

Provenances of detrital materials in the Lake Suigetsu sediment and quantitative evaluation of their mixing ratio

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Lake Suigetsu, central Japan, is characterized by annually laminated sediment, and extremely high resolution and precise age-depth model was established using drilled cores retrieved on 1993 and 2006. For this reason, Lake Suigetsu sediment is ideal subject of high resolution and precise paleo-climate reconstruction. Detrital material accumulated in Lake Suigetsu is thought to have 3 provenances with 3 different transport paths. One is eolian dust transported by wind from Asian continent. Second is detrital material transported by small rivers from surrounding slopes. Third is suspended sediment supplied from Hasu River and transported through Lake Mikata, which is connected to Lake Suigetsu with shallow channel. Mechanism and flux of detrital materials from these 3 sources could be controlled by the behavior of westerly jet, slope failure due to flood and/or earthquake, and rainfall and erosional process within the drainage area. Therefore, if we could reconstruct the flux of detrital materials from each provenance, we could gain detailed information on histories of paleo-climate and disasters.

In this study, we did factor analysis of chemical composition of detrital fraction extracted from the sediment by chemical treatment. Each end-member extracted by factor analysis was characterized with respect to mineral composition, color, and grain-size distribution. We compared these characteristics with samples taken from probable sources and from event layers in the sediment, and tried to re-construct the flux change of each detrital component.

Keywords: Lake Suigetsu, Deglaciation, Holocene, Factor analysis, Multi-regression analysis