

Tetraonchoidid Monogeneans from Lizardfish of Japan

By

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A survey was made on the parasites of marine fishes of the Tsushima Islands lying in the southern entrance to the Sea of Japan. The fishes for study were obtained by commercial stationary net. The monogeneans were fixed in acetic sublimate under slight cover glass pressure, stained with Heidenhain's hematoxylin and mounted in balsam. The present report deals with two species of tetraonchoidid monogeneans, *Pavlovskioides litoralis* BYCHOWSKY, GUSSEV et NAGIBINA and *Heteropavlovskioides synodontis* n. g., n. sp., from lizardfish, *Trachinocephalus myops* and *Saurida elongata* (family Synodontidae). The specimens are deposited in the collection of the National Science Museum, Tokyo.

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Family Tetraonchoididae BYCHOWSKY, 1951

Pavlovskioides litoralis BYCHOWSKY, GUSSEV et NAGIBINA, 1965

(Figs. 1-3)

Host. *Trachinocephalus myops* (SCHNEIDER) and *Saurida elongata* (TEMMINCK et SCHLEGEL).

Habitat. Gills.

Locality. Tsushima Islands, Japan.

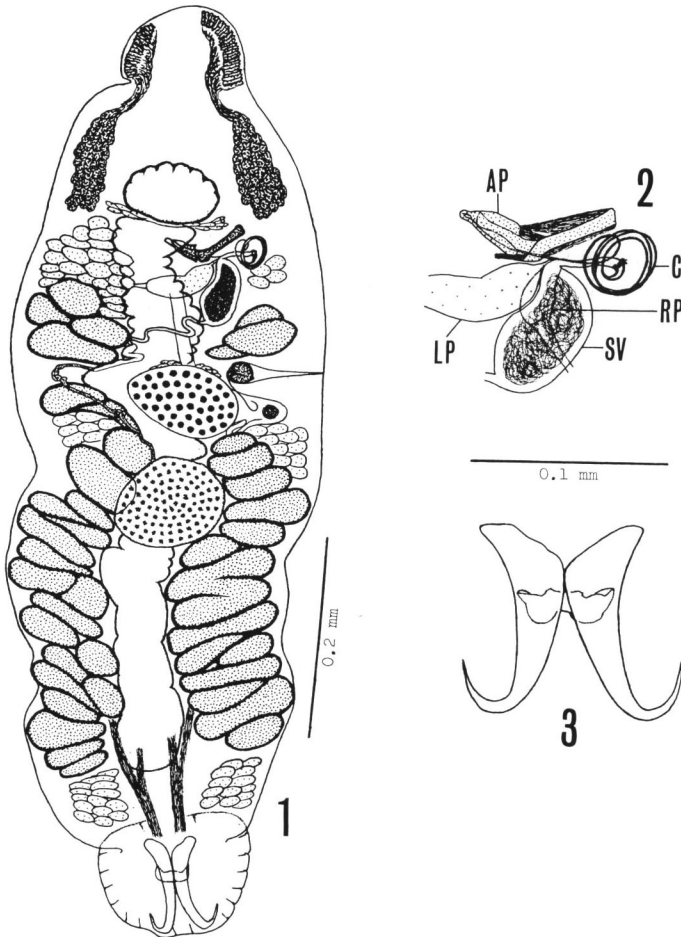
Date. 21-VII-1973 and 27-IV-1974.

Specimen No. NSMT-PI-1550, 1640 and 1653.

Description. Body subcylindrical, 0.90-1.42 mm long and 0.214-0.337 mm wide. Opisthaptor discoid, 0.117-0.168 × 0.148-0.230 mm, aseptate, provided with a pair of anchors, a transverse bar and 16 marginal hooklets. Anchors 0.090-0.101 mm long lineally from tip of root to height of curve of blade; transverse bar swollen in both sides, ventral to anchors, 0.036-0.053 mm long; marginal hooklets falciform, 0.011-0.014 mm long. Cement glands well developed. Conspicuous muscle bundles coming from inner wall of body proper are attached to root of anchors. Numerous head organs divided into two groups along lateral margins of rounded head. Eyespots absent.

Mouth just anterior to pharynx; pharynx globular, $0.057\text{--}0.090 \times 0.070\text{--}0.101$ mm; esophagus very short, surrounded by esophageal glands; caecum single, terminating some distance anterior to opisthohaptor.

Testis oval, $0.072\text{--}0.129 \times 0.077\text{--}0.131$ mm, dorsal to caecum, about middle of body. Vas deferens arising from anterior end of testis, running sinuously between ovary and left body margin, then crossing caecum ventrad to enter seminal vesicle. Seminal vesicle pyriform, $0.064\text{--}0.095 \times 0.026\text{--}0.049$ mm, right to midline, between pharynx and ovary. Cirrus narrow tubular, sclerotized, receiving ducts of seminal vesicle and two prostatic reservoirs at its slightly expanded and thickened proximal end,



Figs. 1-3. *Pavlovskioides litoralis* BYCHOWSKY, GUSSEV et NAGIBINA, 1965. — 1. Entire worm (NSMT-PI-1653), dorsal view. — 2. Male terminal genitalia, dorsal view. — 3. Anchors and transverse bar, dorsal view. AP, accessory piece; C, cirrus; LP, left prostatic reservoir; RP, right prostatic reservoir; SV, seminal vesicle.

then making three or four circles like a spiral spring, of these first two or three circles overlap each other, and distal end of cirrus along middle groove of accessory piece. Accessory piece sclerotized, long sideways, 0.075–0.095 mm long as a whole, right to midline, posterior to pharynx, consisting of handle-like proximal portion which is surrounded by muscle fibers, and deeply furrowed, two winged distal portion, whose anterior tips are rounded dorsally, pointed ventrally. Genital pore median, a little behind pharynx. Prostatic glands divided into two groups, each group just anterior to vitellaria, of these right one is poorly developed, connected with cirrus through prostatic reservoir.

Ovary globular, $0.057\text{--}0.103 \times 0.077\text{--}0.124$ mm, pretesticular. Oviduct short, connected with duct from seminal receptacle and vitelline reservoir before entering into ootype. Ootype surrounded by shell glands, just in front of ovary. Uterus thin-walled, running straight to genital atrium. No eggs observed. Vagina opening on right margin of body at level of anterior end of ovary; vaginal pouch running transversely; vaginal reservoir sclerotized, heart-shaped; vaginal tube narrow, sinuous; seminal receptacle on right side of ovary. Vitellaria consisting of large follicles, arranged in two longitudinal rows on outside of caecum, except anterior part of caecum and ovarian level; follicles of each row connected to longitudinal vitelline duct, which unites with each other just anterior to ovary to form vitelline reservoir.

Discussion. BYCHOWSKY *et al.* (1965) described this species based on the material from *Trachinocephalus myops* in Tonkin Gulf, South China Sea, and there has been no report on this species since then. The present specimen closely resembles their description. As indicated in Table 1, there is little difference in dimensions between

Table 1. Dimensions of *Pavlovskioides litoralis* BYCHOWSKY, GUSSEV et NAGIBINA (mm).

Author Host Locality	BYCHOWSKY <i>et al.</i> (1965) <i>Trachinocephalus myops</i> Tonkin Gulf, South China Sea	Present author <i>T. myops</i> and <i>Saurida elongata</i> Tsushima Islands, Japan
Body length	1.0–1.5	0.90–1.42
Body width	0.15–0.22	0.214–0.337
Opisthohaptor	0.14–0.16	0.117–0.168 × 0.148–0.230
Anchors	0.08–0.09	0.090–0.101
Transverse bar	0.03–0.05	0.036–0.053
Marginal hooklets	0.01	0.011–0.014
Pharynx	0.06–0.07	0.057–0.090 × 0.070–0.101
Testis	0.07–0.10 × 0.05–0.08	0.072–0.129 × 0.077–0.131
Accessory piece	0.08–0.10	0.075–0.095
Ovary	0.06–0.09	0.057–0.103 × 0.077–0.124

the two. Judging from their figure (p. 149, fig. 4: Γ), however, the cirrus appears to have no connection with the accessory piece in their specimen. Accurately the end of cirrus inserts in the middle groove of accessory piece in the present specimen.

The genus *Pavlovskioides* contains eight species, *P. ichthyoscopi* BYCHOWSKY, GUSSEV et NAGIBINA, *P. litoralis* BYCHOWSKY, GUSSEV et NAGIBINA, *P. antarcticus*

BYCHOWSKY, GUSSEV et NAGIBINA, *P. meridianus* BYCHOWSKY, GUSSEV et NAGIBINA, *P. pearsoni* BYCHOWSKY, GUSSEV et NAGIBINA, *P. trematomi* DILLON et HARGIS, *P. wilkesensis* DILLON et HARGIS and *P. prudhoei* GIBSON; of these *P. meridianus* was considered by DILLON and HARGIS (1968) to be an immature form of *P. antarcticus*. All of them have been reported from South China Sea, Australia and Antarctic waters; therefore, this is the first record of *Pavlovskioides* from Japanese waters, and *Saurida elongata* is a new host record for *P. litoralis*.

Heteropavlovskioides synodontis n. g., n. sp.

(Figs. 4-6)

Host. *Trachinocephalus myops* (SCHNEIDER) (type host) and *Saurida elongata* (TEMMINCK et SCHLEGEL).

Habitat. Gills.

Locality. Tsushima Islands, Japan.

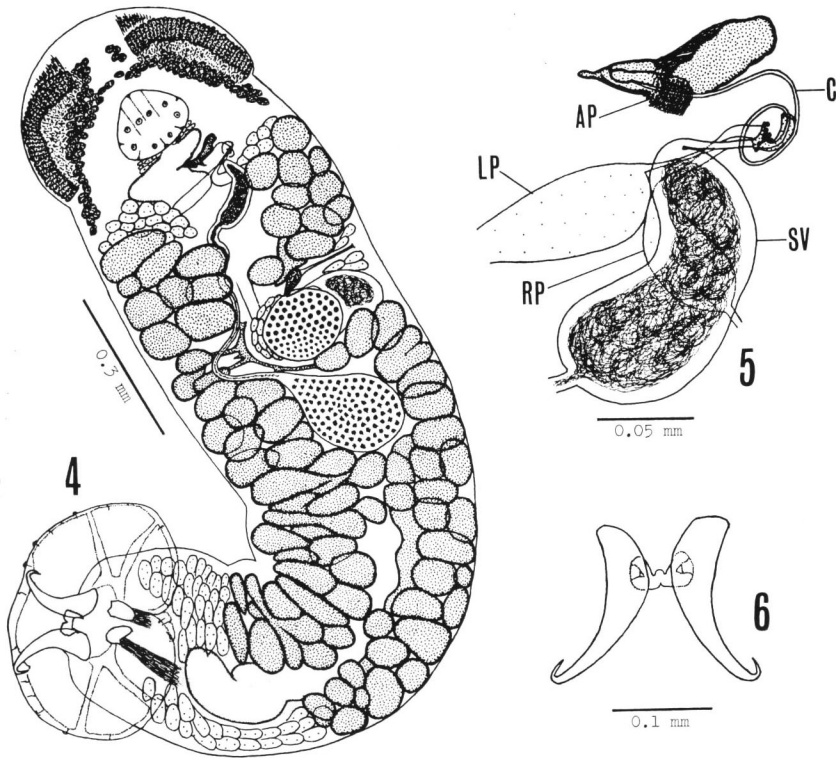
Date. 27-IV-1974.

Specimen No. NSMT-PI-1640 (holotype) and 1653.

Description. Body flattened subcylindrical, 1.78-2.15 mm long and 0.38-0.57 mm wide. Opisthohaptor discoid, $0.31-0.41 \times 0.37-0.53$ mm, with four septa on ventral surface and an incision antero-medially which reaches near anchors; a pair of anchors 0.133-0.173 mm long lineally from tip of root to height of curve of blade; a transverse bar irregular in outline, forming a ring at both ends, 0.053-0.070 mm long; marginal hooklets falciform, 16 in number, about 0.012 mm long. Cement glands well developed. Thin sclerotized pieces lying anterior to anchors, through them muscle bundles coming from inner wall of body proper are attached to root of anchors. Head swollen, semicircular, 0.41-0.50 mm wide, with numerous head organs along antero-lateral margins. Eyespots absent.

Mouth in front of pharynx; pharynx oval, composed of eight large muscle cells, $0.102-0.138 \times 0.138-0.184$ mm; esophagus short, surrounded by esophageal glands; caecum single, terminating near anterior margin of opisthohaptor.

Testis oval, $0.138-0.219 \times 0.128-0.219$ mm, situated medially at about middle of body. Vas deferens running sinuously from anterior end of testis through midway between ovary and left body margin to seminal vesicle. Seminal vesicle fusiform, $0.125-0.166 \times 0.041-0.064$ mm, right to midline, between pharynx and ovary. Cirrus narrow tubular, sclerotized, receiving ducts from seminal vesicle and two prostatic reservoirs at its sheathed proximal part, then making one and a half circle before entering into middle groove of accessory piece. Accessory piece sclerotized, long sideways, 0.085-0.103 mm long, right to midline, posterior to pharynx, consisting of handle-like proximal portion which is surrounded by muscle fibers, and deeply furrowed, two winged distal portion, whose anterior tips are rounded dorsally, somewhat pointed ventrally. Genital pore median, a little behind pharynx. Prostatic glands divided into two groups, each group just anterior to vitellaria, connected with cirrus through



Figs. 4-6. *Heteropavlovskioides synodontis* n. g., n. sp. — 4. Entire worm (NSMT-PI-1640), dorsal view. — 5. Male terminal genitalia, dorsal view. — 6. Anchors and transverse bar, dorsal view. AP, accessory piece; C, cirrus; LP, left prostatic reservoir; RP, right prostatic reservoir; SV, seminal vesicle.

prostatic reservoir.

Ovary globular, $0.097-0.163 \times 0.117-0.184$ mm, pretesticular. Oviduct connected with duct of seminal receptacle and vitelline reservoir before entering into ootype. Ootype surrounded by shell glands, in front of ovary. Uterus thin-walled, running straight to genital atrium. No eggs observed. Vagina opening near right body margin at level of anterior end of ovary; vaginal pouch running transversely; vaginal reservoir sclerotized, saccular, about 0.06 mm long; vaginal tube narrow; seminal receptacle oval, $0.059-0.103 \times 0.064-0.116$ mm, on right side of ovary. Vitellaria consisting of large follicles, arranged in two longitudinal rows; follicles of each row connected to longitudinal vitelline duct, which unites with each other just anterior to ovary to form vitelline reservoir.

Discussion. The present genus resembles *Tetraonchoides* and *Pavlovskioides* in the structure of inner organs, but differs from them in the opisthohaptor having four septa on the ventral surface and an incision antero-medially. In *Tetraonchoides*, the opisthohaptor is provided with sucker-shaped pulvilli on the dorsal surface, whereas

in *Pavlovskioides*, the opisthohaptor is devoid of pulvilli, and occasionally bears weakly developed pits on the ventral surface.

Heteropavlovskioides n. g.

Tetraonchoiidae. Body subcylindrical. Opisthohaptor discoid, with four septa on ventral surface, an incision antero-medially, a pair of anchors, a transverse bar, and 16 marginal hooklets. Cement glands well developed. Head swollen, semi-circular, with numerous head organs. Eyespots absent. Caecum single. Testis at about middle of body. Seminal vesicle between pharynx and ovary. Cirrus sclerotized, narrow tubular, making one and a half circle before entering into middle groove of accessory piece. Accessory piece sclerotized, consisting of handle-like proximal portion and deeply furrowed, two winged distal portion. Genital pore median, a little behind pharynx. A pair of prostatic reservoirs present. Ovary pretesticular. Vagina opening dextral, submarginal. Vaginal reservoir sclerotized. Seminal receptacle on right side of ovary. Vitellaria consisting of large follicles in two longitudinal rows.

Type-species: *Heteropavlovskioides synodontis* n. sp.

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