New sedimentary climate archive in the source region of Homo sapiens A Late Quaternary climate record from Chew Bahir, southern Ethiopia

V. Foerster[1], A. Junginger[2], R. Vogelsang[3], A. Asrat[4], H.F. Lamb[5], B. Wagner[6], F. Viehberg[6], U. Frank[7], M.C. Brown[7], M.H. Trauth[2], F. Schaebitz[1]

[1] University of Cologne, Seminar for Geography and Education, Gronewaldstr. 2, D-50931 Cologne, V.Foerster@uni-koeln.de, F.Schaebitz@uni-koeln.de

[2] University of Potsdam, Institute of Earth and Environmental Science, Karl-Liebknecht-Str. 24-25, D-14476 Potsdam, Annett.Junginger@geo.uni-potsdam.de, Martin.Trauth@geo.uni-potsdam.de,

[3] University of Cologne, Institute of Prehistoric Archaeology; Bernhard-Feilchenfeld-Str. 11, D-50969 Cologne, R.Vogelsang@uni-koeln.de

[4] Addis Ababa University, Department of Earth Sciences; P. O. Box 1176, Addis Ababa, asfawossena@gmail.com

[5] Aberystwyth University, Institute of Geography and Earth Sciences, Aberystwyth SY23 3DB, UK, hfl@aber.ac.uk

[6] University of Cologne, Institute of Geology and Mineralogy, Zülpicher Str. 49A, D-50674 Cologne, wagnerb@uni-koeln.de, finn.viehberg@uni-koeln.de

[7] Helmholtz-Zentrum Potsdam, Deutsches GeoForschungsZentrum – GFZ, D-14473 Potsdam, ufrank@gfz-potsdam.de, mcbrown@gfz-potsdam.de

The Chew Bahir basin, as a newly explored sedimentary climatic archive, lies in a biogeographically highly sensitive transition zone between the Main Ethiopian Rift and the Omo-Turkana basin, the region where the fossils of the oldest known anatomically modern human were found. Thus, a continuous climatic history from this area could give valuable insight into the environmental context of crucial steps in human development.

The recently desiccated lake floor of Chew Bahir was cored as part of a preliminary study for the ICDP "Hominid Sites and Paleolakes Drilling Project" and for the CRC-806 programme "Our Way to Europe", which aim to determine climatic and environmental history during the last 200,000 – 1M yrs. The aim of the Chew Bahir project is to test the potential of this new terrestrial archive and to infer past humidity variations in the southern Ethiopian Rift.

We present a high-resolution (up to 3 years) and well-dated terrestrial record of the last ~46,000 years from the palaeo-lake Chew Bahir in southern Ethiopia. The results are based on a multi-proxy study of six cores (9–18.8 m long) from a NW-SE transect across the southern part of the Chew Bahir basin. The records provide insights into the velocity and character of Late Quaternary wet-dry transitions in tropical East Africa on different time scales: three different modes were identified showing moisture variability on precessional, millennial as well as decadal time scales, all characterised by either abrupt or gradual changes of different magnitudes. These variations also include the highly debated expression of the last orbital controlled dry-wet-dry cycle in tropical East Africa, the so-called African Humid Period (AHP, ~15–5 kyrs BP). The presented material shows that Chew Bahir responds sensitively to even minor climatic fluctuations on millennial to decadal timescales and therefore presents a unique opportunity to retrieve longer (400–500 m) sediment cores within the ICDP programme, in order to reveal the nature, causes, and impact of climate changes in the cradle of humankind.

References

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CRC 806, Collaborative Research Centre 806, Our Way to Europe, homepage: http://sfb806.uni-koeln.de

Hominin Sites and Palaeolakes Drilling Project (HSPDP), homepage: http://hspdp.asu.edu/