The earliest Cretaceous carbonate platform destroyed by volcanism from the Ukrainian/Romanian Carpathians – reconstruction based on microfacies

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There is a unique tectonostratigraphic unit called Kaminnyi Potik occur in the Ukrainian-Romanian Carpathian transborder zone. In the Ukrainian part numerous outcrops of this unit can be observed in many streams near Rachiv city, but its most spectacular occurrence is in the Chyvchyn Mountains. The whole complex consists of volcanogenic-sedimentary rocks and is divided into two Berriasian formations: Chyvchyn and Kaminnyi Potik. In the section of the Chyvchyn Formation, at the base, there are pillow lavas (basalts and andesites/trachyandesites) and volcano-sedimentary breccia with clasts of lava, coral limestones and radiolarites (submarine debris flows), and peperites as well. The Kaminnyi Potik Formation is made up of fine-grained hyaloclastic and carbonate debris flows of a flysch character (including organodetrital limestones with fragments of: corals, bryozoans, echinoderms bivalves and foraminifera), which overlying breccias and coral limestones of the Chyvchyn Formation. The profile ends by thin-bedded cherty limestones.

The thin sections analysis revealed the following microfacies: oolithic-echinoderm packstone/grainstone; coral lithoclastic quartz packstone/grainstone; oolithic-lithoclastic wackestone/packstone; lithoclastic-echinoderm packestone; lithoclastic packestone; radiolarian echinoderm packestone; radiolarian wackestone; radiolarian-calpionellid wackestone and mudstone. Pyroclastic material is often present in the matrix.

The ooids observed in the thin sections and the remains of fauna such as corals, echinoderms and bivalves suggest that the original material came from a carbonate platform that was sheltered by a coral reef. As a result of volcanic eruptions and possibly accompanying earthquakes, the platform has been destroyed and its traces are visible in clasts. Sedimentological character of submarine debris flows, (e.g. fractional graiding, mixture of shallow-water fauna and lithoclasts with deep-marine microfauna (radiolarians and calpionellids) and hyaloclastic material present in the matrix document short-term episodes of a catastrophic nature, leading to the redeposition of shallow-water sediments to the deeper parts of the basin.

eISSN 2353-3641 | ISSN 1731-0830