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Preliminary Study of the Hydrothermal Polymetallic Ore Deposit at the Karancs Mountain, North-East Hungary

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Abstract : The Karancs Mountain is part of the Miocene Inner Carpathian Volcanic Belt and is located in N-NE Hungary, along the Hungarian-Slovakian border. The 14 Ma old andesitic-dacitic units are surrounded by Oligocene sedimentary units (sandstone, siltstone). The host rocks of the mineralisation are siliceous and/or argillaceous volcanic units, quartz veins, hydrothermal breccia, and strongly silicified vuggy rocks, found in the various altered volcanic units. The hydrothermal breccia consists of highly silicified vuggy quartz clasts in quartz matrix. The hydrothermal alteration of the host units shows structural control at the deeper levels. The main ore minerals are galena, pyrite, marcasite, sphalerite, hematite, magnetite, arsenopyrite, anglesite and argentite The mineralisation was first mentioned in 1944 and the first exploration took place between 1961 and 1962 in the area. The first ore geological studies were performed between 1984-1985. The exploration programme was limited only to surface sampling; no drilling programme was performed. Petrographical and preliminary fluid inclusion studies were performed on calcite samples from a galena-bearing vein. Despite the early discovery of the mineralisation, no detailed description is available, thus its size, characteristics, and origin have remained unknown. The aim of this study is to examine the mineralisation, describe the characteristics in detail and to test the possible gold content of the various quartz veins and breccias. Finally, we also investigate the potential relation of the hydrothermal mineralisation to the surrounding similar mineralisations with similar ages (e.g. W-Mátra Mountains in Hungary, Banska Bystrica, Banska Stiavnica in Slovakia) in order to place the mineralisation within the volcanic-hydrothermal evolution of the Miocene Inner Carpathian Belt. As first steps, the study includes field mapping, traditional petrological and ore microscopy; X-ray diffraction analysis; SEM-EDS and EMPA studies on ore minerals, to obtain mineral chemical information. Fluid inclusion petrography and microthermometry and micro-Raman-spectroscopy studies are also planned on quartz-hosted inclusions to investigate the physical and chemical properties of the ore-forming fluid.

Keywords : epithermal, Karancs Mountain, Hungary, Miocene Inner Carpathian volcanic belt, polimetallic ore deposit
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