



Light and ultrastructural analysis of *Myxobolus insignis* (Myxozoa), infecting the Amazonian Fish *Semaprochilodus insignis* (Prochilodontidae)

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Abstract

A myxosporean infecting the gill filaments of the freshwater teleost *Semaprochilodus insignis* collected in the Trombetas River (Central Amazonian Region, Brazil) is described using light and electron microscopy. The spores were ovoid in frontal view with round extremities and measured $15.4 \pm 0.6 \mu\text{m}$ in total length, $12.4 \pm 0.5 \mu\text{m}$ wide and $8.1 \pm 0.7 \mu\text{m}$ thick; the spore valves (up to $0.4 \mu\text{m}$) were surrounded by a uniform dense layer with variable thickness up to $\sim 1.0 \mu\text{m}$ due to the presence of a complex network of anastomosed microfibrils closely adherent to the valves. Two symmetric polar capsules measured $5.9 \pm 0.4 \mu\text{m}$ long and $3.4 \pm 0.5 \mu\text{m}$ wide, each having a polar filament with 7-8 coils slightly obliquely to the longitudinal axis of the polar capsule. The polar capsule wall measured $\sim 0.4 \mu\text{m}$ thick and was constituted by a hyaline substance ($\sim 0.25 \mu\text{m}$ thick) surrounded by a layer of electron dense granular material ($\sim 0.15 \mu\text{m}$ thick). In this paper we present, by the first time, ultrastructural aspects of the spores of *Myxobolus insignis* found in a teleost collected from the Amazonian region, which was previously described based on light microscopy (Eiras *et al.* 2005b).

Key words: Trombetas River, Amazonia, gills, myxosporean, *Myxobolus insignis*, spores, parasite

Introduction

Numerous descriptions of myxosporean species have been reported in fish from different geographic areas (Lom & Dyková 2006). Among the myxosporeans, the genus *Myxobolus* is one the most common myxosporean pathogens infecting fishes, possessing a world-wide distribution (Gioia & Cordeiro 1996; Eiras *et al.* 2005a; Lom & Dyková 2006).

The great majority of the different species of *Myxobolus* parasitizing Brazilian host freshwater fishes were described using light microscopy and diagrammatic drawings of their spores to determine the species (Kent & Hoffman 1984; Molnár & Békési 1993; Molnár *et al.* 1998; Cellere *et al.* 2002; Eiras *et al.* 2005b, 2007; Martins & Onaka 2006). Some ultrastructural data of the developmental stages of the different *Myxobolus* spp. have also been provided (Casal *et al.* 1996, 2002, 2006; Azevedo *et al.* 2002, 2009, 2010, 2011; Tajdari *et al.* 2005; Adriano *et al.* 2006, 2009a, 2009b, 2010).

This paper presents ultrastructural data of *Myxobolus insignis* parasite of *Semaprochilodus insignis* collected from the Amazonian region, which was previously described based on light microscopy (Eiras *et al.* 2005b).