

## Dynamics of particulate organic matter in a small lagoon, Lake Kiba, in Japan

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Lake Kiba is located at Ishikawa prefecture, Japan, and a shallow, semi-closed lagoon. The lake has been suffering organic pollutant. COD concentration is two times higher than the standard level of class A (< 3 mg/L, Environmental quality standards for conservation of the living environment in Japan) during the last decade. The objectives of this study are to elucidate the characteristics of particulate organic matter (POM) in Lake Kiba using carbon isotopes:  $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$ . The carbon isotope composition is basic and useful information to clarify organic pollutants affecting shallow lakes and lagoons.

Water samples were monthly collected at the central lake in the periods of 2014-2016. The percentage and concentration of particulate organic carbon (POC), particulate nitrogen (PN) were measured and calculated from freeze-dried suspended solid which was pretreated from approximately 60 liters of water sample by using continuous flow centrifugation method.

Particulate organic carbon (POC) concentrations of 0.44–5.01 mg/L,  $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$  values were, respectively,  $-32.0$  to  $-22.8$  ‰ and  $-157$  to  $-33$  ‰. The organic matter in suspended solid samples consistently showed depleted  $^{14}\text{C}$ . The carbon isotopes showed seasonal variation, higher in summer, with positive correlation to POC contents. These results indicate that the POC characteristics are controlled by a mixture of two endmembers, organic matter produced by phytoplankton activity within the lake and the watershed organic matter. However, the relation between  $\Delta^{14}\text{C}$  and  $\delta^{13}\text{C}$  values in 2014 and 2015 is different from that in 2016. The similar difference is observed for the relation between  $\Delta^{14}\text{C}$  and POC content for suspended solids. We will discuss about the variation of carbon isotope signatures based on primary production and climate condition.

Keywords: radiocarbon, suspended solids, carbon isotopes