

A Small Collection of Crabs from the Kyushu-Palau Submarine Ridge, with a Description of a New Species of the Homolidae

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Abstract— Thirty specimens of crabs collected from the Kyushu-Palau Submarine Ridge were referred to *Hypsophrys williamsi* (n. sp.) of the Homolidae, *Cyrtomaia horrida* Rathbun and *Leptomithrax kiiensis* Sakai of the Majidae, *Neopilumnoplax serratus* Sakai of the Goneplacidae, and *Geryon granulatus* Sakai of the Geryonidae. Systematic notes on the known species and descriptions of the new species are presented.

Through the courtesy of Drs. Ken-Ichi Hayashi and Osame Tabeta of Shimonoseki University of Fisheries, the author had a good chance to examine the crabs from Komahashi Seamount (SMt) (28°04'N, 134°20'E, 520 m deep) and Kitakôhō SMt (26°43.8'N, 135°20'E, 320 m deep) in the northern part of the Kyushu-Palau Submarine Ridge (Fig. 1) collected along with many benthic fishes in February, 1978, by the experimental trawling to exploit further fish resources under the sponsorship of the Ministry of Agriculture, Forestry and Fishery, Japan.

The specimens are 30 in total number and were referred to five species of four families, viz., a new species of *Hypsophrys* of the Homolidae, *Cyrtomaia horrida* Rathbun and *Leptomithrax kiiensis* Sakai of the Majidae, *Neopilumnoplax serratus* Sakai of the Goneplacidae, and *Geryon affinis granulatus* Sakai of the Geryonidae. These specimens are now preserved in the National Science Museum, Tokyo (NSMT) and Shimonoseki University of Fisheries (SUF).

A new species of the Homolidae is represented only by a male specimen (NSMT-Cr 6417) from Komahashi SMt and described later as *Hypsophrys williamsi*, which was dedicated to Dr. A. B. Williams of the National Marine Fisheries Service, National Museum of Natural History, Washington, D.C. The new species is really the fifth of the genus which is represented by three Indo-West Pacific and one West Atlantic species. It may be close to the Atlantic species described by Dr. A. B. Williams some years ago, but distinctly different from it in many features.

Cyrtomaia horrida Rathbun, 1916 is represented by three males from Komahashi SMt (NSMT-Cr 6418, SUF 530-2-685, 686). This species is characterized by combination of the features that the lateral gastric spines are by far the longest of all the carapace spines and project obliquely forward, and there is no spine at the anterior end of the supraorbital eave, but there is a distinct intercalated spine. Considering these features, this species is in general close to *C. curviceros* Bouvier

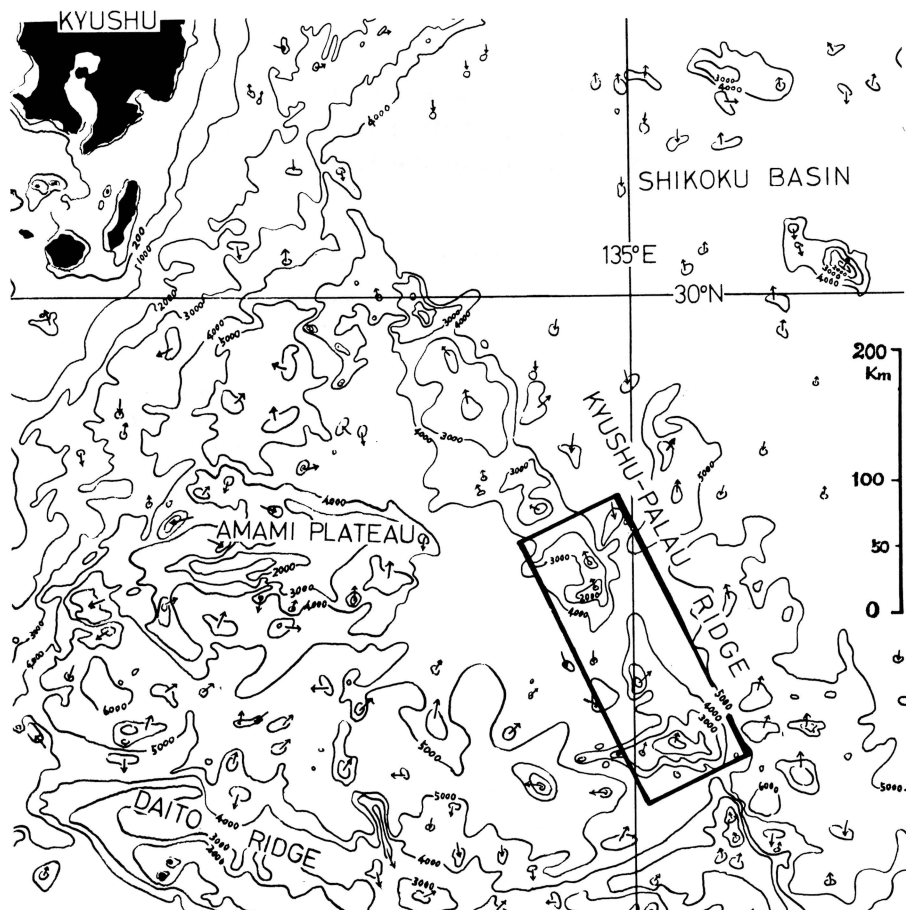


Fig. 1. A chart showing area for investigation in the Kyushu-Palau Submarine Ridge.

from Japan, in which there is, however, no intercalated spine. The subspecies *C. horrida pilosa* Ihle et Ihle-Landenberg based on a female from off Kei Island, 204 m deep, was noted that the lateral gastric spines are shorter, and that the third and fourth ambulatory legs are thickly covered with short hairs. This species has hitherto been known from off Apo Island in the Philippines and far south of Omae-zaki and Tosa Bay, Japan, but very recently Takeda (1980) mentioned the presence of some specimens from off Midway Island in the Central Pacific. They are one male, two ovigerous and two young females (NSMT-Cr 5088), with which the males at hand agree well. The recorded depths in literature are 196 m and 256 fm.

Leptomithrax küiensis Sakai, 1969 is represented only by an ovigerous female (NSMT-Cr 6419) from Kita-kôhō SMT, which is somewhat damaged at the abdominal part and has malformed chelipeds of both sides without chelae. The dactylus or the movable finger in normal chela is somewhat similar to the ambulatory

dactylus, but bears no terminal horny claw; the propodus is quite slender and tapering, without any trace of development as the immovable finger in normal chela. This ovigerous female was compared with a male (NSMT-Cr 5094) from Kushimoto, the southernmost place of Kii Peninsula. In the female at hand the rostral spines are about one-fourth the length of the carapace proper and proportionally much shorter than in the male, and the dorsal surface of the carapace is very sparsely covered with setae, but coarsely with minute tubercles. It is noted that the rostral spines of the male are nearly half, or more, the carapace length as in the holotype. Most of the ambulatory legs are missing in the female, but without doubt the setae are extremely short and sparse, unlike the ambulatory legs of the male in which the setae are distinctly observed even by the naked eye. This discrepancy is probably because of the difference in sexes, but the examination of the additional specimens is highly desirable. This species has hitherto been recorded from Sagami Bay and the vicinity of Kii Peninsula at rather shallow water of 30 to 100 m.

Neopilumnoplax serratus Sakai, 1974 is represented by 24 specimens. Of them 15 (3♂♂, 4♀♀, SUF 530-2-683 and 2♂♂, 6♀♀, NSMT-Cr 6420) are from Komahashi SMT, but the definite localities of the other specimens (5♂♂, 4♀♀, SUF 530-2-684) are unrecorded. In these specimens the formation of the frontal and anterolateral border of the carapace is considerably variable. According to the original and subsequent descriptions in 1974 and 1976, the frontal lateral angle is deeply separated from the preorbital angle by a deep notch, and the anterolateral border is armed with five serrated teeth. It is remarked at present that the lateral indentation of the front is nearly indistinguishable in the larger specimens, and that the first anterolateral tooth or the external orbital angle itself and the second tooth are usually confluent with each other, bearing only a shallow depression in the middle. The dorsal flatness and smoothness of the carapace are usual in the smaller specimens, but in the larger ones the dorsal surface is for its most part weakly convex, with indication of the regions, and the frontal and lateral borders are somewhat crested as a whole. The male abdomen is composed of seven distinct segments, and the second male pleopod is filiform and longer than the first. In the National Science Museum, Tokyo, there are some specimens from Toyama Bay and off the Goto Islands. The morphological variation is also usual in these specimens. This species is restricted to Japanese waters, the known bathymetric range being from 165 to 299 m.

A large male (SUF 530-2-687) without record of definite locality was identified with *Geryon affinis granulatus* Sakai, 1978 which has hitherto been known as *G. trispinosus* (Herbst) in Japan. The new name (Sakai, 1978: 11, 33) as a subspecies (as a variety in the Japanese part) of *G. affinis* A. Milne Edwards et Bouvier was conditionally proposed, as the original author stated, "If such features [convex gastric and hepatic regions, and granulated branchial, gastric and cardiac regions] of the Japanese species are worthy of being recognized as local features, the author wishes to take the present opportunity to give it the new subspecific name *Granulatus*." Such a proposal of a new name might be inappropriate in the light of the International Code of Zoological Nomenclature (Article 15. Names published after 1960.—After 1960, a

new name proposed conditionally, or one proposed explicitly as the name of a "variety" or "form" [Art. 45e], is not available.), but in this paper the new name proposed was tentatively adopted to avoid further confusion. Apart from the nomenclatural problem, the specimens from the vicinity of Kii Peninsula in Japan, the East and South China Seas were directly compared with the specimens from the Central Pacific, the western Indian Ocean and the southeastern Atlantic referable to *G. affinis* which was well figured by the original authors in 1894, Doflein (1904), Christiansen (1969), Griffin and Brown (1976), and Sakai (1978). It is remarked at present that in the specimens from the West Pacific the branchial regions are markedly granulated, the posterolateral borders of the carapace are so convex that the contour of the carapace appears to be distinctly rounded, and the ambulatory legs are decidedly much more stouter. The granulation of the carapace may possibly be variable individually or according to the size, but the proportional differences in the carapace and ambulatory legs are always distinct. As briefly summarized, they are specifically distinct from *G. affinis* and thus must be known as *G. granulatus* Sakai, 1978.

Hypsophrys williamsi n. sp.

Figs. 2, 3

HOLOTYPE: Komahashi SMt, Kyushu-Palau Submarine Ridge (28°04'N, 134°20'E), 520 m deep; 1♂, NSMT-Cr 6417; Feb. 20, 1978. Length of carapace in median line with rostrum, 49.8 mm; greatest length of carapace with rostrum, 52.0 mm; breadth of carapace without lateral spines, 45.0 mm; height of carapace, ca. 25 mm. Length of right cheliped, ca. 90 mm. Length of right second ambulatory leg, ca. 145 mm. Length of last leg, ca. 80 mm.



Fig. 2. *Hypsophrys williamsi* n. sp., holotype ♂ (NSMT-Cr 6417). Scale bar represents 4 cm.

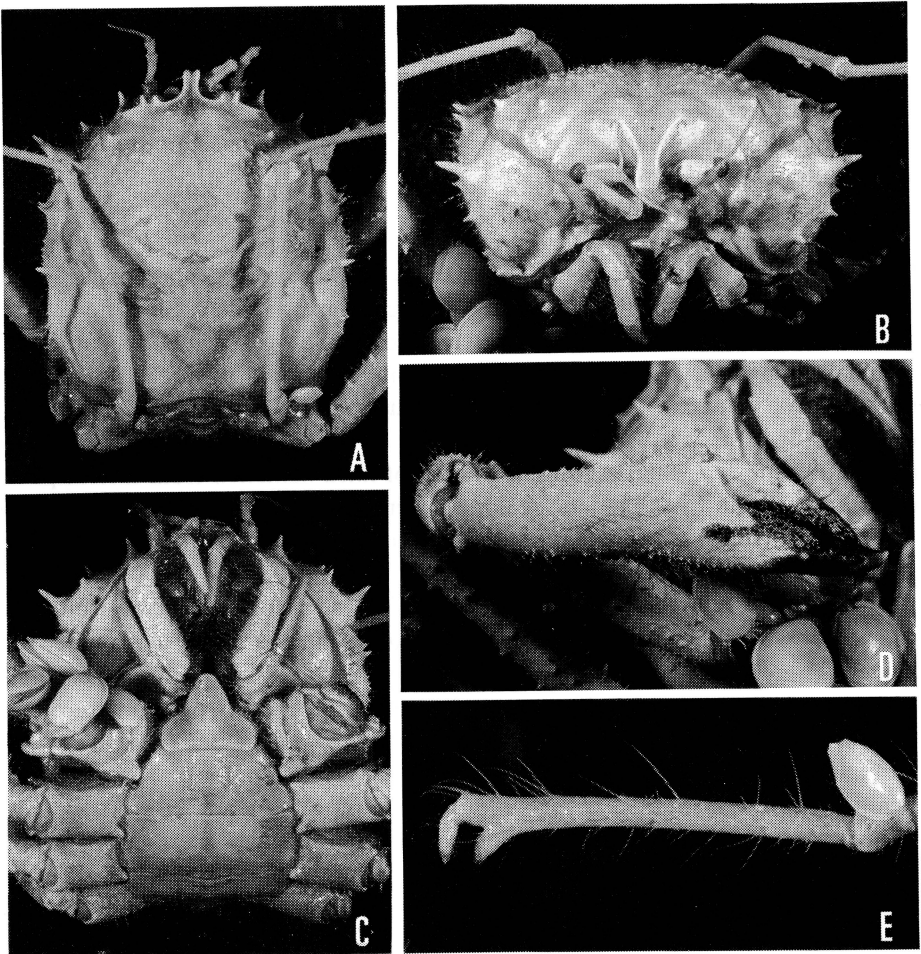


Fig. 3. *Hypsophrys williamsi* n. sp., holotype ♂ (NSMT-Cr 6417). A-C. Carapace in dorsal, frontal and ventral view; D. Chela of right cheliped; E. Distal two segments of left last leg.

DESCRIPTION: Carapace thick and longitudinally ovate or rather quadrangular; dorsal surface flattened as a whole and distinctly divided into regions, being covered with sparse short hairs and minute granules.

Rostrum narrow and directed obliquely downward; its dorsal surface entirely excavated to be a furrow, a thin rim being continuous with supraorbital margin; distal end nearly truncated and obtuse; ventral surface bears a median longitudinal keel and excavated laterally, being reinforced by an interantennular septum at its basal part.

Orbital facet well developed and sharply marked off from dorsal surface of carapace by a supraorbital rim; two small, but sharp teeth on supraorbital border

directed obliquely outward, the outer being the larger; lower angle of orbital facet just outside of antenna armed with a large tooth. First segment of eyestalk small; second segment strongly constricted medially and bulged proximally; cornea well developed at distal end of eyestalk.

Protogastric region large, evenly convex and for its most part uniformly covered with minute scabrous granules; a conical tubercle each at lateral and anterolateral parts; otherwise, a low tubercle at anteroinner part possibly representing epigastric region; mesogastric region very minutely roughened; posterior half of dorsal surface of carapace behind cephalic groove flattened as a whole; epibranchial region behind protogastric region distinctly demarcated and scabrous, with dense minute granules; a pair of oval impressions just behind lateral ends of mesogastric region; cardiac and branchial regions very minutely granulated, being separated from each other by an oblique, weakly curved linear furrow originating from *linea homolica* which runs longitudinally and sinuously from outer angle of orbital facet and passing around protogastric and branchial regions; a branch of *linea homolica* from lateral part of protogastric region to subhepatic region; in ventral view *linea homolica* continuing from orbital facet through anterolateral edge of buccal frame and across pterygostomial region to base of cheliped.

Two spines each with a broad base behind a spine at lower angle of orbital facet and in front of a subhepatic branch of *linea homolica*; lateral surface of carapace wide, minutely granulated and armed with two spines or tubercles along *linea homolica*, which are subequal to each other and to the smaller or the first of two anterolateral spines mentioned above. Posterior border of carapace narrow and concave.

First segment of antennular peduncle greatly inflated for its proximal half. Opening of green gland on a high mound at base of antenna. First segment of antennal peduncle stout, with a small tubercle at anterodistal corner; second segment slightly longer than the first, but hardly shorter than second segment of antennule, widening distally; third segment about half as long as the second; flagella of both sides broken off.

Third maxilliped pediform; ischium minutely granulated, being ornamented with a longitudinal shallow, smooth furrow along its outer border; merus also granulated along inner border and armed with a tiny spiniform granule at median part of outer border; dactylus nearly equal to, or only slightly longer than propodus.

Left cheliped missing. Right cheliped slender and rather sparsely covered with stiff setae of various length; merus not so long and roughly triangular in its cross section; each margin not distinct, being armed each with four or five small tubercles; carpus about half as long as merus and sparsely covered with minute tubercles; palm about equal in length to merus-ischium, widening distally and being indistinctly granulated on upper and outer surfaces; fingers about half as long as palm; lower border of immovable finger weakly convex and slightly twisted outward at proximal part; movable finger thus deeply closing inside immovable one; in each finger cutting edge entire and developed as a thin crest; upper border of movable finger and lower outer and inner borders of immovable finger sharp for their dark-colored distal

halves; dark-color prolonged back to an ocellated spot at each base of outer and inner surfaces of immovable finger; ocellated spot smooth and surrounded by blue.

Ambulatory legs depressed, sparsely setose, longer than chelipeds and similar to each other; first pair slightly shorter than the second, and slightly longer than the third; merus armed with eight or nine equidistant spines on anterior border and with minute granules on upper surface and posterior border, becoming narrow and more strongly depressed distally; total length of carpus and propodus equal to merus-ischium; posterior border of propodus equipped with a pair of movable spines distally at articulation with dactylus; a longitudinal shallow furrow on upper surface of dactylus, which is armed with a row of slender corneous spines along prehensile edge. Last subdorsal leg unarmed and much more slenderer than preceding ambulatory legs, being subcylindrical throughout whole length; carpus and propodus about equal in length to each other, together as long as merus, and about two-thirds of merus of preceding leg; subdistal part of posterior border of propodus produced to be a high mound, which is obliquely truncated and tipped with many corneous spines; dactylus strongly curved at its proximal part, and its spooned tip with many corneous spines opposing to spiny mound of propodus to form a subchela somewhat like nippers; in closing dactylus at more than 90° to axis of leg, a small triangular gape being left.

Abdomen composed of seven segments and ovate in outline; first segment small and entirely embedded into concave posterior border of carapace; fifth segment broadest and as long as penultimate segment, bearing a shallow depression at subdistal part of each lateral border; lateral borders of penultimate segment nearly longitudinal or only slightly inclined along its proximal one-third, and tapering along distal two-thirds; outline of terminal segment essentially triangular as a whole, but medially constricted, with convex proximal and straight distal halves of lateral borders.

Tips of first pleopods of both sides and right second pleopod necrotized, with blackened tissue as well as stump of left cheliped, but their general formation quite similar to those of other species.

REMARKS: As mentioned elsewhere, the genus *Hypsophrys* Wood-Mason, 1891 (in Wood-Mason and Alcock, 1891) is represented by three species from the Indo-West Pacific and one species from the West Atlantic. The known species are the type-species *H. superciliosa* Wood-Mason, 1891 from the Arabian Sea, Maldiva Sea, Bay of Bengal and South China Sea (Wood-Mason and Alcock, 1891; Alcock, 1899a, b, 1901; Gordon, 1950; Serène and Lohavanijaya, 1973), *H. longipes* Alcock et Anderson, 1899 from the Arabian Sea, Nicobar Islands and off Benkulen at west coast of Sumatra (Alcock and Anderson, 1899; Alcock, 1899a, b, 1901; Doflein, 1904), *H. noar* Williams, 1974 from SW of Dry Tortugas, Florida, and *H. murotoensis* Sakai, 1979 from off Muroto-zaki, Japan.

In the basic formation of the carapace, chelipeds and legs, the new species is apparently closer to the Atlantic species, *H. noar*, than to three Indo-West Pacific species. In *H. noar*, however, the marginal spines of the carapace and chelipeds are

much more stronger, the rostrum is distinctly bifid, and the curved spines on the anterior borders of the ambulatory meri are also very strong, without minute accessory granules on the upper surfaces and posterior borders. In the last leg of *H. noar*, the propodus is terminally branched into shallow, somewhat asymmetrical Y-shape, one branch bearing the dactylar condyle and the other terminating in the spooned pad forming stationary member of subchela opposing the short clasping dactylus. The subchela of the new species is more specialized somewhat like nippers as seen in the photograph (fig. 3E).

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ADDENDUM

Three male crab specimens, received from Dr. L. G. Eldredge (Marine Laboratory, University of Guam), were compared with the holotype. They differ by having their carapaces uniformly covered with setae and their chelipeds thickly covered with conical and spiniform granules. These specimens from Station 6 of the National Marine Fisheries Service "Townsend Cromwell" Cruise 78-02(TC-79), 15°12.1'N and 145°37.6'E (west of Saipan Harbor, Saipan, Mariana Islands) were collected on 23 June 1978 at a depth of 27–31 m. They are designated as paratypes and are deposited in the B. P. Bishop Museum, Honolulu, and the Marine Laboratory, University of Guam.