

ACCOUNTS OF SOME CRABS FROM MUTSU BAY, WITH DESCRIPTION OF A NEW GRAPSID FROM ONAGAWA BAY¹⁾

By

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Through the courtesy of Dr. M. TORIUMI the author had a good chance to examine some small collections of crabs mainly from Mutsu Bay deposited in the Marine Biological Station of Asamushi. The crabs of Mutsu Bay had already been dealt with by YOKOYA (1928) as a part of the Biological Survey of Mutsu Bay made during the years 1925-7. In his report were recorded altogether 30 species of 10 families, which are now known as 29 species of 9 families as listed in the table 1 with the emended current names. Afterwards, SAKAI (1939) recorded a new species of the Pinnotheridae designated as *Pinnaxodes mutuensis*, *Paracleistostoma cristatum* de Man of the Ocypodidae and *Helice tridens tridens* de Haan of the Grapsidae. Although at present the following 3 species and 1 subspecies of 4 families were otherwise recorded, the knowledge of the crab fauna of Mutsu Bay as a whole is quite insufficient and many species must be recorded by the further collections. The species added at present are *Paradorippe granulata* (de Haan) of the Dorippidae, *Charybdis bimaculata* (Miers) of the Portunidae, *Actaea rueppellii orientalis* Odhner of the Xanthidae and *Carcinoplax longimana* (de Haan) of the Goneplacidae.

In general, as expected, the crab fauna of Mutsu Bay are mostly represented by the inhabitants of the West Pacific. The exceptions widely distributed in the Indo-West Pacific is *Charybdis bimaculata* of the Portunidae and *Pilumnus minutus* of the Xanthidae. The portunid may be widely distributed due to the high swimming activity and the tolerance ability of the variable circumstances, while this is not the case of the xanthid. Although in this small species the variability of the hairiness and armature of the dorsal surface and anterolateral border of the carapace gives rise to the difficulty in its identification, there seems to be no decidedly primitive characters comparable to the lanceolate natatory leg of a portunid *Macropipus corrugatus* (Pennant) which may be the primitive form with the wide distribution in the Indo-West Pacific and the East Atlantic. Similarly it is remarkable that the Japanese representatives of *Cancer* of the Cancridae and

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Pinnixa of the Pinnotheridae bear the American analogues. Among them *C. amphioctus* is recorded from both the East and the West Pacific without the intervening localities. That the considerable numbers of the species unrecorded from Mutsu Bay are known from Tsugaru Straits may indicate the case in which the certain species prefer the open sea bottom rather than the inland waters, or the incomplete collections in Mutsu Bay. For instances, the former may be the case of *Tymolus japonicus* Stimpson of the Tymolidae which is endemic in Japan from Hakodate Bay southwards to the East China Sea, and the latter *Ebalia tuberculosa* (A. Milne Edwards) of the Leucosiidae which is known from Tsugaru Straits and also common in the inland shallow water of both coasts of Japan.

Although the collections are not quite exhaustive, the crab fauna of Mutsu Bay must be composed of five elements, viz., (1) the Pacific boreal species common to the northern Pacific coast of America, (2) the northwards distributed species in the West Pacific, (3) the endemic species, (4) the southwards distributed species in the West Pacific, and (5) the species widely distributed in the Indo-West Pacific. The first type may be typically represented by *Oregonia gracilis* of the Majidae, the second by *Pisoides bidentatus* and *Scyra compressipes* of the Majidae and *Telmessus cheiragonus* of the Atelecyclidae, and the third by such species as *Rhynchoplax messor* of the Hymenosomatidae, *Pugettia minor* of the Majidae, and *Pinnotheres*

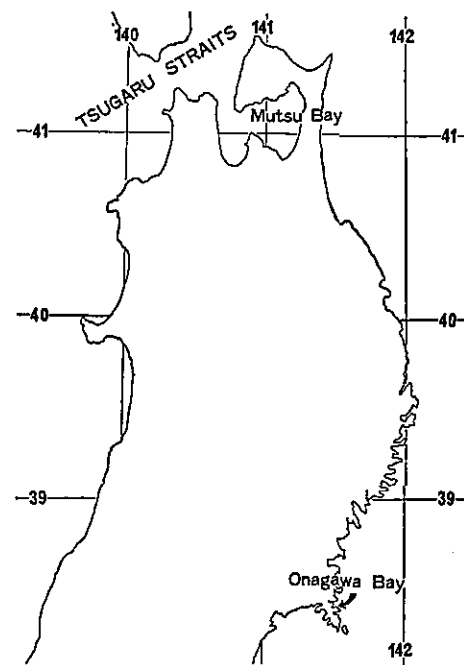


Fig. 1. Map of Tohoku district showing Mutsu Bay and Onagawa Bay, type locality of a new grapsid crab.

Table 1
Crabs recorded by Yokoya (1928)

DROMIIDAE <i>Paradromia japonica</i> (Henderson) [= <i>Petalomera</i>]	XANTHIDAE <i>Pilumnus hirsutus</i> Stimpson [= <i>P. minutus</i> de Haan]
HYMENOSOMATIDAE <i>Trigonoplax unguiformis</i> (de Haan) <i>Rhynchoplax messor</i> Stimpson <i>Halicarcinus septentrionalis</i> n. sp. [= <i>Rhynchoplax coralicora</i> Rathbun]	PINNOTHERIDAE <i>Pinnotheres pholadis</i> de Haan <i>Parapinnixa affinis</i> Holmes [nec Holmes;= <i>Sakaina yokoyai</i> (Glassell)] <i>Pinnixa occidentalis</i> Rathbun [nec Rathbun;= <i>P. rathbuni</i> Sakai]
MAJIDAE * <i>Paratymolus pubescens</i> Miers * <i>Oregonia gracilis</i> Dana <i>O. mutsuensis</i> n. sp. <i>Pugettia minor</i> Ortmann <i>P. incisa</i> (de Haan) <i>Doclea bidentata</i> (A. Milne Edwards) [= <i>Pisoides</i>] <i>Scyra compressipes</i> Stimpson	<i>P. tumida</i> Stimpson <i>Pinnaxodes major</i> Ortmann * <i>Asthenognathus inaequipes</i> Stimpson
CANCRIDAE <i>Cancer bullatus</i> Balss and C. <i>pygmaeus</i> Ortmann [= <i>C. amphioctus</i> Rathbun]	OCYPODIDAE <i>Scopimera globosa</i> de Haan <i>Macrophthalmus japonicus</i> de Haan
ATELECYCLIDAE <i>Telmessus cheiragonus</i> (Telesius)	GRAPSIDAE * <i>Brachynotus longitarsis</i> (Miers) [= <i>Hemigrapsus</i>] <i>B. sanguineus</i> (de Haan) [= <i>Hemigrapsus</i>] <i>B. brevidigitatus</i> n. sp. [= <i>Hemigrapsus penicillatus</i> (de Haan)] <i>Eriocheir japonicus</i> de Haan <i>Platygrapsus depressus</i> (de Haan) [= <i>Gaetice</i>]
PORTUNIDAE <i>Neptunus trituberculatus</i> Miers [= <i>Portunus</i>] <i>Charybdis japonica</i> (A. Milne Edwards)	

* Species also recorded at present.

pholadis, *Pinnixa rathbuni* and *Asthenognathus inaequipes* of the Pinnotheridae. These endemic species are not uncommon in the entire coast of Japan but Hokkaido. In the fourth and fifth types Mutsu Bay forms the northern limit of the distribution, the former being represented by such species as *Paratymolus pubescens* of the Majidae and *Scopimera globosa* of the Ocypodidae, and the latter by *Charybdis bimaculata* of the Portunidae and *Pilumnus minutus* of the Xanthidae as already mentioned. As for the distribution pattern such species as *Portunus trituberculatus* of the Portunidae, *Macrophthalmus japonicus* of the Ocypodidae and *Hemigrapsus longitarsis* of the Grapsidae ranging southwards to North China, Taiwan or Hongkong may be included in the endemic element. Although the vicinity of the Tsushima Islands in the north of Kyushu may be a boundary for the southern species, the considerable numbers of the species extend the ranges in the Japan Sea with the Tsushima Warm Current (TAKEDA, 1973a, b). Some of the them reach the Tsugaru Straits along the Japan Sea coast, while along the Pacific coast they extend the ranges northwards to the vicinity of Inubo-zaki in Chiba Prefecture or Shioya-zaki in Fukushima Prefecture with the Kuroshio Warm Current.

Most of the recorded species are so well known that the descriptive remarks

are generally thought to be unnecessary. It must be, however, mentioned that *Oregonia mutsuensis* of the Majidae described by YOKOYA (1928) on two males of small size from two stations in Mutsu Bay was subsequently recorded only by the same author in 1933 at three stations from the east of Shiriya-zaki in the Pacific coast of Aomori Prefecture southwards to the east of Shiroya-zaki in Fukushima Prefecture. Its bathymetric range is from about 45 in Mutsu Bay to 201 meters off Shiriya-zaki. According to the original description, the dorsal surface is less markedly tuberculated and the hepatic region is more strongly produced laterally than in the case of *O. gracilis*. The rostral spines are almost parallel, but not in contact with each other, and only one fourth the length of the carapace. The terminal segment of the male abdomen is obtusely acuminate, being not emarginated as that of *O. gracilis*.

Two ovigerous females and a smaller female referable to *Pinnaxodes mutsuensis* of the Pinnotheridae described by SAKAI (1939) are comprised in the present collection from Mutsu Bay. They were obtained from the bivalve shell *Modiolus modiolus difficilis* Kuroda et Habe as in the type specimens from Mutsu Bay. The present author otherwise examined a male and a female from Hakodate, the female of which is well agreeable with the ovigerous females from Mutsu Bay. This species is distinguished from *P. major* Ortmann most readily by the feature that the female carapace is entirely naked and rounded quadrangular with an obtuse angle in the middle of each lateral border of the carapace. It is noted at present that in the male the carapace is also naked, polished and pea-shaped with the moderately convex dorsum, and that the first pleopod is well agreeable with the figure given by the original author, bearing a tuft of long hairs at the apex instead of a rectangularly growing process of *P. major* illustrated by SAKAI (1965). There are no specimens at hand from Mutsu Bay referable to *P. major*, but two immature females from Mimase in Kochi Prefecture were identified as *P. major*. The general appearance is quite different from the mature female, being similar to the male from Hakodate referred to this species. The carapace, chelipeds and ambulatory legs are, however, thickly covered with dark velvet. The host of this species is only a bivalve shell already mentioned elsewhere, while *P. major* usually found in the cloaca of *Holothuria monacria* Lesson and in the mantle cavity of *Merethrix mamarckii* Deshayes and *Coelomactra antiquata* (Spenlger) was recorded from *Mytilus* in Mutsu Bay by YOKOYA (1928).

Pinnixa rathbuni of the Pinnotheridae is very common in Mutsu Bay and many specimens of various developmental stages are comprised in the present collection. The great numbers of this species often swarm on the muddy or shelly bottoms of shallow inland waters. This species ranges from Mutsu Bay southwards to the coast of Kagawa Prefecture, and recently TAKEDA and MIYAKE (1968) recorded this species from the East China Sea.

It is otherwise mentioned that *Sakaina yokoyai* of the Pinnotheridae wrongly

referred to *Parapinnixa affinis* from the coast of California by YOKOYA (1928) is known only by a female from off Shukunobe in Mutsu Bay. There is no subsequent record of occurrence, but it is readily distinguished from the congeners, *S. asiatica* (Sakai), *S. japonica* Serène, *S. incisa* Sakai and *S. koreensis* Kim et Sakai by the features that the carapace is exceedingly convex at the anterior hepatic border so as to make a straight line with the anterior border, the posterolateral border is rapidly convergent, and no belt of pubescence is to be seen along the anterior and hepatic borders.

Description of *Acmaeopleura toriumii* sp. nov.

Among the crabs examined are two males and three ovigerous females of the Grapsidae from the coast of Onagawa Bay, Miyagi Prefecture (Fig. 1). They represent a new species of *Acmaeopleura* which has hitherto been known by four species from the West Pacific. A male with the carapace width 4.8 mm and length 4.2 mm is designated as the holotype, and an ovigerous female with the width 5.4 mm and length 4.5 mm as the allotype, both being deposited in the National Science Museum, Tokyo (NSMT-Cr. 971 and 972). The others with registered number NSMT-Cr. 973 form the paratypes. The paratype ovigerous females are 6.2 and 4.0 mm in the width and 5.2 and 3.4 mm in length, respectively. The paratype male is much smaller than the others.

The description of the holotype is prepared as follows. The carapace is quadrilateral, or rather hexagonal with the rounded, or more or less angulated median part of each lateral border, being slightly wider than long. The ratio between the length and width is 1.14. The dorsum is moderately and evenly convex in both directions; it is naked and glabrous, but minutely and irregularly punctate under the binocular microscope. The frontal width is 1.2 mm and just one fourth the carapace width; the front is almost truncated only with the dorsal obsolete depression in the middle, being fringed with a narrow rim; in the dorsal view each lateral end is very rounded, but very weakly angulated in the facial view, being not separated from the supraorbital border which is also narrowly rimmed throughout the length without any interruption. The fronto-orbital width is 3.4 mm, being two thirds or slightly more the carapace width. The lateral and posterior borders are also narrowly rimmed. The very small space of the epimeron is detected in the dorsal view; the posterior border is straight and only slightly narrower than the fronto-orbital width. The suborbital ridge is composed of nine smooth and transverse tubercles. The third maxillipeds are broad and completely close the buccal cavern; the ischium and merus are widely sculptured with a large depression, being covered with the worn-out granules of good size; the palp is stout with the extremely long apical hairs that in the natural position exceed the posterior end of the ischium and are folded in the cavity of the first sternal segment in front of the abdominal trench. The chelipeds are minutely

granulated, equal and large with the inflated palms. The outer surface of the palm is ornamented with a transverse ridge. There is a small tuft of soft hairs at the base of the immovable finger. The ambulatory legs are comparatively slender and fringed with sparse hairs, both borders of the meri being covered with minute granules.

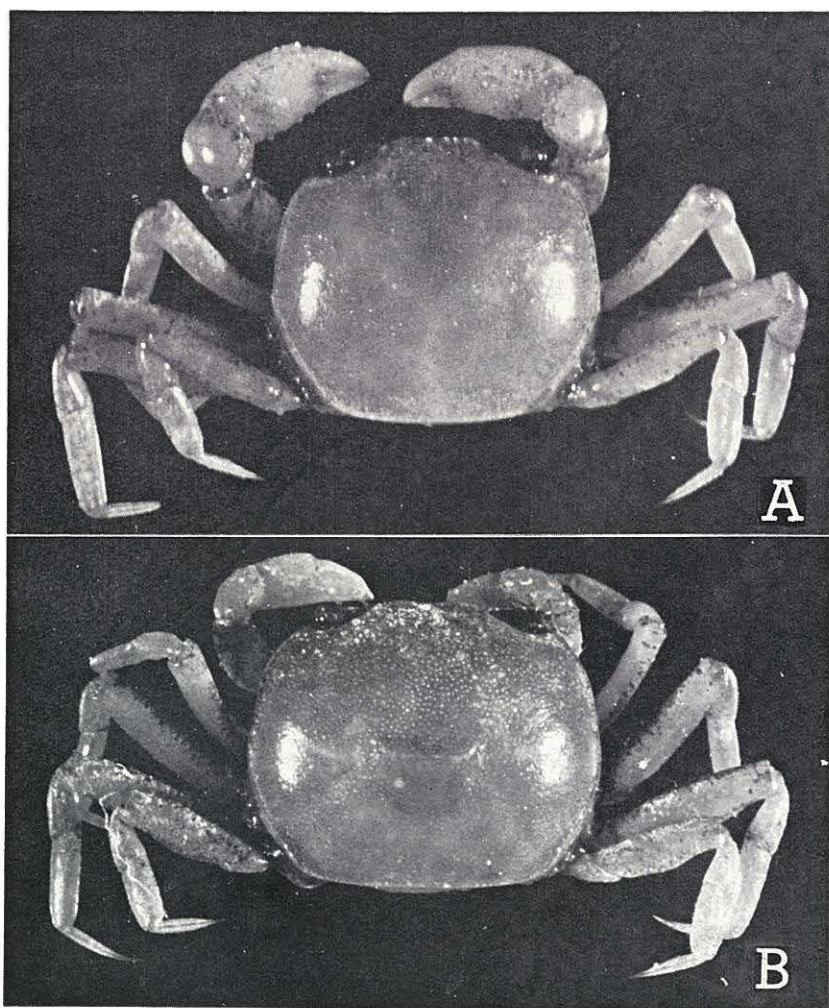


Fig. 2. *Acmaeopleura toriumii* sp. nov. A, holotype (4.8×4.2 mm). B, allotype (5.4×4.5 mm).

The allotype and paratype specimens are well agreeable with the holotype, and only minute individual variation is observable on the contour and ornamentation of the carapace. The ratio between the length and width varies as 1.17, 1.19 and 1.2 in the ovigerous females, but there seems to be no remarkable differences among them. The dorsum of the carapace is variably roughened, and otherwise,

in each of the ovigerous females the granules on the third maxilliped are conical and make the surfaces of the ischium and merus very rough. As the sexual differences as usual there is no stridulatory organ only with the granulated ridge and the palm is not bulged without the tuft of hairs.

The genus *Acmaeopleura* Stimpson is represented by four species from the west Pacific, viz., *A. parvula* Stimpson, 1858 (various localities from Sagami Bay southwards to Amami-Oshima and Nagasaki along Pacific coast, Fukui Prefecture and south coast of Korea), *A. rotunda* Rathbun, 1909 (Gulf of Siam), *A. balssi* Shen, 1932 (Shantung Peninsula in North China, Toyama Bay and Inland Sea of Japan), and *A. depressa* Sakai, 1965 (Sagami Bay).

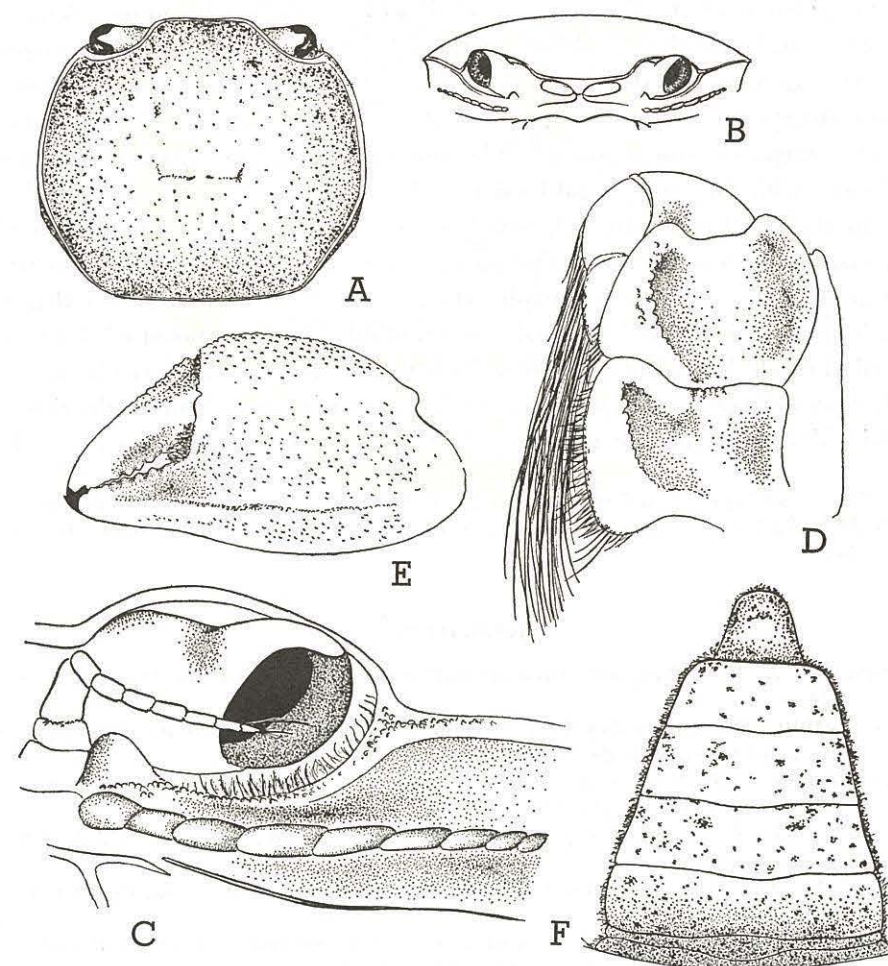


Fig. 3. *Acmaeopleura toriumii* sp. nov., holotype (4.8×4.2 mm). A, B, carapace in dorsal and facial view, respectively. C, orbital region with suborbital crest. D, left third maxilliped. E, left chela in outer view. F, abdomen.

A. parvula, the type species, is most readily distinguished from the others by having the carapace broadened anteriorly. It is otherwise briefly characterized by that the carapace is smooth and depressed, the epimeron cannot be seen in the dorsal view, the chela bears a tuft of soft hairs, and the infraorbital ridge is composed of a long tubercle and two small ones at the lateral end as illustrated by Shen (1932). The knowledge of *A. rotunda* based on a juvenile male only with a schematic figure of the third maxilliped is quite insufficient and the subsequent identification may be almost impossible without the direct comparison with the materials from the type locality. According to RATHBUN (1909, 10), the carapace is as long as broad, a little convex and widest at the middle, the front is one third width of the carapace and separated from the inconspicuous orbital angle by a slight furrow, and the surfaces of the carapace and chelipeds are rough with granulations. It is shortly noted that the apical hairs of the palp of the third maxilliped are figured as short. Even if it is difficult to know the other details from the descriptions, the present species differs from the Gulf of Siam species at least by the features that the carapace is comparatively wider and the front is narrower and completely continuous with the supraorbital border, and the carapace is not at all granulated even in the small specimen. *A. balssi* is the nearest kin of the present species with many common features. The present species is much smaller, the orbit is so large that the fronto-orbit occupies the larger part of the carapace width, the chela bears a small tuft of hairs, and the suborbital crest is composed of nine tubercles side by side instead of two elongate crests and one tubercle at the lateral end. In *A. depressa* known only by the females the carapace is rough, decidedly depressed and widest at the middle, and the epimeron is cannot be seen in the dorsal view.

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