A new gorgoderid trematode of the genus *Phyllodistomum* (Digenea: Gorgoderidae) from *Clarias gariepinus* (Actinopterygii: Clariidae) in Lake Tana, Ethiopia

Новый вид дигенетического сосальщика рода *Phyllodistomum* (Digenea: Gorgoderidae) с сома *Clarias gariepinus* (Actinopterygii: Clariidae) из озера Тана (Эфиопия)

A.E. Zhokhov

А.Е. Жохов

A.E. Zhokhov, Institute for Biology of Inland Waters, Russian Academy of Sciences, Borok, Yaroslavl Province, 152742, Russia. E-mail: zhokhov@ibiw.yaroslavl.ru

Phyllodistomum tana **sp. nov.** is described from the ureters of *Clarias gariepinus* from Lake Tana, Ethiopia. This species is distinguished from its congeners in Africa in having an oblong body shape, transverse loops of the uterus between the posterior margin of ventral sucker and the vitelline follicles, and the localization exclusively in the ureters of *C. gariepinus*. The new species differs from *P. bavuri* and *P. vanderwaali* in the larger size of body, the position of the testes with respect to the ovary and with each other, the lobed vitelline follicles and the sucker ratio.

Новый вид *Phyllodistomum tana* описан из мочеточников сома *Clarias gariepinus* из озера Тана в Эфиопии. Этот вид отличается от других видов рода из Африки удлиненным телом, поперечным расположением петель матки между задним краем брюшной присоски и желточными фолликулами, а также приуроченностью исключительно к мочеточникам *C. gariepinus*. Новый вид отличается от *P. bavuri* и *P. vanderwaali* более крупными размерами тела, расположением семенников по отношению к яичнику и друг к другу, дольчатыми желточными фолликулами и пропорциями присоски.

Key words: parasites of fish, Lake Tana, Ethiopia, Africa, Trematoda, Gorgoderidae, *Phyllodistomum,* new species, *Clarias*

Ключевые слова: паразиты рыб, озеро Тана, Эфиопия, Африка, Trematoda, Gorgoderidae, *Phyllodistomum,* новый вид, *Clarias*

INTRODUCTION

Trematodes of the genus *Phyllodistomum* Braun, 1899 are cosmopolitan in distribution and live as adults in the urinary bladders and ureters of fish. The genus is very large, containing more than 110 species (Pigulewsky, 1953; Cribb, 1987; Kudinova, 1994). In Africa, seven species have been recorded in freshwater fishes: *Phyllodistomum linguale* Odhner, 1902 from *Gymnarchus niloticus* (Sudan), *P. spatulaeforme* (Odhner, 1902) from *Malopterurus electricus* (Sudan), *P. spatula* (Odhner, 1902) from *Bagrus bayad* (Sudan), *P. ghanense* Thomas, 1958 from *Mastacembelus nigromarginatus* (Ghana), *P. symmetrorchis* Thomas, 1958 from *Auchenoglanis occidentalis* (Ghana), *P. vanderwaali* Prudhoe & Hussey, 1977 and *P. bavuri* Boomker, 1984 from *Clarias gariepinus* (South Africa) (Boomker, 1984). All of the species occur in the urinary bladder of freshwater fishes, with the exception of *P. symmetrorchis* which inhabits the coelom.

This paper includes the description of a new species of the genus *Phyllodistomum* found in the ureters of many specimens of the catfish *Clarias gariepinus* (Burchell, 1822), along with observations on its prevalence.

MATERIAL AND METHOD

The host was collected during the Joint Ethiopian-Russian Biological Expedition (JERBE-II). Forty-four specimens of the catfish *Clarias gariepinus* were caught using gill nets and examined in September–November 2007 and 2008 in Lake Tana near Bahar-Dar. Fish were brought to the laboratory alive and were immediately dissected. Worms were killed in hot 4% formaldehyde and preserved in 70% ethanol, stained with alum carmine and mounted in Canada balsam as permanent slides.

Measurements are given as the range with mean in parentheses and are expressed on millimeters.

Superfamily **GORGODEROIDEA**

Family **GORGODERIDAE**

Subfamily **GORGODERINAE**

Phyllodistomum Braun, 1899

***Phyllodistomum tana* sp. nov.**
(Fig. 1)

Holotype No. 5/415(1) and paratypes No. 5/415(2-10) are deposited in the Helminthological Collection of the Institute for Biology of Inland Waters RAS.

Description (based on the holotype and eight paratypes, whole-mounted gravid specimens). Body large, lanceolate, not divided into narrow and broader parts, strongly flattened, 8.5–13.7 (10.8) × 0.7–2.58 (1.72) mm. Tegumental surface aspinose. Oral sucker round, 0.52–0.7 × 0.45–0.62 (0.581 × 0.584) mm, subterminal. Ventral sucker almost globular, 0.4–0.65 × 0.43–0.6 (0.528 × 0.532) mm, slightly smaller than oral sucker. Ratio of means diameter 1:1.097–1:1. Distance between oral sucker and ventral sucker 0.5–1.0 (0.792) mm. Pharynx absent. Oesophagus short, 0.13–0.23 (0.183) mm. Intestinal bifurcation just in anterior half of forebody in all specimens. Intestinal caeca reach close to posterior margin of body. Excretory vesicle tubular,

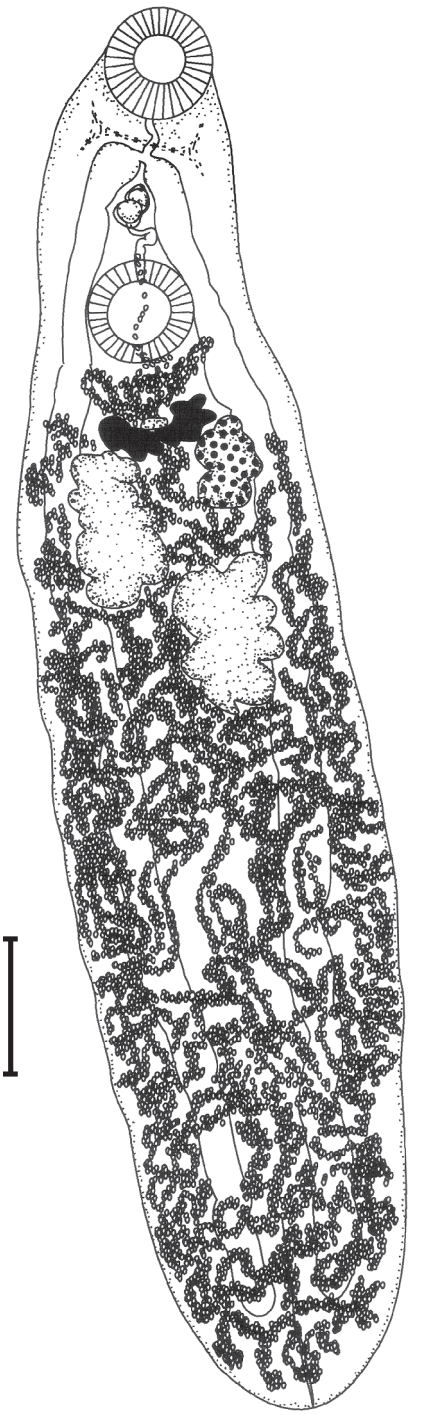

Fig. 1. *Phyllodistomum tana* **sp. nov.**, ventral view. Scale bar: 1 mm.

not be seen at all specimens. Nerve ganglion at level of oesophagus, not clearly visible in some specimens.

Testes large, irregularly lobed, in anterior hindbody on either side of midline; always displaced with one lies in front of other; anterior 0.52–0.85 × 0.17–0.46 (0.302 × 0.693) mm, posterior 0.59–1.0 × 0.17–0.57 (0.37 × 0.78) mm. Seminal vesicle bipartite. Cirrus sac and cirrus absent. Genital pore lies in midline of body, between bifurcation of gut and ventral sucker. Ovary reniform, oval or irregular in outline, 0.35–0.5 × 0.2–0.32 (0.272 × 0.407) mm, lies beside anterior testis and anterior to posterior testis. Mehlis' gland 0.1–0.15 × 0.05–0.13 (0.1 × 0.13) mm, lies between vitelline follicles and is ill-defined. Laurer's canal not observed. Uterus extends to posterior margin of body and in mature specimens fills all available post-vitelline space, overlaps testes and ovary dorsally and ventrally, usually forms 1–2 transversal loops in space between posterior margin of ventral sucker and vitelline follicles at the majority of specimens. Eggs numerous, small, 0.029–0.035 × 0.022–0.026 (0.024 × 0.031) mm. Vitelline follicles 0.16–0.39 (0.3) mm, compact, irregular to lobed, sometimes their margins merge, forming "butterfly- like" structure.

Diagnosis. The new species possesses two diagnostic traits: the transverse loops of uterus between the posterior margin of the ventral sucker and the vitelline follicles and the oblong body shape. This combination of characters distinguishes the new species from all of its African congeners. The position of the testes with respect to the ovary and with respect to each other, the oblong body shape and the lobed vitelline follicles distinguishes the new species from its two congeners which occur in *C. gariepinus*.

Comparative Remarks. Of seven *Phyllodistomum* species recorded in freshwater fishes in Africa, only *P. bavuri* and *P. vanderwaali* occur in *Clarias gariepinus*. These species found in urinary bladder of *C. gariepinus* from Kruger National Park, Transvaal (South Africa) (Prudhoe & Hussey, 1977; Boomker, 1984). It is necessary to note, that *P. bavuri* is present in Lake Tana, too. Often, *P. tana* **sp. nov.** and *P. bavuri* were found living together on the same host, but in different organs, and the new species predominates.

Phyllodistomum tana **sp. nov.** differs from *P. bavuri* and *P. vanderwaali* in the larger size of the body, oral sucker, testes and ovary and differs further in that the sucker-ratio approximates to unity rather than being 1: > 1.5–1.8. In addition, the new species described in this paper, differs from the *P. vanderwaali* in the uterus that occupying the entire space posterior to the vitelline follicles, whereas in *P. vanderwaali* the uterine loops do not cross the caeca laterally. *Pyllodistomum tana* **sp. nov.** also resembles *P. ghanense,* a species described from *Mastacembelus nigromarginatus* in Gana (Thomas, 1958) in having an oblong body shape, in the position of the testes with respect to the ovary and with respect to each other and the uterus, filling all available post-vitelline space; the new species is different from *P. ghanense* in its larger body size and the transverse uterine loops between posterior margin of the ventral sucker and the vitelline follicles.

Furthermore, *P. tana* **sp. nov.** is localised exclusively in the ureters of *C. gariepinus* whereas *P. bavuri* and *P. vanderwaali* are localised in the urinary bladder of the same host. The new species is the largest member of the genus *Phyllodistomum* occurring in freshwater fishes in Africa.

Etymology. The species name derives from the geographical location where specimens were collected.

Type host. *Clarias gariepinus* (Clariidae).

Site. Ureters.

Type locality. Lake Tana (11°33′N, 37°22′E), Bahar-Dar, Ethiopia.

Prevalence and intensity. 14 of 44 (31.8%), 1–23.

Total number of worms found. 86 specimens.

ACKNOWLEDGEMENTS

The study was done within the framework of the Joint Ethiopian-Russian Biological Expedition (JERBE-II).

REFERENCES

Boomker, J. 1984. Parasites of South African freshwater fish. II. Redescription of the African species of the genus *Phyllodistomum* Braun, 1899 (Trematoda: Gorgoderinae) and the description of a new species. *Onderstepoort Journal of Veterinary Researches,* **51**: 129–139.

Cribb, T. 1987. Studies on gorgoderid digeneans from Australian and Asian freshwater fishes. *Journal of Natural History,* **21**: 1129–1153.

Kudinova, M.A. 1994. On the revision of the systematics of the trematode genus *Phyllodistomum* Braun, 1899 (Gorgoderidae). *In*: Shulman, S.S. (Ed.). *Ecological parasitology*. Petrozavodsk: 96–112. (In Russian).

Pigulevsky, S.W. 1953. Family Gorgoderidae Looss, 1901. *Osnovy Trematodologii*, **8:** 251–618. (In Russian).

Prudhoe, S. & Hussey, C.G. 1977. Some parasitic worms in freshwater fishes and fish-predators from the Transvaal, South Africa. *Zoologica Africana,* **12**: 113–147.

Thomas, J.D. 1958. Three new digenetic trematodes, *Emoleptalea proteropora*, n. sp., (Cephalogonimidae: Cephalogoniminae), *Phyllodistomum symmetrorchis*, n. sp. and *Phyllodistomum ghanense*, n. sp. (Gorgoderidae: Gorgoderinae) from West African freshwater fishes. *Proceeding of Helminthological Society of Washington,* **25**: 1–8.

Received 10 February 2010 / Accepted 20 June 2010