Neotrop. Helminthol., 7(2), 2013

ISSN: 2218-6425 impreso / ISSN: 1995-1043 on line

aphia
ASOCIACIÓN PERUANA DE HELMINTOLOGÍA E INVERTEBRADOS AFINES

RESEARCH NOTE / NOTA CIENTÍFICA

RHINOXENUS BULBOVAGINATUS (MONOGENEA, DACTYLOGYRIDAE) PARASITE OF THE NASAL CAVITIES OF *SALMINUS HILARII* (CHARACIFORMES, CHARACIDAE) IN A NEOTROPICAL RIVER, SP, BRAZIL

RHINOXENUS BULBOVAGINATUS (MONOGENEA, DACTYLOGYRIDAE) PARÁSITO DE LA CAVIDAD NASAL DE *SALMINUS HILARII* (CHARACIFORMES, CHARACIDAE) EN UNA RÍO NEOTROPICAL, SP, BRASIL

Rodrigo Bravin Narciso[1*], Heleno Brandão[2], Fábio Hideki Yamada[1] & Reinaldo José da Silva[1]

[1]UNESP - Univ. Estadual Paulista, Campus de Botucatu, Instituto de Biociências, Departamento de Parasitologia, Laboratório de Parasitologia de Animais Silvestres/LAPAS, CEP 18618-970, Botucatu, SP, Brazil. *e-mail: rodrigobtu7@gmail.com
[2]Departamento de Biologia, Universidade Federal do Paraná/UFPR, Setor Palotina, Palotina, PR, Brazil

Suggested citation: Narciso, RB, Brandão, H, Yamada, FH & Silva, RJ. 2013. *Rhinoxenus bulbovaginatus* (Monogenea, Dactylogyridae) parasite of the nasal cavities of *Salminus hilarii* (Characiformes, Characidae) in a neotropical river, SP, Brazil. Neotropical Helminthology, vol. 7, n°2, jul-dec, pp. 335 - 339.

Abstract

The aim of study is to report for the first time the occurrence of *Rhinoxenus bulbovaginatus* infesting the nasal cavity of *Salminus hilarii* from the Taquari River, São Paulo State, Brazil. *Rhinoxenus bulbovaginatus* was originally described parasitizing the nasal cavities of *Salminus brasiliensis* from the Paraná River. *Rhinoxenus* spp. are monogenean parasites from the nasal cavities of Characiformes fishes in the Neotropical region. To date, eight species of *Rhinoxenus* were described in seven different hosts. This study broadens the range of hosts parasitized with monogeneans of nasal cavities.

Keywords: Ancyrocephalinae - Freshwater fish - Neotropical region - "Tabarana"

Resumen

El objetivo del trabajo es registrar una nueva ocurrencia de *Rhinoxenus bulbovaginatus* en la cavidad nasal de *Salminus hilarii* del río Taquari, Estado de São Paulo, Brasil. *Rhinoxenus bulbovaginatus* fue originalmente descrita parasitando cavidades nasales en *Salminus brasiliensis* del río Paraná. *Rhinoxenus* spp. son monogéneos parásitos de las cavidades nasales de los peces Characiformes en la región Neotropical. Hasta la fecha, ocho especies de *Rhinoxenus* fueron descritas en siete especies hospederas. El presente estudio amplía el rango de hospederos parasitados con monogéneos de las cavidades nasales.

Palabras clave: Ancyrocephalinae - Peces de agua dulce - Neotropicales - "Tabarana".

INTRODUCTION

The genus *Rhinoxenus*, proposed by Kritsky *et al.* (1988a), includes monogeneans parasites of the nasal cavities of Characiformes fishes. To date, eight species have been described in this genus: *Rhinoxenus piranhus* Kritsky, Boeger & Thatcher, 1988 (type species) in *Pygocentrus nattereri* Kner, 1858; *R. arietinus* Kritsky, Boeger & Thatcher, 1988 in *Schizodon fasciatus* Spix & Agassiz, 1829; *R. nyttus* Kritsky, Boeger & Thatcher, 1988 in *S. fasciatus*; *R. bulbovaginatus* Boeger, Domingues & Pavanelli, 1995 in *Salminus brasiliensis* (Cuvier, 1816); *R. anaclaudiae* Domigues & Boeger, 2005 in *Triportheus cf. nematurus* (Kner, 1858); *R. curimbatae* Domigues & Boeger, 2005 in *Prochilodus lineatus* Valenciennes, 1837; *R. guianensis* Domigues & Boeger, 2005 in *Curimata cyprinoides* Linnaeus, 1766; *R. euryxenus* Domigues & Boeger, 2005 in *Serrasalmus marginatus* Valenciennes, 1837.

Rhinoxenus spp. are Ancyrocephalinae monogeneans characterized by a pair of dorsal haptor spikes, lack of a dorsal bar, and hooks pair 2 lying on two lateral lobes of the trunk (Kritsky *et al*., 1988a). *Rhinoxenus bulbovaginatus* was first described parasitizing the nasal cavities of *Salminus maxillosus* (=*Salminus brasiliensis*) from the Paraná River, Paraná State, Brazil. This monogenean species differs from the congeners because of the morphology of the male copulatory complex, vagina, and ventral anchor (Boeger *et al.*,1997).

This study is the first record of *R. bulbovaginatus* infecting *Salminus hilarii* (Characidae) from the Taquari river, Upper Paranapanema River, São Paulo State, Brazil.

MATERIAL AND METHODS

Five specimens of *S. hilarii* were collected from April 2011 to July 2012, in the Taquari River, Jurumirim reservoir (23°12'17" S; 49°13'19" W), São Paulo State, Brazil. The monogeneans were removed from the nasal cavities and fixed in 5% formalin, and stored in 70% alcohol. Afterwards the monogeneans were mounted unstained in Grey & Wess medium to study the sclerotized structures (Eiras *et al.*, 2006). Measurements in micrometers are expressed as the mean followed by the range and number (n) of specimens measured in parentheses. The terminology specific to *Rhinoxenus* follows Kritsky *et al.* (1988a). Ecological terms were used according to Bush *et al*. (1997). The image capture were made using a differential interference contrast microscope (Leica DM 5000B). Voucher helminth specimens were deposited in the Coleção Helmintológica do Instituto de Biociências (CHIBB), of the Universidade Estadual Paulista/UNESP from Botucatu, São Paulo State, Brazil.

RESULTS

Rhinoxenus bulbovaginatus Boeger, Domingues & Pavanelli (1995)
(Fig. 1)

Measurements based on five specimens mounted in Grey & Wess medium: Body fusiform 571 (301.5-860.4; n=2) long, 138.9 (111.6-166.3; n=2) wide, divided in cephalic region, trunk and haptor; dorsoventrally flattened. Cephalic lobes poorly developed. Four pairs of head organs, cephalic glands not observed. Four eyes, usually equidistant, and members of posterior pair large than those of anterior pair. Pharynx spherical, 60.6 (n=1) in diameter. Haptor trapezoidal, lacking peduncle. Ventral anchor 102.8 (100.5-105.2; n=6) long, base 15.7 (13.2-17.4; n=4) wide. Ventral bar trapezoidal 40.2 (36.5-44; n=2) long, 9 (8.9-9.1; n=2) wide. Dorsal haptoral spike 106.35 (101.3-105.6; n=6) long. Seven pairs of hooks with Ancyrocephalinae distribution, hook pair 2 lying on 2 bilateral lobes outside haptor, 37 (30-42.3; n-9) long. Male copulatory organ, with about 2 counter-clock rings, first ring 27.6 (26-29.3; n=2) in diameter. Accessory piece 39.2 (32.2-46.3; n=2) long, 19 (18.3-19.8; n=2) wide, articulated with the base of male copulatory organ. Vagina sclerotized, sinistral, simple tube, loop ended at distal bulb. Reproductive organs

not observed. Vitellaria scattered throughout the trunk.

Taxonomic summary

Type host: *Salminus hilarii* Valenciennes, 1850

Type locality: Taquari River, Upper Paranapanema River, São Paulo State, Brazil.

Site of infection: Nasal cavities.

Voucher numbers: CHIBB 120L, 121L and 122L.

Prevalence: 60% (3 of 5 fishes examined).

Mean Intensity of infection: 2 parasites per parasitized host.

Figure 1. Specimen of *Rhinoxenus bulbovaginatus* parasite of nasal cavity of *Salminus hilarii* from Taquari river, São Paulo State, Brazil: (A) total view; (B) Copulatory complex and vagina (arrow); (C) Dorsal haptoral spikes; (D) Ventral anchors and bar (arrow). *Scale bars:* 100 µm (A); 20 µm (B, C, and D).

Table 1. Morphometry (in µm) of *Rhinoxenus bulbovaginatus* parasite of nasal cavity of *Salminus hilarii* from Taquari river, São Paulo State, Brazil.

Measurements	Boeger *et al.* (1995)	Preset Study
Body		
Length	441 (430-454; n=4)	571 (301.5-860.4; n=2)
Width	160 (115-190; n=4)	138.9 (111.6-166.3; n=2)
Pharynx diameter	41-43 (n=2)	60.6 (n=1)
Haptor		
Length	100 - 105 (n=2)	-
Width	102-110(n=2)	-
Ventral anchor		
Length	113 (110-119; n=8)	102.8 (100.5-105.2; n=6)
Width	26 (23-29; n=9)	15.7 (13.2-17.4; n=4)
Dorsal haptorial spike		
Length	119 (115-122; n=5)	106.35 (101.3-105.6; n=6)
Bar		
Length	42 (35-54; n=8)	40.2 (36.5-44; n=2)
Width	-	9 (8.9-9.1; n=2)
Hook		
pair 2	31 (29-33; n=3)	-
Other hooks	41 (29-52; n=16)	37 (30-42.3; n-9)
Male copulatory organ		
First ring diameter	-	27.6 (26-29.3; n=2)
Acessory piece		
Length	-	39.2 (32.2-46.3; n=2)
Width	-	19 (18.3-19.8; n=2)
Testis		
Length	95 (81-118; n=3)	-
Width	24 (25-27; n=3)	-
Germarium		
Length	82 -102 (n=2)	-
Width	27-32 (n=2)	-

DISCUSSION

According to Boeger *et al.* (1995) two genera of Dactylogyridae are known as parasites of the nasal cavities of Characiformes fishes of the Neotropical region: *Rhinonastes* Kritsky *et al.*, (1988b), and *Rhinoxenus* Kritsky, Boeger & Thatcher, 1988. However, *Urocleidoides naris* Rosim, Mendoza-Franco & Luque, 2011 (Rosim *et al.*, 2011) was recently described in the nasal cavities of *Hoplias malabaricus* (Bloch, 1794) from the Cuiabá River, Brazil. Monogenean species of the genus *Rhinoxenus* are parasites of the nasal cavity of Characiformes fishes of the families Characidae, Anostomidae, Prochilodontidae, Curimatidae (Domingues & Boeger, 2005), which is corroborated in this study due to the report of first occurrence of *R. bulbovaginatus* in a characid fish of Taquari river, Brazil.

The specimens of *R. bulbovaginatus* found in *S. hillarii* showed morphology very similar to the specimens collected in *S. brasiliensis* (Kritsky *et al.*, 1988a), excepted for ventral anchor width, which is bigger (Table 1). However, it was suggested that this is a common individual variation rather than some morphological changes associated with biological aspects of the host.

The main morphological characteristic that differs *R. bulbovaginatus* from it congeneric species is the vagina is sclerotized with distal loop and bulb. To date, this monogenean species have been reported parasitizing the nasal cavities only in *S. brasiliensis*. Thus this study suggests the specificity of *R. bulbovaginatus* with fishes of *Salminus* genus. Moreover, this study is the first record of *R. bulbovaginatus* in *S. hilarii* broadening the range of the geographical distribution and occurrence of the genus

Rhinoxenus in freshwater fishes from Neotropical region.

ACKNOWLEDGEMENTS

The authors thank the Coordenação de Aperfeiçoamento Pessoal de Nível Superior (AUX-PE-PNPD 3005/2010) and the Fundação de Amparo a Pesquisa do Estado de São Paulo (2012/20150-4 and 2011/22603-3) and Aline Angelina Acosta for the English review.

BIBLIOGRAPHIC REFERENCES

Boeger, WA, Domingues, MV & Pavanelli, GC. 1995. *Neotropical Monogenoidea. 24.* Rhinoxenus bulbovaginatus *n. sp. (Dactylogyridae, Ancyrocephalinae) from the Nasal Cavity of* Salminus maxillosus *(Osteichthyes, Characidae) from the Paraná river, Paraná, Brazil*. Memórias do Instituto Oswaldo Cruz, vol. 90, pp. 695-698.

Bush, AO, Lafferty, KD, Lotz, JM & Shostak, AW. 1997. *Parasitology meets ecology on its own terms: margolis et al. Revisited*. The Journal of Parasitology, vol. 83, pp. 575-583.

Domingues, MV & Boeger, WA. 2005. *Neotropical Monogenoidea. 47. Phylogeny and coevolution of species of* Rhinoxenus *(Platyhelminthes, Monogenoidea, Dactylogyridae) and their Characiformes hosts (Teleostei, Ostariophysi) with description of four new species*. Zoosystema, vol. 27, pp. 441-467.

Eiras, JC, Takemoto, RM & Pavanelli, GC. 2006. *Métodos de estudo e técnicas laboratoriais em parasitologia de peixes.* 2º ed., Eduem, Maringá, Brasil.

Kritsky, DC, Boeger, WA & Thatcher, VE. 1988a. *Neotropical Monogenea. 11.* Rhinoxenus, *new genus (Dactylogyridae Ancyrocephalinae) with descriptions of three new species from the nasal cavities of Amazonian Characoidea*. Proceedings of the Biological Society of Washington, vol. 101, pp. 87-94.

Kritsky, DC, Thatcher, VE & Boeger, WA. 1988b. Rhinonastes pseudocapsaloideum *n. gen., n. sp. (Dactylogyridae, Ancyrocephalinae), a nasal parasite of Curimatã,* Prochilodus nigricans *Agassiz (Cypriniformes, Prochilodontidae), in Brazil*. The Journal of Parasitology, vol. 74, pp. 695-698.

Rosim, DF, Mendoza-Franco, EF & Luque, JL. 2011. *New and previously described species of* Urocleidoides *(Monogenoidea: Dactylogyridae) infecting the gills and nasal cavities of* Hoplias malabaricus *(Characiformes: Erythrinidae) from Brazil*. The Journal of Parasitology, vol. 97, pp. 406-417.

Received September 13, 2013.
Accepted November 9, 2013.

Correspondence to author/ Autor para correspondencia:
Rodrigo Bravin Narciso

Laboratório de Parasitologia de Animais Silvestres/LAPAS, Departamento de Parasitologia, Instituto de Biociências, Universidade Estadual Paulista/UNESP, CEP 18618-970, Botucatu, SP, Brazil.

E-mail / Correo electrónico:
rodrigobtu7@gmail.com