



## **The Cretaceous-Tertiary boundary in the East Carpathians, Romania: geochemical, mineralogical and nannoplankton evidence**

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The Eastern Carpathians represent an uplifted fold-and-thrust belt attached to a Neogene volcanic arc, which provided sediments both to the Transylvanian and foredeep basins. The mountain chain is mainly composed of Cretaceous and Tertiary sediments. In this study, we present detailed investigations concerning the Cretaceous-Tertiary transition for two different sections. One of them occurs in marine red beds belonging to the Gura Beliei Formation, which crops out south of the Pietroșița locality, in the bend zone of the Eastern Carpathians. The second section, near Voroneț village is situated in the northern part of the Eastern Carpathians, and covers the transition from the Inoceram Formation to the Izvor Formation .

For this study, for both sections samples spanning the latest Maastrichtian-earliest Paleocene interval were analysed. The new investigations are represented by carbon isotope fluctuations in separated organic material, TOC (total organic carbon) content, qualitative and quantitative mineralogy and calcareous nannoplankton. Isotopic analyses were performed on organic material according to the methods described by Teece and Fogel, 2004. The results of the stable isotope analyses are reported in per mil to PeeDee Belemnite Standard (PDB). For mineralogical analysis, quantification was done as described by Srodon et al. (2001) with ZnO as the internal standard. For calcareous nannofossil investigations, smear slides were prepared directly from the untreated material, in order to retain the original sample composition. Both qualitative and semiquantitative investigations were carried out. The taxonomic calcareous identifications follow Burnett (1998). To accomplish the semiquantitative calcareous nannoplankton analyses, 300 specimens were counted in each smear slide under a light microscope at 1600x magnification.

For both sections, the analysed sequence shows that the upper Maastrichtian is a lowstand system tract that comprises several fluctuations. The presence of smectite throughout the section indicates the absence of a strong diagenetic overprint. For Ialomița sections, the correlations between the negative carbon isotope excursions, for carbonates and organic material, the low carbonate content and the drop in the nannoplankton diversity (i.e. the nannofloral mass extinction mirrored in the disappearance of around 90 % of Cretaceous taxa) indicate a sharp drop of the productivity at the Cretaceous/Tertiary boundary with a slow recovery in the lowermost Paleocene sediments. The boundary layer is marked by a peak in clay content peak, followed by positive peak in quartz and feldspar content. Additionally, three rodcosite-rich levels occur in the K/T transition interval characterized by low organic content, and lower  $[U+F064]$   $\delta^{13}C$  values reaching  $-28\text{‰}$  for the organic material. The second section shows a similar mineralogical composition and value of TOC. In contrast the  $[U+F064]$   $\delta^{13}C$  value of the organic material are generally lower (mean value  $-26\text{‰}$  and show not a negative excursion at the boundary.

The youngest bio-events recognized are represented by four earliest Danian successive blooms, such as two abundance peaks of the calcareous dinoflagellate genus *Thoracosphaera*. This taxon usually blooms in unstable environmental conditions at surface waters (Lamolda et al., 2005). The peaks of *Thoracosphaera* are intercalated with two blooms of the nannofossil *Braarudosphaera bigelowii*, taxon that survives at high salinity fluctuations.

### References

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