

New records of *Polymeridium* (Müll.Arg.) R.C.Harris from Brazil with description of a new species from the Caatinga, and a checklist of the Brazilian species

Bruno Micael Cardoso BARBOSA
Lidiane Alves dos SANTOS
Isaiás de OLIVEIRA JUNIOR
Dayane de OLIVEIRA LIMA

Programa de Pós-Graduação em Biologia de Fungos, Universidade Federal de Pernambuco,
Departamento de Micologia, Recife, Pernambuco (Brazil)
brunomicael@hotmail.com
ldn.stalves@gmail.com
isaiasjr@gmail.com
dayanelimaday@hotmail.com

André APTROOT

Instituto de Biociências, Universidade Federal de Mato Grosso do Sul, Avenida Costa e Silva,
s/n Bairro Universitário, CEP 79070-900, Campo Grande, Mato Grosso do Sul (Brazil)
andreaproot@gmail.com

Marcela Eugenia da Silva CÁCERES

Departamento de Biociências, Universidade Federal de Sergipe, Av. Vereador Olímpio Grande,
s/n, Bairro Centro, CEP 49500-000, Itabaiana, Sergipe (Brazil)
mscaceres@hotmail.com (corresponding author)

Submitted on 25 July 2023 | Accepted on 27 October 2023 | Published on 15 March 2024

Barbosa B. M. C., Santos L. A. dos, Oliveira Junior I. de, Oliveira Lima D. de, Aptroot A. & Cáceres M. E. da S. 2024. — New records of *Polymeridium* (Müll.Arg.) R.C.Harris from Brazil with description of a new species from the Caatinga, and a checklist of the Brazilian species. *Cryptogamie, Mycologie* 45 (4): 39-46. <https://doi.org/10.5252/cryptogamie-mycologie2024v45a4>. <http://cryptogamie.com/mycologie/45/4>

ABSTRACT

A new species is described, *Polymeridium stromatocorticatum* B.Barbosa, Aptroot, L.A.Santos & M.Cáceres, sp. nov. found in the Caatinga Biome, collected at Raso da Catarina Ecological Station (Bahia, Brazil). The new species is characterized by the combination of a corticated thallus and aggregated ascomata, while the ascospores exhibit the typical characteristics of a *Polymeridium* (Müll.Arg.) R.C.Harris. The genus has its greatest absolute world diversity in this region of NE Brazil, especially in areas of the Caatinga. Most of the species found in this region express peculiar characteristics related to the chemistry of the thallus, due to the presence of lichexanthone and the lack of inspersion of hamathecium. In addition, an updated checklist of Brazilian species is provided.

KEY WORDS

Lichenized fungi,
Trypetheliales,
pyrenocarpous lichens,
new records,
new species.

RÉSUMÉ

Nouveaux signalements de Polymeridium (Müll.Arg.) R.C.Harris au Brésil avec la description d'une espèce nouvelle de la Caatinga, et une liste de contrôle des espèces brésiliennes.

Une nouvelle espèce est décrite, *Polymeridium stromatocorticatum* B.Barbosa, Aptroot, L.A.Santos & M.Cáceres, sp. nov. trouvée dans le biome de Caatinga, collectée à la station écologique de Raso da Catarina (Bahia, Brésil). La nouvelle espèce est caractérisée par la combinaison d'un thalle cortiqué et d'ascomés agrégés, tandis que les ascospores présentent les caractéristiques typiques d'un *Polymeridium* (Müll.Arg.) R.C.Harris. Le genre a sa plus grande diversité mondiale absolue dans cette région du nord-est du Brésil, en particulier dans les zones de la Caatinga. La plupart des espèces trouvées dans cette région expriment des caractéristiques particulières liées à la chimie du thalle, dues à la présence de lichexanthone et à l'absence d'inspersion d'hamatecium. En outre, une liste de contrôle mise à jour des espèces brésiliennes est fournie.

MOTS CLÉS

Champignons lichénisés,
Trypetheliales,
lichens pyrénocarpes,
signalements nouveaux,
espèce nouvelle.

INTRODUCTION

The genus *Polymeridium* (Müll.Arg.) R.C.Harris belongs to the Trypetheliaceae Eschw., and it is distinguished by common features such as black perithecia, anastomosing interthelial filaments (= hyphae lying between asci), and trentepohlioid algae as the photobiont, while the thallus is thin and whitish (Aptroot *et al.* 2013). Three distinct groups are found in the same genus, viz. the *P. sulphurescens* group with relatively broadly ellipsoid ascospores, the tendency to have a white ring around the ostiole and the often exerted to superficial, somewhat barrel-shaped ascomata; the *P. proponens* group, which is characterized by muriform ascospores and usually eccentric and often fused ostioles; and the core group of the genus, comprising the remaining species with transversely septate or submuriform ascospores (Aptroot & Cáceres 2013). Several species that previously belonged to this genus are now assigned to *Dictyomeridium* (Nyl.) Aptroot, M.P.Nelsen & Lücking, as they are not closely related to the remainder of *Polymeridium* (Aptroot & Lücking 2016; Ingle *et al.* 2017).

In the review by Harris (1993), he had already identified that at least some areas of Brazil, such as the Caatinga, were rich in species of the genus *Polymeridium*. Brazil is known as the most expressive country when it comes to the Trypetheliaceae family, some works carried out in the last decade have demonstrated a high diversity of species for the same biome (Aptroot & Cáceres 2013; Aptroot *et al.* 2013). In view of this, Northeast Brazil is considered the world center of distribution of the genus *Polymeridium*, and a peculiar characteristic of most species that occur in this region is the presence of lichexanthone in the thallus and the lack of inspersion of the hamatecium, which means the absence of minute, scattered oil droplets or granules (Aptroot & Cáceres 2013; Aptroot *et al.* 2016b). A worldwide survey of this genus including an identification key for all accepted species has been carried out previously (Aptroot & Cáceres 2013), citing 53 species, with 34 records for Brazil (still including species that are now in *Dictyomeridium*). The most recent world key is provided by Aptroot (2021) and accepts 51 species. Recently, one further species was published in the genus, viz. *P. megalosporum* H.Harada (Harada 2022). However, based on the description

and illustration, it certainly does not belong to the genus *Polymeridium* or even the family Trypetheliaceae, but to the genus *Thelenella* Nyl. It is most probably a synonym of the almost cosmopolitan species *Thelenella muscorum* (Fr.) Vain.

Here we present the description of a new species found at Estação Ecológica Raso da Catarina, Paulo Afonso, from Bahia state in Northeast Brazil, together with a complete checklist of the genus *Polymeridium* for the country.

MATERIAL AND METHODS

Specimens were observed with an Olympus SZX7 with an attached Nikon Coolpix 995. Hand-made sections of ascomata and thallus were studied in water, 5% KOH and/or Lugol's reagent (1% I₂) after pre-treatment with KOH. Microscopic observations were made using an Olympus BX50 with Nomarski interference contrast and an attached Nikon Coolpix 995. The new species of *Polymeridium* is preserved in the ISE herbarium (Universidade Federal de Sergipe, Campus Professor Alberto Carvalho). Our study is based on material collected mainly by the second author, with references based on literature reviews and online database such as MycoBank. Brazilian states are abbreviated by their usual two capital abbreviations.

ABBREVIATIONS

AL	Alagoas;
AM	Amazonas;
AP	Amapá;
BA	Bahia;
CE	Ceará;
ES	Espírito Santo;
MA	Maranhão;
MG	Minas Gerais;
MS	Mato Grosso do Sul;
MT	Mato Grosso;
PA	Pará;
PB	Paraíba;
PE	Pernambuco;
PI	Piauí;
PR	Paraná;
SE	Sergipe;
SP	São Paulo;
RJ	Rio de Janeiro;

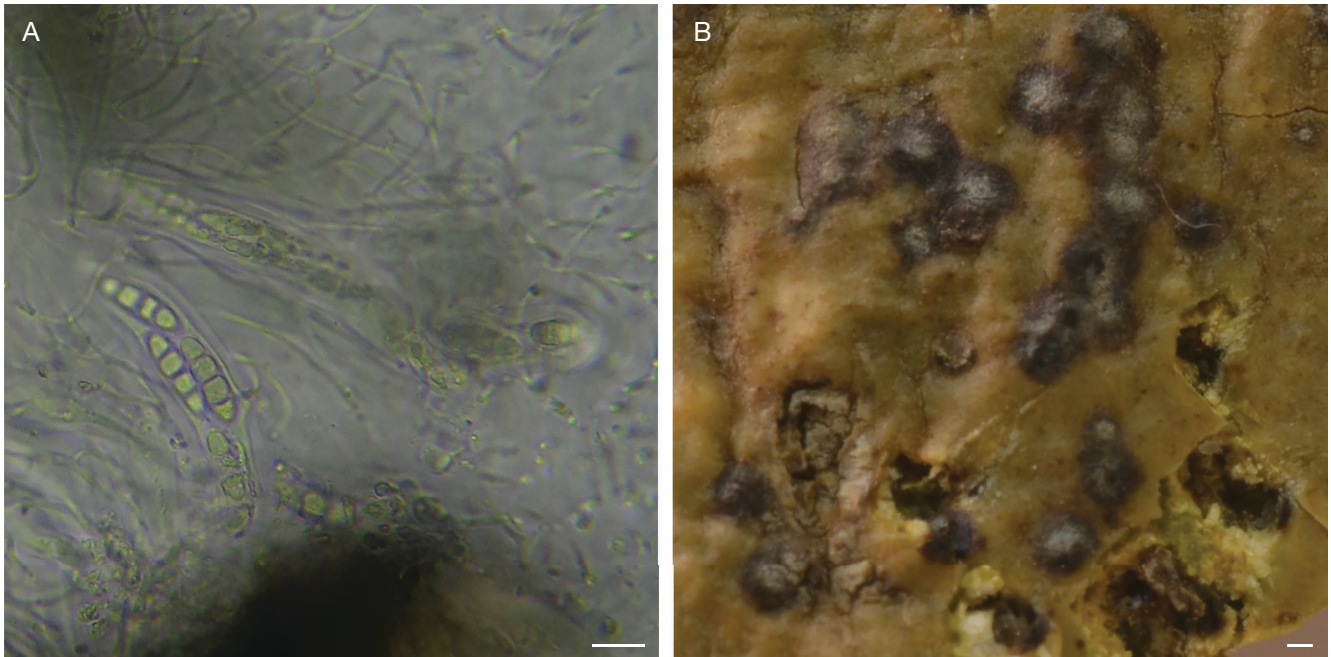


FIG. 1. — *Polymeridium stromatocorticatum* B.Barbosa, Aptroot, L.A.Santos & M.Cáceres, sp. nov.: **A, B**, ascospores and habitus of holotype. Scale bars: 2 μ m.

RO Rondônia;
RR Roraima;
SC Santa Catarina;
TO Tocantins.

RESULTS

NEW SPECIES

Family TRYPETHELIACEAE Eschw.
Genus *Polymeridium* (Müll.Arg.) R.C.Harris

Polymeridium stromatocorticatum

B.Barbosa, Aptroot, L.A.Santos & M.Cáceres, sp. nov.
(Fig. 1)

Polymeridium differing from all known species in the genus by a corticate thallus and aggregated ascomata; ascospores 3-septate, 23-26 \times 5.5-6.5 μ m.

TYPE MATERIAL. — **Brazil** • Bahia, Raso de Catarina; on tree bark; 10.X.2021; leg. L.A. Santos; holotype: ISE[ISE 54094]; isotype: ABL.

ETYMOLOGY. — Named after the stromatic ascomata and the corticate thallus, both unique characters within the genus.

MYCOBANK. — MB852549.

DESCRIPTION

Thallus crustose, up to 3 cm diam., corticate, ochraceous, surrounded by a 0.2 mm wide brown prothallus line. Ascomata closed, 0.3-0.4 mm diam., aggregated in groups of 2-10, black, fused with walls sideways, without crystals; walls c. 30 μ m thick. Ostioles apical, with a whitish grey pruina.

Hamathecium not inspersed. Ascospores 8/ascus, 3-septate, hyaline, 23-26 \times 5.5-6.5 μ m, lumina rectangular; surrounded by a c. 1 μ m thick gelatinous sheath.

This species is characterized by the combination of a corticate thallus and aggregated ascomata, while the ascospores display the typical features of a *Polymeridium*.

Chemistry: thallus KOH-negative, UV-negative; no substances found.

CHECKLIST OF *POLYMERIDIUM* SPECIES FROM BRAZIL

Polymeridium albidoreagens
Aptroot, A.A.Menezes & M.Cáceres

Nova Hedwigia 98 (1): 7 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802982.

DISTRIBUTION IN BRAZIL. — BA (Harris 1993); CE (Aptroot & Cáceres 2013); PA (Aptroot *et al.* 2017); SE (Menezes *et al.* 2018).

Polymeridium albidovarians Aptroot

Nova Hedwigia 98 (1): 7 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802983.

DISTRIBUTION IN BRAZIL. — BA (Harris 1993).

Polymeridium albidum (Müll.Arg.) R.C.Harris

Acta Amazonica 14 (1-2): 69 (Harris 1986).

MYCOBANK. — MB102982.

DISTRIBUTION IN BRAZIL. — AM, RR, BA (Harris 1986); CE (Menezes *et al.* 2013); SE (Cáceres *et al.* 2014); MA (Aptroot *et al.* 2017); PR (Menezes *et al.* 2018).

Polymeridium albocinereum (Kremp.) R.C.Harris

Boletim do Museu Para Emilio Goeldi 7 (2): 625 (Harris 1993).

MYCOBANK. — MB360033.

DISTRIBUTION IN BRAZIL. — RJ (Harris 1993); CE (Menezes *et al.* 2013); PE (Lima 2013); SE (Cáceres *et al.* 2014); MA (Aptroot *et al.* 2017); AL (Andrade 2020); MT (Aptroot & Souza 2021); SC (Aptroot *et al.* 2022).

Polymeridium alboflavescens Aptroot

Nova Hedwigia 98 (1): 8 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802984.

DISTRIBUTION IN BRAZIL. — BA, MT (Harris 1993); RO, CE (Aptroot & Cáceres 2013); TO (Aptroot *et al.* 2017); MS (Torres *et al.* 2021).

Polymeridium albopruinosum
(Makhija & Patwardhan) Aptroot

Nova Hedwigia 98 (1): 8 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802985.

DISTRIBUTION IN BRAZIL. — PA (Harris 1993); PE (Lima 2013); CE (Aptroot & Cáceres 2013); AM (Cáceres & Aptroot 2017).

Polymeridium amylosporum (Vain.) Aptroot

Nova Hedwigia 98 (1): 10 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802986.

DISTRIBUTION IN BRAZIL. — PE (Lima 2013); SE (Cáceres *et al.* 2014).

Polymeridium bengoanum (Vain.) Aptroot

Nova Hedwigia 98 (1): 11 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802987.

DISTRIBUTION IN BRAZIL. — CE (Menezes *et al.* 2013); PE (Lima 2013).

Polymeridium biloculare R.C.Harris

Acta Amazonica 14 (1-2): 70 (Harris 1986).

MYCOBANK. — MB103720.

DISTRIBUTION IN BRAZIL. — RR (Harris 1986).

Polymeridium brachysporum (Malme) Aptroot

Nova Hedwigia 98 (1): 11 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802988.

DISTRIBUTION IN BRAZIL. — CE (Menezes *et al.* 2013); MT (Aptroot & Cáceres 2013).

Polymeridium catapastoides Aptroot

Nova Hedwigia 98 (1): 12 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802989.

DISTRIBUTION IN BRAZIL. — CE (Aptroot & Cáceres 2013); BA (Aptroot & Cáceres 2018).

Polymeridium catapastum (Nyl.) R.C.Harris

Acta Amazonica 14 (1-2): 70 (Harris 1986).

MYCOBANK. — MB103721.

DISTRIBUTION IN BRAZIL. — RR, BA (Harris 1986); PA, MG (Harris 1993); CE (Menezes *et al.* 2013); PE (Lima 2013); SE (Cáceres *et al.* 2014); MA (Aptroot *et al.* 2017); PB (Menezes *et al.* 2018); BA (Oliveira Junior *et al.* 2021); MT (Aptroot & Souza 2021); SE, SP (Aptroot *et al.* 2022).

Polymeridium chioneum (Mont.) R.C.Harris

Lichenographia Thomsoniana, North American Lichenology in Honor of John W. Thomson (Ithaca): 141 (Glenn *et al.* 1998).

MYCOBANK. — MB446204.

DISTRIBUTION IN BRAZIL. — AM (Harris 1986); CE (Menezes *et al.* 2013).

Polymeridium cinereonigricans (Vain.) R.C.Harris

Boletim do Museu Para Emilio Goeldi 7 (2): 631 (Harris 1993).

MYCOBANK. — MB360035.

DISTRIBUTION IN BRAZIL. — MG (Harris 1993); PE (Nascimento 2017); SE (Andrade 2020); MT (Aptroot & Souza 2021); MS (Aptroot *et al.* 2022).

Polymeridium contendens (Nyl.) R.C.Harris

The Bryologist 83 (1): 12 (Tucker & Harris 1980).

MYCOBANK. — MB112732.

DISTRIBUTION IN BRAZIL. — MG (Harris 1993); CE (Menezes *et al.* 2013); SE (Cáceres *et al.* 2014).

Polymeridium corticatum

A.A.Menezes, M.Cáceres & Aptroot

The Lichenologist 45 (4): 546 (Aptroot *et al.* 2013).

MYCOBANK. — MB801913.

EXAMINED MATERIAL. — **Brazil** • Pernambuco, Vale do Catimbau National Park, Buíque; alt. 900 m; on the bark of a tree in the Caatinga area; ISE[ISE54424, ISE54425, ISE54485].

DISTRIBUTION IN BRAZIL. — CE (Menezes *et al.* 2013); PE (this paper).

NOTE

Polymeridium corticatum is reported for the first time for Pernambuco, in the Vale do Catimbau National Park, Buíque.

Polymeridium costaricense Aptroot

Nova Hedwigia 98 (1): 14 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802990.

DISTRIBUTION IN BRAZIL. — CE (Aptroot & Cáceres 2013); TO (Aptroot *et al.* 2017); MT (Aptroot & Souza 2021).

Polymeridium dithecium R.C.Harris

Boletim do Museu Para Emilio Goeldi 7 (2): 632 (Harris 1993).

MYCOBANK. — MB360036.

DISTRIBUTION IN BRAZIL. — AM (Harris 1993); CE (Menezes *et al.* 2013); PE (Lima 2013).

Polymeridium endocrocinum R.C.Harris

Boletim do Museu Para Emilio Goeldi 7 (2): 633 (Harris 1993).

MYCOBANK. — MB360037.

DISTRIBUTION IN BRAZIL. — AM (Harris 1993).

Polymeridium endoflavens

Aptroot, D.S.Andrade & M.Cáceres

The Lichenologist 48 (6): 721 (Aptroot *et al.* 2016b).

MYCOBANK. — MB815155.

DISTRIBUTION IN BRAZIL. — SE (Aptroot *et al.* 2016b).

Polymeridium immersum

Aptroot, A.A.Menezes & M.Cáceres

The Lichenologist 45 (4): 546 (Aptroot *et al.* 2013).

MYCOBANK. — MB801914.

DISTRIBUTION IN BRAZIL. — RO (Aptroot *et al.* 2013).

Polymeridium inspersum Aptroot

Nova Hedwigia 98 (1): 16 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802991.

DISTRIBUTION IN BRAZIL. — BA (Harris 1993); CE (Aptroot & Cáceres 2013); SE (Menezes *et al.* 2018).

Polymeridium jordanii (C.W.Dodge) Aptroot

Nova Hedwigia 98 (1): 18 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802992.

DISTRIBUTION IN BRAZIL. — CE (Menezes *et al.* 2013); PE (Lima 2013); SE (Mendonça 2014); AM (Cáceres & Aptroot 2017); AL (Cavalcante 2020); BA (Aptroot *et al.* 2022).

Polymeridium julelloides

E.L.Lima, M.Cáceres & Aptroot

The Lichenologist 45 (4): 548 (Aptroot *et al.* 2013).

MYCOBANK. — MB801916.

DISTRIBUTION IN BRAZIL. — PE (Lima 2013); CE (Alves 2014); PI (Cavalcante 2020); MS (Aptroot & Spielmann 2020); MT (Aptroot & Souza 2021); BA (Vitória *et al.* 2022).

Polymeridium longiflavens

Aptroot, Mendonça & M.Cáceres

The Lichenologist 48 (6): 723 (Aptroot *et al.* 2016b).

MYCOBANK. — MB815156.

DISTRIBUTION IN BRAZIL. — SE, BA (Aptroot *et al.* 2016b).

Polymeridium microsporum

(Makhija & Patw.) Aptroot

Nova Hedwigia 98 (1): 18 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802993.

DISTRIBUTION IN BRAZIL. — CE (Menezes *et al.* 2013); BA (Oliveira Junior *et al.* 2021).

Polymeridium multiforme Aptroot

Nova Hedwigia 98 (1): 18 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802994.

DISTRIBUTION IN BRAZIL. — PA (Harris 1993); CE (Aptroot & Cáceres 2013); AM (Cáceres & Aptroot 2017); BA (Aptroot & Cáceres 2018).

Polymeridium multiseptatum

Aptroot, A.A.Menezes & M.Cáceres

Nova Hedwigia 98 (1): 19 (Aptroot & Cáceres 2013).

MYCOBANK. — MB802995.

DISTRIBUTION IN BRAZIL. — CE (Aptroot & Cáceres 2013).

Polymeridium neblinae R.C.Harris

Boletim do Museu Para Emilio Goeldi 7 (2): 635 (Harris 1993).

MYCOBANK. — MB360040.

DISTRIBUTION IN BRAZIL. — SE (Cáceres *et al.* 2014); PB (Menezes *et al.* 2018).

Polymeridium pleiomerellum (Müll.Arg.) R.C.Harris

The Bryologist 90 (2): 164 (Egan 1987).

MYCOBANK. — MB132234.

DISTRIBUTION IN BRAZIL. — BA, MT, MS (Harris 1993); CE (Menezes *et al.* 2013); PE (Lima 2013); MA (Aptroot *et al.* 2017); SE (Andrade 2020).

Polymeridium pyrenuloides (Müll.Arg.) Aptroot

Nova Hedwigia 98 (1): 22 (Aptroot & Cáceres 2013).

MYCOBANK. — MB803007.

DISTRIBUTION IN BRAZIL. — SP (Harris 1993); CE (Menezes *et al.* 2013).

Polymeridium quinqueseptatum (Nyl.) R.C.Harris

The Bryologist 83 (1): 12 (Tucker & Harris 1980).

MYCOBANK. — MB113048.

DISTRIBUTION IN BRAZIL. — PA (Harris 1993); AL (Cavalcante 2012); PE (Lima 2013); PB (Xavier-Leite *et al.* 2015); BA (Barbosa & Vitória 2021).

Polymeridium rhodopruinosum
Aptroot & Mercado Diaz

The Lichenologist 48 (6): 633 (Aptroot *et al.* 2016a).

MYCOBANK. — MB815243.

DISTRIBUTION IN BRAZIL. — SE (Aptroot *et al.* 2016a).

Polymeridium siamense (Vain.) Aptroot

Nova Hedwigia 98 (1): 24 (Aptroot & Cáceres 2013).

MYCOBANK. — MB803000.

DISTRIBUTION IN BRAZIL. — CE (Menezes *et al.* 2013); AP (Cáceres & Aptroot 2016); PB (Menezes *et al.* 2018); SE (Andrade 2020).

Polymeridium simulans R.C.Harris

Boletim do Museu Para Emilio Goeldi 7 (2): 641 (Harris 1993).

MYCOBANK. — MB360044.

DISTRIBUTION IN BRAZIL. — AM (Harris 1993); CE (Alves 2014); BA (Oliveira Junior *et al.* 2021).

Polymeridium stramineoatrum (Vain.) Aptroot

Nova Hedwigia 98 (1): 24 (Aptroot & Cáceres 2013).

MYCOBANK. — MB803001.

DISTRIBUTION IN BRAZIL. — MG (Aptroot & Cáceres 2013); PB (Menezes *et al.* 2018); PE (Aptroot *et al.* 2022).

Polymeridium subcinereum (Nyl.) R.C.Harris

The Bryologist 83 (1): 12 (Tucker & Harris 1980).

MYCOBANK. — MB113049.

DISTRIBUTION IN BRAZIL. — SP (Müller 1883); PA (Harris 1993); CE (Menezes *et al.* 2013); PE (Lima 2013); MA (Aptroot *et al.* 2017); PB, SE (Menezes *et al.* 2018); AL (Oliveira Junior *et al.* 2020); BA (Aptroot *et al.* 2022).

Polymeridium subvirescens (Leight.) Aptroot

Nova Hedwigia 98 (1): 25 (Aptroot & Cáceres 2013).

MYCOBANK. — MB803003.

DISTRIBUTION IN BRAZIL. — PA, MT, MS (Harris 1993); AM (Aptroot & Cáceres 2013); CE (Alves 2014); MA (Aptroot *et al.* 2017).

Polymeridium suffusum (C.Knight) Aptroot

Nova Hedwigia 98 (1): 26 (Aptroot & Cáceres 2013).

MYCOBANK. — MB803004.

DISTRIBUTION IN BRAZIL. — CE (Lima 2013); RO (Cáceres *et al.* 2014); PB, SE (Menezes *et al.* 2018).

Polymeridium tribulationis Aptroot

Nova Hedwigia 98 (1): 26 (Aptroot & Cáceres 2013).

MYCOBANK. — MB803005.

DISTRIBUTION IN BRAZIL. — CE (Alves 2014).

Polymeridium xanthoreagens Aptroot

Nova Hedwigia 98 (1): 27 (Aptroot & Cáceres 2013).

MYCOBANK. — MB803006.

EXAMINED MATERIAL. — **Brazil** • Bahia, Fazenda Oiteiro, Araci; alt. 271 m; on the bark of a tree in the Caatinga area; ISE.

DISTRIBUTION IN BRAZIL. — SE (Cáceres *et al.* 2014); BA (this paper).

NOTE

Polymeridium xanthoreagens is being registered for the first time in the state of Bahia, in the Fazenda Oiteiro, Araci.

CONCLUSION

The genus *Polymeridium* was known to be most diverse in Brazil (Aptroot *et al.* 2016b), notably in the relatively dry northeastern part of the country. In 2013, this could still have been mostly an artifact of unequal sampling, but the recent surge in the study of these lichens has confirmed that NE Brazil is really the center of speciation of the genus.

Acknowledgements

The Conselho Nacional de Pesquisa e Desenvolvimento (CNPQ) is thanked for financially supporting this work with a master's scholarship to BMCB (130206/2021-0), and PhD scholarship to IOJ (140158/2021-9) and LAS (140847/2019-7), a research grant to MESC (307569/2019-5), and for supporting the collecting trips (437097/2018-8). The Fundação de Amparo à Ciência e Tecnologia do Estado de Pernambuco (FACEPE) is also thanked for the master's scholarship to DOL (IBPG-0133-2.03/20). Drs H. Kashiwadani and Y. Ohmura are warmly thanked for providing the Harada reference.

REFERENCES

- ALVES M. M. E. 2014. — *Levantamento das espécies de líquens em áreas de Cerrado na Chapada do Araripe – CE*. Master's Thesis. Universidade Regional do Cariri, Crato, 120 p.
- ANDRADE D. S. 2020. — *Líquens corticícolas da restinga no Nordeste do Brasil: aspectos taxonômicos, ecológicos e filogenéticos*. PhD Dissertation. Universidade Federal de Pernambuco, Recife, 156 p.
- APTROOT A. 2021. — World key to the species of Trypetheliaceae and Pyrenulaceae. *Archive for Lichenology* 19: 1-91.
- APTROOT A. & CÁCERES M. E. S. 2013. — A refined species concept in the tropical lichen genus *Polymeridium* (Trypetheliaceae) doubles the number of known species, with a worldwide key to the species. *Nova Hedwigia* 98 (1): 1-29. <https://doi.org/10.1127/0029-5035/2013/0143>
- APTROOT A. & CÁCERES M. E. S. 2018. — New species and new records of lichens from inselbergs and surrounding Atlantic rain forest in the Chapada Diamantina (Bahia, Brazil). *Herzogia* 31 (1): 359-373. <https://doi.org/10.13158/hea.31.1.2018.359>
- APTROOT A. & LÜCKING R. 2016. — A revisionary synopsis of the Trypetheliaceae (Ascomycota: Trypetheliales). *The Lichenologist* 48 (6): 763-982.
- APTROOT A. & SOUZA M. F. 2021. — New lichen species and records from the Chapada dos Guimarães, Mato Grosso, Brazil. *Cryptogamie, Mycologie* 42 (10): 171-180. <https://doi.org/10.5252/cryptogamie-mycologie2021v42a10>
- APTROOT A. & SPIELMANN A. A. 2020. — Four new *Astrothelium* species and a *Mazaediothecium* from Várzea areas in Mato Grosso do Sul, Brazil. *Archive for Lichenology* 21: 1-17.
- APTROOT A., MENEZES A. A., XAVIER-LEITE A. B. & CÁCERES M. E. S. 2013. — New species of *Polymeridium* from Brazil expand the range of known morphological variation within the genus. *The Lichenologist* 45 (4): 545-552. <https://doi.org/10.1017/S0024282913000200>
- APTROOT A., ERTZ D., SALAZAR J. A. E., GUEIDAN C., DIAZ J. A. M., SCHUMM F. & WEERAKOON G. 2016a. — Forty-six new species of Trypetheliaceae from the tropics. *The Lichenologist* 48 (6): 609-638. <https://doi.org/10.1017/S002428291600013X>
- APTROOT A., MENDONÇA C. O., ANDRADE D. S., SILVA J. R., MARTINS S. M. A., GUMBOSKI E., FRAGA C. A. V. & CÁCERES M. E. S. 2016b. — New Trypetheliaceae from northern and southern Atlantic rainforests in Brazil. *The Lichenologist* 48 (6): 713-725. <https://doi.org/10.1017/S0024282916000037>
- APTROOT A., FEUERSTEIN S. C., CUNHA-DIAS I. P. R., LUCENA NUNES Á. R., HONORATO M. E. & CÁCERES M. E. S. 2017. — New lichen species and lichen reports from Amazon forest remnants and Cerrado vegetation in the Tocantina Region, northern Brazil. *The Bryologist* 120 (3): 320-328. <https://doi.org/10.1639/0007-2745-120.3.320>
- APTROOT A., SOUZA M. F., CÁCERES M. E. S., SANTOS L. A. & SPIELMANN A. A. 2022. — New lichen records from Brazil. *Archive for Lichenology* 31: 1-51.
- BARBOSA R. L. & VITÓRIA N. S. 2021. — Lichenized Ascomycota on *Piptadenia moniliformis* and *Solanum mauritanium* in the Raso da Catarina Ecoregion, Caatinga, Brazil. *Mycotaxon* 136: 261.
- CÁCERES M. E. S. & APTROOT A. 2016. — First inventory of lichens from the Brazilian Amazon in Amapá State. *The Bryologist* 119 (3): 250-265. <https://doi.org/10.1639/0007-2745-119.3.250>
- CÁCERES M. E. S. & APTROOT A. 2017. — Lichens from the Brazilian Amazon, with special reference to the genus *Astrothelium*. *The Bryologist* 120 (2): 166-182. <https://doi.org/10.1639/0007-2745-120.2.166>
- CÁCERES M. E. S., LIMA E. L. N., APTROOT A. & LÜCKING R. 2014. — Líquens brasileiros: novas descobertas evidenciam a riqueza no Norte e Nordeste do país. *Boletim do Museu de Biologia Mello Leitão* 35: 101-119.
- CAVALCANTE J. G. 2012. — *Fatores associados à estrutura da comunidade de líquens corticícolas crostosas em duas áreas de Caatinga no estado de Alagoas*. MSc Thesis. Universidade Federal do Sergipe, Itabaiana, 60 p.
- CAVALCANTE J. G. 2020. — *Caracterização da liquenobiota corticícola (Ascomycota) em Manguezais do Nordeste Brasileiro*. PhD Dissertation. Universidade Federal de Pernambuco, Recife, 83 p.
- EGAN R. S. 1987. — A fifth checklist of the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. *The Bryologist* 90: 77-173.
- GLENN M. G., HARRIS R. C. & THOMSON J. W. 1998. — *Lichenographia Thomsoniana: North American lichenology in honor of John W. Thomson*. Mycotaxon Ltd., Ithaca, 445 p.
- HARADA H. 2022. — Taxonomic notes on pyrenocarpous lichens in Japan (13). *Polymeridium megalosporum* (Trypetheliaceae) sp. nov. from Kochi-ken, Shikoku, western Japan. *Lichenology* 20 (1): 1-7.
- HARRIS R. C. 1986. — The family Trypetheliaceae (Loculoascomycetes: lichenized Melanommatales) in Amazonian Brazil. *Acta Amazonica* 14: 55-80. <https://doi.org/10.1590/1809-43921984145080>
- HARRIS R. C. 1993 [1991]. — A revision of *Polymeridium* (Muell. Arg.) R.C.Harris (Trypetheliaceae). *Boletim do Museu Paraense Emílio Goeldi, Série Botânica* 7: 619-644.
- INGLE K. K., TRIVEDI S., NAYAKA S. & UPRETI D. K. 2017. — The lichen genera *Dictyomeridium* and *Polymeridium* (Trypetheliales: Trypetheliaceae) in India. *Taiwania* 62 (1): 50-54. <https://doi.org/10.6165/tai.2017.62.50>
- LIMA E. L. D. 2013. — *Riqueza e composição de líquens corticícolas crostosos em área de Caatinga no Estado de Pernambuco*. Master's Thesis. Universidade Federal de Pernambuco, Recife, 109 p.
- MENDONÇA C. D. O. 2014. — *Influência de diferentes estágios sucessionais na composição e riqueza de líquens na caatinga*. Master's Thesis. Universidade Federal de Sergipe, São Cristóvão, 104 p.
- MENEZES A. A., SOUTO L. S. & LÜCKING R. 2013. — *Composição de espécies e a influência de fatores ambientais na riqueza e composição de microlíquens corticícolas em diferentes fitofisionomias*. Programa de Pós-graduação em Ecologia e Conservação, 77.

- MENEZES A. A., CÁCERES M. E. S., BASTOS C. J. P. & LÜCKING R. 2018. — The latitudinal diversity gradient of epiphytic lichens in the Brazilian Atlantic Forest: does Rapoport's rule apply? *The Bryologist* 121: 480-497. <https://doi.org/10.1639/0007-2745-121.4.480>
- MÜLLER [ARGOVIENSIS] J. 1883. — Lichenologische Beiträge XVIII (nº 590-704). *Flora* 66: 243-249, 271-274, 286-290, 304-306, 317-322, 330-338, 344-354.
- NASCIMENTO E. L. L. 2017. — *Relações filogenéticas de líquens da Amazônia, Mata Atlântica e Caatinga*. PhD Thesis. Universidade Federal de Pernambuco, Recife, 214 p.
- OLIVEIRA JUNIOR I., APTROOT A., SANTOS L. A., CAVALCANTE J. G., KOŠUTHOVÁ A. & CÁCERES M. E. S. 2020. — Two further new lichen species from the Atlantic Forest remnant Pedra Talhada (Alagoas, Brazil), with a species list. *The Bryologist* 123 (4): 617-632. <https://doi.org/10.1639/0007-2745-123.4.617>
- OLIVEIRA JUNIOR I., APTROOT A. & CÁCERES M. E. S. 2021. — Lichens from Monte Pascoal, Bahia, Brazil, with some new pyrenocarpous species and a key to the *Pyrenula* species from Brazil. *The Bryologist* 124 (4): 552-568. <https://doi.org/10.1639/0007-2745-124.4.552>
- TORRES J. M., APTROOT A. & SPIELMANN A. A. 2021. — Capítulo 9. Microlíquens no Chaco Brasileiro, in SARTORI A. L. B., DE SOUZA P. R. & ARRUDA R. C. D. (eds), *Chaco, caracterização, riqueza, diversidade, recursos e interações*. Editora UFMS, Campo Grande: 190-221.
- TUCKER S. C. & HARRIS R. C. 1980. — New or noteworthy pyrenocarpous lichens from Louisiana and Florida. *The Bryologist* 83 (1): 1-20.
- VITÓRIA N. S., FORTES N. G. S., SANTOS M. A. L. DOS, GOMES E. DE S., ALMEIDA SECUNDA E. DE, CÁCERES M. E. S., APTROOT A. & BEZERRA J. L. 2022. — *Guia Ilustrado de Ascomycota, Raso da Catarina – Bahia*. Vol. 1. Editora Oxente, Paulo Afonso, 147 p.
- XAVIER-LEITE A. B., MENEZES A. A., SOUTO L. D. S., APTROOT A., LÜCKING R., SANTOS V. M. D. & CÁCERES M. E. S. 2015. — Epiphytic microlichens as indicators of phytosociological differentiation between Caatinga and Brejos de Altitude. *Acta Botanica Brasílica* 29: 457-466. <https://doi.org/10.1590/0102-33062015abb0116>

Submitted on 25 July 2023;
accepted on 27 October 2023;
published on 15 March 2024.