Production of phytoplankton-derived organic matter in the mouth of Yodo River and its impact on oxygen-depleted water masses in the head of Osaka Bay

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Supplying excessive organic matter often induces oxygen-depleted water masses in semi-enclosed seas. The concentration of dissolved oxygen (DO) was newly added to an environmental index in the Seto Inland Sea in 2016. It is needed to quantitatively simulate the relationship between the terrestrial load of nitrogen and phosphorous and the extent of oxygen-depleted water masses in the coastal seas. In this study, field observations to investigate production and degradation of organic matter were conducted in the river mouth of Yodo River and the head of Osaka Bay in July, August, September and November in 2017. The results for a spatial change of the concentrations of dissolved inorganic nitrogen and particulate organic nitrogen and carbon suggested that a volume of phytoplankton-derived organic matter was generated in the river mouth of Yodo River and a large part of them spreads to the head of Osaka Bay by estuarine circulation. The results for a decomposition experiment showed that 50 - 60% of organic matter in the water samples taken from the river mouth was mineralized within 20 days, suggesting those components would influence on forming oxygen-depleted water masses in Osaka Bay.

Keywords: phytoplankton-derived organic matter, oxygen-depleted water masses, river mouth

