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Macroptilium chuquisacense (Leguminosae: Papilionoideae): a new species from the Bolivian Chaco

Carolina Lima Ribeiro[1], Felipe da Silva Santos[1], Cristiane Snak[2], Gwilym Peter Lewis[3] & Luciano Paganucci de Queiroz[1]

Summary. *Macroptilium* comprises approximately 20 species native to the Americas. Eleven of these have been recorded in Bolivia, representing all three currently recognised sections. This article describes an additional species for the country, *Macroptilium chuquisacense*. This new species is recorded from Chuquisaca and is currently represented by only two collections, which, morphologically, most closely resemble *Macroptilium prostratum*. It is primarily distinguished by its lanceolate leaflets with a sericeous indumentum, flowers approximately 6.5 mm long with petals described as lilac and sericeous floral bracts that exceed the length of the buds at the apex of the inflorescence. A detailed morphological description, illustrations, taxonomic notes, distributional data and an identification key to the Bolivian species of *Macroptilium* are provided.

Key Words. Andean foothills, Fabaceae, Phaseoleae, Phaseolinae, taxonomy.

Introduction

Macroptilium (Benth.) Urb. was initially described as part of the genus *Phaseolus* L., where its species were grouped in a single section (Bentham 1837). It was only in 1928 that Urban elevated the section *Macroptilium* to genus level and proposed a morphological delimitation for the group (Urban 1928; Maréchal *et al.* 1978). The genus is chiefly characterised by its distinctive flowers, in which the wing petals are much larger than the others, notable for their size and showy coloration (Urban 1928; Delgado-Salinas *et al.* 2011).

Currently, *Macroptilium* comprises approximately 20 species, divided into three sections: *Macroptilium* sect. *Microcochle* (Benth.) J.A.Lackey, sect. *Monophyllum* J.A.Lackey, and sect. *Macroptilium,* the typical section (Lackey 1983; Barbosa-Fevereiro 1987; Drewes 1995; Torres-Colín 2006). Native to the Americas, some species have been introduced to other regions due to their economic value as forage crops (Moura *et al.* 2019), particularly *M. atropurpureum* (DC.) Urb., *M. gracile* (Poepp. ex Benth.) Urb., and *M. lathyroides* (L.) Urb. (Torres-Colín 2006).

In Bolivia, eleven species of the genus have been recorded across the three sections: *Macroptilium atropurpureum*, *M. bracteatum* (Ness & Mart.) Maréchal & Baudet, *M. erythroloma* (Mart. ex Benth.) Urb., *M. gracile* and *M. lathyroides* in sect. *Macroptilium*; *M. fraternum* (Piper) Juárez, *M. martii* (Benth.) Maréchal & Baudet, *M. prostratum* (Benth.) Urb., *M. psammodes* (Lindm.) S.I.Drewes & R.A.Palacios and *M. sabaraense* (Hoehne) V.P.Barbosa ex G.P.Lewis in sect. *Microcochle* and *M. monophyllum* (Benth.) Maréchal & Baudet in sect. *Monophyllum* (GBIF.org 2025).

During a taxonomic review of the genus *Macroptilium* in the herbaria of Argentina, specimens were identified that did not correspond to any of the species described to date. Thus, this article describes a twelfth Bolivian species, *M. chuquisacense*, and provides a detailed account of its morphology, distribution and conservation status, contributing to the ongoing documentation of neotropical legume diversity.

Material and Methods

To support the taxonomic treatment and assess the distinctiveness of the new species, a bibliographic review of *Macroptilium* was conducted, mainly consulting Barbosa-Fevereiro (1987), Bentham (1837), Drewes (1995) and Torres-Colín (2006). This involved the examination of nomenclatural types and principal taxonomic works available on platforms including JSTOR Global Plants (https://plants.jstor.org/), Tropicos (https://www.tropicos.org/), and the Biodiversity Heritage Library (https://www.biodiversitylibrary.org/). These sources enabled the identification of three herbarium specimens attributable to a previously undescribed species of the genus.

Morphological data for the new species were obtained exclusively from herbarium specimens. Terminology for morphological descriptions follows

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[1] Programa de Pós-Graduação em Botânica, Universidade Estadual de Feira de Santana, Av. Transnordestina s/n, Novo Horizonte, Feira de Santana, BA 44036-900, Brazil. e-mail: carolima.clr@gmail.com

[2] Universidade Estadual do Oeste do Paraná, Rua Universitária, Jardim Universitário, 1619, Cascavel, PR 85819-110, Brazil

[3] Accelerated Taxonomy Department, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AE, UK

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Radford *et al.* (1976). Specimens of *Macroptilium* from the following herbaria were examined: ALCB, ASE, BAA, BAB, BM, CEN, CEPEC, CORD, CTES, E, EAC, ESA, F, FURB, G, GH, HUEFS, HURB, ICN, INPA, K, LUSC, LY, M, MEXU, MO, MPU, NY, P, PY, RB, SI, UB, UEC, US, VIC and W (herbarium acronyms according to Thiers 2025, continuously updated). All specimens listed were seen by at least one author.

A distribution map was generated using SimpleMappr (https://www.simplemappr.net/). The point locality of the Estación Experimental del Chaco "El Salvador", Luis Calvo, Bolivia, was used as the reference for the new species occurrence. The satellite image of the Estación Experimental del Chaco, Luis Calvo, site was taken from Google Earth (https://www.google.com.br/earth/index.html).

Taxonomic Treatment

Macroptilium chuquisacense *C.L.Ribeiro*, **sp. nov.** Type: Bolívia, Chuquisaca, Luis Calvo, El Salvador, CIMBOC, El Panta, 4 Feb. 1992, *C. S. Toledo & J. N. Joaquin* 10596 (holotype BAB [00012917]; isotype CTES [182983]). Fig. 1.

http://www.ipni.org//urn:lsid:ipni.org:names:77371699-1

Herb, with a thickened subterranean organ of uncertain nature, possibly a napiform tuberous root or xylopodium, thickened, c. 2 × 1 cm. *Stems* erect; trichomes of two types, short or long, erect or depressed, less than 2 mm long, hyaline to yellow; velutinous and hirsute on young stems and velutinous on developed stems. *Stipule* 7 – 13 × 3 – 4 mm, lanceolate, apices acute, with 6 – 8 parallel veins, sericeous, persistent. *Leaves* trifoliolate; petiole 4 – 5.3 cm long, canaliculate, velutinous or hirsute; rachises 6 – 8 mm long, canaliculate, velutinous or hirsute; stipels c. 3 mm long, linear, sericeous, persistent; leaflets lanceolate, with entire, non-lobed margins, apex acute, mucronate, base rounded, papyraceous, sericeous, trichomes transparent, with some orange glandular trichomes, primary veins 3 – 5 from the base, actinodromous, secondary veins in 6 – 10 pairs, prominent on the lower surface; lateral leaflets asymmetrical, 4.9 – 5.7 × 1.4 – 2.1 cm, the outer portion of the blade (from the midvein) 1.3 – 2 × wider than the inner portion; terminal leaflet 4.1 – 6.4 × 1.8 – 2.2 cm, symmetrical. *Inflorescence* an axillary erect pseudoraceme, peduncle c. 10.3 cm long, sericeous or tomentose; peduncular bracts (at the base of the inflorescence) in two lateral tufts, c. 1 mm long, lanceolate, with one middle vein; inflorescence rachis c. 7.4 cm long, sericeous or tomentose; floral nodosities globose, 2 flowers per nodosity; first order bracts (at nodosity base) c. 4 mm long, linear or lanceolate, sericeous, trichomes white, caducous; second order bracts (at pedicel bases) similar in shape and indumentum but 2 – 2.5 mm long; bracteoles (at calyx base) c. 1 mm long, linear; pedicels c. 1.4 mm long. *Flowers* c. 6.5 × 4.4 mm; flower buds c. 4.2 × 3.5 mm. *Calyx* green, tube c. 1.7 × 1.5 mm, campanulate, externally sericeous, 5-toothed, the two upper (vexillary) teeth triangular, acute, c. 1.5 mm long, the three lower teeth (one carinal and two lateral), triangular, acute, carinal tooth c. 1.3 mm long, lateral teeth c. 1.1 mm long. *Petals* lilac; standard petal with claw c. 1.4 mm long, lamina c. 5.6 × 5 mm, elliptical, asymmetrical, apex retuse, two prominent auricles extending from the base to the centre of the lamina, papillae present below and between the auricles; wing petals with a claw c. 2.6 mm long, lamina c. 7.5 × 4.5 mm, orbicular, with a rounded spur near the base on the adaxial margin; keel petals with a claw c. 2.1 mm long, lamina c. 6.7 × 1.2 mm, strongly joined along both margins, ending in a hooked beak, rostrum c. 4.5 mm. *Androecium* c. 7.2 mm long, diadelphous, with nine stamens joined into a staminal sheath, the vexillary stamen free from its base and with a thickened basal portion, hooked at the apex as in the keel, anthers c. 0.3 mm long, dorsifixed with parallel thecae, disc short-cylindrical and uniform around the ovary base. *Ovary* c. 2.6 × 0.4 mm, sessile, sericeous, 4-ovulate, style c. 4.5 mm long, hooked at the apex as in the keel. *Fruit* a legume, 8 – 17 × 2.8 – 3 mm, deflexed and held against the inflorescence rachis, falcate, apex acuminate, laterally compressed between the seeds; valves chartaceous, light-brown, sericeous. *Seeds* 2 – 4 per fruit, c. 2.2 × 2 × 1.3 mm, ovoid, hilum elliptical, excentric; testa light-brown with black markings. Fig. 2.

RECOGNITION. *Macroptilium chuquisacense* is readily distinguished from all congeners by a combination of morphological traits, including a velutinous, hirsute or sericeous indumentum covering the entire plant except the corolla, stipules 7 – 13 mm long, lanceolate and papyraceous leaflets and flowers c. 6.5 mm long with lilac petals. The floral bracts are conspicuously longer than the floral buds at the apex of the inflorescence. Vegetatively, *M. chuquisacense* closely resembles *M. prostratum*, particularly in its lanceolate leaflets with a papyraceous texture; however, the latter differs by having a usually glabrescent indumentum, shorter stipules (less than 5 mm), and wing petals that are yellow rather than lilac.

DISTRIBUTION AND HABITAT. Only three specimens (two collections) of this new species have been identified, all from the same locality in Luis Calvo, Chuquisaca, Bolivia (Map 1). The locality is currently a research and breeding centre for Criollo cattle, the Estación Experimental del Chaco "El Salvador", originally labelled Centro de Investigación y Mejoramiento Bovino Criollo (CIMBOC). The Luis Calvo province

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Fig. 1. Type specimen of *Macroptilium chuquisacense. C. S. Toledo & J. N. Joaquin* 10596 (BAB).

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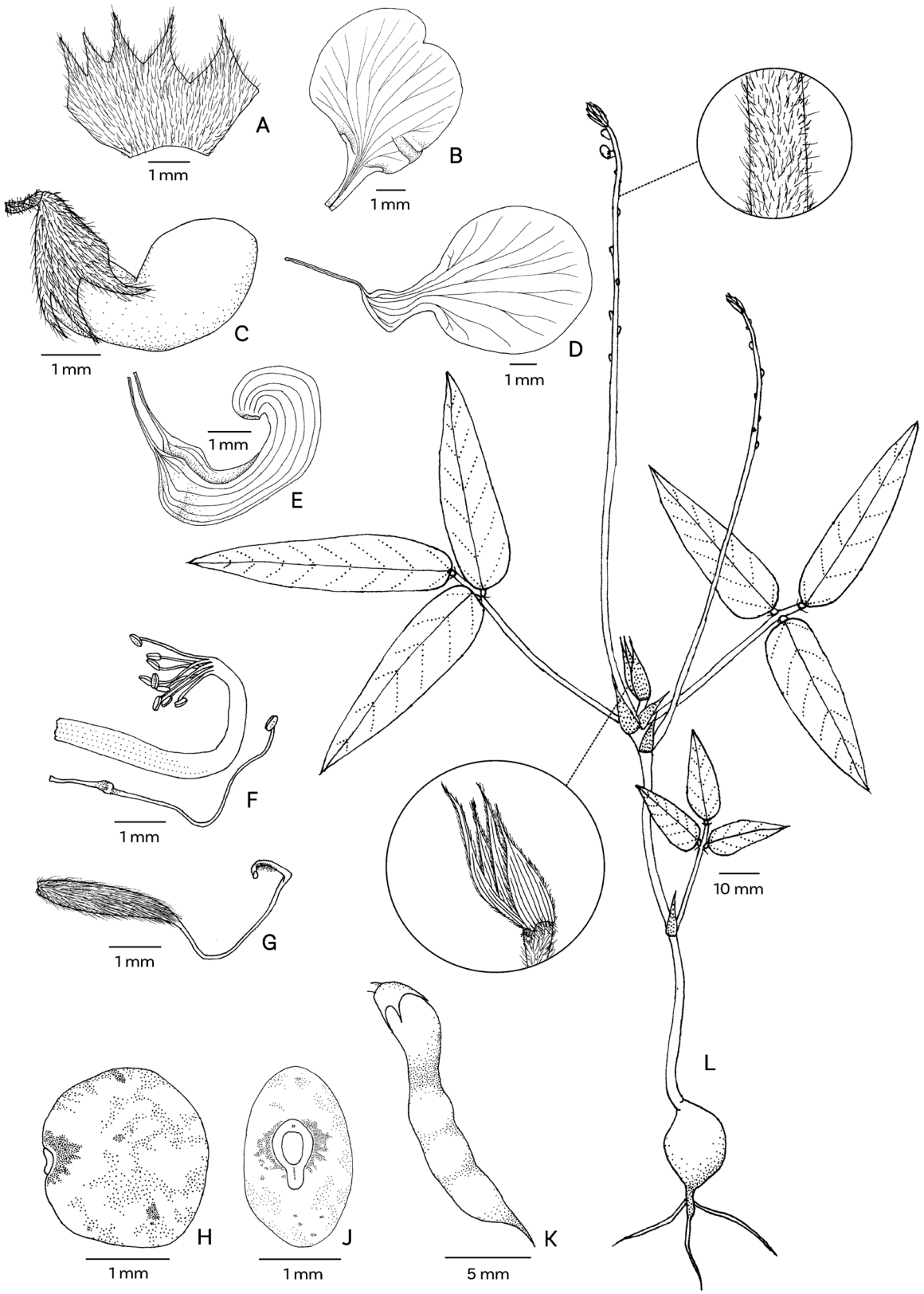
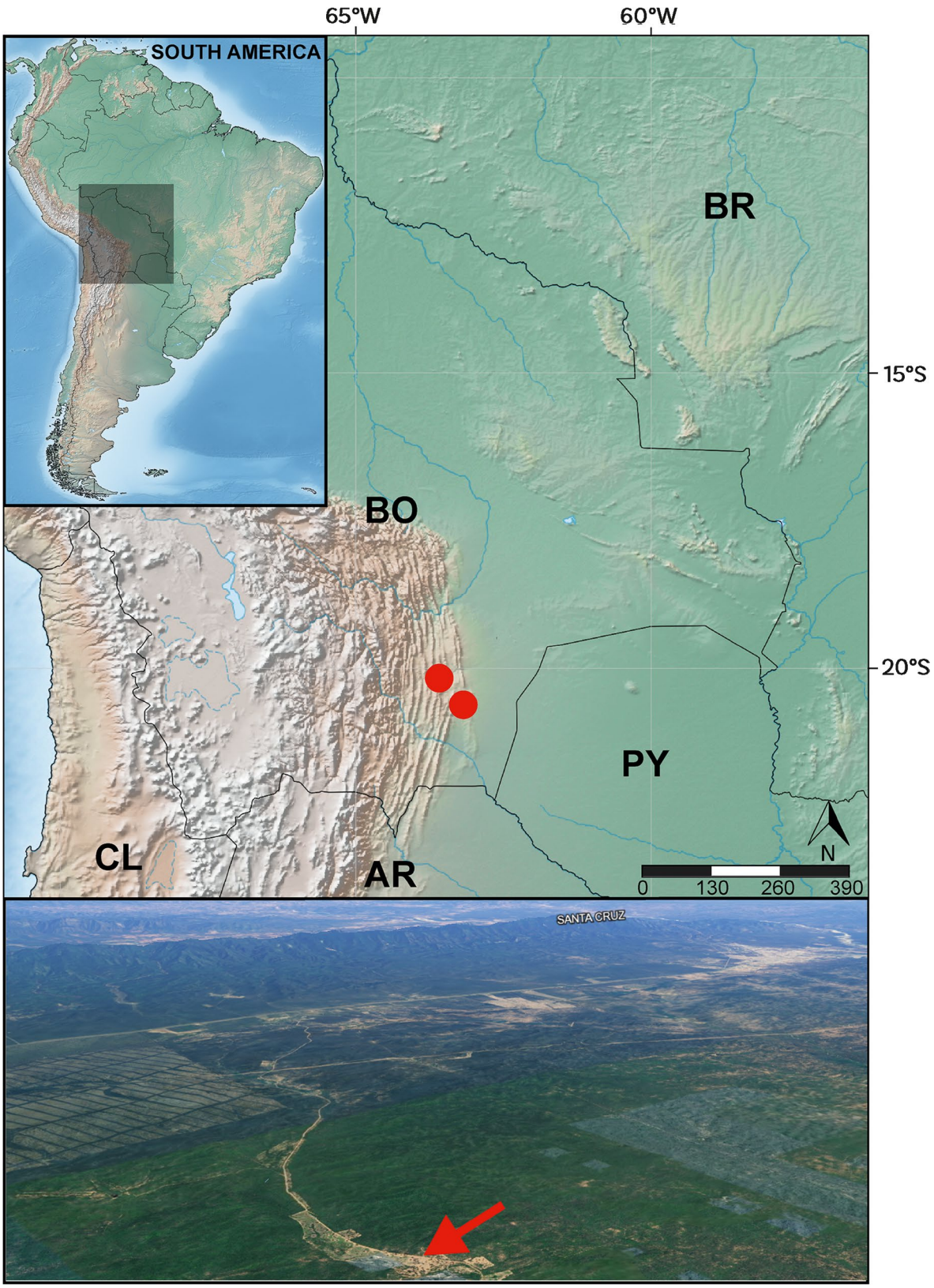


Fig. 2. *Macroptilium chuquisacense*. **A** calyx, opened out, outer surface; **B** standard petal; **C** bud; **D** wing petal; **E** keel petals; **F** androecium; **G** gynoecium; **H** seed, lateral view; **J** seed, hilum view; **K** fruit; **L** habit. (**A** – **G** from *Toledo & Joaquin* 10596; **H** – **L** from *Toledo* 13917). DRAWN BY C. L. RIBEIRO.

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Map 1. Distribution of *Macroptilium chuquisacense* in South America (above) and a satellite image of Luis Calvo province, Bolivia, with a red arrow indicating the Estacion Experimental del Chaco (below). Abbreviations, AR – Argentina, BR – Brazil, BO – Bolívia, CL – Chile, PY – Paraguay.

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is in the Gran Chaco ecoregion, characterised by low deciduous forest vegetation and a long dry season of 6 to 10 months (Ibisch & Mérida 2003).

ADDITIONAL SPECIMEN EXAMINED. BOLIVIA. Chuquisaca, Luis Calvo, El Salvador, CIMBOC, 5 Dec. 1996, *C. S. Toledo* 13917 (paratype: CTES [286935]).

CONSERVATION STATUS. *Macroptilium chuquisacense* is known from only two collections, both from the same locality (Map 1). Due to the limited number of records and the absence of comprehensive data on the species' distribution, population size, and potential threats to it, its conservation status cannot be reliably assessed at this time. Consequently, the species is here provisionally classified as Data Deficient [DD], following the *IUCN Red List Categories and Criteria* (IUCN 2024).

ETYMOLOGY. The epithet 'chuquisacense' emphasises the distribution of this species, which is restricted to Chuquisaca, Bolivia.

PHENOLOGY. Currently, the known flowering and fruiting period of *Macroptilium chuquisacense* is from December to February.

NOTES. In the genus *Macroptilium*, there is a wide range of corolla wing petal colours, which vary from white to yellow, orange, pink, red, dark purple and wine-coloured. However, only *M. chuquisacense* has been recorded with a lilac-coloured corolla (*Toledo & Joaquin* 10596), which is an important characteristic for the identification of this species when in flower. The new species belongs to *Macroptilium* sect. *Microcochle*, because it has flowers less than 8 mm long and campanulate calyces with teeth equal to, or smaller than, the length of the tube.

Identification key to the Bolivian species of *Macroptilium*

1. Leaves unifoliolate ..... **M. monophyllum**
1'. Leaves trifoliolate **2**
2. Flowers with a campanulate calyx; fruits less than 2.5 cm long **3**
2'. Flowers with a tubular calyx; fruits more than 3 cm long **8**
3. Flowers with calyx teeth 1.5 – 5 × longer than the tube; fruits with lanate valves, not compressed between the seeds ..... **M. martii**
3'. Flowers with calyx teeth equal to or shorter than the tube; fruits with pilose, pubescent, hirsute or sericeous valves, compressed between the seeds **4**
4. Twining herb; leaflets lobate ..... **M. sabaraense**
4'. Prostrate or erect herb; leaflets not lobed **5**
5. Leaflets membranaceous; wing petals orange or pink with vinaceous veins **6**
5'. Leaflets papyraceous or chartaceous; wing petals yellow or lilac **7**
6. Indumentum pubescent on the stems; stipules shorter than 6.7 mm long; calyx teeth equal to or longer than the tube ..... **M. psammodes**
6'. Indumentum hirsute on the stems; stipules more than 8 mm long; calyx teeth shorter than the tube ..... **M. fraternum**
7. Stipules more than 7 mm long; wing petals lilac ..... **M. chuquisacense**
7'. Stipules less than 5 mm long; wing petals yellow ..... **M. prostratum**
8. Wing petals orange or salmon-coloured; fruits less than 3.5 mm long ..... **M. erythroloma**
8'. Wing petals red, vinaceous or dark purplish red; fruits more than 4 cm long **9**
9. Indumentum canescent on the lower surface of the leaflets, calyx and inflorescence rachis; wing petals dark purplish red ..... **M. atropurpureum**
9'. Indumentum pilose, pubescent, hispid, hirsute or villous (with hyaline trichomes) on the lower surface of the leaflets, calyces and inflorescence rachis; wing petals red or vinaceous **10**
10. Peduncular bracts forming a complete ring slightly above the peduncle base; floral bracts twice as long as the calyx ..... **M. bracteatum**
10'. Peduncular bract arranged in two tufts at the base of the inflorescence; floral bracts equal to or shorter than the calyx **11**
11. Leaflet papyraceous, pubescent on the upper surface; flowers less than 1.8 cm long; fruits less than 7 cm long ..... **M. gracile**
11'. Leaflets membranaceous, glabrous or glabrescent on the upper surface; flowers more than 2 cm long; fruits more than 9 cm long ..... **M. lathyroides**

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Declarations

Data Availability Data used in this study are included in the text or on the herbarium specimens and images cited.

Author's Contributions All authors contributed to the writing and editing of the manuscript. New species data acquisition and analysis: CLR; Illustration: CLR.

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Conflicts of interest The authors declare that they have no conflicts of interest.

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