



A new species of *Bertiella* (Melanommataceae) from Brazil and a key to accepted species

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Abstract

During an inventory of ascomycetes in the semi-arid region of Brazil, an undescribed specimen of *Bertiella* was found. It is described and illustrated as *B. gelatinosa* sp. nov., based on morphological data. The new fungus is distinguished by the size of the ascospores, which are surrounded by a gelatinous sheath. A synoptic table and a key to all known species of *Bertiella* are presented.

Key words – Ascomycota – Dothideomycetes – Pleosporales – Taxonomy

Introduction

Bertiella (Sacc.) Sacc. & P. Syd. was elevated to the rank of genus by Saccardo & Sydow (1899) after being described as a subgenus in *Bertia* De Not. This small genus is characterized by superficial, subglobose ascomata and bitunicate, cylindrical-clavate, short-stalked asci containing eight fusiform, septate, hyaline ascospores (Table 1). It was considered a synonym of *Massarina* Sacc. by Eriksson & Yue (1986), who examined the holotype of the type species, *Bertiella macrospora* (Sacc.) Sacc. & Traverso, but this synonymy has not been widely accepted (Lumbsch & Huhndorf 2007, Mugambi & Huhndorf 2009, Lumbsch & Huhndorf 2010, Zhang et al. 2012b, Hyde et al. 2013). Morphologically, these genera differ mainly by the position of the ascomata on the substrata, being immersed or erumpent in *Massarina* and superficial in *Bertiella*. Moreover, Hyde et al. (2002) assigned *Bertia macrospora* to *Lophiostoma* as *L. bertillum* Aptroot & K.D. Hyde. Phylogenetic studies indicated that those genera should be kept separate since they belong to different families. *Bertiella* was previously placed in the family Teichosporaceae (Lumbsch & Huhndorf 2007), but molecular phylogenetic studies have found its placement in Melanommataceae (Mugambi & Huhndorf 2009, Tian et al. 2015, Hyde et al. 2016). *Massarina eburnea*, the type species of *Massarina*, belongs in Massarinaceae, while the type of *Lophiostoma*, *L. macrostomum* (Tode) Ces. & De Not., is phylogenetically placed in Lophiostomataceae (Mugambi & Huhndorf 2009, Zhang et al. 2012a).

Six species have been described in *Bertiella*, but only four are currently accepted (<http://www.indexfungorum.org>). *Bertiella breneckleana* Rehm was transferred to *Rosenscheldia*

Speg. by Thiessen & Sydow (1915), while *Bertiella polyspora* Kirschst. was placed in *Kirschsteinia* Syd. & P. Syd. by Sydow & Sydow (1906). All accepted species are saprobic on lignicolous substrates (Morgan 1904, Eriksson & Yue 1986) and are predominantly known from the north temperate zone (Berkeley 1876, Eriksson & Yue 1986, GBIF 2016).

In this study, we present a description and illustrate a new species of *Bertiella* isolated from dead branches in Brazil, as well as a key and synoptic table (Table 1) to the accepted species.

Materials & Methods

Samples of dead branches on the ground were collected in May 2012 at Ubajara National Park, Ceará State, and placed in paper bags. They were transported to the laboratory at the State University of Feira de Santana where they were examined for the presence of ascomata. The description of the area and methods for morphological examination can be found in Almeida et al. (2014). It was not possible to extract DNA because attempts to culture the fungus failed and very few ascomata occur on the substrata to try extraction directly from them. The holotype was deposited in the Herbarium of the State University of Feira de Santana (HUEFS).

Results

Taxonomy

Bertiella gelatinosa D.A.C. Almeida, Gusmão & A.N. Mill., *sp. nov.*

Fig. 1

Mycobank MB818725

Etymology – Referring to the gelatinous sheath covering the ascospores.

Holotype – HUEFS 131229.

Saprobic on decayed branch of unidentified plant. **Sexual morph:** *Ascomata* 100–220 µm high, 200–550 µm diameter, superficial, gregarious or solitary, discoid to subglobose or irregular shape, dark brown, surface roughened. *Pseudoparaphyses* 2–3 µm wide, hyaline, filiform, septate. *Asci* 124–188 × 14–22 µm, 8-spored, bitunicate, clavate, short-stalked, without an ocular chamber. *Ascospores* 42–55 × 6.5–9 µm, biseriate, hyaline, fusiform, 1-septate, constricted at the septum, smooth-walled, surrounded by a gelatinous sheath. **Asexual morph:** Undetermined.

Geographical distribution – Brazil.

Material examined – BRAZIL. Ceará: Ubajara, Ubajara National Park (3°50'24''S, 40°54'17''W), on branch of unidentified woody plant, 3 May 2012, D.A.C. Almeida s.n (HUEFS 131229, holotype designated here).

Notes – *Bertiella gelatinosa* is easily distinguished from all accepted species by its longer ascospores surrounded by a gelatinous sheath (Table 1). This latter characteristic is common in *Massarina* species (Aptroot 1998). However, since this genus has been shown to be polyphyletic (Liew & al. 2002, Zhang & al. 2009), we place the new species in *Bertiella* based on the superficial ascomata.

Key to known species of *Bertiella*

1. Ascospores surrounded by a gelatinous sheath *B. gelatinosa*
1. Ascospores lacking a sheath..... 2
2. Ascomata covered with outwardly projecting, long hairs..... *B. ellipsoidea*
2. Ascomata not as above.....3
3. Ascomata wall cephalothecoid*B. macrospora*
3. Ascomata wall not cephalothecoid 4
4. Ascomata red at apex*B. rhodospila*
4. Ascomata black at apex.....*B. botryosa*

TABLE 1. Synopsis of *Bertiella* species.

Species	Ascomata		Asci		Ascospores			Gelatinous sheath	Size (µm)	References
	Shape	Size (µm) diam.	Shape	Size (µm)	Shape	Septa				
<i>B. botryosa</i>	Subglobose	200	Cylindric-clavate	100–110 × 11–14	Fusiform	1–3	Absent	20–30 × 5–6	Morgan (1904)	
<i>B. ellipsoidea</i>	Subglobose	200–250	Cylindric-clavate	112–160 × 10–12	Ellipsoid	1	Absent	14–18 × 6–7	Hyde, et al. (2016)	
<i>B. gelatinosa</i>	Discoid to subglobose	200–550	Clavate	124–188 × 14–22	Fusiform	1	Present	42–55 × 6.5–9	This paper	
<i>B. macrospora</i>	Subglobose	–	Cylindric-clavate	130–150 × 22	Fusiform	1	Absent	22–43 × 5–9	Eriksson & Yue (1986); Mugambi & Huhndorf (2009)	
<i>B. rhodospila</i>	Pyriform	190–440	Clavate	50–85 × 5–11	Fusiform	3	Absent	16–25 × 3–5	Barr & al. (1986)	

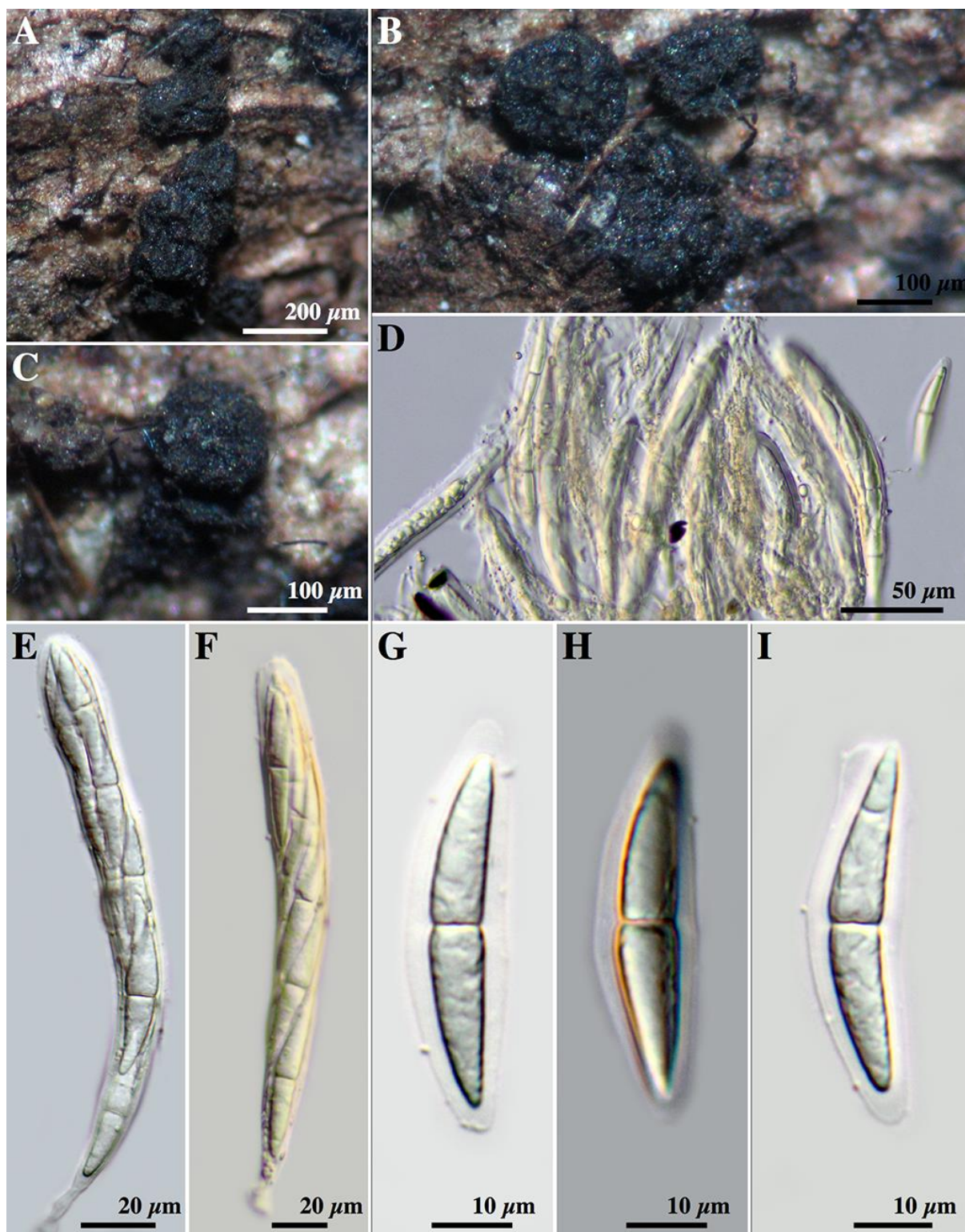


Fig. 1 – *Bertiella gelatinosa*. A–C. Ascomata. D. Asci with ascospores and pseudoparaphyses. E–F. Asci with ascospores. G–I. Ascospores.

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References

- Almeida DAC, Gusmão LFP, Miller AN. 2014 – A new genus and three new species of hysteriaceous ascomycetes from the semiarid region of Brazil. *Phytotaxa* 176, 298–308.
- Aptroot A. 1998 – A world revision of *Massarina* (Ascomycota). *Nova Hedwigia* 66, 89–162.
- Barr ME, Rogerson C, Smith J. 1986 – An annotated catalog of the pyrenomycetes described by Charles H. Peck. *Bulletin of the New York State Museum* 459, 1–74.
- Berkeley MJ. 1876 – Notices of North American Fungi. *Grevillea* 4, 141–162.
- Eriksson O, Yue J – 1986. *Bertiella* (Sacc.) Sacc. & Sydow, a synonym of *Massarina* Sacc. Mycotaxon
- GBIF. 2016. Global Biodiversity Information Facility Data Portal., in Editor (ed.)^(eds.), Book Global Biodiversity Information Facility Data Portal.
- Hyde KD, Hongsanan S, Jeewon R, Bhat DJ et al. 2016 – Fungal diversity notes 367–490: taxonomic and phylogenetic contributions to fungal taxa. *Fungal Diversity* 80, 1–270.
- Hyde KD, Jones EBG, Liu J-K, Ariyawansa H et al. 2013 – Families of Dothideomycetes. *Fungal Diversity* 63, 1-313.
- Liew EC, Aptroot A, Hyde KD. 2002 – An evaluation of the monophyly of *Massarina* based on ribosomal DNA sequences. *Mycologia* 94, 803–813.
- Lumbsch HT, Huhndorf SM. 2007 – Outline of Ascomycota. *Myconet* 13 1–58.
- Lumbsch HT, Huhndorf SM. 2010 – Myconet Volume 14. Part One. Outline of Ascomycota—2009. Part Two. Notes on Ascomycete Systematics. Nos. 4751–5113. *Fieldiana Life and Earth Sciences* 1, 1–64.
- Morgan A. 1904 – New Species of Pyrenomycetes. *The Journal of Mycology* 10, 161–162.
- Mugambi G, Huhndorf S. 2009 – Molecular phylogenetics of Pleosporales: Melanommataceae and Lophiostomataceae re-circumscribed (Pleosporomycetidae, Dothideomycetes, Ascomycota). *Studies in Mycology* 64, 103–121.
- Saccardo PA, Sydow P. 1899 – Supplementum Universale, Pars IV. *Sylloge Fungorum*.
- Sydow H, Sydow P. 1906 – Referate und kritische Besprechungen. *Annals Mycologici* 4, 453–469.
- Thiessen F, Sydow H. 1915 – Die Dothideales. *Kritisch-systematische Originaluntersuchungen. Annales mycologici* 13, 147–746.
- Tian Q, Liu JK, Hyde KD, Wanasinghe DN et al. 2015 – Phylogenetic relationships and morphological reappraisal of Melanommataceae (Pleosporales). *Fungal Diversity* 74, 267–324.
- Zhang Y, Crous PW, Schoch CL, Hyde KD. 2012a – Pleosporales. *Fungal Diversity* 53, 1–221.
- Zhang Y, Crous PW, Schoch CL, Hyde KD. 2012b. Pleosporales. *Fungal Diversity* 53, 1–221.
- Zhang Y, Wang HK, Fournier J, Crous PW et al. 2009 – Towards a phylogenetic clarification of *Lophiostoma* / *Massarina* and morphologically similar genera in the Pleosporales. *Fungal Diversity* 38, 225–251.