

Temporal variability of the environmental conditions in Hiuchi-Nada Bay, Seto Inland Sea, Japan for the past 100 years as recorded by diatoms, ostracodes, and heavy metals.

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Diatoms are important primary producers in coastal ecosystems, however, the complex interactions with both abiotic and biotic variables are not enough clarified. Stratigraphic analysis of sediments to reconstruct the past environments is an effective method to further understand how different environmental conditions have varied in the past and its effect on primary productivity. This study demonstrates the temporal variations of primary producers in Hiuchi-Nada Bay in Seto Inland Sea approximately over the past 100 years by using fossil diatom assemblages. The relationship between diatom assemblages and other ecosystems in anthropogenic coastal area is also discussed by comparing with the data from other site in Seto Inland Sea.

Diatom analysis demonstrated that almost all of recorded taxa were marine or marine-brackish taxa which could be regarded as autochthonous. Two biozones, termed diatom zones DA (80-34 cm depth) and DB (34-1 cm depth), were identified on the basis of cluster analysis for diatom assemblages. The transition of these two zone represents the period of 1960' s high economic growth after WW2 in Japan.

Neodelphineis pelagica, small *Thalassiosira* spp., resting spores of *Chaetoceros* spp., which were reported as eutrophic taxa in Osaka Bay (Hirose et al., 2015, INQUA), markedly increased in concentration and in relative abundance in this phase.

Among autochthonous taxa, the increase of concentrations in planktonic taxa from 1960' s is the common trend in the Seto Inland Sea, but their absolute concentrations are different. That is, the average valve contents in Hi-2C is 1/2 of Suo-Nada Bay, 1/3 of Harima-Nada Bay, 1/5 of Osaka-Bay (Sako, unpublished data; Hirose et al, 2016, JpGU). This result demonstrates the difference of the primary productivity due to eutrophic levels between each area. Meanwhile, although concentration of autochthonous benthic taxa decreased in Osaka Bay after 1960' , increased in Hiuchi-Nada Bay. These results indicate that the productivity of phytoplankton increased under the influence of human-induced eutrophication, but water transparency and bottom environment was relatively sustained in condition to a sufficient degree also for benthic taxa in Hiuchi-Nada Bay than other area which are neighboring the metropolises. We will further discuss ostracode assemblages and chemical components (TOC, TN, TS and heavy metals) from the area.

Keywords: diatom, coastal ecosystem, anthropogenic environmental change, eutrophication, Hiuchi-Nada Bay, Japan, past 100 years