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Taxonomy and systematics

Macroparasites of silversides (Atherinopsidae: *Odontesthes*) in Argentina

Macroparásitos de pejerreyes (Atherinopsidae: Odontesthes*) en Argentina*

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Abstract

This study presents new geographical distribution records for the macroparasites of the marine *Odontesthes nigricans* (Richardson, 1848) (89 wild specimens), and for the freshwater silversides *Odontesthes bonariensis* (Valenciennes, 1835) (43 wild and 108 cultured specimens), and *Odontesthes hatcheri* (Eigenmann, 1909) (183 wild specimens) from Argentina. These data represent records of 12 parasite taxa for *O. nigricans*, 8 for *O. bonariensis*, and 19 for *O. hatcheri*, which include digeneans, monogeneans, cestodes, nematodes, acantocephalans, mollusks, copepods, and branchiurans. For cultured *O. bonariensis*, the records of the present study correspond to the first reports of parasites in the literature. This work provides also data on site of infection, parasite load, and development stages for the parasite species.

Keywords: *Odontesthes nigricans*; *Odontesthes bonariensis*; *Odontesthes hatcheri*; Parasites; Argentina; Freshwater; Marine; Wild; Cultured

Resumen

Este estudio presenta nuevos registros de distribución geográfica de macroparásitos del pejerrey marino *Odontesthes nigricans* (Richardson, 1848) (89 especímenes silvestres), de los pejerreyes de agua dulce *Odontesthes bonariensis* (Valenciennes, 1835) (43 ejemplares silvestres y 108 cultivados) y de *Odontesthes hatcheri* (Eigenmann, 1909) (183 especímenes silvestres) en Argentina. Doce taxones parásitos se registraron para *O. nigricans*, 8 para *O. bonariensis* y 19 para *O. hatcheri*, incluyendo digéneos, monogéneos, cestodos, nematodos, acantocéfalos, moluscos, copépodos y branquiuros. Para los ejemplares de *O. bonariensis* de cultivo, los registros del presente estudio corresponden a los primeros sobre parásitos en la literatura. Además, se presentan datos sobre la localización del parásito, sus valores de infección y sus estados de desarrollo.

Palabras clave: *Odontesthes nigricans*; *Odontesthes bonariensis*; *Odontesthes hatcheri*; Parásitos; Argentina; Agua dulce; Marinos; Silvestres; De cultivo

Introduction

The species of *Odontesthes* (silversides) compose the most representative genus of Atherinopsidae, containing 19 species (Dyer, 2006). The silversides have great adaptability to different habitats and are distributed in marine, brackish, and freshwater environments (Dyer, 2006). Due to the flavor of the meat, these fishes are important in recreational fishery, commercial exploitation, and aquaculture (Grosman, 2001). *Odontesthes bonariensis* (Valenciennes, 1835) is the only cultured species, and has been widely used for repopulation purposes and have been introduced into Europe, Asia, and Africa (Tombari & Volpedo, 2008).

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In Argentina, studies on freshwater silversides are mainly focused on culture, genetics, physiology, and ecology of *O. bonariensis* (Colautti, Garcia, Balboni, & Baigún, 2010; Grosman, 2001), and of *Odontesthes hatcheri* (Eigenmann, 1909) (Ruiz, 2007). The information on the marine silversides is limited, based mainly on *Odontesthes nigricans* (Richardson, 1848) and focused on the physiology of the specimens (Lattuca et al., 2009).

Although silversides species are widely distributed, reports of parasites from wild fishes are scarce and scattered (Carballo, 2008; Carballo, Laurenti, & Cremonte, 2011; Carballo, Navone, & Cremonte, 2011; Carballo, Cremonte, Navone, & Timi, 2012; Drago, 2012; Mancini, Rodríguez, Prosperi, Salinas, & Bucco, 2006; Mancini et al., 2008; Ortubay, Semenas, Úbeda, Quaggiotto, & Viozzi, 1994). Besides publications on rearing silversides, there is no published information on their parasites (Tanzola, Semenas, & Viozzi, 2009). The objective of the present work is to report the macroparasite fauna of the wild marine *O. nigricans* and the wild freshwater *O. bonariensis* and *O. hatcheri*, and the cultured *O. bonariensis*.

Materials and methods

A total of 89 *O. nigricans* were collected from 2 marine sites, 151 *O. bonariensis* were collected from 5 sites, and 183 *O. hatcheri* were collected from 13 sites, both the latter from freshwater environments (Fig. 1; Table 1). The fish were captured using gill and seine nets. Cultured *O. bonariensis* were collected from outdoor man-made ponds and indoor fiberglass tanks located within the campus of INTECH (Instituto Tecnológico de Chascomús), which were supplied with underground waters, and from floating cages located in Lacombe and Chascomús Pampean Lakes (Fig. 1; Table 1). Specimens of *O. hatcheri* and *O. bonariensis* were transported fresh to the laboratory, and those of *O. nigricans* were slit opened and fixed in 5% formalin in the field. Fish were measured, and necropsied to examine fins, skin, eyes, gills, and all internal organs with the aid of a dissecting microscope. The parasites were collected, identified, and counted. Prevalence and mean intensity were calculated. New geographical record refers to the first date that a parasite is reported in a new biogeographic region, ecoregion or basin, and new host record refers to the first time that a parasite is cited for a new host species. Furthermore, we followed the classification proposed by Niewiadomska (2002) for the family Diplostomidae, who considered as valid the genera *Diplostomum*, *Austrodiplostomum*, *Tylodelphys*, and *Dolichorchis*. Measurements of specimens are given in µm. Voucher specimens of parasites were deposited in the Colección Helmintológica del Museo de La Plata, Argentina.

Results

The data obtained represent 15 new geographical records and 2 new host records for *O. nigricans* (Fig. 2; Table 2); 2 new geographical records, 1 new host record (*T. cardiophilus*), and a new species (*Gyrodactylus* sp.) for *O. bonariensis* (Fig. 3;

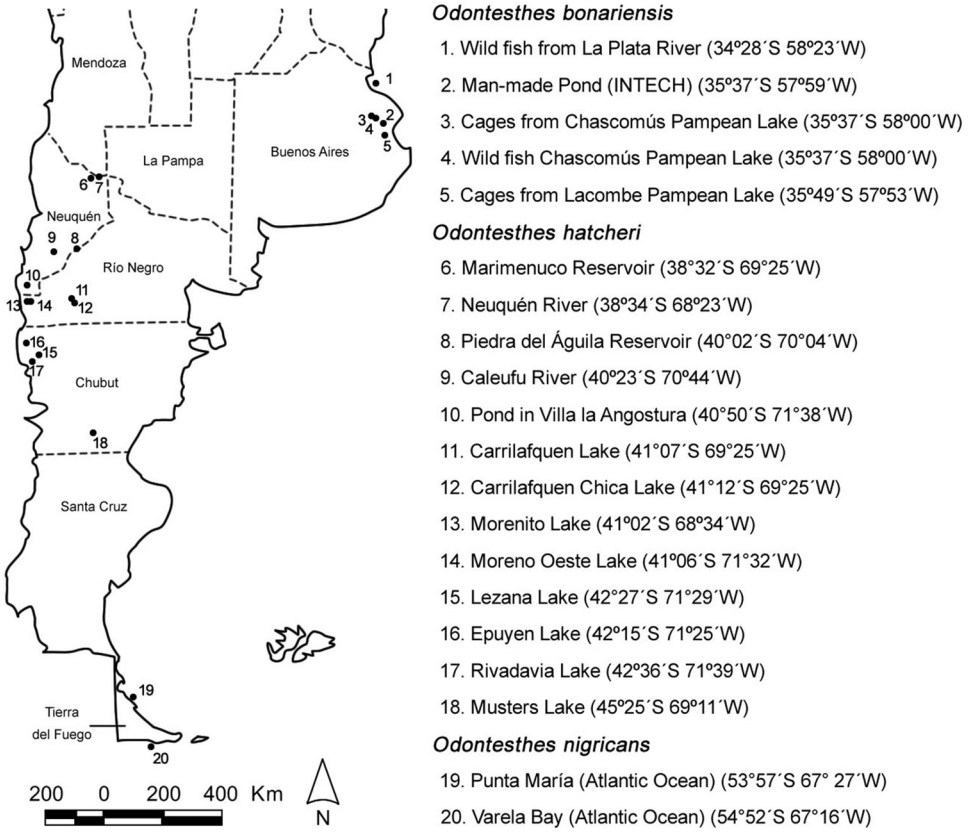

Figure 1. Location of the sampling sites of the silversides and their geographical coordinates in Argentina.