

TWO UNUSUAL NEW GENERA OF PARAMPHISTOMIDAE (TREMATODA, DIGENEA) FROM FRESHWATER FISH OF THE BRAZILIAN AMAZON

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**ABSTRACT**

Two new genera and species of Paramphistomidae (Trematoda, Digenea) are described from freshwater fish of the Brazilian Amazon. *Anavilhanatrema robusta* gen. et sp. nov. is characterized as having a cylindrical body with an anterior expansion, small suckers, a small cirrus sac, large lobate testes, a lobate ovary, long ceca and extensive vitellaria. *Pacudistoma turgida* gen. et sp. nov., on the other hand, is distinguished by having a stout, cylindrical body, a large oral sucker with internal diverticula, a large genital sucker, smaller lobate testes, a spherical ovary, long ceca and relatively extensive vitellaria. Both species appear to be host specific with *A. robusta* found in *Pristobrycon striolatus* (STEINDACHNER) while *P. turgida* occurs in *Myleus pacu* (SCHOMBURGK).

Keywords: amphistome, trematode, Amazon, fish parasite.

**INTRODUCTION**

Paramphistomidae FISCHÖEDER, 1901, is a family of primitive trematodes that is well represented in reptiles and mammals. Fewer are known from piscine hosts, but Travassos et al. (1969) listed 8 genera of these parasites from South American fishes and Yamaguti (1971) recognized 22 genera and 32 species of amphistomes from fish world-wide. Thatcher (1979) redescribed *Dadaytrema oxycephala* (Diesing, 1836) on the basis of Amazonian specimens and added two new genera from Colombian fish. The present study describes two additional new genera from fishes of the Brazilian Amazon.

**MATERIAL AND METHODS**

Fish hosts were netted, identified and eviscerated, after which the intestinal tracts were opened and placed in a 1:4000 formalin solution to relax and kill the trematodes. After 30 minutes, enough formaldehyde was added to the solution to bring the concentration up to about 10%. The preserved digestive tracts were examined by washing and hand sedimentation. The worms were stained in 95% alcohol containing equal parts of eosin and stained in 95% alcohol containing equal parts of eosin and orange-g stains. They were then placed in pure phenol for dehydration. From this solution, they were removed, placed on microscope slides, compressed slightly under cover glasses and cleared with methyl salicylate. They were then mounted in Canada balsam.

Drawings were done with the aid of a Zeiss drawing tube. Measurements were made with a measuring ocular and are in millimeters (mm) except for the smaller sizes which are given in micrometers (µm) and so indicated.

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## Systematic Section

Paramphistomidae FISCHOEDER, 1901

### *Anavilhanatrema* gen. nov.

Generic diagnosis: Paramphistomidae, with the characters of the family. Body large, cylindrical, slightly flattened, with anterior collar-like expansion. Oral sucker small, terminal, with external diverticula; esophagus long, without muscular bulb; ceca of moderate diameter, terminating near acetabulum. Acetabulum small to medium size, subterminal. Testes large, lobate, tandem, pre-equatorial; cirrus sac small, ovoid, containing sinuous tubular seminal vesicle; genital at level of bifurcation. Ovary lobate, lateral to midline, near acetabulum; vitellaria follicular, dorso-lateral to teca, extensive, from cecal ends to posterior testis; uterus largely intercecal, uterine seminal receptacle present near ovary; eggs numerous. Circulatory system present. Excretory vesicle saccular; pore dorsal. Intestinal parasites of freshwater fish.

Type species: *Anavilhanatrema robusta* sp. nov.

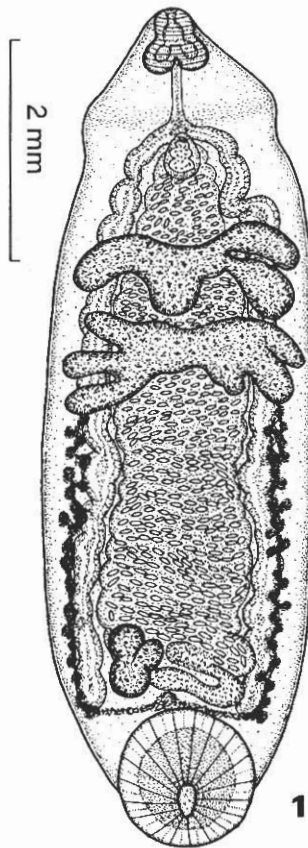


Figura 1 – *Anavilhanatrema robusta* gen. et sp. nov. (ventral view)

Host: *Pristobrycon striolatus* (STEINDACHNER): "piranha."

Site: Intestinal tract.

Locality: Anavilhana Islands, Rio Negro, Amazonas State, Brazil.

Holotype and 6 Paratypes: Invertebrate Collection, Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, AM, Brazil: Three additional paratypes: Helminth Collection, University of Nebraska State Museum, Harold W. Manter Laboratory, Lincoln, Nebraska.

Etymology: The generic name means a trematode from the Anavilhanas, and the specific name refers to the stout and robust body of these worms.

Species diagnosis (10 specimens measured): Body 9.97 (4.59-12.07) long and 3.11 (1.87-3.74) wide; collar 0.97 (0.41-1.43) from anterior extremity and 1.84 (1.26-2.21) wide. Oral sucker 0.65 (0.41-0.75) long by 0.62 (0.41-0.71) wide; diverticula 0.33 (0.20-0.34) long and 0.31 (0.20-0.42) wide. Esophagus 0.47 (0.17-0.65) long; ceca 0.35 (0.20-0.41) in maximum diameter. Acetabulum measures 1.33 (0.71-1.60) long and 1.31 (0.82-1.53) wide. Anterior testis 1.34 (0.68-1.87) long and 2.50 (1.53-3.06) wide. Posterior testis 1.42 (0.68-1.87) long and 2.41 (1.46-2.89) wide. Cirrus sac 0.63 (0.41-0.92) long by 0.45 (0.31-0.58) wide. Ovary 0.73 (0.44-1.02) long and 0.59 (0.41-0.75) wide. Vitelline glands consisting of large follicles that measure 0.21 (0.14-0.24) long and 0.15 (0.90-0.17) wide. Eggs measure 99 x 57  $\mu$ m (84-112 x 42-70).

## Discussion

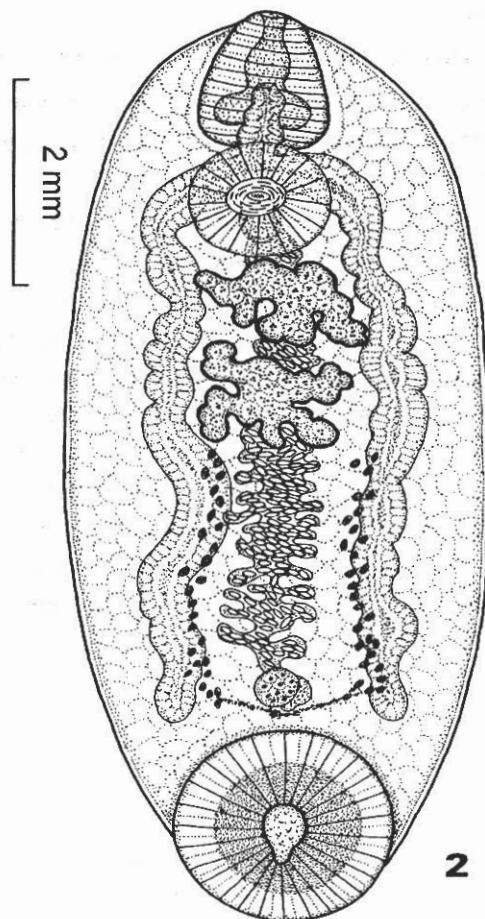
*Anavilhatrema* gen. nov. has a large cylindrical body with an anterior expansion. Other important characters are: small suckers, a small cirrus sac, large lobate testes, a lobate ovary, long ceca and extensive vitellaria. No other known genus has this combination of characters. This species has been found only in a single species of piranha, and so far, no other amphistome has been recovered from the same host.

## *Pacudistoma* gen. nov.

Generic diagnosis: Paramphistomidae, with the characters of the family. Body large, cylindrical, little flattened. Oral sucker large, terminal, with prominent internal diverticula; esophagus long, muscular, without bulb, ceca of medium thickness, long. Acetabulum medium sized, subterminal. Testes large, lobate, tandem, pre-equatorial; cirrus sac small, ovoid, containing saccular seminal vesicle; genital pore immediately postbifurcal, provided with large, muscular genital sucker. Ovary small, spherical, near acetabulum; vitellaria of small follicles, ventral to ceca, between ovary and posterior testis; uterus largely intercecal, uterine seminal receptacle present. Excretory vesicle saccular; pore dorsal. Intestinal parasites of freshwater fish.

Type species: *Pacudistoma turgida* sp. nov.

Figura 2 – *Pacudistoma turgida* gen. et sp. nov. (ventral view)



Host: *Myleus pacu* (SCHOMBURGK): "pacu."

Locality: Jamari River, Rondônia State, Brazil.

Holotype and 6 Paratypes: Invertebrate Collection, Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, AM, Brazil; Three additional paratypes: Helminth Collection, University of Nebraska State Museum, Harold W. Manter Laboratory, Lincoln, Nebraska.

Etymology: The generic name means a "distome" (trematode with two suckers) from a "pacu". The species name is reference to the stout cylindrical body of the worm.

Species diagnosis (10 specimens measured): Body 8.77 (7.14-10.13) long and 3.43 (3.10-3.90) wide. Oral sucker 1.22 (1.05-1.40) wide; cavities of oral diverticula measure 0.31 (0.23-0.37) long by 0.24 (0.14-0.31) wide. Esophagus 0.74 (0.34-1.02) long; ceca 0.44 (0.37-0.54) in maximum diameter. Acetabulum measures 1.66 (1.46-1.87) long and 1.44 (1.39-1.73) wide. Anterior testis 0.84 (0.68-1.19) long and 1.45 (1.25-1.70) wide. Posterior testis 0.90 (0.58-1.19) long and 1.45 (1.02-1.53) wide. Cirrus sac 0.37 (0.31-0.46) long by 0.27 (0.19-0.35) wide. Ovary 0.28 (0.14-0.34) long and 0.28 (0.1-0.34) wide. Ovary 0.28 (0.14-0.34) long and 0.28 (0.21-0.34) wide. Vitelline follicles measure 95 x 74  $\mu$ m (84-98 x 70-84). Eggs measure 107 x 60  $\mu$ m (98-112 x 56-70).

## Discussion

*Pacudistoma turgida* gen. et sp. nov. has a combination of characters not found in other trematode genera. The body is stout, nearly cylindrical, the oral sucker is large and provided with internal diverticula, and there is a large genital sucker. Internally, the esophagus is very muscular throughout but is not provided with a special muscular bulb, the testes are lobate and mainly intercecal and the vitellaria are relatively extensive.

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## RESUMO

Dois novos gêneros e espécies de Paramphistomidae (Trematoda, Digenea) são descritos de peixes de água doce da Amazônia brasileira. *Anavilhanatrema robusta* gen. et sp. nov. é caracterizado por ter um corpo cilíndrico com uma expansão anterior, ventosas pequenas, uma bolsa de cirro pequena, testículos grandes e lobados, um ovário lobado, cecos longos e glândulas vitelínicas extensivas. *Pacudistoma turgida* gen. et sp. nov., no entanto, se distingue por ter um corpo cilíndrico, uma ventosa oral grande com divertículos internos, uma ventosa genital grande, testículos lobados que são menores em tamanho, um ovário esférico, cecos longos e glândulas vitelínicas que são relativamente extensivas. Ambas espécies parecem ser específicas quanto aos hospedeiros, sendo que *A. robusta* encontra-se em *Pristobrycon striolatus* (STEINDACHENER) e *P. turgida* ocorre em *Myleus pacu* (SCHOMBURGK).

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