

Spatial changes in meiofaunal composition between subtidal and intertidal zone and their association with environment factors in sediment in the semi-enclosed inner section of the northern Yatsushiro Sea

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Abstract

The Yatsushiro Sea is an inland sea in the southwestern part of Kyushu Island, which is partly connected to the east China Sea to the south. The innermost part of the sea is semi-enclosed by the Shiranui reclaimed land that was created in 1967. Recent studies showed the rich organic matter has accumulated and highly sulfidic conditions above the standard criterion value for fisheries are present on seafloor in the narrow subtidal section off the Shiranui reclaimed land. Meiofaunal taxa are considered as benthic animals smaller than macrofauna but larger than protozoa (31–1000 μm), which have been regarded as ideal organisms to study the effects of pollution in aquatic ecosystems because of their intimate association with sedimentary environments, high abundance/diversity, and short generation times (several ten days). In this study, we investigated the spatial changes in environment factors in sediment and their associations with the meiofaunal abundance and composition along a transect from intertidal flat to subtidal zone off the reclaimed land, based on sediment samples taken in May-July 2011 (before the rainy season in Japan). Concentration of total sulfide (TS) in sediment was significantly higher at the subtidal stations than at those on the intertidal flat. At some of the former stations, the observed values of TS were greater than those deemed suitable for fisheries recommended by the Japanese Fisheries Resource Conservation Association. Total meiofaunal abundance and their higher taxonomic composition were significantly different between the subtidal and intertidal zone in the investigated field, and nematodes were mostly contributed to those differences. Nematodes are generally known as one of metazoan taxa with higher endurance against environment stresses. Those suggest that the accumulation of organic matter effected at least partly on meiofaunal community in the subtidal zone in inner section of the northern Yatsushiro Sea.