

Thynnascaris haze n. sp. (Nematoda, Anisakidae)
from Goby in the Bay of Tokyo

By

Masaaki MACHIDA

Department of Zoology, National Science Museum, Tokyo,

Kounosuke TAKAHASHI and Satoru MASUUCHI

Tokyo Metropolitan Fisheries Experiment Station, Tokyo

Recently, TAKAHASHI *et al.* (1976, 1977) examined a nematode belonging to the genus *Thynnascaris* from the goby *Acanthogobius flavimanus* obtained at the inner part of the Bay of Tokyo. When the fish grows to 4 to 5 cm long in July, it receives the infection and infection rate runs as high as 70% or more in October. Most nematodes localize in the body cavity (Fig. 1), but some penetrate into the liver, muscles, subcutaneous tissues and occasionally orbit. They are not enclosed within cysts and seem to wander here and there, so that they cause the visceral adhesion, liver enlargement and necrosis in the case of heavy infection (Fig. 2).

The nematode was preserved in 5% formalin and cleared in Gater's solution.

Family Anisakidae
Subfamily Raphidascaridinae

Thynnascaris haze n. sp.

(Figs. 3-6)

Host. *Acanthogobius flavimanus* (TEMMINCK et SCHLEGEL).

Habitat. Body cavity, occasionally liver, muscle, subcutaneous tissue or orbit.

Locality. The Bay of Tokyo.

Specimen No. NSMT-As-1442.

Description. Male smaller, curved ventrally at posterior region. Cuticle with inconspicuous striations and minute lateral ridge on each side of body. Lips pentagonal, anterior process incised medially and uneven antero-laterally; dorsal lip provided with two wide papillae; subventral lips with a wide papilla ventrally, a small papilla and an amphid dorsally. Esophagus slender; ventriculus globular; ventricular appendix gourd-shaped; intestinal caecum wide and very short. Nerve ring some distance anterior to equator of esophagus. Excretory pore and tiny cervical papillae at level of equator of esophagus.

Male. Body 13.1-17.3 mm long and 0.32-0.49 mm wide. Lips 0.066-0.092 mm long; interlabia 0.026-0.051 mm long. Esophagus 1.12-1.62 × 0.13-0.18 mm; ven-

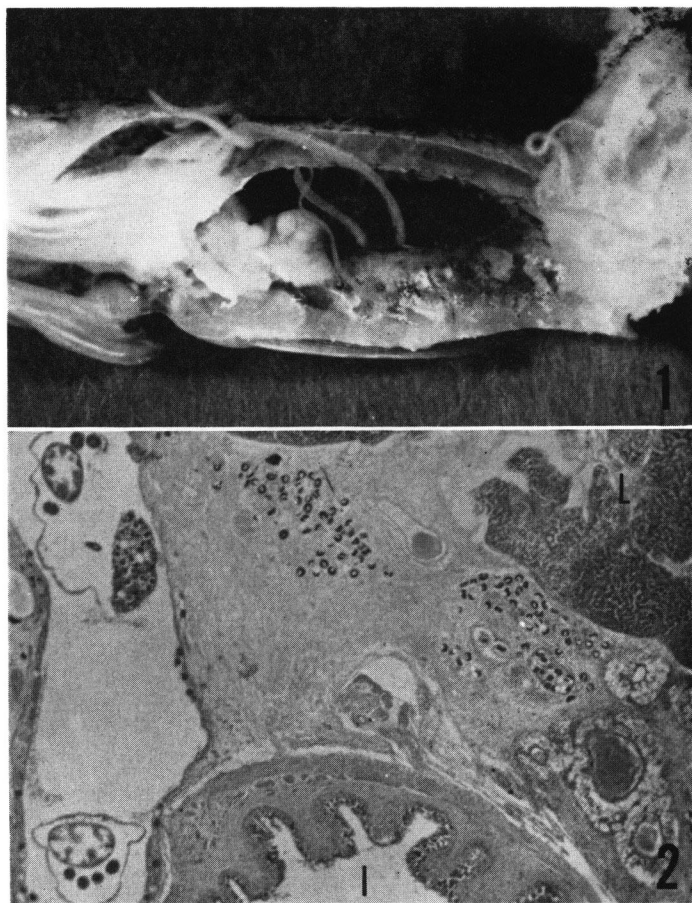
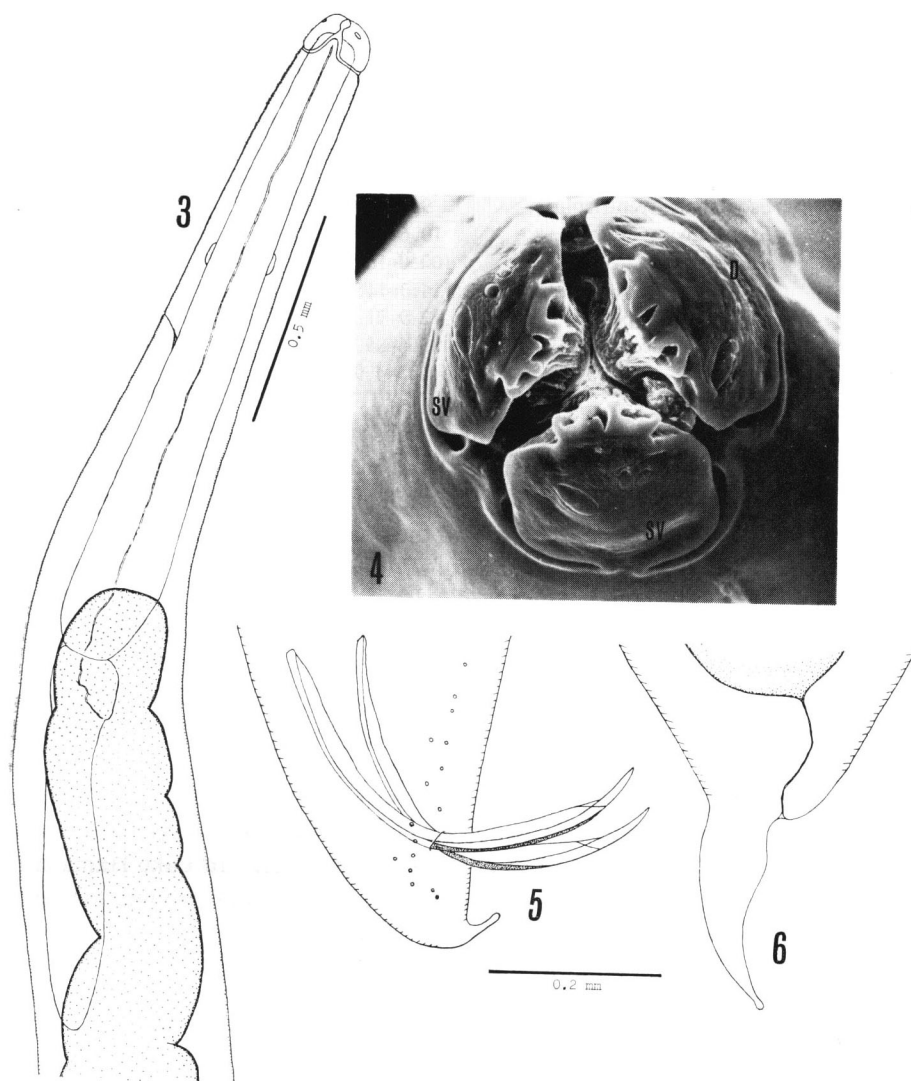


Fig. 1. *Thynnascaris haze* n. sp. in the body cavity of *Acanthogobius flavimanus*.

Fig. 2. Transverse section of *Acanthogobius flavimanus*, showing visceral adhesion (I: intestine, L: liver), adult worm and scattered eggs.

triculus $0.09\text{--}0.16 \times 0.10\text{--}0.19$ mm; ventricular appendix $0.76\text{--}1.28 \times 0.10\text{--}0.18$ mm; intestinal caecum $0.16\text{--}0.45 \times 0.15\text{--}0.23$ mm. Nerve ring and excretory pore at $0.46\text{--}0.55$ mm and $0.55\text{--}0.70$ mm from head end, respectively. Testis usually reaching near posterior end of ventricular appendix or sometimes near ventriculus. Spicules equal, alate except near its sharp-pointed tip, $0.48\text{--}0.67$ mm long or $3.0\text{--}4.9\%$ of body length. Papillae low; 13–17 pairs preanal; 1 pair adanal; 5–6 pairs postanal. Tail abruptly narrowing near end, roundly pointed, $0.10\text{--}0.14$ mm long.

Female. Body $21.4\text{--}29.4$ mm long and $0.48\text{--}0.72$ mm wide. Lips $0.097\text{--}0.117$ mm long; interlabia $0.041\text{--}0.061$ mm long. Esophagus $1.48\text{--}1.80 \times 0.17\text{--}0.21$ mm; ventriculus $0.10\text{--}0.18 \times 0.14\text{--}0.22$ mm; ventricular appendix $0.80\text{--}1.28 \times 0.12\text{--}0.18$ mm; intestinal caecum $0.27\text{--}0.55 \times 0.19\text{--}0.32$ mm. Nerve ring and excretory pore at 0.52--



Figs. 3-6. *Thynnascaris haze* n. sp. — 3. Anterior end of female. — 4. Apical view of head end (scanning electron microscopy. D: dorsal lip, SV: subventral lip). — 5. Posterior end of male. — 6. Posterior end of female.

0.65 mm and 0.61–0.78 mm from head end, respectively. Vulva at 5.8–7.6 mm from head end or 26.3–47.2% of body length from head end. Vagina about 0.18 mm long, surrounded by well-developed musculature. Gonad usually not extending anterior beyond level of vulva. Ovaries terminating some distance anterior to anus. Tail gradually tapering posteriorly, roundly pointed, 0.20–0.38 mm long. Uterine eggs

nearly spherical, thin-shelled, 46–59 μ in diameter.

Dimension indexes of both sexes are shown in Table 1.

Table 1. Dimension indexes of *Thynnascaris haze* n. sp.

	Male	Female
α (Body length/Body width)	31.2–42.5	40.8–49.4
β_1 (" /Esophagus + ventriculus)	9.8–11.7	13.0–16.2
β_2 (" /Esophagus)	10.6–13.0	14.3–17.3
β_3 (" /Ventriculus)	100.0–161.1	142.7–250.0
r (" /Tail)	114.3–145.0	73.1–122.5
X (" /Ventricular appendix)	12.9–21.2	19.5–34.3
Y (" /Intestinal caecum)	35.6–85.0	49.8–91.5
Z (Ventricular appendix/ ")	1.5–4.9	2.0–4.4

Discussion. This species differs from closely related *Thynnascaris seriola* (YAMAGUTI, 1941), n. comb., which we transfer from the genus *Contracaecum* on the basis of having an excretory pore near the level of the nerve ring, in the anterior process of the lips, the tail without spines at the tip, and the position of the vulva. Furthermore, it differs from all the other known species of *Thynnascaris* in that it does not localize in the intestine. Mature and immature worms measuring about 3 mm long in the smallest are found in the body cavity and sometimes in the liver, muscles, subcutaneous tissues or orbit. Many embryonated eggs are also detected in the body cavity.

There are very few large predatory fishes feeding on goby at the inner part of the Bay of Tokyo, so that the nematode eggs or larvae seem to emerge from dead goby into sea water.

Addendum. Through the courtesy of Dr. K. OGAWA, Department of Fisheries, the University of Tokyo, we examined a nematode from *Acanthogobius flavimanus* in Lake Hamana and proved it also to be *Thynnascaris haze*. In Lake Hamana most worms localize in the subcutaneous tissues or muscles in and around the jugular, and a very few in the body cavity.

References

- DOLLFUS, R. Ph., 1933. *Thynnascaris legendrei* n. gen., n. sp. de l'estomac du Germon, *Germio alalonga* (GMEL.). *Bull. Soc. zool. France*, **58**: 7–12.
- HARTWICH, G., 1957. Zur Systematik der Nematoden-Superfamilie Ascaridoidea. *Zool. Jahrb. Syst.*, **85**: 211–252.
- NORIS, D. E., & R. M. OVERSTREET, 1975. *Thynnascaris reliquens* sp. n. and *T. habena* (LINTON, 1900) (Nematoda: Ascaridoidea) from fishes in the northern Gulf of Mexico and eastern U. S. seaboard. *J. Parasit.*, **61**: 330–336.
- TAKAHASHI, K., S. MASUUCHI, T. NAKAMURA & M. SAITO, 1976. On a nematode from *Acanthogobius flavimanus*. *Annual Report of Ecological Survey on Fishes and Shell-fishes in Inner Area of Tokyo Bay*, (267): 42–50. (In Japanese.)
- , ———, T. KAWAMURA, M. OGURA & T. ARIMA, 1977. Ditto (2). *Ibid.*, (276): 89–93. (In Japanese.)
- YAMAGUTI, S., 1941. Studies on the helminth fauna of Japan. Part 33. Nematodes of fishes, II. *Jap. J. Zool.*, **9**: 344–396.