BRECCIA AND VEIN STRUCTURES IN CARNIC MASSIF, ROSIA MONTANA ORE DEPOSIT, APUSENI MOUNTAINS, ROMANIA

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Roşia Montană has been considered a low-sulphidation epithermal ore deposit (Mărza et al. 1997, Tămaş and Bailly 1998; 1999, Tămaş 2002) spatially and genetically related to a Neogene dacite intrusion. Various types of ore bodies occur at Roşia Montană (veins, stockworks, breccias, impregnations, and placers). This study is focused on breccia and vein structures from Cârnic massif as well as on their relationships. Even if the breccia structures presented here are smaller and less important in respect to the better known and widely studied Cetate breccia body from Cetate massif, they provide additional evidences concerning the genesis and the controls of precious metal mineralisation from Roşia Montană.

The Corhuri breccia pipe, located in Cârnic massif, has been exploited both in a coranda (underground unsupported stope, tens of meters wide both horizontally and vertically), and a rooms and pillars zone. The room and pillars mining area has an elliptical shape, its size being approximately 125x110m. The access to this mining area is possible by a rib gallery on the 958m level.

Underground detailed mapping of the Corhuri breccia pipe structure (+958m mining level) allowed us to separate several types of breccias (descriptive): clast-supported breccias, open-space breccias, mosaic breccias, and matrix-supported breccias with coarse and fine matrix.

The mapping of the Corhuri breccia took into account several peculiarities of the main components of the breccias: rock fragments (lithology, shape, dimension, participation), matrix (composition, participation), and open spaces (dimension, filling, frequency). The key genetic descriptive features have been pointed out and consequently
two types of genetic breccias have been separated: phreatomagmatic and phreatic. The phreatomagmatic breccias have a greater spatial development covering almost entirely the rooms and pillars exploitation zone, while the phreatic breccias, which in fact reworked the pre-existent phreatomagmatic breccias, are developed predominantly along the contact of the phreatomagmatic breccia body with the dacite host rock.

The phreatic brecciation event delineated within the Corhuri breccia body post-dates the phreatomagmatic brecciation stage. The subsequent phreatic brecciation can be recognized both in the phreatomagmatic breccia body and in the host rock, too. The effects of the hydrothermal activity are reflected by the occurrence of superposed phreatic breccias onto phreatomagmatic structure, by the presence of phreatic breccia dykes and pockets in the dacite host rock, but also by the vein structures superposed on the phreatomagmatic breccia body.

The Cârnic II breccia is a phreatomagmatic breccia structure. This breccia body has been partially reworked by a later phreatic brecciation (Tâmaș, 2002). The phreatic manifestations are reflected in different ways within the pre-existent breccia body and the host rock. A phreatic rebrecciation has been produced along the northern contact of the phreatomagmatic breccia, while in the dacite host rock a vein structure has been emplaced (the so-called “Fortis vein”; Cauuet et al., 2002). This tabular mineralized structure represents a breccia dyke structure close to Cârnic II breccia pipe body, then it became a classic vein structure, and further on the vein is branching becoming a stockwork.

The mineralized structure mined in the Cârnic V Ancient mining site (Cauuet et al., 2002) is a branching zone of a vertical vein. The vein is mainly composed of quartz but microbreccia sequences (chingă) also occur. The dacite host rock is highly silicified only 40 – 50cm both sides outwards the vein and further on the dacite is free of silicification. Another structure mapped in the Cârnic V Ancient mining site is a 20cm-width barren breccia dyke. The contact of the dyke with the host rock is sharp. Its features proved the phreatomagmatic origin of this breccia body. Crosscutting relationships among the breccia dyke and the vein structures certify that the vein is younger.
Generally speaking, our researches carried out in Cârnic massif, Roșia Montană confirmed that irrespective of the size of phreatomagmatic breccias, this early stage of brecciation could be considered a "ground preparation" for the ore deposition. Later hydrothermal fluid flow has been focused mainly along the contacts of the phreatomagmatic breccias and through the coarse matrix zones.

References: