Foraminiferal stable isotope record from the northeastern Peri-Tethys during the Palaeocene-Eocene Thermal Maximum (PETM)

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The PETM was accompanied by a global warming of 5-8°C. It was characterized by an intense dissolution of carbonate sediments and a significant global excursion in the $^{13}C/^{12}C$ ratio. The PETM is of significant interest because the magnitude and the rate of C release during the PETM are considered to be analogous to that from human burning of fossil fuels, as well as other potential similarities between the PETM and current climate change. One of these is the effect of global and regional climate perturbations on biota. Currently, there is a paucity of PETM records that integrate environmental and palaeontological data from shallow-marine settings. This study investigates the effect of environmental changes on the assemblages and stable isotope compositions of planktonic and benthic species of foraminifera in northern Caucasus, southern Russia. The section contains sedimentary sequences that span the PETM and are dominated by shallow marine carbonates accumulated in northeastern Peri-Tethys.

Our micropalaeontological data show that the initial stages of the negative $\delta^{13}C$ shift in *Subbotina*, *Cibicidoides* and *Nuttallides records* was marked by a decline in foraminiferal concentrations. This was followed by a sharp increase in the abundance of planktonic genera *Subbotina*, *Morozovella*, and *Acarinina* excursion taxa, and the expansion of *Lenticulina* within the benthic population. Further up the section, the $\delta^{13}C$ shift was accompanied by a greater proportion of warm-loving *Morozovella* and *Acarinina.* These patterns in species assemblages, however, were not accompanied by significant negative shifts in $\delta^{18}O$ of planktonic and benthic species, with the exception of *Cibicidoides*, which showed *c.* 0.5-1‰ decrease in $\delta^{18}O$. This suggests that changes in foraminiferal assemblages in the shallow-marine northeastern Peri-Tethys were unlikely to have been caused by an increase in water temperature. Instead, other environmental factors, e.g. water column oxygen levels, salinity, pH could have been more important.