

## Two new metacercariae of the genus *Apatemon* (Trematoda: Strigeidae) from fishes of Lake Tana, Ethiopia

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*Apatemon tilapiae* n. sp. metacercaria and *Apatemon barbusi* n. sp. metacercaria from fishes of Tana Lake (Ethiopia) are described.

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### Introduction

The genus *Apatemon* Szidat, 1928 reported as parasites of mostly in piscivorous birds in Holarctic region, Brazil, Congo, metacercariae in fishes (Keys to the Trematoda, 2002). At present, this genus includes 6 species and subspecies at least: *A. annuligerum* Nordmann, 1832; *A. cobitidis* Linstow, 1890; *A. fuligulae* Yamaguti, 1933; *A. gracilis* Rudolphi, 1819; *A. somateriae* Dubois, 1948; *A. hypseleotis* Negm-Eldin, Davis, 2002 (Gibson, www.faunaeur.org/index.php; Negm-Eldin, Davis, 2002). Four-five species of metacercariae belonging to this genus have been described, but their synonymy is not yet clear (Yamaguti, 1933; Vojtek, 1964; Negm-Eldin, Davis, 2002; Sudarikov et al., 2006). The present study describes a new species of the Strigeidae based on metacercariae from Africa, Ethiopia.

The specimens were collected in Tana Lake near Bahir-Dar in 2006-2008. Measurements are given in millimeters.

### *Apatemon tilapiae* n. sp. metacercaria (Figs 1-2)

*Type-host:* *Oreochromis niloticus* (L.)

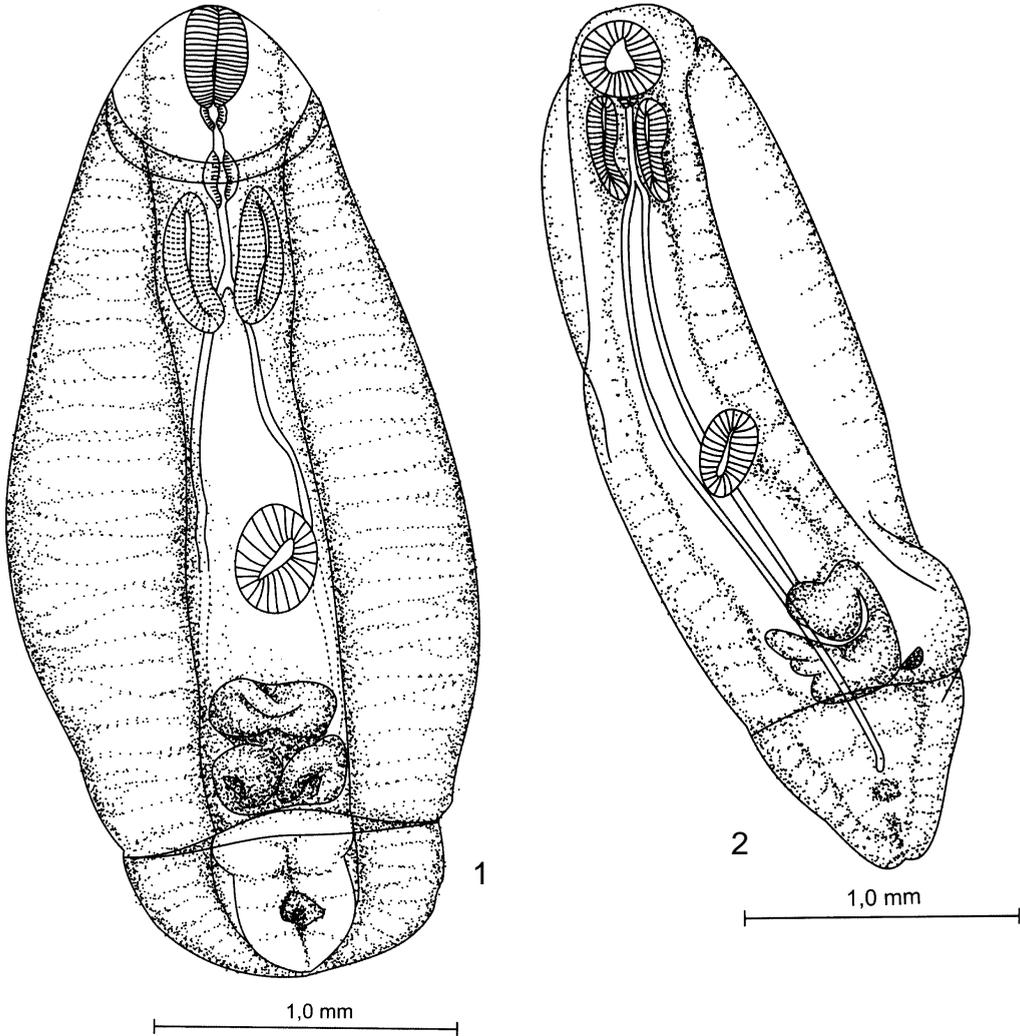
*Site:* Vitreous body of eyes; in heavy infection – cranial cavity.

*Type-locality:* Lake Tana (11°33'N, 37°22'E), Bahir-Dar Distr., Ethiopia.

*Other localities:* River Gumara, tributary of Tana Lake (11°47'N, 37°39'E).

*Material studied:* several tens of specimens, whole-mounts No. 5/402(1-8) deposited in the Helminthological Collection of the Institute for Biology of Inland Waters RAS (Russia, Borok).

*Description.* Description and measurement are based on 10 specimens, killed with hot water, stained with alum carmine and prepared as whole-mounts. Encysted in elliptical no transparent cyst of parasite origin, typically in vitreous body. Cyst (fixed) 1.584-2.016 (1.78 × 0.487); not closely adjoins to a body. Cyst wall 0.012-0.022, thin. Body greyish in life, with maximum width at level of ventral sucker, 1.44-1.98 × 0.168-0.9 (1.724 × 0.447) long, badly divided into 2 distinct segments; anterior segment 1.080-1.296 (1.235) long, with ventral surface concave; posterior segment 0.360-0.684 (0.489) short, conical, rounded. Oral sucker 0.120-0.279 × 0.084-0.207 (0.195 × 0.155), terminal, with subterminal mouth; length usually slightly greater than width. Pseudosuckers 0.162-0.282 × 0.048-0.084 (0.213 × 0.069), situated always below oral sucker. Pseudosuckers longer and narrower than the oral sucker, with elongate, slit-like opening. Ratio of pseudosuckers' length to oral sucker length 1:1.09. Prepharynx short to absent. Pharynx elongate, oval, 0.048-0.126 × 0.044-0.180 (0.066 × 0.09). Oesophagus 0.12-0.242, long. Intestinal caeca difficult to discern, reaching close to posterior end. Intestinal bifurcation anterior to ventral sucker, at level of posterior margins of pseudosuckers. Ventral sucker usually in middle of body, 0.108-0.168 × 0.099-0.144 (0.149 × 0.119). Ratio of oral sucker to ventral



**Figs 1-2.** *Apatemon tilapiae* n. sp. metacercaria: 1, ventral view; 2, lateral view.

sucker width 1:0.97. Ventral sucker always smaller than oral sucker. Brandes organ (tribocytic or holdfast organ of some authors) large, well formed, on some distance from ventral sucker, on margin of anterior and posterior body segments,  $0.153\text{-}0.405 \times 0.180\text{-}0.252$  ( $0.239 \times 0.213$ ), with two lobes. Proteolytic gland very small, at junction of fore- and hindbody. Excretory vesicle wedge-shaped,  $0.312\text{-}0.540$  ( $0.452$ ) long, occupied all posterior segment. Excretory pore median to posterior end. Genital anlage  $0.06 \times 0.063$ , subspherical, lying in posterior body segment.

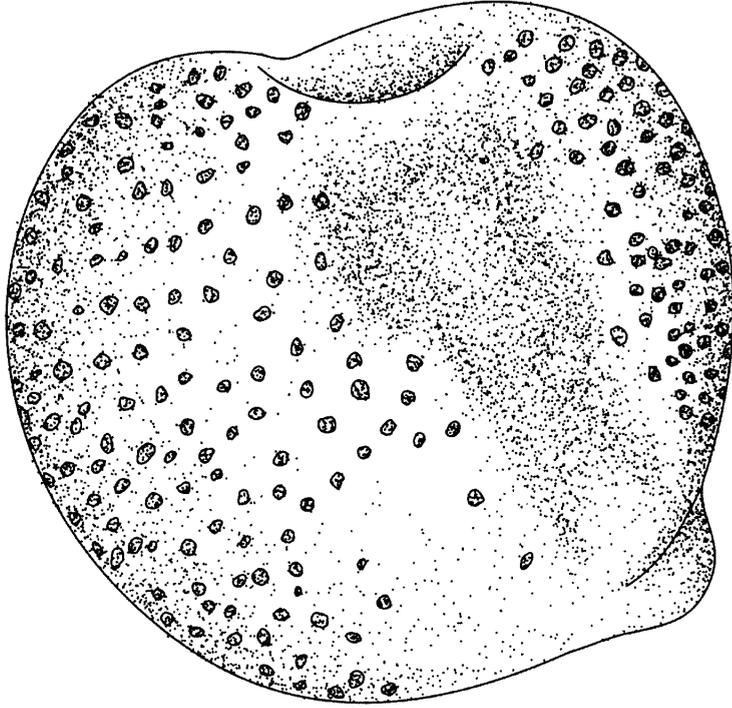
*Remarks.* Of the various species of fishes (Cyprinidae, Clariidae) occurring in Tana Lake, only *Oreochromis niloticus* harboured metacercariae, the former in the vitreous body of eyes. In cases

of heavy infection (16-111 cysts) in small fishes (5-10 cm standard length) metacercariae occur in vitreous body and cranial cavity. Of 57 *O. niloticus* examined during 2006-2008, 39 were infected, the prevalence of infection being 68.4%, mean intensity 24.2 (1-133). The infected fish ranged in size from 13 to 280 mm. The maximum concentration of infection occurred in the size group 50-150 mm. Fishes measuring less than 30 mm were not infected.

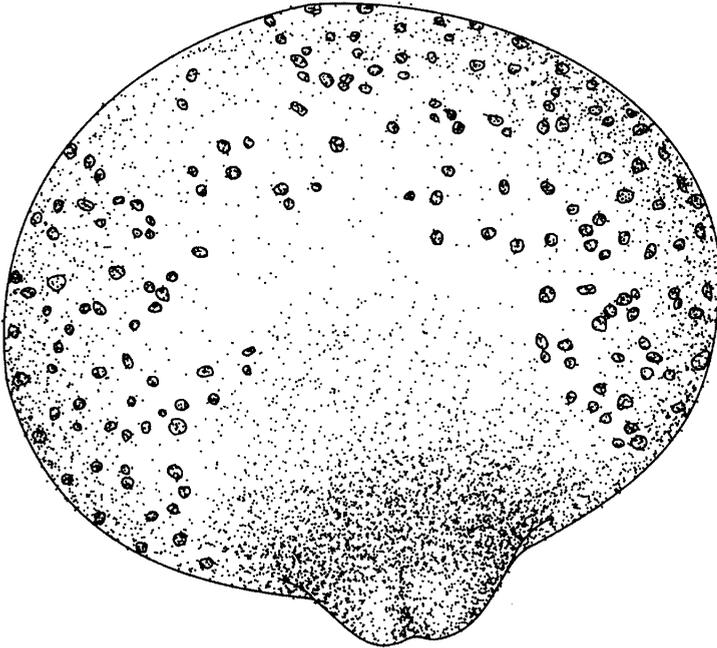
***Apatemon barbusi* n. sp. metacercaria**  
(Figs 3-4)

*Type-host:* *B. tanapelagius* (de Graaf et al., 2000).

*Other hosts:* *Barbus humilis* (Boulenger, 1902), *B.*

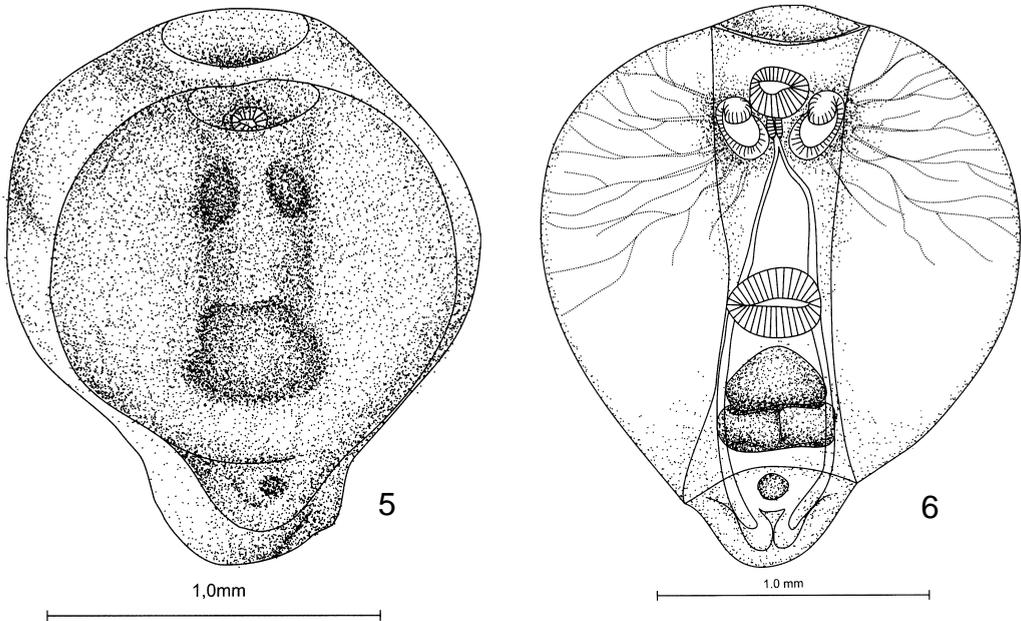


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**Figs 3-4.** *Apatemon barbusi* n. sp. metacercaria: 3, 4, fixed, not stained cysts from cranial cavity of *Barbus humilis*.



**Figs 5-6.** *Apatemon barbusi* n. sp. metacercaria: **5**, stained metacercaria into cyst from cranial cavity of *Barbus humilis*; **6**, ventral view, from cranial cavity of *Barbus humilis*.

*pleurogramma* Boulenger, 1902, *Barbus intermedius* (Rüppell, 1836), *B. nedgia* (Rüppell, 1836), *B. acutirostris* Bini, 1940, *B. macrophthalmus* Bini, 1940, *B. dainellii* Bini, 1940, *B. gorguari* Rüppell, 1836, *Varicorhinus beso* Rüppell, 1835.

*Site:* cranial cavity, vitreous body of eyes, abdominal cavity.

*Type-locality:* Lake Tana (11°33'N, 37°22'E), Bahir-Dar, Ethiopia.

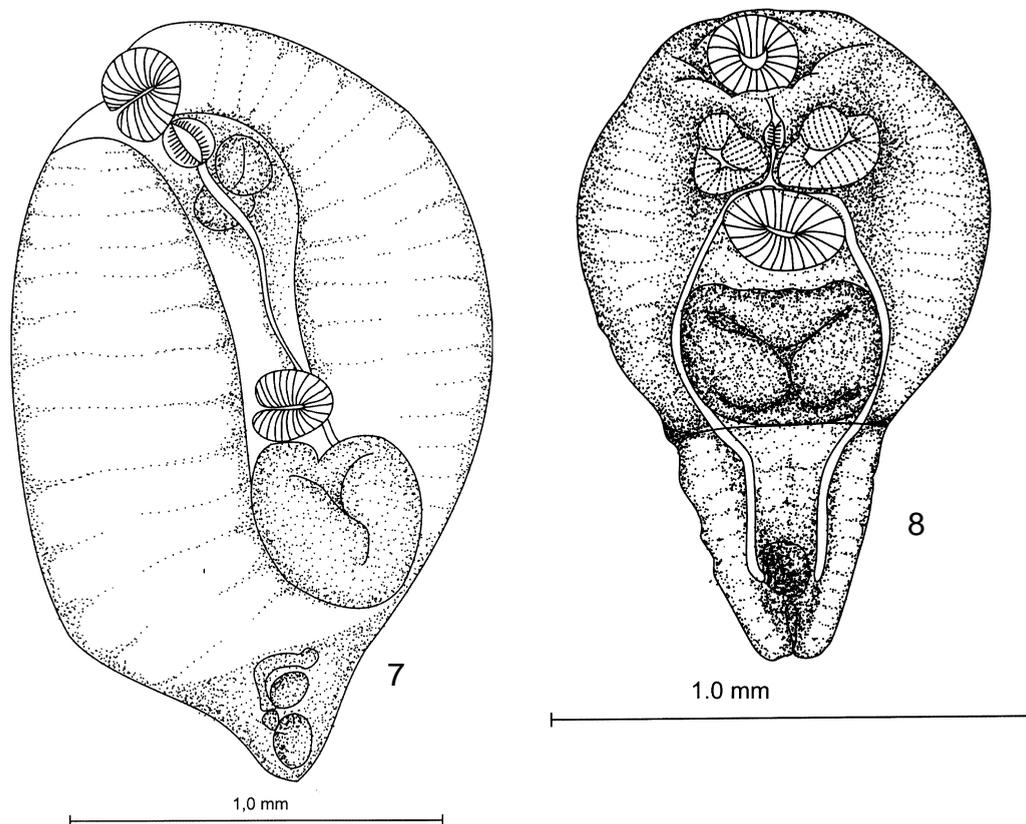
*Other localities:* River Gumara, tributary of Tana Lake (11°47'N, 37°39'E).

*Material studied:* several hundreds of specimens, whole-mounts No. 5/403(1-11) deposited in the Helminthological Collection of the Institute for Biology of Inland Waters RAS (Russia, Borok).

*Description.* Description and measurement are based on 23 fixed specimens from different hosts, killed with hot water and stained with alum carmine. When alive, metacercaria in cyst looks as drop of fat, almost globular. Body pear-shaped or tennis-racket-shaped, surrounded thin-walled no transparent cyst of parasite origin,  $0.653\text{--}0.963 \times 0.548\text{--}0.72$  ( $0.841 \times 0.627$ ). Cyst (fixed)  $0.950\text{--}0.630$  ( $0.922 \times 0.707$ ), not closely adjoins to a body. Body divided into 2 distinct segments; anterior segment  $0.488\text{--}0.535 \times 0.311\text{--}0.334$  ( $0.611 \times 0.322$ ), oval to globular, with ventral surface concave; posterior segment small, conical  $0.165\text{--}0.428 \times 0.237\text{--}0.386$  ( $0.230 \times 0.305$ ). Oral sucker terminal or subterminal, oval,  $0.082\text{--}0.116 \times 0.294\text{--}0.131$  ( $0.091 \times 0.126$ ). Pseudosuckers  $0.162\text{--}0.282 \times 0.048\text{--}0.084$  ( $0.213 \times 0.069$ ), rounded, situated below and each sides

of oral sucker; smaller than oral sucker. Ratio of pseudosuckers' width to oral sucker width 1:0.82; ratio of pseudosuckers' length to oral sucker length 1:1.53. Ventral sucker  $0.098\text{--}0.154 \times 0.122\text{--}0.166$  ( $0.124 \times 0.145$ ), always wider than oral sucker; join to anterior margin of Brandes organ. Sucker-ratio (ventral sucker/oral sucker) length: 1:1.28; width 1:1.15. Prepharynx absent. Pharynx oval,  $0.041\text{--}0.064 \times 0.027\text{--}0.049$  ( $0.05 \times 0.034$ ). Oesophagus short,  $0.055\text{--}0.066$  ( $0.062$ ). Intestinal caeca long,  $0.48\text{--}0.72$  ( $0.564$ ), diverge at lateral margins of Brandes organ, terminating blindly near posterior end of body. Intestinal bifurcation between pseudosuckers. Brandes organ  $0.158\text{--}0.222 \times 0.170\text{--}0.284$  ( $0.20 \times 0.217$ ), oval, situated medially in posterior third of anterior segment, immediately posterior to ventral sucker. Proteolytic gland not seen. Excretory pore terminal, vesicle not always seen. Genital anlage in posterior body segment.

*Remarks.* The largest fish family in Lake Tana is the cyprinids, represented by 3 genera, *Varicorhinus*, *Garra* and *Barbus*, but only *Barbus* spp. harboured metacercariae. The genus *Barbus* represented by 15 different 'large *Barbus*' species (*B. intermedius*, *B. nedgia*, *B. acutirostris*, *B. macrophthalmus* and others) (Nagelkerke, Sibbing, 1997). Three 'small *Barbus*' species (<10 cm standard length) are present in Lake Tana too: *B. humilis*, *B. pleurogramma* and *B. tanapelagius* (Dejen et al., 2002), which are distinct from the



**Figs 7-8.** *Apatemon barbusi* n. sp. metacercaria: **7**, lateral view, from cranial cavity of *Barbus humilis*; **8**, ventral view, from abdominal cavity of *Barbus tanapelagi*us.

large barbs (up to 100 cm SL) by their size, morphology, and ecology.

These metacercariae are common parasites of 'small *Barbus*' and young 'large *Barbus*'. *B. tanapelagi*us had the highest percentage infection and 80% of fish examined harboured metacercarial infections, individual fish harbouring 3-1287 metacercariae. Among examined *B. humilis* and *B. pleurogramma*, 72.3% and 26.7% were found infected by metacercariae, with intensities of 1-225 and 1-16 parasites per fish, respectively.

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