

Additional notes on *Xylaria chordaeformis* (Xylariaceae, Ascomycota) in Brazil

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Additional notes on *Xylaria chordaeformis* (Xylariaceae, Ascomycota) in Brazil. There is a high diversity of *Xylaria* species in the Neotropics; however, there are few mycologists in this region that study the taxonomy of Xylariaceae. With the aim of contributing to the taxonomy of the group, this work provides additional notes on *Xylaria chordaeformis*, a filiform species found on dead wood. The specimen was collected in a private reserve in the state of Santa Catarina, in southern Brazil. The main features that characterize *X. chordaeformis* are filiform stromata, naked mammiform perithecia, and ascospores with a sigmoid germ light. Future molecular studies would allow us to verify whether there are cryptic taxa within *X. chordaeformis* due to the morphological variation (stromata and ascospores) found in this species.

Palabras clave: Brazilian funga, fungal taxonomy, Neotropics

Notas adicionales sobre *Xylaria chordaeformis* (Xylariaceae, Ascomycota) en Brasil. En el Neotrópico se encuentra una gran diversidad de especies de *Xylaria*, sin embargo, hay pocos micólogos de esta zona capacitados en la taxonomía de Xylariaceae. Con el objetivo de contribuir con la taxonomía del grupo, este estudio pretende presentar notas adicionales sobre *Xylaria chordaeformis*, una especie filiforme encontrada sobre madera muerta. El espécimen examinado fue recolectado en una reserva natural privada en el estado de Santa Catarina, en el sur de Brasil. Las principales características de *X. chordaeformis* son: estromas filiformes, peritecios desnudos y mamiformes, ascosporas con surco germinativo sigmoide. Sería interesante hacer futuros estudios moleculares para verificar si existen taxones crípticos en *X. chordaeformis* debido a la variación morfológica (de estromas y ascosporas) encontrada en la especie.

Keywords: funga brasileña, Neotropicos, taxonomia de hongos

INTRODUCTION

Xylaria chordaeformis Lloyd is a neotropical species first collected by Camille Torrend in the

state of Bahia, Brazil. Descriptions of the species are rare in the literature and primarily based on the type specimen (Lloyd, 1918; Ju *et al.*, 2016). Specimens of *X. chordaeformis* were recently co-

Steviana, Vol. 16 (2), 2024 pp.24-27

Original recibido el 12/09/2024

Aceptado el 23/10/2024



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llected in the state of Santa Catarina, in southern Brazil. This work provides a comprehensive description and additional notes on the species, including a color photograph of stromata on natural substrate.

MATERIALS & METHODS

The specimen was collected in Reserva Rio das Furnas, a private natural heritage reserve (53.5 ha) in the municipality of Alfredo Wagner, Santa Catarina State, southern Brazil (27°40'44"S, 49°10'28"W). The reserve is situated at the apex of a canyon (750–900 m a.s.l.) covered with Atlantic Forest. The vegetation comprises a transition of lowland Atlantic rain forest, araucaria forest, and high-elevation grasslands (<https://www.reservariodasfurnas.org>).

The collected material was air-dried and analyzed both macro- and microscopically according to traditional techniques used in taxonomic studies of xylariaceous fungi, such as in Ju & Rogers (1999). While the macroscopic morphology is based on the stromata, the microscopic features are based on asci and ascospores mounted in distilled water preparations, except for the apical rings that were observed in Melzer's reagent. Voucher material is in the fungaria FLOR and at SPSC (Mycological Collection).

RESULTS AND DISCUSSION

Xylaria chordaeformis Lloyd, Mycol. Writings 5, Xyl. Notes 2: 18 (1918). (Figure 1).

Stromata blackish, up to 2.7 cm long × 1.2 mm diam. at the broadest portion, fertile area 1.6 cm long, with some whitish remains of the outer layer near the base; interior white; stipe cylindrical to subcylindrical, glabrous, unbranched, bearing 20–30 perithecia at the upper portion of the wiry axis, arranged in a zigzag or in rows; apex sterile, acute or truncate when broken off. Perithecia mammiform, 1.2–2.0 mm diam., al-

most free, 2–4 confluent, black to dark brown; ostioles subconical, black. Asci not intact; apical ring IKI+, cerulean blue in Melzer's reagent, barrel-shaped to urn-shaped, 5–6 × 2–2.5 μm. Ascospores 23–27 × 4.5–6.5 μm, ellipsoid-inequilateral, with one or two pinched ends, unicellular, smooth, medium brown, with one large guttule; germ slit conspicuous, dorsal, sigmoid, running full-length of ascospore.

Habitat

Growing in small groups on rotten wood near a waterfall.

Examined material

BRAZIL. State of Santa Catarina, Alfredo Wagner, Reserva Rio das Furnas, 27°40'44"S, 49°10'28"W, Atlantic Forest fragment, on rotten wood, 20/III/2021, col. *M.A. Neves R110* (FLOR, SPSC).

Additional examined material

X. chordaeformis: BRAZIL. Bahia, C. Torrend 801 (BPI 713718 ex Lloyd herb. 10382, HOLOTYPE); Bahia, C. Torrend 389 (BPI 713717 ex Lloyd herb. 10030); Santa Catarina, Blumenau, on decayed branches, Jul. 1888, E. Ule, 801, as *Xylaria* sp. (HBG); Santa Catarina, Península da Glória, on fallen trunk, Feb. 1985, E. Ule 343, as *X. tricolor* (HBG)

X. melanura: COLOMBIA. La Mesa, San Antonio, on wood, Lindig 2597 (lectotype PC 0086040, isolectotype K[M]).

Distribution

Neotropical: Brazil – states of Bahia (Lloyd, 1918, type), Paraná (de Meijer, 2006, as '*X. chordiformis*'), Rio Grande do Sul (Ju *et al.*, 2016, correcting identifications of *X. luxurians*), Santa Catarina (present study); Puerto Rico (Lodge, 1996); Ecuador (Lodge *et al.*, 2008, as '*X. chordiformis*').

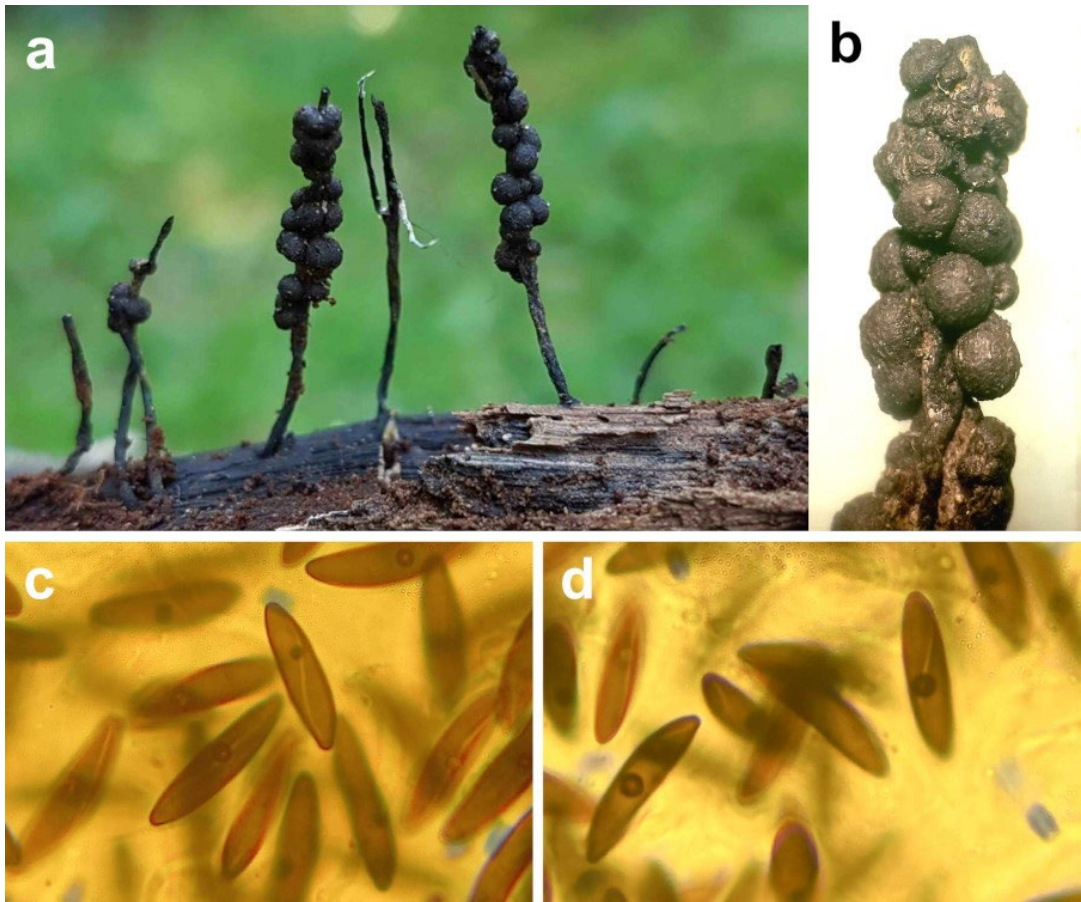


Figure 1. *Xylaria chordaeformis*. a. Stromata in situ. b. Detail of perithecia. c.–d. Ascospores and apical rings in Melzer's reagent (Photographs: a. M.A. Neves. b.–d. L. Trierv.-Per.)

Remarks

In the original description by Lloyd (1918), *X. chordaeformis* was noted as being very similar to *X. filiformis* (Alb. & Schwein.) Fr., but *X. chordaeformis* differs by growing on wood and having larger stromata and ascospores. Compared to a more detailed description of the type of *X. chordaeformis* by Ju *et al.* (2016), the material from Santa Catarina has shorter stromata, a larger fertile area (equal to $\frac{1}{2}$ of the stipe length) with more perithecia, larger perithecia (up to 2 mm diam.), and larger ascospores with a distinct sigmoid germ slit.

Two additional collections of *X. chordaeformis* from Santa Catarina are at HBG, and their ascospore sizes are $(23.6\text{--})25.4\text{--}29.0(\text{--}30.5) \times$

$(7.1\text{--})8.1\text{--}9.1(\text{--}9.7) \mu\text{m}$ (Blumenau) and $(20.9\text{--})22.4\text{--}24.4(\text{--}25.3) \times (6.1\text{--})6.5\text{--}7.3(\text{--}7.8) \mu\text{m}$ (Península da Glória). It appears that the ascospore size ranges in the species constitute a continuum of a relatively broad range of $21.5\text{--}29(\text{--}30.5) \times 5.5\text{--}9.1(\text{--}9.7) \mu\text{m}$, with the holotype spores in the lower range.

Ascospores from the type collection (BPI 713718) have an oblique to slightly sigmoid, spore-length germ slit on the dorsal side. This is a diagnostic characteristic of *X. chordaeformis* and can be used to separate it from similar species, such as *X. meliacearum* Læssøe [ascospores $(19\text{--})21.5\text{--}27.5(\text{--}31.5) \times (5\text{--})5.5\text{--}7(\text{--}8) \mu\text{m}$], which has the ascospore germ slit on the ventral side (Læssøe & Lodge, 1994).

Dennis (1956) considered *X. chordaeformis* as a synonym of *X. melanura* (Lév.) Sacc., another lignicolous species. However, the type material of *X. melanura* has a straight germ slit on the ventral side of the ascospores.

Xylaria luxurians (Rehm) Lloyd is another filiform species that was described from Blumenau, Santa Catarina, and grows on leguminous leaves. It has a felty stipe and ascospores that are $21.1\text{--}25.1 \times 6.6\text{--}8.6 \mu\text{m}$ with a straight germ slit (Dennis, 1956; Læssøe & Lodge, 1994). Some specimens at BPI collected by J. Rick were misidentified as *X. luxurians* and belong to *X. chordaeformis* (Ju *et al.*, 2016).

ACKNOWLEDGEMENTS

We thank the following: Nathan Smith for reviewing the English, André de Meijer for the discussion about *X. chordaeformis*, the curators at BPI, HBG, and K for loaning the specimens for study; and the Reserva Rio das Furnas (<https://www.reservariodasfurnas.org/>) for the access to the collection site.

AUTHORS CONTRIBUTIONS

LTP: data analyses, writing (original draft, review & editing); YMJ: validation, providing additional data, writing (original draft, review); MAN: collecting data, writing (review).

CONFLICTS OF INTEREST

None.

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