

**ONYCOCARIS ANOMALA SP. NOV.,
A NEW PONTONIINE SHRIMP
FROM THE NORTHERN TERRITORY,
AUSTRALIA.**

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SUMMARY

A new species of pontoniine shrimp, *Onycocaris anomala* sp. nov., from Port Darwin, Australia, is described and illustrated. The specimens are incomplete but the morphological features of systematic value can be discerned. The specimens, probably associates of sponges, are most closely related to the incompletely known *Typton dentatus* Fujino and Miyake, particularly on account of the characteristic morphology of the endites of the maxilla and first maxilliped, and it is considered probable that further material of *T. dentatus* may indicate that a new genus is necessary for the inclusion of these two species, which are atypical of both *Onycocaris* Nobili and *Typton* Costa, as at present defined.

INTRODUCTION

Through the kindness of Ms. D.E. Brown, it has been possible to examine some pontoniine shrimps from the collections of the Australian Museum, collected in 1929 by A.A. Livingstone from Port Darwin. The detailed examination of these specimens presented several features of unusual interest, preventing an easy assessment of their generic position. The specimens show features found in aberrant species of the genera *Onycocaris* Nobili and *Typton* Costa, both associates of sponges. Typical species of these genera present no problems in identification. In 1969 Fujino and Miyake described *Typton dentatus* from the Ryukyu Islands. This species shows marked resemblances to the present specimens, particularly in the form of the mouthparts, which are atypical for both the genera *Onycocaris* and *Typton*. The two specimens of *T. dentatus* were unfortunately incomplete, and lacked all second pereopods. The second pereopods of the Darwin specimens show some features that are not known in previously described species of *Onycocaris* but are found in some species of *Typton*.

SYSTEMATICS

***Onycocaris anomala* sp. nov.**

MATERIAL EXAMINED. (i) 2 ovigerous ♀♀, between North and South Shell Islands, Port Darwin, Northern Australia, dredged 3-7 fms, 15 July 1929, coll. A. A. Livingstone. AM reg. no. P. 24994.

(ii) 1 ovigerous ♀, as above. AM reg. no. P. 24993.

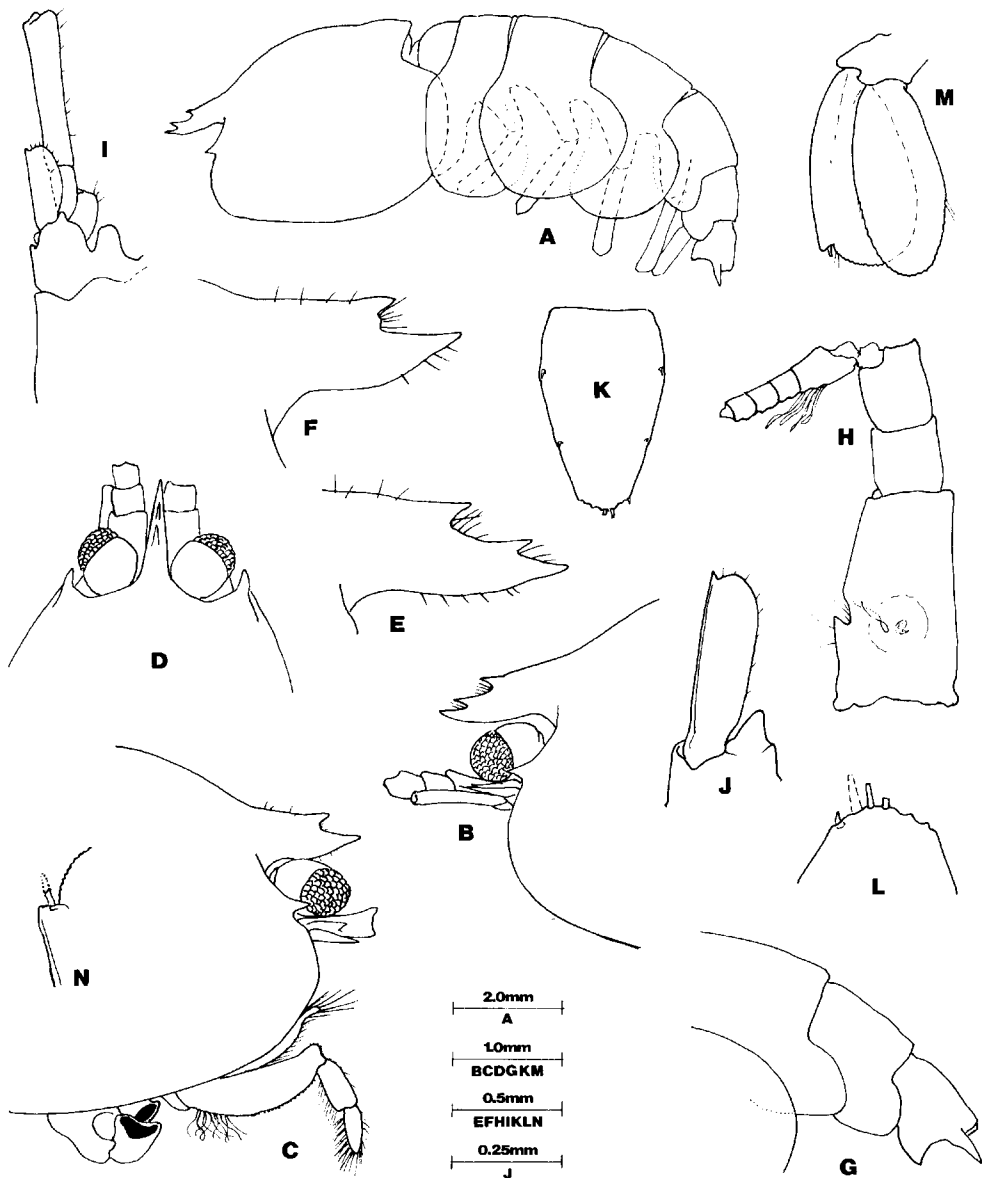


Fig. 1. *Onycocaris anomala* sp. nov. Ovigerous female. A, carapace and abdomen. B, anterior carapace and antennal peduncles. C, anterior carapace, third maxilliped. D, anterior carapace and antennal peduncles, dorsal. E, rostrum. F, rostrum. G, posterior abdomen. H, antennule. I, antenna. J, scaphocerite. K, telson. L, posterior telson spines. M, uropod. N, disto-lateral angle of exopod of uropod. A-B, D-E, G, holotype; C, F, H-N paratypes.

DESCRIPTION. Small, robust, stout bodied pontoniine shrimps, with subcylindrical body form. The carapace is smooth and presents a slightly tumid appearance. The rostrum is short, and moderately depressed, extending to the proximal border of the distal segment of the antennular peduncle. The rostrum tapers distally to an acute tip, with feebly developed lateral carinae. The dorsal margin bears one or two acute teeth on its distal half and the ventral margin is feebly convex and without teeth. Supra-orbital, hepatic and epigastric spines are lacking. The orbit is feebly developed, but an acute

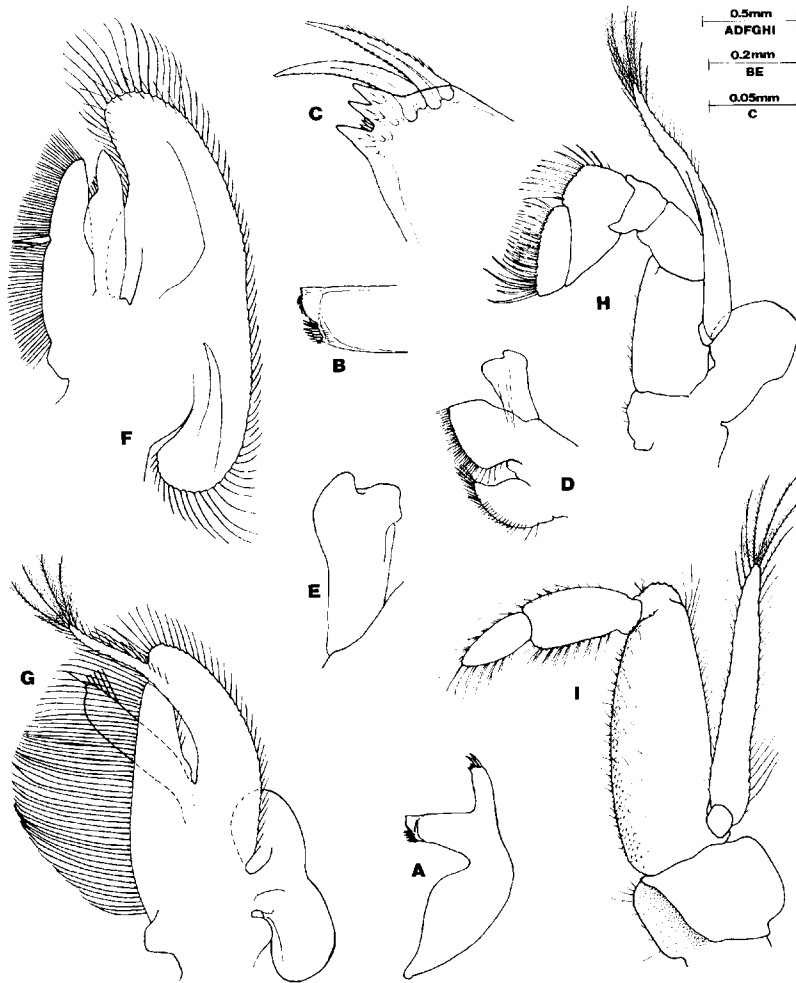


Fig. 2. *Onycocaris anomala* sp. nov. Holotype: A, first pereiopod. B, chela of first pereiopod. Paratype: C, major second pereiopod. D, fingers of major chela, medial aspect. E, fixed finger, distal ventral aspect. F, minor chela. G, fingers of minor chela, lateral aspect. H, fingers of minor chela, medial aspect. Holotype: I, third pereiopod. J, propod and dactyl of third pereiopod. K, propod and dactyl of fifth pereiopod.

tooth lies over the lateral aspect of the eye, slightly above the level of the basicerite. The inferior orbital angle is obsolete. The antero-lateral angle of the branchiostegite is broadly rounded and slightly produced anteriorly. The posterior margin of the branchiostegite is also broadly rounded.

The abdominal segments are smooth. The third tergite is not produced posteriorly. The fifth segment is about as long as the sixth, which is about 1.3 times longer than deep. The postero-lateral angle is long, slender and acute and the postero-ventral angle is large, broad and acute. The pleura of the first three segments are greatly enlarged and rounded. The fourth and fifth pleura are smaller, of almost similar size and also rounded.

The telson is about twice the length of the sixth abdominal segment, broad, about 1.6 times longer than wide, with the greatest width at about one third of the length. The lateral borders are strongly convex, and the width of the posterior margin is a little more than half the width of the anterior border. Two pairs of very small submarginal dorsal spines are present at approximately 0.33 and 0.66 of the telson length. The posterior margin is broadly rounded, without a median point, with three pairs of posterior spines most of which are lost. The lateral spines are very small, similar to the dorsal spines. The intermediate spines are short and stout, equal to about 0.14 of the telson length. The submedian spines are slender, but no complete ones are preserved.

The eyes are well developed, with a hemispherical cornea. The podophthalmite is short and stout, slightly wider than the diameter of the cornea. No accessory pigment spot is discernible.

The antennulae are short and small. The antennular peduncle exceeds the tip of the rostrum by the distal segment. The proximal segment is about 1.7 times longer than wide, with the distal half of the lateral border straight, convergent, to an unarmed disto-lateral angle. The stylocerite is greatly reduced and is represented by a short stout acute process. The statocyst is normally developed with a small statolith. The intermediate segment is slightly longer than wide, about one third of the length of the proximal segment. The distal segment is about 1.3 times the length of the intermediate segment and subequal in width. The flagella are all damaged or missing.

The antenna has a short stout basicerite, unarmed laterally, with a large protuberant aperture for the maxillary gland medially. The ischiocerite and merocerite are normal. The carpocerite is long and slender, reaching to the proximal border of the distal segment of the antennular peduncle, about 4.5 times longer than wide. The flagella are lacking. The scaphocerite is greatly reduced, equal to about half the length of the carpocerite and reaching to about 0.15 of its length. The lamina is about 3.2 times longer than wide, with a straight lateral margin bearing a small acute tooth distally. The anterior margin is rounded, and scarcely exceeds the tip of the disto-lateral spine. The anterior and medial margins are only feebly setose.

The mandible has a robust corpus and is without a palp. The molar process is stout, tapering slightly distally, with a truncated distal end, with large blunt teeth anteriorly and some short setae posteriorly. The incisor process is rather feeble, with three small acute teeth distally. Some small spinules are present between the medial and intermediate teeth. On the disto-lateral extremity two large setulose spines are present.

The maxillula has a short blunt bilobed palp, with the stouter medial lobe devoid of setae. The upper lacinia is short and broad, with numerous short setae forming a fringe along the medial border. The lower lacinia is robust, distally pointed, also with a fringe of short setae along its lower border.

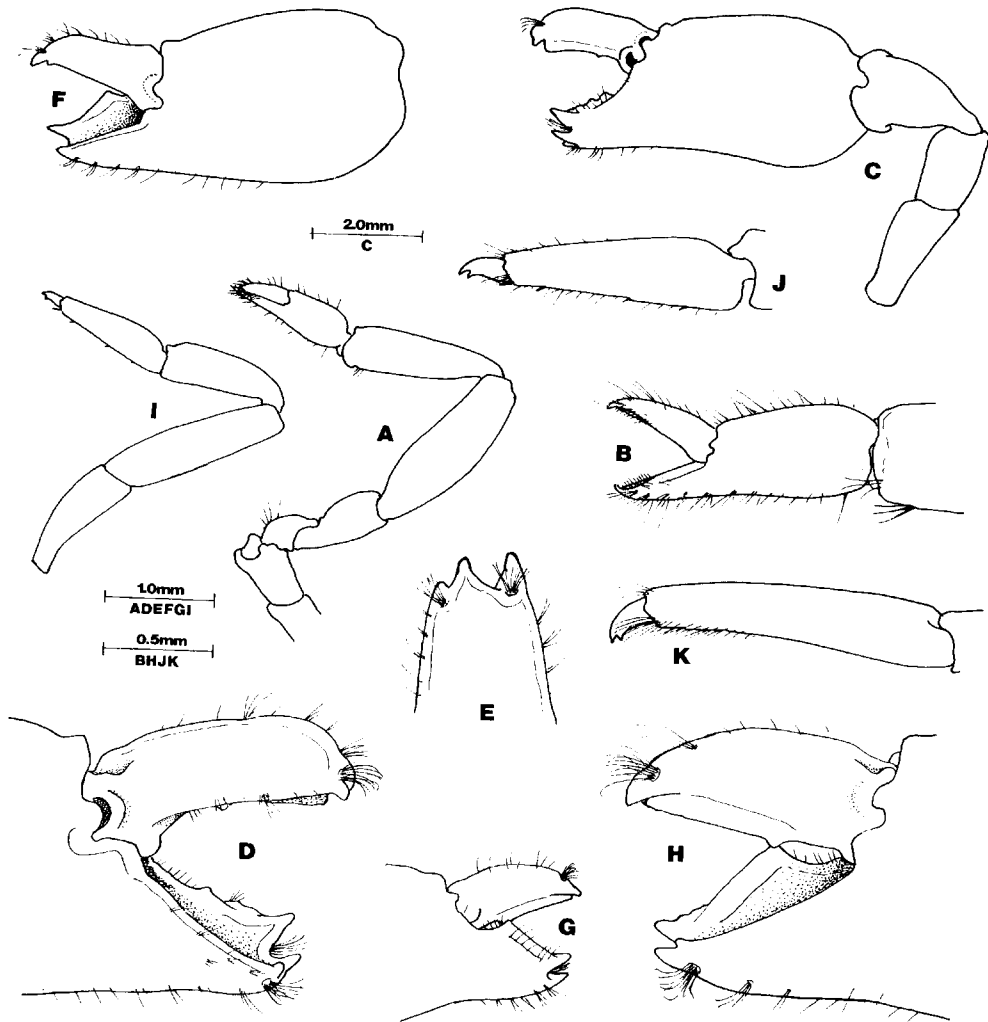


Fig. 3. *Onyccaris anomala* sp. nov., ovigerous female, paratype. A, mandible. B, molar process. C, distal incisor process. D, maxillula. E, palp of maxillula. F, maxilla. G, first maxilliped (flattened). H, second maxilliped. I, third maxilliped.

The maxilla has a stout, centrally swollen palp, with a few preterminal setae on the medial border. The endite is greatly elongated, strongly bowed and oriented at right angles to the plane of the exopod, and narrow, reaching almost to the level of the tip of the palp, with a small notch half way along the medial border, and with a small rounded lobe proximally. The medial border bears a well developed fringe of uniform slender setae, except on the proximal lobe. The scaphognathite is long, about 2.8 times longer than wide, with a well developed narrow posterior lobe and a broad, medially concave anterior lobe.

The first maxilliped has a stout subcylindrical palp with several setae disto-medially. The basal endite is narrow and greatly elongated, reaching almost to the tip of the palp, strongly bowed and oriented at right angles to the exopod. The medial border is entire and provided with a fringe of long slender setae, with shorter setae on the disto-lateral border. The coxal endite is small, rounded and without setae. The exopod is well developed, with a long narrow caridean lobe and a short, slender flagellum. The flagellum bears four long plumose terminal setae and is also provided with short setae along its medial and lateral borders. A large bilobed epipod is present.

The second maxilliped is normal. The distal segment is small, about 2.5 times longer than wide, with several rows of spines along the medial border. The penultimate segment is large, with a well developed disto-medial angle bearing 11-12 long spines. The carpus, merus and ischio-basis present no special features. The exopod has a well developed flagellum, 4-6 long plumose distal setae, with shorter setae along medial and lateral borders. The coxa is not produced medially and a large simple, distally rounded epipod, without a podobranch, is present laterally.

The third maxilliped has the ischio-merus and basis completely fused to form a single segment. This antepenultimate segment is about 3.0 times longer than wide, strongly bowed, tapering distally with a straight lateral border, and a feebly convex medial border. The lateral margin bears numerous short slender setae. The medial margin is sparsely setose, but the ventral medial aspect bears numerous small sub-spherical tubercles throughout its length. The penultimate segment is not attached terminally but arises from a preterminal ventro-medial position. The distal margin of the antepenultimate segment is rounded and bears tubercles similar to those of the medial border. The penultimate segment is robust, moderately compressed, about twice as long as wide and about 0.4 of the length of the antepenultimate segment. The ventral aspect bears small rounded tubercles and numerous groups of slender setae. The terminal segment is about 0.6 of the length of the penultimate and about 2.2 times longer than wide, with numerous groups of setae. The exopod is well developed, broad, exceeding the length of the antepenultimate segment, with long plumose setae distally and short setae along its medial and lateral margins. The coxal segment is broad, strongly compressed and dorsally excavate, but not produced medially and with a low elongated epipod laterally. There is no arthrobranch.

The first pereopods are normal. The chela has a subcylindrical, slightly compressed and distally tapering palm, about 1.8 times longer than deep. The fingers are slender, tapering, about 0.65 of the palm length, with small hooked tips and a sharp cutting edge along the distal halves of the opposing edges only. The palm and fingers bear numerous fine setae. The carpus is about 1.4 of the length of the chela, 3.6 times longer than wide, moderately enlarged distally and with a small group of cleaning setae disto-ventrally. The merus is about 1.15 times the length of the carpus, 3.3 times longer than wide and markedly narrowed proximally. The ischium is a little less than half the length of the basis, 2.2 times longer than wide and 1.5 times the length of the basis. The coxa is without a medial ventral process.

The second pereopods are well developed with large, stout, smooth, and unequal chelae. The palm of the major chela is strongly compressed, about 1.5 times longer than deep, with the ventral border feebly concave. The fingers are robust, equal to about half the palm length. The dactylus is moderately compressed, but thickened ventrally, with a stout cutting edge bearing a small acute tooth at one third of its length. A deep notch separates the distal end of the cutting edge from the slightly swollen anterior end which bears a short, blunt hooked tip. A well marked dactylar fossa is present proximally. The fixed finger is stout and broad, deeply grooved throughout its length to receive the thickened cutting edge of the dactylus. The distal end bears a large hooked tooth on each side of the groove, with a smaller additional tooth medially. The largest tooth is on the lateral edge and a few low irregular teeth are also present on the distal half of this margin. The carpus is about twice as long as wide, a little less than half the palm length, broadly expanded distally and unarmed. The merus and ischium are unarmed. The merus is about 0.4 of the palm length, and 1.4 times longer than wide. The ischium is about 0.5 of the palm length, 1.4 of the merus length and 2.3 times longer than wide. The basis and coxa are stout and present no special features. The chela of the minor second pereopod is about half the length of the first. The palm is strongly compressed, about 1.4 times longer than deep, tapering distally and with a convex or straight ventral border. The dactylus is about 0.6 of the palm length, 2.5 times longer than deep, with a blunt hooked tip and a straight cutting edge bearing a single small tooth at one third of its length, and with a small notch between the distal end of the cutting edge and the tip. The fixed finger is deeply channeled throughout its length to receive the cutting edge of the dactylus. The raised edges of the groove end in large teeth separated by a deep notch. The medial edge is unarmed and feebly concave. The lateral side is elevated to form a large triangular tooth, which opposes the edge of the dactylus with a shearing action. The carpus, merus and ischium are similar to the major pereopod, but smaller.

The ambulatory pereopods are normally developed, and mainly detached. The third (?) has a short, stout biunguiculate dactylus. The unguis is distinct and slightly larger than the accessory spine. The corpus is compressed, about 1.75 times longer than deep, tapering distally and with a series of five accessory setae disto-ventrally. The ventral border bears a series of about 9 small subacute denticles. The propod is about 4.7 times the length of the dactylus, 3.5 times longer than wide, 2.1 times as wide proximally as distally, with a single large spine disto-ventrally and three small spines along the ventral border. The carpus is unarmed, subequal to the length of the propod. The merus is 1.5 times the propod length and 4.0 times longer than wide. The ischium is subequal to the propod length, 3.1 times longer than wide, and distinctly narrowed proximally. Both merus and ischium are unarmed. The fifth pereopod is similar. The dactylus is of similar length, biunguiculate, with ten small denticles ventrally on the carpus. The propod is 1.3 times the length of that of the third pereopod, 4.8 times longer than wide, tapering gradually distally, with numerous setae disto-ventrally but without any spines.

The pleopods are detached. The uropods have a short, stout unarmed protopodite. The exopod is about twice as long as wide, with a strongly convex lateral border, ending in a small blunt tooth, with a slender mobile spine medially. The endopod is subequal to the length of the exopod, which it slightly exceeds, and is about 2.2 times longer than wide.

The ova are numerous and small.

TYPES. The ovigerous female with the bidentate rostrum, P. 24994, is designated as the holotype, the other two females as paratypes. The specimens are deposited in the collections of the Australian Museum.

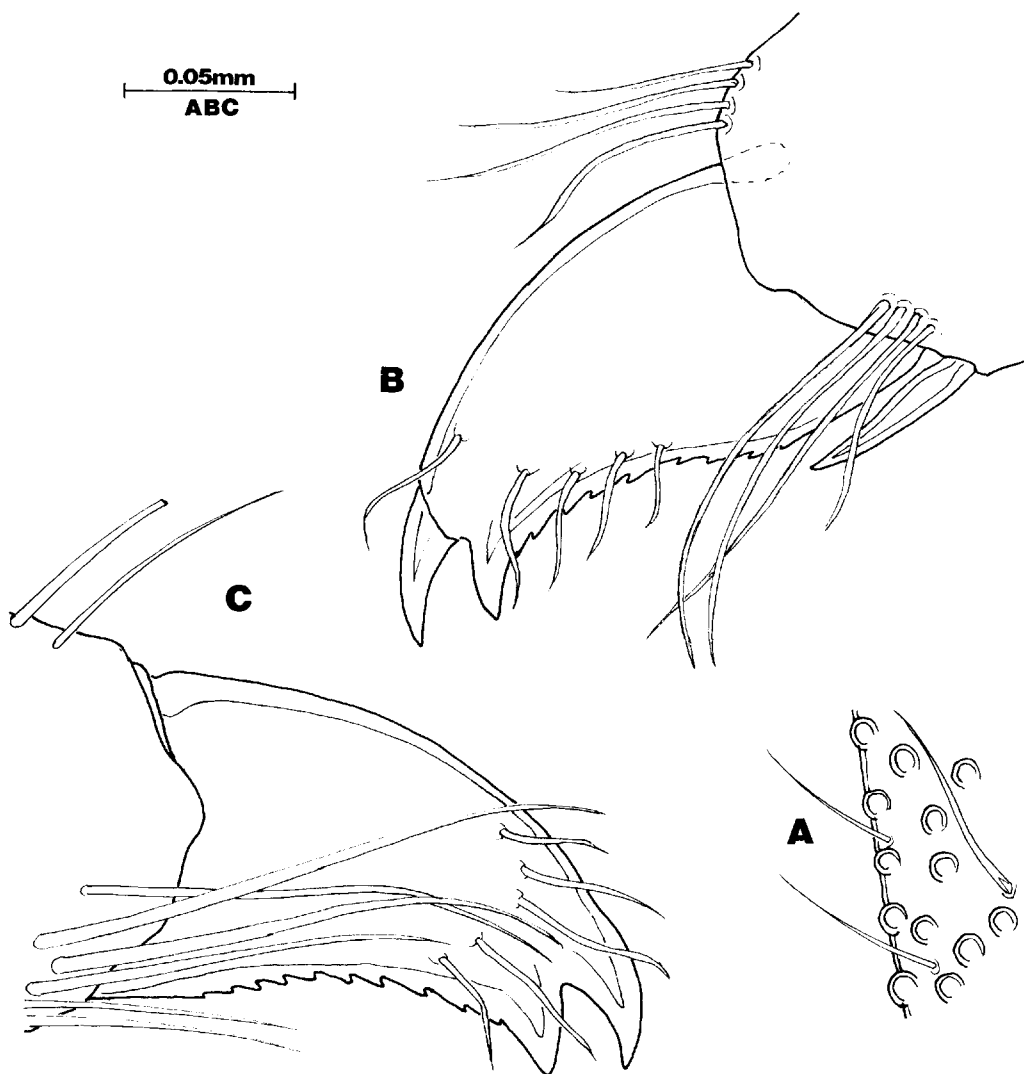


Fig. 4. *Onycocaris anomala* sp. nov., ovigerous female, holotype. A, antepenultimate segment of third maxilliped, ventro-medial margin. B, dactyl of third pereopod. C, dactyl of fifth pereopod.

MEASUREMENTS.

(In mm)	Holotype	Paratype (i)	Paratype (ii)
Post-orbital carapace length	3.8	4.0	3.7
Major chela	—	6.0	—
Minor chela	—	3.3	—
Length of ovum	—	1.0	—

REMARKS. There is no data available on coloration, host or habitat. The label records that the specimens were found amongst dead coral and sponges and it is probable that they were associated with the latter.

Only one pair of second pereiopods are preserved from the three specimens. These appear to be a pair and are provisionally attributed to the larger paratype specimen. The ovigerous female paratype specimen has only a single dorsal rostral tooth. From its appearance, it is likely that this rostrum may be slightly abnormal, with less than its full dentition. The rostrum of the second paratype female is largely missing and the dentition unknown, but from the length of the stump, is unlikely to have exceeded two teeth.

The Systematic Position of *Onycocaris anomala* sp. nov.

The three specimens are considered to belong to the genus *Onycocaris* Nobili on account of the morphology of the chelae of the second pereiopods. Eleven species have so far been referred to this genus and a key to these has been provided by Bruce (1978). From this key *O. anomala* appears to be most closely related to *O. seychellensis* Bruce, and *O. zanzibarica* Bruce, both species with dorsally dentate rostra. *Onycocaris anomala* may be readily separated from both these species by the form of the chelae of the second pereiopods, especially the characteristic dentition of the fingers. In both species the cutting edge of the dactylus is multidentate and neither has a shearing mechanism on the fingers of the minor chela.

DISCUSSION

The true systematic position of *Onycocaris anomala* is obscure, as it presents some marked morphological differences from the other species of the genus, including *O. seychellensis* and *O. zanzibarica*, to which it shows most resemblance. The most note-worthy differences are in the maxilla and first maxilliped, which show a most marked resemblance to those of *Typton dentatus* Fujino and Miyake, 1969. The mouthparts of this species of the genus *Typton* are also markedly different from all other known species of its genus. In view of the very close resemblance of these appendages, *O. anomala* and *T. dentatus* must be considered as very closely related.

In their general morphology, the two species show great similarity, but unfortunately the second pereiopods of *T. dentatus*, which would provide most useful additional information on the relationship of the two species to the genera *Onycocaris* and *Typton*, are not known. The two may be readily separated at species level by the following features:

O. anomala sp. nov.

1. Rostrum with 1-2 small dorsal teeth.
2. Proximal segment of antennular peduncle without acute disto-lateral spine.
3. Scaphocerite normal but small, with distinct disto-lateral tooth distinctly exceeding proximal end of carpocerite.
4. Incisor process of mandible distally tridentate, with two long spines.

T. dentatus Fujino & Miyake

- Rostrum with 3 large dorsal teeth.
 Acute disto-lateral spine present on proximal segment of antennular peduncle.
 Scaphocerite rudimentary, barely reaching proximal end of carpocerite, without disto-lateral tooth.
 Incisor process of mandible bidentate, without long spines.

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| 5. Antepenultimate segment of third maxilliped ventro-medially tuberculate. | Antepenultimate segment of third maxilliped non-tuberculate. |
| 6. Third pereopod with disto-ventral and ventral propod spines. | Third pereopod with disto-ventral spines only. |
| 7. Corpus of ambulatory pereopod dactylus with 9-10 denticles ventrally. | Corpus of ambulatory pereopod dactylus with 3-4 denticles. |
| 8. Telson with small dorsal spines at approximately 0.33 and 0.66 of length. | Telson with minute dorsal spines at approximately 0.5 and 0.75 of length. |

T. dentatus was referred to the genus *Typton* by Fujino and Miyake on account of the marked reduction of the scaphocerite, despite the fact that the rostrum was strongly dentate, whereas it is simple in all other species. Holthuis's (1951) definition of the genus was amended by them to include this form. The marked differences in the mouthparts from other *Typton* species was not discussed.

O. anomala is provisionally referred to the genus *Onycocharis*, despite the marked differences in mouthparts, on account of the chelae of the second pereopods, which are high and compressed (Holthuis 1952, 1956), with a deeply bifid tip to the fixed finger, much as is found in several species of *Onycocharis*. The minor chela, however, shows a large triangular tooth on the outer aspect of the fixed finger, with a shearing dactylus, features not found in other species of *Onycocharis* but reported in some species of *Typton*, i.e. *T. bawii*, of which only the minor chela is known (Bruce, 1972).

The marked differences in the maxillae and first maxillipeds of the two species *O. anomala* and *T. dentatus* from the other species of their genera imply that a distinct difference in their feeding strategy has been evolved. The dense extensive fringes of uniform setae suggest a filtering or sweeping function for these appendages. The relatively strongly setose exopods of the maxillipeds in *O. anomala* may indicate the possibility of a feeding current being created, but these are not indicated in Fujino and Miyake's description of *T. dentatus*. If further specimens of *T. dentatus* are obtained with second pereopods similar to those of *O. anomala*, and not typical of *Typton* spp., it would suggest that the two species should be removed from their present genera and placed in a genus of their own.

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