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Two species of *Microprosthema* found on the coral reefs of the Ryukyu Islands (Stenopodidae, Crustacea)*

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The first knowledge of the genus *Microprosthema* was brought to light by Stimpson (1860), who monotypically reported *M. valida* from Amami-oshima, one of the Ryukyu Islands. An excellent contributor to this group, Stenopodidae, is L. B. Holthuis (1946) who made them known in the monographical treatment and made sure of its systematic position. In addition, recently Malhadevan, Rangarajan & Sankarankutty (1962) have recorded a single species from India, whose name, however, has been left undetermined. But it is thought to be an independent species. We have now access to the records of five species in the world, four of which are known from the Indo-Pacific region.

During the study trips to the Ryukyu Islands the present authors independently payed attention to the occurrence of the *Microprosthema* shrimp and got some informations on the living colour and habitat which have imperfectly been known. From the agreement it was deemed advisable to put together the separate data for publication. All of the specimens are six in number, one of them being from Ishigaki-jima and the other from Amami-oshima Island. The former is referable to *M. validum* and the latter to *M. scabricaudatum*, both are found among the crevices of dead corals on the flat.

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Description of species

Microprosthema validum Stimpson, 1860

(Fig. 1)

Microprosthema valida Stimpson, 1860, p. 114—Amami-oshima Island (type locality).
Stenopusculus crassimanus Richters, 1880, p. 168, pl. 18, figs. 27-29—Mauritius; de Man, 1888, p. 565—Edam Island, Indonesia; Lanchester, 1901, p. 573—Pulau Bidan, Penang; Bouvier, 1908, p. 150—Jibuti.
? *Microprosthema crassimanum*: Balss, 1915, p. 33, figs. 26-30—Berenice, Red Sea.
Stenopus robustus Borradaile, 1910, p. 260, pl. 16, fig. 4—Salomon Atoll, Chagos Archipelago; McNeill, 1926, p. 302—North-west Islet, Capricorn Group, Queensland; Gravely, 1927, p. 138, pl. 19, fig. 6—Gulf of Manaar; McNeill & Ward, 1930, p. 361—Masthead Island, Capricorn Group, Queensland; Hope Island near Cooktown, N. Queensland; Long Reef, Collaroy near Port Jackson.
Microprosthema validum: Holthuis, 1946, p. 50, pl. 3, fig. h—Tenimber Islands; Sape Strait, near Soembawa.

Material examined:

Kabira, Ishigaki-jima I., Ryukyu Is., Feb. 13, 1968, Y. Nakasone leg.—1 sp., ZLKU 11098.

Description: The rostrum is tapering and slightly curved downwards; it slightly falls short of the tip of the scaphocerite, with six dorsal spines but it has no lateral spine overhanging the eye.

The carapace is covered with spinules distinct, those of the anterolateral portion are rather strong. A longitudinal row of three spines runs posteriorly from behind the eye to the cervical groove.

The first abdominal segment has a transverse ridge furnished with a fringe of short setae, with a distinct tooth near the base of the pleuron; the dorsal surface of the pleuron is carinated weakly, and no marked spines are found there. The second abdominal segment is also carinated transversely with two eminent projection near the base of the pleuron, the carina is likewise extended to on the pleuron and ends in a sharp point. The third abdominal segment is divided into two portions by an usual transverse carina, the hind portion of which is the longer, with a longitudinal carina at the middle; likewise the pleuron is wholly carinated but weakly. Both the fourth and the fifth abdominal segments are glabrous, the dorsal carinae are mostly reduced; the posterior margin has a incision near the base of each pleuron; the pleuron ends in a pointed tip and has no additional spines.

The telson is as long as the uropods constricted near the base and becomes narrow distally; marginally it bears a median lateral spine but no marked terminal spines and dorsally it is weakly carinated with two pairs of blunt spines. The endopod of the uropod is marginally serrated with three teeth, likewise the exopod of the same with about seven teeth.

The eyestalk has two spines on the anterior (inner) surface.

The basal segment of the antennule has a distinct stylocerite directed inwards.

The scaphocerite of the antenna is rather broad; its outer margin being roughly straight but slightly concave at the proximal portion and having two teeth; the inner margin is convex and provided at the distal half with plumose setae.

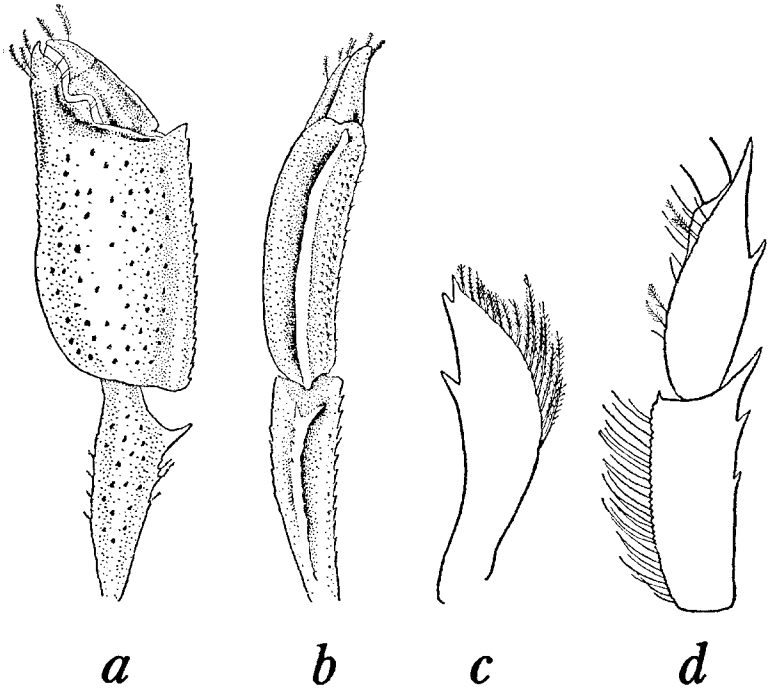

Fig. 1. *Microprosthema validum* Stimpson, male.
a, Left third pereiopod in lateral view, ×71. *b*, left third pereipod in dorsal view, ×71. *c*, left scaphocerite in dorsal view, ×43. *d*, basal two segments of endopod of left third maxilliped, ×43.

The ischium of the third maxilliped is longer than the merus and armed with three spines externally, of which the distal one is the strongest; the inner marginal angle is a minute spine. The merus is rather narrow with two external spines of large size.

The first pereiopod is short and slender, and it bears the segments all smooth. The second pereiopod is similar to but larger than the preceding, the merus being anteriorly provided with three spines.

The third pereiopod is strongly developed. The carpus is slightly shorter than the propodus; it is carinated dorsally and concave inside, with three or four spines and some spinules on the dorsal crista; the ventral and both the lateral margins are also spinulose. The propodus is high and swollen but rather narrow, with a high dorsal crista. The dorsal margin is wholly serrated into about 20 teeth, and the anterior half of the ventral margin is also into about 15 teeth. The outer surface is rather smooth but the inner is covered with many tubercular teeth. The dactylus is half as long as the propodus, its cutting edge having a large median tooth which fits in the concavity between two teeth on the cutting edge of the immovable finger. The fingers are distally furnished with short setae.

The fourth and the fifth pereiopods are long and slender. The carpus is smooth and not subdivided. The propodus is half the length of the carpus without being subdivided, and has nine inner marginal spines which are all movable. The dactylus is short and biunguiculate.

Colour: When alive, the animal is wholly brownish (Nakasone's observation). Closely examined in formalin, it is rather orange yellow. The carapace is reddish orange at the base of the rostrum and scattered anteriorly with reddish chromatophores. The abdominal segments are also reddish chiefly on the carinated portions and margins. The third pereiopod is similar to the carapace, but red chromatophores are scattered on whole over the surface; the proximal portion of the fingers are especially thick in orange and the distal third point is whitish. Other legs are light seashell pink.

Measurements: Only one specimen examined measures 3.7 mm in carapace length.

Habitat: Any detailed habitats have never been given to the present species, however it was roughly recorded that the animals were in most cases taken from the coral reefs. Holthuis (1946) reported it from a depth of 70 m with a record of bottom nature, "coral and shells."

The present specimen was taken at night from the crevices of the dead coral which forms a part of the reef flat, where is exposed at the ebb. In that place this species was found living together with porcellanid crabs, *Pisidia spinuligera* (Dana) and *P. dispar* (Stimpson).

Remarks: The single specimen here examined falls in with

Holthuis' (1946) description, except for the segmentation of the carpus and propodus of last two pereiopods. In Holthuis' account the carpus is subdivided into mostly 4 segments and the propodus into 3, while both the segments of the present material are uniformly non-subdivided. On this regard Dr. Holthuis kindly informed to the present authors that the segmentation of the segments in question is probably the population variation, so the present authors do not hesitate to insert this material into *Microprosthema validum*.

Distribution: This species is widely distributed throughout the Indo-Pacific region. For the details of its distribution the reader is referred to Holthuis (1946).

Microprosthema scabricaudatum (Richters, 1880)

(Fig. 2)

Stenopusculus scabricaudatus Richters, 1880, p. 168, pl. 18, figs. 30-32—Mauritius (type locality); Bouvier, 1908, p. 888—No new record.

Microprosthema scabricaudatum: Balss, 1915, p. 33—No new record; Holthuis, 1946, p. 57, fig. 1, pl. 3, fig. g-Boo Islands, N. W. New Guinea.

Material examined:

Sani, northern coast of Amami-oshima I., Aug. 15, 1966, K. Honda & M. Takeda leg.—4 spp. (including 1 ovig. ♀), ZLKU 11091.

Suno, northern Pacific coast of Amami-oshima I., Aug. 6, 1964, K. Baba leg.—1 sp., ZLKU 11094.

Description: The rostrum is straight, broadly triangular at the base; it reaches beyond the antennular peduncle but fails to reach the end of the scaphocerite (in the smallest specimen it extends beyond the scaphocerite). The dorsal surface is carinated with a row of five to nine spines, the hinder part of it is very indistinct. Marginally it bears one or two spines, which just overhang the eye.

The carapace is spinose, the cervical groove being rather distinct.

The first abdominal segment bears a posterior transverse ridge, which is laterally provided with four or six spinules, without any setae. The second abdominal segment is also furnished with a transverse ridge, on which six to ten spinules are lined up. The pleuron is rather broad and ends in a blunt tip, without any tooth on the margin; the posterior margin is smooth or sometimes spinulose; in the latter case the number of spinules are from one to nine. The third segment is rather broad. It bears a transverse carina dorsally, which reaches the end of the pleuron and is furnished with 8 to 13 spinules. A few spinules are also scattered behind the transverse ridge. The

pleuron has no spine nor spinules laterally, ending in a blunt tip. There is no longitudinal carina on the surface. The transverse ridge on the fourth segment is not prominent but rather weak with 2 to 10 spinules, which are not straightly lined up. A few spinules are also present behind. The fifth segment is similar to the preceding segment, and does not form a transverse ridge so that the spinules are irregularly

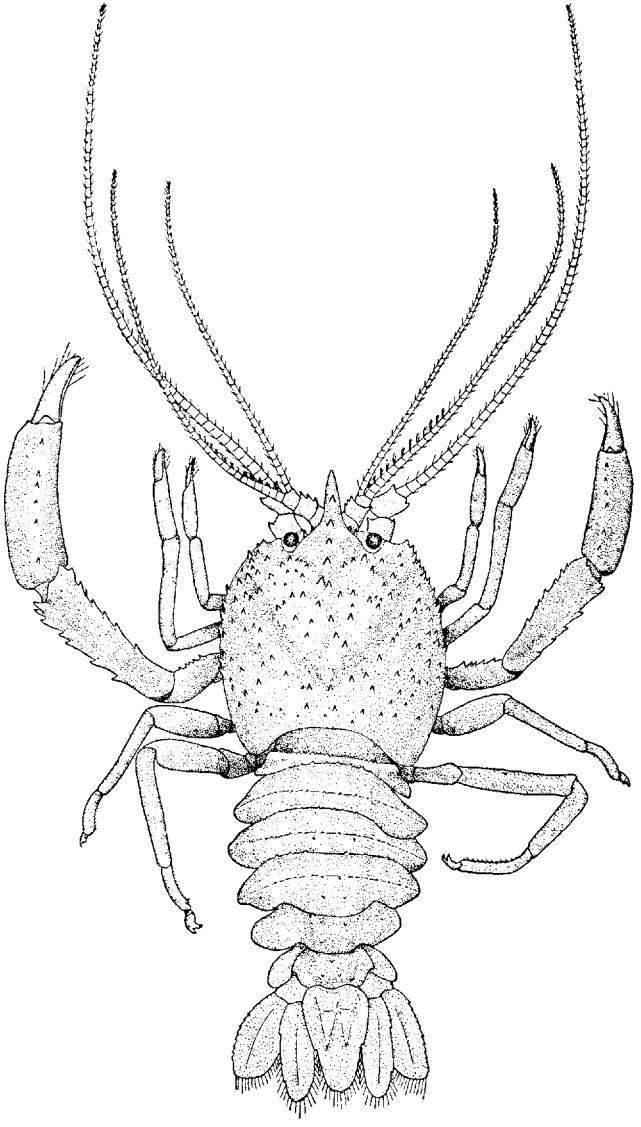

Fig. 2. *Microprosthema scabricaudatum* (Richters), ovigerous female, ×7.5

scattered or it is uniformly smooth without any spinules on the surface. The sixth segment is smooth.

The telson is as long as the uropods, roughly triangular and slightly constricted near the base. The surface is raised in two longitudinal carinae, which end before the posterior margin of the telson; each carina bears a single spine at midway. A pair of spinules is distinctly present at the anterior portion between the dorsal ridges. The posterior margin is roughly truncated, with three spinules, two of them being on both edges and the other between them. The lateral margin bears a spine at midway, which is situated slighly behind the level of the dorsal spine on the longitudinal carina. Marginally the exopod of the uropod has 8 to 11 spines or serrated teeth, and the endopod of the same bears one to three.

The antennular peduncle is spinose, the basal segment having the stylocerite of moderate length. The scaphocerite of the antenna is narrow and long, ending in a sharp point, the outer margin is rather straight and bears at the distal portion two spinules which is, however, sometimes missing; the outer margin is convex and scarcely setose.

The third maxilliped extends beyond the scaphocerite; distally the ischium bears a respective spine on both the outer and the inner margins; the merus is shorter than the ischium, with two strong spines on the outer margin.

The first and the second pereiopods are both smooth without any spines. The third pereiopod is strong; the merus bears about five spines on the inner margin but other portion is smooth. The carpus is distally enlarged, the inner side bearing five to seven spines and the outer side six or seven spines; in addition to this armature three or four spinules are placed slightly inside of the outer side. The propodus is broad, rather thick and swollen, the outer dorsal half being slightly concave; it is wholly smooth on the inner surface but slightly setose on the outer surface; the dorsal surface has a row of 8 to 14 spinules without making crista. The fingers are rather setose and terminate in each a sharp point; each of the fingers bears on its cutting edge a large tooth, that of the movable finger is placed anteriorly to that of the immovable one. The fourth and the fifth pereiopods are similar in shape. The carpus is twice the length of the propodus, which is three times as long as the dactylus and bears about 20 spinules on the inner margin. Both of the carpus and propodus are not subdivided. The dactylus is without setae and distally biunguiculate.

Colour in life: According to Baba's observation, the carapace is wholly yellowish green with red lines along the cervical groove except for the middle portion, and the anterior portion of the carapace and the rostrum (Fig. 2). The abdomen is light seashell pink or yellowish

green with a narrow red stripe on its lateral side. The pereiopods are all light seashell pink, the outer margin of the propodus and the distal portion of the merus are similarly reddish; likewise the fingers are tinged with red on the proximal half or median one-third. Takeda observed that the carapace is uniformly yellowish brown with red markings as in the case mentioned above.

Measurements: The largest specimen that is ovigerous measures 4.9 mm, the smallest 2.7 mm in carapace length including rostrum.

Habitat: All the specimens were, as in the preceding species, taken among the cavities of madreporarian coral. The coral is dead and is not in the tidemarks but on the flat where is exposed at the ebb. In that place this species shares with some of the decapod crustaceans the shelter or abode, such animals are represented by a greenish alpheid, *Alpheus* sp., a porcellanid, *Pachycheles garciaensis* (Ward), and some xanthid crabs, *Actaea cavipes* (Dana), *Liomera bella* (Dana) and *Liomera rugata* (H. Milne Edwards).

Remarks: The carapace length was recorded as 12 mm (Richters, 1880) and 11 mm (Holthuis, 1946), respectively. The present specimens were rather small, the largest of all that bears eggs measures 4.9 mm, being less than a half of the previous measurements. The specific name was derived from the fact that the abdomen was transversely covered with tubercular teeth on each segment. However, such a furnishment in the present material was not so prominent as in the previous statements.

Distribution: This species has been recorded only from two localities with a considerable distance, Mauritius and N. W. New Guinea. The present is the third record and extends its known range far northward to Amami-oshima, one of the Ryukyus.

References

Balss, H. 1915. Die Decapoden des Roten Meeres. I. Die Macruren. Expeditionen S. M. Schiff "Pola" in das Rote Meer. Nördliche und südliche Häfte 1895/96-1897/98. Zoologische Ergebnisse XXX. Berichte der Kommission für Ozeanographische Forschungen. Denkschr. Akad. Wiss. Wien, 91 (suppl.): 1-38, figs. 1-30.

Borradaile, L. A. 1910. No. X.—Penaeidea, Stenopidea, and Reptantia from the Western Indian Ocean. Rep. Percy Sladen Trust Exped. Ind. Ocean 1905, 2: 257-264, pl. 16.

Bouvier, E. L. 1908. Catalogue des Crustacés de la famille des Sténopides des collections du Muséum d'histoire naturelle. Bull. Mus. Hist. nat. Paris, 14: 150-151.

Gravely, F. H. 1927. Orders Decapoda (except Paguridea) and Stomatopoda. The littoral fauna of Krusadai Island in the Gulf of Manaar with appendices on the vertebrates and plants. Bull. Madras Govt. Mus., n. ser. 1 (1): 135-155, figs. 1, 2, pls. 19-26.

Holthuis, L. B. 1946. Biological results of the Snellius Expedition XIV. The Decapoda Macrura of the Snellius Expedition I. The Stenopodidae, Nephropsidae, Scyllaridae and Palinulidae. Temminckia, 7: 1-178, pls. 1-11.

Lanchester, W. F. 1901. On the Crustacea collected during the "Skeat" Expedition to the Malay Peninsula, together with a note on the genus *Actaeopsis*. Part 1. Brachyura, Stomatopoda, and Macrura. Proc. Zool. Soc. London, 1901: 531-574, pls. 33, 34.

Malhadevan, S., K. Rangarajan and C. Sankarankutty 1962. On two specimens of *Microprosthema* sp. (Decapoda Macrura) from Palk Bay. J. Mar. biol. Ass. India, 4 (2): 235-238, figs. 1-5.

de Man, J. G. 1888. Bericht über die von Herrn Dr. J. Brock im indischen Archipel gesammelten Decapoden und Stomatopoden. Arch. Naturg. 53 (1): 215-600, pls. 7-22a.

McNeill, F. A. 1926. The biology of North-West Islet, Capricorn Group. (J) Crustacea. Aust. Zool., 4: 299-318, figs. 1, 2, pl. 41.

McNeill, F. A. and M. Ward 1930. Carcinological notes. No. 1. Rec. Aust. Mus., 17: 357-383, fig. 1, pls. 59-61.

Richters, F. 1880. Decapoda.—K. Möbius, Beiträge zur Meeres Fauna der Insel Mauritius und der Seychellen, 139-178, pls. 15-18.

Stimpson, W. 1860. Prodromus descriptionis animalium evertebratorum, ... Pars VIII. Crustacea Macrura. Proc. Acad. Nat. Sci. Philadelphia, 1860: 91-116.