

Middle to Upper Jurassic stromatactis mud-mounds in the Pieniny Klippen Belt, Carpathians

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Key-words: mud-mounds, stromatactis, carbonate sedimentology, Jurassic, Pieniny Klippen Belt, Carpathians.

Stromatactis mud-mounds are structures still enigmatic, despite of many years of research. Recently, most authors consider stromatactis mud-mounds to be fossil microbial reefs. Particularly enigmatic is the origin of stromatactis structures that appear to be the main megascopic component of the mounds.

Stromatactis mud mounds occur since Neoproterozoic time and reach their maximum in Palaeozoic, especially in Carboniferous and Devonian. Mesozoic examples are rare. They were reported mostly from Jurassic; later examples are dobtfull. Our research concerns Jurassic stromatactis mud-mounds. To date, stromatactis structures were only reported from the Early Jurassic of the Upper Austroalpine of the Eastern Alps, Early Jurassic of Sicily, Oxfordian mud-mounds of southern Germany, offshore Nova Scotia, Oxfordian of Cracow Upland, Poland and Lower Kimmeridgian of southern Portugal. Recently, Middle- and Upper Jurassic stromatactis mud-mounds were found in the Czorsztyn Unit of the Pieniny Klippen Belt in Slovakia and Transcarpathian Ukraine: Slavnické Podhorie, Štepnická Skala, Babiná, Kyjov-Pusté Pole, Priborzhavskoe and Velyky Kamenets. Stratigraphic range of the mounds is Bajocian to Lower Tithonian. Geometry of the mounds could only be studied at Štepnická Skala, Priborzhavskoe and Velyky Kamenets, where flat mound shapes are revealed. Other outcrops show only fragments of the mounds or their shape is merged with the surrounding rocks. Rocks of the mounds are mostly micritic to micropeloidal mudstones, containing fauna of pelecypods, brachiopods, ammonites and crinoids.

All the occurrences are characterized by mass occurrence of stromatactis structures. In some of them (Slavnické Podhorie, Priborzhavskoe and Velyky Kamenets), the stromatactis cavities occur also in the crinoidal limestones underlying the mud-mounds which is an atypical feature.

Only three sites investigated by us involve considerable portion of sponge spicules in the mound matrix which contradicts to a theory favouring sponges as stromatactis builders. There was no discernible type of biota that might serve as being responsible for the stromatactis structures. Also biota itself is variable. The Bajocian to Callovian mounds contain more benthic biota, e.g. brachiopods, bivalves, sponges, agglutinated foraminifers *etc.*, although biota as a whole was dominated by planktonic representatives, as shells of *Bositra* bivalves. The Oxfordian and younger occurrences were fully dominated by planktonic biota, e.g. planktonic foraminifers *Globuligerina*, planktonic crinoids *Saccocoma*, ammonites, shells of *Bositra* or coccal algae *Globochaete alpina*. The latter type also lacks micropeloidal matrix which is ubiquitous in the first type. The micropeloidal to clotted structures are usually attributed to be typical for microbialites.