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Eocene seismicity and paleogeography of the Central Crimea

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The nature of Cretaceous-Eocene boundary is one of the outstanding questions of Crimea Geology. The new data are presented to show that the Cretaceous-Eocene boundary can be established in the Central Crimea very accurately by using the method of quantitative genetic analyses including the Isotope Geochemistry. Integrated lithostratigraphic investigations and Isotope composition of Carbon/Oxygen were conducted on the Cretaceous -Eocene section of the western slope of Ak-Kaya mount (Belogorsk, Crimea). Four layers of different types of rocks were investigated, where the layer 1 and 2 belong to the Maastrichtian, 3 and 4 to the Eocene.

The top of the Maastrichtian layer is characterized by a differently oriented fracture system, including large paleoseismic dislocations or a seismogenic trench. The fracture networks are connected and filled with material similar to the Eocene basal horizon including fragments of various sizes of Maastrichtian rocks.

Five microfacial types of the collected rock samples were distinguished as a result of microscopic examination. Also X-ray phase analysis, $\delta^{13}C$ and $\delta^{18}O$ isotopic analysis and X-ray fluorescence analysis were made to specify and compare the mineral composition of Maastrichtian and Eocene rocks. These analyzes allowed to specify paleogeographic conditions. In addition, measurements of fractures in the Cretaceous–Eocene boundary deposits were made to determine the stages of deformation of the whole structure.

As a result of the research, it was obtained:

1) throughout the entire studied geological interval, sedimentation occurred in a shallow sea of normal salinity. However, conditions were probably more humid in the Eocene, based on lower salinity values.

2) Three major stages of deformation were identified: pre-Eocene, Eocene, and post-Eocene.

3) The average temperature of the formation of Maastrichtian rocks is 19-22°C, and Eocene rocks is 24-27°C. The increase in temperature up to 38°C during the formation of the Eocene basal

horizon may be associated with the global climatic event EECO (Early Eocene Climate Optimum). The synchronicity of the formation of steep submeridional fractures and the basal horizon of the Eocene has been proved. It is shown that the Eocene deformation stage corresponds to the formation of paleoseismic dislocations during the main phase of tectonic activity in the Pontids (Eastern Turkey).