



<https://doi.org/10.11646/phytotaxa.340.2.6>

## *Steiropteris alstonii* (Thelypteridaceae), a new species from Colombia, and some new combinations in the family

ALEXANDRE SALINO<sup>1</sup> & ALAN R. SMITH<sup>2</sup>

<sup>1</sup> Universidade Federal de Minas Gerais, Instituto de Ciências Biológicas, Departamento de Botânica, Caixa Postal 486, 31270-901, Belo Horizonte, Minas Gerais, Brazil; [salinobh@gmail.com](mailto:salinobh@gmail.com)

<sup>2</sup> University Herbarium, University of California, 1001 Valley Life Sciences Bldg. #2465, Berkeley, CA 94720-2465, U.S.A.; [arsmith@berkeley.edu](mailto:arsmith@berkeley.edu)

### Abstract

One new species and three new combinations in neotropical Thelypteridaceae are proposed here. *Steiropteris alstonii* sp. nov. is from Colombia and known only from the type locality. New combinations are proposed in the genera *Amauropelta*, *Christella*, and *Goniopteris*.

**Key words:** Ferns, taxonomy, South America, *Amauropelta*, *Christella*, *Goniopteris*, *Thelypteris*

### Introduction

Thelypteridaceae is a family of ferns with about 1034 species in 30 genera (PPG I 2016). In the Neotropics there are about 390 species, the vast majority belonging to five genera: *Goniopteris* Presl (1836: 181), *Meniscium* Schreber (1791: 757), and *Steiropteris* (Christensen 1911: 81) Pichi Sermolli (1973: 449) are only in the Neotropics and subtropics, *Amauropelta* Kunze (1843: 86) is primarily neotropical, and *Christella* Lévillé (1915: 412) is pantropical. Only four or five species belong to the three other small amphioceanic genera that are temperate, subtropical, and/or pantropical: *Thelypteris* Schmidel (1763: 45), *Stegnogramma* Blume (1828: 172), and *Cyclosorus* Link (1833: 128). There are taxonomic treatments of Thelypteridaceae for some countries/areas including Mexico (Smith 1981, Mickel & Beitel 1988; Mickel & Smith 2004), Antilles, Jamaica, and Puerto Rico (Proctor 1977, 1985, 1989, respectively), Mesoamerica (Smith 1995a), Guatemala (Stolze 1981), Venezuela (Vareschi 1969, Smith 1995b), Guianas (Smith 1993), Ecuador (Smith 1983), Peru (Smith 1992), Bolivia (Smith & Kessler 2017), Brazil (Brade 1972, Sehnem 1979, Ponce 1995, 2007; Ponce et al. 2010, 2013; Salino 2000, Salino & Semir 2002, 2004a, 2004b), Argentina (Ponce 1987, 2016), and Uruguay (Legrand 1952). In addition, there are also three taxonomic revisions: *Christella* (Smith 1971), *Steiropteris* (Smith 1980) and *Meniscium* (Fernandes 2015). Nevertheless, about 45 new species of Thelypteridaceae have been described in the 21st century, 14 in the last four years (Almeida & Salino 2016; unpublished data). Working recently at the fern collection of the herbarium of the Natural History Museum (BM) we noticed one more new species from Colombia. The new species belongs to the genus *Steiropteris*, an exclusively neotropical genus, with about 23 species. Colombia, now with 11 species, has more known species of *Steiropteris* than any other country. *Steiropteris* is characterized by usually 1-pinnate-pinnatifid blades, generally without gradually reduced proximal pinnae, a cartilaginous keel or minutely pubescent false vein running from each sinus toward the costa (lacking in some species), usually peglike or scalelike aerophores at the pinna bases, basal veins from adjacent segments running to sinuses, or anastomosing at acute angles below sinuses, and indusia generally persistent (absent in a few species; Smith 1982). In addition, we are aware that some new combinations are necessary to update and correct names for use in regional floras and modern taxonomic treatments.

## Results and discussion

### New species

#### *Steiropteris alstonii* Salino & A.R.Sm., *sp. nov.* (Figs. 1–2)

This is one of the smaller species of *Steiropteris*, lacks aerophores, and has inconspicuous false veins. *Steiropteris alstonii* is somewhat similar to *S. gardneriana* in habit but differs by having smaller pinnae 2–4.1 × 0.7–1.65 cm (versus 4.5–12 × 1.6–2.7 cm), pinnae slightly undulate to incised to 1/3 or rarely to 1/2 their width (versus 2/3 to 3/4), veins 2–4 pairs per segment (versus 6–10 pairs), and scattered, adpressed, stipitate-capitate glandular hairs (0.08–0.15 mm) mainly on the costae (versus costae abaxially with setose hairs).

**Type:**—COLOMBIA. Department of Nariño: between Paramo and Barbacoas, 500 m, 07 May 1939, *A.H.G. Alston 8464* (holotype BM 000592158, isotype MO 3765956).

Plants terrestrial. Rhizomes erect; rhizome scales 2–3 mm long, lanceolate with long-acuminate apices, castaneous, with acicular hairs. Fronds 23–42 cm long, monomorphic; petioles 10–21 cm long, 0.7–1.25 mm diam., slightly sulcate adaxially, sparsely scaly at bases, scales like those of rhizomes, moderately to densely covered by acicular, arcuate hairs 0.2–0.3 mm long in the adaxial grooves; laminae 13–21 cm long, elliptic, chartaceous, 1-pinnate-pinnatifid, each with a confluent, pinnatifid, caudate apex; rachises pilose like the petioles, but with hairs on all surfaces; aerophores absent; buds absent; pinnae 2–4.1 × 0.7–1.65 cm, 9–16 pairs, alternate to opposite, arcuate to ascending, the proximal pair reduced to 60% of the size of the next distal pair, pinnae slightly undulate to incised to 1/3 (rarely to 1/2) their width, sessile in the distal half of laminae and stalked 1 mm in the proximal half, lanceolate with apices rounded to acute, bases truncate to slightly cordate in the proximal pinnae; abaxial surfaces with scattered, adpressed, stipitate-capitate glandular hairs, these 0.08–0.15 mm long, mainly on costae, costules, and veins; adaxial surfaces with acicular hairs 0.2–0.3 mm long only on the costae; segments 2.9–3.9 mm wide, arcuate, entire, obtuse to acute apically; veins 2–4 pairs per segment, unbranched, with clavate tips adaxially, the basal vein pairs from adjacent segments connivent at sinuses or meeting margins just above the sinuses, distal vein of each pair arising from a costule or costa near the costule; sinus keels slight developed and hairy. Sori round, medial; indusia persistent, round or round-reniform, with setose hairs; sporangia glabrous.

**Distribution and habitat:**—*Steiropteris alstonii* is known only from the type collection in Colombia, where it apparently grows in rain forests on steep banks at ca. 500 m.

**Etymology:**—*Steiropteris alstonii* is named for Arthur Hugh Gart Alston (1902–1958), a British pteridologist and *Selaginella* expert who worked at the Natural History Museum, London (BM Herbarium) and also collected the type specimen.

**Notes:**—In Bolivia there are two small endemic species of *Steiropteris*: *S. parva* (Smith & Kessler 2008: 57) Salino *et al.* (2015: 47) and *S. glabra* Smith & Kessler (2017: 30). The former has even smaller fronds 6.5–10 cm long (versus 23–42 cm) and conspicuous acicular hairs 0.3–2.2 mm long on costae and veins abaxially (versus scattered, adpressed, stipitate-capitate glandular hairs, these 0.08–0.15 mm long on costae, costules, and veins abaxially). The latter species has rhizomes forming caudices to 7 cm long (versus rhizomes erect, but not forming caudices), larger, sessile pinnae 8 × 1.7 cm long (versus 2–4.1 × 0.7–1.65 cm), that are deeply pinnatifid to approximately 1 mm from the costae (versus pinnae slightly undulate to incised to 1/3, rarely to 1/2). In addition, there is no overlap in the area of occurrence in Colombia with *S. gardneriana* because that species occurs only in the region of Magdalena and *S. alstonii* only in the Department of Nariño.

### New combinations

Two of the three new combinations proposed here are to correct errors in combinations made recently by us (Salino *et al.* 2015).

#### *Amauropelta amambayensis* (Christ) Salino & A.R.Sm., *comb. nov.*

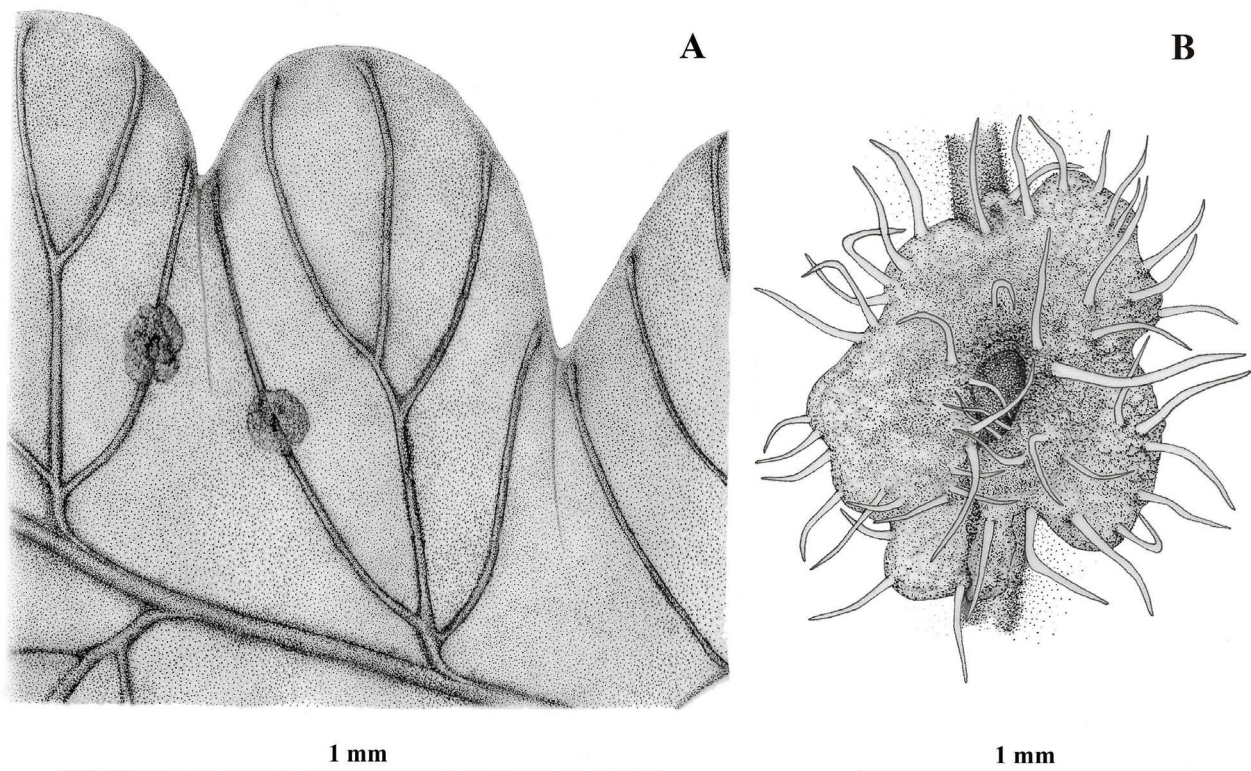
*Dryopteris amambayensis* Christ (1909: 374). *Thelypteris amambayensis* (Christ) Ponce (2000: 310).

**Type:**—PARAGUAY. Amambay: Sierra de Amambay, in silvis humidis Esperanza, July 1909, *Hassler & Rojas 10411b* (holotype G, not seen, isotypes S06-548!, S 06-549!)

This is a correction of authorship of the basionymic author, published by Salino *et al.* (2015) as *Amauropelta amambayensis* (Ponce) Salino & T.E.Almeida in Salino *et al.* (16: 2015).



FIGURE 1. Image of the holotype of *Steiropteris alstonii* (A.H.G. Alston 8464, BM).



**FIGURE 2.** *Steiropteris alstonii*. A. Detail of the abaxial side of segments showing venation, false veins and sori. B. Detail of the setose indusium.

***Christella berroi* (C.Chr.) Salino & A.R.Sm., comb. nov.**

*Dryopteris berroi* Christensen (1913: 185). *Thelypteris berroi* (C.Chr.) Reed (1968: 263).

**Type:**—URUGUAY. “in locis umbrosis ad ripam San Antonio,” *M.B. Berro 5243* (holotype P!, isotype BM000937763!)

This combination is necessary to have all species of Thelypteridaceae occurring in Brazil with current names. Most other species in this genus already have names in *Christella*, some only recently published by Smith & Kessler (2017). Available information (e.g., Almeida *et al.* 2016) indicates that *Christella* may not be monophyletic, and the New World and African species placed there may ultimately go elsewhere, but in lieu of a better solution to this problem, we accept *Christella* as the best placement for now (Smith & Kessler 2017).

***Goniopteris fraseri* (Mett. ex Kuhn) Salino & A.R.Sm., comb. nov.**

*Aspidium fraseri* Mettenius ex Kuhn (1869: 109). *Thelypteris fraseri* (Mett. ex Kuhn) Smith (1980: 32). *Steiropteris fraseri* (Mett. ex Kuhn) Salino *et al.* (2015: 45).

**Type:**—ECUADOR. 1859, *Fraser s.n.* (holotype B20 0056922!, isotypes fragments BM!, K000633645!)

This species undoubtedly belongs to the genus *Goniopteris* because it has somewhat obscure branched and stellate hairs on the fronds; it was erroneously combined in the genus *Steiropteris* by Salino *et al.* (2015).

**Acknowledgments**

The authors thank CNPQ (Conselho Nacional de Desenvolvimento Científico e Tecnológico) for the research fellowship grants (306868/2014-8 and 201414/2017-1) to AS; Fapemig (Fundação de Amparo à Pesquisa do Estado de Minas Gerais) for financial support (APQ-01938-14) to AS; Belkiss Almeri for the botanical illustrations; and Alison Paul, fern curator of BM Herbarium for providing the image of the type specimen of *S. alstonii*.

## References

- Almeida, T.E., Hennequin, S., Schneider, H., Smith, A.R., Nogueira Batista, J.A., Ramalho, A.J., Proite, K. & Salino, A. (2016) Towards a phylogenetic generic classification of Thelypteridaceae: Additional sampling suggests alterations of neotropical taxa and further study of paleotropical genera. *Molecular Phylogenetics and Evolution* 94: 688–700.  
<https://doi.org/10.1016/j.ympev.2015.09.009>
- Almeida, T.E. & Salino, A. (2016) State of the art and perspectives on neotropical fern and lycophyte systematics. *Journal of Systematic and Evolution* 54: 679–690.  
<https://doi.org/10.1111/jse.12223>
- Blume, K.L. (1828) *Enumeratio plantarum Javae et insularum adjacentium : minus cognitarum vel novarum ex herbariis Reinwardtii, Kuhlilii, Hasseltii et Blumii*. Lugduni Batavorum Apud J.W. van Leeuwen, 276 pp.  
<https://doi.org/10.5962/bhl.title.44901>
- Brade, A.C. (1972) O gênero *Dryopteris* (Pteridophyta) no Brasil e sua divisão taxonômica. *Bradea* 1: 191–261.
- Baker, J.G. (1870) Cyatheaceae et Polypodiaceae. In: Martius, C.F.P. (Ed.) *Flora Brasiliensis*. F. Fleischer, Monachii & Lipsiae, pp. 305–624.
- Christ, H. (1909) Ex Herbario Hassleriano: Novitates paraguariensi. III. *Repertorium Specierum Novarum Regni Vegetabilis* 7: 369–382.  
<https://doi.org/10.1002/fedr.19090072211>
- Christensen, C. (1911) On a natural classification of the species of *Dryopteris*. In: Warming, J.E.B. & Rosevinge, J.L.K. (Eds.) *Biologiske Arbejder tilegnede Eugenius Warming*. Hagerup, Copenhagen, pp. 73–85.
- Fernandes, R.S. (2015) Revisão taxonômica de *Meniscium* Schreb. (Thelypteridaceae-Polypodiopsida). Ph.D. thesis, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, 214 pp.
- Kuhn, M. (1869) Reliquiae Mettenianae. *Linnaea* 36: 41–169.
- Kunze, G. (1843) *Die Farrnkräuter in kolorirten Abbildungen naturgetreu Erläutert und Beschrieben*. Leipzig, E. Fleischer, 246 pp.  
<https://doi.org/10.5962/bhl.title.69313>
- Legrand, D. (1952) Las especies de *Dryopteris* del Uruguay. *Comunicaciones Botánicas del Museo de Historia Natural de Montevideo* 2: 1–27.
- Léveillé, A.A.H. (1915) *Flore de Kouy-tchéou*. A work lithographed from the handwritten manuscript, 535 pp.  
<https://doi.org/10.5962/bhl.title.448>
- Link, J.H.F. (1833) *Hortus Regius Botanicus Berolinensis Tomus II*. Berolini apud G. Reimer, 376 pp.
- Mickel, J.T. & Beitel, J.M. (1988) Pteridophyte flora of Oaxaca, Mexico. *Memoirs of the New York Botanical Garden* 46: 1–568.
- Mickel, J.T. & Smith, A.R. (2004) The pteridophytes of Mexico. *Memoirs of the New York Botanical Garden* 88: 1–1054.
- Pichi Sermolli, R.E.G. (1973) Fragmenta pteridologiae – IV. *Webbia* 28: 445–477.  
<https://doi.org/10.1080/00837792.1973.10670006>
- Ponce, M.M. (1987) Revision de las Thelypteridaceae (Pteridophyta) Argentinas. *Darwiniana* 28: 317–390.
- Ponce, M.M. (1995) Las especies austrobrasileñas de *Thelypteris* subg. *Amauropelta*. (Thelypteridaceae, Pteridophyta). *Darwiniana* 33: 257–283.
- Ponce, M.M. (2000) *Thelypteris amambayensis* (H. Christ) Ponce (Thelypteridaceae), una combinación nueva para el Paraguay. *Candollea* 55: 310–311.
- Ponce, M.M. (2007) Sinopsis de las Thelypteridaceae de Brasil central y Paraguay. *Hoehnea* 34: 283–333.  
<https://doi.org/10.1590/S2236-89062007000300003>
- Ponce, M.M. (2016) Thelypteridaceae. In: Zuloaga, F.O. & Belgrano, M.J. (Eds.) *Flora Vascular de la República Argentina. Vol. 2. Licofitas. Helechos. Gymnospermae*. Instituto de Botánica Darwinion. CONICET, San Isidro, pp. 353–384.
- Ponce, M.M., Kieling-Rubio, M.A. & Windisch, P.G. (2010) O genero *Thelypteris* (Thelypteridaceae, Polypodiopsida) no Estado do Mato Grosso, Brasil-I: subgêneros *Goniopteris* C.Presl e *Meniscium* Schreb. *Acta Botanica Brasilica* 24: 718–726.  
<https://doi.org/10.1590/S0102-33062010000300015>
- Ponce, M.M., Kieling-Rubio, M.A. & Windisch, P.G. (2013) The genus *Thelypteris* (Thelypteridaceae, Polypodiopsida) in the state of Mato Grosso, Brazil – II – Subgenera *Amauropelta* (Kunze) A.R. Sm., *Cyclosorus* (Link) C.V. Morton and *Steiropteris* (C. Chr.) K. Iwats. *Acta Botanica Brasilica* 27: 597–603.  
<https://doi.org/10.1590/S0102-33062013000300017>
- Presl, C.B. (1836) *Tentamen Pteridographiae seu Genera Filicacearum Praesertim Justa Venarum Decursum Distributionem Exposita*. T. Haase Söhne, Prague, 256 pp.  
<https://doi.org/10.5962/bhl.title.630>
- Proctor, G.R. (1977) Pteridophyta. In: Howard, R.A. *Flora of Lesser Antilles, Leeward and Windward Islands. Vol. 2*. Harvard University,

- Massachusetts, pp. 1–414.  
<https://doi.org/10.1590/S0100-84042004000100012>
- Proctor, G.R. (1985) *Ferns of Jamaica: A Guide to the Pteridophytes*. British Museum (Natural History), London. 631 pp.
- Proctor, G.R. (1989) Ferns of Puerto Rico and the Virgin Islands. *Memoirs of the New York Botanical Garden* 53: 1–389.
- Salino, A. (2000) *Estudos taxonômicos na família Thelypteridaceae (Polypodiopsida) no Estado de São Paulo, Brasil*. Tese de doutorado, Universidade Estadual de Campinas, Campinas, 327 pp.
- Salino, A. & Semir, J. (2002) Thelypteridaceae (Polypodiophyta) do Estado de São Paulo: *Macrothelypteris* e *Thelypteris* subgêneros *Cyclosorus* e *Steiropteris*. *Lundiana* 3: 9–27.
- Salino, A. & Semir, J. (2004a) *Thelypteris* subg. *Meniscium* (Thelypteridaceae - Pterophyta) no Estado de São Paulo, Brasil. *Revista Brasileira de Botânica* 27: 103–114.
- Salino, A. & Semir, J. (2004b) *Thelypteris* subg. *Amauropelta* (Kunze) A.R. Sm. (Thelypteridaceae - Pterophyta) no Estado de São Paulo, Brasil. *Lundiana* 5: 83–112.
- Salino, A., Almeida, T.E. & Smith, A.R. (2015) New combinations in neotropical Thelypteridaceae. *Phytokeys* 57: 11–50.  
<https://doi.org/10.3897/phytokeys.57.5641>
- Schmidel, C.C. (1763) *Icones Plantarum I et Analyses Partium, currant et edente Joannes Chr. Keller, Pictore Norimbergensi Typis Christiani de Lavnoy, Manip. Secto 1, 45 pp.*
- Schreber, J.C.D. (1791) *Genera plantarum II*. Varrentrapp & Wenner, Frankfurt am Main, pp. 380–872.
- Sehnem, A. (1979) Aspidiáceas. In: Reitz, R. (Ed.) *Flora Ilustrada Catarinense*. Herbario Barbosa Rodrigues, Itajaí, pp. 1–355.
- Smith, A.R. (1971) Systematics of the neotropical species of *Thelypteris* section *Cyclosorus*. *University of California Publications in Botany* 59: 1–143.
- Smith, A.R. (1980) Taxonomy of *Thelypteris* subgenus *Steiropteris* including *Glaphyopteris* (Pteridophyta). *University of California Publications in Botany* 76: 1–39.
- Smith, A.R. (1981) *Flora of Chiapas. Part 2. Pteridophytes*. California Academy of Sciences, San Francisco, 370 pp.
- Smith, A.R. (1983) Polypodiaceae – Thelypteridoideae. In: Harling, G. & Sparre, B. (Eds.) *Flora of Ecuador Vol. 18*. Swedish Research Council, Stockholm, pp. 1–148.
- Smith, A.R. (1992) Pteridophyte of Peru, Part III. 16. *Fieldiana, Botany, n.s.* 29: 1–80.
- Smith, A.R. (1993) Thelypteridaceae. In: Görts-Van Rijn, A.R.A. (Ed.) *Flora of the Guianas Series B: Ferns and Fern Allies. Fascicle 6*. Koeltz Scientific Books, Koenigstein, pp. 77–126.
- Smith, A.R. (1995a) Thelypteridaceae. In: Davidse, G. (Ed.) *Flora Mesoamericana. Psilotaceae a Salviniaceae*. Universidad Nacional Autónoma de México, México, D.F, pp. 164–195.
- Smith, A.R. (1995b) Thelypteridaceae. In: Berry, P.E., Holst, B.K. & Yatskievych, K. (Eds.) *Flora of the Venezuelan Guayana - Pteridophytes and Spermatophytes (Acanthaceae-Araceae)*. Missouri Botanical Garden & Timber Press, Portland, pp. 315–326.
- Smith, A.R. & Kessler, M. (2008) Sixteen new species of *Thelypteris* (Thelypteridaceae) from Bolivia. *Brittonia* 60: 49–62.  
<https://doi.org/10.1007/s12228-008-9003-6>
- Smith, A.R. & Kessler, M. (2017) Prodrômus of a fern flora for Bolivia. XXX. Thelypteridaceae. *Phytotaxa* 331: 1–34.  
<https://doi.org/10.11646/phytotaxa.331.1.1>
- Stolze, R.G. (1981) Fern and fern allies of Guatemala. Part II. Polypodiaceae. *Fieldiana, Botany, n.s.* 6: 473–514.
- Vareschi, V. (1969) Helechos. In: Lasser, T. (Ed.) *Flora de Venezuela*. Instituto Botánico, Caracas, pp. 473–1033.