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A new species of *Meriania* of the Brachycera group (Melastomataceae: Meranieae) with dimorphic stamens

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Abstract

Meriania juan-canoi, a new species endemic to the northern Andes in Colombia is described and illustrated. This new species belongs to the Brachycera group and can be distinguished from the other species by its apically rounded calyptra, completely free ovary and dimorphic stamens. The description of this new species from a relatively well collected area near a major road in southeastern of Medellín, Colombia, confirms our lack of knowledge on the vegetation of several Neotropical regions. Due to the intense agricultural activity in the area where this species grows and the small area where it occurs, we recommend a conservation classification of Critical Risk (CR).

Keywords: Andes, Colombia, dimorphic stamens, Myrtales

Introduction

Meriania Swartz (1798: 823), has almost 118 exclusively Neotropical species ranging from the Antilles and southern México to southeastern Brazil (Wurdack 1980). In Colombia there are 51 species of *Meriania*, 12 of them present in Antioquia (Almeda *et al.* 2016). The Brachycera group comprises most of the species previously included in the genus *Centronia* Don (1823: 284) (Mendoza-Cifuentes & Fernández-Alonso 2012). This set of species is mainly recognized by the presence of a calyptra, petals that change color as the flower matures and generally isomorphic stamens [dimorphic in *M. selvaflorensis* Mendoza (2011: 249) and *M. barbosa* Mendoza, Alvear & Almeda (2014: 24)] with a dorsal connective appendage (Mendoza-Cifuentes 2011, Mendoza-Cifuentes & Fernández-Alonso 2012). This group is exclusive to the northern Andes, occurring from northern Perú to the Mérida Cordillera in Venezuela between 1300 and 3700 m a.s.l., with all species present in Colombia (Mendoza-Cifuentes & Fernández-Alonso 2012). In the present paper a new species of *Meriania* from the high mountain of eastern Antioquia is described, which constitutes the third species with dimorphic stamens belonging to the Brachycera group of *Meriania*.

Materials and methods

During explorations carried out in the municipality of La Unión, Antioquia, reproductive material of the new species was collected. In order to confirm their identity and taxonomic affinities, relevant literature on *Meriania* was reviewed (Almeda *et al.* 2016, Mendoza-Cifuentes & Fernández-Alonso 2012, Mendoza-Cifuentes 2011, Wurdack 1980). Afterward, several herbariums in Colombia were reviewed and three fertile collections were found in the HUA, JAUM and MEDEL herbaria. To elaborate the morphological description, measurements of the vegetative parts and the inflorescence were taken from herbarium material using a digital caliper of 0.1 mm precision. Photographs of the floral parts were taken from fresh material preserved in 70% ethanol, and subsequently measured with the Fiji software (Schindelin *et al.* 2012). The description of the indument was made following the atlas of hairs for Melastomataceae

(Wurdack 1986). The conservation status was assessed using georeferenced data from available collections using IUCN guidelines and criteria (IUCN 2017). The online geospatial conservation assessment tool (GeoCat) was used to calculate extent of occurrence (EOO) and area of occupancy (AOO) with a user-defined cell width of 2 km (Bachman et al. 2011).

Results

Meriania juan-canoi Posada-Herrera, Idárraga & Alzate *sp. nov.* (Figs. 1–3).

Type:—COLOMBIA. Antioquia, Municipality of La Unión: Mesopotamia, locality El Cardal, 05°53'30" N, 75°18'35" W, 2450 m, 28 June 2018 (fl, fr), J. S. Murillo Á. Idárraga, F. Alzate, J. Cano & A. Arcila, 103 (holotype HUA!; isotypes COL, FMB).

Diagnosis: *Meriania juan-canoi* is characterized by the slightly anisophyllous leaves with rounded or cordate base, suprabasal nerves and conic densely roughened trichomes, dimorphic stamens, antesealous stamens with the connective appendage with a bifid apex, an apically rounded calyptra that opens irregularly and the ovary completely free from the hypanthium.

Tree 4–5 m tall, highly branched and tree crown with dense foliage, distal quadrangular internodes 4–9 cm long. Indument consisting of conic densely roughened trichomes, these brownish on petioles, veins on the abaxial leaf surface, axes of the inflorescences and hypanthium and reddish on the flower buds and younger parts. Leaves at the same node slightly anisophyllous. Petioles terete, 2–4.2 cm long, ca. 1.5 mm diam. Leaf blade rigid and brittle, 6.5–19.2 × 3–11.5 cm, elliptic to broadly elliptic; apex acuminate; base obtuse, occasionally slightly cordate; margin revolute and slightly crenate; with two pairs of suprabasal veins following the midvein, the first pair closest to the middle vein 3–6.7 mm above the base, and 25–40 tertiary veins perpendicular to the middle vein, 2.5–6.5 mm apart along the midrib; dense pubescence in upper surface of young leaves, and glabrous in adults leaves, the trichomes dimorphic, most of them conic, roughened, brown, and also with hyaline sessile glandular trichomes on the abaxial surface of the veins. Inflorescence a terminal dichasial cyme, widely branched, 15–25 cm long, with 28–36 flowers; 2–4 branching nodes in the central axis, quadrangular internodes when dry, inflorescence sessile or with a peduncle 4.5–6.5 cm long; flattened branchlets; basal paraclades 5–15 cm long, with 1–2 branching levels; dichasial branches. Bracts foliaceous, narrowly ovate, apex acuminate or sometimes obtuse, the basal ones 8–10 × 2.5–3.5 cm, the distal ones 5.5–1.4 cm. Bracteoles deciduous, linear 6–7 mm long. Flowers 5-merous, diplostemonous. Pedicel with the same pubescence of the branches, 0.7–1.7 cm long. Hypanthium campanulate, 1–1.1 × 1.2–1.6 cm; walls 1.1–1.4 mm thick. Calyptra crustaceous when dry, 0.7–1.3 cm long before anthesis, opening irregularly into three or five lobes, rounded apically; external calycine triangular teeth at the base of the calyptra 3–3.9 mm long. Petals obovate, margin entire, 2.8–3 × 2.1–2.6 cm long, glabrous, magenta and light pink in senescence. Stamens 10, dimorphic, arranged on the lower side of the flower, the antepetalous whorl with longer anthers. Antesealous stamens: filaments ca. 1.7 cm long, ca. 2.0 mm wide near the base and ca. 1 mm wide near the apex, pink, ascendant elbow or filament apex/base of the connective, 0.7 × 0.4 mm, slightly mucronate, white; connective dorsal appendage parallel to the anther, bifid, ca. 2.1 × 1 mm, white with a purple apex; anthers straight, subulate, ca. 1.1 cm long, purple, pore ca. 0.3 × 0.3 mm, dorsally inclined; pedoconnective absent. Antepetalous stamens: filaments 2.3 cm long, ca. 2.0 mm wide near the base and ca. 1 mm wide near the apex, pink, ascendant elbow or filament apex/base of the connective ca. 1.2 × 0.7 mm, subulate, white; connective dorsal, appendage subulate and ca. 4 × 1 mm, white with a purple apex; anther 1.4–1.5 cm long; pore 0.5 × 0.4 mm, dorsally inclined, purple; pedoconnective 1.3 mm long. Ovary completely superior, 6.5–6.7 × 6.3–6.4 mm, ovoid, with 5–6 ribs in cross section, slightly raised in the middle; apex with protruding broad and dull lobes, ca. 1.9 mm long; carpels 5; placenta ovate, 2.1–2.2 × 0.7–0.8 mm. Style columnar-conical, ca. 1.8 cm long, base ca. 3–4 mm diam, curved towards the apex, 1.8–1.9 mm diam, fuchsia. Stigma slightly expanded, ca. 1.6 mm diam, papillose. Fruits a spherical capsule, exposed by a deciduous hypanthium. Seeds linear with an elongated apex, 1.3–1.7 × 0.2–0.3 mm; hilum well-defined and a little darker than the testa.

Phenology:—Specimens in flowers have been collected during March and November and with flowers and fruits during June.

Etymology:—The new species is dedicated to Juan Cano, a Colombian agronomist and enthusiastic naturalist who has devoted great efforts to know and reproduce many of the species of the Andean forests, including this taxon.

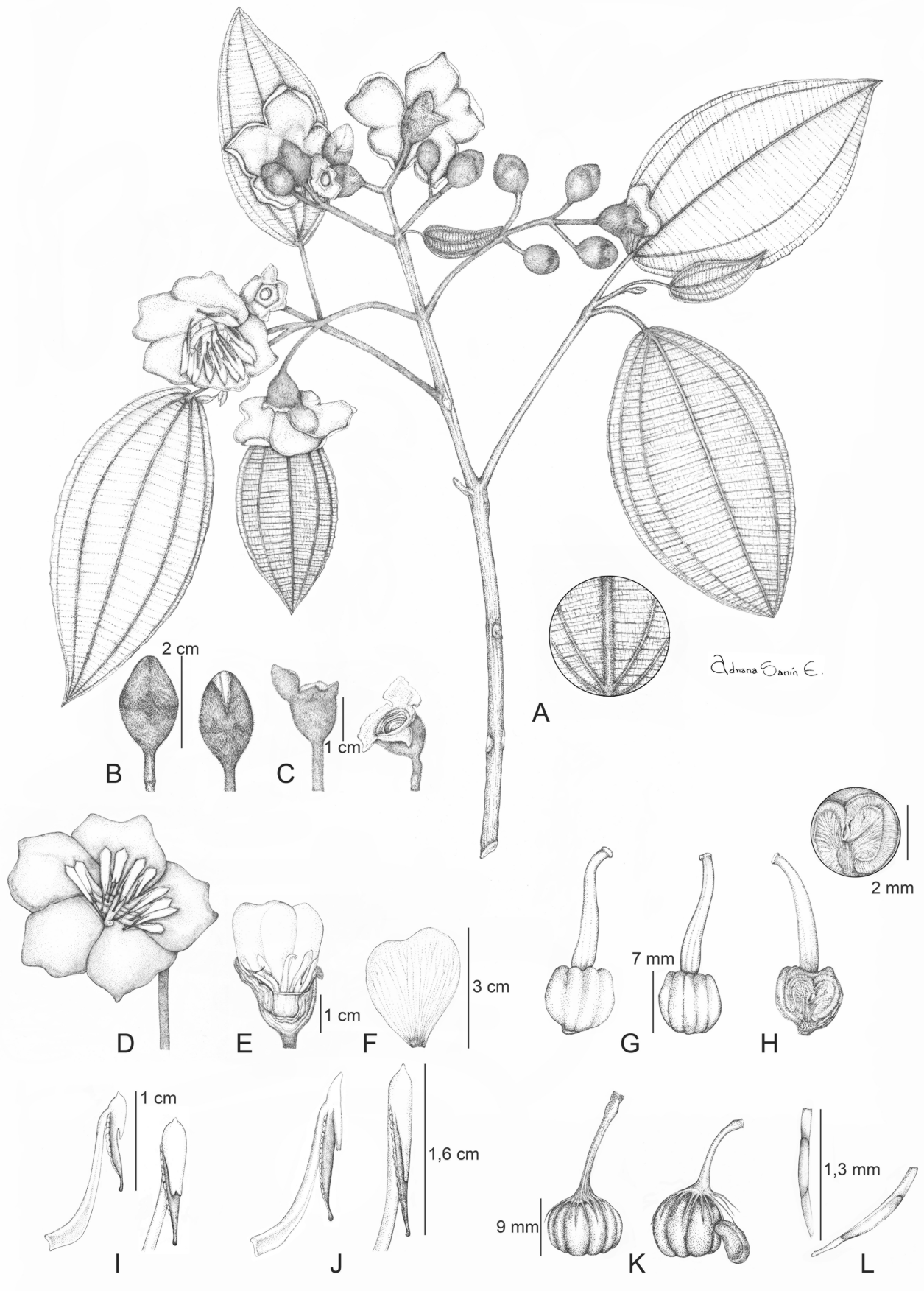


FIGURE 1. *Meriania juan-canoi*. **A.** Terminal branch with inflorescence. **B.** Flower buds. **C.** Calytra opening irregularly. **D.** Flower at anthesis. **E.** Longitudinal section of the flower. **F.** Petal. **G.** Ovary. **H.** Longitudinal section of the ovary. **I.** Antesepalous stamens. **J.** Antepetalous stamens. **K.** Fruits. **L.** Seeds. All drawn from the holotype.

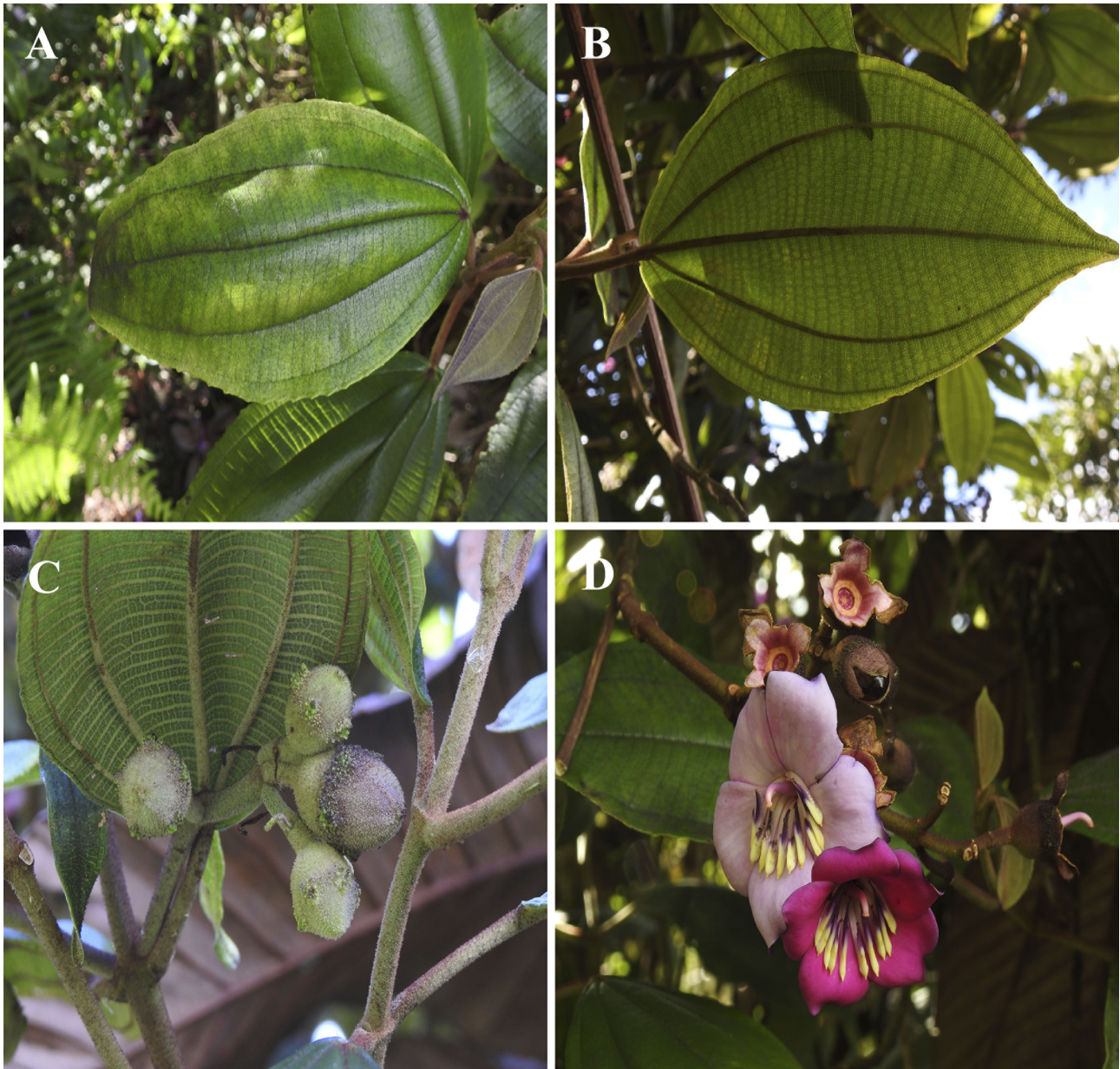


FIGURE 2. *Meriania juan-canoi*. **A.** Adaxial surface of the leaf. **B.** Abaxial surface of the leaf. **C.** Flower buds. **D.** Flowers and calypters. All from *J. S. Murillo et al. 103*.

Habitat and distribution:—*Meriania juan-canoi* is endemic from Colombia where it is known only from two localities. The few individuals found for this species have been recorded in the northern part of the Central Cordillera of Colombia, on the plateau east of Antioquia. This species occurs in Andean forests at elevation between 2176 and 2500 m. The two places where collections come from corresponds to highly converted areas with intense agricultural and livestock activity. However, the plants usually grow on the edges of small basins where agricultural activities cannot be carried out, which has favored their persistence.

Conservation status:—*Meriania juan-canoi* has an extension area (EEO) of 0 km² and an occupation area (AOO) of 8 km². Due to the intense agricultural activity in the area where this species grows and the small area where it occurs, we recommend a conservation classification of Critical Risk (CR): B1, B2ab (i, ii, iii, iv).

Additional specimens examined (paratypes):—COLOMBIA. **Antioquia.** Municipality of La Unión, near to Mesopotamia, 2500 m, *March 2011* (fl), *J. Cano 2* (MEDEL!), Mesopotamia, locality El Cardal, 05°53'30" N, 75°18'35" W, 2450 m, *28 June 2018* (fl), *Á. Idárraga, F. Alzate, J. Cano, S. Murillo & A. Arcila 6642* (HUA!, JAUM!); Municipality of Sonsón, locality La Aguada, 5°42'36" N, 75°13'05" W, 2176 m, *12 November 1997* (fl), *A. Cogollo, H. Rincon, A. Duque, J. Giraldo & W. Giraldo 11466* (JAUM!).

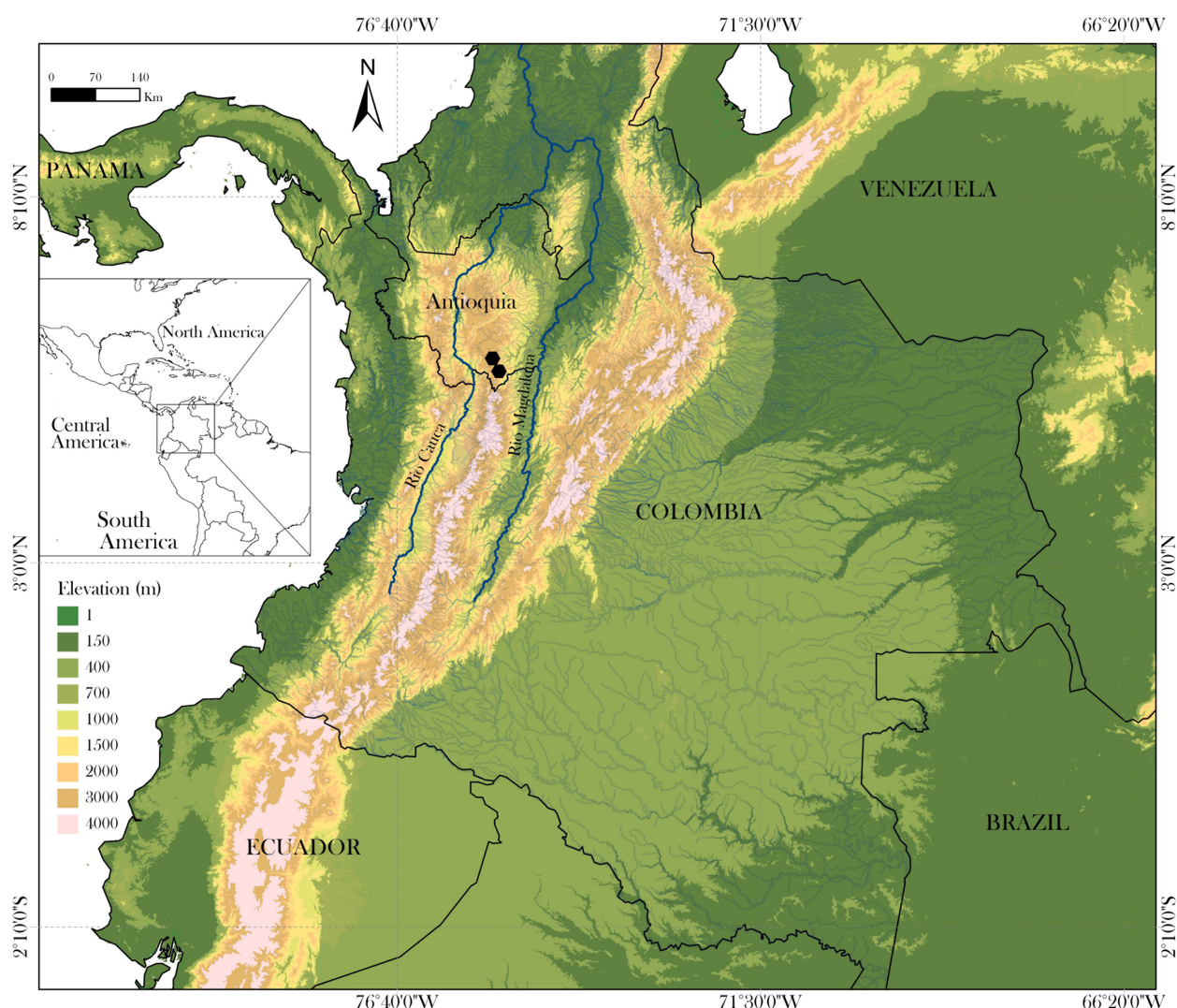


FIGURE 3. Geographic distribution of *Meriania juan-canoi*.

Discussion

The new species is included in the genus *Meriania* based on floral characteristics such as large magenta petals, stamens with a subulate basal appendage of the connective, straight anthers with a dorsally oriented pore and superior ovary. Within this genus, *M. juan-canoi* belongs to the Brachycera group due to the presence of ferruginous trichomes, petals that change color in senescence, anther connectives with ascending appendages and a calyptrate calyx. It is similar to *M. mutabilis* (Gleason 1925: 52) Mendoza & Fernández-Alonso (2012: 280), due to the leaves with rounded or cordate bases, suprabastral nerves and conic densely roughened trichomes, but differs by having slightly crenate leaf margins, an irregularly opening calyptra, dimorphic stamens, and a completely free ovary with a protruding broad apex, with dull lobes. It is also similar to *M. selvaflourensensis* Mendoza (2011: 249) owing to the magenta petals and dimorphic stamens but differs by the arboreal habit the leaves with suprabastral nerves and flower calyptras with an obtuse apex and opening irregularly. It is also similar to *M. barbosa* Mendoza, Alvear & Almeda (2014: 24), but differs by its suprabastral nerves, non subpeltate base, filament apex/base of the connective subulate on the antepetalous and slightly mucronate on the antesealous stamens, antesealous stamens with a bifid connective appendage and complete free ovary (Table 1).

Performing more detailed explorations in areas nearby the occurrence of the new species may lead to the location of other populations and individuals of this species. These explorations would be favored nowadays by the new post-conflict conditions in Colombia.

TABLE 1. Comparison of characters for the species with dimorphic stamens in the Brachycera group: *Meriania juan-canoi*, *M. barbosa* and *M. selvaflorensis*.

Character	Species		
	<i>Meriania juan-canoi</i>	<i>Meriania barbosa</i>	<i>Meriania selvaflorensis</i>
Habit	Tree	Tree	Liana
Leaf base	Obtuse, occasionally slightly cordate	Subpeltate or rounded to slightly cordate	Rounded
Leaf apex	Acuminate	Blunt-acuminate	Strongly acuminate
Margin	Revolvate and slightly crenate	Entire	Entire
Nerves	Suprabasal	Basal	Basal
Calyptra	Opening by irregular fissures	Opening by irregular fissures	Circumsessile
Antepetalous filament apex/base of the connective	Subulate	Triangular	Subulate
Antepetalous connective appendage	Subulate	Subulate	Subulate
Antesepalous filament apex/base of the connective	Slightly mucronate	Widely triangular	Subulate
Antesepalous connective appendage	Bifid	Subulate	Obtuse
Ovary	Free	Basally fused to the hypanthium	Free

Acknowledgments

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