

A new species of *Demidospermus* Suriano, 1983 (Monogenea, Dactylogyridae) parasitic on *Loricariichthys platymetopon* Isbrücker et Nijssen (Loricariidae, Siluriformes) from the Upper Paraná River floodplain, Brazil

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Abstract

Demidospermus paranaensis sp. nov. is described from the gills of *Loricariichthys platymetopon* Isbrücker et Nijssen (Loricariidae, Siluriformes) from the Upper Paraná River floodplain, Brazil. This new species differs from other members of *Demidospermus* in the following features: tegument with annulations throughout trunk and peduncle, eyes absent, longer male copulatory organ (MCO) with ovate base. *Demidospermus paranaensis* sp. nov. is similar to its congeners by having tandem gonads, a counterclockwise-coiled MCO, non-articulated groove-like accessory piece serving as a MCO guide, sinistral vaginal aperture, and V-shaped haptoral bars.

Keywords

Monogenea, Dactylogyridae, *Demidospermus paranaensis* sp. nov., Loricariidae, *Loricariichthys platymetopon*, Brazil

Introduction

Brazil holds the highest number of described and/or reported monogenean species in South America (Cohen and Kohn 2008a). Among monogeneans, twelve species of *Demidospermus* have been identified in South America, mainly in Argentina (Kohn and Cohen 1998, Cohen and Kohn 2008a): *Demidospermus anus* Suriano, 1983, from the gills of *Loricariichthys anus* (Valenciennes) (= *Loricaria anus*); *D. paravaleciennesi* Gutiérrez et Suriano, 1992 from *Synodontis clarias* (Linnaeus) (= *Pimelodus clarias*); *D. valenciennesi* Gutiérrez et Suriano, 1992 from *Parapimelodus valenciennesi* (Lutken); *D. unculus* Gutiérrez et Suriano, 1992, originally described from *Synodontis clarias* and *Trachelyopterus galeatus* (Linnaeus) (= *Parauchenipterus galeatus*); *D. armatus* Kritsky et Gutiérrez, 1998 from *S. clarias*; *D. cornicinus* Kritsky et Gutiérrez, 1998 from *Bergiaria westermanii* (Lutken) (= *Iheringichthys westermanii*); *D. leptosynophallus* Kritsky et Gutiérrez, 1998 also from the gills of *Bergiaria westermanii*; *D. idulus* Kritsky et Gutiérrez, 1998 and *D. majusculus* Kritsky et Gutiérrez, 1998 from the gills of *Pimelodus albicans* (Valenciennes). Kritsky

and Gutiérrez (1998) considered *Omothecium* Kritsky, Thatcher et Boeger, 1987 and *Paramphocleithrum* Suriano et Incorvaia, 1995 as junior synonyms of *Demidospermus*, suggesting three new combinations: *D. bidiverticulatum* Suriano et Incorvaia, 1995 originally described from *P. maculatus* (Lacepède) (= *Pimelodus clarias maculatus*), *D. luckyi* Kritsky, Thatcher et Boeger, 1987, and *D. pinirampi* Kritsky, Thatcher et Boeger, 1987 from *Pinirampus pinirampu* (Spix et Agassiz).

Two species of *Demidospermus* were previously described from the Upper Paraná River floodplain: *D. labrosi* França, Isaac, Pavanelli et Takemoto, 2003 and *D. mandi* França, Isaac, Pavanelli et Takemoto, 2003. However, Cohen and Kohn (2008b) considered *D. labrosi* as a synonym of *D. cornicinus* Kritsky et Gutiérrez, 1998 and *D. mandi* as a synonym of *D. leptosynophallus* Kritsky et Gutiérrez, 1998. Cohen and Kohn (2008b) also reported for the first time *D. anus* in *Loricariichthys platymetopon* from Itaipu Reservoir. The new *Demidospermus* species described herein is parasitic on the armoured catfish *L. platymetopon*, locally known as “casudo-chinelo”, which is closely related to *Loricariichthys anus*, the host from which the genus *Demidospermus* was proposed

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(Suriano 1983), but this new species differs from *D. anus* in some aspects as described below.

Materials and methods

In this study 152 specimens of *L. platymetopon* were collected using gill nets in quarterly sampling in the Upper Paraná

River floodplain, Brazil, during 2004. Gills were removed and placed in vials containing 1:4000 formalin solution for later examination. New specimens of parasites were collected in 2008 for drawings and voucher specimens. The parasites were fixed and stored in 5% formalin. Some specimens were stained with Gomori's trichrome and others were mounted in Hoyer (Eiras *et al.* 2006). Standardized morphological measurements were made using an ocular micrometer. Mean values

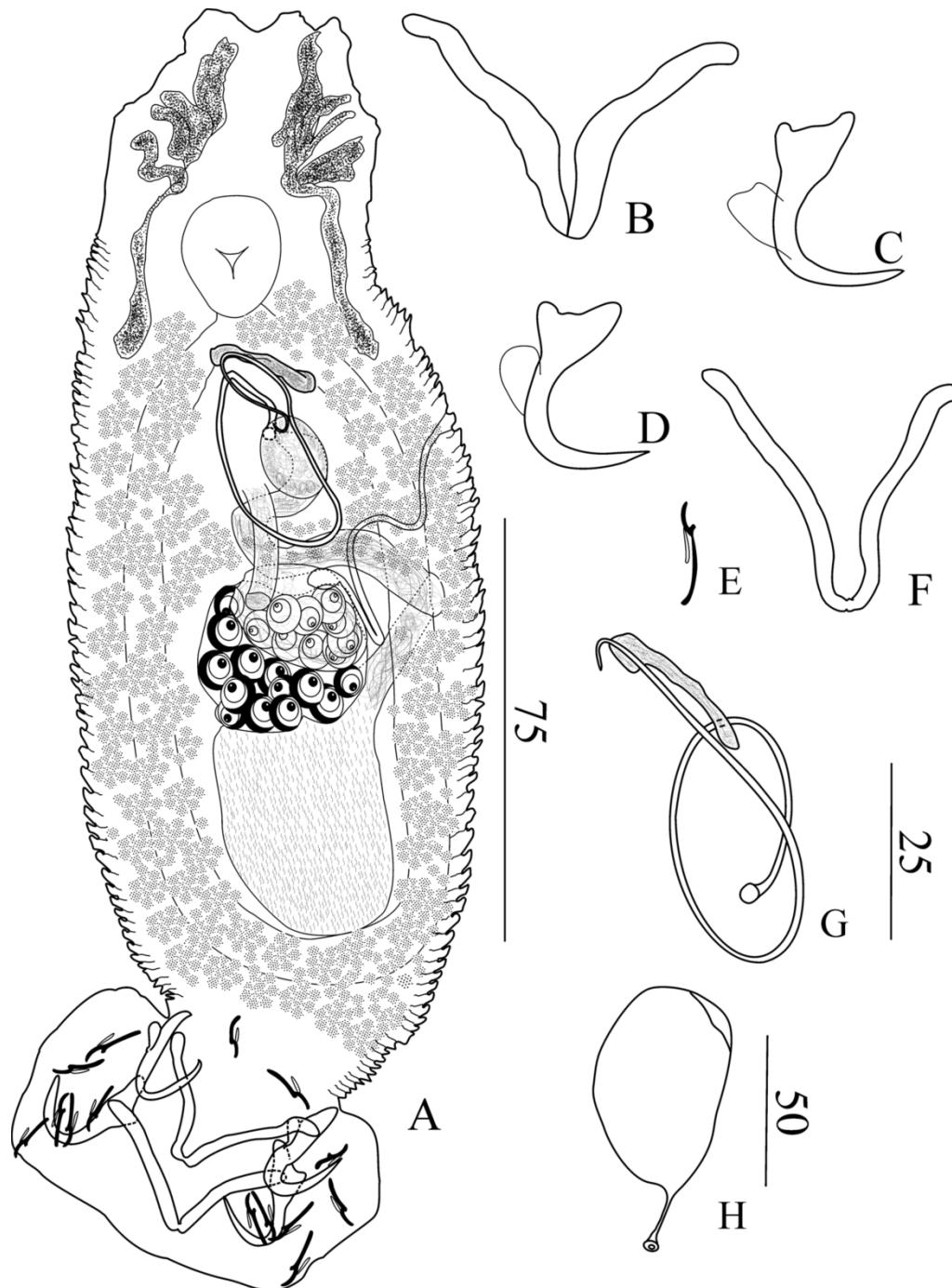


Fig. 1. *Demidospermus paranaensis* sp. nov.: **A.** Composite drawing of whole-mount (ventral view). **B.** Ventral bar. **C.** Ventral anchor. **D.** Dorsal anchor. **E.** Hook. **F.** Dorsal bar. **G.** Copulatory complex. **H.** Egg. Scale bars = 75 µm (A), 25 µm (B-G), 50 µm (H)

(in micrometers) are presented for each morphological measurement, with the range of observed measurements and number of specimens measured (n) given in parentheses. A Nikon YS 2 microscope and drawing tube were used for illustrations. The ecological terminology used throughout this study follows Bush *et al.* (1997). Type specimens are deposited in the Instituto Oswaldo Cruz Helminthological Collection (CHIOC), Rio de Janeiro, Brazil.

Results

Dactylogyridea Bychowsky, 1937

Dactylogyridae Bychowsky, 1933

Ancyrocephalinae Bychowsky, 1937

Demidospermus Suriano, 1983

Demidospermus paranaensis sp. nov. (Fig. 1)

Description (based on 20 adult specimens): Body, 344 (249–431; n = 19) long, greatest width 94 (49–99; n = 20). Cephalic lobes well developed, head organs observed. Tegument with annulations throughout trunk and peduncle. Eyes absent. Pharynx roughly spherical, 25 (18–36; n = 17) long, 21 (14–32; n = 17) wide, oesophagus short. Peduncle short; haptor subhexagonal 45 (36–60; n = 20) long, 59 (42–80; n = 20) wide. Dorsal and ventral anchors similar, each with poorly developed roots. Ventral anchor 25 (17–50; n = 15) long, base 14 (9–30; n = 15) wide. Dorsal anchor 25 (12–60; n = 14) long, base 13 (9–30; n = 14) wide. Ventral bar V or U shaped 81 (61–91; n = 13) long. Dorsal bar V shaped 80 (59–87; n = 12) long. All hooks similar in shape, 15 (14–16; n = 12) long. Filament hook loop 1/2 shank length. Copulatory complex, 25 (15–60; n = 15) long, with accessory piece in form of an elongated groove not articulated and serving as MCO guide. Counterclockwise-coiled MCO 40 (29–84; n = 17) long, 15 (5–40; n = 17) wide; ovate base. Gonads subovate. Testis 54 (46–72; n = 7) long, 29 (17–38; n = 7) wide. Vas deferens conspicuous, looping around left intestinal caecum, seminal vesicle elongate, spherical prostatic reservoir delicate. Ovary 40 (19–55; n = 6) long, 31 (19–42; n = 7) wide. Sinistral vaginal aperture, non-sclerotized, with delicate tube with proximal end leading to midventral seminal receptacle. Uterus delicate. Oviduct and ootype not observed. Egg oval, 58 (22–80; n = 4) long, 34 (15–46; n = 4) wide; with an appendage. Vitelline follicles throughout trunk, but absent in the gonads and copulatory complex regions.

Type host: *Loricariichthys platymetopon* Isbrücker et Nijssen, 1979.

Site of infection: Gill filaments.

Type-locality: Upper Paraná River floodplain, Brazil (22°43'S, 53°10'W).

Prevalence: 26.31%.

Mean intensity: 10.57.

Type-specimens: Holotype CHIOC no. 37255a; paratypes CHIOC nos. 37255b–e.

Etymology: The specific name refers to the type-locality.

Remarks: *Demidospermus paranaensis* sp. nov. differs from congeneric species by possessing tegument with annulations, a longer MCO ring with ovate base and by lacking eyes. This species is similar to *D. anus* Suriano, 1983 from *Loricaria anus*, based on the comparative morphology of the haptor armament (Suriano 1983). *Demidospermus anus* differs from this new species by the size of the anchors, bars and hooks, the morphology of the MCO, and by lacking tegumental annulations. Cohen and Kohn (2008b) reported *D. anus* in *L. platymetopon* from Itaipu Reservoir; however, it is possible that they encountered this new species but did not recognize it as distinct from *D. anus*. The other *Demidospermus* species registered for the Upper Paraná River floodplain, *D. mandi* and *D. labrosi* (now synonyms of *D. cornicinus* and *D. leptosynophallus*, respectively), differ from the new species mainly by each possessing multiple hook morphologies and morphologically different MCO. This new species is similar to *D. luckyi* Kritsky, Thatcher et Boeger, 1987 in the morphology of the bars and the presence of a single hook morphology, but differs from *D. luckyi* that has the MCO base with tissue flaps at each end and tube coil less than one ring.

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References

- Bush A.O., Lafferty K.D., Lotz J.M., Shostak A.W. 1997. Parasitology meets ecology on its own terms: Margolis *et al.* revisited. *Journal of Parasitology*, 83, 575–593. DOI: 10.2307/3284227.
- Cohen S.C., Kohn A. 2008a. South American Monogenea – list of species, hosts and geographical distribution from 1997 to 2008. *Zootaxa*, 1924, 1–42.
- Cohen S.C., Kohn A. 2008b. New data on species of *Demidospermus* (Dactylogyridae: Monogenea) parasitizing fishes from the reservoir of the Itaipu Hydroelectric Power Station, Parana State, Brazil, with new synonymies. *Brazilian Journal of Veterinary Parasitology*, 17, 167–170.
- Eiras J.C., Takemoto R.M., Pavanelli G.C. (Eds.). 2006. Métodos de estudo e técnicas laboratoriais em parasitologia de peixes. 2nd Edition, Maringá, Eduem, 199 pp.
- Kohn A., Cohen S.C. 1998. South American Monogenea – list of species, hosts and geographical distribution. *International Journal for Parasitology*, 28, 1517–1554. DOI: 10.1016/S0020-7519(98)00083-6.
- Kritsky D.C., Thatcher V.E., Boeger W.A. 1987. Neotropical Monogenea. 10. *Omothecium*, new genus (Dactylogyridae: Ancyrocephalinae) and two new species from the Piranambu, *Pirirampus pirinampu* (Spix), (Siluriformes), in Brazil. *Proceedings of Biological Society of Washington*, 100, 8–12.

- Kritsky D.C., Gutiérrez P.A. 1998. Neotropical Monogenoidea. 34. Species of *Demidospermus* (Dactylogyridae, Ancyrocephalinae) from the gills of pimelodids (Teleostei, Siluriformes) in Argentina. *Journal of the Helminthological Society of Washington*, 65, 147–159.
- Suriano D.M. 1983. *Demidospermus anus* gen. nov. sp. nov. (Monogenea: Ancyrocephalinae) parasita branquial de *Loricaria* (L.) *anus* Valenciennes, 1840 (Pisces: Loricariidae) de la laguna de Chascomus – Provincia de Buenos Aires – Republica Argentina. *Neotropica*, 29, 111–119.

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