



Paraphilopinna sp. (Digenea : Didymozoidae)  
parasitizing a freshwater fish, *Misgurnus  
anguillicaudatus* (Cobitidae), in eastern  
Hokkaido, Japan

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## 北海道東部産淡水魚のドジョウ (Cobitidae) に寄生する *Paraphilopinna* sp. (Digenea: Didymozoidae)

*Paraphilopinna* sp. (Digenea: Didymozoidae) parasitizing a freshwater fish, *Misgurnus anguillicaudatus* (Cobitidae), in eastern Hokkaido, Japan

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**Abstract:** Adult specimens of the genus *Paraphilopinna* Zhukov, 1971 (Digenea: Didymozoidae) are described from a freshwater fish, *Misgurnus anguillicaudatus* (Cantor) (Cobitidae), taken in Sarurunto in Shibeche, eastern Hokkaido, Japan. The site of infection is not known. They are morphologically different from the type species *P. fluvialis* Zhukov, 1971 found in *M. anguillicaudatus* from northeastern China. They remain to be identified to species.

**Key words:** *Paraphilopinna* sp., Didymozoidae, Digenea, *Misgurnus anguillicaudatus*, freshwater fish, eastern Hokkaido, Japan

The genus *Paraphilopinna* Zhukov, 1971 (Digenea: Didymozoidae) has hitherto contained the type and only species *P. fluvialis* Zhukov, 1971. This species has only once been described by Zhukov (1971) on the basis of the adult specimens found in the ureter (and once in the gonad) of a freshwater fish, *Misgurnus anguillicaudatus* (Cantor) (Cobitidae), from the Liao Ho [He] River in the basin of the Yellow Sea, China. This paper shows that an unidentified species of the genus occurs in eastern Hokkaido, Japan.

### Materials and Methods

Three individuals (135–195 mm in standard body length) of *M. anguillicaudatus* were caught in Sarurunto or Saruruto-numa (a small marsh) in Shibeche, eastern Hokkaido, Japan, on 4 July 1984, and examined for helminth parasites. They were cut through the body wall the length of the body cavity in the midventral line. After the visceral organs were removed for examination, the bodies were washed in 0.6% saline. A total of three worms of a digenean were found, one on the visceral organs and two in the saline. Accordingly, the exact site of infection could not be determined.

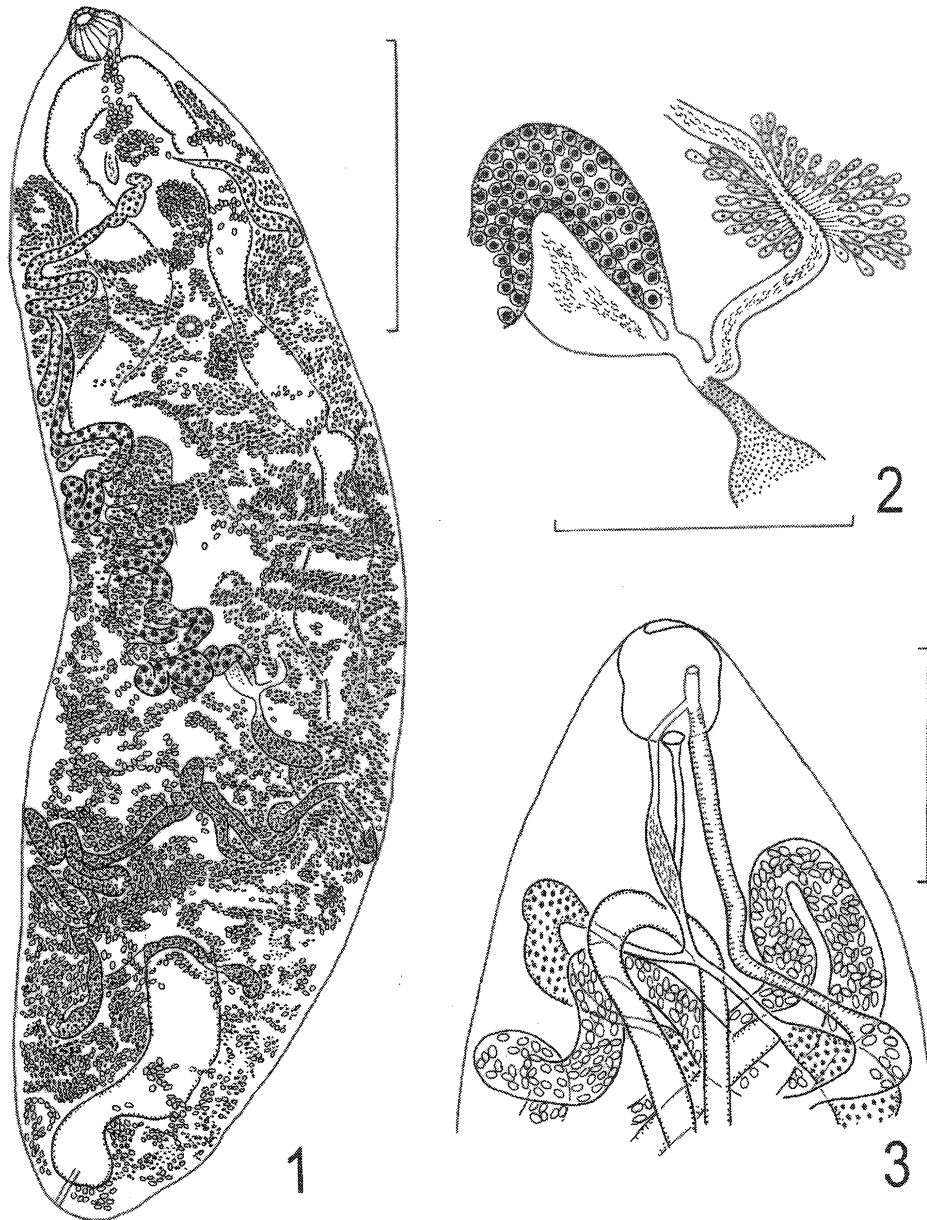
The three worms were slightly flattened and fixed with AFA. Although stained with Heidenhain's iron hematoxylin, Grenacher's alum carmine, and further Mayer's hematoxylin, they were stained poor. They were then mounted in Canada balsam.

Of the three specimens, two were intact, but the other had a damaged posterior part of the body. Measurements (length by width) of the former two are given in millimeters unless otherwise stated, followed by those of the latter in parentheses. Drawings were made with the aid of a drawing tube. The specimens have been deposited in the National Science Museum, Tokyo (NSMT-P1 5513).

Subclass Digenea  
Family Didymozoidae  
***Paraphilopinna* sp.**

**Description** (Figs. 1–3). Based on 3 fully matured adult specimens. Body elongate or filiform, 2.96–4.32 by 0.64–1.22 (more than 2.50 by 0.75). Tegument smooth. Oral sucker almost antero-terminal, 0.11–0.17 by 0.14–0.18 (0.15 by 0.13). Pharynx very small, immediately behind oral sucker, (0.01 by 0.02). Esophagus slender, 0.01–0.18 (0.21) long, bifurcating 0.19–0.29 (0.38) or 5–10% of body length from anterior end; 2 intestinal limbs extending posteriorly near to middle level of body, but their more

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**Figs. 1-3.** *Paraphilopinna* sp. 1 and 2. Adult, entire body, ventral view (1); ovarian complex, ventral view (2). 3. Another adult, anterior part of body, ventral view. Scale-bars: 1 mm in Fig. 1; 0.3 mm in Fig. 3; 0.2 mm in Fig. 2.

posterior parts obscured by many folds of uterus; a single median posterior intestinal cecum present, 1.04 long or 24% of body length, running to posterior end of body. Ventral sucker feeble, 0.08 by 0.07 in 1 specimen, 1.12 or 26% of body length from anterior end; sucker width ratio 1

0.39. Testes double, tubular, long, one shorter than the other, symmetrical in anterior lateral fields of body, winding, commencing at about bifurcal level or 0.48-0.60 (0.37) or 14-16% of body length from anterior end; testicular region 0.80 (0.91) long or 18-27% of body

length. Sperm ducts short, arising from anterior ends of their respective testes, following a straight diagonal course; common sperm duct short. Seminal vesicle spindle-shaped, almost median, prebifurcal, 0.11–0.12 by 0.08 (0.14 by 0.03). Cirrus pouch absent. Pars prostatica not seen. Ejaculatory duct long, running anteriorly, may join metraterm to form a tubular genital atrium. Genital pore sinistro-submedian, ventral to near middle level of oral sucker. Ovary single, tubular, long, dextral, much convoluted, extending anteriorly into testicular region or slightly farther than it; ovarian region 1.20–1.28 (1.52) long or 29–40% of body length. Seminal receptacle elliptical, close to ovary, 0.06–0.14 by 0.02–0.08. Laurer's canal absent. Ootype near ovary, median or submedian, lying 1.68–2.40 (2.08) or 55–57% of body length from anterior end. Uterus highly folded in all available space of body except in prebifurcal region of body; metraterm long. Eggs numerous, operculate, fully-embryonated, 24–27 by 14–16 (24–25 by 14–16)  $\mu$ m. Vitellarium single, tubular, long, winding and much convoluted, extending posteriorly to posterior end of body or not; vitelline region 1.28 long or 29–43% of body length. Excretory vesicle not worked out; excretory pore postero-terminal.

*Discussion.* In these poorly prepared specimens, some morphological details could not be revealed, particularly, the posterior parts of the two intestinal limbs, the position where they were united, the terminal genitalia, and the excretory organs. The testes, ovary, and vitellarium were so much winding and convoluted that their actual lengths could not be measured.

I consider that these didymozoid specimens belong to the genus *Paraphilopinna* Zhukov, 1971 because of a combination of the following

morphological characteristics: The two intestinal limbs appeared to be united to form a single median posterior intestinal cecum; a paired tubular testes were symmetrical in the anterior lateral fields of the body; a single tubular ovary was anterior to the ootype; and a single tubular vitellarium was posterior to the ootype. This is the first published record of the genus *Paraphilopinna* from Japan.

The present specimens morphologically differ from *P. fluvialis* as described by Zhukov (1971) as follows. The oral sucker is larger (0.11–0.17 by 0.13–0.18 instead of 0.05–0.08 by 0.05–0.06). The two intestinal limbs appear to be united more posteriorly (near the middle level of the body instead of near the junction between the anterior and middle thirds of the body). The ventral sucker is larger (0.08 by 0.07 instead of about 0.05–0.06 in diameter). The testes, ovary, and vitellarium are longer and more winding and convoluted. The ootype is located more posterior (slightly behind the middle level of the body instead of at the junction between the middle and posterior thirds of the body). Eggs are smaller (24–27 by 14–16  $\mu$ m instead of 29–31 by 14–20  $\mu$ m). They may represent a new species distinct from *P. fluvialis*. However, they remain to be definitely identified to species until better-prepared, additional specimens are available.

Zhukov (1971) also detected larvae [(?) juveniles] of *P. fluvialis* in the hepatic duct of *Lateolabrax japonicus* (Cuvier) (Lateolabracidae) from the Liao He River. Since juveniles of this marine fish ascend rivers, it seems likely that they acquire the infection with larvae at that time.

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#### Reference

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