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TWO NEW SPECIES OF *PSEUDOTELORCHIS* (DIGENEA, TELORCHIIDAE), PARASITES OF THE CAIMAN, *CAIMAN CROCODILUS YACARE* (REPTILIA, CROCODYLIA) FROM THE PANTANAL MATO-GROSSENSE, BRAZIL

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Pseudotelorchis caimanis *n. sp. and* P. yacarei *n. sp. are described based on specimens collected from* Caiman crocodilus yacare *(Daudin) in the Pantanal Mato-grossense, Brazil. This is the first record of any species of Telorchiidae Stunkard, 1924, parasitizing crocodilians.* Pseudotelorchis caimanis *n. sp. differs from* P. compactus, *the only species described in the genus with seminal receptacle, testes in tandem, and genital pore lateral to acetabulum.* Pseudotelorchis yacarei *n. sp. differs from the two other species for its body shape, for infecting the intestine instead of the uterus, by having regularly disposed instead of irregularly disposed uterine loops, and by having the vitelline glands disposed in longitudinal lateral lines instead of in lateral bunches.*

Key words: *Pseudotelorchis caimanis* n. sp. – *Pseudotelorchis yacarei* n. sp. – digenetic trematodes – Telorchiidae – *Caiman crocodilus yacare* – Pantanal Mato-grossense – Brazil – reptiles

Species of Telorchiidae parasitize amphibians and reptiles, principally quelonians (Yamaguti, 1971), but crocodilians are not included in the list of hosts. Five species of digenetic trematodes were recorded parasitizing *Caiman crocodilus yacare: Odhneriotrema microcephala* (Travassos, 1922), *Pachypsolus sclerops* (Travassos, 1922), *Proterodiplostomum longum* (Dubois, 1988), a new species of *Proctocaecum,* and *Caimanicola marajoara* (Catto & Amato, 1993). In the present paper we describe two new species of Telorchiidae from *C. c. yacare* which are the first species of this family known to parasitize crocodilians.

MATERIALS AND METHODS

The specimens studied are part of the material collected from 64 necropsies performed from January 1985 to January 1989 in the Pantanal Mato-grossense region (Catto, 1991). The hosts were captured alive with written permission from IBAMA/MS (Instituto Brasileiro do Meio Ambiente) given to the senior author and killed in the Laboratório de Parasitologia do Centro de Pesquisa Agropecuária do Pantanal da Empresa Brasileira de Pesquisa Agropecuária, Corumbá, Estado de Mato Grosso do Sul, following suggested procedures. The helminths were collected and processed according to Amato (1985). They were fixed in A. F. A. (ethyl alcohol 70 °GL (Gay Lussac) - 93 parts, formaldehyde solution 37% - 5 parts, and glacial acetic acid - 2 parts), or in glacial acetic acid for 2-3 min without pressure. After 24 hr in A. F. A., the specimens were transferred to the preservative ethyl alcohol 70 °GL. The helminths were stained with Delafield's hematoxilin and were destained in ethyl alcohol 70 °GL with hydrochloric acid 0.5%, dehydrated in an ethyl alcohol series, cleared in beechwood creosote or methyl benzoate, and mounted in Canada balsam. The illustrations were prepared with a drawing tube and a Wild Leitz microscope. Measurements are in micrometers unless otherwise indicated. The range of measurements is followed by the average within parentheses. The abbreviation TBL is for Total Body Length. The terms forebody and hindbody are used according to Yamaguti (1971). Holotype and paratypes were deposited in the Coleção Helmintológica do Instituto Oswaldo Cruz (CHIOC), Rio de Janeiro, Brazil, while paratypes were also deposited in the Helminthological Collection of the United States National Museum (USNM), Beltsville, Maryland, U.S.A.

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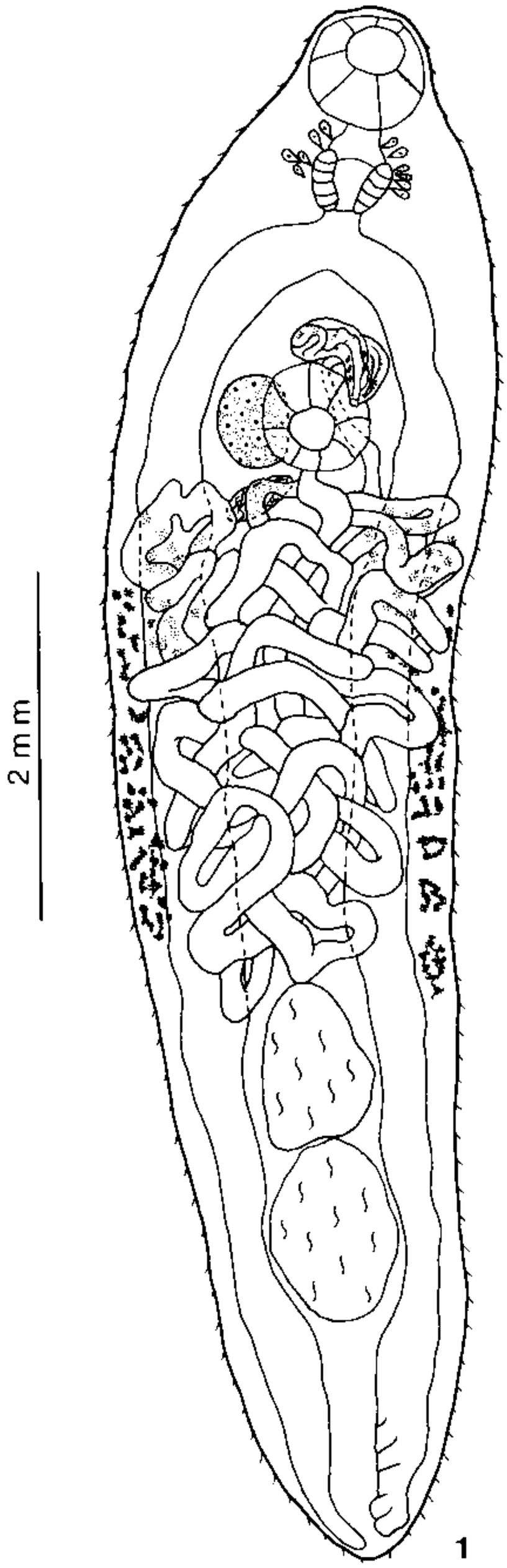

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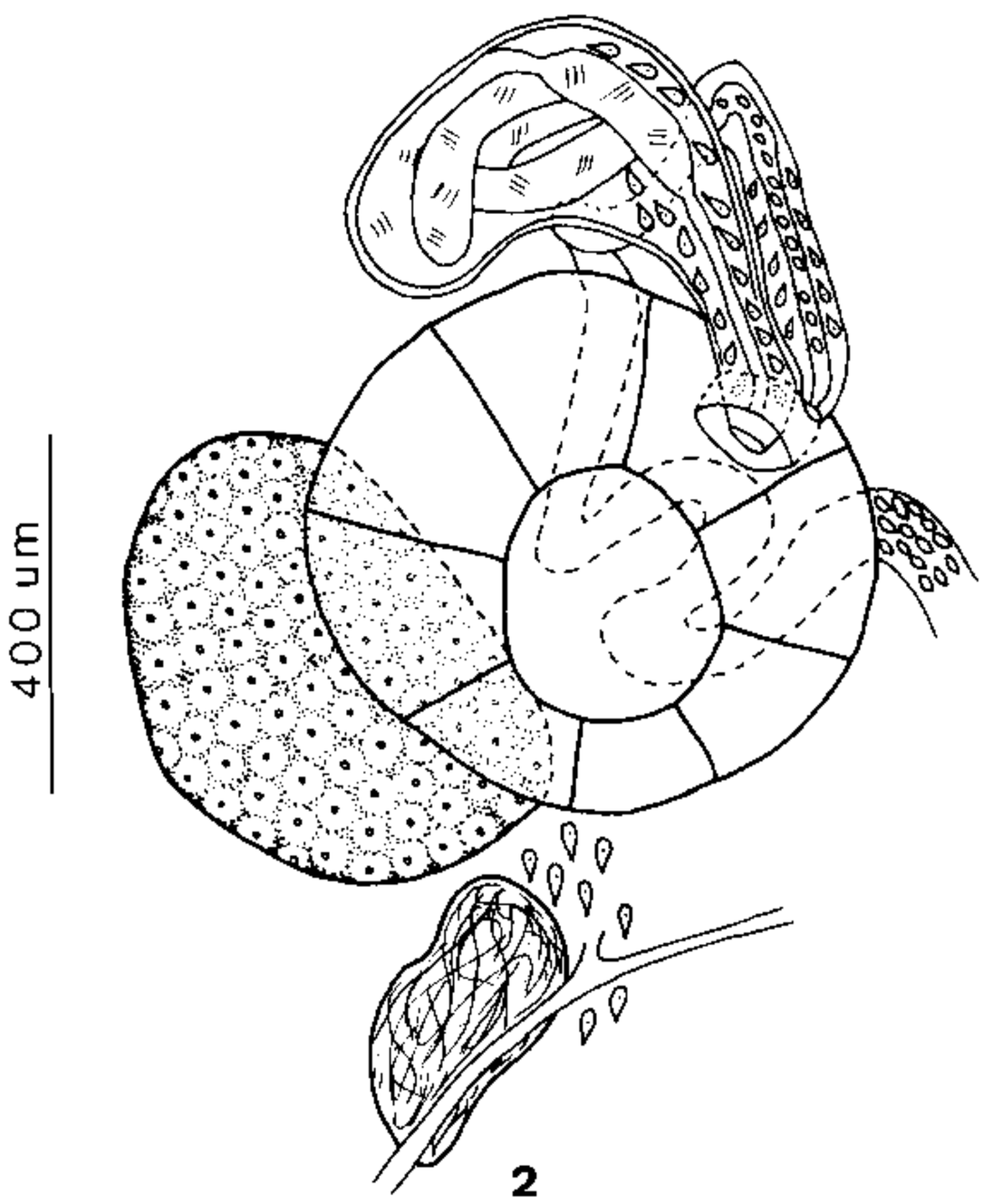

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Pseudotelorchis caimanis n. sp. Fig. 1: holotype, ventral view. Fig. 2: paratype, terminal genitalia.

DESCRIPTIONS

Pseudotelorchis caimanis sp. n.
(Figs 1 and 2)

DESCRIPTION (based on six specimens, mounted *in toto*): Telorchiidae. Body tongue-shaped, wider in anterior portion, 6-8.82 mm (7.75 mm) long, 1.28-2.15 mm (1.90 mm) wide. Tegument with spines; spines getting sparse in the posterior extremity, 22-33 (27) long, 5-9 (8) wide. Body length to width ratio 3.3-4.6:1 (4:1). Parenchyma with conspicuous muscular bundles varying in length and width, forming groups or a network, principally in anterior and median regions of body. Acetabulum 475-640 (582) long, 494-640 (600) wide. Oral sucker width ratio to pharynx 1:0.58-0.70

(1:0.63); oral sucker width ratio to acetabulum 1:0.86-1.02 (1:0.94). Forebody 23-39% (32%) of TBL. Oral sucker subterminal, without expansions, 549-658 (616) long, 530-695 (640) wide; prepharynx 36-146 (96) long; pharynx 311-420 (335) long, 311-457 (408) wide; prepharynx and pharynx surrounded by groups of glandular cells; esophagus 0.8-4.0% (2.6%) of TBL; space anterior to cecal bifurcation 12.0-18.2% (15.2%) of TBL; ceca wide, lateral, dilating beyond testes, reaching posterior extremity of body, sometimes at different levels; postcecal space 0.6-2.1% (1.2%) of TBL. Testes oval to spheric, inter cecal, in tandem; anterior testis 0.64-1.07 mm (0.80 mm) long, 640-713 (680) wide; posterior testis 0.603-1.089 mm (0.854 mm) long, 512-750 (667) wide; posttesticular space 15.1-20.5% (16.6%) of TBL; cirrus pouch anterior to, or partially overlapping acetabulum, 311-512 (405) long, 146-237 (189) wide, containing sinuous seminal vesicle, pars prostatica and cirrus; genital atrium sinistrolateral to acetabulum. Ovary subspheric to irregular, postacetabular, or partially overlapping acetabulum, 366-512 (433) long, 347-494 (414) wide; seminal receptacle and Mehlis' gland postovarian; Laurer's canal not observed; uterus with loops between posterior margin of acetabulum and anterior testis; space taken by uterus 34-39% (36.2%) of TBL; TBL; metraterm strongly developed, muscular and glandular, shorter than cirrus pouch; vitelline glands arranged in bunches, anteriorly cecal and inter cecal, posteriorly extra cecal, between posterior margin of ovary and anterior testis; space taken by vitelline glands 27-40.5% (36%) of TBL; eggs 25-35 (27) long, 11-13 (12) wide. Excretory vesicle wide, "Y" shaped, bifurcating below ovary, anterior branches thin, reaching base of oral sucker; excretory pore terminal.

Taxonomic summary

Type host: *Caiman c. yacare* (Daudin).

Site of infection: oviduct, near the opening of the cloaca.

Type locality: Nhumirim Farm 18° 06'S., 56° 36'W, Corumbá, Mato Grosso do Sul, Brazil.

Prevalence: 1.5%.

Intensity of infection: six, in one host.

Etymology: the specific name *caimanis* refers to the generic name of the host.

Specimens deposited: Holotype: CHIOC No. 32889a, paratypes: CHIOC No. 32889b and 32899c; paratype: USNM No. 82613 (3 slides).

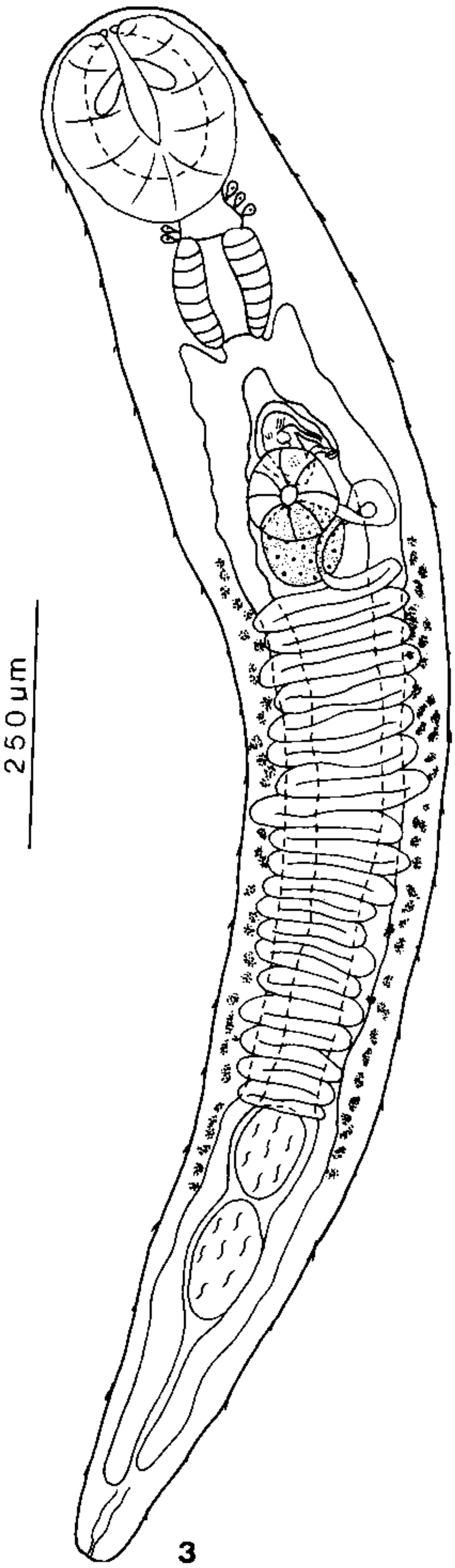
Remarks

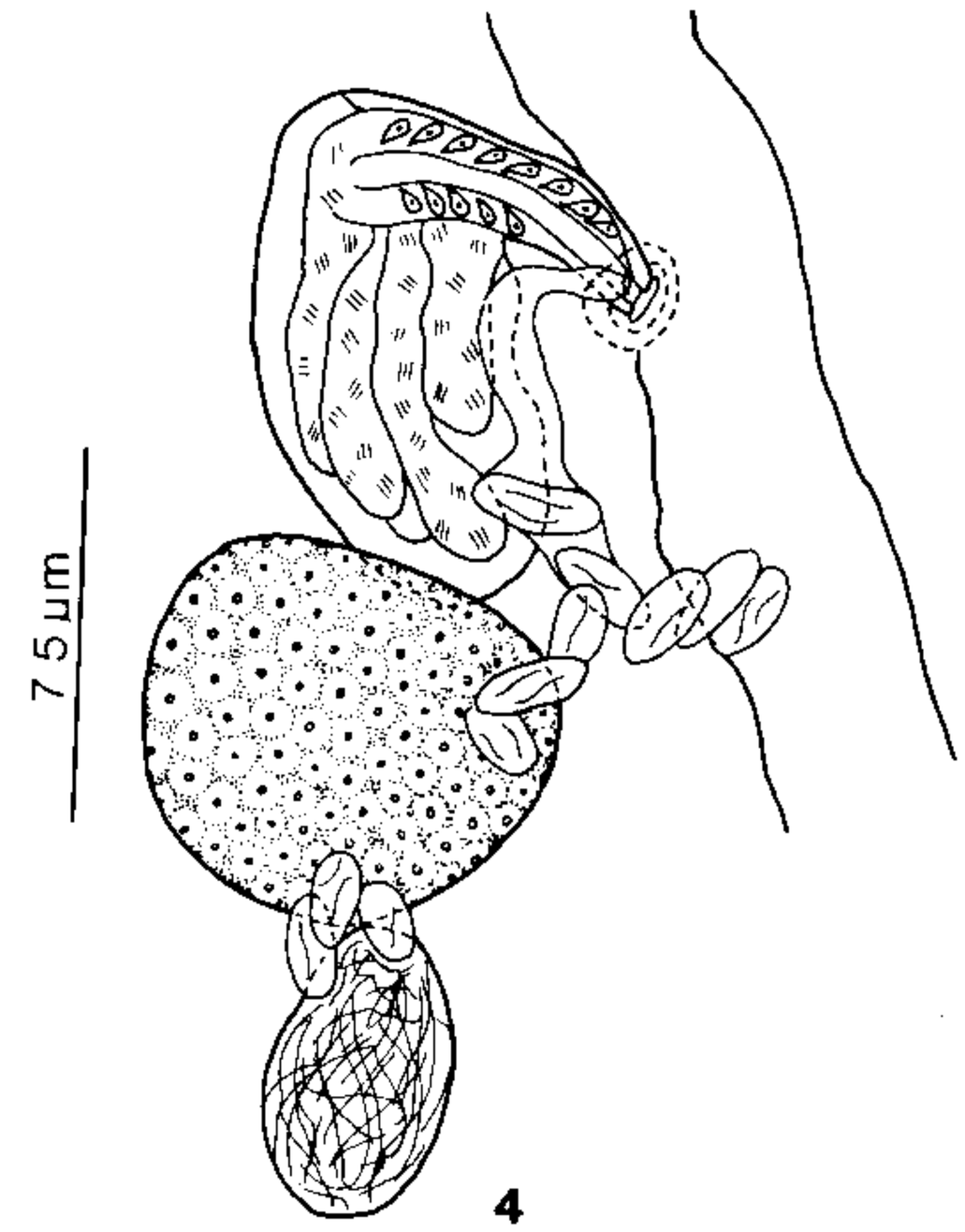
Yamaguti (1971) erected the genus *Pseudotelorchis* for *P. compatus* (Cable & Sanborn, 1970), a parasite of the oviduct of quelonians in North America, based on the anterior extension of the vitelline glands, the position of the ovary, and the cirrus pouch in relation to the acetabulum. Macdonald & Brooks (1989), using phylogenetic analysis, characterized the genus by the following characters: 1. ovary irregular in shape and 2. testes irregularly positioned. The species now described possess the ovary subspheric to irregular, but the testes are always in tandem. *Pseudotelorchis caimanis* n. sp., although presenting these inconsistencies, belongs to *Pseudotelorchis,* because it has, as the only other species in the genus: 1. ovary overlapping the acetabulum, 2. vitelline glands in bunches, 3. tongue-shaped body, and 4. cirrus pouch not overreaching the posterior margin of the acetabulum.

Pseudotelorchis caimanis n. sp., differs from *P. compactus* by the: 1. testes always in tandem, 2. genital pore lateral and not anterior, to acetabulum, 3. longer body, 4. cecal bifurcation closer to the anterior extremity, 5. uterine and postcecal spaces shorter, 6. longer, wider testes, located farther from the posterior extremity of the body, 7. cirrus pouch and eggs smaller.

Pseudotelorchis yacarei n. sp.
(Figs 3-4)

DESCRIPTION (20 specimens, mounted *in toto*): Telorchiidae. Lanceolated body, 1.44-3.07 mm (2.13 mm) long, 256-530 (381) wide; length to width ratio 4.3-6.6:1.0 (5.5:1.0). Tegument with small spines. Acetabulum 94-182 (132) long, 87-182 (130) wide. Forebody 23-39% (32%) of TBL. Oral sucker width ratio to pharynx 1:0.46-0.60 (1:0.53); oral sucker width ratio to acetabulum 1:0.39-0.55 (1:0.48). Oral sucker subventral, 204-394 (278) long, 190-423 (269) wide, with two expansions in ventral surface, anterior borders separated; prepharynx 15-167 (63) long, surrounded by glandular cells; pharynx 102-175 (141) long, 102-153 (143) wide; esophagus 0.6-2.3% (1.3%) of TBL; space anterior to cecal bifur-





Pseudotelorchis yacarei n. sp. Fig. 3: holotype, ventral view. Fig. 4: paratype, terminal genitalia.

cation 14.4-29.5% (19.7%) of TBL; ceca generally ending at different levels, near posterior extremity of body; postcecal space 1.5-7.4% (3.1%) of TBL. Testes oval to spheric, smooth, inter cecal, in tandem, near posterior extremity; anterior testis 87-182 (138) long, 65-189 (126) wide: posterior testis 109-226 (156) long, 58-189 (120) wide; posttesticular space 5.2-24% (13%) of TBL; cirrus pouch with overlapping areas to anterior half of acetabulum,

106-233 (144) long, 43-102 (67) wide; with internal seminal vesicle sinuous, prostatic glands, and cirrus; genital pore sinistro-lateral to acetabulum. Ovary submedian, irregular in shape, smooth, dorsal or posterior to acetabulum, 73-211 (112) long, 5-182 (112) wide; seminal receptacle and Mehlis' gland postovarian; Laurer's canal not observed; uterus with loops regularly arranged, between acetabulum and anterior testis, inter and extra cecal; space taken by uterus 30-39% (34.5%) of TBL; metraterm muscular but not glandular; vitelline glands in lateral, longitudinal lines, anteriorly reaching posterior border of acetabulum, posteriorly reaching posterior margin of anterior testis; space taken by vitelline glands 19.2-41% (28%) of TBL; eggs 23.7-31 (27) long, 11-14.6 (12) wide. Excretory vesicle "Y" shaped, bifurcating dorsally to ovary; excretory pore terminal.

Taxonomic summary

Type host: *Caiman c. yacare* (Daudin).

Site of infection: intestine.

Type locality: Fazenda Nhumirim, 18° 06'S, 56° 36'W, Corumbá, Mato Grosso do Sul, Brazil.

Other localities: Santana Farm, 18° 06'S, 56° 36'W, Corumbá, Mato Grosso do Sul, Brazil.

Prevalence: 29.6%.

Intensity of infection: 1349, in 19 hosts.

Mean intensity of infection: 71.

Etymology: the specific name *yacarei* refers to the subspecific name of the host.

Specimens deposited: Holotype: CHIOC No. 32890a; paratypes: CHIOC No. 32890b, 32890c, 32891, 32892a, 32892b, 32892c, 32893, 32894a, 32894b. USNM paratypes No. 82614 (6 slides), 82615 (2 slides), 82616.

Remarks

There are different opinions about the phylogenetic relations among the Telorchiidae, the Ochetosomatidae, and the Auridistomidae, and also among the genera of Telorchiidae (Caubiscens-Poumarau, 1968; Stunkard & Franz, 1977; Goodman, 1988).

Yamaguti (1971) recognized Auridostomidae and Telorchiidae, the later with three subfamilies. Three genera, *Protenes* (Baker & Covey), *Telorchis* Lühe, 1899, and *Pseudotelorchis* Yamaguti, 1971, were allocated in the Telorchiinae Looss, 1899. The genus *Pseudotelorchis* was erected for *Telorchis compactus* described by Cable & Sanborn (1970) from the oviduct of *Emydoidea blandingi* Holbrook, 1888. The Ochetosomatid were placed in the category tribe within Styphlodorinae Dollfus, 1937, in Plagiorchiidae (Lühe).

Brooks et al. (1985) in their phylogenetic analysis of the Digenea recognized Telorchiidae and Auridistomidae, and included them in the suborder Plagiorchiata. Recently, Macdonald & Brooks (1989) redescribed *Pseudotelorchis compactus* recognizing the genera *Telorchis, Loefgrenia* Travassos, 1920, and *Pseudotelorchis* in Telorchiidae. They excluded *Orchidasma* Looss, 1900 and sinonimized *Protenes* and *Auritelorchis (=Paratelorchis* Stunkard, 1979) as *Telorchis,* because the recognition of these genera would make *Telorchis* paraphyletic.

Pseudotelorchis yacarei n. sp. could not be allocated to the genus *Telorchis* because it does not have the distance between the ovary and the acetabulum, at least, equal to half the diameter of the ovary, which is the sinapomorphy of the group (Macdonald & Brooks, 1989). In addition to this character, this species shares with the other species of *Pseudotelorchis,* the position of the cirrus pouch in relation to the acetabulum, although differing from those species, *Pseudotelorchis yacarei* n. sp. does not have the vitelline glands in bunches and the shape of the body.

A revision of the family will show if the allocation of this species to *Pseudotelorchis* is correct. *Telorchis divincenzii* Mañé-Garzón & Gil, 1961, a parasite of *Hidromedusa tectifera* (Cope), from Argentina, has the oral sucker and the position of the ovary in relation to the acetabulum, similar to the species now described, but the impossibility to obtain specimens for study did not allow its transfer to *Pseudotelorchis.*

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