

## New hosts for two species of Acanthocephala of fishes from Paraná River, State of Paraná, Brazil

Mariana S. Lopes<sup>1,2</sup>; Berenice M. M. Fernandes<sup>2</sup>; Otilio M.P. Bastos<sup>1</sup>, Simone C. Cohen<sup>2</sup> & Anna Kohn<sup>2\*</sup>

<sup>1</sup>Universidade Federal Fluminense – Departamento de Microbiologia e Parasitologia Aplicadas, Laboratório de Parasitologia - Rua Professor Ernani Pires de Melo, 101, Niterói – Rio de Janeiro, CEP: 24210-130. E-mail: mari.lopess@hotmail.com

<sup>2</sup>Laboratório de Helminthos Parasitos de Peixes, Instituto Oswaldo Cruz, FIOCRUZ – Av. Brasil, 4365 - Manguinhos, Rio de Janeiro, CEP: 21040-360.

\* Pesquisador I do CNPq

**Abstract. Acanthocephala of fishes from Paraná River.** During several expeditions to the Paraná River, State of Paraná, Brazil, different groups of helminths were collected from fishes from the Itaipú Hydroelectric Power Station Reservoir. Two species of Acanthocephala were collected in new host species. *Gorytocephalus elongorchis* Thatcher, 1979 was found in the new hosts *Hypostomus cochliodon* Kner, 1854, *H. regani* Ihering, 1905 and *Loricaria* sp. and *Neoechinorhynchus* (*Neoechinorhynchus*) *pimelodi* Brasil-Sato & Pavanelli, 1998 in *Pimelodus maculatus* Lacépède, 1803 (type host) and in the new hosts *Bergiaria westermanni* (Lütken, 1874), *Schizodon knerii* (Steindachner, 1875) and *Brycon orbignyanus* (Valenciennes, 1850).

**Keywords:** fish parasites, reservoir, helminths

**Resumo. Novos hospedeiros para duas espécies de Acanthocephala, parasitos de peixes do rio Paraná, Estado do Paraná, Brasil.** Durante expedições no rio Paraná, Paraná, Brasil, diferentes grupos de helmintos foram coletados em peixes provenientes do reservatório da Usina Hidrelétrica de Itaipú Binacional. Dentre estes helmintos duas espécies de Acanthocephala foram registradas parasitando novos hospedeiros. *Gorytocephalus elongorchis* Thatcher, 1979 foi encontrado parasitando os novos hospedeiros *Hypostomus cochliodon* Kner, 1854, *H. regani* Ihering, 1905 e *Loricaria* sp. e *Neoechinorhynchus* (*Neoechinorhynchus*) *pimelodi* Brasil-Sato & Pavanelli, 1998 em *Pimelodus maculatus* Lacépède, 1803 (hospedeiro tipo) e nos novos hospedeiros *Bergiaria westermanni* (Lütken, 1874), *Schizodon knerii* (Steindachner, 1875) e *Brycon orbignyanus* (Valenciennes, 1850).

**Palavras-chave:** parasitos de peixes, reservatório, helmintos

### Introduction

During several expeditions to the Paraná River, State of Paraná, Brazil, different groups of helminths were collected from fishes from the Itaipú Hydroelectric Power Station Reservoir and influence areas (Kohn *et al.* 2003). From Paraná River basin, few species of acanthocephalans were referred from different host species (PAVANELLI *et al.*, 2004; LIZAMA *et al.*, 2005, 2006; SANTOS *et al.*, 2005; TAKEMOTO

*et al.*, 2009). The hosts studied, *Hypostomus cochliodon* Kner, 1854, *H. regani* (Ihering, 1905), *Loricaria* sp. (Loricariidae), *Bergiaria westermanni* (Lütken, 1874) (Pimelodidae), *Schizodon knerii* (Steindachner, 1875) (Anostomidae) and *Brycon orbignyanus* (Valenciennes, 1850) (Characidae) feed on insects, fruit and debris deposited on the bottom of the river and present great economical importance.

## MATERIAL AND METHODS

The fishes were collected during the years of 1985, 1992, 1993, 2003 and 2009, in Paraná River and in the Reservoir of the Itaipu Hydroelectric Power Station, in the localities of Foz do Iguaçu, Santa Helena, Guaira and Missal by researchers of the "Laboratório de Helmintos Parasitos de Peixes, Instituto Oswaldo Cruz, Rio de Janeiro, Brasil". Fishes were sedated in an Eugenol solution 1ml/10 liters and after the examination they were used for feed of breeding wild animals. The acantocephalans were collected from the intestine of the hosts, cooled in saline solution 0.85% for the extroversion of proboscis, compressed or not under cover slip and stored in alcohol 70°. Wholemounts were stained with carmine of Langeron, dehydrated in graded alcohol series (EIRAS, 1994), clarified in beachwood creosoto (LASKOWSKI & ZDZITOWIECKI, 2004) and mounted as permanent preparations in Canada Balsam. Specimens were deposited in the Helminthological Collection of Instituto Oswaldo Cruz (CHIOC). Measurements were made with the use of a calibrated filar micrometer and are given in millimeters or micrometers, with the mean and range in parenthesis.

## Results

### ***Gorytocephalus elongorchis* Thatcher, 1979**

**Hosts:** intestine of *Hypostomus cochliodon* Kner, 1854; *H. regani* Ihering, 1905 and *Loricaria* sp. (New hosts records).

Localities: Foz do Iguaçu (Paraná River) and Guaira (Reservoir).

CHIOC nº 37378; 37379; 37380 a-b; 37381a-b. Trunk cylindrical, slightly ventrally recurved. Prominent

body wall, containing irregularly-shaped hypodermal nuclei, arranged in five dorsal e one branched ventral. Proboscis round, small, armed with 18 hooks distributed in 3 circular rows with 6 hooks on each. Proboscis receptacle single-walled presenting cephalic spherical ganglion at base. Lemnisci subequal with giant nuclei, one binucleate and other uninucleate.

**Male** (description based on 2 specimens): Trunk 10.0 and 11.60mm long, 1.32 and 1.54mm largest width. Body wall with wide 0.36mm - 0.38mm in largest height and 0.08mm - 0.16mm in smallest. Proboscis invaginated. Long hooks 28 $\mu$  (26–30 $\mu$ ) long, 8.55 $\mu$  (8–10 $\mu$ ) wide and short hooks 12.7 $\mu$  (8–12 $\mu$ ) long, 4.2 $\mu$  (2–4 $\mu$ ) wide. Short lemniscus 1.05 and 1.37mm long, 0.10mm wide and long lemniscus 1.05 and 1.37mm long, 0.12mm wide. Testes contiguous, anterior measuring 1.60 and 1.75mm in length, 0.65 and 1.75mm in width and posterior 1.55 and 2.25mm long, 0.70 and 0.72mm wide.

**Female** (description based on 4 specimens): Trunk 18.2mm (14.8–23.7mm) long, 1.9mm (1.17–2.50mm) largest with. Body wall with wide 0.28mm - 0.50mm in largest height and 0.08mm - 0.24mm in smallest. Proboscis 120 $\mu$  (100–135 $\mu$ ) long, 91.2 $\mu$  (85–95 $\mu$ ) wide. Long hooks 29 $\mu$  (26–30 $\mu$ ) long, 9.7 $\mu$  (6–12 $\mu$ ) wide, short hooks 11 $\mu$  (8–12 $\mu$ ) long, 3 (2–4 $\mu$ ) wide. Long lemniscus 2.38 mm (1.35–3.15mm) long, 0.10mm (0.10–0.27mm) wide and short lemniscus 1.83 mm (1.54–2.07mm) long, 0.07 mm (0.06–0.07mm) wide. Eggs 32 $\mu$  (30–40 $\mu$ ) long, 8 $\mu$  (8–14 $\mu$ ) wide.

### ***Neoechinorhynchus (Neoechinorhynchus) pimelodi* Brasil-Sato & Pavanelli, 1998**

**Hosts:** intestine of *Pimelodus maculatus* Lacépède, 1803 (type host); *Bergiaria westermanni* (Lütken, 1874); *Brycon orbignyanus* (Valenciennes, 1850) and *Schizodon knerii* (Steindachner, 1875) (new host records).

Localities: Guaíra, Santa Helena (Paraná River); Foz do Iguaçu and Missal (Reservoir).

CHIOC nº 37367a-g; 37368a-c; 37369a-c; 37370; 37371. Trunk with five dorsal and one ventral hypodermal nuclei. Proboscis hooks arranged in three circular rows. Anterior hooks are elongated and recurved, with single root that stretch up to half the length of hooks. Middle and posterior hooks are smaller and slightly recurved, with small roots of intermediate size. Elongated neck in males, juveniles and mature females, can be larger in gravid females. Central ganglion situated at the base of proboscis receptacle. Lemnisci subequal in length, one binucleate and the other uninucleate.

**Male** (Description based in 8 specimens): Trunk 1.2mm (1.0-4.0mm) long, 0.6mm (0.3-0.9mm) largest width. Proboscis invaginated. Apical hooks 84µ (68-112µ) long, 10µ (8-16µ) wide, middle hooks 30µ (24-50) long, 7µ (5-8µ) wide and basal hooks 24µ (20-30µ) long, 5µ (4-6µ) wide. Proboscis receptacle 383µ (300-500µ) long, 173µ (150-200µ) wide. Long lemniscus 1196µ (850-1750µ) long, 186µ (160-220µ) wide; short lemniscus 960µ (350-1700µ) long, 153µ (80-250µ) wide. Testes round, anterior 600 and 760 long, 450 and 650 wide, posterior 550 and 560 long, 500 and 820 wide and cement gland with numerous nuclei.

**Female** (Description based on 9 specimens): Trunk 2.02mm (0.90-4.75mm) long, 0.70mm (0.50-0.87mm) wide. Proboscis 179µ (100-240µ) long, 181µ (150-200µ) wide. Apical hooks 51µ (45-100µ) long, 12µ (10-20µ) wide, middle hooks 47µ (20-76µ) long, 8µ (6-10µ) wide and basal hooks 26µ (14-40µ) long, 6µ (4-8µ) wide. Proboscis receptacle Proboscis receptacle 150µ long, 60 µ wide. Long lemniscus 1480µ (675-1725µ) long, 205µ (130-250µ) wide; Short lemniscus 1250µ (825-1500µ) long, 196µ (170-240µ) wide. Eggs round,

16µ (10-25µ) long, 10µ (5-15µ) wide. Ovarian balls 87µ (50-100µ) long, 66µ (47-110µ) wide.

## Discussion

*Gorytocephalus elongorchis* was described by THATCHER (1979), parasitizing *H. carinatus* Steindachner, 1881 from Janauacá Lake, Amazon River basin, Brazil. At the present paper, this species is referred in three new hosts, *H. cochliodon*, *H. regani* e *Loricaria* sp., amplifying the geographical distribution for Paraná River basin. *Neoechinorhynchus* (*Neoechinorhynchus*) *pimelodi* was described by BRASIL-SATO & PAVANELLI (1998) from *Pimelodus maculatus* from São Francisco River, State of Minas Gerais, and posteriorly, these authors presented ecological data of this parasitism (BRASIL-SATO & PAVANELLI, 1999). SANTOS & BRASIL-SATO (2004) referred this species from other host, *Franciscodoras marmoratus* Reinhardt, 1874 in the type locality. In the present study, *N. (N.) pimelodi* is redescribed from the type host, *P. maculatus* and from three new hosts: *Bergiaria westermanni*, *Brycon orbignyianus* e *Schizodon knerii*, recorded from Paraná River, new locality for this species. The acanthocephalans studied in the present paper, *N. (N.) pimelodi* and *G. elongorchis* were recorded parasitizing 4 and 3 different hosts, respectively. MARCOGLIESE (2002) stated that an endoparasite species found in more than one host species may indicate the occurrence of new intermediate hosts in that habitat and even indicates that different species of fishes share one or more food items.

## Acknowledgments

The authors are grateful to the "Superintendência do Meio Ambiente Aquático, Centro de Pesquisas" and to Dr. C. Canzi from "Usina Hidrelétrica de Itaipu

Binacional” for the facilities offered to examine the fish from the reservoir of the Hydroelectric Power Station.

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**Recebido:** 17/03/2011

**Revisado:** 21/03/2011

**Aceito:** 27/05/2011