クロダイに寄生していた単生目吸虫の1新種Haliotrema kurodai n. sp.

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Haliotrema kurodai n. sp. (Monogenea: Dactylogyridae, Ancyrocephalinae), a Monogenean Parasite Obtained from the Japanese Black Sea Bream, *Acanthopagrus schlegeli* (BLEEKER)

Kazuo OGAWA* and Syuzo EGUSA*

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A description is given of *Haliotrema kurodai* n.sp., a monogenean parasite from the gill filament of the Japanese black sea bream, *Acanthopagrus schlegeli*, cultured in aquaria in Shizuoka and Hiroshima Prefs., Japan. This is the first recorded case of *Haliotrema* from fish belonging to the family Sparidae.

Morphologically, this species is most characterized by the presence of four conspicuous reserviors of the cement glands. It should also be noted that the number of the marginal hooks are twelve, which seems to be an exceptional case in the genus.

Haliotrema kurodai n.sp. is very similar to YOUNG's species group 6, from which it differs in the absence of posterior diverticula of the intestine and in the number of the marginal hooks. This species may rather bear a closer resemblance to *Placodiscus acanthopagri* PAPERNA, 1972 in morphology and the host species, but may be discriminated from the latter species by the shape and size of the two anchor complexes. The difference remains unclarified of the nature of the cement reservoirs of *Placodiscus*, the most discriminating character of the genus, from those of some *Haliotrema* species including *H. kurodai*. Further examination of the validity of the genus *Placodiscus* is needed.

A species of ancyrocephalid monogenean was found parasitic on the gill of the cultured Japanese black sea bream, *Acanthopagrus schlegeli* (BLEEKER). An examination of the morphology of the monogenean has revealed that it has been a new species in the genus *Haliotrema*. The specific name, *kurodai*, is due to the Japanese common name of the host ("kurodai").

Materials and Methods

The Japanese black sea bream, *Acanthopagrus schlegeli* (Sparidae), from which the parasites were obtained, had been cultured in aquaria at Fisheries Laboratory of the University of Tokyo in Shizuoka Prefecture and at Nansei Regional Fisheries Research Laboratory in Hiroshima Pref., Japan. Permanent preparations were made under the methods used in a previous paper[1]; stained specimens were used for describing the general structure and specimens fixed in ammonium picrate-glycerin for describing the chitinous parts. Drawings were made with the aid of a camera lucida.

Description of the Species

Haliotrema kurodai n.sp.

Host: The Japanese black sea bream, *Acanthopagrus schlegeli* (BLEEKER).

Habitat: Gill filament.

Localities and dates: Hiroshima Pref., Aug. 5, 1976; Shizuoka Pref., Oct. 12 & Nov. 25, 1976.

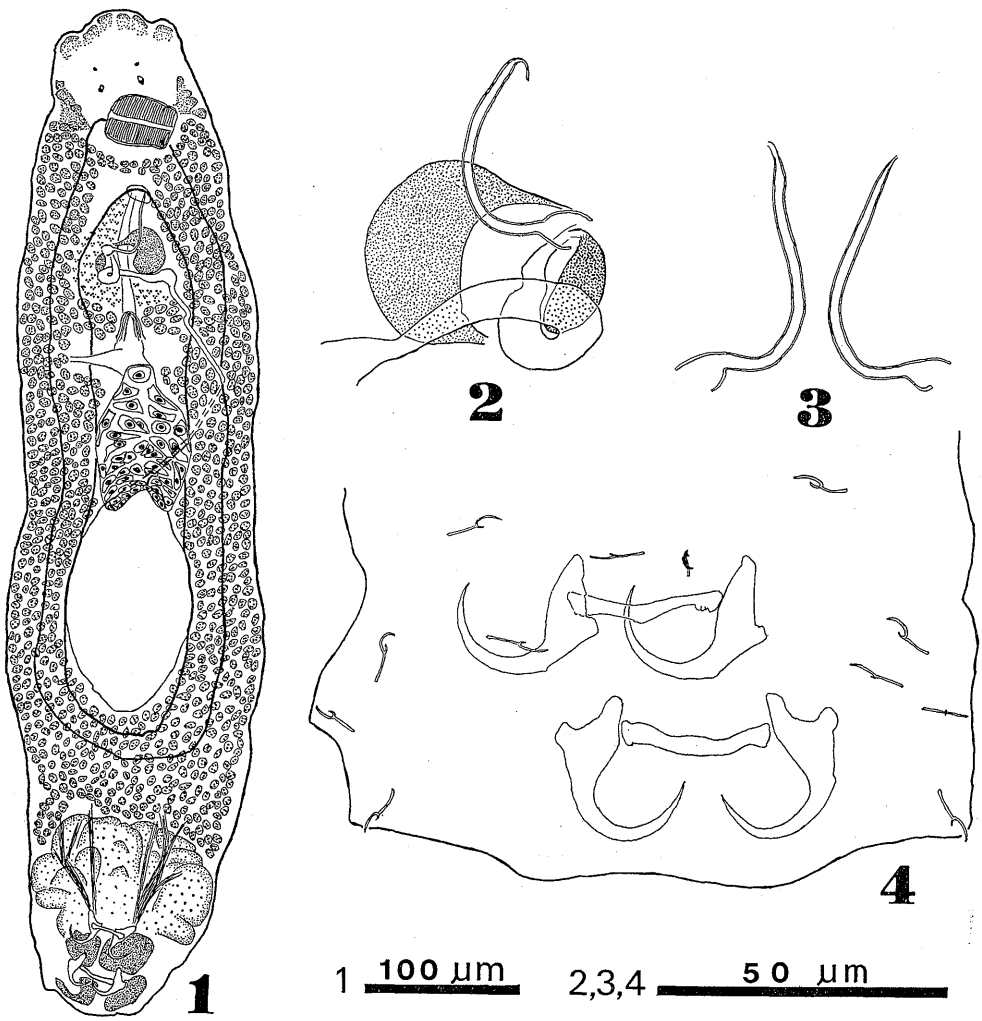
Specimens: The holotype and some paratypes are deposited in the Meguro Parasitological Museum, Tokyo, M.P.M. Coll. No. 19259 and the other paratypes in the authors' collection.

Description (26 specimens examined): The body is fusiform, 490–850×130–179 μm in size. The opisthaptor is rounded and transversely wide, 62–83×82–123 μm in size. There are two pairs of anchors (ventral and dorsal) in the opisthaptor. The ventral anchors are small (24–28, mean 26 μm long, and usually lie anterior to the dorsal ones. The internal processes of the anchors are long and wide, while the external ones are rudimentary. An acute angle is formed between both processes. The points of the anchors direct ventrally. The lengths of various parts of the ventral anchor are as follows: the base 22–24 μm; the internal process

* Department of Fisheries, Faculty of Agriculture, the University of Tokyo (小川和夫・江草周三: 東京大学農学部水産学科).

10–12 μm; the external process 1.5–2.5 μm; the point 11–13 μm. The ventral anchors are supported by a bar ventrally, which is 25–30, mean 27×2–4 μm in size. The dorsal anchors (23–27, mean 25 μm long) are almost the same in size and shape as the ventral ones. The internal processes make approximately a right angle with the external processes. The points of the anchors direct dorsally. The lengths of various parts of the dorsal anchor are as follows: the base 20–23 μm; the internal process 8.5–11 μm; the external process 1.5–2.5 μm; the point 9–12 μm. The dorsal anchors are supported by a straight bar (25–35, mean 28×2.5–4.5 μm in size) dorsally. The marginal hooks, 9–11 μm long, are of larval type and are in six pairs, except one instance, where they are thirteen in number. The cement glands originate behind the testis and are well developed. Four conspicuous reservoirs of the glands are located at the sites of the ventral and dorsal anchors in the opisthaptor. Their contents have an appearence of transparent substances, but actually they are very finely granular substances which remain unstained with carmine. Considering that the anchor complexes are small and the marginal hooks are not well developed, these cement glands may play a principal role in attaching itself to the gill tissue of the host fish.

The prohaptor is in two lobes, where the sticky glands open. Four eye spots are located at the dorsal side of the pharynx. The pharynx is 37–50 ×26–45 μm in size. The esophagus is short.



Figs. 1–4. *Haliotrema kurodai* n.sp. 1: the whole worm of holotype, ventral view. 2: the male terminalia of paratype, dorsal view. 3: the cirri of paratypes. 4: the opisthaptoral armatures of paratype, dorsal view.

The intestine bifurcates and the two branches run on both sides of the body, united posteriorly. There are no diverticula at the posterior end of the intestine.

The testis is ellipsoidal and large, 102–200 × 47–135 μm in size. The vas deferens emerges at the anterior extremity of the testis, turning round the left intestine. After forming the vesicula seminalis (4–10 μm in diameter), which is usually indistinct and curved or looped in shape, it reached the cirrus base. The cirrus is a simple, arched tube, funnel-shaped at the base, and tapers anteriorly, measuring 33–48 μm long in a straight line, 1.5–2 μm wide in the middle and 7–8 μm wide at the base. No accessory piece is accompanied by the cirrus. There are two prostatic reservoirs at the cirrus base. One on the left, 29–38 × 14–23 μm in size, is ovoid or ellipsoidal, and filled with finely granular secretion. The other on the right is usually sausage-shaped, and much smaller than the one on the left, being 13–27 × 5–12 μm in size. Coarsely granular secretion accumulates in the smaller reservoir. The prostate glands are distributed over the inter-intestinal region from the level of the bifurcation to that of the posterior end of the uterus. The ovary, which is situated in front of the testis, is usually ellipsoidal, and 66–112 × 39–74 μm in size. The vagina is a simple duct, bears no chitinous armament, and opens on the ventral surface of the right side of the body. The narrow vaginal duct leads into the receptaculum seminis (18–38 × 21–32 μm in size), which lies just in front of the ovary. The receptaculum seminis, which is formed by dilatation of the oviduct, leads into the ootype. The ootype continues into the straight uterus.

The whole worm, male terminalia and chitinous structures are shown in Figs. 1–4.

Discussion

The morphological characteristics of *Haliotrema kurodai* n.sp. described here almost completely satisfy the generic diagnoses of *Haliotrema* emended both by YAMAGUTI[2] and by YOUNG[3]. This species is most characterized by the presence of four (two pairs of) conspicuous cement reservoirs. The contents have an appearence of transparent substances, but actually they are very finely granular secretions. Besides, a special attention should be paid of the number of the marginal hooks in this species. They are in six pairs and seem to be arranged in the same manner as in *H. johnii* and *H. chrysotaeniae* described by YOUNG[3]. These may be exceptional cases in the genus. However, in the present study, of all the specimens fixed in ammonium picrate-glycerin, only one specimen has thirteen marginal hooks, which may suggest that the marginal hooks initially exist in seven pairs and one pair disappears during the development of the parasite.

Haliotrema is a big genus, containing about one hundred species, and some of them have many characters in common, which makes it possible to divide the genus in part into species groups. YOUNG[3] divided thirty-two species of them into six groups, based on their structural modifications and host specificities, and remained four species unclassified into any group because of their variable characters. Later, BYCHOWSKY and NAGIBINA[4] also recognized that *Haliotrema* species from hosts belonging to one family bear some morphological differences from species from hosts of other phylogenetically distant families, and, based on twenty-five species, presented five species groups, which, speaking, did not strictly coincide with the six groups by YOUNG.

H. kurodai n.sp. differs from all the species in the genus in having smaller anchor complexes, a simple cirrus without an accessory and the intestine without posterior diverticula. This is the first record of *Haliotrema* species from fish belonging to the family Sparidae. Although this species may not be included into any species group mentioned above, it resembles YOUNG's species group 6 in having similar anchor complexes, a tubular cirrus without an accessory and the conspicuous reservoirs of the cement glands in the opisthaptor, but differs in the absence of the posterior diverticula of the intestine and in the number of the marginal hooks. This species may rather bear a closer resemblance to *Placodiscus acanthopagri* PAPERNA, 1972 in the point not only of the morphology but also of the host species, but may be differentiated from the latter species in the shape and size of the two anchor complexes. PAPERNA[5] created the genus *Placodiscus* for his new species, *P. acanthopagri* parasitic on *Acanthopagrus bifasciatus* (FORSKAL), and stated that the genus was most characterized by the refractive opisthaptor reservoirs. Morphologically, the present species is very similar to *P. acanthopagri* at almost all points except the following. 1) In *H. kurodai*, the vagina opens on the right of the body, but in *P. acanthopagri*, it opens on the median line in front of the ovary. 2) In the former species, there

are two prostatic reservoirs, while in the latter species, there is a single reservoir. Since both the vagina and the prostatic reservoirs are thought to be difficult to detect using specimens fixed in formalin[6], further observation should be made of the two structures. It was of PAPERNA's opinion that the presence of two to four refractive reservoirs of the cement glands was the most important key to differentiate *Placodiscus* from other genera[5]. However, no comparative work has been done in detail on the nature of the cement reservoirs in the opisthaptor in the ancyrocephalids. The refractive substances of *P. acanthopagri* may be identical with the hyaline fluid in YOUNG's species group 6 and also with the finely granular substances in the present species, since the secretions in this species have an appearence of refractive and hyaline substances. As a conclusion, it is most appropriate at the present condition that the present species should be classified as a new species in the genus *Haliotrema*, and further examination should be needed of the validity of the genus *Placodiscus*.

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