MINERALOGY, PETROGRAPHY AND ORIGIN OF A HYDROTHERMAL BRECCIA IN THE RECSK PORPHYRY-EPITHERMAL ORE COMPLEX, ILONA VALLEY, PARÁD (NE-HUNGARY)

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The Recsk Igneous Complex is the north-easternmost member of the Palaeogene magmatic range along the Periadriatic-Balaton Lineament (MOLNÁR, 2007). It is located in the north-eastern forelands of the Mátra Mountains, NE-Hungary. In this complex, four volcanic and three related intrusive stages were distinguished by FÖLDESSY *et al.* (2008). The focus of this study was a hydrothermal breccia dyke, located in the Ilona Valley (south of Parád village, in the Recsk Orefield). The host rock of the dyke is a dacite tuff, which formed in the second phase of the Palaeogene volcanism in this area. An interesting aspect of this hydrothermal breccia is that – as MOLNÁR *et al.* (2008) showed by K-Ar studies – its age is Lower Oligocene, which finding opens up a new ground of geological evaluation of the Recsk porphyry-epithermal system.

Following the fieldwork, macroscopic and microscopic observations together with XPD, Raman-spectroscopy and SEM+EDS analyses were carried out in order to characterize the hydrothermal breccia.

Four main types of fragments were detected in the breccia, all of which have suffered a strong hydrothermal alteration. The most abundant clasts are round, intensively altered (to clay minerals and adularia) andesite fragments with 1.5–3 mm size, probably representing the first stage submarine lava flows of the volcanic complex. The second group of fragments consists of mostly argillitised-silicified dacitic tuff (>3 cm size) and idiomorphic feldspar crystals, representing fragments of the host dacitic tuff. Rarely occurring coarse-grained fragments of diorite/quartz-diorite clasts had probably originated from the subvolcanic intrusion below the volcanic sequence. Completely sericitic-silicic fragments with relict sedimentary texture were also recognized probably originating from the basement sedimentary units. The matrix consists mostly of hydrothermal quartz and sericite, however, adularia also occurs. Disseminated pyrite is abundant in both the matrix and the rock fragments, while a small amount of sphalerite is present in the former, and galena occurs in the latter one. Anatase is a common hydrothermal accessory mineral in the andesite fragments, mostly replacing feldspar together with pyrite, but it is completely absent in the matrix and in the other fragments. In addition to these minerals, barite, zircon and monazite fragments were detected in the andesite by the SEM.

According to these results, the hydrothermal breccia dyke most likely started its way from the depth of the basement sedimentary rocks and the subvolcanic intrusion and cut through the first and second phase volcanic rocks. The observable alteration- and partly the ore mineral paragenesis imply, that the formation of the breccia can be related to a low-sulphidation (LS) epithermal system, which is also supported by the previous work of MOLNÁR *et al.* (2008). In contrast, the occurrence of barite and anatase is characteristic to more acidic environments (HEDENQUIST & ARRIBAS, 1999). Three kinds of environments could be assumed for the presence of this kind of acidic fluids: 1.) the deeper part that belong to the subvolcanic intrusion of the system, 2.) a shallower environment, the high sulphidation-type epithermal part, or 3.) a steam heated zone, representing also a shallower part of the system. The known geological background supports shallower depth for the processes that happened during the earlier stages of the evolution of the volcanic sequence. This phenomena – effecting only on the older rock fragments of the breccia – is newly discovered in the area of Parád and is almost completely overprinted by the products of the LS-system.

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