

Evaluation of the source and bioavailability of particulate phosphorus in Yasu River by using sequential extraction methods

*Shinsho Chishiro¹, Ken'ichi Osaka², Kento Fujita¹, Osamu Nagafuchi², Noboru Okuda³

1.Environmental Science Graduate, the University of Shiga Prefecture, 2.Department of ecosystem study, University of Shiga Prefecture, 3.Research Institute for Humanity and Nature

It is well known that primary production in Lake Biwa is limited by phosphorus, and that means phosphorus load into Lake Biwa influence on its environment. In general, it is considered that algae in lake use PO_4 -P as a phosphorus nutrient, however, it has been revealed that a part of particulate phosphorus (PP) also might be used as nutrient in recent study. It has been reported that the load of PP discharged through river increases during ploughing and irrigating the fields or rainfall event, and most of the annual phosphorus load discharged through river is PP. However, there are a few studies that clarify the sources and bioavailability of fraction of PP discharged through river in Japan. The purpose of this study is to estimate sources of bioavailable fractions of PP discharged through Yasu river into Lake Biwa.

River water samples were collected from 5 sites in Yasu river once or twice a week from April 2015 to May 2015. Drainage from paddy fields were collected from Koka city, where locates in middle part of Yasu river watershed once a month between May and July. Furthermore, river water samples after rainfall event were collected from 10 rivers flowing into Lake Biwa on September 2015. After sampling, we separated several fractions of PP from suspended solids by sequential extraction methods (1M ammonium chloride, 0.11M bicarbonate dithionite, 1M NaOH, 0.5M HCl extraction) in water sample. In this method, PO_4 -P is extracted from the particle fraction with high bioavailability in sequence. PO_4 -P extracted from the particle fraction was determined by the molybdenum-blue method.

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