

ANAMORPHIC FUNGI OF THE RASO DA CATARINA ECOREGION: *Aplosporella* (BOTRYOSPHAERIALES) AND *Stilbella* (HYPOCREALES) NEW RECORDS FOR BRAZIL

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Anamorphic fungi colonize diverse hosts, produce asexual reproductive structures, and play important roles in decomposition. *Aplosporella* and *Stilbella* are anamorphic taxa within the phylum Ascomycota and belong to the families Aplosporellaceae and *incertae sedis* respectively. The present work presents a taxonomic study of the Ascomycota that colonize *Solanum mauritianum* Scop. (“cassatinga” or woolly nightshade). *S. mauritianum* branches were collected in August/2018 in Povoado Juá, in the county Paulo Afonso, in the state of Bahia, Brazil, to morphologically characterize their associated fungi. The samples were processed at MICOLAB UNEB-VIII (Mycology Laboratory: Didactic Collection, Fungal Herbarium and Fungal Culture Collection); slides were prepared using lactophenol, Melzer’s reagent, and water. *Aplosporella* sp. and *Stilbella fimetaria* (Pers.) Lindau. were identified. Those two taxa are recorded here for the first time in Brazil, and on a novel botanical host. Morphological analyses, geographic distributions, commentaries, and illustrations are presented for two species identified.

Key words: Ascomycota, caatinga, taxonomy, biodiversity.

Fungos anamórficos da Ecorregião Raso da Catarina: *Aplosporella* (Botryosphaeriales) E *Stilbella* (Hypocreales). Novos registros para o Brasil. Fungos denominados anamorfos produzem estruturas de reprodução assexuada, colonizando hospedeiros diversos e desempenhando importante papel na decomposição. *Aplosporella* e *Stilbella* são taxa anamórficos, do filo Ascomycota, pertencentes às famílias Aplosporellaceae e *incertae sedis*, respectivamente. O objetivo desse trabalho foi realizar um estudo taxonômico dos Ascomycota que colonizam *Solanum mauritianum* Scop. (cassatinga). Galhos de *S. mauritianum* Scop. foram coletados em agosto/2018 no Povoado Juá, no município de Paulo Afonso, no estado da Bahia, Brasil, com a finalidade de caracterizar morfologicamente a micota presente. As amostras foram processadas no MICOLAB UNEB-VIII (Laboratório de Micologia: Coleção Didática, Herbário de Fungos e Coleção de Cultura de Fungos) por meio de preparação de lâminas, utilizando lactofenol, reagente de Melzer e água. *Aplosporella* sp. e *Stilbella fimetaria* (Pers.) Lindau. foram identificadas. Tratam-se de dois táxons documentados pela primeira vez no Brasil, em um novo hospedeiro botânico. Análise morfológica, distribuição geográfica, comentários e ilustração são apresentadas para as duas espécies identificadas.

Palavras-chave: Ascomycota, caatinga, taxonomia, biodiversidade.

Introduction

The Raso da Catarina is one of the eight hot and dry “Caatinga” ecoregions of Bahia State, Brazil (De Queiroz, Rapini, Giulietti, 2006). The Caatinga hosts a wide diversity of native plants and animals, and is considered an area of biological relevance with priority for conservation efforts (Varjão, Jardim, Conceição, 2013). Survey of fungi of the Ascomycota phylum in plants of Caatinga are limited when compared to studies of the mycota associated with native botanical hosts of Atlantic Forest (Cruz e Gusmão, 2009; Oliveira et al., 2014; Vitória et al., 2014; Vitória, Cavalcanti, Bezerra, 2016; Vitória, Santos, Fortes, 2016; Santos, Vitória, Bezerra, 2016; Santos e Vitória, 2017).

The fungal genus *Aplosporella* Speg. is the representative of the phylum Ascomycota, family Aplosporellaceae, order Botryosphaeriales; it comprises 263 recorded species according to the Species Fungorum (2019). The genus was described by Spegazzini in 1880, (Du, 2017). Its principal morphological characteristics are multilocular conidiomata, each with a single ostiole, and brown conidia (Zhu, Tian, Fan, 2018).

The genus *Stilbella* Tode, described in 1790, includes gelatinous and stipitate fungi with sinnema-shaped conidiomata, without dark pigmentation, and aseptate conidia (Seifert, 1985). The Species Fungorum (2019) lists 91 recorded species.

Research efforts focusing on anamorphic fungi have been rare in the Raso da Catarina ecoregion, making such analyses quite relevant. As such, the present work reports on a taxonomic study of the Ascomycota associated with *Solanum mauritianum* Scop. in Povoado Juá, Raso da Catarina Ecoregion, Bahia State, and includes illustrations and descriptions.

Materials and Methods

Collection expeditions were undertaken in August/2018, in Povoado Juá, in the county Paulo Afonso, in the state of Bahia State, Brazil (09°26'32,5' S e 38°25'23,2' W). Branches still attached to *S. mauritianum* were collected and held in paper bags.

The samples were then removed to MICOLAB UNEB VIII (Mycology Laboratory: Didactic Collection, Fungal Herbarium and Fungal Culture

Collection) at the Bahia State University – UNEB - *Campus* Paulo Afonso, for topographic analysis using a stereo microscope (Zeiss) and morphological characterization using a light microscope (Zeiss). Freehand sections of the conidiomata were prepared, and the fungal structures carefully removed and mounted on slides (with coverslips) in water and Melzer's reagent, and stained with lactophenol (cotton blue). Species identifications were based on measurements of taxonomically important structures and consultations of the specialized literature.

Semi-permanent slides were then prepared (PVL resin: polyvinyl alcohol + lactophenol) (Trappe, 1982). The material examined was subsequently deposited in MICOLAB UNEB VIII.

Results and Discussion

I. Aplosporella sp. (Figure 1).

Description: Du et al. (2017).

Material examined: BRAZIL. BAHIA: Povoado Juá, Paulo Afonso, on branches of *S. mauritianum* (cassatinga), 10-08-2017. Barbosa, R.L., 9° 25.893' S and 38° 25.449' W. (MICOLAB UNEB VIII 0103).

Known distribution: Germany, Congo, United States (Species Link, 2019), China (Du, et al., 2017), and Brazil (present work).

Morphological analysis: Conidiomata multi-loculated, 975-1025 x 50-110 µm in transversal section, with a single ostiole, semi-immersed, brown, with black edges; pycnidium 60-13 x 50-250 µm; conidia 25-32.5 x 15-20 µm, aseptate, elliptic, dark brown, verrucose, with thick walls.

Commentary: The present material was identified according to Du et al. (2017). Although it was not possible to identify the species without access to molecular analyses, their morphological characteristics fits to *Aplosporella*. This genus has been recorded on a vast number of substrates (SMML, 2018). *Solanum mauritianum* is, however, a new botanical host to science.

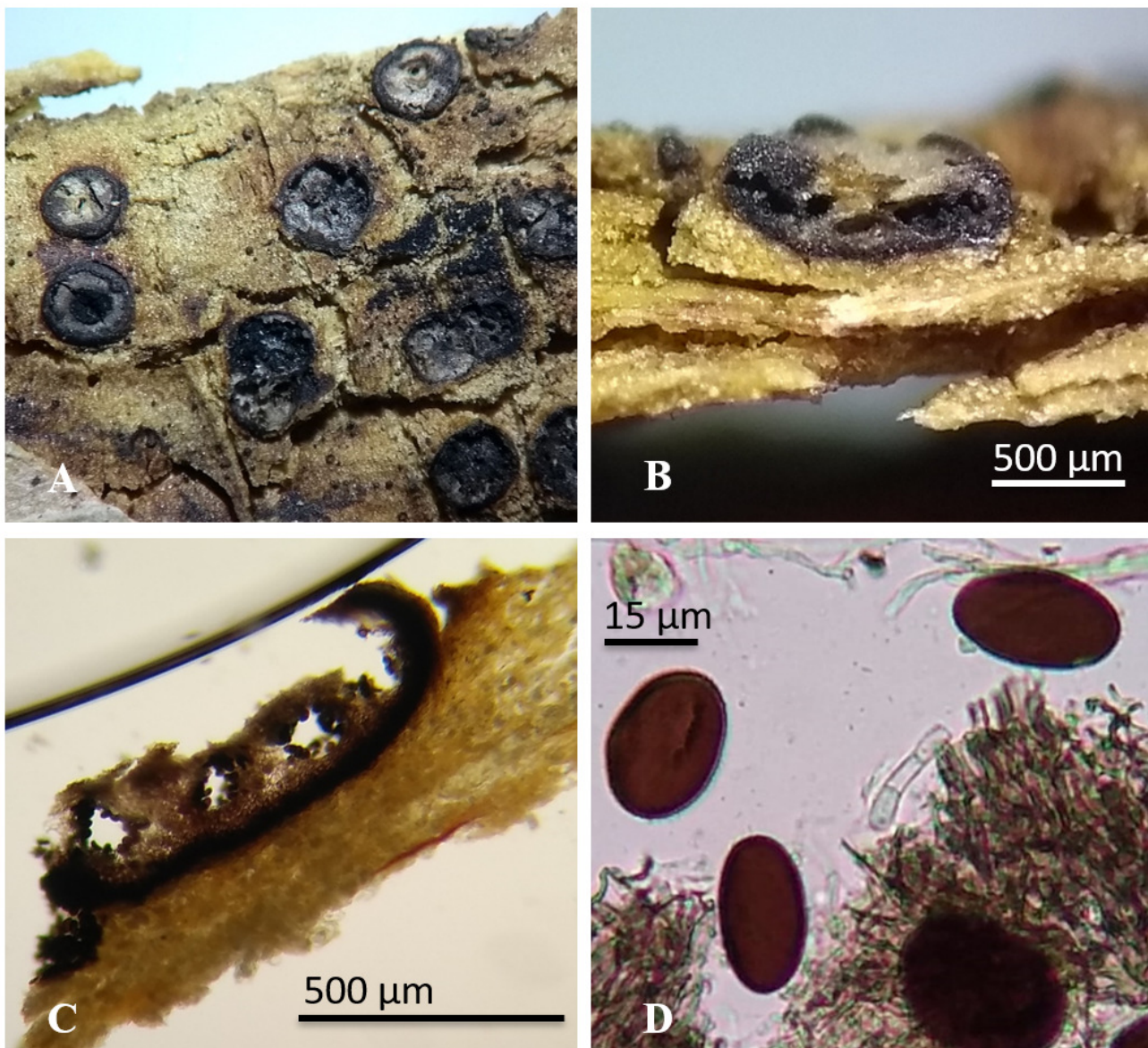


Figure 1. *Aplosporella* sp. A. Conidiomata on the host surface; B-C. Longitudinal section of the conidiomata; D. Conidia.

2. *Stilbella fimetaria* (Pers.) Lindau., Verh. Bot. Ver. Prov. Brandenb. 47:75 (1905) (Figure 2).

Description: Seifert (1985).

Material examined: BRASIL. BAHIA: Povoado Juá, Paulo Afonso, fragments of stumps trapped in *S. mauritianum* (cassatinga), 10-08-2017. Barbosa, R.L., 9° 25.893' S and 38° 25.449' W. (MICOLAB UNEB VIII 0104).

Known distribution: Holland (Species Link, 2019), Brazil (present work).

Morphological analysis: Sinnenmata (225) 425-525 x (400) 675-700 µm, solitary, stipe cylindrical, cream-colored to white, head globose, hemispherical, yellow-orange to cream-colored. Conidia 7.5 x 2.5 µm, unicellular, ellipsoidal, smooth, hyaline.

Commentary: The material examined was morphologically compatible with *S. fimetaria* (Fungi

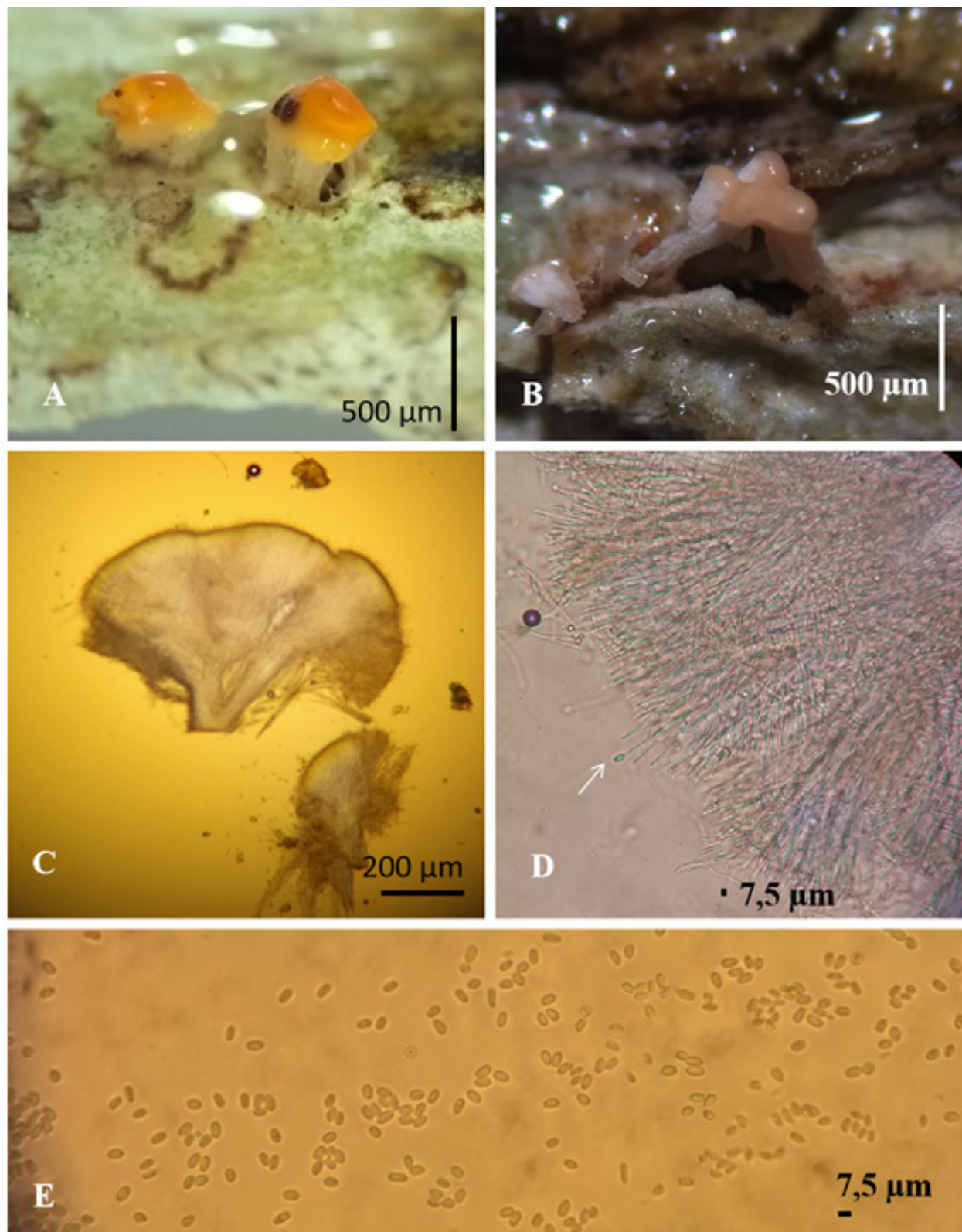


Figure 2. *Stilbella fimetaria*. A-B. Sennema on the host surface; C. Longitudinal section of the sennema; D. Conidiophores and conidia; E. conidia.

MySpecies, 2018). In the original description, the conidia of *S. fimetaria* were described as slightly smaller [(3-0) 3.5 6~ 5 (-6) x (-1.5) 2 6~ 3 vs. 7.5 x 2.5 µm]. All other morphological characteristics, however, were similar. This therefore represents the first record of the species for Brazil, with *S. mauritianum* as a host new to science.

Conclusion

The data obtained in the present work can be utilized by mycologists for online surveys of fungal species known to Brazil.

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Literature Cited

- CRUZ, A. C. R.; GUSMÃO, L. F. P. 2009. Fungos conidiais na Caatinga: espécies associadas ao folhedo. *Acta Botanica Brasilica* (Brasil) 23(4): 999-1012.
- DE QUEIROZ, L. P.; RAPINI, A.; GIULIETTI, A. M. 2006. Rumo ao amplo conhecimento da biodiversidade do semi-árido brasileiro. Ministério da Ciência e Tecnologia. pp.15-18.
- DU, Z. et al. 2017. *Aplosporella ginkgonis* (Aplosporellaceae, Botryosphaeriales), a new species isolated from *Ginkgo biloba* in China. *Mycosphere* 8(2):1246-1252.
- FUNGI MYSPECIES. 2018. Fungi and Lichen of Great Britain and Ireland. Available at: <<http://fungi.myspecie.info/all-fungi/stilbella-fimetaria>> Accessed on: November 29.
- OLIVEIRA, G. M. de et al. 2014. Levantamento de fungos em plantas nativas da Caatinga. Petrolina, PE, Embrapa Semi-Arido.
- SANTOS, E. C. S.; VITÓRIA, N. S. 2017. Espécies de Ascomycota em *Syagrus Coronata* (Mart.) Becc., Água Branca, Alagoas, Brasil. *Revista Ouricuri* (Brasil) 7(1):080-097.
- SANTOS, M. A. L.; VITÓRIA, N. S.; BEZERRA, J. L. 2016. Fungos Colonizando Palmeiras em áreas de Caatinga do Sertão da Bahia. *Agrotropica* (Brasil) 28(1):37-46.
- SEIFERT, K. A. 1985. A monograph of *Stilbella* and some allied hyphomycetes. *Studies in Mycology* 27:1-235.
- SMML. 2018. Fungus-Host Distribution Database. Available at: <<http://nt.arsgrin.gov/fungalDATABASES/fungushost/fungushost.cfm>> Accessed on: November 30.
- SPECIES FUNGORUM. 2019. Authors of Fungal Names. Available at: <<http://www.speciesfungorum.org/Names/names.asp?pg=2>> Accessed on: April 22.
- SPECIES LINK. 2019. Disponível em: <<http://www.splink.org.br/index?lang=pt>> Accessed on: April 22.
- TRAPPE, J. M. 1982. Taxonomy of the fungi forming endomycorrhizae. [W:] Methods and principles of mycorrhizal research. SCHENCK NC (red.). American Phytopathological Society., MN, 1-9.
- VARJÃO, R. R.; JARDIM, J. G.; CONCEIÇÃO, A. D. S. 2013. Rubiaceae Juss. of caatinga of the APA Serra Branca/Raso da Catarina, Bahia, Brazil. *Biota Neotropica* 13(2):105-123.
- VITÓRIA, N. S.; CAVALCANTI, M. A. Q.; BEZERRA, J. L. 2016. Species of *Astrosphaeriella* and *Fissuroma* from palms: new records for South America and Brazil. *Nova Hedwigia* 102(1/2):129-140.
- VITÓRIA, N. S.; SANTOS, M. A. L.; FORTES, N. G. S. 2016. Ecologia e Biodiversidade do Semiárido Nordestino. In: Comunidade fúngica de *Syagrus coronata* (Mart.) Becc: Ascomycota anamórficos e teleomórficos. Paulo Afonso, BA, Editora SABEH. pp.35-45.

- VITÓRIA, N. S. et al. 2014. Ascomycota em palmeiras: novos registros e novos hospedeiros para o Nordeste brasileiro. *Agrotrópica (Brasil)* 26(1):35-42.
- ZHU, H. N.; TIAN, C.; FAN, X. 2018. Studies of Botryosphaeriales fungi associated with canker and dieback of tree hosts in Dongling Mountain of China. *Phytotaxa* 348(2):53-76.

