

Longitudinal distribution patterns of brachyuran crab (Crustacea, Decapoda) community along tidal rivers flowing into the inner area of Ariake Bay

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Abstract

The Ariake Bay is the largest bay in Kyushu Island, Japan, and its inner part forms a huge estuarine environment in which tidal amplitude reaches approximately 6 m. This is a rare case in Japan, and rather similar with the environment in continental area. The effects of this environment extend to wide riverine areas; most large rivers have a characteristic long tidal zone, where freshwater and seawater are vertically well mixed, creating stable high salinity area in the lower reaches and very low salinity area in the upper reaches. However, most studies on aquatic biota in Ariake Bay have been focused on marine coastal regions. Therefore, the present study evaluated the distribution patterns of brachyuran crabs, which is a major benthic animal group of tidal rivers, along the course of tidal rivers flowing into the inner Ariake Bay. The total of 85 rivers from Tamana City, Kumamoto Prefecture to Unzen City, Nagasaki Prefecture, were surveyed from spring to autumn, 2018. In each river, sampling stations were arranged as many as possible at least from the mouth to the upper limit of the tidal zone (i.e. the site where tide-stopping weirs are constructed). The occurrence of crab species around intertidal area was recorded by visual inspection and collection by hand. Twenty-five brachyuran crab species including endangered ones, such as *Tubuca arcuata*, *Deiratonotus cristatum*, and *Cleistostoma dilatatum*, were recorded from 396 sites out of 465 total sites. Their distribution pattern was roughly categorized into 2 groups. The first group species limitedly occurred at lower reaches (e.g. *Tubuca arcuata*, *Cleistostoma dilatatum*), and the second group species were widely distributed from lower to upper reaches (e.g. *Ilyoplax deschampsii*, *Chiromantes dehaaini*). Probably the characteristics of tidal rivers in this area may be reflected in these biodiversity and distribution patterns. Furthermore, clear differences were detected in the distribution patterns of closely related species, between *I. deschampsii* and *I. pusilla*, and between *Hemigrapsus penicillatus* and *H. takanoi*, which have not been sufficiently recognized from the studies in marine coastal regions. Our present study highlighted the importance of tidal rivers as a part of estuarine environment, and suggested the necessity of preservation of long tidal rivers by appropriate weir control for conserving the tidal river communities in Ariake Bay.