The Fauna of Akkeshi Bay
XIII. Caprellidea[1]

By

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(*With 11 Textfigures*)

Some years ago a small but important collection of caprellids from Hokkaido and other Japanese localities was generously entrusted to me for study by Mr. Masao Iwasa then an assistant in the Zoological Institute of the Hokkaido Imperial University. The majority of the collection from Hokkaido came from Akkeshi, but some were from Muroran and Osyoro. Recently, I received another lot of caprellids from Mr. Shiro Okuda, of the Akkeshi Marine Biological Station, collected at the same locality. These collections contain eleven species including three new ones all of which belong to the commonest genus *Caprella*. Besides there are four species newly recorded from Japan.

The following is the list of the species contained in these collections:

1. *Caprella acutifrons* LATR. f. *neglecta* MAYER
2. *Caprella aino* sp. nov.
3. *Caprella bispinosa* MAYER
4. *Caprella* aff. *borealis* MAYER
5. *Caprella danilevskii* CZERNIAWSKI
6. *Caprella drepanochir* MAYER
7. *Caprella laeviuscula* MAYER
8. *Caprella obtusifrons* sp. nov.
9. *Caprella paulina* MAYER
10. *Caprella septentrionalis* KRÖYER
11. *Caprella venusta* UTINOMI (sp. nov.)

Before going further, I wish here to express my hearty thanks to Prof. Tohru Uchida, Director of the Akkeshi Marine Biological

1) Contributions from the Akkeshi Marine Biological Station, No. 39.

Station, and Messrs. Masao Iwasa and Shiro Okuda who have kindly placed the present material at my disposal.

Description of the Species

1. *Caprella acutifrons* LATREILLE f. *neglecta* MAYER

(Fig. 1)

This species is very common among the littoral algae all around the coast of Japan, especially in the temperate region. The forma

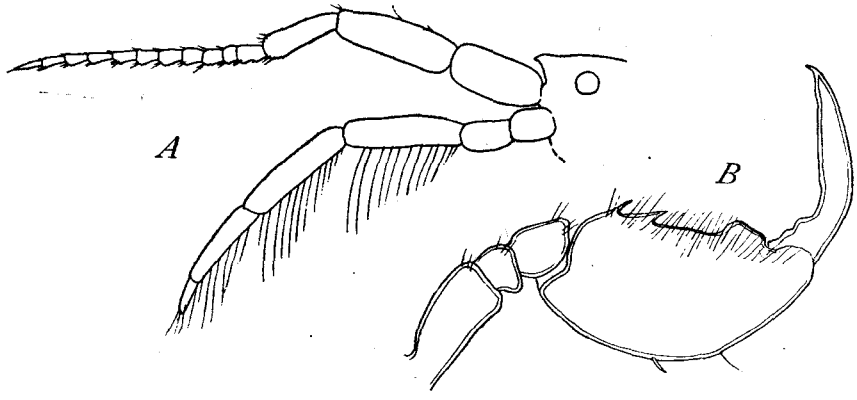

Fig. 1. *Caprella acutifrons* LAT. f. *neglecta* MAYER. *A*, antennae and head of ♂, ×25. *B*, gnathopod 2 of ♂, ×34.

neglecta is a typical littoral representative of caprellids in Japan and has been fully described. Of the materials from Osyoro one male has very plump antennae, with joints 1 + 2 of antenna 1 much longer than joints 1–4 of antenna 2. All other characters, however, are typical of f. *neglecta*. The peduncle of antenna 1 apparently has a tendency to become plump and considerably longer than antenna 2, in well-developed males, much as in many other species.

Locality: Osyoro. 8♂ 8♀. Coll. by M. Iwasa (May 31, 1934).

Distribution: All around coasts of Japan and Hongkong.

2. *Caprella aino* sp. nov.

(Fig. 2)

The single specimen from Muroran is somewhat allied to *Caprella imaii* Utinomi taken from Onagawa Bay on the northeastern coast

of Honsyû, but it differs from the latter in the armature of the body as well as in the structure of peraeopods.

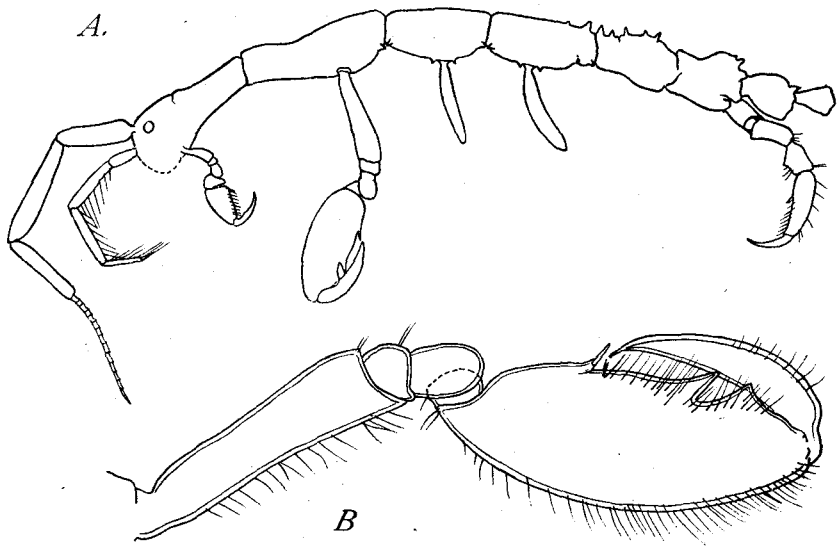

Fig. 2. *Caprella aino* sp. nov. *A*, ♂, ×10. *B*, gnathopod 2 of ♂, ×25.

♂. Body rather slender, 11 mm. long, nearly smooth, except in peraeon segments 4–7. Head smooth, eyes small. Peraeon segment 1 smooth, a little longer than head. Peraeon segment 2 twice as long as peraeon segment 1, and armed with a small tooth at posterior ventro-lateral corner. Peraeon segments 3–4 of subequal length, about two-thirds as long as segment 2, and provided each with a small tubercle on the front and hind ventro-lateral corners, and also with two smaller tubercles above the point of articulation of gills; hind end of back of segment 4 armed with two pairs of tubercles of which the posterior pair are larger than the anterior. Peraeon segment 5 a little shorter than segment 4, and with 5 pairs of small dorsal tubercles, of which the anterior two are separated by a transverse groove from the posterior three. Peraeon segments 6–7 robust, and with a pair of dorsal tubercles. Abdomen ordinary and like that of *Caprella acutifrons;* penes medial.

Antenna 1 longer than half of body length, peduncle somewhat plump, flagellum slightly longer than 2nd joint and 15-articulate. Antenna 2 as long as peduncle of antenna 1. Gnathopod 2 attached

a little behind the middle of peraeon segment 2; 2nd joint shorter than segment 2, elongate, straight, quadrate at its distal end; 4th joint with round end; hand oblong, nearly as long as stalk, tapering both proximally and distally, like that of *Caprella simia;* palm occupying two-thirds of hind margin, somewhat convex, with a strong large poison tooth at its centre separated by a deep notch from a triangularly projecting distal angle; palmar angle bearing a long submedial spine and somewhat produced downward; a pair of accessory spines present near palmar angle; claw falciform, sharply ended, underside smooth and without any proximal concavity. Gills long, narrow. In peraeopods 5–7, distal end of 2nd joint sharply pointed and submedial clasping spines on hand.

No female is represented.

Locality: Muroran. 1♂, on sea-weeds, together with *C. septentrionalis*. Coll. by M. Iwasa (Aug. 12, 1934).

3. *Caprella bispinosa* MAYER

(Fig. 3)

Caprella bispinosa, MAYER, 1890, p. 82; MAYER, 1903, p. 94.

This species is one of the commonest forms in the northern region of Japan, being found in great abundance on the coasts of Hokkaido and Karahuto.

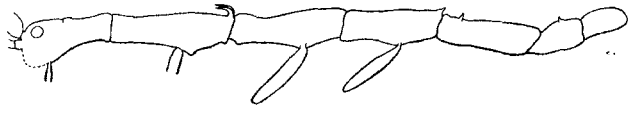

Fig. 3. *Caprella bispinosa* MAYER, ♂, ×3.

In fullgrown males more than 28 mm. in length, the armature of the dorsal projections, which characterizes the species, is sometimes hardly recognizable. All the dorsal projections become obsolete, except the single pair at the hind end of peraeon segment 2 which is slightly shortened. The hand of 2nd gnathopod is narrow, long, more than twice as long as wide, and bears a small poison tooth distally; the palm is straight and the palmar angle is somewhat proximal, projecting slightly, and bears a spine at its end; accessory

spines, one in male and two in female, are nearly obsolete in older specimens.

The dimensions of the largest specimens in the collection are as follows: (in mm.).

	H	P_1	P_2	P_3	P_4	P_5	P_6	P_7	A_1	A_2	G_2*
♂	1.2	1.3	3.5	3.1	2.8	2.4	1.2	0.9	8.4	3.1	3.8
♀	1.2	1.4	3.9	2.8	2.8	2.5	1.4	1.4	11.8	4.6	4.3

Localities: 1) Bessyakudomari, in Akkeshi Bay. Depth 4.5–5.4 m. Numerous ♂ ♀. Coll. by M. Iwasa (July 31, 1933).

2) Between Suehirozaki and Kozima, in Akkeshi Bay. Depth 5–7.5 m. 6 ♀. Coll. by M. Iwasa (July 30, 1933).

3) Osyoro. 2♂ 3♀. Coll. by M. Iwasa (May 31, 1934).

4) Taraika, Saghalien. 3♂ 7♀, on sea-weeds. Coll. by the late Sadae Takahasi (Aug., 1930).

Distribution: "Reise von China nach der Amurmündung", Wladywostok (Mayer), Mutu Bay (Utinomi).

4. *Caprella* aff. *borealis* MAYER

(Fig. 4)

Caprella acutifrons f. *borealis*, MAYER, 1903, p. 83.

♂. Body rather slender, tuberculated, and 8.3 mm. in length. Head with a blunt tooth curved slightly forward above the eye. Peraeon segment 1 twice as long as head, and slightly raised at both the fore and hind ends. Peraeon segment 2 broadened backward, much longer than peraeon segment 1, and provided dorsally with two pairs of tubercles, one a little behind the middle, and the other at the hind end, and laterally with a tubercle at fore and hind ends. Peraeon segment 3 shorter than segment 2, and provided with three pairs of dorsal tubercles arranged with similar intervals and with two ventro-lateral tubercles at the fore end and one tubercle at the hind end. Peraeon segment 4 as long as segment 3, abruptly constricted slightly in front of the hind end, and provided with four pairs of dorsal tubercles and several smaller lateral tubercles. Peraeon segment 5 shorter than segment 4, and provided with two

* Note: H—Head, P_{1-7}—Peraeon segments 1–7, A_{1-2}—Antennae 1–2, G_2—Gnathopod 2.

pairs of dorsal tubercles, and some smaller lateral ones, and also with a large triangular projection near the fore end on each side. Peraeon segments 6–7 diminishing in size backward and each with a pair of dorsal tubercles. Antenna 1 nearly one-third as long as

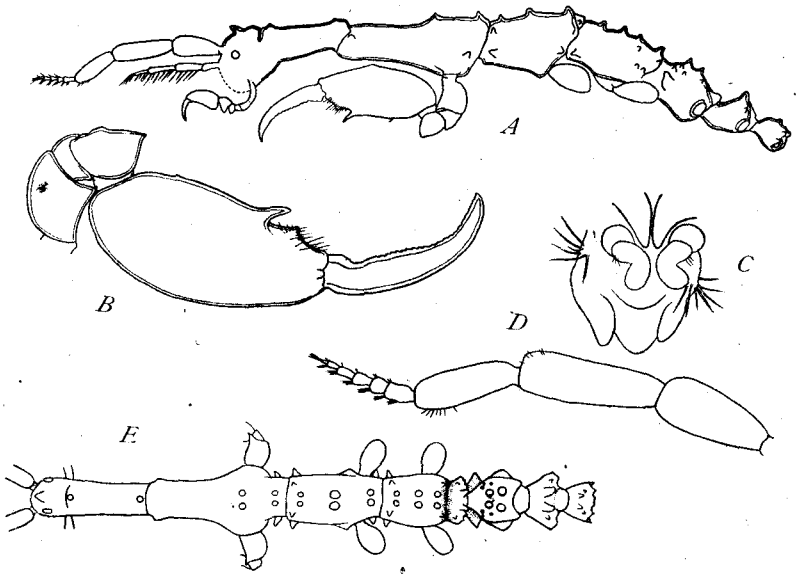

Fig. 4. *Caprella* aff. *borealis* MAYER. *A*, ♂, ×8. *B*, gnathopod 2 of ♂, ×20. *C*, abdomen of ♂, ×90. *D*, antenna 1, ×20. *E*, dorsal view of body, showing arrangement of tubercles, ×8.

body; three joints of peduncle very plump, flagellum slender, nearly as long as the preceding joint and 6-articulate. Antenna 2 slender, a little shorter than two basal joints of antenna 1. Gnathopod 2 attached slightly in front of the hind end of segment 2; 2nd joint very short, plump, a little longer than wide and somewhat quadrate distally; 4th joint produced downwards in a triangular prominence. Hand nearly half as wide as long, with evenly convex fore and hind margins, and much longer than stalk; poison tooth distal and strong; no other spine on hind margin, though with a slight trace of palmar angle somewhat proximally; distal angle sparsely setose, moderately projecting. Claw long, with indented inner margin. Gills small, oval and attached a little behind the middle of peraeon segments 3–4. In peraeopods 5–7, clasping spines of hand proximal, non-dentate; no spines on the distal end of 5th joint.

Abdomen like that of *C. laeviuscula*. Penes medial. 1st pleopod 2-jointed; basal joint rounded, short and nude, distal joint long, recurved outside from the centre.

The present specimen is closely allied to *Caprella acutifrons* f. *borealis* Mayer. Mayer referred his specimen from Kamtschatka to a variety of *C. acutifrons* and mentioned on the ground that "Durch die Form der Grossen Greifhand leitet sie zu *C. drepanochir* über, hat aber die für *acutifrons* typischen abgestuzten Dorne." However, I can not agree with him, because the shape of the head is quite different from that of *C. acutifrons*, and the body is not so plump as in the latter. In *C. acutifrons*, the frontal process above the head lies in front of the eye, so that the front is more angular and ends rather sharply, while in *borealis*, the dorsal projection is small, rather obtuse and placed above or behind the eye, as clearly shown in his figures (1903, Pl. III, Figs. 5–6). In this respect the form *borealis* seems to be more akin to *C. linearis* or *C. septentrionalis* than to *C. acutifrons*. The shape of gnathopod 2 is also very peculiar, and easily distinguishable from that of any forma of *C. acutifrons*. The armature of the dorsal tubercles arranged in pairs in peraeon segments 2–7 seems to be also characteristic, provided that the present specimen is identical with Mayer's. Accordingly I consider f. *borealis* to be a distinct species.

Locality: Between Barasan and Aikappu, in Akkeshi Bay. 1 ♂. Coll. by M. Iwasa (July 17, 1933).

Distribution: Lopatka and Copper Island, both eastern coast of Kamtschatka.

5. *Caprella danilevskii* CZERNIAWSKI

Localities: 1) Daikokuzima, off Akkeshi Bay. 1 ♂, on seaweed *Desmarestia ligulata*, together with *C. obtusifrons* n. sp. Coll. by M. Iwasa (July 22, 1933).

2) Akkeshi. 1 ♂. Coll. by S. Okuda (July, 1942).

Distribution: Almost cosmopolitan. In Japan, recorded from Korea Strait, Southern Saghalien (Mayer), Tateyama (Arimoto), Tanabe Bay, Onagawa, Mutu Bay (Utinomi).

6. *Caprella drepanochir* MAYER

(Figs. 5 & 6)

Caprella drepanochir, MAYER, 1890, p. 81; MAYER, 1903, p. 100.

♂. Length 13 mm. Body moderately plump, devoid of tubercle or spine; but the whole surface is covered with minute granules each surmounted with a sensory hair, such as seen in *Caprella kröyeri*. Head nearly as long as peraeon segment 1. Peraeon segments 2–5 subequal in length, and a little longer than head+peraeon segment 1, no trace of ventro-lateral tooth. Each of peraeon segments 6–7 about half as long as the preceding segment or less.

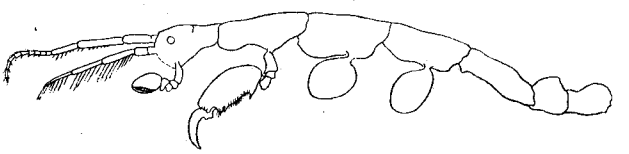

Fig. 5. *Caprella drepanochir* MAYER, ♂, ×10.

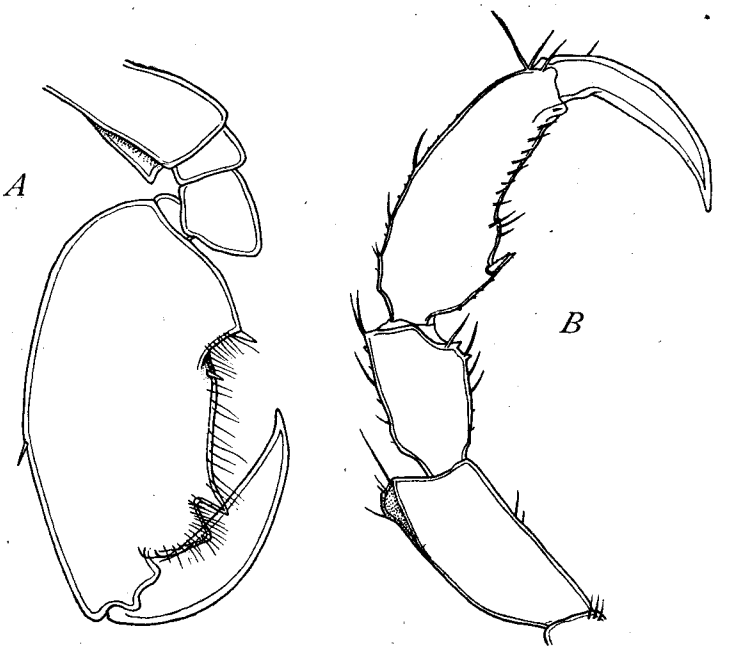

Fig. 6. *Caprella drepanochir* MAYER. *A*, gnathopod 2 of ♂, ×54. *B*, peraeopod 7 of ♂, ×34.

Antenna 1 nearly one-third as long as the body, or larger; its flagellum 10- to 14-jointed. Antenna 2 a little longer than peduncle of antenna 1. Gnathopod 2 articulated a little behind the middle

of peraeon segment 2 (in ♀ a little before the middle), with a short stalk; 2nd joint about twice as long as broad, broadening distally and projecting forward at its distal end; 3rd and 4th joints quadrate; hand oblong, twice as long as wide, fore and hind margins evenly convex, palmar angle bearing a strong proximal spine and broadly projecting backwards, an accessory spine present below proximal pocket of palm, poison tooth sharp, long and distal, distal angle triangularly produced; claw broad, with its inner margin nearly straight or slightly concave and not indented. Gills round to oval, attached a little behind the middle of peraeon segments 3–4. In peraeopods 5–7, hind margin of 5th joint armed with 3–4 teeth, and clasping spines proximal on hand.

Dimension of the largest male (in mm.):

A_1	A_2	H	P_1	P_2	P_3	P_4	P_5	P_6	P_7
4.6	3.0	0.9	1.0	2.3	2.1	2.0	1.8	1.0	0.8

Locality: Akkeshi Bay. Depth 1 m. 32♂ 9♀. Coll. by M. Iwasa (July 12, 1933).

Distribution: "Reise von China nach der Amurmündung, Kapt. Vollbarth," Wladywostok, Bering Island, Chamisso Port, Eschscholtz Bay (Alaska).

7. *Caprella laeviuscula* MAYER

(Fig. 7)

Caprella laeviuscula, MAYER, 1903, p. 109.

♂. Length 9.5 mm. Body nearly smooth, except for a ventrolateral tooth on each side situated at the fore end of peraeon segments 3–4. Suture between head and peraeon segment 1 indistinct. Peraeon segments 2–5 subequal in length, though slightly diminishing backwards in length. Antennae 1–2 short, moderately slender. Gnathopod 2 attached a little behind the middle of peraeon segment 2; 2nd joint about half as long as peraeon segment 2, cylindrical; hand with evenly convex front margin, poison tooth very large, strong, and medial in position, palmar angle bearing a spine submedially situated close to poison tooth, and slightly projecting; besides an accessory spine present at the base of poison tooth, distal angle of palm triangularly projecting, and separated by a deep and wide

median concavity from poison tooth; claw falciform, long, with indented inner margin. Gills oblong, about as long as 2nd joint of gnathopod 2. Peraeopods 5–7 relatively short, clasping spines of

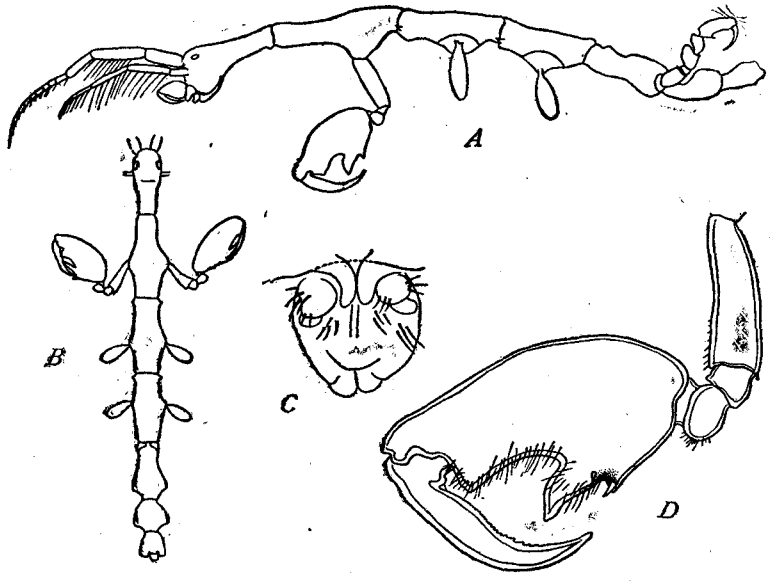

Fig. 7. *Caprella laeviuscula* MAYER. *A*, ♂, ×8. *B*, dorsal view of the same, ×5. *C*, abdomen of ♂, ×90. *D*, gnathopod 2, ×25.

palm submedial. Penes medial. Pleopod 12-jointed, distal one short, nude and curved to outsides. Pleopod 2 of a simple lobe, nude and medial.

Dimension in mm.:

A	A	H+P$_1$	P$_2$	P$_3$	P$_4$	P$_5$	P$_6$	P$_7$
4.0	2.0	1.5	2.0	1.7	1.6	1.2	0.7	0.6

Locality: Bessyakudomari, in Akkeshi Bay. Depth 4.5–5.4 m. 3♂, together with numerous specimens of *C. bispinosa*. Coll. by M. Iwasa (July 31, 1933).

Distribution: Pacific coast of North America, from California to Alaska.

8. *Caprella obtusifrons* sp. nov.

(Fig. 8)

♂, 8.5 mm. in length. Body resembles closely that of *Caprella acutifrons*, but is not so plump. Front of head angular or slightly

produced forward into a blunt tip; eyes small. Peraeon segment 1 a little shorter than head. Peraeon segments 2–3 smooth, the former a little shorter than the latter. Peraeon segment 4 almost

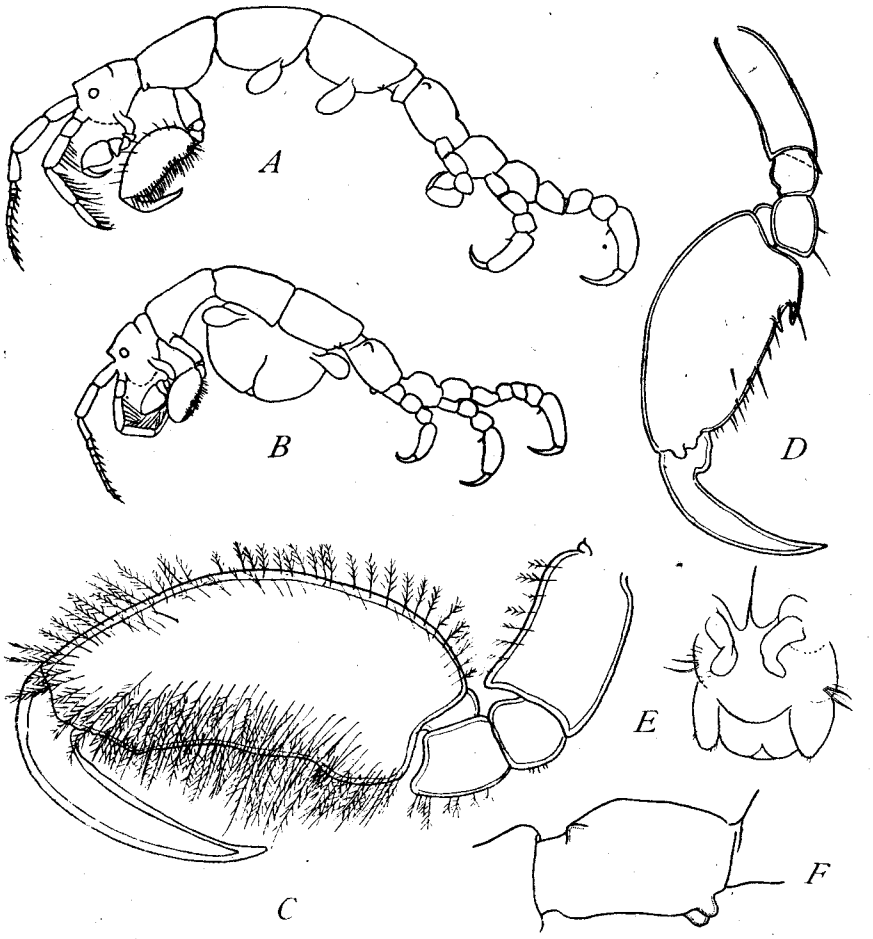

Fig. 8. *Caprella obtusifrons* **sp. nov.** *A*, ♂, ×10. *B*, ♀, ×10. *C*, gnathopod 2 of ♂, ×54. *D*, gnathopod 2 of ♀, ×34. *E*, abdomen of ♂, ×95. *F*, peraeon segment 5 of ♀, ×54.

smooth, with a minute ventro-lateral tooth at the hind end. Peraeon segment 5 deeply constricted in front, and armed on each side with a round tubercle near the front. Antenna 1 short; flagellum 9- to 10-jointed, two-thirds as long as peduncle. Antenna 2 a little shorter

than antenna 1 and with dentate setae on flagellum. Gnathopod 2 short, tomentous all over and attached to the middle of peraeon segment 2; 2nd joint quadrate in outline, broader than half of the length, and with slightly concave distal margin; hand densely covered with feathered hairs, hind margin (palm) slightly concave without any trace of poison tooth and clasping spine (young specimens, however, have distinct clasping spines), distal and proximal ends of palm evenly rounded; claw falciform, long, with a smooth inner margin. Gills oval, attached a little behind the middle of peraeon segments 3–4. Peraeopods 5–7 short, rather broad; front margin of 2nd joint armed with 4 minute teeth; 3rd joint very short; 5th joint with 3 minute teeth on distal margin of under surface; clasping spines on hand dentate and proximal in position. Abdomen of ordinary type; penes medial.

♀, 5.5 mm. in length. It differs from the male mainly in the following points:

Peraeon segment 1 much shorter than half of head. Gnathopod 2 attached near the fore end of peraeon segment 2 and slightly hairy; 2nd joint a little longer than twice of the breadth; palm slightly hairy, somewhat convex, or rather straight, proximally with a clasping spine on a slightly protruded palmar angle and sometimes with an accessory spine. Peraeon segment 5 provided with a pair of tubercles near the hind end of ventral surface. Marginal teeth on 2nd and 5th joints of peraeopods 5–7 indistinct.

In the general outline of the body, the present specimens appear to be most closely allied to *Caprella acutifrons*, especially in the shape of the head, gnathopod 2 and in the forms of peraeopods. The front of the head is, however, quadrate in outline, and not protruded forward. The gill is not so large and rounded as in *C. acutifrons*. Especially, the presence of ventral tubercles on peraeon segment 5 in the female is very peculiar, which feature is shared by *C. aequilibra, C. alaskana, C. acanthogaster, C. paulina, C. striata* etc. The absence of poison tooth, and in old males also of clasping spine on the hand of gnathopod 2 is also characteristic.

Localities: 1) Aikappu, in Akkeshi Bay, 21♂ 17♀, among sea-weeds. Coll. by M. Iwasa (July 19, 1932).

2) Daikokuzima, off Akkeshi Bay. 11♂ 11♀, on sea-weed, *Desmarestia ligulata*, together with *C. danilevskii*. Coll. by M. Iwasa (July 22, 1933).

9. *Caprella paulina* MAYER

(Fig. 9)

MAYER, 1903, p. 116.

♀, 9.4 mm. in length. Body long, rather robust, and provided with paired tubercles of various sizes all over the back; 2 small pairs on head, 2 minute pairs on peraeon segment 1, 3 large pairs on peraeon segment 2, 4 large pairs on peraeon segments 3–4, 3 large pairs on peraeon segment 5, 1 pair on peraeon segments 6–7. Of these tubercles, those placed just above the point of attachment of gnathopod 2 and gills are larger than the others, mushroom-like in shape and granular on the surface; tubercles on peraeon segments 5–7 are rather acutely pointed. Fore end of ventro-laterals of peraeon segment 3 sharply pointed forward. Peraeon segment 5 provided with a sharp projection on each side of the constricted part, and two obtuse ones on ventral surface near the hind end.

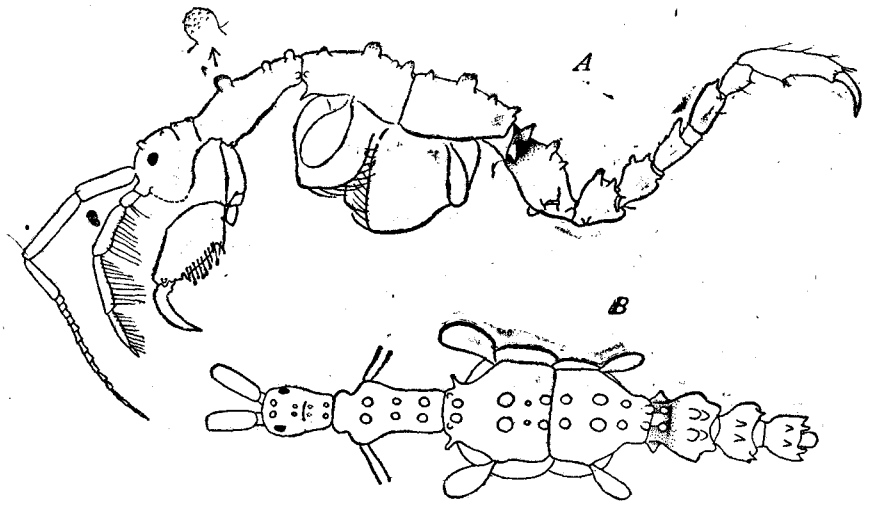

Fig. 9. *Caprella paulina* MAYER. *A*, lateral view of ♀, ×8. *B*, dorsal view of the same, ×8.

Flagellum of antenna 1 a trifle shorter than peduncle. Antenna 2 slightly longer than peduncle of antenna 1. Gnathopod 2 attached near the front end of peraeon segment 2; hand oblong, fore and hind margins evenly convex, a spiniferous palmar angle proximal, accessory tooth hardly visible, poison tooth small and distal; claw

falciform, with non-serrated inner margin. Gills oblong. Three pairs of posterior peraeopods comparatively slender and long; clasping spines on hand submedial.

According to Mayer, the tubercles on the body are considerably variable in number and size, so that it is rather hard to distinguish this species from *Caprella alaskana* and *C. constantina*, all of which inhabit the same region. He mentions that "vielleicht wird sogar später die eine oder andere von ihnen einzugehen haben." The present specimen closely resembles *C. paulina* (♀) shown in his Fig. 7 in Taf. 5. Although the tubercles are fewer in number, their peculiar shape is quite similar. It seems certain that the present specimen is distinct at least from either *C. alaskana* or *C. constantina*.

Locality: Between Barasan and Aikappu, in Akkeshi Bay. 1♀. Coll. by M. Iwasa (July 17, 1933).

Distribution: Alaska, Bering Sea, East coast of Kamtschatka.

10. *Caprella septentrionalis* KRÖYER

(Fig. 10)

MAYER, 1882, p. 62; MAYER, 1890, p. 65; MAYER, 1903, p. 120.

♀, 7.2 mm. in length. Body moderately slender, tuberculate on back. Head with a long, obtuse, prominence bent forward behind the eye. Peraeon segment 1 narrow, short, with a tubercle at the hind end. Peraeon segment 2 with two pairs of dorsal tubercles, one on the middle and one on the hind end. Peraeon segment 3 with a pair of dorsal tubercles on the middle. Peraeon segment 4 with two pairs of dorsal tubercles, one on the middle and one at the hind end, and with a ventro-lateral tooth at the hind corner. Peraeon segment 5 with two pairs of dorsal tubercles on the middle. Peraeon segments 6–7 with a pair of dorsal tubercles. Peraeon segments 2–5 subequal in length.

Antenna 1 shorter than half of the body length; flagellum shorter than peduncle, and composed of 14 joints. Antenna 2 slightly longer than peduncle of antenna 1. Gnathopod 2 attached near the fore end of peraeon segment 2; 2nd joint about half as long as peraeon segment 2; hand rather oval, with fore and hind margins evenly convex, a spine-bearing process of palmar angle proximally and a rudimentary poison tooth distally; distal angle of palm slightly

protuberant; claw long, not indented on inner margin. Gills small, oval and bent forward. Peraeopods 5–7 moderately narrow, short; clasping spines on palm proximal.

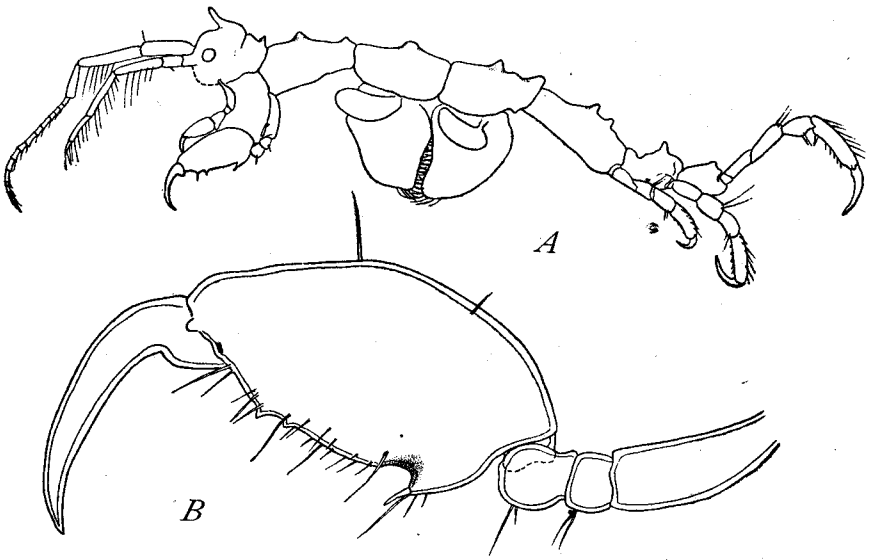

Fig. 10. *Caprella septentrionalis* KROYER. *A*, ♀, ×10. *B*, gnathopod 2 of ♀, ×34.

The single specimen in the present collection seems to be identical with *C. septentrionalis* Kröyer once recorded by Mayer from Tugaru Strait, but never rediscovered from the Pacific area ever since. Future investigation will make it clear its occurrence in the Northern Japan is merely due to an accidental immigrance.

Locality: Muroran. 1♀, on sea-weed, together with *Caprella aino* n. sp. Coll. by M. Iwasa (Aug. 11, 1934).

Distribution: North Atlantic, Schottland, White Sea and in the Pacific known from Tugaru Strait only.

11. *Caprella venusta* UTINOMI

(Fig. 11)

A single specimen found together with the above-mentioned *C. paulina* and *C. borealis*, conforms well with *C. venusta* which I have recently reported as a new species from Asamusi. Detailed descrip-

tion of this species is given in my report on the caprellids from Mutu Bay (Utinomi, 1943), so I shall give only some slight peculiarities relating to the present specimen.

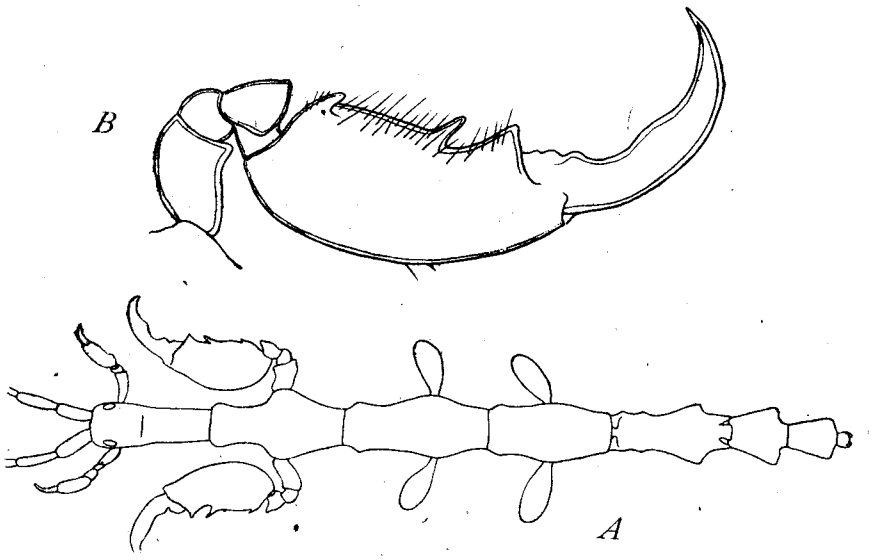

Fig. 11. *Caprella venusta* UTINOMI. *A*, ♂, ×34. *B*, gnathopod 2 of ♂, ×10.

Antenna 1 is comparatively short and bears a flagellum composed of 8–9 joints. Antenna 2 is about two-thirds as long as antenna 1. In gnathopod 2, the 2nd joint is very shorter and the palmar angle is proximal, moderately protruded, but does not carry any clasping spine.

Locality: Aikappu, in Akkeshi Bay. 1♂, together with *C. borealis* and *C. paulina*. Coll. by M. Iwasa (July 17, 1933).

Distribution: Asamusi.

Geographical Remarks

As mentioned in the preceding pages, 11 species of *Caprella* are known from the three localities of Hokkaido, including 3 new species (*C. aino, C. obtusifrons* and *C. venusta*) and 4 boreal species (*C. borealis, C. drepanochir, C. laeviuscula* and *C. paulina*) which have not been recorded from the Japanese waters. Of the remaining 4, 2 (*C. acutifrons* and *C. danilevskii*) are both cosmopolitan forms, and commonly found in the temperate waters of Japan, and the other

2 (*C. bispinosa* and *C. septentrionalis*) are hitherto known only in the colder waters in our territory. The present collection is thus very interesting from the faunistic view-point. To give a more detailed idea on the geographical distribution of the group, I give here a list of all the species known from Hokkaido, together with those from Onagawa and Mutu Bays, examined by myself.

Synopsis of the distribution of caprellids in Northern Japan

	Onagawa Bay	Mutu Bay	Akkesi Bay	Hokkaidô (beside Akkesi)	Karahuto	Further distribution
C. acanthogaster	+	+	.	+	.	Wladywostok, Japan Sea
C. acutifrons f. *neglecta* ..	+	+	.	+	.	Japan to S. China
C. acutifrons f. *verrucosa*	+	.	.	.	.	Japan, S. California
C. aino	.	.	.	+	.	——
C. bispinosa	.	+	+	+	+	Wladywostok, Japan Sea
C. borealis	.	.	+	.	.	E. Kamtschatka
C. danilevskii	+	+	+	.	+	Cosmopolitan
C. drepanochir	.	.	+	.	.	Japan Sea, Bering Sea
C. imaii	+	.	.	.	.	——
C. kröyeri	+	+	.	+	.	Japan south to Misaki, Wladywostok
C. laeviuscula	.	.	+	.	.	Alaska to California
C. obtusifrons	.	.	+	.	.	——
C. paulina	.	.	+	.	.	Alaska to Kamtschatka
C. scaura f. *diceros*	+	+	.	.	.	Japan
C. septentrionalis	.	.	.	+	.	N. Atlantic, Arctic
C. venusta	.	+	+	.	.	——
Total number of species..	7	7	8	6	2	

This list includes 8 boreal forms known only from the Northern Pacific area, except one *C. septentrionalis* once recorded from Tugaru Strait, but commonly occurring in the Northern Atlantic area. Aside from the 4 new species, the remaining 4, *C. acutifrons* f. *neglecta*, *C. acutifrons* f. *verrucosa*, *C. danilevskii*, *C. scaura* f. *diceros*, are widely distributed in the warm waters around the coasts of Japan. The caprellid fauna of Hokkaido and the northern part of Honsyu is thus rather poor, when compared with that of the waters of both Kamtschatka and Alaska. This is but natural, in view of the fact that Caprellas are rather the inhabitants in cold waters than warm waters. As might be well expected by the situation of the island, Hokkaido presents a mixed feature of the southern and northern elements in its caprellid fauna, and it is unlikely that many endemic forms are to be found there. Mayer (1903) has recorded the following 4 boreal species from Tugaru Strait (Tsugarstrasse, 41°N): *Cercops holbölli*, *Caprella chelimana*, *C. eximia* and *C. gracillima*, beside *C. scaura* and *C. septentrionalis* recorded in the present paper.

In this connection it is of some interest to note that the northern part of Honsyu is dominated by *C. acanthogaster* and *C. kröyeri*, while in Hokkaido and probably in Karahuto (Saghalien) *C. bispinosa* seems to be most predominate caprellid; *C. kröyeri* alone extends far southwards, though very scarce in quantity. It must also be taken into account that some caprellids are transported far from their native waters by human agency, by adhering to ships etc., as much the other Amphipoda. As such examples we can name *C. danilevskii*, *C. septentrionalis*, *C. linearis* (also probably, *Cercops holbölli* recorded by Mayer), whose occurrence in the Pacific is possibly due to migration from the Atlantic.

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The Fauna of Akkeshi Bay
XIII. Caprellidea[1]

By

Huzio Utinomi

(= Fujio Hiro)

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(*With 11 Textfigures*)

Some years ago a small but important collection of caprellids from Hokkaido and other Japanese localities was generously entrusted to me for study by Mr. Masao Iwasa then an assistant in the Zoological Institute of the Hokkaido Imperial University. The majority of the collection from Hokkaido came from Akkeshi, but some were from Muroran and Osyoro. Recently, I received another lot of caprellids from Mr. Shiro Okuda, of the Akkeshi Marine Biological Station, collected at the same locality. These collections contain eleven species including three new ones all of which belong to the commonest genus *Caprella*. Besides there are four species newly recorded from Japan.

The following is the list of the species contained in these collections:

1. *Caprella acutifrons* LATR. f. *neglecta* MAYER
2. *Caprella aino* sp. nov.
3. *Caprella bispinosa* MAYER
4. *Caprella* aff. *borealis* MAYER
5. *Caprella danilevskii* CZERNIAWSKI
6. *Caprella drepanochir* MAYER
7. *Caprella laeviuscula* MAYER
8. *Caprella obtusifrons* sp. nov.
9. *Caprella paulina* MAYER
10. *Caprella septentrionalis* KRÖYER
11. *Caprella venusta* UTINOMI (sp. nov.)

Before going further, I wish here to express my hearty thanks to Prof. Tohru Uchida, Director of the Akkeshi Marine Biological

1) Contributions from the Akkeshi Marine Biological Station, No. 39.

Station, and Messrs. Masao Iwasa and Shiro Okuda who have kindly placed the present material at my disposal.

Description of the Species

1. *Caprella acutifrons* LATREILLE f. *neglecta* MAYER

(Fig. 1)

This species is very common among the littoral algae all around the coast of Japan, especially in the temperate region. The forma

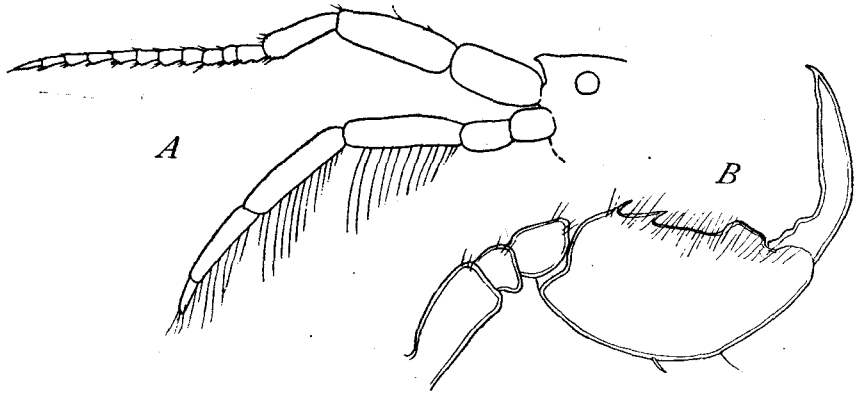

Fig. 1. *Caprella acutifrons* LAT. f. *neglecta* MAYER. *A*, antennae and head of ♂, ×25. *B*, gnathopod 2 of ♂, ×34.

neglecta is a typical littoral representative of caprellids in Japan and has been fully described. Of the materials from Osyoro one male has very plump antennae, with joints 1 + 2 of antenna 1 much longer than joints 1–4 of antenna 2. All other characters, however, are typical of f. *neglecta*. The peduncle of antenna 1 apparently has a tendency to become plump and considerably longer than antenna 2, in well-developed males, much as in many other species.

Locality: Osyoro. 8♂ 8♀. Coll. by M. Iwasa (May 31, 1934).

Distribution: All around coasts of Japan and Hongkong.

2. *Caprella aino* sp. nov.

(Fig. 2)

The single specimen from Muroran is somewhat allied to *Caprella imaii* Utinomi taken from Onagawa Bay on the northeastern coast

of Honsyû, but it differs from the latter in the armature of the body as well as in the structure of peraeopods.

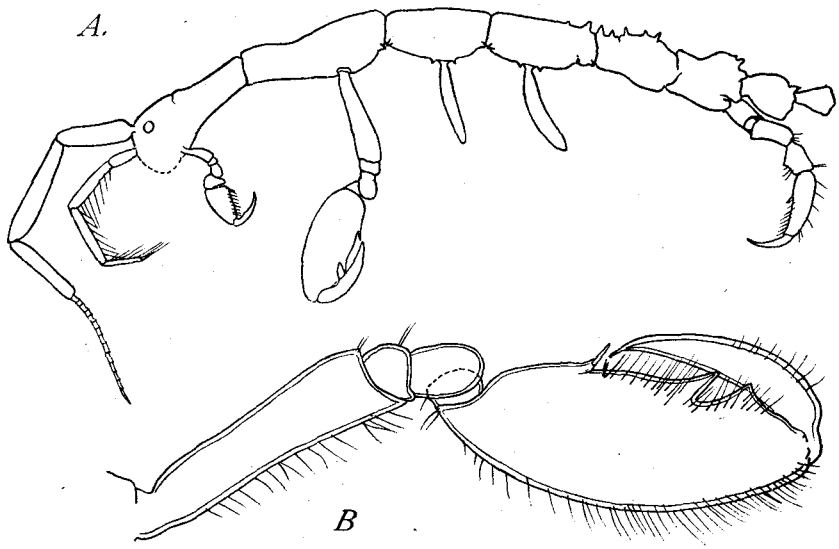

Fig. 2. *Caprella aino* sp. nov. *A*, ♂, ×10. *B*, gnathopod 2 of ♂, ×25.

♂. Body rather slender, 11 mm. long, nearly smooth, except in peraeon segments 4–7. Head smooth, eyes small. Peraeon segment 1 smooth, a little longer than head. Peraeon segment 2 twice as long as peraeon segment 1, and armed with a small tooth at posterior ventro-lateral corner. Peraeon segments 3–4 of subequal length, about two-thirds as long as segment 2, and provided each with a small tubercle on the front and hind ventro-lateral corners, and also with two smaller tubercles above the point of articulation of gills; hind end of back of segment 4 armed with two pairs of tubercles of which the posterior pair are larger than the anterior. Peraeon segment 5 a little shorter than segment 4, and with 5 pairs of small dorsal tubercles, of which the anterior two are separated by a transverse groove from the posterior three. Peraeon segments 6–7 robust, and with a pair of dorsal tubercles. Abdomen ordinary and like that of *Caprella acutifrons;* penes medial.

Antenna 1 longer than half of body length, peduncle somewhat plump, flagellum slightly longer than 2nd joint and 15-articulate. Antenna 2 as long as peduncle of antenna 1. Gnathopod 2 attached

a little behind the middle of peraeon segment 2; 2nd joint shorter than segment 2, elongate, straight, quadrate at its distal end; 4th joint with round end; hand oblong, nearly as long as stalk, tapering both proximally and distally, like that of *Caprella simia;* palm occupying two-thirds of hind margin, somewhat convex, with a strong large poison tooth at its centre separated by a deep notch from a triangularly projecting distal angle; palmar angle bearing a long submedial spine and somewhat produced downward; a pair of accessory spines present near palmar angle; claw falciform, sharply ended, underside smooth and without any proximal concavity. Gills long, narrow. In peraeopods 5–7, distal end of 2nd joint sharply pointed and submedial clasping spines on hand.

No female is represented.

Locality: Muroran. 1♂, on sea-weeds, together with *C. septentrionalis*. Coll. by M. Iwasa (Aug. 12, 1934).

3. *Caprella bispinosa* MAYER

(Fig. 3)

Caprella bispinosa, MAYER, 1890, p. 82; MAYER, 1903, p. 94.

This species is one of the commonest forms in the northern region of Japan, being found in great abundance on the coasts of Hokkaido and Karahuto.

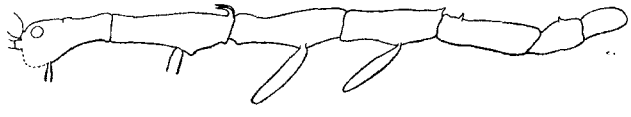

Fig. 3. *Caprella bispinosa* MAYER, ♂, ×3.

In fullgrown males more than 28 mm. in length, the armature of the dorsal projections, which characterizes the species, is sometimes hardly recognizable. All the dorsal projections become obsolete, except the single pair at the hind end of peraeon segment 2 which is slightly shortened. The hand of 2nd gnathopod is narrow, long, more than twice as long as wide, and bears a small poison tooth distally; the palm is straight and the palmar angle is somewhat proximal, projecting slightly, and bears a spine at its end; accessory

spines, one in male and two in female, are nearly obsolete in older specimens.

The dimensions of the largest specimens in the collection are as follows: (in mm.).

	H	P_1	P_2	P_3	P_4	P_5	P_6	P_7	A_1	A_2	G_2*
♂	1.2	1.3	3.5	3.1	2.8	2.4	1.2	0.9	8.4	3.1	3.8
♀	1.2	1.4	3.9	2.8	2.8	2.5	1.4	1.4	11.8	4.6	4.3

Localities: 1) Bessyakudomari, in Akkeshi Bay. Depth 4.5–5.4 m. Numerous ♂ ♀. Coll. by M. Iwasa (July 31, 1933).

2) Between Suehirozaki and Kozima, in Akkeshi Bay. Depth 5–7.5 m. 6 ♀. Coll. by M. Iwasa (July 30, 1933).

3) Osyoro. 2♂ 3♀. Coll. by M. Iwasa (May 31, 1934).

4) Taraika, Saghalien. 3♂ 7♀, on sea-weeds. Coll. by the late Sadae Takahasi (Aug., 1930).

Distribution: "Reise von China nach der Amurmündung", Wladywostok (Mayer), Mutu Bay (Utinomi).

4. *Caprella* aff. *borealis* MAYER

(Fig. 4)

Caprella acutifrons f. *borealis*, MAYER, 1903, p. 83.

♂. Body rather slender, tuberculated, and 8.3 mm. in length. Head with a blunt tooth curved slightly forward above the eye. Peraeon segment 1 twice as long as head, and slightly raised at both the fore and hind ends. Peraeon segment 2 broadened backward, much longer than peraeon segment 1, and provided dorsally with two pairs of tubercles, one a little behind the middle, and the other at the hind end, and laterally with a tubercle at fore and hind ends. Peraeon segment 3 shorter than segment 2, and provided with three pairs of dorsal tubercles arranged with similar intervals and with two ventro-lateral tubercles at the fore end and one tubercle at the hind end. Peraeon segment 4 as long as segment 3, abruptly constricted slightly in front of the hind end, and provided with four pairs of dorsal tubercles and several smaller lateral tubercles. Peraeon segment 5 shorter than segment 4, and provided with two

* Note: H—Head, P_{1-7}—Peraeon segments 1–7, A_{1-2}—Antennae 1–2, G_2—Gnathopod 2.

pairs of dorsal tubercles, and some smaller lateral ones, and also with a large triangular projection near the fore end on each side. Peraeon segments 6–7 diminishing in size backward and each with a pair of dorsal tubercles. Antenna 1 nearly one-third as long as

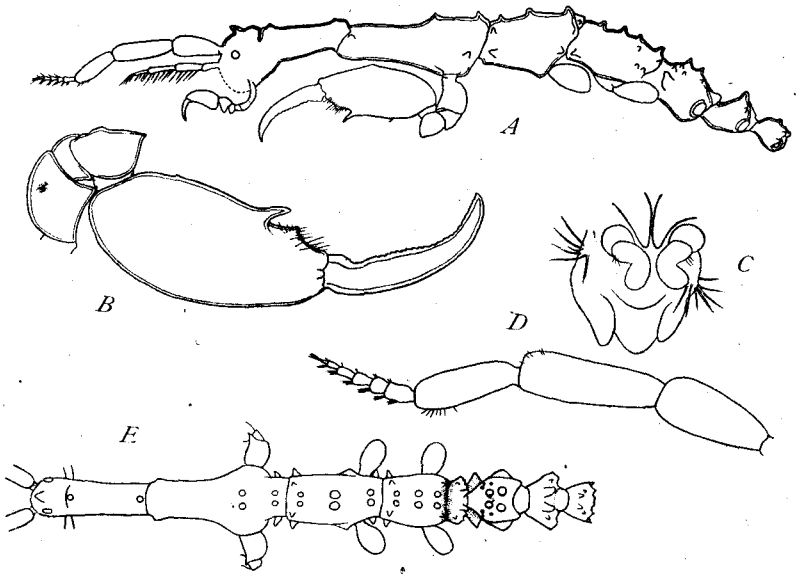

Fig. 4. *Caprella* aff. *borealis* MAYER. *A*, ♂, ×8. *B*, gnathopod 2 of ♂, ×20. *C*, abdomen of ♂, ×90. *D*, antenna 1, ×20. *E*, dorsal view of body, showing arrangement of tubercles, ×8.

body; three joints of peduncle very plump, flagellum slender, nearly as long as the preceding joint and 6-articulate. Antenna 2 slender, a little shorter than two basal joints of antenna 1. Gnathopod 2 attached slightly in front of the hind end of segment 2; 2nd joint very short, plump, a little longer than wide and somewhat quadrate distally; 4th joint produced downwards in a triangular prominence. Hand nearly half as wide as long, with evenly convex fore and hind margins, and much longer than stalk; poison tooth distal and strong; no other spine on hind margin, though with a slight trace of palmar angle somewhat proximally; distal angle sparsely setose, moderately projecting. Claw long, with indented inner margin. Gills small, oval and attached a little behind the middle of peraeon segments 3–4. In peraeopods 5–7, clasping spines of hand proximal, non-dentate; no spines on the distal end of 5th joint.

Abdomen like that of *C. laeviuscula*. Penes medial. 1st pleopod 2-jointed; basal joint rounded, short and nude, distal joint long, recurved outside from the centre.

The present specimen is closely allied to *Caprella acutifrons* f. *borealis* Mayer. Mayer referred his specimen from Kamtschatka to a variety of *C. acutifrons* and mentioned on the ground that "Durch die Form der Grossen Greifhand leitet sie zu *C. drepanochir* über, hat aber die für *acutifrons* typischen abgestuzten Dorne." However, I can not agree with him, because the shape of the head is quite different from that of *C. acutifrons*, and the body is not so plump as in the latter. In *C. acutifrons*, the frontal process above the head lies in front of the eye, so that the front is more angular and ends rather sharply, while in *borealis*, the dorsal projection is small, rather obtuse and placed above or behind the eye, as clearly shown in his figures (1903, Pl. III, Figs. 5–6). In this respect the form *borealis* seems to be more akin to *C. linearis* or *C. septentrionalis* than to *C. acutifrons*. The shape of gnathopod 2 is also very peculiar, and easily distinguishable from that of any forma of *C. acutifrons*. The armature of the dorsal tubercles arranged in pairs in peraeon segments 2–7 seems to be also characteristic, provided that the present specimen is identical with Mayer's. Accordingly I consider f. *borealis* to be a distinct species.

Locality: Between Barasan and Aikappu, in Akkeshi Bay. 1 ♂. Coll. by M. Iwasa (July 17, 1933).

Distribution: Lopatka and Copper Island, both eastern coast of Kamtschatka.

5. *Caprella danilevskii* CZERNIAWSKI

Localities: 1) Daikokuzima, off Akkeshi Bay. 1 ♂, on seaweed *Desmarestia ligulata*, together with *C. obtusifrons* n. sp. Coll. by M. Iwasa (July 22, 1933).

2) Akkeshi. 1 ♂. Coll. by S. Okuda (July, 1942).

Distribution: Almost cosmopolitan. In Japan, recorded from Korea Strait, Southern Saghalien (Mayer), Tateyama (Arimoto), Tanabe Bay, Onagawa, Mutu Bay (Utinomi).

6. *Caprella drepanochir* MAYER

(Figs. 5 & 6)

Caprella drepanochir, MAYER, 1890, p. 81; MAYER, 1903, p. 100.

♂. Length 13 mm. Body moderately plump, devoid of tubercle or spine; but the whole surface is covered with minute granules each surmounted with a sensory hair, such as seen in *Caprella kröyeri*. Head nearly as long as peraeon segment 1. Peraeon segments 2–5 subequal in length, and a little longer than head+peraeon segment 1, no trace of ventro-lateral tooth. Each of peraeon segments 6–7 about half as long as the preceding segment or less.

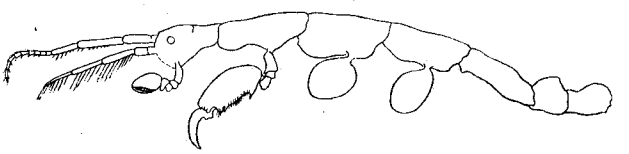

Fig. 5. *Caprella drepanochir* MAYER, ♂, ×10.

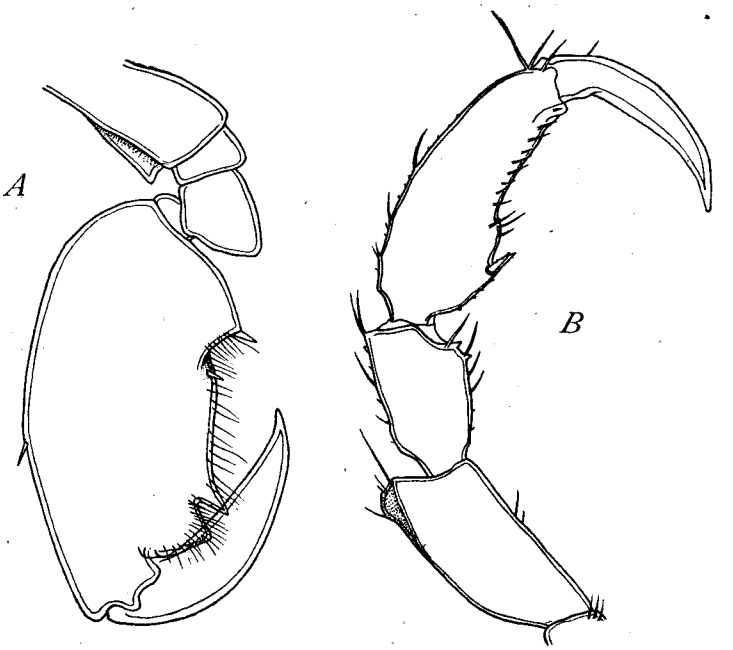

Fig. 6. *Caprella drepanochir* MAYER. *A*, gnathopod 2 of ♂, ×54. *B*, peraeopod 7 of ♂, ×34.

Antenna 1 nearly one-third as long as the body, or larger; its flagellum 10- to 14-jointed. Antenna 2 a little longer than peduncle of antenna 1. Gnathopod 2 articulated a little behind the middle

of peraeon segment 2 (in ♀ a little before the middle), with a short stalk; 2nd joint about twice as long as broad, broadening distally and projecting forward at its distal end; 3rd and 4th joints quadrate; hand oblong, twice as long as wide, fore and hind margins evenly convex, palmar angle bearing a strong proximal spine and broadly projecting backwards, an accessory spine present below proximal pocket of palm, poison tooth sharp, long and distal, distal angle triangularly produced; claw broad, with its inner margin nearly straight or slightly concave and not indented. Gills round to oval, attached a little behind the middle of peraeon segments 3–4. In peraeopods 5–7, hind margin of 5th joint armed with 3–4 teeth, and clasping spines proximal on hand.

Dimension of the largest male (in mm.):

A_1	A_2	H	P_1	P_2	P_3	P_4	P_5	P_6	P_7
4.6	3.0	0.9	1.0	2.3	2.1	2.0	1.8	1.0	0.8

Locality: Akkeshi Bay. Depth 1 m. 32♂ 9♀. Coll. by M. Iwasa (July 12, 1933).

Distribution: "Reise von China nach der Amurmündung, Kapt. Vollbarth," Wladywostok, Bering Island, Chamisso Port, Eschscholtz Bay (Alaska).

7. *Caprella laeviuscula* MAYER

(Fig. 7)

Caprella laeviuscula, MAYER, 1903, p. 109.

♂. Length 9.5 mm. Body nearly smooth, except for a ventrolateral tooth on each side situated at the fore end of peraeon segments 3–4. Suture between head and peraeon segment 1 indistinct. Peraeon segments 2–5 subequal in length, though slightly diminishing backwards in length. Antennae 1–2 short, moderately slender. Gnathopod 2 attached a little behind the middle of peraeon segment 2; 2nd joint about half as long as peraeon segment 2, cylindrical; hand with evenly convex front margin, poison tooth very large, strong, and medial in position, palmar angle bearing a spine submedially situated close to poison tooth, and slightly projecting; besides an accessory spine present at the base of poison tooth, distal angle of palm triangularly projecting, and separated by a deep and wide

median concavity from poison tooth; claw falciform, long, with indented inner margin. Gills oblong, about as long as 2nd joint of gnathopod 2. Peraeopods 5–7 relatively short, clasping spines of

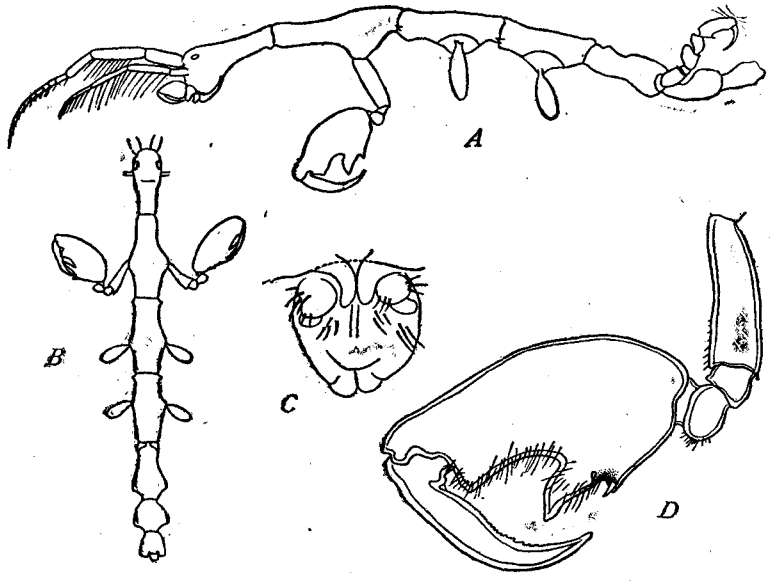

Fig. 7. *Caprella laeviuscula* MAYER. *A*, ♂, ×8. *B*, dorsal view of the same, ×5. *C*, abdomen of ♂, ×90. *D*, gnathopod 2, ×25.

palm submedial. Penes medial. Pleopod 12-jointed, distal one short, nude and curved to outsides. Pleopod 2 of a simple lobe, nude and medial.

Dimension in mm.:

A	A	H+P$_1$	P$_2$	P$_3$	P$_4$	P$_5$	P$_6$	P$_7$
4.0	2.0	1.5	2.0	1.7	1.6	1.2	0.7	0.6

Locality: Bessyakudomari, in Akkeshi Bay. Depth 4.5–5.4 m. 3♂, together with numerous specimens of *C. bispinosa*. Coll. by M. Iwasa (July 31, 1933).

Distribution: Pacific coast of North America, from California to Alaska.

8. *Caprella obtusifrons* sp. nov.

(Fig. 8)

♂, 8.5 mm. in length. Body resembles closely that of *Caprella acutifrons*, but is not so plump. Front of head angular or slightly

produced forward into a blunt tip; eyes small. Peraeon segment 1 a little shorter than head. Peraeon segments 2–3 smooth, the former a little shorter than the latter. Peraeon segment 4 almost

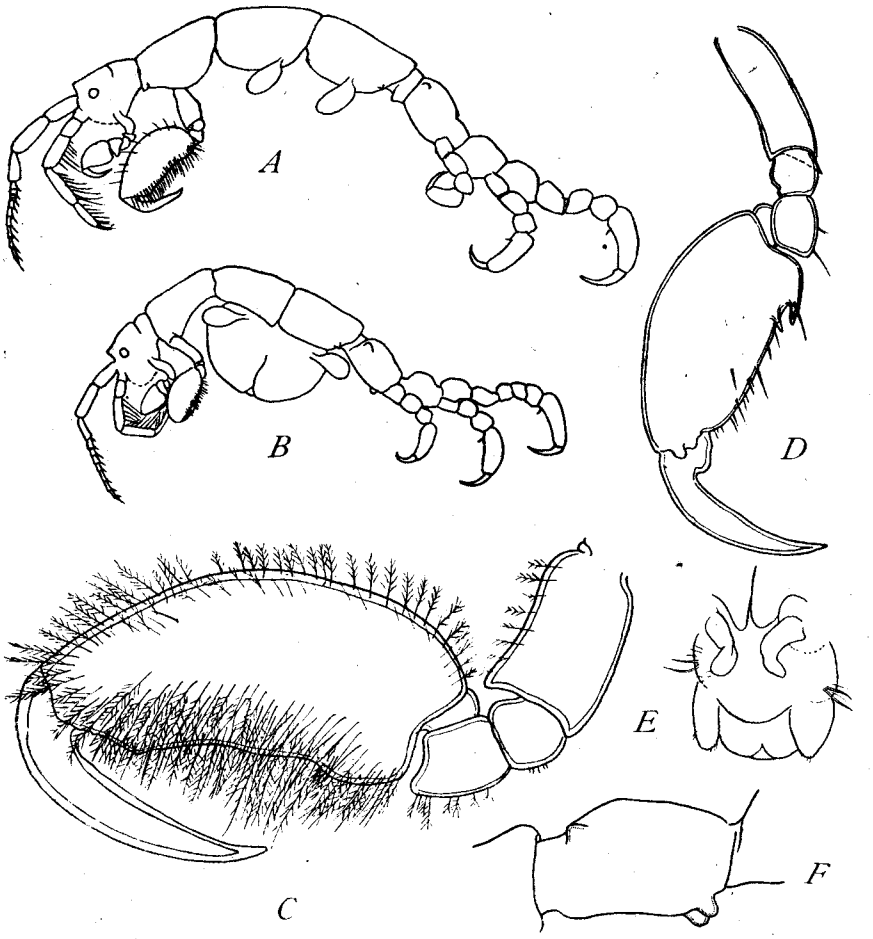

Fig. 8. *Caprella obtusifrons* **sp. nov.** *A*, ♂, ×10. *B*, ♀, ×10. *C*, gnathopod 2 of ♂, ×54. *D*, gnathopod 2 of ♀, ×34. *E*, abdomen of ♂, ×95. *F*, peraeon segment 5 of ♀, ×54.

smooth, with a minute ventro-lateral tooth at the hind end. Peraeon segment 5 deeply constricted in front, and armed on each side with a round tubercle near the front. Antenna 1 short; flagellum 9- to 10-jointed, two-thirds as long as peduncle. Antenna 2 a little shorter

than antenna 1 and with dentate setae on flagellum. Gnathopod 2 short, tomentous all over and attached to the middle of peraeon segment 2; 2nd joint quadrate in outline, broader than half of the length, and with slightly concave distal margin; hand densely covered with feathered hairs, hind margin (palm) slightly concave without any trace of poison tooth and clasping spine (young specimens, however, have distinct clasping spines), distal and proximal ends of palm evenly rounded; claw falciform, long, with a smooth inner margin. Gills oval, attached a little behind the middle of peraeon segments 3–4. Peraeopods 5–7 short, rather broad; front margin of 2nd joint armed with 4 minute teeth; 3rd joint very short; 5th joint with 3 minute teeth on distal margin of under surface; clasping spines on hand dentate and proximal in position. Abdomen of ordinary type; penes medial.

♀, 5.5 mm. in length. It differs from the male mainly in the following points:

Peraeon segment 1 much shorter than half of head. Gnathopod 2 attached near the fore end of peraeon segment 2 and slightly hairy; 2nd joint a little longer than twice of the breadth; palm slightly hairy, somewhat convex, or rather straight, proximally with a clasping spine on a slightly protruded palmar angle and sometimes with an accessory spine. Peraeon segment 5 provided with a pair of tubercles near the hind end of ventral surface. Marginal teeth on 2nd and 5th joints of peraeopods 5–7 indistinct.

In the general outline of the body, the present specimens appear to be most closely allied to *Caprella acutifrons*, especially in the shape of the head, gnathopod 2 and in the forms of peraeopods. The front of the head is, however, quadrate in outline, and not protruded forward. The gill is not so large and rounded as in *C. acutifrons*. Especially, the presence of ventral tubercles on peraeon segment 5 in the female is very peculiar, which feature is shared by *C. aequilibra, C. alaskana, C. acanthogaster, C. paulina, C. striata* etc. The absence of poison tooth, and in old males also of clasping spine on the hand of gnathopod 2 is also characteristic.

Localities: 1) Aikappu, in Akkeshi Bay, 21♂ 17♀, among sea-weeds. Coll. by M. Iwasa (July 19, 1932).

2) Daikokuzima, off Akkeshi Bay. 11♂ 11♀, on sea-weed, *Desmarestia ligulata*, together with *C. danilevskii*. Coll. by M. Iwasa (July 22, 1933).

9. *Caprella paulina* MAYER

(Fig. 9)

MAYER, 1903, p. 116.

♀, 9.4 mm. in length. Body long, rather robust, and provided with paired tubercles of various sizes all over the back; 2 small pairs on head, 2 minute pairs on peraeon segment 1, 3 large pairs on peraeon segment 2, 4 large pairs on peraeon segments 3–4, 3 large pairs on peraeon segment 5, 1 pair on peraeon segments 6–7. Of these tubercles, those placed just above the point of attachment of gnathopod 2 and gills are larger than the others, mushroom-like in shape and granular on the surface; tubercles on peraeon segments 5–7 are rather acutely pointed. Fore end of ventro-laterals of peraeon segment 3 sharply pointed forward. Peraeon segment 5 provided with a sharp projection on each side of the constricted part, and two obtuse ones on ventral surface near the hind end.

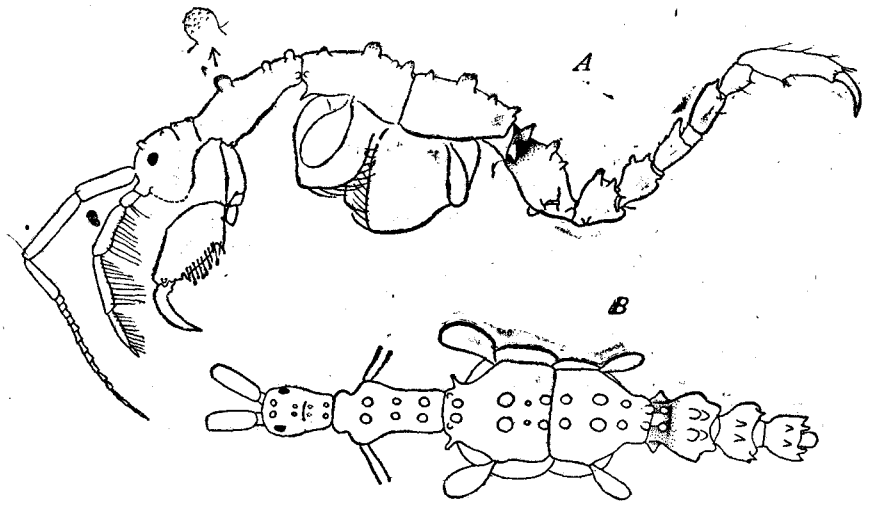

Fig. 9. *Caprella paulina* MAYER. *A*, lateral view of ♀, ×8. *B*, dorsal view of the same, ×8.

Flagellum of antenna 1 a trifle shorter than peduncle. Antenna 2 slightly longer than peduncle of antenna 1. Gnathopod 2 attached near the front end of peraeon segment 2; hand oblong, fore and hind margins evenly convex, a spiniferous palmar angle proximal, accessory tooth hardly visible, poison tooth small and distal; claw

falciform, with non-serrated inner margin. Gills oblong. Three pairs of posterior peraeopods comparatively slender and long; clasping spines on hand submedial.

According to Mayer, the tubercles on the body are considerably variable in number and size, so that it is rather hard to distinguish this species from *Caprella alaskana* and *C. constantina*, all of which inhabit the same region. He mentions that "vielleicht wird sogar später die eine oder andere von ihnen einzugehen haben." The present specimen closely resembles *C. paulina* (♀) shown in his Fig. 7 in Taf. 5. Although the tubercles are fewer in number, their peculiar shape is quite similar. It seems certain that the present specimen is distinct at least from either *C. alaskana* or *C. constantina*.

Locality: Between Barasan and Aikappu, in Akkeshi Bay. 1♀. Coll. by M. Iwasa (July 17, 1933).

Distribution: Alaska, Bering Sea, East coast of Kamtschatka.

10. *Caprella septentrionalis* KRÖYER

(Fig. 10)

MAYER, 1882, p. 62; MAYER, 1890, p. 65; MAYER, 1903, p. 120.

♀, 7.2 mm. in length. Body moderately slender, tuberculate on back. Head with a long, obtuse, prominence bent forward behind the eye. Peraeon segment 1 narrow, short, with a tubercle at the hind end. Peraeon segment 2 with two pairs of dorsal tubercles, one on the middle and one on the hind end. Peraeon segment 3 with a pair of dorsal tubercles on the middle. Peraeon segment 4 with two pairs of dorsal tubercles, one on the middle and one at the hind end, and with a ventro-lateral tooth at the hind corner. Peraeon segment 5 with two pairs of dorsal tubercles on the middle. Peraeon segments 6–7 with a pair of dorsal tubercles. Peraeon segments 2–5 subequal in length.

Antenna 1 shorter than half of the body length; flagellum shorter than peduncle, and composed of 14 joints. Antenna 2 slightly longer than peduncle of antenna 1. Gnathopod 2 attached near the fore end of peraeon segment 2; 2nd joint about half as long as peraeon segment 2; hand rather oval, with fore and hind margins evenly convex, a spine-bearing process of palmar angle proximally and a rudimentary poison tooth distally; distal angle of palm slightly

protuberant; claw long, not indented on inner margin. Gills small, oval and bent forward. Peraeopods 5–7 moderately narrow, short; clasping spines on palm proximal.

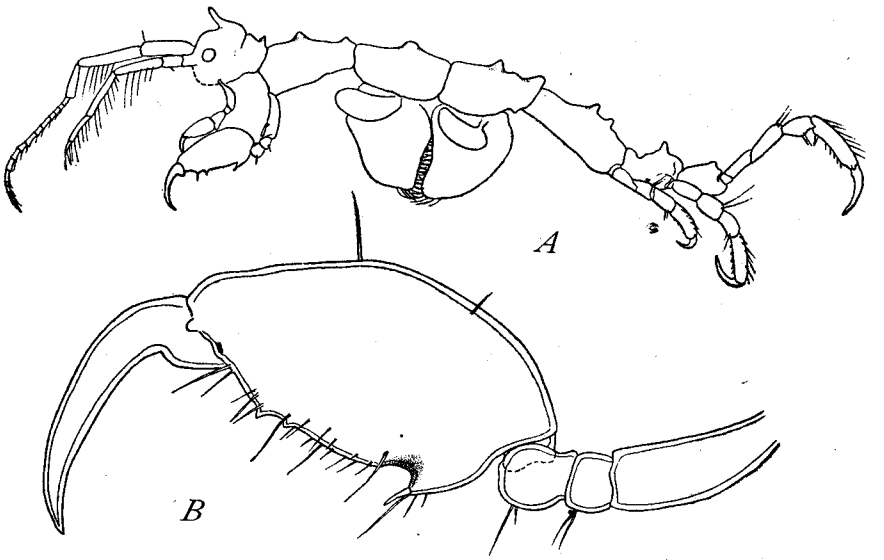

Fig. 10. *Caprella septentrionalis* KROYER. *A*, ♀, ×10. *B*, gnathopod 2 of ♀, ×34.

The single specimen in the present collection seems to be identical with *C. septentrionalis* Kröyer once recorded by Mayer from Tugaru Strait, but never rediscovered from the Pacific area ever since. Future investigation will make it clear its occurrence in the Northern Japan is merely due to an accidental immigrance.

Locality: Muroran. 1♀, on sea-weed, together with *Caprella aino* n. sp. Coll. by M. Iwasa (Aug. 11, 1934).

Distribution: North Atlantic, Schottland, White Sea and in the Pacific known from Tugaru Strait only.

11. *Caprella venusta* UTINOMI

(Fig. 11)

A single specimen found together with the above-mentioned *C. paulina* and *C. borealis*, conforms well with *C. venusta* which I have recently reported as a new species from Asamusi. Detailed descrip-

tion of this species is given in my report on the caprellids from Mutu Bay (Utinomi, 1943), so I shall give only some slight peculiarities relating to the present specimen.

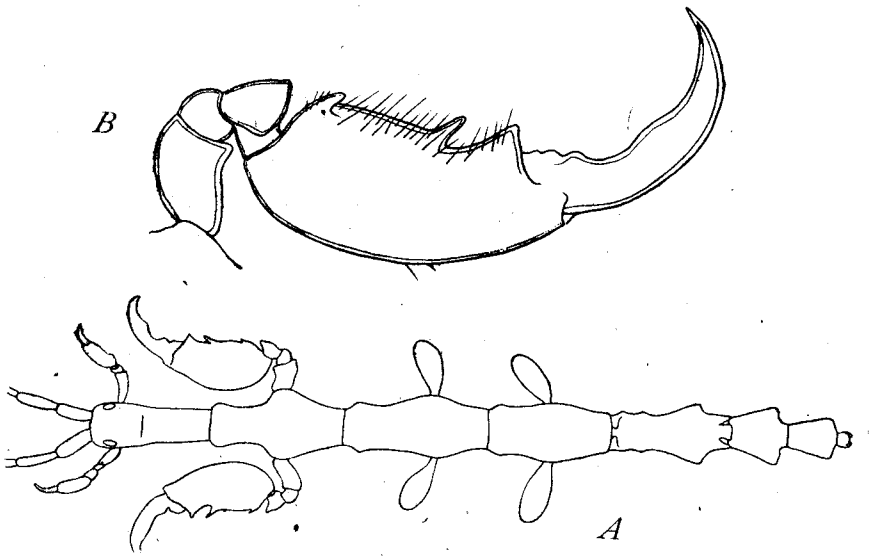

Fig. 11. *Caprella venusta* UTINOMI. *A*, ♂, ×34. *B*, gnathopod 2 of ♂, ×10.

Antenna 1 is comparatively short and bears a flagellum composed of 8–9 joints. Antenna 2 is about two-thirds as long as antenna 1. In gnathopod 2, the 2nd joint is very shorter and the palmar angle is proximal, moderately protruded, but does not carry any clasping spine.

Locality: Aikappu, in Akkeshi Bay. 1♂, together with *C. borealis* and *C. paulina*. Coll. by M. Iwasa (July 17, 1933).

Distribution: Asamusi.

Geographical Remarks

As mentioned in the preceding pages, 11 species of *Caprella* are known from the three localities of Hokkaido, including 3 new species (*C. aino, C. obtusifrons* and *C. venusta*) and 4 boreal species (*C. borealis, C. drepanochir, C. laeviuscula* and *C. paulina*) which have not been recorded from the Japanese waters. Of the remaining 4, 2 (*C. acutifrons* and *C. danilevskii*) are both cosmopolitan forms, and commonly found in the temperate waters of Japan, and the other

2 (*C. bispinosa* and *C. septentrionalis*) are hitherto known only in the colder waters in our territory. The present collection is thus very interesting from the faunistic view-point. To give a more detailed idea on the geographical distribution of the group, I give here a list of all the species known from Hokkaido, together with those from Onagawa and Mutu Bays, examined by myself.

Synopsis of the distribution of caprellids in Northern Japan

	Onagawa Bay	Mutu Bay	Akkesi Bay	Hokkaidô (beside Akkesi)	Karahuto	Further distribution
C. acanthogaster	+	+	.	+	.	Wladywostok, Japan Sea
C. acutifrons f. *neglecta* ..	+	+	.	+	.	Japan to S. China
C. acutifrons f. *verrucosa*	+	.	.	.	.	Japan, S. California
C. aino	.	.	.	+	.	——
C. bispinosa	.	+	+	+	+	Wladywostok, Japan Sea
C. borealis	.	.	+	.	.	E. Kamtschatka
C. danilevskii	+	+	+	.	+	Cosmopolitan
C. drepanochir	.	.	+	.	.	Japan Sea, Bering Sea
C. imaii	+	.	.	.	.	——
C. kröyeri	+	+	.	+	.	Japan south to Misaki, Wladywostok
C. laeviuscula	.	.	+	.	.	Alaska to California
C. obtusifrons	.	.	+	.	.	——
C. paulina	.	.	+	.	.	Alaska to Kamtschatka
C. scaura f. *diceros*	+	+	.	.	.	Japan
C. septentrionalis	.	.	.	+	.	N. Atlantic, Arctic
C. venusta	.	+	+	.	.	——
Total number of species..	7	7	8	6	2	

This list includes 8 boreal forms known only from the Northern Pacific area, except one *C. septentrionalis* once recorded from Tugaru Strait, but commonly occurring in the Northern Atlantic area. Aside from the 4 new species, the remaining 4, *C. acutifrons* f. *neglecta*, *C. acutifrons* f. *verrucosa*, *C. danilevskii*, *C. scaura* f. *diceros*, are widely distributed in the warm waters around the coasts of Japan. The caprellid fauna of Hokkaido and the northern part of Honsyu is thus rather poor, when compared with that of the waters of both Kamtschatka and Alaska. This is but natural, in view of the fact that Caprellas are rather the inhabitants in cold waters than warm waters. As might be well expected by the situation of the island, Hokkaido presents a mixed feature of the southern and northern elements in its caprellid fauna, and it is unlikely that many endemic forms are to be found there. Mayer (1903) has recorded the following 4 boreal species from Tugaru Strait (Tsugarstrasse, 41°N): *Cercops holbölli*, *Caprella chelimana*, *C. eximia* and *C. gracillima*, beside *C. scaura* and *C. septentrionalis* recorded in the present paper.

In this connection it is of some interest to note that the northern part of Honsyu is dominated by *C. acanthogaster* and *C. kröyeri*, while in Hokkaido and probably in Karahuto (Saghalien) *C. bispinosa* seems to be most predominate caprellid; *C. kröyeri* alone extends far southwards, though very scarce in quantity. It must also be taken into account that some caprellids are transported far from their native waters by human agency, by adhering to ships etc., as much the other Amphipoda. As such examples we can name *C. danilevskii*, *C. septentrionalis*, *C. linearis* (also probably, *Cercops holbölli* recorded by Mayer), whose occurrence in the Pacific is possibly due to migration from the Atlantic.

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