



## Conidial fungi from the semi-arid Caatinga Biome of Brazil. A new species of *Dictyochaeta*

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### Abstract

During a survey of freshwater conidial fungi associated with submerged plant debris, an interesting specimen of *Dictyochaeta* was found. *Dictyochaeta aciculata* sp. nov. is characterized by 3-septate, acicular conidia with rounded bases. These morphological characteristics differentiate the species found in Brazil from previously described taxa in *Dictyochaeta* and it is, therefore, described and illustrated herein as a novel species.

**Key words** – freshwater fungi – lotic environment – taxonomy – tropical

### Introduction

The genus *Dictyochaeta* Speg. was erected in 1923, with the type species *D. fuegiana* and it was characterized by setae, conidiogenous cells which are mono- or polyphialidic and conidia 0-septate, without setulae. A brief historical review on nomenclatural aspects on *Dictyochaeta* and related genera, such as *Codinaea* Maire, *Codinaeopsis* Morgan-Jones and *Dictyochaetopsis* Aramb. & Cabello, was present by Li et al. (2012). The same authors, recognized molecular data from Reblová (2000) and Reblová & Winka (2000) for phylogeny of the teleomorph *Chaetosphaeria* Tul. & C. Tul. and its anamorphs.

Molecular studies conducted by Reblová & Winka (2000) revealed that setulate and aseptate conidia of *Dictyochaeta* species grouped into distinct sub groups in the phylogenetic tree. Thus, Reblová (2000) suggested maintaining the genus name *Dictyochaeta* for species without setulae and *Codinaea* for species with setulae.

Despite these taxonomic suggestions, many authors (Whitton et al. 2000, Kirschner & Chen 2002, Cruz et al. 2008) do not agree with Reblová (2000). In contrast, more recent workers are already following (Seephueak et al. 2010, Seifert et al. 2011, Li et al. 2012). Seifert et al. (2011) accepted the results of molecular data, however, they do not separate the two genera based on presence and absence of setulae. For this paper we follow Reblová (2000, 2004) and Reblová & Winka (2000).

*Dictyochaeta* species occur decomposing plant material in terrestrial (Kuthubutheen & Nawawi 1991a, Hernández-Gutiérrez & Mena Portales 1996, Cruz et al. 2008) and aquatic (Kuthubutheen & Nawawi 1991a,b,c, Cai et al. 2004) habitats. In Brazil, 17 species have been found associated with litter (Cruz et al. 2008, Santa Izabel et al. 2011) and two new species have been described (Cruz et al. 2008). In this paper, through investigations of conidial fungi

associated with submerged plant debris in rivers and streams in different areas in the Caatinga Biome, we found an interesting specimen, whose morphological characters agree with those of *Dictyochoaeta*, but it differs from all previously described species in the genus. We therefore propose the Brazilian specimen as a new species.

## Materials & Methods

Samples of submerged plant debris (leaves, petioles, twigs and bark) were collected in rivers and streams of the five priority areas for biodiversity conservation included in the semi-arid Caatinga Biome, northeast of Brazil (Velloso et al. 2002). Field expeditions were conducted in 2011 and 2012, into four states: Paraíba State- Brejo Paraibano, Ceará State- Chapada do Araripe and Serra de Ibiapaba, Piauí State- Serra das Confusões and Bahia State- Serra da Jibóia.

The material was transported in plastic bags to the laboratory, washed in water and incubated in moist chambers at 25°C for 30 days. During this period the samples were examined for the presence of conidial fungi. Slides containing the reproductive structures of fungi were made with resin PVL (polyvinyl alcohol + lactic acid + phenol) and deposited in the Herbarium of the State University of Feira de Santana (HUEFS).

## Results

### *Dictyochoaeta aciculata* S.S. Silva & Gusmão, **sp. nov.**

Figs 1–5

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Etymology – *aciculata*, referring to the conidial morphology.

Colony effuse, brown. Mycelium, partly superficial, partly immersed in substratum. Setae sterile, straight to slightly flexuous, up to 11-septate, light brown, finely verrucose, 195–205 × 6–9 µm. Conidiophores macronematous, mononematous, simple, solitary or in groups of 2–3 associated with base of setae, smooth, straight to slightly flexuous, 3–5-septate, pale brown to subhyaline at apex, 46.5–70 × 4.5 µm. Conidiogenous cells monophialidic, terminal, integrated, conspicuous collarete, smooth, pale brown to subhyaline, 24–31.5 × 4.5 µm. Conidia acicular with rounded bases, 3-septate, smooth, hyaline, 36–40 × 1.5–2 µm; arranged in slimy mass.

Teleomorph – unknown.

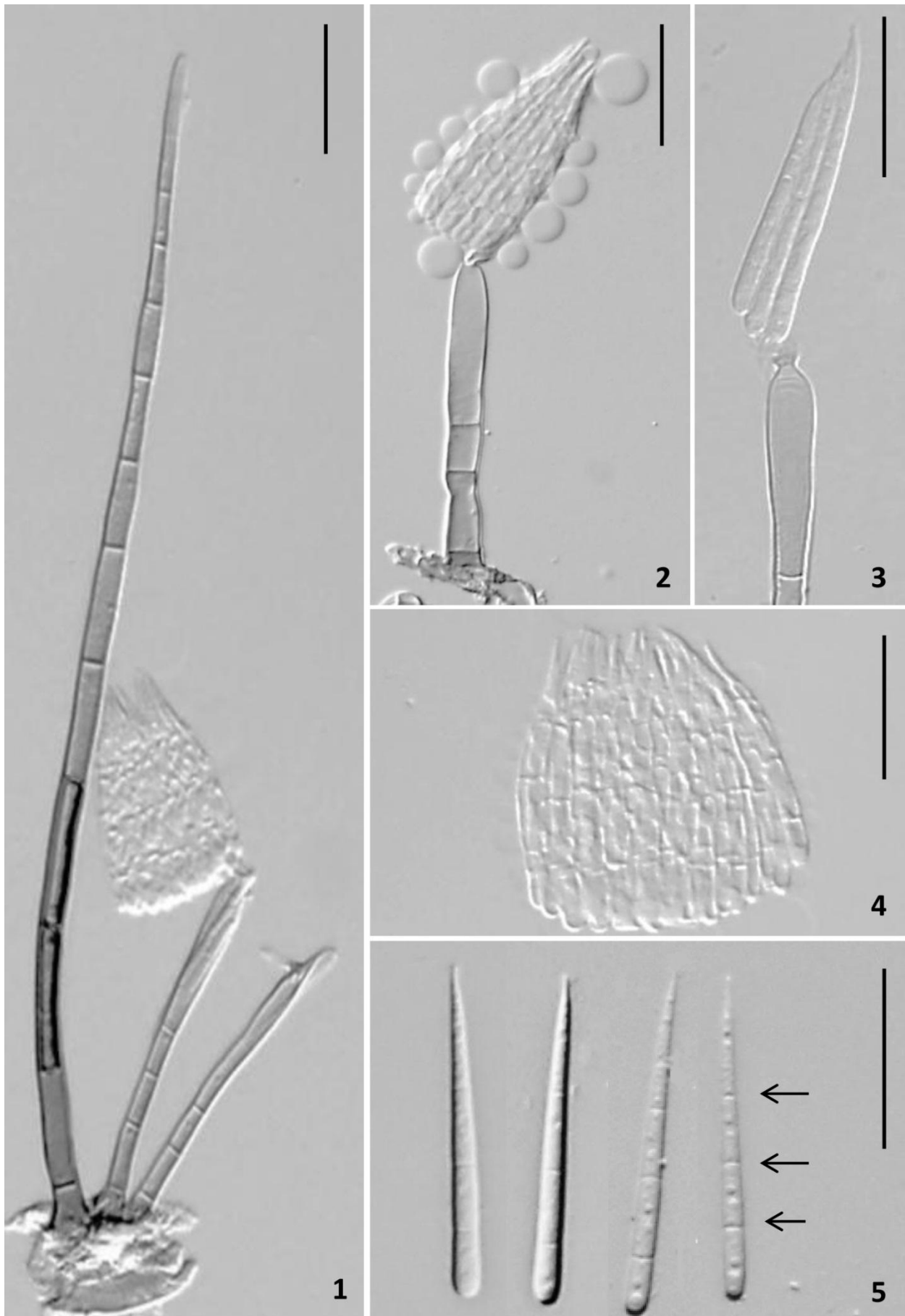
Geographical distribution – Piauí State, Brazil.

Holotypus – BRAZIL: Piauí: Caracol, Serra das Confusões, on submerged petiole, 6.V.2011; S.S.Silva (HUEFS 192225).

## Discussion

Among the species of *Dictyochoaeta*, falcate and lunate conidia are the most common and most representatives. However, only a few species produce septate, non-setulate conidia. These are *D. fruticola* (M.S. Patil, U.S. Yadav & S.D. Patil) Whitton, McKenzie & K.D. Hyde, *D. guadalcanalensis* (Matsush.) Kuthub & Nawawi, *D. ixorae* (M.S. Patil, U.S. Yadav & S.D. Patil) Whitton, McKenzie & K.D. Hyde, *D. lunata* (Matsush.) Whitton, McKenzie & K.D. Hyde and *D. setosa* (S. Hughes & W.B. Kendr.) Whitton, McKenzie & K.D. Hyde, which are morphologically most similar to *D.aciculata* (Table 1).

Despite morphological similarities, *D. aciculata* differs from all other species in the genus by having 3-septate, acicular conidia. In addition the setae are finely verrucose which is another morphological character that distinguishes it from all previously described species in *Dictyochoaeta*.



**Figs 1–5** – *Dictyochaeta aciculata*. 1 General aspect. 2 Conidiophore. 3 Detail of conidiogenous cell. 4 Conidia in a slime mass. 5 Conidia. Arrows indicate the septa. Bars: 20  $\mu$ m.

**Table 1** Comparison of *Dictyochaeta* species morphologically similar to *D. aciculata* (data from original descriptions).

Species	Setae	Conidiogenesis	Conidia			References
			Size (µm)	Form	Septa	
<i>D. aciculata</i>	present	monophialidic	36–40 × 1,5–2	acicular	3	Present study
<i>D. fruticola</i>	present	monophialidic	36–40 × 1.8	cylindric	1	Whitton et al. (2000)
<i>D. guadalcanalensis</i>	absent	polyphialidic	18–27 × 4.5–5.5	obclavate	1	Kuthubutheen & Nawawi (1991c)
<i>D. ixorae</i>	absent	monophialidic	18–12 × 1.8	falcate	1	Whitton et al. (2000)
<i>D. lunata</i>	absent	monophialidic/ polyphialidic	10–16 × 2.5–3.5	lunate	1	Whitton et al. (2000)
<i>D. setosa</i>	present	monophialidic	20–24 × 2–2.8	falcate	1	Whitton et al. (2000)

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