



Taxonomic revision of *Myrosma* (Marantaceae)

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Key words

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Abstract *Myrosma* is a genus of rosulate herbs characterized by a compact and strongly monosymmetric inflorescence with conspicuous, white to pale green, mostly membranous bracts, in the axil of which is a single flower pair. The genus is widely distributed throughout Central Brazil, northern South America, and the Caribbean region. It occurs mostly in savannah environments but can also be found in humid and shaded habitats. We present a taxonomic revision of *Myrosma* recognizing a single species, *Myrosma cannifolia* L.f. A complete description of that species is provided with notes on its ecology, distribution, and variation. Three species and one variety are reduced into synonymy and four names are lectotypified. A complete nomenclatural account for all combinations including the name *Myrosma* is given.

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INTRODUCTION

Myrosma L.f. (*Marantaceae*) is a monotypic genus distributed throughout the Caribbean region, the Guianas, Colombia, Trinidad, Venezuela, Brazil, Peru, and Bolivia. It has traditionally been considered closely related to *Sarante* (Regel & Körn.) Eichler and other genera of Andersson's (1981, 1998) *Myrosma* group (*Hylaeanth* A.M.E. Jonker & Jonker, *Ctenanth* Eichler, and *Stromanthe* Sond.) with which it shares characters such as flower groups with slightly to markedly elongated axes (subbrachyblastic to dolichoblastic in the terminology of Andersson 1998), lack of interphylls, and a short corolla tube. Phylogenetic studies based on molecular data (Andersson & Chase 2001, Prince & Kress 2006, Suksathan et al. 2009) have shown that these genera form part of a strongly supported monophyletic group (the *Maranta* clade) that also includes *Maranta* L., *Monophyllanth* K.Schum., and *Koernickanth* L. Andersson, as well as two more distantly related Asian-African genera, *Halopegia* K.Schum. and *Indianthus* Suksathan & Borchs. The precise generic relationships within this large group remain, however, unresolved. Andersson & Chase (2001) found no resolution for the position of *Myrosma* within the *Maranta* clade based on *rps16* data, but they found strong support for a monophyletic *Sarante*. When morphological data were added to the analysis a sister relationship between *Myrosma* and *Sarante* was indicated. Prince & Kress (2006) did not include *Myrosma* in their analysis.

When originally described (Linnaeus f. 1782) *Myrosma* contained only a single species, *M. cannifolia*, based on the collection C.G. Dahlberg 121 from Suriname. Schumann (1902) in his monograph of *Marantaceae* included eight species in the genus. Three of those (*M. hexantha* (Poepp. & Endl.) K.Schum., *M. hoffmannii* K.Schum., and *M. unilateralis* (Poepp. & Endl.)

K.Schum.) were later transferred to the genus *Hylaeanth* (Jonker-Verhoef & Jonker 1955). Andersson (1981) suggested that three further species (*M. australis* K.Schum., *M. membranacea* (Petersen) K.Schum., and *M. tenuifolia* (Petersen) K.Schum.) were better placed in *Sarante* leaving only two of Schumann's species (*M. cannifolia* L.f. and *M. cuyabensis* (Körn.) K.Schum.) in *Myrosma*. Since 1902 ten additional combinations involving *Myrosma* have been published, but only one of these, *M. boliviana* Loes., was considered a true *Myrosma* by Andersson (1981). The remaining species were all suggested to belong to other genera (*Hylaeanth*, *Sarante*, or *Stromanthe*). Andersson (1998) considered that only a single species should be recognized in the genus.

In this paper we present a modern taxonomic revision of *Myrosma*. We agree with Andersson (1998) in recognizing only a single species. We present a formal nomenclatural account for the genus and the species. Four names are lectotypified and four new synonyms are formally made. We also provide a complete morphological description of *M. cannifolia* including new information on its ecology and distribution documented by specimen records. Finally a nomenclatural account is given for all combinations involving the name *Myrosma*.

MATERIAL AND METHODS

The study is based on bibliography and on the morphologic study of the collections from the following herbaria: B, BM, BR, C, CEN, CEPEC, CESJ, COL, COR, E, ESA, F, FLOR, HBR, HRBN, HTINS, HUFU, IAC, IAN, IBGE, ICN, INPA, G, GB, GH, GUA, K, L, LINN, MAC, MBM, MBML, MG, MO, NY, OXF, P, PACA, PEL, PMSP, R, RB, S, SP, SPF, SPSF, U, UB, UEC, UFG, US, USZ, VEN, VIC, W, WU (acronyms according to Holmgren et al. 2009). Descriptive terminology follows Clausen & Borchsenius (2003). Here the term special paraclade (Kunze 1985) refers to the basic entity in the inflorescence consisting of a condensed (brachyblastic) or expanded (dolichoblastic) axis system supporting one or more flower groups usually taking the form of pairs of flowers. The term equals Andersson's (1976) 'florescence component'.

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SYSTEMATIC TREATMENT

Myrosma

Myrosma L.f. (1782) 80. — Type: *Myrosma cannifolia* L.f.
Thalianthus Klotzsch (1849) 1125, nom. nud.

Small, rosulate herbs; rhizome stoloniferous with persistent cataphylls, sometimes thickened at the tips, starch-storing, giving a bulb-like appearance. *Leaves* homotropic; leaf sheath margin entire. *Inflorescence* simple or with a few primary branches, always subtended by a leaf; partial inflorescences strongly monosymmetrical and compact; bracts ovate to broadly ovate, membranous, rarely herbaceous, white or pale green in live plants, straw-coloured to brown when dry, persistent; special paraclades subbrachyblastic with a single flower pair, without trace of a second one; interphylls and bracteoles absent. *Sepals* 3, prominently veined; corolla tubular, 3-lobed, tube short and wide; outer staminodes 2, petaloid, unequal; callose staminode rectangular, with a rounded or emarginate apex; cucullate staminode distally with a lobed and deflexed trigger appendage; fertile stamen 1, with a large, showy, petaloid appendage, exceeding the anther in size; ovary 3-locular, two of the locules sterile, ovule 1, basal. *Fruit* a slightly trigonous capsule, crowned by persistent sepals. *Seed* 1, arillate, trigonous, with wrinkly surface.

DISCUSSION

Our generic circumscription agrees with Andersson's (1981, 1998) who considered *Myrosma* in a strict sense a highly distinct and characteristic genus, diagnosed by the combination of monosymmetrical, compact inflorescences with whitish green bracts, a large, petaloid staminal appendage, solitary flower pairs, and absence of bracteoles. Some species of *Saranthe* (notably *S. unilateralis* (Baker) L.Andersson) approach *Myrosma* in inflorescence morphology and the only floral character that seems to consistently distinguish the two genera is the size of the staminal appendage (smaller in *Saranthe*). Molecular data, however, do not indicate any close relationship between the two genera (e.g., Andersson & Chase 2001). Ongoing analyses of *matK* and *rps16* intron data (Vieira et al. unpubl. data) suggest that *Saranthe* forms a well-supported monophyletic entity sister to *Ctenanthe* and *Stromanthe*, while *Myrosma*

and *Hylaeante* form a distinct clade more closely related to *Maranta*. For this reason we prefer to maintain *Myrosma* as a separate genus, at least until phylogenetic relationships have been satisfactorily settled. *Hylaeante* differs from *Myrosma* in having the leaf sheath margin splitting up in a reticulum of fibers (fenestrate sheaths).

Myrosma cannifolia L.f. — Fig. 1; Map 1

Myrosma cannifolia L.f. (1782) 80; A.M.E.Jonker & Jonker (1957) 178; Simmonds (1967) 28; L.Andersson (2001) 245. — *Phrynium myrosma* Roscoe (1827) 11, 12, t. 39. — *Maranta myrosma* (Roscoe) A.Dietr. (1831) 136. — *Calathea myrosma* (Roscoe) Körn. (1858) 87. — *Phyllodes myrosma* (Roscoe) Kuntze (1891) 696. — Type: C.G. Dahlberg 121 Herb. Linn. '5.1 *Myrosma* sp.' (holo LINN), Suriname.

Maranta moritziana Körn. (1862) 66. — *Saranthe moritziana* (Körn.) Eichler (1884) 86. — Type: N. Funck 71 (lecto P, selected here), Venezuela, Distrito Federal, Caracas, 1843. Syntypes: J.W.K. Moritz 475 (B†), Colombia; Poiteau s.n. (B†), French Guiana; M.R. Schomburgk 1305 (B†, K), Guyana, Rupununi River region, May 1843.

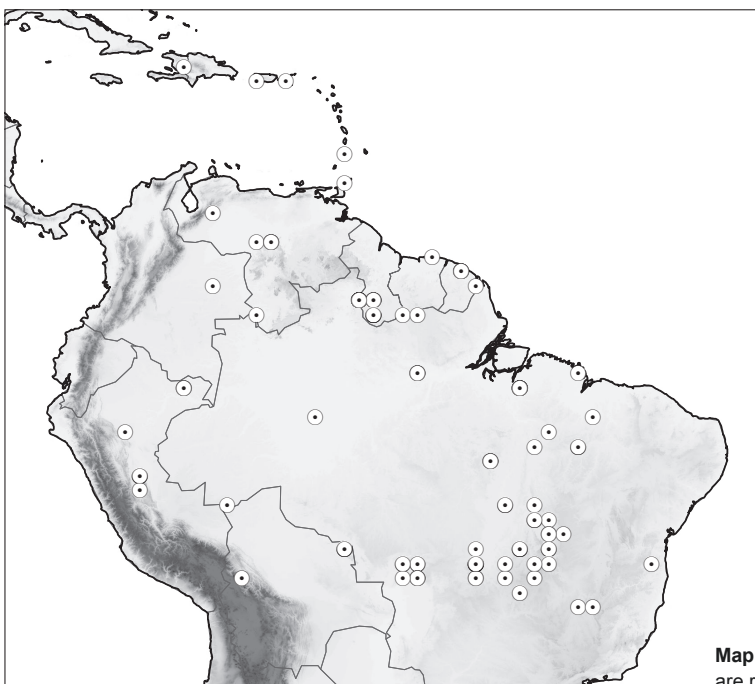
Maranta cuyabensis Körn. (1862) 68. — *Myrosma cuyabensis* (Körn.) K.Schum. (1902) 142, syn. nov. — Type: L. Riedel 857 (lecto G, selected here; isolecto P), Brazil, Mato Grosso, Cuiabá, 1860. Syntype: A.L.P. da Silva Manso & J. Lhotzsky 85 (F, G, MO), Brazil.

Myrosma boliviana Loes. (1915) 270 (var. *boliviana*), syn. nov. — Type: E.H.G. Ule 9247 (holo B†, F negative 9850, photograph GH; lecto MO, selected here), Bolivia, Pando, Rio Tarumano, Porvenir ("Am Tarumano, Nebenfluss des Rio Madeira, im Walde bei Porvenir"), Jan. 1912.

Myrosma boliviana Loes. var. *acreana* Loes. (1915) 270, syn. nov. — Type: E.H.G. Ule 9246 (holo B†; lecto G, selected here; isolecto K, US), Bolivia, Pando, Cobija ("Im der Nähe des Rio Acre bei Cobija"), Jan. 1912.

Saranthe marcgravii Pickel (1939) 50, t. 62, syn. nov. — Type: B.J. Pickel 4338 (holo SP), Brazil, São Paulo, described from a plant cultivated at Horto Florestal in São Paulo, originally from Mato Grosso.

Plants 0.3–1.2 m tall. *Leaves* glabrous or with minute hairs adaxially on the pulvinus and on the leaf blade close to the midrib; sheath 3–17 cm long; petiole proper (0.3–)4–12.5 cm long; pulvinus 2–4 mm long; leaf blade narrowly elliptic to linear or narrowly to widely oblong-elliptic, 8–34.7 by 1.4–13.5 cm, the abaxial side slightly glaucous. *Inflorescence* up to 7 cm long, simple or with 2–3 primary branches; peduncle and internodes puberulent; each branch with 4–26 fertile bracts, these ovate to broadly ovate, 1–1.5 by 1–1.2 cm, glabrous. *Flowers* white or cream, 1–1.5 cm long, glabrous or with minute hairs along the veins of the sepals; ovary 1.8–2 mm long, cylindrical, glabrous; sepals membranous, with prominent venation, 1–1.2



Map 1 Distribution of *Myrosma cannifolia*. Coordinates of collection localities are rounded to nearest whole degree.

by 0.3–0.6 cm; corolla tube 2–2.5 mm long; corolla lobes oblong-elliptic, slightly cucullate, 5–8 by 3–4 mm; major outer staminode obovate with rounded apex, 0.9–1.1 by 0.6 cm, the minor clavate with rounded apex, 0.7–1 by 0.4–0.5 cm; callose staminode rectangular, with a rounded or emarginate apex, c. 6 by 6 mm; cucullate staminode 5–6 mm long, distally with a lobed and deflexed trigger appendage c. 2 mm long; fertile stamen 3–4 mm long, petaloid appendage c. 6 by 3 mm; style 0.5–1 cm long. *Fruit* white when alive, straw-coloured when dry, with a thin pericarp that turns membranous and transparent upon drying, 6–7 by 4–5 mm; seed c. 5 by 4 mm.

Distribution — Greater Antilles (Haiti, Puerto Rico, Virgin Islands), Lesser Antilles (St. Vincent), Colombia (Vichada), Trinidad, Venezuela (Amazonas, Apure, Bolívar, Cojedes, Guárico), Guyana, Suriname, French Guiana, Brazil (Acre, Amazonas, Bahia, Distrito Federal, Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Tocantins), Peru (Cuzco, San Martín, Loreto), Bolivia (La Paz, Santa Cruz). In Brazil *M. cannifolia* is common in the central-northern region and in the central plateau.

Habitat & Ecology — Mostly confined to savannah vegetation where it usually grows near water courses. An exception occurs in Bolivia where the species is found in humid and shady environments.

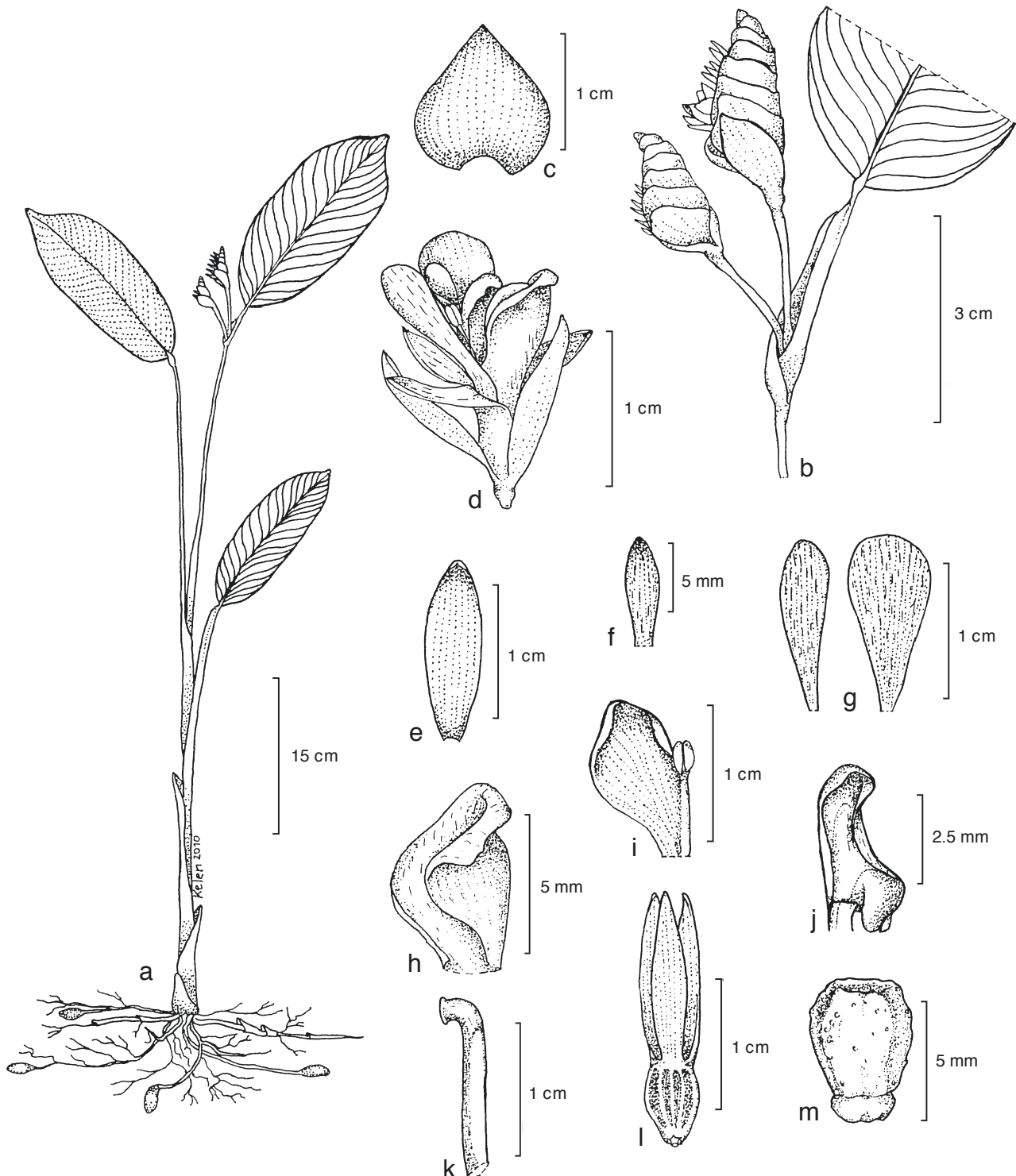


Fig. 1 *Myrosma cannifolia* L. a. Habit; b. inflorescence and part of subtending leaf; c. one inflorescence bract; d. flower; e. sepal; f. corolla lobe; g. outer staminodes; h. callose staminode; i. fertile stamen and petaloid appendix; j. cucullate staminode; k. style and stigma; l. fruit with persistent sepals; m. seed (a, b: S. Vieira et al. 93, ESA; c–m: L. Andersson & M. Hagberg 1566, spirit collection GB).

Notes — *Myrosma cannifolia* most resembles *Saranthe unilateralis* with which it shares the characters of strongly monosymmetric and compact inflorescence, and white to pale green, persistent bracts. However, *M. cannifolia* has a larger staminal appendage (6 by 3 mm vs 4 by 1.5 mm in *S. unilateralis*), smaller leaf blades (11–20(–31) by 1.7–8 cm vs 33.5 by 12–15 cm long), unequal outer staminodes (equal in *S. unilateralis*) and larger flowers (1–1.5 cm vs 0.8–1 cm long).

Linnaeus f. (1782) mentioned only a single collection in his protologue of *Myrosma cannifolia* (C.G. Dahlberg 121). The specimen is found at LINN, being in perfect condition and agreeing completely with the original description. The type specimen is not numbered, but there is no doubt that this specimen is the holotype of the name and that the correct number of the collection is 121. Dahlberg was a Swedish soldier who collected for Linnaeus and who made in Suriname a collection of 186 plant specimens, which were first given to King Gustav III of Sweden and consequently, in 1774, transferred to Linnaeus (Stafleu & Cowan 1976: 588). During his fieldwork in Suriname Dahlberg made accurate field annotations, which were written down in his 'Catalogus der Vlessen, van de Boom, Struik, Plant en Rankgewassen, dewelke ik, in Spiritu vini bewaard heb'. This was a catalogue of all his collections, many of which were collected in spirit and which were later dried. Number 121 gives an extensive description in Dutch of the plant that is the type of *M. cannifolia*. The description starts (translated) with: "This is the leaf, inflorescence, and root of a plantlet called Turara, the flowers are white, sprouting laterally from the side of the stalk ...". The Dutch text by Dahlberg was many years later translated into English by J.E. Smith (1819) "Gathered by Dalberg in Surinam. The root is creeping, with long hairy fibres ..." and at the end "This was one of the plants which made a part of the Surinam collection, preserved in spirits, presented to Linnaeus by King Gustavus".

Körnigke (1862) described *Maranta cuyabensis* (\equiv *Myrosma cuyabensis* (Körn.) K.Schum.) based on two specimens from Central Brazil without a clear indication of a holotype. As diagnostic characters he cited narrowly elliptic leaf blades with narrower base and the glabrous or hirsute inflorescence peduncles. Indeed a number of specimens collected from cerrado and gallery forests from the Brazilian states of Goiás (e.g., H.S. Irwin et al. 34782 (NY)), Mato Grosso (e.g., G. Hatchbach 36149 (BR, C, GB, MBM, NY)) and southern Tocantins (e.g., G. Hatschbach et al. 56022 (C, GB, MBM, NY)) as well as the eastern part of the Department of Santa Cruz in Bolivia (e.g., W.W. Thomas et al. 5687 (GB, NY)) do have extremely narrow leaf blades. However, as no other characters distinguish these plants from typical *M. cannifolia*, we have chosen not to recognize this variation as a formal taxon. As lectotype of *Maranta cuyabensis* we have chosen Riedel 857, as this collection is more complete than the other syntype (A.L.P. da Silva Manso & J. Lhotsky 85). The original material studied by Körnigke was most likely located at BONN but destroyed in 1941. As lectotype we have instead chosen the duplicate at G.

Maranta moritziana was described by Körnigke in the same work as *M. cuyabensis*. It was transferred to *Saranthe* by Eichler (1884) and this decision was accepted by Petersen (1890). Schumann (1902) placed it in synonymy of *Myrosma cannifolia*. Study of the original description and the illustration included in Flora Brasiliensis corroborate that decision. Of the four syntypes listed by Körnigke (1862) two have been located (*N. Funck 71* and *M.R. Schomburgk 1305*). *N. Funck 71* (P) has been selected here as lectotype.

Myrosma boliviana was described by Loesener (1915) from a Bolivian collection E.H.G. Ule 9247 (holotype B†). A duplicate of this collection is found at MO and has been chosen as lecto-

type. The diagnostic character for the species was that it had elliptic to broadly ovate leaves. In the same article Loesener also described a new variety of his new species, *M. boliviana* var. *acreana*, based on a second collection from the same area as the holotype (E.H.G. Ule 9246) representing a plant with smaller dimensions. As noted above *M. cannifolia* displays a large and continuous variation in size and leaf shape and distinct taxa cannot be separated on that basis. However, a small number of specimens collected in the sub-Andean region of the western Amazon from Bolivia to Peru (e.g., T. Plowman 5998 (F), R. Vásquez 3877 (MO), M. Hagberg & E.-L. Medin 357 (GB)) tend to have one elongated internode basally on the flowering stem resulting in a clearly visible node some distance below the inflorescence, a character that we have not observed in any specimen from other parts of the range of *M. cannifolia*. The sub-Andean plants also have inflorescence bracts that are more fibrous and greenish brown (when dried) than those from other areas. If these characters prove to be consistent when more material becomes available it might be considered whether these specimens should be recognized as a distinct taxon.

Finally, study of the type specimen of *Saranthe marcgravii*, made from cultivated plants with origin in Central Brazil, as well as the original description and the excellent illustration provided by Pickel (1939) leave no doubt that this is identical to *M. cannifolia*.

EXCLUDED NAMES

Myrosma australis K.Schum. (1902) 142. — Type: F. Müller s.n. (holo B†, F negative 9849; photograph GH, MO), Brazil, Santa Catarina, Blumenau, mouth of Rio Itahypé. The photographs of the lost type are insufficient to reliably identify which species it represents. It might be a species of *Saranthe*.

Myrosma canniforme Willd. (1797) 13. — Spelling variety of *Myrosma cannifolia* L.f.

Myrosma comosa (L.f.) Spreng. (1825) 9. — *Maranta comosa* L.f. (1782) 80. — *Calathea comosa* (L.f.) Lindl. (1829) sub t. 1210. — Type: E.F. Poeppig 1238 (holo W, n.v.), Peru, Aug. 1829.

Myrosma dasycarpa (Donn.Sm.) Woodson (in Woodson & Schery 1942) 335. — *Calathea dasycarpa* Donn. Sm. (1901) 123. — *Ctenanthe dasycarpa* (Donn.Sm.) K.Schum. (1902) 153. — Syntypes: H.F. Pittier 10350 (CR, n.v.) and H.F. Pittier 11136 (CR, n.v.), both from Costa Rica, Comarca de Limón, Nov. 1896.

Myrosma guapilesensis Donn.Sm. (1897) 251. — *Stromanthe guapilesensis* (Donn.Sm.) H.Kenn. & Nicolson (1975) 502. — Type: J.D. Donnel Smith 4970 (holo US, n.v.), Costa Rica, Guápiles, Apr. 1894.

Myrosma hexantha (Poepp. & Endl.) K.Schum. (1902) 144. — *Thalia hexantha* Poepp. & Endl. (1837) 24, t. 132. — *Hylae-anthe hexantha* (Poepp. & Endl.) A.M.E. Jonker & Jonker (1955) 175. — Type: E.F. Poeppig s.n. (not found), Peru, Loreto, Prov. Maynas, near Yurimaguas.

Myrosma hoffmannii K.Schum. (1902) 145. — *Hylae-anthe hoffmannii* (K.Schum.) A.M.E. Jonker & Jonker ex H.Kenn. (2003) 656. — Type: C. Hoffmann 850 (holo B†), Costa Rica, near Aguacate.

Myrosma lubbersii Hort. ex Gentil (1907) 126, nom. nud. The name probably refers to a species of *Ctenanthe*.

- Myrosma lutea* (Jacq.) J.F.Macbr. (1931) 59. — *Maranta lutea* Jacq. (1790) 117. (Illegitimate homonym of *Maranta lutea* Aubl.). = *Stromanthe jacquinii* (Roem. & Schult.) H.Kenn. & Nicolson (1975) 501.
- Myrosma madagascariensis* Benth. (in Benth. & Hooker 1883) 651. — Lectotype (L.Andersson 1985): "*Phrynium unilaterale* Baker, Ref. Bot. t. 312/Hort. Saunders 1870/Madagascar/coll. Plant" (K). — *Saranthe unilateralis* (Baker) L.Andersson (1985) 62.
- Myrosma membranacea* (Petersen) K.Schum. (1902) 144. — *Saranthe membranacea* Petersen (1890) 169. — Type: A.F.M. Glaziou 14329 (holo B†, photograph GH; lecto P, selected here; isoleccto C), Brazil, Minas Gerais, 8 Feb. 1884.
- Myrosma nana* Baker (1894) 652. — Type: "Plant now in flower at Kew where it was received from Glasnevin in 1893. Probably it is a native of Brazil". = *Saranthe glumacea* (van Houtte ex Körn.) K.Schum. (1902) 139.
- Myrosma panamensis* Standl. (1925) 4. — *Hylaeanthus panamensis* (Standl.) H.Kenn. (1973) 426. — Type: P.C. Standley 26219 (holo US), Panamá, Province Panamá, Dec. 1923.
- Myrosma polystachya* Pulle (1909) 253. — *Hylaeanthus polystachya* (Pulle) A.M.E.Jonker & Jonker (1955) 175. — Type: G.M. Versteeg 793 (holo U; iso NY), Suriname, Upper Tapanahony River, Mt Teboe, 10 Aug. 1904.
- Myrosma setosum* (Roscoe) Benth. (in Benth. & Hooker 1883) 651. — *Phrynium setosum* Roscoe (1828) pl. 41. — *Ctenanthe setosa* (Roscoe) Eichler (1884) 84. — Type: Plate 41 in Roscoe (1828).
- Myrosma stromanthoides* J.F.Macbr. (1931) 59. — *Stromanthe stromanthoides* (J.F.Macbr.) L.Andersson (1981) 236. — Type: L.I. Williams 6563 (holo F, n.v.; iso US, n.v.), Peru, Dep. San Martín, Tarapoto.
- Myrosma tenuifolia* (Petersen) K.Schum. (1902) 144. — *Saranthe tenuifolia* Petersen (1890) 169. — Type: A.F.M. Glaziou 13235 (holo B†, photograph GH; lecto P, 2 sheets, selected here; isoleccto K, C), Brazil, Rio de Janeiro, Feb. 1882.
- Myrosma uleana* Loes. (1915) 271. — Type: E.H.G. Ule 9245 (holo B†; isotype HBG, n.v.), Brazil, Acre, Rio Acre at Xapury. Based on the description of fenestrate leaf sheaths this is clearly a species of *Hylaeanthus*.
- Myrosma unilateralis* (Baker) T.Durand & Schinz (1894) 130. — *Phrynium unilateralis* Baker in Saunders (1873) 5, t. 312. Illegitimate name (non *Myrosma unilateralis* (Poepp. & Endl.) K.Schum.) = *Saranthe unilateralis* (Baker) L.Andersson (1985) 62.
- Myrosma unilateralis* (Poepp. & Endl.) Benth. ex B.D.Jacks. (1894) 284. — *Thalia unilateralis* Poepp. & Endl. (1837) 24, t. 133. — *Hylaeanthus unilateralis* (Poepp. & Endl.) A.M.E.Jonker & Jonker (1955) 175. — Type: E.F. Poeppig s.n. (not found), Peru, Dep. San Martín, Huallaga River valley, near Tocache.

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