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Status of names of *Mitrasacme* species occurring outside Australia

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Abstract

Species of *Mitrasacme* occurring in Australia were revised for the *Flora of Australia* project in 1996, but the genus has never been revised as a whole. A checklist of the names of *Mitrasacme* species that occur outside Australia is presented here, together with their taxonomic status, known distribution and notes on their morphological affinities. *Mitrasacme inornata* Dunlop is formally placed into synonymy under *M. albomarginata* Leenh., and *M. erophila* subsp. *grandiflora* J.Parn. & O.Griffin is formally placed into synonymy under *M. nidulifera* Dunlop. Lectotypes are designated for *M. elata* R.Br., *M. pusilla* Dalzell and *M. setosa* Hance. Neotypes are designated for *M. crystallina* Griff and *M. indica* Wight. The status of *Mitrasacme saxatilis* Backer ex Cammerl. is uncertain; it is doubtful this species should be placed in *Mitrasacme*.

Introduction

Mitrasacme Labill. (Loganieae, Loganiaceae) is most species-rich in Australia, but has a geographic range that extends north through Malesia to Asia and east to New Caledonia. Of the approximately 55 species currently recognised in *Mitrasacme*, 50 species occur in Australia (c. 43 endemic) (Dunlop 1996, Barrett and Barrett 2015, Gibson and Leeuwen 2015), with at least four putative new Australian species awaiting formal recognition. Dunlop (1996) provided the first revision of Australian species of *Mitrasacme* since Bentham and Mueller (1869), but did not review species not occurring in Australia. Asian and Malesian species have been revised in various regional floras (Leenhouts 1962b [Malesia], Backer and Bakhuizen van den Brink 1965 [Jawa, Indonesia], Tirel-Roudet 1972 [Cambodia, Laos, Vietnam], Conn 1995 [Papua New Guinea], Li and Leeuwenberg 1996 [China], Griffin and Parnell 1997 [Thailand]), but *Mitrasacme* has never been revised as a whole, and the account by Dunlop (1996) remains the most comprehensive treatment.

Of those species of *Mitrasacme* occurring in Australia, three species, *M. erophila* Leenh., *M. indica* Wight and *M. pygmaea* R.Br., are also widespread in Malesia and Asia, with *M. pygmaea* also occurring in New Caledonia. *Mitrasacme albomarginata* Leenh., *M. elata* R.Br. and *M. nudicaulis* Reinw. ex Blume are recorded from Australia and New Guinea, with *M. elata* also found on Kepulauan Aru (Aru Islands, Indonesia), and *M. nudicaulis* also from Nusa Tenggara, Indonesia (Lesser Sunda Islands) and Timor Leste. The remaining non-endemic Australian species also occur in Southeast Asia, with species of *Mitrasacme* not recorded in Australia occurring in Southeast Asia and New Guinea. It is uncertain whether the geographic ranges of two Australian species, *M. retroloba* Dunlop and *M. prolifera* R.Br. (Dunlop 1996), extend outside Australia.

They are not dealt with separately here, but see notes on *M. erophila* for information on *M. retroloba*, and notes on *M. indica* for information on *M. prolifera*. Additionally, the full geographic range of *M. micrantha* Domin outside Australia is not known (see notes under that species). *Mitrasacme* was previously regarded as occurring in New Zealand, but all taxa have now been transferred to *Schizacme* Dunlop (Gibbons et al. 2014) or to *Veronica* L. (Plantaginaceae) (Kirk 1896, Garnock-Jones et al. 2007).

Here, we present a checklist of the currently accepted species names of *Mitrasacme* occurring outside Australia, together with their known distribution and notes on their morphological affinities. Two new synonymies are presented and the status of previously published synonymies for all accepted names in *Mitrasacme* has been confirmed from photographic images of type material and/or descriptions given in the protologue, except in the few instances where descriptions and available images were insufficient to place the taxon.

Nomenclature

Currently accepted species of *Mitrasacme* occurring outside Australia

1. *Mitrasacme albomarginata* Leenh., *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 442 (1962). Leenhouts PW, in CGGJ van Steenis (ed.), *Flora Malesiana* ser. 1, 6(2): 385, Fig. 45 (1962). Conn BJ, in *Handbooks of the flora of Papua New Guinea* 3: 169 (1995).

Type: Indonesia: Papua: Digul: Koerik bivouac near Merauke, 7 Sep 1954, *van Royen 4847* (holo: L, photograph!).

Mitrasacme inornata Dunlop, *Flora of Australia* 28: 312 (1996), **syn. nov.**

Type: Australia: Northern Territory: Melville Island, 8 km W of Pularumpi, 11 Oct 1995, *Barritt 1950* (holo: DNA!; iso: MEL, photograph!).

Distribution: The holotype of *Mitrasacme albomarginata* is the only extra-Australian collection of this species. In Australia *M. albomarginata* is known (as *M. inornata*) from few collections; in Queensland from near Weipa, Cape York Peninsula, and in the Northern Territory from Arnhem land, Groote Eylandt (Gulf of Carpentaria), the Tiwi Islands, Coburg Peninsula and near Darwin (AVH 2015). The Indonesian Papua collection is not geographically distant from Australian collections, with this near-coastal species encircling the Gulf of Carpentaria.

Notes: Dunlop's (1996) description of *M. inornata* makes no mention of the white margins of the leaves and calyx lobes described by Leenhouts (1962b), but in Australian material the leaf margin appears to be thickened to slightly hyaline. Dunlop (1996) gives the pedicel length in Australian material as up to 17 mm long, compared with 5–10 mm long given in the protologue of *M. albomarginata* (Leenhouts 1962b). The two descriptions are otherwise in agreement. Our examination of images of the holotype of *M. albomarginata* indicates pedicels are up to 15.5 mm long. The phylogenetic affinities of *M. albomarginata* are with the Australian endemic species *M. alsinoides* R.Br. and *M. secedens* Dunlop (Gibbons et al. in prep), with morphology also resembling *M. indica* and *M. bogoriensis* Leenh.

2. *Mitrasacme bogoriensis* Leenh., *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 444 (1962). Leenhouts PW, in CGGJ van Steenis (ed.), *Flora Malesiana* ser. 1, 6(2): 386, Fig. 47 (1962). Backer CA and RC Bakhuizen van den Brink Jr, *Flora of Java* 2: 209 (1965).

Type: Indonesia: Jawa: Jawa Barat: Batavia Residency, along the river Tji Handjawr [Cihanjavar River], E of Bogor, 29 Dec 1912, *Backer 6218* (holo: BO n.v.; iso: L, photograph!).

Distribution: *Mitrasacme bogoriensis* was described from three collections near Bogor (Leenhouts 1962b). The current conservation status and geographic distribution of this species are uncertain.

Notes: The minutely reticulate seed testa, campanulate calyx, and frondose botryoidal inflorescences of *M. bogoriensis* are similar to *M. alsinoides* and *M. indica*, but further study is required to definitively determine the affinities of this species.

3. *Mitrasacme elata* R.Br., *Prodromus florae Novae Hollandiae* 453 (1810). Leenhouts PW, in CGGJ van Steenis (ed.), *Flora Malesiana* ser. 1, 6(2): 380, Fig. 39 (1962). Conn BJ, in *Handbooks of the flora of Papua New Guinea* 3: 170, Fig. 38 (1995). Dunlop, *Flora of Australia* 28: 45 (1996).

Mitrasacme elata R.Br. **var elata**

Leenhouts PW, *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 446 (1962).

Lectotype (here designated): Australia: Northern Territory: Gulf of Carpentaria: North Island, Sir Edward Pellew Group, 20 Dec 1802, *R. Brown s.n.* (BM1040457, photograph!); **isolectotype:** (BM001040458, photograph!). **Possible syntypes:** Australia: 'North Coast', without date, *R. Brown s.n.* (MEL68565, K000883356, photographs!); Australia: unknown location, without date, *R. Brown s.n.* (K000883355, photograph!); Australia: 'Carpentaria', 1803, *R. Brown s.n.* (P639994, photograph!).

Distribution: *Mitrasacme elata* is found in Australia (Northern Territory), Indonesia [Kepulauan Aru (Aru Islands)], and Papua New Guinea (Leenhouts 1962a, Dunlop 1996).

Notes: The specimen chosen as lectotype is annotated in Brown's hand with 'Exacum junceum Carpentaria Island h, No.9, Dec' 20 desc [description] –21 1802' with a later Brown label '*Mitrasacme elata* prodr 453 desc s. r Dec' 1802'. This appears to be the specimen on which the description was based. Island h refers to North Island, Sir Edward Pellew Group (Stearn 1960). The isolectotype is material mounted on a blue sheet for public display at BM. Although Stearn (1960) suggests such material is suitable for lectotypification it does not, in this case, represent better material than the specimen chosen. Other Brown specimens listed as possible syntypes are from another location 'North Coast' or a later date '1803'.

For *Mitrasacme elata* var. *brevicalyx* Leenh., see *M. nudicaulis* Reinw. ex Blume.

4. *Mitrasacme erophila* Leenh., *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 446; Fig. 72 (1962). Leenhouts PW, in CGGJ van Steenis (ed.), *Flora Malesiana* ser. 1, 6(6): 960 (1972). Tirel-Roudet C, in A Aubréville and J-F Leroy, *Flore du Cambodge, Laos, Vietnam* 13: 80; pl.14 (1972). Griffin O and Parnell J, in *Flora of Thailand* 6(3): 223 (1997).

Type: India: Meghalaya: Mt. Khasia, 400ft, without date, *J.D. Hooker & Thomson, s.n.* (holo: L5156, photograph!; iso: BM1014339, L5157, P63986–P63989, photographs!).

Distribution: Widely distributed in India, Cambodia, Vietnam, Thailand (Griffin and Parnell 1997), Indonesia (Jawa, Nusa Tenggara), Timor Leste (Leenhouts 1962b) and possibly Australia (as *M. retroloba* in Dunlop 1996, see Notes).

Notes: It is likely the name *M. erophila* is applicable to at least some Australian material currently recognised under *M. retroloba* Dunlop. A recent molecular study (Gibbons et al. in prep) indicates that Australian material attributed to *M. retroloba* might be better recognised as more than one species, but further study is required to determine the taxonomic limits of both species. Dunlop (1996) noted that the geographic range of *M. retroloba* extends to Southeast Asia, but the geographic range of the two species, and possible misapplication of names, requires clarification. Available images of type material of *M. erophila* seen by us do not carry Dunlop's annotations.

5. *Mitrasacme indica* Wight, *Icones plantarum Indiae Orientalis* 4(4): 15, t. 1601 (1850). Leenhouts PW, *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 449 (1962). Leenhouts PW, in CGGJ van Steenis (ed.), *Flora Malesiana* ser. 1, 6(2): 384 (1962). Tirel-Roudet C, in A Aubréville and J-F Leroy, *Flore du Cambodge, Laos, Vietnam* 13: 82 (1972). Li P-t and Leeuwenberg AMJ, in *Flora of China* 15: 322 (1996).

Mitrasacme alsinoides auct. non R.Br., Clarke CB, in Hooker JD, *Flora of British India* 4: 80 (1883); Dop P, *Flore générale de l'Indo-chine* 4: 157 (1912).

Mitrasacme alsinoides R.Br. var. *indica* (Wight) H.Hara, *Journal of Japanese Botany* 30: 24 (1955).

Mitrasacme prolifera sensu Dunlop CR, *Flora of Australia* 28: 50 (1996), possibly non R.Br. *Prodromus florae Novae Hollandiae* 453 (1810).

Type citation: "The exact station whence the specimen represented was obtained is uncertain, but I have specimens from various localities, Jaulnah, Arcot, Caimbatore, &c."

Neotype (here designated): India: Arcot: in moist shady places, Jan 1826, unknown collector, [*Herb. Wight s.n.*] K001132432; **possible isoneotype:** India: Arcot, without date, unknown collector s.n. (E179283, photograph!); **possible syntypes:** India, without date, unknown collector [*Herb. R. Wight s.n.*], (K000450679; photograph!); India, Negapitam [Negapetum, now Nagapattinam], 23 Feb 1829, *Wight s.n.* (E179284, photograph!); India, Negapitam, without date, *Wight s.n.* (E179285, photograph!).

Note: Leenhouts (1962b) and Tirel-Roudet (1972) both cite syntypes of *M. indica* they have seen at Kew, with Leenhouts adding that he did not designate a lectotype. Since it is not possible to identify the specimen that was used to circumscribe this species, the Kew collection from Arcot has been chosen as a neotype because the author examined plants from this region of India (refer protologue).

Mitrasacme crystallina Griff. *Notulae ad plantas asiaticas* 6(4): 87 (1854). Illustration: *Icones plantarum asiaticarum* t. 383, Fig. 2 (1854).

Type: India: West Bengal: ‘Bengala Paulo infra Jumalpure [Jamalpure]: in arenosis’, 15 Sep 1835, presumably *herb. W. Griffith.* (K, n.v).

Neotype (here designated): India: Assam: Banks of the [illegible, Bopartus?], close to the water’s edge, 27 Sep 1835, *herb. W. Griffith* 3733, K000883396, lower right, photograph!).

Note: Since the collection from near Jamalpure, cited in the protologue, has not been located, the *herb. W. Griffiths* 3733 is here designated as neotype because it is part of the Griffith’s herbarium and the morphological features of these specimens agree with the protologue.

Mitrasacme pusilla Dalzell, *Hooker’s Journal of Botany and Kew Garden Miscellany* 2: 136 (1850).

Type citation: ‘Crescit in prov. Malwan; fl. Aug. et Sept.’

Lectotype (here designated): unknown location, without date, *Dalzell* (K000883391, photograph! – upper four specimens of sheet). **Possible syntypes:** India: Bombay, without date, *Dalzell* (K000883394, photograph!); unknown location, without date, unknown collector, (K000883392, photograph!).

Note: The above specimen is chosen as lectotype because it is labelled by Dalzell as ‘*Mitrasacme pusilla* n. sp.’

Oldenlandia brachyphylla Merr., *Flora of Manila* 448 (1912). Merrill ED, *An enumeration of Philippine flowering plants* 3: 311 (1923). Leenhouts PW, in van Steenis CGGJ (ed.) *Flora Malesiana* ser. 1, 6(2): 384 (1962). Tirel-Roudet C, in Aubréville A and Leroy J-F, *Flore du Cambodge, Laos, Vietnam* 13: 82 (1972).

Type citation: ‘In old rice paddies and open wet grass lands, Caloocan to Masambong, fl. Oct.–Jan.; known only from the vicinity of Manila.’

Probable Type: Philippines: Vicinity of Manila, Luzon, Nov 1910, *Merrill* 705 (FR, M, U, US, photographs!)

Distribution: *Mitrasacme indica* is widespread in India, China and Southeast Asia, with one record as far north as Khasansky District, Primorsky Krai, Russia (Leenhouts 1962a, Kozhevnikov and Kozhevnikova 2000); possibly also in northern Australia (see notes below). Further study is needed to determine whether collections from Papua New Guinea are attributable to *M. indica* or to *M. prolifera* R.Br. (see notes). *Mitrasacme indica* is a known weed of rice paddies (Biological diversity clearing house mechanism 2015), and so its wide geographic distribution might be explained, in part, by anthropogenic spread.

Notes: Dunlop (1996) placed *M. indica* in synonymy with *M. prolifera* R.Br. However, the name *M. indica* is widely accepted outside Australia. Dunlop’s (1996) description of *M. prolifera*, and material at DNA determined by him as *M. prolifera*, appear to agree with Wight’s description and illustration of *M. indica*, as well as with photographic images of the types. Brown’s name has priority, although it is not certain whether Dunlop correctly applied the name, *M. prolifera* R.Br. At Kew there are two Brown type collections of *M. prolifera*: Australia: Queensland, Shoalwater Bay, 30 Aug 1802, *R. Brown, s.n.* (BM802677; upper right collection on sheet only, photograph!) and BM802679 (photograph!), the duplicate specimen mounted on a blue sheet for public display by Brown. The former sheet also carries a Banks and Solander collection from Endeavor River, Queensland, designated by Bentham (1869) as the type of *M. prolifera* var. *major* Benth. Dunlop (1996) notes this collection could not be located, and so it appears Dunlop did not see this sheet, although he might have seen the duplicate (BM802679).

Brown’s (1810, p. 453) description notes “corolla tubo globoso limbum superante”, suggestive of the strongly urceolate corolla of the morphologically similar Australian species, *M. nummularia* S.Moore. The corolla of Australian material determined by Dunlop to be *M. prolifera* is campanulate. Dunlop (1996) gives the southern limit of *M. nummularia* in Queensland as Cairns. However, *M. nummularia* (as currently applied in Australia) is also known from the type locality of *M. prolifera*, Shoalwater Bay, Queensland. *Mitrasacme nummularia* is a morphologically variable taxon which recent molecular work (Gibbons et al. in prep) suggests might be better recognised as multiple species. Further morphological, and perhaps molecular, study is needed to resolve the complex. Our initial observations suggest that the name *M. prolifera* might be attributable to material within the *M. nummularia* complex collected by us in Cape York Peninsula.

Further examination of type material of *M. prolifera* is necessary, with seed testa and stem ornamentation useful characters that are not mentioned in Brown’s (1810) description and that cannot be seen from images. Until the question is resolved, we continue to accept the name *M. indica*.

6. *Mitrasacme micrantha* Domin, Beiträge zur flora und pflanzengeographie Australiens. *Biblioteca Botanica* 89: 1071 (1928). Leenhouts PW, in CGGJ van Steenis (ed.). *Flora Malesiana* ser. 1, 6(2): 383 (1962). Dunlop CR, *Flora of Australia* 28: 52 (1996).

Type: Australia: Queensland: Cook: Chillagoe, Feb 1910, *K. Domin s.n.* (holo: PR, n.v.).

Distribution: In Australia, *M. micrantha* occurs predominantly in the Northern Territory and Queensland (Dunlop 1996); a recent collection (*R.L. Barrett 8082, M.D. Barrett & B. Anderson*, PERTH) extends the known geographic range in Australia to the Kimberley region, Western Australia. Also known from the Philippines, and likely more widespread in Malesia (see notes).

Notes: Leenhouts (1962a) placed *M. micrantha* in synonymy with *M. pygmaea* var. *malaccensis* (Wight) Hara, but Dunlop (1996) maintains *M. micrantha* as a distinct species. A recent molecular phylogeny (Gibbons et al. in prep) supports Dunlop's conclusions. Although Dunlop (1996) does not list the extra-Australian distribution of this species, two collections from the Philippines are held in Australian herbaria and have been determined by Dunlop and confirmed by us as *M. micrantha*. It is likely *M. micrantha* is more widespread in Malesia, currently included in *M. pygmaea* var. *malaccensis* sensu Leenhouts (1962a), but the full distribution is not known.

Extra-Australian material examined: Philippines: Lamao River, Mount Mariveles, Oct 1903, *E.D. Merrill 3093* (NSW); Philippines, Oct 1913, *M. Ramos 1412* (NSW).

7. *Mitrasacme neglecta* Leenh., *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 449 (1962). Leenhouts PW, in CGGJ van Steenis (ed.). *Flora Malesiana* ser. 1, 6(2): 386, Fig. 46 (1962). Conn BJ, in *Handbooks of the flora of Papua New Guinea* 3: 172 (1995).

Type: Timor, without date, unknown collector (holo: L5158, photograph!).

Distribution: This species is recorded from Indonesia (Jawa, Madura, Nusa Tenggara, Sulawesi), Timor Leste and Papua New Guinea (Leenhouts 1962b).

Notes: The affinities of *M. neglecta* are with the Australian species *M. nummularia* (syn. *M. commutata* Leenh.) (Leenhouts 1962b). Dunlop (1996) notes that *M. neglecta* has been misapplied to *M. nummularia* in Australia.

8. *Mitrasacme nidulifera* Dunlop, *Flora of Australia* 28: 310 (1996).

Type: Australia: Northern Territory; Darwin and Gulf: Mount Boulder, 24 Feb 1989, *Dunlop 7988 & Leach* (holo: DNA!; iso: BRI, CANB, MEL, PERTH).

Mitrasacme erophila subsp. *grandiflora* J.Parn. & O.Griffin *Novon* 5: 59 (1995), **syn. nov.** Griffin O and Parnell J, in *Flora of Thailand* 6(3): 224 (1997).

Type: Thailand: Chang Mai, Omkoi, c. 35 km from pine improvement centre to Omkoi, 28 Dec 1978, *Niyomdham, Suangtho & Sangkhachand 168* (holo: L, photograph!; iso: AAU).

Distribution: In Thailand known only from the type collection for *M. erophila* subsp. *grandiflora*; also in northern Australia (Dunlop 1996).

Notes: The ciliate, horseshoe-shaped anthers, reticulate seed testa and cupular scales on the adaxial leaf surface are diagnostic for *M. nidulifera*. Although Dunlop (1996) gives the height of *M. nidulifera* as to 12 cm, compared with 20 cm given in the protologue of *M. erophila* subsp. *grandiflora* (Parnell 1995), the holotype of *M. nidulifera* is >20 cm high. Known in Thailand only from one collection, it is possible that this is a transitory waif, rather than an established, population.

9. *Mitrasacme nudicaulis* Reinw. ex Blume, *Bijdragen tot de flora van Nederlandsch Indie* 14: 849 (1826). Dunlop CR, *Flora of Australia* 28: 43 (1996).

Type: 'in insula Solor' [Indonesia: Nusa Tenggara: Kepulauan Solor], anno 1821, *Reinwardt 1269* (holo: L, photograph!).

Mitrasacme trinervis Span. 'Prodromus florum timorensis'. *Linnaea* 15: 335; Icon. 58, (1841). *Mitrasacme elata* var. *brevicalyx* Leenh. *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 457 (1962). Leenhouts PW, in CGGJ van Steenis (ed.). *Flora Malesiana* ser. 1, 6(2): 381, Fig. 46 (1962).

Type: Timor, without date, *Spanoghe, s.n.* (L5151; photograph!).

Mitrasacme longiflora F.Muell. ex Benth., *Flora Australiensis* 4: 355 (1868).

Lectotype: (designated Dunlop 1996): Australia: Northern Territory: Darwin and Gulf: Depot Creek, Victoria River, without date, *F.Mueller s.n.* (lecto: K000883360, photograph!; isolecto: MEL, photograph!).

Distribution: *Mitrasacme nudicaulis* is known from Indonesia (Nusa Tenggara), Timor Leste, New Guinea and Australia (Leenhouts 1962a, Dunlop 1996).

Notes: Leenhouts (1962) based *Mitrasacme elata* var. *brevicalyx* on *M. trinervis* Span., placing *M. nudicaulis* in synonymy with *M. elata* var. *brevicalyx* in the same publication. Dunlop (1996) describes two varieties in *M. nudicaulis*, with only *M. nudicaulis* var. *nudicaulis* known outside Australia, and notes that a small-flowered variant is known. Most if not all collections of *M. nudicaulis* var. *nudicaulis* from New Guinea appear to be this small-flowered variant (Leenhouts 1962a, Dunlop 1996).

The name *M. nudicaulis* was misapplied to *M. pygmaea* R.Br. by Bentham (1853) (Leenhouts 1962b).

10. *Mitrasacme pygmaea* R.Br., *Prodromus florae Novae Hollandiae* 453 (1810).

Leenhouts PW, *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 452 (1962). Tirel-Roudet C., in A Aubréville and J-F Leroy, *Flore du Cambodge, Laos, Vietnam* 13: 84 (1972). Li P-t and Leeuwenberg AMJ, in *Flora of China* 15: 323 (1996). Dunlop CR, *Flora of Australia* 28: 37 (1996).

Type: Australia, Queensland, Port Clinton, 22 Aug 1802, R. Brown s.n. (BM, photograph!).

Note: Digital images of collections of *M. pygmaea* held at BM are not available on line but we have film photographs of one of Brown's sheets. These photographs do not carry a specimen database number. Brown typically made duplicates of his collections; we refrain from designating a lectotype until other original material can be examined.

Mitrasacme capillaris Wall., in W. Roxburgh, *Flora Indica*, Ed 1: 420 (1820).

Type: Nepal, without date, E. Gardner in herb. Wallich (not located).

Note: Leenhouts (1962b) cites as holotype a specimen at K: Nepal, Aug 1821, E. Gardner in herb. Wallich 4348. The specimen (K001038781) bears an annotation by Dunlop that it was collected a year after the name was published and, therefore, cannot be the holotype.

Mitrasacme chinensis Griseb. *Novorum actorum Academiae Caesareae Leopoldino-Carolinae naturae curiosorum...* 19(Suppl. 1): 51 (1843).

Type: Meyen (B, presumed lost).

Mitrasacme gallifolia Masam. & Syozi *Acta Phylotaxonomica Geobotanica* 12: 202 (1950).

Type: China: "Ca. Mannei", 25 Nov 1940, Masamune & Fukuyama 110 (TAI, n.v.), fide Tirel-Roudet (1982) and Li & Leeuwenberg (1996).

Mitrasacme lutea H.Lév. *Feddes Repertorium* 4: 331 (1907) nom. illeg., non F.Muell. (1859).

Type: China: Hong Kong, 13 Mar 1895, E.M. Bodinier 1060 (E284736, photograph!).

Mitrasacme malaccensis Wight *Icones Plantarum Indiae Orientalis* 4(4): 15, t. 1601 (1850).

Type: Malaysia, without date, Griffith s.n. (K000450680, photograph!).

Distribution: *Mitrasacme pygmaea* is a widespread species, occurring in China, Taiwan, Japan, Korea, Southeast Asia, Papua New Guinea, northeast Australia and New Caledonia (Leenhouts 1962a, Dunlop 1996, Li and Leeuwenberg 1996).

Notes: Across its geographic range, the vegetative form of *M. pygmaea* varies from scapose or scapiform to many-branched subshrub, the variation probably being related to altitude, latitude and life history. Various infraspecific names have been erected to accommodate this variation; they are not dealt with here, but see references above.

11. *Mitrasacme setosa* Hance *Journal of Botany, British and Foreign* 15: 335 (1877). Leenhouts PW, *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 456 (1962). Tirel-Roudet C, in A Aubréville and J-F Leroy, *Flore du Cambodge, Laos, Vietnam* 13: 89, pl.14 (1972).

Lectotype (here designated): Cambodia: Kampot, Jun 1870, Pierre s.n., in herb. Hance 19731 (BM1014338, photograph!); **isolectotypes:** P639991; P639992 photographs!; **possible residual syntype:** Cambodia, without date, Pierre s.n., in herb. Hance 19731 (K000883389, photograph!).

Distribution: Cambodia (Tirel-Roudet 1972).

Notes: The specimen from BM is chosen as lectotype because type collections by Hance are generally housed there (Stafleu and Cowan 1979), and the specimen is the best of the original material.

In its branching habit, dense indumentum, acute calyx lobes and bilobed, clavate stigmas, this species is similar to the endemic Australian species *M. floribunda* Dunlop, *M. gentianeae* F.Muell. and *M. multicaulis* R.Br. However, the description in Tirel-Roudet (1972) states the seeds are minutely verrucose; seeds of the other three species are smooth and shiny. The general growth habit and few-flowered inflorescences are similar to *M. multicaulis*, but the globular capsule resembles that of *M. floribunda*.

Species excluded from *Mitrasacme*

1a. *Mitrasacme cheesemanii* Buchanan, *Transactions and Proceedings of the New Zealand Institute* 14: 348, pl. 29, Fig. 2 (1881 [1882]).

= *Veronica quadrifaria* Kirk, *Transactions and Proceedings of the New Zealand Institute* 28: 521 (1896).

Hebe cheesemanii (Buchanan) Cockayne & Allan, *Transactions and Proceedings of the New Zealand Institute* 57: 39 (1926).

Leonohebe cheesemanii (Buchanan) Heads, *Botanical Society of Otago Newsletter* 5: 5 (1987).

Note: When *M. cheesemanii* Buchanan was transferred to *Veronica*, the specific epithet *cheesemanii* could not be used, because *Veronica cheesemanii* Benth., Hooker's *Icones Plantarum* 14:48; t. 1366, Fig. A (1881) refers to a different taxon.

2a. *Mitrasacme hookeri* Buchanan, *Transactions and Proceedings of the New Zealand Institute* 14: 348, pl. 29, Fig. 1 (1881 [1882]).

= *Veronica hookeri* (Buchanan) Garn.-Jones, *Taxon* 56: 577 (2007).

Logania ciliolata Hook.f., *Handbook of the New Zealand Flora* 737 (1867).

Hebe ciliolata (Hook.f.) Cockayne & Allan, *Transactions and Proceedings of the New Zealand Institute* 57: 39 (1926).

Leonohebe ciliolata (Hook.f.) Heads, *Botanical Society of Otago Newsletter* 5: 5 (1987).

Veronica gilliesiana Kirk, *Transactions and Proceedings of the New Zealand Institute* 28: 519 (1896).

Hebe gilliesiana (Kirk) J.T.Wall, *New Flora and Silva* 11:135 (1939).

3a. *Mitrasacme mairei* H.Lév., *Repertorium Specierum Novarum Regni Vegetabilis* 13: 257 (1914).

= *Androsace erecta* Maxim (Primulaceae), *Bulletin de l'Académie Impériale des Sciences de Saint-Pétersbourg* 27: 499 (1881), *n.v.*, *fide* Hu Q & Kelso S, Primulaceae, in *Flora of China* 15: 99 (1996).

4a. *Mitrasacme montana* Hook.f. ex Benth. **var. *helmsii*** Kirk, *Transactions and Proceedings of the New Zealand Institute* 22: 445, t. 32 (1890).

= *Schizacme helmsii* (Kirk) K.L.Gibbons, *Telopea* 17: 371 & 372 (2014).

5a. *Mitrasacme novae-zelandiae* Hook.f., *Handbook of the New Zealand Flora* 2: 737 (1867).

= *Schizacme novae-zelandiae* (Hook.f.) K.L.Gibbons, *Telopea* 17: 372 & 374, Fig. 7 (2014).

6a. *Mitrasacme petriei* Buchanan, *Transactions and Proceedings of the New Zealand Institute* 14: 349, pl. 30, Fig. 1 (1881 [1882]).

= *Veronica petriei* (Buchanan) Kirk, *Transactions and Proceedings of the New Zealand Institute* 28: 517 (1896).

Hebe petriei (Buchanan) Cockayne & Allan, *Transactions and Proceedings of the New Zealand Institute* 57: 42 (1926).

Leonohebe petriei (Buchanan) Heads, *Botanical Society of Otago Newsletter* 5: 6 (1987).

Name of uncertain status

Mitrasacme saxatilis Backer ex Cammerl., *Bulletin du Jardin Botanique de Buitenzorg* 3: 301, Abb. 1, figs 1–3 (1923). Leenhouts PW, *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 456 (1962). Leenhouts PW, in CGGJ van Steenis, (ed.), *Flora Malesiana* ser. 1, 6: 385 (1962). Backer, CA and Bakhuizen van den Brink, RC Jr, *Flora of Java* 2: 208 (1965).

Type: Indonesia: Jawa: Jawa Timur: Madura Island, 6 Jul 1916, *Backer 21265* (lecto: designated Leenhouts *Bulletin du Jardin botanique de l'État a Bruxelles* 32: 456 (1962); BO n.v.; isolecto L., photograph!).

Notes: The rigid, pungent-tipped leaves of this species are atypical of *Mitrasacme*, and, in the illustration in the protologue, one leaf of an (opposite) pair appears to overlap the other, whereas in *Mitrasacme* and closely related genera the leaf-bases are joined by an interfoliar sheath (a modification of the interpetiolar stipules typical of Loganiaceae). Further examination of type material is needed, but we are doubtful that this species is attributable to *Mitrasacme*.

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