

Metazoan endoparasites of *Serrasalmus marginatus* (Characiformes: Serrasalminae) in the Negro River, Pantanal, Brazil

Metazoários endoparasitos de *Serrasalmus marginatus* (Characiformes: Serrasalminae) no Rio Negro, Pantanal, Brasil

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Abstract

In order to inventory the metazoan endoparasites of *Serrasalmus marginatus*, 91 specimens were examined. They were captured in the Negro River in Pantanal wetland, State of Mato Grosso do Sul, Central-Western Brazil, from October 2007 to August 2008. Parasites of six taxa were recovered: *Procamallanus (Spirocamallanus) inopinatus*, *Contraecum* sp. (Nematoda), metacercarial type *Diplostomulum* (Digenea), *Brevimulticaecum* sp. (Nematoda) and *Sebekia oxycephala*, *Subtriquetra* sp. 1 and *Subtriquetra* sp. 2 (Pentastomida). The latter five species are reported for the first time in *S. marginatus*.

Keywords: Parasites, prevalence, intensity of infection, freshwater fish, piranha.

Resumo

Com o objetivo de inventariar os metazoários endoparasitos em *Serrasalmus marginatus*, no Rio Negro, Pantanal, Mato Grosso do Sul, Brasil, foram examinados 91 espécimes capturados no período de outubro de 2007 a agosto de 2008. Foram registrados seis táxons parasitos: *Procamallanus (Spirocamallanus) inopinatus*, *Contraecum* sp. (Nematoda), metacercária do tipo *Diplostomulum* (Digenea); *Brevimulticaecum* sp. (Nematoda); e *Sebekia oxycephala*, *Subtriquetra* sp. 1 e *Subtriquetra* sp. 2 (Pentastomida). As últimas cinco espécies citadas são registradas pela primeira vez em *S. marginatus*.

Palavras-chave: Parasitos, prevalência, intensidade de infecção, peixe de água doce, piranha.

Studies on the parasitofauna of piranha *Serrasalmus marginatus* (Valenciennes, 1837) are scarce and mostly have focused on the taxonomy of some groups. The most remarkable reports on endoparasites in *S. marginatus* include that of Tanaka (2000) who reported *Procamallanus (Spirocamallanus) inopinatus*, specimens of Capilariidae, Railliet, 1915, and *Kritskyia* sp. and that of Böeger et al. (2001) who described *Kritskyia annakohnae* in ureters and urinary bladder, both studies in the Paraná River basin. The

hydrographic network of the Pantanal, with a variety of species of teleost fishes, has few records on parasite faunas, including piranha (*S. marginatus*) that is widely distributed in the Paraguay River basin.

Thus, with the aim of registering species composition of metazoan endoparasites in *S. marginatus*, there were necropsied 91 specimens caught with hooks and cast nets from October 2007 to August 2008. Six collections were performed in the middle of the main channel of Negro River (19° 35' 20.04" S and 56° 11' 4.19" W), a tributary of Paraguay River, Pantanal, State of Mato Grosso do Sul, Central-Western Brazil.

The procedures of necropsy, specimen collection, preparation and conservation of endoparasites were performed according to

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Eiras et al. (2006). The recovered parasites were compared with deposited specimens from the Helminthological Collection of Oswaldo Cruz Institute (CHIOC). Representative specimens of parasites were deposited in the Zoological Collection of Reference at Universidade Federal do Mato Grosso do Sul, such as the host (ZUFMS-PIS No. 3086). Parasitological descriptors were calculated according to Bush et al. (1997).

We found six endoparasite species (Table 1). The metacercarial type *Diplostomulum*, comprising the genera *Diplostomum* Nordmann, 1832, *Neodiplostomum* Railliet, 1919 and *Alaria* Schrank, 1788 (NIEWIADOMSKA, 2002), was determined by morphology of the reserve bladder with three longitudinal canals (one median and two lateral with ramifications directed posteriorly) connected anteriorly, posterior to the pharynx, and posteriorly, anterior to the ventral sucker.

The observed morphological characteristics in *P. (S.) inopinatus* are consistent with Moravec descriptions (MORAVEC et al., 1997), except for eight cephalic papillae arranged in two circles around the oral opening as the recovered specimens had only four cephalic papillae. Some individuals of *P. (S.) inopinatus* were compared with the voucher specimen CHIOC 31.324, host: *Leporinus* sp., Machado River, State of Rondônia, Brazil (GIESE et al., 2009). The specimen was visibly smaller, but with the same morphological structures of the one collected in the present study. This parasite is well documented in the literature and has been described in different fish species (PAVANELLI et al., 2004), including *S. marginatus* (TANAKA, 2000).

The first report of *Brevimulticaecum* sp. was of adult specimens in freshwater stingrays *Potamotrygon motoro* (Müller & Henle, 1841) by Rego (1979) in the Salobra River, State of Mato Grosso do Sul, and later Sprent (1990) described this species and named it *Brevimulticaecum regoi*. With respect to teleost fishes, in the neotropical region, there are reports on parasitic larvae of the *Brevimulticaecum* in the following fishes: *Gymnotus carapo* Linnaeus, 1758 and *Loricariichthys brunneus* (Hancock, 1828) in Venezuela (MORAVEC et al., 1997) and *Leporinus friderici* (Bloch, 1794),

L. lacustris Amaral Campos, 1945, *L. obtusidens* (Valenciennes, 1837) and *L. elongatus* Valenciennes, 1850, in Brazil (GUIDELLI, 2006). Some specimens were compared to voucher specimens CHIOC 36.977, host *Potamotrygon falkneri* Castex & Maciel, 1963, Paraná River, State of Paraná, Brazil (LACERDA, 2007). It was not possible to compare the ventriculus in the specimen because of overlapping body parts of the voucher specimen in permanent mounting.

Some larvae of *Contraecaecum* sp. were compared with voucher specimen CHIOC 35.521, host: *Geophagus brasiliensis*, Guandu River, State of Rio de Janeiro, Brazil (AZEVEDO et al., 2006). It was not found any morphological difference among them. Larvae of *Contraecaecum* sp. have been reported in different fish species including *S. marginatus* (PAVANELLI et al., 2004).

Larvae of *Sebekia oxycephala* were compared with voucher specimens CHIOC 32.445, host: *Pygocentrus nattereri* (Kner, 1958) and CHIOC 32.447, host: *Pseudoplatystoma corruscans* Spix & Agassiz, 1829, both in the Cuiabá River, State of Mato Grosso, Brazil (REGO; EIRAS, 1989). It was not found any morphological difference between voucher and collected specimens.

Pentastomids of genus *Subtriquetra* were divided into two morphospecies due to differences in body size, mouth, hooks and spines that are larger in *Subtriquetra* sp. 2. It was not possible to identify the species due to missing larvae descriptions of these pentastomids. Some individuals of both morphospecies were compared with larvae of *S. subtriquetra* (Diesing, 1836) CHIOC 17.697, reported in *Hoplias malabaricus* (Bloch, 1794) in the Salobra River, State of Mato Grosso do Sul, Brazil (TRAVASSOS; FREITAS, 1940), and with some larvae of *Subtriquetra* CHIOC 11.424, hosts: *P. nattereri*, Salobra River, State of Mato Grosso do Sul (unpublished information). The specimens collected showed morphological similarities with both voucher specimens.

It is the first report of metacercarial type *Diplostomulum* and larvae of *Brevimulticaecum* sp., *Sebekia oxycephala* and *Subtriquetra* spp. parasitizing *S. marginatus*.

Table 1. Metazoan endoparasites reported in *Serrasalmus marginatus* caught in the Negro River (19° 35' 20.04" S and 56° 11' 4.19" W), Pantanal, State of Mato Grosso do Sul, Brazil, from October 2007 to August 2008.

Parasites	SI	P (%)	MA ± SD	MI ± SD	RV
Digenea					
Metacercarial type <i>Diplostomulum</i> Poirier, 1886	inside swimming bladder	1.10	0.10 ± 0.10	1	---
Nematoda					
<i>Procamallanus (S.) inopinatus</i> (ZUFMS-INV No. 002)	cecum and intestine	5.49	0.05 ± 0.22	1	---
<i>Brevimulticaecum</i> sp. (ZUFMS-INV No. 003)	stomach tissue and mesentery	16.48	10.46 ± 41.47	63.46 ± 86.33	3–324
<i>Contraecaecum</i> sp. (ZUFMS-INV No. 004)	stomach tissue, cecum and mesentery	51.65	1.63 ± 3.09	3.17 ± 3.7	1–15
Pentastomida					
<i>Sebekia oxycephala</i> (Diesing, 1835) (ZUFMS-INV No. 001)	body cavity	7.69	0.10 ± 0.40	1.42 ± 0.53	1–2
<i>Subtriquetra</i> sp. 1 (ZUFMS-INV No. 005)	swimming bladder	7.69	0.13 ± 0.6	1.71 ± 1.49	1–5
<i>Subtriquetra</i> sp. 2 (ZUFMS-INV No. 006)	swimming bladder	10.98	0.23 ± 0.83	2.1 ± 1.59	1–6

SI = site of infection; P (%) = prevalence; MA = mean abundance; MI = mean intensity; RV = range of variation; SD = standard deviation.

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