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OCCURRENCE OF *HETEROCARPUS SIBOGAE* DE MAN AND *PLESIONIKA WILLIAMSI* FOREST (CRUSTACEA, DECAPODA, PANDALIDAE) IN THE ARABIAN SEA

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ABSTRACT

The occurrence of two species of deep-sea prawns, namely *Heterocarpus sibogae* De Man and *Plesionika williamsi* Forest in the Arabian Sea is reported for the first time. The material is described and illustrated.

INTRODUCTION

Several species of prawns belonging to the family Pandalidae are known to occur in Indian seas. They are mostly deep water forms occupying the upper continental slope. Some of them are also considered as potentially commercial species along the southwest coast of India (George and Rao, 1966; Silas, 1969; Suseelan, 1974). While examining the deep-sea prawn catches landed by the exploratory fishing vessels of the erstwhile Indo-Norwegian Project during 1970 to '79, two species of this family, namely, *Heterocarpus sibogae* De Man and *Plesionika williamsi* Forest were encountered. Except for a brief report of the occurrence of the former species from the Andaman Sea by Alcock (1901) nothing is known about these prawns from the Indian Ocean and hence the present account.

The measurement of total length is the distance from the tip of rostrum to the posterior end of telson, and that of carapace length from the postorbital margin to the posterodorsal margin of the carapace.

INFRAORDER : CARIDEA

Family : Pandalidae

Heterocarpus sibogae De Man (Fig. 1 a - i)

Heterocarpus ensifer, Bate, 1888, p. 638, pl. 112, fig. 4; Alcock, 1901, p. 107.

Heterocarpus sibogae, De Man, 1917, p. 283 (Type locality : Indonesia, 289 - 560 m); 1920, p. 169, pl. 14, fig. 42; Calman, 1939, p. 206; King, 1984, p. 183; Chace, 1985, p. 36, fig. 18 - 20.

Material examined

One female, total length 114 mm, carapace length 34 mm; off Quilon at 310 - 320 m, March 1979.

Description

Integument tomentose formed by lanceolate scalelike spines (Fig. 1 e); rostrum about 2/3 as long as carapace, gradually recurved upwards, armed dorsally with 8 teeth followed by 6 on postrostral crest of which the first one placed behind middle of

carapace, 8 teeth on ventral margin including two small ones situated closely on distal part; carapace with sharp postrostral carina extending almost to posterior margin, three distinct lateral carinae, the uppermost (postocular) occupying only about posterior half, and the middle (postantennular) and lowest (postantennal) carinae running from orbital and branchiostegal spines respectively to hind border; abdominal terga 1-4 sharply carinated, carinae of 3rd and 4th terga produced posteriorly into sharp spines of almost same size (Fig. 1 a); 5th and 6th somites dorsally rounded, 6th about 1.5 times as long as 5th; telson long, nearly as long as uropods, armed with 5 small dorsolateral movable spines on right side and 4 on left side in addition to 3 pairs at distal end (Fig. 1 c, d); antennular flagella about the same length of carapace, stylocerite pointed and reaching middle of second segment of antennular peduncle; scaphocerite narrower distally, reaching 3/4 of rostrum; distolateral spine projecting well beyond anterior margin; 3rd maxilliped stouter than pereopods, extending to 3/4 of scaphocerite, exopod well developed; 1st pereopod reaching middle of scaphocerite; left leg of 2nd pair longer and slender surpassing scaphocerite by whole length of its chela, right leg stouter and reaching proximal 1/4 of scaphocerite; 3rd and 4th pereopods almost same size, the former extending nearly to end of scaphocerite, its dactylus slightly more than 1/3 of propodus (Fig. 1 f); 5th pereopod reaching distal margin of basal segment of antennular peduncle; rami of uropod equal.

Colour of fresh specimenpink ; a dark reddish spot covering almost the entire width of 3rd abdominal somite on either side (Fig. 1 a) appears to be characteristic; tip of rostrum, orbital margin, carinae of 1st and 2nd abdominal terga, distal portion of spines on 3rd and 4th terga, tip of dorsal antennular flagellum and perepods and the entire pleopods reddish.

Distribution

Indo-Pacific : southwest coast of India (present record), Andaman Sea, Indonesia, Philippines to southern Japan, Australia and Southwest Pacific Islands (New Caledonia to Tonga); 247 - 750 m depth.

Remarks

In general appearance this species closely resembles *H. ensifer* A. Milne - Edwards, the type of the genus. According to De Man (1920) they are distinguished by the following characters : (1) The 1st tooth of postrostral crest is placed distinctly behind middle of carapace in *H. sibogae*, whereas it is situated well in advance of the middle of carapace in *H. ensifer*, (2) The 1st and 2nd abdominal terga are provided with high, prominent and sharp carinae in the former species, while these carinae are absent in the latter, and (3) The dactyli of last three pairs of pereopods are longer than 1/3 of propodi in *H. sibogae*, but in *H. ensifer* they are invariably shorter. The present specimen closely agrees with the detailed description and figures of De Man (1920) except that the number of teeth on the ventral margin of rostrum is less and the dorsolateral spines on telson are asymmetrically arranged (Fig. 1 c). Alcock (1901) reports that none of the legs of this species extend beyond atennal scale, but in the present material the left leg of the 2nd pair is long and distinctly surpassing the antennal scale. Chace (1985) observed considerable variations in the extent of dentition on the carapace and the relative lengths of the 2nd pair of pereopods in this species.

The earlier record of the species from Indian waters is that of Alcock (1901), under

the name *H. ensifer* A. M. Edw., based on a single young specimen collected by the *Investigator'* from the Andaman Sea at 344 - 402 m depth. The present material is a full grown female with ovigerous setae and traces of hatched out eggs on the pleopods.

No information is available on the developmental stages of *H. sibogae*. Menon (1972), however, reported the occurrence of a single juvenile specimen of *H. ensifer* off Mombassa, East Africa, and a few larval forms of it off Java and in the central Indian Ocean while studying the plankton collections of the International Indian Ocean Expedition (1960 - '65). One of the characters he considered as an important diagnostic feature of the juvenile of the species (14.8 mm CL) was the absence of dorsal carinae on the first and second abdominal somites. As changes in morphological features during the transformation of different life stages are common in the life history of crustaceans, and in the light of the present authentic record of the occurrence of *H. sibogae* in Indian Ocean, it will be worthwhile to reconsider the identity of the early stages assigned by Menon (1972) to *H. ensifer*.

***Plesionika williamsi* Forest (Fig. 2, a - w)**

Plesionika williamsi, Forest, 1963, p. 621, fig. 1 - 4 (Type locality; Off Guinea, 300 - 455 m); Williams, 1968, p. 105; Crosnier & Forest, 1973, p. 211 - 212, fig. 65 e.

Material examined

2 berried females, total length 144 and 145 mm, carapace length 28.5 and 30.0 mm; Off Quilon at 335 - 357 m, November, 1970. 1 berried female, total length 115 mm, carapace length 23.0 mm; off Quilon at 320 m, March, 1979.

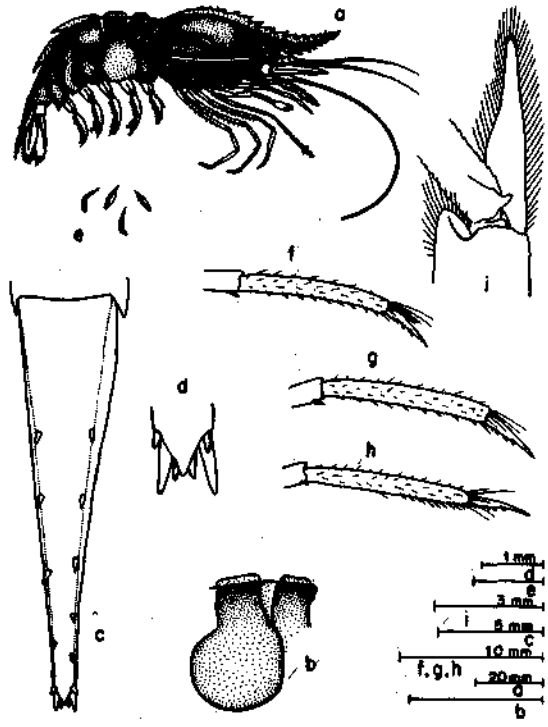

Fig. 1. *Heterocarpus sibogae* De Man: a. Female - lateral view, b. Terga of first and second abdominal somites - lateral view, c. Telson, d. Tip of telson enlarged, e. Body scales, f. Propodus and dactylus of third pereopod, g. Propodus and dactulus of fourth pereopod, h. Propodus and dactylus of fifth pereopod, i. Endopod and part of exopod of first pleopod.

Description

Body covered with lanceolate scales (Fig. 2 c) implanted in small pits; rostrum long, extending far beyond scaphocerite, about 1.5 times as long as carapace, curved downwards upto middle of antennular peduncle and thereafter gradually ascending, armed with 11 dorsal teeth arranged closely on basal crest, proximal 3 or 4 placed behind orbit, first tooth microscopic and movable, next 2 or 3 of medium size and remaining ones larger and of uniform size, upper margin beyond level of 2nd segment of antennular peduncle

smooth, ventral margin serrated with 11 - 15 teeth spaced more widely than dorsal (Fig. 2 a, b); carapace with postrostral carina fading at about middle, branchiocardiae region marked with a blunt ridge gradually sloping anteroventrally and fading at about middle of carapace, lower to lateral ridge a row of three small depressions present anteriorly; all abdominal segements non-carinate; posterior margin of 3rd tergum acutely produced and pointed at middle (Fig. 2d); pleura of first four segments broadly rounded, that of fifth narrowly produced; 6th segment 2.2 to 2.5 times as long as 5th and about 2 times its greatest width, its pleura small and possessing an acute spine near posteroventral corner; telson as long as 6th somite, armed with 4 pairs of small movable spines dorsolaterally and 3 pairs on distal extremity (Fig. 2 e, f); eyes large with distinct ocellus; stylocerite reaching near to distal border of basal segment of antennular peduncle, broadly tapering with convex inner margin, second and third segments of peduncle short (Fig. 2 g), flagella subequal and much longer than entire body length; scaphocerite long, extending beyond antennular peduncle by more than half its length, distal border slightly rounded with a well developed spine on outer margin (Fig. 2 h); mandible with incisor process ending in two large and 5 - 6 small teeth in between, palp 3 segmented, terminal segment longest (Fig. 2 i); palp of maxillula bifid distally (Fig. 2 j); maxilla with upper endite (Fig. 2 k); exopods of all maxillipeds well developed; endites of 1st maxilliped distinctly cleft, palp slender and unsegmented, epipod deeply bilobed (Fig 2 l); endopod of 2nd maxilliped 5 - segmented, exopod slender, epipod large and carrying a well developed podobranch (Fig. 2 m); 3rd maxilliped surpassing scaphocerite by whole length of utlimate and 1/4 of penultimate segments, ultimate segment shorter than penultimate, exopod reaching about middle of basal article, epipod small and terminating in a sickle - shaped hook and laterally bent spine (Fig. 2 n); all pereopods longer and slender; 1st pereopod longer than 3rd maxilliped and exceeding rostrum by about half of its propodus, chela microscopic but well defined (Fig. 2 q, r); 2nd pair equal, reaching tip of rostrum, carpus divided into 27 - 30 joints (Fig. 2 s), merus slightly more than half the length of carpus; 3rd - 5th pereopods excessively long surpassing beyond scaphocerite by whole or greater part of carpus; propodus of 4th leg slightly longer than carpus and 15 - 16 times as long as dactylus; 5th leg longest, about $4^1/_2$ times length of carapace and its dactylus about 1/18 propodus length; exopods lacking in all pereopods; epipods present on 1 - 4 pereopods; endopod of 1st pleopod slightly shorter than 1/3 of exopod, distally narrow and setose; appendix interna with small coupling hooks on distomedian surface (Fig. 2 v, w); endopod of uropods reaching tip of telson.

Distribution

Eastern Atlantic : west Africa (Guinea and Ivory Coast); Indian Ocean : southwest coast of India (present record); 300 - 455 m depth.

Remarks

The original description of the species (Forest, 1963) closely applies to the present material except for the followig differences. The posterior margin of the 3rd abdominal tergum of the female is acutely produced and pointed but it does not terminate in a distinct tooth as reported in the Guinean specimens. Crosnier and Forest (1973) considered the

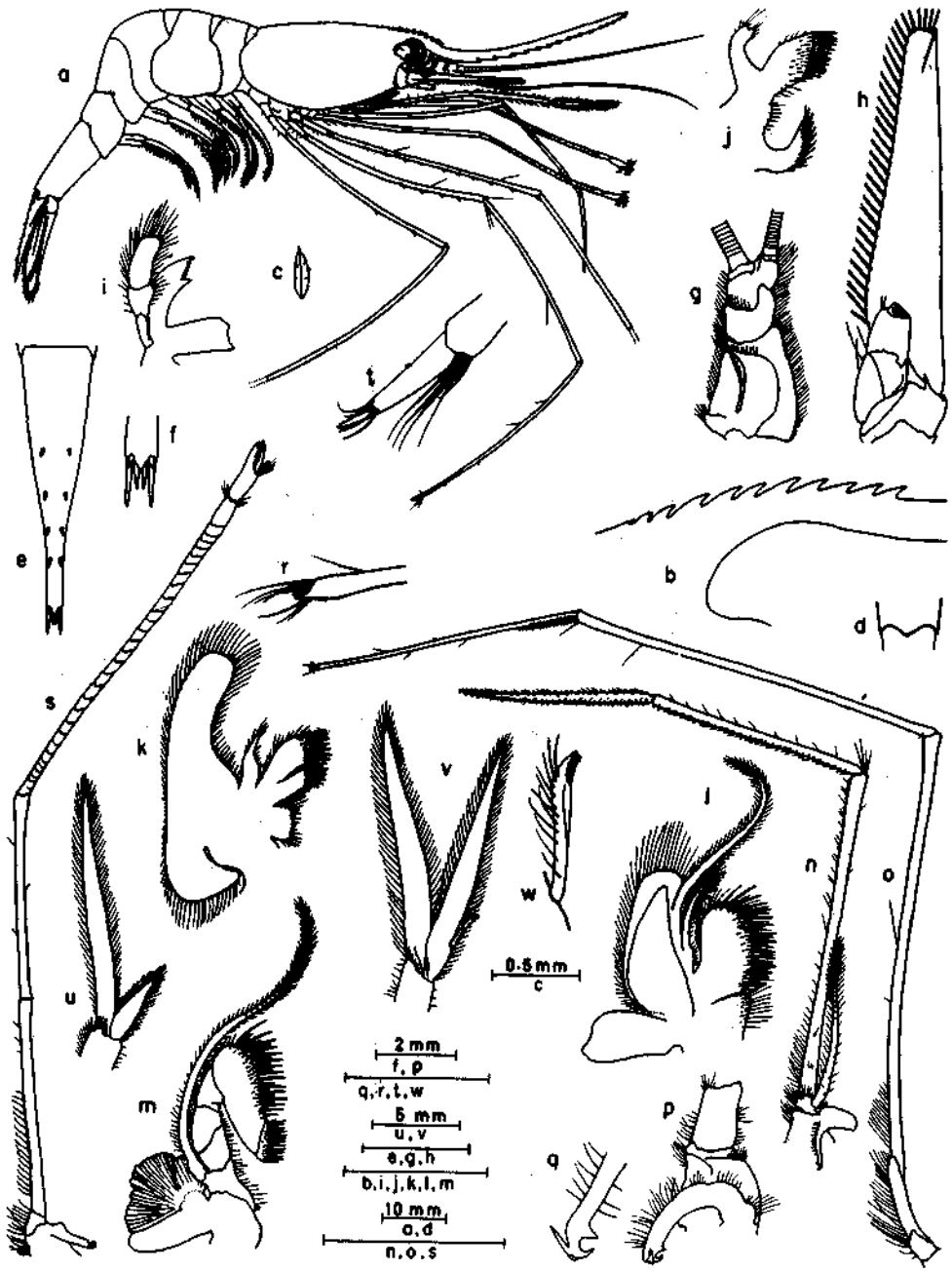

Fig. 2. *Plesionika williamsi* Forest : a. female - lateral view, b. Basal part of rostrum enlarged, c. Body scale, d. Tergum of third abdominal somite - dorsal view, e. Telson, f. Tip of telson enlarged, g. antennular peduncle, h. Scaphocerite with base of antennal filament, i. Mandible, j . Maxillula, k. Maxilla, l. First maxilliped, m. Second maxilliped, n. Third maxilliped, o. First pereopod, p. Coxa of first pereopod with epipod, q. Tip of epipod enlarged, r. Tip of first pereopod, s. Second pereopod, t. Dactylus of fourth pereopod, u. First pleopod, v. Second pleopod, w. Appendix interna of second pleopod enlarged.

presence of a distinct tooth as a 'key' character shared by both *P. williamsi* and *P. ensis*. The length of 6th abdominal segment of the present material varies from 2.2 to 2.5 times that of 5th segment whereas it is only about 2 times as long as 5th segment in the specimens of Forest (1963). The distinction made out for this species (Crosnier and Forest, 1973) on the basis of relative sizes of the last two abdominal segments will not hold good for separating it from *P. ensis* in which the 6th segment is about 2.5 times as long as 5th (Suseelan and Mohamed, 1968). Out of the 11 dorsal teeth on rostrum, the anterior 7 or 8 are of uniform size while Forest observed slight variation in their sizes. The ventral rostral teeth number a little more than those recorded by the earlier workers.

This species is so far known only from the Atlantic and the present record extends its distribution to the Indian Ocean.

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