

Expédition Rumphius II (1975)
Crustacés parasites, commensaux, etc.

(Th. Monod et R. Serène, éd.)

VII. Galatheid Crustaceans (Decapoda, Anomura)

by Keiji BABA *

Abstract. — A collection of Galatheid Crustaceans of the Rumphius Expedition to the Moluccas contains 61 specimens, distributed among 14 species. Most of the species prove to be typical reef-inhabitants. Range extensions are established for three species. A key to the littoral species of *Galathea* known from the eastern part of the East Indian Archipelago is presented. Commensal hosts are newly added to the previous records for three species. Variations of *Allogalathea elegans* are noted.

Notwithstanding the great biological interest, the Galatheid fauna of the Moluccas and the neighboring seas has received quite sporadic attention. Systematic studies of this animal group have been provided as a part of the Decapod Crustacea treated by HENDERSON (1885, 1888) on material collected by the "Challenger"; DE MAN (1888, 1902) on material from the East Indian Archipelago; PORTS (1915) on material from the Torres Strait; GORDON (1935) on material from the former Netherland East Indies; and most recently BABA (1977) on material collected by the "Snellius" Expedition. The results of these studies indicate that, prior to the present report, a total of 32 species have been recorded from the Moluccas and vicinity, 17 species of which are more or less deep-water forms.

The present material has been collected chiefly on shore. It contains 61 specimens, divided among 14 species, largely of the genus *Galathea*; all prove to be typical reef-inhabitants. Three species (*Galathea bimaculata*; *G. amamiensis*; and *Sadayoshia acroporae*) constitute new locality records, as they have previously been known only from the coral reefs of the Ryukyu Islands. However, many more shallow-water species probably have their centers of distribution around the East Indian Archipelago and their known ranges mainly as reef-dwellers may be extended, if this region as well as the reefs of other tropical seas are more extensively surveyed. Much of the material was found in association with crinoids. The commensal hosts were identified by D. L. MEYER, whose cooperation added considerably to our knowledge of commensalism.

* *Biological Laboratory, Faculty of Education, Kumamoto University, Kumamoto, 860, Japan.*

The present and the "Snellius" material examined by myself cover most of the tropical reef species; this made it possible to produce and include herein a key to the reef or shore species of *Galathea* recorded from the Moluccas and neighboring seas. An immature and incomplete specimen of *Galathea* taken from the north coast of Seram is unidentifiable and excluded from this report.

I thank Pr Th. MONOD, Muséum national d'Histoire naturelle, Paris, for making this collection available to me, Dr FENNER A. Chace, Jr., Smithsonian Institution, Washington, D.C., for reviewing the manuscript and for invaluable advice, Dr D. L. MEYER, University of Cincinnati, Ohio, for identifying the crinoids and for providing me with biological background data, and Dr Michael TÜRKAY, Natur-Museum und Forschungsinstitut, Frankfurt a.M., for examining the type of *Galathea consobrina*.

ACCOUNT OF THE SPECIES

Sadayoshia acroporae Baba, 1972

Sadayoshia acroporae Baba, 1972 : 43, figs. 1, 2.

MATERIAL EXAMINED. — Northeast coast of Marsegu I. : on coral; 18 January 1975; Th. MONOD & R. SERÈNE; 1 male (carapace length, 5.1 mm).

REMARKS. — Minor discrepancies between the type and the present material were noted: the movable finger of this specimen is merely tuberculate on the cutting edge, instead of having two pronounced projections as in the type. The ischium of the third maxilliped has a stout inner distal marginal spine in the type, whereas in the present material the spine is quite obsolete. Paired spines on the anterior transverse ridge of the second abdominal segment, evident in the type, are here reduced to small tubercle-like elevations. All of these differences seem to be of no systematic importance.

The type specimen was taken from *Acropora* sp. Although no details are provided as to the habitat of the present material, probably this species is closely associated with certain species of coral of the genus *Acropora*.

DISTRIBUTION. — Previously known from the Ryukyu Islands (type-locality). This is the first subsequent record and extends the known range from the subtropics to the tropics.

Phylladiorhynchus serrirostris (Melin, 1939)

Restricted synonymy :

Galathea serrirostris Melin, 1939 : 72, figs. 43-47.

Phylladiorhynchus serrirostris : BABA, 1977 : 251.

MATERIAL EXAMINED. — Northeast coast of Marsegu I. : on coral; 18 January 1975; Th. MONOD & R. SERÈNE; 1 male (c.l., 4.1 mm).

REMARKS. — According to MELIN (1939) the lateral margins of the rostrum and its base are usually serrated; however, he mentioned an almost complete lack of serrations on the base of the rostrum in a few specimens that he examined. In the present material such serration is completely absent as has been described earlier (MIYAKE & BABA, 1965, 1966). The cheliped is rather strongly developed; the spination however is weak in comparison with those of the Bonin Islands material previously examined in the collection of the Kyushu University, Fukuoka. The left chela is much larger and stouter than the right, strongly gaping with a median protuberance on the cutting margin of the movable finger only. The right chela is as illustrated by MELIN (1939). The presence of two gastric spines, the peculiar shape of the merus of the third maxilliped, and the triangular third thoracic sternum may be sufficient to distinguish this species from other known members of the genus.

DISTRIBUTION. — Bonin Islands (type-locality); Ryukyu Islands; Ternate.

***Galathea subsquamata* Stimpson, 1858**

Synonymy as given by BABA (1977 : 247).

MATERIAL EXAMINED. — Northeast coast of Marsegu I. : on coral; 18 January 1975; Th. MONOD & R. SERÈNE; 1 female (c.l., 5.2 + mm).

REMARKS. — In the previous paper (BABA, 1977) it was pointed out that *Galathea aculeata* Haswell is a synonym of *G. subsquamata*. This unique species, characterized by having epipods on the first three pairs of pereopods, scaly ridges on the gastric region, and the dorsoanterior part of the carapace spinous is now known from Japan southward to western and eastern Australia. The present specimen was taken on coral, as usually was the material from the Ryukyu Islands, the type-locality. Unpublished data also indicate that the same habitat was favored by specimens collected from both the southern coast of Kyushu, Japan and the Palau Islands.

DISTRIBUTION. — Ryukyu Islands (type-locality); Japan; Tablas Island; Sulu Islands; Ternate; Queensland; Western Australia.

***Galathea aegyptiaca* Paulson, 1875**

Synonymy as given by BABA (1977 : 244).

MATERIAL EXAMINED. — East coast of Marsegu I. : on coral; 18 January 1975; Th. MONOD & R. SERÈNE; 1 male (c.l., 7.3 mm). — Gorong I. : on coral; 26 January 1975; Th. MONOD; 3 males (c.l., 4.6-6.4 mm), 1 ovigerous female (c.l., 3.9 mm), 1 female (c.l., 3.9 mm). 27 January 1975; R. SERÈNE & Th. MONOD; 1 ovigerous female (c.l., 5.1 mm), 1 female (c.l., 3.9 mm).

REMARKS. — The two ovigerous females have the eggs eyed, almost ready to hatch; in one of them, collected on 27 January, the eggs are less numerous, numbering only 8, and empty egg-capsules remain on the pleopods.

DISTRIBUTION. — Red Sea (type-locality); Ternate; Timor; Obi Island; Talaud Island; Hollandia (Sukarnapura) Bay, New Guinea; Loyalty Islands; Western Australia; Ryukyu Islands; Bonin Islands.

***Galathea affinis* Ortmann, 1892**

Synonymy as given by BABA (1977 : 247).

MATERIAL EXAMINED. — Gorong I.: on coral; 27 January 1975; R. SERÈNE & Th. MONOD; 1 male (c.l., 3.1 mm).

DISTRIBUTION. — Fiji Islands (type-locality); Tuamotu Island; Rotuma Island; Ellice Islands; Ternate; Bandanaira; Loyalty Islands; Red Sea; Farquhar Islands; Coëtivy Islands; north coast of New Guinea; Timor; Saya de Malha Bank; Chagos Archipelago; Ryukyu Islands.

***Galathea algae* Baba, 1969**

Synonymy as given by BABA (1977 : 248).

MATERIAL EXAMINED. — Gorong I.: on coral; 25 January 1975; R. SERÈNE & Th. MONOD; 3 males (c.l., 3.2-4.3 mm), 1 ovigerous female (c.l., 4.6 mm), 1 female (c.l., 4.3 mm). 26 January 1975; Th. MONOD; 2 males (c.l., 5.0 mm, 6.2 mm), 1 ovigerous female (c.l., 5.2 mm), 2 females (c.l., 4.2 mm, 5.5 mm). 27 January 1975; R. SERÈNE & Th. MONOD; 1 male (c.l., 4.3 mm). — East coast of Marsegu I.: on coral; 18 January 1975; Th. MONOD & R. SERÈNE; 3 males (c.l., 2.9-4.2 mm), 1 ovigerous female (c.l., 3.6 mm), 3 females (c.l., 3.8-4.6 mm).

REMARKS. — In the previous paper (BABA, 1977), the possibility that *Galathea longimana* Paulson and *G. algae* might be identical, because of the proportional length of the rostrum, was unresolved. Of all 18 specimens here examined the rostral length-breadth ratio varies from 1.2 to 1.4, but never reaches 2 as described for *G. longimana*. This problem therefore awaits the discovery of additional *longimana*-like specimens.

Two of the females from Marsegu Island are infested by rhyzocephalan parasites.

DISTRIBUTION. — Red Sea; Tosa Bay, Japan (type-locality); Obi Island; Ternate; Kera, near Timor; Seychelles.

Galathea amamiensis Miyake & Baba, 1966

(Fig. 1)

Galathea amamiensis Miyake & Baba, 1966 : 75, figs. 13, 14.

MATERIAL EXAMINED. — Gorong I. : on coral ; 25 January 1975 ; R. SERÈNE & Th. MONOD ; 1 ovigerous female (c.l., 4.9 mm).

REMARKS. — Compared with the type the following differences were noticed, probably due to the immaturity of the Ryukyu Islands type material. The epipod is evident on the cheliped in the present material, while in the type it is invisible on the left cheliped and only barely discernible as a rudiment on the right. The original description shows that the rostrum is relatively long and its lateral teeth are shallowly incised. Re-examination of the type, however, reveals that, as illustrated in fig. 1, the rostral incisions are rather deep as in the present material. The outer orbital angle is more rounded in the type, but on the right side it is slightly produced, suggesting the possibility of a variability extending to the condition noted in the present material.

DISTRIBUTION. — Ryukyu Islands (type-locality). This is the first subsequent record, extending the known range, presumably as a reef-inhabitant.

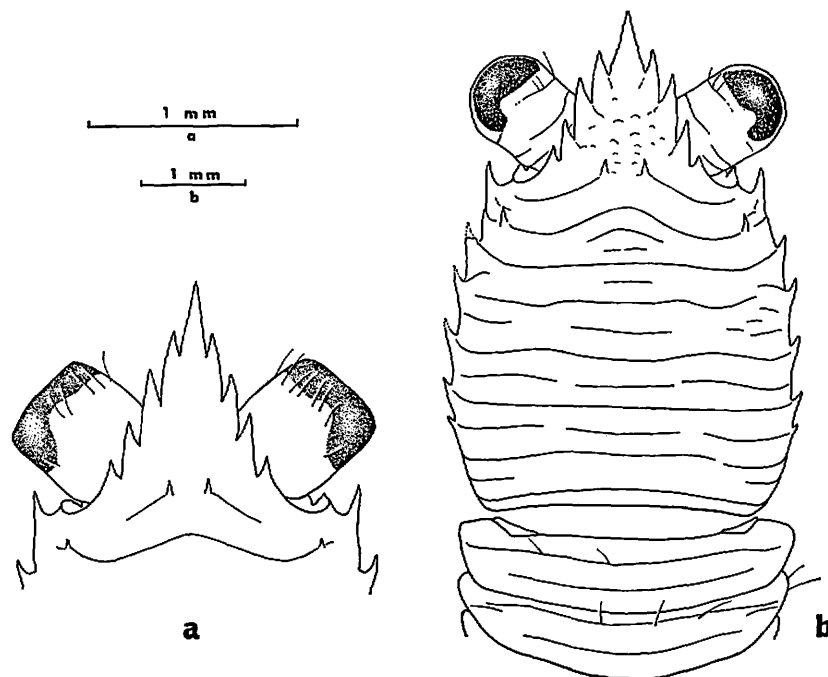


FIG. 1. — *Galathea amamiensis* Miyake & Baba ; a, holotype, male, from Amami-oshima, Ryukyu Islands, anterior part of carapace and rostrum ; b, ovigerous female from Gorong Island, carapace and anterior abdominal segments.

Galathea ohshimai Miyake & Baba, 1967

Galathea ohshimai Miyake & Baba, 1967 : 207, fig. 3.
Galathea ohshimai : BABA, 1977 : 250.

MATERIAL EXAMINED. — East coast of Marsegu I. : on coral; 18 January 1975; Th. MONOD & R. SERÈNE; 1 male (c.l., 3.2 mm).

REMARKS. — The following discrepancies were noticed between the present specimen and the type, as well as previously reported "Snellius" material : In the type and the "Snellius" specimens the rostrum is fully 1.5 times as long as broad, instead of only 1.2 in the present one. The third maxilliped of the latter is much like that of *Galathea orientalis* Stimpson, to which this species is most closely related; the carpus has three spines on the outer margin, the proximal sometimes obsolete. This is quite different from the previous descriptions of the carpus as unarmed. Furthermore, the outer margin of the merus, unlike the condition in the type as well as the "Snellius" material, is distinctly bispinose in the present specimen. From its closest relative, *G. orientalis*, however, this species differs in having no carapacial marginal spinule between the anterolateral spine and the end of the cervical groove.

DISTRIBUTION. — Palau Islands (type-locality); Obi Island; Talaud Island.

Galathea amboinensis De Man, 1888

Galathea amboinensis De Man, 1888 : 457, pl. 19, figs. 3, 3a.
Galathea minuta Potts, 1915 : 87, fig. 4b; pl. 1, fig. 6.
Galathea minuta : HAIG, 1973 : 281.

MATERIAL EXAMINED. — In front of Kotasirih village, Kailakat Bay, Gorong I. : commensal with *Comanthina schlegeli*; 27 January 1975; D. L. MEYER; 1 male (c.l., 6.0 mm).

REMARKS. — Undoubtedly the present specimen is identical with *Galathea minuta* Potts known from Torres Strait, as suggested by HAIG (1973) in the key to the eastern Australian species of *Galathea*. Comparison between DE MAN's description and our material shows that the rostrum is comparatively broad in our specimen; it is slightly more than one and a half times as long as broad in the present specimen, whereas it is nearly twice as long as broad in the illustration given by DE MAN (1888 : pl. 19, fig. 3a). However, the color and color pattern of our specimen are about as described by DE MAN. According to POTTS the longitudinal stripes on the carapace and abdomen as well as on the cheliped are dark blue, instead of orange red in alcohol in our specimen. It seems highly probable that this difference is due to the preservative. However, there is a case to show the color variation in *Galathea bimaculata* from the Ryukyu Islands, which species has blue or brown marks on the carapace when alive. No additional differences were noticed between the accounts of these species and the present material. Thus HAIG's opinion may be fully accepted.

The following additions should be made to the description of this species : Tuft of prominent setae absent on terminal segment of antennule ; epipods present on first three pairs of pereopods.

COMMENSALISM. — POTTS (1915) reported *Galathea minuta* associated with *Comanthus annulatum* (now called *C. timorensis*). The present material was found on *Comanthina schlegeli*.

DISTRIBUTION. — Amboina (type-locality) ; Torres Strait.

***Galathea inflata* Potts, 1915**
(Fig. 2)

Galathea inflata POTTS : 85, fig. 4 ; pl. 1, fig. 7. (Not *G. inflata* : BABA, 1969 b : 33, figs. 1, 2.)

MATERIAL EXAMINED. — Northwest coast of Banda I. : commensal with *Comanthus parvicirrus* ; 31 January 1975 ; D. L. MEYER ; 1 male (c. l., 7.2 mm). — In front of Kota-sirih village, Kailakat Bay, Gorong I. : commensal with *Comanthina schlegeli* ; 25 January 1975 ; D. L. MEYER ; 1 male (c.l., 4.7 mm), 1 ovigerous female (c.l., 4.1 mm). — Gorong I. : on crinoid ; 25 January 1975 ; M. K. MOOSA ; 1 male (c.l., 5.3 mm), 1 ovigerous female (c.l., 5.4 mm). — East coast of Marsegu I. : commensal with *Comanthus bennetti* ; 18 January 1975 ; D. L. MEYER ; 1 ovigerous female (c.l., 8.0 mm). — Locality unknown ; 21 January 1975 ; D. L. MEYER ; 1 male (c.l., 6.2 mm).

DESCRIPTION

Carapace, excluding rostrum, slightly longer than broad. Dorsal surface clearly striate, with distinct cervical groove. Four transverse ridges behind cervical groove more or less elevated. No gastric spines. Lateral margins convex ; greatest breadth measured between hindmost marginal spines ; three spines in front of cervical groove, anteriormost moderately developed, directed anterolaterally, placed just outside of outer orbital angle ; well-developed second anterior spine equivalent to anterolateral spine in most species ; hindmost small, slightly dorsal in position ; small spine near outer extremity of first transverse ridge ; six marginal spines behind cervical groove, all acute but last (hindmost) more or less reduced. Well-developed spine behind insertion of antenna or near anterior part of pleural suture not visible from above.

Rostrum comparatively broad, barely 1.5 times as long as broad when measured from rostral tip to between basal lateral teeth ; dorsally with short setae. Four lateral teeth acute, deeply incised, directed anteriorly ; first small, second slightly larger than subequal anterior two.

Outer orbital angle rounded but with very small spine ; lower margin of orbit minutely dentate. Eyes normal.

Abdomen moderately setose ; second and third segments with two transverse ridges each.

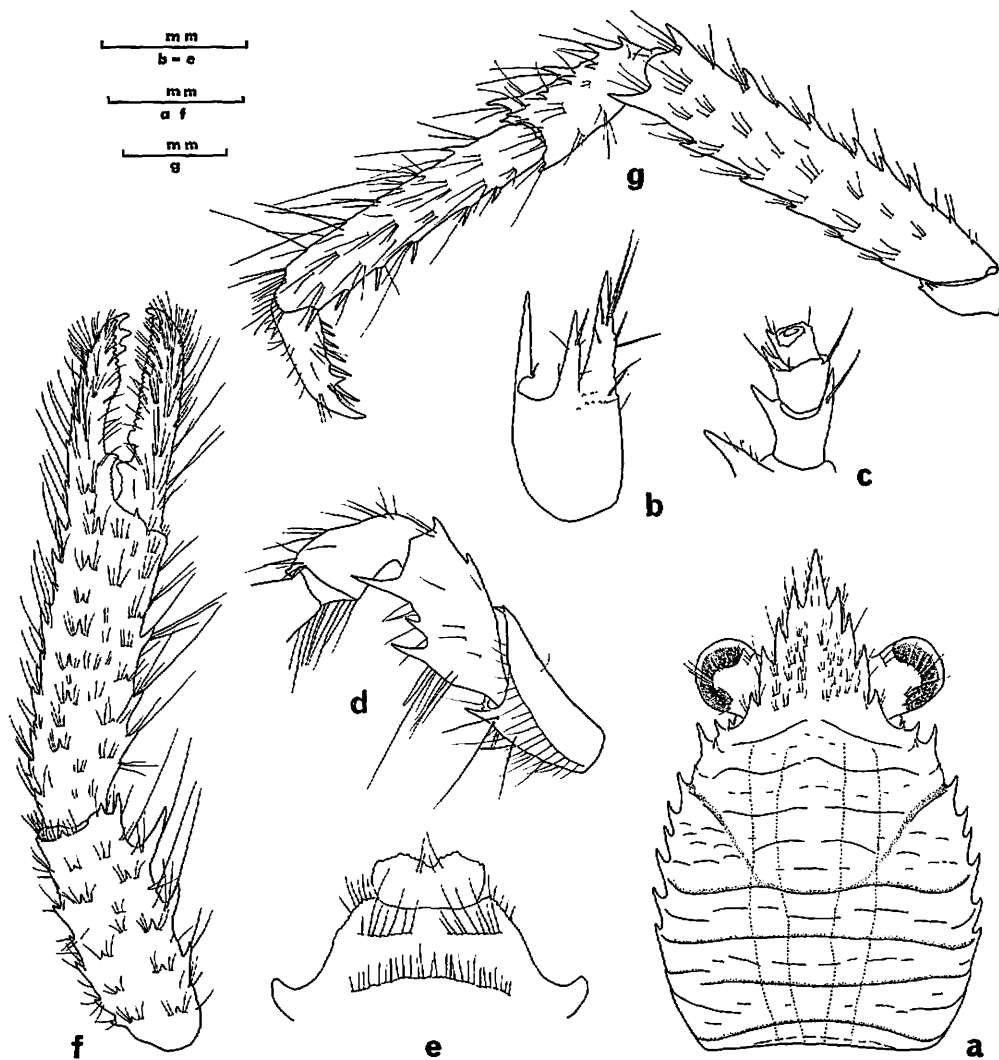


FIG. 2. — *Galathea inflata* Potts, male, from Banda Island ; a, carapace ; b, basal segment of left antennule ; c, left antennal peduncle ; d, endopod of left third maxilliped ; e, anterior part of thoracic sternum ; f, left chela ; g, left first walking leg.

Basal segment of antennule with three terminal spines, inner developed, nearly as long as outer ventral; outer dorsal stouter; terminal segment devoid of pronounced tuft of setae but with few short setae instead. First segment of antennal peduncle produced on inner distal margin; second segment with both marginal terminal spines, third and fourth with inner distal marginal spine each.

Anterior part of sternum as illustrated; anteriormost margin feebly dentate medially, with distinct median notch.

Inner distal margin of ischium of third maxilliped with moderate-sized spine and small additional accompanying spinule inside of it; outer distal margin with small spine; about 23 denticles on inner toothed ridge. Merus longer than ischium when measured on lateral mesial line; three spines on inner margin, proximal situated at middle and subequal to distal, both well developed, remaining medial small; outer margin with two small spines of subequal size. Propodus unarmed, with blunt outer distal marginal process.

Cheliped twice as long as carapace including rostrum, stout, spinose, and thickly furnished with coarse setae. Dorsal spination as illustrated. Palm 1.3 times as long as wrist, slightly more than three times as long as broad. Fingers slightly gaping, with several rounded intermeshing teeth at tip; cutting edge of movable finger dentate on distal half, with two pronounced processes on proximal half; that of immovable finger similarly dentate, distinctly convex on distal third, with proximal process coinciding with gap between two processes of movable finger. Ventral surface of cheliped also irregularly spinose.

Walking legs with coarse setae in moderate numbers. Merus of first walking leg with ten outer marginal and four inner marginal spines, proximal three of outer marginals smaller, distal of inner marginals largest; carpus with four large and one small outer marginal spines, and another four accompanying spinules slightly dorsal to them; inner distal margin spinulated; propodus with one or two proximal outer marginal spines and five or six inner marginal movable spinelets, distal of latter paired with another small ventral one; dactylus barely half as long as propodus, curving distally inward, ending in claw, with one prominent and five very weak processes on inner margin, movable coarse seta arising from each process. Second and third walking legs similar to first; but propodus more setose and its outer marginal spines completely absent. Merus of third leg devoid of outer and inner marginal spines excepting terminal inner marginal.

Pleopod absent from first abdominal segment in male. Simple pleopod arising from second segment. Epipods present on first three pairs of pereopods.

COLOR IN ALCOHOL. — Two longitudinal stripes of white on carapace, extending backward to join each other on dorso-mesial line of abdomen.

VARIATION. — The outer orbital angle is usually spinulated, but one exception is the smallest ovigerous female from Gorong Island, in which it is completely rounded. However, most noticeable about this specimen is the reduction or undifferentiation of epipods on some pereopods. Usually the epipods are present on the first three pairs of pereopods, whereas in this specimen they are normal on the chelipeds only, rudimentary on the first walking leg, and completely absent from the second. The small spine near the outer extremity of the first stria is also wanting in this specimen, as also is the case on the right side only in a male from Gorong Island.

REMARKS. — In the previous paper (BABA, 1969 *b*) I have recorded *Galathea inflata* based on a male collected from the coral reefs of the Ryukyu Islands, with a comment that there are a few discrepancies between the original description and the material examined as follows: the anterior branchial region is not scaly and the cervical groove is indistinct

in the Ryukyu Islands specimen. The "Rumphius" material displays no such differences, and is closer to the true species, also in being commensal with crinoids. Because of the brevity of Potts' original account, comparison with the type-specimen would be most desirable. With the cooperation of Dr. Fenner A. CHACE, Jr. of the Smithsonian Institution, Dr. C. B. GOODHART of the Cambridge University Museum, Dr. R. W. INGLE of the British Museum (Natural History), and Dr. A. J. BRUCE of the Heron Island Research Station, an attempt was made to locate the type, but, we believe that it may have been lost. The series of the "Rumphius" material are characterized by having the first pleopod missing in the male and epipods present on the first three pairs of pereopods. Since the "Rumphius" material is undoubtedly closer to the true species, it seems advisable that *Galathea inflata* : BABA, 1969, be removed from the synonymy of *G. inflata* Potts for the time being.

COMMENSALISM. — The Torres Strait material was associated with *Comanthus timorensis* (originally as *C. annulatum*) on the reefs. The present material was commensal with *Comanthus parvicirrus*, *C. bennetti*, and *Comanthina schlegeli*.

DISTRIBUTION. — Torres Strait (type-locality).

Galathea formosa De Man, 1902

Galathea formosa De Man, 1902 : 717, pl. 23, figs. 40, 40a-40f.
Galathea formosa : BABA, 1977 : 249.

MATERIAL EXAMINED. — Gorong I. : on coral ; 25 January 1975 ; Th. MONOD & R. SERÈNE ; 2 females (c.l., 3.3 mm, 3.9 mm). 27 January 1975 ; R. SERÈNE & Th. MONOD ; 1 male (c.l., 3.8 mm).

REMARKS. — This species, characterized by a broad rostrum, almost parallel lateral margins of the carapace, and a broad dorsal longitudinal stripe of light color, is easily distinguished from other tropical species. No additional characters of significance were noted.

DISTRIBUTION. — Ternate (type-locality) ; northwest of Obi Island. Both the previous and the present records show that this species is confined to the Moluccas, although its range extension to other tropical seas is highly probable.

Galathea bimaculata Miyake & Baba, 1966

Galathea bimaculata Miyake & Baba, 1966 : 69, figs. 9, 10.

MATERIAL EXAMINED. — Northeast coast of Marsegu I. : on coral ; 18 January 1975 ; Th. MONOD & R. SERÈNE ; 2 males (c.l., 3.7 mm, 3.8 mm), 1 ovigerous female (c.l., 3.8 mm).

REMARKS. — The color is fading in alcohol, but the trace of two orange markings, originally recorded as holly berry when alive, remains on the fingers of the cheliped. The following is the additional description for the species : Terminal segment of antennule devoid of tuft of setae ; epipod present only on first pereopod.

DISTRIBUTION. — Ryukyu Islands (type-locality). This is the first subsequent record, extending the known range from southern Japan southward to the Moluccas.

KEY TO THE SHALLOW WATER SPECIES OF *Galathea*
KNOWN FROM THE EASTERN PART OF THE EAST INDIAN ARCHIPELAGO

- | | |
|--|--|
| 1 Gastric spines present | 2 |
| — Gastric spines absent | 9 |
| 2 Rostrum truncate | <i>G. pilosa</i> De Man |
| — Rostrum triangular | 3 |
| 3 Epipods present on P1-P3 | <i>G. subsquamata</i> (p. 645) |
| — Epipods absent on P2-P3 at least | 4 |
| 4 Carapace and rostrum with pronounced plumose hairs on dorsal surface | <i>G. aegyptiaca</i> (p. 645) |
| — Carapace and rostrum devoid of plumose hairs | 5 |
| 5 Pterygostomial flap with one or two spines near anterior part of pleural suture | <i>G. affinis</i> (p. 646) |
| — Pterygostomial flap without spine near pleural suture | 6 |
| 6 Spinule between end of true cervical groove and anterolateral spine | 7 |
| — No spinule between end of true cervical groove and anterolateral spine | 8 |
| 7 Rostral teeth rather deeply incised ; anterior branchial region scaly ; propodus of walking leg with four or more outer marginal spines | <i>G. algae</i> (p. 646) |
| — Rostral teeth shallowly incised ; anterior branchial region not scaly ; propodus of walking leg smooth on outer margin | <i>G. consobrina</i> De Man ¹ |
| 8 Carapace with distinct spine near outer extremity of second stria ; pronounced tuft of setae on distal segment of antennule | <i>G. amamiensis</i> (p. 647) |
| — Carapace devoid of spine near outer extremity of second stria ; no tuft of setae on distal segment of antennule | <i>G. ohshimai</i> (p. 648) |
| 9 Epipods present on P1-P3 | 10 |
| — Epipods present on P1 only | 11 |
| 10 Carapace dark with four longitudinal stripes of light color ; cheliped comparatively broad, palm distinctly less than twice as long as broad | <i>G. amboinensis</i> (p. 648) |
| — Carapace dark with two light colored stripes ; palm nearly or quite three times as long as broad | <i>G. inflata</i> (p. 649) |
| 11 Terminal segment of antennule with pronounced tuft of setae | 12 |
| — Terminal segment of antennule devoid of tuft of setae | 13 |
| 12 Lateral margins of carapace almost straight and parallel ; rostrum slightly longer than broad ; merus of third maxilliped with one or two minute spines on inner margin | <i>G. formosa</i> (p. 652) |
| — Lateral margin of carapace convex ; rostrum twice as long as broad ; merus of third maxilliped with three well-developed inner marginal spines | <i>G. ternatensis</i> De Man |

1. Holotype from Ternate (SMF Cat. No. 4556) in Natur-Museum & Forschungsinstitut, Frankfurt a.M. ; epipods absent from all pereopods, according to M. TÜRKAY.

- 13 Outer orbital angle rounded; cheliped comparatively slender; propodus of walking leg with more than five outer marginal spines proximally..... *G. bimaculata* (p. 652)
— Outer orbital angle pyramidal; cheliped stout, palm rather massive; propodus of walking leg unarmed on outer margin..... *G. platycheles* Miyake

***Allogalathea elegans* (Adams & White, 1848)**

(Fig. 3)

Restricted synonymy :

Allogalathea elegans : HAIG, 1973 : 275.

Allogalathea elegans : BABA, 1977 : 252.

MATERIAL EXAMINED. — East coast of Marsegu I. : 18 January 1975; on *Comanthina schlegeli*; D. L. MEYER; 1 male (c.l., 4.4 mm), 1 ovigerous female (c.l., 7.3 mm); on *Comanthus bennetti*, 2 males (c.l., 6.4 + mm, 5.6 mm). — Lilinta Bay, close to Lilinta village, Misool Is. : 23 January 1975; on *Comanthina schlegeli*; D. L. MEYER; 1 male (c.l., 6.2 mm); on *Comanthus bennetti*, 1 male (c.l., 6.4 mm); on *Comanthus parvicirrus*, 1 male (c.l., 4.0 mm). — Banda I. : on crinoid, 30 January 1975; 1 male (c.l., 6.8 mm). — Northern tip of Banda Sesar I., Banda Is. : 30 January 1975; on *Comanthus bennetti*; D. L. MEYER; 1 female (c.l., 10.0 mm). — Southern entrance between Gunung Api I. and Bandanaira : on *Comanthina schlegeli*; 29 January 1975; D. L. MEYER; 1 male (c.l., 6.7 mm), 1 female (c.l., 7.5 mm). — In front of Kotasirih village, Kailakat Bay, Gorong Is. : 26 January 1975; on *Capillaster multiradiatus*; D. L. MEYER; 1 male (c.l., 9.8 mm). 25 January 1975; on *Comanthus bennetti*, 1 male (c.l., 3.6 mm); on *Himerometra robustipinna*, 1 male (c.l., 3.0 mm), 1 female (c.l., 3.3 mm). 27 January 1975; on *Comanthina schlegeli*, 1 ovigerous female (c.l., 9.0 mm). — Tapalol I., off Biga Bay, Misool Is. : 24 January 1975; on *Stephanometra spicata*; D. L. MEYER; 1 male (c.l., 2.9 mm). — Off Museha and Wayuta estuaries, Seleman Bay, north coast of Seram (Ceram) : 19 January 1975; on *Comanthus parvicirrus*; D. L. MEYER; 1 ovigerous female (c.l., 5.1 mm).

REMARKS. — As regards the coloration, four patterns are known to occur in this species (MIYAKE, 1938; BABA, 1969 a). In addition to these four (1, uniformly dark; 2, dark with median light broad stripe; 3, dark with two narrow light stripes; 4, alternate longitudinal stripes of dark and light), one more pattern is recognized; it is much like the third of the above, but the light stripe is as wide as that of the fourth. A male from Gorong Island belongs to the third pattern, but both the light stripes are interrupted.

The cheliped is also variable; the most notable variability is in the proportional length of the wrist; it varies from 1.3 to 2.3 in length-breadth ratio; careful examination shows, however, that the comparatively broad joint represented by the ratio 1.3 goes to the second color pattern, and the longer by the ratio more than 1.6 to other patterns. The second pattern also provides peculiar spination and setation of the cheliped; as shown in fig. 3 a, the cheliped has less pronounced spination, and it is covered with short setae and spinules, both arising from the scales. This cline is recognizable at an early age, as seen in a male with a carapace 3.6 mm long, from Gorong Island. In other patterns the cheliped has more prominent spination and it is furnished with more coarse setae, especially distally (fig. 3 b).

Epipods are present only on P1 in 14 of the 16 specimens examined. An ovigerous female from Gorong Island, belonging to the third color pattern, has epipods on P1 and P2,

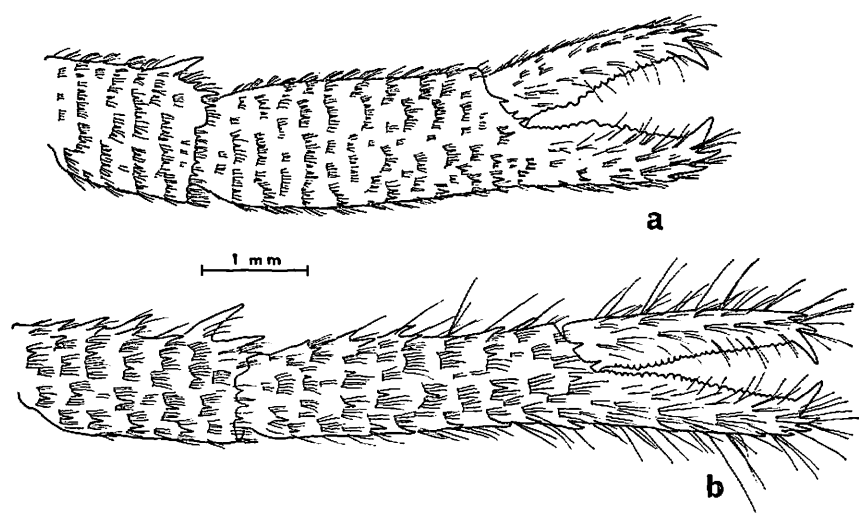


FIG. 3. — *Allogalathea elegans* (Adams & White); a, right chela of female from Banda Island (carapace representing second color pattern); b, right chela of ovigerous female from Gorong Island (carapace representing third color pattern).

as has been reported for the Sulu and the Philippine material (BABA, 1977). A female from the Banda Islands, which belongs to the second color pattern, has a sacculinid parasites, and epipods are evident on P1 through P3. In the previous paper (BABA, 1977), dealing with the "Snellius" material it is noted that the rostrum is comparatively longer, exceeding the remaining carapace length in the form having epipods on P1-P2. However, this is not applicable to the present material, the rostrum-carapace ratio varying from 0.61 to 1.10 (mean = 0.84), quite independent of both the color pattern and the presence or absence of epipods. It is however very interesting to note that the form having epipods on P1-P3 belongs without exception to the second color pattern; this is also confirmed in all examined specimens collected from Eniwetok Atoll, the Marshall Islands (20 in number), by C. A. CHILD of the Smithsonian Institution, and D. M. DEVANEY and A. FIELDING of the Bishop Museum. In conclusion, it seems to me that this species is highly variable intraspecifically, including the number of epipods on the pereopods.

COMMENSALISM. — This species is commonly associated with crinoids. Previously recorded from *Comanthus benetti*, *C. sp.*, *Comanthina schlegeli*, *Tropiometra carinata*, *Lamprometra klunzingeri*, *Heterometra savignii* and *Capillaster multiradiatus* (BARNARD, 1950; HOLTHUIS, 1953; MIYAKE, 1960; BABA, 1969; LEWINSOHN, 1969). No additional records are available other than "on crinoids". The commensal hosts here identified are: *Comanthina schlegeli*, *Comanthus benetti*, *C. parvicirrus*, *Capillaster multiradiatus*, *Stephanometra spicata* and *Himerometra robustipinna*.

DISTRIBUTION. — Including the form having epipods on P1-P3, this species is widely known from the Red Sea southward along the east coast of Africa, eastward to the Fiji Islands via the Malayan Archipelago (type-locality: Philippines), northward to Japan and southward to eastern and western Australia.

REFERENCES

- ADAMS, A., & A. WHITE, 1848. — Crustacea. The zoology of the voyage of H.M.S. Samarang, under the command of Captain Sir Edward Belcher, C.B., F.R.A.S., F.G.S., during the years 1843-1846. London, Benham and Reeve, 66 + viii p., 13 pls.
- BABA, K., 1969 *a*. — Four new genera with their representatives and six new species of the Galatheidae in the collection of the Zoological Laboratory, Kyushu University, with redefinition of the genus *Galathea*. *Ohmu*, **2** : 1-32.
- 1969 *b*. — New addition to the galatheid fauna of Japan (Crustacea, Anomura). *Ohmu*, **2** : 33-40.
- 1972. — A new species of the galatheidean Crustacea from the Ryukyu Islands (Decapoda, Anomura). *Mem. Fac. Educ. Kumamoto Univ., sect. 1, Nat. Sci.*, **20** : 43-48.
- 1977. — Biological results of the Snellius Expedition XXVIII. The galatheid Crustacea of the Snellius Expedition. *Zoöl. Meded., Leiden*, **50** : 243-259.
- BARNARD, K. H., 1950. — Descriptive catalogue of South African decapod Crustacea. *Ann. S. Afr. Mus.*, **38** : 1-837.
- GORDON, I., 1935. — Anomura (excluding Paguridea). Résultats scientifiques du voyage aux Indes Orientales Néerlandaises de L.L.AA.RR. le Prince et la Princesse Leopold de Belgique. *Mem. Mus. r. Hist. nat. Belg. (Hors ser.)*, **3** : 1-12.
- HAIG, J., 1973. — Galatheidea (Crustacea, Decapoda, Anomura) collected by the F.I.S. Endeavour. *Rec. Aust. Mus.*, **28** : 269-289.
- HENDERSON, J. R., 1885. — Diagnoses of the new species of Galatheidea collected during the "Challenger" Expedition. *Ann. Mag. nat. Hist.*, ser. 5, **16** : 407-421.
- 1888. — Report on the Anomura collected by H.M.S. Challenger during the years 1873-76. *Rep. sci. Res. Voyage H.M.S. Challenger, Zool.*, **27** : i-xi + 1-221, pls. 1-21.
- HOLTHUIS, L. B., 1953. — Enumeration of the decapod and stomatopod Crustacea from Pacific coral islands. *Atoll Res. Bull.*, **24** : 1-66, 2 maps.
- LEWINSOHN, Ch., 1969. — The second Israel South Red Sea Expedition, 1965. Report No. 6. Die Anomuren des Roten Meeres (Crustacea Decapoda : Paguridea, Galatheidea, Hippidea). *Zool. Verh., Leiden*, **104** : 1-213, pls. 1-2.
- DE MAN, J. G., 1888. — Bericht über die von Herrn Dr J. Broek im indischen Archipel gesammelten Decapoden und Stomatopoden. *Arch. Naturgesch.*, **53** : 215-600, pl. 7-22a.
- 1902. — Die von Herrn Prof. W. Kükenthal im Indischen Archipel gesammelten Dekapoden und Stomatopoden. *Abh. senckenb. naturforsch. Ges.*, **25** : 467-929, pl. 19-27.
- MELIN, G., 1939. — Paguriden und Galatheiden von Prof. Dr. Sixten Bocks Expedition nach den Bonin-Inseln 1914. *K. svenska VetenskAkad. Handl.*, ser. 3, **18** : 1-119.
- MIYAKE, S., 1938. — Galatheids obtained from Oshima, Prov. Kii. *Annot. zool. Japon.*, **17** : 37-42.
- 1960. — Decapod Crustacea, Anomura. In : OKADA, Y. K. & T. UCHIDA, *Encyclopedia zoologica illustrated in colours*, Tokyo, **4** : 89-97, pls. 44-48 (in Japanese).
- MIYAKE, S., & K. BABA, 1965. — Some galatheids obtained from the Bonin Islands (Crustacea, Anomura). *J. Fac. Agr. Kyushu Univ.*, **13** : 585-593.
- MIYAKE, S., & K. BABA, 1966. — Descriptions of galatheids collected from coral reefs of the Ryukyu Islands. *J. Fac. Agr. Kyushu Univ.*, **14** : 57-79.
- MIYAKE, S., & K. BABA, 1967. — Descriptions of new species of galatheids from the Western Pacific. *J. Fac. Agr. Kyushu Univ.*, **14** : 203-212.

- ORTMANN, A., 1892. — Die Decapoden-Krebse des Strassburger Museums IV. Die Abtheilungen Galatheidea und Paguridea. *Zool. Jahrb., Syst.*, **6** : 241-326, pls. 11, 12.
- PAULSON, O., 1875. — Izsledovanija rakoobraznykh Krasnago Morya s zametkami odnositel'no rakoobraznykh drugikh morei. Chast I. Podophthalmata i Edriophthalmata (Cumacea). Kiev, S. V. Kul'zhenko, 144 + xiv p., 21 pls.
- POTTS, F. A., 1915. — The fauna associated with the crinoids of a tropical coral reef : with especial reference to its color variations. *Pap. Dept. mar. Biol. Carnegie Instn. Wash*, **8** : 71-96, pl. 1.
- STIMPSON, W., 1858. — Prodrömus descriptionis animalium evertibratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem, a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit. Pars VII. Crustacea Anomura. *Proc. Acad. nat. Sci. Philad.*, **10** : 225-252.

Manuscrit déposé le 5 juillet 1978.