Abstract

The microbial endoliths study from the Western Carpathians region was a semi-quantitative survey that included six sampling localities. Samples, ranging from Upper Oligocene to Miocene (Serravalian), came from three localities in Czechia (Mikulov, LOM-1 and Hevlín), two in Slovakia (DNV and LKŠ) and one place in Hungary (Tard Clays, Rozalia Quarry). The main goal of this project was to verify how different levels of hypoxia, established for studied intervals, would affect the microendolilthic assemblages present in tests of benthic foraminifera. Additionally, microbial activity and byproducts, and the overall interplay between bioerosion and bioprecipitation are also analysed. The degree of hypoxy was established using ratio of oxic/dysoxic and hypoxic foraminifera, defined as Benthic Foraminifera Oxygen Index (BFOi) Sampled index shows a predominance of dysoxic indicators, with rare oxic elements. Secondary electron elemental analysis (EDX) reveals a significant enrichment of sulphur, phosphorus and iron in biofilm samples from DNV and Hevlín, when compared to the rock matrix surrounding it. Resin casts reveal a predominance of Dysphotic to Deep Euphotic zones ichnocenosis, with a predominance of Chlorophyte, Rodophyte and heterotroph burrows. Few representatives of Cyanobacteria traces, such as *Euygonum nodosum* and *Scolecia filosa* are present on tests transported from well-oxygenated photic zones, in DNV. Framboidal pyrite from all samples, except for Mikulov, have an isotopic trace ($\delta^{34}S$) compatible to a biogenic deposition, while the vestiges of biofilms surrounding grains of framboidal pyrite is another evidence of their bacterial origin. Raman spectrometry of the biofilms have shown similarities with bacterial pigments. In summary, multiproxy analysis showed changes of microbial activity in relation to decreasing oxygen content, and allowed to identify allochthonous foraminiferal tests, transported from a shallower environment in this case.

Euendolithic assemblages in benthic foraminifera from Sassnitz, Lower Maastrichtian, were investigated in order to broaden the knowledge of a classical region for the ichnological studies. Ichnocenosis shows a typical composition of Deep Euphotic paleobathymetrical zone, including the index elements: *Rhoupala catenata*, *Ichnoreticulina elegans* and Conchocelis, a developmental stage of the Rhodophycean algae Porphyra. In this work a new ichnospecies of Saccomorpha is described, a sign that more ichnological studies are still applicable to the Boreal Realm.

The study on microboring from Barrandian area, was a survey over 792 thin sections, clasts and shells from Ordovician to Middle Devonian of Prague Basin. The aim of the study was to verify the effects of paleoenvironmental and taphonomic factors affecting the distribution of microboring during this interval. The first register of microbial activity is a micrite envelope around brachiopod shells, from Letná Formation (Upper Ordovician). From the Ordovician to the lowermost Devonian, only rare microbioerosion, produced by bacteria and/or microfungi, were recorded. For the Upper Silurian Kopanina Formation (Ludlow) the first evidence of microendolithic activity are organodendritic structures evidenced by thin sections. Devonian representatives are found in crinoid columns, shells and bioclasts and are more abundant in petrographic slides. Results showed an increase of microboring abundance, and a change in the boring tendency from the surface of clasts to the interior of substrates. It may be explained by global trends of microbial evolution in the Early Paleozoic, in synergy with local factors. By local factor it can be cited the drift of Prague Basin to subtropical latitudes (Silurian) and finally tropical zones (Devonian), the increase of oxygen content on the seafloor, and a gradual decreasing of available nutrients, from Lockovian to Emsian.