

Two New Species of the Tribe Mysini (Crustacea, Mysidacea) and a New Record of *Acanthomysis quadrispinosa* from Japan

By

Masaaki MURANO

Department of Aquatic Biosciences, Tokyo University of Fisheries, Tokyo

Abstract Descriptions of two new species, *Exacanthomysis japonica* and *Acanthomysis longicauda*, and a new record of *Acanthomysis quadrispinosa* from Japan are given. *Exacanthomysis japonica* is distinguishable from three known species of the genus by the different number of the carpo-propodus subsegments of third to eighth thoracic endopods, and the shape and armature of the distal part of telson. *Acanthomysis longicauda* is different from five allied species, in which a transverse spine row is present on the sixth abdominal somite, in the sizes of eye and distal spines of telson. *Acanthomysis quadrispinosa* has been known from Madagascar and the northern South China Sea up to date. The present occurrence in Japan far extends easterly and northerly the geographic distribution of the species.

In recent years many biological and environmental investigations in Japanese coastal areas have been carried out for the sake of assessments of nursery bed of commercial fish and influence of pollution to marine ecosystem. The present material was collected during such investigations. The genus *Exacanthomysis* has been represented by the coastal species in the northeastern Pacific from Washington to Alaska. The present record from Japan is the first from the northwestern Pacific. *Acanthomysis longicauda* n. sp. was collected during the investigations in the nursery bed of Japanese flounder, *Paralichthys olivaceus*, and is one of the dominant species there.

The type specimens are lodged in the National Science Museum, Tokyo (NSMT).

Exacanthomysis japonica n. sp.

(Figs. 1, 2)

Type series. Holotype (NSMT–Cr 11073), adult male (7.5 mm); allotype (NSMT–Cr 11074), adult female (9.8 mm); paratypes (NSMT–Cr 11075), 7 adult males (7.6–9.4 mm) and 7 adult females (7.8–9.6 mm); Ishikari Bay, Hokkaido, 4 m deep, sledge net, 24 June 1988; presented by Y. HIROTA.

Other material. Many males and females, same as type specimens.

Body length. Adult males, 7.5–9.4 mm, adult females, 7.8–9.8 mm.

Description. Holotype: Carapace with anterior margin produced in triangular rostrum extending to basal margin of antennular peduncle; rostrum with pointed apex, evenly concave lateral margins and ventral median keel (Fig. 1 A); antero-

lateral corner of carapace rounded; posterior margin emarginate, leaving last thoracic somite exposed.

Eye well developed, somewhat depressed dorso-ventrally, cornea occupied about half of whole eye, broader than eyestalk; eyestalk with hairs on anterior and posterior surfaces, without papilliform process (Fig. 1 A).

Antennular peduncle robust; first segment slightly longer than third segment, with one seta growing posteriorly on inner distal region and several setae at antero-distal corner; second segment short, twice as wide as long; third segment 1.25 times as long as broad, with processus masculinus large and hirsute (Fig. 1 A).

Antennal scale extending beyond distal end of antennular peduncle by 1/4 of its length (Fig. 1 A), lanceolate with rounded apex, 4.5 times as long as broad, setose all round; outer margin very slightly convex; inner margin convex, especially in proximal half; distal suture marked off at distal 1/16 (Fig. 1 C). Antennal peduncle composed of 3 segments; second segment twice longer than broad, longer than each of first and third segments (Fig. 1 C). Antennal sympod with triangular pointed process at antero-lateral angle (Fig. 1 C).

Third segment of mandibular palp more than half as long as second segment, with 16 barbed setae arranged regularly on outer margin (Fig. 1 D). Maxillule with hump-like process at about middle of outer margin of outer lobe; hump with crenulate margin furnished with hairs (Fig. 1 E). Maxilla as in Fig. 1 F. Labrum with long, acute frontal projection.

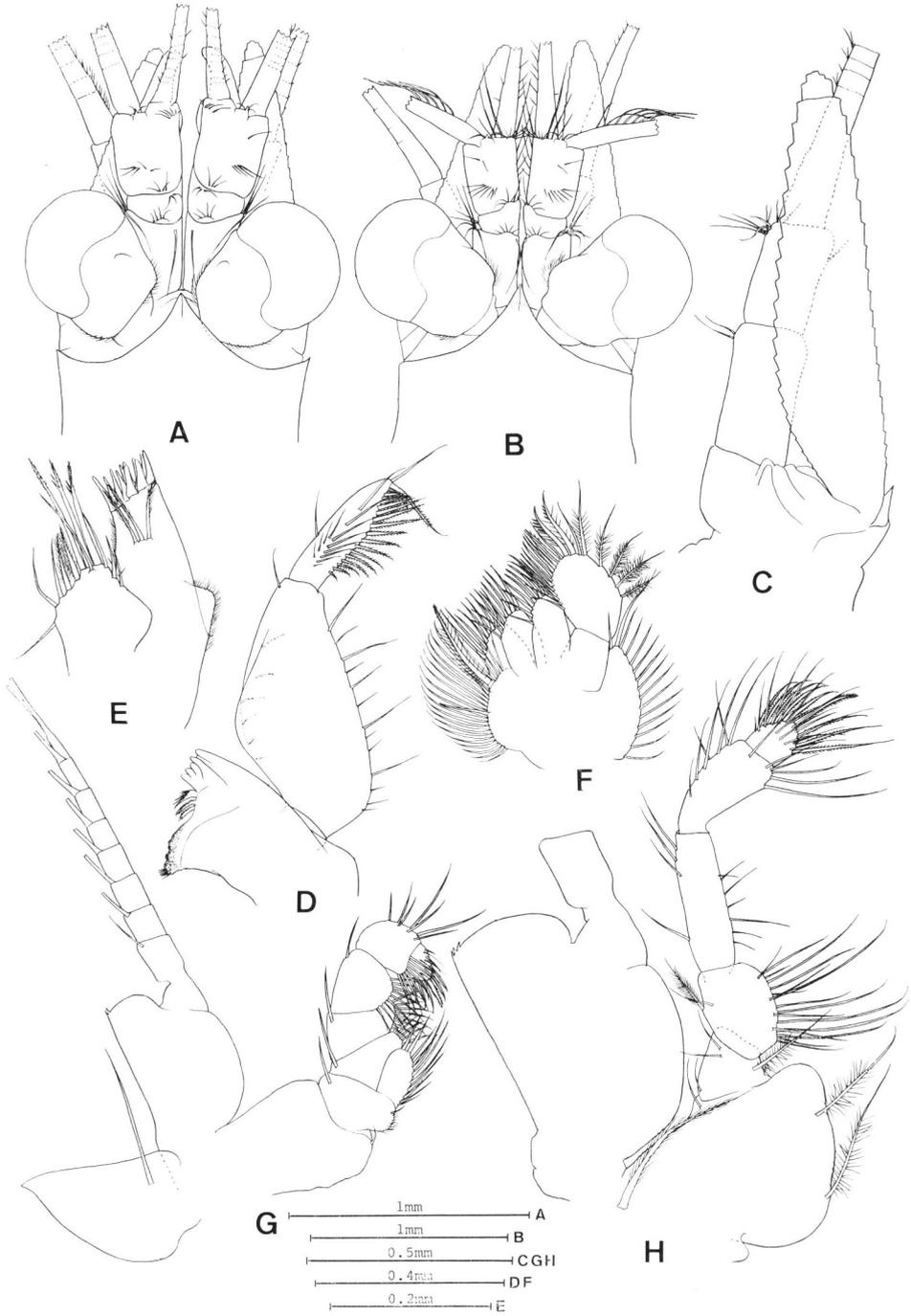
First and second thoracic endopods showing no remarkable characteristics (Fig. 1 G, H). Endopod of third to eighth limbs each with carpo-propodus 4-segmented; first subsegment longer than each of succeeding 3 segments (Fig. 2 C–E). Thoracic exopods with 8- or 9-jointed flagella, basal plate armed on outer distal margin with 2 denticles in first limb, 3 denticles in second to seventh limbs and no denticles in eighth limb (Fig. 1 G, H; Fig. 2 C–E).

First and second abdominal somites with one transverse fold (in dorsal view 2 folds were observed in first somite), third to fifth somites with 2 folds, sixth somite with 3 folds.

Pleopods except fourth pair reduced to short, unsegmented, single lobe; fourth pair biramous, exopod (excepting terminal setae) extending slightly beyond distal margin of fifth abdominal somite, divided imperfectly to 2 joints, first joint less than 4 times as long as second joint, armed on inner distal end with long seta extending beyond middle of terminal setae and with short, simple seta on outer distal end, second joint cylindrical, terminating in 2 strong, barbed setae nearly 3 times as long as its segment; endopod unjointed, extending beyond proximal 2/3 of first joint of exopod (Fig. 2 E).

Uropod rather short compared with telson, entire margin setose; endopod taper-

Fig. 1. *Exacanthomysis japonica* n. sp. A, C–G, holotype; B, allotype; H, a male of paratypes. A, B, anterior end in dorsal view; C, antenna; D, mandible; E, maxillule; F, maxilla; G, first thoracic limb; H, second thoracic limb (flagellum of exopod omitted).



ing, shorter than telson, armed on inner margin near statocyst with 5 spines increasing in length distally; exopod slightly longer than telson, 1.25 times as long as endopod (Fig. 2 H).

Telson elongate triangular with narrow distal margin, about twice as long as sixth abdominal somite, 2.5 times longer than broad, narrowing abruptly near base; distal margin truncate, with 2 pairs of spines, outer pair more than twice as long as inner; lateral margin in proximal half armed with longer and shorter spines arranged rather sparsely and irregularly, in distal half spines grouped to 7 to 8 sets, each set composed of one longer spine followed by 1–5 smaller spines except distal one followed by 8 smaller spines (Fig. 2 H, I).

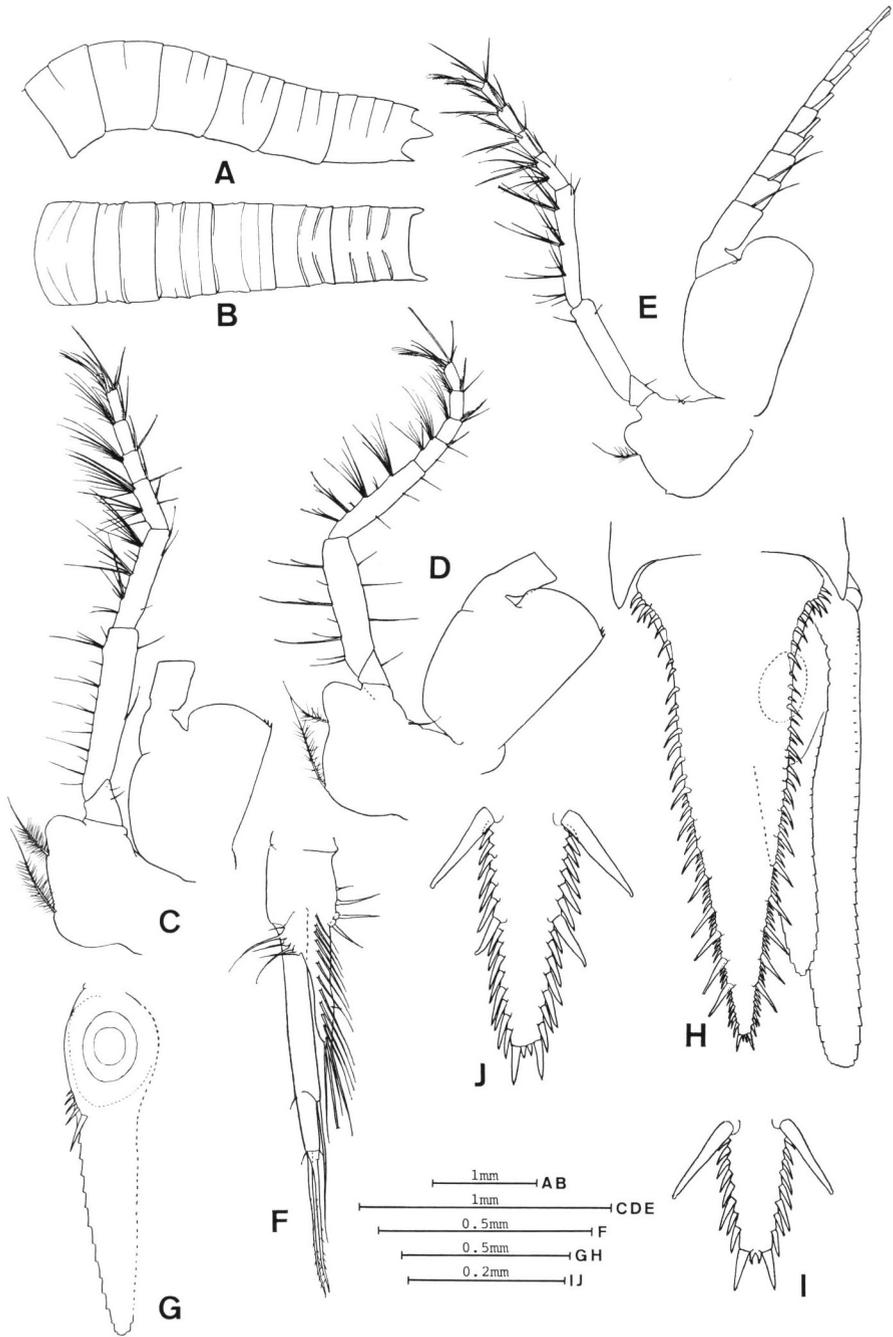
Allotype: As in holotype except for the following points. Antennular peduncle rather slender, first segment as long as third segment, third segment 1.5 times longer than broad, armed with 4 plumose setae on inner margin and 6 plumose setae around base of inner flagellum (Fig. 1 B). Antennal scale extending beyond distal end of antennular peduncle by 1/3 of its length (Fig. 1 B). Marsupium composed of 2 pairs of oostegites. First to fifth pleopods reduced to unsegmented, single lobe.

Remarks. HOLMQUIST (1981) established the genus *Exacanthomysis* to accommodate *Acanthomysis davis* BANNER, 1948. At that time, she added two new species, *E. alaskensis* and *E. arctopacifica*, to the new genus. *Exacanthomysis japonica* n. sp.

Table 1. Morphological differences among four species of the genus *Exacanthomysis*.

	<i>E. japonica</i> n. sp.	<i>E. davis</i>	<i>E. alaskensis</i>	<i>E. arctopacifica</i>
Carapace:				
Antero-lateral corner	Rounded	Rounded	Protruded	Rounded
Antennal scale:				
Length/Width	4.5	4.5–5	6	5
Maxillule:				
Hump-like process	With short hairs	With short hairs	With stout spinules	With short hairs
3–8 thoracic endopods:				
No. of subsegments of carpo-propodus	4	5–6	6	5–7
4th pleopod of male:				
Endopod	2/3 as long as 1st exopodal segment	2/3 as long as 1st exopodal segment	2/3 as long as 1st exopodal segment	As long as 1st exopodal segment
Telson:				
Distal part posterior to distalmost large spine	Twice as long as broad	3 times as long as broad	As long as broad	2.5 times as long as broad
No. of small spines on above portion	8	12	3	13
Body length:	7.5–10 mm	7–10 mm	10.5–15.5 mm	10.5–15 mm

Fig. 2. *Exacanthomysis japonica* n. sp. A, B, F–I, holotype; C–E, a male of paratypes; J, a female of paratypes. A, abdomen in lateral view; B, abdomen in dorsal view; C, third thoracic limb (flagellum of exopod omitted); D, thoracic limb (flagellum of exopod omitted); E, eighth thoracic limb (flagellum of exopod omitted); F, fourth pleopod; G, endopod of uropod; H, uropod and telson; I, distal part of telson; J, distal part of telson.



is therefore the fourth species of this genus. These four species are distinguishable from each other as shown in Table 1.

In the new species there is a variation in the spine arrangement at the distal part of telson (Fig. 2 J). However, the peculiar "rat-tailed" appearance as in *E. davisii* is never seen in the new species.

Three known species are distributed in cold-water areas of the northeastern Pacific, i.e. California to Alaska in *E. davisii*, Washington to Alaska in *E. alaskensis* and Alaska in *E. arctopacifica*. The present record of occurrence is the first for the genus *Exacanthomysis* in the northwestern Pacific.

***Acanthomysis longicauda* n. sp.**

(Figs. 3, 4)

Type series. Holotype (NSMT-Cr 11076), adult male (7.5 mm); allotype (NSMT-Cr 11077), adult female (7.8 mm); paratypes (NSMT-Cr 11078), 10 adult males (6.5–7.8 mm) and 10 adult females (6.8–8.1 mm); Tateyama Bay, Chiba Prefecture, 1–2 m deep, sledge net, 19 June 1978.

Other material. Many males and females (NSMT-Cr 11079); same as type specimens. One female and 1 male (NSMT-Cr 11080); between Jusanko and Ajigasawa, 5–10 m deep, date unknown; presented by H. IKEUCHI. Many males and females (NSMT-Cr 11081); Yura, Kyoto Prefecture, 6–8 m deep, sledge net; 2 November 1983, presented by Y. HIROTA.

Body length. Adult males, 6.3–8.0 mm, adult females, 6.4–8.4 mm.

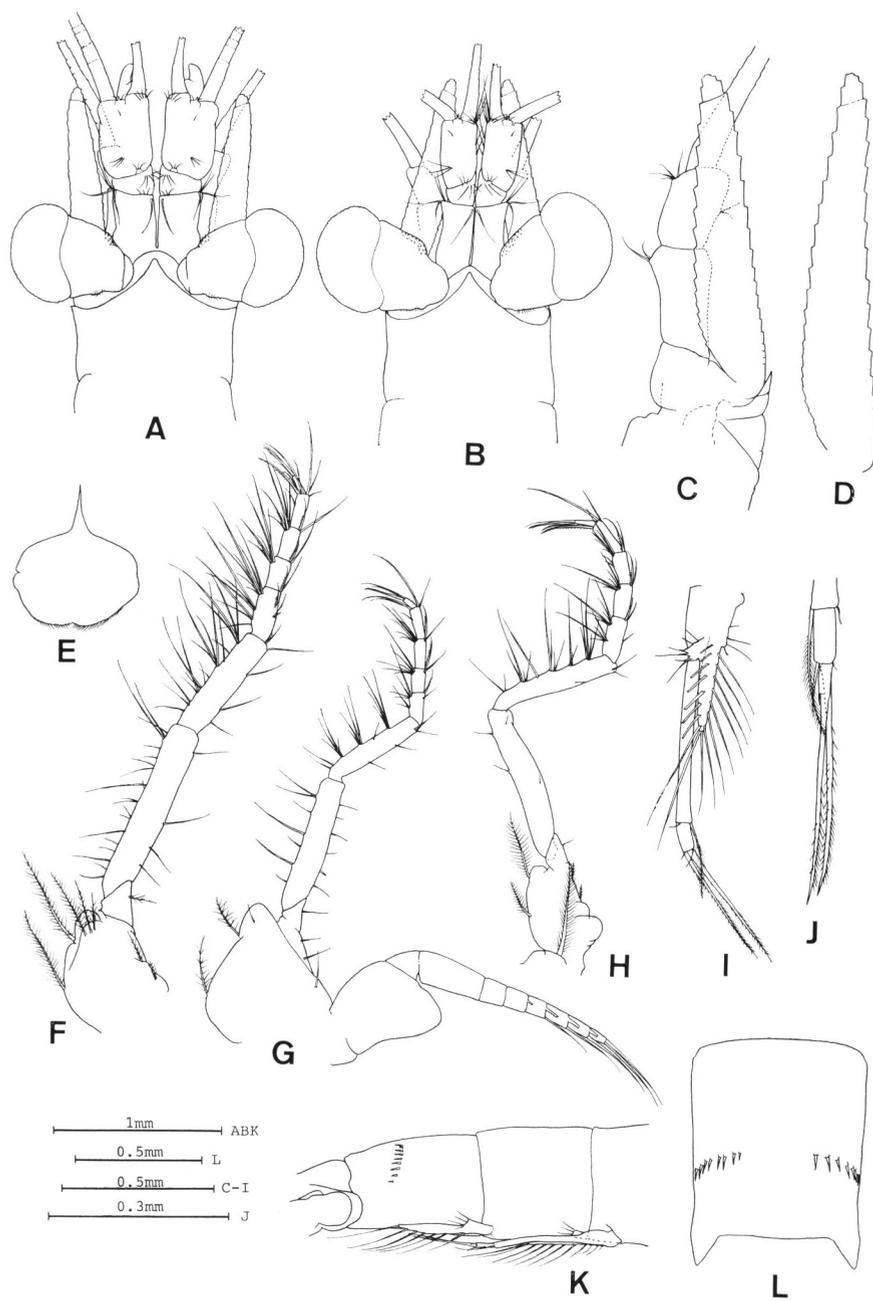
Description. Holotype: Carapace produced anteriorly in low triangular rostrum extending to basal margin of antennular peduncle; rostrum with obtusely pointed apex and concave lateral margins (Fig. 3 A); antero-lateral corner of carapace rounded; posterior margin emarginate, last 3 thoracic somites exposed.

Eye not covered by carapace, far extending laterally beyond lateral margin of carapace, pyriform; cornea somewhat depressed dorso-ventrally, wider than eyestalk (Fig. 3 A); eyestalk without papilliform process, with minute spinules on anterior and posterior surfaces (Fig. 3 A).

Antennular peduncle robust, first segment less than twice as long as broad, armed on antero-lateral corner with 4 long setae, 2 growing anteriorly, one laterally and one posteriorly; second segment short, about twice as broad as long; third segment much wider than second segment, slightly longer than first segment, 1.5 times longer than broad, with processus masculinus very hirsute (Fig. 3 A).

Antennal scale slightly longer than antennular peduncle, more than 5 times as

Fig. 3. *Acanthomysis longicauda* n. sp. A, C, E, G, I, K, L, holotype; B, D, F, H, allotype; J, a male specimen from Kyoto. A, B, anterior end in dorsal view; C, antenna; D, antennal scale; E, labrum; F, endopod of third thoracic limb; G, seventh thoracic limb; H, endopod of eighth thoracic limb; I, fourth pleopod; J, distal part of fourth pleopod; K, posterior part of abdomen in lateral view; L, sixth abdominal somite in dorsal view.



long as broad; outer margin nearly straight; inner margin nearly straight in distal 4/5; distal suture marked off at distal 1/13 (Fig. 3 C). Antennal peduncle extending to 7/10 of antennal scale, composed of 3 segments with length ratio of 1: 1.7: 1.3 (Fig. 3 C).

Labrum longer than broad, anterior margin with long median process acutely pointed (Fig. 3 E).

Third to eighth thoracic endopods rather robust, merus shorter than ischium, carpo-propodus longer than merus, divided into 4 subsegments, dactylus considerably narrower than carpo-propodus, nail slender (Fig. 3 F–H). Proximal plates of thoracic exopods with 3–4 tiny spinules on outer distal margin.

Abdomen composed of 6 somites, sixth somite slightly longer than fifth somite, furnished at posterior third with transverse spine row with median interruption (Fig. 3 K, L).

Pleopods reduced to short, unsegmented, single lobe except fourth pair; fourth pleopod biramous, exopod (excluding terminal setae) extending to posterior end of fifth abdominal somite, 2-segmented, first segment with short simple seta at outer distal corner and long plumose seta far extending beyond distal end of second segment at inner distal corner; second segment short, about 1/7 of first segment in length, twice as long as broad, with 4 setae on distal margin, median 2 of which 5 times as long as second segment, barbed, inner one slightly longer than outer, the other 2 setae short and simple (Fig. 3 I).

Endopod of uropod slightly shorter than telson (Fig. 4 A), with 3 spines on inner margin of statocyst region (Fig. 4 E); exopod of uropod extending beyond distal end of endopod by 1/5 of its length (Fig. 4 A).

Telson elongate triangular with rounded apex, 2.5 times longer than broad; lateral margin concave for short distance near base, then nearly straight to apex, armed with many spines, spines on proximal third spaced, subequal in length, those on distal 2/3 grouped to about 18 sets, each set composed of one long spine and 1–5 small spines; apex with 2 pairs of spines, outer pair considerably longer than inner but clearly shorter than long spines on lateral margins (Fig. 4 A, B).

Allotype: As in holotype except for the following points. Antennular peduncle slenderer than that of male, first segment twice as long as broad, with antero-lateral corner slightly produced and armed with 4 long setae, third segment slightly shorter than first segment, more than twice as long as broad, with 3 long setae at antero-medial corner. Antennal scale extending beyond distal margin of antennular peduncle by 1/5 of its length, nearly 6 times as long as broad. Marsupium composed of 2 pairs of oostegites. All pleopods reduced to short, unsegmented, single lobe.

Remarks. *Acanthomysis longicauda* n. sp. is related to *A. okayamaensis* II, 1964, *A. rotundicauda* LIU et WANG, 1980, *A. serrata* LIU et WANG, 1980, *A. robusta* MURANO, 1984 and *A. tenuicauda* MURANO, 1984 in having the transverse spine row on the sixth abdominal somite. The new species is most closely allied to *A. rotundicauda* in the armature of telson, but distinguishable from the latter species by the following

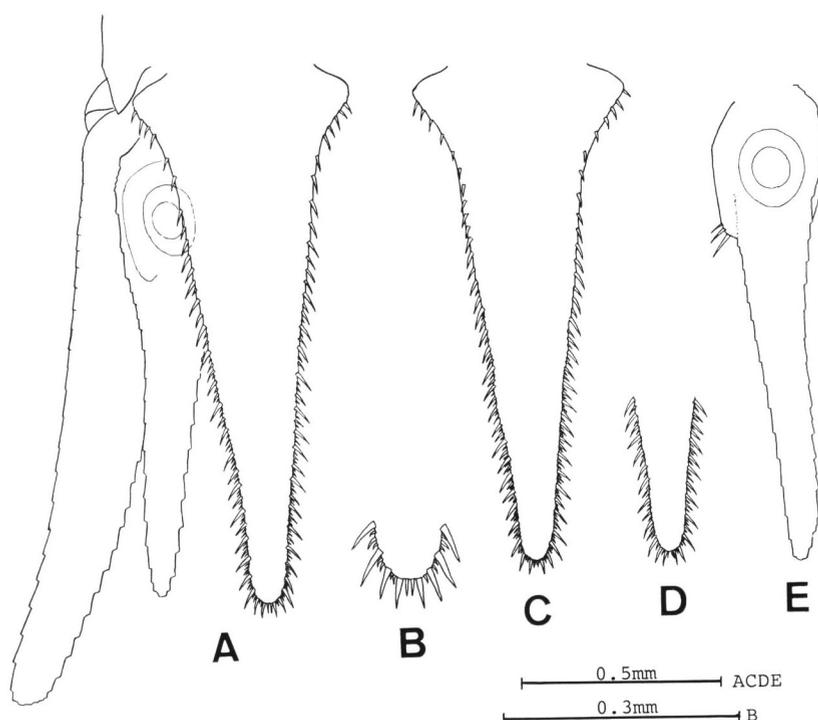


Fig. 4. *Acanthomysis longicauda* n. sp. A, B, E, holotype; C, a male specimen from Kyoto; D, specimen from Aomori. A, uropod and telson; B, distal part of telson; C, telson; D, distal part of telson; E, uropod.

differences. (1) The rostrum reaches the base of antennular peduncle in the new species, but to middle of the first antennular segment in *A. rotundicauda*. (2) The eye is large and considerably extending laterally beyond the lateral margin of carapace in the new species, but rather small and barely extending beyond the body width in *A. rotundicauda*. (3) The telson is 2.5 times as long as broad in the new species, but 2.2 times in *A. rotundicauda*.

The other four species are rather easily distinguishable from *A. longicauda* n. sp. by the strong spines on the distal margin of the telson.

Acanthomysis quadrispinosa NOUVEL, 1965

(Fig. 5)

Acanthomysis quadrispinosa NOUVEL, 1965: 456–464; LIU & WANG, 1986: 191–192.

Material. One adult male, 2 immature males and 3 immature females (NSMT–Cr 11082); Shijiki Bay, Hirado I., Kyushu; date unknown; presented by M. AZUMA. One adult female with embryos (NSMT–Cr 11083); Ariake, Kyushu, 40 m deep, 6

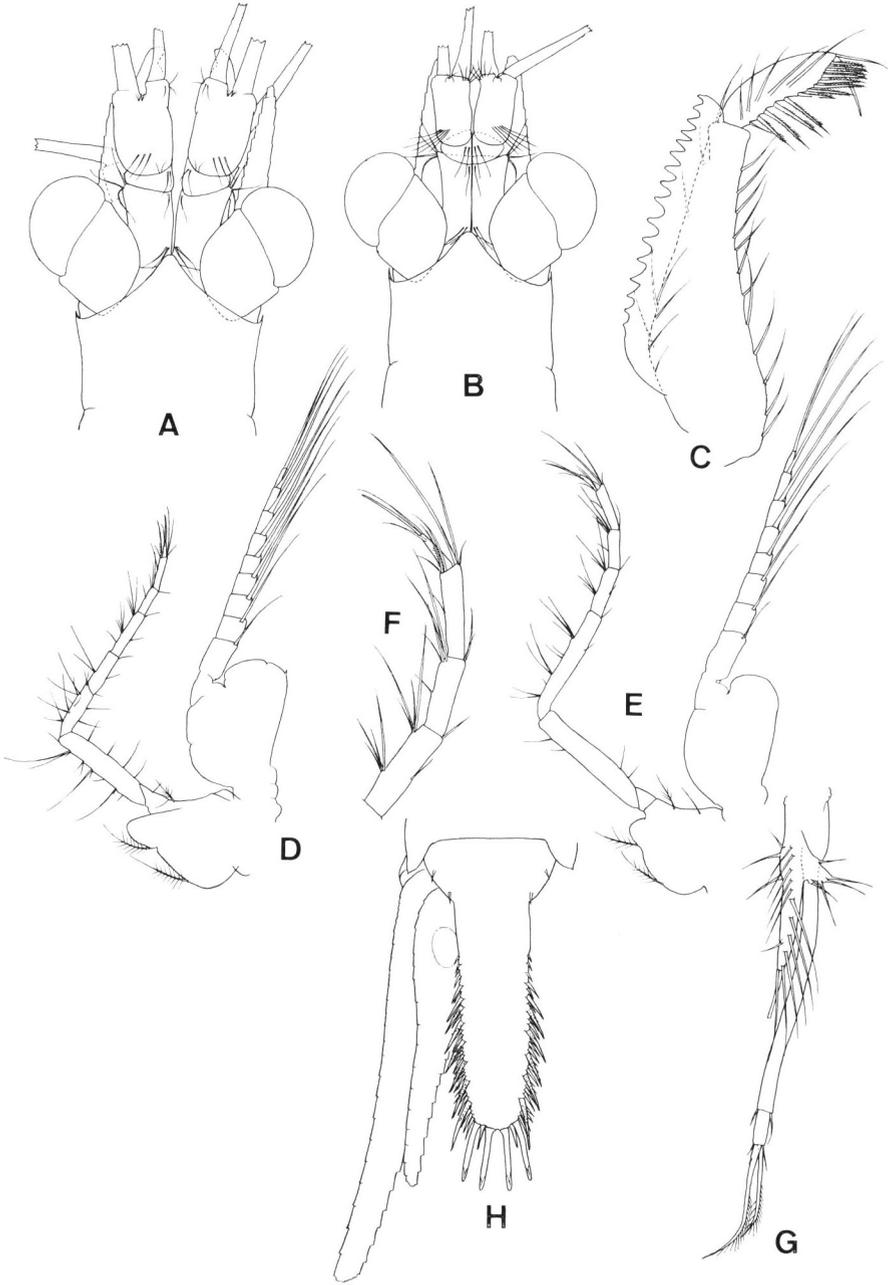


Fig. 5. *Acanthomysis quadrispinosa* NOUVEL. A, C-H, male; B, female. A, B, anterior end in dorsal view; C, mandibular palp; D, sixth thoracic limb; E, eighth thoracic limb; F, distal part of eighth thoracic limb; G, fourth pleopod; H, uropod and telson.

August 1975; presented by T. TAKITA. Ten adult males and 9 adult females (NSMT-Cr 11084); Omura Bay, Kyushu; July 1977; presented by M. AZUMA.

Body length. Adult male, up to 7.3 mm, adult female, 5.9–7.3 mm.

Remarks. *Acanthomysis quadrispinosa* was instituted by NOUVEL (1965) on the specimens from Madagascar. The second record was made by LIU and WANG (1986) on the specimens from coastal waters of the northern South China Sea. The present record of occurrence in Japan is, therefore, the third for this species.

The present specimens are easily identified with this species by the characteristics of the triangular rostrum with rounded apex (Fig. 5 A, B), the serrated inner margin of the second segment of mandibular palp (Fig. 5 C), the 3-subsegmented carpo-propodus of the third to eighth thoracic endopods (Fig. 5 D–F), the 2-segmented fourth male pleopod terminating into 2 unequal setae (Fig. 5 G) and the shape and armature of telson (Fig. 5 H). There are no remarkable differences between the specimens described before.

Distribution. Up to date, this species has been recorded from Madagascar (NOUVEL, 1965) and the northern South China Sea (19°45'–22°00'N, 108°00'–113°30'E) (LIU & WANG, 1986). The present occurrence in Japan extends the distribution range of this species north- and eastwardly. The species seems to be distributed widely in coastal waters of the tropical and temperate regions in the Indo-West Pacific.

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References

- BANNER, A. H., 1948. A taxonomic study of Mysidacea and Euphausiacea (Crustacea) of the northern Pacific, Part II. *Trans. Roy. Can. Inst.*, **27**: 65–125.
- HOLMQUIST, C., 1981. *Exacanthomysis* gen. nov., another detachment from the genus *Acanthomysis* CZERNIAVSKY (Crustacea, Mysidacea). *Zool. Jb. Syst.*, **108**: 247–263.
- II, N., 1964. Fauna Japonica, Mysidae (Crustacea). 610 pp. Tokyo, Biogeogr. Soc. Japan.
- LIU, R. (LIU, J. Y.), & S. WANG, 1986. Studies on Mysinae (Crustacea Mysidacea) of the northern South China Sea. *Stud. Mar. Sinica*, (26): 159–202. (In Chinese with English abstract.)
- MURANO, M., 1984. Two new species of *Acanthomysis* (Crustacea, Mysidacea) from Japan. *Bull. natn. Sci. Mus., Tokyo*, (A), **10**: 107–116.
- NOUVEL, H., 1965. Mysidacés récoltés par S. FRONTIER a Nosy-Bé. II. Description de deux Mysini appartenant aux genres *Diamysis* et *Acanthomysis*. *Bull. Soc. Hist. nat. Toulouse*, **100**: 451–464.

