

Crabs from the East China Sea. II : Addition to Brachygnatha Brachyrhyncha

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Crabs from the East China Sea. II

Addition to Brachygnatha Brachyrhyncha*

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In the first paper dealt with the crabs from the East China Sea three species of the section *Corystoidea* and twenty-five species of the superfamily *Brachyrhyncha* of the section *Brachygnatha* are enumerated. Of the species referred to the latter section two species of the families *Portunidae* and *Goneplacidae* are not named due to the imperfect and young examples. In the present paper ten additional species of the families *Portunidae*, *Xanthidae*, *Goneplacidae* and *Palicidae* are enumerated from the East China Sea. They are comprised in the recently received collections from the north of Taiwan made by the Taiwan Marine Research Institute, and from off the Danjo Islands. The collection from off Taiwan was at our disposal for study through the courtesy of Mr. H. P. Yu of our laboratory, to whom we express our cordial thanks. The ten additional species are as follows.

Section *Brachygnatha*

Superfamily *Brachyrhyncha*

Family *Portunidae*

Charybdis cruciata (Herbst, 1794)

Charybdis miles de Haan, 1835

Portunus gracilimanus (Stimpson, 1858)

Portunus hastatooides Fabricius, 1798

Portunus argentatus (A. Milne Edwards, 1861)

Family *Xanthidae*

Demaniu reynaudii (I.-I. Milne Edwards, 1834)

Pilumnus orbitospinis Kathbun, 1911

* Contributions from the Zoological Laboratory, Faculty of Agriculture, Kyushu University, No. 421.

Family Gonoplacidae

Carcinoplax surugensis Rathbun, 1932*Megaesthesius yokoyai* Sakai, 1939

Family Palicidae

Palicus amadaibai Sakai, 1963

Of the ten species five are referable to the family Portunidae. In the first paper also five species were enumerated and it was accentuated that the collection of portunid crabs is by no means exhaustive. Though altogether ten species are recorded from the Sea to date, it is apparent that more species are found in the further collections. The present five portunid crabs are rather widely distributed in the Indo-West Pacific waters. It is, however, noted that *P. gracilimanus* is new to the fauna of Japan and its adjacent waters.

One of the two species of the family Goneplacidae, *Carcinoplax surugensis*, occurs in the Japanese waters from the Sagami Bay southwards to the Tosa Bay. The present specimen was at first identified as *C. inaequalis* (Yokoya) after comparison with some syntypes of the species. The species is, however, probably synonymous with Rathbun's species, since the ornamentation of the carapace, the armatures of the anterolateral borders of the carapace and the formation of the chelipeds are so similar each other that it is impossible to distinguish the one from the other. It is otherwise noted that *Pilumnoplax* sp. reported by us in the first paper is referable to *Carcinoplax surugensis*. An another species of the family, *Megaesthesius yokoyai*, is very rare and described and figured in detail. It is very characteristic in the formation of the antennules, orbits and eyestalks. It is also noteworthy that several stout hairs along the lower borders of the propodi and dactyli of the ambulatory legs are movable at the bases unlike the usual hairs. Sérène (1964) established a subfamily Chasmocarcininae for the six genera including the present genus allied to the family Pinnotheridae. According to the paper, the subfamily Chasmocarcininae comprises *Chasmocarcinus* Rathbun, *Chasmocarcinops* Alcock, *Hephthopelta* Alcock, *Camatopsis* Alcock, *Scalopidia* Stimpson and *Megaesthesius* Rathbun. However, Sérène (1968) included them into the subfamily Typhlocarcinopsinae together with the genera *Typhlocarcinops* Rathbun, *Typhlocarcinodes* Alcock and *Mertonia* Laurie.

As mentioned elsewhere, one of the two species unnamed in the first paper is referable to *Carcinoplax surugensis* which is dealt with in the present paper. Therefore, altogether thirty-seven species of the section Corystoidea and the superfamily Brachyrhyncha of the section Brachygnatha are known to date from the East China Sea.

Description of species
Family Portunidae
Genus *Charybdis* de Haan, 1835

Charybdis cruciata (Herbst, 1794)

- Charybdis (Goniosoma) crucifera***, Alcock, 1899, p. 51 (lit.) - India.
Goniosoma cruciferum, Lanchester, 1901, p. 545 - Trengganu, Malay Penin.
Charybdis crucifera, Stimpson, 1907, p. 80 - Hongkong, 10-35 m deep.
Charybdis cruciata, Rathbun, 1910, p. 363 - Gulf of Siam, 30-55 m deep.
Charybdis crucifera, Kemp, 1918, p. 250 - Singora faced to Gulf of Siam.
Charybdis crucifera, Balss, 1922, p. 104 - Taiwan and S. China.
Charybdis (Goniosoma) crucifera, Gordon, 1931, fig. 13, e.
Charybdis (Goniosoma) cruciata, Shen, 1932, p. 38, fig. 6, pl. 8 - Hongkong.
Charybdis (Goniosoma) cruciatus, Chopra, 1945, p. 482, fig. 7 - Off River Hooghly, Bay of Bengal.
Charybdis cruciata, Sakai, 1936, p. 124, fig. 58 - Japan.
Charybdis (Charybdis) cruciata, Leene, 1938, p. 24, figs. 1, 2 (lit.) - Java, Bali Sea and Makassar Str., 20-30 m deep.
Charybdis cruciata, Sakai, 1939, p. 403, pl. 82, fig. 3 - Sagami Bay, Kii, Inland Sea and Nagasaki, and Chilung, Taiwan.
Charybdis (Charybdis) cruciata, Stephensen, 1945, p. 114, fig. 24, A - Strait of Hormuz and Gulf of Oman, 12-30 m deep.
Charybdis cruciata, Barnard, 1950, p. 166, fig. 32, a - Durban, Port Alfred and Delagoa Bay, S. Africa.
Charybdis (Charybdis) cruciata, Stephenson, Hudson and Campbell, 1957, p. 495, figs. 2, E, 3, F, pl. 1, fig. 3, pl. 4, fig. B - Queens., N. S. W., N. Ter. and W. Aust., 10-20 m deep.
Charybdis (Charybdis) cruciata, Miyake, 1961a, p. 18 - Amnusa Sea.
Charybdis (Charybdis) cruciata, Crosnier, 1962, p. 75, figs. 130-132 - Madagascar, 5 - 15 m deep.
Charybdis cruciata, Snkai, 1965, p. 123, pl. 62, pl. 63, fig. 1 - Sagami Bay, 10-20 m deep, Aichi Pref. and Kii.

Material examined.

Off Chilung, Taiwan ; 1 ♀ (Length, 31.2 mm ; breadth with lateral teeth, 45.2 mm), ZLKU No. 13362 ; Nov. 1966 ; Taiwan Mar. Res. Inst. leg.

Distribution. This species bears a wide range in the Indo-West Pacific waters from Japan through the West Pacific to Queensland, Australia and through the coast of India to Madagascar and South Africa. The bathymetric range is from 5 to 55 m, and Crosnier (1962) commented that it is rarely found at the intertidal zone.

Charybdis miles de Haan, 1835

- Portunus (Charybdis) miles* de Haan, 1835, p. 41, pl. 11, fig. 1 -Japan.
- Goniosoma miles*, A. Milne Edwards, 3861, p. 378 -Japan.
- Goniosoma miles*, Ortmann, 1893, p. 81 -Tokyo Bay and Kochi.
- Charybdis (Goniosoma) miles*, Alcock, 1899, p. 62 -Gulf of Martaban, 95 and 120 m deep.
- Charybdis (Gonioneptunus) investigatoris* Alcock, 1899, p. 70 -Off Ganjam coast, Bay of Bengal, 65 m deep.
- Charybdis (Gonioneptunus) investigatoris*, Illust. 2001. Invest., 1900, pl. 46, fig. 4.
- Goniosoma miles*, Whitelegge, 1900, p. 157 -Off Newcastle, N.S.W., 40-85 m deep.
- Charybdis miles*, Doflein, 1902, p. 659 - Sagami Bay.
- Charybdis miles*, Rathbun, 1902, p. 27 - Kii.
- Charybdis miles*, Stimpson, 1907, p. 82 - Hongkong.
- Charybdis miles*, Parisi, 1916, p. 175 -Tokyo Bay and Sagami Bay.
- Charybdis miles*, Balss, 1922, p. 104 - Sagami Bay, 50-100 m deep.
- Charybdis miles*, Yokoya, 1933, p. 175 - Kii, Inland Sea, Tosa Bay, Kagoshima Pref. and Koshiki-jima Is., 46-121 m deep.
- Charybdis miles*, Sakai, 1934, p. 302 -Nagasaki.
- Charybdis (Goniosoma) miles*, Chopra, 1935, p. 486, fig. 9 - Off River Hooghly, Bay of Bengal.
- Charybdis miles*, Sakai, 1936, p. 123, pl. 33, fig. 2 -Japan.
- Charybdis (Goniosoma) miles*, Shen, 1937, p. 123, fig. 13 - Off Tioman I., South China Sea.
- Charybdis (Charybdis) miles*, Leene, 1938, p. 38, figs. 10-13 - Borneo Bank, Java Sea and Flores Sea, 59-247 m deep.
- Charybdis miles*, Sakai, 1939, p. 405, pl. 46, fig. 2 -Tateyama Bay, Shimoda and Tosa Bay.
- Charybdis (Charybdis) miles*, Stephenson, Hudson and Campbell, 1957, p. 500, fig. 2, H, 3, I, pl. 2, fig. 3, pl. 4, fig. G -Newcastle and Botany Bay, N. S. W., 40-85 m deep.
- Charybdis (Charybdis) miles*, Miyake, 1961a, p. 18 - Amakusa Sea.
- Charybdis miles*, Sakai, 1965, p. 123, pl. 61 - Sagami Bay, 15-80 m deep.

Material examined.

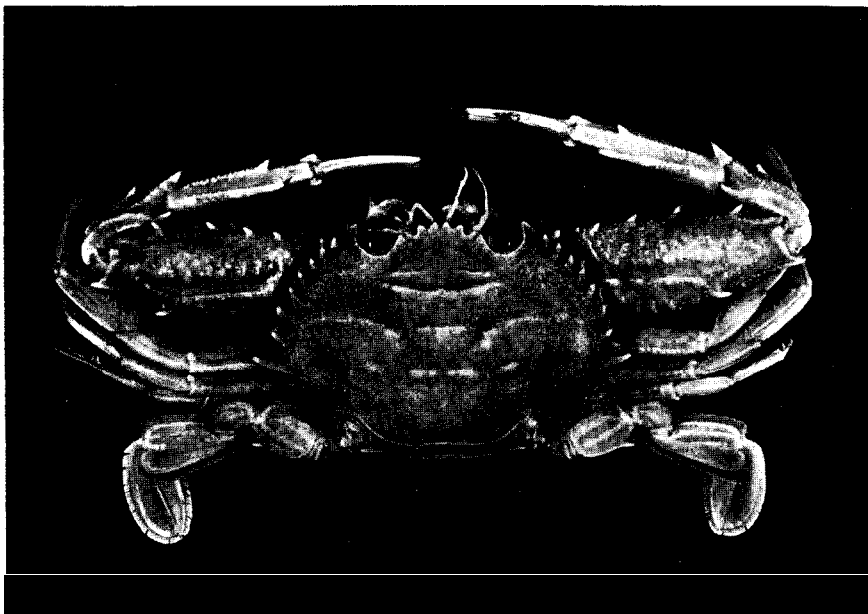
Off Chilung, Taiwan ; 1 ♀ (Length, 25.7 mm ; breadth with lateral teeth, 35 mm), ZLKU No. 13363 ; Nov. 1966 ; Taiwan Mar. Rcs. Inst. leg.

Distribution. This species is widely distributed in the Indo-West Pacific waters from Japan to New South Wales and Western Australia and to the coast of India. The bathymetric range is from 15 to 247m.

Genus *Portunus* Weber, 1795*Portunus gracilimanus* (Stimpson, 1858)

(Fig. 1)

- Ampitrite gracilimanus*, Stimpson, 1907, p. 77, pl. 10, fig. 3 - Hongkong, 30 m deep.
Achelous Whitei A. Milne Edwards, 1861, p. 343, pl. 31, fig. 6 -Borneo.
Neptunus (Achelous) whitei, Miers, 1886, p. 179 -South of New Guinea, 50 m deep.
Achelous Whitei, Walker, 1887, p. 110 - Singapore.
Achelous Whitei, Henderson, 1893, p. 371 -Gulf of Martaban and Madras.
Neptunus (Lupocycloporus) Whitei, Alcock, 1899, p. 44 - Madras and Andamans.
Achelous Whitei, Lanchester, 1900, p. 746 -Singapore.
Lupawhitei, Grant and McCulloch, 1906, p. 19 -Port Curtis, Queens.
Neptunus (Lupocycloporus) whitei, Laurie, 1906, p. 416 -Gulf of Manaar and off Mutwal I., Ceylon.
Portunus (Lupocycloporus) gracilimanus, Rathbun, 1910, p. 362 - Gulf of Siam, 5-55 m deep.
Neptunus (Lupocycloporus) gracilimanus, Balss, 1922, p.108- Siam.
Neptunus (Lupocycloporus) gracilimanus, Chopra, 1935, p. 481, fig. 6 - Off River Hooghly, Bay of Bengal.
Neptunus (Lupocycloporus) gracilimanus, Shen, 1937, p. 113, figs. 9, 10, c - Singapore.
Portunus gracilimanus, Stephenson and Campbell, 1959, p. 115, figs. 2, M, 3, M, pl.

Fig. 1. *Portunus gracilimanus* (Stimpson), ♂ (No. 13366-1).

4, fig. 1, pl. 4, fig. M, pl. 5, fig. M-Albany Passage, Townsville and Port Curtis, Queens., 15 m deep.

Material examined.

Off Chilung, Taiwan ; 3 ♂♂ (Length, 23.4, 20.8 and 19.6 mm; breadth with lateral teeth, 41.3, 36 and 34.3 mm), ZLKU No. 13366 Nov. 1966 ; Taiwan Mar. Res. Inst. leg.

Remarks. It is characteristic that the chelipeds are covered with numerous squamiform granules and a fine pubescence, and that the tips of the fingers are rather prominently curved outwards: In the male abdomen the lateral borders of the ultimate and penultimate segments are not convex or rounded, but almost straight. The first male pleopod is very short and stout, being sharply curved outwards and narrowly tapering at the tip.

As pointed by Stephenson and Campbell (1959), it is less certain whether *Portunus innominatus* Rathbun substituted for Alcock's *Neptunus gracilimanus non* Stimpson is distinct from or synonymous with the present species. Judging from the differences enumerated by Alcock (1899) and the statement of Chopra (1935), however, *P. innominatus* seems to be valid. Though Shen (1937) considers that *P. innominatus* is a synonym of the present species, here it is therefore excluded from the above synonymy.

Distribution. This species ranges from New Guinea and Hongkong to Queensland, Australia and the Andamans and the east coast of India. It has not been previously recorded from the Japanese waters.

Portunus hastatoides Fabricius, 1798

Neptunus (Amphitrite) hastatoides, de Haan, 1833, p. 39, pl. 1, fig. 3 -Japan.

Neptunus (Hellenus) hastatoides, Alcock, 1899, p. 38 (lit.)- Persian Gulf, Madras, Andamans, Gulf of Martaban, Penang and Hongkong.

Neptunus (Amphitrite) hastatoides, Lancheater, 1900, p. 745, pl. 45, fig. 7 -Singapore, 10 m deep.

Neptunus (Hellenus) hastatoides, Borradaile, 1902, p. 208 - Maldive Is., 35-55 m deep.

Portunus hastatoides, Rathbun, 1902, p. 27 - Nagasaki and Kii.

Neptunus (Hellenus) hastatoides, Laurie, 1906, p. 414, fig. 8 - Ceylon, Gulf of Manaar and Palk Bay.

Neptunus (Hellenus) hastatoides var. *unidens* Laurie, 1906, p. 414 - Gulf of Manaar.

Amphitrite hastatoides, Stimpson, 1907, p. 78 - Hongkong, 10-15 m deep.

Lupa (Hellenus) hastatoides, de Man, 1907, p. 391 - Inland Sea of Japan.

Portunus (Achelous) hastatoides, Rathbun, 1910, p.361 - Singapore and Gulf of Siam.

5-55 m deep.

Neptunus (Hellenus) hasratoides, Balss, 1922, p. 108 - Sagami Bay and Nagasaki, China and Philippines.

Neptunus (Hellenus) hastatoides, Yokoya, 1933, p. 178 - Kii, 46 m deep.

Neptunus hastatoides, Sakai, 1934, p. 303 - Nagasaki.

Neptunus (Hellenus) hastatoides, Chopra, 1935, p. 477, fig. 4 - Off River Hooghly, Bay of Bengal.

Neptunus (Hellenus) hastatoides, Sakai, 1936, p. 130, pl. 36, fig. 1 - Japan.

Neptunus (Hellenus) hastatoides, Shen, 1937, p. 107, figs. 5, 8, g, h - Singapore.

Neptunus (Hellenus) hastatoides, Sakai, 1939, pl. 17, fig. 1 - Tateyama Bay, Sagami Bay, Shimoda and Ise Bay.

Neptunus (Hellenus) hastatoides, Stephensen, 1915, p. 122 - Persian Gulf and Gulf of Oman, 3-70 m deep.

Hellenus hastatoides, Barnard, 1950, p. 158, fig. 30, e-g - Zululand, S. Africa, 43 m deep.

Portunus hastatoides, Stephenson and Campbell, 1959, p. 101, figs. 2, D, 3, D, pl. 1, fig. 4, pl. 4, fig. D, pl. 5, fig. D Queens., W. Aust. and N. Ter., 5-15 m deep.

Portunus hastatoides, Miyake, 1961a, p. 18 - Amakusa Sea.

Portunus hastatoides, Miyake, 1961b, p. 172 - Sea of Ariaké.

Portunus hastatoides, Crosnier, 1962, p. 68, figs. 96, 109, 117, 122, 123 - Madagascar, 7-63 m deep.

Portunus hastatoides, Sakai, 1965, p. 119, pl. 58, fig. 2 - Sagami Bay, 30-80 m deep.

Material examined.

Off Chilung, Taiwan; 1 ♂ (Length, 21 mm; breadth with lateral teeth, 41.4 mm), ZLKU No. 13369; Nov. 1966; Taiwan Mas. Res. Inst. leg.

Distribution. This species is widely distributed in the Indo-West Pacific water-s from Japan to Australia and the east coast of Africa, but it is unrecorded from the Ked Sea. The bathymetric range is from very shallow water to 80 m.

Portunus argentatus (A. Milne Edwards, 1861)

Amphitrite argentata White, 1817, p. 126 (*descriptio nulla*) - Borneo.

Veptunus argentatus A. Milne Edwards, 1861, p. 332, pl. 31, fig. 4 - Borneo.

Veptunus (Amphitrite) gladiator var. *argentatus*, Miers, 1886, p. 177 - Celebes Sea, 20-35 m deep.

Neptunus (Amphitrite) gladiator var. *argentatus*, Ortmann, 1893, p. 73 - Kagoshima, Japan.

Neptunus argentatus, Henderson, 1893, p. 368 - Gulf of Martaban.

Veptunus (Amphitrite) argentatus, Alcock, 1899, p. 36 - Andamans, Mergui, Arakan coast, Ganjam coast, Ceylon and Malabar coast, 30-60 m deep.

Neptunus (Amphitrite) argentatus, de Man, 1902, p. 642 - Ternate.

Neptunus (Amphitrite) argentatus, Laurie, 1906, p. 413 - Ceylon and Gulf of Manaar.

- Portunus (Achelous) argentatus*, Rathbun, 1906, p. 871 - Molokai I., Hawaiian Is.
Neptunus (Amphitrite) argentatus, Sakai, 1939, p. 391, fig. 5, b, pl. 81, fig. 1 - Shimoda, Kii and Tosa Bay.
Monomia argentatus, Barnard, 1950, p. 156, figs. 27, c, 30, a-d - Natal and Delagoa Bay, 50 m deep.
Portunus (Achelous) argentatus, Edmondson, 1954, p. 238, figs. 14, 15 - Andamans.
Portunus argentatus, Stephenson, 1961, p. 105, figs. 1, F, 3, D, pl. 2, fig. 2, pl. 1, fig. D, pl. 5, fig. A - W. Aust., 50-65 m deep.
Portunus argentatus, Crosnier, 1962, p. 50, figs. 71, 75, 77, 80, 81, pl. 3, fig. 1 - Madagascar, 10-65 m deep.

Material examined.

Off Chilung, Taiwan ; 9 ♂♂ (The largest, length, **20.5** mm ; breadth with lateral teeth, 39.3 mm), 6 ovig. ♀♀ (The largest, length, 20 mm ; breadth with lateral teeth, 37.7 mm : The smallest, length, 14.5 mm ; breadth with lateral teeth, 27.9 mm), 3 ♀♀ (The largest, length, 20.9 mm ; breadth with lateral teeth, 38.6 mm), 2 ♀♀ infested by *Sacculina*, ZLKU No. 13371 ; Nov. 1966 ; Taiwan Mar. Res. Inst. leg.

Remarks. The first male pleopods are very well agreeable with the figures given by Stephenson (1961). It is rather short and strongly curved outwards, being swollen distally.

Distribution. This species is very widely distributed in the whole Indo-West Pacific waters. The records from the Hawaiian waters are, however, somewhat doubtful.

Family Xanthidae
 Genus *Demanis* Laurie, 1906

Demanis reynaudii (H. Milne Edwards, 1834)

- Xantho scaberrimus* Walker, 1887, p. 109, pl. 7, figs. 1-4 - Singapore.
Xantho (Lophoxanthus) scaberrimus, Alcock, 1898, p. 316 - Olissa coast, 20m deep, and Japan.
Xantho scaberrimus, Rathbun, 1902, p. 25 - Kii, Japan.
Xantho scaberrimus, Rathbun, 1910, p. 350 - Gulf of Siam, 55m deep.
Xantho scaberrimus, Parisi, 1916, p. 180 - Nagasaki.
Lophoxanthus scaberrimus, Balss, 1922, p. 126 - Hongkong.
Xantho reynaudii, Odhner, 1925, pp. 79, 81 (in discussion).
Lophoxanthus scaberrimus, Yokoya, 1933, p. 189 - Tosa Bay, 97 m deep.
Lophoxanthus scaberrimus, Sakai, 1934, p. 309 - Nagasaki.

Xantho reynaudii, Sakai, 1936 p.149, fig. 71 -Japan.

Xantho reynaudii, Sakai, 1939, p.461, pl. 40, fig. 1- Kii.

Lophoxanthus reynaudii, Buitendijk, 1950, p. 77 - Singapore.

Material examined.

Off Chilung, Taiwan ; 1 ♀ (Length, 27.8 mm ; breadth, 37 mm), ZLKU No. 13289 ; Nov. 1966 ; Taiwan Mar. Res. Inst. leg.

Remarks. According to Guinot (1967, pp. 703-704, footnote), the genera *Xantho* and *Lophoxanthus* s. str. are at present restricted to the European and American waters, respectively, and thereby the Indo-Pacific species known as belonging to the genera are transferred to the proper genera. As regards the present species Guinot suggested that it is closely allied to the genus *Demania* Laurie (type-species : *D. splendida* Laurie). In the first paper of the present study, two specimens are identified as *Xantho cultripipes* Alcock but the generic name should be changed to *Demania*.

The present species and *D. cultripipes* are closely related to *D. splendida*. Though Balss (1938) was of opinion that *D. splendida* is synonymous with *D. cultripipes*, as remarked by Buitendijk (1950), *D. splendida* is distinct from both species on account of bearing the more prominent front, the wider median sinus of the front, and the different formation of the anterolateral border and areolation of the carapace.

Distribution. This species is mainly known from the West Pacific, and otherwise from the coast of India. The localities in the West Pacific are Japan, Hongkong-, the Gulf of Siam and Singapore.

Genus *Pilumnus* Leach, 1814

Pilumnus orbitospinis Rathbun, 1911

Pilumnus orbitospinis Rathbun, 1911, p. 229, pl. 16, figs. 1 I, 15 - Chagos Arch., 1(XI)-2119 m deep.

Pilumnus orbitospinis, Takeda and Miyake, 1968a, p. 19, fig. 4, d-f, pl. 3, fig. B (lit.) - Tosa Bay, 150-200 m deep.

Material examined,

32° 13.6' N, 128° 20.2' E, 167 m deep ; 1 ♂ (Length, 4.9 mm ; breadth without lateral spines, 5.8 mm), ZLKU No. 13404 ; Aug. 6, 1967 ; I. Uchimura leg.

Remarks. The general appearance of the carapace is somewhat similar to that of *P. minutus* de Haan, but the anterolateral spines are much slenderer, the inner infraorbital angle is armed with a long spine that is more or less curved dorsally and visible from above, and finally each carpus of the ambulatory legs is unarmed. It is briefly noted here that several specimens reported by Yokoya (1933) as *P. hirsutus* Stimpson which is synonymous with *P. minutus* are apparently referable to the present species.

Distribution. This species has hitherto been known from the Chagos Archipelago, the Indian Ocean, and from Japan. In Japan it is known from the Sagami Bay and the Tosa Bay at the depths of 85 to 200 m.

Family Goneplacidae

Genus *Carcinoplax* H. Milne Edwards, 1852

Carcinoplax surugensis Rathbun, 1932

(Fig. 2)

Carcinoplax surugensis Rathbun, 1932, p. 34 - Suruga Bay, 265 m deep.

Pilumnoplax inaequalis Yokoya, 1933, p. 394, fig. 63 - South of Inubo-zaki, Suruga Bay, off Shizuoka Pref., Kii, Tosa Bay, Bungo Str., off Sata-misaki, Koshikijima Is. and far west of Goto Is., 79-384 m deep.

Carcinoplax surugensis, Sakai, 1965, p. 167, fig. 21, pl. 83, fig. 1 - Sagami Bay, 65-85 m deep, off Mikawa, 85-120 m deep and Tosa Bay.

***Pilumnoplax* sp.**, Takeda and Miyake, 1968b, p. 565, fig. 6 - East China Sea, 110 m deep.

Material examined.

32° 14.8' N, 127° 59.8' E - 32° 24.3' N, 128° 7.7' E, 150-198 m deep ; 1 ♂ (Length, 6.5 mm ; breadth without lateral spines, 8 mm; breadth with lateral spines, 9 mm), ZLKU No. 13405 ; Aug. 7, 1967 ; I. Uchimura leg.

Remarks. The present specimen is very well agreeable with the short descriptions of Rathbun (1932) and Yokoya (1933), though those descriptions are too short for the adequate confirmation. Sakai (1965) reported several specimens from the Sagami Bay, off Aichi Prefecture and the Tosa Bay as *C. surugensis*, and figured the carapace and the tips of the first and second male pleopods. In the present specimen the anterolateral teeth are more distinctly spiniform, tapering regularly. The figure of the pleopods *in situ* is not available for close comparison

with the figures represented in the present paper, but they are probably identical.

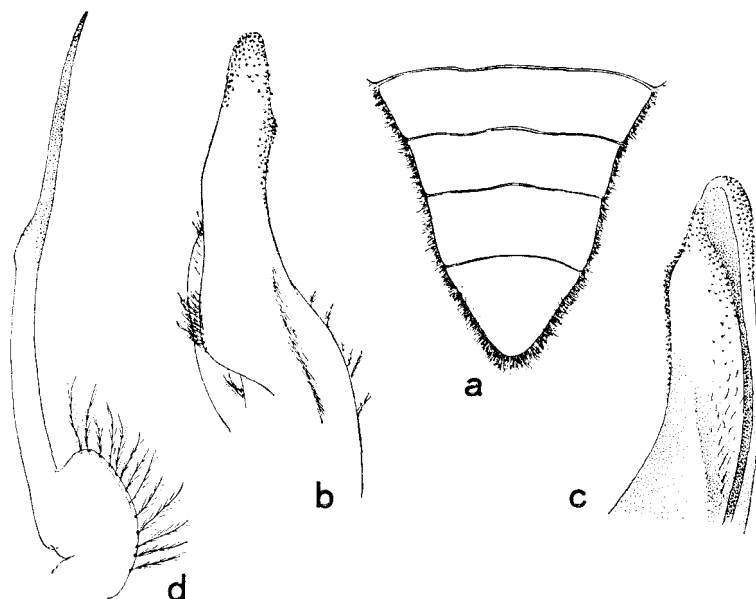


Fig.2. *Carcinoplax surugensis* Rathbun, ♂ (No. 13405). a, Distal four segments of abdomen, $\times 1.3$; b, Left first pleopod in abdominal view, $\times 27$; c, Distal part of the same in sternal view, $\times 40$; d, Left second pleopod in abdominal view, $\times 27$.

At present, in the Zoological Laboratory, Kyushu University are several specimens collected by Soyo-Maru and reported by Yokoya (1933) including some syntypes of *Pilumnoplax inaequalis* listed below. All the specimens are dry, being in rather good condition.

- 1) St. 9, south of Inubo-zaki, 238 m deep. June 22, 1926. 2 ♀♀. All the chelipeps and ambulatory legs are missing.
- 2) St. 194, coast of Maisaka, Shizuoka-ken, 192 m deep. July 2, 1927. 2 ♀♀.
- 3) St. 337, north-cast of Ashizuri-zaki, 130 m deep. July 26, 1928. 1 ♂. The chelipeds and ambulatory legs are detached.

In addition to the above specimens, the following specimens were reported by Yokoya as *Pilumnoplax glaberrima* Ortmann which is synonymous with *Carcinoplax longimanus* (de Haan). The specimens are dry with an exception of a female from the station 431.

- 1) St. 179, near Iro-zaki, 187 m deep. June 28, 1927. 1 ♂, 1 ♀.

- 2) St. 180, west of Iro-zaki, 276 m deep. June 28, 1927. 1 ♀. All the chelipeds and ambulatory legs are detached.
- 3) St. 236, north of Suno-saki, 251 m deep. November 6, 1927. 1 ♂.
- 4) St. 304, off southern Miyazaki-ken, 241 m deep. July 12, 1928. 1 ♂, 1 ♀. The chelipeds and ambulatory legs are detached, and in the female the dorsal surface of the carapace is somewhat damaged.
- 5) St. 431, south-east of Goto Is., 152 m deep. July 16, 1929. 1 ♀.

The following dry male, which is devoid of the chelipeds and ambulatory legs, was listed under the name of *Goneplax renoculis* Rathbun by Yokoya.

St. 540, near Kyo-gasaki, 123 m deep. August 25, 1929. 1 ♀.

In all the specimens the dorsal surface of the carapace is somewhat uneven with a transverse depression at the gastro-cardiac separation. The first anterolateral tooth which forms an external orbital angle is always a lobular one with the rounded outer border. The second tooth is as large as the first or only slightly smaller than it, being directed obliquely forwards; it is very sharp in smaller specimens, but rather obtuse in the larger ones. The third tooth is a slender spine directed obliquely forwards and upwards, and more strongly outwards than in the second. The inner surface of the palm of the cheliped is devoid of a tubercle. It is noted that in the young forms of *Carcinoplax longimanus*, the first anterolateral tooth is tuberculiform and the inner surface of the palm is armed with a tubercular prominence.

An young specimen reported by us as *Pilumnoplax* sp. may be referable to this species.

Distribution. This species occurs in the Japanese waters from the south of Inubo-zaki southwards to the south and west of Kyushu along the Pacific coast. Its bathymetric range is from 65 to 384 m.

Genus *Megaesthesius* Rathbun, 1909

Megaesthesius yokoyai Sakai, 1939

(Figs. 3, 4)

Megaesthesius? sp., Yokoya, 1935, p. 203, fig. 68—Bungo Str., 110 m deep, and south of Sata-misaki, 249 m deep.

Megaesthesius yokoyai Sakai, 1939, p. 577—No new record.

Description. The carapace is subquadrate and strongly arcuated antero-posteriorly, but nearly level from side to side; the surface is rather ill-defined only with the submedial longitudinal furrows and roughened

by somewhat scaly minute granules and by rugosities ; near the orbits, front and lateral borders the scaly granules are rather prominent. The frontal region is well demarcated and strongly convex dorsally, being sulcated in the middle, but in the female the frontal region is not so strongly produced as in the male. The supraorbital border is turned downwards, and its free margin is almost invisible from above ; the dorsal part of the border in dorsal view is almost transverse, slightly retreating backwards near the corner where is obtusely angulated.

The lateral borders of the carapace is parallel to each other ; each of them is provided with three or four notches, of which that in front of the posterior corner is not deep but in reality only a depression. The lobes or teeth thus formed by the notches or depressions are granulated and not strongly protruded from the general contour of the border; of the lobes the last two are armed with spiniform granules, of which one or two of the middle are sometimes much larger than the others. The lateral extremity of the posterior border is prolonged laterally and downwards and armed with several curved spinules; the prolongation is more or less in the appearance of the lobule and visible from above just at the outside of the last two lobes of the lateral border.

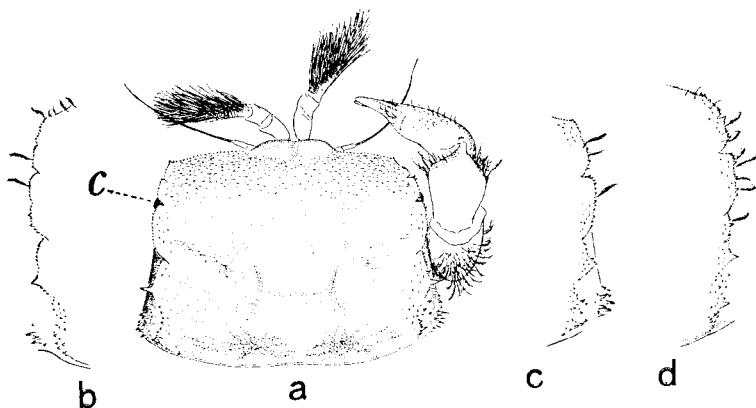


Fig. 3. *Megaesthesius yokoyai* Sakai. a. Carapace with right cheliped of ♂ (No. 12894-1), $\times 7.5$; b. Left lateral border of carapace of ♂ (No. 13406), $\times 10$; c. Right lateral border of ♂ (No. 12894-2), $\times 10$; d. The same of ♀ (No. 12893), $\times 10$. Abbreviation. c. Cornea seen in small notch of lateral border of carapace.

The supraorbital and infraorbital borders are granulated and leave a narrow gape near the lateral corner, though they are rather widely separated near the front. The greater part of the long eyestalk is

tightly embedded in the orbital gape, but the lateral part, about one-third or less the length of the orbit, is folded below the anterolateral border of the carapace ; that exposed part is also immovable in spite of the absence of the fossa; the cornea is well defined and rounded without pigments.

The antennule is enormously stout and fringed with very long silky hairs ; in the male it is especially so and much more stouter than those of the female ; there is no antennular fossa, so that it is wholly visible from above except for the basal segment. The antennal basal segment is only slightly shorter but stouter than the second segment ; just outside of the basal segment is a subacute small tubercle of the inner extremity of the infraorbital border ; the flagellum is long and slightly exceeds the level of the anterolateral border of the carapace, being tipped with two longish silky hairs ; the female flagellum is, however, much shorter and ends far from the level of the anterolateral border, when it is applied to the orbital gape. The pterygostomial region is granulated and swollen, but near the proximal part of the buccal cavity it is rather sunken. The buccal cavity is narrower in front. The third maxillipeds are wide and leave only a very narrow median gape ; the ischium is wide, while the merus is only slightly narrower and somewhat triangular with acute anterior angle; the palp is very short.

The chelipeds are equal and not much stout in both sexes. The segments are covered with long fine plumose hairs, and unarmed except for minute granules. However, the outer surface of the carpus is almost smooth and devoid of hairs, and the palm is covered with thick granules and sparse hairs. The outer angle of the carpus is articulated with the low tubercle at the proximal middle part of the palm. The inner angle of the carpus is more or less angulated in the male, and armed with a spinule in the female. The chela is compressed, especially the immovable finger is conspicuously so. The lower border of the chela is prominently crested and almost serrated with a row of spiniform granules. The movable linger is about twice the length of the upper border of the palm and also bears a row of sharp granules along the outer upper border, but not compressed.

The ambulatory legs are long and comparatively slender. The merus is fringed with a distinct row of long, fine plumose hairs, and in addition, bordered with a row of spinules. The carpus bears a fringe of long plumose hairs along the whole length and some spinules near the distal end, The propodus and dactylus are covered with fine hairs of various lengths mixed each with some stout, movable longish setae or hairs that are mostly implanted along the posterior border.

The male abdomen is composed of five pieces ; the third to fifth segments are fixed and immovable, though the sutures are not entirely

obliterated ; in reality that between the fourth and fifth segments is possibly observable, and in the inner view those segments are all distinctly traceable.

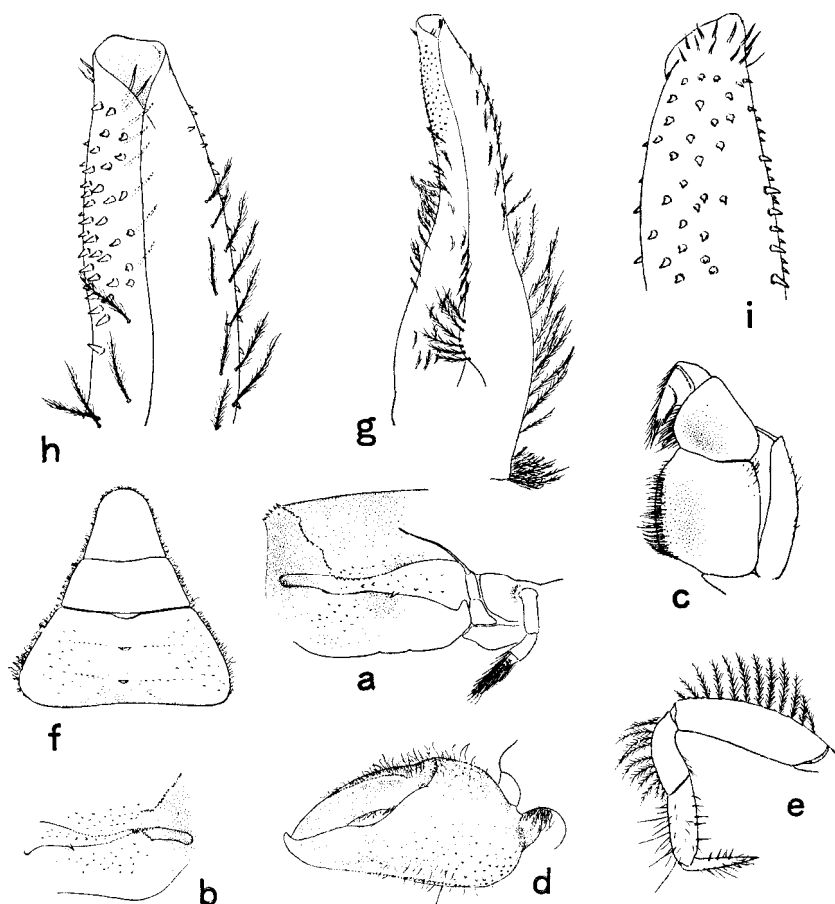


Fig. 4. *Megaesthesius yokoyai* Sakai. a. Right half of carapace of ♀ (No. 12893) in frontal view, hairs omitted, $\times 15$; b. Left orbital region of ♂ (No. 12894-1) in frontal view, $\times 12.5$; c. Left third maxilliped of ♂ (No. 12894-1), $\times 17.5$; d. Left chela of ♂ (No. 12894-1), $\times 12.5$; e. Left third ambulatory leg of ♂ (No. 12894-1), $\times 7.5$; f. Abdomen of ♂ (No. 12894-1) without proximal two segments, $\times 12.5$; g. Left first pleopod of ♂ (No. 12894-1) in abdominal view, $\times 40$; h, i. Distal part of the same in abdominal and sternal view, $\times 100$.

Material examined.

32° 13.5' N, 127° 58.2' E, 147 m deep; 1 ♂ (Length, 3.8 mm; breadth, 4.9 mm), ZLKU No. 13406; Aug. 7, 1967; I. Uchimura leg.

- 34° 16' N, 129° 31.5' E, 105 m deep ; 1 ♂ (Length, 3.4 mm ; breadth, 4.6 mm), ZLKU No. 12892 ; Aug. 5, 1968 ; Tsu-shima I. Exp. leg.
 34° 17.6' N, 129° 48.6' E, 110 m deep ; 1 ♀ (Length, 3.7 mm ; breadth, 4.8 mm), ZLKU No. 12893 ; Aug. 5, 1968 ; Tsu-shima I. Exp. leg.
 34° 25.1' N, 129° 59.3' E, 115 m deep ; 2 ♂♂ (Length, 3.8 and 3.5 mm ; breadth, 5.3 and 4.4 mm), ZLKU No. 12894 ; Aug. 5, 1968 ; Tsu-shima I. Exp. leg.

Remarks. The original description given by Yokoya (1933) is rather insufficient in some characters. Especially it is noted here that the description about the male abdomen is incorrect and should be revised as being composed of five segments. As regards the other features the present description may supply the short original description.

This distinctive species bearing the peculiar orbit and eyestalk is closely related to the another representative of the genus, *M. sagedae* Rathbun, which was recently well defined by Sérène (1964) who considered the Japanese species is conspecific with it. The present species is, however, distinguished from *M. sagedae* by some small but distinct features. In the present species the lateral border of the carapace bears some deep indentations, and the chelipeds and ambulatory legs are hairy. In *M. sagedae* the border is more spiny, and the chelipeds and ambulatory legs are almost naked without long hairs. The third maxilliped of the present species is wider with the more triangular merus and the wider and longer exopod than that of *M. sagedae*.

At present in the Zoological Laboratory, Kyushu University is one dry male collected by S.S. Soyo-Maru from the station 324, the southern Bungo Strait, 106 m deep, and reported by Yokoya (1933) as *Camatopsis rubida* Alcock.

Distribution. This species has hitherto been recorded only from the two localities of the Japanese waters, viz. Bungo Strait and off Satamisaki, Kagoshima Prefecture. The bathymetric range is from 105 recorded at present to 249 m. *M. sagedae* is known from Singapore and the South China Sea at the depths of 5 and 50 m respectively.

Family Palicidae

Genus *Palicus* Philippi, 1838

Palicus amadaibai Sakai, 1963

Palicus oahuensis, Balss, 1922, p. 120, fig. 6 - Sagami Bay.

Palicus oahuensis, Yokoya, 1933, p. 206 - South-east of Inubo-zaki, Suruga Bay and

south-west of Goto Is., 123-177 m deep.

Cymopolia oahuensis, Sakai, 1939, p. 609, fig. 90, a - No new record.

Palicus amadaibai Sakai, 1963, p. 227, fig. 7, a- Sagami Bay, 65-85 m deep and Tosa Bay.

Palicus amadaibai, Sakai, 1965, p. 183, pl. 89, fig. 1- Sagami Bay and Aichi Pref., 80-120 m deep.

Material examined.

32° 15.1' N, 127° 58.9' E, 149 m deep ; 1 ♂ (Length, 10 mm ; breadth, 11.8 mm), ZLKU No. 13411 ; Rug. 7, 1967 ; I. Uchimura leg.

Distribution. This species ranges from the south-west of Inubo-zaki southwards to the Tosa Bay, the Pacific coast, and also occurs in the west of Kyushu. The bathymetric range is from 65 to 177 m.

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