

Research article

***Merianthera calyptrata* sp. nov. (Melastomataceae, Myrtales), a new candelabriform species from Minas Gerais, Brazil**

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Abstract. *Merianthera* is a genus of flowering plants with up to now seven species occurring in eastern Brazil, in the states of Bahia, Espírito Santo, and Minas Gerais. It belongs to the tribe Pyramieae (Melastomataceae), and can be recognized by its shrubby or treelet habit with caducous leaves, 5-merous flowers with a strongly zygomorphic androecium, the latter with dimorphic stamens bearing complex dorsal connective appendages, as well as an inferior ovary and capsular fruits. We describe here a new species of *Merianthera* from two collections and a photographic record, all from the same locality, an inselberg in the Municipality of Jacinto, in northeastern Minas Gerais. Its candelabriform habit, with a fistulose stem, and solitary, axillary or cauliflorous flowers are only shared with *M. burlemarxii*. However, *M. calyptrata* R. Goldenb., Bochorny & Fraga sp. nov. has at least three characters that are absent in *M. burlemarxii* and all other species in the genus: the total absence of both a peduncle and bracteoles, the calytrate calyx and the fruits developing from inferior ovaries and dehiscing through longitudinal slits. The first character appears to be unknown in other species in the family.

Keywords. Cambessedesieae, inselbergs, Pyramieae, xerophytic plants.

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Introduction

Melastomataceae Juss. is a subcosmopolitan family of flowering plants with 173 genera and about 5860 species mainly distributed in tropical and subtropical regions and with a few species in temperate areas (Ulloa Ulloa *et al.* 2022). Three subfamilies are presently recognized, Kibessioideae Naudin, Olisbeoideae Burnett, and Melastomatoideae Ser. ex DC., the latter being the largest by far with 21 tribes (Penneys *et al.* 2022). One of these tribes in Melastomatoideae, recently described as Cambessedesieae Bochorny, Almeda, Michelang. & R.Goldenb. (Bochorny *et al.* 2019), is now assigned to Pyramieae Naudin, a tribal name with priority (Bochorny *et al.* 2022). Its four genera (*Bisglaziovia* Cogn., *Cambessedesia* DC., *Huberia* DC., and *Merianthera* Kuhl.) with a total of 68 species are almost restricted to eastern Brazil, except for four species of *Huberia* occurring in the Peruvian and Ecuadorian Andes (Bochorny *et al.* 2022). Finally, the genus *Merianthera* had up to now seven species (Goldenberg *et al.* 2012), two of which (*M. eburnea* R.Goldenb. & Fraga and *M. sipolisii* (Cogn.) Wurdack) are endemic to ‘Campos Rupestres’ in the Brazilian state of Minas Gerais, and five are restricted to shrubby vegetation growing on inselbergs in eastern Brazil, inside the Atlantic Forest domain; all five occur in Espírito Santo, with three species endemic to this state (*M. bullata* R.Goldenb., Fraga & A.P.Fontana, *M. burlemarxii* Wurdack, and *M. parvifolia* R.Goldenb., Fraga & A.P.Fontana); the other two are also in Bahia (*M. pulchra* Kuhl.) or Minas Gerais (*M. verrucosa* R.Goldenb., Fraga & A.P.Fontana).

One of these species of *Merianthera* has a very striking set of morphological features, mostly vegetative, but also reproductive (Wurdack 1984; Goldenberg *et al.* 2012). Plants of *M. burlemarxii* are ‘candelabriform’ shrubs, i.e., with vegetative shoots that are curved upwards, each shoot thinner near the base and distally thicker; the general aspect of the whole plant is that of a chandelier, with leaves and flowers crowded at the thick apices. These thick apices, in turn, are fistulose, meaning that they are hollow and transversally divided in chambers 1–11 mm high (Goldenberg *et al.* 2012). These hollow, fistulose stems have been suggested to be an adaptation for housing ant colonies, which are quite common in the family (Michelangeli 2010), but no ants were found living in association with *M. burlemarxii* (Ziemmer *et al.* 2017). An alternative explanation for this particular morphology is that it is actually a xeromorphic adaptation related to the harsh conditions offered by the thin soils on the inselbergs, coupled with a highly seasonal climate where these plants live (Ziemmer *et al.* 2017). During the wet season, at least the apical portion of these stems is filled with water-accumulating tissues (aquiferous parenchyma), which may dry up during the dry season and then leaving spaces for the fistulae; the plates dividing the dry stem in fistulae are nodal medullary bundles, which are connected to the aquiferous parenchyma above and below (Ziemmer *et al.* 2017). As for reproductive characters, this species is unique in having depauperate cymes with a solitary, bibracteolate, pedicellate flower growing on top of a short peduncle (Goldenberg *et al.* 2012).

It came to us as a surprise when a photo of a plant very similar to *M. burlemarxii* was posted in February 2017 on ‘DetWeb’, a Facebook group dedicated to identification of Brazilian plants (<https://www.facebook.com/groups/171157419593991>). The very nice photos by Mr Reginaldo Vasconcelos also showed that this plant had very distinctive leaves and, moreover, seemed to be photographed in Minas Gerais, about 250 km from the nearest known population of *M. burlemarxii* in Espírito Santo. With directions kindly provided by Mr Vasconcelos, we were able to return to what is now the type locality, to locate plants of this species. It proved to be a new species with a distinctive set of characters, mostly related to inflorescences, flower calyx, and fruits, that we name and describe here.

Material and methods

The specimens have been deposited at the herbaria BHCN, MBML, UESC, UPCB, and RB (acronyms follow Thiers, continuously updated), while additional duplicates will be sent to K, NY, and other herbaria after the publication of this article. Morphological terminology follows Radford *et al.* (1974), while the

description of trichomes follows Wurdack (1986). Comparisons with currently recognized species of *Merianthera* were based on analyses of herbarium specimens, including types, all listed in Goldenberg et al. (2012).

For the SEM images, leaf fragments were mounted on aluminum stubs, coated with gold, and examined using a scanning electron microscope Tescan Vega 3. The distribution map was generated in QGIS ver. 3.12 software (QGIS Development Team 2022) using layers available from IBGE (2022) and SISEMA (2022). Geographical coordinates were obtained in the field or from herbarium specimens. Conservation status assessments follow IUCN Red List Categories and Criteria version 15.1 (IUCN 2022).

Results

Class Embryopsida Engler ex Pirani & J.Prado
Order Myrtales Reichenbach
Family Melastomataceae Juss.
Subfamily Melastomatoideae Ser. ex DC.

Genus *Merianthera* Kuhlman.

Arquivos do Instituto de Biologia Vegetal do Rio de Janeiro 1 (3): 231–233 (Kuhlmann 1935), **here amended.**

Type species

Merianthera pulchra Kuhlman., *Arquivos do Instituto de Biologia Vegetal do Rio de Janeiro* 1 (3): 231–233 (Kuhlmann 1935).

Description (modified from Goldenberg et al. 2012)

Shrubs to treelets, sparsely to moderately glandulose-granulose. Leaves opposite, entire, acrodromous, caducous. Inflorescences terminal short panicles, depauperate few-flowered cymes or reduced to solitary flowers; bracts absent, bracteoles absent or small, caducous. Flowers pedicellate, 5(–6)-merous; hypanthium sometimes with a constriction above the ovary; calyx regularly or irregularly lobed, seldom calyptrate and dehiscing through a transversal, circumscissile slit; petals free, obovate to elliptic; stamens 10(–12), glabrous, strongly zygomorphic and dimorphic, filament strongly flattened, connective with one basal (descending) and one apical, erect (ascending) portion, ascending portion always 2-lobed, lobes curved backwards in the antesealous stamens and not curved backwards in the antepetalous stamens, anthers slightly dorsally arched, with a dorsal or apical pore in the antepetalous stamens and an apical to slightly ventrally located pore in the antesealous stamens. Ovary completely inferior, with a sterile, apical stylar column, (3–)4–5-celled, the protruding placentae axillary; style curved at the apex, glabrous or puberulous, stigma punctiform. Fruits costate, apically constricted or not, rupturing along the costae when mature or seldom through (3–)4 regular, longitudinal slits; seeds many, pyramidal, testa rugulose.

Key to the species of *Merianthera* (modified from Goldenberg et al. 2012)

1. Stems hollow, fistulose when dry; flowers solitary, either on top of a short peduncle (then a 1-flowered strongly reduced cyme) or not 2
- Stems solid when dry; flowers in panicles or seldom in depauperate cymes with two or more flowers 3

2. Leaves with an acuminate to abruptly acuminate apex; flowers bibracteolate, borne on a short peduncle; calyx not calyptrate, dehiscing through regular lobes *M. burlemarxii* Wurdack
- Leaves with a rounded or obtuse apex; flowers ebracteolate, not borne on a peduncle; calyx calyptrate, dehiscing through a transversal, circumscissile slit
..... *M. calyptrata* R.Goldenb., Bochner & Fraga sp. nov.

3. Calyx regularly lobed; style basally puberulous or granulose-glandulose 4
 – Calyx irregularly lobed; style glabrous 7
4. Leaves glabrous on abaxial surface; petals purple 5
 – Leaves with dense indumentum on abaxial surface; petals pink 6
5. Hypanthium weakly costate and smooth; calyx lobes lacking external teeth; style glandular-puberulous on its basal half *M. bullata* R.Goldenb., Fraga & A.P.Fontana
 – Hypanthium strongly costate and rugose; calyx lobes with distinct, thick external teeth; style granulose-glandulose at the base *M. verrucosa* R.Goldenb., Fraga & A.P.Fontana
6. Leaves with strigulose abaxial surface, with curled, discrete trichomes
 *M. sipolisii* (Cogn.) Wurdack
 – Leaves with lanate abaxial surface, with arachnoid-amorphous, matted trichomes
 *M. eburnea* R.Goldenb. & Fraga
7. Leaves with petioles 12–29 mm long; panicles with more than 8 flowers *M. pulchra* Kuhlmann
 – Leaves sessile or with petioles up to 9 mm long; depauperate racemes with up to 4(–5) flowers, reduced to triads, diads or sometimes single flowers
 *M. parvifolia* R.Goldenb., Fraga & A.P.Fontana

Merianthera calyptrata R.Goldenb., Bochorny & Fraga sp. nov.

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Figs 1–4

Diagnosis

Merianthera calyptrata sp. nov. differs from *Merianthera burlemarxii* by the acute or slightly cuneate leaf base (vs obtuse to rounded in *M. burlemarxii*), rounded to seldom obtuse apex (vs acuminate or abruptly acuminate), the solitary flower on a single, ebracteolate pedicel, borne directly on the stem, i.e., not borne on a peduncle (vs solitary, bibracteolate, pedicellate flower borne on a short peduncle), calyx closed in bud, calyptrate, dehiscing through a transversal, circumscissile slit that releases a single, conical cap (vs open in bud, with five regular sepals), fruits opening regularly through (3–)4 longitudinal slits running from the apex to almost the base of the fruit (vs fruits opening irregularly, with no apparent line of dehiscence, and the seeds are dispersed as the hypanthium and ovary walls decay and open; fide Goldenberg *et al.* 2012).

Etymology

The epithet refers to the flowers with a calyptrate calyx, a unique feature of *M. calyptrata* sp. nov., and otherwise unknown in the genus and tribe.

Material examined

Type

BRAZIL – **Minas Gerais** • Jacinto, Comunidade de Medeiros, “acesso a esquerda na MG-405 sentido Jacinto - Jaguarão, propriedade do Sr. Augusto Chavier de Souza”; 16°15'25" S, 40°4'27" W; 30 Mar. 2022; *Claudio N. de Fraga & Dayvid R. Couto 4144*; holotype: RB[RB01463285]; isotypes: BHCB, K, MBML, NY, UPCB.

Paratype

BRAZIL – **Minas Gerais** • Jacinto, “Inselbergs no lado esquerdo da MG 405, em direção sul”; 16°10'10" S, 40°17'13" W; 1 Feb. 2022; *A.M. Amorim, F. Cabral & Y. Gouvea 11854*; RB, UESC, UPCB.

Description

Shrubs or treelets up to 2.5 m tall. Branches candelabriform, light brown at the very tip, becoming reddish-brown to dark-vinose (blackish in dried specimens) below the leaf line, terete, each segment is basally thin (0.4–0.6 mm diam.), becoming very thick at its apex (8–11 mm diam.), apparently solid (but becoming hollowed in dried material, with fistulae 2–5 mm high), the surface with the distinct leaf scars sometimes topped by flower scars and always flanked by two white lenticels (one at each side), when young moderately to densely granulose-glandulose and glutinous, the minute, sessile, yellowish glands (in dried specimens), partially covered with a layer of a viscous, shiny, yellowish substance. Leaves isomorphic, with petioles 0.6–1 cm long; blade 4–7 × 1.5–3.5 cm, elliptic to spatulate, base acute to slightly cuneate, apex rounded or seldom obtuse, chartaceous, discolorous both in fresh and dried specimens, acrodromous nerves 3, distinctly suprabasal (distant 0.5–1.2 mm from the base), the laterals sometimes joining the main nerve at the apex, but sometimes joining the leaf margins very near the leaf apex before joining the main nerve and leaf apex, with an additional faint submarginal pair originating near the leaf base and fading away about $\frac{1}{2}$ to $\frac{2}{3}$ of the blade length, main nerve, laterals, transversals and reticulation plane or impressed on adaxial surface and prominent (main nerves) to plane (transversal and reticulation) on abaxial surface, adaxial surface sparse to moderately granulose-glandulose and glutinous (the sessile glands denser on the nerves and nearby surfaces), abaxial with dense vermiform, usually eglandular trichomes 50–230 μm long (measurements from SEM images), mixed with the same minute, sessile, yellowish glands 20–35 μm long (measurements from SEM images) found in young stems and the adaxial leaf surface, the vermiform trichomes restricted to the areolae and absent on the nerves and reticulation and the sessile glands present on both, the glutinous cover thin, i.e., not immersing the vermiform trichomes. Flowers solitary, axillary or sometimes cauliflorous (then from an axillary bud right above a scar left by a caducous leaf), peduncles absent, ebracteate, ebracteolate; 5-merous, on pedicels 10–19 mm long (the pedicel apex hard to distinguish from the tapering hypanthium base). Hypanthium 7–10 × 5–7 mm, greenish brown in mature flowers, conical, outside slightly costate-sulcate, strongly glutinous, apparently moderately to densely glandulose-granulose below the glutinous layer, otherwise glabrous, inside almost totally adhered to the ovary, except for a short, up to 1 mm long, glabrous projection, torus glabrous. Calyx closed and yellowish-green in bud (contrasting with the darker hypanthium), dehiscent through a transversal, circumscissile, clean slit that releases a single conical, yellowish-brown calyptra 11–15 × 6–8 mm, solid (i.e., the tip not hollowed as in Michelangeli & Goldenberg 2021), no evident sepals nor external tooth, no tube remaining on the hypanthium, outside with the same indumentum as the hypanthium, inside sparsely to moderately covered with minute, vermiform, both glandular and eglandular trichomes, but the omnipresent sessile glands very sparse. Petals 21–24 × 14–15 mm, purple in recently opened flowers, lighter and pink in older flowers, adaxial surface shortly papillose, otherwise glabrous on both surfaces, deflexed at anthesis, membranaceous, broadly elliptic, apex rounded or obtuse, margins undulate, not revolute. Stamens 10, dimorphic; antesealous with filaments 16–18 mm long, purple to pinkish (in older flowers), connective purple to reddish, with light yellow to cream extremities, prolonged ca 0.5 mm below the thecae, the ascending appendage 3.5–3.7 mm long, bilobed at the apex, the descending appendage 2–2.3 mm long, narrowly triangular, acute apex, anthers whitish, 4–4.2 mm long, straight; antepetalous with filaments 10–11 mm long, purple to pinkish (in older flowers), connective light yellow to cream, 0.6–0.7 mm prolonged below the thecae, the ascending appendage 4.9–5.2 mm long, straight, bilobed at the apex, the descending appendage ca. 1 mm long, blunt, anthers dark purple, 5–5.7 mm long, straight. Ovary 7–10 mm long, (3–)4-celled, stylar column almost absent, less than 1 mm long, glabrous; style 11–13 mm long, glandular-puberulous on its basal $\frac{2}{3}$, straight with a strongly curved apex, stigma punctiform. Fruits 12–20 × 8–15 mm (including pedicels), not constricted at the apex, opening regularly through (3–)4 longitudinal, loculicidal slits running from the apex to near the base of the fruit, these (3–)4 segments encompassing both the ovary wall and hypanthium; placentae persistent. Seeds not seen.

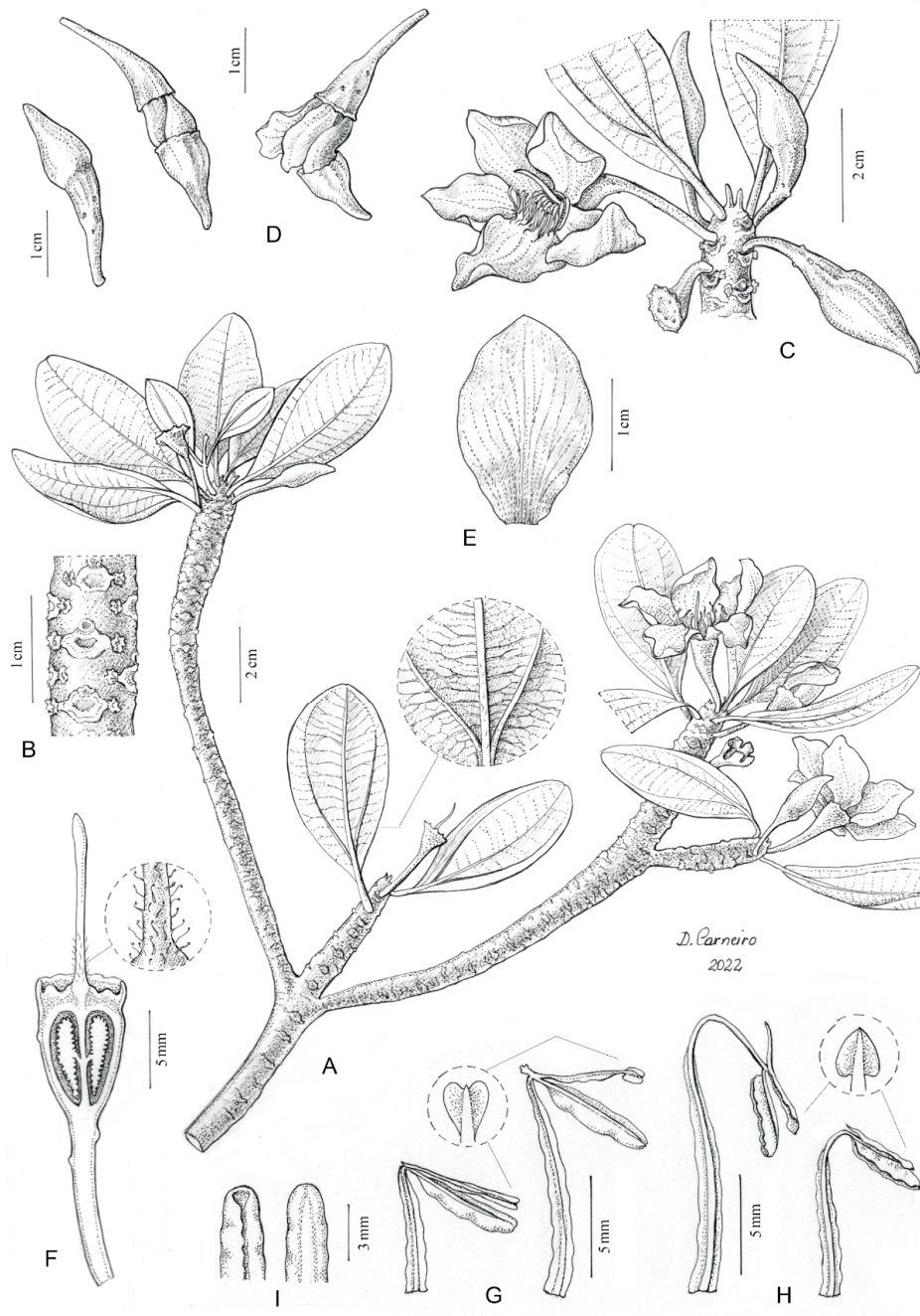


Fig. 1. Illustration of *Merianthera calyptrata* R. Goldenb., Bochorny & Fraga sp. nov. **A.** Fertile branch. **B.** Detail of the branch showing leaf and flower scars plus two lenticels, each at one side of the leaf scar. **C.** Branch tip with leaves, flower buds, an open flower and a fruit. **D.** Flower opening sequence, from left to right: flower bud, with the calyprate calyx still attached to the hypanthium; flower bud, with a circumscissile dehiscence, but the calyptre still holding the petals together; and young flower, with the calyprate calyx falling from the petal tips. **E.** Petal, adaxial surface. **F.** Flower in longitudinal section (calyx, petals and stamens removed) with detail of trichomes at the base of style. **G.** Antesepalous stamens, from bud (left) and mature flower (right). **H.** Antepetalous stamens, from bud (right) and mature flower (left). **I.** Antepetalous stamen, detail of the pore. From Fraga & Couto 4144 (all drawings). Drawn by Diana Carneiro.

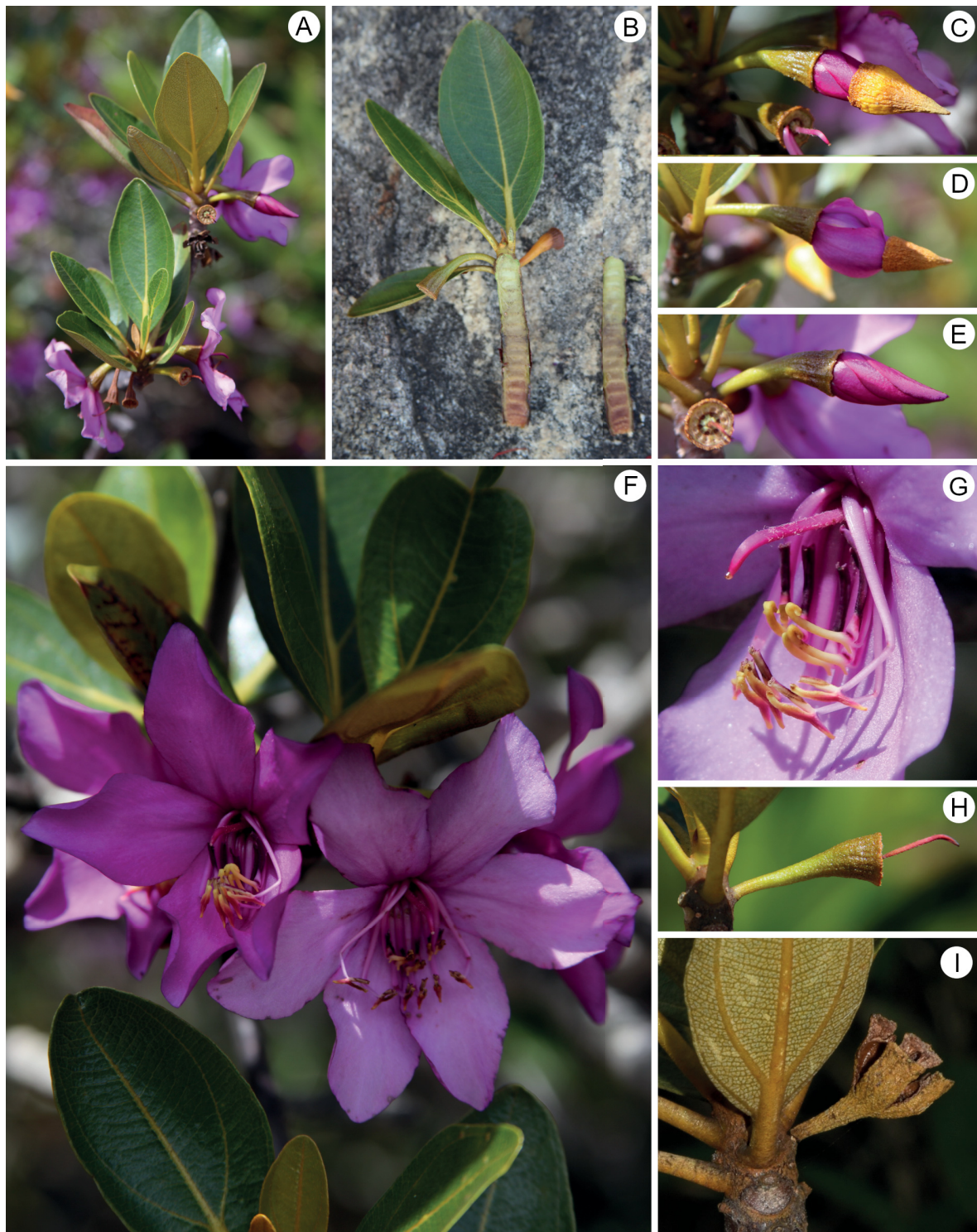


Fig. 2. Field photographs of *Merianthera calyprata* R.Goldenb., Bochorny & Fraga sp. nov. **A.** Fertile branch. **B.** Branch apex, longitudinal section showing the fistulose structure of the stem, with the chambers filled with parenchyma. **C–E.** Sequence of flower anthesis, showing the calyprate calyx with its circumscissile dehiscence. **F.** Flowers, frontal view. **G.** Stamens and style, lateral view. **H.** Old flower, lateral view; this photo shows the single, ebracteolate flower and the absence of a peduncle. **I.** Mature fruit. From: Fraga & Couto 4144 (A–H), Amorim et al. 11854 (I). Photos by C.N. Fraga (A–H) and Y. Gouvea (I).

Distribution, habitat and phenology

Merianthera calyptrata sp. nov. has been recorded three times (two collections and one photo), all from the same locality. The municipality of Jacinto lies on the Minas Gerais side of the border with Bahia, to the south (right margin) of the Jequitinhonha River (Fig. 5). These plants grow on granitic inselbergs (Fig. 4), right on the exposed surface, among other herbaceous, climbing, and shrubby species from genera that are very common on inselbergs (*Alcantarea* (É.Morren ex Mez) Harms, *Mandevilla* Lindl., *Piptadenia* Benth., *Pseudobombax* Dugand, *Pleroma* D.Don, and *Stillingia* Garden) in small vegetation clusters. The climate in this region is highly seasonal, with a strong dry season in winter and a wet summer. The plants were collected with very young flower buds (Amorim *et al.* 11854) and photographed with flowers (by Mr Reginaldo Vasconcelos) in February, then it was collected with open flowers in March (Fraga & Couto 4144), from the middle to the end of the rainy season; both collections had old, persistent, seedless fruits from the previous season, which indicates that the fruits may be present all year long.

Preliminary conservation assessment

This species has been found in only two close locations at a single locality, both outside protected areas and within private properties where cattle is raised. Vegetation on inselbergs is naturally fragmented, and this fragmentation may be intensified by grazing. On the other hand, rock outcrops usually do not attract much agricultural interest, and consequently, they have frequently been preserved from human impact and have kept their refugial character (Porembski *et al.* 1998).

According to *Guidelines for Using the IUCN Red List Categories and Criteria* (IUCN 2022), it should be considered Data Deficient (DD) due to poor sampling. However, AOO of *Merianthera calyptrata* sp. nov. is currently 8 km², and its EOO cannot be defined. Although these figures are within limits for Critically Endangered (CR), under the criterion B2 (AOO less than 10 km²), the number of locations is greater than 1 and falls within the Endangered (EN) category.

We don't have reliable information about continuing decline or extreme fluctuations of populations of this species, but two of the authors of this article made an intensive evaluation of this species in loco, since they were in this place looking precisely for these plants. Due to its apparent rarity and restricted endemic distribution and the fact that their populations are prone to the effects of stochastic events in the near future, it seems prudent to include this species in the Vulnerable category [VU: D2].

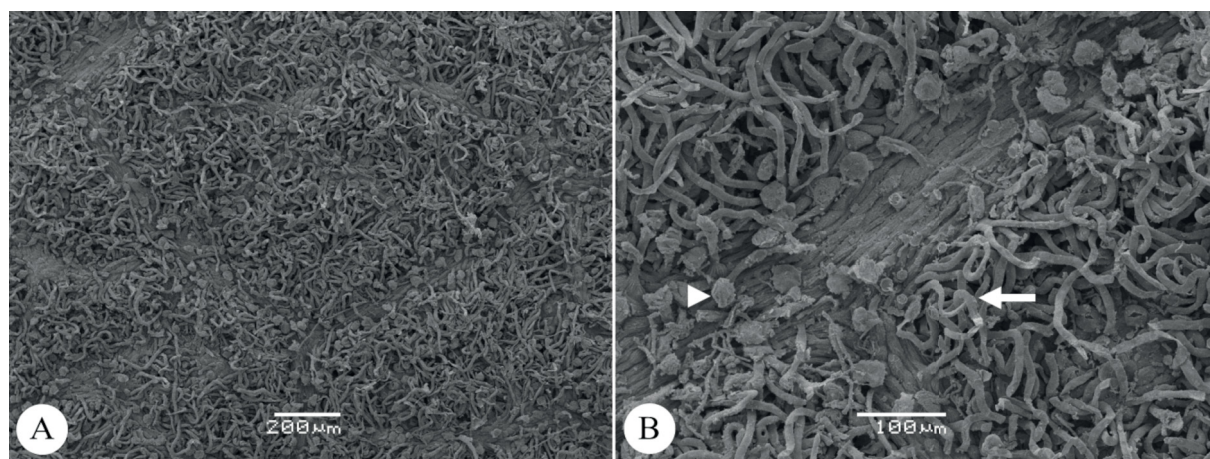


Fig. 3. *Merianthera calyptrata* R.Goldenb., Bochorny & Fraga sp. nov., scanning electron micrographs of the abaxial surface of the leaf. **A.** General view. **B.** Detail of the dense vermiform trichomes (arrow) mixed with sessile glands (arrowhead). Scale bars: A = 200 µm; B = 100 µm. From *A.M Amorim et al. 11854* (UPCB).



Fig. 4. *Merianthera calyptrata* R.Goldenb., Bochorny & Fraga sp. nov. in its habitat. **A.** Inselberg and granitic outcrops where the plant can be found. **B.** Vegetation cluster growing on a cleft, on a granitic outcrop, with *M. calyptrata* to the right and front, with flowers. **C.** Three individuals with spreading crowns, behind some *Alcantarea* (É.Morren ex Mez) Harms (Bromeliaceae). From *Fraga & Couto 4144*. Photos by C.N. Fraga.

Discussion

Merianthera calyptrata sp. nov. is remarkably similar to *Merianthera burlemarxii*, which up to now is known only from the state of Espírito Santo, and with the nearest population found at a distance of 250 km from the former. Both have the remarkable ‘candelabriform’ habit (as explained in the Introduction), with the same fistulose stem (in dried material), and solitary, axillary or cauliflorous flowers. All other species of *Merianthera* are regular shrubs with flowers borne in cymose or paniculate inflorescences (see identification key above; Goldenberg *et al.* 2012). The differences between the two species are listed in the Diagnosis (see above). Among these, there are three characters that seem to be exclusive to *M. calyptrata*, meaning that they are absent in *M. burlemarxii* and all other species in the genus, and sometimes absent in the whole family: the absence of both a peduncle and bracteoles, the calyptrate calyx, and the fruits from inferior ovaries and dehiscent through longitudinal slits.

The first exclusive character in *Merianthera calyptrata* sp. nov. is the absence of a peduncle as well as a pair of bracteoles below the flower. All species of *Merianthera* but *M. burlemarxii* have inflorescences with more than two flowers, thus by definition have peduncles below the flowers. However, *M. burlemarxii* has solitary flowers, but these are clearly reduced cymes, i.e., each grow on a short peduncle. The distinction between peduncle and pedicel is marked by a clear articulation and the presence of a couple of caducous bracteoles at the pedicel base/peduncle apex (Wurdack 1984; Goldenberg *et al.* 2012). The condition found in *M. calyptrata* is remarkably different, with ependuculate and ebracteolate solitary flowers, and this character seems to be otherwise absent from the rest of the family (R.G. pers. obs.; F. Almeda pers. com.): there are a few species in some groups (*Henriettea* DC. and *Bellucia* Raf. in *Henrietteae*

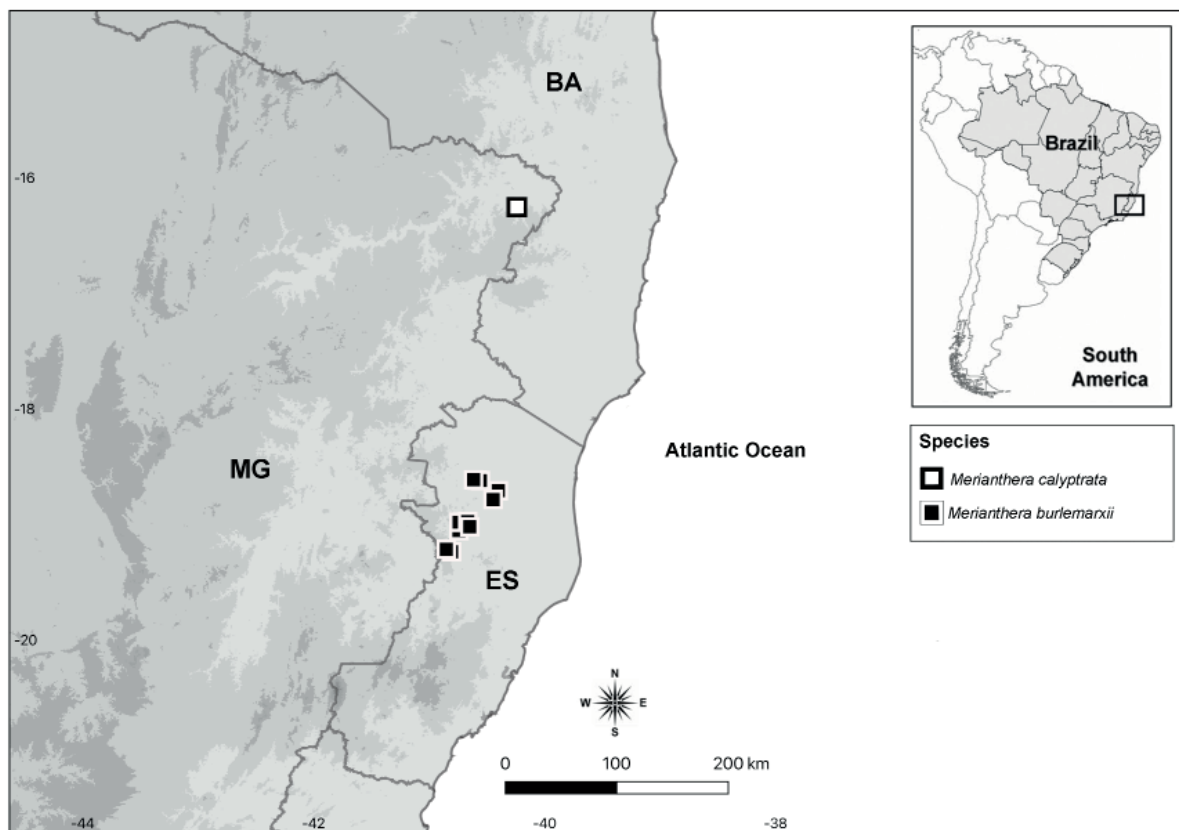


Fig. 5. Distribution of *Merianthera calyptrata* R.Goldenb., Bochorny & Fraga sp. nov. and its closest relative, *Merianthera burlemarxii* Wurdack. BA = Bahia; ES = Espírito Santo; MG = Minas Gerais.

Penneys, Michelang., Judd & Almeda, or *Mouriri* Aubl. in Olisbeoideae Burnett, for instance) with a condition similar to *M. burlemarxii*, where solitary flowers apparently evolved from depauperate cymes, but these always have even a small peduncle, and always a pair of bracteoles at the base of the pedicel, even though sometimes the bracteoles are very early caducous.

The second exclusive character is the calyptrate calyx that gives this species its name. All other species in the genus have either an open calyx dehiscing through regular lobes (*Merianthera bullata*, *M. burlemarxii*, *M. eburnea*, *M. sipolisii*, *M. verrucosa*) or the calyx is closed in bud and dehisces through irregular lobes in *M. parvifolia* and *M. pulchra*, but never through a circumscissile slit that releases a single calyptra. While absent from *Merianthera* and other genera in the tribe Pyramieae (Bochorny *et al.* 2019), this dehiscence mode can be found in at least five different tribes of Melastomataceae: Cyphostyleae Gleason, Henrietteae, Merianieae Triana, Pyxidanthae Griseb., and in at least four unrelated clades of Miconieae DC. (Michelangeli *et al.* 2011; Judd *et al.* 2022).

The third character that is exclusive to *Merianthera calyptrata* sp. nov. is related to the fruits. In all other species of *Merianthera*, the fruits apparently lack a dehiscence region, and “the seeds are dispersed after the hypanthium and ovary walls decay and open (“cápsula rompente” or “rupturing capsule” sensu Baumgratz 1985), and the seeds are released through the gaps left by the falling irregular hypanthium pieces” (Goldenberg *et al.* 2012). The same mechanism is found in some species of *Huberia* (also in the tribe Pyramieae; Bochorny *et al.* 2019, 2022), and in *Allomaieta* Gleason and *Alloneuron* Pilger (both in the tribe Cyphostyleae; Michelangeli *et al.* 2011). All these species in *Merianthera*, *Huberia*, *Allomaieta* and *Alloneuron* have an inferior ovary, and this dehiscence mechanism has been interpreted as a consequence of the ovary position (Goldenberg *et al.* 2012). Most Melastomataceae with inferior ovaries have fleshy fruits, while most species with dry fruits have superior ovaries (Clausing *et al.* 2000, but see Michelangeli *et al.* 2011 for exceptions); in the latter case, the dry fruits from superior ovaries usually release the seeds from apical slits on the mature ovaries, but they do not have the hypanthium tearing along clear lines, like the ones found in *M. calyptrata*. This condition where the hypanthium tears along clear lines may also be found in *Microlicia* D. Don (tribe Lavoisiereae DC.) and *Wurdastom* B. Walln. (Cyphostyleae).

In conclusion, it is remarkable that at least three macromorphological characters occur in this species and are absent in the other members of the genus and tribe. Moreover, at least one of them is apparently lacking in the close to 6000 species in the entire family. If not of great consequence, this at least makes *Merianthera calyptrata* sp. nov. one of the easiest recognizable new species described in Melastomataceae in the recent past. Another aspect is that, despite the recent revision and the small size of the genus, the taxonomy of *Merianthera* still needs some attention, as is the case for the whole inselberg’s flora in southeastern Bahia, northeastern Minas Gerais and western Espírito Santo, where these species are endemic. Plants heretofore determined as *M. burlemarxii*, for instance, seem to actually belong to two different morphological groups (see Goldenberg *et al.* 2012), but a satisfactory resolution of their status still will require more collections and more detailed studies. Since these inselbergs are frequently difficult to reach and consequently poorly collected, it is expected that more species of *Merianthera* might come to light in the near future.

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References

- Baumgratz J.F.A. 1985. Morfologia dos frutos e sementes de Melastomataceas brasileiras. *Arquivos do Jardim Botânico do Rio de Janeiro* 27: 113–155
- Bochorny T., Michelangeli F.A., Almeda F. & Goldenberg R. 2019. Phylogenetics, morphology and circumscription of Cambessedesieae: a new Neotropical tribe of Melastomataceae. *Botanical Journal of the Linnean Society* 190: 281–302. <https://doi.org/10.1093/botlinnean/boz018>
- Bochorny T., Bacci L.F., Michelangeli F.A., Almeda F. & Goldenberg R. 2022. Systematics and evolution of tribe Pyramieae. In: Goldenberg R., Michelangeli F.A. & Almeda F. (eds) *Systematics, Evolution, and Ecology of Melastomataceae*: 359–371. Springer, Cham. https://doi.org/10.1007/978-3-030-99742-7_17
- Clausing G., Meyer K. & Renner S.S. 2000. Correlations among fruit traits and evolution of different fruits within Melastomataceae. *Botanical Journal of the Linnean Society* 133: 303–326. <https://doi.org/10.1111/j.1095-8339.2000.tb01548.x>
- Goldenberg R., Fraga C.N., Fontana A.P., Nicolas A. & Michelangeli F.A. 2012. Taxonomy and phylogeny of *Merianthera* (Melastomataceae). *Taxon* 65 (5): 1040–1056. <https://doi.org/10.1002/tax.615010>
- IBGE, Instituto Brasileiro de Geografia e Estatística. 2022. Mapas. Available from <https://mapas.ibge.gov.br/bases-e-referenciais/bases-cartograficas/malhas-digitais> [accessed 4. Jul. 2023].
- IUCN Standards and Petitions Committee. 2022. *Guidelines for Using the IUCN Red List Categories and Criteria. Version 15.1*. Prepared by the Standards and Petitions Committee. Available from <https://www.iucnredlist.org/documents/RedListGuidelines.pdf> [accessed 4. Jul. 2023].
- Judd W.S., Majure L.C., Michelangeli F.A., Goldenberg R., Almeda F., Penneys D.S. & Stone R.D. 2022. Morphological variability within the Melastomataceae (Myrtales), including a discussion of the associated terminology. In: Goldenberg R., Michelangeli F.A. & Almeda F. (eds) *Systematics, Evolution, and Ecology of Melastomataceae*: 45–85. Springer, Cham. https://doi.org/10.1007/978-3-030-99742-7_3
- Kuhlmann J.G. 1935. Novo gênero de Melastomataceae. *Arquivos do Instituto de Biologia Vegetal do Rio de Janeiro* 1: 231–233.
- Michelangeli F.A. 2010. Neotropical myrmecophilous Melastomataceae: An annotated list and key. *Proceedings of the California Academy of Sciences* 61: 409–449.
- Michelangeli F.A. & Goldenberg R. 2021. A revision of the floribella group of *Miconia* (Melastomataceae, Miconieae) with description of three new species. *Brittonia* 73: 85–105. <https://doi.org/10.1007/s12228-020-09633-w>
- Michelangeli F.A., Nicolas A., Morales-P. M.E. & David H. 2011. Phylogenetic relationships of *Allomaieta*, *Alloneuron*, *Cyphostyla*, *Wurdastom* (Melastomataceae) and the resurrection of the tribe Cyphostyleae. *International Journal of Plant Sciences* 172: 1165–1178. <https://doi.org/10.1086/662032>
- Penneys D.S., Almeda F., Reginato M., Michelangeli F.A., Goldenberg R., Fritsch P.W. & Stone R.D. 2022. A new Melastomataceae classification informed by molecular phylogenetics and morphology. In: Goldenberg R., Michelangeli F.A. & Almeda F. (eds) *Systematics, Evolution, and Ecology of Melastomataceae*: 109–165. Springer, Cham. https://doi.org/10.1007/978-3-030-99742-7_5
- Porembski S., Martinelli G., Ohlemüller R. & Barthlott W. 1998. Diversity and ecology of saxicolous vegetation mats on the inselbergs in the Brazilian Atlantic rainforest. *Diversity and Distributions* 4: 107–119. <https://doi.org/10.1046/j.1365-2699.1998.00013.x>

QGIS, Development Team. 2022. QGIS Geographic Information System. Open Source Geospatial Foundation Project. Available from <http://qgis.osgeo.org> [accessed 14 Jul. 2023].

Radford A.E., Dickison W.C., Massey J.R. & Bell C.R. 1974. *Vascular Plant Systematics*. Harper & Row, New York.

SISEMA, Sistema Estadual de Meio Ambiente e Recursos Hídricos. 2022. Infraestrutura de dados espaciais do Sistema Estadual de Meio Ambiente e Recursos Hídricos. Belo Horizonte: IDE-Sisema. Available from <http://idesisema.meioambiente.mg.gov.br> [accessed 14 Jul. 2023].

Thiers B. continuously updated. Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium.

Available from <http://sweetgum.nybg.org/science/ih/> [accessed 14 Jul. 2023].

Ulloa Ulloa C., Almeda F., Goldenberg R., Kadereit G., Michelangeli F.A., Penneys D.S., Stone R.D. & Veranso-Libalah M.C. 2022. Melastomataceae: global diversity, distribution, and endemism. In: Goldenberg R., Michelangeli F.A. & Almeda F. (eds) *Systematics, Evolution, and Ecology of Melastomataceae*: 3–28. Springer, Cham. https://doi.org/10.1007/978-3-030-99742-7_1

Wurdack J.J. 1984. Certamen Melastomataceis XXXVII. *Phytologia* 55: 131–147.

Wurdack J.J. 1986. Atlas of hairs for Neotropical Melastomataceae. *Smithsonian Contributions to Botany* 63: 1–80. <https://doi.org/10.5479/si.0081024X.63>

Ziemmer J.K., Goldenberg R. & Amano E. 2017. Evolution of aquiferous pith and fistulae in *Merianthera burlemarxii* suggests a rare case of xerophytism in Melastomataceae. *Botanical Journal of the Linnean Society* 185: 119–127. <https://doi.org/10.1093/botlinnean/box045>

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