

**Amphistomes as species markers of the serrasalmid fish,  
*Myleus ternetzi* (NORMAN), from French Guiana, with  
descriptions of two new species and one new genus**

by

Vernon E. Thatcher\* & Michel Jégu

Dr. Vernon E. Thatcher, Instituto Nacional de Pesquisas da Amazônia, Caixa Postal 478, 69011-970 Manaus, AM, Brazil.

M.Sc. Michel Jégu, ORSTOM, Laboratoire d'Ichthyologie, M.N.H.N., 43, rue Cuvier, F-75231 Paris Cedex 05, France.

(Accepted for publication: November 1998).

**Abstract**

Two new species of amphistome (Trematoda) are described from "pacu", *Myleus ternetzi*, from French Guiana. For one of these, a new genus is proposed. Additionally, a common species, *Pseudocladorchis cylindricus*, is reported. *Pacudistoma guianensis* sp. nov. is a robust form with a massive pharynx; a large genital sucker; long, convoluted ceca; and a subterminal acetabulum that is smaller than the genital sucker. *Myleustrema concavatum* gen. et sp. nov., on the other hand, has a slender, flattened body, concave dorsally; a small pharynx; no genital sucker; ceca that are short, slender, and nearly straight; and a small, terminal acetabulum which is provided with papillae. The two new forms seem to be highly host specific and could therefore be used as biological markers.

Keywords: Fish parasites, trematodes, amphistomes, cladorchiids, Brazil, Amazonia, serrasalמידs.

**Resumo**

Duas novas espécies de amphistomídeos (Trematoda) são descritas do peixe serrasalmídeo, *Myleus ternetzi*, da Guiana Francesa. Para uma destas espécies, um gênero novo é proposto. Adicionalmente, uma espécie comum, *Pseudocladorchis cylindricus*, é citado. *Pacudistoma guianensis* sp. nov. é uma forma robusta com uma faringe volumosa; uma ventosa genital grande; cecos compridos e convolutos; e um acetábulo subterminal que é menor do que a ventosa genital. *Myleustrema concavatum* gen. et sp. nov., ao contrário, tem um corpo fino e achatado, que é concavo dorsalmente; ventosa genital faltando; cecos curtos, finos e quase retos; e um acetábulo terminal com a abertura do qual circundada de papilas. Estas novas formas parecem ser altamente específicas ao hospedeiro e por tanto poderiam servir de marcadoras biológicas.

\*Research Fellow of the Brazilian Nacional Research Council (CNPq), Brasília, Brazil.



Helminths, and especially trematodes of the families Cladorchiidae and Haploporidae, have been reported to be useful as population and species markers among South American serrasalmid fish (THATCHER & JÉGU 1996; THATCHER, SEY & JÉGU 1996). The great variety of intestinal trematodes in Amazonian fishes has been reported in a series of papers (THATCHER 1978, 1979a, 1979b, 1980, 1991, 1992a, 1992b, 1992c, 1993; THATCHER & VARELLA 1981). Most of the amphistomes and other trematodes have been found to be highly host specific. The present work proposes to characterize the amphistome fauna of the serrasalmid fish, *Myleus ternetzi*, from French Guiana.

### Material and methods

Fish hosts were netted in the rivers of French Guiana, fixed in 10 % formalin solution and later transferred to 70 % alcohol. The intestinal tracts were removed, opened, and washed in water. The material obtained was concentrated by hand sedimentation and the helminths removed therefrom with the aid of a dissecting microscope. Permanent slide preparations were made by means of the phenol-balsam as described by THATCHER (1991). Drawings were made with the aid of a camera lucida. Measurements were taken with a measuring ocular and are given micrometers ( $\mu\text{m}$ ) except where indicated as millimeters (mm). Means are followed by the extremes in parentheses.

### Results

#### Systematic Section

#### Family Cladorchiidae SOUTHWELL & KIRSHNER, 1937

#### *Pacudistoma* THATCHER, 1992

Generic diagnosis (modified after THATCHER, 1992c); with the characters of the family. Body elongate, robust, subcylindrical. Pharynx massive, terminal, with large external diverticula; esophagus muscular, bulb present; ceca long, thick. Acetabulum small, subterminal. Testes lobate, pre-equatorial; cirrus sac small; genital sucker large; genital pore postbifurcal. Ovary small, spherical, anterior to cecal ends; vitellaria extending laterally from posterior testis to acetabulum. Uterus intercecal; eggs small. Intestinal parasites of freshwater fish.

Type species: *Pacudistoma turgida* THATCHER, 1992.

Type host: *Myleus pacu* (SCHOMBURGK).

Type locality: Jamari River, Rondônia State, Brazil.

Other species: *Pacudistoma guianensis* sp. nov.

#### *Pacudistoma guianensis* sp. nov. (Figs. 1-3)

Host: *Myleus ternetzi* (NORMAN). (Serrasalmidae).

Site: Intestinal lumen.

Locality: Sinnamary River, French Guiana.

Prevalence: 2/11 (18 %).

Holotype and 4 paratypes: Invertebrate Collection, Instituto Nacional de Pesquisas

da Amazônia, Manaus, AM, Brazil.

**Etymology:** The generic name means a distome (trematode) from a "pacu" (the common name of the fish host). The specific name is in reference to the place of origin.

**Specific diagnosis (7 specimens measured):** With the characters of the genus. Body 6.5 (5.6-7.5) mm long and 2.9 (2.7-3.1) mm wide. Acetabulum 903 (790-1,248) long and 966 (832-1,082) wide. Pharynx 1,025 (936-1,144) long and 903 (832-1,040) wide; esophagus 772 (624-832) long; ceca 129-749 in diameter. Anterior testis 450 (344-542) long and 730 (602-1,040) wide; posterior testis 475 (413-520) long and 730 (542-957) wide; cirrus sac 353 (258-430) long and 192 (172-215) in diameter; genital sucker 841 (749-978) long and 933 (811-1,040) wide. Ovary 214 (155-361) long and 221 (172-361) wide; vitelline follicles 69-90; eggs 129 x 56 (120-138 x 52-69).

**Remarks:** *Pacudistoma guianensis* sp. nov. resembles the type species, *Pacudistoma turgida* THATCHER, 1992, in the nature and size of the pharynx, the presence of a large genital sucker, and in the general distribution of the reproductive organs. The new species differs from the type, however, in being smaller (5.6-7.5 mm not 7.14-10.13 mm in length), in having much longer and more convoluted ceca, and in having a relatively smaller acetabulum.

#### *Myleustrema* gen. nov.

**Generic diagnosis:** With the characters of the family. Body elongate, flattened, concave dorsally and convex ventrally, with circlets of papillae around anterior extremity. Pharynx small, terminal, with external diverticula; esophagus long, with small bulb; ceca slender, not reaching acetabulum. Acetabulum small, terminal, with circle of papillae around aperture. Testes weakly lobate, tandem, equatorial; cirrus sac ovoid, with heavy muscular walls, contains internal seminal vesicle; genital pore postbifurcal; small genital atrium present. Ovary subspherical, near cecal ends in posterior quarter of body; vitellaria of limited extent, anterolateral to ovary; uterus intercecal; eggs few. Intestinal parasites of freshwater fish.

Type species: *Myleustrema concavatum* sp. nov.

#### *Myleustrema concavatum* sp. nov. (Figs. 5, 6 & 8)

Host: *Myleus ternetzi*. (Serrasalminidae).

Site: Intestinal lumen.

Locality: Sinnamary River, French Guiana.

Holotype and 8 paratypes: Invertebrate Collection of the Instituto Nacional de Pesquisas da Amazônia, Manaus, AM, Brazil.

**Etymology:** The generic name signifies a trematode from "myleus", the host fish. The specific designation refers to the concave dorsal surface of the worm.

**Species description (9 specimens measured):** With the characters of the genus. Body 3.0 (2.8-3.2) mm long and 1.1 (1.0-1.2) mm wide. Pharynx 255 (241-258) long and 164 (146-181) wide; esophagus 337 (284-404) long; ceca 43-120 in diameter. Acetabulum 243 (172-301) long and 377 (344-430) wide. Anterior testis 208 (129-344) long and 303

(258-344) wide; posterior testis 196 (155-267) long and 266 (220-301) wide; cirrus sac 378 (344-430) long and 188 (172-258) in diameter. Ovary 81 (58-92) long and 67 (46-86) wide; vitelline follicles 23-46 in diameter; eggs 124 x 57 (115-138 x 51-64).

Remarks: Few trematodes are known to be concave dorsally and convex ventrally. Two such trematodes were reported from Brazilian serrasalmid fishes by THATCHER, SEY & JÉGU (1996), namely: *Inpamphistoma papillatum* and *Annelamphistoma elegans*. The new species could be related to these forms, but it differs, however, in lacking the "muscular puckers" which are found in both of the former.

### *Pseudocladorchis cylindricus* (DIESING, 1836) (Fig. 4)

Host: *Myleus ternetzi*. Other hosts (according to THATCHER & JÉGU, 1996): *Mylesinus paraschomburgkii*, *Piaractus brachypomus*, *Mylossoma aureum*, *Pterodoras granulatus* and *Pimelodus ornatus*.

Site: Intestinal lumen.

Prevalence: 15/24 (63 %). Intensity: 1-4 individuals per infected fish.

Locality: Sinnamary River, French Guiana.

Remarks: This species is characterized by having: a robust, cylindrical body; a large pharynx with internal diverticula; short, straight ceca; lobular, parallel testes; a sub-spherical cirrus sac; a uterus that is both inter and extracecal; and extensive vitelline glands that extend anterior to the testes.

*P. cylindricus* seems not to be host specific and has been found in a number of serrasalmid and siluroid fishes. The intensity of infection is usually low (1 or 2 individuals/fish).

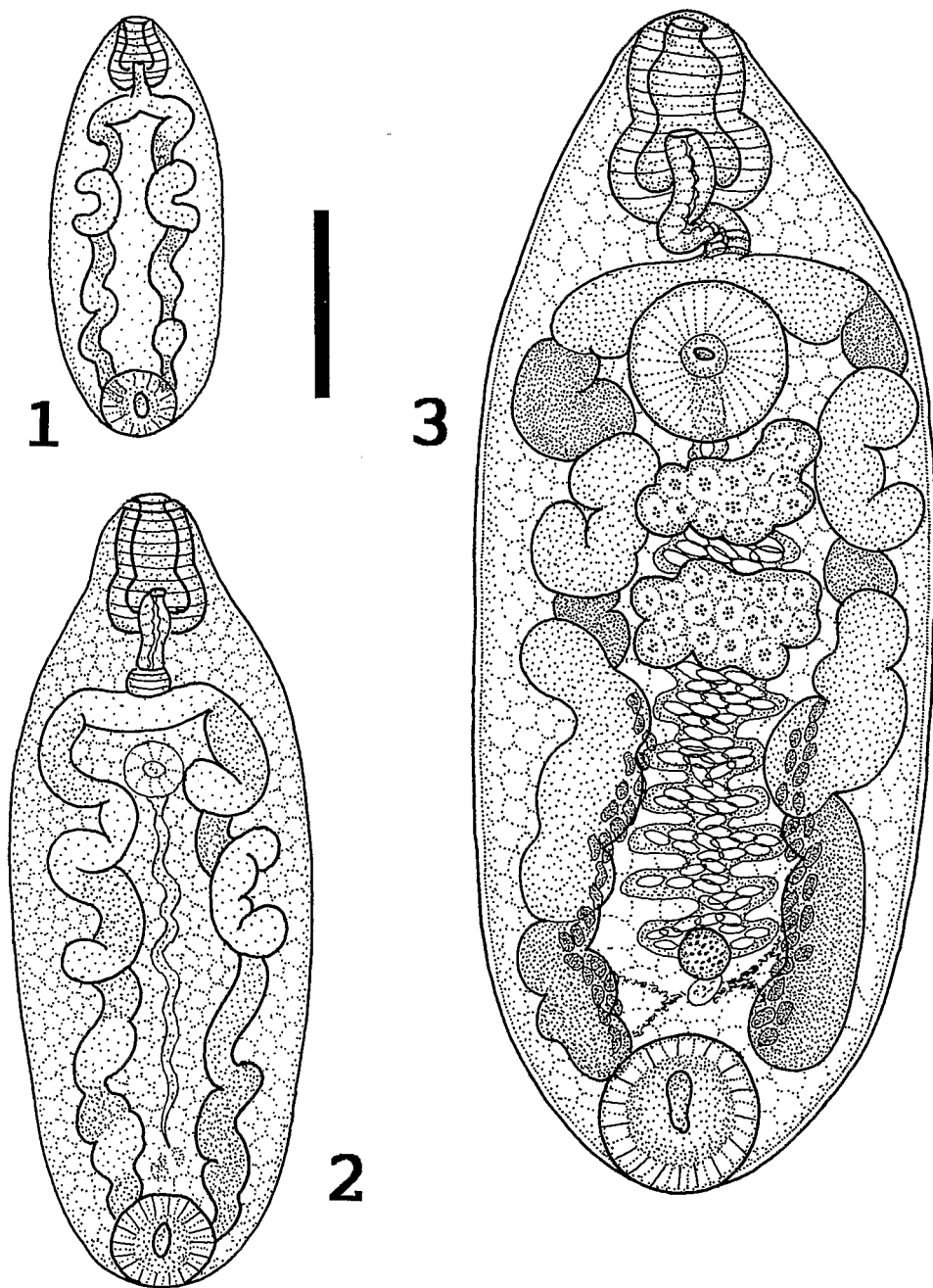
### Conclusions

The two new species appear to be specific for the host, *Myleus ternetzi*, and therefore may be useful as biological markers. It is not new known if these species are found throughout the range of the host. They might even be useful for confirming host identification. Neither of these species has been found in 11 species of "pacu" from the Brazilian Amazon.

### References

- THATCHER, V.E. (1978): Quatro espécies novas de Haploporidae (Trematoda: Digenea) de peixes de água doce de Colômbia com uma revisão do gênero *Saccocoelioides* SZIDAT, 1954. - *Acta Amazônica* 8(3): 477-484.
- THATCHER, V.E. (1979a): O primeiro trematódeo negro, *Amazonadistoma negrensis* n.gen., n.sp. (Digenea: Gorgoderidae) parasita de um peixe amazônico. - *Acta Amazônica* 9(2): 389-392.
- THATCHER, V.E. (1979b): *Brasicystis bennetti* n.gen., n.sp. (Trematoda: Didymozoidae) parasita da pescada (Sciaenidae) da Amazônia. - *Acta Amazônica* 9(4): 747-749.
- THATCHER, V.E. (1980): Duas novas espécies de *Caballerotrema* (Trematoda: Echinostomatidae) do pirarucu e da aruanã (Osteoglossidae) com uma redefinição do gênero e uma redescritção de *C. brasiliense* PRUDHOE, 1960. - *Acta Amazonica* 10(2): 419-423.

- THATCHER, V.E. (1991): Amazon Fish Parasites. - *Amazoniana* 11(3/4): 263-571.
- THATCHER, V.E. (1992a): Two new genera of Paramphistomidae (Trematoda, Digenea) from freshwater fish of Rondônia State, Brazil. - *Mem. Inst. Oswaldo Cruz (Suplemento em homenagem ao centenário de nascimento do Prof. LAURO TRAVASSOS)* 87(Suppl. 1): 287-291.
- THATCHER, V.E. (1992b): *Bacciger pellowae* n.sp. (Trematoda, Fellodistomidae) from a freshwater fish, *Pellona castelnaena* VALENCIENNES of Rondônia State, Brazil. - *Acta Amazônica* 22: 605-608.
- THATCHER, V.E. (1992c): Two unusual new genera of Paramphistomidae (Trematoda, Digenea) from fish of the Brazilian Amazon. - *Acta Amazônica* 22(4): 609-613.
- THATCHER, V.E. (1993): Trematódeos Neotropicais. - INPA/FUA 553 pp.
- THATCHER, V.E. & M. JÉGU (1996): Intestinal helminths as population markers of the Amazonian fish, *Mylesinus paraschomburgkii*, with descriptions of five new genera and seven new species of trematodes. - *Amazoniana* 14(1/2): 143-155.
- THATCHER, V.E., SEY, O. & M. JÉGU (1996): New amphistome (Trematoda) genera and species from Amazonian serrasalmid fishes, *Myleus (Myloplus)*. - *Acta. Zool. Acad. Sci. Hung.* 42: 261-270.
- THATCHER, V.E. & A.B. VARELLA (1980): Duas novas espécies de *Megacoeilium* SZIDAT (Trematoda: Haploporidae) parasitos estomacais de peixes da Amazônia brasileira, com uma redefinição do gênero. - *Acta Amazônica* 11(2): 285-289.



Figs. 1-3:  
*Pacudistoma guianensis* sp. nov. (Growth series - ventral view).  
(scale = 1 mm).

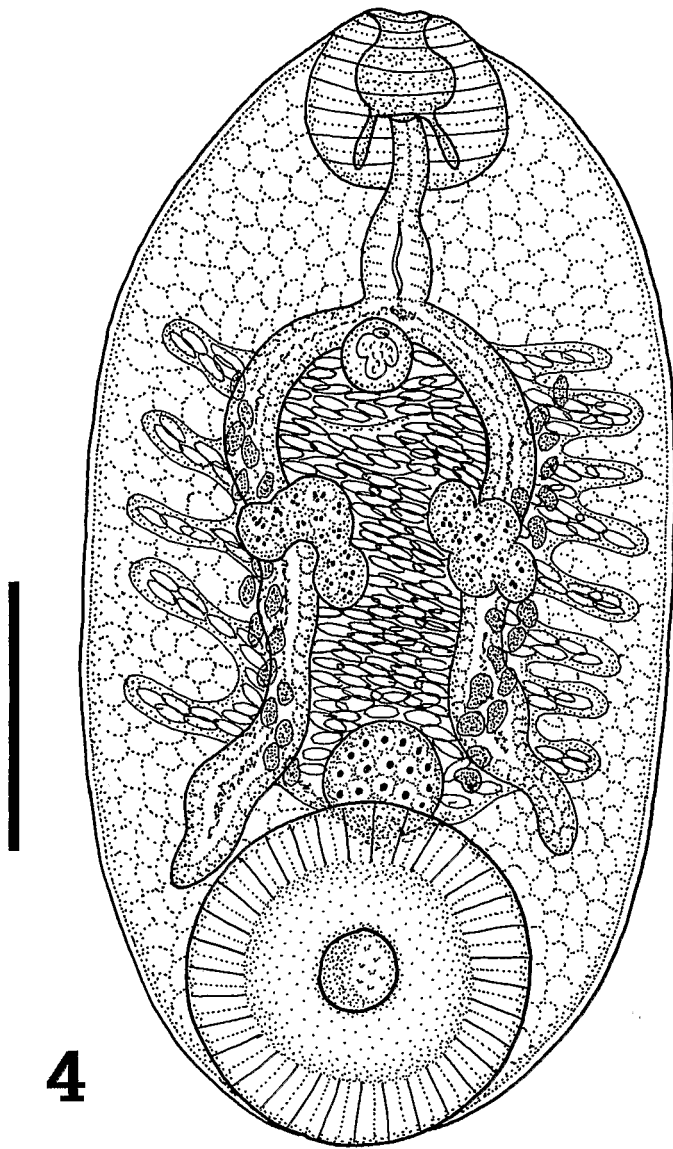
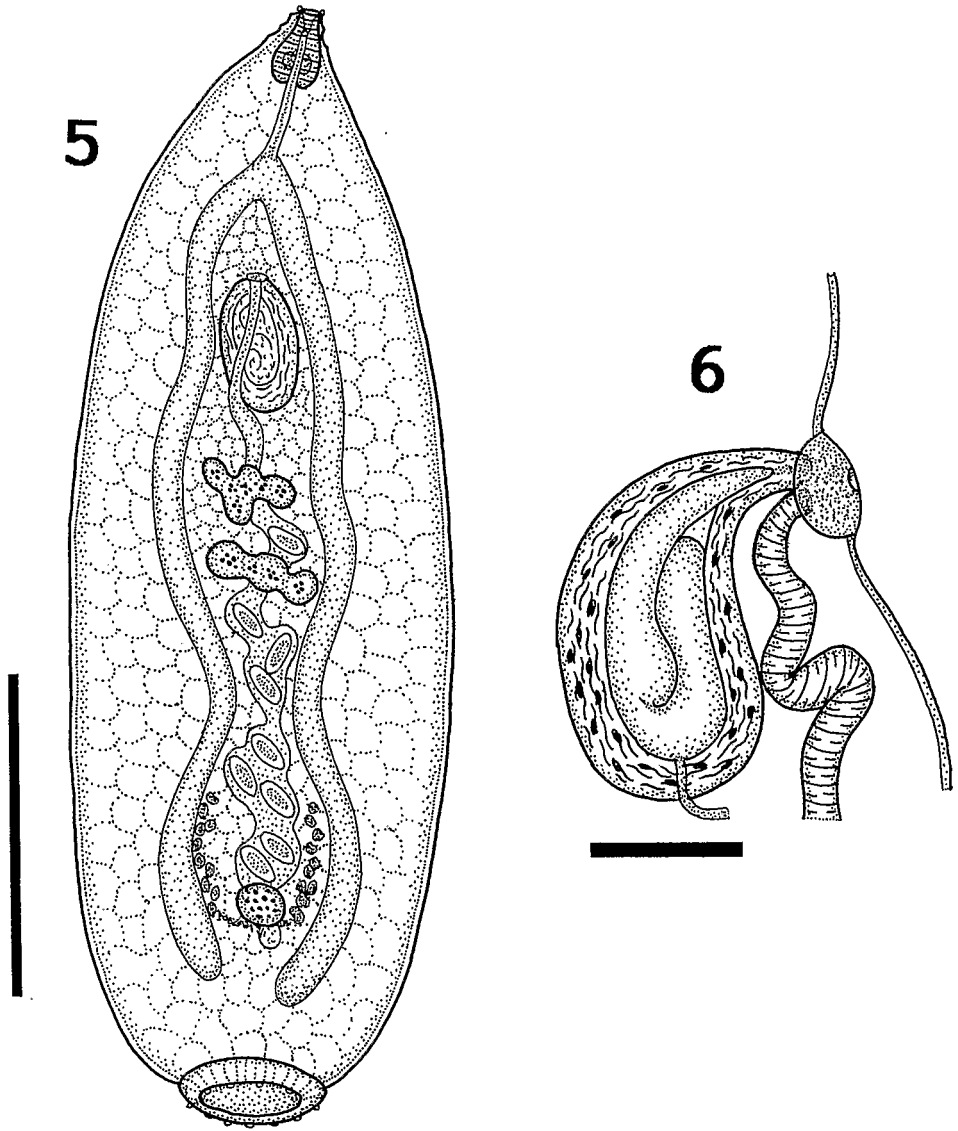


Fig. 4:  
*Pseudocladorchis cylindricus* (DIESING, 1836). (Ventral view).  
(scale = 1 mm).



Figs. 5 & 6:

*Myleustrema concavatum* gen. et sp. nov.

5: Entire specimen - ventral view. 6: Terminal genitalia (lateral view).

(scale: 5 = 1 mm; 6 = 200  $\mu$ m).



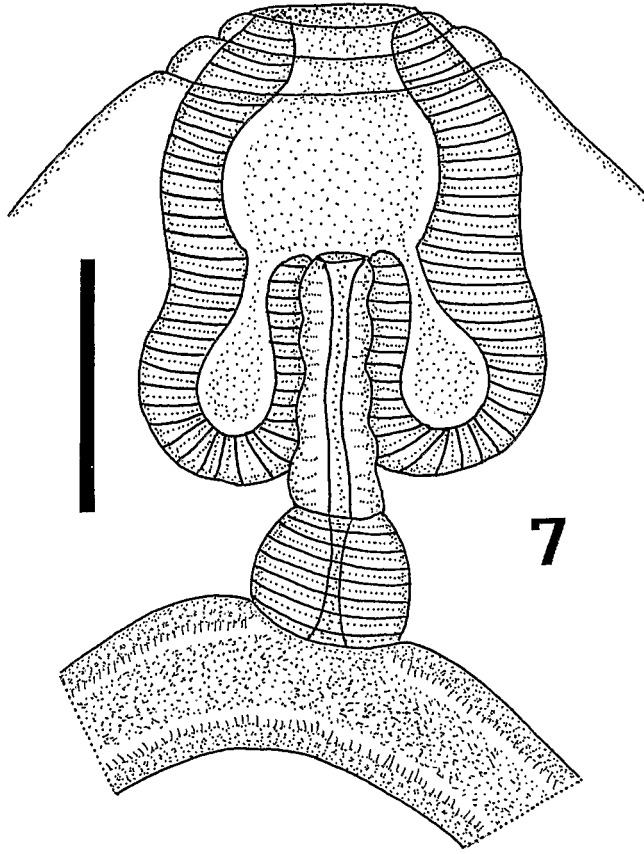


Fig. 7:  
*Pacudistoma guianensis* sp. nov. (anterior extremity - ventral view).  
(scale = 500  $\mu$ m).

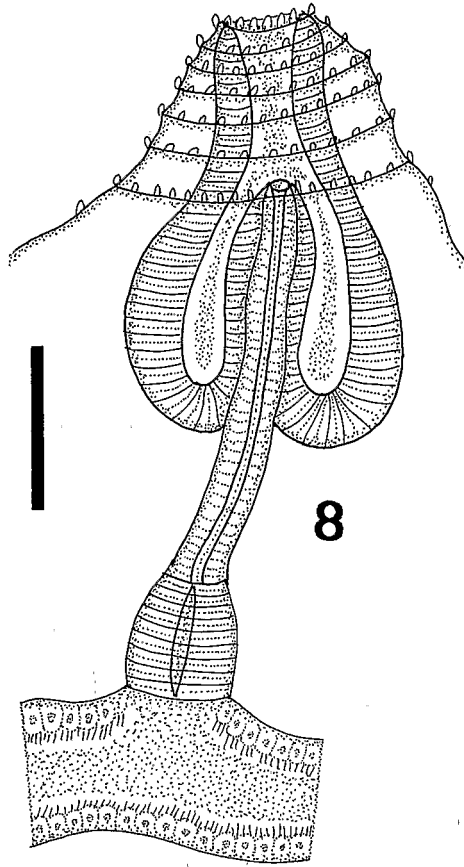


Fig. 8:  
*Myleustrema concavatum* gen. et sp. nov. (anterior extremity - ventral view).  
(scale = 100  $\mu$ m).