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A New Species of *Parspina* (Trematoda: Cryptogonimidae) from Catfish (*Iheringichthys labrosus*) in the Reservoir of the Itaipu Hydroelectric Power Station, Brazil

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ABSTRACT: *Parspina papernai* n. sp. is described from the intestine of *Iheringichthys labrosus* from the reservoir of the Itaipu Binational Hydroelectric Power Station, State of Paraná, Brazil. The new species is characterized by and easily distinguished from the other 2 species in the genus by having the distribution of vitellaria restricted to the hindbody, with follicles extending in a transverse band from the anterior margin of the testes to the posterior portion of seminal vesicle. The new species differs in egg size from *Parspina bagre* and from *Parspina argentinensis* by having a ventral sucker smaller than oral sucker and in egg size.

KEY WORDS: *Parspina papernai* n. sp., Digenea, Cryptogonimidae, catfish, reservoir, Brazil.

The genus *Parspina* Pearse, 1920, was reported in freshwater fishes from South America and was represented by only 2 species: *Parspina bagre* Pearse, 1920, and *Parspina argentinensis* (Szidat, 1954) Sogandares-Bernal, 1959. The type species, *P. bagre,* was reported from Venezuela, parasitizing unidentified species *Gephyrocharax* (type host) and *Hemigrammus* (Iturbe and Gonzáles, 1921). *Parspina argentinensis* was originally described from Argentina in the intestine of *Pimelodus blochii* Valenciennes, 1840 [=*Pimelodus clarias* (Bloch, 1782)] and reported from southern Brazil parasitizing *Pimelodus maculatus* Lacepède, 1803, by Kohn and Fróes (1986), Fortes et al. (1993), Fortes and Hoffman (1995), and Bachmann et al. (2007) and in *Pimelodella lateristriga* (Müller and Troschel, 1849) by Fernandes and Kohn (2001). Recently, Ostrowski de Núñez et al. (2011) examined the type specimens of *P. bagre* and redescribed *P. argentinensis* on the basis of type material and specimens collected from different hosts in Argentina: *P. maculatus*, *Pimelodus albicans* (Valenciennes, 1840), *Pimelodus argenteus* Perugia, 1891, *Parapimelodus valenciennis* (Lütken, 1874), *Iheringichthys labrosus* (Lütken, 1874), and *Pimelodella gracilis* (Valenciennes, 1835).

During studies on the helminth fauna of freshwater fishes from the reservoir of the Itaipu Binational Hydroelectric Power Station in the State of Paraná, Brazil, specimens of *I. labrosus* were found to be parasitized by a new species of *Parspina*. *Iheringichthys labrosus,* locally "mandi-beiçudo," ranges in the Prata River Basin and is abundant in several reservoirs (Burgess, 1989). This fish principally feeds on bivalves and aquatic insects in the Chironomidae. With the end of the trophic upsurge period in the Itaipu reservoir, secondary species may become important resources for commercial fisheries, including *I. labrosus*. It is also important for sport fishing near the sand beaches ("mandizeiros") along the upper Paraná River channel and its main tributaries (Abes et al., 2001). In addition to *P. argentinensis*, 2 other digeneans have been described from this host in Argentina: *Auriculostoma platense* (Szidat, 1954) (Allocreadiidae) and *Sanguinicola coelomica* (Szidat, 1951) (Sanguinicolidae). The purpose of this paper is to describe a new species of *Parspina* from *I. labrosus*.

MATERIALS AND METHODS

Three specimens of *I. labrosus* were collected alive in 1995 from the reservoir of the Itaipu Binational Hydroelectric Power Station, State of Paraná, in the locality of Guaira, Brazil (24°04′48″S; 54°15′21″W) and were identified by ichthyologists from the hydroelectric power station. The intestine of each specimen was examined for helminths, and the digeneans collected were fixed in AFA (alcohol, formalin, and acetic acid) at ambient temperature with and without slight coverslip pressure. Specimens were stained with Langeron's alcoholic acid carmine, dehydrated in an ethanol series, cleared in beechwood creosote and permanently mounted in Canada balsam. Measurements of non compressed worms and compressed (in brackets) are presented as range values (in µm), unless otherwise stated. Specimens were illustrated with the aid of a camera lucida. Light micrographs were made using a Nikon Eclipse 800 camera.

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RESULTS

Parspina Pearse, 1920 (emended)
Cryptogonimidae

Body small, oval, spined. Oral sucker funnel-shaped, longer than wide, with single crown of enlarged oral spines, opens terminally. Ventral sucker embedded or not in ventrogenital sac. Ratio of oral sucker:ventral sucker width 1:1–1.5. Prepharynx short. Pharynx present. Esophagus short. Intestinal bifurcation anterior to ventral sucker. Ceca blind, ending posterior to testes or close to posterior extremity. Testes 2, symmetrical to slightly oblique in mid-hindbody. Seminal vesicle bipartite; pars prostatica and ejaculatory duct free in parenchyma. Cirrus sac absent. Hermaphroditic duct short. Genital pore anterior to ventral sucker. Gonotyl absent. Ovary slightly lobed, transversely elongated, anterior to testes. Uterus in hindbody extending close to posterior extremity. Vitelline follicles distributing in 1 or 2 bilateral groups from level of gonads to intestinal bifurcation or in 1 transverse band confluent dorsally in middle third of body. Arms of excretory vesicle reach the pharynx. Parasitic in alimentary canal of Neotropical freshwater fishes.

Type species: Parspina bagre Pearse, 1920.

Parspina papernai n. sp.
(Figs. 1–7)

Description

Based on observations and measurements of 6 adult specimens: 3 noncompressed worms and 3 compressed; measurements of compressed worms in brackets. Body oval-elongate, tapered at posterior extremity, 1.07–1.32 [1.57–2.30] mm long by 0.35–0.40 [0.52–0.65] mm wide (Figs. 1, 2). Tegument spinous. Oral sucker terminal, muscular, funnel-shaped, 137–160 [190–225] long by 105–130 [167–220] larger width, with a single circumoral crown of 21 or 22 spines, 27–37 [27–40] long by 7–12 [10–12] larger width (Fig. 3). Prepharynx short, 25–30 [12–55] long. Pharynx large, muscular, 62 [60–95] long by 40–67 [72–100] wide. Esophagus tubular, short, 45–62 [37–100] long. Intestinal bifurcation immediately anterior to ventral sucker. Ceca lateral, extending to midway between posterior extent of testes and posterior end of the worm. Ventral sucker rounded, in anterior half of body, pre-equatorial, post bifurcal, smaller than oral sucker, not embedded in ventrogenital sac, 100–105 [117–147] long by 92–115 [130–155] wide. Sucker width ratio 1:0.7–0.9 [1:0.7–0.8]. Testes 2, oval to rounded, symmetrical to

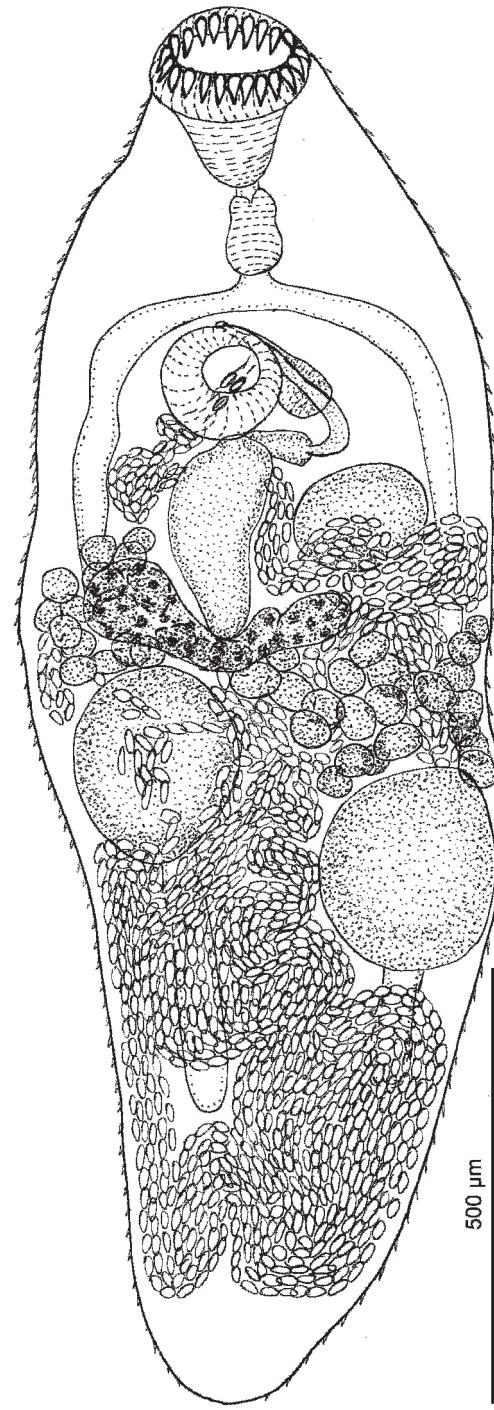


Figure 1. *Parspina papernai* n. sp. holotype, ventral view.

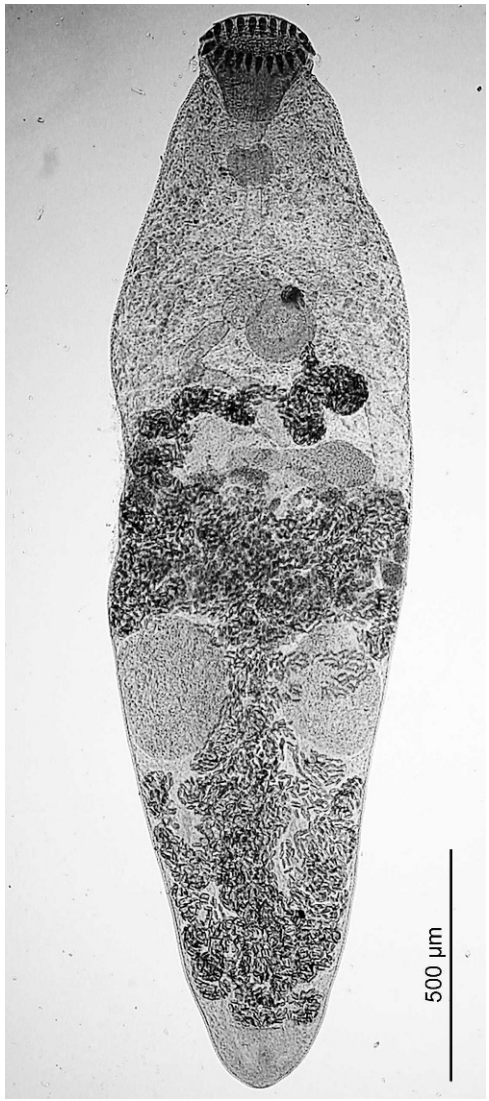
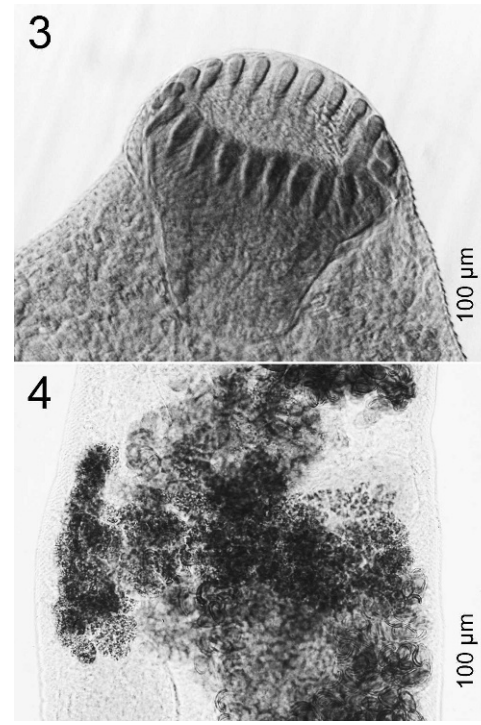


Figure 2. *Parspina papernai* n. sp. paratype, dorsal view.



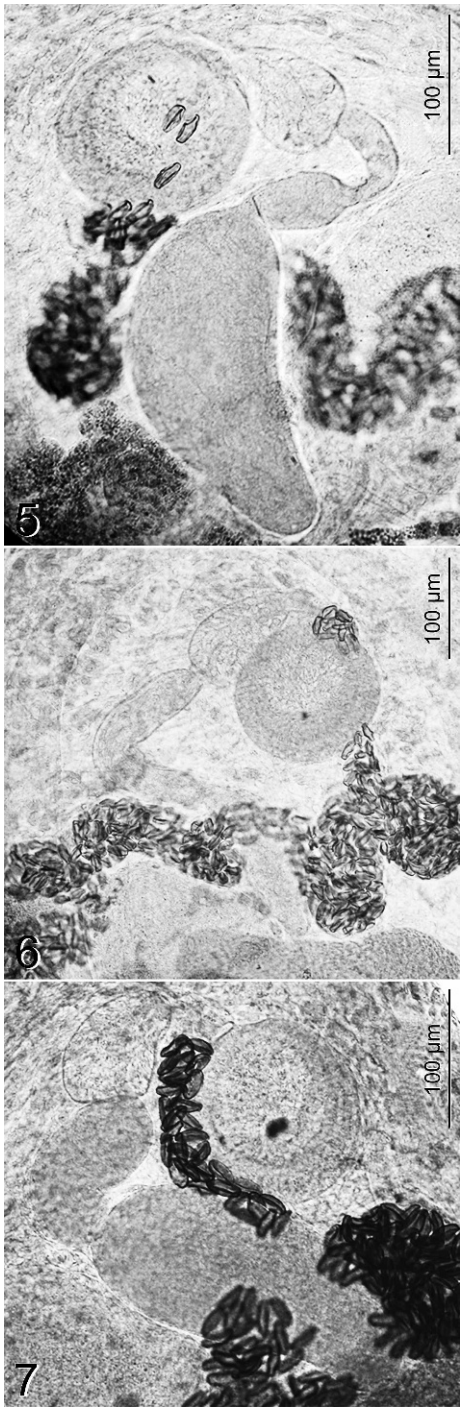
Figures 3, 4. *Parspina papernai* n. sp. **3.** Oral sucker with crown of spines. **4.** Detail of vitelline follicles.

slightly oblique, in the middle of hindbody, far from posterior extremity; testes 127–140 [180–300] long by 95–132 [195–245] wide. Cirrus sac lacking. Seminal vesicle, well developed, bipartite, elongated, posterior to ventral sucker, pretesticular; distal part (closer to genital pore) [110–195] long by [40–65] wide, proximal portion 120 [195–230] long by 50 [62–105] wide (Figs. 5–7). Pars prostatica well developed, 75 [87–122] long by 50 [60–67] wide, surrounding ejaculatory duct, unites with distal end of uterus, forming short hermaphroditic duct (Figs. 5–7). Genital pore median, immediately anterior to ventral sucker (Figs. 1, 2, 5–7). Ovary transversally elongated, slightly lobed, median, immediately anterior to testes, [100–200] long by [287–365] wide. Seminal receptacle large, rounded to oval, lateral to proximal part of seminal vesicle, 82–87 [112–220] long by 57 [145–232] wide. Mehlis' gland and Laurer's canal not observed. Vitelline follicles rounded, confluent dorsally extending in 1 transverse band in middle third of worm, between anterior margin of testes to posterior portion of seminal vesicle (Figs. 1, 2, 5). Uterus coiled, extending from ovary and completely filling space posterior of testes, opens into hermaphroditic duct. Eggs small, operculated, 20–25 [20–25] long by 10–12 [10–12] wide. Excretory vesicle not observed. Excretory pore terminal.

Taxonomic summary

Type and only known host: Iheringichthys labrosus (Lütken, 1874): Pimelodidae.

Type locality: Reservoir of the Itaipu Binational Hydroelectric Power Station, Guaira, State of Paraná Brazil. 24°04′48″S; 54°15′21″W.



Figures 5–7. Three aspects of ventral sucker and terminal genitalia.

Date of collection: 25 October 1995.

Site of infection: Intestine.

Prevalence and mean intensity: Two of 3 (67%), each with 3 parasites worms.

Specimens deposited: Helminthological Collection of the "Instituto Oswaldo Cruz," Brazil, 37.313a (holotype), 37.313b, c; 37.312a–c (paratypes).

Etymology: The specific epithet honors Professor Ilan Paperna for his great contributions to ichthyoparasitology.

Remarks

The original description of *P. argentinensis* included the ventral sucker embedded in a ventrogenital sac (Szidat, 1954). Yamaguti (1971, p. 243) redescribed the holotype of *P. bagre*, type species of the genus *Parspina*, as having a "thin-walled cirrus pouch enclosing the seminal vesicle, pars prostatica and ejaculatory duct." Miller and Cribb (2008) included this character in the diagnosis of the genus, mentioning that this thin membrane should not be considered a true cirrus-sac and that further work was needed to fully characterize this structure.

Recently, Ostrowski de Núñez et al. (2011) examined the type specimens of *P. bagre* and redescribed *P. argentinensis* on the basis of type material and specimens collected from different hosts: *P. maculatus*, *P. albicans*, *P. argenteus*, *P. valenciennis*, *I. labrosus,* and *P. gracilis* from Argentina. New morphological data of the tegumental surface of *P. argentinensis*, among other morphological characters, were described. These authors confirmed the presence of a bipartite seminal vesicle and the absence of cirrus-sac and of a thin walled-membrane enclosing the male terminal genitalia, emending the generic diagnosis. *Parspina bagre* presents vitelline follicles arranged in a single group on each side of the body, extending from the level of the pharynx to the level of the ovary. In *P. argentinensis* the follicles are arranged in 2 groups on each side of the body, separated at the level of the ventral sucker, extending from the level of the pharynx to the level of the ovary.

Parspina papernai n. sp. is characterized and easily distinguished from congeners by having the distribution of vitellaria restricted to the hindbody, with follicles extending in a transverse band from the anterior margin of the testes to the posterior portion of the seminal vesicle. The new species also differs from *P. bagre* in egg size (18–24 × 6–8 compared

with 22–25 × 10–12 in the new species) and from *P. argentinensis* in having a ventral sucker smaller than oral sucker and in egg size (24–32 × 11–16 compared with 22–25 × 10–12 in the new species). *Iheringichthys labrosus*, type host of *P. papernai* n. sp., can also be parasitized by *P. argentinensis,* as reported by Ostrowski de Núñez et al. (2011).

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LITERATURE CITED

Abes, S. S., A. A. Agostinho, E. K. Okada, and L. C. Gomes. 2001. Diet of *Iheringichthys labrosus* (Pimelodidade, Siluriformes) in the Itaipu reservoir. Paraná River, Brazil-Paraguay. Brazilian Archives of Biology and Technology 44:101–105.

Bachmann, F., J. A. Greinert, P. W. Bertelli, H. H. Silva Filho, N. O. T. Lara, L. Ghiraldelli, and M. L. Martins. 2007. Parasitic fauna of *Pimelodus maculatus* (Osteichthyes: Pimelodidae) from the Itajai-Açú river in Blumenau, state of Santa Catarina, Brazil. Acta Scientiarum—Biological Sciences 29:109–114.

Burgess, W. E. 1989. An Atlas of Freshwater and Marine Catfishes a Preliminary Survey of the Siluriformes. T.F.H. Publications, Neptune City, New Jersey. I +784 pp.

Fernandes, B. M. M., and A. Kohn. 2001. On some trematode parasites of fishes from Parana River. Brazilian Journal of Biology 61:461–466.

Fortes, E., and R. P. Hoffmann. 1995. Levantamento da fauna parasitária de peixes do Lago Guaíba, Porto Alegre, Rio Grande do Sul, Brasil. Revista Brasileira de Medicina Veterinária 17:107–111.

Fortes, E., R. P. Hoffman, and T. M. Sarmento. 1993. *Cucullanus fabregasi* sp. n. nematoda parasita do intestino do peixe *Pimelodus maculatus* Lacépède, 1803 do rio Guaíba, Porto Alegre, Rio Grande do Sul. Arquivos da Faculdade de Veterinaria UFRGS, 21:71–76.

Iturbe, J., and E. Gonzáles. 1921. Sobre algunos datos de protozoología y parasitologia recogidos en San Juan de los Morros. Gaceta Médica. Caracas 28:275–283.

Kohn, A., and O. M. Fróes. 1986. *Saccocoelioides godoyi* n. sp. (Haploporidae) and other trematodes parasites of fishes from the Guaiba Estuary, RS, Brazil. Memórias do Instituto Oswaldo Cruz 81:67–72.

Miller, T. L., and T. H. Cribb. 2008. Family Cryptogonimidae Ward, 1917. Pages 51–112 *in* Keys to the Trematoda. Vol. 3. R. A. Bray, D. I. Gibson, and A. Jones, eds. CABI Publishing, Wallingford, U.K., and The Natural History Museum, London, UK.

Ostrowski de Núñez, M. C., N. J. Arredondo, I. L. Doma, and A. A. Gil de Pertierra. 2011. Redescription of *Parspina argentinensis* (Szidat, 1954) (Digenea: Cryptogonimidae) from freshwater fishes (Pimelodidae) in the basins of the Paraná and La Plata Rivers, Argentina, with comments on *P. bagre* Pearse, 1920. Systematic Parasitology 78:27–40.

Szidat, L. 1954. Trematodes nuevos de faces de agua dulce de la Republica Argentina y su intento para aclarar su carácter marino. Revista do Instituto Nacional de Investigacion de las Ciencias Naturales Museo Argentino Bernardino Rivadavia 3:1–85.

Yamaguti, S., 1971.Synopsis of Digenetic Trematodes of Vertebrates. Vols. 1 and 2. Keigaku Publishing, Tokyo, Japan. 1074 pp., 349 pls.