

DISTRIBUTION OF THE SURFACE SEDIMENT OF TIDAL FLAT AND OFFSHORE IN THE INNER PART OF THE ARIAKE SEA, JAPAN

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ABSTRACT;

Recently, environment of laver (*Porphyra yezoensis*) cultivation became unstable in the Ariake Sea, Japan. In the harvest season from 2000 to 2001, the production of the laver dramatically decreased. It is reported that the reason is the depletion of the dissolved nutrients due to the occurrence of the red tide (Ministry of Agriculture, Forestry and Fishery of Japan, 2001). The main sources of the dissolved nutrients to the sea are the inflow from rivers and the elution from the bottom sediment. The results of the experiment of nutrient elution from the bottom sediment of the Ariake Sea for ammonium nitrogen ($\text{NH}_4^+\text{-N}$) and phosphate ($\text{PO}_4^{3-}\text{-P}$) were $28.3\text{-}745.2\text{ mgN}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$ $149.8\text{ - }1134.3\text{ mgP}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$, respectively (Ministry of Environment of Japan, 2001). In winter, which is the season of the laver cultivation, the river flow rate is low and it is considered that the contribution from the bottom sediment becomes relatively high. To clarify the amount of the elution from the sediments including tidal flat area, Ariake Sea Research Project has started to study the characteristics of distribution of the surface sediments. We collected about 100 surface sediment samples from the bottom sediment from the inner part of the Ariake Sea focusing on the interaction between tidal flat sediments and offshore sediments. Oxidation Reduction Potential (ORP), particle size distribution of sediments, organic carbon content, nitrogen content and phosphorous content were measured.

Positive ORP ($\text{ORP} > 0\text{mV}$) areas were distributed in the high elevation area. It was because high frequency of exposed and water exchange on the surface sediment. In contrast, negative ORP ($< 0\text{mV}$), higher concentration of organic carbon and nitrogen were distributed in the bottomset bed in front of the tidal flat where is not exposed by air. It indicates that nutrient concentration in the surface sediment in the Ariake Sea was affected by the bottom topography and material accumulation occurred on bottomset bed in front of tidal flat.

REFERENCES

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