Jahrb. Syst. 25: 685. 1898.

Lectotypus (designated by WHISTLER, 1986: 347): SAMOA. **Savaii:** Aopo, IX.1894, *Reinecke 418* (BISH [BISH1004683] image seen; isolecto-: G [G00356152] image seen).

Note. – This species is endemic to Savaii and Upolu in Samoa (WHISTLER, 1986).

78. *Eumachia savaiiensis* (Rech.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria savaiiensis* Rech. in Repert. Spec. Nov. Regni Veg. 6: 327. 1909.

Typus: SAMOA. **Savaii:** near Maugaafi, 1905, *Rechinger 690* (holo-: W [W1910-0001831] image seen).

Note. – This species is endemic to Savaii and Upolu in Samoa (WHISTLER, 1986).

79. *Eumachia schmielei* (Warb.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria schmielei* Warb. in Bot. Jahrb. Syst. 13: 440. 1891. = *Uragoga schmielei* (Warb.) Kuntze, Revis. Gen. Pl. 2: 962. 1891.

Lectotypus (designated by SOHMER, 1988: 263): PAPUA NEW GUINEA [BISMARCK ARCHIPELAGO]: Ulu Island, 1889, *Warburg 21453* (A [A00095412] image seen).

Note. – This species occurs in the Bismarck Archipelago and the Solomon Islands (SOHMER, 1988).

80. *Eumachia sclerocarpa* (Whistler) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria sclerocarpa* Whistler in J. Arnold Arbor. 67: 351. 1986.

Typus: SAMOA. **Savaii:** above Ologogo, 1973, *Whistler 580* (holo-: PTBG [PTBG037246]; iso-: B, K!, US).

Notes. – This species is endemic to Savaii in Samoa (WHISTLER, 1986). The K isotype was studied physically, but it has not been databased or imaged and therefore does not have a barcode or other identifying accession number.

81. *Eumachia straminea* (Hutch.) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria straminea* Hutch., Pl. Wilson. 3: 416. 1916.

Typus: CHINA. **Yunnan:** Mengtze, mountains to south-east, 1613 m, s.d., *Henry 11138* (holo-: K [000777057] image seen; iso-: NY [NY00132880] image seen).

Note. – This species is found in continental southeastern Asia, in Vietnam and southeastern and southern China (CHEN & TAYLOR, 2011: 300).

82. *Eumachia trichostoma* (Merr. & L.M. Perry) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria trichostoma* Merr. & L.M. Perry in J. Arnold Arbor. 27: 214. 1946.

Typus: SOLOMON ISLANDS. **Florida Island:** N end of N'Gela island, 25.I.1933, *Brass 3515* (holo-: A [A00095421] image seen; iso-: BISH [BISH1004708] image seen, BM [BM001040339] image seen, BRI [BRI-AQ0318268] image seen).

Note. – This species occurs in the Solomon Islands and perhaps also Vanuatu (SOHMER, 1988).



Fig. 3. – Lectotype of *Eumachia oncocarpa* (K. Schum.) Barrabé, C.M. Taylor & Razafim. in G.

83. *Eumachia vaupelii* (Whistler) Barrabé, C.M. Taylor & Razafim., **comb. nov.**

= *Psychotria vaupelii* Whistler in J. Arnold Arbor. 67: 352. 1986.

Typus: SAMOA. **Savaii**: Ologogo, s.d., *Whistler* 499 (holo-: PTBG; iso-: BISH).

Notes. – This species is endemic to Savaii in Samoa (WHISTLER, 1986).

Incompletely known species from Asia, Australasia, and the Pacific Region

The following three names may represent additional species that belong to *Eumachia*. However the identities of these names have not yet been confirmed so new nomenclatural combinations in *Eumachia* are not made for them here.

84. *Psychotria expansa* Blume, Bijdr. 963. 1826.

= *Chassalia expansa* (Blume) Miq., Fl. Ned. Ind. 2: 280. 1857.

Lectotypus (designated by SOHMER, 1988: 320): **INDONESIA. Java**: “ad pedem montis Salak, floret Majo”, s.d., *Blume s.n.* (L [L-908-202-2]).

Notes. – This name was accepted and said to be a species occurring from Borneo to Java and Sumatra by GOVAERTS et al. (2015). However this name was lectotypified and then placed in synonymy with another poorly known species, *Psychotria montana* Blume (discussed below), by SOHMER (1988). The treatment of this name by BEAMAN & ANDERSON (2004), who were followed by GOVAERTS et al. (2015), is confused because they simultaneously accepted the name *P. expansa* Blume and placed a combination based on this name, *Chassalia expansa* (Blume) Miq., in synonymy with a different species, *P. malayana* Jack. The status of *P. expansa* cannot be clarified until these various species are better understood.

85. *Psychotria montana* Blume, Cat. Gew. Buitenzorg: 54. 1823.

= *Chassalia montana* (Blume) Miq., Fl. Ned. Ind. 2: 281. 1857. = *Uragoga montana* (Blume) Kuntze, Revis. Gen. Pl. 2: 961. 1891.

Lectotypus (designated by SOHMER, 1988: 320): **INDONESIA. Java**: s.d., *Blume s.n.* (L [L0281716] image seen).

Notes. – This name was accepted and said to be a species found from southeastern Asia to Java and possibly also in New Guinea by GOVAERTS et al. (2015). However SOHMER (1988)

studied *Psychotria montana* in some detail, and concluded it was too poorly known to include in his formal treatment. SOHMER did however lectotypify this name, and formally synonymized *P. expansa* with it. SOHMER (1988) discussed *P. montana* because he thought several specimens from New Guinea might belong to this species, and suggested that *P. montana* may be related to *Eumachia leptothyrsa*. In the end he left resolution of the identities of *P. montana*, *P. expansa*, and the New Guinea specimens for future study, and it is also beyond the scope of this present study.

86. *Psychotria polita* Valetton in Bot. Jahrb. Syst. 61: 95. 1927.

Lectotypus (designated by SOHMER, 1988: 324): **PAPUA NEW GUINEA**: NE New Guinea, Etappenberg, 850 m, 16.X.1912, *Ledermann* 9311 (L [L0001229] image seen).

Notes. – This species was described from New Guinea, and this name was lectotypified by SOHMER (1988) even though he considered its identity too unclear to include it in his formal treatment. The holotype specimen was deposited at B, and has been destroyed. The lectotype is the only authentic material of *Psychotria polita* known, and has only very young inflorescences so its identity cannot be determined easily. SOHMER (1988) suggested that *P. polita* might be the same as *P. rostrata* Blume from Java, another species of uncertain identity. The type specimen of *P. polita* does have the yellowish green drying color and hard fragmented stipules of *Eumachia*, but the identity of this name is otherwise unclear so it is not recognized as a species of *Eumachia* here.

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Bibliography

- ANDERSSON, L. (1992). A provisional checklist of neotropical Rubiaceae. *Scripta Bot. Belg.* 1.
- ANDERSSON, L. (2001). Margaritopsis (Rubiaceae, Psychotriaceae) is a pantropical genus. *Syst. Geogr. Pl.* 71: 73-85.
- ANDERSSON, L. (2002a). Re-establishment of Carapichea (Rubiaceae, Psychotriaceae). *Kew Bull.* 57: 363-374.
- ANDERSSON, L. (2002b). Relationships and generic circumscriptions in the Psychotria complex (Rubiaceae, Psychotriaceae). *Syst. Geogr. Pl.* 72: 167-202.
- ANDERSSON, L. (2002c). Validation of three new combinations in Margaritopsis (Rubiaceae, Psychotriaceae). *Syst. Geogr. Pl.* 72: 230.
- APPLEQUIST, W.L. (2014). Report of the Nomenclature Committee for Vascular Plants: 66. *Taxon* 63: 1358-1371.
- BARRABÉ, L. & A.P. DAVIS (2013). (2207) Proposal to conserve the name Margaritopsis against Eumachia (Rubiaceae). *Taxon* 62: 1069-1070.
- BARRABÉ, L., S. BUERKI, A. MOULY, A.P. DAVIS, J. MUNZINGER & L. MAGGIA (2012). Delimitation of the genus Margaritopsis (Rubiaceae) in the Asian, Australasian, and Pacific region, based on molecular phylogenetic inference and morphology. *Taxon* 61: 1251-1268.
- BARRABÉ, L., A. MOULY & J. FLORENCE (2013). Psychotriaceae (Rubiaceae) neocaledonicarum specierum nomenclator. *Adansonia ser.* 3, 35: 281-357.
- BEAMAN, J.H. & C. ANDERSON (2004). Rubiaceae. In: *The Plants of Mount Kinabalu* 5: 1-165. Royal Botanic Gardens, Kew.
- BERGER, A. (2012). *Distribution and systematic significance of selected secondary metabolites within Psychotriaceae/Palicoureeae (Rubiaceae)*. M.S. Thesis, Universität Wien.
- CHEN, T. & C.M. TAYLOR (2011). Psychotria Linnaeus. In: WU, C.Y., P.H. RAVEN & D.Y. HONG (ed.), *Fl. China* 19: 294-301.
- DELPRETE, P.G. & J.H. KIRKBRIDE JR. (2015). New combinations in Eumachia (Rubiaceae) for species occurring on the Guiana Shield. *J. Bot. Res. Inst. Texas* 9: 75-79.
- FOSBERG, F.R. (1942). Rubiaceae. In: *Fijian plant studies II. Botanical results of the 1940-41 cruise of the "Cheng Ho" by A.C. Smith & Collaborators*. *Sargentia* 1: 118-140.
- FOSBERG, F.R. (1991). The Micronesian species of Psychotria L. In: FOSBERG, F.R. & M.-H. SACHET (ed.), *Studies in Indo-Pacific Rubiaceae*. *Allertonia* 6: 244-268.
- GOVAERTS, R., M. RUHSAM, L. ANDERSSON, E. ROBBRECHT, D. BRIDSON, A.P. DAVIS, I. SCHANZER & B. SONKÉ (2015). *World Checklist of Rubiaceae*. Facilitated by the Royal Botanic Gardens, Kew [<http://apps.kew.org/wcsp>].
- GUILLAUMIN, A. (1932). Contribution to the flora of New Hebrides; plants collected by S.F. Kajewski in 1928 and 1929. *J. Arnold Arb.* 13: 1-29.
- JOHANSSON, J.T. (1992). Pollen morphology in Psychotria (Rubiaceae, Rubioideae, Psychotriaceae) and its taxonomic significance. A preliminary survey. *Opera Bot. Belg.* 115: 5-71.
- LACHENAUD, O. (2013). *Le genre Psychotria (Rubiaceae) en Afrique occidentale et centrale: taxonomie, phylogénie et biogéographie*. Ph.D. Dissertation, Université Libre de Bruxelles, Belgium.
- LIOGIER, H.A. (1963). Familia 1. Rubiaceae. *Flora de Cuba* 5: 13-146. Editorial Universitaria, Universidad de Puerto Rico, Río Piedras, Puerto Rico.
- LIOGIER, H.A. (1995). Familia 198. Rubiaceae. In: LIOGIER, H.A. (ed.), *La Flora de la Española* 7: 207-439. Universidad Central del Este vol. 71, Serie Científica 28. San Pedro de Macorís, Dominican Republic.
- LORENCE, D.H., C.M. TAYLOR, C.D. ADAMS, L. ANDERSSON, W. BURGER, P. DELPRETE, K. ES, T. MCDOWELL, H. OCHOTERENA, C. PERSSON, F. PIESCHAERT & D.W. TAYLOR (2012). Rubiaceae. In: DAVIDSE G. & C. ULLOA ULLOA (ed.), *Fl. Mesoamericana* 4(2): 1-288.
- MARTINS, D. & C.V. NUNEZ (2015). Secondary metabolites from Rubiaceae Species. *Molecules* 20: 13422-13495.
- MÜLLER, J.P. (1876). Rubiaceae brasilienses novae (continuatio). *Mapouria Aubl. Flora* 53: 457-460, 464-466, 495-498.
- MÜLLER, J.P. (1881). Rubiaceae, Tribus VI. Psychotriaceae. In: MARTIUS, C.F.P. DE (ed.), *Flora Brasiliensis* 6: 161-469. Leipzig.
- NEPOKROEFF, M., B. BREMER & K.J. SYSTMA (1999). Reorganization of the genus Psychotria and tribe Psychotriaceae (Rubiaceae) inferred from ITS and rbcL sequence data. *Syst. Bot.* 24: 5-27.
- PIESSCHAERT, F. (2001). *Carpology and pollen morphology of the Psychotriaceae (Rubiaceae-Rubioideae), towards a new tribal and generic delimitation*. Ph.D. Dissertation, Catholic University of Leuven, Belgium.
- PIESSCHAERT, F., E. ROBBRECHT & E. SMETS (1999). Chassalia subcordatifolia, a new combination in African Rubiaceae (Rubioideae, Psychotriaceae). *Syst. Geogr. Pl.* 69: 189-194.
- RAZAFIMANDIMBISON, S.G., C.M. TAYLOR, N. WIKSTROM, T. PAILLER, A. KHODABANDEH & B. BREMER (2014). Phylogeny and generic limits in the sister tribes Psychotriaceae and Palicoureeae (Rubiaceae): Evolution of schizocarps in Psychotria and origins of bacterial leaf nodules in the Malagasy species. *Amer. J. Bot.* 101: 1102-1126.
- ROBBRECHT, E. (1989) A remarkable new Chazaliella (African Psychotriaceae), exemplifying the taxonomic value of pyrene characters in the Rubiaceae. *Bull. Mus. Natl. Hist. Nat., B, Adansonia* 11: 341-349.

- ROBBRECHT, E. & J.-F. MANEN (2006). The major evolutionary lineages of the coffee family (Rubiaceae, angiosperms). Combined analysis (nDNA and cpDNA) to infer the position of *Coptosapelta* and *Luculia*, and supertree construction based on *rbcl*, *rps16*, *trnL-trnF* and *atpB-rbcL* data. A new classification in two subfamilies, Cinchonoideae and Rubioideae. *Syst. Geogr. Pl.* 76: 85-146.
- RUHSAM, M., R. GOVAERTS & A.P. DAVIS (2008). Nomenclatural changes in preparation for a World Rubiaceae Checklist. *Bot. J. Linn. Soc.* 157: 115-124.
- SMITH, A.C. & S.P. DARWIN (1988). Rubiaceae. In: SMITH, A.C. (ed.), *Fl. Vitiensis Nova* 4: 143-376.
- SOHMER, S.H. (1988). The nonclimbing species of the genus *Psychotria* (Rubiaceae) in New Guinea and the Bismarck Archipelago. *Bishop Mus. Bull. Bot.* 1.
- SOHMER, S.H. & A.P. DAVIS (2007). The genus *Psychotria* (Rubiaceae) in the Philippine Archipelago. *Sida, Bot. Misc.* 27: 1-247.
- STAFLEU, F. & R.S. COWAN (1979). Taxonomic Literature vol. 2. *Regnum Veg.* 98.
- STAFLEU, F. & R.S. COWAN (1988). Taxonomic Literature vol. 7. *Regnum Veg.* 116.
- STEYERMARK, J.A. (1972). *Psychotria*. In: MAGUIRE, B.M. et al. (ed.), *Flora of the Guayana Highlands*. *Mem. New York Bot. Gard.* 23: 406-717.
- TAYLOR, C.M. (2001). Overview of the Neotropical genus *Notopleura* (Rubiaceae: Psychotrieae), with the descriptions of some new species. *Ann. Missouri Bot. Gard.* 88: 478-525.
- TAYLOR, C.M. (2005). *Margaritopsis* (Rubiaceae, Psychotrieae) in the Neotropics. *Syst. Geogr. Pl.* 75: 161-177.
- TAYLOR, C.M. (2015). Rubiacearum americanarum magna hama pars XXXIII: the new group *Palicourea* sect. *Didymocarpae* with four new species and two new subspecies (Palicoureeae). *Novon* 23: 452-478.
- TAYLOR, C.M. & R.E. GEREAU (2013). The genus *Carapichea* (Rubiaceae: Psychotrieae). *Ann. Missouri Bot. Gard.* 99: 100-127.
- TAYLOR, C.M., M.T.V.A. CAMPOS & D. ZAPPI (2007). Flora da Reserva Ducke, Amazonas, Brazil: Rubiaceae. *Rodriguésia* 58: 549-616.
- TAYLOR, C.M., J.A. STEYERMARK, P.G. DELPRETE, A. VICENTINI, R. CORTÉS, D. ZAPPI, C. PERSSON, C. B. COSTA & E.A. DA ANUNCIACÃO (2004). Rubiaceae. In: BERRY, P. et al. (ed.), *Fl. Venezuelan Guayana* 8: 497-847.
- VERDCOURT, B. (1975). Studies in the Rubiaceae-Rubioideae for the 'Flora of Tropical East Africa': 1. *Kew Bull.* 30: 247-327.
- VERDCOURT, B. (1976). Rubiaceae (part 1). In: TURRILL, W.B. & R.M. POLHILL (ed.) *Fl. Trop. E. Africa*.
- VERDCOURT, B. (1977). A synopsis of the genus *Chazaliella* (Rubiaceae-Psychotrieae). *Kew Bull.* 31: 785-818.
- VERDCOURT, B. (1980). A Conspectus of *Polysphaeria* (Rubiaceae). *Kew Bull.* 35: 97-130.
- VERDCOURT, B. (1989). 94. Rubiaceae. In: LAUNERT, E. (ed.), *Fl. Zambesiaca* 5(1).
- WELSH, S.L. (1998). *Flora Societensis*. E.P.S. Inc., Orem, Utah.
- WHISTLER, W.A. (1986). A revision of *Psychotria* (Rubiaceae) in Samoa. *J. Arnold Arbor.* 67: 341-370.
- ZAPPI, D.C. (2003). Revision of *Rudgea* (Rubiaceae) in southeastern and southern Brazil. *Kew Bull.* 58: 513-596.