

## Deep-Sea Galatheidean Crustacea (Decapoda, Anomura) Taken by the R/V *Soyo-Maru* in Japanese Waters

### I. Family Chirostylidae

By

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(Communicated by Kiyoshi ASANUMA)

### Introduction

The present material, made available by Dr. M. TAKEDA, was collected with beam trawl by Dr. T. OKUTANI on board the R/V *Soyo-Maru* of the Tokai Regional Fisheries Research Laboratory, Tokyo, during the years 1959–1974 in deep waters of three major regions, i.e., 1) around the Izu-shoto (Izu Islands) from the southern part of Sagami Bay southward to near Torishima, 2) Kumanonada east of Kii Peninsula, and 3) south of Kyushu around Tokara-gunto and west of Osumi-gunto. Of the 64 specimens here included three have been taken from the abyssal depths below 3,000 m, 32 from the bathyal and 29 from the transitional; they are divided among 20 species: 11 of Chirostylidae and 9 of Galatheidae. For the lack of deep-sea explorations it is not surprising that seven species proved new to science and eight to be newly added to the Japanese fauna. Excluded from here are three specimens of the Galatheidae, two of which are abyssal and seem to be new each but both are broken and undescrivable, and the remaining one is identified with *Munidopsis trachynotus* (ANDERSON), which is apparently new to the fauna of Japan; unfortunately, however, biological data are absent from the label.

Inasmuch as no sufficient records are available to allow discussion of the deep-sea chirostylid and galatheid faunas, only the brief account of the distribution of the species here treated is given. Of the eight species newly recorded herein, two (*Munidopsis rostrata* and *M. antonii*) occur in both the Atlantic and the Indopacific, both being unexceptionally abyssal or bathyal; and the remaining six (*Uroptychus nigricapillis*, *U. nanophyes*, *U. sibogae*, *Munida proxima*, *Munidopsis ciliata* and *M. valdiviae*) are known from the Malayan region and/or the Indian Ocean, as also are the three known species included in this paper (*Uroptychus scambus*, *U. scandens* and *Munida andamanica*). One lower bathyal and one abyssal forms (*Munidopsis ciliata* and *M. subsquamosa*) show amphi-Pacific connections; this may be a reflection of their occurrence in greater depths, as previously mentioned of the deep-sea decapod crustaceans that the East Pacific Barrier has comparatively little influence on the distribution of

the purely abyssal benthal forms whereas it is a considerable barrier for the archi-benthal species (EKMAN, 1953: quoted from BALSS (1925)).

If all previously recorded specimens are correctly identified, *Uroptychus nigricapillis* seems to be the only eurybathic chirostylid, as has been taken between 66 and nearly 2,000 m; a few such cases, not included in this collection, are also known in the Galatheidae.

Because of the difficulty of printing this paper will be divided into two parts. The first part will contain the species account of the Chirostylidae and the second part the Galatheidae.

All the specimens here reported are deposited in the National Science Museum, Tokyo (NSMT).

I thank Drs. Takashi OKUTANI and Masatsune TAKEDA of the National Science Museum, Tokyo, for making this collection available to me. I am indebted to Dr. Fenner A. CHACE, Jr. of the Smithsonian Institution, Washington, D.C., for allowing me to have access freely to the identified specimens deposited there; Dr. R. W. INGLE of the British Museum (Natural History), London, for the loan of the syntypes of *Uroptychus spinimarginatus*; and Dr. J. H. STOCK of the Zoological Museum, Amsterdam, for providing facilities to examine the chirostylid specimens of the *Siboga* collection.

#### Family Chirostylidae

##### *Eumunida dofleini* GORDON, 1930

(Fig. 1)

*Eumunida dofleini* GORDON, 1930: 750, figs. 11a, 12a (type-locality: Sagami Bay).

*Eumunida smithii*: BALSS, 1913: 21 (in part).

*Material.* *Soyo-Maru* Sta. 59; 35°05.35' N, 139°18.65' E; 550 m; 27 Nov. 1960 — 1 ovig. ♀. *Soyo-Maru* Sta. T10; 35°04.8' N, 139°11.1' E; 425 m; 27 Jul. 1974 — 1 ovig. ♀. *Soyo-Maru* Sta. B2; 33°55.1' N, 140°00.5' E; 860–870 m; 1 Dec. 1968 — 1 ovig. ♀.

*Measurements.* Carapace lengths of ovigerous females, 33.0–42.0 mm; diameters of ova, 0.47–0.55 mm.

*Remarks.* The specimens listed above represent the first subsequent record since GORDON (1930) described this species based upon two females from the specimens of *E. smithii* misidentified by BALSS (1913).

In addition to GORDON's definition of the species it is here noted that the transverse ridges of the carapace are indistinctly elevated. The sternum of the fourth thoracic somite, which is usually unarmed laterally, bears a tubercular process at the mid-lateral margin on the right side only, in a female from Sta. 59. The merus of the third maxilliped is as described by GORDON for the sp<sup>1</sup>; but, the sp<sup>2</sup> varies from complete absence to a moderately developed spine. The propodal anterior marginal spine



Fig. 1. *Eumunida dofeini* GORDON, ovigerous female from *Soyo-Maru* Sta. T10, 1974, carapace length, 42.0 mm.

of the walking leg said to be present only on the first leg (GORDON, l.c.), is variably present also on the second leg, or totally absent from all legs.

*Distribution.* Previously known from Sagami Bay. The bathymetric range is now recorded between 425 and 870 m.

*Uroptychus okutanii* n. sp.

(Figs. 2-3)

*Material.* *Soyo-Maru* Sta. B3; 33°05.7' N, 140°01.5' E; 455 m; 3 Jun. 1962 — 1 ♂. *Soyo-Maru* Sta. B3; 33°00.5' N, 140°03.5' E; 510 m; 15 Nov. 1960 — 1 ♀, holotype, NSMT-Cr. 6170.

*Diagnosis.* Belonging to *Uroptychus spinimarginatus* group. Body entirely covered with fine setae. Rostrum comparatively broad, nearly as long as remaining carapace, laterally unarmed but few rudimentary distal denticles. Carapace devoid of distinct dorsal spines, armed with medium-sized lateral marginal spines. Eyes short, relatively large, cornea partly concealed beneath rostrum. Third segment of antennal peduncle produced disto-internally. Merus and carpus of 3rd maxilliped spinose marginally. Third thoracic sternum moderately depressed, anterior margin deeply concave with further U-shaped notch separating 2 median spines.

*Description of holotype.* Carapace excluding rostrum broader than long, dorsally convex weakly, covered with short fine setae, with median transverse groove between gastric and cardiac regions. No gastric spines. Lateral margins diverging posteriorly, with 10 or 11 medium-sized spines including anterolateral one, and another few small spines anteriorly, especially on hepatic region, and below level of marginal line in posterior half.

Rostrum relatively long and broad, nearly as long as remaining carapace, almost horizontal, dorsally flattish and setose like carapace, ventrally carinate; lateral margin unarmed but rudiments of few notches in distal 1/3 of length.

Upper orbital margin narrow, outer angle produced; eyes short, cornea comparatively wide, partly concealed beneath rostrum.

Abdomen also covered with fine setae.

Pterygostomian flap minutely tuberculate, anteriorly produced into acute spine curving slightly dorsad.

Antennule comparatively small, flagellum falling short of rostral tip; distal 2 segments armed with terminal spine each; antennal scale as broad as peduncle, extending beyond midlength of ultimate peduncular segment; basis proximal to scale not produced; 3rd segment produced disto-internally.

Third maxilliped setose; ischium roundly produced at disto-inner margin; inner toothed ridge with rudimentary denticles; merus with 4 spines in distal half of inner margin and disto-mesial spine; carpus also with 2 or 3 spinules slightly ventral to outer margin and barely discernible for setae.

Sternum covered with fine setae; 3rd thoracic sternum moderately depressed, anterior margin deeply concave, with U-shaped median notch separating 2 median spines; anterolateral angle acute; lateral margin oblique with 1 or 2 minute processes; 4th thoracic sternum lacking transverse ridge, lateral margin denticulate with moderate-sized spine at distal end.

Chelipeds detached and missing.

Only one walking leg, presumably 1st leg, detached from body; entirely covered with fine setae; merus armed with about 12 low, anterior marginal and 2 posterior marginal spines; both terminals moderate in size; carpus 0.7 as long as propodus; propodus slightly curving inward, posterior margin thickly furnished with much longer setae; dactylus relatively short, less than half of propodus, indistinctly curving inward, armed with terminal spine; posterior margin particularly setose.



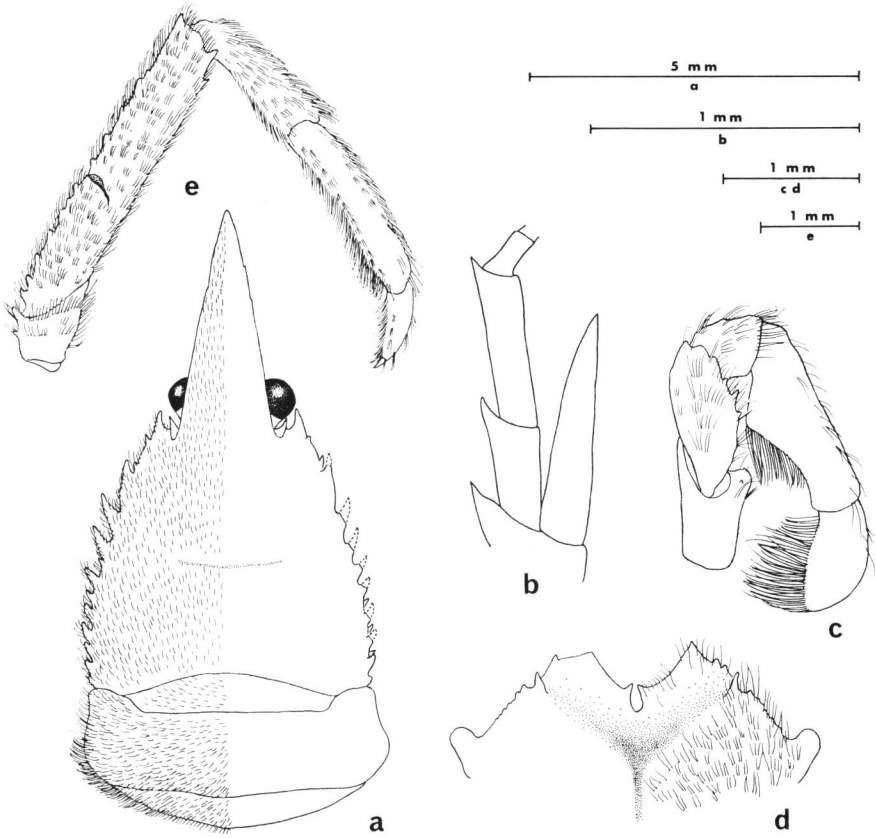


Fig. 2. *Uroptychus okutanii* n. sp., female holotype. — a, carapace and abdomen, fine setae omitted from right half; b, left antennal peduncle; c, endopod of right 3rd maxilliped; d, anterior part of sternal segments; e, right walking leg detached from body.



Fig. 3. *Uroptychus okutanii* n. sp., male paratype. — a, right antennal peduncle; b, endopod of left 3rd maxilliped.

*Description of paratype.* The male paratype with the carapace partly broken is larger than the female holotype; rostrum slightly shorter than remaining carapace but much broader relatively; lateral margin of carapace more or less convex, with 6 spines behind indistinct cervical groove; antennal peduncle with much stouter terminal spine on each of distal 2 segments, basis proximal to scale with produced spine; spination of 3rd maxilliped much more pronounced, marginal spines of propodus clearly discernible.

*Measurements of holotype.* Length of carapace including rostrum, 7.0 mm; breadth of carapace, 4.2 mm.

*Measurements of paratype.* Carapace length of male, 7.7 mm.

*Remarks.* The absence of posterior marginal spines from the dactylus of the only one detached walking leg, presumably the first leg, displays that this species belongs to the *Uroptychus spinimarginatus* group (BABA, 1977 a). The pilose body seems close to that of *U. mortenseni* VAN DAM from the Kei Islands and Manado Bight, but the rostrum is relatively broader and the eyes are not elongate, partly hidden beneath the rostrum in this species. Another closer relative is *U. spinimarginatus* HENDERSON from the Kermadec Islands and south of the Philippines. Due to the brevity of the species account (HENDERSON, 1885, 1888), one male and one ovigerous female syntypes of *U. spinimarginatus* from the Kermadec Islands were borrowed from the British Museum (Natural History), examination of which led us to believe that this species is distinct in the following particulars: 1) Lateral spines of the carapace, excluding anterolateral one and a few following spinules, are located in the proximal 4/5 of the margin whereas in *U. spinimarginatus* these spines are relatively much larger and are present further backward, in proximal 3/5 of the margin; 2) distal two segments of the antennal peduncle bear a strong terminal spine instead of being unarmed or minutely produced only on the penultimate segment as in *U. spinimarginatus*; and the third segment proximal to penultimate segment is acutely produced in the new species.

*Type-locality.* Off the east coast of Hachijo-jima (33°00.5' N, 140°03.5' E); 510 m.

### *Uroptychus nigricapillis* ALCOCK, 1901

(Fig. 4)

*Uroptychus nigricapillis* ALCOCK, 1901: 283, pl. 3, fig. 3 (type-locality: Andaman Sea); ALCOCK & MCARDLE, 1902: pl. 56, fig. 3; Laurie, 1926: 123; VAN DAM, 1933: 26; -1940: 98, fig. 2; TIRMIZI, 1964: 390, figs. 4, 5.

*Material.* *Soyo-Maru* Sta. 104; 31°12.0' N, 131°42.4' E; 1,125 m; 10 Feb. 1973 — 1 ♀.

*Measurements.* Carapace length of female without eggs, 12.0 mm.

*Remarks.* The female, bearing a rhizocephalan parasite, agrees with the account of this species previously noted as highly variable in the spination of the carapace, in size and shape of the rostrum, in the relative length of the antennal scale and in

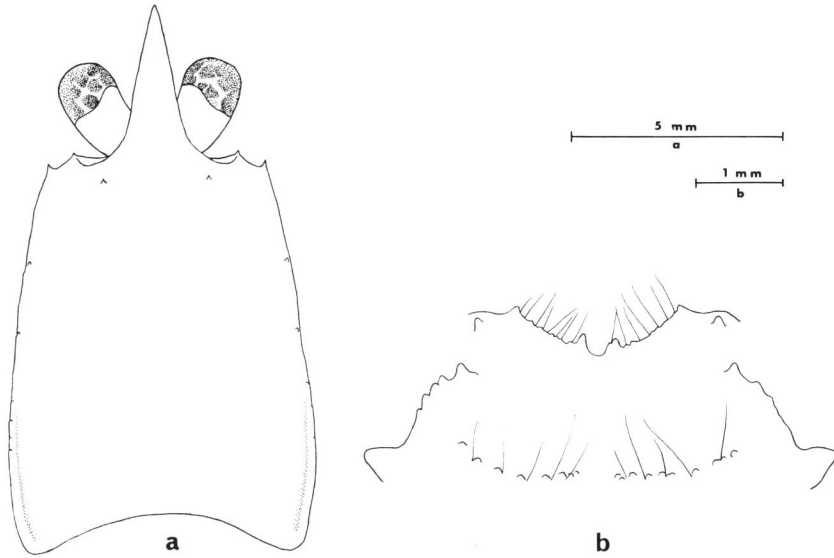


Fig. 4. *Uroptychus nigricapillis* ALCOCK, female from *Soyo-Mar* Sta. 104, 1973. —a, carapace; b, anterior part of sternal segments.

the armament of the sternal segments (TIRMIZI, 1964). The anterior margin of the third thoracic sternum bears two median processes separated by a shallow, indistinct notch, instead of a deep one as described for the *John Murray* material (TIRMIZI, l.c.). Only the right second walking leg remains undetached from the body; the dactylus bears 9 posterior marginal spines which decrease in size toward the base of the segment, excluding the ultimate one which is broken and lost but supposed to be as large as the penultimate judging from the pit.

*Distribution.* Previously known from the Andaman Sea, Java Sea, west of Makassar Strait, south Arabian coast, Saya de Malha Bank, Maldives, and Zanzibar area; in 66–1,939 m. The range is now extended further west and north to Japan.

#### *Uroptychus nanophyes* McARDLE, 1901

(Fig. 5)

*Uroptychus nanophyes* McARDLE, 1901: 525 (type-locality: northeast coast of Sri Lanka); ALCOCK & McARDLE, 1902: pl. 57, figs. 1, 1a; VAN DAM, 1940: 96, fig. 1.

*Uroptychus sexspinosus* BALSS, 1913: 27, fig. 21 (type-locality: Okinose, Sagami Bay).

*Material.* *Soyo-Mar* Sta. B2; 34°42.5' N, 139°58.0' E; 440 m; 30 Jun. 1966 — 1 ♀ without eggs. *Soyo-Mar* Sta. B3; 33°10.8' N, 140°03.8' E; 490 m; 1 Dec. 1968 — 1 ovig. ♀. *Soyo-Mar* Sta. B3; 33°09.0' N, 140°02.1' E; 475 m; 11 Nov. 1971 — 1 ovig. ♀. *Soyo-Mar* Sta. B3; 33°06.5' N, 140°04.8' E; 490–495 m; 12 Dec. 1963 —



Fig. 5. *Uroptychus nanophyes* McARDLE, female from *Soyo-Maru* Sta. B3, 1960. — a, carapace; b, distal segments of 1st walking leg.

1 ovig. ♀. *Soyo-Maru* Sta. B3; 33°00.5' N, 140°03.5' E, 510 m; 15 Nov. 1960 — 1 ♀ without eggs.

*Measurements.* Carapace lengths of ovigerous females, 11.4–13.2 mm; of non-ovigerous females, 8.0, 12.6 mm; diameter of ovum, 1.0 mm.

*Remarks.* The spinules on the carapace, first supposed to be much numerous in the male (McARDLE, 1901) but latter noted as also present in the female (van DAM, 1940), are widely variable in number in only four female specimens examined; however, the anterior gastric row is constantly present, even in less spinose specimens. The lateral margin of the rostrum now bears four to seven spinules instead of three or four as in the original account, which spinules, however, tend to be reduced in size in two specimens.

The following addition is made to the description of this species: Distal 2 segments of antennal peduncle with strong terminal spines; basis produced at outer distal margin; antennal scale reaching end of ultimate peduncular segment. Dactylus of walking leg indistinctly curving inward; posterior margin with about 12 spinelets including terminal one, penultimate stouter, remaining spinelets ending in blunt point.

*Uroptychus sexspinosus* BALSS known from the male holotype from Sagami Bay is undoubtedly identical with this species. BALSS (1913) inadvertently overlooked the *Investigator* species; the given two allies are from the Gulf of Panama and the West Indies, and both are much far distantly related to his species. Minor differences between this material and BALSS' description, such as no distinct rostral lateral spine in *U. sexspinosus*, may in all probability fall within the limits of variation.

*Distribution.* Previously known from off Sri Lanka, the Java Sea and Sagami Bay, Japan, in 66–926 m.

*Uroptychus sibogae* VAN DAM, 1933

(Fig. 6)

*Uroptychus sibogae* VAN DAM, 1933: 28, figs. 39–41 (type-locality: west of Manado, Celebes).

**Material.** *Soyo-Maru* Sta. B3; 33°10.3' N, 140°01.7' E; 480 m; 13 Feb. 1966 — 1 ovig. ♀. *Soyo-Maru* Sta. B3; 33°08.7' N, 140°02.0' E; 480 m; 29 Jun. 1969 — 1 ovig. ♀. *Soyo-Maru* Sta. B3; 33°07.6' N, 139°58.5' E; 430 m; 5 Jul. 1967 — 1 ♂, 3 ovig. ♀. *Soyo-Maru* Sta. B3; 33°06.5' N, 140°04.8' E; 490–495 m; 12 Dec. 1963 — 1 ♀ without eggs.

**Measurements.** Carapace length of male, 7.2 mm; of ovigerous females, 8.4–10.6 mm; of non-ovigerous female, 9.3 mm; diameters of ova, 1.1–1.3 mm.

**Remarks.** The combination of the characters, such as the elongate eyestalk almost reaching to the end of the rostrum, the lateral margin of the carapace with a distinct spine at the end of the cervical groove, and the anterior margin of the third thoracic sternum medially greatly concave with an U-shaped, deep notch separating two median spines, displays that there is no confusion about the identity with *U. sibogae*. Following addition not included in the original account is made to the description of this species, also on examination of the male holotype now deposited in the Zoological Museum, Amsterdam: Distal 2 segments of antennal peduncle unarmed; basis indistinctly produced; antennal scale extending beyond midlength of, but, falling short of end of, ultimate peduncular segment. Cheliped massive, lacking processes or spines on surface; chela as described by VAN DAM (1933); palm as long as wrist. Walking legs moderately depressed, sparsely furnished with long coarse setae, especially propodus; merus and carpus unarmed; propodus with 9 posterior marginal spinelets;

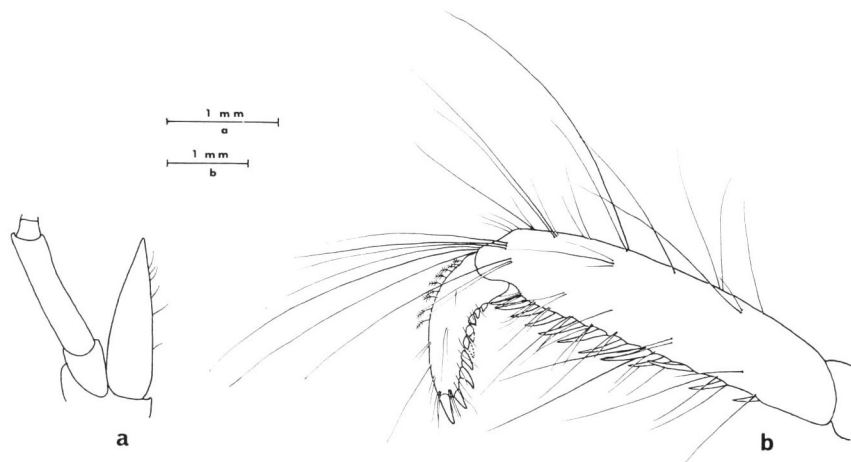


Fig. 6. *Uroptychus sibogae* VAN DAM, ovigerous female from *Soyo-Maru* Sta. B3, 1969. — a, left antennal peduncle; b, distal segments of left walking leg (1st or 2nd).

dactylus curving inward at proximal 1/3 of length, with 8 or 9 posterior marginal spinelets decreasing in size toward base of segment.

*Distribution.* Previously known from the male holotype from the west of Manado, Celebes, in 1,901 m. The range is now extended northward to Japan.

*Uroptychus scambus* BENEDICT, 1902

*Uroptychus scambus* BENEDICT, 1902: 297, fig. 41 (type-locality: off Honshu, Japan); DOFLEIN & BALSS, 1913: 134; VAN DAM, 1937: 100, fig. 1.

*Uroptychus glyphodactylus* MACGILCHRIST, 1905: 249 (type-locality: east of the Andamans); ALCOCK & MACGILCHRIST, 1905: pl. 70, fig. 4; pl. 71, fig. 1.

*Material.* *Soyo-Maru* Sta. 44; 33°53.2' N, 136°51.2' E; 1,120–1,160 m; 7 Mar. 1967 — 1 ♂, 1 ovig. ♀. *Soyo-Maru* Sta. B4; 32°11.3' N, 140°01.5' E; 1,400 m; 13 Oct. 1969 — 1 ovig. ♀. *Soyo-Maru* Sta. B4; 31°44.3' N, 140°21.8' E; 1,700 m; 3 Jul. 1969 — 1 ♂. *Soyo-Maru* Sta. B5; 30°37.5' N, 140°31.0' E; 1,660–1,830 m; 5 Dec. 1967 — 1 ♂, 1 ovig. ♀.

*Measurements.* Carapace lengths of males, 5.6–8.3 mm; of ovigerous females, 5.4–8.6 mm; diameter of ovum, 1.5×1.7 mm.

*Remarks.* The antennal scale is variably developed in size, from a lappet measuring 1/4 of the penultimate peduncular segment to slightly falling short of the end of that segment; in the ovigerous female holotype now deposited in the National Museum of Natural History, Smithsonian Institution it shows an intermediate size, terminating in the midlength of the segment. In addition to MACGILCHRIST's account of the chelipeds for both sexes, it is noted that the inner margin of the palm is cristiform in all the present male specimens; unfortunately, the chelipeds of the females listed above are missing; in the holotype it is indistinctly ridged.

*Distribution.* Previously taken from the Solor Strait, Andaman Sea, the Nicobar Islands and Japan; in 296–1,070 m. The present specimens have been taken from much greater depths between 1,120 and 1,830 m.

*Uroptychus setosipes* n. sp.

(Fig. 7)

*Material.* *Soyo-Maru* Sta. 60; 30°52.0' N, 128°39.5' E; 770–800 m; 3 Feb. 1972 — 1 ovig. ♀. *Soyo-Maru* Sta. 73; 29°24.5' N, 129°59.0' E; 1,000–1,010 m; 6 Feb. 1965 — 1 ♂, holotype, NSMT-Cr. 6175.

*Diagnosis.* Carapace smooth, glabrous dorsally, with anterolateral spine more or less distinct; lateral margin unarmed, distinctly or indistinctly ridged. Eyes relatively large. Third maxilliped spineless. Third thoracic sternum weakly depressed, anterior marginal sinus with median paired spines. Cheliped almost smooth and glabrous, fingers not crossing at tip. Distal 2 segments of walking legs with long coarse setae; propodus with 7–8 posterior marginal spinelets; dactylus relatively thick posterior margin with 8–12 short, low spinelets, ultimate (terminal) one distinctly

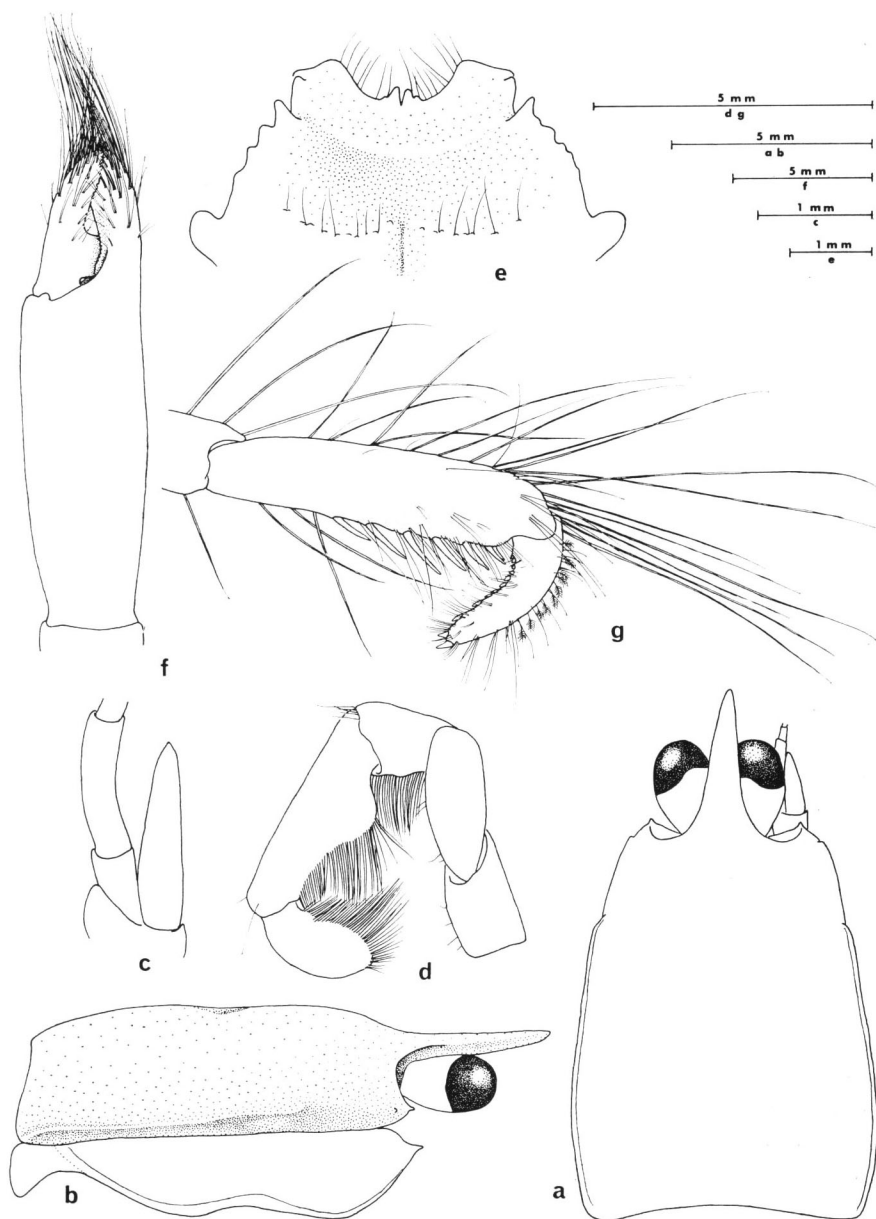


Fig. 7. *Uroptychus setosipes* n. sp., male holotype. —a, carapace, dorsal view; b, same, lateral view; c, left antennal peduncle; d, endopod of left 3rd maxilliped; e, anterior part of sternal segments; f, right chela; g, distal segments of right 2nd walking leg.

larger than penultimate, and following 5 or 6 spinelets directing almost parallel with margin.

*Description of holotype.* Carapace longer than broad, glabrous, without dorsal spines, moderately convex dorsally, anteriorly distinctly elevated from level of rostrum in lateral view, slightly concave between gastric and cardiac regions. Lateral margins gently diverging posteriorly, ridged in posterior 7/9 of length; ridge semitransparent in dorsal aspect. Anterolateral angle indistinctly produced.

Rostrum almost horizontal, flattish, barely half as long as remaining carapace. Outer orbital angle produced and spinulate.

Eyes relatively large, reaching 2/3 of rostral length, eyestalk more or less dilated.

Antennal peduncle lacking spine on distal 2 segments; antennal scale falling short of end of ultimate segment; basis minutely but distinctly produced distally.

Third maxilliped lacking spines on merus and carpus.

Third thoracic sternum weakly depressed; anterior margin relatively wide, greatly concave, with paired median spines; small but distinct process slightly ventral to mid-lateral margin; following sternum with disto-lateral marginal spine of moderate size.

Chelipeds about 3 times as long as carapace, moderately massive, spineless, glabrous excepting fingers; arm weakly tuberculate ventrally; palm as long as wrist, 2.6 times as long as broad at midlength, lateral margins slightly convex; fingers barely half as long as palm, setose especially distally and ventrally, gaping in proximal 3/5, not crossing at tip; distal 2/5 of opposable margins touching each other with tuberculate ridges when closed; movable finger with broad basal process on gaping margin, its edge minutely tuberculate, fitting into opposing longitudinal concavity of movable finger, when closed.

Walking legs similar, depressed, relatively wide; 2nd leg largest, 3rd smaller than 2nd; merus and carpus of 1st leg spineless; propodus with long coarse setae, 4 times as long as broad at widest portion, posterior ridge with 8 spinelets in distal 2/3 of length, distal 2 subequal, one of them ventral to another, both much shorter than following (distal 3rd); dactylus relatively thick, curving inward at proximal 1/3 of length, half as long as propodus, posterior margin with about 10 small, low, movable spinelets, ultimate (terminal) larger, penultimate nearer terminal one, others directing almost parallel with margin, distal 3rd far remote from and equidistant between penultimate and distal 4th.

*Description of paratype.* The ovigerous female paratype differs from the holotype in the following: Carapace well calcified and not semitransparent along lateral margin; lateral margin indistinctly ridged, only leaving minute tubercular elevation at end of ridge as in holotype; anterolateral spine small but distinct; rostrum relatively shorter, barely half as long as remaining carapace; basis of antennal peduncle more acutely produced; cheliped much slenderer, indistinctly massive; palm shorter than wrist, about 4 times as long as broad, lateral margins almost parallel; fingers not gaping; much shallower basal concavity of immovable finger holding basal process



on opposing margin when closed; dactylus of walking leg relatively larger, fully half as long as propodus, posterior margin bearing 8 short spinelets.

*Measurements of holotype.* Length of carapace including rostrum, 12.9 mm; width of carapace, 7.7 mm; length of cheliped (right), 41.0 mm; of wrist, 11.9 mm; of palm, 11.8 mm; of movable finger, 5.5 mm.

*Measurements of paratype.* Carapace length of ovigerous female, 10.0 mm; length of right cheliped, 33.4 mm; diameter of ovum,  $1.1 \times 1.2$  mm.

*Remarks.* This species seems very near *Uroptychus indicus* ALCOCK from the Arabian Sea and the Bay of Bengal. Direct comparison with one ovigerous female of *U. indicus* in the *Investigator* collection, 9328/9, previously borrowed from Dr. K. K. TIWARI of the Zoological Survey of India reveals that in *U. indicus* the general appearance of the carapace, rostrum and chelipeds are much like those of the new species, but, the third thoracic sternum is more deeply depressed and the dactylus of the walking leg bears more pronounced posterior marginal spines; the terminal one is smaller than the following several marginals; all marginals, 11 in number, are clearly elected, not directing parallel with the margin as in this new species.

*Type-locality.* East of Tokara-gunto ( $29^{\circ}24.5' N$ ,  $129^{\circ}59.0' E$ ); 1,000–1,010 m.

### *Uroptychus glaber* n. sp.

(Figs. 8–9)

*Material.* *Soyo-Maru* Sta. B3;  $33^{\circ}10.0' N$ ,  $140^{\circ}02.7' E$ ; 470 m; 18 Nov. 1959 — 1 ♂, 2 ovig. ♀, 3 ♀ without eggs (male is holotype, NSMT-Cr. 6177).

*Diagnosis.* Carapace rather flattish dorsally, smooth, glabrous, posteriorly widening, lateral margins entire. Anterolateral angle produced. Rostrum triangular, greatly concave dorsally, ending in round tip. Eyes elongate. Distal 2 segments of antennal peduncle unarmed. Endopod of 3rd maxilliped lacking marginal spines. Third thoracic sternum shallowly depressed, anterior margin weakly concave, with deep U-shaped median notch. Cheliped massive, spineless, almost glabrous except for fingers. Walking legs also unarmed, depressed; dactylus relatively slender, bearing 7 well-developed spines, ultimate and penultimate subequal but indistinctly larger than distal 3rd.

*Description of holotype.* Carapace excluding rostrum slightly broader than long, dorsally flattish but feebly convex, smooth and glabrous, without any processes or spines; lateral margins posteriorly diverging, converging from posterior 1/5 of length, semitransparent along entire length in dorsal aspect; anterolateral spine well developed.

Rostrum more or less deflexed, dorsally deeply concave, barely half as long as remaining carapace, broad at base, ending in round tip, marginally semitransparent like carapace.

Outer orbital angle roundly produced, not ending in spine.

Eyes moderately elongate, cornea not dilated, terminating in distal 1/3 of rostrum.

Abdomen also smooth and glabrous. Pterygostomian flap anteriorly produced

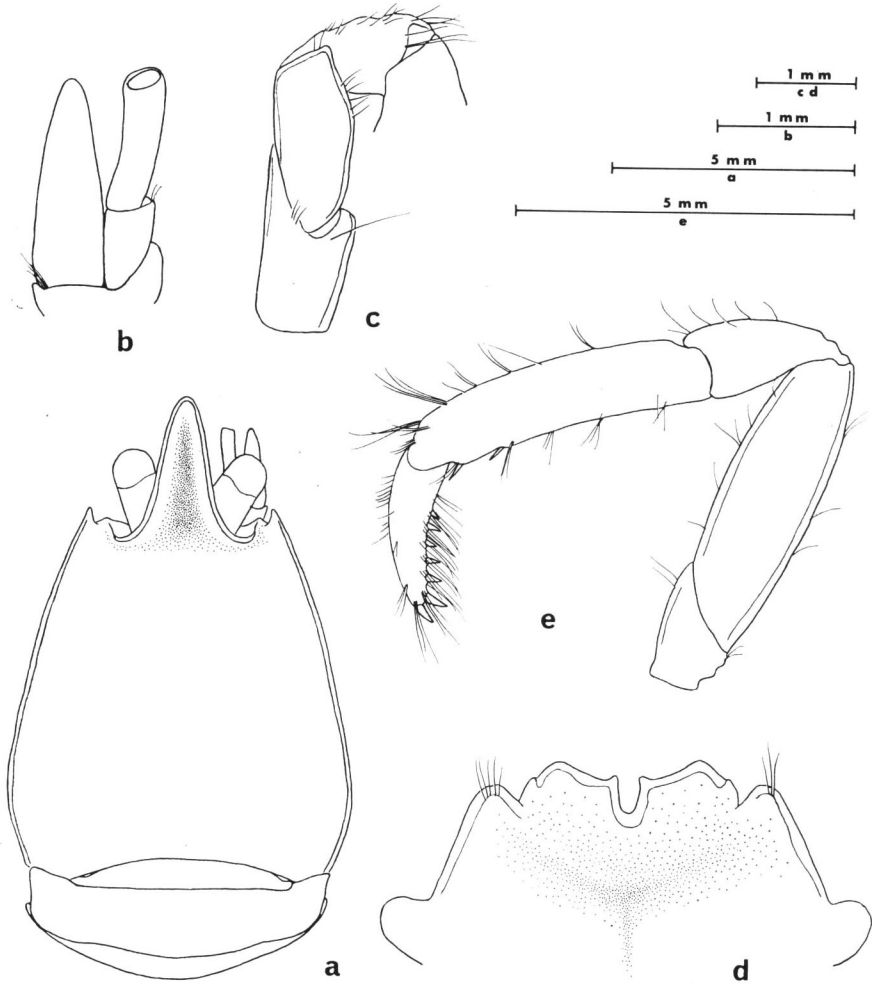


Fig. 8. *Uroptychus glaber* n. sp., male holotype. —a, carapace and abdomen; b, right antennal peduncle; c, endopod of right 3rd maxilliped; d, anterior part of sternal segments; e, left 2nd walking leg.

moderately.

Distal 2 segments of antennal peduncle unarmed; antennal scale wider than peduncle, almost reaching to end of ultimate segment; basis proximal to scale minutely produced.

Ischium of 3rd maxilliped with about 30 denticles on inner toothed ridge; merus and carpus unarmed, sparsely setose; basal 2 segments of endopod with semitransparent margins.

Sternal segments comparatively broad; 3rd thoracic sternum weakly depressed, anterior margin shallowly concave, with U-shaped median notch; following sternum without transverse ridge anterolaterally roundly produced; semitransparent margins as illustrated for both sterna.

Chelipeds missing.

Left 2nd and 3rd walking legs undetached from body, similar, but 2nd slightly larger; sparsely furnished with setae; merus depressed, anterior and posterior margins distinctly convex and semitransparent along entire length; carpus barely half as long as propodus; propodus 4.8 times as long as broad, dully curving inward, posterior margin with 2 spinelets rather distally; dactylus relatively slender, dully curving inward, more than half of propodus length, posterior margin particularly setose, with 7 more or less pronounced spines including terminal one, ultimate and penultimate subequal and only slightly larger, remaining spines decreasing in size toward base of segment.

*Measurements of holotype.* Length of carapace including rostrum, 9.5 mm; width of carapace, 7.1 mm.

*Measurements of paratypes.* Carapace lengths of ovigerous females, 9.7, 10.0 mm; of females without eggs, 6.7–8.5 mm; diameter of ovum, 1.1 mm.

*Variation.* The anterior margin of the third thoracic sternum is slightly produced at lateral extremity in most of the type-series instead of being rounded as in the holotype. Under high magnification the lateral margin of the carapace is feebly crenulate in two female paratypes.

The chelipeds are detached from all the type material, but they are essentially similar, and therefore a medium-sized cheliped is described: Rather massive, more

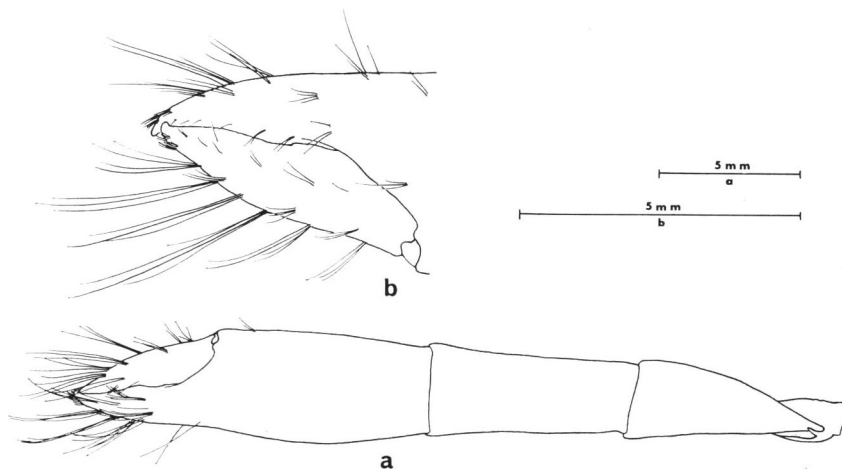


Fig. 9. *Uroptychus glaber* n. sp. — a, detached cheliped, dorsal view; b, fingers of same, ventral view.

or less depressed, unarmed and glabrous except for fingers; ischium with dorsal process not spiniform but rounded and moderately developed; palm slightly longer than wrist, twice as long as broad, feebly dilated at midlength; fingers setose, 2/3 as long as palm, curving ventrad, not gaping, ending in rounded small process, crossing at tip; opposable margins touching each other, not straight but slightly undulating; prominent basal process of movable finger fitting into opposing concavity.

*Remarks.* Dorsally smooth carapace and elongate eyestalk indicate that this species is near *Uroptychus joloensis* VAN DAM from the Sulu Sea, from which it is distinct in having no lateral spines on both the rostrum and the carapace and the palm of the cheliped 1.5 times as long as the fingers. It also seems related to *U. suluensis* VAN DAM from the north of the Sulu Islands; the latter species, however, is characterized by having the carapace distinctly crenulate on the lateral margin, the outer orbital angle spinulate, and the arm and wrist of the cheliped with small terminal spines. Furthermore, examination of the ovigerous female syntype of *U. suluensis* from the *Siboga* Sta. 105, deposited in the Zoological Museum, Amsterdam, revealed additional characters to be noted as distinct from the new species: distal two segments of antennal peduncle with distinct terminal spine; merus of 3rd maxilliped with spinules on disto-inner margin; dactylus of walking leg relatively short, rather straight, bearing 7 posterior marginal spines, ultimate and penultimate much stouter and subequal.

*Type-locality.* Off east coast of Hachijo-jima (33°10.0' N, 140°02.7' E); 470 m.

### *Uroptychus pilosus* n. sp.

(Figs. 10–11)

*Material.* *Soyo-Maru* Sta. 44; 33°53.2' N, 136°51.2' E; 1,120–1,160 m; 7 Mar. 1967 — 2 ♂ (larger male is holotype, NSMT-Cr. 6172). *Soyo-Maru* Sta. 104; 31°12.0' N, 131°42.4' E; 1,125 m; 10 Feb. 1973 — 1 ovig. ♀.

*Diagnosis.* Body entirely covered with fine setae. Carapace spineless, gastric region anteriorly markedly elevated from level of rostrum. Rostrum triangular, dorsally flattish. Eyes elongate. Antennal scale short, marginally spinulate. Merus of 3rd maxilliped with minute spines on distal half of inner margin. Third thoracic sternum shallowly depressed, anterior margin concave, with U-shaped median notch. Cheliped slender, palm relatively long, 8 times as long as broad, fully 4 times as long as movable finger. Merus of walking leg armed with small spines in proximal half of anterior margin; propodus lacking spinelets posteriorly; dactylus dully curving inward, with 2 terminal spines pronounced and subequal.

*Description of holotype.* Carapace excluding rostrum slightly longer than broad, convex dorsally, thickly covered with fine setae; gastric region transversely elevated at anterior border, posteriorly separated by deep groove from branchiocardiac regions; lateral margins convex behind cervical groove; anterolateral angle rounded, with few spinules just inside of it; feeble ridge slightly dorsal to posterior branchial lateral

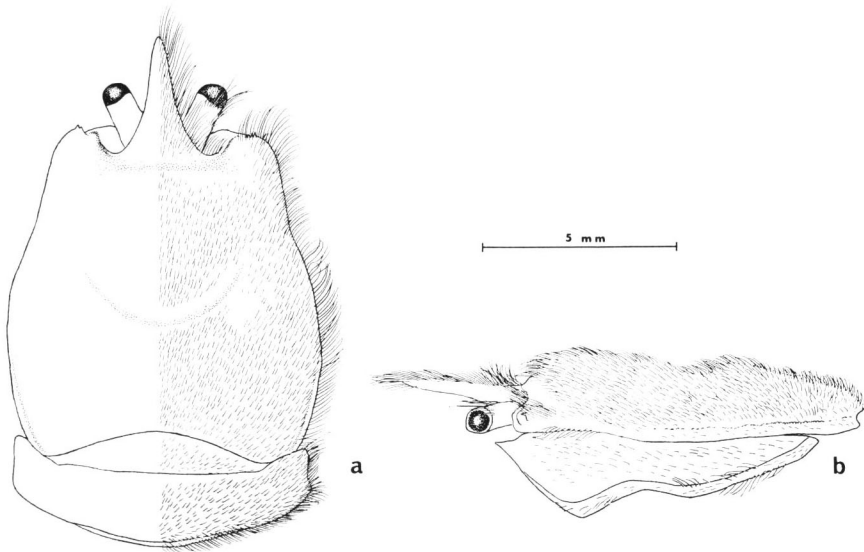


Fig. 10. *Uroptychus pilosus* n. sp., male holotype. — a, carapace and abdomen, dorsal view; b, same, lateral view.

margin. Distinct groove just behind and outside of outer part of upper orbital margin.

Rostrum triangular, broad at base, narrowing distally, almost horizontal, and also dorsally setose like carapace.

Orbit widely developed, eyes cylindrical, elongate, terminating in  $2/3$  of length of rostrum, furnished with setae distoexternally, cornea less than half as long as eye-stalk.

Abdomen also covered with fine setae.

Pilose pterygostomial flap strongly produced anteriorly.

Antennal peduncle relatively small, distal 2 segments unarmed, penultimate segment relatively long; antennal scale wider than peduncle, sparsely setose externally, reaching to end of penultimate segment, laterally and terminally spinulate; basis acutely produced.

Anterior sternal segments as illustrated; 3rd thoracic sternum shallowly depressed; anterior margin concave and setose, with prominent U-shaped median notch; disto-lateral angle of following sternum minutely produced.

Third maxilliped setose; inner margin of merus with angle of about  $135^\circ$  at mid-length, bearing few tubercular processes distal to midlength; minute process also present at distomesial margin; inner toothed ridge of ischium with rudimentary, about 20 denticles of irregular size; carpus unarmed.

Setose cheliped 4.5 times as long as carapace, subcylindrical, and spineless; ischium with distinct disto-dorsal spine; palm 4.6 times as long as finger, slightly longer

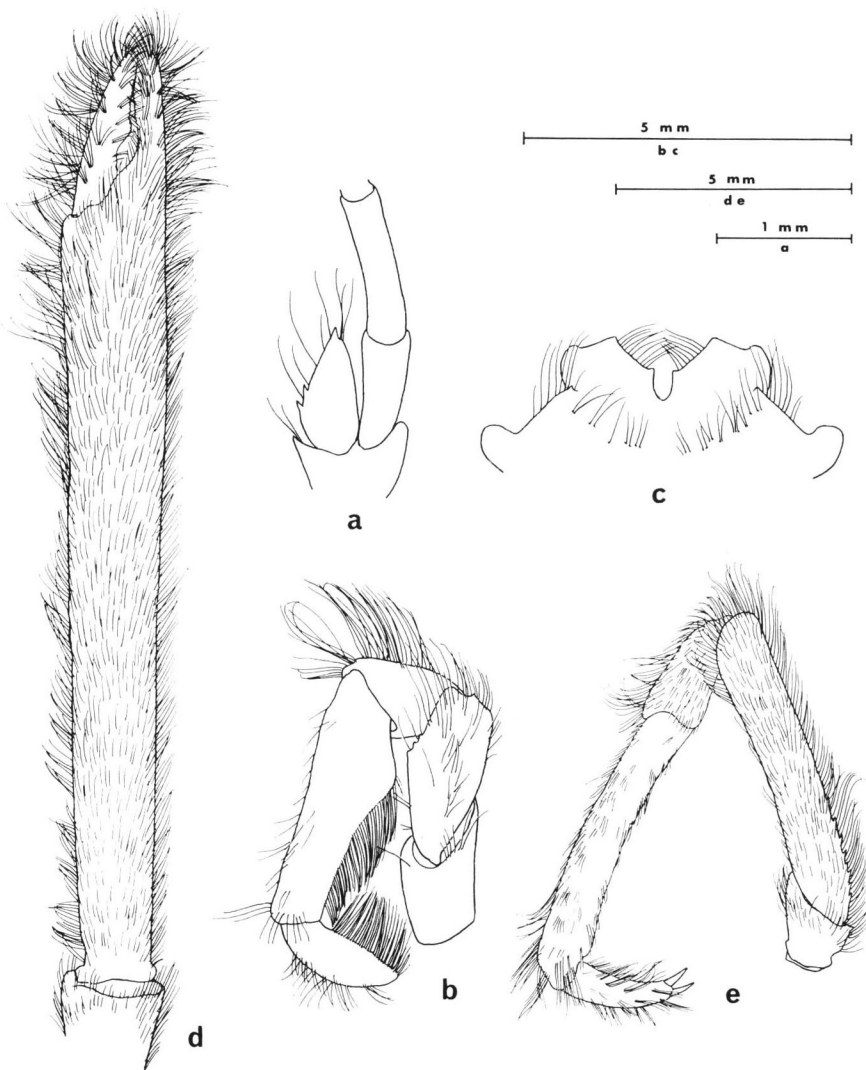


Fig. 11. *Uroptychus pilosus* n. sp., male holotype. — a, right antennal peduncle; b, endopod of left 3rd maxilliped; c, anterior part of sternal segments; d, right chela; e, left walking leg detached from body.

than wrist, more or less depressed, about 8 times as long as broad, lateral margins subparallel; fingers slightly gaping, ending in rounded point and crossing; cutting edge of movable finger roundly produced medially, opposing edge concave.

Walking legs detached from body, pilose like cheliped; merus with about 10 minute but sharp spines in proximal half of anterior margin; carpus unarmed, less

than half of propodus; propodus 2.5 times as long as dactylus, posterior margin lacking spinelets; dactylus dully curving inward, posterior margin entire, unarmed except for 2 terminal spines pronounced and subequal.

*Measurements of holotype.* Length of carapace including rostrum, 10.2 mm; width of carapace, 8.0 mm; length of cheliped (right), 46.5 mm; of wrist, 14.6 mm; of palm, 16.1 mm; of movable finger, 3.5 mm.

*Measurements of paratypes.* Carapace length of male, 7.8 mm; of ovigerous female, 11.1 mm; diameters of ova, 1.3–1.5 mm.

*Variation.* The ovigerous female paratype is much larger than other two males including the holotype. It is less pilose on the dorsal surfaces of the carapace and abdomen, its antennal scale distinctly overreaching the end of the penultimate antennal segment. The male paratype bears much sharply produced outer orbital angle and the third thoracic sternum with a narrow but deep median notch on the anterior margin instead of the U-shaped notch as in the holotype as well as ovigerous female paratype; the minute distomesial marginal spine of the merus of the third maxilliped is absent from this specimen.

*Remarks.* The body entirely thickly covered with fine setae, the eyestalk elongate and cylindrical, characteristic of this species, are shared by *Uroptychus setosidigitalis* BABA from the Hawaiian Islands and *U. tomentosus* BABA from New Zealand waters. But this species is most noticeably different in that the dactylus of the walking leg has the posterior margin unarmed but two terminal spines; such an unusual form of the dactylus is known only for *U. sternospinosus* TIRMIZI; with the exception of the *U. spinimarginatus* group which is characterized partly by having the first leg relatively slender and unarmed on the posterior margin of the dactylus of the walking leg (BABA, 1977 a), the disposition and size of such posterior marginals seem to be systematically important.

*Type-locality.* Kumanonada off east coast of Kii Peninsula (33°53.2' N, 136°51.2' E); 1,120–1,160 m.

### *Uroptychus soyomaruae* n. sp.

(Figs. 12–13)

*Material.* *Soyo-Maru* Sta. B2; 33°55.1' N, 140°00.5' E; 860–870 m; 1 Dec. 1968 — 1 ovig. ♀, holotype, NSMT-Cr. 6178.

*Diagnosis.* Carapace dorsally covered with papilla-like granules, with 2 strong gastric spines anteriorly, cardiac region distinctly circumscribed. Lateral margins gradually diverging posteriorly, with anteriolateral spine developed. Rostrum spini-form, almost horizontal. Distal 2 segments of antenna unarmed. Third maxilliped lacking spines on merus and carpus. Anterior margin of 3rd thoracic sternum roundly concave, with paired median spines, lacking median notch; small process ventral to each anteriolateral extremity. Chelipeds relatively long, granulate, ends of arm and wrist nodulated. Walking legs unarmed on merus and carpus; carpus elongate;

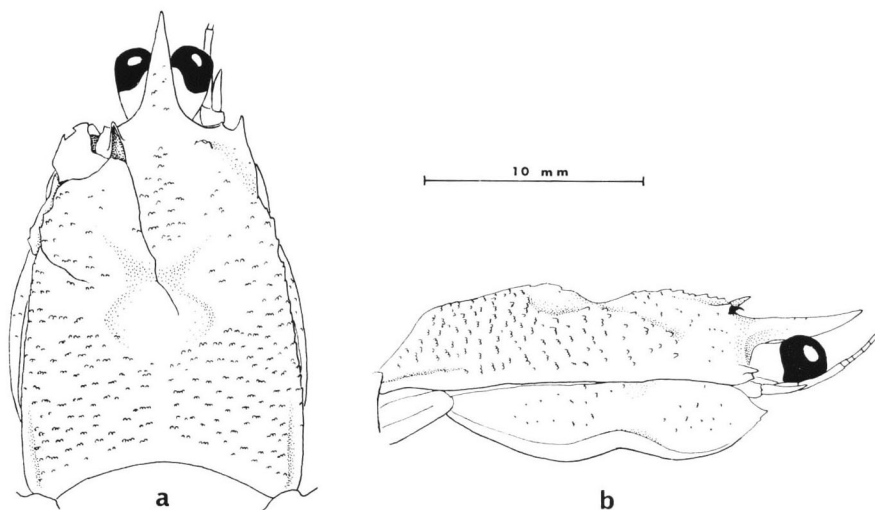


Fig. 12. *Uroptychus soyomaruuae* n. sp., ovigerous female holotype. —a, carapace, dorsal view; b, same, lateral view.

propodus with posterior marginal spinelets in distal half; dactylus curving inward, with small posterior marginal spines decreasing in size proximally.

*Description of holotype.* Carapace excluding rostrum longer than broad, antero-laterally partly damaged on left side; dorsal surface moderately convex, covered with minute papilla-like granules; gastric region with pair of strong spines behind and slightly inside of insertion of antennal peduncle, posteriorly separated from both cardiac and anterior branchial regions by shallow groove. Cardiac region convex, anterolaterally bordered by shallow but distinct concavity. Lateral margins gradually diverging posteriorly, distinctly concave at end of cervical groove; no ridge in front of cervical groove; branchial margin weakly ridged and minutely crenulate; shallow groove slightly dorsal to posterior 1/4 of lateral margin. Outer orbital angle minutely produced.

Rostrum spiniform, almost straight but slightly turning dorsad distally, nearly 1/4 as long as remaining carapace.

Eyes relatively large, more or less elongate, extending as far forward as 2/3 of rostral length. Abdomen glabrous, devoid of tubercular granules.

Pterygostomial flap also tuberculate, distinctly produced anteriorly.

Antennal peduncle elongate, distal 2 segments unarmed, ultimate segment about twice as long as penultimate; antennal scale nearly as wide as peduncle, extending beyond end of, but, falling short of midlength of, penultimate peduncular segment; basis indistinctly produced.

Third maxilliped lacking spines on merus and carpus.

Anterior part of sternal segments as illustrated; 3rd thoracic sternum considerably



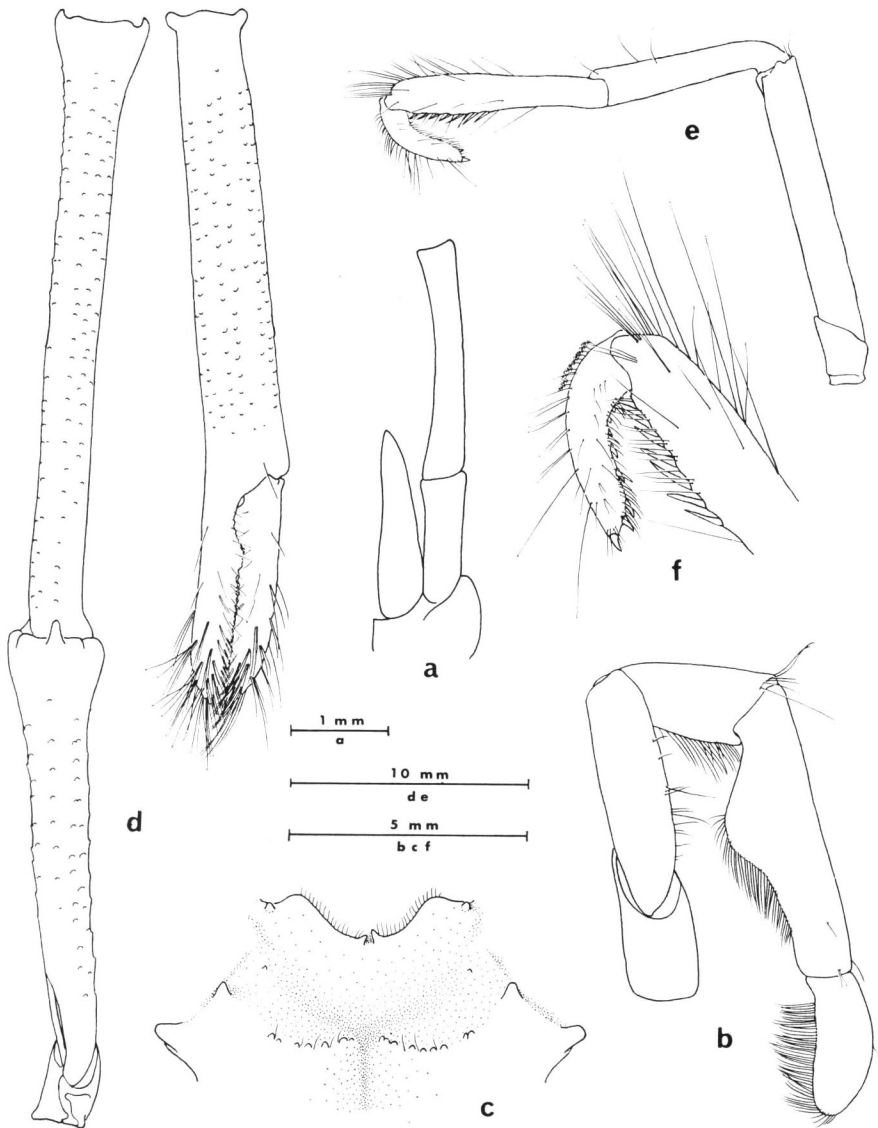


Fig. 13. *Uroptychus soyomaruae* n. sp., ovigerous female holotype. — a, right antennal peduncle; b, endopod of right 3rd maxilliped; c, anterior part of sternal segments; d, right cheliped, dorsal view; e, left walking leg detached from body; f, same, distal part.

depressed, anterior margin roundly concave, with 2 median processes; small but distinct another process slightly ventral to disto-lateral extremity; following sternum mesially deeply grooved, transversely elevated with tubercles, with anterolateral process moderately developed.

Cheliped covered with granules, nearly 4 times as long as carapace, comparatively slender, subcylindrical; granulation much pronounced on ventral surface; arm distally nodulated, with prominent but blunt dorsomesial spine there; wrist also distally widened, without distal spine, 1.3 times as long as palm; palm wider than preceding 2 segments, more or less depressed, 6 times as long as broad, lateral margins subparallel; fingers setose especially distally, lacking granules, about half as long as palm, tips rounded, not crossing; opposable margins not gaping, denticulate in distal 2/3 of length; basal broad process of movable finger fitting to opposing concavity when closed.

All walking legs detached from body, left 1st leg missing; 1st, 2nd, and 3rd legs similar, merus decreasing in size posteriorly; merus and carpus unarmed, carpus comparatively long, 0.75 as long as propodus; propodus setose especially distally, with 7 posterior marginal spinelets in distal half; dactylus also setose, barely half as long as propodus, curving inward proximally, posterior margin with 8 short spinelets decreasing in size toward base of segment.

*Measurements of holotype.* Length of carapace including rostrum, 19.4 mm; width of carapace, 12.4 mm; length of cheliped (right), 77.4 mm; of palm, 19.0 mm; of movable finger, 9.9 mm; diameter of ovum,  $1.7 \times 1.9$  mm.

*Remarks.* This species seems closely related to *Uroptychus sternospinosus* TIRMIZI from the Maldives in general appearance of the carapace and cheliped, from which it differs noticeably in that the fourth thoracic sternum has no pronounced spine, and that unlike those illustrated for *U. sternospinosus* the distal two segments of the walking leg are not subchelate, the propodus being armed with about 7 posterior marginal spinelets in the distal half and the dactylus with 8 posterior marginals.

*Type-locality.* Southeast of Miyake-jima ( $33^{\circ}55.1' N$ ,  $140^{\circ}00.5' E$ ); 860–870 m.

#### *Uroptychus scandens* BENEDICT, 1902

*Uroptychus scandens* BENEDICT, 1902: 298, fig. 42 (type-locality: off Honshu, Japan); BALSS, 1913: 27, figs. 19, 20; YOKOYA, 1933: 68; VAN DAM, 1933: 27, fig. 38; — 1937: 102; — 1940: 97; MIYAKE, 1947: 734, fig. 2123; — 1960: 97, pl. 48, fig. 7; — 1965: 634, fig. 1040; MIYAKE & BABA, 1967: 227, fig. 2.

*Material.* *Soyo-Maru* Sta. B3;  $33^{\circ}06.5' N$ ,  $140^{\circ}04.8' E$ ; 490–495 m; 12 Dec. 1963 — 1 ♂. *Soyo-Maru* Sta. 72d;  $31^{\circ}13.6' N$ ,  $129^{\circ}58.5' E$ ; 310 m; 12 Feb. 1959 — 2 ♂.

*Measurements.* Carapace lengths of males, 4.0–5.3 mm.

*Remarks.* *Leiopterus fimbriatus* (HERKLOTS), the pennatularian previously known as the commensal host of this species, is not recorded with the present material.

*Distribution.* This species is ordinarily a shelf form, as has previously been taken in 50–393 m, from the Kei Islands, Banda Sea, Java Sea, East China Sea and Japan. The bathymetric range is now recorded down to 495 m.

## References

- ALCOCK, A., 1901. A descriptive catalogue of the Indian deep-sea Crustacea Decapoda Macrura and Anomala, in the Indian Museum. Being a revised account of the deep-sea species collected by the Royal Indian Marine Survey Ship Investigator. 286+iv pp., pls. 1-3. Calcutta, Indian Museum.
- & A. F. MCARDLE, 1902. Illustrations of the zoology of the Royal Indian Marine Surveying Steamer "Investigator." Crustacea, pt. 10, pls. 56-67.
- & A. C. MACGILCHRIST, 1905. Illustrations of the zoology of the Royal Indian Marine Surveying Steamer "Investigator." Crustacea, pt. 11, pls. 68-76.
- BABA, K., 1977 a. A new species of *Uroptychus* (Crustacea, Anomura, Chirostylidae) from off Honshu, Japan. *Annot. zool. Japon.*, **50**: 123-126.
- 1977 b. Five new species of chirostylid crustaceans (Decapoda, Anomura) from off Midway Island. *Bull. Natn. Sci. Mus., Tokyo, (Zool.)*, **3**: 141-156.
- BALSS, H., 1913. Beiträge zur Naturgeschichte Ostasiens. Ostasiatische Decapoden I. Die Galatheiden und Paguriden. *Abh. Bayer. Akad. Wiss., Suppl.* **2** (9): 1-85, pls. 1-2.
- 1925. Macrura der Deutschen Tiefsee-Expedition. 2. Natantia, Teil A. *Wiss. Ergebn. Deutsch. Tiefsee-Exp. ("Valdivia")*, **20**: 217-315, pls. 20-28.
- BENEDICT, J. E., 1902. Descriptions of a new genus and forty-six new species of crustaceans of the family Galatheidae, with a list of the known marine species. *Proc. U.S. Natn. Mus.*, **26**: 243-334.
- VAN DAM, A. J., 1933. Die Decapoden der Siboga-Expedition, VIII. Galatheidea: Chirostylidae. *Siboga-Expeditie, monogr.* **39a**<sup>7</sup>: 1-46.
- 1937. Einige neue Fundorte von Chirostylidae. *Zool. Anz.*, **120**: 99-103.
- 1939. Ueber einige *Uroptychus*-Arten des Museums zu Kopenhagen. *Bijdr. Dierk.*, **27**: 392-407.
- 1940. Anomura, gesammelt vom Dampfer "Gier" in der Java-See. *Zool. Anz.*, **129**: 95-104.
- DOFLEIN, F., & H. BALSS, 1913. Die Galatheiden der Deutschen Tiefsee-Expedition. *Wiss. Ergebn. Deutsch. Tiefsee-Exp. ("Vildivia")*, **20**: 125-184, pls. 12-17.
- EKMANN, S., 1953. Zoogeography of the Sea. xiv+417 pp. London, Sidwick & Jackson.
- GORDON, I., 1930. On the species of the galatheid genus, *Eumunida* (Crustacea, Decapoda). *Proc. zool. Soc. London*, **1929**: 741-753.
- HENDERSON, J. R., 1885. Diagnoses of the new species of Galatheidae collected during the "Challenger" Expedition. *Ann. Mag. nat. Hist.*, (5), **16**: 407-421.
- HENDERSON, J. R., 1888. Report on the Anomura collected by H. M. S. Challenger during the years 1873-76. *Rept. Sci. Res. Voy. H.M.S. Challenger, Zool.*, **27**: i-xi+1-221, pls. 1-21.
- LAURIE, R. D., 1926. Anomura collected by Mr. J. Stanley GARDINER in the western Indian Ocean in H.M.S. "Sealark." *Trans. Linn. Soc. London, (2-Zool.)*, **19**: 121-167, pls. 8-9.
- MACGILCHRIST, A. C., 1905. Natural history notes from the R.I.M.S. "Investigator," Capt. T.H. HEMMING, R. N. (retired), commanding. — Series III, No. 6. An account of the new and some of the rarer decapod Crustacea obtained during the surveying seasons 1901-1904. *Ann. Mag. nat. Hist.*, (7), **15**: 233-268.
- MCARDLE, A. F., 1901. Natural history notes from the Royal Indian Marine Survey Ship "Investigator," commander T. H. HEMMING, R. N., commanding. — Series III. No. 5. An account of the trawling operations during the surveying-season of 1900-1901. *Ibid.*, (7), **8**: 518-526.
- MIYAKE, S., 1947. Crustacea Anomura. In: UCHIDA, S., Illustrated encyclopedia of the fauna of Japan (exclusive of insects), rev. ed., Tokyo: 731-750, figs. 2115-2171. (In Japanese.)
- 1960. Decapoda Crustacea, Anomura. In: OKADA, Y. K., & T. UCHIDA, Encyclopedia zoologica illustrated in colours, Tokyo, **4**: 89-97, pls 44-48. (In Japanese.)
- 1965. Crustacea, Anomura. In: OKADA, Y. K., S. UCHIDA, & T. UCHIDA, New Illustrated encyclopedia of the fauna of Japan, Tokyo, **2**: 630-652, figs. 1032-1115. (In Japanese.)

- MIYAKE, S., & K. BABA, 1967. Galatheids of the East China Sea (Chirostylidae and Galatheidae, Decapoda, Crustacea). *J. Fac. Agr. Kyushu Univ.*, **14**: 225-246.
- TIRMIZI, N. M., 1964. Crustacea: Chirostylidae (Galatheidea). *Sci. Rept. John Murray Exp.*, **10**: 385-415.
- YOKOYA, Y., 1933. On the distribution of decapod crustaceans inhabiting the continental shelf around Japan, chiefly based upon the materials collected by S. S. Sôyô-Marû during the years 1923-30. *J. Coll. Agr. Tokyo imp. Univ.*, **12**: 1-226.