

A New Bathyal Species of the Squat Lobster Genus *Munida* Leach, 1820 (Crustacea: Decapoda: Anomura: Munididae) from Japan

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Abstract A new species of the squat lobster genus *Munida* Leach, 1820, *M. watatsumi*, is described and illustrated on the basis of two ovigerous female specimens collected in the Kumano Sea, Japan, at bathyal depths of 1982 – 2012 m. It appears close to *M. ampli antennulata* Komai, 2011, known from the Iwaki Seamount, North Pacific off Japan, *M. magniantennulata* Baba and Türkay, 1992 from the Lau Basin and off Queensland, southwestern Pacific, *M. manqingae* Liu, Lin and Huang, 2013 from the Southwest Indian Ridge, and *M. typhle* Macpherson, 1994 from the western Pacific. Differentiating characters between the new species and the latter four congeneric species are discussed. The new species is the tenth of the genus extending to the depth greater than 1500 m.

Key words : *watatsumi*, *ampli antennulata*, Kumano Sea

Munida Leach, 1820 is the most species-rich genus in the superfamily Galatheoidea, represented by about 280 species worldwide (Baba *et al.*, 2008; updated by Macpherson, 2009; 2013; Cabezas *et al.*, 2009; 2011; Hendrickx and Ayon-Parente, 2010; Komai, 2011a; 2011b; 2012). From waters around Japan, 37 species of the genus have been recorded (Komai, 2012). The vast majority of species in the genus occur in sublittoral to upper bathyal zone down to 1000 m, but ten species extends to the middle bathyal depths greater than 1500 m (Baba *et al.*, 2008; Komai, 2011a; Liu *et al.*, 2013).

The present article serves to describe a new species of *Munida*, *M. watatsumi* sp. nov., on the basis of two specimens collected from the Kumano Sea, Japan, at depths of 1982 – 2012 m, during the KT04-6 cruise of RV “Tansei-maru” of the Japan Agency for Marine Science and Technology (JAMSTEC). The new species appears close to *M. ampli antennulata* Komai, 2011, presently known only from Iwaki Seamount, North Pacific off Japan, *M. magniantennulata* Baba and Türkay, 1992 from the Lau Basin and off Queensland, southwestern Pacific, *M. manqingae* Liu, Lin and Huang, 2013 from the Southwest Indian Ridge, and *M. typhle* Macpherson, 1994, widely distributed in the western Pacific. Differentiating characters between the new species and the latter four

close relatives are discussed.

The type specimens are deposited in the collections of the Natural History Museum and Institute, Chiba (CBM). The measurement provided is postrostral carapace length (cl), measured from the base of the rostrum to the midpoint of the posterior margin of the carapace. The higher classification follows that recently proposed by Ahyong *et al.* (2010).

Taxonomy

Family **Munididae** Ahyong, Baba, Macpherson and Poore, 2010

Genus ***Munida*** Leach, 1820

Munida watatsumi sp. nov.

(Figs. 1 – 3A, B)

Material examined. Holotype: RV “Tansei-maru”, KT04 – 6 cruise, stn KN-8(1), Kumano Sea, 33°43.53'N, 136°42.32'E, 1982 – 2012 m, 1 May 2004, beam trawl, coll. H. Kohtsuka, ovigerous female (cl 10.2 mm), CBM-ZC 12097.

Paratype: same data as holotype, 1 ovigerous female (cl 5.8 mm), CBM-ZC 12098.

Comparative material. *Munida ampli antennulata*. Holotype, female (cl 7.0 mm), RV “Soyo-maru”, 2009 cruise, Iwaki Seamount, 36°51.8'N, 144°48.8'E, 1744 m, 9

August 2009, benthos net, coll. Keiichi Kakui, CBM-ZC 10020.

Description. Holotype female. Carapace (excluding rostrum) (Fig. 1A) 1.2 times as long as wide. Dorsal surface gently convex transversely; main transverse ridges mostly uninterrupted medially; secondary transverse striae few; most striae without row of setae. Gastric region slightly elevated, with 1 pair of epigastric spines (these epigastric spines appearing to arise from granulate ridge interrupted medially); postrostral carina low, obsolescent. 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 short, transverse or obliquely transverse ridges, but without spine; posterior part of branchial region with 5 main transverse ridges (excluding posterodorsal ridge) and a few short secondary striae laterally between main ridges. Cardiac region with 4 transverse ridges, anterior 3 ridges interrupted laterally, posteriormost ridge complete, extending to lateral margin. Intestinal region with short transverse ridge medially; posterodorsal ridge distinct, slightly convex medially, with 1 secondary stria. Frontal margins slightly oblique. Anterolateral margins slightly convex; lateral margins nearly straight in general outline. Anterolateral spines each located at anterolateral angle, moderately long, falling short of level of sinus between rostrum and supraocular spines. Second marginal spine anterior to cervical groove about half-length of anterolateral spine. Branchial margins each with 5 small spines, anteriormost spine larger than other spines.

Rostrum (Fig. 1A) spiniform, about 0.4 times as long as carapace, nearly horizontal in lateral view. Supraocular spines moderately long, slightly diverging anteriorly and very slightly ascending in lateral view, about 0.3 length of rostrum. Inner orbital spine slender, clearly visible in dorsal view.

Pterygostomial flap (Fig. 1B) pointed anteriorly with minute granule; lateral face rugose with scattered obliquely transverse ridges.

Thoracic sternite 3 (Fig. 1C) about 3.7 times wider than long, distinctly separated from sternite 4, much wider than anterior width of sternite 4; anterior margin faintly granulate, with distinct, V-shaped median notch. Sternite 4 with medially interrupted transverse ridge adjacent to anterior margin, anterior part somewhat sloping toward anterior; ventral surface shallowly concave medially, with faint very short

striae medially. Sternites 5 - 7 smooth. Transverse ridges dividing sternites nearly smooth, with sparse short setae.

Second pleomere (Fig. 1A) with 1 distinct, uninterrupted, transverse stria on tergum; anterior ridge unarmed. Third pleomere (Fig. 1A) with 1 uninterrupted, transverse stria on tergum, unarmed anteriorly. Fourth pleomere only with anterior ridge on tergum, unarmed. Sixth pleomere (Fig. 2G) with broadly W-shaped groove on posterior half, otherwise smooth. Telson (Fig. 2G) slightly wider than long, incompletely divided in 5 plates (division of posterolateral plate not obvious); scattered squamiform ridges on posterolateral plates.

Eyes (Figs. 1A, 2A) small. Cornea about as long as eyestalk, not dilated, corneal width subequal to width between rostrum and supraocular spine and about 0.10 of carapace length. Eyestalk cylindrical; eyelashes absent.

Basal segment of antennular peduncle (Figs. 1A, 2A) stout, length excluding distal spines about 1.7 of width; distal spines unequal with mesial spine much shorter than lateral; 2 lateral spines present, distal spine located proximal to base of distolateral spine, not reaching it, proximal spine located slightly midlength of segment; statocyst lobe inflated, ventral surface rounded, with scattered minute tubercles and sparse setae.

Antennal peduncle (Figs. 1A, 2A) moderately stout, overreaching distal corneal margins by length of fourth segment. First segment with moderately short distomesial spine reaching midlength of second segment; distolateral angle unarmed. Second segment with small spine each at distomesial and distolateral angles, spines subequal in length, distomesial spine reaching midlength of third segment. Third segment with small spine at distomesial angle, unarmed on distolateral angle. Fourth segment unarmed.

Third maxilliped (Fig. 2B) moderately slender. Ischium distinctly longer than merus, with tiny ventrodistal spine, extensor distal angle unarmed. Merus not markedly narrowed distally, flexor margin with 2 greatly unequal spines, distal spine tiny, proximal spine prominent, arising slightly proximal to midlength; extensor distal margin unarmed. Exopod narrowly distally, distinctly overreaching distal margin of merus; lateral surface slightly rugose.

Only right cheliped (Fig. 1D - F) preserved, about 2.0 times as long as carapace. Merus with row of 7 spines on dorsal surface laterally (spines increasing in

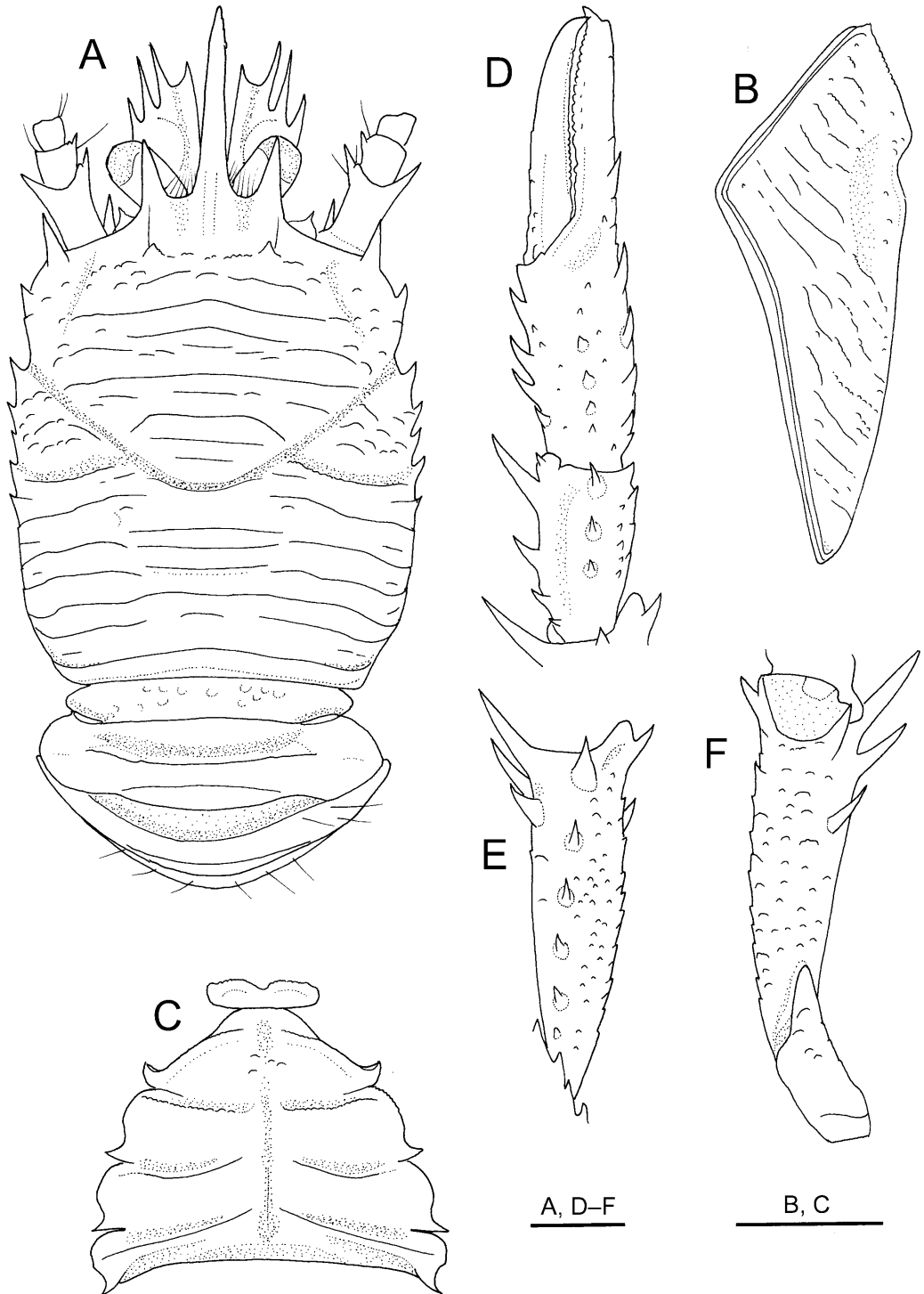


Fig. 1. *Munida watatsumi* sp. nov., holotype, ovigerous female (cl 10.2 mm), CBM-ZC 12097. A, carapace, pleon (flexed), and cephalic appendages, dorsal view; B, left pterygostomial flap, ventrolateral view (perpendicular); C, thoracic sternum, ventral view; D, chela and carpus of right cheliped, dorsal view (setae omitted); E, merus of right cheliped, dorsal view (setae omitted); F, same, ventral view. Scale bars: 2 mm.

size distally, distolateral spine strongly diverging) and 2 prominent spines distomesially (distal spine stronger than distolateral spine); lateral face with minute, somewhat scale-like tubercles becoming larger ventrally and with 1 strong spine at ventrodistal angle; mesial face with sparse granules, armature including 1 prominent subdistal spine somewhat proximal to base of distomesial spine, 1 prominent spine at ventromesial distal angle and 1 more prominent spine on ventromesial margin arising at distal 0.3 length of merus; ventral surface with tiny to small scale-like tubercles; setae on surfaces simple or slightly plumose, length quite variable. Carpus about 0.8 times as long as palm, about 1.9 times longer than distal width; dorsolateral margin with 4 spines noticeably increasing in size distally (distalmost spine submarginal), dorsomesial margin with 4 spines (second spine prominent, strongly diverging; distomesial spine tiny); lateral face with some small, scale-like tubercles becoming larger ventrally and 1 conspicuous subterminal spine on midline; ventromesial face with 2 small subterminal spines. Palm about 1.8 times longer than wide; dorsal surface with row of tiny spines and tubercles on midline, dorsolateral margin 5 spines noticeably increasing in size distally, dorsomesial margin with 4 spines also increasing in size distally, distomesial angle unarmed; mesial face without conspicuous spines (Fig. 3A); ventral surface with small, low, scale-like or multidenticulate tubercles; fixed finger straight, terminating in sharp claw, with 1 tiny subdistal tubercle laterally and 1 moderately strong spine somewhat proximal to midlength (Fig. 3B), cutting edge slightly sinuous, with row of minute, rounded denticles. Dactylus 1.3 times as long as palm, unarmed on dorsal surface, terminating in sharp, curved claw crossing tip of fixed finger; mesial margin with few low tubercles; cutting edge with row of minute, rounded denticles over entire length, very narrow proximal hiatus between dactylus and fixed finger. Setation on chela sparse, setae on dorsal surface short, those on lateral and mesial faces mixture of short and longish ones.

Ambulatory legs (second to fourth pereopods) moderately long and slender, second and third pereopods subequal in length, fourth pereopod shorter than preceding pereopods. Second pereopod (Fig. 2C), when anteriorly extended, reaching level of midlength of rostrum by tip of mero-carpal articulation, about 1.9 times as long as carapace; merus about 0.9 times as long as carapace, about 7.1 times longer than wide,

dorsal margin with row of sparse setae and 10 spines noticeably increasing in size distally, ventral margin with 1 strong distolateral spine followed by 3 smaller spines and some short transverse ridges, lateral face with scattered short setae, ventromesial distal angle with 1 moderately small spine; carpus about one-third length of propodus, with prominent extensor distal spine followed by 1 smaller spine or 2 close proximal spinules on extensor margin, flexor distal margin produced in spine, lateral face with weak longitudinal ridge dorsally, otherwise nearly smooth; propodus with few minute granules on extensor margin, lateral face with few minute granules and few long setae, flexor margin with row of movable spines evenly spaced; dactylus (Fig. 2D) about 0.6 times as long as propodus and 5.9 times longer than basal width, slightly curved distally, bearing sparse short to long stiff setae, flexor margin faintly sinuous, with 9 or 10 corneous spinules decreasing in length proximally along entire length (ultimate spinule slender, contiguous with claw). Third pereopod (only right side preserved) (Fig. 2E) similar to second pereopod; merus bearing row of 11 spines increasing in size distally and becoming double row proximally on dorsal margin, ventral margin with 1 moderately strong distal spine followed by 1 smaller spine and row of short transverse ridges; carpus similar to that of second pereopod; propodus with 6 movable spines on flexor margin; dactylus broken off at distal part, thus exact number of flexor spinules unknown (preserved part with 7 flexor spinules). Fourth pereopod (Fig. 2F) slightly falling short of anterolateral angle of carapace by mero-carpal articulation; ischium with tiny dorsodistal spine; merus about 0.7 length of that of second pereopod, with 5 or 6 spinules (including distal one) on dorsal margin and with 1 strong distal spine followed by low transverse ridges on ventral margin; carpus with prominent extensor distal spine and flexor distal spine, distinctly smaller than those of preceding pereopods, extensor margin with 1 additional small spine slightly distal to midlength; propodus with 5 movable spines on flexor margin; dactylus with 9 corneous spinules on flexor margin.

Merus of fifth pereopod almost smooth on lateral surface.

Uropodal exopod (Fig. 2H) with lateral margin faintly denticulate, with minute movable spinules; outer surface with movable spinules arranged in 2 longitudinal rows along lateral margin; posterior margin truncate, with row of minute movable spinules.

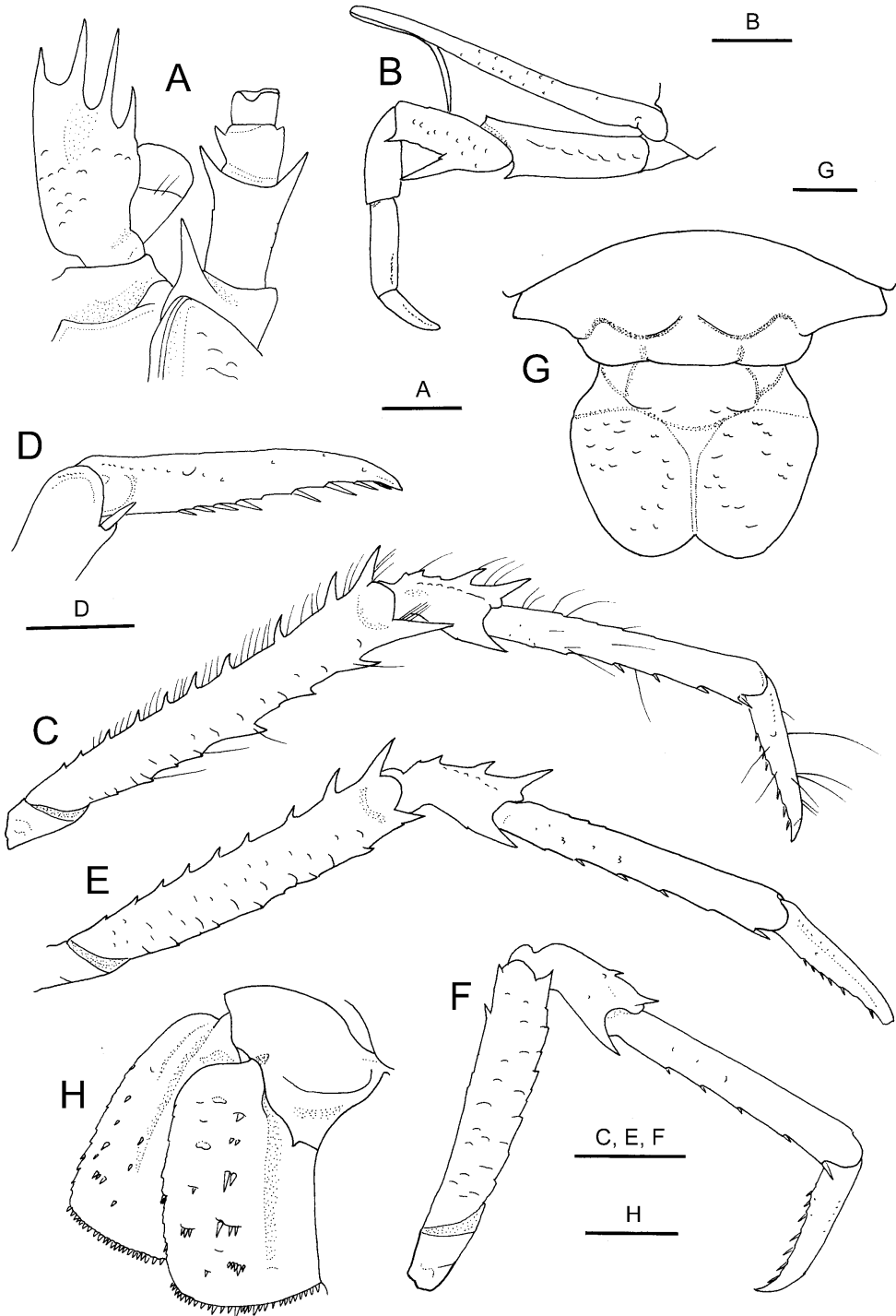


Fig. 2. *Munida watatsumi* sp. nov., holotype, ovigerous female (cl 10.2 mm), CBM-ZC 12097. A, left eye, basal segment of left antennular peduncle, and antennular peduncle, ventral view; B, left third maxilliped, lateral view (setae omitted); C, right second pereopod, lateral view; D, same, dactylus, lateral view (setae omitted; fifth flexor spine from ultimate missing); E, right third pereopod, lateral view (sixth flexor spine from proximal on dactylus missing); F, right fourth pereopod, lateral view; G, sixth pleomere and telson, outer view; H, left uropod, outer view. Scale bars: 2 mm for C, E, F; 1 mm for A, B, D, G, H.

Endopod with lateral margin faintly denticulate, bearing minute movable spinules; outer surface with low, short transverse ridges arranged in 2 longitudinal rows, each bearing 1 – 3 movable spinules, on lateral half; posterior margin roundly truncate, with row of minute movable spinules. Uropodal protopod (Fig. 2D) with minute spine posteriorly on inner side.

Paratype. Generally similar to holotype. Anterior part of branchial region with 2 main transverse striae. Posterodorsal carina on carapace without secondary stria. Rostrum about 0.3 times as long as carapace. Chelipeds about 1.8 times as long as carapace; fixed finger with 2 strong dorsolateral spines; cutting edges of fingers only faintly denticulate.

Coloration in life. Not known.

Distribution. So far known only from Kumano Sea, Japan, at depths of 1982 – 2012 m.

Remarks. *Munida watatsumi* sp. nov. appears closest to *M. ampliattenuata* and *M. magniantennulata* in having five branchial spines and one pair of epibranchial spines on the carapace, slightly oblique frontal margins of the carapace, unarmed second pleomere, small, non-dilated cornea (the corneal width is almost equal to the distance of the sinus between the rostrum and supraocular spine), and the relatively stout basal segment of the antennular peduncle. The new species differs from *M. ampliattenuata* in the following particulars: (1) main transverse ridges on the posterior branchial region of the carapace are entire in *M. watatsumi* sp. nov., whereas many of them are interrupted or subdivided in short ridges in *M. ampliattenuata*; (2) there are distinctly fewer secondary striae between main ridges in *M. watatsumi* sp. nov. than in *M. ampliattenuata*; (3) spines on the antennal peduncle are relatively stronger in *M. watatsumi* sp. nov. than in *M. ampliattenuata*, particularly the distomesial spine on the first segment reaches the midlength of that segment; (4) the palm of the cheliped is distinctly longer than the carpus and lacks spines on the mesial face in *M. watatsumi* sp. nov., whereas the palm is subequal in the length to the carpus and armed with one or two strong spines on the mesial face in *M. ampliattenuata*; (5) dorsolateral spines on the fixed finger of the chela are strong in *M. watatsumi*, rather than minute in *M. ampliattenuata*.

The new species is distinguished from *M. magniantennulata* by (1) the less convex anterolateral margin of the carapace, (2) the absence of a spine on the anterior part of the branchial region, (3) the stronger distomesial spine on the first segment of the antennal

peduncle (reaching to the midlength of the second segment versus far falling short of it), (4) the possession of two spines on the flexor margin of the third maxilliped merus, and (5) the presence of conspicuous spines on the fingers of the cheliped. In *M. magniantennulata*, the anterior part of the branchial region bears one small spine; the third maxilliped merus is armed with three spines on the flexor margin; and the fingers of the cheliped do not have conspicuous spines (Baba and Türkay, 1992).

Munida manqingae and *M. typhle* are also similar to *M. watatsumi* sp. nov. Nevertheless, the new species is immediately distinguished from *M. typhle* by (1) the relatively short supraocular spines (reaching to distal corneal margins versus overreaching them), (2) the possession of only one pair of epigastric spines on the carapace, (3) the lack of spines on the second pleomere, and (4) the relatively short distomesial spine of the first segment of the antennal peduncle (reaching midlength of first segment versus nearly reaching distal margin of first segment). In *M. typhle*, there are five pairs of epigastric spines on the carapace; the second pleomere is armed with two pairs of spines on the anterior ridge (Macpherson, 1994). The slightly oblique frontal margin of the carapace (versus strongly oblique) and the possession of one pair of epigastric spines (versus three pairs) immediately distinguish the new species from *M. manqingae* (cf. Liu *et al.*, 2013).

The following nine species of *Munida* are known to occur at depths greater than 1500 m (Baba *et al.*, 2008; Komai 2011a; Liu *et al.*, 2013): *M. ampliattenuata* (Iwaki Seamount, North Pacific, 1744 m), *M. asprosoma* Ahyong and Poore, 2004 (New South Wales, Vanuatu and Taiwan, 277 – 1802 m), *M. curvipes* Benedict, 1892 (southeastern Pacific off Chile, 1922 m), *M. endeavourae* Ahyong and Poore, 2004 (off southeastern Australia, Norfolk Ridge and Kermadec Ridge, 620 – 1700 m), *M. magniantennulata* (Lau Basin and off Queensland, southwestern Pacific, 1223 – 2003 m), *M. manqingae* (Southwest Indian Ridge, 2218 m), *M. microphthalma* A. Milne-Edwards, 1880 (Atlantic Ocean, 621 – 2165 m), *M. subcaeca* Bouvier, 1922 (eastern and western Atlantic, 842 – 1700 m), and *M. tiresias* Macpherson, 1994 (New Caledonia, Taiwan, and Japan, 1140 – 2063 m). The present new species is the tenth of *Munida* occurring at such great depths, and represents one of the deepest records next to *M. manqingae*, *M. microphthalma* and *M. tiresias*.

Etymology. Named after the Japanese god of the sea “Watatsumi”.

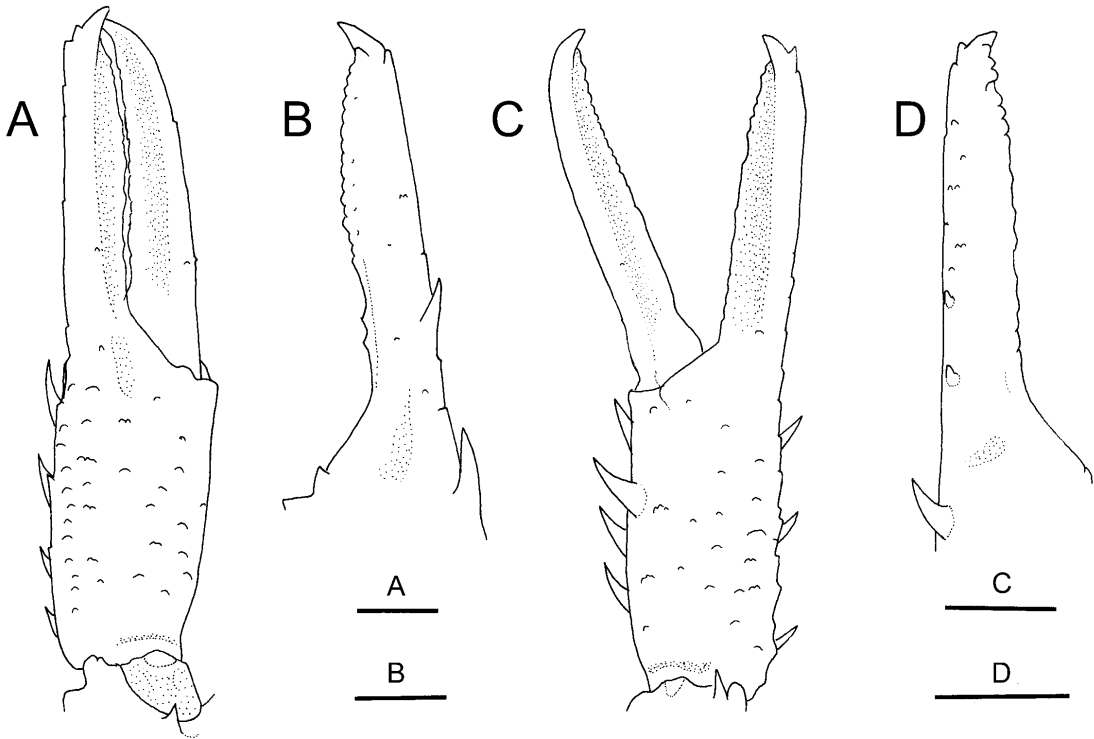


Fig. 3. A, B, *Munida watatsumi* sp. nov., holotype, ovigerous female (cl 10.2 mm), CBM-ZC 12097. C, D, *Munida ampliantennulata* Komai, 2011, holotype, female (cl 7.0 mm), CBM-ZC 10020. A, C, chela, ventral view (A, right; C, left); B, D, fixed finger of chela, dorsal view (B, right; D, left). Scale bars: 1 mm.

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日本産深海性チュウコシオリエビ属 (甲殻亜門：
十脚目：異尾下目：チュウコシオリエビ科) の1新種

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三重県沖熊野灘の深海（水深1982～2012 m）から採集された雌標本2個体に基づき、チュウコシオリエビ科チュウコシオリエビ属の新種 *Munida watatsumi* (新称:ワタツミチュウコシオリエビ) を記載した。本属には280種を超える既知種が知られるが、大多数は浅海域～漸深海帯に生息し、1500 mを超える大深度に生息する種は本新種を含め、10種に限られる。本新種は、形態的には *M. ampli antennulata* Komai, 2011 (磐城海山), *M. magni antennulata* Baba and Türkay, 1992 (南西太平洋), *M. manqingae* Liu, Lin and Huang, 2013 (南西インド洋海嶺), および *M. typhle* Macpherson, 1994 (西太平洋) の4種に形態的に類似するが、頭胸甲の形状とその背面の横走陵線の数、鉗脚の棘の大きさや位置などの諸形質により識別される。

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