

Crabs of the Ogasawara Islands

IV. A Collection Made at the New Volcanic Island,
Nishino-shima-shinto, in 1975

By

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Introduction

Nishino-shima is an oceanic solitary island about 700 m in NNE-SSW direction and 300 m in a direction perpendicular to it, lying at latitude $27^{\circ} 14.6' N$, longitude $140^{\circ} 52.6' E$, about 930 km south of Tokyo and about 130 km west of Chichi-jima Island. This small island is nearly flat, being only 25 m at its highest point, but as the coastal line is scraped off by the violent waves, steep cliff is formed throughout it. Judging from the chart, the sea around this island generally extends down to the depths of 3,000 to 4,000 m and separated on the eastern side by a deep basin from the nearest exposed lands, the main islands of Ogasawara. At the southeastern side not far from the island, however, there is a submarine caldera-type ground with a depressed summit of a depth of 107 m. At the beginning of April, 1973, a yellowish brown zone on the sea just at this place was found, and in May smoke and small eruptions became distinctly recognized. The eruption was successively and vigorously repeated, and in September it grew up to a volcanic island with five pits, which is about 600 m long from east to west, about 300 m from north to south and about 60 m high. The activity and development of the new island during these months were reported in detail by OSSAKA (1973 a, b, 1974) and OSSAKA *et al.* (1974). Subsequently the volcanic activity calmed down to a considerable extent, so that in December the new island thus formed with a stable contour was formally named Nishino-shima-shinto. After a short lull, however, intermittent eruptions occurred and at last in June, 1974, the old and new islands were united with each other through volcanic debris.

Before the joining of the old and new islands, in March, 1974, a fishery-oceanographic survey was carried out in the waters around this active new island by a group of scientists from the Tokyo University of Fisheries. The results including some papers dealing with fish larvae, zoo- and phytoplankton were reported in the volume 61 of the Journal of the Tokyo University of Fisheries. At that time, though the new island was



Fig. 1. Air photograph of the old island, Nishino-shima (left side) and the new island, Nishino-shima-shinto (right side) taken in June, 1975. Both the islands were united by volcanic debris erupted in June, 1974. According to recent information, the contour was greatly changed in some places by violent waves. (Through the courtesy of the Maritime Safety Agency.)

rather in a stage of lull, it was still impossible to make littoral or sublittoral collections of invertebrate animals. Since the union of both the islands the volcanic activity subsided, and in July, 1975, the junior author got a chance to survey benthic animals inhabiting the inlet formed between the two islands. The crabs then collected are recorded in this paper, in which fragments of crabs found in the stomachs of fishes angled in July, 1975, at the eastern side of the new island are also mentioned in the discussion for consideration of the crab fauna in the waters as a whole. References listed for each species include original description, all the synonyms generally accepted,

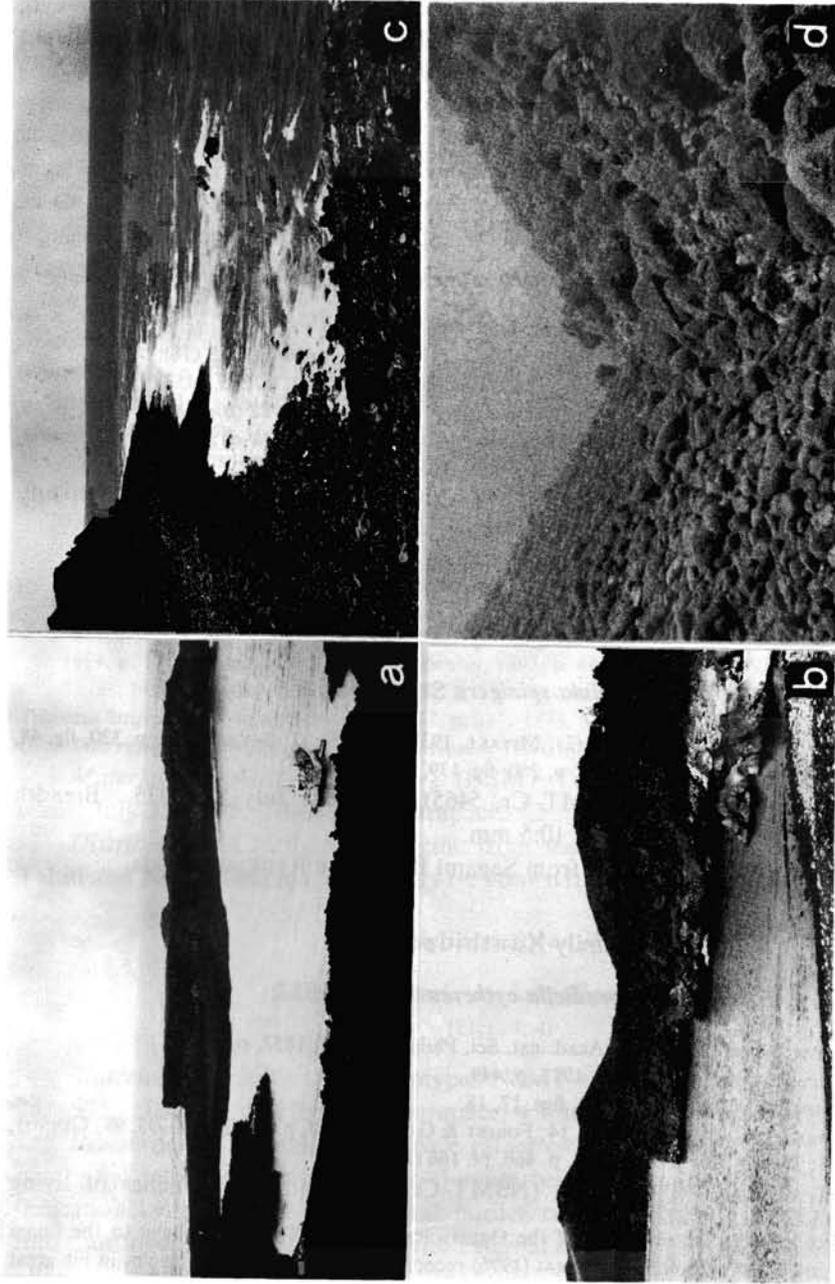


Fig. 2. — a. The old island, Nishino-shima and the inlet named Tsukiura Bay viewed from the new island, Nishino-shima-shinto. — b. Southwestern part of the new island viewed from the coast of bridge between the two islands. — c. Southernmost place of the new island facing the open sea. The highland is the first pit. — d. Canyon in the inlet formed by the two islands. Left side is the slope of the old island and the right slope is the submarine extension of the new island.

good figures, useful discussions or descriptions and interesting geographical records. The specimens dealt with here are deposited in the National Science Museum, Tokyo.

The authors wish to thank the crew of the research vessel Kôyô of the Ogasawara Fisheries Center, who collaborated during the survey.

Records of Species

Family Calappidae

3.¹⁾ *Calappa hepatica* (LINNAEUS, 1758)

Cancer hepaticus LINNAEUS, 1758, Syst. Nat., 12, p. 1048.

Cancer tuberculatus HERBST, 1803, Vers. Nat. Krabben u. Krebse, 1, p. 204, pl. 13 (78).

Calappa sandwichiensis EYDOUX et SOULEYET, 1842, Voy. Bonite, Zool., 1, p. 245, pl. 3 (9, 10).

Calappa hepatica: ALCOCK, 1896, p. 142; BORRADAILE, 1903, p. 436, pl. 22 (6); SAKAI, 1937, p. 89, pl. 12 (2); 1976, p. 128, pl. 38 (1, 3); BARNARD, 1950, p. 348, fig. 66 (a-d); FOREST & GUINOT, 1961, p. 11, figs. 1, 2; TYNDALE-BISCOE & GEORGE, 1962, p. 79, fig. 2 (6).

Material examined. 1 young ♀ (NSMT-Cr. 5464), among volcanic debris; July 25, 1975. Breadth of carapace, 20.5 mm.

Distribution. Throughout the Indo-West Pacific.

Family Majidae

145. *Tiarinia spinigera* STIMPSON, 1858

STIMPSON, 1858, p. 217; 1907, p. 13, pl. 3 (2); MIYAKE, 1937, p. 28, fig. 2; SAKAI, 1938, p. 320, fig. 48, pl. 38 (5); 1965, p. 91, pl. 42 (4); 1976, p. 260, fig. 139, pl. 91 (3).

Material examined. 1 ♀ (NSMT-Cr. 5465), stranded; July 25, 1975. Breadth of carapace excluding lateral spines, 10.5 mm.

Distribution. Japanese waters from Sagami Bay to the Ryukyu Islands.

Family Xanthidae

41. *Chlorodiella cytherea* (DANA, 1852)

Chlorodius cytherea DANA, 1852, Proc. Acad. nat. Sci. Phila., 6, p. 79; 1852, p. 213.

Chlorodiella niger var. *cytherea*: LAURIE, 1915, p. 449.

Chlorodiella davaoensis WARD, 1941, p. 10, figs. 17, 18.

Chlorodiella cytherea: HOLTHUIS, 1953, p. 14; FOREST & GUINOT, 1961, p. 95, figs. 90-93, 98; GUINOT, 1962, p. 238; 1964, p. 70; SAKAI, 1976, p. 466, pl. 166 (2).

Material examined. 1 young ♀ (NSMT-Cr. 5466), among branches of living

1) Registered number for the crabs of the Ogasawara Islands. The species new to the fauna in question are indicated by boldface. SAKAI (1976) recorded several Ogasawara species in his great monograph, among which the following two species of the Dynomenidae and Portunidae are new to the fauna. 143. *Dynomene praedator* A. MILNE EDWARDS, 1879. 144. *Thalamita admete* (HERBST, 1803).

coral; July 25, 1975. Breadth of carapace including lateral teeth, 4.0 mm.

Remarks. Though this species has been generally considered to be a synonym of *Ch. nigra* (FORSKÅL), it was resurrected and well figured by FOREST and GUINOT (1961). In this species the anterolateral surface of the carapace is rather roughened with the granulated areolae, the third anterolateral tooth is always spiniform or tuberculiform, and the last tooth is very small or often almost obsolete. The beak of the male first pleopod is abruptly recurved toward the base as represented by MIYAKE (1938) as *Ch. laevissima* (DANA) and by FOREST and GUINOT (*op. cit.*).

Distribution. This species is probably widely distributed in the whole Indo-West Pacific waters.

66. *Ozius rugulosus* STIMPSON, 1858

STIMPSON, 1858, p. 34; 1907, p. 60, pl. 7 (6); HELLER, 1865, p. 22, pl. 3 (1); A. MILNE EDWARDS, 1873, p. 240, pl. 11 (3); ALCOCK, 1898, p. 182; SAKAI, 1939, p. 518, pl. 98 (5); 1976, p. 472, pl. 168 (1); MIYAKE, 1939, pp. 184, 217, pl. 14 (2); FOREST & GUINOT, 1961, p. 121, figs. 107, 108.

Material examined. 1 subadult ♀ (NSMT-Cr. 5467), stranded; July 25, 1975. Breadth of carapace, 26.5 mm.

Distribution. Indo-West Pacific waters except for the Hawaiian Islands.

89. *Trapezia flavopunctata* EYDOUX et SOULEYET, 1842

Trapezia flavopunctata EYDOUX et SOULEYET, 1842, Voy. Bonite, Zool., 1, p. 230, pl. 2 (3); MIERS, 1884, p. 11; DE MAN, 1890, p. 65; ORTMANN, 1893, p. 485; EDMONDSON, 1962, p. 301, figs. 31 (d), 32 (a); FOREST & GUINOT, 1961, p. 136, fig. 138; SAKAI, 1976, p. 510, pl. 182 (4).

Trapezia latifrons A. MILNE EDWARDS, 1867, p. 281; 1873, p. 259, pl. 10 (7); LENZ, 1901, p. 467.

Grapsillus rufopunctatus flavopunctatus: RATHBUN, 1906, p. 866.

Material examined. 1 young ♀ (NSMT-Cr. 5468), among branches of living coral; July 25, 1975. Breadth of carapace, 5.5 mm.

Distribution. Chiefly West Pacific from the Ryukyu and Hawaiian Islands to Tahiti and New Caledonia, and otherwise known from Mauritius.

Family Goneplacidae

146. *Zehntneria novaesulicola* sp. nov.

(Figs. 3, 4)

Material examined. 1 ♂ (holotype, NSMT-Cr. 5469), under living coral; July 25, 1975. Breadth and length of carapace, 4.1 and 2.8 mm, respectively.

Description of holotype. Carapace rather ovate, weakly declivous anteriorly and nearly flat laterally and posteriorly, dorsum being glabrous without fur and distinct indication of regions. Anterolateral border convex, narrowly crested and divided into four lobes; the first confluent with external orbital angle which is not produced at all; the second as long as the first, but the following two smaller; anterior ends of second to fourth lobes angulated. Posterolateral border not distinctly delimited from last anterolateral lobe, but generally shorter than anterolateral border.

Frontal border one-third as broad as carapace and nearly truncated, bearing a small median interruption. Frontal regions side by side weakly convex and surrounded laterally and posteriorly by narrow and indistinct furrows. Supraorbital border microscopically roughened, and infraorbital border more or less sinuate in the middle, slightly roughened near a notch below external orbital angle. Infraorbital inner end not produced at all. Eyestalk bulged basally and constricted at base of cornea, being tightly embedded in orbit. Antennal basal segment short and not reaching front. Antennal flagellum exceeds twice the length of major diameter of orbit.

Third maxilliped broad and glabrous; inner margin of ischium sharp without fringe of hairs; merus subquadrate with weakly raised median surface and with antero-external angle ventrally curved and only slightly angulated.

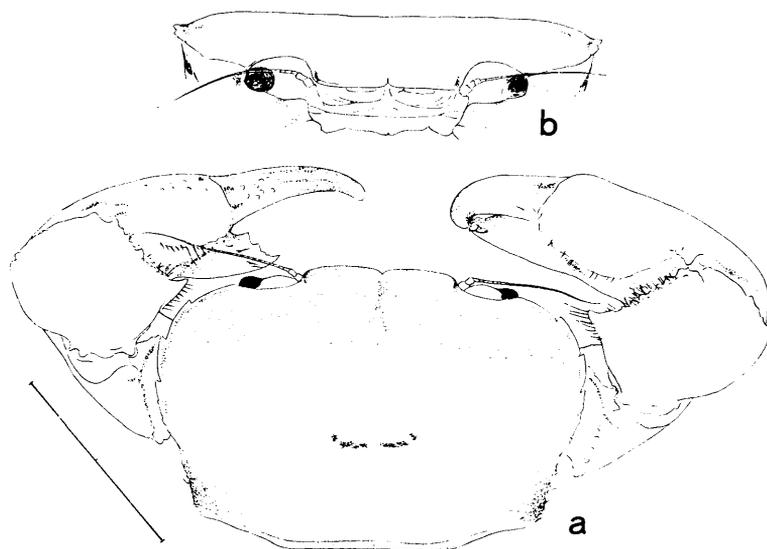


Fig. 3. *Zehntneria novaeinsulicola* sp. nov., holotype ♂; a, carapace and chelipeds in dorsal view; b, carapace in frontal view. Scale in mm.

Chelipeds heavy and unequal, the right being the larger. Merus short and its whole inner surface excavated and armed with several conical granules of good size both on its anterior and posterior borders. Carpus large and glabrous only with minute conical granules and short soft shaggy hairs along its inner anterior border, its inner angle being more or less tuberculated with several long stiff setae. Palm high and entirely smooth; its inner upper part weakly crested along its nearly whole length and lower border along its proximal half. Fingers stout and sharply toothed on cutting edges; in both chelae basal part of immovable finger fairly bulged; in smaller chela proximal upper part of movable finger granulated.

Ambulatory legs slender and fringed with rather sparse silky hairs of various lengths; third pair much longer than the others, and the first and fourth subequal to

each other and shorter than the second. Anterior borders of meri of first to third pairs armed with series of granuliform tubercles or conical granules throughout their lengths, but in merus of last pair anterior border only indistinctly roughened proximally and nearly unarmed. Dactylus of last pair distinctly depressed and weakly curved upward near its horny tip.

Remarks. Although the validity of *Zehntneria* TAKEDA referred to the Carcino-

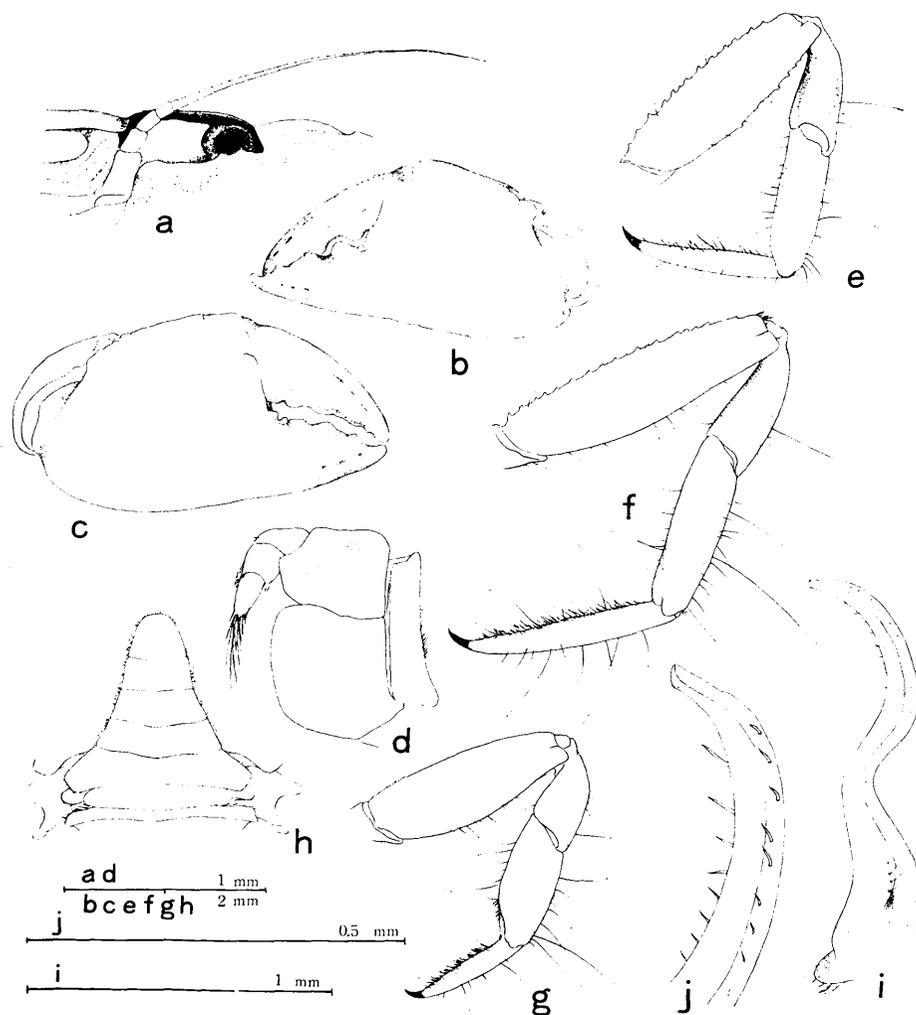


Fig. 4. *Zehntneria novaesulicola* sp. nov., holotype ♂; a, orbital region in ventral view; b & c, left and right chela in outer view; d, left third maxilliped; e, f & g, right second, third and fourth ambulatory legs, respectively; h, abdomen; i & j, right first pleopod in abdominal view.

placinae may not be thorough in its discussion, the new species is without doubt very close to *Z. miyakei* TAKEDA from the Palau Islands. It is, however, differentiated from the Palau species in the broader carapace without fur, the strong conical granules on the cheliped and ambulatory meri, and the male first pleopod strongly curved.

Family Grapsidae

110. *Grapsus tenuicrustatus* (HERBST, 1783)

Cancer tenuicrustatus HERBST, 1783, Vers. Nat. Krabben u. Krebse, 1, p. 113, pl. 3 (33, 34).

Grapse rude H. MILNE EDWARDS, 1837, p. 87.

Grapsus hirtus RANDALL, 1839, J. Acad. nat. Sci. Phila., 8, p. 124.

Grapsus maculatus: H. MILNE EDWARDS, 1853, p. 167, pl. 6 (1); BARNARD, 1950, p. 113, figs. 22 (d), 23 (b).

Grapsus pharaonis H. MILNE EDWARDS, 1853, p. 168.

Grapsus gracilipes H. MILNE EDWARDS, 1853, p. 168.

Grapsus grapsus: ALCOCK, 1900, p. 392.

Grapsus grapsus tenuicrustatus: RATHBUN, 1906, p. 838; SAKAI, 1939, p. 649, p. 106 (4); EDMONDSON, 1959, p. 158, figs. 1 (a), 2.

Grapsus maculatus gracilipes: TESCH, 1928, p. 72, pl. 2 (3).

Grapsus gracillimus SENDLER, 1923, p. 32, pl. 6 (5).

Grapsus maculatus tenuicrustatus: STEPHENSEN, 1945, p. 194, fig. 59 (A–D).

Grapsus tenuicrustatus: BANERJEE, 1960, p. 136, figs. 1 (a), 2 (a, c–g); CROSNIER, 1965, p. 10, figs. 1–3, pl. 1 (1); SAKAI, 1976, p. 629, pl. 214.

Material examined. 1 ♂, 1 ovig. ♀, 2 carapaces (NSMT–Cr. 5470), on rocks; July 25, 1975. Breadth of carapace, 43.5 mm in male and 48.0 mm in ovigerous female.

Distribution. Throughout the Indo–West Pacific.

147. *Planes marinus* RATHBUN, 1914

(Figs. 5, 6a)

Planes marinus RATHBUN, 1914, p. 120, pl. 3; 1918, p. 258, pl. 64; CHACE, 1966, p. 646; DELL, 1968, p. 21; ARNAUD, BEUROIS & NOEL, 1972, p. 10, figs. 3, 4.

Pachygrapsus marinus: CHACE, 1951, pp. 65–103, figs. 1 (c), 2 (c, f, i, p–r), 3 (o–t); EDMONDSON, 1959, p. 171, figs. 8 (b), 9 (b); DELL, 1963, p. 179, figs. 1–3; CROSNIER, 1965, p. 28, figs. 28, 33, 34.

Material examined. 1 ♂, 1 ovig. ♀ (NSMT–Cr. 5471), among volcanic debris; July 25, 1975. Breadth of carapace, 11.9 mm in male and 12.6 mm in ovigerous female.

Remarks. This rare species has hitherto been unrecorded from the Japanese waters, but rather well figured by the authors cited above, being readily distinguished from *P. cyaneus* DANA by having the subquadrate carapace with the distinct striae. In the specimens at hand the natatory fringes of soft hairs on the ambulatory legs are well developed. On this character and the form of the male first pleopod CHACE (1966) discussed the systematic status in referring this species to *Planes*, not to *Pachygrapsus*.

Distribution. As represented in Fig. 5, this species has hitherto been recorded from several distant localities in the Pacific, Indian and Atlantic Oceans. The type-locality is the open sea off Lower California, lat. 23°49'N, long. 127°50'W.

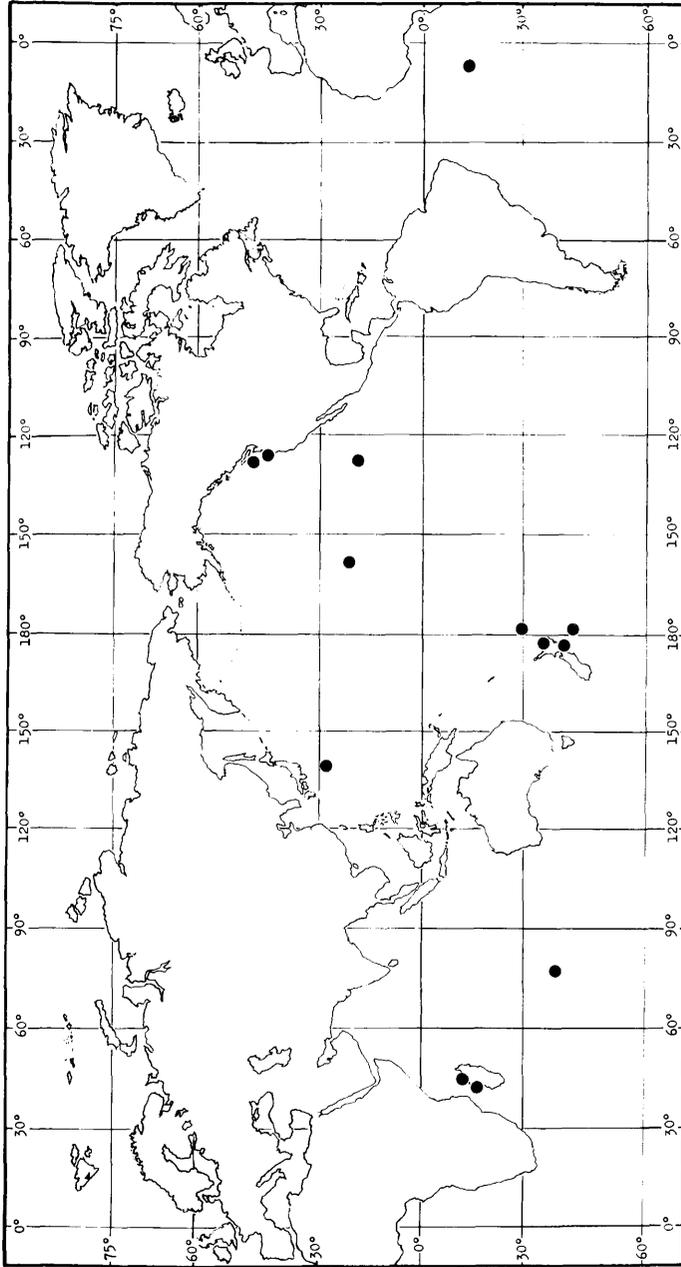


Fig. 5. Distribution of *Planes marinus* RATHBUN.

Xenograpsus gen. nov.

Type-species. *Xenograpsus novaeinsularis* sp. nov.

Diagnosis. Carapace rather quadrate, slightly broader than long, and moderately convex in both directions. Dorsum uneven without distinct areolation and with oblique striae on posterolateral surface. Front about one-third as broad as carapace, bearing a median small interruption. Infraorbital floor with a deep notch near its inner lobe. Antennal flagellum including a distal aesthete about equal to, or slightly longer than, major diameter of orbit. Third maxillipeds broad and completely closing buccal cavern; outer border of merus generally convex throughout its length; exopod narrow. Anterolateral border of carapace with an indistinct incision behind external orbital angle, and posterolateral border nearly longitudinal.

Chelipeds stout in male and much smaller in female. Palm bulged. Fingers stout with deeply excavated inner surfaces; distal part of cutting edges each with a horny marginal reinforcement and a tuft of stiff setae. Ambulatory legs rather stout and depressed with granulated borders. Distal four segments of first three pairs with longitudinal ridges and rows of hairs. Male andomen narrow with elongated terminal segment. Male first pleopod rather stout and not heavily calcified, bearing a subdistal outgrowth and a distal marginal horny fringe nearly disguised by setae.

Remarks. The new genus is referred to the Varuninae due to the presence of a ridge running parallel to the infraorbital border, the broad third maxillipeds which entirely close the buccal cavern and the narrow male abdomen with elongated terminal segment. Its systematic status is, however, highly puzzling in this subfamily since it is similar in the general appearance of the carapace to *Planes* DANA of the Grapsinae rather than to the genera of the Varuninae, and as mentioned later, the chelipeds are related to those of the Macrophthalminae of the Ocypodidae. Among the varunine genera the new genus seems to be the closest to *Pseudograpsus* A. MILNE EDWARDS in which the carapace is slightly longer than, or as long as, broad without oblique striae, the front is truncated and nearly lamellar, the anterolateral border of the carapace bears two rather indistinct incisions, and the inner surface of the male chela is usually ornamented with a tuft of soft hairs. The male first pleopod of the new genus may indicate the affinity to *Pseudograpsus* in having the subterminal outgrowth, but it differs in having short and stout shaft with a horny terminal margin.

148. *Xenograpsus novaeinsularis* sp. nov.

(Figs. 6b, c, 7, 8)

Material examined. 1 ♂ (holotype, NSMT-Cr. 5472), 1 ♀ (allotype, NSMT-Cr. 5473), 1 ♂, 1 ovig. ♀ (paratypes, NSMT-Cr. 5474), under volcanic debris; July 25, 1975. Breadth and length of carapace (in mm); 7.4 and 6.8, respectively, in holotype,

Fig. 6. — a. *Planes marinus* RATHBUN, ♂. — b, c. *Xenograpsus novaeinsularis* gen. et sp. nov., holotype ♂ (b) and allotype ♀ (c). Scales in mm.

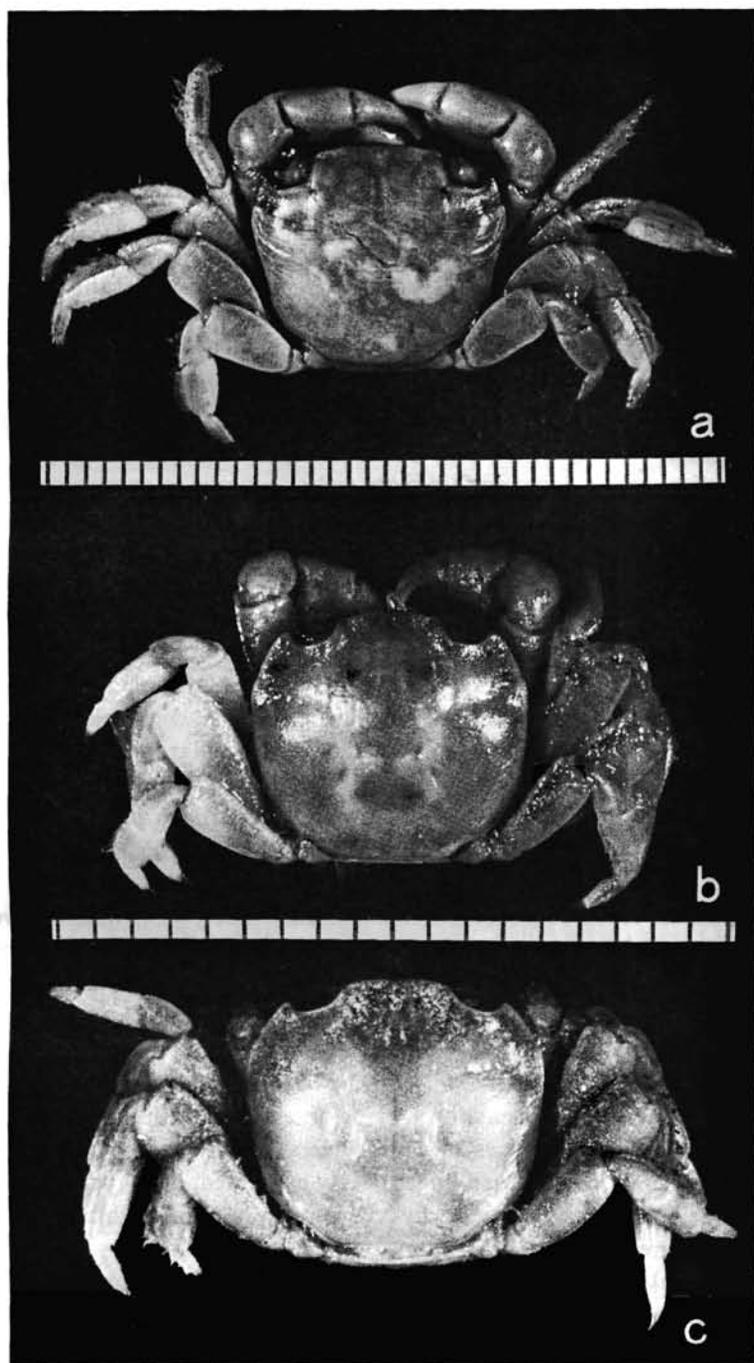


Fig. 6.

8.1 and 7.2 in allotype, 5.7 and 5.0 in paratype male, and 6.8 and 5.9 in paratype ovigerous female. Fronto-orbital breadth (in mm); 5.4 in holotype, and 5.8 in allotype.

Description of holotype. Carapace rather quadrate, slightly broader than long, and not markedly convex in both directions. Its dorsum slightly uneven anteriorly, with striated and sunken posterolateral surface; surface behind fronto-orbital border and hepatic regions weakly depressed, and epigastric, protogastric, mesogastric and cardiac regions barely traceable; anterior end of each epigastric region more or less granulated.

Front about one-third as broad as carapace and slightly shorter than true posterior border of carapace, bearing a shallow median interruption; in dorsal view each lobe bordered with a series of conical granules and fairly convex forward in its middle and dorsally in its lateral part, while in frontal view anterior median part in front of this series of granules perpendicularly deflexed as an antennular anterior septum which is concave, bordered with granules and not bifid at its tip; ventral prolongation of frontal lateral end conical and its inner surface more or less concave as an outer part of antennular fossa. Supraorbital border with a series of tiny granules and a possible trace of interruption near the inner one-third. Infraorbital border also with granules larger than those on supraorbital border, bearing a deep incision at inner one-third; terminal lobe large, visible from above and tightly grasping antennal basal segment. Suborbital ridge beaded with minute granules. Antennal flagellum about two-thirds as long as major diameter of orbit, but bears a long aesthete and as a whole only slightly longer than major diameter of orbit. Third maxillipeds broad and completely closing buccal cavern; outer angle of merus not angulated nor auricular, and outer border itself strongly convex throughout its length.

Anterolateral border of carapace slightly arched in front of an indistinct notch, and posterolateral border behind it nearly longitudinal and twice as long as anterolateral border.

Both chelipeds stout, equal to and similar to each other, being thickly covered with minute granules. Merus exerted beyond carapace by its distal half, and upper border not sharp. Carpus unarmed with inner angle generally rounded. Outer surface of palm with some longitudinal rows of granules in addition to thick covering of similar granules; inner surface with a strong protuberance near its proximal end, so that the palm tapers in upper view. Movable finger comparatively long and curved in accordance with immovable finger weakly bent down, being ornamented with some weak granulated longitudinal ridges; cutting edges of both fingers sharply toothed, each with some conical teeth; inner surface of each finger deeply excavated, distal part of cutting edge thus formed being reinforced by a horny half hoof; a prominent tuft of stiff setae disguises this structure.

Ambulatory legs rather stout and depressed. Third pair the longest, and first and fourth pairs subequal to each other and much shorter than the others. Meri widening distally and covered with conical granules on and along both borders; their anterior borders more or less crested and fringed with sparse, short soft hairs. Carpi

also crested on anterior borders with granules; each upper surface of first three carpi with two longitudinal rows of granulated linear ridges which are united with each other at their bases and widely apart distally; posterior or shorter ridge with a fringe

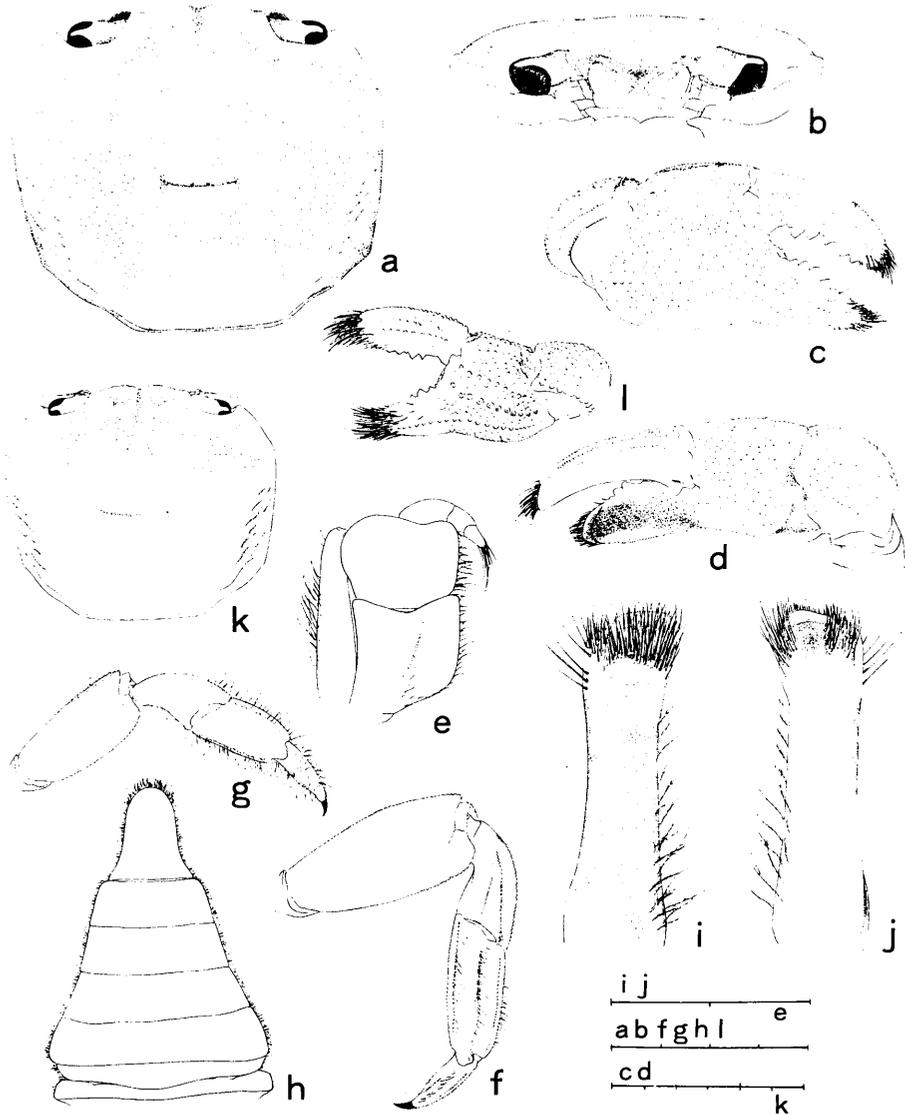


Fig. 7. *Xenograpsus novaainsularis* gen. et sp. nov., holotype ♂ (a-j) and allotype ♀ (k, l); a & b, carapace in dorsal and frontal views; c & d, right chela in outer and upper views; e, right third maxilliped; f & g, right third and fourth ambulatory legs; h, abdomen; i & j, left first pleopod in abdominal and sternal views; k, carapace in dorsal view; l, left chela in outer view. Scales in mm.

of silky longish hairs along its anterior edge; in last carpus ridges on upper surface almost indistinguishable; lower surfaces of first three carpi each also with a longitudinal granulated ridge. First propodus with two granulated ridges on and along anterior border, and with a longitudinal row of silky longish hairs throughout the length of shallow median depression; second and third carpi similar to preceding carpus, but an additional ridge with a fringe of hairs along each posterior border; last carpus bears no median row of hairs, but both borders are densely fringed with hairs. Dactyli rather sparsely hairy, bearing two granulated ridges running along both borders; in each of last three dactyli a longitudinal ridge present on upper surface.

Abdomen rather narrow; terminal segment elongated with rounded tip, being twice as long as penultimate segment. First pleopod rather short, stout and not heavily calcified, bearing a terminal horny fringe nearly disguised by stiff setae.



Fig. 8. *Xenograpsus novaainsularis* gen. et sp. nov., holotype (a) and allotype (b).

Notes on allotype and paratypes. In the allotype female there are some residue eggs after hatching. The allotype generally agrees with the holotype, but the epigastric regions are more accentuated and the anterolateral interruption of the carapace is nearly indistinguishable. As one of the sexual differences both chelipeds are much smaller, though similar to the male chelipeds; especially the palm is small with larger granules, so that the fingers are comparatively long and stout; the terminal tufts of setae in both fingers are more prominent. In the paratype male all the ambulatory legs of the left side are missing. All the features including the anterolateral formation of the carapace well agrees with those of the holotype male. The paratype ovigerous

female also bears no distinct interruption at the anterolateral border of the carapace like the allotype female.

Remarks. The first appearance of the carapace, chelipeds and ambulatory legs is considerably similar to that of *Camptandrium japonicum* (SAKAI) of the Macrophthalminae of the Ocypodidae. Recently the senior author examined several specimens identified with this species from the river mouth of the Oura-gawa in Okinawa through the kindness of Dr. Y. NAKASONE of the University of the Ryukyus, to whom his cordial thanks are tendered. The general similarity is really surprising, especially in the formation of the chelae, though it is an ocypodid species with the different fronto-orbital, abdominal and male pleopod formation. The carapace of *C. japonicum* is broader with two indistinct anterolateral incisions and more uneven with frosted granules and without oblique striae, and the inner surface of the palm is not bulged.

On the other hand, the general appearance of the carapace of this species indicates its close affinity to *Planes cyaneus* DANA, an Indo-Pacific ocean-drifting crab, which is decisively referable to the Grapsinae due to the orbital details, the third maxillipeds and the shape of the male abdomen. Its carapace is similar to that of the new species in having an indistinct incision behind the external orbital angle and the oblique striae on its posterolateral surfaces, but much narrower and evenly convex in both directions. In the Varuninae to which this species is referred, *Pseudograpsus albus* STIMPSON may be the nearest kin of the new species. In the latter species widespread in the Indo-West Pacific waters, however, the carapace is not ornamented with oblique striae, the anterolateral incisions are two in number and a tuft of soft hairs fills the gap between the fingers, the tips of which are neither distinctly hollowed nor covered with setae.

104. *Cyclograpsus longipes* STIMPSON, 1858

STIMPSON, 1858, p. 105; 1907, p. 131; DE MAN, 1897, p. 355, pl. 32 (43); RATHBUN, 1907, p. 36; HOLTHUIS 1953, p. 32; SAKAI, 1976, p. 667, pl. 227 (3).

Material examined. 1 ovig. ♀ (NSMT-Cr. 5475), under volcanic debris; July 25, 1975. Breadth of carapace, 9.0 mm.

Distribution. West Pacific from the Ogasawara and Ryukyu Islands to the Tuamotu and Fiji Islands.

Discussion

Altogether 10 species of 5 families were found on July 25, 1975, by intertidal and diving collections, viz., 1 species of the Calappidae, 1 of the Majidae, 3 of the Xanthidae, 1 of the Goneplacidae and 4 of the Grapsidae. Among them the records of *Tiarinia spinigera* of the Majidae and *Ozium rugulosus* of the Xanthidae are based on stranded specimens. Although the biological survey of the old island or Nishino-shima has not been done up to now, it may be generally thought that only a few crab species

are supporting themselves in crevices or under stones at the oceanic island washed by violent waves. The two species stranded are without doubt the members of such species and probably originated from the old island, even if both the species are not uncommon in Chichi-jima, Haha-jima and their associated islands. Another species adapted to the oceanic island is *Grapsus tenuicrustatus* of the Grapsidae, running noisily and quickly and jumping from rock to rock. This large rock crab is the commonest inhabitant of the new island and is considered to be the immigrants from the old island. The sea bed of the inlet formed by the united two islands is thickly covered with volcanic debris and ashes, and thus the coral blocks having grown on the east slope of the old island were without doubt deadly damaged. During the observation by diving the junior author found several small coral blocks growing on debris under precarious surroundings. These coral blocks were accompanied by the youngs of *Chlorodiella cytherea* and *Trapezia flavopunctata* of the Xanthidae, both of which are commonly found in the main islands of Ogasawara. According to YAMAZI and WAKAMIYA (1975), who studied the zooplankton samples collected at 13 stations in the waters surrounding the new island in March, 1974, the planktonic larvae of benthic and attached invertebrates were distributed widely, though occurring rather sparsely in number. The development of these coral blocks with young crabs exclusively found among living coral branches is the results of settlement of the pelagic larvae. *Calappa hepatica* of the Calappidae was represented by a young form, and most of larger invertebrates such as sea urchins and gastropods were also still small in size. *Planes marinus* of the Grapsidae is so characteristic for its ocean-drifting habit that the pair obtained seems to have arrived accidentally at the new island together with seaweed.

As mentioned above, the crabs collected by the junior author are only 10 in number, but fragments of many crab species were found in the stomach contents of fishes angled at the eastern side of the new island. Among many fish species are commoner *Lethrinus variegatus* VALENCIENNES and *Epinephelus fasciatus* (FORSSKÅL), both of which are abundant also in the sea around Chichi-jima and Haha-jima Islands. KIDO (1975) reported the result of angling made in the middle of March, 1974, in the water in question. According to this report, many fishes were obtained in the waters off the west coast of the old island, but only some specimens of the two species above mentioned were caught on the eastern coast of the new island. In July, 1975, many fishes living in the coastal waters are observed also in the inlet. Considering this observation by diving as well as from the result of angling, it may be said that the coastal waters were considerably recovered from the damage. These fishes living in the coastal waters do not make the round trip, so that examination of the stomach contents is of great significance. The following is the list of crabs found in stomachs of several specimens of *Lethrinus variegatus*.

Specimen 1 (28.8 cm in body length)—*Menaethius monoceros* LATREILLE (2 small exs.) of the Majidae, *Portunus* sp. (fingers of both chelae) and *Thalamita* aff. *admete* (HERBST) (3 broken carapaces, 8 right and 9 left chelae) of the Portunidae, and *Trapezia flavopunctata* EYDOUX et SOULEYET (right chela) of the Xanthidae. The *Thalamita*

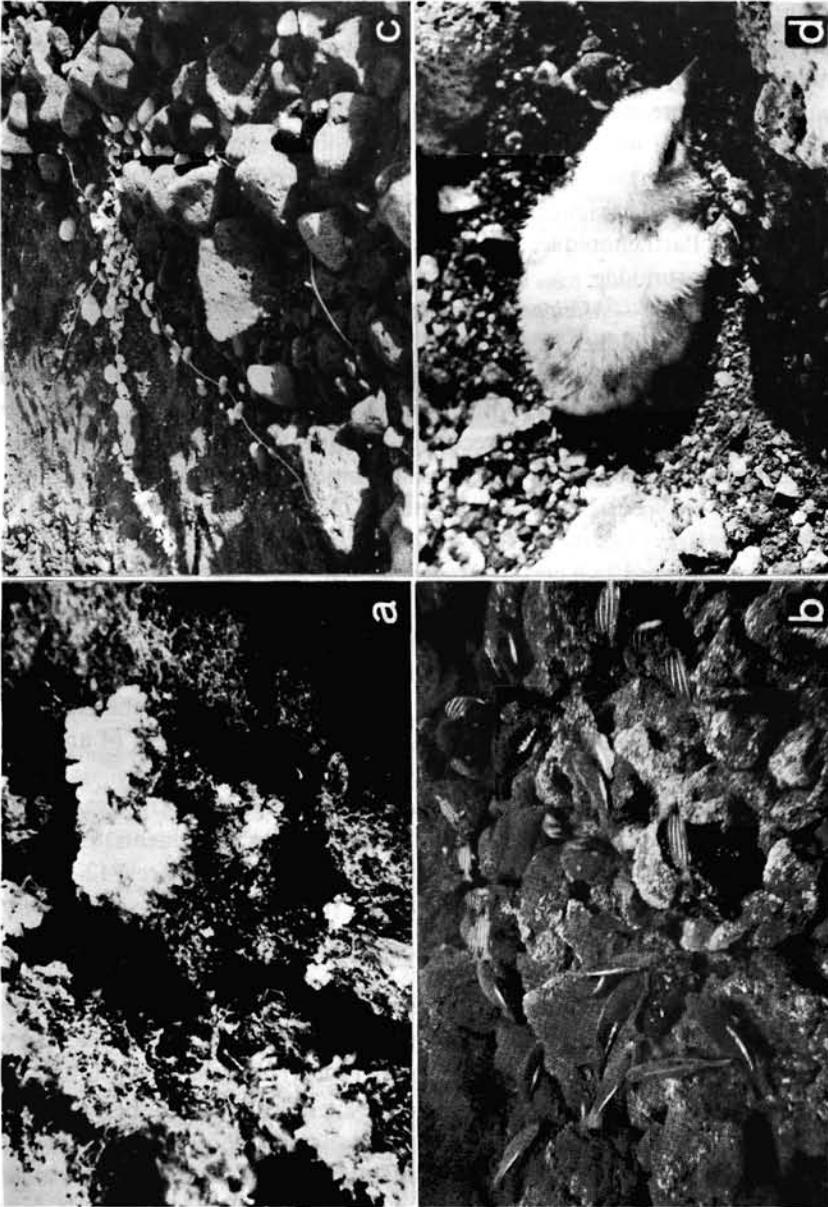


Fig. 9. — a, b. Small coral blocks growing on volcanic debris (a) and fishes (b), in shallow coastal waters of the new island. — c. *Ipomoea* sp. growing on the coast of the new island. — d. A chick of *Sula leucogaster*.

species is small and characteristic in having two frontal lobes, five anterolateral teeth with the small fourth one, and the chelae without squamiform sculpture.

Specimen 2 (30.7 cm) — *Portunus* sp. (fingers of left chela) and *Thalamita* aff. *admete* (HERBST) (10 damaged carapaces, 16 left and 14 right chela and chelipeds) of the Portunidae and *Trapezia flavopunctata* EYDOUX et SOULEYET (1 carapace and 1 left cheliped). Besides, there are a right chela of a mud shrimp, *Callinassa* sp., and fragments of a sand crab, *Albunea* sp.

Specimen 3 (34.2 cm) — *Menaethius monoceros* LATREILLE (1 ♂) and *Tiarinia spinigera* STIMPSON (1 small carapace) of the Majidae, ? *Echinoecus pentagonus* RATHBUN (left cheliped) of the Parthenopidae, and *Thalamita* aff. *admete* (HERBST) (6 right and 5 left chelae) of the Portunidae.

Specimen 4 (34.6 cm) — *Micippoides angustifrons* A. MILNE EDWARDS (1 ovig. ♀, without rostrum) of the Majidae, *Thalamita* aff. *admete* (HERBST) (3 damaged carapaces, 7 right and 5 left chelae) of the Portunidae, and *Actaeodes quadriareolatus* (TAKEDA et MIYAKE) (anterior half of carapace, both chelipeds and 2 ambulatory legs) of the Xanthidae. The last species is the second record following the original description on a female from Amami-oshima. This specimen is imperfect, but definitely identified with this species. This species is registered for the Ogasawara Islands crabs as, 149. *Actaeodes quadriareolatus* (TAKEDA et MIYAKE, 1968).

Specimens 5, 6 (33.6 and 34.6 cm) — *Micippoides angustifrons* (A. MILNE EDWARDS) (1 young ♂, with left cheliped) of the Majidae, *Portunus* cf. *granulatus* (H. MILNE EDWARDS) (fragments of carapace), *Portunus* sp. (right chela) and *Thalamita* aff. *admete* (HERBST) (many broken carapaces and chelipeds) of the Portunidae, *Platypodia* sp. (1 ♀ without carapace) and an unidentified species (left chela) of the Xanthidae. In addition to these crabs are three megalopa larvae and a smaller chela of an alpheid shrimp.

Specimens 7–9 (36.6, 37.2 and 39.7 cm) — *Calappa hepatica* (LINNAEUS) (1 ex., fragments) of the Calappidae, *Leucosia anatum* (HERBST) (1 ex., fragments) of the Leucosiidae, *Thalamita* aff. *admete* (HERBST) (several fragments of carapaces, 12 right and 11 left chelae) of the Portunidae, and *Platypodia* sp. (both chelae and some legs) and *Actaea nodulosa* (WHITE) (1 ex., fragments) of the Xanthidae. 150. *Leucosia anatum* (HERBST, 1783) is new to the Ogasawara Islands.

In addition to the above samples obtained from *Lethrinus variegatus*, stomach content of a specimen (47.7 cm in body length) of *Carangoides ferdau* (FORSSKÅL) was examined. Many chelae of *Thalamita* aff. *admete* (HERBST) were contained in it.

These results are rather similar to the stomach contents of four fish species reported by TAKEDA and KURATA (1976), indicating the fact that in the coastal waters of the new island, a crab fauna similar to that of the main islands of Ogasawara has already developed. It is noteworthy that a portunid species, *Thalamita* aff. *admete* (HERBST) is exceptionally common in the stomach contents of the fishes examined.

References

- ALCOCK, A., 1896, 1898, 1900. Materials for a carcinological fauna of India. No. 2. The Brachyura Oxystomata. No. 3. The Brachyura Cyclometopa. Part. 1. The family Xanthidae. No. 6. The Brachyura Catometopa, or Grapsoida. *J. Asiat. Soc. Bengal*, **65**: 134-296, pls. 6-8, **67**: 67-233, **69**: 280-456.
- ARNAUD, P. M., J. BEUROIS & P. NOEL, 1972. Portunidae et Grapsidae des îles Saint Paul et Amsterdam, Océan Indien (Decapoda, Brachyura). *Beaufortia*, **20**: 7-14.
- BANERJEE, S. K., 1960. Biological results of the Snellius Expedition. XVIII. The genera *Grapsus*, *Geograpsus* and *Metopograpsus* (Crustacea Brachyura). *Temminckia*, **10**: 132-199.
- BARNARD, K. H., 1950. Descriptive catalogue of South African decapod Crustacea. *Ann. S. Afr. Mus.*, **38**: 1-837.
- BORRADAILE, L. A., 1903. Marine crustaceans. VI. The sand crabs (Oxystomata). *The fauna and geography of the Maldive and Laccadive Archipelagoes*, **1**: 434-439, pl. 22.
- CHACE, F. A., JR., 1951. The oceanic crabs of the genera *Planes* and *Pachygrapsus*. *Proc. U.S. Natn. Mus.*, **101**: 65-103.
- 1966. Decapod crustaceans from St. Helena Island, South Atlantic. *Ibid.*, **118**: 622-662.
- CROSNIER, A., 1965. Crustacés décapodes Grapsidae et Ocypodidae. *Faune de Madagascar*, **18**: 1-143, pls. 1-11.
- DANA, J. D., 1852. Crustacea. *United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842 under the command of Charles WILKES, U.S.N.*, **13**: 1-1393.
- DELL, R. K., 1963. *Pachygrapsus marinus* (RATHBUN), a new crab for New Zealand waters. *Trans. Roy. Soc. N. Z.*, (Zool.), **3**: 179-180.
- 1968. Notes on New Zealand crabs. *Rec. Dominion Mus.*, **6**: 13-28.
- EDMONDSON, C. H., 1959. Hawaiian Grapsidae. *Occ. Pap. Bernice P. Bishop Mus.*, **22**: 154-202.
- 1962. Xanthidae of Hawaii. *Ibid.*, **22**: 215-309.
- FOREST, J., & D. GUINOT, 1961. Crustacés décapodes brachyours de Tahiti et des Tuamotu. *Expédition française sur les récifs coralliens de Nouvelle-Calédonie*, Vol. prélim.: i-xi+1-195 pls.1-18.
- GUINOT, D., 1962. Sur une collection de crustacés décapodes brachyours des îles Maldives et de Mer Rouge (Expédition "Xarifa" 1957-1958). *Kieler Meeresforsch.*, **18**: 231-244.
- 1964. Crustacés décapodes brachyours (Xanthidae) des campagnes de la Calypso en Mer Rouge (1952), dans le Golfe Persique et à l'île Aldabra (1954). *Mém. Mus. Hist. nat., Paris*, (A), **32**: 1-108, pls. 1-12.
- HELLER, C., 1865. Die Crustaceen. *Reise der österreichischen Fregatte "Novara" um die Erde in den Jahren 1857-1859 unter den Befehlen des Commodors B. von WÜLLERSTORF-URBAIR*, (Zool.), **2** (3): 1-280, pls. 1-25.
- HOLTHUIS, L. B., 1953. Enumeration of the decapod and stomatopod Crustacea from Pacific coral islands. *Atoll Res. Bull.*, **24**: 1-66.
- KIDO, T., 1975. On the living environment for fish in the coastal waters surrounding the new and old volcanic island, "Nisi-no-sima." *J. Tokyo Univ. Fish.*, **61**: 59-62. (In Japanese with English summary.)
- LAURIE, R. D., 1915. Reports on the marine biology of the Sudanese Red Sea. XXI. On the Brachyura. *J. Linn. Soc. Lond.*, (Zool.), **31**: 407-475, pls. 42-45.
- LENZ, H., 1901. Ergebnisse einer Reise nach dem Pacific (SCHUINSLAND 1896-1897). *Crustaceen. Zool. Jahrb., Syst.*, **15**: 429-482, pl. 32.
- MAN, J. G. DE, 1890. Carcinological studies in the Leyden Museum. No. 4. *Notes Leyden Mus.*, **12**: 49-126, pls. 3-6.
- 1895-1898. Bericht über die von Herrn Schiffscapitän STORM zur Atjeh, an den westlichen Küsten von Malakka, Borneo und Celebes sowie in der Java-See gesammelten Decapoden und Stomatopoden. *Zool. Jahrb., Syst.*, **8**: 485-609, **9**: 75-218, 339-386, **725-788**, **10**: 677-708, **14** pls.

- MIERS, J. E., 1884. On some crustaceans from Mauritius. *Proc. zool. Soc. Lond.*, **1884**: 10-17, pl. 1.
- MILNE EDWARDS, A., 1867. Description de quelques espèces nouvelles de crustacés brachyures. *Ann. Soc. ent. France*, (4), **7**: 263-288.
- 1873. Recherches sur la faune carcinologique de la Nouvelle-Calédonie. Part 2. *Nouv. Arch. Mus. Hist. nat., Paris*, **9**: 155-332, pls. 4-18.
- MILNE EDWARDS, H., 1834, 1837. *Histoire naturelle des crustacés, comprenant l'anatomie, la physiologie et la classification des ces animaux*, **1**: i-xxxv+1-468, **2**: i-iii+1-532. Atlas 1-32, pls. 1-42.
- 1853. Mémoire sur la famille des ocyropodiens (suite). *Ann. Sci. nat.*, (3), **20**: 163-228, pls. 6-11.
- MIYAKE, S., 1937. Brachyura of the Danjo Islands. *Biogeographica*, **2**: 28-30. (In Japanese.)
- 1938. Unrecorded crabs from Formosa collected by Prof. Hiroshi OHSHIMA in 1932. *Trans. nat. Hist. Soc. Formosa*, **28**: 187-196. (In Japanese.)
- 1939. Notes on Crustacea Brachyura collected by Professor Teiso ESAKI's Micronesia Expeditions 1937-1938 together with a check list of Micronesian Brachyura. *Rec. oceanogr. Wks. Jap.*, **10**: 168-247, pls. 12-17.
- ORTMANN, A., 1893. Die Decapoden-Krebse des Strassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. DÖDERLEIN bei Japan und bei den Riu-Kiu Inseln gesammelten und zur Zeit im Strassburger Museum aufbewahrten Formen. VII. Brachyura. II. Cyclometopa. *Zool. Jahrb., Syst.*, **7**: 411-495, pl. 17.
- OSSAKA, J., 1973 a, b. On the submarine eruption of Nishinoshima. *Bull. volcanol. Soc. Jap.*, (2), **18**: 97-98, 173-174. (In Japanese.)
- 1974. On the activity and development of volcano Nishinoshima, Bonin Islands. *J. Geogr.*, **83**: 125-133. (In Japanese with English summary.)
- , Y. OHIRA & I. MINATO, 1974. On the submarine eruption of Nishinoshima (3). *Bull. volcanol. Soc. Jap.*, (2), **19**: 37-38. (In Japanese.)
- RATHBUN, M. J., 1906. The Brachyura and Macrura of the Hawaiian Islands. *U.S. Fish Comm. Bull.*, **35**: 827-930, pls. 1-24.
- 1907. Reports on the scientific results of the expedition to the tropical Pacific, in charge of Alexander AGASSIZ, by the U.S. Fish Commission Steamer "Albatross." IX, X. The Brachyura. *Mem. Mus. Comp. Zool.*, **23**: 23-74, pls. 1-9.
- 1914. New genera and species of American brachyrhynchous crabs. *Proc. U.S. Natn. Mus.*, **47**: 117-129, pls. 1-10.
- 1918. The grapsoid crabs of America. *Bull. U.S. Natn. Mus.*, **97**: i-xxii+1-461, pls. 1-151.
- SAKAI, T., 1937, 1938, 1939. Studies on the crabs of Japan. II. Oxystomata. *Sci. Rept. Tokyo Bunrika Daigaku*, (B), **3**, Suppl. **2**: 67-192, pls. 10-19. III. Brachygnatha, Oxyrhyncha. IV. Brachygnatha, Brachyrhyncha. Yôkendo Co., Ltd., pp. 193-364, pls. 30-41, pp. 365-741, pls. 42-111.
- 1965. The Crabs of Sagami Bay. i-xvi+1-206+1-92+1-32 pp., pls. 1-100. Tokyo, Maruzen Co., Ltd.
- 1976. Crabs of Japan and the Adjacent Seas. i-xxix+1-773+1-461+1-16 pp., pls. 1-251. Tokyo, Kodansha Co., Ltd.
- SENDLER, A., 1923. Die Decapoden und Stomatopoden der Hanseatischen Südsee-Expedition. *Abh. Senck. nat. Ges.*, **38**: 21-47, pls. 5-6.
- STEPHENSEN, K., 1945. The Brachyura of the Iranian Gulf. *Danish Sci. Invest. Iran*, **4**: 57-237.
- STIMPSON, W., 1858. Prodromus descriptionis animalium evertibratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro RINGGOLD et Johanne RODGERS Ducibus, observavit et descripsit. Pars III. Crustacea Maioides. Pars V. Crustacea Ocyropoidea. *Proc. Acad. nat. Sci. Phila.*, **9**: 216-221, **10**: 93-110.
- 1907. Report on the Crustacea (Brachyura and Anomura) collected by the North Pacific Exploring Expedition, 1853-1856. *Smiths. misc. Coll.*, **49**: 1-240, pls. 1-26.
- TAKEDA, M., 1972. Systematic status of *Ceratoplax villosa* ZEHNTNER and some related species

- (Crustacea, Decapoda, Brachyura). *Proc. Jap. Soc. syst. Zool.*, **8**: 34-41.
- TAKEDA, M., & Y. KURATA, 1976. Crabs of the Ogasawara Islands. II. First report on the species obtained from stomachs of fishes. *Res. Crust.*, **7**: 116-137. (In Japanese with English summary.)
- & S. MIYAKE, 1968. Two new xanthid crabs inhabiting coral reefs of the Ryukyu Islands. *Ohmu*, **1**: 183-189, pl. 8.
- TESCH, J. J., 1918. The Decapoda Brachyura of the Siboga-Expedition. I. Hymenosomidae, Retroplumidae, Ocypodidae, Grapsidae, and Gecarcinidae. *Siboga-Exp.*, **39c**: 1-148, pls. 1-6.
- TYNDALE-BISCOE, M., & R. W. GEORGE, 1962. The Oxystomata and Gymnopleura (Crustacea, Brachyura) of Western Australia with descriptions of two new species from Western Australia and one from India. *J. Roy. Soc. W. Austral.*, **45**: 65-96.
- WARD, M., 1941. New Brachyura from the Gulf of Davao, Mindanao, Phillipine Islands. *Amer. Mus. Novit.*, **1104**: 1-15.
- YAMAZI, I., & M. WAKAMIYA, 1975. Zooplankton in the waters surrounding a new active volcanic island, Nishinosima-sintô. *J. Tokyo Univ. Fish.*, **61**: 71-92. (In Japanese with English summary.)