

Galatheids of the East China Sea
(Chirostylidae and Galatheidae, Decapoda, Crustacea)¹⁾

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A knowledge of the galatheids of the East China Sea has incompletely been built. In the previous paper (1964) we described only one species, *Galathea balssi*, from this region. Miyake (1965) illustrated the Japanese anomuran Crustacea and added the East China Sea as a new locality to *Uroptychus scandens*, *Galathea orientalis*, *G. pusilla* and *Munida japonica*, its source is the same to the present material. The material with which this paper deals is based upon a collection which has chiefly been made by Mr. Hideo Yamashita of the Seikai Regional Fisheries Research Laboratory. Another specimen is also included herein, which was collected from Sogwipo, Chejudo by Prof. Hunn Su Kim of Sung Kyun Kwan University, Korea and kindly forwarded to us. These collections contain about 400 specimens distributed among eleven species, the two species of which were newly described.

We wish to express our gratitude to the above two gentlemen for offering the material and for their kind informations on the correct data.

Family Chirostylidae Ortmann, 1892

Genus *Uroptychus* Henderson, 1888

Uroptychus grandirostris Yokoya, 1933

(Fig. 1)

Uroptychus grandirostris Yokoya, 1933, p. 68, fig. 29 (Type localities: west of Siwo-misaki; west of Tanabe; west of Muroto-zaki; west of Sata-misaki; south of Nagasaki; southwest of Goto Is. and south of Goto Is.); Miyake, 1947, p. 735, fig. 2125; -1965, p. 633, fig. 1038.

1) Contributions from the Zoological Laboratory, Faculty of Agriculture, Kyushu University, No. 355.

Material examined.

One male and one ovigerous female, ZLKU No. 13541; 31°29.2' N, 130°01.5' E; 196 m deep; June 13, 1964.

Remarks. The species is easily distinguished from the other members

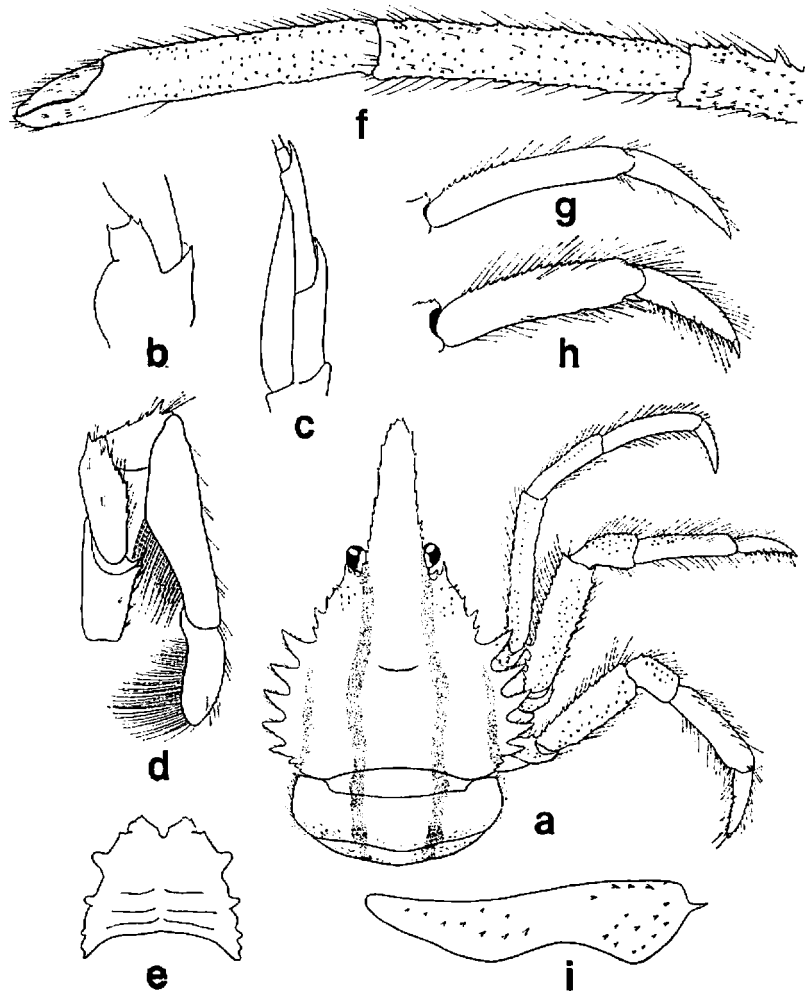


Fig. 1. *Uroptychus grandirostris* Yokoya.

a, Body in dorsal view, $\times 4.5$; b, basal segment of right antennule, $\times 23$; c, right antennal peduncle, $\times 16$; d, endopod of right third maxilliped, $\times 11$; e, sternal segments, $\times 4.5$; f, left cheliped, $\times 4.5$; g, distal segments of right first ambulatory leg, $\times 7.5$; h, distal segments of right second ambulatory leg, $\times 7.5$; i, right pterygostomial flap, $\times 4.5$.

of this genus by having a row of strong lateral spines of the carapace and by having a long rostrum. The carapace and abdomen are, as usual, furnished with four longitudinal stripes of reddish brown colour in five per cent of formalin. Another good character is the first ambulatory leg which is smaller than the second and has no spines on the inner margin of the dactylus (Fig. 1, g and h).

The male measures 9.9 mm and the ovigerous female 9.0 mm, from the tip of the rostrum to the posterior margin of the carapace.

Distribution. Restricted to the Japanese waters in depths of 165 to 223 m.

Uroptychus scandens Benedict, 1902

(Fig. 2)

Uroptychus scandens Benedict, 1902, p. 298, fig. 42 (Type locality: off Honshu, Japan); Balss, 1913, p. 27, figs. 19, 20; van Dam, 1933, p. 27, fig. 38; Yokoya, 1933, p. 68; van Dam, 1937, p. 102;—1940, p. 97; Miyake, 1947, p. 734, fig. 2123;—1960, p. 97, pl. 48, fig. 7;—1965, p. 634, fig. 1040.

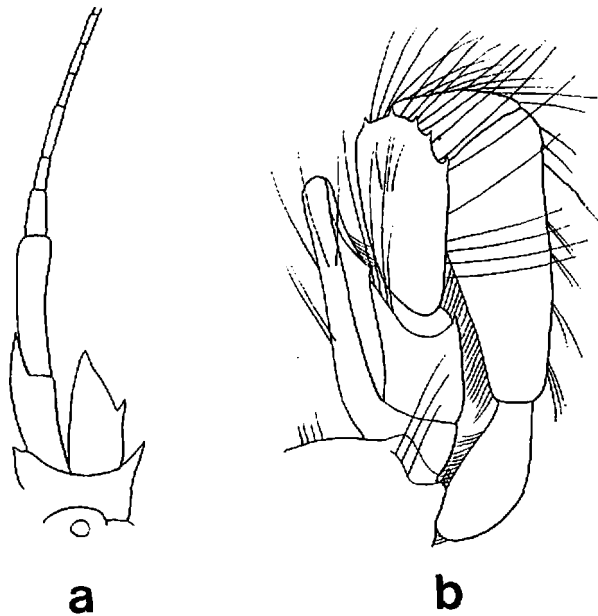


Fig. 2. *Uroptychus scandens* Benedict.
a, Left antennal peduncle, $\times 30$; b, right third maxilliped, $\times 20$.

Material examined.

One male, one ovigerous female and three females, ZLKU No. 9443; 31°29.8' N, 128°01.5' E; 145 m deep; June 23, 1963.

Remarks. This species is, as usual, found in commensal with penatularians, *Leiopterus fimbriatus* (Herklots). In five per cent of formalin the entire body is of a light pink colour.

The male measures 4.5 mm and the ovigerous female 4.5 mm in carapace length.

Distribution. The species has previously been known from the Japanese waters, Kai Islands and Banda Sea in depths of 50 to 393 m.

Family Galatheidæ Dana, 1852

Genus *Galathea* Fabricius, 1793

Galathea balssi Miyake et Baba, 1964

Galathea balssi Miyake and Baba, 1964, p. 205, figs. 1, 2 (Type locality: East China Sea).

Galathea australiensis: Balss, 1913, p. 13, fig. 13.

Material examined.

One ovigerous female, ZLKU No. 9461; 28°36.6' N, 124°40.0' E; 84 m deep; June 30, 1962.

Three males, ZLKU No. 12019; 30°15.0' N, 127°31.7' E; 130 m deep; June 30, 1961.

Two females, ZLKU No. 10417; 31°09.5' N, 127°16.0' E; 111 m deep; Mar. 26, 1964.

Four males and one ovigerous female, ZLKU No. 9664;* 31°31.7' N, 128°27.4' E; 128 m deep; June 9, 1962.

Remarks. Since the original description by us (1964) based upon the only one male specimen, several additional specimens have been obtained from the type locality. Fortunately, a detailed examination of the present material shows that the original type specimen is in the typical feature.

We will describe here that all of the pereopods have no epipods, about which we omitted to write in the previous paper.

The largest male measures 11.5 mm and the largest ovigerous female 6.3 mm, from the tip of the rostrum to the posterior margin of the carapace.

Distribution. This is known from the Sagami Bay, Nagasaki and the East China Sea in depths of 84 to 150 m.

Galathea elegans Adams et White, 1848

(Fig. 3)

Galathea elegans White, 1847, p. 66 (*nomen nudum*).

* A couple of specimens is deposited in the Rijksmuseum van Natuurlijke Historie, Leiden.

Galathea elegans Adams and White, 1848, pl. 12, fig. 7 (Type localities: Philippine; Borneo); Haswell, 1882b, p. 163; Walker, 1887, p. 112; de Man, 1888, p. 455; Henderson, 1888, p. 117; —1893, p. 431; de Man, 1902, p. 709; Grant and McCulloch, 1906, p. 50, pl. 4, figs. 6, 6a; Balss, 1913, p. 4, figs. 2, 3; Potts, 1915, p. 83, fig. 4a, pl. 1, fig. 5; Balss, 1921, p. 22; Laurie, 1926, p. 133; Gordon, 1935, p. 7; Estampador, 1937, p. 498; Miyake, 1938, p. 37, tab. 2, figs. A-C, Fig. 1, A-C; Melin, 1939, p. 77, figs. 48-53; Miyake, 1947, p. 733, fig. 2188; Barnard, 1947, p. 379; —1950, p. 487, fig. 91, i-k; Utinomi, 1956, p. 63, pl. 32, fig. 4; Miyake, 1965, p. 635, fig. 1045.

Galathea longirostris Dana, 1852, p. 482; 1855, pl. 30, fig. 11.

Galathea deflexifrons Haswell, 1882 a, p. 761; —1882 b, p. 163.

Galathea grandirostris Stimpson, 1858, p. 252; —1907, p. 234; Henderson, 1888, p. 119, pl. 12, fig. 3; Estampador, 1937, p. 498.

Galathea longirostris Yokoya, 1936, p. 136, fig. 6.

Material examined.

One ovigerous female, ZLKU No. 12013: 29°47.5' N, 126°58.0' E—29°53.2' N, 126°56.0' E; 103 m deep; July 7, 1961.

Rostrum longer than a half of the length of carapace; lateral margin armed with eight small spines on the left and nine on the right; dorsal surface pubescent. Outer orbital angle slightly spined. Lateral margin of carapace with a anterolateral spine, two small spines on hepatic region, three on anterior branchial region and three others on posterior branchial region. A small spine situating behind the insertion of antenna. No spines on gastric region.

Basal segment of antennule armed with three spines. First segment of antennal peduncle without spines; second segment with an inner distal marginal and an outer distal marginal spine; third segment with a spine on inner distal margin.

Ischium of third maxilliped shorter than merus; the latter armed with three spines on inner margin and with a single spine on its outer distal margin. Chelipeds wanting.

Ambulatory legs thickly furnished with long setae; merus of first ambulatory leg with weakly pointed spines on outer margin; inner marginal spines of propodus obscure; carpus with five not well-developed spines on outer margin and without rows of spines on dorsal surface; dactylus with five serrated teeth or unguiculi on inner margin. Second ambulatory leg not remain. Third ambulatory leg similar to the first in shape, but weak in armature.

Pterygostomial flap without spines on surface and on anterior margin. Cheliped with epipod.

Length of carapace including rostrum 13.1 mm, breadth of carapace 8.0 mm, length of rostrum (a distance between angles of basal lateral

teeth) 5.0 mm.

Remarks. Melin (1939) mentioned that the Balss' specimen from Japan was not identical with *G. elegans* for the characters such as those, the number of lateral spines of the carapace and the shape of the third maxilliped. He further stated that the Haswell's (1882 a, 1882 b) *G. elegans* and *G. deflexifrons* were probably the same to the Balss' specimen. Miyake (1938) observed in six specimens from Japan variations as to the above mentioned characters and colour patterns. According to his results it may be advisable that the Balss' specimen is referred to *G. elegans*.

This species has often been recorded in commensal with crinoids, such as *Comanthus* sp., *Tropiometra carinata* and etc (Haswell, 1882 b; Potts, 1915; Miyake, 1938, 1947, 1965; Barnard, 1950). Unfortunately, such a habit is uncertain in the present specimen.

Distribution. This is so far known from the Japanese waters, Bonin Islands, Malay Archipelago, Micronesia, Australia, Indian Ocean and South Africa. The bathymetric range is from the intertidal zone to 120 m.

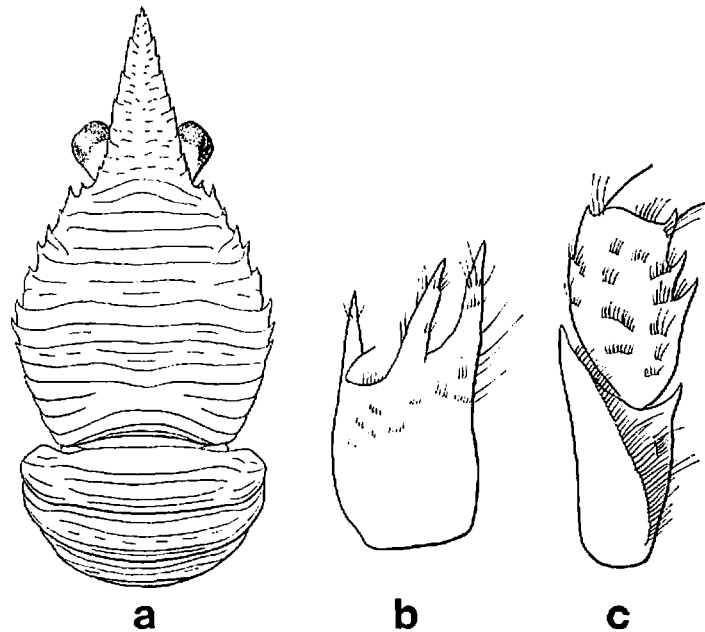


Fig. 3. *Galathea elegans* Adams et White.

a, Body in dorsal view, $\times 4$; b, basal segment of left antennule, $\times 17$; c, endopod of right third maxilliped, $\times 17$.

Galathea multilineata Balss, 1913

(Fig. 4)

Galathea multilineata Balss, 1913, p. 9, figs. 6-8 (Type locality: Joga-shima, Boshu); Yokoya, 1933, p. 56.

Material examined.

One female, ZLKU No. 10416; 31°29.2' N, 130°01.5' E; 196 m deep; June 13, 1964.

Rostrum nearly as long as broad, and armed with four teeth on each side; teeth very small; dorsal surface pubescent, the setae short and plumose. Transverse ridges on dorsal surface of carapace thick, and

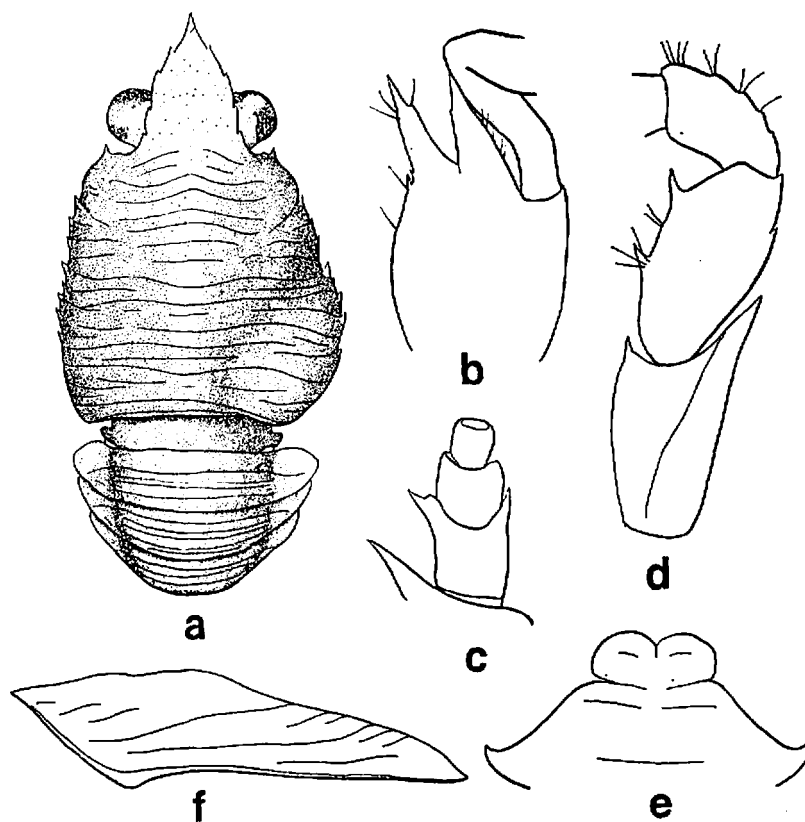


Fig. 4. *Galathea multilineata* Balss.

a, Body in dorsal view infested by a bopyrid in right branchial chamber, $\times 8$; b, basal segment of right antennule, $\times 34$; c, left antennal peduncle, $\times 34$; d, endopod of left third maxilliped, $\times 34$; e, anterior part of sternal segments, $\times 23$; f, left pterygostomial flap, $\times 16$.

arrangement as represented in Fig. 4, a. Lateral margin of carapace armed with six spines on the left and seven on the right.

Outer orbital angle rounded and unarmed. Basal segment of antennule armed with two large spines on outer distal margin. Anterior prolongation of first segment of antenna short; second segment with an inner distal marginal and an outer distal marginal spine; third segment without spine.

Ischium of third maxilliped slightly longer than merus, and furnished with a small spine at inner distal angle; merus with a small spine at inner distal angle and two spines on inner margin, the outer margin slightly spined on middle; carpus without spines but with eminences on outer margin. Chelipeds and ambulatory legs wanting. Cheliped with epipod.

Colour in formalin. Carapace and abdomen yellow. A white stripe placed longitudinally on carapace and first to fourth abdominal segments.

Length of carapace including rostrum 6.3 mm, breadth of carapace 4.3 mm, length of rostrum 2.0 mm.

Remarks. This specimen differs from the original description in having no spines on the outer margin of the carpus of the third maxilliped.

Distribution. This is restricted to the Japanese waters from the Sagami Bay to the southward as far as the East China Sea. The bathymetric range is from 120 to 210 m.

Galathea orientalis Stimpson, 1858

(Fig. 5)

Galathea orientalis Stimpson, 1858, p. 252 (Type locality: Hong Kong); —1907, p. 231; Miers, 1879, p. 51; Ortmann, 1892, p. 252, pl. 11, figs. 10, 10 a, i; Doflein, 1902, p. 644; Sakai, 1935, p. 60; Melin, 1939, p. 63, figs. 36–38; Nakazawa, 1927, p. 1035, fig. 1993; —1947,* p. 732, fig. 2115; Utinomi, 1956, p. 63, pl. 32, fig. 5; Miyake, 1960, p. 97, pl. 48, fig. 5; —1965, p. 634, fig. 1042.

Galathea acanthomera: Balss, 1913, p. 2, fig. 1; de Man, 1907, p. 402, pl. 31, figs. 14, 15; Yokoya, 1933, p. 55; Miyake, 1938, p. 39, fig. 2, A–B; Kikuchi, 1932, p. 7; Makarov, 1962, p. 85.

Material examined.

One ovigerous female, ZLKU No. 9672; Sogwipo, Chejudo; 50 m deep; Oct. 13, 1963.

One male and two ovigerous females, ZLKU No. 13166; 27°14. 5' N, 122°31.3' E; 90 m deep; June 11, 1962.

* See Miyake (1947).

One male and one ovigerous female, ZLKU No. 13171; 27°14.5' N, 124°45.0' E; 98 m deep; June 12, 1962.

One ovigerous female and one female, ZLKU No. 13169; 27°21.5' N, 123°21.0' E; 95 m deep; June 12, 1962.

Eight males, two ovigerous females and one female, ZLKU No. 13174; 28°30.3' N, 124°10.5' E; 87 m deep; June 14, 1962.

Two males and one ovigerous female, ZLKU No. 13185; 28°30.8' N, 123°31.2' E; 66 m deep; June 15, 1962.

One ovigerous female, ZLKU No. 13173; 28°32.0' N, 125°34.0' E; 101 m deep; June 13, 1962.

Three males and four ovigerous females, ZLKU No. 13189; 29°58.5' N, 126°59.5' E; 100 m deep; June 17, 1962.

One ovigerous female, ZLKU No. 13188; 29°59.5' N, 126°14.5' E; 85 m deep; June 17, 1962.

Remarks. Ortmann (1892) emphasized that the carpus of the third maxilliped has two spines on the outer margin. This is an important and definite character, however, a detailed examination of the present material shows that in small specimens the spines diminish or are

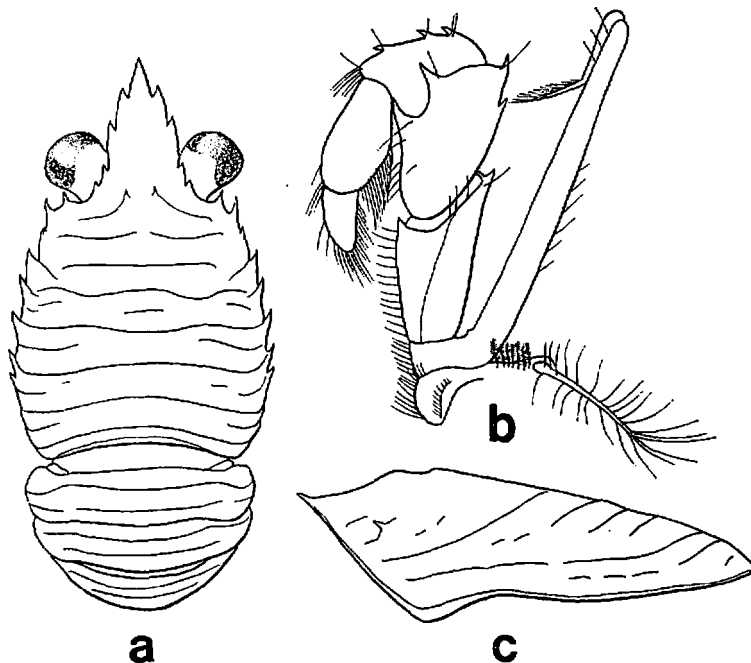


Fig. 5. *Galathea orientalis* Stimpson.

a, Body in dorsal view, $\times 7$; b, left third maxilliped, $\times 28$;
c, left pterygostomial flap, $\times 19$.

lacking. Another good character for the species is represented by the presence of a spine on the pterygostomial flap.

The species is widely variable in some characters, viz. the number of the meral marginal spines of ambulatory legs, the shape of the cheliped and colour and its patterns. These variations were observed in large number of specimens from the Japanese waters deposited in our Laboratory, which will be reported later elsewhere.

Though the descriptions for *G. acanthomera* entered into details, previous authors all omitted to write whether their specimens were furnished with plumose setae on the ambulatory legs. According to Stimpson (1858) this is very allied to *G. acanthomera* which is characterized by having plumose setae on legs and by having rather large basal rostral teeth. Melin (1939) synonymized *G. acanthomera* with *G. orientalis* after the examination of the material from the Bonin Islands, but he did not mention the plumose character of ambulatory legs. It will, therefore, remain questionable whether *G. acanthomera* is referable to *G. orientalis*. However, it was thought advisable that the species which have been described by many authors for *G. acanthomera* might be referred to *G. orientalis*.

The largest male measures 6.5 mm, and the largest ovigerous female 5.8 mm, from the tip of the rostrum to the posterior margin of the carapace.

Distribution. This species is the most common in the Japanese waters and has been taken from the Sagami Bay to Kagoshima Bay, and from the Sea of Japan, Korea Strait, Hong Kong and the Bonin Islands. The bathymetric range is from the intertidal zone to 200 m.

Galathea pusilla Henderson, 1885

(Fig. 6)

Galathea pusilla Henderson, 1885, p. 407 (Type locality: off the New South Wales coast); —1888, p. 121, pl. 12, figs. 1, 1a, b; Grant and McCulloch, 1906, p. 49, pl. 4, figs. 5, 5a (in part); Miyake, 1965, p. 635, fig. 1044.

Galathea integra Benedict, 1902, p. 248; Balss, 1913, p. 7, figs. 4, 5; Yokoya, 1933, p. 55; Laurie, 1926, p. 135; Miyake, 1947, p. 732, fig. 2117.

Material examined.

One female, ZLKU No. 10644; 31°29.3' N, 130°01.5' E; 196 m deep; June 13, 1964.

Two males, ZLKU No. 9659; 31°31.7' N, 128°27.4' E; 128 m deep; June 9, 1962.

One male, ZLKU No. 10420; 33°34.9' N, 128°25.2' E; 120 m deep; June 18, 1964.

One female, ZLKU No. 10419; 33°59.4' N, 128°48.0' E; 102 m deep; June 19, 1964.

Rostrum armed on each side with one tooth of a large size at the base, and with a shallow notch on each margin near the tip. Outer orbital angle pyramidal. Eight spines on lateral margin of carapace.

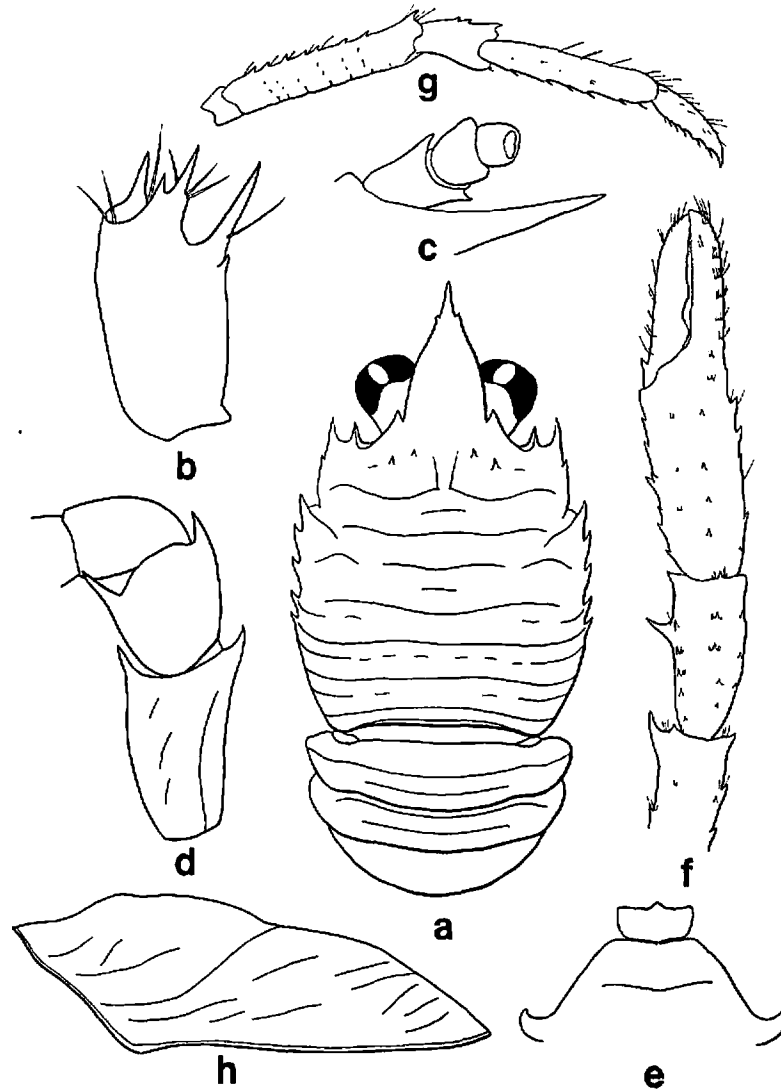


Fig. 6. *Galathea pusilla* Henderson.

a, Body in dorsal view, $\times 15$; b, basal segment of left antennule, $\times 30$; c, right antennal peduncle, $\times 30$; d, endopod of left third maxilliped, $\times 30$; e, anterior part of sternal segments, $\times 20$; f, right cheliped, $\times 16$; g, right ambulatory leg, $\times 16$; h, left pterygostomial flap, $\times 30$.

A transverse row of four spines situating in front of gastric region. Basal segment of antennule furnished with five spines on distal end, two of them small. Anterior prolongation of first segment of antenna very long, reaching to the middle of rostrum; second segment with two small spines on distal margins.

Ischium of third maxilliped longer than merus; the latter armed with a large spine on middle of inner margin, and an inwardly curved spine on outer distal margin. Anterior margin of sternum of third thoracic somite protruded anteriorly at its middle.

Cheliped and ambulatory legs without epipods.

The largest male measures 5.5 mm, and the largest female 4.1 mm in carapace length.

Remarks. The specimens before us fall precisely into Henderson's diagnosis, only apart from the arrangement of the transverse ridges on the posterior part of the carapace. In 1902, Benedict described *G. integra* from Honshu, Japan, but he did not compare with *G. pusilla* to which his species was closely allied. From their papers we can not find any different character between these two species.

This species is very similar to *G. serrirostris* Melin and *G. ikedai* Miyake and Baba, the third maxillipeds of which are quite unique in shape and arranged in similar manner to this species. This can, however, be easily distinguished from them by the number of gastric spines and by the shape of the sternum of the third thoracic somite.

Grant and McCulloch (1906) recorded for this species from Port Curtis, Queensland and mentioned that some of their specimens had one pair of gastric spines. On five specimens examined here, it was proved that the number of gastric spines were fairly constant. The specimens which were described by Grant and McCulloch as having a single pair of gastric spines may be perhaps referable to *G. serrirostris* or another. But the final determination is to be based upon the shape of the sternum of the third thoracic somite.

Distribution. Japanese waters from Tsugaru Strait to Tanegashima, New South Wales coast and Western Indian Ocean in depths of 71 to 307 m.

Galathea rubromaculata sp. nov.

(Figs. 7, 8)

Type. Holotype, male, No. 8744, ZLKU; 32°24.8' N, 129°24.7' E; 173 m deep; Oct. 24, 1962.

Carapace as long as broad, excluding rostrum. Cervical groove not distinct. No spines on gastric region. Lateral margin of carapace armed on each side with six teeth, one in front of cervical groove and the

other five behind it.

Rostrum about as long as broad, and armed with four teeth on each side; dorsal surface not pubescent.

Outer orbital angle not pyramidal, but forming a spine directing rather outwards. No spines behind the insertion of antenna.

Basal segment of antennule armed with three spines at its distal margin. Anterior prolongation of first segment of antenna three times the breadth of second segment; the second segment armed with an inner distal marginal and an outer distal marginal spine; third segment with an inner distal marginal spine.

Ischium of third maxilliped nearly as long as merus; the latter with two strongly developed spines on inner margin, and its outer margin with two minute spines; carpus smooth on outer margin.

Cheliped rather large but short, attaining twice the length of carapace; movable finger equal to wrist in length, and shorter than palm; palm three-fifths as broad as long weakly spined on outer and inner margins, its dorsal surface scarcely spinose, but furnished with short setae; wrist with spines and spinules on both margins and on dorsal surface; the three inner marginal spines strong, its middle one being the largest; arm rather short with three large inner marginal spines, two or three dorsal spines and a series of spines or spinules on outer margin; its distal margin armed with two spines of rather large size dorsally. Ambulatory legs not remain. Sternum of third thoracic somite oblong.

Chelipeds and ambulatory legs lacking epipods.

Colour in formalin. Eleven red blotches placed on carapace as will be well understood with reference to the accompanying figure. One pair of red blotches situated on lateral sides of second abdominal segment, but the third segment with a single red blotch on the left. Four red blotches also arranged in a longitudinal row on pterygostomial flap.

Measurements in holotype (in mm):

Length of carapace including rostrum	7.0
Breadth of carapace	4.8
Length of rostrum	2.0

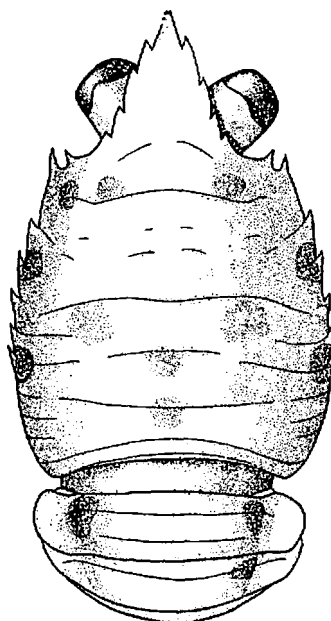


Fig. 7. *Galathea rubromaculata*
sp. nov., holotype, male,
in dorsal view, $\times 8.3$.

Breadth of rostrum	1.8
Length of cheliped	15.6
Length of wrist	2.8
Length of palm	3.6
Breadth of palm	2.2
Length of movable finger	3.3

Remarks. This species is similar to *G. platycheles* Miyake from which it is distinguished by the coloration and by lacking epipods on chelipeds.

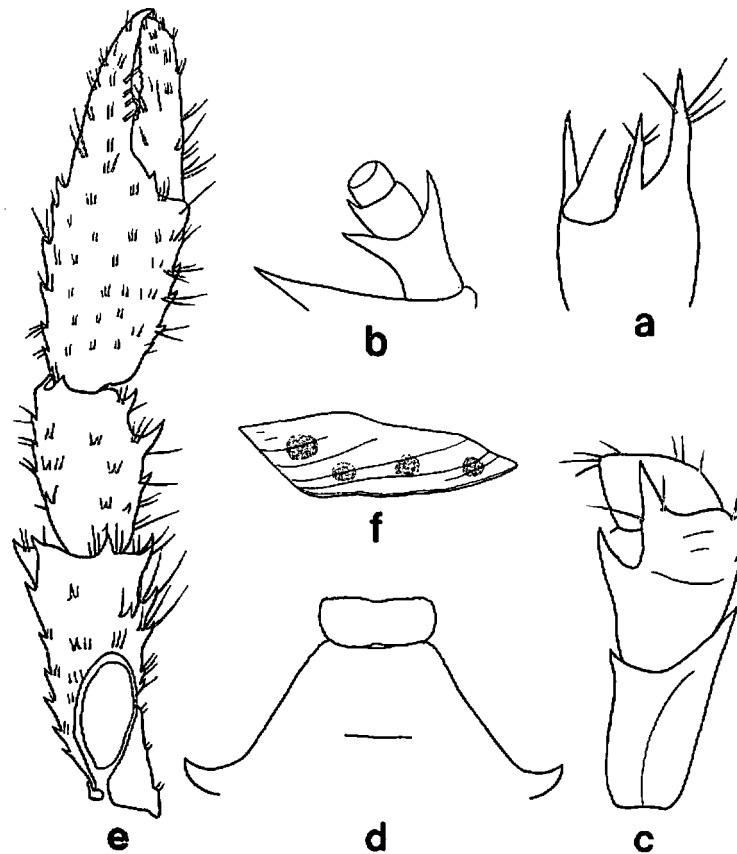


Fig. 8. *Galathea rubromaculata* sp. nov.

a, Basal segment of left antennule, $\times 22$; b, left antennal peduncle, $\times 22$; c, endopod of left third maxilliped, $\times 22$; d, anterior part of sternal segments, $\times 22$; e, left cheliped, $\times 7.8$; f, left pterygostomial flap, $\times 7.8$.

Galathea yamashitai sp. nov.

(Figs. 9, 10)

Types. Holotype, male, ZLKU No. 9661; paratype, one ovigerous female, ZLKU No. 9662; 31°31.7' N, 127°27.4' E; 128 m deep; June 9, 1962.

Rostrum longer than twice its breadth; lateral margin armed on each side with four teeth, the basal one rather large; dorsal surface scali-form.

Outer orbital angle slightly spinulate. Carapace armed with two spines in front of cervical groove, one of them very small and slightly dorsal in position. Behind cervical groove lateral margin armed with five spines. Eight transverse striae present in front of cervical groove, and six unbroken striae behind it. Two spines on gastric region.

Basal segment of antennular peduncle armed on its distal margin with three spines, one of them at inner side very short and thin; its surface ornamented with striae provided with fringes of fine setae. Antennal peduncle setose. Anterior prolongation of first segment of antenna short, its length equal to the breadth of second segment; second segment armed with two spines on distal margin, and the third segment with a single spine.

Ischium of third maxilliped longer than merus, bearing a minute spine on each of the inner distal and outer distal margin; merus armed on its inner margin with two spines, the distal one minute but the proximal strongly developed; utero margin of merus with three spines; carpus having outer margin almost smooth, furnished with three obscure eminences. Chelipeds and ambulatory legs wanting in both types. Pterygostomial flap without spines on upper surface.

Chelipeds and ambulatory legs without epipods.

Measurements in holotype (in mm) :

Length of carapace including rostrum	6.1
Breadth of carapace	3.7
Length of rostrum	2.4

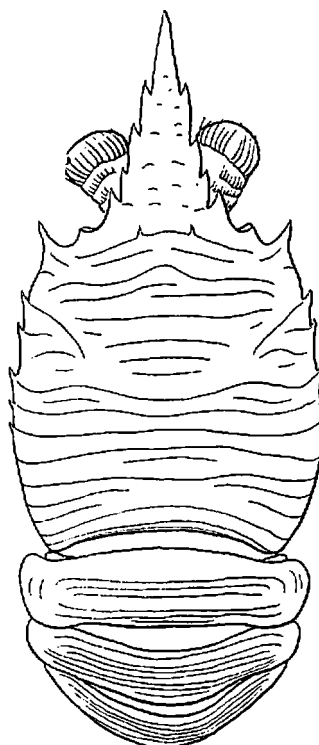


Fig. 9. *Galathea yamashitai* sp. nov., holotype, male, in dorsal view, $\times 12$.

Breadth of rostrum 1.0

Remarks. This species is closely allied to *G. orientalis* Stimpson in the armature of the lateral margin of the carapace, from which it differs in the following respects. (1) The pterygostomial flap has no spine on the upper surface. (2) The carapace bears many striae on the dorsal surface. (3) The cheliped has no epipod.

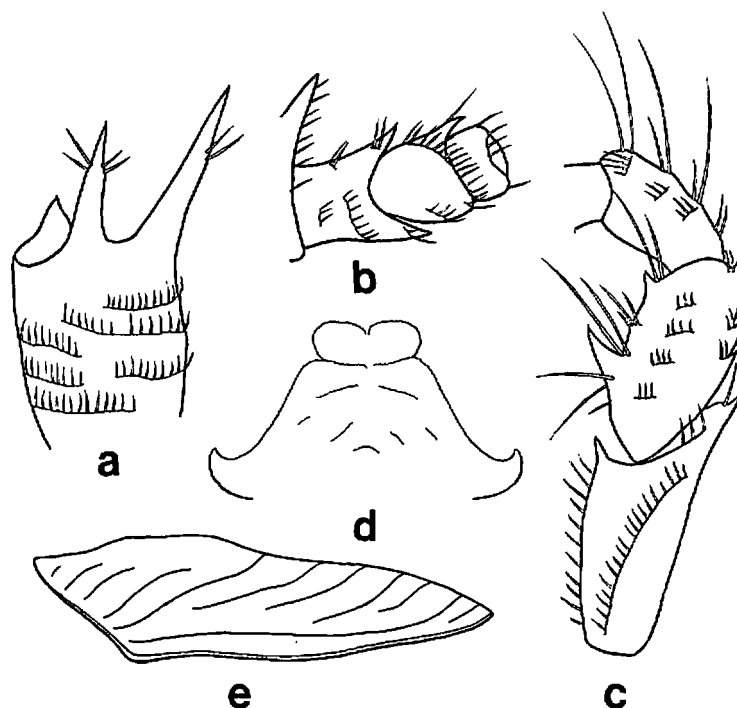


Fig. 10. *Galathea yamashitai* sp. nov., holotype.

a, Basal segment of left antennule, $\times 35$; b, left antennal peduncle, $\times 35$; c, endopod of left third maxilliped, $\times 35$; d, anterior part of sternal segments, $\times 24$; e, left pterygostomial flap, $\times 17$.

Genus *Munida* Leach, 1820

Munida japonica Stimpson, 1858

(Figs. 11, 12)

Munida japonica Stimpson, 1858, p. 252 (Type locality: Kagoshima Bay, Japan); —1907, p. 235; Miers, 1879, p. 51; Ortmann, 1892, p. 254, pl. 11, figs. 11i, k; Doflein, 1902, p. 644; Balss, 1915, p. 3; Parisi, 1917, p. 1; Laurie, 1926, p. 135; Yokoya, 1933, p. 58; Melin, 1939,

- p. 85, figs. 54-57; Nakazawa and Miyake, 1947,* p. 733, fig. 2119;
 Miyake, 1965, p. 635, fig. 1046; Makarov, 1962, p. 96, fig. 35.
Munida japonica typica Balss, 1913, p. 15, fig. 14; Kikuchi, 1932, p. 7;
 —1959, p. 50.
Munida honshuensis Benedict, 1902, p. 261, fig. 11.
Munida sp. Nakazawa, 1927, p. 1036, fig. 1994.
Munida japonica japonica Yanagita, 1943, p. 24, fig. 7a-d.

Material examined.

One female, ZLKU No. 10678; 27°14.5' N, 124°45.0' E; 98 m deep; June 12, 1962.

One male, ZLKU No. 10677; 28°32.0' N, 126°18.8' E; 115 m deep; June 13, 1962.

Two males, ZLKU No. 10784; 31°09.5' N, 127°16.0' E; 111 m deep; Mar. 26, 1964.

Seventeen males, eleven ovigerous females and seven females, ZLKU No. 10679; 31°29.2' N, 130°01.5' E; 196 m deep; June 13, 1964.

One male, ZLKU No. 10676; 31°29.7' N, 128°01.3' E; 146 m deep; June 14, 1964.

Thirty eight males, thirty two ovigerous females and seven females, ZLKU No. 10786; 32°24.8' N, 129°24.7' E; 173 m deep; Oct. 24, 1962.

One male and one ovigerous female, ZLKU No. 10782; 32°36.7' N, 127°42.8' E; 145 m deep; June 17, 1964.

Ten males, nine ovigerous females and eight females, ZLKU No. 10806; 33°09.2' N, 128°01.4' E; 158 m deep; June 18, 1964.

Two males and two ovigerous females, ZLKU No. 10635; 33°23.4' N, 129°03.9' E; 100 m deep; June 18, 1964.

Twenty nine males, twenty six ovigerous females and six females, ZLKU No. 10641; 33°34.9' N, 128°25.2' E; 120 m deep; June 18, 1964.

Five males, two ovigerous females and two females, ZLKU No. 10771; 33°59.4' N, 128°48.0' E; 102 m deep; June 19, 1964.

Fifteen males, nine ovigerous females and two females. ZLKU No. 10637; 34°00.7' N, 129°19.4' E; 110 m deep; June 20, 1964.

Remarks. The species has been discussed as having considerable variations. As Balss (1913) and Yanagita (1943) say, this species is variable particularly in the length of the rostrum and in the number of spines on the abdominal segment. However, it is decidedly clear that the merus of the third maxilliped has a spine on the outer distal margin. Yanagita mentioned that the distinctly separatable character of the two, *M. japonica japonica* and *M. japonica heteracantha*, is "the spine on the outer margin of the merus of the third maxilliped," which is wanting in the latter. Our observations quite agree with the Yanagita's, however, it is a question that the two forms *japonica* and *heteracantha*

* See Miyake (1947).

are treated at the level of subspecies.

On the other hand, this species is usually furnished with no striae on the first abdominal segment and on the thoracic sternum, but to be of great interest to us, it was observed that some of the specimens, 9 in number, have many striae on them. This character is rather distinct in the specimens from the East China Sea, but some from the Tosa Bay deposited in our laboratory show a transitional or intermediate form. It was therefore thought advisable that the striated character on the first abdominal segment and sternal segments is to be treated as a variation.

Distribution. This is known from the Japanese waters from the Sagami Bay to Tanegashima including the Sea of Japan, the Bonin Islands, Red Sea and Mauritius. The bathymetric range is from 30 to 500 m.

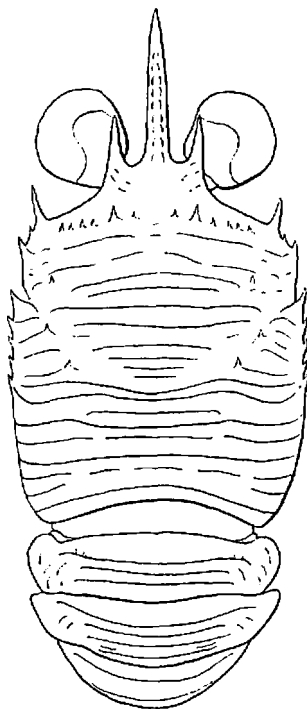


Fig. 11. *Munida japonica* Stimpson, in dorsal view, $\times 9.7$.

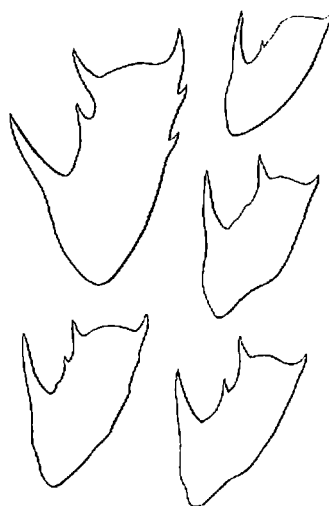


Fig. 12. *Munida japonica* Stimpson, showing variations of the shape of merus of third maxilliped.

Munida scabra Henderson, 1885

(Fig. 13)

Munida scabra Henderson, 1885, p. 409 (Type locality: off Kai Island);
—1888, p. 134, pl. 15, figs. 4, 4a, b; Yokoya, 1933, p. 63; Yanagita,
1943, p. 30, figs. 9, 10a-c.

Material examined.

Three males, one ovigerous female and two females, ZLKU No. 10919; 31°29.7' N, 128°01.3' E; 146 m deep; June 14, 1964.

One male and three females, ZLKU No. 10838; 32°36.7' N, 127°42.8' E; 145 m deep; June 17, 1964.

Thirteen males, five ovigerous females and fourteen females, ZLKU No. 10843; 158 m deep; June 18, 1964.

One ovigerous female, ZLKU No. 10837; 33°23.4' N, 129°03.9' E; 100 m deep; June 18, 1964.

Three males, one ovigerous female and three females, ZLKU No. 10912; 33°34.9' N, 128°25.2' E; 120 m deep; June 18, 1964.

Fifteen males, seven ovigerous females and fifteen females, ZLKU No. 10875; 33°59.4' N, 128°48.0' E; 102 m deep; June 19, 1964.

One female, ZLKU No. 10842; 34°00.7' N, 129°19.4' E; 110 m deep; June 20, 1964.

Two males, ZLKU No. 10833; 34°19.0' N, 129°05.4' E; 150 m deep; June 19, 1964.

One ovigerous female and one female, ZLKU No. 10835; 34°25.3' N, 129°05.4' E; 150 m deep; June 19, 1964.

Remarks. It is a remarkable character that the rostrum is short and the dorsal surface of the carapace is setose. In addition, it seems to be an interesting subject that in this species the ischium of the third maxilliped is rather thin in comparison with that of *M. japonica*.

The largest male measures 10.5 mm and the largest ovigerous female 11.0 mm in carapace length.

Distribution. Known from the Kai Islands and Japanese waters in depths of 106 to 393 m.

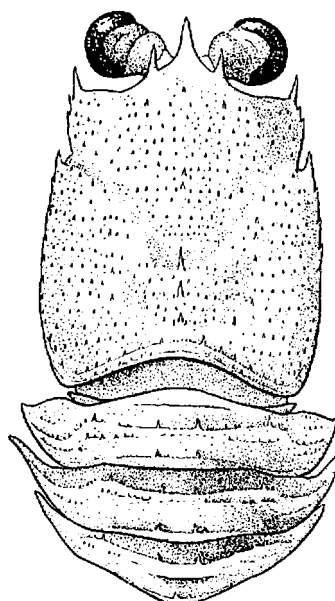


Fig. 13. *Munida scabra* Henderson, in dorsal view, $\times 5$.

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* Illustrations of 25 species are inherited from Nakazawa (1927).

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