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ON *LYSMATA GRABHAMI* (GORDON), A WIDELY DISTRIBUTED TROPICAL HIPPOLYTID SHRIMP (DECAPODA, CARIDEA)

BY

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The deepwater caridean fauna contains a considerable number of cosmopolitan or circumtropical species but the shallow water fauna includes a very restricted number of species with even a circumtropical distribution. The capture of some specimens of *Lysmata grabhami* (Gordon, 1935), first described from specimens from Madeira in the northern Atlantic Ocean, in the western Indian Ocean, increases the small number of shallow water Caridea with a distribution in both the Atlantic and Indo-West Pacific regions.

Lysmata grabhami (Gordon, 1935)

Hippolysmata grabhami Gordon, 1935: 319-323, figs. 10-11; Holthuis, 1947: 19; Randall, 1958: 334; Faulkner & Smith, 1970: 74, 139, 1 pl., 1 fig.
Hippolysmata (*Hippolysmata*) *grabhami*. — Limbaugh, Pederson & Chace, 1961: 247-249, figs. 5-6.
Lysmata grabhami. — Chace, 1972: 128.

Material examined. — 2 ovigerous females, Nyali, Mombasa, 3°03.0'S 39°43.5'E, 26th August 1973, coll. Niall Bruce.

Habitat. — The specimens were obtained from beneath a large coral head on the outer side of the fringing lagoon, at a depth of 2.5 m, in association with a large anemone and several *Stenopus hispidus* (Olivier).

Remarks. — The specimens agree precisely with the information given by Gordon (1935). The smaller female has a rostral dentition of 7/5, with one epigastric tooth and a post-orbital tooth. The larger female has a dentition of 6/5. The smaller specimen has been preserved and the larger specimen has been kept alive in the laboratory aquarium. In the smaller specimen, the carpus of the second pereiopod consists of 21 segments, the merus of 9 segments and the distal end of the ischium also shows feeble indications of two segments. The proximal end of the ischium bears numerous curved setae along the medial border as reported by Gordon. The telson is about 1.35 times the length of the sixth abdominal segment, with approximately straight lateral margins converging

posteriorly to a truncated tip, slightly produced in the midline. Two pairs of small dorsal spines are present at 0.4 and 0.6 of the telson length. The posterior margin bears a pair of small lateral spines, similar to the dorsal spines, and a pair of larger sub-median spines, about three times as long as the dorsal spines. The exopod of the uropod has the lateral margin slightly convex, ending in a small acute tooth, with a large mobile spine proximally. An additional small acute fixed tooth is also present medial to the spine.

The basic colour pattern is almost exactly as reported by Gordon. The yellow ochre of the branchiostegite and pleura is continuous with the broad red dorsal stripe and not separated by a narrow translucent line. The median band of white is expanded laterally over the centre of the sixth abdominal segment. A narrow line of white extends up the centre of the lamina of the scaphocerite, the rest is transparent. The telson has the proximal third red and the rest white. The uropods are red, except for conspicuous patches of white at the antero-lateral region and the distal end of the exopod. The ova are a pale turquoise colour.

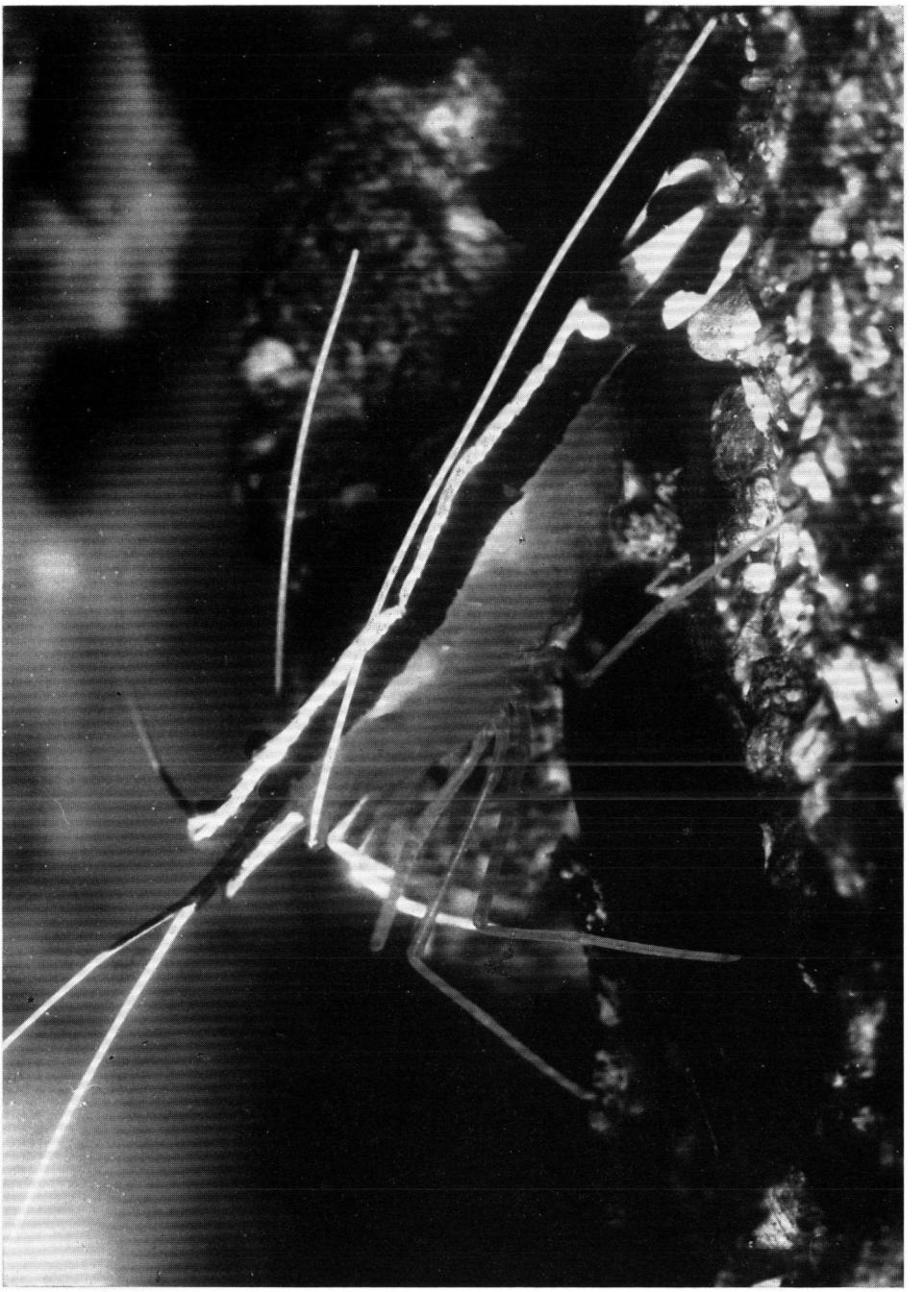
Measurements. — Smaller female: total body length 58 mm, carapace and rostrum 22 mm, post-orbital carapace length 13 mm. Diameter of ova 0.6 mm.

Distribution. — Type locality, Funchal, Madeira. Also recorded from Hawaii, the Society Islands and the Gulf of Aqaba in the Indo-West Pacific region and from the north-eastern Gulf of Mexico, Florida Keys, the Bahamas, the Lesser Antilles and Antigua. This species has not been previously recorded from the Indian Ocean.

DISCUSSION

The Indian Ocean specimens of *Lysmata grabhami* (Gordon) resemble the Atlantic specimens described by Gordon very closely in their colouration and illustrate how conservative the colour patterns of some shrimps can be throughout an extensive geographical range. *L. grabhami* must be one of the most strikingly coloured of tropical shallow water Caridea. The red and white pattern is reminiscent of *Stenopus hispidus* Olivier, and Limbaugh, Pederson & Chace (1961) have noted that in the Bahamas, *L. grabhami* was to be found in association with that species, as also occurred in the case of the Kenyan specimens. The conspicuous white antennae are of particular interest in that, like *S. hispidus, L. grabhami* has been reported as a cleaner shrimp in the Society Islands, the Gulf of Aqaba and Bahamas (Randall, 1958; Faulkner & Smith, 1970; Limbaugh, Pederson & Chace, 1961). Chace (1971) has also reported the association of this species with the giant anemone *Stoichactis helianthus* on Antigua Island, and the Kenyan specimens were also noted to be in the presence of an unidentified giant anemone.

In the major divisions of the tropical marine biotope, the Atlantic, Indo-West Pacific and the East Pacific regions, it is rarely found that a shrimp occurs in more than a single region. In the Penaeidae no shrimps are found naturally in more than one region. In the Caridea, only *Brachycarpus biunguiculatus*



Lysmata grabhami (Gordon), ovigerous female, Nyali, Mombasa, Kenya.

(Lucas) has been reported from all three regions. Five species, *Leander tenuicornis* (Say), *Gnathophyllum americanum* Guérin, *Gnathophylloides mineri* Schmitt, and the hippolytids *Thor amboinensis* (De Man) and now *Lysmata grabhami*, are found in both the Atlantic and Indo-West Pacific regions. Similarly three pontoniinid shrimps, *Periclimenes soror* Nobili, *Fennera chacei* Holthuis and *Harpiliopsis depressus* (Stimpson) and two alpheids *Alpheus lottini* Guérin and *Synalpheus charon* (Heller) are found in both the Eastern Pacific and Indo-West Pacific regions. One stenopid shrimp *Stenopus hispidus* (Olivier) is truly circumtropical, having been recorded from all three regions. It is interesting to note that of these twelve widely distributed species, ten are commensally associated with other invertebrates or are fish cleaners and that only three, *L. tenuicornis, B. biunguiculatus* and *G. americanum* are apparently free-living, although little is known of the life history of the last two species.

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ON *GAMMARUS* FROM FRESH WATERS IN THE ISLANDS OF ORKNEY AND SHETLAND

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Over the past ten years, at my request, the following persons have very kindly made collections of *Gammarus* from streams and lochs in Shetland: Dr. R. Bray, Mr. A. Joyce, Professor A. Milne and Mr. P. Milne. In addition, through the courtesy of Dr. P. Maitland, I was recently able to examine specimens obtained during a survey of the freshwater invertebrates of Orkney (Kellock & Maitland, 1969). The results are briefly presented here as there are no modern