

# Particulate and Dissolved Components in Sea Water of Omura Bay

Satoshi Akagi, Koichiro Katsuki, Masayo Kumano and Seigo Matsuo  
*Nagasaki Prefectural Institute of Public Health  
and Environmental Science, JAPAN*

Omura Bay (distance from north to south: 26 km, east to west: 11 km, area: 320 km<sup>2</sup>, mean depth: 15 m, mean volume: 4.7 km<sup>3</sup>) is located in the central part of Nagasaki prefecture. The topography is that of a typical enclosed inner bay connected with the open sea through Sasebo Bay by northern two narrow straits (Hario Strait and Haiki Strait). The sea bed is flat. There is little movement of the bay water because the tidal range in Omura Bay is only one-third (mean range: 0.54 meter) of that in Sasebo Bay. Therefore, sufficient water change corresponding to the sea water volume of the bay does not take place. Oxygen-deficient water formed in the bottom layer in every summer season is a characteristic phenomenon in this stagnant sea and we reported formation of oxygen-deficient water mass in the bay in EMECS'90. The formation of oxygen-deficient water mass in inner bay shows not only progressive of eutrophication but also occurrences of upwelling phenomenon and red tides.

So we describe particulate and dissolved components in the water of Omura Bay for the purpose of understanding the movement of particulate and dissolved organic matter from April 1988 to March 1992. We considered that relation of particulate matter and chlorophyll a and that gel chromatography of dissolved matter by use of Sephadex G-15.

The result was that fluctuations of dissolved chemical oxygen demand (D-COD) and dissolved organic carbon (DOC) in the filtrated sea water at the point of central part in the bay were 1.2-2.6 mg/l and 0.8-2.0 mgC/l. The average ratios D-COD/COD and DOC/TOC were 83% and 80% respectively. Those of D-COD and DOC at the point of inner part were 1.2-2.8 mg/l and 0.9-2.4 mgC/l. The average ratios of D-COD/COD and DOC/TOC were 72% and 71% respectively. D-COD and DOC in both points were major factor affecting the values of COD and TOC. Particulate chemical oxygen demand (P-COD) at central part included detritus-COD: 0.19 mg/l and phytoplankton-COD: 0.15 mg/l, but P-COD at inner part included phytoplankton-COD: 0.34 mg/l and detritus-COD: 0.24 mg/l respectively.

The gel chromatogram of DOM in the surface water and that of bottom at central part were different in patterns. The DOC ratios of molecular weights >1,000 and <1,000 by using dialysis tube at inner parts were 68% and 29% (3%: recovery loss). Amino acids detected mainly in fraction which has high TOC content and ultraviolet absorbance in the gel chromatogram were Glysin and Serine.