

Two New Species of *Pleopeltis* (Polypodiaceae) from Andean South America

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ABSTRACT.—*Pleopeltis orientalis* and *P. oreophila* are described as new. *Pleopeltis orientalis* is restricted to the Cordillera Oriental of Colombia. It resembles the South American species *Pleopeltis fraseri* (Mett. ex Kuhn) A. R. Sm. and *Pleopeltis remota* (Desv.) A. R. Sm. *Pleopeltis oreophila* is found in interandean valleys of northern Peru. It resembles *Pleopeltis pycnocarpa* (C. Chr.) A. R. Sm. and *Polypodium segregatum* Hook.

During taxonomic work on Andean ferns, I found two species of *Pleopeltis* here described as new. Both are members of what was formerly referred to as *Polypodium* subg. *Marginaria* (Bory) C. Chr., that is, the scaly species of *Polypodium*. This group was previously treated in part by de la Sota (1966) and Maxon (1916a, 1916b). Morphological and molecular data (Windham, 1993; Schneider *et al.*, 2004) suggest that these species belong with *Pleopeltis* instead of *Polypodium* *sensu stricto*. Some new combinations have already been made (Windham, 1993; Kessler and Smith, 2005) and others are pending a revision of the limits of *Pleopeltis* by Alan Smith (A. R. Smith, pers. com.). For this reason, the species described here are compared to other species of *Pleopeltis* and *Polypodium*. The species of *Polypodium* discussed herein will eventually be transferred to *Pleopeltis*.

***Pleopeltis orientalis* Sundue, *sp. nov.* TYPE.**—Colombia. **Santander:** Mun. Vetas, vic. of Vetas, 3100–3200 m, open rocky hillsides, 16–20 Jan 1927, Killip & Smith 17295 (holotype: NY; isotype: US). **Fig. 1 A–D.**

Rhizomata dense squamosa, squamis distincte bicoloribus, parte centrali fascia crassa nigrescenti indurata lanceolata 0.6 mm lata ornata, partibus squamae ad fasciam parallelis pallide brunneolis, tenuibus, 0.3–0.5 mm latis, saepe aetate erosis, marginibus squamae denticulatis. Laminae 7.0–19.0 × 6.5–9.5 cm, coriaceae, 1-pinnatisectae, ovatae vel triangulares, ad basem latissimae et truncatae, ad apicem acutae; superficies abaxiales laminae dense squamosae, squamis 1.5–2.0 × 0.7–1.0 mm, peltatim affixis, clathratis, luminibus subocclusis, brunneolis, maximam partem concoloribus praeter insertionem brunneam atque margines subhyalinas, ovatis vel lanceolato-ovatis, ad basem rotundatis, ad apicem acutis, marginibus denticulatis, dentibus simplicibus vel bifidis.

Plants epipetric. Rhizome long-creeping, 3–6 mm wide, densely scaly, the scales 3.5–4.0 × 1.2–1.6 mm, peltate, loosely appressed, lanceolate, distinctly bicolorous, the central portion with a thick, blackish, indurate, lanceolate, stripe 0.6 mm wide, the outer portions of the scale on either side of the stripe

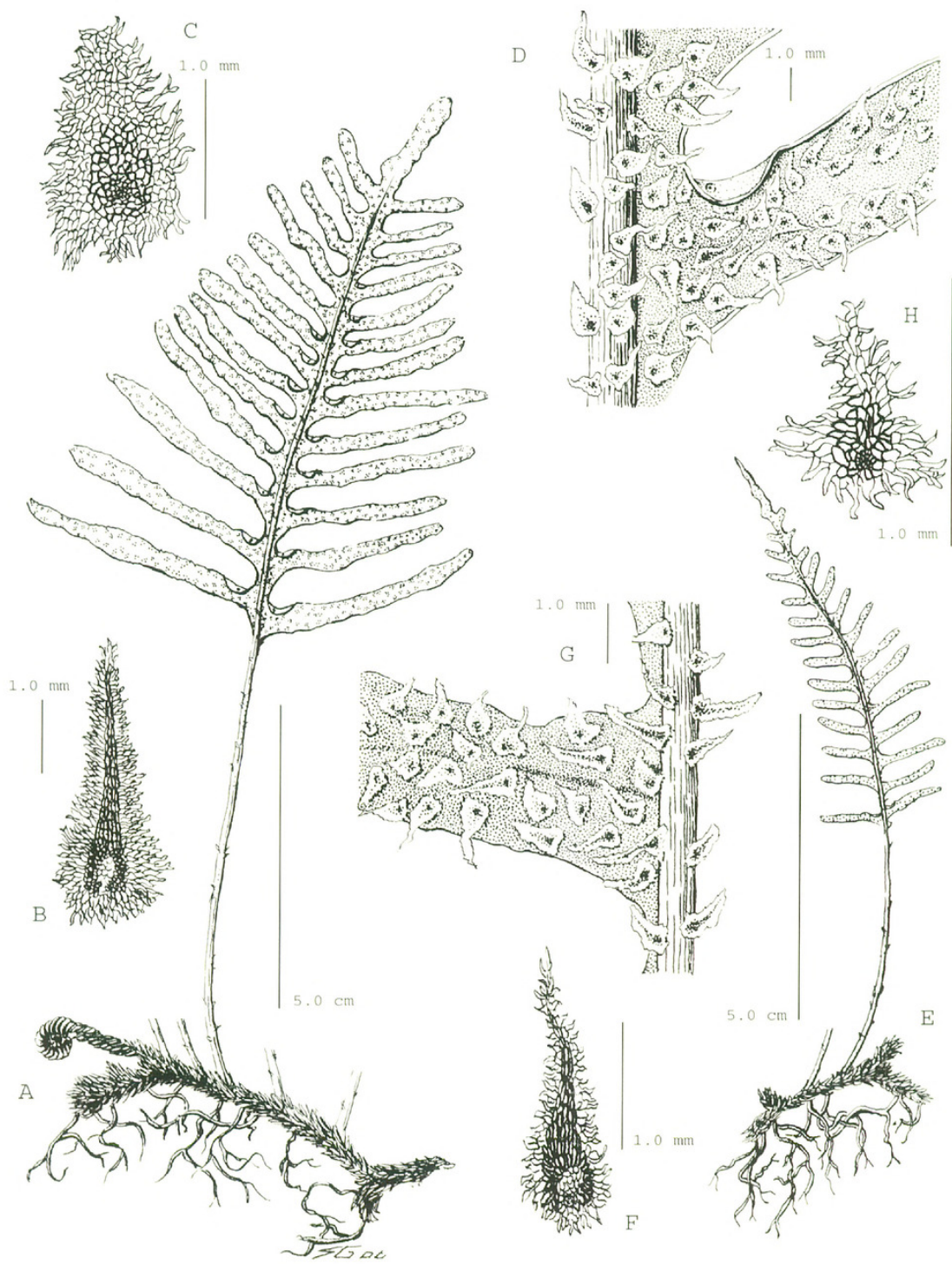


FIG. 1. A–D. *Pleopeltis orientalis* A. habit. B. rhizome scale. C. laminar scale. D. abaxial lamina detail (Killip & Smith 17295 NY). E–H. *Pleopeltis oreophila* E. habit F. rhizome scale (Sagástegui et Leiva 12531 MO). G. abaxial lamina detail. H. laminar scale (Sagástegui & Leiva 15422 UC).

light tan, thin, 0.3–0.5 mm wide, often eroded in age, the margin denticulate. Phyllopodia short, indistinct. Fronds monomorphic. Petioles $5\text{--}15 \times 0.5\text{--}2.0$ mm, adaxially grooved, brown to purple-brown, or sometimes stramineous, moderately to densely scaly, the scales similar to those of the laminar axes. Laminae $7.0\text{--}19.0 \times 6.5\text{--}9.5$ cm, 1-pinnatisect, coriaceous, yellowish-brown in dried specimens, ovate to triangular, widest at the base, the base truncate, the apex acute; pinnae $2.0\text{--}5.5 \times 0.3\text{--}0.5$ cm, 8–16 pairs, linear, even-sided, basal pinnae spreading, the medial and distal pinnae ascending, the pinna bases adnate, the acroscopic margin of the pinna base often slightly folded toward the abaxial side and provided with a dark-colored sunken nectary, the pinna apices acute, the pinna margins entire for most of their length, notched distally, the adaxial lamina surfaces glabrous except for a few scattered scales along the adaxial costae, these scales similar to those of the abaxial axes, hydathodes present, sunken into the laminar tissue, white-encrusted; abaxial lamina surfaces densely scaly, the scales $1.5\text{--}2.0 \times 0.7\text{--}1.0$ mm, peltately attached, clathrate, the lumina partially occluded, light-brown, essentially concolorous except for the dark-brown point of attachment and somewhat hyaline edges, ovate to lanceolate-ovate, the base rounded, the apex acute, the margin denticulate, the teeth simple or bifid, the scales of the axes tending to differ by being up to 3.5×1.5 mm, lanceolate, bicolorous, the central portion dark-brown, and the scale apices being long-attenuate. Veins obscured by the thick lamina. Sori in one row between the costa and the pinna margins, round, (6)10–14 pairs per pinna, obscured by laminar scales when young, partially confluent at maturity. Spore color unknown.

DISTRIBUTION AND HABITAT.—Cordillera Oriental of Colombia, on or among rocks in open rocky slopes and thickets along streams, from 2250–3250 m.

ETYMOLOGY.—This species is named after the Cordillera Oriental of Colombia to which it is apparently confined.

ADDITIONAL SPECIMENS EXAMINED.—COLOMBIA. **Boyacá:** Mun. Ráquira, desierto de la candelaria, 2250 m, 10 Apr 1974, *Acosta-Artega* 282 (NY); Mun. Ráquira, slope south of Río Gomeza (Río Arobispo), 7–10 km E of Socha, 6° N, $72^\circ 55\text{--}57'$ W, rock ledge, cleared rocky slope with great boulders, scattered bushes, and brushy ravines, 3050–3070 m, 11 Nov 1944, *Fosberg* 22305 (US); **Cundinamarca:** Mun. Suesca, en la parte inferior de las rocas, 2600 m, 2 Jun 1974, *Acosta-Artega* 424 (NY); **Santander:** Mun. Vetás, vic. of Vetás, thickets along stream, 3100–3250 m, 16 Jan 1927, *Killip & Smith* 17356 (NY).

Discussion.—The characteristic sharply bicolorous rhizome scales of *Pleopeltis orientalis* ally it with *Pleopeltis fraseri* (Kuhn) A. R. Sm. and *Pleopeltis remota* (Desv.) A. R. Sm. of South America, and with Central American and Mexican species such as *Polypodium plebeium* Schltdl. & Cham. and *Polypodium madrense* J. Sm. It differs from these by having densely scaly abaxial lamina surfaces, laminar scales that are ovate to lanceolate-ovate and clathrate, and pinnae that are narrow, and spreading to ascending. By

comparison, other South American species in this group are usually sparsely scaly on the laminae abaxially. Some specimens of *Pleopeltis fraseri* from northern Ecuador and the Cordillera Central of Colombia are moderately scaly. These plants could be confused with *Pleopeltis orientalis*, but they differ by having wider pinnae, and darker-brown lamina scales that have a narrow, attenuate apex, arising from an expanded scale base. The spore color of *Pleopeltis orientalis* is unknown because this character is lost in herbarium specimens of *Pleopeltis*. For example, the spores of *Pleopeltis wiesbaurii* (Sodiño) Lellinger are green when fresh (M. Sundue, pers. obs.), but fade to white after drying. *Pleopeltis orientalis* might have green spores like *Pleopeltis remota*, or yellow spores like those of *Pleopeltis fraseri* or *Polypodium plebeium*, all of which appear quite similar to the new species.

Pleopeltis oreophila Sundue, *sp. nov.* TYPE.—Peru. **Cajamarca:** Prov. Contumazá, de piedras, 2400 m, 13 Jun 1983, *Sagástegui & López 10602* (holotype: NY; isotype: F). **Fig. 1, E–H.**

Rhizomata dense squamosa, squamis bicoloribus, parte centrali fascia conspicua fusca, atrobrunnea vel nigrescenti, opaca, indurata praeter insertionem brunneam, partibus squamae ad fasciam parallelis pallide brunneolis, hyalinis, saepe aetate erosis, marginibus denticulatis, dentibus simplicibus vel bifidis. Laminae 6.2–13 × 1.1–3.5 cm coriaceae, lanceolatae, subaequilatae, proxime sub medio vel interdum ad basem latissimae, profunde pinnatisectae, ut videtur 1-pinnatae; superficies adaxiales laminae glabrae; superficies abaxiales laminae dense squamosae, squamis 0.6–1.0 mm × 0.4–0.5 mm, clathratis, luminibus apertis vel partim occlusis, ovatis vel lanceolatis, concoloribus atque pallide brunneis vel obscure rubescenti-brunneis, insertione infusca, marginibus hyalinis, denticulatis, dentibus simplicibus vel plerumque bifidis, squamis secus axes saepe bicoloribus parte distali squamae nigrescentibus, induratis, luminibus occlusis.

Plants epipetric. Rhizome long-creeping, 1.5–3.0 mm wide, densely scaly, the scales 1.7–2.6 × 0.4–0.6 mm, peltate, loosely appressed, linear-lanceolate, long-attenuate, bicolorous, the central portion with a conspicuous dark stripe, the stripe dark-brown to blackish, opaque, indurate except for the point of attachment which is brown, the outer portions on either side of the stripe tan, hyaline, often eroded in age, the margin denticulate, the teeth simple or bifid. Phyllopodia short, indistinct. Fronds monomorphic. Petioles 3.5–8.0 cm × 0.7–1.1 mm, blackish, terete, adaxially grooved, sparsely scaly. Laminae 6.2–13 × 1.1–3.5 cm, coriaceous, lanceolate, nearly parallel-sided, widest just below the middle or sometimes at the base, deeply pinnatisect, appearing 1-pinnate, the lamina base truncate, the apex gradually reduced, attenuate; pinnae 6–15 × 1.5–3.0 mm, (7)10–14(20) pairs, linear, ascending, the bases adnate, the apices rounded to acute, the pinna margins crenate or minutely notched on smaller pinnae, the basal pinnae sometimes with a basal constriction caused by the acroscopic and basiscopic margins folding toward the abaxial side, the acroscopic margin provided with a dark sunken nectary, at

least on basal pinnae; adaxial lamina surfaces glabrous, hydathodes present, sunken, not white-encrusted; abaxial lamina surfaces densely scaly, the scales 0.6–1.0 mm \times 0.4–0.5 mm, clathrate, the lumina clear to partially occluded, ovate to lanceolate, concolorous and light brown to dark reddish brown, the point of attachment dark, the margins hyaline, denticulate, the teeth simple or more often bifid, the scales along axes often bicolorous with the distal portion of the scale blackish, indurate, the lumina occluded. Veins obscured by the thick lamina. Sori in one row between the costa and the pinna margin, round, 6–8 pairs per pinna, obscured by laminar scales when young, confluent at maturity on small pinnae. Spore color unknown.

DISTRIBUTION AND HABITAT.—Interandean valleys in northern Peru, growing on rocks between 2400–2500 m.

ETYMOLOGY.—Derived from the Greek “oreophilus”, meaning mountain loving.

ADDITIONAL SPECIMENS EXAMINED.—PERU. **Cajamarca:** Prov. Contumazá, sobre rocas, 2400 m, 28 Mar 1985, *Sagástegui & Leiva 12531* (MO, UC); Prov. Contumazá, ladera rocosa, 2500 m, 12 Dec 1993, *Sagástegui, Leiva, & Lezama 15107* (F, NY); Prov. Contumazá, Bosque Cachil, bosque húmedo, 2500 m, 12 Nov 1994, *Sagástegui & Leiva 15422* (F, UC).

Discussion.—The lamina and rhizome scales of *Pleopeltis oreophila* ally it with *Pleopeltis appressa* M. Kessler & A. R. Sm. *Pleopeltis buchtienii* (H. Christ & Rosenst.) A. R. Sm., *Pleopeltis pycnocarpa* (C. Chr.) A. R. Sm., *Polypodium segregatum* Hook., and *Pleopeltis tweediana* (Hook.) A. R. Sm. This species most closely resembles *P. pycnocarpa*, and most specimens studied were previously identified as this species. *Pleopeltis oreophila* differs from that species by having laminar and rhizome scales with bifid marginal teeth, darker petioles, more elongate and deeply pinnatisect laminae with more widely spaced pinnae (4–10 pairs in *P. pycnocarpa*), and a basal constriction on the basal pinnae which is absent in *P. pycnocarpa*. Both species are epipetric, but *P. pycnocarpa* grows almost exclusively at or above 3000 m, whereas *P. oreophila* is found between 2400–2500 m. *Pleopeltis oreophila* is also similar to *Polypodium segregatum* Hook. which also has laminar scales with bifid marginal teeth and pinnae with basal constrictions. That species differs by having lighter-colored petioles, larger fronds, and more pinnae (13–21), that are more widely spaced, and that have more narrowly constricted pinna bases. *Polypodium segregatum* is known only from Ecuador where it is an epiphyte usually growing between 2400–3000 m. The spore color of *Pleopeltis oreophila* is unknown (see discussion under *Pleopeltis orientalis*), but is expected to be yellow because most *Pleopeltis* have yellow spores, as does its putative close relative *P. pycnocarpa*.

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