Macrura and Anomura of Decapod Crustacea found in the Neighbourhood of Onagawa, Miyagi-ken

By

YU YOKOYA

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MACRURA AND ANOMURA OF DECAPOD CRUSTACEA FOUND IN THE NEIGHBOURHOOD OF ONAGAWA, MIYAGI-KEN

By

Yu Yokoya

Fishery Institute, Faculty of Agriculture, Tokyo Imperial University

(With 13 text-figures)

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Recently, by the courtesy of Professor S. Hôzawa and of Lecturer T. Imai of the Tôhoku Imperial University, I have had an opportunity to examine the specimens of Macrura and Anomura collected in the neighbourhood of the Onagawa Oceano-chemical Institute of the same University, which is situated on the north-eastern coast of Honsyû, Japan.

The number of species contained in the collection is forty-five in all, of which twenty-five are Macrourous species and the remaining twenty are Anomourous. The species thus far obtained in this district are rather meagre in number, but they present some interesting features in respect to their distribution. Though the distribution of most of the subtropic species is limited to the south of Kinkazan, on the Pacific coast of Honsyû, many specimens of such species are found among collections from Onagawa where lies a little north of Kinkazan. This fact seems to be due to the current of the sea as I have already mentioned in my paper published in 1933. *Pandalopsis lamelligera* (Brandt) and *Upogebia isaeffi* (Balss) are species which have not hitherto been obtained from Japanese waters. On the other hand two species of shrimps and a hermit crab found here are new to science, i. e., *Spirontocaris onagawaensis*, *Nectocrangon hozawai* and *Eupagurus imaii*. *Spirontocaris minuta* Yokoya was originally described from immature specimens, but this time I have found some mature ones in the collection. *Latreutes dorsalis* Stimpson is one species which has, as far as I know, not been collected since it was originally described in 1860. The following are the species which are distributed, or are thought to be distributed, in the subtropic regions: *Trachypenaeus curvirostris* (Stimpson), *Ceratopenaeus dalei* (Rathbun), *Alpheus brevicristatus* de Haan, *Alpheus japonicus* Miers, *Alpheus haanii* Ortmann, *Spirontocaris geniculata* (Stimpson), *Spirontocaris rectirostris* (Stimpson), *Latreutes*

planirostris DE HAAN, *Crangon affinis* DE HAAN, *Callianassa petalura* STIMPSON, *Paguristes digitalis* STIMPSON, and *Eupagurus dubius* ORTMANN. The occurence of these species in this district is supposed to be due to the warm current, which first flows northwards in the Japan Sea along the west coast of Honsyû and then after passing though the Tugaru Strait, flows southward along the east coast of Honsyû together with the cold ocean current.

MACRURA

Penaeidae BATE

Genus TRACHYPENAEUS ALCOCK

Trachypenaeus curvirostris (STIMPSON)

Japanese name: Saru-ebi

Penaeus curvirostris STIMPSON, 1860, p. 44; KISHINOUYE, 1900, p. 23, pl. 6, fig. 4, pl. 7, fig. 10, 10 A–C; DE MAN, 1907, p. 436.
Parapenaeus curvirostris, RATHBUN, 1902, p. 38.
Trachypenaeus curvirostris, BALSS, 1914, p. 11; YOKOYA, 1930, p. 526; 1933, p. 9.

Loc. Okati Bay 14 m. deep. July 17, 1935. 1 female.
Konorihama, trap net. June 28, 1935. 3 females.

The specimens are nearly equal in length, one measuring 85 mm. in total length. The species is provided with a small but distinct supraorbital tooth as in the case of *T. asper* ALCOCK.

Distribution: Concerning the distribution of the present species I have stated in my previous paper published in 1933.

Genus CERATOPENAEUS KISHINOUYE

Ceratopenaeus dalei (RATHBUN)

Japanese name: Daru-ebi

Parapenaeus dalei RATHBUN, 1902, p. 42.
Ceratopenaeus dalei, YOKOYA, 1930, p. 526; 1933, p. 6.

Loc. Siranezaki, 34 m. deep. July 20, 1935. 3 females.
Yatarôzima, 34 m. deep. July 23, 1935. 1 female.

Distribution: Japan: On the Pacific side, it has not been reported from north of Kinkazan.

Pasiphaeidae BATE

Genus LEPTOCHELA STIMPSON

Leptochela gracilis STIMPSON

Japanese name: Hosohasami-ebi

STIMPSON, 1860, p. 42; BATE, 1888, p. 860, pl. 189, fig. 2; BALSS, 1914, p. 19; YOKOYA, 1933, p. 13.

Loc. Koyatori Inlet, 18 m. deep. July 19, 1935. 1 male.

Distribution: Corea; Japan: Around Honsyû, Sikoku and Kyûsyû.

Pandalidae BATE

Genus PANDALUS LEACH

Pandalus nipponensis YOKOYA

Japanese name: Botan-ebi

YOKOYA, 1933, p. 16, text-fig. 5.

Loc. Kosikine, 19 m. deep. July 18, 1935. 2 females, one of which bears eggs.

Distribution: Pacific side of Honsyû; it has not been recorded from north of Kinkazan.

Pandalus borealis KRÖYER

Japanese name: Akataraba-ebi

RATHBUN, 1904, p. 35; 1929, p. 8; YOKOYA, 1933, p. 25.

Loc. Off Ozaki, about 130 fathoms deep. December 23, 1935. 1 male.

Distribution: Circumpolar. From Greenland to Cape Cod; from Bering Sea to the Columbia River; northern Europe; Japan Sea; from the Pacific side of Japan, it has hitherto not been known.

Pandalus hypsinotus BRANDT

Japanese name: Toyama-ebi

BRANDT, 1851, p. 125; DOFLEIN, 1902, p. 635, pl. 4, figs. 1 & 2; RATHBUN, 1902, p. 46; BRASHNIKOW, 1907, p. 114, pl. 2, fig. 9; BALSS, 1914, p. 29; YOKOYA, 1933, p. 16.

Loc. Onagawa Harbour, 8 m. deep. August 2, 1935. 1 young specimen.

Distribution: Unalasca; Bering Sea; Japan: Hokkaidô and Japan Sea; from the Pacific side of Honsyû it has not been reported.

Genus PANDALOPSIS BATE

Pandalopsis lamelligera (BRANDT)

Japanese name: Hiraasiaka-ebi

Pandalus lamelligerus BRANDT, 1851, p. 124, pl. 5, fig. 20.
Pandalopsis lamelligera, BRASHNIKOW, 1907, p. 99; BALSS, 1914, p. 32.

Loc. Konorihama, trap-net, December 15, 1934. 1 egg-bearing female.

The terminal halves of the rostrum and antennal scales were broken in the above specimen, but in other respects it is referable to the present species. This specimen is shown in Fig. 1.

Distribution: Okhotsk Sea. It has not been known from Japanese waters.

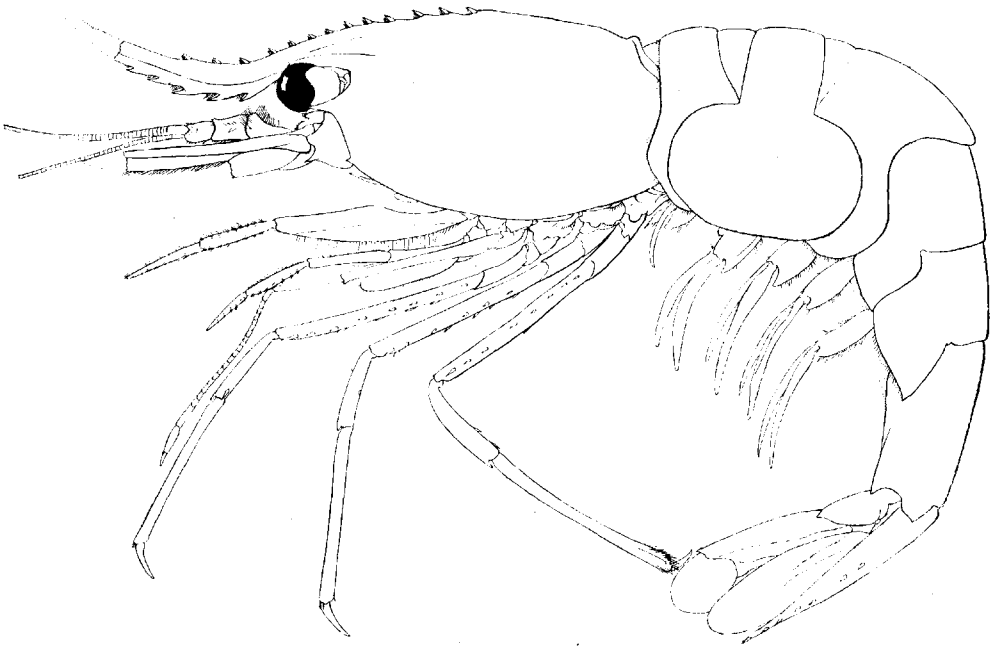

Fig. 1. *Pandalopsis lamelligera* (BRANDT). (Natural size)

Alpheidae BATE

Genus ALPHEUS FABRICIUS

Alpheus brevicristatus DE HAAN

Japanese name: Haziki-ebi

Alpheus malabaricus brevicristatus DE HAAN, 1850, p. 177, pl. 45, fig. 1.

A. malabaricus, ORTMANN, 1890, p. 481.
A. kingsleyi MIERS, 1879, p. 54.

Loc. Onagawa Harbour, 6 m. deep. July 16, 1935. 2 males and 2 females, one of the females bearing eggs.

An accessory appendix found on the margin of the second pleopod is noticeable in the male; this feature is shown in Figure 2 together with that of *Alpheus haanii* ORTMANN.

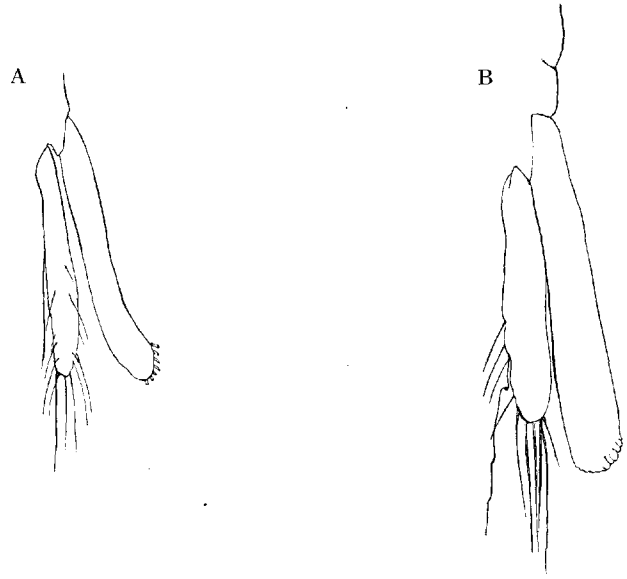

Fig. 2. Inner margin of endopodite of 2nd pleopod, showing accessory appendix.
A. *Alpheus brevicristatus* DE HAAN. B. *Alpheus haanii* ORTMANN.

Distribution: Japan: Tokyo Bay, Sagami Bay (ORTMANN); Toba, Mie-ken (MIERS). I have examined some numbers of specimens of this species taken from Naha, Loo Choo Isls. It was also obtained from southern Corea, Mikawa Bay and Misaki, Kanagawa-ken, etc. Thus this species seems to have subtropic distribution.

Alpheus japonicus MIERS

Japanese name: Tenagateppô-ebi

MIERS, 1879, p. 53; ORTMANN, 1890, p. 476, pl. 36, fig. 14; DE MAN, 1907, p. 430, pl. 33, fig. 53; YOKOYA, 1930, p. 527.

Loc. Onagawa Harbour, 8 m. deep. July 16, 1935. 3 egg-bearing females.
Distribution: Japan: Southern Japan; On the side of the Japan Sea,

it is distributed northwards to Mutu Bay, but on the Pacific side of Honsyû, it has not been reported from north of Tokyo Bay.

Alpheus haanii ORTMANN

Japanese name: Koteppô-ebi

Alpheus minor DE HAAN, 1849, p. 180, pl. 45, fig. 5.
Alpheus haanii ORTMANN, 1890, p. 472; DE MAN, 1897, p. 751.

Loc. Onagawa Harbour, 8 m. deep. August 2, 1935. 2 males and 10 egg-bearing females.

The length of the larger chela is individually variable compared with that of the carapace. In the larger male, which measures 41,8 mm. in total length, the larger chela is about twice as long as the carapace and about four times as wide as long. While in the smaller male, which is 31,9 mm. long, the larger chela is one and a half times as long as the

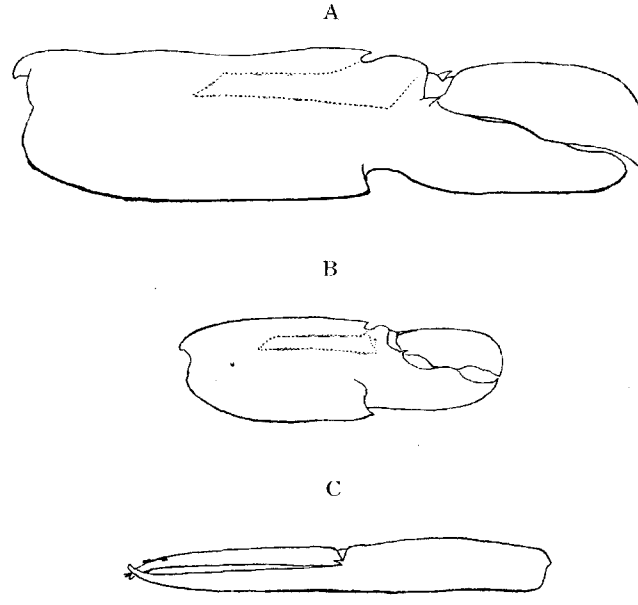

Fig. 3. *Alpheus haanii* ORTMANN.
A. Larger chela of a male, measuring 41,8 mm. in total body length, exterior aspect. (×3)
B. Larger chela of a male, measuring 31,9 mm. in total body length, exterior aspect. (×3)
C. Smaller chela of a female, measuring 44,2 mm. in total body length, exterior aspect. (×3)

carapace and about three times as wide as long. In the female, however, the larger chela is not so large as in that of the male and is less elongate in shape than in that of the opposite sex. But in the female specimens, the larger one has a better developed chela than the smaller specimen has. The smaller chela of the first leg is similar in feature in both sexes, but it seems to be somewhat different from the figure given by DE HAAN in "Fauna Japonica".

Distribution: Japan: Tokyo Bay and Kagosima. I have examined some specimens of this species obtained from other localities such as Niigata-ken, Seto Inland Sea and the southern and north-western coasts of Tyôsen (Corea).

Hippolytidae ORTMANN

Genus SPIRONTOCARIS BATE

Spirontocaris ochotensis (BRANDT)

Japanese name: Hokkaimo-ebi

Hippolyte ochotensis BRANDT, 1851, p. 120, pl. 5, fig. 17; STIMPSON, 1860, p. 34.
Spirontocaris ochotensis, RATHBUN, 1904, p. 71, fig. 26 in text; BRASHNIKOW, 1907, p. 124.

Loc. Iigohama, 8,4 m. deep. July 18, 1935. 1 male.

The specimen contained in the collection is referable to the present species, but it differs from the type in some points.

The rostrum much exceeds the end of the peduncle of the first antenna, and is a little shorter than the antennal scale. On its upper margin there

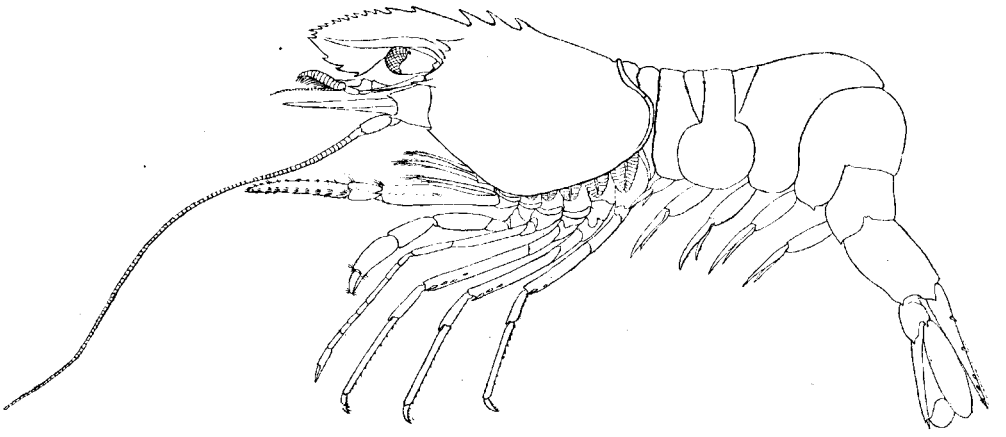

Fig. 4. *Spirontocaris ochotensis* (BRANDT). (×5)

are ten minute teeth arranged in front of the three large teeth on the carapace. Of the two flagella of the first antênna, the outer one is stout and short, extending a little beyond the end of the rostrum, while the inner slender one exceeds the end of the antennal scale.

Distribution: Sitka; Bering Island; Petropavlovsk, Kamchatka; Okhotsk Sea; Japan: Hakodate Bay. It has hitherto not been known from the coasts of Honsyû.

Spirontocaris onagawaensis n. sp.

Japanese name: Onagawamo-ebi

Loc. Takasiro, 7,5 m. deep. July 18, 1935. 1 probably male.
Nonohama, 4,6 m. deep. July 18, 1935. 1 probably male, infected by a parasitic Isopoda.

The two specimens are probably of the same species, though some different features are recognizable. The following description is based chiefly on the specimen taken from Takasiro. The median carina of the carapace is provided with five teeth, of which the posterior four are on the carapace and the most posterior one lies near the middle of the carapace excluding the rostrum, while in the specimen from Nonohama six teeth are found on the median carina, the posterior five of which are situated on the carapace and the most posterior one lies a little behind the middle of the carapace excluding the rostrum. The terminal half of the rostrum is provided with minute teeth placed on both the upper and lower margins; the teeth being located 9 above and 3 below in the specimen from Takasiro while in the other specimen 11 or 12 of the teeth are above, and 4 are below. Of the two supraorbital teeth, the upper anterior one is much stronger than the other. An antennal tooth and a pterygostomian tooth are well developed. The abdomen is moderately laterally compressed, being geniculated at the third somite. The pleura of the anterior three abdominal somites are laterally rounded, while those of the fourth and the fifth somites are pointed. The sixth somite is a little longer than one half of the rostrum and is two-thirds as wide as long. The telson is one and two-thirds times as long as the sixth somite and is provided with four pairs of movable spinules on the dorsal side.

The eye-stalk is moderately stout, with an ocellus on the upper surface, just behind the margin of the cornea. The peduncle of the first antenna

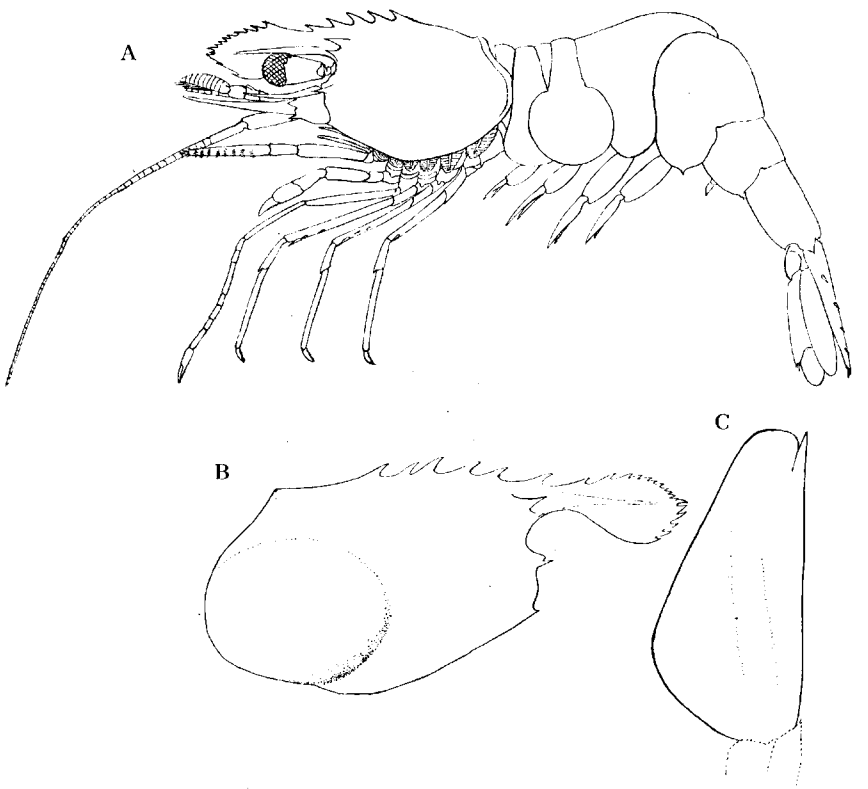

Fig. 5. *Spirontocaris onagawaensis* n. sp.
A. The specimen from Takasiro. (×6)
B. Carapace of the specimen from Nonohama. (×6).
C. Antennal scale of the same specimen. (×12)

reaches distally four-fifths of the rostrum, while in the specimen from Nonohama it reaches almost to the end of the rostrum. The stylocerite exceeds the end of the second peduncular joint. The antennal scale of the second antenna which reaches almost to the end of the outer stout flagellum of the first antenna, is about one half as wide as long. The third maxilliped and the anterior three legs are provided with epipodites. The third maxilliped bears an exognath, which attains to a proximal two-thirds of the antepenultimate joint of the endognath. The first leg is stouter than any of the other legs, exceeding the end of the penultimate joint of the third maxilliped by the length of the movable finger of the chela. The second leg is long and slender, exceeding the end of the antennal scale; of the seven carpal articles, the third is the longest of

all, and the terminal comes next, while the remaining five articles are subequal in length, and the penultimate one seems to be somewhat shorter than the others. The posterior three legs are subequal in feature, the dactyli being short; the meri of the third and the fourth legs bear three spinules on their terminal halves, while that of the last leg is provided with a spinule near its distal end.

Sirontocaris geniculata (STIMPSON)

Japanese name: Kosimagarimo-ebi

Hippolyte geniculata STIMPSON, 1860, p. 34; ORTMANN, 1891, p. 503, pl. 37, fig. 3.
Spirontocaris geniculata, RATHBUN, 1902, p. 45; YOKOYA, 1930, p. 530; 1933, p. 26.
Spirontocaris alcimede DE MAN, 1907, p. 416, pl. 32, figs. 42–46.

Loc. Iigohama, 8,4 m. deep. July 18, 1935. 3 males and 10 females.
Takasiro, 7,5 m. deep. July 18, 1935. 1 male and 1 female.
Onmae Bay, 10 m. deep. July 24, 1935. 1 male and 1 female.
Onagawa Harbour, 8 m. deep. August 2, 1935. 1 female infected by a parasitic Isopoda.

Rostral teeth 5 or 6 above, from 7 to 9 below.

Distribution: Japan: Hakodate, Muroran, Tanagawa, Tokyo Bay, Inland Sea, north of Oga, Mutu Bay and localities above mentioned.

Spirontocaris rectirostris (STIMPSON)

Japanese name: Asinagamo-ebi

Hippolyte rectirostris STIMPSON, 1860, p. 33; DOFLEIN, 1902, p. 637, pl. 3, fig. 7.
Spirontocaris rectirostris, DE MAN, 1907, p. 411, pl. 32, figs. 31-34; BALSS, 1914, p. 43.

Loc. Konorihama, 12 m. deep. June 15, 1935. 1 male and 1 young.
Isihama, 10 m. deep. June 16, 1936. 3 females.
Onagawa Harbour, 8 m. deep. August 2, 1935. 1 female.

Distribution: Japan: Hakodate, Aomori, Nagasaki, Inland Sea, Sagami Bay and the above mentioned localities.

Spirontocaris pandaloides (STIMPSON)

Japanese name: Tunonagamo-ebi

Hippolyte pandaloides STIMPSON, 1860, p. 34; DOFLEIN, 1902, p. 637, pl. 5, fig. 3.
Spirontocaris pandaloides DE MAN, 1907, p. 418, pl. 32, figs. 47, 48; YOKOYA, 1930, p. 530.

Loc. Onmae Bay, 18 m. deep. July 15, 1935. 1 female.
„ 10 m. deep. July 24, 1935. 1 male.
Iigohama, 8,4 m. deep. July 18, 1935. 3 males.
Onagawa Harbour, 8 m. deep. August 2, 1935. 2 females.
Takasiro, 7,8 m. deep. July 18, 1935. 2 youngs.
Distribution: Hakodate to Inland Sea of Japan; Corean Strait.

Spirontocaris minuta YOKOYA

Japanese name: Himemo-ebi

YOKOYA, 1930, p. 531, textfig. 2; 1933, p. 28, textfig. 11.

Loc. Yokoura, 21 m. deep. July 18, 1935. 2 females.

In both of these specimens, the rostral teeth are 6 both above and below.

Distribution: Japan: Mutu Bay; Sado Isl. and Oga; above mentioned locality.

Spirontocaris japonica YOKOYA

Japanese name: Yamatomo-ebi

YOKOYA, 1930, p. 533, textfig. 3.

Loc. Iigohama, 8,4 m. deep. July 18, 1935. 1 egg-bearing female.
Nonohama, 4,6 m. deep. July 18, 1935. 2 females, 1 of which bears eggs.
Yokoura, 21 m. deep. July 18, 1935. 1 egg-bearing female.
Onmae Bay, 10 m. deep. July 24, 1935. 4 males.
Koyatori, at the beach. July 30, 1935. 3 males.
Onagawa Harbour, 8 m. deep. August 2, 1935. 5 females.

The original description of the species given by me was based upon four young or immature specimens. Now examining many maturated specimens, I should like to describe it here once more.

The rostrum is about one and one-third times as long as the rest of the carapace, and is provided with four or five or rarely six teeth above, and with three or four or rarely two teeth below. Of the teeth found on the upper margin one is behind the eye and the next one stands just above the orbital crescent. The eye-stalk is rather long, nearly cylindrical, distally gradually inflated. The cornea is a little inflated, in the alcoholic specimen a small round black spot is noticeable near the margin of the pale black cornea. In the first antenna, the stylocerite reaches to the

end of the proximal peduncular joint, which is twice as long as the succeeding two peduncular joints combined. The proximal and the next peduncular joints are pointed distally at the outer margin. The scaphocerite of the second antenna is nearly as long as the rostrum. The third maxilliped somewhat exceeds the proximal two-thirds of the antennal scale, the exognath is a little longer than two-thirds of the antepenultimate

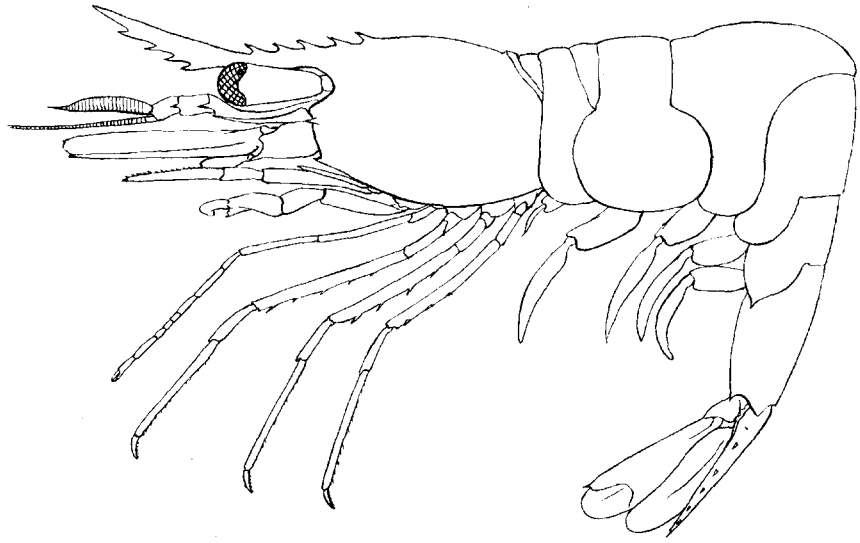

Fig. 6. *Spirontocaris japonica* YOKOYA. (×7)

segment of the endognath. The first leg is robust; the second is slender; of the carpal articles the second is the longest of all and the terminal is a little longer than either the first or the third, the latter two are subequal in length; the remaining three articles are very short and those combined are still shorter than the second.

The posterior three legs are similar in feature, meri are provided with five, four and three spinules placed on the posterior margins of the third, fourth and fifth legs respectively.

The abdomen was shown in the previous description, but the telson is provided with five pairs of spinules which are seen in the dorsal aspect.

Distribution: Japan: Mutu Bay and Onagawa.

Genus LATREUTES STIMPSON

Latreutes planirostris (DE HAAN)

Japanese name: Hiratunomo-ebi

Cyclorhynchus planirostris DE HAAN, 1849, p. 175, pl. 45, fig. 7.
Rhynchocyclus planirostris, STIMPSON, 1860, p. 27.
Latreutes planirostris, ORTMANN, 1891, p. 505, pl. 37, figs. 4 d-l, 4 n; DE MAN, 1907, p. 421.
Platybema planirostre, RATHBUN, 1902, p. 46.

Loc. Koyatori, sandybeach. July 30, 1935. 1 male.
Onagawa Harbour, 8 m. deep. August 2, 1935. 1 egg-bearing female.

Distribution: Japan: Hakodate, Inland Sea, Ariake Bay, Kagosima, Tokyo Bay and the above mentioned localities.

Latreutes dorsalis STIMPSON

Japanese name: Ôtunomo-ebi

STIMPSON, 1860, p. 27.

Loc. Onagawa Harbour, 8 m. deep. August 2, 1935. 1 male.

This species has not been reported since STIMPSON first described it from Hakodate, Hokkaidô. I should like here to describe it once more.

The medial obtuse carina of the carapace is armed with a pointed tooth and a tubercle, and is continuous with the rostrum which is a little longer than the carapace. The rostrum is knife shaped and is about one-third as wide as long; the upper margin is concave and is armed with eight minute teeth distributed on the distal half, while on the lower margin there are six of these. The antennal spine is distinct, and seems to be jointed; at the antero-lateral corner of the carapace there are eight or nine minute but sharply pointed teeth. The eye-stalk is rather short. Two flagella of the first antenna are subequal in length, reaching to the end of the rostrum, and are a little longer than twice the length of the peduncle; the outer flagellum is proximally stout and very thickly fringed with downy hairs. The stylocerite is rather short, the proximal peduncular joint is furnished with a short pointed tooth on the outer distal end, the succeeding two joints are obliquely articulated with each other. In the second antenna the flagella are missing on both sides; the scaphocerite is almost as long as the carapace, and is pointed distally forming an elongated triangle. The third maxilliped is short and robust, attaining the level of the peduncular end of the first antenna. The first leg also is robust and

reaches to the end of the penultimate joint of the third maxilliped. The succeeding four pairs of legs are slender. The second leg exceeds the end of the third maxilliped; of the carpal articles, the proximal and the distal ones are subequal in length and the intermediate one is the longest.

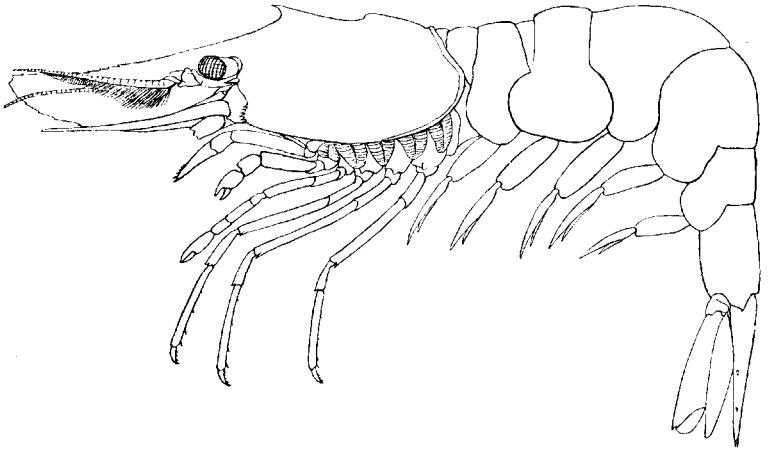

Fig. 7. *Latreutes dorsalis* STIMPSON. (×6)

The posterior three pairs of legs are subequal in length as well as in feature and are longer than any of the preceding pairs of legs. The merus is provided with a pointed tooth near the distal end and on the inferior margin; the dactylus is rather short with five or six spines on the posterior magin. There is no epipodite on the base of any of the walking legs.

The second to fourth abdominal somites are dorsally obtusely carinate on the middle line, and the others are rounded. The sixth somite is nearly one and one-half times as long as the fifth, and is three-fifths as long as the telson. The telson is armed with two pairs of marginal spinules and the posterior end is sharply pointed; on each side of this point there is a spinule. The sixth abdominal appendage does not exceed the end of the telson, and the "diaresys" of the outer plate is placed very obliquely.

Crangonidae BATE

Genus CRANGON FABRICIUS

Crangon affinis DE HANN

Japanese name: Zako-ebi

DE HAAN, 1849, p. 183; YOKOYA, 1930, p. 541; 1933, p. 32.

Loc. Iigohama, 8,4 m. deep. July 18, 1935. 2 males and 3 egg-bearing females.
Yokoura, 28 m. deep. July 18, 1935. 1 egg-bearing female.
Kosikine, 19 m. deep. July 18, 1935. 1 infected male and 1 female.
Koyatori Inlet, 14 m. deep. July 19, 1935. 1 male.
„ 18 m. deep. „ „ „ 1 male and 2 females.
Siranezaki, 34 m. deep. July 20, 1935. 4 females, of which 1 bears eggs.
Takozima, 26 m. deep. July 20, 1935. 1 male and 1 egg-bearing female.
Ôura Bay, 8 m. deep. July 24, 1935. 1 infected male and 3 females, 1 of the females bears eggs.
Takenoura, 15 m. deep. October 14, 1935. 1 egg-bearing female.
Isihama, 10 m. deep. June 16, 1936. 5 males and 12 females, 10 of the females bear eggs.

Most of the male specimens are infected by parasitic Isopoda, *Bopyrus*. In male specimens the thoracic sternum is different in structure from that of the female. The thoracic sternum of the male is provided with four

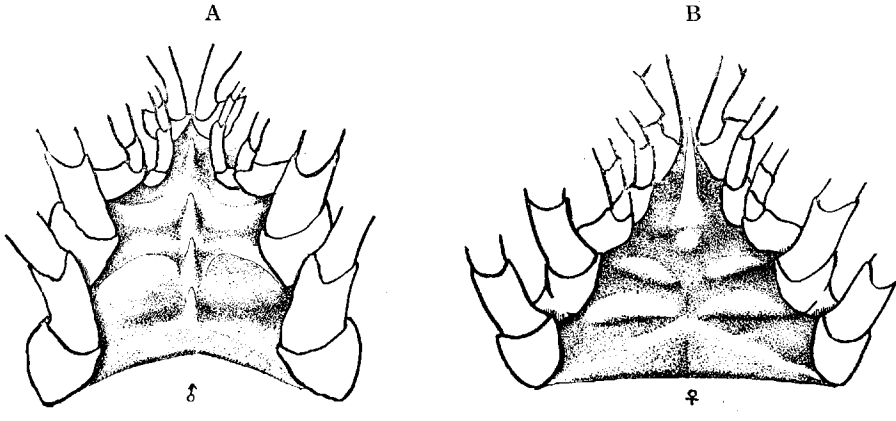

Fig. 8. Thoracic sternum of *Crangon affinis* DE HAAN.
A. of a male. B. of a female.

sharply pointed teeth on the medial line, each one being placed in the middle between the legs of each pair of posterior four legs; and there are two pairs of transverse ridges, situated on each side of the second and the third medial teeth. In the female, however, the thoracic sternum has a strong tooth between the bases of the second pair of legs, and an obtuse tubercle is found just behind this tooth. The transverse ridges of

the female are more obtuse than those of the male.

Distribution: Japan and Tyôsen (Corea).

Crangon dalli RATHBUN

Japanese name: Daruzako-ebi

RATHBUN, 1902, p. 889; 1904, p. 119, textfig. 60; YOKOYA, 1933, p. 33.

Loc. Off Ozaki, about 130 fathoms deep. December 23, 1935. 1 female.

Distribution: Washington; Alaska; Kurile Islands. Japan: East of northern Honsyû.

Crangon communis RATHBUN

Japanese name: Tyairozako-ebi

RATHBUN, 1899, p. 556; 1904, p. 123, textfig. 64; YOKOYA, 1933, p. 34.
Crago communis, SCHMITT, 1921, p. 95, fig. 63.

Loc. Off Ozaki, about 130 fathoms deep. December 23, 1935. 3 females.

Distribution: From Bering Sea to San Diego, California; Kamtchatka. Japan: northern Honsyû.

Genus NECTOCRANGON BRANDT

Nectocrangon hozawai n. sp.*

Japanese name: Hozawawatari-ebi

Loc. About 5 miles off Ozaki, 130 fathoms deep. December 23, 1935. 1 female.

Near *Nectocrangon lar* (OWEN), but differing in the following points:

On the median carina of the carapace, there is a distinct tubercle besides two pointed teeth, and it is laterally compressed and is situated in front of the anterior median tooth. Of these two medial teeth, the anterior one is at the anterior third of the carapace, and at a point a little behind the half way mark from this tooth of the posterior carapace margin there is the other tooth. The median carinae of the abdominal somites are high and are more strongly laterally compressed and are more acute than those of *N. lar;* paired carinae of the sixth abdominal somite are distinctly extended to the posterior margin of the somite.

* The species is named in honour of Prof. S. HÔZAWA.

On this margin there are two obtuse lobes which are continuous to the carinae. The chela of the first leg is three and two-thirds times as wide as long.

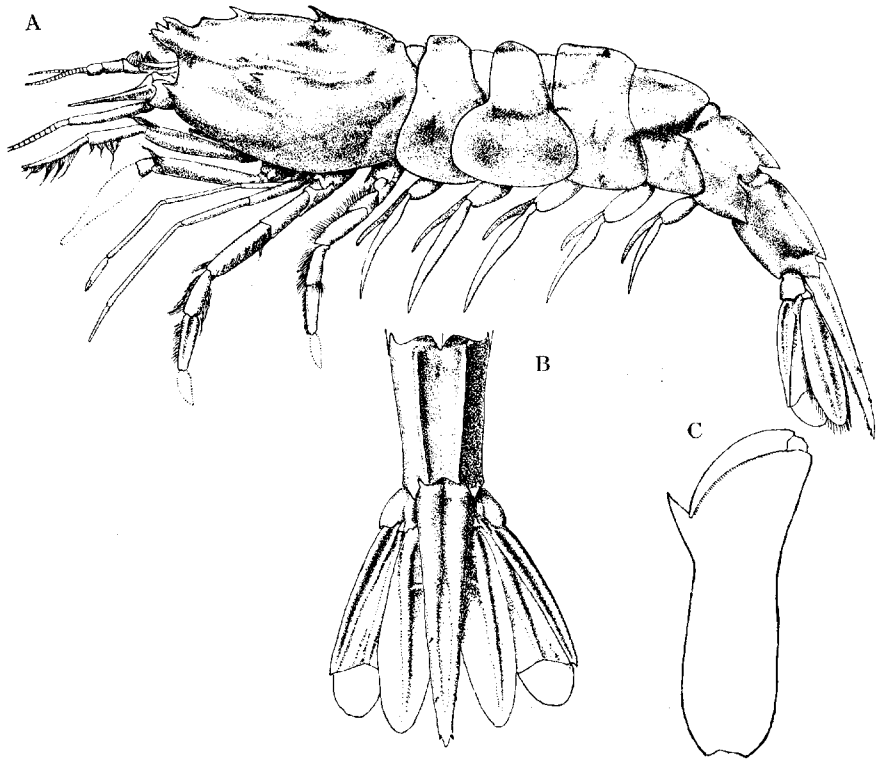

Fig. 9. *Nectocrangon hozawai* n. sp.
A. Entire animal, left aspect. (×1⅓)
B. Posterior two abdominal somites, dorsal aspect. (×2)
C. Chela. (×8)

The colour of the alcoholic specimen is pale ochre yellow and brownish bands found on the carapace are almost transverse, while those of the abdomen are oblique.

Callianassidae BATE

Genus CALLIANASSA LEACH

Callianassa petalura STIMPSON

Japanese name: Sunamoguri

STIMPSON, 1860, p. 23.

Callianassa subterranea japonica ORTMANN, 1892, p. 56, pl. 1, fig. 10 a; DOFLEIN, 1902, p. 644; BALSS, 1914, p. 91; YOKOYA, 1930, p. 543; 1933, p. 52.

Loc. Kirigasaki, sandy beach, August 14, 1935. 2 males and 1 egg-bearing female.
Onmae, sandy beach. August 26, 1935. 1 young specimen.
Konorihama, sandy beach. May 15, 1934. 1 male.

Distribution: Japan: Around Honsyû, Sikoku and Kyûsyû.

Genus UPOGEBIA LEACH

Upogebia issaeffi BALSS

Japanese name: Kita-anazyako

BALSS, 1913 a, p. 239; 1914, p. 89, figs. 48, 49.

Loc. Konorihama, sandy beach. May 15, 1934. 2 females.

Distribution: Vladivostock; it has never hitherto been reported from Japanese waters.

ANOMURA

Porcellanidae HENDERSON

Genus PACHYCHELES STIMPSON

Pachycheles stevensii STIMPSON

Japanese name: Kanimodoki

STIMPSON, 1858, p. 242; 1907, p. 187, pl. 23, fig. 6; MIERS, 1879, p. 47; ORTMANN, 1892, p. 267; 1897, p. 294; BALSS, 1913 b, p. 32.

Loc. Isihama beach. July 14, 1935. 1 male and 1 egg-bearing female.
Yatarôzima, 34 m. deep. July 23, 1935. 1 male.
Sannôzima beach. July 30, 1935. 1 male.

Distribution: Vladivostock; Hokkaidô; Japan: Tokyo Bay, Nagasaki and the localities above mentioned.

Paguridae DANA

Subfamily Pagurinae ORTMANN

Genus PAGURISTES DANA

Paguristes barbatus ORTMANN

Japanese name: Hukage-yadokari

Paguristes barbatus (HELLER) ORTMANN, 1892, p. 279, pl. 12, fig. 7; ALCOCK, 1905, p. 155; DOFLEIN, 1902, p. 645; BALSS, 1913 b, p. 39; YOKOYA, 1933, p. 74.

Loc. Izusima Harbour, 28 m. deep. July 17, 1935. 1 male.

Takenoura, 23 m. deep. July 18, 1935. 4 males.
Kosikine, 19 m. deep. July 18, 1935. 6 males and 11 females, 9 of which bear eggs.
Siranezaki, 34 m. deep. July 20, 1935. 2 males.
Ôisozaki, 36 m. deep. July 20, 1935. 4 males and 7 females, 6 of which bear eggs.
Near Izusima, 31 m. deep. July 22, 1935. 1 female.
Onagawa Bay, 39 m. deep. July 22, 1935. 2 males and 4 females, 3 of which bear eggs.
Onagawa Harbour, August 3, 1935. 6 males and 1 female.

The specimens coincide with the description given by ORTMANN, but the branchiae are 11 in number, as a podobranchia is found on the third maxilliped in addition to the branchial formula given by him. Two pairs of abdominal appendages are developed in the male and are similar in feature to those of *Paguristes digitalis* STIMPSON. The figures of paired

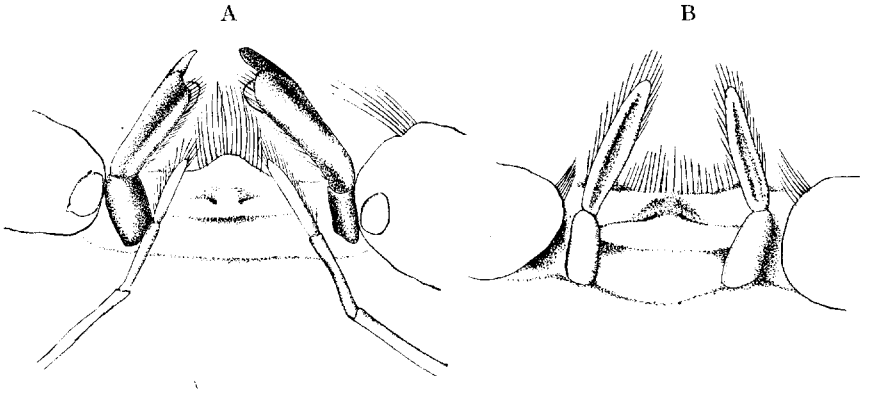

Fig. 10. *Paguristes barbatus* ORTMANN.
A. Posterior part of thoracic sternum, showing two pairs of abdominal appendages of a male.
B. Posterior part of thoracic sternum, showing a pair of abdominal appendage of a female.

abdominal appendages of the latter species were shown by BALSS in 1913. The anterior pair is stout and two-jointed, while the posterior is slender and three-jointed in both of the species. Of the anterior pair, the basal joint is short and stout, but the terminal joint is flattened and is somewhat longer than three times the length of the basal. It consists of three portions: a dorsal lobe, a ventral lobe and a terminal projection. The dorsal and the ventral lobes are folded into each other along the outer

margin, and near the distal end of this margin the terminal projection arises. The dorsal lobe is shorter than that of *Paguristes digitalis* and the ventral lobe is provided with minute tubercles on the margins and on its ventral surface. In the female, the posterior pair is degenerated and the terminal joint of the anterior pair is simple in structure.

Distribution: Japan: On the Pacific side, being found in the localities along the line extending southwards of Onagawa to Sikoku. In the Japan Sea it is reported from Nagato and Noto.

Paguristes digitalis STIMPSON

Japanese name: Menaga-yadokari

STIMPSON, 1858, p. 247; 1907, p. 212, pl. 25, fig. 1; BALSS, 1913 b, p. 37, figs. 26, 27; YOKOYA, 1933, p. 73.

Loc. Kosikine, 19 m. deep. July 18, 1935. 2 males and 3 egg-bearing females.

Distribution: Japan: Hakodate, Tugaru Strait, Sagami Bay, Tusima Strait and above mentioned locality.

Genus DIOGENES DANA

Diogenes edwardsii (DE HAAN)

Japanese name: Edwaruzi-yadokari

Pagurus edwardsii DE HAAN, 1849, p. 211, pl. 50, fig. 1.

Diogenes edwardsii, STIMPSON, 1858, p. 246; 1907, p. 202, pl. 24, fig. 1; ORTMANN, 1892, p. 295; RATHBUN, 1902, p. 37; BALSS, 1913 b, p. 44; TERAO, 1913, p. 362; YOKOYA, 1933, p. 77.

Loc. Samenoura Bay, 21 m. deep. July 23, 1935. 4 males and 1 egg-bearing female.

Onagawa Harbour, 10 m. deep. August 3, 1935. 1 male.

Distribution: China Sea; Hongkong; Japan: Tokyo Bay, Bôsyû, Sagami Bay, Inland Sea, Nagasaki and near Lake Hamana-ko. North of Kinkazan it has hitherto not been known.

Subfamily Eupagurinae ORTMANN

Genus EUPAGURUS BRANDT

Eupagurus pectinatus STIMPSON

Japanes name: Kusi-yadokari

STIMPSON, 1858, p. 249; 1907, p. 220; BALSS, 1913 b, p. 60, fig. 35, pl. 1, fig. 8; YOKOYA, 1933, p. 83.

Loc. Onmae Bay, 18 m. deep. July 16, 1935. 1 female in a sponge.
„ 12 m. deep. July 17, 1935. 1 female.
Kosikine, 25 m. deep. June 2, 1935. 1 female.

Distribution: Castri Bay; Japan: Tugaru Strait, Hakodate, off the mouth of the River Mogami, Sado Isl., Toyama Bay and Corea Strait. From the Pacific side of Honsyû, it has not hitherto been reported.

Eupagurus gracilipes STIMPSON

Japanese name: Hosoasi-yadokari

STIMPSON, 1858, p. 248; 1907, p. 217; DOFLEIN, 1902, p. 647, pl. 6, figs. 6–8; ALCOCK, 1905, p. 177; BALSS, 1913 b, p. 56.

Eupagurus nipponensis YOKOYA, 1933, p. 87, textfig. 32. (not *E. gracilipes* YOKOYA, l.c. p. 89, textfig. 33).

Loc. Okati Bay, 35 m. deep. July 17, 1935. 1 female.
Siranezaki, 34 m. deep. July 20, 1935. 1 male.
Ôisozaki, 36 m. deep. July 20, 1935. 1 male.
Samenoura Bay, 21 m. deep. July 23, 1935. 1 male and 1 female.
Onagawa Harbour, 10 m. deep. August 3, 1935. 1 male.

Distribution: Japan: Tugaru Strait, Sagami Bay, Tokyo Bay, Suruga Bay, Kosiki Isls., Gotô Isls. and above mentioned localities.

Eupagurus middendorffii BRANDT

Japanese name: Ibo-yadokari

Pagurus (Eupagurus) middendorffii BRANDT, 1851, p. 108, pl. 5, figs. 1 16.

Pagurus middendorffii, RATHBUN, 1902, p. 646; 1904, p. 160.

Eupagurus middendorffii, DOFLEIN, 1902, p. 646; ALCOCK, 1905, p. 178; STIMPSON, 1907, p. 226; BALSS, 1913 b, p. 58.

Loc. Tukahama, 9 m. deep. July 18, 1935. 1 male and 1 egg-bearing female.
Nonohama, 4,6 m. deep. July 18, 1935. 1 male.

The fingers of the chelae, especially the left one, open and close obliquely downwards. Hands and wrists are granular on both sides, and these excepting the left wrist are devoid of hairs. Granules of the chelipeds seem to the naked eye to be flattened, but under magnifying lens they are nearly conical, though the tips are rounded. The colour of the alcoholic specimen is pale orange and a number of brownish bands are seen on the chelipeds as well as on the succeeding two pairs of legs. The specimens which I have dealt with are referable to the present species, though the carpus of the cheliped is comparatively shorter.

Distribution: Northern California; Bering Sea; Castri Bay; Okhotsk Sea; Northern Japan.

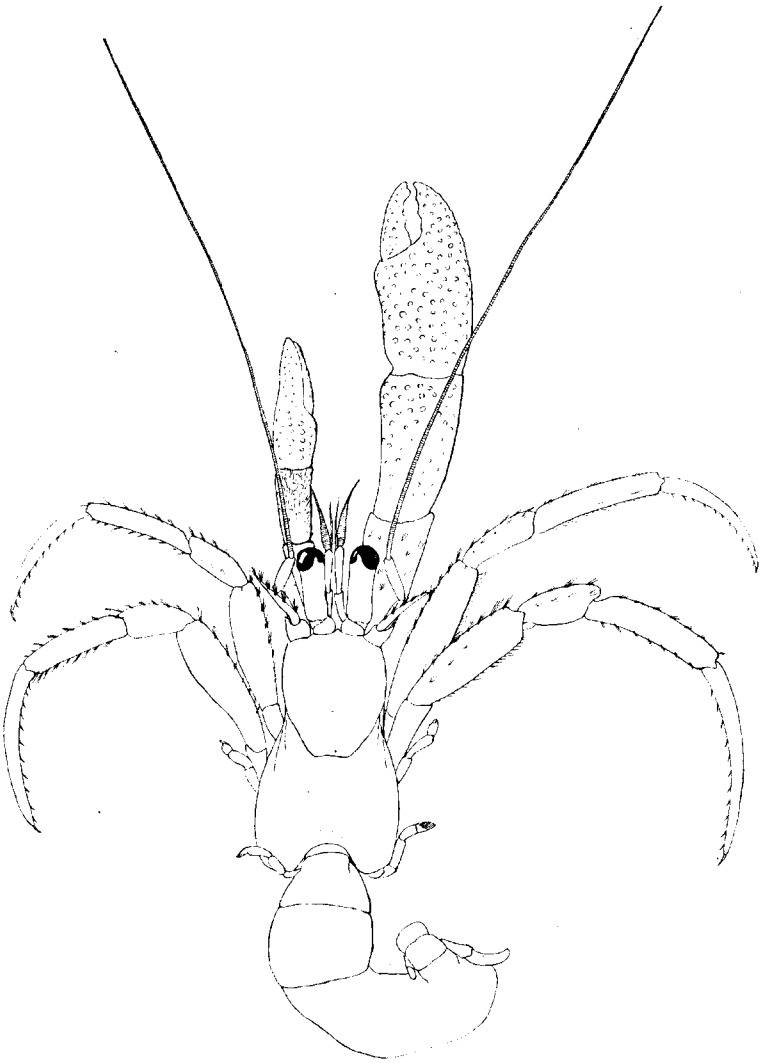

Fig. 11. *Eupagurus middendorffii* BRANDT. (×6)

Eupagurus brachiomastus THALLWITZ

Japanese name: Ikubi-yadokari

THALLWITZ, 1891, p. 35; ORTMANN, 1892, p. 312.

Loc. Kosikine, 19 m. deep. July 18, 1935. 2 males and 3 egg-bearing

females.

Siranezaki, 34 m. deep. July 20, 1935. 2 females, 1 of which bears eggs.

Onagawa Harbour, 10 m. deep. August 3, 1935. 2 females.

The specimens referable to the present species seem to be rather rare in Japan, as this species has not been reported, as far as I know, since THALLWITZ first described it from Japan or China.

The anterior half of the carapace is smooth and polished in the middle

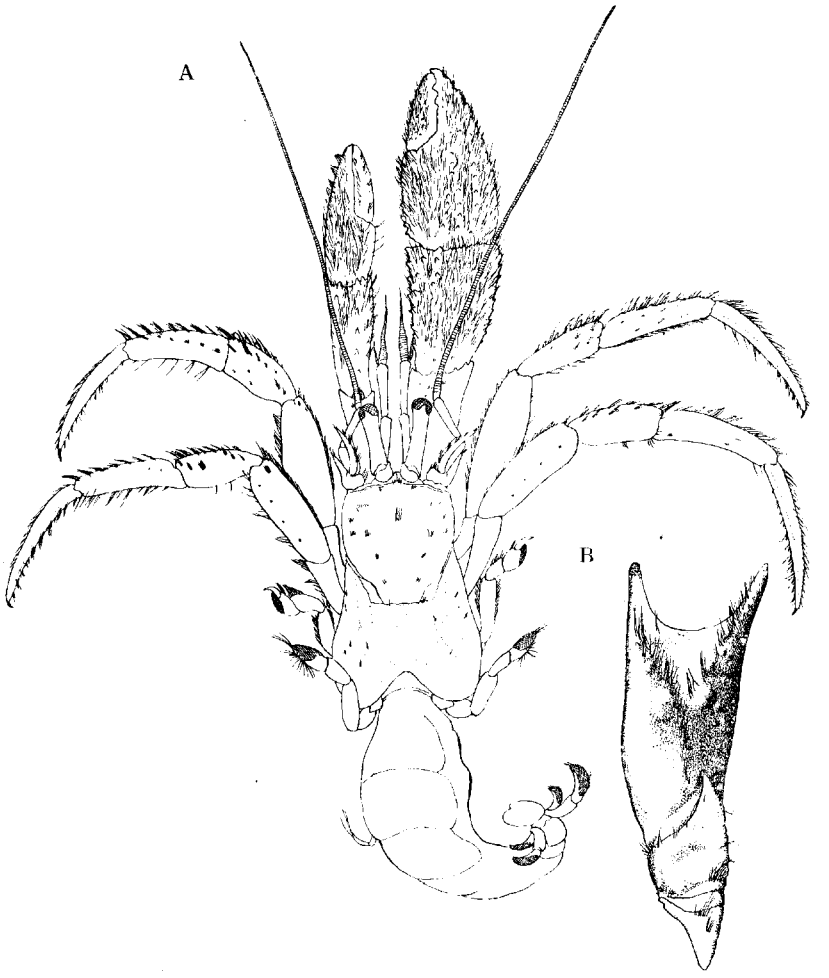

Fig. 12. *Eupagurus brachiomastus* THALLWITZ.

A. Entire animal, dorsal aspect. (×3)

B. Basi-ischium and merus of the larger cheliped, ventral aspect. (×6)

except the part a little back of the frontal margin. The rostral tooth projects forwards, the lateral tooth is obsolete. The eye-stalk is a little longer on the right side. The penultimate peduncular joint of the first antenna reaches almost to the end of the eye-stalk. The peduncle of the second antenna exceeds the end of the eye, while its styliform scale scarcely reaches the end of the eye-stalk. The chelipeds are hairy, the hairs on the dorsal surfaces of the chelae and of the carpi are especially dense and long, covering the spinulous tubercles found on them. The carpus of the right larger cheliped is a little longer than two-thirds the length of the chela, of which the finger is a little shorter than the palm. The merus is provided with a number of tubercles on the anterior half of the inferior margin; and among these tubercles two situated near the middle of the the margin are the most prominent. In the left cheliped, the carpus is about four-fifths as long as the chela, of which the finger is one and a half times as long as the palm; and no prominent tubercle is noticeable on the inferior margin of the merus. Of the succeeding two pairs of walking legs, the right ones are a little longer than the corresponding legs on the left side; and in the anterior pair the carpi and propodi are provided with a series of spinulous tubercles arranged on their superior margin.

Distribution: Japan or China; Castri Bay and the above mentioned localities.

Eupagurus dubius ORTMANN

Japanese name: Gihokkai-yadokari

ORTMANN, 1892, p. 307, pl. 12, fig. 14; DOFLEIN, 1902, p. 646; BALSS, 1913 b, p. 55; YOKOYA, 1933, p. 81.

Loc. Ôisozaki, 36 m. deep. July 20, 1935. 1 male.

Distribution: Japan: Tokyo Bay, Sagami Bay, Mie-ken, Tusima Isl. and the above mentioned locality.

Eupagurus ochotensis BRANDT

Japanese name: Hokkai-yadokari

Pagurus (*Eupagurus*) *bernhardus* var. C, *spinimana;* or sp. *ochotensis* BRANDT, 1851, p. 108.

Pagurus ochotensis, BENEDICT, 1901, p. 463; RATHBUN, 1904, p. 157; SCHMITT, 1921, p. 130.

Eupagurus ochotensis, STIMPSON, 1907, p. 218; BALSS, 1913 b, p. 60; YOKOYA, 1933, p. 82.

Bernhardus armatus DANA, 1852, p. 442, pl. 27, fig. 2.

Eupagurus ortmanni BALSS, 1911, p. 7.

Loc. Samenoura Bay, 21 m. deep. July 23, 1936. 1 female.

Distribution: From Vancouver Isl. to San Diego, California; Okhotsk Sea; Aniwa Bay; Vladivostock; Japan: From Tugaru Strait to Inuboezaki on the Pacific side and from the same strait to Sado Isl. on the side of the Japan Sea.

Eupagurus constans STIMPSON

Japanese name: Igaguri-yadokari

STIMPSON, 1858, p. 248; 1907, p. 218, pl. 24, fig. 3; HENDERSON, 1888, p. 67, pl. 6, fig. 8; ORTMANN, 1892, p. 320; DOFLEIN, 1902, p. 647; ALCOCK, 1905, p. 177; BALSS, 1913 b, p. 55; TERAO, 1913, p. 366; YOKOYA, 1933, p. 81.

Loc. Takenoura Bay, 12 m. deep. August 14, 1935. 1 female.
Onagawa Harbour, 10 m. deep. August 2, 1935. 2 males and 1 female.

Distribution: Japan: From Tugaru Strait to Lake Hamana on the Pacific side, while on the opposite side it has been known from Oga and from Nagasaki.

Eupagurus obtusifrons ORTMANN

Japanese name: Tankaku-yadokari

ORTMANN, 1892, p. 313, pl. 12, fig, 18; YOKOYA, 1933, p. 85.

Loc. Konorihama, 15 m. deep. November 15, 1935. 2 males.

Distribution: Japan: Siwoyazaki to Bungo Strait and Tugaru Strait. Onagawa seem to be the connection between Tugaru Strait and Siwoyazaki.

Eupagurus imaii n. sp*.

Japanese name: Imai-yadokari

Loc. Siranezaki, 34 m. deep. July 20, 1935. 1 male.

The rostrum strong, sharply pointed and almost attaining the middle of the ophthalmic scale. The lateral teeth are distinct but are much shorter than the rostral horn. The anterior half of the carapace is almost smooth surfaced, and a little longer than one and a half times the length of the posterior half when measured on the medial line. The posterior half of the carapace is soft, but a longitudinal calcified area is found on each side of the cardiac region.

The eye-stalk is moderately stout, a little longer than the antennal acicule, but distinctly shorter than the peduncle of the second antenna.

* In honour of Dr. TAKEO IMAI.

The peduncle of the first antenna is much longer than the peduncle of the second antenna, when it extends forwards. The chelipeds are hairy, the right one being much larger than the left, the merus is furnished with granular teeth on the inferior margins, while the superior surface

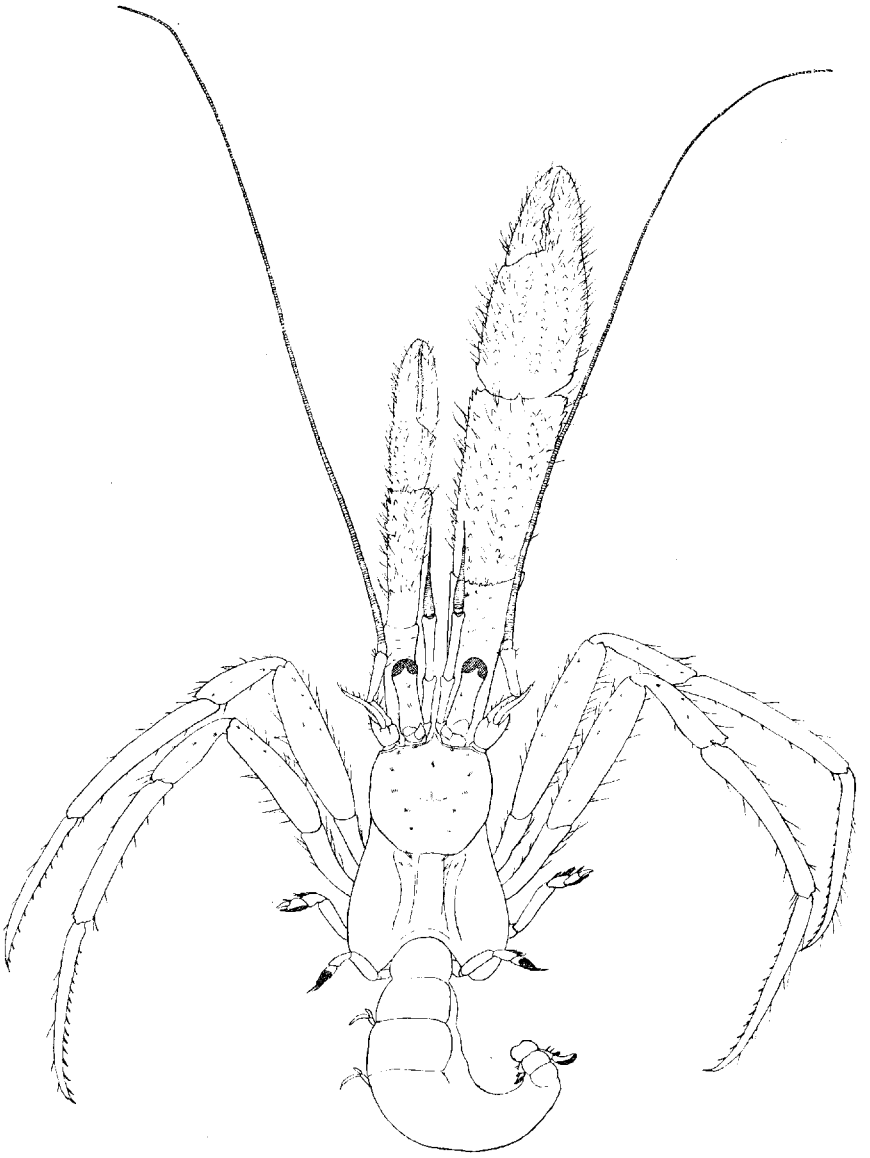

Fig. 13. *Eupagurus imaii* n. sp. (×6)

is somewhat tubercular and almost naked. The carpus is four-fifths as long as the chela in the right hand, while it is nearly seven-eighths as long in the left. The finger is a little longer than four-fifths of the palm in the right hand, while in the left it is almost twice as long as the palm; and the inner margin of the finger is provided with one or two stronger teeth besides a number of small ones in the right hand, while in the smaller left hand, in place of the teeth, there is a series of tubercular small lobes of almost equal size. The walking legs are slender, and are hairy on the superior and the inferior margins, and the right leg is somewhat longer than the left leg. In the anterior pair of the walking legs, the propodus is nearly as long as the dactylus, while in the posterior pair the former is somewhat but distinctly shorter than the latter.

This species is closely allied to *Eupagurus anomalus* BALSS. However, the rostral horn in the present species is not only weaker, but the surface of the carapace and the walking legs also are not so strongly sculptured as are those of *Eupagurus anomalus*.

Lithodidae BOUVIER

Genus HAPALOGASTER BRANDT

Hapalogaster dentatus (DE HAAN)

Japanese name: Ibotoge-gani

Lomis dentata DE HAAN, 1849, p. 219, pl. 48, fig. 2.
Hapalogaster dentatus, STIMPSON, 1858, pp. 232, 245; 1907, p. 198; ORTMANN, 1892, p. 323; MIERS, 1879, p. 47; BALSS, 1913, p. 71; YOKOYA, 1928, p. 758.

Loc. Iigohama, beach. July 31, 1935. 2 males and 1 female.

The male has no abdominal appendages, but in the female they are seen on the left side.

Distribution: Vladivostock; Japan: from Nagasaki to Hokkaidô.

Genus OEDIGNATHUS BENEDICT

Oedignathus inermis (STIMPSON)

Japanese name: Ibo-gani

Hapalogaster inermis STIMPSON, 1860 a, p. 243.
Dermaturus inermis, BALSS, 1913 b, p. 71 (cited other previous literature and synonyms).
Oedignathus inermis, SCHMITT, 1921, p. 151, pl. 19, fig. 1; YOKOYA, 1925, p. 769.

Loc. Isihama beach, July 14, 1935. 2 young males and 2 young females.
Iigohama beach, July 31, 1935. 1 male and 1 female.

Distribution: From Unalaska to Pacific Grove, California; Hokkaidô; Japan: Aomori, Tusima Isl. and above mentioned localities.

Genus CRYPTOLITHODES BRANDT

Cryptolithodes expansus MIERS

Japanese name: Menko-gani

MIERS, 1879, pp. 21, 49; RATHBUN, 1902, p. 32, textfig. 1; BALSS, 1913 b, p. 71, pl. 1, figs. 6, 7, textfig. 55.

Loc. Onmae Bay, 8 m. deep. July 17, 1935. 1 young female.
Yokoura, 28 m. deep. July 18, 1935. 1 female.

Even in the larger specimen from Yokoura, the carapace is 19,8 mm. long and 25,4 mm. wide.

Distribution: Japan: Rikuzen and Aomori.

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