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Clathrosporium retortum, a novel aeroaquatic fungus in the Sordariomycetidae (Ascomycota) from Brazil

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Abstract

Clathrosporium retortum sp. nov., collected on submerged mixed leaf litter samples at Ilha do Cardoso State Park, São Paulo state, Brazil, is described based on morphological and molecular data. The fungus is characterized by forming whitish, dense, subglobose to irregular propagules, hyaline to subhyaline when young, subhyaline to dark brown at maturity, that are formed by densely interwoven conidial filaments with each conidial cell repeatedly branching bilaterally or occasionally unilaterally. Phylogenetic analyses using partial LSU nrDNA sequence data suggest that *C. retortum* belongs in the Sordariomycetes (Ascomycota) where it forms a well-supported clade with *Clohesia corticola* in the Sordariomycetidae, but its ordinal or familial placement remains unresolved. Its phylogenetic placement confirms the polyphyletic nature of aeroaquatic fungi like *Clathrosporium*, as it was distantly related to one available sequence in GenBank named as *C. intricatum*, the type species, which is phylogenetically related to the Helotiales (Leotiomycetes). However, due to lack of authenticity of the identity of this sequence with the type specimen of *C. intricatum*, a broad concept of *Clathrosporium* is tentatively adopted here to accommodate the present fungus instead of introducing a new genus. *Beverwykella clathrata*, *Helicoön septatissimum* and *Peyronelina glomerulata* are recorded for the first time from Brazil. *Cancellidium applanatum* and *Candelabrum brocchiatum* are new records for the state of São Paulo.

Key words: biodiversity, hyphomycetes, insular areas, molecular, taxonomy

Introduction

Beverwijk (1951) first proposed the ecological group of aeroaquatic hyphomycetes to conceptualize fungi that are able to reproduce asexually only at the interface of air and water. The aeroaquatic fungi are known to occur in almost all types of aquatic environments (Bodiagyn & Prokhorov 2010). Moreover, they are adapted to sites with low concentrations of oxygen being prevalent in small water bodies, lentic-forest lakes and swamps (Bärlocher *et al.* 1978, Fisher & Webster 1979, 1981, Field & Webster 1983). Their propagules are morphologically diverse, but all species have one characteristic in common, which is the storage of air inside their propagules between the cells, enabling them to float on the air-water interface (Goh & Hyde 1996, Michaelides & Kendrick 1982, Webster & Descals 1981). Together with other microfungi, aeroaquatic hyphomycetes play an important role in nutrient cycling as leaf litter decomposers (Bodiagyn & Prokhorov 2010).

This ecological group of fungi has been poorly studied in the Neotropics with only a few scattered records or novelties from submerged wood or herbaceous debris in freshwater or terrestrial habitats (Allegrucci *et al.* 2009, Becerra *et al.* 2007, Castañeda & Kendrick 1991, Delgado & Mena 2004, Heredia *et al.* 2000, Matsushima 1983, 1993, Voglmayr & Delgado 2001, 2003, Zelski *et al.* 2014). In Brazil, such studies are still scarce, nevertheless there are results concerning the "Caatinga" biome in the country's northeast (Barbosa & Gusmão 2011, Silva *et al.* 2014). In order to increase our knowledge about the diversity of freshwater hyphomycetes in Brazil, submerged mixed leaf litter samples were collected from lotic environments in biodiversity-rich insular areas of the southeastern Brazilian coast. Several interesting aeroaquatic taxa were recovered after incubation of material from the surveyed areas. Among these, one fungus producing whitish, dense propagules morphologically similar to *Clathrosporium* Nawawi & Kuthub. in shape and branching pattern (Hennebert 1998, Nawawi & Kuthubutheen 1987) was isolated twice at the same location.

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