

DESCRIPTION OF TWO NEW GENERA AND FOURTEEN NEW SPECIES
OF JAPANESE CRABS FROM THE COLLECTION OF HIS MAJESTY THE
EMPEROR OF JAPAN

BY

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This paper is the second report on new and noteworthy crabs collected by His Majesty the Emperor of Japan at Sagami Bay, the first report being issued in vol. 3 pt. 2 of this journal (cf. Sakai, 1961). As in the first report, some noteworthy crabs from other localities are described together with His Majesty's species; the specimens of such crabs have been dedicated to His Majesty, in response to His research, by local carcinologists or collectors of Japan.

The new species described herein number fourteen, two of which are referable to new genera, as listed below:

LEUCOSIIDAE

- Ebalia dimorphoides* sp. nov.
- E. hayamaensis* sp. nov.
- E. nudipes* sp. nov.
- E. tosaensis* sp. nov.
- Nucia perlata* sp. nov.
- Heteronucia globata* sp. nov.
- Merocryptoides frontalis* gen. et sp. nov.

CALAPPIDAE

- Osachila imperialis* sp. nov.
- O. japonica* sp. nov.

RANINIDAE

- Ranilia orientalis* sp. nov.

PALICIDAE

- Palicus amadaibai* sp. nov.
- P. microfrons* sp. nov.
- P. hatsumaensis* sp. nov.

DYNOMENIDAE

- Paradynomene tuberculata* gen. et sp. nov.

The type specimens will be deposited in His Majesty's Museum at the Imperial Palace.

***Ebalia dimorphoides* sp. nov.** (fig. 1a)

1 ♀, holotype, off Hayama, Amadaiba, 70 m deep, coll. by His Majesty.

1 ♀, west of Jyogashima light, Misaki, 85 m deep, coll. by His Majesty.

Description. — The entire animal seems to be smooth, but under the magnifying glass the surface of the carapace and chelipeds is thickly covered with very fine granules. The carapace is apparently broader than long, the middle

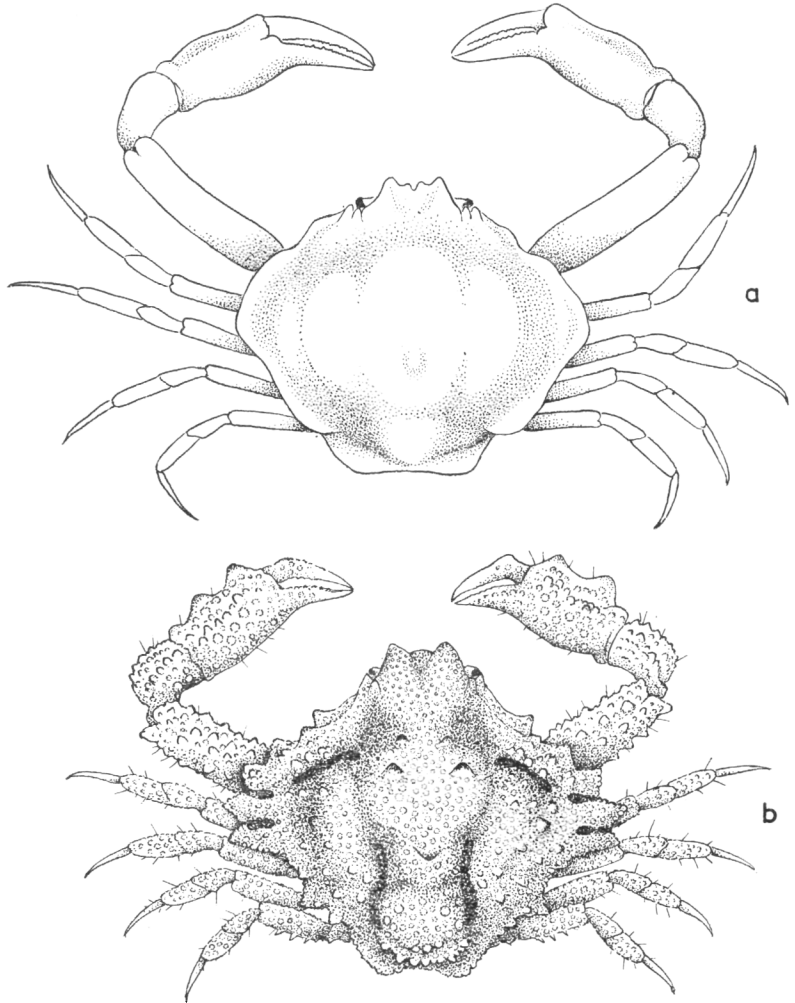


Fig. 1. a, *Ebalia dimorphoides* sp. nov., holotype, $\times 8$. b, *Ebalia hayamaensis* sp. nov., holotype, $\times 8.5$.

portion is markedly convex, while the post-frontal region is sunk, and the metagastric and cardiac areas are respectively marked with an obtuse protuberance. The front is divided into four teeth, of which the outer two are prominent and the inner two are small and dentiform, separated by a V-shaped median frontal

sinus. The two upper orbital fissures are distinct. The hepatic border is moderately convex, its middle portion is obscurely marked with an obtuse tooth. The antero-lateral and postero-lateral borders are entirely continuous, thin and cristiform, the margins being somewhat upturned as in the case of the related genus *Cryptocnemus*.

The chelipeds are slender, twice as long as the carapace; the merus, carpus and propodus are subcylindrical, but the anterior and posterior borders are not at all cristiform. The fingers are as long as the propodus, clearly bent inward from the long axis of the propodus; their prehensile edges are uniformly cut into tiny sharp teeth.

The ambulatory legs are very slender, the merus, carpus and propodus are subcylindrical and the dactylus is slender and as long as the propodus.

The abdomen of the female is composed of three pieces, the terminal segment is very narrow and oblong, inserted into the deep sinus of the penultimate composite segment.

Relationship. — The new species is obviously related to *Nursia dimorpha* Balss (1929) from the Red Sea, but in the new species the front is four-dentate instead of having two truncate edges, and the propodus of each ambulatory leg is more slender and lacks the laminar process on the posterior border characteristic of *N. dimorpha*.

Measurements. — Female holotype, length of carapace 4.5 mm, width of same 6.0 mm.

***Ebalia hayamaensis* sp. nov. (fig. 1 b)**

1 ♀, holotype, off Hayama, Amadaiba, Kannon-zuka-dashi, 65 m deep, coll. by His Majesty.

Description. — The carapace of this new species is markedly broader than long, sub-hexagonal in outline. The dorsal surface is rather depressed, thickly covered with minute granules. There are a number of tubercles of various sizes on each region, i.e. one pair of good size on the anterior portion of the gastric region, and another pair of smaller size in front of them. The cardiac and intestinal regions are respectively convex, each marked with a conical tubercle in the middle portion, and four or five additional small ones on either side of the cardiac region. A tubercle of good size is present on the inner branchial surface; in front and in rear of this, a number of smaller ones may be present.

The front is composed of two obtuse processes, below which the anterior extremity of the epistome can be seen from the dorsal side. There are two upper orbital fissures, but both supra- and pre-orbital teeth are absent. The hepatic region is produced into a conical process, which projects obliquely downward; posterior to this, the lateral border is marked with four triangular teeth, of which the third and fourth are large, located at the broadest portion of the carapace.

On the dorsal surface of the carapace, there are characteristic eroded grooves, which are symmetrically disposed, i.e. a pair, which are long and oblique, located between the hepatic and branchial regions; another pair, which are longitudinal,

located on either side of the cardiac and intestinal regions, and furthermore, three narrow ones between the antero-lateral teeth. The posterior border is marked with an obtuse process in the middle portion.

The chelipeds are rather robust; the merus has four and the carpus has three longitudinal rows of tubercles, the propodus also has two or three indistinct rows and its outer border bears two prominent processes. The dactylus is very slender (i.e. compressed) compared with the immovable finger, the prehensile edge of both is uniformly marked with minute teeth.

The ambulatory legs are very slender, each segment is subcylindrical, covered with microscopic granules, interspersed with several longish hairs. The merus has a few high tubercles along the posterior border.

Measurements. — Female holotype, length of carapace 5.0 mm, width of same 6.0 mm.

***Ebalia nudipes* sp. nov.** (fig. 2 a)

1 ♂, holotype, off Mimase, Tosa Bay, 100-150 m deep, coll. by K. Sakai.

Description. — The new species is closely related to *E. jordani* Rathbun (1906) from the Hawaiian Islands. After careful comparison with the type of *E. jordani* at the Smithsonian Institution at Washington, the Japanese species is designated as new.

The entire body is naked, lacking hairs and tomentum even on the thoracic legs; the carapace is thickly covered with microscopic granules but it appears almost smooth to the naked eye. The general outline of the carapace may hardly be distinguished from that of *E. jordani*, but the tubercle found near the middle of the branchial region is elongate and oblique in the new species, whereas it is composed of a cluster of four tubercles in *E. jordani*. The front is obtuse, only slightly marked with a median sinus, while in *E. jordani* it is clearly bilobed.

The chelipeds and ambulatory legs are generally the same as in the Hawaiian species.

The terminal segment of the male abdomen is more elongate compared with that of *E. jordani*. The first male pleopod is the best character for distinguishing the two species, the tip being thin and rather broad in the new species, whereas it is rather pointed and bifurcate in *E. jordani*.

"*E. jordani*" recorded by Yokoya (1933) from Omae-zaki, Suruga Bay, may perhaps be identical with this new species.

Measurements. — Male holotype, length of carapace 12 mm, width of same 12 mm.

***Ebalia tosaensis* sp. nov.** (fig. 2 b)

1 ♀, holotype, off Mimase, Tosa Bay, 100 m deep, coll. by K. Sakai.

Description. — The carapace of this new species is subglobose in outline, beset with sixteen conical protuberances; the dorsal surface is thickly covered with fine

and coarse granules, of which some on the lateral borders or near the foot of the protuberances are high, and mushroom-like in appearance.

The characteristic sixteen conical protuberances are as follows: two side by side on the protogastric region and projecting upward and forward, their apices approaching each other; two in the median line, i.e. one each on cardiac and intestinal region, the former projecting upward and the latter backward; on the lateral border, one hepatic and two anterior branchial, which are situated at a lower level; then three lateral branchial ones, which are at a higher level, the anterior one projecting obliquely forward, the posterior one obliquely backward, and the middle one located at the antero-lateral angle, at a slightly lower level.

The front is narrow, its anterior border is obscurely bilobed; the posterior border is much broader than the front, marked with a low obscure protuberance at either postero-lateral angle.

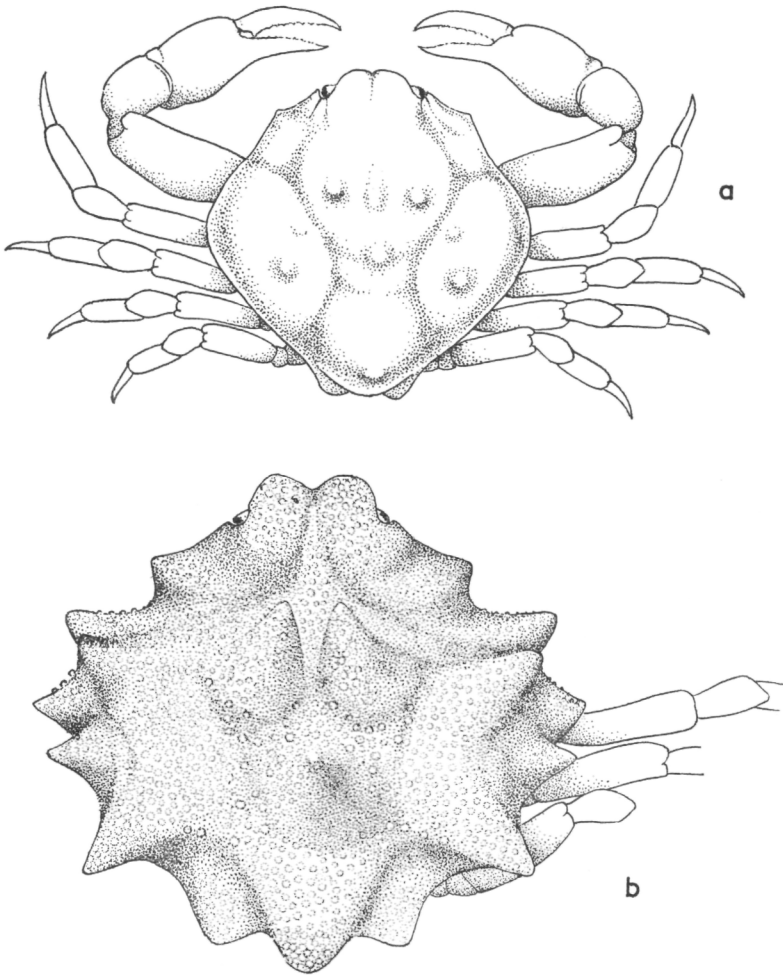


Fig. 2. a, *Ebalia nudipes* sp. nov., holotype, $\times 3.5$. b, *Ebalia tosaensis* sp. nov., holotype, $\times 12$.

Chelipeds are lacking. The ambulatory legs are very slender, the merus, carpus and propodus are subcylindrical, each being thickly covered with flat granules of microscopic size; the dactylus is almost as long as the propodus, slightly curved inward.

Relationship. — The new species is closely related to *E. longispinosa* Ihle (1918) from the Kei Islands, from which it may easily be distinguished by having conical protuberances instead of lacinated processes on the carapace.

Measurements. — Female holotype, length of carapace 5.5 mm, width of same 6.0 mm.

***Nucia perlata* sp. nov. (fig. 3 a)**

3 ♂♂, 2 ♀♀ (one male and female of which are designated as holotype and allotype respectively), off Hayama, Amadaiba, Kannonzuka-dashi, Ohyama-dashi, 65-85 m deep, coll. by His Majesty.

2 ♂♂, 2 ♀♀, west of Jyogashima light, Misaki, 85 m deep, coll. by His Majesty.

2 ♂♂, 1 ♀, off Mimase, Tosa Bay, coll. by K. Sakai.

Description. — The entire animal is thickly covered with pearly granules of various sizes. The carapace is globular, nearly as long as broad; there is a pair of lateral grooves, which define the cardiac region on either side; these grooves are posteriorly connected with the circular groove, by which the intestinal region is defined and isolated from the cardiac and branchial regions. The hepatic region is also defined from the gastric and branchial regions by a groove, which extends forward towards the post-orbital area, where the carapace is extremely sunk.

The ventral side of the body is also thickly covered with rather flat granules. The basal antennal segment occupies the interval between the outer edge of the antennular fossa and the inner inferior edge of the orbit; the orbital fossa is thus entirely excluded from the antennular fossa by the basal antennal segment.

The chelipeds are rather short and robust, the carpus is relatively small and subglobular, the propodus is inflated in the middle and the fingers are distinctly longer than the propodus. The prehensile edges of the fingers are uniformly beset with tiny low triangular teeth. The ambulatory legs are rather robust, each segment is thickly covered with pearly granules; a few hairs are scattered on the propodus and dactylus.

Relationship. — This new species is closely related to *N. tuberculosa* A. Milne-Edwards (1874) and also to *N. modesta* Ihle (1918). From both species it may be distinguished by the characteristic grooves demarcating its cardiac, intestinal and hepatic regions.

Measurements. — Male holotype, length of carapace 8.0 mm, width of same 8.5 mm.

***Heteronucia globata* sp. nov. (fig. 3 b)**

1 ♂, holotype, off Manazuru, Sagami Bay, 80 m deep, coll. by the staff of the Manazuru Marine Laboratory.

Description. — Although the single male type specimen is rather young, it does not agree with other species of the genus *Heteronucia* already described from the

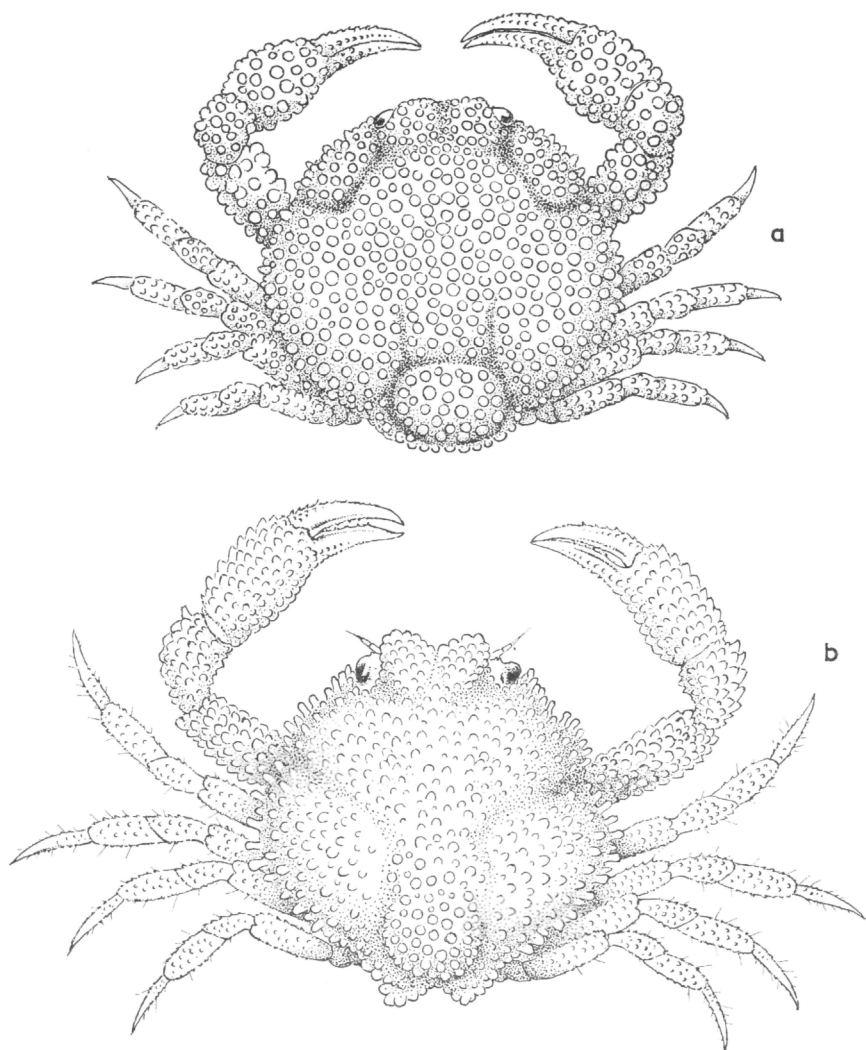


Fig. 3. a, *Nucia perlata* sp. nov., holotype, $\times 6.5$. b, *Heteronucia globata* sp. nov., holotype, $\times 13.6$.

Indo-Pacific, and it is designated as a new species. The carapace is as long as broad, somewhat rhomboidal in outline, the dorsal surface is convex, with vesicular tubercles, of which those found near the lateral and posterior borders are very high with a knobbed tip. The gastric region is ill-defined, but the mesogastric area is indicated by a pair of granulated tubercles. The cardiac region is convex, circular in outline. The front is well produced forward, the anterior margin of each lobe is thick and closely covered with rather flat granules. The supra-orbital margin has pre- and supra-orbital fissures. The hepatic region is moderately convex and the branchial border is quite swollen. These two borders are armed with long, curved

spine-shaped tubercles, their tips being knobbed as already described. The posterior border is nearly as wide as the front, with a rounded lobule on either side.

The antennular fossae are just like those of *Heteronucia venusta* Nobili (1906), the common Indo-Pacific species, but their outer edge does not touch the inner, inferior orbital lobe, thus the hiatus between the two is loosely filled by the basal segment of the antenna, the flagellum of which is composed of four segments, and is apparently longer than that of *H. venusta*.

The chelipeds are rather slender, the merus, carpus and propodus are thickly covered with low conical tubercles, most of which are arranged in longitudinal rows. The fingers are a little shorter than the palm.

The ambulatory legs are also rather slender, the tubercles on each segment are conical, arranged in longitudinal rows. The dactylus is as long as the propodus and very slender.

The abdomen is sparingly covered with flat granules; the third to fifth segments are fused together.

Measurements. — Male holotype, length of carapace, measured in the median line, 3.3 mm, width of same 3.5 mm.

Merocryptoides gen. nov.

Diagnosis. — Near to *Merocryptus* A. Milne Edwards (1873), but the dorsal surface is obviously depressed. The broad front is markedly produced forward and upward; the low gastric region is very narrow; the small cardiac region is slightly convex whereas the intestinal region is markedly convex and its posterior boundary is upturned. The hepatic region is moderately prominent and its dorsal surface is depressed to form a semicircular facet surrounded by a series of elongated tubercles. Below this facet a small hepatic lobe is visible in dorsal aspect. The outer margin of the branchial region has two projections; the anterior one is a small facet just posterior to that on the hepatic region, directed obliquely downward. The posterior one forms the prominent lateral wing-like lobe, upturned at the apex whence a transverse row or crest of pearly tubercles extends inward to end in an irregular facet, also more or less surrounded by elongated tubercles. The male abdomen is broadly triangular in outline, not so markedly elongate as in *Merocryptus*. The anterior male pleopod, represented in fig. 4 b, is slender, sinuous, strongly curved inward near the apex and beset with scattered setae. In *Merocryptus* this pleopod is rather robust, straight and densely fringed with soft hair.

Type species. — *Merocryptoides frontalis* sp. nov.

Merocryptoides frontalis sp. nov. (fig. 4)

5 ♂♂, 7 ♀♀ (one male and female of which are designated as holotype and allotype respectively), shoal water of tide-pool between Hayama and Misaki, coll. by His Majesty.

3 ♀♀, fragmentary, beach at Nagashima, Mie Prefecture, coll. by Mr. Shin-ichi Tanaka.

5 ♂♂, 4 ♀♀, beach at Manazuru, Sagami Bay, coll. by Mr. Miyoshi Matsuo and others.

Description. — The carapace is sub-rhomboidal in outline; the entire surface is thickly covered with round flattened tubercles of various sizes as shown in fig. 4a. The front is markedly produced forward and upward, forming a thick neck, and its anterior border is faintly bilobate.

The gastric region is very narrow, rather depressed, and studded with medium-sized pearly tubercles. The cardiac region is also small and very narrow, but slightly convex and thickly beset with rather large pearly tubercles. The intestinal region is markedly convex, semicircular in outline, bordered laterally and posteriorly by elongate tubercles and its posterior edge is markedly upturned.

The upper surface of the hepatic region is depressed, is bordered by a series of elongate tubercles and is studded with a few round tubercles; below and in front of this facet, a small obtuse hepatic lobe is visible. On the antero-lateral margin, behind the hepatic facet, is another semicircular facet projecting obliquely

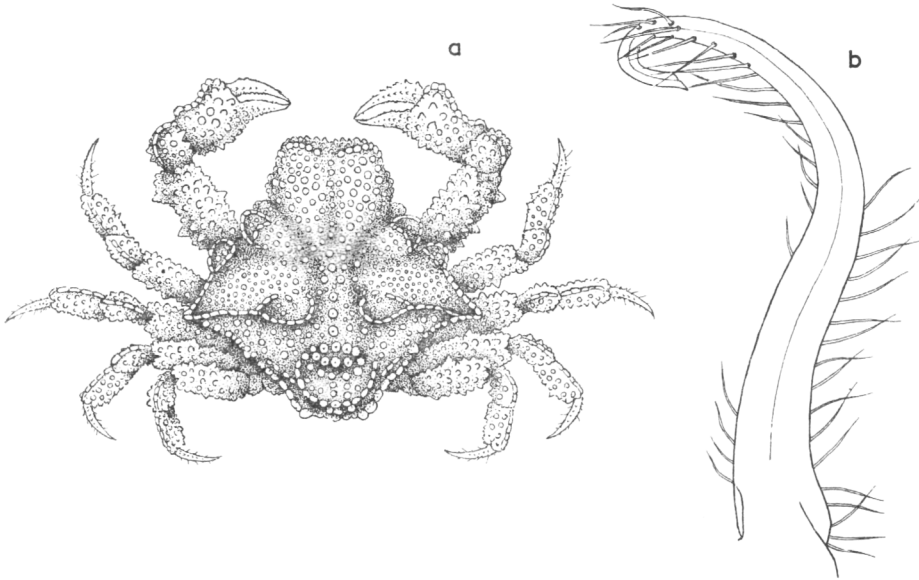


Fig. 4. *Merocryptoides frontalis* gen. et sp. nov. a, holotype, $\times 12$; b, anterior pleopod of male, $\times 37.5$.

downward. The wing-like lateral lobe, bounded by a series of elongate tubercles, is upturned at the apex, whence a transverse crest of tubercles crosses the branchial region and ends in a small triangular or somewhat irregular facet, also elegantly bordered by a series of tubercles. The branchial area in front of the crest is flat or depressed and thickly covered with tubercles of various sizes.

On the postero-lateral margin there is an indistinct protuberance, which is obsolescent or absent in some specimens. The posterior margin is just as wide as the front and has three low, indistinct protuberances.

The chelipeds are robust and symmetrical, the merus has two obtuse processes

on the posterior border, one being median and low, the other subterminal and prominent. The carpus bears two rows of tubercles on the upper outer border. The propodus has a prominent process near the distal end of the outer border. All pairs of the ambulatory legs are thickly covered with granules, the merus bears a prominent process in the middle of the anterior border; the carpus and propodus have a series of elongate tubercles along the anterior or upper border.

The external maxilliped has the merus a little shorter than the ischium and is obtusely pointed at the tip; the exognath is not so broad as that of *Merocryptus*; its tip is rounded, not much exceeding the middle point of the merus.

The male abdomen is broadly triangular in outline; it is apparently broader than in *Merocryptus*, and its terminal segment is rather short and peculiar in having a trilobate outline; the third to fourth abdominal segments of the male are fused together, but there remains a suture line on either side between each segment. The first male pleopod (fig. 4b) is markedly curved inward near the apex, and furnished with several long setae; in *Merocryptus* the tip of same is straight and flat, the outer border being very thickly furnished with soft hairs.

Sexual differences. — As in the genus *Merocryptus*, the type species of *Merocryptoides* also exhibits a certain degree of sexual dimorphism in form and ornamentation of the carapace. The male has been described above; in the female the carapace is wider, with a rather shorter neck, and the 'wings' are larger and more laterally directed (cf. fig. 4a). The protuberances of the carapace are less striking in the female than in the male. Although the tubercles on the median portion of the gastric area are of good size in both sexes, in the male they are rounded, in the female they are usually oblong. In the female also, the tubercles on the anterior part of the branchial region (in front of the transverse crest of tubercles) are small and of uniform size; in the male these tubercles vary in size.

Measurements. — Male holotype, length of carapace 3.2 mm, width of same 3.3 mm. Female allotype, length of carapace 5.0 mm, width of same 5.3 mm.

Osachila Stimpson, 1871

The genus *Osachila* comprises nine species in all, most of which are inhabitants of the Atlantic and Pacific seas of North, Central and South America; one species, however, ranges to the Atlantic coast of Africa. Two new species are described herein, one collected by His Majesty and the other sent from the Kii Peninsula and Tosa Bay to the Emperor for comparison. These records appear to be the first for this genus in the Indo-Pacific. In the structure of the external maxilliped and the buccal frame, all American species agree with each other in having the merus fairly long and pointed at the anterior extremity, the buccal frame also is anteriorly dilated and pointed at the anterior extremity, where the efferent branchial orifices approach each other. In the West African and Japanese species, the merus of the external maxilliped is much shorter than the ischium and its distal extremity is divided into two processes, the anterior extremity of the buccal cavern is truncate and the efferent branchial orifices are well separated by the narrow median transverse ridge.

Whether such differences merit generic or subgeneric value is not certain at present, but it seems natural to separate the species of this genus into two groups in accordance with these characters.

Osachila imperialis sp. nov. (fig. 5 a-d)

1 ♀, holotype, Okino-yama, off Misaki, 80 m deep, coll. by His Majesty.

Description. — The carapace of this new species is broadly oval in outline, the dorsal surface is rather depressed, thickly covered with obscure tubercles. There are eight protuberances on the dorsal surface, of which two are in the median line and the remainder are disposed symmetrically on either side. Of these symmetrical protuberances, the protogastric ones are the largest and are markedly convex, the two anterior branchial ones are moderately large, while the inner branchial ones are small and only slightly convex. The metagastric area is depressed and low, the cardiac region is also very small and low, while the intestinal region is moderately convex.

The front is obtusely produced beyond the outline of the carapace and its anterior edge is obscurely bilobed. The antero-lateral and postero-lateral borders are continuous, marked with eight low triangular lobes, which are in contact with each other at their bases. The posterior border is a little broader than the front and is obscurely cristate.

The anterior extremity of the buccal frame is, contrary to the usual character of the American species, not at all pointed, the median portion of the anterior edge of the buccal frame is subtruncate or sinuate; on either side of this ridge the efferent branchial orifices open. The external maxilliped has the merus distinctly shorter than the ischium, the exopodite is narrow and its tip not much exceeding the junction between the ischium and merus. The truncate anterior margin of the merus is obscurely divided into two processes, the outer one of which is somewhat dilated and obscurely bifid, fitted to the efferent branchial orifice, while the inner one is short and rather transverse, and its anterior edge is fitted against the median edge of the buccal frame between the two efferent branchial orifices (cf. fig. 5 b).

The chelipeds are symmetrical, the merus is flattish, almost concealed beneath the expanded antero-lateral borders of the carapace; the carpus is enlarged, its antero-internal edge is produced into a tooth; the propodus is high, its upper inner edge bears two obtuse teeth, while its lower edge is armed with three pointed teeth. On the lower margin of the broad immovable finger there is a proximal expansion bearing three teeth on its free edge (fig. 5 c); the movable finger is rather slender.

The ambulatory legs are compressed, the merus has two teeth on the posterior edge, the carpus has a prominent tooth on the anterior border; the propodus of the anterior two pairs is armed with three teeth on the anterior border, and two teeth on the posterior border, whereas in the third pair, both borders are armed

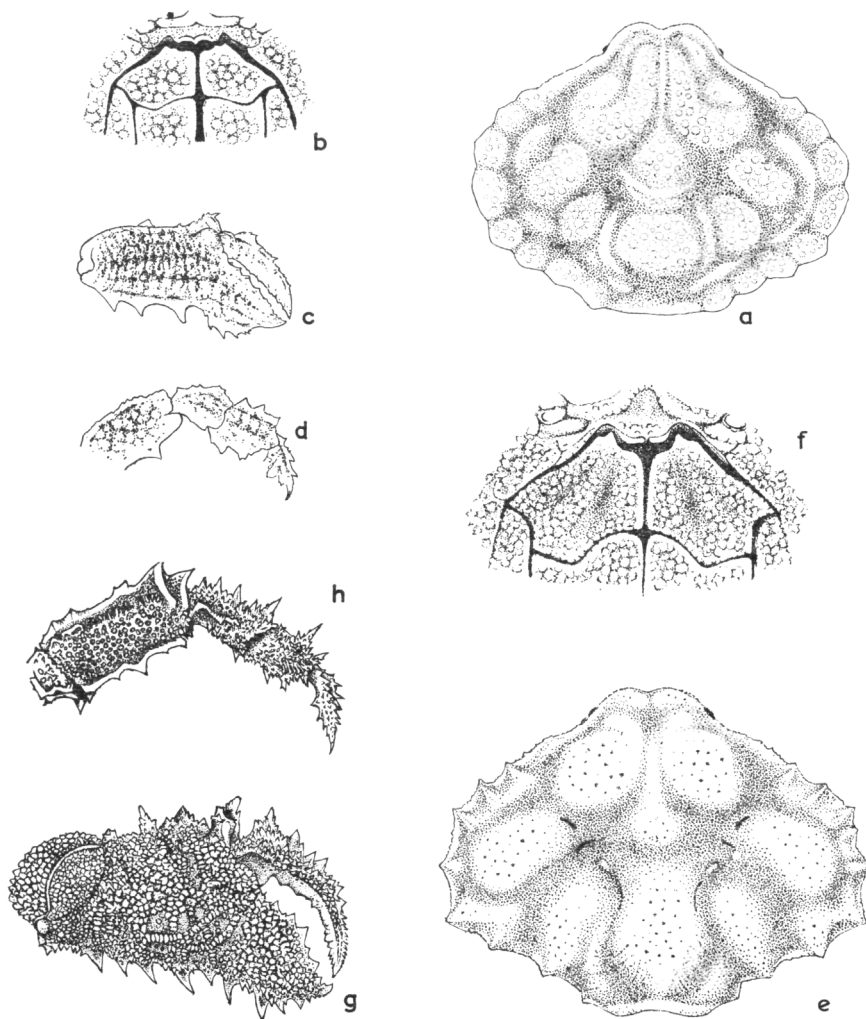


Fig. 5. a-d, *Osachila imperialis* sp. nov. a, carapace of holotype, dorsal aspect, $\times 2.6$; b, anterior portion of buccal region, ventral aspect, $\times 4$; c, right chela, outer aspect, $\times 3$; d, second ambulatory leg, outer aspect, $\times 3$. e-h, *Osachila japonica* sp. nov. e, carapace of holotype, dorsal aspect, $\times 1.1$; f, anterior portion of buccal region, ventral aspect, $\times 2.6$; g, right chela, outer aspect, $\times 1.5$; h, third ambulatory leg, outer aspect, $\times 1.5$.

with two teeth. In the last pair, the teeth on both borders are obscure. All the dactyli are compressed; in each of the anterior three pairs the posterior edge has two distinct teeth, whereas in the last pair these teeth are obsolescent.

The abdomen of the female holotype is rugose, its terminal segment is broadly triangular, the length not exceeding the breadth.

Measurements. — Length of carapace 19 mm, width of same 15 mm.

***Osachila japonica* sp. nov. (fig. 5 e-h)**

1 ♀, holotype, Sakai-Hama, Kii Province, coll. by Mr. M. Ozaki and sent through Dr. H. Utinomi of the Seto Marine Biol. Laboratory.

1 ♀, off Mimase, Tosa Bay, coll. by K. Sakai.

Description. — This new species is apparently the largest of all the known species of this genus: its dorsal surface is extremely convex, with eight protuberances, of which the protogastric ones are so large and markedly swollen that the frontal region is mostly concealed by them in dorsal aspect. The outer branchial protuberances are also markedly convex, but the inner branchial ones are a little less convex; the meta-gastric and cardiac regions are rather low and depressed, the surfaces outside of these regions are extremely depressed. The intestinal region is fairly well demarcated and convex. The surfaces of these protuberances are sparingly pitted.

The front is thick, obtusely bilobed. The antero-lateral and postero-lateral borders are continuous, cut into eight lobes, each of which is carinate near the middle but there are no suture lines between the lobes. The posterior border is markedly broader than the front, its free edge is thick and medially concave.

The external maxillipeds perfectly close the buccal cavern, the merus and ischium are thickly covered with coarse tubercles; the former is markedly shorter than the latter and its anterior extremity divided into two processes. The outer process is more prominent than in *O. imperialis* and is apparently bifid and fitted to the deep efferent branchial orifice, while the inner one is low and rather transverse, and its anterior edge is fitted against the median transverse ridge of the anterior buccal frame between the two efferent branchial orifices (fig. 5 f).

The chelipeds are robust, each segment is thickly covered with coarse tubercles, which are asteroidal in shape and arranged to form a network. The merus is flattish prismatic in shape, its inner surface is flat, its superior ridge is armed with five or six teeth, the last one of which is large and sub-terminal, and its lower edge is cut into three erect spines. The carpus is convex on the outer surface, its antero-internal angle is produced into a sharp tooth, whence a serrated ridge runs toward the inner surface. The propodus is very high, its upper ridge is sharp and armed with three teeth, the lower edge is armed with four sharp spines. The upper margin of the movable finger is also sharp and armed with four or five spines, the lower margin of the immovable finger is also armed with four or five spines. The prehensile edge of both fingers is cut into five or six low triangular teeth.

The ambulatory legs gradually decrease in size from the first to the fourth pair, the anterior border of the merus is cristate, and armed with a terminal and a subterminal tooth. The upper and lower posterior borders are also cristate, the former is irregularly serrated. The carpus and propodus of each pair are roughly covered with tiny tubercles, some of which are developed into spinules; the anterior and posterior borders are armed with several sharp spines.

The abdomen is thickly covered with tiny tubercles, most of which form small groups or networks.

Measurements. — Female holotype, length of carapace 39 mm, width of same 51 mm.

***Ranilia orientalis* sp. nov.** (fig. 6)

1 ♂, holotype, south of Manazuru Peninsula, Sagami Bay, 85 m deep, coll. by the staff of the Manazuru Marine Laboratory.

Description. — The carapace is longitudinally sub-elliptical, anteriorly broadened, moderately convex from side to side but only slightly so from front to back. The dorsal surface is covered with flat and spine-shaped tubercles, which are mostly arranged in transverse rows of various length so that it looks squamose in appearance; but on the surface near the sub-hepatic region, such tubercles are irregularly and independently disposed.

The front is composed of three teeth, the middle one of which is large and projecting forward, and the lateral ones small and separated from it by a broad round sinus. The upper orbital lobe is moderately broad, its inner angle projecting into a tooth, separated by a narrow fissure from the lateral frontal tooth. The outer orbital tooth is moderately prominent, separated from the outer edge of the upper orbital lobe by a narrow fissure. Far behind the outer orbital tooth, there is an antero-lateral tooth, which is sharp and directed obliquely forward, the carapace being broadest at this point.

The two basal segments of the antenna are rather broad, and the first segment has a lobule at the distal external angle. The merus of the external maxilliped is distinctly longer than the ischium and the suture between ischium and basis is oblique, a characteristic of the genus *Ranilia*.

The chelipeds are robust; the merus and carpus are covered with squamiform tubercles on the upper and outer surfaces, but their lower inner surfaces are smooth and glabrous. The propodus is very high and flat, the squamiform tubercles are not so thick as in the preceding segments; the immovable finger is armed with two obtuse teeth on the prehensile edge; the movable finger is long and extremely curved inward.

Of the four pairs of ambulatory legs, the anterior three pairs are stout and subequal in size, the second pair being the longest; the last pair is thin and dorsally placed, with the ischium, merus, carpus and propodus subequal in length. The carpus of the third pair is long and distally thickened, having an elongated lobule at the lower distal end. The carpus and propodus of the last pair are remarkably expanded at the anterior border. The dactylus of each pair is conspicuously different in shape as shown in fig. 6. That of the first pair is elongate triangular and curved inward, that of the third pair elongate rectangular, and finally that of the last pair is very small and elongate ovoid in shape.

Measurements. — Male holotype, length of carapace 24.5 mm, width of same 17.5 mm.

Remarks. — No representative of *Ranilia* has been recorded in the Indo-Pacific until now, the known species have been restricted to the Atlantic and Pacific coasts of America.

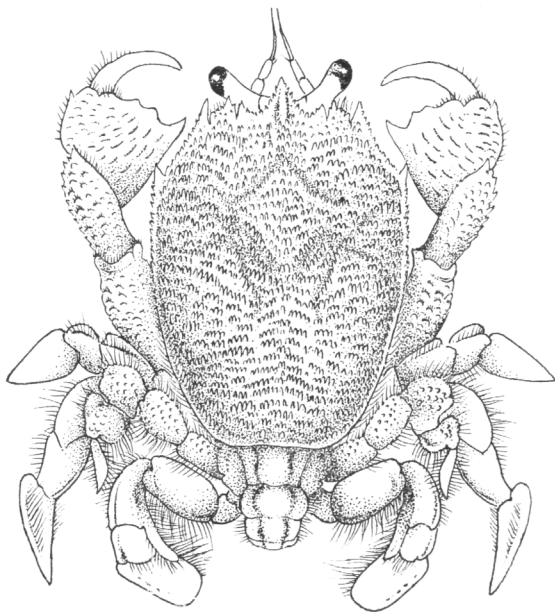


Fig. 6. *Ranilia orientalis* sp. nov., holotype, $\times 2$.

***Palicus amadaibai* sp. nov. (fig. 7a)**

2 ♂♂, 3 ♀♀ (one male and female of which are designated as holotype and allotype respectively), off Hayama, Amadaiba, Kannon-zuka-dashi, Ohyama-dashi, 65-85 m deep, coll. by His Majesty.

1 ♂, 2 ♀♀, west of Jyogashima light, Misaki, 65-85 m deep, coll. by His Majesty.

2 ♂♂, 1 ♀, off Mimase, Tosa Bay, coll. by K. Sakai.

Description. — The carapace is a little broader than long, the dorsal surface is moderately convex, the regions are fairly well defined, each region being covered with a velvety tomentum and beset with tubercles of various sizes, the larger ones are again covered with tiny granules. The front is cut into four well developed teeth, of which the median two are slightly on a lower level than the others and project forward, while the lateral ones slant outward with their tips directed slightly inward. The supra-orbital eave is broad and its anterior end obscurely pointed. There are two upper orbital teeth, of which the inner one is broad and subtruncate, the outer one is narrower and pointed at the tip. The lateral borders are cut into five teeth, of which the first or the outer orbital one is very prominent and curved inward at the tip, the second one is well separated

from the former by a large interval and is directed antero-laterally; the third, fourth and fifth teeth are closely approximated and gradually decrease in size from the front backwards. The postero-lateral and posterior borders are provided with a line of well separated broad tubercles.

The eye-stalk bears two low tubercles, one near the end and the other near the middle of the anterior border. The basal antennal segment is armed with an elongate lobule at the outer extremity.

In both sexes, the right cheliped is larger and heavier than the left, but the fingers of the smaller cheliped are longer and more slender and inwardly curved than those of the other partner. The merus, carpus and propodus have tubercles of various sizes on the upper or outer surfaces; the carpus also has a lobiform process near the anterior end of the outer border.

In the anterior three pairs of the ambulatory legs, the merus has two longitudinal rows of spinules on the upper surface; the anterior border is armed with three or four teeth, the terminal one being prominent and acuminate; the posterior border is also armed with several small and sharp teeth. The carpus bears three lamellate teeth on the anterior border, but in the first pair, the middle tooth is rudimentary. The propodus is distally broadened, its anterior border is thickly fringed with feathered hairs and its distal end has an acuminate tooth; the posterior border is entire and sparingly furnished with short feathered hairs. The dactylus is typically foliaceous, and its posterior border has two or three denticles, the anterior border being furnished with longish feathered hairs.

Relationship. — *Palicus oahuensis* of Balss (1922), Yokoya (1933), Sakai (1939) (nec Rathbun, 1906) may perhaps belong to this new species. His Majesty's specimens were compared with the type of *P. oahuensis* Rathbun (1906) by courtesy of the Smithsonian Institution at Washington and were recognized as distinct from that species.

Measurements. — Male holotype, length of carapace 12 mm, width of same 15 mm.

***Palicus microfrons* sp. nov. (fig. 7b)**

1 ♀, holotype, west of Jyogashima light, Misaki, 85 m deep, coll. by His Majesty.

Description. — The carapace is subquadrate in outline, the lateral borders are almost straight and slightly divergent backwards. The dorsal surface is fairly well areolated, the individual areolae are thickly covered with granules and tubercles, the latter are of good size and are capped with a cluster of tiny granules. The cardiac region has a pair of transverse crests.

The front is moderately produced forward; of the four frontal teeth, the median two are very small, closely approximated and on a lower level, the lateral ones are broad and lobiform. Just behind these frontal teeth, is a transverse series of post-frontal tubercles, of which the median two are most conspicuous. The supra-orbital eave is sinuate and the two upper orbital teeth are each rounded at the tip.

The lateral borders are straight and slightly divergent posteriorly, and are cut into five truncate teeth, which are closely approximated and decrease in size from the front backwards. The posterior border bears about six well-separated crest-like tubercles.

The chelipeds of the holotype are subequal, the merus, carpus and propodus are furnished with tubercles of various sizes on both upper and outer surfaces. In the anterior three pairs of ambulatory legs, the merus is proximally inflated; its upper surface is sparingly spinulate and its anterior and posterior borders are furnished with several sharp teeth; the terminal lobe of the anterior border is prominent. The carpus has two lobules on the anterior border, the one proximal

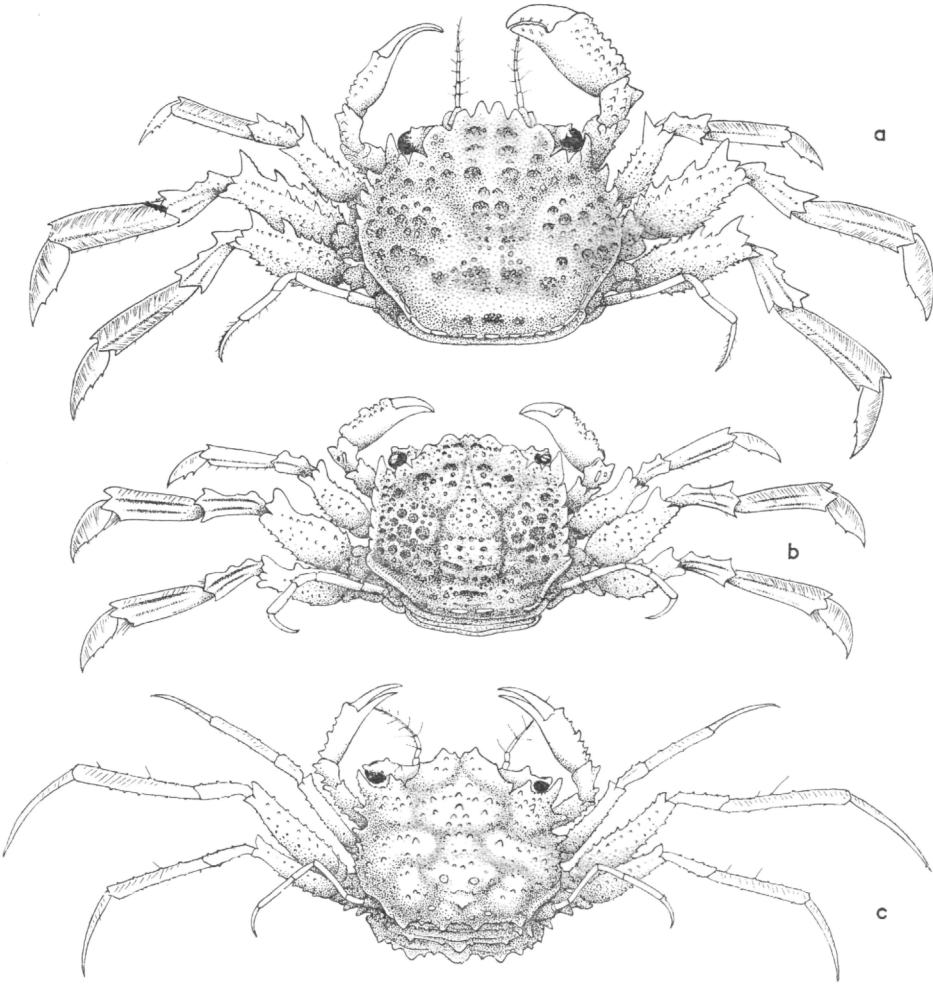


Fig. 7. a, *Palicus amadaibai* sp. nov., holotype, $\times 2.4$. b, *Palicus microfrons* sp. nov., holotype, $\times 3$. c, *Palicus hatusimaensis* sp. nov., holotype, $\times 6$.

and the other terminal. Both borders of the propodus are entire; the posterior border of the dactylus has two or three minute spinules.

Relationship. — This species is closely related to *P. woodmasoni* Alcock (1900) from the Andaman Sea, from which it may easily be distinguished by the different shape and arrangement of the frontal and lateral teeth as well as the different features of the granules and tubercles of the dorsal surface of the carapace.

Measurements. — Female holotype, length of carapace 8.0 mm, width of same 9.0 mm.

***Palicus hatusimaensis* sp. nov. (fig. 7 c)**

1 ♀, holotype, near the coast of Hatusima, Sagami Bay, 30-50 m deep, coll. by the staff of the Manazuru Marine Laboratory.

Description. — The carapace is broadly subquadrate in outline and slightly constricted near the middle of the lateral borders. The dorsal surface is uneven, each region being sparingly studded with tubercles of various sizes. The front is bilobate, each lobe slanting inwards and its inner angle marked with a denticle. The supra-orbital cave is concave in the middle; there is a single upper orbital tooth, which is rather prominent but not at all acuminate, between the supra-orbital cave and the outer orbital tooth.

Each lateral border of the carapace has four or five teeth, of which the first or the outer orbital one is most prominent and directed obliquely forward. The second one is well separated from the first and is directed sideways; behind the second tooth the carapace is well constricted by a sinus, behind which one large and two or three tiny teeth may be found. The posterior border is furnished with four equidistant tubercles.

The chelipeds are rather slender, the right one is a little heavier than the left; the merus, carpus and propodus are tuberculate on the upper and outer surfaces; the fingers are slender and curved inwards, the prehensile edges are entire. The three anterior pairs of ambulatory legs are very thin and slenderer than in either of the preceding species of this genus; the second pair being just 2.5 times as long as the carapace. The merus, carpus and propodus are tuberculate on the anterior and posterior borders; in the merus the upper surface has two longitudinal rows of tiny spinules; in the propodus and dactylus, the anterior border is sparingly furnished with hairs. The dactylus of all pairs is very slender and curved inwards, not at all foliaceous as is usual in other species of this genus.

Measurements. — Male holotype, length of carapace 4.0 mm, width of same 4.5 mm.

***Paradynomene* gen. nov.**

Diagnosis. — The carapace of this new genus is subquadrangular in outline, slightly longer than broad, the dorsal surface is well areolated, the individual areolae having each one or two low conical tubercles. The front is well produced

anteriorly, cut into three teeth, of which the median one is small and salient, apparently on a lower plane, while the lateral ones are broad and cristate. The upper and lower orbital margins are serrate, lacking the outer orbital tooth. The lateral borders are parallel, armed with large principal teeth and a few small subsidiary ones.

The flagellum of the antenna is rather short, not exceeding half the length of the carapace. The external maxillipeds are operculiform, completely closing the buccal cavern; the merus is much broader than the ischium and is conspicuously declining inwards against the plane of the ischium.

The chelipeds are robust and equal, the carpus and propodus are armed with acuminate teeth on anterior and posterior borders; the fingers are glabrous, hollowed at the tip. The anterior three pairs of ambulatory legs are robust and as long as the chelipeds; the merus, carpus and propodus are armed with several teeth on anterior and posterior borders. The fourth pair of ambulatory legs are very small and dorsal in position as is characteristic of the *Dynomenidae*; the dactylus is entirely rudimentary.

The male abdomen is composed of seven distinct segments; there is a platelet on either side intercalated between the sixth and seventh segments.

Remarks. — Hitherto, only two genera of the family *Dynomenidae* were known, namely, *Dynomene* Latreille, 1829, and *Acanthodromia* A. Milne Edwards, 1880, to which must now be added this new genus. *Paradynomene* differs from *Dynomene* in having the carapace subquadrangular and conspicuously convex instead of being transversely oval or polygonal and less convex. The general features of the front, thoracic appendages and also the external maxillipeds resemble those of *Dromia* or *Cryptodromia* of the family *Dromiidae*, rather than those of *Dynomene* or *Acanthodromia*.

Type species. — *Paradynomene tuberculata* sp. nov.

***Paradynomene tuberculata* sp. nov. (fig. 8)**

1 ♂, holotype, west of Jyogashima light, Misaki, 85 m deep, coll. by His Majesty.

Description. — The entire body is thickly and uniformly covered with granules, but is only very sparsely tomentose. The carapace is subquadrilateral in outline; the dorsal surface is markedly convex and conspicuously areolate, the individual areolae bearing low conical tubercles which are arranged as follows: — two on the post-frontal area (i.e. one on each epigastric lobule); a transverse row of three conspicuous ones on the protogastric and mesogastric regions, followed by two smaller ones on the metagastric region; a conspicuous one on each mesobranchial area, on either side of the urogastric region which bears two very inconspicuous ones; two on the cardiac, and one on the intestinal region; an oblique row of four tubercles on each metabranchial area, of which the innermost (most posterior) is the largest.

The front is produced anteriorly in the shape of a low triangle, cut into three

teeth, of which the median one is small and salient, apparently on a lower plane, while the lateral ones are broad and somewhat cristate, armed with a process at inner and outer angles. The upper and lower orbital margins are finely serrate, lacking the outer orbital tooth. The lateral borders are parallel, each armed with six principal teeth, of which the third is somewhat dorsal in position and the last is located on the postero-lateral border. Several additional small teeth occur between these principal teeth; several long hairs may be found at the top of the larger teeth.

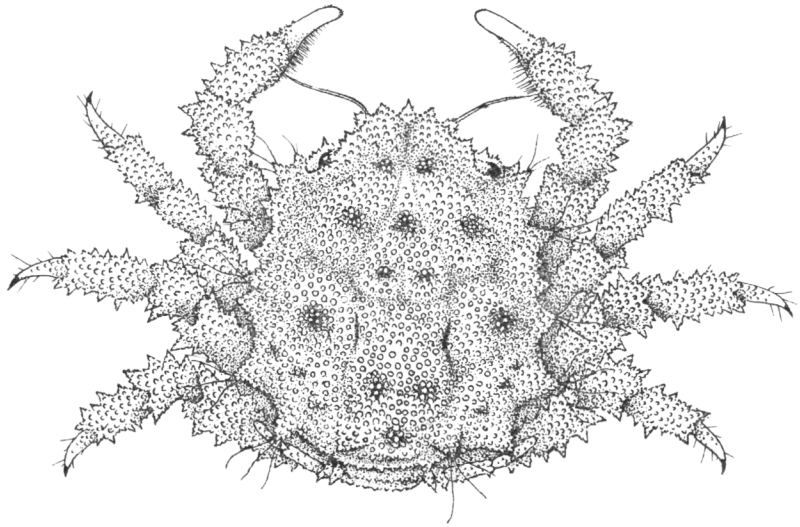


Fig. 8. *Paradynomene tuberculata* sp. nov., holotype, $\times 4.5$.

The basal segment of the antenna is armed with a process at its outer extremity; the flagellum is rather short, not exceeding half the length of the carapace. The external maxillipeds completely close the buccal cavern; the merus is much broader than the ischium and slopes inwards instead of continuing the plane of the ischium, thus the posterior wall of the concave pre-buccal region is formed.

The chelipeds are massive, the merus is armed with a few processes on anterior and posterior borders, the carpus is armed with four or five teeth on the outer border, the propodus has its upper surface obscurely sulcate and its outer and inner borders armed with four or five small teeth. The fingers are almost glabrous, have some small proximal granules, and are hollowed at their distal ends.

The first three pairs of ambulatory legs are as massive as the chelipeds; the merus, carpus and propodus are armed with three or four teeth of unequal size on anterior and posterior borders, the dactylus is unarmed. The fourth ambulatory legs are very small and thin, dorsal in position, and the dactylus is quite rudimentary.

The male abdomen is composed of seven distinct segments, having an intercalated platelet on either side between the penultimate and terminal segments.

Measurements. — Male holotype, length of carapace 10.5 mm, width of same 9.5 mm.

ZUSAMMENFASSUNG

In diesem Berichte, dem zweiten über die Sammlungen des Kaisers, sind die Beschreibungen von 14 neuen Arten mit 2 neuen Gattungen enthalten. Es sind 8 Arten mit 2 Gattungen vom Kaiser selbst beim Studium an der Bucht von Sagami bei Tokio gesammelt worden. Andere 6 Arten sind als vergleichendes Material von lokalen Krebs sammlern dem Kaiser feierlich überreicht worden. Nach systematischer Gliederung dieser neuen Gattungen und Arten gehören eine Gattung und 9 Arten zu Oxystomata, 3 Arten zu Brachygnatha, eine Art zu Gymnopleura und eine Art, zugleich neue Gattung, zu Dromiacea.

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