

PALEOENVIRONMENT AND ASSOCIATED FOSSILS IN THE BRAD JASPER (MIOCENE) FROM THE SOUTHERN PART OF THE APUSENI MOUNTAINS

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The origin of the Brad Jasper, one of the well-known gem resources in Romania, can be better explained due to the recent high-resolution investigations. The jasper probably occurred by precipitation of silica from the hot springs associated to the volcanic activity, in a shallow-water environment. The metasomatic processes are also involved in the genesis. Microcrystalline quartz (chalcedony) and opal dominate the mineral composition of the jasper. The environment conditions and the variable SiO₂ and Fe₂O₃ contents influenced its red, orange, white, blue-gray and black colors. Although the stratigraphic position of the unit was disputed before, the presence of the marine fossils (radiolarians, foraminifera, gastropods and calcareous nannoplankton) confirm the Badenian (Middle Miocene) age. The Miliolid foraminifera and gastropod species are epiphytic, this fact suggesting the presence of widespread nearshore algal vegetation, developed in a lower salinity environment. They are associated with diatoms, silicified wood, bacteria and fungi. Some portions of the section could suggest nearly freshwater or even temporarily subaerial conditions. Only the presence of radiolarian and calcareous nannoplankton specimens prove certain offshore influences on the local environment.