

## The Latest Danian Event along a paleobathymetric gradient in the Nile Basin (Eastern Desert, Egypt)

J. Sprong<sup>1</sup>, Tanja J. Kouwenhoven<sup>1</sup>, A. Bornemann<sup>2</sup>, P. Schulte<sup>4</sup>,  
P. Stassen<sup>1</sup>, E. Steurbaut<sup>1,3</sup>, M. Youssef<sup>5</sup>, R.P. Speijer<sup>1</sup>

<sup>1</sup>Dept. of Earth and Environmental Sciences, Leuven University, Leuven, Belgium

<sup>2</sup>Institute of Geophysics and Geology, Leipzig University, Leipzig, Germany

<sup>3</sup>Royal Belgian Institute of Natural Sciences, Brussels, Belgium

<sup>4</sup>GeoZentrum Nordbayern, Universität Erlangen-Nürnberg, Germany

<sup>5</sup>Geology Department, Faculty of Science, South Valley University, Qena, Egypt

The Latest Danian Event (LDE; Bornemann et al. 2009) in the Nile Basin is characterized by an anomalous lithology and geochemistry, a negative  $\delta^{13}\text{C}$  shift and a peculiar succession of benthic foraminiferal faunas. In the field the LDE is commonly developed as a couplet of a purplish-brown marl bed and a black shale bed intercalated in the Dakhla Formation, with a total thickness of 5–25 cm. The lower LDE bed has a laminated texture and contains abundant pyritic molds, fish remains and coprolites; together with absence of benthic microfossils evidencing anoxia at the sea floor. We studied benthic foraminifera in five sections along a paleobathymetric transect ranging from middle-outer neritic to bathyal paleodepths. In all sections the lower LDE bed is barren of benthic foraminifera, whereas the upper bed records an incursion of a low-diversity benthic shallow-water assemblage dominated by *Neoeponides duwi*. The LDE appears to be related to the rapid transgressive phase after the lowstand of a regional (global?) sea-level cycle, causing anoxia at the sea floor. The presence of *N. duwi* and the associated assemblage, earlier interpreted as shallowing, is more likely explained by this shallow-water assemblage migrating to deeper waters, thereby filling niches temporarily vacated by other taxa. The correlative occurrence of a 1–2 per mil negative  $\delta^{13}\text{C}$  excursion in several Egyptian sections as well as in the eastern Atlantic (Zumaia, Spain: Arenillas et al., 2008; Bornemann et al., 2009) and in ODP Hole 761B offshore NW Australia (Bornemann et al. 2009; Quillévéré et al., 2002) in concert with micropaleontologic, geochemical and sedimentological characteristics suggest a perturbation of the global carbon cycle characteristic of a hyperthermal event. The latter is supported by deep-water warming at Shatsky Rise, ODP 1209, in the Pacific Ocean (Westerhold et al., in rev.). This would also explain why the record bears strong similarities with the PETM in Egypt (see poster by Stassen et al., CBEP 2011).

### References:

- Arenillas, I., Molina, E., Ortiz, S., Schmitz, B., 2008. Foraminiferal and stable isotopic event stratigraphy across the Danian–Selandian transition at Zumaya (northern Spain): chronostratigraphic implications. *Terra Nova* 20, 38–44.
- Bornemann, A., Schulte, P., Sprong, J., Steurbaut, E., Youssef, M., Speijer, R. P., 2009. Latest Danian carbon isotope anomaly and associated environmental change in the southern Tethys (Nile Basin, Egypt). *Journal of the Geological Society* 166, 1135–1142.
- Quillévéré, F., Aubry, M.-P., Norris, R.D., Berggren, W.A., 2002. Paleocene oceanography of the eastern subtropical Indian Ocean: an integrated magnetostratigraphic and stable isotope study of ODP Hole 761B (Wombat Plateau). *Palaeogeography, Palaeoclimatology, Palaeoecology* 184, 371–405.
- Westerhold, T., Röhl, U., Donner, B., McCarren, H. K., Zachos, J. C., in review. A complete high-resolution Paleocene benthic stable isotope record for the central Pacific (ODP Site 1209). *Paleoceanography*.