

## A New Species of the Squat Lobster Genus *Munida* (Decapoda: Anomura: Munididae) from the North Pacific off Japan

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**Abstract** A new species of the squat lobster genus *Munida* Leach, *M. ampli antennulata*, is described and illustrated on the basis of two specimens from the Iwaki Seamount, off northeastern Honshu, Japan, at a depth of 1744 m. It closely resembles *M. magniantennulata* Baba and Türkay and *M. subcaeca* Bouvier, but the different structure of the basal segment of the antennular peduncle readily distinguishes the new species from the two relatives. This new species is the ninth of the genus occurring at the bathyal depths greater than 1500 m worldwide.

**Key words:** Crustacea, Decapoda, Anomura, Munididae, *Munida*, new species, North Pacific, Japan.

During a 2009 research cruise of the RV *Soyomaru* of the National Research Institute of Fisheries Science, Fisheries Research Agency, the bathyal to abyssal slope on the Iwaki Seamount, located nearly to the Japan Trench, east of Fukushima Prefecture, was sampled using a small beam trawl (=benthos net). This data presents the first records of the marine fauna of this seamount. Among the small collection of decapod crustaceans, two specimens of galatheid lobsters were found. Detailed examination has revealed that these specimens represent an undescribed species of *Munida* Leach, 1820. In this study, this new species is described and illustrated under the name *M. ampli antennulata*. It appears closest to *M. magniantennulata* Baba and Türkay, 1992 known from the Lau Basin and off Queensland, Australia, and *M. subcaeca* Bouvier, 1922 from the Atlantic, both known from depths greater than 1000 m. Differentiating characters between the new species and the two relatives are discussed.

The type specimens are deposited in the Natural History Museum and Institute, Chiba (CBM) and the National Museum of Nature and Science, Tokyo (NSMT). The measurement provided is postrostral carapace length (CL), measured in

millimeters from the base of the rostral spine to the midpoint of the posterior margin of the carapace. Higher classification follows that recently proposed by Ahyong *et al.* (2010)

### Taxonomic Account

*Munida ampli antennulata* sp. nov.

[New Japanese name: Kaizan-chu-koshiori-ebi]

(Figs. 1–3)

*Material examined.* Holotype: female (cl 7.0 mm), Iwaki Seamount, 36°51.8'N, 144°48.8'E, 1744 m, 9 August 2009, benthos net, RV *Soyomaru*, coll. Keiichi Kakui, CBM-ZC 10020.

Paratype: 1 juvenile (cl 4.0 mm), same data as holotype, NSMT-Cr 21343.

*Description.* *Holotype.* Carapace (excluding rostrum) (Figs. 1, 2A) 1.2 times longer than wide. Dorsal surface gently convex transversely; main transverse striae mostly interrupted; numerous short to moderately short secondary transverse striae present; most ridges and striae without setae. Gastric region slightly elevated, with pair of epigastric spines (these epigastric spines appearing to arise from short spinulose ridges) and scattered tiny granules laterally; postrostral



Fig. 1. *Munida ampli antennulata* sp. nov., holotype, female (cl 7.0 mm), CBM-ZC 10020. Habitus, dorsal view, showing coloration in fresh.

carina low, faintly tuberculate, extending from midlength of rostrum to beyond level of epigastric spines. Cervical groove distinct. No conspicuous spines other than epigastric spines present on dorsal surface. Anterior part of branchial region between cervical groove and transverse groove with scattered granules. Frontal margins very slightly oblique. Lateral margins feebly convex. Anterolateral spines each located at anterolateral angle, relatively small, distinctly posterior to sinus between rostrum and supraocular spines. Second marginal spine anterior to cervical

groove less than 0.3 length of anterolateral spine. Branchial margins each with 5 small spines, anteriormost spine larger than other spines.

Rostrum (Fig. 2A) spiniform, about 0.3 times as long as carapace, nearly horizontal in lateral view. Supraocular spines relatively short and stout, slightly diverging anteriorly and very slightly ascending in lateral view, not overreaching ocular peduncles, about 0.3 length of rostrum.

Pterygostomial flap (Fig. 1B) unarmed anteriorly, lateral face rugose with irregular transverse

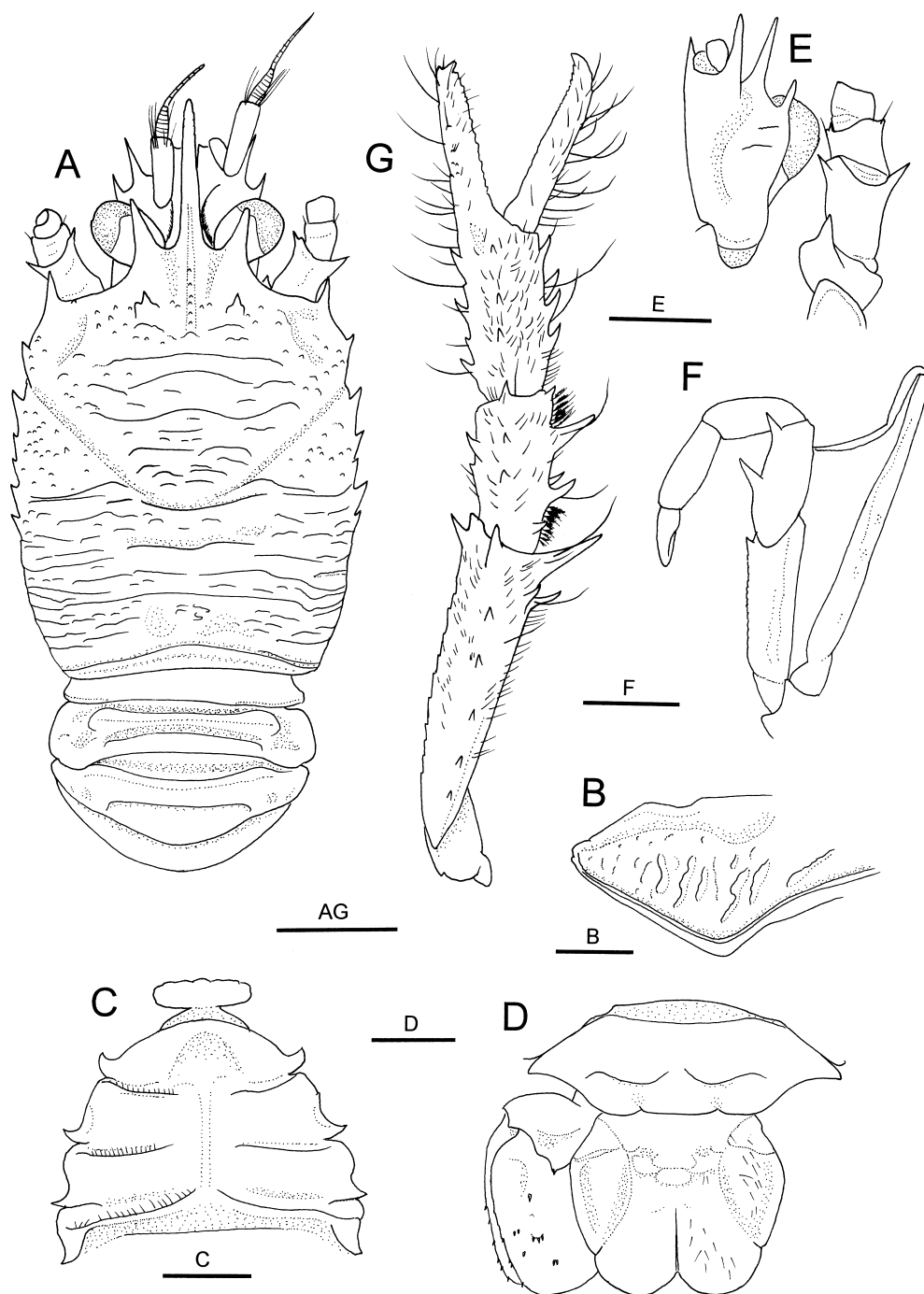


Fig. 2. *Munida ampli antennulata* sp. nov., holotype, female (cl 7.0 mm), CBM-ZC 10020. A, carapace, abdomen and cephalic appendages, dorsal view (setae omitted); B, left pterygostomial flap, ventrolateral view; C, thoracic sternum, ventral view (setae on left side omitted); D, sixth abdominal somite, telson and left uropod, outer view (spinules on uropod and setae omitted); E, left eye, basal segment of antennular peduncle and antennal peduncle, ventral view; F, left third maxilliped, lateral view (setae omitted); G, left cheliped, dorsal view. Scale bars: 2 mm for A, G; 1 mm for B–F.

or obliquely transverse ridges.

Third thoracic sternite (Fig. 2C) about 3.4 times wider than long, slightly wider than anterior width of fourth sternite; anterior margin faintly granulate, without conspicuous median notch. Fourth to sixth sternites smooth. Seventh sternite smooth laterally. Transverse ridges nearly smooth, with row of short setae.

Second abdominal somite (Fig. 2A) with 1 distinct transverse ridge on tergum; anterior ridge unarmed. Third somite (Fig. 2A) with anterior and 1 transverse ridges, unarmed anteriorly. Fourth somite (Fig. 2A) only with anterior ridge, unarmed. Telson (Fig. 2D) slightly wider than long; subdivision incomplete, but median suture in posterior half clearly delimited.

Eyes (Fig. 2A) small. Cornea shorter than eyestalk, not dilated, corneal width subequal to width between rostrum and supraocular spine and 0.14 of carapace length. Eyestalk slightly narrowed proximally; eyelash absent.

Basal segment of antennular peduncle (Fig. 2A, E) stout, length excluding distal spines about 1.4 of width; distal spines distinctly unequal with mesial spine distinctly shorter than lateral; 2 lateral spines present, distal spine slightly longer than distolateral spine, proximal spine located subdistally; statocyst lobe inflated, surface rounded.

Antennal peduncle (Fig. 2A, E) moderately stout, reaching distal corneal margins. First segment with short distomesial spine not reaching midlength of second segment; distolateral angle unarmed. Second segment with small spine each at distomesial and distolateral angles, spines subequal, distomesial spine not reaching midlength of third segment. Third segment with minute spine at distolateral angle, unnamed on distomesial angle. Fourth segment unarmed.

Third maxilliped (Fig. 2F) moderately slender. Ischium distinctly longer than merus, with minute ventrodistal spine, dorsodistal angle unarmed. Merus slightly narrowed distally, ventral margin with 2 strong, slightly unequal spines, distal spine slightly smaller than proximal spine arising at about midlength; dorsodistal margin

unarmed. Carpus, propodus and dactylus unarmed; propodus not inflated.

Chelipeds (Figs. 2G, 3A–C) similar, subequal in length, about 2.0 times as long as carapace, without setae-bearing short ridges on surfaces; setae non-iridescent. Merus with row of 6 (right) or 7 (left) spines on dorsal surface laterally (spines increasing in size distally, distalmost spine much stronger than others and strongly diverging) and 2 spines mesially (spine at distomesial angle strong, second spine subdistal); lateral face with scattered tiny granules and spinulose tubercles ventrally and with 1 strong spine on ventrodistal angle; mesial face with moderately strong subdistal spine, ventromesial margin with 2 spines (one at distoventral angle and one at about midlength); ventral surface with scattered spinules or short spinulose ridges; surfaces with scattered simple setae and few long stiff setae distomesially, mesial face with short plumose setae. Carpus subequal in length to palm; dorso-lateral margin with 5 small spines and few spinules (distalmost spine largest), dorsomesial margin with 4 spines (second spine strongest, strongly diverging); lateral face with few spinules or granules and 1 spine located at about midlength; mesial face with 1 moderately strong spine at middle portion; ventral surface with few minute spinulose tubercles and with 1 distal spine. Palm about 2.7 times longer than wide; dorsal surface with row of 4 small spines along midline and 1 minute spine at articulation to dactylus, dorsolateral margin with 3 (left) or 4 (right) large spines (distalmost spine on right side located distal to base of fixed finger), dorsomesial margin also with 3 strong spines; mesial face with 1 strong spine slightly distal to midlength; ventral surface with few short transverse ridges; fixed finger straight, terminating in sharp claw, with 1 minute subdistal tubercle laterally, cutting edge slightly denticulate; surfaces with scattered short setae dorsally, sparse long stiff setae laterally and mesially. Dactylus 1.1 times as long as palm, unarmed on dorsal surface, terminating in sharp, curved claw crossing tip of fixed finger; lateral margin unarmed, with several long stiff setae;

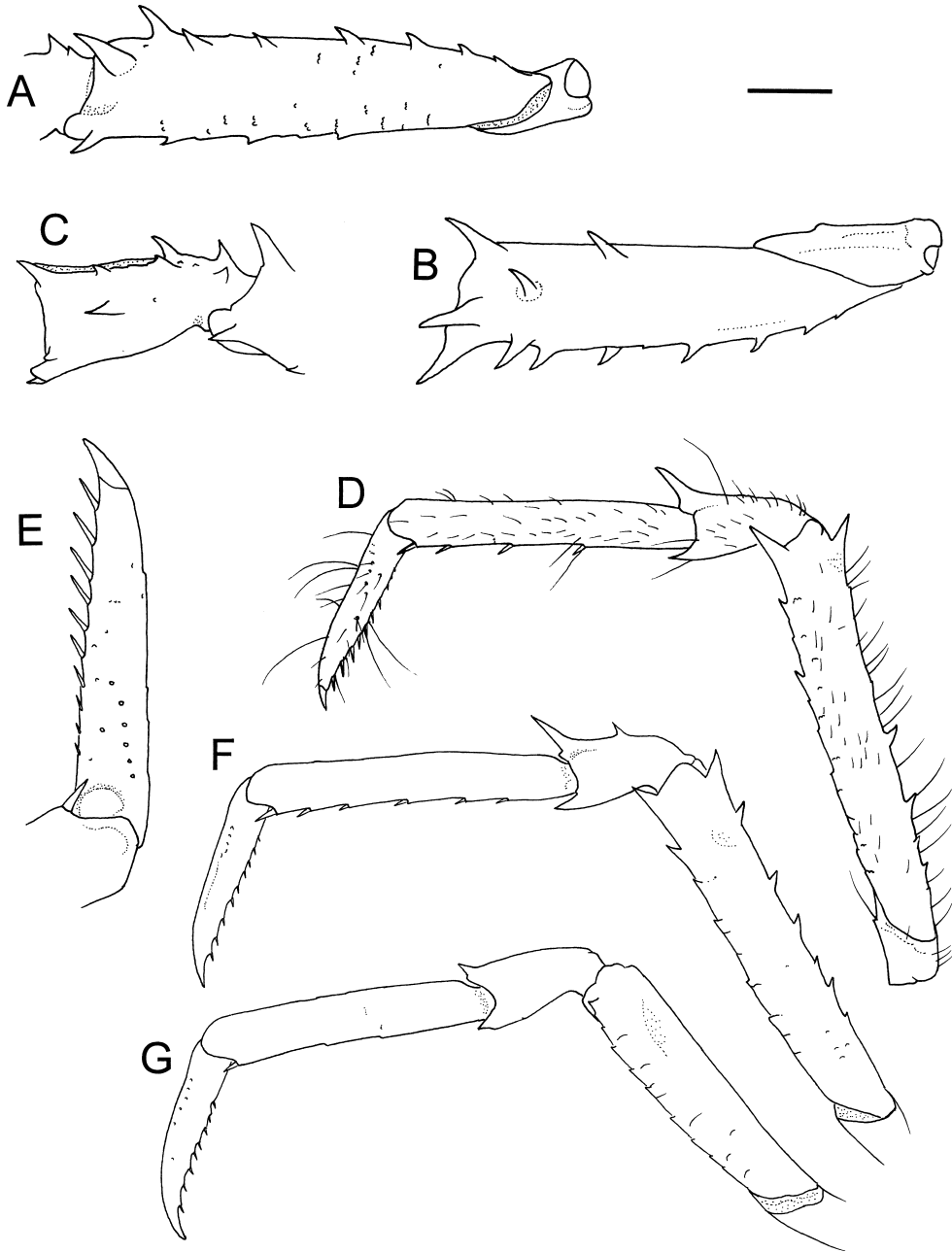


Fig. 3. *Munida ampli antennulata* sp. nov., holotype, female (cl 7.0 mm), CBM-ZC 10020. A, merus of left cheliped, lateral view (setae omitted); B, same, ventral view; C, carpus of left cheliped, lateral view (setae omitted); D, left second pereopod (first ambulatory leg), lateral view; E, same, dactylus, lateral view (setae omitted); F, left third pereopod (second ambulatory leg), lateral view (setae omitted); G, left fourth pereopod (third ambulatory leg), lateral view (setae omitted). Scale bar: 1 mm for A–D, F, G; 0.5 mm for E.

cutting edge faintly denticulate in proximal 0.8, with row of minute teeth in distal 0.2; no hiatus between dactylus and fixed finger.

Ambulatory legs (second to fourth pereopods) moderately long and slender, slightly decreasing in length posteriorly (Fig. 1). Second pereopod (Fig. 3D) about 1.9 times as long as carapace; merus about 0.7 times as long as carapace, about 7.1 times longer than high, dorsal margin with row of sparse setae and 3 spines and a few spinules, distal spine strongest, ventral margin with 1 strong distal spine followed by 3 small spines interspersed with short spinulose ridges, lateral face with scattered short setae; carpus about half length of propodus, with prominent extensor distal spine, flexor distal margin produced in spine, lateral face with scattered short setae; propodus unarmed on extensor margin, lateral face with scattered short setae, flexor margin with row of 4 (left) or 6 (right) movable spines; dactylus (Fig. 3E) about 0.7 times as long as propodus, slightly curved distally, bearing sparse short to long stiff setae, flexor margin slightly sinuous, with 10 corneous spines notably decreasing in length proximally. Third pereopod (Fig. 3F) with merus bearing row of 7 spines increasing in size distally on dorsal margin and row of tiny spines and short spinulose ridges on ventral margin; carpus with 1 small extensor spine in addition to strong extensor distal spine; propodus with 6 movable spines on flexor margin; dactylus with 10 corneous spines on flexor margin. Fourth pereopod (Fig. 3G) reaching to lateral end of cervical groove of carapace by mero-carpal articulation; merus about 0.7 length of that of second pereopod, unarmed on dorsal margin, bearing short transverse ridges on ventral margin; carpus with extensor distal and flexor distal spines much smaller than those of preceding pereopods; propodus with 2 (left) or 5 (right) movable spines on flexor margin; dactylus with 8 movable spinules on flexor margin.

Fifth pereopod without distinctive features.

Uropodal protopod (Fig. 2D) with 1 small spine posteriorly.

*Paratype.* Differing from holotype in the fol-

lowing points. Epigastric spines on carapace simple; dorsal striae less clearly delimited. Third segment of antennal peduncle bearing minute distolateral and distomesial spinules. Cheliped (only right side preserved) relatively shorter, and armature and setation relatively weaker. Meri of ambulatory legs with row of spinules on extensor margins.

*Coloration in fresh* (Fig. 1). Body with very limited pigmentation. Carapace light pink, becoming pale posteriorly. Ocular peduncles and antennal peduncles light pink, antennular peduncles semitransparent with tinge of pink. Cornea brown. Chelipeds whitish, with tinge of pink on fingers and spines on meri. Second to fifth pereopods whitish.

*Distribution.* Known only from the type locality, Iwaki Seamount, Japan, at a depth of 1744 m.

*Remarks.* *Munida ampli antennulata* sp. nov. closely resembles *M. magniantennulata* known from the Lau Basin and off Queensland, Australia (depth range 1223–2003 m), and *M. subcaeca* from the eastern and western Atlantic (depth range 842–1700 m) (Baba *et al.*, 2008). These three species have five spines on the branchial margin of the carapace, the small cornea (the corneal width is equal or less than the distance between the sinus formed by the supraocular and rostral spines), the enlarged basal segment of the antennular peduncle, and the small distomesial spine on the first segment of the antennal peduncle, not reaching the midlength of the second segment (Bouvier, 1922; Chace, 1942; Baba and Türkay, 1992).

The new species differs from both *M. magniantennulata* and *M. subcaeca* in the structure of the basal segment of the antennular peduncle. In *M. ampli antennulata*, the statocyst lobe is strongly inflated, and the lateral spines are located more distally than in the latter two species. For example, the proximal lateral spine is located distinctly distal to the midlength of the basal segment in the new species, rather than at the midlength in the latter two species. Furthermore, *M. ampli antennulata* differs from *M. magniantennulata* in the less convex hepatic margin of the carapace,

the absence of a spine on the anterior part of the branchial region, the possession of two ventral spines on the merus of the third maxilliped, and the relatively short palm of the cheliped, which is subequal in the length to the carpus. In *M. magniantennulata*, the anterior part of the branchial region bears one small spine; the merus of the third maxilliped is armed with three ventral spines; and the palm of the cheliped is distinctly longer than carpus (Baba and Türkay, 1992). From *M. subcaeca*, *M. ampliantennulata* is distinguished by having only one pair of epigastric spines on the carapace, instead of two or more pairs in *M. subcaeca*, and the less oblique frontal margins of the carapace (Bouvier, 1922; Chace, 1942; Baba and Türkay, 1992). The size and position of the anterior two lateral spines on the carapace are also different between the two species. In *M. ampliantennulata*, the first spine is larger than the second spine, and it is located at the anterolateral angle of the carapace. In contrast, in *M. subcaeca*, the two spines are subequal, and the first spine is located on the frontal margin mesial to the anterolateral angle of the carapace. Finally, in the new species, the second spine is located at about the midlength of the hepatic lateral margin, whereas it is distinctly close to the first spine in *M. subcaeca*.

De Grave *et al.* (2009) counted 246 species in *Munida*, and subsequent to that publication, five new species have been recently described by Macpherson (2009). *Munida ampliantennulata* is one of the deepest inhabitants in the genus. Other than the three species mentioned in this paper, the following five species of *Munida* are known to occur in the depths greater than 1500 m: *M. asprosoma* Ahyong and Poore, 2004 (New South Wales, Vanuatu and Taiwan, 277–1802 m; Baba *et al.*, 2009); *M. curvipes* Benedict, 1902 (south-eastern Pacific off Chile, 1922 m; Benedict, 1902); *M. endeavourae* Ahyong and Poore, 2007 (off southeastern Australia, Norfolk Ridge and Kermadec Ridge, 620–1700 m; Ahyong and Poore, 2004; Ahyong, 2007); *M. micropthalma* A. Milne-Edwards, 1880 (Atlantic Ocean, 621–2165 m; Baba *et al.*, 2008); *M. tiresias*

Macpherson, 1994 (New Caledonia and Okinawa Trough, Japan, 1140–2063 m; Macpherson, 1994; Osawa and Takeda, 2007).

*Etymology.* The Latin *amplus* (=large) plus *antennula* (antennule) plus *tus* (suffix denoting possession) refers to the large basal segment of the antennular peduncle.

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