Sediment provenance and Indian summer monsoon variability in the Mahanadi Basin of the Bay of Bengal during the last 200 ka

JONGMIN LEE1, MINORU IKEHARA2, KEIJI HORIKAWA3, YOSHIHiro ASAHARA4, SUNGHAN KIM5
AND BOO KEUN KHIM1

1Pusan National University
2Kochi University
3University of Toyama
4Graduate School of Environmental Studies, Nagoya University
5Korea Polar Research Institute

Presenting Author: jmhpj123@pusan.ac.kr

To trace the sediment provenance change in response to the Indian monsoon variability, clay mineral compositions of fine-grained sediments and detrital Nd/Sr isotopes (εNd and 87Sr/86Sr) of bulk sediments were measured at IODP Site U1445 located in the Mahanadi Basin of the northwestern Bay of Bengal. AMS 14C dates and the correlation between δ18O values of G. ruber and the SPECMAP determine the age of studied interval that covers the two glacial-interglacial cycles (MIS 1 to 7). εNd values and 87Sr/86Sr ratios of detrital particles range -19 to -14 and 0.731 to 0.753, respectively. εNd values was almost constant during 200 ka whereas 87Sr/86Sr ratios are relatively higher in the interglacial period than glacial period. The clay mineral compositions consist of illite (46-73%), smectite (3-34%), kaolinite (10-20%), and chlorite (7-16%). High smectite and low illite and chlorite contents occur during the interglacial period, and vice versa. Based on Nd/Sr isotopes and clay mineral compositions, the sediments from the Ganges-Brahmaputra and Mahanadi Rivers have been deposited at IODP Site U1445 in the Mahanadi Basin. However, the temporal change of high smectite/(illite+chlorite) ratios during the interglacial period are likely to reflect the different weathering pattern by the Indian summer monsoon, indicating more weathering by stronger Indian summer monsoon during the interglacial period. Thus, IODP Site U1445 records the potential information on sediment provenance and weathering history of the source regions through the Indian monsoon variability.