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RESEARCHES ON THE COAST OF SOMALIA.
GALATHEA TANEGASHIMAE BABA (CRUSTACEA
DECAPODA) FROM SOMALIA AND NOTES
ON *GALATHEA SPINOSOROSTRIS* DANA

(PUBBLICAZIONI DEL CENTRO DI STUDIO
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CHANAN LEWINSOHN

Department of Zoology, Tel-Aviv University

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Recently Dr M. Vannini (Istituto di Zoologia of the University of Florence) sent me for examination a number of specimens of the genus *Galathea*. This material was collected in Somalia during the investigations carried out by the Centro di Studio per la Faunistica ed Ecologia Tropicali of the Consiglio Nazionale delle Ricerche of Florence (Director, Prof. L. Pardi).

All specimens proved to belong to a single species, viz., *G. tanegashimae* Baba, 1969, the type locality of which is the island of Kyushu, Japan. Since the original publication of the species, it has also been found off the west coast of Thailand (07°34'N 98°00'E) (W. JAVED, unpublished, Ph. D. thesis, 1974, University of Karachi). The present record extends the known range of the species considerably.

During the study of this material some problems were encountered concerning the relationship between this species and *Galathea spinosorostris* Dana. Some attention is given here to the identity of the latter species.

The specimens were collected on various species of corals, however, it is not known if there are true commensal relationships between the living corals and this *Galathea* species.

I want to express my sincere gratitude to Dr M. VANNINI (Istituto di Zoologia of the University of Florence) for entrusting me with the study of this material and to Prof. L. B. HOLTHUIS (Rijksmuseum van Natuurlijke Historie, Leiden) for assistance with the English text.

Galathea tanegashimae Baba, 1969.

Galathea tanegashimae BABA, 1969, pp. 16-18, fig. 4.

Galathea spinosorostris; TIRMIZI, 1966, pp. 181-182, figs 4B, 5.

? *Galathea spinosorostris*; LAURIE, 1926, pp. 124-125.

Material examined: Gesira, 10 km south of Mogadiscio, IX. 1979; 1 ovig. ♀ cl. 4.5 mm, (3) from *Porites nigrescens* Dana, MF 905; 1 ♂ cl. 6.0 mm, (20) MF 906; 2♂♂ cl. 5.0 and 6.0 mm, (38) from *Acropora variabilis* (Klunzinger), TAU; 1 ♂ cl. 5.0 mm, (39) from *Porites nigrescens*, MF 907; 1 ovig. ♀ cl. 4.5 mm, (42) from *Acropora* sp., MF 908; 1 ♂, 1 ovig. ♀, cl. ♂ 5 mm, cl. ♀ 4 mm, (50) from *Porites nigrescens*, RMNH; 1 ovig. ♀ cl. 3.5 mm, (97) from *Acropora hemprichi* (Ehrenberg), MF 909; 1 ♂ cl. 4.0 mm, (97) from *Acropora hemprichi*, MF 910; 1 ♂ cl. 3.5 mm, (111) from *Acropora scadens* (Klunzinger), MF 911.

The material is deposited in the Museo Zoologico of the University of Florence (MF); the Zoological Museum of the Tel-Aviv University (TAU) and the Rijksmuseum van Natuurlijke Historie, Leiden (RMNH).

The abbreviation cl. is used for carapace length.

Description: the rostrum bears four teeth on either lateral margin. The distal three of these teeth are of the same size and their outer margin is convex; the fourth is much smaller. A distinct exorbital spine is present, which is not placed on the orbital margin itself but just outside it. The lateral margin of the carapace shows eight spines, the antero-lateral spine included. The second spine of the lateral margin (i.e. the one behind the antero-lateral spine) is very small and in some specimens it is hardly visible. An additional spine is placed below the antero-lateral spine, and somewhat more posteriorly. A pair of small gastric spines is situated on the carapace; they are placed rather far apart.

The transverse ridges of the carapace are not very strong, and usual only clearly visible if the carapace is removed from the body and examined separately. It is impossible to make a distinction between primary and secondary ridges. Before the cervical ridge four more ridges can be distinguished. All are broken up into smaller parts. Very small additional pieces of ridges may be seen between the four larger. The anterior ridge carries the gastric spines, the next (second) ridge is continuous in the medial part. The cervical groove is hardly noticeable. The cervical ridge is almost complete, but does not reach the spines on the lateral margin of the

carapace. Behind the cervical ridge there are three continuous ridges, the anterior of which, however, does not reach the lateral margin of the carapace. Between the cervical ridge and the first of the three complete ridges, there is a row of very short ridge-like elevations, while between the second and the last of the complete ridges there is a rather long ridge laterally.

The basal segment of the antennula carries three spines, the disto-lateral of which is the largest.

The basal segment of the antenna, as usual in the genus, shows a well developed basal spine. The second segment has two spines, one disto-lateral and one disto-medial while the third segment has a single disto-medial spine.

The merus of the third maxilliped is about as long as the ischium. Its inner margin carries two spines: one large in the middle of the margin, the other small, situated apically. The outer margin of the merus bears two or three small spines.

The third thoracic sternite has the anterior margin rounded and clearly incised in the middle.

The pterygostomial flap narrows anteriorly and ends there in a spine-like point. Its upper surface bears four complete or partial ridges.

In the first pereopods (chelipeds) an epipodite is present. No epipodites were found on any of the other legs. The spines on the chelipeds and other pereopods are not further discussed here. In various species of the genus *Galathea* the number and arrangement of the spines is quite variable. This is also the case in the present specimens. Sometimes the spinulations of the right and the left chelipeds of the same animal are different. Large spines, as found on the carpus and merus of the chelipeds in other species of *Galathea*, can also be seen in the present species. The distal spine on the lower margin of the dactylus of the second to the fourth pereopods in the present species is larger than the other spines and gives the impression of a small additional claw.

Remarks: there can be little doubt that the present species belongs to *G. tanegashimae* Baba. BABA (1969) compared his new species with *G. affinis* Ortmann, to which in his opinion it showed the closest affinity. BABA enumerated the following differences between the two species: in *Galathea affinis* there is a spine on the anterior margin of the pterygostomial flap, which is absent in *G. tanegashimae*; in *G. affinis* there is no epipodite on the chelipeds. The following differences between the two species can be added here: (i) the basal part of the tip of the rostrum in *G. affinis* is broader; (ii) the transversal ridges on the carapace of *G. affinis* are more complete than in *G. tanegashimae*; (iii) in *G. affinis* the inner margin of the merus of the third maxilliped has only one spine, the outer margin none. *G. affinis* thus can be easily distinguished from *G. tanegashimae*.

It is more difficult to decide whether or not our material is conspecific with the female that TIRMIZI (1966) published under the name *G. spinosorostris* Dana, and whether *G. tanegashimae* should or should not be considered a junior synonym of DANA's species name. As *G. spinosorostris* has repeatedly been mentioned in the literature, I have tried to evaluate these various records. I have come to the conclusion that the specimen reported by TIRMIZI (1966) as *G. spinosorostris* are identical with *G. tanegashimae*, the same probably is true for the material studied by LAURIE (1926) and assigned to the same species.

The original description of *G. spinosorostris* by DANA (1852, pp. 480-481; 1855, pl. 30, figs 9a-c) is as follows (the latin diagnosis, which contains nothing that is not in the description, has been omitted here): « Beak broad and large, triangular, but little oblong, slenderly acute at apex, and having four slender spines or spiniform teeth on either side, the posterior spines small, and between them, on surface of carapax, two minute spinules. Anterior feet spinous, slender. No median area. Abdomen near base either side rounded.

Plate 30, fig. 9a, front of carapax, much enlarged; b, second and third joints of outer maxillipeds, *ibid.*; c, anterior legs, *ibid.*

Sandwich Islands.

The breadth of the beak at base is full two-thirds its length, and the spiniform teeth either side of it are long and narrow triangular. The third joint of the outer maxillipeds is rather longer than the second, and has two spines on inner side, one of them apical».

DANA's description and figures, according to modern standards, are insufficient for recognition of the species. They fit a great number of species of *Galathea*. The available data show that the species is a *Galathea* with the following taxonomically important characters: the rostrum carries three pairs of large lateral teeth, which are of about equal size, and one basal pair which is much smaller. The carapace has a pair of gastric spines, otherwise the gastric region is not marked (« no median area »). The inner margin of the merus of the third maxilliped has two spines of about equal size; a small spine is situated on the outer margin; the ischium shows a distal spine on the outer margin. DANA's figure of the cheliped shows no special features, it resembles the cheliped of most species of the genus *Galathea*. Type material of *G. spinosorostris* is not extant anymore.

As to the later records of *G. spinosorostris* in the literature a number of these are not based on new material: so HASWELL (1882, p. 162) mentioned the possibility that *G. australiensis* Stimpson is synonymous with *G. spinosorostris*. BENEDICT (1902, p. 303) cited the species in his enumeration of the species of *Galathea*. DOFLEIN & BALSS (1913, p. 170) listed it when dealing with the geographical distribution of the genus.

BOUVIER (1915, p. 26) compared his new species *G. mauritiana* (a synonym of *G. affinis* Ortmann) with DANA's account of *G. spinosorostris* and, correctly, considered the species distinct. LEWINSOHN (1969, p. 110) mentioned records by NOBILI reporting *G. spinosorostris* from Eritrea. MICHEL (1974, p. 752) listed *G. spinosorostris* in a catalogue of species known from Mauritius.

Several authors examined material that they assigned (sometimes with doubt) to *G. spinosorostris*: RICHTERS (1880, p. 161) listed five specimens from Mauritius without giving any morphological details. MIERS (1884, p. 560) had several specimens from the Amirante islands and the Farquhar group, which he doubtfully assigned to *G. spinosorostris*; he remarked: « To this species are rather doubtfully referred female specimens collected... ». He also compared his material with *G. labidolepta* Stimpson, but believed it closer to *G. spinosorostris*. DE MAN (1888, pp. 456-457) brought a male from Amboina to *G. spinosorostris*, likewise with doubt as he was not certain of the correct identification: « Ich bringe darum das vorliegende Exemplar zu derselben Art, ohne von der Richtigkeit ueberzeugt zu sein. ». The « darum » refers to the fact that MIERS and RICHTERS, had already reported the species from the Indian Ocean. HENDERSON (1893, pp. 431-432) described material from India as *G. spinosorostris* but stated: « I refer these with some doubt to this species. ». Two of his three specimens lacked the gastric spines of the carapace, thus differing from DANA's original description. HENDERSON thought, like HASWELL did before, that *G. spinosorostris* and *G. australiensis* might be synonymous, and used the name *G. spinosorostris* for reasons of priority. NOBILI (1901, p. 6) cited a specimen from Eritrea (Red Sea), but later (NOBILI, 1906, p. 127) assigned it, with doubt, to *G. aegyptiaca* Paulson. LENZ (1910, p. 566) saw material from Madagascar, Europa Island and Fiji and assigned it to *G. spinosorostris*, citing *G. aegyptiaca* as a synonym, referring also to NOBILI's (1906) figures of the latter species. As LENZ mentioned the presence of two spines on the second transverse ridge of the carapace, spines which are present in *G. aegyptiaca*, his specimens could actually belong to Paulson's species. LAURIE (1926, p. 124-125) under the name *G. spinosorostris* dealt with rather extensive material from islands of the western Indian Ocean, and remarked: « Southwell's figure is an excellent representation of the present specimens... » and « I find that in the 3rd maxillipede the distal tooth of the inner border of the merus is smaller than in Dana's figure and in some it is very much reduced ». LAURIE hardly gave any reasons at all why he assigned his material to *G. spinosorostris*. His reference to SOUTHWELL does not provide any good reason for this, while, as already cited above LAURIE himself indicated that the spines on the inner margin of the merus of the third maxilliped did not agree with DANA's figure of that segment.

In his synonymy of *G. spinosorostris*, LAURIE listed « *Galathea spinulifera* Southwell, 1909, fig. 12 ». Actually SOUTHWELL (1909, p. 121, pl. fig. 12) described and figured a species of *Galathea* under the name *Munida spinulifera* Miers, not *Galathea spinulifera* as LAURIE mistakenly stated. The reason why SOUTHWELL referred to a species of *Galathea* under the generic name *Munida* is explained by his reference to MIERS (1884). MIERS (1884, pp. 279-280) described a new species of *Munida*, viz., *M. spinulifera* and provided an illustration of it (pl. 31). In the same paper MIERS also mentioned *Galathea australiensis* Stimpson, and likewise provided a figure of it on pl. 31. On this plate, however, the legends of the two figs A and B are interchanged: fig. B showing *G. australiensis* is said to represent *M. spinulifera* and fig. A showing *M. spinulifera* is said in the legend to be *G. australiensis*. Evidently, SOUTHWELL thought his specimens identical with those figured by MIERS on pl. 31 fig. B, thus *G. australiensis*, but led astray by the erroneous legend of the plate used the name *M. spinulifera* for them. The name *G. australiensis* is not mentioned by SOUTHWELL at all, but he evidently meant that species. Judging by SOUTHWELL's own illustration, however, we can say with certainty that his specimens definitely are not *G. australiensis*. Most probably his material is *G. tanegashimae* even though no gastric spines are shown in SOUTHWELL's figure and neither is their presence or absence mentioned in his description.

TIRMIZI (1966, pp. 181-182, figs 4B, 5) mentioned a specimen from the Zanzibar area as belonging to *G. spinosorostris*. She refers also to SOUTHWELL and remarked that in her specimen two gastric spines are present which are not mentioned by either SOUTHWELL or LAURIE. TIRMIZI furthermore pointed out that in her specimen the third maxilliped was like that in LAURIE's specimens and thus differed from the original figure of *G. spinosorostris*.

To summarize we can say that the original description of *G. spinosorostris* is insufficient to recognise the species, while subsequent records did not add positive information that made the identity of the species clearer. It seems quite possible that all or part of the subsequent records of *G. spinosorostris* are based on material of other species. The only author who mentioned material from the type locality is EDMONDSON (1933, p. 228, fig. 134), who wrote about it as follows: « The most common one, *Galathea spinosorostris* Dana occurs on the reefs and also in moderate depths. The triangular rostrum has four spines on each lateral margin. ». Unfortunately EDMONDSON's descriptive remarks are quite insufficient; his figure of the rostrum of *G. spinosorostris* shows it with four lateral teeth, the basal one being much smaller than the other teeth. The second tooth is distinctly larger (but smaller than the two distal teeth) and has a rather peculiar shape. Furthermore the figure shows four gastric spines on the carapace.

EDMONDSON's account does not help to solve the problem of the identity of *G. spinosorostris*. It would be most desirable if topotypic material of *G. spinosorostris* from Hawaii could be carefully studied, described and figured so that the status of *G. spinosorostris* could be made clear. The selection of a neotype then could definitely fix the identity of the species.

SUMMARY

Galathea tanegashimae Baba (Crustacea Decapoda), previously known from Japan and Thailand, has been found in Somalia, living on alive scleroactinians (*Acropora* and *Porites*). A redescription is given and the relationships between this species and *G. spinosorostris* Dana are discussed.

RIASSUNTO

Galathea tanegashimae Baba (Crustacea Decapoda) fino ad oggi nota per il Giappone (isola di Kyushu) e la Thailandia, è stata rinvenuta in Somalia su Scleroattinie intertidali del genere *Acropora* e *Porites*. La specie viene ridescritta e vengono discusse le sue relazioni con la forma affine, *G. spinosorostris* Dana.

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Address of the author: Dr CHANAN LEWINSOHN, Department of Zoology, Tel-Aviv University, Tel-Aviv (Israel).