

Sedimentary, geochemical and biological record of the Cretaceous Anoxic Events in the Pieniny Klippen Belt, Polish Carpathians

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The Pieniny Klippen Belt represents a long, narrow, arch – like structure situated between The Inner and the Outer Carpathians.

The Cretaceous Oceanic Anoxic Events (OAE) have been recorded within the Pieniny rock successions as the grey and brownish black, organic carbon – rich sediments.

The Kapusnica Formations dated as Aptian – Albian is composed of carbonate mudstones and cherts. The Cenomanian – Turonian Magierowa Member consists of alternating beds of laminated black shales and bioturbated, green mudstones.

Biostratigraphic data enable assign them to the following zones: *Rotalipora ticinensis*, *R. appenninica* and *R. cushmani*.

Organic matter – rich sediments have been correlated with sea – level rise episodes, produced probably by an increased rate of sea floor spreading. Intensive volcanism and excessive CO₂ supply seem to be caused of the Mid – Cretaceous greenhouse effect.

The combined study of mentioned sediments shows:

- 1) lamination and fractionation,
- 2) increasing TOC,
- 3) trace – elements enrichments,
- 4) positive excursion $\delta^{13}C$,
- 5) extinction rate of planktonic foraminiferids reaching 50 – 70 %, while the extinction of benthic fauna was as high as 90 %.

A huge amount of terrigenous material was transported into the Pieniny Basin by the rivers and wind, during the Mid - Cretaceous time span. Occasionally, “plankton blooms” have caused supply of the marine organic matter into sediments.

The Kapusnica Formation was probably deposited rapidly, in oxic environment, while deposition of the Cenomanian – Turonian sequence took place under cyclic alternating (anoxic – euxinic) conditions.