

A New Capillariid Nematode from a Boxfish of Sagami Bay, Japan

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Abstract Described herein is a new capillariid nematode, *Capillaria hakofugu*, taken from the rectum of a boxfish, *Ostracion immaculatus*, from Sagami Bay, Japan. It resembles the members of the subgenus *Neocapillaria* of the genus *Capillaria*, but differs from them in having no papillae on each side of the cloacal opening, an entire esophagus which extends to 36 to 45% of body length in the male and 25 to 31% in the female, a spicule 0.11 to 0.15 mm long, and eggs 47 to 58 by 22 to 28 μm .

A capillariid nematode was obtained from the rectum of a boxfish, *Ostracion immaculatus*, from Sagami Bay, the Pacific coast of central Japan. This is the new species. The nematodes were preserved in 5% formalin, and cleared in glycerin for study. The specimens are deposited in the National Science Museum, Tokyo (NSMT).

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Family Capillariidae

Capillaria hakofugu sp. nov.

(Figs. 1-7)

Host. *Ostracion immaculatus* TEMMINCK et SCHLEGEL (Ostraciidae).

Site. Rectum.

Locality. Sagami Bay, Pacific coast of central Japan.

Specimen No. NSMT-As 2116.

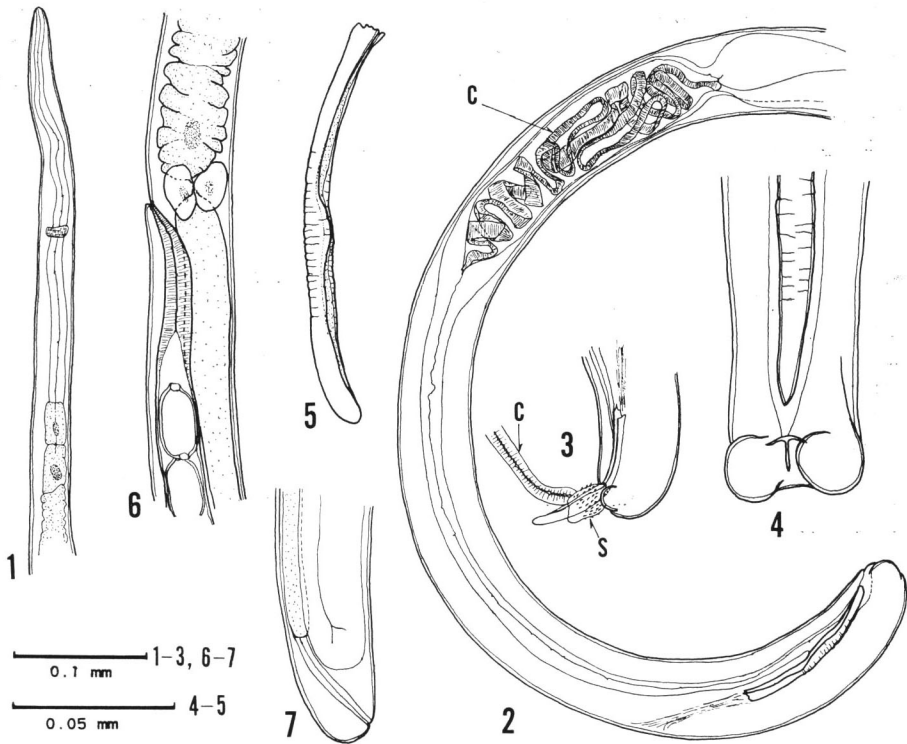
Description. Male $1/2$ to $2/3$ as long as female. Bacillary bands extending along almost whole body. Head end narrowed, rounded, provided with indistinct minute subterminal oral papillae. Nerve ring lying near the middle of muscular esophagus. Stichosome composed of 34-44 stichocytes, each of which possesses a large nucleus and several transverse striations. Two large wing-like cells situated at junction between esophagus and intestine.

Male. Based on 12 specimens. Body 7.18–9.74 mm long by 0.05–0.06 mm in maximum width at about middle of posterior half. Width of lateral bacillary band 13–20 μm near posterior end of esophagus. Entire esophagus 3.04–4.04 mm long, corresponding to 36–45% of body length. Muscular esophagus 0.17–0.33 mm long and stichosome 2.84–3.29 mm long. Nerve ring lying at 0.07–0.15 mm from head end. A single spicule well-sclerotized, 0.11–0.15 mm long, corresponding to 1.1–1.7% of body length, with its somewhat swollen middle third, 10–15 μm wide, having transverse grooves. Spicule sheath with minute spines observable when it is evaginated. Cloacal opening T-shaped. No papillae present on either side of cloacal opening. When the spicule sheath evaginates, a long narrow cirrus also evaginates through the cloacal opening. Usually the cirrus lying sinuously in the cloaca. Tail 13–25 μm long, with a pair of subventral lobes. Caudal papillae, caudal alae and cuticular membrane absent on the tail.

Female. Based on 10 specimens. Body 13.6–17.9 mm long by 0.06–0.08 mm in maximum width at about middle of posterior half. Width of lateral bacillary band 14–23 μm near posterior end of esophagus. Entire esophagus 3.90–4.90 mm long, corresponding to 25–31% of body length. Muscular esophagus 0.30–0.44 mm long and stichosome 3.50–4.54 mm long. Nerve ring lying at 0.15–0.19 mm from head end. Vulva situated 30–50 μm posterior to the junction between esophagus and intestine, 3.93–4.95 mm from head end, corresponding to 25–31% of body length. No appendage surrounding the vulva. Eggs 47–58 \times 22–28 μm , arranged in one row in the uterus near the vulva, and in two or more rows proximally. Rectum 0.08–0.13 mm long. Anus subterminal, tail 8–15 μm long.

Discussion. In his taxonomical revision of capillariid nematodes from fishes, MORAVEC (1987) created *Neocapillaria* as a new subgenus in the genus *Capillaria* for *Capillaria pterophylli* HEINZE, 1933, *C. cooperi* JOHNSTON et MAWSON, 1945 and *C. wickinsi* OGDEN, 1965. *Capillaria pterophylli* has been obtained from freshwater cichlid and cyprinid fishes in Eastern Europe, *C. cooperi* from callionymid and balistid fishes in the Indian Ocean and *C. wickinsi* from pleuronectid fishes in the Atlantic Ocean and the North Sea. The present new species most resembles these three species in having the spicule sheath covered with minute spines, the tail of the male provided with two subventral lobes without cuticular margins, and no appendage surrounding the vulva, but differs from them in possessing no papillae on either side of the cloacal opening. Further, the present new species differs from the three species in the following respects: *C. pterophylli* has a larger proportion of the length of entire esophagus to that of body (53 to 66% in the male and 35 to 53% in the female) and a longer spicule (0.174 to 0.210 mm); *C. cooperi* has a larger proportion of the length of entire esophagus to that of body (61% in the male and 38% in the female) and larger eggs (63 to 69 by 27 to 30 μm); and *C. wickinsi* possesses a very long spicule (0.534 to 0.660 mm).

Recently, in addition to the above three species, ARYA (1985) described *Capillaria schmidtii* from fish of the genus *Raja* from the Indian Ocean. This species differs from



Figs. 1-7. *Capillaria hakofugu* sp. nov.—1. Anterior end of female, lateral view. 2. Posterior part of male, showing sinuous cirrus (C) in the cloaca, lateral view. 3. posterior end of male, showing evaginated spicule sheath (S) and cirrus (C), lateral view. 4. Same, ventral view. 5. Spicule, lateral view. 6. Vulval region of female, lateral view. 7. Posterior end of female, lateral view.

the present species, *C. hakofugu*, in having a longer stichosome (5.83 to 7.41 mm in the male and 6.52 to 9.38 mm in the female) and the vulva surrounded by a globe-shaped appendage. JUSTINE and RADUJKOVIC (1988) reported *C. baina*e from a marine blennioid fish of Yugoslavia. Compared with *C. hakofugu*, this species has a shorter body length (4.7 to 6.3 mm in the male and 6.8 to 8.0 mm in the female), and a shorter esophagus (2.4 to 3.6 mm in the male and 3.3 to 3.7 mm in the female), and a spicule sheath without spines. MORAVEC *et al.* (1988) described *Pseudocapillaria parablenni* from a blennioid fish of the Mediterranean. They placed this species in the genus *Pseudocapillaria* owing to the nonspiny spicule sheath, which measured 0.57 mm long when evaginated. The spicule sheath was fairly long, compared with the spicule 90 to 99 μ m long, so it may be the cirrus, which JUSTINE and RADUJKOVIC (1988) detailed. Perhaps MORAVEC *et al.* mistook the cirrus for the spicule sheath. Therefore, it is necessary to confirm whether the spicule sheath is spiny or not. There is a possibility that this

species belongs to the genus *Capillaria* for the above reason. It is different from *C. hakofugu* in having a larger proportion of the length of entire esophagus to that of body (49 to 54% in the male and 41 to 50% in the female) and larger eggs (63 to 66 by 27 to 30 μm).

The specific name *hakofugu* refers to the Japanese name of the host.

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