Corrosion of heavy minerals in the middle Campanian siliciclastic deposits of SE Poland – environmental implications

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The Campanian and Maastrichtian (Upper Cretaceous) deposits of the Roztocze Hills, represented mainly by opoka, sandy opoka, gaize or sandy limestone have been consequently considered to represent relatively deep, shelf type deposits. In the so far interpretations, the studied opoka-like facies were located close to the axial part of the Danish-Polish Trough, which has usually been equated with its deepest part, with main transport direction along its axis. The current studies covering the "middle/upper" Campanian deposits showed unexpected sedimentological features, which are in contrast to the supposed deep-sea depositional environment and can be attributed to cyclic, deltaically influenced sedimentation (REMIN et al., 2015; WALASZCZYK & REMIN, 2015). Here we present preliminary results of microscopic analysis of heavy and light minerals coming from the middle Campanian deposits of the SE Poland.

Amongst the analyzed heavy and light minerals, considerable variability in the degree of weathering (mechanical and chemical) is observed. Even within a single sample, the state of preservation of heavy "ultrastable minerals" (e.g. zircon, rutile, tourmaline) varies markedly. Surprisingly, in the studied sediments we observed co-occurence of "ultrastable minerals" with well-preserved minerals susceptible to chemical and mechanical weathering, i.e. feldspars (microcline), pyroxenes (augite) and amphiboles (hornblende). Glauconite content changes within the cyclothems, always rising up-section with the highest content in the gaize part of the cyclothem.

The results indicate that the terrigenous material in the cyclic middle Campanian deposits of SE Poland originated from various sources. One of the sources was most likely "old" sediments, repeatedly redeposited and subjected to long-term weathering. The second source must have to be represented by fresh weathered zones, which were the source of minerals susceptible to weathering and simultaneously with low degree of chemical weathering.

Such an association of heavy and light minerals in the studied sediments, together with their various degree of weathering, indicates changing climatic conditions that additionally influenced the sedimentological processes. The current interpretations pointing to warm or subtropical climate seems to confirm this (e.g. CIEŚLIŃSKI, 1964; HALAMSKI, 2011).

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