

Chemosensitivity and role of swimming legs of mud crab, *Scylla paramamosain*, in feeding activity as determined by electrocardiographic and behavioural observations

ABSTRACT

Swimming crabs have a characteristic fifth pair of legs that are flattened into paddles for swimming purposes. The dactyl of these legs bears a thick seta along its edge. The chemoreceptive and feeding properties of the seta are supported with scientific evidence; however, there is no available data on the sensitivity of the setae in portunid crabs. The underlying mechanisms of the chemo- and mechano-sensitivity of appendages and their involvement in feeding activities of the mud crab (*Scylla paramamosain*) were investigated using electrocardiography and behavioural assay, which focused on the responses of the mud crab to chemical and touch stimulus. Electrocardiography revealed the sensory properties of the appendages. The dactyls of swimming legs and the antennules were chemosensitive, but not mechanosensitive and vice versa for the antennae. However, the mouthparts, claws, and walking legs were chemo- and mechanosensitive. Only the chemosensitive appendages, including the swimming legs, were directly involved in feeding. The flattened dactyls of the swimming legs were more efficient than the pointed dactyls of the walking legs in detecting the food organism crawling on the substrate. The structural features enhanced the capacity of the crab in coming into contact with scattered food items. This study revealed that the swimming legs are important appendages for feeding in the mud crab.