

Two New Trematodes from Tropical Marine Fishes of Southwestern Japan

By

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Abstract

Two new species of trematodes are described from marine fishes captured in the Ryukyu Islands, southwestern Japan. *Paragyliachen arusettae* sp. nov. (Gyliachenidae) from the rectum of *Arusetta sexstriatus* is distinguished from *P. chaetodontis* by having much larger body, large cirrus pouch with well-developed prostatic cells, genital pore just posterior to caecal bifurcation, ramiform vitellaria, and smaller eggs. *Neohexangitrema zebrasomatis* gen. et sp. nov. (Angiodictyidae) from the intestine of *Zebrasoma veliferum* is characterized in lacking posterior projections, and having intercaecal testes and ovary, esophagus with posterior bulb, hermaphroditic pouch close to the oral sucker, and genital pore near posterior border of the oral sucker.

This report deals with two new species of trematodes which I collected in the Ryukyu Islands, southwestern Japan, in April, 1978 and May, 1983. The trematodes were washed in saline, fixed in 70% ethanol under coverslip pressure, stained with alum carmin or Heidenhain's hematoxylin and mounted in balsam. The specimens are deposited in the collection of the National Science Museum, Tokyo. I wish to thank Dr. S. KAMEGAI, Meguro Parasitological Museum, Tokyo, for the loan of the holotype of *Paragyliachen chaetodontis* for the purpose of comparing with my specimens.

Gyliachenidae

Paragyliachen arusettae sp. nov.

(Figs. 1-3)

Habitat. Rectum of *Arusetta sexstriatus* (KUHL et VAN HASSELT) (Pomacanthidae).

Locality. Okinawa Island, southwestern Japan.

Date. 20-V-1983.

Specimen No. NSMT-PI 2784.

Description. Based on 8 specimens. Body plump, orange-colored in life. After flattening, body pyriform, 9.0-16.2 mm long and 4.05-6.60 mm wide at junction between middle and posterior third of body. Cuticle aspinose. Oral sucker subterminal,

consisting of anterior ring with indented projections anteriorly $0.34\text{--}0.44 \times 0.46\text{--}0.65$ mm and posterior barrel $0.60\text{--}0.78 \times 0.53\text{--}0.65$ mm. Preoral lip with eight to ten papilla-like projections. Esophagus nearly S-shaped, 1.9–4.9 mm long in a straight line except for posterior bulb, surrounded by glandular cells. A short distance before bulb, esophagus having a spindle-shaped swelling. Bulb conical, muscular, $0.52\text{--}0.80 \times 0.38\text{--}0.48$ mm, covered with glandular cells, at junction between anterior and middle third of body or a little more posteriorly. Caeca extending to middle of posterior third of body. Acetabulum longitudinally elongated, reddish in color in life around orifice, $1.50\text{--}2.13 \times 1.05\text{--}1.80$ mm, at middle of posterior third of body or more anteriorly. Sucker ratio 1: 1.95–3.21.

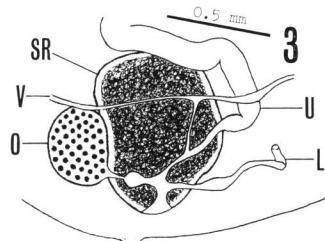
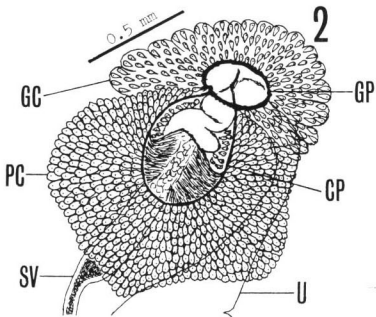
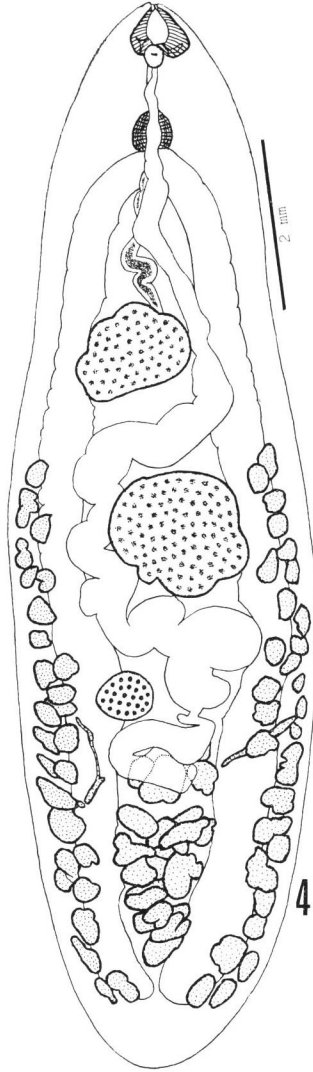
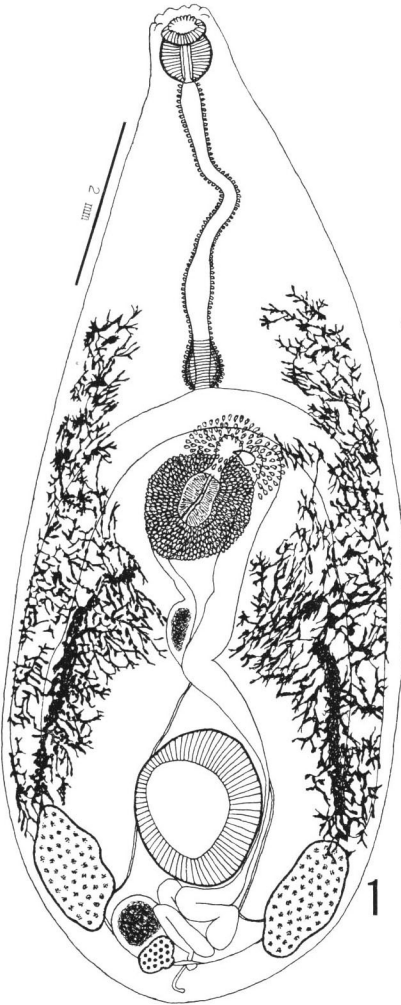
Testes elliptical, occasionally with irregular surface, symmetrical, obliquely posterior to acetabulum; the right $1.30\text{--}1.58 \times 0.85\text{--}1.55$ mm and the left $1.25\text{--}1.70 \times 0.72\text{--}1.25$ mm. Vas efferens arising from middle of testes and running into external seminal vesicle. External seminal vesicle tubular, 0.11–0.35 mm wide, lying longitudinally, beginning from a level between acetabulum and cirrus pouch. Cirrus pouch subglobular, $0.47\text{--}1.20 \times 0.33\text{--}0.65$ mm, near middle of body, containing oval pars prostatica $0.15\text{--}0.56 \times 0.21\text{--}0.62$ mm and eversible cirrus. Prostatic cells well-developed, enclosing cirrus pouch densely in the shape of a heart, $0.09\text{--}1.55 \times 1.13\text{--}1.63$ mm as a whole. Genital atrium shallow, surrounded by glandular cells. Genital pore just posterior to caecal bifurcation.

Ovary round to oval, $0.30\text{--}0.45 \times 0.30\text{--}0.51$ mm, median or submedian between acetabulum and posterior extremity. Seminal receptacle elliptical, $0.40\text{--}1.05 \times 0.60\text{--}1.30$ mm, dorsal to ovary. Laurer's canal opening dorsally sinistral or posterosinistral to ovary. Vitellaria ramiform, thin, extending along caeca from pharyngeal level or more anteriorly to anterior part of testes. Vitelline ducts descending on dorsal side of testes and united with each other to form vitelline reservoir lying just antero-sinistral to ovary. Uterus ascending in median field and opening into genital atrium. Uterine eggs thin-shelled, $74\text{--}83 \times 43\text{--}49$ μm . Excretory vesicle inverted triangular, bifurcating just posterior to ovary into lateral collecting tubes; pore terminal.

Discussion. At present, the genus *Paragyliachen* YAMAGUTI, 1934 contains only one species, *P. chaetodontis* YAMAGUTI, 1934, from the rectum of *Chaetodon* sp. and *Holacanthus septentrionalis* (= *Chaetodontoplus septentrionalis*) of southern Japan. In his report on *P. chaetodontis*, YAMAGUTI (1934) erroneously stated that the pars prostatica was entirely outside the cirrus pouch. OZAKI (1937) correctly described as "cirrus pouch small, elongate, enclosing large pars prostatica, penis and penis gland cells." However, this correction was overlooked by YAMAGUTI (1971) when he described the diagnosis of the genus *Paragyliachen*, again. My examination

Figs. 1–3. *Paragyliachen arusettae* sp. nov. — 1. Entire worm, ventral view. — 2. Terminal genitalia, ventral view. — 3. Ovarian complex, ventral view. CP, cirrus pouch; GC, glandular cell; GP, genital pore; L, Laurer's canal; O, ovary; PC, prostatic cell; SR, seminal receptacle; U, uterus; V, vitelline duct.

Fig. 4. *Neohexangitrema zebrasomatis* gen. et sp. nov., entire worm, ventral view.



of the holotype (MPM Coll. No. 22392) and other specimens (NSMT-PI 1540) of *P. chaetodontis* revealed the oral sucker with an anterior ring and the preoral lip with papilla-like projections, as in the present species.

The present species differs from *P. chaetodontis* by having a much larger body, a large cirrus pouch with well-developed prostatic cells, a genital pore just posterior to caecal bifurcation, ramiform vitellaria, and slightly smaller eggs.

Angiodictyidae

Neohexangitrema zebrasomatis gen. et sp. nov.

(Fig. 4)

Habitat. Intestine of *Zebrasoma veliferum* (BLOCH) (Acanthuridae).

Locality. Irabu Island, southwestern Japan.

Date. 30-IV-1978.

Specimen No. NSMT-PI 2110.

Description. Based on 8 specimens. Body elongate, rather thick, 4.6–8.1 mm long and 1.5–2.2 mm wide near equator of body, with slightly pointed anterior and round posterior extremity. Cuticle aspinose. Oral sucker subterminal, cup-shaped, $0.24\text{--}0.39 \times 0.27\text{--}0.52$ mm, with retrodorsal pockets. Esophagus 0.33–0.77 mm long except for posterior bulb. Bulb oval, muscular, $0.23\text{--}0.40 \times 0.15\text{--}0.47$ mm, just anterior to middle of anterior third of body. Caeca wide, terminating blindly near posterior extremity. Acetabulum absent.

Testes large, ovoid, occasionally with irregular surface, tandem, separated by uterus, occasionally close to each other, intercaecal or slightly overlapping caeca; the anterior $0.45\text{--}1.04 \times 0.44\text{--}1.17$ mm, at junction between anterior and middle third of body, and the posterior $0.49\text{--}0.96 \times 0.55\text{--}1.35$ mm, near equator of body. External seminal vesicle sinuous, beginning from upper side of anterior testis. Hermaphroditic pouch small, globular, $0.17\text{--}0.28 \times 0.12\text{--}0.23$ mm, containing short duct from external seminal vesicle, distal end of short metraterm and short hermaphroditic duct which is surrounded by glandular cells, close to oral sucker. Genital pore near posterior border of oral sucker.

Ovary ovoid, $0.28\text{--}0.52 \times 0.20\text{--}0.54$ mm, right to midline, at junction between middle and posterior third of body. Laurer's canal not made out. Uterus intercaecal or slightly overlapping caeca, arising from postovarian region and ascending windingly beside and between or occasionally dorsal to testes; proximal coils filled with sperms. Uterine eggs rather thick-shelled, $77\text{--}87 \times 49\text{--}54$ μm . Vitellaria consisting of large follicles, extracaecal usually from between midlevel of either testis to caecal termination and intercaecal postovarian region. Excretory pore dorsal, near level of caecal termination. Excretory vesicle and lymphatic system cannot be traced.

Discussion. The present genus resembles *Curumai* TRAVASSOS, 1961 from Brazilian freshwater fish and *Polyangium* LOOSS, 1902 from marine turtles in lacking projections

at the posterior extremity and having intercaecal testes and ovary. However, *Curumai* differs from the present genus in that it has the esophagus without a posterior bulb, a cirrus pouch, and the genital pore just anterior to caecal bifurcation. Further, *Polyangium* differs from the present genus by having the testes and ovary located in the postequatorial area and the genital pore located somewhat posterior to the oral sucker, and lacking a hermaphroditic pouch. In possessing a hermaphroditic pouch close to the oral sucker, the present genus is alike *Hexangitrema* PRICE, 1937 from marine fish, especially *H. pomacanthi* PRICE, 1937 redescribed by OVERSTREET (1969). However, *Hexangitrema* is distinguishable from the present genus by having two projections at the posterior extremity and the ovary located near the caecal termination. I tentatively place the present genus in the subfamily Curumaiinae because of occurring in fish and lacking posterior projections of the body.

Neohexangitrema gen. nov.

Angiodictyidae, Curumaiinae. Body elongate, rather thick, without posterior projections. Oral sucker cup-shaped, with retrodorsal pockets; esophagus rather short, with posterior bulb; caeca terminating near posterior extremity. Acetabulum absent. Testes large, oval, occasionally irregular in outline, tandem in intercaecal field; anterior testis at the junction between anterior and middle third of body and posterior testis at equator. Seminal vesicle tubular, sinuous, extending to anterior testis. Hermaphroditic pouch small, close to oral sucker. Genital pore near posterior border of oral sucker. Ovary ovoid, right to midline, at the junction between middle and posterior third of body. Uterus winding from behind ovary forward, passing beside and between or occasionally dorsal to testes. Vitellaria consisting of large follicles, distributed outside of both caeca usually from the midlevel between two testes to caecal termination and in intercaecal postovarian region. Excretory pore dorso-subterminal. Intestinal parasites of marine fishes.

Type species: *Neohexangitrema zebrasomatis* sp. nov.

References

- OVERSTREET, R. M., 1969. Digenetic trematodes of marine teleost fishes from Biscayne Bay, Florida. *Tulane Stud. Zool. Bot.*, **15**: 119–176.
- OZAKI, Y., 1937. Studies on the trematode families Gyliauchenidae and Opistholebetidae, with special reference to lymph system. II. *J. Sci. Hiroshima Univ.*, (B), **5**: 167–244.
- PRICE, E. W., 1937. Three new genera and species of trematodes from cold-blooded vertebrates. *Skrjabin Jubilee Vol.*, 483–490.
- TRAVASSOS, L., 1961. Sobre um novo trematodeo parasito de intestino de peixes de agua doce do Brasil — *Curumai curumai* gen. nov. sp. nov. (Trematoda, Angiodictyidae). *Atas Soc. Biol. Rio de Janeiro*, **5**: 1–4.
- YAMAGUTI, S., 1934. Studies on the helminth fauna of Japan. Part 2. Trematodes of fishes, I. *Jap. J. Zool.*, **5**: 249–541.
- 1971. Synopsis of Digenetic Trematodes of Vertebrates. 1074 pp., 249 pls. Tokyo, Keigaku Publ.

