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ORCID
AFAV: 0000-0001-9634-0365
MJRR: 0000-0002-0526-7818
RR: 0000-0003-1090-7557

Microlicia geraizeira (Melastomataceae, Lavoisiereae): A newly discovered species from northern Minas Gerais, Brazil

Ana Flávia Alves Versiane[1,*], Maria José Reis Da Rocha[2], Rosana Romero[3]

[1] *Instituto de Pesquisas Jardim Botânico do Rio de Janeiro, Rua Pacheco Leão, 915, Rio de Janeiro, RJ, Brazil*
[2] *Universidade do Estado de Minas Gerais, Departamento de Ciências Biológicas, Avenida São Paulo 3996, 32400-000, Ibirité, MG, Brasil*
[3] *Instituto de Biologia, Universidade Federal de Uberlândia, Rua Ceará s.n., 38400-902, Uberlândia, Minas Gerais, Brazil*
*Corresponding author. Email: anaflaviaversiane@gmail.com

Abstract. One-third of Brazilian melastomes occur in Minas Gerais, the most floristically diverse state in the country. In this paper, we introduce *Microlicia geraizeira*, a new species of Melastomataceae exclusively collected in the Serra Nova e Talhado State Park, northern Minas Gerais. The new species has leaves, hypanthia, and sepals densely covered with spherical glands mixed with glandular trichomes, elliptic-lanceolate to oblong-lanceolate leaf blades, urceolate hypanthia, triangular to narrowly triangular sepals, pentamerous flowers, dimorphic and concolor androecium, tetrasporangiate anthers, and five locular ovaries. We compare *M. geraizeira* to *M. gentianoides*, *M. indurata*, *M. macrantha*, *M. mellobarretoi*, *M. pilosa*, and *M. septentrionalis*. Also, we provide an illustration plate, field images, an occurrence map, and an identification key for closely similar species.

Keywords: *Campo rupestre*, conservation area, endemism, Espinhaço Range, Gerais.

INTRODUCTION

Brazil has the highest Melastomataceae Juss. diversity in the world, with approximately 1,500 species (Ulloa Ulloa 2022; Goldenberg et al. 2024). Minas Gerais is the most plant-diverse state in Brazil, housing 14,786 species of angiosperm (Flora & Funga do Brasil 2024) and is home to one-third of the Brazilian melastomes (Goldenberg et al. 2024). Among the neotropical melastomes, *Microlicia* D.Don is the second largest genus, with nearly 300 species (Versiane et al. 2021; Pacifico and Almeda 2022), mainly occurring in grasslands and *campo rupestre* areas of Minas Gerais (Pacifico et al. 2020).

This unique diversity in Minas Gerais results from the state's distinctive landscapes and environments directly influenced by its topography and soil characteristics (Drummond et al. 2009). The state hosts more than 300

conservation units managed by government authorities (MMA 2024), which are crucial to preserving and safeguarding its biodiversity. One such conservation unit is the Serra Nova and Talhado State Park (SNTSP), created in 2008 and located at the extreme north of the Espinhaço Range (IEF 2024). The park represents an ecotone of the Caatinga and Cerrado domains with enclaves of the Atlantic Forest, and its vegetation includes *campo limpo*, *campo rupestre*, *cerrado*, *floresta estacional semidecidual*, and *floresta estacional decidual* (IEF 2024). It encompasses part of the municipalities of Rio Pardo de Minas, Serranópolis de Minas, Mato Verde, Porteirinha, and Riacho dos Machados (IEF 2024).

The northern region of the Espinhaço Range in Minas Gerais remains botanically underexplored, especially compared to other areas such as the Diamantina Plateau, Serra do Cipó, and the Iron Quadrangle. During our studies of Melastomataceae in this region, we discovered a new species of *Microlicia* from the SNTSP. This species has been identified as *Microlicia gentianoides* (DC.) Versiane & R.Romero (see Martins and Almeda 2017, as *Lavoisiera gentianoides* DC.), however, careful analysis revealed it to be an undescribed species. Here, we provide a morphological description, an illustration plate, field images, an occurrence map, and comparisons with its morphological relatives.

MATERIAL AND METHODS

This study was based on morphological examination of *Microlicia* specimens deposited at BHCB, CESJ, HUFU, RB, NY, M, MCCA, MBM, and UPCB herbaria (Thiers 2024) and online specimen images on Reflora Virtual Herbarium (2024), speciesLink (2024), and JSTOR Global Plants (2024). The morphological terminology follows Radford et al. (1986), and the trichome descriptions follow Versiane and Romero (2022). The occurrence map was prepared using QGIS software version 3.28.2-A Coruña (QGIS, 2022). The extent of occurrence (EOO) and area of occupancy (AOO) were calculated using the GeoCAT tool (Bachmann et al. 2011) to access the preliminary conservation status (IUCN 2022).

TAXONOMIC TREATMENT

Microlicia geraizeira Versiane & R.Romero, **sp. nov.** (Figures 1, 2).

Type: Brazil, Minas Gerais, Serranópolis, Parque Estadual Serra Nova, cachoeira Sete Quedas, cânion do Talhado, 15°48'40"S, 42°46'23"W, 895 m, 03 Apr 2022 (fl.), *M. Verdi et al.* 8683 (holotype RB; isotypes HUFU, NY).

Diagnosis

Microlicia geraizeira is morphologically similar to *M. gentianoides* but easily recognized by its leaves densely covered with spherical glands mixed with glandular trichomes (vs. glabrous or only margins sparsely setose in *M. gentianoides*), hypanthia entirely covered with spherical glands mixed with glandular trichomes (vs. glabrous at the base and with setose or glandular trichomes at the apices or upper half, rarely entirely glabrous).

Description

Shrubs, 1–4 m tall, erect, branched, slender, and dichotomous. Younger and older branches terete, not winged, brownish when dry, densely covered with glandular trichomes mixed with spherical glands, trichomes 0.2–0.4 mm long, leafy only at the ends of branches; nodes with conspicuous semi-circular horizontal scars; internodes 3–12 mm long, corky, with knobby thickenings that persist where a leaf has fallen away, covered with spherical glands mixed with glandular trichomes. Leaves horizontal to slightly ascending, imbricate, semi-amplexicaul, concolor, green-yellowish when dry, sessile; blades 22–60 × 7–19 mm, chartaceous, elliptic-lanceolate to oblong-lanceolate, apices acute, bases slightly rounded to attenuate, margins entire, flat, not callose, sometimes slightly hyaline, covered with glandular trichomes; both surfaces densely covered with glandular trichomes mixed with spherical glands, trichomes 0.3–0.6 mm long; 7–9-veined, primary and secondary veins visible on the abaxial surfaces, secondary veins inconspicuous at the apices, tertiary veins absent. Flowers aggregated at the branch apices, 5-merous, sessile; hypanthia 8–12 × ca. 4 mm, urceolate, constricted distally above the ovary, not costate, green-yellowish when dry, densely covered with glandular trichomes 0.4–0.6 mm long; calyx tubes ca. 0.5 mm long; sepals 4–12 × 1–2 mm, triangular to narrowly triangular, apices acute, with a terminal glandular trichome ca. 0.5 mm long, green-yellowish when dry, both surfaces densely covered with glandular trichomes; petals 18–24 × 8–15 mm, white to rarely light pink with conspicuous translucent venation, oblong, apices rounded, acute or retuse, with a glandular trichome up to 0.5 mm long, margins entire, glabrous; androecium dimorphic, concolored, stamens 10, anthers tetrasporangiate; antesepalous stamens 5, larger, filaments 9–10 mm long, yellow, anthers ca. 7.5 mm long (including beaks), oblong, yellow, beaks 1 mm long, yellow, pedoconnectives 3.7–5.8 mm long,

Figure 1. *Microlicia geraizeira* Versiane & R.Romero. A. Branches. B. Detailed branch glandular trichomes. C. Adaxial leaf surface. D. Detailed glandular trichomes on adaxial leaf surface E. Abaxial leaf surface. F. Detailed glandular trichomes on abaxial leaf surface. G. Flower. H. Hypanthium and sepals. I. Detailed hypanthium glandular trichomes. J. Petal. K. Smaller stamen (antepetalous) on the left, larger stamen (antesepalous) on the right. L. Ovary and style. M. Ovary cross-section showing five locules. N. Old capsules with disintegrating hypanthium and persisting vascular strands. O. Seed. (Drawn by Klei Sousa from *Verdi et al. 8683*).

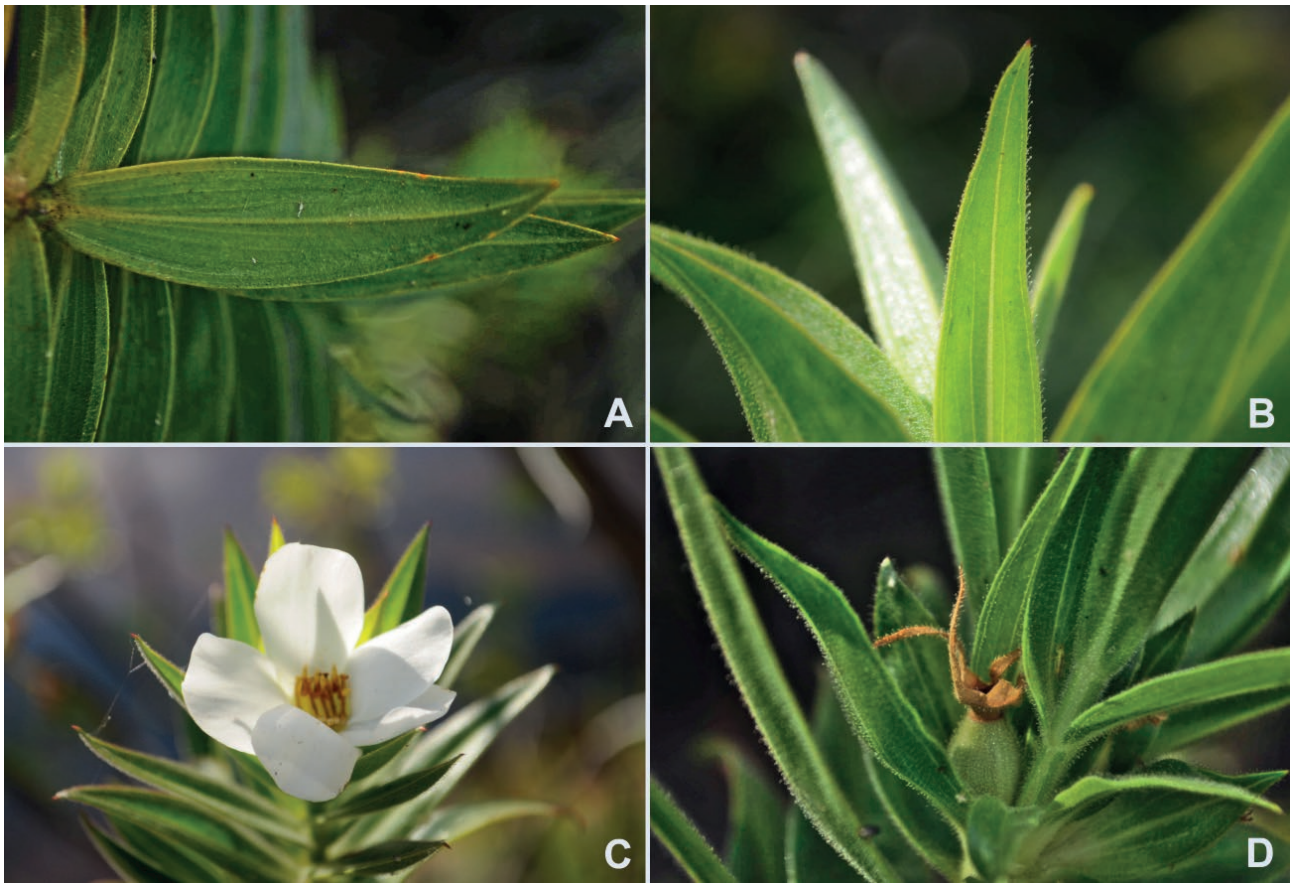

Figure 2. *Microlicia geraizeira* Versiane & R.Romero. A-B. Leaf blades. C. Flower. D. Immature fruit. Photos by Pablo B. Meyer (voucher *P.B. Meyer 3739*).

yellow, ventral appendages 0.8–1.7 mm long, yellow, apices slightly bilobed; antepetalous stamens 5, smaller, filaments 7–8 mm long, yellow, anthers ca. 5.5 mm long (including beaks), yellow, beaks ca. 0.6 mm long, yellow, pedoconnectives 1.7–2 mm long, yellow, ventral appendages 0.3–0.8 mm long, yellow, apices rounded or slightly bilobed; ovaries 6–7 × 2.7–4 mm, 5-locular, globose, superior, glabrous; styles 9–10 mm long, cream, straight or slightly curved, stigmas punctiform. Capsules 7–10 × 4–4.5 mm, oblong, brownish, entirely covered by the hypanthia, dehiscence acropetal, vascular strands persisting after capsule walls have fallen away, columellas deciduous. Seeds ca. 0.9 × 0.4 mm, testa foveolate, slightly curved to one side.

Etymology

The specific epithet honors the *geraizeiros*, traditional communities (see Decree nº 8.750/2016) inhabiting northern Minas Gerais, where this new species is endemic. The term comes from the region known as *Gerais,* which is in the transitional zone between the Cerrado and Caatinga biomes (Dayrell 1998). The *geraizeiros* have long fought to protect the *Gerais*' biodiversity, but since the 1970s, it has been severely threatened by *Eucalyptus* sp. monocultures, mining, and cattle ranching (Dayrell 1998; Nogueira 2009; Magalhães and Amorim 2015).

Distribution, habitat & phenology

Microlicia geraizeira occurs in humid areas in the SNTSP, northern Minas Gerais (Fig. 3). It was collected with flowers and fruits in March, April, and October, only with fruits in December.

Assessment of conservation status

Microlicia geraizeira has a restricted Area of Occupancy (AOO = 16 km²), an Extent of Occurrence (EOO = 30 km²), and a population of few individuals. However, since it occurs exclusively within a protected area, ensuring its preservation, we consider this species as

Least Concern (LC) (see IUCN 2012). We emphasize the importance of maintaining conservation units and creating new ones to protect and conserve our rich, sometimes rare, biodiversity.

Comments and affinities

Microlicia geraizeira is morphologically similar to *M. gentianoides*, *M. indurata* Almeda & R.B.Pacifico, *M. macranta* Versiane & R.Romero, *M. mellobarretoi* (Markgr.) Versiane & R.Romero, *M. pilosa* Versiane & R.Romero, and *M. septentrionalis* Almeda & R.Pacifico. Except for *M. gentianoides*, which occurs in Minas Gerais and Bahia states, *Microlicia macrantha* in Distrito Federal, Goiás, Minas Gerais, and São Paulo, and *M. indurata* endemic to Goiás, all remaining species are restricted to Minas Gerais (see Martins and Almeda 2017; Almeda et al. 2023) (Fig. 3).

Microlicia geraizeira has been identified as *M. gentianoides* probably due to both species having sessile and semi-amplexicaul leaves, elliptic-lanceolate to oblong-lanceolate leaf blades with acute apices, pentamerous flowers with white petals, triangular sepals, yellow stamens, and fruits with acropetal dehiscence. Nevertheless, *M. geraizeira* is distinguished in having leaves green-yellowish when dry (vs. brown in *M. gentianoides*), both leaf surfaces densely and entirely covered with trichomes (vs. glabrous adaxial surfaces or sparsely setose only at the margins, glabrous or inconspicuously punctate abaxial surfaces), hypanthia and sepals entirely covered with glandular trichomes mixed with spherical glands (vs. glabrous at the apices and bases, or with glandular trichomes below the constricted neck or the upper half, rarely totally glabrous). Apart from the type collection (*Martius 1375*) and the specimens *Pohl s.n.* and *1288* made in Minas Gerais, all recent records of *M. gentianoides* are from Abaíra and Rio de Contas in the Chapada Diamantina, Bahia (Martins and Almeda 2017) (Fig. 3).

Microlicia geraizeira and *M. macrantha* have sessile and large leaves (20–60 mm long), flowers aggregated at the apex of branches, androecium dimorphic with yellow stamens, and fruits with vascular strands persisting after capsule dehiscence. However, *M. geraizeira* differs by its leaves covered with glandular trichomes mixed with spherical glands (vs. glabrous adaxial surface and covered with spherical glands on abaxial surface in *M. macrantha*), pentamerous flowers (vs. hexamerous), cylindric-tubulose hypanthia (vs. cylindric-oblong and suburceolate), triangular to narrowly triangular sepals (vs. subulate to triangular), five locular ovaries (vs. six).

Microlicia geraizeira and *M. indurata* have branches, leaves, hypanthia, and sepals covered with glandular trichomes and spherical glands, elliptic-lanceolate leaf blades, sessile and chartaceous leaves, white petals, and yellow stamens. But *M. geraizeira* differs by its pentamerous flowers (vs. hexamerous in *M. indurata*), cylindric-tubulose hypanthia (vs. campanulate), triangular to narrowly triangular sepals (vs. oblong to lanceolate), five locular ovaries (vs. six). *Microlicia indurata* is endemic to the Serra dos Pireneus, Goiás (Almeda et al. 2023).

Microlicia geraizeira and *M. mellobarretoi* have sessile and semi-amplexicaul leaves, elliptic-lanceolate to oblong-lanceolate leaf blades, pentamerous flowers, yellow stamens, five locular ovaries, and capsules with acropetal dehiscence. However, *M. geraizeira* has leaves densely covered with glandular trichomes mixed with spherical glands (vs. glabrous, sometimes adaxial surfaces with sparsely long glandular trichomes or only at the bases in *M. mellobarretoi*), not callose margins (vs. callose), chartaceous leaves (vs. coriaceous), hypanthia entirely covered with glandular trichomes (vs. glandular trichomes only at the middle region), and white to rarely light pink petals (vs. pink to lavender with a yellow base). *Microlicia mellobarretoi* is endemic to northern Minas Gerais in Grão Mogol (Martins and Almeda 2017), Itacambira, and Botumirim municipalities (Fig. 3).

Microlicia geraizeira and *M. pilosa* have leaves, hypanthia, and sepals covered with glandular trichomes, elliptic-lanceolate leaf blades, entire margins, and yellow stamens. However, *M. geraizeira* differs by its sessile leaves (vs. short-petiolate [ca. 1 mm long] in *M. pilosa*) and chartaceous leaf blades (vs. membranaceous), pentamerous flowers (vs. hexamerous), cylindric-tubulose hypanthia (vs. cylindric to campanulate), triangular to narrowly triangular sepals ([4–12 mm long] vs. short-triangular [1–1.5 mm long.]), white to rarely light pink petals (vs. pink with greenish-yellow base), five locular ovaries (vs. six), capsules with acropetal dehiscence (vs. basipetal). *Microlicia pilosa* is endemic to the Pico do Itambé State Park, in Santo Antônio do Itambé, Minas Gerais (Martins and Almeda 2017) (Fig. 3).

Microlicia geraizeira and *M. septentrionalis* have sessile and semi-amplexicaul leaves, triangular sepals, pentamerous flowers, yellow stamens, and five locular ovaries. But *M. geraizeira* differs in having both leaf surfaces covered with glandular trichomes mixed with spherical glands (vs. glabrous or abaxial surfaces rarely punctate in *M. septentrionalis*), elliptic-lanceolate to oblong-lanceolate leaf blades (vs. ovate-lanceolate), not callose margins (vs. callose), and cylindric-tubulose hypanthia (vs. campanulate) entirely covered with glandular trichomes (vs. glabrous bases with glandular trichomes ring at the apices). *Microlicia septentrionalis* occurs only in Pico da Formosa, Monte Azul, northern Minas Gerais (Almeda et al. 2023) (Fig. 3).

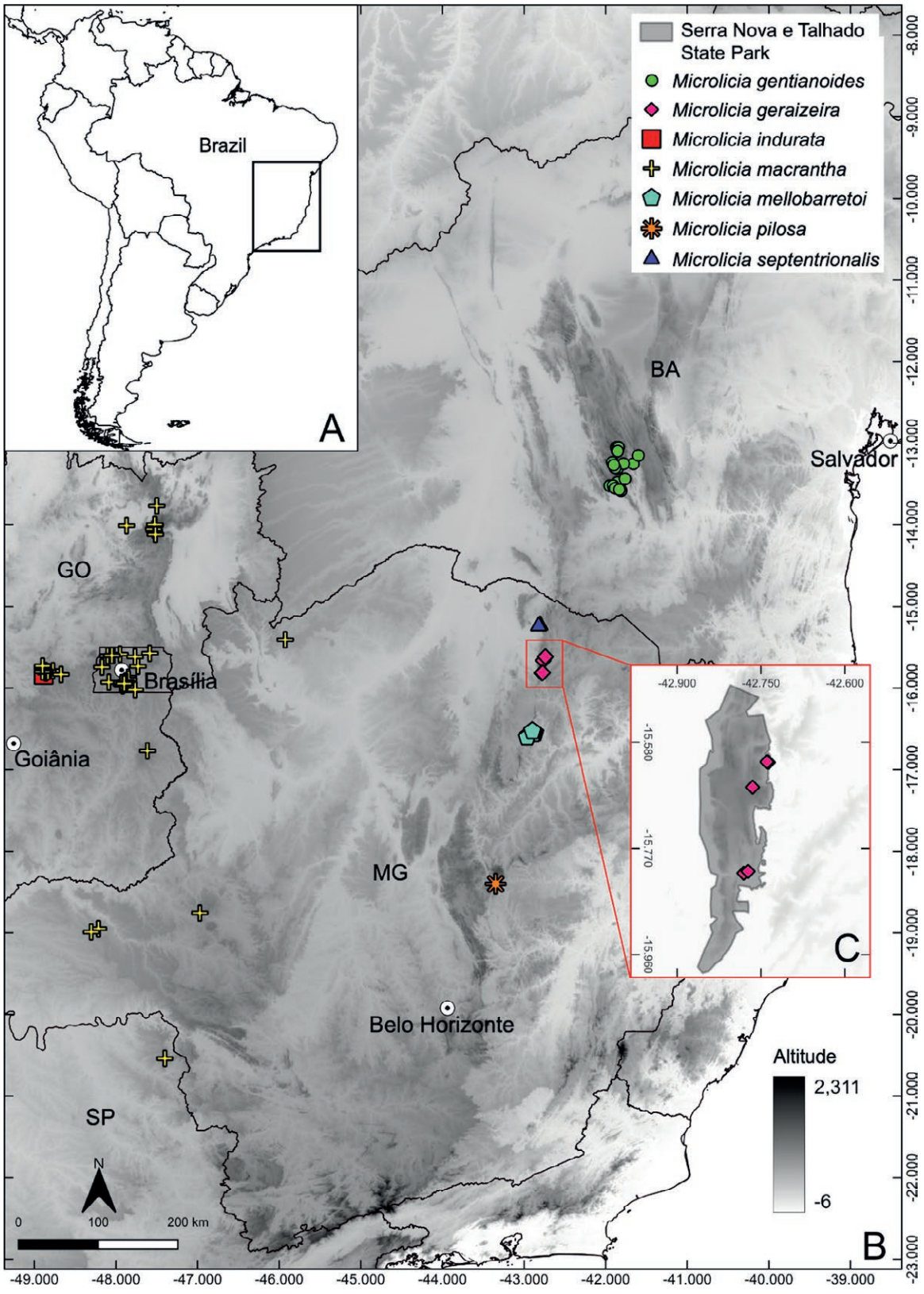

Figure 3. A. South America map. B. Distribution of *Microlicia geraizeira* Versiane & R.Romero and its morphologically similar species in Brazil. C. Occurrence of *M. geraizeira* in the Serra Nova State Park, Minas Gerais.

Identification key of *Microlicia geraizeira* and its morphologically similar species

1. Leaves with both surfaces glabrous or with spherical glands on abaxial surfaces or adaxial surfaces sparsely setose in the margins or bases **2**

   Leaves with both surfaces covered with glandular trichomes mixed or not with spherical glands **4**

2. Leaves with adaxial surfaces glabrous or with setose trichomes, abaxial surfaces with spherical glands **3**

   Leaves with both surfaces glabrous or sometimes adaxial surfaces with glandular trichomes or abaxial surfaces only with spherical glands at the apices, petals pink or lavender with a yellow base **4**

3. Flowers pentamerous with entirely white or yellowish-green petals, hypanthia glabrous at the apices and bases, or with glandular trichomes below the constricted neck or the upper half, rarely totally glabrous ..... ***M. gentianoides***

   Flowers hexamerous with pink petals with a yellow base or white to yellowish-white with a yellow base, hypanthia covered with spherical glands ..... ***M. macrantha***

4. Leaves ovate-lanceolate, hypanthia campanulate with glandular trichomes only at the apices; Pico da Formosa, MG .. .. ***M. septentrionalis***

   Leaves oblong to elliptic, hypanthia subcylindric to subturceolate with glandular trichomes only at the middle region; Grão Mogol, MG ..... ***M. mellobarretoi***

5. Leaves petiolate, sepals 1–1.5 mm long..... ***M. pilosa***

   Leaves sessile, sepals 4–12 mm long **6**

6. Flowers pentamerous, hypanthia cylindric-tubulose, sepals triangular to narrowly triangular, ovaries five locular; SNTSP, MG ..... ***M. geraizeira***

   Flowers hexamerous, hypanthia campanulate, sepals oblong to lanceolate, ovaries six locular; Serra dos Pireneus, GO ..... ***M. indurata***

Additional specimens examined (paratypes)

BRAZIL: **Minas Gerais:** Porteirinha, Parque Estadual de Serra Nova e Talhado, 06 Nov 2019 (fl.), *P.B. Meyer & P.A. Junqueira 3739* (BHCB). Rio Pardo de Minas, Serra Nova, Chapadão de Santana, 08 Oct 1995 (fl., fr.), *F.R.S. Pires et al. s.n.* (CESJ, RB); idem, Parque Estadual Serra Nova, 15°39'37.5"S, 42°45'53.7"W, 1000–1230 m, 13 Mar 2007 (fl., fr.), *A. Salino et al. 11744* (BHCB, RB); idem, trilha para o escorregador no Córrego da Velha, 15°36'53.9-57.3"S, 42°44'20.6-5.6"W, 834–858 m, 21 Mar 2012 (fl.), *J.A. Lombardi 9037* (UPCB); idem, trilha do escorregador, 15°36'57"S, 42°44'12"W, 21 Mar 2012 (fl.), *M. J. R. Rocha et al. 431* (BHCB, HUFU, NY, RB); idem, trilha de acesso a casa de apoio, 27 Aug 2019 (fl.), *R. Nichio-Amaral et al. 944* (HUFU, MCCA, VIES). Serranópolis de Minas, Sete Quedas, 17 Apr 2007 (fl.), *O.S. Ribas & J.M. Silva* 7733 (UPCB); idem, Parque Estadual de Serra Nova e Talhado, 15°48'52"S, 42°46'50"W, 886 m, 26 Apr 2013 (fr.), *Barboza et al. 3874* (MBM).

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