Geophysical Research Abstracts
Vol. 19, EGU2017-8801, 2017
EGU General Assembly 2017

Ostracod stable isotope ratios indicate marine incursions in the Dacian Basin during the Upper Miocene and Pliocene

Alina Floroiu (1), Iuliana Vasiliev (1,2), Marius Stoica (1), Christiaan van Baak (3), Arjan de Leeuw (4), Wout Krijgsman (3), Andreas Mulch (2,5)

(1) Faculty of Geology and Geophysics, Bucharest University, Tectonics and Environmental Geology, Geology, Bucharest, Romania (iuli.iuliana@yahoo.com), (2) Senckenberg Biodiversity and Climate Research Centre BiK-F, Senckenberganlage 25, D-60325 Frankfurt am Main, Germany, (3) Paleomagnetic Laboratory Fort Hoofddijk, Budapestlaan 17, 3584 CD Utrecht, The Netherlands, (4) CASP, 181A Huntingdon Road, CB3 0DH Cambridge, United Kingdom, (5) Institute for Geosciences, Goethe University Frankfurt, Frankfurt am Main 60438, Germany

The Dacian Basin (Romania) was part of the former Paratethys Sea that stretched over Eurasia during the Miocene to Pliocene. During that time connection of the Paratethys to the open ocean was highly variable which hampers the correlation of regional and global climatic and biotic events. Additionally, the high degree of endemism typically limits the possibility for oxygen and carbon isotope comparisons on foraminifera. Here, we present the first stable ostracod isotope (δ^{18}O and δ^{13}C) data of the Dacian Basin covering the latest Miocene to Pliocene. Next to mollusks, ostracods currently provide the only continuous biogenic carbonate record in the Dacian Basin. The high-resolution ostracod δ^{18}O and δ^{13}C data were obtained from the well-dated, thick Slanicul de Buzau section (e.g. van Baak, et al., 2015) and compared to the strontium isotope data from the same section (Grothe et al., 2016). To minimize the effects of species-dependent biosynthetic fractionation on the δ^{18}O and δ^{13}C values we target single specimen measurements, preferentially on *Cyprideis* sp.,and *Tyrrhenocythere* sp. Collectively, these data provide a first-order reconstruction of the most significant changes affecting the basin during the 6.3 to 3.3 Ma time interval. The δ^{18}O and δ^{13}C records from Slanicul de Buzau show both very large variations attaining up to 13‰ (from around -11‰ to 2‰) over the sampled 3 Myr interval. Such large changes cannot be explained only by interspecies dependent variations in the biosynthetic fractionation. More likely, they indicate important changes in δ^{18}O of Dacian Basin water and carbon cycling. In particular, two intervals have much higher δ^{18}O values (attaining up to 0 and +2 ‰) when compared to the rest of the record. The first occurs at ~5.4 Ma and coincides with the 'Bosphorian Flood', an interval that is also marked by elevated ^{87}Sr/^{86}Sr values close to those recorded in the oceanic waters at that time (Grothe et al., 2016). We interpret this interval as a time when an influx of saltier, possibly also warmer water, affected the Dacian Basin. The second one, at around 3.4-3.3 Ma, is also marked by somehow higher ^{87}Sr/^{86}Sr. Because the timing of this younger interval with higher δ^{18}O values coincides with the Mid Pliocene Warm period we speculate that an influx of warmer, possibly also saltier water, affected the Dacian Basin at that time. The δ^{13}C data do not follow the δ^{18}O record. At 5.5 Ma (during the 'Bosphorian Flood') the highest δ^{13}C values are recorded (+2 ‰). After this interval, until the end of our record at 3.3 Ma we observe a consistent decrease in the δ^{13}C values (up to -11 ‰). We interpret this δ^{13}C decrease as a steady change in the environmental conditions of the Dacian Basin, from more eutrophic at 5.5 Ma to more oligotrophic towards 3.3 Ma.