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New records of conidial fungi for Brazil

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ABSTRACT

In order to study the diversity of the leaf litter and aerial litter filamentous fungi, sample were collected from a semi-deciduous seasonal forest located in the Miguel Calmon, state of Bahia, Brazil. Leaf litter and aerial litter samples were collected. Samples were placed in moist chambers. Five conidial fungi were described for the first time in Brazil. Comments about their specimens and distribution were provided.

Key Words: Leaf litter, conidial fungi, mycota, taxonomy.

INTRODUCTION

The Parque Estadual das Sete Passagens (*Seven Passages State Park*) (PESP) is located in the Northern Chapada Diamantina, Brazil and has an area of 2,821 ha, with the presence of rupestrian field vegetation and semi-deciduous forest, with a record of around 532 plant species distributed in 316 genera and 103 families (Alves and Accioly 2009). This high level of forest diversity is related to spacial heterogeneity, resulting in a particular flora. Conservation areas, like the PESP, are appropriate and recommended for performing inventories and ecological studies on little known groups, like conidial fungi, due to the high level of forest diversity and the good state of conservation in which they are found.

Contributions to knowledge about filamentous fungi in the Brazilian Semi-arid areas were published, from 2007 to 2014, where various new species and new records were reported for the region, with highlights from Marques *et al.* 2007, Castañeda-Ruiz *et al.* 2008, Castañeda-Ruiz *et al.* 2009, Leão-Ferreira and Gusmão 2010, Barbosa *et al.* 2011, Cruz *et al.* 2012, Leão-Ferreira *et al*. 2013 and Almeida *et al.* 2014. Despite the studies conducted, these fungi are still little known since traditionally, in Brazil, greater attention has been given to phytopathogenic species due to the impact on agriculture and consequently, on the economy, making an investigative effort necessary in order to know a more specific number of saprobic species that represent the Brazilian ecosystems.

This article aims to describe the filamentous fungal species that make up the new records for Brazilian mycota, found in the Parque Estadual das Sete Passagens, Miguel Calmon, Bahia, Brazil.

MATERIAL AND METHODS

Leaf litter and aerial litter collections were made in a fragment of the semi-deciduous seasonal forest in the Parque Estadual das Sete Passagens, city of Miguel Calmon, Bahia, on a monthly basis over the period from October/2009 to September/2010 (Fig. 1 and 2).

Samples from the leaf litter and aerial litter were placed in Kraft paper sacks, transported to the laboratory and submitted to a washing technique under running water (Castañeda-Ruiz 2005). After drying, the materials were packed in moist chambers. During a period of 30 days, the substrates were observed under a stereo microscope, the reproductive structures of the fungi were collected and transfered for mounting on PVL (polyvinyl alcohol + lactophenol) resin. The identification of the fungi was performed using a specialized bibliography. The material was deposited in the Herbarium at the Universidade do Estado da Bahia (HUNEB), Senhor do Bonfim Collection.

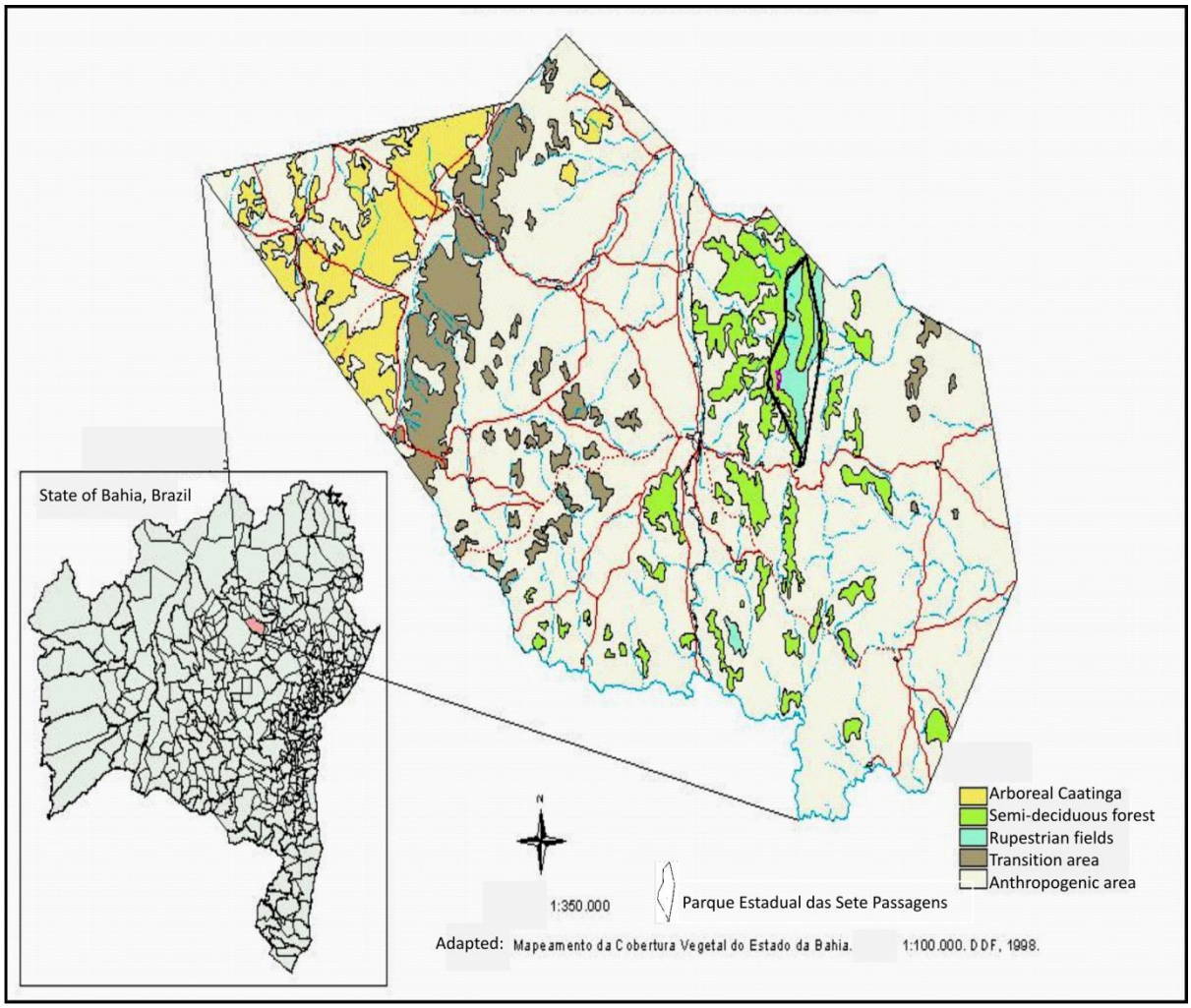

Fig. 1. Map of the study area (Adapted SEMARH 2006).

RESULTS AND DISCUSSION

1. *Cladosporium antillanum* R.F. Castañeda, Fungi Cubenses II (La Habana): 3, 1987. **Fig. 3 A-C**

Conidiophores macronematous, monematous, branched, straight or flexous, septate, brown, 265-500 x 5-7µm. Conidiogenous cell, terminal, integrated, sympodial, flat-tipped denticles, inflated apex. Conidia in chains, 1-septate, cylindrical, smooth, hyaline, 11-13 x 5 µm.

Geographical distribuition: Cuba (Castañeda-Ruiz 1987), Itália (Farr *et al.* 2012).

Material examined: BRAZIL. Bahia: Miguel Calmon, "Parque Estadual das Sete Passagens". On aerial litter Angiosperma unidentified, 03/X/2009. M.F.O. Marques s.n. (HUNEB/SB 1474).

Fig. 2. A -B Areas sampled in the Parque Estadual das Sete Passagens.

The *Cladosporium* genus of species are isolated from diverse environments around the world and are among the most common species of fungi (David 1997). In the material examined, the conidiophores are a little smaller than those recorded by Castañeda- Ruiz (1987). *C. antillanum* differs from the species *C. adianticolum* R.F. Castañeda and *C. ferrugineum* R.F. Castañeda for having conidiophores septated, smooth, conidia 0-1septate and conidiophores and conidia that were smaller, rusty and smooth, respectively (Castañeda-Ruiz 1987). The species is being cited for the first time in South America.

2. *Dictyochaeta subfuscospora* Kuthub. &Nawawi, Mycol. Res.95 (10): 1214, 1991. **Fig. 3 D-F**

Setae fertile, erect or curved, septate, smooth, brown 100-157,5 x 5-10 µm. Conidiophores arranged around the setae, macronematous, mononematous, solitary or fasciculate, straight or flexous, smooth, terminating in 1 or 2 collarettes, brown, 25-35 x 5 µm. Conidiogenous cell polyphialidic, integrated, terminal with prominent collarettes, brown. Conidia in slimy masses, ovate, 0-septate, smooth, initially hyaline to subhyaline, brown in maturity, 15-25 x 7,5-10 µm.
Geographical distribuition: Austrália (Hyde and Goh 1997); Malásia (Kuthubutheen and Nawawi, 1991); Hong Kong (Tsui*et al.* 2001).
Material examined: BRAZIL. Bahia: Miguel Calmon, "Parque Estadual das Sete Passagens". On leaves of Angiosperma unidentified, 03/X/2009. M.F.O. Marques s.n. (HUNEB/SB 1475).

The species described in *Dictyochaeta* and *Codinaea* have hyaline conidio. *D. subfuscospora*, however, has conidia that are initially hyaline to sub-hyaline, becoming a clear brown (Kuthubutheen and Nawawi 1991), which makes them quite different from the descriptions of the other species of this genus. The characteristics of the material studies are in agreement with those described by Kuthubutheen and Nawawi (1991). Tsui *et al.* (2001) recorded isolated differences from Hong Kong where they verified the presence of two types of conidia: ellipsoids and spherical, in addition to the absence of sympodial proliferation. The species is being cited for the first time in the neotropics.

3. *Ellisembia filia* Wu, W.P. *Sporidesmium*, *Endophragmiella* and related genera from China. 131, 2005. **Fig. 3 G**

Conidiophores macronematous, mononematous, solitary, straight or flexous, septate, smooth, base triangular, brown, 20-32,5 x 5-7,5 µm. Conidiogenous cell monoblastic, integrated, terminal, determinated. Conidia solitary, obclavate, 6-8 distoseptate, smooth, brown, 42,5-52,5 x 12,5-15 µm, filiforme appendage, hyaline, 30-45µm.
Geographical distribuition: China (Wu and Zhuang 2005).
Material examined: BRAZIL. Bahia: Miguel Calmon, "Parque Estadual das Sete Passagens". On

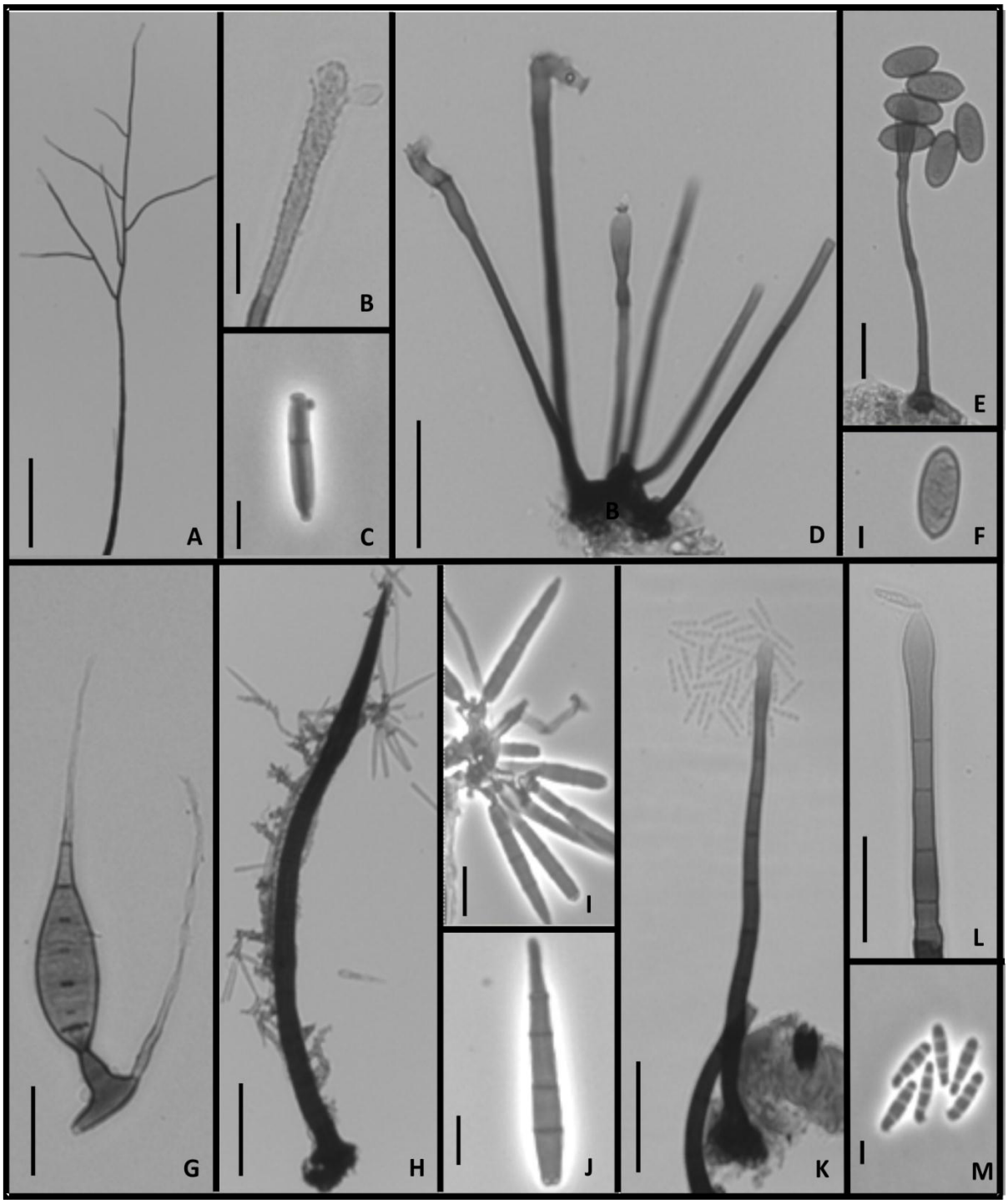

Fig. 3. A- C. *Cladosporium antillanum*.**A.** General aspect. **B.** Details conidiophore apex. **C.** Conidia; **D-F.** *Dictyochaeta subfuscospora*. **D-E**. General aspect. **F.** Conidia. **G.** General aspect of *Ellisembia filia*. H-J. *Fuscophialis gigas*. **H.** *F. gigas* on *Paraceratocladium silvestre*. **I.** General aspect. **J.** Conidia. **K-M.** *Kylindria triseptata*. **K.** General aspect. **L.**Conidiophore apex. **M.** Conidia. Bars = 50 µm (A, D, H, K); 20 µm (B,E,G, L); 10 µm (I, J); 5 µm (C, F,M).

aerial litter Angiosperma unidentified, 17/V/2010. M.F.O. Marques s.n. (HUNEB/SB 1476).

Ellisembia filia is characterized by presenting a short conidiophore, not having percurrent proliferation, and conidia with 7-8 distoseptates, with a filiform appendix (Wu and Zhuang 2005). The species *E. flagelliformis* (Matsush.)W.P. Wu and *E. bambusae* (M.B. Ellis) Subram. are similar to the species described. However, *E. flagelliformis* has conidia that are not as straight and have apical filiform appendices, 0-1 septate and *E. bambusae* has a filiform appendix, surrounded by a mucilaginous mass, 0-septate (Ellis 1965, Matsushima 1975). In the material examined, the conidiophores were larger than what was recorded in the original description by Wu and Zhuang (2005). The species is being cited for the first time in the neotropics.

4. *Fuscophialis gigas* R. F. Castañeda, Fungi Cubenses II: 7. 1987. **Fig. 3 H-J**

Conidiophores macronematous, mononematous, simple, septate, cylindrical to ampulliform, brown, 12,5-17,5 x 2,5-3 µm. Conidiogenous cell polyblastic, intercalary or terminal, integrated, sympodial, apically denticulate or entire extent of conidiophore. Conidia solitary, subhyaline, 3-4septate, navicular to subulate, thickened at the base, 12, 5-35 x 2, 5µm.

Geographical distribuition: Cuba (Castañeda-Ruiz 1987).

Material examined:BRAZIL. Bahia: Miguel Calmon, "Parque Estadual das Sete Passagens". On leaves of *Myrcia multiflora* (Lam) DC. (Myrtaceae), 17/IV/2008. C. A. Oliveira s.n. (HUNEB/SB 1408).

The genus *Fuscophialis* is comprised of four species (*F. brasiliensis* B. Sutton, *F. cubensis* Mercado & J. Mena, *F. gigas* R.F. Castañeda and *F. suttonii* Dulym., W.P. Wu & Peerally. *Fuscophialis brasiliensis* B. Sutton and *F. gigas* are similar species that are distinguished by the number of septa and the dimensions of the conidia (Sutton 1977, Castañeda-Ruiz 1987). The specimen studied presented conidia with smaller dimensions than those referred to in the original description of the species. *F. gigas* was recorded for the first time on *Gesneriae* sp. (Gesneriaceae) leaves, attached to the setae of the *Paraceratocladium polysetosum* Castañeda (Castañeda-Ruiz 1987). In the material analyzed, the specimens were recorded on the setae of the *Paraceratocladium silveste* Castañeda. This constitutes the first record of the species in South America.

5. *Kylindria triseptata* (Matsush.) DiCosmo, S.M. Berch& W.B. Kendr., Mycologia75(6): 971, 1983. **Fig. 3 K-M**

Conidiophores macronematous, mononematous, erect, septate, smooth, brown, dark brown base to the middle region, and pale brown from the middle region, 202,5-225×7,5-10µm. Conidiogenous cell, terminal, integrated, determinate. Conidia 3-septate, cylindrical, smooth, hyaline, 12,5-17,5 x 2,5-5,0µm.

Geographical distribuition: Etiópia (Bhat and Sutton 1985); Índia, Cuba, Hong Kong (Farr et al. 2012).

Material examined: BRASIL, Bahia, Miguel Calmon, Parque Estadual das Sete Passagens. On leaves of Angiosperma unidentified, 04/XI/2008. R. F. Araújos.n. (HUNEB/SB 1495).

The genus was created in 1983 by DiCosmo et al. (1983) to include monophyletic species previously place in *Cylyndrotrichum* and there are currently 15 species. *K. triseptata* (Matsush.) DiCosmo, S.M. Berch and W.B. Kendr.is a type species from this genus. The material studies present some 2-septated conidia, as observed in the original description of the species described by Matsushima (1975). This constitutes the first record of the species in South America.

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