



Original Paper

Miscellaneous notes on the fern family Blechnaceae (Polypodiopsida) from Tropical America

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Abstract

We present here new discoveries in Blechnaceae (Polypodiopsida). There are new records in *Austroblechnum*, *Blechnum*, *Cranfillia*, and *Parablechnum* for different political units and areas of the Neotropics. These (and other) records are reported here, alongside with two new necessary combinations in *Parablechnum* and an updated key to the Brazilian species of the genus. Also, an update of *Blechnum* description was made.

Key words: new records, nomenclature, *Parablechnum*, pteridophytes.

Resumo

São apresentadas novas descobertas em Blechnaceae (Polypodiopsida). Há novos registros em *Austroblechnum*, *Blechnum*, *Cranfillia* e *Parablechnum* para diferentes unidades políticas e áreas do Neotrópico. Esses (e outros) registros são reportados aqui, juntamente com duas novas combinações em *Parablechnum* e uma chave atualizada para as espécies brasileiras do gênero. Além disso, foi feita uma atualização da descrição de *Blechnum*.

Palavras-chave: novos registros, nomenclatura, *Parablechnum*, pteridófitas.

Introduction

The family Blechnaceae was composed, until recently, by the large genus *Blechnum* and eight satellite genera, such as *Pteridoblechnum* Hennisman, *Sadleria* Kaulf., and *Doodia* R. Br. (Tryon & Tryon 1982; Kramer *et al.* 1990). There were evidences, however, during last decades, that *Blechnum* was non-monophyletic (Cranfill & Kato 2003; Schuettpelz & Pryer 2007; Shepherd *et al.* 2007; Rothfels *et al.* 2012; Gabriel y Galán *et al.* 2013; Perrie *et al.* 2014). So, a new classification proposed by Gasper *et al.* (2016, 2017), adopted by PPG I (2016), recognizes 24 genera, and a new genus proposed by Molino *et al.* (2019) expands the number to 25. The largest genus is *Parablechnum* C. Presl, followed by *Austroblechnum* Gasper & V.A.O. Dittrich and *Blechnum*. In the last years, many works have

been conducted about the morphology, taxonomy, nomenclature, and phylogeny of the family (*e.g.*, Chambers & Farrant 2001; Kessler *et al.* 2007; Shepherd *et al.* 2007; Rolleri *et al.* 2010; Dittrich *et al.* 2012; Gabriel y Galán 2013; Cárdenas *et al.* 2019; Bauret *et al.* 2020; Molino *et al.* 2020), and many more are to be expected, as researchers in Europe, South America, and Oceania are working now with the group.

Since Gasper *et al.* (2016, 2017), we found out that some new combinations were necessary. So, here we provide new information about the nomenclature, taxonomy, and distribution of the family Blechnaceae in tropical America.

Material and Methods

During visits to the herbaria BM, K, P, PR, S and RB (abbreviations follow Thiers,

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continuously updated) we found new records for a few species. We also analyzed *Blechnum* species and realized that a new description of the genus is needed, since a species until now considered as *Blechnum* was moved to *Parablechnum*. For *Parablechnum*, new records were found in Brazil, so a new key to the Brazilian species in the genus is provided, based exclusively on Brazilian samples.

Results and Discussion

New combinations and description

1. *Parablechnum striatum* (Sw.) Gasper & V.A.O. Dittrich, *comb. nov.* - *Onoclea striata* Swartz (1806: 304, 422). Type: Martinica, St. Kitts. Synonyms: *Lomaria ryanii* Kaulfuss (1824: 155). *Blechnum ryanii* (Kaulf.) Hieronymus (1908: 245). *Parablechnum ryanii* (Kaulf.) Gasper & Salino in Gasper *et al.* (2016: 217).

Gasper *et al.* (2016) combined the name *Lomaria ryanii* under *Parablechnum* (*Parablechnum ryanii*). Notwithstanding, in the Fern Flora of the Lesser Antilles (Proctor 1977) *Blechnum striatum* (Sw.) Christensen (1906: 160), and the name on which it is based, *Onoclea striata* Sw., are listed as synonyms of *Blechnum ryanii*. However, *Onoclea striata* Swartz (1806) is older than *Lomaria ryanii* Kaulfuss (1824). Before the transfer of these names to *Parablechnum*, there was a *Blechnum striatum* Brown (1810: 152), based on a type from Australia, that impeded the transfer of *Onoclea striata* to *Blechnum*. In *Parablechnum* there is no such impediment, so the appropriate name for these plants must be *Parablechnum striatum*, not *Parablechnum ryanii*.

2. *Parablechnum anthracinum* (R.C. Moran) Gasper & V.A.O. Dittrich, *comb. nov.* - *Blechnum anthracinum* Moran (1992: 132).

When we published the new classification of Blechnaceae some years ago (Gasper *et al.* 2016), there was one species of *Blechnum* quite odd in the genus. It is a plant with very scaly rachises, pinnae weakly revolute, stipes and rachises atropurpureous and short-stalked or sessile pinnae throughout the blade, features rare or absent in *Blechnum s.s.* (as circumscribed in the aforementioned works). Kessler *et al.* (2007) argue that *B. anthracinum* belongs to the *Blechnum occidentale* L. group,

despite the blackish, creeping rhizomes and the supposed epiphytic habit. Rolleri *et al.* (2012) believe that *B. anthracinum* is closely related to a hemiepiphytic group now known as *Lomaridium* C. Presl. Some observations about the relationships of this species were made by Moran (1992), who highlighted the presence of strongly denticulate scales. According to him, *B. anthracinum* is related to *B. occidentale* and *B. glandulosum* Kaulf. ex Link (1822: 462) (= *B. occidentale*), but he has also suggested a relationship with *Parablechnum stipitellatum* (Sodirol) Gasper & Salino in Gasper *et al.* (2016: 217) (as *Blechnum stipitellatum* Sodirol (Christensen) (1906: 160). Recently, Silva *et al.* (2021) noted that the spores of this species are quite distinct from spores of *Blechnum*, which usually have perine with or without crests, whilst *P. anthracinum* has cristate spores, with filaments and perforations. Therefore, it is now clear that it was not a *Blechnum* species, but rather a *Parablechnum* with monomorphic fronds, a rare feature in *Parablechnum*, but seen in other species such as *Parablechnum monomorphum* (Moran & Øllgaard 1995: 177) Gasper & Salino in Gasper *et al.* (2016: 216) and *Parablechnum obtusum* (Moran & Smith 2005: 237) Gasper & Salino in Gasper *et al.* (2016: 217). Consequently, we transfer this name to *Parablechnum* and provide a new description of *Blechnum*.

3. *Blechnum*.

Type: *Blechnum occidentale* Linnaeus (1753: 1077) (as *Blechnum orientale*).

Plants terrestrial or epipetric; rhizomes erect to decumbent, stoloniferous, slender to rather stout, bearing linear, linear-oblong, triangular, narrowly triangular, lanceolate or linear-lanceolate, pale or dark brown, concolorous or bicolorous, entire scales (or scales with few teeth); fronds monomorphic or subdimorphic; stipes slender, short (sometimes absent) or long, stramineous to pale brown, with scales similar to those of rhizomes proximally, and sometimes with multicellular, catenate, hyaline hairs toward apices; blades concolorous, lanceolate to deltate-lanceolate, entire (rare), pinnatisect or 1-pinnate, gradually reduced or truncate proximally, apices pinnatifid or conform; rachises glabrous or pilose, without scales; buds absent; aerophores absent; pinnae sessile, adnate or subpetiolulate,

lanceolate, oblong-lanceolate or ensiform, margins entire, finely denticulate; veins rarely partially anastomosing, usually free and then 1–3 furcate, each ending near margins in an enlarged tip; sori linear, continuous or rarely interrupted along the costae, indusia slightly erose or ciliate; spores reniform, exine usually smooth, without verrucae or ridges; $x = 31$.

New records

1. *Austroblechnum organense* (Brade 1935: 2) Gasper & V.A.O. Dittrich in Gasper *et al.* (2016: 203).

This species is so far known from Brazil, Venezuela, and Colombia (Dittrich *et al.* 2017). This is the first record to Ecuador: Bolívar, road Chillanes - El Tambo, 1,700–2,300 m, 19.VII.1991, *H. van der Werff*, *B. Gray* & *G. Tipas* 12,476 (QCNE - photo!).

2. *Blechnum* × *caudatum* Cavanilles (1802: 262).

This hybrid is known from Mexico, Belize, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Suriname, Ecuador, Peru, Bolivia, and southeastern/southern Brazil. This is the first record for northern Brazil: Brazil, Amazonas, Barcelos, Vicinity of Pico Rondon, Perimetral Norte. Highway km 211, southern ridge of Pico Rondon, 700 m, 1°32'N, 62°48'W, 3.II.1984, *G.T. Prance et al.* 28805 (INPA, NY00814006 - photos! at <<https://specieslink.net/>> and <<http://floradobrasil.jbrj.gov.br/reflora/herbarioVirtual/ConsultaPublicoHVUC/ConsultaPublicoHVUC.do>>).

3. *Blechnum* × *leopoldense* (Dutra 1938: 36) V.A.O. Dittrich & Salino in Dittrich *et al.* (2015: 217).

This hybrid is known from northwestern Argentina and southern Brazil (Sehnem 1968; Sota 1973; Dittrich *et al.* 2015). This is a new record to Uruguay: Montevideo, 18.VI.1876, *C. Fruchard* (P01535236).

4. *Cranfillia caudata* (Baker in Hooker & Baker 1867: 179) V.A.O. Dittrich & Gasper in Dittrich *et al.* (2017: 13).

This species is so far recorded, in Brazil, just for Minas Gerais state (Dittrich *et al.* 2017, 2020) and is considered vulnerable by Dittrich *et al.* (2013). Here it is cited for the states of

São Paulo and Rio de Janeiro and for Serra do Mar range for the first time: São Paulo, São José do Barreiro, trilha ao lado da Pousada Chão de Estrelas, 22°42'59"S, 44°36'41"W, 5.X.2006, *C.M. Mynssen et al.* 1045 (RB00645603); Rio de Janeiro, Nova Friburgo, Parque Estadual dos Três Picos, Três Picos, Vale dos Deuses, trilha para a Cabeça do Dragão, 22°19'23.3"S, 42°43'12.8"W, 21.VI.2014, *E.R. Damasceno & I.C.G. Campos* 844 (R - photo).

5. *Parablechnum atropurpureum* (Smith in Steyermark & Maguire 1984: 5) Gasper & Salino in Gasper *et al.* (2016: 215).

This species is so far known only from Venezuela (Smith 1995). Here it is recorded for the first time in Brazil (Fig. 1a): Roraima, 1,800 m, II.1910, *E. Ule* 8509 (K, B200034238 - photo at <<https://specieslink.net/>>).

6. *Parablechnum lechleri* (Mettenius 1859: 17) Gasper & Salino in Gasper *et al.* (2016: 216).

This species is so far known for the Lesser Antilles, the Guayana Highlands and the Andes from Venezuela to Bolivia (Smith & Kessler 2018). Here it is recorded in Brazil for the first time (Fig. 1b-c): Brazil, Bahia, Abaíra, Mata do Cigano, 13°15'N, 41°55'W, 1,850 m, 22.III.1992, *T. Laessoë & T. Silva* H 53301 (K). This record was made concurrently by Molino (2022) while this work was under submission.

7. *Parablechnum loxense* (Kunth in Humboldt *et al.* 1815: 18) Gasper & Salino in Gasper *et al.* (2016: 216).

This taxon is so far known for Costa Rica, Panama, Colombia, Venezuela, Ecuador, Peru, and Bolivia (Tryon & Stolze 1993; Smith & Kessler 2018). Here it is recorded in Chile for the first time: Chile, *sine loco, without date*, *Anon. s.n.*, P01462420 (P, Herbarium Richard). This record was made concurrently by Molino (2022) while this work was under submission.

8. *Parablechnum obtusum* (Moran & Smith 2005: 237) Gasper & Salino in Gasper *et al.* (2016: 217).

This taxon was described from Venezuela and is so far known exclusively from this South American country. Here we report two collections from Colombia: Cauca, Páramo de Puracé, Central Cordillera, 3,500 m, 26.V.1944, *E.P. Killip & F.C.*



Figure 1 – a. *Parablechnum atropurpureum* from Roraima, Brazil, b-c. *Parablechnum lechleri* from Bahia, Brazil. [a. collected by *E. Ule* 8509 (B200034238); b-c. collected by *T. Laessle* & *T. Silva* H 53301 (K)].

Lehmann 38591 (US barcode 01525151, photo! at <<https://collections.nmnh.si.edu/search/botany/>>). Caldas, Carretera entre Manizales y el Hotel Termales del Ruiz, 3,000–3,500 m, 8.VI.1966, *E. Forero et al.* 526 (F C0644727F, NY04187103, photos! at <<http://inct.splink.org.br/>>). This record was made concurrently by Molino (2022) while this work was under submission.

9. *Parablechnum rheophyticum* (Moran in Moran & Øllgaard: 52) Gasper & Salino in Gasper *et al.* (2016: 217).

This taxon was described from Ecuador and was never mentioned to other countries. Here we report it to Colombia for the first time: Colombia,

Nariño, Mpio. de Ricaurte. Resguardo Indígena Nulpe Medio, Orillas del Río Nulpe, 01°06'N, 78°13'W, 715 m, 6.I.1996, *B.R. Ramírez & M.S. González* 9438 (UC1732585 - photo! at <<https://pteridportal.org/portal/collections/harvestparams.php>>).

Specimen citation (correction)

In a previous paper published by us (Dittrich *et al.* 2018) we have cited *Parablechnum cordatum* (Desvaux 1811: 330) Gasper & Salino in Gasper *et al.* (2016: 216) for the first time in Guyana but we did not cite the specimen seen. Here is the correct citation of it: Guyana, Roraima, 1863–1864, *C.F. Appun* 1154 (K).

Updated key to the Brazilian species of *Parablechnum*, based on Brazilian specimens

- 1. Conical aerophores present at the base of stipes..... 2
- 1'. Conical aerophores never present at the base of stipes (tuberculate aerophores may be present)..... 3
- 2. Bases of distal pinnae with bulbils..... *Parablechnum proliferum*
- 2'. Bases of pinnae without bulbils *Parablechnum lechleri*
- 3. Pinnae clearly revolute..... 4
- 3'. Pinnae flat (or plane)..... 5
- 4. Pinna ascending (generally strongly), rachises stramineous; plants from SE and S Brazil *Parablechnum ustorianum*
- 4'. Pinnae patent to weakly ascending, rachises atropurpureous; plants from N Brazil (Roraima state)..... *Parablechnum atropurpureum*
- 5. Pinnae bases cordate or subcordate..... *Parablechnum cordatum*
- 5'. Pinnae bases cuneate *Parablechnum glaziovii*

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Data availability statement

In accordance with Open Science communication practices, the authors inform that all data are available within the manuscript.

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