

Three Aspidogastrea Trematodes from Marine Fishes of Japan¹⁾

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Abstract Three species of aspidogastrea trematodes are reported for the first time from the western North Pacific. They are: *Lobatostoma manteri* ROHDE, 1973 from the intestine of *Trachinotus blochii*; *Rugogaster hydrolagi* SCHELL, 1973 from the rectal glands of *Chimaera phantasma*; and *Mutlicalyx elegans* (OLSSON, 1869) from the gall bladder of *Chimaera phantasma*.

Three species of aspidogastrea trematodes were obtained from marine fishes of Japan: *Lobatostoma manteri* ROHDE, 1973 from a carangid *Trachinotus blochii*, *Rugogaster hydrolagi* SCHELL, 1973 and *Mutlicalyx elegans* (OLSSON, 1869) from a chimaerid *Chimaera phantasma*. They are first records from the western North Pacific. The brief morphological descriptions and comments are given.

Most worms were washed in saline, fixed in AFA or 70% ethanol under coverslip pressure, stained with Heidenhain's hematoxylin or alum carmine and mounted in balsam. Some worms were dehydrated by serial ethanol, critical point dried, coated with gold and observed in a SEM (JEOL-T 220). The specimens are deposited in the National Science Museum, Tokyo (NSMT).

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Family Aspidogastridae

Lobatostoma manteri ROHDE, 1973

(Fig. 1)

Material examined. From intestine of *Trachinotus blochii* (LACEPÈDE) (Carangidae), Okinawa-jima, 6–VI–1988 (NSMT-P1 3429).

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Description. Based on 10 mature specimens. Body 5.1–8.4 mm long by 1.6–2.4 mm wide. Head end 0.8–1.3 mm wide, consisting of two ventral and three dorsal lobes. Pharynx $0.25\text{--}0.39 \times 0.18\text{--}0.35$ mm. Ventral disk reddish in color in life, 3.3–4.9 mm long, 53–70% of body length, with 62 marginal alveoli. Anterior median alveoli divided by median ridge. Tail variable in length depending on contraction. Testis oval, $0.85\text{--}1.40 \times 0.72\text{--}1.00$ mm, near posterior end of body. Cirrus pouch well-developed, $0.51\text{--}1.28 \times 0.47\text{--}1.20$ mm, just behind anterior border of ventral disk. Ovary elongated oval, $0.45\text{--}0.73 \times 0.18\text{--}0.35$ mm, anterior to testis. Uterus occupied from posterior end of body to cirrus pouch, containing numerous eggs. Eggs oval, $86\text{--}98 \times 51\text{--}62$ μm . Vitellaria composed of small follicles, arranged in two parallel rows from near anterior margin to posterior margin of disk.

Remarks. This species was originally described by ROHDE (1973) from the fish, *Trachinotus blochii* in the Australian Great Barrier Reef and utilized the snails, *Cerithium moniliferum*, *Peristernia australiensis* and *Planaxis sulcatus* as intermediate hosts. Our specimens were also obtained from the same fish of Japanese waters.

We collected two additional specimens of *L. manteri* which contained eggs but seemed not to be fully grown. In the specimens, body 2.2 and 3.9 mm long, ventral disk 1.2 and 2.5 mm long, respectively, marginal alveoli 30 or so in number and eggs dense in the posterior half of the body, whereas sparse in the anterior half.

ROHDE (1975) described the marginal alveoli to reach the full number in larval *L. manteri* in the snail intermediate host. He also stated that in two larvae with body length of approximately 1.3 mm, the ventral disk was divided into half the number of alveoli usually found in adults. If such a larva is eaten by fish, does the larva grow up without acquiring the full number of alveoli? It is not clear whether the marginal alveoli increase in number in the final host.

Family Rugogastridae

Rugogaster hydrolagi SCHELL, 1973

(Figs. 2 & 5)

Material examined. From rectal glands of *Chimaera phantasma* JORDAN et SNYDER (Chimaeridae), Tosa Bay, 28-II-1990 (NSMT-P1 3873) and 14-XII-1990 (NSMT-P1 4095); Suruga Bay, 24-I-1991 (NSMT-P1 4118).

Description. Based on five mature specimens. Each of them with a broken posterior end. Body more than 9 mm long by 1.1–2.3 mm wide, with 25 or more transverse rugae. Anterior flat portion 1.9–3.5 mm long. Vestigial acetabulum $0.30\text{--}0.38 \times 0.47\text{--}0.62$ mm, just anterior to the border between anterior flat and the remainder rugate portion. Mouth opening large, subterminal, $0.15\text{--}0.24 \times 0.21\text{--}0.40$ mm. Pharynx $0.21\text{--}0.32 \times 0.25\text{--}0.42$ mm. Esophagus short. Caeca terminating some distance anterior to posterior end of body. Testes 68–85 in number and arranged mostly in two longitudinal rows. Testis $0.07\text{--}0.21 \times 0.09\text{--}0.70$ mm. Cir-

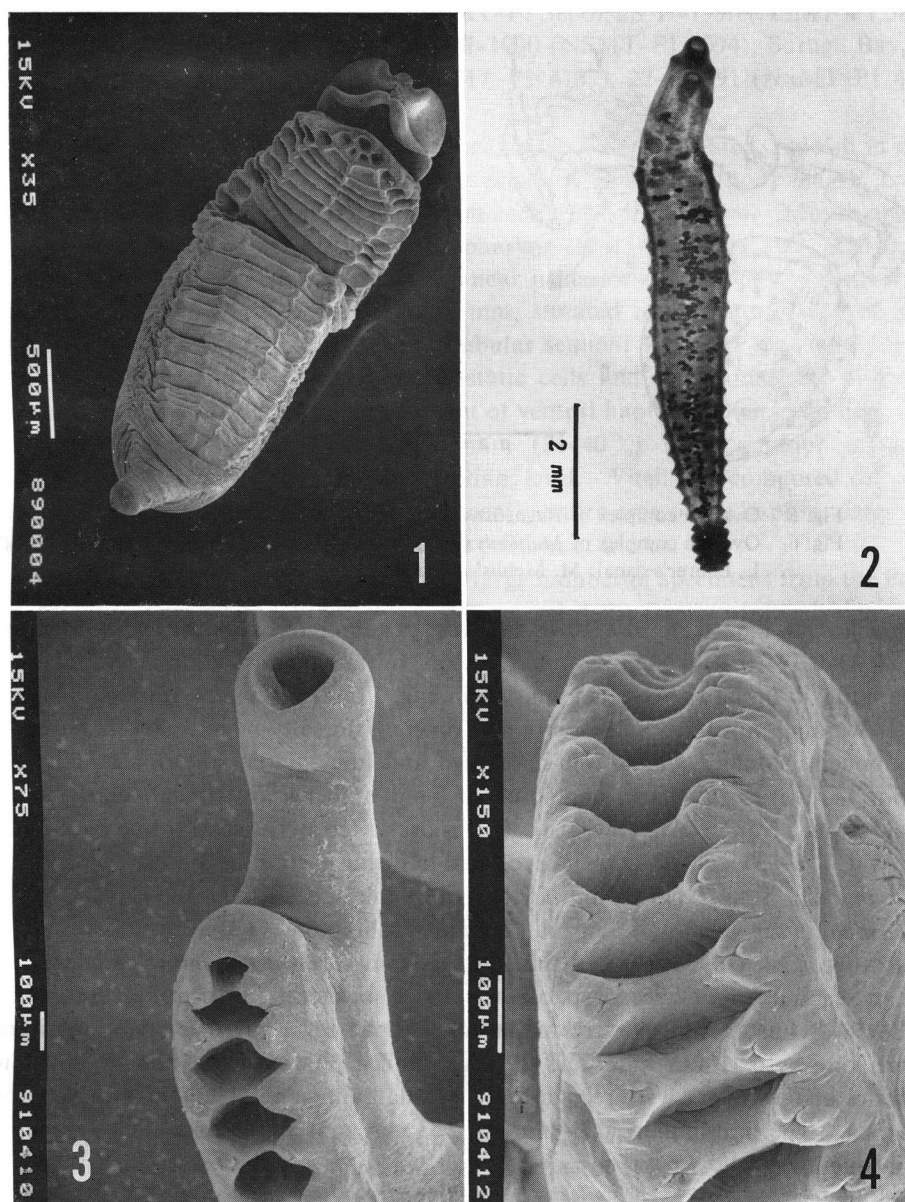


Fig. 1. SEM micrograph of *Lobatostoma manteri* ROHDE, 1973, ventral view.

Fig. 2. Optical micrograph of *Rugogaster hydrolagi* SCHELL, 1973, dorsal view.

Figs. 3 & 4. SEM micrographs of *Multicalyx elegans* (OLSSON, 1869), ventral view. — 3. Anterior end of body. 4. Ventral haptor.

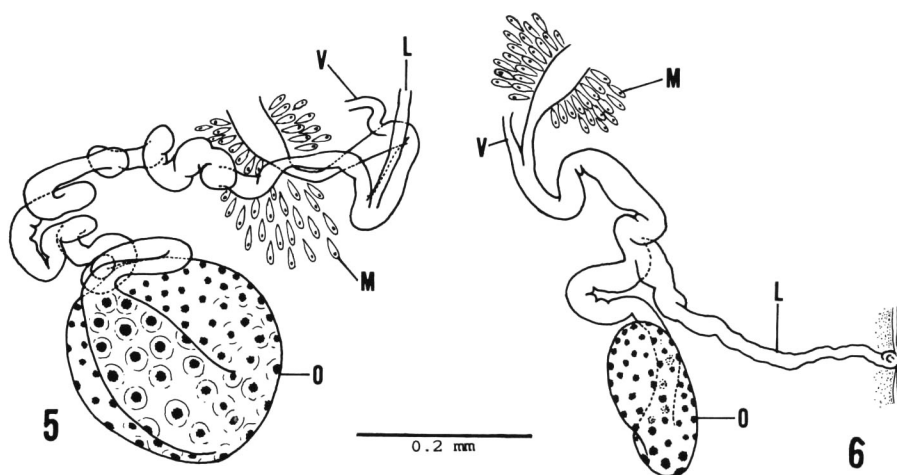


Fig. 5. Ovarian complex of *Rugogaster hydrolagi* SCHELL, 1973, ventral view.

Fig. 6. Ovarian complex of *Multicalyx elegans* (OLSSON, 1869), lateral view.

L, Laurer's canal; M, Mehlis' gland; O, ovary; V, vitelline duct.

rus pouch oval, $0.37\text{--}0.83 \times 0.37\text{--}0.48$ mm, just posterior to caecal bifurcation. Ovary oval, $0.23\text{--}0.37 \times 0.26\text{--}0.50$ mm, anterodextral or anterosinistral to acetabulum or overlapping it in part. Oviduct long, winding. Laurer's canal running forward, slightly winding, not filled with sperm and opening dorsally near posterior border of cirrus pouch. Mehlis' glands well-developed and immediately anterior or obliquely anterior to ovary. Vitellaria composed of small follicles, distributed chiefly along lateral to caeca from ovarian level to caecal ends. Metraterm ventral to cirrus pouch. Eggs oval, $118\text{--}134 \times 64\text{--}85$ μm , embryonated in distal portion of uterus.

Remarks. SCHELL (1973) initially described this species from the ratfish, *Hydrolagus colliei*, in the vicinity of San Juan Island, Washington. Later, SHVETSOVA (1990) and ROHDE *et al.* (1992) reported this species from *Hydrolagus ogibyi* caught in the Tasman Sea and from *Chimaera* sp. off the coast of southeastern Australia, respectively.

Some of our specimens were immature without eggs. The youngest specimen, 5.6 mm long by 0.71 mm wide, had 29 rugae and a pharynx, 0.13 mm by 0.16 mm. The testes and an ovary were recognizable as small anlagen. The vitellaria were not developed. The acetabulum, 0.24 mm by 0.33 mm, was observed clearly to suggest that it functions well.

Family Multicalycidae

Multicalyx elegans (OLSSON, 1869)

(Figs. 3, 4 & 6)

Material examined. From gall bladder of *Chimaera phantasma* JORDAN et SNYDER

(Chimaeridae), Tosa Bay, 27-II-1990 (NSMT-P1 3860), 28-II-1990 (NSMT-P1 3872), 11-XII-1990 (NSMT-P1 3897) and 14-XII-1990 (NSMT-P1 4094); Suruga Bay, 20-I-1991 (NSMT-P1 4097), 21-I-1991 (NSMT-P1 4102), 22-I-1991 (NSMT-P1 4109) and 24-I-1991 (NSMT-P1 4117).

Description. Based on 10 mature specimens. Body elongated, reddish in color in life, 7.1–16.7 mm long. Ventral haptor occupied 86–94% of body length, having 59–151 alveoli. Marginal organs located on each transverse septum. Mouth opening terminal, 0.22–0.50 mm in diameter. Prepharynx short. Pharynx oval, $0.25\text{--}0.27 \times 0.23\text{--}0.39$ mm; caecum single, terminating near posterior end of body. Testis single, ovoid to triangular, $0.45\text{--}1.45 \times 0.37\text{--}1.10$ mm, situated near posterior end of body. Deferent duct running forward, forming tubular seminal vesicle in the distal portion, becoming slender and surrounded by prostatic cells and then connected with short ejaculatory duct. Genital pore just in front of ventral haptor. Ovary elliptical, $0.58\text{--}0.77 \times 0.12\text{--}0.50$ mm, located at 2.9–4.7 mm (21–40%) from anterior extremity. Laurer's canal opening dorsally on ovarian level. Vitellaria composed of small follicles, in both lateral sides of caecum on nearly entire area of the haptor. Eggs oval, $100\text{--}118 \times 53\text{--}75$ μm , embryonated in distal portion of uterus.

Remarks. Based on examination of a large number of specimens from the Pacific and Atlantic, THONEY and BURRESON (1988) regarded the family Multicalycidae to be composed of a single genus, *Multicalyx*, and two species, *M. elegans* from holocephalans and *M. cristata* from elasmobranchs. *M. cristata* was much larger than the former, reaching 60 cm in length and having 1,500 alveoli or more. The testis did not lie at the posterior end of the body in mature specimens.

Our youngest specimen was 1.6 mm in length and had seven alveoli. The testicular and ovarian anlagen were located near the posterior end of the body. The position of the ovary was observed to move forward as the worm develops. A specimen having poorly-formed eggs was 6.4 mm in length and had about 55 alveoli. The ovary was situated at 3.6 mm (55%) from the anterior extremity.

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