

## Variation of carbon isotope ( $\delta^{13}\text{C}$ and $\Delta^{14}\text{C}$ ) of organic matter in suspended solids at Lake Kiba-gata

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In Lake Kiba-gata which is located at Komatsu City, annual average of chemical oxygen demand (COD) concentration in lake water is 6-7mg/L and over 3mg/L of the environmental standard relating to water pollution in this lake type. We need to elucidate the cause of organic pollutant in Lake Kiba-gata. Previous research by our laboratory shows a positive correlation between dissolved COD and dissolved organic carbon concentration, and particulate COD and particulate organic carbon (POC) concentration during April 2017- January 2018. Therefore, information and data on dynamics of organic matter is important to make reducing COD from the present level at Lake Kiba-gata. The aim of this study is to understand dynamics of organic matter in the lake by using carbon isotopes ( $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$ ) of particulate organic matter because simulative use of  $\delta^{13}\text{C}$  and  $\Delta^{14}\text{C}$  provides information on sources of organic matter. We carried out monthly sampling at a site of inflow river and five sites in the lake from April 2015 to December 2018. The suspended solids samples were isolated from 60 L of surface lake water collected at center of the lake by using continuous flow centrifugation method.

The POC concentration shows seasonal variation with 0.44 mg/L to 5.0 mg/L: the higher concentration was observed at summer season and lower concentration was observed at winter season.  $\delta^{13}\text{C}$  value of POC has variation from -32.2‰ in winter to -22.8‰ in summer. The higher  $\delta^{13}\text{C}$  value shows the contribution of phytoplankton in the lake.  $\Delta^{14}\text{C}$  value of POC shows similar seasonal variation. There is positive correlation between the  $\delta^{13}\text{C}$  value and  $\Delta^{14}\text{C}$  value except for the winter samples during December to February. The  $\Delta^{14}\text{C}$  value also positively correlates with POC concentration (the unit of mg/l and ‰). The higher  $\Delta^{14}\text{C}$  value and POC concentration indicate the higher contribution of apparently younger organic matter to suspended solids. These results indicate that the POC concentration is controlled by the activity of phytoplankton in the lake during spring to autumn season.

Keywords: lake water, organic pollution, COD