SYSTEMATICS AND PHYLOGENY

Towards a complete phylogeny of African Melastomateae: Systematics of *Dissotis* and allies (Melastomataceae)

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Abstract *Dissotis* has long been regarded as the most species-rich genus of African Melastomataceae, yet its diagnostic characters have never been examined in an explicitly phylogenetic context. In a previous study, we recovered a large clade consisting of "*Dissotis* and allies" but with poorly understood generic limits. Here we present a nearly complete phylogeny of African Melastomateae with focus on *Dissotis* and allies using sequences generated from two nuclear (nrETS, nrITS) and two plastid markers (*ndhF*, *psbK-psbL*), sampling 94 accessions representing 69 species including outgroups. We infer phylogenetic relationships using maximum likelihood, parsimony and Bayesian approaches and propose a revised generic classification of *Dissotis* and allies based on our molecular trees. In addition, we reconstruct the ancestral state of 20 important morphological characters of African Melastomateae. *Dissotis* and *Antherotoma* as previously circumscribed are polyphyletic, while all four of the previously recognised sections of *Dissotis* subg. *Dissotis* are monophyletic (i.e., sections *Dissotis*, *Macrocarpae*, *Sessilifoliae* and *Squamulosae*). We also recovered a clade consisting of *D. congolensis*, *A. senegambiensis*, *A. clandestina* and *Nerophila gentianoides* plus the species earlier treated in African *Osbeckia*. Ancestral character reconstruction indicates there are no unambiguous morphological synapomorphies for *Dissotis* s.l. In particular, the character of staminal dimorphism is shown to be homoplasious. However, the individual clades making up *Dissotis* and allies are each diagnosed by one to several morphological characters. In view of these results, we propose the following changes for the classification of African Melastomateae: (1) five new genera are described, *Almedanthus* (for *Dissotis pachytricha*), *Eleotis* (for *D.* sect. *Sessilifoliae*), *Feliciotis* (for *D.* sect. *Macrocarpae*), *Pyrotis* (for *D. gilgiana*) and *Rosettea* (for *D.* sect. *Squamulosae*); (2) the genus *Nerophila* is reinstated with an expanded circumscription to include *Antherotoma senegambiensis*, *A. clandestina*, *D. congolensis*, *D. pauciflora* and three species earlier treated in African *Osbeckia*; (3) circumscription of *Dissotis* s.str. is reduced to six species; (4) the monospecific genus *Derosiphia* is reinstated; and (5) two species previously placed in *Dissotis* are transferred to *Antherotoma*. To complete our generic realignment, 12 new synonyms and 58 new combinations are effected at or below the species level. A total of 40 lecto- or neotypes are designated. A revised key is provided for African Melastomateae, including all nine genera presently recognised in *Dissotis* and allies. *Dissotis leonensis* (type and only species of *D.* subg. *Paleodissotis*) together with the monospecific *Cailliella* and *Dionychastrum* remain unsampled.

Keywords Africa; ancestral character reconstruction; *Antherotoma*; *Dissotis*; Melastomataceae; molecular phylogenetics; *Osbeckia*; systematics; taxonomy

Supporting Information may be found online in the Supporting Information section at the end of the article.

■ INTRODUCTION

Within the last three decades, molecular phylogenetics has had a substantial impact on systematists' hypotheses about plant relationships and ultimately on our system of classification (Daly & al., 2001). In particular, our understanding and practice of generic classification have greatly changed (Humphreys & Linder, 2009) in the attempt to incorporate monophyletic groups as inferred by molecular studies. Nevertheless, putting into practice the extensive phylogenetic realignments often requires numerous nomenclatural changes. A genus was defined by Legendre & Vaillancourt (1969) as a monophyletic group of species that occupies a given adaptive zone. According to Humphreys & Linder (2009), a "good" genus should be predictive and stable, and a "useful" genus should be diagnosable and of a workable size. Monophyly has been suggested as a criterion to ensure both stability and predictiveness of taxa (Albach, 2008). Lumping several paraphyletic genera into a single large genus is better for some authors (Forrest & Hollingsworth, 2003; Orthia & al., 2005; Pfeil & Crisp, 2005; Hörandl & Stuessy, 2010; Stuessy & Hörandl, 2014; Michelangeli & al., 2016 and refs. therein), while the

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alternative of splitting large and unwieldy groups into smaller, distinct genera is preferred by others (Nepokroeff & al., 1999; Pelser & al., 2007; Kriebel & al., 2015). In this study, we combine morphology (i.e., diagnosability) and the principle of monophyly to maintain well-established names and revise the infra- and intergeneric classifications within the "*Dissotis* and allies" clade sensu Veranso-Libalah & al. (2017).

Dissotis Benth. has been considered the largest genus of Melastomataceae in Africa, with about 120 species according to one recent treatment (Renner, 1993). However, there has also been a considerable degree of controversy about its delimitation and infrageneric classification. The genus was first described by Bentham (1849) based on a single species, the West African *D. grandiflora* (Sm.) Benth. (Table 1; Fig. 1E, F), which was said to differ from *Osbeckia* L. chiefly by its dimorphic stamens with those of the antesepalous whorl (i.e., the whorl alternating with the petals) having the anther connective greatly elongated at the base (Fig. 1F). The name *Dissotis* was derived in reference to the appendages present at the base of the connective, which were likened to a pair of ears (cf. Jacques-Félix, 1995: 268).

Joseph Dalton Hooker (1871) in the *Flora of Tropical Africa* recognised 20 species of *Dissotis* (including seven that were newly described). His circumscription of the genus was guided by concepts defined in the *Genera plantarum* (Bentham & Hooker, 1867) and included species previously treated in *Heterotis* Benth., *Melastomastrum* Naudin and *Argyrella* Naudin (Table 1), united with *Dissotis* by the shared feature of staminal dimorphism. While noting the homostemonous *Osbeckia* as a "very large Tropical Asiatic genus, closely allied to *Dissotis*", his treatment also included three African species, i.e., *O. senegambiensis* Guill. & Perr., *O. multiflora* Sm. and *O. tubulosa* Sm. He further proposed a new status at generic rank for *O*. sect. *Antherotoma* Naudin, typified by the African-Madagascan species *O. antherotoma* Naudin (≡ *Antherotoma naudinii* Hook.f.), which resembles *Osbeckia* by its equal stamens (Fig. 1A,B) but was said to differ by its anthers dehiscing by a large pore, a lengthened connective at the base and an ovary crowned with bristles.

Triana (1872: 164), however, noted that within *Dissotis* there are certain species, e.g., *D. senegambiensis* (Guill. & Perr.) Triana and *D. decandra* (Sm.) Triana, in which the two staminal whorls are equal or nearly so. He further noted some Welwitsch collections of *D. debilis* (Sond.) Triana in which different flowers of the same plant exhibited two staminal types, very unequal on the one hand and nearly equal on the other. He concluded that the character of iso- versus dimorphism of stamens was not important for the delimitation of genera in the Old World Melastomateae and proceeded to transfer into *Dissotis* all the African species previously recognised in *Osbeckia*. For Triana, the elongation of the anther connective was the important character in distinguishing between these two genera (because in *Osbeckia* the connective is reduced to a collar-like thickening immediately below the thecae; see Hansen, 1977). He treated 32 species in *Dissotis*, divided between three sections, i.e., *D*. sect. *Dissotis* (sepals deciduous), *D*. sect. *Heterotis* (Benth.) Hook.f. (sepals persistent) and *D*. sect. *Argyrella* (Naudin) Triana (characterised as white-pubescent subshrubs).

In the last worldwide monograph of the family, Cogniaux (1891) re-emphasized staminal dimorphism as a generic character. He divided *Osbeckia* into six sections including *O*. sect. *Pseudodissotis* Cogn. comprised mainly of African species, as well as *O*. sect. *Antherotoma* with two species (Table 1). His treatment of *Dissotis* did not include a sectional classification, yet within the genus he described 11 new species. As pointed out later by Jacques-Félix (1981), the approach adopted by Cogniaux (1891) led him to separate into different genera not only some closely related species, e.g., *Dissotis multiflora* (Sm.) Triana and *D. brazzae* Cogn., which differ from each other only by the degree of staminal dimorphism, but also different collections of the same species, some heterostemonous, such as *D. phaeotricha* (Hochst.) Harv., whilst some others, homostemonous, were named as *O. zambesiensis* Cogn. Although artificial, the classification of Cogniaux (1891) had a long-lasting influence on subsequent treatments of African Melastomateae, e.g., the regional monographs by Gilg (1898) and Engler (1921) as well as the *Flora of West Tropical Africa* (Hutchinson & Dalziel, 1927; Keay, 1954). The trend during the European colonial period in Africa was for newly discovered species to be added incrementally to these genera without any critical attempt at revision. Unfortunately, virtually all of Gilg and Engler's types in the Berlin Herbarium were destroyed during World War II; many names are thus in need of lecto- or neotypification.

The revisionary period began after the war, initially with a series of papers by the Portuguese botanists Abílio and Rosette Fernandes (Fernandes & Fernandes, 1954a,b,c,d,e, 1955, 1956a,b,c, 1960a,b, 1961, 1969). Within *Dissotis*, they described 23 new species as well as 12 new varieties. They further proposed that all of the African species previously treated in Cogniaux's *Osbeckia* sect. *Pseudodissotis* should be transferred to *Dissotis*, noting in certain species the frequent occurrence of "osbeckioid" forms (stamens isomorphic). On the other hand, they also transferred 10 species from *Dissotis* to other genera, mostly to the re-established *Melastomastrum*, but notably also to the monospecific *Pseudosbeckia* A.Fern. & R.Fern. Most importantly, within the genus *Dissotis*, which had by that time become rather large and cumbersome, they established much-needed structure by proposing a revised infrageneric classification consisting of six subgenera, including *D*. subg. *Osbeckiella* A.Fern. & R.Fern., *D*. subg. *Heterotis* (Benth.) A.Fern. & R.Fern., *D*. subg. *Argyrella* (Naudin) A.Fern. & R.Fern., *D*. subg. *Dupineta* (Raf.) A.Fern. & R.Fern., *D*. subg. *Dissotidendron* A.Fern. & R.Fern. and *D*. subg. *Dissotis* with four sections, *D*. sect. *Macrocarpae* A.Fern. & R.Fern., *D*. sect. *Sessilifoliae* A.Fern. & R.Fern., *D*. sect. *Squamulosae* A.Fern. & R.Fern. and *D*. sect. *Dissotis* (Table 2). This infrageneric classification was reflected in their treatment for the *Conspectus florae Angolensis* (Fernandes & Fernandes, 1970), but their later contribution for the *Flora Zambesiaca* did not recognise the sections within *D*. subg. *Dissotis* (Fernandes & Fernandes, 1978).

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Table 1. Summary of the present classification of *Dissotis* Benth. and related genera (African Melastomateae) in comparison to the earlier classifications of Bentham (1849), Naudin (1850), Hooker (1871), Triana (1872) and Cogniaux (1891). Numbers shown in brackets are the number of African species recognised in each treatment. Names shown in brackets are the types (or in certain cases a list of species recognised) for that taxon.

This study	Bentham (1849)	Naudin (1850)	Hooker (1871)	Triana (1872)	Cogniaux (1891)
Almedanthus Ver.-Lib. & R.D.Stone, **gen. nov.** [**1**; *A. pachytrichus* (Gilg ex R.E.Fr.) Ver.-Lib. & R.D.Stone]	Not treated	Not treated	Not treated	Not treated	Not treated
Antherotoma (Naudin) Hook.f. [**10**; *A. naudinii* Hook.f.]	Not treated	***Osbeckia*** L. § ***Antherotoma*** Naudin [**1**]	***Antherotoma*** [**2**] ***Dissotis*** Benth. § ***Dissotis***, in small part [*D. phaeotricha* (Hochst.) Harv., *D. villosa* Hook.f.]	***Antherotoma*** [**1**] ***Dissotis*** § ***Heterotis*** (Benth.) Hook.f., in part	***Osbeckia*** § ***Antherotoma*** Naudin [**2**] ***Dissotis***, in part ***Osbeckia*** § ***Pseudodissotis*** Cogn., in part
Argyrella Naudin [**7**; *A. canescens* (E.Mey. ex Graham) Harv.]	Not treated	***Argyrella*** [**1**]	***Dissotis*** Benth. § ***Dissotis***, in small part [*D. canescens* (E.Mey. ex Graham) Hook.f.]	***Dissotis*** § ***Argyrella*** (Naudin) Triana [**1**]	***Dissotis***, in part
Derosiphia Raf. [**1**; *D. tubulosa* (Sm.) Raf.]	***Osbeckia*** § ***Podocaelia*** Benth., in part	Not treated (*Osbeckia tubulosa* Sm. on list of "additional but very uncertain species")	***Osbeckia***, in part	***Dissotis*** § ***Dissotis***, in small part [*D. tubulosa* (Sm.) Triana]	***Osbeckia*** § ***Pseudodissotis***, in small part
Dissotidendron (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit [**11**; *D. melleri* (Hook.f.) Ver.-Lib. & G.Kadereit]	Not treated	Not treated	***Dissotis*** § ***Dissotis***, in small part [*D. melleri* Hook.f.]	***Dissotis*** § ***Dissotis***, in small part	***Dissotis***, in small part
Dissotis s.str. [**6**; *D. grandiflora* (Sm.) Benth.]	***Dissotis*** [**1**]	***Osbeckiastrum*** Naudin [**1**]	***Dissotis*** § ***Dissotis*** [**12**]	***Dissotis*** § ***Dissotis*** [**11**]	***Dissotis*** [**32**]
Dupineta Raf. [**5**; *D. multiflora* (Sm.) Raf.]	***Osbeckia*** § ***Podocaelia***, in part	Not treated (*Osbeckia multiflora* Sm. on list of "additional but very uncertain species")	***Osbeckia***, in part	***Dissotis*** § ***Dissotis***, in small part [*D. multiflora* (Sm.) Triana]	***Dissotis***, in part
Eleotis Ver.-Lib. & R.D.Stone, **gen. nov.** [**4**; *E. welwitschii* (Cogn.) Ver.-Lib. & R.D.Stone]	Not treated	Not treated	Not treated	Not treated	***Dissotis***, in small part [*D. welwitschii* Cogn.] ***Osbeckia*** § ***Pseudodissotis***, in part
Feliciotis Ver.-Lib. & G.Kadereit, **gen. nov.** [**12**; *F. speciosa* (Taub.) Ver.-Lib. & G.Kadereit]	Not treated	Not treated	Not treated	Not treated	Not treated

(Continues)

Table 1. Continued.

This study	Bentham (1849)	Naudin (1850)	Hooker (1871)	Triana (1872)	Cogniaux (1891)
Guyonia Naudin [**14**; *G. tenella* Naudin]	***Heterotis*** Benth. § ***Cyclostemma*** Benth. [**1**]	***Guyonia*** [**1**]	***Guyonia*** [**2**] ***Dissotis*** § ***Dissotis***, in small part [*D. antennina* (Sm.) Hook.f.]	***Guyonia*** [**1**] ***Dissotis*** § ***Heterotis*** (Benth.) Hook.f., in part	***Guyonia*** [**2**] ***Dissotis***, in small part
Heterotis [**6**; *H. rotundifolia* (Sm.) Jacq.-Fél.]	***Heterotis*** § ***Heterotis*** [**3**]	***Osbeckia*** § ***Macrodesmiae*** Naudin, in part	***Dissotis*** § ***Dissotis***, in part	***Dissotis*** § ***Heterotis***, in part	***Dissotis***, in part
Melastomastrum Naudin [**6**; *M. capitatum* (Vahl) A.Fern. & R.Fern.]	***Heterotis*** § ***Leiocalyx*** Benth. [**1**] ***Heterotis*** § ***Wedeliopsis*** Benth. [**4**]	***Melastomastrum*** [**1**]	***Dissotis*** Benth. § ***Heterotis*** [**8**]	***Tristemma*** Juss., in part	***Dissotis***, in part
Nerophila Naudin [**8**; *N. gentianoides* Naudin]	Not treated	***Nerophila*** [**1**] ***Osbeckia*** § ***Oxyrhinae*** Naudin, in small part	***Nerophila*** [**1**] ***Osbeckia***, in part	***Nerophila*** [**1**] ***Dissotis*** § ***Dissotis***, in small part	***Nerophila*** [**1**] ***Osbeckia*** § ***Asterostoma*** Triana, in small part ***Osbeckia*** § ***Antherotoma*** Naudin, in part ***Osbeckia*** § ***Pseudodissotis***, in small part ***Rhodosepala*** Baker
Nothodissotis Ver.-Lib. & G.Kadereit [**2**; *N. barteri* (Hook.f.) Ver.-Lib. & G.Kadereit]	Not treated	Not treated	***Dissotis*** § ***Dissotis***, in small part	***Dissotis*** § ***Dissotis***, in small part	***Dissotis***, in small part
Osbeckia s.str. [**0**; *O. chinensis* L.] (Asiatic species only)	***Osbeckia*** § ***Osbeckia*** [**0**] (Asiatic species only)	***Osbeckia*** [**4**]	***Osbeckia*** [**3**]	***Osbeckia*** s.str. [**0**] (Asiatic species only)	***Osbeckia*** L. [**14**]
Pyrotis Ver.-Lib. & R.D.Stone, **gen. nov.** [**1**; *P. gilgiana* (De Wild.) Ver.-Lib. & R.D.Stone]	Not treated	Not treated	Not treated	Not treated	Not treated
Rosettea Ver.-Lib. & G.Kadereit, **gen. nov.** [**21**; *R. longicaudata* (Cogn.) Ver.-Lib. & G.Kadereit]	***Osbeckia***, in small part [*O. princeps* (Kunth) DC.]	***Osbeckia*** § ***Macrodesmiae***, in part	***Dissotis*** § ***Dissotis***, in small part [*D. eximia* (Sond.) Harv.]	***Dissotis*** § ***Dissotis***, in small part [*D. princeps* (Kunth) Triana]	***Dissotis***, in part

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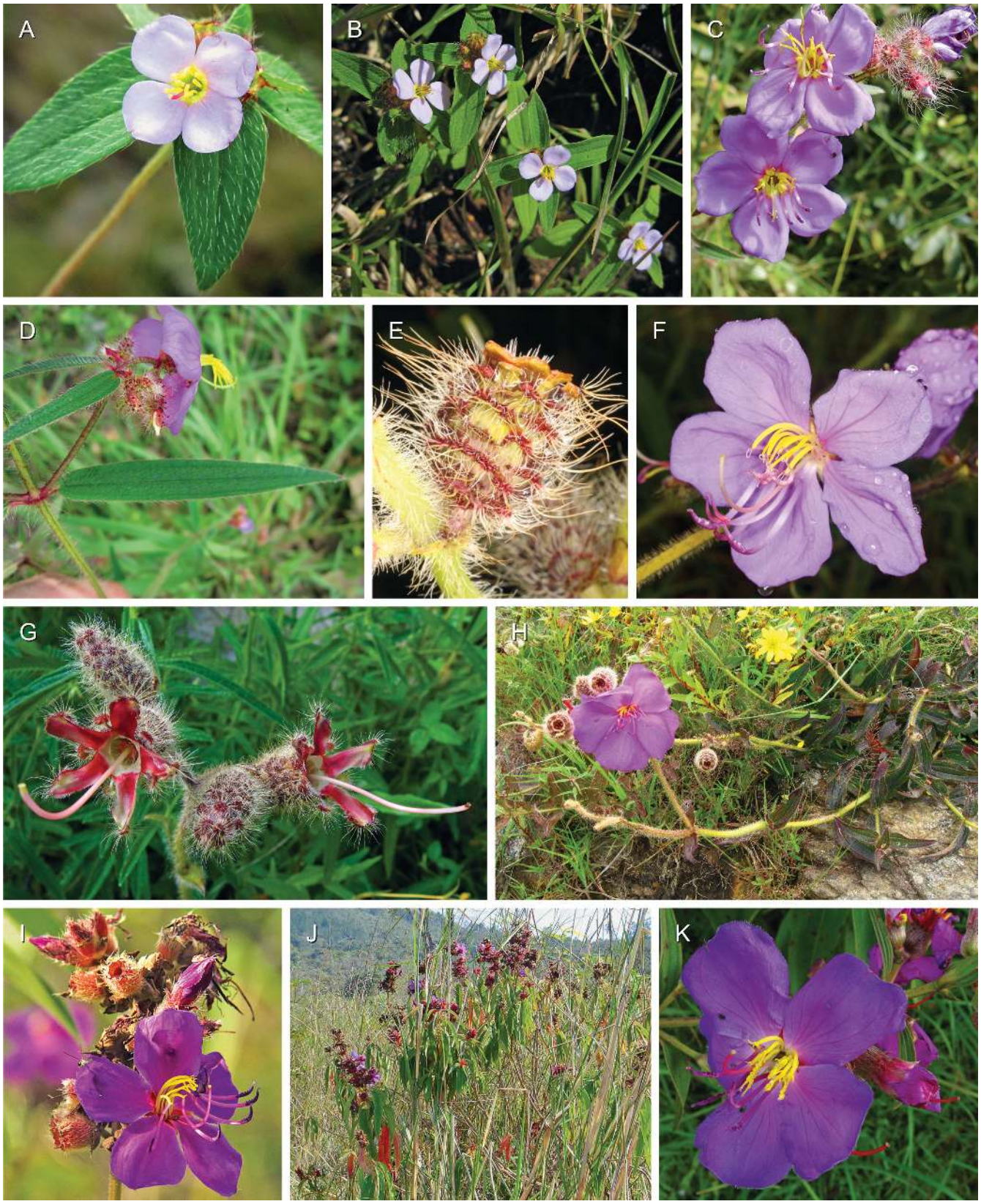


Fig. 1. Representatives of *Dissotis* and allies. **A & B**, *Antherotoma naudinii*; **C & D**, *Antherotoma irvingiana*; **E & F**, *Dissotis grandiflora*; **G & H**, *Dissotis longisetosa*; **I & J**, *Rosettea princeps* (*D. princeps*); **K**, *Feliciotis perkinsiae* (*D. perkinsiae*). — Photographs by N. Rakotoarivelo (A), A. Ramahefaharivelo (B), M.C. Veranso-Libalah (C, D), P. Phillipson (E, F), B. Wursten (I, J), V. Droissart (G, H, K).

Table 2. Summary of the present classification of *Dissotis* Benth. and related genera (African Melastomateae) in comparison to the earlier classifications of Fernandes & Fernandes (1954a, 1969), Jacques-Félix (1981, 1995) and Veranso-Libalah & al. (2017). Numbers shown in brackets are the number of African species recognised in each treatment. Names shown in brackets are the types (or in certain cases a list of species recognised) for that taxon.

Fernandes & Fernandes (1954a, 1969)	Jacques-Félix (1981, 1995)	Veranso-Libalah & al. (2017)	This study
Dissotis Benth. subg. ***Dissotis***, in small part [*D. pachytricha* Gilg ex R.E.Fr.]	***Dissotis*** § ***Macrocarpae*** A.Fern. & R.Fern., in small part	Unsampled & untreated	***Almedanthus*** Ver.-Lib. & R.D.Stone, **gen. nov.** [**1**; *A. pachytrichus* (Gilg ex R.E.Fr.) Ver.-Lib. & R.D.Stone]
Antherotoma (Naudin) Hook.f. [**2–3**] ***Dissotis*** subg. ***Osbeckiella*** A.Fern. & R.Fern. [**5**]	***Antherotoma*** [**11**, including *Dissotis* subg. *Osbeckiella*]	***Antherotoma*** [**11**, excl. *Dissotis* § *Senegambia* A.Fern. & R.Fern.]	***Antherotoma*** [**10**; *A. naudinii* Hook.f.]
Dissotis subg. ***Argyrella*** (Naudin) A.Fern. & R.Fern. [**2**]	***Argyrella*** Naudin [**5**, but new combinations in Jacques-Félix (1995) not validly published]	***Argyrella*** [**7**]	***Argyrella*** [**7**; *A. canescens* (E.Mey. ex Graham) Harv.]
Derosiphia Raf. [**1**]	***Dissotis*** subg. ***Dupineta*** (Raf.) A.Fern. & R.Fern., in small part [*D. tubulosa* (Sm.) Triana]	Distinct from *Dupineta* Raf., placed in "*Dissotis* and allies" clade	***Derosiphia*** [**1**; *D. tubulosa* (Sm.) Raf.]
Dissotis subg. ***Dissotidendron*** A.Fern. & R.Fern. [**4**]	***Dissotis*** subg. ***Dissotidendron***	***Dissotidendron*** (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit [**11**]	***Dissotidendron*** [**11**; *D. melleri* (Hook.f.) Ver.-Lib. & G.Kadereit]
Dissotis § ***Dissotis*** [**8**]	***Dissotis*** § ***Dissotis*** [**6**]	Placed in "*Dissotis* and allies" clade [excl. *Argyrella*, *Dissotidendron* and *Dupineta* Raf.]	***Dissotis*** s.str. [**6**; *D. grandiflora* (Sm.) Benth.]
Dissotis subg. ***Dupineta*** (Raf.) A.Fern. & R.Fern. [**4**]	***Dissotis*** subg. ***Dupineta*** [**6**]	***Dupineta*** [**5**]	***Dupineta*** [**5**; *D. multiflora* (Sm.) Raf.]
Dissotis § ***Sessilifoliae*** [**2**]	***Dissotis*** § ***Sessilifoliae*** [**5**]	Placed in "*Dissotis* and allies" clade but not formally treated	***Eleotis*** Ver.-Lib. & R.D.Stone, **gen. nov.** [**4**; *E. welwitschii* (Cogn.) Ver.-Lib. & R.D.Stone]
Dissotis § ***Macrocarpae*** A.Fern. & R.Fern. [**2**]	***Dissotis*** § ***Macrocarpae*** [**>6**]	Placed in "*Dissotis* and allies" clade but not formally treated	***Feliciotis*** Ver.-Lib. & G.Kadereit, **gen. nov.** [**12**; *F. speciosa* (Taub.) Ver.-Lib. & G.Kadereit]
Guyonia Naudin [**2**]	***Guyonia*** [**1–2**] ***Heterotis*** Benth. § ***Cyclostemma*** Benth. [except *H. pobeguinii* (Hutch. & Dalziel) Jacq.-Fél.]	***Guyonia*** [**14**]	***Guyonia*** [**14**; *G. tenella* Naudin]
Dissotis subg. ***Heterotis*** (Benth.) A.Fern. & R.Fern. [**3**]	***Heterotis*** § ***Heterotis*** [**4**]	***Heterotis*** s.str. [**6**]	***Heterotis*** [**6**; *H. rotundifolia* (Sm.) Jacq.-Fél.]
Melastomastrum Naudin [**6**]	***Melastomastrum*** [**6**]	***Melastomastrum*** [**6**]	***Melastomastrum*** [**6**; *M. capitatum* (Vahl) A.Fern. & R.Fern.]
Untreated	***Chaetolepis*** (DC.) Miq., in small part [*C. gentianoides* (Naudin) Jacq.-Fél.] ***Antherotoma***, in part [*A. clandestina* Jacq.-Fél.] ***Dissotis*** § ***Dissotis***, in small part [*D. pauciflora* (Baker) Jacq.-Fél.]	Unsampled & untreated	***Nerophila*** Naudin [**8**; *N. gentianoides* Naudin]

(Continues)

Table 2. Continued.

Fernandes & Fernandes (1954a, 1969)	Jacques-Félix (1981, 1995)	Veranso-Libalah & al. (2017)	This study
	Dissotis § ***Sessilifoliae*** A.Fern. & R.Fern., in small part [*D. congolensis* (Cogn.) Jacq.-Fél.] ***Osbeckia*** L., in small part [*O. decandra* (Sm.) DC., *O. praviantha* Jacq.-Fél., *O. togoensis* Leuenb.]		
Untreated	***Dissotis*** § ***Macrocarpae***, in part [*Dissotis barteri* Hook.f.]	Unsampled & untreated	***Nothodissotis*** Ver.-Lib. & G.Kadereit [**2**; *N. barteri* (Hook.f.) Ver.-Lib. & G.Kadereit]
Osbeckia [**5**]	***Osbeckia*** [**4**]	*Osbeckia* s.l. not monophyletic; African spp. placed in "*Dissotis* and allies" clade [except *O. porteresii* Jacq.-Fél. which was transferred to *Melastomastrum* Naudin]	***Osbeckia*** s.str. [**0**; *O. chinensis* L.] (Asiatic species only)
Dissotis subg. ***Dissotis***, in small part [*D. gilgiana* De Wild.]	***Dissotis*** § ***Sessilifoliae***, in small part	Placed in "*Dissotis* and allies" clade but not formally treated	***Pyrotis*** Ver.-Lib. & R.D.Stone, **gen. nov.** [**1**; *P. gilgiana* (De Wild.) Ver.-Lib. & R.D.Stone]
Dissotis § ***Squamulosae*** A.Fern. & R.Fern. [**5**]	***Dissotis*** § ***Squamulosae*** [**3**, definition imprecise]	Placed in "*Dissotis* and allies" clade but not formally treated	***Rosettea*** Ver.-Lib. & G.Kadereit, **gen. nov.** [**21**; *R. longicaudata* (Cogn.) Ver.-Lib. & G.Kadereit]

By the year 1974, the number of specific and infraspecific taxa recognised in *Dissotis* had reached a maximum of 170. However, Wickens (1975) later reduced 16 species to synonyms in his treatment for the *Flora of Tropical East Africa*, and Jacques-Félix (1975) transferred another seven species to *Melastomastrum*. Further reduction in number of taxa in *Dissotis* resulted from synonymy in other regional Floras (Fernandes & Fernandes, 1978; Jacques-Félix, 1983a,b) or transfers to *Antherotoma* (Naudin) Hook.f. or the reestablished *Heterotis* (Jacques-Félix, 1981, 1995; Table 2). The taxonomic conclusions of Jacques-Félix were based on previous cytological results (Favarger, 1952, 1962) and his own in-depth study of staminal morphology. He considered *Dissotis* sensu Fernandes & Fernandes (1969) to be polyphyletic and, even after restoring *D.* subg. *Heterotis* to generic status and moving the species of *D.* subg. *Osbeckiella* into an expanded *Antherotoma*, he placed the morphologically unusual species *D. leonensis* Hutch. & Dalziel in the newly established *D.* subg. *Paleodissotis* Jacq.-Fél. and further suggested generic rank for *D.* subg. *Argyrella*, *D.* subg. *Dupineta* and *D.* subg. *Dissotidendron* (although he stopped short of formally recognising them as separate genera). As for *Osbeckia*, he considered it to be a mainly Asiatic genus and restored the Madagascan species previously placed there to *Rousseauxia* DC. (Jacques-Félix, 1973). However, he retained four West African species in *Osbeckia*, i.e., *O. decandra* (Sm.) DC., *O. porteresii* Jacq.-Fél. (now *Melastomastrum porteresii* (Jacq.-Fél.) Ver.-Lib. & G.Kadereit), *O. praviantha* Jacq.-Fél. and *O. togoensis* Leuenb., citing their undifferentiated stamens (Jacques-Félix, 1981, 1995) (Fig. 2H,I).

Recently, Veranso-Libalah & al. (2017) have tested the previous morphologically based classifications of African Melastomateae in a phylogenetic context using sequence data from three DNA regions (nrITS, *psbK-psbL*, *accD-psaI*). Their study recovered 11 monophyletic groups (see Table 2), 9 of which were previously recognised as genera: *Argyrella*, *Dichaetanthera* Endl., *Dissotis* s.str. and allies, *Dupineta* Raf., *Guyonia* Naudin, *Heterotis* s.str., *Melastomastrum*, *Pseudosbeckia* and *Tristemma* Juss. The other two monophyletic groups consist of *Dissotidendron* (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit (formerly treated as *Dissotis* subg. *Dissotidendron*) and the new genus *Anaheterotis* Ver.-Lib. & G.Kadereit for the species formerly treated as *Heterotis pobeguinii* (Hutch. & Dalziel) Jacq.-Fél. The large clade of "*Dissotis* and allies" was strongly supported but internally unresolved and contained all species previously treated in *Dissotis* subg. *Dissotis* (including sections *Dissotis*, *Sessilifoliae*, *Squamulosae* and *Macrocarpae*) as well as *Dissotis tubulosa* (Sm.) Triana (formerly treated in *D.* subg. *Dupineta*) plus the species placed by Jacques-Félix (1995) in the genus *Antherotoma* and two species of African *Osbeckia*, i.e., *O. decandra* and *O. togoensis*. Veranso-Libalah & al. (2017) concluded that staminal morphology is an evolutionarily labile character that is not very useful for classification of African Melastomateae. They further suggested that the otherwise Asian *Osbeckia* s.str. does not occur in Africa. However, no taxonomic decisions



Fig. 2. Representatives of *Dissotis* and allies. **A & B**, *Rosettea thollonii* (*D. thollonii*); **C & D**, *Eleotis welwitschii* (*D. welwitschii*); **E–G**, *Derosiphia tubulosa*; **H & I**, *Nerophila decandra* (*Osbeckia decandra*); **J & K**, *Nerophila congolensis* (*D. congolensis*); **L & M**, *Nerophila clandestina* (*A. clandestina*); **N & O**, *Nerophila gentianoides*. — Photographs by A. Gockele (A, B), D. Goyder (C, D), E. Bidault (E–I), D. Harris (J, K), M.C. Veranso-Libalah (L, M), Rainer Wendt (N, O).

could be made for species-groups of *Dissotis* and allies due to a lack of phylogenetic resolution within this clade.

The monospecific genus *Nerophila* Naudin was treated among the Old World Osbeckieae or Melastomateae by several authors (Hooker, 1871; Cogniaux, 1891; Van Tieghem, 1891; Krasser, 1893; Van Vliet & al., 1981; Renner, 1993) (Fig. 2N,O), until recently when Jacques-Félix (1995) transferred it to the New World genus *Chaetolepis* (DC.) Miq. (as *Chaetolepis gentianoides* (Naudin) Jacq.-Fél.), hence the only African species treated among New World Melastomateae. Using cladistic analyses based on morphology, Grimm & Almeda (2013) revised *Chaetolepis* and also supported the placement of *C. gentianoides* among New World Melastomateae. More recently, however, Veranso-Libalah & al. (2018) included this species in a molecular phylogenetic analysis and found it was nested within the "*Dissotis* and allies" clade.

In view of these earlier results, the present study seeks to: (i) resolve phylogenetic relationships within the "*Dissotis* and allies" clade sensu Veranso-Libalah & al. (2017) using two nuclear (nrETS, nrITS) and two plastid (*ndhF*, *psbK-psbL*) markers, together with added sampling of some morphologically distinct species (e.g., *Dissotis pachytricha* Gilg ex R.E. Fr., *Antherotoma clandestina* Jacq.-Fél. and *Nerophila gentianoides* Naudin); (ii) reconstruct the ancestral state and state shifts of morphological characters that had been important for the generic and infrageneric delimitation; and (iii) provide a revised classification for this morphologically diverse clade. We decided to exclude sequence data from the plastid *accD-psaI* region used in our previous study (Veranso-Libalah & al., 2017) because of difficulty with polymerase chain reaction (PCR) amplification leading to missing data for many samples. On the other hand, the added data from the nrETS and *ndhF* regions have substantially improved the resolution and branch support within the "*Dissotis* and allies" clade.

■ MATERIALS AND METHODS

Sampling and outgroups. — We included a total of 94 accessions, representing 69 species, to resolve phylogenetic relationships within the "*Dissotis* and allies" clade of Veranso-Libalah & al. (2017). Within this clade, 33 species were sampled (51%) including the type of *Dissotis* (*D. grandiflora*) as well as the types of *D.* subg. *Osbeckiella* (*D. debilis*), *D.* sect. *Macrocarpae* (*D. speciosa* Taub.), *D.* sect. *Sessilifoliae* (*D. welwitschii* Cogn.) and *D.* sect. *Senegambia* Jacq.-Fél. (*D. senegambiensis*). We also sampled the types of *Derosiphia* Raf. (*D. tubulosa* (Sm.) Raf.), *Nerophila* (*N. gentianoides*) and *Antherotoma* (*A. naudinii*) as well as two African *Osbeckia* species (*O. decandra*, *O. togoensis*). As outgroup, we included a total of 36 Old World Melastomateae species from 14 genera. Unfortunately, because of inadequate material we were not able to sample the types of *Dissotis* sect. *Squamulosae* (*D. longicaudata* Cogn.), *D.* subg. *Paleodissotis* (*D. leonensis*) or the Madagascan genus *Rhodosepala* Baker (*R. pauciflora* Baker). However, we did sample two other species, *D. sizenandoi* Cogn. and *D. thollonii* Cogn., that were previously included in the circumscription of *D.* sect. *Squamulosae* by Fernandes & Fernandes (1970). Voucher information and GenBank accession numbers are provided in Appendix 1.

DNA extraction, amplification and sequencing. — Total genomic DNAs were extracted from silica-dried leaf materials or herbarium specimens, then amplified and sequenced as decribed in Veranso-Libalah & al. (2017, 2018). Sequences of four loci (nrETS, nrITS, *ndhF*, *psbK-psbL*) were previously amplified and sequenced for African Melastomateae by Veranso-Libalah & al. (2017, 2018). These regions have already been employed to resolve the phylogeny of genera of Melastomataceae (Reginato & al., 2010; Michelangeli & al., 2013; Kriebel & al., 2015; Reginato & Michelangeli, 2016). Additionally, 24 new sequences were generated for this study (see Appendix 1).

Phylogenetic inference. — We conducted phylogenetic analyses using maximum likelihood (ML), maximum parsimony (MP) and Bayesian inference (BI) methods. We first separately analysed each of the four datasets (nrETS, nrITS, *ndhF*, *psbK-psbL*), then combined the two nuclear (nrETS, nrITS) and two plastid (*ndhF*, *psbK-psbL*) datasets and analysed them with the same settings. We identified a supported conflict between the plastid and nuclear gene trees regarding the position of *Antherotoma irvingiana* (Hook.) Jacq.-Fél. As a result, we excluded this species from the subsequent concatenated analyses of all four markers. Our sequence alignments are provided in the electronic supplementary material (suppl. Appendices S1–S4: alignments nrETS, nrITS, *ndhF* and *psbK-psbL*).

The ML trees were generated using RAxML v.8.2.8 (Stamatakis, 2014), and searches were implemented with 1000 fast bootstrap replicates under the GTRCAT model. The MP analyses were carried out in PAUP* v.4.0b10 (Swofford, 2002). A heuristic search of 1000 replicates with random sequence addition was conducted, with TBR branch swapping and MulTrees on. The swapping was performed on a maximum of 50 trees (nchuck = 50). All characters were unordered and equally weighted, and gaps were treated as missing data. Bootstrap values (Felsenstein, 1985) were calculated from 10,000 replicates using a heuristic search with the TBR algorithm for branch swapping and one random addition-sequence replicate. The Bayesian inference was performed using BEAST v.1.8.2 (Drummond & Rambaut, 2007). The best-fitting model for nucleotide substitutions was determined using Akaike information criterion (AIC) in jModelTest v.2.1.6 (Darriba & al., 2012). The selected substitution models for the plastid and nuclear datasets were GTR + Γ + I and GTR + Γ, respectively. The BI analyses were conducted with gamma distribution in four categories and Birth-Death process chosen as tree prior. We ran two independent Markov chain Monte Carlo (MCMC) chains of 20 million generations each, sampling every 2000 generations, starting with a random tree. The individual output log files were examined using Tracer v.1.5

Table 3. Character state coding for the ancestral character state reconstruction of 20 morphological characters considered important or diagnostic for generic and infrageneric delimitation in African Melastomateae.

1.	**Habit:** tree (0); erect herb (1); shrub/subshrub (2); decumbent herb (3)
2.	**Leaf duration:** deciduous (0); evergreen (1)
3.	**Leaf arrangement:** opposite (0); whorled in threes (1)
4.	**Third-order veins:** prominent on both abaxial and adaxial surface (0); abaxial only (1); absent (2)
5.	**Leaf attachment:** sessile (0); petiolate (1); subsessile (2); variable (3)
6.	**Inflorescence:** panicle (0); head/glomerulate (1); flowers solitary or few (2); cyme (3)
7.	**Bract type:** non-foliaceous (0); foliaceous or scarious (1)
8.	**Bract duration:** persistent (0); caducous (1)
9.	**Bract size:** large (>4.0 mm) (0); small (<4.0 mm) (1)
10.	**Merosity:** tetramerous (0); pentamerous (1); variable; penta-, hexa- or heptamerous (2)
11.	**Hypanthium pubescence:** ring of bristles (0); stellate hairs intermixed with glandular-tipped hairs (1); glandular hairs (2); glabrous (3); simple or pilose hairs (4); stellate hairs (5); silvery-sericeous (6); variable (7); scaly reflexed hairs (8); mixed simple and stellate hairs (9)
12.	**Sepal duration:** early caducous (0); tardily caducous (1); persistent (2)
13.	**Intersepalar appendages:** present (0); absent (1)
14.	**Staminal type:** isomorphic (0); dimorphic (1); sub-equal (2)
15.	**Ventral staminal appendages:** present (0); absent (1); rudimentary (2)
16.	**Staminal pedoconnective:** present (0); absent (1); rudimentary (2)
17.	**Anther pore dehiscence:** introrse (0); extrorse (1)
18.	**Fruit dehiscence:** indehiscent (0); dehiscent (1)
19.	**Capsule accrescence:** accrescent (0); non-accrescent (1)
20.	**Shape of fruiting capsule:** developing a long neck with longitudinal ribs (0); without a long neck and longitudinal ribs (1)

(Rambaut & Drummond, 2009) to assess convergence. All parameters had an effective sample size (ESS) value greater than 200. The resultant tree files were combined using LogCombiner v.1.8.0 (Drummond & Rambaut, 2007). The first 2000 trees (10%) were discarded as burn-in, and a maximum clade credibility (MCC) tree was constructed using TreeAnnotator v.1.8.0 (Drummond & al., 2012). We considered the clades as resolved when the bootstrap value in the ML (BSL) and MP (BSP) analyses was ≥70% and the posterior probability (PP) ≥0.95 in the BI analysis.

Ancestral character reconstruction. — Twenty morphological characters considered important or diagnostic for the classification of African Melastomateae were coded as discrete characters (see Table 3; suppl. Table S1). Sixty-nine accessions (excluding *A. irvingiana*) were included in the analysis (one accession per species or two accessions in the case of the evidently polyphyletic *Antherotoma debilis* (Sond.) Jacq.-Fél.). One hundred trees chosen at random from the BEAST posterior distribution were used for ancestral character reconstruction. Ancestral states were estimated under the maximum likelihood optimization using the Mk1 model in Mesquite v.3.04 (Maddison & Maddison, 2015). In addition, each of the 20 morphological characters was manually mapped on the ML tree to visualise which characters are taxonomically important amongst members of the "*Dissotis* and allies" clade.

■ RESULTS

Molecular variation. — The combined dataset contained 2887 characters from all four markers (nrITS, nrETS, *ndhF*, *psbK-psbL*). The plastid and nuclear markers are relatively variable (Table 4). Of the 94 accessions included in the analyses, 73 were represented by sequence data from all four loci, 15 by three loci and 6 by two loci (see Appendix 1).

Major phylogenetic relationships among African Melastomateae. — Similar tree topologies were recovered in the ML, MP and BI analyses, respectively (MP and BI topologies not shown). The backbone of the nuclear gene tree was better resolved than that of the plastid gene tree in all three analyses (topologies of the ML analyses shown in Fig. 3). One strongly

Table 4. Summary statistics of genomic regions sequenced for phylogenetic analyses of *Dissotis* and allies.

Marker	Accessions sampled	Aligned base pairs	% Missing data	Conserved sites	Variable sites	% Variable sites	PIS	% PIS	Best-fit model
nrETS	78	659	17	274	372	56	301	46	GTR+Γ
nrITS	90	1030	4	643	304	30	221	21	GTR+Γ
ndhF	89	680	5	476	191	28	128	19	GTR+Γ+I
psbK-psbL	94	518	0	353	116	22	78	15	GTR+Γ+I
Combined	94	2887	7	1746	983	34	782	27	GTR+Γ+I

PIS, parsimony-informative site; Best-fit model, Best-fit substitution model estimated under the AIC criterion using jModelTest

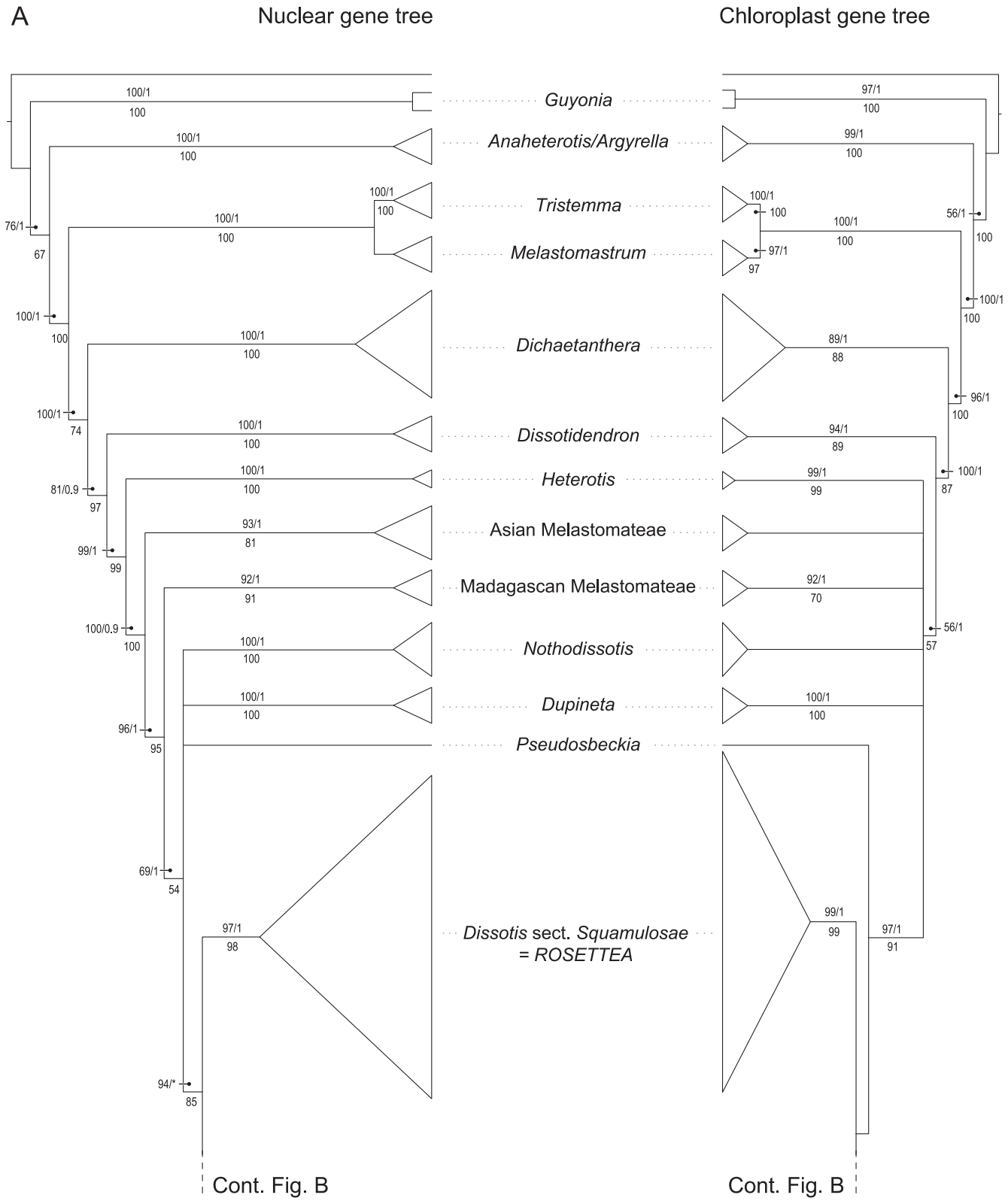


Fig. 3. Maximum likelihood phylogenetic cladograms of *Dissotis* and allies based on nuclear (nrITS, nrETS) and plastid (*ndhF*, *psbK-psbL*) matrices. Values above branches refer to bootstrap values resulting from the ML analysis (only values ≥50) and posterior probabilities resulting from Bayesian inference (only values ≥0.95). Values below branches refer to bootstrap values resulting from the parsimony analysis (only values ≥50). An asterisk (*) denotes a branch supported by either bootstrap or posterior probability only. The genera and species names used follow the new classification.

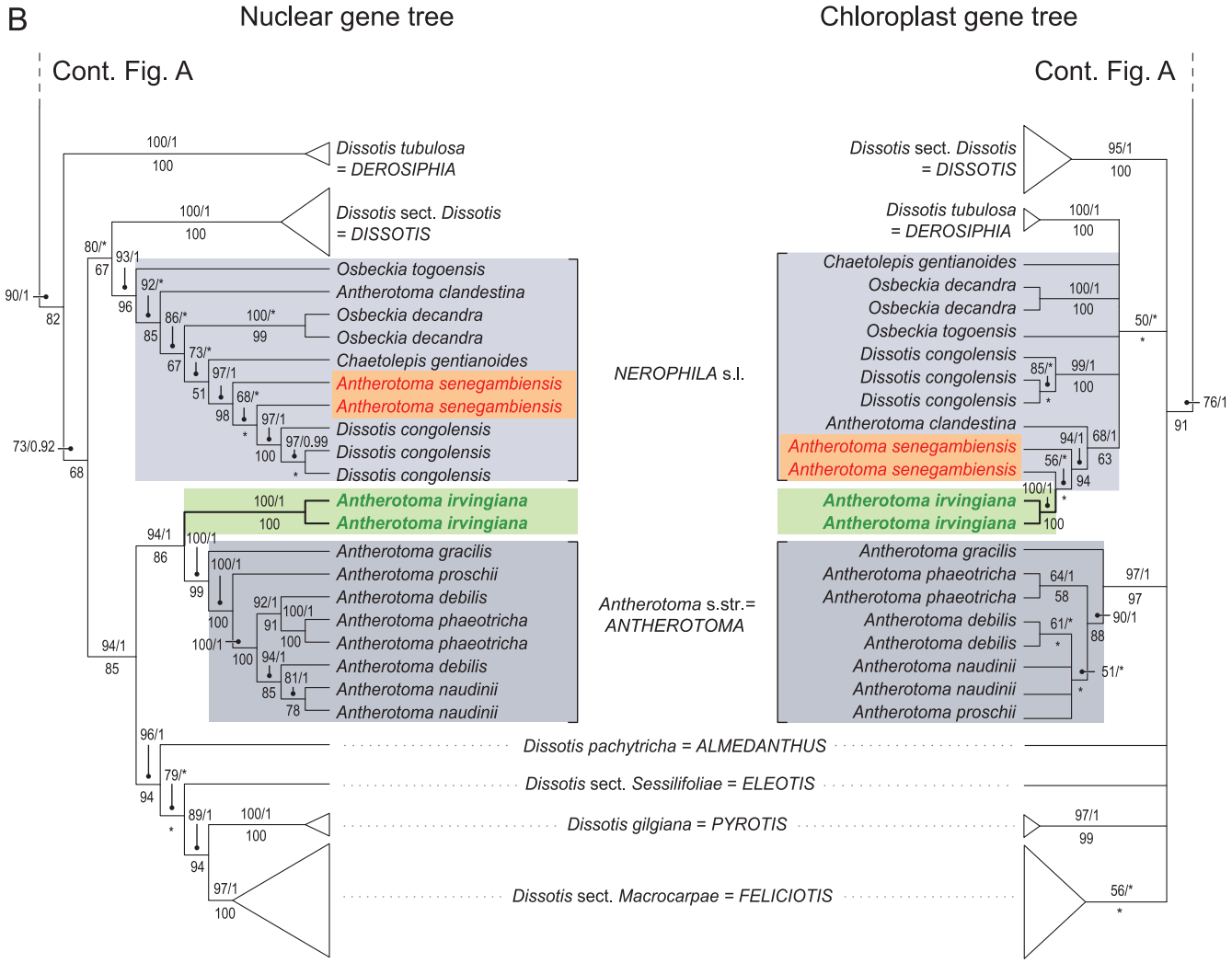


Fig. 3. Continued.

supported conflict was found between the nuclear and plastid gene trees regarding the position of *Antherotoma irvingiana* (Fig. 3). The two samples representing *A. irvingiana* were resolved in a sister-group relationship with *Antherotoma* s.str. in the nuclear gene tree and close to *Antherotoma senegambiensis* within *Nerophila* s.l. in the plastid tree.

The topology of the tree based on the combined nuclear and plastid datasets (excluding the two samples of *Antherotoma irvingiana*) showed a better resolution with higher support values than the separate gene trees for most nodes (Figs. 3, 4). Only the combined dataset resolved *Pseudosbeckia* as sister to the "*Dissotis* and allies" clade with BSL 89 (Fig. 4). Within the "*Dissotis* and allies" clade, the basally branching clade, *D.* sect. *Squamulosae* (= *Rosettea*, gen. nov.) is sister to the rest (Fig. 4). Within the latter clade, the monospecific lineage *Dissotis tubulosa* (= *Derosiphia tubulosa*) is sister to a clade that received only weak BSP but good BSL and PP values and consisted of three well-supported lineages, viz. *Dissotis* sect. *Dissotis* (= *Dissotis* s.str.), *Nerophila* s.l., and a clade consisting of *Antherotoma* s.str., *Dissotis* sect. *Sessilifoliae* (= *Eleotis*, gen. nov.), *Dissotis pachytricha* (= *Almedanthus*, gen nov.), *Dissotis gilgiana* De Wild. (= *Pyrotis*, gen. nov.) and *D.* sect. *Macrocarpae* (= *Feliciotis*, gen. nov.; Fig. 4). *Chaetolepis gentianoides* (≡ *Nerophila gentianoides*) was recovered within the *Nerophila* s.l. clade together with *Dissotis congolensis* (Cogn.) Jacq.-Fél., *Antherotoma clandestina*, *A. senegambiensis* (Guill. & Perr.) Jacq.-Fél., *Osbeckia decandra* and *O. togoensis*. In the *Antherotoma* + *Almedanthus* + *Eleotis* + *Pyrotis* + *Feliciotis* clade, *Antherotoma* is supported as sister to the remaining four genera. Among these, *Almedanthus* and *Eleotis* branch off successively, and *Pyrotis* and *Feliciotis* are resolved as sister groups with moderate support (Fig. 4). The *Antherotoma* s.str. clade (excluding *A. clandestina* and *A. senegambiensis*) was recovered as monophyletic (BSL 100/PP 1/BSP 100; Figs. 3, 4). *Almedanthus* and *Pyrotis* are both monospecific lineages not belonging to any of the other clades (Fig. 4).

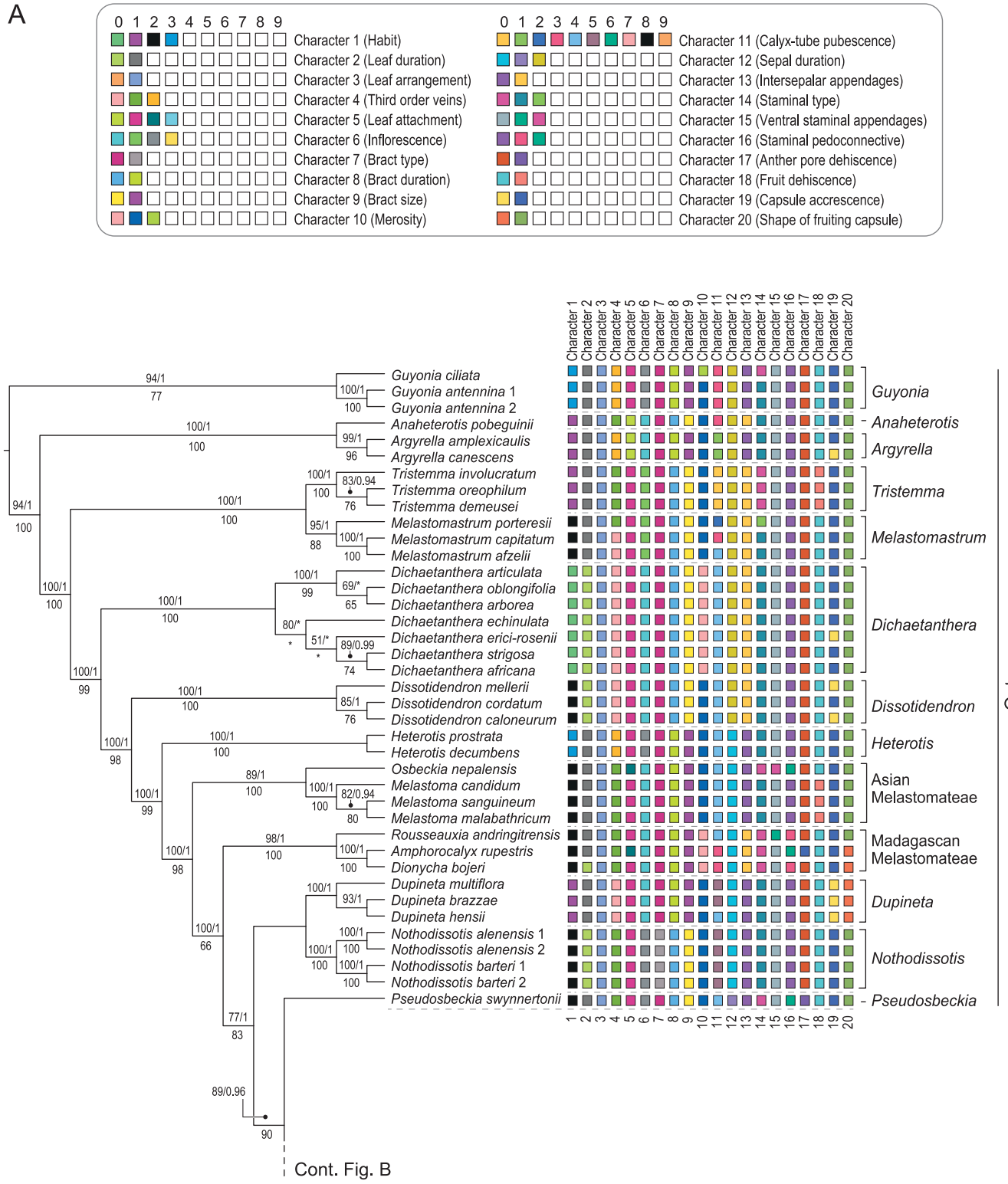


Fig. 4. Maximum likelihood phylogenetic cladogram of *Dissotis* and allies derived from the combined data matrix (nrITS, nrETS, *psbK-psbL*, *ndhF*). Values above branches refer to bootstrap values resulting from the ML analysis (only values ≥50) and posterior probabilities resulting from Bayesian inference (only values ≥0.95). Values below branches refer to bootstrap values resulting from the parsimony analysis (only values ≥50). An asterisk (*) denotes a branch supported by either bootstrap or posterior probability only. The coloured boxes next to the species names are diagnostic morphological characters manually mapped to show the diversity within the *Dissotis* and allies clade. Also shown is a colour key for the manually mapped diagnostic morphological characters within the *Dissotis* and allies clade. See Table 3 for the detailed character state coding. The genera and species names used follow the new classification.

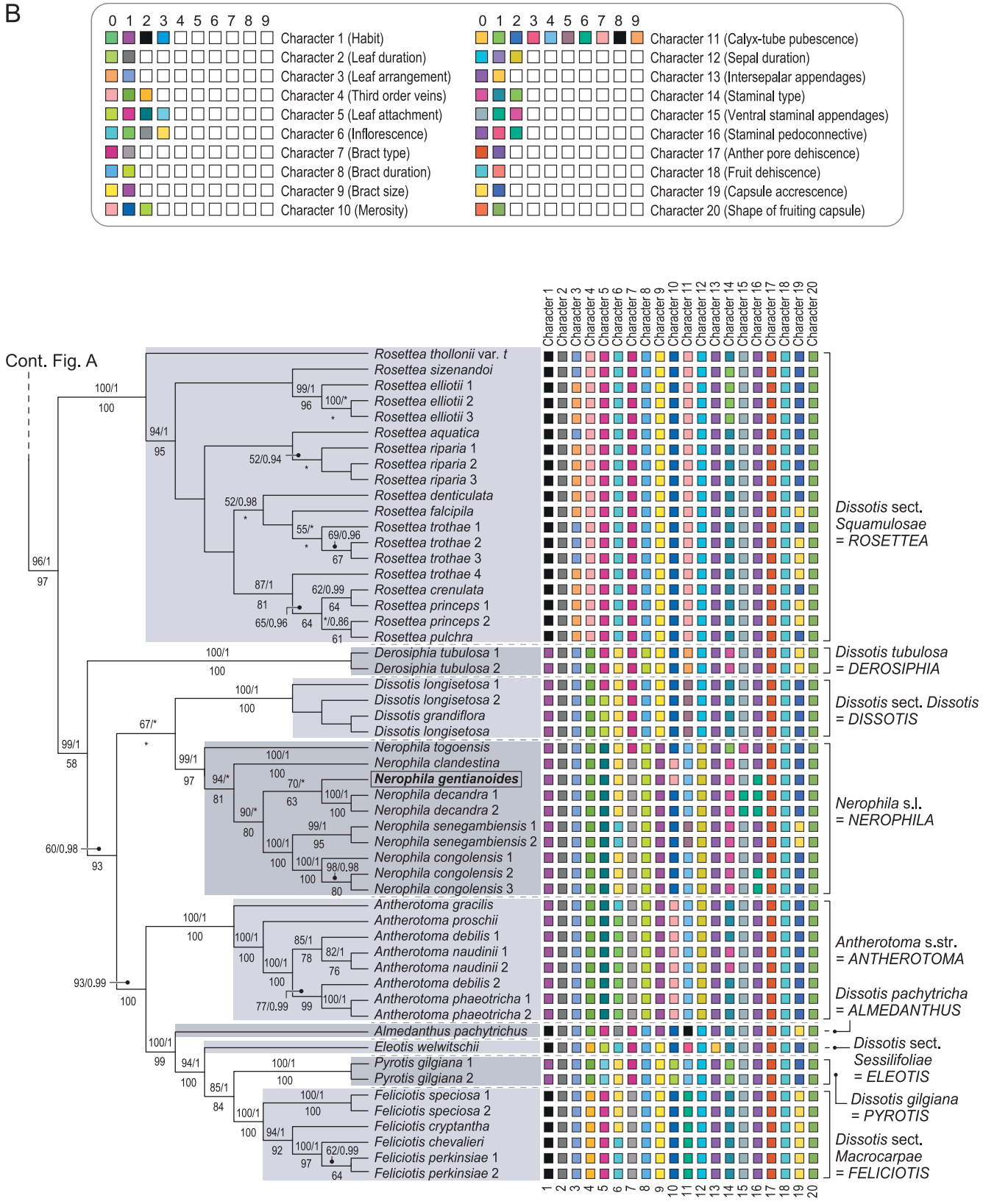


Fig. 4. Continued.

Ancestral character reconstruction. — Our analyses (Figs. 4–6; suppl. Figs. S1–S10) show that the characters previously used for circumscription of *Dissotis* and most other genera of African Melastomateae exhibit varying degrees of homoplasy (Table 5). Prominence of the reticulate venation on leaf surfaces, inflorescence type, staminal type and capsule accrescence are among the most labile characters (suppl. Figs. S2, S3, S7, S10). Hypanthium pubescence also shows numerous shifts but is highly variable with nine character states (Table 5; suppl. Fig. S6). Several character states studied are symplesiomorphies of African Melastomateae and the "*Dissotis* and allies" clade (Table 5; suppl. Figs. S1–10), albeit the reticulate venation shows low probability values and is therefore uncertain (suppl. Fig. S2). Only the trait "sepal duration", which was evidently ancestral for the African Melastomateae, shows an apomorphic state, namely "sepals early caducous", for the "*Dissotis* and allies" clade. However, within this clade there are two reversals to persistent sepals in *Antherotoma* s.str. and *Nerophila* s.l. (suppl. Fig. S6).

A shrubby habit was ancestral for the African Melastomateae as a whole and for the "*Dissotis* and allies" clade as well (suppl. Fig. S1); however, six shifts to an herbaceous growth form are apparent, with three reversals to secondary woodiness within *Dissotis* and allies. Bract characters (type, duration and size) are highly informative in various terminal clades of African Melastomateae and therefore valuable as diagnostic characters (suppl. Figs. S4, S5). The character of tetramerous flowers originated four times independently and is among the diagnostic characters of three clades, i.e., *Dichaetanthera*, Madagascan endemic Melastomateae and *Antherotoma* s.str. (Fig. 5). The *Nerophila* s.l. clade consists of some species with tetramerous flowers and others with pentamerous flowers. Additionally, two independent shifts to flowers with variable merosity (penta-, hexa- and heptamerous) are recovered in *Guyonia ciliata* Hook.f. and *Pyrotis*. Characters of the stamen (staminal type, ventral staminal appendages and staminal pedoconnective, characters 14–16 in Fig. 4), previously thought to be very important in generic delimitation of African Melastomateae, are seen to be highly homoplasious, including within *Dissotis* and allies (Fig. 6; suppl. Figs. S7, S8). The presence of intersepalar appendages seems to be an ancestral state of African Melastomateae with at least four independent losses (Fig. 5). The loss of intersepalar appendages is diagnostic for six clades, i.e., *Melastomastrum*, *Tristemma*, *Dissotidendron*, *Dichaetanthera*, Madagascan endemic genera and *Eleotis*. Hypanthium pubescence is highly variable within the African Melastomateae, although some clades have diagnostic pubescence types, e.g., stellate and/or glandular hairs appearing dusty in *Argyrella*, silvery-sericeous hairs in *Feliciotis*, stellate hairs in *Dissotis* s.str., reflexed scale-like appendages in *Almedanthus* and persistent stellate emergences on the subspherical base and simple bristles on the distinct cylindrical apex in *Derosiphia* (Table 5; Fig 4; suppl. Fig. S6).

The major results of the ancestral character state reconstruction are (1) *Dissotis* in its previous circumscription has no unifying, synapomorphic characters; and (2) most morphological characters previously used for the delimitation of genera, subgenera and sections in African Melastomateae are useful but need a careful reassessment in a revised classification.

■ DISCUSSION

Generic limits within *Dissotis* and allies. — The traditional taxonomy of Melastomataceae, like that of most other plant families, has mainly relied on one or a few morphological characters for generic and species delimitation. This is certainly true of *Dissotis*, which was originally said to differ from *Osbeckia* mainly by having dimorphic anthers with those of the external (antesepalous) whorl bearing a well-developed and elongated connective at the base (vs. anthers uniform or isomorphic in *Osbeckia*; Bentham, 1849). *Dissotis* was at first treated as monospecific, but by the year 1974, a total of 170 species had been included in the genus, with many new species described and others transferred from various genera (e.g., *Osbeckia* and *Heterotis*). In spite of this added diversity and morphological variability, the diagnosis of *Dissotis* was never expanded or comprehensively re-examined. The genus served instead as a "dustbin", i.e., a place for any species that could not be clearly assigned to one of the other morphologically distinctive genera, e.g., *Dichaetanthera*, *Heterotis*, *Melastomastrum* or *Tristemma*.

In the present study, the circumscription of "*Dissotis* and allies" defined by Veranso-Libalah & al. (2017) is again supported (Fig. 4) but with denser taxonomic sampling and an increased amount of molecular data. This large clade, with the monospecific *Pseudosbeckia* resolved as its sister lineage, was found to consist of several distinct lineages including *D*. sect. *Squamulosae*, *D. tubulosa*, *D*. sect. *Dissotis*, *Nerophila* s.l. (including the African *Osbeckia* species, *Chaetolepis gentianoides, Antherotoma clandestina, A. senegambiensis* and *D. congolensis*), *Antherotoma* s.str*., D. pachytricha*, *D*. sect. *Sessilifoliae*, *D. gilgiana* and *D*. sect. *Macrocarpae* (Fig. 4). Although the sections within *D*. subg. *Dissotis* have been neglected in most recent taxonomic treatments (Wickens, 1975; Fernandes & Fernandes, 1978; Jacques-Félix, 1983a,b), we are able to recognise all of them in our molecular and morphological analyses.

In view of these results, the question arises of how best to represent them in terms of the generic classification. One option would be to retain the existing classification without any nomenclatural changes or adjustments in generic limits, but this would be highly undesirable since *Antherotoma*, *Chaetolepis*, *Dissotis* and *Osbeckia* as previously circumscribed are clearly paraphyletic or polyphyletic. Another alternative would be to retain a broadly defined genus *Dissotis* and revise the existing infrageneric classification so that each of the subsidiary lineages shown in Fig. 4 is treated as a subgenus or section. This would maximize nomenclatural stability (only five new combinations required) as

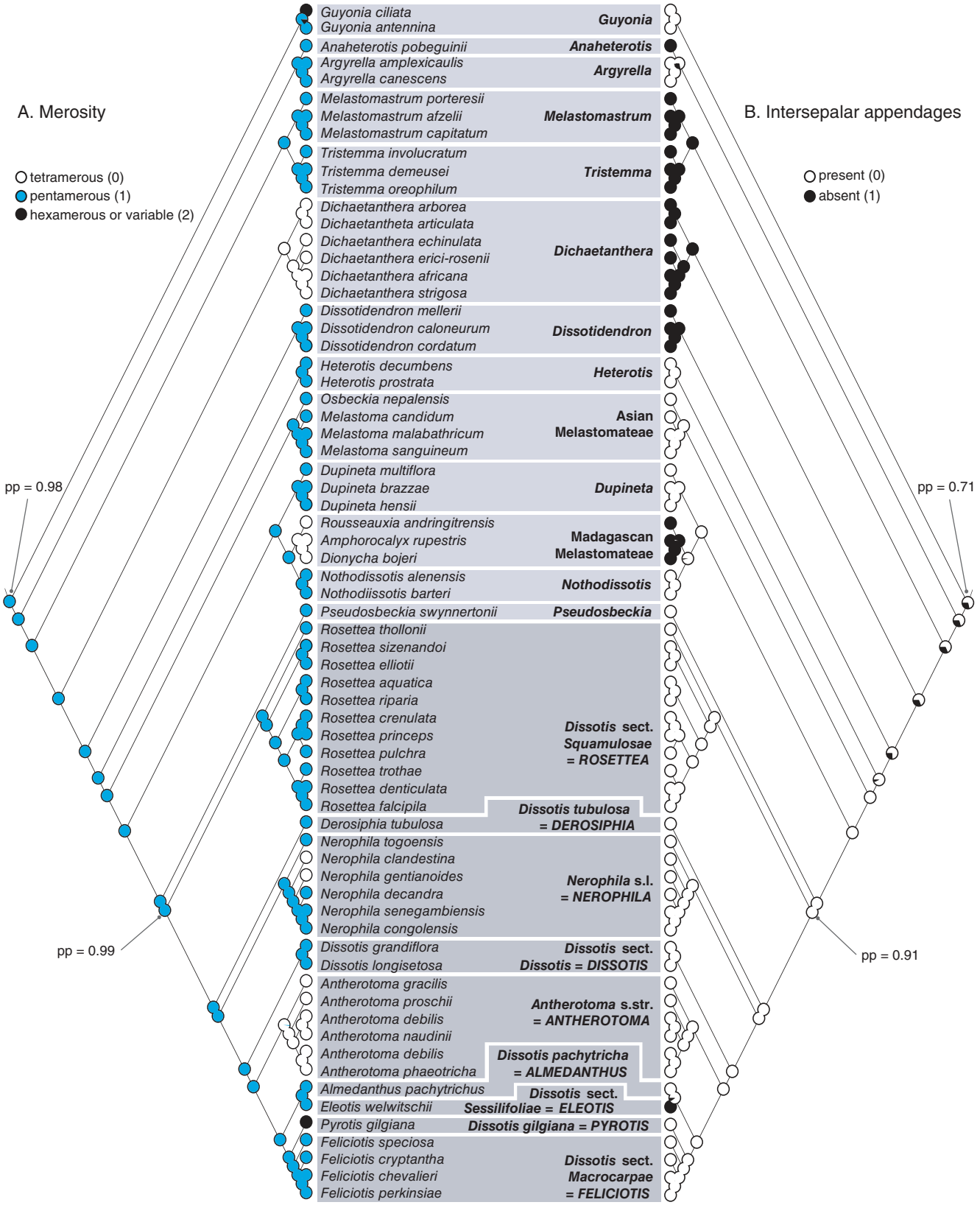


Fig. 5. Ancestral character reconstruction of selected characters in African Melastomateae. **A**, Merosity; **B**, Intersepalar appendages.

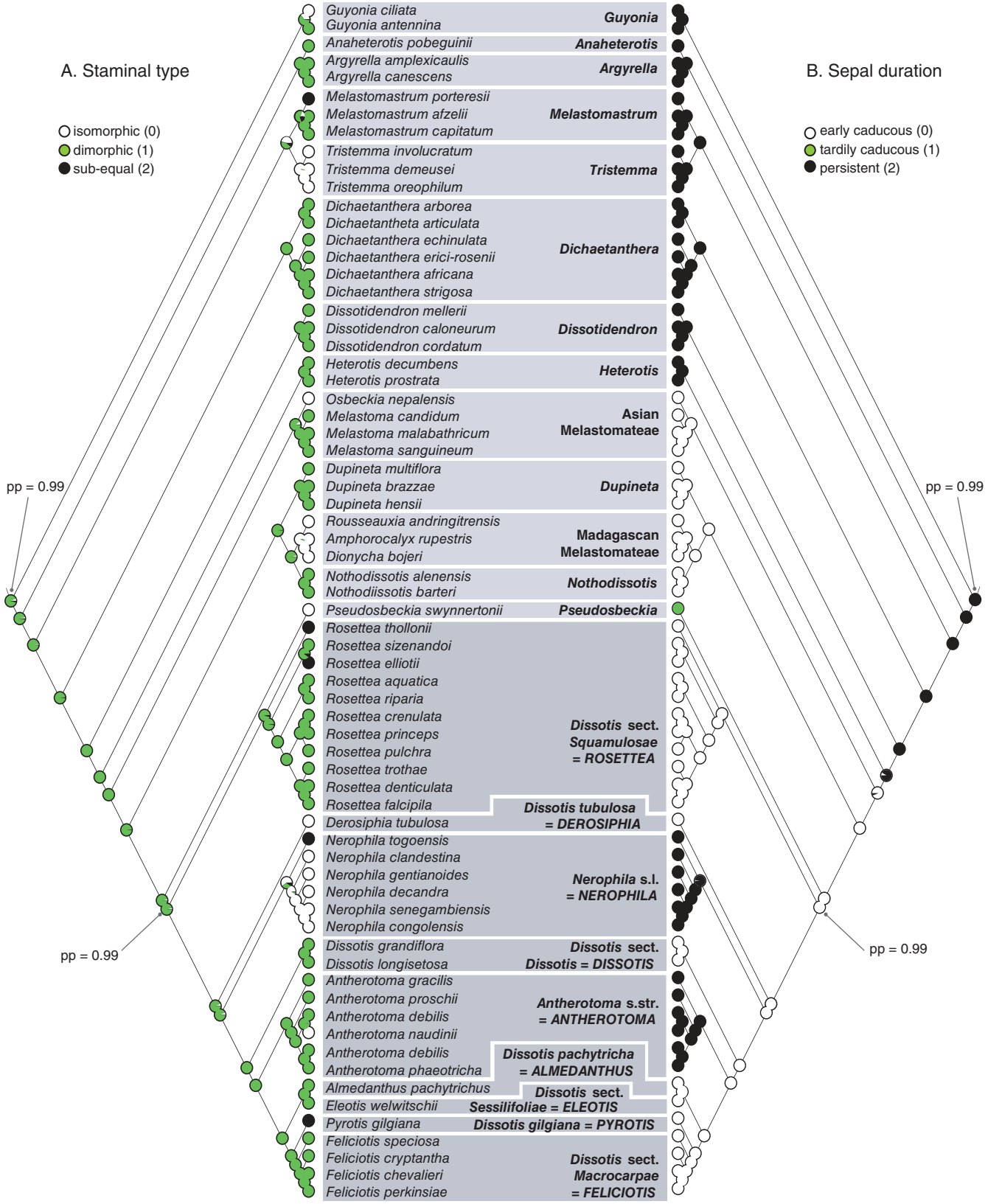


Fig. 6. Ancestral character reconstruction of selected characters in African Melastomateae. **A**, Staminal type; **B**, Sepal duration.

Table 5. Results of the ancestral character state analysis.

Character	Reconstructed ancestral state for African Melastomateae/ "*Dissotis* and allies" clade	Number of character state shifts	Figure
Habit	Shrub/subshrub 0.73 / Shrub/subshrub 0.93	10 (4 shifts from shrub to erect herb; 2 from shrub to decumbent herb; 1 from shrub to tree; 3 reversals from erect herb to shrub)	Fig. S1
Leaf duration	Persistent or evergreen 0.99 / Persistent or evergreen 0.99	4 shifts to deciduous; no reversals	Fig. S1
Leaf arrangement	Opposite 0.99 / Opposite 0.99	4 (at least 3 shifts from opposite to whorled in threes; 1 reversal from whorled in threes to opposite)	Fig. S2
Third-order veins	Unclear (Abaxial only 0.46) / Abaxial only 0.74	9 (at least 5 shifts from abaxial only to absent; 3 from abaxial only to prominent on both surfaces; 1 from absent to abaxial only); no reversals	Fig. S2
Leaf attachment	Petiolate 0.98 / Petiolate 0.98	8 (3 shifts from petiolate to sessile; 4 from petiolate to subsessile; 1 from petiolate to variable); no reversals	Fig. S3
Inflorescence	Panicle 0.87 / Panicle 0.89	11 (4 shifts from panicle to flowers solitary or few; 1 from panicle to cyme; 1 from panicle to head/glomerulate; 1 from flowers solitary or few to head/glomerulate; 1 shift from cyme to flowers head/glomerulate; 1 reversal from flowers solitary or few to panicle; 2 reversals from cyme to panicle)	Fig. S3
Bract type	Non-foliaceous 0.99 / Non-foliaceous 0.99	4 shifts from non-foliaceous to foliaceous or scarious; no reversals	Fig. S4
Bract duration	Caducous 0.99 / Caducous 0.99	3 shifts from caducous to persistent; no reversals	Fig. S4
Bract size	Large (>4.0 mm) 0.64 / Small (<4.0 mm) 0.90	5 shifts from large to small; 2 reversals from small to large	Fig. S5
Merosity	Pentamerous 0.98 / Pentamerous 0.99	7 (2 shifts from pentamerous to variable [penta-, hexa- or heptamerous]; 5 from pentamerous to tetramerous); no reversals	Fig. 5; Fig. S5
Hypanthium pubescence	Simple hairs 0.68 / Simple hairs 0.99	17 (at least 2 shifts from simple hairs to glabrous; 1 shift from stellate hairs intermixed with glandular-tipped hairs to glabrous; at least 1 shift from simple hairs, stellate hairs to glabrous; at least 1 shift from scaly reflexed-hairs, glabrous to glabrous; 1 from simple hairs to stellate hairs intermixed with glandular-tipped hairs; at least 2 shifts from simple hairs to glandular hairs; at least 1 shift from simple hairs to ring of bristles; 2 from simple hairs to stellate hairs; 1 from simple hairs to variable; 1 from simple hairs to stellate hairs to mixed simple and stellate hairs; 1 unclear shift from scaly reflexed-hairs, glabrous to scaly reflexed-hairs; 1 from simple hairs to silvery sericeous; 1 reversal from stellate to simple hairs; at least 1 reversal from glabrous, simple hairs, stellate hairs to mixed simple and stellate hairs)	Fig. S6
Sepal duration	Persistent 0.99 / Early caducous 0.99	4 (1 shift from persistent to early caducous; 1 from early to tardily caducous; 2 reversals from early caducous to persistent)	Fig. 6; Fig. S6
Intersepalar appendages	Present 0.71 / Present 0.91	6 shifts from present to absent; no reversals	Fig. 5; Fig. S7
Staminal type	Dimorphic 0.89 / Dimorphic 0.95	13 (8 shifts from dimorphic to isomorphic; 4 from dimorphic to sub-equal; 1 from isomorphic to sub-equal); no reversals	Fig. 6; Fig. S7
Ventral staminal appendages	Present 0.99 / Present 0.99	4 (2 shifts from present to rudimentary; 2 from present to absent); no reversals	Fig. S8
Staminal pedoconnective	Present 0.99 / Present 0.99	6 (1 shift from present to rudimentary; 3 from present to absent; 1 from rudimentary to absent; 1 reversal from absent to present)	Fig. S8
Anther pore dehiscence	Introrse 0.99 / Introrse 0.99	1 shift from introrse to extrorse; no reversals	Fig. S9

(Continues)

Table 5. Continued.

Character	Reconstructed ancestral state for African Melastomateae/ "*Dissotis* and allies" clade	Number of character state shifts	Figure
Fruit dehiscence	Dehiscent 0.99 / Dehiscent 0.99	3 shifts from dehiscent to indehiscent; no reversals	Fig. S9
Capsule accrescence	Non-accrescent 0.83 / Non-accrescent 0.98	10 shifts from non-accrescent to accrescent; one reversal	Fig. S10
Shape of fruiting capsule	Without a long neck and longitudinal ribs 0.99 / Without a long neck and longitudinal ribs 0.99	2 shifts from without a long neck and longitudinal ribs to developing a long neck with longitudinal ribs; no reversals	Fig. S10

well as consistency with earlier treatments (e.g., Fernandes & Fernandes, 1969; Jacques-Félix, 1981, 1995), but would result in a lack of diagnosability for *Dissotis* s.l., because our ancestral character reconstructions have shown there are no unambiguous morphological synapomorphies for this group (Figs. 4–6; suppl. Figs. S1–S10). The characters used previously to define the genus *Dissotis* are instead almost exclusively symplesiomorphies characterizing the African Melastomateae as a whole (Table 5). In particular, the character of staminal dimorphism is a symplesiomorphy and has been shown to be homoplasious. We found 6 independent origins of homomorphic staminal morphology ("isomorphic" and "sub-equal" character states) within *Dissotis* and allies and 12 independent origins amongst the Old-World Melastomateae as a whole (Fig. 6A), albeit not a single reversal back to dimorphic staminal morphology.

Our preferred classification involves dividing *Dissotis* s.l. into a series of segregate genera corresponding to the lineages shown in Fig. 4 (see also Tables 1 and 2). These groups would satisfy the monophyly criterion and also maximize diagnosability since each of the subsidiary lineages of *Dissotis* and allies is morphologically well defined (Fig. 4). For example, despite the fact that all species in *D*. sect. *Squamulosae* and *D*. sect. *Macrocarpae* are subshrubs or shrubs with caducous sepals, the former have leaf venation prominent on both sides and a paniculate inflorescence, while the latter have leaf venation inconspicuous to absent on both sides and a cymose inflorescence (only two species having panicles; characters 4 and 6 in Fig. 4). In addition, the hypanthium amongst species of *D*. sect. *Macrocarpae* has a characteristic silvery-sericeous pubescence that is absent in all other clades (trait 11 in Fig. 4).

Pentamerous flowers are a symplesiomorphy in Melastomateae and *Dissotis* and allies (Table 5; Fig. 5A; suppl. Fig. S5). Floral merosity is nevertheless a good character for generic delimitation in our revised classification. For example, excluding the pentamerous *A. senegambiensis* (now treated in *Nerophila*), all remaining species of *Antherotoma* are tetramerous. The species of *Nerophila* s.l. are either tetra- or pentamerous, while the remaining clades within *Dissotis* and allies consist only of pentamerous species (Figs. 4, 5A).

Some but not all of the groups we recognise within *Dissotis* and allies already have names at the generic level, e.g., *Antherotoma*, *Derosiphia* (for *Dissotis tubulosa*), *Dissotis* s.str. (for the group that includes the type, *D. grandiflora*) and *Nerophila* (for the group that includes *N. gentianoides*). Although our generic realignment would require five new generic names and 58 new combinations at the species level and below, it would also produce groups that are easier to work with and more appropriate for monographic studies, in contrast to the unwieldily large and morphologically complex *Dissotis* s.l. In conclusion, we believe the splitting-up of *Dissotis* s.l. is the correct decision because it will lead to more stable and "good" genera. In what follows, we discuss the various clades recovered in the "*Dissotis* and allies" clade and also propose a revised taxonomic treatment. Species that were not sampled in a phylogenetic context were also included on the basis of their morphology.

***Rosettea* gen. nov. (*Dissotis* sect. *Squamulosae*). —** We sampled 11 species (ca. 52 %) of *D*. sect. *Squamulosae*, and these formed a well-supported clade (BSL 100/PP 1/BSP 100) in our molecular analyses (Figs. 3, 4). However, our current molecular results greatly differ from the previous morphological placement of many species (Fernandes & Fernandes, 1969, 1970; Jacques-Félix, 1981). For example, Fernandes & Fernandes (1970) treated *D. sizenandoi* and *D. thollonii* in *D*. sect. *Squamulosae*, while *D. princeps* (Kunth) Triana and *D. crenulata* Cogn. were included in *D*. sect. *Dissotis*. Jacques-Félix (1981) later treated *D. princeps* and *D. thollonii* in *D*. sect. *Macrocarpae* and *D. sizenandoi* in *D*. sect. *Squamulosae*. Several other species here recognised as belonging to this group were also placed by Fernandes & Fernandes (1970) in *D*. sect. *Dissotis* (*D. benguellensis* A.Fern. & R.Fern., *D. carrissoi* A.Fern. & R.Fern., *D. castroi* A.Fern. & R.Fern., *D. echinata* A.Fern. & R.Fern., *D. falcipila* Gilg).

At the morphological level, *D*. sect. *Squamulosae* was defined mainly on the basis of hypanthium pubescence (Fernandes & Fernandes, 1969), a highly polymorphic character in African Melastomateae (trait 11 in Fig. 4). Our present characterization of this group is as follows: subshrubs/shrubs with densely scurfy to glabrous stems; longitudinal

nerves and tertiary veins very prominent on both adaxial and abaxial leaf surfaces; leaf-surface rugose, pubescent with hairs hirsute, tomentose, scabrid, downy or appressed; and 2–3 leaves arising from each node (Fig. 4). Species of this clade have pentamerous flowers in a paniculate inflorescence (Fig. 4) and hypanthium campanulate to urceolate. Some species have hypanthia with squamulose pubescence whilst in others the hairs are pectinate-ciliate or multifid. The stamens are usually markedly dimorphic with only one species (*D. thollonii* and *D. thollonii* var. *elliotii* (Gilg) Jacq.-Fél.) having subequal stamens (Figs. 2A,B, 4). Although we were unable to sequence *D. longicaudata* (type of *D*. sect. *Squamulosae*), this species is morphologically well placed in this group and most similar to *D. thollonii* var. *elliotii*.

Based on the phylogenetic position and distinct morphology of *D*. sect. *Squamulosae*, we propose its treatment as a separate new genus, *Rosettea* (see Taxonomic Treatment). As currently circumscribed, this group has 21 species, 9 of which are endemic to Angola and 12 restricted to the Sudano-Zambezian region (sensu White, 1983) with only *D. princeps* extending southward to Eswatini and KwaZulu-Natal.

Our phylogenetic results further suggest that *D. princeps* sensu Jacques-Félix (1983a, including the plants previously treated as *Dissotis bamendae* Brenan & Keay) is not monophyletic. Three accessions of *D. bamendae* were sampled and formed a partially supported clade excluding our two accessions of *D. princeps* s.str. In addition, all accessions of *D*. *thollonii* var. *elliotii* sampled were recovered in a monophyletic clade sister to *D. sizenandoi*, while *D. thollonii* var. *thollonii* branches off first and is sister to the remaining *Rosettea* species (Fig. 4). Our analyses hence support the reinstatement of two species, *D. riparia* Gilg & Ledermann ex Engl. (= *D. bamendae*) and *D*. *elliotii* Gilg, treated in the *Flore du Cameroun* (Jacques-Félix, 1983a) as synonyms of *D*. *princeps* and *D*. *thollonii* var. *elliotii*, respectively. *Rosettea riparia* and *R. elliotii* are in this study treated as new combinations for *D. riparia* and *D. elliotii*, respectively.

***Derosiphia* (*Dissotis*) *tubulosa*. —** *Dissotis tubulosa* was first described as *Osbeckia tubulosa* (Smith, 1813) and later transferred to the monospecific genus *Derosiphia* (Rafinesque, 1838), then to *Dissotis* (Triana, 1872), then to the monospecific genus *Podocaelia* (Benth.) A.Fern. & R.Fern. (Fernandes & Fernandes, 1962). More recently, it was placed in *Dissotis* subg. *Dupineta* (Jacques-Félix, 1981, 1983, 1995).

Dissotis tubulosa shows several apomorphic character states with a unique combination of characters (Fig. 4). It is an annual, erect herb with reddish-maroon stems and petioles (Fig. 2G). The stamens are isomorphic with a short pedoconnective having two ventral tubercules (Fig. 2F). The fruit is accrescent with a subspherical base covered with persistent stellate emergences and a distinct cylindrical apex covered by simple bristles (Fig. 2E). *Dupineta* species on the other hand are perennial herbs without reddish-maroon stems and petioles, intersepalar appendages present, hypanthial emergences caducous, stamens dimorphic, appendages bifid and hypanthium accrescent.

Our molecular phylogenetic results support the exclusion of this species from *Dupineta* and indicate it belongs instead to the larger clade of "*Dissotis* and allies", but as a separate lineage (Fig. 4) (see also Veranso-Libalah & al., 2017). We therefore reinstate the monospecific genus *Derosiphia* for this morphologically unique species restricted to the Sudano-Guinean region (Jacques-Félix, 1995).

***Dissotis* s.str. (*D.* sect. *Dissotis*). —** Our molecular analyses included two species of *Dissotis* sect. *Dissotis*, namely *D. grandiflora* (type of *Dissotis*) and *D. longisetosa* Gilg & Ledermann ex Engl., and these formed a well-supported lineage (BSL 100/PP 1/BSP 100) within the larger clade of "*Dissotis* and allies" (Fig. 4). We thus propose a much narrower circumscription of the genus *Dissotis* to include only the six species placed in *D*. sect. *Dissotis* by Jacques-Félix (1981). These are perennial herbs endemic to grasslands of the Guinean-Congolian region and having a characteristic morphology: the hypanthium has stipitate-stellate emergences (Fig. 1E,G), whereas the sepals show stellate emergences or a tuft of setae at the apex but are glabrous or with sparse simple hairs on the back. The stamens are markedly unequal or subequal in size (but not in colour) with distinct bifid appendages (Fig. 1F,H).

Fernandes & Fernandes (1970) previously placed the following species in *D*. sect. *Dissotis*: *D*. *benguellensis*, *D*. *carrissoi*, *D*. *castroi*, *D*. *crenulata*, *D. densiflora* (Gilg) A.Fern. & R.Fern., *D*. *echinata*, *D*. *falcipila* and *D*. *princeps*. These species were left unplaced by Jacques-Félix (1981), except for *D*. *princeps* (placed in *D*. sect. *Macrocarpae*) and *D. densiflora* (placed in *D*. sect. *Senegambia* and later transferred to *Antherotoma* by Jacques-Félix, 1995). Based on our phylogenetic and morphological analyses, all of the species treated in *D*. sect. *Dissotis* by Fernandes & Fernandes (1970) are now placed in the genus *Rosettea* (q.v.), except for *A*. *densiflora* (Gilg) Jacq.-Fél., which remains unplaced in our study (see below).

***Nerophila* s.l. —** In studying staminal morphology of African Osbeckieae (Melastomateae), Jacques-Félix (1981) indicated the presence of four *Osbeckia* species (*O. decandra*, *O. porteresii*, *O. praviantha*, *O. togoensis*) in Africa. However, Veranso-Libalah & al. (2017) transferred *O*. *porteresii* to *Melastomastrum* and further suggested that Africa does not have any *Osbeckia* s.str. (based on the type *O. chinensis* L.). In our present molecular phylogenetic analyses, we included two of the three currently recognised African *Osbeckia* species (*O. decandra*, *O. togoensis*), and these were recovered in a well-supported clade, *Nerophila* s.l., together with *N. gentianoides*, *Antherotoma clandestina*, *A. senegambiensis* and *Dissotis congolensis*. Within this clade, *O. togoensis* branches off first, while *O. decandra* was weakly supported as sister to *N. gentianoides* (only supported in the ML analysis; BSL 70; Fig. 4).

Our phylogenetic results are in line with those of Veranso-Libalah & al. (2017) and further indicate that the genus *Chaetolepis* is a strictly New World entity with no representatives in Africa (see also Veranso-Libalah & al., 2018). As suggested

by Triana (1872), our results confirm that *Nerophila* is most closely related to the African *Osbeckia*. We further suggest that *A. clandestina* and *A. senegambiensis* should be excluded from *Antherotoma* s.str. and *D. congolensis* from *Dissotis*. We propose instead that all six species recovered in the *Nerophila* s.l. clade should be treated in an expanded genus *Nerophila*. Also to be included here are two species not sampled in our study, *O. praviantha* and the Madagascan *D. pauciflora* (Baker) Jacq.-Fél. (Jacques-Félix, 1995), which had been treated previously in *Rhodosepala* as *R. pauciflora* (Baker, 1887; Cogniaux, 1891; Perrier de la Bâthie, 1932, 1951) and in *Dissotis* as *D. hildebrandtii* Kraenzl. (Kraenzlin, 1931) or as part of *D. senegambiensis* (Jacques-Félix, 1977). As presently circumscribed, *Nerophila* comprises eight species distributed mainly in tropical Africa with one species endemic to Madagascar.

Nerophila differs morphologically from its closest relative *Antherotoma* and also from *Dissotis* s.str. by the following combination of characters: inflorescence cymose with flowers tetra- or pentamerous and subtended by two or four leaves; sepals persistent; stamens isomorphic with pedoconnective rudimentary or absent; and pubescence generally appressed-setulose to pilose (Fig. 2H–O). *Antherotoma* on the other hand has tetramerous flowers in heads with small persistent bracts, distinct intersepalar appendages and stamens isomorphic. *Dissotis* s.str. has stipitate-stellate emergences on the hypanthium and sepals with stellate emergences or a tuft of setae at the apex but glabrous or with sparse simple hairs on the back.

***Antherotoma* s.str. —** Several previous authors (Bentham & Hooker, 1867; Triana, 1872; Fernandes & Fernandes, 1969) considered *Antherotoma* as a monospecific genus (*A. naudinii*), distinguished from other African Melastomateae by being an erect annual herb with capitulate inflorescences, tetramerous flowers, small persistent bracts, distinct intersepalar appendages and isomorphic stamens (Fig. 1A, B). Jacques-Félix (1995) later broadened the circumscription of *Antherotoma* to include all species previously treated in *D.* subg. *Osbeckiella* (Fernandes & Fernandes, 1969, 1970; Wickens, 1975; Jacques-Félix, 1981, 1983a). He also recognised two morphologically distinct sections within *D.* subg. *Osbeckiella*, i.e., sect. *Osbeckiella* and sect. *Senegambia* (Jacques-Félix, 1981).

In our molecular phylogenetic analyses, we sampled *A. naudinii* and seven other species of *Antherotoma* s.l. (sensu Jacques-Félix, 1995). Five of these species were earlier treated in *D.* sect. *Osbeckiella* and two species in *D.* sect. *Senegambia* (i.e., *A. irvingiana* and *A. senegambiensis*). We excluded *A. irvingiana* from further analyses due to conflict in its position between the nuclear and plastid gene trees (Fig. 3 and see further discussion below). Our combined analyses recovered a well-supported clade (BSL 100/PP 1/BSP 100; Fig. 4) consisting of *A. naudinii* plus all species (except *A. clandestina*) previously treated in *D.* sect. *Osbeckiella*. This is a morphologically well-defined clade, with the species recognisable as herbs with a capitulate inflorescence (paniculate in *A. gracilis*) having tetramerous flowers and hypanthia with simple bristles (Fig. 1A,B). On the other hand, *A. clandestina* and *A. senegambiensis* were resolved as members of *Nerophila* s.l. (q.v.) and clearly do not belong in *Antherotoma* s.str.

Antherotoma in its new circumscription consists of 10 species mainly distributed in continental Africa but with the type, *A. naudinii*, also found in the Comoro Islands and Madagascar. Also included here are two species originally described in *Dissotis* (*D. fenarolii* A.Fern. & R.Fern., *D. wildei* Jacq.-Fél.) that were not sampled for our molecular phylogenetic study, but that fit well within *Antherotoma* on morphological grounds (see Taxonomic Treatment).

It should be further noted that the two individuals of *A. debilis* included in our phylogenetic analyses are not monophyletic, with one accession recovered as sister to *A. phaeotricha* (Hochst.) Jacq.-Fél. and the other sister to *A. naudinii* (Fig. 4). *Antherotoma debilis* is a morphologically variable species with six described varieties and is also very similar to *A. phaeotricha*. A detailed population study of *A. debilis* is needed to understand better the genetic diversity within this species.

Antherotoma irvingiana was recovered in the nuclear gene tree as sister to the *Antherotoma* s.str. clade, while in the plastid gene tree it was sister to *A. senegambiensis* (Fig. 3). It has mainly tetramerous flowers and dimorphic stamens (Fig. 1C,D), making it morphologically close to most species in *Antherotoma* s.str., while *A. senegambiensis* has pentamerous flowers and isomorphic stamens. Nevertheless, some individuals of *A. irvingiana* have both penta- and tetramerous flowers within the same locality (M.C. Veranso-Libalah, pers. obs. in Cameroon; Fig. 1C). Both *A. irvingiana* and *A. senegambiensis* have paniculate inflorescences and urceolate hypanthium covered with long whitish or purplish-hirsute and stellate-setose linear emergences (Fig. 1C,D), in contrast with species of *Antherotoma* s.str., which have capitulate inflorescences (paniculate in *A. gracilis*) and ovoid-subspherical hypanthium covered with whitish-brownish simple bristles. Plants of *A. irvingiana* with tetramerous flowers and markedly unequal stamens have been treated as a variety of *A. senegambiensis* (*D. senegambiensis* var. *alpestris* (Taub.) A.Fern. & R.Fern.), while those with pentamerous flowers and markedly unequal stamens have been treated as a form of that species (*D. senegambiensis* f. *irvingiana* (Hook.) A.Fern. & R.Fern.) by Fernandes & Fernandes (1972, 1978). Although the type of *A. irvingiana* is from Nigeria, its distribution extends to the Sudanian-Zambezian region and thus overlaps that of *A. senegambiensis*. Because of its conflicting phylogenetic results and divergent morphology, *A. irvingiana* is left unplaced in this study. We suggest it may be a hybrid between *A. senegambiensis* and a yet-to-be-identified species in *Antherotoma* s.str.

***Almedanthus* gen. nov. (*Dissotis pachytricha*). —** *Dissotis pachytricha* is a morphologically distinct species with a unique combination of characters (Fig. 4) and a characteristic hypanthium pubescence (suppl. Fig. S6). It can be recognised

as follows: subshrub with leaves glabrous or sparsely appressed-hairy, papyraceous (rigid on drying), discolorous; flowers pentamerous, either solitary or in groups of a few; and hypanthium with large reflexed scale-like appendages abruptly narrowed to one to several setae. This species was treated in *D*. subg. *Dissotis* by Wickens (1975) and Fernandes & Fernandes (1978) but remained unplaced to any section. Jacques-Félix (1981) later treated *D. pachytricha* in *D*. sect. *Macrocarpae*, but its hypanthium pubescence (large, reflexed scale-like appendages) is unlike that of the other members of this section (with hypanthium pubescence dense and silvery-sericeous). Two varieties of *D. pachytricha* have also been described (var. *grandisquamulosa* Wickens, var. *orientalis* A.Fern. & R.Fern.), distinguished mainly by the nature of the scale-like appendages on the hypanthium. Our molecular results support *D. pachytricha* as a distinct lineage, separate from the other lineages within the larger "*Dissotis* and allies" clade. We thus propose its recognition as a monospecific new genus, *Almedanthus* (see Taxonomic Treatment).

***Eleotis* gen. nov. (*Dissotis* sect. *Sessilifoliae*). —** *Dissotis* sect. *Sessilifoliae* was first proposed by Fernandes & Fernandes (1969). We sampled three of the six species included in this section by Jacques-Félix (1981), and our molecular phylogenetic analyses resolved them in three different positions within the *Dissotis* and allies clade. The type, *D. welwitschii*, was recovered as sister to a clade consisting of *D. gilgiana* and *D*. sect. *Macrocarpae* (Fig. 4), while *D. congolensis* was placed within *Nerophila* s.l. (q.v.) and *D. gilgiana* was resolved as sister to *D*. sect. *Macrocarpae*.

Dissotis anchietae A.Fern. & R.Fern., *D. buraeavii* (Cogn.) A.Fern. & R.Fern. and *D. glaberrima* A.Fern. & R.Fern. were not sampled by us, but these three species together with *D. welwitschii* have a distinctive morphology (perennial herbs or subshrubs with sessile leaves that are sparsely hairy to glabrous and hypanthium pubescence similar to that of the leaves) as well as a peculiar ecogeography (marshes or swamps of Central Africa in Angola, Gabon, D.R. Congo and Zambia). The original description of *D*. sect. *Sessilifoliae* clearly delimits these four species from the other African Melastomateae genera. We therefore propose that *D*. sect. *Sessilifoliae* should be treated as a separate new genus, *Eleotis* (see Taxonomic Treatment).

On the other hand, *D. congolensis* and *D. gilgiana* are morphologically different from the other species previously treated in *D*. sect. *Sessilifoliae*. *Dissotis congolensis* had long been placed in *Osbeckia* (Cogniaux, 1889, 1891; Gilg, 1898; Engler, 1921; Jacques-Félix, 1955; Wickens, 1975; Fernandes & Fernandes, 1978) until transferred to *D*. sect. *Sessifoliae* by Jacques-Félix (1981). However, the petiolate leaves and densely hirsute pubescence of the hypanthium sets *D. congolensis* apart from *D. welwitschii* and the other three species currently treated in *Eleotis*. Our analyses indicate it belongs in *Nerophila* s.l. (q.v.).

***Pyrotis* gen. nov. (*Dissotis gilgiana*). —** *Dissotis gilgiana* is a savannah herb known only from Zambia and the Democratic Republic of the Congo (Katanga region). It is a low perennial (rarely up to 50 cm high) with numerous stems arising from a woody underground rootstock forming a tuber-like structure. The rootstock permits this species to resprout after fire, as evidenced by several collections where the burnt branches are still visible (M.C. Veranso-Libalah, pers. obs.). The species is also characterised by attenuate leaf bases that are contracted to a short, sometimes indistinct petiole. It has penta- or hexa- (hepta-)merous flowers, a very rare character state in African Melastomateae (Fig. 5A), as well as a cymose inflorescence and hypanthium with sparse bristles. Two varieties have been described (*D. gilgiana* var. *petiolata* De Wild., *D. gilgiana* var. *witteana* Jacq.-Fél.), differing from the typical variety mainly by leaf shape and attachment.

Two accessions of *D. gilgiana* were included in our molecular analyses and recovered as a monophyletic group sister to *D*. sect. *Macrocarpae* (Fig. 4). Based on our molecular and morphological results, we propose treating *D. gilgiana* as a monospecific new genus, *Pyrotis* (see Taxonomic Treatment).

***Feliciotis* gen. nov. (*Dissotis* sect. *Macrocarpae*). —** Our molecular sampling of *D*. sect. *Macrocarpae* included the type, *D. speciosa* (= *D. macrocarpa* Gilg), plus three other species (*D. chevalieri* Gilg ex Engl., *D. cryptantha* Baker, *D. perkinsiae* Gilg) previously treated in this group (Jacques-Félix, 1981, 1995). All of these species were recovered in a well-supported clade (BSL 100/PP 1/BSP 100; see Fig. 4) that is sister to *Pyrotis* (q.v.).

At the morphological level, *D*. sect. *Macrocarpae* has been distinguished by its pentamerous flowers arranged in mostly terminal cymes or rarely panicles, bracts scarious or foliaceous and hypanthium pubescence densely silvery-sericeous (Fernandes & Fernandes, 1970; Wickens, 1975; Jacques-Félix, 1981, 1995), all of which are clear and easily recognisable synapomorphies (Fig. 5, suppl. Figs. S3, S4, S6). Based on our phylogenetic and morphological results, we propose that the *D*. sect. *Macrocarpae* clade should be treated as a new genus, *Feliciotis* (see Taxonomic Treatment). This group will comprise 12 species, including the following eight that were not sampled for our molecular analyses: *D. alata* A.Fern. & R.Fern., *D. formosa* A.Fern. & R.Fern., *D. gossweileri* Exell, *D. longisepala* A.Fern. & R.Fern., *D. pterocaulos* Wickens, *D. ruandensis* Engl., *D. sessilicordata* Wickens and *D. simonis-jamesii* Buscal. & Muschl. As presently circumscribed, *Feliciotis* is widely distributed in the Zambezian and Sudanian-Guinean parts of Africa, in habitats ranging from marshes, swamps or river margins to savannahs and montane grasslands.

However, our circumscription of *Feliciotis* excludes several species previously treated in *D*. sect. *Macrocarpae* (Jacques-Félix, 1981, 1995), namely *D. barteri* Hook.f., *D. denticulata* A.Fern. & R.Fern., *D. princeps*, *D. scabra* Gilg, *D. splendens* A.Chev. & Jacq.-Fél., and *D. trothae* Gilg. The first species, *D. barteri*, is a deciduous shrub having the sepals asymmetrical and notched at the apex, and the hypanthium with stalked stellate appendages. *Dissotis barteri* and a newly described

species from Equatorial Guinea are clearly different from the others in *D*. sect. *Macrocarpae* and are now treated in *Nothodissotis* Ver.-Lib. & G.Kadereit (Veranso-Libalah & al., 2019). Four of the above species (*D. denticulata*, *D. princeps*, *D. scabra*, *D. trothae*) are now treated in *Rosettea* (q.v.) while *D. splendens* remains unplaced.

Unplaced taxa. — Although sampled phylogenetically, we propose that *A. irvingiana* be excluded from *Antherotoma* on the basis of its merosity, inflorescence and hypanthium pubescence. At the molecular level, it is also very different from the rest of the *Antherotoma* species (see Table 6).

Two species (*A. densiflora*, *D. splendens*) were not included in our molecular phylogenetic analyses and remain unplaced within the currently recognised African Melastomateae genera. Although their morphology is strikingly unique, we are currently unable to suggest any taxonomic placement. In addition, the only species in *D*. subg. *Paleodissotis*, *D. leonensis*, is still unsampled in a phylogenetic context. Although a morphologically unique entity, this species remains unplaced in the current treatment.

■ TAXONOMIC TREATMENT

Based on the phylogenetic and morphological results presented in this paper, we propose the following changes in the classification of African Melastomateae: (1) the genus *Derosiphia* Raf. is reinstated; (2) three new genera are described, *Feliciotis* (for *Dissotis* sect. *Macrocarpae* A.Fern. & R.Fern.), *Rosettea* (for *Dissotis* subg. *Squamulosae* A.Fern. & R.Fern.) and *Eleotis* (for *Dissotis* sect. *Sessilifoliae* A.Fern. & R.Fern.); (3) two additional monospecific genera are newly described, *Almedanthus* (for *Dissotis pachytricha* Gilg ex R.E.Fr.) and *Pyrotis* (for *Dissotis gilgiana* De Wild.); (4) the genus *Nerophila* Naudin is reinstated but with an expanded circumscription to include *Antherotoma clandestina* Jacq.-Fél., *A. senegambiensis* (Guill. & Perr.) Jacq.-Fél., *Dissotis congolensis* (Cogn.) Jacq.-Fél., *D. pauciflora* (Baker) Jacq.-Fél. and and some members of African *Osbeckia* sensu Jacques-Félix (1981, 1995); (5) the circumscription of *Dissotis* is substantially narrowed to include only members of *D*. sect. *Dissotis* sensu Jacques-Félix (1981); and (6) *Antherotoma* (Naudin) Hook.f. is maintained as a distinct genus but narrowed to exclude *A. irvingiana* (Hook.) Jacq.-Fél. (unplaced) as well as *A. senegambiensis* and *A. clandestina* (both treated in *Nerophila*). Twelve new synonyms and a total of 58 new combinations are effected at the species level and below. Some of these species were not included in our phylogenetic analyses, but we are confident in proposing new combinations for them based on their morphology. Descriptions and diagnoses (both molecular and morphological) are provided for all the recognised genera within the "*Dissotis* and allies" clade. The positions of the specific nucleotide substitutions used in the molecular diagnosis are based on the sequence alignments provided in the electronic supplementary material (suppl. Appendices S1–S4).

We also provide an updated key to the genera of African Melastomateae, including the nine genera currently recognised within the *Dissotis* and allies clade (Tables 1 and 2).

Revised key to the genera of African Melastomateae

1 Trees or shrubs; hypanthium margin truncate or with short sepals, leaving the corolla exposed in bud; flowers tetramerous; seeds with dorsal hyaline papillae .... ***Dichaetanthera***

1 Herbs, subshrubs or shrubs; hypanthium with well-developed sepals, contorted and concealing the corolla in young bud stage; flowers tetra- or pentamerous (rarely hexa- or heptamerous); seeds without hyaline papillae 2

2 Herbs; sepals persistent; stamens isomorphic (except *T. cornifolium*), with anthers erect; hypanthium with hairs often arranged in complete or incomplete rings (rarely glabrous or hairy all over); fruit fleshy, baccate, irregularly bursting..... ***Tristemma***

2 Herbs, subshrubs or shrubs; sepals persistent or caducous; stamens heteromorphic or isomorphic with anthers spreading or curved; hypanthium variously pubescent but not arranged in rings; fruit dry, capsular, bursting regularly via valves 3

3 Leaves sessile or amplexicaul.....4

3 Leaves petiolate (except *Feliciotis sessilicordata*).....6

4 Stems, leaves and hypanthium covered with dense stellate and/or glandular hairs appearing dusty; sepals persistent..... ***Argyrella***

4 Stems, leaves and hypanthium glabrous or glabrescent; sepals persistent or caducous.....5

5 Stems thick and somewhat fleshy, winged; hypanthium glabrous with prominent longitudinal nerves; bracts and sepals persistent; leaf and calyx margins conspicuously ciliate, appearing dentate ..... ***Anaheterotis***

5 Stems slender and non-fleshy, unwinged; hypanthium glabrous or glabrescent without longitudinal nerves; bracts and sepals caducous; leaf and calyx margins entire .... ***Eleotis***

6 Sepals persistent; intersepalar appendages absent or present 7

6 Sepals caducous (sometimes tardily so); intersepalar appendages always present 14

7 Herbs or subshrubs; flowers solitary or arranged in heads or cymes (rarely panicles), separately involucrate by several pairs of leaves or bracts 8

7 Herbs, subshrubs or shrubs; flowers in cymes or panicles but not involucrate 11

8 Herbs; intersepalar appendages present; flowers tetra- (rarely penta-)merous; bracts small (<4 mm long), persistent or caducous.....9

8 Herbs, subshrubs or shrubs; intersepalar appendages absent; flowers pentamerous; bracts large (>4 mm long), persistent.....10

9 Flowers tetra- or pentamerous, solitary or arranged in

cymes or panicles; bracts caducous; pedoconnective and staminal appendages rudimentary or absent..... ***Nerophila***

9 Flowers tetramerous, arranged in heads (panicle in *A. gracilis*); bracts persistent; pedoconnective present with bilobed staminal appendages ..... ***Antherotoma***

10 Shrubs; flowers solitary; stamens isomorphic, with two ventral appendages and one dorsal appendage, pedoconnective not developed, anthers erect; seeds finely echinulate, curved only towards the top, cuneate at base with an elongated hilum ..... ***Cailliella***

10 Herbs or subshrubs/shrubs; flowers solitary or in heads; stamens iso- or dimorphic, with two ventral appendages, no dorsal appendage, pedoconnectives well developed, anthers falcate or sigmoid; seeds tuberculate, cochleate and without a hilum ..... ***Melastomastrum***

11 Herbs, decumbent or rooting at the nodes (sometimes erect); flowers solitary or in cymes (rarely panicles); bracts small (<4 mm long), persistent or caducous 12

11 Subshrubs or shrubs; flowers in cymes or panicles; bracts large (>4 mm long), caducous 13

12 Decumbent herbs; hypanthium with stalked stellate emergences (simple eglandular hairs in *H. decumbens*); flowers in cymes; seeds rough with tubercles arranged in parallel rows, with a basal aril (this sometimes very short) ..... ***Heterotis***

12 Decumbent or erect herbs; hypanthium usually glabrous or with glandular hairs (simple eglandular hairs in *G. pygmaea*); flowers solitary (panicle in *G. jacquesii*); seeds smooth or with tubercles not arranged in parallel rows, not arillate ..... ***Guyonia***

13 Inflorescence a 1–3(–7)-flowered cyme; leaves evergreen, small, 1.5–2.5 × 1–1.5 cm; intersepalar appendages present but reduced to a bristle; stamens isomorphic .... ***Dionychastrum***

13 Inflorescence a many-flowered panicle; leaves deciduous, much larger; intersepalar appendages absent; stamens usually dimorphic ..... ***Dissotidendron***

14 Shrubs; sepals asymmetrical, notched at apex; leaves deciduous ..... ***Nothodissotis***

14 Herbs, subshrubs or shrubs; sepals ± symmetrical, entire; leaves evergreen 15

15 Low perennial herb with numerous stems arising from a woody rootstock; leaf base attenuate, with an indistinct or contracted petiole ..... ***Pyrotis***

15 Annual or perennial herbs, subshrubs or shrubs without a woody rootstock; leaf base cuneate to rounded or subcordate, with a distinct petiole 16

16 Annual or perennial herbs; hypanthium with simple or stellate hairs or both.....17

16 Subshrubs or shrubs; hypanthium pubescence various but not stellate.....19

17 Stems and petioles reddish-maroon; hypanthium with a distinct subspherical base and cylindrical apex, base covered with stellate emergences, apex with simple pubescence; stamens isomorphic..... ***Derosiphia***

17 Stems and petioles not reddish-maroon; hypanthium urceolate, tubulate or campanulate, glabrous or with simple or stellate hairs; stamens dimorphic 18

18 Hypanthium with persistent stellate-pedicellate hairs, not accrescent in fruit; intersepalar appendages present; sepals glabrous or with sparse simple hairs on the back, apex with stellate appendages; fruits lacking a long neck with longitudinal ribs ..... ***Dissotis***

18 Hypanthium with caducous, simple or stellate hairs, accrescent in fruit; intersepalar appendages present or absent; sepals with short simple hairs on the back, apex ciliate; fruits developing a long neck with longitudinal ribs ..... ***Dupineta***

19 Sepals tardily caducous; stamens isomorphic, opening by an extrorse pore; leaves distinctly bicoloured, dark green above and yellowish-green beneath ..... ***Pseudosbeckia***

19 Sepals early caducous; stamens dimorphic (except *Rosettea thollonii*), opening by an introrse pore; leaves dark green on both surfaces 20

20 Hypanthium with large, reflexed scale-like appendages abruptly narrowed to 1 or several setae; flowers 1–3 .... ***Almedanthus***

20 Hypanthium pubescence various but not with large, reflexed scale-like appendages; flowers solitary or arranged in cymes or panicles.....21

21 Stems with always opposite leaves arising from each node; leaf margins entire, third-order veins absent on both surfaces; true and leafy bracts present, tardily caducous; hypanthium covered with dense silvery-sericeous pubescence ..... ***Feliciotis***

21 Stems with whorled or opposite leaves arising at each node; leaf margins serrate, dentate or crenate, third-order veins prominent on both surfaces; true bracts present, leafy bracts absent, early caducous; hypanthium pubescence various but not densely silvery-sericeous ..... ***Rosettea***

1. ***Almedanthus*** Ver.-Lib. & R.D.Stone, **gen. nov.** – Type: *Almedanthus pachytrichus* (R.E.Fr.) Ver.-Lib. & R.D. Stone (≡ *Dissotis pachytricha* R.E.Fr.)

Morphological diagnosis. – *Almedanthus* differs from all other African Melastomateae by the following diagnostic characters: shrub or subshrub with leaves glabrous or sparsely appressed-hairy, papyraceous (rigid on drying), discolorous; flowers pentamerous, either solitary or in groups of few; and hypanthium with large reflexed scale-like appendages abruptly narrowed to one to several setae.

Molecular diagnosis. – *Almedanthus* also differs from the other African Melastomateae genera in the following specific nucleotide substitutions: one nrETS nucleotide position: A/C to G at position 859 (summarised in Table 6).

Description. – Shrub or subshrub; branchlets weakly 4-angular to terete, sparsely setose to glabrescent. Leaves evergreen, opposite, petiolate; lamina lanceolate, lanceolate-elliptic or oblong-elliptic, entire or minutely crenulate at the margin, papyraceous (rigid on drying), usually discolorous

Table 6. Diagnostic nucleotide substitutions in plastid (*ndhF*, *psbK-psbL*) and nuclear ribosomal (nrETS, nrITS) markers among African Melastomateae.

	Position in alignment	Specific substitutions	Comment
Almedanthus			
nrETS	859	**G**	**A** (*Eleotis*)
			A/C (*Antherotoma*)
			C (the rest of the African Melastomateae)
Antherotoma			
nrETS	236/420	**A**	**C** (*A. irvingiana* and the rest of the African Melastomateae)
	284	**A**	**G** (*A. irvingiana* and the rest of the African Melastomateae)
	614	**G**	**A** (*A. irvingiana* and the rest of the African Melastomateae) **T** (*N. gentianoides*)
psbK-psbL	194–198	**-----**	**AAACG** (*A. irvingiana* and the rest of the African Melastomateae)
	334	**A**	**G** (*A. irvingiana* and the rest of the African Melastomateae)
	412	**T**	**C** (*A. irvingiana* and the rest of the African Melastomateae)
ndhF	58/121	**A**	**T** (*A. irvingiana* and the rest of the African Melastomateae)
	382	**C**	**A** (*A. irvingiana* and the rest of the African Melastomateae)
Derosiphia			
nrETS	40	**T**	**G** (*Argyrella*) **G/A** (*Melastomastrum, Nerophila*, *Tristemma*) **A** (rest of the African Melastomateae)
	73/130	**A**	**G** (rest of the African Melastomateae)
	140	**T**	**-** (*Anaheterotis*, *Argyrella*, *Dichaetanthera*, *Dissotidendron*, *Guyonia*, *Heterotis, Melastomastrum*, *Tristemma*) **A** (*N. gentianoides*) **G** (rest of the African Melastomateae)
	201	**A**	**T** (rest of the African Melastomateae)
	279	**A**	**C** (rest of the African Melastomateae)
	360	**G**	**A** (rest of the African Melastomateae)
	445	**C**	**T** (*A. gracilis*) **G** (rest of the African Melastomateae)
	525	**C**	**A** (*Dichaetanthera, Dissotidendron*, *Nerophila*) **G** (rest of the African Melastomateae)
	634	**C**	**G** (*Dissotidendron*) **A** (rest of the African Melastomateae)
nrITS	107	**T**	**A** (*A. irvingiana*) **C** (rest of the African Melastomateae)
	271	**A**	**G** (*Dupineta*) **C/T** (*Antherotoma*, *Nerophila*) **C** (*Nothodissotis*)

(Continues)

Table 6. Continued.

	Position in alignment	Specific substitutions	Comment
Derosiphia nrITS *(continued)*	277	**C**	**G** (rest of the African Melastomateae)
	296–297	**--**	**AG** (*Almedanthus, Eleotis, Feliciotis*) **CG** (rest of the African Melastomateae)
	301	**G**	**T** (rest of the African Melastomateae)
	314	**C**	**A** (*N. decandra*) **G** (rest of the African Melastomateae)
	493	**T**	**A** (rest of the African Melastomateae)
	514/531/710	**T**	**C** (rest of the African Melastomateae)
	551	**T**	**G** (*Melastomastrum, Nerophila*, *Tristemma*) **A** (rest of the African Melastomateae)
	624	**G**	**C** (*Anaheterotis*, *Argyrella*, *Guyonia* and *Pseudosbeckia*) **T** (rest of the African Melastomateae)
	660–669	**----------**	**CTCCACGGCG** (rest of the African Melastomateae)
	669/854	**A**	**C** (rest of the African Melastomateae)
	677/724/935	**T**	**G** (rest of the African Melastomateae)
	689/700	**A**	**G** (rest of the African Melastomateae)
psbK-psbL	322	**C**	**T** (rest of the African Melastomateae)
	394	**T**	**C/G** (*Nothodissotis*) **C** (rest of the African Melastomateae)
	572	**T**	**A** (*Nerophila*, *Tristemma*) **G** (*Melastomastrum*) **C** (rest of the African Melastomateae)
	574	**A**	**G** (rest of the African Melastomateae)
	602/611	**T**	**C** (rest of the African Melastomateae)
ndhF	495/657	**C**	**A** (rest of the African Melastomateae)
Dissotis			
nrETS	266	**G**	**T** (*Heterotis*) **A** (rest of the African Melastomateae)
	286	**G**	**A** (rest of the African Melastomateae)
nrITS	100	**G**	**C** (rest of the African Melastomateae)
	130	**A**	**C** (*N. gentianoides*) **T** (rest of the African Melastomateae)
	181	**T**	**G** (*Nothodissotis*, *N. clandestina*) **A** (rest of the African Melastomateae)
	194	**A**	**C** (rest of the African Melastomateae)
	266–267	**TC**	-- (rest of the African Melastomateae)
	835	**A**	**C** (*Dissotidendron*) **T** (rest of the African Melastomateae)
ndhF	427	**T**	**C** (*N. decandra*) **A** (rest of the African Melastomateae)
	536	**C**	**T** (rest of the African Melastomateae)

(Continues)

Table 6. Continued.

	Position in alignment	Specific substitutions	Comment
Eleotis			
nrETS	364	**G**	**A** (rest of the African Melastomateae)
	607–609	**GAG**	**G-G** (*Feliciotis*, *Pyrotis*) **---** (rest of the African Melastomateae)
ndhF	121	**G**	**A** (*Antherotoma*) **T** (*A. irvingiana* and the rest of the African Melastomateae)
Feliciotis			
nrETS	369–370	**AG**	**G-** (*Guyonia*) **GT** (*Dupineta*) **GG** (*Eleotis*, *Pyrotis*) **AA** (*Antherotoma*, *N. gentianoides*) **GA** (*A. irvingiana* and rest of the African Melastomateae)
nrITS	109	**G**	**C** (*Anaheterotis*, *Antherotoma*, *Argyrella*, *Dichaetanthera*, *Dissotidendron*, *Heterotis*) **C/-** (*Guyonia*) **-** (*Melastomastrum*, *Tristemma*) **A** (*A. irvingiana* and the rest of the African Melastomateae)
	272	**T**	**G** (*N. togoensis*) **C** (rest of the African Melastomateae)
	531	**G**	**T** (*Derosiphia*) **C** (rest of the African Melastomateae)
ndhF	280	**A**	**T** (*Anaheterotis*, *Argyrella*, *Dichaetanthera*, *Guyonia*, *Melastomastrum*, *Tristemma*) **C** (rest of the African Melastomateae)
Nerophila			
nrETS	213/646	**T**	**A** (rest of the African Melastomateae)
	434	**A**	**C** (rest of the African Melastomateae)
	564	**C**	**G** (rest of the African Melastomateae)
nrITS	138	**C**	**T** (*Almedanthus*, *Eleotis*, *Feliciotis*) **G** (rest of the African Melastomateae)
Pyrotis			
nrETS	243	**T**	**A** (*Anaheterotis*, *Argyrella*, *Dissotidendron*, *Heterotis*, *Guyonia*, *Melastomastrum*) **A/G** (*Dichaetanthera*, *Tristemma*) **C** (*A. irvingiana* and the rest of the African Melastomateae)
	350–352	**AGG**	**---** (rest of the African Melastomateae)
	369–370	**GG**	**GA** (*A. irvingiana* and rest of the African Melastomateae)
	403	**A**	**G** (rest of the African Melastomateae)
nrITS	563	**T**	**-** (*Melastomastrum*) **G/-** (*Tristemma*) **G** (rest of the African Melastomateae)
	576	**T**	**G** (*Melastomastrum* and *Tristemma*) **C** (rest of the African Melastomateae)
psbK-psbL	43–44	**TC**	**AG** (rest of the African Melastomateae)

(Continues)

Table 6. Continued.

	Position in alignment	Specific substitutions	Comment
ndhF	298	**T**	**G** (*Anaheterotis*, *Argyrella*, *Dichaetanthera*, *Guyonia*, *Melastomastrum*, *Tristemma*) **C** (rest of the African Melastomateae)
	591	**T**	**A** (rest of the African Melastomateae)
Rosettea			
nrETS	159	**T**	**G** (rest of the African Melastomateae)
	282	**G**	**A** (*Anaheterotis*, *Argyrella*, *Dichaetanthera*, *Dissotidendron*, *Guyonia*, *Heterotis*, *Melastomastrum*, *Nothodissotis*, *Tristemma*) **T** (rest of the African Melastomateae)
	321–322	**GG**	**CG** (*Dupineta*, *G. ciliata*, *Heterotis* and *N. clandestina*) **AA** (*Melastomastrum*) **CA** (rest of the African Melastomateae)
	365	**A/G**	**C** (rest of the African Melastomateae)
	424	**G**	**T** (*A. naudinii*) **A** (rest of the African Melastomateae)
	488	**C**	**A** (*N. clandestina*) **T** (rest of the African Melastomateae)
	494	**T**	**A** (rest of the African Melastomateae)
	575	**A**	**C** (*Anaheterotis*, *Argyrella*, *Derosiphia* and *N. gentianoides*) **G** (rest of the African Melastomateae)
	629	**C**	**A** (rest of the African Melastomateae)
nrITS	40	**C**	**T** (rest of the African Melastomateae)
	49	**T**	**A** (rest of the African Melastomateae)
	91	**T**	**G** (*Anaheterotis*, *A. irvingiana*, *Argyrella*, *Dupineta*, *Guyonia*, *Nerophila*) **A** (rest of the African Melastomateae)
psbK-psbL	25/126	**C**	**A** (rest of the African Melastomateae)
	177	**G**	**C** (rest of the African Melastomateae)
	191	**G**	- (*Tristemma*) **T** (rest of the African Melastomateae)
	502	**A**	**G** (rest of the African Melastomateae)
ndhF	136–168	**TTCGTTATTAT TATCACCAAAT AGTAATGAAAA**	- (deletion of 33 bases for the rest of the African Melastomateae)
	199	**G**	**T** (rest of the African Melastomateae)
	249	**C**	**A** (rest of the African Melastomateae)
	371	**A**	**G** (rest of the African Melastomateae)
	478	**C**	**G** (rest of the African Melastomateae)

Melastomateae genera: *Almedanthus, Anaheterotis*, *Antherotoma*, *Argyrella*, *Derosiphia*, *Dichaetanthera*, *Dissotidendron, Dissotis*, *Dupineta*, *Eleotis, Feliciotis, Heterotis*, *Guyonia*, *Melastomastrum, Nothodissotis, Nerophila*, *Pseudosbeckia*, *Pyrotis*, *Rosettea* and *Tristemma*

(dark green and sometimes shining on the upper face, bright- to yellow-green underneath), glabrous or sparsely appressed-setose above, sparsely short white appressed setose beneath, third-order veins invisible on both surfaces. Inflorescence terminal, with one to few pentamerous flowers; bracts non-foliaceous, early caducous, length > 4 mm. Hypanthium subglobose to cylindric-campanulate, densely covered with large reflexed scale-like appendages abruptly narrowed to one to several setae; sepals early caducous, oblong to oblanceolate; intersepalar appendages present and similar to the uppermost hypanthium appendages. Petals reddish purple, obovate. Stamens 10, dimorphic; pedoconnective present and with bilobed ventral appendages; anthers opening by a small, introrse pore. Ovary 5-locular, the lower half adnate to the hypanthium; style filiform; stigma punctiform, convex, setose at the apex. Fruit an indehiscent capsule; fruiting calyx accrescent, ovoid to subspherical, contracted at the mouth; capsule setose at the apex, completely enclosed by the calyx. Seeds small, cochleate.

Etymology. – The generic name *Almedanthus* is a masculine noun, proposed in honour of American botanist Frank Almeda (CAS), who has worked extensively with Melastomataceae.

Almedanthus pachytrichus (Gilg ex R.E.Fr.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Dissotis pachytricha* Gilg ex R.E.Fr., Wiss. Erg. Schwed. Rhodesia-Kongo-Exp. 1911–1912, 1(1): 180. 1914 – Holotype: Zambia, between Mallolo and Kitwe [Katwe], N. from Luwingu, *R.E. Fries 1203* (UPS No. V-681723!).

Almedanthus pachytrichus var. ***grandisquamulosus*** (Wickens) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Dissotis pachytricha* var. *grandisquamulosa* Wickens in Kew Bull. 29(1): 144. 1974 – Holotype: Tanzania, Kigoma District, S. of Uvinza, *Bullock 3283* (K barcode K000313055!; isotype: K barcode K000313053!).

Almedanthus pachytrichus var. ***orientalis*** (A.Fern. & R.Fern.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Dissotis pachytricha* var. *orientalis* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 30: 176, t. 11. 1956 – Holotype: Tanzania, Njombe District, Lupemba, Ruhudji R., *Schlieben 510* (BR barcode 000006423155!).

2. ***Antherotoma*** (Naudin) Hook.f. in Bentham & Hooker, Gen. Pl. 1(3): 745. 1867 ≡ *Osbeckia* sect. *Antherotoma* Naudin in Ann. Sci. Nat., Bot., sér. 3, 14: 55. 1850 – Type: *Antherotoma naudinii* Hook.f. (≡ *Osbeckia antherotoma* Naudin).

= *Dissotis* subg. *Osbeckiella* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 43: 285. 1969 – Type: *Dissotis debilis* (Sond.) Triana.

Morphological diagnosis. – *Antherotoma* differs from all other African Melastomateae by the following combination of characters: herbs with tetramerous flowers in heads (panicle in *A. gracilis*), persistent bracts and ovoid-subspherical hypanthium having simple hairs and indumentum setose (Fig. 1A,B).

Molecular diagnosis. – *Antherotoma* (excluding *A. irvingiana*) also differs from other African Melastomateae genera in the following specific nucleotide substitutions: four nrETS nucleotide positions: C to A at positions 236/420, G to A at position 284, A/T to G at position 614; two *psbK-psbL* nucleotide substitutions and indel of five bases: G to A at position 334, C to T at position 412, AAACG to ----- from 194–198; and three *ndhF* nucleotide substitutions: T to A at positions 58/121 and A to C at position 382 (summarised in Table 6).

Description. – Erect annual or perennial herbs (sometimes subshrubs) with slender, indistinctly tetragonous, sparsely setose to glabrescent stems. Leaves persistent, opposite, subsessile; lamina ovate, linear-lanceolate, oblong-ovate or oblong-lanceolate, margins entire, crenulate or serrulate, sparsely appressed-setose on both surfaces, third-order veins invisible on both surfaces. Inflorescence terminal, flowers in heads, rarely panicles, tetramerous (Fig. 1B); bracts foliaceous, persistent, length > 4 mm. Hypanthium ovoid-urceolate, with simple hairs and indumentum setose; sepals persistent, triangular-subulate; intersepalar appendages present, linear or ligulate. Petals mauve, pink or purple, obovate (Fig. 1A). Stamens 8, iso- or dimorphic; pedoconnective present, arched and with 2 tubercular (bilobed) ventral appendages at the junction of the filament; anthers opening by a large, introrse pore. Ovary 4-locular, the lower half adnate to the hypanthium; style filiform, with a small setose crown around the style-base; stigma punctiform or simple, convex. Fruit an indehiscent capsule; fruiting calyx non-accrescent, ovoid-subspherical; capsule enclosed in the dry hypanthium, 4-valved, setose at the apex. Seeds small, cochleate.

Antherotoma debilis (Sond.) Jacq.-Fél. in Bull. Mus. Natl. Hist. Nat., B, Adansonia, sér. 4, 16(4): 270. 1995 ('1994') ≡ *Osbeckia debilis* Sond. in Linnaea 23: 47. 1850 ≡ *Dissotis debilis* (Sond.) Triana in Trans. Linn. Soc. London 28(1): 58, t. 4, fig. 44a, b. 1872 ('1871') – **Lectotype (designated here):** South Africa, Transvaal, Magalisberg, *Zeyher 539* (P barcode P00412527!; isolectotypes: BM barcode BM000902394!, K barcode K000313349!, P barcodes P00412528! & P00412529!).

= *Dissotis penicillata* Gilg in Monogr. Afrik. Pflanzen-Fam. 2: 14. 1898 – Lectotype (designated by Fernandes & Fernandes in Exell & al., Consp. Fl. Angolensis 4: 138. 1970): Angola: Huilla, *Antunes 126* (COI barcode COI00005421!).

= *Dissotis bangweolensis* R.E.Fr., Wiss. Erg. Schwed. Rhodesia-Kongo-Exp. 1911–1912, 1(1): 178. 1914 – Holotype: Zambia, Lake Bangweulu, Kamindas, Kapata, *R.E. Fries 936* (UPS No. V-059938!).

= *Dissotis pusilla* R.E.Fr., Wiss. Erg. Schwed. Rhodesia-Kongo-Exp. 1911–1912, 1(1): 178. 1914 ≡ *Dissotis debilis* var. *pusilla* (R.E.Fr.) A.Fern. & R.Fern. in Anais Junta Invest. Ultramar 10: 19. 1955 – Holotype: Zambia, Luesa R., *R.E. Fries 593* (UPS No. V-046460!).

= *Dissotis paludosa* Gilg ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 748. 1921 – **Lectotype (designated here):** D.R. Congo (Katanga), Kundelungu, s.d., *Kassner 2591* (K barcode K000313106!; isolectotype?: Z barcode Z-000015025!).

= *Osbeckia luxenii* De Wild. in De Wildman & Staner, Contr. Fl. Katanga, Suppl. 5: 48. 1933 ≡ *Dissotis luxenii* (De Wild.) A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 66. 1954, **syn. nov.** – Holotype: D.R. Congo, *Luxen 67* (BR barcode 000006494209!; isotypes: BR barcodes 000006493554! & 000006494537!).

= *Dissotis debilis* var. *prostrata* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 181, t. 1. 1954 – Holotype: Angola, Lunda, Saurimo, Vila Henrique de Carvalho, margem da estrada junto ao Rio Luachimo, alt. 1100 m, *Exell & Mendonça 720* (COI barcode COI00005422!; isotype: LISC barcode LISC 002812!).

Notes. – The protologue of *Osbeckia debilis* specified the collection *Zeyher 539* but did not state where the material was deposited. Jacques-Félix (1995) later reported that the holotype is in S, but he might have merely assumed this based on general knowledge that the major part of Sonder's South African herbarium is deposited there. However, other parts were reportedly sold after Sonder's death. We cannot find any solid evidence that the type of *Osbeckia debilis* is really accessioned in S. A search for *Zeyher 539* on Sweden's Virtual Herbarium (http://herbarium.emg.umu.se/) yielded a record for the type of *Ligularia tenuifolia* Eckl. & Zeyh. (= *Pelargonium hirtum* (Burm.f.) Jacq.), a very different plant. We have thus chosen one of the duplicates of *Zeyher 539* housed in P as the lectotype of *Osbeckia debilis* (with isolectotypes in BM, K and P).

The name *Osbeckia debilis* Naudin is an illegitimate later homonym of *Osbeckia debilis* Sond. (based on different original material). The name *Osbeckia debilis* Naudin was later treated by Triana (1872) followed by Cogniaux (1891) as a taxonomic synonym of *Osbeckia zeylanica* L.f. According to IPNI, the publication date of the name *Osbeckia debilis* Sond. was Feb. 1850. According to *TL-2*, the publication date of the name *Osbeckia debilis* Naudin was July 1850.

De Wildeman (1913: 118) remarked that the *Dissotis paludosa* original material *Kassner 2591* in B was not the same plant as the material of this number in Z. He further noted that the material in Z is closer to *D. phaeotricha* (Hochst.) Harv. (≡ *A. phaeotricha* (Hochst.) Jacq.-Fél.). We have chosen the duplicate in K as the lectotype.

The original description of the little-known *Osbeckia luxenii* clearly matches that of *A. debilis*, which is also known from D.R. Congo. As such, we suggest that *O. luxenii* (≡ *Dissotis luxenii*) should be treated as a synonym of *A. debilis*.

Antherotoma fenarolii (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis fenarolii* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 184, t. 5. 1954 – Holotype: Angola, Cuanza Sul, Libolo, *Fenaroli 1187* (BER n.v.; isotype: COI barcode COI00005424!).

Antherotoma procumbens (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis procumbens* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 183, t. 4. 1954 – Holotype: Angola, regione Moxico, pr. flumen Cuemba, *Gossweiler 11236* (COI barcode COI00005426!; isotypes: COI barcodes COI00005427! & COI00005428!, LISC barcode LISC 002817!).

Antherotoma proschii (Briq.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Dissotis proschii* Briq. in Annuaire Conserv. Jard. Bot. Genève 1902: 5. 1902 – Holotype: Zambia, pays des Ba-Rotsi, env. de Sefula, *de Prosch 10* (G barcode G00418214!).

= *Dissotis angustifolia* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 181, t. 2 & 3. 1954 ≡ *Antherotoma angustifolia* (A.Fern. & R.Fern.) Jacq.-Fél. in Bull. Mus. Natl. Hist. Nat., B, Adansonia, sér. 4, 16(2–4): 271. 1995 ('1994'), **syn. nov.** – Holotype: Mozambique, Cabo-Delgado. Macomia, proximidades de Ingoane, *Barbosa 2073* (COI barcode COI00005439!; isotypes: LISC barcode LISC 002417!, LMA barcodes LMA0023200-0! & LMA0023200-1!).

Antherotoma wildei (Jacq.-Fél.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis wildei* Jacq.-Fél. in Bull. Jard. Bot. Natl. Belg. 44(1–2): 164, fig. 2. 1974 – Holotype: D.R. Congo, District du Bas-Katanga, Parc National de l'Upemba, 750 m d'altitude, rive marécageuse de la Lufira, *de Wilde 733* (BR barcode 000006423452!; isotype: WAG barcode WAG0002334!).

Other included species. – *Antherotoma gracilis* (Cogn.) Jacq.-Fél., *Antherotoma phaeotricha* (Hochst.) Jacq.-Fél., *Antherotoma tenuis* (A.Fern. & R.Fern.) Jacq.-Fél., *Antherotoma tisserantii* (Jacq.-Fél.) Jacq.-Fél.

3. ***Derosiphia*** Raf. in Sylva Tellur.: 101. 1838 ≡ *Osbeckia* sect. *Podocaelia* Benth. in Hooker, Niger Fl.: 345. 1849 ≡ *Podocaelia* (Benth.) A.Fern. & R.Fern. in Estud. Cient. Homenag. J. Carr. da Costa (Trab. Centro Bot. Junta Invest. Ultram. 1(9)): 5. 1962 – Type: *Derosiphia tubulosa* (Sm.) Raf. (≡ *Osbeckia tubulosa* Sm.).

Morphological diagnosis. – *Derosiphia* differs from all other African Melastomateae by the following combination of characters: annual herb with reddish stems and petioles (Fig. 2G), hypanthium with distinct subspherical base and cylindrical apex (Fig. 2E), base of hypanthium covered with persistent stellate emergences, while the cylindrical part is covered by simple bristles (Fig. 2E), stamens isomorphic (Fig. 2F) with a short pedoconnective and two ventral tubercules, and fruit accrescent lacking longitudinal ribs.

Molecular diagnosis. – *Derosiphia* also differs from the other African Melastomateae genera in the following specific nucleotide substitutions: ten nrETS nucleotide positions: G/A to T at position 40, G to A at positions 73/130, -/G/A to T at position 140, T to A at position 201, C to A at position

279, A to G at position 360, T/G to C at position 445, A/G to C at position 525, A/G to C at position 634; 19 nrITS nucleotide substitutions: A/C to T at position 107, C/T/G to A at position 271, G to C at position 277, T to G at position 301, A/G to C at position 314, A to T at position 493, C to T at positions 514/531/710, G/A to T at position 551, T/C to G at position 624, C to A at position 854, G to T at positions 667/724/935, G to A at positions 689/700; two indels at positions 296–297 (AG/CG to --) and 660–669 (CTCCACGGCG to ----------); six *psbK-psbL* nucleotide substitutions: T to C at position 322, C/G to T at position 394, A/G/C to T at position 572, G to A at position 574 and C to T at positions 602/611; two *ndhF* nucleotide substitutions: A to C at positions 495/657 (summarised in Table 6).

Description. – Annual herb with weakly tetragonous stems, reddish and sparsely pubescent (Fig. 2F,G). Leaves opposite, petiolate; lamina ovate-lanceolate, margins entire to minutely crenulate, glabrous or sparsely appressed-setose, third-order veins prominent on the abaxial surface. Flowers pentamerous (rarely hexamerous; Fig. 2F), in terminal cymes of 3–5 flowers; bracts non-foliaceous, caducous, length < 4 mm. Hypanthium ovoid-cylindical (distinct subspherical base and cylindrical apex; Fig. 2E), base covered with persistent stellate emergences, while the cylindrical part is covered by simple bristles (Fig. 2E); sepals triangular, early caducous; intersepalar appendages present, linear, caducous after anthesis. Petals pink, obovate. Stamens isomorphic (Fig. 2F), pedoconnective short and visibly arched with 2-tuberculate ventral appendages; anthers opening by a small, introrse pore. Ovary 5-locular, the lower half adnate to the hypanthium; style filiform; stigma punctiform, convex. Fruit an indehiscent capsule; fruiting calyx accrescent, ovate-cylindrical; capsule setose at the apex. Seeds small, cochleate.

Derosiphia tubulosa (Sm.) Raf., Sylva Tellur.: 101. 1838 ≡ *Osbeckia tubulosa* Sm. in Rees, Cycl. 25: *Osbeckia* no. 5. 1813 ≡ *Dissotis tubulosa* (Sm.) Triana in Trans. Linn. Soc. London 28(1): 58. 1872 ('1871') ≡ *Podocaelia tubulosa* (Sm.) A.Fern. & R.Fern. in Estud. Cient. Homenag. J. Carr. da Costa (Trab. Centro Bot. Junta Invest. Ultram. 1(9)): 6. 1962 – Holotype: Sierra-Leone, *Afzelius s.n*. in Herb. Smith (LINN-HS No. 653.5!).

4. ***Dissotis*** Benth. in Hooker, Niger Fl.: 346. 1849, nom. cons. ≡ *Hedusa* Raf., Sylva Tellur.: 101. 1838, nom. rej. – Type: *Dissotis grandiflora* (Sm.) Benth. (≡ *Osbeckia grandiflora* Sm.).

= *Osbeckiastrum* Naudin in Ann. Sci. Nat., Bot., sér. 3, 14: 118. 1850 – Type: *Osbeckiastrum heudelotii* Naudin.

Morphological diagnosis. – *Dissotis* s.str. differs from all other African Melastomateae by the following combination of characters: hypanthia with stipitate-stellate emergences (Fig. 1E) and sepals with stellate emergences at the apex but glabrous on the back (Fig. 1G).

Molecular diagnosis. – *Dissotis* also differs from the other African Melastomateae genera in the following specific nucleotide substitutions: two nrETS nucleotide positions: A/T to G at position 266, A to G at position 286; six nrITS nucleotide substitutions: C to G at position 100, T/C to A at position 130, G/A to T at position 181, C to A at position 194, an indel at position 266–267 (TC to --), T/C to A at position 835; and two *ndhF* nucleotide substitutions: C/A to T at position 427 and T to C at position 536 (summarised in Table 6).

Description. – Perennial herbs or subshrubs, with or without tuberous base, sparingly to densely branched, hispid, hirsute to glabrescent, nodes with prominent long, stiff hairs (Fig. 1H). Leaves persistent, opposite, petiolate to subsessile; lamina elliptic-oblong or lanceolate, margins mostly crenate-serrate (crenules bristle- or cilium-tipped), appressed-setose on both sides, third-order veins prominent on abaxial side only. Flowers pentamerous, in 2–3-flowered terminal cymes or panicles; bracts non-foliaceous, caducous, length > 4 mm (Fig. 1E,G). Hypanthium campanulate, with stipitate-stellate hairs (Fig. 1E,G); sepals with tuft of setae or stellate hairs at apex, early caducous; intersepalar appendages present, linear-subulate (Fig. 1G). Petals mauve, obovate. Stamens 10, dimorphic; pedoconnective with 2 subulate ventral appendages (Fig. 1F,H); anthers opening by a small, introrse pore. Ovary 5-locular, the lower half adnate to the hypanthium; style filiform, with a small setose crown around the style-base; stigma punctiform or simple, convex. Fruit an indehiscent capsule; fruiting calyx non-accrescent; capsule urceolate, 5-valved, tipped with a fascicle of bristles. Seeds small, cochleate.

Dissotis grandiflora (Sm.) Benth. in Hooker, Niger Fl.: 347. 1849 ≡ *Osbeckia grandiflora* Sm. in Rees, Cycl. 25: *Osbeckia* no. 6. 1813 ≡ *Melastoma elongatum* D.Don in Mem. Wern. Nat. Hist. Soc. 4: 291. 1822, nom. illeg., non Vahl 1798 ≡ *Hedusa grandiflora* (Sm.) Raf., Sylva Tellur.: 101. 1838, nom. rej. – Holotype: Sierra Leone, *Afzelius s.n*. in Herb. Smith (LINN-HS No. 653.6!).

= *Osbeckiastrum heudelotii* Naudin in Ann. Sci. Nat., Bot., sér. 3, 14: 119. 1850 – Holotype: Guinea, *Heudelot 773* (P barcode P00412534!; isotype?: K barcode K000313124!).

Dissotis grandiflora var. ***lambii*** (Hutch.) Keay in Kew Bull. 7(4): 545. 1953 ≡ *D. lambii* Hutch. in Bull. Misc. Inform. Kew 1: 230. 1916 – Holotype: Nigeria, Kaduna, *Lamb 58* (K barcode K000313123!).

= *Dissotis kerstingii* Gilg ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 752. 1921, **syn. nov.** – Holotype: Togo, "in den Baumsteppen des mittleren Togo bei Basari" (original material presumably in B and destroyed during WWII) – **Neotype (designated here):** Benin, Zou, Ouessé, Malété (Toui), Inselberg, 14 Jul 2000, *Phillipson & Diabaté 6337* (WAG barcode WAG.1092800!; isoneotypes: MO barcode MO-2721313, WAG barcode WAG.1092801!).

Note. – The description of *Dissotis kerstingii* in the protologue clearly matches that of *D. grandiflora* var. *lambii*. No specimens were cited, and we were unable to locate any of the original material in B or duplicates in other herbaria. We

therefore selected a specimen in WAG as the neotype (with isoneotypes in MO and WAG).

Other included species. – *Dissotis elegans* (Robyns & Lawalrée) A.Fern. & R.Fern., *Dissotis homblei* (De Wild.) A.Fern. & R.Fern., *Dissotis idanreensis* Brenan, *Dissotis lebrunii* (Robyns & Lawalrée) A.Fern. & R.Fern., *Dissotis longisetosa* Gilg & Ledermann ex Engl.

5. ***Eleotis*** Ver.-Lib. & R.D.Stone, **gen. nov.** ≡ *Dissotis* sect. *Sessilifoliae* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 43: 290. 1969 – Type: *Eleotis welwitschii* (Cogn.) Ver.-Lib. & R.D.Stone (≡ *Dissotis welwitschii* Cogn.).

Morphological diagnosis. – *Eleotis* differs from other African Melastomateae by the following combination of characters: perennial herbs, glabrous or glabrescent (Fig. 2E); leaves sessile, glabrous or with sparse simple hairs; hypanthium glabrous or glabrescent, cupulate.

Molecular diagnosis. – *Eleotis* also differs from the other African Melastomateae genera in the following specific nucleotide substitutions: two nrETS nucleotide positions: A to G at position 364, G-G/--- to GAG at positions 607–609; and one *ndhF* nucleotide substitution: T/A to G at position 121 (summarised in Table 6).

Description. – Perennial herbs, glabrous or glabrescent throughout (Fig. 2D). Leaves persistent, opposite, sessile; lamina ovate-lanceolate to oblong-lanceolate, base semi-amplexicaul, third-order veins invisible. Flowers pentamerous, in terminal cymes or lax panicles; bracts non-foliaceous, caducous, length > 4 mm. Hypanthium cupuliform, glabrous or glabrescent; sepals broadly ovate, margins ciliate, caducous; intersepalar appendages present (*E. brazzae*, *E. buraeavii*) or absent (*E. welwitschii*). Petals dark red or purple, obovate (Fig. 2C). Stamens 10, dimorphic; pedoconnective present, with two ventral bilobed or bipartite appendages (Fig. 2C); anthers opening by a small, introrse pore. Ovary 5-locular, adnate to the hypanthium; style filiform, with a small setose crown around the style-base; stigma punctiform or simple, convex. Fruit an indehiscent capsule; fruiting calyx non-accrescent; capsule slightly urceolate. Seeds minute, numerous, cochleate, tuberculate.

Etymology. – *Eleotis* is a feminine noun; the first part of the word comes from the Greek helos, genitive heleos, meaning "marsh"; *otis* means "related to *Dissotis*". It is a reference to the ecology of the four species in this group.

Eleotis anchietae (A.Fern. & R.Fern.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Dissotis anchietae* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 189. 1954 – Holotype: Angola, Benguela, Caconda, *Anchieta 143* (LISU barcode LISU 234092!; isotype: LISU barcode LISU230493!).

Eleotis brazzae (A.Fern. & R.Fern.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Osbeckia brazzae* Cogn. in Candolle & Candolle, Monogr. Phan. 7: 335. 1891 ≡ *Dissotis glaberrima* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 70. 1954 – Holotype: "Terrains humides, bords des marigots Poste dell'Alima-Leketi Afrique Occidentale (Congo et Ogôoué)", *J. de Brazza 47* (P barcode P00412531!; isotype: BR barcode 0000008953650!).

Note. – When transferred to the genus *Dissotis*, the species originally named as *Osbeckia brazzae* Cogn. was renamed as *D. glaberrima* A.Fern. & R.Fern., because the combination *D. brazzae* was already occupied by *D. brazzae* Cogn. (≡ *Dupineta brazzae* (Cogn.) Ver.-Lib. & G.Kadereit). If *Osbeckia brazzae* Cogn. is transferred to *Eleotis*, then *brazzae* is the oldest available epithet and has priority over *glaberrima* (see Art. 11.4 of the *ICN*; Turland & al., 2018). The correct name is thus *E. brazzae*.

Eleotis buraeavii (Cogn.) Ver.-Lib. & R.D.Stone **comb. nov.** ≡ *Osbeckia buraeavii* Cogn. in Candolle & Candolle, Monogr. Phan. 7: 335. 1891 ≡ *Dissotis buraeavii* (Cogn.) A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 70. 1954 – Lectotype (designated by Jacques-Félix in Leroy, Fl. Gabon 25: 20. 1983): Gabon, Franceville, *Thollon 443* (P barcode P05253693!; isolectotype: BR barcode 0000006493912!).

= *Dissotis gilletii* De Wild. in Ann. Mus. Congo Belge, Bot., sér. 5, 1[3]: 298. 1906 ('1905') – **Lectotype (designated here):** D.R. Congo, Bas-Congo, *Gillet 1816* (BR barcode 0000006422783!).

= *Osbeckia pauciramosa* Jacq.-Fél. in Bull. Mus. Natl. Hist. Nat., sér. 2, 8: 368, t. 1. 1935 ≡ *Dissotis buraeavii* var. *pauciramosa* (Jacq.-Fél.) A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 27: 70. 1954 – Holotype: Congo Republic, pays Batéké, de Brazzaville à St. Paul du Nkoué, *Chevalier 27391* (P barcode P05253690!).

Note. – The protologue of *Dissotis gilletii* cited two collections (syntypes), both of which are housed in BR. We thus selected one of these (*Gillet 1816*) as the lectotype. The other syntype is *Oddon 1873* (BR0000006494247!).

Eleotis welwitschii (Cogn.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Dissotis welwitschii* Cogn. in Candolle & Candolle, Monogr. Phan. 7: 371. 1891 – Lectotype (designated by Fernandes & Fernandes in Exell & al., Consp. Fl. Angolensis 4: 150. 1970): Angola, Huíla, Lubango, morro de Lopolo, alt. 1586 m, *Welwitsch 917* (G barcode G00319501!; isolectotypes: BM barcode BM000902395!, BR barcodes 0000016909793! & 0000016909786!, C barcode C10000972!, COI barcode COI00069313!, LD barcode 1215741!, LISU barcodes LISU209423! & LISU209424!, P barcode P00412565!, PRE barcode PRE0341352-0!).

6. ***Feliciotis*** Ver.-Lib. & G.Kadereit, **gen. nov.** ≡ *Dissotis* sect. *Macrocarpae* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 43: 290. 1969 – Type: *Feliciotis speciosa* (Taub.) Ver.-Lib. & G.Kadereit (≡ *Dissotis speciosa* Taub. = *Dissotis macrocarpa* Gilg).

Morphological diagnosis. – *Feliciotis* differs from all other African Melastomateae by the following combination

of characters: leaf-lamina with longitudinal nerves very prominent adaxially and subprominent abaxially, third-order veins not visible, hypanthium with dense silvery-sericeous pubescence.

Molecular diagnosis. – *Feliciotis* also differs from the other African Melastomateae genera in the following specific nucleotide substitutions: one nrETS nucleotide positions: G-/GT/GG/AA/GA to AG at positions 369–370; three nrITS nucleotide substitutions: A/-/C to G at position 109, C/G to T at position 272, T/C to G at position 531; one *ndhF* nucleotide substitution: T/C to A at position 280 (summarised in Table 6).

Description. – Perennial herbs or subshrubs; branches tetragonous, winged or unwinged, pubescent. Leaves persistent, opposite, petiolate (except *F. sessilicordata*); lamina lanceolate, lanceolate-ovate or narrowly oblong, midrib and 1–2 pairs of longitudinal nerves impressed above, prominent below, transverse veins and third-order veins neither raised nor visible, margins entire. Flowers pentamerous, solitary or in 3–5-flowered cymes (panicles in *F. perkinsiae* and *F. chevalieri*; Fig. 1K), surrounded by the uppermost leaves; bracts either leaf-like or scarious or with both foliaceous and scarious bracts present, leaf-like bracts persistent, length > 4 mm, scarious bracts caducous and sericeous outside. Hypanthium campanulate with densely appressed sericeous-villous hairs concealing the scale-like appendages; sepals early caducous, densely appressed-setose externally; intersepalar appendages persistent, oblong-ovate. Petals violet or purple, obovate. Stamens 10, dimorphic, pedoconnective with two ventral bilobed appendages (Fig. 1K), anthers opening by a small, introrse pore. Ovary 5-locular, the lower half adnate to the hypanthium; style filiform, with a small setose crown around the style-base; stigma punctiform or simple, convex. Fruit an indehiscent capsule; fruiting calyx accrescent, globose or subspherical, setose at apex. Seeds small, numerous, cochleate, tuberculate.

Etymology. – The generic name *Feliciotis* is a feminine noun formed by combining *Felicia* and *otis*. The first part of the name commemorates Henri Jacques-Félix (1907–2008), French botanist, who worked at P and made an enormous contribution to our understanding of the Melastomataceae of tropical Africa and Madagascar. The second part of the name is meant to signify the affinity of the new genus with *Dissotis*.

Feliciotis alata (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis alata* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 34: 60. 1960 – Holotype: Burundi, Mosso, Kiofi, marais à *Hyparrhenia*, *Michel 3745* (BR barcode 000008953780!; isotype: COI barcode COI00081464!).

Feliciotis chevalieri (Gilg ex Engl.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis chevalieri* Gilg ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 750. 1921 – Neotype (designated by Jacques-Félix in Bull. Mus. Natl. Hist. Nat., sér. 2, 8(1): 108. 1936): Congo-Brazzaville, Haut Oubangui, Fort de Possel, la Kémo, *Chevalier 5309* (P barcode P05281281!).

Feliciotis cryptantha (Baker) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis cryptantha* Baker in Bull. Misc. Inform. Kew 1894: 345. 1894 – Holotype: Malawi, *Buchanan 625* (K barcode K000313386!; isotype: BM n.v.).

= *Dissotis spectabilis* Gilg in Bot. Jahrb. Syst. 30(3–4): 366. 1901 – Holotype: Tanzania, N. Mt. Rungwe, *Goetze 1138* (B†) – **Lectotype (designated here):** Tanzania, N. Mt. Rungwe, *Goetze 1138* (BM barcode BM000902294!; isolectotype: P barcode P00412525!).

Note. – The protologue of *Dissotis spectabilis* cited the specimen *Goetze 1138*, presumably destroyed during WWII since there was no trace of it in B. However, we were able to locate two duplicates in other herbaria. We thus selected the specimens in BM and P as the lectotype and isolectotype, respectively.

Feliciotis formosa (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis formosa* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 34: 65. 1960 – Holotype: Tanzania, Songea District, Kwamponjore Valley, *Milne-Redhead & Taylor 9924* (K barcode K000313406!; isotypes: COI barcodes COI00081470! & COI00081471!, EA barcode EA000002115!, K barcode K000313405!).

Feliciotis gossweileri (Exell) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis gossweileri* Exell in J. Bot. 67 (Suppl. 1): 178. 1929 – Holotype: Angola, Benguela, Caconda, margens do ribeiro Seculo, *Gossweiler 4308* (BM barcode BM000902291!; isotype: COI barcode COI00005425!).

Feliciotis longisepala (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis longisepala* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 34: 63. 1960 – Holotype: Burundi, Mosso, Kininya, savane à *Hyparrhenia rufa*, *Michel 3315* (BR barcode 000006422790!; isotypes: COI barcode COI00001465!, YANG n.v.).

Feliciotis perkinsiae (Gilg) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis perkinsiae* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 21. 1898 – **Neotype (designated here):** Ghana, Volta Region, Amedzofe – Togo, *De Wit & Morton A2885* (WAG barcode WAG.1934866!).

= *Dissotis schweinfurthii* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 21. 1898 – Syntypes: South Sudan, "Ghasalquellengebiet: Land der Niamniam, in den Steppen bei Isingeria", *Schweinfurth 3194* (B†); D.R. Congo, "Land der Monbuttu, in der Steppe bei Munsa", *Schweinfurth 3445* (B†) – **Neotype (designated here):** D.R. Congo, Gaduma, *Claessens 1521* (BR barcode 0000019002873!; isoneotype: BR barcode 0000019002880!).

= *Dissotis magnifica* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 22. 1898, **syn. nov.** – Holotype: Uganda?, "Centralafrikanisches Seengebiet: Runssoro" [= Rwenzori], Jun 1889, *Grant Stairs 13* (B†) – **Neotype (designated here):** Uganda, upper slopes, Mt Otzi,

W. Nile, 4500–5000 ft., *E.M. Cherry 6* (BR barcode 0000018230048!; isoneotype: K n.v.).

= *Dissotis violacea* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 22. 1898 – Syntypes: D.R. Congo, "Centralafrikanisches Seengebiet: West-Lendu, auf Grashügeln der Abumbi-Ituri-Wasserscheide, auf Laterit, 1300 m ü.M.", *Stühlmann 2674a* (B†); "Walegga-Plateauabfall, 700 m ü. M.", *Stuhlmann 2880* (B†) – **Neotype (designated here):** D.R. Congo, Gugo près Yakoma (Ubangi), *Thonner 248* (BR barcode 0000019002859!; isoneotype: BR barcode 0000019002842!).

= *Dissotis dasytricha* Gilg & Ledermann ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 749. 1921 ('*dasystricha*'), **syn. nov.** – Type: Cameroon, Bambuto Mts., "in den Bambutobergen der sudanischen Parksteppenprovinz" (original material presumably in B and destroyed during WWII) – **Neotype (designated here):** Cameroon, West, 3 km N. of Foumban, along road to Banyo, left bank Nchi, *Leeuwenberg 8888* (WAG barcode WAG.1934925!; isoneotype: BR barcode 0000019002514!).

= *Dissotis vorwerkiana* Gilg & Ledermann ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 752. 1921, **syn. nov.** – Type: Cameroon, "zwischen Mboêda und Sanschu im Kongoagebirge in Kamerun" (original material presumably in B and destroyed during WWII) – **Neotype (designated here):** Cameroon; Littoral; Mbourouko, N. Manengouba Mts., WNW of Nkongsamba, *Leeuwenberg 8604* (K barcode K00050196!; isoneotypes: WAG barcodes WAG.1934929! & WAG.1934930!).

Notes. – The protologue of *Dissotis perkinsiae* cited four collections (syntypes), all housed in B and presumably destroyed during WWII (Ghana, Odomi, *Kling 138*; Togo, häufig an trockenen sonnigen Stellen des Agomegebirges bei Misahöhe [Missahohé], *Baumann 320*; Togo, Bismarcksburg, in den Grassteppen bei der Station, *Büttner 211 & 385*). We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Ghana housed in WAG as the neotype.

The protologue of *Dissotis schweinfurthii* cited two collections (syntypes) housed in B, both of which were presumably destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected two specimens from D.R. Congo and housed in BR as the neotype and isoneotype, respectively.

The description of *Dissotis magnifica* in the protologue clearly matches that of *D. perkinsiae* also known from the same locality. The protologue cited the collection *Grant Stairs 13* in herb. Schweinfurth, presumably deposited in B and later destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Uganda and housed in BR as the neotype.

The protologue of *Dissotis violacea* cited two collections (syntypes) housed in B, both of which were presumably destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected two specimens from D.R. Congo and housed in BR as the neotype and isoneotype, respectively.

The description of *Dissotis dasytricha* in the protologue clearly matches that of *D. perkinsiae* also known from the same locality. No specimens were cited, and we were unable to locate any of the original material in B or duplicates in other herbaria. We thus selected specimens in WAG and BR as the neotype and isoneotype, respectively.

The description of *Dissotis vorwerkiana* in the protologue clearly matches that of *D. perkinsiae* also known from the same locality in Cameroon. No specimens were cited, and we were unable to locate any of the original material in B or duplicates in other herbaria. We thus selected a specimen housed in K as the neotype and two in WAG as isoneotypes.

Feliciotis pterocaulos (Wickens) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis pterocaulos* Wickens in Kew Bull. 29(1): 146. 1974 – Holotype: Tanzania, Buha District, 48 km Uvinza–Kasulu, *Verdcourt 3427* (K barcode K000313407!; isotype: EA barcodes EA000002114! & EA000002123!).

Feliciotis ruandensis (Engl.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis ruandensis* Engl. in Engler & Drude, Veg. Erde 9(3,2): 750. 1921 – Neotype (designated by Fernandes & Fernandes in Bol. Soc. Brot., sér. 2, 34: 62. 1960): Rwanda, Mile 94 Astrida-Usumbura Road, on steep, grassy banks alt. 2100–2400 m, 15 May 1959, *Lind 2539* (BR barcode 0000006423193!; isoneotype: COI barcode COI00081466!).

Note. – The original material was presumably in B and destroyed during WWII. No specimens were cited in the protologue, but the type locality was described as "zwischen Kiwu und dem Rugegewald, sowie oberhalb Usumbura um 1600–1800 m".

Feliciotis sessilicordata (Wickens) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis sessilicordata* Wickens in Kew Bull. 29(1): 146. 1974 ('*sessili-cordata*') – Holotype: Tanzania, Mpanda District, Kabungu, alt. ± 2500 m, *Semsei 111* in F.H. 2542 (K barcode K000313057; isotypes: EA n.v., K barcode K000313056!).

Feliciotis simonis-jamesii (Buscal. & Muschl.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis simonis-jamesii* Buscal. & Muschl. in Bot. Jahrb. Syst. 49: 481. 1913 – Holotype: Zambia, Northern Prov., Lake Bangweulu, *von Aosta 927* (B†) – **Neotype (designated here):** Zambia, Abercorn District, *Burtt 6268* (BR barcode 0000019003832!; isoneotype: K n.v.).

= *Dissotis degasparisiana* Buscal. & Muschl. in Bot. Jahrb. Syst. 49: 480. 1913 ('*De Gasparisiana*') – Holotype: Zambia, Northern Prov., Lake Bangweulu, *von Aosta 1135* (B†) – **Neotype (designated here):** Zambia, Lake Chila in open, *Richards 4937* (BR barcode 0000013189334!; isoneotype: K n.v.).

Notes. – The protologue of *Dissotis simonis-jamesii* cited the collection *von Aosta 927*, presumably housed in B and later destroyed during WWII. We were also unable to locate

any duplicates in other herbaria. We thus selected a specimen from Zambia and housed in BR as the neotype.

The protologue of *Dissotis degasparisiana* cited the collection *von Aosta 1135*, presumably housed in B and later destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Zambia and housed in BR as the neotype.

Feliciotis speciosa (Taub.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis speciosa* Taub. in Engler, Pflanzenw. Ost-Afrikas C: 295. 1895 – Holotype: Uganda, Menjo [Mengo], *Stuhlmann 1335* (B†) – **Neotype (designated here):** Uganda, Masaka District, 2 miles west of Katera, *Drummond & Hemsley 4614* (BR barcode 0000020420598!; isoneotype: K n.v.).

= *Dissotis macrocarpa* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 18. 1898 – Holotype: Uganda, Masaka District, "Massaihoehland(?): bei Buddu häufig", *Scott-Elliot 7480* (B†) – **Lectotype (designated here):** Uganda, Buddu, common near water, *Scott-Elliot 7480* (K barcode K000313050!).

= *Dissotis helenae* Buscal. & Muschl. in Bot. Jahrb. Syst. 49: 479. 1913 – Holotype: Zambia, Northern Prov., between Lakes Bangweulu and Tanganyika, *von Aosta 1346* (B†) – **Neotype (designated here):** Tanzania, T4. Mpanda Distr, 10 km on Mpanda – Inyonga road, *Bidgood & al. 3953* (BR barcode 0000019003924!; isoneotypes: K n.v., P barcode P05222536!).

= *Dissotis emanueli* Buscal. & Muschl. in Bot. Jahrb. Syst. 49: 482. 1913, **syn. nov.** – Holotype: Rwanda, "Bergsteppe, Ruanda, 1100 m ü. M.", *von Aosta 1224* (B†) – **Neotype (designated here):** D.R. Congo, s. loc., *Lejeune 35* (BR barcode 0000018229998!; isoneotype: BR barcode 0000018229981!).

= *Dissotis mirabilis* Bullock in Bull. Misc. Inform. Kew 1931: 99. 1931 – Holotype: Uganda, Masaka District, Katera, Minziro Forest, *Brasnett 22* (K barcode K000313048!; isotype: K barcode K000313049!).

Notes. – The protologue of *Dissotis speciosa* cited the collection *Stuhlmann 1335*, presumably housed in B and later destroyed during WWII. since there was no trace of it in B. We were also unable to locate any duplicates in other herbaria. As such, we selected a specimen from Uganda and housed in BR as the neotype.

The protologue of *Dissotis macrocarpa* cited the specimen *Scott-Elliot 7480*, housed in B and presumably destroyed during WWII. We were able to locate a duplicate in K and have selected it as the lectotype.

The protologue of *Dissotis helenae* cited the collection *von Aosta 1346*, presumably housed in B and later destroyed during WWII. We were also unable to locate any duplicates in other herbaria. As such, we selected a specimen from Tanzania and housed in BR as the neotype, with duplicates in K and P as isoneotypes.

The description of *Dissotis emanueli* in the protologue clearly matches that of *D. speciosa* also known from the same locality. The protologue cited the collection *von Aosta 1224*, presumably housed in B and later destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected two specimens from D.R. Congo and housed in BR as the neotype and isoneotype, respectively.

7. ***Nerophila*** Naudin in Ann. Sci. Nat., Bot., sér. 3, 14: 119. 1850 – Type: *Nerophila gentianoides* Naudin (≡ *Chaetolepis gentianoides* (Naudin) Jacq.-Fél.).

= *Rhodosepala* Baker in J. Linn. Soc., Bot. 22: 475. 1887 – Type: *Rhodosepala pauciflora* Baker.

= *Dissotis* sect. *Senegambia* Jacq.-Fél. in Adansonia, sér. 2, 20(4): 425. 1981 – Type: *Dissotis senegambiensis* (Guill. & Perr.) Triana.

Morphological diagnosis. – *Nerophila* differs from all other African Melastomateae by the following combination of characters: plants with dense hispid, strigose or pilose pubescence (Fig. 2H–O), flowers tetra- or pentamerous, solitary or arranged in few-flowered cymes or panicles (Fig. 2H–O), hypanthium campanulate-urceolate with indumentum pilose, sepals with ciliate margins, pedoconnective and staminal appendages absent or rudimentary (Fig. 2I,J,L,N).

Molecular diagnosis. – *Nerophila* also differs from the other African Melastomateae genera in the following specific nucleotide substitutions: three nrETS nucleotide positions: A to T at positions 213/646, C to A at position 434, G to C at position 564; one nrITS nucleotide substitution: G/T to C at positions 138 (summarised in Table 6).

Description. – Annual or perennial herbs (Fig. 2H–O); stems and branchlets tetragonous or terete, winged or unwinged with densely hirsute or setose hairs. Leaves opposite, subsessile to shortly petiolate; lamina ovate, linear-lanceolate, oblong or lanceolate, midrib and 1–2 pairs of basal longitudinal nerves impressed above, slightly raised beneath, pubescence appressed-setose to pilose. Flowers tetra- or pentamerous, in terminal and/or axillary cymes or panicles (Fig. 2H–O); bracts foliaceous or scarious, caducous, length < 4 mm. Hypanthium campanulate, ovoid-urceolate, indumentum pilose to setose or stellate-setose (Fig. 2H–O); sepals persistent or tardily caducous, triangular, lanceolate-oblong, margins ciliate; intersepalar appendages present, linear or subulate. Petals yellow or pinkish to purple, obovate. Stamens 8 or 10, isomorphic (rarely subequal); anthers recurved towards the apex, spiral, linear or falcate, pedoconnective absent or shortly produced, ventral appendages absent or rudimentary (a very short 2-lobed appendage produced at the base); anthers opening by a small, introrse pore. Ovary 4- or 5-locular, the lower half adnate to the hypanthium; style filiform, with a small setose crown around the style-base; stigma punctiform or simple, convex. Fruit an indehiscent capsule; fruiting calyx accrescent or non-accrescent; capsule ovoid to urceolate, pilose. Seeds small, numerous, cochleate.

Nerophila clandestina (Jacq.-Fél.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Antherotoma clandestina* Jacq.-Fél. in Adansonia, sér. 2, 11(3): 545. 1971 – Holotype: Cameroon:

Ngaoundéré, pente supérieure du Nganha (1600–1950 m), sur rochers humides, *Jacques-Félix 8672* (P barcode P00412519!; isotypes: P barcode P00412520!, YA barcode YA0031842!).

Nerophila congolensis (Cogn.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Osbeckia congolensis* Cogn. in Verh. Bot. Vereins Prov. Brandenburg 31: 95. 1889 ≡ *Dissotis congolensis* (Cogn.) Jacq.-Fél. in Adansonia, sér. 2, 20(4): 424. 1981 – Holotype: D.R. Congo, Kibaka, *Büttner 24* (B†) – **Neotype (designated here)**: D.R. Congo, *Dewèvre 527* (BR barcode 0000006493394!; isoneotypes: BR barcodes 0000006493721! & 0000017290326!).

= *Osbeckia congolensis* var. *robustior* Cogn. in Verh. Bot. Vereins Prov. Brandenburg 31: 95. 1889 – Holotype: "Ad flumen Congo prope Bolobo et Lukolela", *Büttner 25* (B†) – **Lectotype (designated here):** D.R. Congo, ad Bolobo et Lukolela, *Büttner 25* (BR barcode 0000006494377!).

= *Osbeckia albiflora* Cogn. ex De Wild. & T.Durand in Ann. Mus. Congo Belge, Bot., sér. 2, 1(1): 21. 1899, **syn. nov.** – Holotype: D.R. Congo, *Dewèvre 1070a* (BR barcode 0000008952202!; isotype: BR barcode 0000008952530!).

= *Osbeckia pusilla* De Wild., Pl. Bequaert. 1: 377. 1922, nom. illeg., non Zoll. & Moritzi (1845), **syn. nov.** – Holotype: D.R. Congo, *Bequaert 7585* (BR barcode 0000008954190!).

Notes. – The protologue cited the collection *Büttner 24*, presumably housed in B and later destroyed during WWII. We were unable to locate any duplicates in other herbaria. We thus selected a specimen from D.R. Congo housed in BR as the neotype.

The collection cited in the protologue of *Osbeckia congolensis* var. *robustior* was presumably housed in B and later destroyed during WWII. We located a duplicate in BR and have selected it as the lectotype.

Studying the morphology of the type specimens of *O. albiflora* and *O. pusilla* housed in BR, it is clear that these two poorly collected species should be treated as synonyms of *N. congolensis*.

Nerophila decandra (Sm.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Osbeckia zeylanica* var. *decandra* Sm. in Rees, Cycl. 25: *Osbeckia* no. 2. 1813 ≡ *Osbeckia decandra* (Sm.) DC., Prodr. 3: 143. 1828 ≡ *Antherotoma afzelii* Hook.f. in Oliver, Fl. Trop. Afr. 2: 444. 1871 ≡ *Dissotis decandra* (Sm.) Triana in Trans. Linn. Soc. London 28(1): 58. 1872 ('1871') ≡ *Osbeckia afzelii* (Hook.f.) Cogn. in Candolle & Candolle, Monogr. Phan. 7: 330. 1891 ≡ *Antherotoma decandra* (Sm.) A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 70. 1954 – Type: Sierra Leone, *Afzelius s.n*. in Herb. Smith (LINN-HS No. 653.2, sub *Osbeckia zeylanica*).

Note. – Keay (1952: 164) noted there is another specimen in BM, collected by Afzelius in Sierra Leone, labelled and initialled by Robert Brown as "*Osbeckia zeylanica* var. Sm. in Rees Cyclop., sed sp. distincta". This he considered to be authentic *Osbeckia decandra*, although we have not seen the specimen. Another Afzelius specimen was kept in B (fide Gilg, 1898: 6, sub *O. afzelii*) but was presumably destroyed during WWII; it nevertheless served as the basis for the illustration in Gilg (1898: pl. 1C).

Nerophila gentianoides Naudin in Ann. Sci. Nat., Bot., sér. 3, 14: 120. 1850 ≡ *Chaetolepis gentianoides* (Naudin) Jacq.-Fél. in Bull. Mus. Natl. Hist. Nat., B, Adansonia, sér. 4, 16(2–4): 272. 1995 ('1994') – Holotype: Senegal, marécages le long des rivières de la Sénégambie, *Heudelot 668* (P barcode P00412501!; isotypes: CAS barcode 0003625!, K barcode K000312783!, P barcodes P00412502! & P00412503!).

Nerophila pauciflora (Baker) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Rhodosepala pauciflora* Baker in J. Linn. Soc., Bot. 22: 475. 1887 ≡ *Dichaetanthera pauciflora* Drake in Grandidier, Hist. Phys. Madagascar 35 [Plantes 5, Atlas 3]: pl. 382. 1897 ≡ *Dissotis senegambiensis* sensu Jacq.-Fél. in Adansonia, sér. 2, 17(1): 77. 1977, non (Guill. & Perr.) Triana 1872 ≡ *Dissotis pauciflora* (Baker) Jacq.-Fél. in Bull. Mus. Natl. Hist. Nat., B, Adansonia, sér. 4, 16(2–4): 271. 1995 ('1994') – Holotype: Madagascar, Central Madagascar, *Baron 4909* (K barcode K000312761!; isotype: P barcode P00412682!).

= *Rhodosepala procumbens* Cogn. in Candolle & Candolle, Monogr. Phan. 7: 339. 1891 – **Lectotype (designated here):** Madagascar, environs de Tananarivo, *Goudot 2532* (G barcode G00301953!).

= *Rhodosepala erecta* Cogn. in Candolle & Candolle, Monogr. Phan. 7: 339. 1891 ≡ *Dissotis hildebrandtii* Kraenzl. in Vierteljahrsschr. Naturf. Ges. Zürich 76(3–4): 151. 1931 – Holotype: Madagascar, Flora von Central-Madagascar, Betsiléo, Nandahizana, *Hildebrandt 3903* (G barcode G00319433!; isotypes: K barcode K000312757!, M barcode M-0105935!, Z barcode Z-000015166!).

Note. – The protologue of *Rhodosepala procumbens* cited a *Goudot* collection in the Delessert Herbarium (which after Delessert's death was moved and incorporated into G in 1869). We found three *Goudot* collections of *R. procumbens* in G, all of them annotated by Cogniaux and to be regarded as syntypes. We have chosen *Goudot 2532* as the lectotype and the additional syntypes are *Goudot 2541* (G00301955!), *Goudot 2553* (G00301954!) and *Goudot s.n*. (BR0000006247447!).

Nerophila praviantha (Jacq.-Fél.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Osbeckia praviantha* Jacq.-Fél. in Bull. Inst. Franç. Afrique Noire 15: 973. 1953 – Holotype: Guinea-Conakry, Macenta, pelouse des croupes granitiques, *Jacques-Félix 1238* (P barcode P00412496!; isotypes: P barcodes P00412497! & P00412498!).

Nerophila senegambiensis (Guill. & Perr.) Ver.-Lib. & R.D. Stone, **comb. nov.** ≡ *Osbeckia senegambiensis* Guill. & Perr. in Guillemin & al., Fl. Seneg. Tent. 1: 310.

1833 ≡ *Dissotis senegambiensis* (Guill. & Perr.) Triana in Trans. Linn. Soc. London 28(1): 58. 1872 ('1871') ≡ *Antherotoma senegambiensis* (Guill. & Perr.) Jacq.-Fél. in Bull. Mus. Natl. Hist. Nat., B, Adansonia, sér. 4, 16(2–4): 270. 1995 ('1994') – Type: Senegal, Mboro, May 1826, *Leprieur s.n*. (P barcode P00412552!).

= *Osbeckia abyssinica* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 8. 1898 ≡ *Dissotis irvingiana* var. *irvingiana* f. *abyssinica* (Gilg) A.Fern. & R.Fern. in Garcia de Orta 2: 179. 1954 – Holotype: Ethiopia, Begemder, Carruta, *Schimper 1437* (B†) – **Lectotype (designated here):** *Schimper 1437* (PRE barcode PRE0601729-0!; isolectotype: E barcode E00505194!).

= *Osbeckia calotricha* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 8. 1898 – Holotype: Uganda or South Sudan, Madi, between Fort Fatiko [Patiko] and Ismailia, *Baker 201* (B†) – **Neotype (designated here):** Chad, territoire du Chari, Dar Banda, Kaga Djé, *Chevalier 6663* (P barcode P00412554!).

= *Osbeckia saxicola* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 7. 1898 – **Lectotype (designated here):** South Sudan, Land der Djur [Jur], Seriba Ghattas, *Schweinfurth 1494b* (K barcode K000313084!; isolectotypes: BR barcode 0000006493578!, K barcode K000313085!).

= *Osbeckia crepiniana* Cogn. in Ann. Mus. Congo Belge, Bot., sér.1, 1(1): 23, t. 12, fig. 10 & 11. 1898 – Holotype: D.R. Congo, Bas-Congo, Zambi, *Dewévre 208* (BR barcode 0000006423124!).

= *Osbeckia cogniauxiana* De Wild., Pl. Bequaert. 1: 374. 1922 – Holotype: D.R. Congo, Angi, steppe à *Andropogon*, s.d., *Bequaert 5793* (BR barcode 0000008953865!).

= *Dissotis kaessneriana* Kraenzl. in Viertjahrsschr. Naturf. Ges. Zürich 76(3–4): 151. 1931 ('*kassneriana*') – Holotype: Kenya, Kitui District, Galunka, *Kässner 861* (Z barcode Z-000015023!; isotype: K barcode K000313061!).

Notes. – The protologue of *Osbeckia abyssinica* cited the collection *Schimper 1437*, housed in B and presumably destroyed during WWII. Fortunately, we were able to locate two duplicates of the same field collection in other herbaria. We thus selected the specimens in PRE and E as the lectotype and isolectotype, respectively.

The protologue of *Osbeckia calotricha* cited the collection *Baker 201* in herb. Schweinfurth, presumably deposited in B and later destroyed during WWII. The type locality of *O. calotricha* is very imprecise, being somewhere between Fort Fatiko [Patiko] in Uganda and the city of Ismailia in Egypt. The type collection was most likely made in the area occupied by the Madi people in northern Uganda or the adjacent part of South Sudan. We thus selected a specimen from Chad and housed in P as the neotype.

The protologue of *Osbeckia saxicola* cited seven specimens (syntypes), all housed in B and presumably destroyed during WWII. Fortunately, for some of these collections we were able to find duplicates in other herbaria. We thus selected *Schweinfurth 1494b* (specimen in K) as the lectotype, with other duplicates in BR and K as isolectotypes. The remaining syntypes are as follows: South Sudan, "Ghasalquellengebiet: Land der Niamniam, auf dem Granitfelsen Nambia, östlich vom Bache Kischi", *Schweinfurth 3764* (B†; K000313082!); South Sudan, "Land der Djur [Jur], bei der grossen Seriba Ghattas, in der Steppe", *Schweinfurth 1494a*, *1994* & *1970* (B†), *Schweinfurth 1494* (B†; K000313080!, P00412553!); South Sudan, "Land der Mittu, Mvolo", *Schweinfurth Ser. III. n. 128* (B†); South Sudan, "am Wege zu Ngamas Dorf, *Schweinfurth Ser. III. n. 129* (B†).

Nerophila togoensis (Leuenb.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Osbeckia togoensis* Leuenb. in Willdenowia 10(1): 23. 1980 – Holotype: Togo, Mitteltogo, Alédjo, felsiges Gelände um das Campement, *Ern & al. 781* (B barcode B 10 0159363!; isotypes: K barcode K000312782!, P barcode P05264401!).

8. ***Pyrotis*** Ver.-Lib. & R.D.Stone, **gen. nov.** – Type: *Pyrotis gilgiana* (De Wild.) Ver.-Lib. & R.D.Stone (≡ *Dissotis gilgiana* De Wild.).

Morphological diagnosis. – *Pyrotis* differs from all other African Melastomateae by the following characters: perennial herbs with numerous stems arising from a woody rootstock (tuber-like structure); leaf-margin crenulate, each tooth ending in a falcate bristle; leaf-base attenuate with an indistinct or contracted petiole; flowers penta- to hexa- (hepta-)merous; hypanthium with appressed-setose pubescence.

Molecular diagnosis. – *Pyrotis* also differs from the other African Melastomateae genera in the following specific nucleotide substitutions: four nrETS nucleotide positions: C/A/G to T at position 243, insertion AGG (three bases) absent from the rest at positions 350–352, GA to GG at positions 369–370, G to A at position 403; two nrITS nucleotide substitutions: -/G to T at position 563, G/C to T at position 576; one *psbK-psbL* nucleotide substitution: AG to TC at positions 43–44; and two *ndhF* nucleotide substitutions: G/C to T at position 298, A to T at position 591 (summarised in Table 6).

Description. – Perennial herb up to 45 cm tall (usually shorter) with numerous stems forming a dense clump arising from a woody rootstock (tuber-like); stems upright, simple or few-branched, distinctly tetragonous, green, sparsely setose with short bristles, bulbous at the base. Leaves sparse, opposite; lamina linear to elliptic, ovate or subcircular, attenuate at the base into an indistinct petiole or contracted into a petiole up to 8 mm long, margins crenulate, each tooth ending in a falcate bristle. Flowers penta- to hexa- (hepta-)merous, in 3-flowered cymes (rarely solitary); bracts non-foliaceous, lanceolate, scarious, length > 4 mm, tardily caducous. Hypanthium subhemispherical or subcampanulate, appressed-setose (bristles sparse to somewhat dense, short, whitish); sepals oblong-lanceolate, obtuse or acute, red, dorsally appressed-setose, ciliate at margin, caducous; intersepalar appendages present, shortly triangular, bristle-tipped. Petals pale mauve to bright pink, obovate. Stamens 10–12 (rarely 14), slightly dimorphic; pedoconnective

present with 2 basal ventral bilobed appendages; anthers opening by a small, introrse pore. Ovary 5- or 6-locular, the lower half adnate to the hypanthium; style filiform, with a small setose crown around the style-base; stigma punctiform or simple, convex. Fruiting hypanthium subhemispherical. Fruit an indehiscent capsule; fruiting calyx non-accrescent; capsule slightly shorter than the receptacle, spherical. Seeds minute, numerous, cochleate.

Etymology. – The generic name *Pyrotis* is a feminine noun combining the Greek words *pyr*, genitive *pyros*, meaning "fire" and *otis*, "allied with *Dissotis*". It is a reference to the fact that this species is able to withstand grassland fires and resprout because of its tuber-like, woody underground rootstock.

Pyrotis gilgiana (De Wild.) Ver.-Lib. & R.D.Stone, **comb. nov.** ≡ *Dissotis gilgiana* De Wild. in Ann. Mus. Congo Belge, Bot., sér. 4, 1(3): 217. 1903 – Holotype: D.R. Congo, Haut-Plateau au Katanga, 1600 m, *Verdick s.n*. (BR barcode 0000006493776!).

= *Dissotis wildemaniana* Gilg ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 749. 1921 ('*wildemanniana*') – Holotype: D.R. Congo, "im oberen Katanga um 1600 m" (original material in B and presumably destroyed during WWII) – **Lectotype (designated here):** D.R. Congo, Katanga, vallée de la Lufira, Sep 1911, *Hock s.n*. (BR barcode 0000013425838!).

Note. – The name *Dissotis wildemaniana* first appeared in the "Études sur la flore du Katanga*"* (De Wildeman, 1913), without description but citing a *Hock* specimen housed in B. The name was later validated by Engler (1921) but without citing any collections. The above-cited duplicate in BR bears the name *D. wildemaniana* on the original label and seems in all respects to be an appropriate choice for the lectotype.

Pyrotis gilgiana var. ***petiolata*** (De Wild.) Ver.-Lib. & R.D. Stone, **comb. nov.** ≡ *Dissotis gilgiana* var. *petiolata* De Wild. in Ann. Mus. Congo Belge, Bot., sér. 4, 1(3): 218. 1903 – Holotype: D.R. Congo, Katanga, Lukafu, *Verdick 113* (BR barcode 0000006493448!).

Pyrotis gilgiana var. ***witteana*** (Jacq.-Fél.) Ver.-Lib. & R.D. Stone, **comb. nov.** ≡ *Dissotis gilgiana* var. *witteana* Jacq.-Fél. in Bull. Jard. Bot. Natl. Belg. 44: 166. 1974 – Holotype: D.R. Congo, District du Bas-Katanga, Parc national de l'Upemba, vers la rivière Luanana, 1400 m d'altitude, en forêt claire, *de Witte 3065* (BR barcode 0000006494469!).

9. ***Rosettea*** Ver.-Lib. & G.Kadereit, **gen. nov.** ≡ *Dissotis* sect. *Squamulosae* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 43: 291. 1969 – Type: *Rosettea longicaudata* (Cogn.) Ver.-Lib. & G.Kadereit (≡ *Dissotis longicaudata* Cogn.).

Morphological diagnosis. – *Rosettea* differs from all other African Melastomateae by the following characters: shrubs with densely scurfy to glabrous stems; leaves 2–3 from each node, with longitudinal nerves and third-order veins very prominent on both adaxial and abaxial surfaces; hypanthium with squamulose or pectinate-ciliate pubescence (Fig. 1I).

Molecular diagnosis. – *Rosettea* also differs from the other African Melastomateae genera in the following specific nucleotide substitutions: nine nrETS nucleotide positions: G to T at position 159, A/T to G at position 282, CG/AA/CA to GG at positions 321–322, C to A/G at position 365, T/A to G at position 424, A/T to C at position 488, A to T at position 494, C/G to A at position 575, A to C at position 629; three nrITS nucleotide substitutions: T to C at position 40, A to T at position 49, G/A to T at position 91; five *psbK-psbL* nucleotide substitutions: A to C at positions 25/126, C to G at position 177, -/T to G at position 191, G to A at positions 502; and five *ndhF* nucleotide substitutions: an insertion of TTCGTTATTATTATCACCAAATAGTAATGAAAA (33 bases), deleted from the other the genera at positions 136–168, T to G at position 199, A to C at position 249, G to A at position 371, G to C at position 478 (summarised in Table 6).

Description. – Subshrubs or shrubs, branches tetragonous or terete. Leaves evergreen, opposite or whorled in threes, petiolate; lamina ovate, lanceolate, ovate-lanceolate, oblong or oblong-lanceolate, margin entire, crenulate, dentate or serrate, midrib and 2–3(4–5) pairs of basal longitudinal nerves impressed above, prominent beneath, third-order veins prominent on both surfaces. Flowers pentamerous, in 3–4-flowered cymes aggregated into terminal panicles (Figs. 1I, 2B); bracts non-foliaceous, caducous, length > 4 mm (Fig. 2A). Hypanthium cylindrical, campanulate or urceolate; pubescence variable (setulose, pectinate-setose, capitate, penicillate, squamose, sericeous, echinulate, fascicled silky bristles); sepals dorsally scaly or appressed-setose, caducous; intersepalar appendages similar to the upper appendages of the hypanthium, but larger. Petals violet to purple, obcordiform or obovate, margin minutely ciliate. Stamens 10, markedly dimorphic (Fig. 1I) except in *R. thollonii* having slightly unequal stamens (Fig. 2A,B); pedoconnective arched with bilobed or bifid ventral appendages at the base, a small dorsal appendage sometimes also present; anthers opening by a small, introrse pore. Ovary 5-locular, adnate to the hypanthium; style filiform, with a small setose crown around the style-base; stigma punctiform or simple, convex. Fruit an indehiscent capsule; fruiting calyx non-accrescent or accrescent; capsule urceolate or ovoid, with setose apex not exserted. Seeds small, numerous, cochleate, tuberculate.

Etymology. – The name *Rosettea* is a feminine noun commemorating the Portuguese botanist Rosette Batarda Fernandes (1916–2005), who worked at COI and together with her husband Abílio Fernandes made a huge contribution to the taxonomy of African Melastomataceae.

Rosettea aquatica (De Wild.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis aquatica* De Wild. in Ann. Mus. Congo Belge, Bot. sér. 4, 1(3): 217. 1903 – Holotype: D.R. Congo, haut plateau du Katanga, bords des eaux, Aug 1900, *Verdick s.n*. (BR barcode 0000006422868!).

= *Dissotis romiana* De Wild., Comp. Kasai: 375. 1910 – Holotype: D.R. Congo, Dilolo, Jun 1908, *Sapin s.n.* (BR barcode 0000006423186!; isotype: BR barcode 0000006423513!).
= *Dissotis hockii* De Wild. in Repert. Spec. Nov. Regni Veg. 11: 518. 1913 – Holotype: D.R. Congo, "Ober-Katanga: Katentania", Oct. 1911, *Hock s.n.* (BR barcode 0000006422851!).

Rosettea benguellensis (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis benguellensis* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 195, t. 15. 1954 – Holotype: Angola, Huambo, Serra de Moco, prope rio Viana, afluente do Cubal, alt. 1800 m, *Gossweiler 12293* (COI barcode COI0005453!; isotypes: BM n.v., LISC barcodes LISC 002405!, LISC 002803! & LISC 002804!).

Rosettea benguellensis var. ***parviflora*** (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis benguellensis* var. *parviflora* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 197, t. 16. 1954 – Holotype: Angola, Benguela, Caála, entre Robert Williams e Calenga, *Exell & Mendonça 3051* (COI barcode COI00005454!; isotypes: BM barcode BM000902301!, LISC barcodes LISC 002806! & LISC 002808!).

Rosettea carrissoi (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis carrissoi* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 193, t. 14. 1954 – Holotype: Angola, Cuanza Sul, inter Bimbe et Sanga, alt. 1300 m, *Exell & Mendonça 3071* (COI barcode COI00005414!; isotypes: BM barcode BM000902298!, K barcode K00313366!, LISC barcode LISC 002810!).

Rosettea castroi (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis castroi* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 200, t. 22. 1954 – Holotype: Angola, Huambo, Sacaála, prope Nova Lisboa, *Castro 36* (COI barcode COI00005415!; isotype: COI barcode COI00005416!).

Rosettea cordifolia (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis cordifolia* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 187, t. 8. 1954 – Holotype: Angola, Lunda Sul, Saurimo, Vila Henrique de Carvalho, alt. 1100 m, *Exell & Mendonça 567* (COI barcode COI00005420!; isotypes: BM barcode BM000902296!, LISC barcode LISC 002811!).

Rosettea crenulata (Cogn.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis crenulata* Cogn. in Candolle & Candolle, Monogr. Phan. 7: 376. 1891 – Holotype: Angola, Huíla, Lubango, morro de Lopolo, alt. 1159–1677 m, *Welwitsch 916* (G barcode G00319506!; isotypes: BM barcode BM0000902295!, BR barcode 0000006494056!, COI barcode COI00069337!, K barcode K000313357!, LISU barcode LISU209429!, M barcode M-0105938!, P barcode P00412524!, PRE barcode PRE0341345-0!).

Rosettea denticulata (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis denticulata* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 29: 57, t. 11. 1955 – Holotype: Zambia, Shiwa Ngandu, alt. 1554 m, *Greenway 5765* (PRE barcode PRE0341347-0!; isotypes: EA barcode EA000002109!, K barcode K000313369!).

Rosettea echinata (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis echinata* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 199, t. 20. 1954 – Holotype: Angola, Huambo, Caála, Lépi, alt. 1700 m, *Gossweiler 12149* (COI barcode COI00005423!; isotypes: LISC barcodes LISC 002814!, LISC 002406! & LISC 002816!).

Rosettea elliotii (Gilg) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis elliotii* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 19. 1898 ≡ *Dissotis thollonii* var. *elliotii* (Gilg) Jacq.-Fél. in Satabié & Leroy, Fl. Cameroun 24: 28. 1983 – Holotype: Sierra Leone, Kukuna road, *Scott-Elliot 4513* (B†) – **Lectotype (designated here):** Sierra Leone, *Scott-Elliot 4513* (K barcode K000313140!).
= *Dissotis conraui* Gilg ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 752. 1921, **syn. nov.** – Type: Cameroon, "im Grasland von Bali im nördlichen Kamerun" (original material presumably in B and destroyed during WWII) – **Neotype (designated here):** Cameroon, km 18 Bamenda-Mbouda Road = 10 km Santa-Bamenda, *Leeuwenberg 9350* (BR barcode 0000015899149!; isoneotypes: UPS No. V-681058!, WAG barcodes WAG.1092544! & WAG.1092545!).

Notes. – The protologue of *Dissotis elliotii* cited the specimen *Scott-Elliot 4513*, housed in B and presumably destroyed during WWII. We were able to locate a duplicate in K and have selected it as the lectotype.

No specimens were cited in the protologue of *Dissotis conraui*, and we were unable to locate any of the original material in B or duplicates in other herbaria. We thus selected a specimen from Cameroon housed in BR as the neotype (with isoneotypes in UPS and WAG).

Rosettea falcipila (Gilg) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis falcipila* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 23, t. 3A. 1898 – Holotype: "Oberes Congogebiet: Baschilange, Mussumba des Muata Jamwo, 8½° s. Br.", *Pogge 132* (B†) – **Neotype (designated here):** Zambia, Kitwe, *Fanshawe 9810* (BR barcode 00000134266286!; isoneotypes: K n.v., P barcode P05281358!).
= *Dissotis verdickii* De Wild. in Ann. Mus. Congo Belge, Bot., sér. 4, 1(3): 218. 1903 – **Lectotype (designated here):** D.R. Congo, Haut plateau du Katanga, Aug. 1900, *Verdick s.n.* (BR barcode 0000006494407!).
= *Dissotis angusii* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 30: 178, t. 14. 1956 – Holotype: Zambia, Mansa Distr.,

Samfya, near Lake Bangweulu, *Angus 292* (COI barcode COI00081468!; isotypes: BR barcode 0000006494131!, FHO n.v., K barcode K000313372!)

Notes. – The protologue of *Dissotis falcipila* cited the specimen *Pogge 132*, housed in B and presumably destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Zambia and housed in BR as the neotype (with isoneotypes in K and P).

The protologue of *Dissotis verdickii* cited two collections (syntypes), both of which are housed in BR. We thus selected one of these (*Verdick s.n*. in Aug 1900) as the lectotype. The additional syntype is from D.R. Congo, Lufaka, *Verdick 621b* (BR0000013426149!).

Rosettea longicaudata (Cogn.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis longicaudata* Cogn. in Candolle & Candolle, Monogr. Phan. 7: 373. 1891 – Holotype: Angola, Huíla, Lubango, morro de Lopolo, alt. 1159–1677 m, *Welwitsch 915* (G barcode G00319502!; isotypes: BM barcode BM000902403!, BR barcode 0000006494162!, C barcode C10000971!, K barcode K000313394!, LISU barcode LISU209425!, M barcode M-0105943!, P barcode P00412540!).

Rosettea louisii (Jacq.-Fél.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis louisii* Jacq.-Fél. in Bull. Jard. Bot. Natl. Belg. 44(1–2): 164. 1974 – Holotype: D.R. Congo, district de l'Ubangi-Uele, Makara au S.W. de Watsa, piton granitique de Kidzeni, 1450 m d'altitude, dalles ou mamelons de granite sec, en pente à 45°, station appelée «Kabwa» à *Euphorbia nyikae* et *Faurea speciosa*, dans une crevasse, *Louis 4578* (BR barcode 0000006494582!; isotypes: BR barcode 0000006422820!, P barcode P02274608!).

Rosettea peregrina (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis peregrina* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 30: 180, t. 15. 1956 – Holotype: Zambia, Kawambwa Distr., Kawambwa-Mansa road, *Angus 676* (COI barcode COI00081469!; isotypes: BR barcode 0000006423162!, FHO n.v., K barcode K000313375!).

Note. – "*Dissotis kassneri* Gilg ex De Wild." (in Ann. Mus. Congo Belge, Bot., sér. 4, 2(1): 117. 1913), based on the collection *Kassner 2576* (B†; K000313093!), also belongs to this species but was published without a validating description.

Rosettea princeps (Kunth) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Rhexia princeps* Kunth in Humboldt & Bonpland, Monogr. Melastom. 2: 122, t. 46. 1823 ≡ *Osbeckia princeps* (Kunth) DC., Prodr. 3: 140. 1828 ≡ *Dissotis princeps* (Kunth) Triana in Trans. Linn. Soc. London 28(1): 57. 1872 ('1871') – Holotype: erroneously stated as being collected in Brazil, probably from Mozambique, *Galvão da Silva s.n*. [Fernandes & Fernandes, 1978: 263; see also Jacques-Félix, 1995: 238] (P barcode P00412548!; isotype: P barcode P00412549!).

= *Osbeckia eximia* Sond. in Linnaea 23: 48. 1850 ≡ *Dissotis eximia* (Sond.) Harv., Gen. S. Afr. Pl., ed. 2: 114. 1868 – **Lectotype (designated here):** South Africa, Port Natal [Durban], *Gueinzius 145* (S No. 14-41364!; isolectotypes: BR barcode 0000019003252!, MEL barcode MEL1010609!, P barcode P00412550!).

= *Dissotis goetzei* Gilg in Bot. Jahrb. Syst. 28(4): 442. 1900, **syn. nov.** – Holotype: Tanzania, "Uhehe: Utschungwe-Berge bei Muhanga, an unbewaldeten Abhängen", *Goetze 621* (B†) – **Neotype (designated here):** Tanzania, Iringa, Ludewa, Livingstone Mountains, ca. 2 km SE of peak of Ngolo Mountain, in open woodland at junction of two small streams, *Gereau & al. 5117* (MO barcode MO-2646865!).

= *Dissotis verticillata* De Wild. in Bull. Jard. Bot. État Bruxelles 5(1): 78. 1915 – **Lectotype (designated here):** D.R. Congo, Thsisinka, *Homblé 1265* (BR barcode 0000006422844!; isolectotype: BR barcode 0000006423179!).

Notes. – The protologue of *Osbeckia eximia* cited two collections (syntypes), both of which are housed in S. We thus selected one of these (*Gueinzius 145*) as the lectotype. The other syntype is *Gueinzius 492* (S-G-4399!), also from Port Natal [Durban].

The protologue of *Dissotis goetzei* cited the collection *Goetze 621*, presumably housed in B and later destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Tanzania and housed in MO as the neotype.

The protologue of *Dissotis verticillata* cited the collection *Homblé 1265*, of which we found two sheets in BR and selected one of them as the lectotype.

Rosettea princeps var. ***candolleana*** (Cogn.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis candolleana* Cogn. in Candolle & Candolle, Monogr. Phan. 7: 373. 1891 ≡ *D. princeps* var. *candolleana* (Cogn.) A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 29: 56, t. 9, 10. 1955 – Lectotype (designated by Fernandes & Fernandes in Exell & al., Consp. Fl. Angolensis 4: 156. 1970): Angola, Pungo-Andongo, *Welwitsch 904* (G barcode G00319505!, isolectotypes: BM barcode BM000902401!, BR barcode 0000019003481!, K barcode K00313380!, LISU barcode LISU209427!).

= *Dissotis muenzneri* Gilg ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 751. 1921 – Type: Tanzania, "auf Bergwiesen im nördlichen Nyassaland, bei Langenburg und Kyimbila, 1350 m" (original material presumably in B and destroyed during WWII) – **Lectotype (designated here):** Tanzania, Rungwe District, Kyimbila, *Stolz 237* (S. No. S09-15473!; isolectotypes: HBG barcode HBG509092!, L barcodes L.2533874! & L.2533875!, M barcode M-0105942!, MO barcode MO-313691!, WAG barcode WAG0002333!).

Note. – No *Dissotis muenzneri* specimens were cited in the protologue, but in several herbaria we located duplicates of the collection *Stolz 237* with original labels giving the same locality and bearing the name *D. muenzneri*. We thus selected one of these duplicates housed in S as the lectotype.

Rosettea pulchra (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis pulchra* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 29: 54, t. 8. 1955 – Holotype: Zimbabwe, Melsetter, Chimanimani Mts., *Plowes 1216* (SRGH barcode SRGH0078383-0!).

Rosettea rhinanthifolia (Brenan) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Osbeckia scaberrima* Exell in J. Bot. 66 (Suppl. 1): 176. 1928, nom illeg., non Hayata 1911 ≡ *Osbeckia rhinanthifolia* Brenan in Kew Bull. 5(3): 342. 1951 ('1950') ≡ *Dissotis rhinanthifolia* (Brenan) A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 71. 1954 – Holotype: Angola, Cuando Cubango, Cuito-Canavale, banks of river Kuiriri [Cuiriri] near Longa, *Gossweiler 4079* (BM barcode BM000902400!; isotypes: BR barcode 0000006423506!, COI barcode COI00005429!, K barcode K000313354!, LISC barcodes LISC 002818! & LISC 002819!).

Rosettea rhinanthifolia var. ***exellii*** (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis rhinanthifolia* var. *exellii* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 43: 296. 1969 – Holotype: Angola, Moxico, Perímetro Florestal do Luso, margens do rio Luena, alt. c. 1000 m, *P. Araújo 124* (LISC barcode LISC 002820!; isotype: LUA n.v.).

Rosettea riparia (Gilg & Ledermann ex Engl.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis riparia* Gilg & Ledermann ex Engl. in Engler & Drude, Veg. Erde 9(3,2): 749. 1921 – Holotype: Cameroon, Bambuto Mts., "an Bächen mit Raphia-galerie in den Bambutobergen um 1700 m" (original material presumably in B and destroyed during WWII) – **Neotype (designated here):** Cameroon, West, W Bamboutos Mts., Fosimondi, fallow around the village, *Tchiengue & Enow 1932* (WAG barcode WAG.1923186!; isoneotypes: K barcode K000518592!, MO n.v., YA!).

= *Dissotis bamendae* Brenan & Keay in Kew Bull. 7(4): 546. 1953 ('1952') – Holotype: Cameroon, Bamenda, *Keay* in FHI 28344 (K barcode K000050173!).

Note. – No *Dissotis riparia* specimens were cited in the protologue, and we were unable to locate any of the original material in B or duplicates in other herbaria. We thus selected a specimen from Cameroon and housed in WAG as the neotype (with isoneotypes in K, MO and YA).

Rosettea scabra (Gilg) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis scabra* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 21. 1898 – **Lectotype (designated here):** South Sudan, "Land der Niamniam, auf Feldern und Culturstellen bei Kulenscho's Dorf", Feb 1870, *Schweinfurth 2861* (K barcode K000313077!).

= *Dissotis graminicola* Hutch. in Bull. Misc. Inform. Kew 1921 (10): 371. 1921 – Holotype: Northern Nigeria, Naraguta, in wet grass lands, *H.V. Lely 543* (K barcode K000313143!).

Note. – The protologue of *Dissotis scabra* cited three specimens (syntypes), all housed in B and presumably destroyed during WWII. Fortunately, for two of these collections we were able to find duplicates in K. We thus selected the K specimen of *Schweinfurth 2861* as the lectotype. The remaining syntypes are as follows: South Sudan, "Ghasalquellengebiet: Land der Bongo, in den Steppen zwischen Tondj [Tonj] und Dugurru", Nov 1869, *Schweinfurth 2675* (B†; K000313076!); South Sudan, "in den Steppen bei Gumba's Dorf", Jun 1870, *Schweinfurth 3959* (B†).

Rosettea sizenandoi (Cogn.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis sizenandoi* Cogn. in Bol. Soc. Brot., 11: 88. 1893 ('*Sizenandi*') – **Lectotype (designated here):** Angola, Lunda, Camaxilo, Muatianvo, margens do Rio Cuango, alt. 1000 m, *Marques 179* (COI barcode COI00005430! isotype: BR barcode 0000006420550!).

Note. – The BR and COI sheets of *Marques 179* are both labeled as the holotype, and the protologue did not specify where it was deposited. We have thus selected the COI specimen as the lectotype.

Rosettea sizenandoi var. ***brevipilosa*** (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis sizenandoi* var. *brevipilosa* A.Fern. & R.Fern. in Bol. Soc. Brot., sér. 2, 28: 191, t. 12 1954 – Holotype: Angola, Moxico, Dilolo, Teixeira de Sousa, prope rio Luao, alt. 1100 m, *Gossweiler 12223* (COI barcode COI00005431!; isotypes: LISC barcodes LISC 002404! & LISC 002821!).

Rosettea thollonii (Cogn.) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis thollonii* Cogn. in Verh. Bot. Vereins Prov. Brandenburg 31: 96. 1889 – **Lectotype (designated here):** Congo Rep., Brazzaville, *Thollon 441* (P barcode P00412559!; isolectotype: P barcode P00412560!).

= *Dissotis pulcherrima* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 20. 1898 – Syntypes: Togo, Misahöhe, an sumpfigen Stellen in grösseren Trupps, *Baumann 387* (B†); Bismarcksburg, Steppe am Ketschenkibache, *Büttner 369*, (B†) – **Neotype (designated here):** Togo, Zone IV, Bémé, 3 km South of Adéta, wet meadows, 16 Dec 1977, *Ern 2719* (P barcode P05223153!).

= *Dissotis elliotii* var. *setosior* Keay & Brenan in Kew Bull. 5(3): 342. 1951 ('1950') – Holotype: Nigeria, *Savory & Keay FHI 25080* (K barcode K000313137!; isotype: P barcode P00412562!).

Notes. – The protologue of *Dissotis thollonii* cited two collections (syntypes), the first of these being *Büttner 26* ("Ad flumen Congo"), presumably housed in B and later

destroyed duing WWII without any duplicates in other herbaria. The second collection cited was *Thollon 441*, with material deposited in P. We found two sheets of *Thollon 441* in P and selected one of them as the lectotype. "*Dissotis floribunda* A.Chev." (Explor. Bot. Afrique Occ. Franç. 1: 273. 1920), based on the collection *Chevalier 20254* (P05222638!, P05222640!) from Guinea, also belongs to this species but was published without a validating description.

The protologue of *Dissotis pulcherrima* cited two collections (syntypes) housed in B, both of which were presumably destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Togo and housed in P as the neotype.

Rosettea trothae (Gilg) Ver.-Lib. & G.Kadereit, **comb. nov.** ≡ *Dissotis trothae* Gilg in Engler, Monogr. Afrik. Pflanzen-Fam. 2: 19. 1898 – Holotype: Burundi, "Centralafrikanisches Seengebiet: in einem sumpfigen Flussbett am Westabhang des Mgera-Gebirges [Migera Hills], Mittel-Urundi, Umuesi", Oct 1896, *von Trotha 28* (B†) – **Neotype (designated here):** Burundi, Prov. Ruyigi, Rusengo-Canguzu, *Reekmans 7000* (BR barcode 0000013423865!; isoneotypes: P barcode P05223121!, WAG barcode WAG.1092587!).

= *Dissotis mildbraedii* Gilg in Mildbraed, Wiss. Erg. Deut. Zentr.-Afr. Exped., Bot. 2: 583. 1913 – Holotype: Burundi, Rugege, *Mildbraed 728* (B†) – **Neotype (designated here):** Burundi, Mumasuma, mission de Ruhinga, *Reekmans 9309* (BR barcode 0000013423834!; isoneotypes WAG barcodes WAG.1092592! & WAG.1092594!).

= *Dissotis urundiensis* Gilg in Bot. Jahrb. Syst. 51: 231. 1914, **syn. nov.** – Holotype: Burundi, "Zentralafrik. Zwischenseenland: Nordost-Urundi", 1911, *Hans Meyer 1099* (B†) – **Neotype (designated here):** Burundi, Mont Heha, *Reekmans 8199* (BR barcode 0000013423841!; isoneotypes: L barcode L.2533907!, WAG barcode WAG.1092593!).

= *Dissotis grandiceps* Kraenzl. in Vierteljahrsschr. Naturf. Ges. Zürich 76: 149. 1931 – Holotype: Tanzania, Kibanda, slopes of mountains, *Kassner 3055* (Z barcode Z-000015019!).

Notes. – The protologue of *Dissotis trothae* cited the collection *von Trotha 28* housed in B and presumably destroyed during WWII. We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Burundi and housed in BR as the neotype (with isoneotypes in P and WAG).

The protologue of *Dissotis mildbraedii* cited the specimen *Mildbraed 728*, presumably housed in B and later destroyed duing WWII. We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Burundi and housed in BR as the neotype (with isoneotypes in WAG).

The protologue of *Dissotis urundiensis* cited the specimen *Hans Meyer 1099*, presumably housed in B and later destroyed duing WWII. We were also unable to locate any duplicates in other herbaria. We thus selected a specimen from Burundi and housed in BR as the neotype (with isoneotypes in L and WAG).

■ AUTHOR CONTRIBUTIONS

MCVL, RDS and GK designed the study; MCVL performed the laboratory work, edited and aligned the sequences, performed all data analyses and drafted the manuscript; all authors contributed to the manuscript. — MCVL, https://orcid.org/0000-0001-7847-1740; RDS, https://orcid.org/0000-0003-2752-7788; GK, https://orcid.org/0000-0003-0094-8769

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■ LITERATURE CITED

Albach, D.C. 2008. Further arguments for the rejection of paraphyletic taxa: *Veronica* subgen. *Pseudolysimachium* (Plantaginaceae). *Taxon* 57: 1–6. https://doi.org/10.2307/25065943

Baker, J.G. 1887. Further contributions to the flora of Madagascar. *J. Linn. Soc. Bot.* 22: 441–537. https://doi.org/10.1111/j.1095-8339.1887.tb02431.x

Bentham, G. 1849. Melastomaceae. Pp. 344–358 in: Hooker, W.J. (ed.), *Niger flora*. London: Hippolyte Baillière. https://doi.org/10.5962/bhl.title.594

Bentham, G. & Hooker, J.D. 1867. Melastomaceae. Pp. 725–773 in: Hooker, W.J. (ed.), *Genera plantarum*, vol. 1(3). Londini [London]: venit apud Reeve & Co. https://doi.org/10.5962/bhl.title.747

Cogniaux, A. 1889. Melastomaceae. Pp. 95–96 in: Büttner, R., Neue Arten von Guinea, dem Kongo und dem Quango. *Verh. Bot. Vereins Prov. Brandenburg* 31: 64–96.

Cogniaux, A. 1891. Melastomaceae. Pp. 1–1256 in: Candolle, A. de & Candolle, C. de (eds.), *Monographiae phanerogamarum*, vol. 7. Parisiis [Paris]: sumptibus G. Masson. https://doi.org/10.5962/bhl.title.45961

Daly, D.C., Cameron, K.M. & Stevenson, D.W. 2001. Plant systematics in the age of genomics. *Pl. Physiol.* 127: 1328–1333. https://doi.org/10.1104/pp.010788

Darriba, D., Taboada, G.L., Doallo, R. & Posada, D. 2012. jModelTest 2: More models, new heuristics and parallel computing. *Nature, Meth.* 9: 772. https://doi.org/10.1038/nmeth.2109

De Wildeman, E. 1913. Études sur la Flore du Katanga. *Ann. Mus. Congo Belge, Bot.*, sér. 4, 2(1): 1–180. https://bibdigital.rjb.csic.es/idurl/1/15823

Drummond, A.J. & Rambaut, A. 2007. BEAST: Bayesian evolutionary analysis by sampling trees. *B. M. C. Evol. Biol.* 7: 214. https://doi.org/10.1186/1471-2148-7-214

Drummond, A.J., Suchard, M.A., Xie, D. & Rambaut, A. 2012. Bayesian phylogenetics with BEAUti and the BEAST 1.7. *Molec. Biol. Evol.* 29: 1969–1973. https://doi.org/10.1093/molbev/mss075

Engler, A. 1921. *Die Pflanzenwelt Afrikas insbesondere seiner tropischen Gebiete: Grundzüge der Pflanzenverbreitung in Afrika und die Charakterpflanzen Afrikas*, vol. 3(2), *Charakterpflanzen Afrikas (insbesondere des tropischen): Die Familien der afrikanischen Pflanzen und ihre Bedeutung in derselben*. [= Engler, A. & Drude, O. (eds.), *Die Vegetation der Erde*, vol. 9.] Leipzig: Engelmann. https://doi.org/10.5962/bhl.title.50144

Favarger, C. 1952. Recherches sur quelques Mélastomacées d'Afrique occidentale. *Ber. Schweiz. Bot. Ges.* 62: 5–65.

Favarger, C. 1962. Nouvelles recherches cytologiques sur les Mélastomatacées. *Ber. Schweiz. Bot. Ges.* 72: 290–305.

Felsenstein, J. 1985. Confidence limits on phylogenies: An approach using the bootstrap. *Evolution (Lancaster)* 39: 783–791. https://doi.org/10.2307/2408678

Fernandes, A. & Fernandes, R. 1954a. Contibution to the knowledge of the Melastomataceae of Moçambique. *Bol. Soc. Brot.*, sér. 2, 28: 205–220 (+ 6 plates).

Fernandes, A. & Fernandes, R. 1954b. Contribuição para o conhecimento das Melastomatáceas da Guiné Portuguesa. *Garcia de Orta* 2: 273–285.

Fernandes, A. & Fernandes, R. 1954c. Melastomataceae africanae novae vel minus cognitae – I. *Bol. Soc. Brot.*, sér. 2, 28: 181–205.

Fernandes, A. & Fernandes, R. 1954d. Sobre a posição sistemática da secção *Pseudodissotis* Cogn. do género *Osbeckia* L. *Garcia de Orta* 2: 165–197.

Fernandes, A. & Fernandes, R. 1954e. Sur la position systématique de la section *Pseudodissotis* Cogn. du genre *Osbeckia* L. (Note préliminaire). *Bol. Soc. Brot.*, sér. 2, 28: 65–77.

Fernandes, A. & Fernandes, R. 1955. Melastomataceae africanae novae vel minus cognitae – II. *Bol. Soc. Brot.*, sér. 2, 29: 47–64.

Fernandes, A. & Fernandes, R. 1956a. Melastomataceae africanae novae vel minus cognitae – III. *Bol. Soc. Brot.*, sér. 2, 30: 183–297.

Fernandes, A. & Fernandes, R. 1956b. Revisão das Melastomatáceas do Herbário Nacional de Pretória. *Mem. Soc. Brot.* 11: 5–51.

Fernandes, A. & Fernandes, R. 1956c. Revisão das Melastomatoideae do East African Herbarium e do Southern Rhodesia Government Herbarium. *Mem. Soc. Brot.* 11: 65–96.

Fernandes, A. & Fernandes, R. 1960a. Contribution to the Knowledge of the Melastomataceae of Uganda, Kenya and Tanganyika. *Bol. Soc. Brot.*, sér. 2, 34: 179–202.

Fernandes, A. & Fernandes, R. 1960b. Melastomataceae africanae novae vel minus cognitae – IV. *Bol. Soc. Brot.*, sér. 2, 34: 59–92 (+ 26 plates).

Fernandes, A. & Fernandes, R. 1961. Contribution to the knowledge of the Melastomatoideae of the Federation of Rhodesia and Nyasaland. *Kirkia* 1: 68–78.

Fernandes, A. & Fernandes, R. 1962. O que é *Osbeckia tubulosa* Sm.? Pp. 1–9 in: *Estudos científicos oferecidos em homenagem ao Prof. Doutor J. Carrington da Costa por ocasião do seu 70o aniversário – Abril de 1961*. Lisbon: Junta de Investigações do Ultramar.

Fernandes, A. & Fernandes, R. 1969. Melastomaceae africanae novae vel minus cognitae – V. *Bol. Soc. Brot.*, sér. 2, 43: 285–306 (+17 plates).

Fernandes, R. & Fernandes, A. 1970. Melastomataceae. Pp. 114–165 in: Exell, A.W., Fernandes, A. & Mendes, E.J. (eds.), *Conspectus florae Angolensis*, vol. 4. Lisbon: Junta de Investigações do Ultramar e Instituto de Investigação Científica de Angola.

Fernandes, A. & Fernandes, R. 1972. Melastomataceae africanae novae vel minus cognitae – VI. *Bol. Soc. Brot.*, sér. 2, 46: 63–71 (+6 plates).

Fernandes, R. & Fernandes, A. 1978. Melastomataceae. Pp. 220–276 in: Launert, E. (ed.), *Flora Zambesiaca*, vol. 4. Richmond: Royal Botanic Gardens, Kew.

Forrest, L.L. & Hollingsworth, P.M. 2003. A recircumscription of *Begonia* based on nuclear ribosomal sequences. *Pl. Syst. Evol.* 241: 193–211. https://doi.org/10.1007/s00606-002-0033-y

Gilg, E. 1898. *Monographien afrikanischer Planzen-Familien und -Gattungen*, vol. 2, *Melastomataceae*. Leipzig: Engelmann. https://doi.org/10.5962/bhl.title.53505

Grimm, D. & Almeda, F. 2013. Systematics, phylogeny, and biogeography of *Chaetolepis* (Melastomataceae). *J. Bot. Res. Inst. Texas* 7: 217–263.

Hansen, C. 1977. The Asiatic species of *Osbeckia* (Melastomataceae). *Ginkgoana* 4: 1–150.

Hooker, J.D. 1871. Melastomataceae. Pp. 439–464 in: Oliver, D. (ed.), *Flora of Tropical Africa*, vol. 2. London: Reeve & Co. https://doi.org/10.5962/bhl.title.42

Hörandl, E. & Stuessy, T.F. 2010. Paraphyletic groups as natural units of biological classification. *Taxon* 59: 1641–1653. https://doi.org/10.1186/1471-2148-8-22

Humphreys, A.M. & Linder, H.P. 2009. Concept versus data in delimitation of plant genera. *Taxon* 58: 1054–1074. https://doi.org/10.2307/27757002

Hutchinson, J. & Dalziel, J.M. 1927. *Flora of west tropical Africa*, vol. l(1). London: The Crown Agents for the Colonies.

Jacques-Félix, H. 1955. *Icones plantarum Africanarum*. Dakar: Institut français d'Afrique noire.

Jacques-Félix, H. 1973. Contribution à l'étude du genre *Rousseauxia* (Melast.). *Adansonia*, ser. 2, 13: 177–194.

Jacques-Félix, H. 1975 ("1974"). Le genre *Melastomastrum* Naudin (Melastomataceae). *Bull. Mus. Natl. Hist. Nat., Sér. 3, Bot.* 17: 49–84.

Jacques-Félix, H. 1977. Synonymes nouveaux de Mélastomatacées d'Afrique et de Madagascar. *Adansonia*, ser. 2, 17: 77–78.

Jacques-Félix, H. 1981. Observations sur les caractères staminaux et la classification des Osbeckieae (Melastomataceae) Capsulaires Africaines. *Adansonia*, ser. 2, 20: 405–429.

Jacques-Félix, H. 1983a. *Flore du Cameroun*, vol. 24, *Mélastomatacées*. Yaoundé: Délégation Générale à la Recherche Scientifique et Technique.

Jacques-Félix, H. 1983b. *Flore du Gabon*, vol. 25, *Melastomataceae*. Paris: Museum National d'Histoire Naturelle.

Jacques-Félix, H. 1995. Histoire des Melastomataceae d'Afrique. *Bull. Mus. Natl. Hist. Nat., B, Adansonia* 16: 235–311.

Keay, R.W.J. 1954. *Flora of West Tropical Africa*, 2nd ed., vol. 1(1). London: Crown Agents for Oversea Governments and Administrations.

Kraenzlin, F. 1931. Beiträge zur Kenntnis der Melastomataceae. *Vierteljahrsschr. Naturf. Ges. Zürich* 76: 147–159.

Krasser, F. 1893. Melastomataceae. Pp. 130–199 in: Engler, A. & Prantl, K. (eds.), *Die natürlichen Pflanzenfamilien*, III(7). Leipzig: Engelmann.

Kriebel, R., Michelangeli, F.A. & Kelly, L.M. 2015. Discovery of unusual anatomical and continuous characters in the evolutionary history of *Conostegia* (Miconieae: Melastomataceae). *Molec. Phylogen. Evol.* 82: 289–313. https://doi.org/10.1016/j.ympev.2014.09.021

Legendre, P. & Vaillancourt, P. 1969. A mathematical model for the entities species and genus. *Taxon* 18: 245–252. https://doi.org/10.2307/1218824

Maddison, W.P. & Maddison, D.R. 2015. Mesquite: A modular system for evolutionary analysis, version 3.04. http://mesquite project.org (accessed 15 Dec 2015).

Michelangeli, F.A., Guimaraes, P.J.F., Penneys, D.S., Almeda, F. & Kriebel, R. 2013. Phylogenetic relationships and distribution of New World Melastomeae (Melastomataceae). *Bot. J. Linn. Soc.* 171: 38–60. https://doi.org/10.1111/j.1095-8339.2012.01295.x

Michelangeli, F.A., Almeda, F., Alvear, M., Bécquer, E.R., Burke, J., Caddah, M.K., Goldenberg, R., Ionta, G.M., Judd, W.S., Majure, L.C., Meirelles, J., Nicolas, A.N., Ocampo, G., Penneys, D.S., Skean, J.D., Jr. & Ulloa Ulloa, C. 2016. (2462) Proposal to conserve *Miconia*, nom. cons. against

the additional names *Maieta* and *Tococa* (Melastomataceae: Miconieae). *Taxon* 65: 892–893. https://doi.org/10.12705/654.27

Naudin, C. 1850. Melastomacearum quae in musaeo parisiensi continentur monographicae descriptionis. *Ann. Sci. Nat., Bot.*, sér. 3, 13: 273–303.

Nepokroeff, M., Bremer, B. & Sytsma, K.J. 1999. Reorganization of the genus *Psychotria* and Tribe Psychotrieae (Rubiaceae) inferred from ITS and *rbcL* sequence data. *Syst. Bot.* 24: 5–27. https://doi.org/10.2307/2419383

Orthia, L.A., Cook, L.G. & Crisp, M.D. 2005. Generic delimitation and phylogenetic uncertainty: An example from a group that has undergone an explosive radiation. *Austral. Syst. Bot.* 18: 41–47. https://doi.org/10.1071/SB04016

Pelser, P.B., Nordenstam, B., Kadereit, J.W. & Watson, L.E. 2007. An ITS phylogeny of tribe Senecioneae (Asteraceae) and a new delimitation of *Senecio* L. *Taxon* 56: 1077–1104. https://doi.org/10.2307/25065905

Perrier de la Bâthie, H. 1932. Les Mélastomacées de Madagascar. *Mém. Acad. Malgache* 12: 1–292 (+10 plates). https://doi.org/10.3406/jatba.1932.5135

Perrier de la Bâthie, H. 1951. *Flore de Madagascar et des Comores: 153e Famille. — Mélastomatacées*. Paris: Firmin-Didot et Cie.

Pfeil, B.E. & Crisp, M.D. 2005. What to do with *Hibiscus*? A proposed nomenclatural resolution for a large and well known genus of Malvaceae and comments on paraphyly. *Austral. Syst. Bot.* 18: 49–60. https://doi.org/10.1071/SB04024

Rafinesque, C.S. 1838. *Sylva telluriana*. Philadelphia: printed for the author and publisher. https://doi.org/10.5962/bhl.title.2757

Rambaut, A. & Drummond, A.J. 2009. Tracer, version 1.5. http://beast.bio.ed.ac.uk/ (accessed 15 Mar 2016).

Reginato, M. & Michelangeli, F.A. 2016. Untangling the phylogeny of *Leandra* s.str. (Melastomataceae, Miconieae). *Molec. Phylogen. Evol.* 96: 17–32. https://doi.org/10.1016/j.ympev.2015.11.015

Reginato, M., Michelangeli, F.A. & Goldenberg, R. 2010. Phylogeny of *Pleiochiton* (Melastomataceae, Miconieae): Total evidence. *Bot. J. Linn. Soc.* 162: 423–434. https://doi.org/10.1111/j.1095-8339.2009.01022.x

Renner, S.S. 1993. Phylogeny and classification of the Melastomataceae and Memecylaceae. *Nordic J. Bot.* 13: 519–540. https://doi.org/10.1111/j.1756-1051.1993.tb00096.x

Smith, J. 1813. *O[sbeckia] tubulosa*. In: Rees, A. (ed.), *The Cyclopaedia*, vol. 25. London: printed for Longman, etc. https://doi.org/10.5962/bhl.title.59683

Stamatakis, A. 2014. RAxML version 8: A tool for phylogenetic analysis and post-analysis of large phylogenies. *Bioinformatics* 30: 1312–1313. https://doi.org/10.1093/bioinformatics/btu033

Stuessy, T.F. & Hörandl, E. 2014. Evolutionary systematics and paraphyly: Introduction. *Ann. Missouri Bot. Gard.* 100: 2–5. https://doi.org/10.3417/2012083

Swofford, D.L. 2002. PAUP*: Phylogenetic analysis using parsimony (*and other methods), version 4. Sunderland, MA: Sinauer.

Triana, J. 1872. Les Mélastomatacées. *Trans. Linn. Soc. London* 28(1): 1–188. https://doi.org/10.1111/j.1096-3642.1871.tb00222.x

Turland, N.J., Wiersema, J.H., Barrie, F.R., Greuter, W., Hawksworth, D.L., Herendeen, P.S., Knapp, S., Kusber, W.-H., Li, D.-Z., Marhold, K., May, T.W., McNeill, J., Monro, A.M., Prado, J., Price, M.J. & Smith, G.F. (eds.) 2018. *International Code of Nomenclature for algae, fungi, and plants*. Regnum Vegetabile 159. Glashütten: Koeltz Botanical Books. https://doi.org/10.12705/Code.2018

Veranso-Libalah, M.C., Stone, R.D., Fongod, A.G.N., Couvreur, T.L.P. & Kadereit, G. 2017. Phylogeny and systematics of African Melastomateae (Melastomataceae). *Taxon* 66: 584–614. https://doi.org/10.12705/663.5

Veranso-Libalah, M.C., Kadereit, G., Stone, R.D. & Couvreur, T.L.P. 2018. Multiple shifts to open habitats in Melastomateae (Melastomataceae) congruent with the increase of African Neogene climatic aridity. *J. Biogeogr.* 45: 1420–1431. https://doi.org/10.1111/jbi.13210

Veranso-Libalah, M.C., Lachenaud, O., Stone, R.D. & Kadereit, G. 2019. *Nothodissotis* (Melastomataceae), a new genus from Atlantic Central Africa, including the new species *N. alenensis* from Equatorial Guinea. *PhytoKeys* 118: 89–103. https://doi.org/10.3897/phytokeys.118.31572

White, F. 1983. *The vegetation of Africa: A descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map of Africa*. Paris: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000058054

Wickens, G.E. 1975. *Flora of Tropical East Africa: Melastomataceae*. London: Crown Agents for Overseas Governments and Administrations.

Van Tieghem, P. 1891. Classification anatomique des Mélastomacées. *Bull. Soc. Bot. France* 38: 114–124. https://doi.org/10.1080/00378941.1891.10828542

Van Vliet, G.J.C.M., Koek-Noorman, J. & Ter Welle, B.J.H. 1981. Wood anatomy, classification and phylogeny of the Melastomataceae. *Blumea* 27: 463–473.

Appendix 1. Voucher information.

Species name, Synonym, Country, Region, Collector number, herbarium code, herbarium barcode or sheet number and Lab code if available. GenBank accessions numbers are given for all nrETS, nrITS, *ndhF*, *psbK-psbL* sequences included in this study. Missing sequence data is indicated by a dash (–). DNA sequences newly generated for this study are marked with an asterisk (*). The bold numbers in brackets after the species name indicate the different duplicate accessions.

Almedanthus pachytrichus (Gilg ex R.E.Fr.) Ver.-Lib. & R.D.Stone (*Dissotis pachytricha*), Tanzania, Rukwa, Sumbawanga Rural, *SHCP 30* (MO [MO-2721890], –, MK617537*, MK677458*, –; ***Amphorocalyx rupestris*** H.Perrier, Madagascar, *F. Almeda 8723* (CAS), –, JQ730047, JQ730467, –; ***Anaheterotis pobeguinii*** (Hutch. & Dalziel) Ver.-Lib. & G.Kadereit, Guinea, *A.S. Goman 259* (BR [0000017294690]), MF398010, KX889284, MF398108, KY284809; ***Antherotoma angustifolia*** (A.Fern. & R.Fern.) Jacq.-Fél., Zambia, *M.G. Bingham 9607* (WAG [WAG.1091744], MF397936, KX889210, MF398030, KY284727; ***Antherotoma debilis*** (Sond.) Jacq.-Fél. (***1***), Angola, Cuando Cubango, *D. Goyder 8094* (K), MF397937,–, MF398031, KY284728; ***Antherotoma debilis*** (Sond.) Jacq.-Fél. (***2***), Mozambique, Bilene, *J.E. Burrows 14526* (BNRH), MF397938,–, MF398032, KY284729; ***Antherotoma gracilis*** (Cogn.) Jacq.-Fél., Angola, *Bamps & al. 4165* (BR [0000018229899]), MF397939, KX889212, MF398033, KY284731; ***Antherotoma irvingiana*** (Hook.f.) Jacq.-Fél., Cameroon, NW, Mbiame, *M.C. Veranso 199* (MJG [20954]), MF397941, KX889214, MF398035, KY284733; ***Antherotoma irvingiana*** (Hook.f.) Jacq.-Fél., Cameroon, NW, Sabga, *M.C. Veranso 226* (MJG [20985]), MF397940, KX889213, MF398034, KY284732; ***Antherotoma naudinii*** Hook.f. (***1***), Zimbabwe, Chimanimani Mtns, *B. Wursten 2271* (BR), MF397942, KX889215, MF398036, KY284734; ***Antherotoma naudinii*** Hook.f. (***2***), Cameroon, NW, Mbiame, *M.C. Veranso 200* (MJG [20955]), MF397943, KX889216, MF398037, KY284735; ***Antherotoma phaeotricha*** (Hochst.) Jacq.-Fél. (***2***), Tanzania, Kagera, Bukoba, *D. Sitoni & al. 1032* (MO [5695038]), MF397945, KX889218, MF398039, KY284737; ***Antherotoma phaeotricha*** (Hochst.) Jacq.-Fél. (***1***), Tanzania, Kagera, Bukoba, *L. Festo 708* (MO [5741704]), MF397944, KX889217, MF398038, KY284736; ***Argyrella amplexicaulis*** (Jacq.-Fél.) Ver.-Lib. & G.Kadereit, Guinea, Nzérékoré, *G. Traore 29* (BR [0000016915527]), MF398000, KX889273, MF398097, KY284798; ***Argyrella canescens*** (E.Mey. ex Graham) Harv., Cameroon, Adamawa, Ngaoundere, *M.C. Veranso 154* (MJG [20962]), MF398006, KX889280, MF398104, KY284805; ***Derosiphia tubulosa*** (Sm.) Raf. (*Dissotis tubulosa*) (***1***), Cameroon, NW, Bambili, *M.C. Veranso 217* (MJG [20979]), MF397997, KX889271, MF398094, KY284795; ***Derosiphia tubulosa*** (Sm.) Raf. (*Dissotis tubulosa*) (***2***), Cameroon, NW, Donga-Mantung, Akweto, *M.C. Veranso 221* (MJG [20957]), MF397996, KX889270, MF398093, KY284794;

Appendix 1. Continued.

Dichaetanthera africana (Hook.f.) Jacq.-Fél., Gabon, *Wieringa & al. 3817* (BR), DICHAFRI170, –, KX889221, KY284740, MG702551; ***Dichaetanthera arborea*** Baker, Madagascar, *G. Clausing & al. 281* (MJG), MF397948, KX889223, MF398043, KY284742; ***Dichaetanthera articulata*** Endl., Madagascar, Toamasina, Atsinanana, *D. Ravelonarivo & F. Edmond 4320* (MO [MO-2698044]), MF397949, KX889224, MF398044, KY284743; ***Dichaetanthera ericirosenii*** (R.E.Fr) A.Fern. & R.Fern., Tanzania, Rukwa, Sumbawanga, *H.H. Schmidt & al 1190* (MO [4627710]), MF397950, KX889225, MF398045, KY284744; ***Dichaetanthera echinulata*** (Hook.f.) Jacq.-Fél., Guinea, Boké, Boffa, *Bidault & al. 2551* (BRLU), –, MG518529, MG518553, MG702565; ***Dichaetanthera oblongifolia*** Baker, Madagascar, *F. Almeda 7926a* (CAS), –, –, JQ730075, JQ730493; ***Dichaetanthera strigosa*** (Cogn.) Jacq.-Fél., Gabon, Haut-Ogooue, *A.F. Bradley & al. 1016* (MO [MO-275871]), DICHSTRI174, –, KX889226, KY284745, MF398046; ***Dionycha bojeri*** Naudin, Madagascar, *F. Almeda 8626* (CAS), –, JQ730076, JQ730287, –; ***Dissotidendron caloneurum*** (Gilg ex De Wild.) Ver.-Lib. & G.Kadereit, Tanzania, *S. Bidgood & al. 4484* (C), MF397954, KX889230, MF398050, KY284749; ***Dissotidendron cordatum*** (Gilg) Ver.-Lib. & G.Kadereit, D.R. Congo, *F. Malaisse, E. Semereab & G. Handjila 533* (BR [0000017293129]), MF397962, KX889239, MF398059, KY284759; ***Dissotidendron melleri*** (Hook.f.) Ver.-Lib. & G.Kadereit, Tanzania, Iringa, Njombe, *O.A. Kibure 745* (MO [5796672]), MF397971, KX889248, MF398069, KY284769; ***Dissotis grandiflora*** Benth., Guinea, *Phillipson 6387* (MO [6647301 & 6647302], MF397964, KX889243, MF398062, KY284763; ***Dissotis longisetosa*** Gilg & Ledermann ex Engl. (***1***), Cameroon, NW, Mbiame, *M.C. Veranso 205* (MJG [20958]), MF397969, KX889246, MF398067, KY284767; ***Dissotis longisetosa*** Gilg & Ledermann ex Engl., (***2***), Cameroon, NW, Bui, *M.C. Veranso 178* (MJG [20969]), MF397970, KX889247, MF398068, KY284768; ***Dissotis longisetosa*** Gilg & Ledermann ex Engl. (***3***), Cameroon, NW, Mbiame, *M.C. Veranso 203* (MJG [20977]), MF397968, KX889245, MF398066, KY284766; ***Dupineta brazzae*** (Cogn.) Ver.-Lib. & G.Kadereit, Cameroon, NW, Donga-Mantung, Akweto, *M.C. Veranso 215* (MJG [20981]), MF397953, KX889229, MF398049, KY284748; ***Dupineta hensii*** (Cogn.) Ver.-Lib. & G.Kadereit, D.R. Congo, Bomane, Aruwimi river, *E. Boyekoli 595* (BR), MF397966,–, MF398064, KY284765; ***Dupineta multiflora*** (Sm.) Raf., Cameroon, SW, Mundemba, *M.C. Veranso 104* (MJG [20964]), MF397974, KX889251, MF398072, KY284772; ***Eleotis welwitschii*** (Cogn.) Ver.-Lib. & R.D.Stone (*Dissotis weltwitschii*), Angola, Moxico province, *D. Goyder 8240* (K), MF397998,–, MF398095, KY284796; ***Feliciotis chevalieri*** (Gilg ex Engl.) Ver.-Lib. & G.Kadereit (*Dissotis chevalieri*), Cameroon, Adamawa, Lac Tison, *M.C. Veranso 130* (MJG [20982]), MF397975, KX889252, MF398073, KY284773; ***Feliciotis cryptantha*** (Baker) Ver.-Lib. & G.Kadereit (*Dissotis cryptantha*), Tanzania, Rukwa, Mpanda, *W.R.Q. Luke & al. 16225* (MO [6590694]), MF397960, KX889237, MF398057, KY284757; ***Feliciotis perkinsiae*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis perkinsiae*) (***1***); Cameroon, NW, Mbiame, *M.C. Veranso 196* (MJG [20952]), MF397985, KX889261, MF398082, KY284783; ***Feliciotis perkinsiae*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis perkinsiae*) (***2***), Cameroon, NW, Bui, *M.C. Veranso 179* (MJG [20968]), MF397976, KX889253, MF398074, KY284774; ***Feliciotis speciosa*** (Taub.) Ver.-Lib. & G.Kadereit (*Dissotis speciosa*) (***1***), Tanzania, Kagera, Bukoba, *Festo 107* (MO [MO-2721878]), DISSSPEC116, MF397987, MK617536*, MF398084, MK617549*; ***Feliciotis speciosa*** (Taub.) Ver.-Lib. & G.Kadereit (*Dissotis speciosa*) (***2***), Tanzania, Kagera, Bukoba rural, *L. Festo & al. 1073* (MO [MO-2721877]), DISSSPEC115, MK617547*, MK617535*, –, MK617548*; ***Guyonia antennina*** (Benth.) Ver.-Lib. & R.D.Stone (*Heterotis antennina*), Guinea, Boke, Boffa, *E. Bidault 2378* (BRLU), GUYOANTE2378, MK617544*, MK617539*, MK677460*, MK617551*; ***Guyonia antennina*** (Benth.) Ver.-Lib. & R.D.Stone (*Heterotis antennina*), Guinea, Boke, Boffa, *E. Bidault 2358* (BRLU), GUYOANTE2358, MK617543*, MK617538*, MK677459*, MK617550*; ***Guyonia ciliata*** Hook.f., Liberia, Lofa, *C.C.H. Jongkind 11859* (BR [0000016915534]), MF397999, KX889272, MF398096, KY284797; ***Heterotis decumbens*** (P.Beauv.) Jacq.-Fél., Cameroon, South, Kribi, *M.C. Veranso 170* (MJG [20978]), MF398008, KX889282, MF398106, KY284807; ***Heterotis prostrata*** (Thonn.) Benth., Cameroon, SW, Mundemba, *M.C. Veranso 119* (MJG [20991]), MF398013, KX889287, MF398111, KY284812; ***Melastoma candidum*** D.Don, Taiwan, *C.H. Chen 6443* (TAIE), –, JQ730103, JQ730312, –; ***Melastoma malabathrichum*** L., China, *D.S. Penneys 1998* (CAS), –, JQ730105, JQ730314, –; ***Melastoma sanguineum*** Sims, China, *D.S Penneys 2000* (CAS), –, JQ730106, JQ730315, –; ***Melastomastrum afzeli*** (Hook.f.) A.Fern & R.Fern., *C.C.H.Jongkind 10424* (BR [0000013189273]), Guinea, MELAAFZE155, MF398015, KX889290, KY284715, MF398113; ***Melastomastrum capitatum*** (Vahl) A.Fern. & R.Fern., Tanzania, Kigoma, *C.J. Kayombo & Frank M. Mbago 1158* (MO [MO-04127]), MF398016, KX889291, MF398114, KY284816; ***Melastomastrum porteresii*** (Jacq.-Fél.) Ver.-Lib. & G.Kadereit, Guinea, *G. Traore 48* (BR [0000016974258]), MF398022, KX889299, MF398122, KY284825; ***Nerophila clandestina*** (Jacq.-Fél.) Ver.-Lib. & R.D.Stone (*Antherotoma clandestina*), Cameroon, Santa, *M.C. Veranso 230* (MJG), –, MG518525, MG518549, MG702566; ***Nerophila congolensis*** (Cogn.) Ver.-Lib. & R.D.Stone (*Dissotis congolensis*) (***3***), Gabon, Haut-Ogooue, *G.M. Walters 1004* (MO [MO-228453]), –, KX889234, MF398054, KY284754; ***Nerophila congolensis*** (Cogn.) Ver.-Lib. & R.D.Stone (*Dissotis congolensis*) (***1***), Gabon, *L.J.T. White 693* (MO [4987764]), MF397958, KX889235, MF398055, KY284755; ***Nerophila congolensis*** (Cogn.) Ver.-Lib. & R.D.Stone (*Dissotis congolensis*) (***2***), Cameroon, Adamawa, Tibati, *M.C. Veranso 151* (MJG [20973]), MF397957, –, MF398053, KY284753; ***Nerophila decandra*** (Sm.) Ver.-Lib. & R.D.Stone (*Osbeckia decandra*) (***1***), *Bidault & al. 153* (BR [0000016974180]), Guinea, –, KX889297, MF398120, KY284823; ***Nerophila decandra*** (DC.) Ver.-Lib. & R.D.Stone (*Osbeckia decandra*) (***2***), Liberia, *J.G. Adam 28699* (BR [0000016974197]), –, KX889298, MF398121, KY284824; ***Nerophila gentianoides*** Naudin (*Chaetolepis gentianoides* (Naudin) Jacq.-Fél.), Guinea, Boké, Boffa, *Bidault & al. 2389* (BRLU) MG518530, –, MG702561, MG518554; ***Nerophila senegambiensis*** (Guill. & Perr.) Ver.-Lib. & R.D.Stone (*Antherotoma senegambiensis*) (***1***), Tanzania, Kagera, Bukoba, *Festo 1184* (MO [5593949]), MF397946, KX889219, MF398040, KY284738; ***Nerophila senegambiensis*** (Guill. & Perr.) Ver.-Lib. & R.D.Stone (*Antherotoma senegambiensis*) (***1***), Zimbabwe, *B. Wursten 2269* (BR), MF397947, KX889220, MF398041, KY284739; ***Nerophila togoensis*** (Leuenb.) Ver.-Lib. & R.D.Stone (*Osbeckia togoensis*), Benin, *Akoeginou & al. 4268* (BR [0000016974401]), –, KX889301, MF398124, KY284827; ***Nothodissotis alenensis*** Ver.-Lib. & O.Lachenaud (**1**), Equatorial Guinea, Río Muni, Monte Alén National Park, *Parmentier & Esono 3453* (BRLU [0000196]), MK617540*, MG518527, MG702563, MG518551; ***Nothodissotis alenensis*** Ver.-Lib. & O.Lachenaud (**2**), Equatorial Guinea, Río Muni, Monte Alén National Park, *Parmentier & Esono 2763* (BRLU [0000197]), MK617545*, MK617541*, MK677462*, MK617552*; ***Nothodissotis barteri*** (Hook.f.) Ver.-Lib. & G.Kadereit (***1***), Cameroon, Province du Littoral, reserve de faune d'Ebo, village de Ndokbaguengue, Campement de Djouma, *V. Droissart 1668* (BRLU), –, MG518528, MG518552, –; ***Nothodissotis barteri*** (Hook.f.) Ver.-Lib. & G.Kadereit (***2***), Gabon, Woleu-Ntem, *L. Ngok Banak 1196* (MO [MO-2721899]), MK617546*, MK617542*, MK677461*, MK617553*; ***Osbeckia nepalensis*** Hook., China, *D.S. Penneys 1986* (CAS), –, JQ730118, JQ730329, –; ***Pseudosbeckia swynnertonii*** (Baker f.) A.Fern & A.Fern., Mozambique, Chimanimanis, *B. Wursten 2235* (BR), MF398024, KX889302, MF398125, KY284828; ***Pyrotis gilgiana*** (De Wild.) Ver.-Lib. & R.D.Stone (*Dissotis gilgiana*) (***1***), D.R. Congo, *M. Schaijes 2005* (BR [0000017295055]), –, KX889242, MF398061, KY284762; ***Pyrotis gilgiana*** (De Wild.) Ver.-Lib. & R.D.Stone (*Dissotis gilgiana*) (***2***), D.R. Congo, R. Isi Signal Kisonsa, *R. Dessefans 5537* (BRLU), MF397956, KX889233, MF398052, KY284752; ***Rosettea aquatica*** (De Wild.) Ver.-Lib. & G.Kadereit (*Dissotis romiana*), D.R. Congo, Oso de Nzilo, *M. Schaijes 2348* (BR [0000013426477]), MF397984, KX889260, MF398081, KY284782; ***Rosettea crenulata*** (Cogn.) Ver.-Lib. & G.Kadereit (*Dissotis crenulata*), Angola, *B. Goyder, Baker & Clark 7476* (GRA), MF397959, KX889236, MF398056, KY284756; ***Rosettea denticulata*** (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit (*Dissotis denticulata*), Zambia, *D.K. Harder & al. 2249* (WAG [WAG.1091980]), MF397961, KX889238, MF398058, KY284758; ***Rosettea elliotii*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis thollonii* var. *elliotii*) (**1**), Cameroon, NW, Mbiame, *M.C. Veranso 208* (MJG [20967]), MF397988, KX889263, MF398085, KY284785; ***Rosettea elliotii*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis thollonii* var. *elliotii*) (**2**), Cameroon, Adamawa, Tibati, *M.C. Veranso 144* (MJG [20959]), MF397989, KX889264, MF398086, KY284786; ***Rosettea elliotii*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis thollonii* var. *elliotii*) (**3**), Cameroon, Adamawa, Tibati, *M.C. Veranso 145* (MJG [20960]), MF397990, KX889265, MF398087, KY284787; ***Rosettea falcipila*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis falcipila*), Zambia, Lisombo, *J. Loveridge 859* (BR [0000013426262]), MF397963, KX889241, MF398060, KY284761; ***Rosettea princeps*** (Kunth) Ver.-Lib. & G.Kadereit (*Dissotis princeps*) (***1***), Zimbabwe, Chimanimanis, *B. Wursten 2256* (BR), MF397981, KX889258, MF398079, KY284779; ***Rosettea princeps*** (Kunth) Ver.-Lib. & G.Kadereit (*Dissotis princeps*) (***2***), Mozambique, *O. Maurin 3393* (UJ [UJ09328]), MF397982, KX889259,–, KY284780; ***Rosettea pulchra*** (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit (*Dissotis pulchra*), Zimbabwe, Chimanimanis, *B. Wursten 2277* (BR), MF397983,–, MF398080, KY284781; ***Rosettea riparia*** (Gilg & Ledermann ex Engl.) Ver.-Lib. & G.Kadereit (*Dissotis bamendae*) (***1***), Cameroon, NW, Santa, *M.C. Veranso 231* (MJG [20992]), MF397979, KX889256, MF398077, KY284777; ***Rosettea riparia*** (Gilg & Ledermann ex Engl.) Ver.-Lib. & G.Kadereit (*Dissotis bamendae*) (***2***), Cameroon, Adamawa, Ngaoundere, *M.C. Veranso 156* (MJG [20961]), MF397978,

Appendix 1. Continued.

KX889255, MF398076, KY284776; ***Rosettea riparia*** (Gilg & Ledermann ex Engl.) Ver.-Lib. & G.Kadereit (*Dissotis bamendae*) (***3***), Cameroon, NW, Bui, *M.C. Veranso 181* (MJG [20953]), MF397980, KX889257, MF398078, KY284778; ***Rosettea sizenandoi*** (Cogn.) Ver.-Lib. & G.Kadereit (***Dissotis sizenandoi***), D.R. Congo, *S. Ntore 232* (BR [0000016153400]), MF397986, KX889262, MF398083, KY284784; ***Rosettea thollonii*** (Cogn.) Ver.-Lib. & G.Kadereit (*Dissotis thollonii* var. *thollonii*), Congo, *L. Devred 509* (BR [0000016908123]), MF397991, KX889266, MF398088, KY284788; ***Rosettea trothae*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis trothae*) (***1***), Tanzania, Rukwa, Mpanda, *Luke 16260* (MO [6590682]), MF397994, KX889269, MF398091, KY284791; ***Rosettea trothae*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis trothae*) (***2***), Tanzania, Iringa, Makete, *J. Lovett 4716* (MO [5000525]), MF397993, KX889268, MF398090, KY284790; ***Rosettea trothae*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis trothae*) (***3***), Tanzania, Rukwa, Nkasi, *SHCP 322* (MO [6135499]), MF397992, KX889267, MF398089, KY284789; ***Rosettea trothae*** (Gilg) Ver.-Lib. & G.Kadereit (*Dissotis trothae*) (***4***), Burundi, *S. Ntore 142* (BR [0000016993273]), MF397995,–, MF398092, KY284793; ***Rousseauxia andringitrensis*** (H.Perrier) Jacq.-Fél., Madagascar, *F. Almeda 9390* (CAS), –, –, JQ730139, JQ730561; ***Tristemma demeusei*** De Wild., Congo (Brazzaville), Sangha, *D.W. Thomas & al. 8838* (MO), MF398027, KX889306, MF398129, KY284831; ***Tristemma involucratum*** Benth., Liberia, *C.C.H. Jongkind 12379* (BR [0000016976337]), MF398028, KX889307, MF398130, KY284832; ***Tristemma oreophilum*** Gilg, Gabon, *F.J. Breteler 14156* (BR [0000017420655]), MF398029, KX889308, MF398131, KY284833.