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## Seven new southeastern Brazilian species of *Myrcia* (Myrtaceae)

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### Abstract

There are described, illustrated, compared with related species and commented in their conservation issues *Myrcia delicata*, *M. exapata*, *M. guarujana*, *M. parca*, *M. pseudosplendens*, *M. ubatubana* and *M. venosissima*. *Myrcia delicata*, from the states of São Paulo and Rio de Janeiro, is close to *M. neocambessedea*, differing through its triflorous, slender inflorescences; *Myrcia exapata*, from Rio de Janeiro, is related to *M. calycampa*, differing through its obovate blades, longer peduncles and dichasial branches; *Myrcia guarujana*, from São Paulo, is related to *M. colpodes*, but differs in its pilose flowers and trilocular ovaries; *Myrcia parca*, from the state of Espírito Santo, is related to *M. warmingiana*, but differs in its narrower, concolorous blades, pauciflorous inflorescences and smooth ovaries; *Myrcia pseudosplendens*, from Minas Gerais, is close to *M. splendens*, but has costate fruits and exfoliating bark; *Myrcia ubatubana*, from São Paulo, is related to *M. ferruginea*, but is kept apart through its pauciflorous inflorescences and narrower blades, and *Myrcia venosissima*, from Minas Gerais, resembles *M. almasensis*, differing through its uniflorous to triflorous inflorescences and flowers with longer calyx lobes.

**Keywords:** Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, taxonomy, IUCN

### Introduction

Myrtaceae are represented in Brazil by about 1,000 species (Sobral *et al.* 2015); along the examination of specimens from southeastern Brazil (states of Espírito Santo, Minas Gerais, Rio de Janeiro and São Paulo; IBGE 2015a) we have spotted unidentified collections of the genus *Myrcia* De Candolle (1827: 406) that we here propose as new.

### Material and methods

Specimens examined are kept in the herbaria cited in the text, which are identified through the acronyms cited in Thiers (2015). Species are defined according to the morphological species concept (“the presence of one or more unique characters or a unique combination of them”—Nixon & Wheeler 1990, McDade 1995), and terminology mostly follows standard taxonomy glossaries (e.g. Hickey & King 2000, Gonçalves & Lorenzi 2011). Online images of type specimens of related species, when available, are referred by the herbarium acronym followed by the barcode of the specimens.

Regarding the conservation status, IUCN criteria (IUCN 2001) were followed. There are provided additional data regarding the sampling efforts in the collection sites of the species here described; this information is represented by the total of gatherings in a given municipality (data in CRIA 2015) divided by its area (data in IBGE 2015b). Such information may be helpful, considering that species scarcely gathered in places where sampling efforts were significant may indeed be rare in nature. We consider here as a minimally surveyed area one that reaches the Campbell index (one gathering per km<sup>2</sup>; Campbell 1989), an amount greater than the average of collections in Brazil (0.6 collection per square kilometer; see Sobral & Stehmann 2009).

## Taxonomy

1. *Myrcia delicata* Gressler & Sobral, sp. nov. Type:—BRAZIL. São Paulo: mun. Ubatuba, Parque Estadual da Serra do Mar, núcleo Picinguaba, margins of Rio da Fazenda and Trilha do Corisco, 70 m high, S 23°20'11.8" S, 44°49'55.3" W, 22 February 2009, E. Gressler 754 (holotype RB!; isotype HRCB!). Figures 1, 2.

This species is related to *Myrcia neocambessedea*, from which it is distinguished by the twigs covered with appressed trichomes (versus glabrous in *M. neocambessedea*), constantly triflorous inflorescences with one flower at the apex of the main axis and two at the apex of secondary axes (vs. with five apically congested flowers), the main axis 35–50 mm long and the secondary axes evident, 8–9 mm long (vs. 40–50 mm long, the secondary axes inconspicuous, 2–3 mm long), the main axis less than five times longer than the secondary ones (vs. main axis more than ten times longer than the secondary ones). It can also remind *Myrcia curtipedula*, differing through its pilose (vs. glabrescent in *M. curtipedula*) and shorter blades (to 60 × 14 mm vs. up to 100 × 30 mm).

Tree 2–9 m high, erect or occasionally prostrate with adventitious roots along the stem, these becoming thick and helping support the plant. Twigs densely covered with appressed coppery simple trichomes 0.7–1 mm long, the internodes 9–16 mm long × 0.6–0.8 mm wide; apical gems densely pilose, covered with white trichomes to 0.5 mm. Leaves with petioles 1.5–2 × 0.5–0.8 mm, pilose as the twigs and bearing in the axile 2 to 4 pairs of linear, glabrous colleters 0.2–0.4 × 0.1 mm; blades lanceolate, ovate-lanceolate or oblong-lanceolate, 38–60 × 8–14 mm, 3.6–4.7 times longer than wide, visibly discolored when dry, dark green adaxially and dull, pale green abaxially, the adaxial side glabrous or with sparse grey trichomes to 0.1 mm on the midvein, the abaxial side with three types of grey trichomes, the surface with somewhat appressed and scattered trichomes to 0.2 mm, these interspersed with somewhat erect larger trichomes to 0.5 mm, and the midvein densely covered with appressed trichomes to 1 mm; glandular dots < 0.1 mm in diameter, 5 to 10/mm<sup>2</sup>, barely visible on both sides; apex acuminate to 14 mm; base obtuse to rounded; midvein plane or slightly impressed adaxially, raised abaxially; lateral nerves 40 to 50 at each side, slightly visible and faintly salient on both sides, leaving the midvein at angles about 80°; marginal vein 0.2–0.3 mm from the margin. Inflorescences axillary, triflorous, with more or less dense erect trichomes to 0.5 mm, the axiles of the ramifications with concave, linear to lanceolate bracts 3–4 × 0.5 mm, with trichomes to 0.3 mm at the abaxial side; main axis 35–50 × 0.2–0.3 mm; secondary axes 8–9 × 0.2 mm. Flowers slightly scented, sessile at the apex of the axes; bracteoles narrowly lanceolate, 2–3 × 1 mm, slight concave or plain, with trichomes like the bracts and with 2 to 4 pairs of linear colleters like those on the petioles; flower buds globose to obovate, 3–4 × 3 mm, covered with grey to whitish trichomes 0.2–0.3 mm, these more dense above the ovary; calyx lobes five, widely triangular to hemispheric, slightly unequal, 0.8–1.5 × 1.2–1.6 mm, strongly reflexed at anthesis, with trichomes to 0.1 mm adaxially; petals five, white, orbicular, to 3 mm in diameter, adaxially glabrous and abaxially with trichomes to 0.2 mm; stamens 80 to 100, filaments 2–4 mm, the anthers globose, 0.2–0.3 × 0.3 mm, eglandular, the thecae with the interior staminal sac opening extrorsely and apically and the exterior one introrsely and basally; staminal ring to 2 mm in diameter, with dense trichomes to 0.2 mm; calyx-tube to 0.3 mm deep; styles 4–4.5 mm, proximally with scattered trichomes to 0.2 mm, otherwise glabrous, the stigma minutely capitate and verruculose; ovary bilocular, with two central-basal ovules per locule. Fruits globose to oblong, 6 to 9 mm in diameter, dark red to black when ripe; seed subglobose to widely reniform, with dark brown, easily detachable testa and embryo with two distinct, folded cotyledons surrounded by an hypocotyl.

Distribution, habitat and phenology:—This species occurs in shady locations in the interior of coastal rainforests of the municipalities of Paraty (state of Rio de Janeiro) and Ubatuba (state of São Paulo), at altitudes from 70–500 m elev.; flowers were collected from November to February, and fruits from February to September, the fruits ripening since July.

Conservation:—Most collections of *Myrcia delicata* are from the State Park of Picinguaba, in the municipality of Ubatuba, São Paulo, and there is only one collection known from Paraty, in Rio de Janeiro. Paraty and Ubatuba are contiguous municipalities which sum 1,648 km<sup>2</sup> (IBGE 2015b), and there are about 31,500 collections from there, resulting in an average of 19 collections/km<sup>2</sup>, a high sampling effort. Considering this, the fact that this species has been only sporadically collected may be an indicative of its rareness. Nevertheless, in the absence of additional environmental information, we presently score it as DD (Data Deficient) according to IUCN conservation criteria (IUCN 2001).

Affinities:—*Myrcia delicata* is apparently related to *Myrcia neocambessedea* E.Lucas & Sobral (Sobral *et al.* 2010: 55; for description see Berg 1857–1859: 24, under *Gomidesia cambessedea* O.Berg; type image: P barcode 02273013), a scarcely collected species from the forests of Rio de Janeiro, from which it can be distinguished by the



**FIGURE 1.** *Myrcia delicata*—unmounted holotype (scale: 50 mm).



FIGURE 2. *Myrcia delicata*—flowering twig (from Gressler 754; photo E. Gressler).

characters given in the diagnosis. Additionally, the inflorescence structure of *Myrcia delicata* could occasionally remind that of *Myrcia curtipedula* Nic Lughadha (Nic Lughadha *et al.* 2010: 21; type image: K barcode 000331907), which can bear triflorous inflorescences like those of *M. delicata*; in *M. curtipedula*, however, the leaves are glabrescent and larger (to  $100 \times 30$  mm). *Myrcia delicata* clearly matches those of informal “group 3” in the phylogenetic scheme of Lucas *et al.* (2011), which mainly comprises the species formerly included in the Bergian genus *Gomidesia* (Berg 1855–1856: 27).

**Etymology:**—From the Latin word for “delicate”, alluding to the small blades and tender inflorescences of the species.

**Paratypes:**—BRAZIL. São Paulo: mun. Ubatuba, Parque Estadual da Serra do Mar, núcleo Picinguaba, margens do Rio da Fazenda e Trilha do Corisco,  $23^{\circ}20'15.0''$  S,  $44^{\circ}49'55.5''$  W, 17 January 2007, E. Gressler 153 (BHCB!, HRCB!); idem, 17 January 2007, E. Gressler 139 (HRCB); 22 June 2007, E. Gressler 97 (HRCB!); idem, 20 January 2008, E. Gressler 338 (HRCB!); idem, 7 August 2009, E. Gressler 1115 (HRCB!); idem, 7 August 2009, E. Gressler 1020 (HRCB!, HUFSJ!); mun. Ubatuba, Sertão da praia do Puruba, fazenda Cambucá, trilha Cambucá–Cunha, SAD 69, zona 23, 17 February 2005, N.M. Ivanauskas *et al.* 6022 (BHCB!, SPSF!). Rio de Janeiro: mun. Paraty, fazenda São Roque, 4 August 1988, M.C. Marques 104 (RB!).

2. *Myrcia exapata* Sobral, sp. nov. Type:—BRAZIL. Rio de Janeiro: mun. Nova Friburgo, Reserva Ecológica Municipal Macaé de Cima, Nascente do Rio das Flores,  $22^{\circ}00'S$ ,  $42^{\circ}03'W$ , 6 March 1989, M. Peron *et al.* 773 (holotype RB!, isotypes MO, NY, SP). Figure 3.

This species is related to *Myrcia ochrooides* in its inflorescence structure, from which it is distinguished by its larger, obovate and mostly glabrous blades (to  $140 \times 55$  mm versus to  $40 \times 30$  mm, elliptic or ovate and densely pilose at least when young in *M. ochrooides*), and its larger flowers (flower buds to 8 mm vs. up to 5 mm); it also reminds in its calyx morphology *Myrcia calycampa*, differing through its leaves with relatively shorter petioles (the ratio blade length / petiole length 25–33:1 versus 8–18:1 in *M. calycampa*), obovate blades (vs. elliptic to narrowly elliptic) with obtuse or slightly cordate bases constricted at the junction with the petiole (vs. acute or rarely obtuse, never constricted at the junction with the petiole), and inflorescences with peduncles to 50 mm, the branching restricted to the upper portion (vs. up to 10 mm, the ramification regular along the axis).



FIGURE 3. *Myrcia exapata*—holotype. Insert: inflorescences (scale: 10 mm).

Trees 10–15 m. Twigs complanate, when young with simple grey trichomes to 0.5 mm, the internodes to 15 × 3–4 mm. Leaves with petioles 3–6 × 2 mm, adaxially complanate and somewhat sulcate; blades lanceolate or obovate, 100–140 × 30–55 mm, 2.5–3.5 times longer than wide, the young ones with simple grey trichomes to 0.2 mm, the adult ones glabrous and dull on both faces; glandular dots 5 to 8/mm<sup>2</sup>, about 0.1 mm in diameter, visible only when the blades are examined against light; apex acuminate for 6–10 mm; base obtuse or slightly cordate, constricted at the very junction with the petiole; midvein impressed adaxially and strongly raised abaxially; lateral veins 12 to 16 at each side, impressed or plane, scarcely visible adaxially and raised abaxially, leaving the midvein at angles 60–70°, intermixed with secondary fainter lateral veins; marginal veins one or sometimes two, respectively 1.5–2 and 0.2–0.3 mm from the margin, the margin itself with a yellowish thickening about 0.2 mm wide and somewhat revolute near the base. Inflorescences axillary, paniculiform, with one sessile apical flower, one or two times ramified, the ramifications dichasial, with up to nine flowers, the axis complanate, 50–60 × 3 mm, the peduncle to 50 mm, the secondary axes to 12 × 1 mm and the tertiary ones, when present, 5–7 × 1 mm; flowers with pedicels absent; bracteoles not seen, probably deciduous before anthesis; flower buds globose or obovate, 6–8 × 5 mm, dense and uniformly covered by simple grey trichomes 0.5–0.8 mm; calyx lobes five, pilose as the buds, unequal between them, triangular or widely triangular, 2.5–3 × 3.5–4 mm; petals white, rounded to obovate, to 8 × 5–6 mm, adaxially glabrous, abaxially with scattered trichomes to 0.5 mm; stamens about 200, filaments to 5 mm, the anthers subglobose, 0.3 × 0.2–0.3 mm, the thecae asymmetrical and sometimes with one connectival gland; staminal ring to 6 mm in diameter, with grey trichomes to 0.2 mm; style to 6 mm, the stigma punctiform; calyx tube absent or to 0.5 mm deep; ovary with two locules and two ovules per locule. Fruits globose to elliptic, 10–12 × 10 mm, immature in the specimens examined; seeds not examined.

**Distribution, habitat and phenology:**—This species is presently known from three flowering collections from montane rainforests in the municipality of Nova Friburgo, in the southeastern Brazilian state of Rio de Janeiro, at about 1100 m elev.; flowers were collected in March, and immature fruits in August and September.

**Conservation:**—Although the known specimens were collected in a protected area, the Reserva Ecológica de Macaé de Cima, in the municipality of Nova Friburgo, the information available allow scoring it, according to IUCN criteria (IUCN 2001) as Endangered (EN), since it fits criteria B1 (extent of occurrence smaller than 5,000 km<sup>2</sup>; the municipality of Nova Friburgo has 933 km<sup>2</sup>; see IBGE 2015b), B1a (collected in no more than five locations) and B1b(iii) (projected decline of extent and quality of the habitat; see Barros 2006). Additionally, there are about 13,600 collections from the municipality of Nova Friburgo (CRIA 2015), resulting in an average of 14.5 collections/km<sup>2</sup>, what can be considered a good sampling effort; considering this, the existence of only three gatherings of *Myrcia exapata* may be an additional evidence of its rarity.

**Affinities:**—This species is very singular in its inflorescence morphology, with a large peduncle with the ramifications restricted to its distal portion. It is here tentatively compared with *Myrcia ochroides* O.Berg (1857–1859: 208), a species collected in northeastern Brazil, which bears inflorescences that remind those of *M. exapata*, but is clearly distinct in the features cited in the diagnosis. It may also be compared, due to its relatively large calyx lobes, to the Amazonian *Myrcia calycampa* Amshoff (1942: 153; for description see Berg 1855–1856: 130, under *Calycampe latifolia* O.Berg; type image: P barcode 001615017), from which it is distinguished through the characters given in the diagnosis. The features of *M. exapata* match partially the species included in the informal “group 5” by Lucas *et al.* (2011), to which *M. calycampa* also belongs, due to its bilocular ovary, five free calyx lobes, pilose staminal ring and short calyx tube (in some species of the group absent).

**Etymology:**—The name is derived from the Greek verb for “deceive” or “escape from surveillance” alluding to the fact that this species was not recognized as belonging to *Myrcia*, having been cited as *Myrceugenia kleinii* D.Legrand (Legrand 1961: 306) in a floristic inventory of Macaé de Cima, a locality in Nova Friburgo (Barroso & Peron 1994).

**Paratypes:**—BRAZIL. Rio de Janeiro: mun. Nova Friburgo: Macaé de Cima, 22°00'S, 42°03'W, 26 April 1988, G. Martinelli *et al.* 12455 (BHCB!, RB!); idem, 28 September 1989, M. Peron 889 (RB!).

3. *Myrcia guarujana* Sobral, Magenta & Caliari, *sp. nov.* Type:—BRAZIL. São Paulo: mun. Guarujá, Serra do Guararu, loteamento Ipiranga, área C, P19, árvore 1087, 16 April 2013, M. Magenta, P.S.P. Sampaio & J.M. Santos 883 (holotype RB!, isotypes ESA!, HUSC!). Figure 4.

This species is apparently related to *Myrcia colpodes*, from which it is kept apart through its longer blades (to 300 mm versus 230 mm in *M. colpodes*), its densely pilose flowers (vs. glabrous) with calyx lobes to 7 mm (vs. 2 mm) and ovaries with three locules (vs. two).



**FIGURE 4.** *Myrcia guarujana*—holotype (scale: 50 mm). Insert: flower bud (scale: 10 mm).

Tree to 5 m. Twigs densely pilose when young, the trichomes brown and simple, to 3 mm, falling with age; internodes  $15\text{--}60 \times 4\text{--}5$  mm. Leaves with petioles  $4\text{--}5 \times 2.8\text{--}3$  mm, subterete and with scattered trichomes; blades markedly bullate, narrowly lanceolate to oblong,  $160\text{--}305 \times 50\text{--}64$  mm, 4–5.5 times longer than wide, discolorous, lighter abaxially, glabrous and somewhat shining adaxially, sparsely pilose abaxially, the trichomes more dense along the midvein; glandular dots about 0.1 mm in diameter, up to  $4/\text{mm}^2$ ; apex acuminate to 15–20 mm; base cordate; midvein impressed adaxially and strongly raised abaxially; lateral veins 15 to 20 at each side, leaving the midvein at angles of 70–80°, impressed adaxially and raised abaxially; marginal veins two, 3–4 and 0.5–1 mm from the margin, raised on both sides, the margin itself strongly recurved, with a yellow girdle to 0.2 mm wide. Inflorescences axillary or at the apex of branches, not subtended by leaves, paniculiform, up to two times branched, the main axis to  $200 \times 2$  mm, with 20 to 30 flowers, the peduncle to  $100 \times 2$  mm, the first branches two or three pairs, the proximal ones to 20 mm and the distal ones to 5 mm, the axes with trichomes as the twigs; bracts not seen, possibly deciduous before anthesis; flowers sessile; bracteoles not seen, possibly deciduous before anthesis; flower buds globose to obovate,  $9\text{--}10 \times 5\text{--}7$  mm, uniformly and densely covered with brown trichomes to 1.5 mm, globose, sometimes slightly constricted above the ovary; calyx lobes five, ovate-triangular, glabrous internally, slightly unequal in size between them,  $4\text{--}7 \times 4\text{--}5$  mm; petals five, rounded,  $5\text{--}6 \times 6$  mm, glabrous adaxially and pilose abaxially; stamens about 100, filaments 6–7 mm, the anthers globose, to  $0.4 \times 0.4$  mm, eglandular; staminal ring ca. 5 mm in diameter, glabrous; calyx tube to 2 mm deep, glabrous; style 8–9 mm, the stigma punctiform and minutely papillose; ovary with three locules and two ovules per locule. Fruits not seen.

**Distribution, habitat, phenology:**—This species is presently known from the type, collected in rainforest in an urban area of the municipality of Guarujá, in the coastal zone of the state of São Paulo; flowers were collected in April.

**Conservation:**—The municipality of Guarujá has an area of 143 km<sup>2</sup> (IBGE 2015b), and there are registered about 1,200 collections from there (CRIA 2015), with an average of 8.3 collections/km<sup>2</sup>, what can be considered a reasonable sampling effort. Considering this, the fact that *Myrcia guarujana* is known for only one collection may be an indicative of its rareness. Nevertheless, in the absence of additional information, we score this species as DD (Data Deficient) according to IUCN conservation criteria (IUCN 2001).

**Affinities:**—In their phylogenetic study of *Myrcia* s.l. Lucas *et al.* (2011) associated the presence of trilocular ovaries to three clades, informally named groups 3, 4 and 6, respectively characterized, among other features, by anthers opening through asymmetrical slits, thin staminal ring and blades with one gland per areole. In spite of the trilocular ovary, *Myrcia guarujana* does not seem to match the characters of any of these groups. On the other hand, it is morphologically close to *Myrcia colpodes* Kiaerskou (1893: 80; type image: P barcode 00161301), a species presently known only from the type specimen, collected in Rio de Janeiro by Auguste Glaziou in 1862, with which it is compared in the diagnosis. *Myrcia colpodes* is a species with bilocular ovaries and developed calyx tube that matches the characters of “group 9” of Lucas *et al.* (2011), which comprises the species formally included in the Bergian genus *Aulomyrcia* (Berg 1855–1856: 35).

**Etymology:**—The epithet is allusive to the municipality where the type was collected.

**4. *Myrcia parca* Sobral, sp. nov.** Type:—BRAZIL. Espírito Santo: mun. Viana, arredores da Rebio São Paulo Viana, propriedade do sr. Valtinho, 20°18'23" S, 40°32'30" W, 700 m, 19 January 2009, L. Kollmann, A.P. Fontana, R. Goldenberg & R. Forzza 11477 (holotype RB!; isotypes BHCB, CEPEC, MBML, UPCB). Figure 5.

This species is apparently related to *Myrcia warmingiana*, from which it is distinguished through its concolorous blades (versus markedly discolorous in *M. warmingiana*), up to three times longer than wide (vs. 2.6–2.8), with up to 30 lateral veins (vs. less than 20), one marginal vein (vs. two), glabrous adult blades (vs. pilose), inflorescences triflorous (vs. with 5 or more flowers) sepals to 1 mm (vs. to 2 mm) and ovary smooth (vs. longitudinally 10–ridged); it may also remind *Myrcia curtipedula*, from which it can be distinguished mostly by the erect inflorescences (versus pendulous in *M. curtipedula*) with applanate axis to 1.7 mm wide (vs. rounded, to 0.7 mm wide) with up to three flowers (vs. up to 10 flowers), the ratio of the inflorescence axis to the pedicels of the lateral flowers 10–14:1 (vs. 2–3.5:1), the obovate flower buds (vs. globose) and the ovaries densely pilose, clearly distinct from the calyx lobes (vs. glabrous or sparsely pilose, not contrasting with the calyx lobes).

Tree to 7 m. Plants glabrous except for the flowers and very young leaves. Twigs brown, terete; internodes  $20\text{--}30 \times 1\text{--}2$  mm. Leaves when young covered with simple grey trichomes to 0.1 mm, these falling entirely in adult ones; petioles  $7\text{--}10 \times 0.8\text{--}1$  mm, adaxially canaliculate, about the same color as the blades when dry; blades narrowly elliptic,



**FIGURE 5.** *Myrcia parca*—holotype. Insert: inflorescences (scale: 10 mm).

95–135 × 27–40 mm, 3.2–4 times longer than wide, concolorous or weakly discolored, then lighter abaxially, when dry; glandular dots to 10/mm<sup>2</sup>, about 0.1 mm in diameter, moderately visible on both faces; apex acuminate in 18–24 mm; base cuneate; midvein finely impressed adaxially and moderately raised abaxially; lateral veins to 30 at each side, leaving the midvein at angles about 80°, visible and moderately raised on both sides, a little more so abaxially, intermixed with secondary lateral veins sometimes about the same gauge; marginal vein 0.8–0.9 mm from the margin, the margin itself plain. Inflorescences axillary or at the apex of branches and not subtended by leaves, triflorous, the flowers at the end of an applanate axis 30–44 × 1–1.8 mm, the apical flower sessile, the lateral flowers with pedicels up to 3 × 0.6 mm; bracts not seen, deciduous before anthesis, leaving visible scars, these with about ten linear colleters to 0.3 mm; bracteoles not seen, deciduous before anthesis and leaving visible scars; flower buds obovate, 5–6.5 × 3–4 mm, the ovary densely covered with simple white, appressed trichomes to 0.1 mm, clearly distinct from the glabrous or less pilose calyx lobes, these five, slightly unequal between them, some rounded and others rounded and very minutely apiculate, 0.8–1 × 2 mm, with scattered trichomes as the ovary adaxially or on both sides; petals five, white, elliptic, 4 × 2.5–3 mm; stamens not counted, filaments to 5 mm, the anthers elliptic, to 0.6 × 0.3 mm, with one apical gland and thecae slightly displaced in distinct levels; staminal ring to 2 mm in diameter, with scattered trichomes; calyx tube to 1 mm deep, with scattered trichomes; style to 9 mm, the stigma slightly capitate and finely papillose; ovary bilocular, with two ovules per locule. Fruits unknown.

**Distribution, habitat and phenology:**—This species is presently known only from the type collection, from montane rainforests of the municipality of Viana, in the state of Espírito Santo, at about 700 m elev.; flowers were collected in January.

**Conservation:**—The municipality of Viana has an area of 312 km<sup>2</sup> from which are known 560 gatherings, with an average of 1.8 collection/km<sup>2</sup>, a moderate sampling effort. Considering this, the fact of this species being known for only one collection may be an indicative of its relative rareness; additionally, the small area of the municipality, if considered as a proxy of the species' extent of occurrence, would be also suggestive of an endangered status (IUCN 2001). Nevertheless, since no additional information on the environmental conditions of the collection site are known, it seems adequate to score this species as DD (Data Deficient) according to IUCN conservation criteria (IUCN 2001).

**Affinities:**—This species also has characters that allow to assign it to the informal “group 3” proposed by Lucas *et al.* (2011), which encompasses the species with sinuose opening of anthers formerly assigned to the Bergian genus *Gomidesia* (Berg 1855–1856: 6); *Myrcia parca* is apparently related to *Myrcia warmingiana* Kiaerskou (1893: 104; type image: P barcode 02273024), from the neighboring state of Rio de Janeiro, and can also remind *Myrcia curtipeduncula* Nic Lughadha (Nic Lughadha *et al.* 2010: 21; type image: K barcode 000331907) also collected in Espírito Santo, but is distinguished from them through the characters given in the diagnosis.

**Etymology:**—The epithet is derived from the Latin word for “sparing” or “not frequent”, alluding to the paucity of flowers of the inflorescences.

5. *Myrcia pseudosplendens* Sobral & Mazine, sp. nov. Type:—BRAZIL. Minas Gerais: mun. Santana do Paraíso, propriedade de Fernando Dantas dos Santos, 19°24'42.9" S, 42°31'43.4" W, 26 January 2011, M. Sobral 13570 (holotype RB!; isotypes BHCB!, HUFSJ!). Figures 6, 7.

This species is related to *Myrcia splendens*, from which it can be distinguished by its exfoliating bark (not exfoliating in *M. splendens*), usually wider blades (1.9–2.7 times longer than wide vs. 2.5–4 times longer than wide) and longitudinally sulcate fruits (vs. smooth) crowned by inflexed calyx lobes (vs. erect).

Tree to 8 m high, the cork pale grey and somewhat longitudinally exfoliating. Twigs brown when dry, densely covered with light brown, simple erect trichomes to 0.5 mm, the cortex peeling longitudinally and then becoming grey; internodes 20–55 × 1.5–2 mm. Leaves with petioles 2.5–4 × 1–1.5 mm, moderately sulcate adaxially, with trichomes as the twigs; blades elliptic to lanceolate, sometimes ovate-lanceolate, 67–130 × 35–47 mm, 1.9–2.7 times longer than wide, slightly discolored when dry, the adaxial face dull green and except for the midvein glabrous or sparsely covered with simple erect trichomes to 0.3 mm, the abaxial face light green and covered by trichomes as the abaxial side, these more dense along the midvein and lateral veins; apex acute to acuminate by 5–15 mm; base cuneate to rounded; glandular dots visible through light, smaller than 0.1 mm in diameter and 5 to 10/mm<sup>2</sup>; midvein impressed adaxially and strongly raised abaxially; lateral veins 13 to 20 at each side, moderately visible and sometimes slightly impressed adaxially and markedly raised abaxially, leaving the midvein at angles of 70–80°; secondary lateral veins visible mostly abaxially, with about the same gauge of the main lateral ones; marginal vein 1–2 mm from the margin, the margin itself revolute. Inflorescences axillary and terminal, paniculiform, with 15 to 30 flowers, the axis 40–70 ×



**FIGURE 6.** *Myrcia pseudosplendens*—isotype at HUFSJ (scale: 50 mm).



FIGURE 7. *Myrcia pseudosplendens*—immature fruits (from Sobral 13570).

1.5–2 mm, sometimes applanate, densely covered with simple erect trichomes to 0.3 mm, with one to three branches, these distally smaller along the axis and forming a triangular profile, respectively  $20\text{--}35 \times 0.5\text{--}0.8$  mm,  $10\text{--}20 \times 0.5$  mm and  $4\text{--}5 \times 0.5$  mm, the proximal branch sometimes with a second degree branching to  $4 \times 0.8$  mm; bracts not seen; flowers sessile; bracteoles triangular, one or two, to  $1 \times 0.5$  mm, with trichomes to 0.2 mm; flower buds obovate,  $4\text{--}5 \times 4$  mm, uniformly covered with simple erect trichomes, the ovary sometimes a little more densely so; calyx lobes five, unequal between them, widely triangular to ovate,  $1\text{--}1.5 \times 1.5\text{--}1.8$  mm, adaxially less pilose or sometimes glabrous; petals five, rounded, to  $3 \times 3$  mm, pilose abaxially; stamens about 100, filaments 4.5–5 mm, the anthers subglobose, to  $0.4 \times 0.3$  mm, opening through longitudinal slits, with one apical gland; staminal ring densely pilose, 2.5–2.8 mm in diameter; calyx tube absent; style 5–7 mm, proximally with scattered white trichomes to 0.4 mm, the stigma punctiform and sometimes with trichomes to 0.1 mm; ovary with five moderate longitudinal ridges, two locules and two ovules per locule. Fruits elliptic to oblong,  $8\text{--}10 \times 5$  mm, immature, densely covered with simple trichomes to 0.3 mm, with five longitudinal ridges, the calyx lobes persisting and inflexed at the apex, sometimes resembling that they are wanting; seed one per fruit, immature.

Distribution, habitat and phenology:—*Myrcia pseudosplendens* was collected in rainforests in the hinterland of the state of Minas Gerais, in the municipalities of Marliéria and Santana do Paraíso, at altitudes about 230 m elev.; flowers were collected in December and fruits in January.

Conservation:—This species was collected in the municipalities of Marliéria and Santana do Paraíso, in the central eastern portion of the state of Minas Gerais. Marliérea has an area of 546 km<sup>2</sup> (IBGE 2015b), and there are 5,900 collections from it (CRIA 2015), with an average of 13 collections/km<sup>2</sup>, and Santana do Paraíso has an area of 276 km<sup>2</sup> with 80 collections (IBGE 2015b, CRIA 2015), with an average of 0.2 collection/km<sup>2</sup>, showing very different collection efforts along the known range of the species. Considering this, and the lack of additional environmental information, it seems adequate to presently consider the species as Data Deficient (DD) according to the IUCN conservation criteria (IUCN 2001).

Affinities:—This species is closely similar to the widespread and very variable *Myrcia splendens* (Swartz) De Candolle (Swartz 1788: 79, as *Myrtus splendens*; De Candolle 1828: 244; type image: G barcode 00227975; for description see McVaugh 1958: 659), a species ranging from Central America to southern South America (Govaerts *et al.* 2015), from which it is distinguished through the characters given in the diagnosis, especially for the consistently longitudinally ridged fruits. In the same way as *M. splendens*, it matches most of the characters that define informal “group 5” in the phylogenetic scheme of Lucas *et al.* (2011), such as the paniculiform inflorescence, flowers with absent calyx tube (in some species short but visible) and bilocular ovary.

Etymology:—The epithet is allusive to the striking resemblance of this species with *Myrcia splendens*.

Paratypes:—BRAZIL. Minas Gerais: mun. Marliéria, Parque Estadual do Rio Doce, região do vinhático, 4 December 1997, W.P. Lopes 503 (VIC!); mun. Santana do Paraíso, propriedade de Fernando Dantas dos Santos, 19°24'42.9" S, 42°31'43.4" W, 23 December 2011, M. Sobral 14568 (BHCB!, HUFSJ!, RB!).

6. *Myrcia ubatubana* Mazine & Sobral, sp. nov. Type:—BRAZIL. São Paulo: mun. Ubatuba, Parque Estadual da Serra do Mar, -23.4339, -45.0711, 800 m, 13 April 2011, A.C.O. Souza, L.C. Bernacci & R. Belinelo s.n. (holotype IAC 53476!; isotype HUFSJ!). Figure 8.

This species is related to *Myrcia ferruginosa*, from which it is distinguished by its pauciflorous (up to nine flowers versus 20 or more in *M. ferruginosa*), less ramified inflorescences (one level of branching versus two or more) and narrower blades (to 4–5.5 times longer than wide vs. 2.5–3 times longer than wide).

Trees 11–17 m. Twigs densely covered with rufescent simple trichomes to 1 mm; internodes subterete, 35–50 × 2 mm. Leaves with petioles 4–7 × 1.2–2 mm, more or less pilose, adaxially sulcate; blades lanceolate to narrowly lanceolate, 115–170 × 21–40 mm, 4–5.5 times longer than wide, discolored when dry, dull green adaxially and yellow-brown abaxially, mostly glabrous adaxially or with trichomes along the midvein, more or less densely pilose abaxially, with rufescent appressed trichomes to 1 mm, these becoming more sparse with age but usually persisting along the midvein; glandular dots to 0.1 mm in diameter, 10 to 15/mm<sup>2</sup>, usually coinciding with the areolae, visible adaxially; apex acuminate in 15–20 mm; base widely cuneate or obtuse; midvein impressed adaxially and raised abaxially; lateral veins 40 to 50 at each side, leaving the midvein at angles 80–85°, slightly raised on both sides; marginal vein about 1 mm from the margin, sometimes a second vein 0.5 mm from the margin, the margin itself recurved. Inflorescences paniculiform, 45–50 × 1–1.2 mm, the peduncle 22–30 × 1.2 mm, with one branch to 6 mm, with about nine sessile flowers in three clusters at the tip of the branches; bracts widely triangular, to 5 × 4 mm, with rufescent trichomes to 0.5 mm abaxially; bracteoles two, concealing the flower buds, ovate or elliptic, 5 × 3–4 mm, pilose abaxially as the bracts; flower buds elliptic, to 5 × 4 mm, with calyx lobes mostly fused and hardly distinguishable, tearing at anthesis in four or five irregularly triangular pieces 1.5–2.5 × 3–3.5 mm; petals 3 to 4, rounded or obovate, glabrous, to 2.5 × 2 mm; stamens about 90, filaments 6–7 mm, the anthers elliptic, 0.4 × 0.3 mm, with one subapical gland; staminal ring 3 mm in diameter, glabrous; calyx tube 2 mm deep, glabrous; style 10 mm, glabrous, the stigma slightly capitate and minutely papillose; ovary with two locules and two ovules per locule. Fruits not seen.

Distribution, habitat, phenology:—This species is a tree from northern coastal rainforests of the state of São Paulo, being presently known only from the municipality of Ubatuba; flowers were collected in January, February and April.

Conservation:—The municipality of Ubatuba has been intensely surveyed botanically, since there are registered more than 22,300 gatherings (CRIA 2015) for an area of 723 km<sup>2</sup> (IBGE 2015b), with the elevated average of 31 collections/km<sup>2</sup>; nevertheless, the relative scarcity of collections may be an indicative of the relative rareness of *M. ubatubana*. So, in the absence of additional information, we suggest that this species be scored as DD (Data Deficient) according to IUCN criteria (IUCN 2001), irrespective of the fact that all collections known are from a protected area, what could suggest that populations of this species are devoid of environmental risks.

Affinities:—*Myrcia ubatubana* is apparently related to *Myrcia ferruginosa* Mazine (Mazine *et al.* 2014: 98; replacement name for *Marlierea silvatica* (O.Berg) Kiaerskou [Berg 1855–1856: 81; Kiaerskou 1893: 51; type image: K barcode 000330563]; for description see Legrand & Klein 1971, under this name), from which it is distinguished through the characters given in the diagnosis. The partially closed calyx tearing irregularly at anthesis and the bilocular ovaries of this species suggest its inclusion in the informal “group 2” of the phylogenetic scheme of *Myrcia* s.l. proposed by Lucas *et al.* (2011), which comprises some species formerly included in the genus *Marlierea* Cambessèdes (1832–1833: 373).



**FIGURE 8.** *Myrcia ubatubana*—isotype at HUFSJ. Insert: inflorescences (scale: 10 mm).

Paratypes:—BRAZIL. São Paulo: mun. Ubatuba, Estação Experimental de Ubatuba—IAC, 31 January 1980, G.J. Shepherd, J.Y. Tamashiro & A.F. Silva (IAC 21209!, UEC); idem, Parque Estadual da Serra do Mar, Núcleo Picinguaba / Instituto Agronômico de Campinas, trilha do Poção, (SAD69, zona 23), 16 February 2005, N.M. Ivanauskas, F.M. Souza, R. Cielo Filho, C.O. Araújo, D. Souza & Sr. Rosendo 6017 (RB!, SPSF); idem, Parque Estadual Serra do Mar, -23.4339, -45.0711, 800 m, 13 April 2011, A.C.O. Souza, L.C. Bernacci & R. Belinelo s.n., (IAC 53477!; HUFSJ!); idem, 22 February 2011, A.C.O. Souza, L.C. Bernacci & R. Belinelo s.n. (IAC 53475!; HUFSJ!); idem, 14 April 2011, A.C.O. Souza, L.C. Bernacci & R. Belinelo s.n. (IAC 53478!; HUFSJ!).

7. *Myrcia venosissima* Sobral & P.L.Viana, sp. nov. Type:—BRAZIL. Minas Gerais: mun. Felício dos Santos, APA Felício, trilha para a cachoeira do Sumidouro, 18°13'00"S, 43°15'00"W, 20 May 2007, P.L. Viana, M. Sobral, K. Antunes & H. Bispo 5201 (holotype RB!, isotypes BHCB!, HUFSJ!). Figure 9.

This species is related to *Myrcia almasensis*, from which it is distinguished by its habit (a shrub to 0.5 m vs. up to 5 m in *M. almasensis*), its inflorescences with shorter peduncles (to 3 mm vs. up to 10 mm), with 1 to 3 flowers (vs. up to 10 flowers), and its flowers with longer bracteoles (to 5 mm vs. up to 2 mm), longer calyx lobes (to 5 mm vs. to 2 mm) and longer styles (to 7 mm vs. to 1 mm).

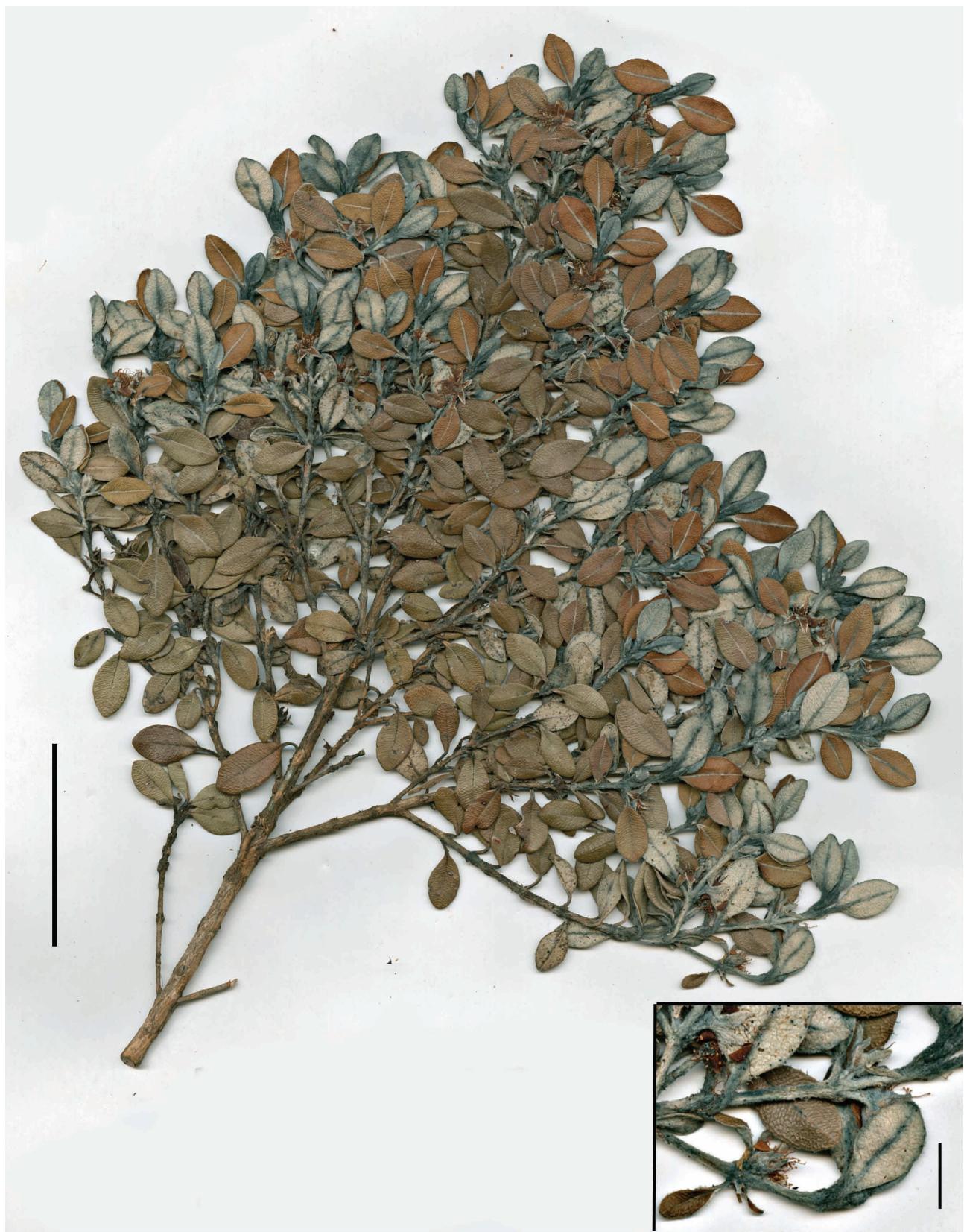
Shrub to 0.5 m. Twigs densely covered with white or grey more or less appressed trichomes to 1 mm, falling with age and then the bark brown or grey, rugose; internodes 6–8 × 1–1.5 mm. Leaves with petioles 3–4.5 × 0.6–0.8 mm, canaliculate; young leaves with white trichomes to 0.2 mm, these falling with age; blades elliptic, 13–21 × 8–11 mm, 1.6–2 times longer than wide, strongly discolored when young, the adaxial side brown or green except for the midvein, which is covered by dense white trichomes to 0.2 mm, the abaxial side white or grey, covered by a dense floccose indumentum, with trichomes to 1 mm; adult leaves with adaxial side mostly glabrous and sometimes shining, occasionally with scattered trichomes along the midvein, and abaxial side with densely appressed trichomes to 0.1 mm; glandular dots visible mostly on the adaxial side, to 0.1 mm in diameter and 7 to 10/mm<sup>2</sup>; apex widely acute to rounded; base cuneate; midvein impressed adaxially and raised abaxially; secondary veins 12 to 15 at each side, straight, leaving the midvein at angles about 70°, visible and sometimes clearly prominent on both sides; marginal vein 0.5–0.6 mm from the margin, the margin itself revolute and with a yellow or brown ridge about 0.1 mm thick. Flowers axillary, sessile or with pedicels to 2 × 1 mm, solitary or up to three crowded at the apex of axillary peduncles 2–3 × 1–1.5 mm; bracts narrowly triangular, to 5.5 × 2 mm, apparently persisting at anthesis, adaxially glabrous and abaxially covered with trichomes to 0.2 mm; bracteoles narrowly triangular, to 5 × 1.2 mm, pilose as the bracts and apparently also persisting after anthesis, with up to four linear white colleters to 0.2 × 0.02 mm at the base of the adaxial side; flower buds elliptic, 4–5 × 3–3.5 mm, densely covered with white or grey trichomes to 0.2 mm; calyx lobes five, more or less equal between them, narrowly triangular, 3.5–5 × 2–2.5 mm, adaxially glabrous and abaxially with trichomes to 0.2 mm; petals white, elliptic, concave, 4 × 2.5–3 mm, glabrous; stamens about 120, filaments 4–6 mm, anthers elliptic, to 0.4 × 0.2 mm, eglandular; staminal ring to 3 mm wide, with scattered trichomes to 0.2 mm; calyx tube 0.5 mm deep; style 6–7 mm, glabrous, the stigma punctiform and minutely papillose; ovary with three locules and two ovules per locule. Fruits not seen.

Distribution, habitat and phenology:—This species is presently known only from the municipality of Felício dos Santos, in the central portion of the state of Minas Gerais, where it grows in rocky fields along the Espinhaço Range, at altitudes about 1,300 m elev.; flowers were collected in June.

Conservation status:—This species is presently known from two gatherings from Felício dos Santos, a municipality with 358 km<sup>2</sup> (IBGE 2015b). Considering that this area is scarcely surveyed—there are presently only 314 collections from there (CRIA 2015), with an average of 0.9 collection/km<sup>2</sup>—and there is no additional information about the distribution of this species, it seems adequate to score it as DD (Data Deficient) according to IUCN criteria (IUCN 2001).

Affinities:—*Myrcia venosissima* is apparently related to the Bahian endemic *M. almasensis* Nic Lughadha (1994: 323; type image: K barcode 000332041), with which it shares the markedly reticulate leaves and ovaries with three locules, but is distinguished by the characters given in the diagnosis. This species probably matches those of informal “group 6” in the phylogenetic scheme of Lucas *et al.* (2011) due to its trilocular ovary; nevertheless, a very characteristic feature of this group, that is the presence of nearly one gland per areole in the blades, was not observed in *M. venosissima*.

Etymology:—The epithet means “very venose” in Latin, alluding to the dense venation of the leaves of the species.



**FIGURE 9.** *Myrcia venosissima*—unmounted holotype (scale: 50 mm). Insert: detail of inflorescences (scale: 10 mm).

Paratype:—BRAZIL. Minas Gerais: mun. Felício dos Santos, APA Felício—Cachoeira do Sumidouro, 18°13'00" S, 43°15'00" W, 10 Jun. 2006, P.L. Viana, F.S.F. Leite, L.E. Lopes & M. Ferreira 2515 (BHCB!).

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