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***Gnathia capillata*, a new species of the genus *Gnathia* (Crustacea, Isopoda)  
from Sado Island, the Sea of Japan**

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**ABSTRACT** A new species of gnathiid isopod crustacean is described as *Gnathia capillata*, based on an adult male individual which was bred in the laboratory from the parasitic praniza larva on the stingray *Dasyatis akajei*, caught off the coast of Sado Island, Niigata Prefecture, the Sea of Japan. The features of its praniza juvenile is also described.

**KEY WORDS** *Gnathia* / Gnathiidea / isopod / taxonomy / Sado Island / new species / the Sea of Japan

## **Introduction**

During the course of histological studies on the chondrichthyan central nervous system conducted by the second author, many gnathiid praniza juveniles infesting the branchial chamber wall of the fish were noticed and many specimens were removed from the host fishes, stingrays and gummy sharks, *D. akajei*, *D. matsubarai* and *Mustelus manazo*, and they were examined histologically to learn (1) the details of their internal organs (Honma *et al.*, 1991) and (2) the pathological changes of host fishes brought about by the attack of pranizae (Honma and Chiba, 1991)

After maintaining the pranizae in an aquarium, the second author obtained a single epimorphosed male. This male and several juveniles were sent to the first author for identification. As a result, this isopodan species is proved to be new to science and we are describing it here as a new species.

## **Materials and Methods**

Material examined: 1 male (holotype, 7.6 mm in body length including mandibles but excluding both antennae), bred from parasitic praniza stage which had been removed from the gill chamber wall of the sting ray, *Dasyatis akajei*, and several other condrichthian fishes, off Sado coll. Yoshiharu Honma. The holotype has been deposited in the museum of the Sado Marine Biological Station of Niigata University (SMBS-inv. 1). The paratypes have

been deposited in the Sado Marine Biological Station and the Toyama Science Museum.

*Gnathia capillata* n.sp.

(Japanese name: Kebuka–umikuwagata, new: meaning hairy marine stag beetle)

Figs. 1 and 2

**Description:** **Adult male** (Fig. 1A): Body 3.7 times as long as wide. Color dull yellow. Almost all the body surface setose. Cephalon rectangular, 1.3 times as long as wide. Lateral margins almost straight. Supraocular lobe slightly rose. Mediofrontal process raised and having slightly indented apex. Frontolateralis lacking. Wide dorsal in anterior midline. Eyes well developed. Each eye composed of 35 ommatidia. Both cephalon and pereonid somites with many long setae on dorsolateral their surface. Pereonites 2–3 very short, reaching lateral margin of body. Pereonite 4 about twice as long as pereopod 3. Pereonites 5 a little longer than pereonite 4. Pereonite 6 longer and wider than pereopod of 5. Pereonite 7 as long as pereonite 6, with shallow concavity on posterior end. Epimera of pereonites not prominent.

Pleonite narrow and 1.5 times as long as pereonite 7; each segment subequal in length. Pleotelson triangular, with straight lateral margin, with several long setae.

Antennula (Fig. 1B) with 5 peduncular segments; length ratio of segments 2: 2: 5. Flagellum 3-segmented; terminal segment with 2 aesthetascs and a long seta.

Antenna (Fig. 1C) with 5 peduncular segments; flagellum 5-segmented; length ratio of segments 2: 2: 2: 4: 5. Flagellum 5-segmented.

Mandible (Fig. 1D) with slight incisura and unarmed to basal neck. Mandibular blade with 8 teeth. Mandibular setae and armed carina lacking.

Maxilliped (Fig. 1E): 5-segmented; segment 1 wide and lacking setae; segment 2 square with 6 setae; segment 3 square with 10 setae; segment 4 square, 3/5 times as long as segment 3, with 6 setae; terminal segment slender, with 6 setae on basal half.

Pylopod (Fig. 1F): 2-segmented; segment 1 wide and triangular with more than 60 setae on margin; segment 2 small and round, distal end slightly tridentate, without seta.

Pereopod 1 (Fig. 1G): basis elliptical, with many long setae; ischium narrower than basis, with long setae; merus and carpus, each with 5 spines on inner margin.

Pereopods 2 to 4 (Fig. 1 H–I): relative lengths of each segment almost as in pereopod 1, but setae more sparsely scattered and much shorter than those of pereopod 1.

Pereopod 5 (Fig. 1J): longer than preceding legs. Penes (Fig. 1K) short and rounded.

Pleopod 2 (Fig. 1L): basis rectangular, with 2 setae on inner margin; endopod elliptical, with 5 setae on distal margin and a relatively short stylus; exopod as long as endopod, with 5 setae on distal margin.

Uropod (Fig. 1M): each ramus lanceolate and almost equal in length; each ramus bearing 11–13 relatively long plumose setae.

**Praniza juveniles** (Fig. 2A): Body 3.6 times as long as wide, measuring 5–8 mm long and 2–3 mm wide. Color dull yellow. Almost all the body surface with many hair. Cephalon

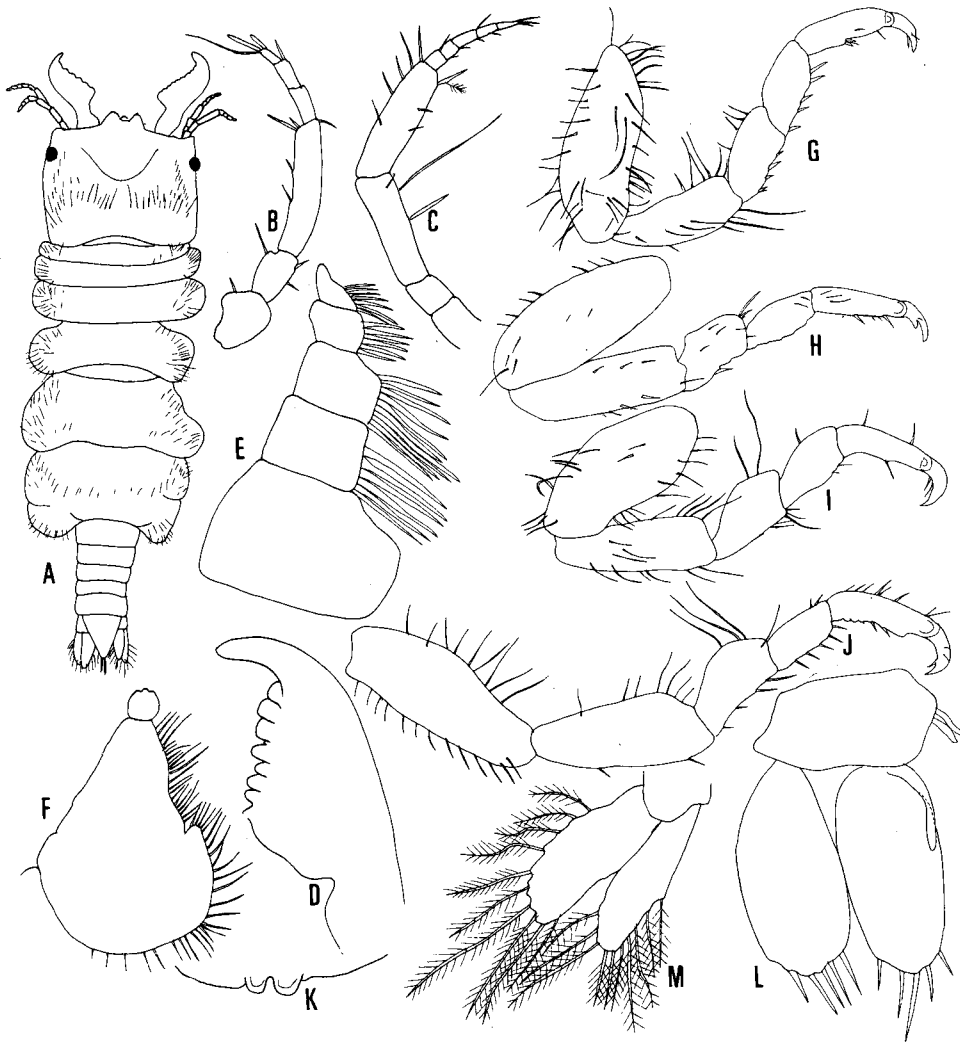


Fig. 1. *Gnathia capillata* n. sp. Holotype (male 7.6 mm long). A: Dorsal view, B: Antennula, C: Antenna, D: Paragnath, E: Maxilliped, F: Pylopod, G: Pereopod 1, H: Pereopod 2, I: Pereopod 3, J: Pereopod 5, K: Penes, L: Pleopod 2. M: Uropod.

rectangular, as long as wide; lateral margins almost straight. Supraocular lobe slightly rose. Mediofrontal process raised and having a slightly indented apex. Frontolateralis lacking. Wide dorsal in anterior midline. Eyes well developed. Each eye composed 44 ommatidia. Both cephalon and pereon with many long setae on dorsal surface. Pereonites fused Pereonites 4–5 long, occupying approximately 5 of the whole length. Pereonite 5 fused pereonite 4.

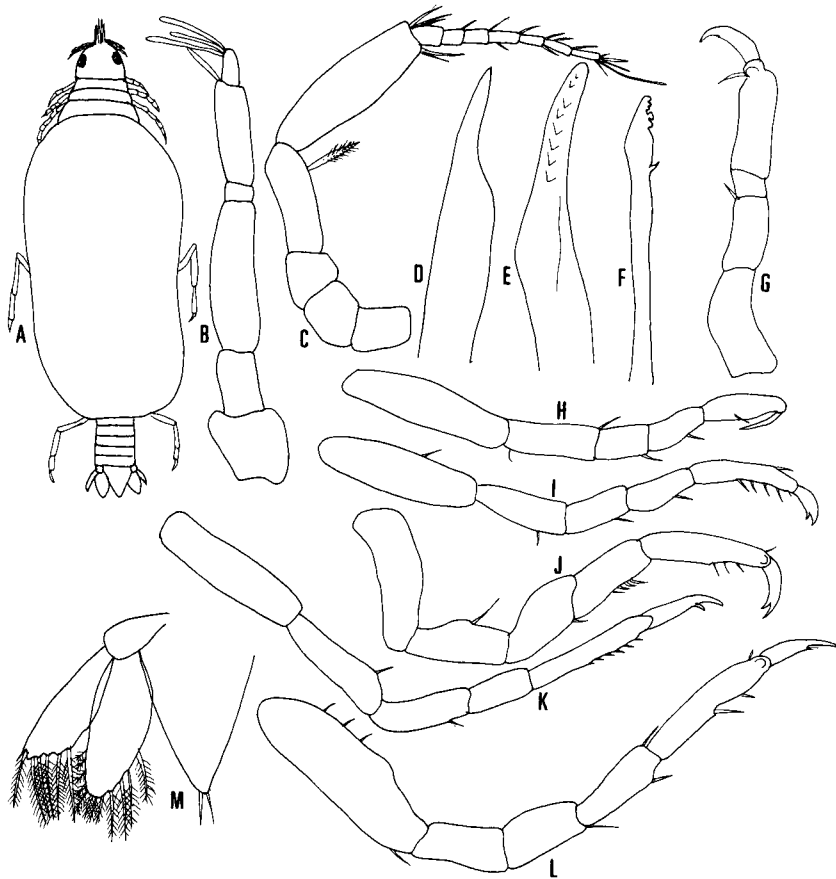


Fig. 2. *Gnathia capillata* n. sp (Praniza, parasitic juvenile 8.0 mm long). A: Dorsal view, B: Antennula, C: Antenna, D: paragnath; E: mandible, F: Maxillula, G: Gnathopod; H-L: Pereopods 1-5, M: Telson and Uropod.

Pleonite narrow and altogether as long as pereonite 7 all segments subequal in length. Pleotelson triangular, with straight lateral margins and apical setae.

Antennula (Fig. 2B) with 3 peduncular segments. Flagellum 3 segment; first segment short; second segment long; terminal segment rectangular with 3 aesthetascs at tip.

Antenna (Fig. 2C) with 5 peduncular segment; relative lengths of segments 2: 2: 2: 5: 7. Fourth segment with big plumose seta. Flagellum all segments subequal in length.

Paragnath (Fig. 2D) slender.

Mandible (Fig. 2E) Mandibular setae lacking. Maxilliped 3-segmented; segment 1 wide without seta; segment 2 square, with 6 setae; segment 3 square, with 10 setae; segment 4 square and 3/5 as long as segments, with 6 setae; segment 5 slender, with 6 setae on basal

half.

Gnathopod (Fig. 2G): basis and ischium fused; merus rectangular; carpus triangular; propodus rectangular; dactylus.

Pereopods 1–5 (Fig. 2H–L): basis rectangular; ischium a little shorter than basis; merus and carpus rectangular and shorter than ischium; propodus long, with several setae on inner margin; dactylus relatively long. Both rami of all pleopods elliptical.

Uropod (Fig. 2M): almost basis; both rami subequal in length, bearing setae relatively long setae; endopod elliptical, with 6 setae around margin; exopod elliptical with 12 plumose setae.

Etymology: The specific name *capillatus* (Latin: = hairy), alludes to the hairiness of the dorsal surface.

## Discussion

The gnathiid, consisting of more than 100 species, are characteristic among the isopod in having a parasitic juvenile stage living on various kinds of marine fish (Monod, 1926). Taxonomic studies on gnathiids in Japan have been few. First Monod (1926) listed two species, *Gnathia nipponensis* (from Genkainada Strait, the mouth of the Sea of Japan) and *G. (Elaphognathia) licaonides* from Misaki, central part of the Pacific coast of Honshu. Nishimura (1968) reported as postjuvenile stage of a gnathiid collected from Seto on the Kii Peninsula of the southern coast of Honshu.

After that, Nunomura (1981, 1982, 1992, 1998) described nine new species based on adult male specimens which were caught at Sugashima (central part of the Pacific coast of Honshu), Saiki (east coast of Kyushu), Ibaraki (eastern Japan), Amakusa (west coast of Kyushu) and off Iwate (Pacific side of Northeast Honshu), respectively. Hitherto ecological information of the gnathiids had long been ignored in Japan, but recently Tanaka (2003) and Tanaka and Aoki (1999, 2000), started a series of ecological works on *Elaphognathia cornigera* including life history.

The present new species, the first gnathiid reported from the central part of the Sea of Japan, differs from the other known Japanese species in having many hair on dorsal and dorso-lateral surface. This species is most closely allied to *Gnathia biorbis* Holdich and Harrison (1980) collected from Townsville Harbour, Australia. The new species differs from *G. biolobis* and also from another Australian species in *G. halei* (Cals, 1973) in having following characteristics: (1) fewer segments in the pylopod, (2) the shape of the mandible, (3) smaller eyes, and (4) the absence of tubercles on the inner part of pereopods.

Since the present description is based merely opportunity upon a single male specimen and some parasitic pranzia specimens, the authors wish to have the opportunity to make detailed comparative studies based on more specimens.

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