

Fig. 5. *Paralebbeus zotheerculatus*: A, First pereiopod; B, Same, chela; C, Second pereiopod; D, Same, carpus and chela; E, Same, chela; F, Third pereiopod; G, Same, propod and dactyl; H, Fifth pereiopod; I, First pleopod; J, Second pereiopod. A–H, Female paratype; I, J, Female holotype.

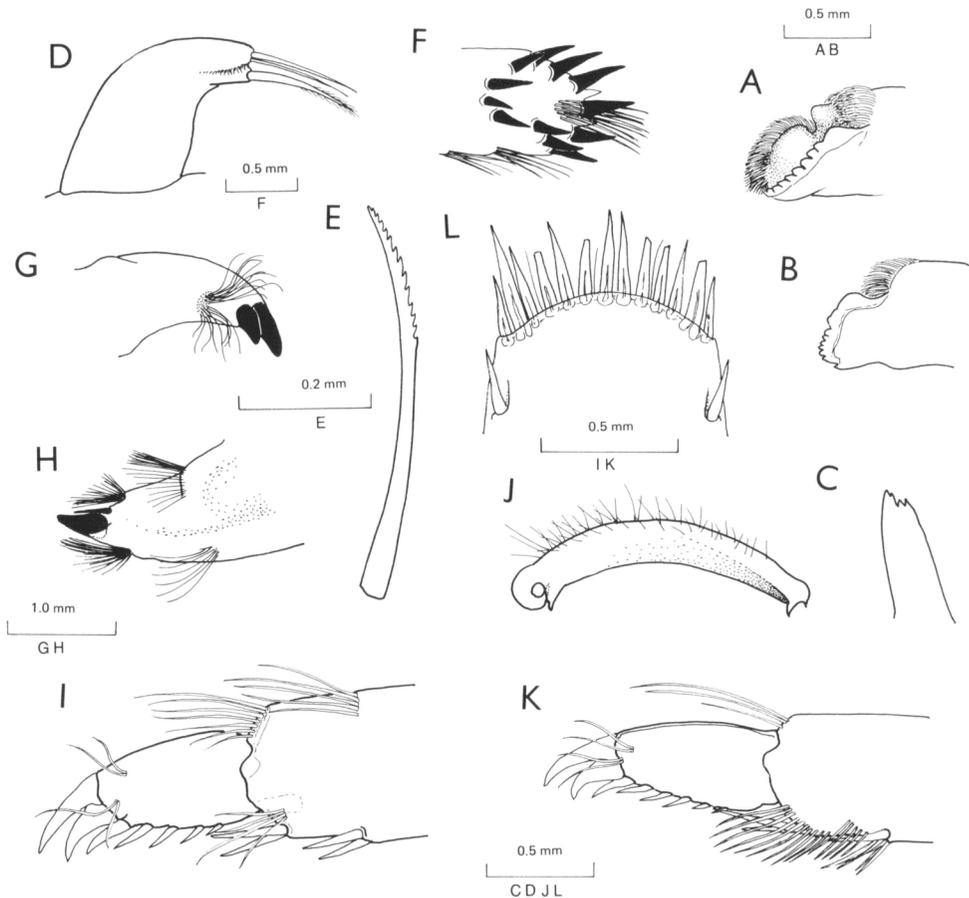


Fig. 6. *Paralebbeus zotheerculatus*, female paratype: A, Molar process of mandible, anterior aspect; B, Same, posterior aspect; C, Incisor process of mandible; D, Palp of maxillula; E, Lower lacinia of maxillula, distal spine; F, Third maxilliped, distal end of terminal segment; G, First pereiopod, dactyl; H, Same, fixed finger; I, Third pereiopod, dactyl and distal end of propod; J, Same, epipod; K, Fifth pereiopod, dactyl and distal end of propod; L, Telson, posterior margin.

turned. Small pterygostomial spine present on each side of carapace.

Additional paratypes.—In close agreement with holotype. Specimen from NWS/68 lacking first and fifth pereiopods and one of fourth pereiopods. Pterygostomial spines absent from both sides. Telson with 4 dorsal spines on one side, 5 on other. Specimen from NWS/66 complete and also with 4 dorsal spines on one side of telson and 5 on other. Pterygostomial spines present on both sides of carapace.

Coloration.—Body mainly transparent,

abdomen whitish speckled with small red chromatophores increasing in density posteriorly, caudal fan reddish; antennae whitish; third maxilliped deep red; fingers of first pereiopod reddish, third to fifth pereiopods red, especially distally. Cornea black. Intra-thoracic organs orange. Ova turquoise.

Host.—All specimens collected from small chambers in hexactinellid sponges, probably of the genus *Euplectella*.

Habitat.—Bottom temperatures 7.88°–8.70°C.

Parasites.—One specimen with pair of

bopyrid isopods in right branchial chamber. These have been identified as *Bopyroides lamellatus* (Krøyer), a species not previously recorded from Southern Hemisphere.

Etymology.—The specific epithet is derived from “zothecula” (Latin), a small chamber.

Discussion

The specimens of *Paralebbeus zotheculatus* described above were all obtained from inside trawl-caught hexactinellid sponges, in small closed chambers only found on breaking up the sponges, leaving their association with the sponge beyond any doubt (Fig. 1). Most of the sponges collected were damaged and incomplete, which probably accounts for only single specimens of shrimps being found; it seems probable that they were originally in heterosexual pairs.

The discovery of *Paralebbeus zotheculatus* is of particular interest as it represents the first established example of an association between a caridean shrimp and a hexactinellid sponge. This niche has been largely taken over by stenopodid shrimps, such as *Spongicola*, *Spongiocaris*, and *Spongi-coloides* (Saint Laurent and Cleve 1981).

The genus *Lebbeus* White contains about 25 species (Wicksten and Méndez 1982, Butler 1980) which occur predominantly in northern seas, although one species, *L. indicus*, has been described from Indonesian waters (Holthuis 1947). Most of these have been trawl-caught specimens and no details of their associations, if any, have been preserved. One of the boreal species found in shallow waters has been observed to live in association with sea anemones (Butler 1980, *L. grandimanus* [Brazhnikov] on *Cribriopsis* and *Tealia* spp.) but none have been reported in association with hexactinellid or any other sponges. The only hippolytid shrimp so far recorded as an associate of Porifera is *Gelastocaris paronae* Nobili, which lives on the external surface of shallow-water Indo-West Pacific sponges.

Three specimens of a hippolytid shrimp that probably belongs to this genus and possibly to the same species were collected during the *Albatross* Philippine Expedition, 1907–1910, but, as each specimen differs in some respects from the above description, they are not considered to be part of the type series of *Paralebbeus zotheculatus*. A female (CL 9.7 mm) from Verde Island Passage, Philippines, agrees most closely with the Australian series but it has a more slender rostrum, the anterior margin of the carapace not deeply recessed below the antennal spine, the scaphocerite with the lateral margin slightly concave rather than faintly convex at midlength, and the chela of the first pereopod with the distal corneous teeth on the dactyl subequal rather than staggered. A male (CL 6.9 mm) from west of Halmahera, Indonesia, has a small supraorbital spine on the left side and none on the right, no pterygostomial denticle on either side, the telson with only two and three left and right lateral dorsal spines, and the corneous subdistal spines on the third maxilliped more numerous and extending somewhat farther proximally on the terminal segment. A female (CL 11.7 mm) from southern Celebes, Indonesia, resembles the male in the spination on the third maxilliped but it has no supraorbital spine on either side, a vestige of a pterygostomial denticle on the left side of the carapace but none on the right, the telson with two lateral dorsal spines on the left side and one on the right, and the right scaphocerite shorter than the left. These specimens will be discussed in greater detail in the report now in preparation by the junior author on the alpheid families of the *Albatross* Philippine Expedition.

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