ILP 16th Sedimentary Basins
GEOSCIENCE Symposium 7th
6-7 October 2022
Bucharest

MID CRETACEOUS ANOXIC AND OXIC PALAEOSETTINGS IN THE EASTERN CARPATHIANS

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ABSTRACT

The Cretaceous was an Earth period containing most of the known global Oceanic Anoxic Events (OAEs), with a short duration (up to 500 Ky); their main features are the lithological overprint, expressed in the black shale occurrence and significant fluctuations of isotope $d^{13}C_{org}$ values. Globally, these events led to the instauration of a greenhouse climate mode. A high frequency of OAEs is placed within mid Cretaceous times, in the Aptian-Turonian interval, but these events were described also in the Early Cretaceous, i.e., Valanginian and Barremian, and in the Upper Cretaceous, the newest discovery being the Santonian-Campanian Boundary Event. The timing of globally distributed OAEs is in general coincident with the emplacement of large igneous provinces, suggesting that their deposition was induced by a high volcanism.

In the outer part of the Eastern Carpathians, the thin-skinned nappes expose rich-organic black shales. Their occurrence mirrored the palaeogeographic setting of the Moldavide basin, i.e., some continental ridges with limited circulation during the Early Cretaceous. This feature determined the occurrence of an anoxic sedimentation, which lasted more than 20 Ma (from the Valanginian stage up to the Albian). This anoxic interval, distributed on large areas of the Carpathian bend (i.e., Poland, Slovakia and Ukraine), is not correlatable with global Cretaceous Oceanic Anoxic Cretaceous Events, and might be regarded as regional rather than global. Taking into account this depositional characteristic, it is difficult to point out a global oceanic anoxic event in an anoxic basin as the one of the Moldavides. However, in the innermost (western) part the Moldavide, within the Teleajen Nappe, the sedimentation was not fully anoxic, as rich-organic black shales deposited only in short intervals, mostly during the Valanginian-Barremian. Starting from the uppermost Albian, the anoxic deposition of the whole Moldavide basin shifted to a dysoxic one and eventually to an oxic sedimentation, reflected in the occurrence of red marine hemipelagites and turbidites. This work presents the identification of the mid Cretaceous OAEs in the Eastern Carpathians. The shift from an anoxic setting to an oxic one, causes and consequences, are also discussed herein.