FINE FEATURES OF THE DACTYLUS OF THE AMBULATORY PEREIOPODS IN A BIVALVE-ASSOCIATED SHRIMP, *ANCHISTUS MIERSI* (DE MAN), UNDER THE SCANNING ELECTRON MICROSCOPE (DECAPODA, NATANTIA, PONTONIINAE)

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It appears that, in commensal decapod crustaceans, the morphological modifications resulting from the peculiar mode of life in association with their hosts occur in various degrees. In pontoniine shrimps, almost all the endocommensal species inhabiting the gastric or mantle cavities of such animals as sponges, bivalves, and tunicates have certain specialized morphological characters adapted to their niches, especially in the structure of the ambulatory pereiopods, as well as in the other parts of the body. Hooking-type pereiopods to hold on to the host body are well developed in many of these species. Especially in the genera *Pontonia, Typton, Onycomaris* and *Periclimenaeus* various types of hooking structures in the dactylus occur as a modification resulting from the special relation to the morphological details of each host organism. These morphological differences, therefore, are of particular taxonomic importance.

For the investigation of the fine features of the dactylus the light microscope is limited due to its relatively low resolving power and its shallow depth of field. The author recently had the chance to use a scanning electron microscope for examining the fine structure of the dactylus of the pereiopods in *Anchistus miersi* (De Man) which is a representative of an Indo-West Pacific bivalve-associated genus.

MATERIALS AND METHODS

The pereiopods examined were dissected from a specimen of *Anchistus miersi* (De Man), which was taken from a giant clam, *Tridacna* sp., on a coral reef of the Ryukyu Islands, and which has been preserved in 70% alcohol. The pereiopods were soaked in distilled water for about 24 hours. They were then transferred to 6.5% glutaraldehyde (Millonig's buffer) for about 2 hours. The process was followed by soaking in 1% osmium tetroxide (Millonig’s buffer to pH 7.4) for 2 hours. Acetone was used for removing water from the material. After drying the preserved appendages were coated with carbon and gold in a vacuum. The
material was scanned with a Nippon Denshi scanning electron microscope (JSM-U3).

Fig. 1. *Anchistus miersi* (De Man), dactylus of third pereiopod in lateral view. Scale shows 0.5 mm.

RESULTS

The pereiopods of *Anchistus miersi* are stout and the surface of each segment is rather smooth except for thin hairs and setae near the distal portion of the propodus. The dactylus is short and hooked, with a scoop-shaped depression on the anterior surface. On the posterior border there is a strongly hooked tooth. Under high magnification with the light microscope there appear to be a great many extremely minute spinules or granules on the anterior border. Kemp (1922) gave an illustration of the dactylus of this species, indicating these spines by dots of the pen. The scanning electron microscope clearly reveals the detailed features of the anterior border, which is far beyond the power of the light microscope. Under the scanning electron microscope the anterior border looks rather flat, and broadly grooved longitudinally in the middle from the base to near the distal end. This depression or groove appears to be caused by that the region is thinly chitinized and soft, and either naturally sunken or due to shrinking. The sides are much more strongly chitinized than the middle portion. The entire surface of this border is covered with small, curved, and densely packed spines whose tips are blunt or truncate. The spines in the groove are inclined distally. Toward the tip of the dactylus the groove becomes gradually shallower, and the spines are more pointed, flattened and more strongly inclined distally. The posterior accessory tooth is also finely spinulate like the tip of the dactylus.

DISCUSSION

The application of the scanning electron microscope to the observation of the fine structure of the appendages in crustaceans has lately been recommended by Grice & Lawson (1971), and by Abele (1971). The former authors used a scanning electron microscope to observe the structure of the mandible in calanoid copepods and the latter examined brachyuran gonopods. Hay & Sandberg (1967)