Apedunculata discoidea gen. n., sp. n. (Monogenea: Dactylogyridae) parasitic on *Prochilodus lineatus* (Valenciennes, 1837) (Characiformes: Prochilodontidae) from southeastern Brazil

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Received November 16, 2007 – Accepted December 12, 2007 – Distributed August 31, 2009

(With 7 figures)

Abstract

A new species of dactylogyrid monogenean, *Apedunculata discoidea* gen. n., sp. n. is described and illustrated from the gills of the freshwater fish *Prochilodus lineatus* (Valenciennes, 1837) in pisciculture ponds from Pirassununga, São Paulo, Brazil. Diagnostic characters of the new genus and species are: 1) vagina dextrolateral slightly sclerotised, opening anteriorly at level of copulatory complex; 2) copulatory organ coiled with two counterclockwise rings; 3) Accessory piece distal and not articulated; 4) body disk-shaped, lacking a peduncle.

Keywords: Monogenea, Dactylogyridae, *Apedunculata discoidea* gen. n., sp. n., *Prochilodus lineatus,* Prochilodontidae.

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Resumo

Uma espécie nova de monogenético dactilogirídeo, *Apedunculata discoidea* gen. n., sp. n. parasita das brânquias do peixe de água doce *Prochilodus lineatus* (Valenciennes, 1837) proveniente de pisciculturas de Pirassununga, São Paulo, Brasil, é descrita e ilustrada. As características diagnósticas do novo gênero e da nova espécie são: 1) vagina dextrolateral levemente esclerotizada, com abertura ao nível do complexo copulatório; 2) órgão copulatório em espiral com duas voltas no sentido anti-horário; 3) peça acessória distal e não articulada; 4) corpo com formato de disco e sem pedúnculo.

Palavras-chave: Monogenea, Dactylogyridae, *Apedunculata discoidea* gen. n., sp. n., *Prochilodus lineatus,* Prochilodontidae.

1. Introduction

Prochilodontids are benthopelagic, potamodromous fishes with significant importance as food resource and they have great potential for intensive pisciculture. Nevertheless, there are only a few studies on monogeneans parasitic on these species from Brazil. *Rhinonastes pseudocapsaloideum* Kritsky, Thatcher and Boeger, 1988 parasitic on *P. nigricans* Agassiz; *Tereancistrum ornatus* Kritsky, Thatcher and Kayton, 1980 and *Anacanthoroides mizellei* Kritsky and Thatcher, 1976 parasitic on *P. reticulatus* Steindachner, were described from the Amazonas River Basin (Kritsky and Thatcher, 1976; Kritsky et al., 1980; 1988). Eiras et al. (1995) recorded unidentified dactylogyrids from the gills and skin of *P. lineatus* from ponds in São Paulo. Most recently, three species of monogeneans parasitizing *P. lineatus* Valenciennes from Paraná and Paranapanema Rivers were described, respectively: *Kritskyia boegeri* Takemoto, Lizama and Pavanelli, 2002, *Protorhinoxenus prochilodi* Domingues and Boeger, 2002, *Tereancistrum curimba Lizama*, Takemoto and Pavanelli, 2004, *T. ornatus* Lizama, Takemoto and Pavanelli, 2004 and *Rhinoxenus curimbatae* Domingues and Boeger, 2005 (Domingues and Boeger, 2002; 2005; Takemoto et al., 2002; Lizama et al., 2004).

In this report, a new genus of dactylogyrid is proposed and a new species parasitic on *Prochilodus*

lineatus (Valenciennes, 1837) from Brazil is described and illustrated.

2. Material and Methods

The monogeneans studied are part of the material collected from 72 specimens of *P. lineatus* collected from pisciculture ponds of CEPTA (Centro de Pesquisa e Gestão de Recursos Pesqueiros Continentais) in Pirassununga, state of São Paulo, Brazil, from April 1999 to March 2000. The fish measured 24-33 cm (mean = 27 ± 2.9 cm) in standard length and weighed 321-512 g (mean = 406.2 ± 61.7 g). The monogeneans were removed from the gills of the hosts with a 1:4000 formalin solution, fixed in 5% formalin and stored in 70% ethanol. Additional collections of monogeneans were made using hot water followed by immediate fixation in 5% formalin. The parasites were stained with Gomori's trichrome and mounted in Canada balsam; some specimens were mounted in Gray and Wess medium (Humason 1979) for study of sclerotised structures. Measurements are in micrometres (μm), the mean is followed by the range and number of specimens measured (n) in parentheses. The illustrations were made with the aid of a drawing tube mounted on a Hund Wetzlar H-600 phase contrast microscope. The holotype and the paratypes were deposited in the Helminthological Collection of the Instituto Oswaldo Cruz (CHIOC), Rio de Janeiro, Brazil.

3. Results

Monogenea Van Beneden, 1858

Dactylogyridae Bychowsky, 1933

Apedunculata gen. n.

Diagnosis: Body disk-shape, divided into cephalic region, trunk, haptor. Tegument thin. Eyes 4. Pharynx muscular, glandular; intestinal caeca 2, confluent in posterior trunk, lacking diverticula. Gonads overlapping, testis dorsal to germarium. Vas deferens apparently looping left caecum, seminal vesicle a dilatation of vas deferens; prostatic reservoir at level of anterior portion of caeca. Copulatory complex comprising sclerotised male copulatory organ, accessory piece. Male copulatory organ a coiled sclerotised tube with counterclockwise rings. Accessory piece not articulated. Seminal receptacle anterior to testis. Vagina sclerotised; vaginal aperture sligthly sclerotised, dextrolateral. Vitellaria follicular. Haptor with 14 hooks with typical ancyrocephaline distribution (Mizelle 1936), comprising shank of two subunits; ventral bar "U-modified" shape; dorsal bar elongate; pair of ventral and dorsal anchors with shaft and base differentiated, deep roots. Parasites of gills of characiform fishes.

Etymology: the generic name refers to absence of haptor peduncle. Latin (a [absence] + *pedunculus* [peduncle]).

Type-species: *Apedunculata discoidea* sp. n. parasitic on *Prochilodus lineatus* (Valenciennes, 1837) (Characiformes, Prochilodontidae).

Apedunculata discoidea sp. n. (Figs. 1-7)

Description: (based on 25 specimens): Body disk-shape, 280 (220-410, n = 25) long, greatest width 160 (110-260, n = 25). Cephalic lobes scarcely developed; cephalic glands. Posterior pair of eyes greater than anterior pair. Few accessory granules dispersed in anterior body. Pharynx spherical, 25 (22-33, n = 9) in diameter. Peduncle absent. Haptor 12 (11-13, n = 5) long, 136 (110-180, n = 11) wide. Ventral anchor, short broad deep root, curved shaft, recurved point extending to root level,16 (13-18, n = 10) long, 13 (10-15, n = 10) wide; dorsal anchor similar but with elongated deep root, 20 (13-23, n = 10) long, 16 (13-23, n = 10) wide. Ventral bar 35 (31-46, n = 12) long, U-shape; dorsal bar 42 (31-52, n = 14) long, longer than ventral bar, with medial ondulation. Hooks similar, 6.5 (5.0-10.0, n = 6) long, posterior shank subunit wider than anterior subunit, truncated thumb, evenly curved shaft and point; FH loop extending to end of anterior shank subunit. Male copulatory organ sclerotised, a coiled tube with two counterclockwise rings, proximal ring 32 (26-41, n = 10) in diameter. Accessory piece not articulated, without copulatory ligament. Testis dorsal to germarium, spherical, 42 (31-65, n = 11) in diameter; vas deferens elongate; conspicuous seminal vesicle; prostatic reservoir at level of anterior portion of caeca. Germarium pyriform 53 (39-70, n = 4) long, 22 (20-26, n = 4) wide; dextrolateral vaginal duct slightly sclerotised, 86 (60-120, n = 12) long, opening into central seminal receptacle. Vitellaria lateral. Uterus not observed.

Type-host: *Prochilodus lineatus* (Valenciennes, 1837)

Site of infection: gills.

Figure 1. *Apedunculata discoidea* gen. n., sp. n. Composite drawing of whole mount (ventral view).

Type-locality: ponds in Pirassununga, State of São Paulo, Brazil.

Type-specimens: holotype, CHIOC No 36904, paratypes (four specimens stained and mounted) CHIOC No 36905 to 36908.

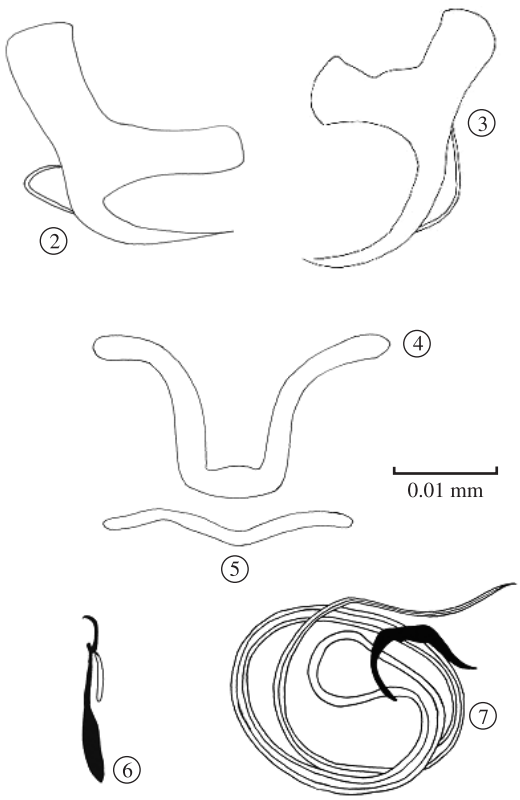
Etymology: the specific name refers to the disk shape of the body.

4. Discussion

Apedunculata discoidea gen. n., sp. n. can be defined by a combination of characters: 1) vagina dextrolateral slightly sclerotised, anteriorly opening at level of copulatory complex; 2) copulatory organ coiled with two counterclockwise rings; 3) accessory piece distal and not articulated; 4) body disk-shape with absence of haptor peduncle. The new genus is close to *Demidospermus* Suriano, 1983 by the presence of vaginal aperture to the level of copulatory complex and by the presence of accessory piece of male copulatory complex not articulated (see Kritsky and Gutierrez, 1998), nevertheless, the new genus can be separated from *Demidospermus* by the absence of haptorial peduncle, testis dorsolateral to germarium (postgermarial in *Demidospermus*), number of rings of the copulatory organ (a single ring in *Demidospermus*) and by the vaginal aperture (sinistrolateral in *Demidospermus*).

Gussevia Kohn and Paperna, 1964 is another dactylogyrid genus close to *Apedunculata* gen. n. because the presence of dextrolateral vagina and accessory piece not articulated (see Kritsky et al., 1986), but can be easily separated from the new genus by the cirrus coil (with clockwise rings in *Gussevia*; with counterclockwise rings in the new genus) and the configuration of the haptor (divided in anterior and posterior lobes in *Gussevia*; not divided in *Apedunculata* gen. n.). Also, all known species of *Gussevia* are parasitic on cichlid fishes, while the type species of the new genus is parasite of a prochilodontid fish.

Acknowledgements — We thank Paulo S. Ceccarelli (CEPTA) for providing the fishes studied. Ana M. Cuglianna was partially supported by a student fellowship from the Coordenação de Aperfeiçoamento do Pessoal do Ensino Superior (CAPES). José L. Luque was supported by a Research fellowship from CNPq (Conselho Nacional de Pesquisa e Desenvolvimento Tecnológico).



Figures 2-7. *Apedunculata discoidea* gen. n., sp. n. Figure 2. Dorsal anchor. Figure 3. Ventral anchor. Figure 4. Ventral bar. Figura 5. Dorsal bar. Figure 6. Hook. Figure 7. Male copulatory organ (dorsal view).

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