

Changes of eco-systems during the last 500 years caused by human impacts in Lake Suigetsu, central Japan

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Annually laminated (varved) lacustrine sediments have been found in many Japanese lakes including Lake Suigetsu. Several studies for the reconstruction of past environmental and climatic changes have been carried out with varved sediments. However we have not yet clarified the relationships among abrupt changes of environment, biologic changes in lake eco-systems, and organic and inorganic changes in bottom sediments. Two problems can be summarized as follows; 1) on authigenesis of minerals as main components of sediments and 2) on ecological response of living microplanktons to changes of lake water condition.

By reason of confirming how the chemical composition of authigenic minerals and the species composition of diatom assemblages in varved sediments are linked with chemical composition of lake water, we carried out new coring and took 12 cores of well-preserved varved sediments by Meckeleth piston sampler at Lake Suigetsu in 2000. Based on varve chronological, sedimentologic and micropaleontologic investigations, we clarified the following facts; 1) most of authigenic mineral particles have precipitated directly from bottom water mass through sulfate reduction, but not from interstitial water in sediments; 2) abrupt environmental changes in water eco-system were caused by human impacts in and around Lake Suigetsu during the last 500 years; 3) after the lake eco-system gradually evolved by low rate external impacts, it never returned to the initial condition without other impacts; 4) short term changes of lake eco-system and phytoplankton communities have been caused by external human impacts with high rate.