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Flora of Singapore precursors, 58: Nomenclatural notes in Pandaceae

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ABSTRACT. The species of Pandaceae in Singapore are listed along with their synonyms. All names are typified, which in several cases has required clarifications of or corrections to typifications included in previous publications.

Keywords. Euphorbiaceae sensu lato, *Galearia*, lectotypification, *Microdesmis*

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Introduction

The Pandaceae have generally been regarded as part of the Euphorbiaceae sensu lato (Webster, 1994, 2014; Radcliffe-Smith, 2001), and classified in the subfamily Acalyphoideae, tribe Galearieae, although it has at times been moved into and out of the Euphorbiaceae (Forman, 1966; Radcliffe-Smith, 1987). Engler & Gilg (1912) considered the Pandaceae to be so distinct from Euphorbiaceae that they even introduced the order Pandales with the Pandaceae as the sole family. Molecular research (Wurdack et al., 2004, 2005) divided the Euphorbiaceae s.l. into five families, with the Pandaceae separate and quite distinct from the other families. The Pandaceae can be distinguished from the Euphorbiaceae (in a narrow sense) by the narrower rays in the wood, the lack of an obturator in the seeds, and the lack of a columella in the fruits (Euphorbiaceae in the strict sense have wider rays, possess an obturator and a columella in the fruit). For the most part they also differ in the possession of drupaceous fruits in Pandaceae, with the vast majority of species in the Euphorbiaceae having capsules. However, genera and species with drupes do also exist within the subfamily Acalyphoideae of the Euphorbiaceae (e.g., several species of *Mallotus* Lour.). The Pandaceae are generally difficult to identify and often confused with genera now placed in Salicaceae and Achariaceae. As the family lacks simple diagnostic characters it is mostly identified through identification of its genera. As there are only three genera in the family and only two genera in Singapore, *Galearia* Zoll. & Moritzi and *Microdesmis* Hook.f. ex Planch., this is not considered to be problematic.

The family has been revised for *Flora Malesiana* (van Welzen, 2011) and the *Flora of Peninsular Malaysia* (Syahida-Emiza, 2013). There is also a comprehensive synopsis of *Galeria* (Forman, 1971). Whilst preparing an account of the Pandaceae for the *Flora of Singapore* (van Welzen, in prep.), it became apparent that some clarifications of and corrections to these earlier works were needed. We also take the opportunity to typify some names. The taxonomic framework we adopt follows that of Lindsay et al. (2022) and van Welzen (in prep.). We list the current name and its synonyms for each taxon and provide a discussion of any nomenclatural and/or typification clarifications necessary.

Typifications and nomenclatural notes

1. *Galearia fulva* (Tul.) Miq., Fl. Ned. Ind. 1(2): 430 (1850). — *Cremostachys fulva* Tul., Ann. Sci. Nat., Bot. sér. 3, 15: 261 (1851). — *Bennettia fulva* (Tul.) Müll.Arg., Linnaea 34: 205 (1865). — TYPE: [Malaysia], Insula du Prince de Galle [Penang], s.d., *Collector unknown s.n.* (lectotype CGE [CGE00120706], designated here).

Cremostachys lindlaeana Tul., Ann. Sci. Nat., Bot. sér. 3, 15: 262 (1851). — *Bennettia lindlaeana* (Tul.) Müll.Arg., Linnaea 34: 205 (1865), as '*lindleyana*'. — *Galearia lindlaeana* (Tul.) Hook.f., Fl. Brit. India 5: 379 (1887), as '*lindleyana*'. — *Galearia caudata* Forman, Kew Bull. 14: 316 (1960), nom. illeg. superfl. — TYPE: [India], Kamaon, s.d., *Collector unknown [Wallich?] s.n.* (lectotype CGE [CGE00120707], designated here).

Bennettia pedicellata R.Br. in Bennett, Pl. Jav. Rar. 251 (1852). — *Galearia pedicellata* (R.Br.) Miq., Fl. Ned. Ind. 1(2): 430 (1859), nom. illeg. non Zoll. & Moritzi (1846). — TYPE: [Malaysia, Penang], s.d., *Porter s.n.* [EIC 8585C] (lectotype BM [BM000951620], designated by Forman (1971: 161)).

Bennettia affinis R.Br. in Bennett, Pl. Jav. Rar. 251 (1852). — *Galearia affinis* (R.Br.) Miq., Fl. Ned. Ind. 1(2): 430 (1859). — TYPE: [Malaysia, Penang], s.d., *Finlayson 22* [EIC 8585B p.p.] (lectotype BM [BM000907661], designated by Forman (1971: 160)).

Bennettia finlaysonii R.Br. in Bennett, Pl. Jav. Rar. 251 (1852), as '*finlaysoni*'. — *Galearia finlaysonii* (R.Br.) Miq., Fl. Ned. Ind. 1(2): 429 (1859). — TYPE: [Malaysia, Penang], s.d., *Finlayson 28* (lectotype BM [BM000907659], designated by Forman (1971: 160)).

Bennettia jackiana R.Br. in Bennett, Pl. Jav. Rar. 251 (1852). — *Galearia jackiana* (R.Br.) Miq., Fl. Ned. Ind. 1(2): 430 (1859). — TYPE: [Malaysia], Penang, s.d., *Jack s.n.* [EIC 8585A] (lectotype BM [BM000907660], designated by Forman (1971: 161)).

Bennettia phlebocarpa R.Br. in Bennett, Pl. Jav. Rar. 251 (1852). — *Galearia phlebocarpa* (R.Br.) Miq., Fl. Ned. Ind. 1(2): 429 (1859). — TYPE: Singapore, 1822, *Wallich s.n.* [EIC 8585D] (lectotype BM [BM000907662], designated by Forman (1971: 161)).

Bennettia wallichii R.Br. in Bennett, Pl. Jav. Rar. 251 (1852). — *Galearia wallichii* (R.Br.) Kurz, Prelim. Rep. Forest Pegu, App. A (1875) cxiii. — TYPE: [Myanmar], Tavoy, s.d., *Wallich s.n.* [EIC 8585E] (lectotype BM [BM000951610], designated by Forman (1971: 161)).

Galearia elliptica Miq., Fl. Ned. Ind., Eerste Bijv. 469 (1861). — TYPE: [Indonesia], Sumatra, Palembang, Muara-enim, s.d., *Teijsmann HB 3825* (lectotype U [U.1468089], designated here; isolectotypes U [U.1468088, U.1468090]; possible isolectotype K [K000253965, as *s.n.*]).

Galearia splendens Miq., Fl. Ned. Ind., Eerste Bijv. 469 (1861). — *Bennettia splendens* (Miq.) Müll.Arg., Linnaea 34: 205 (1865). — TYPE: [Indonesia], Sumatra, Poeloe Pisang, prope Padang, s.d., *Teijsmann HB 550* (lectotype U [U.1468091], designated by Forman (1971: 161); possible isolectotype K [K000253972, as *s.n.*]).

Galearia sumatrana Miq., Fl. Ned. Ind., Eerste Bijv. 469 (1861). — TYPE: [Indonesia], Sumatra, Province Lampong, near Kebang, s.d., *Teijsmann HB 4307* (lectotype U [U.1468092], designated by Forman (1971: 161); possible isolectotype K [K000253964, as *s.n.*]).

Galearia angustifolia Miq., Fl. Ned. Ind., Eerste Bijv. 470 (1861). — TYPE: [Indonesia], Sumatra, Palembang, near Muara-enim, s.d., *Teijsmann HB 3925* (lectotype U [U.1468087], designated by Forman (1971: 161); isolectotype A [A00106198, fragment from U]; possible isolectotype K [K000253966, as *s.n.*]).

Bennettia subulata Müll.Arg. in de Candolle, Prodr. 15(2): 1039 (1866). — *Galearia subulata* (Müll.Arg.) Hook.f., Fl. Brit. India 5: 379 (1887). — TYPE: [Malaysia], Prince of Wales Island [Penang], s.d., *Collector unknown s.n.* (lectotype MEL [MEL37352], designated by Forman (1971: 161); possible isolectotype G-DC [G00318877]).

Galearia helferi Hook.f., Fl. Brit. India 5: 378 (1887). — TYPE: [Myanmar], Tenasserim, 20 February 1839, *Helfer 505* [Kew distribution no. 4968] (lectotype K [K000253984], designated here; possible isolectotype P [P00712450, only with the Kew distribution number]).

Galearia philippinensis Merr., Philipp. J. Sci., Bot. 9: 482 (1914). — TYPE: Philippines, Basilan, September 1912, *Reillo BS 16319* (lectotype BM [BM000951619], designated here; isolectotypes K [K000253967], L [L0016214], P [P00712455], US [US00096523]).

Galearia minor Gage, Rec. Bot. Surv. India 9: 234 (1922). — TYPE: [Malaysia], Pahang, Pulau Jellum, August 1891, *Ridley s.n.* (lectotype SING [SING0097604], designated by van Welzen (2011: 27)).

Galearia ridleyi Gage, Rec. Bot. Surv. India 9: 235 (1922). — TYPE: [Malaysia], Johor, Gunung Janeng, 20 October 1892, *Lake & Kelsall s.n.* (lectotype SING [SING0097600], designated by Syahida-Emiza (2013: 343); isolectotype SING [SING0097602]).

Galearia sessiliflora Merr., J. Straits Branch Roy. Asiat. Soc. 86: 320 (1922). — TYPE: [Malaysia], North Borneo [Sabah], Batu Lima near Sandakan, 1920, *Ramos 1312* (lectotype US [US00096524], designated here).

Galearia stenophylla Merr., J. Straits Branch Roy. Asiat. Soc. 86: 320 (1922). — TYPE: [Malaysia], North Borneo [Sabah], Batu Lima near Sandakan, 1920, *Ramos 1542* (lectotype K [K000253983], designated here; isolectotypes A [A00043599], BM [BM000951612], L [L0016215], P [P00712454], US [US00096525]).

Galearia fusca Ridl., Fl. Malay Penins. 3: 257 (1924). — TYPE: [Malaysia], Negeri Sembilan, Gemas, 16 September 1920, *Burkill 6375* (lectotype K [K000253978], designated by Forman (1971: 162); isolectotype SING [SING0144064]).

Galearia dongnaiensis Pierre ex Gagnep., Bull. Soc. Bot. France 71: 1025 (1925). — TYPE: [Vietnam], Province Bien-Hoa, Mt Pong-Lu, March 1877, *Pierre 1969* (lectotype P [P00603692], designated here; isolectotypes A [A00105730], K [K000253977], P [P00603693, P00603694]).

Galearia dolichobotrys Merr., Philipp. J. Sci. 29: 384 (1926). — TYPE: [Malaysia], North Borneo [Sabah], Banguey [Banggi] Island, 1923, *Castro & Melegrito 1377* (holotype UC [UC241612]; isotypes A [A00043596], K [K000253968]).

Galearia lancifolia Ridl., Bull. Misc. Inform. Kew 1926: 476 (1926). — TYPE: [Malaysia], Selangor, Ulu Gombak, 24 November 1921, *Hume 9931* (lectotype SING [SING0144063], designated here).

Notes. Forman (1971) cited the type of *Cremostachys fulva* Tul. and the type of *Cremostachys lindlaeana* Tul. as 'Type: Penang, Herb. Wall. 8585C parte ex Herb. Lindley (holotype, CGE!)', i.e., with exactly the same information. The implication is that the East India Company (EIC) Herbarium collection 8585C, which would often be cited as *Wallich 8585C* (even though the actual collector was George Porter), is a mixed collection and specimens of it typify two different names. Tulasne (1851) explicitly stated the collections were in the Lindley Herbarium and two specimens labelled with the two names by Tulasne have been located in CGE (herbarium codes follow Thiers, continuously updated). Neither specimen is labelled as being collected

by Wallich or has any evidence that it is from the EIC Herbarium. Forman (1971) does note that the locality information on the CGE specimen of *Cremostachys lindlaeana* is 'Kamaon', transliterated by Tulasne (1851) as Kamooa, but asserts that this is a mistake and it should say Penang, the collection locality of EIC 8585C. Tulasne (1851) makes no mention of Wallich or the EIC collection in the protologue of *Cremostachys fulva* but does have 'Wallich' in brackets after the collection locality of 'Kamooa' in the protologue of *Cremostachys lindlaeana* even though Wallich is not mentioned on the actual specimen. There is no evidence that these two specimens form part of the EIC collection 8585C or that the locality information on the type of *Cremostachys lindlaeana* is incorrect. Forman (1971) does not explain how he concluded the CGE specimens were specimens of EIC 8585C but under the name *Bennettia pedicellata* R.Br. he includes the type information as 'Type: Penang, Herb. Wall. 8585C parte (holotype, BM!), based on the same type as *Cremostachys lindlaeana* Tul., vide supra'. This would render *Bennettia pedicellata* a superfluous homotypic synonym of *Cremostachys lindlaeana*, which is indeed how the name was treated by van Welzen (2011) and Syahida-Emiza (2013). Not only does Robert Brown in Bennett (1852) not refer to *Cremostachys lindlaeana*, but to suggest that *C. lindlaeana* is homotypic with *Bennettia pedicellata* would be to discount the information actually on the sheet of *C. lindlaeana* in CGE. Here, we treat these names as heterotypic and consequently, *Bennettia pedicellata* is not superfluous. As it is not certain whether there were additional specimens of *Cremostachys fulva* and *Cremostachys lindlaeana* distributed from the Lindley Herbarium, the two CGE specimens are designated here as lectotypes of the two names.

Forman (1971) effectively designated the lectotype of *Bennettia pedicellata* by citing '(holotype, BM!)'. There are three specimens of EIC 8585C in BM but Forman has clearly distinguished one of them as the type with a type label and suggested that one of the other two is not even a duplicate. In Wallich (1848), it is suggested that George Porter was the collector of EIC 8585C but his name does not appear on the BM specimen. We refrain here from listing any isolectotypes from amongst the several additional specimens of EIC 8585C due to the suggestion in the literature and on specimens that not all material of this number belongs to a single gathering.

Robert Brown in Bennett (1852) described several more new species from amongst the specimens catalogued under number 8585 in Wallich (1848). *Bennettia affinis* R.Br. was described from a specimen of *Finlayson 22* [EIC 8585B], although it is not entirely clear that the '22' is Finlayson's collection number. The specimen does state that it is part of EIC 8585B and the specimen in BM has been effectively lectotypified by Forman (1971). Forman (1971), likewise, effectively lectotypified *Bennettia finlaysonii* R.Br. with a specimen of *Finlayson 28* in BM, again with some doubt as to whether the 28 is actually a collection number or not, which Forman (1971) and Syahida-Emiza (2013) state is also part of EIC 8585B. However, in this case the EIC number is not on the specimen although there is a 'Herb. Wallich' label which does indicate the EIC herbarium collection. The remaining names published by Robert Brown in Bennett (1852) are *Bennettia jackiana* R.Br., *B. phlebocarpa* R.Br. and *B. wallichii* R.Br., described respectively from EIC 8585A, 8585D and 8585E, and all

of which have been effectively lectotypified by Forman (1971) on the specimens of these numbers in BM. Given the earlier noted complications with concluding whether specimens under these EIC numbers are duplicates or not, we refrain from listing any isolectotypes. Ultimately, all of the material under EIC 8585 is now included within *Galearia fulva* and it is very possible that whatever differences Brown perceived, even between specimens that were supposedly duplicates, were taxonomically insignificant and the specimens of the same number are indeed duplicates after all.

Miquel (1861) listed four new species of *Galearia* which are now also all treated as synonyms of *G. fulva*. These are *Galearia elliptica* Miq., *G. splendens* Miq., *G. sumatrana* Miq. and *G. angustifolia* Miq., all of them based on Teijsmann's collections from Sumatra. Three of these names were effectively lectotypified by Forman (1971) as listed above. For *Galearia elliptica* Miq., Forman (1971) listed two syntypes. A specimen in U of one of the two collections has been selected as the lectotype.

Forman (1971) effectively designated a lectotype for *Bennettia subulata* Müll. Arg. on a specimen labelled as having come from the Lindley Herbarium and which Forman speculates is part of the same collection as the type of *Cremostachys fulva* Tul. Both Forman (1971) and van Welzen (2011) suggest this is part of EIC 8585C which we discuss and refute above. It is nevertheless possible that it is part of the same collection as the type of *Cremostachys fulva*.

Galearia helferi Hook.f. was described from two collections. Forman (1971) and van Welzen (2011) listed both syntypes and we are not aware that the name has hitherto been lectotypified. Here, we designate the K specimen of *Helfer 505* [= Kew distribution no. 4968] as the lectotype. The specimen in P is labelled as Kew distribution no. 4968 but lacks the Helfer 505 number. As the Kew distribution numbers sometimes include more than one collection it is possible it is not a duplicate of the K specimen, although in this case it is likely to be.

Forman (1971) cited an 'isotype K' for *Galearia stenophylla* Merr. although, as it has no holotype, this would actually be a syntype. Syahida-Emiza (2013) later called this specimen a 'holotype' but at that time this did not constitute an effective lectotypification with that specimen. To avoid possible confusion, we here designate the same K specimen as the lectotype.

For *Galearia dongnaiensis* Pierre ex Gagnep., we designate the most complete specimen from amongst the syntypes as the lectotype.

Van Welzen (2011) cited 'holo PNH†' for the type of *Galearia dolichobotrys* Merr. but in the introduction to the paper in which the protologue was published (Merrill, 1926), it is quite clearly stated that the new species are based on the specimens in UC. We, therefore, cite the UC specimen as the holotype here.

Forman (1971), van Welzen (2011) and Syahida-Emiza (2013) all listed a holotype in K for *Galearia lancifolia* Ridl. However, Ridley (1926) cited a type collection, *Hume 9931*, but did not say in which herbarium the single specimen is located and the duplicate in SING is clearly labelled with Ridley's name in Ridley's hand. Therefore, there is no holotype but Forman's suggestion that the holotype is in Kew would be an effective lectotypification. The problem is that there does not appear to be a specimen of *Hume 9931* in Kew. Because it is either lost or Forman (1971)

made a mistake that has been perpetuated by later authors, the specimen in SING is here selected as the lectotype. Indeed, it appears that H.L. Hume did not deposit specimens in Kew. To test this, a general search of specimens of any species collected by H.L. Hume and that serve as the types of names was conducted in JSTOR Global Plants in February 2026. This search resulted in eight specimens, six of them in SING and two of them in K. The two specimens in Kew are, however, both the result of SING specimens having been cut into two with part donated to Kew. It is distinctly possible, therefore, that there never was a *Hume 9931* specimen at Kew.

2. *Galearia maingayi* Hook.f., Fl. Brit. India 5: 377 (1887). — TYPE: [Malaysia], Malacca [Melaka], s.d., *Maingay 2733* [Kew distribution no. 1412] (lectotype K [K000253985], designated by Syahida-Emiza (2013: 345); isolectotype K [K000253987]).

Notes. Galearia maingayi Hook.f. was described with two syntypes, *Maingay 2733* [Kew distribution no. 1412] and *Maingay 3129* [Kew distribution no. 1412/2]. Forman (1971) and van Welzen (2011) both cited the two syntypes, but Syahida-Emiza lectotypified the name with one of the two, *Maingay 2733* [Kew distribution no. 1412] specimens in Kew.

3. *Microdesmis caseariifolia* Planch. ex Hook., Hooker's Icon. Pl. 8: t. 758 (1848), as '*casearіaefolia*'. — TYPE: [Myanmar], Moulmein, s.d., *Lobb 337* (lectotype K [K000253908], designated by Syahida-Emiza (2013: 349)).

Tetragyne acuminata Miq., Fl. Ned. Ind., Eerste Bijv. 463 (1861). — TYPE: [Indonesia], Sumatra, Lampongs, Mangala, s.d., *Teijsmann HB 4362* (lectotype U [U0244864], designated here).

Microdesmis philippinensis Elmer, Leafl. Philipp. Bot. 4: 1300 (1911). — TYPE: Philippines, Brooks Point (Addison Peak), February 1911, *Elmer 12620* (lectotype NY [NY00272966], designated here; isolectotypes A [A00043601], E [E00504756], F [F0056911F, F0056912F], K [K000253914], L [L0158206], NY [NY00022708], P [P00712459], U [U.1468098], US [US00096526]).

Notes. Microdesmis caseariifolia Planch. ex Hook. was briefly described with two syntypes, a Griffith specimen from Malacca and *Lobb 337* from Singapore. The specimen of *Lobb 337* in 'herb. Hook.' as cited in the protologue is, however, labelled as being from Moulmein in Myanmar, not from Singapore. There are, however, known problems with the locality data on Lobb's specimens (see Middleton & Turner, 2019). Van Welzen (2011) cited both syntypes, but Syahida-Emiza (2013) designated the *Lobb 337* specimen in K as the lectotype.

Tetragyne acuminata Miq. was validly published under Art. 38.6 of the ICN (Turland et al., 2025) because even though it is given without a description, it is the only species listed for the new genus *Tetragyne* Miq. The '(T.)' given in the protologue is a reference to a Teijsmann collection, in this case from 'Lampong, prope Mangala'. Although only one specimen has been located which matches these details, it cannot be assumed it was always a unicate and consequently cannot be assumed to be a holotype. The description of this specimen as a 'holotype' in van Welzen (2011) did not effect a lectotype designation which is instead done here.

Microdesmis philippinensis Elmer was described from two syntypes, the flowering collection *Elmer 12620* and the fruiting collection *Elmer 13151*, both from Palawan in the Philippines. We here designate a duplicate of *Elmer 12620* with typed notes by Elmer on the sheet as the lectotype.

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