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Machaerium guidone (Leguminosae: Papilionoideae: Dalbergieae) — a remarkable new species from northeast Brazil, with a revised key to *Machaerium* species of the Caatinga

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Summary. *Machaerium* is a predominantly Neotropical genus comprising nearly 130 species of trees, shrubs, and lianas, ranging from southern Mexico to northern Argentina. In Brazil, approximately 74 species are recognised, 44 of which are endemic. This study is based on morphological observations on field and herbarium specimens, including detailed examination of 28 specimens and all *Machaerium* types. The relevant published literature was reviewed. A new species, *Machaerium guidone*, is described, it is predominantly found in the Brazilian Caatinga and detailed information on its habitat, distribution, conservation status, phenology and morphological, taxonomic affinities are provided. Additionally, we include field images, illustrations, a distribution map, IUCN Red List assessments and a revised identification key for all *Machaerium* species occurring in the Brazilian Caatinga. The newly described species increases the number of *Machaerium* species in the Brazilian Caatinga to 14 and the number of endemic species to 45 in the country. This discovery underlines the need for continued botanical inventories and protection of sensitive dry forests.

Key Words. conservation, endemism, Fabaceae, Neotropical dry forests, taxonomy.

Introduction

Among papilionoid legume genera, *Machaerium* Pers. stands out for its remarkable morphological and ecological diversity. Comprising approximately 130 species, it is predominantly distributed throughout the Neotropics (Lozano & Klitgaard 2006; Filardi & Lima 2014). Notably, however, one species — *Machaerium lunatum* (L.f.) Ducke — extends its range to the west coast of Africa (Lozano & Klitgaard 2006). Within the Neotropical distribution of *Machaerium*, two major species groups are recognised: one occurring from southern Mexico to the Amazon, and another extending from central South America to northern Argentina (Lozano & Klitgaard 2006; Filardi & Lima 2014).

This genus includes trees, shrubs and lianas, and its diversity is particularly concentrated in Brazil where 74 species are found, 44 (60%) of which are endemic (Hoehne 1941; Lewis 1987; Sartori & Tozzi 1998; Ribeiro & Lima 2007; Filardi *et al.* 2013, 2025; Filardi & Lima 2014). The greatest species richness and endemism are found in the Atlantic Forest, with 41 species, and in the Amazon, with 33 species (Filardi & Lima 2014; Filardi *et al.* 2025). *Machaerium* is also distributed in Cerrado (23 species), Caatinga (13 species), Pantanal (8 species), and Pampas (2 species) (Filardi *et al.* 2025). Species from the Atlantic Forest are currently the most taxonomically well-resolved within the genus, due to recent taxonomic treatments conducted in this region. These studies have led to the description of five new species (e.g. Mendonça-Filho *et al.* 2011; Filardi & Lima 2014). In contrast, other Brazilian domains remain significantly less studied, and a comprehensive understanding of *Machaerium* biodiversity across all Brazilian domains — and throughout the Neotropics — is essential for accurate species delimitation, conservation assessments and the identification of priority areas for habitat protection. This highlights the urgent need for further taxonomic and systematic studies.

In the Caatinga, one of the preliminary studies on *Machaerium* richness considered only five species and two varieties (Queiroz 2009). This study focused on species exclusive to this biome, overlooking those that occur in other vegetation types. In the *Flora e Funga do Brasil* project (Filardi *et al.* 2025) this number was expanded to 13 species, including those occurring in transitional regions (Caatinga/Cerrado; Caatinga/

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Atlantic Forest), with eight species endemic to Brazil (62%), and one found exclusively in the Caatinga biome. Nevertheless, this figure may still underestimate the true diversity of the genus, as other studies suggest that a thorough examination of specimens from Northeast Brazil could reveal new taxa (Lewis 1987; Queiroz 2009).

During fieldwork in Bahia in November 2022, and through the study of herbarium specimens from the Caatinga Domain, we discovered a remarkable new species, *Machaerium guidone* Filardi & Milanezi-Jordão. This species is described, illustrated, and compared with its closest morphologically similar species. Data on its geographic distribution and conservation status are also provided, along with an updated identification key for all 14 species of *Machaerium* found in this biome, and for endemic species to Brazil, occurrence in phytogeographic domains is also indicated.

Material and Methods

The herbarium materials were examined from CEN, CEPEC, HUEFS, IPA, K, PEUFR, PEUFR-HST (Herbarium Sérgio Tavares), R, RB, SJRP, UFP and US (herbarium acronyms follow Thiers 2025). Images in high resolution available in the Reflora Virtual Herbarium (http://reflora.jbrj.gov.br/reflora/herbarioVirtual) and speciesLink (https://specieslink.net/search/index) by herbaria ALCB, EAC and UFRN were also analysed.

The description and illustration were based on dried and rehydrated materials using a stereomicroscope Leica DFC295 and on field observations; the terminology of habitat, shape, colour and indumentum of the structures follows Harris & Harris (2001) and Beentje (2016), inflorescence analysis follows Weberling (1989), specific *Machaerium* morphological characters follow Hoehne (1941), Rudd (1977, 1987a, 1987b), Filardi *et al.* (2013) and Filardi & Lima (2014) and stem features follow the definitions by Acevedo-Rodrígues (2015). The definition of the Caatinga Domain (CD) proposed by Queiroz *et al.* (2017) is followed, in it the CD is considered an ecologically and evolutionarily heterogeneous region that includes floristic elements from at least four different biomes: Caatinga Seasonally Dry Tropical Forests and Woodlands (SDTFWs), Savannas, Tropical Rain Forests and Rupestrian Grasslands ("Campos Rupestres") (Queiroz 2006, 2009; Moro *et al.* 2015; Conceição *et al.* 2016).

Geographic distribution and habitat data for the new species described here were obtained from labels on the exsiccate and analysed using QGIS version 3.28.4 (https://qgis.org/), which was used to create the distribution map.

We assessed the conservation status of the *Machaerium* species described here according to version 3.1 of the *IUCN categories and criteria and guidelines* (IUCN 2001; 2022). Available data on distribution, population, habitat, ecology, uses, trade and threats were incorporated into the National System for the Conservation of Flora (ProFlora), managed by the Brazilian National Center for Plant Conservation (CNCFlora) at the Rio de Janeiro Botanical Garden Research Institute (JBRJ). CNCFlora serves as the IUCN Species Survival Commission Brazil Plant Red List Authority (IUCN SSC BPRLA) and documents the assessments. The assessment will undergo technical review by the IUCN Red List Unit before being added to the Species Information System (SIS) of the IUCN for official publication. As a result, the full conservation assessment of this new *Machaerium* species described will be available on both global and national Red Lists.

The Area of Occupancy (AOO) and Extent of Occurrence (EOO) were calculated based on their standard definitions implemented in GeoCAT (Bachman *et al.* 2011). These estimates were generated from ProFlora of CNCFlora, utilising occurrence records validated by botanical specialists in Leguminosae (the first and third authors of this article). For historical records, missing geographic coordinates, or those georeferenced to the centroid of a territorial unit (e.g., state, municipality, or protected area), the CNCFlora team adjusted the locality information using available data from specimen labels.

Taxonomic Treatment

Machaerium guidone *Filardi & Milanezi-Jordão*, **sp. nov.** Type: Brazil: Piauí: São Raimundo Nonato, Zabelê, Parque Nacional da Serra da Capivara, 08°44'1"S 42°29'21"W, 630 m, 22 Jan. 1998, fl., *J. R. Lemos & J. Lima* 35 (holotype EAC [EAC0026958!]; isotypes PEUFR-HST [HST 9056], IPA [IPA 58471], PEUFR [PEUFR 28552], UFP [UFP 24373 image!]). Figs 1 and 2.

http://www.ipni.org/urn:lsid:ipni.org:names:77374451-1

Lianas to scandent *shrubs* 1 – 3 m tall. *Stem* 3 cm in diam., cylindrical; cross section with a single cambium; pith in a central position, lobed. *Branch* cylindrical, unarmed, grey to grey-brown, glabrescent to pubescent; lenticels conspicuous; cataphylls present; stipules foliar, triangular. *Leaves* 3 – 12 cm long; pulvinus 0.12 cm long, aureo-villous; petiole 0.5 – 1 cm long, aureo-villous; rachis 2.5 – 5.1 cm long, aureo-villous; pulvinule 0.07 cm long, aureo-villous. Leaflets 9 – 13, alternate rarely opposite, discolorous, margin slightly revolute, coriaceous; adaxial surface lustrous or opaque, glabrous; abaxial surface opaque, sparsely aureo-villous; midrib villous; mucron pubescent; secondary veins brochidodromous. Basal leaflets 0.9 – 1.5

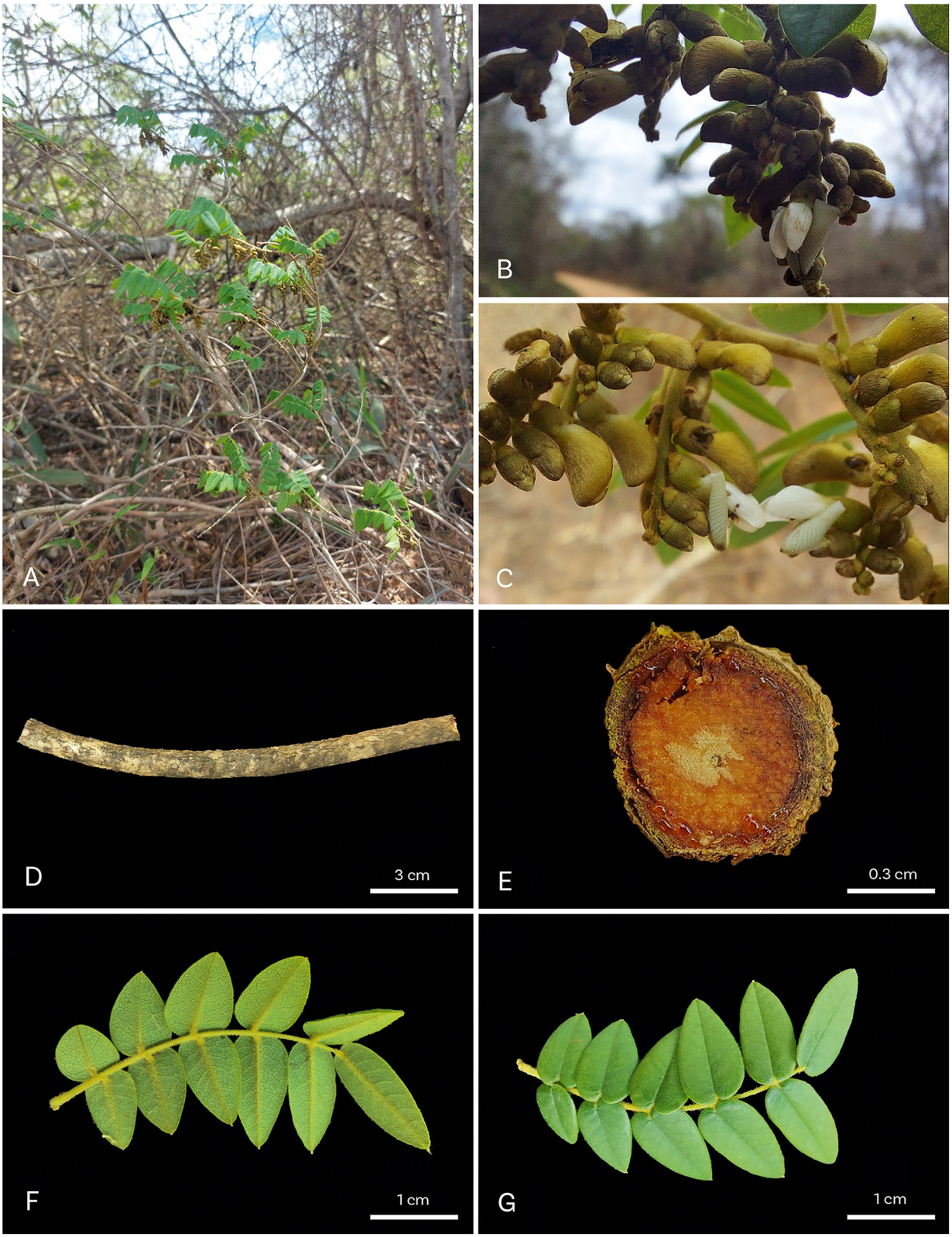


Fig. 1. Field images of *Machaerium guidone*. **A** habitat, Caatinga biome, at Licínio de Almeida, Bahia; **B** terminal inflorescence; **C** axillary inflorescences; **D** cataphylls; **E** stem, cross section, detailing the single cambium; **F** leaf, abaxial surface; **G** leaf, adaxial surface. PHOTOS: V. M. M. JORDÃO.

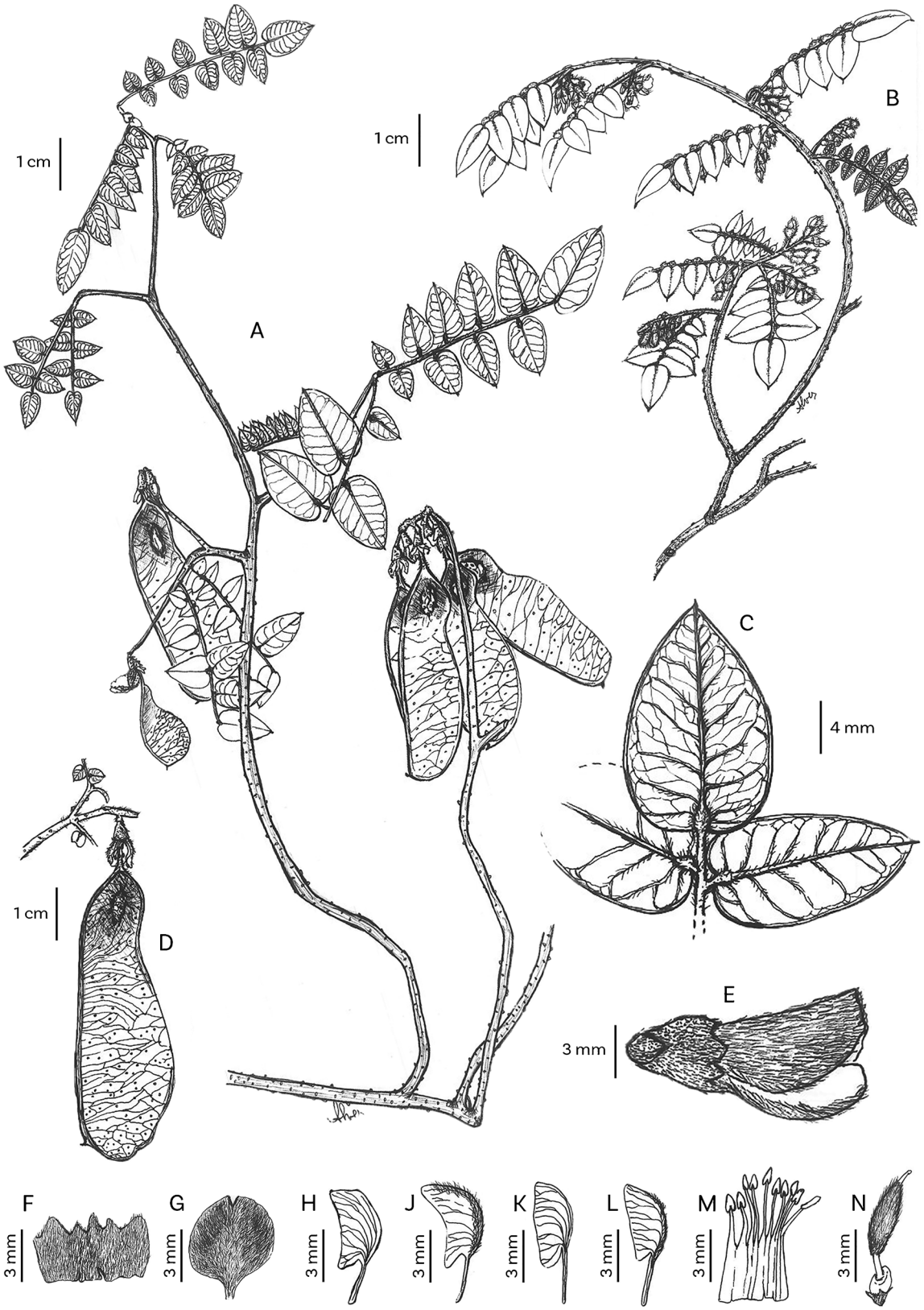


Fig. 2. Illustration of *Machaerium guidone*. **A** branch, with fruits (*A. C. Sevilha et al.* 6736); **B** branch, with flowers (*V. M. M. Jordão et al*. 234); **C** leaf, terminal leaflet and leaflet pair; **D** fruit; **E** flower; **F** calyx; **G** banner petal; **H** wing petal, inside view; **J** wing petal, outside view; **K** keel petal, inside view; **L** keel petal, outside view; **M** androecium; **N** gynoecium. DRAWN BY JAQUELINE A. VIEIRA.

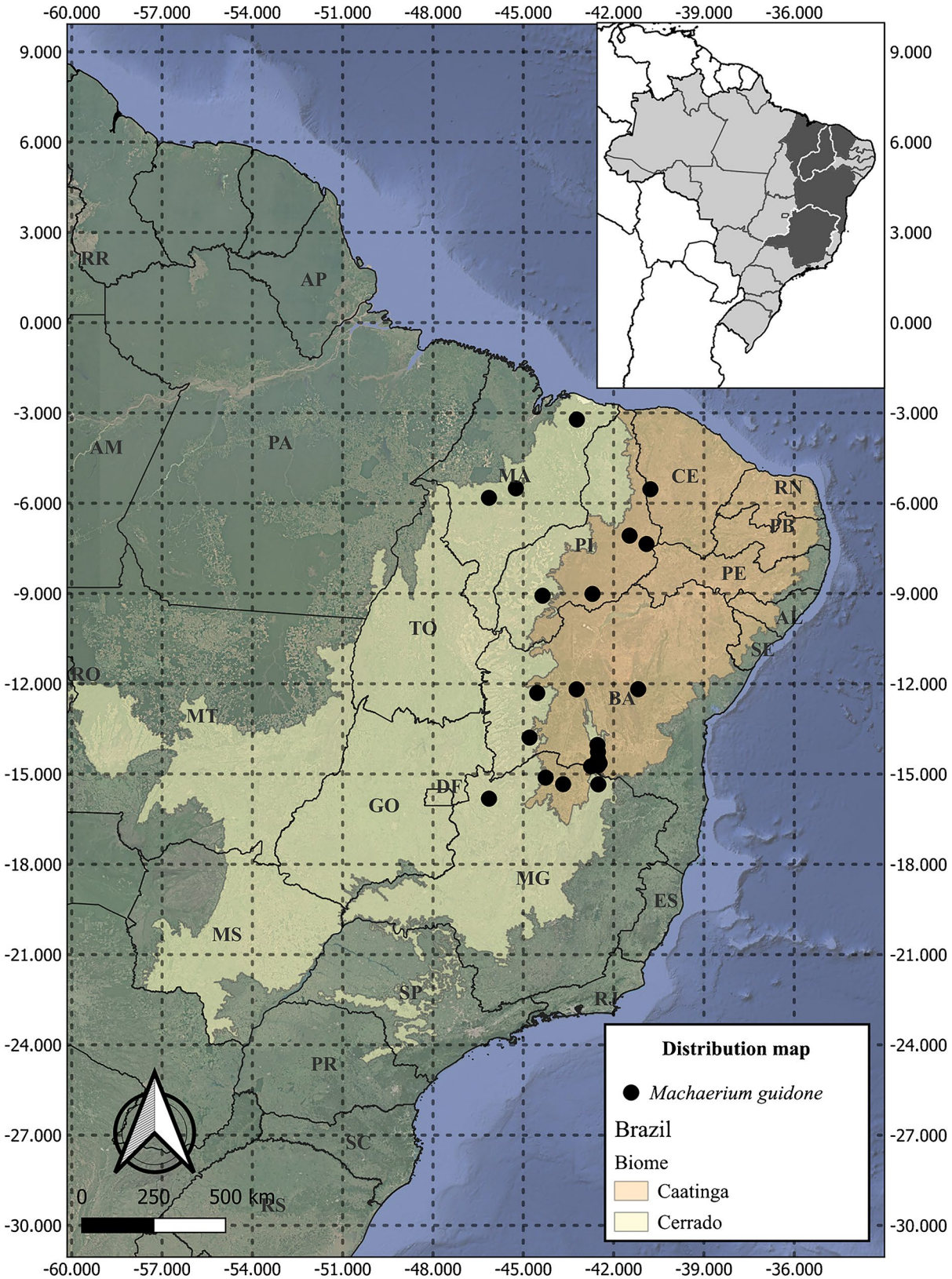
× 0.7 – 1.1 cm, ovate; apices mucronulate, slightly retuse, rarely acuminate; bases cordate to subcordate. Middle leaflets 1.1 – 3.7 × 0.8 – 3.7 cm, lanceolate to ovate; apices mucronulate, slightly retuse, rarely acuminate; bases cordate to subcordate. Terminal leaflet 1.1 – 5.6 × 0.6 – 2.2 cm, elliptic; apex mucronulate; base cordate. *Inflorescence* a panicle, 3.2 – 6.3 cm long, axillar; peduncle 0.9 – 1.2 cm long, aureo-villous; rachis 4.3 – 5.1 cm long, aureo-villous; lateral axis 1.6 – 2.0 cm long, aureo-villous; bracts not seen. *Flowers* sessile, 7.2 – 7.6 mm long; bracteoles 1.5 – 1.7 × 1.4 – 1.5 mm, ovate, tomentose. Calyx campanulate, 3.1 – 3.4 × 6 – 6.3 mm, aureo-tomentose. Corolla white; banner petal 7 – 7.4 × 6.2 – 6.5 mm, orbicular, externally aureo-sericeous-tomentose, internally glabrous, apex retuse, base attenuate, claw 1.4 – 1.6 mm long; wing petals 7.3 – 7.6 × 2.2 – 2.5 mm, oblong, aureo-tomentose dorsally, apices acute, bases auriculate, claws 3.0 – 3.2 mm long; keel petals 6.9 – 7.1 × 2.1 – 2.2 mm, straight-oblong, aureo-tomentose dorsally, apices obtuse, bases auriculate. Androecium with 10 monadelphous stamens; filament sheath 4.0 mm long, glabrous; filaments 2.3 – 2.5 mm long, glabrous; anthers 0.5 × 0.2 mm, oblong. Gynoecium with a cupulate nectariferous disc, 0.9 × 0.8 mm; stipe 1.2 – 1.3 mm, glabrous; ovary 2.4 – 2.6 × 0.9 – 1.1 mm, aureo-tomentose; style 0.7 – 0.9 mm long, glabrous; stigma punctate. *Fruit* a samara, 5.5 – 6.0 cm long; stipe 0.6 – 0.7 cm long, fulvo-pubescent; seed chamber 1.5 – 2.0 × 1.0 – 1.2 cm, falcate, reticulate-verrucose, brown, glabrous; wing 3.0 – 4.2 × 1.4 – 1.8 cm, oblong to oblong-falcate, reticulate, punctate, brown, glabrous; apex obtuse, apiculate rarely short-apiculate.

RECOGNITION. *Machaerium guidone* sp. nov. resembles *M. oblongifolium* Vogel in its lianescent habit and verrucose seed chamber but differs in several key characters: leaflet number 9 – 13 (vs 3 – 7 in *M. oblongifolium*), leaflet base shape cordate or subcordate (vs rounded to attenuate), leaflet apex mucronate (vs acuminate, shortly cuspidate or obtuse), leaflet texture leathery (vs membranous to papery) and the indumentum on the abaxial surface villous (vs tomentose). Another morphologically similar species in leaflet shape is *M. mucronulatum* Mart. ex Benth., but *M. guidone* differs in habit, liana or scandent shrub (vs tree in *M. mucronulatum*), size of the basal leaflets 0.9 – 1.5 cm (vs 2.0 – 4.7 cm), indumentum colour of leaflet, inflorescence, the external surface of the vexillary petal and the ovary, which are golden (vs ferruginous) and stigma shape, punctate (vs capitate).

DISTRIBUTION. *Machaerium guidone* is a Brazilian endemic species and occurs in the states of Bahia, Ceará, Maranhão, Minas Gerais and Piauí, in northeastern and southeastern Brazil (Map 1).

SPECIMENS EXAMINED. PARATYPES. BRAZIL. BAHIA: Baianópolis, fazenda São Roque, 2 Nov. 2011, fl., *A. M. Miranda & J. Ferraz* 6486 (HUEFS!, IPA!, RB!); Licínio de Almeida, estrada de terra próxima a BA-156, cerca de 4 km da cidade de Licínio de Almeida, 14°42'48"S 42°30'33"W, 875 m elev., 10 Nov. 2022, fl., *V. M. M. Jordão et al.* 234 (SJRP!). **Ceará**: Novo Oriente, baixa fria, planalto da Ibiapaba, 16 Feb. 1991, fr., *F. S. Araújo* 287 (EAC!, K!, RB!, UFRN!). **Minas Gerais**: Santo Antônio do Retiro, sítio 16, ponto 1, 15°20'42"S 42°30'14"W, 881 m elev., 21 March 2017, fr., *A. C. Sevilha et al.* 6736 (CEN!, SJRP!).

ADDITIONAL SPECIMENS EXAMINED. BRAZIL. BAHIA: Bom Jesus da Lapa, médio São Francisco, c. 2.5 km E da estrada Bom Jesus da Lapa-Ibotirama em ramal entrando a c. 9.1 km N de Bom Jesus da Lapa, 13°13'5"S 43°18'26"W, 10 Feb. 2000, fr., *L. P. Queiroz et al.* 5838 (ALCB!, CEPEC!, HUEFS!, UEC!); Brejinho das Ametistas, 14°17'30"S 42°32'8"W, 12 Dec. 2009, fl., *L. J. Alves et al.* 23 (HUEFS!); Caetité, 14°02'S 42°32'W, 13 March 1981, fr., *S. B. Silva* 185 (HUEFS!, RB!); Coribe, cerca de 10 km L de Coribe, estrada Coribe/Descoberto, 13°47'22"S 44°19'29"W, 670 m, 17 April 2002, fr., *F. França et al.* 3847 (HUEFS!); Ibotirama, rod. BA-160, 5 – 10 km de Ibotirama, 500 m, 16 March 1995, fr., *G. Hatschbach et al.* 61977 (HUEFS!, MBM!, US!); Licínio de Almeida, fazenda Xaxá, na margem do rio, 14°39'21"S 42°32'49"W, 923 m, 7 Aug. 2014, fr., *M. L. Guedes et al.* 22160 (ALCB!); Licínio de Almeida, rod. para Urandi, c. 3.8 km da cidade, 14°42'47"S 42°30'33"W, 800 m, 31 March 2001, fr., *J. G. Jardim et al.* 3281 (CEPEC!, HUEFS! [2 exs.], UESC); Licínio de Almeida, serra geral, estrada para Urandi, 7 km de Licínio de Almeida, 14°44'43"S 42°31'2"W, 750 m, 9 Dec. 2009, fl., *E. Melo et al.* 7360 (ALCB!); Licínio de Almeida, serra geral Licínio de Almeida, estrada, 5 km de Licínio de Almeida para Urandi, 14°43'10"S 42°30'50"W, 850 m, 9 Dec. 2009, fl., *M. L. Guedes et al.* 16693 (ALCB!, HUEFS! [2 exs.]); Licínio de Almeida, rod. BA, Caculé/Licínio de Almeida, 14°38'29"S 42°27'41"W, 850 m, 30 March 2001, fr., *J. G. Jardim et al.* 3252 (ALCB!, CEPEC!, HUEFS! [2 exs.], UESC). **Ceará**: Novo Oriente, baixa fria, planalto da Ibiapaba, 5 Jan. 1991, fl., *F. S. Araújo* 240 (EAC!); Novo Oriente, depois da Cabeça de Onça, Serra da Ibiapaba, 29 April 1979, fr., *A. Fernandes et al.* s.n. (EAC!, HUEFS!); Novo Oriente, estrondo, planalto da Ibiapaba, 5 Jan. 1991, fl., *F. S. Araújo* 241 (EAC!); Novo Oriente, estrondo, planalto da Ibiapaba, 5 Jan. 1991, fl., *F. S. Araújo* 434 (EAC!, K!, UEC!). **Maranhão**: Barra do Corda, próximo à zona urbana, 10 Nov. 1979, fl., *E. Nunes & P. Martins* s.n. (EAC!); Caracol, parque Nacional da Serra das Confusões, entre o portal do parque e a descida da Serra das Confusões, 09°13'18"S 43°29'20"W, 650 m, 20 Feb. 2013, fl., *G. Martinelli et al.* 18031 (RB!); Grajaú, entre Grajaú e Barra do Corda, 12 Nov. 1979, fl.,



Map 1. Distribution of *Machaerium guidone* in Brazil.

E. Nunes & P. Martins s.n. (EAC!, HUEFS!); Grajaú, rodovia a 6 km da cidade de Grajaú, 21 April 1983, fr., *M. F. F. Silva et al.* 1175 (INPA!, US!); Grajaú, 05°43'S 45°57'W, 4 April 1983, fr., *J. A. Ferreira & C. A. Miranda* 324 (RB!). **Minas Gerais**: Jaíba, distrito de Irrigação de Jaíba, 12 Dec. 1996, fl., *E. Tameirão-Neto* 2280 (UEC!); Januário, distrito de Fabião, 2 km na estrada partindo do Abrigo do Malhador, 15°07'26"S 44°15'20"W, 26 Oct. 1997, fl., *J. A. Lombardi* 2096 (BHCB, HUEFS!). **Piauí**: Bom Jesus, serra do Uruçuí, 6 June 1998, fr., *A. Fernandes* s.n. (EAC26722!); Padre Marcos, Serra Velha, 10 Jan. 1995, fl. *M. E. Alencar* 236 (HUEFS!); Padre Marcos, Serra Velha, km 2 da vicinal para Alagoinha do Piauí, 420 m, 21 May 1995, fr., *M. E. Alencar* 253 (HUEFS!, K!); Padre Marcos, Serra Velha, km 2 da vicinal para Alagoinha do Piauí, 420 m, 21 June 1996, fr., *M. E. Alencar* 284 (UEC!); Picos, BR 316, KM 341, 2 May 1978, fr., *A. Fernandes & Matos* s.n. (EAC3872!, HUEFS138752!).

HABITAT. *Machaerium guidone* occurs in deciduous forest, including the vegetation locally known as "capoeira", in arboreal Caatinga, in "carrasco" vegetation, and in the Caatinga-Cerrado transitional vegetation on sandy and clay soils at elevations between 670 and 880 m.

CONSERVATION STATUS. *Machaerium guidone* has a wide distribution in municipalities of the states of Bahia, Ceará, Maranhão, Minas Gerais, and Piauí. Its EOO is 486,468 km^2, and its AOO is 88 km^2. The EOO exceeds the threshold for applying a threat category, while the AOO is likely underestimated, compared to the EOO. Furthermore, no direct threats or population data have been identified that would allow the assignment of a risk category or the application of other criteria. Therefore, the species was provisionally assessed as Least Concern [LC]. As knowledge of the species grows through advancements in taxonomy and expanded field surveys, new populations will likely be discovered, providing a more precise understanding of its geographic distribution.

PHENOLOGY. The species flowers from October to January, presenting fruits from February to August.

ETYMOLOGY. The epithet serves as a posthumous tribute to Brazilian archaeologist Niède Guidon, renowned for her pioneering research on rupestrian art sites in the state of Piauí. Her groundbreaking theories on early human presence in the Americas and her tireless dedication were instrumental in the creation of Serra da Capivara National Park — a UNESCO World Heritage Site and the type locality of the new species described here.

NOTES. Among the species occurring in the Caatinga domain, *Machaerium guidone* is distinct from all others, and can be recognised by its liana or scandent habit, foliar stipules, ovate to lanceolate leaflets with a cordate base and a pubescent mucron (Fig. 2). Its flowers have ovate bracteoles, white petals and a monadelphous androecium with a glabrous filament sheath and filaments. As for the fruits, the samaras feature a prominent, reticulate-verrucose seed chamber.

The morphological plasticity observed in *Machaerium guidone* across its distribution range is particularly notable in the leaves. Leaflet size varies widely within the Maranhão population (cf. *E. Nunes & P. Martins* s.n. – EAC7346 and HUEFS138751) when compared to other populations. However, reproductive characters remain fairly stable.

Regarding habitat preference, of the 14 species of the genus found in the Caatinga, five species (36%) have a broad distribution and also occur in grassland and forest formations in other South American countries: *Machaerium acutifolium* Vogel, *M. brasiliense* Vogel, *M. hirtum* (Vell.) Stellfeld, *M. stipitatum* Vogel, and *M. villosum* Vogel. Of the remaining species, nine are endemic to Brazil, with three occurring in grassland and/or forest areas across the Caatinga, Cerrado and Atlantic Rainforest biomes: *M. oblongifolium*, *M. punctatum* Pers. and *M. sericiflorum* Vogel. Another three species are found in both the Caatinga and Cerrado domains: *M. guidone*, *M. mucronulatum* and *M. opacum* Vogel, and two others occur in the Caatinga and in seasonal semi-deciduous forests of the Atlantic Rainforest: *M. leucopterum* Vogel and *M. ovalifolium* Glaz. ex Rudd. Only one species, *M. floridum* (Mart.) Ducke is restricted exclusively to the Caatinga domain.

Key to the species of *Machaerium* in the Brazilian Caatinga

1a. Leaflet veins cladodromous, parallel secondary veins branching toward the margins…. **2**

1b. Leaflet veins brochidodromous, secondary veins uniting in simple or compound arches toward the margins…. **3**

2a. Trees; spinescent stipules straight and parallel or perpendicular to the branches, usually overlapping; leaflets with abaxial surface sparse sericeous to glabrescent or with indumentum only on the main vein; flowers up to 1.6 cm long; Argentina, Bolivia, Brazil, Colombia, Guyanas, Panama, Paraguay, Peru and Venezuela… …. **M. hirtum**

2b. Lianas or scandent shrubs; spinescent stipules recurved to the branches, non-overlapping; leaflets with abaxial surface uniformly villous; flowers up to 1 cm long; Brazil: Bahia and Minas Gerais; Caatinga, Cerrado and Atlantic Rainforest……**M. sericiflorum**
3a. Trees; branches with spinescent stipules……**4**
3b. Trees, lianas or scandent shrubs; branches without spinescent stipules……**6**
4a. Spinescent stipules perpendicular to the branches reddish, 1 cm long; leaflets 5 – 7, elliptic to ovate; Brazil: Bahia, Espírito Santo, Minas Gerais, Pernambuco, and Rio de Janeiro; Caatinga and Atlantic Rainforest……**M. leucopterum**
4b. Spinescent stipules perpendicular to the branches not reddish, 0.4 cm long; leaflets (7 –) 11 – 25 (– 37), oblong……**5**
5a. Leaflets (7 –) 11 – 15, 1 – 2 cm width; petals reddish; seed chamber verrucose; Brazil – Bahia, Espírito Santo, Minas Gerais and Rio de Janeiro; Caatinga and Atlantic Rainforest …… **M. ovalifolium**
5b. Leaflets 17 – 25 (– 37), 0.3 – 0.7 cm width; petals whitish; seed chamber non-verrucose; Brazil – Bahia and Minas Gerais; Caatinga……**M. floridum**
6a. Trees with trunk not ramified at the base……**7**
6b. Lianas to scandent shrubs, rarely small trees, with trunk ramified at the base……**12**
7a. Leaflet bases cordate to subcordate……**8**
7b. Leaflet bases acute, attenuate, obtuse or rounded……**9**
8a. Leaflet apices always mucronulate, adaxial surface glabrescent to sparse pubescent; Brazil – Bahia, Goiás, Maranhão and Tocantins; Caatinga and Cerrado……**M. mucronulatum**
8b. Leaflet apices never mucronulate, adaxial surface regular and persistent pubescent; Brazil – Bahia, Distrito Federal, Goiás, Mato Grosso do Sul, Minas Gerais, Piauí and Tocantins; Caatinga and Cerrado……**M. opacum**
9a. Flowers 0.5 – 1.2 cm long; leaf rachis puberulent to glabrous; adaxial surface of mature leaflets sparse sericeous to glabrous……**10**
9b. Flowers 0.8 – 0.9 cm long; leaf rachis tomentose to villous; adaxial surface of mature leaflets tomentose-glabrescent to villous……**11**
10a. Adaxial surface of mature leaflets glabrous; flowers 0.8 – 1.2 cm long; seed chamber verrucose; Argentina, Bolivia, Brazil, Paraguay, Peru and Venezuela……**M. acutifolium**
10b. Adaxial surface of mature leaflets sparse sericeous to glabrous; flowers 0.5 – 0.7 cm long; seed chamber striate; Argentina, Bolivia, Brazil and Paraguay……**M. stipitatum**
11a. Leaflet bases acute or rounded, adaxial surface of mature leaflets sparse tomentose; banner petal externally sparse sericeous not nigrescent; seed chamber striate; Argentina, Bolivia and Brazil……**M. brasiliense**
11b. Leaflet bases attenuate, adaxial surface of mature leaflets villous; banner petal externally sericeous-nigrescent; seed chamber verrucose-reticulate; Bolivia, Brazil and Paraguay…. …… **M. villosum**
12a. Leaflet bases cordate to subcordate, apices mucronulate; banner petal externally with golden indumentum; Brazil – Bahia, Ceará, Maranhão, Minas Gerais and Piauí; Caatinga and Cerrado……**M. guidone**
12b. Leaflet bases acute, attenuate, obtuse or rounded, apices acuminate, acute or obtuse; banner petal externally with brown or nigrescent indumentum…… **13**
13a. Branches, leaf rachis and inflorescence rachis villous; bracts persistent; calyx with unequal teeth; banner petal externally with nigrescent indumentum; Brazil – Bahia, Minas Gerais and Rio de Janeiro; Caatinga, Cerrado and Atlantic Rainforest……**M. punctatum**
13b. Branches, leaf rachis and inflorescence rachis tomentose; bracts caducous; calyx with equal teeth; banner petal externally with brown indumentum…… **14**
14a. Scandent shrubs to small trees, with trunk ramified at the base; leaflets 7 – 19; bracteoles 0.1 – 0.2 cm long; seed chamber striate; Argentina, Bolivia and Brazil……**M. brasiliense**
14b. Lianas; leaflets (3 –) 5 – 7; bracteoles 0.2 – 0.3 cm long; seed chamber verrucose-reticulate; Brazil – Bahia, Espírito Santo, Goiás, Minas Gerais, Rio de Janeiro and São Paulo; Caatinga, Cerrado, and Atlantic Rainforest……**M. oblongifolium**

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Declarations

Data availability All data used in his study is included in the text or is available on the specimens cited.

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Authors' contributions This work is derived from a MSc dissertation by VMMJ, which was developed under the supervision of DS and FLRF. VMMJ, FLRF and DS carried out the taxonomic work, VMMJ performed the morphological measurements and field work and VMMJ wrote the manuscript with contributions from FLRF and DS.

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