

A NEW SPECIES OF *Xylaria* ON *Salzmannia nitida* IN BAHIA, BRAZIL

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Xylaria salzmanniae sp. nov. is described on dead leaves of *Salzmannia nitida* (Rubiaceae) in Serra da Jiboia, municipality of Santa Teresinha, semiarid region of Bahia, Brazil.

Key words: Brazilian fungi, Rubiaceae, Taxonomy, Xylariaceae.

Uma nova espécie de *Xylaria* em *Salzmannia nitida* na Bahia, Brasil. *Xylaria salzmanniae* sp. nov. é descrita em folhas mortas de *Salzmannia nitida* (Rubiaceae) na Serra da Jiboia, município de Santa Teresinha, região semiárida da Bahia, Brasil.

Palavras-chave: Fungos brasileiros, Rubiaceae, Taxonomia, Xylariaceae.

Introduction

The genus *Xylaria* comprises 218 species, mostly growing saprophytically on plant remains but some are coprophilous or endophytes (Ju and Rogers, 2019). Pathogenicity is not well demonstrated in *Xylaria* but *X. polymorpha* (Pers.) Grev. is regarded as a real plant pathogen causing butt rot on urban trees (Proffer, 1988). The generic delimitation of *Xylaria*, *Podosordaria* and *Poronia* is based primarily on the anamorphs, but this premise is still under discussion. *Podosordaria* is known to have a lindquistia-like anamorph. This character is used to separate this genus from *Xylaria* which possesses an anamorph of another type (*Xylaria* type) (Daranagama et al., 2016). *Podosordaria aristata* (Mont.), *P. axifera* (Mont.) and *X. sicula* Pass. & Beltrani, which occur on leaves and fruits of several plants, have sexual morphs resembling our species but their teleomorphs are poorly described in the literature.

The Atlantic Rain Forest stretches along the Eastern coastline of Brazil but remnants of it can be found on the slopes of hills of the semiarid region of Bahia where the rain precipitation varies from 220 to 400 mm per year (INMET, 2019). In Serra da Jiboia, an altitude marsh located in the municipality of Santa Teresinha, State of Bahia, Northeast of Brazil (12°51'S, 39°28'W) (IBGE, 2021), an interesting fungus was noted occurring in association with *Salzmannia nitida* DC a shrub of the family Rubiaceae which occurs in the littoral areas of Brazil and other neotropical countries (Pereira and Barbosa, 2004). Stromata of the fungus were present on decaying leaves fallen on the ground and on dead leaves hanging in the plant.

The objective of this paper was to identify and describe the fungus encountered on *Salzmannia nitida* which is proposed as a new species, *Xylaria salzmanniae* nov. sp.

Materials and Methods

The material consisting of dead leaves of *S. nitida* with fungal stroma was taken to the Microbiology Laboratory of the Federal University of Recôncavo da Bahia - UFRB, in Cruz das Almas, for morphological characterization and isolation in pure culture. Fragments of the fungal species were transferred to Petri dishes containing BDA medium and incubated at 28 °C. The isolated *Xylaria* sp. was then characterized

by macro and micromorphology. Subsequently, five replicates of the fungal isolate were preserved in sterile distilled water (Castellani, 1967).

Morphology observation

The stromal surface and hairiness were observed using a dissecting scope. For micromorphological characterization, perithecial fragments containing asci, ascospores and paraphyses were mounted between microscope slides and coverslips using Melzer reagent, 3% KOH, lactic acid plus cotton blue and acid fuchsin stains. The observations were made using a LEICA ICC50 HD microscope, plus the LAS program (version 4.5.0). Shape and size of perithecia, asci, ascospores, conidiophores, conidiogenous cells, conidia and ascospore germ slits were analysed and used to compare our species with other *Xylaria* species described in the literature.

Our descriptions was deposited in MycoBank database (MB 833222).

Results and Discussion

Xylaria salzmanniae J. L. Bezerra, L. O. Barbosa & J. Pereira sp. nov. Figures A-G.

Etymology: *salzmanniae*, referring to the host plant.

Stromata capitate, black, usually simple, context fleshy, white, more abundant below the perithecial cavities (Figure 1 D), 0.8-2.3 mm total length; fertile region suglobose, aristate, surface smooth to slightly rough, black, 0.1-0.8 mm diam.; stipe cylindraceous, simple, pilose, 0.5-2.0 mm long, rarely bifurcate or absent (Figure 1); orange granules surrounding ascomata absent; KOH reaction absent. Perithecia 3-4 per stroma, immersed, of membranaceous consistence, 50-230 × 40-200 µm, with slightly prominent ostiole; arista filiform, dark at maturity, 100-270 × 10-40 µm. Asci cylindrical clavate, 8-spored, 75-95 × 7-10 µm, amyloid apical ring hat-shaped, 4,5-10 × 2 µm. Paraphyses hyaline, filamentous, slightly mucous. Ascospores ellipsoid, smooth, asymmetrical, 11-14 × 5-6 µm, germ slit straight, longitudinal, of the spore size. Asexual morph of the *Xylaria* type, on pulvinate stromata, covered by hyaline, cylindrical, parallel, contiguous conidiophores, simple or bifurcate, denticulate, continuous or 1-2 septate, 15-20 × 4-7 µm, denticles 0.5-1 µm long. Conidia ellipsoid, continuous, smooth, thin walled, 4-6 × 1.5-2 µm (Table 1).



Figure 1. *Xylaria salzmaniae*. (A) Colonized dead leaves and branches (arrow) of *Salzmania nitida*. (B) Stromata on leaves (arrow). (C) Captate stroma showing pilose stipe (arrow). (D) Perithecial cavities (arrow) and white context. (E) Ascospores with longitudinal germ slit (arrow) and amyloid ring in the ascus. (F) Conidiophores and conidia (arrow). (G) Pure culture on BDA medium forming stromata. Barrs: 1 cm (B); 3 cm (C e D); 20 μ m (E e F).

Cultural characteristics:

Only the anamorph was observed on BDA colonies attaining 90 mm diameter after eight days of incubation; conidial stromata formed at the 16th day (Figure 1); the mycelium was white, depressed, dense, velvety with dark, pulvinate conidiomata formed on the surface.

Type: Brazil, Bahia, Serra da Jiboia, municipality of Santa Teresinha, alt. 161 m, (UTM: zone 24 L, 447912 W 8579954 S), on fallen leaves of *Salzmania nitida* DC. (Rubiaceae), 4 July 2006, J. L. Bezerra & L. O. Barbosa (Holotype AAUF 68937) (Figure 2).

Xylaria salzmaniae possibly is an endophyte that forms stromata on the host leaves when they mature and die. Pathogenicity tests performed indoors with on *S. nitida* seedlings and healthy detached leaves did not succeed. This species

Table 1 – *Xylaria salzmaniae* and other xylariaceous stipitate species on leaves and fruits

Taxon	<i>Xylaria salzmaniae</i>	<i>X. sicula</i> ¹	<i>Podosordaria aristata</i> ²	<i>P. axifera</i> ³
Country/Host	Brazil / <i>Salzmania nitida</i>	Moroco / <i>Olea europae</i>	Mexico/ <i>Guazuma ulmifolia</i>	Central and South America / <i>Schefflera</i> spp. and <i>Panax</i> sp
Substrate	Dead leaves	Dead fruits and leaves	Dead fruits	Dead leaves
Stroma head	Subglobose, aristate	Subglobose to irregular, aristate	Globose to conic, aristate	Subglobose to irregular, aristate
Stroma stipe(mm)	0,8-2,3 long	10-30 long	35-40 long	2-4 long
Ascus(μ m)	75-95 x 7-10	100 x 7	100-115 x 6-7.5	260-280 x 7.15-9.6
Ascospore (μ m)	Ellipsoid, asymmetrical 11-15 x 5-7	Ellipsoid, asymmetrical 10 x 4-5	Cymbiform, asymmetrical 9-10 x 4-4,5	Elongated 21-28 x 6-7
Germ slit	Straight (spore length)	Straight (spore length)	Straight (3/4 spore length)	Straight to sigmoid (spore length)

¹Saccardo (1882); ²Gonzalez and Rogers (1989); ³Laessle and Lodge (1994).



Figure 2. A- Location of the municipality of Santa Teresinha-Ba, included in the semiarid region. B- Location (UTM: zone 24 L, 447912 W 8579954 S) of the collection area in the Serra da Jibóia reserve. Image source: Google Earth e Google Map.

differs from *Podosordaria aristata*, *P. axifera* and *X. sicula* by a combination of features as shown in Table 1. More similarity was apparent with *X. sicula* from which differs by much shorter stromata stipes, geographical distribution and host. *Xylaria sphaerica* was described by Haung et al. (2015) on wood from Hainan, China, showing some similarities to *X. sicula* but presenting protruding branches near the base of the stromata head. This character differs strongly from *P. salzmaniae*. No culture or anamorph were mentioned.

In view of the results obtained in this work, it is concluded that the fungus under study is a new species of the genus *Xylaria*, named *X. salzmaniae* in reference to the plant host.

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