



Achlya catenulata sp. nov., a new Saprolegniales (Oomycetes, Straminipila) from Brazilian mangrove swamp

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Abstract

Achlya catenulata sp. nov. was collected from water samples in a mangrove swamp of the “Parque Estadual da Ilha do Cardoso”, São Paulo State, Brazil. This new species is characterized by the presence of achlyoid type of zoospore discharge from both primary and secondary sporangia, catenulate smooth-walled oogonia in chains of up to 11 oogonia, declinuous antheridial branches and eccentric oospores, which generally failed to mature. Maximum likelihood phylogenetic analyses based on the ITS and LSU regions (rDNA) placed this species within the *Achlya sensu stricto* clade.

Key words: catenulate oogonia, eccentric oospores, ITS and LSU phylogeny, Oomycota, taxonomy

Introduction

The genus *Achlya* Nees belongs to Saprolegniales, a representative order of Oomycetes which are commonly found as saprobes on plants and animal debris in freshwater and terrestrial habitats (Dick 2001, Johnson *et al.* 2002, Shearer *et al.* 2007). Some species can also be etiologic agents of diseases of freshwater fishes and crustaceans, with some reports of pathogens in plant roots (Willoughby 2003, Marano *et al.* 2011, Beakes *et al.* 2014). Molecular studies showed that this order forms a well-supported monophyletic clade, however, the families and genera have been reorganized (Dick *et al.* 1999, Spencer *et al.* 2002, Beakes & Sekimoto 2009, Beakes *et al.* 2014). More recently, Beakes *et al.* (2014) proposed Achlyaceae fam. nov. which aggregates four genera, *Achlya sensu stricto*, *Brevilegnia*, *Dictyuchus* and *Thraustotheca*, all with eccentric oospores in the “achlyoid/thraustothecoid clade”. Currently, the family Saprolegniaceae *sensu stricto* is composed by species producing centric/subcentric oospores in the genera *Aplanes*, *Aplanopsis*, *Calyptralegnia*, *Newbya*, *Protoachlya*, *Pythiopsis* and *Saprolegnia*, and the Verrucalvaceae by *Aphanomyces*, *Aquastella*, *Pachymetra*, *Plectospira*, *Sommerstorffia* and *Verrucalvus*. The taxonomical position of the genus *Leptolegnia* is still uncertain. This genus has been previously included in both Leptolegniaceae and Saprolegniaceae (Dick *et al.* 1999, Petersen & Rosendahl 2000, Johnson *et al.* 2002) and therefore needs additional studies in order to elucidate its phylogenetic position.

Achlya has approximately 50 valid species (Johnson *et al.* 2002, El Androusse *et al.* 2006, Paul & Steciow, 2008, Kirk *et al.* 2008). Historically, this genus has been divided into different groups or sub-genera (Coker 1923, Johnson 1956) showing the morphological plasticity in its species. Molecular studies showing that *Achlya sensu lato* is polyphyletic have been increased in the last few years (Riethmüller *et al.* 1999, Leclerc *et al.* 2000, Dick 2001, Spencer *et al.* 2002, Beakes *et al.* 2014). Based on SSU (rDNA) phylogenetic analyses Spencer *et al.* (2002) transferred to *Newbya* gen. nov. the species with centric and subcentric oospores and laterally attached antheridia, which formed a monophyletic clade and were previously segregated from *Achlya* (Dick 1973). Other species of *Achlya* with both cymose and internal proliferation of the zoosporangia and motile and nonmotile spores on emerging were transferred to *Protoachlya* (Coker 1923, Johnson *et al.* 2005).

Our new species was isolated from water samples in a mangrove swamp of the “Parque Estadual da Ilha do