

## SHORT NOTE

# *Acanthostomoides apophalliformis* (Trematoda: Cryptogonimidae) Does Not Cause Detectable Mortality in *Galaxias maculatus* (Teleostomi: Galaxiidae)

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## ABSTRACT

The present study was conducted to determine if parasite induced mortality existed in a “puyen” population in Moreno Lake, southern Argentina. Data on both parasite abundance and degree of aggregation of parasite frequency distribution showed the absence of fish mortality induced by *A. apophalliformis*.

**Key words:** *Galaxias maculatus*, *Acanthostomoides apophalliformis*, parasite-induced host mortality

## INTRODUCTION

The “puyen” *Galaxias maculatus* is a small native fish that inhabits southern South America and Oceania. This is a protected species in Nahuel Huapi National Park and Reserve, southern Argentina. *Acanthostomoides apophalliformis* is a digenetic trematode whose metacercaria stage frequently parasitizes “puyenes”, generally located in the liver (Revenga and Scheinert, 1999a). In a recent study, Revenga et al. (2005) reported mean intensities of 1.8 – 4.4 parasites/infected fish and prevalences of 41.4 - 96.7 % in Lake Moreno, southern Argentina. Information on the biology of *A. apophalliformis* is available in Torres et al., (1988); Ostrowsky et al., (1999); Trochine, (2000). Up to 13 metacercariae have been found in histological liver

sections of “puyenes” (representing approximately 15 % of the liver volume), producing atrophy by compression and, in most cases, no inflammatory reaction was found (Revenga, Torres and Siegmund unpublished). Such an extensive alteration is considered a possible cause for inducing host mortality.

Anderson and Gordon (1982) introduced a quantitative approach for detecting signs of parasite-induced host mortality in fish populations. They used simulation experiments (Monte Carlo) and considered a decline of both parasite mean abundance and degree of aggregation of parasite frequency distribution (measured as the variance to mean abundance ratio) in older fishes, to be clear signs (though not conclusive) of such a mortality. The present study applied this quantitative techniques, to determine if damage,

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observed at histopathological level, induced significant mortality in a “puyen” population in Lake Moreno.

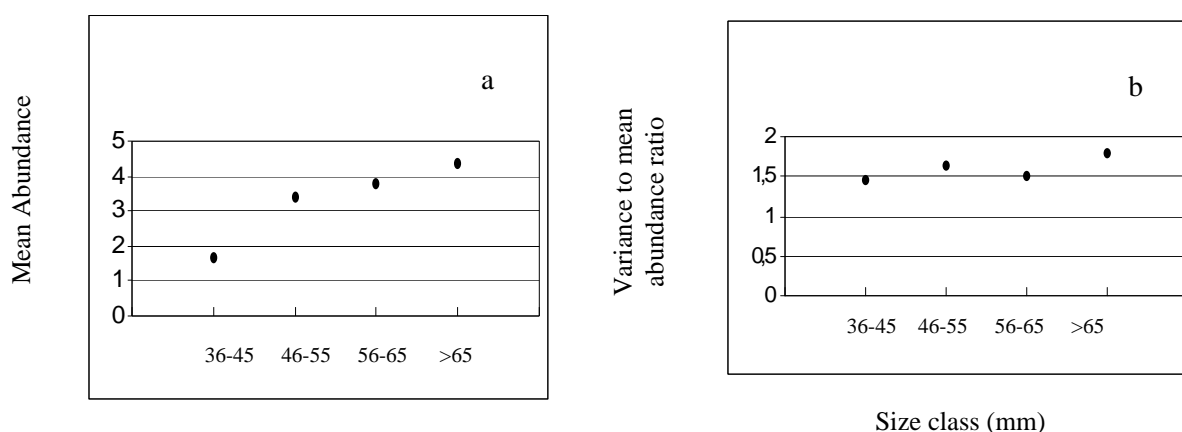
## MATERIALS AND METHODS

In January 2001, 477 “puyenes” *G. maculatus* were obtained in baited traps in Lake Moreno (41° 04' S, 71° 33' W), southern Argentina. Traps were submerged at a depth not more than 0.5 m for one day. In the lab, the fishes were measured and dissected under stereomicroscope to collect *A. apophalliformis*. Parasites were processed

according to Ostrowski et al., (1999). In this paper the terms mean abundance, mean intensity and prevalence are used according to the recommendations of Margolis et al. (1982).

## RESULTS AND DISCUSSION

Fig. 1 showed that mean abundance of parasites increased steadily with size (as age indicator) of fish (a), whereas variance to mean abundance ratio increased from size class 36-45 to size class 46-55 mm, decreased in size class 56-65 mm and increased again in size class > 65 (b).



**Figure 1** - Variation of parameters for detecting parasite-induced host mortality according to host size (taken as age indicator) for *Galaxias maculatus* from Lake Moreno. a: abundance; b: variance to mean abundance ratio.

This pattern clearly differed from that shown by Anderson and Gordon (1982), for “convex” or “peaked” curves of parasite mean abundance, declining concomitantly with the variance to mean abundance ratio in older fish. It was, therefore, concluded that the lesions occupying up to 15 % of the liver volume and atrophy by compression observed by Revenga, Torres and Siegmund (unpublished) did not induce significant mortality in the “puyen” population studied. Similar results were reported by Revenga and Scheinert (1999b) for *Tylodelphys barilochensis*, another trematode also infecting “puyenes” as the metacercaria stage.

The fact that both fish and parasites were autochthonous, high parasite abundance (prevalences 41.4-96.7 %), lack of inflammatory reactions in most cases (Revenga, Torres and

Siegmund, *loc. cit.*) and absence of parasite-induced host mortality, suggested that the system had coevolved according to the mutualistic model reviewed by Holmes (1983).

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## RESUMO

*Acanthostomoides apophalliformis* (Trematoda: Cryptogonimidae) não causa mortalidade detectável no peixe *Galaxias maculatus* (Teleostomi: Galaxiidae) de Argentina do Sul. O

"puyen", *Galaxias maculatus*, é um peixe nativo pequeno que habita a América do Sul e a Oceania. *Acanthostomoides apophalliformis* é um trematódeo digenético que parasita, freqüentemente, os "puyenes". O estudo atual foi conduzido para determinar se existe mortalidade induzida por parasito no população do "puyen" no lago Moreno, no sul de Argentina. Os dados de abundância do parasito e no grau de agregação da distribuição de freqüência do parasito, sugerem a ausência de mortalidade induzida por *A. apophalliformis* em "puyenes".

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