

## New and Rare Crabs from the Palau Islands

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Examining the crabs from the Palau Islands collected by Prof. S. Miyake and deposited in the Zoological Laboratory, Kyushu University (ZLKU), the author found some rare and undescribed species. The present paper contains the descriptions of altogether nine species referable to six families. The new species described herein are *Thalamita miyakei* of the Portunidae, *Etisus odhneri* of the Xanthidae, *Camptandrium rathbunae* of the Ocypodidae, and *Sesarma (Parasesarma) palauense* of the Grapsidae.

Before going any further, the author acknowledges Prof. Sadayoshi Miyake for his kind guidance during the performance of this research and the valuable materials upon which the present paper is based. The author's cordial thanks are also due to Prof. Tune Sakai for his continued guidance. The author must be also thankful to Dr. C. Michel of the Mauritius Institute for sending him some comparative specimens.

Family LEUCOSIIDAE

Genus *Cryptocnemus* Stimpson, 1858

*Cryptocnemus aberrans* Balss, 1938

(Fig. 1)

*Cryptocnemus aberrans* Balss, 1938: 10, pl. 1 fig. 3; Miyake, 1939: 199.

Description: The carapace is markedly transverse with the thin, upturned wide margins, the proportion between the length in median line and the greatest breadth being 1:1.56; the dorsal surface of the carapace is glabrous and only weakly convex in both directions without distinct indication of the regions; in reality, however, the mesogastric and cardiac regions are hardly traceable. The front bears a great dorsal inclination, so that the epistomial region is entirely visible in the dorsal view. The lateral part of the epistomial region is weakly angulated as an anterior end of the lateral thin margin. The anterolateral part of the thin margin is weakly convex in the middle; the posterolateral part is strongly convergent and dorsally convex; the posterior part is not distinctly delimited from the posterolateral, being slightly concave in the middle. The front is strongly raised, its free margin being entire, weakly convex forwards and microscopically granulated.

The chelipeds are large and equal, being distinctly depressed. The borders of the merus are strongly crested and minutely serrulated; especially, the distal half of the anterior upper border and the whole length of the posterior border are lobular.

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The anterior border of the carpus and both borders of the palm are thin and serrated; near the distal end of the posterior border of the palm some granules are rather prominent. The inner surface of the palm is inflated and tipped with a curved row of granules, which runs from the proximal part of the palm in a line with a granulated ridge on the posterior upper border of the carpus to the proximal part of the movable finger. The fingers are half the length of the palm with some granulated ridges; the cutting edges are minutely toothed near the tips, leaving a narrow gape with hairs at the proximal halves.

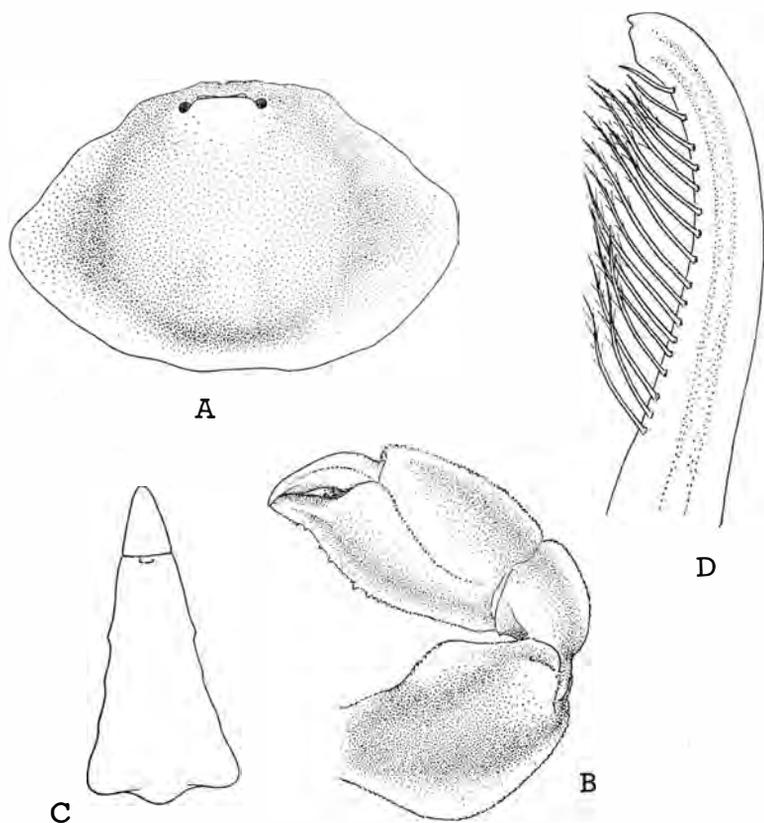


Fig. 1. *Cryptocnemus aberrans* Balss, ♂ (ZLKU 2147; cb. 6.3 × cl. 4 mm). A, carapace; B, right cheliped; C, abdomen; D, distal half of left first pleopod in sternal view.

The ambulatory legs are concealed beneath the carapace in flexion, decreasing the length from the first to the last pair; each segment save the dactylus is distinctly depressed. Both borders of the merus, the anterior border of the carpus and both borders of the propodus are markedly crested and minutely serrated. In the lower surface of the merus is a longitudinal weak ridge along the posterior border, so that

between them is formed a longitudinal shallow cavity, to which the carpus and propodus are applied in flexion. In each of the upper surfaces of the carpus and propodus is a longitudinal granulated ridge in the middle.

The male abdomen is composed of three segments; the median segment is very prominent without vestiges of the sutures, at the distal end of which there is a low transverse prominence. The male first pleopod is long and rather simple with the subterminal fringe of hairs, while the second is short.

Material examined: Ngaláp, Songél a Lise, Goréor I. (Lat. 7° 21' N, long. 134° 30' E), 1 ♂, ZLKU 2147, July 11, 1939, S. Miyake leg.

Measurements: Male—Breadth of carapace, 6.3 mm; length of carapace, 4 mm.

Remarks: The present male examined is referable to the present rare species without doubt. The present species is readily distinguished from the congeners by having the markedly transverse carapace with the wide, upturned marginal crest and the dorsal inclination of the front which is not notched in the middle. The male first pleopod is represented in the present paper.

Distribution: This species is known from the British Solomon Islands and the Palau Islands.

#### Family ATELECYCLIDAE

#### Genus *Kraussia* Dana, 1852

#### *Kraussia rastripes* Müller, 1887

(Pl. 1 Figs; 1, 2)

*Kraussia rastripes* Müller, 1887: 480, pl. 4 fig. 5; Borradaile, 1900: 576; Balss, 1938: 28, fig. 13; Miyake, 1939: 203.

Materials examined: aUgulpelú Reef, aUgulpelú I. (Lat. 7° 17' 30" N, long. 134° 32' E), 1 ♂, ZLKU 5932, May 3, 1938, S. Murakami leg.; Same locality, 3 ♂♂, 1 ♀, ZLKU 1161, May 5, 1939, S. Miyake leg.

Measurements: Male—Breadth of carapace, 13.5 mm; length of carapace, 11.4 mm; fronto-orbital breadth, 7.1 mm. Female—Breadth of carapace, 16.3 mm; length of carapace, 13.8 mm; fronto-orbital breadth, 8.5 mm.

Remarks: The present species resurrected by Balss (1938) is in reality very close to *K. integra* (de Haan). The carapace of *K. integra* is more circular and evenly convex in both directions, while in the present species the carapace is apparently narrower and weakly but decidedly convex from side to side. In the present species the lateral border of the carapace is regularly spinulated, and its posterolateral part is rather strongly concave. The right and left chelae of *K. integra* are different in shape from each other, but those of the present species are alike in both sexes. In the present species the palm is covered with squamiform granules on the outer distal part more prominently in the present female than the males examined; the immovable finger is very short and the movable one is strongly curved, leaving a wide gape in which there are a small tooth on the movable and a blunt one on the

immovable finger; each of the outer and inner surfaces of both fingers is provided with a prominent tuft of hairs, by which the teeth on the cutting edges are almost disguised; in the movable finger there are three or four conical teeth each on the upper and outer upper ridges. The fingers of *K. integra* are apparently longer than those of the present species; in the larger chela the movable finger is rather strongly curved at the tips, but there is only a narrow gape on account of the presence of one large and two smaller teeth on the immovable finger; both fingers of the smaller chela are more slender than those of the larger one, and the movable finger is less markedly curved, leaving a narrow gape throughout the length; in both chelae the movable fingers bear no prominent teeth. In *K. integra* each of the dactyli of the ambulatory legs is distinctly lanceolate and roughly tuberculated. In the present species, however, the dactyli of all the legs are less markedly tuberculate, especially the tubercles on the dactylus of the last leg are apparently fewer and larger, and the dactyli of the first two pairs are more lobular with the sinuate anterior and convex posterior borders.

The chelae are generally agreeable with the figure given by Balss (1938), in which the palm is, however, provided with an oblique furrow. In the specimens examined the tuberculation of the palm is fairly variable as noted above, but such a furrow is not found in any specimens examined.

Distribution: This species is known from Trincomalee in Ceylon, Rotuma Island in the south Pacific, New Guinea, the Palau, Caroline and Gilbert Islands.

Family PORTUNIDAE

Genus *Thalamita* Latreille, 1829

*Thalamita miyakei* sp. nov.

(Fig. 2; Pl. 2)

Diagnosis: Front with two lobes concave outer one third. Second, third and fifth anterolateral teeth subequal, and fourth tooth less than half size of other teeth. Antennal basal segment long and bears a thin crest tipped with a dark-coloured spine. Propodus of natatory leg strongly spinose.

Description of holotype: The dorsal surface of the carapace is very sparsely covered with short setae and long tubular hairs, the latter being mostly on the ridges and more or less symmetrically disposed; the frontal, protogastric and mesogastric regions are distinct as usual, and the latter is indicated by a distinct row of granules; the epibranchial ridge is well developed and interrupted medially and by the cervical grooves; the mesobranchial ridge is short but distinct at either side of the indistinct cardiac ridge.

The front is composed of two broad lobes separated by a median deep notch; each lobe is rather distinctly concave at the outer one third. The inner orbital lobe is broad and little arched, being about four-fifths the breadth of each frontal lobe.

The antennal basal segment is markedly long, for its greater part covered with minute conical granules and bears a thin crest tipped with a dark-colored spine, that is directed strongly outwards and appears to be a spine as a whole; the spini-

form crest is in reality bears two or three indistinct serrulations on the upper border, being wholly visible from above.

All the anterolateral teeth of the carapace are very sharp; the first is the stoutest, the fourth is less than half the size of the preceding; the second, third, and fifth are subequal or the second is only slightly larger than the others.

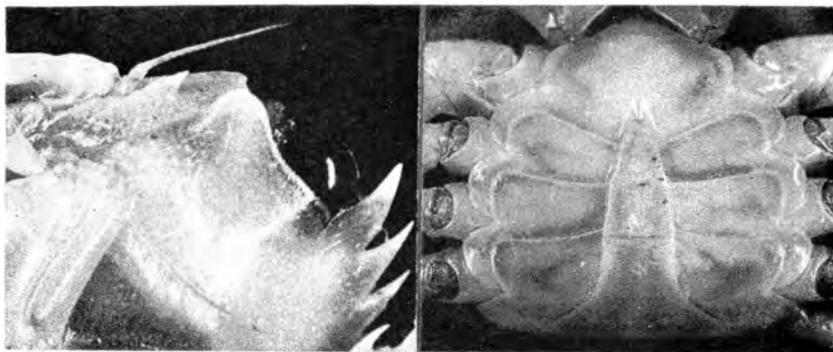


Fig. 2. *Thalamita miyakei* sp. nov., holotype ♂ (ZLKU 5133; cb. 18.6×cl. 11.9 mm). Left, fronto-orbital region in abdominal view; Right, thoracic sternum and abdomen.

The right cheliped is only slightly larger than the left. The anterior border of the merus is armed with three strong spines, the proximal of which is the smallest as usual. The carpus is armed with usual four spines. The palm is glabrous and armed with five spines as seen in most of the known species; the distal spine on the upper border is placed at the distal one third, and the upper border of the palm ends in a small conical granule; the median carina on the outer surface is indistinct only with a proximal and a distal granulated crest; the lower carina with a row of microscopical granules is very strong as usual.

In the natatory leg the merus bears a strong subterminal and a small terminal spine on the posterior border; the posterior border of the propodus is armed with altogether nine strong spines, of which seven are on the upper side of the fringe of feathered hairs, and the other two on the lower side; in the propodus of the left leg there is an additional conical granule.

In the abdomen the penultimate and terminal segments are tapering without a lateral convexity; the terminal segment is rather long, the length being about one and a half the breadth at the base. The first pleopod is fringed with conspicuous backwardly directed setae along the subterminal part up to the tip.

Description of allotype and paratypes: The allotype and the female paratype are in the good condition of preservation, but unfortunately, in the male paratype both chelipeds, all the left ambulatory legs, the right first and third ambulatory legs and the abdomen are missing. In all the specimens available the front, the anterolateral teeth, and the spiniform crest of the antennal basal segment are well

agreeable with those of the holotype. In all the specimens the cardiac ridge is more or less distinct, being interrupted in the median line. It is otherwise remarkable that in the allotype and the female paratype the dorsal surface of the carapace is covered with short setae rather sparsely but much more densely than in the holotype, while the carapace of the male paratype is nearly naked only with scattered long tubular hairs like the holotype. The variation of the hairiness is probably due to the sexes.

In the allotype the propodus of the natatory leg bears one lower and six upper spines in the right leg, and the lower spines are two in the left leg. In the female paratype the upper spines are seven in the right leg and six in the left, and there is only one lower spine in both legs. In the male paratype the propodus is armed with only four upper and two lower spines.

Materials examined: Ngaláp, Songél a Lise, Goréor I. (Lat. 7° 21' N, long. 134° 30' E), 1 ♂ (holotype), ZLKU 5133, 1 ♀ (allotype), ZLKU 5134, 1 ♂, 1 ♀ (paratypes), ZLKU 5135, April 19, 1939, S. Miyake leg.

Measurements: Holotype, male—Breadth of carapace with lateral teeth, 18.6 mm; length of carapace, 11.9 mm; distance between external orbital angles, 18.1 mm. Allotype, female—Breadth of carapace with lateral teeth, 18.6 mm; length of carapace, 11.6 mm; distance between external orbital angles, 17.8 mm. Paratype, female—Breadth of carapace with lateral teeth, 22.2 mm; length of carapace, 13.8 mm; distance between external orbital angles, 21.3 mm.

Remarks: The present species is included in an *admete* group in which the front is two-lobed, the inner orbital lobes are rather straight and the first male pleopod bears stout bristles sticking out from both sides of the subterminal part. The species grouped are rather similar to each other in the general formation of the carapace, but the present species may be the nearest kin of *T. quadrilobata* Miers with respect to the spininess of the chelipeds. The present species is, however, remarkably different from *T. quadrilobata* in having a high spiniform crest on the antennal basal segment instead of three large spines.

#### Family XANTHIDAE

Genus *Etisus* H. Milne Edwards, 1834

*Etisus deflexus* Dana, 1852

(Fig. 3A, B; Pl. 1 Fig. 3)

*Etisus deflexus* Dana, 1852: 184; Odhner, 1925: 84; Sakai, 1936: 164, fig. 5; Balss, 1938: 44.

Nec *Etisus deflexus*: Klunzinger, 1913: 247 (= *E. demani* Odhner).

Description: The carapace is markedly wide, depressed, and minutely granulated near the front, the anterolateral, and posterolateral borders; the dorsal surface of the carapace is well divided into regions which are not strongly convex; the areolae 1-4M are all distinct, the areola 2M being nearly entire; the areola 1L is not defined, while 2 and 3L are fused with each other and present a large areola

which is very shallowly separated from the second anterolateral tooth; the areola 4L is transverse and only indistinctly separated from the third anterolateral tooth; the areola 2P in front of the posterior border of the carapace is not medially interrupted, but the lateral parts are so convex that 2P is seemingly composed of a pair of two transverse areolets.

The front is cut into two convex lobes by a median V-shaped sinus and fringed with a transverse row of hairs behind the free margin and in front of the frontal ridge-like areola designated as F; each of the lateral angles is strongly developed as a lobular projection and directed obliquely downwards like the frontal main lobes. The supraorbital border is tumid and divided into three parts by two distinct notches; the inner and middle parts are convex dorsally and the outer part forms the external orbital angle which is more or less tuberculated and convex dorsally and laterally.

The anterolateral border of the carapace is armed with four sharp teeth behind the external orbital angle; the first is smaller than the external orbital angle and placed just near and somewhat below it; the second is conical, while the following two are sharper and directed more laterally. The posterolateral border of the carapace is very strongly convergent behind the end of the posterior slope of the last anterolateral tooth.

The chelipeds are quite unequal, the right being the larger in the male examined. The merus is for its greater part exerted beyond the carapace; along the anterior margin is a longitudinal deep furrow that is continuous to the subterminal transverse furrow. The inner angle of the carpus is not prominent only with a small protuberance. The palm is rather compressed and covered with minute granules chiefly on the upper and outer upper surfaces. In the larger chela the fingers leave a wide gape, while the smaller fingers are narrowly gaped throughout the lengths; the immovable finger of the larger chela bears a small tooth at the base and a large high tooth near the hollowed tip; the movable finger of the same is armed with a large tooth at the base and three small ones in the middle; in the smaller chela the fingers are indistinctly toothed on the cutting edges along the whole lengths; the coloration is fairly extended back onto the palm towards the upper border and along the lower border.

The ambulatory legs are comparatively slender, thickly granulated, and densely fringed with yellow hairs mainly along the anterior borders. The propodus and dactylus are also fringed with hairs along the posterior borders. In each of the dactyli the anterior border is thickly armed with small dentiform spinules, and in the posterior border the subterminal strong tooth near the terminal claw is always prominent. The male first pleopod is rather simple without long hairs.

Material examined: Ngadarák Reef (Lat.  $7^{\circ} 17' 30''$  N, long.  $134^{\circ} 28' 30''$  E), 1 ♂, ZLKU 1265, May 22, 1939, S. Miyake leg.

Measurements: Male—Breadth of carapace with lateral teeth, 23.8 mm; length of carapace, 14 mm; breadth of front, 6.1 mm; fronto-orbital breadth, 15 mm.

Remarks: The present species is peculiar in having the depressed and markedly

transverse carapace. Odhner (1925) is the first who distinguished the present species from the congeners after the original description, and afterwards it is only dealt with by Sakai (1936) and Balss (1938). The male first pleopod is represented by Sakai, and in the present paper.

**Distribution:** This species is restricted to the west Pacific, being known only from the Fiji, Gilbert, and Palau Islands.

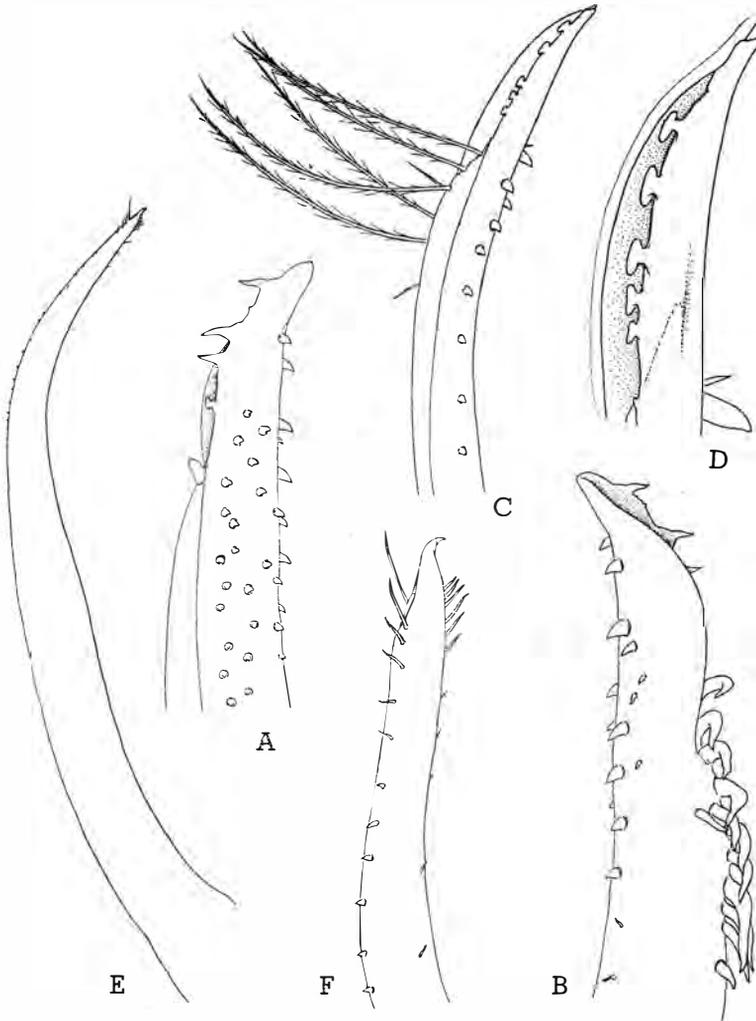


Fig. 3. *Etisus deflexus* Dana, ♂ (ZLKU 1265; cb. 23.8 × cl. 14 mm). A, B, distal part of left first pleopod in abdominal and sternal view, respectively. *Etisus demani* Odhner, ♂ (ZLKU 1329; cb. 15.6 × cl. 11 mm). C, D, distal part of left first pleopod in abdominal view. *Etisus odhneri* sp. nov., holotype ♂ (ZLKU 2866; cb. 9.9 × cl. 7.1 mm). E, first pleopod in abdominal view; F, distal part of the same.

*Etisus odhneri* sp. nov.

(Fig. 3 E, F; Pl. 3)

**Diagnosis:** Small species. Carapace transversely ovate and evenly convex in both directions. Dorsum with granulated areolae. Front with two lobes double-rimmed and fringed with two rows of pearly granules. Anterolateral border with four conical teeth behind external orbital angle. Chelipeds heavy with abruptly curved and gaped fingers.

**Description of holotype:** The carapace is more or less transversely ovate and only evenly convex in both directions; the dorsal surface is well separated into regions which are not strongly convex; the frontal region and the wide shallow furrow along the supraorbital and anterolateral borders are rather sparsely covered with small warty granules, while most of the regions are roughened by numbers of the transverse short ridges that are more or less beaded to form transverse indistinct rows; the short ridges are almost indistinct or absent on the posterior part of the mesogastric region (3M) and the cardiac region (1P); the areola 1M is more or less convex anteriorly and shallowly separated from the inner part of 2M which is imperfectly subdivided into two by a longitudinal shallow but distinct furrow on the anterior half; the outer part with a small tuft of feathered hairs on the anterior margin is about one and a half times the breadth of the inner part; in the median line 3M bears a pair of transverse slit-like furrow at the posterior end; the areola 4M is small but very distinct, being separated from 3M by a narrow deep furrow and from 1P by a wide deep depression; the areola 1L is only a small prominence obliquely behind and inside the first anterolateral tooth; the areolae 2 and 3L are almost separated by an oblique furrow; the areola 3L is again more or less subdivided into two by a shallow transverse furrow, the anterior subregion being smaller and subequal to 2L; the areola 4L is convex and subequal to or only slightly larger than 2L, being well isolated from the adjacent regions and the anterolateral tooth; the areola 5L is very large with a small tuft of feathered hairs near the middle of the anterior margin and imperfectly separated from 6L by the oblique anterior and posterior incisions; the areola 1P is also prominent and weakly convex towards the posterior border of the carapace in the median line; the areola 2P is rather strongly convex fore and aft near the lateral end just above the base of the last ambulatory leg; the posterolateral dorsal surface is ornamented with a furrow which is extended towards the posterior angle of 6L.

The front is rather prominent and cut into two lobes by a median deep notch, being distinctly double-rimmed with fringes of two rows of pearly granules; each lobe is more extended forwards near the median notch and weakly retreats laterally, bearing a rounded, rather strong lateral lobule. The supraorbital border bears two notches as usual and fringed with a row of granules. The infraorbital border is rather deeply concave, the inner infraorbital angle being strongly extended forwards and subacute at the apex. The antero-external angle of the antennal basal segment is a little prolonged into the orbit, but imperfectly shuts out the flagellum

from the orbit.

The anterolateral border of the carapace is armed with four teeth excluding the external orbital angle which is conical with an acute apex and rather similar to the anterolateral teeth; the four anterolateral teeth are similar to each other, conical and fringed with granules, the first being the smallest of the series; in each of the first and third the posterior slope is slightly longer than the anterior; in all the teeth the granules at the ends of the slopes are larger, but rounded and not protruded from the general contour of the border; each of the third and fourth bears a longish seta at the dorsal part.

The chelipeds are heavy, the right being only slightly larger than the left. The merus is granulated and exerted beyond the carapace by its distal part; the anterior and upper borders are fringed with longish feathered hairs; the anterior border is bluntly crested and bears a row of granules, some of which near the proximal part are prominent, while the upper border is rounded. The outer surface of the carpus is rather reticulated with scattered and beaded granules and bears a rounded prominence near the articulation with the palm; the inner angle is armed with two spiniform teeth, the upper of which is much the larger and curved upwards. The palm is very high and the oblique rugosities with the ridges of low fused granules on the outer surface are everywhere prominent; in the smaller chela the ornamentation mentioned is more prominent than in the larger chela. The immovable finger bears a deep depression with the granulated ridge along the lower border and a granulated ridge along the prehensile edge; the lower border is rather strongly convex in the middle; in both chelae each movable finger is abruptly curved to be nearly vertical near the tip, leaving a wide gape between both fingers; in the larger chela the prehensile edge of the immovable finger bears altogether four teeth at the proximal half, the distal one of which is very prominent and high, and the movable finger is provided with two, the proximal one of which is molar-like and the distal one is conical; the formation of the smaller chela is rather similar to that of the larger, but the teeth are much smaller and conical, especially the proximal two of the immovable finger are very small and granuliform; each of the outer surfaces of all the fingers is provided with two more or less distinct hairs in the middle near the prehensile edge; the distal halves of the fingers are deeply hollowed and provided with a prominent tuft of hairs in the immovable finger and with a prominent and two small tufts in the movable finger; the color of the immovable finger is not much extended back onto the palm.

The ambulatory legs are hairy and spinulated. The anterior border of the merus is fringed with feathered hairs and bears more than fifteen conical granules. The anterior border of the carpus and both borders of the propodus are thickly covered with conical granules of various size. The dactylus is also armed with conical granules, of which several on the anterior border and one on the subterminal part of the posterior border are spiniform.

In the abdomen, the right halves of the second and third segments are somewhat damaged. The first pleopod bears a very small beak only with some short sub-

terminal hairs.

Description of allotype: Unfortunately, the posterior half of the carapace is damaged, and only the left cheliped and the left first ambulatory leg are present. The ornamentation of the dorsal surface of the carapace and the formation of the front and the anterolateral teeth agrees with those of the holotype. The left chela is also very similar to the smaller chela of the holotype with the markedly gaped fingers and the conical teeth. The abdomen is well developed with prominent marginal hairs and the well-developed pleopods in spite of the small size of the carapace; the second and third segments are widening as usual, while each lateral border of the fourth is rapidly divergent towards the subterminal part and then convergent; the fifth and sixth are bulged, but in the fifth each lateral border is very weakly angulated more or less distally; the terminal segment is truncated just at the summit.

Materials examined: Ngarsmau, Babldáob I. (Lat. 7° 37' N, long. 134° 33' E), 26 m deep, 1 ♂ (holotype), ZIKU 2866, 1 ♀ (allotype), ZLKU 1775, July 14, 1939, H. Ohshima and S. Miyake leg.

Measurements: Holotype, male—Breadth of carapace with lateral teeth, 9.9 mm; length of carapace, 7.1 mm; breadth of front, 3.2 mm; fronto-orbital breadth, 6.6 mm. Allotype, female—Breadth of carapace with lateral teeth, ca. 7.5 mm; length of carapace, ca. 5.5 mm; breadth of front, 2.5 mm; fronto-orbital breadth, 5.3 mm.

Remarks: Among the congeners, *E. demani* Odhner is the closest to the present species on account of having the remarkable formation of the abruptly curved fingers. The areolation of the dorsal surface of the carapace, the front and the chelipeds are in fact similar to each other in both species. *E. demani* is, however, distinguished from the present species most readily by the features that the anterolateral teeth are rather tuberculated with prominent accessory granules, the anterior border of each merus of the ambulatory legs is armed with larger granules of ten or so in number, the first male pleopod bears a long beak with some mushroom-shaped outgrowths and some long hairs, and in the female abdomen each lateral border of the fourth to sixth segments is generally convex and the terminal segment is widely truncated. The present species is much smaller than *E. demani*, and in close comparison the dorsal areolae of the carapace are more strongly convex and the male abdomen is narrower in *E. demani*.

Genus *Pilodius* Dana, 1851

*Pilodius palaoensis* (Sakai, 1936)

(Pl. 4 Figs. 3, 4; Pl. 5)

*Chlorodopsis* (*Cyclodius*) *palaoensis* Sakai, 1936: 167, pl. 13 fig. 2, pl. 14 fig. 1; 1939: 505 footnote.

Materials examined: Toágel Mid [Ngarmid passage], Goréor I. (Lat. 7° 22' N, long. 134° 30' E), 1 juv. ♂, ZLKU 2985, January 29, 1938, S. Murakami

leg.; Same locality, 1 ♂, ZLKU 1818, May 18, 1939, S. Miyake leg.

Ngarekamais, Goréor I. (Lat. 7° 21' N, long. 134° 29' E), 1 juv. ♂, ZLKU 2986, May 26, 1938, S. Murakami leg.

Ngaláp, Songél a Lise, Goréor I. (Lat. 7° 21' N, long. 134° 30' E), 2 ♂♂, 2 ♀♀, ZLKU 1814, April 11, 1939, S. Miyake leg.

Ngadarák Reef (Lat. 7° 17' 30" N, long. 134° 28' 30" E), 3 ♂♂, 4 ♀♀, ZLKU 1821, May 31, and June 1, 1939, S. Miyake leg.

Measurements: Male—Breadth of carapace with lateral spines, 36 mm; length of carapace, 25.3 mm; fronto-orbital breadth, 21.8 mm. Female—Breadth of carapace with lateral spines, 51 mm; length of carapace, 35 mm; fronto-orbital breadth, 29.3 mm.

Remarks: Though the present species has been generally regarded to be synonymous with *P. pilumnoides* (White), it was proved to be valid. In the present collection are twelve specimens referable to the present species in addition to the specimens referable to *P. pilumnoides*. They are represented by the various developmental stages and readily distinguished from the specimens referable to the latter species. Otherwise, two juvenile specimens are referable to the present species with question rather than to *P. pilumnoides*.

Most of the features are in reality referred to those of *P. pilumnoides*, but the front is well developed and not turned down, being deeply cut into two lobes by a median U-shaped sinus. The lateral lobules of the front are also well developed. Therefore, the carapace is seemingly narrower than that of *P. pilumnoides* as remarked by Sakai (1939). The dorsal surface is also covered with short setae, but in the smaller specimens the longer brush-like hairs are much denser and in the larger the setae almost worn out to be naked. The fingers are usually more strongly gaped especially near the tip. It is otherwise remarkable that the present species is much larger than *P. pilumnoides* as apparently shown by the fact that in the present species a female of the carapace length 13.7 mm is very young, but in *P. pilumnoides* an ovigerous female bears its carapace length 10 mm.

Distribution: This species has been originally described on two females from the Palau Islands.

#### Genus *Viaderiana* Ward, 1942

*Viaderiana* Ward, 1942, p. 101.

Carapace quadrate and covered with hairs of various length. Dorsum smooth with ill-defined areolae. Frontal region declivous with two well-developed lobes. Each lobe with rather produced lateral lobule. Anterolateral border of carapace with two spines or spiniform teeth excluding external orbital angle, and sometimes with a rudimental tooth behind them. Orbit large and bears two shallow depressions on supraorbital border. Antennal basal segment just touched with ventral prolongation of front. Flagellum markedly long with numbers of secondary hairs. Third maxillipeds not very wide with excavated antero-internal and rounded antero-external angles of meri. Chelipeds rather short and unequal, but not quite so.

Upper border of merus with a subterminal spine and palm with some longitudinal rows of granules. Ambulatory legs very long and usually armed with some spines on anterior border of each merus. Dactylus of last leg weakly curved upwards, but not markedly different from those of preceding pairs.

The present genus has hitherto been represented only by the imperfectly known type species, *V. typica* Ward. In the present paper, chiefly as a matter of convenience, the following species are included in the present genus.

*Viaderiana affinis* (Tesch, 1918), comb. nov.

*aranaea* (Tesch, 1918), comb. nov.

*beaumonti* (Alcock, 1900), comb. nov.

*quadrispinosa* (Zehntner, 1894), comb. nov.

*typica* Ward, 1942

*Viaderiana typica* Ward, 1942

(Pl. 1 Fig. 4)

*Viaderiana typica* Ward, 1942: 101, pl. 6 fig. 6.

Description. The carapace is narrow and quadrate, being covered with rather dense longish and long hairs; most of the long hairs are brush-like and disguise the areolation of the carapace; the proper dorsal surface is weakly areolated with shallow interregional furrows, and the frontal, mesogastric, protogastric, hepatic, and cardiac regions are traceable; the hepatic and cardiac regions are usually rather convex than the others; the dorsal surface is for its greater part smooth, but the protogastric, hepatic, and posterolateral regions are more or less roughened by blunt but rather conical granules. The front is strongly produced and declivous downwards, being cut into two truncated lobes by a median, deep, wide sinus; the sinus is so deep that its median proximal part or the bottom is just in a level of the interantennular septum in the obliquely upper view; the lateral part of each lobe is rounded and then very deeply concave, bearing the blunt lateral lobule that is rather directed downwards and distinctly separated from the supraorbital angle by the dorsal sulcus.

The anterolateral part of the lateral border of the carapace is much shorter than the posterolateral, being armed with two prominent spine-tipped teeth behind the external orbital angle; the first of the two is more stout with a more curved spine at the tip; just at the posterior end of the second is a vestige of the third tooth which is usually indicated by a granule of good size but almost indistinguishable in some specimens. The posterolateral border is nearly longitudinal or very slightly inclined, being granulated together with its dorsal surface.

The orbit is large, but not markedly transverse; the supraorbital border is granulated and fringed with setae, bearing two distinct depressions; the border between the depressions is weakly convex, and the outer border of the lateral depression is directed obliquely forwards as an inner border of the external orbital angle; in the dorsal view the external orbital angle is conical and rather lobulate, being bordered with three or four conical granules each along the inner and outer borders. The infraorbital border is prominently raised and fringed with setae and conical

granules, bearing a notch below the external orbital angle; the inner infraorbital angle is extended forwards and convex ventrally, being thickly covered with setae; the inner extremity of the inner infraorbital angle is rounded and broadly touched with the wide and flattened basal segment of the antenna; the inner angle of the antennal basal segment is rather broadly touched with the ventral prolongation of the front; the second and third segments are also stout and provided each with a tuft of two or three hairs at the outer angle; the flagellum with sparse long secondary hairs are very long and exceeds twice the length of the major diameter of the orbit. The third maxillipeds are rather wide but leave a narrow gape in the middle; the ischium is provided with sparse longish brush-like hairs along the outer border and with a fringe of long hairs on the inner border, the exposed surface being for its greater part sunken; the merus is quadrate, and its inner proximal part is obliquely cut out, so that a deep transverse V-shaped sinus is left between the ischium and merus.

The chelipeds are rather short and subequal in both sexes; however, in reality, the male chelae are only slightly unequal in close comparison with each other and possibly larger than those of the female. The upper border of the merus is armed with one or two conical granules of good size at the proximal part and a high, tuberculated subterminal tooth that is rather thin distally and tipped with a spinule or conical granule; the terminal spinule of the upper border of the merus is present, but in some specimens worn out or broken off to be a conical or blunt granule. The carpus is covered with setae and long hairs, being roughened by the sparse conical granules; among the granules two along the inner border are always larger than the others and in the appearance of the spinules; of the two the distal one near the middle of the border is more prominent and weakly curved outwards; the inner angle of the carpus is produced into a very high tubercle tipped with a spine. The palm is entirely covered with conical granules, setae and long hairs like the carpus; those granules are somewhat beaded to form some longitudinal rows, and a longitudinal shallow furrow along the upper border is traceable. The fingers are rather long, but stout, being covered with setae and longish hairs nearly to the tips; in each of the movable and immovable fingers the outer surface is impressed with two longitudinal distinct furrows, one along the cutting edge and the other along the border; in addition, in the movable finger is a similar but less prominent furrow on the inner surface near the upper border, while the lower border of the immovable finger bears also a furrow; those furrows are rendered ridge-like; the inner surfaces of the movable fingers are deeply hollowed and the tips are also excavated; the cutting edges are regularly and very sharply toothed along the whole lengths.

The ambulatory legs are markedly slender and densely fringed with long hairs. In the first three pairs each merus is roughened by conical granules near the proximal end and armed with a strong spine associated with some long hairs on the anterior border; very rarely the spine is absent only with a tuft of hairs; in all the legs each of the meri is provided with a subterminal tuft of long hairs and armed with a terminal spine which is much smaller than the spine of the anterior border but always

distinct. The carpus is ornamented with a longitudinal furrow, and on the upper surface along the furrow the long hairs are more prominent than the anterior border. The propodus is more or less depressed and also provided with a longitudinal shallow furrow that occupies most of the upper surface.

Material examined: S.W. Madalâi, Goréor I. (Lat. 7° 20' 30" N, long. 134° 28' E), 1 ovig. ♀, ZLKU 1657, May 11, 1938, S. Murakami leg.

Measurements: Ovigerous female—Breadth of carapace, 14.8 mm; length of carapace, 11.1 mm; breadth of front with lateral lobules, 5.2 mm; fronto-orbital breadth, 10.7 mm.

Remarks: In the Zoological Laboratory the following specimens are also preserved.

Maézato, Ishigaki-jima I., Ryukyu Is., 1 ♂, 1 ovig. ♀, 1 ♀, ZLKU 1661, May 23, 1940, S. Miyake and T. Kawahara leg.

The present materials examined are agreeable with a male from Mauritius referred to the present species by Ward (1942) and sent on loan by Dr. C. Michel of the Mauritius Institute, in which the hairs are rubbed off and all the chelipeds and ambulatory legs are detached.

In the present species the most remarkable feature different from the allied species is the formation of the fingers. Though the cutting edges are sharply toothed as usual, their inner surfaces are deeply hollowed out. Otherwise, the general formation of the carapace and ambulatory legs is rather similar to that of *V. quadrispinosa* (Zehntner), as already noted in the original brief description.

Distribution: This species has hitherto been known only from Mauritius in the western Indian Ocean.

#### Family OCYPODIDAE

##### Genus *Camptandrium* Stimpson, 1858

*Camptandrium* Stimpson, 1858: 106 [52]; 1907: 137; Tesch, 1918: 58 (in key); Shen, 1935: 29 (key to species); Sakai, 1939: 612 (in key).

Carapace more or less subhexagonal or rather quadrate, flattened with raised regions. Lateral border of carapace with two obtuse teeth behind external orbital angle. Third maxillipeds operculate, scarcely gaped, and distal inner half of merus cut out for insertion of palp. Male chelipeds strong unlike those of female. Male abdomen with five segments, and male first pleopod curiously recurved towards base with forked distal part.

As *Camptandrium paludicola* Rathbun is now known to be a monotypical representative of the genus *Ilyograpsus* Barnard of the family Grapsidae, only three species have hitherto been referred to the present genus. Among them, however, *C. anomalum* Shen may be generically distinct from the others on account of having the quite peculiar formation of the male abdomen and the male first pleopod. The contour and ornamentation of the carapace seem to be close to those of *C. sexdentatum* rather than to those of the allied genera *Cleistostoma* de Haan and *Para-*

*cleistostoma* de Man. It is probable that Shen's species represents a genus distinct from the known genera of the Ocypodidae.

As a result, only the following species exclusively known from the west Pacific are referable to the present genus.

*Camptandrium elongatum* Rathbun, 1931

*rathbunae* sp. nov.

*sexdentatum* Stimpson, 1858

*Camptandrium rathbunae* sp. nov.

(Fig. 4; Pl. 6)

Diagnosis: Small species. Carapace nearly quadrate and flattened. Dorsum with symmetrical raised regions and with short dark-colored fur. External orbital angle acuminate and directed obliquely forwards. Anterolateral part of lateral border of carapace with a rather conical tooth, and behind it lateral border of carapace rather concave. Posterolateral part convex with a strong conical tooth at its anterior end.

Description of holotype: The carapace is nearly quadrate, little broader than long and flattened; the dorsal surface is symmetrically provided with the raised regions, being covered with a short, dark-colored characteristic fur that is very prominent on the regions; the dorsal surface of the front bears a pair of the prominences, behind of which a transverse more or less crested prominence traverses between the inner parts of both orbits, being interrupted medially and laterally; each of the lateral parts of the crested prominences is confused with the orbit; the protogastric region bears an oblique prominence along the outer shallow furrow, while the mesogastric region is provided with a median anterior and a pair of the posterior transverse prominences; the cardiac region is large with a pair of the somewhat rhomboidal prominences, which is indistinctly separated in the middle and rather strongly angulated anteriorly and laterally; the intestinal region bears a longitudinal prominence, the small part of the posterior median part being devoid of hairs; the hepatic region outside of the mesogastric region is provided with a short transverse prominence; the cardiac region bears a strong transverse prominence, the lateral end of which is rather angulated; obliquely in front of the cardiac region is a small but rather tuberculated prominence, behind it and obliquely behind the cardiac region a weak prominence is demarcated; otherwise, the lateral border of the carapace in front of the base of the last ambulatory leg and the lateral end of the posterior border of the carapace are more or less angulated; the posterior border of the carapace is straight and considerably broader than the front.

The front is about one third the distance between the external orbital angles, strongly declivous and deeply concave in the middle in the dorsal view. The supraorbital border obliquely retreats along its inner part and distinctly transverse along the lateral greater part, bearing a small notch at the junction of the two parts; it is otherwise very weakly concave near the prominent external orbital angle that is acuminate and directed obliquely forwards. The infraorbital border is very

deeply and widely concave just below the external orbital angle, transverse in the median greater part and then strongly produced at the inner angle; the lateral end of the transverse part is only rounded. The third maxillipeds with sparse hairs are markedly operculate, scarcely gaping; the lateral border of the ischium is only weakly concave, and the antero-internal angle is produced and rather angulated; the merus is longer and broader than the ischium, the inner half of the anterior border being cut out for the insertion of the palp.

The anterolateral part of the lateral border of the carapace is armed with a rather conical tooth that is weakly directed forwards; the slope of the external orbital angle is nearly straight and weakly convergent posteriorly, but the lateral border of the carapace behind the tooth is rather strongly concave; the posterolateral part of the lateral border is convex and armed with a strong conical tooth at the anterior end, that is larger than the anterolateral tooth.

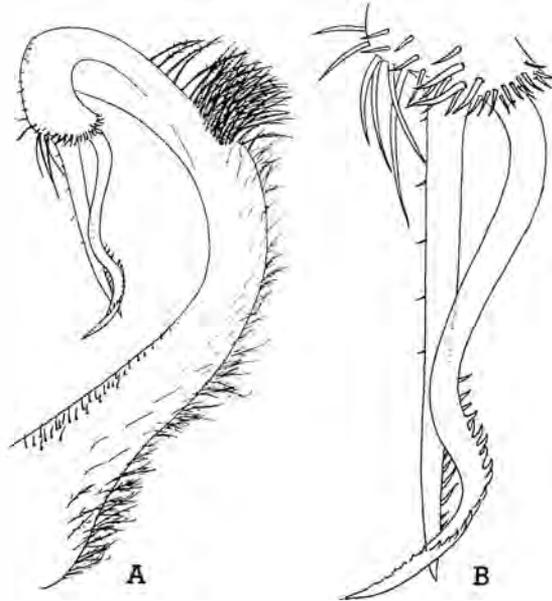


Fig. 4. *Camptandrium rathbunae* sp. nov., allotype ♂ (ZLKU 1602; cb.  $5.8 \times c.$  5.1 mm). A, left first pleopod in abdominal view; B, tip of the same.

The chelipeds are equal, nearly naked and much weaker than the ambulatory legs. The fingers are narrowly gaped, spooned as usual like the other ocypodids.

The ambulatory legs are rather long and stout, and the merus, carpus, and propodus are covered, in addition to the fringes of long feathered hairs, with short dark-colored hairs like the dorsal surface of the carapace; the second and third pairs are longer than the first and fourth. Each merus of all the pairs is armed with a terminal tuberculated tooth on the anterior border, and the distal end of the posterior border is also strongly produced. The carpus and propodus are slenderer than the

merus and together as long as the merus. The dactylus is as long as the propodus and weakly curved in the first three pairs.

Description of allotype: The general formation of the carapace is quite identical with that of the holotype, but the dark-colored hairs are more prominent on the posterior part of the carapace and the supraorbital and lateral borders are rather distinctly granulated. The chelipeds are not long, but stout unlike those of the holotype, especially the palm is strongly bulged. The upper border of the movable finger is not curved, while the lower border of the immovable finger is convex, leaving a wide gape; both cutting edges are finely crenulate, and that of the movable finger presents near the base a large molar-like tooth, the free margin of which is also finely crenulate. The ambulatory legs are more heavily covered with the dark-colored hairs than those of the holotype. The dactyli are slightly shorter than the propodi. The abdomen is composed of five segments, the third to fifth being fused; at the subdistal part of the fused segment the abdomen is fairly constricted. The pleopod is forked at the apex and curiously recurved towards the base.

Materials examined: Ngarbagéd, Goréor I. (Lat. 7° 19' 40" N, long. 134° 28' 40" E), 1 ♂ (allotype), ZLKU 1602, 1 ♀ (holotype), ZLKU 1603, 2 ♂♂, 7 ♀♀ (paratypes), ZLKU 1604, May 20, 1939, S. Miyake leg.

Measurements: Holotype, female—Breadth of carapace, 5.4 mm; distance between external orbital angles, 4.9 mm; length of carapace, 4.9 mm. Allotype, male—Breadth of carapace, 5.8 mm; distance between external orbital angles, 5.4 mm; length of carapace, 5.1 mm. Paratype, male: Breadth of carapace, 4.5 mm; distance between external orbital angles, 4.2 mm; length of carapace, 4.1 mm. Paratype, female: Breadth of carapace, 6.5 mm; distance between external orbital angles, 5.8 mm; length of carapace, 5.8 mm.

Remarks: The paratypes are not much different from the holotype and allotype. The hairiness and the formation of the chelipeds are variable as usual case in the congeners. The short dark-colored hairs are, however, characteristic of the present species. The chelipeds of the small male is much stouter than those of the female, the cutting edges being unarmed.

The present species is closer to *C. sexdentatum* Stimpson rather than to *C. elongatum* Rathbun, both of which are comprised in the collection of the Zoological Laboratory. The general formation of the carapace is somewhat similar to that of *C. sexdentatum*, but the contour of the carapace, the hairiness, granulation, and ornamentation of the dorsal surface and the armature of the ambulatory legs are markedly different from those of the earlier known species.

## Family GRAPSIDAE

Genus *Sesarma* Say, 1817Subgenus *Parasesarma* de Man, 1897*Sesarma* (*Parasesarma*) *palauense* sp. nov.

(Pl. 7)

Diagnosis: Small species. Carapace quadrate and broader anteriorly than posteriorly. Mesogastric region and postfrontal lobes distinct but not convex. Branchial region with six oblique lines. Front almost perpendicularly deflexed, and in dorsal view widely but shallowly concave in median part, convex laterally and indistinctly concave near lateral angles. A transverse convex region with some short hairs at dorsal surface of convex part of front. Outer surface of palm nearly smooth, but inner surface with conical granules of good size. Three rows of pectinated crests parallel to proximal margin of palm. A row of 19 transverse tubercles on upper border of movable finger up to its tip.

Description of holotype: The carapace is quadrate and broader anteriorly than posteriorly; the mesogastric region and the postfrontal lobes are very distinct, but not convex; the dorsal surface is almost smooth, but in reality the anterior one third is more or less squamose or rugose; the branchial region is ornamented with six oblique lines or ridges that are not parallel to each other; the anteriormost originates from the external orbital angle; the anterior margins of the four postfrontal lobes are rather angulated; the lateral one is only slightly smaller than the median one, being weakly subdivided into two by a transverse furrow that is extended longitudinally backwards just near the inner part of the supraorbital border.

The front is almost perpendicularly deflexed, the free margin in the dorsal view being widely but shallowly concave in the middle, convex laterally and again very indistinctly concave near the lateral angles; at the dorsal part of each convex part and just below the furrow between the postfrontal lobes is a transverse convex region with some short hairs, the surface of which is roughly punctated. The supraorbital border is longitudinal at the proximal part, rather strongly convex in the middle and deeply concave near the acute external orbital angle.

In the cheliped the anterior border of the merus bears a lamellar expansion with several marginal granules, the distal end of which is rather strongly angulated. The outer surface of the carpus is very rough with many short ridges with two or three granules. The outer surface of the palm is almost smooth only with microscopical indistinct granules, while the inner surface is covered with conical granules of good size; there are three pectinated crests on the upper surface parallel to the proximal margin of the palm, of which the distal two are longer and subequal, but the distal of the two is composed of the taller and more teeth. The upper border of the movable finger bears a row of 19 transverse tubercles up to the tip of the finger.

The ambulatory legs are markedly thin, and each merus is rather foliaceous. The anterior border of the merus is minutely serrated with a subdistal spine, the upper surface is transversely striated with many short ridges, and the posterior border

is unarmed. The distal three segments are much narrower than the merus and fringed with setae; the upper surface of the carpus is ornamented with two longitudinal ridges and that of the propodus with one; the ridge of the propodus is obliquely extended from the proximal median part to the distal part of the posterior border.

Material examined: Ngarbagéd, Goréor I. (Lat. 7° 19' 40" N, long. 134° 28' 40" E), 1 ♂ (holotype), ZLKU 3380, May 2, 1939, S. Miyake leg.

Measurements. Holotype, male—Distance between external orbital angles, 9.4 mm; breadth of front, 4.9 mm; length of carapace, 7.5 mm.

Remarks: The present species is closely related to *S. (P.) lenzii* de Man and *S. (P.) carolinense* Rathbun which are close to each other. *S. (P.) carolinense* is said that the lamina of the merus of the cheliped is less projecting distally, the palm is smoother inside and out, the pectinate ridges are not parallel to the proximal margin of the palm and the tubercles on the upper border of the movable finger are of different shape and not obliquely placed. Among the features mentioned the smooth outer surface of the palm is also applicable to the present species, as the palm is thickly granulated in *S. (P.) lenzii*. In *S. (P.) sigillatum* Tweedie which is a synonym of Rathbun's species, the tubercles of the upper border of the movable finger are said to be 15 or 16 in number. The other features of the present species are closer to those of *S. (P.) lenzii*. In the present species, however, the deflexed part of the front is provided with a pair of the transverse prominences, the outer postfrontal lobe is rather distinctly subdivided by a transverse furrow, the oblique lines or ridges on the branchial region are regular and only six in number, the anteriormost of which is extended from the more acute external orbital angle, the median part of the supraorbital border is convex, the pectinate crests are three and the transverse tubercles on the upper border of the movable finger are 19 in number up to the tip. In the previous records of *S. (P.) lenzii* by de Man (1888) as *S. melissa* with question, de Man (1897), de Man (1902) as a variety, and Crosnier (1965), the pectinate crests on the upper surface of the palm are two and the tubercles on the upper border of the movable finger are 12 to 14 in number. Although it may be probable that the length and number of the pectinate crests are variable with the advancing ages, the upper border of the movable finger presents a greater number of the said tubercles in the present species.

Tesch (1918) recorded a juvenile male of the carapace length 9.5 mm from the Flores Seas, which is referred to de Man's species, but curiously to the subgenus *Chiromantes*. If the specimen is really a juvenile referable to *Chiromantes*, it cannot apparently be referable to de Man's, Rathbun's, and the present species only on the fact. According to Tesch's remarks, it is notable that there is a transverse crest with four or five granules on the inner surface of the palm near the articulation with the movable finger, and the upper border of the finger is provided with 18 transverse tubercles. Only the last feature mentioned seems to be close to the present species. It is highly probable that Tesch's material is a juvenile of a species of *Chiromantes*.

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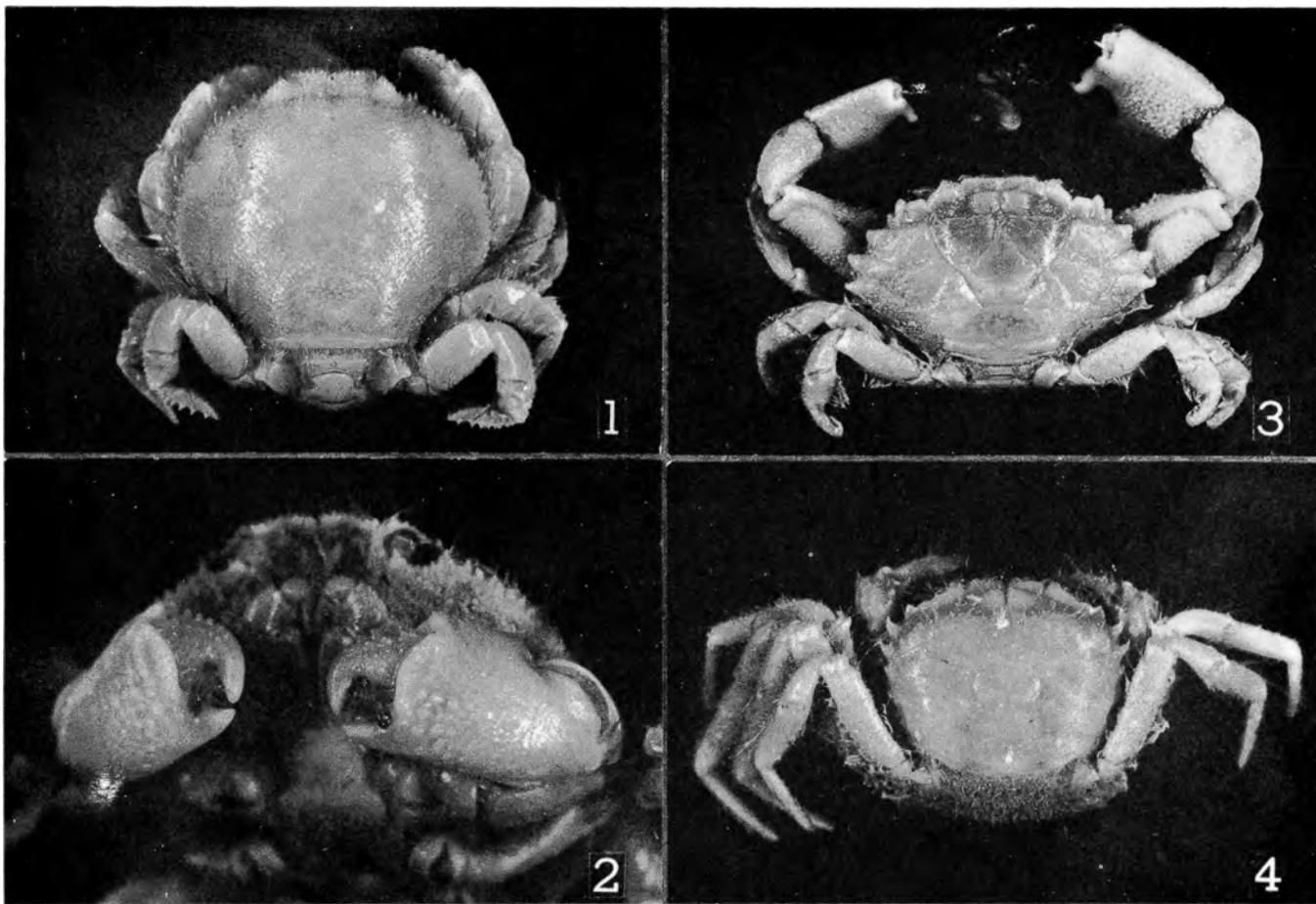


Plate 1. Figs. 1, 2. *Kraussia rastripes* Müller, ♀ (16.3×13.8 mm). Fig. 3. *Etisus deflexus* Dana, ♂ (23.8×14 mm).  
Fig. 4. *Viaderiana typica* Ward, ovig. ♀ (14.8×11.1 mm).

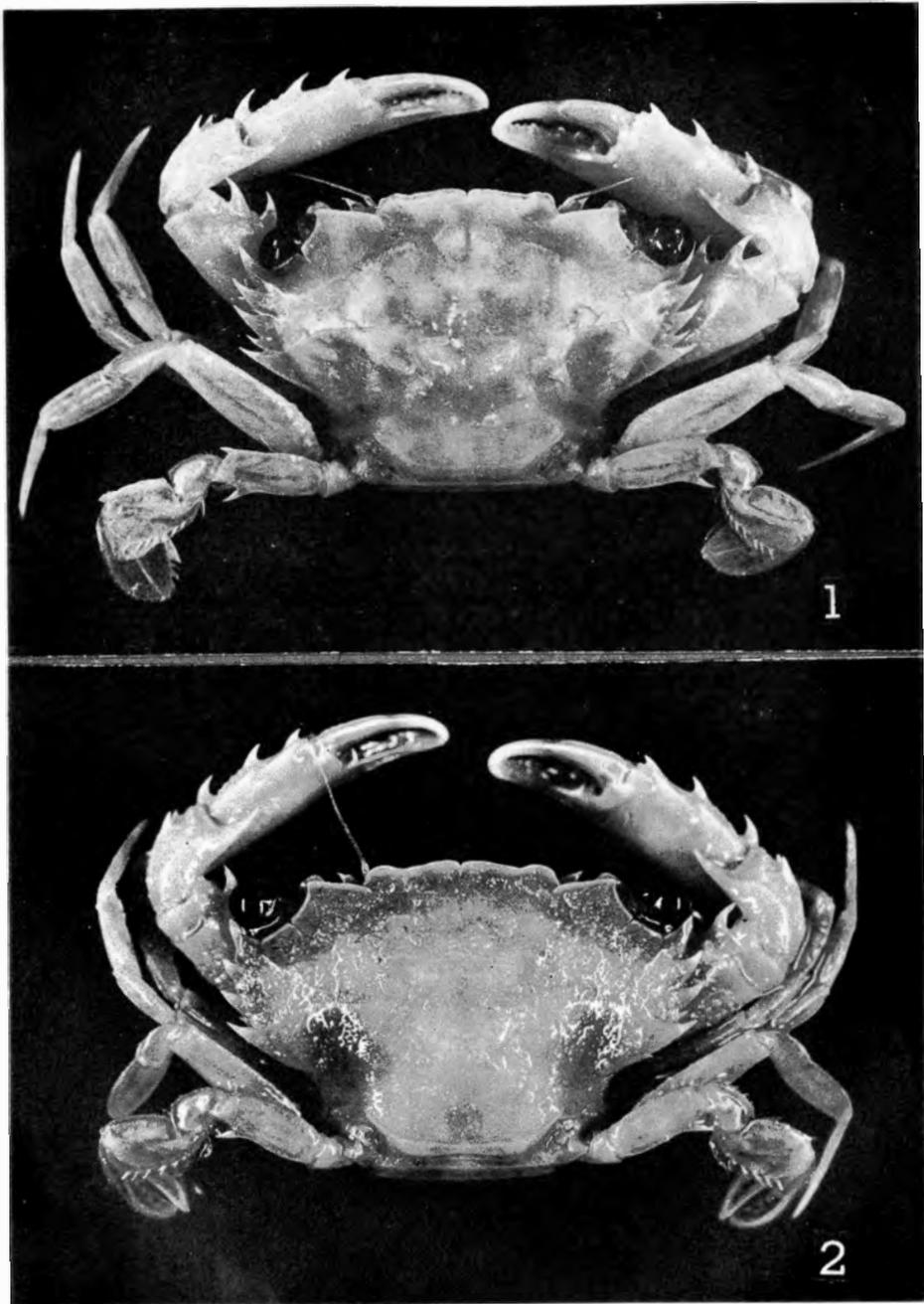


Plate 2. Figs. 1, 2. *Thalamita miyakei* sp. nov. 1, holotype ♂ (18.6×11.9 mm),  
2, allotype ♀ (18.6×11.6 mm).

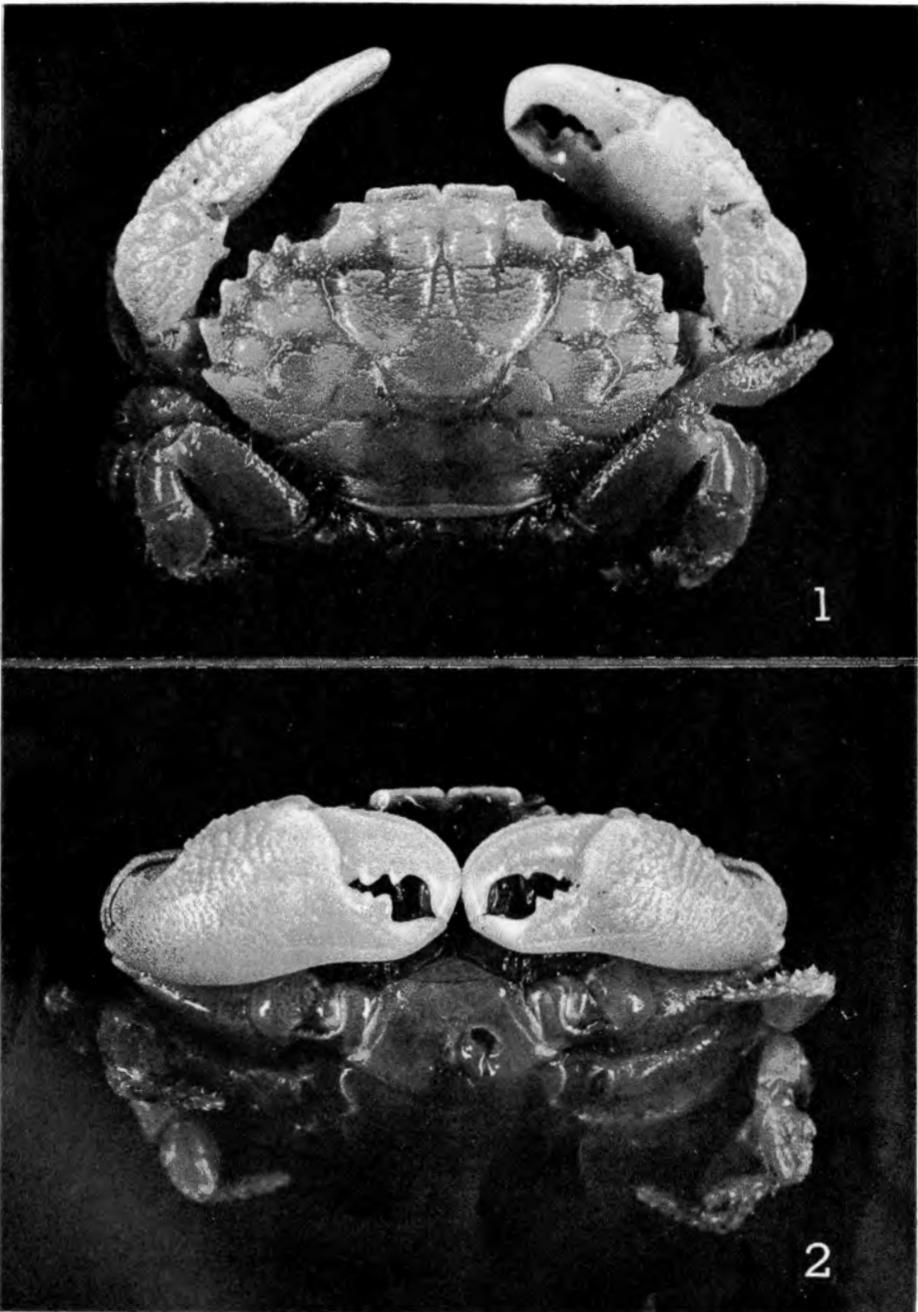


Plate 3. Figs. 1, 2. *Etisus odhneri* sp. nov., holotype ♂ (9.9×7.1 mm).

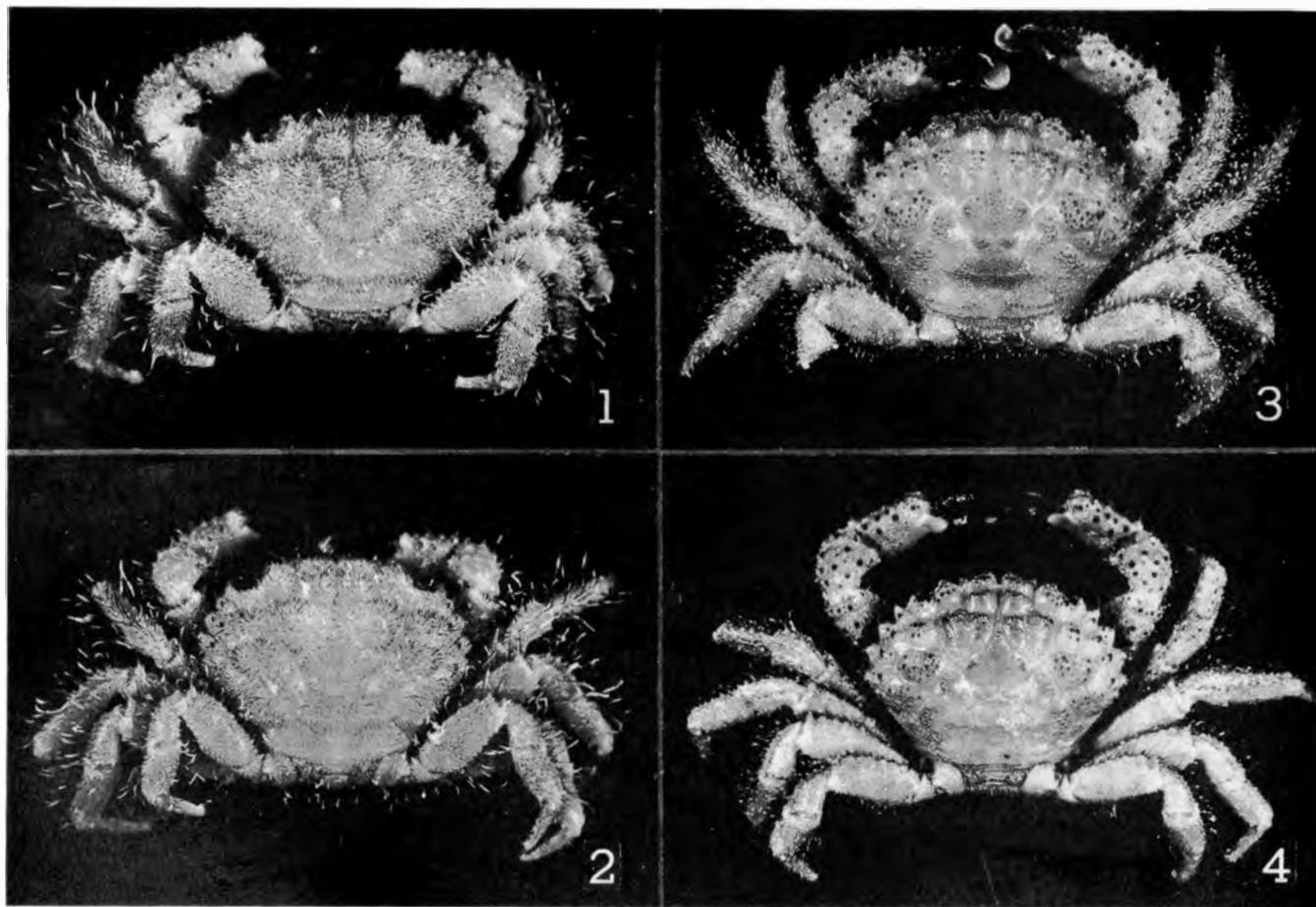


Plate 4. Figs. 1, 2. *Pilodius pilumnoides* (White), 1, ♂ (17.7×11.5 mm). 2, ♀ (18.6×9.1 mm). Figs. 3, 4. *Pilodius palaoensis* (Sakai). 3, ♀ (51×35 mm). 4, ♂ (36×25.4 mm).

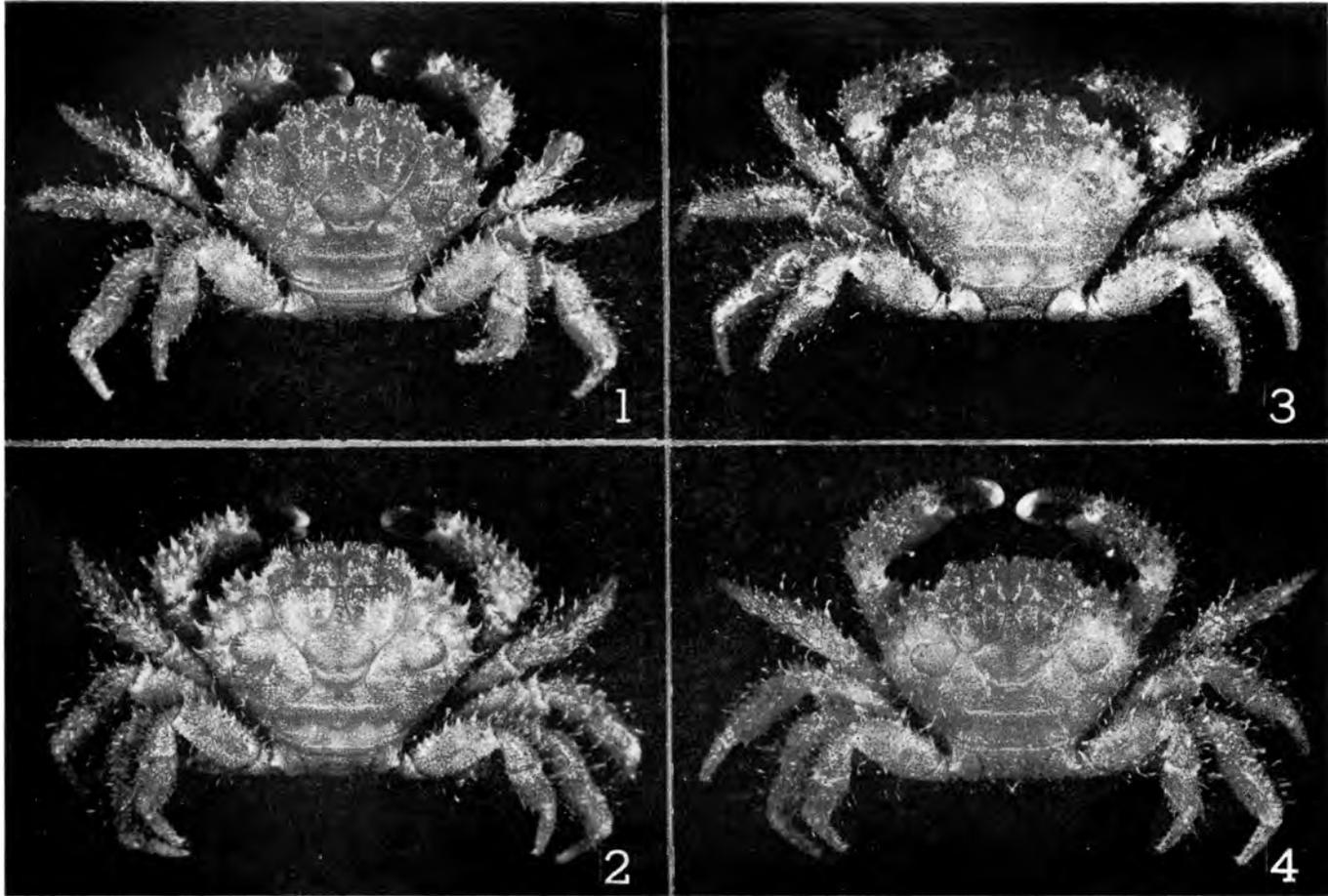


Plate 5. Figs. 1-4. *Pilodius palaensis* (Sakai). 1, ♀ (18.7×14.7 mm). 2, ♀ (18.6×13.4 mm). 3, ♂ (26×18.9 mm).  
4, ♂ (18.4×13.2 mm).

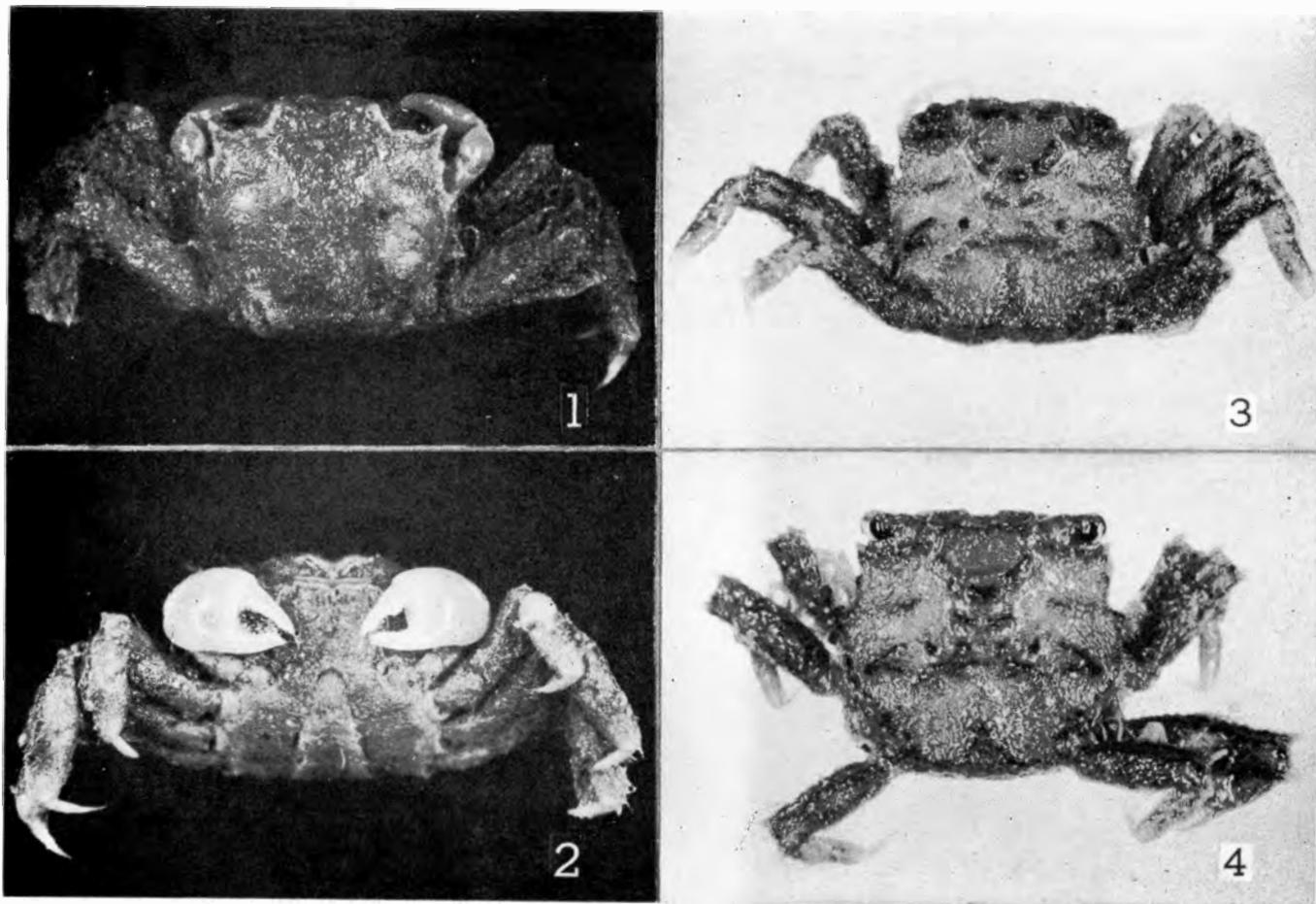


Plate 6. Figs. 1-4. *Camptandrium rathbunae* sp. nov. 1, 2, allotype ♂ (5.8×5.1 mm). 3, paratype ♀ (5.5×5 mm).  
4, paratype ♀ (5.5×5 mm).

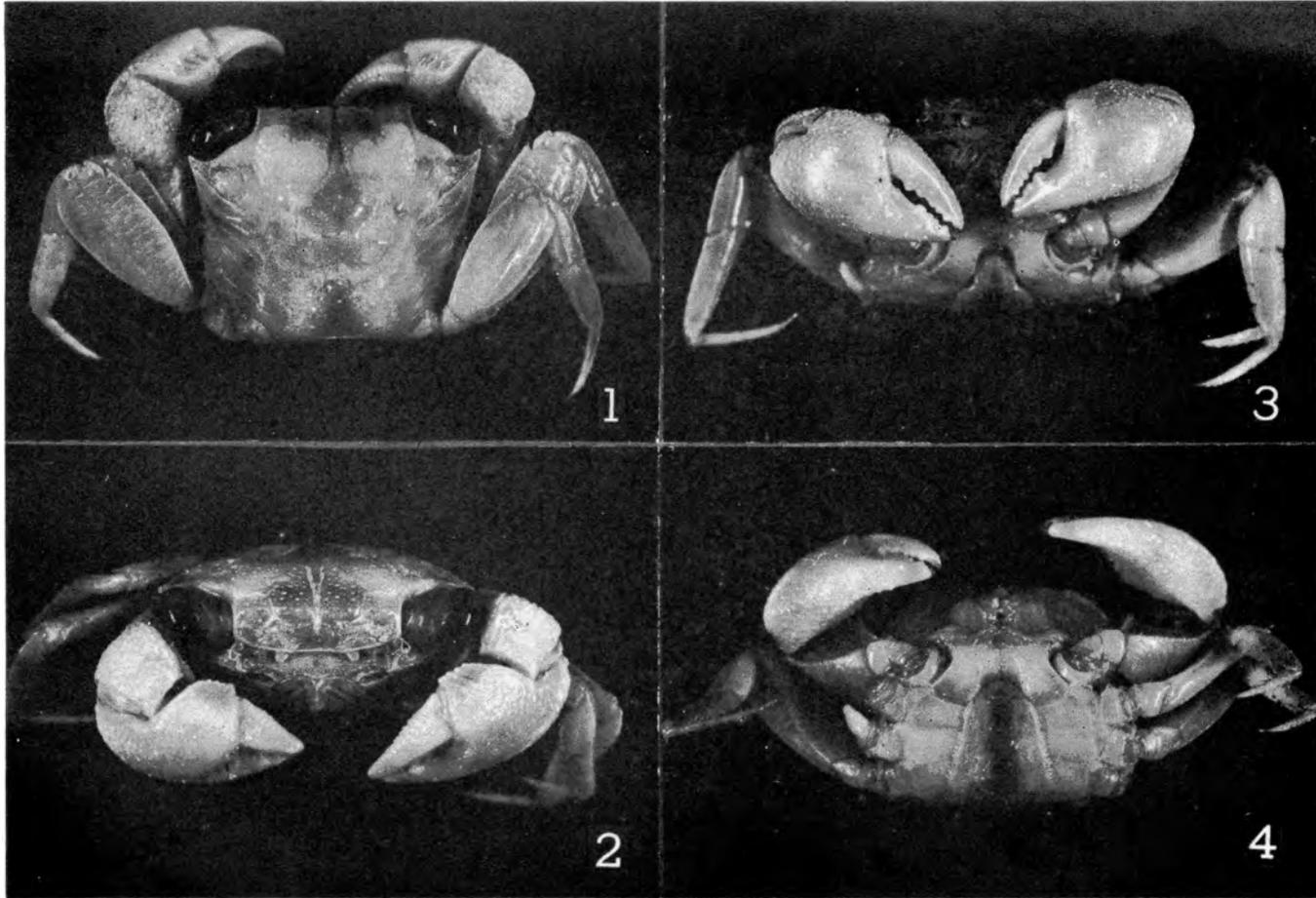


Plate 7. Figs. 1-4. *Sesarma (Parasesarma) palauense* sp. nov., holotype ♂ (9.4×7.5 mm).