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Chirostylid and Galatheid Crustaceans (Decapoda: Anomura) of the "Albatross" Philippine Expedition, 1907-1910

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Contents

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Introduction

The present report is based upon the collection of the anomuran Crustacea Chirostylidae and Galatheidae of the "Albatross" Philippine Expedition of 1907-1910, now deposited in the National Museum of Natural History, Smithsonian Institution. The explorations were made mainly in the Philippines and Indonesia, but also extended north to the vicinity of Formosa when the "Albatross" sailed to Hong Kong for extensive repairs. A comprehensive account of the cruise and the complete station list may be consulted in Anonymous (1910). During this cruise numerous trawling and shore stations were occupied, covering the continental shelf to the lower bathyal zone down to 3,300 m (1,804 fm). The study material was taken by 9- to 25-foot beam trawls at 204 of the 577 stations worked and by hand on shore. The 1,305 specimens obtained are divided among 96 species, 40 of which are shelf forms. This is one of the richest collections of the Chirostylidae and Galatheidae ever assembled from the Indo-Malayan region.

The "Philippines and vicinity" temporarily used here to report on the "Albatross" collection may be construed to represent the entire Indo-Malayan faunal region, as it is believed that the Ambonesian region or the triangle "Luzon-Borneo-New Guinea" is the center of distribution for most of the shelf forms in the Indo-West Pacific and the elements here spread hence in every direction (Ekman, 1953:17). The scattered literature (Adams and White, 1848; Miers, 1884; Henderson, 1885, 1888; De Man, 1888, 1902; Ortmann, 1892, 1894; Potts, 1915; Gordon, 1930, 1935; Van Dam, 1933, 1937, 1938, 1939, 1940; Boone, 1935; Johnson, 1970; Tirmizi and Javed, 1976; Baba, 1977a, 1979b) records a total of 71 species from this region; 26 of Chirostylidae and 45 of Galatheidae. *Munida semoni* Ortmann, 1894 from Ambon is considered a synonym of *M. heteracantha*, and *M. andamanica* of Boone (1935) from Solor Strait a synonym of *M. japonica*.

This collection comprises 96 species, representing four genera of Chirostylidae and 11 of Galatheidae. Three new genera and 31 new species are characterized, and one new name is proposed. For each species, expanded systematic accounts with synonymy, material, measurements, diagnosis, habitat preference shown by the "Albatross" specimens, type-locality and distribution record are given. In the account of new species the description of holotype, and of paratypes if necessary, is also provided. Keys to all known genera of the two families are presented. Keys to species

are provided for the Indo-West Pacific *Munida* and *Paramunida*, the Philippine *Uroptychus*, and the "Albatross" presentation of *Eumunida*, *Gastroptychus*, *Galathea* and *Munidopsis*, but not for small genera.

In the species accounts station data are abbreviated. Complete station data extracted from Anonymous (1910) and a list of species taken at each station are given in the Appendix.

Genera and species are arranged alphabetically. Carapace length is measured in the midline between the rostral tip and the posterior margin of the carapace, unless otherwise mentioned.

Thirty-one of the 96 species included in this collection are newly described herein; also newly recorded are 35 species that are previously known elsewhere outside the Philippines and vicinity. Thus, a total of 137 species are now known from this region. The "Albatross" collection covers about 70 percent of these known species. Because of the remarkable number of new additions to the chirostylid and galatheid faunas of the Philippines made by this collection, as well as the lack of sufficient knowledge of ecology, larval life and factors limiting the dispersal of these crustaceans, an analysis of the distribution of the Philippine or Indo-Malayan species in question is not practical at the present time.

Eleven of the 15 Philippine genera contain coastal species; strictly sublittoral are the chirostylid *Chirostylus* and galatheid *Allogalathea*, *Bathymunida*, *Fennerogalathea* and *Lauriea*; not a few species of the remaining six genera go down to transitional depths, especially those of *Uroptychus* and *Munida* to the bathyal zone below about 500 m (*Uroptychus acostalis, U. gracilimanus, U. nigricapillis, U. scambus, U. sibogae, Munida andamanica, M. japonica, M. major, M. microps* and *M. variabilis*). *Eumunida* and *Gastroptychus* of the Chirostylidae occur mostly in the transitional but the latter goes deeper. Similarly, *Paramunida* and *Munidopsis* of the Galatheidae are adapted to deep-water habitats; the former prefers transitional depths, the latter ranges widely in transitional and bathyal zones. Three species are known to be eurybathic: *Uroptychus nigricapillis* (66-2,000 m), *Munida andamanica* (141-1,360 m) and *Paramunida scabra* (70-1,630 m).

It is well known that the Indo-Malayan region is very rich in species, especially of shelf forms (Ekman, 1953:17). Johnson (1966:437) discussed the barriers against the westward dispersal of the Malaysian marine decapod crustaceans at the Strait of Malacca and the west coast of India. Haig (1974), in her distributional analysis of western Australian anomurans, stated that most of the tropical anomurans there have affinities with other tropical Indo-West Pacific forms and that the absence of 17 of the tropical Indian Ocean species of the Indo-Malayan origin in Western Australia suggests that Western Australia received elements by way of the northern coast of Australia.

Sixty-two of the 137 Philippine species of chirostylids and galatheids are inhabitants of the continental shelf, but many of these species (27 species) also go down at least to transitional depths. Sixteen of the shelf forms are restricted to the Philippines; one extends the range eastward to the Palaus, 22 to Japan and vicinity, only two spread west to the western Indian Ocean, and 18 are widely distributed from the east African coast and/or the Red Sea to Japan; a few of the last also reach the eastern edge of the Indo-West Pacific.

As has been mentioned earlier (Baba, 1981b:111), amphi-Pacific connections

across the East Pacific Barrier are established by five deep-sea species (*Uroptychus nitidus occidentalis, Munidopsis antonii, M. ciliata, M. rostrata* and *M. subsquamosa*). Six species of *Munidopsis* occur in both the Atlantic and the Indo-Pacific (*M. antonii, M. aries, M. bairdi, M. rostrata, M. spinosa* and *M. tridentata*).

Eighteen of the Philippine species are reef-associated. Nine of them (*Galathea aegyptiaca, G. affinis, G. amamiensis, G. bimaculata, G. pilosa, G. platycheles, Coralliogalathea humilis, Phylladiorhynchus serrirostris* and *Sadayoshia acroporae*), all true corallophiles, stop northerly dispersal at the northern part of the Ryukyu Islands where is the northern limit for the formation of the coral reefs. This is just as mentioned by Ekman (1953:16) (originally by Balss (1924)) that 70 species of tropical crabs stop short here, and according to Ekman, the northern boundary of the Indo-Malayan region is placed there. Two other reef-associated galatheids (*Galathea subsquamata* and *Allogalathea elegans*) extend the range further north to the Kii Peninsula of Japan, as also do some of the pagurids (Baba, 1982a:57). Many reef-pagurids and brachyurans reach the eastern extremity of the Indo-West Pacific (Ball and Haig, 1972; Takeda, 1973, 1976; Takeda and Shimazaki, 1974; Baba, 1982a); however, only a few such cases are known for galatheids: *Galathea affinis* from the Tuamotus, *G. pilosa* and *G. spinosorostris* from the Hawaiian or Line Islands, and *Allogalathea elegans* from the Fiji Islands. Several lots in the Copenhagen Museum collection show that *Phylladiorhynchus serrirostris* should also be known from Honolulu, Hawaii (unpublished). Very possibly additional eastern West Pacific records of Philippine galatheids may be expected from more extensive surveys.

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Systematic Account

Family Chirostylidae

The Chirostylidae now contain five genera: *Chirostylus* Ortmann, 1892; *Eumunida* Smith, 1883; *Gastroptychus* Caullery, 1896; *Pseudomunida* Haig, 1979; and *Uroptychus* Henderson, 1888.

There has appeared another genus in the literature: *Hapaloptyx* Stebbing, 1920, containing a single species *H. difficilis* Stebbing described from a unique ovigerous female from South Africa (Stebbing, 1920:262). This genus, however, has received little attention. Van Dam (1933:44) disagreed with placing it in the Chirostylidae because of the presence of both the broad exopod without flagellum on the first maxilliped and the epipod on the second maxilliped (Stebbing, 1920: pl. 105).

Closer examination of Stebbing's account revealed, further, that the chelipeds noted to be detached from the body should belong to some brachyuran crab because unlike those of chirostylids as well as galatheids the lateral of the fingers is movable when seen from a dorsal aspect, and that it is not unlikely that the first maxilliped is erroneously figured; it seems to me that the exopod of the first maxilliped indicated by Stebbing (1920:262) may in reality be an epipod and that the true exopod with flagellum that is usually dorsal to the epipod might have inadvertently been overlooked. If this is true, most of the peculiarities except for the edentate mandible and the presence of an epipod on the second maxilliped would indicate that *Hapaloptyx* approaches, or, is nearly identical with, *Chirostylus*. In order to confirm these two unusual characters reexamination of the type would be highly desirable; the type (dry) is now deposited in the collection of the South African Museum under catalogue number, S.A.M. A1440 (Kensley, 1974:66).

Key to Genera of Chirostylidae

1. One or two pairs of supraocular spines; mandible smooth or feebly dentate on incisor margin 2
– No supraocular spines; mandible strongly dentate on incisor margin 3
2. Two pairs of supraocular spines; 3 pairs of hepatic spines in oblique line ..... ***Eumunida***
– One pair of supraocular spines; hepatic spines absent ..... ***Pseudomunida* Haig, 1979**
3. Pereopods usually spinose and slender..... 4
– Pereopods not extremely spinose, short or of moderate length ..... ***Uroptychus***
4. Rostrum absent ..... ***Chirostylus***
– Rostrum present and spiniform ..... ***Gastroptychus***

Genus *Chirostylus* Ortmann, 1892

The genus *Chirostylus* now contains only three species, all occurring in the sublittoral zone of the Indo-West Pacific (Miyake and Baba, 1968; Tirmizi and Khan,1979). The forms having a distinct rostrum formerly merged with *Chirostylus*

have been transferred to *Gastroptychus* Caullery (Miyake and Baba, 1968:381; Baba, 1977d:206).

Tirmizi and Khan (1979:77) noted that the occurrence of a rostral spine is not unusual in *Chirostylus ortmanni* as well as in *C. micheleae* and concluded that the presence or absence of the rostrum is of little or no generic importance. This spine, however, should not be regarded as the true rostrum. In my opinion, it is identical with those irregularly appearing elsewhere on the carapace.

1. *Chirostylus dolichopus* Ortmann, 1892

Chirostylus dolichopus Ortmann, 1892:246, pl. 11: figs. 2, 2b, 2c, 2e, 2i, 2z. – Miyake, 1960:97, pl. 48: fig. 8. – Miyake and Baba, 1968:381, figs. 1b, 2. – Haig, 1974:447. – Tirmizi and Khan, 1979:86, fig. 6. – Miyake, 1982:143, pl. 48: fig. 1.

Material. – Sulu Archipelago (Sta. 5144: 1 ♂; Sta. 5145: 1♂; Sta. 5174: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 5.0-5.7 mm; of ovigerous female, 4.2 mm; diameter of ovum, 0.7 mm.

Diagnosis. – Carapace glabrous, gastric region moderately convex with pair of spines behind eyes. Cervical groove shallow; small spine directly behind each end of cervical groove. Lateral margins convex; greatest breadth measured at posterior 1/3 of length. Anterolateral spine well developed. Rostrum totally absent. Outer orbital angle with tiny spine. Eyestalk elongate, fully twice as long as cornea; cornea not dilated. Strong distolateral marginal process of antennular basal segment subdivided into 4 spines. Anterior margin of sternum of third thoracic somite almost transverse, bearing 6 spinules. Chelipeds spinous, subcylindrical, more than 10 times as long as carapace. Dactyli of walking legs 1/11 as long as propodi, ventrally with line of 6-8 spines, penultimate distinctly larger.

Habitat. – Taken in 35-42 m on bottoms of sand or sand mixed with shells.

Remarks. – The specimens listed above display the typical features as reported by Ortmann (1892:246) and Miyake and Baba (1968:381). Coloration of a fresh specimen is shown by Miyake (1982: pl. 48: fig. 1). No additional characters of significance were noted.

Type-locality. – Sagami Bay, Japan.

Distribution. – Known from Japan, Sulu Archipelago, Western Australia and the Indian Ocean off the coast of Tanzania, in depths between 35 and 140 m. Haig (1974:447) believed that this species belongs to a tropical form and has spread from the center of distribution, the Indo-Malayan region, southward to Western Australia and north to Japan via the Philippines.

Genus *Eumunida* Smith, 1883

Two species have been described since the revisionary work of Gordon (1930) who treated all the species known up to the time of her publication: *Eumunida gordonae* from south of Japan and *E. debilistriata* from off Midway Island (Baba, 1976, 1977c). All known species, ten in number, are known from the Indo-Pacific, and one (*E. picta*) seems to be the Atlantic element occurring in both the western and eastern

Atlantic (Chace, 1942:3) but it has been recorded also from between Australia and New Zealand (Gordon, 1930:742). This "Albatross" collection contains only four species including a new species.

Due to the general paucity of the specimens the range of morphological variation in each species is not sufficiently known, and therefore Gordon's key to the species is still most useful.

Key to Philippine Species

1 Spine on each side of sternum of fourth thoracic somite 2
– No spine on each side of sternum of fourth thoracic somite 3
2. Pad on ventral surface of palm of cheliped ..... **2. *E. funambulus***
– No pad on ventral surface of palm of cheliped ..... **3. *E. pacifica***
3. Pad on ventral surface of palm of cheliped ..... **5. *E. smithii***
– No pad on ventral surface of palm of cheliped ..... **4. *E. propior***

2. *Eumunida funambulus* Gordon, 1930

Eumunida funambulus Gordon, 1930:744, figs. 1c, 2a, 2b, 3b, 4b, 5. – Van Dam, 1933:10; 1937:102. – Baba, 1973:121, fig. 3, pl. 4: fig. 2.

Material. – Off northern Mindanao (Sta. 5517: 2 ♂, 1 ♀). – Between Cebu and Bohol (Sta. 5417: 1 ♀). – Between Masbate and Leyte (Sta. 5398: 3 ♀). – South China Sea off southwestern Luzon (Sta. 5113: 2 ♂, 1 ♀; Sta. 5298: 1 ♀).

Measurements. – Carapace lengths of males, 15.5-28.5 mm; of nonovigerous females, 14.1-45.0 mm.

Diagnosis. – Carapace with distinct transverse ridges, laterally armed with 7 spines; paired gastric spines (α of Gordon, 1930:744) and oblique row of 3 hepatic spines. Merus of third maxilliped with 1 distodorsal and 1 or 2 ventral marginal spines. Sternum of third thoracic somite with paired median processes; following sternum with strong lateral marginal spine on each side. Palm of cheliped with ventral pad of densely packed hairs, shorter than fingers, massive, covered with soft setae. Propodi of walking legs with several dorsal marginal spines in adult.

Habitat. – Taken in 209-309 m on bottoms of mud or sand or globigerina.

Remarks. – No marked differences were noticed between the present material and the paratype female from Sahul Bank, south of Timor, now deposited in the National Museum of Natural History, Smithsonian Institution. The anterior carapacial spines supposed to be characteristic of this species (Gordon, 1930:745) are subject to some variation; the three hepatics and the spine "α" of Gordon (1930: fig. 5) are constantly present; however, the spine "β" (Gordon, 1930: fig. 5) is missing in three of the 11 specimens examined, independent of age. The propodus of the walking leg is also variably spinose on the dorsal margin. As pointed out by Gordon, the number of spines in adults is greater than in immature or smaller specimens. However, the actual number is not so large as in Gordon's material; it varies from 0 to 5 in the first walking leg, 0 to 6 in the second and 0 to 8 in the third; the complete suppression of spines (not in all but in some appendages) occurs in specimens having the cara-

pace less than 19.4 mm long. In a female with a carapace length of 25.5 mm from Sta. 5298, the left cheliped is the smaller; most notable in the specimen, however, is the complete absence of the ventral pad on the palm of the smaller cheliped. Presumably it is due to regeneration.

As has been pointed out earlier (Baba, in Baba, Hayashi and Toriyama, 1986), the specimen of Miyake (1982) should be called *E. pacifica*.

Type-locality. – Gulf of Aden (12°45'N, 45°17'E).

Distribution. – This is a rather widespread Indo-Pacific species; it has previously been taken from the Gulf of Aden, Socotra Channel, between Aden and Bombay, south of Timor, Madura Strait of Java, north coast of Sumatra, Celebes Sea, between Cebu and Leyte, and Japan; in 128-732 m.

3. *Eumunida pacifica* Gordon, 1930

Figure 1

Eumunida pacifica Gordon, 1930:746, figs. 6, 7. – Baba, in Baba, Hayashi and Toriyama, 1986:165, 287, fig. 116.

Eumunida funambulus: Miyake, 1982:144, pl. 48: fig. 3.

Material. – Off southern Obi (Sta. 5634: 1 ♂).

Measurements. – Length of carapace, 18.3 mm; of cheliped, 51.4 mm.

Diagnosis. – Carapace with distinct transverse ridges, armed with 7 lateral marginal spines; no gastric spines; 3 hepatic spines in oblique row, foremost prominent. Merus of third maxilliped with tubercular or distinct process on ventral margin. Two median processes on anterior margin of sternum of third thoracic somite; following sternum with well developed lateral spine. Chelipeds slender, subcylindrical, palm ventrally armed with 4 or 5 spines near mesial margin, lacking pad of densely packed hairs. Propodi of walking legs without dorsal marginal spines.

Description. – Carapace (Figure 1a) excluding spines slightly longer than broad. Dorsal transverse ridges distinct and more or less elevated; those on anterior gastric region interrupted, squamiform; several posterior ridges uninterrupted. Cervical groove distinct. Three pairs of hepatic spines present, foremost much pronounced. Spines "α" and "β" of Gordon (1930: fig. 5) absent. Lateral margins convex; greatest breadth of carapace measured at midlength; 2 spines on anterior branchial margin, 4 on posterior branchial margin.

Rostrum spiniform, about half as long as remaining carapace. Inner supraocular spine extending to 0.78 of length of rostrum. Outer supraocular spine moderately remote from, and slightly overreaching midlength of, inner one.

Eyestalk short, cornea dilated distally.

Antennal peduncle consisting of 5 segments; second segmental spine terminating at midlength of fourth segment; third segmental spine almost reaching end of fifth segment; fourth segment with 1 small distolateral and 1 greatly produced distomesial spines, latter reaching tip of fifth segmental spine; 3 well-developed, equal-sized spines on fifth segment.

Ventral margin of merus of third maxilliped (Figure 1b) with median spine on right side, tubercular process on left side; distodorsal margin very minutely pro-

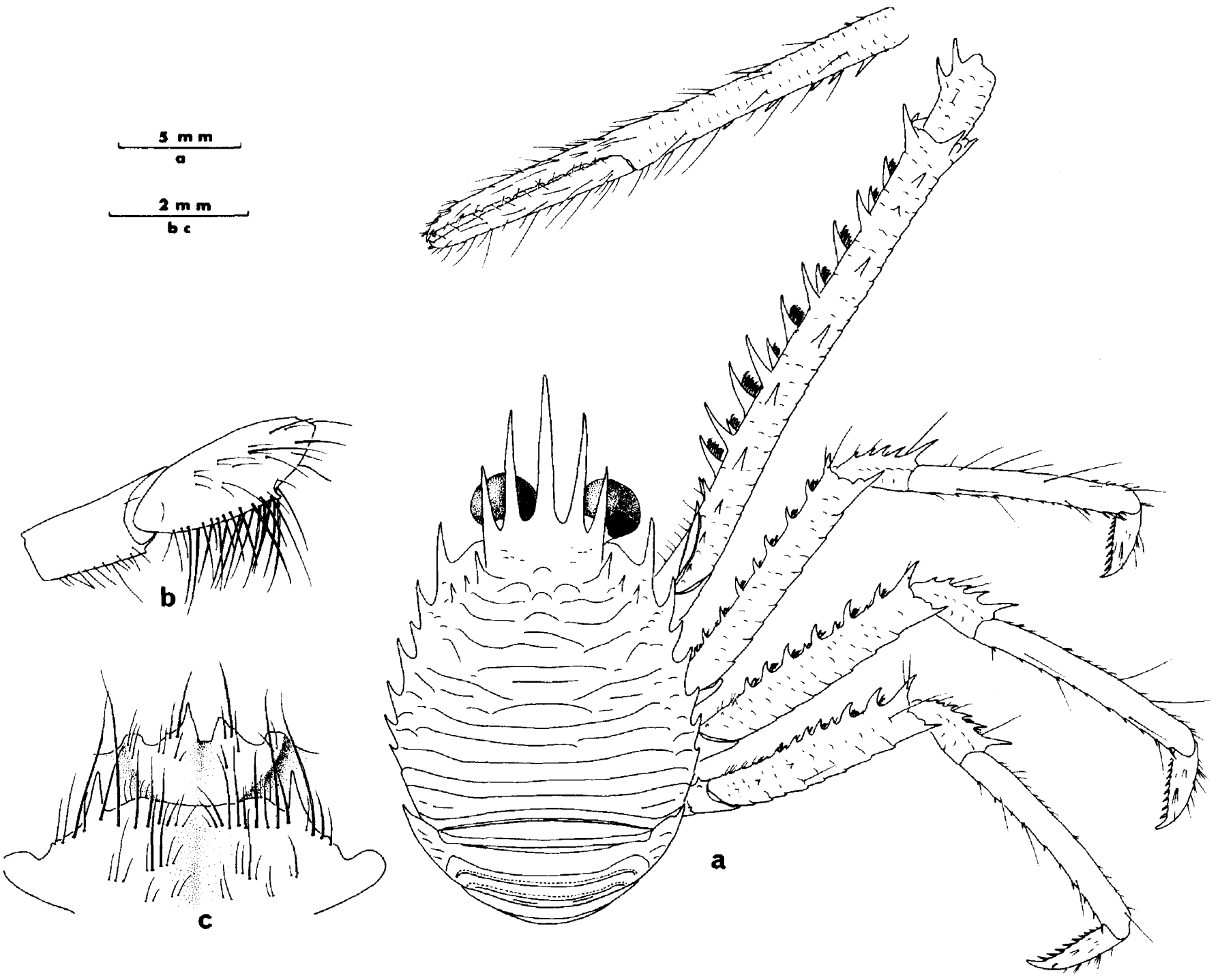

Figure 1. – *Eumunida pacifica* Gordon, male from "Albatross" Sta. 5634: a, dorsal view; b, proximal segments of endopod of right third maxilliped; c, anterior part of sternal segments.

duced on right side only.

Sternal segments medially concave, anterior part as illustrated (Figure 1c); 2 median processes distinct on anterior margin of third thoracic sternum; following sternum with prominent lateral spine and setiferous transverse ridges; anterior ridge uninterrupted and greatly elevated, posterior ridge interrupted and squamiform but distinctly elevated.

Distal 2 segments of left cheliped broken and missing. Right cheliped (Figure 1a) squamate on surface, subcylindrical, relatively slender, about 4 times as long as carapace excluding rostrum. Merus with strong spines arranged in 3 rows: ventral row of 10 or 11 spines nearer mesial margin, mesial row of 6 spines, and dorsomesial row of 10 spines. Carpus short, with 2 mesial marginal and 1 distoventral spines, dorsally spineless. Chela sparsely furnished with coarse setae. Palm not massive, about 7 times as long as wide, mesial and lateral margins subparallel, 1.3 times as long as movable finger; ventral surface lacking pad of densely packed short hairs, bearing 5 spines nearer mesial margin. Fingers not gaping; opposable margins almost straight and minutely tuberculate, that of fixed finger with several

larger tubercles or processes equidistantly arranged.

All walking legs (Figure 1a) undetached from body, moderately depressed. Merus of first walking leg squamate dorsally, with 11 dorsal marginal and 1 distoventral marginal spines; fine plumose setae arising from base of each dorsal marginal spine. Carpus with 5 dorsal marginal spines only. Propodus sparsely furnished with long coarse setae, ventral margin with 12 or 13 movable spinelets; dorsal margin unarmed. Dactylus with relatively short setae, slightly less than half as long as preceding segment, distally curving ventrad, ending in spiniform claw; ventral margin serrate weakly, with 9 robust setae. Second walking leg similar to first leg; merus slightly wider but shorter, with few spinules on dorsolateral face near proximal dorsal margin; carpus longer. Merus of third walking leg wider and shorter than that of second, dorsal marginal spines reduced to minute size in proximal 1/3 of length; few spinules in midline on proximal dorsolateral face.

Habitat. – Taken in 602 m; bottom unknown.

Remarks. – Inasmuch as there has been no record since that of the female holotype, the original brief description is expanded above. The "Albatross" specimen generally agrees with Gordon's definition, but it differs in having the movable finger of cheliped 0.78 as long as the palm; in the holotype it is somewhat longer [1.08 times as long, by my interpretation from Gordon's figure]. This difference, however, may have no systematic importance even if additional material becomes available, as suggested under the "Remarks" on *Eumunida propior* and *E. smithii* in this paper.

Type-locality. – Northwest coast of Roti, south of Timor (10°26'S, 123°15'E).

Distribution. – Known from Savu Sea off Roti, Ceram Sea off Obi, and Kyushu-Palau Ridge in 293-1,320 m.

4. *Eumunida propior*, new species

Figure 2

Eumunida balssi: Van Dam, 1933:10. [not *E. balssi* Gordon, 1930:752]

Material. – Off northern Mindanao (Sta. 5516: 1 ♂, 2 ♀ [1 ♀ is holotype, USNM 150333]; Sta. 5517: 4 ♂; Sta. 5518: 1 ♀; Sta. 5543: 2 ♂). – South China Sea off southwestern Luzon (Sta. 5279: 1 ♂).

Diagnosis. – Carapace with distinct transverse ridges; lateral margin with 6 spines, convex medially; 3 hepatic spines subequal in size. No gastric spines. Outer supraocular spine moderately remote from, and, reaching midlength of, inner supraocular spine. Merus of third maxilliped with midventral spine only. Sternum of third thoracic somite with acute median processes; following sternum unarmed. Palm of cheliped nearly as long as finger, thickly covered with fine setae, lacking ventral pad. Propodi of walking legs without dorsal marginal spines.

Description of holotype. – Carapace (Figure 2a) excluding rostrum slightly broader than long. Gastric region well defined; 3 hepatic spines subequal in size. Transverse ridges as illustrated, moderately elevated; anterior branchial region with squamiform striae. Lateral margins convex, armed with 6 spines decreasing in size posteriorly. Greatest width measured between penultimate lateral spines.

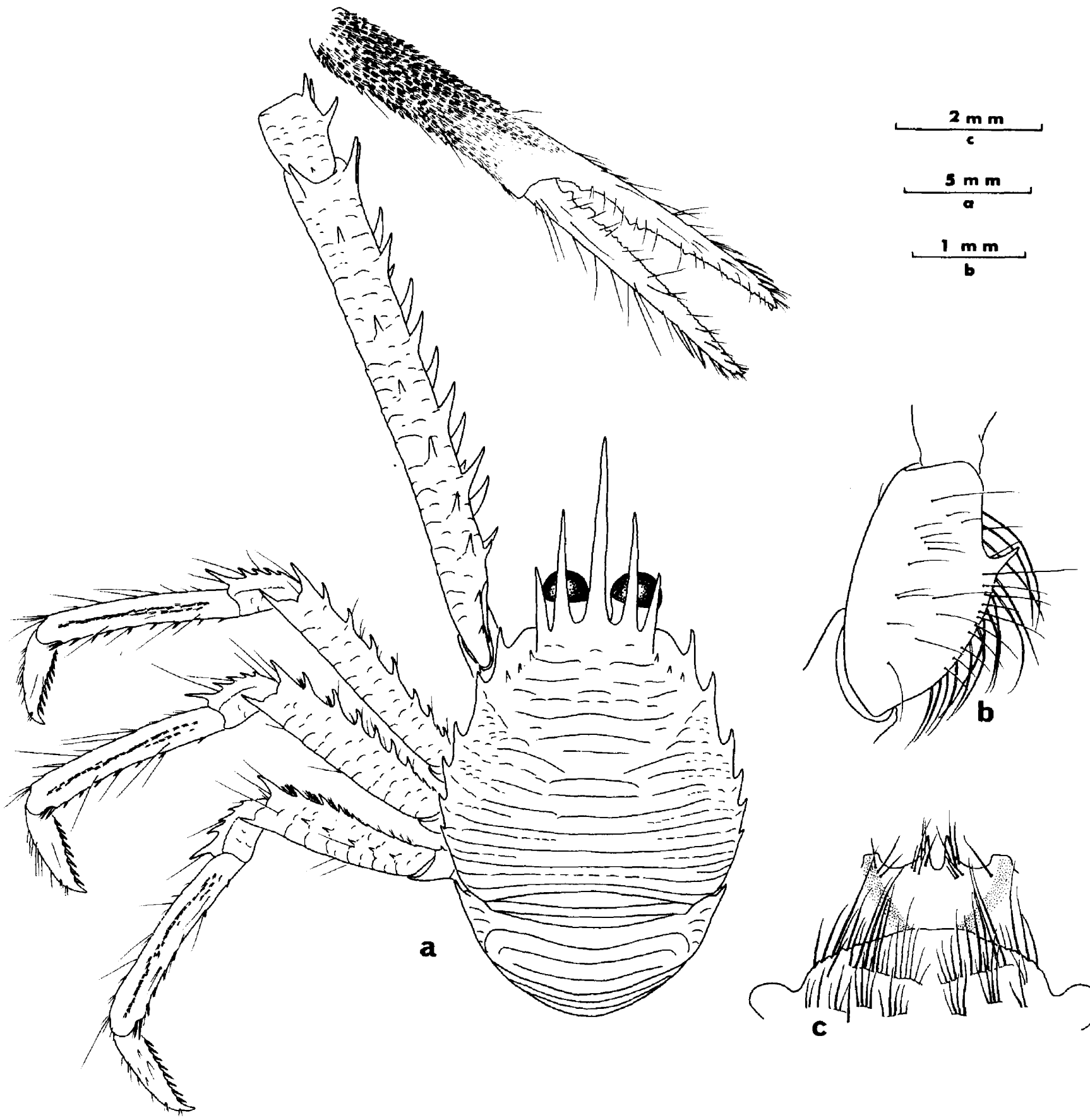

Figure 2. – *Eumunida propior*, new species, female holotype from "Albatross" Sta. 5516: a, dorsal view; b, merus of right third maxilliped; c, anterior part of sternal segments.

Rostrum (Figure 2a) sharply spiniform, 2/3 of remaining carapace length; inner supraocular spine terminating in 2/3 of length of rostrum, twice as long as outer supraocular.

Cornea moderately dilated, reaching end of outer supraocular spine.

Merus of third maxilliped (Figure 2b) with midventral marginal spine of moderate size.

Anterior part of sternal segments as illustrated (Figure 2c); pair of well developed median processes on anterior margin of third thoracic sternum; following sternum spineless.

Cheliped (Figure 2a) subcylindrical, 4.7 times as long as carapace excluding rostrum. Ischium with moderate-sized ventral spine. Merus squamate, armed with 3 rows of spines: dorsomesial, dorsolateral and ventrolateral; ventrolateral row composed of large and small spines regularly alternated; few ventromesial spines present distally. Carpus also squamate, with 2 mesial marginal and 1 distoventral spines. Palm slightly shorter than movable finger, not massive, covered with short fine plumose setae, armed with 4 ventromesial spines; no pad on ventral surface of palm. Fingers not gaping, furnished with relatively long coarse setae; opposable margins as illustrated.

First 2 walking legs (Figure 2a) similar, squamate, sparsely furnished with long coarse setae. Merus of first walking leg with 10 dorsal marginal, 1 disto-ventrolateral and 6 ventromesial spines, all distal largest. Carpus with 5 acute spines on dorsal margin, ultimate largest. Propodus smooth dorsally, ventrally armed with 9 spinelets; short fine setae in midline on dorsolateral face. Dactylus slightly more than half as long as propodus, with 9 spinelets on serrate ventral margin. Second walking leg similar to first leg, but merus shorter, propodus slightly longer. Merus of third walking leg shorter than that of second, armed with 5 spines in midline on dorsolateral face; dorsal marginal spines less prominent, distinctly decreasing in size toward base of segment.

Measurements of holotype. – Length of carapace including rostrum, 17.7 mm; width of carapace, 10.9 mm; length of cheliped (left), 48.4 mm; of carpus, 3.6 mm; of palm, 10.2 mm; of movable finger, 10.7 mm.

Measurements of paratypes. – Carapace lengths of males, 6.8-17.6 mm; of females, 11.5-16.3 mm.

Variation. – The dactylus-palm ratio of the cheliped varies between 0.90 and 1.27 (average, 1.02).

Habitat. – Taken in 214-366 m on bottoms of sand or mud or globigerina.

Remarks. – The new species is closely related to *Eumunida balssi* Gordon from Japan in having the palm of cheliped densely covered with fine plumose setae. It is, however, readily distinguished by lacking a distolateral spine on the merus of the third maxilliped and dorsal marginal spines on the propodi of first three walking legs. These differences were confirmed by examining three comparative specimens of *E. balssi*; one male from off Koajiro, Sagami Bay, Japan and one female from off Shimoda, Sagami Bay, both in the collection of the Kyushu University, Fukuoka, and another male from west of Goto Island, west of Kyushu, Japan (32°26'N, 128°37'E) in 249 m, in the collection of the Zoologisk Museum, Copenhagen. The "Siboga" specimens have doubtfully been referred to *E. balssi*, due to the complete absence of the distolateral spine on the merus of the third maxilliped (Van Dam, 1933:10); in all probability they will prove to belong to this new species.

Type-locality. – Northeast of Pt. Tagolo Light, off northern Mindanao (8°46'N, 123°32'30"E).

Distribution. – Known from the Mindanao Sea and the South China Sea in 214-366 m. The "Siboga" material was obtained from northeast of the Sulu Islands and from south of Kur of the Kei Islands, in 204-275 m.

5. *Eumunida smithii* Henderson, 1885

Figure 3

Eumunida smithii Henderson, 1885:413; 1888:169, pl. 15: figs. 5, 5a, 5b. – Gordon, 1930:749, figs. 9, 10. – Van Dam, 1933:11.

Material. – South China Sea off southwestern Formosa (Sta. 5317: 1 ♀).

Measurements. – Length of carapace including rostrum, 14.0 mm; of cheliped 38.2 mm.

Diagnosis. – Carapace widest posteriorly, with 7 or 8 lateral marginal spines; transverse ridges distinct; no gastric spines; 3 hepatic spines subequal-sized. Outer supraocular spine distinctly remote from, and, terminating in midlength of, inner one. Merus of third maxilliped with midventral spine. Sternum of third thoracic somite with acute median processes on anterior margin, following sternum unarmed laterally. Palm of cheliped with ventral pad of densely packed short setae. Propodi of walking legs spineless on dorsal margin.

Habitat. – Taken in 421 m on bottom of sand and shells.

Remarks. – The present specimen generally agrees with the description of *E. smithii* given by Gordon (1930:749), especially in the shapes of the sternum and third maxilliped. According to Gordon, the palm of the cheliped is massive and shorter than the finger. The present material, however, seems at variance with this definition; the palm (Figure 3a) is less massive and distinctly longer, the dactylus-propodus ratio being 0.80 instead of 1.27 as in Gordon's material. Van Dam (1933:11) suggested that the dactylus-propodus ratio of the cheliped as well as the first walking leg is variable with age. The measurements given by her show the ratio of 0.86 for the cheliped of the larger male and 1.05 for the smaller male. In addition, as compared with the case of *E. propior* in which the ratio varies between 0.90 and 1.27 in the 11 specimens examined, the above-mentioned variation may not be surprisingly great.

The ovigerous female from Sahul Bank, south of Timor, mentioned in Gordon's publication, was made available on loan through the courtesy of the British Museum (Natural History). Relative lengths of supraocular spines are about the same as those of the "Albatross" specimen; however, the carapace is much broader and distinctly widening posteriorly (Figure 3e); the walking legs are also broader, with the propodus 4.3 times as long as wide instead of about 6 times as long in the "Albatross." Possibly these differences may be due to age or individual variation.

Type-locality. – Little Kei Island.

Distribution. – Known from the Kei Islands, south of Timor and the South China Sea off southwestern Formosa in 204-421 m.

Genus *Gastroptychus* Caullery, 1896

All *Chirostylus* species but one (*C. dolichopus*) listed by Van Dam (1933:38) are transferred to *Gastroptychus*. Since her publication six species have been described (Chace, 1942; Haig, 1968; Baba, 1974b, 1977c, 1977d, 1986b). Eight of the 15 known species were taken in the Indo-West Pacific. This "Albatross" collection contains three species.

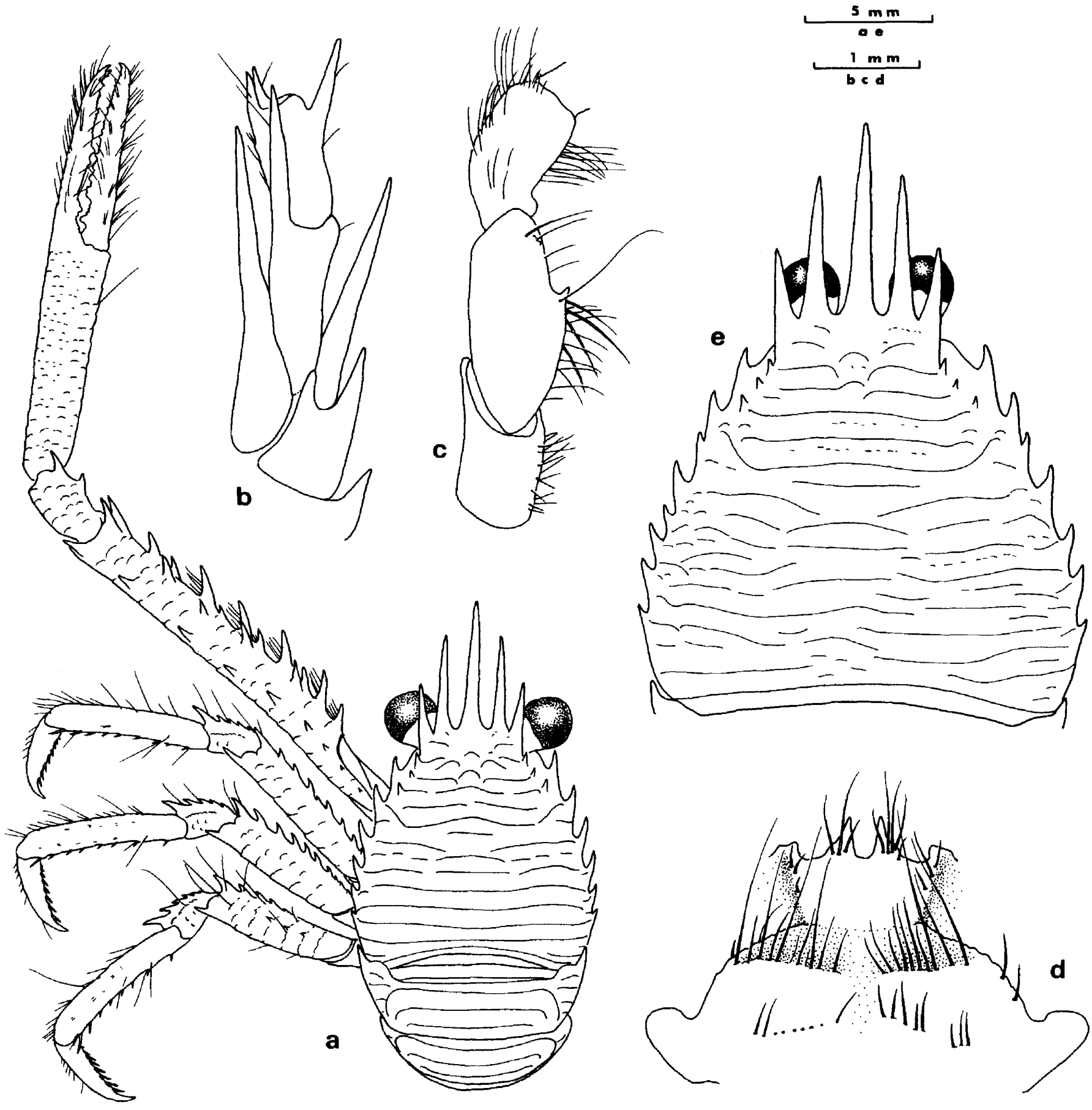

Figure 3. – *Eumunida smithii* Henderson, female from "Albatross" Sta. 5317: a, dorsal view; b, left antennal peduncle; c, endopod of right third maxilliped, distal 2 segments omitted; d, anterior part of sternal segments. Ovigerous female from Sahul Bank, south of Timor, BMNH Reg. 1919.1.6.-10: e, carapace.

Key to "Albatross" Philippine Species Examined

1. Abdominal segments smooth and spineless dorsally; sternum of third thoracic somite with about 8 spinules on concave anterior margin .... 8. ***G. sternoornatus***
– Abdominal segments with spinules dorsally; pair of spines on anterior surface of sternum of third thoracic somite..... 2
2. Third abdominal segment smooth dorsally ..... 7. ***G. investigatoris***

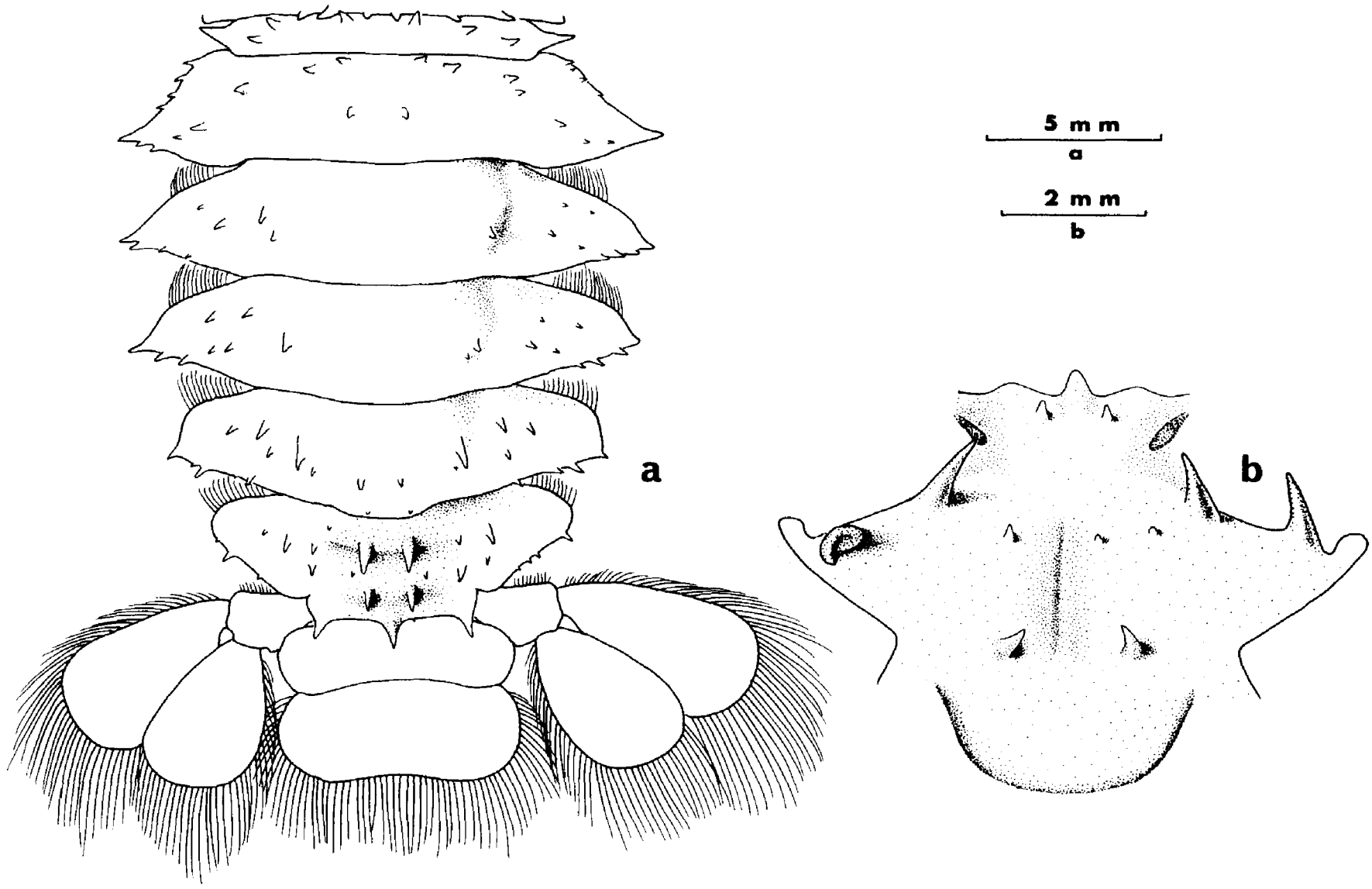

Figure 4. – *Gastroptychus hendersoni* (Alcock and Anderson), female from "Albatross" Sta. 5603, carapace length 18.1 mm: a, abdomen; b, anterior part of sternal segments.

– Third abdominal segment with small spines at least on pleura.. **6. *G. hendersoni***

6. *Gastroptychus hendersoni* (Alcock and Anderson, 1899)

Figure 4

Ptychogaster hendersoni Alcock and Anderson, 1899a:23; 1899b: pl. 45: figs. 2, 2a. – Alcock, 1901:280.
Chirostylus hendersoni: Tirmizi, 1964:389, fig. 3.
Gastroptychus hendersoni: Baba, in Baba, Hayashi and Toriyama, 1986:167, 288, fig. 117.

Material. – Off south coast of Minahassa Peninsula, Sulawesi (Sta. 5603: 1 ♀).

Measurements. – Carapace length, 18.1 mm; cheliped length, 120.5 mm.

Diagnosis. – Carapace covered with spines and less numerous spinules; 2 larger spines behind eyes constantly present; stout spines arranged roughly in longitudinal rows. Cervical groove distinct. All abdominal segments spinose at least on pleura. Eyes more or less dilated distally. Antennal scale reduced to small triangular lappet. Sternum of third thoracic somite as illustrated.

Habitat. – Shelly bottom in 1,469 m.

Remarks. – The sternum of the third thoracic somite, noted as much the same as that of *G. investigatoris* (see Tirmizi, 1964:389), bears two pairs of spines flanking the median groove, and a spinule equidistant between the left anterior small spine and

the left distolateral spine (Figure 4b).

Type-locality. – Off Travancore [= Kerala coast].

Distribution. – Known from off the Kerala State of India, South Arabian coast, off northeastern Sulawesi, and the Kyushu-Palau Ridge, in 787-1,469 m.

7. Gastroptychus investigatoris (Alcock and Anderson, 1899)

Figure 5

Ptychogaster investigatoris Alcock and Anderson, 1899a:24; 1899b: pl. 45: fig. 1. – Alcock, 1901:281. – Kemp and Sewell, 1912:25.
Chirostylus investigatoris: Doflein and Balss, 1913:132, figs. 1, 2. – Tirmizi, 1964: 386, figs. 1, 2.
Gastroptychus investigatoris: Zarenkov and Khodkina, 1981:86, fig. 3.

Material. – Between Cebu and Leyte (Sta. 5405: 1 ♂, 1 ovig. ♀). – Molucca Sea off west coast of Halmahera (Sta. 5622: 1 ovig. ♀).

Measurements. – Carapace length of male, 15.9 mm; of ovigerous females, 17.1-20.9 mm; diameter of ovum, 1.0 mm.

Diagnosis. – Carapace covered with spinules and spines; 2 pronounced spines behind eyes, and similar larger ones arranged in 4 longitudinal rows. Cervical groove distinct. Abdominal segments thickly covered with fine setae, less spinose, third segment almost spineless; anterior segment of telson longer than posterior one. Eyes slightly dilated distally. Antennal scale as in preceding species. Sternum of third thoracic somite with 2 spines on anterior surface; following sternum medially grooved, 2 or 3 pairs of spines flanking median groove, ultimate larger; lateral margin with 2 strong spines.

Habitat. – Taken in 479-503 m on hard or mud bottom.

Remarks. – All the "Albatross" specimens agree with Alcock's definition. In two specimens from Station 5405 the fourth abdominal segment is unarmed and smooth, as in the male of the "John Murray" material (Tirmizi, 1964:387).

Alcock (1901:280) noted that the anterior segment of the telson is much more than half as long as the posterior in *G. investigatoris* while it is not in *G. hendersoni*. In the "Albatross" *G. investigatoris* the ratio of the anterior segment to the posterior is 27: 33 in the ovigerous female from Station 5622; 20:23 in the male and 24:27 in the ovigerous female, both from Station 5405. In the female of *G. hendersoni* from Station 5603 it is 23:34. These ratios indicate that the anterior segment is variably longer than the posterior in *G. investigatoris* and that Alcock's scale is not applicable to the "Albatross" material of *G. hendersoni*.

The median longitudinal groove on the sternum of the third thoracic somite said to be distinct in the "John Murray" material from the Maldives (Tirmizi, 1964:387) is missing in the present specimens (Figure 5b).

The antennal peduncle is described and illustrated here for the species (Figure 5a): The ultimate segment is less than twice as long as the penultimate and bears a distinct terminal spine, which is lacking on the penultimate segment; an antennal scale is present but greatly reduced in size.

Type-locality. – Andaman Sea.

Distribution. – Known from the Marcus-Necker Rise, the Philippines in the above

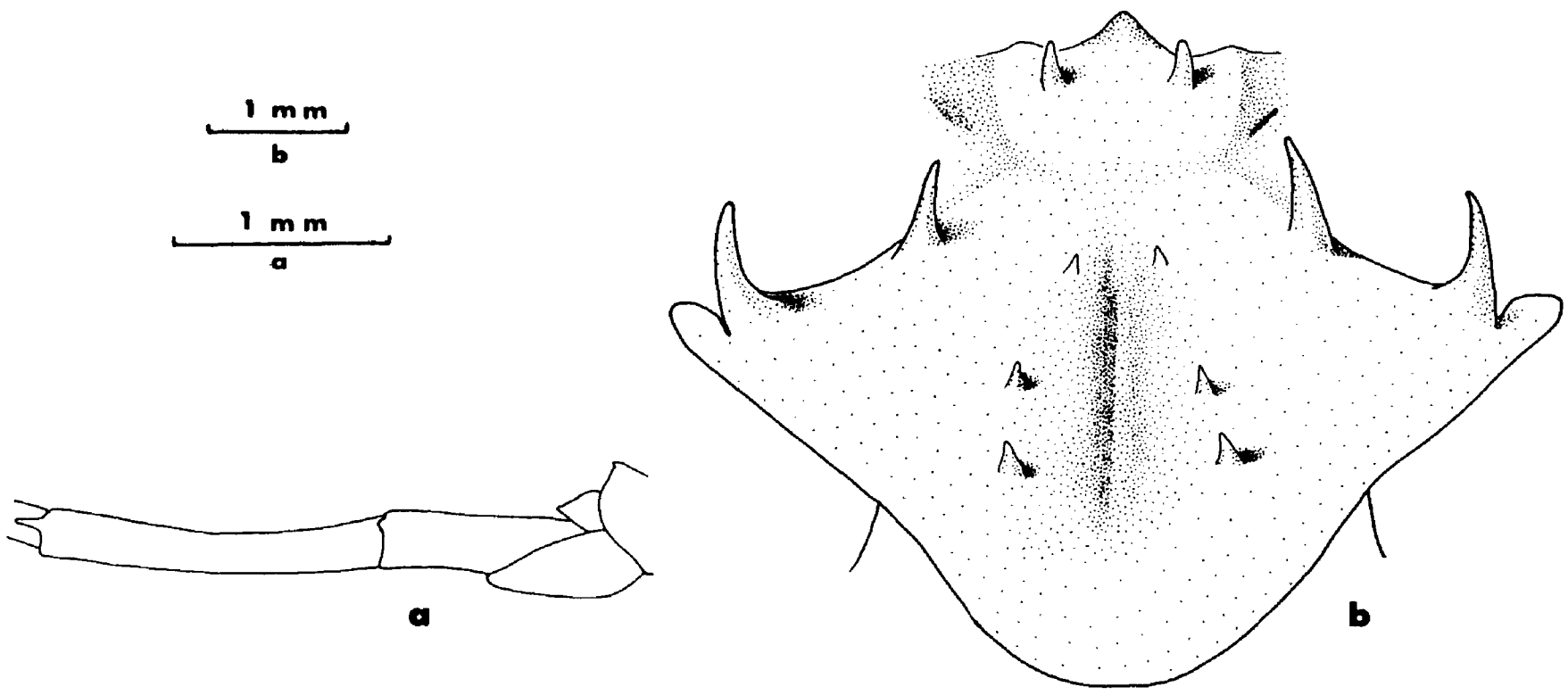

Figure 5. – *Gastroptychus investigatoris* (Alcock and Anderson), male from "Albatross" Sta. 5405, carapace length 15.9 mm: a, left antennal peduncle; b, anterior part of sternal segments.

listed localities and the Indian Ocean from off the east coast of Sumatra westward to the Arabian Sea in depths between 479 and 1,500 m.

8. *Gastroptychus sternoornatus* (Van Dam, 1933)

Figure 6

Chirostylus sterno-ornatus Van Dam, 1933:15, figs. 21-23.

Material. – Vicinity of Marinduque off southwestern Luzon (Sta. 5221: 1 ovig. ♀). – Off southeastern Mindoro (Sta. 5261: 1 ♂).

Measurements. – Carapace of male detached from body and missing; carapace length of ovigerous female, 13.5 mm; diameter of ovum, 1.2 x 1.3 mm.

Diagnosis. – Carapace spinose; prominent spines behind eyes, on median gastric and median cardiac regions, and near posterior margin. Rostrum spiniform, slender, upcurved. Abdominal segments unarmed. Eyes elongate, cornea dilated. Distal 2 segments of antennal peduncle with strong distal spine, antennal scale slender, falling short of end of peduncle. Sternal segments of third and fourth thoracic somites spinous on anterior margin.

Habitat. – Taken in 265-353 m on bottoms of mud, or mud mixed with sand.

Remarks. – The present specimens agree well with the original description as well as the female holotype from the "Siboga" Station 254 now deposited in the Zoological Museum, Amsterdam. As indicated by the name this species is characterized by having spinous sternal segments. In the male, however, the spination is much reduced especially on the posterior portion.

Two pairs of gonopods are present in the male. The first gonopod is much like that of *G. investigatoris* illustrated by Tirmizi (1964: fig. 1). The second bears a round flap dorsally (Figure 6a, b), instead of a tongue-like projection as in *G. investigatoris*.

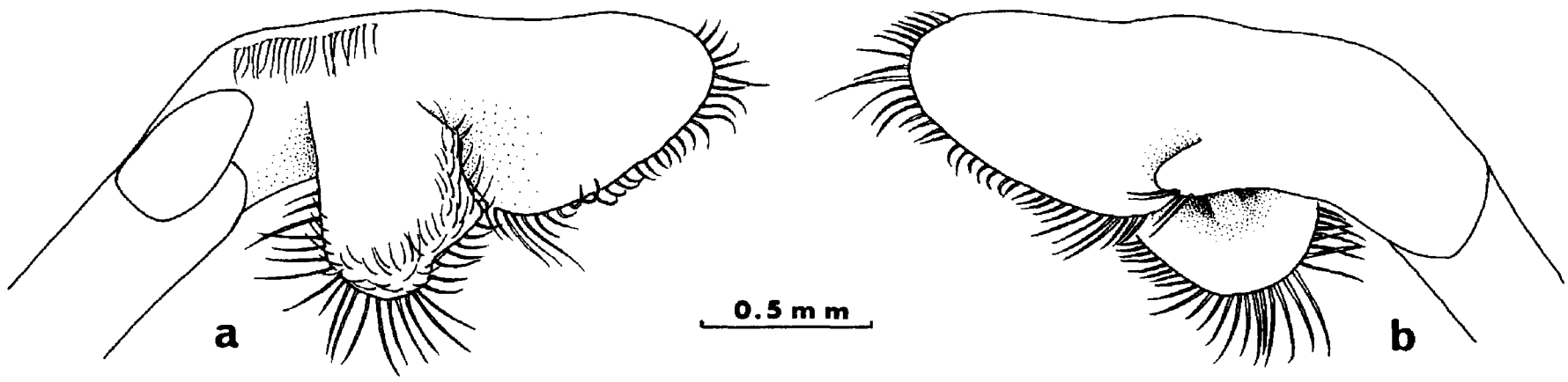

Figure 6. – *Gastroptychus sternoornatus* (Van Dam), male from "Albatross" Sta. 5261: a, distal part of second gonopod, dorsal view; b, same, ventral view.

Type-locality. – Off the Kei Islands.

Distribution. – Known from the Philippines in the vicinity of Mindoro and off the Kei Islands in 265-353 m.

Genus *Uroptychus* Henderson, 1888

A list of all species known before 1933 is provided by Van Dam (1933:38), in which 22 species and three subspecies are recorded from the Indo-West Pacific. Since the publication of her report 32 species have been described in this region (Yokoya, 1933; Van Dam, 1939, 1940; Miyake, 1961; Tirmizi, 1964; Miyake and Baba, 1967a; Kim, 1972; Kensley, 1977, 1981; Baba, 1977b, 1979a, 1981b, 1986a; Baba and Tirmizi, 1979). *Uroptychus nanophyes* and *U. sexspinosus* have been synonymized in a previous paper (Baba, 1981b:117). Also, *Uroptychus edwardi* Kensley is merged with *U. scambus* in this paper. Three subspecies are known from the Indo-West Pacific: *U. granulatus japonicus* Balss, *U. nitidus occidentalis* Faxon and *U. gracilimanus bidentatus* Doflein and Balss. The first one, however, proved to be specifically distinct from the typical form from the Galapagos Islands (see below). *Uroptychus nitidus* contains a typical west Atlantic form and its varieties (Chace, 1942:11), east Atlantic *U. nitidus concolor* and amphi-Pacific *U. nitidus occidentalis*; in spite of their geographical isolation morphological differences among them seem too subtle to permit treating them as distinct species. Due to the lack of subsequent record of specimens, the systematic status of *U. gracilimanus bidentatus* remains indeterminate. The present "Albatross" collection contains 18 species, eight of which are new to science.

Overall, 62 species and two subspecies are known from the Indo-West Pacific, including those newly described in this paper; 26 of them are recorded from the Philippines and vicinity.

It seems likely that future examination may relegate some of the described species to synonym. Consultation with the literature shows that comparison should carefully be made between *U. tridentatus* (Henderson) and *U. zezuensis* Kim, for the differences noted by Kim (1972:56) are so slight that such taxonomic distinction seems hardly justified. *U. latirostris* Yokoya, 1933 from Japanese waters should be a synonym of *U. cavirostris* Alcock and Anderson, 1899, as confirmed by examination of the holotype of the latter by K.K. Tiwari at my request.

To the aberrant *Uroptychus spinimarginatus* group (Baba, 1977b:124) is added the new species *U. albatrossae* (see "Remarks" on *U. mortenseni*).

Key to Species of *Uroptychus* from the Philippines and Vicinity

1. Rostrum carinate ventrally, distinctly longer than half of remaining carapace length 2
– Rostrum indistinctly carinate ventrally, less than half of remaining carapace length 6
2. First walking leg similar to second leg; dactylus with ventral marginal spines ..... **19. *U. naso***
– First walking leg slenderer than following 2 legs; dactylus unarmed on ventral margin 3
3. Body and legs densely covered with fine setae ..... **18. *U. mortenseni***
– Body and legs provided with less pronounced setae 4
4. Carapace covered dorsally with spinules ..... **25. *U. spinulifer***
– Carapace almost spineless dorsally 5
5. Rostrum with 2 or 3 lateral spines near apex; ultimate segment of antennal peduncle unarmed ..... **24. *U. spinimarginatus***
– Rostrum with more than 13 lateral spines along its whole length; distal 2 segments of antennal peduncle with strong terminal spine.... **10. *U. albatrossae***
6. Carapace with dorsal spines..... 7
– Carapace unarmed dorsally 9
7. Dactyli of walking legs short and blunt .....***U. scandens*** (Benedict, 1902:298, fig. 42; Van Dam, 1933:27, fig. 38; 1940:97)
– Dactyli of walking legs normal, ending in sharp point 8
8. Lateral margin of carapace with strong spines; fourth thoracic sternum with well developed distolateral spine; distal 2 segments of antennal peduncle produced distally ..... ***U. nanophyes*** (McArdle, 1901:525; Alcock and McArdle, 1902: pl. 57:fig. 1, 1a; Van Dam, 1940: 96, fig. 1; Baba, 1981b:117, fig. 5)
– Lateral margin of carapace feebly serrate or with tubercular processes; fourth thoracic sternum without distolateral process; distal 2 segments of antennal peduncle unarmed ..... **20. *U. nigricapillis***
9. Lateral margin of carapace with spines or serrations 10
– Lateral margin of carapace smooth and unarmed except for anterolateral spine 20
10. Rostrum triangular, about as broad at base as long..... ***U. cavirostris*** (Alcock and Anderson, 1899a:26; Van Dam, 1933:22, figs. 33, 34. Holotype female, 2672/10, in Zoological Survey of India was examined by K.K. Tiwari)
– Rostrum triangular, but not extremely wide at base 11
11. Third thoracic sternum with pair of spines on anterior median margin..... 12
– Third thoracic sternum without spines on anterior median margin 13
12. Eyes extending anteriorly about as far as tip of rostrum ..... **23. *U. sibogae***
– Eyestalk extending anteriorly about as far as distal 1/3 of rostral length ..... **13. *U. comptus***

13. Anterior margin of third thoracic sternum V-shaped or simply excavated without median notch 14
– Anterior margin of third thoracic sternum roundly excavated, with distinct median notch 15
14. Carapace dorsally granulate; eyes extending anteriorly about as far as tip of rostrum; propodi of walking legs with single ventral marginal spinelet distally ..... **21. *U. occultispinatus***
– Carapace dorsally smooth; eyes falling far short of extensive rostrum; propodi of walking legs with several ventral marginal spinelets..... ***U. xipholepis*** (Van Dam, 1933:32, figs. 47-50)
15. Dactyli of walking legs feebly curving ventrad, about 3 times as long as wide, bearing 10-18 ventral marginal spinelets 16
– Dactyli of walking legs nearly straight, about twice as long as wide, bearing 4-7 ventral marginal spinelets 17
16. Ultimate and penultimate segments of antennal peduncle with strong terminal spine .....**15. *U. crassipes***
– Ultimate segment of antennal peduncle unarmed distally ..... **17. *U. levicrustus***
17. Ultimate and penultimate dactylar spines of walking legs distinctly larger ....***U. suluensis*** (Van Dam, 1933:29, figs. 42-44)
– Penultimate and antepenultimate, or even third from ultimate, of dactylar spines of walking legs pronounced 18
18. Carapace with 1 tiny and 1 moderate-sized lateral spines somewhat anterior to midlength, other than anterolateral ..... ***U. joloensis*** (Van Dam, 1939:395, figs. 2, 2a, 2b, 2c)
– Carapace with at least 3 or 4 pronounced lateral spines, other than anterolateral 19
19. Ultimate and penultimate segments of antennal peduncle with strong terminal spine ..... ***U. tridentatus*** (Henderson, 1885:421; 1888:181, pl. 6: fig. 1; Van Dam, 1933:30, figs. 45, 46; 1937: 99; Baba, 1973:117)
– Ultimate segment of antennal peduncle spineless distally ..... **14. *U. convexus***
20. Carapace much wider than long ..... **22. *U. scambus***
– Carapace as long as wide or longer..... 21
21. Rostrum broadly triangular, deeply excavated dorsally..... ***U. brevirostris*** (Van Dam, 1933:20, figs. 29-32; 1940:96; Baba, 1973:119)
– Rostrum moderately or narrowly triangular, dorsally flattish 22
22. Merus of cheliped with distinct tubercles on mesial proximal margin .... ***U. australis*** (Henderson, 1885:420; 1888:179, pl. 21: fig. 4)
– Merus of cheliped without tubercles on mesial margin 23
23. Propodi of walking legs widened at middle, with 2 distinct spines at midlength of ventral margin .....**11. *U. bispinatus***
– Propodi of walking legs nearly uniform in breadth, with several spinelets in distal half of ventral margin 24
24. Carapace less than twice as long as rostrum; distal 2 of ventral marginal spinelets of dactyli of walking legs distinctly separated from remaining

proximal group of spinelets ..... **26. *U. vandamae***
– Carapace more than 3 times as long as rostrum; ventral marginal spinelets of dactyli of walking legs arranged equidistantly 25
25. Antennal scale 1.5 times as wide as peduncle ..... **12. *U. brevisquamatus***
– Antennal scale barely as wide as peduncle 26
26. Fourth thoracic sternum with prominent distolateral projection reaching anterior end of preceding sternum; carapace lacking groove along lateral margin ..... **9. *U. acostalis***
– Fourth thoracic sternum moderately produced at distolateral angle; carapace with distinct groove along posterior half of lateral margin.... **16. *U. gracilimanus***

9. *Uroptychus acostalis*, new species

Figure 7

Material. – Makassar Strait (Sta. 5664: 1 ovig. ♀; Sta. 5668: 1 ♂, holotype, USNM 150312).

Diagnosis. – Carapace dorsally smooth and glabrous, lateral margin convex, smooth or feebly indented, anterolateral spine distinct; greatest breadth of carapace measured at about posterior 1/3 of carapace. Rostrum triangular, 2/5 as long as remaining carapace. Outer orbital angle pyramidally produced. Eyes more or less elongate. Distal 2 segments of antennal peduncle unarmed. Merus and carpus of third maxilliped spineless. Third thoracic sternum depressed, concave on anterior margin, with 2 median spines separated by narrow notch, lateral margin with small but distinct process at midlength; following sternum greatly produced at distolateral angle. Chelipeds massive, spineless and almost glabrous except for fingers; palm about twice as long as wide, fingers distally crossing. Propodi of walking legs with 5-7 spinelets in distal half of ventral margin; dactyli half as long as propodi, with 9 or 10 ventral marginal spinelets gradually decreasing in size toward base of segment.

Description of holotype. – Carapace (Figure 7a) excluding rostrum as long as wide, dorsal surface somewhat convex, smooth, glabrous, without ridge along posterolateral margin. Lateral margins convex, spineless except for well developed anterolateral spine; greatest breadth of carapace measured at level of insertion of second walking leg. Outer orbital angle pyramidally produced.

Rostrum (Figure 7a) triangular, moderately wide at base, 2/5 as long as remaining carapace, overreaching cornea, dorsal surface flattish and smooth.

Abdominal segments also smooth, glabrous and spineless.

Eyes more or less elongate, terminating in distal 2/3 of rostral length; cornea not dilated, more than half as long as remaining eyestalk.

Distolateral marginal process of antennular basal segment simple but well developed. Ultimate segment of antennal peduncle (Figure 7b) barely twice as long as penultimate when measured on lateral margin, both segments unarmed distally; antennal scale slightly wider than peduncle, falling short of end of ultimate segment; basis moderately produced at distolateral angle.

Ischium of third maxilliped with 16 (left) or 14 (right) denticles in proximal 5/6 of

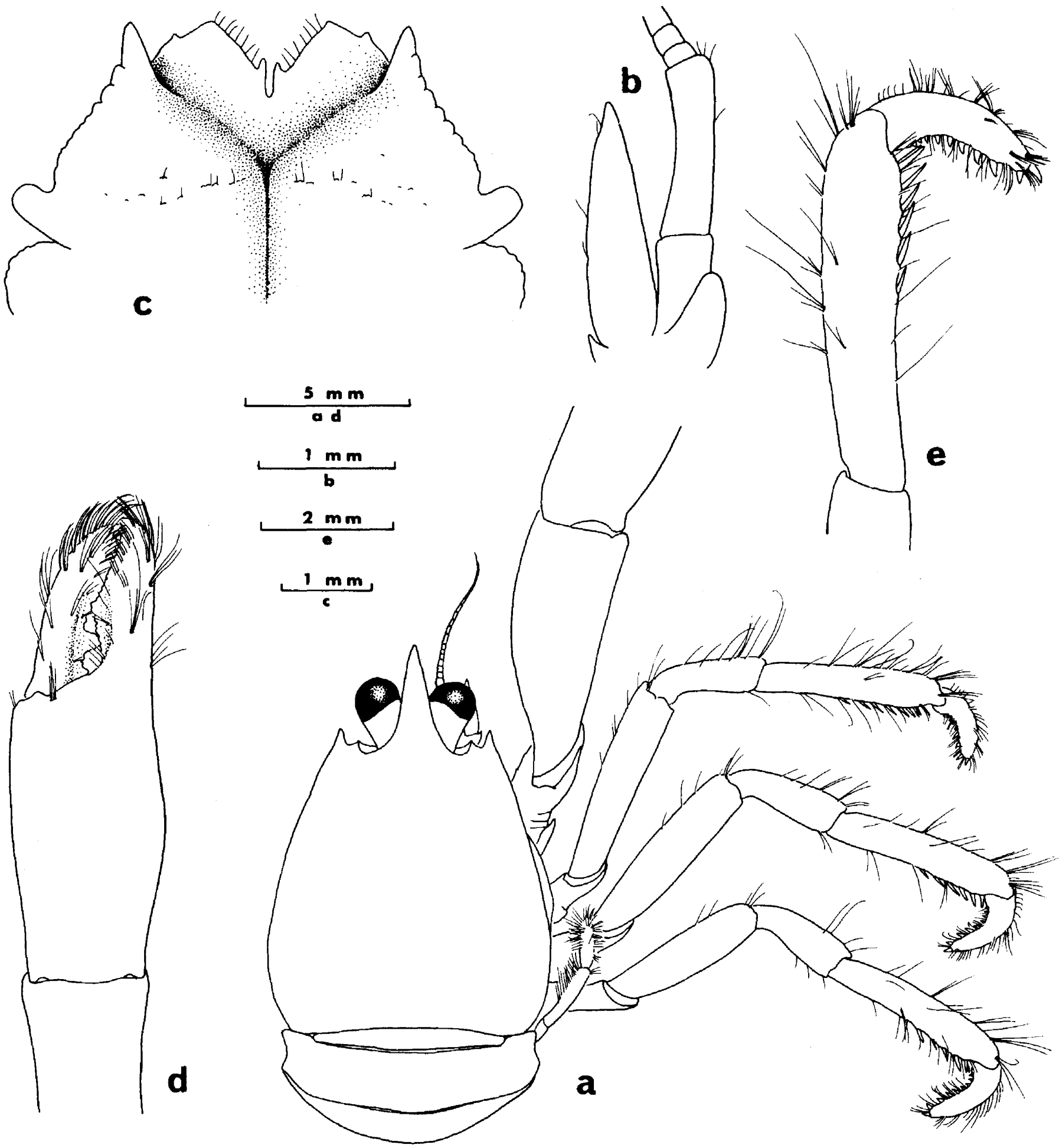

Figure 7. – *Uroptychus acostalis*, new species, male holotype from "Albatross" Sta. 5668: a, dorsal view; b, right antennal peduncle; c, anterior part of sternal segments; d, right chela; e, distal segments of right first walking leg.

mesial ridge, proximal denticles much pronounced. Merus and carpus spineless.

Anterior part of sternal segments as illustrated (Figure 7c). Third thoracic sternum greatly depressed, anterior margin concave with median deep, narrow notch; distinct spines paired just outside notch; lateral margin oblique with minute but distinct tubercular process at midlength. Distolateral angle of following sternum

strongly produced, reaching anterior margin of preceding sternum.

Cheliped (Figure 7a, b) 3 times as long as carapace including rostrum. Ischium with distinct dorsal spine. Merus subcylindrical, feebly tuberculate on ventral surface. Palm rather massive, depressed, twice as long as wide, nearly as long as carpus. Fingers 2/3 as long as palm, setose, gaping in proximal half, sharply pointed at tip and crossing distally; opposable margin of movable finger with 2 prominent processes on gaping portion; that of fixed finger bluntly produced at midlength.

Walking legs (Figure 7a) slender, depressed, moderately setose. Meri and carpi unarmed. Propodi (Figure 7e) about 5 times as long as wide, slightly widening distally; ventral marginal spinelets numbering 7, 6, 5 in first, second and third leg respectively, placed in distal half. Dactyli (Figure 7e) half as long as propodi, curving ventrad, ventral marginal spines including terminal one numbering 9, 10, 10 in first, second and third leg respectively; no prominent spine among them.

Measurements of holotype. – Length of carapace including rostrum, 12.1 mm; width of carapace, 8.2 mm; length of cheliped (right), 37.5 mm; of carpus, 9.6 mm; of palm, 9.4 mm; of movable finger, 6.8 mm.

Measurements of paratype. – Carapace length of ovigerous female, 16.4 mm; diameter of ovum, 1.0 mm.

Variation. – The ovigerous female paratype differs from the holotype in the following: Carapace feebly indented laterally; cheliped fully 4 times as long as carapace, palm 3 times as long as wide, 1.9 times as long as movable finger, and carpus ventrally covered with tubercles; propodi of walking legs with series of ventral marginal spinelets more numerous than in holotype: 9, 9, 6 spinelets in first, second and third leg respectively.

Habitat. – Taken in 732-1,650 m on hard or mud bottom.

Remarks. – This new species belongs to a group which may be centered around *U. indicus* by having both the carapace and the cheliped smooth and spineless and the distal two segments of the antennal peduncle unarmed. Differences among them are so subtle that they may be confused with one another. However, I am inclined to believe that *U. acostalis* is distinct from two closely related species, *U. gracilimanus* (Henderson) and *U. indicus* Alcock; these relatives have distinct posterolateral ridges on the carapace; also characteristic of this new species is the fourth thoracic sternum extremely produced distolaterally to reach the end of the third thoracic sternum. In addition, the dactyli of the walking legs in *U. indicus* bear an ultimate ventral marginal spinelet distinctly smaller than the penultimate.

Type-locality. – Northwest of Mamuju Island, Makassar Strait (2°28'15"S, 118°49'00"E).

Distribution. – Known from the male holotype and an ovigerous female paratype taken in Makassar Strait in 732-1,650 m.

10. *Uroptychus albatrossae*, new species

Figure 8

Material. – Off northern Mindanao (Sta. 5519: 1 ♂, 1 ovig. ♀ [ovigerous female is holotype, USNM 150302]). – Between Negros and Siquijor (Sta. 5536: 1 ♂). – Between

Cebu and Bohol (Sta. 5411: 1 ovig. ♀).

Diagnosis. – Belonging to *U. spinimarginatus* group. Carapace and abdomen covered with fine setae. Carapace posteriorly widening; lateral margin with 7 or 8 stout spines excluding well developed anterolateral. Rostrum longer than remaining carapace, dorsally grooved, laterally dentate, ventrally carinate. Orbit rather deep, outer angle with small spine. Distal 2 segments of antennal peduncle with prominent terminal spine. Sternum of third thoracic somite not deeply depressed, anterior margin with U-shaped median notch and paired median spines. Chelipeds minutely tuberculate, about 3 times as long as carapace; palm 3 times as long as finger. First walking leg slenderer than 2 following legs, dactylus unarmed ventrally. Second and third walking legs similar, tuberculate dorsally; dactyli with 12 ventral marginal spines, penultimate prominent.

Description of holotype. – Carapace (Figure 8a) posteriorly widening, as long as broad, exclusive of rostrum and lateral marginal spines; greatest breadth of carapace measured between third from posteriormost lateral spines. Dorsal surface moderately convex, covered with short fine setae, cervical groove indistinct. Lateral margin posteriorly convex, with 7 or 8 stout spines, all nearly perpendicular to lateral margin but anterolateral one directed anterolaterad, hindmost reduced to small size; few tiny spines on hepatic region and behind orbit. Frontal margin posterior to orbits deeply concave, prominently raised. Outer orbital angle produced. Posterior margin moderately concave.

Rostrum (Figure 8a) narrow, elongate, slightly longer than remaining carapace, ventrally carinate. Dorsal surface devoid of setae, furnished with moderately numerous tubercular spinules, and shallowly excavated mesially in proximal 1/3 of length; lateral margin with 13 or 15 small teeth.

Abdomen spineless, thickly covered with setae much finer than those on carapace.

Eyes not elongate, partially concealed beneath rostrum. Pterygostomian flap anteriorly produced, with about 10 spinules on surface.

Distolateral process of antennular basal segment normally developed with accompanying spine ventral to it. Distal 2 segments of antennal peduncle (Figure 8b) each with strong spine on distomesial margin; ultimate segment slightly longer; antennal scale nearly as wide as penultimate segment, extending anteriorly to tip of ultimate segmental spine.

Ischium of third maxilliped distolaterally provided with spinules, mesial ridge with 18 or 19 closely placed denticles. Merus barely twice as long as ischium, armed with 1 large distodorsal marginal and 4 denticular ventral marginal spines. Carpus also strongly produced terminally, with 3 dorsal spinules.

Sternum of third thoracic somite (Figure 8c) weakly depressed; anterior margin gently concave, with U-shaped median notch separating 2 small median spines; distolateral angle strongly produced anteromesad; lateral margin also produced at midlength; following sternum with prominent distolateral spine.

Cheliped (Figure 8a, d) barely 3 times as long as carapace including rostrum, covered with denticles except for fingers; fine setae present sparsely on mesial and lateral margins, thickly on whole surfaces of fingers. Ischium with ventral terminal spine and dorsoproximal spine. Merus and carpus subcylindrical; 5 rows of spines on merus: 2 dorsal, 2 marginal and 1 ventral. Chela moderately depressed, palm

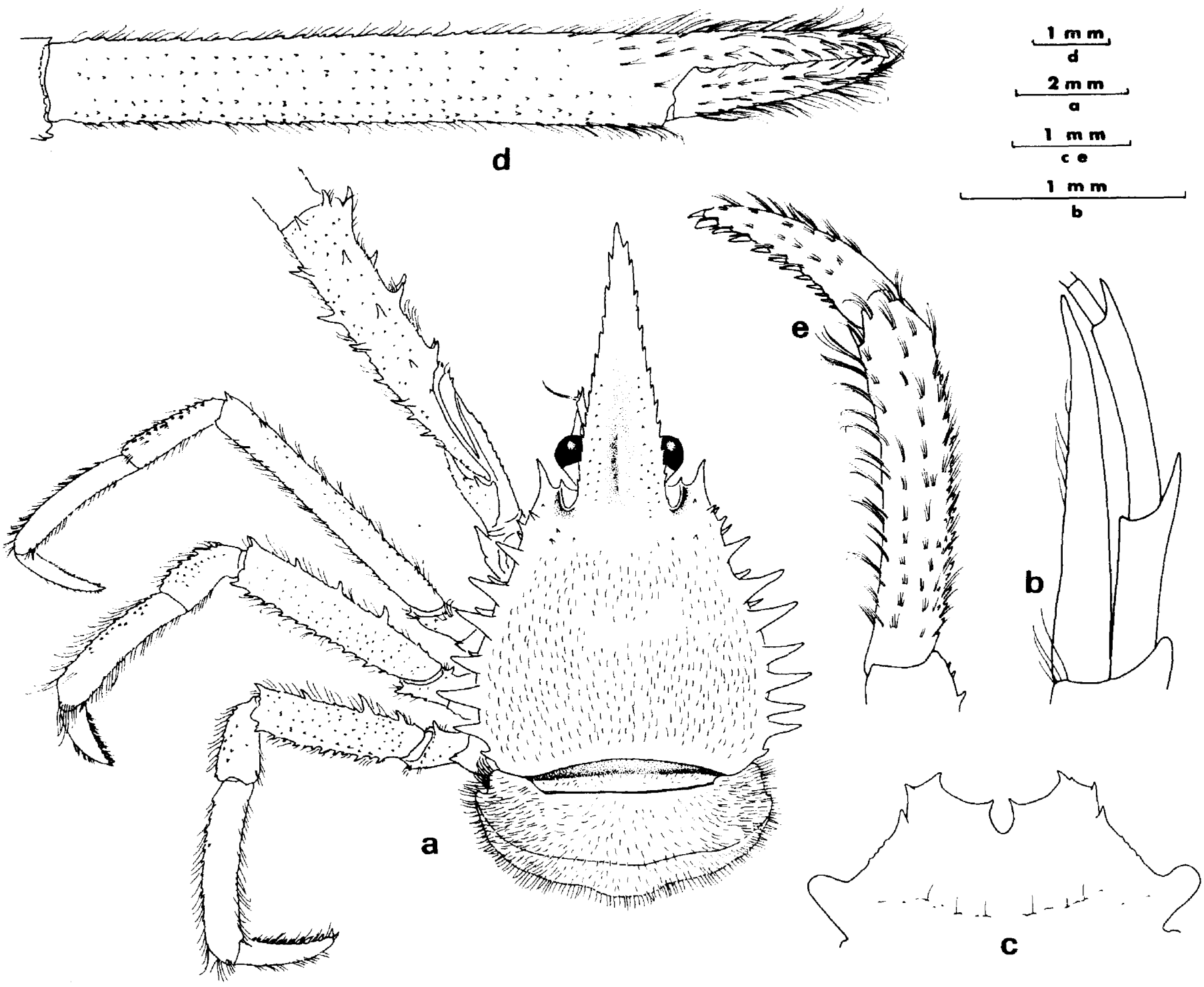

Figure 8. – *Uroptychus albatrossae*, new species, ovigerous female holotype from "Albatross" Sta. 5519: a, dorsal view; b, right antennal peduncle; c, anterior part of sternal segments; d, left chela; e, distal segments of left second walking leg.

shorter than carpus, about 6 times as long as broad, mesial and lateral margins subparallel; fingers not gaping, about 1/3 as long as palm, crossing distally.

First walking leg (Figure 8a) slenderer than following 2 legs, moderately setose marginally. Merus denticulate dorsally, dorsal and ventral margins with spinules. Carpus proportionately slender, with 10 spinules on dorsal margin. Propodus slightly curving, provided with distinct spinelet at distoventral margin. Dactylus also slightly curving ventrad, more than half as long as preceding segment, ventral margin unarmed but finely setose. Second walking leg stouter than first leg, moderately setose, tuberculate on dorsolateral faces of merus, carpus and proximal half of propodus. Merus with 4 prominent spines on dorsal margin and much smaller spines on ventral margin. Carpus comparatively broad, dorsal margin with spinules. Propodus slightly curving, provided with paired, elongate spinelets at distoventral margin. Dactylus relatively broad, slightly curving; 12 cornified spines on ventral margin decreasing in size proximally, ultimate one slenderer than penul-

timate, penultimate prominent but low, not sharply pointed. Third walking leg similar to second, merus distinctly shorter; tubercular processes or spinules on propodus less numerous.

Measurements of holotype. – Length of carapace including rostrum, 10.0 mm; width of carapace excluding lateral spines, 5.0 mm; length of cheliped (left), 27.7 mm; of carpus, 8.9 mm; of palm, 7.9 mm; of movable finger, 2.9 mm; diameter of ovum, 0.8 mm.

Measurements of paratypes. – Carapace lengths of males, 3.7-11.5 mm; of ovigerous female, 11.9 mm.

Variation. – The carapace of a young male paratype, 3.7 mm long, is less setose than those of other larger paratypes as well as the holotype; seven or eight lateral marginal spines are present without reduction on at least one side in two male paratypes; the hindmost is reduced in size in the holotype and ovigerous female paratype, and also are two or three posterior spines in the smallest male paratype. The number of the rostral lateral teeth are inconstant, ranging between 10 and 15 in larger specimens; in the young male it is reduced to four in the distal half. Also the dorsal tubercular spinules are barely discernible in the young. The ovigerous female paratype has the left cheliped undetached from the body; the fingers are slightly gaping, with a large basal tooth on the opposable margin of the movable finger. Paired spines outside the median U-shaped notch on the anterior margin of the third thoracic sternum are completely absent from one male paratype, as in a specimen of *U. mortenseni* reported in this paper.

Habitat. – Taken in 265-510 m on bottoms of mud, or sand mixed with coral or globigerina.

Remarks. – *Uroptychus albatrossae* seems to be closely related to *U. grandirostris* Yokoya from Japanese waters, from which it differs in having more numerous lateral marginal spines of the carapace and in the shape of the dactylus of the second or third walking leg; in *U. grandirostris* the ultimate of the ventral marginal spines of the dactylus is most prominent instead of the penultimate as in *U. albatrossae*.

Type-locality. – Northeast of Pt. Tagolo Light, off northern Mindanao (8°47'N, 123°31'15"E).

Distribution. – Recorded here from the Philippines in the Mindanao Sea, between Negros and Siquijor, and between Cebu and Bohol, and off Hong Kong in the East China Sea, in 265-510 m.

11. *Uroptychus bispinatus*, new species

Figure 9

Material. – Molucca Sea between Halmahera and northern Sulawesi (Sta. 5614: 1 ♀, holotype, USNM 150311).

Diagnosis. – Carapace smooth and glabrous dorsally, lateral margins diverging posteriorly, anterolateral spine indistinct. Rostrum triangular, relatively short but extending beyond eye. Eyes large, relatively wide. Distal 2 segments of antennal peduncle unarmed, antennal scale short, reaching end of penultimate segment. Merus and carpus of third maxilliped spineless. Third thoracic sternum distolat-

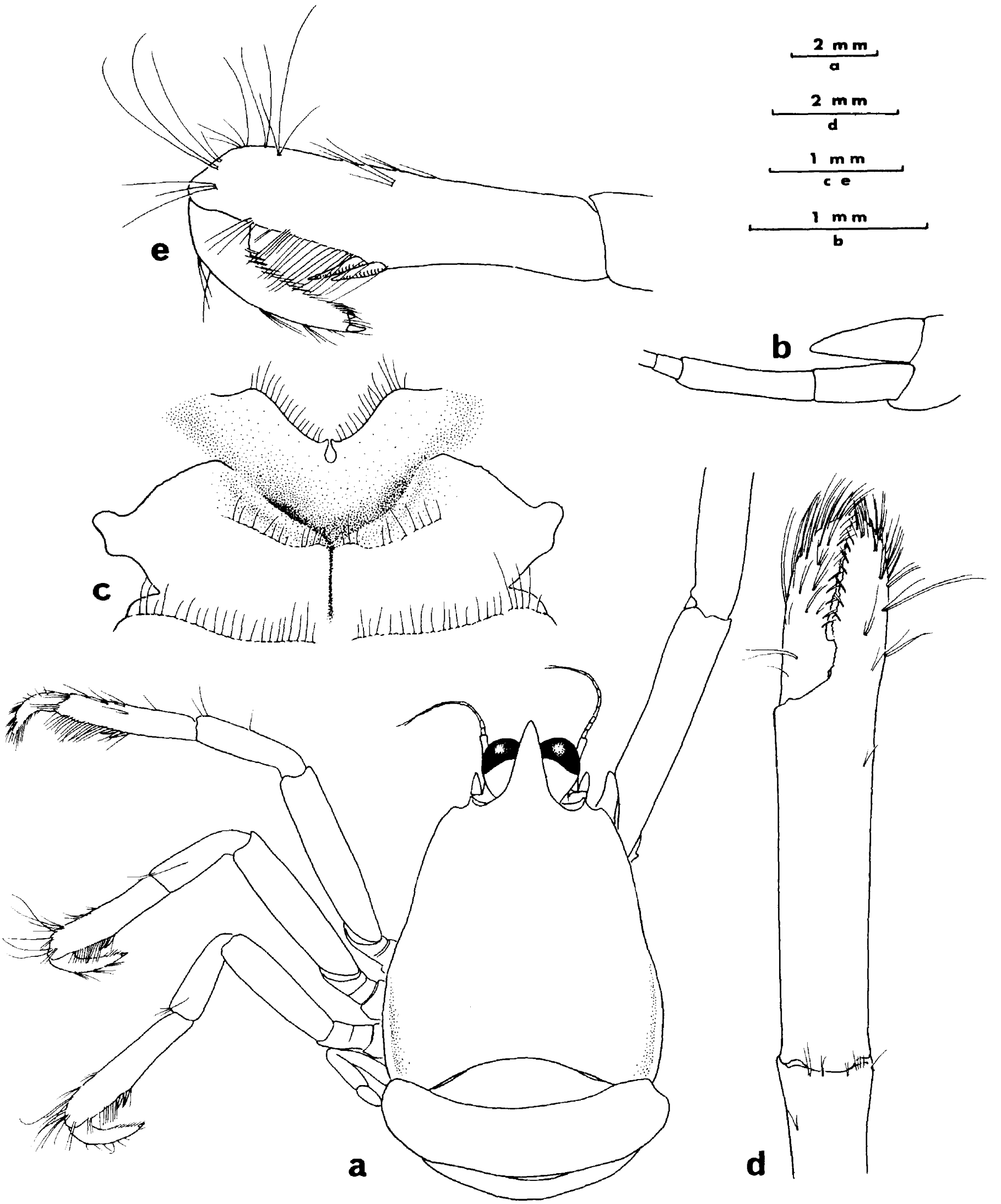

Figure 9. – *Uroptychus bispinatus*, new species, female holotype from "Albatross" Sta. 5614: a, dorsal view; b, left antennal peduncle; c, anterior part of sternal segments; d, right chela; e, distal segments of left first walking leg.

erally rounded, anterior margin deeply concave, with 2 small median spines separated by small, round notch. Chelipeds slender, palm 4 times as long as wide, twice as long as movable finger, fingers setose, distally rounded without crossing. Propodi of walking legs widened at midlength, with 2 or 3 ventral marginal spines near or distal to midlength; dactyli strongly curving ventrad at proximal 1/3 of length, ventral margin very setose, provided with 2 distal spines, penultimate smaller.

Description of holotype. – Carapace (Figure 9a) excluding rostrum nearly as long as wide, dorsal surface smooth and glabrous, with distinct ridge along posterior half of lateral margin. Lateral margins smooth, diverging posteriorly. Anterolateral angle obtusely produced. Outer orbital angle produced but not spiniform. Posterior margin deeply concave.

Rostrum triangular, broad at base, 1/3 as long as remaining carapace, distinctly overreaching eye, dorsal surface flattish and smooth.

Eyes large, eyestalk relatively wide.

Abdominal segments smooth, devoid of setae and striae.

Distolateral process of basal antennular segment simple and very short. Antennal peduncle (Figure 9b) slender, distal 2 segments unarmed, penultimate segment 2/3 as long as ultimate, antennal scale slightly wider than peduncle at base, reaching or falling short of end of penultimate peduncular segment, terminal process absent from basal segment proximal to scale.

Merus and carpus of third maxilliped spineless; denticles barely discernible on mesial ridge of ischium. Third thoracic sternum (Figure 9c) depressed, distolateral angle rounded, anterior margin fringed with setae, deeply concave, with small but deep median notch; pair of spinules present outside of median notch. Following sternum lacking lateral process.

Left cheliped missing. Right cheliped (Figure 9a, d) about 3 times as long as carapace including rostrum, relatively slender, unarmed. Ischium with distinct dorsal spine. Carpus longer than palm. Chela more or less depressed; palm fully 4 times as long as wide, twice as long as movable finger, almost devoid of setae, mesial and lateral margins subparallel; fingers setose, indistinctly gaping, distally rounded without crossing, opposable margin of movable finger slightly concave, with prominent proximal process fitting into opposing concavity of fixed finger.

Walking legs (Figure 9a) similar, considerably depressed. Meri and carpi spineless and almost glabrous. Propodi (Figure 9e) twice as long as dactyli, with long setae in distal half; dorsal margin almost straight, ventral margin produced at midlength, with 2 or 3 elongate spines distal to midlength. Dactyli (Figure 9e) strongly curving ventrad at proximal 1/3 of length, ventral margin thickly setose, provided with well developed terminal and reduced subterminal spines. Right third walking leg missing.

Measurements of holotype. – Length of carapace including rostrum, 8.2 mm; width of carapace, 6.3 mm; length of cheliped (right), 25.9 mm; of carpus, 7.9 mm; of palm, 6.3 mm; of movable finger, 3.3 mm.

Habitat. – Taken in 2,013 m on bottom of mud, sand and globigerina.

Remarks. – That the propodi of the walking legs bear two or three elongate, ventral marginal spines at about midlength and that the dactyli of the same have only two terminal spines on the ventral margin are characteristic of this new species. I

am inclined to believe that these peculiarities are consistent and distinguish *U. bispinatus* from *U. indicus* and its allies, e.g. *U. brevisquamatus*, *U. gracilimanus*, *U. vandamae,* etc.; all these relatives as well as this new species share the smooth, spineless carapace and unarmed cheliped with one another.

Type-locality. – Southwest of Tifori Island between Halmahera and northern Sulawesi (0°31'00"N, 125°58'45"E).

Distribution. – Recorded here from the above mentioned type-locality, in 2,013 m.

12. *Uroptychus brevisquamatus*, new species

Figure 10

Material. – Off southern Obi (Sta. 5635: 1 ovig. ♀, holotype, USNM 150319).

Diagnosis. – Carapace posteriorly widening, smooth and glabrous dorsally and marginally; anterolateral spine well developed. Rostrum triangular, extending slightly beyond eye. Outer orbital angle rounded. Eyes large, moderately elongate. Distal 2 segments of antennal peduncle unarmed, antennal scale extremely wide. Third maxilliped smooth and spineless on merus and carpus. Third thoracic sternum with 2 anterior median marginal spines separated by narrow notch, lateral margin with pronounced process medially. Chelipeds smooth, relatively massive, distally setose, fingers crossing distally. Propodi of walking legs with series of ventral marginal spinelets; dactyli curving ventrad, with 10 short ventral spinelets.

Description of holotype. – Carapace (Figure 10a) excluding rostrum as long as broad, widening posteriorly, dorsal surface smooth, glabrous and weakly ridged along posterolateral margin. Lateral margins spineless but anterolateral spine distinct. Outer orbital angle rounded. Posterior margin moderately concave.

Rostrum short, barely 1/3 as long as remaining carapace, slightly overreaching eye, triangular but feebly truncate, dorsal surface flattish and glabrous.

Eyes short, relatively wide, cornea less than half as long as remaining eyestalk.

Abdominal segments smooth and glabrous.

Distolateral process of antennular basal segment simple and short. Distal 2 segments of antennal peduncle (Figure 10b) unarmed, ultimate segment about twice as long as penultimate; antennal scale extremely wide, twice as wide as, and, extending beyond midlength of, ultimate segment; basal segment proximal to scale strongly produced on distolateral margin.

Merus and carpus of third maxilliped spineless; merus produced roundly on distal margin, ischium with 24 (left) or 20 (right) denticles on mesial ridge.

Anterior part of sternal segments as illustrated (Figure 10c); third thoracic sternum greatly depressed, anterior margin setose, deeply concave, provided with 2 median spines separated by narrow notch, lateral margin with 1 (right) or 2 (left) spines. Following sternum denticulate in distal half or distal 1/3 of lateral margin, with distolateral process barely reaching end of preceding sternum.

Cheliped (Figure 10a, d) 3 times as long as carapace including rostrum. Ischium with anteriorly curved dorsal and well developed ventral spines. Merus relatively short, subcylindrical, ventrally with several small, low spines, distomesial margin produced near ventral surface. Carpus spineless, more or less depressed, slightly

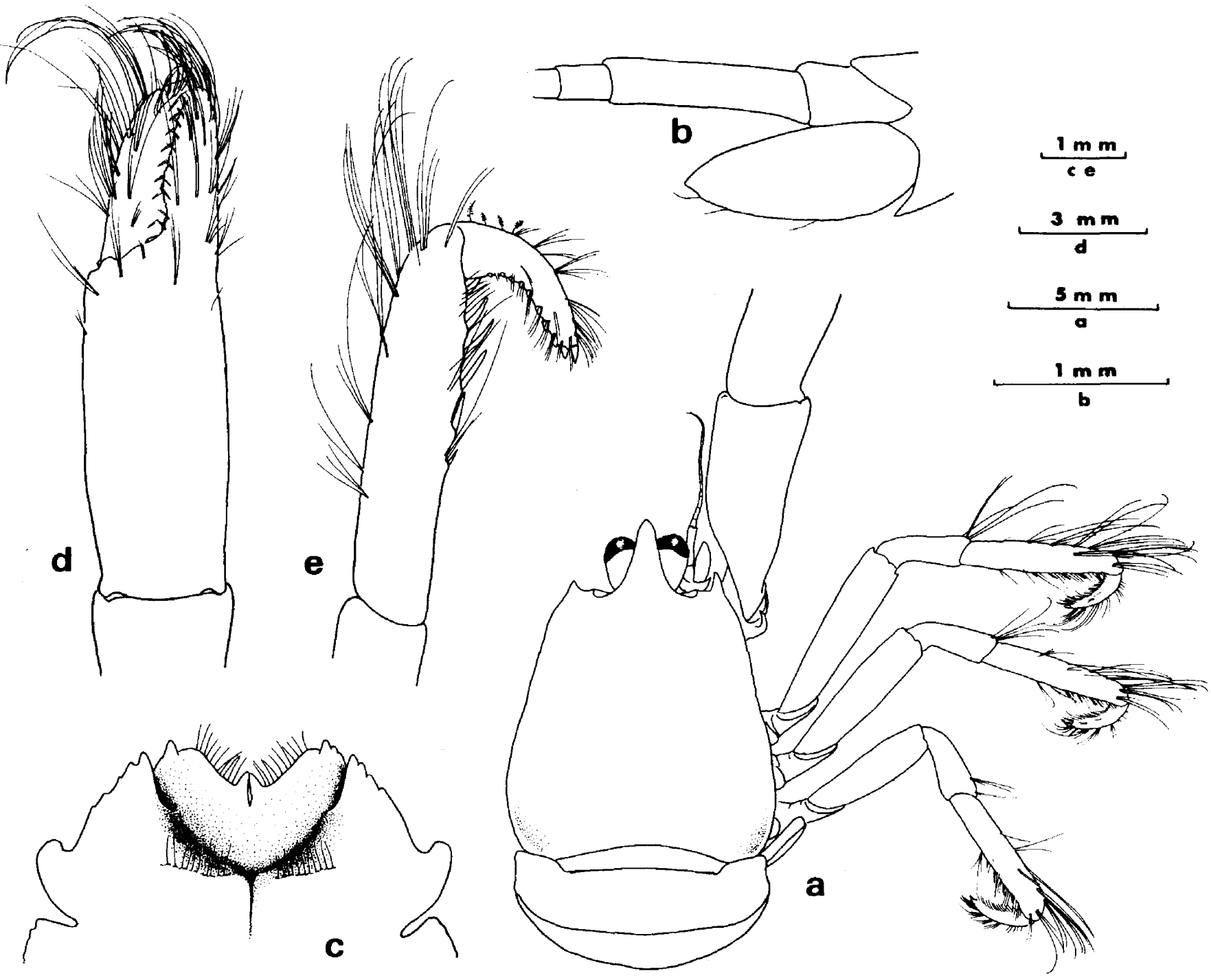

Figure 10. – *Uroptychus brevisquamatus*, new species, ovigerous female holotype from "Albatross" Sta. 5635: a, dorsal view; b, right antennal peduncle; c, anterior part of sternal segments; d, right chela; e, distal segments of right first walking leg.

longer than palm. Palm massive, moderately depressed, 2.6 times as long as wide. Fingers setose especially distally, not gaping, distally crossing; opposable margin of movable finger with prominent, low, basally wide process at proximal 1/3 of length; opposing margin concave proximally.

Walking legs (Figure 10a) similar, moderately depressed. Meri spineless and glabrous. Carpi with long setae only on distodorsal margin. Propodi straight, setose dorsally and ventrally, with 5 or 6 spinelets in distal half of ventral margin. Dactyli curving ventrad, marginally setose, less than half of propodus length; ventral margin provided with 10 short spines decreasing in size toward base of segment.

Measurements of holotype. – Length of carapace including rostrum, 11.2 mm; width of carapace, 8.7 mm; length of cheliped (left), 33.1 mm; of carpus, 9.0 mm; of palm, 8.6 mm; of movable finger, 5.3 mm; diameter of ovum, 1.7 mm.

Habitat. – Taken in 732 m on bottom of coral, rock and soapstone.

Remarks. – This new species is allied to *U. indicus* Alcock, from which it differs in having a rounded outer orbital angle and an extremely broad antennal scale. In

addition, the size of the ovum of this new species is distinctly greater than that of *U. indicus* reported to be 0.9 x 1.1 mm (Baba, 1977c:153).

Type-locality. – Southeast of Gomumu Island, off southern Obi (1°53'30"S, 127°39'00"E).

Distribution. – Known from the unique type-specimen taken off southern Obi in 732 m.

13. *Uroptychus comptus*, new species

Figure 11

Material. – Off northeastern Borneo (Sta. 5586: 1 ♂, holotype, USNM 150458).

Diagnosis. – Carapace widening posteriorly, obscurely tuberculate dorsally, almost glabrous, weakly ridged along posterior 1/4 of lateral margin; lateral margin feebly denticulate; anterolateral spine small but distinct. Rostrum triangular, barely half as long as remaining carapace, distinctly overreaching eye. Eyes more or less elongate, cornea not dilated. Outer orbital angle pyramidally produced. Distal 2 segments of antennal peduncle spineless. Merus and carpus of third maxilliped unarmed. Third thoracic sternum depressed, anterior margin concave, with 2 stout median spines; tooth-like process at midlength of lateral margin. Chelipeds relatively long and stout, spineless, glabrous except for fingers; palm moderately depressed, more than twice as long as finger, fingers crossing distally. Propodi of walking legs fully twice as long as dactyli, with 7 or 8 ventral marginal spinelets; dactyli with 10 ventral marginal spinelets.

Description of holotype. – Carapace (Figure 11a) excluding rostrum distinctly longer than wide, moderately convex dorsally, almost glabrous, sparsely and feebly tuberculate dorsally, posteriorly widening, feebly ridged in posterior 1/4 of length. Greatest breadth measured at posterior 1/4. Lateral margins denticulate behind end of indistinct cervical groove. Anterolateral spine small but distinct. Outer orbital angle moderately produced pyramidally.

Rostrum triangular, dorsally flattish and glabrous, 0.4 as long as remaining carapace.

Abdomen glabrous and smooth dorsally.

Eyes relatively large, moderately elongate, extending nearly to distal 1/3 of rostral length; cornea not dilated, more than half as long as remaining eyestalk.

Distal 2 segments of antennal peduncle (Figure 11b) relatively slender, unarmed; ultimate segment more than twice as long as penultimate when measured on lateral margin; antennal scale also slender, overreaching end of ultimate segment; basis proximal to scale moderately produced at distolateral margin.

Ischium of third maxilliped with 14 closely placed denticles on mesial ridge. Merus and carpus unarmed.

Sternum of third thoracic somite (Figure 11c) greatly depressed; anterior margin deeply concave with 2 stout median spines; low but distinct spine at midlength of each lateral margin. Following sternum tuberculate ventrally, mesially grooved; lateral margin bluntly serrate, strongly produced distally.

Chelipeds unequal in size; right cheliped (Figure 11d) larger, fully 4 times as long

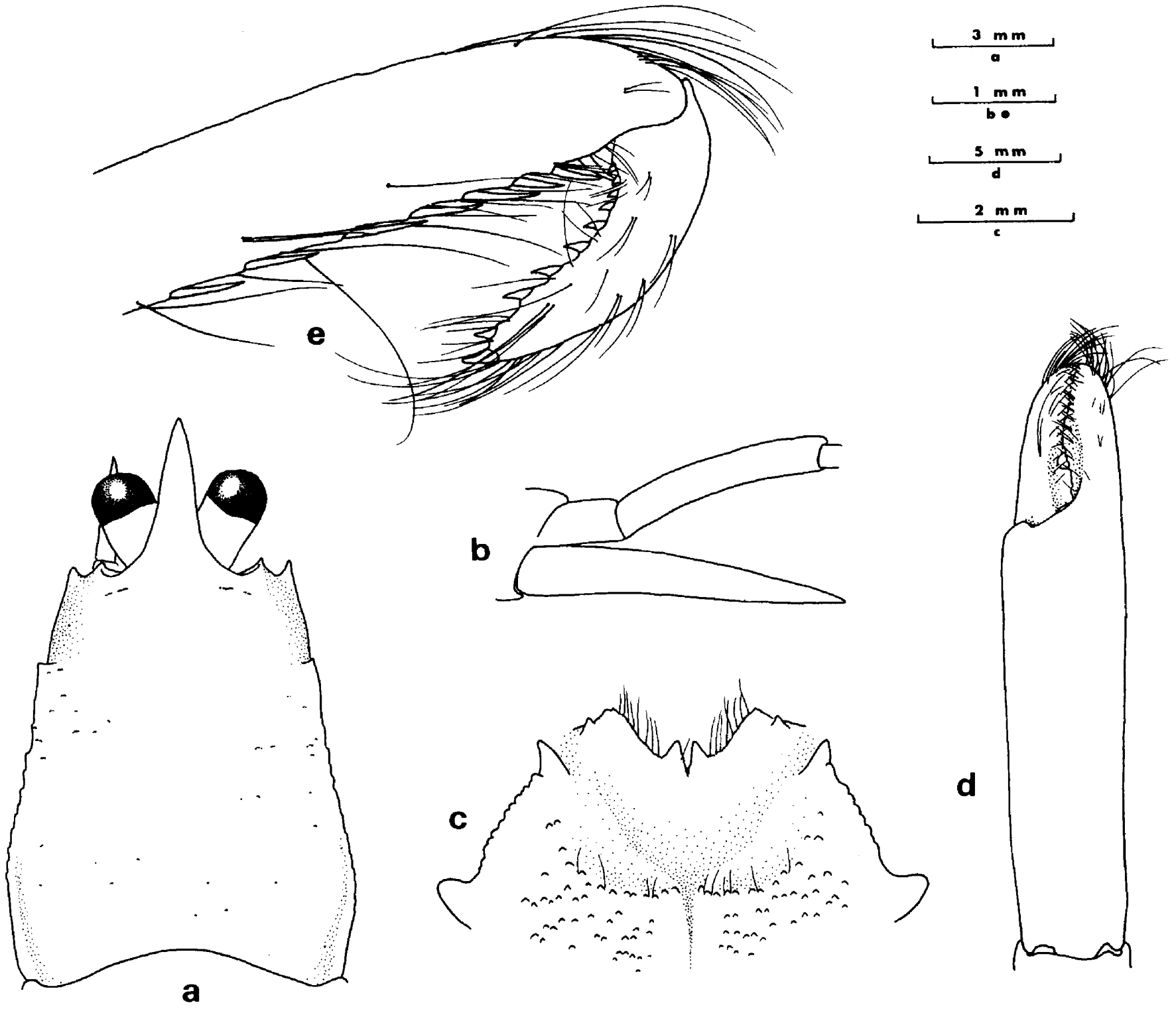

Figure 11. – *Uroptychus comptus*, new species, male holotype from "Albatross" Sta. 5586: a, carapace; b, left antennal peduncle; c, anterior part of sternal segments; d, right chela; e, distal segments of detached right walking leg.

as carapace, almost glabrous excepting fingers, smooth dorsally, granulate ventrally, and moderately depressed. Palm 3.8 (left) or 4.2 (right) times as long as broad, 2.0 (left) or 2.6 (right) times as long as movable finger, shorter than carpus; mesial and lateral margins subparallel. Fingers setose, relatively short, ending in blunt point, distally crossing; opposable margins touching each other in distal half when closed, bearing flattish, low basal process on movable finger.

Walking legs detached from body. Meri and carpi depressed, unarmed and glabrous. Propodi (Figure 11e) 5.6 times as long as broad, furnished with long coarse setae distally and ventrally; ventral margin with 7-9 spinelets in distal 2/3 of length. Dactyli (Figure 11e) curving ventrad, moderately setose, less than half as long as propodi, provided with 10 relatively short ventral marginal spines.

Measurements of holotype. – Length of carapace including rostrum, 14.3 mm; width of carapace, 8.9 mm; length of cheliped, 53.2 mm (left), 60.3 mm (right); of

palm, 13.2 mm (left), 17.7 mm (right); of movable finger, 6.6 mm (left), 6.8 mm (right).

Habitat. – Taken in 635 m on mud bottom.

Remarks. – *Uroptychus comptus* seems to be closely related to *U. acostalis* described in this paper in having distal two segments of the antennal peduncle unarmed and in lacking a prominent spine among the ventral marginals of the dactyli of the walking legs, from which it is distinct in the following particulars: The carapace is distinctly longer than wide with more pronounced lateral dentitions and a distinct ridge dorsal to the posterior part of the lateral margin; the distolateral angle of the fourth thoracic sternum is produced anteriorly but fails to reach the anterior end of the preceding sternum. Another relative may be *U. sibogae* which shares with this new species peculiarities like denticulate lateral margins of the carapace, unarmed distal two segments of the antennal peduncle and the characteristic arrangement of the ventral marginal spines of the dactyli of the walking legs. However, *U. sibogae* is characterized by extremely elongate eyestalks extending about to the rostral tip, the third thoracic sternum with a deep median sinus on the anterior margin, and the propodus of the walking leg with more numerous ventral marginal spinelets along its entire length.

Type-locality. – East of Sipadan Island, off northeastern Borneo (4°06'50"N, 118°47'20"E).

Distribution. – Known from the above mentioned type-locality in 635 m.

14. *Uroptychus convexus*, new species

Figure 12

Material. – Between Cebu and Bohol (Sta. 5411: 1 ♀, holotype, USNM 150320).

Diagnosis. – Carapace wider than long, greatly convex dorsally, widening posteriorly, armed with lateral marginal spines of moderate size. Rostrum triangular, wide at base. Eyestalk elongate and tapering. Ultimate segment of antennal peduncle unarmed, penultimate one with strong terminal spine. Merus of third maxilliped with 2 denticular ventral marginal processes, carpus with minute terminal spine. Third thoracic sternum depressed, anterior margin with U-shaped median notch, distolateral angle sharply produced. Chelipeds massive, merus with few spines ventrally and marginally, fingers more than half as long as palm, crossing distally. Propodi of walking legs with pair of spinelets on distoventral margin; dactyli straight, provided with 6 ventral marginal spinelets, penultimate and antepenultimate subequal and distinctly larger.

Description of holotype. – Carapace (Figure 12a) excluding rostrum wider than long, posteriorly widening. Dorsal surface smooth and greatly convex, gastric region anteriorly with interrupted, setiferous transverse ridge, hepatic region more or less depressed. Lateral margin convex; greatest breadth of carapace measured at posterior 1/3 of length. Anterolateral spine distinct, followed by several lateral spines: foremost small, located at end of indistinct cervical groove and slightly dorsal to level of anterolateral spine; following 3 or 4 spines pronounced, decreasing in size posteriorly. Front margin deeply concave; outer orbital angle minutely produced.

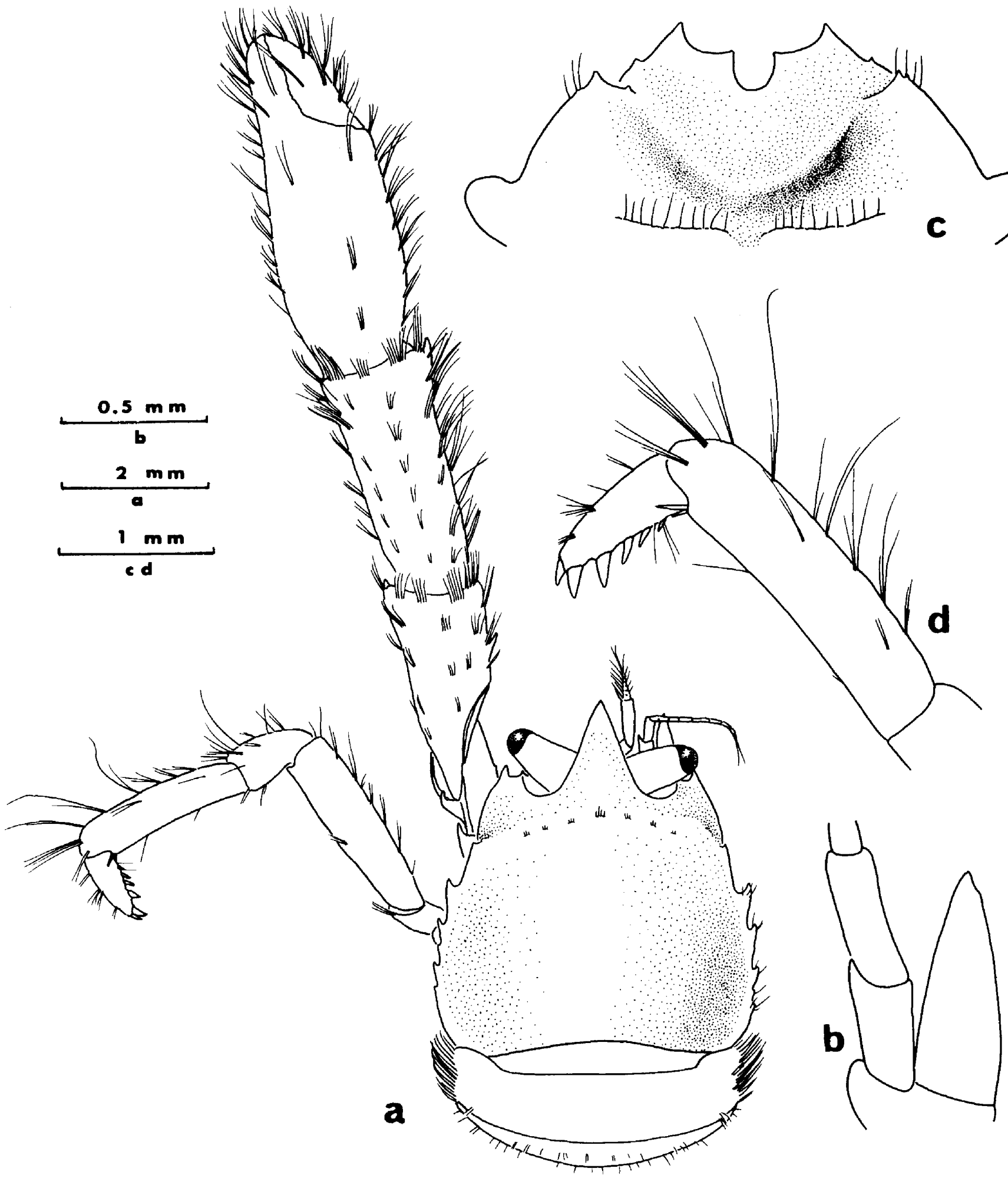

Figure 12. – *Uroptychus convexus*, new species, female holotype from "Albatross" Sta. 5411: a, dorsal view; b, left antennal peduncle; c, anterior part of sternal segments; d, distal segments of left first walking leg.

Rostrum less than half of remaining carapace length, sharply triangular, wide at base; dorsal surface smooth, glabrous and feebly excavated.

Eyestalk elongate, tapering, falling short of rostral tip, cornea less than 1/3 as

long as remaining eyestalk.

Abdominal segments dorsally smooth and almost glabrous, pleura fringed with setae.

Distolateral process of antennular basal segment short, spiniform. Ultimate segment of antennal peduncle (Figure 12b) unarmed, penultimate segment slightly shorter than ultimate, bearing strong distomesial spine; antennal scale comparatively wide, overreaching midlength of ultimate segment; basal segment proximal to scale unarmed.

Ischium of third maxilliped with 20 closely placed denticles on mesial ridge, merus with 2 tubercular processes in distal half of ventral margin, carpus minutely produced distally.

Third thoracic sternum (Figure 12c) depressed, distolateral angle sharply produced, anterior margin with U-shaped median sinus, lateral margin with small tooth slightly posterior to midlength. Anterolateral angle of following sternum with 1 or 2 tiny spines.

Cheliped (Figure 12a) 2.7 times as long as carapace, rather massive, furnished with setae of moderate length. Ischium with dorsal and distoventral spines, both well developed. Merus subcylindrical, relatively short, armed with 1 mid-mesial marginal, 1 distolateral and 3 ventral spines. Carpus as long as palm, distomesial and distolateral spines distinct. Palm massive, moderately depressed, almost twice as long as wide; greatest breadth measured at proximal 1/3 of length. Fingers more than half as long as palm, not gaping, distally crossing; movable finger with tubercular process at midlength of opposable margin; opposing margin also tuberculate and feebly produced medially.

Left first walking leg (Figure 12a) undetached from body, similar to another, detached leg. Meri and carpi unarmed. Propodi (Figure 12d) with paired ventral marginal spinelets distally. Dactyli (Figure 12d) almost straight, barely half as long as propodi, ventral margin with 6 spinelets including small terminal one, penultimate and antepenultimate subequal and distinctly larger.

Measurements of holotype. – Length of carapace including rostrum, 5.0 mm; width of carapace, 4.2 mm; length of cheliped (left), 13.7 mm; of carpus, 3.5 mm; of palm, 3.6 mm; of movable finger, 2.1 mm.

Habitat. – Taken in 265 m on mud bottom.

Remarks. – This new species seems closely related to *Uroptychus suluensis* Van Dam from the north of Jolo Island. Direct comparison with the syntypes of *U. suluensis* now deposited in the Zoological Museum, Amsterdam, disclosed that it differs in the following respects: 1) The carapace in the new species is more convex than in *U. suluensis*. 2) The ultimate segment of the antennal peduncle which bears a distinct terminal spine in *U. suluensis* is unarmed in *U. convexus*. 3) The dactyli of the walking legs in *U. suluensis* bears seven ventral marginal spinelets, the distal two of which are prominent; in *U. convexus*, however, it is the penultimate and antepenultimate that are larger.

Type-locality. – Southwest of Lauis Pt. Light, between Cebu and Bohol (10°10'30"N, 123°51'15"E).

Distribution. – Recorded from the above mentioned type-locality in 265 m.

15. *Uroptychus crassipes* Van Dam, 1939

Uroptychus crassipes Van Dam, 1939:392, fig. 1.

Material. – East coast of Mindoro (Sta. 5123: 2 ♂, 1 ♀)

Measurements. – Carapace lengths of males, 7.5-8.0 mm; of female, 7.1 mm.

Diagnosis. – Carapace slightly wider than long, dorsally covered with fine setae. Lateral margins convex; well developed anterolateral and 2 minute accompanying spines in front of indistinct cervical groove and 4 acute, large spines behind it. Rostrum triangular, 3/4 as long as remaining carapace, excavated dorsomedially, bearing small but distinct lateral tooth near tip. Front margin deeply concave, outer orbital angle produced. Eyes elongate, cornea less than half as long as remaining eyestalk. Distal 2 segments of antennal peduncle strongly produced terminally, antennal scale overreaching end of ultimate peduncular segment. Anterior margin of third thoracic sternum shallowly concave, with deep median notch separating 2 obtusely produced spines. Chelipeds comparatively large and massive, furnished with rather long setae, merus and carpus with terminal spines, palm less than twice as long as movable finger. Dactyli of walking legs with 10-16 ventral marginal spinelets, penultimate most prominent.

Habitat. – Taken on green mud bottom in 518 m.

Remarks. – The male holotype now deposited in the Zoological Museum, Copenhagen, was examined for confirmation. The ventral marginal spines of the dactyli of the walking legs vary between 15 and 18 in number in the "Albatross" specimens, whereas in the type they are reduced to 10. No additional characters of significance were noted.

Type-locality. – Kei Islands (5°29'S, 132°27'E).

Distribution. – Known from the Kei Islands and the Philippines off the east coast of Mindoro in 290-518 m.

16. *Uroptychus gracilimanus* (Henderson, 1885)

Diptychus gracilimanus Henderson, 1885:420.

Uroptychus gracilimanus: Henderson, 1888:181, pl. 21: fig. 5. – Doflein and Balss, 1913:134. – Parisi, 1917:3. – Tirmizi, 1964:392, figs. 6-9. – Baba, 1969c:45, figs. 3, 4.

Material. – Molucca Sea off west coast of Halmahera (Sta. 5618: 2 ♂; Sta. 5619: 1 ♂).

Measurements. – Carapace lengths of males, 6.3-9.4 mm.

Diagnosis. – Carapace totally smooth and glabrous, dorsally with distinct ridge along posterior half of lateral margin. Lateral margin convex posteriorly, anterolateral spine well developed. Rostrum relatively wide at base, flattish dorsally, extending slightly beyond eye. Outer orbital angle indistinctly produced. Eyes more or less elongate, cornea half as long as remaining eyestalk. Distal 2 segments of antennal peduncle unarmed, antennal scale falling short of end of ultimate peduncular segment. Merus and carpus of third maxilliped spineless. Anterior margin of third thoracic sternum concave, with narrow median notch separating 2 median spines, lateral margin with pronounced median process. Chelipeds smooth, spineless,

distally setose, palm moderately massive, fingers crossing distally. Propodi of walking legs twice as long as dactyli, with series of ventral marginal spinelets, dactyli moderately curving, provided with 8-12 ventral marginal spinelets decreasing in size toward base of segment.

Habitat. – Taken in 763-796 m on bottoms of mud or mud mixed with fine sand.

Remarks. – The third thoracic sternum is nearly as described by Tirmizi (1964:394, fig. 7). The following thoracic sternum bears the distolateral angle divided into two spines; in one of the three specimens examined the outer of the right two spines are subdivided into two small spines, as illustrated for the East China Sea material (Baba, 1969c: fig. 4c), although the inner is much pronounced in the "Albatross" specimen. The antennal scales vary in size from slightly overreaching the end of the penultimate peduncular segment to barely reaching the end of the ultimate segment. The basis proximal to the antennal scale is feebly produced distally instead of being almost rounded as in the East China Sea material.

Type-locality. – Off Port Jackson.

Distribution. – Known from the east African coast, west coast of Sumatra, Molucca Sea, New South Wales coast, East China Sea, and Japan, in 421-1,668 m.

17. *Uroptychus levicrustus*, new species

Figure 13

Material. – Off southern Obi (Sta. 5634: 1 ovig. ♀, holotype, USNM 150309).

Diagnosis. – Carapace dorsally unarmed; lateral margins behind indistinct cervical groove subparallel and dentate, anterolateral spines well developed. Rostrum narrow, less than half as long as carapace. Eyes short, cornea not dilated. Ultimate segment of antennal peduncle unarmed, penultimate segment with minute terminal spine, antennal scale falling short of end of ultimate peduncular segment. Merus and carpus of third maxilliped unarmed. Third thoracic sternum depressed, anterior margin with U-shaped median notch. Chelipeds subcylindrical, ischium and merus with distinct ventral spine; palm relatively long; fingers setose, crossing distally. Propodi of walking legs with ventral marginal spinelets in distal half; dactyli thickly setose marginally, slightly curving, provided with 14-17 ventral marginal spinelets excluding short, prominent terminal spine.

Description of holotype. – Carapace (Figure 13a) excluding rostrum nearly as long as wide. Dorsal surface flattish, smooth, devoid of setae. Lateral margins subparallel behind end of indistinct cervical groove, converging anteriorly; anterolateral spine well developed, followed by pronounced spine just behind ordinary end of cervical groove and several dentiform processes further behind. Front margin deeply excavated; outer orbital angle produced.

Rostrum narrow, nearly triangular, almost flattish and glabrous dorsally, 2/5 as long as remaining carapace.

Eyestalk relatively short, distinctly overreaching midlength of rostrum; cornea not dilated.

Abdominal segments almost smooth, sparsely furnished with fine setae dorsally.

Antennular basal segment normal, distolateral process simple. Ultimate segment

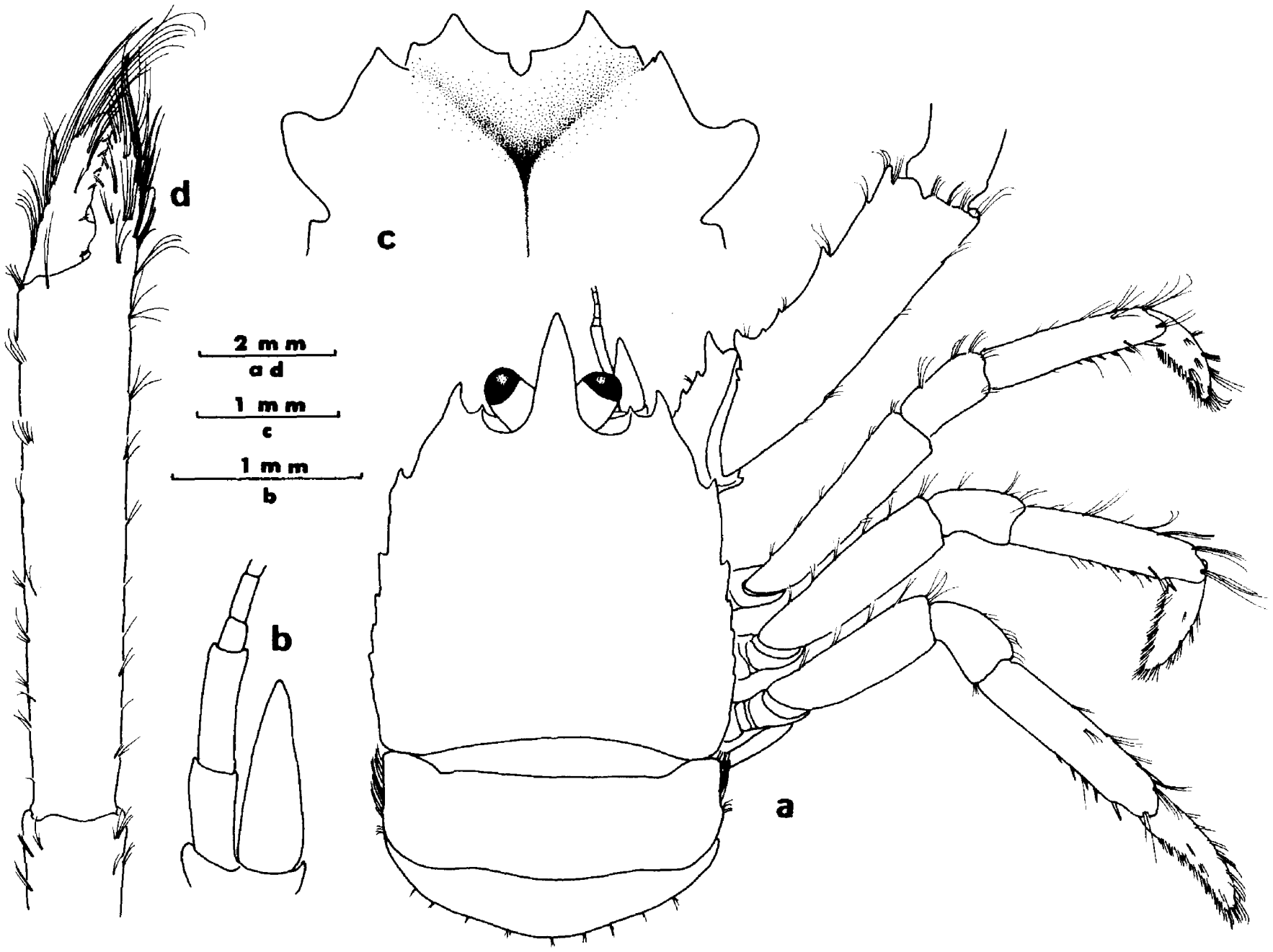

Figure 13. – *Uroptychus levicrustus*, new species, ovigerous female holotype from "Albatross" Sta. 5634: a, dorsal view; b, left antennal peduncle; c, anterior part of sternal segments; d, right chela.

of antennal peduncle (Figure 13b) unarmed, 1.3 times as long as penultimate; penultimate segment with small obtuse terminal spine; antennal scale wider than peduncle, falling short of end of ultimate segment; basal segment proximal to scale sharply produced at distolateral margin.

Mesial ridge of ischium of third maxilliped with rudimentary denticles; merus and carpus unarmed.

Sternum of third thoracic somite (Figure 13c) strongly depressed, anterior margin concave with U-shaped median notch, greatly produced on either lateral extremity, lateral margin bearing low process posteriorly. Following sternum markedly produced at distolateral angle.

Cheliped (Figure 13a, d) subcylindrical, fully 4 times as long as carapace, chela more or less depressed. Ischium with 1 sharp but moderate-sized dorsal and 3 ventral spines. Merus with several ventral spines near mesial margin. Palm nearly as long as carpus, about 3 times as long as movable finger, 5 times as long as wide, slightly widening distally; dorsal and ventral surfaces almost smooth, mesial and lateral margins sparsely setose. Fingers setose, feebly gaping proximally, crossing distally; opposable margins rather straight and denticulate in distal half; prominent

basal process of movable finger fitting into opposing concavity.

Walking legs (Figure 13a) similar, unarmed, relatively slender and sparsely setose marginally. Propodi almost straight, 1.5 times as long as dactyli, ventral margin with 6 spinelets in distal half. Dactyli feebly curving ventrad, setose marginally, ventral margin with 15 spinelets on first leg, 18 on second and third, ultimate prominent but short; all spinelets obscured by dense setae.

Measurements of holotype. – Length of carapace including rostrum, 6.6 mm; width of carapace, 5.3 mm; length of cheliped (right), 27.9 mm; of carpus, 8.9 mm; of palm, 8.6 mm; of movable finger, 3.1 mm; diameter of ovum, 1.1 x 1.3 mm.

Habitat. – Taken in 602 m, bottom unknown.

Remarks. – This new species seems somewhat near to *U. occultispinatus* described in this paper in the dentate lateral margin of the carapace and the thickly setose dactyli of the walking legs. However, it is distinct in having distal two segments of the antennal peduncle nearly spineless and the ultimate of the ventral marginal spinelets of the dactyli of the walking legs most prominent.

Type-locality. – Southwest of Gomumu Island off southern Obi (1°54'00"S, 127° 36'00"E).

Distribution. – Known only from the type-locality in 602 m.

18. *Uroptychus mortenseni* Van Dam, 1939

Uroptychus mortenseni Van Dam, 1939:398, figs. 3, 4.

Material. – South China Sea off southwestern Luzon (Sta.5116: 2 ♂).

Measurements. – Carapace lengths of males, 9.9-10.1 mm.

Lectotype. – Female, "Danish Expedition to the Kei Islands" Sta. 52, 5°46'S, 132°49'35"E, 532 m, 7 May 1922; size as given by Van Dam (1939:402).

Diagnosis. – Belonging to *U. spinimarginatus* group. Entire body thickly covered with fine setae. Lateral margins of carapace diverging posteriorly, armed with smaller spines in front of indistinct cervical groove and prominent spines behind it. Rostrum triangular, dorsally flattish, ventrally carinate, slightly shorter than carapace; lateral margins unarmed. Eyes moderately elongate. Distal 2 segments of antennal peduncle with terminal spine. Merus of third maxilliped with 1 distolateral and 3 ventral spines, carpus with terminal spine. Chelipeds slender, merus spinulose dorsally and marginally. First walking leg slenderer than 2 following legs; dactylus unarmed. Second and third legs similar; meri spinulose dorsally and marginally; penultimate of ventral marginal spinelets of dactyli prominent.

Habitat. – Taken in 366 m; bottom unknown.

Remarks. – The syntypes collected by the Danish Expedition to the Kei Islands from Stations 52 and 58 were examined at the Zoological Museum, Copenhagen. The female from Station 52 is here designated as the lectotype in order to restrict the type-locality; its illustrations and measurements are given in the original description.

It has previously been proposed that those species having a long rostrum, armed lateral margins of the carapace and slender first walking leg should for the sake of convenience be called the *Uroptychus spinimarginatus* group (Baba, 1977b:124; 1981b:116). This group contains seven species including *U. mortenseni* as well as *U. albatrossae* described in this paper. *U. mortenseni* is easily distinguished from other

members of that group by having the entire body thickly covered with fine setae.

The sternum of the third thoracic somite is deeply concave on the anterior margin with a small V-shaped median notch. Van Dam (1939:401) mentioned that "In seiner Mitte zeigt der Vorderrand der Sterna der äusseren Maxillipeden eine untiefe V förmige Einbuchtung. Gleich daneben steht links und rechts ein winziges Dörnchen." This is true of one of the syntypes from Station 58; however, in the lectotype as well as the present material such small spines are completely absent.

The following characters, inadvertently omitted or not fully described originally, are provided for the species: Distal 2 segments of antennal peduncle subequal in length, bearing strong distal spine each; antennal scale falling short of end of ultimate segment but overreaching its midlength, lateral margin fringed with setae; basis proximal to scale strongly produced on distolateral margin. Merus of third maxilliped with prominent distolateral spine and 3 moderate-sized ventrals in distal half, carpus also with distinct terminal spine. First walking leg slender, dactylus unarmed. Dactyli of second and third walking legs with 11 ventral marginal spinelets, penultimate not slender but stocky and most prominent, ultimate smaller than penultimate but much larger than remainder.

Type-locality. – Kei Islands (5°46'S, 132°49'35"E).

Distribution. – Known from the Kei Islands, off northern Sulawesi and South China Sea off southwestern Luzon, in 250-366 m.

19. *Uroptychus naso* Van Dam, 1933

Uroptychus naso Van Dam, 1933:23, figs. 35-37; 1939:402;1940:97. – Baba, 1969c:42,figs. 1, 2.

Material. – Molucca Sea off west coast of Halmahera (Sta.5617: 2 ♂). – Sulu Archipelago (Sta. 5577: 2 ♂).

Measurements. – Carapace lengths of males, 6.2-15.3 mm.

Diagnosis. – Carapace minutely granulate dorsally, deep groove bordering gastric and cardiac regions. Lateral margins diverging posteriorly with dentition along entire length. Rostrum also minutely granulate, relatively wide, triangular, moderately excavated dorsally, ventrally carinate, half as long as remaining carapace; lateral margin with 4-11 small teeth. Eyes partly hidden under rostrum. Distal 2 segments of antennal peduncle with terminal spine. Anterior margin of third thoracic sternum with deep U-shaped median notch, devoid of paired median spines. Chelipeds covered with spinules and tubercles, depressed distally. Walking legs granulate, first, second and third legs similar; meri depressed, relatively wide, dorsal and ventral margins dentate; dactyli also relatively wide, less than half as long as propodi, bearing about 9 ventral marginal spinelets, penultimate most prominent.

Habitat. – Coarse sand bottom in 240-439 m.

Remarks. – Lateral teeth of the rostrum vary between 4 and 11 in number. In the smaller specimens they are less numerous, restricted in the distal half.

Bundles of short setae on the distal two segments of the first walking leg are completely absent from the specimens listed above; the presence or absence of these setae was presumed to represent either populational variation or sexual distinction (Baba, 1969c:44). Fortunately, I have had a chance to examine Van Dam's material now de-

posited in Amsterdam and Copenhagen Museums. The male and female syntypes from "Siboga" Station 251 and a female from the Java Sea collected by "Gier" have no traces of such setae. In all of the specimens listed in her 1939 publication, however, the bundles are evident only on the propodus, but there is some variability: In two males, one from Station 49 of the Danish Kei Islands Expedition and another from eastern Asia, the bundles are only discernible under high magnification; a male from Japan collected by Th. Mortensen has smaller bundles; another male collected by the telegraph company bears a few bundles. Thus, the possibility that the setae represent a sex character is dismissed.

This species is related to the *U. spinimarginatus* group (Baba, 1977b:124) in the shapes of both the rostrum and the carapace, but it differs in having the first walking leg similar to two following legs.

Type-locality. – Kei Islands.

Distribution. – Known from the Kei Islands, Java Sea, Sulu Archipelago, Molucca Sea, East China Sea and Japan, in 68-439 m.

20. *Uroptychus nigricapillis* Alcock, 1901

Uroptychus nigricapillis Alcock, 1901:283, pl. 3: fig. 3. Alcock and McArdle, 1902: pl. 56: fig. 3. – Laurie, 1926: 123. – Van Dam, 1933:26; 1940:98, fig. 2. – Tirmizi,1964:390, figs. 4, 5. – Baba, 1981b:116, fig. 4.

Material. – Flores Sea off southern Sulawesi (Sta. 5660: 1 ovig. ♀). – Between Siquijor and Bohol (Sta. 5527: 1 ♂, 1 ovig. ♀, 1 ♀). – South China Sea off southwestern Luzon (Sta 5274: 1 ♂).

Measurements. – Carapace lengths of males, 8.8-11.9 mm; of ovigerous females, 9.3-13.9 mm; of nonovigerous female, 8.0 mm; diameter of ovum, 1.8 mm.

Diagnosis. – Carapace smooth and glabrous except for pair of gastric spines behind eyes. Lateral margins slightly diverging posteriorly, feebly serrate or with tubercular processes behind indistinct cervical groove; anterolateral spine small but distinct; outer orbital angle obtusely produced. Rostrum widely or narrowly triangular, flattish dorsally. Abdomen smooth and glabrous. Eyes comparatively large. Distal 2 segments of antennal peduncle unarmed, ultimate segment more than 2.5 times as long as penultimate, antennal scale extending to 2/3 of length of ultimate segment. Third maxilliped unarmed. Anterior margin of third thoracic sternum deeply concave, provided with 2 median spines nearer each other or separated by distinct notch. Chelipeds more than 3 times as long as carapace, spineless, glabrous except for fingers; fingers setose, half as long as palm. Walking legs similar; dactyli gently curving ventrad, barely half as long as propodi, armed with 9 or 10 ventral marginal spinelets decreasing in size toward base of segment.

Habitat. – Taken in 717-1,266 m on bottoms of mud and sand, or globigerina ooze.

Remarks. – Tirmizi (1964:391) mentioned that the "John Murray" material shows high variability in the spinosity of the dorsum of the carapace, in size and shape of the rostrum, in relative lengths of antennal peduncle and its scale, and in the armature of the sternum. This is true also of the present material; for instance, the paired gastric spines are prominent in a male from Station 5274, while less pronounced in all other specimens examined; the same male specimen also has a distinct spine at

the anterolateral end of the branchial region, while in the remainder that spine is reduced to a tiny tubercular process.

Type-locality. – Andaman Sea.

Distribution. – Off southwestern Luzon, between Siquijor and Bohol, Flores Sea, Java Sea, Andaman Sea, South Arabian coast, Saya de Malha Bank, Maldives, Zanzibar area and Japan; this species is eurybathic (Baba, 1981b:112), having been recorded in depths between 66 and 1,930 m.

21. *Uroptychus occultispinatus*, new name

Figures 14, 15

Uroptychus granulatus Benedict var. *japonica* Balss,1913:25, fig. 18.

Material. – Between Siquijor and Bohol (Sta. 5529: 1 ovig. ♀).

Measurements. – Carapace length of ovigerous female, 8.5 mm; diameter of ovum, 1.1 x 0.9 mm.

Diagnosis. – Carapace excluding rostrum slightly broader than long, posteriorly widened, dorsally granulate, moderately setose and grooved along posterior 1/3 of lateral margin; lateral margin convex and dentate. Rostrum broadly triangular, dorsally excavated. Outer orbital angle produced. Eyes elongate, cornea less than half as long as remaining eyestalk. Distal 2 segments of antennal peduncle with acute terminal spine; antennal scale reaching end of ultimate peduncular segment. Merus and carpus of third maxilliped smooth marginally, each with moderate-size distolateral spine. Sternum of third thoracic somite depressed, anterior margin deeply excavated, nearly V-shaped. Chelipeds setose, rather massive, chela moderately depressed, fingers comparatively wide, crossing distally; opposable margins denticulate; median rounded process of fixed finger fitting into bilobed processes on opposing margin. Walking legs similar, setose; meri and carpi unarmed; propodi distally with ventral marginal spinelet; dactyli more than half as long as propodi, ventral margin particularly setose with 13 or 14 spinelets, penultimate very prominent.

Habitat. – Taken in 807 m on bottom of mud and globigerina.

Remarks. – The present specimen with distally broken, rounded rostrum is undoubtedly referable to *Uroptychus granulatus japonicus* Balss, 1913. Examination of the male syntype of *U. granulatus japonicus* from Okinose, Sagami Bay, now deposited in the Zoologische Staatssammulung, München and made available on loan by L. Tiefenbacher showed that the carapace is much more distinctly granulate than in the "Albatross" specimen, with more irregular dentition on the lateral margin, and that the anterior margin of the sternum of the third thoracic somite (Figure 15b) is more deeply excavated medially in the type. In his original account of *U. granulatus japonicus*, Balss (1913: fig. 18) figured the dactyli of the walking legs with the ultimate posterior marginal spine most prominent. This is, however, incorrectly illustrated; in reality, this prominent spine is present just proximal to the ultimate small spine (Figure 15a). Balss's figure is drawn apparently from another male syntype, in which the rostrum lacks a lateral apical spine and the lateral margin of the carapace is more strongly dentate. The distomesial marginal spines of the

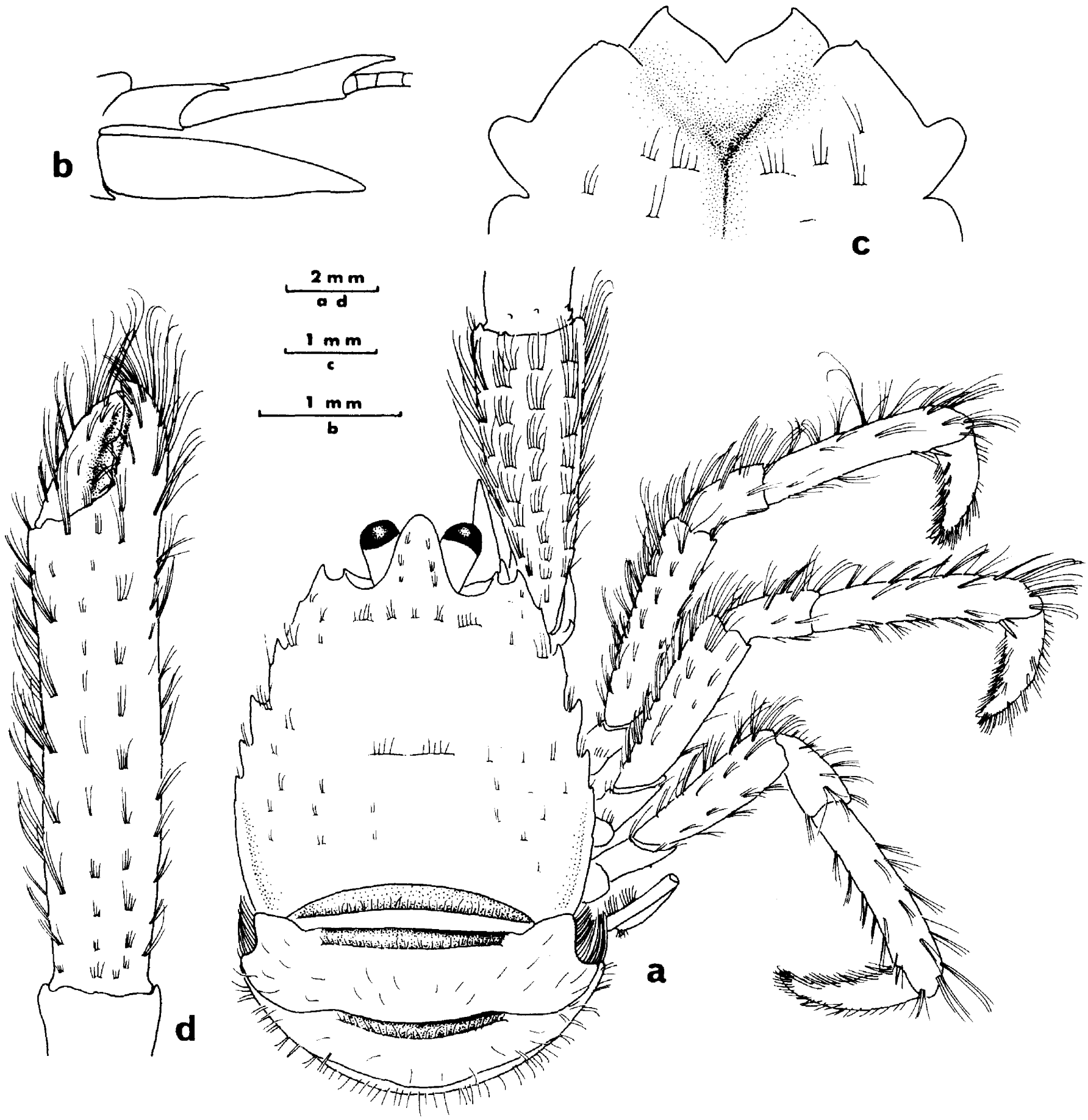

Figure 14. – *Uroptychus occultispinatus*, new name, ovigerous female from "Albatross" Sta. 5529: a, dorsal view; b, left antennal peduncle; c, anterior part of sternal segments; d, right chela.

merus of cheliped as illustrated by Balss are not distinct in the male syntype examined, as well as in the "Albatross" specimen (Figure 14a).

The larger of the two syntypes of *Uroptychus granulatus* from the Galapagos Islands examined on loan by the courtesy of R.B. Manning displays the following peculiarities which clearly indicate that the western and eastern Pacific analogues are different from each other in a specific level: 1) The distal two segments of the antennal peduncle are unarmed (Figure 16b); 2) the chelae, especially the fingers, are relatively very slender; 3) the merus and carpus of the third maxilliped are distally

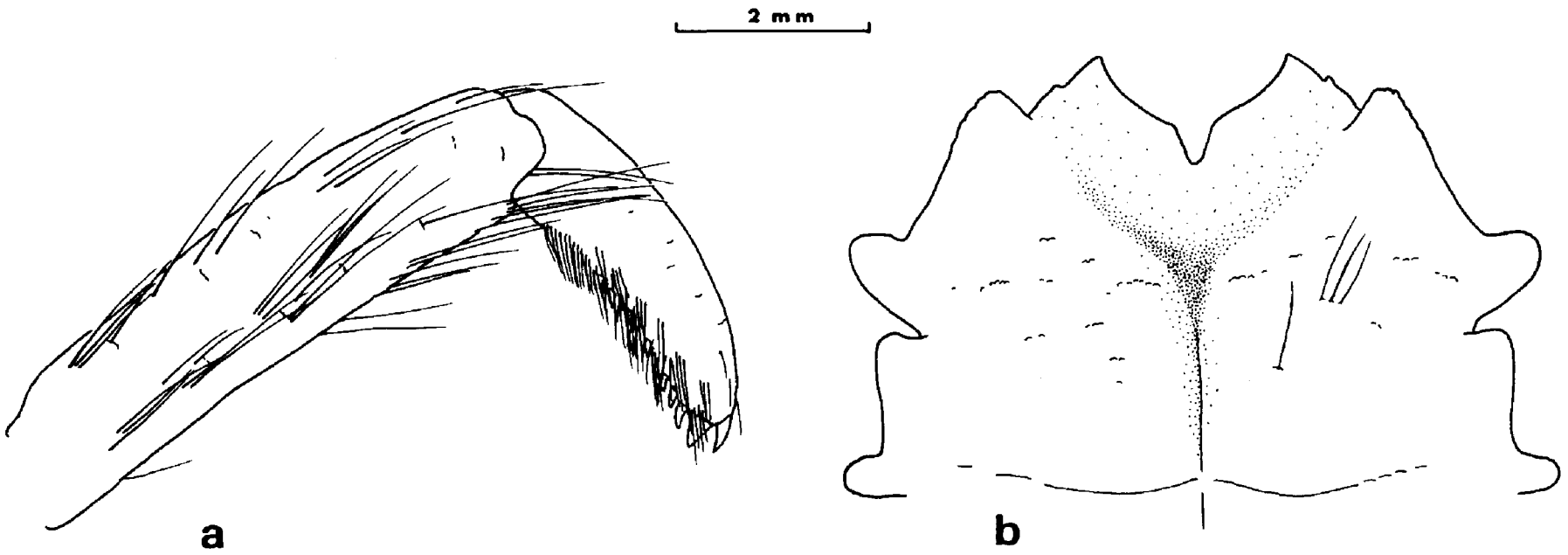

Figure 15. – *Uroptychus granulatus japonicus* Balss, male syntype from Okinose Bank, Sagami Bay, Japan, carapace length 13.6 mm: a, distal segments of detached right walking leg; b, anterior part of sternal segments.

rounded without a terminal spine (Figure 16c); and 4) the dactylus of the walking leg bears shorter and more numerous ventral marginal spinelets (Figure 16e). However, Balss's name should not be merely shifted because of the precedence to be given to *U. japonicus* Ortmann, 1892. Thus the new name, *U. occultispinatus,* is proposed here.

Type-locality. – Sagami Bay, Japan.

Distribution. – Sagami Bay and between Siquijor and Bohol, in 807 m.

22. *Uroptychus scambus* Benedict, 1902

Uroptychus scambus Benedict, 1902:297, fig. 41. – Doflein and Balss, 1913:134. – Van Dam, 1937:100, fig. 1. – Baba,1981b:120.

Uroptychus glyphodactylus MacGilchrist, 1905:249. – Alcock and MacGilchrist, 1905: pl. 70: fig. 4; pl. 71: fig. 1.

Uroptychus edwardi Kensley, 1981:69, figs. 6, 7.

Material. – Teluk Tomini, Sulawesi (Sta. 5605: 1 ovig. ♀).

Measurements. – Carapace length of ovigerous female, 6.2 mm.

Diagnosis. – Carapace broader than long, dorsally glabrous, smooth and convex; lateral margin extremely convex, smooth but with well developed anterior spine. Rostrum short, broadly or moderately or narrowly triangular. Eyestalk elongate. Distal segments of antennal peduncle unarmed, antennal scale falling short of end of penultimate peduncular segment. Thoracic sterna relatively wide, anterior margin of third thoracic sternum shallowly or widely concave with minute median notch. Chelipeds elongate, massive, fingers curving laterad, gaping in male, provided with prominent process on each opposable margin. Dactyli of walking legs subprehensile, slightly shorter than propodi, curving ventrad, bearing about 16 ventral marginal spinelets obscured by dense setae; propodi with similar dense setae on ventral margin.

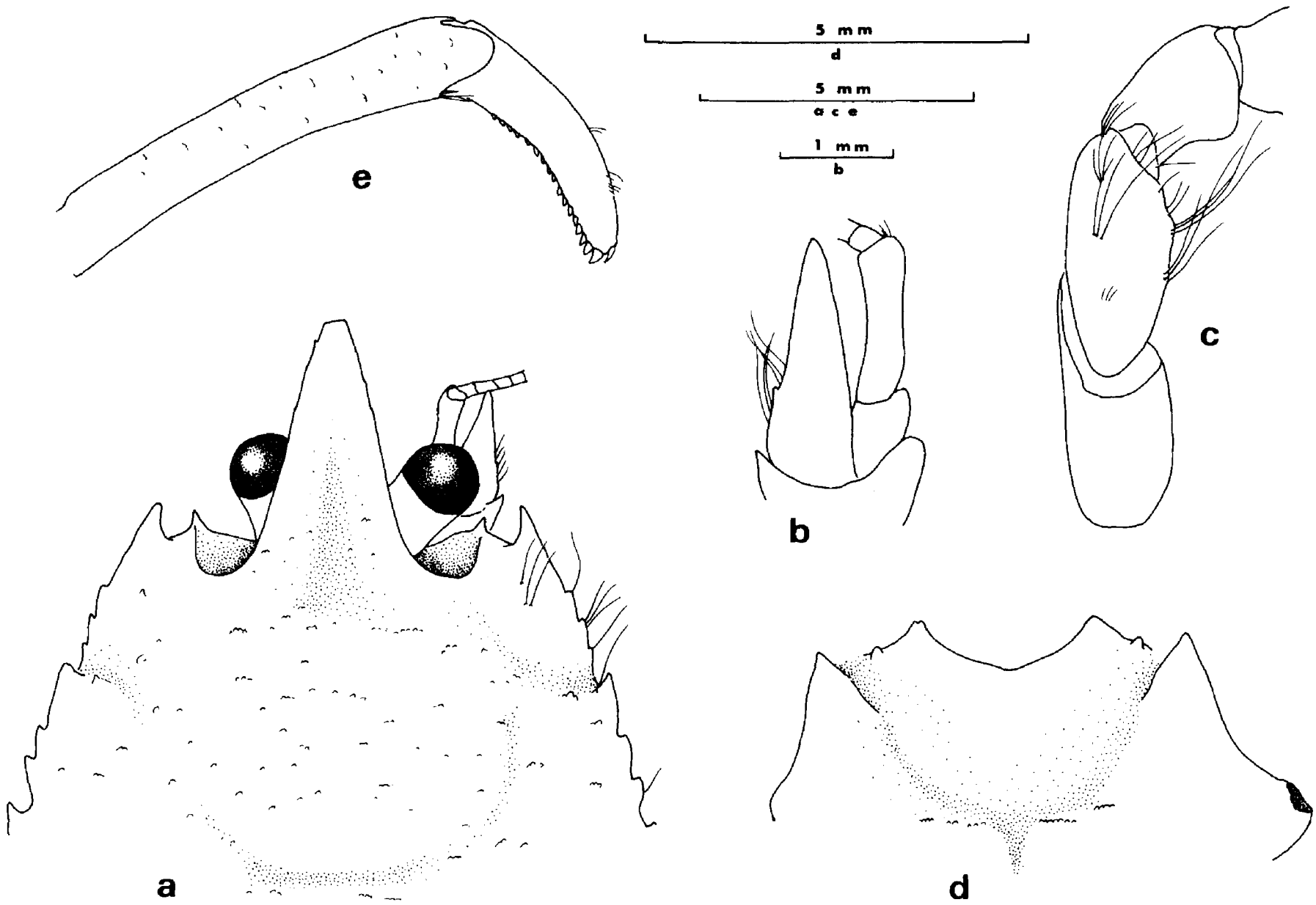

Figure 16. – *Uroptychus granulatus* Benedict, ovigerous female syntype from off the Galapagos Islands, USNM 205671, carapace length 16.2 mm: a, anterior half of carapace; b, right antennal peduncle; c, endopod of right third maxilliped; d, anterior part of sternal segments; e, distal segments of right third walking leg.

Habitat. – Taken in 1,184 m; bottom unknown.

Remarks. – In addition to the type and the "Albatross" Philippine material, two more lots were found on the shelves in the National Museum of Natural History, Smithsonian Institution: a male from "Albatross" Sta. 4959, 28.5 miles southwest of Mizunoko Shima Light, Japan (32°36'30"N,132°23'20"E), 741-1,058 m (405-578 fm), greenish-brown mud and Foraminifera; a male and an ovigerous female from "Albatross" Sta. 5083, 34.5 miles southwest of Omae Zaki Light, Japan (34°04'20"N, 137°57'30"E), 1,175 m (642 fm), fine gray sand and globigerina.

The fingers of the "Albatross" Philippine specimen are gaping in the left cheliped as in the type, but in the right cheliped the prominent processes are lacking on the opposable margins. As mentioned previously for the Japanese male specimen (Baba, 1981b:120), the palm in the male from the "Albatross" Station 5083 is also distinctly ridged and cristiform on the mesial margin and the carpus bears very prominent spines distally.

Kensley (1981:72) believed that the spiciform rostrum is characteristic of *Uroptychus edwardi* and that it distinguishes his new species from the related *U. scambus* and *U. glyphodactylus*. The rostral shape, however, seems to be subject to variation,

as shown in the case of *U. nigricapillis* Alcock (Tirmizi, 1964:391). In fact, one of the Japanese specimens mentioned in my earlier paper (Baba, 1981b:120), an ovigerous female from "Soyo Maru" Station 44, has the rostrum much more like that of the type of *U. scambus*, and another male from the same locality as well as two males and two ovigerous females in the three other lots have the rostrum spiciform as shown by Kensley but rather variable in its basal width and relative length. All other details of *U. edwardi* agree quite well with the material of *U. scambus* including the type that I have examined. Accordingly, the discrimination between these two species stressed by Kensley (1981:72) may hardly be justified.

Type-locality. – Off Honshu, Japan.

Distribution. – Known from Japan, Sulawesi, Solor Strait, the Nicobar Islands, Andaman Sea and the Indian Ocean off Natal; in 296-1,830 m.

23. *Uroptychus sibogae* Van Dam, 1933

Figure 17

Uroptychus sibogae Van Dam, 1933:28, figs. 39-41. – Baba,1981b:119, fig. 6.

Material. – Molucca Sea off west coast of Halmahera (Sta. 5623: 1 ♂).

Measurements. – Carapace length of male, 10.1 mm.

Diagnosis. – Carapace glabrous and unarmed dorsally. Lateral margins slightly diverging posteriorly but weakly convex, with distinct anterolateral and 1 following spine directly behind end of indistinct cervical groove; obscurely serrate behind this latter spine. Rostrum widely triangular, concave dorsally. Outer orbital angle produced, ending in small spine. Eyes much elongate, cornea more or less dilated, less than half as long as remaining eyestalk. Distal 2 segments of antennal peduncle slender, unarmed; antennal scale extending about to end of ultimate peduncular segment. Merus and carpus of third maxilliped unarmed. Sternum of third thoracic somite depressed, anterior margin with 2 median spines separated by deep U-shaped notch, following sternum with distinct distolateral process. Chelipeds massive, spineless, distally setose; fingers about half as long as palm, distally not crossing. Walking legs similar; meri and carpi almost unarmed, propodi with series of ventral marginal spinelets along entire length, dactyli curving ventrad, ventrally with line of about 9 spinelets, no prominent spine among them.

Habitat. – Taken in 498 m on bottom of sand and mud.

Remarks. – The specimen agrees well with the original description as well as with the holotype examined at the Zoological Museum, Amsterdam. A supplementary account of this species is provided in the previous paper (Baba, 1981b:119). No additional characters of significance were noted.

Type-locality. – West of Manado, Sulawesi.

Distribution. – Off the north coast of Sulawesi, Molucca Sea and Japan, in 430-1,901 m.

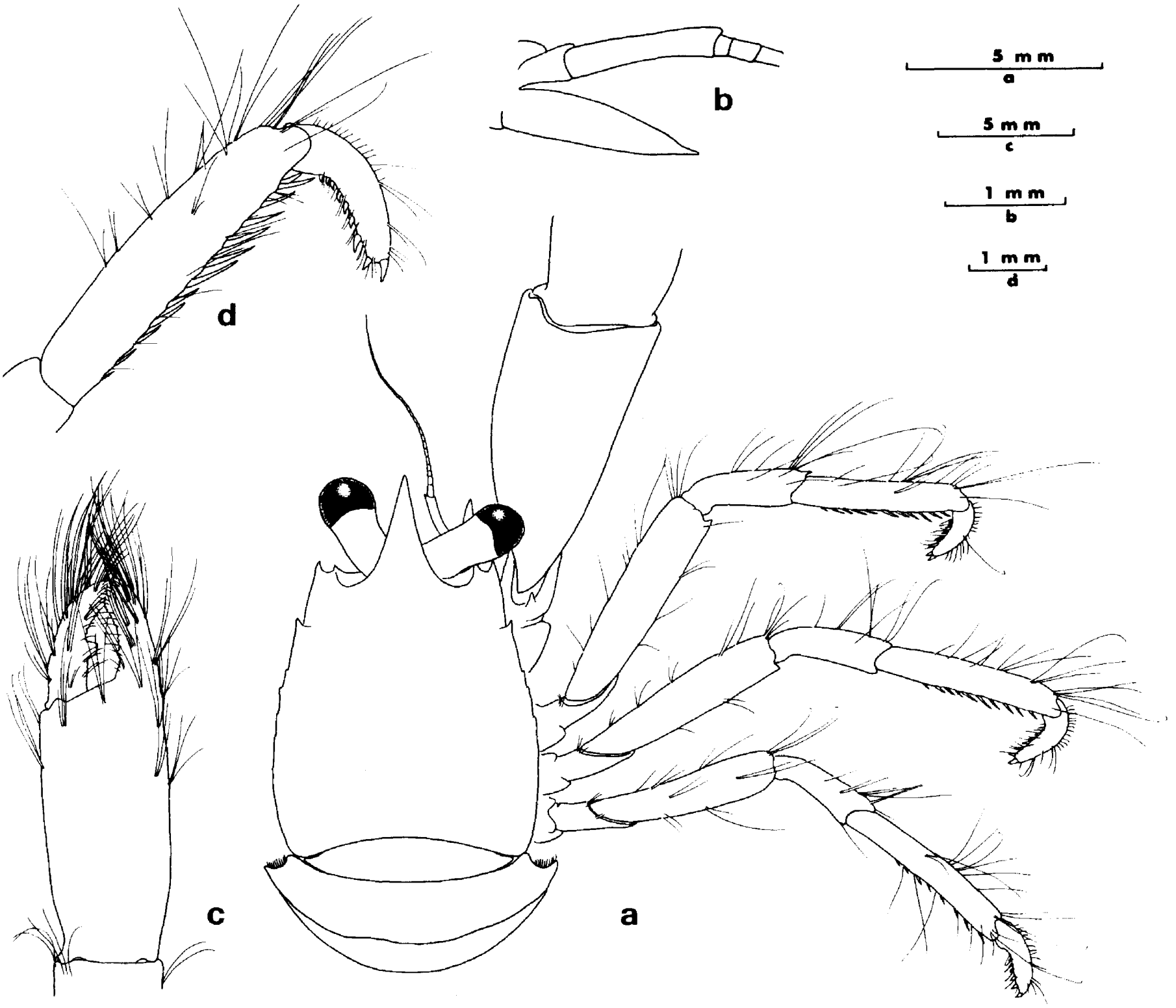

Figure 17. – *Uroptychus sibogae* Van Dam, male from "Albatross" Sta. 5623: a, dorsal view; b, left antennal peduncle; c, right chela; d, distal segments of right first walking leg.

24. *Uroptychus spinimarginatus* (Henderson, 1885)

Figures 18, 19

Diptychus spinimarginatus Henderson, 1885:419.
Uroptychus spinimarginatus: Henderson, 1888:176, pl. 21: figs. 2, 2a.

Material. – Palawan Passage (Sta. 5348: 1 ♂).

Measurements. – Carapace length, 8.7 mm.

Lectotype. – Ovigerous female, "Challenger" Sta. 170, off the Kermadec Islands (29°55'S, 178°14'W), 952 m (520 fm), volcanic mud; measurements as given by Henderson (1888:177).

Diagnosis. – Body covered with fine setae. Carapace slightly broader than long; lateral margins diverging posteriorly, armed with 1 or 2 small and 5 stout spines ex-

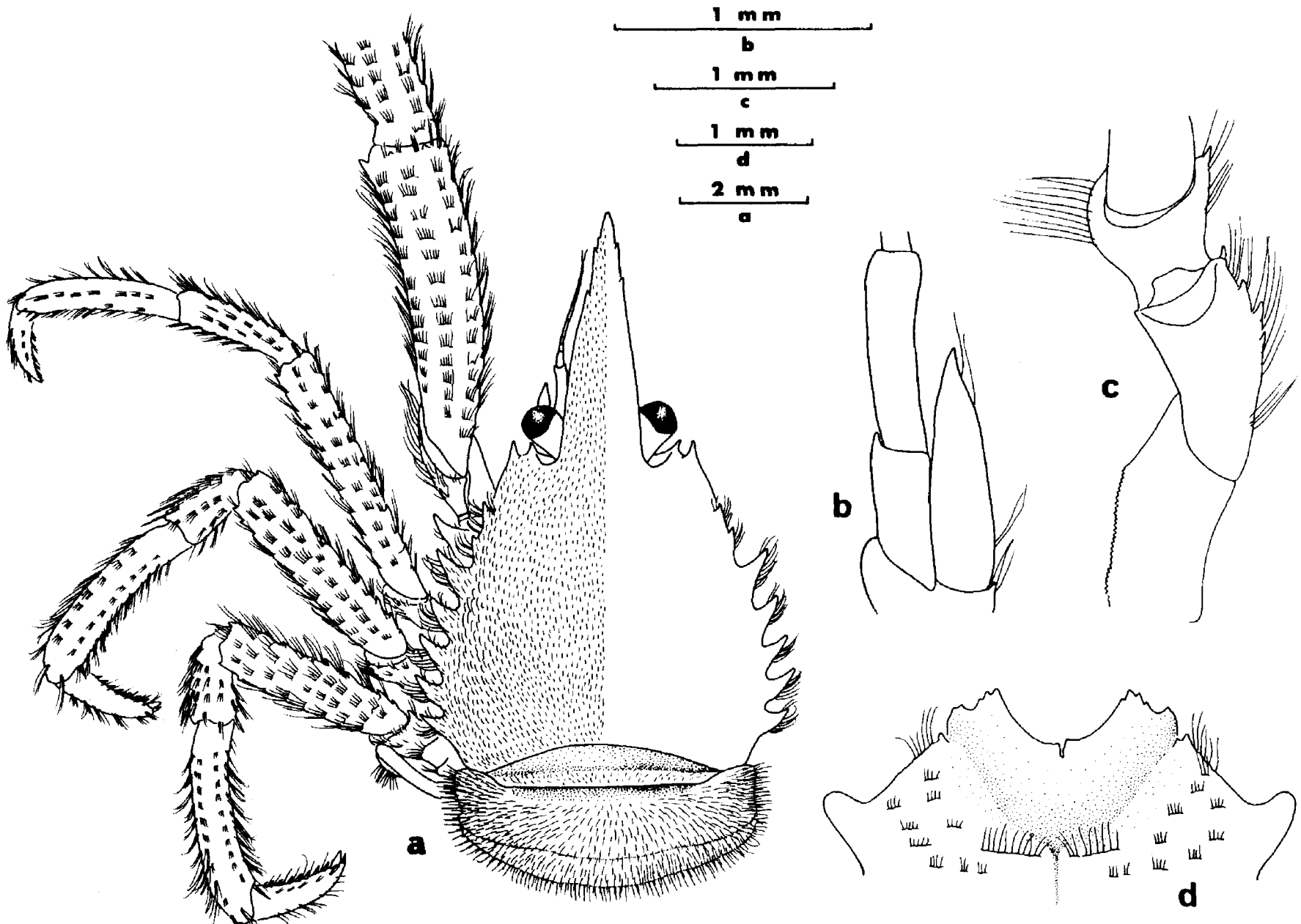

Figure 18. – *Uroptychus spinimarginatus* (Henderson), male from "Albatross" Sta. 5348: a, dorsal view; b, left antennal peduncle; c, endopod of left third maxilliped, distal 2 segments omitted; d, anterior part of sternal segments.

cluding moderate-sized anterolateral spine. Rostrum somewhat shorter than remaining carapace, dorsally flattish, ventrally carinate and distolaterally provided with 2 or 3 denticles. Front margin concave; outer orbital angle produced. Ultimate and penultimate segments of antennal peduncle unarmed or with small terminal spine. Anterior margin of third thoracic sternum deeply concave with distinct median notch narrowly or widely U-shaped or V-shaped. Merus of third maxilliped with distolateral and ventral marginal spinules. Chelipeds granulose and setose, barely 3 times as long as carapace, distally depressed, lacking distinct spines. Walking legs setose, unequal; first leg slenderer than 2 following legs, dactylus unarmed ventrally; second and third legs similar, meri with spinose dorsal margin, dactyli stout, half as long as propodi, armed with 9-11 ventral marginal spinelets, penultimate prominent.

Habitat. – Coral and sand, in 686 m.

Remarks. – This species is known from two different localities, off the Kermadec Islands and south of the Philippines. Originally Henderson (1885) listed no specimens other than an ovigerous female without locality or measurements. In his subsequent publication (Henderson, 1888:177) all systematically needed biological data including measurements of the ovigerous female from the Kermadec Islands are

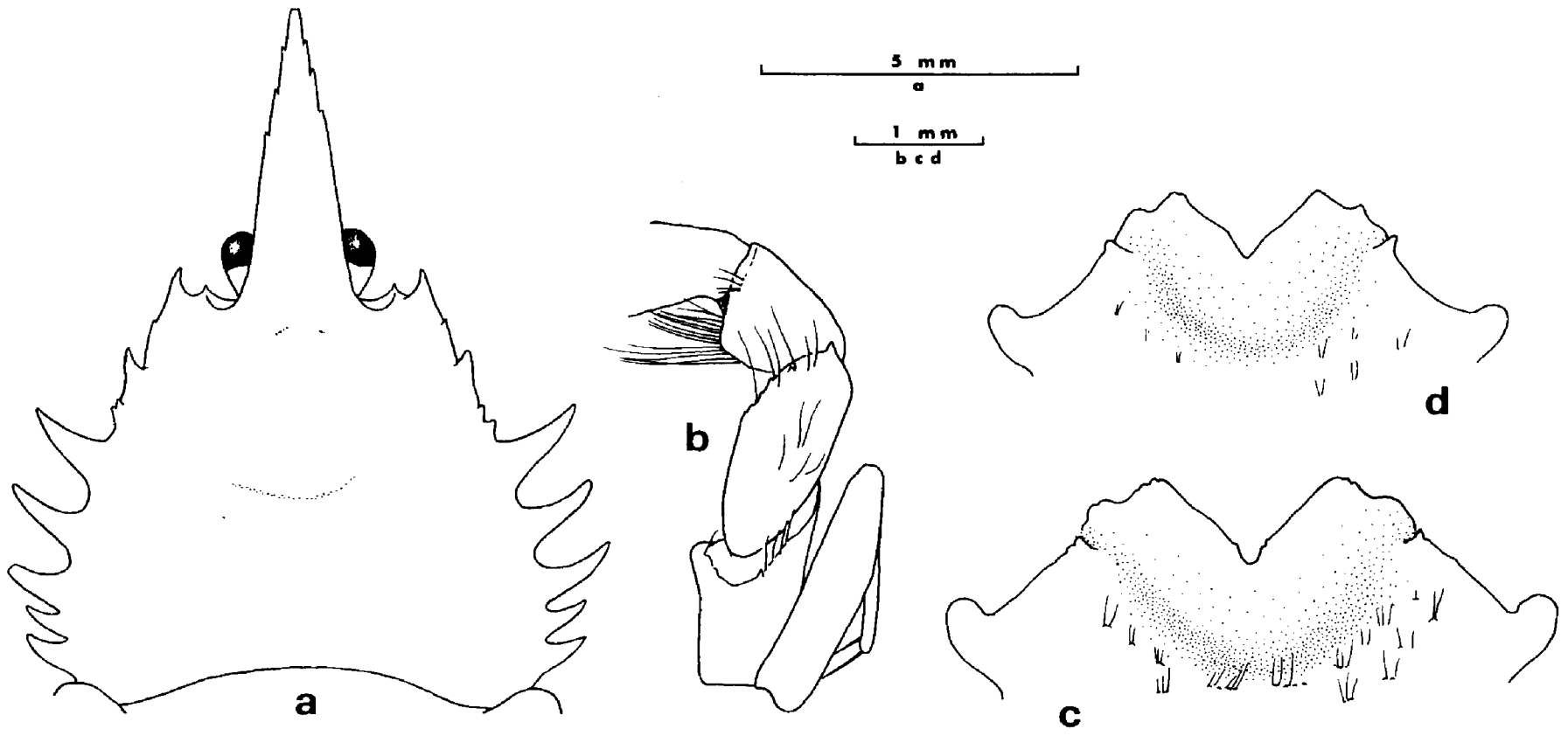

Figure 19. – *Uroptychus spinimarginatus* (Henderson), ovigerous female syntype from off the Kermadec Islands, BMNH Reg. 1888:33, carapace length 11.0 mm: a, carapace; b, left third maxilliped; c, anterior part of sternal segments. Male syntype from same locality, carapace length 9.1 mm: d, anterior part of sternal segments.

given. Very possibly two figures in Plate 21 of Henderson (1888) are based on that ovigerous female, by my interpretation from the size. This specimen, now selected as the lectotype, was examined together with another male syntype from the "Challenger" Station 170, both made available on loan by the courtesy of R.W. Ingle of the British Museum (Natural History). The carapace of the ovigerous female lectotype (Figure 19a) is wider posteriorly than those of the male syntype and the "Albatross" specimen. The penultimate segment of the antennal peduncle is moderately produced distally in the male syntype as well as in the "Albatross" material (Figure 18b), whereas such a process or spine is totally absent from the lectotype. The anterior margin of the third thoracic sternum is variably notched medially; the median notches in the types (Figure 19c, d) are dissimilar and both are also different from that of the "Albatross" (Figure 18d). "One or two minute spinules being alone present at the distal end of the merus of the third maxilliped" as mentioned by Henderson (1888: 177) is not exactly true of the lectotype, in which several denticles are discernible on the distal two-thirds of the mesial margin (Figure 19b); these denticles are more pronounced in the "Albatross" specimen (Figure 18c).

Type-locality. – Off the Kermadec Islands (29°55'S, 178°14'W).

Distribution. – Known from off the Kermadec Islands, Palawan Passage and south of the Philippines [= Kepulauan Talaud], in 686-952 m.

25. *Uroptychus spinulifer* Van Dam, 1940

Figure 20

Uroptychus spinulifer Van Dam, 1940:100, fig. 3.

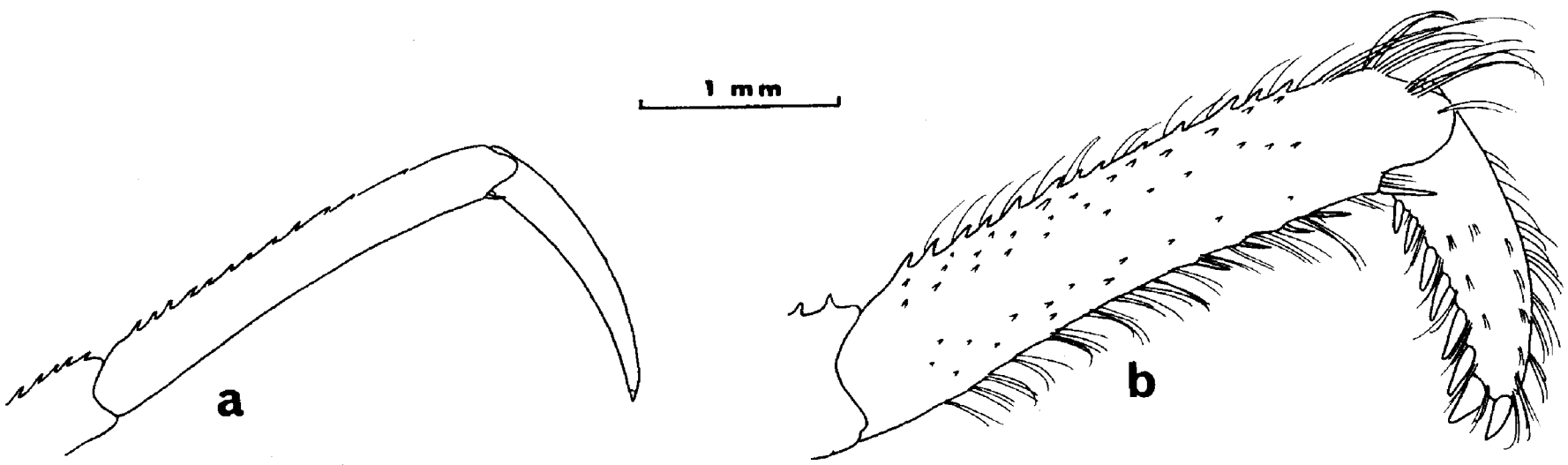

Figure 20. – *Uroptychus spinulifer* Van Dam, female from "Albatross" Sta. 5617: a, distal segments of right first walking leg; b, of right second walking leg.

Material. – Molucca Sea off west coast of Halmahera (Sta. 5617: 1 ♀).

Measurements. – Carapace length of female, 10.7 mm.

Diagnosis. – Belonging to *U. spinimarginatus* group. Body entirely covered with spinules. Carapace with groove between gastric and cardiac regions; lateral margins posteriorly diverging, more or less convex with larger spines behind indistinct cervical groove. Rostrum longer than carapace, ventrally carinate and laterally denticulate. Eyes partially concealed beneath rostrum. Distal 2 segments of antennal peduncle produced distally. Meral ventral margin of third maxilliped with 4 spines. Anterior margin of third thoracic sternum deeply excavated, with 2 median spinules separated by U-shaped notch. Chelipeds 3 times as long as carapace, spinations of ischium and merus much pronounced. Walking legs comparatively short; first leg slender, propodus dentate on dorsal margin, dactylus smooth marginally, gently curving ventrad, more than half as long as propodus; second and third legs similar but longer and wider than first, propodi with dorsal and dorsolateral spinules, dactyli about half as long as propodi, provided with 8 ventral marginal spinelets, penultimate one prominent.

Habitat. – Taken in 240 m; bottom unknown.

Remarks. – The present specimen characterized by the dissimilar first and second walking legs and the ventrally carinate rostrum agrees well with the original description and the holotype of *U. spinulifer* examined at the Zoological Museum, Amsterdam, except only that the spinules on the first and second abdominal segments, evident in the type, are totally absent.

Type-locality. – Java Sea (5°39'S, 111°19'E).

Distribution. – Molucca and Java Seas in 68-240 m.

26. *Uroptychus vandamae*, new species

Figure 21

Uroptychus australis Henderson var. *indicus*: Van Dam, 1933:18, figs. 25-27. [not *U. australis* var. *indicus* Alcock, 1901:284]

Material. – Molucca Sea off west coast of Halmahera (Sta. 5620: 2 ♂, larger male

holotype, USNM 150316). – Makassar Strait (Sta. 5664: 1 ovig. ♀).

Diagnosis. – Carapace longer than wide, dorsally and marginally smooth and spineless excepting distinct anterolateral spine. Lateral margin more or less convex. Rostrum narrowly triangular, fully half as long as carapace. Outer orbital angle slightly produced. Eyes relatively wide. Distal 2 segments of antennal peduncle unarmed. Anterior margin of third thoracic sternum concave with 2 median spines flanking small rounded notch. Chelipeds relatively slender, spineless, distally depressed moderately; palm glabrous, twice as long as movable finger; fingers setose, not crossing distally. Propodi of walking legs with long coarse setae especially thick distally, ventral margin with 4 or 5 spinelets; dactyli with proximal and distal groups of ventral marginal spinelets.

Description of holotype. – Carapace (Figure 21a) excluding rostrum longer than wide, widest at posterior 1/3 of length. Dorsal surface smooth, glabrous, moderately convex, lateral margin convex, feebly ridged along posterior 1/3 of length. Outer orbital angle feebly produced, indistinctly spiniform.

Rostrum narrowly triangular, relatively elongate, more than half as long as remaining carapace, straight and horizontal, smooth and glabrous dorsally and marginally.

Eyes comparatively large, reaching about to midlength of rostrum, cornea more than half as long as remaining eyestalk.

Abdominal segments dorsally smooth and glabrous.

Distolateral process of antennular basal segment simple but well developed. Distal 2 segments of antennal peduncle (Figure 21b) spineless, ultimate segment fully twice as long as penultimate, antennal scale as wide as peduncle, terminating at midlength of ultimate peduncular segment, basal segment proximal to scale produced at distolateral margin.

Ischium of third maxilliped with 13 closely placed denticles on proximal 4/5 of mesial ridge. Merus and carpus unarmed.

Third thoracic sternum (Figure 21c) depressed, distolateral angle rounded, anterior margin concave with paired median spines, each spine placed outside of rounded median notch, lateral margin armed with distinct median process directed slightly ventrad. Lateral margin of following sternum dentate in anterior half.

Cheliped (Figure 21a, d) 3 times as long as carapace, relatively slender and unarmed. Ischium with distinct dorsal spine. Carpus longer than palm, distally setose. Palm moderately depressed, 3 times as long as wide, twice as long as movable finger, mesial and lateral margins subparallel. Fingers distally setose, slightly gaping in proximal half, ending in blunt point, not crossing distally; prominent basal process of movable finger fitting into concavity of opposing margin.

Walking legs (Figure 21a) similar, depressed, spineless on dorsal margin, distally setose. Carpi 0.6 as long as propodi. Propodi (Figure 21e) almost straight, widening medially, narrowing toward both ends, distally furnished with long setae, barely twice as long as dactyli; ventral margin with 5 spinelets in first and second legs, 4 in third. Dactyli (Figure 21e) nearly as long as carpi, strongly curving ventrad, setose marginally; ventral margin with 2 groups of spinelets distinctly separated by some distance; 6 minute spinules in proximal half of length, 2 more or less prominent ones at distal portion; ultimate nearly as stout as penultimate but distinctly longer.

Measurements of holotype. – Length of carapace including rostrum, 10.5 mm;

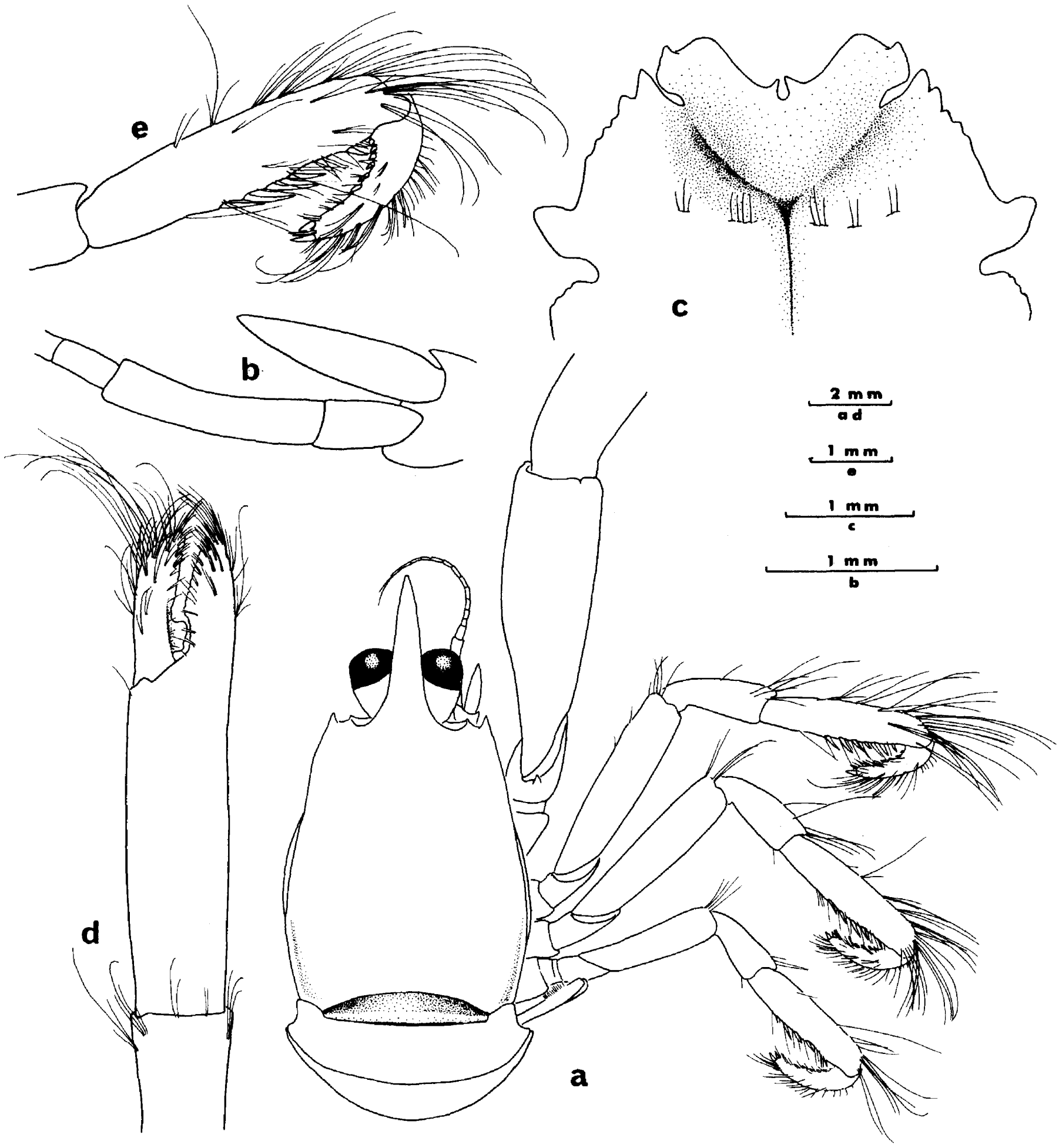

Figure 21. – *Uroptychus vandamae*, new species, male holotype from "Albatross" Sta. 5620: a, dorsal view; b, left antennal peduncle; c, anterior part of sternal segments; d, right chela; e, distal segments of right first walking leg.

width of carapace 5.7 mm; length of cheliped (left), 32.9 mm; of carpus, 9.8 mm; of palm, 8.5 mm; of movable finger, 4.2 mm.

Measurements of paratypes. – Carapace length of male, 7.6 mm; of ovigerous female, 10.1 mm; diameter of ovum, 1.2 mm.

Variation. – The arrangement of ventral marginal spinelets of the dactyli of the

walking legs is unusual; in the holotype and the male paratype the distal group of two spines are separated remotely from the proximal group (Figure 21e); in the ovigerous female paratype, however, this unarmed portion is occupied by another spinelet equidistant between these groups so that the distal second, third and fourth spinelets are loosely arranged.

Habitat. – Taken in 655-732 m on hard or mud bottoms.

Remarks. – Examination of the "Siboga" specimens of *Uroptychus australis indicus* reported by Van Dam (1933:18) and now deposited in the Zoological Museum, Amsterdam revealed that the dactyli of the walking legs in the specimens from Stations 85, 87, 284 and 300 are much like those of the holotype and male paratype of *U. vandamae*; also alike are those of the "Siboga" specimens from Stations 262 and 266 and that of the ovigerous female paratype. These characters as well as other essential features indicate that Van Dam's *U. indicus* and the present "Albatross" specimens are identical. Subsequent examination of the ovigerous female syntype of *U. indicus* (9328/9) now deposited in the Zoological Survey of India, Calcutta, made available through the courtesy of K.K. Tiwari, disclosed, however, that our material is distinct in the unusual arrangement of the ventral marginal spinelets of the dactyli of the walking legs, especially in the spineless portion and the more pronounced ultimate spinelet.

The closest relative, however, seems to be *Uroptychus remotispinatus* Baba and Tirmizi recently described from Japan and off the east coast of Africa (Baba and Tirmizi, 1979:52), which species shares the unique dactyli of the walking legs with this new species. In *U. vandamae*, however, the carpi of the walking legs are relatively much shorter, the third thoracic sternum is strongly depressed, and the lateral margin of the fourth thoracic sternum is relatively longer.

Type-locality. – Northwest of Makyan Island off west coast of Halmahera (0°21' 30"N, 127°16'45"E).

Distribution. – Known from Molucca Sea, Makassar Strait, Kei Island, south of Timor and off Roti, in 560-918 m.

Family Galatheidae

In addition to six currently recognized genera of the Galatheidae six more have been proposed for the Indo-West Pacific species in earlier papers: *Liogalathea, Allogalathea, Phylladiorhynchus, Sadayoshia, Lauriea* and *Coralliogalathea* (Baba, 1969a:2, 3, 5, 18; 1971:51; Baba and Javed, 1974:61). *Phylladiorhynchus* has been recorded also in the Caribbean Sea (Mayo, 1972:523), and consultation with the literature proved that the western and eastern Atlantic *Galathea agassizi* should be transferred to *Liogalathea*. And recently *Nanogalathea* has been erected for an Indian Ocean species (Tirmizi and Javed, 1980:127). The present report includes three new genera, *Allomunida, Fennerogalathea* and *Paramunida*. Overall, 16 genera are now known in the Galatheidae, five of which are common to both the Atlantic and the Indo-Pacific; the remaining 11 occur in the Indo-Pacific.

Key to Genera of Galatheidae

1. Eyes usually well developed; exopod of first maxilliped with lash. Subfamily Galatheinae 2
– Eyes usually reduced; exopod of first maxilliped without lash. Subfamily Munidopsinae ..... ***Munidopsis***
2. Rostrum triangular 3
– Rostrum mostly spiniform or with dorsal and ventral spines 11
3. Lateral margins of rostrum nearly unarmed, at most finely serrate or with rudimentary teeth 4
– Lateral margin of rostrum with distinct teeth 7
4. Rostral margin finely serrate ..... ***Nanogalathea*** **Tirmizi and Javed, 1980**
– Rostral margin with 4 indistinct or rudimentary denticles 5
5. Carapace lacking distinct transverse ridges; eyestalk relatively narrow and elongate ..... ***Fennerogalathea***
– Carapace with transverse ridges; eyestalk relatively wide 6
6. Carapace with 1-3 lateral marginal spines; antenna well developed, second segment with 2 terminal spines ..... ***Liogalathea*** **Baba, 1969**
– Carapace with 6 lateral marginal spines; antenna much reduced, second segment unarmed ..... ***Allomunida***
7. Endopod of uropod extremely wide ..... ***Lauriea***
– Endopod of uropod normal, about as long as wide 8
8. Rostrum extremely elongate, with 5-9 lateral teeth ..... ***Allogalathea***
– Rostrum moderate in length, with 2-5 lateral teeth 9
9. Rostrum leaflet-like with tiny distolateral and distinct basilateral teeth ..... ***Phylladiorhynchus*** **Baba, 1969**
– Rostrum with 3-5 distinct lateral teeth 10
10. Rostrum with 3 lateral teeth on each side; second segment of antennal peduncle lacking distomesial spine; third thoracic sternum strongly produced anteriorly, nearly triangular ..... ***Coralliogalathea*** **Baba and Javed, 1974**
– Rostrum with 4 lateral teeth; second segment of antennal peduncle with 2 terminal spines; third thoracic sternum relatively short and narrow, anterior margin distinctly or indistinctly bilobed ..... ***Galathea***
11. Pterygostomian flap visible in dorsal view ..... ***Pleuroncodes*** **Stimpson, 1860**
– Pterygostomian flap not visible in dorsal view 12
12. Two supraocular spines on each side ..... ***Sadayoshia***
– One supraocular spine on each side 13
13. Rostrum with dorsal and ventral teeth ..... ***Cervimunida***
– Rostrum unarmed dorsally and ventrally 14
14. Rostrum spiniform, well developed; transverse ridges of carapace distinct ..... ***Munida***
– Rostrum extremely short; transverse ridges of carapace usually reduced 15
15. Carapace with abnormally developed gastric and cardiac spines; first segment of antennal peduncle with short process ..... ***Bathymunida***
– Carapace covered with granules or spinules, lacking abnormally developed gastric and cardiac spines; first segment of antennal peduncle with elongate, anteriorly directed process ..... ***Paramunida***

Genus *Allogalathea* Baba, 1969

27. *Allogalathea elegans* (Adams and White, 1848)

Restricted synonymy:
Galathea elegans Adams and White, 1848: pl. 12: fig. 7.
Allogalathea elegans: Baba, 1969a: 6, fig. 1. – Haig, 1973:275; 1974:447. – Baba, 1977a:252; 1979b:654, fig. 3. – Miyake, 1982:150, pl. 50: fig. 5.

Material. – Butung Strait between Sulawesi and Butung (Sta. 5641: 1 ovig. ♀). – North Balabac Strait off northern Borneo (Sta. 5355: 1 ♀). – Sulu Archipelago (Sta. 5137: 1 ♀; Sta. 5138: 2 ovig. ♀; Sta. 5139: 1 ovig. ♀; Sta. 5157: 1 ♂, 1 ovig. ♀, 1 ♀; Sta. 5163: 1 ovig. ♀; Sta. 5165: 1 ovig. ♀; no station number: south side of Marongas I., vicinity of Jolo, shore, coral head, 10 Feb 1908: 1 ♂, 5 ovig. ♀, 1 ♀). – Davao Gulf off southeastern Mindanao (Sta. 5249: 3 ♂, 1 ovig. ♀; Sta. 5252: 1 ovig. ♀; Sta. 5254: 1 ♂). – Between Samar and Leyte (Sta. 5482: 1 ovig. ♀). – Sibuyan Sea (Sta. 5179: 1 ♂). – Luzon Strait off Batan (Sta. 5321: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 5.7-10.5 mm; of ovigerous females, 7.1-11.8 mm; of nonovigerous females, 5.5-14.0 mm.

Diagnosis. – Carapace lacking dorsal spines, transverse ridges uninterrupted, fringed with rather coarse setae. Rostrum extremely elongate, ventrally carinate, armed with 5-9 lateral teeth. Basal segment of antennule with 3 terminal spines. Merus of third maxilliped with 2 or 3 spines on ventral margin; dorsal margin unarmed or with 1-3 spinules or rudimentary denticles. Epipod usually present on cheliped, rarely on first, or first and second walking legs.

Habitat. – Taken on shore to a depth of 81 m, mostly on bottoms of coral sand, occasionally mixed with shells, or on coral bottoms. There is no record of commensalism on the labels of any of the lots examined, although *A. elegans* is commonly associated with comatulid Crinoidea. The known commensal hosts are listed in Baba (1979b:655).

Remarks. – The variabilities in color patterns, proportional length of the carpus of cheliped and number of epipods on the pereopods are discussed in the previous paper (Baba, 1979b:654). Conclusively, I believe that this species is highly variable intraspecifically, and that the Palauan form supposed to be a distinct species in having epipods on the first three pereopods (Baba, 1969a:6) should be merged with *A. elegans*.

Type-locality. – Philippine Islands.

Distribution. – Known from the Red Sea, east coast of Africa, eastward to the Fiji Islands via the Malayan Archipelago, northward to Japan and southward to eastern and western Australia; intertidal to 146 m.

Genus *Allomunida*, new genus

Diagnosis. – Rostrum triangular, armed with 3-5 rudimentary lateral teeth. Outer orbital angle produced. Gross morphology of carapace and abdomen as in *Munida*. Eyestalk short, cornea well developed but not greatly swollen distally. Antennular basal segment stocky with 2 terminal spines laterally. Antenna much

reduced, second and third segments unarmed, flagellum short. Anterior margin of third thoracic sternum roundly convex, with few small median processes. Ischium of third maxilliped as long as merus, triangular in cross section, mesial ridge dentate. Chelipeds comparatively large. Walking legs slender, dorsal margins of all segments spineless; dactyli with distinct denticles and setae on ventral margin. Telson well developed, indistinctly subdivided. Male gonopods on first and second abdominal segments.

Type-species. – *Allomunida magnicheles*, new species.

Etymology. – Derived from *allos* (Gr., = other, different) + *Munida*.

Gender. – Feminine.

28. *Allomunida magnicheles*, new species

Figures 22, 23

Material. – Sulu Archipelago (Sta. 5158: 1 ♂; Sta. 5160: 8 ♂, 1 ovig. ♀ [1 male is holotype, USNM 150328]). – Tanon Strait between Negros and Cebu (Sta. 5191: 1 ovig. ♀).

Description of holotype. – Carapace (Figure 22) with distinct transverse ridges, longer than wide, posteriorly widening, sparsely furnished with coarse setae. Gastric region convex, with pair of small spines anteriorly, transverse ridges interrupted. Cervical groove indistinct. Median transverse ridge behind cervical groove somewhat elevated and sinuous. Posterior transverse ridge distinctly elevated, uninterrupted and spineless. Lateral margin with 6 spines, anterolateral one well developed, remainder located behind cervical groove, much reduced in size.

Rostrum triangular, extremely wide at base, distally narrowing, moderately excavated dorsally, with 3 rudimentary lateral teeth in proximal half on either side, nearly half as long as remaining carapace.

Eyes well developed, moderately depressed, more or less dilated distally, cornea occupying half of eyestalk, eyelashes short.

Abdominal segments spineless, sparsely furnished with coarse setae; second and third segments with 4 ridges each, fourth segment with 5 ridges. Telson (Figure 23f) comparatively wide, indistinctly subdivided.

Antennular basal segment (Figure 23a) stocky, with concavity on ventral proximal surface; 2 terminal spines placed laterally, relatively short and subequal; distomesial margin unarmed. Antennal peduncle (Figure 23b) comparatively reduced; first segment with distomesial process, following segments unarmed; flagellum short, terminating in midlength of merus of cheliped.

Ischium of third maxilliped (Figure 23c) as long as merus, but much wider, mesial ridge with about 18 closely placed denticles, distoventral margin not produced. Merus and carpus sparsely setose, merus with 2 ventral marginal spines of small size, dorsal margin unarmed.

Sternum of third thoracic somite (Figure 23d) relatively wide, medially depressed and provided with setiferous transverse ridge, anterior margin convex with minute median processes. Following sternum with setiferous transverse ridge anteriorly.

Cheliped (Figure 22) massive, fully 3 times as long as carapace including ros-

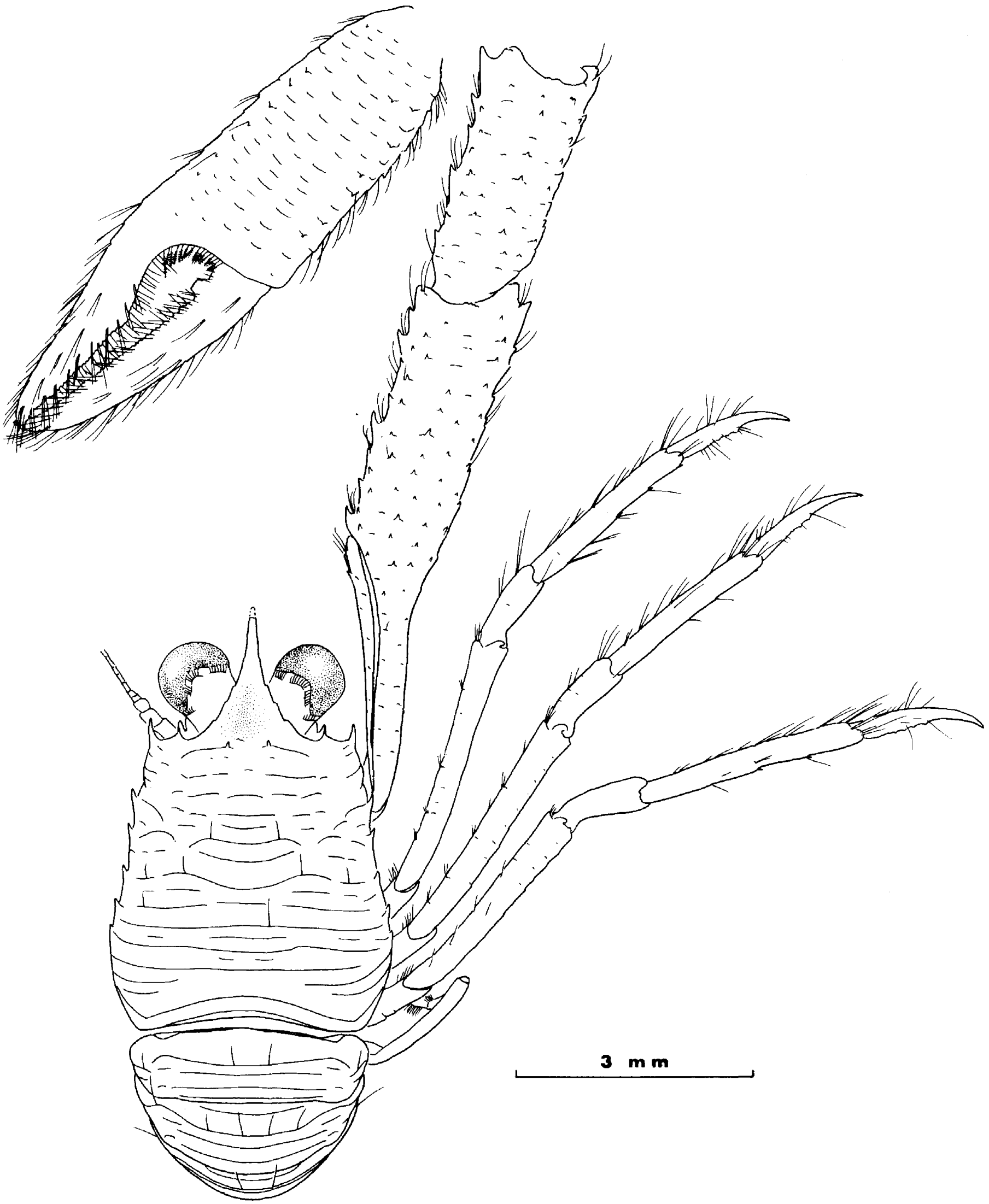

Figure 22. – *Allomunida magnicheles*, new species, male holotype from "Albatross" Sta. 5160, dorsal view.

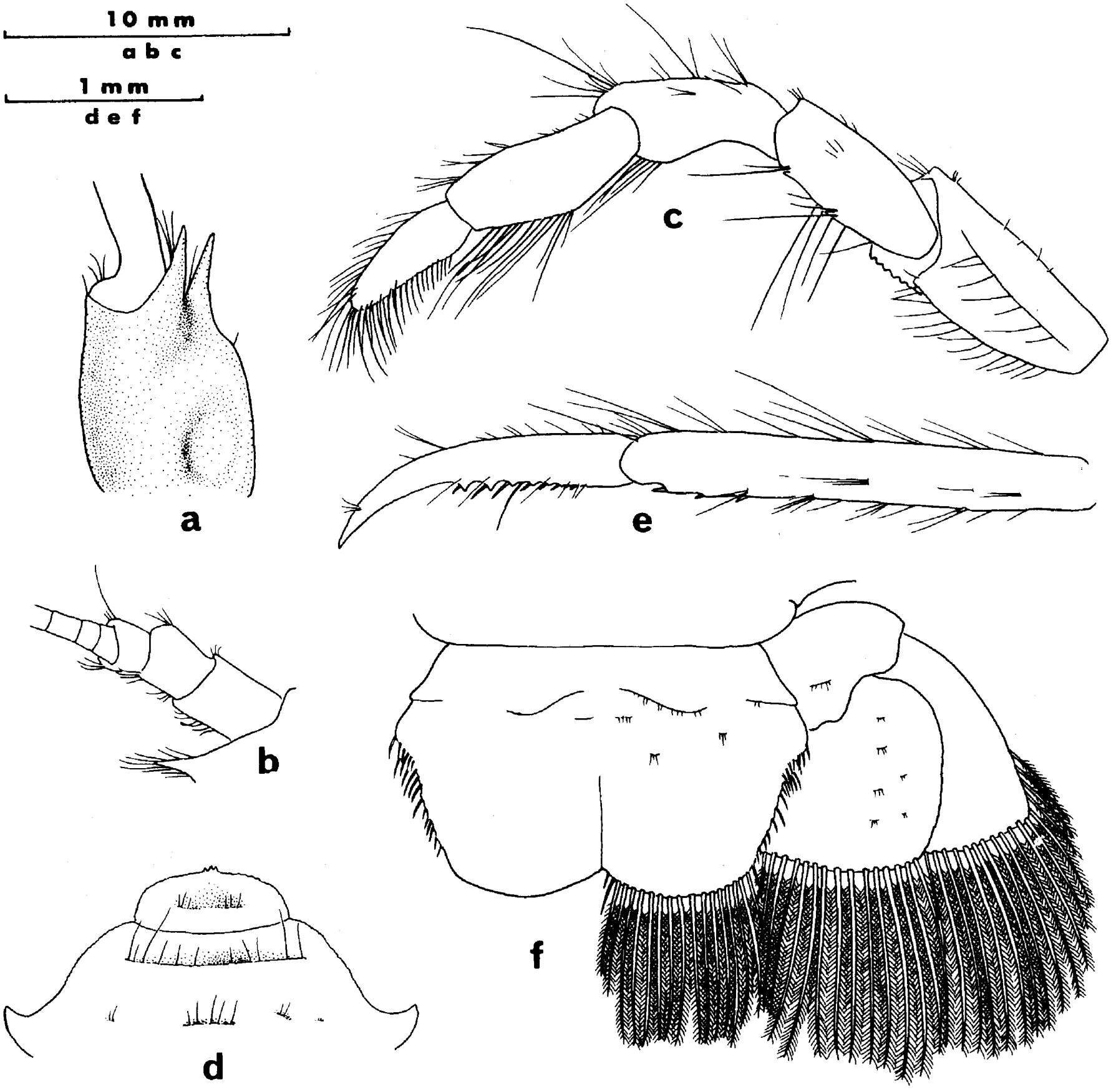

Figure 23. – *Allomunida magnicheles*, new species, male holotype from "Albatross" Sta. 5160: a, basal segment of left antennule; b, left antennal peduncle; c, endopod of left third maxilliped; d, anterior part of sternal segments; e, distal segments of left first walking leg; f, telson and right uropod.

trum, chela depressed, other segments subcylindrical; dorsally tuberculate, marginally and distally furnished with short setae. Ischium lacking dorsal and ventral spines. Merus relatively massive in distal half, slender in proximal half, mesial marginal spines more or less stouter. Carpus slightly shorter than movable finger. Palm fully more than half as long as carapace, 2.2 times as long as wide, 1.5 times as wide as carpus, dorsally squamate. Fingers slightly shorter than palm, strongly gaping proximally in right cheliped, not gaping in left cheliped; distally crossing; opposable margin of movable finger of right cheliped almost straight and minutely

denticulate throughout, provided with prominent but low proximal process; that of fixed finger greatly concave proximally.

Walking legs (Figure 22) similar, slender, lacking spines on entire margins of meri and carpi; distal 2 segments (Figure 23e) moderately setose. Propodi almost straight, about 1.5 times as long as dactyli, with 5 or 6 ventral marginal spinelets. Dactyli slender, curving ventrad distally, ventral margin with about 7 denticles in proximal 3/5 of length, distal 2 somewhat pronounced; spinelet arising from each denticle.

Two pairs of gonopods present.

Epipod present on cheliped.

Measurements of holotype. – Length of carapace, 5.5 mm; width of carapace, 3.3 mm; length of cheliped (right), 18.6 mm; of carpus, 3.2 mm; of palm, 4.0 mm; of movable finger, 3.5 mm.

Measurements of paratypes. – Carapace lengths of males, 4.1-4.9 mm; of ovigerous females, 4.0 and 4.6 mm; diameter of ovum, 0.3 mm.

Variation. – Rostral lateral teeth are all rudimentary, numbering three to five, mostly four. The anterior marginal processes of the third thoracic sternum, usually two or three in number, are barely discernible in three paratypes. In males, the fingers of the cheliped vary from being strongly gaping to being nongaping, as also does the palm from being extremely massive to being nonmassive; females have no such gaping and massive cheliped.

Habitat. – Taken in disjunct depths of 22 and 472 m on bottoms of mud, sand or sand mixed with shells.

Remarks. – The occurrence of this species with quite unusual characters shows no alternative but to establish a monotypic new genus. *Allomunida magnicheles* superficially resembles the species of both *Galathea* and *Munida*, from which it differs in having the antenna reduced especially in armature and size, the third thoracic sternum medially convex on the anterior margin, and the walking legs without dorsal marginal spines. It approaches *Galathea* and differs from *Munida* in having a stout antennular basal segment with two terminal spines, a triangular rostrum with rudimentary lateral teeth, the eyes well developed but not greatly swollen distally. It is similar to *Munida* and differs from *Galathea* in the general striation and spinosity of the carapace, and in having slender walking legs, especially the dactyli.

Type-locality. – Northeast of Tinakta I., Sulu Archipelago (5°12'40"N, 119°55'10"E).

Distribution. – Sulu Archipelago and Tanon Strait between Negros and Cebu, in 22 and 472 m.

Genus *Bathymunida* Balss, 1913

29. *Bathymunida longipes* Van Dam, 1938

Bathymunida longipes Van Dam, 1938:195, figs. 1, 2.

Material. – Sulu Archipelago (Sta. 5140: 7 ♂).

Measurements. – Carapace lengths of males, 6.9-7.0 mm.

Diagnosis. – Carapace posteriorly narrowing, dorsally provided with mostly

interrupted, weak transverse ridges, and abnormally developed gastric and cardiac spines in addition to small epigastric and postcervical spines. Lateral margin with 6 spines in anterior half. Median rostral spine extremely short, much smaller than supraoculars. Base of both rostrum and supraoculars relatively wide. Basal segment of antennule more or less elongate, with 2 distinct terminal and 1 minute lateral spines. Chelipeds 10-13 times as long as carapace. Dactyli of walking legs slender, strongly curving ventrad, ventral margin smooth, dorsal margin minutely crenulate in proximal half.

Habitat. – Taken in 140 m on bottom of fine coral sand.

Remarks. – The fingers of the cheliped are widely gaping proximally with a single process on the opposable margin of the movable finger, instead of two processes as in the type. Fringes of setae ventrally placed along the mesial and lateral margins of the chela as mentioned earlier for the full-grown male of *Bathymunida brevirostris* Yokoya (Baba, 1970:62) are also recognizable only near the distal portion of the palm. The meaning of the limited occurrence of such setae in the male that have been presumed to represent a sexual character (Baba, 1970:62) has been unresolved as yet.

Type-locality. – Kangean Group in the Java Sea.

Distribution. – Known from the Sulu Archipelago and Java Sea, in 100-140 m.

Genus *Cervimunida* Benedict, 1902

30. *Cervimunida princeps* Benedict, 1902

Cervimunida princeps Benedict, 1902:249, fig. 3. – Balss, 1913:18, fig. 15, pl. 1: fig. 1. – Parisi, 1917:2. – Yokoya, 1933:65. – Miyake, 1947:733, fig. 2120; 1960:97, pl. 48: fig. 6; 1965:635, fig.1047; 1982:150, pl. 50: fig. 4. – Baba, in Baba, Hayashi and Toriyama, 1986:167, 288, fig. 118.

Material. – Off northern Luzon (Sta. 5325: 2 ♂, 2 ovig. ♀, 1 sp. (sex indet.)).

Measurements. – Carapace lengths of males, 41.9 and 41.0+ mm; of ovigerous females, 27.0 and 39.0 mm; of immature specimen, 11.7 mm.

Diagnosis. – Carapace strongly striated, dorsally armed with 6 epigastric, 2 lateral protogastric, 2 postcervical and 2 anterior branchial spines. Cervical groove distinct. Lateral margin with 7 spines, anterolateral spine well developed. Rostrum laterally compressed, arched, with 2 dorsal and 1 ventral teeth. Supraocular spines curving dorsad and laterad, barely half as long as rostrum. Eyes distally dilated. Second, third and fourth abdominal segments each armed with about 8 spines on anterior ridge. Basal segment of antennule with 2 lateral and 2 terminal spines, mesial terminal larger. Merus of third maxilliped with 2 equal-sized ventral and 1-3 small dorsal spines. Chelipeds moderately spinose, thickly covered with fine setae. Epipods absent from pereopods.

Habitat. – Taken in 410 m on bottom of green mud.

Remarks. – This genus contains only two species. The other is the eastern Pacific *Cervimunida johni*; frozen and canned tails of this galatheid are known as "langostinos" (Schmitt, 1965:180). Color illustrations of *C. princeps* have been provided by Miyake (1960: pl. 48: fig. 6; 1982: pl. 50: fig. 4) and Baba in Baba, Hayashi and Toriyama (1986: fig. 118). No additional characters of significance were noted.

Type-locality. – Off Honshu, Japan.

Distribution. – Previously known from Japanese waters in 76-452 m.

Genus *Fennerogalathea*, new genus

Diagnosis. – Rostrum triangular, flattish, wide at base, bearing 2 small lateral teeth near base. Carapace not rugose except for protogastric and posterior transverse ridges, armed dorsally with small spines. Outer orbital angle produced. Second through fourth abdominal segments transversely ridged anteriorly, with pronounced tuft of setae medially. Eyestalk slender, elongate, fully as long as rostrum. Antennule and antenna as in *Galathea*; basal segment of antennal peduncle lacking distomesial process. Propodus of third maxilliped widened medially. Sternum of third thoracic somite nearly rectangular and medially notched on anterior margin; following sternum relatively long. Telson well developed, incompletely subdivided, anterior lateral plate small but distinct. Chelipeds subcylindrical, comparatively long, covered with spinules. Walking legs slender; dactyli distinctly serrate on ventral margin.

Type-species. – *Fennerogalathea chacei*, new species.

Etymology. – It is a pleasure to dedicate this genus to Fenner A. Chace, Jr.; we owe much to his 1942 publication for a better understanding of the western Atlantic galatheideans. Personally, I received his many helpful suggestions, ranging from scientific approach to content, during preparation of the present report.

Gender. – Feminine.

31. *Fennerogalathea chacei*, new species

Figures 24, 25

Material. – Vicinity of Marinduque off southwestern Luzon (Sta. 5371: 1 ovig. ♀, holotype, USNM 150324; Sta. 5376: 1 ♂, 1 ♀).

Description of holotype. – Carapace (Figure 24) longer than wide when measured from behind eye to posterior margin, dorsally not rugose excepting protogastric and posterior transverse ridges, armed with spinules as figured. Gastric region indistinctly defined, armed with 3 transverse rows of spinules: anterior row epigastric, composed of 4 spinules; median row protogastric, composed of 7 spinules, 4 of them on concave transverse ridge, 2 mesial close to each other; and posterior row of 2 spinules metagastric. Cervical groove indistinct. Cardiac region with 2 spinules indistinctly defined. Single spinule on anterior branchial region slightly anterior to level of protogastric row, 2 other spinules on midbranchial region. Posterior transverse ridge distinctly elevated, spineless. Three striae feebly discernible in posterior 1/3 of branchial region. Front margin oblique, with spinule at midpoint on right side only. Lateral margins subparallel, converging posteriorly from posterior 1/3 of length, armed with 7 small spines including poorly developed anterolateral spine; anterior second spine slightly dorsal to marginal level, with accompanying spine anterior and ventral to it. Outer orbital angle produced, ending in tiny spine.

Rostrum triangular, wide at base, flattish dorsally, distally curving dorsad and 0.4 as long as remaining carapace; lateral margin with 2 small posterior and 1 or 2

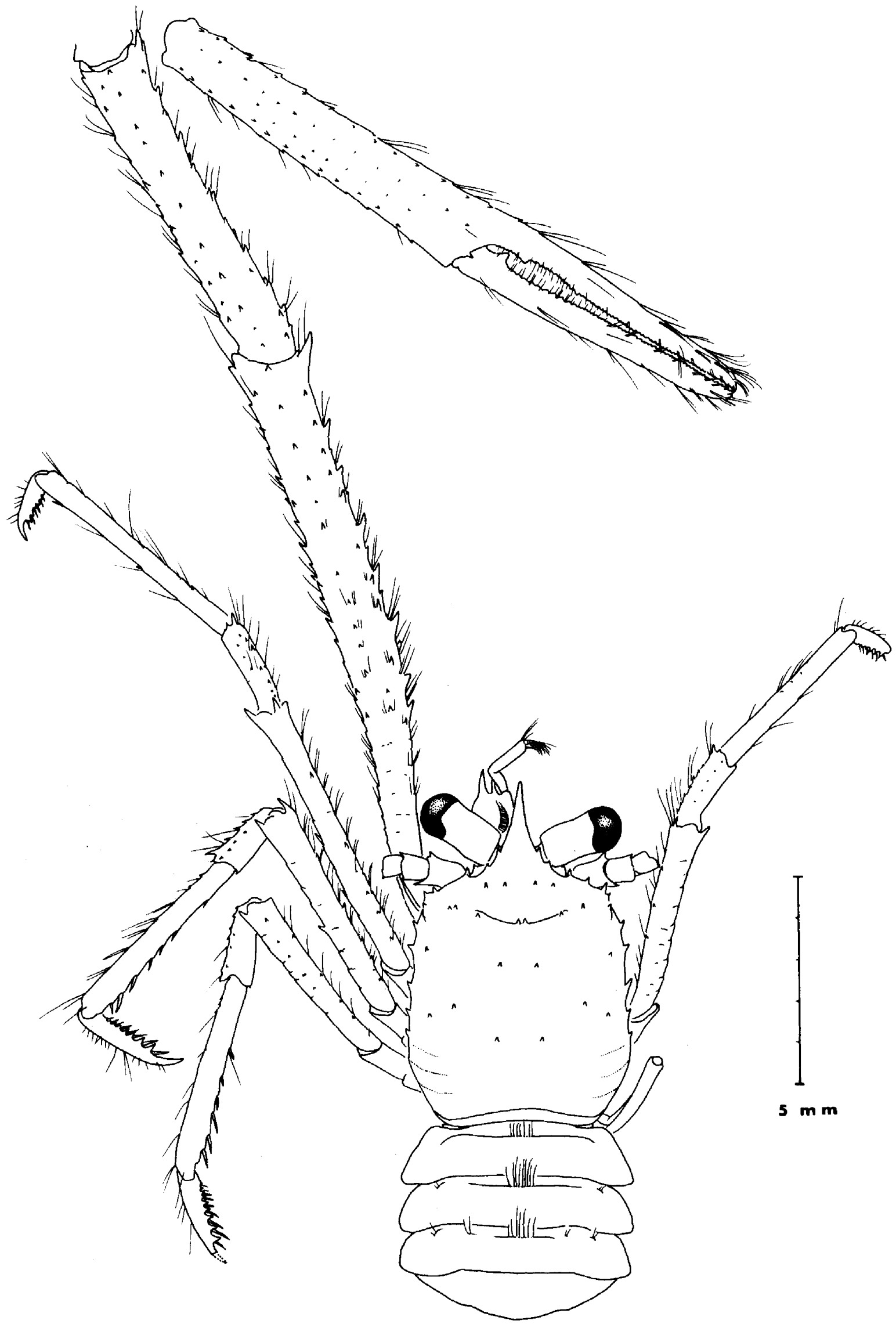

Figure 24. – *Fennerogalathea chacei*, new species, ovigerous female holotype from "Albatross" Sta. 5371, dorsal view.

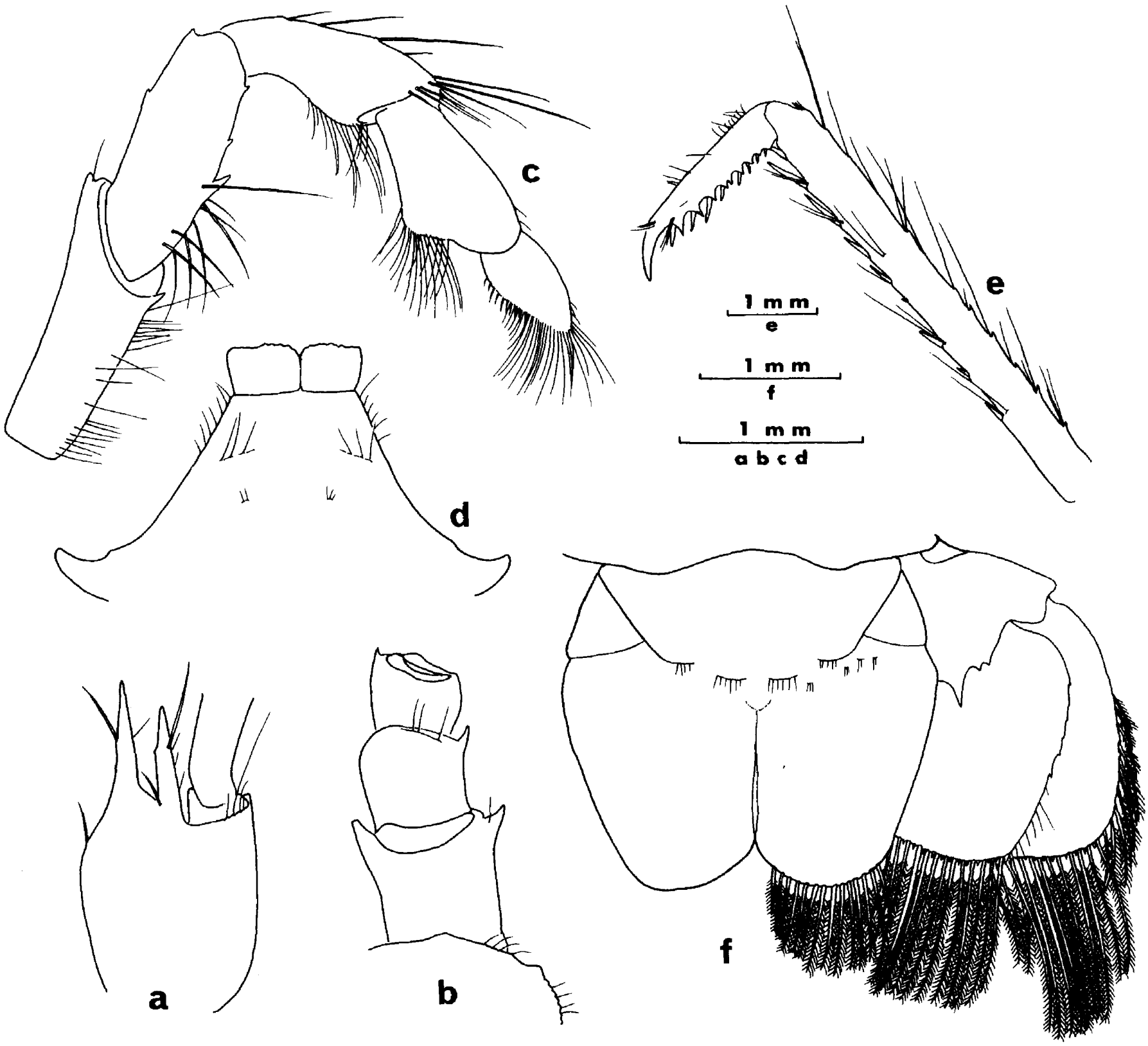

Figure 25. – *Fennerogalathea chacei*, new species, ovigerous female holotype from "Albatross" Sta. 5371: a, basal segment of right antennule; b, right antennal peduncle; c, endopod of right third maxilliped; d, anterior part of sternal segments; e, distal segments of left first walking leg; f, telson and right uropod.

tiny anterior spines.

Eyestalk subcylindrical, elongate, fully as long as rostrum; cornea feebly dilated, about half as long as remaining eyestalk; eyelashes short, restricted to dorsomedial portion.

Second, third and fourth abdominal segments with distinct anterior stria, each furnished medially with prominent tuft of setae. Pleuron of each segment roundly produced. Telson (Figure 25f) relatively long, incompletely subdivided, anterior lateral plate small but distinctly defined.

Basal segment of antennule (Figure 25a) stocky with 2 terminal spines (lateral and dorsolateral) of subequal size, distomesial margin unarmed; distal segment

with pronounced setae. Antenna (Figure 25b) well developed, first segment lacking distomesial process; second segment slightly wider and longer than third, moderately produced on both terminal margins; third segment with small distomesial spine.

Third maxilliped (Figure 25c) moderately setose, 2 distal segments comparatively wide. Ischium triangular in cross section, mesial ridge with about 20 closely placed denticles, distodorsal and distoventral margins with small process. Merus longer than ischium when measured in midline, armed with larger median and 2 smaller distal spines equidistant in distal half of ventral margin and 2 very minute spines or processes on dorsal margin. Carpus unarmed.

Anterior part of sternal segments as illustrated (Figure 25d); third thoracic sternum relatively narrow, nearly rectangular, less than 1/3 as wide as following sternum, mesially grooved, anterior margin minutely dentate with median notch; fourth thoracic sternum relatively long, anterior margin as wide as preceding sternum.

Right cheliped wanting. Left cheliped (Figure 24) 4.6 times as long as carapace, subcylindrical, spinose and marginally setose. Ischium with distoventral and lateral spines. Merus relatively long, with 6 rows of spines: 2 dorsal, 2 marginal and 2 ventral; marginal spines larger; all rows continuous onto carpus and palm, but distally reduced. Palm slightly longer than carpus, 5 times as long as wide, somewhat depressed, widening distally. Fingers shorter than palm, moderately gaping, distally touching each other with 3 intermeshing teeth, armed ventrally with 6 spines in distal 1/4 of length; each opposable margin dentate with distinct proximal process.

Walking legs (Figure 24) slender, sparsely setose; first walking leg overreaching end of merus of cheliped; merus with relatively small spines, 6 dorsal marginal and 6 ventral marginal, both distal ones prominent; carpus with 7 small dorsal marginal spines and 3 much smaller ones on dorsolateral face; propodus straight, 12.5 times as long as wide, fully twice as long as dactylus, armed with 5 dorsal marginal spinules in proximal half and 9 ventral marginal spinelets; dactylus straight in proximal 3/4, curving ventrad and spiniform in distal 1/4; 9 ventral marginal teeth much pronounced, decreasing in size toward base of segment; spinelet arising from base of each tooth. Two following legs similar to first but smaller; merus of third walking leg with another row of spinules dorsally, devoid of ventral marginal spines except distal one.

Epipod present on cheliped.

Measurements of holotype. – Length of carapace including rostrum, 8.4 mm; breadth of carapace, 5.1 mm; length of cheliped (left), 38.7 mm; of carpus, 7.9 mm; of palm, 8.5 mm; of finger, 6.8 mm; diameter of ovum, 0.3 mm.

Measurements of paratypes. – Carapace length of male, 4.8 mm; of nonovigerous female, 5.2 mm.

Variation. – The arrangements of spines on the carapace in the three specimens examined are essentially similar; the epigastric spines in both paratypes, however, are reduced to two in number, and they are considerably remote from each other and situated behind posterior rostral teeth. In the male paratype, the fingers are more strongly gaping than in the ovigerous female holotype, bearing a prominent process on the opposable margin of the movable finger.

Male gonopods are present on the first and second abdominal segments.

Habitat. – Taken in 152-165 m on bottoms of mud or mud mixed with sand.

Remarks. – The combination of the characters manifested by *Fennerogalathea* indicates that this unusual form does not fit any diagnoses of the formerly accepted genera in the Galatheidae. The new species is much like the species of *Galathea* in the general appearance of the third maxilliped, the flattish rostrum and the stocky basal antennular segment; *F. chacei* differs from that genus in having no distinct set of transverse ridges on the carapace, the eyestalk elongate rather than massive and both the cheliped and walking legs much more slender, the last indicating an approach to *Munida* in some extent. The reduced transverse ridges of the carapace and the elongate eyestalk, unlike those of both *Galathea* and *Munida*, suggest that *Fennerogalathea* approaches *Lauriea*; however, the latter is much more remote because of the specialized dactyli of the walking legs and unique uropod (Baba, 1971:52).

Type-locality. – Southeast of Tayabas Light, off southwestern Luzon (13°49'40"N, 121°40'15"E).

Distribution. – Recorded here from two localities in Tayabas Bay off southwestern Luzon, in 152-165 m.

Genus *Galathea* Fabricius, 1793

Key to Philippine Species of *Galathea* Examined

1. Epipod present at least on first pereopod 2
– Epipod absent from all pereopods 10
2. Epipods present on first through third pereopods 3
– Epipod present on first pereopod only 5
3. Rostrum comparatively long, ventrally keeled ..... **37. *G. genkai***
– Rostrum medium-sized, dorsoventrally flattened 4
4. Gastric spines present; lateral margin of carapace diverging posteriorly; gastric region with squamiform striae ..... **43. *G. subsquamata***
– No gastric spines; lateral margin of carapace convex; gastric region with uninterrupted striae ..... **33. *G. amboinensis***
5. Rostrum with 2 lateral teeth ..... **35. *G. bidens***
– Rostrum with 4 or 5 lateral teeth 6
6. Gastric spines present 7
– Gastric spines absent 9
7. Basal segment of antennule with 3 well developed terminal spines ..... **42. *G. spinosorostris***
– Basal segment of antennule with 2 well developed terminal spines, mesial terminal process reduced 8
8. Rostral lateral teeth deeply incised; carapace usually pubescent; no spine on distomesial margin of antennular basal segment ..... **40. *G. pubescens***
– Rostral lateral teeth shallowly incised; carapace indistinctly pubescent; small but distinct process on distomesial margin of antennular basal segment ..... **32. *G. albatrossae***
9. Rostrum with 4 lateral teeth ..... **44. *G. ternatensis***

– Rostrum with 5 lateral teeth ..... **39. *G. multilineata***
10. Carapace lacking transverse ridges, covered with fine setae ..... **38. *G. kuboi***
– Carapace with normal transverse ridges 11
11. Gastric spines absent ..... **41. *G. rubromaculata***
– Gastric spines present 12
12. Merus of third maxilliped with 2 ventral marginal spines, distal much smaller ..... **34. *G. balssi***
– Merus of third maxilliped with 2 well developed, subequal-sized spines on ventral margin ..... **36. *G. consobrina***

32. *Galathea albatrossae*, new species

Figure 26

Material. – Sulu Sea off western Mindanao (Sta. 5131: 3 ♂, 1 ovig. ♀, 2 ♀; Sta. 5132: 2 ovig. ♀). – Off northwestern Palawan (Sta. 5342: 1 ♂, holotype, USNM 150437). – South China Sea off southwestern Luzon (Sta. 5099: 1 ♂, 1 ovig. ♀; Sta. 5104: 2 ovig. ♀, 1 ♀).

Diagnosis. – Carapace distinctly rugose, dorsally armed with 2-8 (mostly 4) spinules on first transverse ridge, 2-5 on hepatic region. Rostrum triangular, moderately wide at base, laterally 4-toothed, incisions relatively shallow. Basal segment of antennule with 3 terminal spines, dorsolateral and lateral ones well developed, mesial one small. Merus of third maxilliped with 2 or 3 spines on ventral margin, proximal larger. Chelipeds comparatively slender. Propodi of walking legs with 2 dorsal marginal spines; dactyli strongly curving ventrad distally, ventral marginal teeth pronounced, especially ultimate. Epipod on cheliped.

Description of holotype. – Carapace (Figure 26a) excluding rostrum slightly longer than wide, dorsal surface distinctly rugose, cervical groove indistinct. First transverse ridge with 6 spinules: 4 behind base of rostrum and another near each lateral extremity. Five spinules on hepatic region. Anterolateral spine distinct. Lateral margin moderately convex; 5 medium-sized spines on branchial margin. Outer orbital angle produced, but neither pyramidal nor spiniform, as illustrated. Additional marginal spine between outer orbital angle and anterolateral spine on right side only.

Rostrum (Figure 26b) sharply triangular, barely twice as long as wide, about half as long as remaining carapace; dorsal surface slightly excavated mesially, with scaly ridges fringed with fine setae. Lateral margin with 4 teeth somewhat shallowly incised. Median process minutely crenulate laterally.

Eyes well developed, eyestalk somewhat elongate with setiferous striae.

Second, third and fourth abdominal segments provided with 4 transverse ridges, deeply grooved in front of first and third ridges.

Antennular basal segment (Figure 26c) terminally armed with 2 normally developed lateral and 1 small mesial spines; distal segment with pronounced tuft of setae. First segment of antennal peduncle (Figure 26d) sharply produced on mesial margin; second segment with small distomesial and acute distolateral spines; third

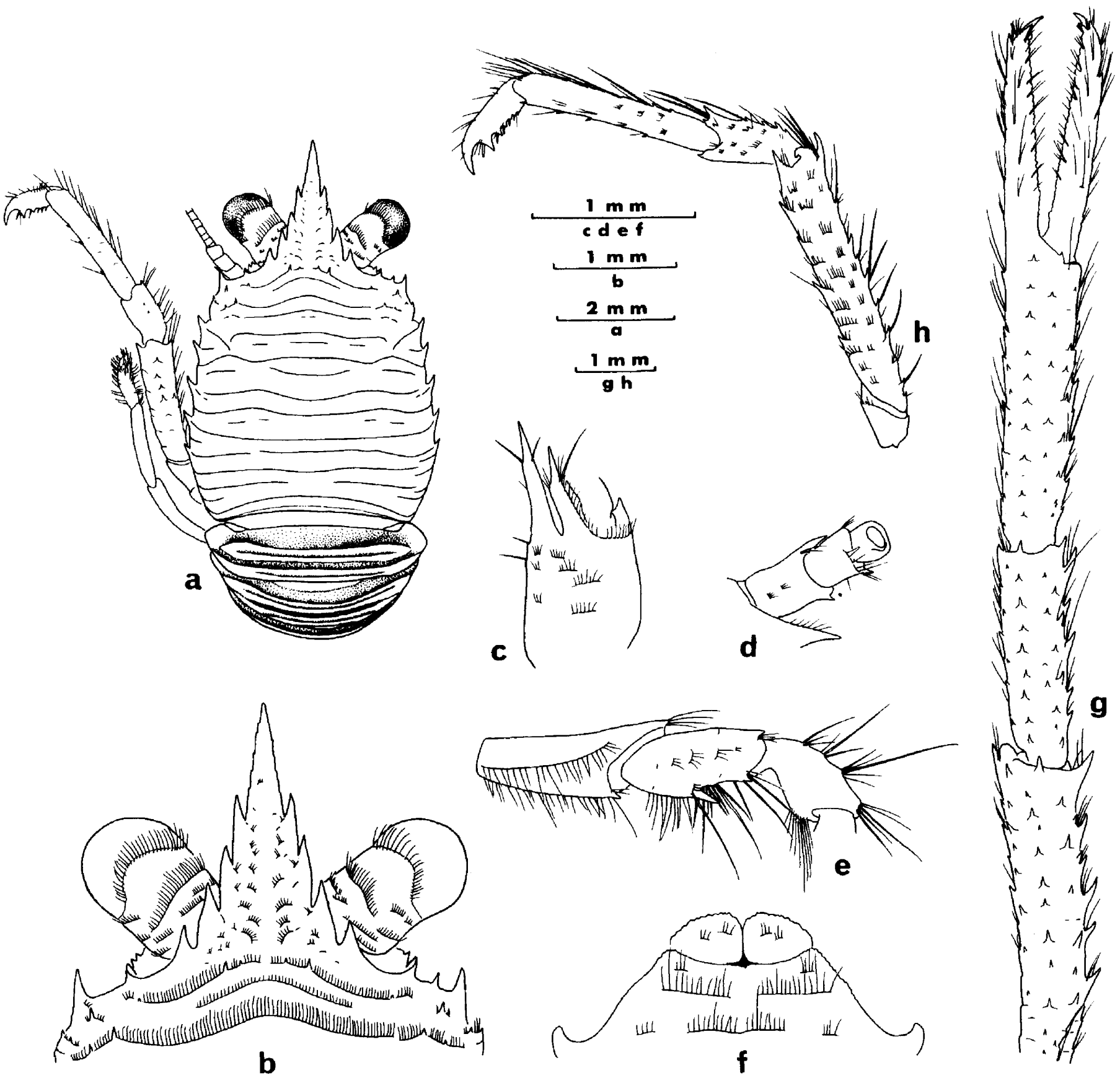

Figure 26. – *Galathea albatrossae*, new species, male holotype from "Albatross" Sta. 5342: a, dorsal view; b, anterior part of carapace; c, basal segment of right antennule; d, right antennal peduncle; e, endopod of right third maxilliped, distal 2 segments omitted; f, anterior part of sternal segments; g, left cheliped; h, left first walking leg.

segment also minutely produced on distomesial margin.

Third maxilliped (Figure 26e) moderately setose. Ischium as long as merus, distoventral margin minutely produced, mesial ridge with 21 (left) or 23 (right) closely placed denticles. Merus bispinose on ventral margin, proximal spine moderate in size, located at midlength, distal one reduced but visible; dorsal margin minutely produced distally. Carpus spineless.

Anterior sternal segments as illustrated (Figure 26f).

Right cheliped missing. Left cheliped (Figure 26g) detached from body, slender, subcylindrical, spinose and sparsely furnished with coarse setae marginally. Dorsal

and ventral spines small, arranged in longitudinal rows. Palm 4.4 times as long as wide, mesial and lateral margins almost parallel. Fingers shorter than palm, not gaping, distally spiniform and crossing, armed with small spine directly dorsal to each tip and another at distolateral margin of fixed finger; opposable margins almost straight and tuberculate.

Left third walking leg (Figure 26a) undetached from body; left first and second and right third legs present but detached. First walking leg (Figure 26h) relatively slender, provided with coarse setae on dorsal margin. Merus with 10 dorsal marginal and 5 ventral marginal spines, both terminal ones well developed. Carpus with 5 spines on dorsal margin and 4 other spinules on dorsolateral face. Propodus about twice as long as dactylus, armed with 2 dorsal marginal spinules proximally and 4 ventral marginal spinelets. Dactylus distally spiniform, strongly curving ventrad, ventral margin with 6 teeth, ultimate prominent, remainder relatively small; distinct seta arising from base of each tooth. Second walking leg very similar to first. Third walking leg much shorter than 2 preceding legs, merus armed with less numerous marginal and 4 or 5 distinct dorsal spines.

Epipod present on cheliped.

Measurements of holotype. – Length of carapace, 6.8 mm; width of carapace, 4.2 mm; length of cheliped (left), 17.7 mm; of carpus, 2.9 mm; of palm, 3.9 mm; of movable finger, 3.4 mm.

Measurements of paratypes. – Carapace lengths of males, 4.8-7.8 mm; of ovigerous females, 5.3-7.6 mm; of nonovigerous females, 5.4-7.3 mm.

Variation. – Gastric spines on the first transverse ridge vary between two and eight in number, but mostly four; the spinule near the lateral extremity distinct in the holotype is absent from all the paratypes. The number of hepatic spinules is also variable; but, two spinules, one just behind between the outer orbital angle and the anterolateral spine and another posterior to the anterolateral spine, are constantly present. The merus of the third maxilliped usually bears three ventral marginal spines, rarely two as in the holotype or four in an appendage of one of the ovigerous female paratypes.

Habitat. – Taken in 26-60 m on mud bottoms, mostly mixed with sand.

Remarks. – The new species seems to be closely related to *Galathea pubescens* Stimpson, from which it differs in that the rostrum is relatively more shallowly incised laterally, the pubescence of the carapace is much less pronounced and the antennular basal segment bears a small but distinct distomesial process. It is also near to *G. inconspicua* Henderson from off Banda Island in having several gastric spinules; however, the latter, taken in an unusual depth of 659 m, has an extremely narrow rostrum.

Type-locality. – Northwest of Endeavor Point off northwestern Palawan (10°56' 55"N, 119°17'24"E).

Distribution. – Recorded here from the Sulu Sea and the South China Sea off northwestern Palawan and off southwestern Luzon, in 26-60 m.

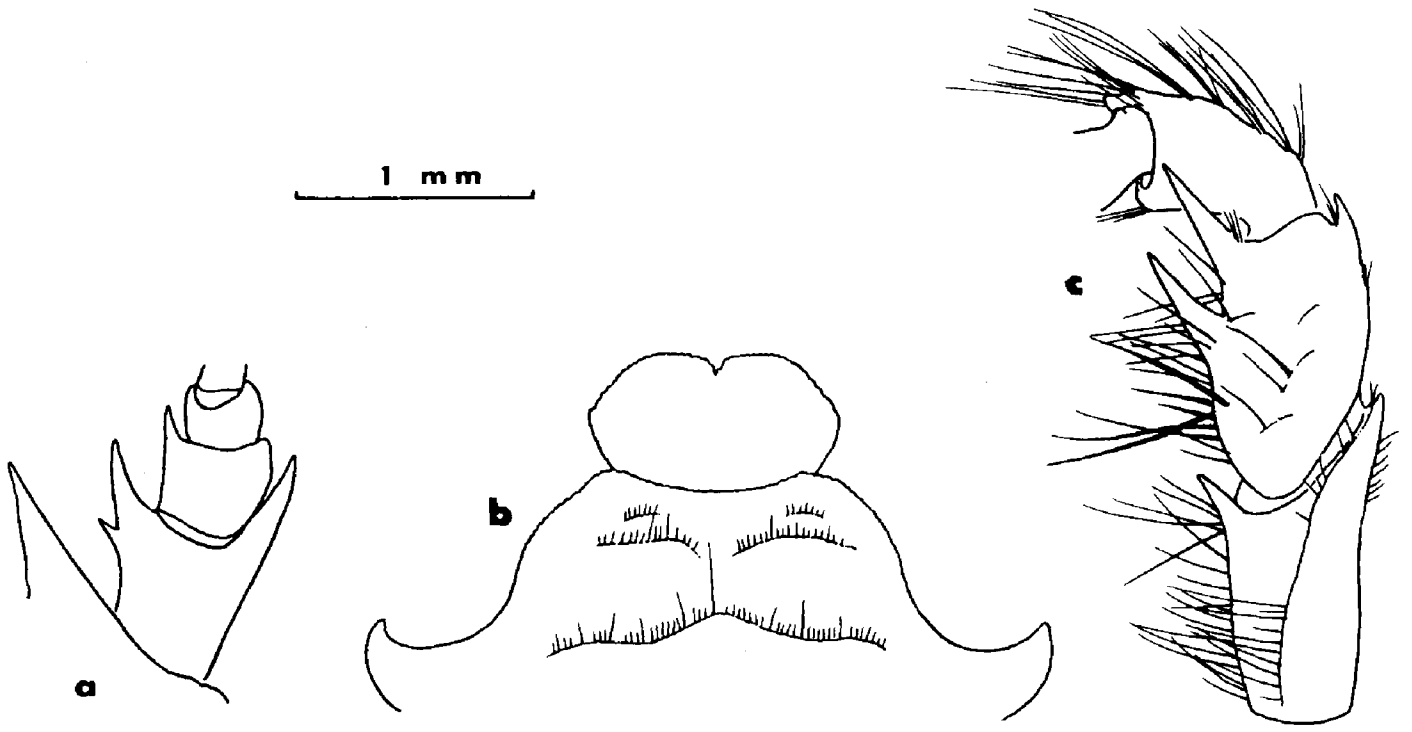

Figure 27. – *Galathea amboinensis* de Man, ovigerous female from shore of Marongas I., Sulu Archipelago: a, left antennal peduncle; b, anterior part of sternal segments; c, endopod of left third maxilliped, distal 2 segments omitted.

33. *Galathea amboinensis* De Man, 1888

Figure 27

Galathea amboinensis De Man, 1888:458, pl. 19: figs. 3, 3a. – Baba, 1979b:648.
Galathea minuta Potts, 1915:87, fig. 4B, pl. 1: fig. 6. – Haig, 1973:281.

Material. – Sulu Archipelago (No station number: south side of Marongas I., vicinity of Jolo, shore, coral head, 10 Feb 1980: 1 ♂, 1 ovig. ♀).

Measurements. – Carapace length of male, 7.7 mm; of ovigerous female, 10.3 mm.

Diagnosis. – Several dark and light longitudinal stripes on carapace and abdomen. Carapace greatly convex laterally, gastric spines absent. Rostrum wide at base with 4 acute lateral teeth. Antennular basal segment with 3 terminal spines; no tuft of setae on terminal segment. Merus of third maxilliped with 2 strong ventral and 1 small distodorsal spines. Chelipeds short, massive, depressed distally and very spinose. Epipods on cheliped and 2 following legs.

Habitat. – Taken from coral head on shore. This species has been found on *Comanthus annulatum* (now called *C. timorensis*), a common crinoid inhabiting the coral reefs of the Torres Strait (Potts, 1915:87), and on *Comanthina schlegeli* in the Moluccas (Baba, 1979b:649).

Remarks. – The rostrum of the "Albatross" material is 1.2 or 1.3 times as long as wide; this is relatively much shorter than those previously reported for the Moluccan specimens (Baba, 1979b:648). A trace of dark longitudinal stripes are still evident on the carapace and abdomen. Its pattern in the male is quite the same as that of De Man's material, but in the ovigerous female additional dark stripes are seen between the usual dark ones, extending from just behind the cervical groove to near the end of the third abdominal segment.

The antennal peduncle, anterior part of sternal segments and proximal three

segments of the endopod of the third maxilliped are as illustrated (Figure 27a, b, c).

Type-locality. – Ambon.

Distribution. – Sulu Archipelago, Moluccas and Torres Strait; on shore.

34. *Galathea balssi* Miyake and Baba, 1964

Galathea australiensis: Balss, 1913:13, fig. 13. [not *G. australiensis* Stimpson, 1858:251].
Galathea balssi Miyake and Baba, 1964:205, figs. 1, 2. – Haig, 1973:278, fig. 2a-f.

Material. – Sulu Archipelago (Sta. 5140: 4 ♂, 5 ovig. ♀). – East of Masbate (Sta. 5213: 1 ♂, 1 ovig. ♀, 1 ♀). – South China Sea off southwestern Luzon (Sta. 5117: 1 ♀).

Measurements. – Carapace lengths of males, 7.2-15.2 mm; of ovigerous females, 10.5-12.8 mm; of nonovigerous females, 8.3-13.2 mm.

Diagnosis. – Carapace armed dorsally with 2 spines on gastric region and 1 spinule near each lateral extremity of second transverse ridge. No spine between well developed anterolateral spine and end of cervical groove. Rostrum with 4 acute lateral teeth, broadly triangular, fully 1.5 times as long as wide. Basal segment of antennule with 3 terminal spines. Merus of third maxilliped medially widening, ventral margin with large proximal and small distal spines, dorsal margin minutely bispinose. Chelipeds relatively stout, furnished with coarse setae. Dactyli of walking legs with well developed teeth on ventral margin. Epipod absent from all pereopods.

Habitat. – Taken in depths of 140-216 m on bottoms of sand, or mud or mud mixed with shells.

Remarks. – Individual variations are noted in the following particulars: In one of the males from Station 5140 the usual pair of gastric spines are completely absent; in another male the right spine of the pair is missing; two of the ovigerous females from the same station, as well as the ovigerous female from Station 5231, have very minute gastric spines that are discernible only under high magnification. The tuft of setae on the terminal segment of the antennule, supposed to be systematically important (Haig, 1973:278), is distinct in *G. balssi*; however, in six specimens from Station 5140 it is much less pronounced, only consisting of several short setae. The merus of the third maxilliped usually bears two ventral marginal spines, the distal being much the smaller; in two of the 13 specimens examined an additional spine is present between them; in another two specimens the distal spine is reduced and barely discernible.

The specimen collected off the South Arabian coast by the "John Murray" Expedition and identified by Tirmizi (1966:186) as *Galathea whiteleggei,* but supposed by Haig (1973:278) to be closer to *G. balssi*, seems to differ from this species in additional details of the merus of the third maxilliped; in addition to the differences noted by Haig, this segment in *G. balssi* is relatively much wider at midlength and almost unexceptionally narrowing toward the distal end. Thus, *G. whiteleggei* of Tirmizi seems to approach *G. albatrossae* described in this paper, not only in this character but also in having spinules on the first transverse ridge.

Type-locality. – East China Sea (27°01.2'N, 122°56'E).

Distribution. – Known from Japan, East China Sea, South China Sea off southwestern Luzon, east of Masbate, Sulu Archipelago and Queensland, in depths of 31-

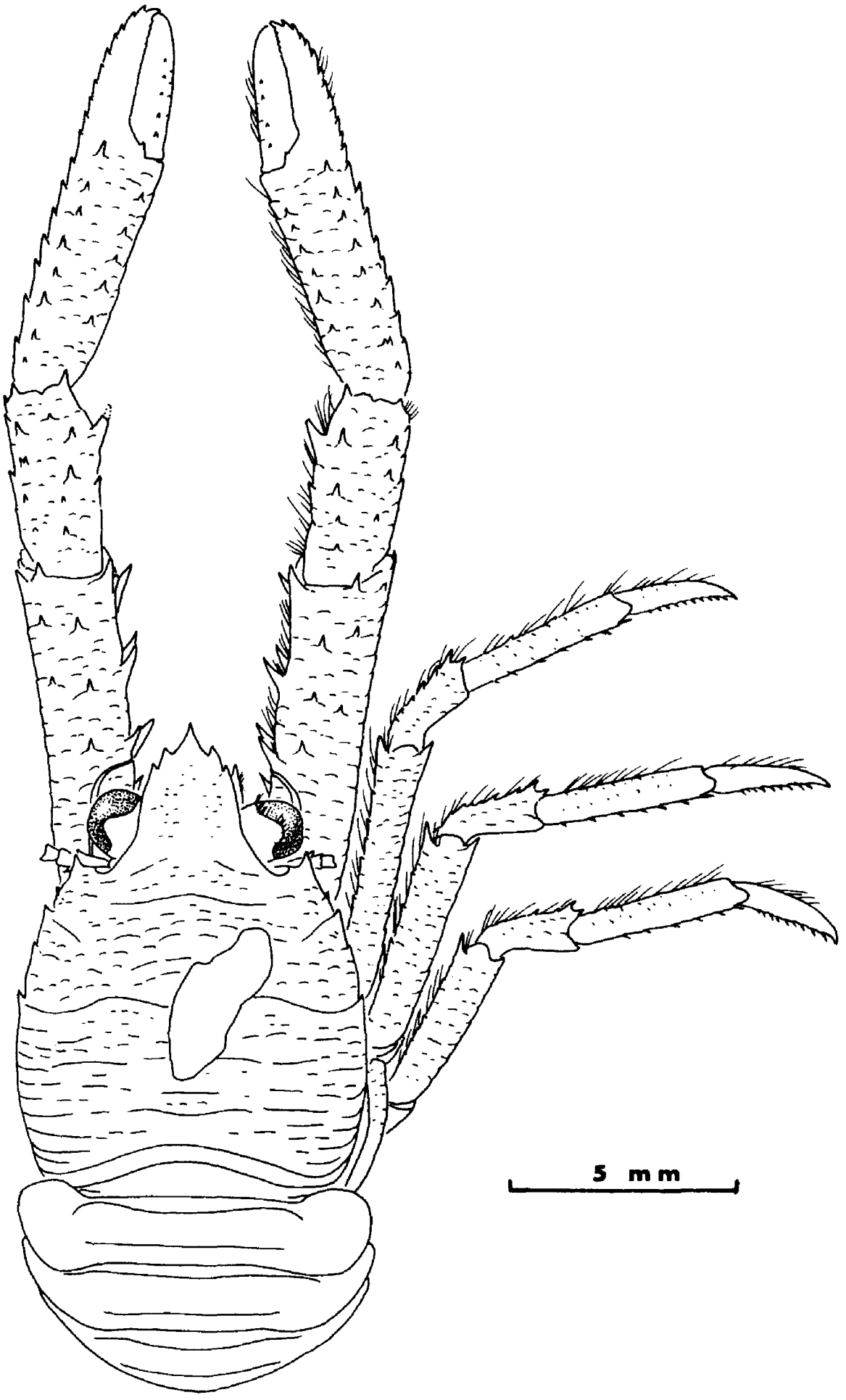

Figure 28. – *Galathea bidens*, new species, ovigerous female holotype from "Albatross" Sta. 5411, dorsal view.

216 m. There is a lot of two specimens taken off Oki-Shima, Korea Strait in 108 m, in the collection of the National Museum of Natural History, Smithsonian Institution.

35. *Galathea bidens*, new species

Figures 28, 29

Material. – Between Cebu and Bohol (Sta. 5411: 1 ovig. ♀, holotype, USNM 150326).

Diagnosis. – Transverse ridges of carapace mostly interrupted and squamiform, but median and posterior ridges uninterrupted; no gastric spines; lateral margin convex with 4 rather reduced spines. Rostrum wide at base, subtruncate, with 2 distolateral teeth on each side. Basal segment of antennule with 2 well developed terminal spines, distomesial margin indistinctly produced. Third thoracic sternum narrow, medially grooved. Telson divided into 8 distinct plates. Chelipeds with epipod.

Description of holotype. – Carapace (Figure 28) excluding rostrum wider than long, dorsal surface without coarse setae moderately convex. Gastric and cardiac regions partly broken. Transverse ridges mostly interrupted and almost squamiform, but median and posterior ridges uninterrupted and relatively elevated. Gastric spines absent. Cervical groove indistinct. Lateral margin convex with medium-sized anterolateral and 3 small anterior branchial spines; another minute spine also present slightly ventral to margin between anterolateral spine and end of cervical groove. Outer orbital angle rounded.

Rostrum (Figure 28) wide at base, subtruncate, dorsally flattish; lateral margin with 2 small distal teeth.

Eyestalk relatively wide but short, cornea not dilated distally.

Basal segment of antennule (Figure 29a) with 2 terminal spines, dorsolateral one stouter and setiferous dorsally, distomesial margin slightly produced; distal segment with tuft of pronounced setae. First segment of antennal peduncle (Figure 29b) produced at distomesial margin; second segment with small distomesial and strong distolateral spines; third segment unarmed.

Ischium of third maxilliped (Figure 29c) produced on ventral and distodorsal margins; mesial ridge with 17 closely placed denticles. Merus slightly longer than ischium when measured at midline; ventral margin with 2 large, subequal-sized spines and 1 rudimentary spinule; dorsal margin with well developed terminal spine. Few eminences on carpal dorsal margin.

Sternum of third thoracic somite (Figure 29d) nearly as long as wide, deeply grooved medially, anterior margin tuberculate and deeply incised medially.

Second, third and fourth abdominal segments with 2 transverse ridges each. Telson as illustrated (Figure 29f); subdivisions distinct as in most *Munidopsis* species.

Chelipeds (Figure 28) similar, about twice as long as carapace, subcylindrical proximally, more or less depressed distally, squamate dorsally and ventrally, spinose moderately, furnished with short setae on entire mesial margin. Merus with 4 rows of spines: 2 dorsal rows of smaller spines, 1 mesial marginal and 1 ventral, both of prominent spines; continuous distally onto palm. Three mesial marginal spines on carpus, median prominent. Palm moderately depressed, 3 times as long as wide; mesial margin of chela unarmed, lateral margin spinous along entire length. Fingers not gaping, distally rounded, touching each other with few intermeshing teeth, opposable margins straight, minutely tuberculate; several spinules on dorsal surface of movable finger.

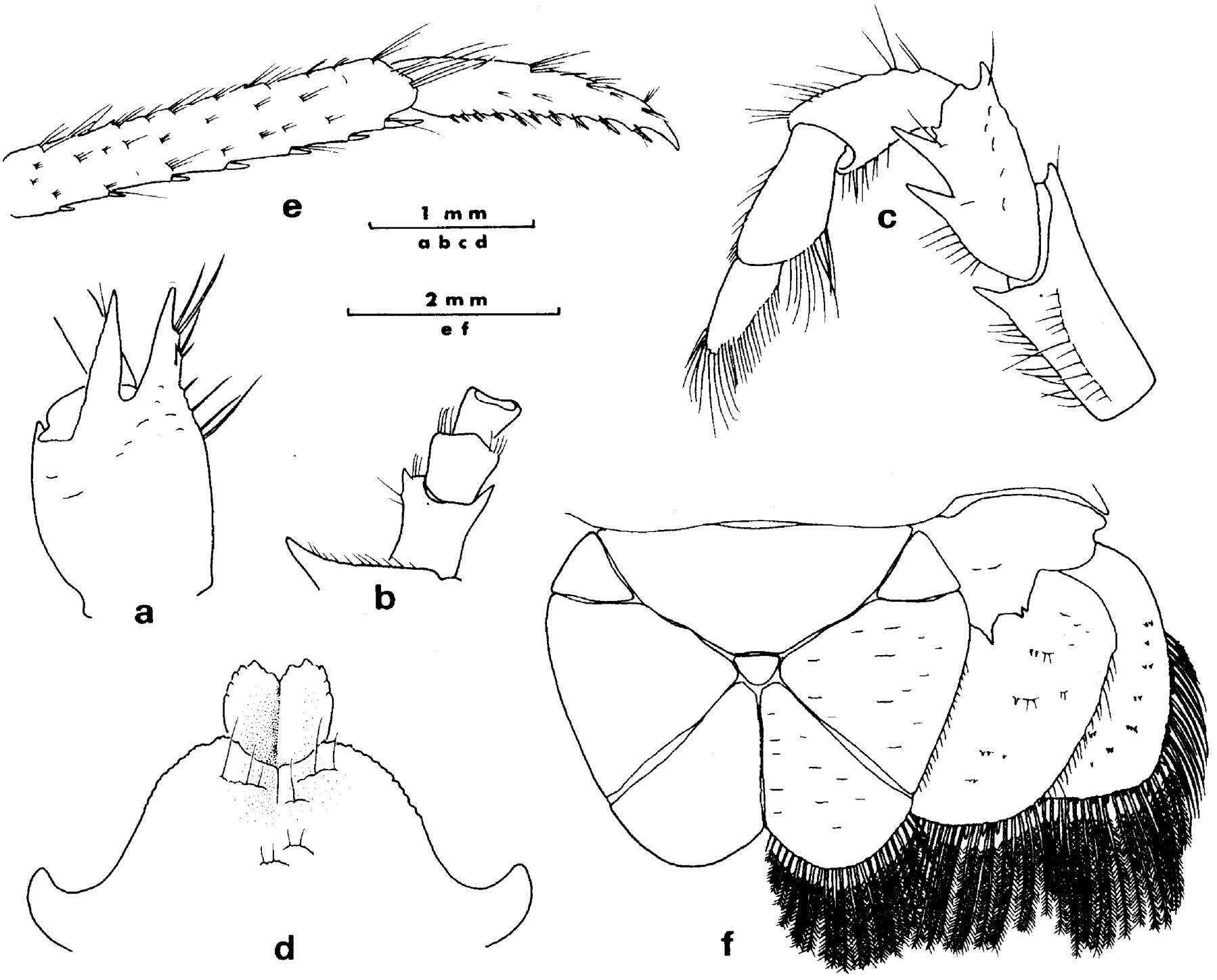

Figure 29. – *Galathea bidens*, new species, ovigerous female holotype from "Albatross" Sta. 5411: a, basal segment of left antennule; b, left antennal peduncle; c, endopod of left third maxilliped; d, anterior part of sternal segments; e, distal segments of right first walking leg; f, telson and right uropod.

Walking legs (Figure 28) subcylindrical, squamate on dorsolateral face, dorsal margin setiferous. First 2 legs similar. Meri with 8 dorsal marginal and 1 disto-ventral marginal spines. Carpi with 7 small dorsal marginal spines. Propodi (Figure 29e) minutely tuberculate on dorsal margin, provided with 7 movable spinelets on ventral margin. Dactyli 2/3 as long as propodi, feebly curving ventrad distally, ventral margin weakly serrate, with about 10 coarse setae. Third leg shorter than preceding 2 legs; merus unarmed but both terminal marginal spines distinct.

Epipod present on cheliped.

Measurements of holotype. – Length of carapace including rostrum, 10.3 mm; width of carapace, 7.3 mm; length of cheliped (right), 22.6 mm; length of palm, 6.0 mm; of movable finger, 3.4 mm; diameter of ovum, 0.4 mm.

Habitat. – Taken in 265 m on mud bottom.

Remarks. – Unusual characteristics manifested by this new species seem to be of more than specific importance, as mentioned below: 1) The lateral margin of the

carapace behind the cervical groove bears only three spines, instead of five as in other species of *Galathea*; 2) the rostrum bears two lateral teeth on the distal portion; in typical *Galathea*, it bears four, only excepting *Galathea multilineata* in which it is five-toothed; 3) the third thoracic sternum is elongate, nearly as long as wide; almost unexceptionally it is wider than long in typical *Galathea*; and 4) the telson is subdivided into distinct plates as in the deep-sea *Munidopsis*. It is apparent that this species belongs to the Galatheinae, for the exopod of the first maxilliped bears a distinct lash. Most of these characters seem to be constant; however, it is deemed advisable to place it in *Galathea* for the time being until more material is discovered.

Type-locality. – Southwest of Lauis Point Light in Bohol Strait (10°10'30"N, 123°51'15"E).

Distribution. – Known from the above-mentioned, unique holotype taken between Cebu and Bohol in 265 m.

36. *Galathea consobrina* De Man, 1902

Figure 30

Galathea consobrina De Man, 1902:720, pl. 23: figs. 41, 41a-f.

Material. – Sulu Archipelago (Sta. 5141: 2 ♂; Sta. 5147: 1 ovig. ♀). – Davao Gulf off southeastern Mindanao (Sta. 5249: 1 ♂; Sta. 5251: 1 ♂; Sta. 5254: 2 ♂, 4 ovig. ♀). – Sibuyan Sea (Sta. 5179: 1 ovig. ♀, 1 ♀).

Measurements. – Carapace lengths of males, 4.2-7.0 mm; of ovigerous females, 4.9-8.3 mm; of nonovigerous female, 4.8 mm.

Diagnosis. – Carapace dorsally armed with paired gastric spines and 3 hepatic spinules; most of transverse ridges uninterrupted; lateral margin with 6 rather acute spines. Rostrum sharply triangular, 4 lateral teeth deeply incised. Basal segment of antennule with 3 terminal spines, terminal segment with long setae without tufting. Merus of third maxilliped with 2 stout spines on ventral margin. Chelipeds relatively massive. Epipods absent from cheliped and walking legs.

Habitat. – Taken in 37-68 m on bottoms of coral or coral sand sometimes mixed with shells.

Remarks. – The present material agrees well with the description of *Galathea consobrina* De Man, only excepting that several coarse setae behind the second transverse ridge of the carapace are wanting. The absence of epipods from all pereopods in the holotype from Ternate was confirmed by Michael Türkay (Baba, 1979b:653).

The three hepatic spinules are constantly present in all the specimens examined. The merus of the third maxilliped is mostly bispinose on the dorsal margin, but in some the proximal spine is obsolete and rarely both are barely discernible. The anterior margin of the third thoracic sternum is also variably notched medially; it is deeply notched in most of the specimens, shallowly notched in three specimens, and lacking a median notch in a male from Station 5254.

The record of a female specimen from Sorong Doom [West Irian], doubtfully referred to *G. consobrina* by Gordon (1935:5), is tentatively removed from the synonymy, because two of the three hepatic spinules are absent in her figure, and, be-

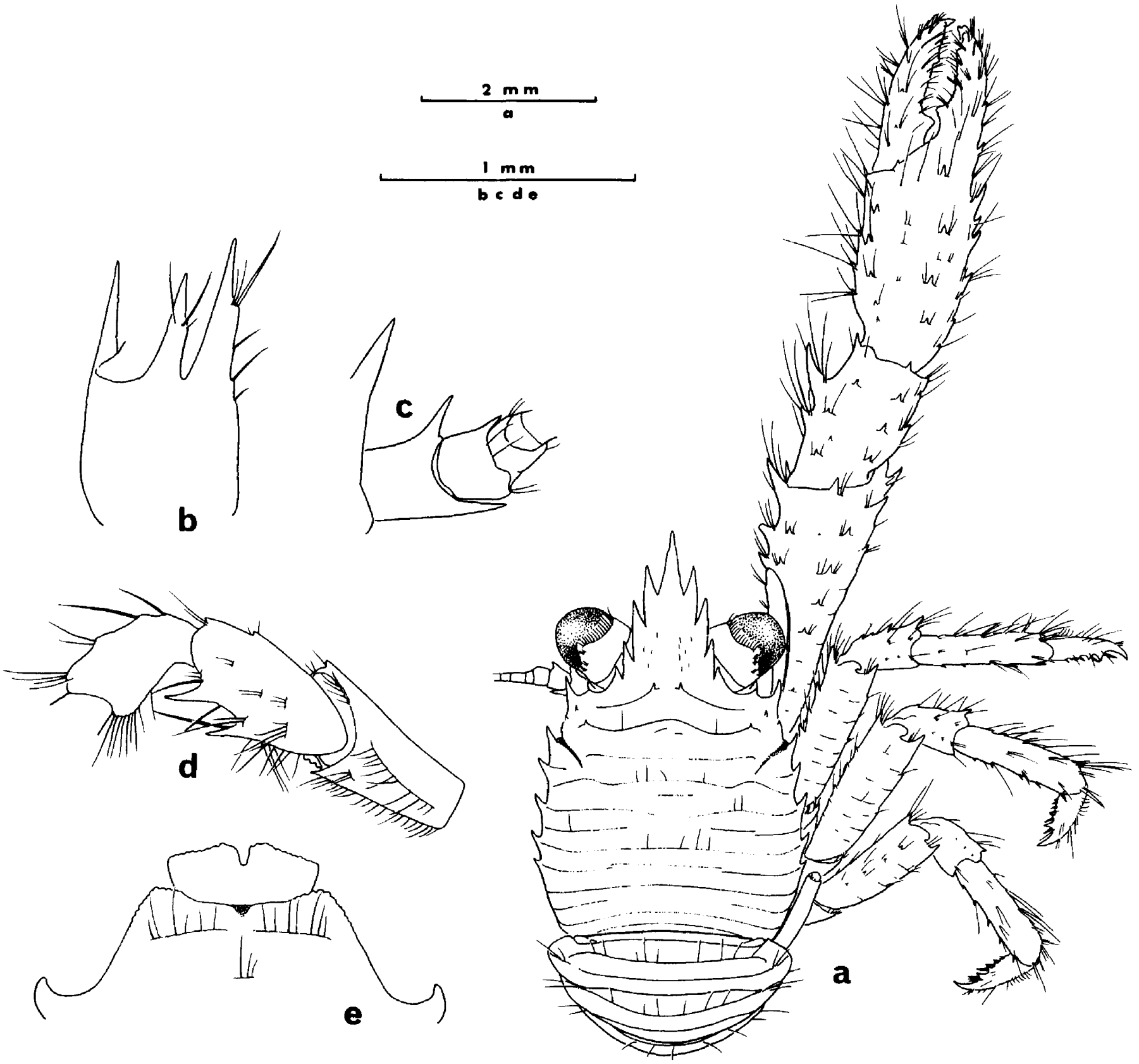

Figure 30. – *Galathea consobrina* De Man, male from "Albatross" Sta. 5141: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of left third maxilliped, distal 2 segments omitted; e, anterior part of sternal segments.

cause the presence or absence of epipods on the pereopods, one of the useful specific characters, is not mentioned.

Type-locality. – Ternate.

Distribution. – Known from the Moluccas and the Philippines in Davao Gulf, Sulu Archipelago and Sibuyan Sea; in 37-68 m.

37. *Galathea genkai* Miyake and Baba, 1964

Galathea genkai Miyake and Baba, 1964:208, figs. 3, 4. – Lewinsohn, 1969:120, fig. 23. – Haig, 1974:447.

Material. – Sibuyan Sea (Sta. 5179: 1 ♂).

Measurements. – Length of carapace, 12.3 mm.

Diagnosis. – Carapace indistinctly striated especially in anterior half, with scattered spinules on hepatic and anterior branchial regions; no gastric spines; lateral margin with 8-10 spines. Rostrum extremely elongate, 4-toothed laterally, strongly keeled ventrally. Merus of third maxilliped with 2 strong spines each on dorsal and ventral margins. Chelipeds spinose, depressed distally; merus and carpus with well developed, depressed spine on distomesial margin. Walking legs also spinose, propodi with several spines on dorsal margin and dorsolateral face. Epipods present on cheliped and following 2 walking legs.

Habitat. – Taken in 68 m on bottom of hard sand. The Red Sea material was found on crinoids, *Decametra chadwicki* and *Heterometra savignii* (see Lewinsohn, 1969:123).

Type-locality. – North coast of Kyushu, Japan.

Distribution. – Known from the Red Sea, Western Australia, Sibuyan Sea in the Philippines and north coast of Kyushu, Japan in 10-68 m.

38. *Galathea kuboi* Miyake and Baba, 1967

Galathea kuboi Miyake and Baba, 1967a:205, fig. 2.

Material. – Off northern Mindanao (Sta. 5501: 1 ovig. ♀). – South China Sea off southwestern Luzon (Sta. 5116: 1 ♂).

Measurements. – Carapace length of male, 9.7 mm; of ovigerous female, 11.0 mm.

Diagnosis. – Carapace covered with fine setae, lacking distinct transverse ridges, anterior gastric region with transverse row of several tiny spines. Rostrum dorsally flattish with 4 acute lateral teeth. Basal segment of antennule with 3 terminal spines. Propodi of walking legs with several dorsal marginal spines; dactyli relatively short, ending in acute spine, ventral margin with 3 prominent processes. Epipod absent from cheliped and walking legs.

Habitat. – Taken in 366-392 m on bottom of fine sand and gray mud.

Remarks. – This species has been described from the incomplete male holotype, in which all the pereopods are missing. In the present material, the walking legs are complete although detached from the body. They may be described as follows: First walking leg larger than second, thickly setose; merus squamiferous, armed with 13 rather acute dorsal marginal spines decreasing in size proximally, and 2 distoventral marginal spines; carpus with 6 spines on dorsal margin and 4 spinules on dorsolateral face; propodus twice as long as dactylus, dorsal margin with 5 spines in proximal half, ventral margin with 5 movable spinelets; dactylus strongly curving ventrad distally, ventral margin with 3 rather prominent spines. Second walking leg feebly spinose, dactylus with 2 ventral marginal spines. Third walking leg shorter than second; merus much shorter, with less numerous dorsal marginal spines of small size and about 8 spinules on dorsolateral face; carpus and dactylus similar to those of second leg, but propodus with less numerous dorsal marginal

spines.

Type-locality. – Off Daiozaki, Mie Prefecture, Japan.

Distribution. – Previously known from the unique male holotype from off the Pacific coast of Honshu, Japan.

39. *Galathea multilineata* Balss, 1913

Galathea multilineata Balss, 1913:9, figs. 6-8. – Yokoya, 1933:56. – Miyake and Baba, 1967c:231, fig. 4.

Material. – Off eastern Mindanao (Sta. 5241: 1 ♂; Sta. 5244: 1 ovig. ♀). – Sulu Archipelago (Sta. 5545: 1 ♂). – East coast of Mindoro (Sta. 5121: 1 ovig. ♀). – South China Sea off southwestern Luzon (Sta. 5266: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 8.6-9.8 mm; of ovigerous females, 7.3-9.9 mm.

Diagnosis. – Carapace lacking gastric spines, bearing numerous transverse ridges. Lateral margin with 9 small spines. Rostrum broadly triangular and relatively elongate with 5 shallowly incised lateral teeth. Two terminal spines on basal segment of antennule. Merus of third maxilliped with 2 ventral marginal spines of moderate-size and 2 small dorsal marginal spines. Chelipeds and walking legs very setose. Epipod on cheliped.

Habitat. – Taken in 198-393 m on muddy bottoms.

Remarks. – This species is characterized by a relatively broad rostrum with five shallowly incised lateral teeth. No additional characters of significance were noted.

Type-locality. – Sagami Bay, Japan.

Distribution. – Known from the Philippines as herein recorded, Japanese waters and the East China Sea, in 120-393 m.

40. *Galathea pubescens* Stimpson, 1858

Galathea pubescens Stimpson, 1858:252; 1907:233. – Balss, 1913:11, figs. 11, 12. – Yokoya, 1933:57. – Miyake, 1947:732, fig. 2117; 1965:634, fig. 1043. – Tirmizi, 1966:187. – Haig, 1974:447. – Miyake, 1982:145, pl. 49: fig. 3.

Material. – Off northern Mindanao (Sta. 5508: 1 ♂). – Between Cebu and Bohol (Sta. 5417: 1♂). – Between Cebu and Leyte (Sta. 5409: 1 ovig. ♀). – East coast of Mindoro (Sta. 5121: 2 ♂; Sta. 5122: 1♂). – South China Sea off southwestern Luzon (Sta. 5111: 1 ♂; Sta. 5117: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 4.1-10.6 mm; of ovigerous female, 11.1 mm (rostrum broken in other specimen).

Diagnosis. – Carapace pubescent, usually with dorsal spinules in anterior half; lateral margin convex with 6 or 7 spines. Rostrum also pubescent, sharply incised laterally with 4 acute teeth. Basal segment of antennule with 2 terminal spines, distomesial margin unarmed. Merus of third maxilliped with 3 ventral marginal and 1 or 2 dorsal marginal spines, ischium greatly produced on distodorsal margin. Cheliped with epipod.

Habitat. – Taken in 198-494 m, usually on green mud bottoms.

Remarks. – This species is well defined and exquisitely illustrated by Balss (1913:11, figs. 11, 12). The spination and pubescence of the dorsal surface of the carapace are nearly as illustrated by Balss in five of the eight specimens examined. In the remaining specimens, however, small spines are present only on the entire length of the first transverse ridge and near the lateral extremity of the following ridge, in which specimens the hairs or setae covering the body tend to be less numerous and the transverse ridges much more weakly elevated. The merus of the third maxilliped is also as illustrated by Balss in five of the 16 appendages of eight specimens; the median spine of the ventral marginals is reduced in two appendages, as also is the distal one in three appendages; in the remaining six appendages the distal two are reduced or barely discernible while the proximal is greatly developed. Above-mentioned variations are also recognizable in 76 specimens collected from the East China Sea and deposited in the Zoological Laboratory, Kyushu University, Fukuoka (unpublished). A color illustration has been published by Miyake (1982: pl. 49: fig. 3).

Type-locality. – The original description is based upon the material from two different localities, on the east coast of Amami-oshima of the Ryukyus and off Hakodate, Hokkaido, Japan. The type material is almost certainly lost. Although this species is rather common in Japanese waters and the East China Sea, topotypic specimens have not been found.

Distribution. – Known from Japanese waters, East China Sea, Philippines, Western Australia and Zanzibar; in 40-494 m.

41. *Galathea rubromaculata* Miyake and Baba, 1967

Galathea rubromaculata Miyake and Baba, 1967c:236, figs. 7, 8.

Material. – Off northern Mindanao (Sta. 5519: 1 ovig. ♀).

Measurements. – Carapace length of ovigerous female, 9.5 mm.

Diagnosis. – Red blotches bilaterally arranged on carapace and abdominal segments. Carapace weakly striated, lacking gastric spines, armed with 6 lateral marginals. Rostrum broadly triangular with 4 shallowly incised lateral teeth. Basal segment of antennule with 3 terminal spines. Merus of third maxilliped with 2 stout ventral marginal and 2 small dorsal marginal spines. Chelipeds rather short and massive. Epipods absent from cheliped and walking legs.

Habitat. – Taken on bottom of globigerina and sand in 333 m.

Remarks. – Red blotches on the carapace and abdomen, characteristic of this species, remain without fading in spirit for more than 60 years. They are somewhat fewer than in the holotype; present are the anterior gastric, postcervical, anterior branchial, and second abdominal segmental, all bilaterally arranged, and a single smaller blotch on the posteromesial portion of the carapace, and two larger ones on the pterygostomial flap.

Type-locality. – East China Sea (32°24.8'N, 129°24.7'E).

Distribution. – Previously known from the male holotype from the East China Sea off the west coast of Kyushu, Japan in 173 m.

42. *Galathea spinosorostris* Dana, 1852

Galathea spinoso-rostris Dana, 1852:480; 1855: pl. 30: figs. 9a-9c.
Galathea spinosorostris: Laurie, 1926:124. – Tirmizi, 1966:181, figs. 4B, 5.
Galathea longimana: Lewinsohn, 1969:107, fig. 20.
Galathea algae Baba, 1969a:11, fig. 2; 1977a:248; 1979b:646; 1982a:59.

Material. – South China Sea off southwestern Luzon (Sta. 5109: 1 ♂). – Off northern Luzon (Sta. 5325: 1 ♂).

Measurements. – Carapace lengths of males, 3.9 and 5.1 mm.

Diagnosis. – Carapace dorsally armed with 2 distinct gastric and 3 minute hepatic spines, anterior branchial striation subsquamate. Outer orbital angle unarmed, but spine present just outside of it. Rostrum broadly triangular, flattish, bearing 4 deeply incised lateral teeth. Basal segment of antennule with 3 terminal spines, distal segment lacking tuft of setae. Merus of third maxilliped with 2 large ventral marginal and 2-3 small dorsal marginal spines. Chelipeds strongly spinose. Propodi of walking legs with several spines on proximal part of dorsal margin. Epipod present on cheliped only.

Habitat. – Taken in 22-410 m on bottom of coral or mud.

Remarks. – None of the published accounts of *Galathea spinosorostris* seem sufficient to establish the identity of this species. Examination of topotypic specimens (one male from Waikiki Reef, Hawaii in the collection of the Smithsonian Institution; nine males, five ovigerous females, one female from Honolulu in 18-73 m in the collection of the University of Copenhagen) disclosed that *G. spinosorostris* and *G. algae* are identical.

Laurie (1926:124) synonymized *G. spinulifer* of Southwell (1906), not *Munida spinulifer* Miers (1884), with *G. spinosorostris*, on examination of the specimens from several localities in the western Indian Ocean. Tirmizi (1966:181) reported it from Zanzibar and stated that her material agrees with the descriptive remarks of Laurie as well as Southwell in the carapacial striation but differs in having gastric spines that are absent in Southwell's illustration and that are not mentioned by Laurie. In all probability Laurie is correct in identifying those specimens, because of mentioning the characteristic striation of the carapace and the presence of a tiny spine on the anterior part of the lateral margin. Tirmizi's specimen is much like those of the "Snellius" which I have examined previously (Baba, 1977a:248). Possibly they are identical, although the presence of epipods only on the cheliped is not mentioned by Tirmizi.

Johnson (1970:6) reported *G. spinosorostris* from Singapore, but his illustration and descriptive remarks clearly indicate that it belongs to a different species, especially for having uninterrupted striae on the carapace.

It seems not unlikely that *G. spinosorostris* and *G. longimana* Paulson are conspecific, but specimens as originally characterized (Paulson, 1875:94) especially in regard to the narrow rostrum and very long cheliped have not been found in recent collections.

Type-locality. – Hawaiian Islands.

Distribution. – This species seems to be one of the most widespread species in the Indo-West Pacific. Known from the Red Sea, Zanzibar, Providence, Amirante, Sey-

chelles, Coëtivy, Saya de Malha Bank, Cargados Carajos, Chagos, Timor, Moluccas, Obi Island, Ternate, off northern and southwestern Luzon, Palau Islands, Japan and Hawaiian Islands; found commonly on coral reefs in intertidal waters, down to 410 m.

43. *Galathea subsquamata* Stimpson, 1858

Galathea subsquamata Stimpson, 1858:252; 1907:233. – Henderson, 1888:118, pl. 12: fig. 4. – Yokoya, 1933:58. – Miyake, 1938:40, figs. 3A, 3B. – Baba, 1977a:247; 1979a:525; 1979b:645.
Galathea aculeata Haswell, 1882a:761; 1882b:162. – Grant and McCulloch, 1906:48, pl. 4: figs. 4, 4a. – McNeill, 1968:33. – Haig, 1973:280; 1974:447.

Material. – Sulu Archipelago (Sta. 5137: 1 ♂, 1 ovig. ♀; Sta. 5141: 2 ♂, 3 ovig. ♀, 1 ♀; Sta. 5144: 1 ♂, 2 ovig. ♀; Sta. 5145: 5 ♂, 1 ovig. ♀, 2 ♀; Sta. 5147: 1 ♂; Sta. 5160: 3 ♂, 2 ovig. ♀; Sta. 5174: 4 ovig. ♀; no station number: south side of Marongas I., vicinity of Jolo, shore, coral head, 10 Feb 1908: 2 ♂, 11 ovig. ♀). – Between Burias and Luzon (Sta. 5218: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 3.4-8.1 mm; of ovigerous females, 4.8-9.5 mm; of nonovigerous females, 5.7-8.1 mm.

Diagnosis. – Carapace with squamiform striae on gastric region, armed with 2 gastric spines and several other spinules in anterior half; lateral margin diverging posteriorly with 7 acute spines. Rostrum with 4 acute, deeply incised lateral teeth. Antennular basal segment with 3 terminal spines; tuft of long setae on distal margin of terminal segment. Propodi of walking legs with several dorsal marginal spines; dactyli distally curving ventrad, ending in sharp spine, ultimate of ventral marginal processes very prominent. Epipods on cheliped and following 2 walking legs.

Habitat. – Taken from coral head on shore to a depth of 53 m on sand or coral sand bottoms, occasionally mixed with shells.

Remarks. – The label of one of the three lots from Station 5145 indicates that two male and one nonovigerous female specimens were taken from the interior of the pearl oyster. This species is most frequently taken from branching corals or in crevices of coral rocks, and association with a bivalve has never been recorded for a galatheid crustacean. In this respect Fenner A. Chace, Jr. offered me helpful suggestions: "One of the problems that plagued me in regard to the "Albatross" Philippine collections arose from label notes that obviously refer to one animal in a mixed lot but that may have been copied onto other labels when the primary lot was split. One lot of the most common alpheid in the collections – a new genus – contains a label indicating that the specimens came "from Venus basket," yet no alpheids to my knowledge are known to be associated with *Euplectella*. I have been unable, however, to find any records in our collections of either pontoniines or pinnotherids from Station 5145, so there is no proof that the label noting association with a pearl oyster was intended for a species other than the galatheid. (Personal communication)."

Type-locality. – Amami-oshima of the Ryukyu Islands.

Distribution. – Known from Japanese waters from Inubo-zaki southward to the Ryukyus, Palau Islands, Philippines, Moluccas, Northern Territory, Queensland,

Western Australia and New Caledonia; from shore to a depth of 238 m.

44. *Galathea ternatensis* De Man, 1902

Galathea orientalis var. *ternatensis* De Man, 1902:714.
Galathea ternatensis Melin, 1939:67, figs. 39-42.
Galathea ternatensis: Miyake and Baba, 1963:405, figs. 1, 2. – Haig, 1974:447. – Baba, 1977a:245; 1979a:525.

Material. – Sulu Archipelago (Sta. 5146: 2 ♂; Sta. 5157: 1 ♂, 1 ovig. ♀; Sta. 5158: 3 ♂, 2 ovig. ♀; Sta. 5159: 2 ♂; Sta. 5160: 7 ♂, 12 ovig. ♀). – Sibuyan Sea north of Cebu (Sta. 5400: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 4.2-7.0 mm; of ovigerous females, 4.5-6.3 mm.

Diagnosis. – No gastric spine. A spinule, in most cases, near lateral extremity of second stria. A small but distinct spine between anterolateral spine and above-mentioned spinule. Coarse setae sparsely distributed on carapace. Rostrum about twice as long as broad; 4 rather shallowly separated lateral teeth. Basal segment of antennule with 3 distal spines; terminal segment with tuft of setae distally. Merus of third maxilliped with 3 ventral marginal and 1 or 2 dorsal marginal spines. Anterior margin of third thoracic sternum moderately produced with median notch. Distal 2 claws of dactyli of walking legs prominent. Epipod on cheliped only (From Baba, 1977a:245).

Habitat. – Taken in 18-46 m on sandy bottoms, occasionally mixed with shells.

Remarks. – No additional characters of significance were noted.

Type-locality. – Ternate.

Distribution. – Previously recorded from Providence Island, the Maldives, Western Australia, New Caledonia, Ternate, north of New Guinea, the Bonin Islands and Japan; in depths between 20 and 210 m.

Genus *Lauriea* Baba, 1971

45. *Lauriea gardineri* (Laurie, 1926)

Galathea gardineri Laurie, 1926:131, pl. 9: figs. 1-5. – Tirmizi, 1966:177, fig. 2. – Lewinsohn, 1969:112. – Haig, 1974:447.
Galathea biunguiculata Miyake, 1953:199, figs. 1, 2.
Lauriea gardineri: Baba, 1971:53, fig. 1a; 1977a:251.

Material. – Sulu Archipelago (Sta. 5145: 1 ♂; Sta. 5147: 1 ovig. ♀; no station number: south side of Marongas I., vicinity of Jolo, shore, coral head, 10 Feb 1908: 1 ovig. ♀, 1 ♀).

Measurements. – Carapace length of male, 3.8 mm; of ovigerous females, 4.9 and 5.3 mm; of nonovigerous female, 5.8 mm; diameters of ova, 0.8-1.0 mm.

Diagnosis. – Body covered with relatively long coarse setae. Carapace devoid of

distinct striae, dorsally armed with spinules, laterally with rather acute spines. Eyes somewhat elongate, cornea not dilated distally. Rostrum sharply triangular, flattish, with 4 lateral teeth. Tail fan relatively wide, especially endopod of uropod. Basal segment of antennule with 3 terminal spines, mesial terminal smaller. Sternum of third thoracic somite much wider, medially produced on anterior margin. Third maxilliped relatively small in size, merus with 2 ventral marginal spines. Chelipeds short, spinose and setose. Walking legs also short, setose, dactyli strongly biunguiculate.

Habitat. – Taken from coral head on shore to a depth of 42 m on bottom of coral sand and shells.

Remarks. – The nonovigerous female from Marongas Island is infested by rhizocephalan parasites. The egg-size, 0.8-1.0 mm in diameter, is greater than those of most of the shallow water inhabitants of the Galatheidae; in *Galathea* and *Munida*, it is 0.5-0.6 mm.

Type-locality. – Seychelles.

Distribution. – Known from the Red Sea, Providence Island, Seychelles, Sulu Archipelago, Kepulauan Talaud, Western Australia, Palau Islands and Japan, in depths between 6 and 106 m.

Genus *Munida* Leach, 1820

The aberrant group of *Munida* centered around *M. scabra* (see Baba, 1981a:291) is shifted to a distinct genus, *Paramunida*, in this paper.

Approximately 95 species of *Munida*, including those newly described in this paper, are known in the world; 42 from the Indo-West Pacific, 10 from the eastern Pacific, seven from the southern Ocean and 38 species and two subspecies from the Atlantic. A key to the 30 western Atlantic species is provided by Chace (1942:32). Since his publication two species and two subspecies have been described in the Atlantic (Zariquiey Alvalez, 1952; Miyake and Baba, 1970; Mayo, 1972). From a distributional viewpoint, a key to the 42 Indo-West Pacific species seems preferable for the study of the Philippine species. The "Albatross" collection contains 26 species, including 11 new species. The 16 previously described species are incorporated in the key; seven of them have been reported in earlier papers (Miyake and Baba, 1967a; Baba, 1974a, 1982b, 1986a, 1986b; Baba and Yu, 1987), and a male syntype of *M. vigilliarum* in the collection of the Zoological Survey of India and all syntypes of *M. militaris* in the collection of the British Museum (Natural History) were examined on loan. Accordingly, specimens of seven species, i.e., *M. africana, M. comorina, M. normani, M. sanctipauli, M. spinicordata, M. spinulifera* and *M. tuberculata*, were not available for study during preparation of the key. It seems probable that subsequent examination will prove some of these eight species to be synonymous with known species because of the brevity of the descriptions, but they are tentatively included in the key on the basis of distinctions carefully determined from the species descriptions. Of the previous records, *Munida semoni* Ortmann (1894:24, pl. 1: fig. 4) is treated as a synonym of *M. heteracantha* Ortmann, and *M. militaris curvirostris* Henderson (1888:139, pl. 3: fig. 7) is merged with *M. militaris* Henderson, because the distinctions cited in the literature for the subspecies are so subtle as to be very questionable.

Key to Indo-West Pacific Species of *Munida*

1. Epipods on first, second and third pereopods 2
– Epipod absent from pereopods 3
2. Carapace and cheliped with long setae; propodus of first walking leg with 8-9 spinelets on ventral margin ..... **51. *M. elegantissima***
– Carapace lacking long setae dorsally; cheliped with plumose setae; propodus of first walking leg with 4 spinelets on ventral margin ..... **49. *M. bellior***
3. Rostrum with pronounced setae dorsally ..... **64. *M. pilorhyncha***
– Rostrum lacking setae dorsally 4
4. Supraocular spines overreaching end of rostrum ..... **61. *M. longispinata***
– Supraocular spines barely reaching, or, falling far short of, end of rostrum 5
5. Fourth abdominal segment armed with dorsal spines 6
– Fourth abdominal segment spineless 18
6. Anterolateral spine of carapace unusually produced; antennal peduncle spineless ..... **60. *M. leviantennata***
– Anterolateral spine of carapace normally developed; first and second segments of antennal peduncle armed with spines 7
7. More than 2 epigastric spines; rostrum dorsally carinate; supraocular spines comparatively close to rostrum; merus of third maxilliped with at least 2 ventral marginal spines ..... **48. *M. babai***
– Two epigastric spines; rostrum not carinate dorsally; supraocular spines widely separated from rostrum; merus of third maxilliped with single midventral marginal spine 8
8. Fourth abdominal segment lacking spine on posterior ridge 9
– Fourth abdominal segment with spine on posterior ridge 10
9. Two spines on posterior transverse ridge of carapace; lateral protogastric spine present on each side; merus of third maxilliped unarmed on dorsal margin ..... **65. *M. pilosimanus***
– No spine on posterior transverse ridge of carapace; lateral protogastric spine absent; merus of third maxilliped with distodorsal marginal spine.. ***M. tenuipes*** (Miyake and Baba, 1967a:209, fig. 4)
10. First segment of antennal peduncle with unusually prolonged process 11
– First segment of antennal peduncle with moderate-sized process 14
11. Cardiac spine absent ..... **56. *M. incerta***
– Cardiac spine present 12
12. Two terminal spines of basal segment of antennule subequal in size .... **71. *M. variabilis***
– Mesial terminal spine of basal segment of antennule smaller than lateral terminal 13
13. Two spines behind postcervical spine; distomesial spine of second segment of antennal peduncle reaching end of third segment; walking legs very slender ..... **52. *M. eminens***
– No spine behind postcervical spine; distomesial spine of second segment of antennal peduncle distinctly overreaching end of peduncle; walking legs moderately slender ..... **54. *M. fortiantennata***
14. Pair of protogastric spines directly behind pair of epigastric spines ..... ***M. soelae***

(Baba, 1986a:2, fig. 3)
– No protogastric spines 15
15. Transverse row of spinules on cardiac region ..... ***M. normani***
(Henderson, 1885:408; 1888:129, pl. 13: figs. 5, 5a, 5b)
– Prominent median spine on cardiac region 16
16. Postcervical spine absent ..... ***M. spinicordata***
(Henderson, 1885:413; 1888:146, pl. 15: figs. 3, 3a, 3b)
– Postcervical spine present 17
17. Rostrum slenderer than supraocular spines; first segment of antennal peduncle bluntly produced on distomesial margin ..... **69. *M. similis***
– Rostrum as stout as or slightly stouter than supraocular spines; first segment of antennal peduncle with distinct, sharp distomesial process ..... **70. *M. squamosa***
18. Lateral margin of carapace with 4 or less spines behind cervical groove 19
– Lateral margin of carapace with 5 spines behind cervical groove 24
19. Chelipeds strongly depressed dorsoventrally, fingers relatively long, 2.5 times as long as palm ..... ***M. brucei***
(Baba, 1974a:55, figs. 1, 2)
– Chelipeds moderately depressed dorsoventrally, fingers shorter than or as long as or longer than palm, but not exceeding 1.5 times length of palm 20
20. Carapace dorsally spinose in front of cervical groove, in addition to epigastric and lateral protogastric spines ..... ***M. sentai***
(Baba, 1986b:628, figs. 3, 4)
– Carapace armed with epigastric and lateral protogastric spines but no other spinulation in front of cervical groove 21
21. Striae on carapace prominently granulate; merus of third maxilliped with 4 or 5 irregular-sized spines on ventral margin ..... ***M. tuberculata***
(Henderson, 1885:413; 1888:145, pl. 15: figs. 2, 2a-b)
– Striae on carapace not granulate; merus of third maxilliped with 2 ventral marginal spines, proximal larger 22
22. Third abdominal segment with 1-4 spines on anterior ridge ..... **62. *M. major***
– Third abdominal segment spineless 23
23. Two terminal spines of antennular basal segment well developed, subequal in size ..... ***M. albiapicula***
(Baba and Yu, 1987:331, figs. 1, 2)
– Mesial terminal spine of antennular basal segment very small, lateral terminal spine well developed ..... **68. *M. rufiantennulata***
24. Front margin strongly oblique 25
– Front margin transverse or slightly oblique 28
25. Abdominal segments unarmed ..... **67. *M. roshanei***
– Spines present at least on second abdominal segment 26
26. Third abdominal segment unarmed ..... **53. *M. exigua***
– Third abdominal segment with dorsal spines 27
27. Six epigastric spines; dactylus as long as propodus in third walking leg ..... **59. *M. kuboi***
– Twelve epigastric spines; dactylus distinctly shorter than propodus in third walking leg ..... ***M. spinulifera***
(Miers, 1884:279, pl. 31: fig. B; Tirmizi and Javed, 1976:85, fig. 4)

28. Eyes small, cornea scarcely wider than eyestalk 29
– Eyes large, cornea dilated 32
29. Second abdominal segment spineless ..... ***M. comorina***
(Alcock and Anderson, 1899a:18; 1899b: pl. 43: fig. 3; Alcock, 1901:239)
– Second abdominal segment armed with dorsal spines 30
30. Carapace dorsally armed with epigastric spines only ..... ***M. crassa***
(Baba, 1982b:107, fig. 3)
– Carapace with epigastric and other dorsal spines 31
31. Transverse ridges of carapace granulate; postcervical and lateral protogastric spines absent; second abdominal segment with 2 spines; chelipeds and walking legs stout ..... ***M. parvioculata***
(Baba, 1982b:104, figs. 1, 2b)
– Transverse ridges of carapace not granulate; postcervical and lateral protogastric spines present; second abdominal segment with 6-10 spines; chelipeds and walking legs slender ..... **63. *M. microps***
32. Merus of third maxilliped with single median spine on ventral margin 33
– Merus of third maxilliped with 2 or more spines on ventral margin 34
33. Two terminal spines of antennular basal segment subequal in size; third abdominal segment with 2 dorsal spines ..... ***M. vigilliarum***
(Alcock, 1901:243; male syntype deposited in Zoological Survey of India was examined)
– Lateral terminal spine of antennular basal segment larger than mesial terminal; third abdominal segment unarmed ..... ***M. africana***
(Doflein and Balss, 1913:145, pl. 14: fig. 1)
34. Third abdominal segment with dorsal spines 35
– Third abdominal segment spineless 36
35. Second segment of antennal peduncle with strong distomesial spine overreaching third segment; third thoracic sternum 0.36 as wide as following; chelipeds setose ..... **66. *M. prominula***
– Second segment of antennal peduncle with stout distomesial spine not overreaching third segment; third thoracic sternum 0.45 as wide as following; chelipeds less setose ..... **47. *M. armata***
36. Merus of third maxilliped with distodorsal marginal spine 37
– Merus of third maxilliped unarmed on dorsal margin 39
37. Transverse row of 6-8 epigastric spines ..... ***M. sanctipauli***
(Henderson, 1885:411; 1888:142, pl. 3: fig. 6; Barnard, 1950:489, fig. 92b; Kensley, 1977:162)
– Transverse row of more than 10 epigastric spines 38
38. Rostrum 3 times as long as supraocular spine; postcervical and branchial dorsal spines absent; sternum of third thoracic somite wider than anterior margin of following sternum ..... **57. *M. inornata***
– Rostrum about twice as long as supraocular spine; postcervical and branchial dorsal spines present; sternum of third thoracic somite barely as wide as anterior margin of following sternum ..... **58. *M. japonica***
39. Chelipeds relatively long and slender ..... **55. *M. heteracantha***
– Chelipeds short and massive 40
40. Rostrum laterally compressed ..... **50. *M. compressa***

– Rostrum spiniform 41
41. Palm of cheliped without row of spines ventral to mesial marginal row .... **46. *M. andamanica***
– Palm of cheliped with 1 or 2 rows of spines ventral to mesial marginal row .... ***M. militaris***
(Henderson, 1885:410; 1888:137, pl. 14: figs. 2, 2a-b, 5, 5a-b; syntypes deposited in the British Museum (Natural History) were examined)

46. *Munida andamanica* Alcock, 1894

Munida militaris var. *andamanica* Alcock, 1894:321. – Alcock and Anderson, 1895: pl. 13: fig. 2.
Munida andamanica Alcock, 1901:242. – Kemp and Sewell, 1912:25. – Doflein and Balss, 1913:143. – Balss, 1913:17. – Parisi, 1917:1. – Yokoya, 1933:63. – Yanagita, 1943:29. – Tirmizi, 1966:198, figs. 17-19. – Baba, 1982b:103. – Miyake, 1982:149, pl. 50: fig. 1. – Baba, in Baba, Hayashi and Toriyama, 1986:169, 289, fig. 119.
Munida curvatura Benedict, 1902:253, fig. 5.

Material. – Teluk Bone, Sulawesi (Sta. 5656: 1 ovig. ♀). – Molucca Sea off west coast of Halmahera (Sta. 5618: 1 ♂; Sta. 5619: 2 ♂; Sta. 5621: 1 ♂; Sta. 5622: 1 ♂, 2 ovig. ♀, 1 ♀; Sta. 5624: 1 ♀; Sta. 5625: 5 ♂, 4 ovig. ♀, 1 ♀; Sta. 5626: 7 ♂, 1 ovig. ♀, 3 ♀, 1 sp.). – Off northeastern Borneo (Sta. 5586: 1 ♂; Sta. 5589: 6 ovig. ♀; Sta. 5590: 2 ovig. ♀; Sta. 5592: 1 ovig. ♀, 2 ♀). – Off northern Mindanao (Sta. 5501: 2 ♂, 1 ♀, 1 sp.; Sta. 5502: 1 ♂, 1 ♀; Sta. 5502-3: 1 ♂, 1 ovig. ♀, 3 ♀; Sta. 5504: 7 ♂, 1 ovig. ♀, 11 ♀; Sta. 5506: 1 ♂; Sta. 5508: 3 ♂, 2 ovig. ♀; Sta. 5511: 2 ♂, 3 ♀; Sta. 5523: 1 ♂; Sta. 5541: 1 ♂, 1 ♀). – Between Negros and Siquijor (Sta. 5536: 1 ♂; Sta. 5537: 2 ♀). – Between Cebu and Siquijor (Sta. 5533: 1 ♂). – Between Siquijor and Bohol (Sta. 5528: 1 ♀). – Between Cebu and Bohol (Sta. 5198: 1 ♀). – Between Cebu and Leyte (Sta. 5404: 1 ovig. ♀; Sta. 5405: 2 ♂; Sta. 5406: 1 ♂, 1 ovig. ♀; Sta. 5409: 4 ovig. ♀, 3 ♀; Sta. 5410: 3 ♂, 1 ovig. ♀, 2 ♀). – Sulu Sea off southwestern Panay (Sta. 5126: 1 ♀). – Off northwestern Panay (Sta. 5259: 1 ♂, 1 ♀). – East of Masbate (Sta. 5214: 2 ♂). – Off southeastern Luzon (Sta. 5444: 2 ♂). – Between Burias and Luzon (Sta. 5388: 4 ♂, 2 ovig. ♀, 1 ♀). – Off southeastern Mindoro (Sta. 5260: 2 ♂, 2 ovig. ♀, 2 ♀). – East coast of Mindoro (Sta. 5122: 1 ♂, 1 ♀; Sta. 5123: 9 ♂, 7 ovig. ♀, 12 ♀; Sta. 5124: 1 ♂). – Vicinity of Marinduque off southwestern Luzon (Sta. 5221: 1 ♂; Sta. 5373: 4 ♂, 1 ovig. ♀, 4 ♀). – South China Sea off northwestern Luzon (Sta. 5441: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 9.8-30.0 mm; of ovigerous females, 15.2-29.0 mm; of nonovigerous females, 12.3-31.4 mm.

Diagnosis. – Carapace strongly rugose; transverse row of 6-12 epigastric spines; 1 lateral protogastric spine on each side; postcervical and anterior branchial spines variably present or absent; lateral margin with 7 spines. Rostrum spiniform, curving dorsad. Supraoculars almost horizontal, directed laterad, terminating opposite midlength of rostrum. Second abdominal segment with 2-10 spines (mostly 8). Cornea dilated, eyelashes short. Terminal 2 spines of antennular basal segment subequal in size. Merus of third maxilliped with 2 ventral marginal spines, distal smaller, sometimes rudimentary. Chelipeds comparatively short, spinous and very setose; setae plumose, partly coarse and iridescent; distomesial marginal spine of

merus extraordinarily developed. Two pairs of male gonopods. Epipods absent from pereopods.

Habitat. – Taken in 340-1,360 m usually on mud bottoms, occasionally mixed with sand, globigerina, rarely with fragments of shells or on sandy bottoms.

Remarks. – Details of the coloration in fresh specimens and the synonymity with *M. curvatura* were noted in a previous paper (Baba, 1982b:104). A fine color photograph has been published by Miyake (1982: pl. 50: fig. 1).

The record of this species from Admara Island, Solar Straits [= Adonara Island, Solor Islands] (Boone, 1935:42) should be deleted. The illustration (Boone, 1935: pl. 10) suggests that her specimen is closer to *Munida japonica* than to *M. andamanica*, especially in the shape of the cheliped; the fingers are not so strongly curved as in *M. andamanica*; the merus and carpus are spineless; and the distomesial marginal spine of the merus is not so prominent as in *M. andamanica*.

Type-locality. – Andaman Sea.

Distribution. – This is a rather widespread species in the Indo-West Pacific; previously known from off the east coast of Africa, Arabian Sea, Maldives, Andaman Sea, west of Sumatra, Java Sea, Sulawesi, Moluccas, Philippines, Okinawa Trough and Japan; in 141-1,360 m.

47. *Munida armata*, new species

Figure 31

Material. – South China Sea off southwestern Luzon (Sta. 5266: 1 ♀; Sta. 5272: 1 ♂, 3 ovig. ♀ [1 ovigerous female is holotype, USNM 150380]).

Diagnosis. – Carapace distinctly rugose, striae numerous, mostly interrupted; 5 pairs of epigastric spines, submedian pair behind supraocular spines prominent; 1 lateral protogastric, 1 postcervical and 1 anterior branchial spines on each side; lateral margins subparallel, with 2 spines in front of cervical groove and 5 behind it, anterolateral spine well developed. Front margin nearly transverse. Rostrum slightly arched in lateral view. Supraocular spines subparallel, more or less close to, and, terminating opposite midlength of, rostrum. Eight to 10 spines on second abdominal segment, 2 or 3 spines on third segment. Eyes moderately dilated, eyelashes short. Basal segment of antennule elongate, terminal 2 spines equal-sized. Ischium of third maxilliped with prominent spine on distoventral margin; merus with 2 ventral marginal spines, both well developed. Sternum of third thoracic somite much wider than anterior margin of following sternum. First walking leg overreaching end of carpus of cheliped when extended forward, propodus with 11-12 ventral marginal spinelets. Two pairs of male gonopods. Epipods absent from all pereopods.

Description of holotype. – Carapace (Figure 31a) longer than wide, provided with numerous transverse ridges mostly interrupted. Ten epigastric spines, pair directly behind supraoculars prominent. Lateral protogastric spine near lateral extremity of second transverse ridge; additional minute spine midway between anterolateral and lateral protogastric spines on right side only. Cervical groove distinct. Postcervical spine present. Anterior branchial region with small but distinct spine directly

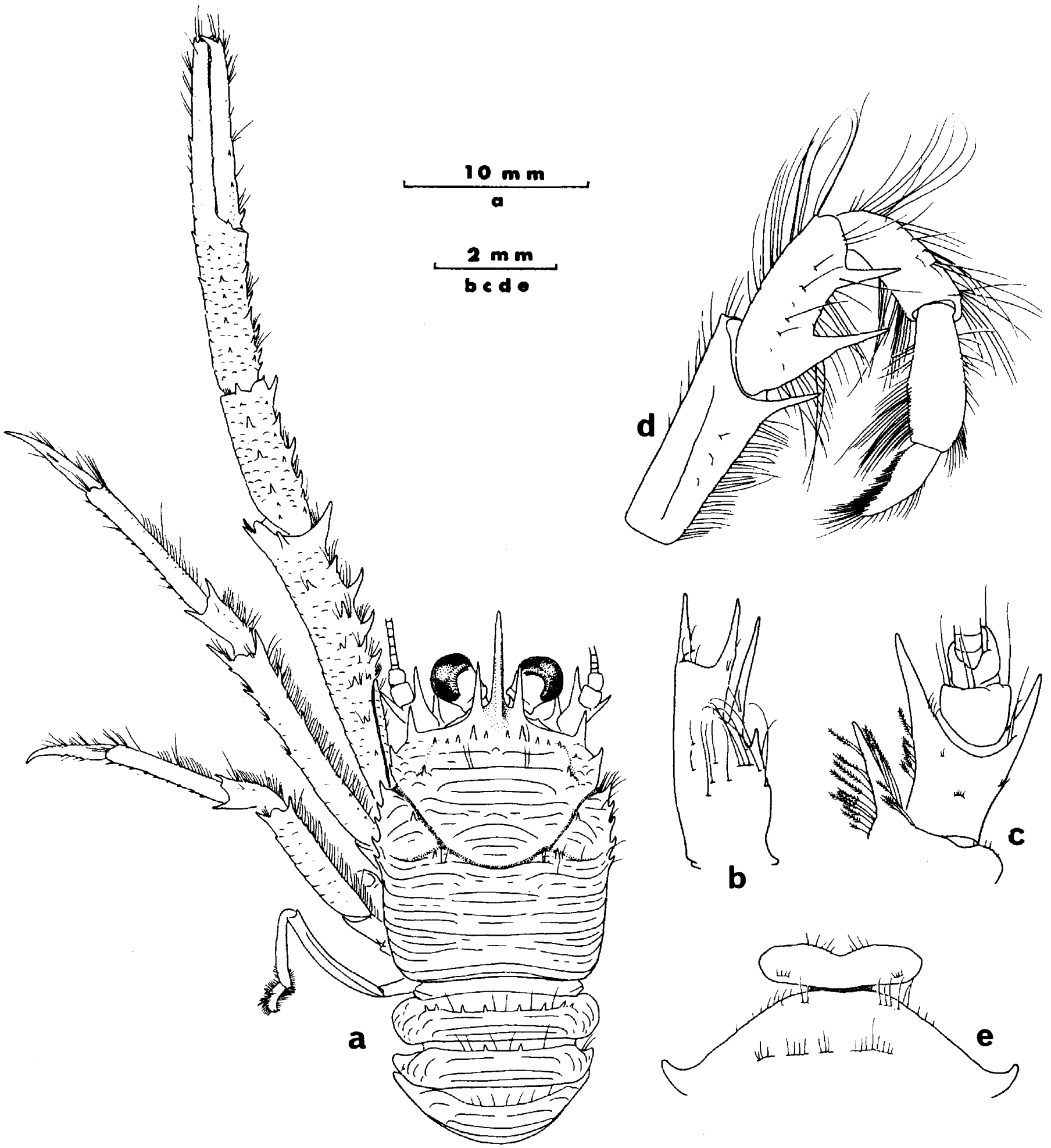

Figure 31. – *Munida armata*, new species, ovigerous female holotype from "Albatross" Sta. 5272: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of right third maxilliped; e, anterior part of sternal segments.

behind anterior bifurcation of cervical groove. Posterior transverse ridge unarmed. Front margin nearly transverse. Lateral margins subparallel, setose near end of cervical groove; 2 spines in front of cervical groove, one of them anterolateral and well developed, another smaller, contiguous tiny spine on left side; 5 small, subequal-sized spines on anterior branchial margin.

Rostrum spiniform, slightly arched in lateral view, distinctly more than 1/3 as long as remaining carapace. Supraocular spines parallel, directed upward, somewhat close to, and, about half as long as, rostrum.

Abdomen with distinct striae as illustrated (Figure 31a). Second segment with 8 spines on anterior ridge, third segment with 2 median spines.

Eyes moderately dilated distally, more or less depressed dorsoventrally, eyelashes short.

Basal antennular segment (Figure 31b) elongate, moderately setose midventrally, 2 terminal spines equal in size, lateral margin convex with 2 spines, distal one elongate, almost parallel to lateral terminal spine, proximal one extremely short. First segment of antennal peduncle (Figure 31c) with prominent spine reaching as far as distal margin of second segment; 2 distal marginal spines of second segment well developed, nearly as large as spine on first segment; third segment unarmed.

Third maxilliped (Figure 31d) setose. Ischium triangular in cross section, mesial ridge with about 25 denticles; distoventral marginal spine strongly produced. Merus as long as ischium, ventral margin with 2 prominent spines of subequal size, dorsal margin unarmed.

Anterior part of sternal segments as illustrated (Figure 31e); sternum of third thoracic somite laterally expanded, with shallow median sinus on anterior margin, distinctly wider than anterior margin of following sternum.

Right cheliped missing. Left cheliped (Figure 31a) 2.5 times as long as carapace including rostrum, subcylindrical, dorsally squamate, sparsely setose especially on mesial margin. Merus with 4 rows of spines and 1 distolateral spine, mesial marginal row much pronounced. Carpus shorter than palm, bearing 4 rows of spines, dorsal row nearer mesial margin consisting of much smaller spines. Palm more or less depressed, 4 times as long as wide, bearing 4 rows of spines; lateral marginal row consisting of only 2 spines, continued onto fixed finger. Fingers longer than palm, strongly curving distally and crossing; opposable margins straight; movable finger with pronounced proximal marginal spine and few dorsal spinules.

First and third pairs of walking legs undetached from body, second pair missing. First walking leg longer and more spinous on merus, but less squamate dorsally, reaching end of carpus of cheliped, furnished with both plumose and iridescent setae on dorsal margin. Merus with 12 dorsal marginal and 6 ventral marginal spines, both terminal largest, 3 proximal dorsal marginal spines slightly dorsolateral in position. Carpus strongly produced on both distal margins, with few small dorsal marginal spines. Ventral margin of propodus with 11 or 12 spinelets. Dactylus distally curving ventrad, ending in sharp point, ventral margin with about 10 denticles.

Epipod absent from pereopods.

Measurements of holotype. – Length of carapace including rostrum, 20.3 mm; width of carapace, 12.1 mm; length of cheliped (left), 50.5 mm; of carpus, 8.7 mm; of palm, 9.2 mm; of movable finger, 11.8 mm.

Measurements of paratypes. – Carapace length of male, 12.3 mm; of ovigerous females, 19.5 and 20.7 mm; of nonovigerous female, 15.0 mm.

Habitat. – Taken on bottoms of mud or mud mixed with shells and coral sand, in 183-216 m.

Remarks. – *Munida armata* is much like *M. prominula* from the Philippines de-

scribed in this paper; the relationships are discussed under the "Remarks" of the latter species. This new species also seems to be closely related to *M. japonica* Stimpson, from which, however, it differs in having the third abdominal segment with two median spines, the sternum of the fourth thoracic somite distinctly narrowing anteriorly and the merus of the third maxilliped spineless on the dorsal margin.

Type-locality. – Southwest of Corregidor Light, off southwestern Luzon (14°N, 120° 22'30"E).

Distribution. – Known from two different localities in the South China Sea off southwestern Luzon; in 183 and 216 m.

48. *Munida babai* Tirmizi and Javed, 1976

Figure 32

Munida babai Tirmizi and Javed, 1976:81, figs. 1-3.

Material. – Between Samar and Leyte (Sta. 5481: 1 ♂). – South China Sea off Hong Kong (Sta. 5309: 2 ♂).

Measurements. – Carapace lengths of males, 6.7-9.7 mm.

Diagnosis. – Carapace longer than wide; lateral margins subparallel with relatively small spines, anterolateral spine moderate-sized; twelve tiny epigastric spines, submedian pair directly behind supraoculars slightly larger; no lateral protogastric spines; small but distinct postcervical spine on each side; posterior transverse ridge unarmed. Front margin oblique. Rostrum arched in lateral view, laterally setose, dorsally ridged and crenulate. Supraocular spines very short, directed slightly mesad and dorsad, and close to rostrum. Eyes dilated, eyelashes long, reaching end of cornea. Second, third and fourth abdominal segments armed with small spines on anterior ridge. Antennular basal segment with 2 equal-sized terminal and 3 lateral spines. Anterior margin of third thoracic sternum convex, widely and deeply notched medially, nearly as wide as anterior part of following sternum. Two pairs of male gonopods. Epipod absent from all pereopods.

Habitat. – Taken in 112-113 m on bottom of green mud or sand mixed with shells and gravel.

Remarks. – Undoubtedly the present material is referred to *Munida babai*, although the following variations and differences are noticed: Two of the three specimens examined have 8, 4 (with or without additional spinule), 3 spines on the second, third and fourth abdominal segment respectively, and the remaining one 6, 3, 3, instead of 6, 2, 2 as described for the type. The ischium of the third maxilliped, said to be marginally spinose in the type (Tirmizi and Javed, 1976:83), is smooth in the "Albatross" material (Figure 32d), excepting the right appendage of the male from Station 5481 (Figure 32f), in which the merus is more spinose on the ventral margin.

That the dactylus of the walking leg is less than half as long as the propodus in the type (Tirmizi and Javed, 1976:83) seems at variance with their illustration which yields an apparent dactylus-propodus ratio of 0.64 (Tirmizi and Javed, 1976: fig. 2D). If this illustration is precise the ratio in question is distinctly less than that of the

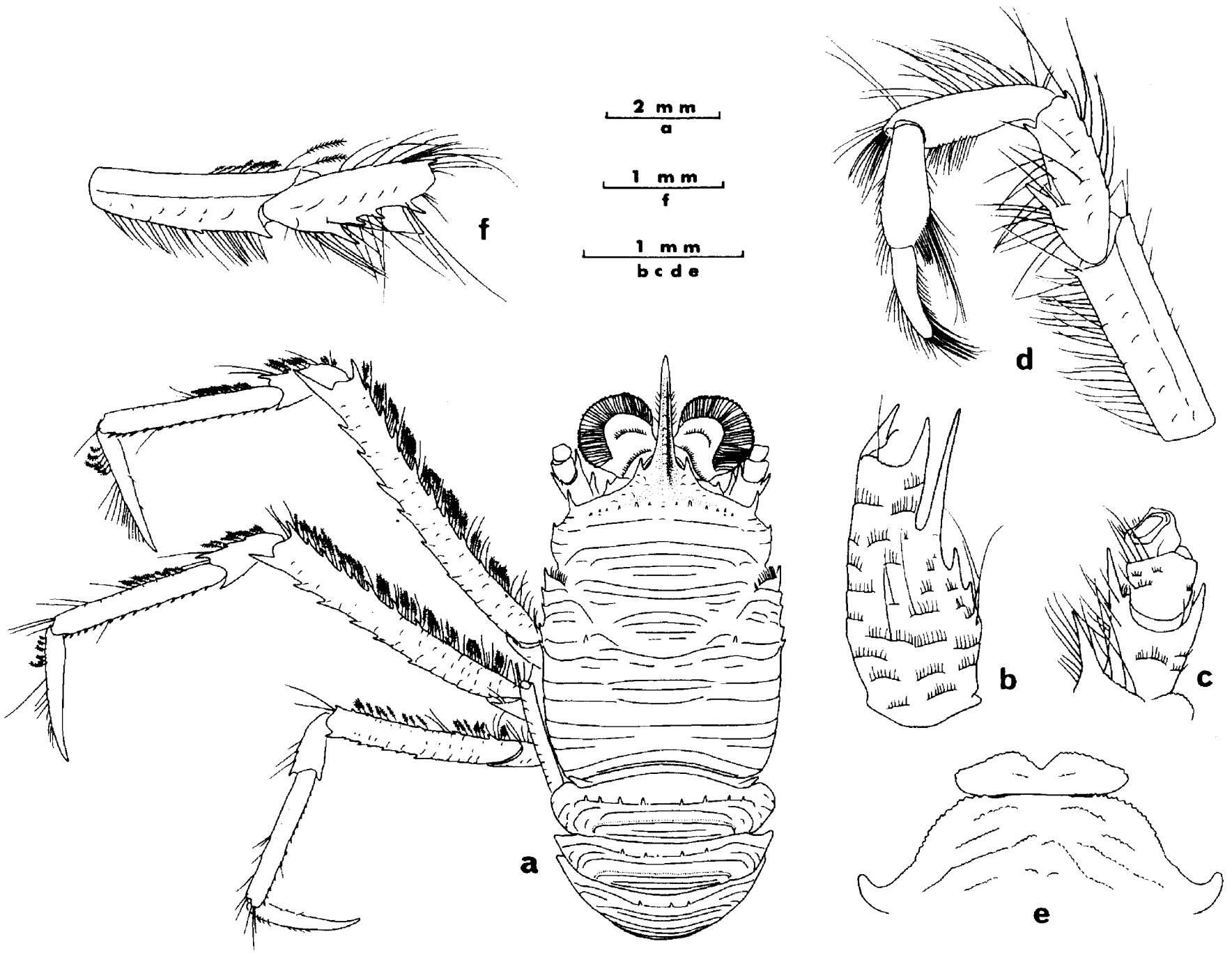

Figure 32. – *Munida babai* Tirmizi and Javed, male from "Albatross" Sta. 5309, carapace length 7.5 mm: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of left third maxilliped; e, anterior part of sternal segments. Male from "Albatross" Sta. 5481, carapace length 9.7 mm: f, proximal segments of endopod of right third maxilliped.

"Albatross" material in which it is 0.84. The propodi of the walking legs in the "Albatross" specimens (Figure 32a) bear 15 spinelets on the ventral margin, instead of 10 as in the type.

Type-locality. – Off Natal, southeast Africa (29°35'S, 31°38'E).

Distribution. – Off Natal, between Samar and Leyte in the Philippines and off Hong Kong; in 112-150 m.

49. *Munida bellior* Miyake and Baba, 1967

Munida bellior Miyake and Baba, 1967b:216, figs. 3, 4.

Material. – Between Masbate and Leyte (Sta. 5398: 1 ♀).

Measurement. – Carapace length of female, 14.8 mm.

Diagnosis. – Carapace nearly glabrous dorsally, armed with row of 10 epigastric spines on first stria, 1 lateral protogastric near each lateral extremity of second

stria, 4 anterior branchials directly behind anterior bifurcation of cervical groove, and 1 postcervical on each side. Front margin transverse. Rostrum spiniform. Supraocular spines subparallel, terminating opposite midlength of rostrum. Merus of third maxilliped with 2 strong ventral marginal spines, dorsal margin unarmed; carpus with distoventral spine. Sternum of third thoracic somite with distinct or indistinct lateral process. Chelipeds and walking legs with plumose setae; propodus of first walking leg with 4 spinelets on ventral margin. Epipods on cheliped through second walking leg.

Habitat. – Taken in 209 m on bottom of green mud.

Remarks. – The presence of epipods on first three pairs of pereopods is very characteristic of this species as well as the related species *Munida elegantissima*, as also is the presence of a spine on the carpus of the third maxilliped. I believe that the distinctions between these two species as noted in the key to species are constant.

Type-locality. – Sagami Bay, Japan.

Distribution. – Known from the Philippines between Masbate and Leyte and Sagami Bay, Japan, in 80-209 m.

50. *Munida compressa*, new species

Figures 33, 34

Material. – Molucca Sea off west coast of Halmahera (Sta. 5621: 1 ♂, holotype, USNM 150347). – South China Sea off southwestern Luzon (Sta. 5116: 1 ♂, 1 ovig. ♀, 2 ♀; Sta. 5289: 1 ♂, 1 ♀; Sta. 5294: 1 ♂, 1 ♀). – South China Sea off Hong Kong (Sta. 5301: 2 ♂, 1 ♀). – South China Sea off southwestern Formosa (Sta. 5317: 1 ♂, 1 ovig. ♀, 1 ♀).

Diagnosis. – Carapace strongly rugose, armed with 3 pairs of epigastric spines, mesial and lateral pairs much smaller; lateral protogastric spinule on each side; lateral margins converging posteriorly, each with 7 spines. Front margin transverse. Rostrum strongly compressed laterally, curving dorsad. Supraoculars directed slightly laterad, rather distantly separated from, and, nearly half as long as, rostrum. Second abdominal segment with 8 spines on anterior ridge. Eyes swollen, eyelashes short. Two terminal spines of antennular basal segment subequal in size. Merus of third maxilliped with 2 ventral spines, distal much smaller. Sternum of third thoracic somite medially incised on anterior margin; following sternum triangular, anterior margin narrower than that of preceding sternum. Chelipeds short, massive, marginally provided with both fine and iridescent setae; merus with 4 prominent terminal spines, mesial terminal strongest; palm with well developed spine somewhat proximal to midlength of lateral margin of chela. Two pairs of male gonopods. Epipods absent from pereopods.

Description of holotype. – Carapace (Figures 33, 34a) excluding rostrum nearly as long as wide when measured between front and posterior margins; dorsal surface with distinct striae. Gastric region with transverse row of epigastric spines, as illustrated (Figure 33); 2 directly behind supraoculars prominent; small lateral protogastric spine on each side. Hepatic region squamate. Cervical groove distinct. Long coarse setae numerous on cardiac transverse ridge, sparse on anterior, median and

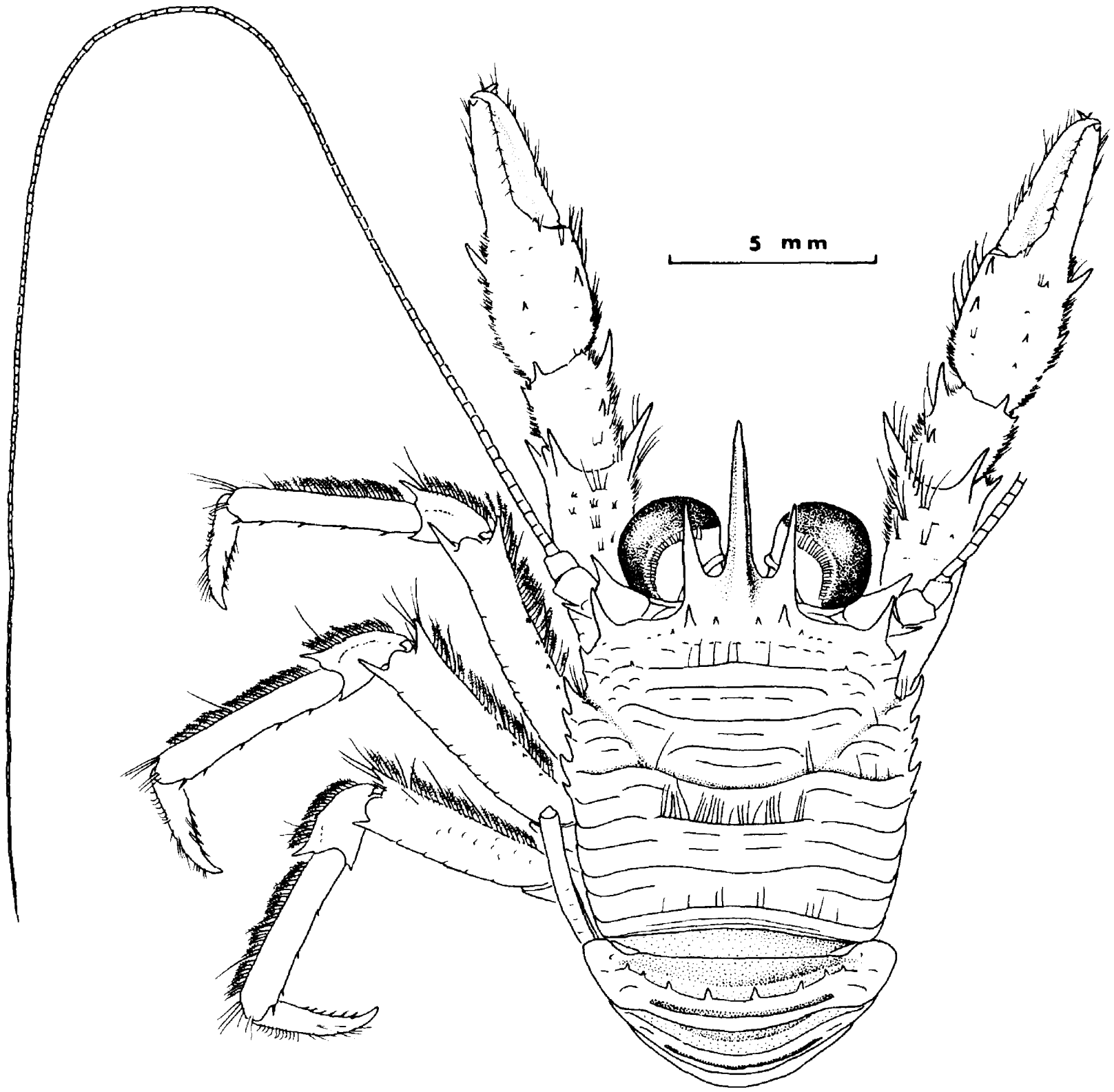

Figure 33. – *Munida compressa*, new species, male holotype from "Albatross" Sta. 5621, dorsal view.

posterior transverse ridges and near end of cervical groove. Lateral margins converging posteriorly; anterolateral spine prominent, followed by 6 spines; greatest width measured between anterior limits of branchial regions.

Rostrum (Figures 33, 34a) strongly compressed laterally, curving dorsad, twice as long as supraocular spine; ventrally furnished with plumose setae. Supraocular spines directed feebly laterad, rather remote from rostrum, reaching corneal margin.

Second abdominal segment (Figure 33) with 8 spines on anterior ridge, median 2 larger; following segments unarmed. Eyes large, dilated distally, eyelashes short.

Basal segment of antennule (Figure 34b) ventrally setose, less than twice as long as wide, armed with 2 terminal spines of subequal size and 2 lateral spines, proximal lateral small, distal lateral overreaching lateral terminal. First segment of antennal peduncle (Figure 34c) with short spine on distomesial margin; second

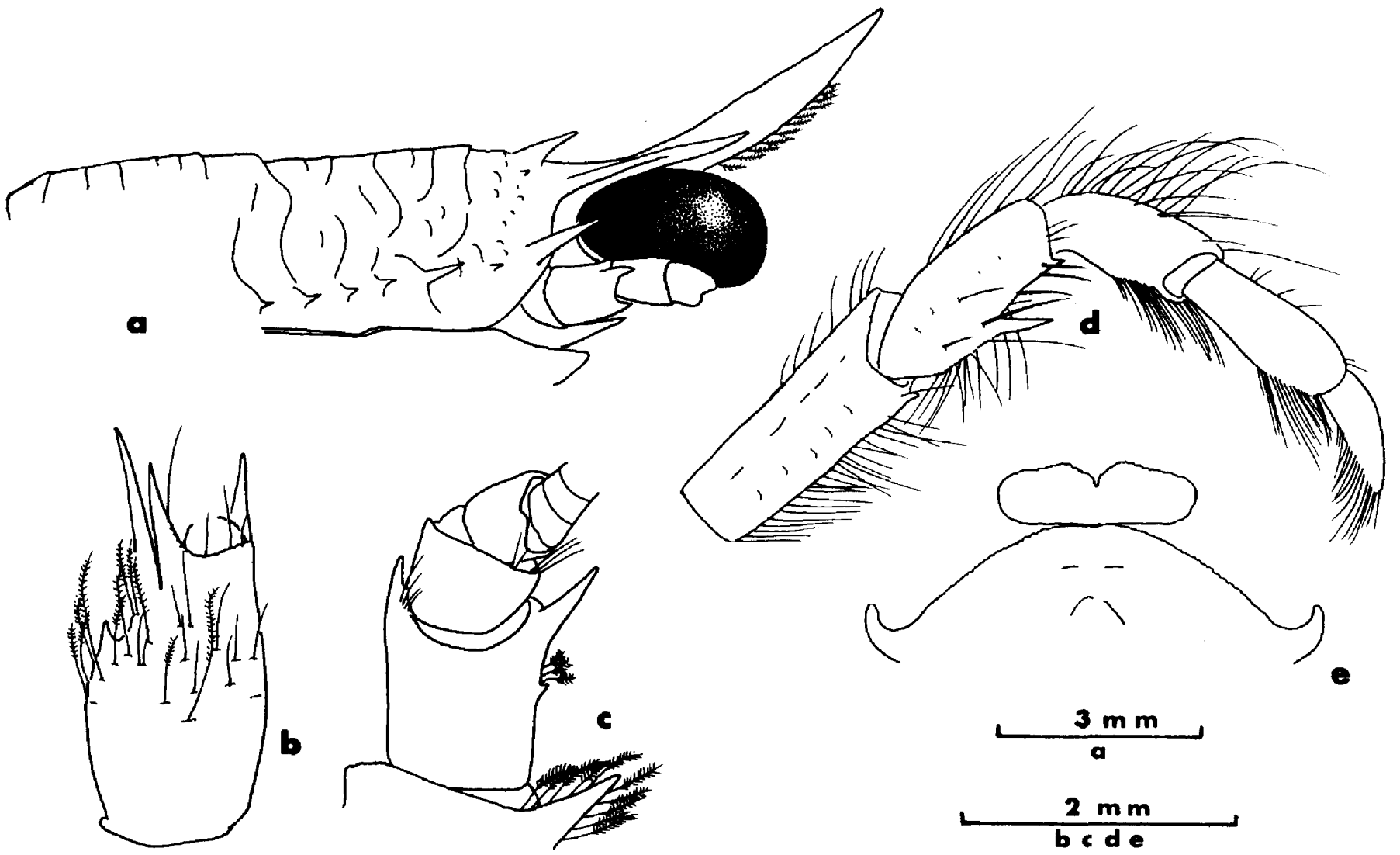

Figure 34. – *Munida compressa*, new species, male hólotype from "Albatross" Sta. 5621: a, carapace, lateral view; b, basal segment of right antennule; c, right antennal peduncle; d, endopod of right third maxilliped; e, anterior part of sternal segments.

segment produced at both distal margins, bearing minute spine at midlength of mesial margin; third segment unarmed.

Ischium of third maxilliped (Figure 34d) triangular in cross section, longer than merus, minutely produced on distoventral margin, mesial ridge bearing 27 denticles. Merus bispinose on ventral margin, distal spine much reduced.

Anterior part of sternal segments as illustrated (Figure 34e); sternum of third thoracic somite wider than anterior margin of following sternum, anterior margin moderately convex with distinct median notch.

Chelipeds (Figure 33) similar, slightly longer than carapace including rostrum, furnished with both plumose and iridescent setae particularly thick on mesial margin. Merus feebly squamate, armed with 4 prominent terminal spines, mesial terminal strongest, overreaching midlength of carpus. Carpus with 3 terminal spines and 1 dorsal nearer mesial margin. Palm rather massive, more or less depressed, somewhat longer than wide, slightly shorter than finger, lateral margin with 2 or 3 spines, distal one prominent; 2 rows of few small spines on dorsal surface. Fingers depressed, but moderately thick, strongly curving distally and crossing, each ending in sharp point; opposable margins straight; fixed finger with small lateral marginal spine near tip.

Walking legs (Figure 33) rather stout, moderately depressed, provided with plumose setae on dorsal margin except dactyli. Merus of first walking leg armed with 8 dorsal marginal and 1 distoventral spines, both distal ones strongest. Carpus

produced at distodorsal and distoventral margins, dorsolateral surface unarmed. Propodus 1.4 times as long as dactylus, 5 ventral marginal spinelets distinct. Dactylus relatively stout, distally curving ventrad, ventral margin with 8 spinelets, each arising from very minute tooth; dorsal margin with nonplumose, coarse setae; lateral face with uniformly short, very finely plumose and curved setae along proximal dorsal margin. Second walking leg similar to first leg. Third walking leg shorter; merus unarmed marginally except for both terminal ones.

Two pairs of gonopods present.

Epipod absent from all pereopods.

Measurements of holotype. – Length of carapace including rostrum, 12.7 mm; width of carapace, 8.0 mm; length of cheliped (left), 17.7 mm; of carpus, 2.7 mm; of palm, 3.6 mm; of movable finger, 4.1 mm.

Measurements of paratypes. – Carapace lengths of males, 15.1-17.3 mm; of ovigerous females, 16.3-17.4 mm; of nonovigerous females, 9.3-17.1 mm.

Variation. – Two large epigastric spines directly behind the supraoculars and other four small ones mesial and lateral to the large are constantly present; additional spines further lateral to these are small, granulate, and sometimes obsolete. The small lateral protogastric spine is distinct in most of the specimens including the holotype, completely absent in the two paratypes.

Habitat. – Taken in 315-545 m usually on sandy bottoms, occasionally mixed with shells or pebbles or mud.

Remarks. – This species is very closely related to *Munida andamanica* Alcock in all respects, but it is easily distinguished by the shape of the rostrum. In the new species the rostrum is strongly compressed laterally (hence, the specific name, *compressus*, L = compressed), while in *M. andamanica* it is spiniform.

I have examined following specimens of *M. compressa* when they were alive or fresh in preservative; all of them are now deposited in the Zoological Laboratory, Kyushu University, Fukuoka (ZLKU): Tosa Bay, 28-30 Mar 1960, coll. K. Sakai: 7 ♂, 7 ovig. ♀, 3 ♀, ZLKU 7560; 250 m, 10 Jan 1961, coll. K. Sakai: 1 ♂, ZLKU 10955; Feb-Apr 1963, coll. K. Sakai: 1 ♂, 1 ovig. ♀, 2 ♀, ZLKU 10956; 16 Jan 1963, coll. K. Sakai: 1 ♂, ZLKU 10960. Off Tosa-shimizu, Tosa Bay, 180 m, 30 Apr 1961, coll. K. Kurohara: 1 ovig. ♀, 2 ♀, ZLKU 8125. Carapace lengths of males, 17.3-20.0 mm; of ovigerous females, 17.2- 20.5 mm; of nonovigerous females, 14.4-24.1 mm. The rostrum is reddish only near the tip, instead of being so on the basal portion as in *M. andamanica* Alcock (Baba, 1982b:104; Miyake, 1982: pl. 50: fig. 1).

Type-locality. – Northeast of Makyan Island in the Molucca Sea (0°15'00"N, 127° 24'35"E).

Distribution. – Molucca Sea, South China Sea from off southwestern Luzon north to off southwestern Formosa, and Tosa Bay, Japan; in 180-545 m.

51. *Munida elegantissima* De Man, 1902

Munida elegantissima De Man, 1902:726, pl. 24: figs. 42, 42a-b. – Laurie, 1926:138. – Tirmizi, 1966:190, fig. 12. – Baba, 1969b:37, figs. 3, 4. – Haig, 1973:270;1974:447. – Baba, 1977a:253.
Munida alcocki Southwell, 1906:222, fig. 2.

Material. – Off northeastern Borneo (Sta. 5593: 1 ♀). – Sibuyan Sea (Sta. 5179: 1 ♂).

Measurements. – Carapace length of male, 11.6 mm; of nonovigerous female, 10.0 mm.

Diagnosis. – Carapace dorsally rugose, sparsely provided with coarse setae; 10 epigastric spines on first stria; 1 lateral protogastric, 2 anterior branchial and 1 postcervical spines on each side. Front margin transverse or slightly oblique. Rostrum spiniform. Supraocular spines subparallel, overreaching midlength of rostrum. Abdominal segments unarmed. Merus of third maxilliped with 2 strong ventral marginal and 1 small distodorsal marginal spines; carpus with distinct spine on distoventral margin. Sternum of third thoracic somite with lateral process. Long coarse setae on cheliped and walking legs; propodus of first walking leg with 8-9 ventral marginal spinelets. Epipods on cheliped and 2 walking legs.

Habitat. – Taken in 68-70 m on sandy bottoms.

Type-locality. – Malay Archipelago. Exact locality is unknown (De Man, 1902:726).

Distribution. – Known from Amirantes, Providence Island, Zanzibar, Gulf of Mannar, Malay Archipelago, Celebes Sea, Seram Sea, Japan, and Western and Eastern Australia; in 20-200 m.

52. *Munida eminens*, new species

Figure 35

Material. – Palawan Passage (Sta. 5348: 1 ♂). – Off southeastern Luzon (Sta. 5444: 2 ♂, [larger male is holotype, USNM 150339]).

Diagnosis. – Carapace strongly rugose, armed with paired epigastrics, 2 mesial cardiacs, 2 postcervicals each followed behind by another 2 spines, and 2-4 spines on posterior ridge; lateral margin with 6 subequal-sized spines. Front margin nearly transverse. Rostrum spiniform and straight. Supraocular spines directed laterad, rather remote from, and, feebly half as long as, rostrum. Second through fourth abdominal segments with 4 spines on anterior transverse ridge; posterior ridge of fourth segment with well developed median spine. Eyes swollen. Basal segment of antennule with 2 terminal spines, lateral terminal distinctly larger. Distomesial process of first segment of antennal peduncle extremely prolonged, nearly reaching level of rostral tip. Third maxilliped pubescent; ischium strongly produced on distoventral margin; merus with only one ventral marginal spine near midlength. Sternal segments relatively wide. Chelipeds and walking legs slender, lacking epipods; dactyli of walking legs not spiniform, but proportionately wide. Male gonopods absent from first abdominal segment.

Description of holotype. – Carapace (Figure 35a) slightly longer than wide. Gastric region anteriorly bordered by distinct groove, posteriorly by cervical groove; pair of epigastric spines behind supraoculars. Transverse ridges mostly interrupted. Postcervical spine largest and anteriormost of row of 3 spines on branchiocardiac boundary. Cardiac transverse ridge with prominent median spine distinctly elevated, with smaller spine also in midline posteriorly. Posterior transverse ridge uninterrupted, elevated, armed with 2 median spines. Anterior branchial region squamate. Lateral margins moderately convex and setose, armed with 2 spines in front of cervical groove and 4 behind it; anterolateral spine somewhat pronounced, foremost

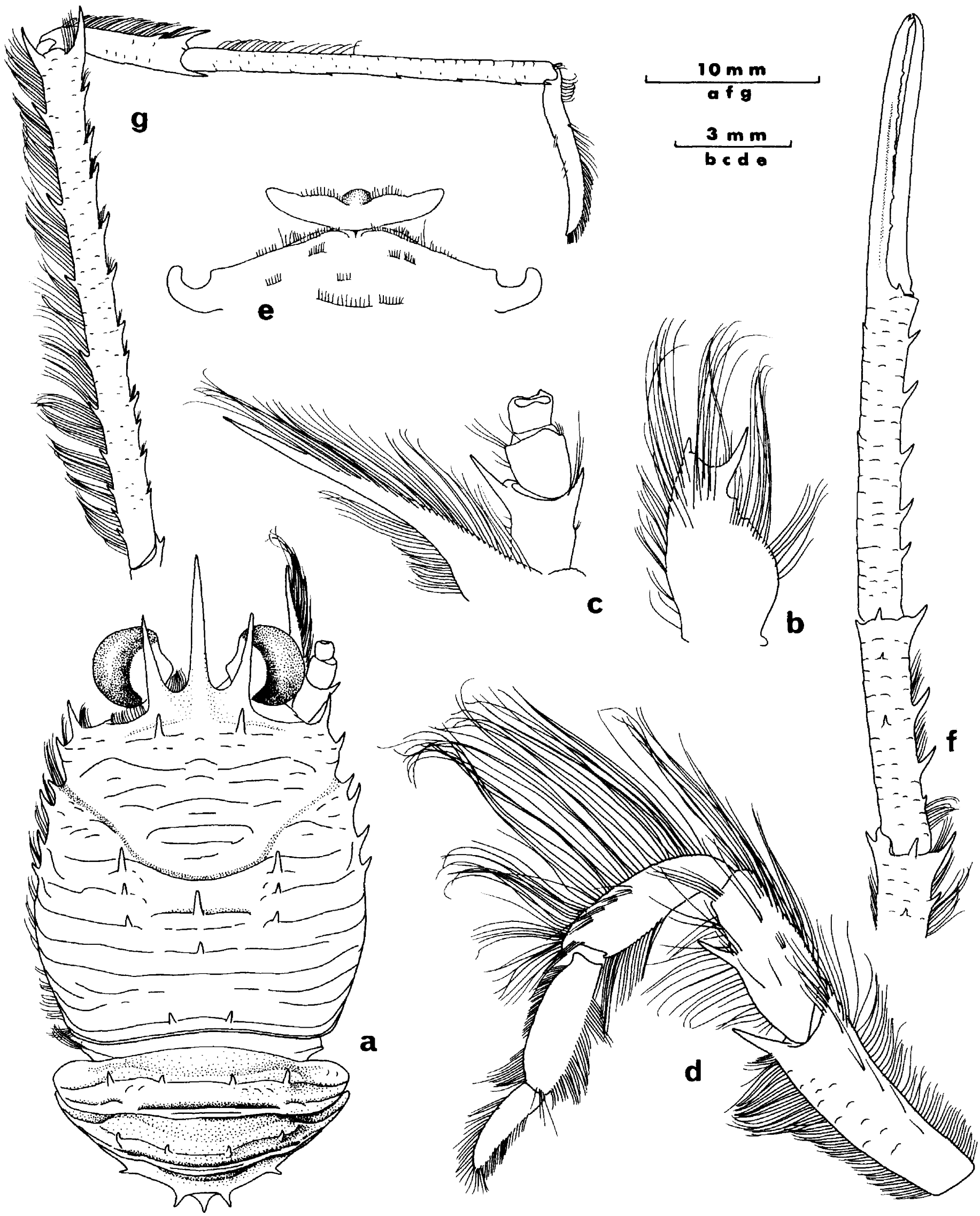

Figure 35. – *Munida eminens*, new species, male holotype from "Albatross" Sta. 5444: a, carapace and abdomen; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of left third maxilliped; e, anterior part of sternal segments; f, left cheliped; g, right first walking leg.

of branchial marginal spines located directly behind cervical groove, distinctly smaller than following spine and slightly ventral in position.

Rostrum (Figure 35a) spiniform, almost straight, 0.4 as long as remaining carapace. Supraocular spines slightly exceeding beyond cornea, overreaching midlength of rostrum, considerably remote from rostrum, and directed laterad.

Second, third and fourth abdominal segments with 4 equal-sized spines on anterior transverse ridge; posterior ridge of fourth segment with strong median spine. Pleuron of second segment more or less rounded; following pleura tapering. Gonopods absent from first abdominal segment.

Eyes dilated, eyelashes short.

Basal segment of antennule (Figure 35b) elongate, setose, lateral margin convex at proximal 1/3 of length, with 2 small tubercular elevations suggesting rudiments of spines; 2 terminal spines present, mesial terminal larger. Distomesial prolongation of first segment of antennal peduncle (Figure 35c) well developed, but nearly reaching level of rostral tip, thickly furnished with long setae especially on lateral margin; second segment produced on both distal margins; third segment spineless.

Third maxilliped (Figure 35d) setose. Ischium longer than merus, relatively thin, distoventral margin strongly produced, mesial ridge with rudimentary denticles. Merus with only one ventral marginal spine near midlength. Carpus unarmed, provided with setae especially long on dorsal margin.

Sternal segments (Figure 35e) comparatively wide and short; anterior margin of third thoracic sternum roughly transverse, but weakly undulating; following sternum widely triangular, in contact with about 1/3 of posterior margin of preceding sternum.

Chelipeds (Figure 35f) similar, subcylindrical, squamate, setiferous except for chela, 3 times as long as carapace including rostrum. Merus with 4 longitudinal rows of spines. Carpus shorter than movable finger, with 3 rows of spines and small distolateral marginal spine. Palm glabrous, slightly longer than finger, fully 7 times as long as wide, armed with 5 mesial marginal spines of large size and 2 lateral marginal of small size. Chela longer than merus of walking leg. Fingers not gaping, slightly curving distally; opposable margins minutely tuberculate, equidistantly provided with somewhat pronounced tubercles; fixed finger bifid distally.

Walking legs (Figure 35g) slender, depressed, squamate, setose especially on dorsal margins of merus and carpus. Merus of first walking leg as long as carpus plus propodus, armed with 11 dorsal marginal and 12 ventral marginal spines; distalmost of both marginal spines strongly developed. Carpus produced on both distal margins, bearing small dorsal marginal spine at distal 1/5 of length. Propodus 16 times as long as wide, about twice as long as dactylus, dorsal margin setose in proximal half, ventral margin with 5 spinelets. Dactylus weakly falciform, depressed, proportionately wide, dorsal margin setose, ventral margin nearly smooth.

Epipods absent from all pereopods.

Measurements of holotype. – Length of carapace including rostrum, 28.5 mm; width of carapace, 18.1 mm; length of cheliped (left), 85.8 mm; of carpus, 13.8 mm; of palm, 19.3 mm; of movable finger, 17.3 mm.

Measurements of paratypes. – Carapace lengths of males, 18.7 and 21.2 mm.

Habitat. – Taken in 564-686 m on bottom of mud or sand and coral.

Variation. – The posterior cardiac spine is absent in the male paratype from Station 5444. The posterior transverse ridge bears four spines in both the paratypes, instead of two as in the holotype. Dorsal marginal spines of the carpi of the walking legs vary from one to three including the terminal one on the first leg, and two to four on the second and third.

Remarks. – The general arrangement of the carapacial spines and the great prolongation of the first segment of antennal peduncle in this species suggest a close relationship with *M. variabilis* described below. Differences between these two species are noted under the "Remarks" of *M. variabilis*. *M. eminens* is also related to *M. normani* Henderson from the Fiji Islands, but it is distinguished by the extremely prolonged process on the first segment of the antennal peduncle; hence, the specific name: *eminens*, L., = projecting, alluding to this prolongation.

Type-locality. – Northwest of Atalaya Point, Batag Island, southeastern Luzon (12°43'51"N, 124°58'50"E).

Distribution. – Off the Pacific coast of southeastern Luzon and the South China Sea off Palawan, in 564-686 m.

53. *Munida exigua*, new species

Figure 36

Material. – East of Masbate (Sta. 5212: 1 ♂). – Vicinity of Marinduque off southwestern Luzon (Sta. 5371: 2 ♀; Sta. 5376: 2 ♂, 2 ovig. ♀ [1 male is holotype, USNM 150395]). – South China Sea off Hong Kong (Sta. 5309: 1 ♂).

Diagnosis. – Carapace longer than wide, with numerous transverse ridges mostly interrupted; 10-12 epigastric spines, 2 directly behind supraoculars most prominent; postcervical spine present; lateral margins subparallel, armed with 7 spines, anterolateral spine well developed. Front margin oblique. Rostrum almost straight, horizontal, weakly carinate dorsally. Supraocular spines extremely short and rather close to rostrum. Second abdominal segment with 8 spines on anterior ridge. Eyes moderately dilated distally, eyelashes short. Two terminal spines of antennular basal segment subequal in size. Ischium of third maxilliped strongly produced on distoventral margin; merus with 2 ventral marginal spines, distal one smaller, dorsal margin spineless. Sternum of third thoracic somite sinuous on anterior margin, as wide as anterior margin of following sternum. Chelipeds and walking legs slender, lacking epipods; first walking leg not reaching end of carpus of cheliped, propodus with 12 ventral marginal spinelets, dactylus slenderly spiniform. Two pairs of male gonopods.

Description of holotype. – Carapace (Figure 36a) excluding rostrum distinctly longer than wide. Transverse ridges numerous, mostly interrupted, sparsely furnished with iridescent setae. Gastric region more or less convex with row of 12 spines anteriorly, as illustrated; pair directly behind supraoculars prominent, mesial pair small, lateral second tiny and slightly anterior to level of transverse row. Postcervical spine small but distinct. Posterior transverse ridge spineless. Front margin oblique. Lateral margins subparallel, armed with 7 spines; well developed anterolateral and small spine posterior to it in front of cervical groove and other 5

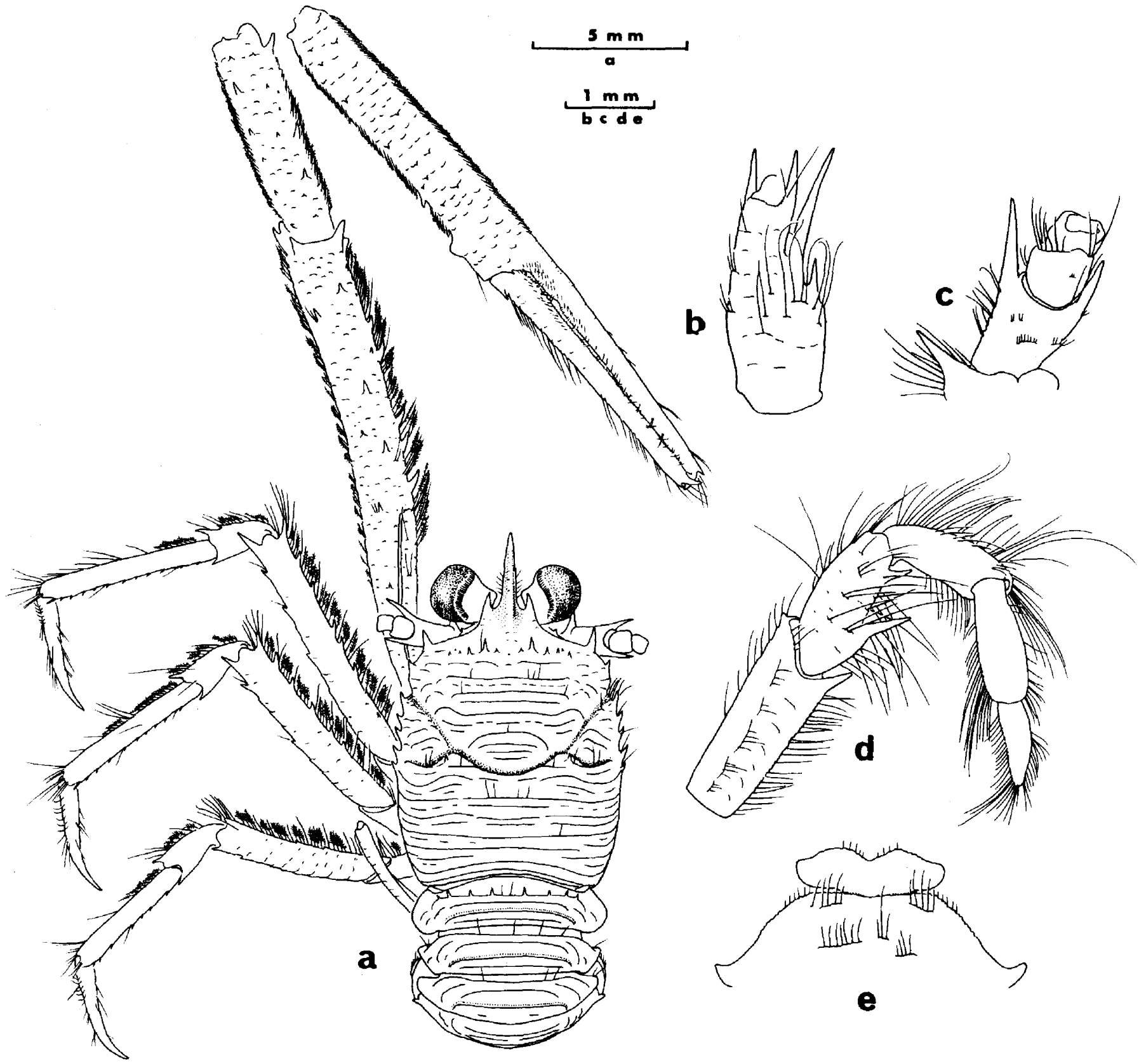

Figure 36. – *Munida exigua*, new species, male holotype from "Albatross" Sta. 5376: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of right third maxilliped; e, anterior part of sternal segments.

behind it.

Rostrum (Figure 36a) almost straight, horizontal, dorsally carinate weakly, laterally furnished with fine setae, slightly more than 1/4 of remaining carapace length. Supraocular spines subparallel, about 1/5 as long as, and rather close to, rostrum.

Second abdominal segment with 4 transverse ridges, anterior ridge with 8 spines; following segments spineless.

Eyes moderately dilated, but not greatly depressed dorsoventrally, eyelashes short.

Basal segment of antennule (Figure 36b) elongate, sparsely setose on ventral surface, armed with 2 terminal spines of subequal size and 2 lateral spines, proximal lateral short, located at midlength of segment, distolateral one well developed,

reaching tip of mesial terminal. First segment of antennal peduncle (Figure 36c) moderately produced on distomesial margin; second segment with 2 terminal spines, third segment unarmed.

Endopod of third maxilliped as illustrated (Figure 36d); ischium triangular in cross section, mesial ridge with 24 (left) or 21 (right) denticles, distoventral margin greatly produced. Merus shorter than ischium, bearing 2 ventral marginal spines, distal one smaller; dorsal margin unarmed.

Sternum of third thoracic somite (Figure 36e) nearly as wide as anterior margin of following sternum, strongly sinuous on anterior margin.

Right cheliped missing; left cheliped (Figure 36a) 4 times as long as carapace including rostrum, subcylindrical, squamate, sparsely tuberculate dorsally, setose marginally. Merus furnished with both long plumose and iridescent setae on mesial margin, armed with 4 rows of spines, mesial marginal row much pronounced. Spination of carpus as figured. Palm 5.5 times as long as wide, 1.4 times as long as carpus, slightly longer than fingers; mesial and lateral margins almost parallel, mesial margin with few spines and moderate-sized distal knob. Fingers subcylindrical, furnished with coarse setae marginally, feebly gaping at proximal portion, distally curving and crossing, ending in sharp point; tiny spine located just outside of each tip; small but distinct marginal spine at base of movable finger.

Walking legs (Figure 36a) comparatively slender, weakly squamate dorsally, furnished with both fine plumose and coarse iridescent setae on dorsal margin. First walking leg reaching midlength of carpus of cheliped when extended forward. Merus marginally armed with spines, dorsal and ventral terminal largest. Carpus with both terminal spines and 1 small dorsal marginal spine at distal 1/4 of length. Propodus 8 times as long as wide, 1.3 times as long as dactylus, ventral margin with 12 spinelets. Dactylus very slender, spiniform, distally curving ventrad, sparsely furnished with long coarse setae; 7 spinelets discernible under high magnification in distal half of ventral margin. Second walking leg similar to first, bearing fewer marginal spines and spinelets. Third walking leg much shorter than anterior 2 legs, marginal spines more reduced, dactylus more strongly curving ventrad, with 3 tiny ventral marginal spines.

Two pairs of male gonopods.

Epipods absent from all pereopods.

Measurements of holotype. – Length of carapace including rostrum, 11.0 mm; width of carapace, 6.7 mm; length of cheliped (left), 44.0 mm; of carpus, 7.3 mm; of palm, 10.4 mm; of movable finger, 9.0 mm.

Measurements of paratypes. – Carapace lengths of males, 7.8-9.4 mm; of ovigerous females, 12.1-13.0 mm; of nonovigerous females, 8.2-8.7 mm.

Habitat. – Taken in 110-198 m on bottoms of mud or mud mixed with sand.

Variation. – The next to anteriormost of the 12 epigastric spines are barely discernible or completely lost in four paratypes; the median two spinules are vestigial in a male from Station 5212. Unlike the holotype all the paratypes bear a distinct row of three or four small dorsal spines on the palm of the cheliped. The distomesial marginal knob of the palm seen in the holotype presumably is the result of injury; it is completely absent from all paratypes.

Remarks. – This new species is closely related to *Munida babai* Tirmizi and Javed in general appearance, especially in having an extremely short rostrum. The short

eyelashes, the lack of spines on the third and fourth abdominal segments, and the absence of the distodorsal spine on the merus of the third maxilliped, however, are characteristic of this new species.

One male and two female specimens were also taken by the Japanese R/V "Soyo Maru" in Sagami Bay, Japan (35°16.2'N, 139°29.5'E, 68-72 m, 8 Apr 1958, beam trawl), and now deposited in the National Science Museum, Tokyo; the male is 11.5 mm in carapace length and the females 10.9 mm and 13.0 mm (larger female ovigerous). No morphological differences between the Japanese and Philippine specimens were noted.

Type-locality. – Southeast of Tayabas Light, off southwestern Luzon (13°42'50"N, 121°51'30"E).

Distribution. – Recorded here from the Philippines in the east of Masbate Island and Tayabas Bay off southwestern Luzon, off Hong Kong, and Sagami Bay, Japan; in 68-198 m.

54. *Munida fortiantennata*, new species

Figure 37

Material. – Molucca Sea off west coast of Halmahera (Sta. 5618: 1 ♀, holotype, USNM 150378).

Diagnosis. – Carapace with interrupted but distinct striae, armed with 2 epigastrics, 2 postcervicals, 1 median cardiac and 4 spines on posterior ridge; lateral margin with 2 spines in front of cervical groove and 4 behind it. Front margin slightly oblique. Rostrum almost straight. Supraocular spines as stout as rostrum at base, directed slightly laterad, widely separated from, and, overreaching midlength of, rostrum. Second through fourth abdominal segments with 4 spines on anterior ridge; posterior ridge of fourth segment with prominent median spine. Eyes dilated. Basal segment of antennule with 1 lateral and 2 terminal spines, lateral terminal larger than mesial terminal. Anterior prolongation of first segment of antennal peduncle reaching end of rostrum. Third maxilliped setose; prominent spine on distoventral margin of ischium and on midventral margin of merus. Sternum of third thoracic somite wider than anterior margin of following sternum. Chelipeds moderately squamate, relatively short and slender. Walking legs comparatively short, first leg reaching about to midlength of palm of cheliped; propodi lacking ventral marginal spinelets. Epipods absent from all pereopods.

Description of holotype. – Carapace (Figure 37a) as long as wide when measured between front and posterior margins; dorsal surface strongly rugose, striae mostly interrupted, squamiform in anterior half. Gastric region weakly convex with 2 prominent spines behind supraoculars. Cervical groove distinct. Postcervical spine well developed. Cardiac region rather well circumscribed, anteriorly depressed, with elevated transverse ridge bearing well developed median spine. Uninterrupted posterior transverse ridge with 4 distinct spines. Front margin somewhat oblique. Lateral margin moderately convex with 6 spines: moderate-sized anterolateral and smaller accompanying spines in front of cervical groove and other 4 behind it; foremost of latter located near end of cervical groove, much smaller and rather ventral in position.

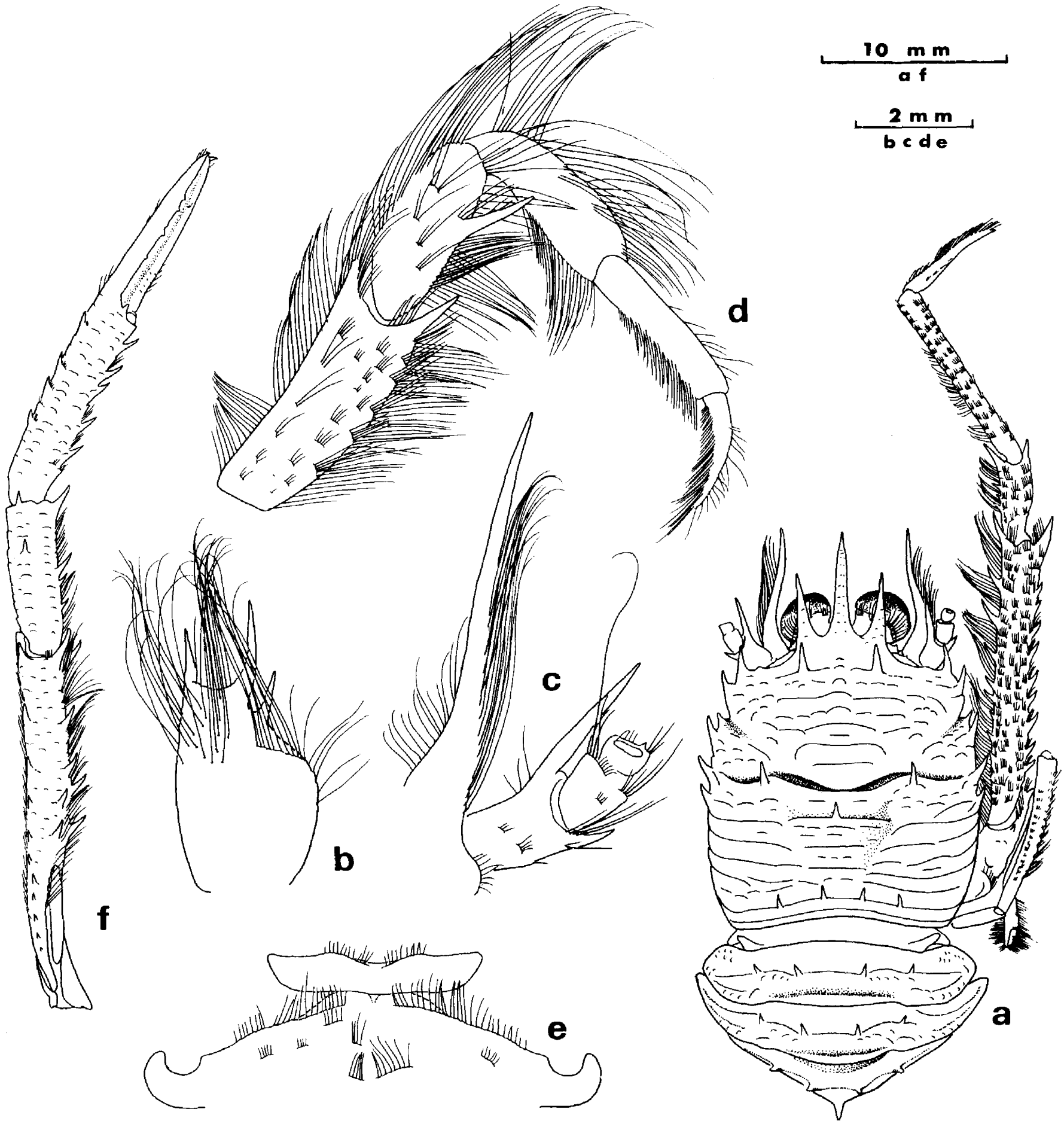

Figure 37. – *Munida fortiantennata*, new species, female holotype from "Albatross" Sta. 5618: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of right third maxilliped; e, anterior part of sternal segments; f, left cheliped.

Rostrum almost straight, laterally ridged, about 1/3 as long as remaining carapace; dorsal surface feebly granulate with fine setae. Supraocular spines straight, stout basally, sharp distally, directed slightly laterad, widely separated from rostrum, distinctly overreaching cornea, terminating opposite distal 1/3 of rostral spine.

Eyes moderate in size, not strongly dilated distally, eyestalk short, eyelashes not reaching corneal margin.

Second through fourth abdominal segments (Figure 37a) with 4 spines on anterior ridge, median 2 somewhat larger; prominent median spine on posterior ridge of fourth segment.

Basal segment of antennule (Figure 37b) medially swollen, setose in distal half; lateral terminal spine larger than mesial terminal; lateral margin with short, slender spine distally. Anterior prolongation of first segment of antennal peduncle (Figure 37c) well developed, reaching rostral tip, fringed with long setae on lateral margin; distomesial process of second segment overreaching end of antennal peduncle, ending opposite midlength of anterior prolongation of first segment, distolateral process moderate-sized.

Endopod of third maxilliped (Figure 37d) setose; distal 2 segments slender. Ischium relatively thin, ventral margin with well developed distal spine, mesial ridge with 20 denticles of irregular size. Merus with prominent spine on midventral margin.

Anterior part of sternal segments as illustrated (Figure 37e); sternum of third thoracic somite wider than anterior margin of following sternum.

Right cheliped missing. Left cheliped (Figure 37f) moderately spinose, squamate, subcylindrical, 2.3 times as long as carapace including rostrum; mesial margins of merus and carpus thickly provided with plumose setae. Three longitudinal rows of acute spines on merus: dorsal row of 11 spines, mesial marginal of 5, and ventromesial marginal of 4. Two dorsal and 4 mesial marginal spines distinct on carpus. Palm more or less depressed, longer than fingers, nearly 5 times as long as wide, armed with 4 lateral marginal and 5 mesial marginal spines, latter larger. Fingers not gaping, feebly ridged dorsally, slightly longer than carpus; opposable margins almost straight, with several pronounced tubercles interspersed among small ones; fixed finger bifid at apex.

Right third walking leg (Figure 37a) undetached from body, others detached, all similar; depressed, squamate, marginally spinose, and setose on dorsal margin. Meri armed with 12 dorsal marginal and 10 ventral marginal spines, terminal one of latter strongly produced. Carpi produced at both distal margins, dorsal margin with 3 spines. Propodi about 10 times as long as wide, lacking distinct ventral marginal spinelets. Dactyli about half as long as propodi, relatively slender but depressed, curving slightly ventrad, dorsal margin setose, ventral margin almost smooth but provided with 1-5 very tiny serrae.

Epipods absent from all pereopods.

Measurements of holotype. – Length of carapace including rostrum, 21.7 mm; width of carapace, 14.3 mm; length of cheliped (left), 52.0 mm; of carpus, 9.0 mm; of palm, 11.7 mm; of movable finger, 9.8 mm.

Habitat. – Taken in 763 m on mud bottom.

Remarks. – The presence of the cardiac spine, the extremely developed anterior prolongation of the first segment of the antennal peduncle and the lack of a spine at midlength of the lateral margin of the antennular basal segment, so characteristic of *Munida fortiantennata*, are also shared with the Philippine *M. eminens* and *M. variabilis*. The former differs clearly from these two relatives in that there is no spine behind the postcervical spine, and that the second segment of the antennal peduncle bears a strongly produced terminal spine distinctly overreaching the peduncle.

Type-locality. – Northwest of Mareh Island in the Molucca Sea off western Halmahera (0°37'00"N, 127°15'00"E).

Distribution. – Recorded here from the unique female holotype from the Molucca Sea, in 763 m.

55. *Munida heteracantha* Ortmann, 1892

Figure 38

Munida heteracantha Ortmann, 1892:255, pl. 11: figs. 12, 12i, 12k. – Doflein, 1902:644. – Baba, 1969c: 49.
Munida semoni Ortmann, 1894:24, pl. 1: figs. 4, 4i.
Munida japonica var. *heteracantha*: Balss, 1913:15.– Melin, 1939:89, fig. 58.
Munida japonica heteracantha: Yanagita, 1943:27, fig. 8.

Material. – Off northern Mindanao (Sta. 5517: 1 ♂; Sta. 5519: 1 ovig. ♀; Sta. 5523: 1 ♂). – Between Negros and Siquijor (Sta. 5536: 1 ♂, 2 ♀; Sta. 5537: 1 ovig. ♀, 1 ♀). – Between Cebu and Bohol (Sta. 5197: 3 ♂, 1 ovig. ♀, 2 ♀; Sta. 5411: 15 ♂, 6 ovig. ♀, 1 ♀, 1 sp. (sex indet.); Sta. 5412: 5 ♂, 4 ovig. ♀; Sta. 5416: 2 ♂, 2 ovig. ♀; Sta. 5417: 8 ♂, 2 ovig. ♀, 2 ♀; Sta. 5418: 1 ♀; Sta. 5419: 3 ♂, 5 ovig. ♀, 2 ♀). – Between Cebu and Leyte (Sta. 5408: 1 ♂, 1 ovig. ♀; Sta. 5409: 1 ♂, 1 ovig. ♀). Between Burias and Luzon (Sta. 5387: 1 ♂). – Vicinity of Marinduque off southwestern Luzon (Sta. 5372: 1 ♂). – South China Sea off southwestern Luzon (Sta. 5116: 1 ♂, 1 ovig. ♀; Sta. 5272: 1 ♀). – South China Sea off northwestern Luzon (Sta. 5440: 1 ♂; Sta. 5441: 1 ♂). – Off southeastern Luzon (Sta. 5453: 1 ♀).

Measurements. – Carapace lengths of males, 11.2-26.4 mm; of ovigerous female, 17.3-25.3 mm; of nonovigerous females, 10.3-24.4 mm.

Diagnosis. – Carapace with numerous striae, dorsally armed with 8-12 epigastric spines; lateral protogastric, postcervical and anterior branchial spines variably present or absent. Front margin slightly oblique. Rostrum laterally ridged, curving faintly dorsad. Supraocular spines almost horizontal, rather close to, and distinctly less than half as long as, rostrum. Second abdominal segment with 8-14 spines. Eyes dilated distally, eyelashes variable in length. Two terminal spines of antennular basal segment subequal in size. Merus of third maxilliped with 2 ventral marginal spines, distal one smaller; dorsal margin unarmed. Sternum of third thoracic somite wider than anterior margin of following sternum. Chelipeds and walking legs squamate, lacking epipods. Two pairs of male gonopods.

Habitat. – Taken usually on green mud bottoms, rarely mixed with sand and shells, or on globigerina; in 216-511 m.

Remarks. – Ortmann (1892:24) described *Munida semoni* from Ambon because he thought it to be distinct from *M. heteracantha* in having the supraocular spine as long as the eye and the merus of the third maxilliped with three ventral marginal spines. However, there may be little justification for such discrimination, for examination of the present "Albatross" Philippine material as well as another collection from Japanese waters now deposited in the Kyushu University (ZLKU 4324, 4690, 7577, 8072, 8989, 11004, 11010), both of *M. heteracantha*, disclosed that these morpho-

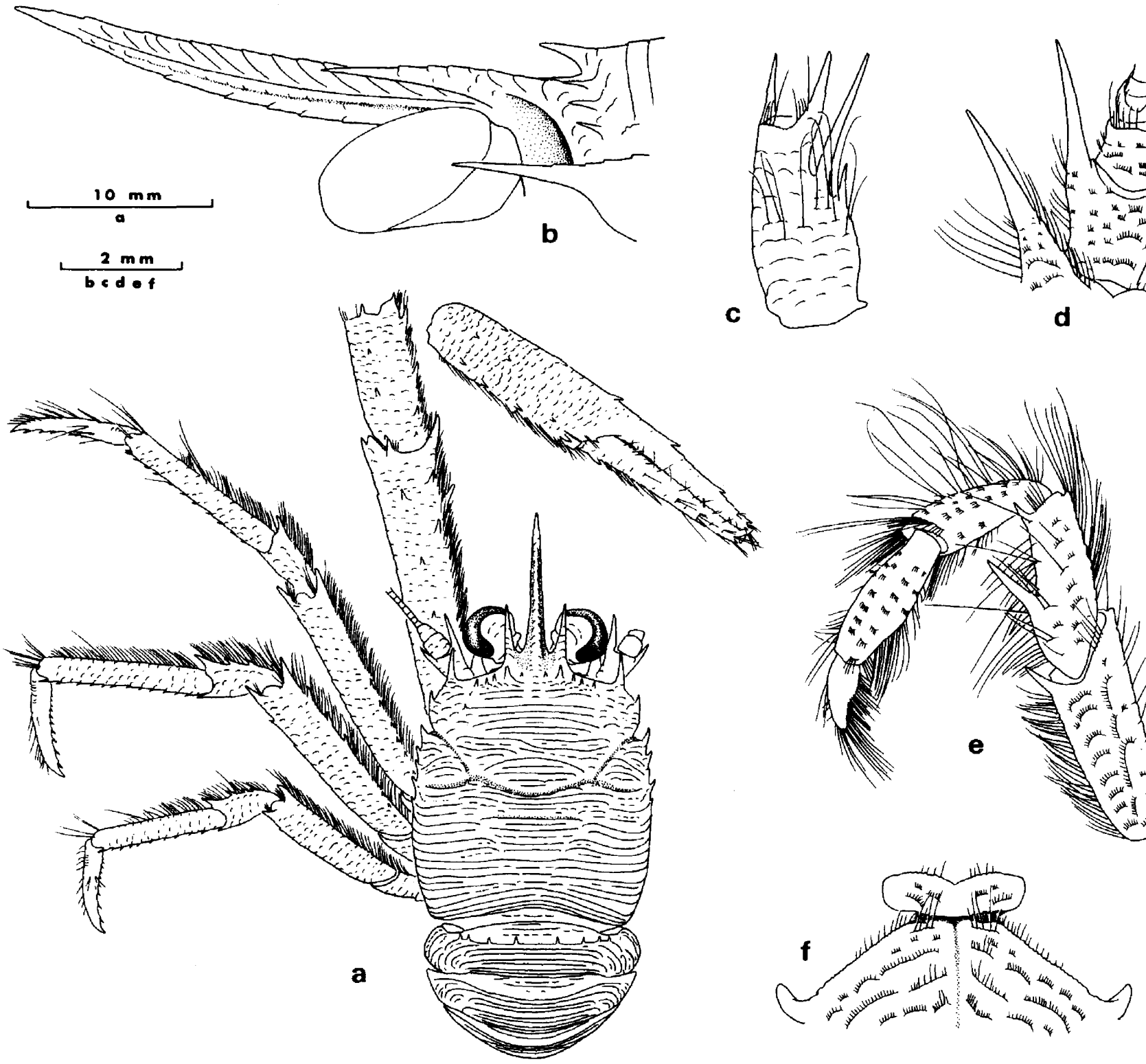

Figure 38. – *Munida heteracantha* Ortmann, male from "Albatross" Sta. 5411, carapace length 22.0 mm: a, dorsal view; b, rostrum; c, basal segment of left antennule; d, left antennal peduncle; e, endopod of left third maxilliped; f, anterior part of sternal segments.

logical characters are highly variable. In all the specimens examined the supraocular spines are, without exception, less than a half of the rostral length, varying from reaching or slightly exceeding to falling distinctly short of, the end of the cornea. The meral mesial margin of the third maxilliped usually bears two spines, but in several specimens it is variably spinose, even trispinose, as is characteristic of *M. semoni*. Furthermore, careful examination reveals another morphological variation existing in this species: The epigastric spines vary from eight to 12, usually 10; the lateral protogastric spine and the postcervical just behind the anterior bifurcation of the cervical groove are irregularly present or absent; the postcervical spine is present in much of the material, but it tends to be reduced and it is sometimes totally absent; the second abdominal segment bears eight to 12 dorsal spines, rarely 14, usually eight. The eyelashes are also variable in length, from quite short to reaching fully to the corneal margin.

Type-locality. – Kadsiyama [? = Katsuyama] and Sagami Bay, Japan.

Distribution. – Known from the Philippines between Mindanao and Luzon, the East China Sea, the Bonin Islands, and Sagami Bay and vicinity; in 30-511 m.

56. *Munida incerta* Henderson, 1888

Munida incerta Henderson, 1888:130, pl. 13: figs. 4, 4a. – Estampador, 1937:498. – Yanagita, 1943:15, figs. 1, 2. – Barnard, 1950:492, fig. 92a. – Tirmizi, 1966:205, fig. 22. – Miyake, 1982:146, pl. 49: fig. 5. – Baba, in Baba, Hayashi and Toriyama, 1986:171, 290, fig. 121.

Material. – Molucca Sea off west coast of Halmahera (Sta. 5621: 4 ♂, 4 ovig. ♀, 4 ♀; Sta. 5622: 4 ♂, 2 ovig. ♀, 1 ♀; Sta. 5623: 1 ♂, 2 ♀; Sta. 5624: 1 ♂, 1 ♀). – Sulu Archipelago (Sta. 5576: 1 ♂). – Off northeastern Borneo (Sta. 5580: 1 ♂; Sta. 5592: 3 ♂, 1 ♀; Sta. 5593: 1 ♂). – Off northern Mindanao (Sta. 5541: 1 ovig. ♀). – South China Sea off southwestern Luzon (Sta. 5111: 1 ovig. ♀; Sta. 5116: 2 ♂, 2 ovig. ♀; Sta. 5265: 2 ♂, 1 ♀; Sta. 5281: 1 ♀). – South China Sea off northwestern Luzon (Sta. 5441: 3 ♂, 8 ovig. ♀, 7 ♀).

Measurements. – Carapace lengths of males, 14.8-34.5 mm; of ovigerous females, 25.5-34.0 mm; of nonovigerous females, 18.1-31.0 mm.

Diagnosis. – Carapace more or less flattish, dorsally armed with 2 epigastric spines and longitudinal row of 3 spines on branchiocardiac boundary on each side, laterally with 2 spines in front of cervical groove and 4 behind it; no spine on posterior transverse ridge. Front margin transverse. Rostrum slenderly spiniform, straight, horizontal. Supraocular spines subparallel, horizontal. Second through fourth abdominal segments with 4 spines on anterior ridge; fourth segment with median spine on posterior ridge. Eyes dilated distally, cornea moderately depressed. Mesial terminal spine of basal segment of antennule larger than lateral terminal. First segment of antennal peduncle with well developed anterior prolongation. Merus of third maxilliped with midventral and distodorsal spines, both slender; ischium greatly produced on distoventral margin. Chelipeds and walking legs squamate dorsally and ventrally; walking legs depressed, dorsolaterally flattish. Male gonopod absent from first abdominal segment.

Habitat. – Taken in 70-558 m on bottoms of sand and/or mud, occasionally mixed with coral or broken shells.

Remarks. – Specimens from Stations 5111, 5116 and 5265 were identified by J.E. Benedict. No additional characters of significance were noted.

Type-locality. – Off Zamboanga, Mindanao.

Distribution. – Known from the east African coasts of Delagoa Bay off southern Mozambique and Zanzibar, the Malay Archipelago between the Moluccas and Luzon, Okinawa Trough and off the Pacific coast of Honshu, Japan; in 17-658 m.

57. *Munida inornata* Henderson, 1885

Figure 39

Munida inornata Henderson, 1885:411; 1888:140, pl. 14: figs. 6, 6a-b.

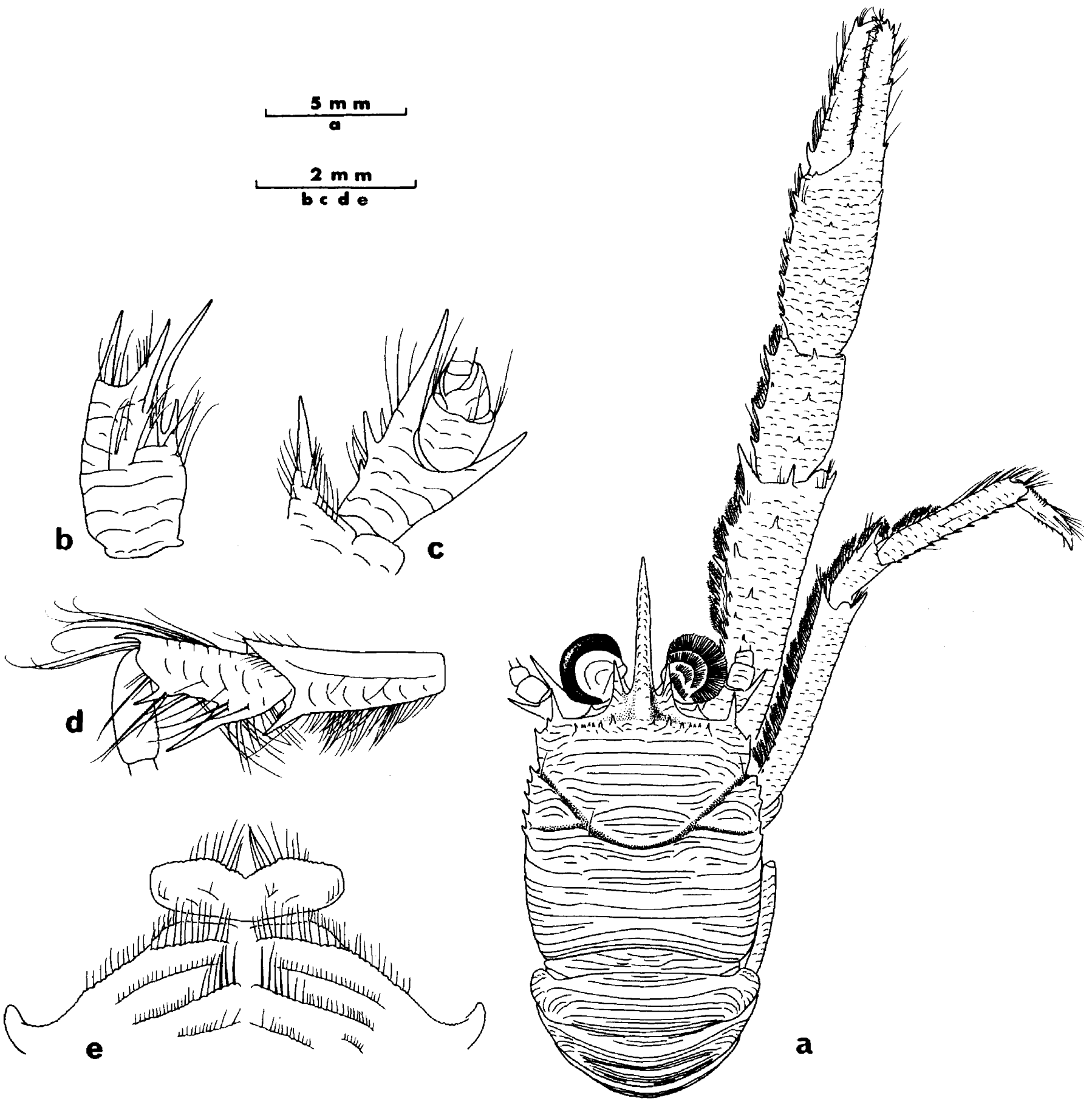

Figure 39. – *Munida inornata* Henderson, male from "Albatross" Sta. 5173: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of left third maxilliped, distal 2 segments omitted; e, anterior part of sternal segments.

Material. – Sulu Archipelago (Sta. 5173: 1 ♂).

Measurements. – Carapace length of male, 14.1 mm.

Diagnosis. – Carapace with numerous transverse ridges, armed with 12-14 epigastric spinules; no postcervicals. Front margin transverse. Rostrum half as long as remaining carapace, directed anterodorsally in straight line, laterally ridged, ventrally carinated. Supraocular spines subparallel, extremely short, not overreaching proximal 1/4 of rostral spine, more or less close to rostrum. Abdomen unarmed or

with few spinules on second segment. Eyes dilated distally, eyelashes long. Terminal spines of antennular basal segment subequal in size. First segment of antennal peduncle with process not overreaching second segment; second segment with 2 strong terminal and 1 or 2 small mesial marginal spines. Merus of third maxilliped with 2 prominent spines on ventral margin, proximal one larger, dorsal margin with distinct terminal spine. Sternum of third thoracic somite slightly wider than anterior margin of following sternum. Chelipeds and walking legs squamate dorsally and ventrally, lacking epipods. First walking leg overreaching end of carpus of cheliped when extended forward, propodus with 11 ventral marginal spinelets. Two pairs of male gonopods.

Habitat. – Taken in 340 m on bottom of shells and coral.

Remarks. – The present specimen agrees well with the species accounts of Henderson (1885:411; 1888:140), except that there is no trace of spines on the second abdominal segment and that the cheliped is slightly stouter, with very numerous spines especially on the mesial and lateral margins of the chela.

This species is so closely related to *Munida japonica* Stimpson and *M. heteracantha* Ortmann that difficulty may be encountered in separating them from this one. In *M. japonica*, however, the lateral protogastric and postcervical spines are usually present; the front margin of the carapace is more or less oblique; the sternum of the third thoracic somite is narrower than the anterior margin of the following sternum; and the supraocular spine is distinctly longer. *M. heteracantha* seems much closer to *M. inornata* in the striation of the carapace and the shape of the sternum, but it differs in lacking a distinct spine on the distodorsal margin of the merus of the third maxilliped.

Type-locality. – Off the Admiralty Islands (1°54'00"S, 146°39'40"E).

Distribution. – Previously known from the above mentioned type-locality in 275 m.

58. *Munida japonica* Stimpson, 1858

Munida japonica Stimpson, 1858:252; 1907:235. – Ortmann, 1892:254, pl. 11: figs. 11, 11i, 11k. – De Man, 1902:724. – Balss, 1915:3. – Parisi, 1917:1. – Laurie, 1926:135. – Yokoya, 1933:58. –Melin, 1939:85, figs. 54-57. – Miyake, 1947:733, fig. 2119; 1965:635, fig. 1046. – Tirmizi, 1966:195, figs. 15, 16. – Miyake and Baba, 1967c:240, figs. 11, 12. – Lewinsohn, 1969:131, fig. 26. – Haig, 1973:271. – Baba, 1977a:253. – Miyake, 1982:146, pl. 49: fig. 4. – Baba, in Baba, Hayashi and Toriyama, 1986:171, 290, fig. 122.

Munida honshuensis Benedict, 1902:261, fig. 11.

Munida japonica typica Balss, 1913:15, fig. 14.

Munida militaris variety *andamanica*: Boone, 1935:42, pl.10.

Munida japonica japonica Yanagita, 1943:24, fig. 7.

Material. – Flores Sea off southern Sulawesi (Sta. 5661: 2 ♀). – Davao Gulf off southeastern Mindanao (Sta. 5253: 1 ovig. ♀; Sta. 5254: 1 ♂, 9 ovig. ♀, 2 ♀; Sta. 5255: 1 ♂, 1 ♀). – Off northern Mindanao (Sta. 5517: 2 ♂; Sta. 5519: 1 ovig. ♀). – Off northeastern Palawan (Sta. 5432: 1 ovig. ♀). – Between Samar and Leyte (Sta. 5481: 1 ♀; Sta. 5483: 1 ♂, 1 ♀). – Between Masbate and Leyte (Sta. 5398: 1 ♂). – Off southeastern Luzon (Sta. 5453: 1 ♂). – Vicinity of Marinduque off southwestern

Luzon (Sta. 5369: 1 ovig. ♀). – South China Sea off southwestern Luzon (Sta. 5279: 1 ♂). – South China Sea off northwestern Luzon (Sta. 5442: 1 ♂, 1 ovig. ♀).

Measurements. – Carapace lengths of males, 7.3-24.0 mm; of ovigerous females, 5.8-18.7 mm; of nonovigerous females, 5.7-16.1 mm.

Diagnosis. – Carapace distinctly rugose, striae usually uninterrupted; 10-14 epigastric spines; 1 lateral protogastric, 1 anterior branchial and 1 postcervical spines on each side. Front margin slightly oblique. Rostrum spiniform, horizontal. Supraocular spines subparallel, about half or less than half as long as rostrum. Second abdominal segment spineless, rarely with few tubercles. Eyes dilated distally, eyelashes long. Basal segment of antennule typical, 2 terminal spines subequal in size. Second segment of antennal peduncle with 1 small mesial marginal and 2 well developed terminal spines. Merus of third maxilliped with distinct spine on distodorsal margin. Sternum of third thoracic somite nearly as wide as anterior margin of following sternum. Two pairs of male gonopods. Epipods absent from all pereopods.

Habitat. – Taken in 51-333 m on bottoms of mud, or sand, occasionally mixed with coral or globigerina or broken shells and gravel, or on coral or hard bottom.

Remarks. – The specimens from Stations 5253, 5254 and 5432 seemed at the time of preliminary sorting to be distinct from the typical *M. japonica*, because of their much smaller size, the carapace lengths of ovigerous females ranging from 5.8 to 8.1 mm. Closer examination of this material also showed that the distodorsal marginal spine of the merus of the third maxilliped, characteristic of *M. japonica*, is sometimes barely discernible. Inasmuch as no other characters that might distinguish it from typical *M. japonica*, however, this form is merged with *M. japonica* for the time being.

As pointed out under the "Remarks" of *M. andamanica*, Boone's *M. andamanica* seems to be identical with this species.

Type-locality. – Kagoshima Bay, Japan.

Distribution. – Known from the Red Sea, Zanzibar, Providence Island, Mauritius, Western Australia, Indonesia and the Philippines between southern Sulawesi and Luzon, the Bonin Islands, East China Sea, and Japan; in 30-900 m.

59. *Munida kuboi* Yanagita, 1943

Figure 40

Munida kuboi Yanagita, 1943:20, figs. 5, 6.

Material. – Illana Bay off southwestern Mindanao (Sta. 5256: 1 ♀). – Between Cebu and Bohol (Sta. 5416: 1 ♂). – South China Sea off southwestern Luzon (Sta. 5116: 1 ♂; Sta. 5117: 1 ♂).

Measurements. – Carapace lengths of males, 14.3-20.0 mm; of nonovigerous female, 20.5 mm.

Diagnosis. – Carapace excluding rostrum 1.5 times as long as wide, lateral margins almost parallel; 8 epigastric spines; 1 lateral protogastric and 1 postcervical spines on each side. Front margin oblique. Rostrum slightly arched in lateral view.

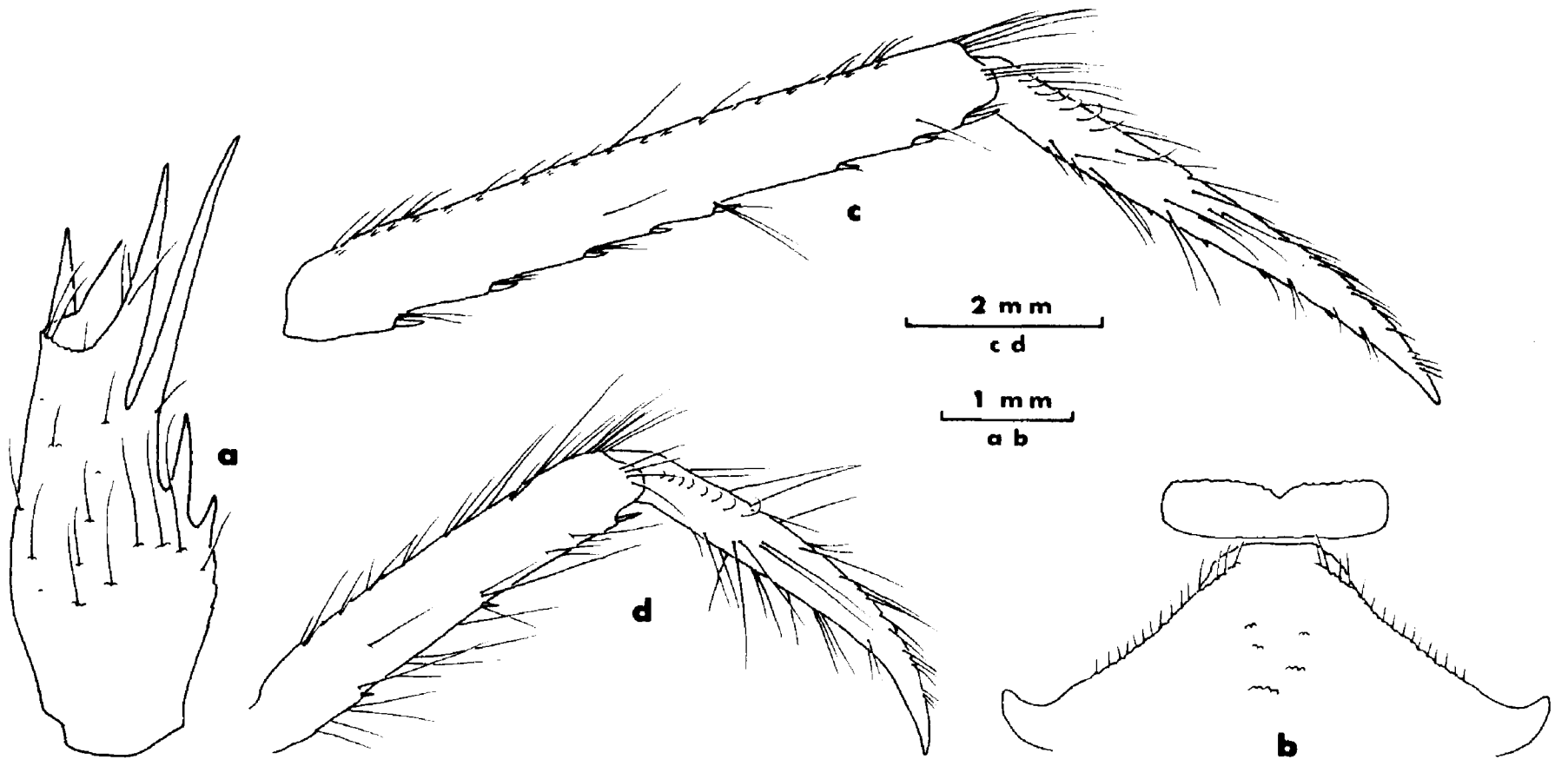

Figure 40. – *Munida kuboi* Yanagita, male from "Albatross" Sta. 5116, carapace length 16.7 mm: a, basal segment of left antennule; b, anterior part of sternal segments; c, distal segments of right first walking leg; d, distal segments of right third walking leg.

Supraocular spines subparallel. Second and third abdominal segments armed with 7-11 and 2-4 spines respectively. Antennular basal segment with 2 terminal and 2 lateral spines, lateral terminal larger than mesial terminal. Chelipeds slender, subcylindrical, covered with spinules, fingers usually gaping in proximal 1/3 of length. Dactyli 0.8 as long as propodi in first and second walking legs, nearly as long in third. Male gonopods on first and second abdominal segments. Epipods absent from pereopods.

Habitat. – Taken in 216-366 m on mud bottoms.

Remarks. – In a male specimen from Station 5116 the antennular basal segment bears an additional lateral marginal spine, as illustrated (Figure 40a). The dactylus of the walking leg is said to be 4/5 as long as the propodus (Yanagita, 1943:22). This is true of the first and second legs (Figure 40c); in the third leg, however, these two segments are almost subequal in size (Figure 40d); the dactylus is curved more distinctly than in the anterior two legs, and the ventral marginal spinelets of the propodus are reduced to three in number.

The sternum of the third thoracic somite is described and illustrated here for the species (Figure 40b): The anterior margin minutely dentate, medially notched, almost parallel to posterior margin, and distinctly wider than anterior margin of following sternum.

Type-locality. – Toyama Bay in the Sea of Japan.

Distribution. – Previously known only from the above mentioned type-locality in 78-148 m.

60. *Munida leviantennata*, new species

Figures 41, 42

Material. – Molucca Sea off west coast of Halmahera (Sta. 5626: 1 ♀, holotype, USNM 150338).

Diagnosis. – Carapace with minutely tuberculate transverse ridges, armed with 5 epigastrics, 2 protogastrics, 2 metagastrics, 2 postcervicals, 4 cardiacs and other 2 spines on posterior ridge. Lateral margins nearly parallel, each with only 3 spines, foremost anterolateral and strongly developed, remaining 2 much reduced. Front margin transverse. Rostrum spiniform, arched in lateral view. Supraocular spines rather close to rostrum. Second through fourth abdominal segments with 2 distinct transverse ridges; anterior ridges with 6, 4, 2 spines on second, third, fourth segment respectively; posterior ridges with 2 spines. Eyes dilated and depressed distally, eyelashes short. Basal segment of antennule elongate, armed with 2 well developed, equal-sized terminal and 1 small midlateral spines. Antennal peduncle unarmed. Third maxilliped strongly pubescent; merus with midventral spine. Sternum of third thoracic somite wider than anterior margin of following sternum. Meri of walking legs greatly produced on distoventral margin. Epipods absent from pereopods.

Description of holotype. – Carapace (Figure 41) distinctly longer than wide, lateral margins subparallel, anterolateral spine strongly produced forward, followed by 2 small spines, one of them located directly behind anterolateral spine and another at end of cervical groove. Dorsal surface of carapace with interrupted transverse ridges, all ridges minutely tuberculate when seen under high magnification. Spination as illustrated (Figure 41); 5 epigastric, 2 protogastric, 2 metagastric and 2 postcervical spines; transverse row of 4 cardiac spines much reduced in size; posterior transverse ridge with 2 spines.

Rostrum slender, moderately compressed laterally, arched in lateral view, finely crenulate dorsally, less than 1/3 as long as remaining carapace; extending far beyond corneal margin. Supraocular spines broken, presumably rather close to rostrum.

Second, third and fourth abdominal segments with 2 elevated transverse ridges; anterior ridges with 6, 4 and 2 spines on second, third and fourth segment respectively; posterior ridges with 2 spines.

Eyes considerably dilated distally, dorsoventrally depressed; eyelashes short.

Basal segment of antennule (Figure 42a) setose, very elongate, constricted on distal 1/3 of length, with 2 equal-sized terminal and 1 short midlateral spines. Antennal peduncle (Figure 42b) unarmed; first segment with few short setae on rounded distomesial margin; second segment more than twice as long as wide, bluntly produced and furnished with long coarse setae on distomesial and lateral margins; third segment narrower than second, twice as long as wide, unarmed, also provided with long setae distally.

Third maxilliped (Figure 42c) unusually setose. Ischium longer than merus, strongly produced on distoventral margin; merus with prominent midventral spine, dorsal margin unarmed. Distal 2 segments slender.

Sternum of third thoracic somite (Figure 42d) without distinct median notch,

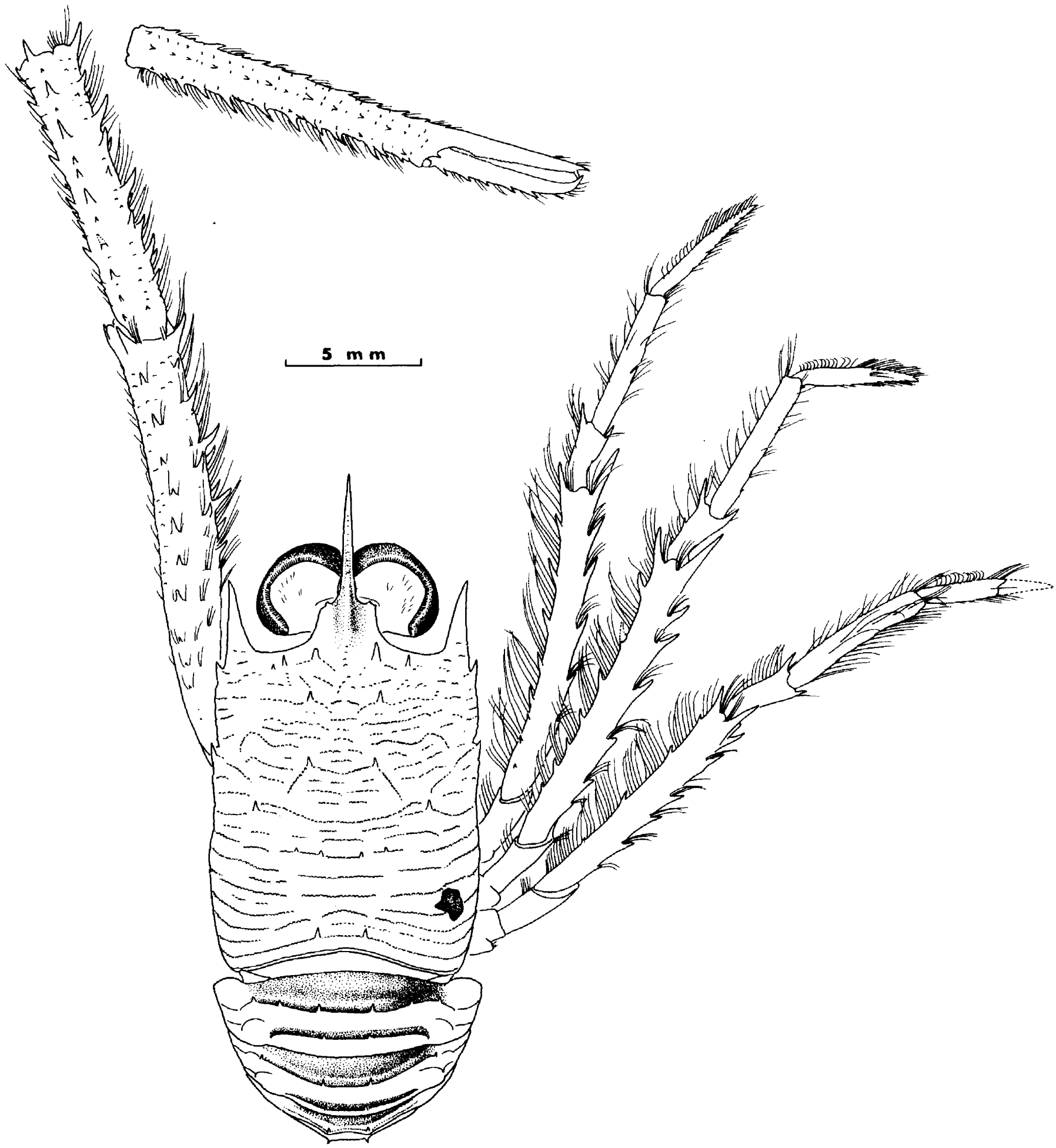

Figure 41. – *Munida leviantennata*, new species, female holotype from "Albatross" Sta. 5626, dorsal view.

minutely dentate on anterior margin, comparatively wide, considerably separated from following sternum.

Cheliped (Figure 41) subcylindrical, somewhat slenderer distally, spinose, and weakly squamate; mesial margins of merus, carpus and palm with iridescent setae. Spination as illustrated. Merus wider than carpus. Carpus nearly as long as palm, fully twice as long as finger. Palm 7 times as long as wide, distinctly narrower than

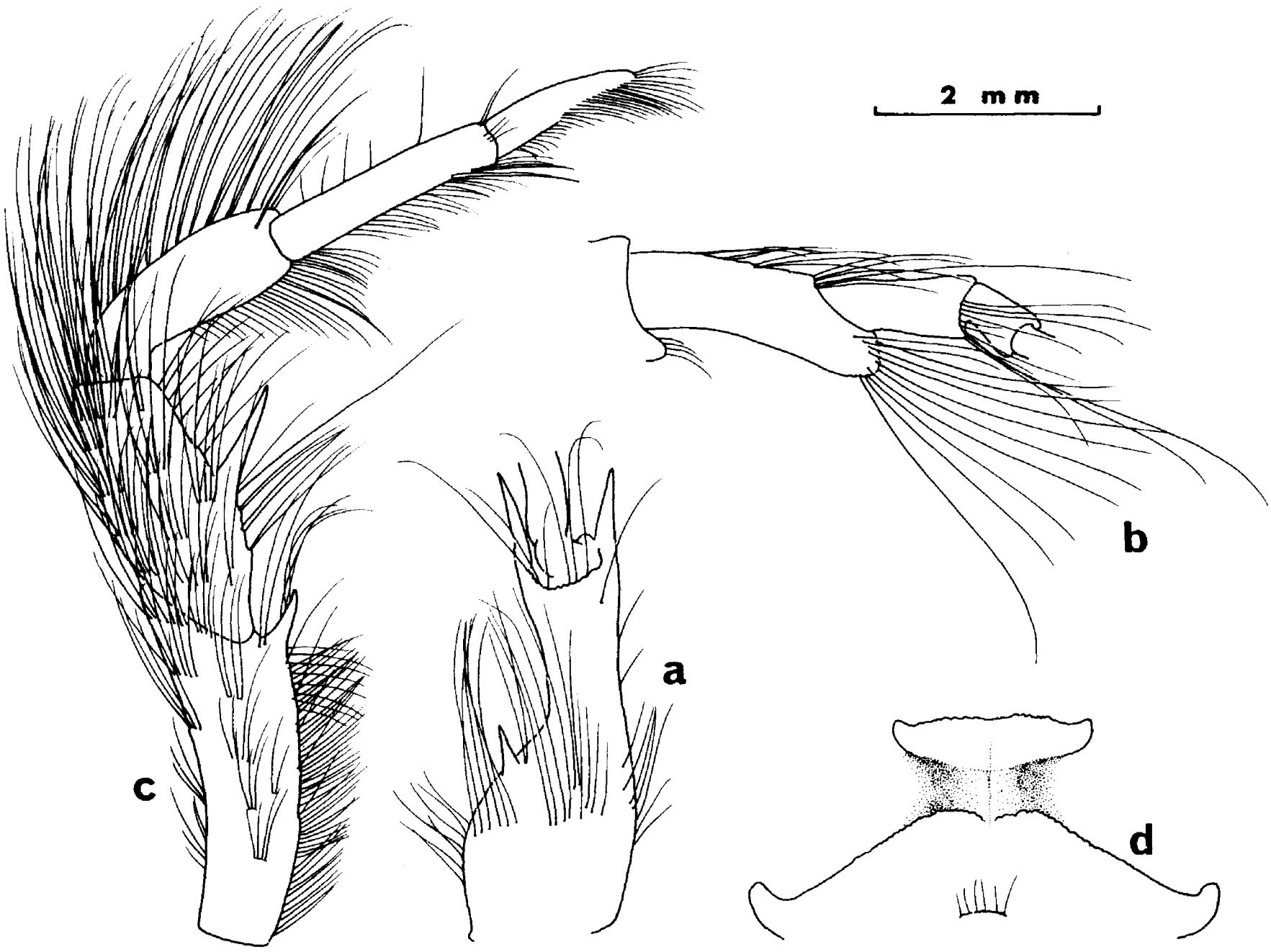

Figure 42. – *Munida leviantennata*, new species, female holotype from "Albatross" Sta. 5626: a, basal segment of right antennule; b, right antennal peduncle; c, endopod of right third maxilliped; d, anterior part of sternal segments.

carpus. Fingers relatively slender, not gaping, strongly curving distally, ending in sharp point; opposable margins tuberculate without any processes, fixed finger biramous at apex.

Walking legs (Figure 41) similar, depressed, setose especially on dorsal margin; iridescent setae on merus; first walking leg falling short of end of carpus of cheliped when extended forward. Meri strongly spinous on both margins; 9 dorsal marginal spines decreasing in size proximally, proximal one smallest, lateral in position; ventral margin with 6 well developed spines, terminal one greatly elongate, falling only slightly short of end of carpus in first and second walking legs. Carpi with well developed distodorsal and distoventral spines; another small dorsal marginal spine on first and second walking legs. Propodi somewhat longer than dactyli, 6 times as long as wide, almost straight, armed with 4 spinelets on ventral margin. Dactyli proportionately wide, depressed, feebly curving ventrad distally, dorsal margin moderately crenulate, provided with simple coarse setae in distal half and short plumose setae in proximal half. Epipods absent from pereopods.

Measurements of holotype. – Length of carapace including rostrum, 18.4 mm;

width of carapace, 9.5 mm; length of cheliped (left), 48.1 mm; of carpus, 11.6 mm; of palm, 11.8 mm; of movable finger, 5.7 mm.

Habitat. – Taken in 485 m on bottom of gray mud and fine sand.

Remarks. – It seems difficult to determine the closest relatives to this new species, because of the following peculiarities: 1) The antennal peduncle is spineless; hence, the specific name, *levis*, L., = smooth + antenna; 2) the anterolateral spine of the carapace is extremely strong, directed straight forward; 3) lateral marginal spines of the carapace are reduced to three in number including the anterolateral one, instead of six or seven as in most of the *Munida* species; 4) the antennular basal segment is extremely elongate, its lateral margin bearing a small median spine only, without a prolonged spine proximal to the lateral terminal spine as in most species of *Munida*.

Type-locality. – Northeast of Kayoa Island, in Molucca Sea off west coast of Halmahera (0°07'30"N, 127°29'00"E).

Distribution. – Recorded here from the above mentioned locality in 485 m.

61. *Munida longispinata*, new species

Figures 43, 44

Material. – Off northern Mindanao (Sta. 5502: 1 ♂; Sta. 5504: 4 ♂, 3 ovig. ♀; Sta. 5506: 1 ovig. ♀). – East coast of Mindoro (Sta. 5122: 1 ♂, 2 ♀; Sta. 5123: 1 ♀; Sta. 5124: 2 ♂, 1 ♀). – Vicinity of Marinduque off southwestern Luzon (Sta. 5373: 2 ♂). – South China Sea off southwestern Luzon (Sta. 5365: 2 ♂ [1 male is holotype, USNM 150361]).

Diagnosis. – Carapace with numerous interrupted transverse ridges, armed with 2 epigastrics, 2 postcervicals, 1 median cardiac and 2 spines on posterior ridge; lateral margins subparallel. Front margin transverse. Rostrum relatively short, curving dorsad. Supraocular spines strong, distinctly overreaching rostral tip, directed laterad, widely separated from rostrum. Second, third and fourth abdominal segments with 2 greatly elevated transverse ridges; anterior ridges with 4 spines on second and third segments, 2 on fourth segment; prominent median spine on posterior ridge of fourth segment. Eyes dilated distally, eyelashes short. Basal segment of antennule with 1 small distolateral and 2 terminal spines, mesial terminal small. First segment of antennal peduncle lacking distal marginal spine. Third maxilliped setose, ischium strongly produced distally on ventral margin; merus with prominent midventral and small distodorsal spines. Sternum of third thoracic somite wider than anterior margin of following sternum. Chelipeds and walking legs nearly equal in length, very slender, lacking epipods. Male gonopods on only second abdominal segment.

Description of holotype. – Carapace (Figure 43) nearly as long as wide. Dorsal surface with numerous interrupted transverse ridges. Pair of median epigastric spines. Postcervical spine small but distinct. Cardiac region markedly elevated, with well developed median spine. Two small spines on posterior transverse ridge. Front margin transverse. Lateral margins subparallel, each with 6 spines: moderate-sized anterolateral and another smaller in front of cervical groove and other 4 behind it; anterior third spine directly behind cervical groove much smaller and slightly

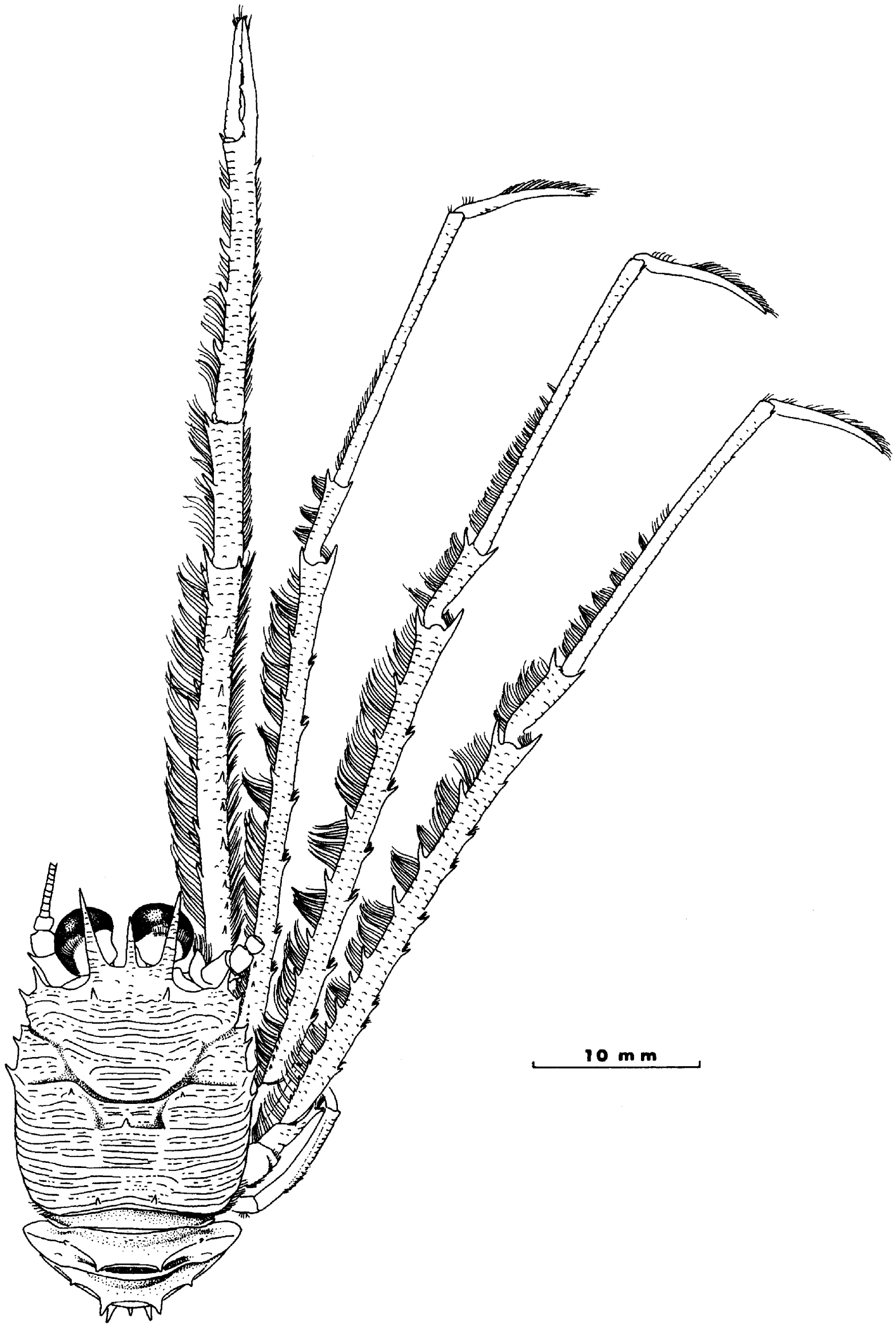

Figure 43. – *Munida longispinata*, new species, male holotype from "Albatross" Sta. 5365, dorsal view.

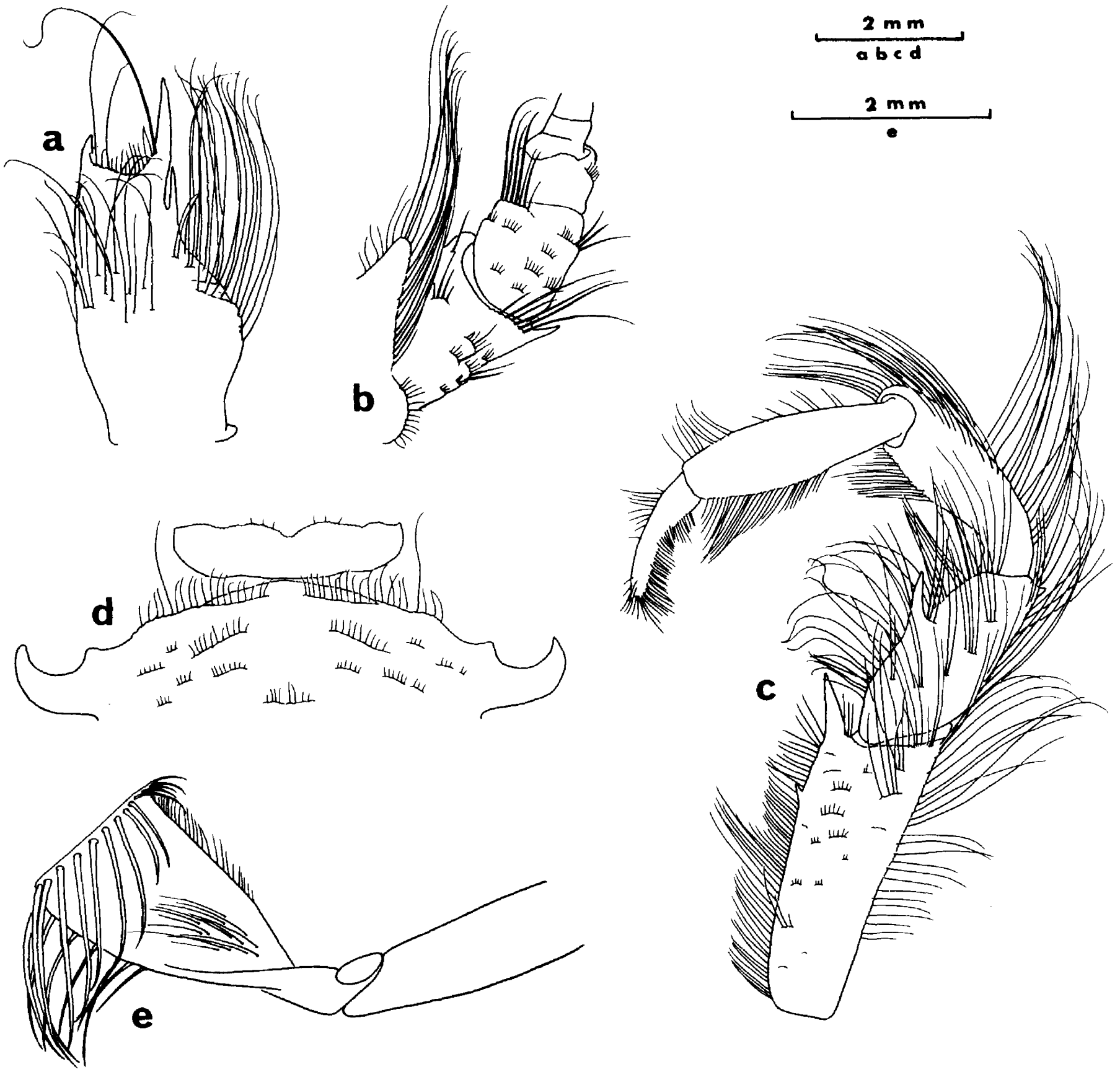

Figure 44. – *Munida longispinata*, new species, male holotype from "Albatross" Sta. 5365: a, basal segment of left antennule; b, left antennal peduncle; c, endopod of left third maxilliped; d, anterior part of sternal segments; e, gonopod of second abdominal segment.

ventral to level of marginal row of spines, sixth absent from left side.

Rostrum (Figure 43) spiniform, relatively short, not reaching corneal margin, directed dorsad. Supraocular spines strong, dorsally squamate, overreaching rostrum and cornea, arched in lateral view, directed dorsad and laterad, and rather remote from rostrum.

Eyes large, dilated distally, but not particularly depressed; eyelashes short.

Second, third and fourth abdominal segments with 2 elevated transverse ridges; anterior ridges with 4 spines on second and third segments, 2 median spines larger than lateral 2; no lateral spines on fourth segment; posterior ridge of fourth segment

with prominent median spine. Gonopod (Figure 44e) on second segment only.

Antennular basal segment (Figure 44a) setose on distal half, armed terminally with 2 spines, lateral terminal strong, mesial terminal reduced to small size, lateral margin convex at midlength, with small, slender spine nearly parallel to lateral terminal spine. First segment of antennal peduncle (Figure 44b) bluntly produced on distomesial margin, laterally fringed with long plumose setae; second segment with small distolateral spine; third segment spineless.

Third maxilliped (Figure 44c) thickly provided with long setae. Ischium relatively thin, mesial ridge not sharply ridged, provided with 23 denticles of small and irregular size, ventral margin greatly produced distally, bearing spinule at 1/4 of length from distal end. Merus shorter than ischium, bearing prominent midventral and small but distinct distodorsal spines.

Sternum of third thoracic somite (Figure 44d) laterally expanded, anterior margin minutely dentate and weakly sinuous; following sternum 3.8 times as wide as long, anterior margin not in contact with preceding sternum.

Cheliped (Figure 43) slender, subcylindrical, dorsally and ventrally squamate, marginally setose, 3.7 times as long as carapace. Spination as illustrated. Merus relatively elongate, nearly as long as merus of walking leg. Carpus longer than fingers, half as long as palm. Palm fully 10 times as long as wide. Fingers barely half as long as palm, slightly gaping with few pronounced tubercular processes on opposable margins, distally crossing; fixed finger bifid distally. Left cheliped wanting.

Walking legs (Figure 43) similar, slender, depressed, squamate, almost reaching tip of cheliped; dorsal margin with fine plumose setae excepting whole dactylus and distal half of propodus. Merus of first walking leg with 11 dorsal marginal and 7 or 8 ventral marginal spines, both distal ones largest. Carpus with distodorsal and distoventral marginal spines only. Propodus more than 20 times as long as wide, fully twice as long as dactylus; 4 ventral marginal spinelets feebly discernible. Dactylus moderately depressed, curving slightly ventrad, ventral margin minutely serrate in proximal 1/3 of length, dorsal margin with short coarse setae in distal 1/3.

Epipods absent from pereopods.

Measurements of holotype. – Length of carapace including rostrum, 18.3 mm; width of carapace, 13.8 mm; length of cheliped (right), 67.4 mm; of carpus, 9.6 mm; of palm, 18.0 mm; of movable finger, 8.1 mm.

Measurements of paratypes. – Carapace lengths of males, 11.7-20.5 mm; of ovigerous females, 15.5-19.7 mm; of nonovigerous females, 14.5-22.9 mm.

Habitat. – Taken in 392-619 m on muddy bottoms.

Variation. – The relative length of the rostrum varies from reaching to falling slightly short of the corneal margin, neither reaching nor overreaching the supraoculars. The supraocular spines are usually directed laterad as in the holotype, but a single exception is the case of an ovigerous female paratype from Station 5504, in which they are nearly parallel.

Remarks. – There is no close relative in the Indo-Pacific. The new species seems to be nearer to *Munida longipes* A. Milne Edwards previously known from the western Atlantic. Examination of two females of that species taken from the Straits of Florida and three males from the Gulf of Mexico in the collection of the National Museum of Natural History, Smithsonian Institution, all identified by Fenner A.

Chace, Jr., revealed that they differ from the new species in the following respects: In *M. longispinata* the fourth abdominal segment bears a prominent median spine on the posterior transverse ridge, which spine is completely absent in *M. longipes*; the lateral marginal spine of the basal antennular segment is nearer to the lateral terminal spine in *M. longispinata*, while in *M. longipes*, it is much remote from and much smaller or sometimes barely discernible.

Type-locality. – Southeast of C. Santiago Light, off southwestern Luzon (13°44' 24"N, 120°45'30"E).

Distribution. – Off southwestern Luzon and the east coast of Mindoro and Mindanao Sea, in 392-619 m.

62. *Munida major*, new species

Figures 45, 46

Material. – Sulu Sea off Cagayan I. (Sta. 5425: 1 ♀). – Between Leyte and Mindanao (Sta. 5491: 3 ♀ [1 female is holotype, USNM 150384]; Sta. 5492: 5 ♂, 1 ovig. ♀, 8 ♀; Sta. 5494: 1 ♀).

Diagnosis. – Carapace strongly rugose; 4 epigastric spines, median 2 tiny or obsolete; small postcervical spine on each side; lateral margins converging posteriorly, each with 6 spines. Front margin transverse. Rostrum spiniform, distally curving dorsad. Supraocular spines stout, directing slightly laterad, barely half as long as, and, rather remote from, rostrum. Second abdominal segment with 6-8 spines on anterior ridge, third segment with 1-4 spines. Eyes swollen, eyelashes short. Basal segment of antennule elongate; 2 terminal spines subequal in size. Merus of third maxilliped with large median and tiny distal spines on ventral margin; no spine on dorsal margin. Sternum of third thoracic somite wider than anterior margin of following sternum. Chelipeds relatively short, setose and spinose; distomesial marginal spine of merus prominent. Walking legs distally depressed; first leg overreaching end of palm of cheliped; propodi with paired spinelets on distoventral margin. Two pairs of male gonopods. Epipods absent from pereopods.

Description of holotype. – Carapace (Figure 45) nearly as long as wide when measured between front and posterior margins. Transverse ridges distinctly elevated. Gastric region more or less convex, indistinctly circumscribed from hepatic region; pair of spinules between 2 well developed epigastric spines; no spine lateral to large epigastric on right side but 1 tiny spinule on left side. Postcervical spine small but distinct on each side. Posterior transverse ridge unarmed. Lateral margins converging posteriorly, armed with 6 spines: strong anterolateral and another medium-sized spines in front of cervical groove and other 4 behind it.

Rostrum spiniform, stout especially at base, turning upward distally, barely half as long as carapace. Supraocular spines also stout but short, falling short of end of cornea, less than half of rostral length, directed slightly laterad, distantly separated from rostrum.

Eyes largely swollen, cornea occupying more than half of eye in dorsal view, eyelashes short.

Second abdominal segment with 2 ridges sharply defined, anterior ridge with 7

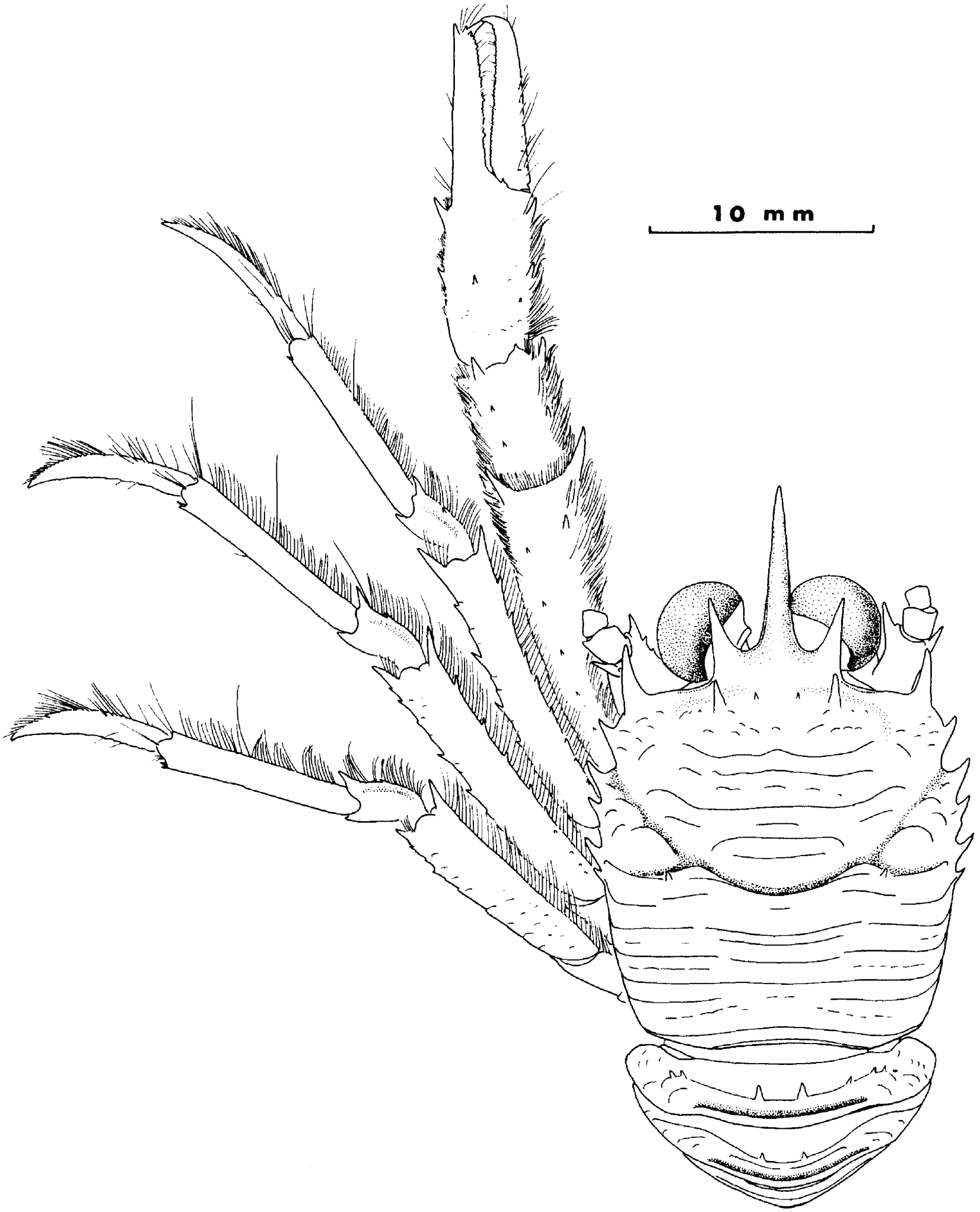

Figure 45. – *Munida major*, new species, female holotype from "Albatross" Sta. 5491, dorsal view.

spines, median 2 prominent; third segment with pair of spines on anterior ridge; fourth segment spineless.

Basal segment of antennule (Figure 46a) elongate, setose in distal half, 2 terminal spines subequal in size, 2 lateral marginal spines normal, distal one larger and close to lateral terminal. First segment of antennal peduncle (Figure 46b) with

moderate-sized distomesial spine; second segment produced on both distal margins, with 2 accompanying small spines on mesial margin; third segment unarmed.

Third maxilliped (Figure 46c) setose especially on merus and carpus. Ischium triangular in cross section, distoventral margin with short process; mesial ridge with 25 denticles. Merus as long as ischium, ventral margin with well developed median and rudimentary terminal spines, dorsal margin unarmed.

Anterior part of sternal segments as illustrated (Figure 46d); sternum of third thoracic somite laterally expanded, wider than anterior margin of following sternum.

Cheliped (Figure 45) 1.6 times as long as carapace including rostrum, relatively massive, moderately depressed distally, furnished with fine plumose setae especially thick along mesial margin; ventral surface somewhat tuberculate. Merus with prominent terminal spines, mesial terminal much larger; dorsal row of 6 small spines close to lateral margin and another few spines near mesial margin; ventral surface with 2 spines: 1 near mesial margin and 1 near lateral margin. Carpus with 3 dorsal, 2 mesial marginal and 1 distolateral marginal spines, 2/3 as long as finger. Palm moderately massive, nearly as long as fingers, about twice as long as wide; marginally armed with 2 spines on each side, both distal ones much larger; dorsally with smaller spine between proximal marginal spines. Fingers not gaping, strongly curving distally and crossing; opposable margins tuberculate, nearly straight; distinct lateral marginal spine near apex of fixed finger.

Walking legs (Figure 45) moderately depressed, feebly squamate on dorsolateral face, first leg overreaching end of palm of cheliped, thickly furnished with plumose setae on dorsal margin except for dactylus. Merus of first walking leg with 12 dorsal marginal and 5 ventral marginal spines, both terminal spines prominent. Carpus produced on both distal margins, with accompanying spinule at midlength of dorsal margin. Propodus 7.7 times as long as wide; distoventral margin with paired spinelets. Dactylus somewhat shorter than propodus, not spiniform but somewhat depressed, proportionately wide, curving gently ventrad; ventral margin with 12-13 minute serrae; spinelet arising from base of each serra; dorsal margin thickly furnished with coarse setae in distal half. Second walking leg similar to first. Third walking leg shorter than anterior 2 legs; merus more distinctly squamate on dorsal face, without dorsal marginal spines but terminal one; ventral marginal serrae and spinelets of dactylus reduced to 9 in number.

Epipods absent from all pereopods.

Measurements of holotype. – Length of carapace including rostrum, 26.6 mm; width of carapace, 15.8 mm; length of cheliped (left), 42.9 mm; of carpus, 6.0 mm; of palm, 8.3 mm; of movable finger, 9.0 mm.

Measurements of paratypes. – Carapace lengths of males, 21.0-28.2 mm; of ovigerous female, 28.4 mm; of nonovigerous females, 17.6-31.0 mm.

Habitat. – Taken in 906-1,350 m on bottoms of mud, occasionally mixed with coral and sand.

Variation. – Two small spines between the paired larger epigastric spines, distinct in six specimens including the holotype, are barely discernible in the remaining paratypes. Branchial marginal spines of the carapace are usually four in number as in the holotype; however, the specimens from Station 5492 display a remarkable variation, the spines numbering from two to five: In specimens with two spines,

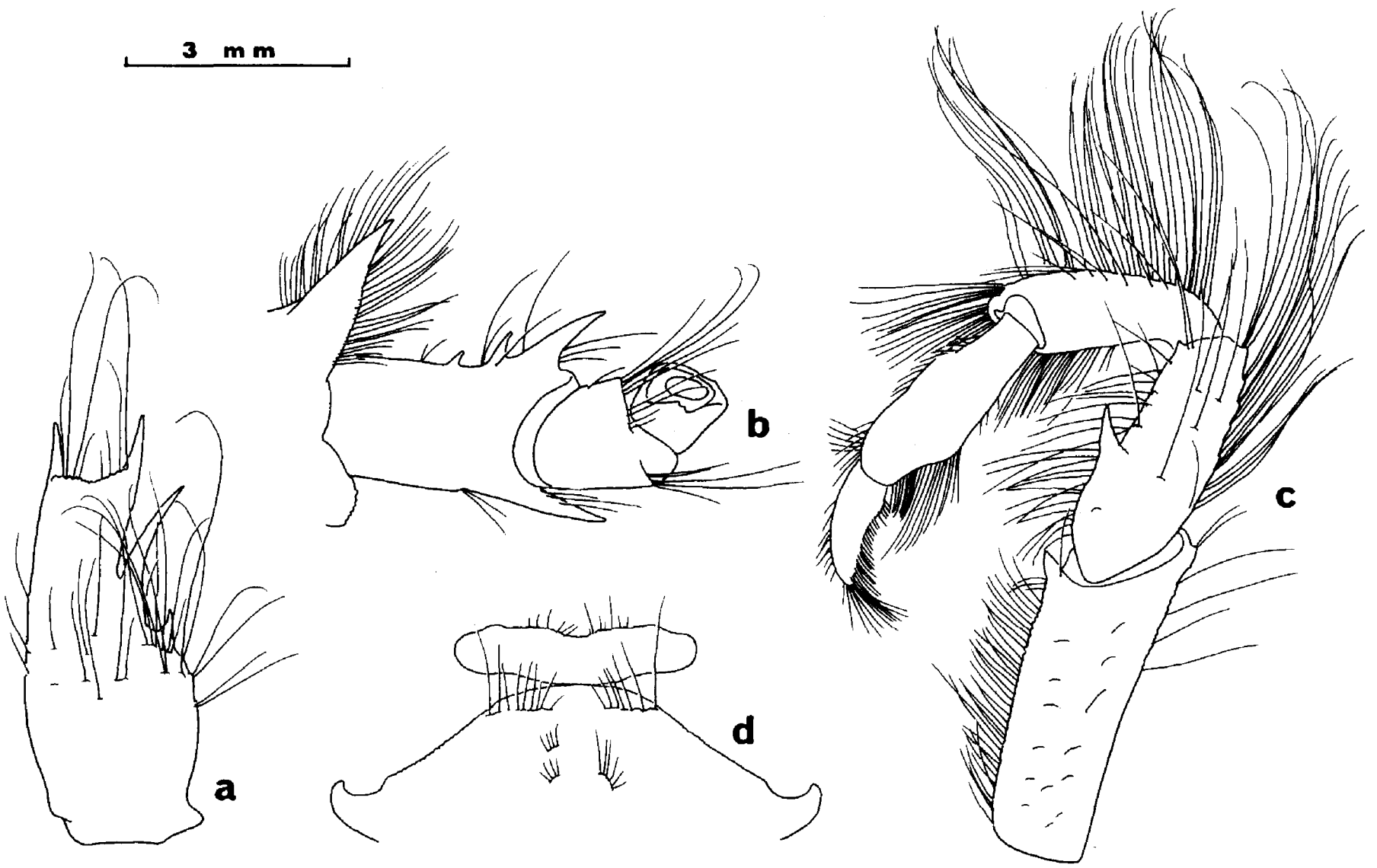

Figure 46. – *Munida major*, new species, female holotype from "Albatross" Sta. 5491: a, basal segment of left antennule; b, left antennal peduncle; c, endopod of left third maxilliped; d, anterior part of sternal segments.

the second and fourth (from anterior to posterior) are missing; in those with three spines, the hindmost or next to hindmost is absent; when there are five spines, the additional one is situated between the second and third. The second abdominal segment bears six to eight spines on the anterior ridge; of all the 18 paratypes, eight specimens possess six spines, six specimens seven spines, and four specimens eight spines. Similarly, the third segment bears from one to four spines: Two median spines are usually present; but, one of them is obsolete in three specimens, and one or two more spines are added to the median pair in two specimens. No complete elimination of spines from this segment was observed.

Remarks. – This species is closely related to *Munida andamanica* Alcock widely known in the Indo-West Pacific. The differences are very subtle, but I believe that the following peculiarities are characteristic of this species: 1) The third abdominal segment bears a pair of spines on the anterior ridge; 2) the supraocular spines are relatively short and stout; 3) carapacial marginal spines behind the cervical groove are usually four in number, not five as in *M. andamanica*.

Type-locality. – Notheast of Diuata Point, between Leyte and Mindanao (9°24'N, 125°12'E).

Distribution. – Recorded here from the Sulu Sea off the Cagayan Islands and the eastern Mindanao Sea, in 906-1,350 m.

63. *Munida microps* Alcock, 1894

Munida microps Alcock, 1894:326; 1901:240. – Alcock and Anderson, 1895: pl. 13: fig. 5. – Tirmizi, 1966:194, fig. 14. – Haig, 1973:271, fig. 1.
Munida microps var. *lasiocheles* Alcock, 1894:327;1901:241.
Munida lasiocheles: Alcock and Anderson, 1895: pl. 13: fig. 8.

Material. – Teluk Bone, Sulawesi (Sta. 5650: 1 ♂).

Measurements. – Carapace length of male, 19.7 mm.

Diagnosis. – Carapace distinctly rugose; 6 epigastric spines, median 2 much smaller; lateral protogastric spine present or absent; postcervical and anterior branchial spines present on each side; 2 lateral marginal spines in front of cervical groove larger than 5 following marginals. Front margin oblique. Rostrum spiniform, curving slightly dorsad. Supraocular spines directed somewhat laterad, less than half of rostral length. Second abdominal segment with 6-10 spines; third segment unarmed or with 2 spines. Eyes relatively small, cornea scarcely broader than stalk. Basal segment of antennule elongate, mesial terminal spine much smaller than lateral terminal. Merus of third maxilliped with 2 or 3 ventral marginal spines, proximal larger. Sternum of third thoracic somite wider than anterior margin of following sternum. Two pairs of male gonopods. Epipods absent from all pereopods.

Habitat. – Taken in 988 m on mud bottom.

Remarks. – The present specimen agrees well with Alcock's definition as well as with a male specimen from the Andaman Sea collected by the "Investigator" and now deposited in the National Museum of Natural History, Smithsonian Institution, except for the two spines on the third abdominal segment in the "Albatross" specimen. Haig (1973:273) suggested that *Munida microps lasiocheles* supposed to be the dimorphic male of *M. microps* by Alcock (1901:242) is probably a distinct species if the illustration of Alcock and Anderson (1895: pl.13: fig. 8) is accurately depicted. Alcock (1901:242) mentioned, however, that similar instances of dimorphism in *Munida* were found by Henderson, Milne Edwards and Bouvier. Inasmuch as such dimorphism is also noticed in *M. prominula* described in this paper as well as in *Cervimunida princeps* from Japanese waters (unpublished), I am inclined to believe that Alcock's conclusion may be acceptable.

Type-locality. – Andaman Sea.

Distribution. – Known from the Arabian Sea, Maldives, off Colombo, Andaman Sea, Sulawesi and southeastern Australia; in 686-1,234 m.

64. *Munida pilorhyncha* Miyake and Baba, 1966

Munida pilorhyncha Miyake and Baba, 1966:81, figs. 1, 2. – Miyake, 1982:149, pl. 50: fig. 3.

Material. – South China Sea off southwestern Luzon (Sta. 5116: 1 ovig. ♀). – South China Sea off northwestern Luzon (Sta. 5441: 1 ♂).

Measurements. – Carapace length of male, 33.5 mm; of ovigerous female, 33.2 mm.

Diagnosis. – Carapace with numerous transverse ridges; 8-10 epigastric spines; 1

lateral protogastric, 1 anterior branchial and 1 postcervical spines on each side; lateral margin with 7 spines, anterolateral spine well developed. Front margin transverse. Rostrum arched, dorsally provided with long coarse setae. Supraocular spines subparallel, horizontal, terminating opposite midlength of rostrum. Second abdominal segment with 8-9 spines on anterior ridge. Eyes dilated, eyelashes short. Two terminal spines of antennular basal segment subequal in size. Merus of third maxilliped with 2 ventral marginal spines, distal one smaller; dorsal margin spineless. Two pairs of male gonopods. Epipods absent from pereopods.

Habitat. – Taken in 340-366 m; bottom unknown.

Remarks. – The spination of the cheliped in the "Albatross" material is much more pronounced than in the male holotype. No additional characters of significance were noted. The coloration in a fresh male specimen is provided by Miyake (1982: pl. 50: fig. 3).

Type-locality. – Tosa Bay, Japan.

Distribution. – Previously known from Japan in Tosa Bay and off southwestern Kyushu; in 200-300 m.

65. *Munida pilosimanus* Baba, 1969

Munida pilosimanus Baba, 1969a:26, figs. 8, 9. – Baba, in Baba, Hayashi and Toriyama, 1986:173, 291, fig. 123.

Material. – Sulu Archipelago (Sta. 5172: 1 ♂).

Measurements. – Carapace length of male, 16.8 mm.

Diagnosis. – Carapace numerously rugose, armed with 2 epigastrics, 2 lateral protogastrics, 2 postcervicals each accompanying smaller spine directly behind it, and 2 spines on posterior ridge; lateral margin convex, armed with 6 spines; 2 in front of cervical groove and 4 behind it. Front margin transverse. Rostrum relatively long, straightly spiniform, horizontal. Supraocular spines directed ventrad, less than half as long as rostrum. Second through fourth abdominal segments with 4 spines on anterior ridge. Eyes distally dilated and depressed. Mesial terminal spine of antennular basal segment larger than lateral terminal. Merus of third maxilliped with midventral spine, ischium strongly produced on distoventral margin. Chelipeds subcylindrical, squamate, moderately spinose, and furnished with plumose setae on mesial margin. Walking legs slender, squamate, provided with plumose setae on dorsal margin, propodi with several rudimentary spinelets on ventral margin. Male gonopods on second abdominal segment only. Epipods absent from all pereopods.

Habitat. – Taken in 582 m on bottom of sand and shells.

Remarks. – The specimen is much smaller than, but, agrees well with, the types, only excepting that the carapace bears less numerous transverse ridges and that the rostrum is relatively longer, 0.68 as long as the carapace; these differences may be due to its younger stage.

Type-locality. – Tosa Bay, Japan.

Distribution. – Known from the Sulu Archipelago, Kyushu-Palau Ridge, Okinawa Trough and Tosa Bay, Japan, in 250-582 m.

66. *Munida prominula*, new species

Figure 47

Material. – South China Sea off southwestern Formosa (Sta. 5317: 1 ♂, 1 ♀ [female is holotype, USNM 150382]).

Diagnosis. – Carapace elongate, 10-12 epigastric spines; lateral protogastric and postcervical spines present but small; lateral margins subparallel, each with well developed anterolateral and few minute spines in front of cervical groove and 5 small spines behind it. Front margin slightly oblique. Rostrum straight, horizontal, dorsally weakly carinate, laterally ridged and setose. Supraocular spines directed slightly laterad, more or less close to, and, ending opposite midlength of, rostrum. Second abdominal segment with 7 or 8 spines on anterior ridge, third segment with 2 spines. Eyes dilated, eyelashes relatively long, but falling short of corneal margin. Basal antennular segment with 2 terminal spines, lateral terminal slightly longer. Second segment of antennal peduncle greatly produced on both distal margins, distomesial spine overreaching end of peduncle or end of cornea, accompanying distinct spine near its base. Merus of third maxilliped with 2 prominent ventral marginal spines, proximal larger. Sternum of third thoracic somite relatively narrow, but wider than anterior margin of following sternum. Chelipeds thickly setose. First walking leg reaching end of carpus of cheliped; propodus with 12-14 ventral marginal spinelets. Two pairs of male gonopods. Epipods absent from pereopods.

Description of holotype. – Carapace (Figure 47a) 1.3 times as long as wide, strongly rugose, transverse ridges mostly interrupted. Eleven epigastric spines, pair directly behind supraoculars prominent. Lateral protogastric spine small but distinct. Hepatic and anterior branchial regions squamate. Small postcervical spine on each side. Posterior transverse ridge spineless. Front margin slightly oblique. Lateral margins subparallel, each with well developed anterolateral and few small spines in front of cervical groove and 5 small, subequal-sized ones behind it.

Rostrum straight, spiniform, blunt carina extending posteriorly onto carapace, 1/3 as long as remaining carapace; lateral margin ridged and setose. Supraocular spines half as long as rostrum, directed slightly laterad, almost reaching end of cornea.

Abdomen rather smooth but 2 distinct transverse ridges on each segment; second segment with 7 spines on anterior ridge, third segment with 2 spines.

Eyes swollen, somewhat depressed, cornea moderately wide; eyelashes long, but falling short of corneal margin.

Basal segment of antennule (Figure 47b) elongate, moderately setose in distal half of ventral surface; 2 terminal spines well-developed, lateral terminal slightly longer; 2 lateral spines, distal one elongate, proximal to lateral terminal and proximal one small, slightly distal to midlength of segment. Antennal peduncle (Figure 47c) setiferous; first segment with short but sharply pointed spine on distomesial margin; second segment with distomesial and distolateral spines, former extremely elongate, overreaching cornea or end of antennal peduncle, accompanying moderate-sized spine at base.

Third maxilliped (Figure 47d) moderately setose, distal segments of endopod slen-

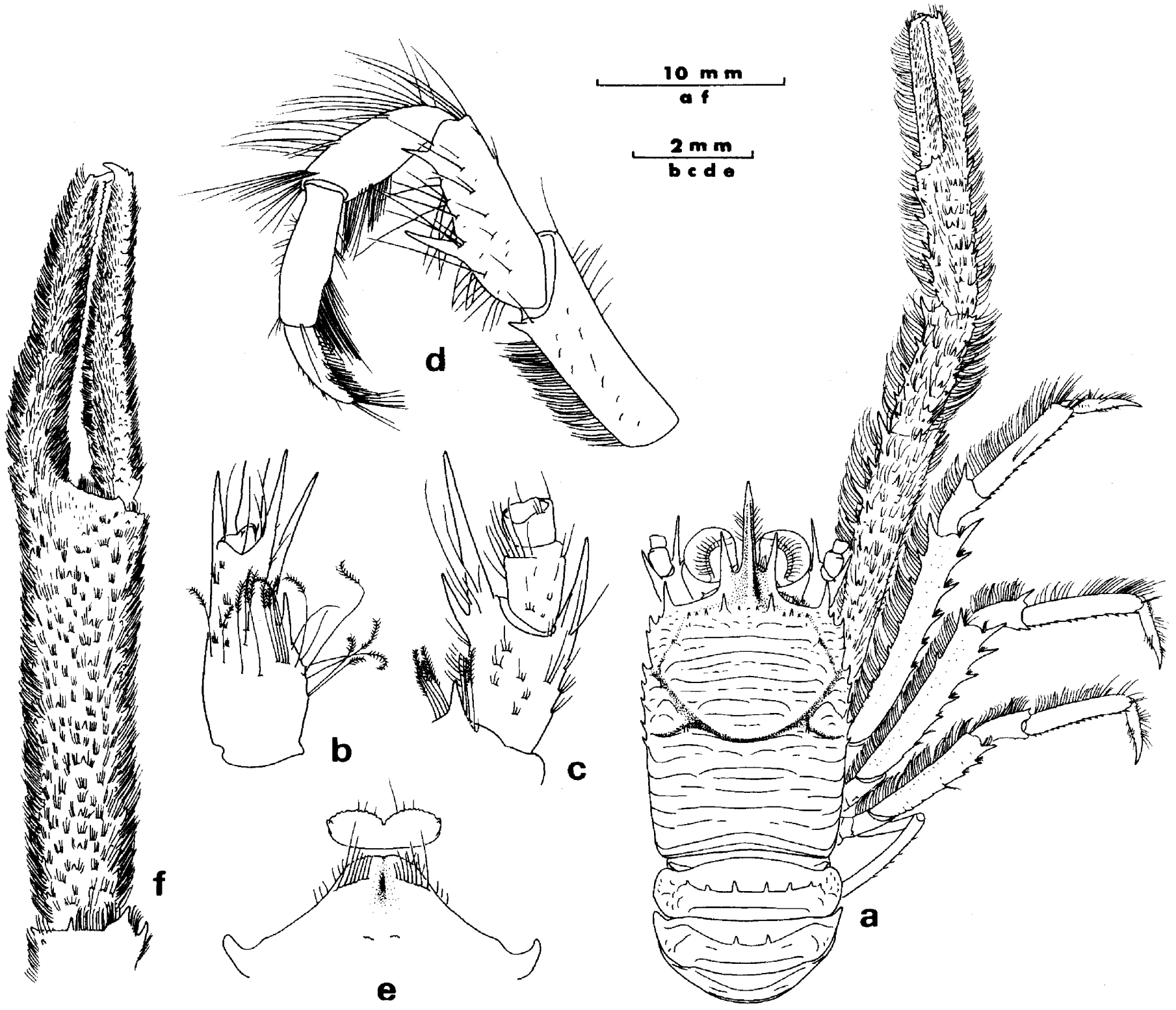

Figure 47. – *Munida prominula*, new species, female holotype from "Albatross" Sta. 5317: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of left third maxilliped; e, anterior part of sternal segments. Male paratype from same locality: f, left chela.

der. Ischium triangular in cross section, mesial ridge with 27 closely placed denticles, distoventral spine small. Merus as long as ischium, ventral margin bispinose, proximal spine larger, dorsal margin unarmed.

Sternum of third thoracic somite (Figure 47e) relatively narrow, 0.36 as wide as following sternum; anterior margin minutely dentate, convex with distinct median notch; following sternum barely 2.5 times as wide as long, roughly triangular, anteromesially hollowed.

Left cheliped missing. Right cheliped (Figure 47a) twice as long as carapace including rostrum, subcylindrical, spinose, moderately tuberculate dorsally, thickly covered with plumose setae; chela more or less depressed. Merus with 4 rows of spines and 1 distolateral marginal spine. Carpus shorter than fingers, armed with spines in 3 rows and scattered tubercles. Palm with 4 longitudinal rows of spines and several tubercular processes, lateral marginal spines continued onto fixed fin-

ger. Fingers slightly longer than palm, not gaping, distally crossing, with distinct spinule near each tip; opposable margins tuberculate, straightly touching each other; movable finger with lateral marginal spine at base and few dorsal spinules.

Walking legs (Figure 47a) depressed, thickly furnished with both plumose and iridescent setae on entire dorsal margin. First walking leg reaching end of carpus of cheliped. Merus weakly squamate dorsally, bearing 8 dorsal marginal and 6 ventral marginal spines, both distal ones largest, especially distoventral marginal. Carpus with 2 spines each on dorsal and ventral margins, both terminal ones strongly produced. Propodus fully 5 times as long as wide, 1.3 times as long as dactylus, slightly narrowing distally, ventral margin with 12-14 closely placed spinelets. Dactylus more or less flattish, ventral margin minutely serrate with very short spinelets. Second walking leg similar to first, spination much reduced on dorsal margin of merus. Third walking leg shorter than first and second legs, dorsal marginal spines absent from merus; carpus with small distodorsal marginal spine only.

Epipods absent from all pereopods.

Description of male paratype. – Mostly similar to holotype. Chelipeds more thickly setose but less prominent in spination than in female holotype; left cheliped (Figure 47f) gaping. Gonopods on first and second abdominal segments.

Measurements of holotype. – Length of carapace including rostrum, 20.2 mm; width of carapace, 10.5 mm; length of cheliped (right), 43.6 mm; of carpus, 7.4 mm; of palm, 8.6 mm; of movable finger, 9.1 mm.

Measurements of paratype. – Carapace length of male, 22.4+ mm (rostrum broken).

Habitat. – Taken on bottom of sand and small shells in 421 m.

Remarks. – *Munida prominula* resembles *M. armata* described in this paper, in the shapes of the antennular basal segment and third maxilliped, and in the armature of the carapace and abdomen, from which, however, it differs in the following particulars: 1) The second segment of the antennal peduncle bears a strong distomesial spine distinctly overreaching the end of the ultimate peduncular segment; 2) the sternum of the third thoracic somite is 0.36 as wide as the following sternum instead of being 0.45 as wide in *M. armata*; 3) the rostrum is laterally ridged and setose; and 4) a spine directly behind the anterior bifurcation of the cervical groove is absent.

Type-locality. – South China Sea off southwestern Formosa (21°36'N, 117°27'E).

Distribution. – Recorded here from a pair of the types from the above mentioned locality, in 421 m.

67. *Munida roshanei* Tirmizi, 1966

Figure 48

Munida roshanei Tirmizi, 1966:192, fig. 13. – Lewinsohn, 1969:127, fig. 25.

Material. – Sulu Archipelago (Sta. 5165: 3 ♂). – North Balabac Strait off northern Borneo (Sta. 5355: 1 ♂; Sta. 5357: 1 ovig. ♀). – East of Masbate (Sta. 5213: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 6.3-11.2 mm; of ovigerous females, 8.3-10.7 mm.

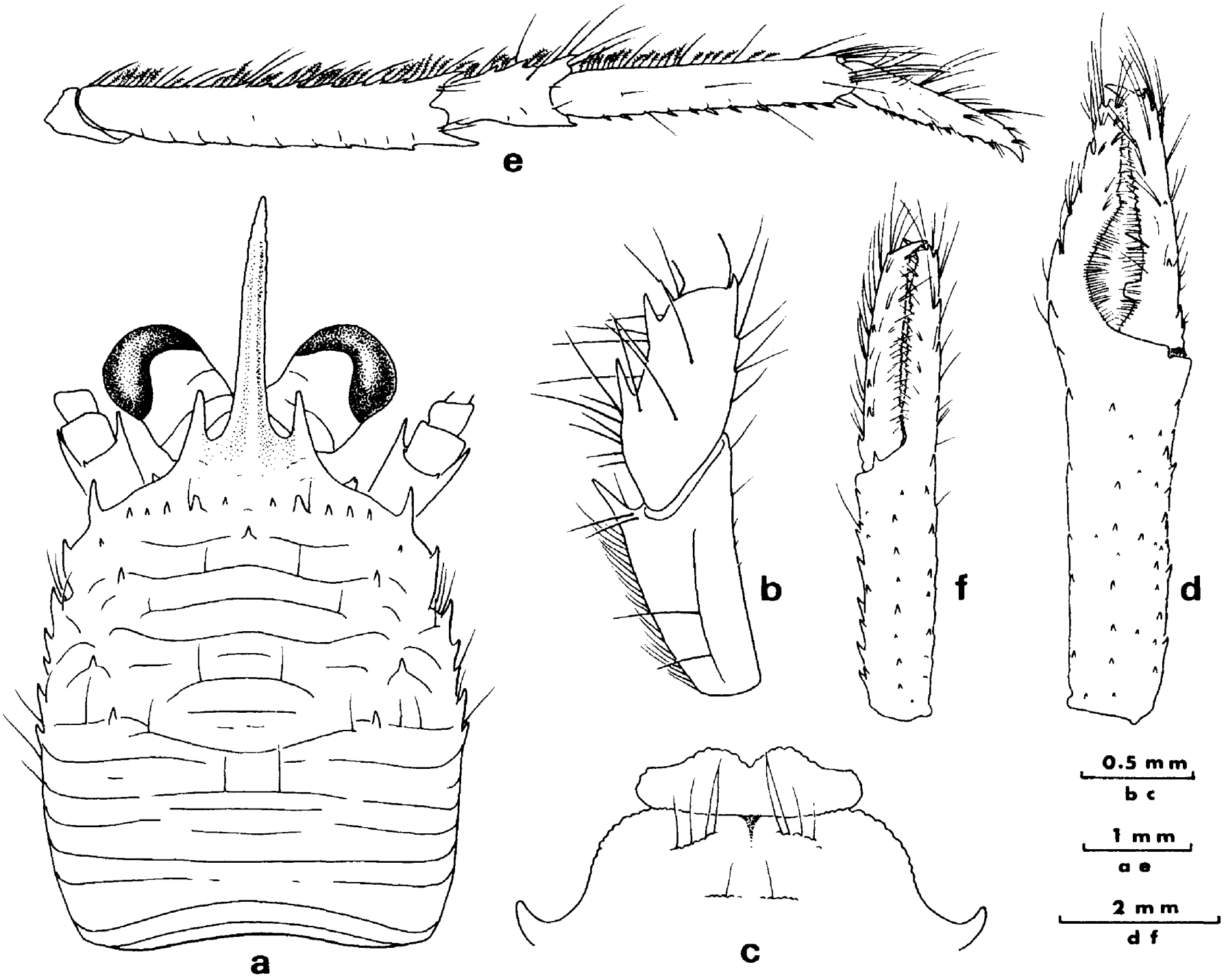

Figure 48. – *Munida roshanei* Tirmizi, male from "Albatross" Sta. 5165, carapace length 7.2 mm: a, carapace; b, endopod of left third maxilliped, distal 2 segments omitted; c, anterior part of sternal segments; d, left chela; e, right first walking leg. Male from same locality, carapace length 6.3 mm: f, right chela.

Diagnosis. – Carapace distinctly longer than wide; 9-12 epigastric spines; 1 lateral protogastric, 1 anterior branchial, 1 postcervical spines on each side; hepatic and protogastric spines present or absent; lateral margin with 7 spines. Front margin oblique. Rostrum carinate dorsally. Supraocular spines subparallel, very short. Abdominal terga unarmed. Eyes moderately dilated distally, eyelashes long. Mesial terminal spine of basal antennular segment as large as lateral terminal. Merus of third maxilliped with 2 or 3 ventral marginal and 1 distodorsal marginal spines; ischium with well developed distoventral spine. Sternum of third thoracic somite sinuous and crenulate on anterior margin, nearly as wide as anterior margin of following sternum. Chela strongly gaping in larger male. Propodi of walking legs with 10-12 ventral marginal spinelets; dactyli about 0.70 as long as propodi, ventral margin with 8-9 spinelets. Two pairs of male gonopods. Epipods absent from pereopods.

Habitat. – Taken in 16-146 m on bottoms of coral, or sand mixed with coral or mud

and shells.

Remarks. – Lewinsohn (1969:127) enumerated the morphological characters that seemed to be constant in the Red Sea material of *M. roshanei* and suggested that this species may be synonymous with *M. kuboi*, for the given characters seem not to help discriminate the two species. This possibility is here dismissed, however, by examination of the specimens of *M. kuboi* collected by the "Albatross" Philippine Expedition and those from Japanese waters now deposited in Kyushu University, Fukuoka under catalogue numbers ZLKU 5202, 7451, 8665, 10932, 10936, 10939: In *M. kuboi*, the carapace is relatively longer, being 1.5 times as long as wide; the second and third abdominal terga bear 7-11 and 2-4 spines respectively; the eyes are distinctly dilated; the lateral terminal spine of the antennular basal segment is longer than the mesial terminal; the sternum of the fourth thoracic somite is triangular with the anterior margin much narrower; and the dactyli of the walking legs are relatively long and slender, as mentioned in the "Remarks" under *M. kuboi*.

Type-locality. – Gulf of Oman.

Distribution. – Known from the Gulf of Aqaba, the Gulf of Aden, the Gulf of Oman, and the Philippines between the Sulu Archipelago and Masbate, in 16-528 m.

68. *Munida rufiantennulata* Baba, 1969

Munida rufiantennulata Baba, 1969a:23, fig. 7.

Material. – Off northern Mindanao (Sta. 5517: 1 ♂, 5 ♀; Sta. 5518: 1 ♂; Sta. 5519: 4 ♂, 1 ♀). – Between Negros and Siquijor (Sta. 5536: 12 ♂, 4 ovig. ♀, 4 ♀; Sta. 5537: 1 ♀). – Between Cebu and Siquijor (Sta. 5535: 1 ♂). – Between Cebu and Bohol (Sta. 5198: 1 ♀; Sta. 5417: 1 ♀). – Between Cebu and Leyte (Sta. 5406: 2 ♂; Sta. 5407: 2 ♂, 1 ovig. ♀; Sta. 5410: 2 ovig. ♀). – East coast of Mindoro (Sta. 5123: 2 ♀). – Vicinity of Marinduque off southwestern Luzon (Sta. 5373: 2 ♂, 1 ♀). – South China Sea off southwestern Luzon (Sta. 5279: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 10.3-21.3 mm; of ovigerous females, 11.0-19.0 mm; of nonovigerous females, 7.3-16.3 mm.

Diagnosis. – Carapace moderately rugose; 4-10 epigastric spines; 1 lateral protogastric, 1 anterior branchial and 1 postcervical spines on each side; lateral margin with prominent anterolateral and small accompanying spines in front of cervical groove, 3 or rarely 4 behind it. Front margin oblique. Rostrum spiniform, horizontal. Supraocular spines subparallel, rather close to rostrum. Second abdominal segment with 8 spines on anterior ridge. Eyes more or less dilated distally, eyelashes short. Basal segment of antennule elongate, mesial terminal spine very small. Merus of third maxilliped with strong median and small distal spines on ventral margin. Sternum of third thoracic somite wider than anterior margin of following sternum. Chelipeds spinose and setose, setae fine and plumose. Walking legs comparatively slender. Two pairs of male gonopods. Epipods absent from pereopods.

Habitat. – Taken in depths of 214-705 m commonly on bottoms of mud, occasionally mixed with globigerina.

Remarks. – The epigastric spines vary between four and 10 in number; median two of the 10 spines are small and occasionally absent, and lateral two on either side

are usually absent or occasionally discernible as rudiments or spinules. Lateral marginal spines behind the cervical groove are usually three in number and subequal in size; but in 11 of the 49 specimens examined another small spine occurs behind the third one.

The extremely oblique front margin is characteristic, also of *Munida roshanei* Tirmizi, from which this species is distinguished by the comparatively wide sternum and fewer branchial marginal spines.

Type-locality. – West coast of Kyushu, Japan.

Distribution. – Known from the west coast of Kyushu, Japan and the Philippines between Mindanao and Luzon, in 167-705 m.

69. *Munida similis*, new species

Figures 49, 50

Material. – Off northern Mindanao (Sta. 5501: 1 ♂, 1 ovig. ♀, 2 ♀; Sta. 5508: 1 ♂, 2 ♀). – Between Cebu and Bohol (Sta. 5198: 1 ♂; Sta. 5417: 1 ovig. ♀). – Between Cebu and Leyte (Sta. 5404-5: 2 ♂, 1 ovig. ♀; Sta. 5408: 1 ♂, 1 ovig. ♀, 2 ♀ [1 female is holotype, USNM 150372]; Sta. 5409: 3 ♂, 2 ♀). – Vicinity of Marinduque off southwestern Luzon (Sta. 5222: 1 ♂, 1 ♀; Sta. 5368: 2 ♂, 1 ♀; Sta. 5374: 5 ♂, 1 ovig. ♀, 2 ♀).

Diagnosis. – Carapace with numerous, minutely granulate transverse ridges, dorsally armed with 2 epigastric, 2 postcervical and 1 median cardiac spines, laterally with 6 spines; posterior transverse ridge unarmed or with 1 or 2 spines or spinules. Front margin transverse. Rostrum spiniform, slender, horizontal, relatively short. Supraocular spines directed slightly laterad, widely separated from, and, stouter but slightly shorter than, rostrum. Second through fourth abdominal segments with 4 spines on anterior ridge; posterior ridge of fourth segment with median spine. Eyes dilated, eyelashes short. Basal segment of antennule with 1 lateral and 2 terminal spines, mesial terminal reduced to small process. First segment of antennal peduncle indistinctly produced. Third maxilliped setose; prominent spine on distoventral margin of ischium; merus with well developed midventral and small distodorsal spines. Sternum of third thoracic somite relatively wide, nearly as wide as anterior margin of following sternum. Chelipeds and walking legs slender, squamate, lacking epipods; first walking leg terminating opposite midlength of palm of cheliped when extended forward. Male gonopod absent from first abdominal segment.

Description of holotype. – Carapace (Figure 49) excluding rostrum slightly wider than long. Transverse ridges numerous, interrupted, and minutely granulate. Gastric region feebly convex with 2 spines behind supraoculars. Moderate-sized postcervical spine on each side. Cardiac region distinctly circumscribed, with long setae and prominent median spine on elevated transverse ridge. Posterior transverse ridge unarmed. Lateral margin moderately convex, armed with well developed anterolateral and another small spines in front of cervical groove and 4 more or less reduced ones behind it.

Rostrum spiniform, horizontal, slightly overreaching, but, distinctly slenderer

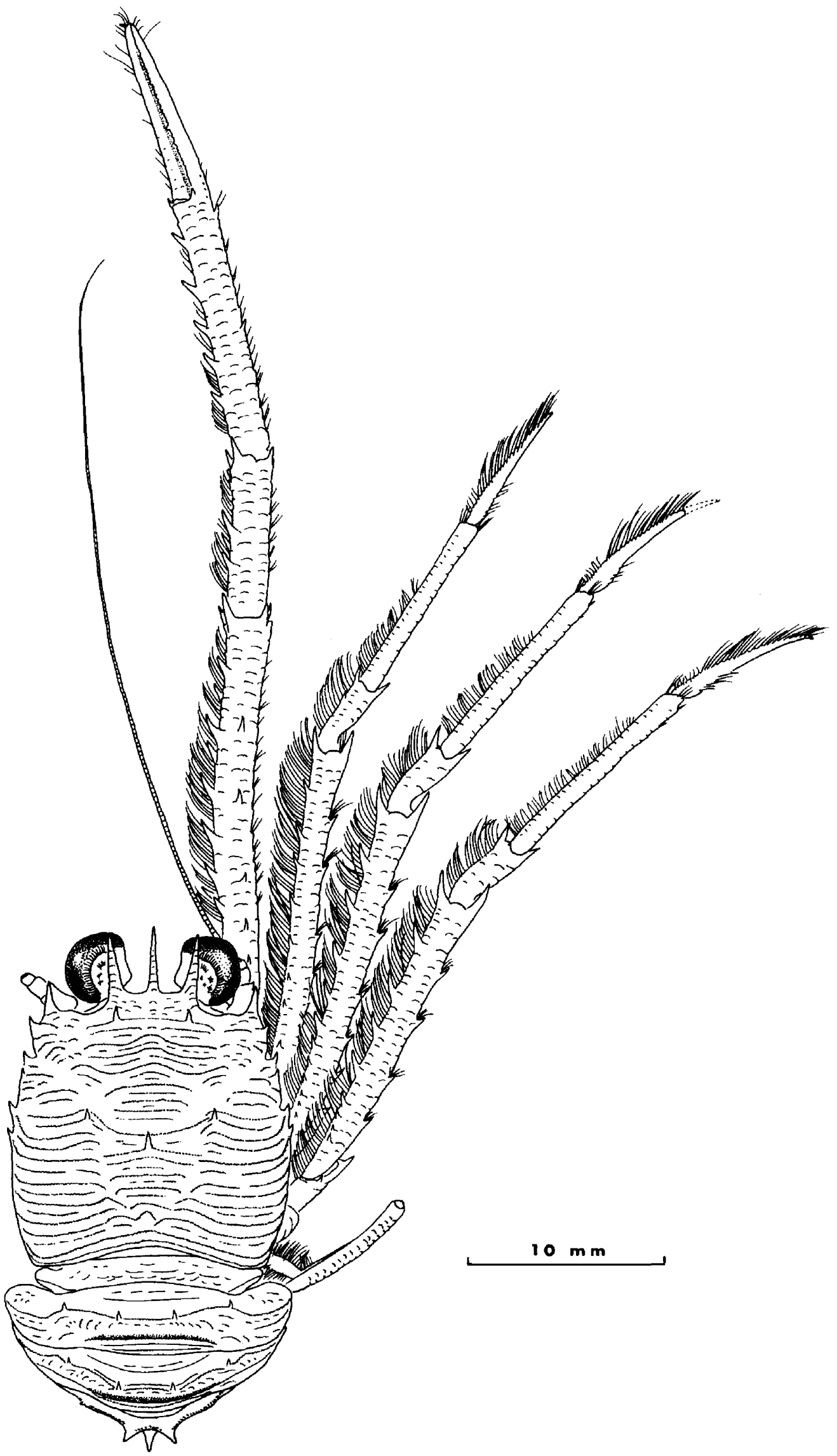

Figure 49. – *Munida similis*, new species, female holotype from "Albatross" Sta. 5408, dorsal view.

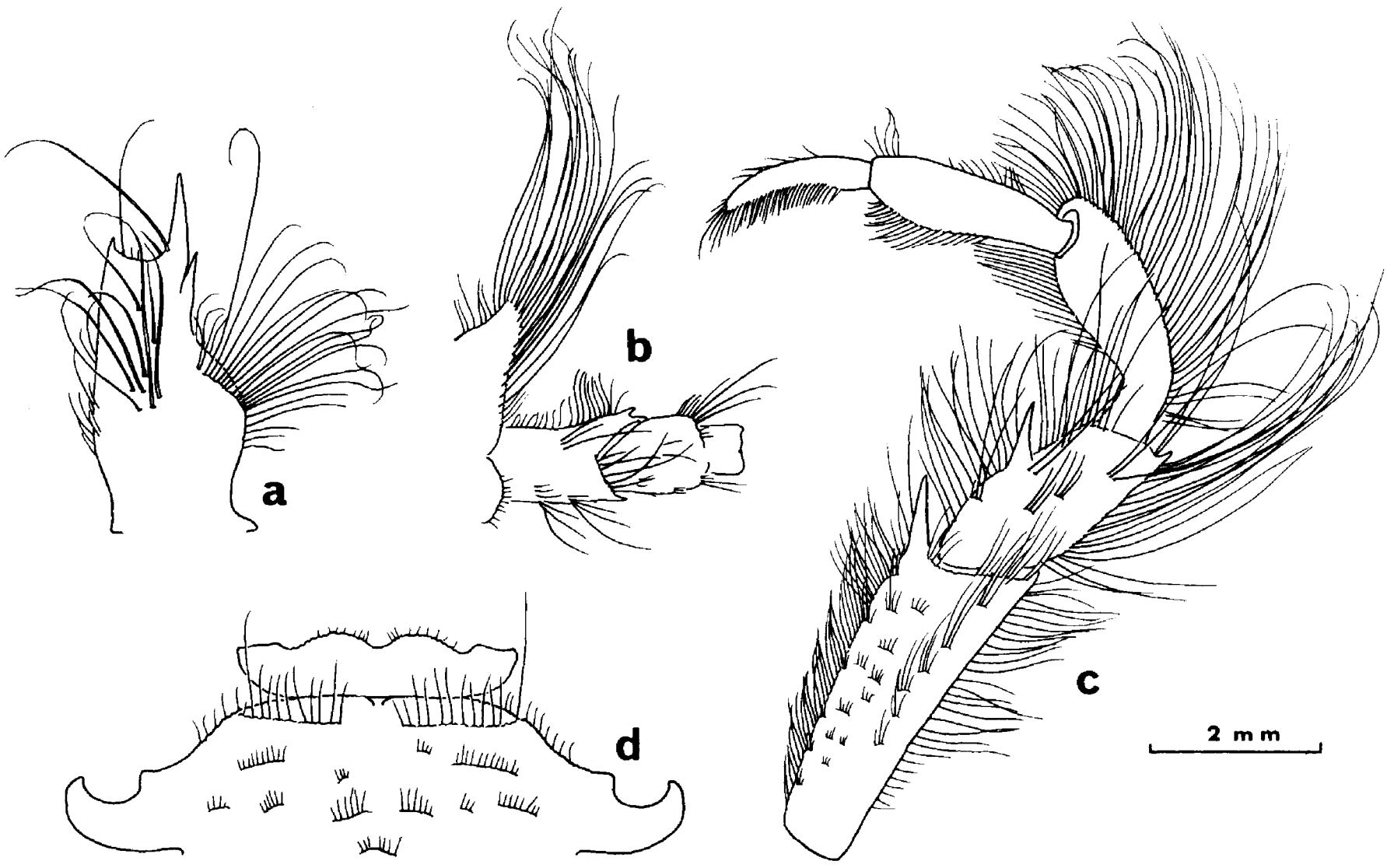

Figure 50. – *Munida similis*, new species, female holotype from "Albatross" Sta. 5408: a, basal segment of left antennule; b, left antennal peduncle; c, endopod of left third maxilliped; d, anterior part of sternal segments.

than, supraocular spine. Supraocular spines widely separated from rostrum, terminating opposite corneal margin, directed slightly laterad.

Second through fourth abdominal segments dorsally squamate with 2 elevated transverse ridges, anterior ridge with 4 spines, median 2 well developed, right lateral missing on fourth segment; posterior ridge of fourth segment with strong median spine.

Eyes swollen, eyelashes short.

Basal segment of antennule (Figure 50a) setose ventrally, with 2 terminal and 1 lateral spines, mesial terminal spine reduced to small size, lateral spine short, virtually appressed to terminal. First segment of antennal peduncle (Figure 50b) bluntly produced distally, provided with long coarse setae on distal and lateral margins; second segment with tiny spines on both distomesial and distolateral angles; iridescent setae on second and third segments.

Third maxilliped (Figure 50c) setose, particularly on merus and carpus, setae coarse and iridescent, or plumose and noniridescent. Ischium relatively thin, strongly produced on distoventral margin, mesial ridge with rudimentary denticles. Merus with prominent midventral and small but distinct distodorsal spines.

Anterior part of sternal segments as illustrated (Figure 50d); anterior margin of third thoracic sternum sinuous, minutely dentate on 2 convexities, posterior margin fitting into whole anterior margin of following sternum.

Cheliped (Figure 49) slender, subcylindrical, dorsally and ventrally squamate,

marginally setose, especially on mesial margin, 3.5 times as long as carapace including rostrum. Merus with 3 rows of spines: ventral row of 5 spines, mesial marginal of 7, dorsal of 7 or 8. Carpus shorter than movable finger, armed with 3 mesial marginal, 2 ventral and 1 distolateral spines. Palm 1.4 times as long as fingers, 7 times as long as wide; 6 mesial marginal spines stout, distal one rather ventral in position; lateral margin with 2 spines, 1 distal and another at midlength. Fingers not gaping, distally crossing; opposable margins straight, minutely tuberculate; fixed finger bifid distally.

Walking legs (Figure 49) slender, depressed, squamate, overreaching carpus of cheliped when extended forward; dorsal margin furnished thickly with fine plumose setae, sparsely with iridescent ones. Merus of first leg with 11 dorsal marginal and 6 ventral marginal spines, both terminal ones largest; short iridescent setae at bases of ventral marginal spines. Carpus greatly produced at distodorsal and distoventral margins, with another spinule on dorsal median margin on right appendage only. Propodus about 10 times as long as wide, ventral marginal spinelets barely discernible, but terminal one distinct. Dactylus 2/3 as long as propodus, slender, slightly curving ventrad; entire dorsal margin and proximal 1/3 of ventral margin setose and minutely dentate. Second and third walking legs similar to first.

Epipods absent from pereopods.

Measurements of holotype. – Length of carapace including rostrum, 16.9 mm; width of carapace, 13.7 mm; length of cheliped (right), 60.0 mm; of carpus, 8.7 mm; of palm, 14.2 mm; of finger, 10.0 mm.

Measurements of paratypes. – Carapace lengths of males, 13.1-21.3 mm; of ovigerous females, 16.1-18.6 mm; of nonovigerous females, 11.3-18.4 mm.

Habitat. – Taken in 291-494 m usually on mud bottoms, occasionally mixed with sand.

Variation. – The posterior transverse ridge of the carapace is variably armed with spines; 10 of the 33 paratypes have a pair of spines on it, and at least another five specimens bear a single spinule instead; in the remaining specimens, however, the spines are totally absent. The anterior second of the branchial marginal spines is slightly dorsal in position and tends to be reduced in size, sometimes to complete absence. The midlateral spine of the antennular basal segment, which is usually present in typical *Munida* species, is absent in most of the material examined. Similarly, the terminal marginal spines of the second segment of the antennal peduncle are usually reduced to spinules and rarely are completely absent. Fingers of the cheliped are moderately gaping proximally in most of the males; in such cases, the opposable margin of the fixed finger is more deeply excavated than that of the movable finger and the distal portion of the palm is massive.

Remarks. – *Munida similis* is apparently so closely related to *M. squamosa* which also is included in this "Albatross" collection, that it may be difficult to distinguish this species from that one without careful examination. In *M. similis*, the rostrum is slenderer but slightly longer than the supraocular spine, and the first segment of the antennal peduncle is bluntly produced on the distomesial margin. In *M. squamosa*, on the other hand, the rostrum is nearly as stout as or slightly stouter than the supraocular spine, and the first segment of the antennal peduncle bears a distinct, sharp process. In addition, the antennular basal segment lacks a midlateral spine in *M. similis*.

Type-locality. – Southeast of Capitancillo Light, Camotes Sea between Cebu and Leyte (10°40'15"N, 124°15'E).

Distribution. – Recorded here from the Philippines between Luzon and Mindanao, in 291-494 m.

70. *Munida squamosa* Henderson, 1885

Munida squamosa Henderson, 1885:409; 1888:131, pl. 13: figs. 1, 1a-b. – Yanagita, 1943:18, figs. 3, 4.
Munida squamosa var. *prolixa* Alcock, 1894:322. – Alcock and Anderson, 1895: pl. 13: fig. 3. – Alcock, 1901:244.

Material. – Davao Gulf off southeastern Mindanao (Sta. 5247: 1 ♀). – Illana Bay off southwestern Mindanao (Sta. 5256: 1 ♀, 1 sp. (sex indet.)). – Off northern Mindanao (Sta. 5517: 1 ♂, 13 ovig. ♀, 7 ♀; Sta. 5518: 3 ♂, 3 ovig. ♀; Sta. 5519: 13 ♂, 13 ovig. ♀, 6 ♀; Sta. 5523: 1 ♂, 1 ovig. ♀, 1 ♀; Sta. 5541: 1 ♂, 1 ovig. ♀; Sta. 5543: 1 ♂). – Between Cebu (Sta. 5535: 1 ♂). – Between Cebu and Bohol (Sta. 5197: 2 ♂, 2 ♀; Sta. 5411: 3 ♂, 5 ♀; Sta. 5412: 5 ♂, 3 ovig. ♀, 4 ♀; Sta. 5417: 2 ♂, 1 ovig. ♀, 4 ♀; Sta. 5418: 7 ♂; Sta. 5419: 6 ♂, 3 ovig. ♀, 13 ♀; Sta. 5420: 1 ♀). – Between Panay and Negros (Sta. 5183: 1 ♂, 1 ovig. ♀). – East coast of Mindoro (Sta. 5121: 1 ♂, 1 ovig. ♀; Sta. 5122: 1 ♂). – Vicinity of Marinduque off southwestern Luzon (Sta. 5375: 1 ♀). – South China Sea off southwestern Luzon (Sta. 5110: 1 ♀; Sta. 5118: 7 ♂, 1 ♀; Sta. 5266: 1 ♂, 1 ovig. ♀, 1 ♀; Sta. 5272: 1 ♀; Sta. 5273: 1 ♂, 2 ovig. ♀; Sta. 5279: 1 ♂; Sta. 5289: 1 ♀; Sta. 5298: 1 sp. (sex indet.); Sta. 5363: 1 ♂). – South China Sea off northwestern Luzon (Sta. 5441: 2 ♀).

Measurements. – Carapace lengths of males, 9.9-29.6 mm; of ovigerous females, 20.8-25.0 mm; of nonovigerous females, 9.8-26.2 mm.

Diagnosis. – Carapace relatively wide, dorsally armed with 2 epigastrics, 2 postcervicals, 1 median cardiac and 2 spines on posterior ridge, laterally with 2 spines in front of cervical groove, 3 or 4 behind it. Front margin transverse. Rostrum sharply spiniform, horizontal. Supraocular spines curving slightly laterad, widely separated from, and, 3/4 as long as, rostrum. Second, third and fourth abdominal segments armed with 4 spines on anterior ridge; median spine on posterior ridge of fourth segment. Eyes dilated distally. Antennular basal segment with mesial terminal spine smaller than lateral terminal, midlateral spine present but small. Third maxilliped thickly setose, ischium sharply produced on distoventral margin, merus with midventral spine. Chelipeds and walking legs strongly squamate, lacking epipods. Male gonopods on second abdominal segment only.

Habitat. – This species shows a marked habitat preference as three-fifths of the localities from which the material was collected are of muddy bottoms; it also is taken on bottoms of sand or globigerina, occasionally mixed with fragments of shells; in 176-567 m.

Remarks. – Alcock (1894:322) described *Munida squamosa* var. *prolixa* originally based upon specimens from the Andaman Sea, and later by more specimens, from the Arabian Sea (Alcock, 1901:244). In his descriptions, however, any hints of distinctions between the typical form and the subspecies are not given. In this regard, Fenner A. Chace, Jr. kindly suggested to me that "Perhaps Alcock did "hint" at the difference between the typical species and the variety in the name of the latter:

"*prolixa*," meaning "stretched out long." Alcock notes that the length and breadth of the carapace are "nearly the same," while Henderson's table of measurements indicates that the carapace of the typical form is slightly broader than long. This is certainly no reason to elevate the Indian Ocean population to subspecific rank but it may have been the only difference that Alcock could find to distinguish forms that he believed might be distinct on geographic grounds." (Personal communication). Two lots of *M. squamosa prolixa* of the "Investigator" collection, now deposited in the National Museum of Natural History, Smithsonian Institution, one containing a male and a female from 6°50'20"N, 29°36'20"E in 333-397 m (182-217 fm) and another an ovigerous female from the Arabian Sea in 260-732 m (142-400 fm), display no distinct morphological characters which support such discrimination, fitting well the accounts of *M. squamosa* given by Henderson (1885:409; 1888:131).

Five lots of the above listed specimens from the "Albatross" Stations 5121, 5122, 5197, 5266 and 5273 have been identified by J.E. Benedict.

Type-locality. – North of the Admiralty Islands.

Distribution. – This species is known from the north of Papua, the Philippines, Andaman Sea, Arabian Sea and Japan, in 176-732 m.

71. *Munida variabilis*, new species

Figures 51, 52

Material. – Off northern Mindanao (Sta. 5510: 1 ovig. ♀; Sta. 5511: 2 ♀; Sta. 5512: 1 ♀; Sta. 5513: 3 ♂). – Between Cebu and Leyte (Sta. 5410: 3 ♂, 3 ♀). – East coast of Mindoro (Sta. 5123: 4 ♂, 1 ovig. ♀, 1 ♀; Sta. 5124: 5 ♂, 9 ♀). – Vicinity of Marinduque off southwestern Luzon (Sta. 5373: 1 ♂, 2 ovig. ♀, 2 ♀ [1 ovigerous female is holotype, USNM 150350]).

Diagnosis. – Carapace armed dorsally with spines on gastric, cardiac and branchial regions and on posterior ridge, all variable in number, laterally with 5 or 6 spines. Front margin nearly transverse. Rostrum spiniform, slightly arched in lateral view. Supraocular spines stout, directed laterad, overreaching midlength of rostrum. Second, third and fourth abdominal segments with 4 spines on anterior ridge; posterior ridge of fourth segment with distinct median spine. Eyes dilated, eyelashes short. Basal segment of antennule with 2 equal-sized terminal and 1 small lateral spines. Prolongation of first segment of antennal peduncle prominent. Third maxilliped thickly setose; ischium with well developed distoventral spine; merus with midventral spine only. Thoracic sternal segments relatively wide, fourth thoracic sternum extremely narrowed anteriorly. Chelipeds and walking legs slender, lacking epipods; first walking leg reaching end of cheliped. Male gonopod absent from first abdominal segment.

Description of holotype. – Carapace (Figure 51) nearly as long as wide, exclusive of rostrum. All transverse ridges interrupted; hepatic and anterior branchial regions lacking distinct striae. Cervical groove rather deep. Anterior cardiac region deeply excavated. Three pairs of spines on moderately convex gastric region, as illustrated. Postcervical spine much larger, additional 2 pairs of spines aligned with postcervicals, and additional spinule further behind on right side only. Two

Figure 51. – *Munida variabilis*, new species, ovigerous female holotype from "Albatross" Sta. 5373, dorsal view.

moderate-sized cardiac spines on distinctly elevated transverse ridge. Posterior transverse ridge elevated with 4 equidistantly arranged, prominent spines and additional spinule between 2 right spines. Lateral margins constricted at end of cervical groove, moderately convex behind it, setose in anterior half; 2 moderate- and equal-sized spines in front of cervical groove and 4 more behind it, foremost of latter ventral to level of marginal row, anterior second strongest.

Rostrum spiniform, 1/3 as long as remaining carapace, slightly arched in lateral view. Supraocular spines stout, directed distinctly laterad, considerably remote from rostrum, measuring 2/3 of rostral length, slightly overreaching cornea.

Eyes well developed, dilated distally, eyelashes short.

Second, third and fourth abdominal segments (Figure 51) with 4 prominent spines on greatly elevated anterior transverse ridge; well developed median spine on posterior ridge of fourth segment.

Basal segment of antennule (Figure 52a) setose in distal half, 2 terminal spines subequal in size, lateral margin with rather reduced spine near base of lateral terminal spine. Prolongation of first segment of antennal peduncle (Figure 52b) overreaching supraocular spine, fringed laterally with long setae; second segment with both distomesial and distolateral spines; third segment unarmed.

Third maxilliped (Figure 52c) very setose, distal 2 segments very slender. Ischium rather thin, distinctly longer than merus, distoventral spine well developed, larger than midventral spine of merus, mesial ridge with 17 small denticles. Endopod of right third maxilliped detached from body and missing.

Anterior part of sternal segments as illustrated (Figure 52d); sternum of third thoracic somite laterally expanded, distinctly wider than anterior margin of following sternum.

Cheliped (Figure 51) slender, subcylindrical, moderately spinose, squamate dorsally and ventrally, setose laterally, especially on merus, barely 3 times as long as carapace. Merus longer than carapace including rostrum, with 4 longitudinal rows of spines, 2 mesial marginal rows much pronounced. Palm 6.7 times as long as wide, 1.4 times as long as movable finger, armed with 4 rows of spines: dorsal row of 3 small spines, lateral marginal of 4 moderate-sized spines, and mesial marginal and ventromesial marginal, both of large spines. Fingers not gaping, crossing distally, bifid at tip of fixed finger; opposable margins almost straight.

Walking legs (Figure 51) slender, weakly squamate dorsally, almost subequal to cheliped in length. First walking leg with long plumose setae on dorsal margins of merus and carpus. Merus with 15 dorsal marginal and 14 ventral marginal spines, terminal of latter greatly elongate. Carpus with 2 terminal spines of large size and 1 spinule at midlength of dorsal margin. Propodus barely twice as long as dactylus, ventral marginal spinelets indistinct. Dactylus slender, curving ventrad, setose on dorsal margin; ventral margin smooth but few proximal setae. Second walking leg similar to first. Third walking leg also similar to preceding 2 legs; carpus with 2 dorsal marginal spines in addition to large terminal one.

Epipods absent from all pereopods.

Measurements of holotype. – Length of carapace including rostrum, 17.7 mm; width of carapace, 11.9 mm; length of cheliped (right), 51.6 mm; of carpus, 7.6 mm; of palm, 12.0 mm; of movable finger, 8.7 mm.

Measurements of paratypes. – Carapace lengths of males, 12.3-27.3 mm; of

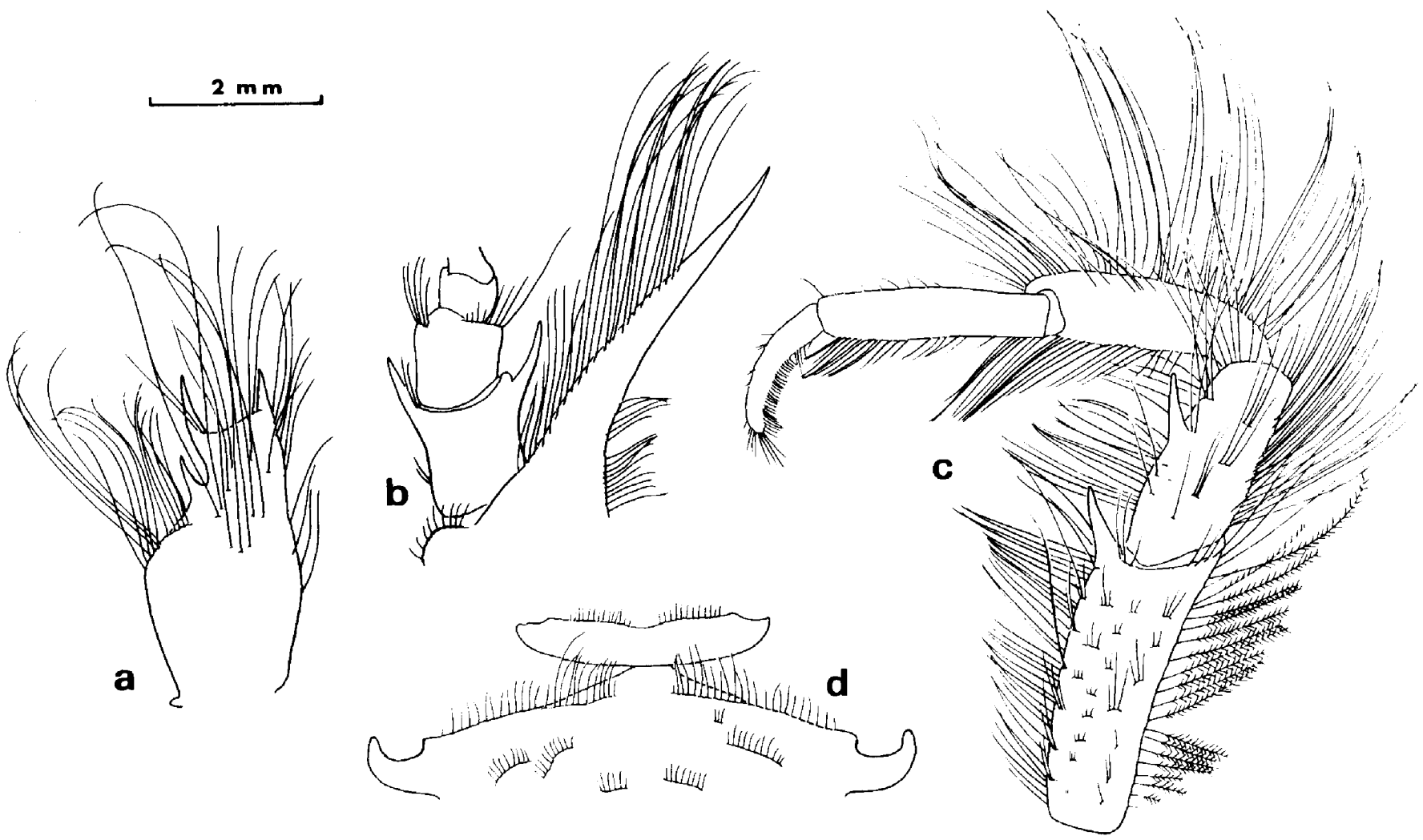

Figure 52. – *Munida variabilis*, new species, ovigerous female holotype from "Albatross" Sta. 5373: a, basal segment of right antennule; b, right antennal peduncle; c, endopod of left third maxilliped; d, anterior part of sternal segments.

ovigerous females, 18.8-23.6 mm; of nonovigerous females, 13.5-27.8 mm.

Habitat. – Taken in 514-924 m, usually on bottoms of mud, occasionally mixed with sand.

Variation. – The carapace is variably spinose: The foremost of the anterior branchial marginal spines which is usually ventral to the level of the marginals if present is absent in half number of the specimens examined; the number of spines on the posterior ridge varies from three to nine (usually four); cardiac spines on the elevated transverse ridge vary from one to four, but usually one or two; rarely, a few other spinules occur in front of the elevated cardiac ridge. Usually the postcervical spine on each side is accompanied by two equal-sized spines behind, all these being arranged in a longitudinal row on the branchiocardiac border; occasionally present are additional few spinules lateral to the postcervical as well as lateral to the hindmost spine of this longitudinal row. The pairs of both the epigastric and median protogastric spines are constantly present, but the mesogastric and metagastric regions bear one to four (usually two) spines, or rarely two or three tubercles or nothing. The lateral protogastric spine is absent except for a few specimens. The posterior cardiac and intestinal regions are usually spineless but rarely armed with one to seven spinules.

The armature of the fourth abdominal segment is also highly variable. Most of the specimens inclusive of the holotype have four spines on the anterior ridge and a single median spine on the posterior ridge, the latter being constantly present. The former, however, are variable between two and four; when there are two, the median

two remain prominent and the lateral two are reduced; when there are three, the right or left lateral is missing.

Remarks. – The presence of both more numerous gastric spines and the extremely prolonged basal process of the antennal peduncle distinguishes *Munida variabilis* from a superficially allied species *M. normani* Henderson from off the Fiji Islands. Another closer relative seems to be *M. eminens* described in this paper, from which *M. variabilis* may be distinct in having 1) paired protogastric and several mesogastric or metagastric spines, 2) the posterior transverse ridge of the carapace with three to nine (usually four) spines, 3) the chela shorter than the meri of the walking legs, and 4) the dactyli of the walkings legs relatively slenderer distally.

Type-locality. – Southwest of Tayabas Light, off southwestern Luzon (13°40'N, 121° 31'10"E).

Distribution. – Between Luzon and Mindoro, between Cebu and Leyte, and Mindanao Sea, in 514-924 m.

Genus *Munidopsis* Whiteaves, 1874

This genus now contains 153 species; 94 from the Indo-Pacific, 62 from the Atlantic and eight from the southern Ocean; six of them are widespread species in both the Indo-Pacific and the Atlantic. Insofar as the Indo-Pacific species are concerned, 57 are known in the Indo-West Pacific, four of which are also recorded from the eastern Pacific (Baba, 1981b:111). The present "Albatross" collection comprises 20 species, five of which are new. Distributionally notable is that *Munidopsis spinosa*, previously regarded as one of the Atlantic elements, was taken in the Philippines.

The chance of meeting these deepsea animals is so limited that the ranges of morphological variations are insufficiently known. And therefore it is most likely that future access to more material would show that some of the known species will prove to be synonymous with previously described species. The key to the species previously known in the Indo-Pacific would be desirable; unfortunately, however, materials sufficient to allow production of such a key have not been available to me; accordingly, here is given a key only to the Philippine and Indonesian species examined.

Thanks to the work of Chace (1942), it is believed that the subgenera, *Munidopsis, Orophorhynchus, Elasmonotus, Galathodes* and *Bathyankyristes*, and even the genus *Galacantha* do not reflect intrinsic relationships, and therefore they all should be merged with *Munidopsis*.

Key to Philippine and Indonesian Species of *Munidopsis* Examined

1. Epipods present on pereopods 2
– Epipods absent from all pereopods 9
2. Epipods present on first through third pereopods 3
– Epipod present on first pereopod only 6
3. Rostrum unarmed laterally ..... **87. *M. spinosa***
– Rostrum armed with lateral spines 4

4. Abdominal terga smooth except for median spines on second through fourth segments ..... **91. *M. valdiviae***
– Abdominal terga totally spinose or tuberculate, in addition to median spines on second through fourth segments 5
5. Carapace covered with spinules ..... **89. *M. trachynotus***
– Carapace covered with simple or scale-like tubercles ..... **83. *M. rostrata***
6. Eyespine present ..... **75. *M. ciliata***
– Eyespine absent 7
7. Spines on second through fourth abdominal segments ..... **82. *M. regia***
– No spine on abdominal segments 8
8. Rostrum broadly triangular; eyestalk straight, short, about 1.5 times as long as broad ..... **79. *M. latimana***
– Rostrum styliform; eyestalk slender, twice as long as broad, distally curving laterad ..... **78. *M. dasypus***
9. Eyespine present; eyestalk fused to carapace 10
– Eyespine absent; eyestalk movable 12
10. Eyespine well developed, cornea small; body thickly covered with fine setae ..... **80. *M. pilosa***
– Eyespine small, cornea relatively large; body almost glabrous or with few setae 11
11. Rostrum distinctly carinate dorsally, not denticulate apically; sternum of fourth thoracic somite with 2 or 3 marginal spines on each side of juncture with sternum of third somite ..... **73. *M. bispinoculata***
– Rostrum indistinctly carinate dorsally, denticulate apically; sternum of fourth thoracic somite with 1 marginal spine on each side of juncture with sternum of third somite ..... **85. *M. similior***
12. Propodus of walking legs distally widening, subchelate with dactylus..... ..... **88. *M. tenax***
– Propodus of walking legs uniform in width, not subchelate with dactylus..... 13
13. Rostrum with lateral spines 14
– Rostrum laterally smooth or serrate 15
14. Carapace with dorsal spines ..... **81. *M. plumatisetigera***
– Carapace spineless dorsally ..... **90. *M. tridentata***
15. Carapace with dorsal spines ..... **84. *M. scobina***
– Carapace spineless dorsally 16
16. Cornea more than length of remaining eyestalk 17
– Cornea much shorter than remaining eyestalk 18
17. Chelipeds fully 3 times as long as carapace; posterior 2 plates of telson about 1.7 times as long as broad ..... **77. *M. cylindrophthalma***
– Chelipeds twice as long as carapace; posterior 2 plates of telson relatively short, about 1.1 times as long as broad ..... **72. *M. andamanica***
18. Lateral margin of carapace cristiform, overhanging pterygostomian flap .... **74. *M. carinimarginata***
– Lateral margin of carapace subcristiform, but not overhanging pterygostomian flap 19
19. Rostrum laterally serrate; posterior 2 plates of telson elongate, 1.4 times as long as broad ..... **86. *M. sinclairi***

– Rostrum laterally smooth; posterior 2 plates of telson relatively short, about 0.8 as long as broad ..... **76. *M. crenatirostris***

72. *Munidopsis andamanica* MacGilchrist, 1905

Figure 53

Munidopsis Wardeni: Alcock, 1901:157 (in part).
Munidopsis Wardeni Anderson, var. *andamanica* MacGilchrist,1905:245.
Munidopsis (Munidopsis) Wardeni: Doflein and Balss, 1913:153, pl. 14: fig. 2.

Material. – Teluk Bone, Sulawesi (Sta. 5650: 1 ♀). – Molucca Sea off west coast of Halmahera (Sta. 5619: 2 ovig. ♀). – Between Leyte and Mindanao (Sta. 5491: 1 ♂). – East coast of Mindoro (Sta. 5124: 1 ♂). – South China Sea off southwestern Luzon (Sta. 5114: 1 ovig. ♀).

Measurements. – Carapace lengths of males, 14.6 and 28.7 mm; of ovigerous females, 19.2-23.0 mm; of nonovigerous female, 16.1 mm.

Diagnosis. – Carapace thickly covered with short fine setae, feebly rugose posteriorly, lacking dorsal spines; lateral margins subparallel, notched between hepatic and branchial regions; anterolateral angle distinctly or indistinctly spiniform. Front margin oblique and convex directly behind insertion of antennal peduncle. Small spine ventral to front margin between eyestalk and antenna. Rostrum narrowly triangular, dorsally convex or weakly carinate, almost horizontal or slightly deflexed, covered with fine setae. Second and third abdominal segments each with 2 elevated transverse ridges, spineless. Telson divided into 12 plates. Eyes movable; eyestalk without cornea short, cornea elongate, distally directed laterad. Chelipeds twice as long as carapace, covered with relatively long plumose setae, subcylindrical, but chela moderately depressed; merus with 4 prominent terminal spines and 1 mesial marginal at midlength; fingers distally touching each other with few intermeshing teeth; opposable margins dentate, almost straight. Walking legs short and setose; first leg barely reaching end of merus of cheliped, dorsal margin of merus spineless or proximally armed with few spines, excepting distinct terminal spine. Epipods absent from all pereopods.

Habitat. – Taken in 514-1,350 m on bottoms of mud or mud mixed with sand or coral, and on sand bottom.

Remarks. – Alcock (1901:258) noted that two small specimens of *Munidopsis wardeni* from the Andaman Sea have no spine on the second and third abdominal segments. Subsequently MacGilchrist (1905:245) obtained similar but larger specimens in the same sea, proposed for them a variety *andamanica*, and mentioned that the carapace is generally smoother and its transverse ridges are less prominent. One of the "Investigator" specimens of *M. wardeni*, 1355/10, now deposited in the National Museum of Natural History, Smithsonian Institution, was examined: The carapace is much rugose dorsally and granulose laterally; the second and third abdominal segments are spinulose on transverse ridges, and the meri of the walking legs bear five prominent spines on the dorsal margin. Although the differences between

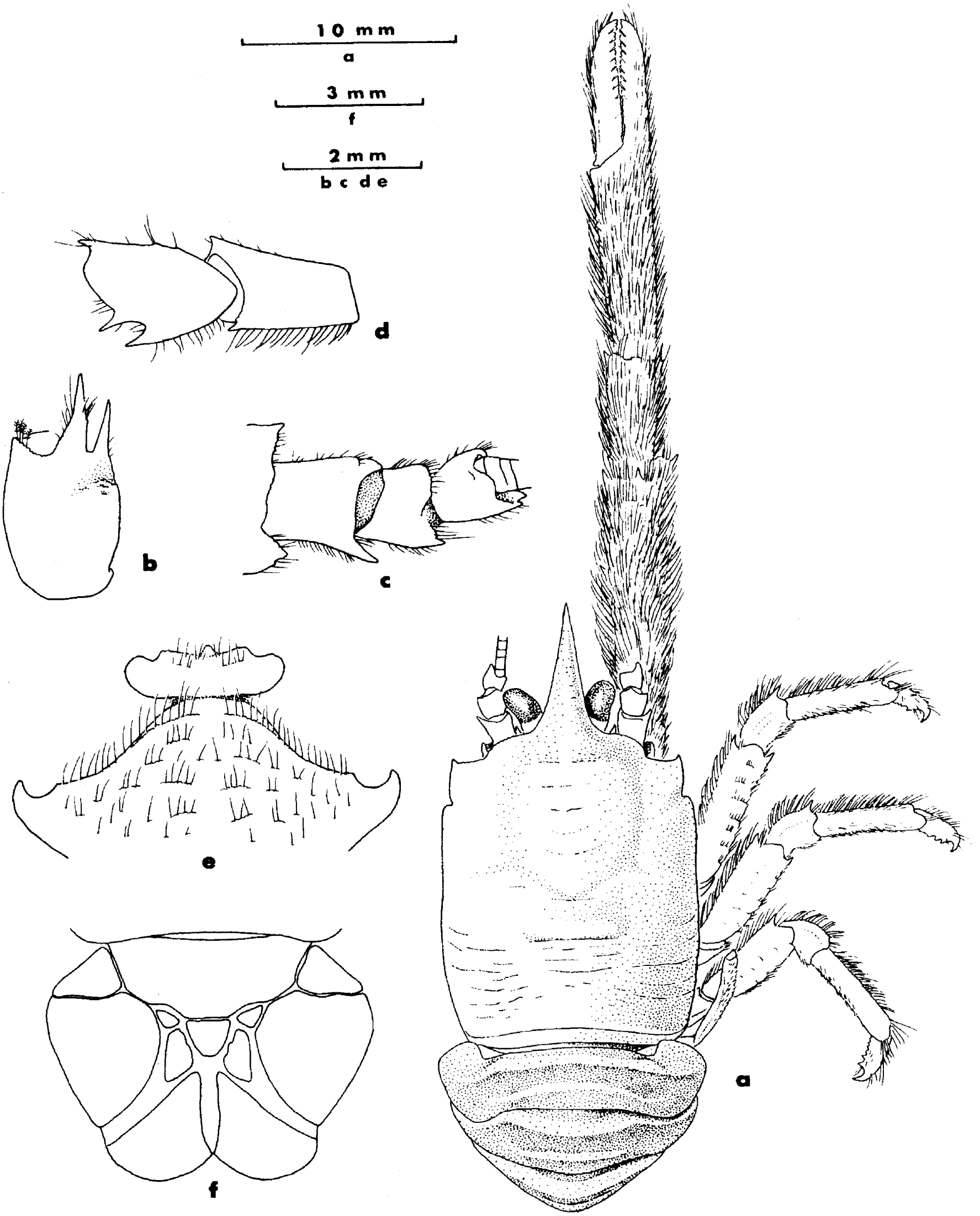

Figure 53. – *Munidopsis andamanica* MacGilchrist, ovigerous female from "Albatross" Sta. 5114, carapace length 21.7 mm: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, proximal segments of endopod of left third maxilliped; e, anterior part of sternal segments; f, telson.

wardeni and *andamanica* are subtle, I believe that they are sufficiently distinct to be of specific importance.

The "Valdivia" record of *M. wardeni* from off western Sumatra (Doflein and Balss, 1913:153) should be transferred to the synonymy of *M. andamanica* because its description and illustration demonstrate that it belongs to that species.

Type-locality. – Andaman Sea.

Distribution. – Known from the Andaman Sea, off western Sumatra, Teluk Bone in southern Sulawesi, Molucca Sea, Mindanao Sea, off the east coast of Mindoro and the South China Sea off southwestern Luzon; in 514-1,350 m.

73. *Munidopsis bispinoculata*, new species

Figure 54

Material. – Teluk Bone, Sulawesi (Sta. 5658: 1 ovig. ♀). – Teluk Tomini, Sulawesi (Sta. 5612: 1 ♂). – Off southwest coast of Halmahera (Sta. 5628: 4 ovig. ♀; Sta. 5630: 1 ♂, 1 ovig. ♀ [ovigerous female is holotype, USNM 150424]).

Diagnosis. Carapace rather smooth, posteriorly provided with interrupted ridges, dorsally unarmed; lateral margins slightly diverging posteriorly, each with 2 spines anteriorly. Front margin gently oblique with small but distinct antennal spine. Rostrum comparatively narrow, dorsally carinate, barely 1/3 as long as remaining carapace. Second and third abdominal segments each with 2 elevated, spineless transverse ridges. Telson divided into 8 plates. Eyes immovable, cornea well developed, distally narrowing, bearing 2 eyespines, inner one smaller. Sternum of third thoracic somite with 2 anterior marginal spines, following sternum with 2 or 3 acute spines in anterior half of lateral margin. Chelipeds as long as carapace including rostrum; chela with denticulate carina on distolateral margin. First walking leg distinctly overreaching cheliped; merus and carpus spinose on dorsal margin. Epipods absent from all pereopods.

Description of holotype. – Carapace (Figure 54a) excluding rostrum longer than wide, almost glabrous and spineless dorsally. Gastric region with few weak striae slightly convex and indistinctly circumscribed. Cervical groove indistinct. Posterior 1/3 of carapace with interrupted transverse ridges, anterior cardiac transverse ridge moderately elevated. Posterior transverse ridge uninterrupted, lacking spines. Front margin oblique with small antennal spine. Lateral margins slightly diverging posteriorly, armed with smaller anterolateral spine and another directly behind ordinary end of cervical groove.

Rostrum narrowly triangular, almost horizontal, distinctly carinate dorsally, barely 1/3 as long as remaining carapace.

Abdominal terga unarmed; second and third segments each with 2 moderately elevated transverse ridges. Telson (Figure 54f) divided into 8 plates.

Eyes (Figure 54a) fused to carapace, cornea well developed, wide at base, narrowing distally; 2 eyespines distinct, outer one larger, inner one ventral in position.

Basal segment of antennule (Figure 54b) slightly longer than wide, with 2 terminal spines. First segment of antennal peduncle (Figure 54c) with 2 terminal spines,

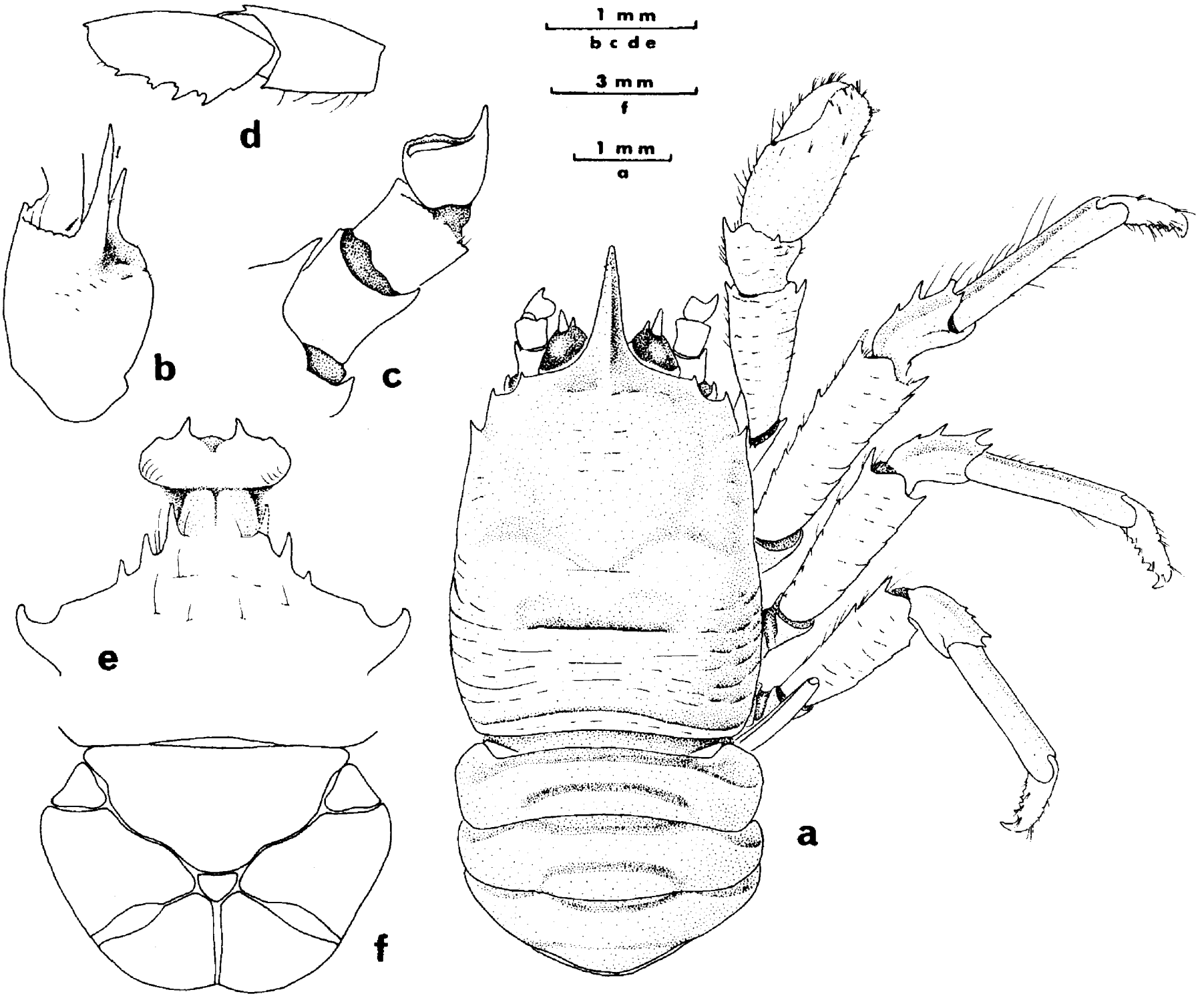

Figure 54. – *Munidopsis bispinoculata*, new species, ovigerous female holotype from "Albatross" Sta. 5630: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, proximal segments of endopod of left third maxilliped; e, anterior part of sternal segments; f, telson.

mesial one strong, reaching end of second segment, lateral one much reduced; second segment with distolateral spine only; third segment spineless; fourth segment with prominent process on distolateral margin.

Merus of third maxilliped (Figure 54d) more than 1.5 times as long as ischium, provided with irregular dentitions on ventral margin and small distal spine on dorsal margin; both distodorsal and distoventral margins of ischium minutely produced.

Anterior part of sternal segments as illustrated (Figure 54e); sternum of third thoracic somite with 2 prominent spines on anterior margin; following sternum with 3 strong lateral marginal spines equidistant in anterior half.

Cheliped (Figure 54a) comparatively small, nearly as long as carapace, sparsely furnished with short setae. Ischium with dorsal, ventral and lateral spines. Merus almost glabrous, with 3 terminal spines. Carpus distally widening, with 2 terminal

spines. Chela depressed, palm without spines slightly longer than wide, nearly as long as finger. Fingers not gaping, distally rounded, touching each other with several intermeshing teeth; lateral margin of fixed finger with denticulate carina.

Walking legs (Figure 54a) relatively stout. First walking leg overreaching cheliped, sparsely setose; merus dorsally flattish, squamate, feebly carinate ventrally, slightly widening distally, armed with 7 dorsal marginal and few ventral marginal spines, both terminal ones strongest; carpus weakly ridged on dorsolateral face, armed with 4 dorsal marginal spines, terminal one small; propodus 6 times as long as wide, nearly 1.5 times as long as dactylus, ridged on dorsolateral face, bearing distoventral marginal spinelet; dactylus strongly curving ventrad distally, ventral margin with about 9 denticles. Second walking leg similar to first, but shorter. Third walking leg much shorter, particularly merus; marginal spines rather reduced on merus and carpus.

Epipods absent from pereopods.

Measurements of holotype. – Length of carapace including rostrum, 10.7 mm; width of carapace, 6.3 mm; length of cheliped (right), 10.9 mm; of carpus, 1.4 mm; of palm, 1.9 mm; of movable finger, 2.0 mm.

Measurements of paratypes. – Carapace lengths of males, 11.8+ and 12.4 mm; of ovigerous females, 9.6-11.0 mm.

Variation. – The inner eyespine, which is usually small but fully discernible in dorsal view, is reduced to only a papilla-like process in two ovigerous female paratypes; also, in one of them, the antennal spine on the front margin is absent on the left side, but distinct on the right side.

Habitat. – Taken in 933-2,363 m on bottoms of mud, or mud mixed with coral sand.

Remarks. – This species is very near to *Munidopsis similior* described in this paper. Their relationships will be discussed under the "Remarks" of *M. similior*. Another of the close relatives in the Pacific is *M. ceratophthalma*, in which, however, only a single eyespine is present and it is continuous from eyestalk, not arising from the cornea as in the new species (Alcock, 1901: pl. 3: fig. 2; Alcock and McArdle, 1902: pl. 57: fig. 3). The western Atlantic analogue, *M. spinoculata* A. Milne Edwards, seems to be closely related to this new species. The differences are much more subtle than they are between *M. bispinoculata* and *M. similior*. It is possible that *M. bispinoculata* is identical with *M. spinoculata*, because of this occurrence in considerable depths, but I am inclined to believe in the immutability of the following particulars noted in a specimen of the Atlantic species taken by the "Albatross" at Station 2140 near Jamaica in 1,768 m and deposited in the National Museum of Natural History, Smithsonian Institution: the rostrum is wider and denticulate apically, as in *M. similior*; the inner eyespine is barely discernible; and the sternum of the third thoracic somite is more subrectangularly expanded laterally and without prominent marginal spines anteriorly.

Type-locality. – Southeast of Doworra Island, off southern Halmahera (0°56'30"S, 128°05'00"E).

Distribution. – Recorded here from Sulawesi and off southern Halmahera, in 933-2,363 m.

74. *Munidopsis carinimarginata*, new species

Figure 55

Material. – Molucca Sea off west coast of Halmahera (Sta. 5621: 1 ♂, 1 ovig. ♀ [male is holotype, USNM 150418]).

Diagnosis. – Carapace without dorsal and lateral spines weakly convex, dorsal transverse ridges rudimentary, lateral margin convex and sharply carinate. Front margin transverse, but lateral half distinctly depressed below level of mesial half; small spine ventral to front margin between eyestalk and antennal peduncle. Rostrum widely triangular, flattish, slightly deflexed. Abdomen spineless, second through fourth segments with 2 transverse ridges, anterior ridge prominently elevated. Telson divided into 12 plates. Eyes small and movable, cornea as long as remaining eyestalk. Chelipeds subcylindrical, less than twice as long as carapace, thickly covered with fine setae, merus with terminal spines only. Walking legs short, setose on dorsal margin, merus relatively wide, flattish and minutely granulate on dorsolateral face, cristiform on dorsal margin, moderately carinate on ventral margin, lacking marginal spines other than distal one; first walking leg reaching end of merus of cheliped. Epipods absent from pereopods.

Description of holotype. – Carapace (Figure 55a) excluding rostrum longer than wide, dorsal surface covered with fine setae, spineless, almost smooth but interrupted, weak transverse ridges in posterior 1/3 and on gastric region. Gastric region convex, indistinctly circumscribed. Hepatobranchial border distinct. Cardiac region abruptly depressed in front of elevated transverse ridge. Posterior transverse ridge elevated, uninterrupted and unarmed. Lateral margin convex, spineless, carinate, overhanging pterygostomian flap, distinctly notched between hepatic and branchial regions; anterolateral angle rounded; greatest width of carapace measured at midlength. Front margin different in level in mesial and lateral halves of width, each half margin transverse, lateral half distinctly depressed below level of mesial half. Small spine ventral to front margin between eyestalk and antennal peduncle.

Rostrum widely triangular, flattish dorsally, slightly deflexed, less than half as long as remaining carapace.

Abdomen spineless, second through fourth segments with 2 transverse ridges, anterior ridge greatly elevated. Telson (Figure 55f) divided into 12 plates, pair of posterior plates widely separated from midlateral plates; midlateral plate with fringe of coarse setae on lateral margin.

Eyes small, movable, falling short of midlength of rostrum; cornea as long as remaining eyestalk.

Basal segment of antennule (Figure 55b) stocky with 4 terminal spines; mesial 2 spines tiny and divided by cleft, other 2 well developed, lateral of latter with 2 denticles on ventral margin. Antennal peduncle as illustrated (Figure 55c); third segment with short spiniform process on distolateral margin.

Ischium of third maxilliped (Figure 55d) triangular in cross section, dorsal and ventral margins produced terminally, distodorsal process tiny. Merus relatively wide with 2 well developed ventral and 1 distinct distodorsal spines.

Sternum of third thoracic somite (Figure 55e) 3 times as wide as long, anterior margin with 2 setiferous, minutely dentate lobes.

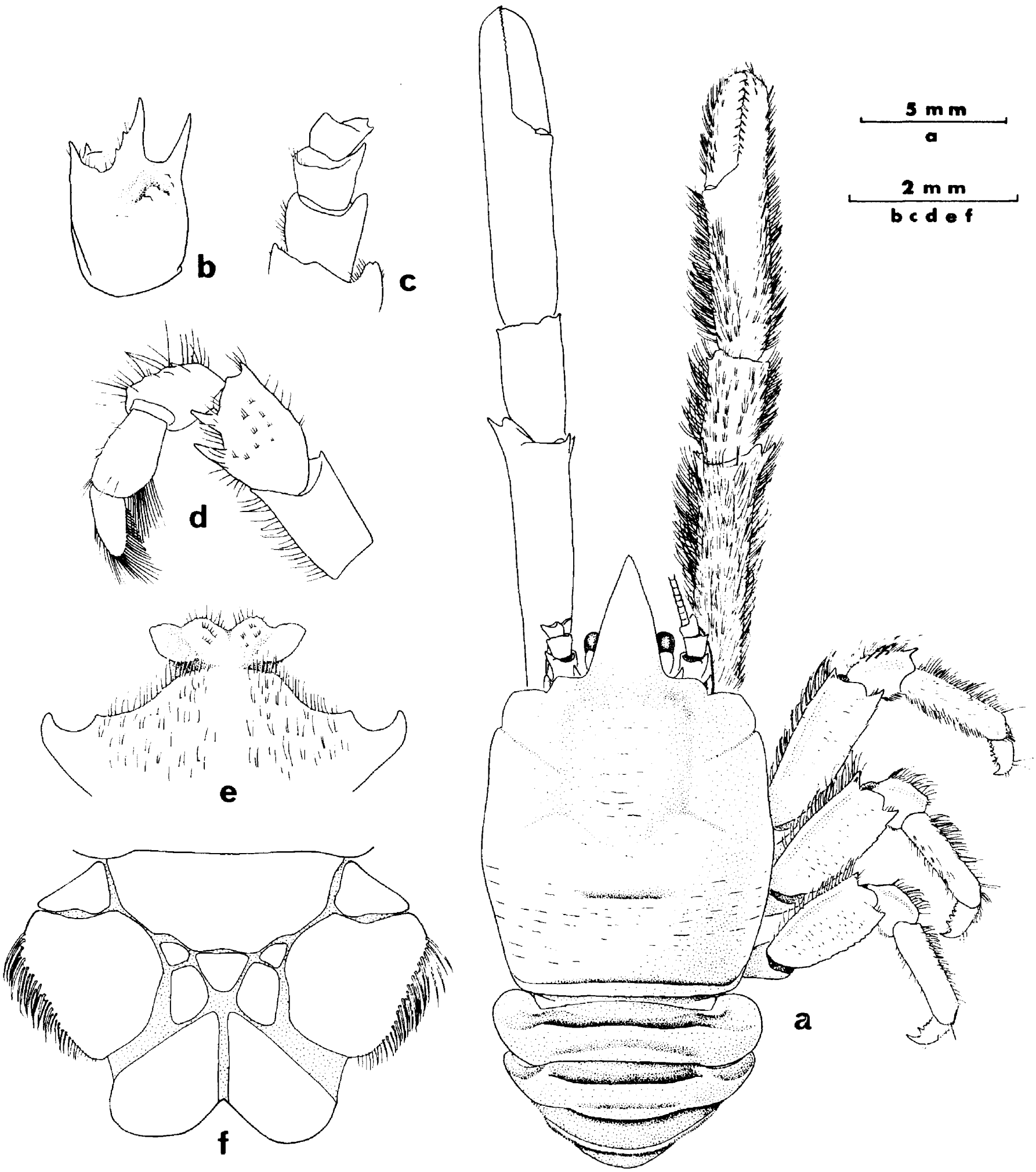

Figure 55. – *Munidopsis carinimarginata*, new species, male holotype from "Albatross" Sta. 5621: a, dorsal view; b, basal segment of left antennule; c, left antennal peduncle; d, endopod of left third maxilliped; e, anterior part of sternal segments; f, telson.

Chelipeds (Figure 55a) unequal in size; left one longer, 1.8 times as long as carapace including rostrum, thickly covered with fine setae, subcylindrical but chela more or less depressed. Ischium with dorsal and ventral spines. Merus with 3