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The nutrient profiles in the Kojima lake sediment

Guangzhe Jin[1*], Shin-ichi Onodera[1], Atsuko Amano[2], Takaharu Sato[1], Yuta Shimizu[1]

[1]Hiroshima University, [2]AIST

Coastal and lake sediments are important in accumulating the phosphorus and other forms of nutrients, and also important in modifying the relative availability of nitrogen and phosphorus . sediments are important sinks for nutrients transported to the open ocean. Phosphorus and other nutrients may be transferred to other forms or remobilizing when they come into sediments because of both degradation of organic matters and reactivation of some nutrients during early diagenesis.
We collected two cores as KJL-1 and 2 in Kojima Lake which is an estuary lake connected with Seto Inland Sea at Okayama Prefecture.We take the sediments as the sample to take the nutrient profiles in the pore water of the sediment and the sediment TP and TIP value. Reactive PO_4-P, NH_4-N, NO_2-N,NO_3-N and reactive SiO_2-Si were determined in pore water analysis and also with phosphorus fractionation experiments .The results of nutrients profiles shows that PO_4-P is at low level and varies much at different depth . The two cores showed that it has an increasing trend with the whole depth increasing. TP in pore water shows slightly decreasing down core from around 5 ppm at surface pore water to around 4 ppm at 78 cm depth in KJL-1 but shows a decreasing trend at KJL-2 .And the most part of phosphorus in sediment pore water are consist of organic phosphorus in this experiment. The NH_4-N shows an accumulate trend and it is at low level near zero at surface of sediment and consistently increasing down core to around 30ppm at the bottom. NO_2-N and NO_3-N varies much near the surface and appears at very low level but decrease to almost zero below 20 cm in KJL-1 and in KJL-2 it also has low concentrations between 40-80cm .TN shows similar regular pattern with NH_4-N and NH_4-N seems the most content of N forms in sediment. SiO_2-Si shows consistently decreasing down core in KJL-1 and shows an increasing trend below 40cm in core KJL-2 which followed with a decreasing trend. The increasing of NH_4-N and the changed of nitrite and nitrate through depth may has connection with the redox situation of the sediment.
The two sites in the same lake show different types of P profiles. In KJL-1, TP and TIP shows an increasing trend through the whole profile, while the KJL-2 shows a slightly decreasing down core. The KJL-2 site seems having high value of phosphorus concentration than KJL-1.The fractionation experiments shows that the P bound to oxides of reducible metals which mainly are Fe and Mn consist of the biggest part of the P forms and leads the increasing of TP in KJL-1 and the decreasing in KJL-2. The P from Al oxides and non-reducible metals and Apatite and other inorganic P are slightly increasing down core in KJL-1 but not shows a clearly trends in KJL-2. Loosely sorbed P shows a small part in TP and shows low concentration at the surface of the sediment.
Phosphorus profiles in sediment and the fractionation of phosphorus can illustrate the phosphorus resources .Nutrients in sediment pore water can be used to determine the source of nutrients in sediments and they can also to indicate the extent of environment pollution. The rest experiments of the forms of phosphorus in sediments are still in progress.

Keywords: Nutrient, Sediment, Kojima Lake