

INCUBATION OF EGGS

The parent crab (carapace length 11.5mm, width 12.0mm) carried 683 eggs within seven days of hatching. At this stage the eggs are ovoid in shape, measuring 0.69mm \times 0.56mm, and the yolk is coloured bright orange. The embryo is transparent and without chromatophores, but eyespots are clearly visible. Two days from hatching eggs increased in size to 0.73mm \times 0.60mm, with larval chromatophores visible, especially in the telson which is coloured bright red. Remaining yolk is orange. Eggs about to hatch (Fig. 1) measure 0.78mm \times 0.63mm.

After the eggs hatched ovaries of the female crab were found to be gravid with bright orange immature eggs measuring 0.50mm \times 0.45mm.

PRE-ZOEAL LARVA

The pre-zoea larva of *P. spinosus* (Fig. 2) is completely enveloped in a delicate cuticle. From the time of hatching it swims actively and is strongly attracted towards light. The pre-zoeal stage lasts from 30 to 45 minutes under laboratory conditions (16°C).

DESCRIPTION OF PRE-ZOEAL LARVA

Cephalothorax

Proximal half of rostrum invaginated beneath carapace to level of posterior margin of eye (Fig. 2). Distal half telescoped, lying beneath the thorax, but small marginal setae not easily visible. Carapace folded and wrinkled, especially posteriorly. Remaining yolk visible in live specimens as bright orange pigmentation posterior to eye. Posterior carapace spines not invaginated but telescoped and procurved, and ventral spines found in zoea larvae (Wear, 1965a) not visible at this stage. Eyes large and sessile.

Cephalic Appendages

First antennae (antennules) (Fig. 3) unsegmented with surrounding pre-zoeal cuticle extended into one long lateral plumose process on inner margin and two long distal plumose processes. Outer distal margin with two small unarmed processes.

Second antennae (Fig. 4) two-segmented. Proximal protopod with a single unarmed process arising from its inner distal margin. Distal exopod with six long plumose processes along inner and distal margins, and a smaller unarmed process arising from tip on outer margin. Aciculate tip of exopod characterising stage one zoea larvae (Wear, 1965a) folded inside unarmed process.

Mandibles (Fig. 5) first maxillae (Fig. 6) and second maxillae (Fig. 7) as those of stage one zoea, but in the pre-zoea these appendages are surrounded by the pre-zoeal cuticle which is without spines or processes. First and second maxillae with spines of first zoea visible and protruding through cuticle.

Thoracic Appendages

First, second and third maxillipeds are developed (Fig. 2). The maxillipeds are non-functional, have no natatory setae, and the covering pre-zoeal cuticle is without spines or processes.

First maxillipeds (Fig. 2) biramous, consisting of short coxopod, longer basipod and unjointed exopod. Endopod four-segmented, half the length of exopod. Four terminal setae visible beneath cuticle of exopod, but do not protrude.

Second maxillipeds (Fig. 2) similar to the first, but with smaller, unjointed endopod.

Third maxillipeds (Fig. 2) uniramous and without setae as in the first stage zoea larvae (Wear, 1965a).