[EJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-IS Intersection

[M-IS08]Drilling Earth Science

convener:Yasuhiro Yamada(Japan Agency for Marine-Earth Science and Technology (JAMSTEC), R&D Center for Ocean Drilling Science (ODS)), Junichiro Kuroda(Department of Ocean Floor Geoscience, Atmosphere and Ocean Research Institute, the University of Tokyo), Kohtaro Ujiie(筑波大学生命環境系, 共同), Yusuke Suganuma(National institute of Polar Research)
Tue. May 22, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
"Earth Drilling Science" session aims to exchange the latest information and scientific achievements in Ocean/Continental drilling projects and to promote the interdisciplinary science. The session covers a wide range of drilling sciences, earth dynamics, environments, and the drilling-related technologies. The overview of the recent scientific drillings as well as future projects of any types of scientific drilling will be reported.

[MIS08-P01]The Paleo-Brahmaputra signature found from the Lower Miocene of Bengal Fan deposits, IODP Exp. 354

*Kohki Yoshida[1], Ai Osaki[3], Nozomi Hatano[4], Christian France-Lanord[2] (1.Department of Geology, Faculty of Science, Shinshu University, 2.Centre National de la Recherche Scientifique, 3.Graduate School of Science and Technology, Shinshu University, Japan, 4.Interdisciplinary Graduate School of Science and Technology)
Keywords:Himalaya, Orogeny, provenance

The Bengal Fan is the largest submarine fan in the world. It has developed as a result of the collision of India with Asia, reflecting the orogeny of the Himalayas. The changes in the mineral assemblages of fan sediments record the uplift history of the Himalayan orogenic system. In the deepest site, U1451A and B of IODP Expedition 354, a complete sequence of fan deposits from the Oligocene was recovered (France-Lanord et al., 2015). The sediments drilled at this site consisted of mica and quartz-rich sand, silt, and clay, with the exception of the lower Oligocene-Eocene section. In this study, we examined the heavy mineral assemblage in the sediments in the Benga Fan with chemistry of detrital garnets, amphibole and chromian spinels.

It is already reported that the heavy mineral assemblage of the Early Miocene silt-sands mainly was characterized by the predominance of garnet and amphibole grains with a small amount of kyanite, sillimanite and staurolite by Yoshida et al. (2016). The most sand layers in the lower Miocene contain tourmaline, apatite, rutile and hornblende grains with high Mg garnets correlatable to the metamorphic garnets in the High Himalaya Crystalines. However, several sand layers contain sodic amphiboles and chromian spinels, which show very low TiO2 content(<0.05wt%) suggestive of depleted ultra-mafic rock origin. The detrital garnet grains, which are included in these sand layers with chromian spinels, mainly consisted of low-Mg almandine garnets. In the Middle Miocene sequence, most of the sand layers are scarce of sodic amphibole and chromian spinels, though the Pliocene and Pleistocene sands includ both sodic amphiboles and chromian spinels.

The sand layers including both sodic amphibole and chromian spinels were possibly derived from Yarlung Tsangpo suture zone and the ophiolite zone in the Burman mountain ranges. Garzanti et al. (2010, 2011) reported the predominance of chromian spinels in the upper stream of the Brahmaputra river, which is indicative that the sand layers including sodic amphiboles and chromian spinels were carried by

"paleo-Brahmaputra river" and supplied to Bengal Fan. Though the Gangs river, which carried the most of detritus from central and western Himalayas, constantly supplied a large amount of detritus into Bengal Fan, the paleo-Brahmaputra river could supply the detritus from eastern Himalaya and Burman mountain ranges in the early Miocene period. The detritus originated from the paleo-Brahmaputra river's discharge in the early Miocene was considered to be derived from the collision orogen among the eastern edge of Indian continent, southeastern part of Tibet block and Burman block in late Oligocene to early Miocene period. The predominance of the sodic amphiboles and chromian spinels in Pliocene and Pleistocene sands is thought to be caused by strong uplift around Eastern Himalaya syntaxis.

References

France-Lanord, C., Spiess, V., and Klaus, A., 2015, Expedition 354 Preliminary Report Bengal Fan Neogene and late Paleogene record of Himalayan orogeny and climate: a transect across the Middle Bengal Fan, doi:10.14379/iodp.pr.354.2015

Garzanti, E., Andò, S., France-Lanord, C., Vezzoli, G., Censi, P., Galy, V., &Najman, Y., 2010, Mineralogical and chemical variability of fluvial sediments. 1. Bedload sand (Ganga-Brahmaputra, Bangladesh). Earth and Planetary Science Letters, 299, 368–381. https://doi.org/10.1016/j.epsl.2010.09.017

Garzanti, E., Andó, S., France-Lanord, C., Censi, P., Vignola, P., Galy, V., &Lupker, M., 2011, Mineralogical and chemical variability of fluvial sediments 2. Suspended-load silt (Ganga-Brahmaputra, Bangladesh). Earth and Planetary Science Letters, 302, 107–120.

Yoshida, K., Nakajima, T., Osaki, A., Matsumoto, Y., Gyawali, B.R., Regmi, A.D., Rai, L. and Sakai, H., 2016, Heavy mineral assemblages in Bengal Fan sediments, IODP Exp. 354, and foreland basin fill of Himalaya. 123th Ann. Meet. Geol. Soc. Japan, R8-P-7.