

Some new records of shallow-water galatheid crustaceans (Anomura: Galatheidae) from the Dampier Archipelago, Western Australia

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Abstract – A collection of galatheid crustaceans from the Dampier Archipelago, north-western Australia, is studied. Six species are reported: *Allogalatea elegans* (Adams and White, 1848), *Galathea orientalis* Stimpson, 1858, *G. subsquamata* Stimpson, 1858, *Lauriea gardineri* (Laurie, 1926), *Phylladorhynchus integrirostris* (Dana, 1852) and *Phylladorhynchus nudus* sp. nov. *Galathea corallicola* Haswell, 1888 is redescribed and its relationship with *G. orientalis* Stimpson, 1858 and *G. coralliophilus* Baba and Oh, 1990 are discussed.

INTRODUCTION

During recent expeditions to the Dampier Archipelago in 1998 and 1999, an interesting collection of shallow-water galatheids was collected. The shallow-water galatheid fauna in this area of the Indian Ocean is not very well known, although some species have been reported, e.g. *Allogalatea elegans* (Adams and White, 1848), *Galathea aegyptiaca* (Paulson, 1875), *G. australiensis* Stimpson, 1858, *G. corrallicola* Haswell, 1882, *G. genkai* Miyake and Baba, 1964, *G. magnifica* Haswell, 1882, *G. pubescens* Stimpson, 1858, *G. subsquamata* Stimpson, 1858, *G. ternatensis* de Man, 1902, *Lauriea gardineri* (Laurie, 1926) and *Phylladorhynchus* sp. (see Haig, 1973, 1974 and references cited therein).

The present material revealed the existence of six species (*Allogalatea elegans*, *Galathea orientalis*, *G. subsquamata*, *Lauriea gardineri*, *Phylladorhynchus integrirostris*) and *P. nudus* sp. nov. A redescription of *G. corallicola* Haswell, 1888 and its relationship with *G. orientalis* Stimpson, 1858 and *G. coralliophilus* Baba and Oh, 1990, are also included.

MATERIALS AND METHODS

The types of the new species and other material have been deposited in the collections of the Western Australian Museum, Perth. Measurements in millimeters given are of carapace length, excluding rostrum, and the terminology used mainly follows Zariquiey-Alvarez (1952), Baba (1988), Baba and de Saint Laurent (1996).

Abbreviations used in the text are as follows: Western Australian Museum, Perth (WAM); the Australian Museum, Sydney (AM); station (stn); millimeters (mm); ovigerous (ovig.); juvenile (juv.).

SYSTEMATICS

Allogalatea elegans (Adams and White, 1848)

Galathea elegans Adams and White, 1848: pl. 12, fig. 7.

Allogalatea elegans Baba, 1969: 6, fig. 1. – 1979: 654, fig. 3. – 1988: 54. – Haig, 1973: 275. – 1974: 447. – Tirmizi and Javed, 1993: 27, figs 12, 13.

Material examined

Western Australia, Dampier Archipelago. WAM C 26709 (2 males, 3.1–5.2 mm), stn DA2/99/06 (20°21.69'S, 116°52.40'E), 33–36 m, 14.07.1999; WAM C 26711 (1 female, 2.8 mm), stn DA2/99/12 (20°20.75'S, 117°01.16'E), 32–34 m, 15.07.1999; WAM C 26714 (1 male, 2.5 mm), stn DA2/99/21 (20°32.25'S, 116°58.48'E), 16.4–18 m, 16.07.1999; WAM C 26715 (1 male 2.8 mm; 1 female 3.3 mm), stn DA2/99/23 (20°21.00'S, 116°40.39'E), 37 m, 17.07.1999; WAM C 26716 (3 males, 2.3–2.8 mm; 4 females, 2.0–2.5 mm; 1 juv. 1.3 mm), stn DA2/99/24 (20°21.79'S, 116°38.05'E), 38.5 m, 17.07.1999; WAM C 26717 (1 male 6.0 mm), stn DA2/99/25 (20°22.29'S, 116°35.56'E), 39 m, 17.07.1999; WAM C 26719 and WAM C 26721 (2 males, 3.6, 5.1 mm; 2 ovig. females, 4.2, 6.9 mm, respectively), stn DA2/99/32 (20°26.95'S, 116°44.86'E), 15–16 m, 18.07.1999; WAM C 26724 (1 ovig. female, 5.1 mm), stn DA2/99/37 (20°36.54'S, 116°34.98'E), 14–15 m, 19.07.1999; WAM C 26725 (1 female 4.4 mm), stn DA2/99/38 (20°37.47'S, 116°35.37'E), 11–13 m, 19.07.1999; WAM C 26727 (1 female 5.0 mm), stn DA2/99/40 (20°37.74'S, 116°31.05'E), 10.5–11 m, 19.07.1999; WAM C 26729 (1 ovig. female 5.5 mm), stn DA2/99/41 (20°35.63'S, 116°28.07'E), 16–17.4 m, 20.07.1999; WAM C 26730 (1 male, 2.8 mm; 1 female, 4.3 mm), stn DA2/99/41 (20°36.63'S, 116°28.07'E), 16–17.4 m, 20.07.1999; WAM C 26732 (1 ovig. female 5.9 mm),

stn DA2/99/43 (20°31.6'S, 116°29.03'E), 21–22 m, 20.07.1999; WAM C 26733, (1 ovig. female 5.8 mm) stn DA2/99/47 (20°36.58'S, 116°23.66'E), 20–22.5 m, 20.07.1999; WAM C 26734 and WAM C 26738 (1 male, 4.6; 1 mle, 2.2 mm, resectively), stn DA2/99/49 (20°40.30'S, 116°22.59'E), 15.5–16 m, 20.07.1999; WAM C 26736 (1 ovig. female, 5.0 mm), stn DA2/99/49 (20°40.30'S, 116°22.59'E), 15.5–16 m, 20.07.1999; WAM C 26739 (1 female, 4.6 mm), stn DA2/99/56 (20°30.10'S, 116°28.27'E), 33–34.5 m, 21.07.1999; WAM C 26745 (2 ovig. females, 6.4–6.8 mm), stn DA2/99/74 (20°38.34'S, 116°29.18'E), 10.5–11.5 m, 24.07.1999; WAM C 26747 (1 male, 3.7 mm; 1 ovig. female, 5.1 mm), stn DA2/99/78 (20°31.09'S, 116°33.04'E), 14–15 m, 25.07.1999; WAM C 26751 (1 male, 3.6 mm), stn DA2/99/85 (20°26.38'S, 116°39.76'E), 28–29 m, 26.07.1999; WAM C 26754 (1 male, 5.3 mm), stn DA2/99/87 (20°25.48'S, 116°39.07'E), 33–33.5 m, 26.07.1999; WAM C 27679 (2 males, 2.5–2.8 mm; 1 ovig. female 4.4 mm), stn DA3/99/66 (20°36.82'S, 116°31.85'E), 13–15 m, 06.09.1999.

Remarks

This species seems to be highly variable intraspecifically, in the colour pattern and number of epipods on the pereopods (Baba, 1979; 1988). The specimens examined show different colour patterns, e.g. uniformly dark, alternate longitudinal stripes of dark and light, these stripes being different in numbers and thickness, and the epipods absent from all pereopods, present on the chelipeds or present on the chelipeds and first walking legs. Also variable are the number and size of the spines on the chelipeds, as was pointed out by Baba (1979; 1988).

Distribution

Known from the eastern coast of Africa, Malaysia, Japan, Palau Islands, the Philippines, Taiwan, Indonesia, eastern and western Australia and Fiji Islands in depths between 0–183 m. The present material has been collected in 10.5–39.0 m.

Galathea corallicola Haswell, 1882

Figure 1

Galathea corallicola Haswell, 1882: 162. – Whitelegge, 1900: 190. – Haig, 1974: 447.

Material examined

Syntypes

AM P 270 (3 males, 3.2–4.3 mm, 1 female 3.8 mm), Port Molle, Queensland, under blocks of dead coral, between tide marks.

Description

Carapace, excluding rostrum, as long as wide,

bearing 2 gastric spines on first stria; transverse striae mostly uninterrupted; lateral margin moderately convex, with 7 spines, 2 in front of and 5 behind cervical groove, first anterolateral and well developed, second small, fourth and fifth prominent; outer angle of orbit strongly produced, ending in sharp point.

Rostrum sharply triangular, 1.4 times as long as wide when measured between incisions formed by 2 proximal teeth, lateral margin with 4 deeply incised spines.

Second and third abdominal tergites with 2–3 uninterrupted striae.

Pterygostomian flap anteriorly ending in sharp spine, bearing small spine on second ridge.

Basal segment of antennular peduncle with 3 well developed distal spines, dorsal one longer than others; tuft of hairs on terminal segment. Basal segment of antennal peduncle with sharp distomesial spine barely overreaching end of second segment, second segment with distomesial and distolateral spines; third segment with small distomesial spine.

Merus of third maxilliped with 2 strong subequal spines on flexor margin, extensor margin with 3 small spines; extensor margin of carpus unarmed, but rugose and with several eminences.

Third thoracic sternite as wide as long, barely bilobated; anterior margin of following sternite as wide as preceding sternite, concave medially.

Chelipeds missing in syntypes examined. Walking legs detached from body. Merus of first (or second) walking leg with row of spines on dorsal margin, one strong distal spine on ventral border; carpus with row of dorsal spines and some spines on lateral side; propodus with some spines on proximal half of dorsal border, few spinules on proximal half of lateral side and 5 movable spinules along ventral margin; dactylus distally spiniform, strongly curving ventrad, flexor margin with 7 spines, ultimate prominent.

Epipods present on chelipeds.

Remarks

Galathea corallicola was described by Haswell (1882) from specimens collected in shallow waters off Queensland. However, the species has been rarely cited since that time.

The presence of a spine on the anterior stria of the pterygostomian flap, two epigastric spines, seven lateral spines on the carapace and epipods on the chelipeds, link *G. corallicola* to *G. orientalis* Stimpson, 1858 (see below) and *G. coralliophilus* Baba and Oh, 1990 from Singapore and the Gulf of Thailand.

Galathea corallicola and *G. coralliophilus* are characterized by the lack of spines on the extensor margin of the carpus of the third maxilliped, the character separating them from *G. orientalis*. The

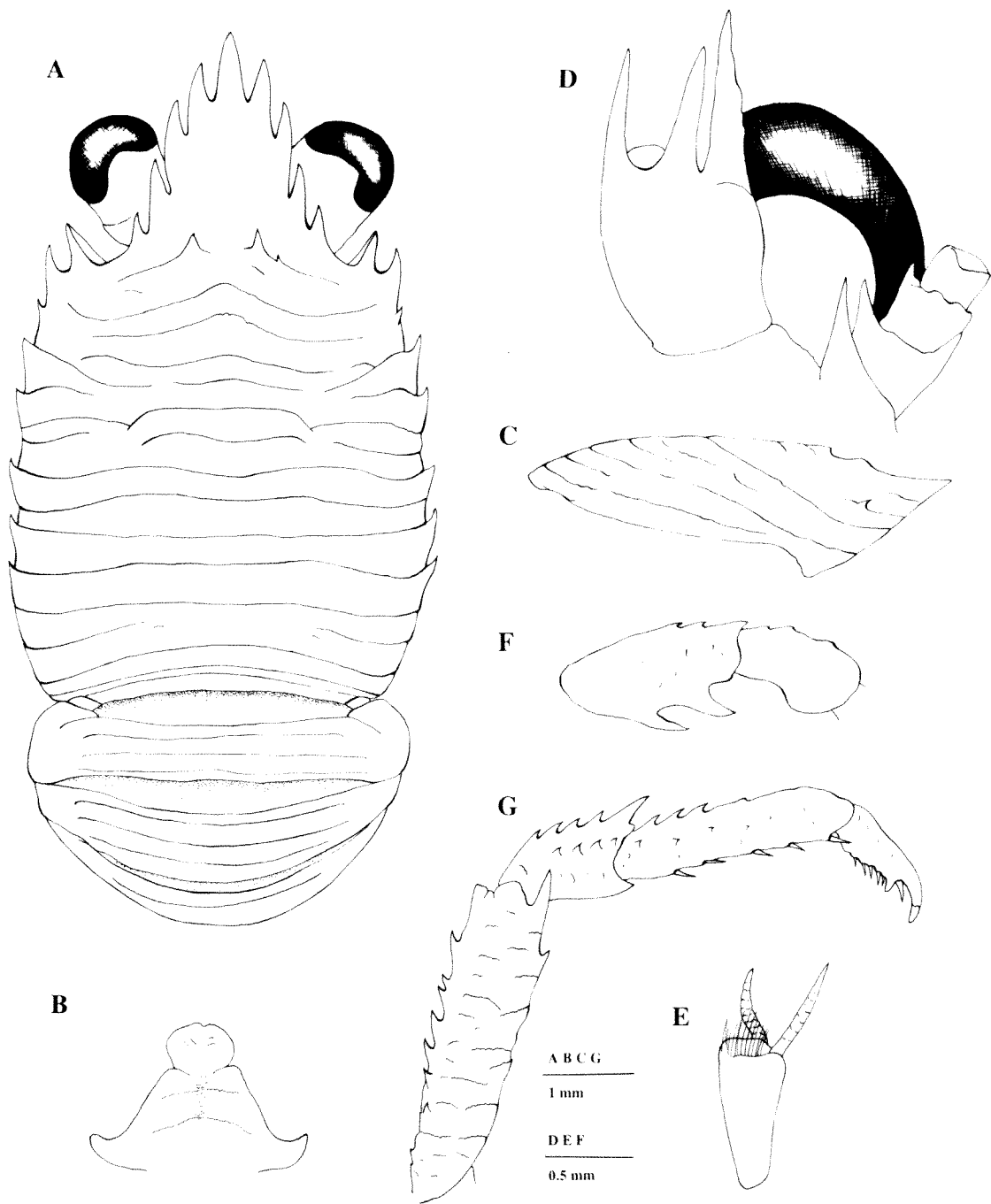


Figure 1 *Galathea corallicola* Haswell, 1888. Syntype, Port Molle, Queensland (Australian Museum, P 270). Male 4.3 mm; **A**, carapace and abdomen, dorsal view; **B**, anterior part of thoracic sternum; **C**, right pterygostomian flap; **D**, ventral view of cephalic region, showing antennular and antennal peduncles; **E**, terminal segment of antennular peduncle; **F**, merus and carpus of right third maxilliped, lateral view; **G**, right walking leg (detached).

two species are separated by the number of uninterrupted striae posteriorly to the cervical groove, two in *G. coralliophius* and four in *G. corallicola*.

***Galathea orientalis* Stimpson, 1858**

Galathea orientalis Stimpson, 1858: 252. – 1907: 231.
– Miers, 1879: 51. – Ortmann, 1892: 252, pl. 11,

figs. 10a, i. – Doflein, 1902: 644. – Melin, 1939: 63, figs. 36–38. – Miyake and Baba, 1967: 232, fig. 5. – Haig, 1974: 447. – Miyake, 1982: 145, pl. 49 fig. 1.

Galathea acanthomera Balss, 1913: 2, fig. 1. – de Man, 1907: 402, pl. 31, figs 14, 15. – Yokoya, 1933: 55. – Makarov, 1962: 85.

Material examined

WAM C 25541 (1 ovig. female, 2.9 mm), stn DA1/

98/30 (20°31.59'S, 116°51.09'E), 11 m, 27.10.1998; WAM C 25542 (1 male, 2.6 mm; 1 ovig. female, 2.9 mm; 1 female, 1.8 mm), stn DA1/98/32 (20°23.52'S, 116°54.11'E), 14 m, 28.10.1998; WAM C 27607 (1 male, 2.1 mm), stn DA2/99/13 (20°26.52'S, 117°00.5'E), 19.5 m, 16.07.1999; WAM C 26713 (1 female, 1.8 mm), stn DA2/99/18 (20°35.67'S, 116°54.97'E), 10.0–10.5 m, 16.07.1999; WAM C 26718 (1 male, 2.9 mm), stn DA2/99/29 (20°24.64'S, 116°44.05'E), 28–29 m, 17.07.1999; WAM C 26723 (1 male, 2.1 mm), stn DA2/99/36 (20°33.58'S, 116°36.87'E), 13 m, 19.07.1999; WAM C 26017 (1 male, 1.6 mm), stn DA2/99/48 (20°37.43'S, 116°24.08'E), 20.5–21.0 m, 20.07.1999; WAM C 26737 (1 ovig. female, 2.4 mm), stn DA2/99/49 (20°40.30'S, 116°22.59'E), 15.5–16 m, 20.07.1999; WAM C 25972 (1 male, 2.5 mm), stn DA2/99/49 (20°40.30'S, 116°22.59'E), 15.5–16 m, 20.07.1999; WAM C 27610 (1 male, 2.4 mm), stn DA2/99/65 (20°38.31'S, 116°38.46'E), 10–15 m, 23.07.1999; WAM C 26558 (1 male, 2.6 mm), stn DA2/99/72 (20°42.13'S, 116°26.22'E), 10 m, 24.07.1999; WAM C 26755 (1 male, 2.1 mm), stn DA2/99/98 (20°39.81'S, 116°31.92'E), 10.5–11 m, 28.07.1999; WAM C 26756 (1 male, 2.2 mm), stn DA2/99/99 (20°37.36'S, 116°26.85'E), 17–19 m, 28.07.1999; WAM C 27666 (1 ovig. female, 2.6 mm; 1 female, 1.8 mm), stn DA3/99/49 (20°32.43'S, 116°32.68'E), 3–9 m, 31.08.1999; WAM C 27660–62, (1 ovig. female, 3.4 mm; 1 female, 1.8 mm; 3 males 2.5–3.3 mm; 3 ovig. females 2.8–4.0 mm), stn DA3/99/41 (20°29.24'S, 116°36.97'E), 1–4 m, 28/29.08.1999; WAM C 27663 and WAM C 27664, (2 males, 2.8–3.1 mm; 1 ovig. female 3.0 mm; 1 female 2.4 mm), stn DA3/99/44 (20°29.59'S, 116°34.45'E), 2.5–6 m, 29.08.1999; WAM C 27669, (1 male, 2.4 mm), stn DA3/99/53 (20°34.53'S, 116°34.57'E), 3–7 m, 01.09.1999; WAM C 27670, (1 male, 2.0 mm; 1 ovig. female, 2.7 mm), stn DA3/99/55 (20°35.15'S, 116°35.62'E), 17 m, 02.09.1999; WAM C 27671 (1 male 2.6 mm, 2 ovig. female 1.7–2.4 mm, 1 female 1.7 mm), stn DA3/99/56 (20°38.94'S, 116°26.22'E), 2–11 m, 03.09.1999; WAM C 27674 (1 male 2.6 mm, 1 ovig. female 2.8 mm), stn DA3/99/61 (20°34.66'S, 116°39.72'E), 3–5 m, 04.09.1999; WAM C 26722 and WAM C 27677 (1 male, 2.4 mm; 2 males, 1.8, 2.44 mm; 2 ovig. females, 2.8, 3.0 mm; 1 juv. 1.5 mm), stn DA3/99/64 (20°36.66'S, 116°38.94'E), 2–5 m, 06.09.1999; WAM C 27681 (1 male, 2.5 mm; 2 ovig. females, 2.9–3.6 mm), stn DA3/99/68 (20°27.98'S, 116°39.73'E), 6 m, 07.09.1999; WAM C 27682 (1 ovig. female 2.4 mm), stn DA3/99/69 (20°24.47'S, 116°46.30'E), 15–18 m, 08.09.1999.

Remarks

G. orientalis is easily distinguished from other related species by the presence of distinct spines on the extensor border of the carpus of the third maxilliped, a spine on the pterygostomian flap and

epipods on the chelipeds. As in *Allogalatea elegans* (see above) and *Galathea subsquamata* (see below), however, epipods are lacking in most of the specimens examined. Considering this variability, as well as the other differences between specimens reported earlier, i.e. number of spines and presence of plumose setae on the walking legs (see Miyake and Baba, 1967), a more complete revision of the material from different localities is strongly recommended.

Distribution

Known from Japan, Sea of Japan, Korea Strait, Hong Kong (Type locality), Bonin Islands and Western Australia, between 0 and 200 m. The present material has been collected at 1–28 m.

Galathea subsquamata Stimpson, 1858

Galathea subsquamata Stimpson, 1858: 252. – 1907: 233. – Henderson, 1888: 118, pl. 12, fig. 4. – Baba, 1977: 525. – 1979: 645. – 1988: 79.

Galathea aculeata Haswell, 1882a: 761. – 1882b: 162. – Whitelegge, 1900: 190. – Grant and McCulloch, 1906: 43, 48, pl.4, fig. 4a. – McNeill, 1968: 33. – Haig, 1973: 280. – 1974: 447.

Material examined

WAM C 25885 (1 male, 4.1 mm; 2 ovig. females, 3.3–3.8 mm), stn DA1/98/01 (20°25.85'S, 118°52.95'E), 3–6.5 m, 17.10.1998; WAM C 25891 (1 male, 3.2 mm), stn DA1/98/08 (20°29.18'S, 116°47.71'E), 2–8 m, 20.10.1998; WAM C 25451 (1 ovig. female, 3.2 mm), stn DA1/98/12 (20°30.20'S, 116°47.25'E), 2–7 mm, 21.10.1998; WAM C 25543 (1 ovig. female, 4.4 mm), stn DA1/98/33 (20°27.96'S, 116°49.69'E), 1–8 m, 29.10.1998; WAM C 26710 (1 ovig. female, 4.6 mm; 1 female, 2.4 mm; 1 juv. 1.8 mm), stn DA2/99/08 (20°22.76'S, 117°02.23'E), 30–31 m, 15.07.1999; WAM C 26712 (1 male, 3.3 mm), stn DA2/99/13 (20°26.52'S, 117°00.50'E), 19.5 m, 16.07.1999; WAM C 26720 (1 male, 4.6 mm; 2 ovig. females, 3.3–5.3 mm), stn DA2/99/32, (20°26.95'S, 116°44.86'E), 15–16 m, 18.07.1999; WAM C 26728 (2 males, 2.2–3.6 mm), stn DA2/99/41 (20°35.63'S, 116°28.07'E), 16–17.4 m, 20.07.1999; WAM C 26731 (1 ovig. female, 2.8 mm), stn DA2/99/42 (20°34.16'S, 116°30.11'E), 14–16 m, 20.07.1999; WAM C 26572 (1 male, 1.7 mm), stn DA2/99/48 (20°37.43'S, 116°24.08'E), 20.5–21.0 m, 20.07.1999; WAM C 26735 (1 ovig. female, 3.8 mm), stn DA2/99/49 (20°40.30'S, 116°22.59'E), 15.5–16 m, 20.07.1999; WAM C 26740 (1 male 2.4 mm), stn DA2/99/58 (20°29.11'S, 116°30.78'E), 25–25.5 m, 21.07.1999; WAM C 26631 (1 male, 2.2 mm), stn DA2/99/59 (20°32.23'S, 116°41.63'E), 17–19 m, 22.07.1999; WAM C 26741 (2 males, 2.8–5.3 mm; 1 ovig. female, 4.0 mm), stn DA2/99/60 (0°31.38'S, 116°44.24'E), 16–17 m, 22.07.1999; WAM C 26742 (1 male, 2.5 mm), stn

DA2/99/62 (20°30.69'S, 116°48.58'E), 7–9 m, 22.07.1999; WAM C 26743 (1 ovig. female, 2.8 mm), stn DA2/99/65 (20°38.31'S, 116°38.46'E), 10–15 m, 23.07.1999; WAM C 26744 (ovig. female, 3.6 mm), DA2/99/70 (20°41.45'S, 116°30.78'E), 10 m, 24.07.1999; WAM C 26746 (2 males, 2.6–3.8 mm), stn DA2/99/75 (20°32.16'S, 116°33.70'E), 14–19 m, 25.07.1999; WAM C 26748 (1 ovig. female, 4.2 mm), stn DA2/99/79 (20°27.64'S, 116°29.54'E), 38 m, 25.07.1999; WAM C 27978 (1 male, 2.8 mm), stn DA2/99/82 (22°27.57'S, 116°32.35'E), 32–36 m, 25.07.1999; WAM C 26750 (2 ovig. females, 3.4–5.5 mm), stn DA2/99/84 (20°29.94'S, 116°38.11'E), 12.5–15 m, 26.07.1999; WAM C 26752 and WAM C 26753 (1 male, 1.8 mm; 1 female, 1.6 mm), stn DA2/99/85 (20°26.38'S, 110°39.76'E), 28–29 m, 26.07.1999; WAM C 25534 (1 male, 3.4 mm; 1 ovig. female, 3.8 mm), stn DA2/99/95 (20°37.37'S, 116°31.69'E), 5–7 m, 27.07.1999; WAM C 27656 (1 male, 2.5 mm), stn DA3/99/36 (20°30.06'S, 116°40.58'E), 6–14 m, 27.08.1999; WAM C 25657 and WAM C 26658 (1 male, 2.1 mm, 1 ovig. female, 4.0 mm; 1 ovig. female, 3.4 mm), stn DA3/99/37 (20°30.61'S, 116°38.92'E), 2.0–3.5 m, 27.08.1999; WAM C 27659 (1 ovig. female, 2.9 mm), stn DA3/99/40 (20°26.65'S, 116°36.52'E), 6–14 m, 28.08.1999; WAM C 27665 (1 female, 2.6 mm), stn DA3/99/49 (20°32.43'S, 116°32.68'E), 3.0–5.0 m, 31.08.1999; WAM C 27668 (2 males, 1.8–2.1 mm; 1 ovig. female, 3.6 mm; 1 female, 2.3 mm), stn DA3/99/52 (20°29.74'S, 116°30.18'E), 9–26 m, 01.09.1999; WAM C 35471 (2 ovig. female, 3.2–3.4 mm), stn DA3/99/53 (20°34.53'S, 116°34.57'E), 3–7 m, 01.09.1999; WAM C 27673 (1 male, 4.5 mm; 1 ovig. female, 5.3 mm), stn DA3/99/60 (20°32.89'S, 116°39.51'E), 1.5–7.0 m, 04.09.1999; WAM C 25961 (1 ovig. female, 3.8 mm), stn DA3/99/61 (20°34.66'S, 116°39.72'E), 3–5 m, 04.09.1999; WAM C 27675 (1 ovig. female, 3.8 mm), stn DA3/99/63 (20°37.47'S, 116°38.29'E), 5 m, 05.09.1999; WAM C 27676 and WAM C 27980 (1 male, 2.0 mm, 2 ovig. females, 3.8, 4.2 mm; 1 male, 2.8 mm); stn DA3/99/64 (20°36.66'S, 116°36.96'E), 2–5 m, 06.09.1999; WAM C 25984 (1 male, 3.5 mm), stn DA3/99/67 (20°26.51'S, 116°40.23'E), 6–24 m, 07.09.1999; WAM C 27683 (2 males, 3.0–3.6 mm), stn DA3/99/70 (20°27.45'S, 116°39.58'E), 5–7 m, 08.09.1999.

Remarks

Galathea subsquamata is characterized, among other aspects (see Baba, 1988: 79 for a more complete diagnosis) by the presence of squamiform striae on the gastric region, 2 gastric spines on the dorsal surface of the carapace and epipods on the chelipeds and following 2 walking legs. The specimens here examined agree quite well with the descriptions provided earlier. However, the epipods on the second and third pereopods are very small or barely discernible in some specimens.

Distribution

This species is known from Japanese waters (type locality: Ryukyu Islands), Palau Islands, Philippines, Moluccas, Northern Australia, New Caledonia, in depths between 0 and 238 m. The present material has been collected between 2 and 38 m.

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. 1. – 1977: 251. – 1988: 80. – 1990: 961. – 1994: 42, fig. 1. – Lewinsohn, 1982: 299, fig. 1. – Tirmizi and Javed, 1993: 23, figs. 10–11. – Kato and Okuno, 2001: 88, unnumbered fig.

Material examined

WAM C 26726 (1 ovig. female, 3.0 mm), stn DA2/99/39 (20°37.05'S, 116°33.86'E), 13–14 m, 19.07.1999; WAM C 26749 (1 female, 2.2 mm), stn DA2/99/82 (20°27.57'S, 116°32.35'E), 32–36 m, 25.07.1999.

Remarks

The specimens examined agree quite well with the description and illustrations provided by various authors (i.e. Laurie, 1926; Baba, 1971; 1988; 1994; Lewinsohn, 1982), except a small distal spine is observed on the flexor margin of the propodus of the third maxilliped.

Distribution

Known from the eastern coast of Africa, Japan, Palau Islands, Sulu Archipelago, Bay of Bengal, western Australia, in depths between 6 and 177 m.

Phylladorhynchus integrirostris (Dana, 1852)

Galathea integrirostris Dana, 1852: 482. – 1855, pl. 30, figs 12a, b.

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

Phylladorhynchus serrirostris. – Baba, 1969: 4. – 1990: 969.

Phylladorhynchus integrirostris. – Lewinsohn, 1982: 295, fig. 1. – Baba, 1991: 485: figs 4c, d. – Tirmizi and Javed, 1993: 33, fig. 15.

Material examined

WAM C 27667 (1 male, 2.8 mm; 2 ovig. females, 2.1 mm and broken specimen), stn DA3/99/50 (20°32.85'S, 115°26.71'E), 10–20 m, 31.08.1993; WAM C 27672 (1 male, 2.8 mm), stn DA3/99/59, West Lewis I. (20°33.95'S, 116°38.33'E), intertidal,

04.09.1999; WAM C 27680 (1 male, 2.5 mm), stn DA3/99/67, (20°26.51'S, 116°40.23'E), 6–24 m, 07.09.1999.

Distribution

Widely distributed in the Indian and Pacific Oceans, from east coasts of Africa, Madagascar, Providence Islands, Bay of Bengal, Malay Archipelago, Andaman Sea, Moluccas, Ternate, north Australia, Ryukyu Islands, Japan, Bonin Islands, New Caledonia, Chesterfield Islands, Marshall Islands, Hawaii, Juan Fernandez and Easter Islands, between 32 and 138 m.

Phylladorhynchus nudus sp. nov.

Figure 2

Material examined

Holotype

WAM C 27678 (male, 2.6 mm), stn DA/99/64 (20°36.66'S, 116°36.94'E), 2–5 m, 06.09.1999.

Paratypes

WAM C 25991 (1 male, 2.4 mm), stn DA3/99/61 (20°34.66'S, 116°39.72'E), 3–5 m, 04.09.1999; WAM C 33071 (1 male, 1.5 mm; 1 female, 2.2 mm), stn DA/99/64 (20°36.66'S, 116°36.94'E), 2–5 m, 06.09.1999.

Etymology

From the Latin, *nudus*, bare, naked, in reference to the absence of epigastric spines.

Description

Carapace, excluding rostrum, 0.85 times as long as wide. Anterior half of dorsal surface with 4 transverse ridges, first one on epigastric region interrupted at middle, lacking spines, fourth one on metagastric region interrupted at middle. Posterior half with 3 uninterrupted transverse ridges interspersed with interrupted ones. All ridges with numerous short, not iridescent, thin setae and few short iridescent thick ones. All setae uniramous. Cervical groove slightly distinct. Lateral borders convex, greatest width measured between penultimate branchial marginal spines, bearing 7 spines, first anterolateral, third to seventh situated on branchial region.

Rostrum depressed dorsally and convex ventrally, about 0.6 times as long as remaining carapace, lateral margins slightly convex, with well developed supraocular spine and moderately sized subterminal spine on each side, dorsal surface slightly concave longitudinally. Orbit laterally armed. Pterygostomial flap with small spine on anterior margin, ending in small spine.

Abdomen unarmed, tergite of second to fourth somites with one transverse uninterrupted ridge.

Male pleopods only on second abdominal somite.

Thoracic sternites smooth. Third sternite with anterior margin slightly convex, with acute lateral process. Fourth sternite with few short arcuate striae, concave medially. Anterior part of fourth sternite wider than third.

Eyes large, maximum corneal diameter about 0.4 distance between bases of anterolateral spines.

Basal segment of antennule stout, wide relative to length, reaching end of corneae, bearing 3 terminal spines (dorsolateral strongest; ventrolateral doubled; mesial rather small) and 1 small lateral spine proximal to dorsolateral terminal.

First segment of antennal peduncle with one well developed distal spine on mesial margin reaching end of third segment; second segment with short distomesial and distolateral spines; third segment with short distolateral spine.

Ischium of third maxilliped longer than merus when measured along dorsal margin, distodorsally and distoventrally bearing small spine. Merus of third maxilliped with well developed median spine on flexor margin; extensor margin with distal spine.

Chelipeds about 4 times (holotype) as long as postorbital carapace length, subequal in length, right or left stouter than other side in males, squamous, with numerous short uniramous setae. Palm longer than fingers. Merus armed with some spines, strongest spine on distal border short. Carpus with several well developed spines on mesial side and several spines scattered on dorsal and mesial sides. Palm with spines on mesial and lateral borders. Fingers unarmed.

Second pereopod slightly more than 2 times carapace length; merus shorter than carapace, about 4 times as long as high, about 2 times carpus length and 1.3 times as long as propodus; propodus about 2 times as long as high, and 1.5 times longer than dactylus. Merus with several well developed spines along dorsal border, increasing in size distally. Carpus with few dorsal spines and one distoventral spine. Propodus with 6–7 movable ventral spines. Dactylus slightly curving distally, with 5–6 spines along flexor margin. Second and third pereopods subequal; fourth pereopod shorter than second and third. Epipods absent from all pereopods.

Remarks

Previously there are only four species known in the genus *Phylladorhynchus* Baba, 1969, all from the Indian and Pacific Oceans: *P. bengalensis* Tirmizi and Javed, 1980, *P. ikedai* (Miyake and Baba, 1965), *P. integrirostris* (Dana, 1852) and *P. pusillus* (Henderson, 1885) (see Baba, 1991). The new species is easily distinguished from the other species by the following: (1) the epigastric spines are absent in the new species, whereas there are two spines in *P. integrirostris*, four in *P. pusillus* or

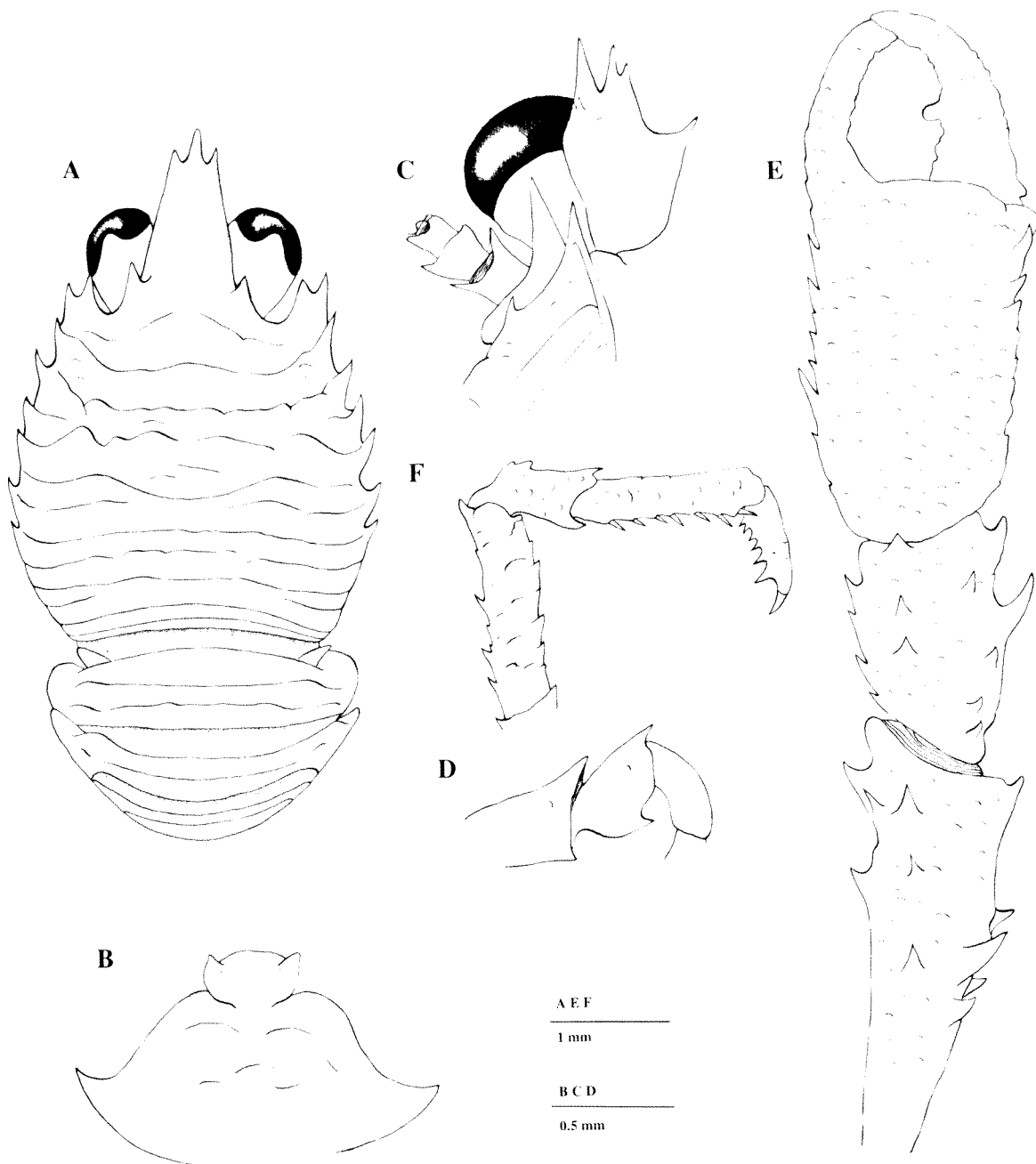


Figure 2 *Phylladorhynchus nudus* sp. nov. Holotype, male, 2.6 mm; **A**, carapace and abdomen, dorsal view; **B**, anterior part of thoracic sternum; **C**, ventral view of cephalic region, showing antennular and antennal peduncles; **D**, right third maxilliped, lateral view; **E**, left cheliped, lateral view; **F**, right first walking leg.

five in *P. bengalensis* and *P. ikedai*; (2) the lateral margins of the rostrum are clearly less convex (i.e. nearly straight) in the new species than in the other species. Furthermore, the subterminal lateral spines of the rostrum are well developed in *P. nudus*, whereas they are very small in the other species.

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REFERENCES

- Adams, A. and White, A. (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, 13 pls.
- Baba, K. (1969). Four new genera with their

- representatives and six new species of the Galatheididae in the collection of the Zoological Laboratory, Kyushu University, with redefinition of the genus Galathea. *OHMU, Occasional Papers of Zoological Laboratory Faculty of Agriculture, Kyushu University* 2: 1-32.
- Baba, K. (1971). *Lauriea*, a new genus proposed for Galathea gardineri Laurie (Crustacea, Anomura, Galatheididae). *Memoirs of the Faculty of Education, Kumamoto University*, section 1 (Natural Science) 22: 117-124.
- Baba, K. (1977). Biological results of the Snellius Expedition XXVIII. The galatheid Crustacea of the Snellius Expedition. *Zoölogische Mededelingen, Leiden* 50: 243-259.
- Baba, K. (1979). Expédition Rumphius II (1975) Crustacés parasites, commensaux, etc. (Th. Monod et R. Serène, éd.). VII. Galatheid Crustaceans (Decapoda, Anomura), *Bulletin du Muséum national Histoire naturelle, Paris*, 4 série, 1, section A, 3: 643-657.
- Baba, K. (1988). Chirostyloid and Galatheid Crustaceans (Decapoda: Anomura) of the Albatross Philippine Expedition, 1907-1910. *Researches on Crustacea*, Special Number 2: v + 203 pp.
- Baba, K. (1990). Chirostyloid and Galatheid Crustaceans of Madagascar (Decapoda, Anomura). *Bulletin du Muséum national Histoire naturelle, Paris*, 4 série, 11, section A, 4: 921-975.
- Baba, K. (1991). Crustacea Decapoda: *Alainius* gen. nov., *Leiogalathea* Baba, 1969, and *Phylladorhynchus* Baba, 1969 (Galatheididae) from New Caledonia. In Crosnier, A. (ed.), Résultats des Campagnes MUSORSTOM, 9. *Mémoires du Muséum national d'Histoire naturelle, Paris* 152: 479-491.
- Baba, K. (1994). *Lauriea siagiani*, a new galatheid (Decapoda: Anomura: Galatheididae) from Bali, Indonesia. *Crustacean Research* 23: 40-45.
- Baba, K. and Oh, S.C. (1990). *Galathea coralliophilus*, a new decapod crustacean (Anomura: Galatheididae) from Singapore, Gulf of Thailand, and West Iran. *Proceedings of the Biological Society of Washington* 103: 358-363.
- Baba, K. and de Saint-Laurent, M. (1996). Crustacea Decapoda: Revision of the genus *Bathymunida* Balss, 1914, and description of six new related genera (Galatheididae). In Crosnier, A. (ed.), Résultats des Campagnes MUSORSTOM, 15. *Mémoires du Muséum national d'Histoire naturelle, Paris* 168: 433-502.
- Balss, H. (1913). Ostasiatische Decapoden I. Die Galatheiden und Paguriden. In Doflein, F., Beiträge zur Naturgeschichte Ostasiens. *Abhandlungen der mathematisch-physische Klasse der K. Bayerischen Akademie der Wissenschaften, München*, (supplement) 2: 1-85.
- Dana, J.D. (1852). Crustacea, Part 1. In *United States exploring expedition, during the years 1838-1842, under the command of Charles Wilkes, U.S.N.* 13: viii + 685 pp. C. Sherman, Philadelphia.
- Dana, J.D. (1855). Crustacea, Atlas. In *United States exploring expedition, during the years 1838-1842, under the command of Charles Wilkes, U.S.N.* 14: 24 pp., 96 pls. C. Sherman, Philadelphia.
- Doflein, F. (1902). Ostasiatische Dekapoden. *Abhandlungen der Bayerischen Akademie der Wissenschaften* 21: 613-670.
- Grant, F.E. and McCulloch, A.R. (1906). On a collection of Crustacea from the Port Curtis district, Queensland. *Proceedings of the Linnean Society of New South Wales* 31: 2-53.
- Haig, J. (1973). Galatheididae (Crustacea, Decapoda, Anomura) collected by the F.I.S. Endeavour. *Records of the Australian Museum* 28: 269-289.
- Haig, J. (1974). The Anomuran crabs of Western Australia: Their distribution in the Indian Ocean and adjacent seas. *Journal of the Marine Biological Association of India* 14: 443-451.
- Haswell, W.A. (1882a). Description of some new species of Australian Decapoda. *Proceedings of the Linnean Society of New South Wales* 6: 750-763.
- Haswell, W.A. (1882b). *Catalogue of the Australian stalk-and sessile-eyed Crustacea*. Australian Museum, Sydney, pp. xxiv + 326, 4 pls.
- Henderson, J.R. (1885). Diagnoses of the new species of Galatheididae collected during the Challenger Expedition. *Annals and Magazine of Natural History* 16: 407-421.
- Henderson, J.R. (1888). Report on the Anomura Collected by H.M.S. Challenger During the Years 1873-76. *Report on the Scientific Results of the Voyage of H.M.S. Challenger during the years 1873-76, Zoology* 27: vi + 221 pp.
- Kato, S. and Okuno, J. 2001. *Shrimps and Crabs of Hachijo Island*. TBS Britanica Co. Ltd., Tokyo. 156 pp.
- Laurie, R.D. (1926). Anomura collected by J. Stanley Gardiner in the western Indian Ocean in H.M.S. Sealark. In Reports of the Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner, M.A. Vol. 8, No. VI. *Transactions of the Linnean Society of London* (2-Zoology) 19: 121-167.
- Lewinsohn, C. (1969). Die Anomuren des Roten Meeres (Crustacea Decapoda: Paguridea, Galatheidea, Hippidea). *Zoologische Verhandelingen, Leiden* 104: 1-213.
- Lewinsohn, C. (1982). *Phylladorhynchus integristrostris* (Dana) und *Lauriea gardineri* (Laurie) (Decapoda, Anomura) aus dem nördlichen Roten Meer. *Crustaceana* 42: 295-301.
- Makarov, V.V. 1938 (1962). *Fauna of the U.S.S.R. Crustacea*. Vol. X, n° 3. Akademii Nauk SSSR, Moskow (Published by the NSF, Washington, Israel Program for Scientific Translations, 1962), 283 pp.
- Man, J. G. de (1902). Die von Herrn Professor Kükenthal im indischen Archipel gesammelten Dekapoden und Stomatopoden. In Kükenthal, ergebnisse einer zoologischen. Forschungsreise in den Molukken und Borneo. *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft* 25: 467-929, plates 19-27.
- Man, J. G. de (1907). On a collection of Crustacea Decapoda and Stomatopoda chiefly from the Inland Sea of Japan, with descriptions of new species. *Transactions of the Linnean Society, London*, series 2, Zoology 9: 387-454.

- McNeill, F.A. (1968). Crustacea, Decapoda and Stomatopoda. *Scientific Report of the Great Barrier Reef Expedition* 7: 1-98.
- Melin, G. (1939). Paguriden und Galatheiden von Prof. Dr. Sixten Bocks Expedition nach den Bonin-Inseln 1914. *Kungl. Svenska Vetenskapsakademiens Handlingar*, series 3, 18: 1-119.
- Miers, E. J. (1879). On a collection of Crustacea made by Capt. H.C. St. John, R.N. in the Corean and Japanese seas. Part 1. Podophthalmia. *Proceedings of the Zoological Society of London* 1879: 18-59.
- Miyake, S. 1953. On three new species of *Galathea* from the western Pacific. *Journal of the Faculty of Agriculture, Kyushu University* 10: 199-208.
- Miyake, S., 1982. *Japanese Crustacean Decapods and Stomatopods in Color*. Vol. 1. Macrura, Anomura and Stomatopoda. Hoikusha Publ. Co., Osaka. vii + 261 pp.
- Miyake, S. and Baba, K. (1964). Two new species of *Galathea* from Japan and the East China Sea. *Journal of the Faculty of Agriculture, Kyushu University* 13: 205-211.
- Miyake, S. and Baba, K. (1965). Some galatheids obtained from the Bonin Islands (Crustacea, Anomura). *Journal of the Faculty of Agriculture, Kyushu University* 13: 585-593.
- Miyake, S. and Baba, K. (1967). Descriptions of galatheids collected from coral reefs of the Ryukyu Islands (Crustacea, Anomura). *Journal of the Faculty of Agriculture, Kyushu University* 14: 225-246.
- Ortmann, A. (1892). Die Decapoden Krebse des Strassburger Museums IV. Die Abtheilungen Galatheidea und Paguridea. *Zoologischen Jahrbuchern, Abtheilung für Systematik, Geographie und Biologie der Tiere* 6: 241-326.
- Paulson, O.M. (1875). *Studies on Crustacea of the Red Sea with Notes regarding other Seas*. Part 1. Podophthalmata and Edriophthalmata (Cumacea). Jerusalem: The Israel Program for Scientific Translations 164 pp. 21 pls.
- Stimpson, W. (1858). Prodrömus descriptionis animalium everttebratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem a Republica Federata missa, Cadwaladaro Ringgold et Johanne Rodgers Ducibus, observavit et descripsit. Pars VII. Crustacea Anomura. *Proceedings of the Academy of natural Sciences of Philadelphia* 10: 225-252.
- Stimpson, W. (1907). Report on the Crustacea (Brachyura and Anomura) collected by the North Pacific Exploring Expedition, 1853-1856. *Smithsonian Miscelanea Collection* 49: 1-240.
- Tirmizi, N.M. (1966). Crustacea : Galatheidae. *The John Murray Expedition 1933-23, Scientific Reports* 11: 167-234.
- Tirmizi, N.M. and Javed, W. (1993). *Indian Ocean Galatheids (Crustacea: Anomura)*. University Grants Commision, Islamabad, Pakistan, 147 pp.
- Whitelegge, T. (1900). Scientific results of the trawling expeditions of H.M.C.S. *Thetis*. Crustacea. Part I. *Memoirs of the Australian Museum* 4: 133-199.
- Yokoya, Y. (1933). On the distribution of decapod crustaceans inhabiting the continental shelf around Japan, chiefly based upon the materials collected by S.S. Soyo-Maru during the years 1923-1930. *Journal of the College of Agriculture, Tokyo Imperial University*, 12: 1-226.
- Zariquey-Alvarez, R. (1952). Estudio de las especies europeas del gen. *Munida* Leach 1818. *Eos* 28: 143-231.