ON THE EARLY LARVAL STAGE OF *PETROLISTHES OHSHIMAI* (MIYAKE) (DECAPODA : PORCELLANIDAE)

ABSTRACT

The early larval stage (Zoea 1) of the porcellanid crab, *Petrolisthes ohshimai* (Miyake), associated with a giant sea anemone, *Stoichactis* sp. is described and illustrated here. The larvae were reared from eggs from two ovigerous females collected from shallow waters off Kunduchi Marine Biological Station, Dar es Salaam.

STUDIES of the larval stages of decapods of the Indian Ocean area have been limited and much remains to be done to enable identification of these larvae in plankton samples.

Porcellanidae, which constitutes a group of crab-like decapods, are represented by fewer genera and species compared to true crabs, Brachyura. Their larval stages are very characteristic and are easily distinguished in a plankton sample by the enormously long rostral and posterior spines. A review of literature on the larval stages of this group reveals that there is an increase in the effort to study this group in recent years and in this respect the contributions of Gohar and Al-Kholy (1957), Wear (1964a, 1964b, 1965a, 1965b and 1966), Sankoli (1967) and Shenoy and Sankoli (1967) are valuable.

Petrolisthes ohshimai (Miyake) is an interesting porcellanid crab associated with the giant sea-anemone, *Stoichactis* sp. This species is fairly common in this area within a depth of five metres and has also been collected from Zanzibar. It is not uncommon to see the shrimp, *Periclimenes brevicarpalis* (Schenkel) and the fish, *Amphiprion* sp. together with the crab. The crabs as well as the shrimps are invariably found in pairs, a male and a female.

Two ovigerous females were collected by skin diving by one of us (C.S.K.) on 2nd May 1972 opposite to Kunduchi Marine Biological Station. These were kept alive in separate containers and when the eggs were examined at the time of collection, they were in an advanced stage of development. Eggs failed to develop any further in one case as the crab shed all the eggs on the next day. The first larval stage was obtained from the second crab when zoeae were released on 6th May 1972. Subsequent stages in the development of larvae could not be obtained in the laboratory.

Description of Zoea I

Carapace (Fig. 1a) : longer than broad, almost oval in shape in dorsal view ; rostral spine long, tapering and about 11 to 12 times length of posterior spines, rounded in cross section and armed with spinules on ventral surface ; posterior spine somewhat flattened dorso-ventrally, curved and with a row of spinules on ventro-lateral surface reducing in size distally.

Antennule (Fig. 1b) : long, fairly of uniform thickness for about one-third length but tapering abruptly towards tip and carrying two aesthetes and three setae.

Antenna (Fig. 1c) : two-segmented, distal segment produced into a stout lobe tapering gradually into a pointed tip carrying a subterminal seta on outer side ;

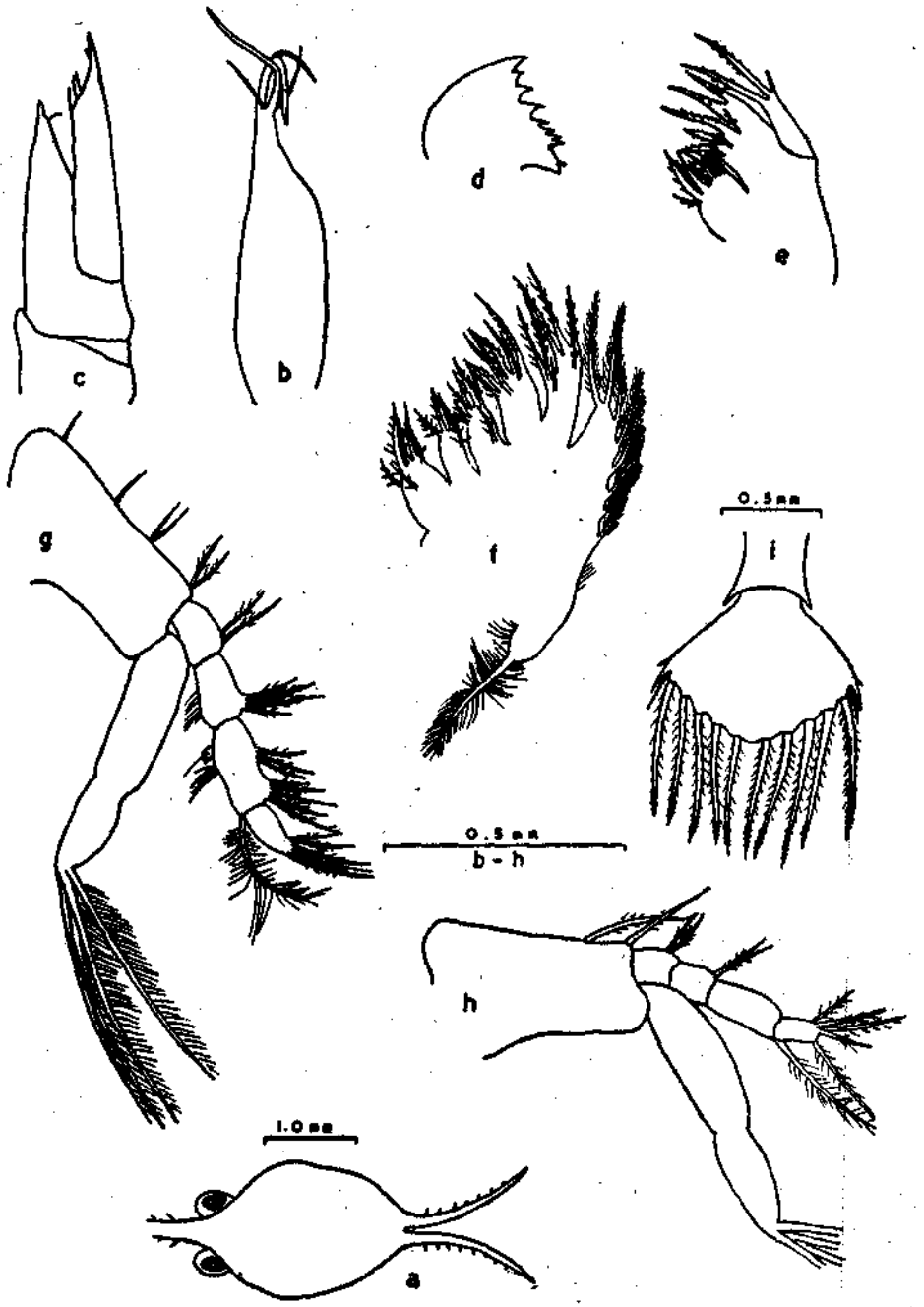

Fig. 1. Zoea I of *Petrolisthes ohshimai* (Miyake). a. carapace—dorsal view; b. antennule; c. antenna; d. mandible; e. maxillule; f. maxilla; g. maxilliped I; h. maxilliped II; and i. telson.

distal segment carrying a longer lobe on outer side abruptly narrowing to a sharp pointed tip, three subterminal hairs and a spinule on this lobe.

Mandible (Fig. 1d) : armed with cutting teeth, larger on anterior half and smaller and irregular on posterior half.

Maxillule (Fig. 1e) : Endopodite single-segmented carrying two larger and smaller setae. Coxal endite subdivided into two, distal lobe with two large and a small setae and proximal lobe having three setae at the tip and two small ones near the base. Basal endite provided with nine setae of varying size.

Maxilla (Fig. 1f) : Scaphognathite carrying eight feathery setae. Endopodite provided with eight setae altogether. Coxal endite with eight setae on each lobe. Basal endite having six and five setae on proximal and distal lobes respectively.

Maxilliped I (Fig. 1g) : biramous. Basipodite having six setae. Endopodite four-segmented and exopodite carrying four swimming setae. First endopodite segment as long as last but shorter than second and third and provided with two setae on inner side, second segment shorter than third and with four setae on inner side and a few hairs on outer side, third segment having setae arising in two groups—first of three and second of five and yet another long plumose seta on outer side distally, distal segment carrying five setae.

Maxilliped II (Fig. 1h) : also biramous and exopodite with four swimming setae. Basipodite having two setae near distal end. Endopodite four-segmented ; first, second and fourth endopodite segments of same length and half the length of third ; number of setae from first to fourth segment as follows—2, 2, 1 and 5.

Maxilliped III : represented as a bud.

Abdomen : of five segments and telson. Width of abdominal segments reducing from first to fourth. Fifth segment longest, fourth shorter than fifth and rest shortest and of same length. Postero-lateral angle of fourth and fifth segments armed with spines, those on fifth much larger than those on fourth.

Telson (Fig. 1i) : diamond-shaped, broader than long with following processes from outer side to middle : a minute spinule, a conspicuous spine, a hair and five long plumose setae distal one-third of which toothed and rest with hairs ; innermost pair of setae arising from central prominence.

Colouration : Living larvae transparent and with some chromatophores of brownish and greenish colour. Carapace with a large brownish chromatophore in the middle nearer anterior end, eyes with greenish chromatophores and rostrum with three broad brownish bands.

Discussion

Porcellana Lamarck and *Petrolisthes* Stimpson are two closely related genera of Porcellanidae. Gurney (1942) and Lebour (1943, 1950) have mentioned the characteristic features of the larvae of these two genera. On the basis of his study, Wear (1964a) has shown that in the case of larvae of *Petrolisthes navaezelandiae* Filhol, telson has the characteristic feature of the larvae of *Porcellana*. However, in the larvae of *P. ohshimai* the condition of telson is like the rest of the species of *Petrolisthes*.

Sankoli (1967), while describing the larval stages of *Petrolisthes lamarckii* (Leach), has given a key for the separation of four species of *Petrolisthes* [*P. armatus* (Gibbes), *P. boscii* (Audouin) and *P. rufescens* Heller] which excludes two other species [*P. novaezelandiae* and *P. elongatus* (Milne Edwards)] already described by Wear (1964a, 1964b).

P. ohshimai has a very characteristic larva, very easily distinguished from the rest. The large rostral spine, about 11 to 12 times the length of posterior spine (1.8 to 2.1 times in *P. elongatus*, 2 times in *P. rufescens*, 2.6 to 2.7 times in *P. novaezealandiae*, 4 times in *P. armatus* and *P. boscii* and 6 to 8 times in *P. lamarckii*) and the presence of a spinule on telson outside the usual spine are two of the diagnostic features of the first larval stage of *P. ohshimai*.

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REFERENCES

GOHAR, H. A. F. and AL-KHOLY, A. A. 1957. *Publ. Mar. Biol. Sta. Ghardaqa*, 9 : 185-189.

GURNEY, R. 1942. *Larvae of decapod Crustacea.* Ray. Soc. London, 1-122.

LEBOUR, M. V. 1943. *J. Mar. biol. Ass. U.K.*, **25** : 721-737.

———. 1950. *Proc. Zool. Soc. Lond.*, **120** : 369-379.

SANKOLI, K. N. 1967. *Proc. Symposium on Crustacea,* Marine Biological Association of India, Cochin. Pt. 2 : 744-776.

SHENOY, S. and SANKOLI, K. N. 1967. *Ibid.*, 805-814.

WEAR, R. G. 1964a. *Trans. roy. Soc. N. Z. Zoology*, 4 (18) : 229-244.

———. 1964b. *Ibid.*, **5** (2) : 39-53.

———. 1965a. *Ibid.*, **5** (12) : 147-168.

———. 1965b. *Ibid.*, **6** (13) : 127-132.

———. 1966. *Ibid.*, **8** (10) : 119-124.