Geophysical Research Abstracts
Vol. 16, EGU2014-11093, 2014
EGU General Assembly 2014

Paleoenvironmental reconstruction of the Latest Danian Event at ODP Site 1210 (Shatsky Rise, Pacific Ocean)

Sofie Jehle (1), André Bornemann (1), Arne Deprez (2), and Robert P. Speijer (2)

(1) Universität Leipzig, Institut für Geophysik & Geologie, Leipzig, Germany (a.bornemann@uni-leipzig.de), (2) KU Leuven, Department of Earth and Environmental Sciences, Belgium

During the Paleocene the marine ecosystem was disturbed by several transient climate events, e.g. the Dan-C-2 (65.2 Ma), the Latest Danian Event (LDE, 61.75 Ma), the Early Late Paleocene Event (ELPE, 58.9 Ma) and, most intensely studied, the Paleocene-Eocene Thermal Maximum (PETM, 56 Ma). So far the LDE (or "Top Chron 27n Event" according to Westerhold et al., 2011) has rarely been studied in deep-sea sites and with respect to planktic foraminifera faunas. This event is already known from Zumaia/Spain, Bjala/Bulgaria, Egypt, Shatsky Rise and Walvis Ridge (e.g. Bornemann et al., 2009; Westerhold et al., 2011). In the deep-sea the LDE is usually characterized by two distinctive Fe peaks in XRF core scanning data, paralleled by peaks in magnetic susceptibility, and a prominent ($\sim$0.7 ‰) negative d^{13}C excursion (CIE) in benthic foraminifera. Benthic foraminiferal d^{18}O data of Westerhold et al. (2011) from nearby ODP Site 1209 suggest a bottom-water temperature rise of $\sim$2˚C accompanying the negative CIE. Thus, the LDE has been considered as a further potential Paleocene "hyperthermal".

ODP Site 1210 at Shatsky Rise covers most of the Paleocene. Here we present data of the biotic response (planktic foraminifera assemblages), carbonate preservation and d^{18}O and d^{13}C isotope signals of the surface, subsurface and benthic taxa covering a time span of about 800 kyr around the LDE. Trends of both d^{18}O and d^{13}C of planktic and benthic foraminifera show negative shifts at the onset of the LDE. A 0.6 ‰ decrease within 100 ky in planktic oxygen isotope data suggest a temperature rise of $\sim$3 to 3.5˚C, whereas benthic foraminifera bottom water temperatures confirm a $\sim$2˚C rise as measured at Site 1209. In general the planktic isotope data display some scattering and are noisier than the benthic values. We tentatively infer that the amplitude in δ^{18}O data for surface and subsurface dwellers is about 0.2 ‰ larger than our benthic record, while for δ^{13}C the same is only the case for subsurface dwellers. In general, δ^{13}C changes are more abrupt and pronounced than δ^{18}O changes at the base of the LDE. Dissolution according to planktic foraminiferal fragmentation, P/B-ratios and coarse fraction can be considered to be minor during the LDE, but moderate drops in preservation have been observed about 300 kyr before and 350 kyr after the main event peak. Planktic foraminiferal fauna shows distinct changes during the onset of the LDE, especially species of *Praemurica*, which disappear shortly before the event, whereas *Igorina albeari* increases from 'few' to 'abundant' within the first Fe XRF LDE peak. *Morozovella angulata* follows a slow but constant rise, while *M. praeangulata* shows the opposite pattern.

Bornemann, A., et al. (2009), J. Geol. Soc. 166, 1135-1142.

Westerhold, T., et al. (2011), Paleoceanography 26, doi:10.1029/2010PA002092.