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Geochemical and mineralogical microbial signatures recorded within the condensed deposits of the Middle-Upper Jurassic transition on the Romanian territory

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Condensed deposits of the Middle-Upper Jurassic transition are exposed in different areas of peri-Tethyan Europe from Portugal, Spain, France, England Switzerland, Germany, Poland, and Hungary to Romania. The Middle-Upper Jurassic successions which belong to different geotectonic units from the Romanian territory exhibit signs of reduced sedimentation, omission, erosion, *in situ* reworking and synsedimentary cementation. These signs are represented by different types of discontinuities associated with intervals of stratigraphic condensation that are exposed in the next zones:
- South Carpathians: Rucăr-Bran area, Bucegi Mts. and Piatra Craiului Mts. that belong to the sedimentary cover of the Getic Nappe (Median Dacides, interpreted as parts of the strongly deformed European continental margin); Sviniţa zone that belongs to the sedimentary cover of the Danubian units, supposed to derive from the East European Plate continental margin, representing the most external Carpathian basement/cover unit (Marginal Dacides) and were originally part of the northwest Moesian foreland;
- North Apuseni Mountains: the Jurassic sequences from the Vadu Crişului area that belong to the sedimentary cover of the Bihor Unit, one of the major geotectonic units of the Inner Dacides, interpreted as parts of the strongly deformed Foreapulian (Tisia) continental margin;
- Central Dobrogea: representing an easternmost segment of the Moesian Platform.
The aim of the present paper is to reports new data concerning the geochemistry and mineralogy of ferruginous microbialites associated with the Bathonian-Callovian condensed units and to assess the possible microbial origin of these structures. Moreover, these new data add to our knowledge regarding the occurrence of ferruginous microbialites recorded in relation to different stratigraphic discontinuities and condensed sequences within the northern peri-Tethyan area during the Jurassic.
The compositional features of the Fe-microbialites forming the macro-oncoids cortex and covering the discontinuity surfaces located on the top or toward the upper part of a heterochronous condensed beds are presented. The investigated discontinuities are heavily mineralized with Fe oxyhydroxides. The chemical composition of the crusts is mainly dominated by Fe_2O_3, which reaches high values. Other identified components include CaO, SiO_2, MgO, Al_2O_3, P_2O_5 with low amounts of MnO. Mineralogical data indicate that the Fe-microbialites are mostly composed of goethite, hematite, calcite and magnetite. The XRD patterns obtained from oriented aggregates showed the presence of clay minerals such as illite, kaolinite, chlorite and montmorillonite. $\delta^{13}C$ and $\delta^{18}O$ records have been analyzed to reconstruct diagenetic processes. We performed the iron isotopes, trace and rare earth elements to

decipher whether the ancient microbial consortium including iron-oxidizing bacteria, could be considered as the primary producers. The Fe-microbialites and macro-oncoids cortex yield a large range of $\delta^{56}Fe$ values, from -0.76 to +0.66‰ but contain predominantly positive values indicating that there was partial Fe(II) oxidation maintained by the iron-oxidizing microbial consortium. Such studies are of importance as they could reflect the effects of the regional and global changes documented for the Middle-Late Jurassic time interval in different settings of the peri-Tethyan areas.

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