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A new species of *Heteromysis* (Crustacea: Mysida: Mysidae) from Japan

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Abstract: A new species of *Heteromysis, H. japonica,* is described from Nagasaki, Kyushu, southwestern Japan. The new species is distinguished from all the known species of the genus by a combination of the prolonged rostrum, the eyestalk without a spiniform process, the third antennular peduncle segment without a flagellated spine, the shape and armature of the endopod of the third thoracic limb, the male pleopods not being modified, and the spination of the uropodal endopod and the telson. Intraspecific variations in the uropodal endopod and the telson are discussed. An atypical form occurred in the materials from Osaka Bay and Bingo-Geiyo-nada, the eastern and central parts of the Seto Inland Sea.

Key words: Crustacea, Mysidae, *Heteromysis,* new species, Japan

Introduction

Currently, the genus *Heteromysis* comprises about 70 species, as far as we can determine, while only one species, *Heteromysis xanthops*, has been reported from the deep water in Suruga Bay, Japan, by Ii (1964). In recent fisheries and environmental surveys in Japanese waters, an undescribed species was found among the biological samples. The description of the species is given herein. All specimens examined are lodged in the National Science Museum, Tokyo (NSMT).

Systematic accounts

Genus *Heteromysis* S. I. Smith, 1873

Heteromysis japonica sp. nov. (Figs 1–3)

Material

Type series. Holotype (NSMT-Cr 14284), adult male (5.7 mm); allotype (NSMT-Cr 14285), adult female (5.2 mm); paratypes (NSMT-Cr 14286), 1 adult female (5.0 mm) and 1 immature male (4.5 mm); Nomo (about 32°34′N 129°44′), Nagasaki Prefecture, Japan, 5 m, muddy bottom, sledge net, 27 May 1976, donated by T. Takita and S. Inoue.

Other material. Osaka Bay (about 34°36′N 135°18′E).—1 adult male (7.2 mm), 1 adult male (divided into two parts) and 1 immature male (4.9 mm) (NSMT-Cr 14287); May 1996. One adult male (5.4 mm), 2 adult females (5.6, 5.5 mm) and posterior part of body (sex unknown) (NSMT-Cr 14288); 24 May 1996. *One male (divided into two parts) (NSMT-Cr 14289); August 1996.

Bingo-Geiyo-nada (about 34°19′N 133°11′E), Seto Inland Sea.—1 gravid female (ca 5.5 mm) (NSMT-Cr 14290), Matsunaga Bay, 22 July 1998. *One male (5.8 mm) (NSMT-Cr 14294); off Innoshima Is., 12 June 2000. One gravid female (6 mm) and 1 male (ca 5.8 mm) (NSMT-Cr 14291); off Mukaishima Is., 3 July 2000. One female (5.7 mm) (NSMT-Cr 14292); off Mukaishima Is., 2 August 2000. *One female (4.2 mm) (NSMT-Cr 14295); off Innoshima Is., 4 July 2000. One juvenile (2.3 mm) (NSMT-Cr 14293); off Innoshima Is., 2 August 2000. One female (ca 5.5 mm) (NSMT-Cr 14296); off Innoshima Is., 4 September 2000. All specimens were collected with a sledge net from on or just above the sandy mud bottom around a *Zostera* zone at depths of 1–2 m.

Shijiki Bay (about 33°11′N 129°44′E), Hiradoshima Is., Nagasaki Prefecture.—1 juvenile (3.3 mm) (NSMT-Cr 14297), collection data unknown, donated by M. Azuma.

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(Specimens with an asterisk are of atypical form.)

Description of type specimens

Body moderately robust, slightly depressed dorsoventrally.

Rostrum (Fig. 1A, B) narrowly triangular with rounded apex extending beyond middle of first segment of antennular peduncle, directed slightly downwards; lateral margin concave. Anterolateral corner of carapace rounded; posterior margin deeply emarginate, leaving last thoracic somite uncovered.

Eyes (Fig. 1A, B) rather closely set; cornea well pigmented, slightly narrower than eyestalk; eyestalk without denticle at distal end of mesial margin.

Antennular peduncle more robust in male (Fig. 1A) than in female (Fig. 1B); first segment with prolonged distolateral corner tipped with several setae; second segment short, triangular in dorsal view, with 2 long setae at distomesial corner; third segment longest, twice as long as broad, mesial margin with 1 seta at about middle, distomesial corner with 2 plumose and 2 naked setae, one of naked setae directed outwardly and the other inwardly, lateral margin 1.7 times longer than mesial margin, unarmed.

Antennal scale (Fig. 1D) reaching distal third of third antennular peduncle segment, foliate in shape, 2.7 times as long as maximum breadth at about middle, setose all around; suture marked off at about distal eleventh. Antennal peduncle (Fig. 1D) slightly longer than antennal scale, slightly shorter than antennular peduncle, 3-segmented with middle segment longest. Antennal sympod (Fig. 1D) without distolateral denticle.

Mandible, maxillule, maxilla and endopods of first and second thoracic limbs as shown in Fig. 1E–G and Fig. 2A, B, respectively.

Endopod of third thoracic limb (Fig. 2C) developed, rather slender; merus 3.5 times longer than broad, armed on middle portion of mesial margin with 3 spines, proximal one small, distal one strong, more than 1/4 length of segment supporting it; carpopropodus as long as merus, mesial margin slightly convex, with 5 paired spines on distal half, these spines not flagellated and becoming progressively larger distally; dactylus fused incompletely with carpopropodus, with 3 long and several short setae on distal margin; terminal claw strong, slightly less than half as long as carpopropodus.

Endopod of fourth thoracic limb (Fig. 2D) with ischium short; merus longest, about 1.5 times longer than ischium; carpopropodus divided into 6 subsegments; dactylus small; terminal claw robust, 3 times longer than dactylus. Endopod of fifth thoracic limb (Fig. 2E) slender, ischium longest, carpopropodus 6-subsegmented, terminal claw considerably shorter than that of fourth limb. Endopods of sixth and seventh thoracic limbs broken off. Endopod of eighth thoracic limb (Fig. 2F) similar to that of fifth limb. Penis (Fig. 2F, G) short, cylindrical, slightly curved anteriorly, with 1 short spiniform seta and 1 long seta at anterodistal corner and 1 subterminal and 2 terminal setae on posterodistal corner.

Ventral sternites without processes.

Abdominal somites without ventral processes; anterior 5 somites subequal in length, sixth somite 1.3 times longer than fifth.

All pleopods of male (Fig. 3A–E) reduced to single, unsegmented lobe, increasing in length towards posterior pairs, without specialized structures.

Uropod (Fig. 3F, H) short, broad, setose all around; endopod overreaching distal end of telson by 1/6 of its length, armed with 7 spines along mesial margin; exopod longer than endopod by 1/8 of its length.

Telson (Fig. 3F, G) triangular with posterior cleft, 1.15 times as long as last abdominal somite, 1.17 times as long as maximum width at base; lateral margin straight, armed on posterior 3/5 with 10–14 spines increasing in length posteriorly; each apex of posterior lobes narrowly truncate, with 2 spines, outer spine twice as long as inner; posterior cleft less than 2/9 of telson length, with 12 spinules along whole length of margin.

Etymology

The specific name, *japonica*, refers to the locality in which the specimens were collected.

Remarks

As far as we can determine, about 70 species of the genus *Heteromysis* have been recorded. *Heteromysis japonica* sp. nov. is distinguished from all known species of the genus by a combination of the following characters: (1) the narrowly triangular rostrum with rounded apex, (2) the eyestalk without a small triangular process at the distal end of the mesial margin, (3) the third antennular peduncle segment without a flagellated spine at distomesial corner, (4) the endopod of the third thoracic limb rather slender, with three spines on the mesial margin of the merus and five paired spines on mesial margin of the carpopropodus, (5) all pleopods not modified sexually, (6) the uropodal endopod furnished with seven spines along the mesial margin, (7) the telson furnished with 10–14 spines on the posterior 3/5 of the lateral margin, and (8) the telson cleft with 12 spinules.

Heteromysis japonica is distinguished from another Japanese heteromysid species, *H. xanthops* Ii, 1964, by the narrowly triangular rostrum, the antennular peduncle without a flagellated spine at the distomesial corner, and the third thoracic limb with the merus furnished with spines.

Variation

In specimens from Bingo-Geiyo-nada, some intraspecific variations, probably depending upon localities, were observed in the rostrum, the antenna, the uropodal endopod, and the telson. The rostrum (Fig. 1C) is produced more narrowly than in type specimens. The antennal scale and pe-

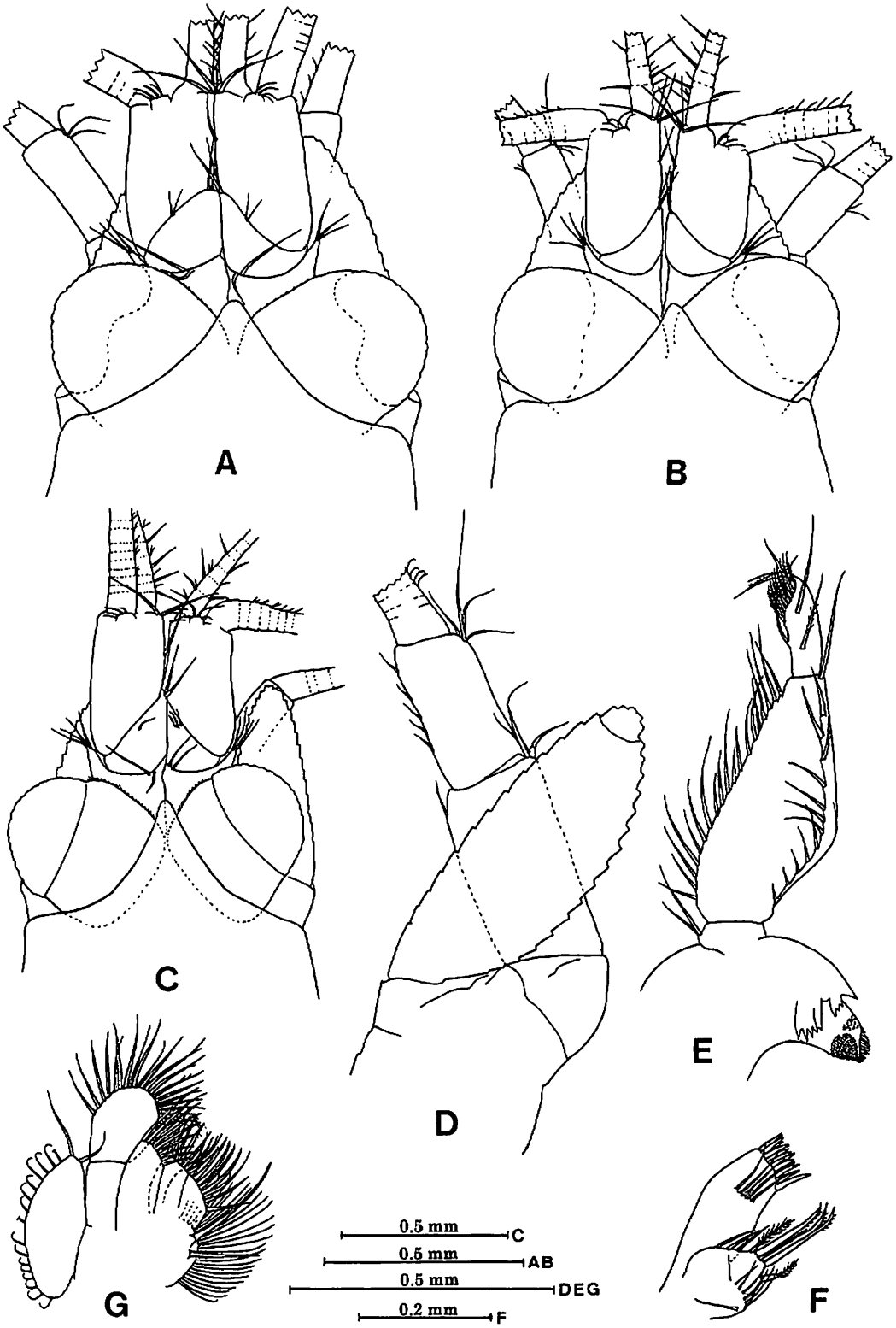

Fig. 1. *Heteromysis japonica* sp. nov., A, D–G: holotype; B: allotype; C: a female specimen from off Innoshima Is. A, anterior portion of body; B, anterior portion of body; C, anterior portion of body; D, antenna; E, mandible and mandibular palp; F, maxillule; G, maxilla.

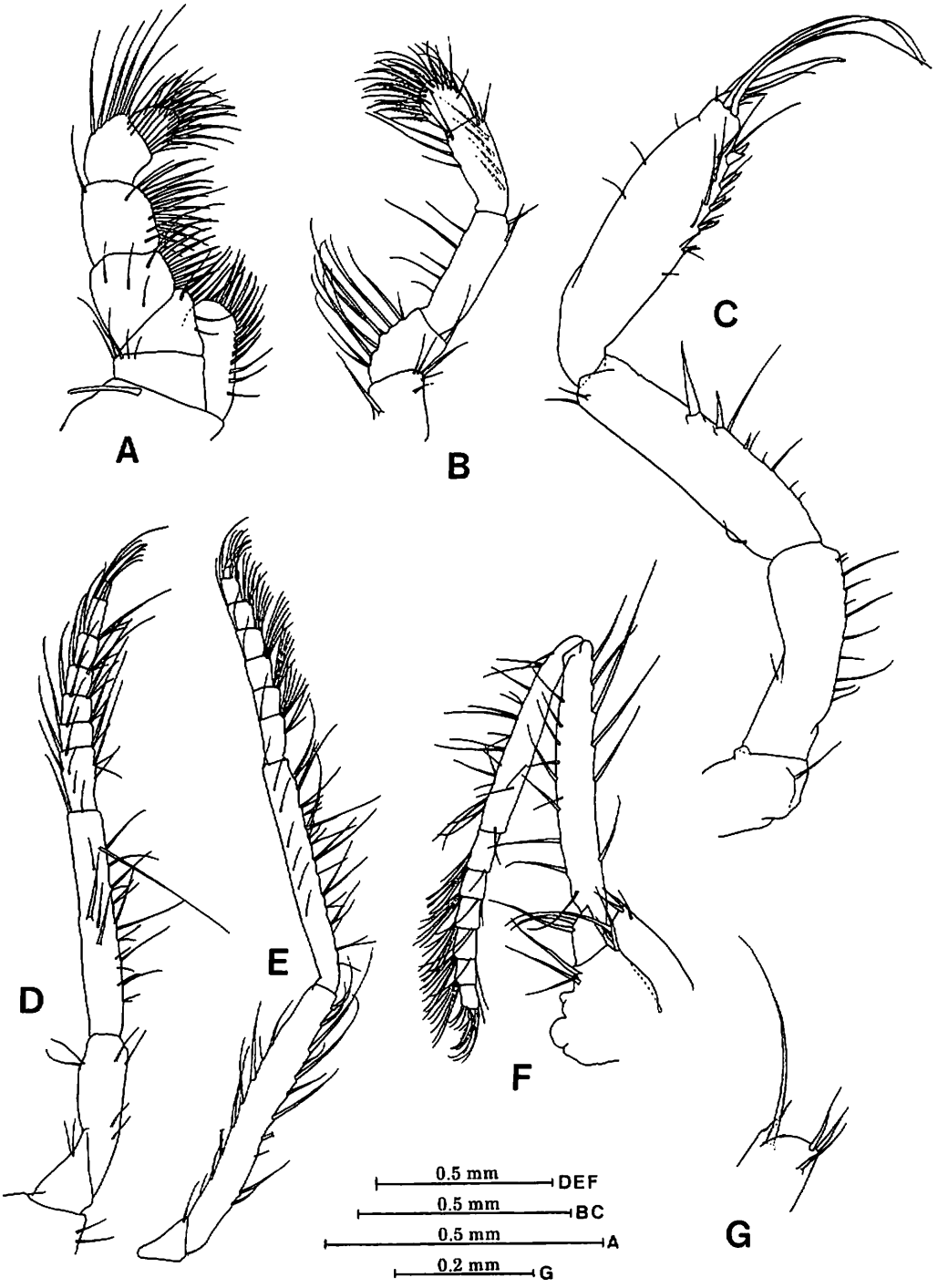

Fig. 2. *Heteromysis japonica* sp. nov., A, D–G: holotype; B, C: allotype. A, endopod of first thoracic limb; B, endopod of second thoracic limb; C, endopod of third thoracic limb; D, endopod of fourth thoracic limb; E, endopod of fifth thoracic limb; F, endopod of eighth thoracic limb with penis; G, distal portion of penis.

duncle (Fig. 1C) are somewhat shorter than those of the type specimens, and extends to the middle of the third antennular peduncle segment. Differences in the number of spines on the mesial margin of the uropodal endopod (Fig. 3I) and the lateral and cleft margins of the telson are summarized in Table 1. Specimens from Bingo-Geiyo-nada possess more spines than in those from the type locality, particularly on the uropodal endopod.

On the other hand, specimens from Osaka Bay, located at a distance of only about 200 km from Bingo-Geiyo-nada, do not show striking variations in external morphology between those from the type locality. Each population of Osaka Bay and Bingo-Geiyo-nada appears to be independent from each other, although there are no obvious barriers

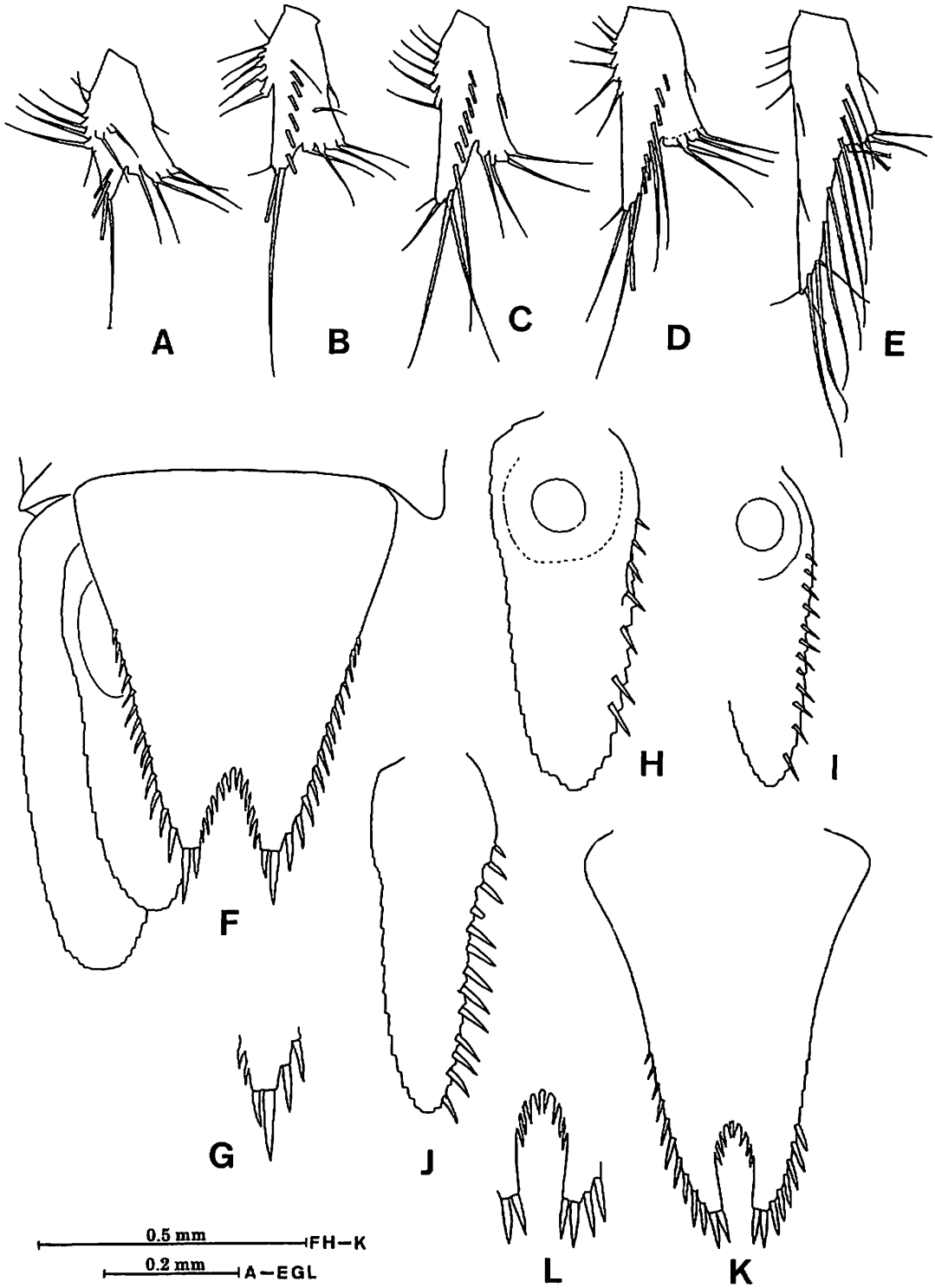

Fig. 3. *Heteromysis japonica* sp. nov., A–H: holotype; I: a male specimen from off Mukaishima Is.; J–L: a male specimen from Osaka Bay. A, first pleopod; B, second pleopod; C, third pleopod; D, fourth pleopod; E, fifth pleopod; F, uropod and telson; G, posterior portion of right apex of telson; H, uropodal endopod, ventral view; I, uropodal endopod; J, uropodal endopod; K, telson; L, posterior portion of telson.

Table 1. Comparison of spine number on the uropodal endopod and the telson among specimens from Nomo, Osaka Bay and Bingo-Geiyo-nada, and atypical specimens.

		Number of spines on mesial margin of uropodal endopod	Number of lateral spines of telson	Number of spines on cleft margin of telson
Type specimens from Nomo	No. examined	6	6	3
	Range	7	10–14	12
	Mean	7	12	12
Specimens from Osaka Bay	No. examined	14	14	7
	Range	5–10	9–15	12–19
	Mean	6.7	11.2	14.6
Specimens from Bingo-Geiyo-nada	No. examined	7	4	2
	Range	10–12	11–14	17–21
	Mean	10.9	12.8	19
Atypical specimens from Osaka Bay & Bingo-Geiyo-nada	No. examined	4	5	3
	Range	12–15	9–10	6–10
	Mean	13.3	9.8	8

that preclude intercourse between the populations.

Atypical forms

Three specimens, one from Osaka Bay and two from Bingo-Geiyo-nada (these are marked with * in the paragraph on material), exhibit a form atypical with respect to the uropodal endopod and the telson. The number of spines on the mesial margin of the uropodal endopod (Table 1) averaged seven in the type specimens and 13.3 in these three specimens, and these spines (Fig. 3J) are clearly more robust than in the type specimens. The lateral margin of the telson (Fig. 3K) in these three speimens is furnished with fewer spines on slightly less than its posterior half as compared to the type specimens. The outer spine on the terminal end of each distal lobe (Fig. 3L) is subequal to the inner one in length in these specimens, while it is twice as long as the inner in the type specimens (Fig. 3G). Furthermore, spines arming the cleft margin of the telson are only eight in number and are restricted to the anterior half in these specimens (Fig. 3K, L). The two types are not considered to be geographical forms, because they occur sympatrically. There is a possibility that the atypical specimens represent a species different from the new species, *Heteromysis japonica*. These atypical specimens are somewhat damaged and the endopod of the third thoracic limb, which is useful for identification, is lost in all the specimens. Further studies based on more material with intact appendages may allow clarification of the true identity of these atypical specimens.

Ecological note

Some species of *Heteromysis* are known to be associated with host organisms such as sponges and cnidarians (eg. Ii 1964, Murano 1988, 1998, Müller 1993). In *H. japonica*, however, any host organisms that suggest commensalism have not been found from the sledge net samples.

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