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Elaphoglossum montanum, a New Species from Southern Brazil

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ABSTRACT.—*Elaphoglossum montanum*, a new fern species of the Atlantic Forest in southern Brazil, is described, illustrated, and compared to the most similar species. It belongs to the *Elaphoglossum* "*Subulate scales clade*" and occurs in the upper montane forest regions in the States of Rio Grande do Sul and Santa Catarina, between 600 and 1400 m.

KEY WORDS.—Atlantic Forest, southern Brazil, pteridophytes, taxonomy, floristic diversity

Elaphoglossum Schott ex J. Sm. contains ca. 600 species and ranks as one of the largest and most complex genera of ferns (Mickel and Atehortúa, 1980). It is pantropical but it is most diverse in the Neotropics, where ca. 80% of the species occur (Moran *et al.*, 2007). In Brazil, the highest species diversity is in the Atlantic Forest biome (Windisch and Kieling-Rubio, 2010), which is considered by Tryon (1972) as one of the three main centers of fern endemism and speciation in Tropical America. In southern Brazil (States of Paraná, Santa Catarina, Rio Grande do Sul), about 40 species of *Elaphoglossum* occur (Windisch and Kieling-Rubio, 2010), most of them occuring in humid forests, especially in montane and submontane areas.

Mickel and Atehortúa (1980) considered the genus *Elaphoglossum* as presenting nine sections, based on morphological characters. Part of these sections was supported by the molecular phylogeny presented by Skog *et al.* (2004) and Rouhan *et al.* (2004). Among the clades recovered by those studies is the "*Subulate scales clade*". Rouhan *et al.* (2004) indicated more details studies should precede a formal taxonomic definition of this group within the genus *Elaphoglossum*.

During a study on the genus *Elaphoglossum* for Brazil, we found a new species with subulate scales and hydathodes on the laminar margin, belonging to the "*Subulate scales clade*", *sensu* Skog *et al.* (2004), which we describe as follow.

Elaphoglossum montanum Kieling-Rubio & P.G. Windisch, ***sp. nov.*** TYPE.—BRAZIL. Santa Catarina: Lauro Müller, Serra do Rio do Rastro (28°23′58.1″S 49°33′0.3″W), 1372 m, 10 Mar 2011, *Kieling-Rubio & Windisch 900* (holotype ICN; isotypes B, RB). **Figs. 1–2.**

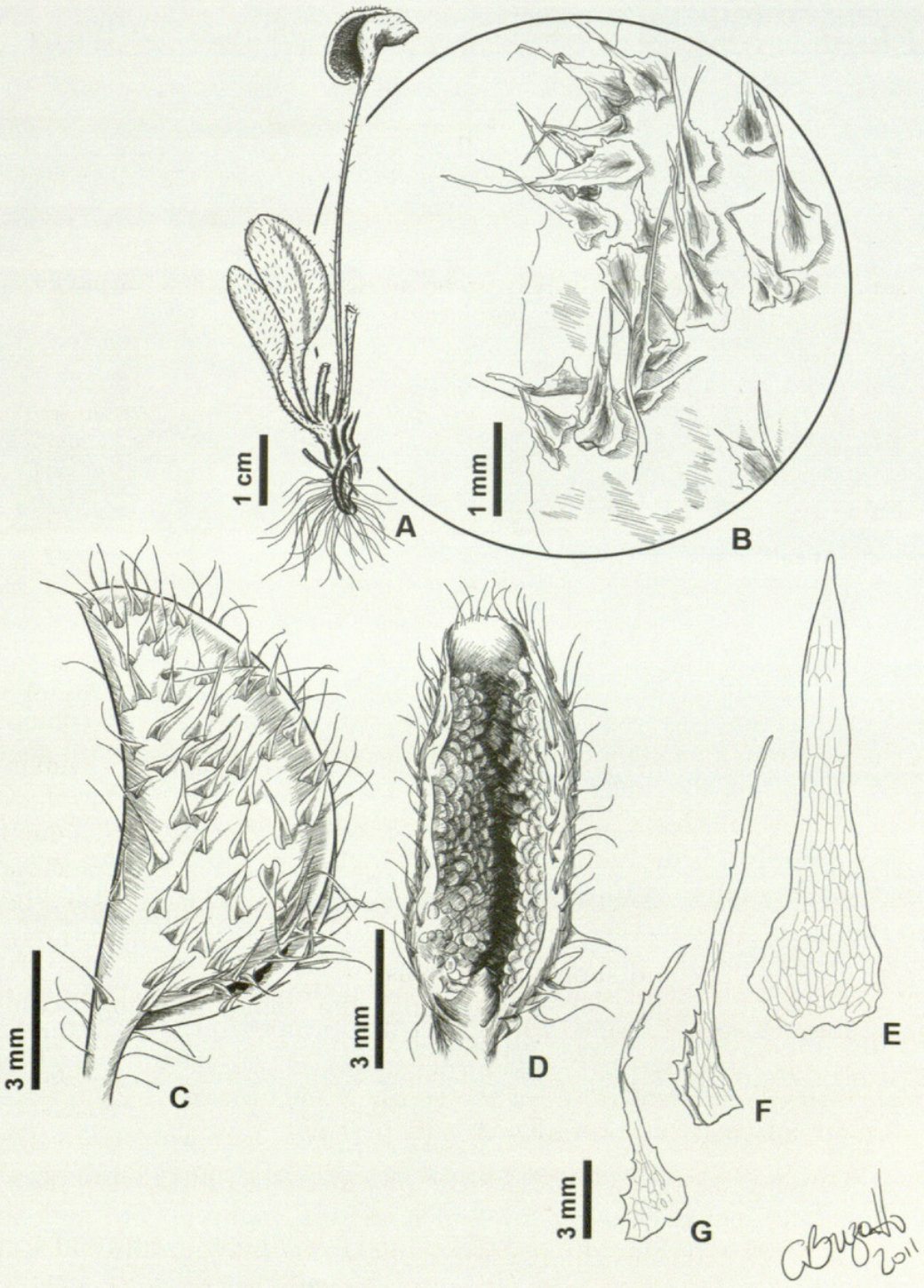

FIG. 1. *Elaphoglossum montanum*. A) Habit. B) Sterile lamina. C) Fertile lamina. D) Fertile lamina partially opened exposing sporangia. E) Rhizome scale. F–G) Laminar scales. (All Kieling-Rubio & Windisch 900 ICN).

Species *Elaphoglossum piloselloides* (C. Presl) T. Moore habitu aliquot similis, a qua frondibus fertilibus rotundatis et sporis uniformiter echinatis sine cristis differt.

Plants litophytic. Rhizomes short-ascending, 1.5–2.9 mm diam., rhizome scales 0.2–0.4 × 2.5 mm, brown, lanceolate. Fronds dimorphic, 2.8–9 cm long.

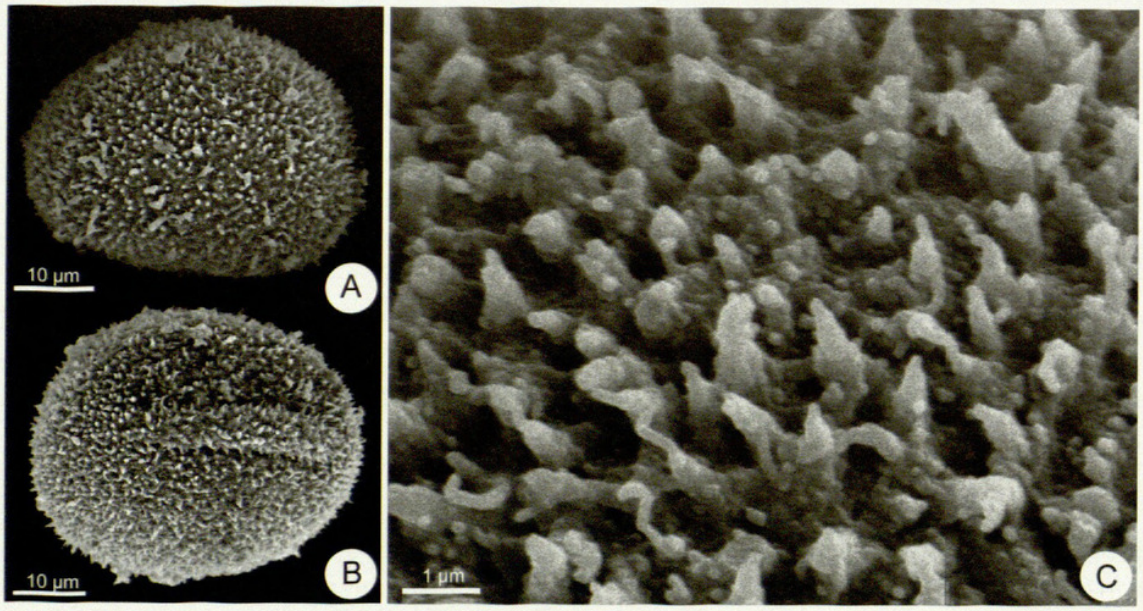

FIG. 2. A–C. Scanning electron micrographs of spore of *Elaphoglossum montanum* (Spanholi s.n. ICN). A) Distal face. B) Proximal face. C) Detail of the echinate perispore.

Sterile fronds simple, 2.8–7 cm long; stipes 1.5–4.0 cm long × 0.5–0.8 (1.0) mm diam., light green, covered with subulate scales (bases flat or somewhat enrolled), 2–5 mm long, light brown sometimes darker at the base, with dentate margins and a hair-like apex; laminae 1.3–3.0 cm long × 0.4–0.8 mm wide, chartaceous to coriaceous, elliptic, apices rounded, margins recurved when dry, veins barely visible, terminating in hydathodes close to the margins; laminar scales similar to those of the stipes, densely covering both surfaces when young, then glabrescent on the adaxial surface. Fertile fronds equaling or usually longer than the sterile ones; stipes 2.5–6.0 cm long × 0.6–1.0 mm diam., brown, scales similar to those on sterile fronds; fertile laminae 0.5–3.0 cm long × 0.4–1.0 cm wide, rounded (appearing reniform when conduplicate), base narrowly decurrent, adaxial surfaces covered with subulate scales similar to those of the sterile fronds; margins membranous. Spores monolete with a uniformly echinate perispore (Fig. 2).

DISTRIBUTION AND ECOLOGY.—*Elaphoglossum montanum* is only known from the upper montane region between the States of Rio Grande do Sul and Santa Catarina, in areas with humid forests, from 600 to ca. 1400 m. The two known populations were found on wet cliffs, in shaded places, along (and even underneath) individuals of *Gunnera manicata* Linden ex André.

ETYMOLOGY.—The specific epithet "*montanum*" refers the occurrence of the species in the mountains of the Serra Geral.

ADDITIONAL SPECIMENS EXAMINED.—BRAZIL. Rio Grande do Sul: Barracão, Rio Bernardo José com rio Pelotas, 02 Sep 2000, *Spanholi s.n.* (HAS 39037, MBM 256416); Bom Jesus, Barragem – Rio dos Touros, 09 Dec 1958, *Camargo s.n.*

(PACA 79067); São Francisco de Paula, Taimbé, 27 Feb 1959, *Sehnem s.n.* (HUCS 7292); 17 Feb 1953, *Sehnem 6328* (PACA); Taimbezinho, 30 Apr 1967, *Sehnem s.n.* (PACA 79068). Santa Catarina: Bom Jardim da Serra, Serra do Rio do Rastro, 09 Dec 1994, *Bueno 4468* (ICN); Colônia Anita Garibaldi, 1907, *Spannagel 405* (B, RB); Lages, 1906, *Spannagel 165* (HB); Urubici, Serra do Corvo Branco, 01 Jan 2009, *Buzatto 411* (ICN); Urubici, Serra do Corvo Branco, 09 Nov 2010, *Dettke 452* (ICN); Urubici, Serra do Corvo Branco, 28°03′25″S 49°21.5′41″W, 1200 m, 11 Mar 2011, *Kieling-Rubio & Windisch 915* (ICN).

Elaphoglossum montanum is similar to *E. piloselloides* (from Peru to southeastern and central-western Brazil), and *E. jamesonii* (Hook. & Grev.) T. Moore (Andean region) by presenting small fertile fronds that remain conduplicate until the full maturation of the sporangia, and by the subulate scales with dentate margins and hair like tips present on the fronds. However, *Elaphoglossum montanum* can be easily distinguished by having a more rounded fertile laminae, echinate spores, and light brown subulate scales on the adaxial surfaces of the sterile laminae. In contrast, *E. piloselloides* has narrowly and oblong fertile laminae, crested spores (Moran *et al.* 2007) and dark brown subulate scales on the adaxial surfaces of the sterile laminae. *Elaphoglossum jamesonii*, on the other hand, can be distinguished by its crested perispores (SEM of spore from the *type* at Berlin, B-200070911).

Elaphoglossum minutissimum R. C. Moran & Mickel, from Costa Rica (Moran and Mickel, 2004) is also a similar species, which differs from *E. montanum* by not having conduplicate fronds.

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