INITIAL RESULTS OF TEXTURAL AND FLUID INCLUSION ANALYSES OF GYŰRŰFŰ RHYOLITE FORMATION (PERMIAN, SW HUNGARY)

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Facies interpretation of volcanic rocks is of critical importance for the reconstruction of eruptive processes, particularly in ancient and sometimes strongly altered successions with limited outcrop. However, this is often a difficult task since some pyroclastic rocks such as high-grade ignimbrites and felsic lavas may develop similar textures during emplacement, cooling and post-depositional alteration.

In this study, we investigate drill cores and thin sections of the subsurface Permian volcanic rocks (Gyűrűfű Rhyolite Formation, boreholes D 9015, D 9018 and XV) from southern Transdanubia, Mecsek Mountains which represent a felsic igneous province in the post-collisional Variscan foreland. In the study area, the Gyűrűfű Rhyolite has been interpreted traditionally as a rather monotonous complex of lava flows.

The most conspicuous feature of the studied core samples is the apparent porphyritic texture comprising abundant, but unevenly distributed, mostly broken feldspar and quartz phenocrysts. An important indicator of volcaniclastic origin is, however, the presence of relict coarsely porphyritic pumice lapilli, which has been flattened during compaction. In thin section the studied Gyűrűfű samples are thoroughly recrystallised. Using cathodoluminescence (CL), however, recrystallised shards are clearly evident in the matrix showing original vitriclastic textures. Some shards have recognisable rod and bubble-wall shapes, but those at the edges of quartz and feldspar crystals are strongly deformed and indicate welding compaction. The formerly glassy shards show remnants of axiolitic devitrification texture. In the relict pumice clasts, the internal vesicular microstructure has been destroyed. The brown rims of pumice clasts show axiolitic and spherulitic devitrification. Their central parts consist of a mosaic of fine-grained quartz and feldspar. Axiolitic devitrification develops during primary cooling and crystallisation of hot volcanic glass, and is a good indicator of primary emplacement of volcaniclastic deposits. Our data show that previously identified lavas are best interpreted as ignimbrites and that, as a result, the importance of explosive volcanism has been underestimated in the western part of the Mecsek Mts.

With respect to the petrographic character of the fluid inclusion assemblages, the studied samples from drill core XV display very similar features. Fluid inclusions are situated along arcuate trails in fragmented quartz grains indicating the pervasive nature of parent fluids. The direct connection of these trails to fractures of fragmented quartz grains is obvious at some places. Thus it is plausible to interpret these inclusions to contain fluids present after deposition of the formation and responsible for the cementation of the quartz grains. According to our preliminary microthermometric results, fluid inclusions homogenize to the liquid phase in a range between 89 and 125 °C (N = 33) with a maximum between 98 and 103 °C which is a minimum of the fluid temperature. Assuming the percolative nature of the fluid, and thus low fluid-rock ratio, it is plausible to consider that the fluid temperature was governed by the rock itself. Thus the measured range of homogenisation temperatures is also a minimum for the igneous mass at the time of fluid entrapment. Final melting temperatures are in a range between -4.5 and -2.8 °C, consistent with salinities between 7.17 and 4.8% *w*NaCl equivalent. These measurements, however, were successful only in four inclusions due to prevalent metastable behaviour.

This research has been supported by the Hungarian Scientific Research Found (OTKA; No. PD 83511) and by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences (AV).