



## *Pleopeltis* (Polypodiaceae) in Brazil

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### Abstract

Polypodiaceae is notable for being one of the richest, most diverse, and abundant groups of ferns in tropical and subtropical forests. Currently, 65 genera and approximately 1652 species are recognized in the family. *Pleopeltis* is a monophyletic genus and comprises approximately 90 species, most of which are exclusive to the Neotropics. The aim of this scientific contribution is a taxonomic treatment of the *Pleopeltis* species occurring in Brazil. It has been based on the morphological data of specimens from Brazilian and foreign herbaria, as well as on observations and collections made in the field. Eighteen species are recognized in Brazil and occur in all Brazilian biomes, notably the Atlantic Forest (16 spp.). At least one species occurs in all Brazilian states, and the states of Espírito Santo and Minas Gerais (southeastern Brazil) are the richest (11 spp. each). According to the Brazilian Flora Red List, three species are officially threatened, *P. alborufula* and *P. monoides* are endangered, and *P. trinidadensis* is critically endangered; however, we suggest including two more species in the official list: *P. aturensis* and *P. stolzei*. The taxonomic treatment includes a genus description, identification key to the species, synonyms, species description, distribution maps, illustrations, list of specimens studied, taxonomic comments, and information on habitat and distribution.

**Keywords:** Amazon, Atlantic Forest, ferns, poikilohydric ferns, *Polypodium s.l.*

### Introduction

The family Polypodiaceae is notable for being one of the richest, most diverse, and abundant groups of ferns in tropical and subtropical forests (Schneider *et al.* 2004, PPG I 2016). It has undergone many classification changes (Schneider *et al.* 2004, 2006, Smith *et al.* 2006a, b, Otto *et al.* 2009) and currently comprises 65 genera and approximately 1.652 species (PPG I 2016).

The genus *Pleopeltis* Humb. & Bonpl. ex Willdenow (1810: 211), as redefined by Smith & Tejero-Díez (2014) is the largest genus of Polypodiaceae in the Neotropics with about 90 species, but with two species and one hybrid in Africa, India, and Sri Lanka. According to Schneider *et al.* (2004) and Otto *et al.* (2009), *Pleopeltis* is monophyletic, and sister group to *Polypodium* Linnaeus (1753: 1082) and *Pecluma* Price (1983:109). However, Assis *et al.* (2016) concluded that *Pleopeltis* is sister to *Polypodium s.s.* based on molecular (Otto *et al.* 2009) and morphological (Smith & Tejero-Díez 2014) evidence. The redefined *Pleopeltis* now includes many species of *Polypodium* with peltate and persistent laminar scales treated before as *Polypodium* subg. *Marginaria* (Bory) Christensen (1906: 506), as well as species in the *Polypodium polypodioides* group (Moran 1995), *Dicranoglossum* Smith (1854: 232), *Microphlebodium* Gómez (1985: 58), *Neurodium* Fée (1852: 28), and *Pseudocolysis* Gómez (1977: 116) (Smith & Tejero-Díez 2014, PPG I 2016). The scales in *Pleopeltis* are an important character to distinguish species, mainly the laminar scales. These scales can be rounded, ovate, lanceolate with a rounded, acute, acuminate, or filiform apex. Laminar scales in some species are rounded at the base and with a long apex acuminate to filiform, this measuring up to 5 times the width of the base (Fig 20 E, F, H, K). These scales were named by Weatherby (1947) and Sota (1965, 1966) as gomphoid scales.

Studies on the genus in Brazil are restricted to floristic surveys and regional or local floras (i.e. Sehnem 1970, Labiak 2005, Prado 2005, Rolim & Salino (2008), Assis & Labiak (2009), Almeida *et al.* (2017), Gonçalves & Schwartsburd 2017). In addition, there are taxonomic studies that partially treated the genus, such as de la Sota (1965,

1966), de la Sota *et al.* (2007), Salino (2009), and Prado & Hirai (2010). We provide a taxonomic treatment of the *Pleopeltis* species in Brazil.

## Materials & methods

This study is based on herbarium material as well as on observations and collections made personally in the field. The collections were deposited in the herbarium of the Universidade Federal de Minas Gerais (BHCB). Material was examined at the following herbaria (acronyms according to Thiers 2020): ALCB, BA, BHCB, CEN, CEPEC, CESJ, CGMS, CORD, ESA, FURB, GH, HB, HUEFS, HUFU, HUTO, INPA, K, LP, MBML, MCNS, MG, NY, OUPR, P, PAMG, RB, SI, SJRP, SP, SPF, TEPB, UEC, UFP, UFRN, US, VIC and VIES. In addition, digital herbaria were consulted, such as INCT-Herbário Virtual da Flora e dos Fungos (INCT-HVFF 2018), Jabot-Banco de Dados da Flora Brasileira (JBRJ 2017), and Re flora-Herbário Virtual (Re flora 2017). Type material was analysed in herbaria and from online images, all type specimens examined are cited with an exclamation mark (!). The genus description is based on herbarium specimens and information in Smith & Tejero-Díez (2014) and Fawcett & Sundue (2016). The species descriptions are mostly based on herbarium specimens, protologues, and previously published descriptions.

Spores were examined at the Centro de Microscopia, Universidade Federal de Minas Gerais, using scanning electron microscopy (SEM). Spores were removed from herbarium specimens, then transferred to aluminium stubs with double-coated conductive tape and sputter-coated with gold, and finally imaged using a FEI Quanta 200F SEM with an accelerating voltage of 15 kV.

Morphological terms for ferns are based on Lellinger (2002), except for the symmetric plane shapes, base and apex shapes of the lamina, which follow Radford *et al.* (1974), and spore ornamentation is according to Tryon & Lugardon (1991). All terms are listed in ascending order of size, proportion or shape, and colors are listed from lightest to darkest.

Information from herbarium specimens were used for the habitat section, and geographic distributions are based on specimens examined and literature (Maxon 1916, Weatherby 1939, Davidse *et al.* 1995, Smith & Tejero-Díez 2014). The distribution maps were made using the software ARCGIS 9.0. The conservation status assessment is based on IUCN (2017) criteria and comments about the criteria are provided. The selected specimens examined are presented in alphabetical order by state and municipality.

## Results

### Diversity and ecology

Eighteen species were recorded for Brazil (Table 1), of which four species (ca. 25%) are endemic to the country (*P. alborufula*, *P. minarum*, *P. monoides*, and *P. trinidadensis*). The most common habit found among the *Pleopeltis* species was epiphytic (14 spp.), followed by epipetric (13 spp.) and terrestrial (eight spp.). Except for *P. aturensis*, *P. bombycina*, and *P. lepidopteris*, the species exhibit more than one habit. The genus was recorded in all Brazilian biomes, notably the Atlantic Forest (16 spp.), Amazon (eight), and the Cerrado (six). Most of the species occur in more than one biome, but *P. alborufula* and *P. trinidadensis* were recorded only in Atlantic Forest, and *P. aturensis*, *P. bombycina* and *P. stolzei* only in the Amazon biome. At least one species occurs in all Brazilian states (*P. astrolepis*), and the states of Espírito Santo and Minas Gerais are the richest (11 spp. each), followed by Bahia (10 spp.). *Pleopeltis trinidadensis* is endemic to Trindade Island. According to the *Lista da Flora Ameaçada de Extinção* (MMA-Ministério do Meio Ambiente 2014), three species are threatened, *P. alborufula* and *P. monoides* are endangered, and *P. trinidadensis* is critically endangered.

**TABLE 1.** Species of *Pleopeltis* in Brazil and their habit and biomes of occurrence. (EP = epiphyte; ET = epipetric; TE = terrestrial; AM = Amazon; CA = Caatinga; CE = Cerrado; AF = Atlantic Forest; PA = Pampa; PT = Pantanal).

Species	Habit			Brazilian Biomes					
	EP	ET	TE	AM	CA	CE	AF	PA	PT
<i>P. alborufula</i>		X	X				X		
<i>P. astrolepis</i>	X	X	X	X	X	X	X	X	X
<i>P. aturensis</i>	X			X					
<i>P. bombycina</i>	X			X					
<i>P. burchellii</i>	X			X	X	X	X		
<i>P. furcata</i>	X	X				X	X		
<i>P. gyroflexa</i>	X	X		X	X		X		
<i>P. hirsutissima</i>	X	X	X		X	X	X	X	X
<i>P. lepidopteris</i>			X				X	X	
<i>P. macrocarpa</i>	X	X	X	X	X	X	X	X	X
<i>P. minarum</i>		X	X			X	X		
<i>P. minima</i>	X	X			X	X	X	X	X
<i>P. monoides</i>	X	X	X	X			X		
<i>P. pleopeltidis</i>	X	X				X	X	X	
<i>P. pleopeltifolia</i>	X	X		X	X	X	X	X	
<i>P. stolzei</i>	X			X					
<i>P. trinidadensis</i>		X	X				X		

## Taxonomic treatment

*Pleopeltis* Humb. & Bonpl. ex Willd. (in Willdenow 1810: 211), *Polypodium* subg. *Pleopeltis* (Humb. & Bonpl. ex Willd.) Christensen (1906: 506). Type:—*Pleopeltis angusta* Humb. & Bonpl. ex Willd.

*Marginaria* Bory (1824: 587). *Polypodium* L. subg. *Marginaria* (Bory) Christensen (1906: 506). Type:—*Marginaria polypodioides* (L.)

Tidestr. [*Acrostichum polypodioides* L.] = *Pleopeltis polypodioides* (L.) E.G.Andrews & Windham

*Lepicystis* (J.Sm.) Smith (1842: 195). *Goniophlebium* sect. *Lepicystis* Smith (1841: 56). Type:—*Goniophlebium incanum* J.Sm. = *Pleopeltis polypodioides* (L.) E.G.Andrews & Windham

*Neurodium* Fée. Type:—*Neurodium lanceolatum* (L.) Fée = *Pleopeltis marginata* A.R.Sm. & Tejero

*Dicranoglossum* J.Sm. Lectotype (designated by J.Smith, *Hist. Filicum* 120. 1875):—*Dicranoglossum furcatum* (L.) J.Sm. = *Pleopeltis furcata* (L.) A.R.Sm.

*Pseudocolysis* L.D.Gómez, Type:—*Pseudocolysis bradeorum* (Rosenst.) L.D.Gómez = *Pleopeltis bradeorum* (Rosenst.) A.R.Sm. & Tejero

×*Pleopodium* Schelpe & N.C.Anthony, *Bothalia* 15:557. 1985.Type:—×*Pleopodium simianum* Schelpe & N.C.Anthony [ *Pleopeltis macrocarpa* (Bory ex Willd.) Kaulf. × *Polypodium polypodioides* (L.) Watt subsp. *ecklonii* (Kunze) Schelpe] = *Pleopeltis* ×*simiana* (Schelpe & N.C.Anthony) N.R.Crouch & Klopper

*Microphlebodium* L.D.Gómez. Type:—*Microphlebodium muenchii* (Christ) L.D.Gómez [ *Polypodium muenchii* Christ] = *Pleopeltis muenchii* (Christ) A.R.Sm. & Tejero

**Plants** epiphytic, epipetric or terrestrial; **rhizomes** short to long-creeping, scaly, scales peltate, concolorous to bicolorous, clathrate or not, comose or glabrous, orbiculate to lanceolate, margins entire, denticulate, fimbriate or erose; **fronds** monomorphic to holodimorphic, sessile to petiolate; petioles with or without wings; **laminae** simple to 1-pinnate-pinnatifid, rarely more divided, linear to oblong, glabrous to densely scaly, scales peltate, orbiculate to lanceolate; **pinnae or segments** with or without auricle; hydathodes present or absent; **venation** free or anastomosing with included veinlets; **sori** rounded to linear, medial to marginal, glabrous or with peltate scales; **sporangia** glabrous; **spores** yellow, ellipsoidal, 45–68 µm, monolete, generally verrucose, low to high verrucose sometimes papillate, baculate and with sparse to dense globules.

Key to the species of *Pleopeltis* in Brazil

1. Laminae simple (Figs. 1I; 5A; 8H; 14A).....2
- Laminae divided .....5
2. Fronds monomorphic; lamina margins entire.....3
- Fronds subdimorphic to holodimorphic; lamina margins repand (Fig. 5A).....*P. gyroflexa*
3. Rhizome scales glabrous and brown; fronds short to long petiolate (0.4–6 cm long); petioles terete .....4
- Rhizome scales comose (Fig. 1J) and dark brown to blackish; fronds sessile to short-petiolate (0–1.1 cm long); petioles flattened. ....*P. astrolepis*
4. Rhizome scales concolorous with margins lacinate; laminae base cuneate; veins conspicuous.....*P. stolzei*
- Rhizome scales bicolorous with margins erose; laminae base attenuate; veins obscure..... *P. macrocarpa*
5. Fronds bifurcate (Fig. 4A, E); sori linear, marginal .....6
- Fronds pinnatifid to pinnate; sori rounded to oblong, medial .....7
6. Fronds 8–20 cm long; veins totally anastomosing (Fig. 18A) .....*P. desvauxii*
- Fronds 12–50 cm long; veins free and bifurcate (Fig. 18B), rarely anastomosing near the margin ..... *P. furcata*
7. Laminae sparsely scaly to glabrous abaxially; sori without scales .....8
- Laminae densely scaly abaxially; sori with scales .....10
8. Rhizomes short-creeping.....9
- Rhizomes long-creeping..... *P. pleopeltifolia*
9. Petioles terete; 17–34 pinnae pairs; segments 0.3–0.6 cm wide, perpendicular to the rachises (Fig. 2A).....*P. aturensis*
- Petioles angulate; 5–8 pinnae pairs; segments 0.5–1.5 cm wide, oblique to the rachises.....*P. pleopeltidis*
10. Laminae 2–15 cm long, glabrous to slight scaly adaxially (Fig. 19C); spores simple verrucate ..... 11
- Laminae 8–65 cm long, scaly adaxially (Fig. 19A, E); spores verrucate to papillate.....12
11. Rhizomes scales with central blackish band (Fig. 12J, 17A,J); laminae abaxially with lanceolate scales with serrulate to lacerate margins ..... *P. burchellii*
- Rhizomes scales without central blackish band (Fig. 9I, 17B, E); laminae abaxially with round to ovate scales with entire margin .....*P. minima*
12. Laminae base truncate or subtruncate .....13
- Laminae base gradually reduced .....14
13. Laminae 30–60 × 4–8 cm; laminar tissue adaxially covered by scales with base rounded and long-acuminate to the filiform apex (Fig. 14O, 20F).....*P. trinidadensis*
- Laminae 8–33 × 2–5 cm; laminar tissue adaxially covered by lanceolate scales (Fig. 1F, 19A, 20M-N).....*P. alborufula*
14. Segment margins cartilaginous and hyaline .....*P. lepidopteris*
- Segment margins thick and green.....15
15. Rachises abaxially covered by scales with base rounded and long-acuminate to the filiform apex .....16
- Rachises abaxially covered by lanceolate scales.....17
16. Rhizome scales 2–3 mm long; reduced basal pinnae linear (Fig. 2H) ..... *P. bombycina*
- Rhizome scales 4–7 mm long; reduced basal pinnae triangular (Fig. 11A)..... *P. monoides*
17. Laminae abaxially covered by lanceolate scales ..... *P. minarum*
- Laminae abaxially covered by scales with base rounded and long-acuminate to the filiform apex (Fig. 20G) .....*P. hirsutissima*

**1. *Pleopeltis alborufula*** (Brade) Salino (2009: 106). Figs. 1A–H, 7A, 19A–B, 20A, M–N. *Polypodium alborufulum* Brade (1951: 29). Type:—BRAZIL. Espírito Santo: Castelo, Forno Grande, 1200m, 12 May 1949, *A.C. Brade 19791* (holotype, RB!; isotype SP!)

*Pleopeltis bradei* (de la Sota) Salino (2009: 106). *Polypodium bradei* de la Sota (1965: 266) *syn. nov.* Type:—BRAZIL. Espírito Santo: Castelo, Forno Grande, 1200 m, 12 May 1949, *A.C. Brade 19791B* (holotype: RB!).

**Plants** epipetric or rarely terrestrial. **Rhizomes** short-creeping, with scales lanceolate, brown, with bases rounded, apex acuminate and margins lacinate, with simple projections; **fronds** monomorphic, 8–33 × 2–5 cm, petiolate; petioles 2–9 cm long, terete, without wings, moderately scaly; **laminae** 6–24 cm long, pinnatisect, lanceolate, base truncate to subtruncate, apex acuminate to acute; rachises terete, densely scaly; **pinnae** 8–35 pairs, proximal 2–4 pairs

reduced; medial pinnae 1.1–2.4 × 0.3–0.5 cm, linear-lanceolate, base adnate to the rachises, auricle present or absent, with or rarely without hydathodes, apex acuminate, margins entire, moderately to densely scaly on both surfaces; **venation** anastomosing, obscure; **frond scales** lanceolate, brown to dark brown in those of petioles, and light brown to stramineous in those of both surfaces of pinnae, base rounded with projections simple, eventually bifid and brown to blackish point of attachment, apex acuminate to filiform, margins stramineous to hyaline and erose to lacinate; **sori** rounded, medial, covered by scales; **spores** papillate.

**Selected specimens examined:**—BRAZIL. **Espírito Santo:** Castelo, Parque Estadual do Forno Grande, 16 July 2008, *L. Kollmann 11095* (MBML, RB, UPCB); idem, idem, Parque Estadual Forno Grande, 26 June 2008, *A. Salino 13652* (BHCB); Domingos Martins, Parque Estadual da Pedra Azul, 5 December 2008, *A. Salino 14117* (BHCB); Nova Venécia, Topo da Pedra do Elefante, 25 August 2009, *A. Salino 14422* (BHCB); Santa Maria do Jetibá, Pedra do Garrafão, 28 August 2009, *A. Salino 14542* (BHCB); **Rio de Janeiro:** Santa Maria Magdalena, Serra do Tamanduá, 20 March 1935, *J. Santos Lima 289* (RB).

**Distribution and habitat:**—Endemic to Atlantic Forest in Brazil and known only from rocky outcrops at 800–1600 m elevation in the states of Espírito Santo and Rio de Janeiro (Fig. 3A).

**Notes:**—This species is recognized by the few pairs of reduced pinnae at the lamina base and rachis and laminar tissue with lightly colored, lanceolate scales that have deeply dentate margins.

*Polypodium bradei* was described from part of an isotype of *Polypodium alborufulum*. De la Sota (1965) used the presence of auricles at the base of the pinnae and small differences in the scales to differentiate *P. bradei* from *P. alborufulum* although Brade (1951) also cited auricles in the original description of *Polypodium alborufulum*. The material used to describe the two species has morphological “aberrations,” such as branches and projections on the pinnae, suggesting a deformation that could have resulted in the differences observed. Thus, after an extensive analysis of the scales, spores, and morphology of the type material of the two species, we think *Pleopeltis bradei* should be synonymized under *Pleopeltis alborufula* because the material has similar scales and spore morphology.

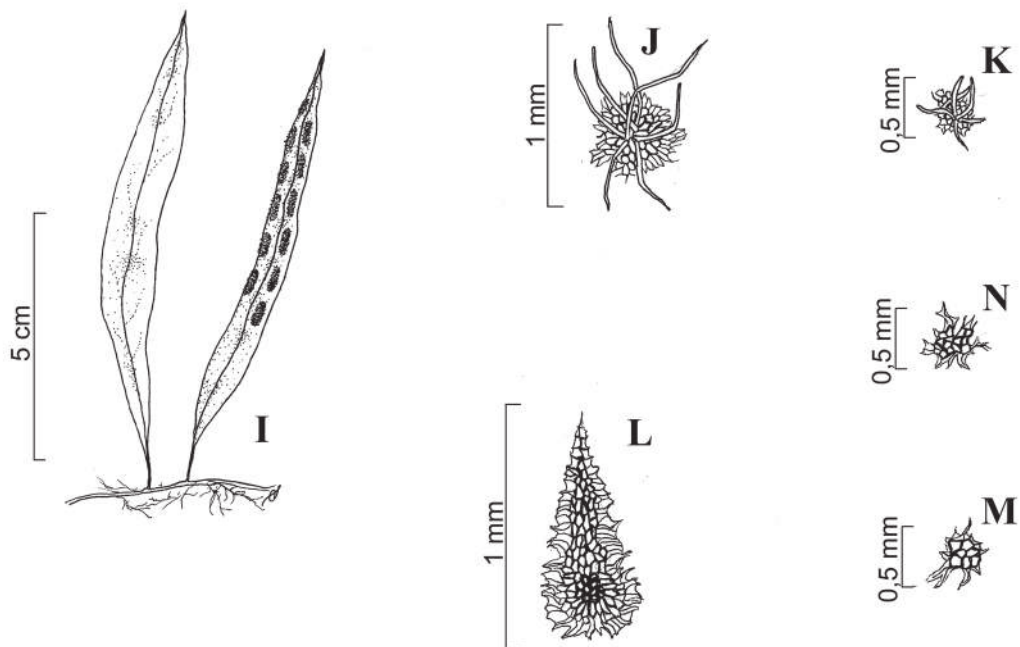
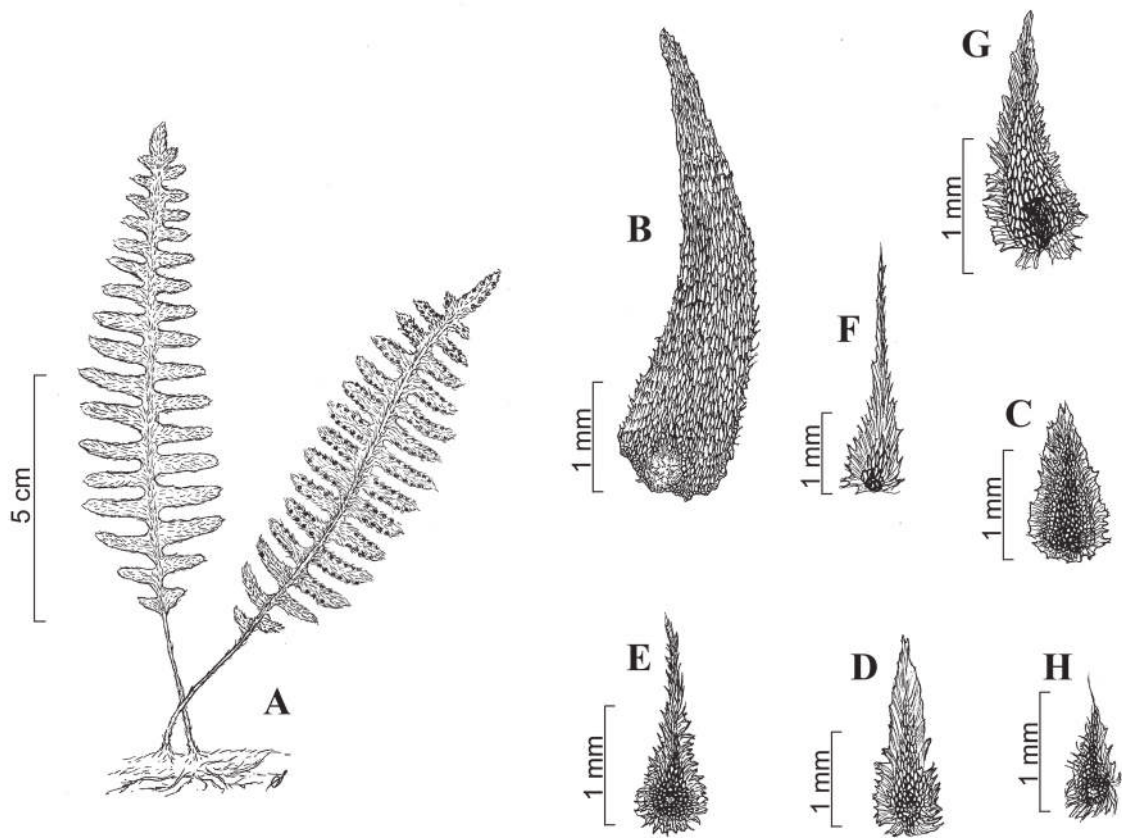
This species is categorized as Endangered (EN) because it has a small area of occupation and extent of occurrence (MMA 2014). *Pleopeltis alborufula* occurs in about five localities, all areas of rocky outcrops of granite. Some locations are protected in Conservation Units, but other areas are used for extraction of rocks for commercial use.

**2. *Pleopeltis astrolepis*** (Liebm.) Fournier (1872: 87). Figs. 1I–N, 7B, 18E. *Polypodium astrolepis* Liebmann (1849: 185). *Phlebodium astrolepis* (Liebm.) Conzatti (1939: 100). Type:—MEXICO. Oaxaca: Trapiche de la Concepción, *F.M. Liebmann s.n.* (lectotype: C, designated by Smith (1981); isolectotype: BM!)

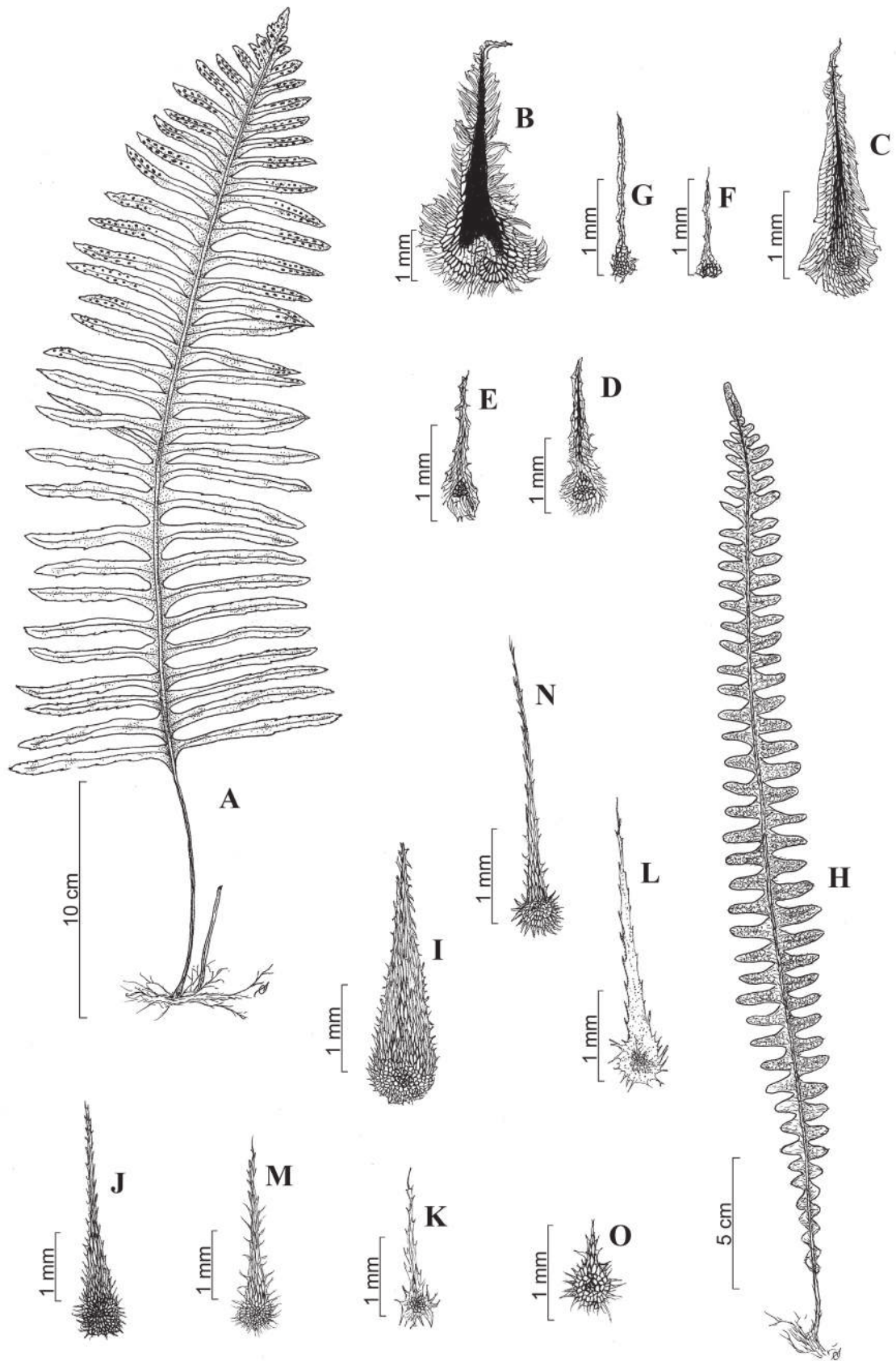
**Plants** epiphytic, epipetric or rarely terrestrial. **Rhizomes** long-creeping with scales rounded, totally blackish, comose, margin erose to ciliate; **fronds** monomorphic, 3–15 × 0.4–3 cm, entire, sessile to short-petiolate, petioles flattened dorsiventrally, 0–1.1 cm long, with inconspicuous to short wings, glabrous; **laminae** 3–13 cm long, lanceolate, base attenuate to cuneate, apex attenuate to acute, margin entire, flat to revolute, adaxial surface glabrous or with simple hyaline hairs and sparsely scaly; costae terete, with sparse scales peltate blackish, lanceolate to rounded; **venation** free, simple, furcate to eventually anastomosing; **frond scales** rounded to lanceolate, dark brown to blackish, base rounded, apex acuminate, margin ciliate; **sori** linear to rounded, medial, glabrous; **spores** shallowly verrucate with sparse globules.

**Selected specimens examined:**—BRAZIL. **Alagoas:** Matriz do Camaragibe, Mata Garabu, 01 April 2005, *F. Cavalcante 17* (MAC); São Luis do Quintude, 21 August 2004, R.P. Lyra-Lemos 8453 (ALCB); São José da Lage, Sede da Usina Serra Grande, 19 December 2000, *M. R. Pietrobom 4674* (SP); Viçosa, Fazenda Mata Verde, 29 December 2007, *Chagas-Mota 187* (MAC); **Amapá:** Calçone, 11 December 2000, *F. Cesarino 16* (BHCB). **Amazonas:** Barcelos, Rio Aracá, 13 August 2011, *G. Martinelli 16989* (RB). **Bahia:** Almadina, Fazenda São José, 10 December 2014, *A. Salino 16004* (BHCB); Camacan, Fazenda Serra Bonita, 2 February 2005, *F. B. Matos 266* (CEPEC); Igrapiúna, Litoral Sul, 19 July 2010, *M.L. Guedes, M.L. 17365* (ALCB); Itanhém, Corró, 17 August 2004, *J.R. Stehmann 3751* (BHCB); Una, estrada São José/Una, 21 July 1984, *A.M. Carvalho 2102* (CESJ, CEPEC). **Ceará:** Maranguape, Serra da Pirapora, 9 August 2011, *T.E. Almeida 3050* (BHCB). **Espírito Santo:** Alegre, Parque Estadual da Cachoeira da Fumaça, 14 September 2008, *A. Salino 13957* (BHCB); Cariacica, Reserva Biológica de Duas Bocas., 14 June 2010, *A. Salino 14973* (BHCB); Divino de São Lourenço, Parque Nacional do Caparaó, 10 February 2011, *F.S. Souza 1467* (BHCB); Ibitirama, 11 September 2008, *A. Salino 13796* (BHCB); Nova Venécia, Pedra do Elefante, 25 August 2009, *A. Salino 14414* (BHCB); Santa Tereza, 11 October 2001, *L. Kollmann 4828* (BHCB, MBML). **Goiás:** Aporé, 02 August 1995, *M.R. Pietrobom-Silva 2403* (SJRJ). **Mato Grosso:** Costa Rica, Povoado Lajes, 20 February 1996, *F. Firetti 46* (SJRJ); Cupim, 20 December 1893, *C.A.M. Lindman A2629* (US). **Mato Grosso do Sul:** Corumbá, Mineração Corumbaense

Reunidas, 17 February 2005, *V. J. Pott 7457* (BHCB, CGMS); **Minas Gerais:** Araçuaia, Parque Estadual da Serra do Brigadeiro, 28 May 2000, *A. Salino 5566* (BHCB); Açucena, 30 March 2009, *T.E. Almeida 1924* (BHCB); Barroso, Mata do Baú, 15 December 2001, *L.C.S. Assis 414* (CESJ); Camanducaia, Mata do Trevo de acesso, 1 June 2001, *A. Salino 6881* (BHCB, CESJ); Capitólio, Cachoeira Feixo da Serra., 13 July 2006, *A.A. Arantes 1999* (BHCB); Carandaí, Pedra do Sino Hotel Fazenda., 29 April 2005, *N.F.O. Mota 111* (BHCB); Carangola, 8 October 1987, *L.S. Leoni 132* (BHCB); Caratinga, Margens do rio Manhuaçu, 9 December 2009, *T.E. Almeida 2146* (BHCB); Carrancas, Serra de Carrancas, 18 June 2007, *A. Salino 12249* (BHCB); Chácara, Fazenda Fortaleza de Santana, 16 July 2011, *D.E.F. Barbosa 16* (CESJ); Conceição do Mato Dentro, Morro do Pilar, 25 September 2005, *T.E. Almeida 132* (BHCB); Congonhas, 2 June 2005, *S.G. Rezende 714* (BHCB); Delfim Moreira, 16 March 2011, *T.E. Almeida 2833* (BHCB); Felício do Santos, APA Felício., 30 October 2004, *A. Salino 9919* (BHCB); Furnas, Cachoeira Feixo da Serra., 28 September 2005, *A.A. Arantes 1436* (BHCB); Gonzaga, 24 September 2009, *T.E. Almeida 2110* (BHCB); Guarani, Usina Hidrelétrica de Ponte., 20 June 1998, *A. Salino 4262* (BHCB); Itabira, Serra da Cachoeira Alta, 2 August 2006, *T.E. Almeida 296* (BHCB); Itabirito, Serra da Moeda, 14 June 2001, *A. Salino 7067* (BHCB, CESJ); Itambé do Mato Dentro, Distrito de Santana do Rio Preto, 6 August 2006, *T.E. Almeida 354* (BHCB); Jaboticatubas, Serra do Cipó, 5 November 2009, *E.B.A. Dias 673* (CEN); Jequitinhonha, Reserva Biológica da Mata Escura, 25 March 2008, *A. Salino 13143* (BHCB); João Monlevade, 14 September 1989, *P.H.A. Pequeno 87* (BHCB); Juiz de Fora, Mata do Krambeck, 25 March 2008, *F.S. Souza 344* (CESJ); Lavras, Parque Florestal Quedas do Rio Bonito, 17 June 2007, *A. Salino 12174* (BHCB); Lima Duarte, Serra Negra, 5 April 2009, *J.H.C. Ribeiro 82* (CESJ); Mariana, RPPN Horto Alegria, 30 April 2015, *J.A.M. Paiva 372* (BHCB); Miradouro, Córrego Pai Inácio, 27 September 2000, *A. Salino 6009* (BHCB); Nova Lima, Área de Proteção do Mutuca., 3 February 2002, *F.A. Carvalho 45* (BHCB); Olaria, Serra do Cruz, 23 June 2011, *F.E. Alves 96* (CESJ); Ouro Branco, 20 October 2009, *D.T. Souza 1005* (BHCB); Ouro Preto, Camarinhas, 19 May 2000, *A. Salino 5454* (BHCB); Passa-Vinte, Usina Hidrelétrica de Paes Leme, 15 November 2000, *A. Salino 5933* (BHCB); Rio Acima, RPPN de Andaime, 18 May 2004, *J.B. Figueiredo 458* (BHCB); Rio Preto, Ninho da Égua, 9 November 2005, *F.S. Souza 51* (BHCB, CESJ); Sabará, Mina de Cuiabá da Anglogold Ashanti, 4 May 2006, *D.T. Souza 40* (BHCB); Salto da Divisa, 4 March 2004, *A. Salino 9427* (BHCB); Santa Bárbara, RPPN Capivari, 12 December 2009, *A.J. Arruda 09* (BHCB); Santa Maria do Salto, Distrito de Talismã, 23 August 2003, *J.A. Lombardi 5466* (BHCB); Santana do Riacho, RPPN Brumas do Espinhaço e Ermo do Gerais, 9 July 2012, *M.G.C. Fernandes 1403* (BHCB); Simonésia, RPPN Mata do Sossego, 23 May 2006, *A. Salino 11182* (BHCB, CESJ). **Pará:** Ananindeua, Bairro PAAR, 20 September 2009, *M.R. Pietrobom 5939* (RB); Belém, Bairro Pedreira, 03 October 2004, *M.R. Pietrobom 5652* (RB); Canaã dos Carajás, Floresta Nacional de Carajás, Serra Sul, Corpo A, 15 February 2010, *T.E. Almeida 2216* (BHCB); Bocaina, 13 February 2012, *L.F.A. Paula 563* (BHCB). **Paraíba:** Teixeira, a caminho do sítio Tamboril, 18 May 2002, *M.F. Agra 5887* (HUEFS). **Paraná:** Caiobá. Prainha, 26 July 1944, *C. Stelfeld 772* (RB); Foz do Iguaçu, Parque Nacional do Iguaçu, 7 August 2013, *M. Lautert 328* (BHCB); Guairá, Parque Nacional de Sete Quedas, 18 March 1982, *A.T. Silva 353* (SP); Paranaguá, Ilha do Mel, 18 October 1992, *A. Salino 1556* (BHCB). **Pernambuco:** Garanhuns, Hotel Tavares Correia, *A. Sehnem 12743* (RB); São Vicente Ferrer, Complexo Serra Mascarenhas, 5 October 1998, *M.R.P. Silva 4435* (BHCB); Jaqueira, Usina Colônia, 31 May 2001, *M.S. Lopes 219* (RB, UFP). **Rio de Janeiro:** Cachoeiras de Macacu, Reserva Ecológica de Guapiaçu, 01 August 2010, *K. Baber 477* (RB); Guapimirim, Estação Ecológica Estação de Paraíso, 21 November 1991, *L. Sylvestre 670* (RB); Itatiaia, PARNA Itatiaia, 22 October 2018, *D.R. Couto 4127* (RB); Nova Friburgo, 10 October 1951, *C. Capel s.n.* (RB 76500); Paraty, Morro do Corisco, 23 April 1993, *R. Marquete 943* (RB); Petrópolis, 24 May 1943, *O.C. Góes 74* (RB); Teresópolis, Parque Nacional da Serra dos Orgãos, 28 February 2005, *R. Engelmann 296* (RB). **Rio Grande do Sul:** Caxias do Sul, Jardim Botânico, 25 March 2006, *P. Rabelo 21* (UPCB). **Santa Catarina:** Blumenau, Parque Nacional da Serra do Itajaí, 28 October 2007, *A.L. Gasper 842* (BHCB, FURB); Garcia, 21 March 1952, *L.B. Smith 6299* (COL); Joinville, 26 August 1842, *P. Schwacke 13345* (RB); Nova Trento, 22 January 1940, *J.A. Rubs 206* (RB). **São Paulo:** Analândia, Serra do Cuscuzeiro, June 1993, *A. Salino 1775* (BHCB); Bananal, Estação Ecológica do Bananal, 9 March 2001, *A. Salino 6339* (BHCB); Eldorado, Parque Estadual do Jacupiranga, 22 March 2005, *A. Salino 10125* (BHCB); Itanhaém, Hotel Fazenda São Camilo, 16 April 2001, *A. Salino 6576* (BHCB, CESJ); Miracatu, Reserva Votorantim, 27 March 2013, *T.E. Almeida 3202* (BHCB); Paranapanema, Estação Ecológica, 3 August 2006, *R. Cielo Filho 534* (BHCB); Ribeirão Grande, Parque Estadual Intervalas, 15 April 2003, *A. Salino 8428* (BHCB, CESJ); Sete Barras, 27 July 1994, *A. Salino 1989* (BHCB); São Luís do Paraitinga, Parque Estadual da Serra do Mar, 4 March 2001, *A. Salino 6176* (BHCB, CESJ); São Paulo, Cidade Jardim, 20 March 1946, *W. Hoehne 2027* (CESJ, SJRP); Ubatuba, Parque Estadual da Ilha Anchieta, 7 May 1993, *A. Salino 1704* (BHCB); Sergipe: Areia Branca, PARNA Serra de Itabaiana, 29 May 2017, *J.L. Santos 43* (ASE).

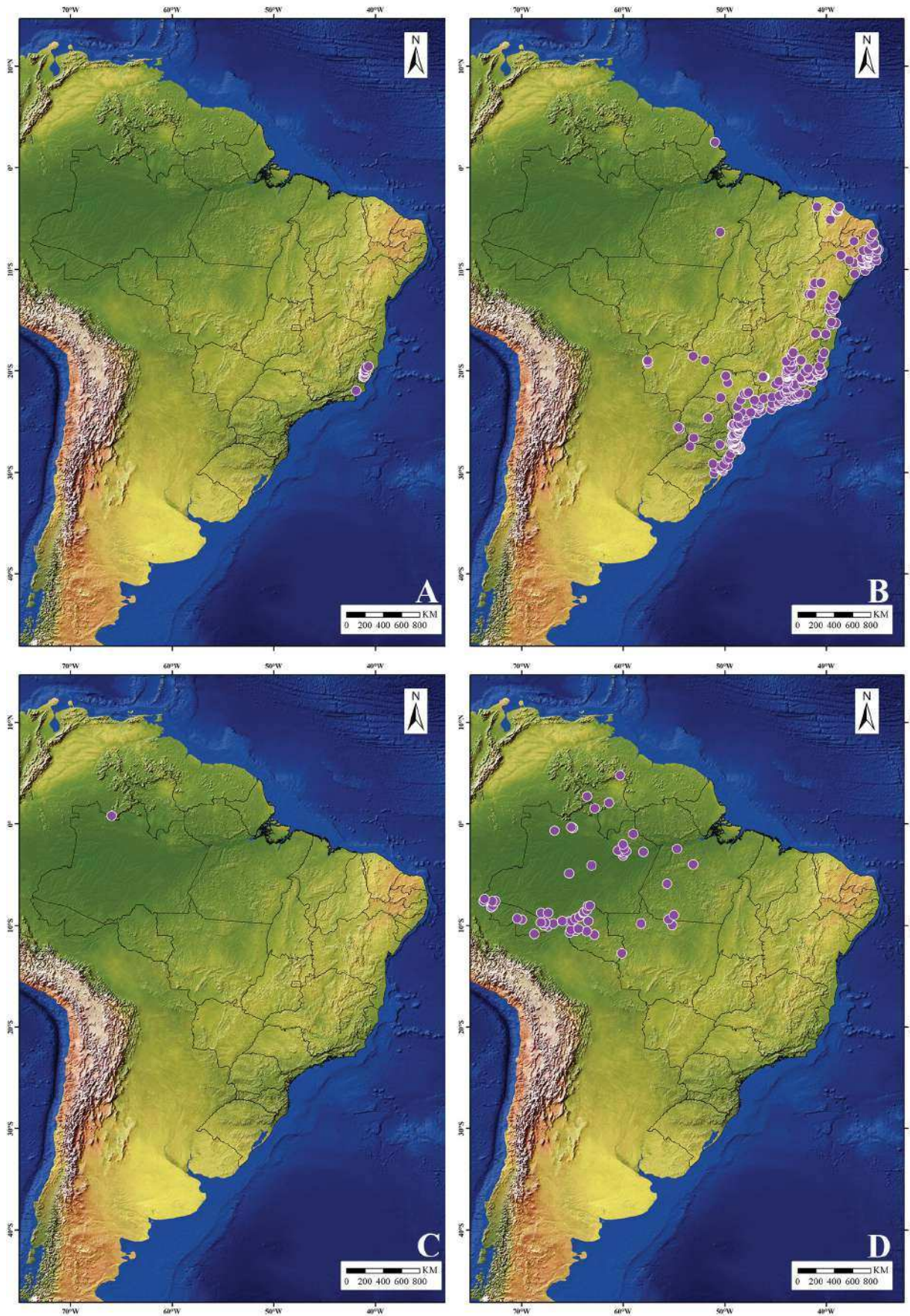


**FIGURE 1.** A–H. *Pleopeltis alborufula*. A. Habit; B. Rhizome scale; C. Petiole scale; D. Adaxial rachis scale; E. Abaxial rachis scale; F. Adaxial laminar scale; G. Abaxial laminar scale; H. Sorus scale. I–N. *P. astrolepis*. I. Habit; J–K. Rhizome scales; L. Abaxial rachis scale; M. Adaxial laminar scale; N. Abaxial laminar scale.



**FIGURE 2.** A–G. *Pleopeltis aturensis*. A. Habit; B. Rhizome scale; C. Petiole scale; D. Adaxial rachis scale; E. Abaxial rachis scale; F. Adaxial laminar scale; G. Abaxial laminar scale. H–O. *P. bombycina*. H. Habit, I. Rhizome scale; J. Petiole scale; K. Adaxial rachis scale; L. Abaxial rachis scale; M. Adaxial laminar scale; N. Abaxial laminar scale; O. Sorus scale.





**FIGURE 3.** Distribution of four species of *Pleopeltis* in Brazil. A. *P. alborufula*; B. *P. astrolepis*; C. *P. aturensis*; D. *P. bombycina*.

**Distribution and habitat:**—United States of America, Mexico, Antilles, Guatemala, Belize, Honduras, El Salvador, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Suriname, French Guiana, Ecuador, Peru, and Bolivia. In Brazil, this species occurs in practically all vegetation domains and states between sea level to 1800 m, rarely above this elevation (Fig. 3B).

**Notes:**—Differs from all other species because of its simple fronds, comose rhizome scales and blackish, flat winged petiole, sori linear, rarely round. *Pleopeltis astrolepis* is most like *P. macrocarpa* and *P. stolzei*, but it can be differentiated by the comose rhizome scales and flat petiole, while the latter two species have glabrous rhizome scales and terete petioles.

This species has one of the largest distributions of the genus in the country and has great morphological variation. Apparently, it can exhibit dwarfism or neoteny because there are various records of very small plants compared to the average size of fertile individuals. More detailed studies are needed to confirm the presence of these conditions in this species.

**3. *Pleopeltis aturensis*** (Maury) Smith in Smith & Tejero-Díez (2014: 46). Figs. 2A–G, 7C. *Polypodium aturense* Maury (1889: 134). Type:—VENEZUELA. Amazonas: Des bords L'orénoque Salvajito, Raudal d'Atures, 30 July 1887, A. Gaillard III (holotype: P01376336!)

**Plants** epiphytic. **Rhizomes** short-creeping, scales lanceolate, blackish, base rounded with a blackish point of attachment, apex acuminate, margins brown and erose; **fronds** 25–45 × 6–11 cm; petiolate, petioles, terete, 8–20 cm long, without wings, sparsely scaly; **laminae** 17–25 cm long, pinnate, lanceolate to ovate, base truncate, apex acuminate; rachises terete, with sparse scales peltate, brown, base rounded with a blackish point of attachment, apex acuminate, margin stramineous and erose; **pinnae** 17–34 pairs, medial pinnae 5–11 × 0.3–0.6 cm, linear, with the base adnate to the rachises, auricle absent, hydathodes present, apex attenuate, margin entire to crenate, laevigate, sparsely scaly on the adaxial surface, and moderately scaly on the abaxial surface; **venation** free, furcate; **frond scales** lanceolate, blackish or brown, base rounded with a blackish point of attachment, apex acuminate, margin stramineous and erose; **sori** rounded, medial, glabrous; **spores** verrucate with sparse globules.

**Specimens examined:**—BRAZIL. Amazonas: São Gabriel da Cachoeira, Parque Nacional do Pico da Neblina, trilha para a cachoeira do Anta, 28 December 2004, F.A. Carvalho 319 (INPA).

**Distribution and habitat:**—Venezuela and adjacent Brazil, where it is known only from a single collection from the Pico da Neblina in the State of Amazonas (Fig. 3C).

**Notes:**—This species can be recognized by its large size (25–45 × 6–11 cm), short-creeping rhizome with blackish scales, and terete petioles. In Brazil, it can be confused with some morphotypes of *P. pleopeltidis*, but *P. aturensis* is easily differentiated by its short-creeping rhizome and lanceolate to ovate lamina that is 17–25 cm long, while *P. pleopeltidis* has a long-creeping rhizome and a deltoid to lanceolate lamina that is 5–12 cm long. In addition, *P. aturensis* is known only from Amazonian forest and *P. pleopeltidis* occurs in the Atlantic Forest.

*Pleopeltis aturensis* is a very rare species, which is only known from two collections that were made 117 years apart. It was collected for the first time in 1887 by Antoine Gaillard, in Venezuela, and was described by Maury (1889). Subsequently, the species was collected in 2004 by F.A. Carvalho, the first record for Brazil (Carvalho *et al.* 2012).

According to MMA (2014) the species is not threatened. However, after reviewing the IUCN criteria, the authors believe that the species should be classified as EN. Because it presents a small area of occurrence, being known from just one locality and without new collections since its discovery in the country.

**4. *Pleopeltis bombycina*** (Maxon) Smith in Kessler & Smith (2005: 281). Figs. 2H–O, 7D, 20E,J. *Polypodium bombycinum* Maxon (1916: 592). Type:—COLOMBIA. Valle del Cauca [as Cali]: Western Cordillera, Boquerón del río Dagua, 300–1000 m, F.C. Lehmann 7666 (holotype, US!, isotype GH! image)

**Plants** epiphytic. **Rhizomes** short-creeping, with scales lanceolate, stramineous to light brown, base cordate to sagittate with a brown point of attachment, apex acuminate, margin stramineous and erose to lacinate; **fronds** monomorphic, 13–56 × 1.5–5 cm, petiolate, petioles short, terete, 0.5–2 cm long, without wings; **laminae** 12–54 cm long, linear to lanceolate, base gradually reduced, apex acuminate, pinnatifid, pinnae 20–65 pairs, proximal 6–10 pairs reduced, medial pinnae 0.7–2.5 × 0.3–0.6 cm, linear to deltate, base adnate to the rachises, auricle present, apex rounded to acuminate, margins entire, hydathodes present; **venation** anastomosing; **frond scales** with base rounded and long-acuminate to the filiform apex, brown in those from the axes, stramineous to hyaline in those from the laminar surfaces, base with a brown to dark brown point of attachment, margin stramineous to rarely brown in those from the rachises, and lacinate to dentate; **sori** rounded, medial, covered by scales; **spores** papillate with dense globules.

**Selected specimens examined:**—BRAZIL. **Acre:** Cruzeiro do Sul, Alemanha, 29 July 1972, *I. Francisca s.n.* (RB 546364); Mâncio Lima, Parque Nacional da Serra do Divisor, 14 December 2010, *T.E. Almeida & A. Salino 2627* (BHCB). **Amazonas:** Boca do Acre, Floresta Nacional do Purus, 7 December 2009, *M. Silveira 4236* (RB, SP); Coari, Região do Urucú, July 1991, *C. Freitas 385* (SJP); Manacapuru, 20 January 2008, *H. Tuomisto 15199* (SP); Manaus, Reserva Florestal Ducke, 9 February 1995, *M.J.G. Hopkins 1536* (K, SP); Presidente Figueiredo, Estrada do Pau Rosa, 1 October 1998, *C.A.A. Freitas 644* (BHCB, INPA); Balbina, 6 February 2008, *J. Prado 1923* (SP); Santa Isabel do Rio Negro, Estrada do Tibarrá, 29 September 1999, *C.A.A. Freitas 704* (SP). **Mato Grosso:** Alto Taquarí, Rodovia MT-100, 21 February 1994, *M.R. Silva 1230* (SPF); Cotriguaçu, Fazenda São Nicolau, 06 March 2011, *M.C. Vilela-Santos 4811* (CNMT); Novo Mundo, RPPN Lote Cristalino, 05 June 2007, *G.S. Henicka 85* (SPF). **Mato Grosso do Sul:** Corumbá, 15 September 1999, *E.L.M. Assis 58* (BHCB). **Pará:** Estrada Santarém-Cuiabá, BR 163, Km 1222, 21 May 1983, *M.N.F. Silva 387* (NY); Itaituba, estrada Santarém-Cuiabá, 21 May 1983, *M.N. Silva 387* (K). **Rondônia:** Ariquemes, Mineração Mibrasa, 12 May 1982, *L.O.A. Teixeira 369* (BHCB, INPA, K); Jaci Paraná, Cachoeira de Jirau, 22 March 2010, *G. Pereira-Silva 15112* (CEN, HUEFS); Porto Velho, Margem Esquerda do Rio Madeira, 2 December 2009, *N.C. Bigio 86* (CEN); Vilhena, Fazenda Flor da Serra, 20 May 1984, *C.S. Rosário 442* (MG). **Roraima:** Pacaraima, Cordilheira Pacaraima, 20 September 1979, *N.A. Rosa 3506* (INPA); Serra dos Surucucus, 18 February 1969, *G.T. Prance 10047* (INPA, NY).

**Distribution and habitat:**—Panama, Bolivia, Colombia, Guyana, and Venezuela. In Brazil, it occurs mainly in the Amazonian region in the states of Acre, Amazonas, Maranhão, Mato Grosso, Mato Grosso do Sul, Pará, Rondônia, and Roraima, between 100–800 m (Fig. 3D).

**Notes:**—This species can be easily recognized by the presence of scales with base rounded and long-acuminate to the filiform apex on all parts of the lamina, short petioles, and gradually reduced lamina bases. In Brazil, it can be confused with *P. monoides*, but can be differentiated by the shape of the pinnae at the lamina base, which are linear in *P. bombycina* and deltoid in *P. monoides*. *Pleopeltis bombycina* generally has smaller scales on the laminar tissue compared to *P. monoides*.

De la Sota (1966) noted a possible difference between collections from the eastern part of the species' distribution compared to the type material, but also affirmed that due to intermediate forms these morphotypes could not be separated into different species. The collections from Brazil are slightly different compared to those from the Andes. Additional studies are needed.

**5. *Pleopeltis burchellii*** (Baker) Hickey & Sprunt ex A.R.Sm. in Smith *et al.* (2018: 53). Figs. 12I–O, 7E, 17A, J, 19C–D, 20B. *Polypodium incanum* var. *burchellii* Baker in Martius (1870: 526). *Polypodium polypodioides* (Linnaeus 1753: 1525) var. *burchellii* (Baker) Weatherby (1939: 29). *Pleopeltis polypodioides* (L.) Andrews & Windham in Windham (1993: 46) var. *burchellii* (Baker) Smith (2005: 281). Type:—BRAZIL. Goyaz [Goiás]: *Burchell 6998* (holotype K!, isotype GH! image)

**Plants** epiphytic. **Rhizomes** long-creeping, with scales, linear-triangular to lanceolate, blackish, base rounded with a blackish point of attachment, apex long-acuminate, margin stramineous to brown and incised; **fronds** monomorphic 3–15 × 2–5 cm; petiolate, petioles terete, 1–7 cm long, without wings, scaly; **laminae** 2–8 cm long, pinnate, lanceolate to deltate, base truncate, apex acuminate; rachises terete, scaly; **pinnae** 9–15 pairs, 0.3–2 × 0.1–0.4 cm, linear, base adnate to the rachises, auricle absent, hydathodes present, apex rounded to acuminate, margin entire, laevigate, adaxial surface glabrous; abaxial surface scaly; **venation** anastomosing; **frond scales** lanceolate to ovate, light brown to brown, base rounded with a dark brown to blackish point of attachment, apex acute, margin stramineous to light brown and entire, serrulate to denticulate; **sori** rounded, medial, covered by scales; **spores** verrucate.

**Selected specimens examined:**—BRAZIL. **Amapá:** Calçoene, 11 December 2000, *F. Cesarino 16* (BHCB). **Distrito Federal:** Brasília, mata do córrego do Gama, 14 December 2002, *J.A.N. Batista 1328* (CEN). **Goiás:** Aporé, Povoado Itumirim, 16 February 1992, *M.R. Silva 70* (SPF); Goiânia, 7 February 1988, *J.R. Pirani 2071* (SPF); Itauçu, Fazenda Turvo-Inhumas, 28 November 2003, *R.C. Forzza 2473* (SPF); Luziania, AHE Corumbá IV, 23 November 2001, *M. Carvalho-Silva 97* (CEN). **Mato Grosso:** Nova Xavantina, 26 March 2003, *J.G. Souza 27* (SP); Vila Bela da Santíssima Trindade, Parque Estadual Serra de Ricardo Franco, 7 March 2011, *T.E. Almeida 2756* (BHCB); **Mato Grosso do Sul:** Bonito, Parque Nacional da Serra da Bodoquena, 12 November 2002, *V.J. Pott 5996* (BHCB, CGMS); Corumbá, 29 May 1999, *E.L.M. Assis 10* (BHCB); Inocência, 11 November 1995, *M.R. Pietrobom-Silva 2471* (SP). **Minas Gerais:** Araguaí, Distrito de Paracaiba, 27 January 2007, *A. Salino 11550* (BHCB); Arcos, 11 April 2004, *A. Salino 9563* (BHCB); Uberlândia, 4 March 1996, *E. Tameirão Neto 1921* (BHCB). **Pará:** Canaã dos Carajás, Floresta Nacional de Carajás, Serra Sul, Corpo C, 13 February 2010, *T.E. Almeida 2153* (BHCB); Marabá, Serra Norte, 27 May

1982, *R. Secco 351* (SPF); Parauapebas, Serra Sul-Corpo B, 20 May 2010, *A.J. Arruda 219* (BHCB); Santarém, Praia da Ponta de Pedras, 4 January 2014, *T.E. Almeida 3410* (BHCB). **Tocantins:** Caseara, Assentamento Califórnia, 4 May 2004, *E.R. Santos 71* (BHCB, HUTO).

**Distribution and habitat:**—Colombia, Venezuela, Guyana, French Guiana, Ecuador, Peru, and Bolivia. In Brazil, it occurs in the states of Acre, Amazonas, Amapá, Pará, Rondônia, Roraima, Tocantins, Maranhão, Bahia, Distrito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, and Minas Gerais (Fig. 13D) in the forest formations of low areas of the Cerrado and Amazonian Domain, it is one of the most abundant epiphytes in some areas of the Amazon, between 50–700 m.

**Notes:**—In Brazil, it can be confused with *P. minima*, but *P. burchellii* has blackish rhizome scales and lanceolate scales on the laminar tissue, while *P. minima* has brown rhizome scales and round to widely ovate scales on the laminar tissue. In addition, these taxa only co-occur in the states of Bahia, Minas Gerais and Mato Grosso do Sul.

**6. *Pleopeltis desvauxii*** (Klotzsch) Salino (2009: 107). Figs. 4A–D, 7F, 18A. *Taenitis desvauxii* Klotzsch (1847: 431). Type:—SAINT VINCENT. *Hooker & Greville* (lectotype: LT! image, designated by Proctor (1977))

**Plants** epiphytic or epipetric. **Rhizomes** short-creeping, with scales, ovate to widely-ovate, blackish, base rounded, apex acuminate, margin entire to denticulate; **fronds** monomorphic, 8–20 × 6–10 cm, sessile to short-petiolate, petioles terete, up to 0.2 cm long, alate, glabrous to sparsely scaly; **laminae** 8–19 cm long, bifurcate to eventually trifurcate; obtriangular, base attenuate, apex truncate to obtuse; rachises terete, glabrous; **segments** 5–12 × 0.3–1.4 cm, moderately scaly on both surfaces; **frond scales**, ovate to widely-ovate, or lanceolate (those of rachises), dark brown to blackish, base rounded, apex acuminate, margin entire to denticulate; **venation** anastomosing; **sori** linear, marginal, glabrous; **spores** with plain surface to shallowly verrucate.

**Selected specimens examined:**—BRAZIL. **Acre:** Mâncio Lima, Parque Nacional da Serra do Divisor, 14 December 2010, *T.E. Almeida 2628* (BHCB). **Amapá:** Rio Oiapoque, Ilha do Escondido, 12 August 1960, *H.S. Irwin 47442* (NY, IAN). **Amazonas:** Manaus, Reserva Florestal Ducke, 3 July 1993, *J. Prado 993* (SP). **Ceará:** Pacatuba, Serra da Aratanha, *E.L. Paula-Zárate s.n.* (EAC 25422). **Pará:** Canaã dos Carajás, Floresta Nacional de Carajás, Serra Sul, Corpo B, 14 February 2010, *T.E. Almeida 2159* (BHCB); Parauapebas, Serra Sul, 17 March 2009, *P.L. Viana 4109* (BHCB). **Roraima:** Serra dos Surucucus, 18 February 1969, *G.T. Prance 10023* (NY); Rorainópolis, 17 February 2008, *H. Tuomisto 15778* (SP).

**Distribution and habitat:**—Antilles, Guyana, French Guiana, Venezuela, Ecuador, Peru, and Bolivia. In Brazil, this species occurs mainly in the Amazonian region in the states of Acre, Amapá, Amazonas, Pará, Rondônia, and Roraima, as well as in the mountain region of Ceará state, (Fig. 6A), and eventually occurs in gallery forest of Cerrado in the State of Minas Gerais, between 100–700 m.

**Notes:**—This species can be recognized by its obtriangular lamina with straight segments (0.3–1.4 cm wide), ovate scales, and anastomosing veins. It can be confused with *P. furcata*. However, these species only co-occur in the state of Minas Gerais and can be differentiated by venation, which is free and furcate or eventually anastomosing near the costae in *P. furcata* and completely anastomosing in *P. desvauxii* (Fig. 18A).

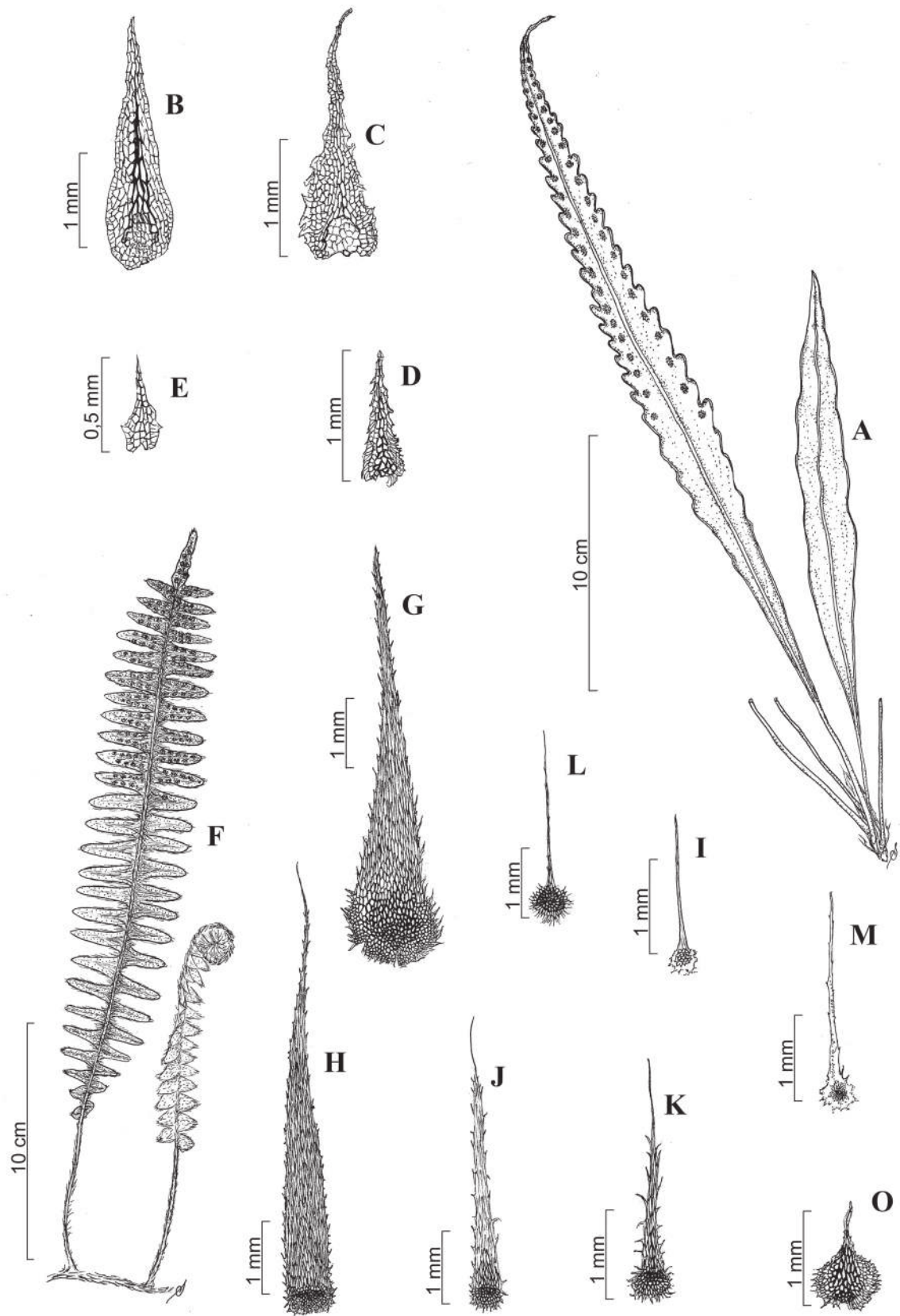
**7. *Pleopeltis furcata*** (L.) Smith in Smith & Tejero-Diéz (2014: 46). Figs. 4E–G, 7G, 18B. *Pteris furcata* Linnaeus (1753: 1073). *Dicranoglossum furcatum* (L.) Smith in Seemann (1854: 232) Type—BOLIVIA. Polo-Polo bei Coroico, Nordyungas, altura sobre el mar 1100 m, 09 October 1912, *O. Buchtien s.n.* (holotype, E! image)

**Plants** epiphytic or epipetric. **Rhizomes** short-creeping, with scales lanceolate, blackish, base rounded, apex acuminate, margin entire; **fronds** monomorphic, 12–50 × 5–13 cm sessile to short-petiolate, petioles terete, 0–1 cm long., alate, glabrous; **laminae** with 12–49 cm long, furcate, obtriangular, base attenuate, apex obtuse to truncate; rachises terete, glabrous; **segments** 7–15 × 0.4–1.3cm, sparsely scaly on both surfaces; **venation** free, furcate to eventually anastomosing near to the costae; **frond scales**, ovate to widely-lanceolate, blackish, base rounded, apex acute, margin hyaline and erose; **sori** linear, marginal, glabrous; **spores** shallowly verrucate with sparse globules.

**Selected specimens examined:**—BRAZIL. **Bahia:** Jussari, RPPN Serra do Teimoso., 2 November 2002, *A. Salino 8176* (BHCB); Una, 21 April 1999, *M. Barradas-Paciencia 399* (SP). **Espírito Santo:** Cariacica, Reserva Biológica Duas Bocas, 21 October 2008, *P. Labiak 5024* (CEPEC); Santa Tereza, Reserva Biológica Augusto Ruschi, 30 July 2002, *R.R. Vervloet 596* (BHCB). **Minas Gerais:** Almenara, 28 February 2004, *A. Salino 9369* (BHCB); Descoberto, Reserva Biológica da Represa do Grama, 26 November 2000, *R. C. Forzza 1723* (SP); Santa Maria do Salto, Distrito de Talismã, 23 August 2003, *J.A. Lombardi 5461* (BHCB). **Paraná:** Ilha do Mel, Baía de Paranaguá,



**FIGURE 4.** A–D. *Pleopeltis desvauxii*. A. Habit; B. Rhizome scale; C. Abaxial rachis scale; D. Abaxial laminar scale. E–G. *P. furcata*. E. Habit; F. Rhizome scale; G. Abaxial laminar scale.



**FIGURE 5.** A–E. *Pleopeltis gyroflexa*. A. Habit; B. Rhizome scale; C. Petiole scale; D. Abaxial rachis scale; E. Abaxial laminar scale. F–O. *P. hirsutissima*. F. Habit; G. Rhizome scale; H. Petiole scale; I. Adaxial rachis scale; J–K. Abaxial rachis scale; L. Adaxial laminar scale; M. Abaxial laminar scale; O. Sorus scale.

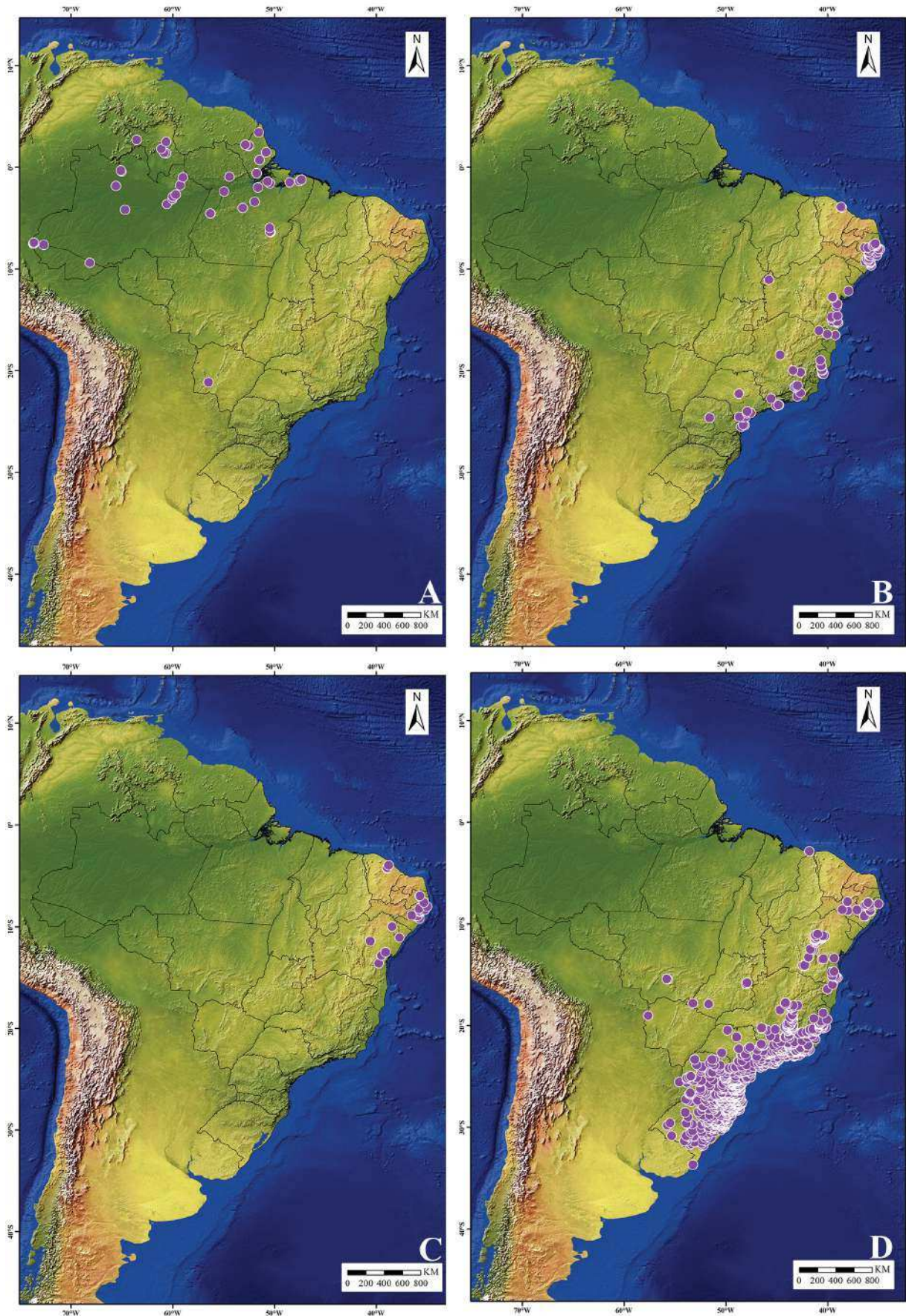


FIGURE 6. Distribution of four species of *Pleopeltis* in Brazil. A. *P. desvauxii*; B. *P. furcata*; C. *P. gyroflexa*; D. *P. hirsutissima*.

May 1949, *R. Hertel s.n.* (RB 688699). **Pernambuco:** Bonito, Mata da Reserva Biológica Municipal de Bonito, 31 October 2000, *A. Santiago 322* (BHCB); São Vicente Férrer, Complexo da Serra do Mascarenhas, 22 February 1999, *M.R.P. Silva 4526* (BHCB, SP). **São Paulo:** Cananéia, Ilha do Cardoso, 2 June 1982, *F. Barros 730* (SP); Eldorado, Parque Estadual do Jacupiranga, 28 March 2005, *A. Salino 10268* (BHCB); Juquiá, Reserva Votorantim, 28 March 2013, *T.E. Almeida 3214* (BHCB); Sete Barras, Parque Estadual Carlos Botelho, 24 September 2002, *V.A.O. Dittrich 1163* (BHCB); Ubatuba, Parque Estadual da Serra do Mar, 10 November 1993, *A. Salino 1850* (BHCB).

**Distribution and habitat:**—Cuba, Colombia, Ecuador, Haiti, Dominican Republic, Suriname, Trinidad and Tobago, and Venezuela. In Brazil, this species occurs in the states of Alagoas, Bahia, Pernambuco, Sergipe, Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, and Paraná (Fig. 6B), mainly in the forest formations of the Atlantic Forest Domain. Rarely found above 1000 m elevation.

**Notes:**—This species can be recognized by its large size (12–50 cm long), compared to *P. desvauxii* (8–20 cm long), and by its free and furcate veins, which eventually form areolae near the costae (versus totally anastomosed veins in *P. desvauxii*).

**8. *Pleopeltis gyroflexa*** (Christ) Schwartsburd (2014: 17). Figs. 5A–E, 7H, 17C. *Polypodium gyroflexum* Christ (1898: 994). Type:—BRAZIL. Ceará: Serra de Baturité, Guaramiranga, epiphyte sur les caféiers, [“Auf Cafeträuchern häufig”], September 1897, *J. Huber s.n.* (lectotype: P! image designated by Schwartsburd (2014), isolectotype: MG! image)

*Pleopeltis repanda* Smith. (1990: 259). Type:—VENEZUELA. Bolívar: Altiplanicie Nuria, upper part of westfacing wooded slopes, E of Miamo, 300–500 m, 8 January 1961, *J.A. Steyermark 88177* (holotype, UC, isotype: US! image).

**Plants** epiphytic or epipetric. **Rhizomes** short-creeping, with scales lanceolate, blackish, base rounded, apex attenuate, margins erose to denticulate; **fronds** subdimorphic to holodimorphic, 25–42 × 1.3–2 cm, petiolate, petiole angulate, 4–6 cm long, without wings, glabrous; **laminae** 21–38 cm long simple, linear-lanceolate, base attenuate, apex acuminate to acute, margin repand, sparsely scaly on both surfaces; rachises terete, glabrous; **venation** anastomosing; **frond scales** lanceolate to widely-ovate, brown to dark brown, base rounded with a blackish point of attachment, apex acuminate, margin brown and entire to denticulate; **sori** oblong, submarginal, glabrous; **spores** papillate with globules.

**Selected specimens examined:**—BRAZIL. **Alagoas:** Murici, Estação Ecológica de Murici, 07 May 2009, *A.F.N. Pereira 1109* (UFP); São José da Lage, Usina Serra Grande, 19 December 2000, *M.R. Pietrobon s.n.* (UFP 33438). **Bahia:** Bananeiras, Cachoeira, Vale dos Rios Paraguaçu e Jacuípe, December 1980, *G.P. Cavalo 979* (ALCB, HUEFS); Jeremoabo, Fazenda Natureza, 12 August 2005, *E.B. Miranda 901* (HUEFS); Santa Terezinha, Recôncavo Sul, 25 October 2010, *M.L. Guedes 17847* (ALCB, VIES); Serra da Jibóia, 31 October 2009, *T.S. Macedo 175* (HUEFS); Varzedo, Recôncavo Sul, 7 December 2015, *M.L. Guedes 24271* (ALCB). **Ceará:** Pacatuba, Serra de Pacatuba, 22 July 1997, *M. Almeida-Neto 206* (HUEFS); Pará: 1898, *Canceolak s.n.* (K). **Paraíba:** Areia, Brejo Paraibano, 9 December 2011, *E. Melo 10720* (HUEFS). **Pernambuco:** Bezerros, Serra Negra-Sítio Frexeiras, 30 July 1999, *S.R.S. Xavier 25* (UFP). **Roraima:** Cordilheira Pacaraima, 24 September 1979, *N.A. Rosa 3538* (MG). **Sergipe:** Riachão do Dantas, 18 November 1985, *G. Viana 1204* (UFP).

**Distribution and habitat:**—Venezuela and Guyana. In Brazil, this species occurs in the forest formations of Amazon and Atlantic Forest of the Northeast in the states of Alagoas, Bahia, Ceará, Pará, Paraíba, Pernambuco, Roraima, and Sergipe (Fig. 6C).

**Notes:**—This species can be recognized by its repand margins of the fertile lamina and large fronds (25–42 × 1.3–2 cm). Younger individuals can be confused with *P. macrocarpa* because they lack a clearly repand margin. However, they can be differentiated by the lamina scales that are widely ovate in *P. gyroflexa* and lanceolate in *P. macrocarpa*.

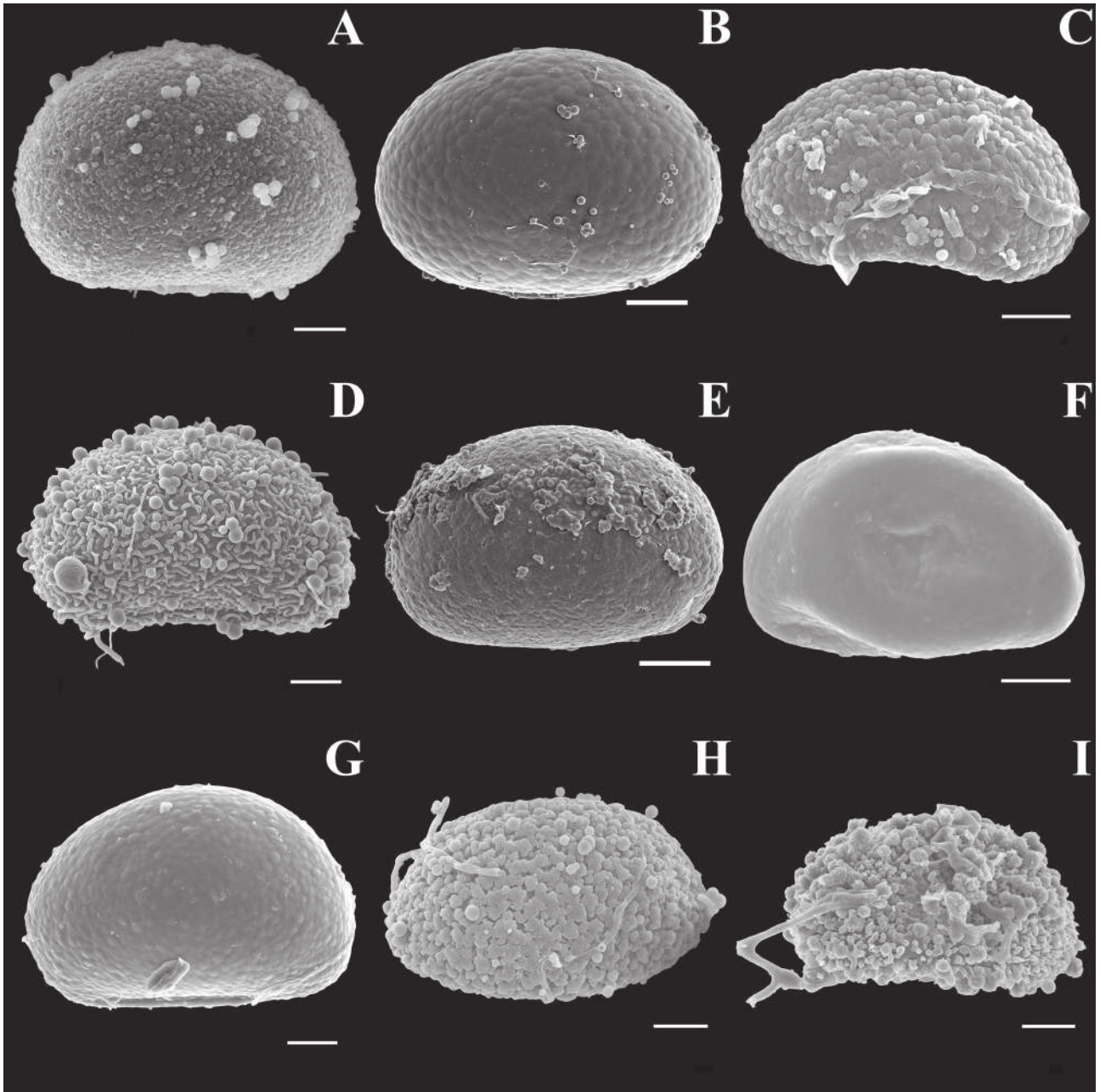
As observed by Schwartsburd (2014), this species has a disjunct documented distribution in the country with populations in Amazonian forest in the state of Roraima and Atlantic Forest in states in the Northeast Region. With intermittent areas under-investigated, it is possible that the actual distribution of this species is continuous from the Guiana Shield to Northeastern Brazil.

**9. *Pleopeltis hirsutissima*** (Raddi) de la Sota in de la Sota et al (2007: 239). Figs. 5F–O, 7I, 18C, G, H, 20G. *Polypodium hirsutissimum* Raddi (1819: 286). Type:—BRAZIL. Rio de Janeiro, *G. Raddi s.n.* (syntypes P!, P)

**Plants** epiphytic, epipetric or terrestrial. **Rhizomes** short-creeping, with scales lanceolate, brown, base rounded with dark brown point of attachment, apex acuminate and margin stramineous to brown and lacinate, with projections



simple to bifid; **fronds** monomorphic, 10–65 × 1.2–8.2 cm, petiolate, petioles 0.5–12 cm long, terete, scaly; **laminae** 9–53 cm long, pinnatisect, linear to lanceolate, base gradually reduced, apex acuminate to acute; rachises terete, densely scaly; **pinnae** 14–60 pairs, proximal 2–15 pairs reduced, linear, medial pinnae 0.5–5 × 0.2–0.6 cm, linear, bases adnate to the rachises, auricle present, hydathodes present, apex rounded to acuminate, margin entire, flat, on the adaxial surface scaly; **venation** anastomosing; **frond scales** lanceolate and brown to dark brown (those of petioles and rachises and sori) or scales with base rounded and long-acuminate to the filiform or aristate apex and hyaline (those of both surfaces of pinnae), base with a dark brown to blackish point of attachment, margin stramineous and dentate (those of petioles and rachises and sori) or margin hyaline and erose to lacinate (those of both surfaces of pinnae and sori); **sori** rounded, medial, covered by scales; **spores** papillate with dense globules.



**FIGURE 7.** Spores of nine species of *Pleopeltis* from Brazil. A. *P. alborufula*; B. *P. astrolepis*; C. *P. aturensis*; D. *P. bombycina*; E. *P. burchellii*; F. *P. desvauxii*; G. *P. furcata*; H. *P. gyroflexa*; I. *P. hirsutissima*. Scale bar = 20 μm

**Selected specimens examined:**—BRAZIL. **Alagoas:** Quebrangulo, Reserva Biológica da Pedra Talhada, 23 October 2014, *L. Nusbauermer* 4208 (JPB, MAC). **Amazonas:** Manaus, Reserva Florestal Ducke, 9 January 1998, *A.A. Costa* 670 (SP); São Paulo de Olivença, Comunidade Aracu, 17 March 2011, *C.N. Fraga* 3155 (RB). **Bahia:** Abaíra, Catolés, 14 May 1992, *W. Ganev* 262 (HUEFS, K, SPF, SP); Camacan, RPPN Serra Bonita, 17 July 2009, *A. Amorim* 7872 (CEPEC); Caetité, Brejinho das Ametistas, 19 December 2007, *M.L. Guedes* 14339 (ALCB); Itajuípe,

Distrito União Queimada, 9 February 1994, *A.M. Carvalho 4353* (CEPEC); Jacobina, Piemonte da Diamantina, 4 June 2011, *A.C.V. Crestani 181* (ALCB); Monte Tabor, 14 October 2007, *J.L. Ferreira 173* (HUEFS); Jussari, 13 August 1998, *A.M. Amorim 2471* (SP); Miguel Calmon, 8 May 2005, *J.G. Freitas 37* (HUEFS); Morro do Chapéu, Estrada para Morrão, 5 May 2007, *J.L. Ferreira 76* (HUEFS); Palmeiras, Morro do Pai Inácio, 28 March 1997, *A.A. Conceição 563* (SPF); Rio de Contas, Pico das Almas, 23 November 1988, *R.M. Harley 26253* (CEPEC, K, SPF); Una, estrada São Joas/Una, 7 April 1995, *A. Amorim 1673* (CEPEC). **Distrito Federal:** Morro do Archer, 15 August 1958, *E. Pereira 4002* (RB); Brasília, Fazenda Água Limpa, 4 May 2011, *R.P. Oliveira 42* (CEN). **Espírito Santo:** Cariacica, Reserva Biológica Duas Bocas, 6 May 2008, *C.N. Fraga 2059* (RB); Castelo, Forno Grande, 13 October 2000, *L. Kollmann 3263* (MBML, BHCB); Domingos Martins, Parque Estadual da Pedra Azul, 5 December 2008, *A. Salino 14102* (BHCB); Mimoso do Sul, Pedra dos Pontões, 28 November 2004, *D.R. Couto 212* (BHCB); Conceição de Muqui, 9 July 2011, *D.R. Couto 1996* (VIES). **Goiás:** Luziania, Fazenda Corumbá, 9 April 2003, *G. Pereira-Silva 7478* (CEN). **Mato Grosso:** Alto Taquari, Fazenda Bambuzal, 21 February 1994, *M.R. Silva 1230* (SPF); Chapada dos Guimarães, Parque Nacional da Chapada dos Guimarães, 2 March 2011, *T.E. Almeida 2685* (BHCB). **Mato Grosso do Sul:** Corumbá, Mineração Corumbaense Reunida SA, 16 February 2005, *V.J. Pott 12546* (BHCB, CGMS); Mundo Novo, RPPN Lote Cristalino I, 05 June 2007 (INPA). **Minas Gerais:** Aiuruoca, Vale do Matutu, 11 October 2004, *A. Salino 9778* (BHCB); Alto Caparaó, Parque Nacional do Caparaó, 29 November 2010, *F.S. Souza 1178* (BHCB); Baependi, Parque Estadual Serra do Papagaio, 23 July 2010, *F.S. Souza 950* (BHCB, CESJ); Barbacena, Beira de estrada, 27 April 2013, *D.R. Gonzaga 238* (BHCB, CESJ); Boa Esperança, Serra da Boa Esperança, 14 December 2007, *A. Salino 13070* (BHCB); Brazópolis, 30 October 2008, *T.E. Almeida 1551* (BHCB); Bueno Brandão, 18 July 2007, *A. Salino 12756* (BHCB); Caeté, Serra da Piedade, 4 March 1976, *M. Brandão 5524* (PAMG); Caldas, Distrito de Pocinhos do Rio Verde., 15 July 2007, *A. Salino 12611* (BHCB); Camanducaia, Matão, 8 December 2000, *L.C.N. Melo 21* (BHCB, CESJ); Monte Verde, 18 August 2001, *L.C.N. Melo 64* (BHCB); Carandaí, Santa Cecília, 28 October 1952, *Duarte 5543* (LP, RB); Carangola, Serra do Brigadeiro, 25 February 1989, *B. Cosenza s.n.* (CESJ 23466); Descoberto, Serra do Gramma, 18 April 1925, *J.G. Kuhlmann 24* (VIC); Carrancas, Serra de Carrancas, 19 June 2007, *A. Salino 12349* (BHCB); Congonhas, 23 August 2005, *M.S. Mendes 836* (BHCB); Coronel Pacheco, Fazenda da Companhia, 16 May 1944, *E.P. Heringer 1250* (RB); Delfim Moreira, 15 March 2011, *L.L. Giacomim 1349* (BHCB, CESJ); Gonçalves, Mata do Edi, 31 October 2015, *L.C. Moura 13* (BHCB); Itabirito, Mina do Pico, 22 January 2008, *L.J. Arruda 333* (BHCB); Itambé do Mato Dentro, Distrito de Santana do Rio Preto, 6 August 2006, *T.E. Almeida 345* (BHCB); Itamonte, Hotel Casa Alpina, 20 January 2011, *T.A. Batista 186* (BHCB, CESJ); Itumirim, 20 May 1994, *M. Brandão 24108* (PAMG); Juiz de Fora, Área de Preservação Ambiental Mata do Krambeck, 18 October 2008, *F.S. Souza 586* (CESJ); Lambari, Parque Estadual Nova Baden, 27 February 2008, *G.E. Valente 2025* (SP, VIC); Lima Duarte, Parque Estadual do Ibitipoca, São Francisco do Prata, 9 May 1989, *L. Krieger 24785* (BHCB, CESJ); Moeda, Serra da Moeda, 23 January 2006, *G. Heringer 13* (BHCB); Nova Lima, RPPN Capitão do Mato, 19 September 2003, *J.B. Figueiredo 78* (BHCB); Olaria, Serra do Cruz, 11 September 2010, *F.E. Alves 3* (CESJ); Ouro Preto, Parque Estadual do Itacolomi, 2 April 2006, *L.B. Rolim 319* (BHCB); Paraisópolis, Parque Ecológico do Brejo Grande, 31 October 2008, *T.E. Almeida 1602* (BHCB); Passa Quatro, Serra da Mantiqueira, 4 September 2013, *L.N. Gonçalves 180* (RB); Passa-Vinte, 14 February 2009, *T.E. Almeida 1784* (BHCB); Poços de Caldas, 1 December 1981, *F. Barros 663* (SP); Rio Acima, Serra do Gandarela/C1, 11 October 2007, *F.F. Carmo 1334* (BHCB); Rio Preto, Serra Negra, Serra do Funil, 14 November 2004, *F.S. Souza 8* (BHCB, CESJ); Sabará, Mina de Cuiabá da Anglo Gold Ashanti, 30 May 2006, *D.T. Souza 60* (BHCB); Santa Bárbara do Monte Verde, Serra Negra-Fazenda Três Cruzes, 22 April 2004, *J.P. Condack 114* (RB); Santa Rita do Sapucaí, Reserva da Serra de Santa Rita, 29 May 1994, *M. Brandão 23981* (PAMG); Santana do Riacho, Distrito de Cardeal Mota, 15 December 1997, *F.P.F. Athayde 286* (RB, SP); Sapucaí-Mirim, 24 August 1978, *A.T. Silva 107* (SP); São Roque de Minas, Parque Nacional da Serra da Canastra., 15 July 1997, *A. Salino 3232* (BHCB). **Paraná:** 40Km de Horizonte, 28 January 1985, *A. Krapovickas 39707* (LP); Adrianópolis, Parque Estadual das Lauráceas, 12 December 2006, *F.B. Matos 1309* (CEPEC, SP); Agudos do Sul, 11 April 2010, *T.E. Almeida 2309* (BHCB); Antonina, Reserva Natural Rio Cachoeira, 2 March 2005, *F.B. Matos 480* (SP); Califórnia, 25 September 1996, *F.G. Silva 1995* (BHCB); Campina Grande do Sul, Parque Estadual Pico Paraná, 29 September 2007, *J.B.S. Pereira 81* (VIC); Contenda, Sítio Hamich, 2 June 1983, *S.M. Langer 2* (SPF); Corvo, Alto da Serra do Mar, 13 April 1948, *G. Tessmann 236* (UFP); Curitiba, Santa Felicidade, 23 September 1972, *G. Hatschbach 30356* (LP, SI); Céu Azul, Parque Nacional do Iguaçu, 31 July 2012, *M. Lautert 60* (BHCB); Guarapuava, Serra da Esperança, 14 October 2011, *J. Prado 2179* (SP); Guaratuba, Alto da Serra, 25 July 1960, *A.P. Duarte 5313* (LP); Imbituva, 13 January 1983, *J.R. Pirani 407* (SPF); Matinhos, Parque Florestal do Rio da Onça, 8 December 2004, *F.B. Matos 97* (CEPEC); Palmas, 20 April 1983, *J.R. Pirani 585* (SPF); Paranaguá, Ilha do Mel, 17 October 1992, *A. Salino 1541* (BHCB); Paulo Freitas, BR-476, 20 April 1983, *J.R. Pirani 584* (SPF, SP); Piraquara, Recreio da Serra, 14 June 2014,

*M.L. Brotto 1696* (RB); Ponta Grossa, Vila Velha, 31 May 1989, *A.C. Cervi 2675* (SJRP); Itaiacoca, 5 October 1995, *J.M. Silva 1541* (BHCB, CESJ, RB); Quatro Barras, Distrito Borda do Campo, 9 May 1996, *F. França 2515* (BHCB, CEPEC, HUEFS); Santa Tereza do Oeste, Parque Nacional do Iguaçu, 12 February 2011, *R.S. Viveros 218* (BHCB); Saponema, Salto das Orquídeas, 24 May 1997, *V.F. Kinupp 568* (BHCB); São Mateus do Sul, arredores da Usina, 26 January 2005, *R. Wasum 2432* (UFP); Três Barras do Paraná, Parque Estadual do Rio Guarani, 2 October 2012, *M. Lautert 105* (BHCB); Tunas do Paraná, Parque Estadual de Campinhos, 16 December 1998, *J.M. Cruz 45* (BHCB); Vila Velha, rio Quebra-Perna, 10 January 1987, *A. Krapovickas 40734* (LP). **Pernambuco:** Bezerros, Serra Negra, 30 December 1998, *S.R.S. Xavier 06* (UFP); Jaqueira, Usina Colônia, 17 October 2001, *M.S. Lopes 662* (UFP); Maraial, Lagoa dos Gatos, 20 April 1994, *A.M. Miranda 1606* (UFP); Triunfo, Cachoeira do Pinga, 12 February 1969, *G. Mariz 442* (UFP). **Rio Grande do Sul:** Antônio Prado, Fazenda Filipini, 27 May 2007, *R. Wasum 4104* (BHCB); Canoas, 10 August 1949, *I.L. Afonso 14262* (CESJ, SPF); Capão da Canoa, Fazenda Pontal, 28 February 2002, *F.P.F. Athayde 1081* (SJRP); Caxias do Sul, Vila Seca, 1 January 2010, *R. Beltrão 51* (CESJ); Cidreira, Lagoa da Tapera, 23 September 2012, *F. Conzatti 586* (VIC); Farroupilha, Parque dos Pinheiros, 7 September 2005, *R. Menghel 51* (BHCB); Gramado, 8 March 2010, *J. Prado 2127* (SP); Kappesberg, pr. Caxias, 11 September 1949, *R. Rambo 43403* (RB); Pelotas, Arroio do Padre, 10 June 1959, *G.L. Brauner 121* (RB); IPEAS, 22 January 1973, *A. Krapovickas 22871* (BA, LP); Reutersberg, próximo a Dois Irmãos, 6 June 1949, *R. Rambo 41890* (LP); Sapucaia do Sul, Morro Sapucaia, 29 June 1986, *I. Fernandes 149B* (SJRP); São Leopoldo, 1941, *J. Eugenio 1456* (RB); São Lourenço do Sul, Arroio Pinto, 3 June 2013, *F. Gonzatti 696* (VIC); Vacaria, Estrada entre a BR-116 e a Vila São Pedro, 16 September 2006, *E.S.G. Guarino 1107* (CEN); Vila Oliva, 12 July 1950, *S. Rambo 47249* (RB). **Rio de Janeiro:** Angra dos Reis, Ilha Grande, 8 October 1993, *R. Marquete 1214* (RB); Araras, 5 February 1974, *D. Sucre 10613* (RB); Cachoeira de Macacu, Cachoeira do Tenebroso, 10 August 2004, *S.L.S. Winter 252* (RB); Duque de Caxias, Xerém, 17 October 1999, *J.M.A. Braga 5474* (RB); Guapimirim, Estação Ecológica do Paraíso, 28 September 2010, *K. Baber KB565* (RB); Itatiaia, Três Picos, 15 December 1927, *Campos Porto 1612* (RB); Macaé, Glicério, 7 July 2004, *C. Mynssen 631* (RB); Magé, Parque Nacional da Serra dos Órgãos, 23 March 2010, *R.A. Engelmann RE0620* (RB); Mangaratiba, Reserva Ecológica Rio das Pedras, 6 May 1997, *C. Mynssen 109* (RB); Maricá, Cachoeira do Espraiado, 10 June 2004, *S.L.S. Winter 139* (RB); Mendes, Fazenda São José das Paineiras, 1 May 1993, *T. Konno 137* (RB); Nova Friburgo, Teodoro de Oliveira, 8 August 1989, *A. Amorim 144* (RB); Macaé de Cima, Cônego, 16 June 2004, *R.C. Forzza 3432* (RB, SPF, SP); Nova Iguaçu, Reserva Biológica do Tinguá, 22 August 2013, *M.G. Bovini 3900* (RB); Paraty, Morro do Carisquinha, 4 August 1994, *S. Benarrosh 23* (RB); Petrópolis, Carangola, 22 May 1945, *O.C. Goes 1149* (LP); Resende, Itatiaia National Park, , 31 July 1966, *G. Eiten 7733* (SP, TEPB); Rio das Ostras, Restinga de Balneário das Garças, 14 December 1999, *H.N. Braga 700* (RB); Rio de Janeiro, Parque Nacional da Tijuca, 21 September 1975, *J.P.P. Carauta 1827* (RB); Santa Maria Madalena, Morro da torre de TV, 28 March 2011, *C. Mynssen 1211* (RB); Teresopolis, Parque Nacional da Serra dos Órgãos, 1 November 2004, *R. Engelmann RE016* (RB). **Rondônia:** Porto Velho, Rio Madeira, 2 December 2009, *N.C. Bigio 86* (RB). **Santa Catarina:** Aguas Mornas, 4 February 1994, *A. Krapovickas 44749* (LP); Anita Garibaldi, 21 January 2009, *M. Verdi 1343* (BHCB); Biguassuí, Antônio Carlos, s.d. *P.R. Reitz 295* (RB); Blumenau, 23 November 2009, *T.J. Cadorin 664* (RB); Bom Retiro, Serra do Panelão, 2 May 2008, *A.L. Gasper 1754* (BHCB, FURB); Campo Belo do Sul, Fazenda Gateados, 3 May 2005, *G. Pereira-Silva 9996* (BHCB); Capão Alto, 18 March 2008, *M. Verdi 477* (BHCB); Caçador, Reserva Genética Florestal de Caçador, 16 October 1994, *D.B. Falkenberg 6757* (HUEFS); Garuva, Sol Nascente, 7 April 2010, *T.J. Cadorin 1927* (RB); Itaiópolis, Moema, 18 August 2010, *M. Verdi 5429* (RB); Ituporanga, Rio do Norte, 13 August 2010, *M. Verdi 5308* (RB); Joinville, Rio Manso, 2 February 2010, *T.J. Cadorin 1105* (RB); Mafra, 25 April 1968, *F.B. Mattos 15306* (SP); Paineal, Fazenda Farofa, 3 April 2007, *A. Salino 11954* (BHCB, SPF); Ponte Alta, Morro do Funil, 25 March 2008, *A.L. Gasper 1653* (BHCB, FURB); Porto União, Pinheiral, 19 December 1966, *L.B. Smith 8843* (SI); Rio Fortuna, Rio Indaiá, 9 April 2010, *M. Verdi 4298* (RB); Siderópolis, Serrinha, 19 November 2009, *J.L. Schimitt 605* (RB); São Francisco do Sul, Ilha Araújo do Meio, 6 July 2007, *J. Meirelles 17* (RB); Treviso, Brasília, 24 November 2009, *J.L. Schimitt 696* (RB); Três Barras, Flona Três Barras, 9 June 2008, *A.L. Gasper 1808* (BHCB, FURB); Urubici, Mundo Novo, 12 November 1964, *J. Matos 12113* (SP). **São Paulo:** Analândia, Serra do Cuscuzeiro, June 1993, *A. Salino 1774* (BHCB); Atibaia, Pico da Pedra Grande, 14 September 1991, *A. Salino 1098* (BHCB); Bananal, Estação Ecológica do Bananal, 10 March 2001, *A. Salino 6375* (BHCB); Biritiba Mirim, Estação Biológica de Boracéia, 29 September 1983, *A. Custódio Filho 1612* (SP); Campos do Jordão, 20 February 1937, *Campos Porto 3092* (RB, VIC); Cananéia, Estrada da Quarentenária, 26 January 2012, *M.H.N. Alexandre 70* (SP); Capão Bonito, Rodovia Francisco Alves–Negrão-SP258, 23 October 2007, *R.C. Forzza 4742* (RB, SP); Caraguatatuba, Parque Estadual da Serra do Mar, 6 March 2008, *M.J.M. Christenhusz 4961* (SP); Cubatão, 21 May 1995, *M.R. Pietrobom 1775* (SPF); Cunha, Parque Estadual da Serra do Mar, 15 December 1996, *A. Salino 2866* (BHCB); Eldorado, Parque Estadual do Jacupiranga, 22 March 2005, *A. Salino 10102* (BHCB); Embu,

Rodoanel Mário Covas, 30 August 2007, *J. Prado 1705* (SP); Guarulhos, Bairro das Pimentas, 1 March 1981, *O. Yano 3198* (SP); Ibiúna, bairro Morro Grande, 30 June 1998, *J. Prado 969* (SP); Peropava, 13 June 1986, *E.L.M. Catharino 821* (RB); Ilhabela, 1991, *V.C. Souza 12296* (BHCB); Itaberá, 28 July 1991, *J.V. Godoi 114* (SP); Itapeçerica da Serra, 23 September 1996, *A. Rapini 195* (SP); Itirapina, 12 October 1984, *L.M. Esteves 23* (SP); Jambeiro, 12 February 1980, *A.T. Silva 216* (SP); Jundiá, Serra do Japi, 16 October 2009, *R.Y. Hirai 626* (SP); Mairiporã, Parque Estadual da Cantareira., 6 November 2008, *F.A.R.D.P. Arzolla 1331* (BHCB); Miracatu, Reserva Votorantim, 26 March 2013, *T.E. Almeida 3186* (BHCB); Mogi das Cruzes, Parque Natural Municipal da Serra do Itapeti, 17 September 2005, *V.A.O. Dittrich 1336* (BHCB); Paraibuna, 9 February 1977, *A.T. Silva 370* (SP); Paranapanema, Estação Ecológica, 15 May 2007, *J.A. Pastore 1413* (BHCB); Paranapiacaba, Estação Biológica, 7 December 1982, *A. Custódio Filho 1135* (SP); Pindamonhangaba, Fazenda São Sebastião, 25 January 1997, *S.A. Nicolau 1318* (SP); Ribeirão Grande, Parque Estadual da Serra do Mar, 15 June 2003, *A. Salino 8423* (BHCB, CESJ); Salesópolis, 27 December 1996, *S. Nicolau 1233* (RB, SP); Salesópolis, Estação Experimental de Boraceia, 3 March 1962, *O.P. Travassos 306* (RB); Santo Amaro, 10 August 1942, *L. Roth 198* (SP); Santo André, Vila de Paranapiacaba, 13 October 2009, *E.K.O. Hattori 883* (BHCB); São Bernardo do Campo, Parque Caminhos do Mar, 19 December 1994, *E.L.C. Marzola 195* (SP); São Carlos, Parque Ecológico, 13 October 1998, *V.R. Pires 8* (SJRP); São Lourenço da Serra, Res. Particular do Patrimônio Natural Paiol Maria, 17 August 2010, *J.A. Lombardi 7787* (BHCB); São Luís do Paraitinga, Parque Estadual da Serra do Mar, 6 March 2001, *A. Salino 6206* (BHCB, CESJ); São Paulo, Reserva Biológica Parque Estadual das Fontes do Ipiranga, 7 February 1976, *J.A. Corrêa 132* (SP); Tapiraí, Fazenda São José, 24 February 2008, *S. Lehtonen 602* (SP); Ubatuba, Araribá, 12 July 1999, *V.A.O. Dittrich 628* (BHCB); Vinhedo, Fazenda Rio da Prata, 28 July 1993, *C.E. Rodrigues Jr. 503* (SP).

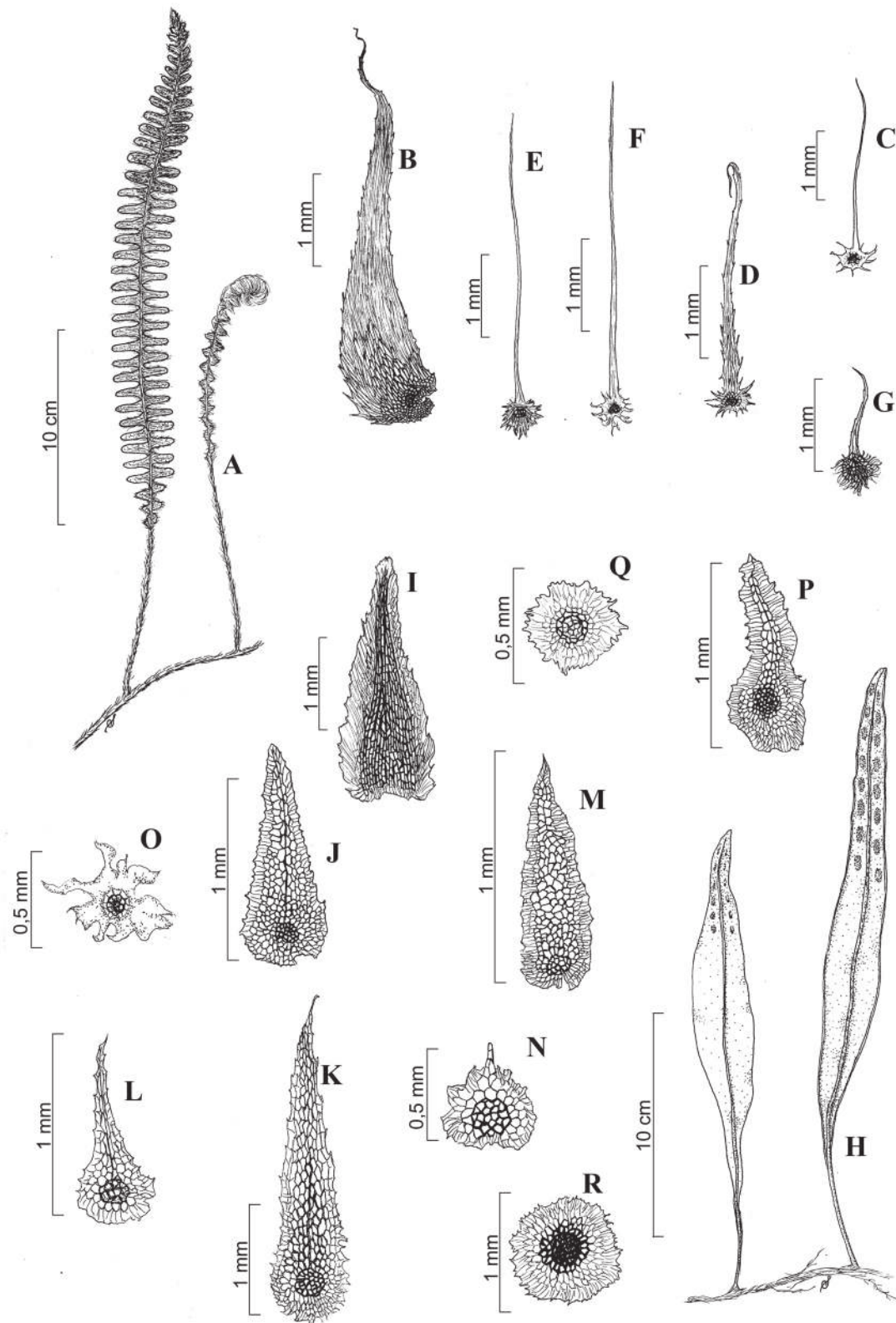
**Distribution and habitat:**—Widely distributed in the south of South America, in Argentina, Bolivia, Paraguay, and Uruguay. In Brazil, this species occurs in the states of Amazonas, Roraima, Rondônia, Alagoas, Bahia, Pernambuco, Piauí, Distrito Federal, Goiás, Mato Grosso, Mato Grosso do Sul, Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Rio Grande do Sul, and Santa Catarina (Fig. 6D) in several phytophysiognomies of Atlantic Forest, Cerrado and Amazon domains, between 0–2000 m.

**Notes:**—The presence of lanceolate scales on the rachises and scales with base rounded and long-acuminate to the filiform apex (Fig. 20G) on the laminar tissue on both surfaces are notable characters for the species. This species exhibits great morphological variation, mainly in relation to material from coastal and inland areas. Some morphotypes might be distinct species; however, additional studies (e.g., population genetics and morphometry) are needed to correctly delimit each morphotype.

**10. *Pleopeltis lepidopteris*** (Langsd. & Fisch.) de la Sota in de la Sota *et al.* (2007: 239). Figs. 8A–G, 15A, 20H,K. *Acrostichum lepidopteris* Langsdorff & Fischer (1810: 5). Type:—BRAZIL. Santa Catarina: Insula Santa Catharina, *Langsdorff s.n.* (lectotype LE 00000089! Image, here designated)

**Plants** terrestrial. **Rhizomes** short to long-creeping, with scales lanceolate, brown to dark brown, base rounded with a dark brown to blackish point of attachment, apex acuminate, margin castaneous and short-denticulate; **fronds** monomorphic, 20–60 × 1–6 cm, petiolate, petioles short to long, terete, 1.5–7 cm long, without wings, densely scaly; **laminae** 18–52 cm long, pinnatifid to pinnatisect, linear to linear-lanceolate, base gradually reduced, apex acuminate; rachises angulate, densely scaly; **pinnae** 37–57 pairs, proximal 2–7 pairs reduced, auriculate to linear, medial pinnae 0.3–2 × 0.4–0.7 cm, linear to oblong, base adnate to the rachises, auricle present, hydathodes present, apex obtuse, margin entire to slowly revolute, cartilaginous, densely scaly on both surfaces; **venation** anastomosing; **frond scales** with base rounded and long-acuminate to the filiform apex or ovate (those of sori), brown to dark brown (those of petioles and rachises) or stramineous to hyaline (those of both surfaces of pinnae), base with a dark brown to blackish point of attachment, margin hyaline to brown, lacinate or denticulate; **sori** rounded, medial, covered by scales; **spores** with plain surface to shallowly verrucate with sparse globules.

**Selected specimens examined:**—BRAZIL. **Espírito Santo:** Guarapari, Setiba, km 32, 16 May 1988, *L. Behar 71* (SJRP, VIES); **Paraná:** Balsa Nova, São Luiz do Purunã, 16 February 2013, *C. Michelin 1664* (BHCB); Ponta Grossa, Parque Estadual de Vila Velha, 11 October 2003, *P.H. Labiak 2965* (SP); **Rio Grande do Sul:** Bagé, BR-153, Km 84, June 1985, *M. Sobral 3931* (SPF); Cidreira, Fazenda Azaléia, 19 July 2012, *E. Valduga 397* (VIES); Guaibas, Br116, Km 32, Morro São Maximiano, s. d., *E. de la Sota 6371* (LP); Palmares do Sul, Lagoa da Porteira, 12 October 2012, *F. Gonzatti 610* (VIES); Porto Alegre, 1906, *A. Thier 317* (SI); Sapucaia do Sul, Morro Sapucaia, 29 June 1986, *I. Fernandes 149A* (SJRP); Steinkopf, 28 June 1949, *B. Rambo 42210* (RB); Tapes, Estrada Tapes-Barra do Ribeiro, 16 July 2013, *F. Gonzatti 787* (VIC); Torres, 4km S del acceso a Torres, BR101, 31 January 1994, *A. Krapovickas*



**FIGURE 8.** A–G. *Pleopeltis lepidopteris*. A. Habit; B. Rhizome scale; C. Adaxial rachis scale; D. Abaxial rachis scale; E. Adaxial laminar scale; F. Abaxial laminar scale; G. Sorus scale. H–R. *P. macrocarpa*. H. Habit. I. Rhizome scale; J. Petiole scale; K–L. Adaxial rachis scale; M–N. Abaxial rachis scale; O. Adaxial laminar scale; P–Q. Abaxial laminar scale; R. Sorus scale.

44727 (LP). **Rio de Janeiro:** Macaé, 9 July 1972, *A. Mattos 553* (RB); Maricá, Itaipuaçu, 8 April 1977, *L. Krieger 14794* (BHCB, CESJ, VIC); Rio de Janeiro, Restinga de Itapeba, 11 June 1960, *C.M. Chaves 10* (K). **Santa Catarina:** Florianópolis, Praia da Joaquina, Parque Municipal Dunas da Lagoa da Conceição, 15 October 2013, *H.C. Bloemer 8* (FURB); Garopaba, Praia do Rosa, 29 November 2012, *F. Gonzatti 608* (VIES); Imbituba, 18 October 1979, *A.T. Silva 157* (SP).

**Distribution and habitat:**—Paraguay and Uruguay. In Brazil, this species occurs in the states of Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul (Fig. 10A), mainly in the “restingas” of Atlantic Forest and occasionally in other forest types above 400 m elevation.

**Notes:**—This species is unique because it has cartilaginous pinnae margins as well as longer scales with base rounded and long-acuminate to the filiform apex on all lamina parts, making it easy to identify. In Brazil, usually occurs in coastal areas, but it is found inland in the states of Rio Grande do Sul, Santa Catarina, and Paraná, as observed by de la Sota (1966). Specimens from Minas Gerais and Bahia determined as *P. lepidopteris* were reidentified as *P. hirsutissima* or *P. minarum*. The specimen Handro 350 (SP) is *P. lepidopteris* from Minas Gerais; however, it is from a cultivated plant from the São Paulo Botanical Garden and there is no reliable information about the origin of the plant. Therefore, we chose not to record (or mention) the species for Minas Gerais, until new records confirm its occurrence in the state.

**11. *Pleopeltis macrocarpa*** (Bory ex Willd.) Kaulfuss (1820: 41). Figs. 8H–R, 15B, 17F, 18D. *Polypodium macrocarpum* Bory ex Willdenow (1810: 147). Type:—LA RÉUNION: “Mascareigne, regions inferieures”, *Bory s.n.* (holotype: B! image, isotype: P)

**Plants** epiphytic, epipetric or terrestrial. **Rhizomes** long-creeping, with scales lanceolate, blackish, base rounded with a blackish point of attachment, apex acuminate, margin hyaline to stramineous and erose; **fronds** monomorphic, 3–27 × 0.63 cm, petiolate, petioles short to long, terete to triangular, 0.4–6 cm long, without wings, scaly; **laminae** 2–20 cm long, simple, lanceolate to elliptic, base attenuate to cuneate, apex acute to acuminate, margin entire to revolute, laevigate to slowly repand, scaly on the both surfaces; rachises terete, glabrescent; **venation** anastomosing; **frond scales** lanceolate to ovate and brown to stramineous, rarely hyaline or widely-elliptic to rounded and dark brown (those of sori), base rounded with a dark brown to blackish point of attachment, apex acuminate, margin hyaline or brown and entire to erose or laciniate; **sori** rounded to elliptic, medial, covered by scales; **spores** verrucate with very sparse globules.

**Selected specimens examined:**—BRAZIL. **Acre:** Sena Madureira, Floresta Estadual do Antimary, 19 August 2016, *D.S. Costa 969* (RB); **Alagoas:** São José da Lage, Sede da Usina Serra Grande, 19 December 2000, *M.R. Pietrobom 4673* (SP); **Bahia:** Abaíra, Mata da Furquilha, 14 April 1999, *R.C. Forzza 1218* (BHCB); Quijingue, Serra das Candeias, 3 August 2010, *D. Cardoso 3023* (HUEFS); **Ceará:** Maranguape, Serra da Pirapora, 9 August 2011, *T.E. Almeida 3051* (BHCB); Pacatuba, Serra de Pacatuba, 22 July 1997, *M. Almeida-Neto 206* (SJRP). **Espírito Santo:** Castelo, Parque Estadual Forno Grande, 25 June 2008, *A. Salino 13534* (BHCB); Domingos Martins, Parque Estadual da Pedra Azul, 5 December 2008, *A. Salino 14106* (BHCB); Ibitirama, Parque Nacional do Caparaó, 11 September 2008, *A. Salino 13788* (BHCB); Santa Maria de Jetibá, Pedra do Garrafão, 19 November 2015, *I.O. Moura 83* (BHCB); Santa Teresa, Santo Henrique, 3 February 2011, *F.S. Souza 1325* (BHCB); São Paulo do Aracê, no entorno do Parque Estadual da Pedra Azul, 29 September 2016, *I.O. Moura 166* (BHCB). **Mato Grosso:** 10 November 1977, *B.C. Passos 1186* (RB). **Minas Gerais:** Alagoa, Parque Estadual da Serra do Papagaio, 11 December 2007, *A. Salino 12923* (BHCB); Alto Caparaó, Parque Nacional do Caparaó, 29 November 2010, *F.S. Souza 1175* (BHCB); Alto Jequitibá, 3 December 2010, *F.S. Souza 1271* (BHCB); Araponga, Parque Estadual Serra do Brigadeiro, 26 May 2000, *A. Salino 5493* (BHCB, CESJ); Barroso, Mata do Baú, 21 October 2001, *L.C.S. Assis 343* (CESJ); Brazópolis, Pico dos Dias, 24 March 2009, *L.L. Giacomini 797* (BHCB); Bueno Brandão, 18 July 2007, *A. Salino 12757* (BHCB); Caeté, Serra da Piedade, 27 October 1987, *M.M.N. Braga 149* (BHCB); Caldas, Pocinhos do Rio Verde, 6 December 2008, *M.G. Rezende 264* (CESJ); Camanducaia, Matão, 8 December 2000, *L.C.N. Melo 57* (BHCB, CESJ); Carangola, Córrego Água Limpa, 4 October 1987, *L.S. Leoni 34* (CESJ); Carrancas, Serra de Carrancas, 18 June 2007, *A. Salino 12248* (BHCB); Catas Altas, RPPN Santuário do Caraça, 20 August 2013, *T.E. Almeida 3335* (BHCB); Conceição do Mato Dentro, Parque Natural Municipal do Ribeirão do Campo, 1 August 2002, *R.C. Mota 1554* (BHCB); Delfim Moreira, 1 November 2008, *T.E. Almeida 1650* (BHCB); Descoberto, Serra do Relógio, 31 October 2009, *F.S. Souza 769* (BHCB, CESJ); Espera Feliz, Parque Nacional do Caparaó, 1 December 2010, *F.S. Souza 1221* (BHCB); Felício do Santos, APA Felício, 1 November 2004, *A. Salino 9989* (BHCB); Gonçalves, 28 October 2008, *T.E. Almeida 1506* (BHCB); Ibitirama, Parque Nacional do Caparaó, 30 November 2010, *F.S. Souza 1197* (BHCB); Itabirito, Serra de Capanema,

4 June 2007, *F.F. Carmo* 645 (BHCB); Itamarandiba, Parque Estadual da Serra Negra, 4 July 2006, *A. Salino* 11274 (BHCB); Itamonte, Parque Nacional do Itatiaia, 10 July 2007, *A. Salino* 12373 (BHCB); Jequitinhonha, Reserva Biológica da Mata Escura, 25 March 2008, *A. Salino* 13142 (BHCB); Liberdade, 15 February 2009, *T.E. Almeida* 1823 (BHCB); Lima Duarte, Parque Estadual do Ibitipoca, 21 June 2007, *T.E. Almeida* 1212 (BHCB); Moeda, Marinho da Serra, 2 February 2009, *F.F. Carmo* 4217 (BHCB); Monte Verde, 20 August 2001, *L.C.N. Melo* 149 (BHCB); Nova Lima, RPPN de Tumbá, 16 April 2004, *J.B. Figueiredo* 345 (BHCB); Olaria, Serra do Cruz, 23 June 2011, *F.E. Alves* 119 (CESJ); Ouro Preto, 1933, *J. Badini* 69 (BHCB, OUPR); Paraisópolis, Parque Ecológico do Brejo Grande., 31 October 2008, *T.E. Almeida* 1601 (BHCB); Passa-Vinte, 14 February 2009, *T.E. Almeida* 1793 (BHCB); Rio Acima, Serra de Gandarela, 13 November 2007, *F.F. Carmo* 1383 (BHCB); Rio Pardo de Minas, Parque Estadual da Serra Nova, 26 March 2012, *J.M. Costa* 1132 (BHCB); Rio Preto, Serra Negra, Fazenda Tiririca, 13 November 2004, *F.S. Souza* 01 (CESJ); Santa Bárbara, RPPN Capivari, 1 April 2009, *A.J. Arruda* 116 (BHCB); Santa Maria do Salto, Distrito de Talismã, 7 March 2004, *A. Salino* 9454 (BHCB); Santo Antônio do Itambé, Parque Estadual do Pico do Itambé, 5 October 2006, *T.E. Almeida* 532 (BHCB); Simonésia, RPPN Mata do Sossego, 20 May 2006, *A. Salino* 11043 (BHCB); São Gonçalo do Rio Preto, Parque Estadual do Rio Preto, 7 December 2003, *A. Salino* 9328 (BHCB, CESJ). **Paraná:** Serra do Mar, 12 October 1998, *A. Salino* 4385 (BHCB); Carambeí, 20 March 2013, *C. Michelin* 1834 (BHCB); Pará: Canaã dos Carajás, 8 December 2007, *N.F.O. Mota* 1120 (BHCB). **Paraíba:** Areia, Campus da Escola de Agronomia Nordeste, 28 June 1986, *I.C. Oliveira* 6830 (SJRP). **Pernambuco:** Jaqueira, Serra do Espelho, 1 April 2012, *L.L. Giacomim* 1797 (BHCB). **Rio de Janeiro:** Itatiaia, Parque Nacional do Itatiaia, 20 May 1999, *K.T. Ribeiro* 176 (RB); Nova Friburgo, Macaé de Cima, 8 November 2010, *C.N. Fraga* 3232 (BHCB); Rio de Janeiro, s.d., *A.F.M. Glaziou* 1735 (RB); Santa Maria Madalena, Parque Estadual do Desengano, 20 December 1988, *M. Moraes* 304 (RB); Teresópolis, Parque Nacional da Serra dos Órgãos, Trilha da Pedra do Sino, 23 August 2010, *R.A. Engelmann* 912 (RB). **Rio Grande do Sul:** Cambará do Sul, 09 November 2006, *P.B. Schwartzburd* 1155 (UPCB); Canela, 25 June 1989, *G. Grazziotin* s.n. (NY 671837); São José dos Ausentes, 06 April 2011, *J.L. Schmitt* 3167 (FURB). **Santa Catarina:** Bom Retiro, Serra do Panelão, 2 May 2008, *A.L. Gasper* 1751 (BHCB, FURB); Joinville, Parque de Exposições, 13 February 2012, *R.W. Barreto* 1662 (VIC); Leoberto Leal, 28 April 2009, *S. Dreveck* 869 (BHCB, FURB); Painei, 3 April 2007, *A. Salino* 11945 (BHCB); Papanduva, 24 June 2008, *A.L. Gasper* 1822 (BHCB, FURB); Rio do Sul, Mirador, 10 December 2009, *A. Korte* 1470 (BHCB, FURB); **São Paulo:** Atibaia, Pedra Grande, 7 June 1993, *A. Salino* 1756 (BHCB); Bananal, Estação Ecológica do Bananal, 8 March 2001, *A. Salino* 6280 (BHCB, CESJ); Campos do Jordão, Parque Estadual de Campos do Jordão, 9 June 1992, *A. Salino* 1421 (BHCB); Cunha, Parque Estadual da Serra do Mar, 15 December 1996, *A. Salino* 2865 (BHCB); Pindamonhangaba, Represa Izabel, 3 June 1984, *R.F. Novelino* 205 (CESJ); Ribeirão Grande, Parque Estadual Intervales, 15 April 2003, *A. Salino* 8427 (BHCB, CESJ); São José do Barreiro, Parque Nacional da Serra da Bocaina, 2 May 2011, *L.L. Giacomim* 1574 (BHCB); São Luiz do Paraitinga, Parque Estadual da Serra do Mar, 9 August 2001, *A. Salino* 7405 (BHCB); Ubatuba, 12 July 1999, *V.A.O. Dittrich* 632 (BHCB). **Sergipe:** Lagarto, Mata de Doutor João, 13 July 2008, *J.E. Nascimento-Junior* 351 (ASE); Riachão do Dantas, 09 August 1982, *G. Viana* 604 (ASE).

**Distribution and habitat:**—Occurs in Africa, India, Madagascar, Sri-Lanka, Antilles, Costa Rica, El Salvador, Honduras, Panama, Argentina, Bolivia, Colombia, Ecuador, French Guiana, Paraguay, Peru, Suriname, Uruguay, and Venezuela. In Brazil, *P. macrocarpa* is widely distributed, occurring in all vegetation domains and states (Fig. 10B), between 0–2600 m.

**Notes:**—This species is easily recognized by its lanceolate lamina, long, cylindrical, glabrous to glabrescent petiole, sori depressions on the adaxial surface of the lamina, and sori with large peltate scales that are blackish at the point of attachment and with hyaline margins (Fig. 18D).

*Pleopeltis macrocarpa* is one of the few species of the genus that occurs outside the Neotropics (Africa and Asia). The species exhibits great morphological variation and there are numerous varieties throughout its distribution. We decided not to discuss the varieties (and possible hybrids) because they need to be studied in more detail to correctly delimit and describe them.

**12. *Pleopeltis minarum*** (Weath.) Salino (2009: 107). Figs. 9A–G, 15C, 20I, L. *Polypodium minarum* Weatherby (1947:78). Type:—BRAZIL. Minas Gerais: Serra da Piedade, *Claussen* 78 (holotype, P01374422!)

**Plants** epipetric or terrestrial. **Rhizomes** short-creeping, with scales, lanceolate, light brown to brown, base rounded with a dark brown point of attachment, apex acuminate, margin brown and lacinate; **fronds** monomorphic 9–50 × 0.9–2.5 cm; petiolate, petioles long, terete, 0.5–10 cm long, without wings; **laminae** 8–40 cm long, pinnatisect, linear to linear-lanceolate, rachises terete, scaly; **pinnae** 20–45 pairs, proximal 2–4 pairs reduced, linear, medial pinnae

0.4–1.8 × 0.3–0.6 cm, linear to oblong, base adnate to the rachises, auricles present, hydathodes presents, apex rounded to acuminate, margin entire, laevigate, scaly on both surfaces; **venation** anastomosing; **frond scales** lanceolate and whitish or hyaline, rarely light brown with long-acuminate apex, base with a brown to dark brown point of attachment, margin light brown to brown or hyaline and laciniate; **sori** rounded, medial, covered by scales; **spores** papillate with sparse globules.

**Selected specimens examined:**—BRAZIL. **Bahia:** Caetité, Região de Brejinho das Ametistas, April 2008, *M.S. Mendes 600* (BHCB, HUEFS); Jacaraci, Morro do Chapéu, 25 April 2010, *V.A.O. Dittrich 1686* (CESJ); Licínio de Almeida, Serra do Salto, 11 May 2012, *N. Roque 3532* (ALCB); Morro do Chapéu, Fazenda Vanessa, 13 October 2006, *E. Melo 4548* (HUEFS); **Minas Gerais:** Barão de Cocais, Serra do Cambotas, 20 March 2014, *M.O. Pivari 1815* (BHCB); Belo Horizonte, Mina de Águas Claras, 26 April 2013, *E. Miranda 178* (BHCB); Belo Vale, 23 October 2001, *A. Salino 7674* (BHCB); Betim, Serra do Rola Moça, 5 March 1940, *H.L.M. Barreto 10667* (BHCB); Brumadinho, Parque Estadual Serra do Rola Moça, 28 March 2011, *F.F. Carmo 5529* (BHCB); Buenópolis, Parque Nacional das Sempre Vivas, 29 April 2007, *T.E. Almeida 866* (BHCB); Caeté, Serra da Piedade, 9 April 1996, *A. Salino 2701* (BHCB); Catas Altas, RPPN Serra do Caraça., 19 April 2004, *T.E. Almeida 1* (BHCB); Conceição do Mato Dentro, Parque Nacional da Serra do Cipó, 13 April 1994, *N.M. Castro 13* (SP); Congonhas, RPPN Poço Fundo, 17 April 2015, *J.A.M. Paiva 254* (BHCB); Congonhas do Norte, Serra Talhada, 19 January 2004, *J.R. Pirani 5137* (SP, SPF); Diamantina, Parque Estadual do Biribiri, 2 October 2006, *T.E. Almeida 430* (BHCB); Felício do Santos, APA Felício, 30 October 2004, *A. Salino 9932* (BHCB); Gouveia, Cadeia do Espinhaço, 17 March 2007, *A. Salino 11873* (BHCB); Grão Mogol, Vale do Ribeirão, 21 July 1987, *R. Mello Silva 841* (SPF); Ibitité, Serra do Rola Moça, s.d., *M. Brandão 28468* (PAMG); Igarapé, Pico Itatiaiaçu, 9 January 2008, *F.F. Carmo 1637* (BHCB); Itabira, Serra da Cachoeira Alta, 2 August 2006, *T.E. Almeida 308* (BHCB); Itabirito, RPPN Cata Branca, 20 August 2015, *J.A.M. Paiva 650* (BHCB); Itamarandiba, Parque Estadual da Serra Negra, 5 July 2006, *A. Salino 11313* (BHCB); Itambé do Mato Dentro, Distrito de Santana do Rio Preto, 5 August 2006, *T.E. Almeida 312* (BHCB); Joaquim Felício, Serra do Cabral, 11 February 2006, *A. Salino 10851* (BHCB); Mariana, RPPN Horto Alegria, 14 May 2015, *J.A.M. Paiva 477* (BHCB); Morro do Pilar, Serra do Cipó, 26 April 1978, *H.C. Lima 485* (RB); Nova Lima, Parque Estadual do Rola Moça, 27 December 2007, *F.F. Carmo 1678* (BHCB); Ouro Preto, Serra da Capanema, 28 February 2008, *F.F. Carmo 2509* (BHCB); Rio Acima, 27 January 2004, *J.B. Figueiredo 227* (BHCB); RPPN de Andaime, 20 May 2004, *J.B. Figueiredo 472* (BHCB); Rio Pardo de Minas, Parque Estadual da Serra Nova, 23 March 2012, *L.A.A. Góes-Neto 724* (BHCB); Rio Vermelho, Pedra Menina, 6 March 1988, *J. Prado 11835* (SPF); Sabará, Mina do Segredão, 9 November 2007, *R.C. Mota 3481* (BHCB); Santa Bárbara, Caraça, Gruta do Padre Caio, 24 May 1987, *N.S. Bittencourt Júnior 1* (BHCB); Santa Luzia, Serra do Cipó, 4 February 1938, *H.L.M. Barreto 8922* (BHCB); Santana do Riacho, Serra do Cipó, 14 October 1989, *V.C. Souza 733* (SPF); Santana do Pirapama, Serra do Cipó, 30 November 2009, *C.C. Zappi 2691* (SPF); Santo Antônio do Itambé, Parque Estadual do Pico do Itambé, 4 October 2006, *T.E. Almeida 520* (BHCB); Serra da Piedade, November 1915, *F.C. Hoehne 6562* (SP); São Gonçalo do Rio Preto, Parque Estadual do Rio Preto, 7 December 2003, *A. Salino 9331* (BHCB); Tiradentes, Serra de São José, 20 June 2007, *T.E. Almeida 1129* (BHCB).

**Distribution and habitat:**—*Pleopeltis minarum* is restricted to the states of Minas Gerais and Bahia (Fig. 10C), and occurs mainly in the outcrops along the quartzite and ferruginous fields along the Espinhaço Mountains between 600–1800 m.

**Notes:**—This species is easily recognized by the presence of dense, lanceolate, generally whitish scales on all parts of the lamina. It is usually confused with *P. hirsutissima*, but this species can be easily differentiated by its brownish scales with base rounded and long-acuminate to the filiform apex. In addition, *P. hirsutissima* occurs as an epiphyte and *P. minarum* is always epipetric.

**13. *Pleopeltis minima*** (Bory) J.Prado & R.Y.Hirai (2010: 100). Figs. 9–O, 15D, 17B, E, 20C–D. *Marginaria minima* Bory (1826: 177). *Goniophlebium incanum* (Sw.) J. Sm. var. *minus* Fée (1869: 107). *Polypodium minimum* (Bory) Herter (1925: 368), *Polypodium polypodioides* (Linnaeus 1753: 1068–1069). Watt (1867: 158) var. *minus* (Fée) Weatherby (1939: 31) *Polypodium polypodioides* (L.) Watt. var. *minimum* (Bory) Kuhlmann & Kuhn (1948: 22). Type:—Santa Catarina: "parties témprées du Brésil" *Crypt. Voy. de la Coquille 61* (lectotype P! image, designated by Prado & Hirai (2010))

*Polypodium squalidum* Vellozo (1831: t76). *Pleopeltis squalida* (Vell.) de la Sota (2003: 196). Type:—Fl. Flumin. Icon. 11. Tab. 76 (lectotype P! designated by Burkart (1963; isolectotypes B!, BM!))

*Polypodium microlepis* Fée (1852a: 238). Type:—America Australi, Herb. Mougeotiano, *Pamplin 38* (holotype: P00632929! image).



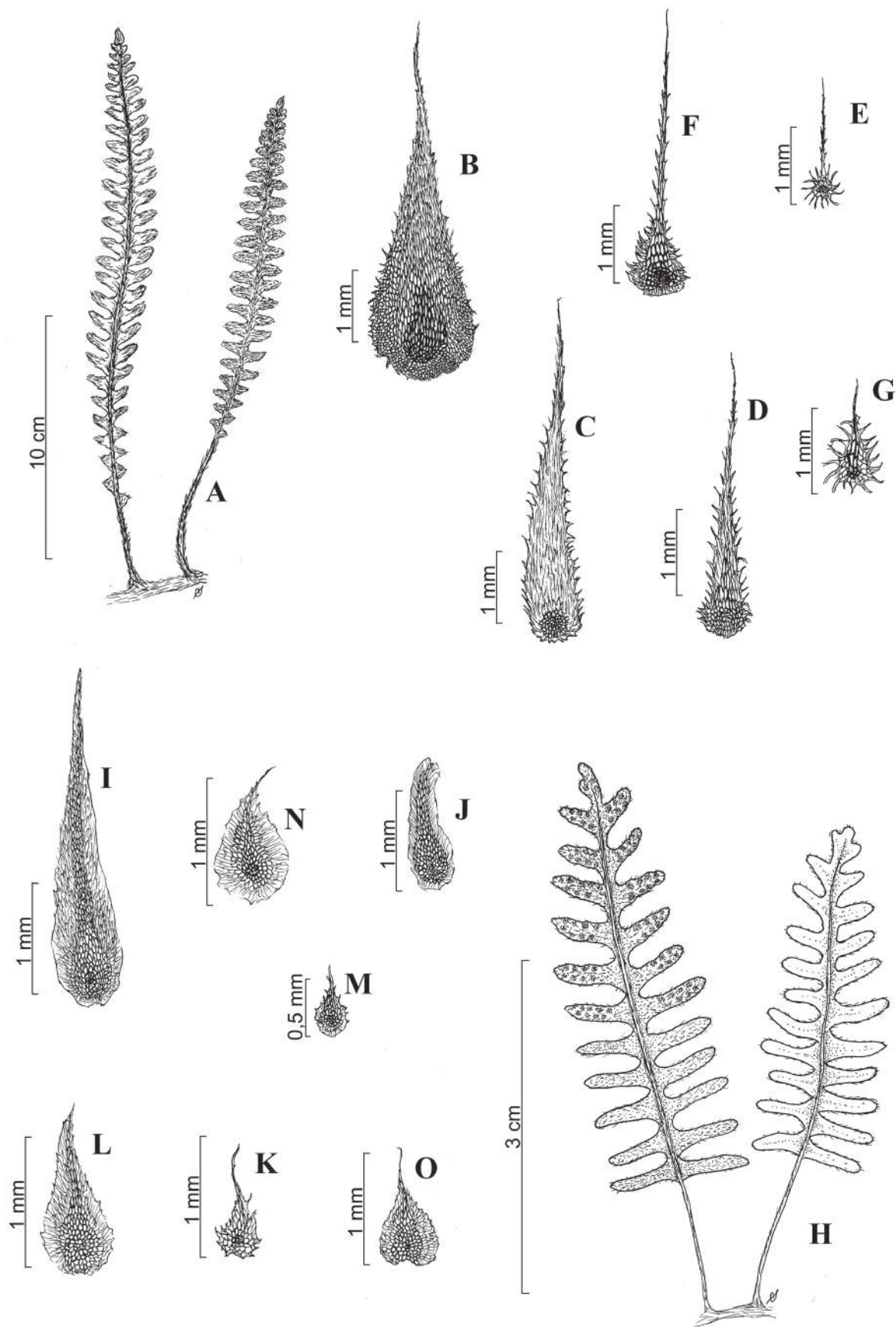
**Plants** epiphytic or epipetric. **Rhizomes** long-creeping, with scales linear-triangular to lanceolate, brown to dark brown, base rounded with a brown point of attachment, apex long-acuminate, margin light brown to brown and denticulate; **fronds** monomorphic, 2–15 × 0.9–3 cm, petiolate, petioles long, terete, with 0.5–5 cm long, without wings, scaly; **laminae** 1.5–10 cm long, pinnatisect to pinnate, deltate to lanceolate, base truncate, apex obtuse to acuminate; rachises terete, scaly; **pinnae** 4–15 pairs, 0.3–1.4 × 0.1–0.3 cm, linear to linear-lanceolate, base adnate to the rachises, auricles absent, hydathodes present, apex rounded to attenuate, margin entire, laevigate to involute, adaxial surface glabrous to glabrescent, abaxial surface scaly; **venation** anastomosing; **frond scales** lanceolate to widely-ovate, brown to stramineous, base rounded with a brown to blackish point of attachment, apex acuminate to acute, margin stramineous to brown, entire to denticulate; **sori** rounded, medial, covered by scales; **spores** with nearly plain surface to shallowly verrucate with sparse globules.

**Selected specimens examined:**—BRAZIL. **Bahia:** Caitité, August 2008, *M.S. Mendes 599* (BHCB); Paulo Afonso, Aldeia Serrota, 24 March 2006, *M. Colaço 101* (HUEFS). **Ceará:** Crato, Flona do Araripe, 26 October 2010, *M. Mata 2213* (HUEFS). **Espírito Santo:** Linhares, Floresta Nacional de Goytacazes, 14 May 2008, *A. Salino 13380* (BHCB); Cacheiro do Itapemirim, RPPN Cafundó, 29 October 2009, *A. Salino 14659* (BHCB); Castelo, Parque Estadual da Mata das Flores, 24 June 2008, *A. Salino 13513* (BHCB); Linhares, Reserva Natural Vale, 30 June 1993, *D.A. Folli 1925* (BHCB); Pinheiros, Reserva Biológica do Córrego do Veado, 9 June 2009, *A. Salino 14298* (BHCB); Nova Venécia, Pedra do Elefante, 25 August 2009, *A. Salino 14415* (BHCB); Rio Novo do Sul, Comunidade Couro dos Monos, 30 October 2009, *A. Salino 14693* (BHCB); Santa Tereza, Toma Vento, 14 August 2001, *L. Kollmann 4322* (BHCB, MBML). **Mato Grosso do Sul:** Dourados, Fazenda Paradouro, 13 June 1997, *L.P. Clemente 26* (BHCB, SP). **Minas Gerais:** Arcos, 11 October 1940, *J.E. Oliveira 192* (BHCB); Carangola, Fazenda Santa Rita, 25 August 1988, *L.S. Leoni 36* (BHCB); Caratinga, Estação Biológica de Caratinga., 24 March 2000, *A. Salino 5127* (BHCB); Juiz de Fora, Parque da Laginha, 16 November 1981, *P.L. Krieger 2692* (BHCB, CESJ); Marliéria, Lagoa do Jacaré, 20 December 2007, *M.O. Pivari 736* (BHCB); Sacramento, Engenheiro Lisboa, 20 February 1989, *M. Brandão 14760* (PAMG); Salto da Divisa, 5 March 2004, *A. Salino 9436* (BHCB); Tombos, 7 July 1935, *H.L.M. Barreto 1451* (BHCB). **Paraná:** Capitão Leônidas Marques, 15 June 1999, *J.M. Silva 2986* (BHCB); Céu Azul, Parque Nacional do Iguaçu, 7 December 2011, *R.S. Viveros 283* (BHCB); Foz do Iguaçu, 13 February 2013, *M. Lautert 177* (BHCB); Palotina, Parque Estadual São Camilo, 27 January 2011, *C. Kozera 3798* (CESJ). **Rio de Janeiro:** Cachoeira de Macacu, Parque Estadual Três Picos, 04 August 2010, *A. Bonnet s.n.* (RB 514343); Mangaratiba, Reserva Ecológica Rio das Pedras, 21 January 2000, *M. Guerra Santos 1388* (RB); Maricá, Cachoeira do Espraiado, 10 June 2004, *S.L.S. Winter 129* (RB); Rio de Janeiro, Arboreto Jardim Botânico, 07 June 2004, *S.L.S. Winter 120* (RB). **Rio Grande do Sul:** Caxias do Sul, 4 May 2007, *N.F.O. Mota 798* (BHCB); São Lourenço do Sul, Arroio do Pinto, 3 June 2013, *F. Gonzatti 703* (VIC); São Vendelino, 1 May 2001, *F.P.F. Athayde 942* (BHCB); Timbó do Sul, Serra da Rocinha, 18 November 2008, *J.M. Silva 7348* (CESJ). **Santa Catarina:** Anita Garibaldi, Cachoeira Primeira, 13 December 2008, *A. Stival-Santos 281* (BHCB, FURB); Capão Alto, Fazenda Gateados, 4 May 2005, *G. Pereira-Silva 10016* (BHCB); Chapecó, Linha de Monte Carlo, 4 March 2009, *S. Dreveck 692* (BHCB, FURB); Itá, Fonte Pedra, 21 January 2009, *S. Dreveck 662* (BHCB, FURB); Ponte Serrada, Fazenda São Francisco, 25 June 2009, *A. Stival-Santos 750* (BHCB, FURB). **São Paulo:** Botucatu, Parque Ecológico da Pavuna, 28 May 2009, *L.B. Santos 294* (VIES); Pirassununga, Morro da Senzala, 10 October 1986, *A. Salino 02* (BHCB).

**Distribution and habitat:**—Bolivia, Argentina, Paraguay, and Uruguay. In Brazil, *Pleopeltis minima* occurs in the states of Mato Grosso do Sul, Ceará, Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Rio Grande do Sul, and Santa Catarina (Fig. 10D), mainly in the forest formations of Atlantic Forest and Cerrado domains, between 0–1200 m.

**Notes:**—This species can be recognized by its small frond size (2–15 cm long), brownish rhizome scales, and abaxial lamina surface that has widely ovate, whitish scales with an entire to finely serrulate margin. It can be confused with *P. burchellii*, but they can be differentiated by the rhizome scales without a central blackish band in *P. minima* (17B, E), while in *P. burchellii* the rhizome scales have a central blackish band (Fig. 17A,E).

*Pleopeltis minima* has been often identified as *Polypodium squalidum* Vell. and *Pleopeltis squalida* (Vell.) de la Sota. However, according to Prado & Hirai (2010), these names were not validly published. The authors emphasize that the taxa are morphologically similar, presenting small differences, besides a continuous morphological variation between the plants in their geographic extension. Thus, the treatment of *P. squalida* as a synonym of *P. minima* is reaffirmed.



**FIGURE 9.** A–G. *Pleopeltis minarum*. A. Habit; B. Rhizome scale; C. Petiole Scale; D. Abaxial rachis scale; E. Adaxial laminar scale; F. Abaxial laminar scale; G. Sorus scale. H–O. *P. minima*. H. Habit; I. Rhizome scale; J. Petiole scale; K. Adaxial rachis scale; L. Abaxial rachis scale; M. Adaxial laminar scale; N. Abaxial laminar scale. O. Sorus scale.

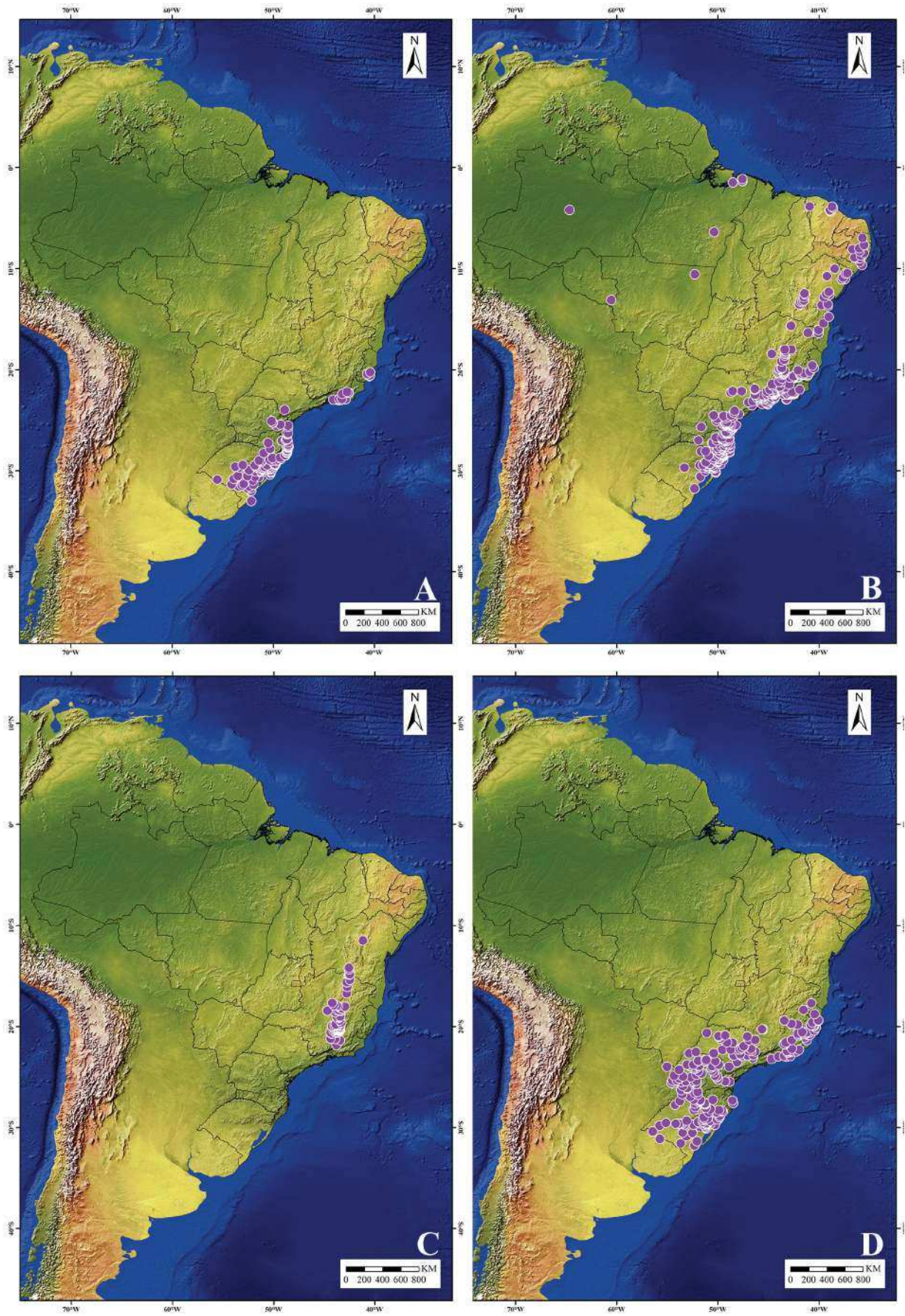


FIGURE 10. Distribution of four species of *Pleopeltis* in Brazil. A. *P. lepidopteris*; B. *P. macrocarpa*; C. *P. minarum*; D. *P. minima*.

**14. *Pleopeltis monoides*** (Weath.) Salino (2009: 107). Figs. 11A–H, 15E, 17H, 19E–F. *Polypodium monoides* Weatherby (1947: 165). Type:—BRAZIL. Bahia: Forest of the Gongogy Basim, 100–300 m, *Curran 274* (holotype: GH! image, isotype, US!)

**Plants** epiphytic, terrestrial or epipetric. **Rhizomes** short-creeping, with scales linear-triangular to lanceolate, brown, base rounded with a dark brown to blackish point of attachment, apex long-acuminate, margin brown and lacinate; **fronds** monomorphic 8–65 × 2–7 cm; petiolate, petioles short, terete to angulate, 0.1–4 cm long, without wings, scaly; **laminae** 8–60 cm long pinnatisect, linear-lanceolate to lanceolate, base gradually reduced, apex acuminate to acute; rachises terete, scaly; **pinnae** 24–40 pairs, proximal 2–12 pairs reduced, widely-triangular, medial pinnae 0.6–4 × 0.2–0.6 cm, linear, base adnate to the rachises, auricle present, hydathodes present, apex attenuate, margin entire, scaly on both surfaces; **venation** anastomosing; **frond scales** with base rounded and long-acuminate to the filiform apex or ovate (those of sori), stramineous to brown, base with a brown to dark brown point of attachment, margin hyaline or stramineous to brown and dentate to lacinate; **sori** rounded, medial, covered by scales; **spores** verrucate with dense globules.

**Selected specimens examined:**—BRAZIL. **Bahia:** Arataca, Serra das Lontras, 29 April 2006, *A. Amorim 5976* (CEPEC); Camacan, Fazenda Serra Bonita, 2 February 2005, *F.B. Matos 281* (CEPEC); Itapebi, Lombardia, 22 November 2006, *A.P. Fontana 2537* (RB); Jussari, Rod. Jussari/Palmira, 13 August 1998, *A. Amorim 2471* (CEPEC); Mucugê, Guiné, 5 October 2005, *C.F. Azevêdo-Gonçalves 1031* (HUEFS); Una, Estrada São José-Una, 7 April 1995, *A. Amorim 1673* (ALCB, HUEFS). **Pará:** Vila Nova, Rio Tapajós, 21 December 1951, *J.M. Pires 3572* (US).

**Distribution and habitat:**—Restricted to the states of Bahia, Espírito Santo, Pará, and Rondônia (Fig. 13A), where it occurs mainly on rocks in the forest formations, between 100–1800 m.

**Notes:**—This species is easily recognized by its scales with base rounded and long-acuminate to the filiform apex on all parts of the lamina and gradually reduced base of the lamina with deltoid to widely triangular, reduced pinnae. In Brazil, it can be confused with *P. bombycina*, but the pinnae at the base of the lamina are deltoid to widely triangular in *P. monoides* and linear in *P. bombycina*.

This species is categorized as Endangered (EN) because it has a small area of occupation and extent of occurrence (MMA 2014). *Pleopeltis monoides* occurs in a few areas of rocky outcrops. Some locations are protected in Conservation Units, but other areas are used for extraction of rocks for commercial use.

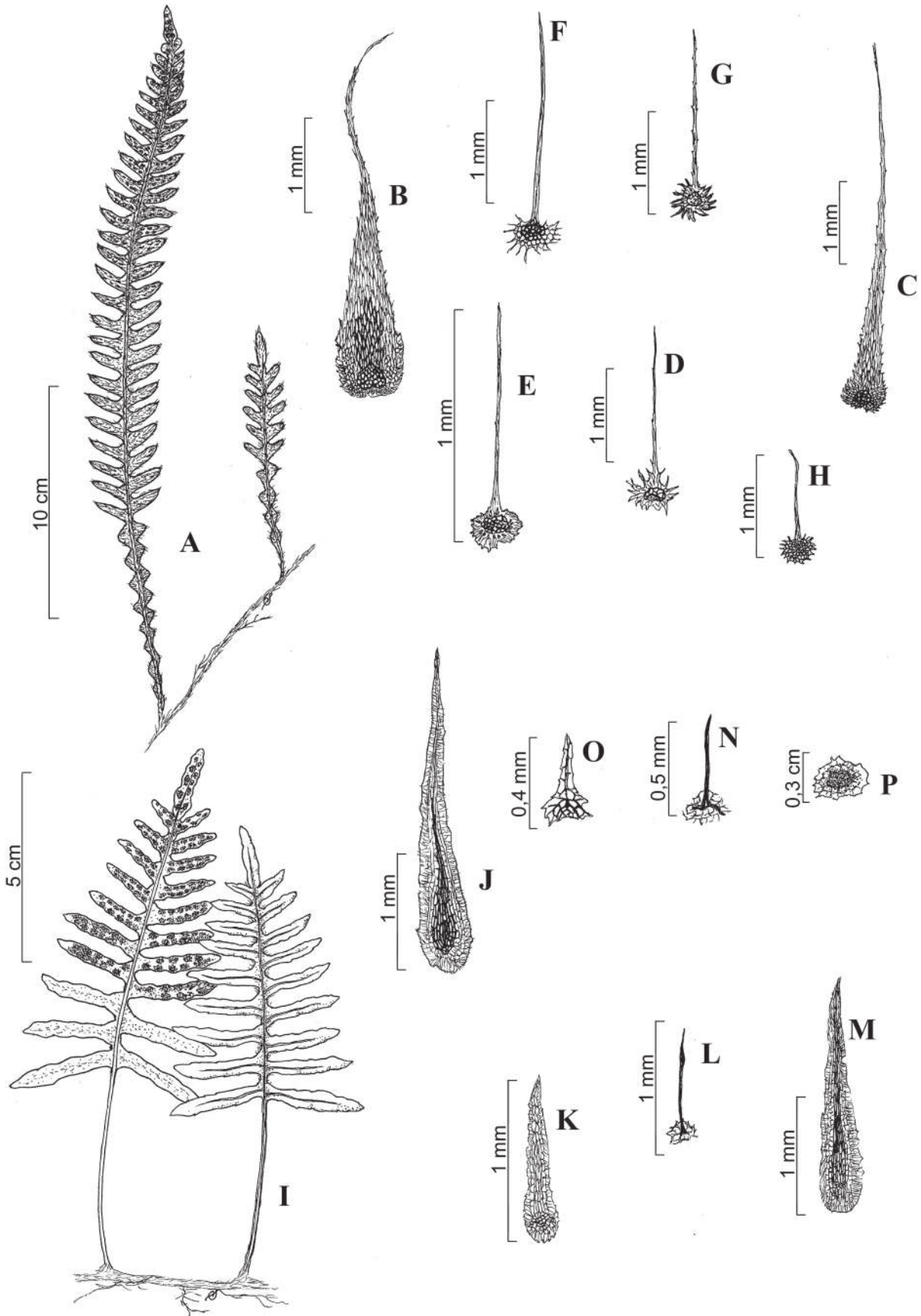
**15. *Pleopeltis pleopeltidis*** (Fée) de la Sota (2007: 239). Figs. 11I–P, 15F. *Polypodium pleopeltidis* Fée (1869: 86). Type:—BRAZIL. Rio de Janeiro: Serra dos Orgãos, 7 February 1868, *A.F.M. Glaziou 2817* (lectotype P00557895! image, designated by de la Sota *et al.* (2007))

*Polypodium typicum* Fée (1873: 52). Type:—BRAZIL. “Brasília fluminense ad Itatiaia,” *Glaziou 5294* (holotype: S! image).

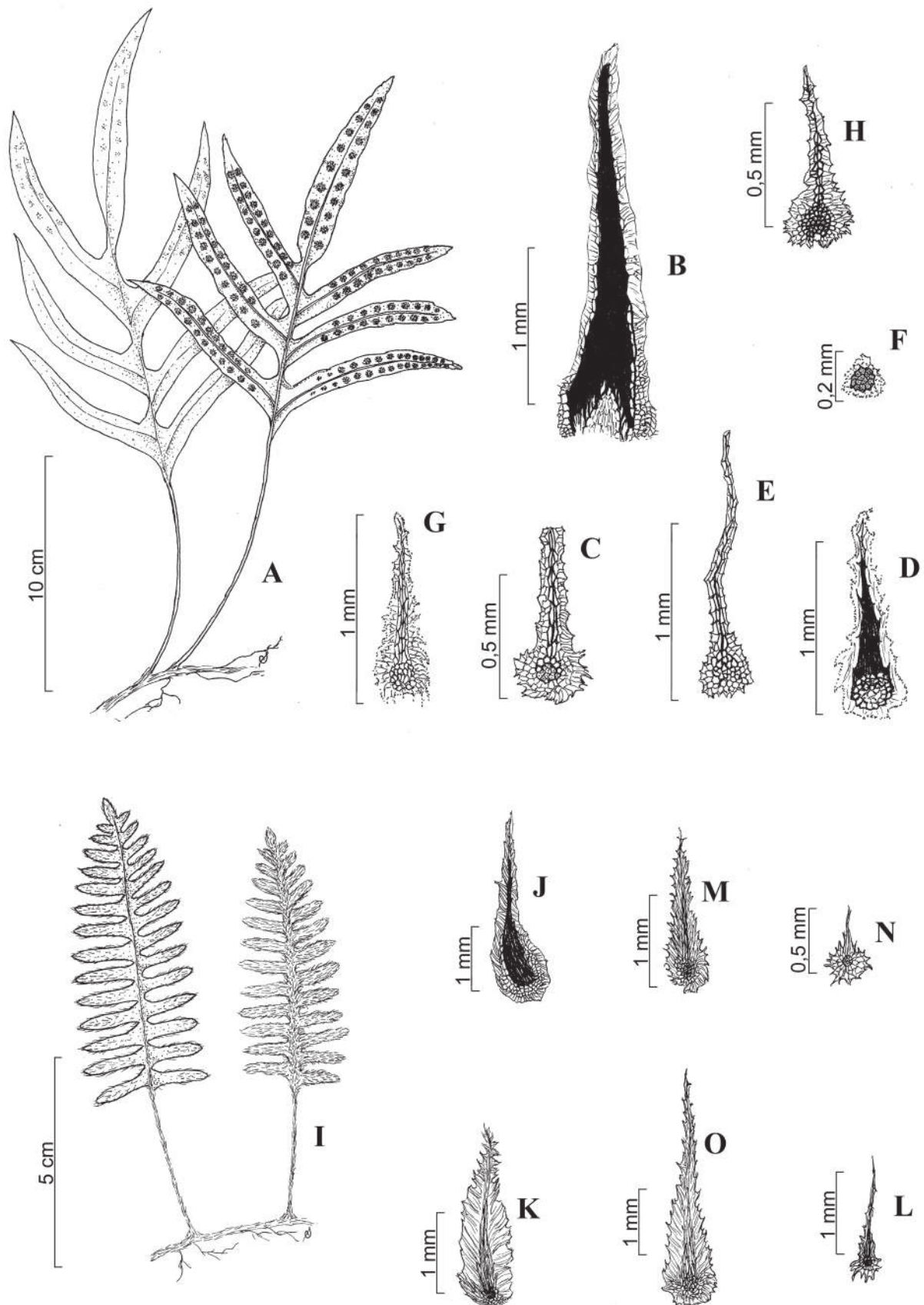
*Polypodium typicum* Fée var. *wacketii* Rosenstock (1906: 140). Type:—BRAZIL. São Paulo: Alto da Serra, 1904, *Wacket 137* (holotype S! image).

**Plants** epiphytic or epipetric. **Rhizomes** long-creeping, with scales linear-lanceolate, blackish, base cuneate with a blackish point of attachment, apex acuminate, margin stramineous and entire to erose; **fronds** monomorphic 8–25 × 3–7 cm; petiolate, petioles, angulate, 2.5–13 cm long, without wings or with inconspicuous wings near lamina base, glabrescent or sparsely scaly; **laminae** 5–12 cm long, pinnatisect to pinnate-pinnatifid, deltate to lanceolate, base truncate, apex acuminate; rachises terete, sparsely scaly; **pinnae** 5–8 pairs, with 1–3 × 0.1–0.7 cm, linear, with base adnate to the rachises, auricle absent, hydathodes present, apex attenuate, margin entire to crenate, laevigate, sparsely to moderately scaly on both surfaces; **frond scales** lanceolate to ovate, hyaline to stramineous, base rounded with a stramineous to brown point of attachment, apex acuminate, margin hyaline to stramineous and erose; **venation** free, furcate; **sori** rounded, medial, glabrous; **spores** shallowly verrucate with sparse globules.

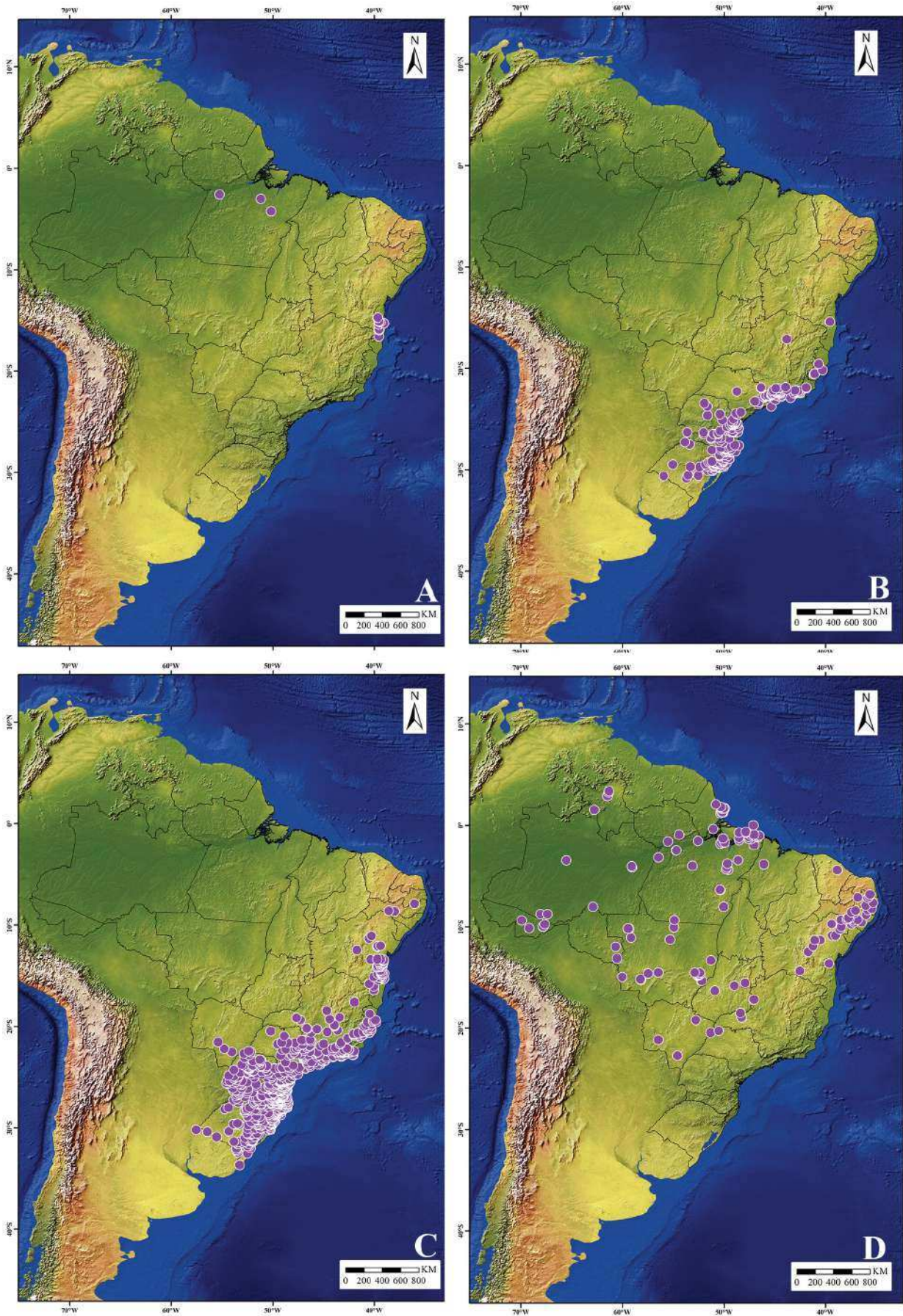
**Selected specimens examined:**—BRAZIL. **Bahia:** Camacan, Fazenda Serra Bonita, 28 July 2008, *F.B. Matos 1528* (CEPEC). **Espírito Santo:** Castelo, Parque Estadual Forno Grande, 25 June 2008, *A. Salino 13594* (BHCB); Serra, Área de Proteção Ambiental Mestre Álvaro, 03 March 2012, *P.H.D. Barros 118* (VIES). **Minas Gerais:** Aiuruoca, Serra do Papagaio, 21 June 1943, *G.M. Magalhães 5776* (BHCB); Alagoa, Parque Estadual da Serra do Papagaio, 11 December 2007, *A. Salino 12954* (BHCB); Brazópolis, 30 October 2008, *T.E. Almeida 1563* (BHCB); Caldas, Pocinhos do Rio Verde, 13 September 2008, *F.S. Souza 542* (CESJ); Camanducaia, Pinheirão, 19 June 2000, *A. Salino 5587* (BHCB, CESJ); Delfim Moreira, 1 November 2008, *T.E. Almeida 1646* (BHCB); Itamonte, Parque Estadual Serra do Papagaio, 6 November 2007, *L. Echternacht 1511* (BHCB); Lima Duarte, Serra Negra, 28 April



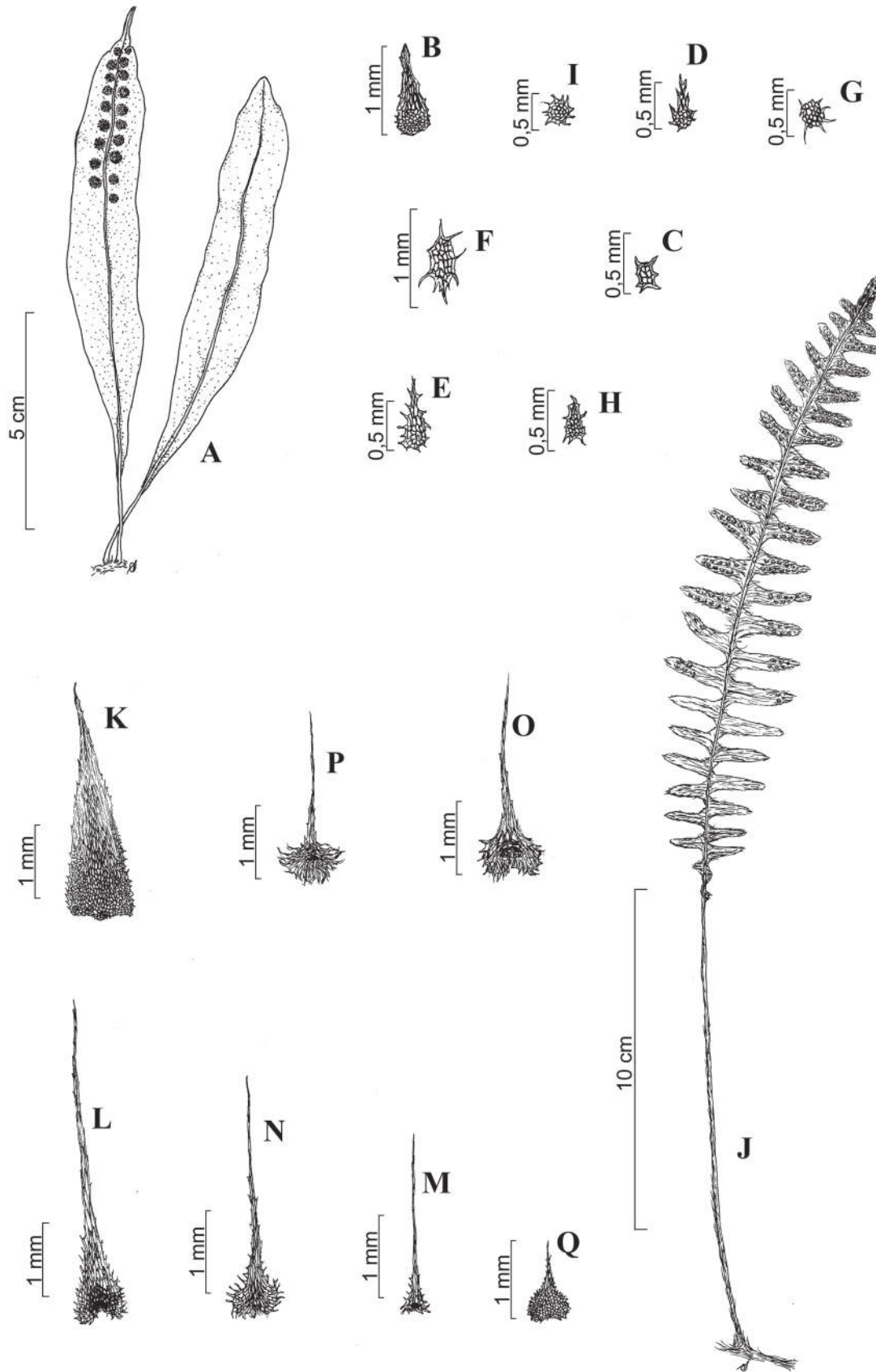
**FIGURE 11.** A–H. *Pleopeltis monoides*. A. Habit; B. Rhizome scale; C. Petiole scale; D. Adaxial rachis scale; E. Abaxial rachis scale; F. Adaxial laminar scale; G. Abaxial laminar scale. H. Sorus scale. I–P. *P. pleopeltidis*. I. Habit; J. Rhizome scale; K. Petiole scale; L. Adaxial rachis scale; M. Abaxial rachis scale; N. Adaxial laminar scale; O. Abaxial laminar scale; P. Sorus scale.



**FIGURE 12.** A–H. *Pleopeltis pleopeltifolia*. A. Habit; B. Rhizome scale; C. Petiole scale; D. Adaxial rachis scale; E. Abaxial rachis scale; F–G. Adaxial laminar scale; H. Abaxial laminar scale. I–O. *P. burchellii*. I. Habit; J. Rhizome scale; K. Petiole scale; L. Adaxial rachis scale; M. Abaxial rachis scale; N. Adaxial laminar scale; O. Abaxial laminar scale.

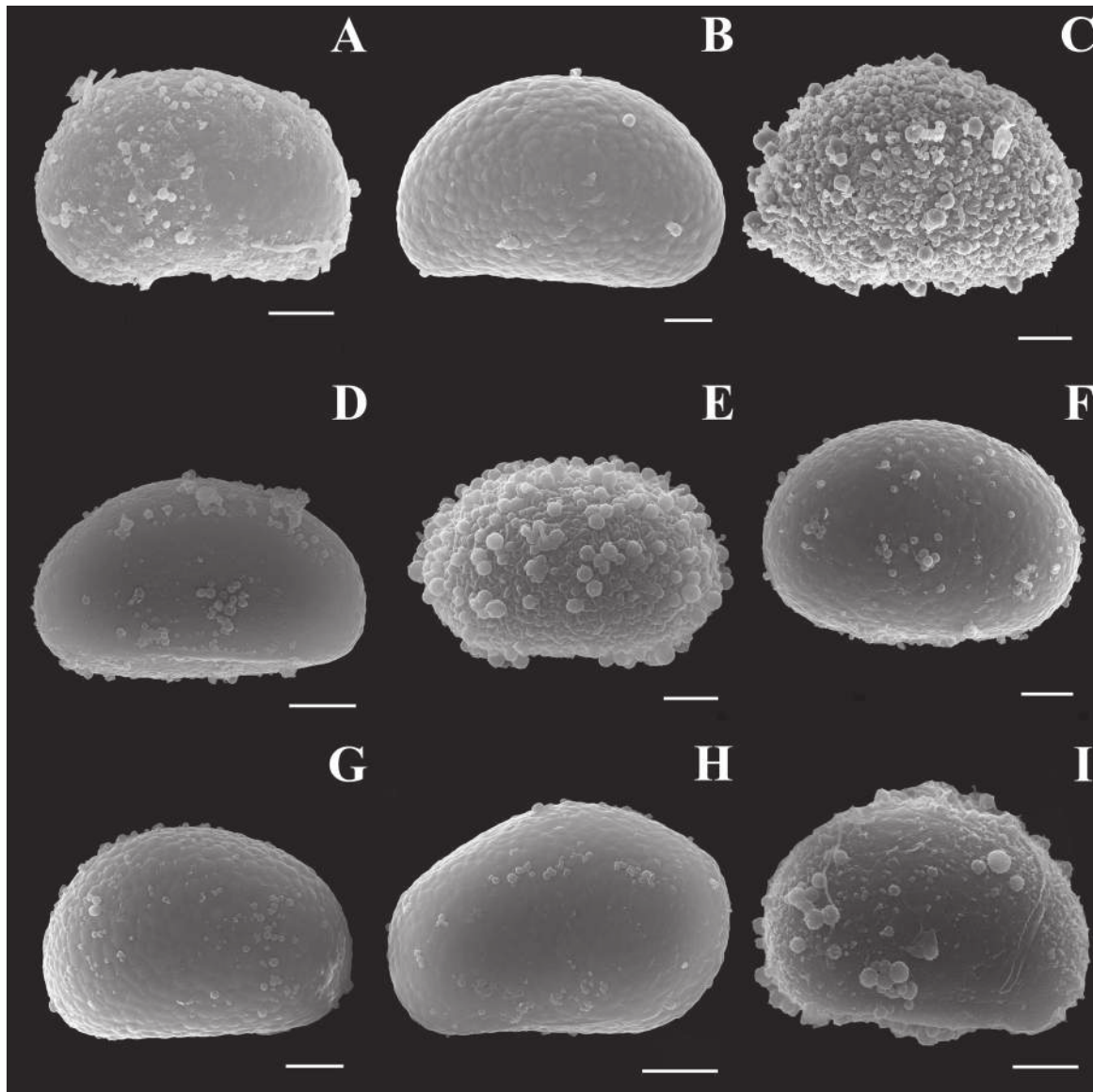


**FIGURE 13.** Distribution of four species of *Pleopeltis* in Brazil. A. *P. monoides*; B. *P. pleopeltidis*; C. *P. pleopeltifolia*; D. *P. burchellii*.



**FIGURE 14.** A–I. *Pleopeltis stolzei*. A. Habit; B. Rhizome scale; C. Petiole scale; D. Adaxial rachis scale; E. Abaxial rachis scale; F–G. Adaxial laminar scale; H–I. Abaxial laminar scale. J–Q. *P. trindadensis*. J. Habit; K. Rhizome scale; L. Petiole scale; M. Adaxial rachis scale; N. Abaxial rachis scale; O. Adaxial laminar scale; P. Abaxial laminar scale; Q. Sorus scale.





**FIGURE 15.** Spores of nine species of *Pleopeltis* from Brazil. A. *P. lepidopteris*; B. *P. macrocarpa*; C. *P. minarum*; D. *P. minima*; E. *P. monoides*; F. *P. pleopeltidis*; G. *P. pleopeltifolia*; H. *P. stolzei*; I. *P. trinidadensis*. Scale bar = 20  $\mu$ m

2008, *F.S. Souza 437* (CESJ); Marmelópolis, Fazenda Saiqui, 12 July 1997, *F.R. Nonato 341* (SJRP); Monte Verde, Pico do Bispo, 20 July 2001, *L.C.N. Melo 146* (CESJ); Olaria, Serra do Cruz, 23 June 2011, *F.E. Alves 105* (CESJ). **Paraná:** Quatro Barras, Serra da Mãe, 18 March 1991, *W. Oliveira 98* (SJRP). **Rio de Janeiro:** Guapimirim, Parque Nacional da Serra dos Órgãos, 06 October 2013, *T.V. Costa 33* (RB); Itatiaia, Road to plateau, 6 November 2014, *A. Weigand 139* (UFRN); Resende, Parque Nacional de Itatiaia, 25 October 1981, *G. Martinelli 7766* (RB); Teresópolis, Parque Estadual dos Três Picos, 17 January 2015, *C. Baez 201* (RB). **Rio Grande do Sul:** Bom Jesus, Fazenda do Cilho, 11 September 2011, *F. Gonzatti 146* (RB); Canela, Parque do Caracol, 08 November 2006, *J.M. Kalk s.n.* (FURB 10563); Farroupilha, 13 October 2008, *E. Passini 262* (VIES); Fritzenberg-Montenegro, 18 January 1943, *A. Sehnem 1201* (RB); São Francisco de Paula, próximo a Alpes de São Francisco, 15 October 2002, *P.G. Windisch 9808* (BHCB). **Santa Catarina:** Benedito Novo, Fazenda Campo do Zinco, 02 November 2009, *J.L. Schmitt 503* (FURB); Joinville, 10 December 2009, *T.J. Cadorin 805* (FURB); Paineil, 3 April 2007, *A. Salino 11938* (BHCB); Urubici, Xaxim., 27 April 2009, *A.L. Gasper de 2093* (BHCB, FURB). **São Paulo:** Bananal, Estação Ecológica do Bananal, 8 March 2001, *A. Salino 6268* (BHCB); Campos do Jordão, Parque Estadual, 2 June 1984, *R.F. Novelino 218* (CESJ); Cunha, Parque Estadual da Serra do Mar, 19 December 1996, *A. Salino 2986* (BHCB); Iporanga, Parque Estadual Intervalles, 19 April 2003, *A. Salino 8615* (BHCB); Mairiporã, Parque Estadual da Cantareira., 20 July 2005, *F.A.R.D.P. Arzolla 870* (BHCB); Mogi das Cruzes, Serra do Itapeti, 23 October 2005, *V.A.O. Dittrich 1394* (BHCB); Pindamonhangaba, 2 April 2002, *V.A.O. Dittrich 1107* (BHCB).

**Distribution and habitat:**—Argentina, Paraguay, and Uruguay. In Brazil, it occurs in the states of Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul (Fig. 13B) mainly in forest formations of Atlantic forest, between 0–2200 m.

**Notes:**—This species can be recognized by its long-creeping rhizome and deltate to lanceolate lamina. In Brazil, it can be confused with *P. desvauxii* and *P. furcata*, but these species differ by the shape and position of the sori. The sori are rounded and medial in *P. pleopeltidis* and linear and marginal in *P. desvauxii* and *P. furcata*. In addition, the lamina is deltoid in *P. pleopeltidis* and obtriangular in the other species.

*Polypodium typicum* Fée is the oldest name designated for this species. However, it is prohibited to use the epithet *typicum* for plant species, according to the International Code of Nomenclature for Algae, Fungi, and Plants (Shenzhen code-Turland *et al.* 2018), so de la Sota *et al.* (2007) designated the name *Polypodium pleopeltidis* for this taxon.

**16. *Pleopeltis pleopeltifolia*** (Raddi) Alston (1956: 21). Figs. 12A–H, 15G. *Polypodium pleopeltifolium* Raddi (1819: 286). Type:—Brazil: “Brasilia, invenitur cum sequenti in veteribus muris prope Rio de Janeiro”, 1819, *Raddi s.n.* (holotype: PI!)

**Plants** epiphytic or rarely epipetric. **Rhizomes** short-creeping, with scales linear-lanceolate, blackish, base cuneate with a blackish point of attachment, apex acuminate, margin stramineous and entire to erose; **fronds** monomorphic 8–35 × 3.5–15 cm, petiolate; petioles angulate to sulcate, 3–15 cm long, alate, scaly; **laminae** 5–20 cm long pinnatisect to furcate, ovate, elliptic or lanceolate, base truncate to cuneate, apex truncate to acute; rachises angulate to terete, scaly; **segments** 2–12 pairs, 2.5–15 × 0.5–1.5 cm, linear, base adnate to the rachises, auricle absent, hydathodes present, apex acuminate, margin entire to crenate, slightly revolute, scaly on both surfaces; **venation** anastomosing; **frond scales** linear-lanceolate, lanceolate to ovate, brown to blackish, base rounded with a blackish point of attachment, apex acuminate, margin stramineous and entire to erose with projections simple to bifid; **sori** rounded, medial, glabrous; **spores** shallowly verrucate with very sparse globules.

**Selected specimens examined:**—BRAZIL. **Bahia:** Arataca, Serra da Lontras, 29 April 2006, *A.M. Amorim 5959* (BHCB); Ilhéus, CEPLAC, Quadra D, 7 March 2007, *R.A.X. Borges 872* (CEPEC); Ipiaú, Mirabela Mineração, 13 November 2007, *D.T. Souza 343* (BHCB); Ipirá, Serra do Engenho, 15 May 2007, *E. Melo 4771* (HUEFS); Ituberá, Assentamento Limoeiro, 16 December 2001, *D.M. Loureiro 410* (ALCB); Uruçuca, 28 November 1987, *P.J.M. Maas 7072* (CEPEC). **Distrito Federal:** Brasília, Fazenda Água Limpa/UnB, 2 December 1994, *B.M.T. Walter 2302* (CEN). **Espírito Santo:** Alegre, Parque Estadual da Cachoeira da Fumaça, 14 September 2008, *A. Salino 13956* (BHCB); Cariacica, Reserva Biológica de Duas Bocas, 12 June 2010, *A. Salino 14883* (BHCB); Castelo, Parque Estadual Forno Grande, 25 June 2008, *A. Salino 13586* (BHCB); Linhares, Reserva Florestal de Linhares, 7 May 1997, *D.A. Folli 3000* (BHCB); Nova Venécia, Pedra do Elefante, 25 August 2009, *A. Salino 14413* (BHCB). **Goiás:** Goiânia, 7 February 1988, *J.R. Pirani 2070* (SPF). **Mato Grosso do Sul:** BR-463, Km 64,7, 26 March 2001, *M.D. Moraes 617* (CEN); Dourados, Fazenda Paradoiro, 20 June 1997, *L.P. Clemente 34* (BHCB, CGMS). **Minas Gerais:** Andradas, Pico do Gavião, 16 July 2007, *A. Salino 12749* (BHCB); Araguaí, Distrito de Paracaíba, 27 January 2007, *A. Salino 11551* (BHCB); Arcos, 15 December 2007, *A. Salino 13090* (BHCB); Bandeira, Mata do Boi Rajado, 6 October 2003, *A. Salino 9093* (BHCB); Belo Horizonte, Parque Municipal Professor Guilherme Lage, 23 December 2011, *L.C. Paixão 4* (BHCB); Boa Esperança, Serra da Boa Esperança, 14 December 2007, *A. Salino 13036* (BHCB); Brazópolis, 30 October 2008, *T.E. Almeida 1547* (BHCB); Bueno Brandão, 18 July 2007, *A. Salino 12759* (BHCB); Caldas, Distrito de Pocinhos do Rio Verde, 12 May 2012, *T.E. Almeida 3174* (BHCB); Carmópolis de Minas, Estação Ecológica Mata do Cedro, 28 November 2004, *L.A. Echternacht 711* (BHCB); Conceição do Mato Dentro, Morro do Pilar, 25 September 2005, *T.E. Almeida 136* (BHCB); Furnas, Represa de Furnas, 15 February 2006, *A.A. Arantes 1653* (BHCB); Gonçalves, 28 October 2008, *T.E. Almeida 1492* (BHCB); Juiz de Fora, Campus da UFJF, 4 April 2012, *S.G. Furtado 12* (CESJ); Lambari, Parque Estadual de Nova Baden, 13 July 2007, *A. Salino 12542* (BHCB); Nova Lima, RPPN Mata do Jambreiro, 2 March 2004, *J.B. Figueiredo 262* (BHCB); Nova Ponte, 23 February 1997, *E. Tameirão Neto 2308* (BHCB); Novo Cruzeiro, 10 February 2004, *J.R. Stehmann 3595* (BHCB); Ouro Preto, Rodrigo Silva, 1933, *J. Badini 80* (OUPR); Paracatu, Reserva do Acangaú., 3 February 2006, *A. Salino 10741* (BHCB); Perdizes, 27 May 1994, *E. Tameirão Neto 1762* (BHCB); Rio Preto, RPPN São Lourenço do Funil, 8 December 2007, *F.S. Souza 207* (CESJ); Sacramento, Engenheiro Lisboa, 20 February 1989, *M. Brandão 14798* (PAMG); Salto da Divisa, 22 February 2003, *A. Salino 8280* (BHCB); Santa Maria do Salto, Distrito de Talismã, 9 March 2004, *A. Salino 9507* (BHCB); Sapucaí Mirim, Serra Campestre, 1 August 1988, *A. Salino 521* (BHCB); São Roque de Minas, Parque Nacional da Serra da Canastra, 14 July 1997, *A. Salino 3171* (BHCB); Tombos, 5 June 1941, *J.E. Oliveira 510* (BHCB); Vespasiano, Fazenda Campestre, 2 November 2010, *S.G. Rezende 3976* (BHCB). **Paraná:** Araucária, Rio Iguçu,

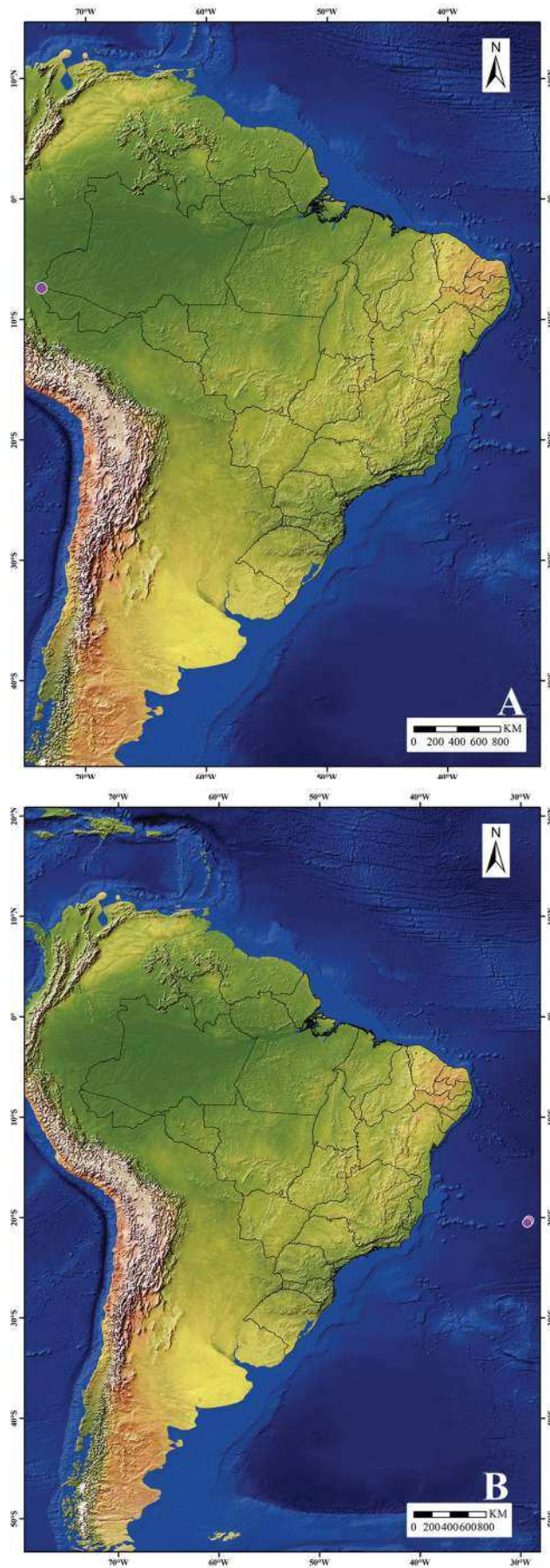
31 January 2000, *E. Barbosa* 640 (CESJ); Campina do Simão, 4 March 2009, *T.E. Almeida* 1871 (BHCB); Capitão Leônidas Marques, Fazenda Deni Schwartz, 15 June 1999, *J.M. Silva* 2970 (CESJ); Cerro Azul, 10 February 2001, *O.S. Ribas* 3230 (BHCB); Céu Azul, Parque Nacional do Iguaçu, 31 July 2012, *M. Lautert* 59 (BHCB); Foz do Iguaçu, 1 August 2010, *R.S. Viveros* 125 (BHCB); Palotina, Parque Estadual de São Camilo, 2 March 2011, *C. Kozera* 3833 (CESJ); Paranaguá, Ilha do Mel, 10 October 1992, *A. Salino* 1505 (BHCB); Saponema, Salto das Orquídeas, 24 May 1997, *V.F. Kinupp* 532 (BHCB); São João do Triunfo, 9 November 2005, *R. Wasum* 3264 (BHCB); São Mateus do Sul, arredores da Usina, 26 January 2005, *R. Wasum* 2431 (CESJ); Tibagi, 19 September 1996, *C.E. Rodrigues Júnior* 1160 (BHCB); Três Barras do Paraná, Parque Estadual do Rio Guarani, 2 October 2012, *M. Lautert* 111 (BHCB); Villa Nova, January 1905, *Kuntze* 15899 (CORD). **Rio Grande do Sul:** Antônio Prado, Capela Borgo Forte, 27 May 2007, *R. Wasum* 4119 (BHCB, CESJ); Caxias do Sul, Campus UCS, 17 August 2006, *E. Fasini* 115 (CESJ); Gramado, Parque Knor, 11 July 1982, *T.S.M. Grandi* 1079 (BHCB); Vacaria, Estrada entre a BR-116 e a Vila São Pedro, 16 September 2006, *E.S.G. Guarino* 1106 (CEN). **Rio de Janeiro:** Parati, Parque Nacional da Serra da Bocaina, 7 August 2001, *A. Salino* 7340 (BHCB); Rio de Janeiro, Jardim Botânico, 12 August 1989, *M. Brandão* 16802 (PAMG). **Santa Catarina:** Anita Garibaldi, 21 January 2009, *M. Verdi* 1345 (BHCB); Capão Alto, Fazenda Gateados, 4 May 2005, *G. Pereira-Silva* 10018 (BHCB); Otacílio Costa, Vila Santa Aparecida, 1 May 2008, *M. Verdi* 633 (BHCB). **São Paulo:** Analândia, Serra do Cuscuzeiro, 25 October 1986, *A. Salino* 42 (BHCB); Botucatu, Parque Ecológico da Pavuna, 16 November 2009, *L.B. Santos* 455 (BHCB); Brotas, 14 July 1991, *A. Salino* 946 (BHCB); Cananéia, Parque Estadual do Jacupiranga, 26 March 2005, *A. Salino* 10244 (BHCB); Caraguatatuba, 15 July 1953, *W. Hoehne* 4108 (CESJ, SP); Iguape, Estação Ecológica de Chauás, 7 January 1999, *C. Kozera* 766 (BHCB); Ihabela, 1991, *V.C. Souza* 12295 (BHCB); Itanhaém, Hotel Fazenda São Camilo, 16 April 2001, *A. Salino* 6575 (BHCB); Itapeva, Estação Ecológica, 27 August 2008, *C.R. Lima* 86 (BHCB); Itirapina, Reserva do Instituto Florestal, 14 December 1995, *A. Begovacz* 15 (BHCB); Jundiá, Reserva Biológica Municipal da Serra do Japi, 11 June 2007, *J.A. Lombardi* 6723 (BHCB); Paranapanema, Estação Ecológica, 2 August 2006, *R. Cielo Filho* 537 (BHCB); Pariquera-Açu, Parque Estadual de Pariquera-Abaixo (PEPA), 5 January 1999, *M. Sztutman* 93 (BHCB); Piracicaba, Parque da ESALQ/USP, 25 May 1987, *M.B. Gimenes* 9 (BHCB); Porto Ferreira, Parque Estadual de Porto Ferreira., 8 April 2010, *J.A. Lombardi* 7771 (BHCB); Ribeirão Grande, Parque Estadual Intervalas, 15 April 2003, *A. Salino* 8417 (BHCB, CESJ); São Luís do Paraitinga, Parque Estadual da Serra do Mar, 4 March 2001, *A. Salino* 6117 (BHCB); São Sebastião, 20 April 2000, *A. Salino* 5323 (BHCB); Tapiraí, Reserva Votorantim, 29 March 2013, *T.E. Almeida* 3225 (BHCB); Ubatuba, Parque Estadual da Ilha Anchieta, 4 January 1993, *A. Salino* 1641 (BHCB).

**Distribution and habitat:**—Argentina, Paraguay and Uruguay. In Brazil, it occurs in the states of Bahia, Espírito Santo, Distrito Federal, Goiás, Mato Grosso do Sul, Minas Gerais, Paraná, Pernambuco, Rio de Janeiro, Rio Grande do Sul, São Paulo, and Santa Catarina (Fig. 13C) in the forest formations in Atlantic Forest domain and eventually in the gallery forest of the Cerrado domain, between 0–1900 m., being one of the epiphytes most abundant in the coastal areas.

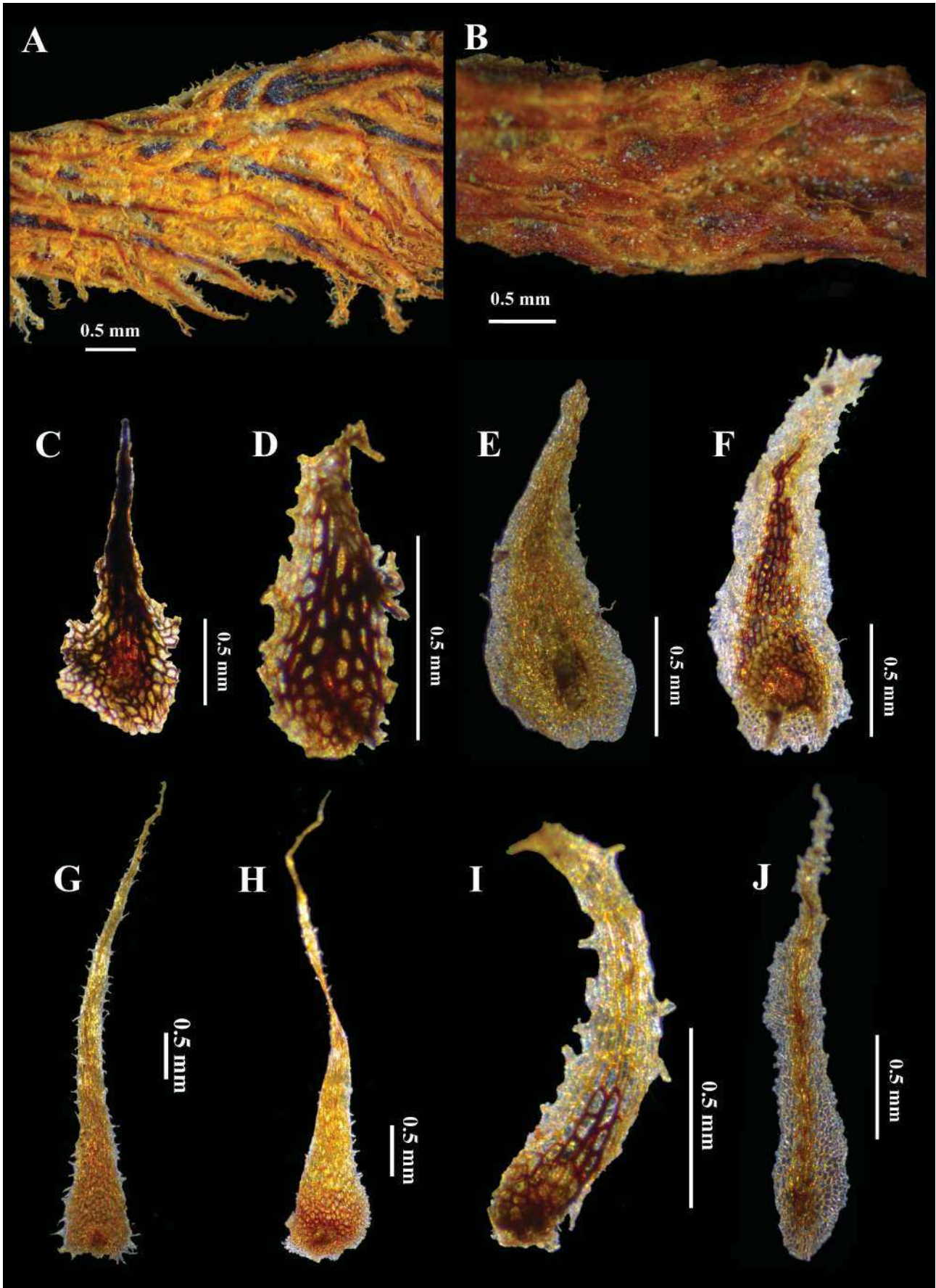
**Notes:**—This species can be recognized by its short-creeping rhizomes and ovate, elliptic or lanceolate laminae with wide segments (0.5–1.5 cm wide). In Brazil, it can be confused with *Pleopeltis pleopeltidis*, but the species are easily differentiated by the short-creeping rhizome in *P. pleopeltifolia* and long-creeping rhizome in *P. pleopeltidis*. It can also be confused with *P. desvauxii* and *P. furcata*, but the sori are round and medial in *P. pleopeltifolia* and linear and marginal in *P. desvauxii* (Fig. 18F) and *P. furcata*.

**17. *Pleopeltis stolzei*** Smith (2005: 282). Figs. 14A–I, 15H, 17D, I. *Pleopeltis macrocarpa* (Willd.) Kaulf. var. *laciniata* Stolze (1993: 143). Type:—PERU. Huánuco: Tingo María, hills above river, *Moran & Fernández* 3681 (holotype: USM; isotypes: F! image, MO)

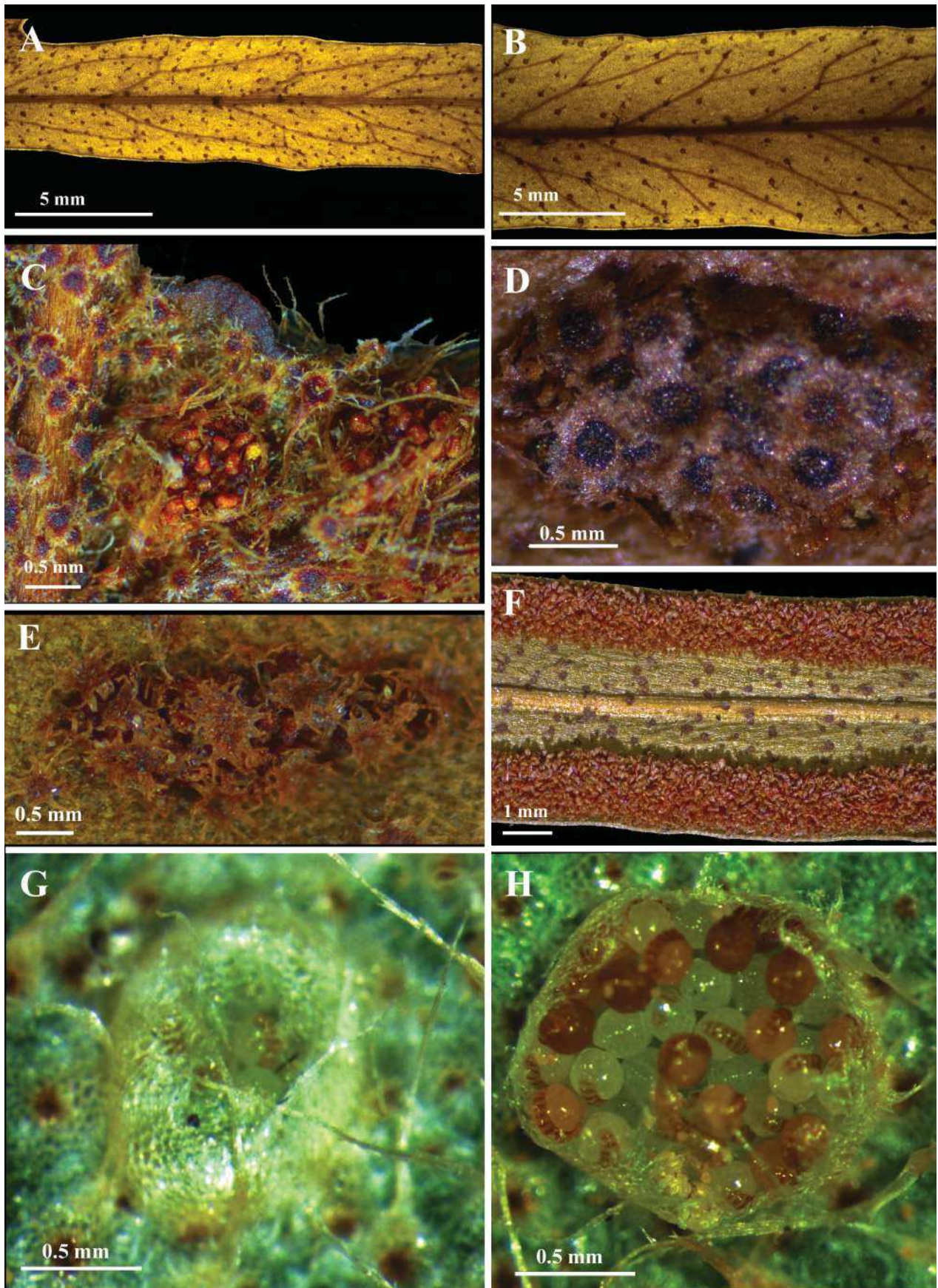
**Plants** epiphytic. **Rhizomes** short-creeping, with scales lanceolate, blackish, base rounded with a blackish point of attachment, apex acuminate, margin blackish and entire; **fronds** monomorphic, 9–13 × 1.2–1.6 cm, petiolate, petioles terete, 0.5–1.5 cm long, alate, scaly; **laminae** 8–11 cm long, simple, lanceolate to elliptic, base cuneate, apex acuminate to aristate, margin entire, scaly on both surfaces; rachises terete, glabrescent; **venation** anastomosing; **frond scales** lanceolate to ovate (those of petioles), ovate to stellate (those of both surfaces of laminae) or widely-elliptic to rounded (those of sori), stramineous to brown or brown to blackish, base rounded with a blackish point of attachment, apex acuminate, margin stramineous, brown to blackish and entire, erose or lacinate; **sori** rounded, infra-medial, covered by scales; **spores** shallowly verrucate with sparse globules.



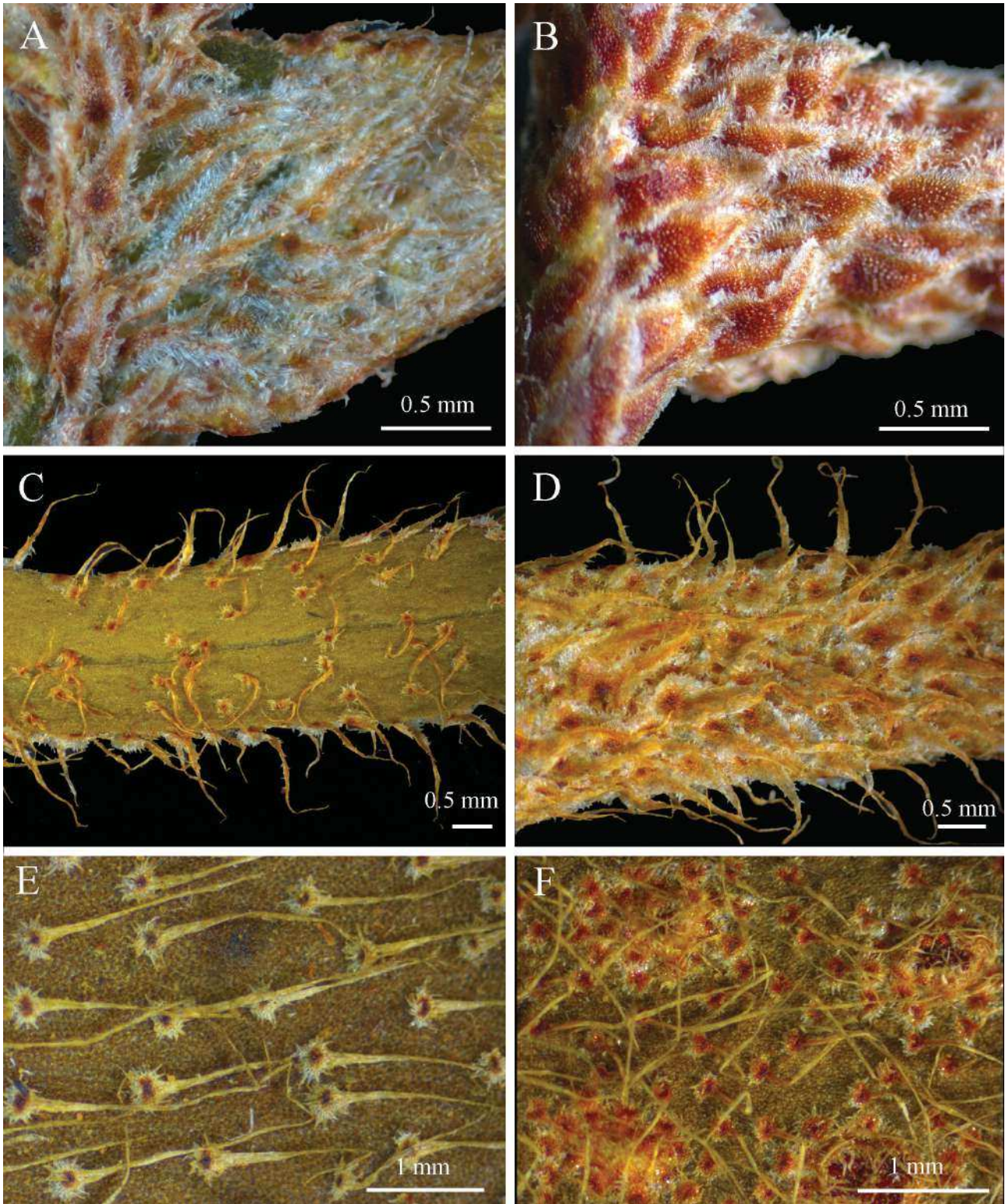
**FIGURE 16.** Distribution of two species of *Pleopeltis* in Brazil. A. *P. stolzei*; B. *P. trinidadensis*.



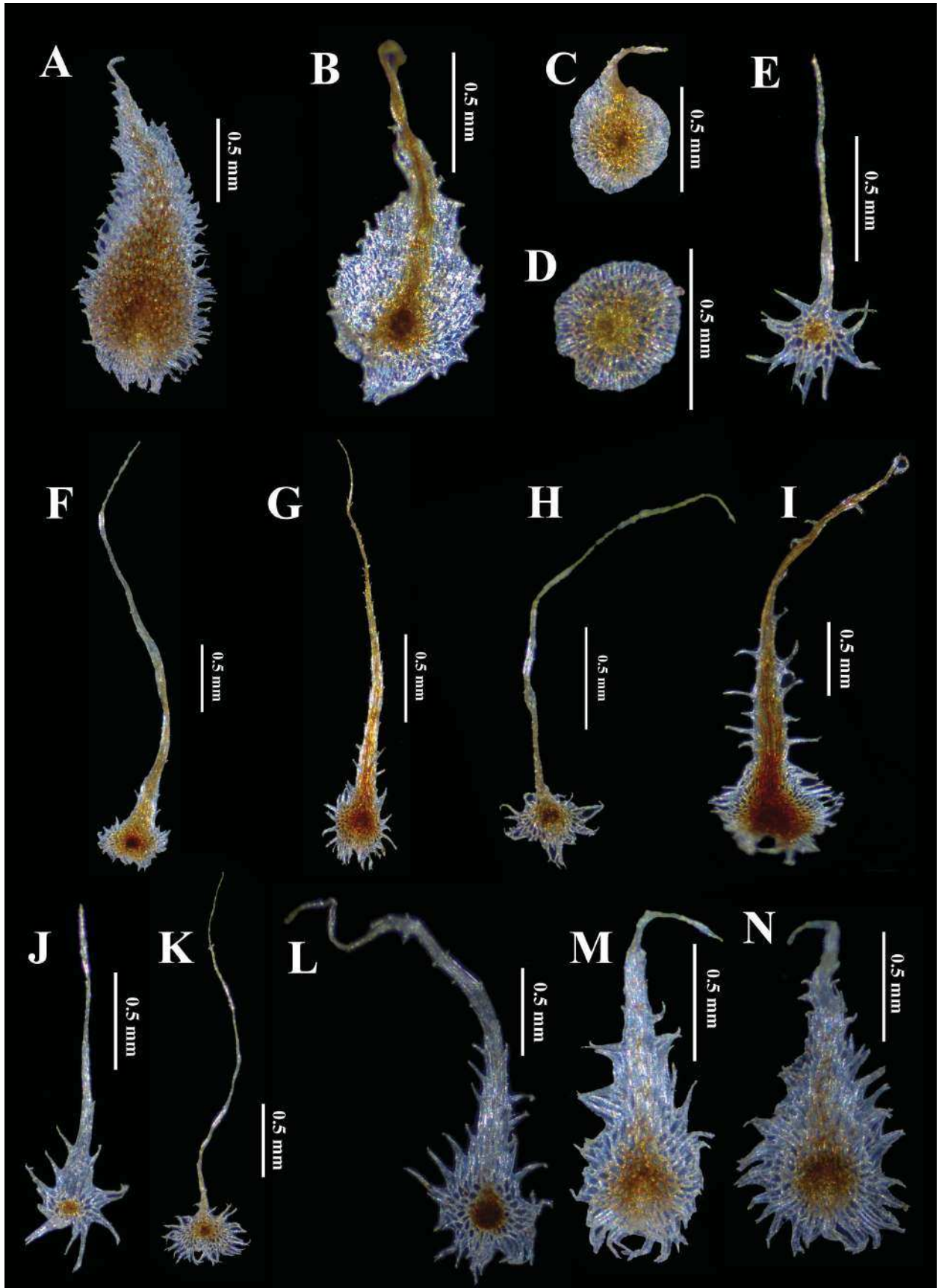
**FIGURE 17.** Rhizome scales of seven species of *Pleopeltis* from Brazil. A. *P. burchelii*, rhizome; B. *P. minima*, rhizome; C. *P. gyroflexa*; D. *P. stolzei*; E. *P. minima*; F. *P. macrocarpa*; G. *P. bombycina*; H. *P. monoides*; I. *P. stolzei*; J. *P. burchelii*.



**FIGURE 18.** Venation and sori of four species of *Pleopeltis* from Brazil. A. *P. desvauxii*, anastomosing veins; B. *P. furcata*, free veins; C. *P. hirsutissima*, two sori surrounded by scales; D. *P. macrocarpa*, sorus covered by peltate scales; E. *P. astrolepis*, sorus covered by peltate scales; F. *P. desvauxii*, linear marginal sori; G. *P. hirsutissima*, immature sorus covered by peltate scales; H. *P. hirsutissima*, mature sorus surrounded by peltate scales.



**FIGURE 19.** Laminar indument of three species of *Pleopeltis* from Brazil. A. *P. alborufula*, adaxial surface; B. *P. alborufula*, abaxial surface; C. *P. burchelii*, adaxial surface; D. *P. burchelii*, abaxial surface; E. *P. monoides*, adaxial surface; F. *P. monoides*, abaxial surface.



**FIGURE 20.** Lamina scales of eight species of *Pleopeltis* from Brazil. A. *P. alborufula*, abaxial scale; B. *P. burchellii*, abaxial scale; C–D. *P. minima*, abaxial scales; E. *P. bombycina*, abaxial scale; F. *P. trinidadensis*, abaxial scale; G. *P. hirsutissima*, abaxial scale; H. *P. lepidopteris*, abaxial scale; I. *P. minarum*, abaxial scale; J. *P. bombycina*, adaxial scale; K. *P. lepidopteris*, adaxial scale; L. *P. minarum*, adaxial scale; M–N. *P. alborufula*, adaxial scales.



**Specimens examined:**—BRAZIL. **Acre:** Mâncio Lima, Parque Nacional da Serra do Divisor, 14 December 2010, T.E. Almeida & A. Salino 2629 (BHCB); **Amazonas:** Barreririnha, 14 April 1970, B.W.P. Albuquerque 304 (INPA); Tabatinga, Tribo dos Ticum, 13 October 1976, P.I.S. Braga 3119 (INPA); March 1875, J.W. Traill 1289 (K).

**Distribution and habitat:**—Ecuador, Peru, and Bolivia. In Brazil, it is known only from Acre and Amazonas states (Fig. 16A).

**Notes:**—This species can be recognized by its cuneate lamina base and brown scales on the abaxial surface of the lamina. In Brazil, it can be confused with *P. macrocarpa*. However, *P. stolzei* has a winged petiole unlike the petiole of *P. macrocarpa*.

According to MMA (2014) the species is not threatened. However, after reviewing the IUCN criteria (IUCN 2017, <https://www.iucnredlist.org/resources/categories-and-criteria>), the authors believe that the species should be classified as EN. It presents a small area of occurrence and occupation, being known to only one locality (Serra do Divisor).

**18. *Pleopeltis trinidadensis*** (Brade) Salino (2009: 107). Figs. 14J–Q, 15I, 20F. *Polypodium trinidadense* Brade (1936: 4). Type:—BRAZIL. Espírito Santo: Ilha da Trindade, *Campos Porto 585* (holotype: RB!, isotype: F)

**Plants** epipetric or terrestrial. **Rhizomes** short-creeping, with scales lanceolate, brown, base rounded with a brown to blackish point of attachment, apex acuminate and margin light brown and incised to lacinate; **fronds** monomorphic, 30–60 × 4–8 cm; petiolate, petiole angulate, 10–20 cm long, without wings, densely scaly; **laminae** 20–40 cm long pinnatisect, linear-lanceolate, base truncate, apex acute; rachises angulate, densely scaly; **pinnae** 18–37 pairs, medial pinnae 1.7–4 × 0.4–0.6 cm, linear, base adnate to the rachises, auricle present, hydathodes present, apex acute to obtuse, margin entire, densely scaly on both surfaces; **venation** anastomosing; **frond scales** with base rounded and long-acuminate to the filiform apex, brown, base with a dark brown point of attachment, margin brown and incise to lacinate; **sori** rounded, medial, covered by scales; **spores** verrucate to papillate with sparse globules.

**Selected specimens examined:**—BRAZIL. **Espírito Santo:** Ilha de Trindade, 24 October 2011, V.A.O. Dittrich 1739 (CESJ); idem, 25 January 1992, J.M.L. Gomes 1735 (VIES).

**Distribution and habitat:**—Endemic to Trindade Island (Fig. 16B), in the State of Espírito Santo, where it occurs in rock outcrops.

**Notes:**—This species can be recognized by its dense, brown scales with base rounded and long-acuminate to the filiform apex on all parts of the lamina, long petiole, and abruptly reduced lamina base. This species is categorized as Critically Endangered (CR) because it occupies an area of less than 10 km<sup>2</sup> (MMA 2014). *Pleopeltis trinidadensis* is known only of a few collections from Trindade Island.

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