

Reconstruction of detrital flux to Lake Suigetsu during the past 20kyrs based on Color and XRF data

SUZUKI, Yoshiaki^{1*}; TADA, Ryuji¹; NAKAGAWA, Takeshi²; NAGASHIMA, Kana³; HARAGUCHI, Tsuyoshi⁴; GOTANDA, Katsuya⁵; IRINO, Tomohisa⁶; SUGISAKI, Saiko¹; SG12/06, Project members⁷

¹Univ. Tokyo, ²Univ. Newcastle, ³JAMSTEC, ⁴Osaka City University, ⁵Chiba University of Commerce, ⁶Hokkaido University, ⁷SG12/06 Project

Lake Suigetsu is known for its highly precise age-depth model based on numerous ¹⁴C dating combined with varve counting and wiggle matching with Chinese stalagmite record. For this reason, the sediments are capable of providing extremely precise and high resolution records of past climatic changes. Several paleo-climate reconstruction studies have been conducted based on pollen and diatom analyses of the Lake Suigetsu sediments. However, studies focusing on its detrital material were rare because its detrital component is expected to be a mixture of eolian dust, detrital material derived from surrounding slope of the lake, and suspended material derived from Hasu River that flew into Lake Mikata and came into Lake Suigetsu through a narrow and shallow channel, and it is difficult to separately evaluate materials from these different sources. However, our recent study revealed that it is possible to evaluate the contribution of the detrital material derived from Hasu River through Lake Mikata (See our presentation #01575 in Paleoclimatology and paleoceanography session).

In this study, we tried to reconstruct temporal changes in the flux of detrital material derived from Hasu River during the past 20kyrs based on Color data and XRF data of the major element composition of the sediments analyzed by XRF. We estimated the end-members to explain variations in major element chemical composition using Q-mode factor analysis and oblique rotation of reference vectors. We extracted 4 end members and found that characteristics of factor 2 resemble those of Hasu River suspension. Because number of major element composition data are limited, we estimate contribution of factor 2 to the sediment based on color data. We estimated contents of factor 2 using Multi-regression analysis between color data and factor 2 loading (composition). Factor 2 flux was calculated from factor 2 contents, dry bulk density, and linear sedimentation rates, and the result shows long-term and short-term trends. The short-term trend is characterized by sudden increases and subsequent gradual decreases of factor 2 flux where the sudden increases coincides with sedimentation of "event layers" that could represent earthquake. The long-term trend, which seems to reflect intensity of river discharge from Hasu-River, seems to reflect rainfall intensity, shows mirroring image against stalagmite record in China suggesting that precipitation decreased in Suigetsu area when precipitation increased in South China.

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