Geophysical Research Abstracts
Vol. 17, EGU2015-12520, 2015
EGU General Assembly 2015

Timing and climatic imprint of the 8.2 ka BP event from Kulishu Cave in northern China

Zhibang Ma (1), Hai Cheng (2,3), Wuhui Duan (1), Ming Tan (1), Lisheng Wang (1), and R. Lawrence Edwards (3)

(1) Key Laboratory of Cenozoic Geology and Environment, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China(mzb@mail.iggcas.ac.cn), (2) Institute of Global Environmental Change, Xi'an Jiaotong University, Xi'an 710049, China(cheng021@mai.xjtu.edu.cn), (3) Department of Earth Sciences, University of Minnesota, Minneapolis, MN 55455, USA(edwar001@umn.edu)

A prominent abrupt climate event ca. 8.2 ka BP has been attributed to changes in the North Atlantic climate. Alternative mechanisms, such as interaction between atmospheric circulation, ice-sheet dynamics, and the influence of solar activity, have been also proposed to explain abrupt climatic events. However, evidence remains elusive. We have generated an absolutely-dated and high-resolution (<2 yrs) speleothem (17.5 cm high) oxygen isotope (δ^{18}O) record from Kulishu Cave in Beijing area that characterizes Asian summer monsoon (ASM) variations from 9000 to 8000 yr BP. The record consists of 572 δ^{18}O data with a mean temporal resolution of 1.5 yr, which can be divided into three periods. (1) From 8960 to 8260 yr BP, the δ^{18}O value fluctuated between -8.22‰ and -10.49‰ with an average value of -9.43‰(2) The period of 8260–8120 yr BP is marked by frequent oscillations: During the first 80 yr, δ^{18}O values show a gradual increase trend toward the maximum value of the entire record (-7.33 ‰) with superimposed significant variability. The subsequent decrease of δ^{18}O to -9.50‰ takes about 30 yr. During the last ca. 25 yr, δ^{18}O increases to -8.06‰(3) From 8120 to 8080 yr BP, δ^{18}O values decrease to a level about -10.32‰ indicating the termination of the "8.2 ka" event. The δ^{13}C variations also reveal an abrupt event between 8260 and 8080 yr BP, characterized by a similar heavier excursion with a magnitude almost as same as the δ^{18}O change. Our record is broadly similar to the 8.2 ka event previously reported ASM records from central and southeastern China, Greenland ice cores and other records from across high-low latitude. The 8.2 ka ASM event may be causally linked to the North Atlantic forcing, and/or solar variation amplified through ocean-atmosphere circulations.