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An unusual new species of *Chusquea* sect. *Serpentes* (Poaceae: Bambusoideae: Bambuseae) from the Bolivian Andes

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Abstract. *Chusquea hystrix*, a new species of *Chusquea* sect. *Serpentes* and the first of this section to be identified in Bolivia, is here described. This species is easily distinguished from other described *Chusquea* by the presence of sharp, brown hairs 1–4 mm long on the culm internodes, 2.5–5 mm long on the culm leaf sheaths, and 2.5–3.5 mm long on the foliage leaf sheaths. Unlike other species of *C.* sect. *Serpentes* for which full culm leaves are known, *C. hystrix* has pseudopetiolate, photosynthetic culm leaf blades, a character state previously primarily known from *Chusquea* sect. *Tenellae*. Although morphologically distinctive, *C. hystrix* is known only from the type locality and is thus considered endemic to the department of La Paz, Bolivia. We present a full vegetative macromorphological description of *C. hystrix*, micromorphological description of the foliage leaves, informal conservation assessment, map showing the location of the only known collection of *C. hystrix*, and an updated description of and key to *C.* sect. *Serpentes*.

Keywords: Chusqueinae, micromorphology, Neotropical woody bamboo

INTRODUCTION

Chusquea Kunth is the most species-rich genus of Neotropical woody bamboos, comprising just over 200 described species (Vidal et al. 2023; Refulio-Rodriguez et al. 2025). While many of the bamboo species native to Bolivia belong to *Chusquea,* the country's bamboo flora is relatively poorly-collected and understudied (Clark 2001). About 20 described species of *Chusquea* have been previously recorded in Bolivia, compared to 34 in neighboring Peru (Renvoize et al. 1998; Guerreiro et al. 2016; Attigala et al. 2017; Refulio-Rodriguez et al. 2025). One of the sections of *Chusquea* previously thought absent from Bolivia is *Chusquea* sect. *Serpentes* L.G.Clark of *C.* subg. *Chusquea*. *Chusquea* sect. *Serpentes* was recently recircumscribed to include nine species, including the separately described *C. kochii* Ruiz-Sanchez, Mejía-Saulés & L.G.Clark (Ruiz-Sanchez et al. 2022; McMurchie et al. 2022). Species of *C.* sect. *Serpentes* are generally distinguished from other *Chusquea* by the combination of their scandent habit, broad foliage leaves, infravaginal branching, and two to 12 subsidiary buds in a single constellate row (McMurchie et al. 2022). Described members of *C.* sect. *Serpentes* have a montane distribution from central Mexico to the central Andes, with the Peruvian *C. aspera* L.G.Clark considered the southern-most species (Ruiz-Sanchez et al. 2022; McMurchie et al. 2022).

In 2021 we had identified an unusual herbarium specimen of *Chusquea* from the department of La Paz, Bolivia, which had several characteristics in common with members of *C.* sect. *Serpentes*, including wide foliage leaves, a leaning and climbing habit, and two subsidiary branches emerging infravaginally from the culm leaf sheath. However, this specimen (the Royal Botanic Gardens, Kew (K) duplicate of *S. G. Beck & R. Foster 18535*) displayed other features unlike those of any known *C.* sect. *Serpentes*, including pseudopetiolate, photosynthetic culm leaf blades; asymmetrical, chartaceous culm leaf inner ligules up to 12.0 mm long; and long, sharp, brown hairs on the culm and foliage leaf sheaths and internodes. The differences between this species and more typical *C.* sect. *Serpentes* were so pronounced that we did not include it as *incertae sedis* within *C.* sect. *Serpentes* when recircumscribing the section (McMurchie et al. 2022). Sharp trichomes of the type observed on this species are atypical of *Chusquea* in general, being more characteristic of the Arthrostylidiinae and Guaduinae (Judziewicz et al. 1999). In addition to several genera in the Arthrostylidiinae, pseudopetiolate, photosynthetic culm leaf blades are also known from *C.* sect. *Tenellae* L.G.Clark, of which two previously described species, *C. ovatifolia* Attigala, A.Fuentes & L.G.Clark and *C. ramosissima* Lindm., are found in Bolivia (Attigala et al. 2017). Foliose, pseudopetiolate culm leaf blades are also found associated with the mid- to upper culm nodes of the Ecuadorian endemic *C. perligulata* (Pilg.) McClure of *C.* sect. *Verticillatae* L.G.Clark (Clark and Mason 2019).

To clarify the identify of this specimen further, we examined the foliage leaf micromorphology of the K duplicate of *S. G. Beck & R. Foster 18535* using scanning

electron microscopy (SEM). To confirm the generic placement of this species, it is necessary to determine the presence of two papillae per subsidiary cell of the stomatal apparatus, a micromorphological synapomorphy of *Chusquea* (Leandro et al. 2019). We additionally searched for the presence of horizontally elongated silica bodies in the costal zones of the foliage leaves, a characteristic unknown from *C.* sect. *Serpentes* but seen in all previously surveyed species of *C.* sect. *Tenellae* (Leandro et al. 2019; McMurchie et al. 2022).

MATERIALS & METHODS

We examined herbarium material from K and LPB for this study, comparing the specimens against *C.* sect. *Serpentes* and *C.* sect. *Tenellae* specimens from ISC, K, LPB, MO, US, and USZ. We followed Thiers (2025 [continuously updated]) in usage of standard herbarium acronyms. Herbarium material from K was examined macromorphologically with the assistance of a Bausch & Lomb 0.7X–3X StereoZoom dissecting microscope, while herbarium material from LPB was examined using a hand lens. Macromorphological descriptions followed the terminology used by McMurchie et al. (2022), Fadrique et al. (2019), and Clark (1989).

Photos of the foliage leaf, culm leaf, and branch complement used for the macromorphological composite image of *S. G. Beck & R. Foster 18535* (K duplicate) were taken in an MK Digital Direct Photo-eBoxPlus using a Canon EOS 5D Mark II camera. A Nikon SMZ745ST digital stereo microscope was used to view smaller features, including ligular regions and the base of the culm leaf. A Nikon Digital Sight DS-Vi1 camera and Nikon Digital Sight DS-L2 camera control system were used to take photos of these smaller structures.

Scanning electron microscopy (SEM) was performed on a foliage leaf sample from *S. G. Beck & R. Foster 18535* (K duplicate) at the Roy J. Carver High Resolution Microscopy Facility (HRMF) at Iowa State University following the procedure of McMurchie et al. (2022) and a slightly modified version of the McMurchie et al. (2022) procedure using iridium for sputter coating of the leaf material rather than platinum. Micromorphological descriptions followed Ellis (1979), with additional reference to Leandro et al. (2017) for description of unicellular microhairs. The composite image of macromorphological features and the micromorphological figure were assembled using Adobe Photoshop 2024 version 25.11.0 (Adobe Systems, San Jose CA, U.S.A.; Preston Brown et al. 2024). SEM images were deposited in an Iowa State University DataShare Repository and are available at https://doi.org/10.25380/iastate.30015391.

QGIS Desktop version 3.18.2-Zürich was used to construct the map using a South America void-filled digital elevation model created by the World Wildlife Fund published by the U.S. Geological Survey through the HydroSHEDS program (World Wildlife Fund 2006; QGIS Development Team 2021). Political borders were obtained from the HCMGIS QGIS plugin (Quach 2025). The location of *S. G. Beck & R. Foster 18535* was estimated using Google Earth Pro 7.3.6.10201 (Google 2025); following the protocol of McMurchie et al. (2022), the estimated coordinates are placed in brackets with an asterisk. We followed the guidelines of the International Union for Conservation of Nature to perform the analysis of occupancy (AOO) and informal conservation assessment (IUCN 2012, 2018, 2024).

RESULTS

The results of our macro- and micromorphological examination of *S. G. Beck & R. Foster 18535* indicated that the collection represents a new species of *C.* sect. *Serpentes.*

Macromorphological comparison. Photos of the holotype are given in Figs. 1 & 2, and a composite of the critical macromophological features from the isotype are presented in Fig. 3. *Chusqua hystrix* is readily morphologically distinguished from *C. aspera* by the presence of sharp,

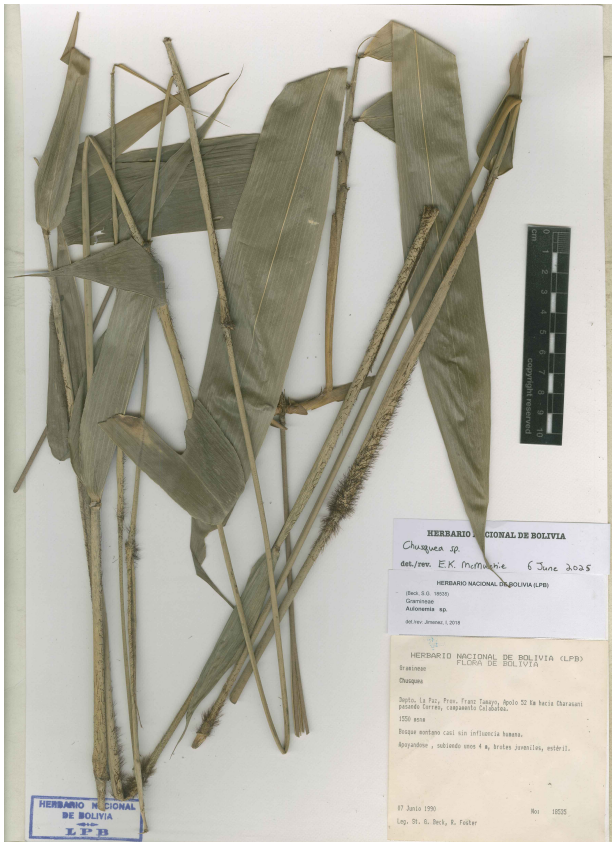

Figure 1. *Chusquea hystrix*, *S. G. Beck & R. Foster 18535* (LPB). This sheet displays culms with intact culm leaves placed on top of a subsidiary branch with a single foliage leaf complement. Photo by Edgar Mayta Chipana.

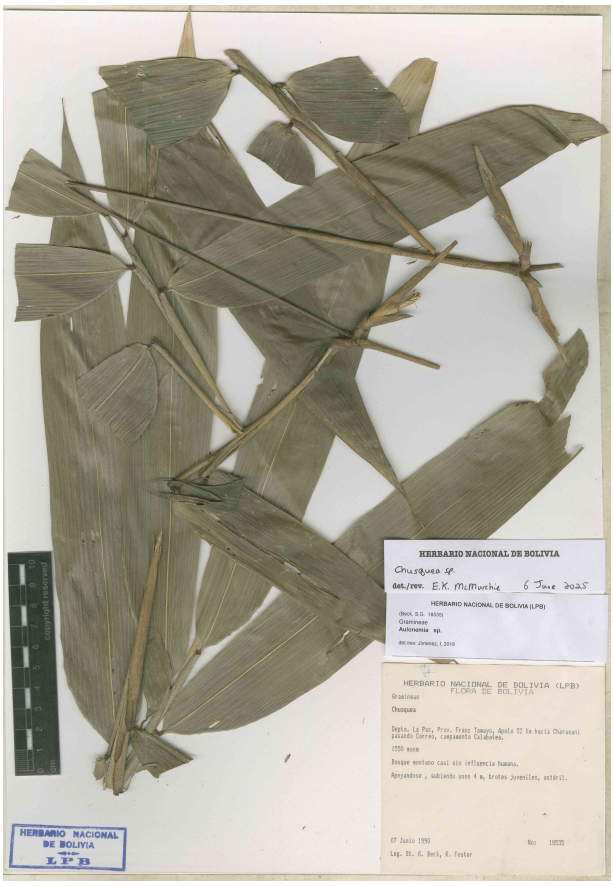

Figure 2. *Chusquea hystrix, S. G. Beck & R. Foster 18535* (LPB). This sheet displays branch complements with leafy subsidiary branches. Photo by Edgar Mayta Chipana.

brown hairs on the culm internodes (Fig. 1), abaxial surface of the culm leaf sheaths (Fig. 3B), and keels of the foliage leaf sheaths (Fig. 3E); this trichome type is lacking from *C. aspera*. The 0.6–3.0 mm wide culm leaf girdles of *C. hystrix* (Fig. 3B) are within the normal range for *C.* sect. *Serpentes*, for which the culm leaf girdles are 0.3–15 mm wide; note that McMurchie et al. (2022) incorrectly reported the culm leaf girdles of *C.* sect. *Serpentes* as both 0.3–5 cm wide and 0.3–5 mm wide. The inner ligules of the foliage leaves of *C. hystrix* are only 1.2–2.0 mm long and truncate (Fig. 3E), as opposed to the rounded, 2.5–7.0 mm long foliage leaf inner ligules of *C. aspera.* Although the pseudopetiolate, photosynthetic culm leaf blades of *C. hystrix* (Fig. 1; Fig 3D) are similar in morphology to those of other described Bolivian *Chusquea* of *C.* sect. *Tenellae*, *C. ovatifolia* and *C. ramosissima*, these species lack the sharp, brown hairs on their culm internodes and culm and foliage leaf sheaths that *C. hystrix* has (Fig. 1; Fig. 2; Fig. 3B, C, E). *Chusquea ovatifolia* and *C. ramosissima* have more subsidiary branches per complement than *C. hystrix*, with *C. ovatifolia* having (3–)5–9 and *C. ramosissima* having 20–50 subsidiary branches per complement, compared to the two subsidiary branches of *C. hystrix* (Fig. 2; Fig. 3F). The foliage leaf blades of *C. hystrix* are typically much larger in size than those of the Bolivian *C.* sect. *Tenellae*, at (9.4–)22.3–31.0 cm long and 2.7–4.6 cm wide (Fig. 2; Fig. 3A), compared to those of *C. ovatifolia*, which has foliage leaf blades (3–)4–8.2 cm long and 0.8–2.5 wide, and *C. ramosissima*, with foliage leaf blades 4–9.4(–12) cm long and 0.5–1.5(–1.8) cm wide.

Foliage leaf micromorphology. Scanning electron microscopy (SEM) images are presented in Fig. 4, and are summarized in the following description.

Adaxial surface: Long cells elongated horizontally in the costal and intercostal zones. Bulliform cells elongated horizontally, though less so than other intercostal cells, individual cells slightly taller vertically than other intercostal cells. Short cells between the long cells in the costal zones, infrequent in the intercostal zones, containing silica bodies. Silica bodies vertically elongated, smooth saddle-shaped with a wide central portion to irregularly cross-shaped in the costal zones; vertically elongated and rounded, smooth saddle-shaped with a wide central portion, or irregularly cross-shaped in the intercostal zones. Papillae absent from long cells. Prickles absent. Microhairs in the intercostal zones, of two types: one type unicellular, the base slightly inflated or parallel-sided, the apex sharply pointed; the other bicellular, the basal cell slightly longer than the distal cell, basal and distal cells much longer than they are wide, the basal cell slightly constricted at the base, the distal cell slightly tapered to a rounded apex. Macrohairs absent. Stomatal apparatuses rare; subsidiary cells low triangular-shaped; two simple, rounded papillae per subsidiary cell.

Abaxial surface: Long cells elongated horizontally in the costal and intercostal zones. Short cells between the long cells in the costal zones, infrequent in the intercostal zones, containing silica bodies. Silica bodies nearly equidimensional and cross-shaped or vertically elongated and rounded, cross-shaped, irregularly smooth saddle-shaped with a wide central portion, or crenate in the costal zones; vertically elongated and smooth saddle-shaped with a wide central portion or irregularly cross-shaped in the intercostal zones. Papillae absent from long cells. Prickles absent to abundant in costal zone and intercostal zone in the interstomatal band, with a few scattered between stomatal apparatuses in the stomatal band; barbs typically short, less commonly long, pointing in the same direction or rarely turned 90° from the direction most are pointing. Microhairs in the costal and intercostal zones, of two types: one type unicellular, the base parallel-sided, the apex sharply pointed; the other bicellular, the basal cell slightly shorter to slightly longer than the distal cell, basal and distal cells much longer than they are wide, the basal cell more or less parallel-sided at the base, the distal cell broadly rounded to slightly tapered to a rounded apex. Macrohairs absent to rare in costal zones, absent in intercostal zones; unicellular, the base of the hair swollen. Stomatal apparatuses in two to five rows on both sides of costal zones; subsidiary cells low triangular-shaped; two simple, rounded papillae per subsidiary cell.

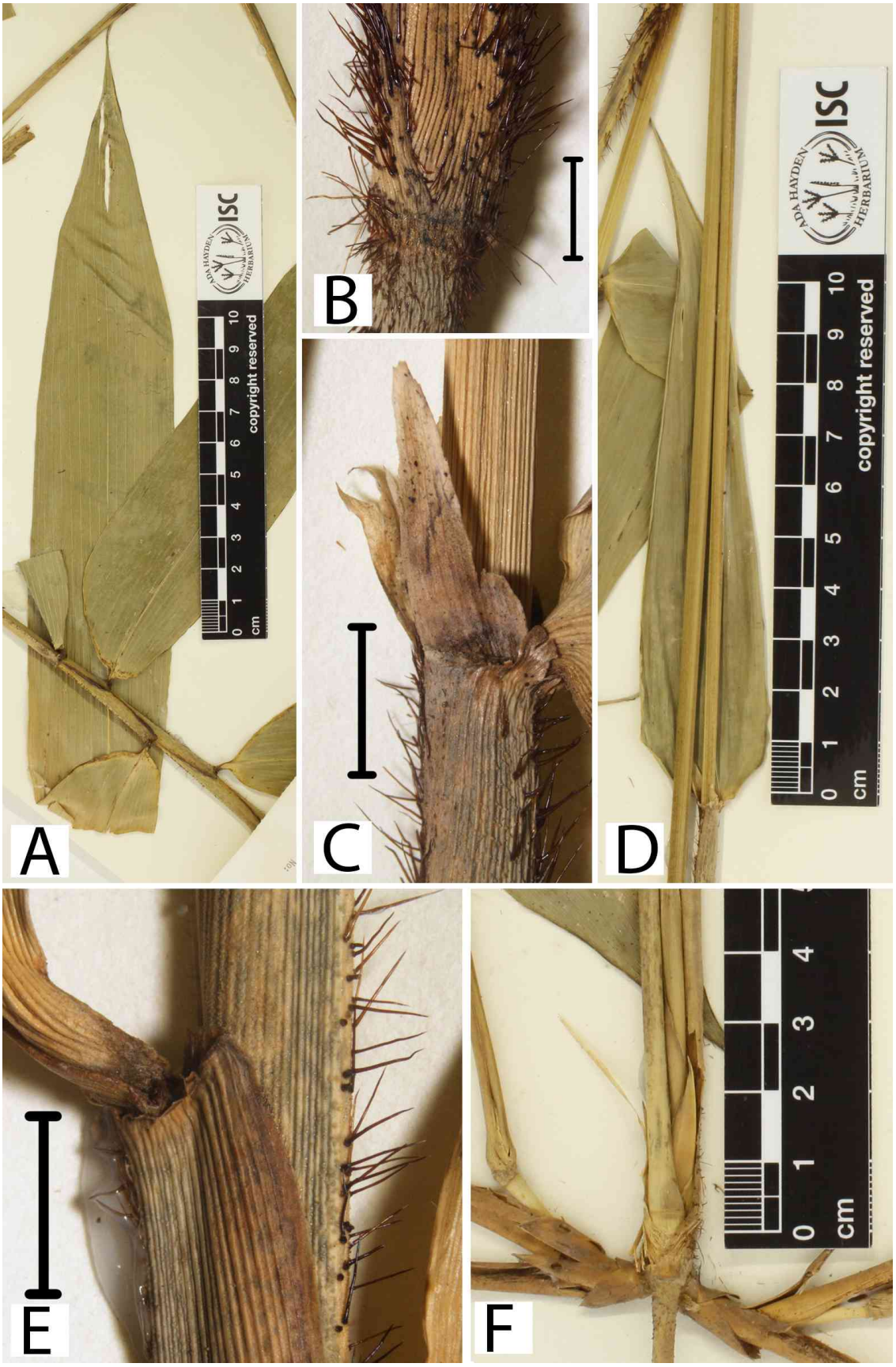

Figure 3. *Chusquea hystrix*, *S. G. Beck & R. Foster 18535* (K). Selected macromorphological features. A. Foliage leaf, abaxial surface, B. Culm leaf sheath base and girdle, C. Culm leaf inner ligule, D. Culm leaf blade, E. Foliage leaf ligular region, F. Branch complement. Scale bars in B, C, and E are 5 mm. Photos by Elizabeth K. McMurchie.

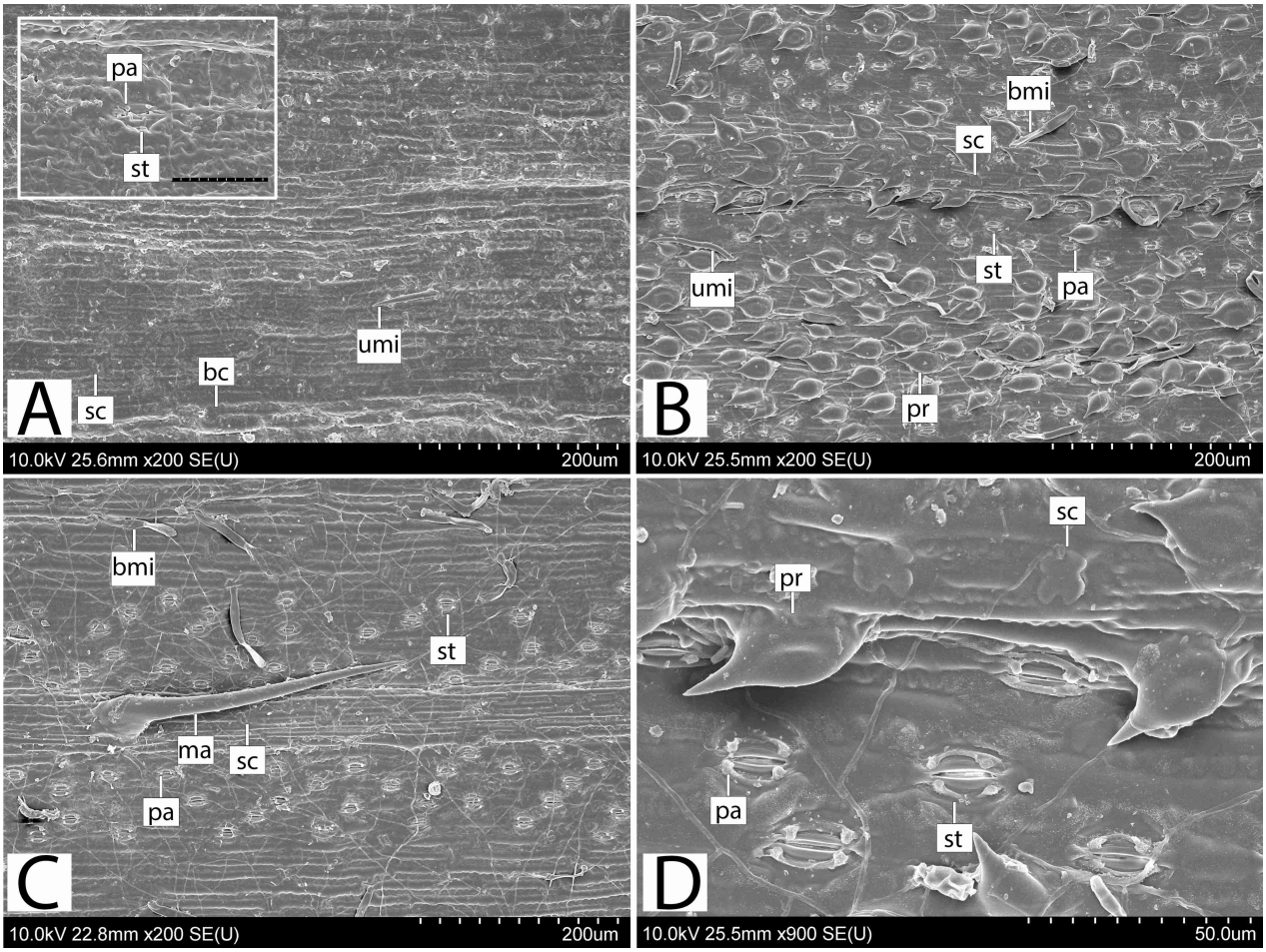

Figure 4. Micromorphology of foliage leaves of *C. hystrix* from *S. G. Beck & R. Foster 18535* (K). Adaxial surface (A), abaxial surface (B–D). Abbreviations: bc = bulliform cell; ma = macrohair; bmi = bicellular microhair; umi = unicellular microhair; pa = papilla; pr = prickle; sc = silica cell; st = stomatal apparatus. Inset scale bar 50 µm. Imaging by Elizabeth K. McMurchie.

DISCUSSION

Chusquea hystrix is morphologically unusual not only for *C.* sect. *Serpentes*, but for *Chusquea* as a whole, enabling it to be readily distinguished from other *Chusquea* despite the lack of a known flowering specimen. The sharp, brown, relatively long hairs seen on the internodes (Fig. 1), culm leaf sheaths (Fig. 1; Fig. 3B, C), and foliage leaf sheath keels (Fig. 2; Fig. 3E) appear unique among described species of *Chusquea* (Judziewicz et al. 1999; Ruiz-Sanchez et al. 2021). Examination of the branching, which clearly displays two subsidiary branches beneath a single central bud or branch (Fig. 2; Fig. 3F), supports the placement of this species in *Chusquea*, as the arrangement of a single central bud surrounded by multiple subsidiary buds or branches is unique to *Chusquea* in the Neotropical woody bamboos (Judziewicz et al. 1999). The presence of pseudopetiolate, photosynthetic culm leaf blades (Fig. 1; Fig. 3D) led us to initially consider that *C. hystrix* might be a member of *C.* sect. *Tenellae*, as these character states are limited to this section in the Central Andes (Attigala et al. 2017; Clark and Mason 2019). However, the central bud of *C. hystrix* is triangular rather than parallel-sided with a broadly triangular apex as seen in *C.* sect. *Tenellae*, and the two branches appear to have emerged from a single row, a character state typical of *C.* sect. *Serpentes* (Attigala et al. 2017; McMurchie et al. 2022). The relatively large, linear-lanceolate to lanceolate foliage leaf blades seen in *C. hystrix* (Fig. 2; Fig. 3A) are also typical of *C.* sect. *Serpentes*, as opposed to *C.* sect. *Tenellae*, where foliage leaf blades are usually smaller in size and lanceolate to ovate in shape (Attigala et al. 2017; McMurchie et al. 2022). Finally, while *C.* sect. *Tenellae* contains almost all previously described species of *Chusquea* known to have pseudopetiolate, photosynthetic culm leaf blades, excluding the Ecuadorian *C. perligulata* (Attigala et al. 2017; Clark and Mason 2019), full culm leaves of two species of *C.* sect. *Serpentes*, *C. acutigluma* L.G.Clark & McMurchie and *C. aspera*, have never been observed, leaving the possibility

that culm leaf blades of these species could be morphologically similar to those of *C. hystrix* (McMurchie et al. 2022).

Micromorphologically, the placement of *C. hystrix* in *Chusquea* was supported by the presence of two papillae per subsidiary cell of the stomatal apparatuses (Fig. 4A inset, D) (Leandro et al. 2019). *Chusquea hystrix* differs from species of *Chusquea* sect. *Tenellae* in that it lacks horizontally-elongated silica bodies in the costal zones of its foliage leaves (Leandro et al. 2017). The vertical elongation of the silica bodies in the costal zones of the foliage leaves of *C. hystrix* (Fig. 4 A–D) supports the placement of this species in *C.* sect. *Serpentes*, where vertically elongated silica bodies in the costal zones of the foliage leaves are ubiquitous (Clark 1986; McMurchie et al. 2022). The shape of the silica bodies seen in the foliage leaves of *C. hystrix* is unusual, however. Cross-shaped silica bodies in the costal zones of foliage leaves like those seen in *C. hystrix* (Fig. 4D) have been previously recognized in a few species of *Chusquea*, including *C. pittieri* Hack. and *C. valdiviensis* É.Desv. in Gay (Piperno and Pearsall 1988; Guerreiro et al. 2013), but are not typical of the genus (Leandro et al. 2019). Prior to this study, cross-shaped silica bodies, which are more typically associated with the Olyreae, had never been observed in the foliage leaves of *C.* sect. *Serpentes* or *C.* sect. *Tenellae* (Clark 1986; Leandro et al. 2017; Leandro et al. 2019; McMurchie et al. 2022). The silica bodies of *C. hystrix* are occasionally crenate in the costal zones of the abaxial surface of the foliage leaf; although crenate silica bodies have been observed in this location in some members of *C.* sect. *Tenellae*, in those species, they are always horizontally elongated (Leandro et al. 2017). Unicellular microhairs, previously not observed in *C.* sect. *Serpentes*, but seen in *C.* sect. *Tenellae*, were seen in *C. hystrix* on both surfaces of the foliage leaves (Fig. 4A, B) (Leandro et al. 2017). Although uncommon, unicellular microhairs are not unique to *C.* sect. *Tenellae*, however, and have also been observed in *C. robinfosteri* Refulio, Klahs & L.G. Clark (Leandro et al. 2019; Refulio-Rodriguez et al. 2025). Among species of *C.* sect. *Serpentes* for which foliage leaf micromorphology has previously been examined, *C. hystrix* appears most similar to *C. virgata* Hack., which lacks the papillae found in abundance on the abaxial surface of the intercostal zones in *C. acutigluma*, *C. latifolia* L.G.Clark, *C. recurvata* L.G.Clark, McMurchie & B.J.Peterson, and *C. serpens* L.G.Clark (Clark 1986; McMurchie et al. 2022). The foliage leaf abaxial surface of *C. hystrix* is variable in appearance based on presence of trichomes, with prickles and macrohairs sometimes present or absent (Fig 4 B–D).

The description of *C. hystrix* represents an expansion of the range of *C.* sect. *Serpentes* into Bolivia (Fig. 5). Unfortunately, due to heavy deforestation in the area in which the only known collection of this species was made, the species is likely Critically Endangered if the population in which it was found has not been destroyed. As the woody bamboos of Bolivia are relatively understudied (Clark 2001; Ruiz-Sanchez et al. 2021), there could be additional populations of *C. hystrix* in the wild or represented by herbarium specimens. Notably, the sharp brown trichomes of *C. hystrix*, combined with the pseudopetiolate, photosynthetic culm leaf blades of this specimen, give it the superficial appearance of *Aulonemia* Goudot (Judziewicz et al. 1999), to which the Herbario Nacional de Bolivia (LPB) duplicate specimen was referred. Due to these features that are unusual for *Chusquea*, unidentified collections of *C. hystrix* could potentially be found among specimens of *Aulonemia* or other Arthrostylidiinae, but can be distinguished readily by the presence of multiple subsidiary branches around a single central bud or branch (Judziewicz et al. 1999). Careful examination of the branching in the Neotropical woody bamboos is necessary to confirm generic identification; if branching is not included in a specimen, micromorphological examination of foliage leaves can support identification as well (Leandro et al. 2019).

TAXONOMIC TREATMENT

CHUSQUEA SECT. SERPENTES L.G.Clark, Syst. Bot. Monogr. 27: 91. 1989. TYPE: *Chusquea serpens* L.G.Clark.

Culms vining, trailing, or clambering and hanging, 2–40 m long. Internodes 8.4–58.8 cm long, mostly solid and terete, usually scabrid to scabrous, sometimes glabrous or with sharp, brown hairs, not waxy. Culm leaves usually persistent, often abaxially scabrous or asperous, with sharp brown hairs in *C. hystrix*; sheaths more or less rectangular to triangular; outer ligule typically absent; blades typically erect, usually deciduous, variable in size relative to sheaths, lacking a pseudopetiole and more or less similar to the sheath in color (but pseudopetiolate and green in *C. hystrix*); girdle 0.3–15 mm wide, usually well developed. Nodes at mid-culm with one circular or triangular central bud subtended by 2(–12) smaller, subequal subsidiary buds; sheath scar dipping slightly below bud complement to more or less horizontal; root thorns absent; supranodal ridge evident, usually not prominent. Branching infravaginal, with or without a promontory at the base; central bud developing or not; subsidiary branches 0.9–5.7 mm in diameter. Foliage leaf blades 7.5–36 cm long, 0.9–8.5 cm wide, L: W 2.5–16, abaxially tessellate or not, green, flat in cross section. Synflorescences 4.7–60 cm long, narrowly or sometimes openly paniculate. Spikelets 6.8–15.7 mm long, terete or slightly laterally compressed; glumes variable, often at least 1/10 the spikelet length, although smaller in *C. glauca*, *C. pohlii*, and *C. virgata*; glume II often 1/4(–1/2) the spikelet length, but much smaller in *C. glauca*, *C. pohlii*, and *C. virgata*; glumes III and IV unequal, mucronate to awned except acute in *C. virgata*; glume III 1/2(–2/3) the spikelet length (1/3–2/5 in *C. virgata*); glume IV at least 5/8 the spikelet length (ca. 2/5 in *C. virgata*).

Key to the species of *Chusquea* sect. *Serpentes* based on vegetative characters

(adapted from McMurchie et al., 2022)

1. Foliage leaf sheath keels and internodes with sharp, dark brown hairs ..... *C. hystrix* L.G.Clark, McMurchie & Baya
1. Foliage leaf sheath keels and internodes glabrous, scabrous, or pubescent with hyaline to light brown hairs, but lacking sharp, dark brown hairs 2
   2. Foliage leaf inner ligules acute (rarely rounded) at the tip 3
   2. Foliage leaf inner ligules truncate to rounded, never acute 5
3. Culm leaf margins fused for 2.3 cm above base; subsidiary buds (2–)4–9(–12) per node; subsidiary branches not rebranching; Costa Rica and Panama ..... *C. pohlii* L.G.Clark
3. Culm leaf margins not fused; subsidiary buds 2 per node; subsidiary branches often rebranching; Colombia or Venezuela 4
   4. Foliage leaves 3–4 per complement; foliage leaf inner ligules acute, 1.9–6.7 mm long; central bud triangular; Colombia ..... *C. acutigluma* L.G.Clark & McMurchie
   4. Foliage leaves 6–12 per complement; foliage leaf inner ligules acute (rarely rounded), 2.2–8.5 mm long; central bud circular; Venezuela .. *C. recurvata* L.G.Clark, McMurchie & B.J.Peterson
5. Internodes scabrid, with a glaucous white band ca. 0.5 cm wide usually present on younger culms just below the nodal line; culm leaf sheaths 4–9 cm long ..... *C. glauca* L.G.Clark
5. Internodes glabrous to scabrous or hirsute, lacking a glaucous white band on younger culms below the nodal line; culm leaf sheaths 5–39 cm long 6
   6. Subsidiary buds 2–12 per node; internodes glabrous; subsidiary branch diameter 0.9–3.5 mm; foliage leaf blades 7.5–17 cm long, pseudopetiole abaxially pubescent 7
   6. Subsidiary buds always 2 per node; internodes usually scabrous for at least part of length, sometimes glabrous; subsidiary branch diameter (1.6–)2.7–5.5 mm; foliage leaf blades 11.5–36 cm long, pseudopetiole abaxially glabrous or occasionally with sparse hairs 8
7. Culm leaf sheaths 9.5–12.3 cm long, abaxially glabrous; foliage leaf blades 1.6–3.3 cm wide, their length to width ratio 3.2–5.2, ovate to lanceolate; Costa Rica and Panama ..... *C. virgata* Hack.
7. Culm leaf sheaths 5–10.5 cm long, abaxially hispid at the base, glabrous above; foliage leaf blades 1–1.9 cm wide, their length to width ratio 7.2–8.8, lanceolate; Mexico ..... *C. kochii* Ruiz-Sanchez, Mejía-Saulés & L.G.Clark
   8. Foliage leaf blades 3–8.5 cm wide, their length to width ratio 2.5–6; culms rebranching extensively from the lower nodes ..... *C. latifolia* L.G.Clark
   8. Foliage leaf blades 1.8–5 cm wide, their length to width ratio 5–9; culms rarely or apparently not rebranching 9
9. Culm leaf sheaths abaxially asperous; foliage leaf inner ligules 2.5–7 mm long; Peru ..... *C. aspera* L.G.Clark
9. Culm leaf sheaths glabrous to verrucose, sometimes with numerous rigid hairs; foliage leaf inner ligules 1–2(–2.5) mm long; Central and South American cloud forests from Costa Rica to the southern border of Ecuador ..... *C. serpens* L.G.Clark

Chusquea hystrix L.G.Clark, McMurchie & Baya, **sp. nov.** TYPE: BOLIVIA. Depto. La Paz: Prov. Franz Tamayo, Apolo 52 Km hacia Charasani pasando Correo, campamento Calabatea, [-14.93°, -68.41°]*, 1550 m, 7 June 1990 fl., *S. G. Beck & R. Foster 18535* (holotype, LPB!; isotype, K! [H2016/00428 2; H2016/00428 3]). Figs. 1–4.

Diagnosis. *Chusquea hystrix* differs from all other known species of *Chusquea* sect. *Serpentes* by the following combination of characters: Internodes 13.3–58.8 cm long, hispid with 1–4 mm long, sharp, brown hairs tapering off about 2–4 cm below the nodes; culm leaves with pseudopetiolate blades 11.1–18.9 cm long, 1.3–4.7 cm wide, green and photosynthetic when young, lanceolate to linear-lanceolate; and culm leaf sheath abaxial surfaces and foliage leaf sheath keels hispid with sharp, dark brown hairs.

Macromorphological description. Rhizomes unknown. Upper culms 0.4–0.5 cm diam., ca. 4 m long when young; leaning and climbing. Internodes 13.3–58.8 cm long, terete to slightly sulcate, mostly solid but hollow near nodes, scabrous, becoming hirsute and hispid 2–4 cm below nodes with 1–4 mm long, sharp, brown hairs. Culm leaves with sheaths persistent, 13.4–18.5 cm long, green and mottled with gray when young, abaxially basally densely hispid with 2.5–5 mm long, sharp, brown hairs, these hairs becoming sparser higher up the sheath, the apex sparsely hispid or merely scabrous, adaxially glabrous, the

margins densely ciliate with sharp brown hairs similar to those of abaxial sheath surface, not fused; sheath summit extension present on the underlapping side, erect, 1.0–2.0 mm long; girdles 0.6–3.0 mm wide, light brown, with two types of hair: 2.5–4 mm long, spreading, sharp, dark brown hairs and 0.5–0.8 mm long, retrorsely appressed, soft, golden-brown hairs; inner ligules asymmetrical and V-shaped, with the underlapping side 6.1–12.0 mm long and the overlapping side (3.0–)6.0–7.2 mm long, vascularized, chartaceous, pubescent with minute, antrorsely appressed, light golden-brown hairs; outer ligules (0.8–)1.7–2.1 mm long, truncate, erect, glabrous, the margins often erose and splitting with age; pseudopetioles 1.4–2.2 mm long, adaxially minutely hispid with hyaline hairs, abaxially glabrous; blades 11.1–18.9 cm long, 1.3–4.7 cm wide, lanceolate to linear-lanceolate, green and photosynthetic when young, eventually deciduous, abaxially glabrous to scabrous, weakly tessellate, adaxially glabrous, weakly tessellate, the base rounded, the midrib prominent, visible for all or most of the length of the blade, the margins minutely antrorsely scabrid, the apex narrowing to a bristle-like tip. Nodes swollen; central bud triangular, subtended by two subsidiary buds; nodal region 7.0–9.5 mm tall; nodal line more or less horizontal; supranodal ridge conspicuous. Branching infravaginal, comprising two subequal subsidiary branches and a central branch that may or may not develop and when developing, develops after subsidiary branches; subsidiary branches spreading, 19.6–28.5 cm long, 3.9–5.0 mm diam., not rebranching; single observed example of an immature developing central branch 9.1 cm long. Foliage leaves 5–8 per complement; foliage leaf sheaths green mottled with brown and gray, often brown at the margin, carinate, hispid along keel with sharp brown hairs 2.5–3.5 mm long, the rest of the sheath glabrous, the overlapping margin ciliate with 0.8–1.5 mm long, sharp, brown hairs, these wearing away with age, the underlapping margins glabrous or sparsely ciliate with light brown hairs ca. 0.5 mm long; sheath summit extension present on the underlapping side only, 1.0–2.0 mm long, glabrous, fused to the inner ligule; outer ligules 0.4–0.8 mm long, glabrous, truncate, erect to somewhat spreading, the margins wavy; inner ligules 1.2–2.0 mm long, truncate, glabrous, chartaceous; pseudopetioles 3.0–5.1(–5.8) mm long, distinct, somewhat asymmetrical, adaxially hispid with hairs 0.1–0.3 mm long, hyaline, to glabrous, abaxially glabrous; blades (9.4–)22.3–31.0 cm long, 2.7–4.6 cm wide, L:W ratio = (3.4–)5.0–6.8, linear-lanceolate with some younger leaves lanceolate, adaxially glabrous, not tessellate to very weakly tessellate, abaxially scabrous, tessellate to very weakly tessellate, the base oblique, asymmetrical, rounded, the midrib visible for full length of blade and centric to somewhat excentric, the margins cartilaginous, minutely antrorsely scabrid, the apex attenuate, narrowing to a bristle-like tip. Synflorescences unknown.

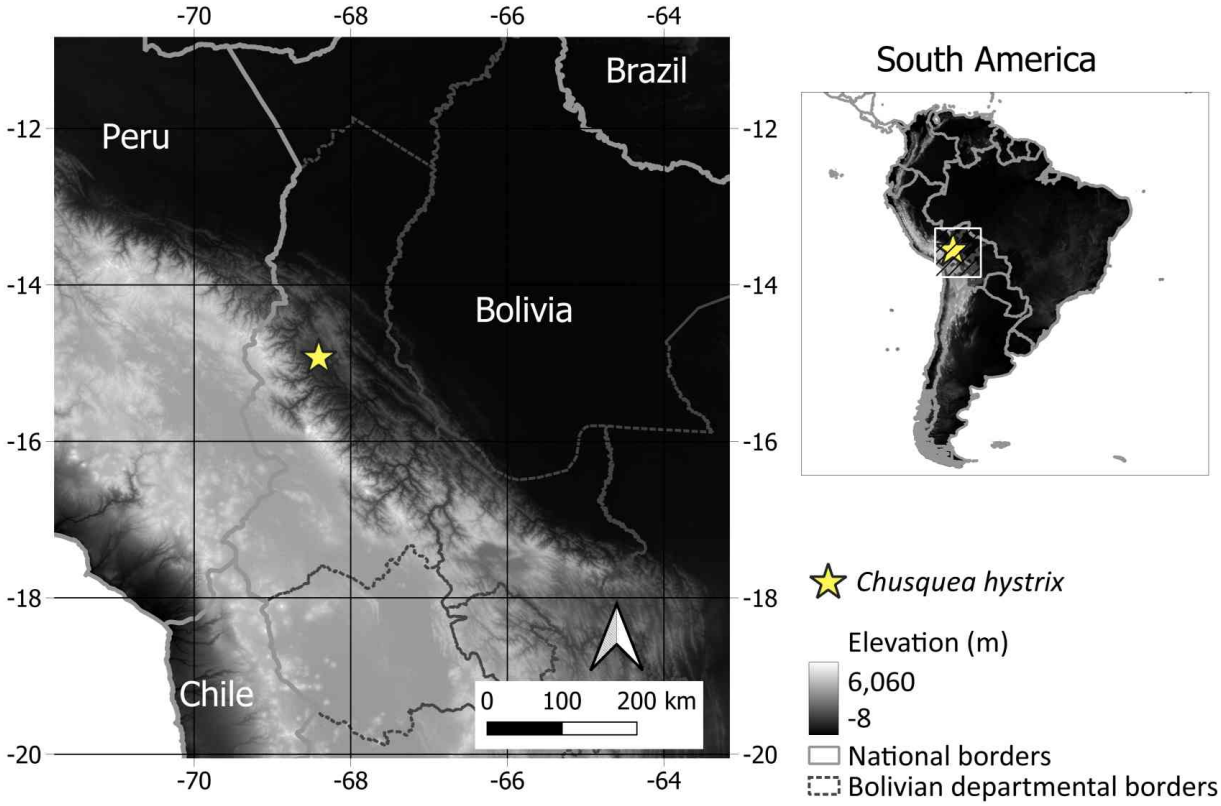

Figure 5. Shaded relief maps of the known geographic distribution of *C. hystrix* in the department of La Paz, Bolivia. The white box on the South America inset denotes the area depicted in the enlarged map. Digital elevation model created by the World Wildlife Fund through the HydroSHEDS program (World Wildlife Fund 2006) under an Attribution-NonCommercial 3.0 Unported license (https://creativecommons.org/licenses/by-nc/3.0/deed.en).

Etymology. This species is named for the sharp, hispid pubescence of its internodes, culm leaf sheaths, and foliage leaf sheath keels, reminiscent of the quills of a porcupine.

Phenology. No flowering specimens of this species are known.

Distribution and habitat. Franz Tamayo province, La Paz Department, Bolivia; primary humid mountain forest (bosque montano húmedo); 1550 m (Fig. 5). At the time of collection, Stephan Beck reported on the specimen label that *S. G. Beck & R. Foster 18535* grew in a forest with almost no human influence, but current satellite images show that this location has since undergone significant agricultural development (Google Earth Pro 2025).

Informal conservation assessment. Known only from the type collection in an area that has undergone significant deforestation since 1990. As there was only one known population of *C. hystrix*, we cannot estimate extent of occurrence (EOO). Based on limited label data, the area of occupancy (AOO) is estimated to be 4 km^2. The results of our AOO analysis and likelihood of continuing habitat degradation through development indicate that, pending field assessment, *C. hystrix* would be considered Critically Endangered (CR) under criteria B2ab(iii) were a formal conservation assessment to take place (IUCN 2018, 2024). If gregarious monocarpic flowering occurs in this species, then B2c(iv) would also apply (IUCN 2024).

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