

Relationship between Bottom Sediment and Sinking Particles in the Osaka Bay, the Seto Inland Sea, Japan

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The Osaka Bay, located in the eastern Seto Inland Sea, is one of the most polluted enclosed seas in Japan. For this study the bay was divided into two parts, an inner area and an offshore because of the tidal front which formed at a depth of 20 to 30 meters¹⁾. As a result of this division there appeared a difference in the chemical composition between the sinking particles of the inner and outer sea areas¹⁾. In this study the chemical characters of bottom sediment and the sinking particles were compared in order to investigate the sedimentation process of the inner area of the Osaka Bay. The bottom sediment was sampled by a gravity core sampler and the sinking particles were collected by a sediment trap located near the bottom of the sea. Total phosphorus(T-P), total organic carbon(TOC), and total nitrogen(T-N) was measured in the samples taken. Inorganic phosphorus(I-P) was the sum of three fractions: CDB-P, NaOH-P, and HCl-P, as determined by the phosphorus fractionation method²⁾. Organic phosphorus (O-P) was determined by subtraction of I-P from T-P. The ESR method was also used to determine the value of Mn^{2+} in both bottom and the sinking particles.

The concentrations of T-P, TOC, and T-N in the bottom sediment (0-1cm) were lower than those in sinking particles. The content of O-P, NaOH-P, and CDB-P in the bottom sediment (0-1cm) was less than in the sinking particles. $Mn^{2+}/Mn^{2+}_{std.}$ ratios of the bottom sediment as determined by the ESR method were higher than those of sinking particles. These results suggested that (1) sinking particles and bottom sediment had different chemical characters in their bioelements and Mn^{2+} , (2) sinking particles settled on the bottom sediment with time-lag to some degree, and (3) the some of organic matter in sinking particles decomposed before settling on the bottom.

1) Montani, S., Mishima, Y. and Okaichi, T (1991) *Marine Poll. Bull.* **23**, 107-111.

2) Williams, J.D.H., Mayer, T. and Nriagu, J.O. (1980) *Soil Sci. Soc. Am. J.*, **44**, 462-465.

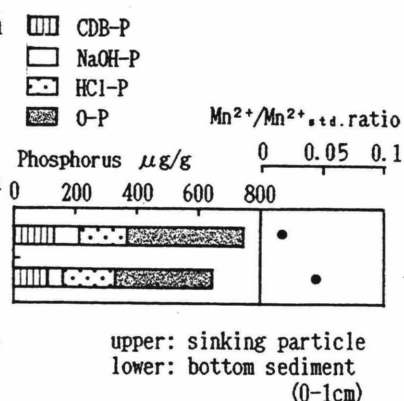


Fig. 1 Phosphorus concentration and $Mn^{2+}/Mn^{2+}_{std.}$ ratio of the sinking particle and the bottom sediment at st. 22 in the Osaka Bay