Taxonomy and systematics

A new species of Neoechinorhynchus (Eoacanthocephala: Neoechinorhynchidae) from the freshwater fish Ageneiosus inermis (Siluriformes) in the Brazilian Amazon

Abstract

This work describes a new species of the genus Neoechinorhynchus, a parasite found in the Siluriformes fish, Ageneiosus inermis collected in Catalão Lake. This species is most closely related to N. (N.) pterodirides and N. (N.) pimelodis than other species registered in Brazil. The size of its trunk, hooks and male reproductive system distinguish it from these 2 species. This work contributes to increase the knowledge of the biodiversity of fish parasites in the Amazon.

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Keywords: Fish parasite; Ageneiosus inermis; Solimões and Negro rivers; Catalão Lake; Amazon

Introduction

The phylum Acanthocephala is a poorly known helminth group in Neotropical fishes. The composition of the known acanthocephalan fauna shows that the Neoechinorhynchidae is the family most represented (Santos, Gibson, Tavares, & Luque, 2008). In Brazil few species are known from this genus. Of the 109 species described as belonging to the genus Neoechinorhynchus Stiles & Hassall, 1905, 7 are relegated to other genera, 14 are considered invalid, 11 belong to the subgenus Hebesoma, 48 belong to the subgenus Neoechinorhynchus and 29 are retained as valid but cannot be assigned to any subgenus (Amin, 2002).

In Brazil, only 7 species have been described thus far. This study describes a new species of Neoechinorhynchus a parasite
of Ageneiosus inermis, collected from a floodplain lake in the Amazon.

Materials and methods

The fish were collected from the Catalão Lake, a fluvial-lacustrine system at the confluence of the Negro and Solimões rivers (03°10′04″ S, 59°54′45″ W) during the flood period in May 2015. The fish were necropsied in the field and their bodies were fixed, labeled and analyzed in the Laboratory of Fish Parasitology at the National Institute for Amazonian Research (INPA). The specimens were then fixed in 70% ethanol for processing. Worms stained in regressive staining techniques (Carmin alcoholic) according to Amato, Boeger, and Amato (1991), and cleared in immersion oil and mounted in Canada balsam. Drawings were made with the assistance of a lightfield Olympus BH-2 microscope. All measurements are in micrometers (μm). Ecological parameters follow Bush, Lafferty, Lotz, and Shostak (1997). Holotype and paratypes were deposited in the Non-insect Invertebrate Collection of the Instituto Nacional de Pesquisas da Amazônia-INPA.

Description

Neoechinorhynchus (Neoechinorhynchus) inermis n. sp. (Figs. 1–3)

General. With characters of the genus and subgenus Neoechinorhynchus. Elliptical or ovoid body, smooth and rough edges. Neck visible and well developed. Proboscis globular, with 18 hooks distributed in 3 rows of 6 hooks. Larger anterior hooks. Proboscis sheath with simple muscular layer. Central ganglion spherical and located in the proboscis sheath. 5 giant nuclei present on the dorsal side of the amebiform’s trunk and 1 on the ventral side. Lemnisci of different sizes. Lacunar system with main channels situated on dorsal and ventral sides (Table 1).

Male: measurements based on 2 male specimens. Trunk length 1.836–1.296 (1.556 ± 381.4) and width 540. Conical neck length 99–68.4 (83.7 ± 21.9) and width 82.8–54 (68.1 ± 19.9). Proboscis length 126–99 (112.5 ± 19) and width 108–79.2 (93 ± 20). Lemniscus uninucleate length 490–210 (350 ± 198) and width 140–105 (122.5 ± 24.7) and binucleate with sacculus format length 301–140 (220 ± 113) and width 105–98 (101.5 ± 4.9). Giant amoeboid nuclei, 5 dorsal and 1 or 2 ventral. Anterior hooks (the largest) length 133–116.2 (124.5 ± 12) and width 14–10.5 (12.2 ± 2.8), middle hooks length 79.4–29.4 (54 ± 35.4) and width 5.1–3.4 (4 ± 1.4) and posterior hooks 26.6–23.1 (24.8 ± 2.1) and width 2.1. Proboscis receptacle length 414–288 (351 ± 89.1) and width 324–198 (261 ± 89.1). Anterior testis length 246.6–198 (222.3 ± 33.9) and width 216–180 (198 ± 25.5). Posterior testis length 133.2–270 (201.6 ± 96.9) and width 97.2–127 (112.1 ± 21.2). Cement gland length 198–288 (243 ± 63.6) and width 369–180 (270 ± 127.3). Ovoid shaped cement reservoir length 270–180 (225 ± 63.6) and width 118.8–108 (113 ± 7.1). Saeffigten’s elongated pouch length 504–396 (450 ± 76.4) and width 127.8–126 (126 ± 0.7). Male reproductive system occupies 71–75% of the body length.

Female: it was not found.

Taxonomic summary

Type host: A. inermis (Linneus, 1766) Auchenipteridae, common name: Mandubé.

Type locality: Catalão Lake (03°10′04″ S, 59°54′45″ W); the confluence of the Negro and Solimões rivers near Manaus city.

Specimens deposited: holotype INPA-17: non-insect Invertebrate Collection INPA; Paratipes INPA-18.

Site of infestation: upper intestine.

Prevalence: 55; mean intensity: 5.6; mean abundance: 3.1.

Etymology: its name is derived from the host’s name.

Remarks

In Brazil, 7 species of Neoechinorhynchus (N.) have been registered: N. (N.) butnerae Golvan, 1956; N. (N.) curemai Noronha, 1973; N. (N.) macrunculus Machado Filho, 1954; N. (N.) paraguayensis Machado Filho, 1959; N. (N.) pinelodi Brasil-Sato & Pavanelli, 1998; N. (N.) pterodoridis Thatcher, 1981 and N. (N.) voropesoi Melo et al., 2015 (Amin, 2002; Santos et al., 2008; Thatcher, 2006).

N. (N.) butnerae; N. (N.) pterodoridis; N. (N.) voropesoi, and N. (N) curemai have been registered in the Amazon region (Martins, Fujimoto, Andrade, & Tavares-Dias, 2000; Noronha, 1984; Santos et al., 2008; Thatcher, 2006).

Thatcher (1981) outlines the characteristics that distinguish N. pterodoridis from other species: (1) neck long and visible, (2) anterior, middle and posterior circles of hooks larger than in other species. This species was compared with N. paraguayensis and N. golvani Salgado-Maldonado, 1978.

cain, 1992. *N. pimelodis* is shown to be most closely related to *N. (N.) pterodoridis* Thatcher, 1981. Of the species that occur in Brazil, this new species described here is most similar to *N. (N.) pterodoridis* and *N. (N.) pimelodis*.

*N. (N.) inermes* sp. n. shows most similarity to *N. (N.) pterodoridis* collected from the Amazonas River (Thatcher, 1981) and *N. (N.) pimelodis* collected from the São Francisco River (Brasil-Sato & Pavanelli, 1998). It is distinguished from *N. (N.) pterodoridis* with smaller trunk length, and from *N. (N.) pimelodis* with greater trunk length.

The proboscis of *N. (N.) inermes* sp. n. is smaller than that of *N. (N.) pterodoridis* and approximately the same size as that of *N. (N.) pimelodis*. Its neck is much smaller than the necks of both other species. The lemnisci are also much smaller. The male reproductive system occupies 75% of its cavity which is larger than in both *N. (N.) pterodorides* (73%) and *N. (N.) pimelodis* (50.73%).

The anterior and medium hooks of *N. (N.) inermes* sp. n. are smaller than those of *N. (N.) pterodoridis* and larger than those of *N. (N.) pimelodis*. The posterior hooks are of similar size as *N. (N.) pimelodis*. Anterior testis is smaller compared to the other species and the posterior testis is smaller than that of *N. (N.) pterodoridis* and larger than that of *N. (N.) pimelodis*.

The cement gland of *N. (N.) inermes* sp. n. is smaller than that of *N. (N.) pterodoridis* and larger than that of *N. (N.) pimelodis*. The cement reservoir is larger than those of both other species. Morphological study presents similarities between the anatomy of the *N. (N.) inermes* sp. n. and both *N. (N.) pterodoridis* and *N. (N.) pimelodis*, but it is distinguished by significant differences in the main organs of these 2 species.

Based on these characteristics, the present work describes the first species of the genus parasitizing *A. inermis*, the eighth species of the genus described from Brazil. Thus, the present work contributes to the knowledge of Brazilian parasites by adding a new species and new host for the genus *Neoechinorhynchus*.

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**References**


