

The pre-zoeal cuticle surrounding the cephalic appendages conforms to the basic porcellanid pattern. Long, feathered processes are particularly well developed, especially on the antennae, and are quite clearly used as natatory organs in the pre-zoeal stage. The antennal endopod is here represented as an empty sac (Fig. 4) without fringing setae. The antennal endopod of the zoea larvae is absent in stage one, but appears in the second zoeal stage (Wear, 1965a) and is therefore an example of temporary loss of appendages in larval life similar to *Pinnotheres* discussed by Gurney (1942).

With the exception of *Petrocheles spinosus* the pre-zoeal telson is similar in all described porcellanid species each having 5 + 5 long plumose inner processes, and 1 + 1 shorter lateral processes. The telson formula is therefore 6 + 6. In the zoea larvae of these there are 7 + 7 setae, and the second telson setae are reduced to a fine hair. Processes homologous to the second telson setae are not present in the pre-zoeae. This feature is presumably a secondary specialisation, as the Porcellanidae obviously cannot be considered closely related to the Caridea in which a telson formula of 6 + 6 also occurs in the pre-zoea larvae (Gurney, 1942).

However, in *Petrocheles spinosus* the pre-zoeal telson has 7 + 7 posterior processes (1 + 1 short lateral processes and 6 + 6 strongly developed inner plumose processes) thus conforming to the basic pre-zoeal pattern shown by all Decapoda with the exception of the Caridea and the remainder of the Porcellanidae. This evidence therefore supports earlier suggestions (Wear, 1965a) that the genus *Petrocheles* is in many larval characters close to the anomuran ancestry of the Porcellanidae.

Ecdysis from the pre-zoea larval stage to the stage one zoea in *P. spinosus* is a considerably more rapid process than in either *Petrolisthes elongatus* (Wear, 1965b) or *P. novaezelandiae* (Wear, 1965c). In *Petrocheles spinosus* the posterior carapace spines do not extend until the rostrum is completely evaginated and the moulting process is near to completion. The pre-zoeal cuticle surrounding these spines remains intact throughout the ecdysis. However, in *Petrolisthes elongatus* and in *P. novaezelandiae* the cuticle is shed from the posterior carapace spines as the pre-zoea hatches from the egg, and the spines extend slowly throughout the one hour to five hour moulting process.

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