

CANNONIA AUSTRALIS (ASCOMYCOTA, XYLARIACEAE) FOUND IN EQUATORIAL BRAZIL

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Abstract. Trierweiler-Pereira, L.; L.A.N.N. Agra, M. Capdet & A. I. Romero. 2012. *Cannonia australis* (Ascomycota, Xylariaceae) found in equatorial Brazil. *Darwiniana* 50(1): 170-173.

Cannonia is a xylarioid genus originally described from the southern hemisphere (Argentina and Australia) growing on dead parts of palms. To date, the genus is considered monospecific and the only species recognized is *C. australis*. During collection trips in the State of Maranhão, Brazil, specimens of *C. australis* were gathered on the inflorescence rachis and floral pedicels of a *Syagrus* species (Arecaceae). Description and line drawings are provided, this being the first record from Brazil.

Keywords. Ascomycetes; Brazilian fungi; Neotropical mycobiota; Xylariales; xylophilous fungi; palm fungi.

Resumen. Trierweiler-Pereira, L.; L.A.N.N. Agra, M. Capdet & A. I. Romero. 2012. *Cannonia australis* (Ascomycota, Xylariaceae) hallado en Brasil ecuatorial. *Darwiniana* 50(1): 170-173.

Cannonia es un género xilariáceo originalmente descrito para el hemisferio sur (Argentina y Australia) que crece sobre partes muertas de palmeras. Actualmente, el género es considerado monoespecífico y la única especie reconocida es *C. australis*. Durante viajes de exploraciones micológicas en el estado de Maranhão, Brasil, se coleccionaron especímenes de *C. australis* sobre el raquis de la inflorescencia y los pedicelos florales de una especie de *Syagrus* (Arecaceae). Se describe e ilustra esta especie registrada por primera vez para Brasil.

Palabras clave. Ascomicetes; hongos brasileños; hongos xilófilos; micobiota neotropical; Xylariales.

INTRODUCTION

Xylariaceae Tul. & C. Tul. is a large family of Ascomycetes that currently includes 85 genera and more than 1,300 species (Kirk et al., 2008). Brazilian studies concerning the family are basically related to classical taxonomy (i.e. based on morphological characters) and articles published by Brazilian researchers in the last decade are very

scant (Pereira et al., 2008a, b, 2009, 2010; Trierweiler-Pereira et al., 2009).

The species within the family are separated in two lineages: Hypoxyloideae and Xylarioideae, supported by anamorph type, chemotaxonomy and molecular data (Tang et al., 2009). However, the boundaries between genera remain controversial in some cases.

The genus *Cannonia* Joanne E. Taylor & K.D.

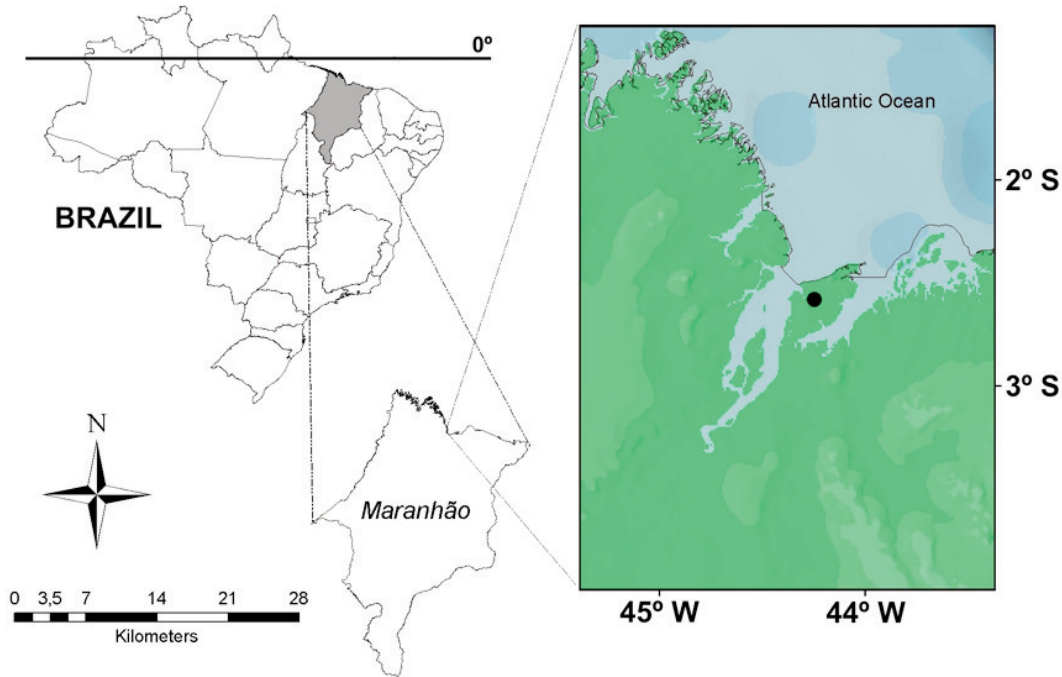


Fig. 1. Geographic location of specimens of *Cannonia australis* in State of Maranhão, Brazil.

Hyde was proposed in the last decade (Taylor & Hyde, 1999) and to date is monospecific. *Cannonia* differs from other Xylariaceae genera by its ascus features: broad cylindrical to clavate, 8-spored, with very short pedicel, inamyloid, lacking apical apparatus, and the ascus can be evanescent. Asci were absent in the holotype material, collected by Spegazzini in Argentina, originally identified as *Cerastostoma australe* Speg. *Cannonia australis* specimens are so far found only on palms.

The present work aims to contribute to the knowledge of Xylariaceae in Brazil and reports the occurrence of *Cannonia australis* for the first time near the equator.

MATERIALS AND METHODS

The examined material was collected during field trips in the State Park of Bacanga (between 2°32'30" and 2°37'30" S, 44°15'00" and 44°18'44" W), located in the midwest area of the Island of São Luís, State of Maranhão, Brazil (Fig. 1). This park was created in 1980 and its area is nearly 3,000 hectares (Ribeiro et al., 2005) and

part of "Floresta Protetora dos Mananciais da Ilha de São Luís". In this area typical plants of the Amazon and Atlantic Rain Forest biomes occur (Muniz et al., 1994). The climate is tropical hot-humid, with predominance of rainfall between January and April (Araújo et al. 2005; Figueredo et al. 2009) and the peak of rainfall in the last mentioned month is 500 mm.

All measurements of microscopic structures were made in mounts of 3% KOH, which were examined with a phase contrast microscope. Drawings were made with a camera lucida. The voucher material is deposited at ICN Herbarium (Thiers, 2012)

RESULTS

Cannonia australis (Speg.) Joanne E. Taylor & K.D. Hyde, Mycol. Res. 103:1398 (1999). TYPE: Argentina, Parque de Palermo, 15-V-1881, *C. Spegazzini* 7045 (holotype LPS!). Fig. 2A-C.

Stromata present, poorly developed, forming

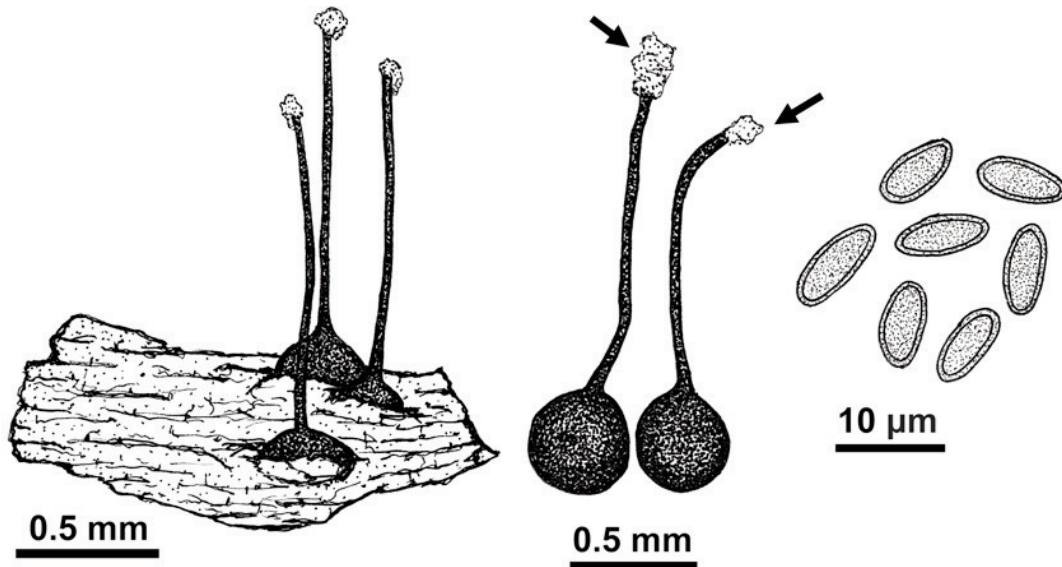


Fig. 2. *Cannonia australis*. **A**, perithecia immersed in the substratum. **B**, general aspect of perithecia when removed from the substratum (arrows indicate setae = cirri). **C**, ascospores. From *Agra s.n.* (ICN).

black granules amongst some perithecia, but most perithecia are naked; stromatal surface carbonaceous, blackish, dull; without extractable pigments in 10% or 3% KOH, subperithecial tissue absent. Perithecia globose to subglobose, blackish, 0.4-0.9 mm diam., embedded in the host tissue, with a long, cylindrical, slender neck; neck erumpent from the substratum surface, 1.2-1.6 mm; brownish masses of spores (cirri) are frequently observed above the necks. Asci evanescent, not observed. Ascospores short ellipsoidal, fusoid, laterally compressed, golden yellow brown, 7.0-10.0 µm, germ slit indistinct.

Observations. Characteristic features of *C. australis* are: palm as host species; blackish, globose perithecia (immersed in the substratum) with long neck; ascospores ellipsoidal, golden yellow brown. Asci can be evanescent - they were not observed in the holotype material, and were absent in the Brazilian specimen; however they were observed and illustrated by Capdet & Romero (2010). According to Taylor & Hyde (1999) the germ slit is straight and running full-length of ascospore, but it was inconspicuous in the examined material.

Brazilian material of *C. australis* was collected on the inflorescence rachis and floral pedicels of *Syagrus* Mart. (Arecaceae), possibly *S. oleraceae* (Mart.) Becc. In Argentina (Iguazú National Park, near the Brazilian border), *Cannonia australis* was also collected on a *Syagrus* species, *S. romanzoffiana* (Cham.) Glassman (Capdet & Romero, 2010). Additionally, the species is known to occur on *Butia yatay* (Mart.) Becc. in Argentina, and *Trachycarpus fortunei* (W.J. Hooker) H.A. Wendland in Australia (Taylor & Hyde, 1999). However, *T. fortunei* is a palm native from China and Burma (Myanmar) and it was cultivated in a botanical garden in Australia.

The presence of *C. australis* in Brazil is the first report of the species at low latitude (2°11' S). In Argentina, this species is frequently found further south in a temperate region (31°50' S, 58°17' W; Parque Nacional El Palmar, Entre Ríos province) on *B. yatay* where it seems to be very well established. On *B. yatay*, *C. australis* covers quite large patches on the spathe and the inflorescence rachis and floral pedicels, but it is also present in the sheaths, petioles, foliar rachis, leaflets and parts of the inflorescence, at any time of year. Its presence on spathes of *S. romanzoffiana* (Misiones province, subtropical region 25°41' S, 54°18' W) is

on more limited areas than on *B. yatay* spathes (Capdet & Romero 2010).

As it was suggested by Stone et al. (1996) for other ascomycetes, *C. australis* sporulates in abundance on parts that have been fallen for less than a year, and thus it must be suspected that *C. australis* may colonize living tissues. There are records of other xylariaceous endophytes from palms (Taylor et al., 1999; Fröhlich et al., 2000), so it is possible that *C. australis* is an endophyte. However, there is not enough information to ascertain that. Nevertheless, the association of *C. australis* with palms is consistent.

Butia and *Syagrus* belong to subfamily *Ceroxyloideae*, tribe *Cocoeae*, and have not been the subject of any modern biogeographical analysis. These two genera are endemic from South America with Gondwanan origin, and dated phylogenies of *Cocoeae* (Gunn, 2004) and the *Ceroxyloideae* (Trénel et al., 2007) indicate Eocene trans-oceanic dispersal between America and Africa.

Examined material

BRAZIL. **Maranhão.** São Luís, Parque Estadual do Bacanga, on *Syagrus* sp., 30-IX-2009, *Agra s.n.* (ICN 168396).

BIBLIOGRAPHY

- Araujo, E.P.; J.W.C. Parente Jr. & S.A. Espig. 2005. Estudo das Unidades de Paisagem da Ilha do Maranhão: delimitação e dinâmica. Simpósio Brasileiro de Sensoriamento Remoto 12, 16-21 de abril, Goiânia (Brasil): 2607-2609.
- Capdet, M. & A. I. Romero. 2010. Fungi from palms in Argentina. 1. *Mycotaxon* 112: 339-355.
- Figueiredo, P. S.; É. K. M. D. Ribeiro, D. M. A. Lacerda & E. C. Girnos. 2009. Estratégia reprodutiva de *Cochlospermum orinocense* (Kunth) Steud.: fenologia, biologia floral e sistema de cruzamento em uma espécie pioneira de florestas na Amazônia. *Revista Brasileira de Botânica* 32: 781-792.
- Fröhlich, J.; K. D. Hyde & O. Petrini. 2000. Endophytic fungi associated with palms. *Mycological Research* 104: 1202-1212.
- Gunn, B. F. 2004. The phylogeny of the *Cocoeae* (Arecaceae) with emphasis on *Cocos nucifera*. *Annals of the Missouri Botanical Garden* 91: 505-522.
- Kirk, P.M.; P. F. Cannon, D. W. Minter & J. A. Stalpers. 2008. *Dictionary of the fungi*, 10th edition. Wallingford: CAB International.
- Muniz, F. H.; O. Cesar & R. Monteiro. 1994. Aspectos florísticos quantitativos e comparativos da vegetação arbórea da reserva florestal do Sacavém, São Luís, Maranhão (Brasil). *Acta Amazonica* 24: 189-218.
- Pereira, J.; J. L. Bezerra & L. C. Maia. 2008a. Revision of taxa of the URM Herbarium 2. *Hypoxylon* species described by A. C. Batista. *Mycotaxon* 104: 405-408.
- Pereira, J.; J. L. Bezerra & L. C. Maia. 2008b. *Kretzschmaria albogrisea* sp. nov. and *K. curvirima* from Brazil. *Mycotaxon* 106: 237-241.
- Pereira, J.; J. D. Rogers & J. L. Bezerra. 2009. New Xylariaceae taxa from Brazil. *Sydowia* 61: 321-325.
- Pereira, J.; J. D. Rogers & J. L. Bezerra. 2010. New Annulohypoxylon species from Brazil. *Mycologia* 102: 248-252.
- Ribeiro, F.V.; M. S. Furtado, N. F. C. Lima, L. C. Brito & A. C. Feitosa. 2005. Erosive processes at Bacanga State Park area. *Sociedade & Natureza* (Uberlândia) Special Issue: 142-147.
- Stone, J. K.; M. A. Sherwood & G. C. Carroll. 1996. Canopy microfungi: function and diversity. *Northwest Science* 70: 37-45.
- Tang, A. M. C.; R. Jeewon & K. D. Hyde. 2009. A re-evaluation of the evolutionary relationships within the Xylariaceae based on ribosomal and protein-coding gene sequences. *Fungal Diversity* 34: 127-155.
- Taylor, J. E. & K. D. Hyde. 1999. *Cannonia* gen. nov., from palms in the Southern Hemisphere. *Mycological Research* 103: 1398-1402.
- Taylor, J. E.; K. D. Hyde & E. B. G. Jones. 1999. Endophytic fungi associated with the temperate palm, *Trachycarpus fortunei*, within and outside its natural geographic range. *New Phytologist* 142: 335-346.
- Thiers, B. [continuously updated, accessed 2012] Index Herbariorum: a global directory of public herbaria and associated staff. *New York Botanical Garden's Virtual Herbarium*, <http://sweetgum.nybg.org/ih>
- Trenél, P.; M. H. Gustafsson, W. J. Baker, C. B. Asmussen-Lange, J. Dransfeld & F. Borchsenius. 2007. Mid-Tertiary dispersal, not vicariance explains Gondwanan distribution pattern in the wax palm subfamily (Ceroxyloideae: Arecaceae). *Molecular Phylogenetics and Evolution* 45: 272-288.
- Trieverleir-Pereira, L.; A. I. Romero, J. M. Baltazar & C. Loguercio-Leite. 2009. Addition to the knowledge of Xylaria (Xylariaceae, Ascomycota) in Santa Catarina, Southern Brazil. *Mycotaxon* 107: 139-156.