

## Relationship between environment and macrobenthos distribution in the coastal area of Kashima city in Ariake Sea

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In the coastal area of Kashima City in Ariake Sea, there are wide spread of mud flats and many endemic species including goggle-eyed goby live. Also, active commercial fishing is conducted including laver culture, oyster and arkshell farming. Red tide and hypoxic water mass sometimes happened recently in this area and became a problem. However, there are no data of detailed distribution of water quality, bottom sediment quality and organisms including both subtidal and intertidal area. The “Hizen-Kashima Higata” which locates in the northern part of this area was listed as a site of Ramsar Convention in 2015. Therefore, in order to clarify the environmental features and ecosystem of this area and construct a suitable conservation program, we started environmental monitoring in 2015. Water qualities were measured at 18 stations with a multi-parameter water quality meter in summer and winter. Measurements were conducted in spring tide and neap tide. Temperature, salinity, turbidity, chlorophyll fluorescence and DO were measured. Bottom sediment and macrobenthos sampling was carried out at the same 18 stations with a grab sampler in summer and winter. Bottom sediment and macrobenthos sampling was also carried out at 5 stations along the coast on the mudflat. Water content, organic carbon, total nitrogen AVS and ORP were measured. The sediment for collecting macrobenthos was sieved through a 1-mm mesh and the residue was fixed in 70 % ethanol. The macrobenthos samples were sorted and identified in the laboratory. Based on these data, the average distributions of water and sediment quality are clarified and their relationships between macrobenthos distribution was investigated.

The results of the analysis of the data between 2015 and 2018 were as follows. The Hizen-Kashima Higata is a mudflat that had most strong influence of fresh water and temperature variation in the mudflats in Kashima City. The turbidity was highest in the Hizen-Kashima Higata and chlorophyll was relatively low. These results suggest that the Hizen-Kashima Higata is a most harsh environment for organisms among the mudflats in Kashima City. The DO concentration in the subtidal zone was low and sometimes become hypoxic in neap tide in summer. The sediment ORP was low and AVS was high in this area. These results suggest that the subtidal zone is a harsh environment for organisms. However, the macrobenthos species and abundance were higher in the subtidal area than other areas both in summer and winter. The species and abundance of macrobenthos were lowest in the Hizen-Kashima Higata. There was a high negative correlation between water temperature and macrobenthos species and abundance in winter suggesting that the distribution of macrobenthos was strongly influenced by temperature. In summer, there was no significant correlation between ORP and the macrobenthos species and abundance. AVS has also no significant correlation between macrobenthos species and abundance. The reasons for these results are unknown now. The Hizen-Kashima Higata was a most harsh environment for organisms and the macrobenthos fauna was poorest in the mudflats in Kashima City. Therefore, for the conservation of mudflat ecosystem, it is sufficient to extend the conservation area. We will show the results including the monitoring in 2019-20 in the session.

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