Geophysical Research Abstracts
Vol. 18, EGU2016-141, 2016
EGU General Assembly 2016

Paleoclimate change in the Nakuru basin, Kenya, at 119 - 109 ka derived from δ18Odiatom and diatom assemblages and 40Ar/39Ar geochronology

Andreas Bergner (1), Alan Deino (2), Melanie Leng (3), and Francoise Gasse (4)

(1) University of Potsdam, Institut of Earth and Environmental Sciences, Potsdam, Germany (bergner@geo.uni-potsdam.de), (2) Berkeley Geochronology Center, Berkeley, CA, U.S.A., (3) NERC Isotope Geosciences Laboratory, British Geological Survey, Nottingham, U.K., (4) Centre Européen de Recherche et d'Enseignement de Géosciences de l'Environement (CEREGE), Aix en Provence, France

A 4.5m-thick diatomite bed deposited during the cold interval of the penultimate interglacial at ~119 - 109 ka documents a period in which a deep freshwater lake filled the Nakuru basin in the Central Kenya Rift (CKR), East Africa. Palaeohydrological conditions of the basin are reconstructed for the paleolake highstand using δ18Odiatom and characterization of diatom assemblages. The age of the diatomite deposit is established by precise 40Ar/39Ar-dating of intercalated pumice tuffs. The paleolake experienced multiple hydrological fluctuations on sub-orbital (~1,500 to 2,000 years) time scales. The magnitude of the δ18Odiatom change (+/- 3‰ and significant changes in the plankton-littoral ratio of the diatom assemblage (+/- 25%) suggest that the paleolake record can be interpreted in the context of long-term climatic change in East Africa. Using 40Ar/39Ar age control and nominal diatomite-sedimentation rates we establish a simplified age model of paleohydrological vs. climatic change, from which we conclude that more humid conditions prevailed in equatorial East Africa during the late Pleistocene over a relatively long time interval of several thousands years. Then, extreme insolation at eccentricity maximum and weakened zonal air-pressure gradients in the tropics favored intensified ITCZ-like convection over East Africa and deep-freshwater lake conditions.