Three promising tonnes of sediment cores from Chew Bahir, south Ethiopia, to reconstruct 0.5 Ma of climatic history

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Chew Bahir, as a newly explored and just recently ICDP-cored climatic archive, lies between the Main Ethiopian Rift and the Omo-Turkana basin, site of the oldest known fossils of anatomically modern humans. Today Chew Bahir is a saline mudflat in a deep tectonically-bound basin that contains a several kilometre thick sedimentary infill. This basin was cored during a ICDP-supported deep drilling campaign in Oct–Dec 2014, as the last out of five sites of the Hominin Sites and Paleolakes Drilling Project’ (HSPDP). As a key part of HSPDP, which aims at understanding the role of environmental changes in human evolution, the Chew Bahir cores will elucidate palaeoenvironments of the last 500 kyrs covering the transition into the Middle Stone Age, and the origin and dispersal of Homo sapiens.

We present here the initial outcome of the recent successful drilling campaign, giving a first overview of the recovered material from the Chew Bahir basin, including core site selection, a synthesis of the prior studies, employed drilling techniques and preliminary field data. We also provide a summary of the proxies expected, and the sampling plan. Duplicate sediment cores, HSPDP-CHB14-2A and 2B, were retrieved, to 278.58 m and 266.38 m below surface respectively, consist of more than 115 sections each, which all sum up to nearly 3t of sediment. The recovered material is comprised of mostly fine green-greyish to light coloured and reddish clays intercalated by mica-rich sand layers and several potential tephras. The recovery proportions for both cores exceed 85%. Based on the extrapolation of the sedimentation rates from short cores (Foerster et al., 2012, Foerster et al., 2014, Trauth et al., 2015) taken in a NW-SE transect across the basin, we anticipate a record covering at least the last 500,000 yrs BP. The good recovery and relatively high time resolution of the cores promise a continuous environmental record that will allow tests of climate-evolution hypotheses relevant to human origins.

References: